Hydrogeologic Characterization Report

Pickles Butte Sanitary Landfill

Volume 2: Appendix C (Soil Analytical Laboratory Report)

Prepared for **Pickles Butte Sanitary Landfill**
Canyon County, Idaho

April 25, 2014

Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

Laboratory Report for
Daniel B. Stephens & Associates, Inc.
Pickles Butte No-Migration Petition

Project No.: ES09.0154.12

April 12, 2012

Daniel B. Stephens & Associates, Inc.

5840 Osuna Road NE • Albuquerque, New Mexico 87109

April 12, 2012

John Kay
Daniel B. Stephens & Associates, Inc.
6020 Academy Rd. N.E.
Albuquerque, NM 87109
(505) 822-9400

Re: DBS&A Laboratory Report for Daniel B. Stephens & Associates, Inc. Pickles Butte No-Migration Petition ES09.0154.12

Dear Mr. Kay:

Enclosed is the final report for the Daniel B. Stephens & Associates, Inc. Pickles Butte No-Migration Petition ES09.0154.12 samples. Please review this report and provide any comments as samples will be held for a maximum of 30 days. After 30 days samples will be returned or disposed of in an appropriate manner.
All testing results were evaluated subjectively for consistency and reasonableness, and the results appear to be reasonably representative of the material tested. However, DBS&A does not assume any responsibility for interpretations or analyses based on the data enclosed, nor can we guarantee that these data are fully representative of the undisturbed materials at the field site. We recommend that careful evaluation of these laboratory results be made for your particular application.

The testing utilized to generate the enclosed final report employs methods that are standard for the industry. The results do not constitute a professional opinion by DBS&A, nor can the results affect any professional or expert opinions rendered with respect thereto by DBS&A. You have acknowledged that all the testing undertaken by us, and the final report provided, constitutes mere test results using standardized methods, and cannot be used to disqualify DBS&A from rendering any professional or expert opinion, having waived any claim of conflict of interest by DBS&A.

We are pleased to provide this service to Daniel B. Stephens & Associates, Inc. and look forward to future laboratory testing on other projects. If you have any questions about the enclosed data, please do not hesitate to call.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.
SOIL TESTING & RESEARCH LABORATORY

Joleen Hines
Laboratory Supervising Manager

Enclosure

Daniel B. Stephens & Associates, Inc.
Soil Testing & Research Laboratory
5840 Osuna Rd. NE
Albuquerque, NM 87109
505-889-7752
FAX 505-889-0258

Summaries

Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties[1]			Saturated Hydraulic Conductivity[2]			Moisture Characteristics[3]								Particle Size[4]			Specific Gravity[5]		Air Perm-eability	Atterberg Limits	Proctor Compaction
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K_{unsat}	DS	WS	H	F	C			
PB-11 (39-40)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-11 (154-155)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-11 (184-185)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-11 (209-210)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-11 (229-230)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-11 (248-249)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-11 (274-275)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-11 (294-295)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-11 (309-310)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-11 (334-335)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-11 (359-360)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (69-70)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (109-110)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (154-155)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (179-180)	X	X				X	X	X		X	X			X		X	X	X			X	

[1] G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method

[2] CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall

[3] HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, Kunsat = Calculated Unsaturated Hydraulic Conductivity

[4] DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer

[5] F = Fine (<4.75mm), C = Coarse (>4.75mm)

Summary of Tests Performed (Continued)

Laboratory Sample Number	Initial Soil Properties[1]			Saturated Hydraulic Conductivity[2]			Moisture Characteristics[3]								Particle Size[4]			Specific Gravity[5]		Air Perm-eability	Atterberg Limits	Proctor Compaction
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K_{unsat}	DS	WS	H	F	C			
PB-12 (204-205)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (224-225)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (249-250)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (264-265)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (284-285)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (309-310)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (334-335)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-12 (349-350)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-13 (279-280)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-13 (349-350)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-13 (444-445)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-13 (499-500)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-13 (534-535)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-13 (554-555)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-13 (563-564)	X	X				X	X	X		X	X			X		X	X	X			X	

[1] G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method

[2] CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall

[3] HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, Kunsat = Calculated Unsaturated Hydraulic Conductivity

[4] DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer

[5] F = Fine (<4.75mm), C = Coarse (>4.75mm)

Summary of Tests Performed (Continued)

Laboratory Sample Number	Initial Soil Properties[1]			Saturated Hydraulic Conductivity[2]			Moisture Characteristics[3]								Particle Size[4]			Specific Gravity[5]		Air Perm-eability	Atterberg Limits	Proctor Compaction
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K_{unsat}	DS	WS	H	F	C			
PB-13 (585-586)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-13 (604-605)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-13 (625-626)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-13 (639-640)	X	X				X	X			X	X			X		X	X	X			X	
PB-13 (660-661)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-14 (294-295)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-14 (304-305)	X	X		X			X	X		X	X			X		X	X	X			X	
PB-14 (532-533)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-14 (549-550)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-14 (569-570)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-14 (594-595)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-14 (620-623)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-14 (635-636)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-14 (709-710)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-14 (727-728)	X	X				X	X	X		X	X			X		X	X	X			X	

[1] G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method

[2] CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall

[3] HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, Kunsat = Calculated Unsaturated Hydraulic Conductivity

[4] DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer

[5] F = Fine (<4.75mm), C = Coarse (>4.75mm)

Summary of Tests Performed (Continued)

Laboratory Sample Number	Initial Soil Properties[1]			Saturated Hydraulic Conductivity[2]			Moisture Characteristics[3]								Particle Size[4]			Specific Gravity[5]		Air Perm-eability	Atterberg Limits	Proctor Compaction
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K_{unsat}	DS	WS	H	F	C			
PB-14 (741-742)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-14 (749-750)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-15 (435-436)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-15 (464-465)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-15 (483-484)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-15 (502-503)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-15 (524-525)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-15 (539-540)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-15 (559-560)	X	X				X	X	X		X	X			X		X	X	X			X	
PB-15 (574-575)	X	X			X		X	X		X	X			X		X	X	X			X	
PB-15 (604-605)	X	X				X	X	X		X	X			X		X	X	X			X	

[1] G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method

[2] CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall

[3] HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, Kunsat = Calculated Unsaturated Hydraulic Conductivity

[4] DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer

[5] F = Fine (<4.75mm), C = Coarse (>4.75mm)

Notes

Sample Receipt and Preparation
Fifty six samples, each in a 2.5" diameter acetate sleeve sealed with end caps and tape, were received on January 4, 2012. The sample lengths ranged between 12” to 20”. The majority of the samples appeared to be intact upon receipt, but many of the samples appeared to have little to significant headspace, to have an annulus, and/or to be somewhat loose on one or both ends.

Initial properties, saturated hydraulic conductivity, moisture retention properties, particle size analysis, Atterberg limits, and specific gravity testing was requested for each sample.

An intact sub-sample to be used for initial properties and moisture retention properties testing was obtained by trimming the most intact and homogenous end or portion of the original sample with a saw to approximately 1.5" in length; and if possible, a smaller diameter ring was then pushed into this intact sub-sample either by hand or by using a hydraulic jack. Or, if the sub-sample was friable, silicone was used to seal the intact sub-sample into a larger diameter testing ring.

Material immediately adjacent was used for the index testing (particle size analysis, Atterberg limits, and specific gravity analysis).

A third sub-sample was then taken from the next adjacent segment of original sample, again using a saw to obtain an intact portion. This time the acetate sleeve was removed after gently cutting it along the side. The sleeveless sub-sample was then used for the flexible-wall saturated hydraulic conductivity testing.

This order of sub-sample preparation was followed for all samples tested, except the first two samples (PB-11 (39-40) and PB-11 (154-154)), for which the index testing sub-sample was obtained third (rather than second); and samples PB-13 (639-640), PB-14 (635-636), and PB-14 (709-710), for which one or both of the previously tested intact sub-samples were reused for the index testing due to insufficient material.

Moisture Retention Sub-Sample Volume
Due to the required sub-sample preparation techniques, including the use of silicone, it was not always possible to obtain accurate volume measurements of the rigid-wall moisture retention sub-samples. Therefore, based on the assumption that the sub-samples were 100% saturated at the saturation stage, and using the measured sub-sample lengths and measured specific gravities, the diameters of these sub-samples were adjusted between 0.003 cm and 0.17 cm.

Saturated Hydraulic Conductivity
The flexible-wall method (ASTM D5084) was used to measure the saturated hydraulic conductivity (Ksat) on the sleeveless sub-samples, except samples PB-14 (304-305) and PB-15 (574-575) for which intact flexible-wall sub samples were not able to be obtained. The rigid-wall method (ASTM D2434M) was used to measure the saturated hydraulic conductivity of these two sub-samples.

General Notes
An incorrect initial mass was recorded for the PB-14 (620-623) and PB-14 (727-728) rigid-wall sub-samples. The initial mass was calculated for these two sub-samples based on the measured gravimetric moisture content of the respective flexible-wall sub-samples.

Summary of Sample Preparation/Volume Changes

	Initial Sample Data[1]		Volume Change Post Saturation[2]			Volume Change Post Drying Curve[3]		
Sample Number	Moisture Content (%, g/g)	Dry Bulk Density (g/cm^3)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)
PB-11 (39-40)	23.2	1.51	1.51	---	100.0%	1.51	---	100.0%
PB-11 (154-155)	20.3	1.49	1.49	---	100.0%	1.49	---	100.0%
PB-11 (184-185)	23.7	1.55	1.55	---	100.0%	1.55	---	100.0%
PB-11 (209-210)	25.3	1.56	1.56	---	100.0%	1.56	---	100.0%
PB-11 (229-230)	21.0	1.64	1.64	---	100.0%	1.64	---	100.0%
PB-11 (248-249)	25.8	1.54	1.54	---	100.0%	1.54	---	100.0%
PB-11 (274-275)	22.8	1.59	1.59	---	100.0%	1.59	---	100.0%
PB-11 (294-295)	25.2	1.55	1.55	---	100.0%	1.55	---	100.0%
PB-11 (309-310)	25.1	1.57	1.57	---	100.0%	1.57	---	100.0%
PB-11 (334-335)	21.4	1.68	1.68	---	100.0%	1.68	---	100.0%
PB-11 (359-360)	24.2	1.58	1.58	---	100.0%	1.58	---	100.0%

[1]Initial Sample Data: The 'as received' dry bulk density and moisture content.

[2]Volume Change Post Saturation: Volume change measurements were obtained after saturated hydraulic conductivity testing.

[3]Volume Change Post Drying Curve: Volume change measurements were obtained throughout hanging column and pressure plate testing. The 'Volume Change Post Drying Curve' values represent the final sample dimensions after the last pressure plate point.

Notes:

"+" indicates sample swelling, "-" indicates sample settling, and "---" indicates no volume change occurred.

Summary of Sample Preparation/Volume Changes

Sample Number	Initial Sample Data[1]		Volume Change Post Saturation[2]			Volume Change Post Drying Curve[3]		
	Moisture Content (%, g/g)	Dry Bulk Density (g/cm^3)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)
PB-12 (69-70)	26.7	1.51	1.51	---	100.0%	1.51	---	100.0%
PB-12 (109-110)	29.3	1.47	1.47	---	100.0%	1.47	---	100.0%
PB-12 (154-155)	18.2	1.62	1.62	---	100.0%	1.62	---	100.0%
PB-12 (179-180)	18.0	1.52	1.52	---	100.0%	1.52	---	100.0%
PB-12 (204-205)	26.1	1.52	1.52	---	100.0%	1.52	---	100.0%
PB-12 (224-225)	24.8	1.56	1.56	---	100.0%	1.56	---	100.0%
PB-12 (249-250)	25.9	1.55	1.55	---	100.0%	1.55	---	100.0%
PB-12 (264-265)	22.7	1.52	1.52	---	100.0%	1.52	---	100.0%
PB-12 (284-285)	26.8	1.52	1.52	---	100.0%	1.52	---	100.0%
PB-12 (309-310)	27.5	1.51	1.51	---	100.0%	1.51	---	100.0%
PB-12 (334-335)	25.7	1.55	1.55	---	100.0%	1.55	---	100.0%

[1]Initial Sample Data: The 'as received' dry bulk density and moisture content.

[2]Volume Change Post Saturation: Volume change measurements were obtained after saturated hydraulic conductivity testing.

[3]Volume Change Post Drying Curve: Volume change measurements were obtained throughout hanging column and pressure plate testing. The 'Volume Change Post Drying Curve' values represent the final sample dimensions after the last pressure plate point.

Notes:

"+" indicates sample swelling, "-" indicates sample settling, and "---" indicates no volume change occurred.

Summary of Sample Preparation/Volume Changes

Sample Number	Initial Sample Data[1]		Volume Change Post Saturation[2]			Volume Change Post Drying Curve[3]		
	Moisture Content (%, g/g)	Dry Bulk Density (g/cm^3)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)
PB-12 (349-350)	31.1	1.44	1.44	---	100.0%	1.44	---	100.0%
PB-13 (279-280)	26.0	1.52	1.52	---	100.0%	1.52	---	100.0%
PB-13 (349-350)	25.1	1.48	1.48	---	100.0%	1.48	---	100.0%
PB-13 (444-445)	29.2	1.45	1.45	---	100.0%	1.45	---	100.0%
PB-13 (499-500)	27.4	1.50	1.50	---	100.0%	1.50	---	100.0%
PB-13 (534-535)	25.9	1.49	1.49	---	100.0%	1.49	---	100.0%
PB-13 (554-555)	26.0	1.46	1.46	---	100.0%	1.46	---	100.0%
PB-13 (563-564)	26.8	1.47	1.47	---	100.0%	1.47	---	100.0%
PB-13 (585-586)	29.9	1.45	1.45	---	100.0%	1.45	---	100.0%
PB-13 (604-605)	31.4	1.42	1.42	---	100.0%	1.42	---	100.0%
PB-13 (625-626)	28.7	1.46	1.46	---	100.0%	1.46	---	100.0%

[1]Initial Sample Data: The 'as received' dry bulk density and moisture content.

[2]Volume Change Post Saturation: Volume change measurements were obtained after saturated hydraulic conductivity testing.

[3]Volume Change Post Drying Curve: Volume change measurements were obtained throughout hanging column and pressure plate testing. The 'Volume Change Post Drying Curve' values represent the final sample dimensions after the last pressure plate point.

Notes:

"+" indicates sample swelling, "-" indicates sample settling, and "---" indicates no volume change occurred.

Summary of Sample Preparation/Volume Changes

	Initial Sample Data[1]		Volume Change Post Saturation[2]			Volume Change Post Drying Curve[3]		
Sample Number	Moisture Content (%, g/g)	Dry Bulk Density (g/cm^3)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)
PB-13 (639-640)	30.3	1.43	1.43	---	100.0%	1.43	---	100.0%
PB-13 (660-661)	28.6	1.47	1.47	---	100.0%	1.47	---	100.0%
PB-14 (294-295)	31.8	1.38	1.38	---	100.0%	1.38	---	100.0%
PB-14 (304-305)	21.5	1.38	1.38	---	100.0%	1.38	---	100.0%
PB-14 (532-533)	30.6	1.39	1.39	---	100.0%	1.39	---	100.0%
PB-14 (549-550)	29.4	1.44	1.44	---	100.0%	1.44	---	100.0%
PB-14 (569-570)	28.5	1.47	1.47	---	100.0%	1.47	---	100.0%
PB-14 (594-595)	32.1	1.37	1.37	---	100.0%	1.37	---	100.0%
PB-14 (620-623)	26.1	1.48	1.48	---	100.0%	1.48	---	100.0%
PB-14 (635-636)	30.1	1.41	1.41	---	100.0%	1.41	---	100.0%
PB-14 (709-710)	32.5	1.41	1.41	---	100.0%	1.41	---	100.0%

[1]Initial Sample Data: The 'as received' dry bulk density and moisture content.

[2]Volume Change Post Saturation: Volume change measurements were obtained after saturated hydraulic conductivity testing.

[3]Volume Change Post Drying Curve: Volume change measurements were obtained throughout hanging column and pressure plate testing. The 'Volume Change Post Drying Curve' values represent the final sample dimensions after the last pressure plate point.

Notes:

"+" indicates sample swelling, "-" indicates sample settling, and "---" indicates no volume change occurred.

Summary of Sample Preparation/Volume Changes

	Initial Sample Data[1]		Volume Change Post Saturation[2]			Volume Change Post Drying Curve[3]		
Sample Number	Moisture Content (%, g/g)	Dry Bulk Density (g/cm^3)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Initial Density (%)
PB-14 (727-728)	27.2	1.48	1.48	---	100.0%	1.48	---	100.0%
PB-14 (741-742)	28.6	1.47	1.47	---	100.0%	1.47	---	100.0%
PB-14 (749-750)	28.2	1.46	1.46	---	100.0%	1.46	---	100.0%
PB-15 (435-436)	30.5	1.40	1.40	---	100.0%	1.40	---	100.0%
PB-15 (464-465)	33.5	1.39	1.39	---	100.0%	1.39	---	100.0%
PB-15 (483-484)	29.0	1.48	1.48	---	100.0%	1.48	---	100.0%
PB-15 (502-503)	28.7	1.43	1.43	---	100.0%	1.43	---	100.0%
PB-15 (524-525)	30.2	1.47	1.47	---	100.0%	1.47	---	100.0%
PB-15 (539-540)	29.8	1.46	1.46	---	100.0%	1.46	---	100.0%
PB-15 (559-560)	28.8	1.48	1.48	---	100.0%	1.48	---	100.0%
PB-15 (574-575)	30.2	1.43	1.43	---	100.0%	1.43	---	100.0%
PB-15 (604-605)	26.0	1.51	1.51	---	100.0%	1.51	---	100.0%

[1]Initial Sample Data: The 'as received' dry bulk density and moisture content.

[2]Volume Change Post Saturation: Volume change measurements were obtained after saturated hydraulic conductivity testing.

[3]Volume Change Post Drying Curve: Volume change measurements were obtained throughout hanging column and pressure plate testing. The 'Volume Change Post Drying Curve' values represent the final sample dimensions after the last pressure plate point.

Notes:

"+" indicates sample swelling, "-" indicates sample settling, and "---" indicates no volume change occurred.

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Moisture Content: As Received, Gravimetric (%, g/g)	Moisture Content: As Received, Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded, Gravimetric (%, g/g)	Moisture Content: Remolded, Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
PB-11 (39-40)	23.2	35.0	---	---	1.51	1.86	43.5
PB-11 (154-155)	20.3	30.2	---	---	1.49	1.79	44.6
PB-11 (184-185)	23.7	36.8	---	---	1.55	1.92	41.8
PB-11 (209-210)	25.3	39.6	---	---	1.56	1.96	42.0
PB-11 (229-230)	21.0	34.5	---	---	1.64	1.99	38.2
PB-11 (248-249)	25.8	39.8	---	---	1.54	1.94	42.9
PB-11 (274-275)	22.8	36.4	---	---	1.59	1.95	40.8
PB-11 (294-295)	25.2	39.1	---	---	1.55	1.94	42.0
PB-11 (309-310)	25.1	39.4	---	---	1.57	1.97	41.7
PB-11 (334-335)	21.4	35.8	---	---	1.68	2.03	38.1
PB-11 (359-360)	24.2	38.3	---	---	1.58	1.96	41.8

NA = Not analyzed

--- = This sample was not remolded

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity (Continued)

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
PB-12 (69-70)	26.7	40.4	---	---	1.51	1.91	43.9
PB-12 (109-110)	29.3	43.2	---	---	1.47	1.91	46.3
PB-12 (154-155)	18.2	29.6	---	---	1.62	1.92	39.9
PB-12 (179-180)	18.0	27.5	---	---	1.52	1.80	43.4
PB-12 (204-205)	26.1	39.8	---	---	1.52	1.92	42.9
PB-12 (224-225)	24.8	38.7	---	---	1.56	1.95	42.0
PB-12 (249-250)	25.9	40.1	---	---	1.55	1.95	42.6
PB-12 (264-265)	22.7	34.5	---	---	1.52	1.87	43.2
PB-12 (284-285)	26.8	40.8	---	---	1.52	1.93	44.3
PB-12 (309-310)	27.5	41.6	---	---	1.51	1.93	43.6
PB-12 (334-335)	25.7	39.7	---	---	1.55	1.94	42.6
PB-12 (349-350)	31.1	44.7	---	---	1.44	1.88	46.8

NA = Not analyzed

--- = This sample was not remolded

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity (Continued)

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
PB-13 (279-280)	26.0	39.7	---	---	1.52	1.92	42.7
PB-13 (349-350)	25.1	37.1	---	---	1.48	1.85	45.0
PB-13 (444-445)	29.2	42.3	---	---	1.45	1.87	46.7
PB-13 (499-500)	27.4	41.0	---	---	1.50	1.91	44.6
PB-13 (534-535)	25.9	38.7	---	---	1.49	1.88	44.3
PB-13 (554-555)	26.0	37.9	---	---	1.46	1.84	45.2
PB-13 (563-564)	26.8	39.3	---	---	1.47	1.86	44.6
PB-13 (585-586)	29.9	43.4	---	---	1.45	1.89	45.8
PB-13 (604-605)	31.4	44.4	---	---	1.42	1.86	46.6
PB-13 (625-626)	28.7	41.9	---	---	1.46	1.88	44.2
PB-13 (639-640)	30.3	43.5	---	---	1.43	1.87	45.7
PB-13 (660-661)	28.6	42.2	---	---	1.47	1.89	44.7

NA = Not analyzed

--- = This sample was not remolded

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity (Continued)

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
PB-14 (294-295)	31.8	43.9	---	---	1.38	1.82	49.1
PB-14 (304-305)	21.5	29.6	---	---	1.38	1.67	48.7
PB-14 (532-533)	30.6	42.5	---	---	1.39	1.82	47.9
PB-14 (549-550)	29.4	42.4	---	---	1.44	1.87	45.5
PB-14 (569-570)	28.5	41.9	---	---	1.47	1.89	45.2
PB-14 (594-595)	32.1	44.1	---	---	1.37	1.81	47.8
PB-14 (620-623)	26.1	38.8	---	---	1.48	1.87	43.8
PB-14 (635-636)	30.1	42.5	---	---	1.41	1.83	46.9
PB-14 (709-710)	32.5	45.6	---	---	1.41	1.86	47.4
PB-14 (727-728)	27.2	40.4	---	---	1.48	1.89	44.3
PB-14 (741-742)	28.6	42.2	---	---	1.47	1.89	44.4
PB-14 (749-750)	28.2	41.1	---	---	1.46	1.87	45.1

NA = Not analyzed

--- = This sample was not remolded

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity (Continued)

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
PB-15 (435-436)	30.5	42.8	---	---	1.40	1.83	47.5
PB-15 (464-465)	33.5	46.4	---	---	1.39	1.85	48.2
PB-15 (483-484)	29.0	42.9	---	---	1.48	1.91	45.0
PB-15 (502-503)	28.7	41.1	---	---	1.43	1.84	46.9
PB-15 (524-525)	30.2	44.4	---	---	1.47	1.92	44.8
PB-15 (539-540)	29.8	43.4	---	---	1.46	1.89	44.9
PB-15 (559-560)	28.8	42.6	---	---	1.48	1.90	44.4
PB-15 (574-575)	30.2	43.4	---	---	1.43	1.87	45.3
PB-15 (604-605)	26.0	39.3	---	---	1.51	1.90	43.9

NA = Not analyzed

--- = This sample was not remolded

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis		
			Constant Head Rigid Wall	Falling Head Rigid Wall	Falling Head Flexible Wall
PB-11 (39-40)	9.9E-05	NA			X
PB-11 (154-155)	9.1E-06	NA			X
PB-11 (184-185)	5.9E-05	NA			X
PB-11 (209-210)	4.3E-05	NA			X
PB-11 (229-230)	2.8E-07	NA			X
PB-11 (248-249)	1.9E-07	NA			X
PB-11 (274-275)	3.9E-07	NA			X
PB-11 (294-295)	1.6E-07	NA			X
PB-11 (309-310)	1.3E-08	NA			X
PB-11 (334-335)	1.4E-08	NA			X
PB-11 (359-360)	4.3E-09	NA			X
PB-12 (69-70)	1.5E-05	NA			X
PB-12 (109-110)	1.6E-04	NA			X
PB-12 (154-155)	2.6E-08	NA			X
PB-12 (179-180)	1.9E-04	NA			X
PB-12 (204-205)	3.4E-04	NA			X
PB-12 (224-225)	2.1E-06	NA			X
PB-12 (249-250)	9.1E-06	NA			X
PB-12 (264-265)	9.4E-07	NA			X

** = An intact flexible-wall sub sample was not able to be obtained.
--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis		
			Constant Head Rigid Wall	Falling Head Rigid Wall	Falling Head Flexible Wall
PB-12 (284-285)	2.5E-08	NA			X
PB-12 (309-310)	1.4E-08	NA			X
PB-12 (334-335)	4.4E-09	NA			X
PB-12 (349-350)	6.9E-09	NA			X
PB-13 (279-280)	1.2E-04	NA			X
PB-13 (349-350)	4.1E-07	NA			X
PB-13 (444-445)	1.6E-04	NA			X
PB-13 (499-500)	1.7E-05	NA			X
PB-13 (534-535)	1.5E-06	NA			X
PB-13 (554-555)	6.3E-07	NA			X
PB-13 (563-564)	1.2E-07	NA			X
PB-13 (585-586)	7.0E-07	NA			X
PB-13 (604-605)	1.3E-07	NA			X
PB-13 (625-626)	2.0E-07	NA			X
PB-13 (639-640)	1.2E-07	NA			X
PB-13 (660-661)	2.3E-07	NA			X
PB-14 (294-295)	1.6E-06	NA			X
PB-14 (304-305)**	4.9E-05	NA	X		
PB-14 (532-533)	3.9E-06	NA			X

** = An intact flexible-wall sub sample was not able to be obtained.
--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis		
			Constant Head Rigid Wall	Falling Head Rigid Wall	Falling Head Flexible Wall
PB-14 (549-550)	2.3E-06	NA			X
PB-14 (569-570)	2.4E-07	NA			X
PB-14 (594-595)	2.6E-06	NA			X
PB-14 (620-623)	4.8E-07	NA			X
PB-14 (635-363)	3.3E-07	NA			X
PB-14 (709-710)	2.1E-07	NA			X
PB-14 (727-728)	3.4E-08	NA			X
PB-14 (741-742)	2.1E-08	NA			X
PB-14 (749-750)	2.8E-08	NA			X
PB-15 (435-436)	7.2E-04	NA			X
PB-15 (464-465)	8.5E-06	NA			X
PB-15 (483-484)	1.1E-06	NA			X
PB-15 (502-503)	2.4E-07	NA			X
PB-15 (524-525)	1.6E-04	NA			X
PB-15 (539-540)	9.4E-09	NA			X
PB-15 (559-560)	1.5E-06	NA			X
PB-15 (574-575)**	1.2E-07	NA		X	
PB-15 (604-605)	1.8E-06	NA			X

** = An intact flexible-wall sub sample was not able to be obtained.
--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-11 (39-40)	0	43.5
	16	42.1
	51	41.3
	127	40.7
	337	40.1
	7852	24.6
	28860	16.2
	117379	11.4
	857025	8.0
PB-11 (154-155)	0	44.6
	16	43.2
	51	42.4
	127	41.4
	337	37.9
	17235	18.6
	64553	13.4
	133696	10.9
	857025	5.7
PB-11 (184-185)	0	41.8
	16	41.3
	51	41.2
	127	40.8
	337	40.4
	19274	18.5
	60270	13.9
	191518	11.7
	857025	8.3

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-11 (209-210)	0	42.0
	51	41.9
	150	41.7
	337	41.3
	1275	41.0
	10912	28.5
	28452	23.1
	150522	11.1
	857025	7.4
PB-11 (229-230)	0	38.2
	51	37.3
	150	37.1
	337	36.7
	1275	36.1
	9178	22.7
	31920	15.7
	95147	13.0
	857025	6.6
PB-11 (248-249)	0	42.9
	51	42.9
	150	42.7
	337	42.6
	1275	42.2
	11524	25.9
	51704	17.8
	281057	11.8
	855592	8.5

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-11 (274-275)	0	40.8
	22	40.5
	72	39.8
	153	38.8
	337	38.5
	16113	20.8
	39262	16.5
	115135	12.0
	854159	6.8
PB-11 (294-295)	0	42.0
	51	41.5
	152	41.4
	337	41.2
	1275	40.8
	11116	26.9
	32736	17.3
	83930	12.9
	855592	7.6
PB-11 (309-310)	0	41.7
	52	41.5
	151	41.4
	337	41.2
	1275	40.8
	7547	30.9
	45177	18.9
	424135	7.4
	855592	7.2

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-11 (334-335)	0	38.1
	51	37.6
	150	37.4
	337	37.3
	1275	37.2
	12849	25.7
	74445	15.2
	262700	10.0
	855592	8.1
PB-11 (359-360)	0	41.8
	51	41.2
	150	41.0
	337	40.9
	1275	40.7
	13461	24.3
	54355	16.0
	160415	12.3
	855592	7.4
PB-12 (69-70)	0	43.9
	23	42.9
	72	42.6
	155	42.2
	337	40.4
	17847	18.8
	121968	12.0
	415161	9.1
	854159	8.2

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-12 (109-110)	0	46.3
	17	45.1
	50	44.6
	130	44.2
	337	44.1
	5303	30.8
	21722	22.5
	96269	16.4
	855592	10.6
PB-12 (154-155)	0	39.9
	52	39.8
	151	39.6
	337	39.3
	1275	39.1
	10708	25.6
	45075	16.9
	326744	10.6
	854159	7.8
PB-12 (179-180)	0	43.4
	20	43.1
	69	42.6
	155	40.7
	337	37.9
	13053	22.1
	36713	15.9
	118093	12.2
	854159	7.3

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-12 (204-205)	0	42.9
	51	42.5
	150	42.1
	337	41.0
	1275	39.8
	10810	19.4
	62106	10.7
	511226	7.6
	854159	6.7
PB-12 (224-225)	0	42.0
	52	41.6
	151	41.3
	337	41.0
	1275	40.8
	14277	23.0
	64553	15.5
	131350	11.3
	854159	7.9
PB-12 (249-250)	0	42.6
	52	41.9
	151	41.6
	337	41.1
	1275	40.9
	16623	23.3
	72712	15.2
	427398	8.3
	854159	7.8

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-12 (264-265)	0	43.2
	52	42.3
	151	42.2
	337	41.5
	1275	41.0
	14583	25.1
	31512	17.6
	220481	10.8
	854159	7.8
PB-12 (284-285)	0	44.3
	51	43.9
	150	43.8
	337	43.6
	1275	43.1
	12951	27.6
	32940	19.2
	116359	13.7
	854159	8.3
PB-12 (309-310)	0	43.6
	51	42.7
	150	42.6
	337	42.5
	1275	42.4
	18356	24.6
	68735	15.7
	245670	11.5
	854159	8.4

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-12 (334-335)	0	42.6
	52	41.3
	151	41.0
	337	40.9
	1275	40.8
	11014	28.6
	58129	17.4
	285646	10.0
	855592	7.6
PB-12 (349-350)	0	46.8
	52	46.8
	151	46.6
	337	46.4
	1275	45.8
	19784	23.3
	49868	16.8
	106569	12.6
	855592	7.8
PB-13 (279-280)	0	42.7
	16	42.6
	51	42.0
	127	40.7
	337	37.3
	9178	16.5
	58639	9.0
	271165	6.7
	855592	5.1

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-13 (349-350)	0	45.0
	16	44.8
	51	44.2
	127	43.3
	337	42.3
	11014	19.0
	78831	11.0
	440962	7.1
	855592	6.5
PB-13 (444-445)	0	46.7
	20	46.7
	69	46.0
	155	45.3
	337	44.6
	9688	25.2
	37529	17.2
	274938	11.5
	855592	8.8
PB-13 (499-500)	0	44.6
	20	44.3
	69	43.8
	155	43.2
	337	42.9
	13563	20.2
	45381	13.8
	59556	12.7
	855592	7.6

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-13 (534-535)	0	44.3
	20	44.4
	73	44.1
	153	42.0
	337	41.6
	14889	18.4
	58537	12.9
	527848	8.1
	857025	7.2
PB-13 (554-555)	0	45.2
	20	44.9
	69	44.6
	155	43.5
	337	42.3
	18152	19.6
	45993	14.5
	148993	11.7
	854159	7.7
PB-13 (563-564)	0	44.6
	51	44.0
	150	44.0
	337	43.7
	1275	43.4
	19886	18.9
	56803	14.5
	388952	9.5
	857025	6.9

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-13 (585-586)	0	45.8
	20	45.7
	73	45.0
	153	44.7
	337	44.2
	17439	18.9
	55375	12.1
	179485	9.8
	854159	6.7
PB-13 (604-605)	0	46.6
	52	45.9
	151	45.7
	337	45.3
	1275	45.0
	18866	20.5
	62106	12.7
	262700	8.3
	857025	7.1
PB-13 (625-626)	0	44.2
	51	42.4
	150	42.2
	337	42.0
	1275	41.6
	10504	24.8
	32430	16.4
	629523	7.9
	857025	7.3

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-13 (639-640)	0	45.7
	51	44.8
	152	44.6
	13665	24.3
	31818	18.8
	135837	11.9
	854159	8.2
PB-13 (660-661)	0	44.7
	52	44.0
	151	43.7
	337	43.6
	1275	43.2
	10402	24.2
	46503	14.6
	197841	10.1
	855592	7.1
PB-14 (294-295)	0	49.1
	16	47.0
	50	46.2
	127	45.8
	337	45.3
	12442	22.9
	32226	17.1
	243222	10.1
	852726	8.0

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-14 (304-305)	0	48.7
	16	47.9
	50	46.9
	127	46.4
	337	37.5
	23965	20.0
	48237	15.7
	225988	11.4
	854159	8.8
PB-14 (532-533)	0	47.9
	12	45.8
	31	45.5
	99	44.9
	337	43.0
	19886	18.0
	57007	12.1
	231393	9.8
	854159	7.6
PB-14 (549-550)	0	45.5
	12	45.0
	31	44.9
	99	44.7
	337	43.7
	15501	19.5
	32634	16.1
	164290	10.3
	857025	7.4

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-14 (569-570)	0	45.2
	20	44.4
	73	43.7
	153	43.6
	337	43.2
	15093	21.4
	41812	14.2
	126761	12.0
	855592	7.3
PB-14 (594-595)	0	47.8
	16	46.2
	50	45.4
	127	45.0
	337	44.6
	4385	21.9
	37223	12.8
	164800	8.9
	857025	5.4
PB-14 (620-623)	0	43.8
	17	41.6
	50	41.1
	127	40.3
	337	39.3
	6221	26.0
	42118	15.9
	173876	11.0
	852726	6.5

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-14 (635-636)	0	46.9
	20	45.1
	73	44.0
	153	43.9
	337	43.5
	13869	20.3
	36611	14.0
	105651	11.2
	854159	6.8
PB-14 (709-710)	0	47.4
	51	47.4
	150	47.0
	337	45.7
	1275	44.6
	13053	18.1
	59352	11.3
	136653	8.8
	854159	6.3
PB-14 (727-728)	0	44.3
	17	40.7
	50	40.2
	127	39.8
	337	38.6
	10504	23.1
	52214	14.0
	212730	10.0
	852726	6.2

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-14 (741-742)	0	44.4
	51	43.6
	152	43.3
	337	43.0
	1275	42.6
	18866	21.0
	32634	18.9
	68531	15.6
	852726	7.1
PB-14 (749-750)	0	45.1
	52	43.1
	151	42.7
	337	42.1
	1275	41.5
	19172	19.4
	43036	15.0
	73936	12.6
	852726	6.6
PB-15 (435-436)	0	47.5
	16	44.6
	50	43.9
	127	43.6
	337	42.9
	5405	24.6
	22946	16.3
	59556	13.6
	852726	6.9

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-15 (464-465)	0	48.2
	20	47.9
	73	47.6
	153	47.4
	337	47.1
	18458	17.8
	50378	14.2
	129719	10.9
	857025	7.3
PB-15 (483-484)	0	45.0
	51	44.1
	152	44.0
	337	43.6
	1275	43.0
	21314	19.5
	37325	16.8
	121866	14.2
	852726	7.0
PB-15 (502-503)	0	46.9
	16	46.1
	51	45.2
	127	44.3
	337	42.9
	17235	19.1
	41812	14.9
	80156	12.8
	855592	7.8

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-15 (524-525)	0	44.8
	16	44.3
	50	44.0
	127	43.9
	337	41.5
	4895	22.4
	15195	16.3
	93312	10.8
	852726	6.6
PB-15 (539-540)	0	44.9
	12	44.0
	31	43.7
	99	43.3
	337	35.6
	9076	14.6
	21926	11.5
	165106	7.3
	852726	4.9
PB-15 (559-560)	0	44.4
	20	44.0
	73	43.5
	153	43.4
	337	43.1
	15501	21.4
	45993	15.3
	97085	13.1
	854159	7.6

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-15 (574-575)	0	45.3
	51	44.9
	152	44.8
	337	44.4
	1275	43.9
	15501	20.9
	42628	16.1
	92598	12.5
	857025	6.7
PB-15 (604-605)	0	43.9
	17	41.3
	50	40.8
	127	40.2
	337	38.8
	10810	19.8
	107487	10.7
	320829	7.8
	857025	6.7

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
PB-11 (39-40)	0.0007	1.3624	3.95	41.92	NA	NA
PB-11 (154-155)	0.0030	1.2297	0.00	43.69	NA	NA
PB-11 (184-185)	0.0008	1.3679	5.26	41.49	NA	NA
PB-11 (209-210)	0.0002	1.3577	0.00	41.94	NA	NA
PB-11 (229-230)	0.0005	1.3020	0.00	37.86	NA	NA
PB-11 (248-249)	0.0004	1.2884	0.00	43.36	NA	NA
PB-11 (274-275)	0.0007	1.2732	0.00	40.07	NA	NA
PB-11 (294-295)	0.0002	1.6466	6.35	41.62	NA	NA
PB-11 (309-310)	0.0002	1.3543	0.00	41.68	NA	NA
PB-11 (334-335)	0.0002	1.3157	0.00	37.89	NA	NA
PB-11 (359-360)	0.0002	1.4638	4.81	41.50	NA	NA
PB-12 (69-70)	0.0015	1.2795	2.51	43.36	NA	NA
PB-12 (109-110)	0.0008	1.2729	3.66	45.31	NA	NA
PB-12 (154-155)	0.0004	1.2946	0.00	40.14	NA	NA
PB-12 (179-180)	0.0025	1.2171	0.00	43.08	NA	NA
PB-12 (204-205)	0.0003	1.7527	6.63	42.32	NA	NA
PB-12 (224-225)	0.0003	1.5167	5.87	41.76	NA	NA
PB-12 (249-250)	0.0002	1.4512	4.10	42.03	NA	NA
PB-12 (264-265)	0.0004	1.3243	0.00	42.74	NA	NA
PB-12 (284-285)	0.0003	1.3314	0.00	44.33	NA	NA
PB-12 (309-310)	0.0002	1.5478	6.38	43.04	NA	NA
PB-12 (334-335)	0.0002	1.3990	2.51	41.65	NA	NA

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Calculated Unsaturated Hydraulic Properties (Continued)

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
PB-12 (349-350)	0.0003	1.3698	0.00	47.11	NA	NA
PB-13 (279-280)	0.0024	1.3382	1.88	42.62	NA	NA
PB-13 (349-350)	0.0011	1.3795	3.38	44.64	NA	NA
PB-13 (444-445)	0.0009	1.3233	3.90	46.43	NA	NA
PB-13 (499-500)	0.0006	1.4442	5.11	44.11	NA	NA
PB-13 (534-535)	0.0014	1.3253	3.22	44.27	NA	NA
PB-13 (554-555)	0.0013	1.2895	2.08	44.97	NA	NA
PB-13 (563-564)	0.0002	1.6738	6.95	44.34	NA	NA
PB-13 (585-586)	0.0006	1.4450	4.18	45.42	NA	NA
PB-13 (604-605)	0.0002	1.7505	6.30	45.98	NA	NA
PB-13 (625-626)	0.0002	1.6414	6.35	42.88	NA	NA
PB-13 (639-640)	0.0004	1.4319	4.68	45.10	NA	NA
PB-13 (660-661)	0.0003	1.6418	6.65	44.33	NA	NA
PB-14 (294-295)	0.0010	1.3142	2.30	47.34	NA	NA
PB-14 (304-305)	0.0071	1.1911	0.00	48.92	NA	NA
PB-14 (532-533)	0.0015	1.3344	3.47	46.31	NA	NA
PB-14 (549-550)	0.0012	1.2812	0.00	45.34	NA	NA
PB-14 (569-570)	0.0005	1.4173	4.29	44.33	NA	NA
PB-14 (594-595)	0.0013	1.4620	4.79	46.66	NA	NA
PB-14 (620-623)	0.0009	1.2645	0.00	41.78	NA	NA
PB-14 (635-636)	0.0009	1.3539	2.65	45.31	NA	NA
PB-14 (709-710)	0.0005	1.4227	0.00	47.65	NA	NA

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Calculated Unsaturated Hydraulic Properties (Continued)

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
PB-14 (727-728)	0.0009	1.2750	0.00	41.26	NA	NA
PB-14 (741-742)	0.0003	1.4594	4.40	43.93	NA	NA
PB-14 (749-750)	0.0004	1.3650	0.00	43.80	NA	NA
PB-15 (435-436)	0.0014	1.3134	2.35	45.42	NA	NA
PB-15 (464-465)	0.0007	1.4746	5.57	48.04	NA	NA
PB-15 (483-484)	0.0003	1.5142	5.93	44.51	NA	NA
PB-15 (502-503)	0.0016	1.2935	2.37	46.11	NA	NA
PB-15 (524-525)	0.0014	1.4042	4.71	44.62	NA	NA
PB-15 (539-540)	0.0038	1.3602	2.92	44.70	NA	NA
PB-15 (559-560)	0.0006	1.3612	3.38	44.04	NA	NA
PB-15 (574-575)	0.0003	1.5695	5.65	45.20	NA	NA
PB-15 (604-605)	0.0018	1.2578	0.00	42.07	NA	NA

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Particle Size Characteristics

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
PB-11 (39-40)	0.00095	0.017	0.026	27	2.0	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (154-155)	0.00076	0.020	0.027	36	1.8	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (184-185)	0.00061	0.021	0.031	51	2.0	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (209-210)	0.00080	0.012	0.017	21	1.9	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (229-230)	0.0011	0.025	0.042	38	1.2	WS/H	Lean clay with sand (CL)s	Loam	(Est)
PB-11 (248-249)	0.00068	0.0082	0.011	16	1.3	WS/H	Fat clay (CH)	Silt Loam	(Est)
PB-11 (274-275)	0.0011	0.020	0.028	25	1.1	WS/H	Lean clay with sand (CL)s	Silt Loam	(Est)
PB-11 (294-295)	0.00059	0.0095	0.013	22	2.3	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (309-310)	0.00054	0.012	0.016	30	2.6	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (334-335)	0.00064	0.0093	0.015	23	0.88	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (359-360)	0.00045	0.0087	0.013	29	1.2	WS/H	Lean clay (CL)	Silty Clay Loam	(Est)

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Summary of Particle Size Characteristics (Continued)

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
PB-12 (69-70)	0.0017	0.019	0.029	17	2.0	WS/H	Silt (ML)	Silt Loam	
PB-12 (109-110)	0.00086	0.011	0.016	19	1.3	WS/H	Fat clay (CH)	Silt Loam	(Est)
PB-12 (154-155)	0.00059	0.011	0.017	29	2.3	WS/H	Silt (ML)	Silt Loam	(Est)
PB-12 (179-180)	0.0012	0.016	0.022	18	1.6	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-12 (204-205)	0.0011	0.025	0.035	32	2.2	WS/H	Silt (ML)	Silt Loam	(Est)
PB-12 (224-225)	0.00090	0.010	0.018	20	1.2	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-12 (249-250)	0.00083	0.012	0.017	20	1.1	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-12 (264-265)	0.00060	0.011	0.016	27	1.8	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-12 (284-285)	0.00045	0.0082	0.011	24	2.1	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-12 (309-310)	0.00041	0.0092	0.012	29	1.7	WS/H	Fat clay (CH)	Silt Loam	(Est)
PB-12 (334-335)	0.00056	0.0073	0.011	20	0.94	WS/H	Fat clay (CH)	Silty Clay Loam	(Est)

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Summary of Particle Size Characteristics (Continued)

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
PB-12 (349-350)	0.00070	0.0083	0.012	17	1.1	WS/H	Fat clay (CH)	Silt Loam	(Est)
PB-13 (279-280)	0.0064	0.062	0.079	12	2.6	WS/H	Sandy silt s(ML)	Sandy Loam	
PB-13 (349-350)	0.0023	0.030	0.039	17	1.6	WS/H	Silt with sand (ML)s	Silt Loam	
PB-13 (444-445)	0.00097	0.012	0.017	18	1.7	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-13 (499-500)	0.0012	0.018	0.023	19	1.7	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-13 (534-535)	0.0013	0.016	0.024	18	1.4	WS/H	Silt (ML)	Silt Loam	(Est)
PB-13 (554-555)	0.0011	0.013	0.018	16	2.1	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-13 (563-564)	0.0011	0.013	0.017	15	2.6	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-13 (585-586)	0.00088	0.015	0.019	22	3.8	WS/H	Silt (ML)	Silt Loam	(Est)
PB-13 (604-605)	0.0019	0.016	0.020	11	1.9	WS/H	Silt (ML)	Silt Loam	
PB-13 (625-626)	0.0022	0.016	0.020	9.1	2.0	WS/H	Silt (ML)	Silt	

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Summary of Particle Size Characteristics (Continued)

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
PB-13 (639-640)	0.0032	0.027	0.037	12	1.4	WS/H	Silt with sand (ML)s	Silt Loam	
PB-13 (660-661)	0.0017	0.017	0.022	13	2.2	WS/H	Silt (ML)	Silt Loam	
PB-14 (294-295)	0.0010	0.011	0.015	15	2.4	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-14 (304-305)	0.00078	0.0094	0.012	15	2.7	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-14 (532-533)	0.0037	0.028	0.035	9.5	1.7	WS/H	Silt (ML)	Silt Loam	
PB-14 (549-550)	0.0050	0.027	0.035	7.0	1.5	WS/H	Silt (ML)	Silt Loam	
PB-14 (569-570)	0.0025	0.017	0.027	11	1.8	WS/H	Silt (ML)	Silt Loam	
PB-14 (594-595)	0.0045	0.027	0.032	7.1	2.0	WS/H	Silt (ML)	Silt Loam	
PB-14 (620-623)	0.0021	0.018	0.024	11	2.4	WS/H	Silt (ML)	Silt Loam	
PB-14 (635-636)	0.0026	0.021	0.028	11	2.3	WS/H	Silt (ML)	Silt Loam	
PB-14 (709-710)	0.0014	0.017	0.024	17	2.4	WS/H	Silt (ML)	Silt Loam	

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Summary of Particle Size Characteristics (Continued)

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
PB-14 (727-728)	0.0021	0.018	0.024	11	1.9	WS/H	Silt (ML)	Silt Loam	
PB-14 (741-742)	0.0011	0.015	0.019	17	3.1	WS/H	Silt (ML)	Silt Loam	(Est)
PB-14 (749-750)	0.0025	0.025	0.033	13	2.0	WS/H	Silt (ML)	Silt Loam	
PB-15 (435-436)	0.0041	0.028	0.039	9.5	1.4	WS/H	Silt with sand (ML)s	Silt Loam	
PB-15 (464-465)	0.0038	0.023	0.028	7.4	1.8	WS/H	Silt (ML)	Silt Loam	
PB-15 (483-484)	0.0016	0.019	0.027	17	1.5	WS/H	Lean clay (CL)	Silt Loam	
PB-15 (502-503)	0.0024	0.018	0.023	9.6	1.5	WS/H	Silt (ML)	Silt Loam	
PB-15 (524-525)	0.0061	0.036	0.045	7.4	2.1	WS/H	Silt (ML)	Silt Loam	
PB-15 (539-540)	0.0095	0.065	0.081	8.5	1.9	WS/H	Sandy silt s(ML)	Sandy Loam	
PB-15 (559-560)	0.0033	0.025	0.031	9.4	1.7	WS/H	Silt (ML)	Silt Loam	
PB-15 (574-575)	0.0027	0.022	0.028	10	1.9	WS/H	Silt (ML)	Silt Loam	
PB-15 (604-605)	0.0025	0.026	0.038	15	1.5	WS/H	Silt with sand (ML)s	Silt Loam	

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Percent Gravel, Sand, Silt and Clay*

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
PB-11 (39-40)	0.0	4.9	79.0	16.1
PB-11 (154-155)	0.0	10.0	72.1	18.0
PB-11 (184-185)	0.0	10.7	68.9	20.4
PB-11 (209-210)	0.0	8.0	73.9	18.0
PB-11 (229-230)	0.0	24.2	61.1	14.7
PB-11 (248-249)	0.0	0.7	74.6	24.7
PB-11 (274-275)	0.0	19.0	65.2	15.8
PB-11 (294-295)	0.0	1.4	76.9	21.6
PB-11 (309-310)	0.0	2.9	77.9	19.2
PB-11 (334-335)	0.0	1.3	75.1	23.6
PB-11 (359-360)	0.0	6.3	66.2	27.5
PB-12 (69-70)	0.0	3.7	85.4	10.9
PB-12 (109-110)	0.0	6.4	73.3	20.3
PB-12 (154-155)	0.0	5.1	75.7	19.2
PB-12 (179-180)	0.0	4.1	80.9	15.0
PB-12 (204-205)	0.0	12.8	73.9	13.3

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Summary of Particle Size Characteristics (Continued)

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
PB-12 (224-225)	0.0	4.6	75.8	19.6
PB-12 (249-250)	0.0	2.1	76.7	21.1
PB-12 (264-265)	0.0	2.2	77.5	20.3
PB-12 (284-285)	0.0	1.8	74.9	23.3
PB-12 (309-310)	0.0	0.5	75.2	24.3
PB-12 (334-335)	0.0	2.2	70.5	27.3
PB-12 (349-350)	0.0	1.2	74.1	24.6
PB-13 (279-280)	0.0	42.8	51.4	5.8
PB-13 (349-350)	0.0	15.6	75.5	8.9
PB-13 (444-445)	0.0	3.6	78.8	17.6
PB-13 (499-500)	0.0	2.5	84.6	13.0
PB-13 (534-535)	0.0	5.6	80.4	13.9
PB-13 (554-555)	0.0	5.5	80.1	14.4
PB-13 (563-564)	0.0	2.0	85.0	13.0
PB-13 (585-586)	0.0	2.0	85.0	13.0
PB-13 (604-605)	0.0	6.4	83.2	10.4

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Summary of Particle Size Characteristics (Continued)

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
PB-13 (625-626)	0.0	1.5	89.0	9.5
PB-13 (639-640)	0.0	16.5	75.3	8.2
PB-13 (660-661)	0.0	3.6	85.6	10.8
PB-14 (294-295)	0.0	2.6	81.8	15.6
PB-14 (304-305)	0.0	0.4	82.3	17.2
PB-14 (532-533)	0.0	13.0	80.3	6.7
PB-14 (549-550)	0.0	10.2	83.2	6.5
PB-14 (569-570)	0.0	7.0	85.1	7.9
PB-14 (594-595)	0.0	3.1	90.6	6.3
PB-14 (620-623)	0.0	3.4	86.8	9.8
PB-14 (635-636)	0.0	4.9	86.3	8.8
PB-14 (709-710)	0.0	7.4	80.3	12.3
PB-14 (727-728)	0.0	5.7	84.5	9.8
PB-14 (741-742)	0.0	2.6	85.6	11.8
PB-14 (749-750)	0.0	12.0	79.3	8.7
PB-15 (435-436)	0.0	17.1	76.8	6.2

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Summary of Particle Size Characteristics (Continued)

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
PB-15 (464-465)	0.0	3.6	90.0	6.4
PB-15 (483-484)	0.0	9.5	79.0	11.5
PB-15 (502-503)	0.0	5.0	86.0	9.1
PB-15 (524-525)	0.0	13.6	82.5	3.9
PB-15 (539-540)	0.0	44.3	51.2	4.5
PB-15 (559-560)	0.0	4.6	87.2	8.1
PB-15 (574-575)	0.0	5.1	86.2	8.6
PB-15 (604-605)	0.0	19.5	71.3	9.2

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Summary of Atterberg Tests

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
PB-11 (39-40)	46	22	24	CL
PB-11 (154-155)	45	23	22	CL
PB-11 (184-185)	42	23	19	CL
PB-11 (209-210)	45	24	21	CL
PB-11 (229-230)	37	21	16	CL
PB-11 (248-249)	52	23	29	CH
PB-11 (274-275)	40	22	18	CL
PB-11 (294-295)	46	21	25	CL
PB-11 (309-310)	45	23	22	CL
PB-11 (334-335)	47	19	28	CL
PB-11 (359-360)	49	20	29	CL
PB-12 (69-70)	40	28	12	ML
PB-12 (109-110)	52	24	28	CH
PB-12 (154-155)	40	28	12	ML
PB-12 (179-180)	39	24	15	CL
PB-12 (204-205)	34	26	8	ML
PB-12 (224-225)	42	22	20	CL
PB-12 (249-250)	44	26	18	CL
PB-12 (264-265)	44	23	21	CL
PB-12 (284-285)	47	26	21	CL

--- = Soil requires visual-manual classification due to non-plasticity

Summary of Atterberg Tests (Continued)

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
PB-12 (309-310)	58	27	31	CH
PB-12 (334-335)	54	20	34	CH
PB-12 (349-350)	52	27	25	CH
PB-13 (279-280)	---	---	---	ML
PB-13 (349-350)	---	---	---	ML
PB-13 (444-445)	47	23	24	CL
PB-13 (499-500)	43	26	17	CL
PB-13 (534-535)	---	---	---	ML
PB-13 (554-555)	44	26	18	CL
PB-13 (563-564)	47	26	21	CL
PB-13 (585-586)	---	---	---	ML
PB-13 (604-605)	46	28	18	ML
PB-13 (625-626)	---	---	---	ML
PB-13 (639-640)	47	36	11	ML
PB-13 (660-661)	---	---	---	ML
PB-14 (294-295)	45	25	20	CL
PB-14 (304-305)	48	25	23	CL
PB-14 (532-533)	43	32	11	ML
PB-14 (549-550)	---	---	---	ML
PB-14 (569-570)	42	31	11	ML

--- = Soil requires visual-manual classification due to non-plasticity

Summary of Atterberg Tests (Continued)

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
PB-14 (594-595)	---	---	---	ML
PB-14 (620-623)	43	34	9	ML
PB-14 (635-636)	---	---	---	ML
PB-14 (709-710)	38	28	10	ML
PB-14 (727-728)	43	31	12	ML
PB-14 (741-742)	46	28	18	ML
PB-14 (749-750)	41	35	6	ML
PB-15 (435-436)	40	32	8	ML
PB-15 (464-465)	42	33	9	ML
PB-15 (483-484)	45	26	19	CL
PB-15 (502-503)	42	29	13	ML
PB-15 (524-525)	---	---	---	ML
PB-15 (539-540)	---	---	---	ML
PB-15 (559-560)	---	---	---	ML
PB-15 (574-575)	45	35	10	ML
PB-15 (604-605)	---	---	---	ML

--- = Soil requires visual-manual classification due to non-plasticity

Summary of Specific Gravity Tests

	<4.75mm Material		>4.75mm Material		Bulk Sample
Sample Number	Specific Gravity	Percent of Bulk Sample	Specific Gravity	Percent of Bulk Sample	Specific Gravity
PB-11 (39-40)	2.68	100	---	0	2.68
PB-11 (154-155)	2.69	100	---	0	2.69
PB-11 (184-185)	2.68	100	---	0	2.68
PB-11 (209-210)	2.70	100	---	0	2.70
PB-11 (229-230)	2.66	100	---	0	2.66
PB-11 (248-249)	2.71	100	---	0	2.71
PB-11 (274-275)	2.69	100	---	0	2.69
PB-11 (294-295)	2.68	100	---	0	2.68
PB-11 (309-310)	2.70	100	---	0	2.70
PB-11 (334-335)	2.71	100	---	0	2.71
PB-11 (359-360)	2.71	100	---	0	2.71
PB-12 (69-70)	2.70	100	---	0	2.70
PB-12 (109-110)	2.75	100	---	0	2.75
PB-12 (154-155)	2.70	100	---	0	2.70
PB-12 (179-180)	2.70	100	---	0	2.70
PB-12 (204-205)	2.68	100	---	0	2.68
PB-12 (224-225)	2.70	100	---	0	2.70
PB-12 (249-250)	2.70	100	---	0	2.70
PB-12 (264-265)	2.68	100	---	0	2.68
PB-12 (284-285)	2.74	100	---	0	2.74
PB-12 (309-310)	2.69	100	---	0	2.69

--- = Unnecessary since specified fraction <5% of composite mass

* = Based on specific gravity of material < 4.75 mm

Summary of Specific Gravity Tests

	<4.75mm Material		>4.75mm Material		Bulk Sample
Sample Number	Specific Gravity	Percent of Bulk Sample	Specific Gravity	Percent of Bulk Sample	Specific Gravity
PB-12 (334-335)	2.70	100	---	0	2.70
PB-12 (349-350)	2.71	100	---	0	2.71
PB-13 (279-280)	2.66	100	---	0	2.66
PB-13 (349-350)	2.70	100	---	0	2.70
PB-13 (444-445)	2.72	100	---	0	2.72
PB-13 (499-500)	2.70	100	---	0	2.70
PB-13 (534-535)	2.68	100	---	0	2.68
PB-13 (554-555)	2.66	100	---	0	2.66
PB-13 (563-564)	2.65	100	---	0	2.65
PB-13 (585-586)	2.68	100	---	0	2.68
PB-13 (604-605)	2.65	100	---	0	2.65
PB-13 (625-626)	2.62	100	---	0	2.62
PB-13 (639-640)	2.65	100	---	0	2.65
PB-13 (660-661)	2.67	100	---	0	2.67
PB-14 (294-295)	2.72	100	---	0	2.72
PB-14 (304-305)	2.69	100	---	0	2.69
PB-14 (532-533)	2.67	100	---	0	2.67
PB-14 (549-550)	2.65	100	---	0	2.65
PB-14 (569-570)	2.69	100	---	0	2.69
PB-14 (594-595)	2.64	100	---	0	2.64
PB-14 (620-623)	2.65	100	---	0	2.65

--- = Unnecessary since specified fraction <5% of composite mass

* = Based on specific gravity of material < 4.75 mm

Summary of Specific Gravity Tests

	<4.75mm Material		>4.75mm Material		Bulk Sample
Sample Number	Specific Gravity	Percent of Bulk Sample	Specific Gravity	Percent of Bulk Sample	Specific Gravity
PB-14 (635-363)	2.66	100	---	0	2.66
PB-14 (709-710)	2.68	100	---	0	2.68
PB-14 (727-728)	2.67	100	---	0	2.67
PB-14 (741-742)	2.66	100	---	0	2.66
PB-14 (749-750)	2.66	100	---	0	2.66
PB-15 (435-436)	2.68	100	---	0	2.68
PB-15 (464-465)	2.68	100	---	0	2.68
PB-15 (483-484)	2.69	100	---	0	2.69
PB-15 (502-503)	2.70	100	---	0	2.70
PB-15 (524-525)	2.67	100	---	0	2.67
PB-15 (539-540)	2.65	100	---	0	2.65
PB-15 (559-560)	2.66	100	---	0	2.66
PB-15 (574-575)	2.63	100	---	0	2.63
PB-15 (604-605)	2.70	100	---	0	2.70

--- = Unnecessary since specified fraction <5% of composite mass

* = Based on specific gravity of material < 4.75 mm

Initial Properties

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
PB-11 (39-40)	23.2	35.0	---	---	1.51	1.86	43.5
PB-11 (154-155)	20.3	30.2	---	---	1.49	1.79	44.6
PB-11 (184-185)	23.7	36.8	---	---	1.55	1.92	41.8
PB-11 (209-210)	25.3	39.6	---	---	1.56	1.96	42.0
PB-11 (229-230)	21.0	34.5	---	---	1.64	1.99	38.2
PB-11 (248-249)	25.8	39.8	---	---	1.54	1.94	42.9
PB-11 (274-275)	22.8	36.4	---	---	1.59	1.95	40.8
PB-11 (294-295)	25.2	39.1	---	---	1.55	1.94	42.0
PB-11 (309-310)	25.1	39.4	---	---	1.57	1.97	41.7
PB-11 (334-335)	21.4	35.8	---	---	1.68	2.03	38.1
PB-11 (359-360)	24.2	38.3	---	---	1.58	1.96	41.8

NA = Not analyzed

--- = This sample was not remolded

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity (Continued)

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
PB-12 (69-70)	26.7	40.4	---	---	1.51	1.91	43.9
PB-12 (109-110)	29.3	43.2	---	---	1.47	1.91	46.3
PB-12 (154-155)	18.2	29.6	---	---	1.62	1.92	39.9
PB-12 (179-180)	18.0	27.5	---	---	1.52	1.80	43.4
PB-12 (204-205)	26.1	39.8	---	---	1.52	1.92	42.9
PB-12 (224-225)	24.8	38.7	---	---	1.56	1.95	42.0
PB-12 (249-250)	25.9	40.1	---	---	1.55	1.95	42.6
PB-12 (264-265)	22.7	34.5	---	---	1.52	1.87	43.2
PB-12 (284-285)	26.8	40.8	---	---	1.52	1.93	44.3
PB-12 (309-310)	27.5	41.6	---	---	1.51	1.93	43.6
PB-12 (334-335)	25.7	39.7	---	---	1.55	1.94	42.6
PB-12 (349-350)	31.1	44.7	---	---	1.44	1.88	46.8

NA = Not analyzed

--- = This sample was not remolded

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity (Continued)

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
PB-13 (279-280)	26.0	39.7	---	---	1.52	1.92	42.7
PB-13 (349-350)	25.1	37.1	---	---	1.48	1.85	45.0
PB-13 (444-445)	29.2	42.3	---	---	1.45	1.87	46.7
PB-13 (499-500)	27.4	41.0	---	---	1.50	1.91	44.6
PB-13 (534-535)	25.9	38.7	---	---	1.49	1.88	44.3
PB-13 (554-555)	26.0	37.9	---	---	1.46	1.84	45.2
PB-13 (563-564)	26.8	39.3	---	---	1.47	1.86	44.6
PB-13 (585-586)	29.9	43.4	---	---	1.45	1.89	45.8
PB-13 (604-605)	31.4	44.4	---	---	1.42	1.86	46.6
PB-13 (625-626)	28.7	41.9	---	---	1.46	1.88	44.2
PB-13 (639-640)	30.3	43.5	---	---	1.43	1.87	45.7
PB-13 (660-661)	28.6	42.2	---	---	1.47	1.89	44.7

NA = Not analyzed

--- = This sample was not remolded

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity (Continued)

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
PB-14 (294-295)	31.8	43.9	---	---	1.38	1.82	49.1
PB-14 (304-305)	21.5	29.6	---	---	1.38	1.67	48.7
PB-14 (532-533)	30.6	42.5	---	---	1.39	1.82	47.9
PB-14 (549-550)	29.4	42.4	---	---	1.44	1.87	45.5
PB-14 (569-570)	28.5	41.9	---	---	1.47	1.89	45.2
PB-14 (594-595)	32.1	44.1	---	---	1.37	1.81	47.8
PB-14 (620-623)	26.1	38.8	---	---	1.48	1.87	43.8
PB-14 (635-636)	30.1	42.5	---	---	1.41	1.83	46.9
PB-14 (709-710)	32.5	45.6	---	---	1.41	1.86	47.4
PB-14 (727-728)	27.2	40.4	---	---	1.48	1.89	44.3
PB-14 (741-742)	28.6	42.2	---	---	1.47	1.89	44.4
PB-14 (749-750)	28.2	41.1	---	---	1.46	1.87	45.1

NA = Not analyzed

--- = This sample was not remolded

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity (Continued)

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
PB-15 (435-436)	30.5	42.8	---	---	1.40	1.83	47.5
PB-15 (464-465)	33.5	46.4	---	---	1.39	1.85	48.2
PB-15 (483-484)	29.0	42.9	---	---	1.48	1.91	45.0
PB-15 (502-503)	28.7	41.1	---	---	1.43	1.84	46.9
PB-15 (524-525)	30.2	44.4	---	---	1.47	1.92	44.8
PB-15 (539-540)	29.8	43.4	---	---	1.46	1.89	44.9
PB-15 (559-560)	28.8	42.6	---	---	1.48	1.90	44.4
PB-15 (574-575)	30.2	43.4	---	---	1.43	1.87	45.3
PB-15 (604-605)	26.0	39.3	---	---	1.51	1.90	43.9

NA = Not analyzed

--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (39-40)
Date Sampled: 12/7/2011
Depth: 39-40

	As Received	Remolded
Test Date:	10-Jan-12	---
Field weight of sample* (g):	249.61	
Tare weight, ring (g):	48.37	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	163.38	
Sample volume (cm^3):	108.26	
Measured particle density (g/cm^3):	2.67	
Gravimetric Moisture Content (% g/g):	23.2	
Volumetric Moisture Content (% vol):	35.0	
Dry bulk density (g/cm^3):	1.51	
Wet bulk density (g/cm^3):	1.86	
Calculated Porosity (% vol):	43.5	
Percent Saturation:	80.3	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

	As Received	Remolded
Test Date:	10-Jan-12	---
Field weight of sample* (g):	225.36	
Tare weight, ring (g):	55.59	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	141.07	
Sample volume (cm^3):	94.92	
Measured particle density (g/cm^3):	2.68	
Gravimetric Moisture Content (% g/g):	20.3	
Volumetric Moisture Content (% vol):	30.2	
Dry bulk density (g/cm^3):	1.49	
Wet bulk density (g/cm^3):	1.79	
Calculated Porosity (% vol):	44.6	
Percent Saturation:	67.8	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (184-185)
Date Sampled: 12/7/2011
Depth: 184-185

	As Received	Remolded
Test Date:	10-Jan-12	---
Field weight of sample* (g):	221.77	
Tare weight, ring (g):	41.82	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	145.49	
Sample volume (cm^3):	93.64	
Measured particle density (g/cm^3):	2.67	
Gravimetric Moisture Content (% g/g):	23.7	
Volumetric Moisture Content (% vol):	36.8	
Dry bulk density (g/cm^3):	1.55	
Wet bulk density (g/cm^3):	1.92	
Calculated Porosity (% vol):	41.8	
Percent Saturation:	88.0	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (209-210)
Date Sampled: 12/7/2011
Depth: 209-210

	As Received	Remolded
Test Date:	10-Jan-12	---
Field weight of sample* (g):	198.93	
Tare weight, ring (g):	56.06	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	113.99	
Sample volume (cm^3):	72.95	
Measured particle density (g/cm^3):	2.69	
Gravimetric Moisture Content (% g/g):	25.3	
Volumetric Moisture Content (% vol):	39.6	
Dry bulk density (g/cm^3):	1.56	
Wet bulk density (g/cm^3):	1.96	
Calculated Porosity (% vol):	42.0	
Percent Saturation:	94.3	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (229-230)
Date Sampled: 12/7/2011
Depth: 229-230

	As Received	Remolded
Test Date:	9-Jan-12	---
Field weight of sample* (g):	193.45	
Tare weight, ring (g):	46.47	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	121.48	
Sample volume (cm^3):	74.00	
Measured particle density (g/cm^3):	2.66	
Gravimetric Moisture Content (% g/g):	21.0	
Volumetric Moisture Content (% vol):	34.5	
Dry bulk density (g/cm^3):	1.64	
Wet bulk density (g/cm^3):	1.99	
Calculated Porosity (% vol):	38.2	
Percent Saturation:	90.2	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (248-249)
Date Sampled: 12/7/2011
Depth: 248-249

	As Received	Remolded
Test Date:	9-Jan-12	---
Field weight of sample* (g):	187.62	
Tare weight, ring (g):	41.81	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	115.92	
Sample volume (cm^3):	75.04	
Measured particle density (g/cm^3):	2.71	
Gravimetric Moisture Content (% g/g):	25.8	
Volumetric Moisture Content (% vol):	39.8	
Dry bulk density (g/cm^3):	1.54	
Wet bulk density (g/cm^3):	1.94	
Calculated Porosity (% vol):	42.9	
Percent Saturation:	92.7	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (274-275)
Date Sampled: 12/7/2011
Depth: 274-275

	As Received	Remolded
Test Date:	11-Jan-12	---
Field weight of sample* (g):	200.02	
Tare weight, ring (g):	43.65	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	127.29	
Sample volume (cm^3):	80.00	
Measured particle density (g/cm^3):	2.69	
Gravimetric Moisture Content (% g/g):	22.8	
Volumetric Moisture Content (% vol):	36.4	
Dry bulk density (g/cm^3):	1.59	
Wet bulk density (g/cm^3):	1.95	
Calculated Porosity (% vol):	40.8	
Percent Saturation:	89.1	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (294-295)
Date Sampled: 12/7/2011
Depth: 294-295

	As Received	Remolded
Test Date:	11-Jan-12	---
Field weight of sample* (g):	281.06	
Tare weight, ring (g):	51.86	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	183.13	
Sample volume (cm^3):	117.87	
Measured particle density (g/cm^3):	2.68	
Gravimetric Moisture Content (% g/g):	25.2	
Volumetric Moisture Content (% vol):	39.1	
Dry bulk density (g/cm^3):	1.55	
Wet bulk density (g/cm^3):	1.94	
Calculated Porosity (% vol):	42.0	
Percent Saturation:	93.0	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

	As Received	Remolded
Test Date:	11-Jan-12	---
Field weight of sample* (g):	202.09	
Tare weight, ring (g):	47.74	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	123.39	
Sample volume (cm^3):	78.48	
Measured particle density (g/cm^3):	2.69	
Gravimetric Moisture Content (% g/g):	25.1	
Volumetric Moisture Content (% vol):	39.4	
Dry bulk density (g/cm^3):	1.57	
Wet bulk density (g/cm^3):	1.97	
Calculated Porosity (% vol):	41.7	
Percent Saturation:	94.7	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

	As Received	Remolded
Test Date:	11-Jan-12	---
Field weight of sample* (g):	189.45	
Tare weight, ring (g):	43.42	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	120.30	
Sample volume (cm^3):	71.81	
Measured particle density (g/cm^3):	2.71	
Gravimetric Moisture Content (% g/g):	21.4	
Volumetric Moisture Content (% vol):	35.8	
Dry bulk density (g/cm^3):	1.68	
Wet bulk density (g/cm^3):	2.03	
Calculated Porosity (% vol):	38.1	
Percent Saturation:	94.1	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (359-360)
Date Sampled: 12/7/2011
Depth: 359-360

	As Received	Remolded
Test Date:	11-Jan-12	---
Field weight of sample* (g):	167.56	
Tare weight, ring (g):	39.15	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	103.35	
Sample volume (cm^3):	65.49	
Measured particle density (g/cm^3):	2.71	
Gravimetric Moisture Content (% g/g):	24.2	
Volumetric Moisture Content (% vol):	38.3	
Dry bulk density (g/cm^3):	1.58	
Wet bulk density (g/cm^3):	1.96	
Calculated Porosity (% vol):	41.8	
Percent Saturation:	91.6	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (69-70)
Date Sampled: 12/7/2011
Depth: 69-70

	As Received	Remolded
Test Date:	11-Jan-12	---
Field weight of sample* (g):	172.14	
Tare weight, ring (g):	40.96	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	103.50	
Sample volume (cm^3):	68.58	
Measured particle density (g/cm^3):	2.69	
Gravimetric Moisture Content (% g/g):	26.7	
Volumetric Moisture Content (% vol):	40.4	
Dry bulk density (g/cm^3):	1.51	
Wet bulk density (g/cm^3):	1.91	
Calculated Porosity (% vol):	43.9	
Percent Saturation:	91.9	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (109-110)
Date Sampled: 12/7/2011
Depth: 109-110

	As Received	Remolded
Test Date:	11-Jan-12	---
Field weight of sample* (g):	171.82	
Tare weight, ring (g):	41.37	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	100.90	
Sample volume (cm^3):	68.43	
Measured particle density (g/cm^3):	2.75	
Gravimetric Moisture Content (% g/g):	29.3	
Volumetric Moisture Content (% vol):	43.2	
Dry bulk density (g/cm^3):	1.47	
Wet bulk density (g/cm^3):	1.91	
Calculated Porosity (% vol):	46.3	
Percent Saturation:	93.2	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

	As Received	Remolded
Test Date:	12-Jan-12	---
Field weight of sample* (g):	350.13	
Tare weight, ring (g):	89.72	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	220.23	
Sample volume (cm^3):	135.65	
Measured particle density (g/cm^3):	2.70	
Gravimetric Moisture Content (% g/g):	18.2	
Volumetric Moisture Content (% vol):	29.6	
Dry bulk density (g/cm^3):	1.62	
Wet bulk density (g/cm^3):	1.92	
Calculated Porosity (% vol):	39.9	
Percent Saturation:	74.3	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (179-180)
Date Sampled: 12/7/2011
Depth: 179-180

	As Received	Remolded
Test Date:	12-Jan-12	---
Field weight of sample* (g):	283.79	
Tare weight, ring (g):	65.44	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	184.97	
Sample volume (cm^3):	121.32	
Measured particle density (g/cm^3):	2.69	
Gravimetric Moisture Content (% g/g):	18.0	
Volumetric Moisture Content (% vol):	27.5	
Dry bulk density (g/cm^3):	1.52	
Wet bulk density (g/cm^3):	1.80	
Calculated Porosity (% vol):	43.4	
Percent Saturation:	63.4	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (204-205)
Date Sampled: 12/7/2011
Depth: 204-205

	As Received	Remolded
Test Date:	12-Jan-12	---
Field weight of sample* (g):	285.60	
Tare weight, ring (g):	66.10	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	174.06	
Sample volume (cm^3):	114.16	
Measured particle density (g/cm^3):	2.67	
Gravimetric Moisture Content (% g/g):	26.1	
Volumetric Moisture Content (% vol):	39.8	
Dry bulk density (g/cm^3):	1.52	
Wet bulk density (g/cm^3):	1.92	
Calculated Porosity (% vol):	42.9	
Percent Saturation:	92.7	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (224-225)
Date Sampled: 12/7/2011
Depth: 224-225

	As Received	Remolded
Test Date:	13-Jan-12	---
Field weight of sample* (g):	171.93	
Tare weight, ring (g):	40.04	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	105.69	
Sample volume (cm^3):	67.62	
Measured particle density (g/cm^3):	2.70	
Gravimetric Moisture Content (% g/g):	24.8	
Volumetric Moisture Content (% vol):	38.7	
Dry bulk density (g/cm^3):	1.56	
Wet bulk density (g/cm^3):	1.95	
Calculated Porosity (% vol):	42.0	
Percent Saturation:	92.2	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (249-250)
Date Sampled: 12/7/2011
Depth: 249-250

	As Received	Remolded
Test Date:	13-Jan-12	---
Field weight of sample* (g):	188.46	
Tare weight, ring (g):	44.48	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	114.36	
Sample volume (cm^3):	73.85	
Measured particle density (g/cm^3):	2.70	
Gravimetric Moisture Content (% g/g):	25.9	
Volumetric Moisture Content (% vol):	40.1	
Dry bulk density (g/cm^3):	1.55	
Wet bulk density (g/cm^3):	1.95	
Calculated Porosity (% vol):	42.6	
Percent Saturation:	94.2	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (264-265)
Date Sampled: 12/7/2011
Depth: 264-265

	As Received	Remolded
Test Date:	13-Jan-12	---
Field weight of sample* (g):	165.22	
Tare weight, ring (g):	39.94	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	102.12	
Sample volume (cm^3):	67.16	
Measured particle density (g/cm^3):	2.68	
Gravimetric Moisture Content (% g/g):	22.7	
Volumetric Moisture Content (% vol):	34.5	
Dry bulk density (g/cm^3):	1.52	
Wet bulk density (g/cm^3):	1.87	
Calculated Porosity (% vol):	43.2	
Percent Saturation:	79.9	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (284-285)
Date Sampled: 12/7/2011
Depth: 284-285

	As Received	Remolded
Test Date:	13-Jan-12	---
Field weight of sample* (g):	207.93	
Tare weight, ring (g):	49.65	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	124.87	
Sample volume (cm^3):	81.98	
Measured particle density (g/cm^3):	2.73	
Gravimetric Moisture Content (% g/g):	26.8	
Volumetric Moisture Content (% vol):	40.8	
Dry bulk density (g/cm^3):	1.52	
Wet bulk density (g/cm^3):	1.93	
Calculated Porosity (% vol):	44.3	
Percent Saturation:	92.1	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

	As Received	Remolded
Test Date:	13-Jan-12	---
Field weight of sample* (g):	173.08	
Tare weight, ring (g):	41.12	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	103.50	
Sample volume (cm^3):	68.41	
Measured particle density (g/cm^3):	2.68	
Gravimetric Moisture Content (% g/g):	27.5	
Volumetric Moisture Content (% vol):	41.6	
Dry bulk density (g/cm^3):	1.51	
Wet bulk density (g/cm^3):	1.93	
Calculated Porosity (% vol):	43.6	
Percent Saturation:	95.5	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

	As Received	Remolded
Test Date:	13-Jan-12	---
Field weight of sample* (g):	180.97	
Tare weight, ring (g):	42.35	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	110.32	
Sample volume (cm^3):	71.30	
Measured particle density (g/cm^3):	2.69	
Gravimetric Moisture Content (% g/g):	25.7	
Volumetric Moisture Content (% vol):	39.7	
Dry bulk density (g/cm^3):	1.55	
Wet bulk density (g/cm^3):	1.94	
Calculated Porosity (% vol):	42.6	
Percent Saturation:	93.2	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

	As Received	Remolded
Test Date:	16-Jan-12	---
Field weight of sample* (g):	179.44	
Tare weight, ring (g):	40.17	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	106.25	
Sample volume (cm^3):	73.93	
Measured particle density (g/cm^3):	2.70	
Gravimetric Moisture Content (% g/g):	31.1	
Volumetric Moisture Content (% vol):	44.7	
Dry bulk density (g/cm^3):	1.44	
Wet bulk density (g/cm^3):	1.88	
Calculated Porosity (% vol):	46.8	
Percent Saturation:	95.4	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (279-280)
Date Sampled: 12/7/2011
Depth: 279-280

	As Received	Remolded
Test Date:	16-Jan-12	---
Field weight of sample* (g):	181.87	
Tare weight, ring (g):	43.60	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	109.70	
Sample volume (cm^3):	71.94	
Measured particle density (g/cm^3):	2.66	
Gravimetric Moisture Content (% g/g):	26.0	
Volumetric Moisture Content (% vol):	39.7	
Dry bulk density (g/cm^3):	1.52	
Wet bulk density (g/cm^3):	1.92	
Calculated Porosity (% vol):	42.7	
Percent Saturation:	93.1	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

	As Received	Remolded
Test Date:	16-Jan-12	---
Field weight of sample* (g):	190.17	
Tare weight, ring (g):	46.23	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	115.10	
Sample volume (cm^3):	77.71	
Measured particle density (g/cm^3):	2.69	
Gravimetric Moisture Content (% g/g):	25.1	
Volumetric Moisture Content (% vol):	37.1	
Dry bulk density (g/cm^3):	1.48	
Wet bulk density (g/cm^3):	1.85	
Calculated Porosity (% vol):	45.0	
Percent Saturation:	82.4	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (444-445)
Date Sampled: 12/7/2011
Depth: 444-445

	As Received	Remolded
Test Date:	16-Jan-12	---
Field weight of sample* (g):	171.22	
Tare weight, ring (g):	41.88	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	100.10	
Sample volume (cm^3):	69.16	
Measured particle density (g/cm^3):	2.71	
Gravimetric Moisture Content (% g/g):	29.2	
Volumetric Moisture Content (% vol):	42.3	
Dry bulk density (g/cm^3):	1.45	
Wet bulk density (g/cm^3):	1.87	
Calculated Porosity (% vol):	46.7	
Percent Saturation:	90.6	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (499-500)
Date Sampled: 12/7/2011
Depth: 499-500

	As Received	Remolded
Test Date:	17-Jan-12	---
Field weight of sample* (g):	166.77	
Tare weight, ring (g):	40.05	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	99.46	
Sample volume (cm^3):	66.48	
Measured particle density (g/cm^3):	2.70	
Gravimetric Moisture Content (% g/g):	27.4	
Volumetric Moisture Content (% vol):	41.0	
Dry bulk density (g/cm^3):	1.50	
Wet bulk density (g/cm^3):	1.91	
Calculated Porosity (% vol):	44.6	
Percent Saturation:	92.0	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (534-535)
Date Sampled: 12/7/2011
Depth: 534-535

	As Received	Remolded
Test Date:	17-Jan-12	---
Field weight of sample* (g):	154.18	
Tare weight, ring (g):	37.69	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	92.51	
Sample volume (cm^3):	62.04	
Measured particle density (g/cm^3):	2.68	
Gravimetric Moisture Content (% g/g):	25.9	
Volumetric Moisture Content (% vol):	38.7	
Dry bulk density (g/cm^3):	1.49	
Wet bulk density (g/cm^3):	1.88	
Calculated Porosity (% vol):	44.3	
Percent Saturation:	87.2	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (554-555)
Date Sampled: 12/7/2011
Depth: 554-555

	As Received	Remolded
Test Date:	17-Jan-12	---
Field weight of sample* (g):	233.01	
Tare weight, ring (g):	45.69	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	148.65	
Sample volume (cm^3):	101.96	
Measured particle density (g/cm^3):	2.66	
Gravimetric Moisture Content (% g/g):	26.0	
Volumetric Moisture Content (% vol):	37.9	
Dry bulk density (g/cm^3):	1.46	
Wet bulk density (g/cm^3):	1.84	
Calculated Porosity (% vol):	45.2	
Percent Saturation:	84.0	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (563-564)
Date Sampled: 12/7/2011
Depth: 563-564

	As Received	Remolded
Test Date:	17-Jan-12	---
Field weight of sample* (g):	159.35	
Tare weight, ring (g):	36.05	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	97.25	
Sample volume (cm^3):	66.27	
Measured particle density (g/cm^3):	2.65	
Gravimetric Moisture Content (% g/g):	26.8	
Volumetric Moisture Content (% vol):	39.3	
Dry bulk density (g/cm^3):	1.47	
Wet bulk density (g/cm^3):	1.86	
Calculated Porosity (% vol):	44.6	
Percent Saturation:	88.1	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (585-586)
Date Sampled: NA
Depth: 585-586

	As Received	Remolded
Test Date:	18-Jan-12	---
Field weight of sample* (g)*:*	279.38	
Tare weight, ring (g)*:*	52.60	
Tare weight, pan/plate (g)*:*	0.00	
Tare weight, other (g)*:*	0.00	
Dry weight of sample (g)*:*	174.61	
Sample volume (cm^3)*:*	120.16	
Measured particle density (g/cm^3)*:*	2.68	
Gravimetric Moisture Content (% g/g)*:*	29.9	
Volumetric Moisture Content (% vol)*:*	43.4	
Dry bulk density (g/cm^3)*:*	1.45	
Wet bulk density (g/cm^3)*:*	1.89	
Calculated Porosity (% vol)*:*	45.8	
Percent Saturation:	94.9	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (604-605)
Date Sampled: NA
Depth: 604-605

	As Received	Remolded
Test Date:	25-Jan-12	---
Field weight of sample* (g):	212.02	
Tare weight, ring (g):	48.24	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	124.67	
Sample volume (cm^3):	88.06	
Measured particle density (g/cm^3):	2.65	
Gravimetric Moisture Content (% g/g):	31.4	
Volumetric Moisture Content (% vol):	44.4	
Dry bulk density (g/cm^3):	1.42	
Wet bulk density (g/cm^3):	1.86	
Calculated Porosity (% vol):	46.6	
Percent Saturation:	95.4	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (625-626)
Date Sampled: NA
Depth: 625-626

	As Received	Remolded
Test Date:	16-Jan-12	---
Field weight of sample* (g):	171.97	
Tare weight, ring (g):	38.67	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	103.59	
Sample volume (cm^3):	70.85	
Measured particle density (g/cm^3):	2.62	
Gravimetric Moisture Content (% g/g):	28.7	
Volumetric Moisture Content (% vol):	41.9	
Dry bulk density (g/cm^3):	1.46	
Wet bulk density (g/cm^3):	1.88	
Calculated Porosity (% vol):	44.2	
Percent Saturation:	94.9	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (639-640)
Date Sampled: NA
Depth: 639-640

	As Received	Remolded
Test Date:	23-Jan-12	---
Field weight of sample* (g):	572.51	
Tare weight, ring (g):	279.42	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	224.97	
Sample volume (cm^3):	156.78	
Measured particle density (g/cm^3):	2.64	
Gravimetric Moisture Content (% g/g):	30.3	
Volumetric Moisture Content (% vol):	43.5	
Dry bulk density (g/cm^3):	1.43	
Wet bulk density (g/cm^3):	1.87	
Calculated Porosity (% vol):	45.7	
Percent Saturation:	95.1	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (660-661)
Date Sampled: NA
Depth: 660-661

	As Received	Remolded
Test Date:	23-Jan-12	---
Field weight of sample* (g):	418.92	
Tare weight, ring (g):	190.37	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	177.67	
Sample volume (cm^3):	120.67	
Measured particle density (g/cm^3):	2.66	
Gravimetric Moisture Content (% g/g):	28.6	
Volumetric Moisture Content (% vol):	42.2	
Dry bulk density (g/cm^3):	1.47	
Wet bulk density (g/cm^3):	1.89	
Calculated Porosity (% vol):	44.7	
Percent Saturation:	94.3	

Laboratory analysis by: C. Sessa
Data entered by: J. Hines
Checked by: C. Krous

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (294-295)
Date Sampled: 12/8/2011
Depth: 294-295

	As Received	Remolded
Test Date:	18-Jan-12	---
Field weight of sample* (g):	150.70	
Tare weight, ring (g):	37.54	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	85.85	
Sample volume (cm^3):	62.16	
Measured particle density (g/cm^3):	2.72	
Gravimetric Moisture Content (% g/g):	31.8	
Volumetric Moisture Content (% vol):	43.9	
Dry bulk density (g/cm^3):	1.38	
Wet bulk density (g/cm^3):	1.82	
Calculated Porosity (% vol):	49.1	
Percent Saturation:	89.4	

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (304-305)
Date Sampled: 12/8/2011
Depth: 304-305

	As Received	Remolded
Test Date:	18-Jan-12	---
Field weight of sample* (g):	254.73	
Tare weight, ring (g):	66.63	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	154.78	
Sample volume (cm^3):	112.48	
Measured particle density (g/cm^3):	2.68	
Gravimetric Moisture Content (% g/g):	21.5	
Volumetric Moisture Content (% vol):	29.6	
Dry bulk density (g/cm^3):	1.38	
Wet bulk density (g/cm^3):	1.67	
Calculated Porosity (% vol):	48.7	
Percent Saturation:	60.8	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (532-533)
Date Sampled: 12/8/2011
Depth: 532-533

	As Received	Remolded
Test Date:	18-Jan-12	---
Field weight of sample* (g):	240.78	
Tare weight, ring (g):	57.53	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	140.36	
Sample volume (cm^3):	100.92	
Measured particle density (g/cm^3):	2.67	
Gravimetric Moisture Content (% g/g):	30.6	
Volumetric Moisture Content (% vol):	42.5	
Dry bulk density (g/cm^3):	1.39	
Wet bulk density (g/cm^3):	1.82	
Calculated Porosity (% vol):	47.9	
Percent Saturation:	88.8	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (549-550)
Date Sampled: 12/8/2011
Depth: 549-550

	As Received	Remolded
Test Date:	18-Jan-12	---
Field weight of sample* (g):	252.18	
Tare weight, ring (g):	48.35	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	157.56	
Sample volume (cm^3):	109.24	
Measured particle density (g/cm^3):	2.64	
Gravimetric Moisture Content (% g/g):	29.4	
Volumetric Moisture Content (% vol):	42.4	
Dry bulk density (g/cm^3):	1.44	
Wet bulk density (g/cm^3):	1.87	
Calculated Porosity (% vol):	45.5	
Percent Saturation:	93.2	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (569-570)
Date Sampled: 12/8/2011
Depth: 569-570

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g):	279.67	
Tare weight, ring (g):	63.48	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	168.20	
Sample volume (cm^3):	114.45	
Measured particle density (g/cm^3):	2.68	
Gravimetric Moisture Content (% g/g):	28.5	
Volumetric Moisture Content (% vol):	41.9	
Dry bulk density (g/cm^3):	1.47	
Wet bulk density (g/cm^3):	1.89	
Calculated Porosity (% vol):	45.2	
Percent Saturation:	92.8	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (594-595)
Date Sampled: 12/8/2011
Depth: 594-595

	As Received	Remolded
Test Date:	18-Jan-12	---
Field weight of sample* (g):	188.11	
Tare weight, ring (g):	46.77	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	107.00	
Sample volume (cm^3):	77.92	
Measured particle density (g/cm^3):	2.63	
Gravimetric Moisture Content (% g/g):	32.1	
Volumetric Moisture Content (% vol):	44.1	
Dry bulk density (g/cm^3):	1.37	
Wet bulk density (g/cm^3):	1.81	
Calculated Porosity (% vol):	47.8	
Percent Saturation:	92.2	

Laboratory analysis by: C. Sessa/ K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (620-623)
Date Sampled: 12/8/2011
Depth: 620-623

	As Received	Remolded
Test Date:	25-Jan-12	---
Field weight of sample* (g):	379.69	
Tare weight, ring (g):	140.81	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	189.37	
Sample volume (cm^3):	127.53	
Measured particle density (g/cm^3):	2.64	
Gravimetric Moisture Content (% g/g):	26.1	
Volumetric Moisture Content (% vol):	38.8	
Dry bulk density (g/cm^3):	1.48	
Wet bulk density (g/cm^3):	1.87	
Calculated Porosity (% vol):	43.8	
Percent Saturation:	88.6	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (635-636)
Date Sampled: 12/8/2011
Depth: 635-636

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g):	93.71	
Tare weight, ring (g):	25.90	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	52.11	
Sample volume (cm^3):	36.96	
Measured particle density (g/cm^3):	2.65	
Gravimetric Moisture Content (% g/g):	30.1	
Volumetric Moisture Content (% vol):	42.5	
Dry bulk density (g/cm^3):	1.41	
Wet bulk density (g/cm^3):	1.83	
Calculated Porosity (% vol):	46.9	
Percent Saturation:	90.6	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (709-710)
Date Sampled: 12/8/2011
Depth: 709-710

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g):	109.70	
Tare weight, ring (g):	30.36	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	59.90	
Sample volume (cm^3):	42.62	
Measured particle density (g/cm^3):	2.67	
Gravimetric Moisture Content (% g/g):	32.5	
Volumetric Moisture Content (% vol):	45.6	
Dry bulk density (g/cm^3):	1.41	
Wet bulk density (g/cm^3):	1.86	
Calculated Porosity (% vol):	47.4	
Percent Saturation:	96.2	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (727-728)
Date Sampled: 12/8/2011
Depth: 727-728

	As Received	Remolded
Test Date:	25-Jan-12	---
Field weight of sample* (g):	169.96	
Tare weight, ring (g):	81.08	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	69.87	
Sample volume (cm^3):	47.06	
Measured particle density (g/cm^3):	2.67	
Gravimetric Moisture Content (% g/g):	27.2	
Volumetric Moisture Content (% vol):	40.4	
Dry bulk density (g/cm^3):	1.48	
Wet bulk density (g/cm^3):	1.89	
Calculated Porosity (% vol):	44.3	
Percent Saturation:	91.2	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (741-742)
Date Sampled: 12/8/2011
Depth: 741-742

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g):	100.05	
Tare weight, ring (g):	26.26	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	57.36	
Sample volume (cm^3):	38.95	
Measured particle density (g/cm^3):	2.65	
Gravimetric Moisture Content (% g/g):	28.6	
Volumetric Moisture Content (% vol):	42.2	
Dry bulk density (g/cm^3):	1.47	
Wet bulk density (g/cm^3):	1.89	
Calculated Porosity (% vol):	44.4	
Percent Saturation:	94.9	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (749-750)
Date Sampled: 12/8/2011
Depth: 749-750

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g):	114.83	
Tare weight, ring (g):	31.50	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	65.02	
Sample volume (cm^3):	44.55	
Measured particle density (g/cm^3):	2.66	
Gravimetric Moisture Content (% g/g):	28.2	
Volumetric Moisture Content (% vol):	41.1	
Dry bulk density (g/cm^3):	1.46	
Wet bulk density (g/cm^3):	1.87	
Calculated Porosity (% vol):	45.1	
Percent Saturation:	91.1	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (435-436)
Date Sampled: NA
Depth: 435-436

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g):	255.82	
Tare weight, ring (g):	61.30	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	149.09	
Sample volume (cm^3):	106.16	
Measured particle density (g/cm^3):	2.68	
Gravimetric Moisture Content (% g/g):	30.5	
Volumetric Moisture Content (% vol):	42.8	
Dry bulk density (g/cm^3):	1.40	
Wet bulk density (g/cm^3):	1.83	
Calculated Porosity (% vol):	47.5	
Percent Saturation:	90.1	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (464-465)
Date Sampled: NA
Depth: 464-465

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g)*:*	227.33	
Tare weight, ring (g)*:*	52.95	
Tare weight, pan/plate (g)*:*	0.00	
Tare weight, other (g)*:*	0.00	
Dry weight of sample (g)*:*	130.66	
Sample volume (cm^3)*:*	94.30	
Measured particle density (g/cm^3)*:*	2.67	
Gravimetric Moisture Content (% g/g)*:*	33.5	
Volumetric Moisture Content (% vol)*:*	46.4	
Dry bulk density (g/cm^3)*:*	1.39	
Wet bulk density (g/cm^3)*:*	1.85	
Calculated Porosity (% vol)*:*	48.2	
Percent Saturation:	96.3	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (483-484)
Date Sampled: NA
Depth: 483-484

	As Received	Remolded
Test Date:	25-Jan-12	---
Field weight of sample* (g):	193.49	
Tare weight, ring (g):	43.23	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	116.46	
Sample volume (cm^3):	78.84	
Measured particle density (g/cm^3):	2.69	
Gravimetric Moisture Content (% g/g):	29.0	
Volumetric Moisture Content (% vol):	42.9	
Dry bulk density (g/cm^3):	1.48	
Wet bulk density (g/cm^3):	1.91	
Calculated Porosity (% vol):	45.0	
Percent Saturation:	95.2	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (502-503)
Date Sampled: NA
Depth: 502-503

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g)*:*	248.83	
Tare weight, ring (g)*:*	48.50	
Tare weight, pan/plate (g)*:*	0.00	
Tare weight, other (g)*:*	0.00	
Dry weight of sample (g)*:*	155.62	
Sample volume (cm^3)*:*	108.90	
Measured particle density (g/cm^3)*:*	2.69	
Gravimetric Moisture Content (% g/g)*:*	28.7	
Volumetric Moisture Content (% vol)*:*	41.1	
Dry bulk density (g/cm^3)*:*	1.43	
Wet bulk density (g/cm^3)*:*	1.84	
Calculated Porosity (% vol)*:*	46.9	
Percent Saturation:	87.5	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (524-525)
Date Sampled: 12/7/2011
Depth: 524-525

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g):	267.11	
Tare weight, ring (g):	59.63	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	159.34	
Sample volume (cm^3):	108.33	
Measured particle density (g/cm^3):	2.66	
Gravimetric Moisture Content (% g/g):	30.2	
Volumetric Moisture Content (% vol):	44.4	
Dry bulk density (g/cm^3):	1.47	
Wet bulk density (g/cm^3):	1.92	
Calculated Porosity (% vol):	44.8	
Percent Saturation:	99.2	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (539-540)
Date Sampled: 12/7/2011
Depth: 539-540

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g):	255.12	
Tare weight, ring (g):	58.66	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	151.35	
Sample volume (cm^3):	103.85	
Measured particle density (g/cm^3):	2.65	
Gravimetric Moisture Content (% g/g):	29.8	
Volumetric Moisture Content (% vol):	43.4	
Dry bulk density (g/cm^3):	1.46	
Wet bulk density (g/cm^3):	1.89	
Calculated Porosity (% vol):	44.9	
Percent Saturation:	96.7	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (559-560)
Date Sampled: 12/7/2011
Depth: 559-560

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g)*:*	290.46	
Tare weight, ring (g)*:*	68.51	
Tare weight, pan/plate (g)*:*	0.00	
Tare weight, other (g)*:*	0.00	
Dry weight of sample (g)*:*	172.32	
Sample volume (cm^3)*:*	116.59	
Measured particle density (g/cm^3)*:*	2.66	
Gravimetric Moisture Content (% g/g)*:*	28.8	
Volumetric Moisture Content (% vol)*:*	42.6	
Dry bulk density (g/cm^3)*:*	1.48	
Wet bulk density (g/cm^3)*:*	1.90	
Calculated Porosity (% vol)*:*	44.4	
Percent Saturation:	95.8	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (574-575)
Date Sampled: 12/7/2011
Depth: 574-575

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g):	202.14	
Tare weight, ring (g):	49.38	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	117.30	
Sample volume (cm^3):	81.76	
Measured particle density (g/cm^3):	2.62	
Gravimetric Moisture Content (% g/g):	30.2	
Volumetric Moisture Content (% vol):	43.4	
Dry bulk density (g/cm^3):	1.43	
Wet bulk density (g/cm^3):	1.87	
Calculated Porosity (% vol):	45.3	
Percent Saturation:	95.8	

Laboratory analysis by: C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (604-605)
Date Sampled: 12/7/2011
Depth: 604-605

	As Received	Remolded
Test Date:	19-Jan-12	---
Field weight of sample* (g):	169.06	
Tare weight, ring (g):	38.40	
Tare weight, pan/plate (g):	0.00	
Tare weight, other (g):	0.00	
Dry weight of sample (g):	103.66	
Sample volume (cm^3):	68.67	
Measured particle density (g/cm^3):	2.69	
Gravimetric Moisture Content (% g/g):	26.0	
Volumetric Moisture Content (% vol):	39.3	
Dry bulk density (g/cm^3):	1.51	
Wet bulk density (g/cm^3):	1.90	
Calculated Porosity (% vol):	43.9	
Percent Saturation:	89.6	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Saturated Hydraulic Conductivity

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis		
			Constant Head Rigid Wall	Falling Head Rigid Wall	Falling Head Flexible Wall
PB-11 (39-40)	9.9E-05	NA			X
PB-11 (154-155)	9.1E-06	NA			X
PB-11 (184-185)	5.9E-05	NA			X
PB-11 (209-210)	4.3E-05	NA			X
PB-11 (229-230)	2.8E-07	NA			X
PB-11 (248-249)	1.9E-07	NA			X
PB-11 (274-275)	3.9E-07	NA			X
PB-11 (294-295)	1.6E-07	NA			X
PB-11 (309-310)	1.3E-08	NA			X
PB-11 (334-335)	1.4E-08	NA			X
PB-11 (359-360)	4.3E-09	NA			X
PB-12 (69-70)	1.5E-05	NA			X
PB-12 (109-110)	1.6E-04	NA			X
PB-12 (154-155)	2.6E-08	NA			X
PB-12 (179-180)	1.9E-04	NA			X
PB-12 (204-205)	3.4E-04	NA			X
PB-12 (224-225)	2.1E-06	NA			X
PB-12 (249-250)	9.1E-06	NA			X
PB-12 (264-265)	9.4E-07	NA			X

** = An intact flexible-wall sub sample was not able to be obtained.
--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis		
			Constant Head Rigid Wall	Falling Head Rigid Wall	Falling Head Flexible Wall
PB-12 (284-285)	2.5E-08	NA			X
PB-12 (309-310)	1.4E-08	NA			X
PB-12 (334-335)	4.4E-09	NA			X
PB-12 (349-350)	6.9E-09	NA			X
PB-13 (279-280)	1.2E-04	NA			X
PB-13 (349-350)	4.1E-07	NA			X
PB-13 (444-445)	1.6E-04	NA			X
PB-13 (499-500)	1.7E-05	NA			X
PB-13 (534-535)	1.5E-06	NA			X
PB-13 (554-555)	6.3E-07	NA			X
PB-13 (563-564)	1.2E-07	NA			X
PB-13 (585-586)	7.0E-07	NA			X
PB-13 (604-605)	1.3E-07	NA			X
PB-13 (625-626)	2.0E-07	NA			X
PB-13 (639-640)	1.2E-07	NA			X
PB-13 (660-661)	2.3E-07	NA			X
PB-14 (294-295)	1.6E-06	NA			X
PB-14 (304-305)**	4.9E-05	NA	X		
PB-14 (532-533)	3.9E-06	NA			X

** = An intact flexible-wall sub sample was not able to be obtained.
--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis		
			Constant Head Rigid Wall	Falling Head Rigid Wall	Falling Head Flexible Wall
PB-14 (549-550)	2.3E-06	NA			X
PB-14 (569-570)	2.4E-07	NA			X
PB-14 (594-595)	2.6E-06	NA			X
PB-14 (620-623)	4.8E-07	NA			X
PB-14 (635-363)	3.3E-07	NA			X
PB-14 (709-710)	2.1E-07	NA			X
PB-14 (727-728)	3.4E-08	NA			X
PB-14 (741-742)	2.1E-08	NA			X
PB-14 (749-750)	2.8E-08	NA			X
PB-15 (435-436)	7.2E-04	NA			X
PB-15 (464-465)	8.5E-06	NA			X
PB-15 (483-484)	1.1E-06	NA			X
PB-15 (502-503)	2.4E-07	NA			X
PB-15 (524-525)	1.6E-04	NA			X
PB-15 (539-540)	9.4E-09	NA			X
PB-15 (559-560)	1.5E-06	NA			X
PB-15 (574-575)**	1.2E-07	NA		X	
PB-15 (604-605)	1.8E-06	NA			X

** = An intact flexible-wall sub sample was not able to be obtained.
--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (39-40)
Date Sampled: 12/7/2011
Depth: 39-40

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	273.51	*Saturated Mass (g):*	283.78	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.271	*Dry Mass (g):*	222.15	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.648	*Diameter (cm):*	6.275		☐ Remolded Sample
Area (cm^2):	30.89	*Length (cm):*	4.663	*Number of Lifts:*	NA
Volume (cm^3):	143.56	*Deformation (%)**:*	0.33	*Split:*	NA
Dry Density (g/cm^3):	1.55	*Area (cm^2):*	30.93	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	96.60	*Volume (cm^3):*	144.21	*Particle Density(g/cm^3):*	2.67 ☐ Assumed ☑ Measured
Water Content (%, g/g):	23.1	*Dry Density (g/cm^3):*	1.54	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	35.8	*Dry Density (pcf):*	96.17	*Influent pressure (PSI):*	80.0
Void Ratio (e):	0.73	*Water Content (%, g/g):*	27.7	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	42.1	*Water Content (%, vol):*	42.7	*Panel Used:*	☑ A ☐ B ☐ C
Saturation (%):	85.0	*Void Ratio(e):*	0.74	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	42.4		Date/Time
		Saturation (%):*	100.9	B-Value (% saturation) prior to test*:	0.98 1/16/12 1440
				B-Value (% saturation) post to test:	0.98 1/17/12 1020

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

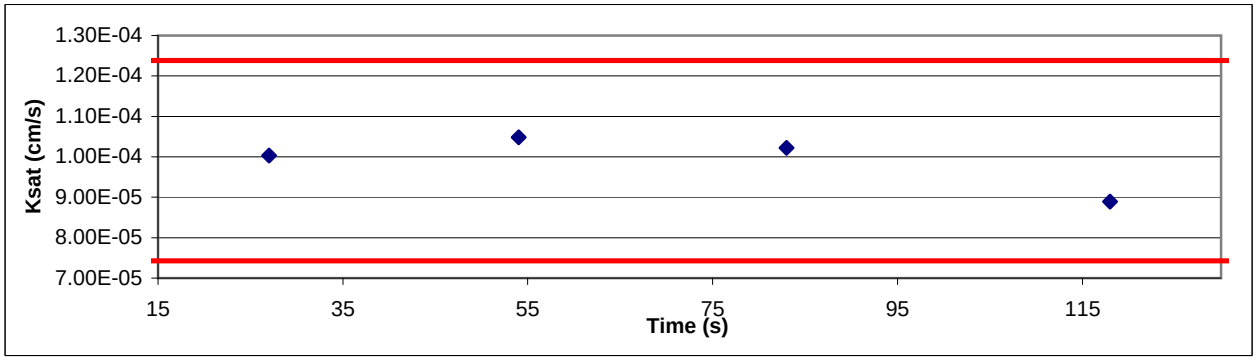
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (39-40)
Date Sampled: 12/7/2011
Depth: 39-40

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
16-Jan-12	13:05:09	21.5	7.80	17.30	2.35	0.17	27	1.00	4%	1.04E-04	1.00E-04
16-Jan-12	13:05:36	21.5	8.00	17.10	2.25						
Test # 2:											
16-Jan-12	13:05:36	21.5	8.00	17.10	2.25	0.17	27	1.00	4%	1.09E-04	1.05E-04
16-Jan-12	13:06:03	21.5	8.20	16.90	2.15						
Test # 3:											
16-Jan-12	13:06:03	21.5	8.20	16.90	2.15	0.17	29	1.00	5%	1.06E-04	1.02E-04
16-Jan-12	13:06:32	21.5	8.40	16.70	2.06						
Test # 4:											
16-Jan-12	13:06:32	21.5	8.40	16.70	2.06	0.17	35	1.00	5%	9.21E-05	8.89E-05
16-Jan-12	13:07:07	21.5	8.60	16.50	1.96						

***Average Ksat* (cm/sec):** **9.91E-05**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 7.43E-05

Ksat (+25%) (cm/s): 1.24E-04

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

Remolded or Initial Sample Properties	
Initial Mass (g):	311.9
Diameter (cm):	6.287
Length (cm):	5.306
Area (cm^2):	31.04
Volume (cm^3):	164.72
Dry Density (g/cm^3):	1.55
Dry Density (pcf):	96.65
Water Content (%, g/g):	22.3
Water Content (%, vol):	34.5
Void Ratio (e):	0.73
Porosity (%, vol):	42.3
Saturation (%):	81.6

Post Permeation Sample Properties	
Saturated Mass (g):	326.04
Dry Mass (g):	255.01
Diameter (cm):	6.28
Length (cm):	5.326
*Deformation (%)**:*	0.38
Area (cm^2):	30.97
Volume (cm^3):	164.98
Dry Density (g/cm^3):	1.55
Dry Density (pcf):	96.49
Water Content (%, g/g):	27.9
Water Content (%, vol):	43.1
Void Ratio(e):	0.74
Porosity (%, vol):	42.4
Saturation (%):*	101.5

Test and Sample Conditions	
Permeant liquid used:	Tap Water
Sample Preparation:	☑ In situ sample, extruded
	☐ Remolded Sample
Number of Lifts:	NA
Split:	NA
Percent Coarse Material (%):	NA
Particle Density(g/cm^3):	2.68 ☐ Assumed ☑ Measured
Cell pressure (PSI):	82.0
Influent pressure (PSI):	80.5
Effluent pressure (PSI):	80.0
Panel Used:	☐ A ☑ B ☐ C
Reading:	☐ Annulus ☑ Pipette

		Date/Time
B-Value (% saturation) prior to test*:	1.00	1/16/11 1450
B-Value (% saturation) post to test:	1.00	1/17/11 1035

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

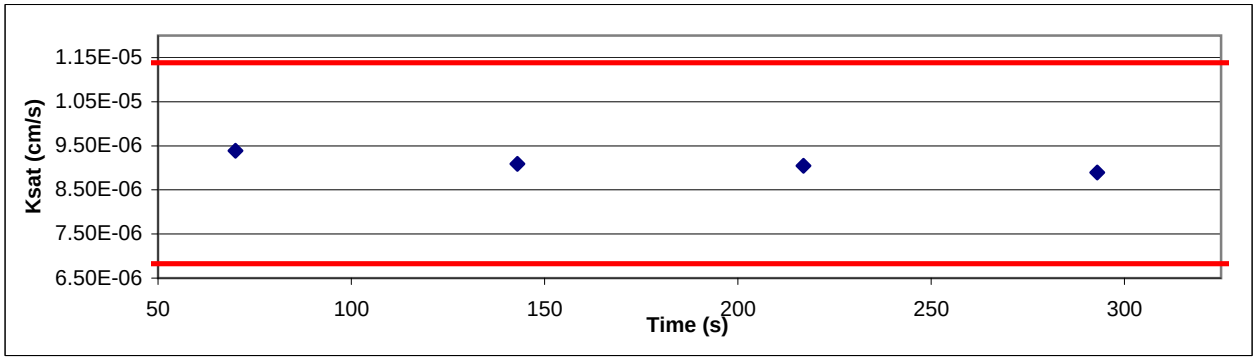
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
16-Jan-12	15:44:32	21.5	5.50	18.95	9.52	0.17	70	1.00	1%	9.73E-06	9.39E-06
16-Jan-12	15:45:42	21.5	5.70	18.75	9.43						
Test # 2:											
16-Jan-12	15:45:42	21.5	5.70	18.75	9.43	0.17	73	1.00	1%	9.42E-06	9.09E-06
16-Jan-12	15:46:55	21.5	5.90	18.55	9.35						
Test # 3:											
16-Jan-12	15:46:55	21.5	5.90	18.55	9.35	0.17	74	1.00	1%	9.38E-06	9.05E-06
16-Jan-12	15:48:09	21.5	6.10	18.35	9.26						
Test # 4:											
16-Jan-12	15:48:09	21.5	6.10	18.35	9.26	0.17	76	1.00	1%	9.22E-06	8.89E-06
16-Jan-12	15:49:25	21.5	6.30	18.15	9.17						

***Average Ksat* (cm/sec):** **9.11E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 6.83E-06

Ksat (+25%) (cm/s): 1.14E-05

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (184-185)
Date Sampled: 40884
Depth: 184-185

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	296.67	*Saturated Mass (g):*	301.79	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.277	*Dry Mass (g):*	238.36	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.965	*Diameter (cm):*	6.269		☐ Remolded Sample
Area (cm^2):	30.95	*Length (cm):*	4.966	*Number of Lifts:*	NA
Volume (cm^3):	153.64	*Deformation (%)**:*	0.02	*Split:*	NA
Dry Density (g/cm^3):	1.55	*Area (cm^2):*	30.87	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	96.85	*Volume (cm^3):*	153.29	*Particle Density(g/cm^3):*	2.67 ☐ Assumed ☑ Measured
Water Content (%, g/g):	24.5	*Dry Density (g/cm^3):*	1.55	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	38.0	*Dry Density (pcf):*	97.07	*Influent pressure (PSI):*	80.0
Void Ratio (e):	0.72	*Water Content (%, g/g):*	26.6	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	41.9	*Water Content (%, vol):*	41.4	*Panel Used:*	☐ D ☐ E ☑ F
Saturation (%):	90.6	*Void Ratio(e):*	0.72	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	41.8		Date/Time
		Saturation (%):*	99.1	B-Value (% saturation) prior to test*:	0.98 1/16/12 1306
				B-Value (% saturation) post to test:	1.00 1/17/12 1050

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

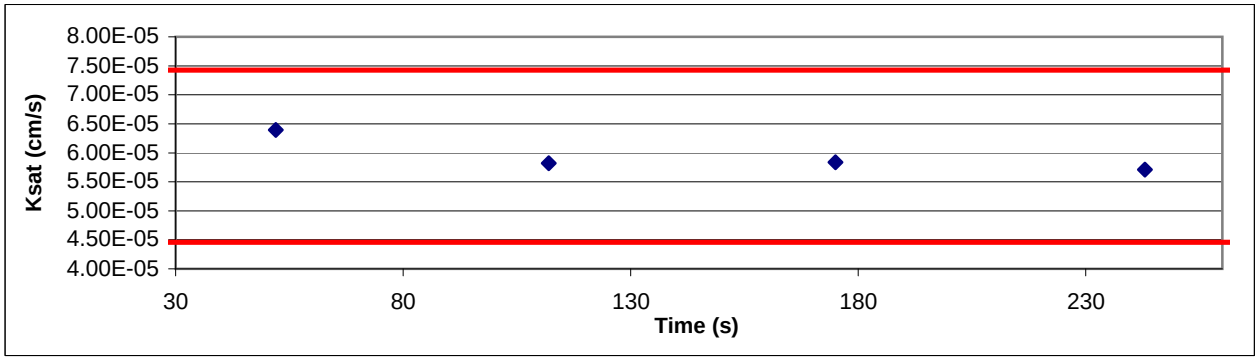
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (184-185)
Date Sampled: 40884
Depth: 184-185

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
17-Jan-12	09:15:07	20.3	10.70	19.25	1.99	0.17	52	1.00	5%	6.44E-05	6.40E-05
17-Jan-12	09:15:59	20.3	10.90	19.05	1.90						
Test # 2:											
17-Jan-12	09:15:59	20.3	10.90	19.05	1.90	0.17	60	1.00	5%	5.86E-05	5.82E-05
17-Jan-12	09:16:59	20.3	11.10	18.85	1.80						
Test # 3:											
17-Jan-12	09:16:59	20.3	11.10	18.85	1.80	0.17	63	1.00	5%	5.88E-05	5.84E-05
17-Jan-12	09:18:02	20.3	11.30	18.65	1.71						
Test # 4:											
17-Jan-12	09:18:02	20.3	11.30	18.65	1.71	0.17	68	1.00	5%	5.75E-05	5.71E-05
17-Jan-12	09:19:10	20.3	11.50	18.45	1.62						

***Average Ksat* (cm/sec):** **5.94E-05**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 4.46E-05

Ksat (+25%) (cm/s): 7.43E-05

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (209-210)
Date Sampled: 40884
Depth: 209-210

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	267.41	*Saturated Mass (g):*	270.11	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.166	*Dry Mass (g):*	210.2	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.658	*Diameter (cm):*	6.170		☐ Remolded Sample
Area (cm^2):	29.86	*Length (cm):*	4.656	*Number of Lifts:*	NA
Volume (cm^3):	139.09	*Deformation (%)**:*	0.05	*Split:*	NA
Dry Density (g/cm^3):	1.51	*Area (cm^2):*	29.90	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	94.34	*Volume (cm^3):*	139.20	*Particle Density(g/cm^3):*	2.69 ☐ Assumed ☑ Measured
Water Content (%, g/g):	27.2	*Dry Density (g/cm^3):*	1.51	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	41.1	*Dry Density (pcf):*	94.27	*Influent pressure (PSI):*	80.0
Void Ratio (e):	0.78	*Water Content (%, g/g):*	28.5	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	43.9	*Water Content (%, vol):*	43.0	*Panel Used:*	☐ D ☑ E ☐ F
Saturation (%):	93.8	*Void Ratio(e):*	0.78	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	43.9		Date/Time
		Saturation (%):*	98.0	B-Value (% saturation) prior to test*:	0.98 1/16/12 1503
				B-Value (% saturation) post to test:	0.98 1/17/12 1040

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

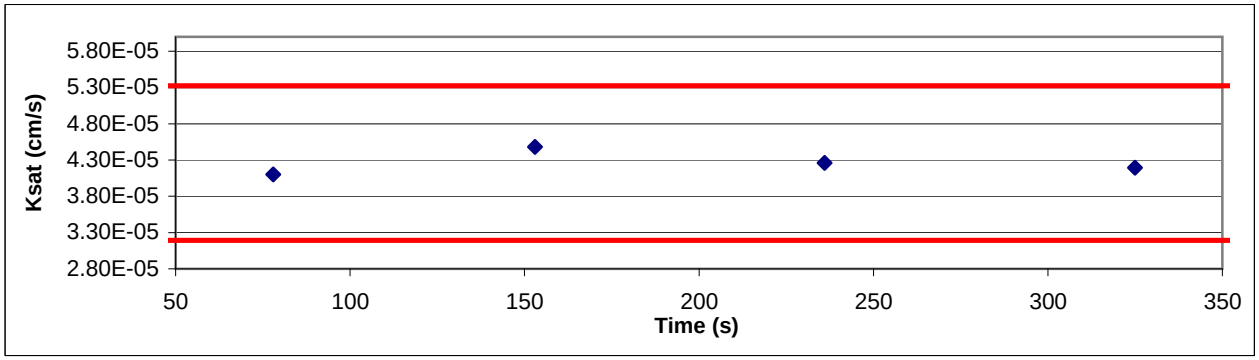
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (209-210)
Date Sampled: 40884
Depth: 209-210

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
17-Jan-12	09:06:09	20.3	10.80	19.40	2.13	0.17	78	1.00	5%	4.13E-05	4.10E-05
17-Jan-12	09:07:27	20.3	11.00	19.20	2.03						
Test # 2:											
17-Jan-12	09:07:27	20.3	11.00	19.20	2.03	0.17	75	1.00	5%	4.51E-05	4.48E-05
17-Jan-12	09:08:42	20.3	11.20	19.00	1.93						
Test # 3:											
17-Jan-12	09:08:42	20.3	11.20	19.00	1.93	0.17	83	1.00	5%	4.29E-05	4.26E-05
17-Jan-12	09:10:05	20.3	11.40	18.80	1.84						
Test # 4:											
17-Jan-12	09:10:05	20.3	11.40	18.80	1.84	0.17	89	1.00	5%	4.22E-05	4.19E-05
17-Jan-12	09:11:34	20.3	11.60	18.60	1.74						

***Average Ksat* (cm/sec):** **4.26E-05**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 3.19E-05

Ksat (+25%) (cm/s): 5.32E-05

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (229-230)
Date Sampled: 40884
Depth: 229-230

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	282.62	*Saturated Mass (g):*	285.03	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.052	*Dry Mass (g):*	227.09	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.885	*Diameter (cm):*	6.053		☐ Remolded Sample
Area (cm^2):	28.77	*Length (cm):*	4.884	*Number of Lifts:*	NA
Volume (cm^3):	140.52	*Deformation (%)**:*	0.02	*Split:*	NA
Dry Density (g/cm^3):	1.62	*Area (cm^2):*	28.78	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	100.88	*Volume (cm^3):*	140.55	*Particle Density(g/cm^3):*	2.66 ☐ Assumed ☑ Measured
Water Content (%, g/g):	24.5	*Dry Density (g/cm^3):*	1.62	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	39.5	*Dry Density (pcf):*	100.87	*Influent pressure (PSI):*	81.0
Void Ratio (e):	0.64	*Water Content (%, g/g):*	25.5	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	39.2	*Water Content (%, vol):*	41.2	*Panel Used:*	☑ D ☐ E ☐ F
Saturation (%):	100.8	*Void Ratio(e):*	0.64	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	39.2		Date/Time
		Saturation (%):*	105.2	B-Value (% saturation) prior to test*:	0.95 1/16/12 1500
				B-Value (% saturation) post to test:	0.98 1/17/12 1435

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

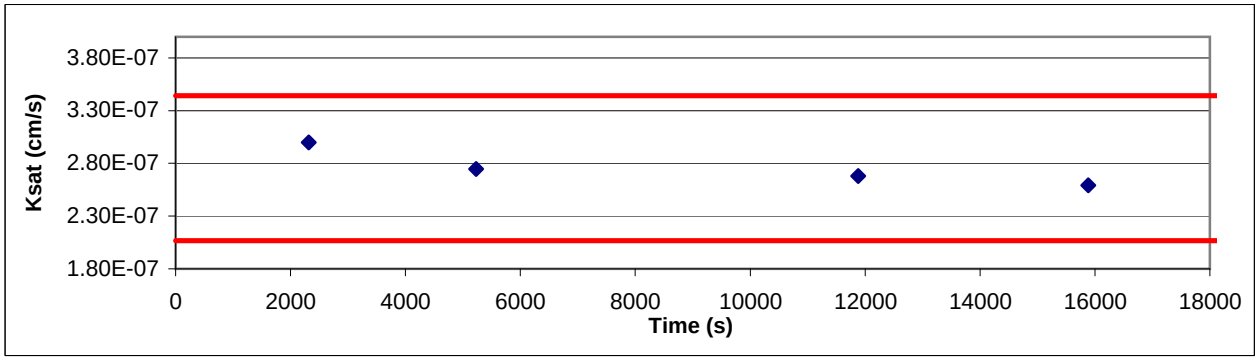
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (229-230)
Date Sampled: 40884
Depth: 229-230

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
17-Jan-12	09:20:00	20.3	6.75	19.95	17.52	0.30	2315	1.00	1%	3.02E-07	3.00E-07
17-Jan-12	09:58:35	20.4	7.10	19.60	17.36						
Test # 2:											
17-Jan-12	09:58:35	20.4	7.10	19.60	17.36	0.35	2913	1.00	1%	2.77E-07	2.75E-07
17-Jan-12	10:47:08	20.4	7.50	19.20	17.17						
Test # 3:											
17-Jan-12	10:47:08	20.4	7.50	19.20	17.17	0.76	6652	0.94	2%	2.70E-07	2.68E-07
17-Jan-12	12:38:00	20.4	8.40	18.35	16.75						
Test # 4:											
17-Jan-12	12:38:00	20.4	8.40	18.35	16.75	0.43	4005	1.00	1%	2.62E-07	2.59E-07
17-Jan-12	13:44:45	20.4	8.90	17.85	16.52						

***Average Ksat* (cm/sec):** **2.75E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 2.07E-07

Ksat (+25%) (cm/s): 3.44E-07

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (248-249)
Date Sampled: 12/7/2011
Depth: 248-249

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	326.48	*Saturated Mass (g):*	329.49	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.01	*Dry Mass (g):*	259.7	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.857	*Diameter (cm):*	5.996		☐ Remolded Sample
Area (cm^2):	28.37	*Length (cm):*	5.859	*Number of Lifts:*	NA
Volume (cm^3):	166.16	*Deformation (%)**:*	0.03	*Split:*	NA
Dry Density (g/cm^3):	1.56	*Area (cm^2):*	28.24	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	97.57	*Volume (cm^3):*	165.43	*Particle Density(g/cm^3):*	2.71 ☐ Assumed ☑ Measured
Water Content (%, g/g):	25.7	*Dry Density (g/cm^3):*	1.57	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	40.2	*Dry Density (pcf):*	98.00	*Influent pressure (PSI):*	81.0
Void Ratio (e):	0.73	*Water Content (%, g/g):*	26.9	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	42.3	*Water Content (%, vol):*	42.2	*Panel Used:*	☐ A ☐ B ☑ C
Saturation (%):	95.1	*Void Ratio(e):*	0.72	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	42.0		Date/Time
		Saturation (%):*	100.4	B-Value (% saturation) prior to test*:	0.98 1/16/12 1455
				B-Value (% saturation) post to test:	1.00 1/17/12 1430

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

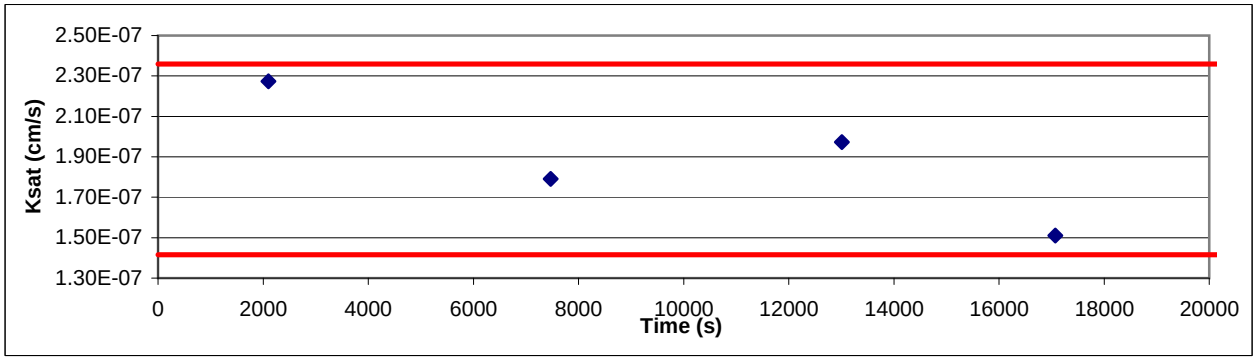
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (248-249)
Date Sampled: 12/7/2011
Depth: 248-249

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
17-Jan-12	08:55:00	20.3	4.20	18.20	14.77	0.17	2100	1.00	1%	2.29E-07	2.27E-07
17-Jan-12	09:30:00	20.3	4.40	18.00	14.69						
Test # 2:											
17-Jan-12	09:30:00	20.3	4.40	18.00	14.69	0.35	5370	1.00	1%	1.81E-07	1.79E-07
17-Jan-12	10:59:30	20.4	4.80	17.60	14.53						
Test # 3:											
17-Jan-12	10:59:30	20.4	4.80	17.60	14.53	0.39	5541	1.00	1%	1.99E-07	1.97E-07
17-Jan-12	12:31:51	20.4	5.25	17.15	14.35						
Test # 4:											
17-Jan-12	12:31:51	20.4	5.25	17.15	14.35	0.22	4059	1.00	1%	1.53E-07	1.51E-07
17-Jan-12	13:39:30	20.4	5.50	16.90	14.25						

***Average Ksat* (cm/sec):** **1.89E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.42E-07

Ksat (+25%) (cm/s): 2.36E-07

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (274-275)
Date Sampled: 12/7/2011
Depth: 274-275

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	307.98	*Saturated Mass (g):*	312.98	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.119	*Dry Mass (g):*	252.31	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.160	*Diameter (cm):*	6.133		☐ Remolded Sample
Area (cm^2):	29.41	*Length (cm):*	5.157	*Number of Lifts:*	NA
Volume (cm^3):	151.74	*Deformation (%)**:*	0.05	*Split:*	NA
Dry Density (g/cm^3):	1.66	*Area (cm^2):*	29.54	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	103.80	*Volume (cm^3):*	152.35	*Particle Density(g/cm^3):*	2.69 ☐ Assumed ☑ Measured
Water Content (%, g/g):	22.1	*Dry Density (g/cm^3):*	1.66	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	36.7	*Dry Density (pcf):*	103.39	*Influent pressure (PSI):*	81.0
Void Ratio (e):	0.62	*Water Content (%, g/g):*	24.0	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	38.1	*Water Content (%, vol):*	39.8	*Panel Used:*	☐ D ☐ E ☑ F
Saturation (%):	96.2	*Void Ratio(e):*	0.62	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	38.4		Date/Time
		Saturation (%):*	103.7	B-Value (% saturation) prior to test*:	0.98 1/27/12 805
				B-Value (% saturation) post to test:	0.98 1/27/12 1140

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

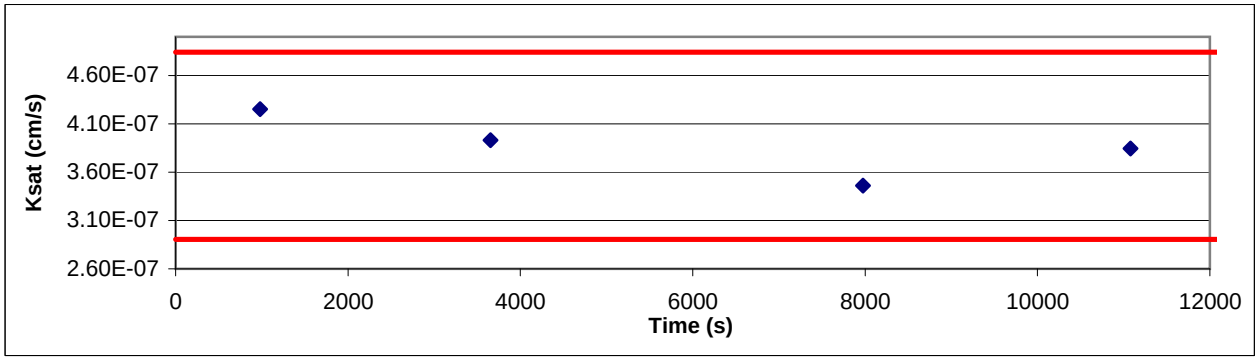
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (274-275)
Date Sampled: 12/7/2011
Depth: 274-275

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
27-Jan-12	08:50:35	21.2	10.40	20.45	15.89	0.17	980	1.00	1%	4.38E-07	4.25E-07
27-Jan-12	09:06:55	21.2	10.60	20.25	15.80						
Test # 2:											
27-Jan-12	09:06:55	21.2	10.60	20.25	15.80	0.43	2675	1.00	1%	4.05E-07	3.93E-07
27-Jan-12	09:51:30	21.2	11.10	19.75	15.58						
Test # 3:											
27-Jan-12	09:51:30	21.2	11.10	19.75	15.58	0.61	4320	1.00	2%	3.57E-07	3.46E-07
27-Jan-12	11:03:30	21.4	11.80	19.05	15.26						
Test # 4:											
27-Jan-12	11:03:30	21.4	11.80	19.05	15.26	0.48	3105	1.00	2%	3.97E-07	3.84E-07
27-Jan-12	11:55:15	21.4	12.35	18.50	15.02						

***Average Ksat* (cm/sec):** **3.87E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 2.90E-07

Ksat (+25%) (cm/s): 4.84E-07

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (294-295)
Date Sampled: 12/7/2011
Depth: 294-295

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	313.63	*Saturated Mass (g):*	319.77	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.471	*Dry Mass (g):*	252.37	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.813	*Diameter (cm):*	6.460		☐ Remolded Sample
Area (cm^2):	32.89	*Length (cm):*	4.830	*Number of Lifts:*	NA
Volume (cm^3):	158.29	*Deformation (%)**:*	0.35	*Split:*	NA
Dry Density (g/cm^3):	1.59	*Area (cm^2):*	32.78	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	99.53	*Volume (cm^3):*	158.31	*Particle Density(g/cm^3):*	2.68 ☐ Assumed ☑ Measured
Water Content (%, g/g):	24.3	*Dry Density (g/cm^3):*	1.59	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	38.7	*Dry Density (pcf):*	99.52	*Influent pressure (PSI):*	81.0
Void Ratio (e):	0.68	*Water Content (%, g/g):*	26.7	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	40.5	*Water Content (%, vol):*	42.6	*Panel Used:*	☑ D ☐ E ☐ F
Saturation (%):	95.6	*Void Ratio(e):*	0.68	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	40.5		Date/Time
		Saturation (%):*	105.1	B-Value (% saturation) prior to test*:	1.00 1/20/12 1440
				B-Value (% saturation) post to test:	1.00 1/24/12 1200

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition

Job Number: ES09.0154.12

Sample Number: PB-11 (294-295)

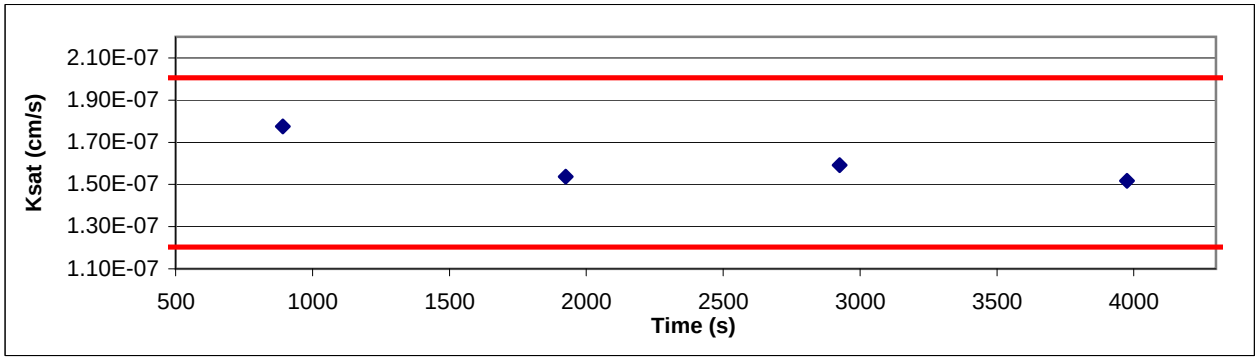
Date Sampled: 12/7/2011

Depth: 294-295

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
20-Jan-12	15:04:30	22.7	5.20	20.25	18.16	0.09	892	1.00	0%	1.89E-07	1.77E-07
20-Jan-12	15:19:22	22.7	5.30	20.15	18.11						
Test # 2:											
20-Jan-12	15:19:22	22.7	5.30	20.15	18.11	0.09	1033	1.00	0%	1.64E-07	1.54E-07
20-Jan-12	15:36:35	22.7	5.40	20.05	18.07						
Test # 3:											
20-Jan-12	15:36:35	22.7	5.40	20.05	18.07	0.09	1000	1.00	0%	1.70E-07	1.59E-07
20-Jan-12	15:53:15	22.7	5.50	19.95	18.02						
Test # 4:											
20-Jan-12	15:53:15	22.7	5.50	19.95	18.02	0.09	1050	1.00	0%	1.62E-07	1.52E-07
20-Jan-12	16:10:45	22.8	5.60	19.85	17.97						

***Average Ksat* (cm/sec):** **1.60E-07**

Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.20E-07

Ksat (+25%) (cm/s): 2.01E-07

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	266.32	*Saturated Mass (g):*	269.64	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.008	*Dry Mass (g):*	213.94	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.749	*Diameter (cm):*	5.985		☐ Remolded Sample
Area (cm^2):	28.35	*Length (cm):*	4.755	*Number of Lifts:*	NA
Volume (cm^3):	134.63	*Deformation (%)**:*	0.13	*Split:*	NA
Dry Density (g/cm^3):	1.59	*Area (cm^2):*	28.13	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	99.20	*Volume (cm^3):*	133.77	*Particle Density(g/cm^3):*	2.69 ☐ Assumed ☑ Measured
Water Content (%, g/g):	24.5	*Dry Density (g/cm^3):*	1.60	*Cell pressure (PSI):*	83.0
Water Content (%, vol):	38.9	*Dry Density (pcf):*	99.84	*Influent pressure (PSI):*	82.0
Void Ratio (e):	0.70	*Water Content (%, g/g):*	26.0	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	41.0	*Water Content (%, vol):*	41.6	*Panel Used:*	☐ A ☐ B ☑ C
Saturation (%):	94.8	*Void Ratio(e):*	0.69	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	40.7		Date/Time
		Saturation (%):*	102.4	B-Value (% saturation) prior to test*:	0.98 1/20/12 1435
				B-Value (% saturation) post to test:	1.00 1/25/12 745

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

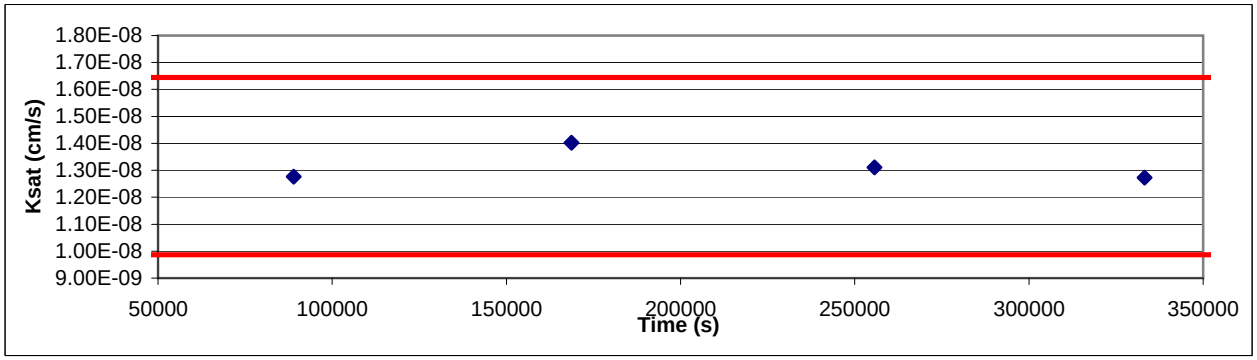
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
21-Jan-12	11:07:40	21.4	7.90	19.40	32.38	0.91	88990	1.00	2%	1.31E-08	1.28E-08
22-Jan-12	11:50:50	20.5	8.95	18.35	31.87						
Test # 2:											
22-Jan-12	11:50:50	20.5	8.95	18.35	31.87	0.87	79720	1.00	2%	1.41E-08	1.40E-08
23-Jan-12	09:59:30	20.0	9.95	17.35	31.38						
Test # 3:											
23-Jan-12	09:59:30	20.0	9.95	17.35	31.38	0.87	86970	1.00	2%	1.31E-08	1.31E-08
24-Jan-12	10:09:00	20.1	10.95	16.35	30.90						
Test # 4:											
24-Jan-12	10:09:00	20.1	10.95	16.35	30.90	0.74	77485	1.00	1%	1.27E-08	1.27E-08
25-Jan-12	07:40:25	19.8	11.80	15.50	30.48						

***Average Ksat* (cm/sec):** **1.32E-08**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 9.87E-09

Ksat (+25%) (cm/s): 1.64E-08

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	267.01	*Saturated Mass (g):*	271.64	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.075	*Dry Mass (g):*	217.84	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.603	*Diameter (cm):*	6.089		☐ Remolded Sample
Area (cm^2):	28.99	*Length (cm):*	4.609	*Number of Lifts:*	NA
Volume (cm^3):	133.42	*Deformation (%)**:*	0.13	*Split:*	NA
Dry Density (g/cm^3):	1.63	*Area (cm^2):*	29.12	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	101.93	*Volume (cm^3):*	134.21	*Particle Density(g/cm^3):*	2.71 ☐ Assumed ☑ Measured
Water Content (%, g/g):	22.6	*Dry Density (g/cm^3):*	1.62	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	36.9	*Dry Density (pcf):*	101.33	*Influent pressure (PSI):*	81.0
Void Ratio (e):	0.66	*Water Content (%, g/g):*	24.7	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	39.7	*Water Content (%, vol):*	40.1	*Panel Used:*	☐ D ☐ E ☑ F
Saturation (%):	92.9	*Void Ratio(e):*	0.67	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	40.0		Date/Time
		Saturation (%):*	100.2	B-Value (% saturation) prior to test*:	0.98 1/20/12 1447
				B-Value (% saturation) post to test:	0.98 1/24/12 1015

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

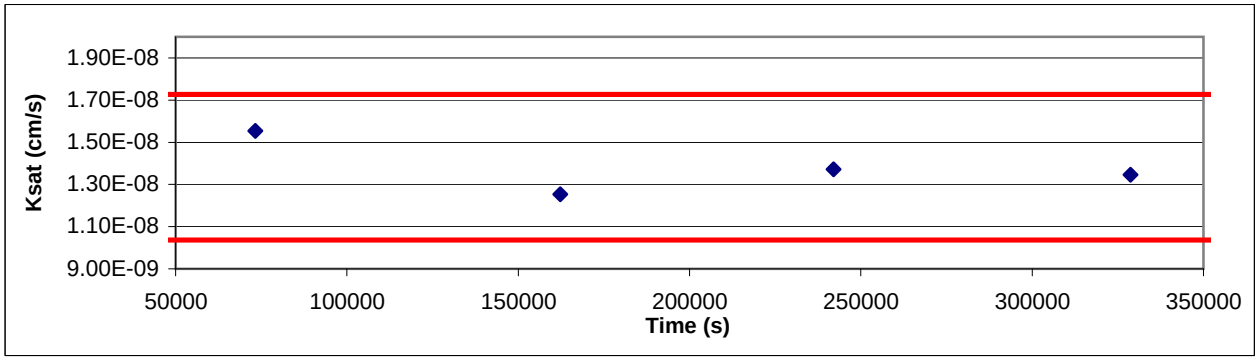
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
20-Jan-12	14:47:30	22.7	5.90	19.90	18.77	0.56	73270	0.93	2%	1.63E-08	1.55E-08
21-Jan-12	11:08:40	21.3	6.57	19.28	18.45						
Test # 2:											
21-Jan-12	11:08:40	21.3	6.57	19.28	18.45	0.53	89000	0.92	2%	1.28E-08	1.25E-08
22-Jan-12	11:52:00	20.5	7.20	18.70	18.14						
Test # 3:											
22-Jan-12	11:52:00	20.5	7.20	18.70	18.14	0.50	79800	1.09	2%	1.38E-08	1.37E-08
23-Jan-12	10:02:00	20.0	7.75	18.10	17.85						
Test # 4:											
23-Jan-12	10:02:00	20.0	7.75	18.10	17.85	0.52	86652	1.00	2%	1.35E-08	1.35E-08
24-Jan-12	10:06:12	20.1	8.35	17.50	17.55						

***Average Ksat* (cm/sec):** **1.38E-08**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.04E-08

Ksat (+25%) (cm/s): 1.73E-08

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (359-360)
Date Sampled: 12/7/2011
Depth: 359-360

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	246.51	*Saturated Mass (g):*	250.46	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.061	*Dry Mass (g):*	198.76	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.294	*Diameter (cm):*	6.058		☐ Remolded Sample
Area (cm^2):	28.85	*Length (cm):*	4.300	*Number of Lifts:*	NA
Volume (cm^3):	123.89	*Deformation (%)**:*	0.14	*Split:*	NA
Dry Density (g/cm^3):	1.60	*Area (cm^2):*	28.82	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	100.15	*Volume (cm^3):*	123.94	*Particle Density(g/cm^3):*	2.71 ☐ Assumed ☑ Measured
Water Content (%, g/g):	24.0	*Dry Density (g/cm^3):*	1.60	*Cell pressure (PSI):*	85.0
Water Content (%, vol):	38.5	*Dry Density (pcf):*	100.12	*Influent pressure (PSI):*	84.0
Void Ratio (e):	0.69	*Water Content (%, g/g):*	26.0	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	40.8	*Water Content (%, vol):*	41.7	*Panel Used:*	☐ D ☑ E ☐ F
Saturation (%):	94.5	*Void Ratio(e):*	0.69	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	40.8		Date/Time
		Saturation (%):*	102.2	B-Value (% saturation) prior to test*:	0.98 1/20/12 1415
				B-Value (% saturation) post to test:	1.00 1/24/12 1020

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

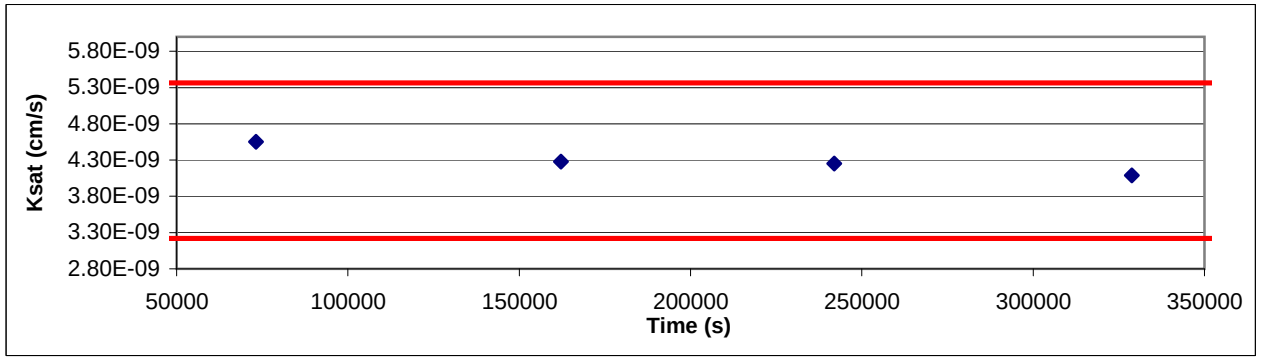
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (359-360)
Date Sampled: 12/7/2011
Depth: 359-360

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
20-Jan-12	14:48:00	22.7	4.75	21.40	69.91	0.61	73200	1.00	1%	4.78E-09	4.55E-09
21-Jan-12	11:08:00	21.3	5.45	20.70	69.53						
Test # 2:											
21-Jan-12	11:08:00	21.3	5.45	20.70	69.53	0.67	89010	0.94	1%	4.37E-09	4.28E-09
22-Jan-12	11:51:30	20.5	6.25	19.95	69.11						
Test # 3:											
22-Jan-12	11:51:30	20.5	6.25	19.95	69.11	0.59	79740	1.08	1%	4.28E-09	4.25E-09
23-Jan-12	10:00:30	20.0	6.90	19.25	68.75						
Test # 4:											
23-Jan-12	10:00:30	20.0	6.90	19.25	68.75	0.61	86865	1.00	1%	4.09E-09	4.09E-09
24-Jan-12	10:08:15	20.1	7.60	18.55	68.37						

***Average Ksat* (cm/sec):** **4.29E-09**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 3.22E-09

Ksat (+25%) (cm/s): 5.37E-09

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (69-70)
Date Sampled: 12/7/2011
Depth: 69-70

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	206.32	*Saturated Mass (g):*	210.51	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.954	*Dry Mass (g):*	161.81	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	3.932	*Diameter (cm):*	5.954		☐ Remolded Sample
Area (cm^2):	27.84	*Length (cm):*	3.926	*Number of Lifts:*	NA
Volume (cm^3):	109.48	*Deformation (%)**:*	0.16	*Split:*	NA
Dry Density (g/cm^3):	1.48	*Area (cm^2):*	27.84	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	92.27	*Volume (cm^3):*	109.30	*Particle Density(g/cm^3):*	2.69 ☐ Assumed ☑ Measured
Water Content (%, g/g):	27.5	*Dry Density (g/cm^3):*	1.48	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	40.7	*Dry Density (pcf):*	92.42	*Influent pressure (PSI):*	80.0
Void Ratio (e):	0.82	*Water Content (%, g/g):*	30.1	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	45.1	*Water Content (%, vol):*	44.6	*Panel Used:*	☐ A ☑ B ☐ C
Saturation (%):	90.2	*Void Ratio(e):*	0.82	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	45.0		Date/Time
		Saturation (%):*	99.0	B-Value (% saturation) prior to test*:	0.98 1/20/12 1422
				B-Value (% saturation) post to test:	0.98 1/20/12 1600

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

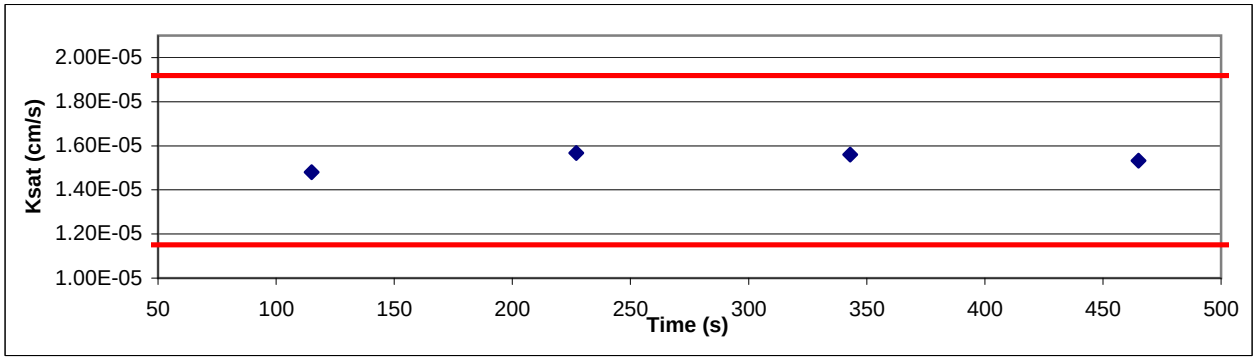
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (69-70)
Date Sampled: 12/7/2011
Depth: 69-70

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
20-Jan-12	15:13:19	22.7	7.30	20.95	4.02	0.17	115	1.00	3%	1.58E-05	1.48E-05
20-Jan-12	15:15:14	22.7	7.50	20.75	3.90						
Test # 2:											
20-Jan-12	15:15:14	22.7	7.50	20.75	3.90	0.17	112	1.00	3%	1.67E-05	1.57E-05
20-Jan-12	15:17:06	22.7	7.70	20.55	3.78						
Test # 3:											
20-Jan-12	15:17:06	22.7	7.70	20.55	3.78	0.17	116	1.00	3%	1.66E-05	1.56E-05
20-Jan-12	15:19:02	22.7	7.90	20.35	3.66						
Test # 4:											
20-Jan-12	15:19:02	22.7	7.90	20.35	3.66	0.17	122	1.00	3%	1.63E-05	1.53E-05
20-Jan-12	15:21:04	22.7	8.10	20.15	3.54						

***Average Ksat* (cm/sec):** **1.54E-05**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.15E-05

Ksat (+25%) (cm/s): 1.92E-05

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (109-110)
Date Sampled: 12/7/2011
Depth: 109-110

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	320.45	*Saturated Mass (g):*	323.75	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.888	*Dry Mass (g):*	251.45	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	6.062	*Diameter (cm):*	5.885		☐ Remolded Sample
Area (cm^2):	27.23	*Length (cm):*	6.059	*Number of Lifts:*	NA
Volume (cm^3):	165.06	*Deformation (%)**:*	0.04	*Split:*	NA
Dry Density (g/cm^3):	1.52	*Area (cm^2):*	27.20	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	95.10	*Volume (cm^3):*	164.82	*Particle Density(g/cm^3):*	2.75 ☐ Assumed ☑ Measured
Water Content (%, g/g):	27.4	*Dry Density (g/cm^3):*	1.53	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	41.8	*Dry Density (pcf):*	95.24	*Influent pressure (PSI):*	80.0
Void Ratio (e):	0.80	*Water Content (%, g/g):*	28.8	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	44.5	*Water Content (%, vol):*	43.9	*Panel Used:*	☐ A ☐ B ☑ C
Saturation (%):	93.8	*Void Ratio(e):*	0.80	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	44.5		Date/Time
		Saturation (%):*	98.6	B-Value (% saturation) prior to test*:	0.98 2/7/12 847
				B-Value (% saturation) post to test:	0.98 2/7/12 1208

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

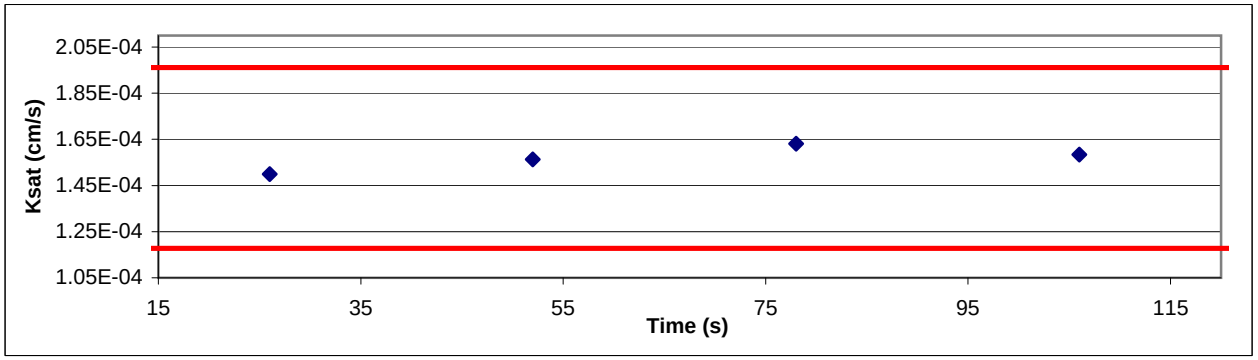
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (109-110)
Date Sampled: 12/7/2011
Depth: 109-110

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
07-Feb-12	10:07:54	20.0	8.60	18.70	1.92	0.17	26	1.00	4%	1.50E-04	1.50E-04
07-Feb-12	10:08:20	20.0	8.80	18.50	1.85						
Test # 2:											
07-Feb-12	10:08:20	20.0	8.80	18.50	1.85	0.17	26	1.00	4%	1.56E-04	1.56E-04
07-Feb-12	10:08:46	20.0	9.00	18.30	1.77						
Test # 3:											
07-Feb-12	10:08:46	20.0	9.00	18.30	1.77	0.17	26	1.00	4%	1.63E-04	1.63E-04
07-Feb-12	10:09:12	20.0	9.20	18.10	1.70						
Test # 4:											
07-Feb-12	10:09:12	20.0	9.20	18.10	1.70	0.17	28	1.00	4%	1.58E-04	1.58E-04
07-Feb-12	10:09:40	20.0	9.40	17.90	1.62						

***Average Ksat* (cm/sec):** **1.57E-04**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.18E-04

Ksat (+25%) (cm/s): 1.96E-04

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	105.09	*Saturated Mass (g):*	109.04	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.024	*Dry Mass (g):*	86.96	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	2.776	*Diameter (cm):*	4.975		☐ Remolded Sample
Area (cm^2):	19.82	*Length (cm):*	2.768	*Number of Lifts:*	NA
Volume (cm^3):	55.03	*Deformation (%)**:*	0.28	*Split:*	NA
Dry Density (g/cm^3):	1.58	*Area (cm^2):*	19.44	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	98.65	*Volume (cm^3):*	53.81	*Particle Density(g/cm^3):*	2.70 ☐ Assumed ☑ Measured
Water Content (%, g/g):	20.8	*Dry Density (g/cm^3):*	1.62	*Cell pressure (PSI):*	83.0
Water Content (%, vol):	32.9	*Dry Density (pcf):*	100.88	*Influent pressure (PSI):*	82.0
Void Ratio (e):	0.71	*Water Content (%, g/g):*	25.4	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	41.5	*Water Content (%, vol):*	41.0	*Panel Used:*	☑ A ☐ B ☐ C
Saturation (%):	79.4	*Void Ratio(e):*	0.67	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	40.1		Date/Time
		Saturation (%):*	102.2	B-Value (% saturation) prior to test*:	0.98 1/20/12 1420
				B-Value (% saturation) post to test:	0.98 1/24/12 1500

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

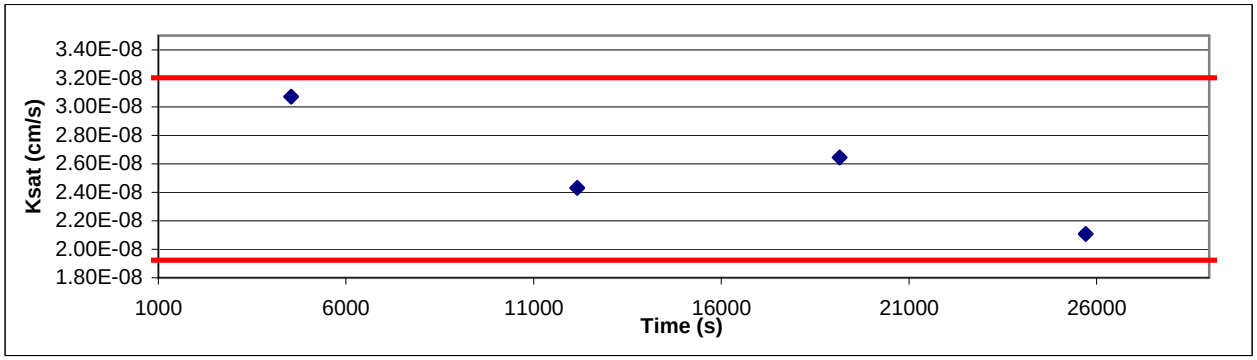
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
23-Jan-12	08:39:00	19.8	8.30	19.75	55.59	0.13	4538	1.00	0%	3.06E-08	3.07E-08
23-Jan-12	09:54:38	20.0	8.45	19.60	55.47						
Test # 2:											
23-Jan-12	09:54:38	20.0	8.45	19.60	55.47	0.17	7624	1.00	0%	2.44E-08	2.43E-08
23-Jan-12	12:01:42	20.2	8.65	19.40	55.30						
Test # 3:											
23-Jan-12	12:01:42	20.2	8.65	19.40	55.30	0.17	6988	1.00	0%	2.67E-08	2.64E-08
23-Jan-12	13:58:10	20.5	8.85	19.20	55.13						
Test # 4:											
23-Jan-12	13:58:10	20.5	8.85	19.20	55.13	0.13	6560	1.00	0%	2.14E-08	2.11E-08
23-Jan-12	15:47:30	20.6	9.00	19.05	55.01						

***Average Ksat* (cm/sec):** **2.56E-08**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.92E-08

Ksat (+25%) (cm/s): 3.20E-08

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (179-180)
Date Sampled: 12/7/2011
Depth: 179-180

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	338.13	*Saturated Mass (g):*	347.08	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.395	*Dry Mass (g):*	269.98	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.457	*Diameter (cm):*	6.395		☐ Remolded Sample
Area (cm^2):	32.12	*Length (cm):*	5.454	*Number of Lifts:*	NA
Volume (cm^3):	175.28	*Deformation (%)**:*	0.05	*Split:*	NA
Dry Density (g/cm^3):	1.54	*Area (cm^2):*	32.12	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	96.16	*Volume (cm^3):*	175.20	*Particle Density(g/cm^3):*	2.69 ☐ Assumed ☑ Measured
Water Content (%, g/g):	25.2	*Dry Density (g/cm^3):*	1.54	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	38.9	*Dry Density (pcf):*	96.20	*Influent pressure (PSI):*	80.0
Void Ratio (e):	0.75	*Water Content (%, g/g):*	28.6	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	42.8	*Water Content (%, vol):*	44.0	*Panel Used:*	☐ A ☑ B ☐ C
Saturation (%):	90.9	*Void Ratio(e):*	0.75	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	42.8		Date/Time
		Saturation (%):*	102.9	B-Value (% saturation) prior to test*:	0.98 2/7/12 845
				B-Value (% saturation) post to test:	0.98 2/7/12 1210

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

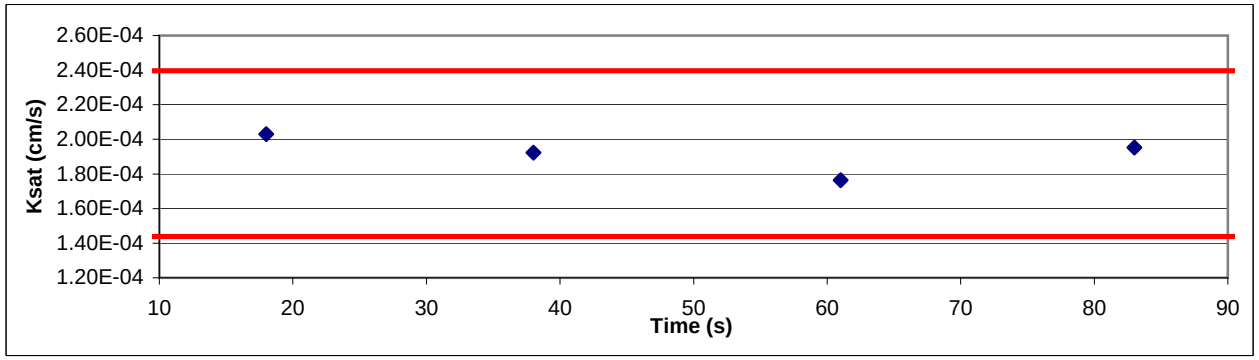
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (179-180)
Date Sampled: 12/7/2011
Depth: 179-180

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
07-Feb-12	10:04:22	20.0	10.50	18.75	1.75	0.17	18	1.00	5%	2.03E-04	2.03E-04
07-Feb-12	10:04:40	20.0	10.70	18.55	1.66						
Test # 2:											
07-Feb-12	10:04:40	20.0	10.70	18.55	1.66	0.17	20	1.00	5%	1.92E-04	1.92E-04
07-Feb-12	10:05:00	20.0	10.90	18.35	1.58						
Test # 3:											
07-Feb-12	10:05:00	20.0	10.90	18.35	1.58	0.17	23	1.00	5%	1.76E-04	1.76E-04
07-Feb-12	10:05:23	20.0	11.10	18.15	1.49						
Test # 4:											
07-Feb-12	10:05:23	20.0	11.10	18.15	1.49	0.17	22	1.00	6%	1.95E-04	1.95E-04
07-Feb-12	10:05:45	20.0	11.30	17.95	1.41						

***Average Ksat* (cm/sec):** **1.92E-04**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.44E-04

Ksat (+25%) (cm/s): 2.40E-04

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (204-205)
Date Sampled: 12/7/2011
Depth: 204-205

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	269.06	*Saturated Mass (g):*	272.38	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.871	*Dry Mass (g):*	213.78	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.100	*Diameter (cm):*	5.864		☐ Remolded Sample
Area (cm^2):	27.07	*Length (cm):*	5.099	*Number of Lifts:*	NA
Volume (cm^3):	138.07	*Deformation (%)**:*	0.02	*Split:*	NA
Dry Density (g/cm^3):	1.55	*Area (cm^2):*	27.01	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	96.66	*Volume (cm^3):*	137.70	*Particle Density(g/cm^3):*	2.67 ☐ Assumed ☑ Measured
Water Content (%, g/g):	25.9	*Dry Density (g/cm^3):*	1.55	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	40.0	*Dry Density (pcf):*	96.92	*Influent pressure (PSI):*	80.0
Void Ratio (e):	0.73	*Water Content (%, g/g):*	27.4	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	42.0	*Water Content (%, vol):*	42.6	*Panel Used:*	☑ A ☐ B ☐ C
Saturation (%):	95.2	*Void Ratio(e):*	0.72	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	41.9		Date/Time
		Saturation (%):*	101.6	B-Value (% saturation) prior to test*:	0.98 2/7/12 840
				B-Value (% saturation) post to test:	0.98 2/7/12 1205

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

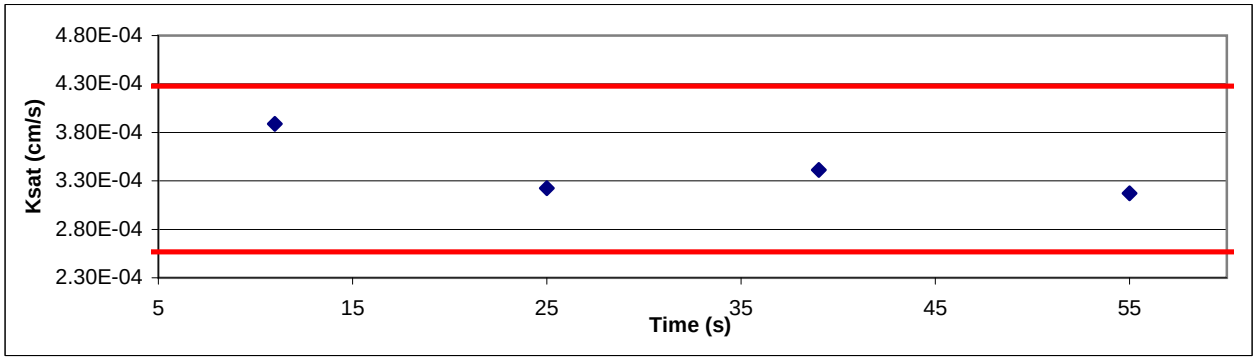
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (204-205)
Date Sampled: 12/7/2011
Depth: 204-205

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
07-Feb-12	10:00:33	20.0	8.30	16.15	1.78	0.17	11	1.00	5%	3.89E-04	3.89E-04
07-Feb-12	10:00:44	20.0	8.50	15.95	1.69						
Test # 2:											
07-Feb-12	10:00:44	20.0	8.50	15.95	1.69	0.17	14	1.00	5%	3.22E-04	3.22E-04
07-Feb-12	10:00:58	20.0	8.70	15.75	1.60						
Test # 3:											
07-Feb-12	10:00:58	20.0	8.70	15.75	1.60	0.17	14	1.00	6%	3.41E-04	3.41E-04
07-Feb-12	10:01:12	20.0	8.90	15.55	1.51						
Test # 4:											
07-Feb-12	10:01:12	20.0	8.90	15.55	1.51	0.17	16	1.00	6%	3.17E-04	3.17E-04
07-Feb-12	10:01:28	20.0	9.10	15.35	1.42						

***Average Ksat* (cm/sec):** **3.42E-04**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 2.57E-04

Ksat (+25%) (cm/s): 4.28E-04

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (224-225)
Date Sampled: 12/7/2011
Depth: 224-225

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	273.68	*Saturated Mass (g):*	278.9	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.869	*Dry Mass (g):*	220.4	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.196	*Diameter (cm):*	5.870		☐ Remolded Sample
Area (cm^2):	27.05	*Length (cm):*	5.192	*Number of Lifts:*	NA
Volume (cm^3):	140.57	*Deformation (%)**:*	0.07	*Split:*	NA
Dry Density (g/cm^3):	1.57	*Area (cm^2):*	27.06	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	97.88	*Volume (cm^3):*	140.51	*Particle Density(g/cm^3):*	2.70 ☐ Assumed ☑ Measured
Water Content (%, g/g):	24.2	*Dry Density (g/cm^3):*	1.57	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	37.9	*Dry Density (pcf):*	97.92	*Influent pressure (PSI):*	80.5
Void Ratio (e):	0.72	*Water Content (%, g/g):*	26.5	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	41.8	*Water Content (%, vol):*	41.6	*Panel Used:*	☑ D ☐ E ☐ F
Saturation (%):	90.6	*Void Ratio(e):*	0.72	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	41.8		Date/Time
		Saturation (%):*	99.6	B-Value (% saturation) prior to test*:	1.00 2/7/12 850
				B-Value (% saturation) post to test:	1.00 2/7/12 1214

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

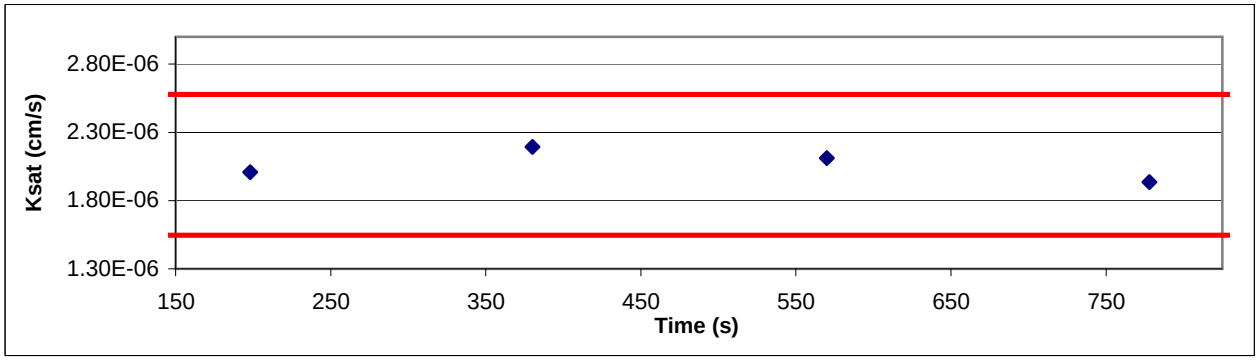
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (224-225)
Date Sampled: 12/7/2011
Depth: 224-225

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
07-Feb-12	10:17:26	20.1	7.90	19.40	9.33	0.09	198	1.00	0%	2.01E-06	2.01E-06
07-Feb-12	10:20:44	20.1	8.00	19.30	9.29						
Test # 2:											
07-Feb-12	10:20:44	20.1	8.00	19.30	9.29	0.09	182	1.00	0%	2.20E-06	2.19E-06
07-Feb-12	10:23:46	20.1	8.10	19.20	9.24						
Test # 3:											
07-Feb-12	10:23:46	20.1	8.10	19.20	9.24	0.09	190	1.00	0%	2.12E-06	2.11E-06
07-Feb-12	10:26:56	20.1	8.20	19.10	9.20						
Test # 4:											
07-Feb-12	10:26:56	20.1	8.20	19.10	9.20	0.09	208	1.00	0%	1.94E-06	1.94E-06
07-Feb-12	10:30:24	20.2	8.30	19.00	9.15						

***Average Ksat* (cm/sec):** **2.06E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.55E-06

Ksat (+25%) (cm/s): 2.58E-06

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (249-250)
Date Sampled: 12/7/2011
Depth: 249-250

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	266.76	*Saturated Mass (g):*	268.87	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.889	*Dry Mass (g):*	211.87	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.843	*Diameter (cm):*	5.963		☐ Remolded Sample
Area (cm^2):	27.24	*Length (cm):*	4.845	*Number of Lifts:*	NA
Volume (cm^3):	131.91	*Deformation (%)**:*	0.05	*Split:*	NA
Dry Density (g/cm^3):	1.61	*Area (cm^2):*	27.93	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	100.27	*Volume (cm^3):*	135.31	*Particle Density(g/cm^3):*	2.70 ☐ Assumed ☑ Measured
Water Content (%, g/g):	25.9	*Dry Density (g/cm^3):*	1.57	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	41.6	*Dry Density (pcf):*	97.75	*Influent pressure (PSI):*	80.0
Void Ratio (e):	0.68	*Water Content (%, g/g):*	26.9	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	40.4	*Water Content (%, vol):*	42.1	*Panel Used:*	☐ D ☑ E ☐ F
Saturation (%):	102.9	*Void Ratio(e):*	0.72	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	41.9		Date/Time
		Saturation (%):*	100.5	B-Value (% saturation) prior to test*:	1.00 2/7/12 852
				B-Value (% saturation) post to test:	1.00 2/7/12 1218

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.

**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

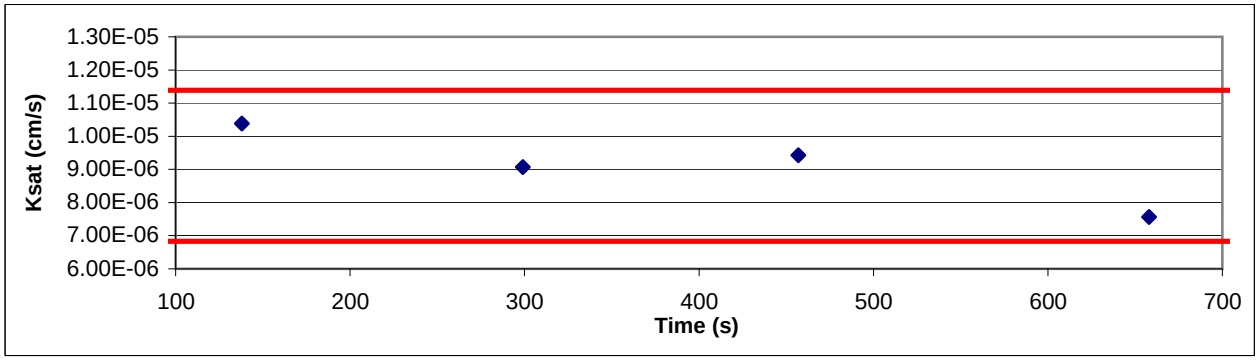
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (249-250)
Date Sampled: 12/7/2011
Depth: 249-250

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
07-Feb-12	10:16:29	20.1	9.30	19.90	2.53	0.09	138	1.00	2%	1.04E-05	1.04E-05
07-Feb-12	10:18:47	20.1	9.40	19.80	2.48						
Test # 2:											
07-Feb-12	10:18:47	20.1	9.40	19.80	2.48	0.09	161	1.00	2%	9.09E-06	9.07E-06
07-Feb-12	10:21:28	20.1	9.50	19.70	2.43						
Test # 3:											
07-Feb-12	10:21:28	20.1	9.50	19.70	2.43	0.09	158	1.00	2%	9.45E-06	9.43E-06
07-Feb-12	10:24:06	20.1	9.60	19.60	2.38						
Test # 4:											
07-Feb-12	10:24:06	20.1	9.60	19.60	2.38	0.09	201	1.00	2%	7.58E-06	7.56E-06
07-Feb-12	10:27:27	20.1	9.70	19.50	2.34						

***Average Ksat* (cm/sec):** **9.11E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 6.83E-06

Ksat (+25%) (cm/s): 1.14E-05

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (264-265)
Date Sampled: 12/7/2011
Depth: 264-265

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	287.25	*Saturated Mass (g):*	296.55	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.979	*Dry Mass (g):*	234.95	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.109	*Diameter (cm):*	6.057		☐ Remolded Sample
Area (cm^2):	28.08	*Length (cm):*	5.109	*Number of Lifts:*	NA
Volume (cm^3):	143.44	*Deformation (%)**:*	0.01	*Split:*	NA
Dry Density (g/cm^3):	1.64	*Area (cm^2):*	28.81	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	102.25	*Volume (cm^3):*	147.20	*Particle Density(g/cm^3):*	2.68 ☐ Assumed ☑ Measured
Water Content (%, g/g):	22.3	*Dry Density (g/cm^3):*	1.60	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	36.5	*Dry Density (pcf):*	99.64	*Influent pressure (PSI):*	80.5
Void Ratio (e):	0.63	*Water Content (%, g/g):*	26.2	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	38.8	*Water Content (%, vol):*	41.8	*Panel Used:*	☐ D ☐ E ☑ F
Saturation (%):	94.0	*Void Ratio(e):*	0.68	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	40.4		Date/Time
		Saturation (%):*	103.7	B-Value (% saturation) prior to test*:	1.00 2/7/12 857
				B-Value (% saturation) post to test:	1.00 2/7/12 1221

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

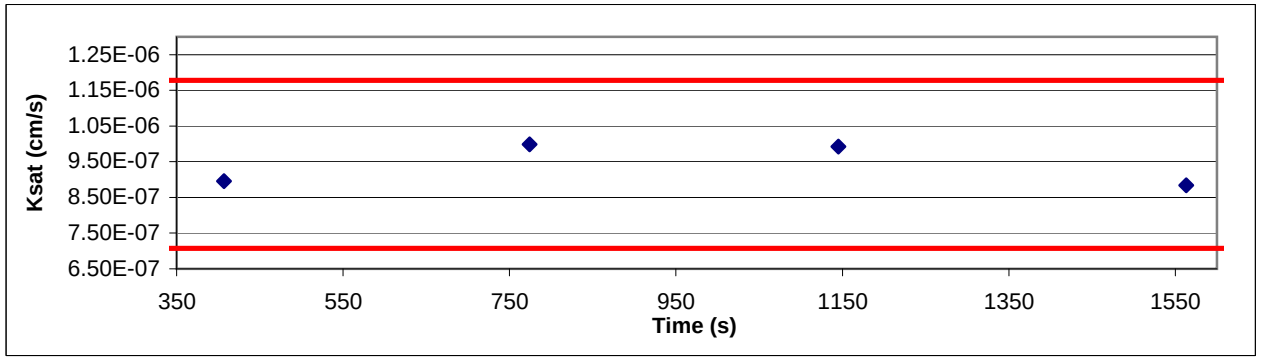
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (264-265)
Date Sampled: 12/7/2011
Depth: 264-265

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
07-Feb-12	10:30:05	20.2	7.30	19.00	9.53	0.09	407	1.00	0%	9.00E-07	8.96E-07
07-Feb-12	10:36:52	20.2	7.40	18.90	9.48						
Test # 2:											
07-Feb-12	10:36:52	20.2	7.40	18.90	9.48	0.09	367	1.00	0%	1.00E-06	9.98E-07
07-Feb-12	10:42:59	20.2	7.50	18.80	9.44						
Test # 3:											
07-Feb-12	10:42:59	20.2	7.50	18.80	9.44	0.09	371	1.00	0%	9.97E-07	9.92E-07
07-Feb-12	10:49:10	20.2	7.60	18.70	9.39						
Test # 4:											
07-Feb-12	10:49:10	20.2	7.60	18.70	9.39	0.09	418	1.00	0%	8.89E-07	8.84E-07
07-Feb-12	10:56:08	20.3	7.70	18.60	9.35						

***Average Ksat* (cm/sec):** **9.43E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 7.07E-07

Ksat (+25%) (cm/s): 1.18E-06

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (284-285)
Date Sampled: 12/7/2011
Depth: 284-285

Remolded or Initial Sample Properties	
Initial Mass (g):	226.43
Diameter (cm):	5.35
Length (cm):	5.331
Area (cm^2):	22.48
Volume (cm^3):	119.84
Dry Density (g/cm^3):	1.49
Dry Density (pcf):	92.86
Water Content (%, g/g):	27.0
Water Content (%, vol):	40.2
Void Ratio (e):	0.84
Porosity (%, vol):	45.6
Saturation (%):	88.2

Post Permeation Sample Properties	
Saturated Mass (g):	230.94
Dry Mass (g):	178.26
Diameter (cm):	5.384
Length (cm):	5.329
*Deformation (%)**:*	0.04
Area (cm^2):	22.77
Volume (cm^3):	121.32
Dry Density (g/cm^3):	1.47
Dry Density (pcf):	91.72
Water Content (%, g/g):	29.6
Water Content (%, vol):	43.4
Void Ratio(e):	0.86
Porosity (%, vol):	46.2
Saturation (%):*	93.9

Test and Sample Conditions	
Permeant liquid used:	Tap Water
Sample Preparation:	☑ In situ sample, extruded
	☐ Remolded Sample
Number of Lifts:	NA
Split:	NA
Percent Coarse Material (%):	NA
Particle Density(g/cm^3):	2.73 ☐ Assumed ☑ Measured
Cell pressure (PSI):	80.0
Influent pressure (PSI):	78.0
Effluent pressure (PSI):	75.0
Panel Used:	☑ A ☐ B ☐ C
Reading:	☐ Annulus ☑ Pipette

		Date/Time
B-Value (% saturation) prior to test*:	0.95	3/9/12 1600
B-Value (% saturation) post to test:	0.95	3/13/12 1535

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

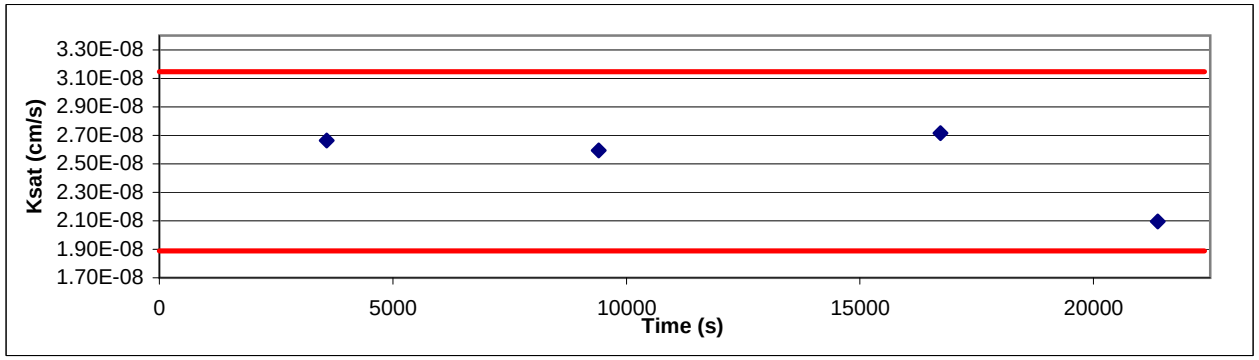
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (284-285)
Date Sampled: 12/7/2011
Depth: 284-285

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
09-Mar-12	16:01:15	22.7	7.05	22.70	42.99	0.09	3585	1.00	0%	2.85E-08	2.66E-08
09-Mar-12	17:01:00	23.0	7.15	22.60	42.95						
Test # 2:											
12-Mar-12	09:30:00	21.3	8.75	21.20	42.30	0.13	5820	1.00	0%	2.68E-08	2.59E-08
12-Mar-12	11:07:00	21.4	8.90	21.05	42.23						
Test # 3:											
12-Mar-12	11:07:00	21.4	8.90	21.05	42.23	0.17	7320	1.00	0%	2.84E-08	2.72E-08
12-Mar-12	13:09:00	22.5	9.10	20.85	42.14						
Test # 4:											
12-Mar-12	13:09:00	22.5	9.10	20.85	42.14	0.09	4650	1.00	0%	2.24E-08	2.10E-08
12-Mar-12	14:26:30	23.2	9.20	20.75	42.10						

***Average Ksat* (cm/sec):** **2.52E-08**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.89E-08

Ksat (+25%) (cm/s): 3.15E-08

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	307.76	*Saturated Mass (g):*	309.74	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.974	*Dry Mass (g):*	239.65	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.658	*Diameter (cm):*	5.964		☐ Remolded Sample
Area (cm^2):	28.03	*Length (cm):*	5.658	*Number of Lifts:*	NA
Volume (cm^3):	158.59	*Deformation (%)**:*	0.00	*Split:*	NA
Dry Density (g/cm^3):	1.51	*Area (cm^2):*	27.94	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	94.34	*Volume (cm^3):*	158.06	*Particle Density(g/cm^3):*	2.68 ☐ Assumed ☑ Measured
Water Content (%, g/g):	28.4	*Dry Density (g/cm^3):*	1.52	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	42.9	*Dry Density (pcf):*	94.65	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.77	*Water Content (%, g/g):*	29.2	*Effluent pressure (PSI):*	74.5
Porosity (%, vol):	43.6	*Water Content (%, vol):*	44.3	*Panel Used:*	☐ A ☐ B ☑ C
Saturation (%):	98.4	*Void Ratio(e):*	0.77	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	43.5		Date/Time
		Saturation (%):*	102.0	B-Value (% saturation) prior to test*:	0.95 3/12/12 1420
				B-Value (% saturation) post to test:	0.98 3/14/12 1323

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

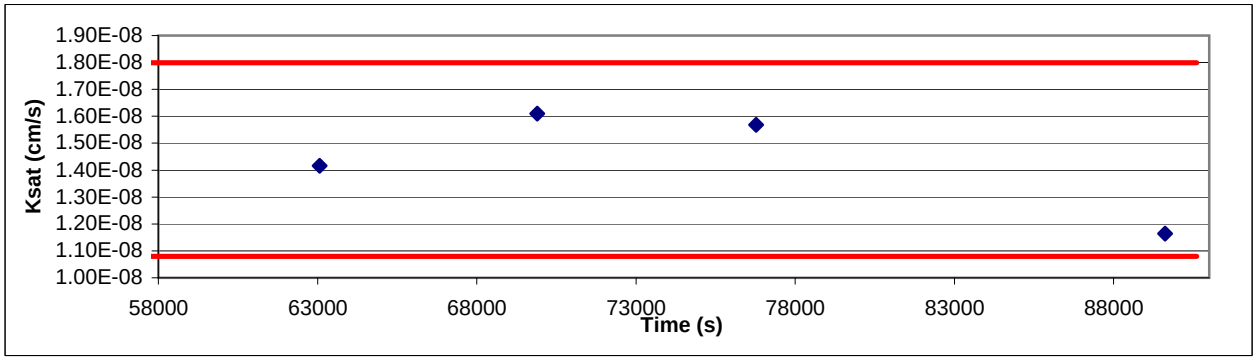
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
12-Mar-12	15:54:00	23.6	2.80	21.35	47.30	1.08	63060	0.85	1%	1.51E-08	1.42E-08
13-Mar-12	09:25:00	21.7	4.15	20.20	46.79						
Test # 2:											
13-Mar-12	09:25:00	21.7	4.15	20.20	46.79	0.13	6840	1.00	0%	1.68E-08	1.61E-08
13-Mar-12	11:19:00	21.8	4.30	20.05	46.73						
Test # 3:											
13-Mar-12	13:27:00	22.6	5.35	19.90	46.48	0.13	6870	1.00	0%	1.68E-08	1.57E-08
13-Mar-12	15:21:30	23.3	5.50	19.75	46.42						
Test # 4:											
14-Mar-12	09:21:00	21.2	6.80	18.65	45.93	0.17	12840	1.00	0%	1.22E-08	1.16E-08
14-Mar-12	12:55:00	22.4	7.00	18.45	45.85						

***Average Ksat* (cm/sec):** **1.44E-08**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.08E-08

Ksat (+25%) (cm/s): 1.80E-08

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	227.66	*Saturated Mass (g):*	230.02	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.845	*Dry Mass (g):*	181.17	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.3	*Diameter (cm):*	5.838		☐ Remolded Sample
Area (cm^2):	26.83	*Length (cm):*	4.299	*Number of Lifts:*	NA
Volume (cm^3):	115.38	*Deformation (%)**:*	0.02	*Split:*	NA
Dry Density (g/cm^3):	1.57	*Area (cm^2):*	26.77	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	98.03	*Volume (cm^3):*	115.08	*Particle Density(g/cm^3):*	2.69 ☐ Assumed ☑ Measured
Water Content (%, g/g):	25.7	*Dry Density (g/cm^3):*	1.57	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	40.3	*Dry Density (pcf):*	98.28	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.72	*Water Content (%, g/g):*	27.0	*Effluent pressure (PSI):*	74.5
Porosity (%, vol):	41.7	*Water Content (%, vol):*	42.5	*Panel Used:*	☐ D ☐ E ☑ F
Saturation (%):	96.6	*Void Ratio(e):*	0.71	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	41.6		Date/Time
		Saturation (%):*	102.1	B-Value (% saturation) prior to test*:	0.98 3/15/12 1654
				B-Value (% saturation) post to test:	0.98 3/19/12 1340

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.

**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

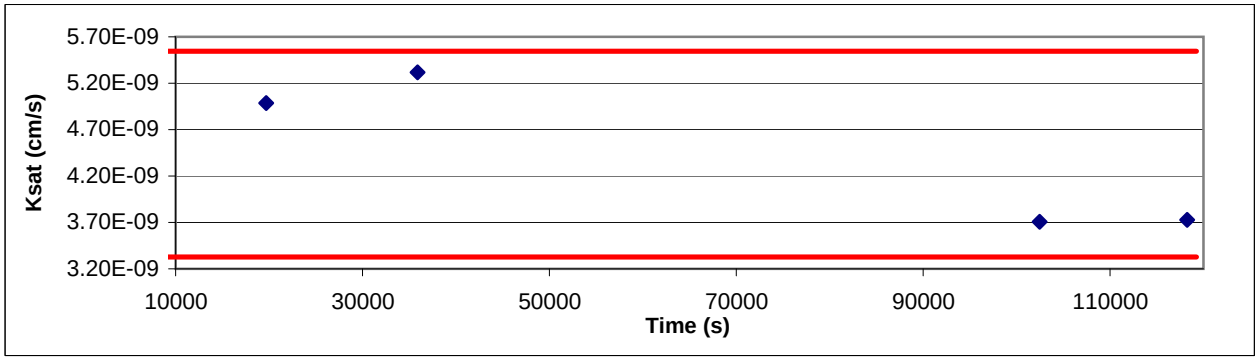
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
16-Mar-12	10:31:00	21.7	2.45	23.10	62.81	0.15	19680	0.75	0%	5.31E-09	4.99E-09
16-Mar-12	15:59:00	23.6	2.65	22.95	62.72						
Test # 2:											
19-Mar-12	10:10:00	21.1	2.45	23.00	62.79	0.13	16200	1.00	0%	5.53E-09	5.32E-09
19-Mar-12	14:40:00	22.2	2.60	22.85	62.71						
Test # 3:											
19-Mar-12	14:40:00	22.2	2.60	22.85	62.71	0.37	66570	0.89	0%	3.82E-09	3.71E-09
20-Mar-12	09:09:30	20.4	3.05	22.45	62.48						
Test # 4:											
20-Mar-12	09:09:30	20.4	3.05	22.45	62.48	0.09	15810	1.00	0%	3.80E-09	3.73E-09
20-Mar-12	13:33:00	21.1	3.15	22.35	62.42						

***Average Ksat* (cm/sec):** **4.43E-09**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 3.33E-09

Ksat (+25%) (cm/s): 5.54E-09

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

Remolded or Initial Sample Properties	
Initial Mass (g):	231.92
Diameter (cm):	5.887
Length (cm):	4.367
Area (cm^2):	27.22
Volume (cm^3):	118.87
Dry Density (g/cm^3):	1.52
Dry Density (pcf):	94.99
Water Content (%, g/g):	28.2
Water Content (%, vol):	42.9
Void Ratio (e):	0.78
Porosity (%, vol):	43.7
Saturation (%):	98.3

Post Permeation Sample Properties	
Saturated Mass (g):	234.03
Dry Mass (g):	180.87
Diameter (cm):	5.891
Length (cm):	4.367
*Deformation (%)**:*	0.01
Area (cm^2):	27.26
Volume (cm^3):	119.02
Dry Density (g/cm^3):	1.52
Dry Density (pcf):	94.87
Water Content (%, g/g):	29.4
Water Content (%, vol):	44.7
Void Ratio(e):	0.78
Porosity (%, vol):	43.8
Saturation (%):*	102.1

Test and Sample Conditions			
Permeant liquid used:	Tap Water		
Sample Preparation:	☑ In situ sample, extruded		
	☐ Remolded Sample		
Number of Lifts:	NA		
Split:	NA		
Percent Coarse Material (%):	NA		
Particle Density(g/cm^3):	2.70	☐ Assumed	☑ Measured
Cell pressure (PSI):	80.0		
Influent pressure (PSI):	78.0		
Effluent pressure (PSI):	76.0		
Panel Used:	☐ A ☑ B ☐ C		
Reading:	☐ Annulus ☑ Pipette		

		Date/Time	
B-Value (% saturation) prior to test*:	0.98	3/19/12	1335
B-Value (% saturation) post to test:	0.98	3/22/12	1208

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

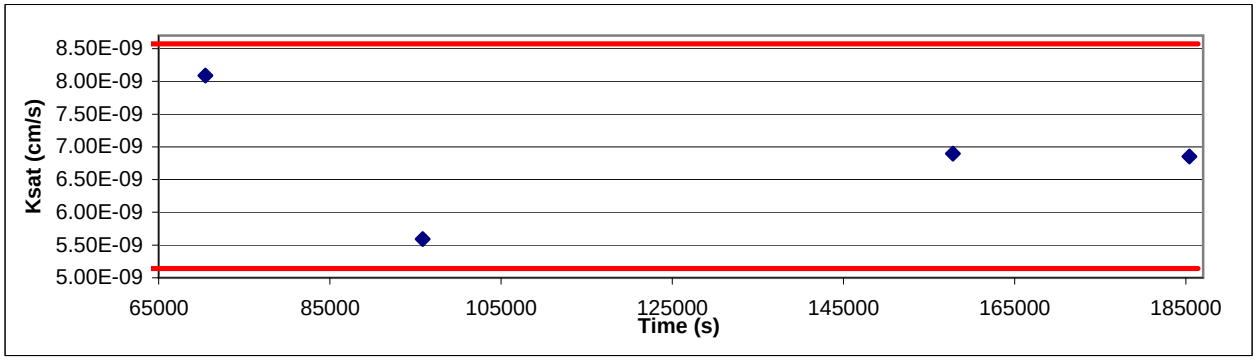
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
19-Mar-12	13:38:30	21.9	1.45	22.30	37.73	0.52	70440	0.85	1%	8.32E-09	8.09E-09
20-Mar-12	09:12:30	20.4	2.10	21.75	37.41						
Test # 2:											
20-Mar-12	09:12:30	20.4	2.10	21.75	37.41	0.13	25410	1.00	0%	5.79E-09	5.59E-09
20-Mar-12	16:16:00	22.6	2.25	21.60	37.33						
Test # 3:											
20-Mar-12	16:16:00	22.6	2.25	21.60	37.33	0.39	61920	1.00	1%	7.16E-09	6.90E-09
21-Mar-12	09:28:00	20.6	2.70	21.15	37.10						
Test # 4:											
21-Mar-12	09:28:00	20.6	2.70	21.15	37.10	0.17	27615	1.00	0%	7.17E-09	6.85E-09
21-Mar-12	17:08:15	23.2	2.90	20.95	36.99						

***Average Ksat* (cm/sec):** **6.86E-09**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 5.14E-09

Ksat (+25%) (cm/s): 8.57E-09

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (279-280)
Date Sampled: 12/7/2011
Depth: 279-280

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	233.25	*Saturated Mass (g):*	233.07	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.683	*Dry Mass (g):*	179.14	*Sample Preparation:*	☐ In situ sample, extruded
Length (cm):	4.962	*Diameter (cm):*	5.648		☐ Remolded Sample
Area (cm^2):	25.37	*Length (cm):*	4.962	*Number of Lifts:*	NA
Volume (cm^3):	125.86	*Deformation (%)**:*	0.00	*Split:*	NA
Dry Density (g/cm^3):	1.42	*Area (cm^2):*	25.05	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	88.85	*Volume (cm^3):*	124.32	*Particle Density(g/cm^3):*	2.66 ☐ Assumed ☑ Measured
Water Content (%, g/g):	30.2	*Dry Density (g/cm^3):*	1.44	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	43.0	*Dry Density (pcf):*	89.96	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.87	*Water Content (%, g/g):*	30.1	*Effluent pressure (PSI):*	77.5
Porosity (%, vol):	46.5	*Water Content (%, vol):*	43.4	*Panel Used:*	☐ D ☑ E ☐ F
Saturation (%):	92.5	*Void Ratio(e):*	0.85	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	45.8		Date/Time
		Saturation (%):*	94.7	B-Value (% saturation) prior to test*:	0.95 3/19/12 1100
				B-Value (% saturation) post to test:	0.95 3/19/12 1226

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

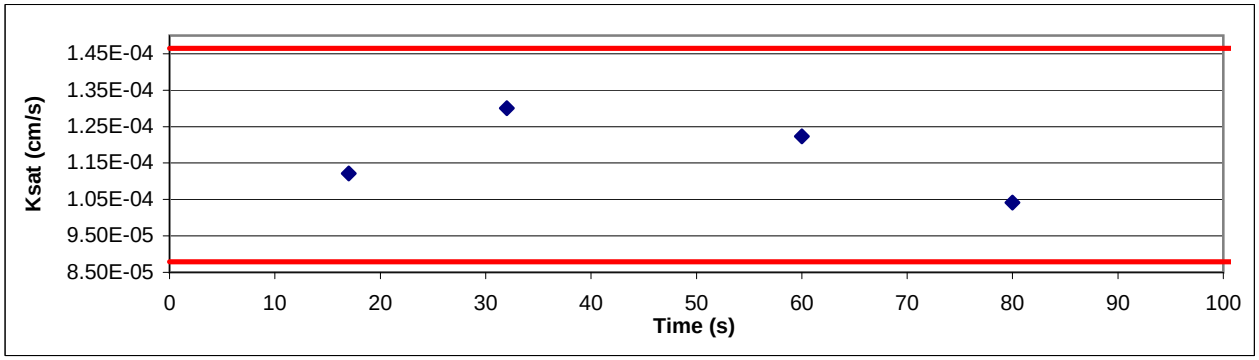
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (279-280)
Date Sampled: 12/7/2011
Depth: 279-280

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
16-Mar-12	11:07:10	21.2	5.00	18.90	10.32	0.43	17	1.00	2%	1.15E-04	1.12E-04
16-Mar-12	11:07:27	21.2	5.50	18.40	10.09						
Test # 2:											
16-Mar-12	11:07:27	21.2	5.50	18.40	10.09	0.43	15	1.00	2%	1.34E-04	1.30E-04
16-Mar-12	11:07:42	21.2	6.00	17.90	9.86						
Test # 3:											
16-Mar-12	11:07:42	21.2	6.00	17.90	9.86	0.74	28	1.13	4%	1.26E-04	1.22E-04
16-Mar-12	11:08:10	21.2	6.80	17.00	9.46						
Test # 4:											
16-Mar-12	11:08:10	21.2	6.80	17.00	9.46	0.43	20	1.00	2%	1.07E-04	1.04E-04
16-Mar-12	11:08:30	21.2	7.30	16.50	9.23						

***Average Ksat* (cm/sec):** **1.17E-04**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 8.79E-05

Ksat (+25%) (cm/s): 1.46E-04

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	256.85	*Saturated Mass (g):*	263.9	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.028	*Dry Mass (g):*	206.15	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.76	*Diameter (cm):*	5.995		☐ Remolded Sample
Area (cm^2):	28.54	*Length (cm):*	4.758	*Number of Lifts:*	NA
Volume (cm^3):	135.84	*Deformation (%)**:*	0.04	*Split:*	NA
Dry Density (g/cm^3):	1.52	*Area (cm^2):*	28.23	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	94.74	*Volume (cm^3):*	134.31	*Particle Density(g/cm^3):*	2.69 ☐ Assumed ☑ Measured
Water Content (%, g/g):	24.6	*Dry Density (g/cm^3):*	1.53	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	37.3	*Dry Density (pcf):*	95.82	*Influent pressure (PSI):*	79.0
Void Ratio (e):	0.78	*Water Content (%, g/g):*	28.0	*Effluent pressure (PSI):*	76.0
Porosity (%, vol):	43.7	*Water Content (%, vol):*	43.0	*Panel Used:*	☐ A ☐ B ☑ C
Saturation (%):	85.5	*Void Ratio(e):*	0.76	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	43.0		Date/Time
		Saturation (%):*	100.0	B-Value (% saturation) prior to test*:	0.95 3/21/12 950
				B-Value (% saturation) post to test:	0.95 3/21/12 1346

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

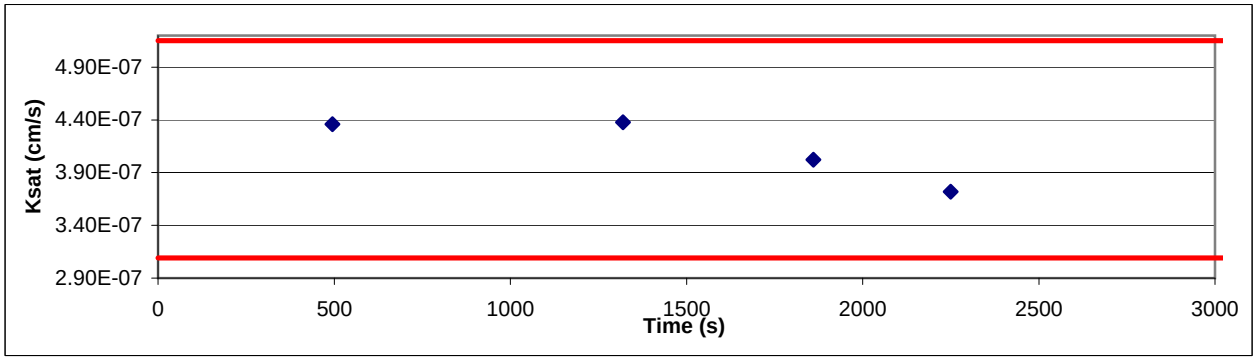
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
21-Mar-12	10:23:30	20.7	4.20	21.30	48.50	0.26	495	1.00	0%	4.43E-07	4.36E-07
21-Mar-12	10:31:45	20.7	4.50	21.00	48.36						
Test # 2:											
21-Mar-12	10:31:45	20.7	4.50	21.00	48.36	0.43	825	1.00	1%	4.45E-07	4.38E-07
21-Mar-12	10:45:30	20.7	5.00	20.50	48.11						
Test # 3:											
21-Mar-12	10:45:30	20.7	5.00	20.50	48.11	0.26	540	1.00	0%	4.10E-07	4.02E-07
21-Mar-12	10:54:30	20.8	5.30	20.20	47.97						
Test # 4:											
21-Mar-12	10:54:30	20.8	5.30	20.20	47.97	0.17	390	1.00	0%	3.79E-07	3.72E-07
21-Mar-12	11:01:00	20.8	5.50	20.00	47.87						

***Average Ksat* (cm/sec):** **4.12E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 3.09E-07

Ksat (+25%) (cm/s): 5.15E-07

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (444-445)
Date Sampled: 12/7/2011
Depth: 444-445

Remolded or Initial Sample Properties	
Initial Mass (g):	213.29
Diameter (cm):	6.363
Length (cm):	3.547
Area (cm^2):	31.80
Volume (cm^3):	112.79
Dry Density (g/cm^3):	1.47
Dry Density (pcf):	92.03
Water Content (%, g/g):	28.3
Water Content (%, vol):	41.7
Void Ratio (e):	0.84
Porosity (%, vol):	45.7
Saturation (%):	91.3

Post Permeation Sample Properties	
Saturated Mass (g):	216.51
Dry Mass (g):	166.27
Diameter (cm):	6.339
Length (cm):	3.547
*Deformation (%)**:*	0.00
Area (cm^2):	31.56
Volume (cm^3):	111.94
Dry Density (g/cm^3):	1.49
Dry Density (pcf):	92.73
Water Content (%, g/g):	30.2
Water Content (%, vol):	44.9
Void Ratio(e):	0.83
Porosity (%, vol):	45.3
Saturation (%):*	99.1

Test and Sample Conditions	
Permeant liquid used:	Tap Water
Sample Preparation:	☑ In situ sample, extruded
	☐ Remolded Sample
Number of Lifts:	NA
Split:	NA
Percent Coarse Material (%):	NA
Particle Density(g/cm^3):	2.71 ☐ Assumed ☑ Measured
Cell pressure (PSI):	80.0
Influent pressure (PSI):	78.0
Effluent pressure (PSI):	78.0
Panel Used:	☑ D ☐ E ☐ F
Reading:	☐ Annulus ☑ Pipette

		Date/Time	
B-Value (% saturation) prior to test*:	0.95	3/19/12	1520
B-Value (% saturation) post to test:	0.95	3/19/12	1638

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

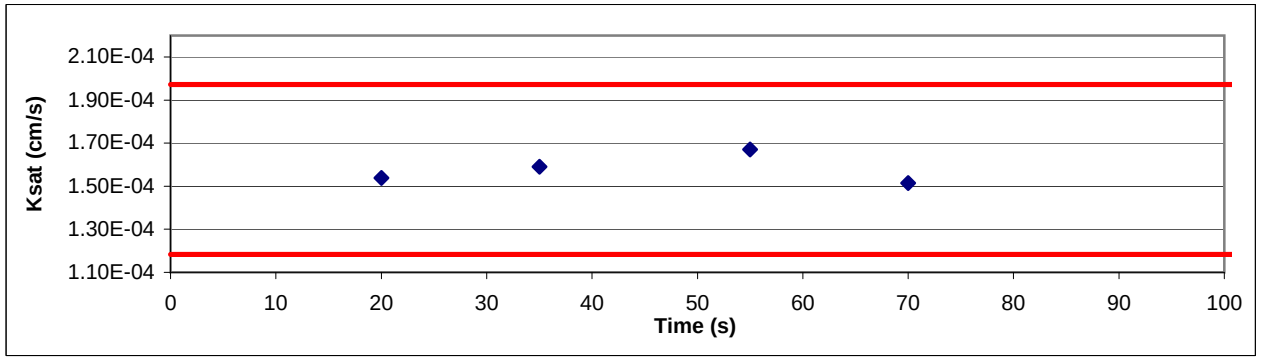
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (444-445)
Date Sampled: 12/7/2011
Depth: 444-445

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
19-Mar-12	15:07:55	22.5	2.30	22.40	6.54	0.56	20	1.17	6%	1.63E-04	1.54E-04
19-Mar-12	15:08:15	22.5	2.90	21.70	6.12						
Test # 2:											
19-Mar-12	15:08:15	22.5	2.90	21.70	6.12	0.41	15	0.90	5%	1.69E-04	1.59E-04
19-Mar-12	15:08:30	22.5	3.40	21.25	5.81						
Test # 3:											
19-Mar-12	15:08:30	22.5	3.40	21.25	5.81	0.54	20	1.08	7%	1.77E-04	1.67E-04
19-Mar-12	15:08:50	22.5	4.00	20.60	5.40						
Test # 4:											
19-Mar-12	15:08:50	22.5	4.00	20.60	5.40	0.35	15	1.00	5%	1.61E-04	1.51E-04
19-Mar-12	15:09:05	22.5	4.40	20.20	5.14						

***Average Ksat* (cm/sec):** **1.58E-04**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.18E-04

Ksat (+25%) (cm/s): 1.97E-04

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (499-500)
Date Sampled: 12/7/2011
Depth: 499-500

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	287	*Saturated Mass (g):*	291.88	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.961	*Dry Mass (g):*	226.33	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.337	*Diameter (cm):*	5.947		☐ Remolded Sample
Area (cm^2):	27.91	*Length (cm):*	5.337	*Number of Lifts:*	NA
Volume (cm^3):	148.94	*Deformation (%)**:*	0.00	*Split:*	NA
Dry Density (g/cm^3):	1.52	*Area (cm^2):*	27.78	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	94.86	*Volume (cm^3):*	148.25	*Particle Density(g/cm^3):*	2.70 ☐ Assumed ☑ Measured
Water Content (%, g/g):	26.8	*Dry Density (g/cm^3):*	1.53	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	40.7	*Dry Density (pcf):*	95.31	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.78	*Water Content (%, g/g):*	29.0	*Effluent pressure (PSI):*	78.0
Porosity (%, vol):	43.7	*Water Content (%, vol):*	44.2	*Panel Used:*	☐ D ☑ E ☐ F
Saturation (%):	93.2	*Void Ratio(e):*	0.77	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	43.4		Date/Time
		Saturation (%):*	101.8	B-Value (% saturation) prior to test*:	0.95 3/21/12 1217
				B-Value (% saturation) post to test:	0.95 3/21/12 1320

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

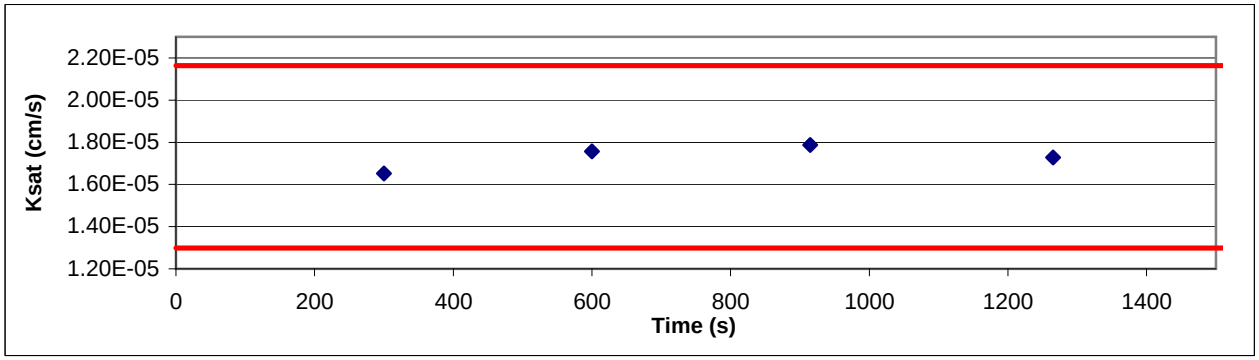
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (499-500)
Date Sampled: 12/7/2011
Depth: 499-500

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
21-Mar-12	12:24:00	21.2	5.40	18.90	2.92	0.35	300	1.00	6%	1.70E-05	1.65E-05
21-Mar-12	12:29:00	21.2	5.80	18.50	2.75						
Test # 2:											
21-Mar-12	12:29:00	21.2	5.80	18.50	2.75	0.35	300	1.00	6%	1.81E-05	1.76E-05
21-Mar-12	12:34:00	21.3	6.20	18.10	2.57						
Test # 3:											
21-Mar-12	12:34:00	21.3	6.20	18.10	2.57	0.35	315	1.00	7%	1.84E-05	1.79E-05
21-Mar-12	12:39:15	21.3	6.60	17.70	2.40						
Test # 4:											
21-Mar-12	12:39:15	21.3	6.60	17.70	2.40	0.35	350	1.00	7%	1.78E-05	1.73E-05
21-Mar-12	12:45:05	21.4	7.00	17.30	2.23						

***Average Ksat* (cm/sec):** **1.73E-05**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.30E-05

Ksat (+25%) (cm/s): 2.16E-05

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (534-535)
Date Sampled: 12/7/2011
Depth: 534-535

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	257.66	*Saturated Mass (g):*	264.3	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.978	*Dry Mass (g):*	206.15	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.792	*Diameter (cm):*	5.94		☐ Remolded Sample
Area (cm^2):	28.07	*Length (cm):*	4.792	*Number of Lifts:*	NA
Volume (cm^3):	134.50	*Deformation (%)**:*	0.01	*Split:*	NA
Dry Density (g/cm^3):	1.53	*Area (cm^2):*	27.71	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	95.69	*Volume (cm^3):*	132.78	*Particle Density(g/cm^3):*	2.68 ☐ Assumed ☑ Measured
Water Content (%, g/g):	25.0	*Dry Density (g/cm^3):*	1.55	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	38.3	*Dry Density (pcf):*	96.92	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.75	*Water Content (%, g/g):*	28.2	*Effluent pressure (PSI):*	77.5
Porosity (%, vol):	42.8	*Water Content (%, vol):*	43.8	*Panel Used:*	☑ D ☐ E ☐ F
Saturation (%):	89.5	*Void Ratio(e):*	0.73	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	42.1		Date/Time
		Saturation (%):*	104.1	B-Value (% saturation) prior to test*:	1.00 3/22/12 1541
				B-Value (% saturation) post to test:	0.98 3/23/12 0935

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition

Job Number: ES09.0154.12

Sample Number: PB-13 (534-535)

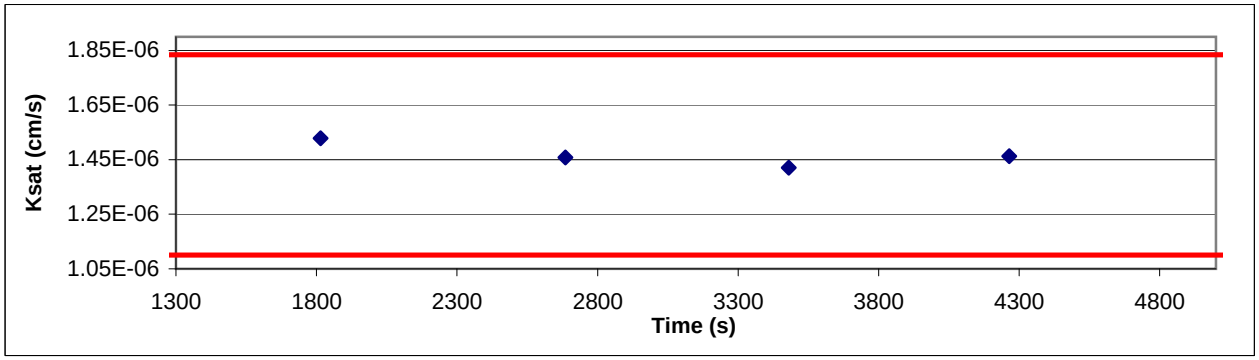
Date Sampled: 12/7/2011

Depth: 534-535

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
22-Mar-12	15:42:15	23.5	5.00	20.25	11.02	0.78	1815	1.00	4%	1.66E-06	1.53E-06
22-Mar-12	16:12:30	23.6	5.90	19.35	10.58						
Test # 2:											
22-Mar-12	16:12:30	23.6	5.90	19.35	10.58	0.35	870	1.00	2%	1.59E-06	1.46E-06
22-Mar-12	16:27:00	23.6	6.30	18.95	10.39						
Test # 3:											
22-Mar-12	16:27:00	23.6	6.30	18.95	10.39	0.30	795	1.00	2%	1.55E-06	1.42E-06
22-Mar-12	16:40:15	23.6	6.65	18.60	10.22						
Test # 4:											
22-Mar-12	16:40:15	23.6	6.65	18.60	10.22	0.30	785	1.00	2%	1.59E-06	1.46E-06
22-Mar-12	16:53:20	23.6	7.00	18.25	10.05						

***Average Ksat* (cm/sec):** **1.47E-06**

Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.10E-06

Ksat (+25%) (cm/s): 1.83E-06

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (554-555)
Date Sampled: 12/7/2011
Depth: 554-555

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	312.05	*Saturated Mass (g):*	320.73	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.049	*Dry Mass (g):*	248.51	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.581	*Diameter (cm):*	6.043		☐ Remolded Sample
Area (cm^2):	28.74	*Length (cm):*	5.576	*Number of Lifts:*	NA
Volume (cm^3):	160.39	*Deformation (%)**:*	0.09	*Split:*	NA
Dry Density (g/cm^3):	1.55	*Area (cm^2):*	28.68	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	96.73	*Volume (cm^3):*	159.93	*Particle Density(g/cm^3):*	2.66 ☐ Assumed ☑ Measured
Water Content (%, g/g):	25.6	*Dry Density (g/cm^3):*	1.55	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	39.6	*Dry Density (pcf):*	97.00	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.72	*Water Content (%, g/g):*	29.1	*Effluent pressure (PSI):*	77.0
Porosity (%, vol):	41.7	*Water Content (%, vol):*	45.2	*Panel Used:*	☐ D ☐ E ☑ F
Saturation (%):	95.0	*Void Ratio(e):*	0.71	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	41.6		Date/Time
		Saturation (%):*	108.7	B-Value (% saturation) prior to test*:	0.98 3/22/12 1133
				B-Value (% saturation) post to test:	1.00 3/22/12 1325

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition

Job Number: ES09.0154.12

Sample Number: PB-13 (554-555)

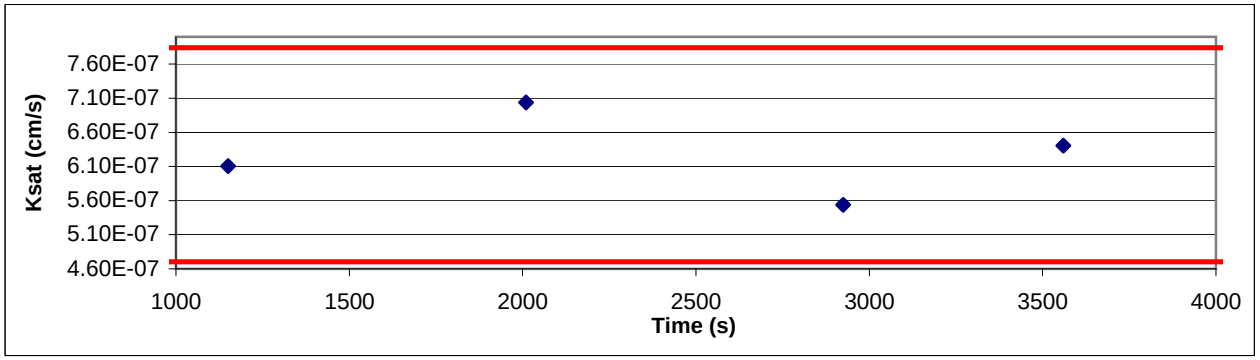
Date Sampled: 12/7/2011

Depth: 554-555

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
22-Mar-12	11:36:00	22.1	2.30	21.75	16.64	0.30	1150	1.00	1%	6.43E-07	6.10E-07
22-Mar-12	11:55:10	22.2	2.65	21.40	16.50						
Test # 2:											
22-Mar-12	11:55:10	22.2	2.65	21.40	16.50	0.26	860	1.00	1%	7.43E-07	7.04E-07
22-Mar-12	12:09:30	22.3	2.95	21.10	16.37						
Test # 3:											
22-Mar-12	12:09:30	22.3	2.95	21.10	16.37	0.22	915	1.00	1%	5.86E-07	5.54E-07
22-Mar-12	12:24:45	22.4	3.20	20.85	16.27						
Test # 4:											
22-Mar-12	12:24:45	22.4	3.20	20.85	16.27	0.17	635	1.00	1%	6.79E-07	6.40E-07
22-Mar-12	12:35:20	22.5	3.40	20.65	16.19						

***Average Ksat* (cm/sec):** **6.27E-07**

Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 4.70E-07

Ksat (+25%) (cm/s): 7.84E-07

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (563-564)
Date Sampled: 12/7/2011
Depth: 563-564

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	208.12	*Saturated Mass (g):*	210.87	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.904	*Dry Mass (g):*	160.37	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.011	*Diameter (cm):*	5.875		☐ Remolded Sample
Area (cm^2):	27.38	*Length (cm):*	4.011	*Number of Lifts:*	NA
Volume (cm^3):	109.81	*Deformation (%)**:*	0.01	*Split:*	NA
Dry Density (g/cm^3):	1.46	*Area (cm^2):*	27.11	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	91.17	*Volume (cm^3):*	108.72	*Particle Density(g/cm^3):*	2.65 ☐ Assumed ☑ Measured
Water Content (%, g/g):	29.8	*Dry Density (g/cm^3):*	1.48	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	43.5	*Dry Density (pcf):*	92.08	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.81	*Water Content (%, g/g):*	31.5	*Effluent pressure (PSI):*	76.5
Porosity (%, vol):	44.9	*Water Content (%, vol):*	46.4	*Panel Used:*	☐ A ☐ B ☑ C
Saturation (%):	96.9	*Void Ratio(e):*	0.80	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	44.3		Date/Time
		Saturation (%):*	104.8	B-Value (% saturation) prior to test*:	1.00 3/27/12 1417
				B-Value (% saturation) post to test:	0.98 3/27/12 1724

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

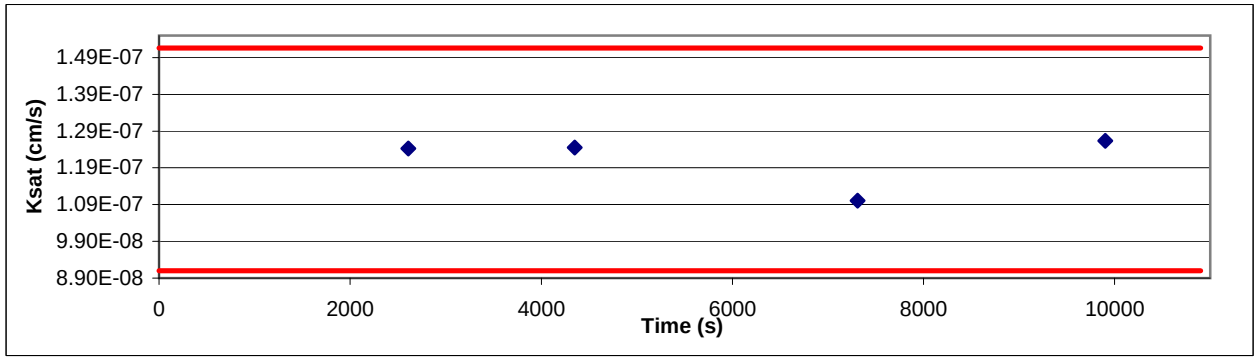
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (563-564)
Date Sampled: 12/7/2011
Depth: 563-564

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
27-Mar-12	14:17:30	23.3	4.00	22.40	31.60	0.26	2610	1.00	1%	1.35E-07	1.24E-07
27-Mar-12	15:01:00	23.4	4.30	22.10	31.43						
Test # 2:											
27-Mar-12	15:01:00	23.4	4.30	22.10	31.43	0.17	1740	1.00	0%	1.35E-07	1.25E-07
27-Mar-12	15:30:00	23.5	4.50	21.90	31.32						
Test # 3:											
27-Mar-12	15:30:00	23.5	4.50	21.90	31.32	0.26	2960	1.00	1%	1.20E-07	1.10E-07
27-Mar-12	16:19:20	23.6	4.80	21.60	31.14						
Test # 4:											
27-Mar-12	16:19:20	23.6	4.80	21.60	31.14	0.26	2590	1.00	1%	1.38E-07	1.26E-07
27-Mar-12	17:02:30	23.6	5.10	21.30	30.97						

***Average Ksat* (cm/sec):** **1.21E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 9.10E-08

Ksat (+25%) (cm/s): 1.52E-07

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (585-586)
Date Sampled: NA
Depth: 585-586

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	277.42	*Saturated Mass (g):*	279.97	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.882	*Dry Mass (g):*	218.6	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.231	*Diameter (cm):*	5.863		☐ Remolded Sample
Area (cm^2):	27.17	*Length (cm):*	5.241	*Number of Lifts:*	NA
Volume (cm^3):	142.14	*Deformation (%)**:*	0.19	*Split:*	NA
Dry Density (g/cm^3):	1.54	*Area (cm^2):*	27.00	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	96.01	*Volume (cm^3):*	141.50	*Particle Density(g/cm^3):*	2.68 ☐ Assumed ☑ Measured
Water Content (%, g/g):	26.9	*Dry Density (g/cm^3):*	1.54	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	41.4	*Dry Density (pcf):*	96.44	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.74	*Water Content (%, g/g):*	28.1	*Effluent pressure (PSI):*	77.5
Porosity (%, vol):	42.6	*Water Content (%, vol):*	43.4	*Panel Used:*	☐ D ☑ E ☐ F
Saturation (%):	97.1	*Void Ratio(e):*	0.73	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	42.3		Date/Time
		Saturation (%):*	102.4	B-Value (% saturation) prior to test*:	0.95 3/26/12 1112
				B-Value (% saturation) post to test:	1.00 3/26/12 1350

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition

Job Number: ES09.0154.12

Sample Number: PB-13 (585-586)

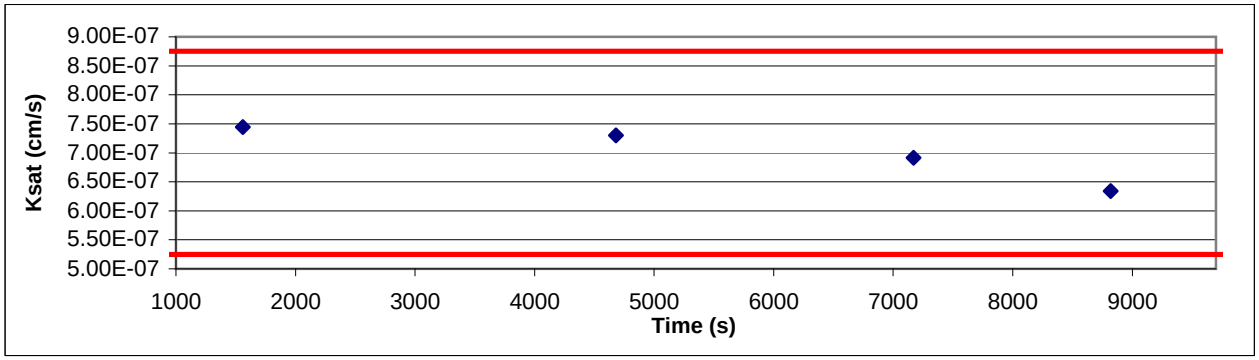
Date Sampled: NA

Depth: 585-586

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
26-Mar-12	11:14:00	22.9	4.30	21.60	10.52	0.30	1560	1.00	1%	7.98E-07	7.44E-07
26-Mar-12	11:40:00	23.0	4.65	21.25	10.37						
Test # 2:											
26-Mar-12	11:40:00	23.0	4.65	21.25	10.37	0.59	3120	1.08	3%	7.87E-07	7.30E-07
26-Mar-12	12:32:00	23.3	5.30	20.55	10.07						
Test # 3:											
26-Mar-12	12:32:00	23.3	5.30	20.55	10.07	0.43	2490	1.00	2%	7.49E-07	6.91E-07
26-Mar-12	13:13:30	23.5	5.80	20.05	9.85						
Test # 4:											
26-Mar-12	13:13:30	23.5	5.80	20.05	9.85	0.26	1650	1.00	1%	6.91E-07	6.34E-07
26-Mar-12	13:41:00	23.7	6.10	19.75	9.72						

***Average Ksat* (cm/sec):** **7.00E-07**

Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 5.25E-07

Ksat (+25%) (cm/s): 8.75E-07

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (604-605)
Date Sampled: NA
Depth: 604-605

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	286.54	*Saturated Mass (g):*	287.9	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.048	*Dry Mass (g):*	218.31	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.256	*Diameter (cm):*	6.007		☐ Remolded Sample
Area (cm^2):	28.73	*Length (cm):*	5.247	*Number of Lifts:*	NA
Volume (cm^3):	151.00	*Deformation (%)**:*	0.17	*Split:*	NA
Dry Density (g/cm^3):	1.45	*Area (cm^2):*	28.34	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	90.26	*Volume (cm^3):*	148.70	*Particle Density(g/cm^3):*	2.65 ☐ Assumed ☑ Measured
Water Content (%, g/g):	31.3	*Dry Density (g/cm^3):*	1.47	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	45.2	*Dry Density (pcf):*	91.65	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.83	*Water Content (%, g/g):*	31.9	*Effluent pressure (PSI):*	77.5
Porosity (%, vol):	45.4	*Water Content (%, vol):*	46.8	*Panel Used:*	☑ A ☐ B ☐ C
Saturation (%):	99.5	*Void Ratio(e):*	0.80	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	44.6		Date/Time
		Saturation (%):*	104.9	B-Value (% saturation) prior to test*:	0.95 3/28/12 1014
				B-Value (% saturation) post to test:	0.95 3/29/12 1016

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

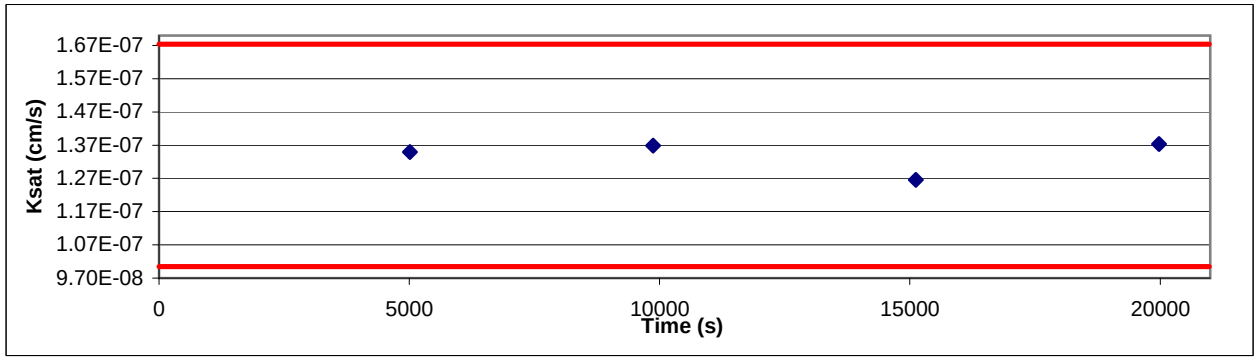
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (604-605)
Date Sampled: NA
Depth: 604-605

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
28-Mar-12	10:15:00	21.6	5.60	20.65	10.02	0.17	5010	1.00	1%	1.41E-07	1.35E-07
28-Mar-12	11:38:30	22.2	5.80	20.45	9.93						
Test # 2:											
28-Mar-12	13:12:00	23.1	6.00	20.20	9.83	0.17	4860	1.00	1%	1.48E-07	1.37E-07
28-Mar-12	14:33:00	23.7	6.20	20.00	9.74						
Test # 3:											
28-Mar-12	14:33:00	23.7	6.20	20.00	9.74	0.17	5250	1.00	1%	1.39E-07	1.27E-07
28-Mar-12	16:00:30	24.0	6.40	19.80	9.65						
Test # 4:											
28-Mar-12	16:00:30	24.0	6.40	19.80	9.65	0.17	4860	1.00	1%	1.51E-07	1.37E-07
28-Mar-12	17:21:30	24.1	6.60	19.60	9.56						

***Average Ksat* (cm/sec):** **1.34E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.00E-07

Ksat (+25%) (cm/s): 1.67E-07

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (625-626)
Date Sampled: NA
Depth: 625-626

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	245.38	*Saturated Mass (g):*	246.85	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.031	*Dry Mass (g):*	189.32	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.515	*Diameter (cm):*	5.986		☐ Remolded Sample
Area (cm^2):	28.57	*Length (cm):*	4.476	*Number of Lifts:*	NA
Volume (cm^3):	128.98	*Deformation (%)**:*	0.88	*Split:*	NA
Dry Density (g/cm^3):	1.47	*Area (cm^2):*	28.14	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	91.63	*Volume (cm^3):*	125.96	*Particle Density(g/cm^3):*	2.62 ☐ Assumed ☑ Measured
Water Content (%, g/g):	29.6	*Dry Density (g/cm^3):*	1.50	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	43.5	*Dry Density (pcf):*	93.83	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.78	*Water Content (%, g/g):*	30.4	*Effluent pressure (PSI):*	77.0
Porosity (%, vol):	44.0	*Water Content (%, vol):*	45.7	*Panel Used:*	☐ A ☑ B ☐ C
Saturation (%):	98.9	*Void Ratio(e):*	0.74	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	42.6		Date/Time
		Saturation (%):*	107.2	B-Value (% saturation) prior to test*:	1.00 3/27/12 1640
				B-Value (% saturation) post to test:	1.00 3/28/12 1328

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

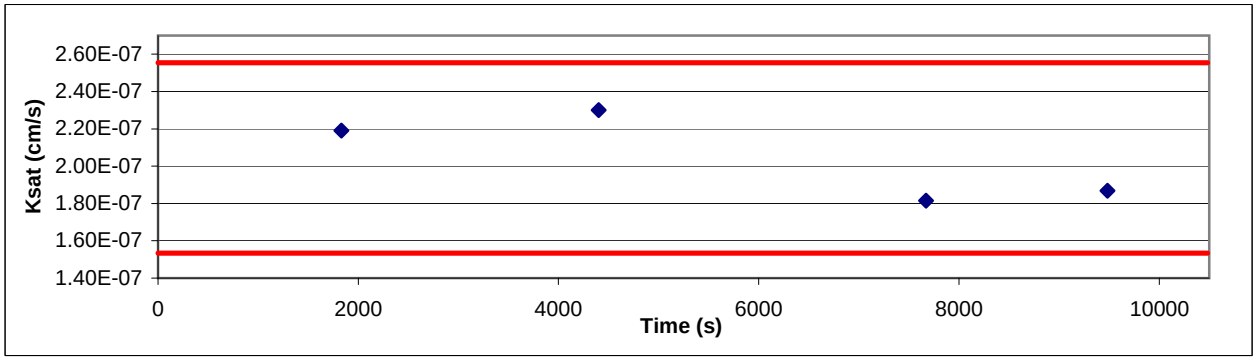
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (625-626)
Date Sampled: NA
Depth: 625-626

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
27-Mar-12	16:42:30	23.6	2.95	21.15	20.41	0.22	1830	1.00	1%	2.39E-07	2.19E-07
27-Mar-12	17:13:00	23.6	3.20	20.90	20.28						
Test # 2:											
28-Mar-12	09:21:40	21.5	3.90	21.90	20.36	0.30	2570	1.00	1%	2.39E-07	2.30E-07
28-Mar-12	10:04:30	21.6	4.25	21.55	20.18						
Test # 3:											
28-Mar-12	10:04:30	21.6	4.25	21.55	20.18	0.30	3270	1.00	1%	1.89E-07	1.82E-07
28-Mar-12	10:59:00	21.9	4.60	21.20	20.00						
Test # 4:											
28-Mar-12	11:36:30	22.2	4.80	20.95	19.88	0.17	1815	1.00	1%	1.97E-07	1.87E-07
28-Mar-12	12:06:45	22.4	5.00	20.75	19.78						

***Average Ksat* (cm/sec):** **2.04E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.53E-07

Ksat (+25%) (cm/s): 2.55E-07

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (639-640)
Date Sampled: NA
Depth: 639-640

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	286.15	*Saturated Mass (g):*	289.27	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.755	*Dry Mass (g):*	219.64	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.871	*Diameter (cm):*	5.733		☐ Remolded Sample
Area (cm^2):	26.01	*Length (cm):*	5.87	*Number of Lifts:*	NA
Volume (cm^3):	152.72	*Deformation (%)**:*	0.02	*Split:*	NA
Dry Density (g/cm^3):	1.44	*Area (cm^2):*	25.81	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	89.78	*Volume (cm^3):*	151.53	*Particle Density(g/cm^3):*	2.64 ☐ Assumed ☑ Measured
Water Content (%, g/g):	30.3	*Dry Density (g/cm^3):*	1.45	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	43.6	*Dry Density (pcf):*	90.49	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.84	*Water Content (%, g/g):*	31.7	*Effluent pressure (PSI):*	76.5
Porosity (%, vol):	45.6	*Water Content (%, vol):*	46.0	*Panel Used:*	☐ A ☑ B ☐ C
Saturation (%):	95.6	*Void Ratio(e):*	0.82	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	45.1		Date/Time
		Saturation (%):*	101.8	B-Value (% saturation) prior to test*:	1.00 3/13/12 1435
				B-Value (% saturation) post to test:	0.95 3/14/12 1540

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

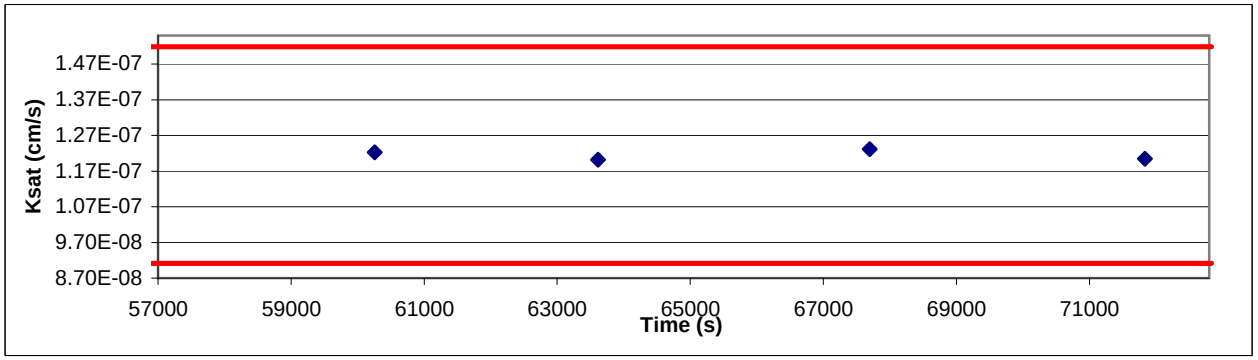
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (639-640)
Date Sampled: NA
Depth: 639-640

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
13-Mar-12	16:37:45	23.6	8.70	19.70	20.14	3.38	60255	1.00	8%	1.30E-07	1.22E-07
14-Mar-12	09:22:00	21.2	12.60	15.80	18.60						
Test # 2:											
14-Mar-12	10:26:00	21.4	12.80	15.60	18.53	0.17	3360	1.00	0%	1.25E-07	1.20E-07
14-Mar-12	11:22:00	21.7	13.00	15.40	18.45						
Test # 3:											
14-Mar-12	11:22:00	21.7	13.00	15.40	18.45	0.22	4080	1.00	1%	1.29E-07	1.23E-07
14-Mar-12	12:30:00	22.2	13.25	15.15	18.35						
Test # 4:											
14-Mar-12	12:30:00	22.2	13.25	15.15	18.35	0.22	4140	1.00	1%	1.28E-07	1.20E-07
14-Mar-12	13:39:00	22.8	13.50	14.90	18.25						

***Average Ksat* (cm/sec):** **1.22E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 9.11E-08

Ksat (+25%) (cm/s): 1.52E-07

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (660-661)
Date Sampled: NA
Depth: 660-661

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	245.98	*Saturated Mass (g):*	247.02	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.94	*Dry Mass (g):*	190.66	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.611	*Diameter (cm):*	5.908		☐ Remolded Sample
Area (cm^2):	27.71	*Length (cm):*	4.609	*Number of Lifts:*	NA
Volume (cm^3):	127.78	*Deformation (%)**:*	0.04	*Split:*	NA
Dry Density (g/cm^3):	1.49	*Area (cm^2):*	27.41	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	93.15	*Volume (cm^3):*	126.35	*Particle Density(g/cm^3):*	2.66 ☐ Assumed ☑ Measured
Water Content (%, g/g):	29.0	*Dry Density (g/cm^3):*	1.51	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	43.3	*Dry Density (pcf):*	94.20	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.78	*Water Content (%, g/g):*	29.6	*Effluent pressure (PSI):*	77.5
Porosity (%, vol):	44.0	*Water Content (%, vol):*	44.6	*Panel Used:*	☑ D ☐ E ☐ F
Saturation (%):	98.5	*Void Ratio(e):*	0.76	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	43.3		Date/Time
		Saturation (%):*	103.0	B-Value (% saturation) prior to test*:	0.95 3/28/12 1007
				B-Value (% saturation) post to test:	0.98 3/28/12 1440

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition

Job Number: ES09.0154.12

Sample Number: PB-13 (660-661)

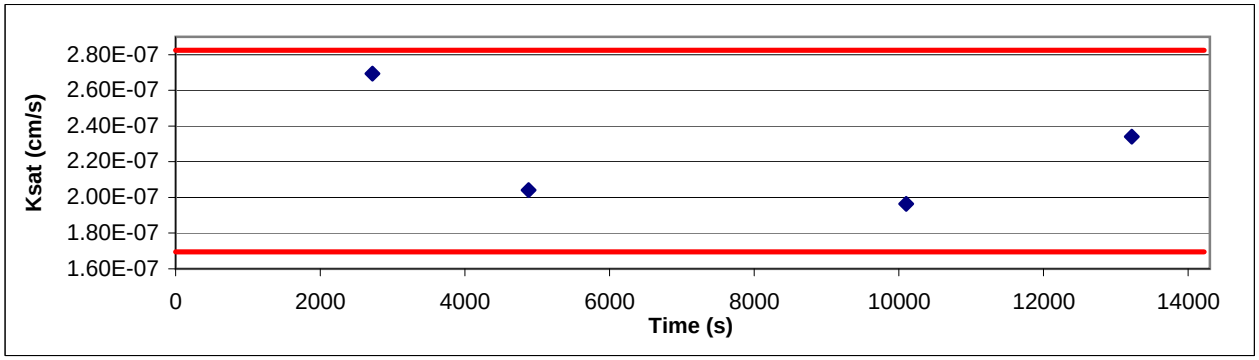
Date Sampled: NA

Depth: 660-661

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
28-Mar-12	10:08:40	21.6	3.20	20.85	12.05	0.22	2720	1.00	1%	2.81E-07	2.69E-07
28-Mar-12	10:54:00	21.8	3.45	20.60	11.93						
Test # 2:											
28-Mar-12	10:54:00	21.8	3.45	20.60	11.93	0.13	2160	1.00	1%	2.14E-07	2.04E-07
28-Mar-12	11:30:00	22.1	3.60	20.45	11.85						
Test # 3:											
28-Mar-12	11:30:00	22.1	3.60	20.45	11.85	0.30	5220	1.00	1%	2.09E-07	1.96E-07
28-Mar-12	12:57:00	23.0	3.95	20.10	11.68						
Test # 4:											
28-Mar-12	12:57:00	23.0	3.95	20.10	11.68	0.22	3120	1.00	1%	2.53E-07	2.34E-07
28-Mar-12	13:49:00	23.4	4.20	19.85	11.55						

***Average Ksat* (cm/sec):** **2.26E-07**

Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.69E-07

Ksat (+25%) (cm/s): 2.82E-07

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (294-295)
Date Sampled: 12/8/2011
Depth: 294-295

Remolded or Initial Sample Properties	
Initial Mass (g):	212.62
Diameter (cm):	5.98
Length (cm):	4.093
Area (cm^2):	28.09
Volume (cm^3):	114.96
Dry Density (g/cm^3):	1.43
Dry Density (pcf):	89.17
Water Content (%, g/g):	29.5
Water Content (%, vol):	42.1
Void Ratio (e):	0.90
Porosity (%, vol):	47.4
Saturation (%):	88.9

Post Permeation Sample Properties	
Saturated Mass (g):	216.85
Dry Mass (g):	164.2
Diameter (cm):	5.94
Length (cm):	4.093
*Deformation (%)**:*	0.00
Area (cm^2):	27.71
Volume (cm^3):	113.42
Dry Density (g/cm^3):	1.45
Dry Density (pcf):	90.38
Water Content (%, g/g):	32.1
Water Content (%, vol):	46.4
Void Ratio(e):	0.88
Porosity (%, vol):	46.7
Saturation (%):*	99.4

Test and Sample Conditions	
Permeant liquid used:	Tap Water
Sample Preparation:	☑ In situ sample, extruded
	☐ Remolded Sample
Number of Lifts:	NA
Split:	NA
Percent Coarse Material (%):	NA
Particle Density(g/cm^3):	2.72 ☐ Assumed ☑ Measured
Cell pressure (PSI):	80.0
Influent pressure (PSI):	78.0
Effluent pressure (PSI):	77.0
Panel Used:	☐ D ☐ E ☑ F
Reading:	☐ Annulus ☑ Pipette

		Date/Time	
B-Value (% saturation) prior to test*:	0.98	3/27/12	1321
B-Value (% saturation) post to test:	0.98	3/27/12	1410

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

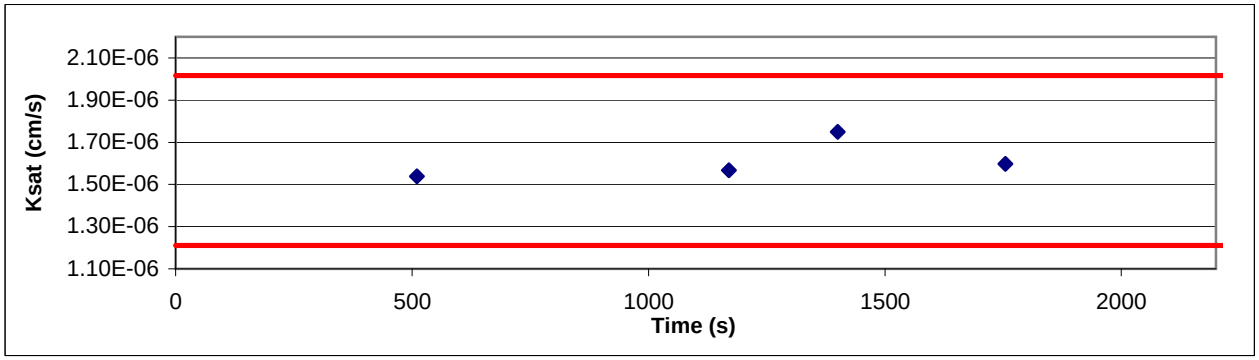
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (294-295)
Date Sampled: 12/8/2011
Depth: 294-295

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
27-Mar-12	13:22:30	22.9	4.40	20.20	21.64	0.43	510	1.00	1%	1.65E-06	1.54E-06
27-Mar-12	13:31:00	23.0	4.90	19.70	21.36						
Test # 2:											
27-Mar-12	13:31:00	23.0	4.90	19.70	21.36	0.56	660	1.00	2%	1.68E-06	1.57E-06
27-Mar-12	13:42:00	23.0	5.55	19.05	21.00						
Test # 3:											
27-Mar-12	13:42:00	23.0	5.55	19.05	21.00	0.22	230	1.00	1%	1.88E-06	1.75E-06
27-Mar-12	13:45:50	23.1	5.80	18.80	20.85						
Test # 4:											
27-Mar-12	13:45:50	23.1	5.80	18.80	20.85	0.30	355	1.00	1%	1.72E-06	1.60E-06
27-Mar-12	13:51:45	23.1	6.15	18.45	20.66						

***Average Ksat* (cm/sec):** **1.61E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.21E-06

Ksat (+25%) (cm/s): 2.02E-06

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Constant Head Method

Job name: Pickles Butte No-Migration Petition
Job number: ES09.0154.12
Sample number: PB-14 (304-305)
Date Sampled: 12/8/2011
Depth: 304-305

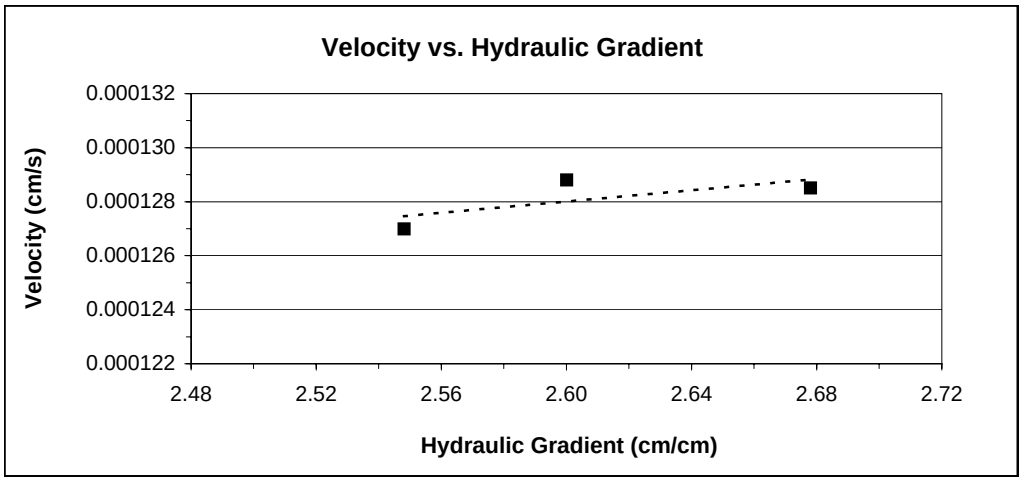
Type of water used: TAP
Collection vessel tare (g)*:* 10.98
Sample length (cm)*:* 3.85
Sample diameter (cm)*:* 6.10
Sample x-sectional area (cm^2)*:* 29.24

Date	Time	Temp (°C)	Head (cm)	Q + Tare (g)	Q (cm^3)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:								
25-Jan-12	12:59:28	20.5	10.3	15.02	4.0	1075	4.8E-05	4.8E-05
25-Jan-12	13:17:23							
Test # 2:								
25-Jan-12	14:00:09	20.5	10	13.50	2.5	669	5.0E-05	4.9E-05
25-Jan-12	14:11:18							
Test # 3:								
25-Jan-12	14:40:56	20.5	9.8	13.42	2.4	657	5.0E-05	4.9E-05
25-Jan-12	14:51:53							

Average Ksat* (cm/sec)*: **4.9E-05**
Oversize Corrected Ksat* (cm/sec)*: **NA**

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not applicable



Laboratory analysis by: K. Wright
Data entered by: K. Wright
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (532-533)
Date Sampled: 12/8/2011
Depth: 532-533

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	162.57	*Saturated Mass (g):*	166.2	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.492	*Dry Mass (g):*	128.32	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	3.681	*Diameter (cm):*	5.452		☐ Remolded Sample
Area (cm^2):	23.69	*Length (cm):*	3.706	*Number of Lifts:*	NA
Volume (cm^3):	87.20	*Deformation (%)**:*	0.69	*Split:*	NA
Dry Density (g/cm^3):	1.47	*Area (cm^2):*	23.35	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	91.87	*Volume (cm^3):*	86.53	*Particle Density(g/cm^3):*	2.67 ☐ Assumed ☑ Measured
Water Content (%, g/g):	26.7	*Dry Density (g/cm^3):*	1.48	*Cell pressure (PSI):*	82.0
Water Content (%, vol):	39.3	*Dry Density (pcf):*	92.58	*Influent pressure (PSI):*	80.0
Void Ratio (e):	0.81	*Water Content (%, g/g):*	29.5	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	44.9	*Water Content (%, vol):*	43.8	*Panel Used:*	☐ D ☑ E ☐ F
Saturation (%):	87.6	*Void Ratio(e):*	0.80	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	44.4		Date/Time
		Saturation (%):*	98.5	B-Value (% saturation) prior to test*:	0.95 4/3/12 1000
				B-Value (% saturation) post to test:	0.95 4/3/12 1130

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

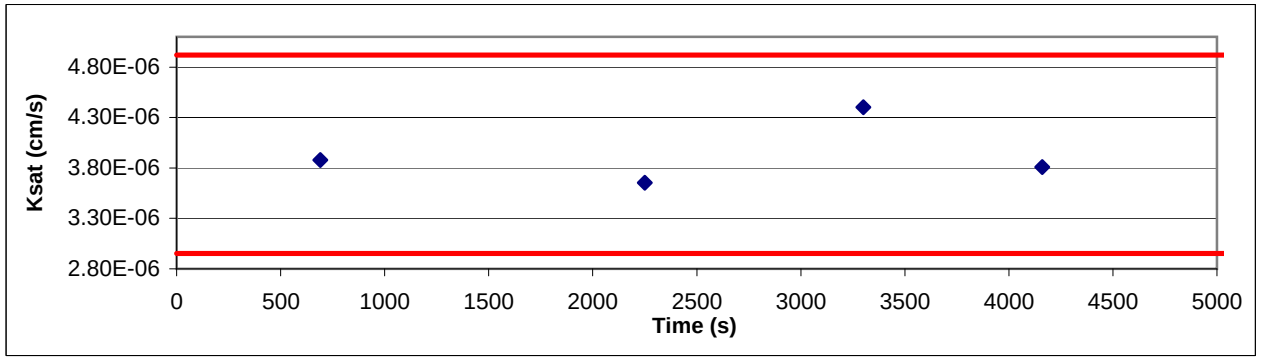
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (532-533)
Date Sampled: 12/8/2011
Depth: 532-533

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
03-Apr-12	10:04:00	21.5	9.10	19.25	3.16	0.17	690	1.00	4%	4.02E-06	3.88E-06
03-Apr-12	10:15:30	21.5	9.30	19.05	3.04						
Test # 2:											
03-Apr-12	10:15:30	21.5	9.30	19.05	3.04	0.35	1560	1.00	8%	3.79E-06	3.65E-06
03-Apr-12	10:41:30	21.5	9.70	18.65	2.79						
Test # 3:											
03-Apr-12	10:41:30	21.5	9.70	18.65	2.79	0.26	1050	1.00	7%	4.56E-06	4.40E-06
03-Apr-12	10:59:00	21.4	10.00	18.35	2.60						
Test # 4:											
03-Apr-12	10:59:00	21.4	10.00	18.35	2.60	0.17	860	1.00	5%	3.94E-06	3.81E-06
03-Apr-12	11:13:20	21.4	10.20	18.15	2.48						

***Average Ksat* (cm/sec):** **3.94E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 2.95E-06

Ksat (+25%) (cm/s): 4.92E-06

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (549-550)
Date Sampled: 12/8/2011
Depth: 549-550

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	292.39	*Saturated Mass (g):*	297.14	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.005	*Dry Mass (g):*	227.11	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.488	*Diameter (cm):*	5.993		☐ Remolded Sample
Area (cm^2):	28.32	*Length (cm):*	5.491	*Number of Lifts:*	NA
Volume (cm^3):	155.43	*Deformation (%)**:*	0.05	*Split:*	NA
Dry Density (g/cm^3):	1.46	*Area (cm^2):*	28.21	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	91.22	*Volume (cm^3):*	154.88	*Particle Density(g/cm^3):*	2.64 ☐ Assumed ☑ Measured
Water Content (%, g/g):	28.7	*Dry Density (g/cm^3):*	1.47	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	42.0	*Dry Density (pcf):*	91.54	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.81	*Water Content (%, g/g):*	30.8	*Effluent pressure (PSI):*	77.0
Porosity (%, vol):	44.8	*Water Content (%, vol):*	45.2	*Panel Used:*	☐ D ☐ E ☑ F
Saturation (%):	93.8	*Void Ratio(e):*	0.80	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	44.6		Date/Time
		Saturation (%):*	101.5	B-Value (% saturation) prior to test*:	0.98 3/29/12 1612
				B-Value (% saturation) post to test:	0.98 3/29/12 1708

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

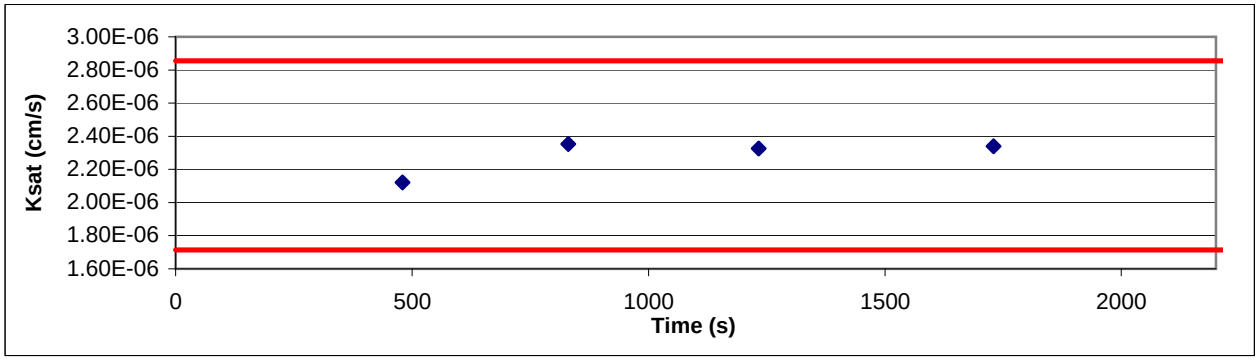
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (549-550)
Date Sampled: 12/8/2011
Depth: 549-550

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
29-Mar-12	16:20:00	24.1	6.70	21.60	15.94	0.43	480	1.00	1%	2.34E-06	2.12E-06
29-Mar-12	16:28:00	24.2	7.20	21.10	15.73						
Test # 2:											
29-Mar-12	16:28:00	24.2	7.20	21.10	15.73	0.35	350	1.00	1%	2.60E-06	2.35E-06
29-Mar-12	16:33:50	24.2	7.60	20.70	15.57						
Test # 3:											
29-Mar-12	16:33:50	24.2	7.60	20.70	15.57	0.39	403	1.00	1%	2.57E-06	2.33E-06
29-Mar-12	16:40:33	24.2	8.05	20.25	15.38						
Test # 4:											
29-Mar-12	16:40:33	24.2	8.05	20.25	15.38	0.48	497	1.00	2%	2.58E-06	2.34E-06
29-Mar-12	16:48:50	24.1	8.60	19.70	15.15						

***Average Ksat* (cm/sec):** **2.28E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.71E-06

Ksat (+25%) (cm/s): 2.86E-06

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (569-570)
Date Sampled: 12/8/2011
Depth: 569-570

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	293.6	*Saturated Mass (g):*	295.82	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.075	*Dry Mass (g):*	228.65	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.213	*Diameter (cm):*	6.047		☐ Remolded Sample
Area (cm^2):	28.99	*Length (cm):*	5.214	*Number of Lifts:*	NA
Volume (cm^3):	151.10	*Deformation (%)**:*	0.02	*Split:*	NA
Dry Density (g/cm^3):	1.51	*Area (cm^2):*	28.72	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	94.47	*Volume (cm^3):*	149.75	*Particle Density(g/cm^3):*	2.68 ☐ Assumed ☑ Measured
Water Content (%, g/g):	28.4	*Dry Density (g/cm^3):*	1.53	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	43.0	*Dry Density (pcf):*	95.32	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.77	*Water Content (%, g/g):*	29.4	*Effluent pressure (PSI):*	75.0
Porosity (%, vol):	43.6	*Water Content (%, vol):*	44.9	*Panel Used:*	☐ A ☐ B ☑ C
Saturation (%):	98.7	*Void Ratio(e):*	0.76	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	43.0		Date/Time
		Saturation (%):*	104.2	B-Value (% saturation) prior to test*:	0.98 3/30/12 1357
				B-Value (% saturation) post to test:	0.98 3/30/12 1508

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

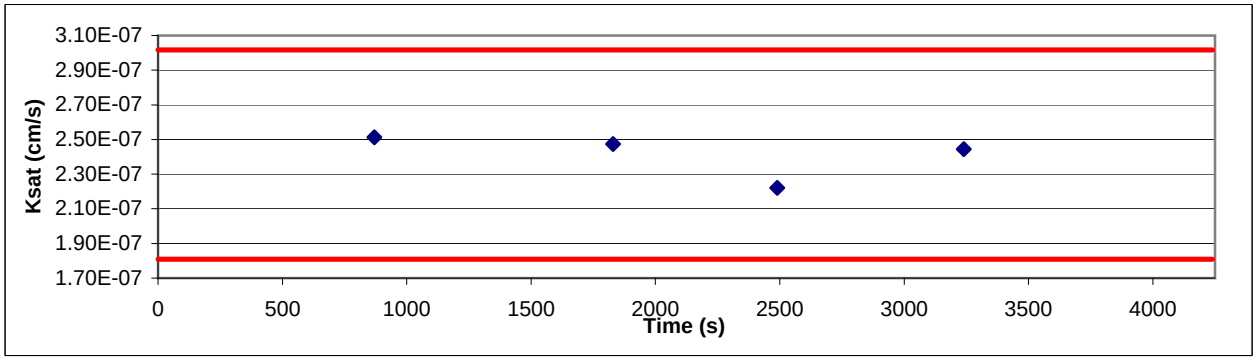
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (569-570)
Date Sampled: 12/8/2011
Depth: 569-570

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
30-Mar-12	14:00:00	22.8	2.50	21.95	44.78	0.26	870	1.00	0%	2.69E-07	2.51E-07
30-Mar-12	14:14:30	22.8	2.80	21.65	44.64						
Test # 2:											
30-Mar-12	14:14:30	22.8	2.80	21.65	44.64	0.28	960	0.86	0%	2.64E-07	2.47E-07
30-Mar-12	14:30:30	22.8	3.15	21.35	44.50						
Test # 3:											
30-Mar-12	14:30:30	22.8	3.15	21.35	44.50	0.17	660	1.00	0%	2.37E-07	2.22E-07
30-Mar-12	14:41:30	22.8	3.35	21.15	44.41						
Test # 4:											
30-Mar-12	14:41:30	22.8	3.35	21.15	44.41	0.22	750	1.00	0%	2.62E-07	2.45E-07
30-Mar-12	14:54:00	22.9	3.60	20.90	44.30						

***Average Ksat* (cm/sec):** **2.41E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.81E-07

Ksat (+25%) (cm/s): 3.02E-07

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (594-595)
Date Sampled: 12/8/2011
Depth: 594-595

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	197.47	*Saturated Mass (g):*	199.38	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.932	*Dry Mass (g):*	150.63	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	3.83	*Diameter (cm):*	5.892		☐ Remolded Sample
Area (cm^2):	27.64	*Length (cm):*	3.827	*Number of Lifts:*	NA
Volume (cm^3):	105.85	*Deformation (%)**:*	0.08	*Split:*	NA
Dry Density (g/cm^3):	1.42	*Area (cm^2):*	27.27	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	88.84	*Volume (cm^3):*	104.35	*Particle Density(g/cm^3):*	2.63 ☐ Assumed ☑ Measured
Water Content (%, g/g):	31.1	*Dry Density (g/cm^3):*	1.44	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	44.3	*Dry Density (pcf):*	90.12	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.85	*Water Content (%, g/g):*	32.4	*Effluent pressure (PSI):*	78.0
Porosity (%, vol):	45.9	*Water Content (%, vol):*	46.7	*Panel Used:*	☐ A ☑ B ☐ C
Saturation (%):	96.4	*Void Ratio(e):*	0.82	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	45.1		Date/Time
		Saturation (%):*	103.5	B-Value (% saturation) prior to test*:	0.98 3/30/12 1620
				B-Value (% saturation) post to test:	0.98 4/2/12 1040

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

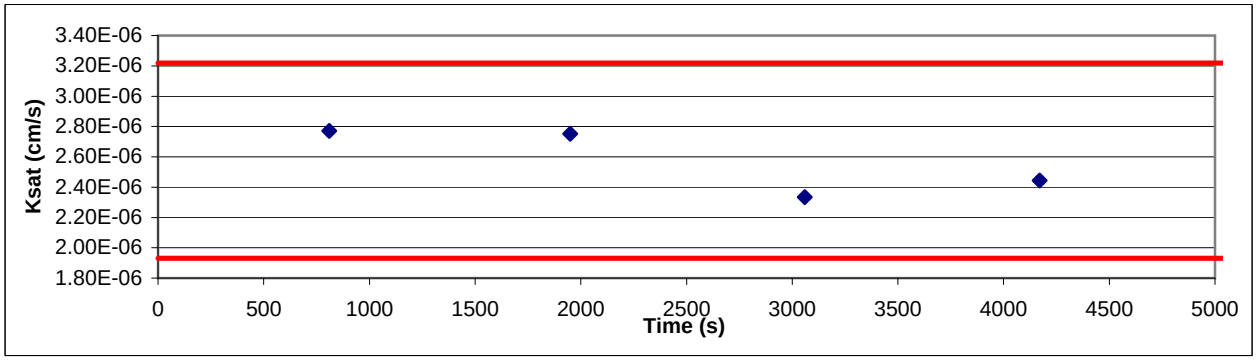
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (594-595)
Date Sampled: 12/8/2011
Depth: 594-595

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
30-Mar-12	16:28:30	23.1	4.50	19.90	4.65	0.26	810	1.00	4%	2.98E-06	2.77E-06
30-Mar-12	16:42:00	23.1	4.80	19.60	4.47						
Test # 2:											
30-Mar-12	16:42:00	23.1	4.80	19.60	4.47	0.35	1140	1.00	5%	2.96E-06	2.75E-06
30-Mar-12	17:01:00	23.1	5.20	19.20	4.22						
Test # 3:											
02-Apr-12	09:40:00	21.9	5.40	19.15	4.15	0.26	1110	1.00	4%	2.44E-06	2.33E-06
02-Apr-12	09:58:30	21.9	5.70	18.85	3.97						
Test # 4:											
02-Apr-12	09:58:30	21.9	5.70	18.85	3.97	0.26	1110	1.00	5%	2.56E-06	2.44E-06
02-Apr-12	10:17:00	21.9	6.00	18.55	3.79						

***Average Ksat* (cm/sec):** **2.57E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.93E-06

Ksat (+25%) (cm/s): 3.22E-06

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (620-623)
Date Sampled: 12/8/2011
Depth: 620-623

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	86.65	*Saturated Mass (g):*	88.79	*Permeant liquid used:*	Tap Water
Diameter (cm):	3.933	*Dry Mass (g):*	68.69	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	3.841	*Diameter (cm):*	3.882		☐ Remolded Sample
Area (cm^2):	12.15	*Length (cm):*	3.838	*Number of Lifts:*	NA
Volume (cm^3):	46.66	*Deformation (%)**:*	0.07	*Split:*	NA
Dry Density (g/cm^3):	1.47	*Area (cm^2):*	11.84	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	91.89	*Volume (cm^3):*	45.43	*Particle Density(g/cm^3):*	2.64 ☐ Assumed ☑ Measured
Water Content (%, g/g):	26.1	*Dry Density (g/cm^3):*	1.51	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	38.5	*Dry Density (pcf):*	94.39	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.80	*Water Content (%, g/g):*	29.3	*Effluent pressure (PSI):*	76.0
Porosity (%, vol):	44.3	*Water Content (%, vol):*	44.2	*Panel Used:*	☐ A ☐ B ☑ C
Saturation (%):	86.9	*Void Ratio(e):*	0.75	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	42.8		Date/Time
		Saturation (%):*	103.4	B-Value (% saturation) prior to test*:	0.95 4/3/12 1524
				B-Value (% saturation) post to test:	0.95 4/3/12 1640

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

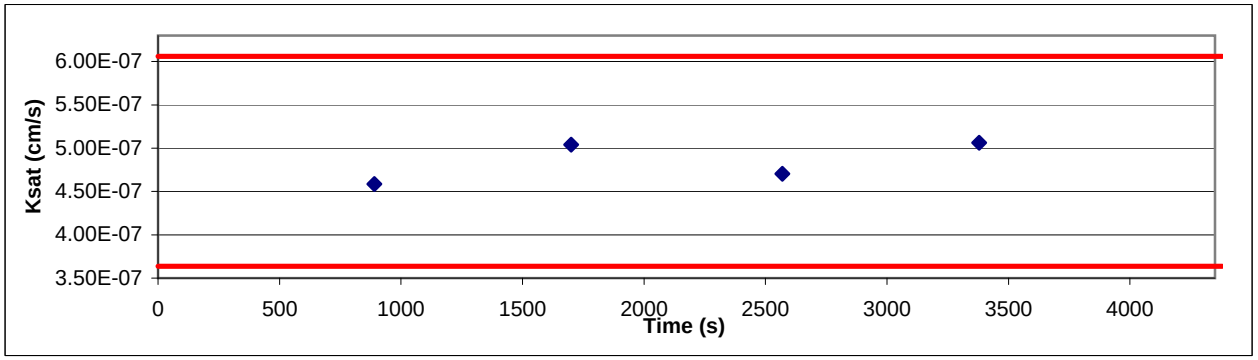
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (620-623)
Date Sampled: 12/8/2011
Depth: 620-623

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
03-Apr-12	15:31:10	22.2	9.40	18.20	39.30	0.17	890	1.00	0%	4.84E-07	4.59E-07
03-Apr-12	15:46:00	22.3	9.60	18.00	39.18						
Test # 2:											
03-Apr-12	15:46:00	22.3	9.60	18.00	39.18	0.17	810	1.00	0%	5.33E-07	5.04E-07
03-Apr-12	15:59:30	22.4	9.80	17.80	39.06						
Test # 3:											
03-Apr-12	15:59:30	22.4	9.80	17.80	39.06	0.17	870	1.00	0%	4.98E-07	4.70E-07
03-Apr-12	16:14:00	22.4	10.00	17.60	38.94						
Test # 4:											
03-Apr-12	16:14:00	22.4	10.00	17.60	38.94	0.17	810	1.00	0%	5.37E-07	5.06E-07
03-Apr-12	16:27:30	22.5	10.20	17.40	38.82						

***Average Ksat* (cm/sec):** **4.85E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 3.64E-07

Ksat (+25%) (cm/s): 6.06E-07

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (635-636)
Date Sampled: 12/8/2011
Depth: 635-636

Remolded or Initial Sample Properties	
Initial Mass (g):	171.21
Diameter (cm):	4.435
Length (cm):	5.902
Area (cm^2):	15.45
Volume (cm^3):	91.18
Dry Density (g/cm^3):	1.45
Dry Density (pcf):	90.26
Water Content (%, g/g):	29.9
Water Content (%, vol):	43.2
Void Ratio (e):	0.84
Porosity (%, vol):	45.5
Saturation (%):	94.9

Post Permeation Sample Properties	
Saturated Mass (g):	172.41
Dry Mass (g):	131.82
Diameter (cm):	4.424
Length (cm):	5.899
*Deformation (%)**:*	0.05
Area (cm^2):	15.37
Volume (cm^3):	90.68
Dry Density (g/cm^3):	1.45
Dry Density (pcf):	90.75
Water Content (%, g/g):	30.8
Water Content (%, vol):	44.8
Void Ratio(e):	0.83
Porosity (%, vol):	45.2
Saturation (%):*	99.0

Test and Sample Conditions	
Permeant liquid used:	Tap Water
Sample Preparation:	☑ In situ sample, extruded
	☐ Remolded Sample
Number of Lifts:	NA
Split:	NA
Percent Coarse Material (%):	NA
Particle Density(g/cm^3):	2.65 ☐ Assumed ☑ Measured
Cell pressure (PSI):	80.0
Influent pressure (PSI):	78.0
Effluent pressure (PSI):	75.0
Panel Used:	☐ D ☑ E ☐ F
Reading:	☐ Annulus ☑ Pipette

		Date/Time	
B-Value (% saturation) prior to test*:	0.98	3/12/12	1435
B-Value (% saturation) post to test:	0.98	3/13/12	1430

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition

Job Number: ES09.0154.12

Sample Number: PB-14 (635-636)

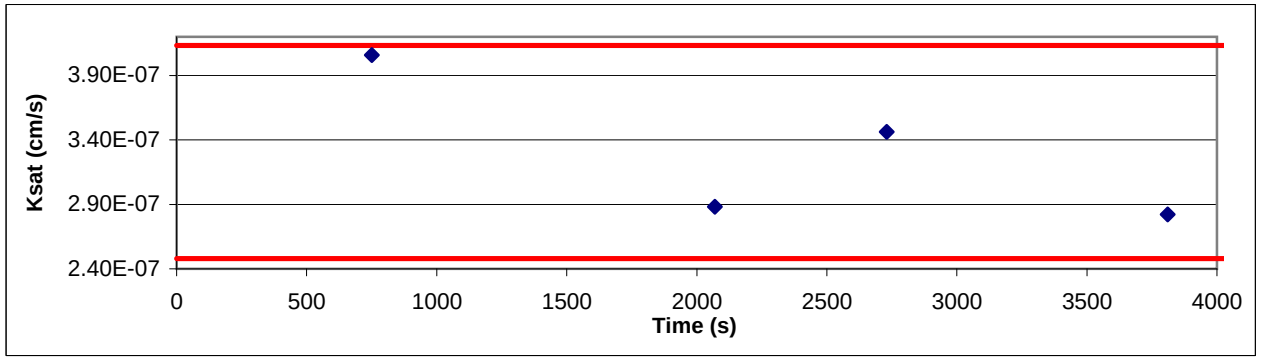
Date Sampled: 12/8/2011

Depth: 635-636

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
12-Mar-12	14:36:30	23.3	2.60	22.40	39.65	0.17	750	1.00	0%	4.39E-07	4.06E-07
12-Mar-12	14:49:00	23.4	2.80	22.20	39.57						
Test # 2:											
12-Mar-12	14:49:00	23.4	2.80	22.20	39.57	0.22	1320	1.00	0%	3.13E-07	2.88E-07
12-Mar-12	15:11:00	23.5	3.05	21.95	39.47						
Test # 3:											
12-Mar-12	15:11:00	23.5	3.05	21.95	39.47	0.13	660	1.00	0%	3.76E-07	3.46E-07
12-Mar-12	15:22:00	23.5	3.20	21.80	39.41						
Test # 4:											
12-Mar-12	15:22:00	23.5	3.20	21.80	39.41	0.17	1080	1.00	0%	3.07E-07	2.82E-07
12-Mar-12	15:40:00	23.6	3.40	21.60	39.33						

***Average Ksat* (cm/sec):** **3.31E-07**

Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 2.48E-07

Ksat (+25%) (cm/s): 4.13E-07

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (709-710)
Date Sampled: 12/8/2011
Depth: 709-710

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	168.48	*Saturated Mass (g):*	170.22	*Permeant liquid used:*	Tap Water
Diameter (cm):	4.537	*Dry Mass (g):*	128.66	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.486	*Diameter (cm):*	4.529		☐ Remolded Sample
Area (cm^2):	16.17	*Length (cm):*	5.485	*Number of Lifts:*	NA
Volume (cm^3):	88.69	*Deformation (%)**:*	0.02	*Split:*	NA
Dry Density (g/cm^3):	1.45	*Area (cm^2):*	16.11	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	90.56	*Volume (cm^3):*	88.36	*Particle Density(g/cm^3):*	2.67 ☐ Assumed ☑ Measured
Water Content (%, g/g):	30.9	*Dry Density (g/cm^3):*	1.46	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	44.9	*Dry Density (pcf):*	90.90	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.84	*Water Content (%, g/g):*	32.3	*Effluent pressure (PSI):*	76.5
Porosity (%, vol):	45.7	*Water Content (%, vol):*	47.0	*Panel Used:*	☑ D ☐ E ☐ F
Saturation (%):	98.2	*Void Ratio(e):*	0.84	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	45.5		Date/Time
		Saturation (%):*	103.4	B-Value (% saturation) prior to test*:	0.98 3/14/12 1337
				B-Value (% saturation) post to test:	0.95 3/14/12 1705

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

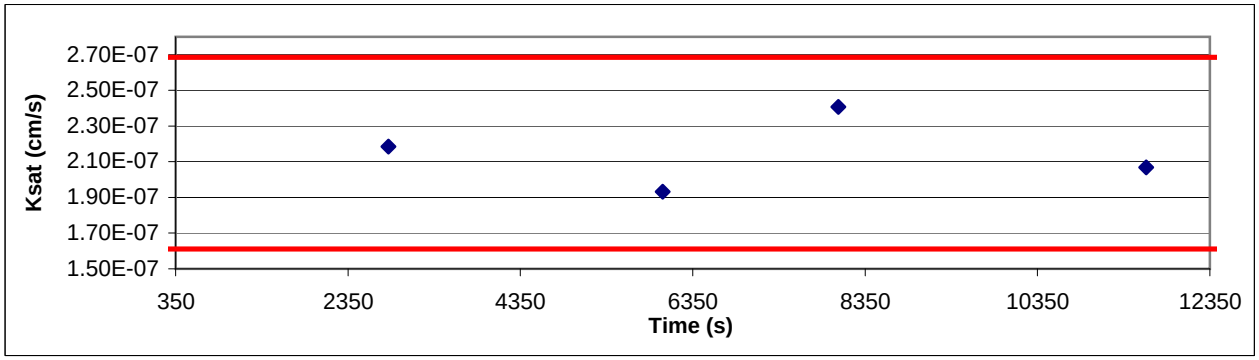
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (709-710)
Date Sampled: 12/8/2011
Depth: 709-710

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
14-Mar-12	13:40:00	22.8	2.70	23.40	23.59	0.22	2820	1.00	0%	2.35E-07	2.18E-07
14-Mar-12	14:27:00	23.2	2.95	23.15	23.49						
Test # 2:											
14-Mar-12	14:27:00	23.2	2.95	23.15	23.49	0.22	3180	1.00	0%	2.09E-07	1.93E-07
14-Mar-12	15:20:00	23.4	3.20	22.90	23.38						
Test # 3:											
14-Mar-12	15:20:00	23.4	3.20	22.90	23.38	0.17	2040	1.00	0%	2.62E-07	2.41E-07
14-Mar-12	15:54:00	23.6	3.40	22.70	23.30						
Test # 4:											
14-Mar-12	15:54:00	23.6	3.40	22.70	23.30	0.26	3570	1.00	1%	2.25E-07	2.07E-07
14-Mar-12	16:53:30	23.6	3.70	22.40	23.17						

***Average Ksat* (cm/sec):** **2.15E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.61E-07

Ksat (+25%) (cm/s): 2.69E-07

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (727-728)
Date Sampled: 12/8/2011
Depth: 727-728

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	106.33	*Saturated Mass (g):*	107.83	*Permeant liquid used:*	Tap Water
Diameter (cm):	3.742	*Dry Mass (g):*	83.59	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	5.019	*Diameter (cm):*	3.736		☐ Remolded Sample
Area (cm^2):	11.00	*Length (cm):*	4.947	*Number of Lifts:*	NA
Volume (cm^3):	55.20	*Deformation (%)**:*	1.46	*Split:*	NA
Dry Density (g/cm^3):	1.51	*Area (cm^2):*	10.96	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	94.54	*Volume (cm^3):*	54.23	*Particle Density(g/cm^3):*	2.67 ☐ Assumed ☑ Measured
Water Content (%, g/g):	27.2	*Dry Density (g/cm^3):*	1.54	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	41.2	*Dry Density (pcf):*	96.23	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.76	*Water Content (%, g/g):*	29.0	*Effluent pressure (PSI):*	74.5
Porosity (%, vol):	43.2	*Water Content (%, vol):*	44.7	*Panel Used:*	☑ D ☐ E ☐ F
Saturation (%):	95.4	*Void Ratio(e):*	0.73	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	42.2		Date/Time
		Saturation (%):*	106.0	B-Value (% saturation) prior to test*:	0.98 4/4/12 1540
				B-Value (% saturation) post to test:	1.00 4/5/12 1550

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

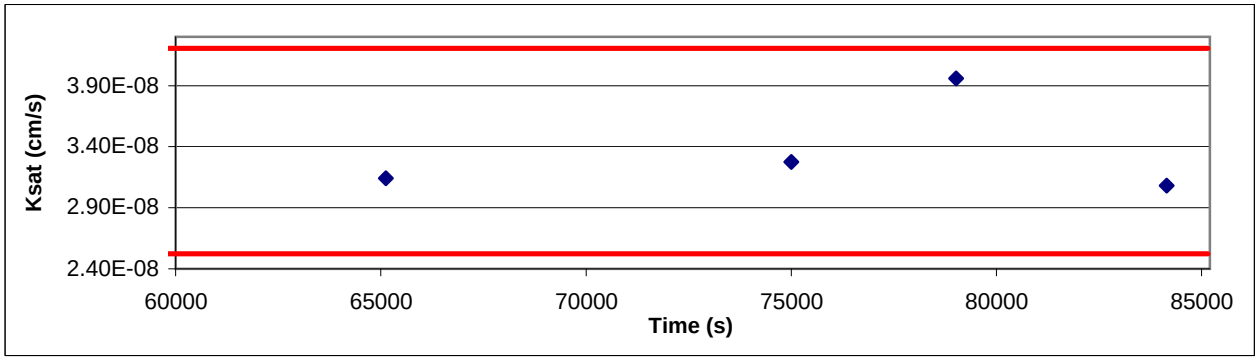
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (727-728)
Date Sampled: 12/8/2011
Depth: 727-728

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
04-Apr-12	15:58:00	23.5	5.90	22.00	53.52	1.11	65120	0.96	1%	3.37E-08	3.14E-08
05-Apr-12	10:03:20	22.3	7.20	20.75	52.93						
Test # 2:											
05-Apr-12	10:03:20	22.3	7.20	20.75	52.93	0.17	9880	1.00	0%	3.50E-08	3.27E-08
05-Apr-12	12:48:00	23.4	7.40	20.55	52.84						
Test # 3:											
05-Apr-12	12:48:00	23.4	7.40	20.55	52.84	0.09	4020	1.00	0%	4.31E-08	3.96E-08
05-Apr-12	13:55:00	23.8	7.50	20.45	52.79						
Test # 4:											
05-Apr-12	13:55:00	23.8	7.50	20.45	52.79	0.09	5130	1.00	0%	3.38E-08	3.08E-08
05-Apr-12	15:20:30	24.1	7.60	20.35	52.74						

***Average Ksat* (cm/sec):** **3.36E-08**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 2.52E-08

Ksat (+25%) (cm/s): 4.21E-08

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (741-742)
Date Sampled: 12/8/2011
Depth: 741-742

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	132.48	*Saturated Mass (g):*	133.85	*Permeant liquid used:*	Tap Water
Diameter (cm):	4.2	*Dry Mass (g):*	104.21	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.963	*Diameter (cm):*	4.172		☐ Remolded Sample
Area (cm^2):	13.85	*Length (cm):*	4.957	*Number of Lifts:*	NA
Volume (cm^3):	68.76	*Deformation (%)**:*	0.13	*Split:*	NA
Dry Density (g/cm^3):	1.52	*Area (cm^2):*	13.67	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	94.61	*Volume (cm^3):*	67.76	*Particle Density(g/cm^3):*	2.65 ☐ Assumed ☑ Measured
Water Content (%, g/g):	27.1	*Dry Density (g/cm^3):*	1.54	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	41.1	*Dry Density (pcf):*	96.01	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.75	*Water Content (%, g/g):*	28.4	*Effluent pressure (PSI):*	76.5
Porosity (%, vol):	42.8	*Water Content (%, vol):*	43.7	*Panel Used:*	☑ A ☐ B ☐ C
Saturation (%):	96.0	*Void Ratio(e):*	0.72	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	42.0		Date/Time
		Saturation (%):*	104.2	B-Value (% saturation) prior to test*:	0.98 4/5/12 1645
				B-Value (% saturation) post to test:	0.98 4/10/12 1110

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

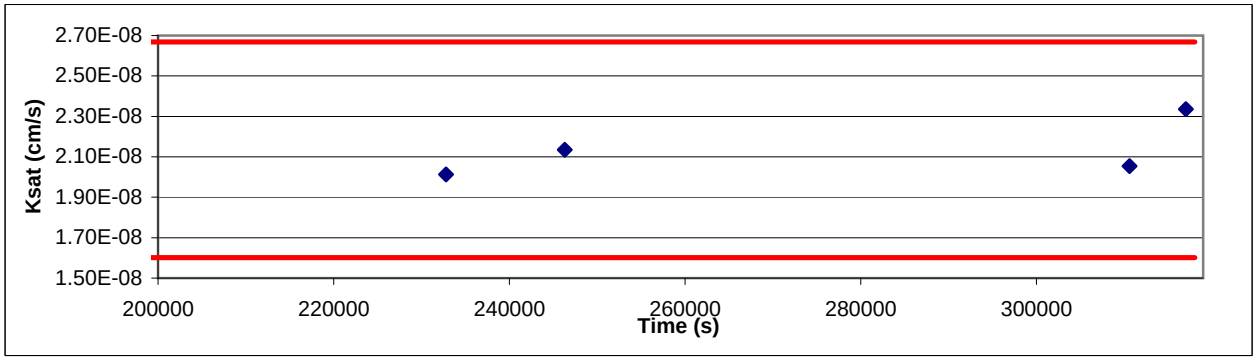
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (741-742)
Date Sampled: 12/8/2011
Depth: 741-742

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
06-Apr-12	16:35:00	23.0	2.05	14.40	24.16	1.41	232800	0.97	3%	2.15E-08	2.01E-08
09-Apr-12	09:15:00	22.4	3.70	12.80	23.41						
Test # 2:											
09-Apr-12	11:32:00	23.2	3.80	12.70	23.36	0.09	13500	1.00	0%	2.32E-08	2.13E-08
09-Apr-12	15:17:00	23.9	3.90	12.60	23.31						
Test # 3:											
09-Apr-12	15:17:00	23.9	3.90	12.60	23.31	0.39	64320	1.00	1%	2.21E-08	2.05E-08
10-Apr-12	09:09:00	22.1	4.35	12.15	23.10						
Test # 4:											
10-Apr-12	09:09:00	22.1	4.35	12.15	23.10	0.04	6420	1.00	0%	2.47E-08	2.34E-08
10-Apr-12	10:56:00	22.5	4.40	12.10	23.08						

***Average Ksat* (cm/sec):** **2.13E-08**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.60E-08

Ksat (+25%) (cm/s): 2.67E-08

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (749-750)
Date Sampled: 12/8/2011
Depth: 749-750

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	127.76	*Saturated Mass (g):*	128.57	*Permeant liquid used:*	Tap Water
Diameter (cm):	4.384	*Dry Mass (g):*	100.25	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.37	*Diameter (cm):*	4.341		☐ Remolded Sample
Area (cm^2):	15.09	*Length (cm):*	4.371	*Number of Lifts:*	NA
Volume (cm^3):	65.96	*Deformation (%)**:*	0.02	*Split:*	NA
Dry Density (g/cm^3):	1.52	*Area (cm^2):*	14.80	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	94.87	*Volume (cm^3):*	64.69	*Particle Density(g/cm^3):*	2.66 ☐ Assumed ☑ Measured
Water Content (%, g/g):	27.4	*Dry Density (g/cm^3):*	1.55	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	41.7	*Dry Density (pcf):*	96.74	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.75	*Water Content (%, g/g):*	28.2	*Effluent pressure (PSI):*	75.0
Porosity (%, vol):	42.9	*Water Content (%, vol):*	43.8	*Panel Used:*	☐ D ☐ E ☑ F
Saturation (%):	97.3	*Void Ratio(e):*	0.72	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	41.7		Date/Time
		Saturation (%):*	104.9	B-Value (% saturation) prior to test*:	0.98 4/5/12 1012
				B-Value (% saturation) post to test:	0.98 4/5/12 1657

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

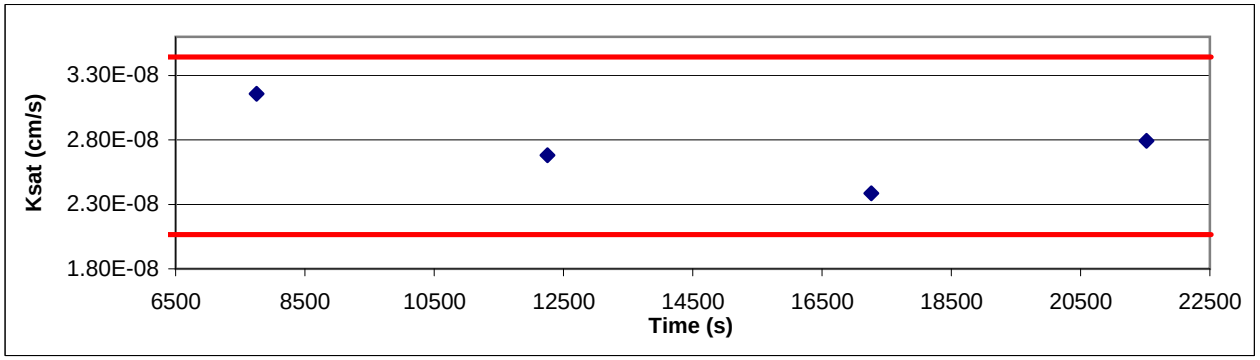
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (749-750)
Date Sampled: 12/8/2011
Depth: 749-750

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
05-Apr-12	10:14:20	22.4	8.80	22.50	51.90	0.17	7750	1.00	0%	3.37E-08	3.16E-08
05-Apr-12	12:23:30	23.2	9.00	22.30	51.79						
Test # 2:											
05-Apr-12	12:23:30	23.2	9.00	22.30	51.79	0.09	4500	1.00	0%	2.91E-08	2.68E-08
05-Apr-12	13:38:30	23.7	9.10	22.20	51.74						
Test # 3:											
05-Apr-12	13:38:30	23.7	9.10	22.20	51.74	0.09	5010	1.00	0%	2.62E-08	2.39E-08
05-Apr-12	15:02:00	24.1	9.20	22.10	51.69						
Test # 4:											
05-Apr-12	15:02:00	24.1	9.20	22.10	51.69	0.09	4260	1.00	0%	3.08E-08	2.79E-08
05-Apr-12	16:13:00	24.2	9.30	22.00	51.63						

***Average Ksat* (cm/sec):** **2.75E-08**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 2.07E-08

Ksat (+25%) (cm/s): 3.44E-08

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (435-436)
Date Sampled: N/A
Depth: 435-436

Remolded or Initial Sample Properties	
Initial Mass (g):	124.58
Diameter (cm):	3.846
Length (cm):	5.932
Area (cm^2):	11.62
Volume (cm^3):	68.91
Dry Density (g/cm^3):	1.46
Dry Density (pcf):	90.86
Water Content (%, g/g):	24.2
Water Content (%, vol):	35.2
Void Ratio (e):	0.84
Porosity (%, vol):	45.6
Saturation (%):	77.2

Post Permeation Sample Properties	
Saturated Mass (g):	129.39
Dry Mass (g):	100.3
Diameter (cm):	3.751
Length (cm):	5.837
*Deformation (%)**:*	1.63
Area (cm^2):	11.05
Volume (cm^3):	64.50
Dry Density (g/cm^3):	1.56
Dry Density (pcf):	97.08
Water Content (%, g/g):	29.0
Water Content (%, vol):	45.1
Void Ratio(e):	0.72
Porosity (%, vol):	41.9
Saturation (%):*	107.7

Test and Sample Conditions			
Permeant liquid used:	Tap Water		
Sample Preparation:	☑ In situ sample, extruded		
	☐ Remolded Sample		
Number of Lifts:	NA		
Split:	NA		
Percent Coarse Material (%):	NA		
Particle Density(g/cm^3):	2.68	☐ Assumed	☑ Measured
Cell pressure (PSI):	80.0		
Influent pressure (PSI):	78.0		
Effluent pressure (PSI):	78.0		
Panel Used:	☐ A ☑ B ☐ C		
Reading:	☐ Annulus ☑ Pipette		
		Date/Time	
B-Value (% saturation) prior to test*:	1.00	4/3/12	1345
B-Value (% saturation) post to test:	0.98	4/3/12	1450

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

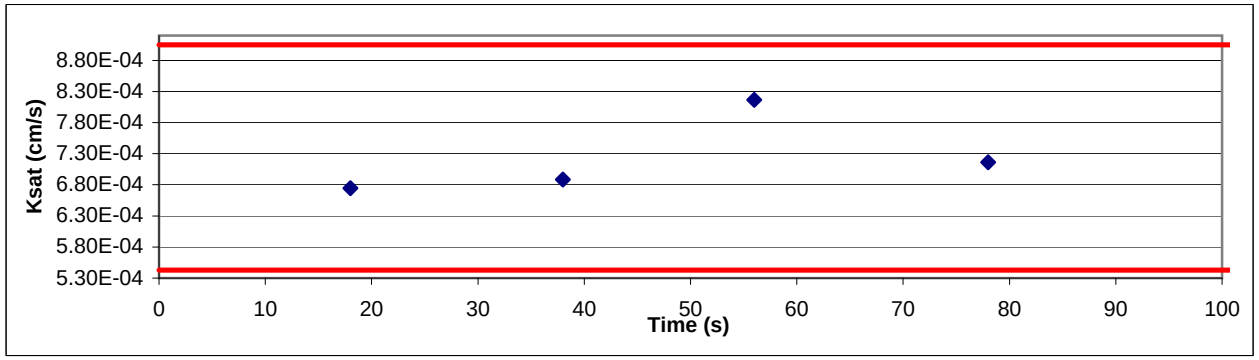
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (435-436)
Date Sampled: N/A
Depth: 435-436

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
03-Apr-12	14:36:30	21.9	10.40	17.80	1.46	0.17	18	1.00	5%	7.06E-04	6.75E-04
03-Apr-12	14:36:48	21.9	10.60	17.60	1.38						
Test # 2:											
03-Apr-12	14:37:05	21.9	10.80	17.35	1.30	0.17	20	1.00	6%	7.21E-04	6.89E-04
03-Apr-12	14:37:25	21.9	11.00	17.15	1.22						
Test # 3:											
03-Apr-12	14:37:25	21.9	11.00	17.15	1.22	0.17	18	1.00	7%	8.55E-04	8.17E-04
03-Apr-12	14:37:43	21.9	11.20	16.95	1.14						
Test # 4:											
03-Apr-12	14:37:43	21.9	11.20	16.95	1.14	0.17	22	1.00	7%	7.50E-04	7.16E-04
03-Apr-12	14:38:05	21.9	11.40	16.75	1.06						

***Average Ksat* (cm/sec):** **7.24E-04**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 5.43E-04

Ksat (+25%) (cm/s): 9.05E-04

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (464-465)
Date Sampled: N/A
Depth: 464-465

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	228.02	*Saturated Mass (g):*	235.17	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.274	*Dry Mass (g):*	178.33	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	4.033	*Diameter (cm):*	6.222		☐ Remolded Sample
Area (cm^2):	30.92	*Length (cm):*	4.029	*Number of Lifts:*	NA
Volume (cm^3):	124.68	*Deformation (%)**:*	0.11	*Split:*	NA
Dry Density (g/cm^3):	1.43	*Area (cm^2):*	30.41	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	89.29	*Volume (cm^3):*	122.49	*Particle Density(g/cm^3):*	2.67 ☐ Assumed ☑ Measured
Water Content (%, g/g):	27.9	*Dry Density (g/cm^3):*	1.46	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	39.9	*Dry Density (pcf):*	90.88	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.87	*Water Content (%, g/g):*	31.9	*Effluent pressure (PSI):*	77.5
Porosity (%, vol):	46.5	*Water Content (%, vol):*	46.4	*Panel Used:*	☐ D ☑ E ☐ F
Saturation (%):	85.7	*Void Ratio(e):*	0.84	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	45.5		Date/Time
		Saturation (%):*	101.9	B-Value (% saturation) prior to test*:	0.98 4/4/12 1353
				B-Value (% saturation) post to test:	0.98 4/4/12 1422

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.

**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

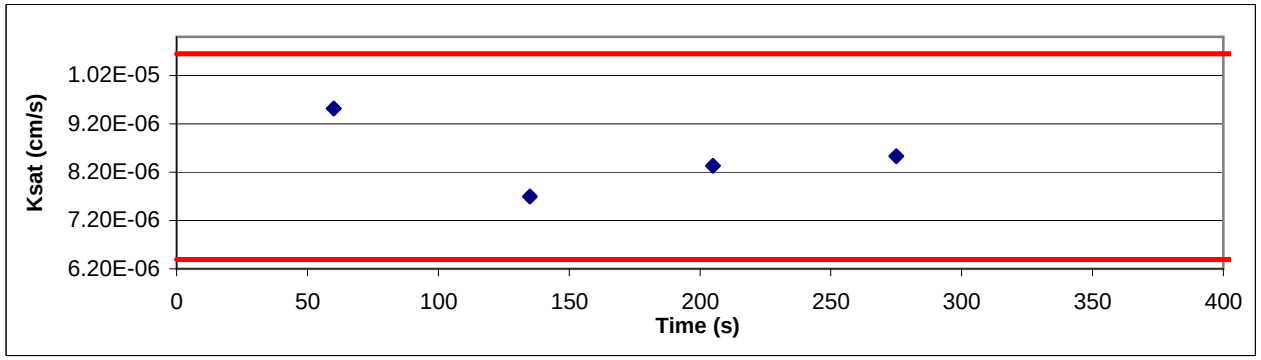
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (464-465)
Date Sampled: N/A
Depth: 464-465

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
04-Apr-12	13:55:55	23.0	12.80	20.10	10.82	0.17	60	1.00	1%	1.02E-05	9.52E-06
04-Apr-12	13:56:55	23.0	13.00	19.90	10.71						
Test # 2:											
04-Apr-12	13:56:55	23.0	13.00	19.90	10.71	0.17	75	1.00	1%	8.26E-06	7.69E-06
04-Apr-12	13:58:10	23.0	13.20	19.70	10.59						
Test # 3:											
04-Apr-12	13:58:10	23.0	13.20	19.70	10.59	0.17	70	1.00	1%	8.95E-06	8.33E-06
04-Apr-12	13:59:20	23.0	13.40	19.50	10.48						
Test # 4:											
04-Apr-12	14:00:40	23.0	13.60	19.25	10.35	0.17	70	1.00	1%	9.16E-06	8.53E-06
04-Apr-12	14:01:50	23.0	13.80	19.05	10.23						

***Average Ksat* (cm/sec):** **8.52E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 6.39E-06

Ksat (+25%) (cm/s): 1.06E-05

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (483-484)
Date Sampled: N/A
Depth: 483-484

Remolded or Initial Sample Properties	
Initial Mass (g):	188.92
Diameter (cm):	5.961
Length (cm):	3.614
Area (cm^2):	27.91
Volume (cm^3):	100.86
Dry Density (g/cm^3):	1.46
Dry Density (pcf):	90.92
Water Content (%, g/g):	28.6
Water Content (%, vol):	41.7
Void Ratio (e):	0.85
Porosity (%, vol):	45.8
Saturation (%):	91.0

Post Permeation Sample Properties	
Saturated Mass (g):	191.53
Dry Mass (g):	146.89
Diameter (cm):	5.914
Length (cm):	3.612
*Deformation (%)**:*	0.07
Area (cm^2):	27.47
Volume (cm^3):	99.21
Dry Density (g/cm^3):	1.48
Dry Density (pcf):	92.43
Water Content (%, g/g):	30.4
Water Content (%, vol):	45.0
Void Ratio(e):	0.82
Porosity (%, vol):	44.9
Saturation (%):*	100.2

Test and Sample Conditions	
Permeant liquid used:	Tap Water
Sample Preparation:	☑ In situ sample, extruded
	☐ Remolded Sample
Number of Lifts:	NA
Split:	NA
Percent Coarse Material (%):	NA
Particle Density(g/cm^3):	2.69 ☐ Assumed ☑ Measured
Cell pressure (PSI):	80.0
Influent pressure (PSI):	78.0
Effluent pressure (PSI):	76.5
Panel Used:	☐ A ☑ B ☐ C
Reading:	☐ Annulus ☑ Pipette

		Date/Time	
B-Value (% saturation) prior to test*:	0.95	4/4/12	1604
B-Value (% saturation) post to test:	0.95	4/4/12	1707

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

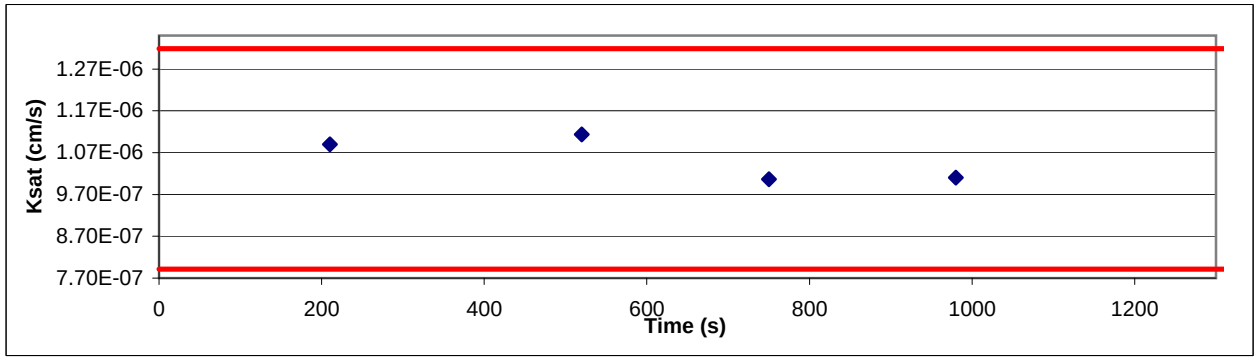
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (483-484)
Date Sampled: N/A
Depth: 483-484

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
04-Apr-12	16:06:30	23.5	10.00	10.40	29.34	0.17	210	1.00	0%	1.18E-06	1.09E-06
04-Apr-12	16:10:00	23.5	10.20	10.20	29.21						
Test # 2:											
04-Apr-12	16:10:00	23.5	10.20	10.20	29.21	0.26	310	1.00	1%	1.21E-06	1.11E-06
04-Apr-12	16:15:10	23.5	10.50	9.90	29.02						
Test # 3:											
04-Apr-12	16:15:10	23.5	10.50	9.90	29.02	0.17	230	1.00	0%	1.09E-06	1.01E-06
04-Apr-12	16:19:00	23.5	10.70	9.70	28.89						
Test # 4:											
04-Apr-12	16:19:00	23.5	10.70	9.70	28.89	0.17	230	1.00	0%	1.10E-06	1.01E-06
04-Apr-12	16:22:50	23.5	10.90	9.50	28.77						

***Average Ksat* (cm/sec):** **1.06E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 7.91E-07

Ksat (+25%) (cm/s): 1.32E-06

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (502-503)
Date Sampled: N/A
Depth: 502-503

Remolded or Initial Sample Properties	
Initial Mass (g):	166.17
Diameter (cm):	5.839
Length (cm):	3.242
Area (cm^2):	26.78
Volume (cm^3):	86.81
Dry Density (g/cm^3):	1.47
Dry Density (pcf):	91.74
Water Content (%, g/g):	30.3
Water Content (%, vol):	44.5
Void Ratio (e):	0.83
Porosity (%, vol):	45.4
Saturation (%):	98.0

Post Permeation Sample Properties	
Saturated Mass (g):	167.03
Dry Mass (g):	127.57
Diameter (cm):	5.818
Length (cm):	3.226
*Deformation (%)**:*	0.49
Area (cm^2):	26.59
Volume (cm^3):	85.77
Dry Density (g/cm^3):	1.49
Dry Density (pcf):	92.85
Water Content (%, g/g):	30.9
Water Content (%, vol):	46.0
Void Ratio(e):	0.81
Porosity (%, vol):	44.7
Saturation (%):*	102.9

Test and Sample Conditions	
Permeant liquid used:	Tap Water
Sample Preparation:	☑ In situ sample, extruded
	☐ Remolded Sample
Number of Lifts:	NA
Split:	NA
Percent Coarse Material (%):	NA
Particle Density(g/cm^3):	2.69 ☐ Assumed ☑ Measured
Cell pressure (PSI):	80.0
Influent pressure (PSI):	78.0
Effluent pressure (PSI):	76.5
Panel Used:	☐ A ☐ B ☑ C
Reading:	☐ Annulus ☑ Pipette

		Date/Time	
B-Value (% saturation) prior to test*:	0.98	4/5/12	1240
B-Value (% saturation) post to test:	0.95	4/5/12	1532

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

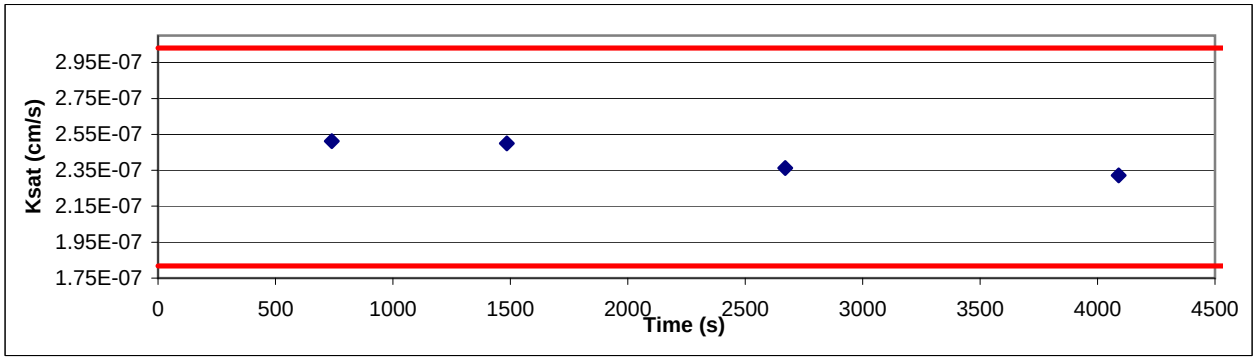
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (502-503)
Date Sampled: N/A
Depth: 502-503

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
05-Apr-12	12:42:30	23.4	8.80	21.80	37.36	0.17	740	1.00	0%	2.73E-07	2.51E-07
05-Apr-12	12:54:50	23.5	9.00	21.60	37.21						
Test # 2:											
05-Apr-12	12:54:50	23.5	9.00	21.60	37.21	0.17	745	1.00	0%	2.72E-07	2.50E-07
05-Apr-12	13:07:15	23.6	9.20	21.40	37.07						
Test # 3:											
05-Apr-12	13:07:15	23.6	9.20	21.40	37.07	0.26	1185	1.00	1%	2.58E-07	2.36E-07
05-Apr-12	13:27:00	23.7	9.50	21.10	36.85						
Test # 4:											
05-Apr-12	14:05:00	23.9	10.00	20.60	36.50	0.30	1420	1.00	1%	2.55E-07	2.32E-07
05-Apr-12	14:28:40	24.0	10.35	20.25	36.25						

***Average Ksat* (cm/sec):** **2.42E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.82E-07

Ksat (+25%) (cm/s): 3.03E-07

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (524-525)
Date Sampled: 12/7/2011
Depth: 524-525

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	128.23	*Saturated Mass (g):*	128.46	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.662	*Dry Mass (g):*	99.1	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	2.775	*Diameter (cm):*	5.572		☐ Remolded Sample
Area (cm^2):	25.18	*Length (cm):*	2.768	*Number of Lifts:*	NA
Volume (cm^3):	69.87	*Deformation (%)**:*	0.26	*Split:*	NA
Dry Density (g/cm^3):	1.42	*Area (cm^2):*	24.38	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	88.54	*Volume (cm^3):*	67.49	*Particle Density(g/cm^3):*	2.66 ☐ Assumed ☑ Measured
Water Content (%, g/g):	29.4	*Dry Density (g/cm^3):*	1.47	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	41.7	*Dry Density (pcf):*	91.66	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.88	*Water Content (%, g/g):*	29.6	*Effluent pressure (PSI):*	78.0
Porosity (%, vol):	46.8	*Water Content (%, vol):*	43.5	*Panel Used:*	☐ D ☑ E ☐ F
Saturation (%):	89.2	*Void Ratio(e):*	0.81	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	44.9		Date/Time
		Saturation (%):*	96.9	B-Value (% saturation) prior to test*:	0.98 4/6/12 1120
				B-Value (% saturation) post to test:	0.98 4/6/12 1222

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

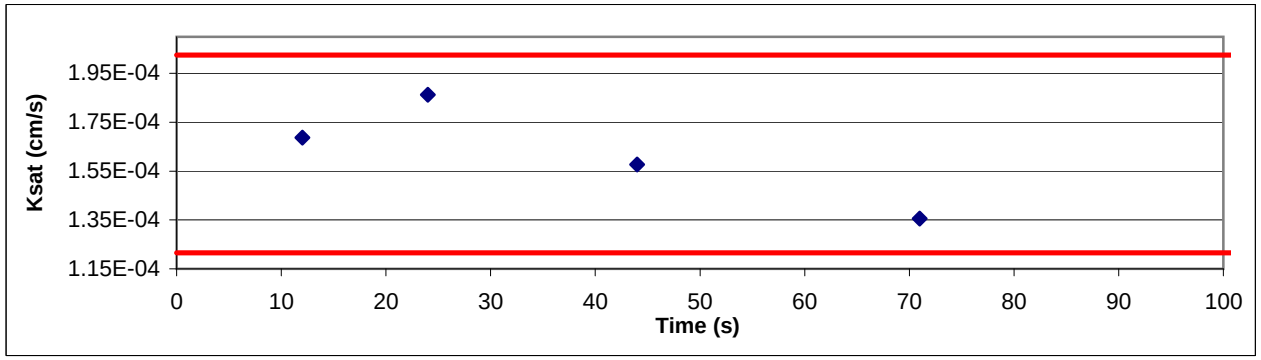
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (524-525)
Date Sampled: 12/7/2011
Depth: 524-525

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
06-Apr-12	11:36:40	23.1	7.40	16.65	3.86	0.17	12	1.00	4%	1.82E-04	1.69E-04
06-Apr-12	11:36:52	23.1	7.60	16.45	3.69						
Test # 2:											
06-Apr-12	11:37:10	23.1	7.80	16.20	3.50	0.17	12	1.00	5%	2.01E-04	1.86E-04
06-Apr-12	11:37:22	23.1	8.00	16.00	3.34						
Test # 3:											
06-Apr-12	11:53:40	23.2	9.00	15.00	2.50	0.17	20	1.00	7%	1.70E-04	1.58E-04
06-Apr-12	11:54:00	23.2	9.20	14.80	2.34						
Test # 4:											
06-Apr-12	11:54:26	23.2	9.40	14.60	2.17	0.17	27	1.00	8%	1.46E-04	1.36E-04
06-Apr-12	11:54:53	23.2	9.60	14.40	2.00						

***Average Ksat* (cm/sec):** **1.62E-04**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.22E-04

Ksat (+25%) (cm/s): 2.03E-04

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (539-540)
Date Sampled: 12/7/2011
Depth: 539-540

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	202.74	*Saturated Mass (g):*	204.1	*Permeant liquid used:*	Tap Water
Diameter (cm):	5.844	*Dry Mass (g):*	159.85	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	3.844	*Diameter (cm):*	5.808		☐ Remolded Sample
Area (cm^2):	26.82	*Length (cm):*	3.836	*Number of Lifts:*	NA
Volume (cm^3):	103.11	*Deformation (%)**:*	0.21	*Split:*	NA
Dry Density (g/cm^3):	1.55	*Area (cm^2):*	26.49	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	96.78	*Volume (cm^3):*	101.63	*Particle Density(g/cm^3):*	2.65 ☐ Assumed ☑ Measured
Water Content (%, g/g):	26.8	*Dry Density (g/cm^3):*	1.57	*Cell pressure (PSI):*	81.0
Water Content (%, vol):	41.6	*Dry Density (pcf):*	98.19	*Influent pressure (PSI):*	79.0
Void Ratio (e):	0.71	*Water Content (%, g/g):*	27.7	*Effluent pressure (PSI):*	76.0
Porosity (%, vol):	41.4	*Water Content (%, vol):*	43.5	*Panel Used:*	☐ A ☑ B ☐ C
Saturation (%):	100.4	*Void Ratio(e):*	0.68	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	40.6		Date/Time
		Saturation (%):*	107.3	B-Value (% saturation) prior to test*:	1.00 4/9/12 1243
				B-Value (% saturation) post to test:	1.00 4/10/12 1156

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

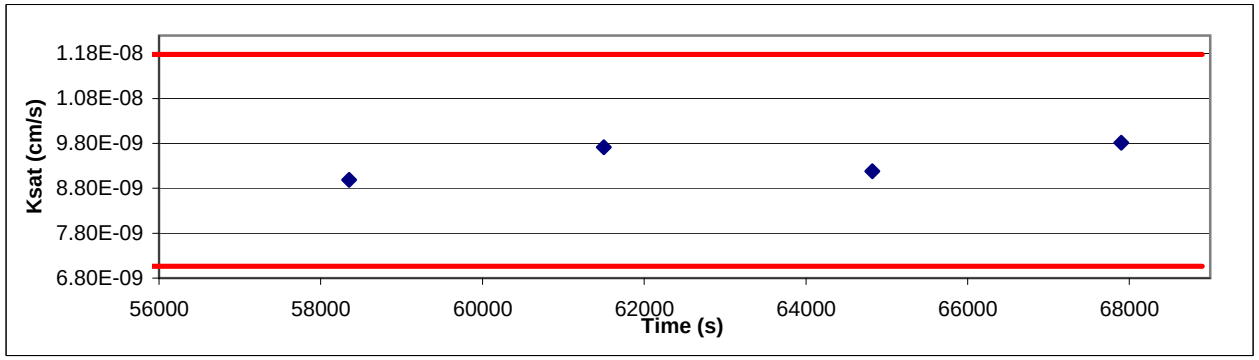
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (539-540)
Date Sampled: 12/7/2011
Depth: 539-540

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
09-Apr-12	16:58:00	23.6	4.70	18.40	59.14	0.76	58350	0.94	1%	9.61E-09	8.98E-09
10-Apr-12	09:10:30	22.1	5.60	17.55	58.61						
Test # 2:											
10-Apr-12	09:10:30	22.1	5.60	17.55	58.61	0.04	3150	1.00	0%	1.02E-08	9.71E-09
10-Apr-12	10:03:00	22.2	5.65	17.50	58.58						
Test # 3:											
10-Apr-12	10:03:00	22.2	5.65	17.50	58.58	0.04	3320	1.00	0%	9.71E-09	9.18E-09
10-Apr-12	10:58:20	22.5	5.70	17.45	58.55						
Test # 4:											
10-Apr-12	10:58:20	22.5	5.70	17.45	58.55	0.04	3080	1.00	0%	1.05E-08	9.82E-09
10-Apr-12	11:49:40	22.9	5.75	17.40	58.52						

***Average Ksat* (cm/sec):** **9.42E-09**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 7.07E-09

Ksat (+25%) (cm/s): 1.18E-08

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (559-560)
Date Sampled: 12/7/2011
Depth: 559-560

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	215.79	*Saturated Mass (g):*	218.16	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.067	*Dry Mass (g):*	168.02	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	3.924	*Diameter (cm):*	6.014		☐ Remolded Sample
Area (cm^2):	28.91	*Length (cm):*	3.922	*Number of Lifts:*	NA
Volume (cm^3):	113.44	*Deformation (%)**:*	0.06	*Split:*	NA
Dry Density (g/cm^3):	1.48	*Area (cm^2):*	28.41	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	92.46	*Volume (cm^3):*	111.40	*Particle Density(g/cm^3):*	2.66 ☐ Assumed ☑ Measured
Water Content (%, g/g):	28.4	*Dry Density (g/cm^3):*	1.51	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	42.1	*Dry Density (pcf):*	94.16	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.80	*Water Content (%, g/g):*	29.8	*Effluent pressure (PSI):*	78.0
Porosity (%, vol):	44.3	*Water Content (%, vol):*	45.0	*Panel Used:*	☑ D ☐ E ☐ F
Saturation (%):	95.0	*Void Ratio(e):*	0.76	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	43.3		Date/Time
		Saturation (%):*	104.0	B-Value (% saturation) prior to test*:	1.00 4/9/12 1040
				B-Value (% saturation) post to test:	1.00 4/9/12 1333

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

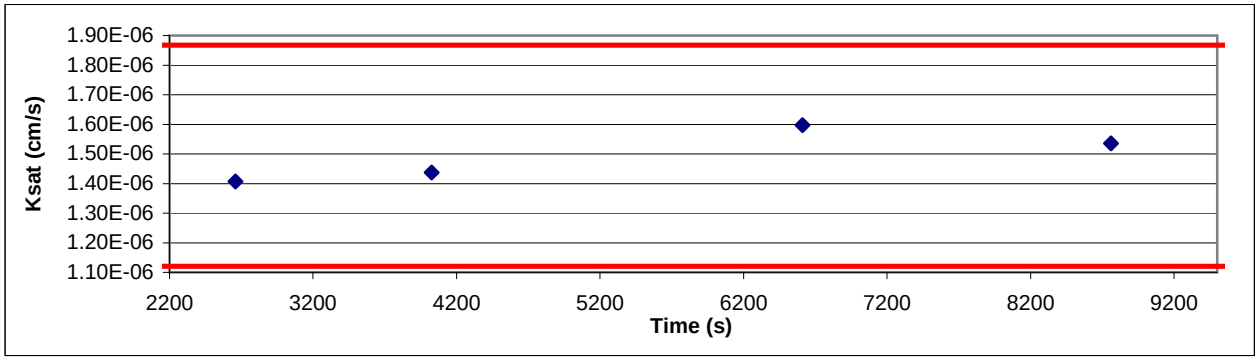
Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (559-560)
Date Sampled: 12/7/2011
Depth: 559-560

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
09-Apr-12	11:00:00	23.0	6.95	13.10	1.81	0.17	2660	1.00	7%	1.52E-06	1.41E-06
09-Apr-12	11:44:20	23.3	7.15	12.90	1.69						
Test # 2:											
09-Apr-12	11:44:20	23.3	7.15	12.90	1.69	0.09	1365	1.00	3%	1.56E-06	1.44E-06
09-Apr-12	12:07:05	23.4	7.25	12.80	1.63						
Test # 3:											
09-Apr-12	12:07:05	23.4	7.25	12.80	1.63	0.17	2585	1.00	7%	1.74E-06	1.60E-06
09-Apr-12	12:50:10	23.6	7.45	12.60	1.52						
Test # 4:											
09-Apr-12	12:50:10	23.6	7.45	12.60	1.52	0.13	2150	1.00	6%	1.67E-06	1.54E-06
09-Apr-12	13:26:00	23.7	7.60	12.45	1.43						

***Average Ksat* (cm/sec):** **1.49E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.12E-06

Ksat (+25%) (cm/s): 1.87E-06

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Falling Head Method

Job name: Pickles Butte No-Migration Petition
Job number: ES09.0154.12
Sample number: PB-15 (574-575)
Date Sampled: 12/7/2011
Depth: 574-575

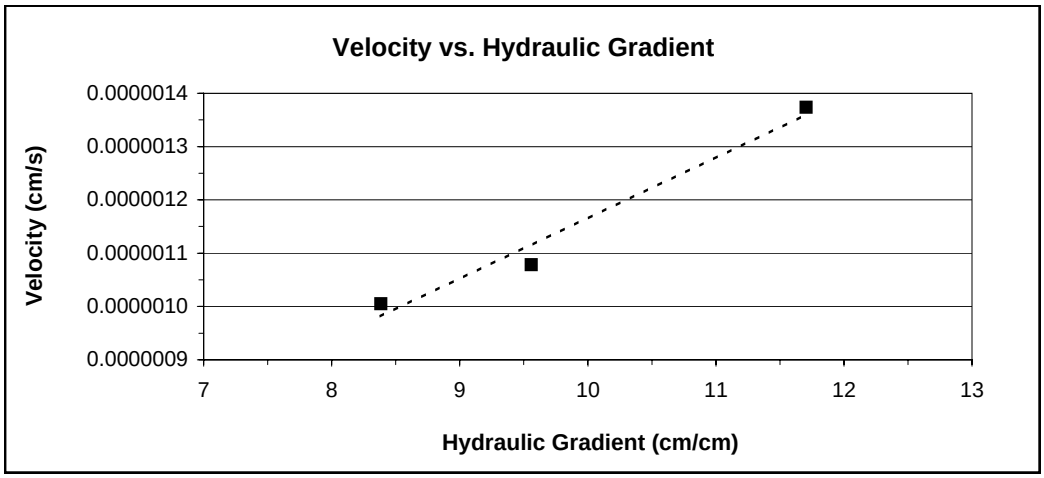
Type of water used: TAP
Backpressure (psi)*:* 0.0
Offset (cm)*:* 3.7
Sample length (cm)*:* 4.24
Sample x-sectional area (cm^2)*:* 19.29
Reservoir x-sectional area (cm^2)*:* 0.70

Date	Time	Temp (°C)	Reservoir head (cm)	Corrected head (cm)	Elapsed time (sec)	Ksat (cm/sec)	Ksat @ 20°C (cm/sec)
Test # 1:							
3-Feb-12	9:03:20	20.0	56.2	52.5	264220	1.2E-07	1.2E-07
6-Feb-12	10:27:00	20.0	46.2	42.5			
Test # 2:							
6-Feb-12	10:27:00	20.0	46.2	42.5	275950	1.2E-07	1.2E-07
9-Feb-12	15:06:10	20.5	38	34.3			
Test # 3:							
9-Feb-12	15:06:10	20.5	38	34.3	63180	1.3E-07	1.3E-07
10-Feb-12	8:39:10	20.5	36.25	32.6			

Average Ksat* (cm/sec)*: **1.2E-07**
Oversize Corrected Ksat* (cm/sec)*: **NA**

Comments:

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NA = Not applicable



Laboratory analysis by: K. Wright
Data entered by: K. Wright
Checked by: J. Hines

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (604-605)
Date Sampled: 12/7/2011
Depth: 604-605

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	200.84	*Saturated Mass (g):*	202.71	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.075	*Dry Mass (g):*	159.72	*Sample Preparation:*	☑ In situ sample, extruded
Length (cm):	3.539	*Diameter (cm):*	6.023		☐ Remolded Sample
Area (cm^2):	28.99	*Length (cm):*	3.539	*Number of Lifts:*	NA
Volume (cm^3):	102.58	*Deformation (%)**:*	0.01	*Split:*	NA
Dry Density (g/cm^3):	1.56	*Area (cm^2):*	28.49	*Percent Coarse Material (%):*	NA
Dry Density (pcf):	97.20	*Volume (cm^3):*	100.82	*Particle Density(g/cm^3):*	2.69 ☐ Assumed ☑ Measured
Water Content (%, g/g):	25.7	*Dry Density (g/cm^3):*	1.58	*Cell pressure (PSI):*	80.0
Water Content (%, vol):	40.1	*Dry Density (pcf):*	98.90	*Influent pressure (PSI):*	78.0
Void Ratio (e):	0.73	*Water Content (%, g/g):*	26.9	*Effluent pressure (PSI):*	78.0
Porosity (%, vol):	42.1	*Water Content (%, vol):*	42.6	*Panel Used:*	☐ D ☐ E ☑ F
Saturation (%):	95.1	*Void Ratio(e):*	0.70	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	41.1		Date/Time
		Saturation (%):*	103.7	B-Value (% saturation) prior to test*:	0.98 4/9/12 1058
				B-Value (% saturation) post to test:	0.98 4/9/12 1320

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: C. Sessa
Data entered by: C. Sessa
Checked by: J. Hines

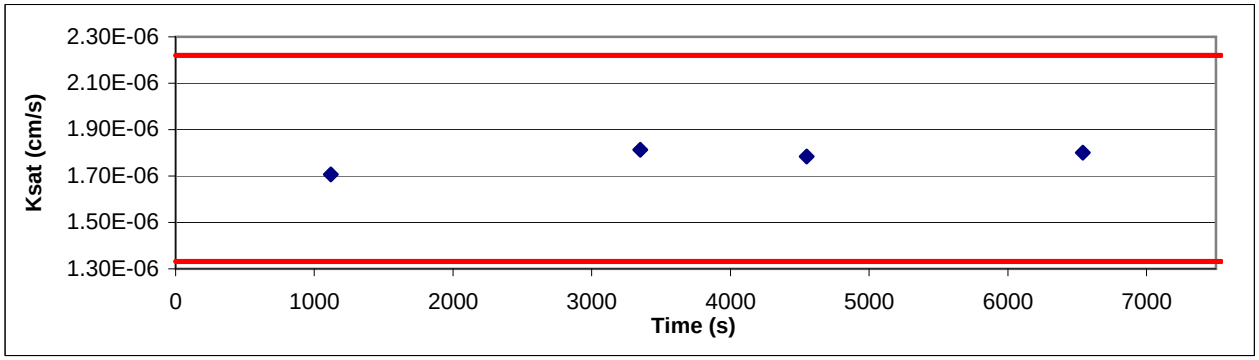
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (604-605)
Date Sampled: 12/7/2011
Depth: 604-605

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
09-Apr-12	11:03:00	23.0	4.40	9.75	1.75	0.09	1120	1.00	4%	1.84E-06	1.71E-06
09-Apr-12	11:21:40	23.1	4.50	9.65	1.68						
Test # 2:											
09-Apr-12	11:21:40	23.1	4.50	9.65	1.68	0.17	2230	1.00	8%	1.96E-06	1.81E-06
09-Apr-12	11:58:50	23.3	4.70	9.45	1.55						
Test # 3:											
09-Apr-12	11:58:50	23.3	4.70	9.45	1.55	0.09	1200	1.00	4%	1.93E-06	1.78E-06
09-Apr-12	12:18:50	23.5	4.80	9.35	1.48						
Test # 4:											
09-Apr-12	12:41:50	23.5	4.90	9.20	1.40	0.13	1990	1.00	7%	1.96E-06	1.80E-06
09-Apr-12	13:15:00	23.7	5.05	9.05	1.31						

***Average Ksat* (cm/sec):** **1.78E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): NA



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.33E-06

Ksat (+25%) (cm/s): 2.22E-06

Moisture Retention Characteristics

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-11 (39-40)	0	43.5
	16	42.1
	51	41.3
	127	40.7
	337	40.1
	7852	24.6
	28860	16.2
	117379	11.4
	857025	8.0
PB-11 (154-155)	0	44.6
	16	43.2
	51	42.4
	127	41.4
	337	37.9
	17235	18.6
	64553	13.4
	133696	10.9
	857025	5.7
PB-11 (184-185)	0	41.8
	16	41.3
	51	41.2
	127	40.8
	337	40.4
	19274	18.5
	60270	13.9
	191518	11.7
	857025	8.3

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-11 (209-210)	0	42.0
	51	41.9
	150	41.7
	337	41.3
	1275	41.0
	10912	28.5
	28452	23.1
	150522	11.1
	857025	7.4
PB-11 (229-230)	0	38.2
	51	37.3
	150	37.1
	337	36.7
	1275	36.1
	9178	22.7
	31920	15.7
	95147	13.0
	857025	6.6
PB-11 (248-249)	0	42.9
	51	42.9
	150	42.7
	337	42.6
	1275	42.2
	11524	25.9
	51704	17.8
	281057	11.8
	855592	8.5

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-11 (274-275)	0	40.8
	22	40.5
	72	39.8
	153	38.8
	337	38.5
	16113	20.8
	39262	16.5
	115135	12.0
	854159	6.8
PB-11 (294-295)	0	42.0
	51	41.5
	152	41.4
	337	41.2
	1275	40.8
	11116	26.9
	32736	17.3
	83930	12.9
	855592	7.6
PB-11 (309-310)	0	41.7
	52	41.5
	151	41.4
	337	41.2
	1275	40.8
	7547	30.9
	45177	18.9
	424135	7.4
	855592	7.2

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-11 (334-335)	0	38.1
	51	37.6
	150	37.4
	337	37.3
	1275	37.2
	12849	25.7
	74445	15.2
	262700	10.0
	855592	8.1
PB-11 (359-360)	0	41.8
	51	41.2
	150	41.0
	337	40.9
	1275	40.7
	13461	24.3
	54355	16.0
	160415	12.3
	855592	7.4
PB-12 (69-70)	0	43.9
	23	42.9
	72	42.6
	155	42.2
	337	40.4
	17847	18.8
	121968	12.0
	415161	9.1
	854159	8.2

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-12 (109-110)	0	46.3
	17	45.1
	50	44.6
	130	44.2
	337	44.1
	5303	30.8
	21722	22.5
	96269	16.4
	855592	10.6
PB-12 (154-155)	0	39.9
	52	39.8
	151	39.6
	337	39.3
	1275	39.1
	10708	25.6
	45075	16.9
	326744	10.6
	854159	7.8
PB-12 (179-180)	0	43.4
	20	43.1
	69	42.6
	155	40.7
	337	37.9
	13053	22.1
	36713	15.9
	118093	12.2
	854159	7.3

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-12 (204-205)	0	42.9
	51	42.5
	150	42.1
	337	41.0
	1275	39.8
	10810	19.4
	62106	10.7
	511226	7.6
	854159	6.7
PB-12 (224-225)	0	42.0
	52	41.6
	151	41.3
	337	41.0
	1275	40.8
	14277	23.0
	64553	15.5
	131350	11.3
	854159	7.9
PB-12 (249-250)	0	42.6
	52	41.9
	151	41.6
	337	41.1
	1275	40.9
	16623	23.3
	72712	15.2
	427398	8.3
	854159	7.8

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-12 (264-265)	0	43.2
	52	42.3
	151	42.2
	337	41.5
	1275	41.0
	14583	25.1
	31512	17.6
	220481	10.8
	854159	7.8
PB-12 (284-285)	0	44.3
	51	43.9
	150	43.8
	337	43.6
	1275	43.1
	12951	27.6
	32940	19.2
	116359	13.7
	854159	8.3
PB-12 (309-310)	0	43.6
	51	42.7
	150	42.6
	337	42.5
	1275	42.4
	18356	24.6
	68735	15.7
	245670	11.5
	854159	8.4

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-12 (334-335)	0	42.6
	52	41.3
	151	41.0
	337	40.9
	1275	40.8
	11014	28.6
	58129	17.4
	285646	10.0
	855592	7.6
PB-12 (349-350)	0	46.8
	52	46.8
	151	46.6
	337	46.4
	1275	45.8
	19784	23.3
	49868	16.8
	106569	12.6
	855592	7.8
PB-13 (279-280)	0	42.7
	16	42.6
	51	42.0
	127	40.7
	337	37.3
	9178	16.5
	58639	9.0
	271165	6.7
	855592	5.1

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-13 (349-350)	0	45.0
	16	44.8
	51	44.2
	127	43.3
	337	42.3
	11014	19.0
	78831	11.0
	440962	7.1
	855592	6.5
PB-13 (444-445)	0	46.7
	20	46.7
	69	46.0
	155	45.3
	337	44.6
	9688	25.2
	37529	17.2
	274938	11.5
	855592	8.8
PB-13 (499-500)	0	44.6
	20	44.3
	69	43.8
	155	43.2
	337	42.9
	13563	20.2
	45381	13.8
	59556	12.7
	855592	7.6

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-13 (534-535)	0	44.3
	20	44.4
	73	44.1
	153	42.0
	337	41.6
	14889	18.4
	58537	12.9
	527848	8.1
	857025	7.2
PB-13 (554-555)	0	45.2
	20	44.9
	69	44.6
	155	43.5
	337	42.3
	18152	19.6
	45993	14.5
	148993	11.7
	854159	7.7
PB-13 (563-564)	0	44.6
	51	44.0
	150	44.0
	337	43.7
	1275	43.4
	19886	18.9
	56803	14.5
	388952	9.5
	857025	6.9

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-13 (585-586)	0	45.8
	20	45.7
	73	45.0
	153	44.7
	337	44.2
	17439	18.9
	55375	12.1
	179485	9.8
	854159	6.7
PB-13 (604-605)	0	46.6
	52	45.9
	151	45.7
	337	45.3
	1275	45.0
	18866	20.5
	62106	12.7
	262700	8.3
	857025	7.1
PB-13 (625-626)	0	44.2
	51	42.4
	150	42.2
	337	42.0
	1275	41.6
	10504	24.8
	32430	16.4
	629523	7.9
	857025	7.3

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-13 (639-640)	0	45.7
	51	44.8
	152	44.6
	13665	24.3
	31818	18.8
	135837	11.9
	854159	8.2
PB-13 (660-661)	0	44.7
	52	44.0
	151	43.7
	337	43.6
	1275	43.2
	10402	24.2
	46503	14.6
	197841	10.1
	855592	7.1
PB-14 (294-295)	0	49.1
	16	47.0
	50	46.2
	127	45.8
	337	45.3
	12442	22.9
	32226	17.1
	243222	10.1
	852726	8.0

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-14 (304-305)	0	48.7
	16	47.9
	50	46.9
	127	46.4
	337	37.5
	23965	20.0
	48237	15.7
	225988	11.4
	854159	8.8
PB-14 (532-533)	0	47.9
	12	45.8
	31	45.5
	99	44.9
	337	43.0
	19886	18.0
	57007	12.1
	231393	9.8
	854159	7.6
PB-14 (549-550)	0	45.5
	12	45.0
	31	44.9
	99	44.7
	337	43.7
	15501	19.5
	32634	16.1
	164290	10.3
	857025	7.4

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-14 (569-570)	0	45.2
	20	44.4
	73	43.7
	153	43.6
	337	43.2
	15093	21.4
	41812	14.2
	126761	12.0
	855592	7.3
PB-14 (594-595)	0	47.8
	16	46.2
	50	45.4
	127	45.0
	337	44.6
	4385	21.9
	37223	12.8
	164800	8.9
	857025	5.4
PB-14 (620-623)	0	43.8
	17	41.6
	50	41.1
	127	40.3
	337	39.3
	6221	26.0
	42118	15.9
	173876	11.0
	852726	6.5

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-14 (635-636)	0	46.9
	20	45.1
	73	44.0
	153	43.9
	337	43.5
	13869	20.3
	36611	14.0
	105651	11.2
	854159	6.8
PB-14 (709-710)	0	47.4
	51	47.4
	150	47.0
	337	45.7
	1275	44.6
	13053	18.1
	59352	11.3
	136653	8.8
	854159	6.3
PB-14 (727-728)	0	44.3
	17	40.7
	50	40.2
	127	39.8
	337	38.6
	10504	23.1
	52214	14.0
	212730	10.0
	852726	6.2

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-14 (741-742)	0	44.4
	51	43.6
	152	43.3
	337	43.0
	1275	42.6
	18866	21.0
	32634	18.9
	68531	15.6
	852726	7.1
PB-14 (749-750)	0	45.1
	52	43.1
	151	42.7
	337	42.1
	1275	41.5
	19172	19.4
	43036	15.0
	73936	12.6
	852726	6.6
PB-15 (435-436)	0	47.5
	16	44.6
	50	43.9
	127	43.6
	337	42.9
	5405	24.6
	22946	16.3
	59556	13.6
	852726	6.9

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-15 (464-465)	0	48.2
	20	47.9
	73	47.6
	153	47.4
	337	47.1
	18458	17.8
	50378	14.2
	129719	10.9
	857025	7.3
PB-15 (483-484)	0	45.0
	51	44.1
	152	44.0
	337	43.6
	1275	43.0
	21314	19.5
	37325	16.8
	121866	14.2
	852726	7.0
PB-15 (502-503)	0	46.9
	16	46.1
	51	45.2
	127	44.3
	337	42.9
	17235	19.1
	41812	14.9
	80156	12.8
	855592	7.8

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-15 (524-525)	0	44.8
	16	44.3
	50	44.0
	127	43.9
	337	41.5
	4895	22.4
	15195	16.3
	93312	10.8
	852726	6.6
PB-15 (539-540)	0	44.9
	12	44.0
	31	43.7
	99	43.3
	337	35.6
	9076	14.6
	21926	11.5
	165106	7.3
	852726	4.9
PB-15 (559-560)	0	44.4
	20	44.0
	73	43.5
	153	43.4
	337	43.1
	15501	21.4
	45993	15.3
	97085	13.1
	854159	7.6

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Moisture Characteristics of the Initial Drainage Curve (Continued)

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
PB-15 (574-575)	0	45.3
	51	44.9
	152	44.8
	337	44.4
	1275	43.9
	15501	20.9
	42628	16.1
	92598	12.5
	857025	6.7
PB-15 (604-605)	0	43.9
	17	41.3
	50	40.8
	127	40.2
	337	38.8
	10810	19.8
	107487	10.7
	320829	7.8
	857025	6.7

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
PB-11 (39-40)	0.0007	1.3624	3.95	41.92	NA	NA
PB-11 (154-155)	0.0030	1.2297	0.00	43.69	NA	NA
PB-11 (184-185)	0.0008	1.3679	5.26	41.49	NA	NA
PB-11 (209-210)	0.0002	1.3577	0.00	41.94	NA	NA
PB-11 (229-230)	0.0005	1.3020	0.00	37.86	NA	NA
PB-11 (248-249)	0.0004	1.2884	0.00	43.36	NA	NA
PB-11 (274-275)	0.0007	1.2732	0.00	40.07	NA	NA
PB-11 (294-295)	0.0002	1.6466	6.35	41.62	NA	NA
PB-11 (309-310)	0.0002	1.3543	0.00	41.68	NA	NA
PB-11 (334-335)	0.0002	1.3157	0.00	37.89	NA	NA
PB-11 (359-360)	0.0002	1.4638	4.81	41.50	NA	NA
PB-12 (69-70)	0.0015	1.2795	2.51	43.36	NA	NA
PB-12 (109-110)	0.0008	1.2729	3.66	45.31	NA	NA
PB-12 (154-155)	0.0004	1.2946	0.00	40.14	NA	NA
PB-12 (179-180)	0.0025	1.2171	0.00	43.08	NA	NA
PB-12 (204-205)	0.0003	1.7527	6.63	42.32	NA	NA
PB-12 (224-225)	0.0003	1.5167	5.87	41.76	NA	NA
PB-12 (249-250)	0.0002	1.4512	4.10	42.03	NA	NA
PB-12 (264-265)	0.0004	1.3243	0.00	42.74	NA	NA
PB-12 (284-285)	0.0003	1.3314	0.00	44.33	NA	NA
PB-12 (309-310)	0.0002	1.5478	6.38	43.04	NA	NA
PB-12 (334-335)	0.0002	1.3990	2.51	41.65	NA	NA

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Calculated Unsaturated Hydraulic Properties (Continued)

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
PB-12 (349-350)	0.0003	1.3698	0.00	47.11	NA	NA
PB-13 (279-280)	0.0024	1.3382	1.88	42.62	NA	NA
PB-13 (349-350)	0.0011	1.3795	3.38	44.64	NA	NA
PB-13 (444-445)	0.0009	1.3233	3.90	46.43	NA	NA
PB-13 (499-500)	0.0006	1.4442	5.11	44.11	NA	NA
PB-13 (534-535)	0.0014	1.3253	3.22	44.27	NA	NA
PB-13 (554-555)	0.0013	1.2895	2.08	44.97	NA	NA
PB-13 (563-564)	0.0002	1.6738	6.95	44.34	NA	NA
PB-13 (585-586)	0.0006	1.4450	4.18	45.42	NA	NA
PB-13 (604-605)	0.0002	1.7505	6.30	45.98	NA	NA
PB-13 (625-626)	0.0002	1.6414	6.35	42.88	NA	NA
PB-13 (639-640)	0.0004	1.4319	4.68	45.10	NA	NA
PB-13 (660-661)	0.0003	1.6418	6.65	44.33	NA	NA
PB-14 (294-295)	0.0010	1.3142	2.30	47.34	NA	NA
PB-14 (304-305)	0.0071	1.1911	0.00	48.92	NA	NA
PB-14 (532-533)	0.0015	1.3344	3.47	46.31	NA	NA
PB-14 (549-550)	0.0012	1.2812	0.00	45.34	NA	NA
PB-14 (569-570)	0.0005	1.4173	4.29	44.33	NA	NA
PB-14 (594-595)	0.0013	1.4620	4.79	46.66	NA	NA
PB-14 (620-623)	0.0009	1.2645	0.00	41.78	NA	NA
PB-14 (635-636)	0.0009	1.3539	2.65	45.31	NA	NA
PB-14 (709-710)	0.0005	1.4227	0.00	47.65	NA	NA

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Calculated Unsaturated Hydraulic Properties (Continued)

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
PB-14 (727-728)	0.0009	1.2750	0.00	41.26	NA	NA
PB-14 (741-742)	0.0003	1.4594	4.40	43.93	NA	NA
PB-14 (749-750)	0.0004	1.3650	0.00	43.80	NA	NA
PB-15 (435-436)	0.0014	1.3134	2.35	45.42	NA	NA
PB-15 (464-465)	0.0007	1.4746	5.57	48.04	NA	NA
PB-15 (483-484)	0.0003	1.5142	5.93	44.51	NA	NA
PB-15 (502-503)	0.0016	1.2935	2.37	46.11	NA	NA
PB-15 (524-525)	0.0014	1.4042	4.71	44.62	NA	NA
PB-15 (539-540)	0.0038	1.3602	2.92	44.70	NA	NA
PB-15 (559-560)	0.0006	1.3612	3.38	44.04	NA	NA
PB-15 (574-575)	0.0003	1.5695	5.65	45.20	NA	NA
PB-15 (604-605)	0.0018	1.2578	0.00	42.07	NA	NA

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (39-40)
Date Sampled: 12/7/2011
Depth: 39-40

Dry wt. of sample (g): 163.38
Tare wt., ring (g): 48.37
Tare wt., screen & clamp (g): 27.22
Initial sample volume (cm^3): 108.26
Initial dry bulk density (g/cm^3): 1.51
Measured particle density (g/cm^3): 2.67
Initial calculated total porosity (%): 43.54

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	23-Jan-12	14:45	286.10	0	43.54
	30-Jan-12	13:05	284.56	16.0	42.11
	6-Feb-12	9:05	283.68	51.0	41.30
	13-Feb-12	10:30	282.99	127.0	40.66
Pressure plate:	23-Feb-12	10:25	282.37	337	40.09

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	51.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (39-40)

Initial sample bulk density (g/cm^3)*:* 1.51
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 142.48
Tare weight, jar (g)*:* 117.15

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	12:01	146.61	7852	24.61
	21-Mar-12	16:30	145.20	28860	16.21
	21-Mar-12	11:31	144.40	117379	11.44

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	7852	---	---	---	---
	28860	---	---	---	---
	117379	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 78.36
Tare weight (g)*:* 44.41

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	80.16	857025	8.00

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

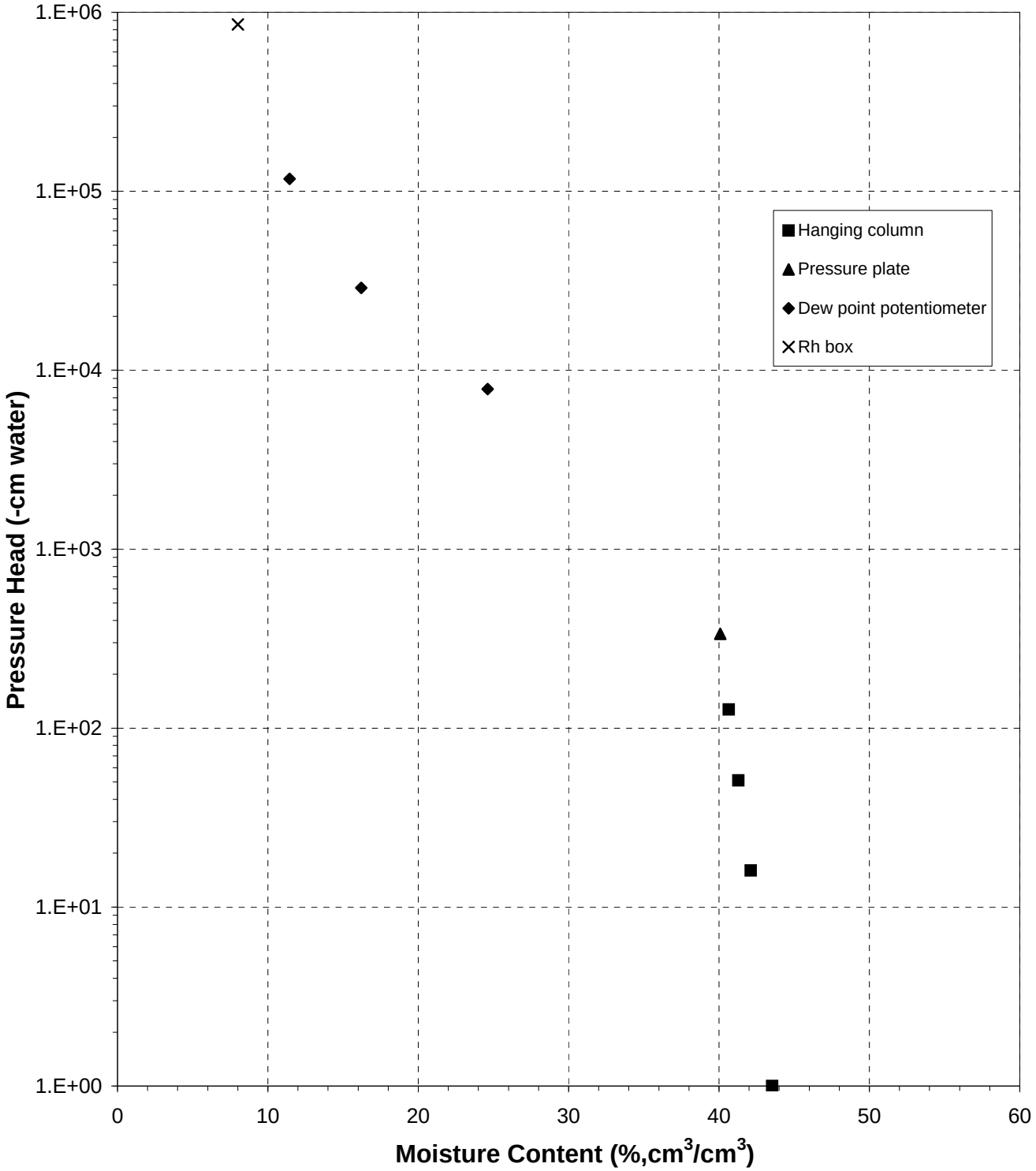
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

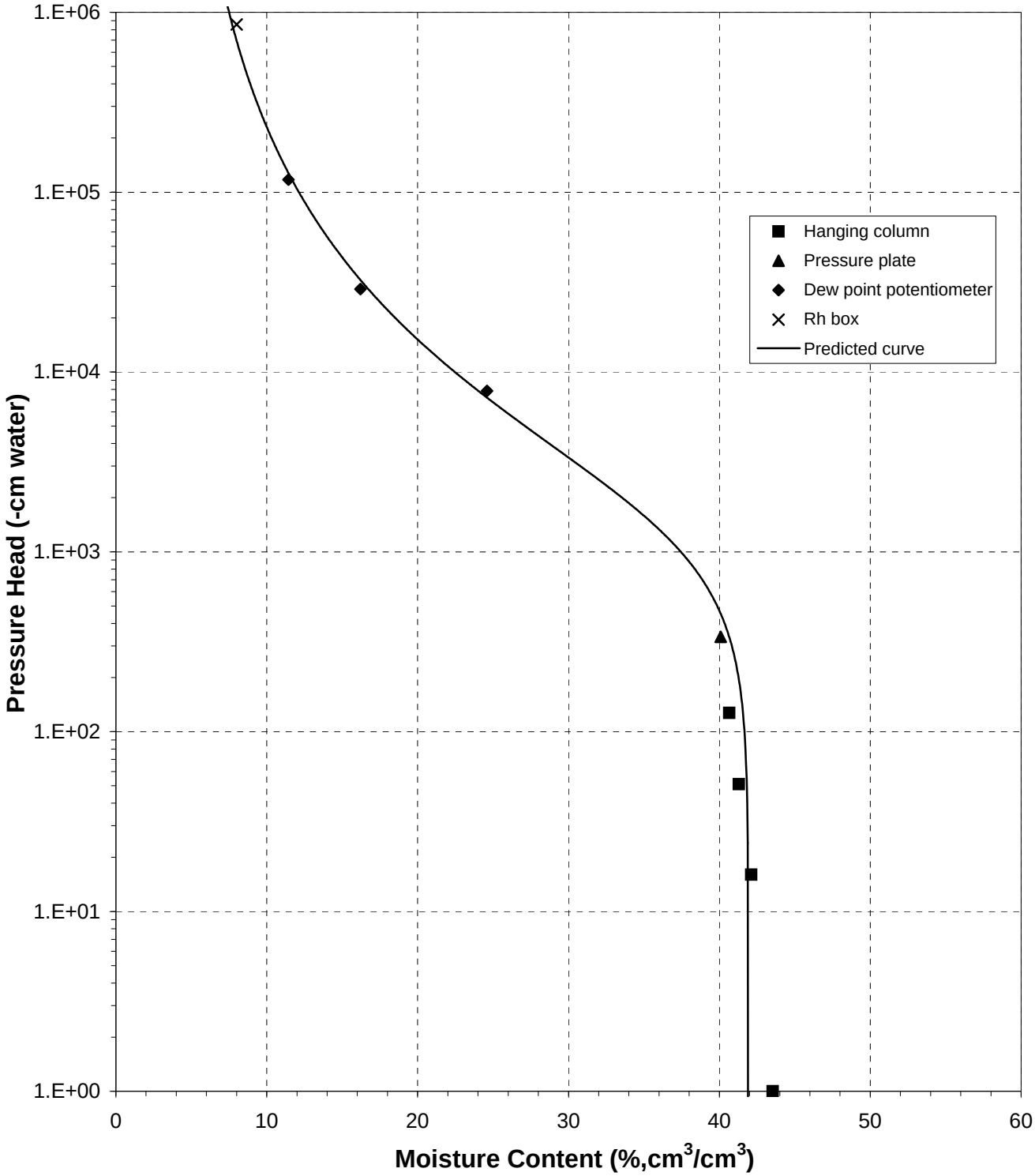
Water Retention Data Points

Sample Number: PB-11 (39-40)



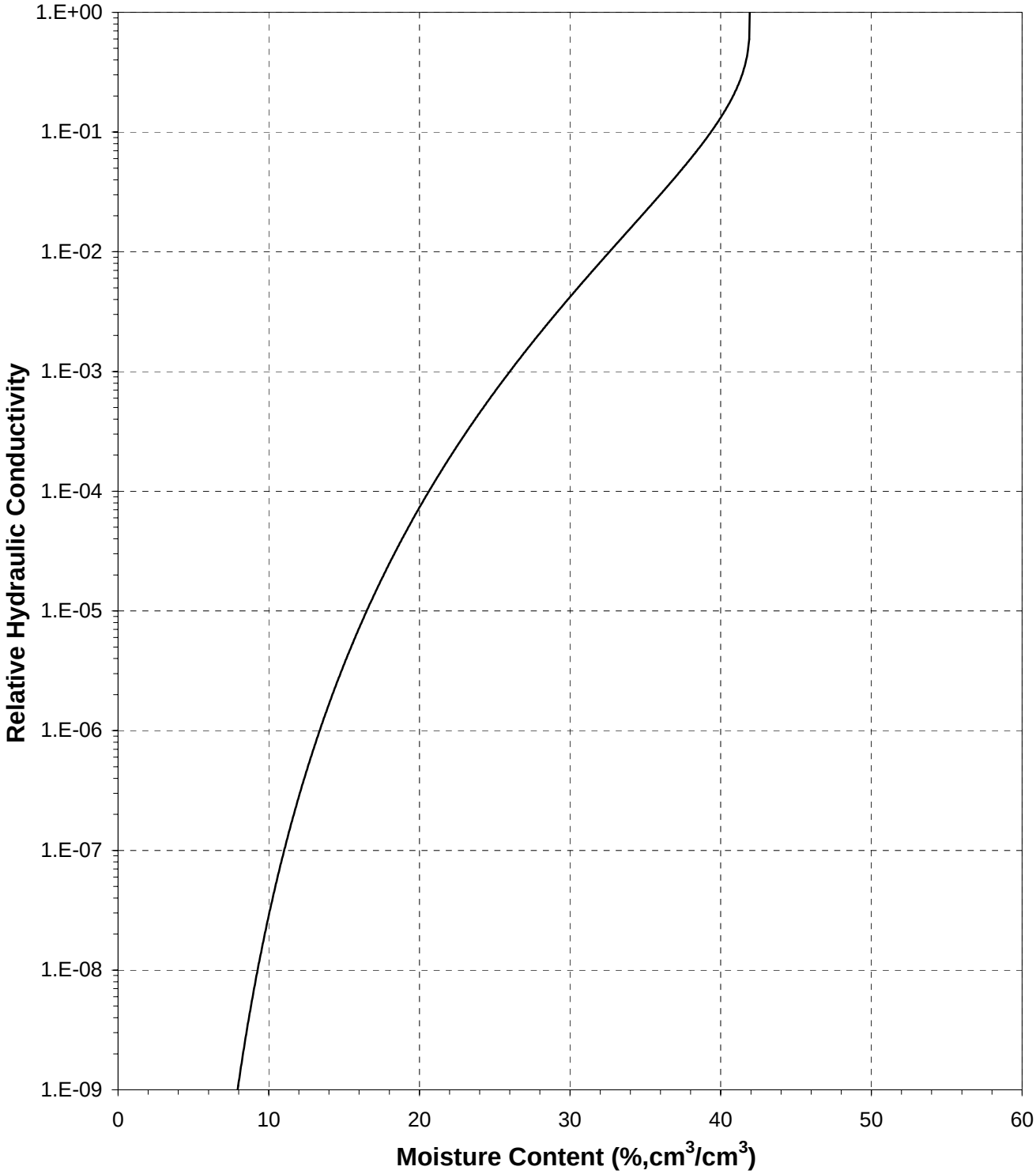
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (39-40)



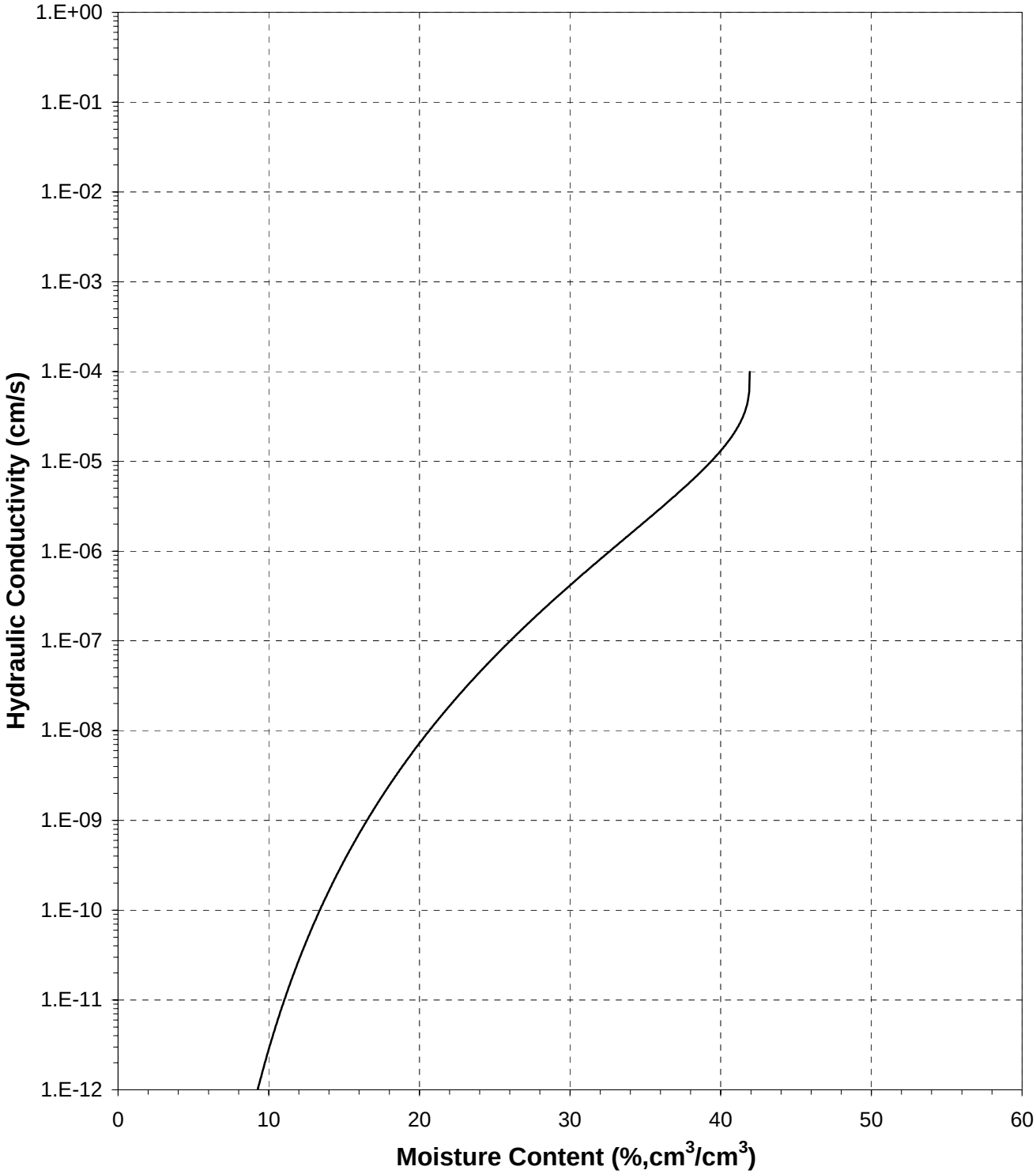
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (39-40)



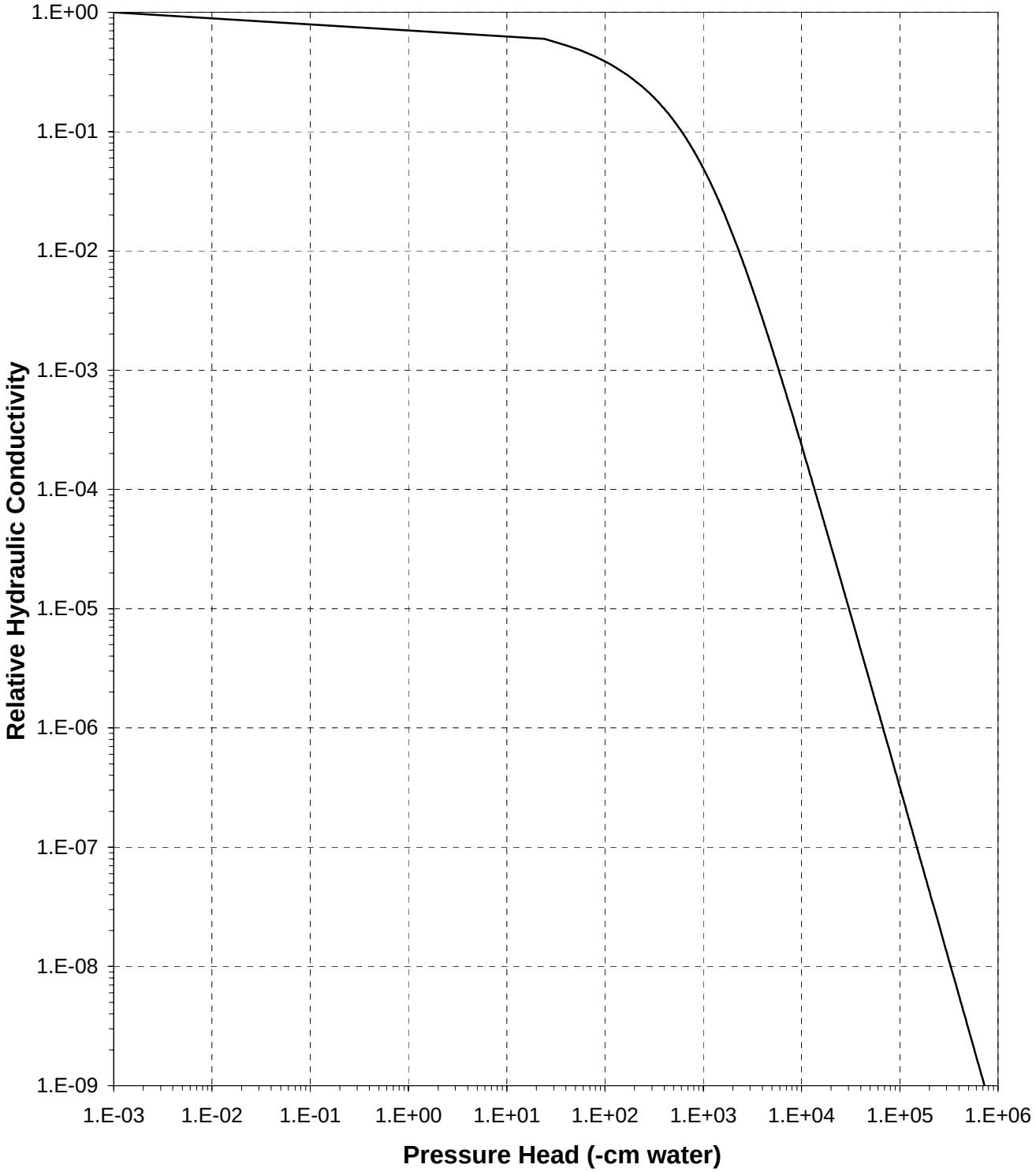
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (39-40)



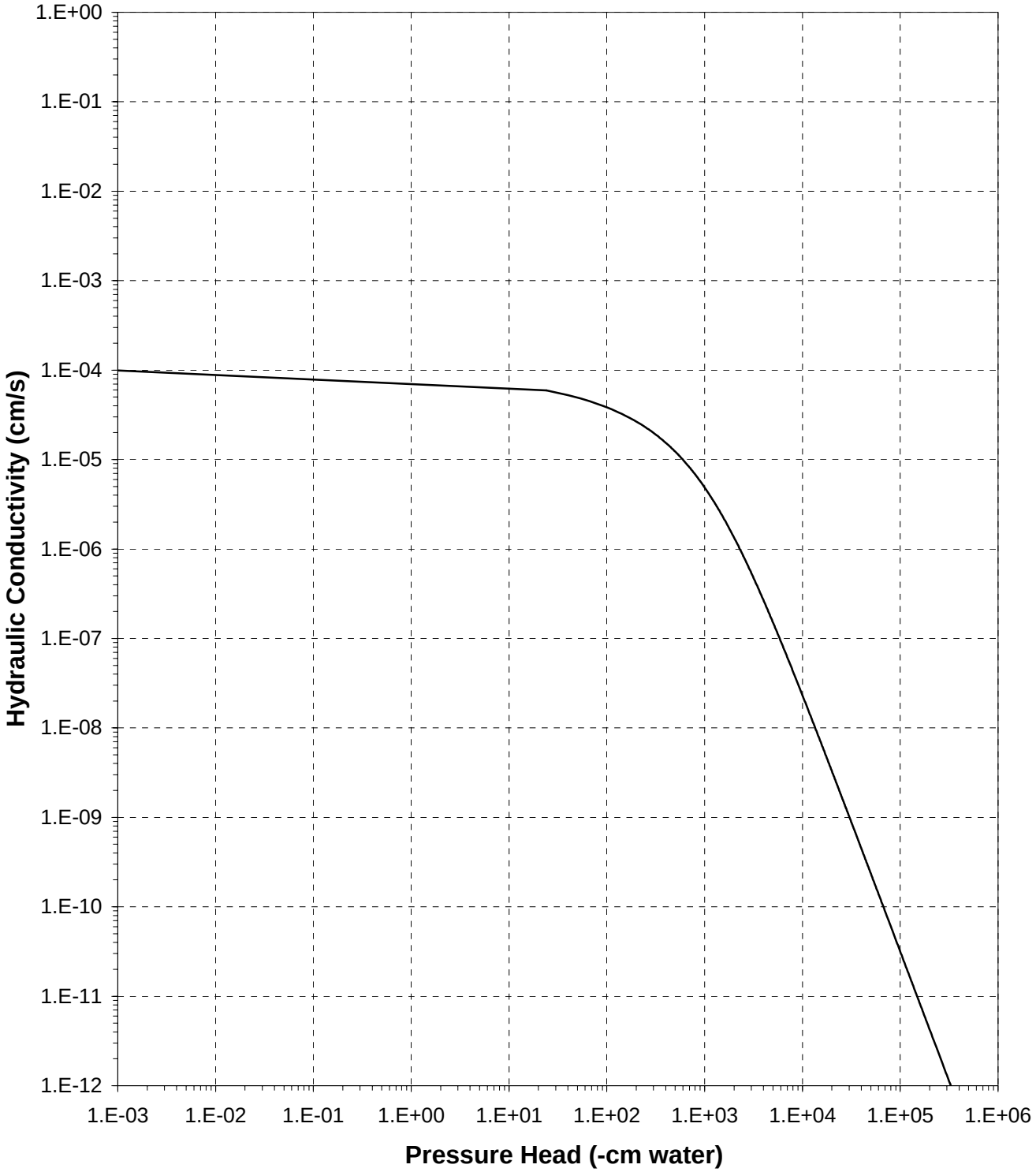
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (39-40)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (39-40)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

Dry wt. of sample (g): 141.07
Tare wt., ring (g): 55.59
Tare wt., screen & clamp (g): 27.71
Initial sample volume (cm^3): 94.92
Initial dry bulk density (g/cm^3): 1.49
Measured particle density (g/cm^3): 2.68
Initial calculated total porosity (%): 44.63

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	23-Jan-12	15:20	266.73	0	44.63
	30-Jan-12	13:55	265.42	16.0	43.25
	6-Feb-12	8:50	264.63	51.0	42.41
	13-Feb-12	10:50	263.67	127.0	41.40
Pressure plate:	23-Feb-12	10:30	260.32	337	37.87

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	51.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (154-155)

Initial sample bulk density (g/cm^3)*:* 1.49
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 141.83
Tare weight, jar (g)*:* 113.39

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	21-Mar-12	16:41	145.39	17235	18.60
	21-Mar-12	12:47	144.39	64553	13.38
	21-Mar-12	11:37	143.92	133696	10.92

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	17235	---	---	---	---
	64553	---	---	---	---
	133696	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 62.37
Tare weight (g)*:* 28.22

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	63.67	857025	5.66

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

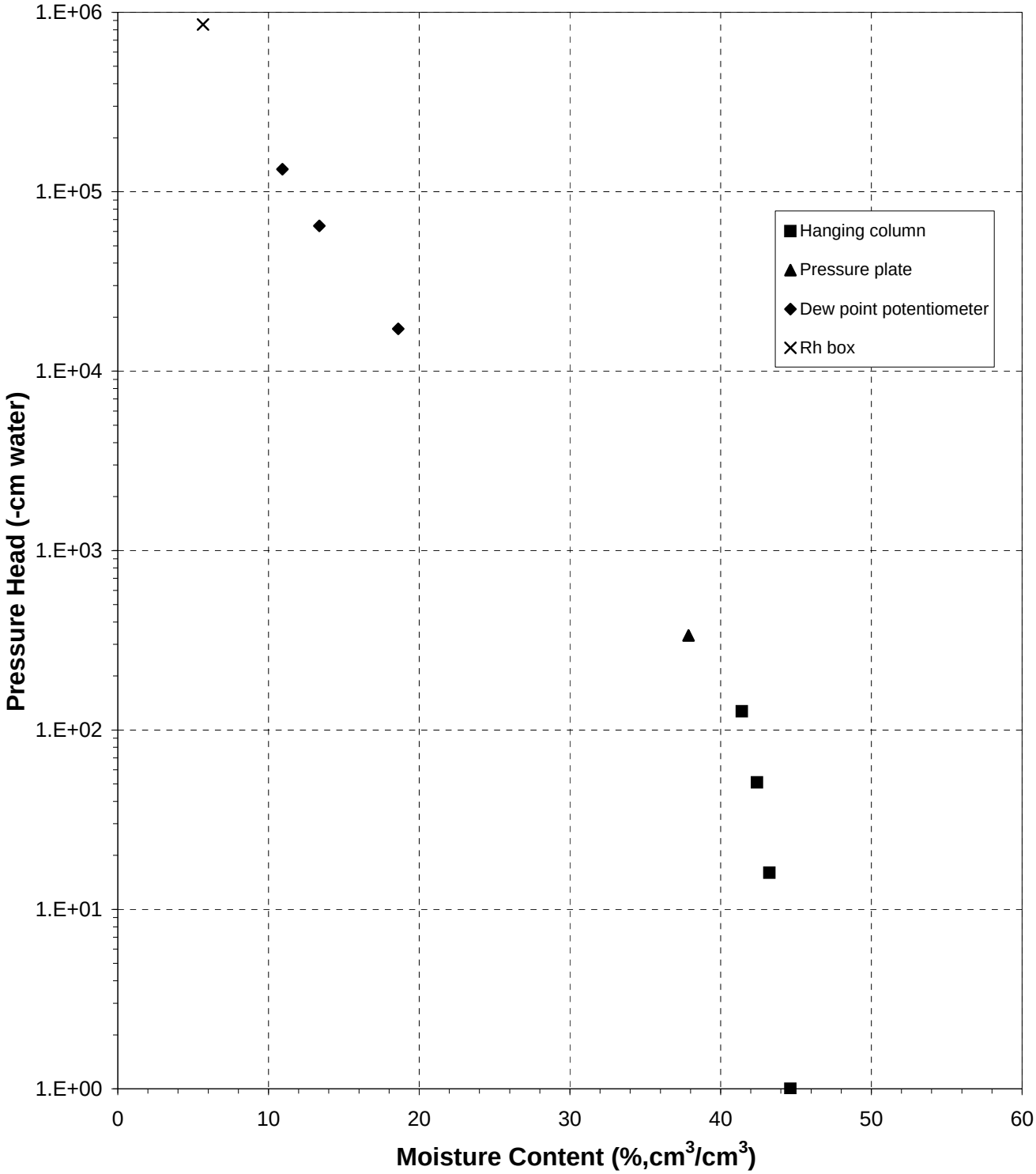
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

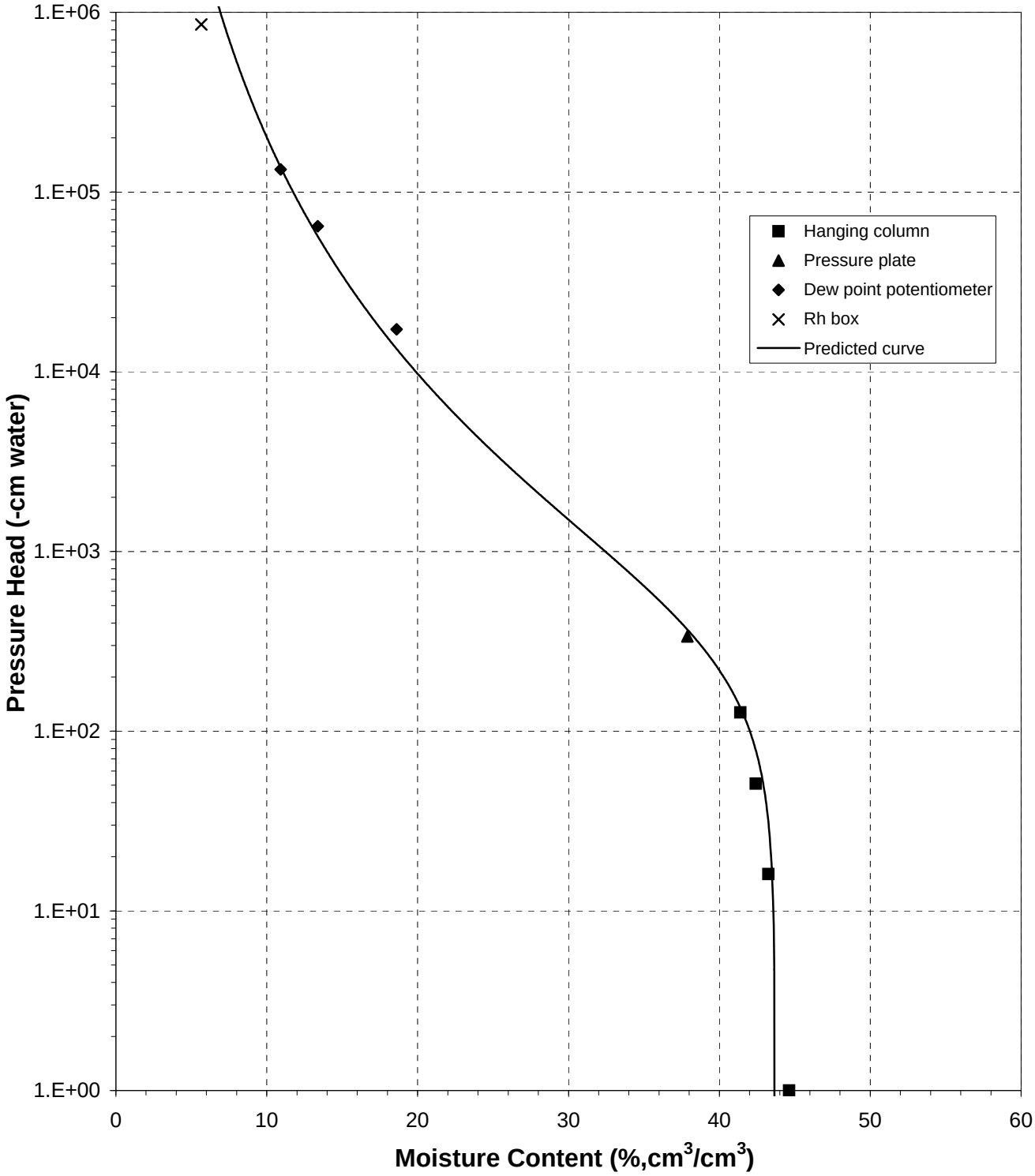
Water Retention Data Points

Sample Number: PB-11 (154-155)



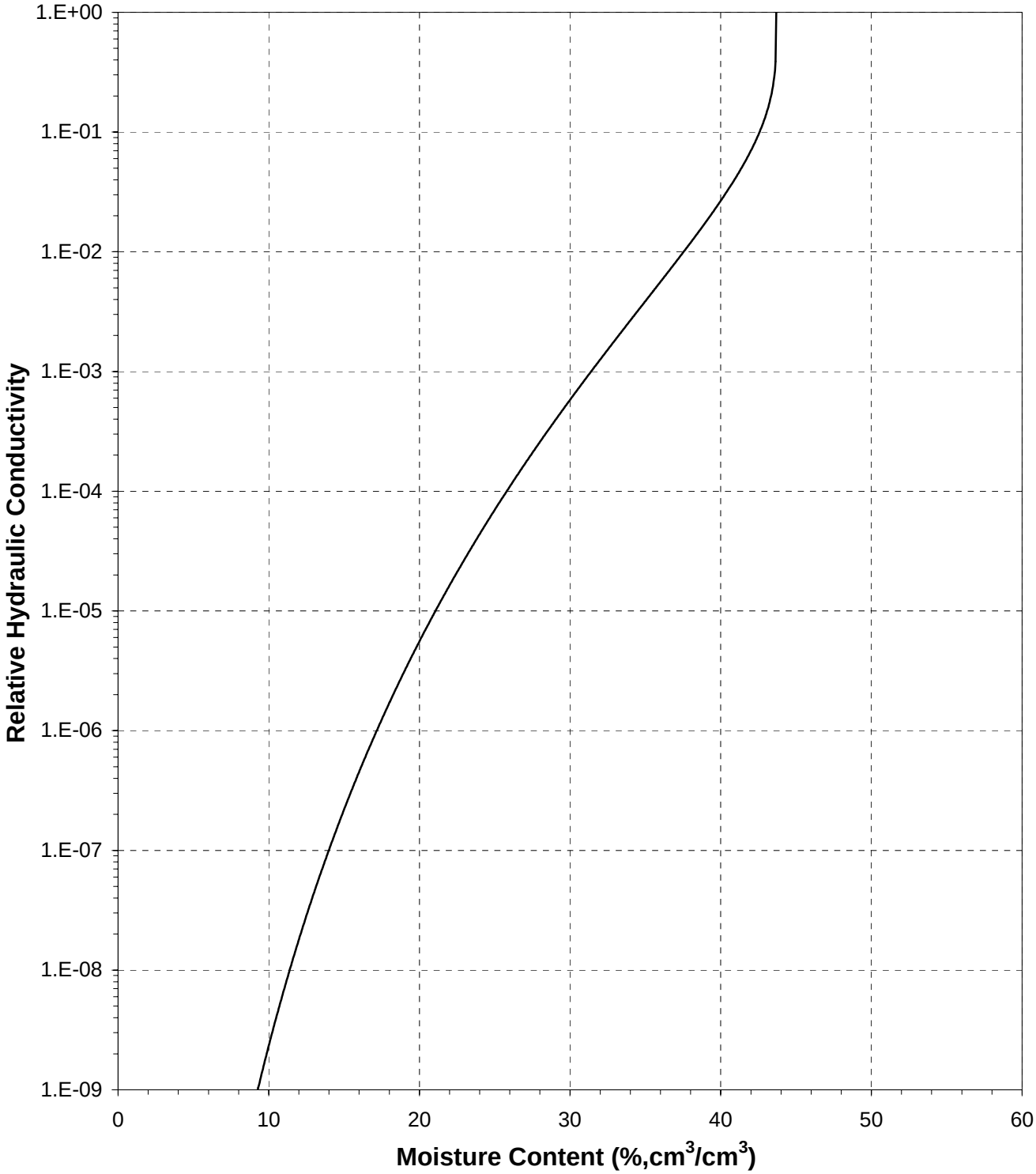
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (154-155)



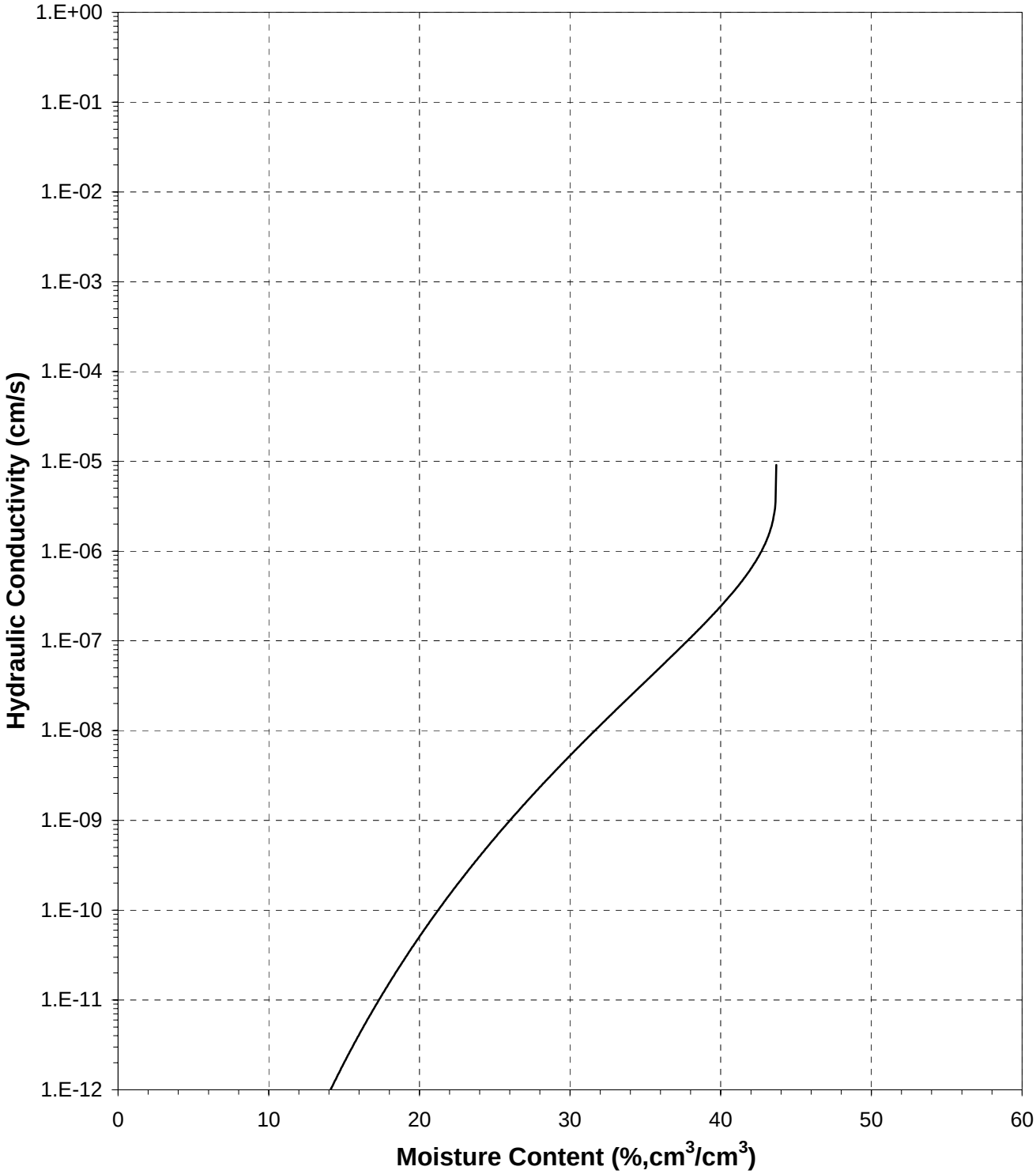
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (154-155)



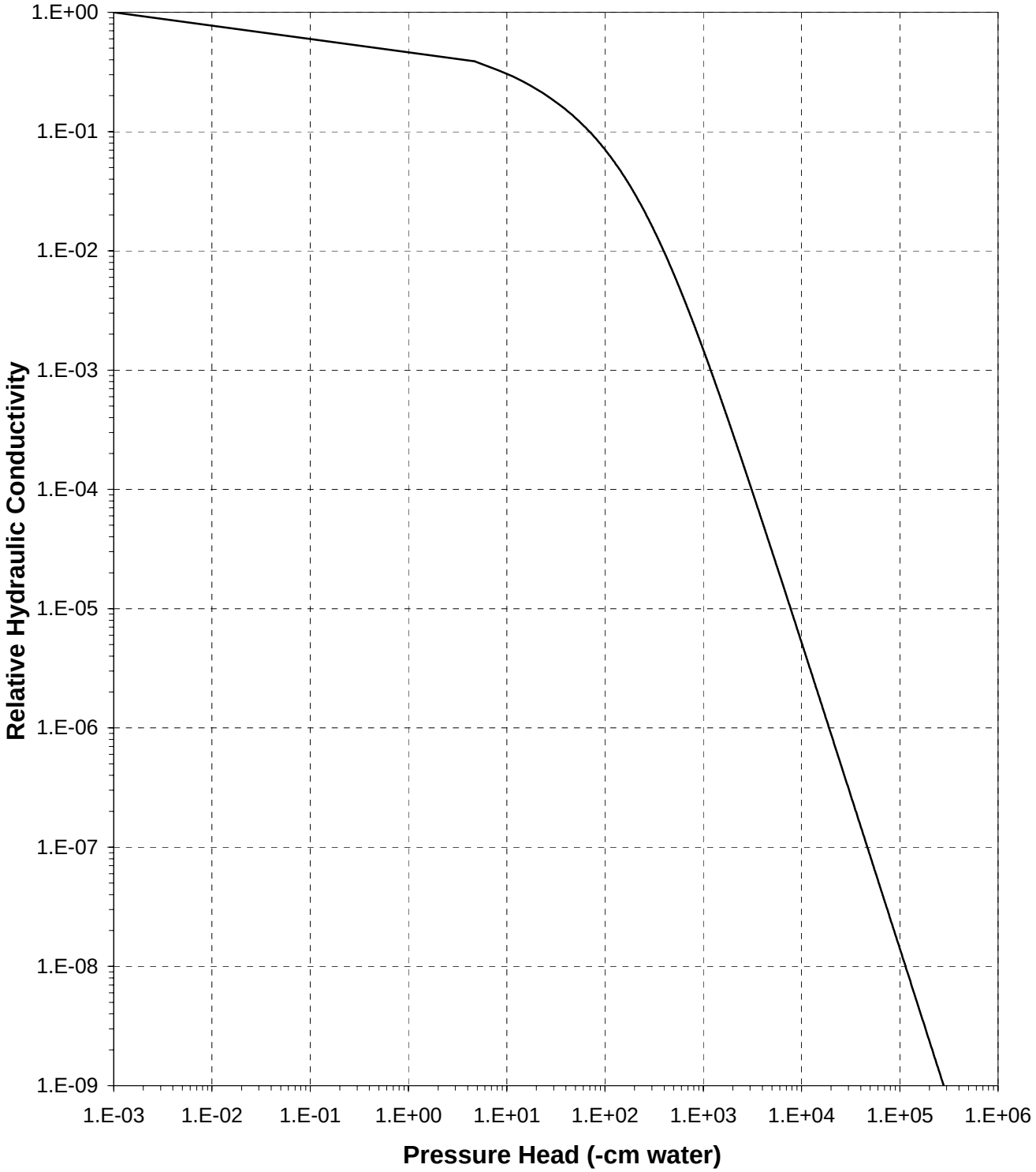
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (154-155)



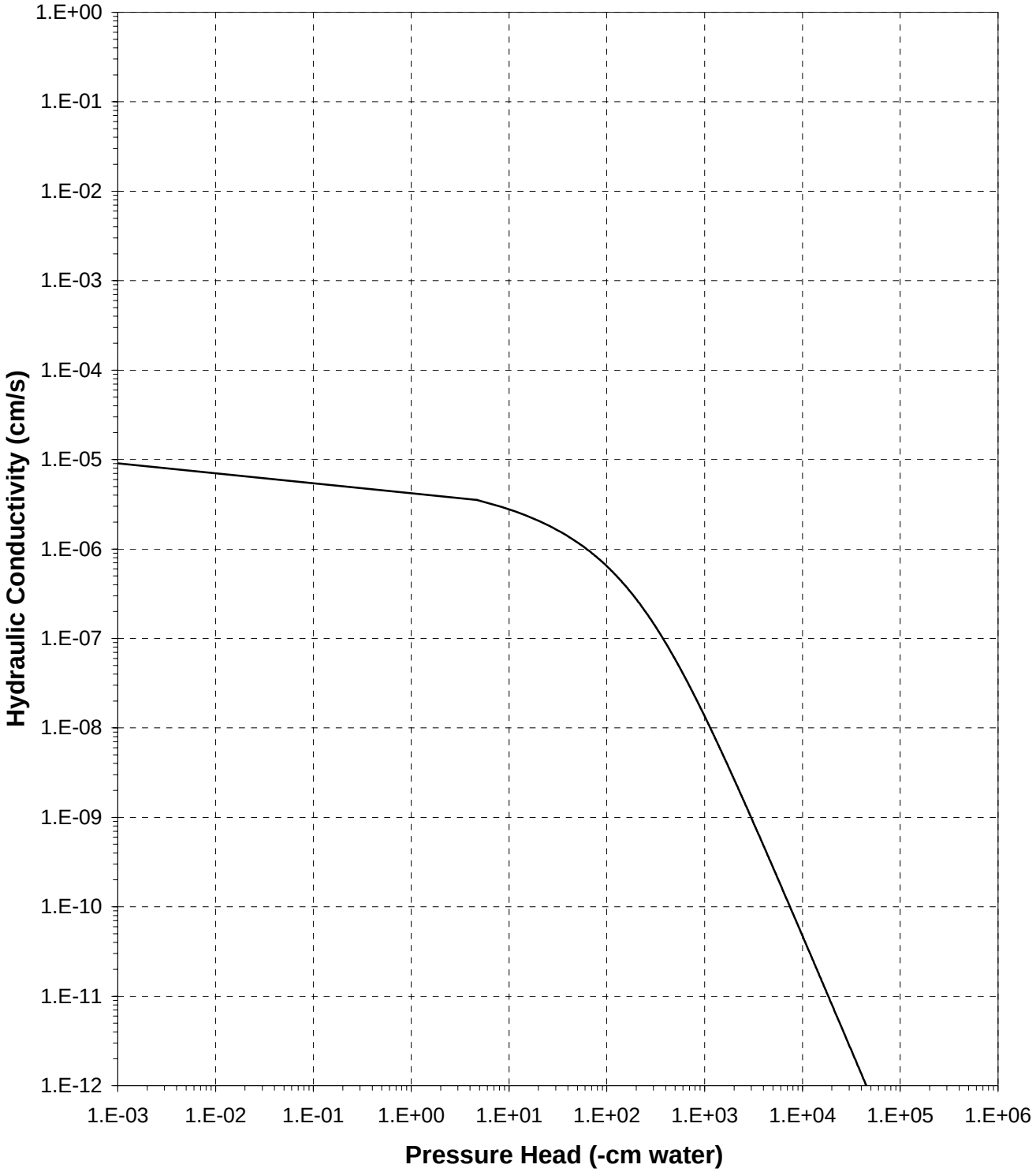
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (154-155)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (154-155)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (184-185)
Date Sampled: 12/7/2011
Depth: 184-185

Dry wt. of sample (g): 145.49
Tare wt., ring (g): 41.82
Tare wt., screen & clamp (g): 27.50
Initial sample volume (cm^3): 93.64
Initial dry bulk density (g/cm^3): 1.55
Measured particle density (g/cm^3): 2.67
Initial calculated total porosity (%): 41.82

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	23-Jan-12	15:10	253.97	0	41.82
	30-Jan-12	12:45	253.51	16.0	41.33
	6-Feb-12	8:45	253.40	51.0	41.21
	13-Feb-12	10:35	253.05	127.0	40.84
Pressure plate:	23-Feb-12	10:35	252.61	337	40.37

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	51.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (184-185)

Initial sample bulk density (g/cm^3)*:* 1.55
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 149.98
Tare weight, jar (g)*:* 117.46

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Dew point potentiometer:	21-Mar-12	17:05	153.86	19274	18.54
	21-Mar-12	12:54	152.89	60270	13.90
	26-Mar-12	14:02	152.42	191518	11.66

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	19274	---	---	---	---
	60270	---	---	---	---
	191518	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 70.80
Tare weight (g)*:* 42.29

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	28-Feb-12	9:00	72.32	857025	8.27

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

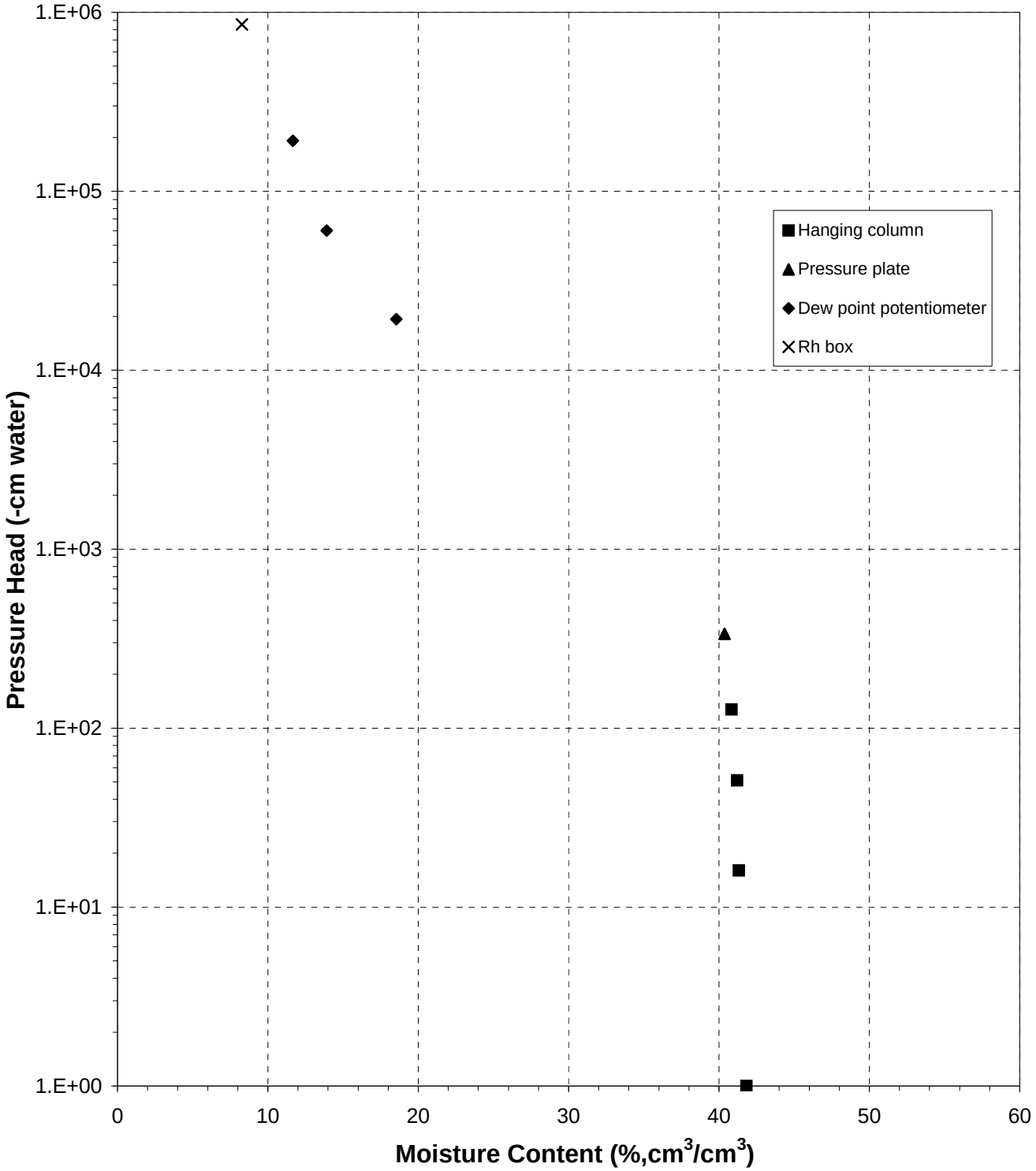
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

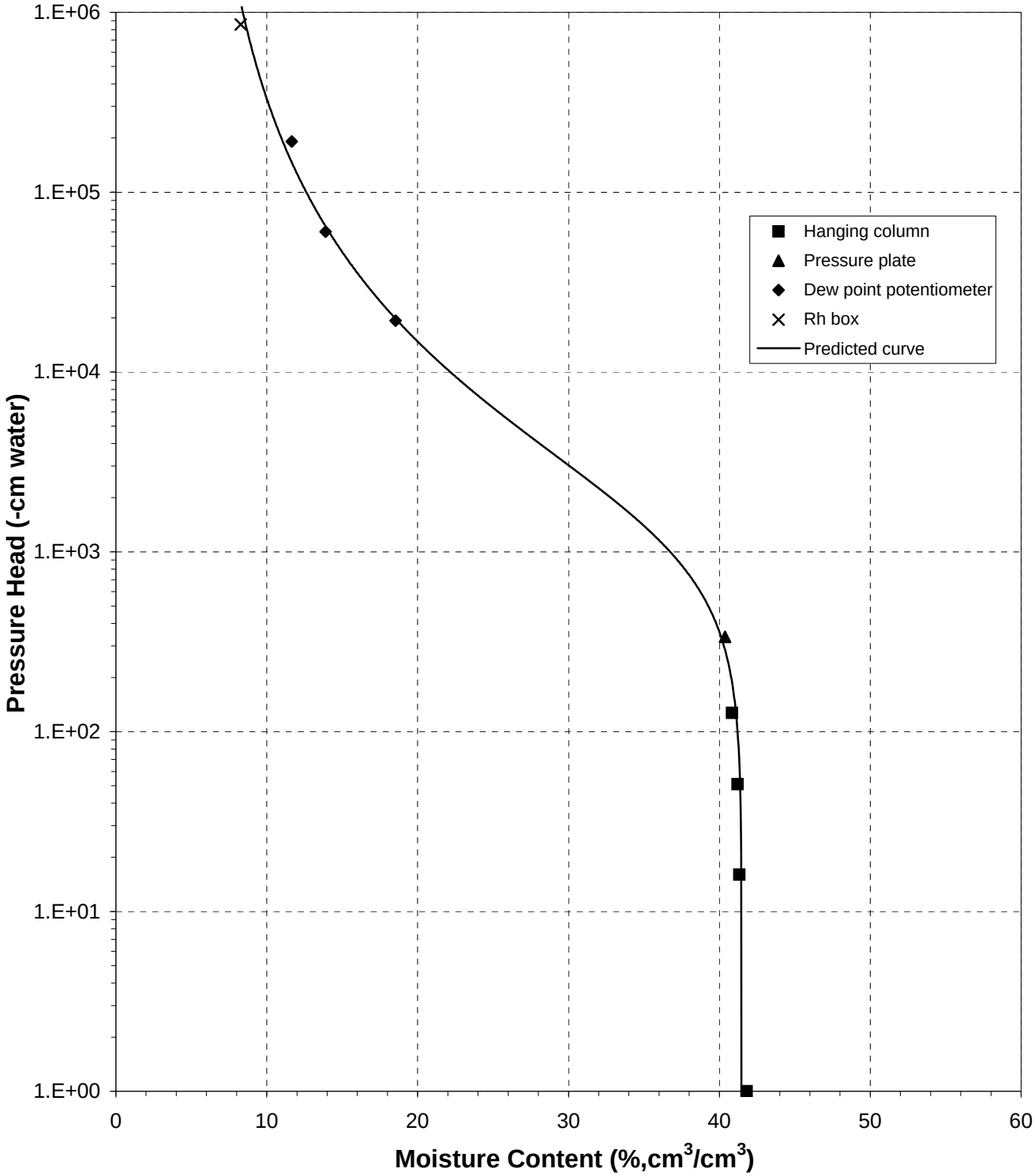
Water Retention Data Points

Sample Number: PB-11 (184-185)



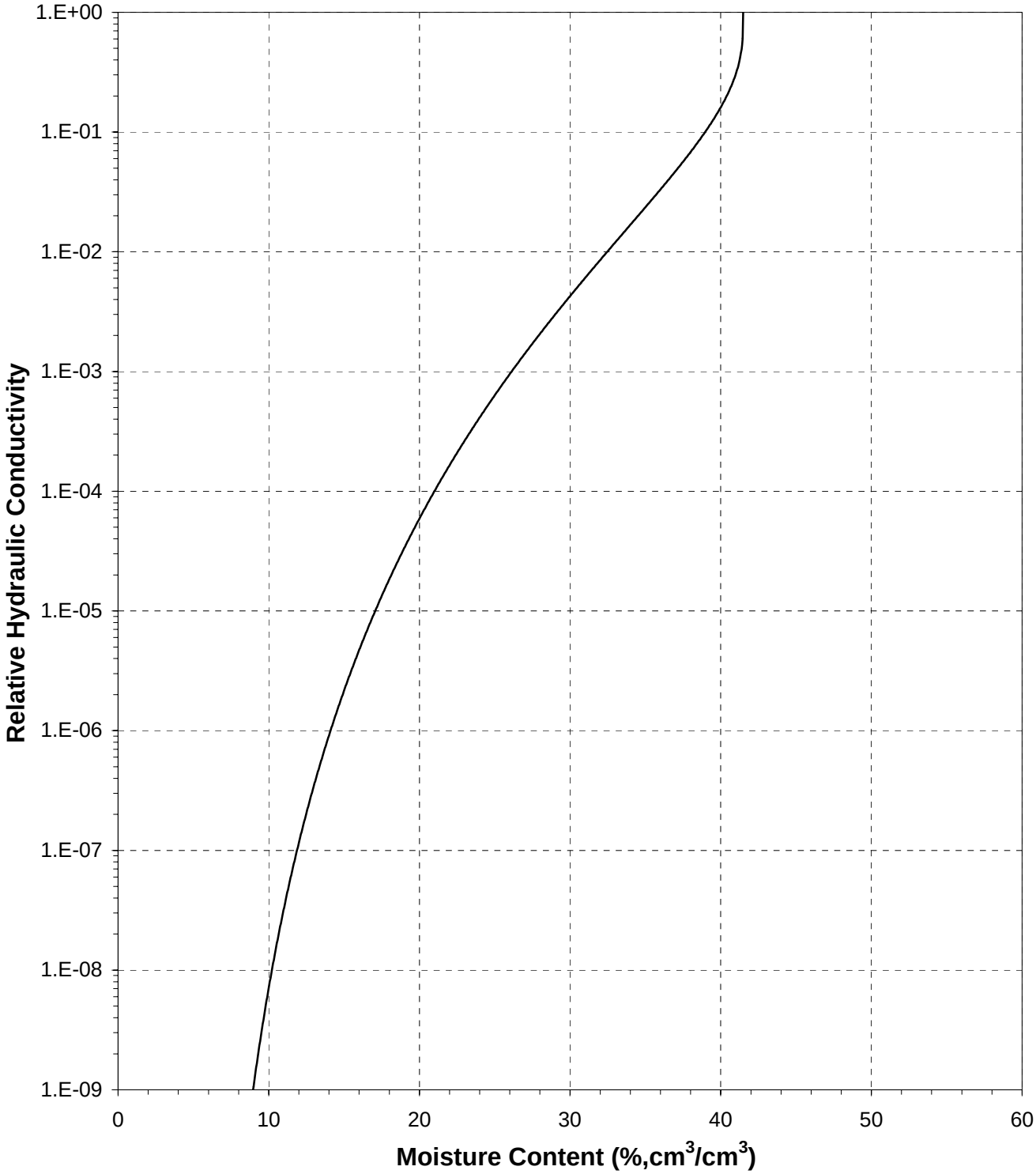
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (184-185)



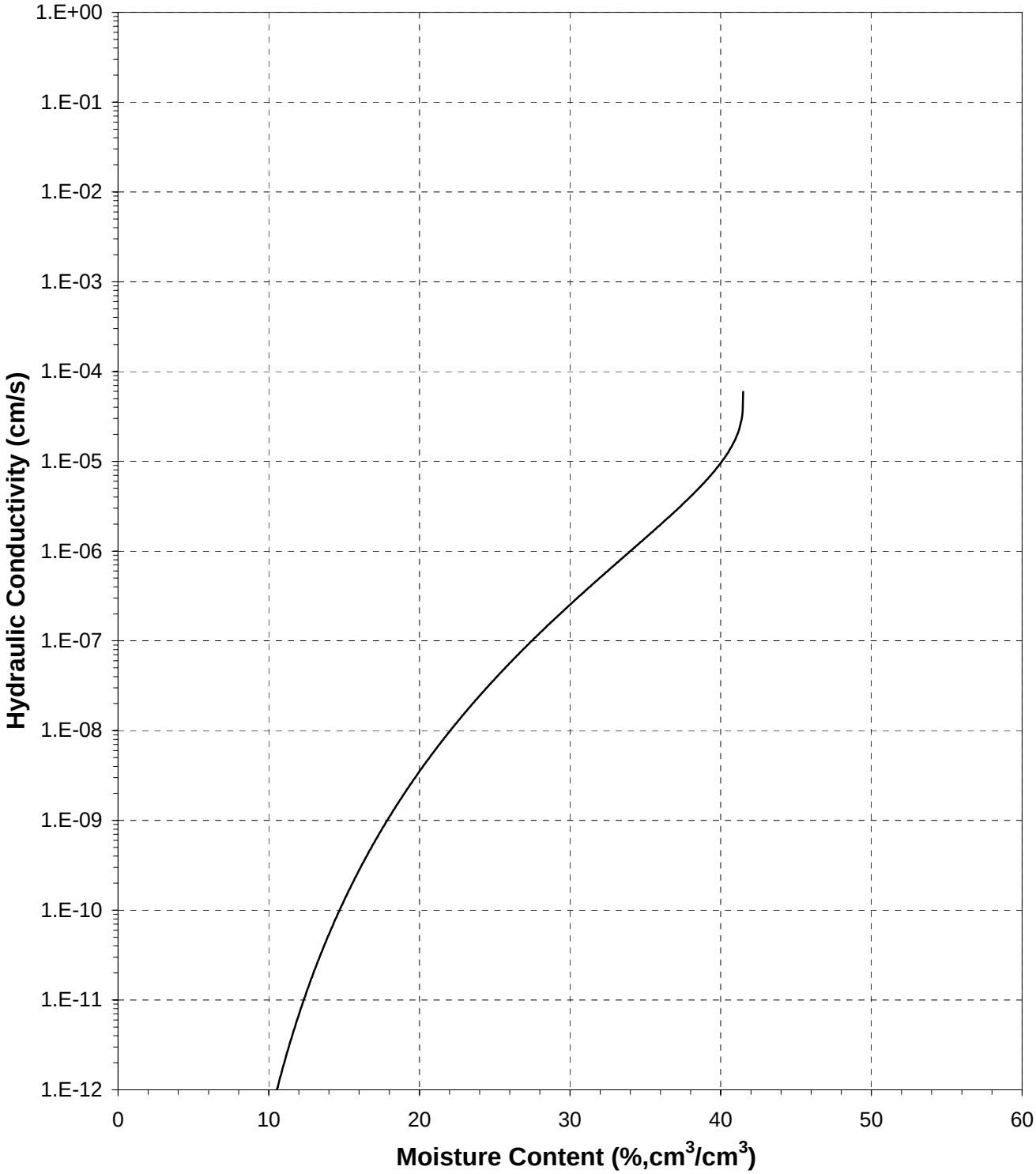
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (184-185)



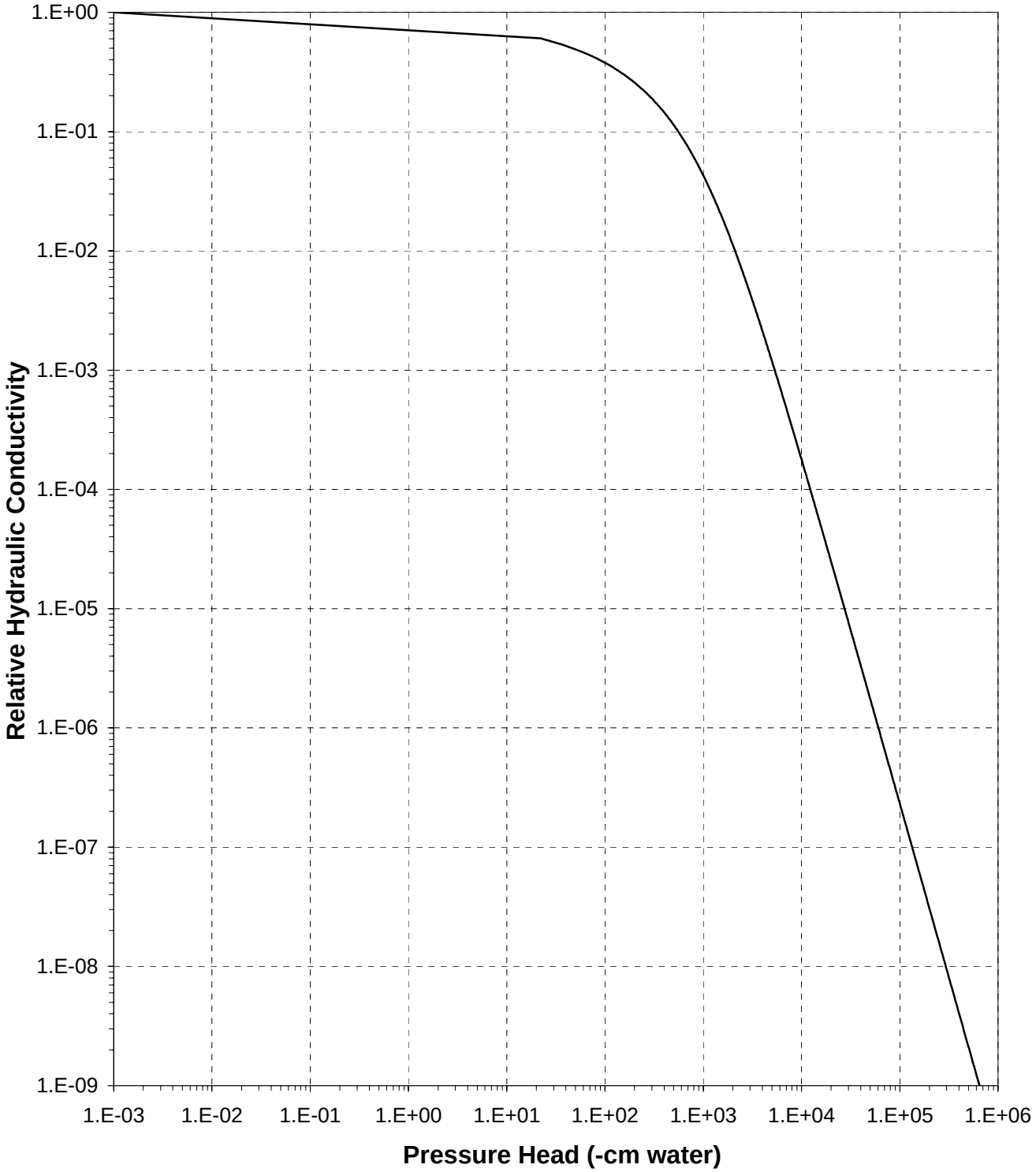
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (184-185)



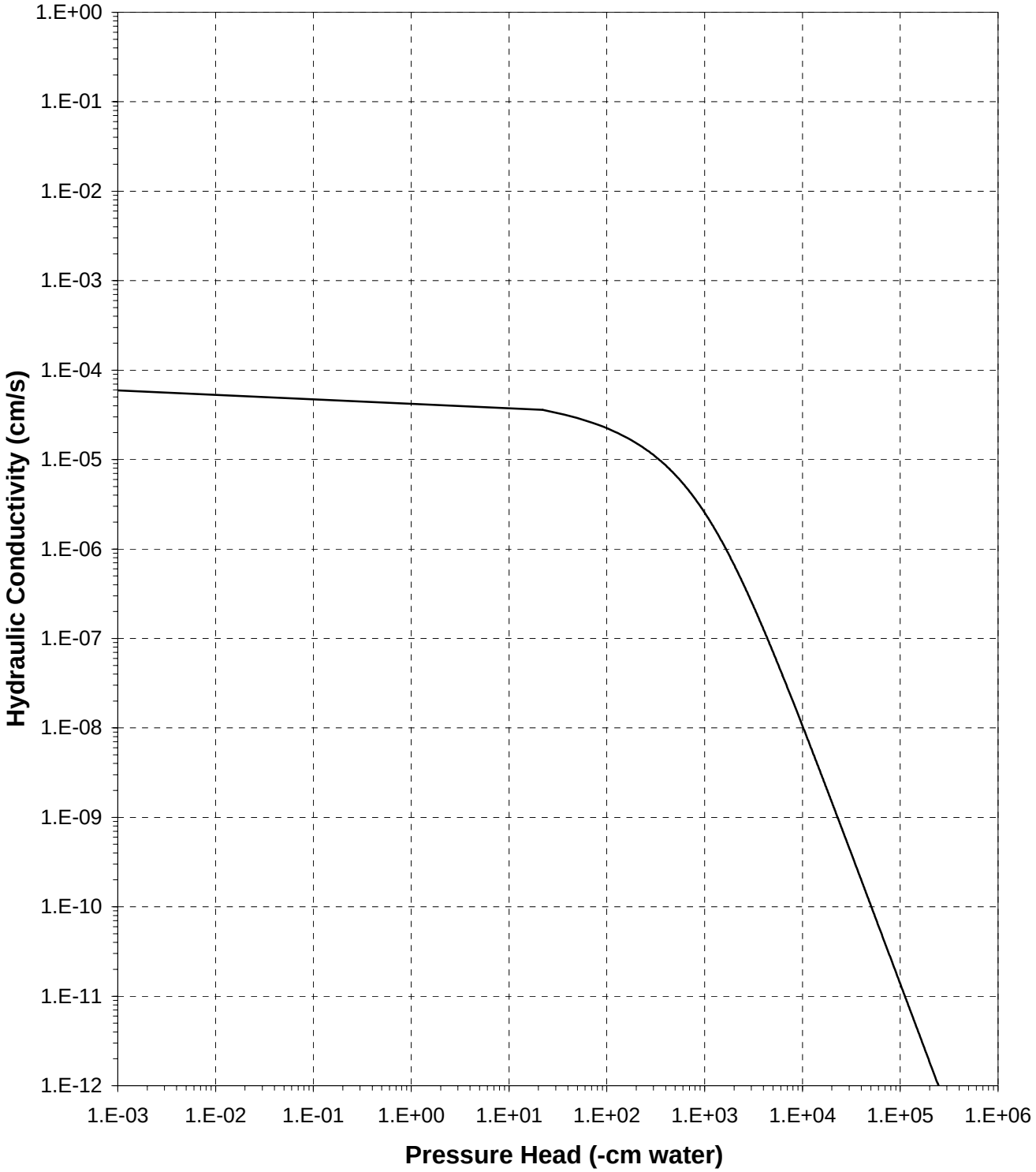
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (184-185)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (184-185)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (209-210)
Date Sampled: 12/7/2011
Depth: 209-210

Dry wt. of sample (g): 113.99
Tare wt., ring (g): 56.06
Tare wt., screen & clamp (g): 23.47
Initial sample volume (cm^3): 72.95
Initial dry bulk density (g/cm^3): 1.56
Measured particle density (g/cm^3): 2.69
Initial calculated total porosity (%): 41.96

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:30	224.13	0	41.96
	7-Feb-12	10:20	224.06	51.0	41.86
	14-Feb-12	8:10	223.96	150.0	41.72
Pressure plate:	28-Feb-12	8:10	223.67	337	41.33
	13-Mar-12	8:40	223.45	1275	41.03

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (209-210)

Initial sample bulk density (g/cm^3)*:* 1.56
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 150.38
Tare weight, jar (g)*:* 115.35

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	13:54	156.77	10912	28.50
	26-Mar-12	14:20	155.57	28452	23.15
	21-Mar-12	11:50	152.86	150522	11.06

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	10912	---	---	---	---
	28452	---	---	---	---
	150522	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 75.54
Tare weight (g)*:* 41.74

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	77.15	857025	7.45

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

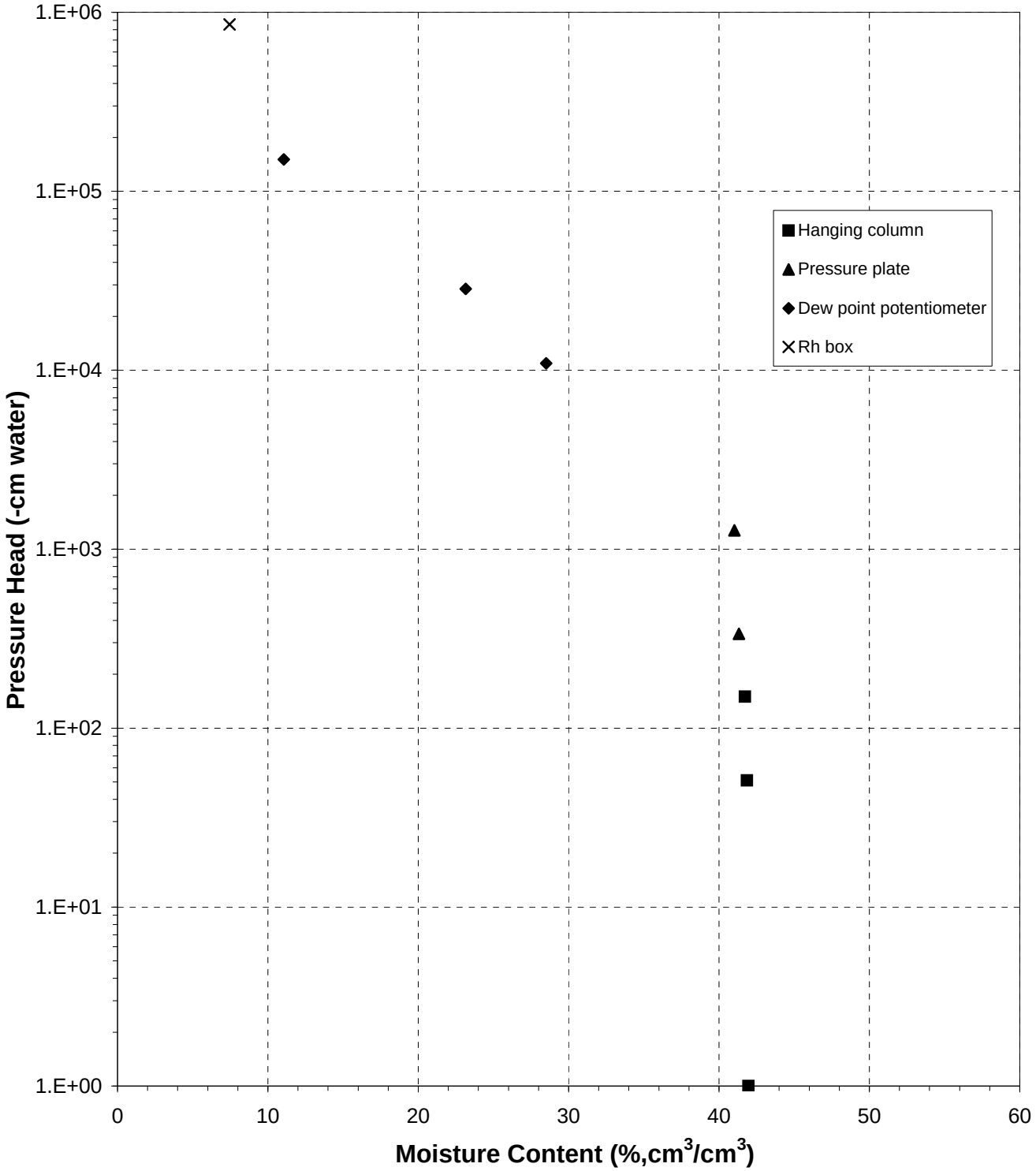
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

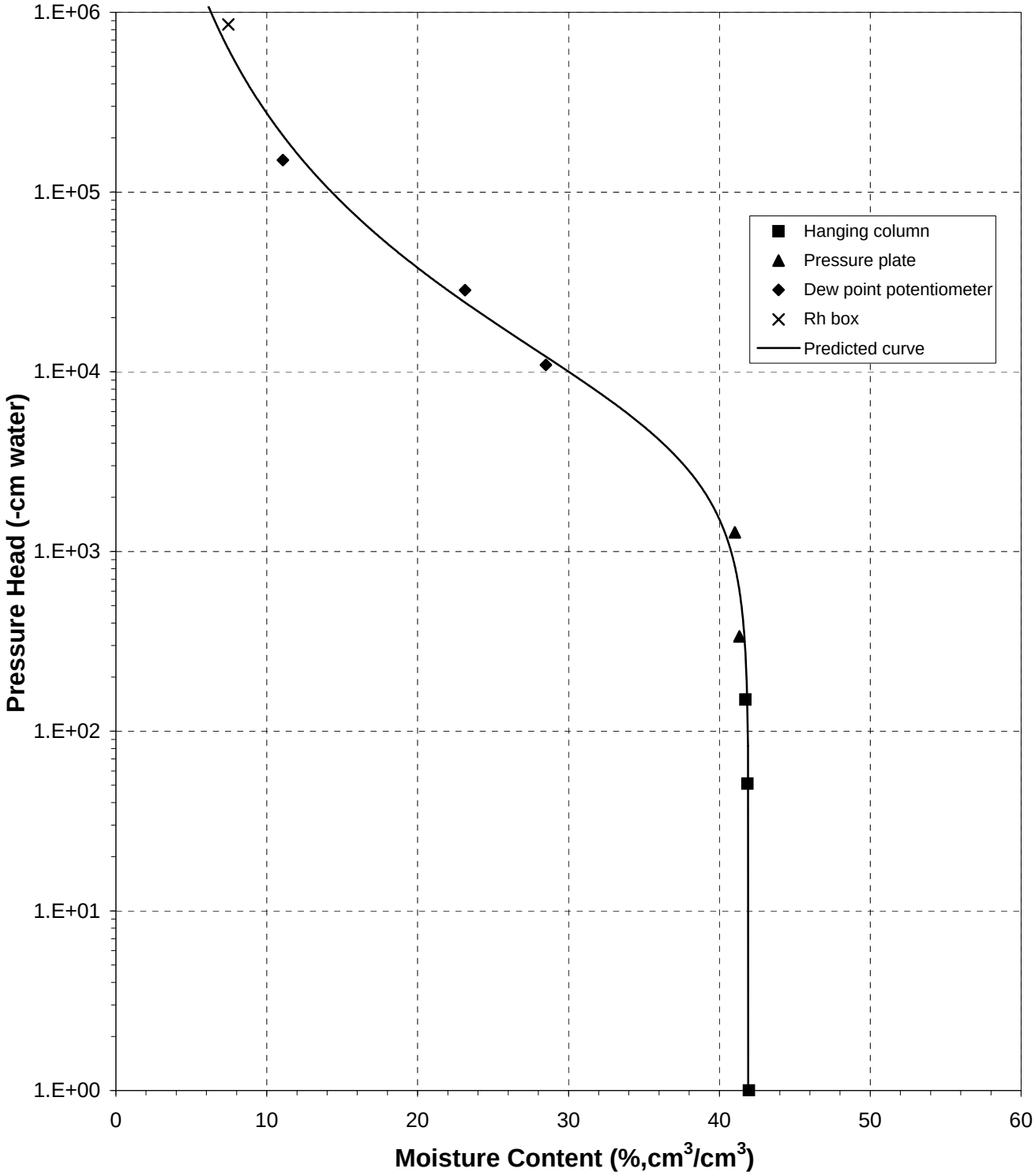
Water Retention Data Points

Sample Number: PB-11 (209-210)



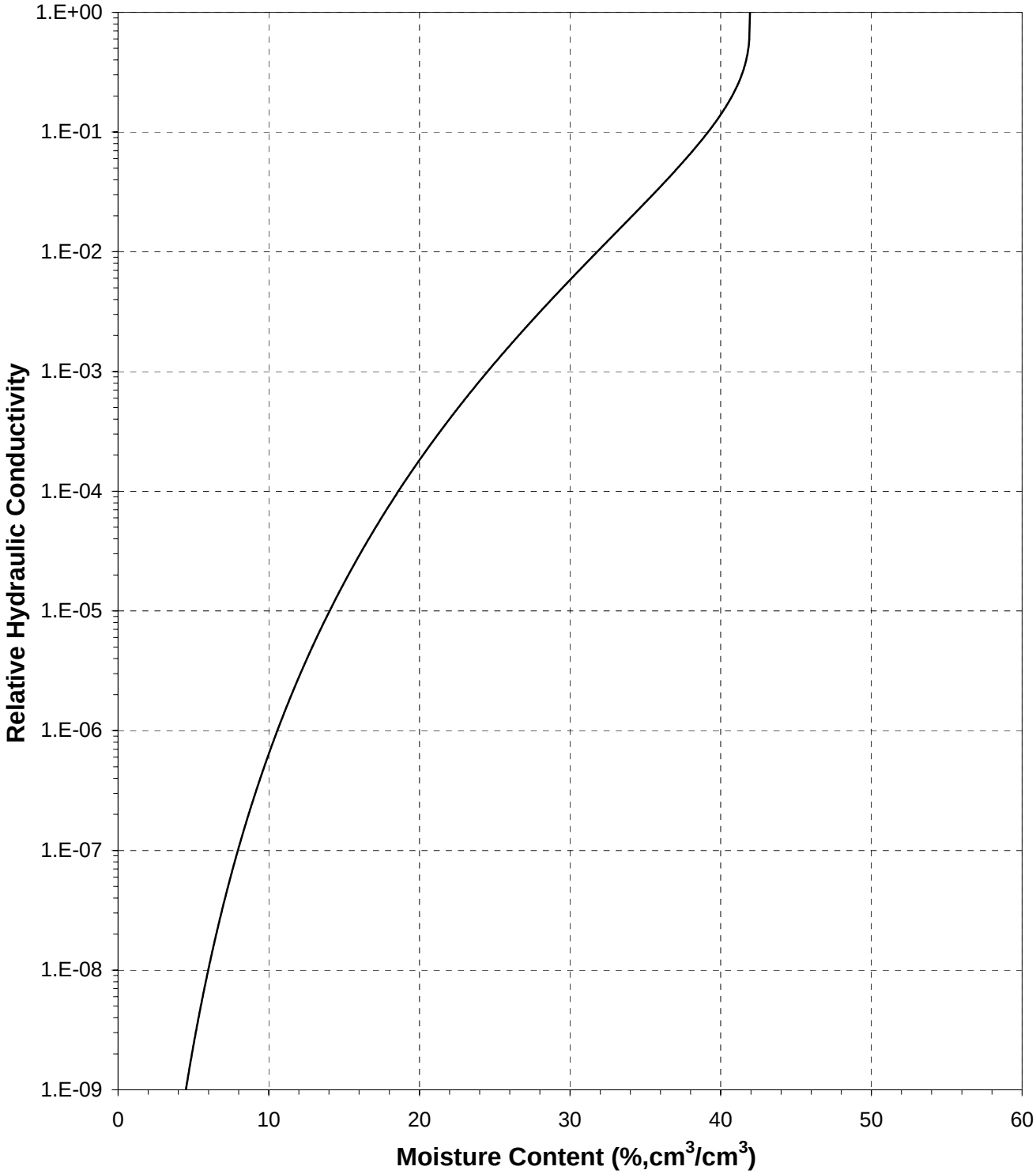
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (209-210)



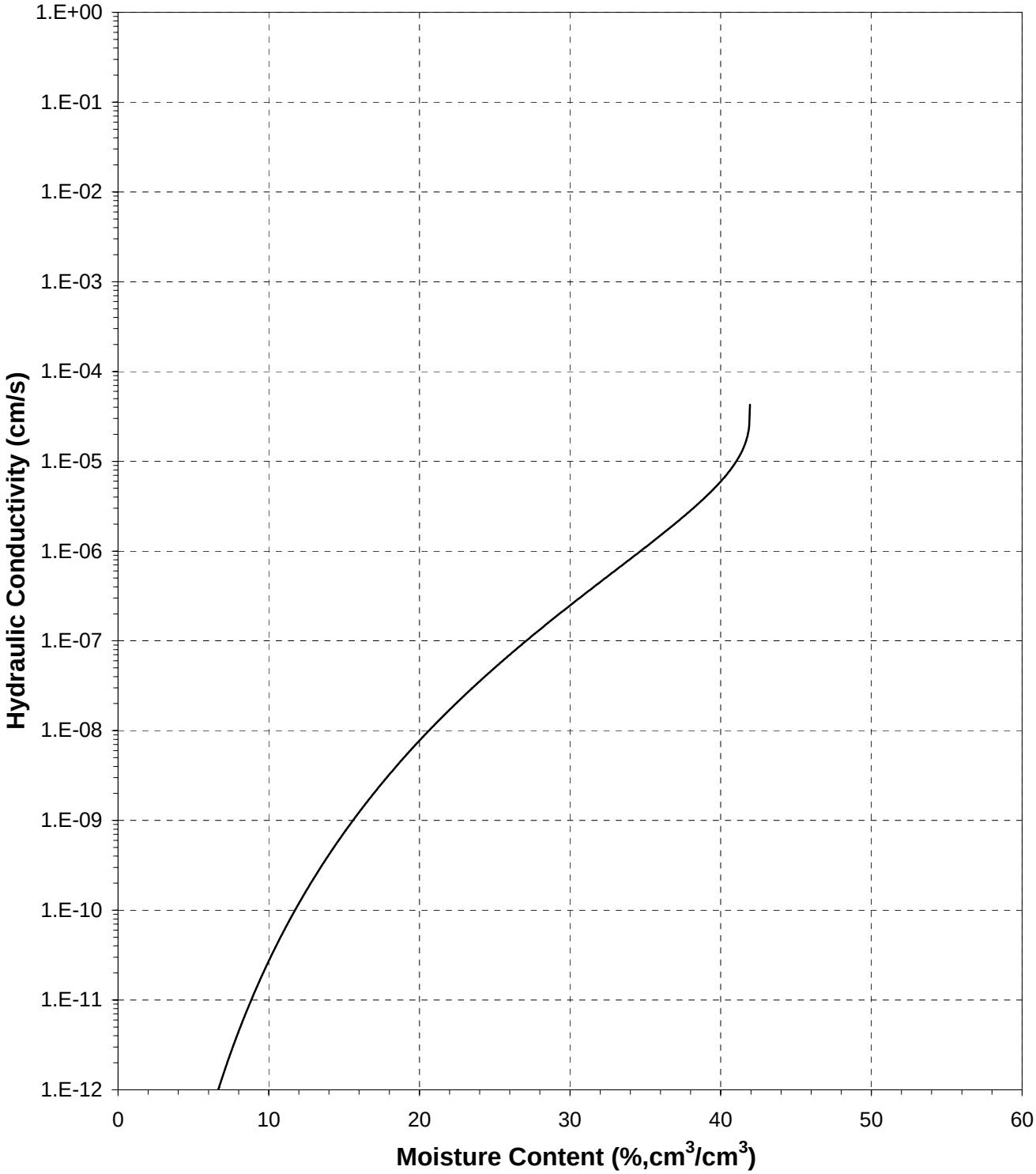
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (209-210)



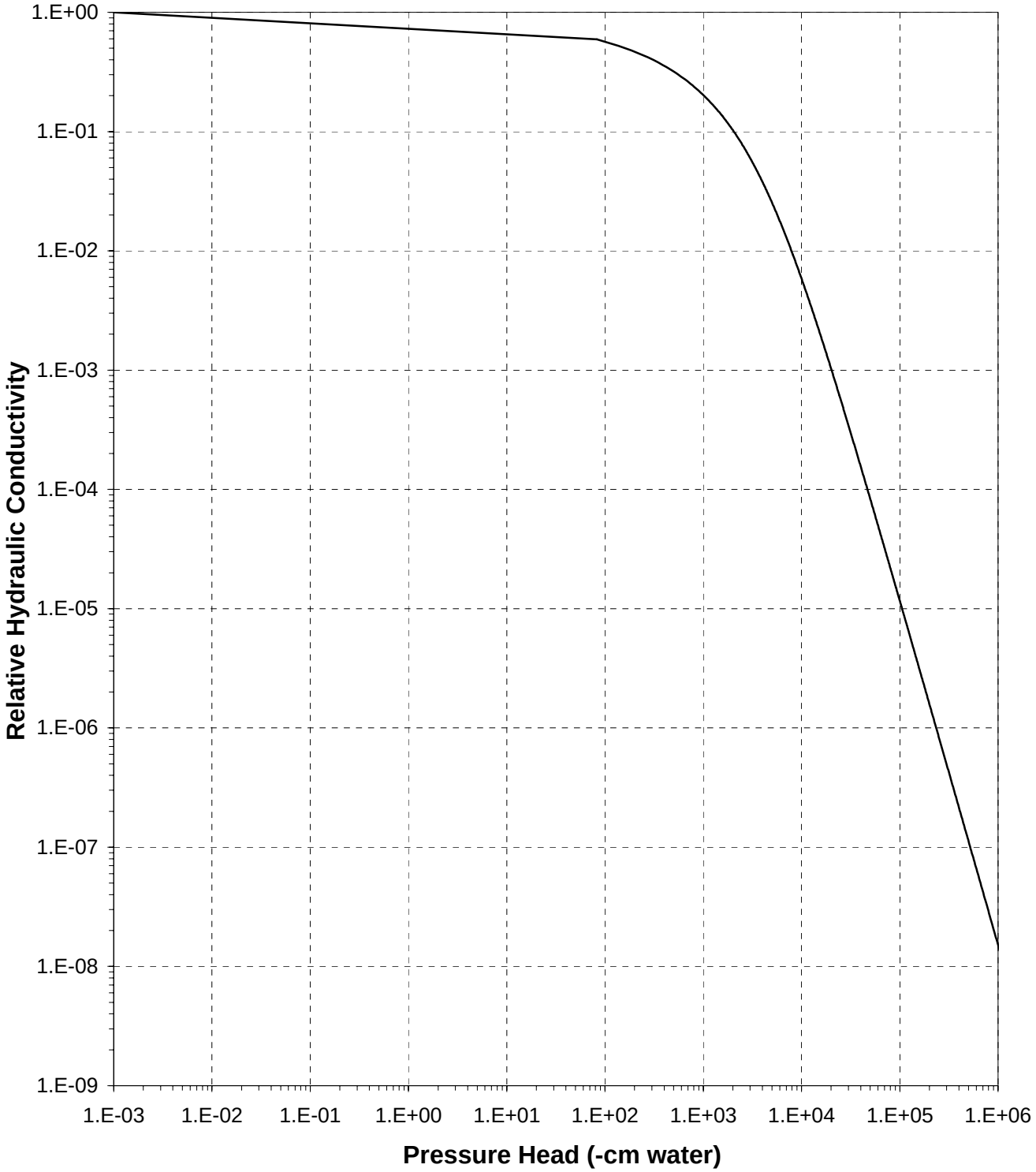
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (209-210)



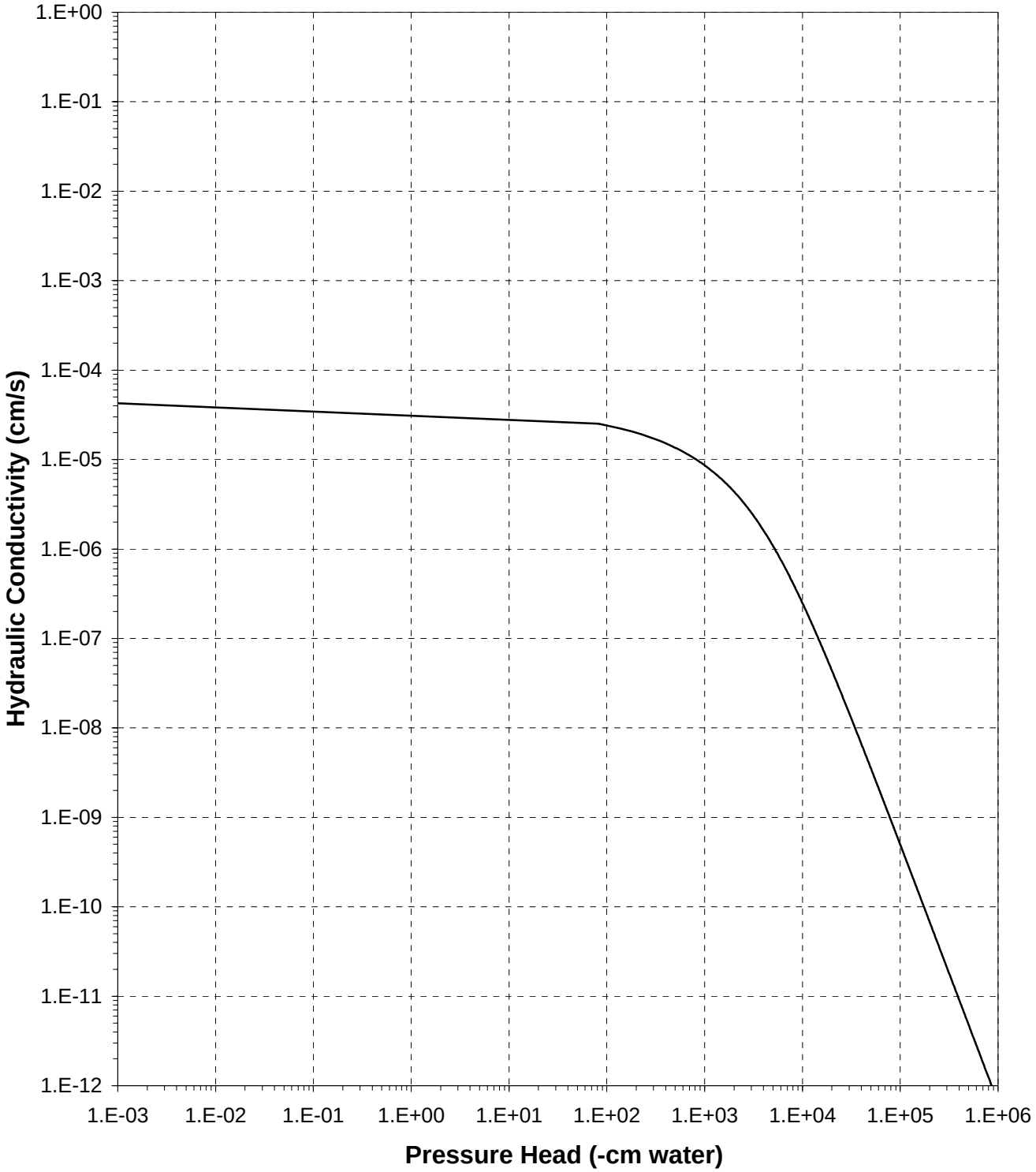
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (209-210)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (209-210)



Daniel B. Stephens & Associates, Inc.

Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (229-230)
Date Sampled: 12/7/2011
Depth: 229-230

Dry wt. of sample (g): 121.48
Tare wt., ring (g): 46.47
Tare wt., screen & clamp (g): 23.16
Initial sample volume (cm^3): 74.00
Initial dry bulk density (g/cm^3): 1.64
Measured particle density (g/cm^3): 2.66
Initial calculated total porosity (%): 38.22

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:45	219.39	0	38.22
	12-Feb-12	10:25	218.69	51.0	37.27
	14-Feb-12	8:15	218.55	150.0	37.08
Pressure plate:	28-Feb-12	8:20	218.30	337	36.75
	13-Mar-12	8:45	217.84	1275	36.12

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (229-230)

Initial sample bulk density (g/cm^3)*:* 1.64
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 151.98
Tare weight, jar (g)*:* 117.98

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	10:38	156.69	9178	22.74
	26-Mar-12	14:35	155.24	31920	15.74
	27-Mar-12	14:45	154.67	95147	12.99

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	9178	---	---	---	---
	31920	---	---	---	---
	95147	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 76.00
Tare weight (g)*:* 40.79

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	77.41	857025	6.58

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

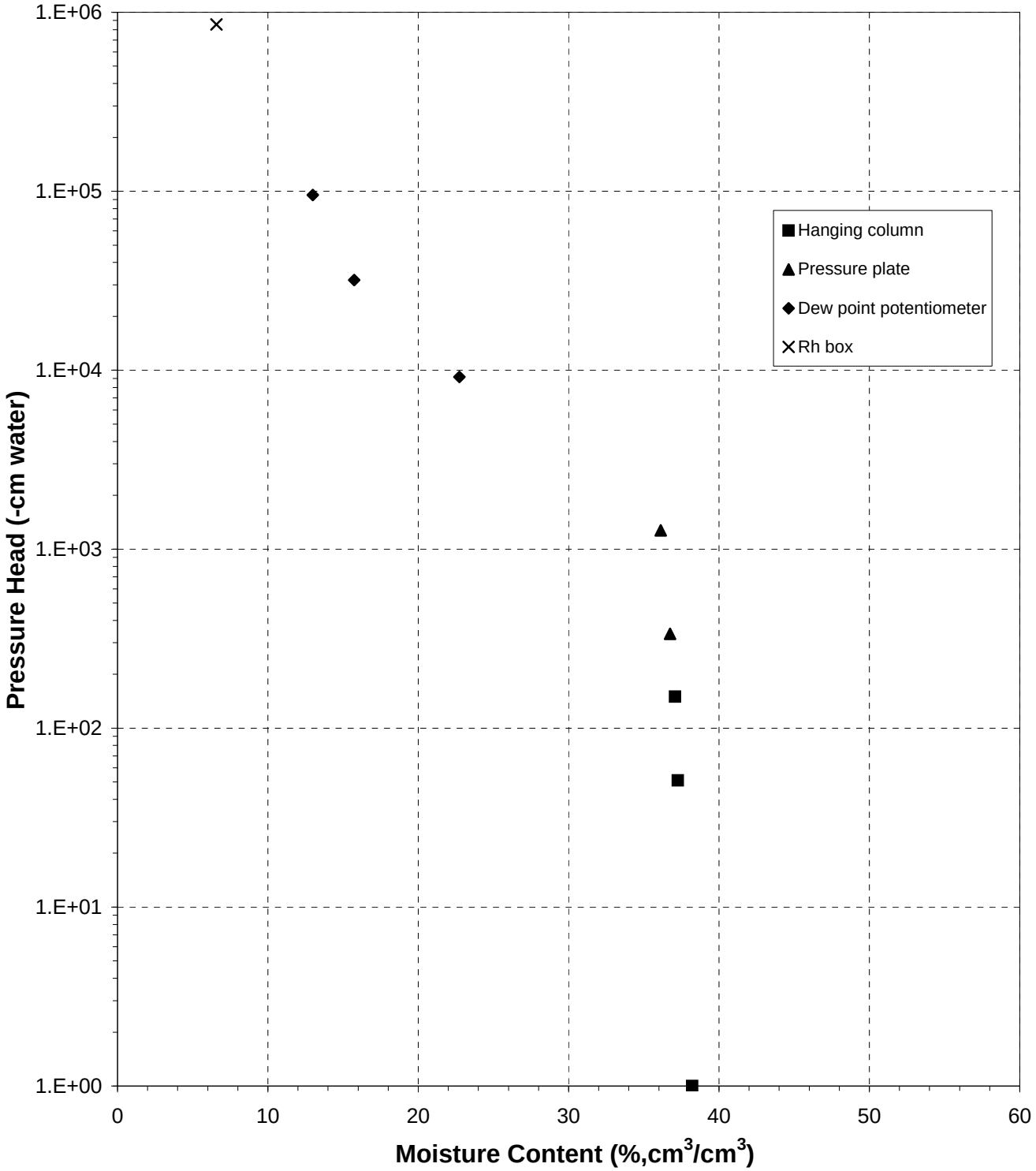
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

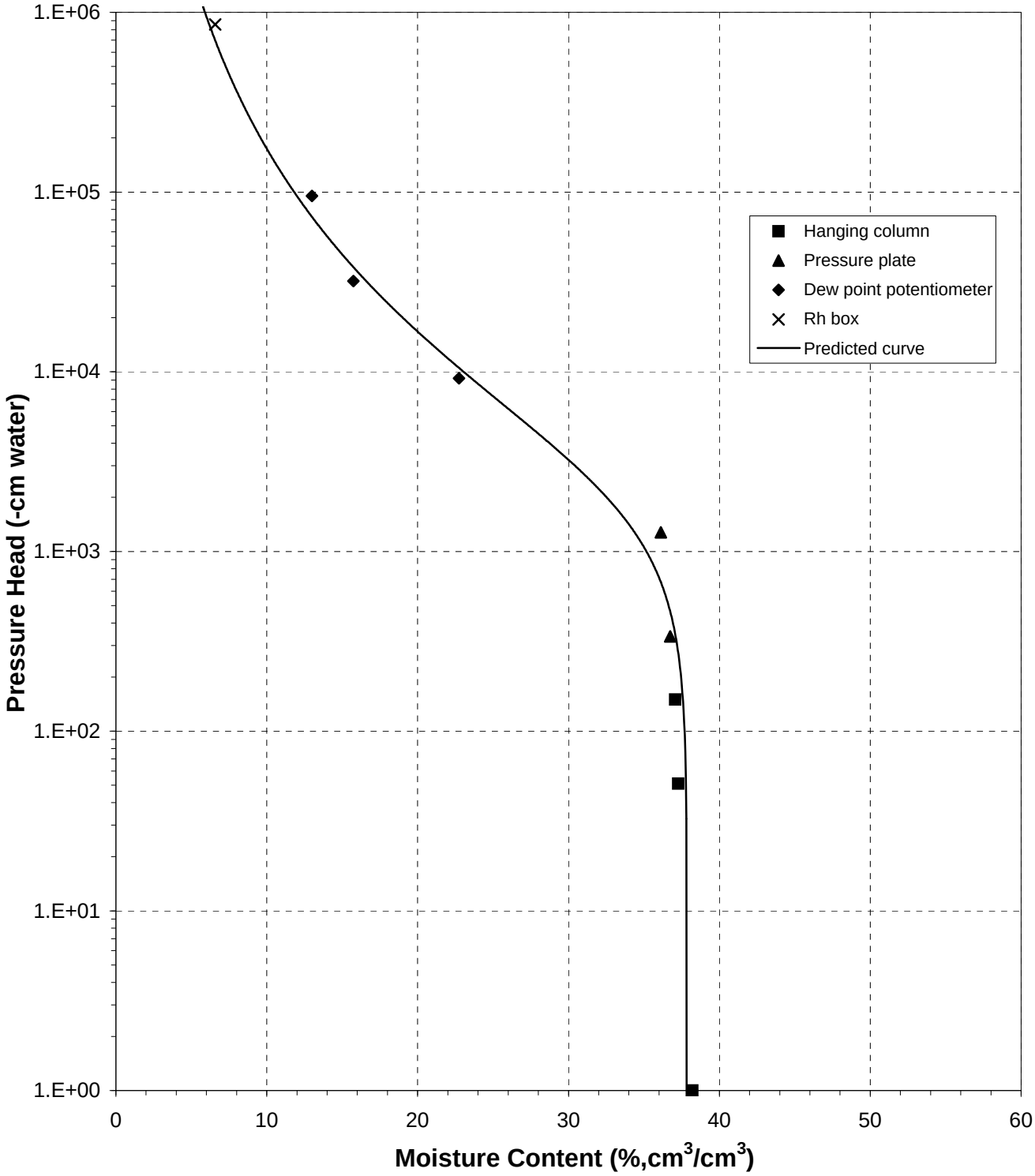
Water Retention Data Points

Sample Number: PB-11 (229-230)



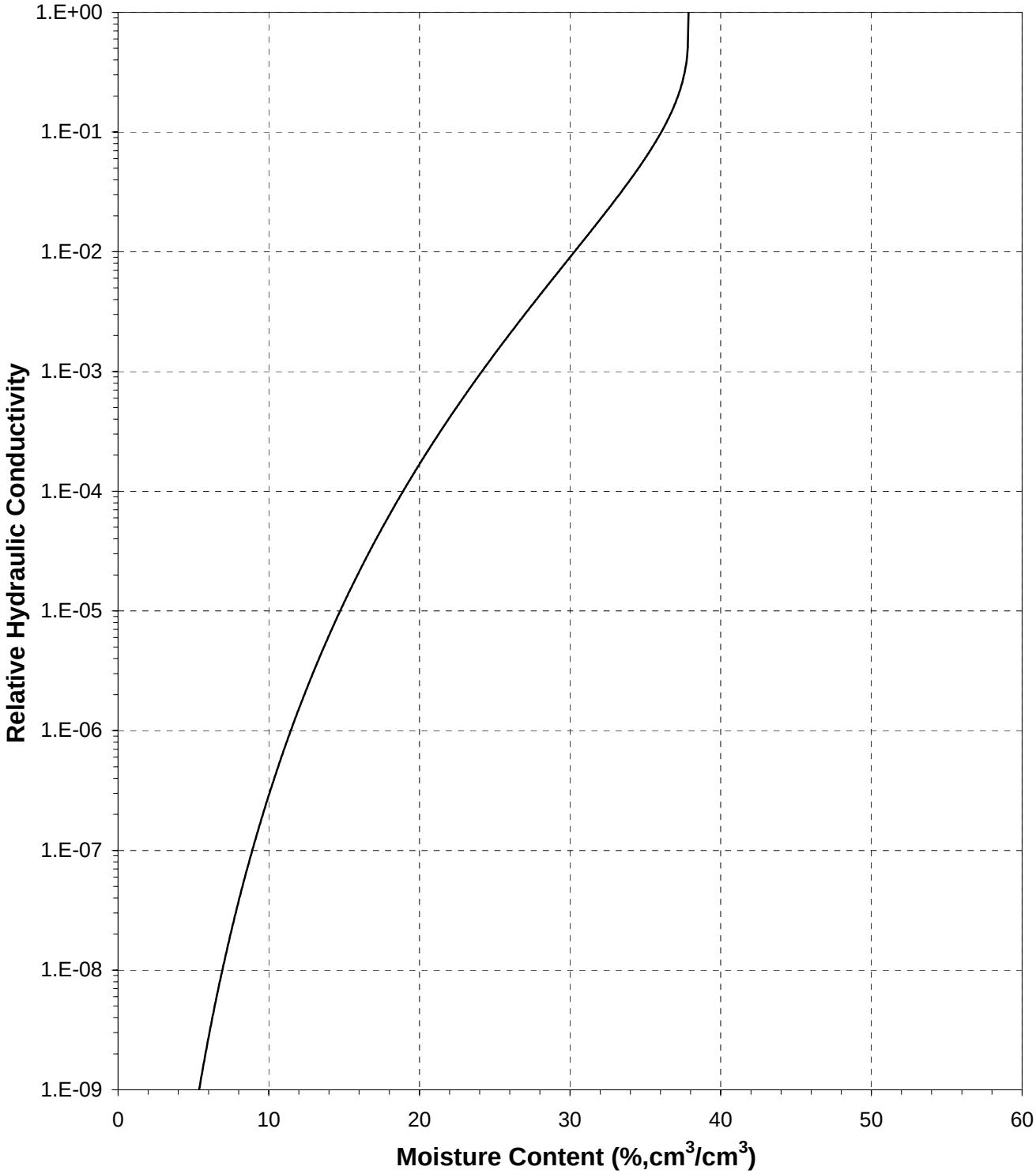
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (229-230)



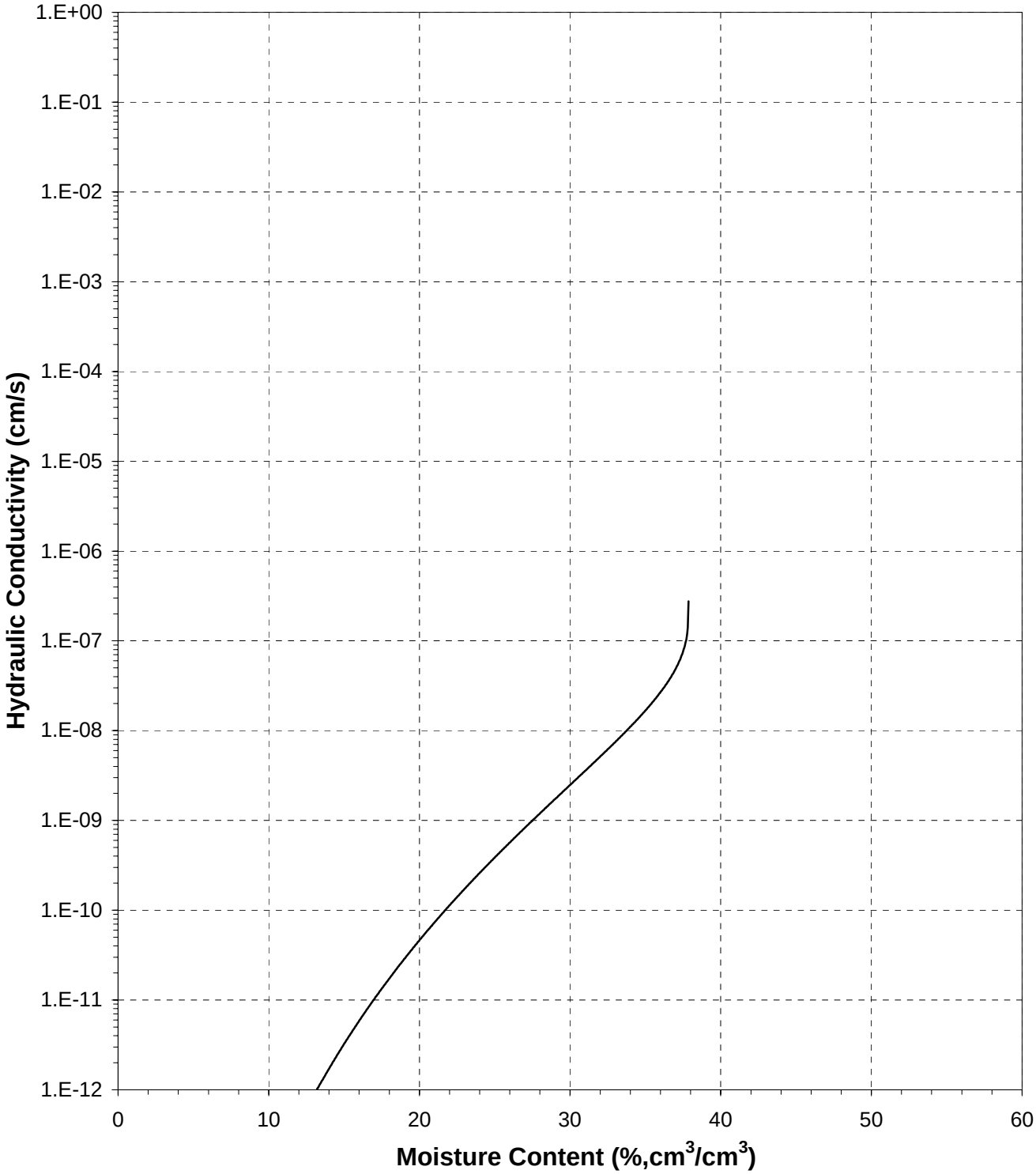
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (229-230)



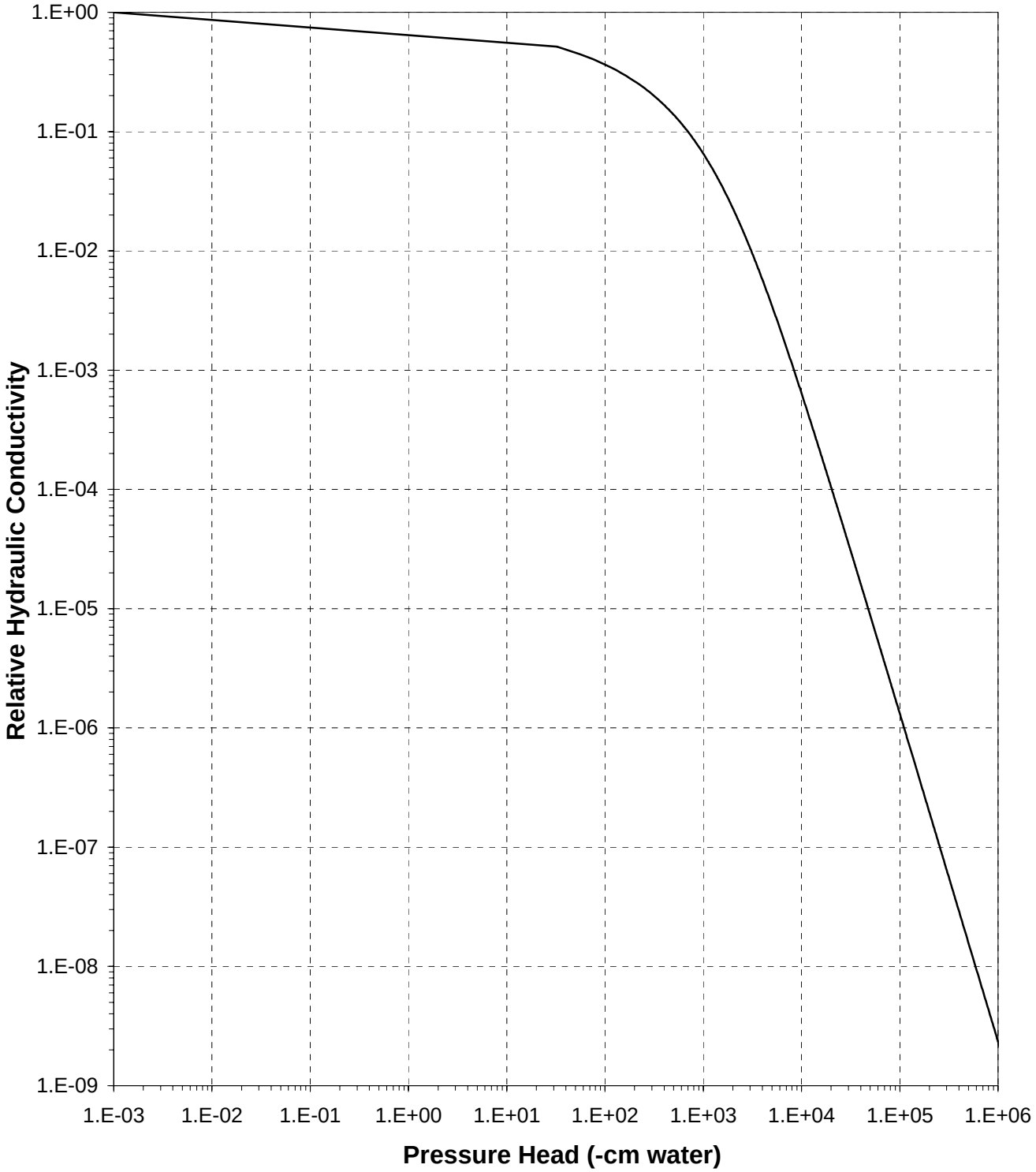
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (229-230)



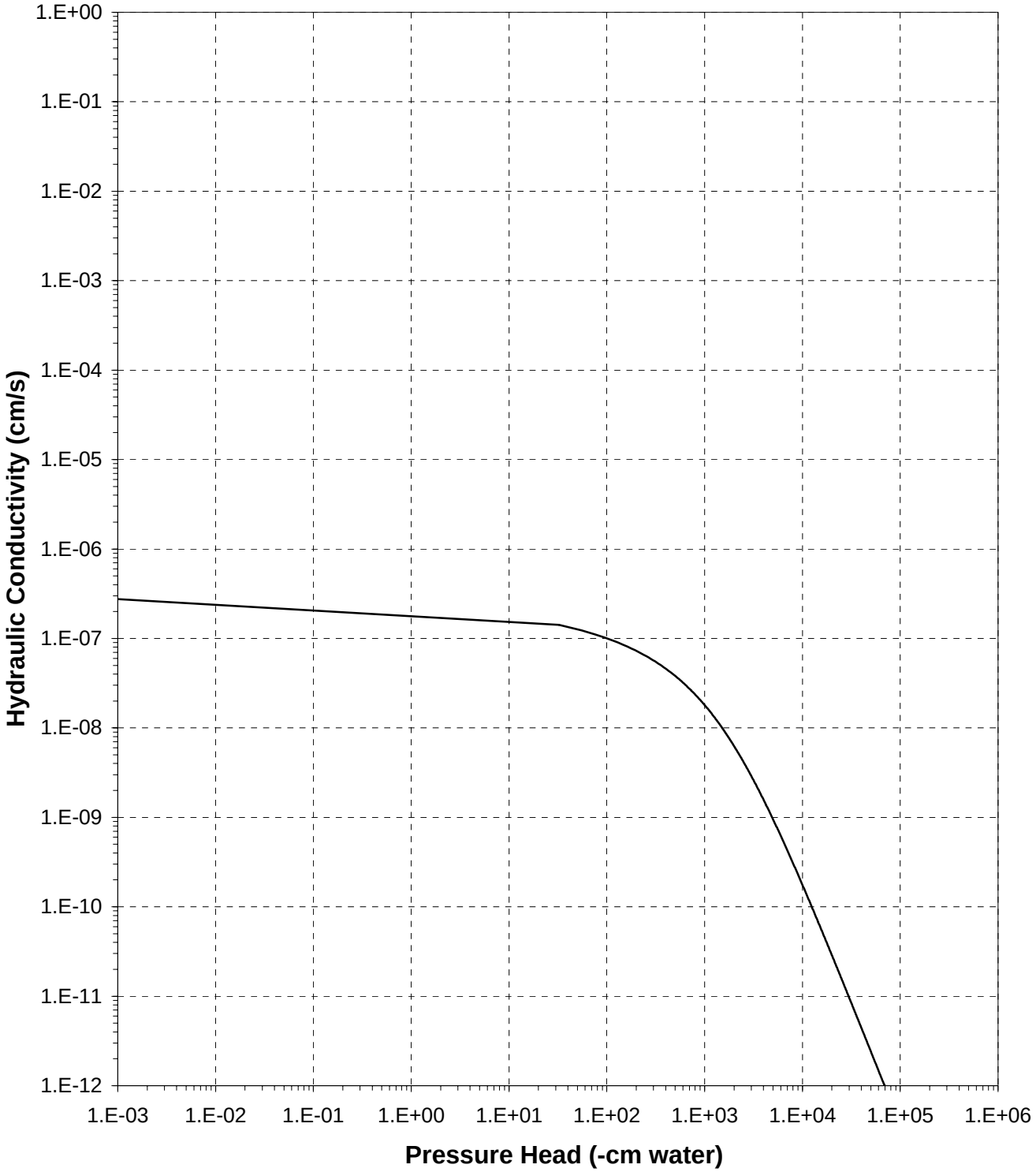
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (229-230)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (229-230)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (248-249)
Date Sampled: 12/7/2011
Depth: 248-249

Dry wt. of sample (g): 115.92
Tare wt., ring (g): 41.81
Tare wt., screen & clamp (g): 22.98
Initial sample volume (cm^3): 75.04
Initial dry bulk density (g/cm^3): 1.54
Measured particle density (g/cm^3): 2.71
Initial calculated total porosity (%): 42.95

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:50	212.94	0	42.95
	7-Feb-12	10:30	212.90	51.0	42.90
	14-Feb-12	8:15	212.77	150.0	42.72
Pressure plate:	28-Feb-12	8:15	212.65	337	42.56
	13-Mar-12	8:45	212.37	1275	42.19

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (248-249)

Initial sample bulk density (g/cm^3)*:* 1.54
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 145.80
Tare weight, jar (g)*:* 113.08

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	15:24	151.29	11524	25.92
	22-Mar-12	13:30	149.57	51704	17.80
	27-Mar-12	11:35	148.30	281057	11.80

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	11524	---	---	---	---
	51704	---	---	---	---
	281057	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 68.47
Tare weight (g)*:* 38.82

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	6-Mar-12	9:30	70.09	855592	8.46

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

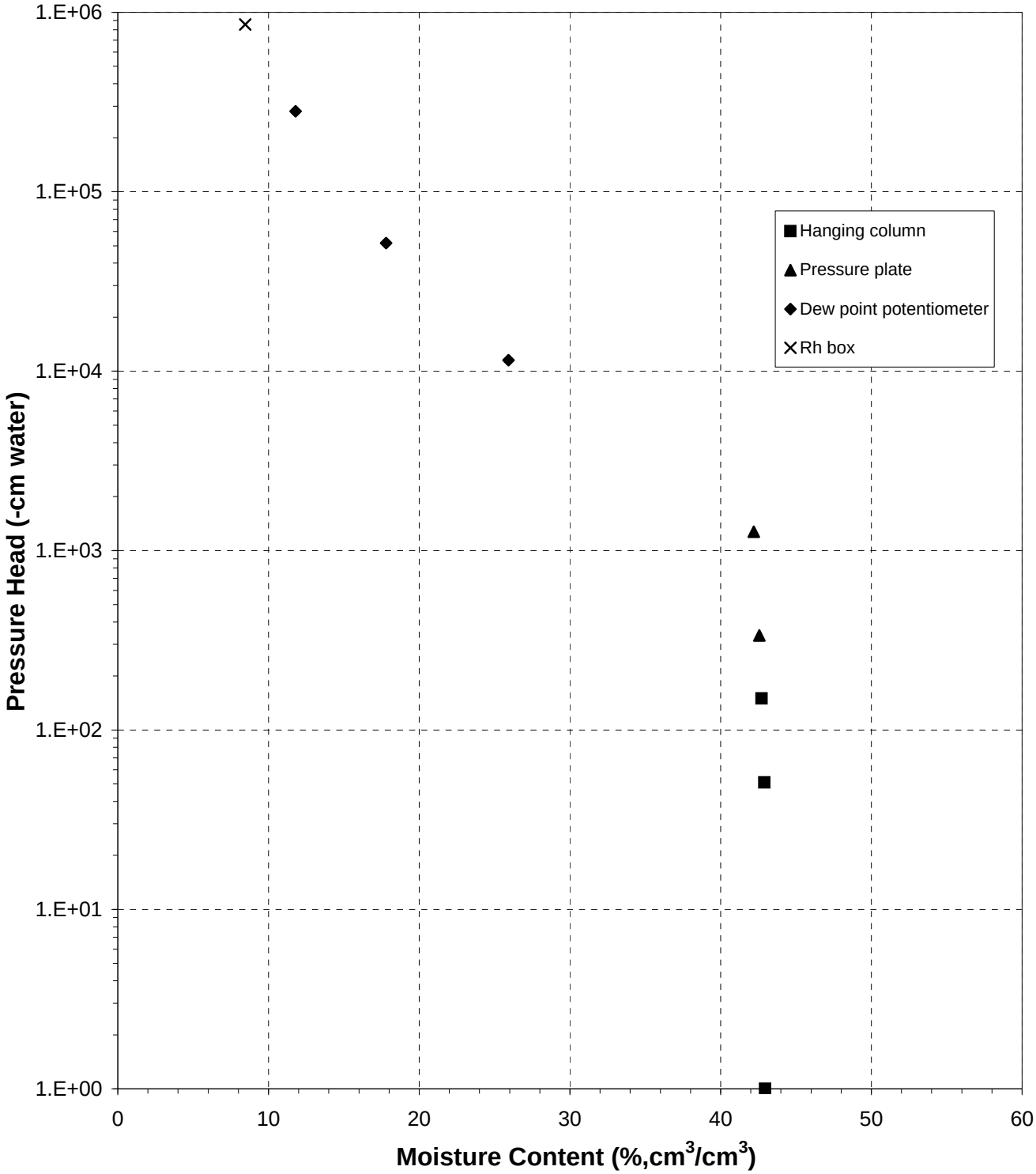
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

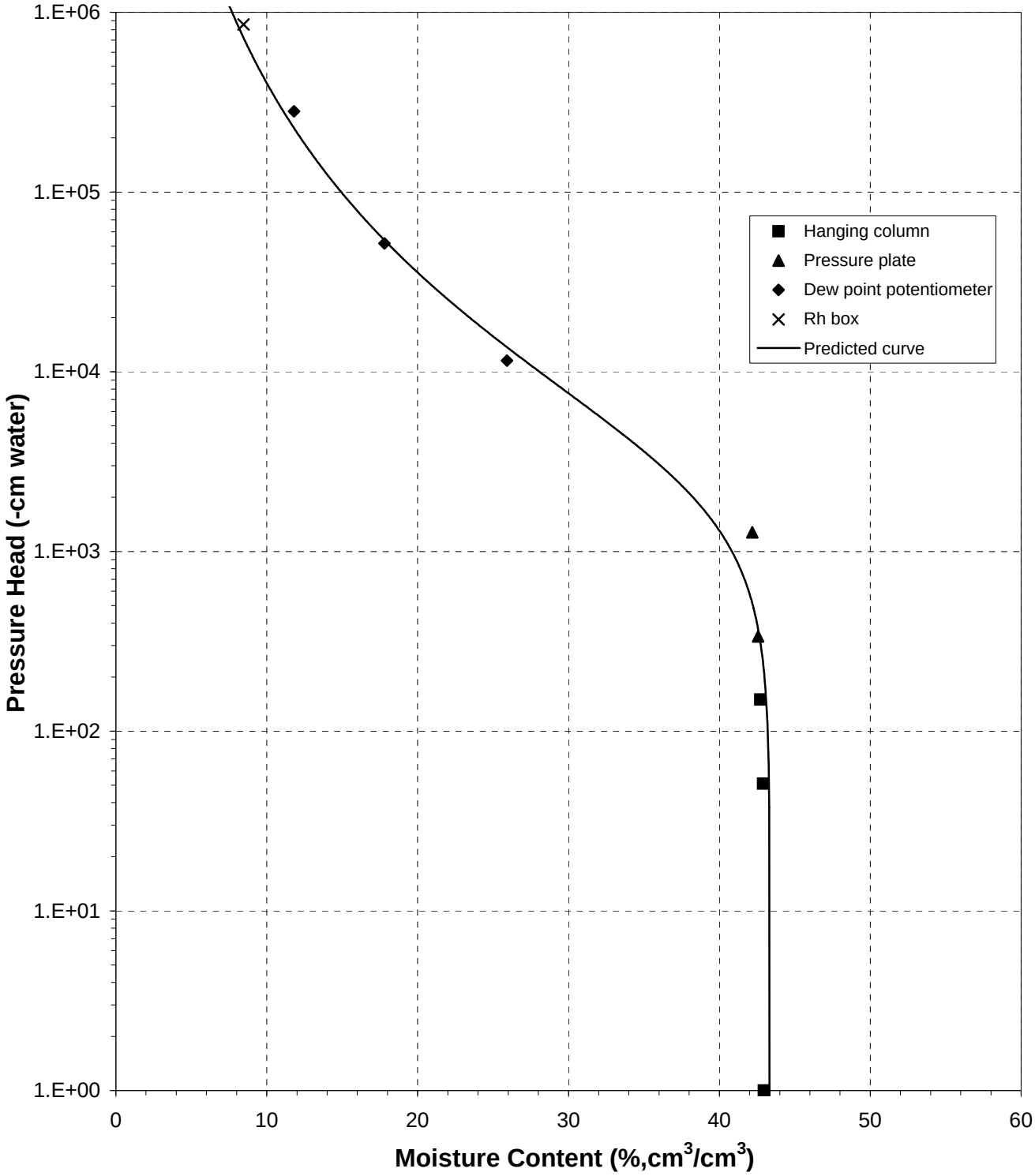
Water Retention Data Points

Sample Number: PB-11 (248-249)



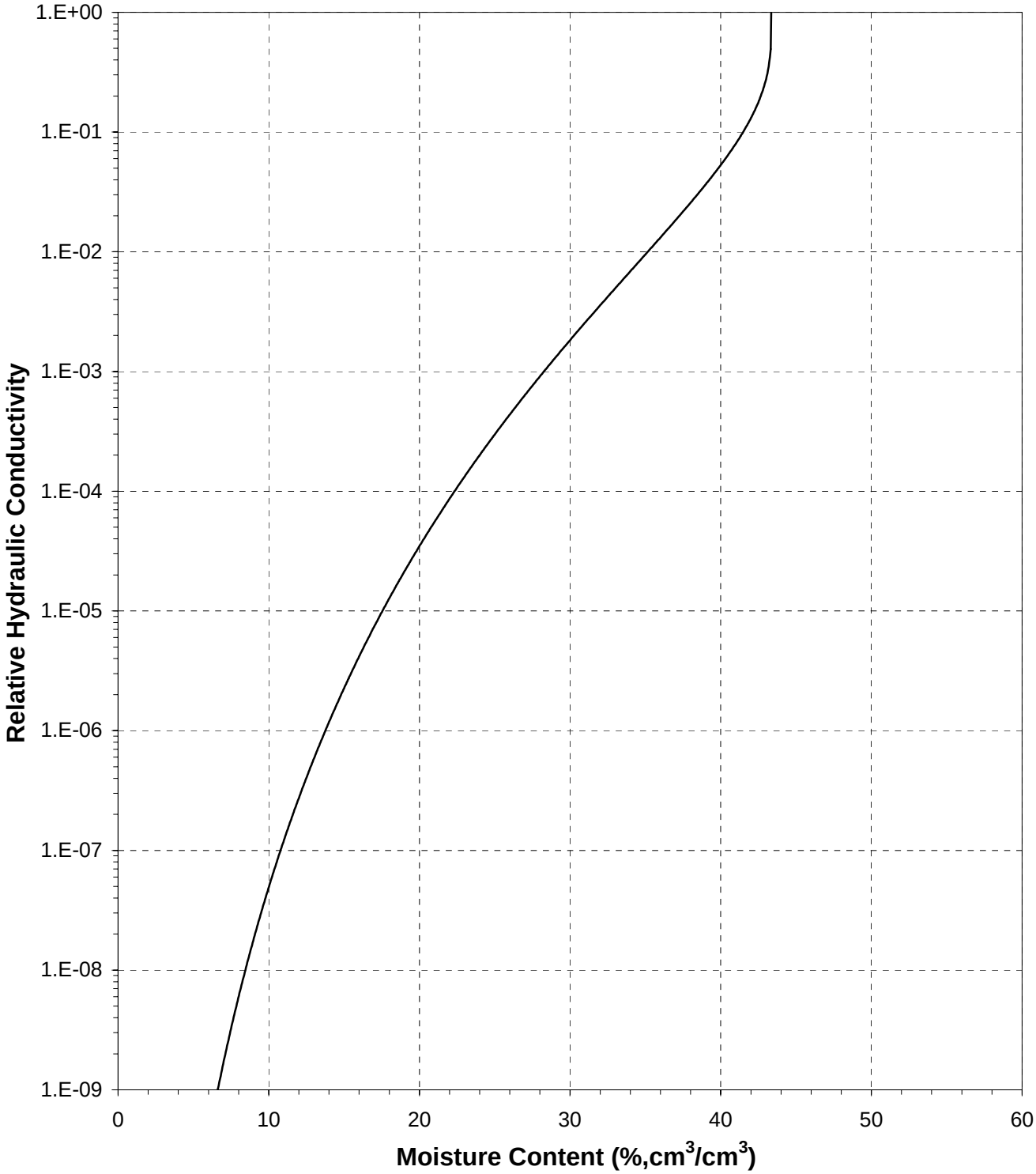
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (248-249)



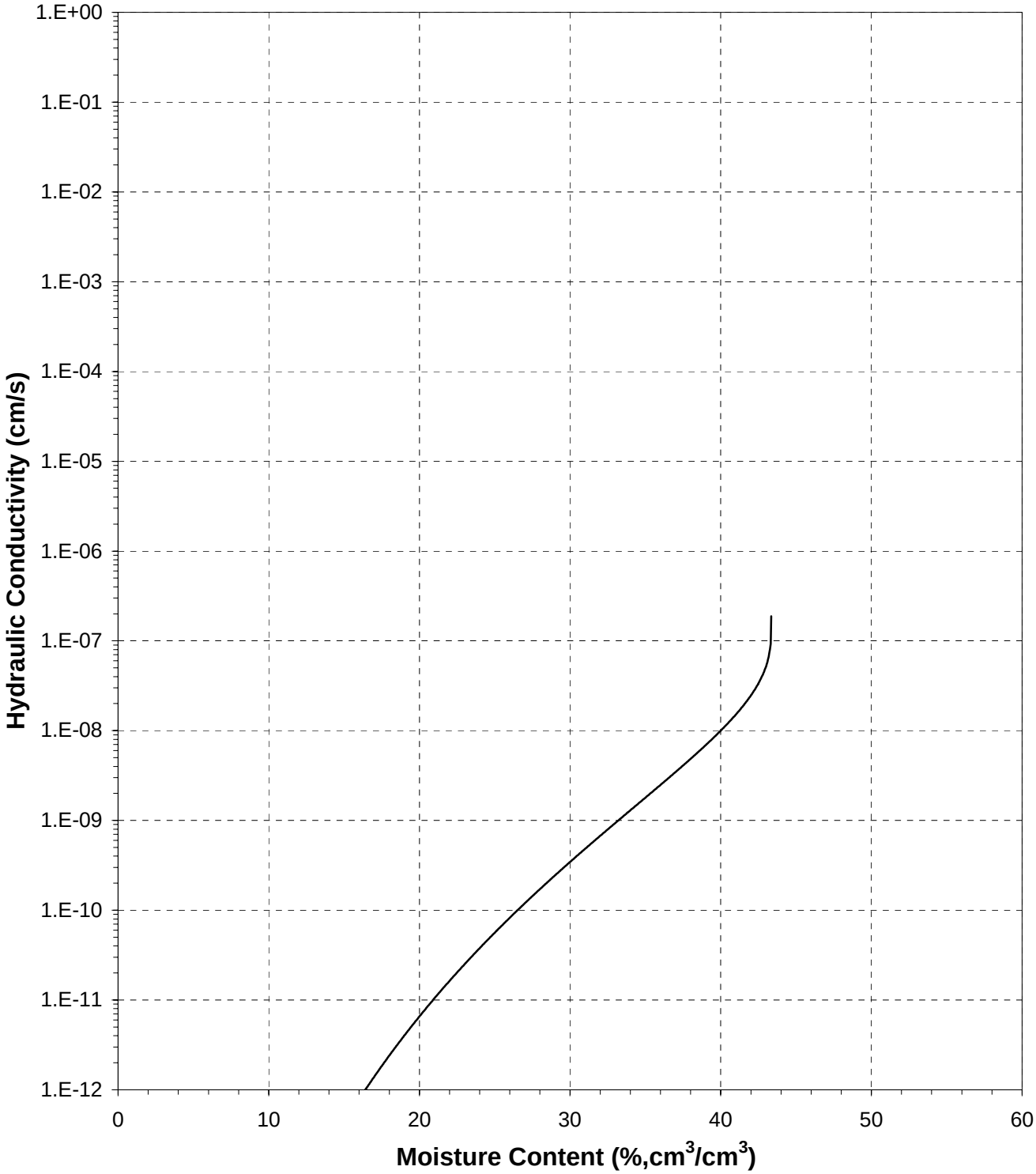
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (248-249)



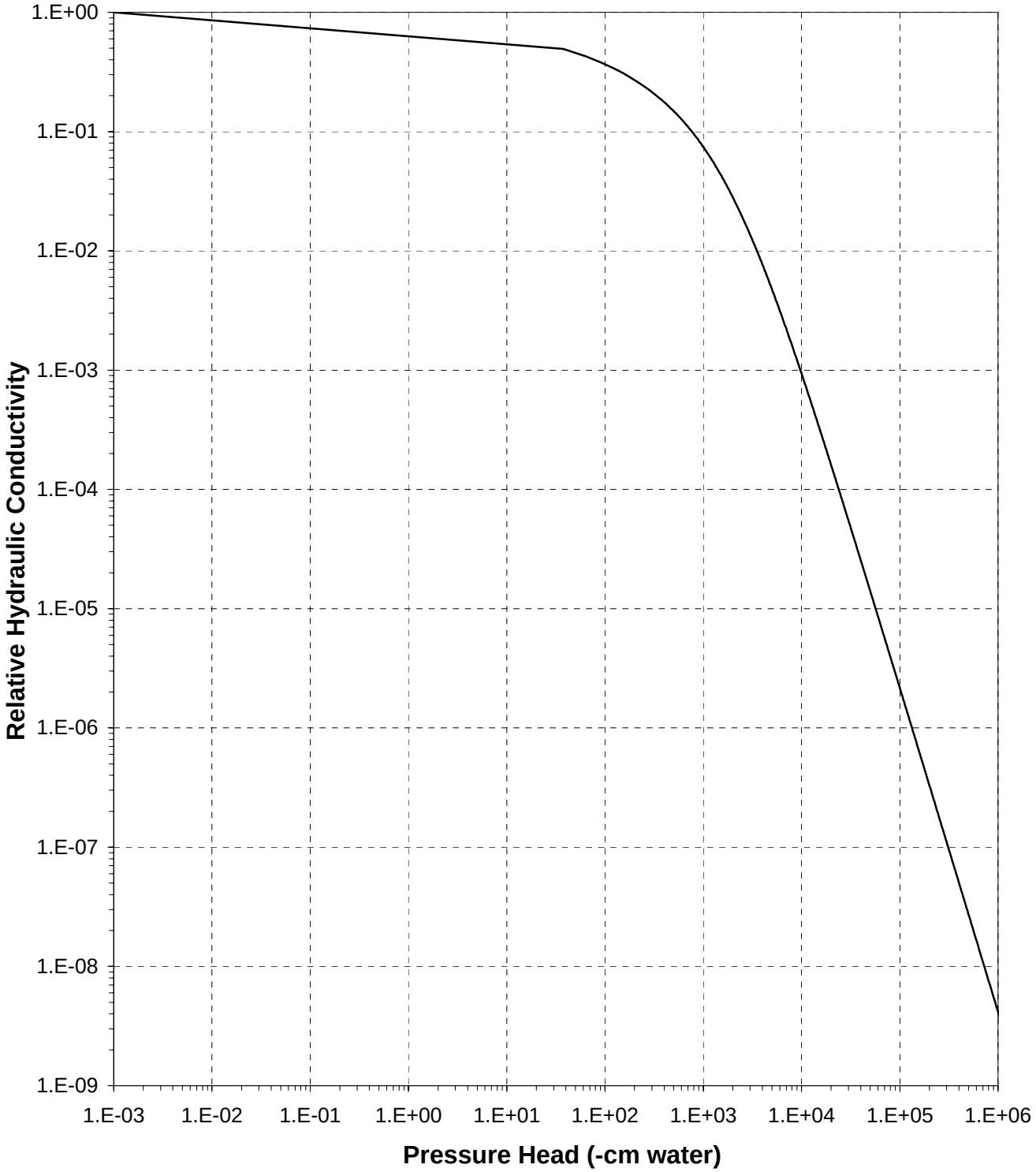
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (248-249)



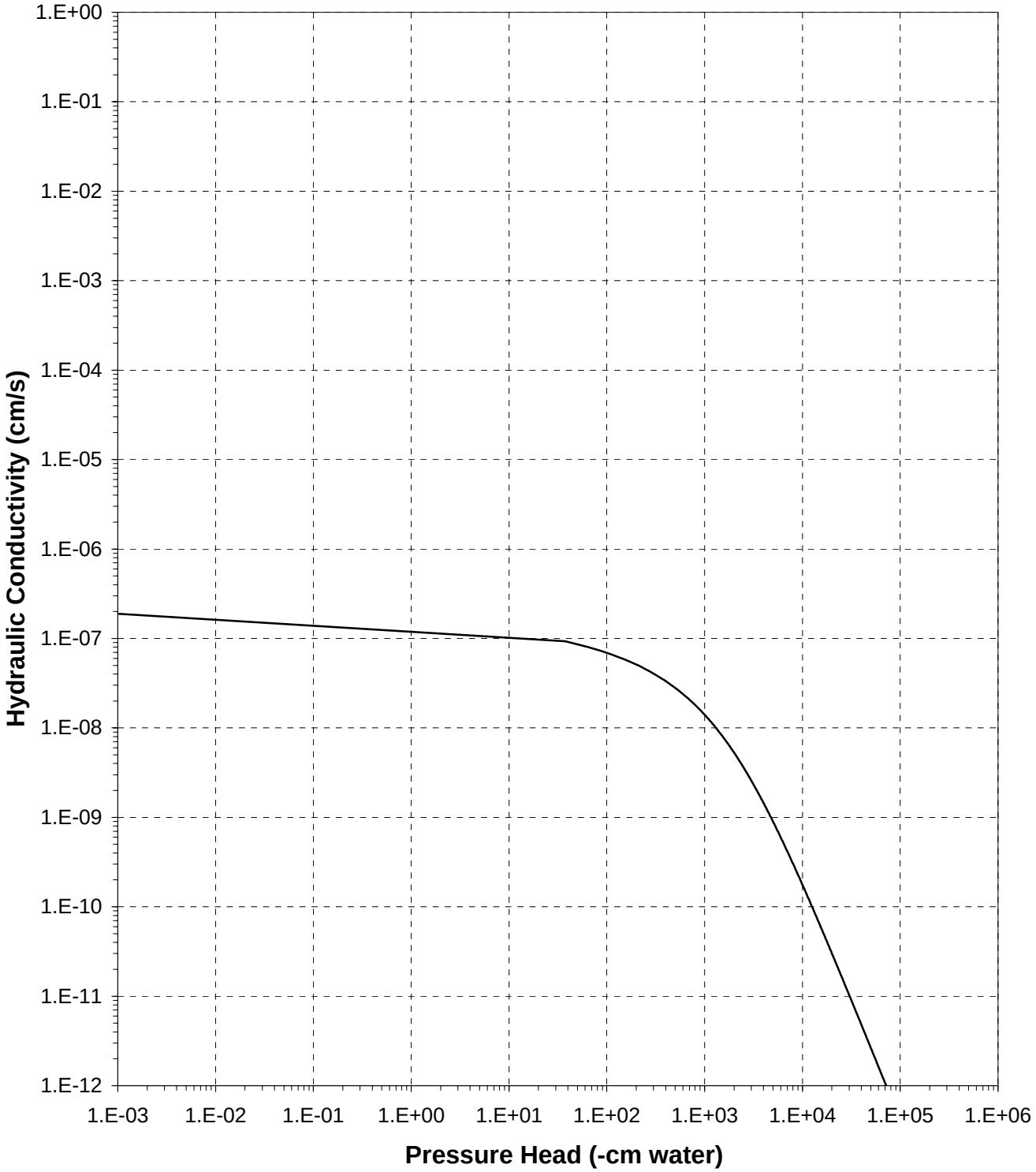
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (248-249)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (248-249)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (274-275)
Date Sampled: 12/7/2011
Depth: 274-275

Dry wt. of sample (g): 127.29
Tare wt., ring (g): 43.65
Tare wt., screen & clamp (g): 27.80
Initial sample volume (cm^3): 80.00
Initial dry bulk density (g/cm^3): 1.59
Measured particle density (g/cm^3): 2.69
Initial calculated total porosity (%): 40.80

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	18-Jan-12	12:45	231.38	0	40.80
	25-Jan-12	12:10	231.13	22.0	40.49
	1-Feb-12	12:20	230.58	72.0	39.80
	8-Feb-12	9:20	229.75	153.0	38.76
Pressure plate:	18-Feb-12	8:45	229.52	337	38.48

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	22.0	---	---	---	---
	72.0	---	---	---	---
	153.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (274-275)

Initial sample bulk density (g/cm^3)*:* 1.59
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 151.52
Tare weight, jar (g)*:* 117.19

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	22-Mar-12	12:11	156.01	16113	20.81
	21-Mar-12	13:50	155.08	39262	16.50
	21-Mar-12	12:06	154.10	115135	11.96

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	16113	---	---	---	---
	39262	---	---	---	---
	115135	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 73.88
Tare weight (g)*:* 41.71

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	2-Mar-12	8:30	75.25	854159	6.76

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

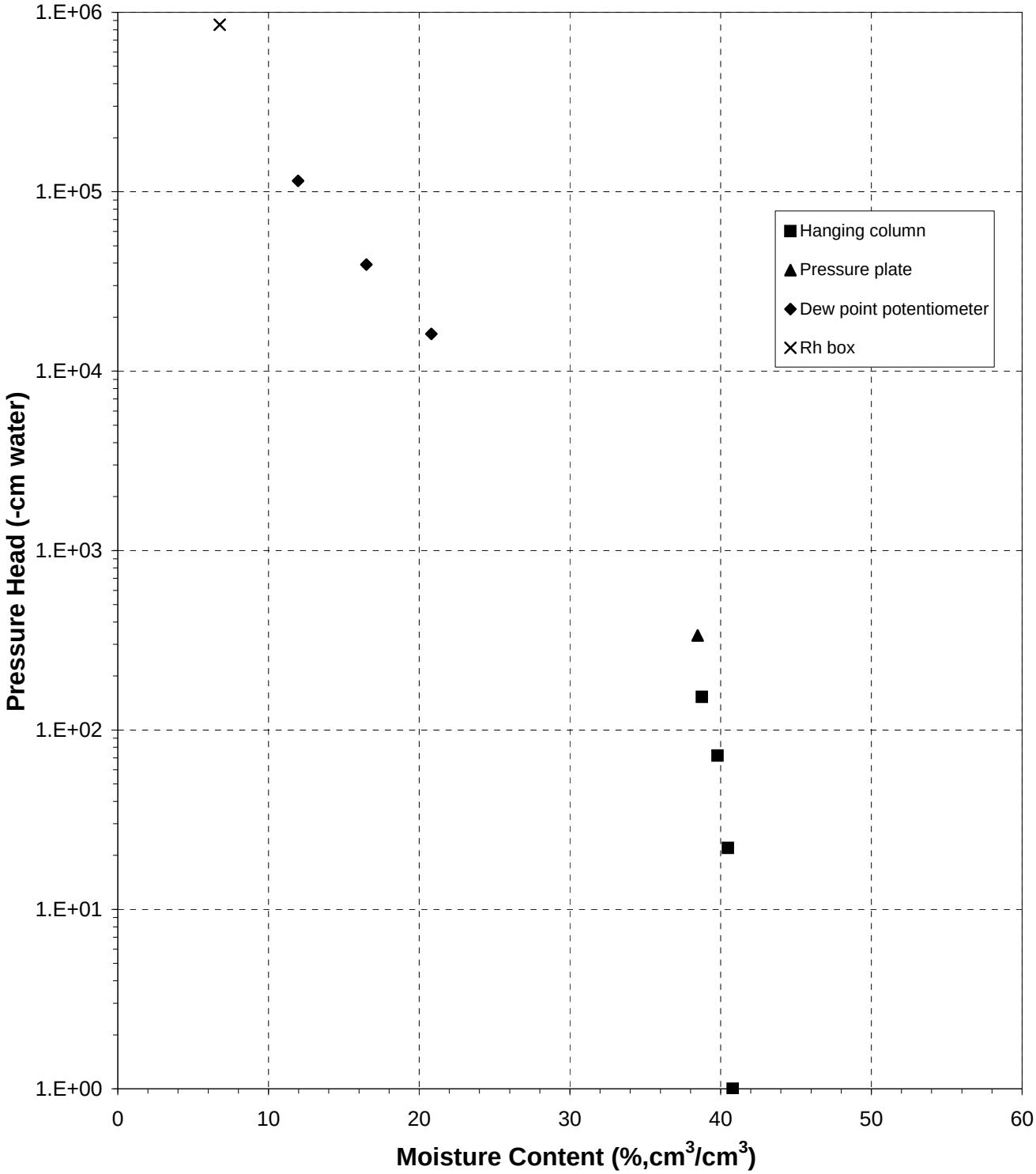
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

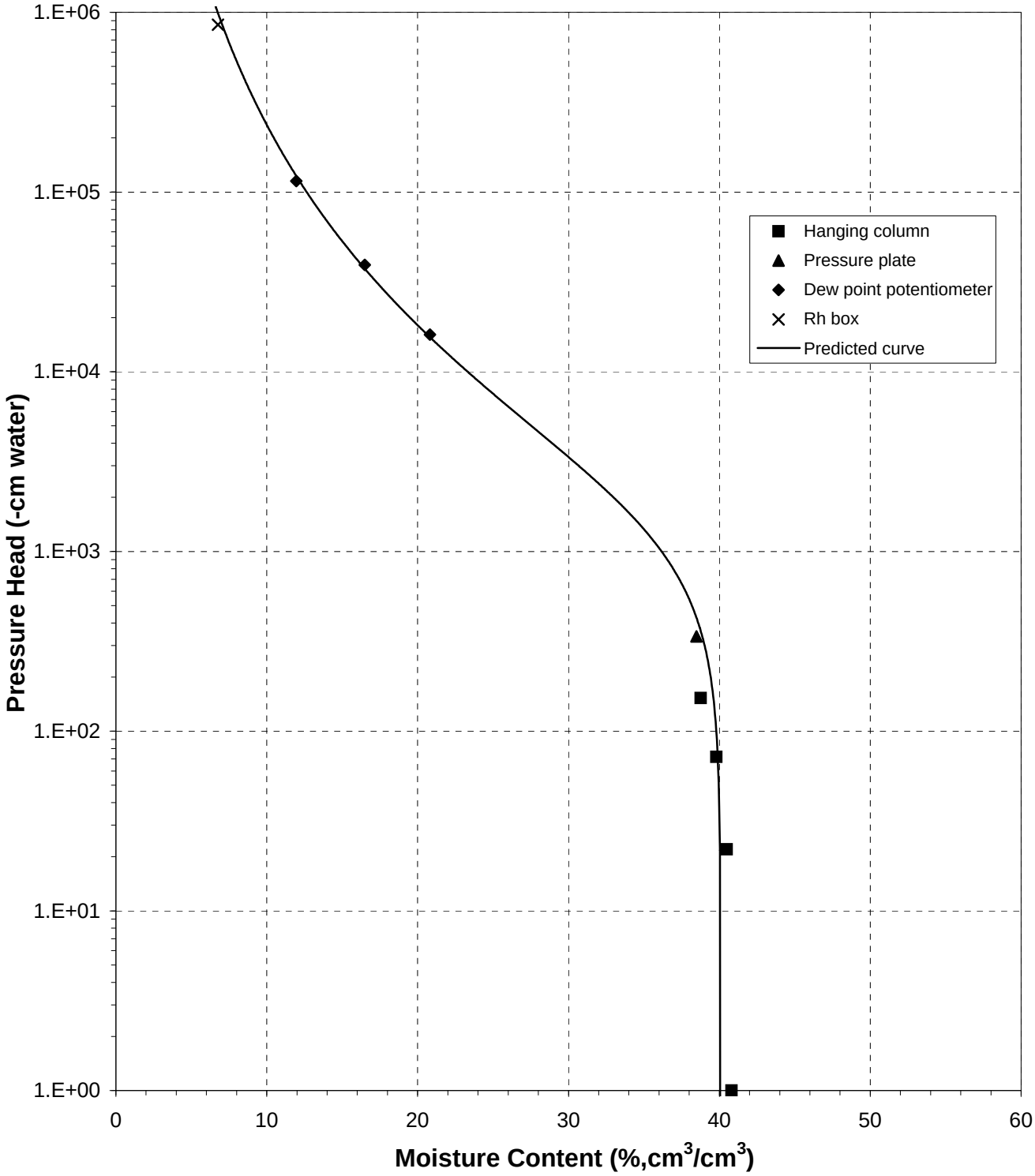
Water Retention Data Points

Sample Number: PB-11 (274-275)



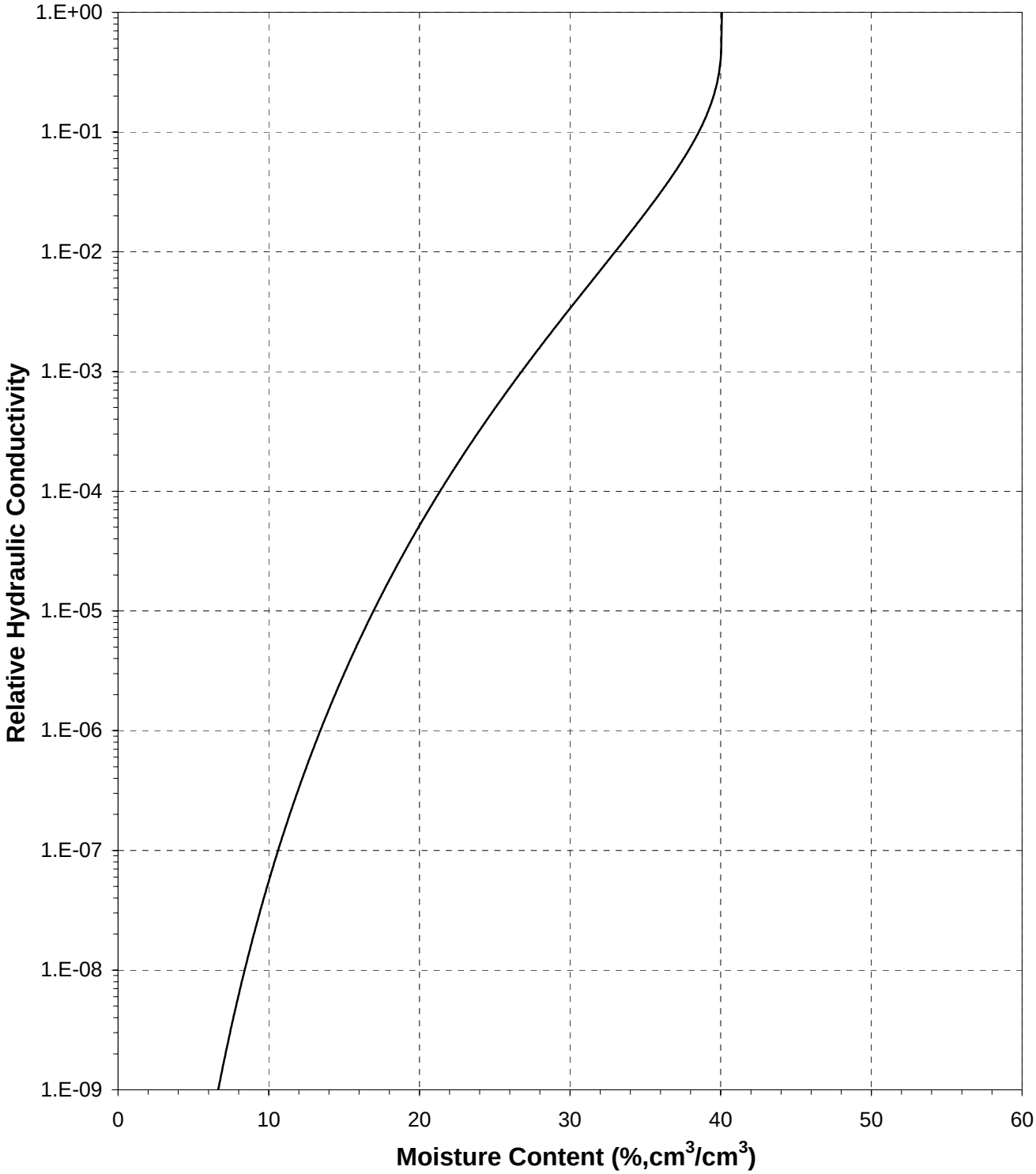
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (274-275)



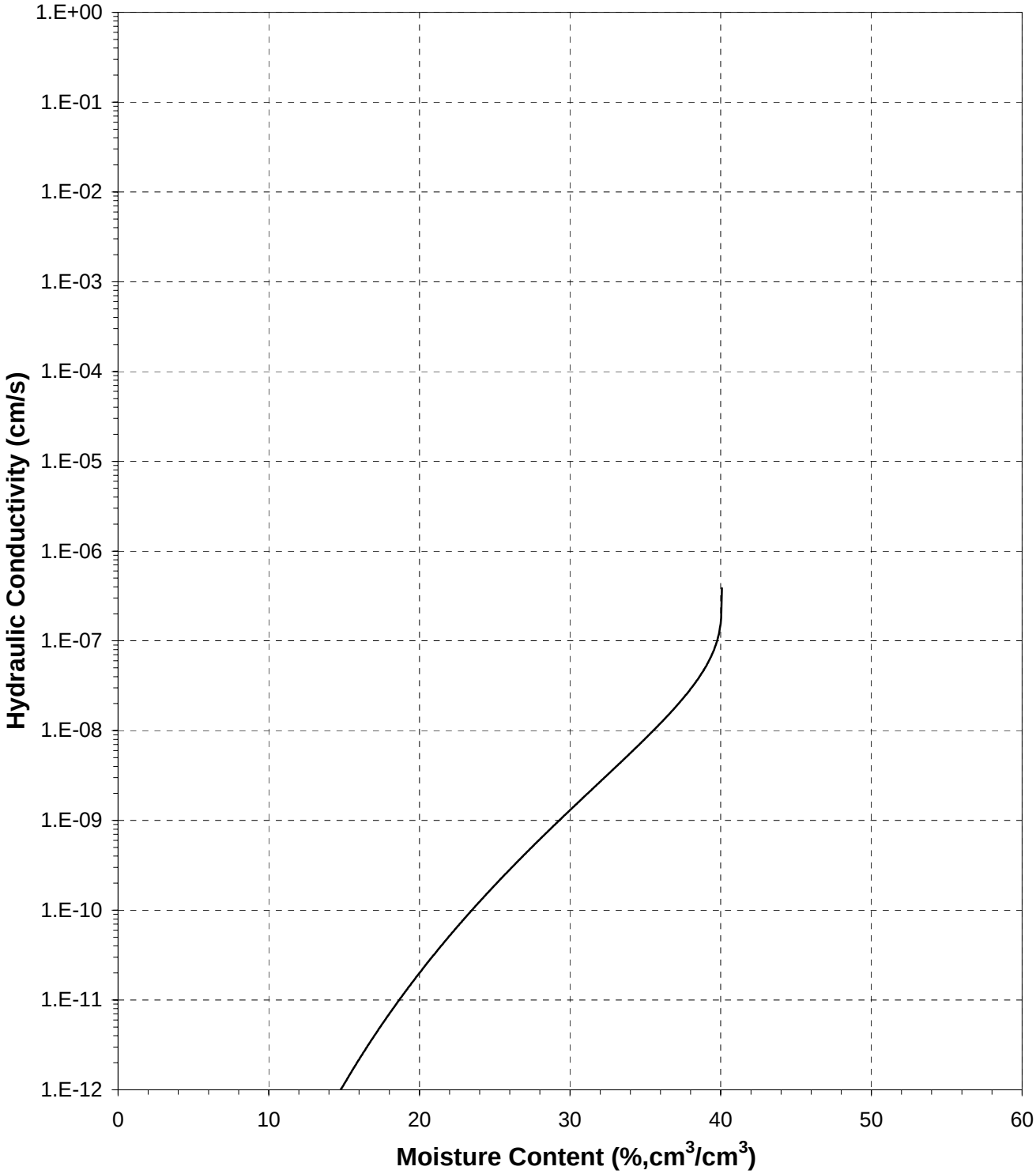
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (274-275)



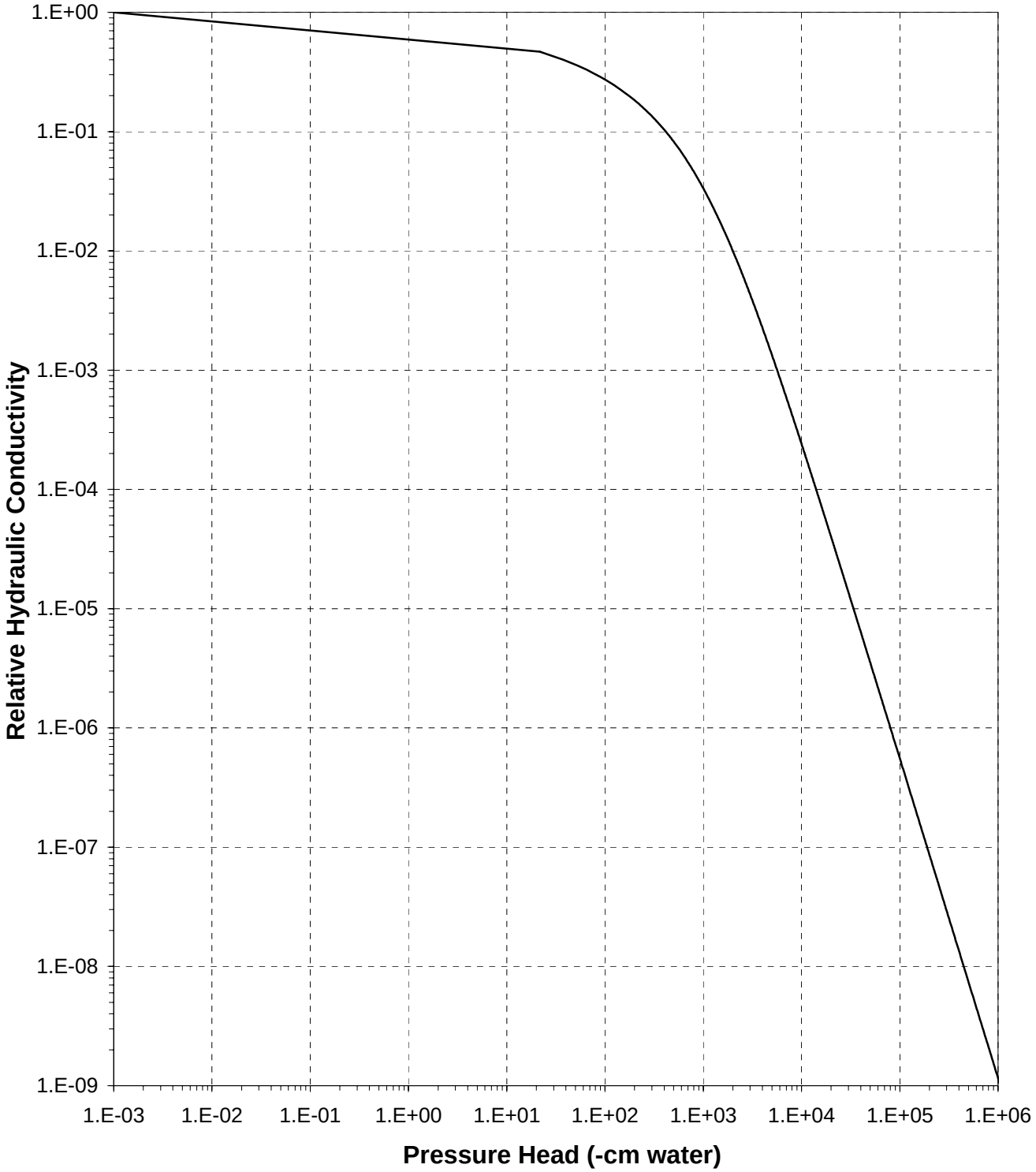
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (274-275)



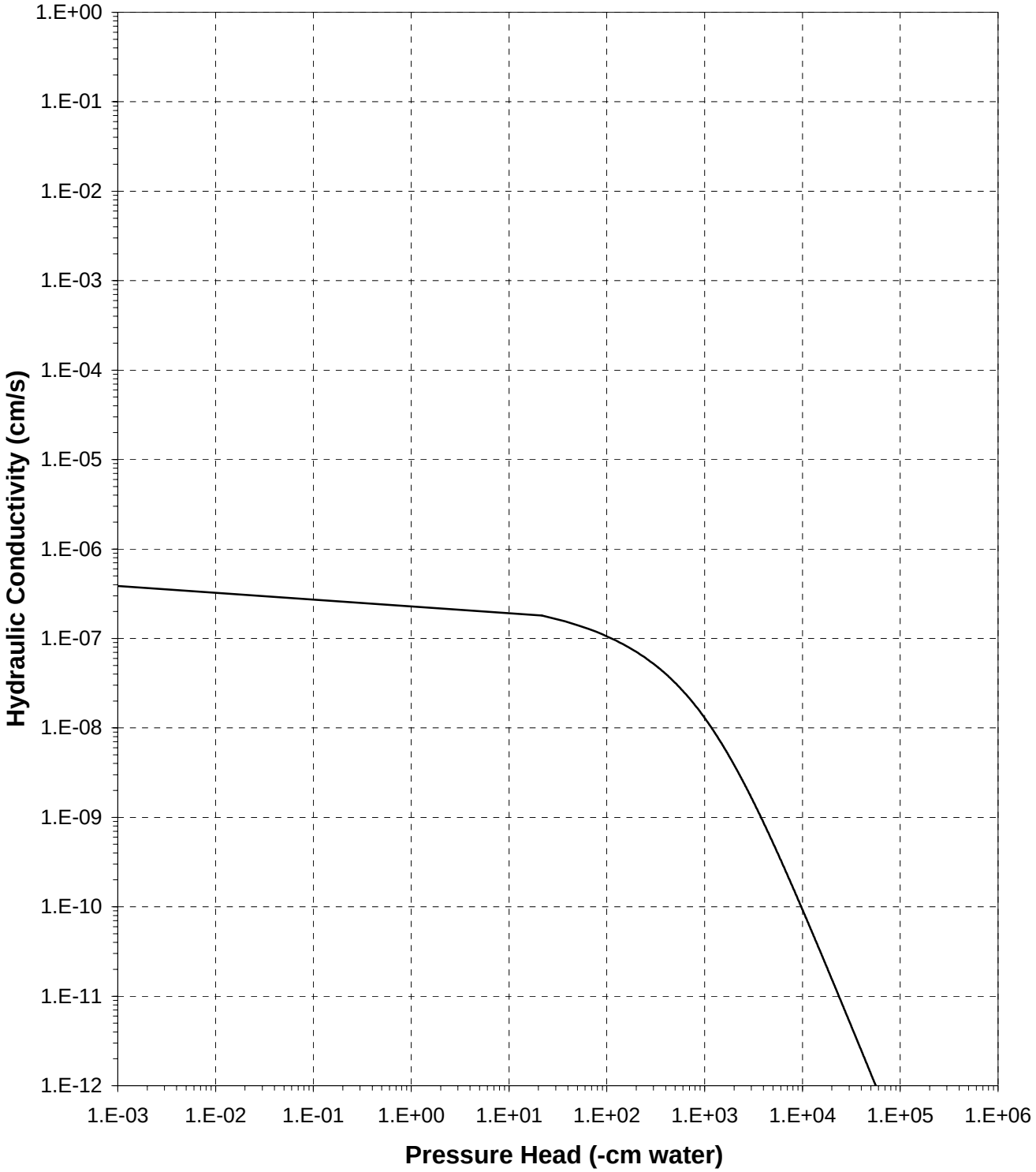
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (274-275)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (274-275)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (294-295)
Date Sampled: 12/7/2011
Depth: 294-295

Dry wt. of sample (g): 183.13
Tare wt., ring (g): 51.86
Tare wt., screen & clamp (g): 24.18
Initial sample volume (cm^3): 117.87
Initial dry bulk density (g/cm^3): 1.55
Measured particle density (g/cm^3): 2.68
Initial calculated total porosity (%): 42.01

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	13-Mar-12	13:10	308.69	0	42.01
	20-Feb-12	11:15	308.06	51.0	41.48
	22-Feb-12	9:35	307.97	152.0	41.40
Pressure plate:	13-Mar-12	13:15	307.70	337	41.17
	27-Mar-12	8:25	307.27	1275	40.81

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	152.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (294-295)

Initial sample bulk density (g/cm^3)*:* 1.55
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 152.19
Tare weight, jar (g)*:* 113.27

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	15:07	158.93	11116	26.91
	22-Mar-12	12:19	156.53	32736	17.33
	21-Mar-12	16:11	155.42	83930	12.89

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	11116	---	---	---	---
	32736	---	---	---	---
	83930	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 62.47
Tare weight (g)*:* 31.75

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	10-Apr-12	8:25	63.98	855592	7.62

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

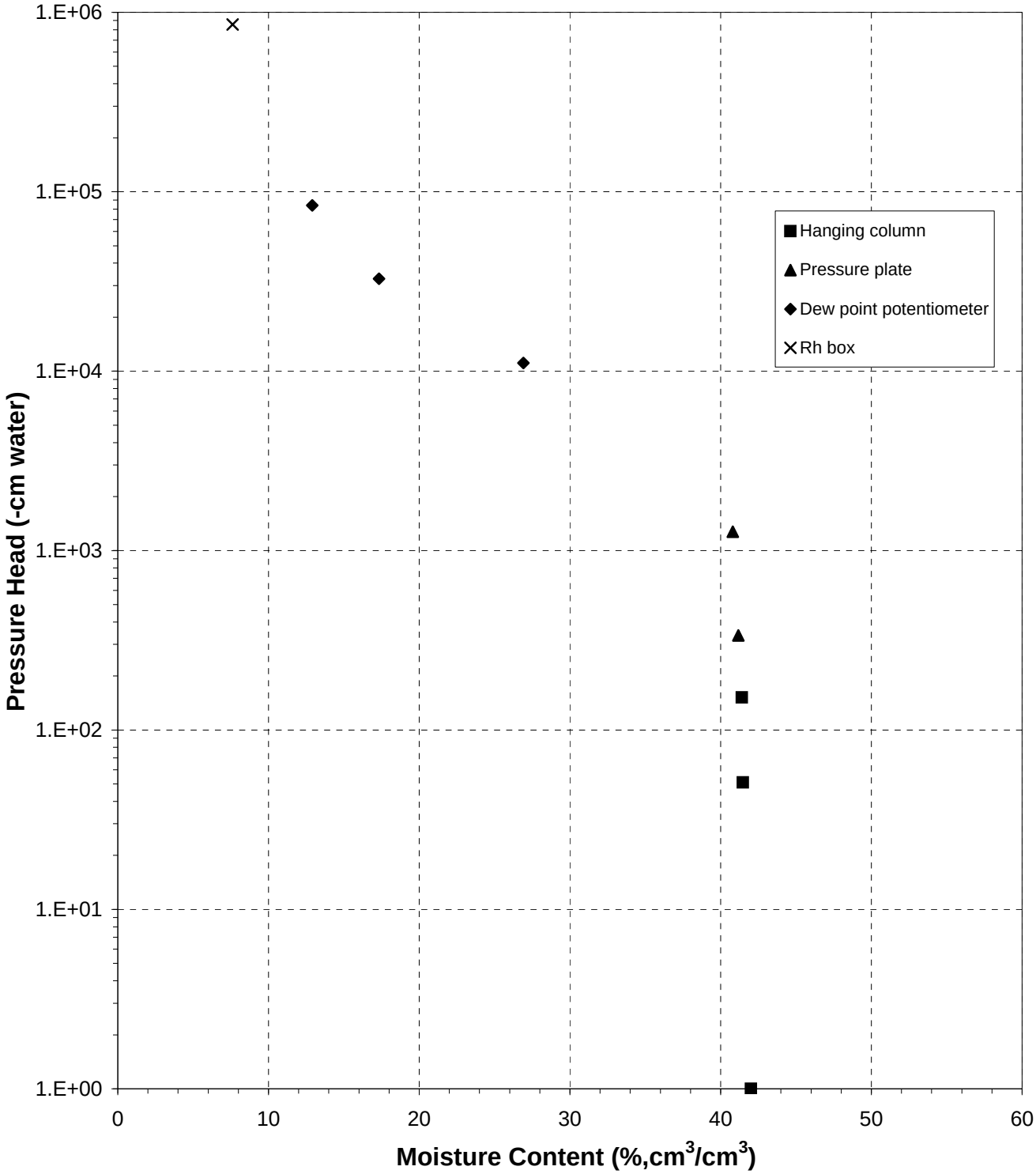
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

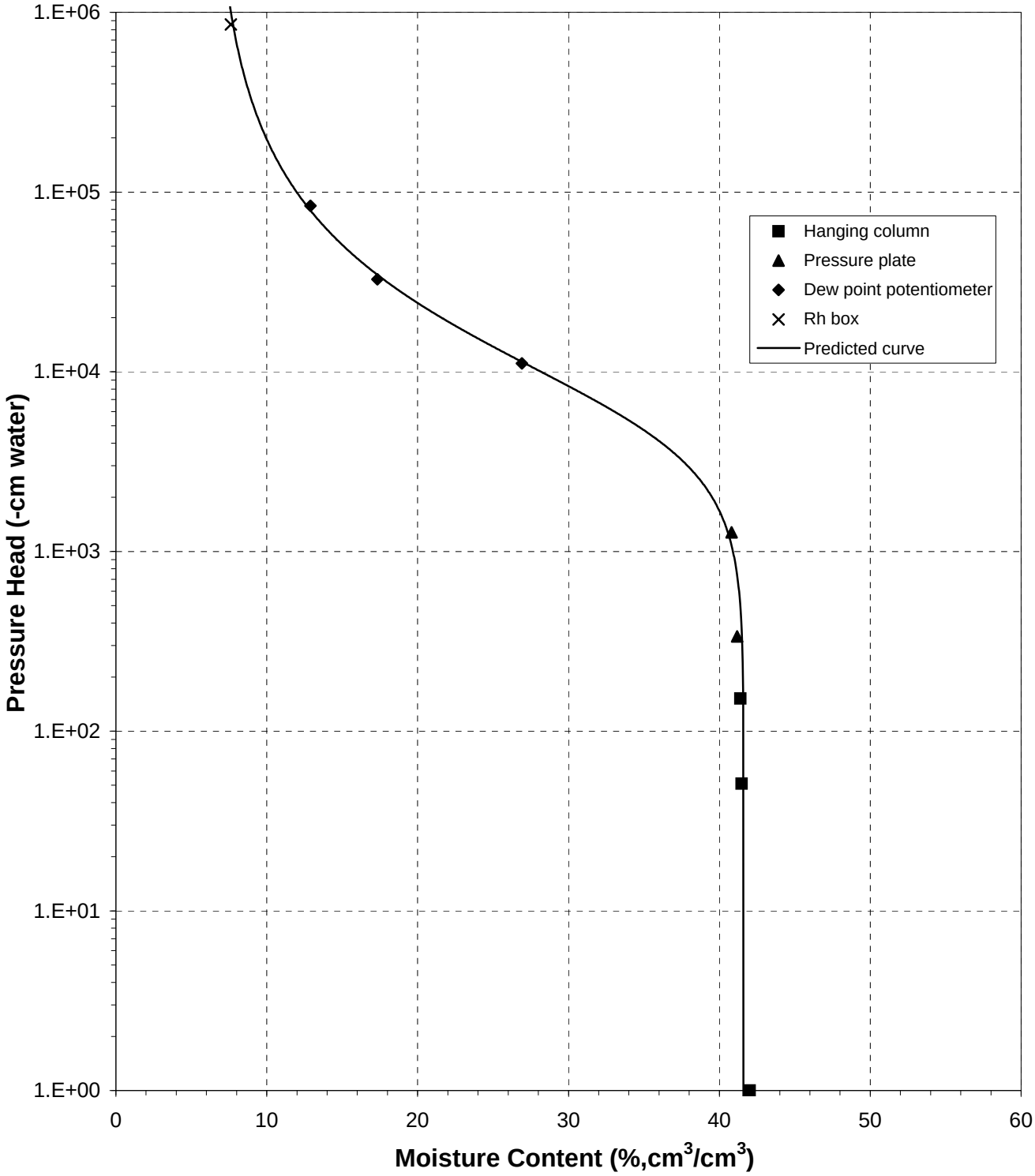
Water Retention Data Points

Sample Number: PB-11 (294-295)



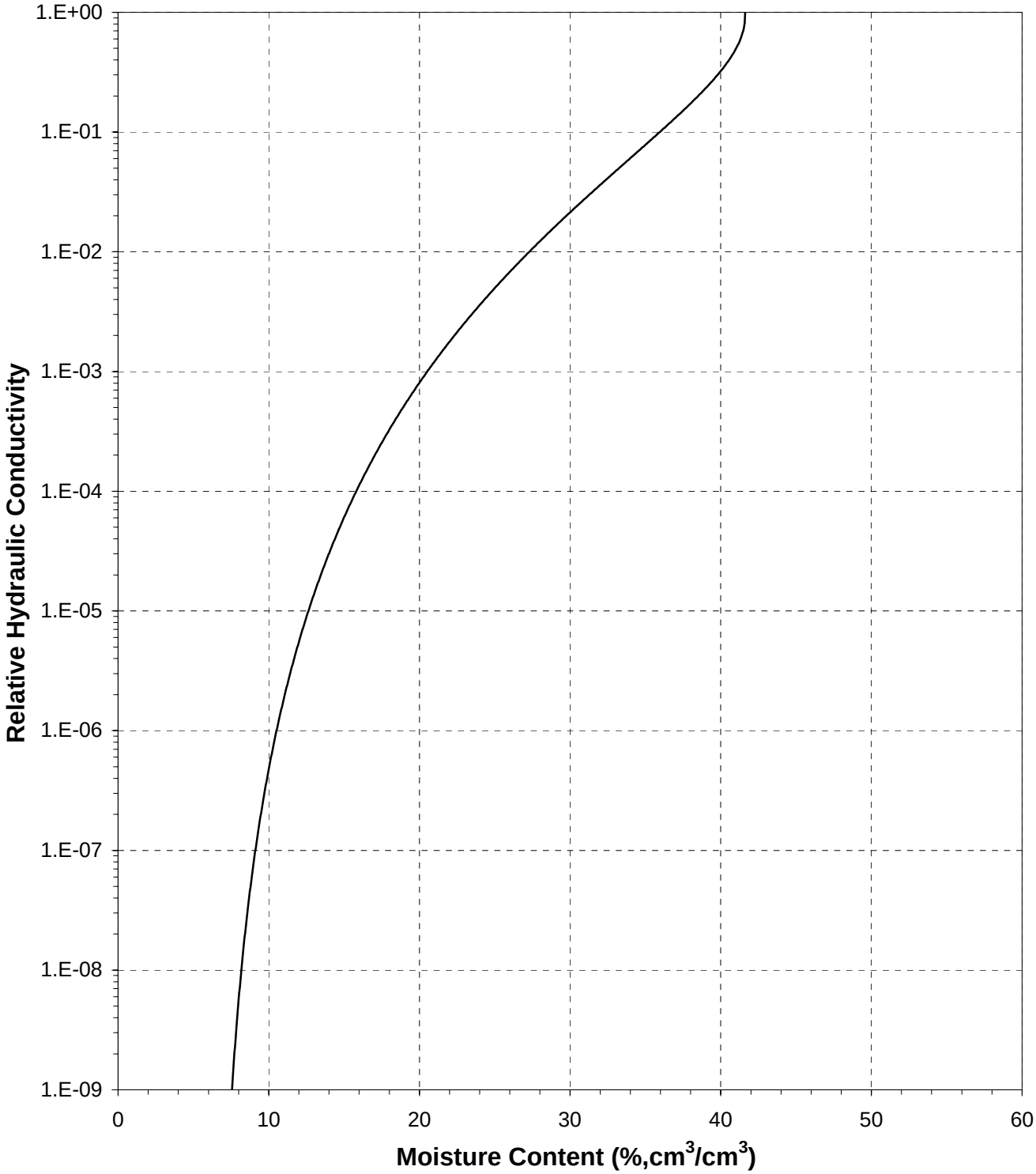
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (294-295)



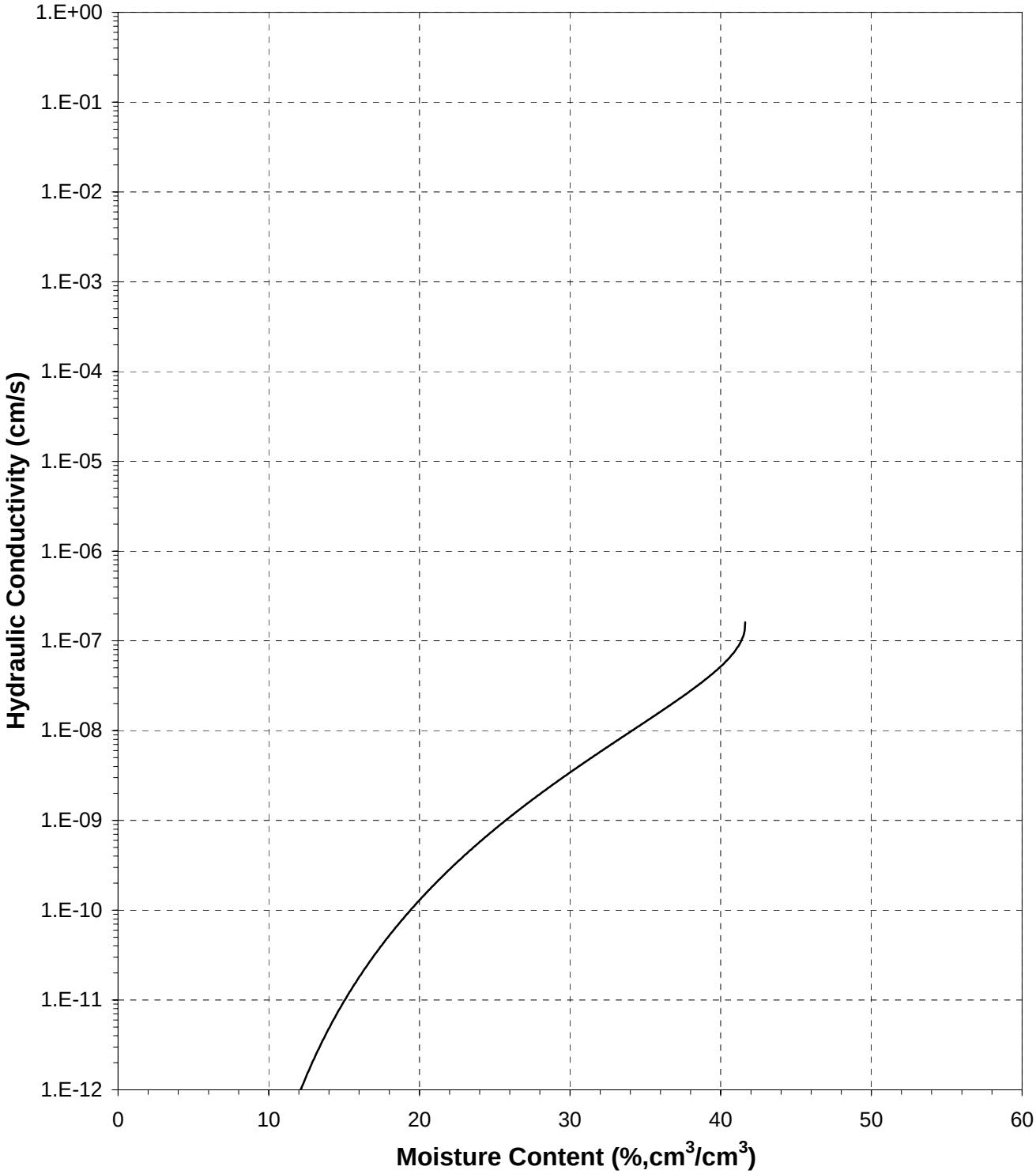
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (294-295)



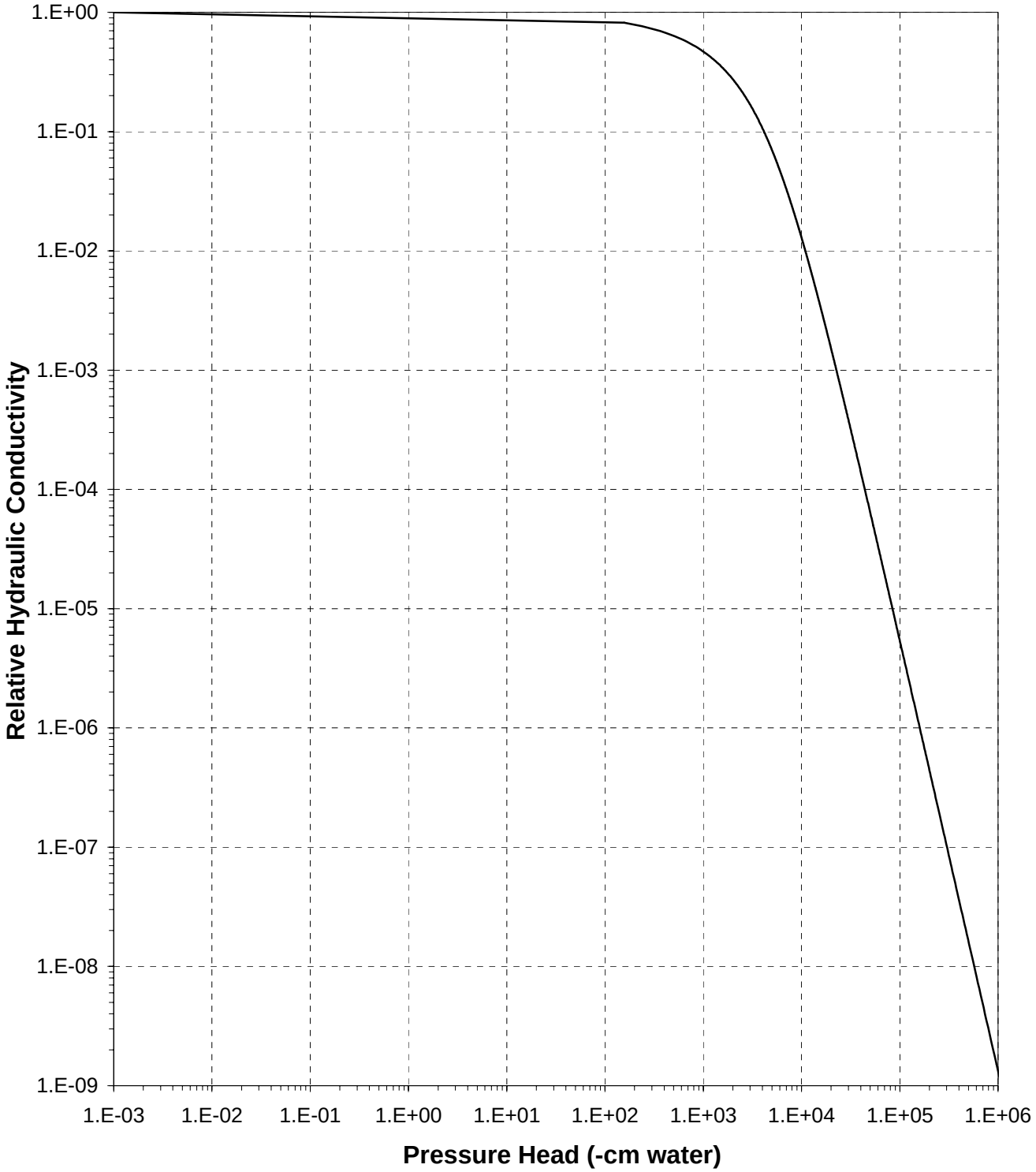
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (294-295)



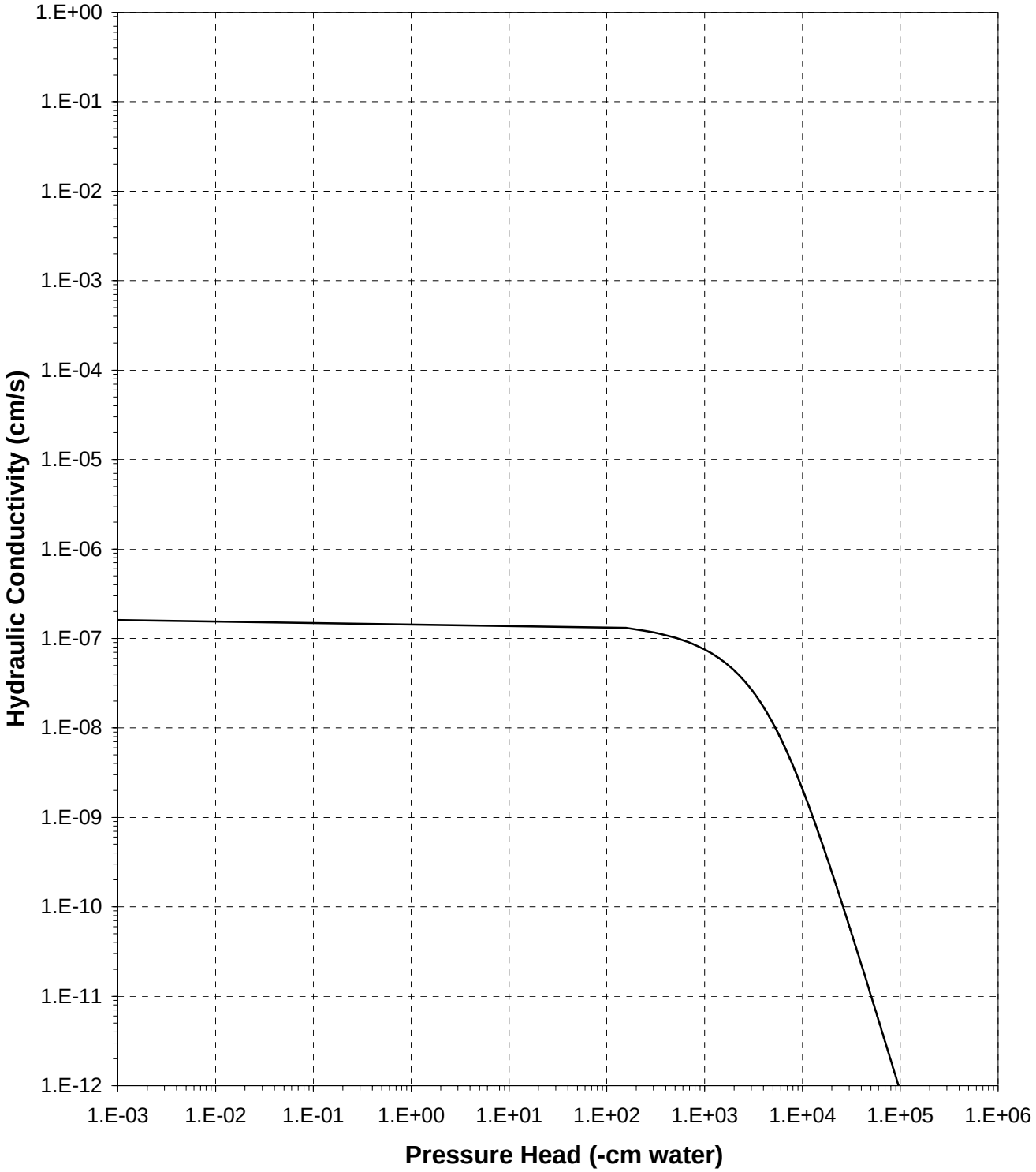
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (294-295)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (294-295)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

Dry wt. of sample (g): 123.39
Tare wt., ring (g): 47.74
Tare wt., screen & clamp (g): 24.11
Initial sample volume (cm^3): 78.48
Initial dry bulk density (g/cm^3): 1.57
Measured particle density (g/cm^3): 2.69
Initial calculated total porosity (%): 41.66

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	8-Feb-12	13:40	227.94	0	41.66
	15-Feb-12	9:20	227.80	52.0	41.49
	22-Feb-12	10:35	227.71	151.0	41.37
Pressure plate:	7-Mar-12	10:45	227.54	337	41.15
	21-Mar-12	8:30	227.29	1275	40.84

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	52.0	---	---	---	---
	151.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (309-310)

Initial sample bulk density (g/cm^3)*:* 1.57
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 138.29
Tare weight, jar (g)*:* 113.12

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	11:23	143.23	7547	30.86
	27-Mar-12	13:10	141.32	45177	18.93
	21-Mar-12	12:26	139.48	424135	7.43

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	7547	---	---	---	---
	45177	---	---	---	---
	424135	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 70.75
Tare weight (g)*:* 41.75

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	10-Apr-12	8:25	72.08	855592	7.20

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

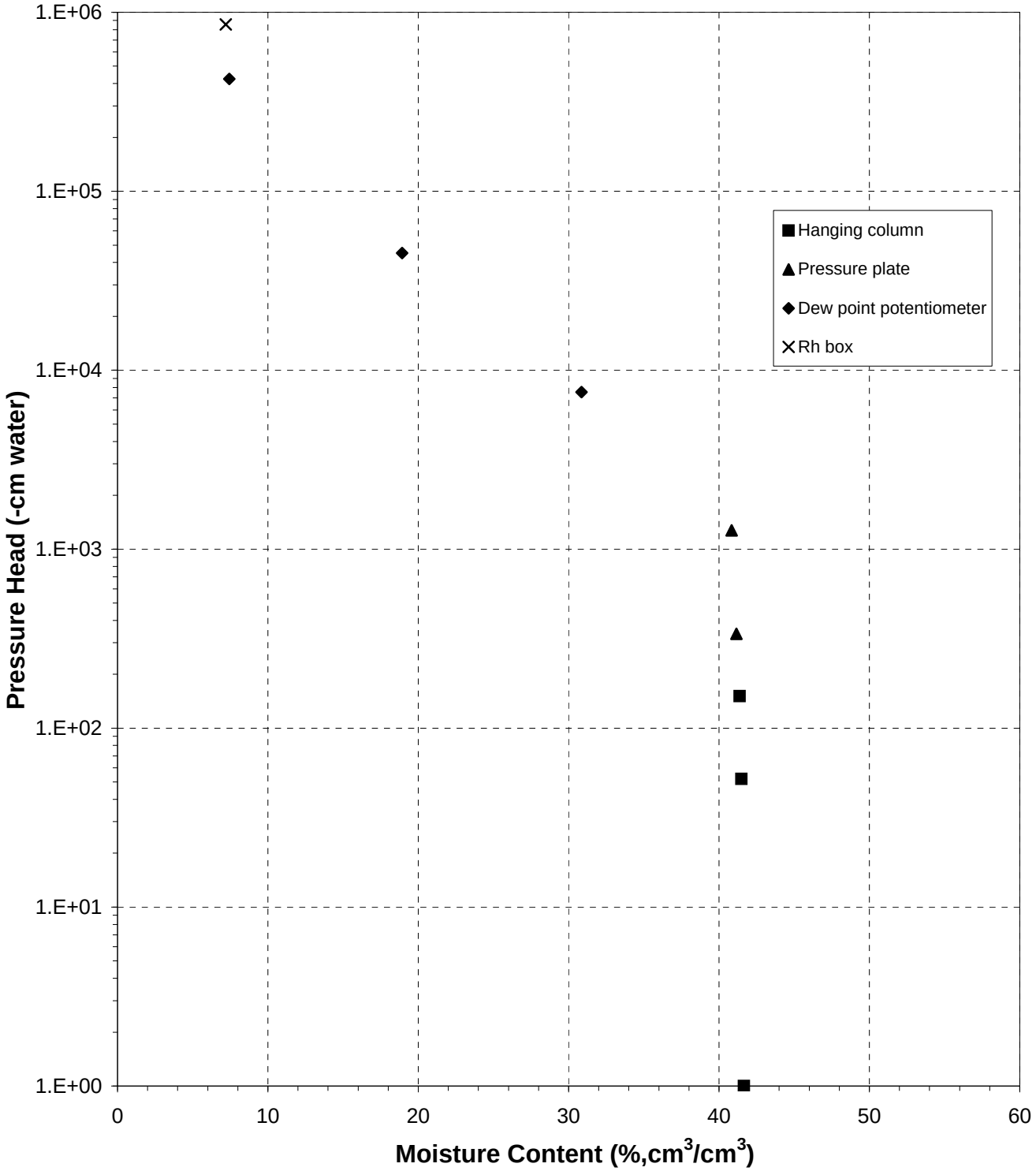
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

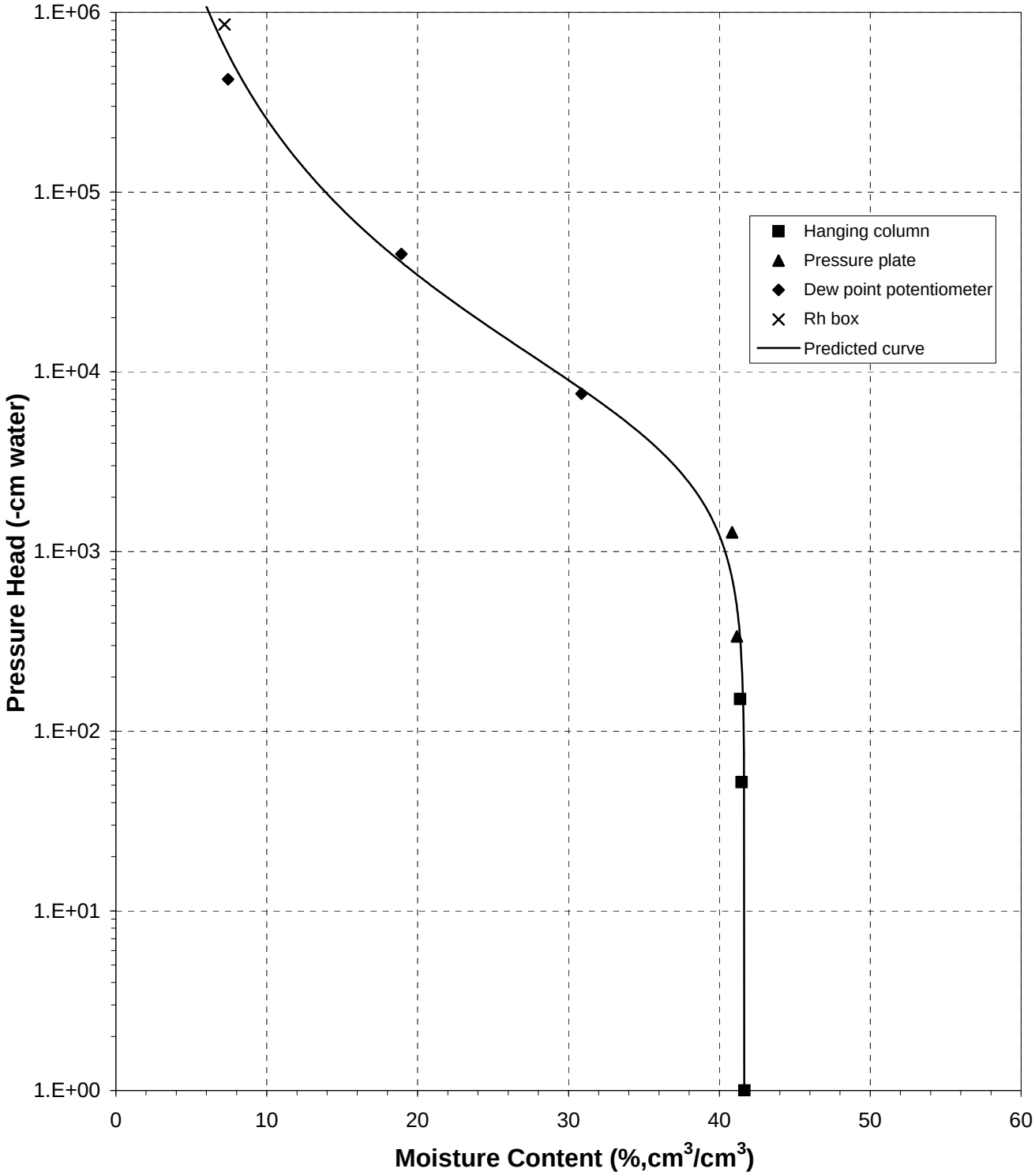
Water Retention Data Points

Sample Number: PB-11 (309-310)



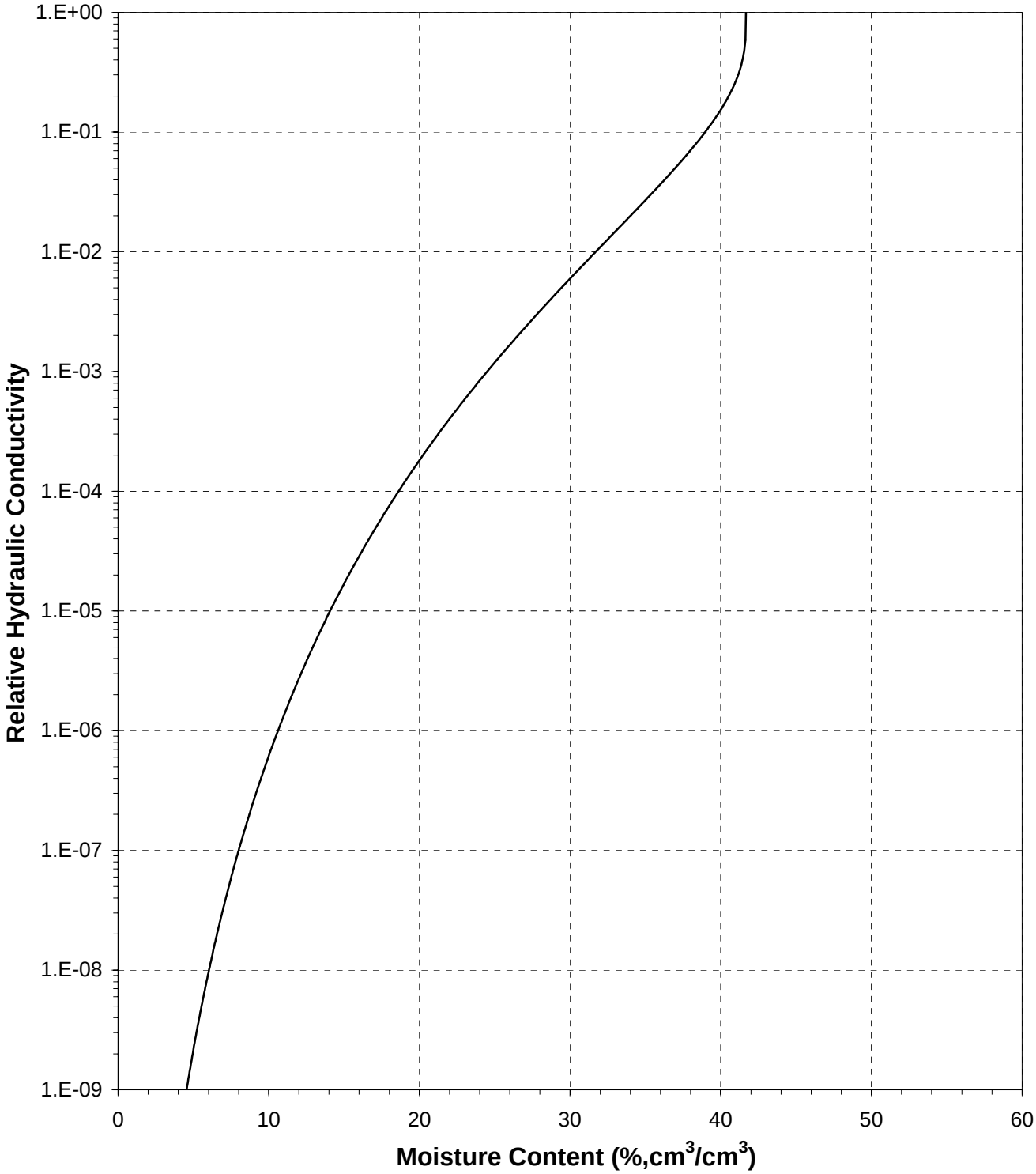
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (309-310)



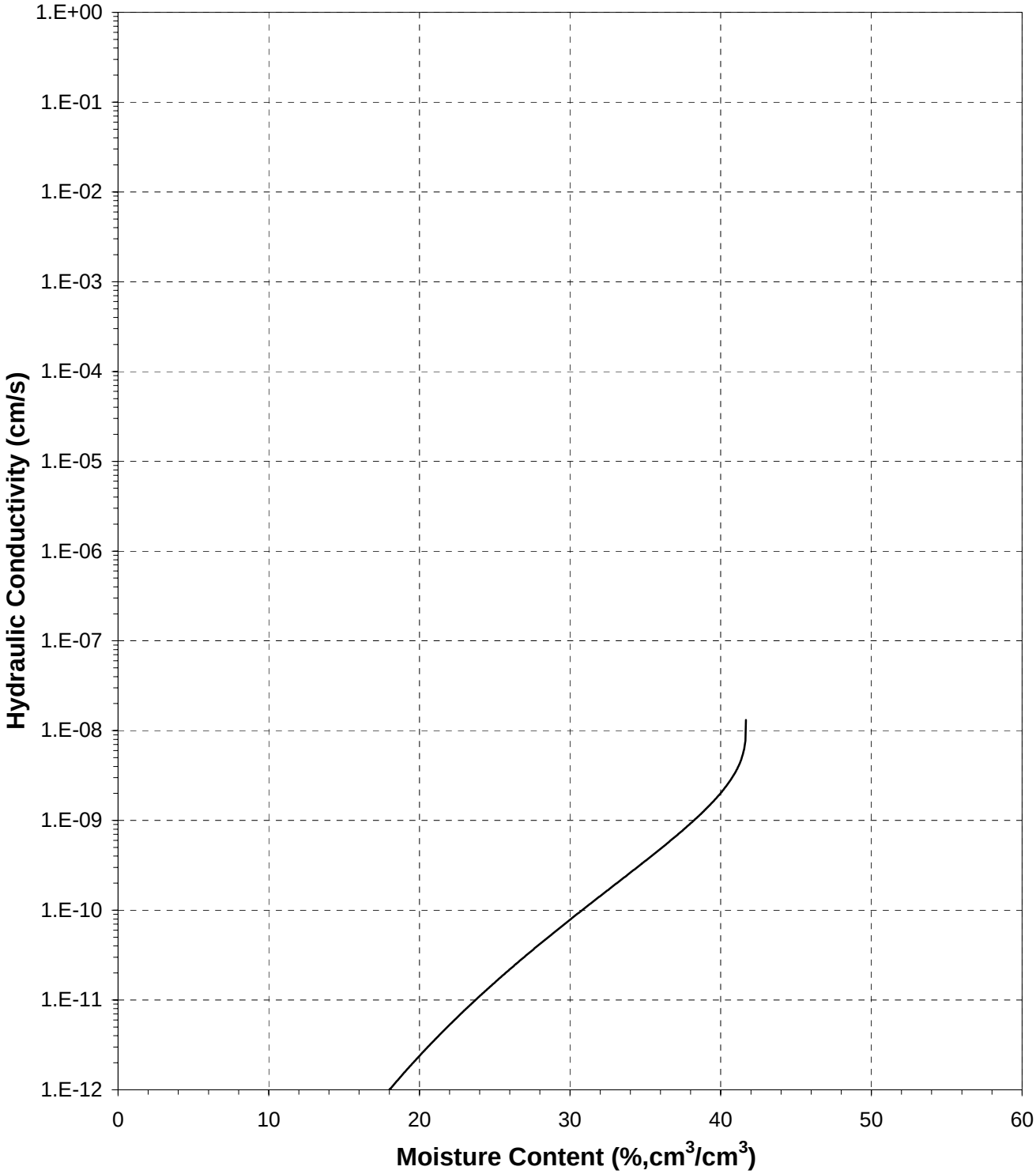
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (309-310)



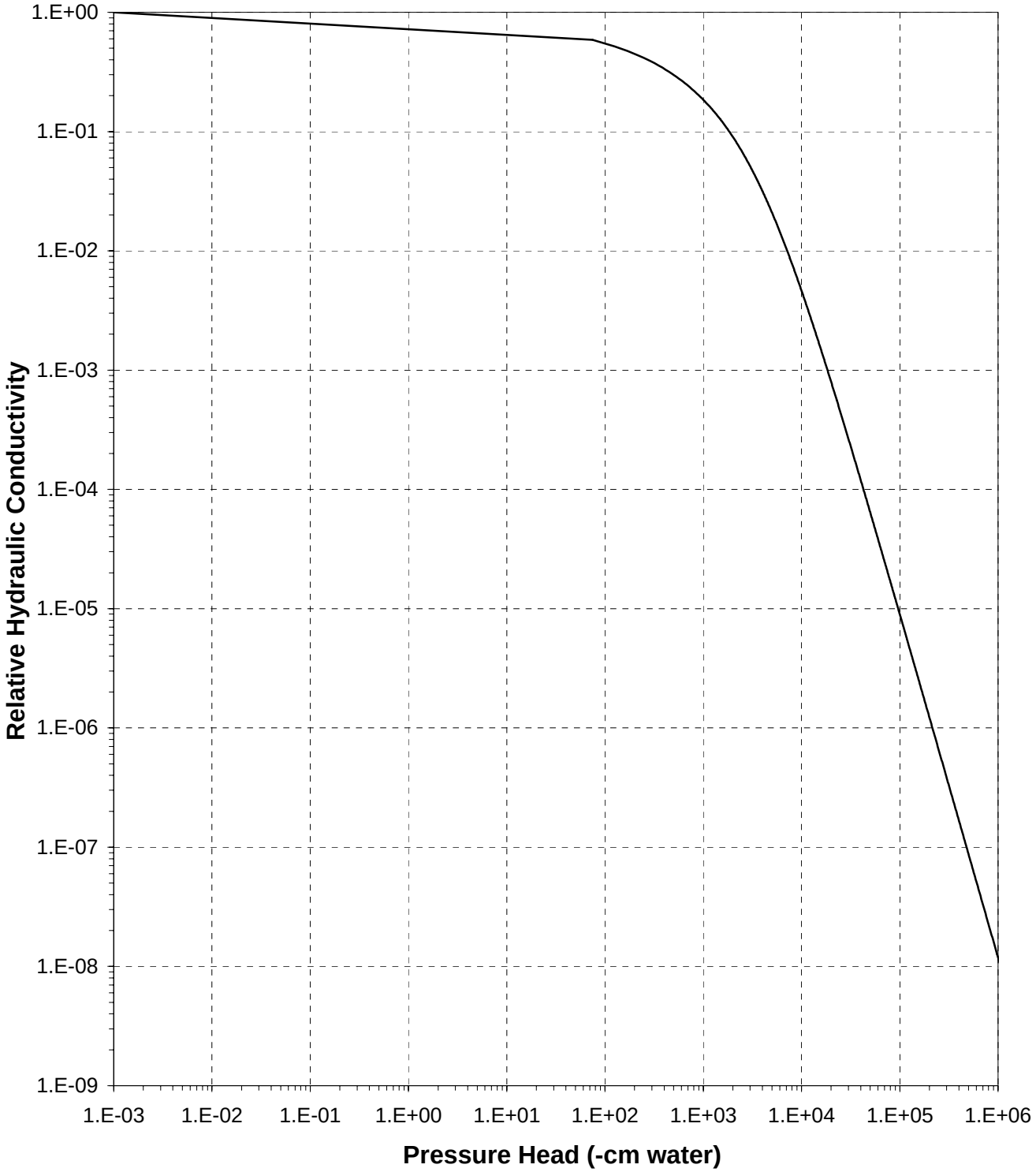
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (309-310)



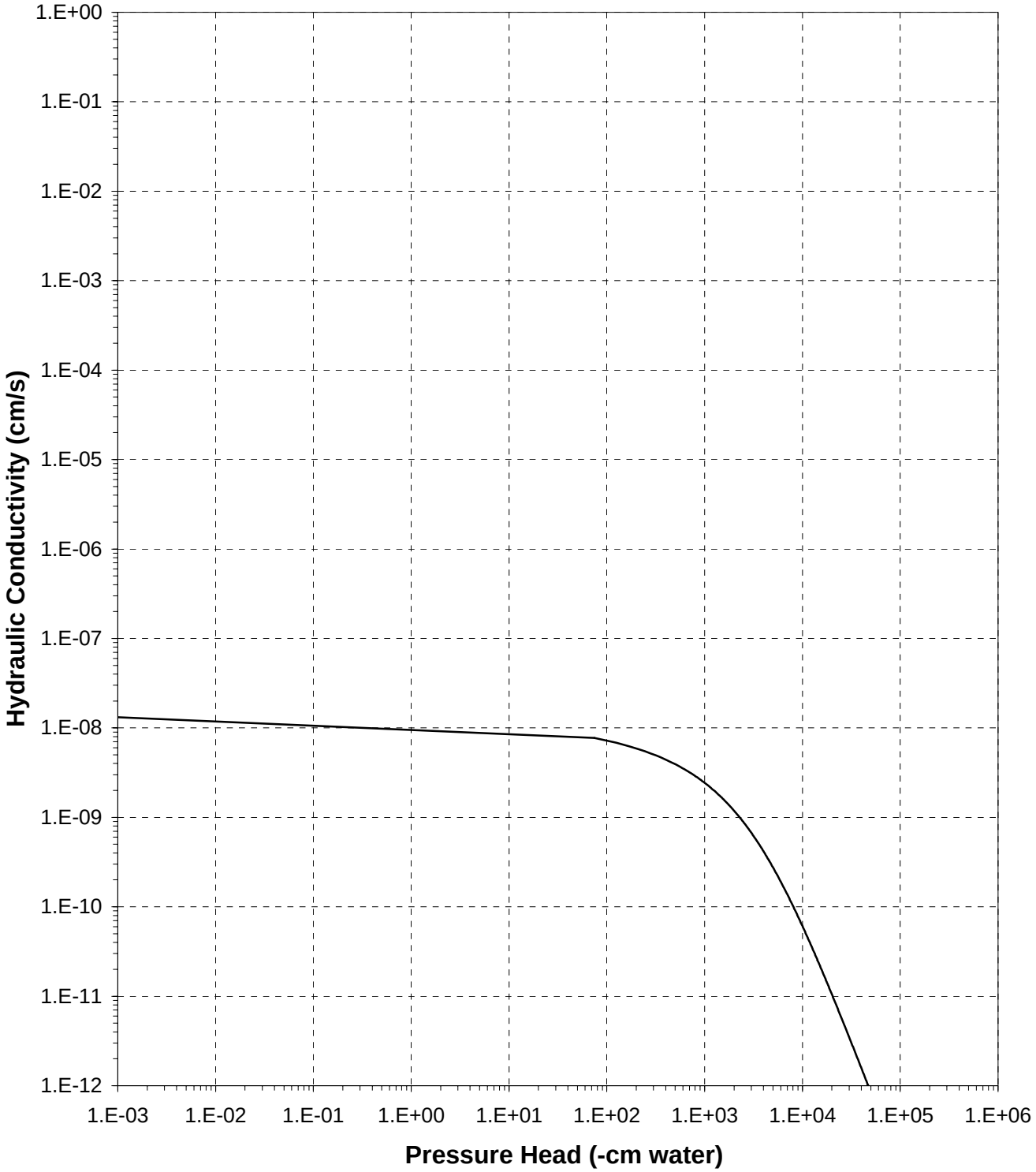
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (309-310)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (309-310)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

Dry wt. of sample (g): 120.30
Tare wt., ring (g): 43.42
Tare wt., screen & clamp (g): 23.32
Initial sample volume (cm^3): 71.81
Initial dry bulk density (g/cm^3): 1.68
Measured particle density (g/cm^3): 2.71
Initial calculated total porosity (%): 38.09

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:40	214.39	0	38.08
	7-Feb-12	10:20	214.07	51.0	37.64
	14-Feb-12	8:20	213.90	150.0	37.40
Pressure plate:	28-Feb-12	8:05	213.83	337	37.30
	13-Mar-12	8:55	213.75	1275	37.19

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (334-335)

Initial sample bulk density (g/cm^3)*:* 1.68
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 146.01
Tare weight, jar (g)*:* 113.20

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	16:47	151.04	12849	25.68
	16-Mar-12	12:25	148.98	74445	15.16
	13-Mar-12	17:11	147.97	262700	10.01

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	12849	---	---	---	---
	74445	---	---	---	---
	262700	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 68.57
Tare weight (g)*:* 38.03

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	6-Mar-12	9:30	70.05	855592	8.11

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

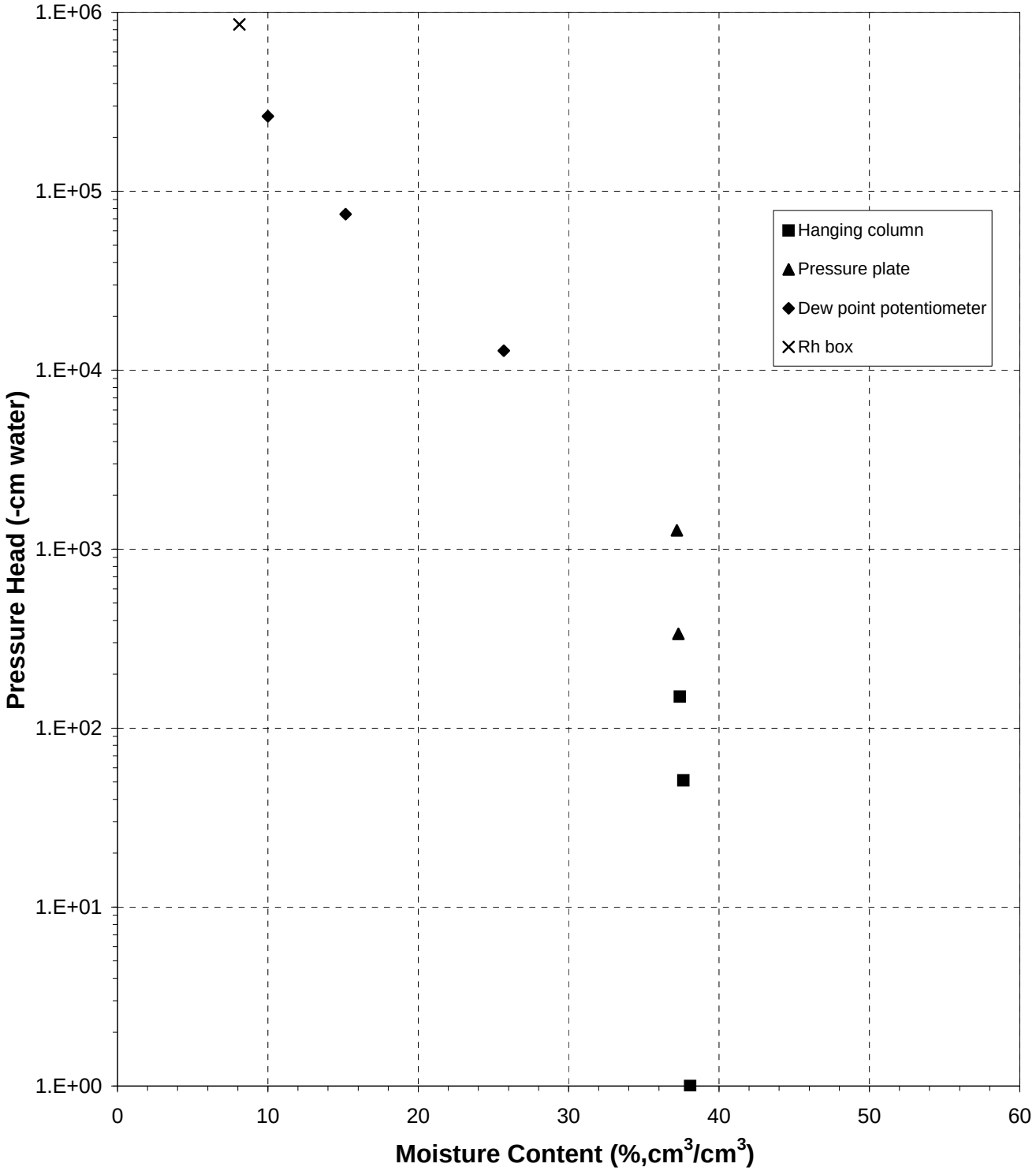
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

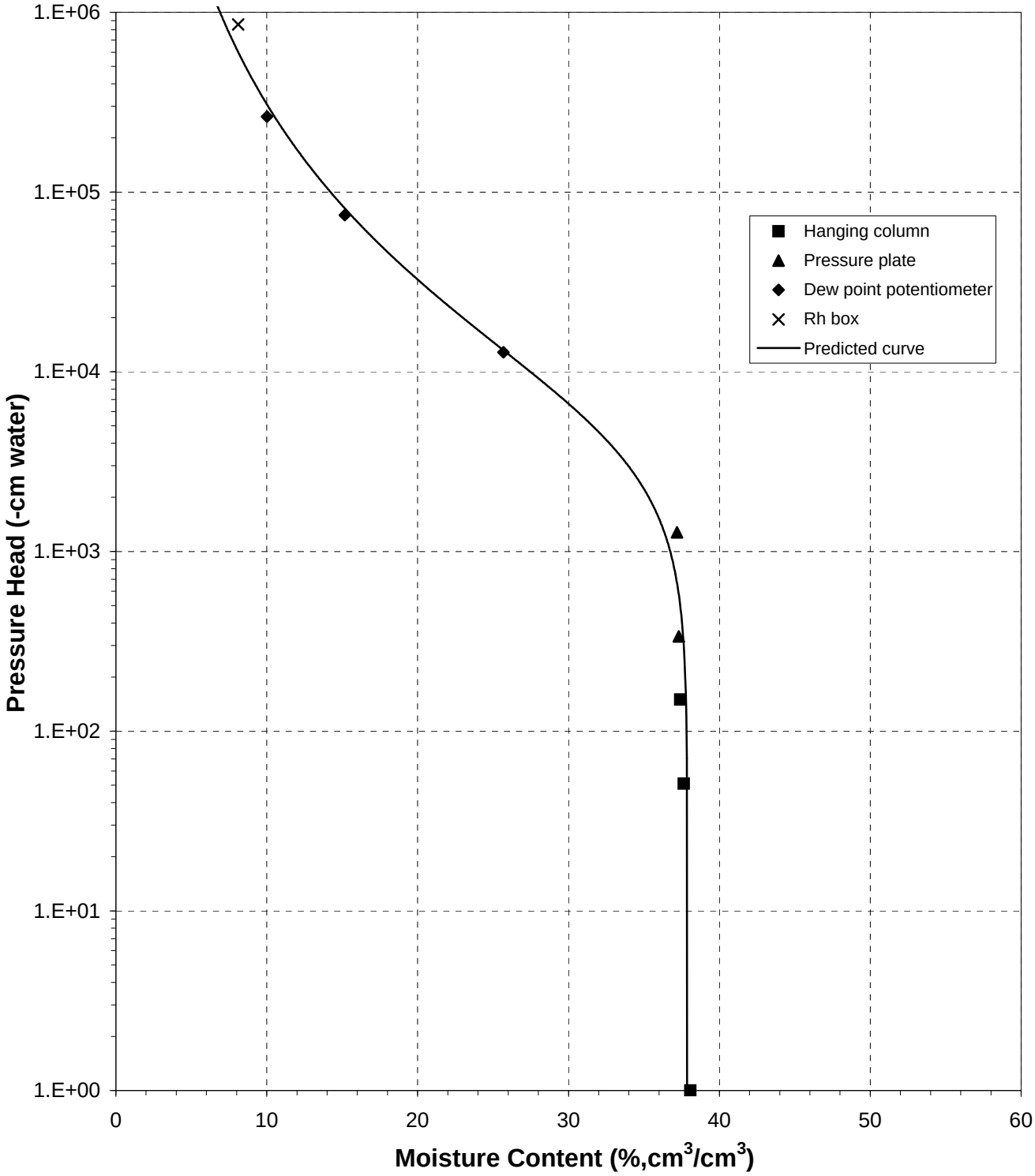
Water Retention Data Points

Sample Number: PB-11 (334-335)



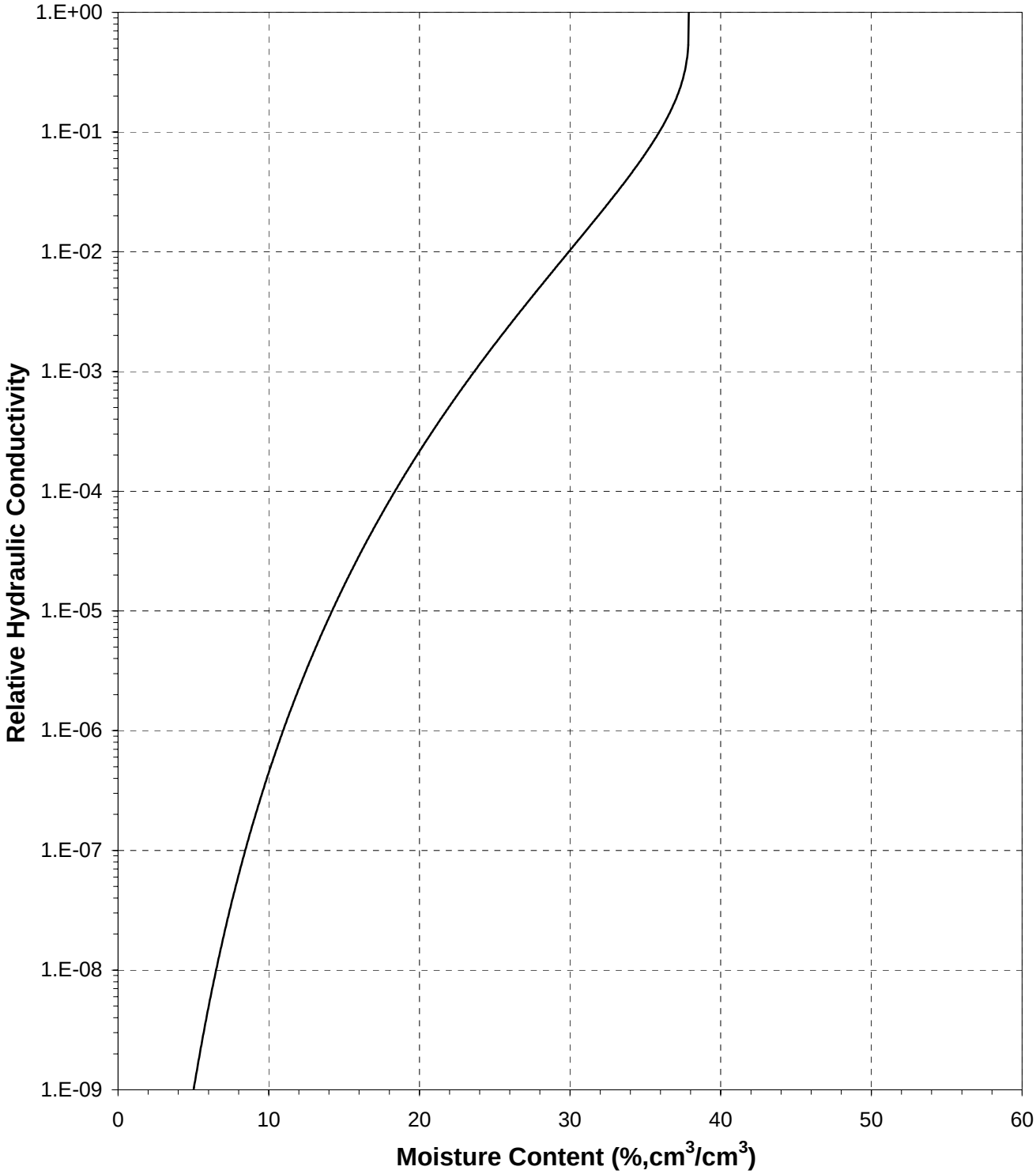
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (334-335)



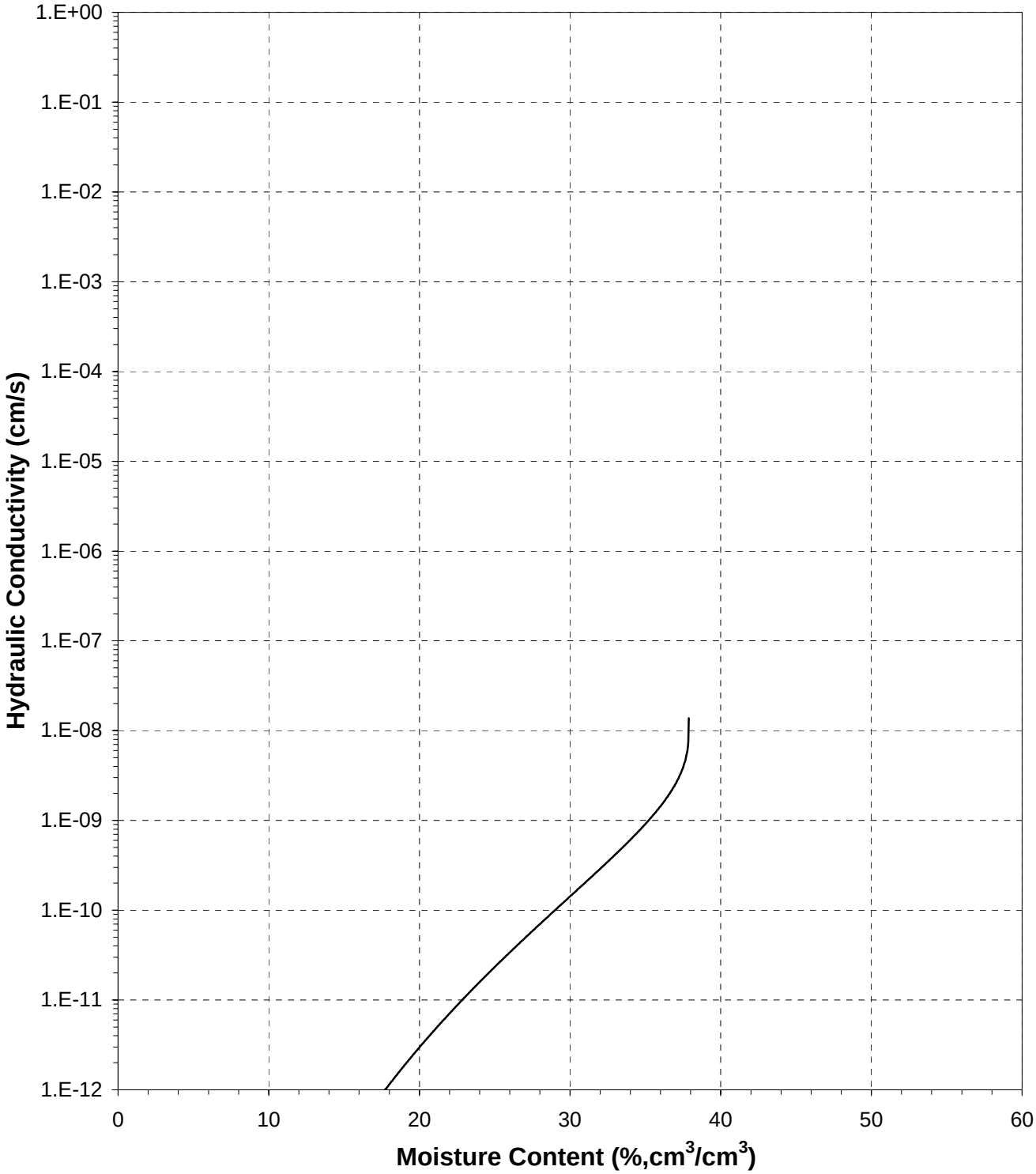
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (334-335)



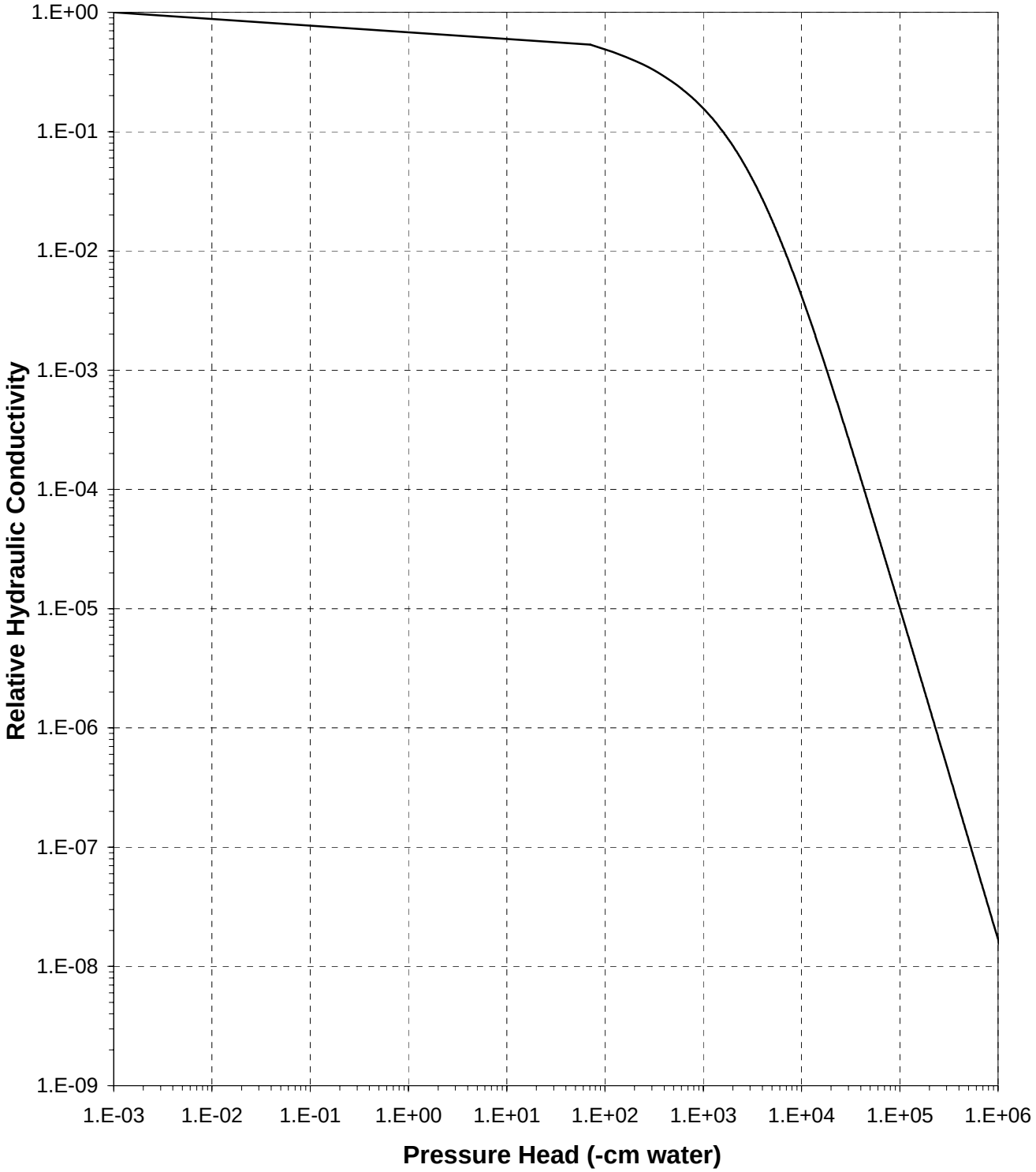
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (334-335)



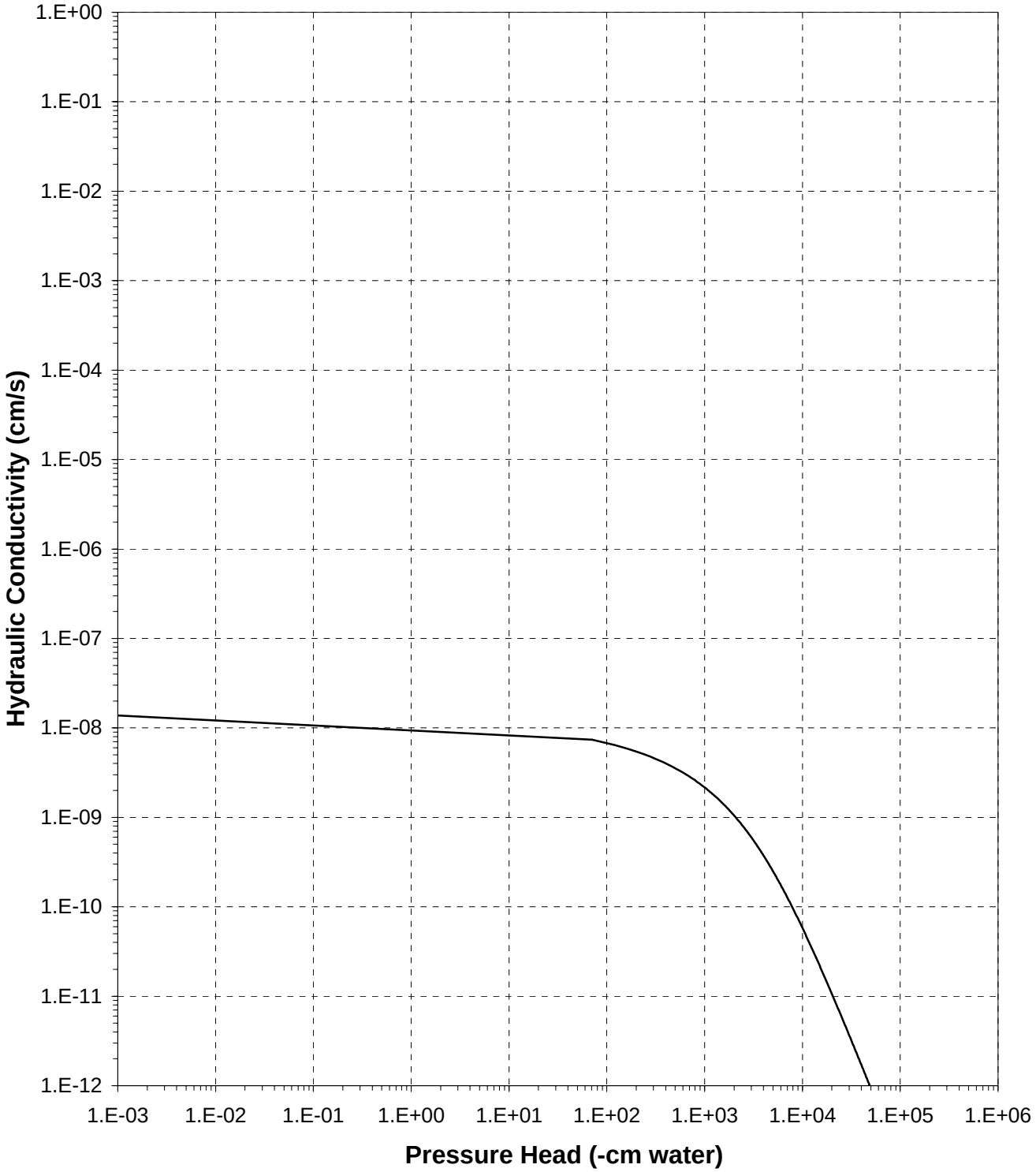
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (334-335)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (334-335)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (359-360)
Date Sampled: 12/7/2011
Depth: 359-360

Dry wt. of sample (g): 103.35
Tare wt., ring (g): 39.15
Tare wt., screen & clamp (g): 25.29
Initial sample volume (cm^3): 65.49
Initial dry bulk density (g/cm^3): 1.58
Measured particle density (g/cm^3): 2.71
Initial calculated total porosity (%): 41.76

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:15	195.14	0	41.76
	7-Feb-12	10:05	194.74	51.0	41.15
	14-Feb-12	8:00	194.64	150.0	41.00
Pressure plate:	28-Feb-12	8:35	194.55	337	40.86
	13-Mar-12	6:20	194.46	1275	40.72

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-11 (359-360)

Initial sample bulk density (g/cm^3)*:* 1.58
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 149.68
Tare weight, jar (g)*:* 112.21

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	15:52	155.46	13461	24.34
	22-Mar-12	14:08	153.47	54355	15.96
	21-Mar-12	15:15	152.59	160415	12.26

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	13461	---	---	---	---
	54355	---	---	---	---
	160415	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 69.80
Tare weight (g)*:* 40.79

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	6-Mar-12	9:30	71.15	855592	7.36

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

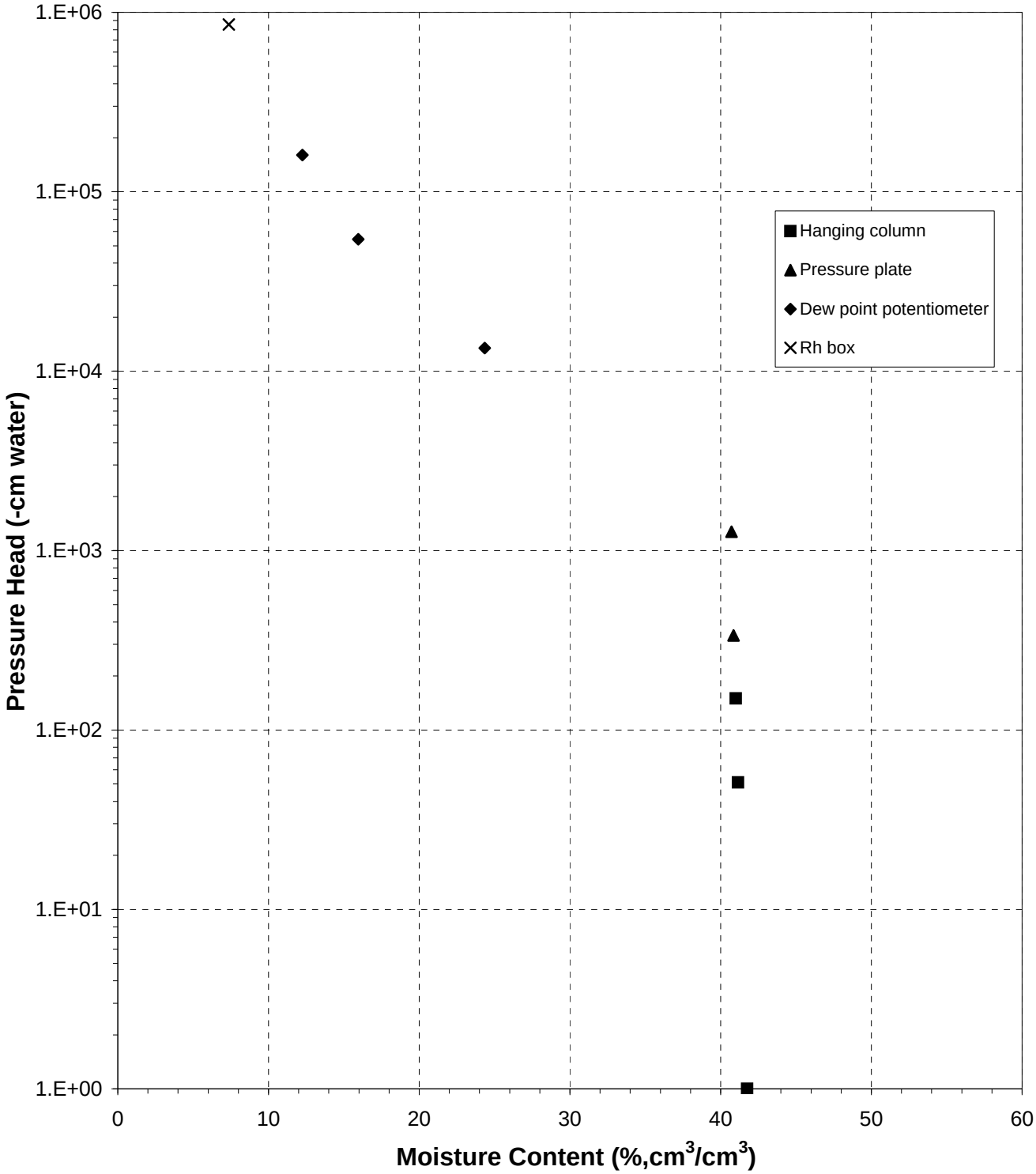
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

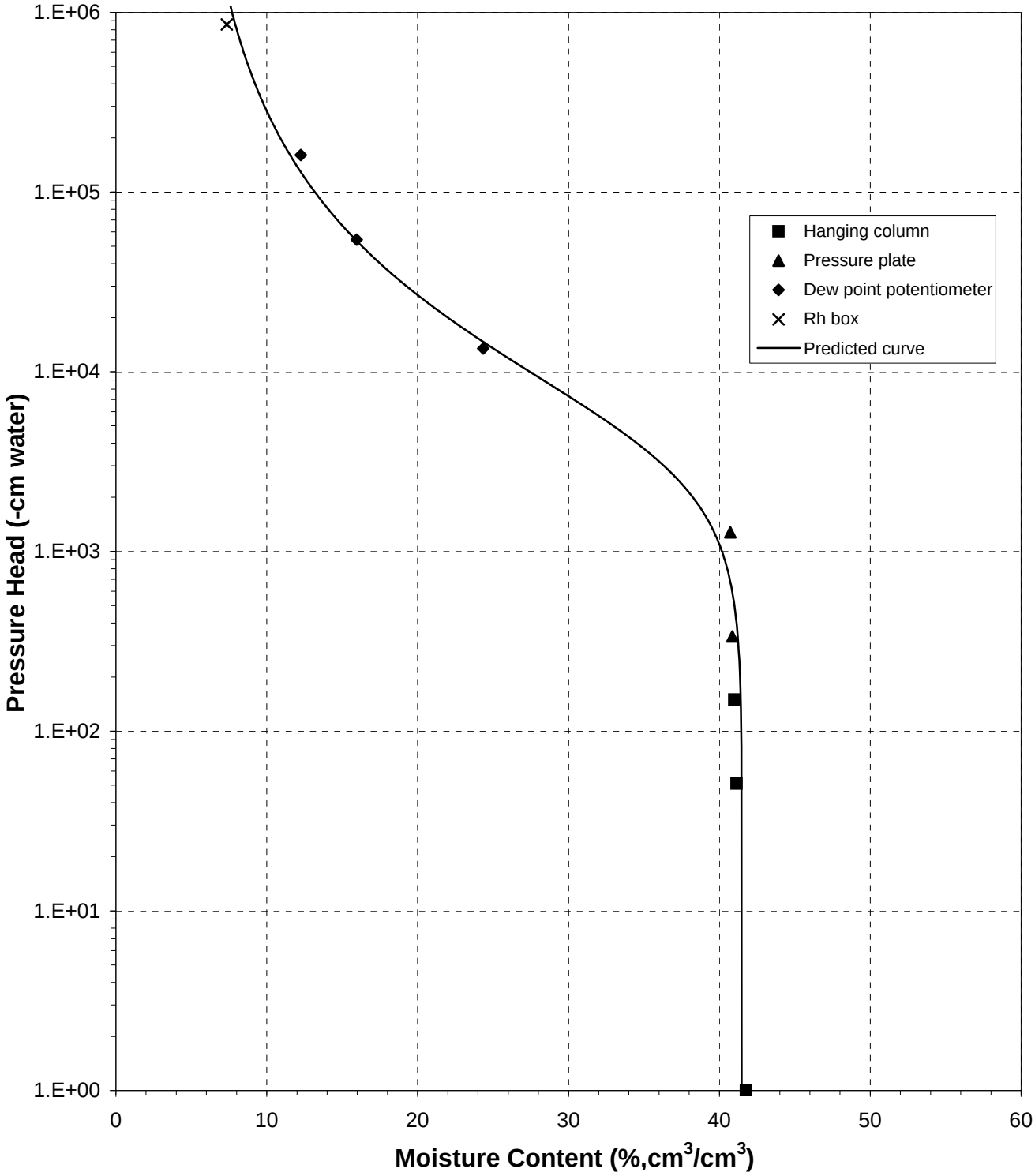
Water Retention Data Points

Sample Number: PB-11 (359-360)



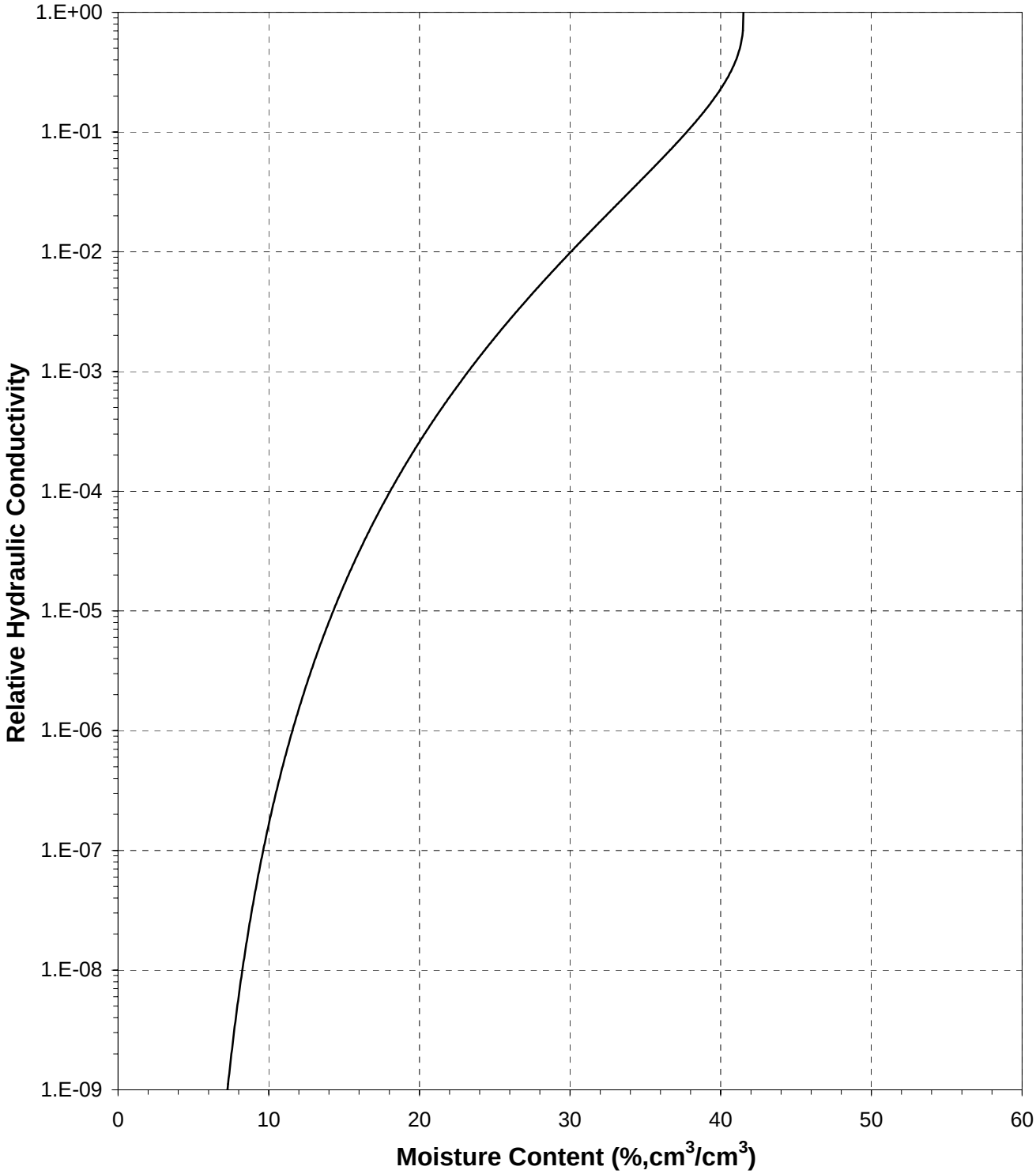
Predicted Water Retention Curve and Data Points

Sample Number: PB-11 (359-360)



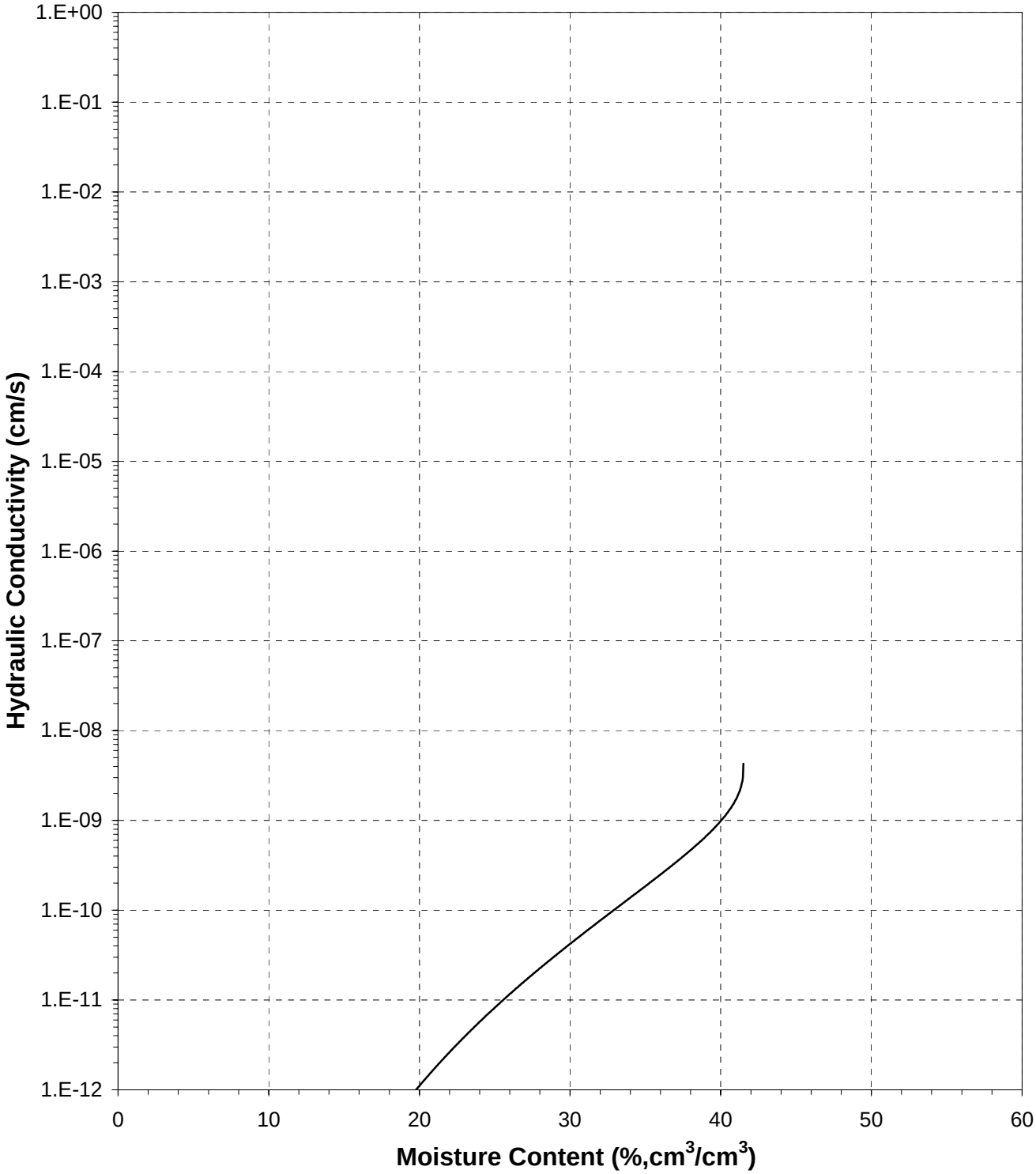
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (359-360)



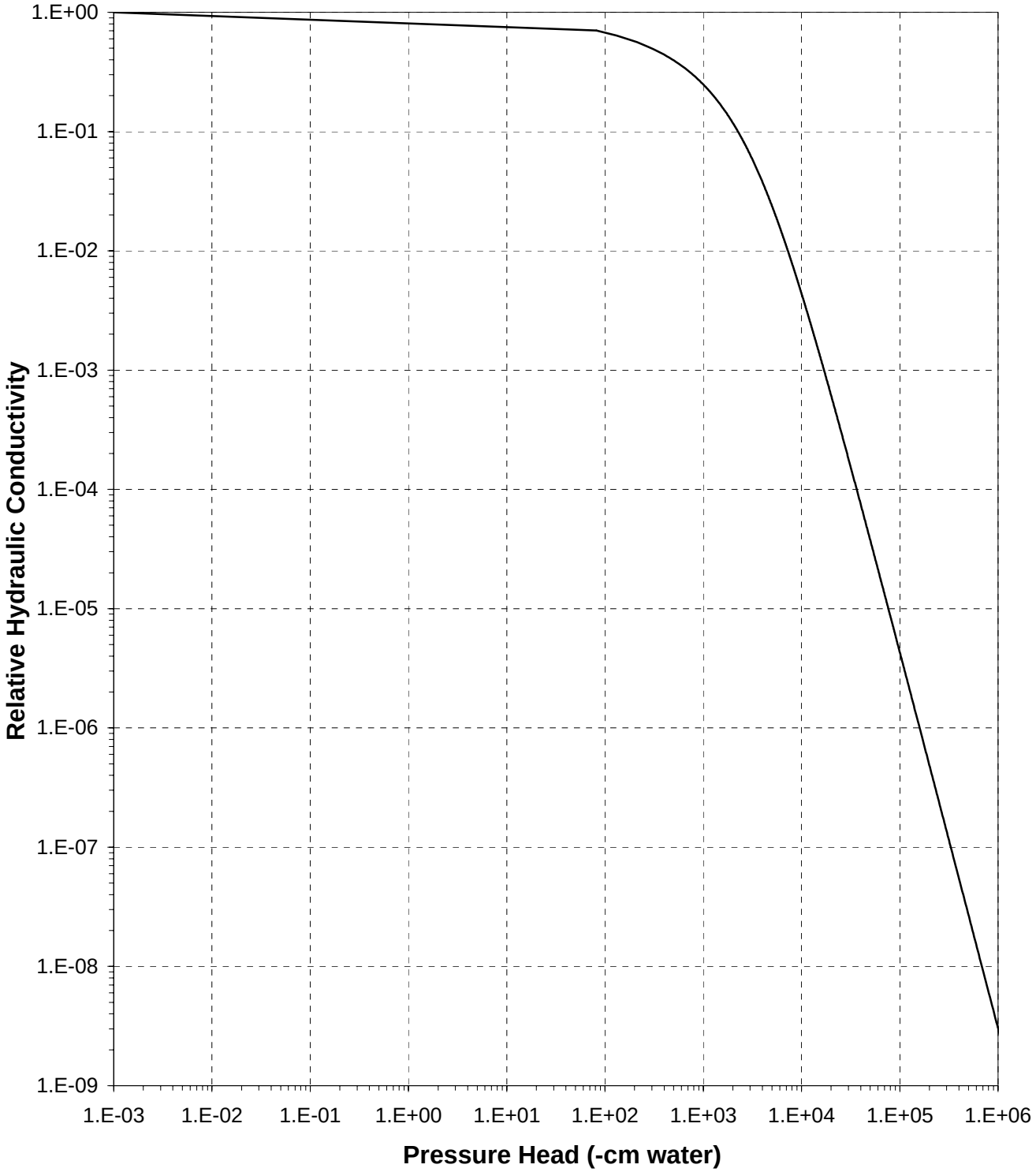
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-11 (359-360)



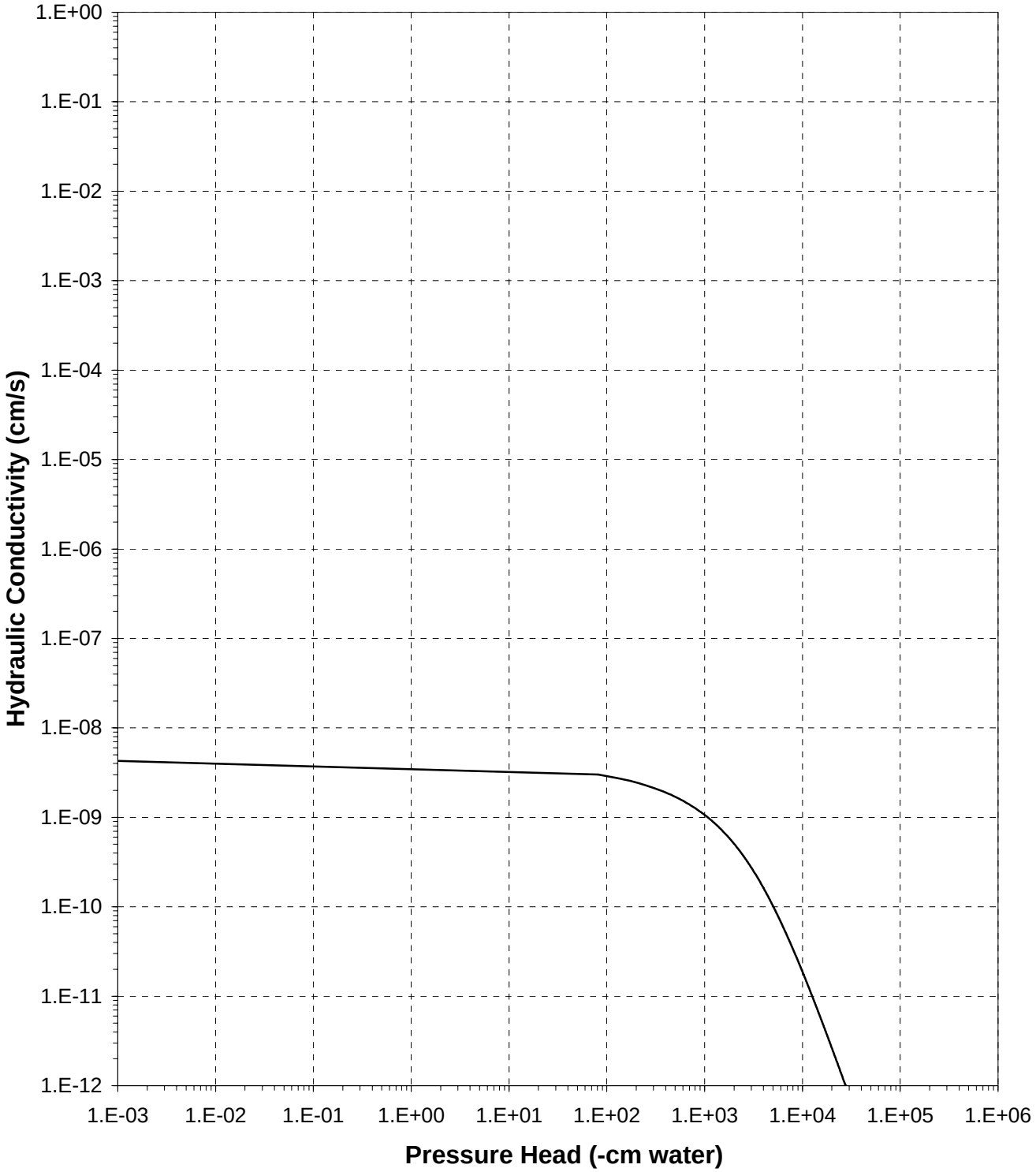
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (359-360)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-11 (359-360)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (69-70)
Date Sampled: 12/7/2011
Depth: 69-70

Dry wt. of sample (g): 103.50
Tare wt., ring (g): 40.96
Tare wt., screen & clamp (g): 26.86
Initial sample volume (cm^3): 68.58
Initial dry bulk density (g/cm^3): 1.51
Measured particle density (g/cm^3): 2.69
Initial calculated total porosity (%): 43.92

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	18-Jan-12	12:50	201.44	0	43.92
	28-Jan-12	12:00	200.71	23.0	42.86
	1-Feb-12	12:30	200.53	72.0	42.59
	8-Feb-12	9:25	200.24	155.0	42.17
Pressure plate:	20-Feb-12	8:40	199.01	337	40.38

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	23.0	---	---	---	---
	72.0	---	---	---	---
	155.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (69-70)

Initial sample bulk density (g/cm^3)*:* 1.51
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 154.06
Tare weight, jar (g)*:* 112.71

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	30-Mar-12	16:40	159.21	17847	18.80
	3-Apr-12	14:25	157.34	121968	11.97
	3-Apr-12	12:05	156.56	415161	9.12

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	17847	---	---	---	---
	121968	---	---	---	---
	415161	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 72.94
Tare weight (g)*:* 41.74

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	22-Mar-12	8:30	74.63	854159	8.19

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

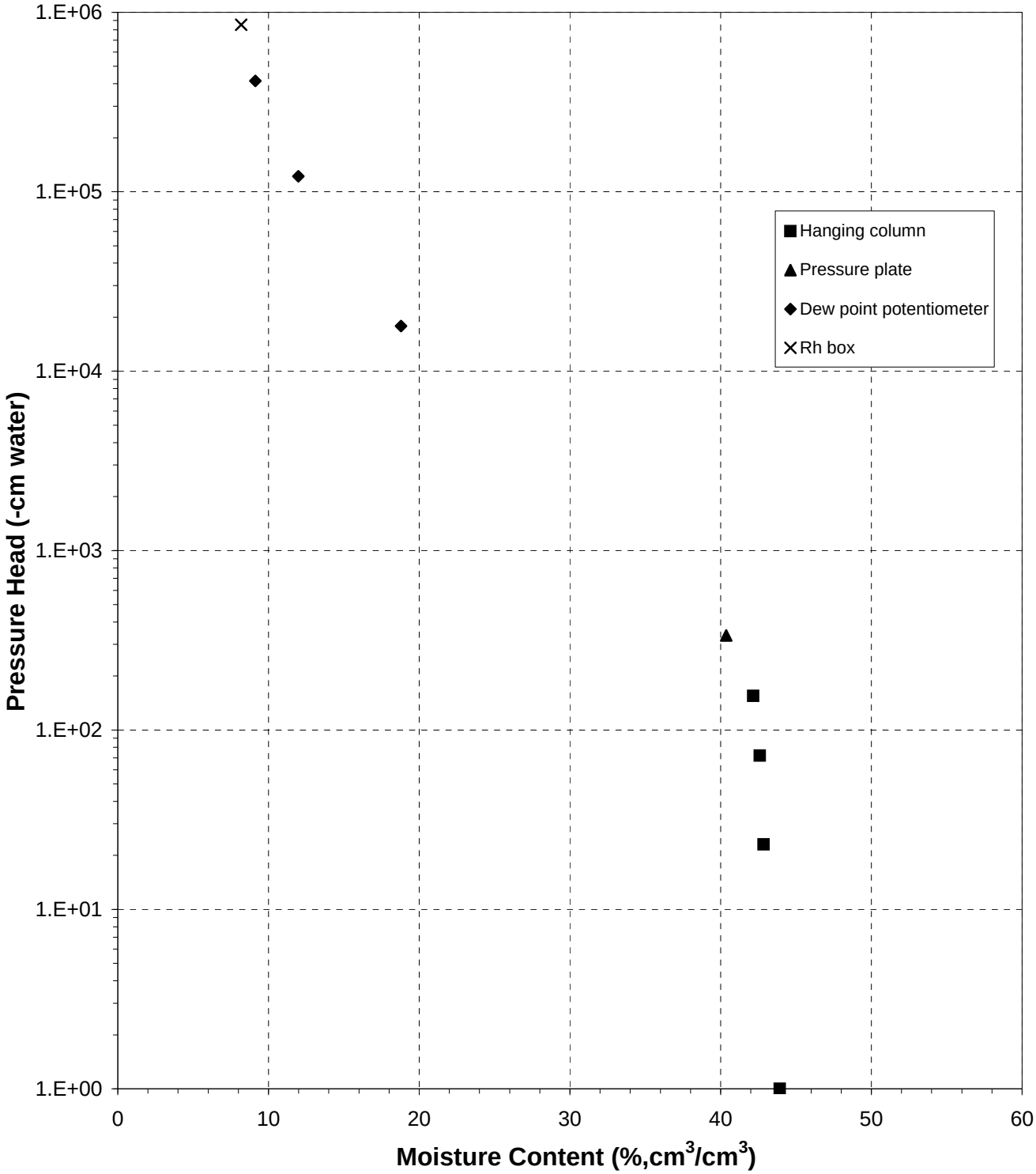
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

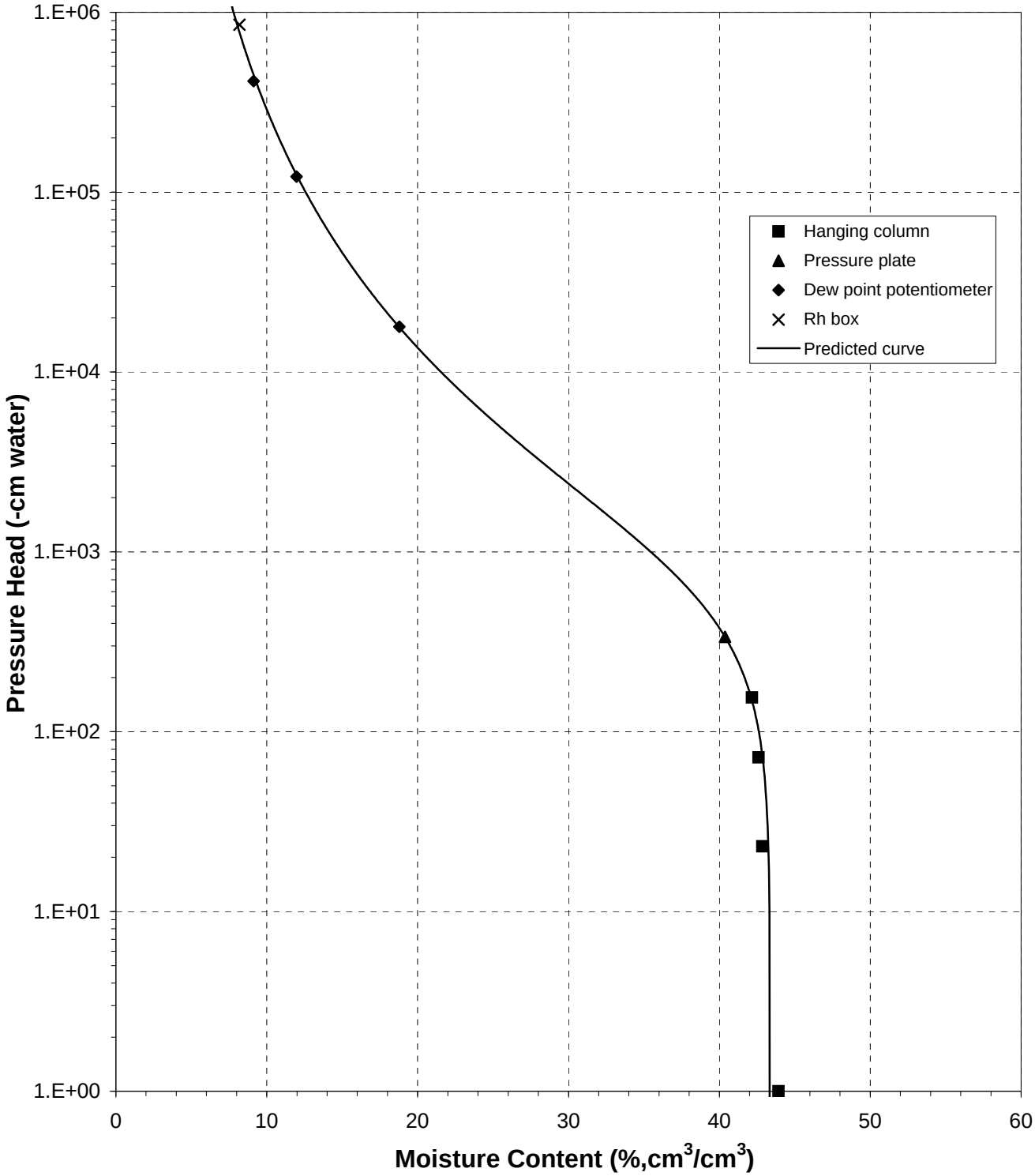
Water Retention Data Points

Sample Number: PB-12 (69-70)



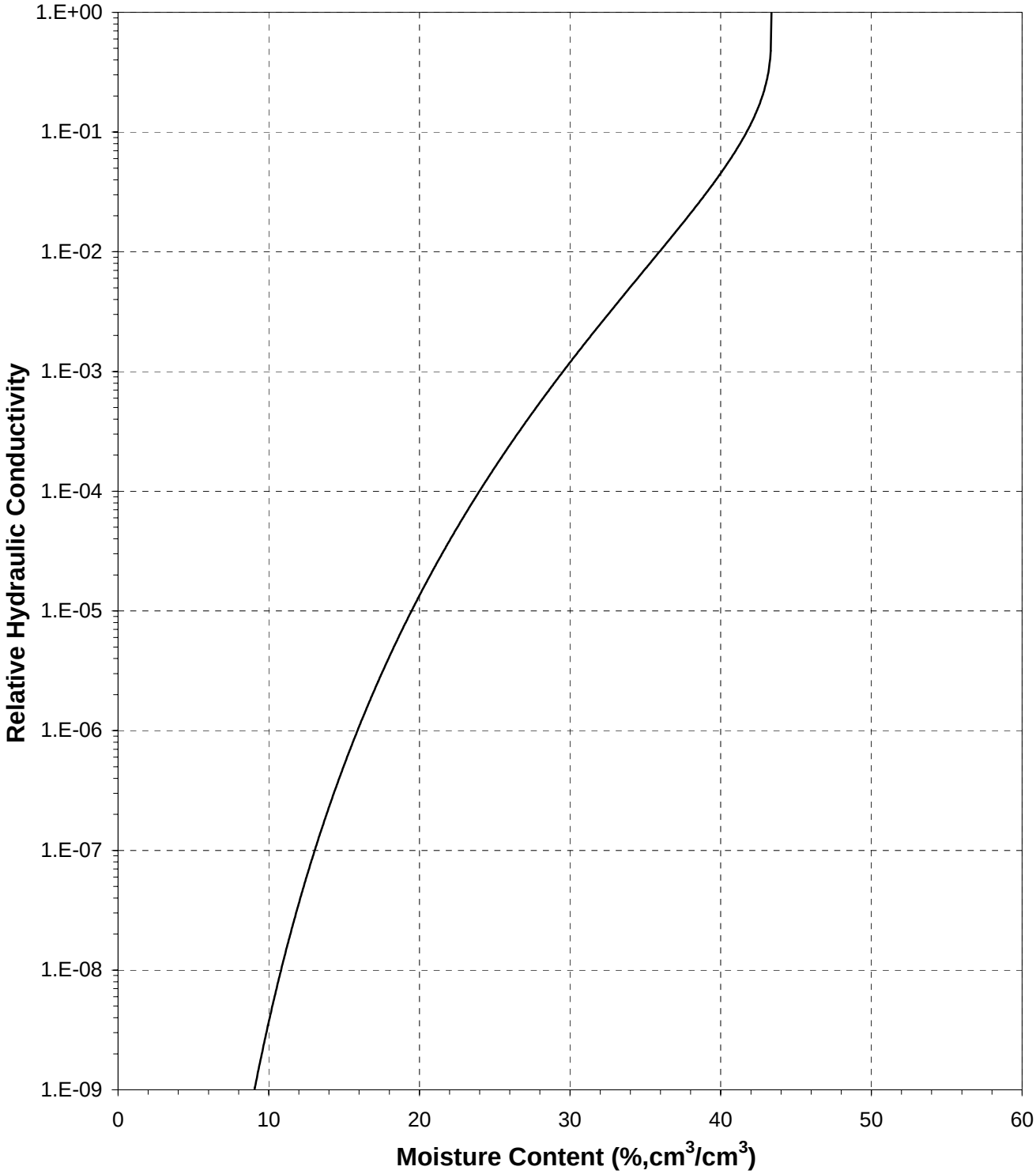
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (69-70)



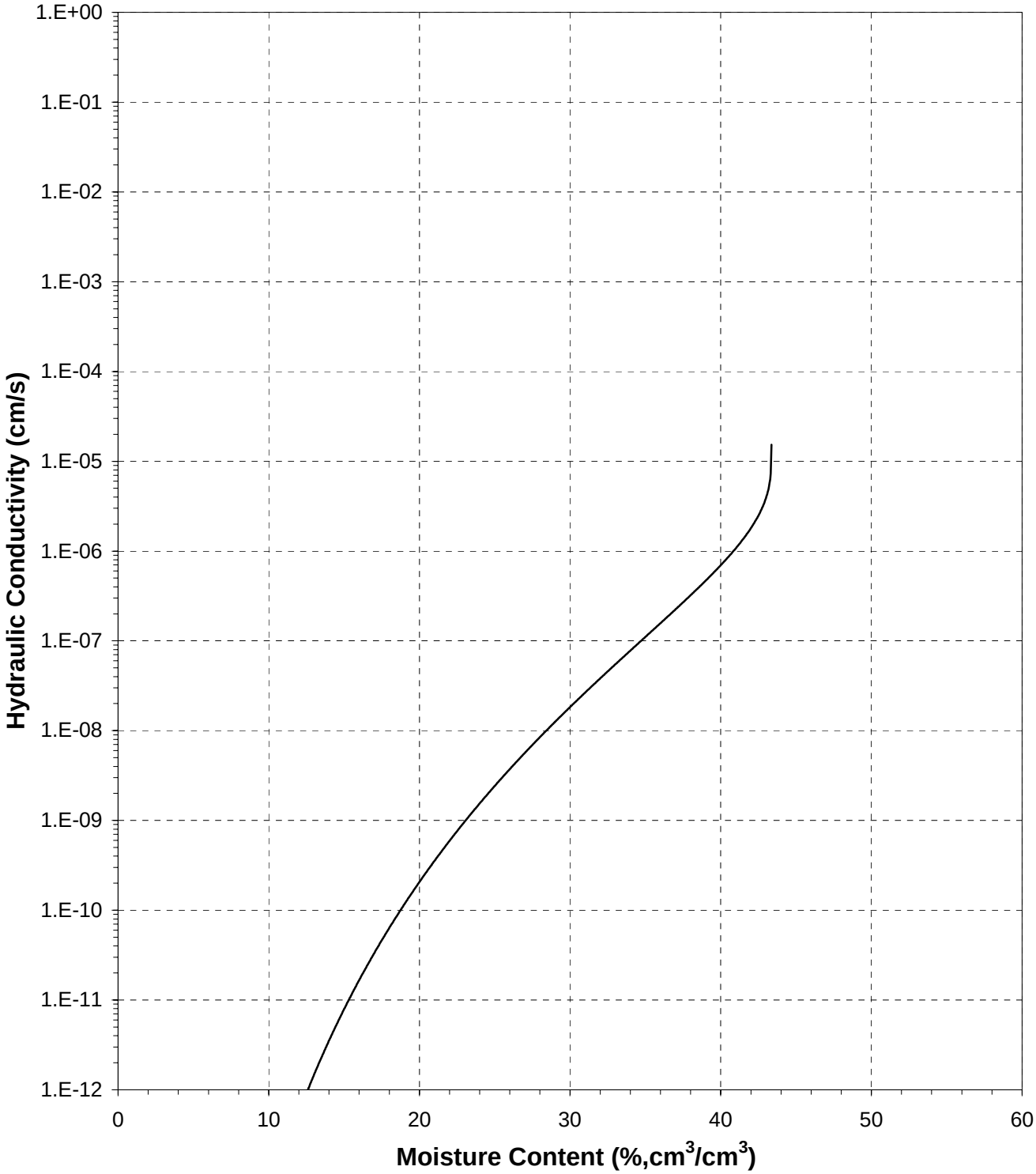
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (69-70)



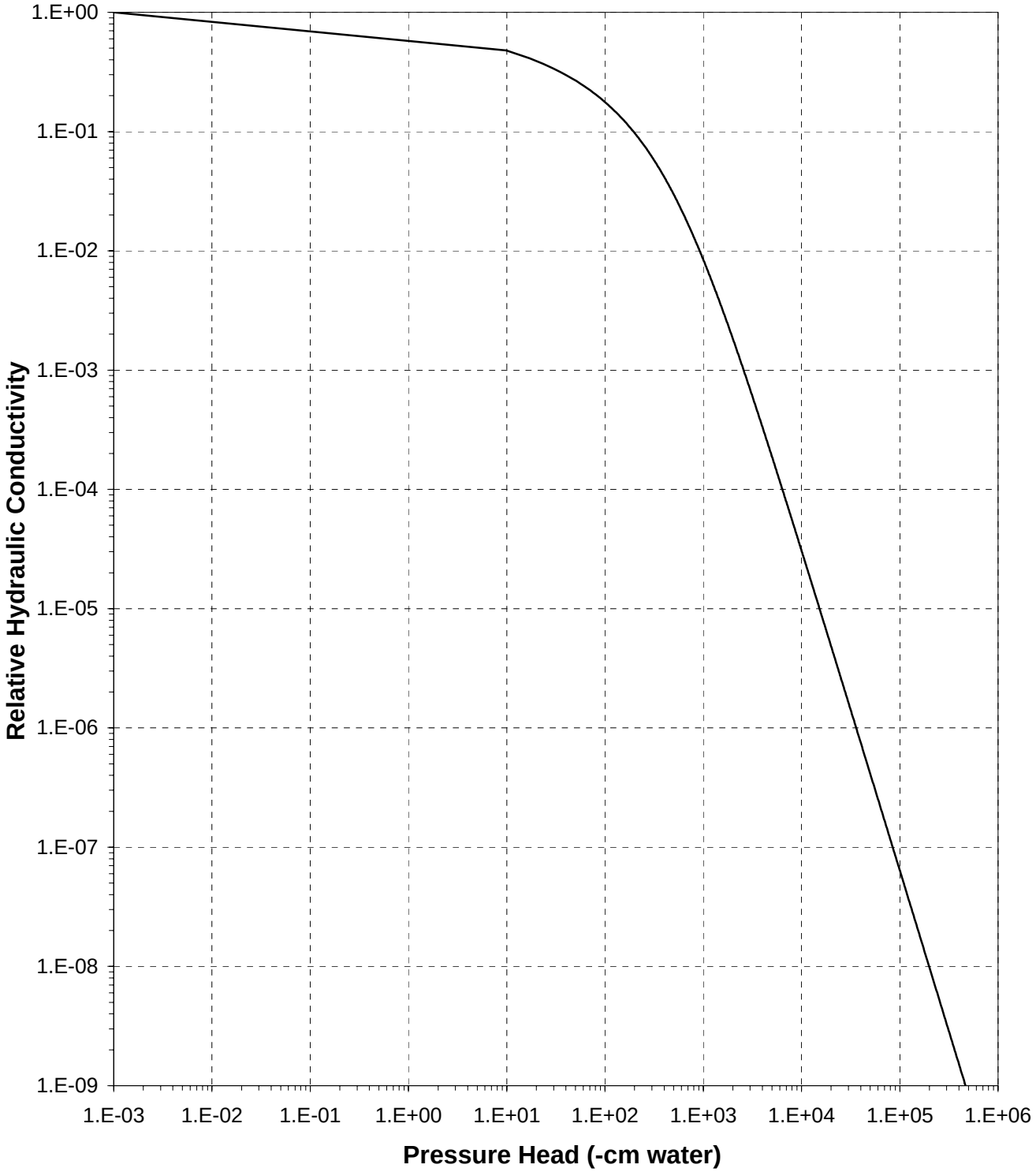
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (69-70)



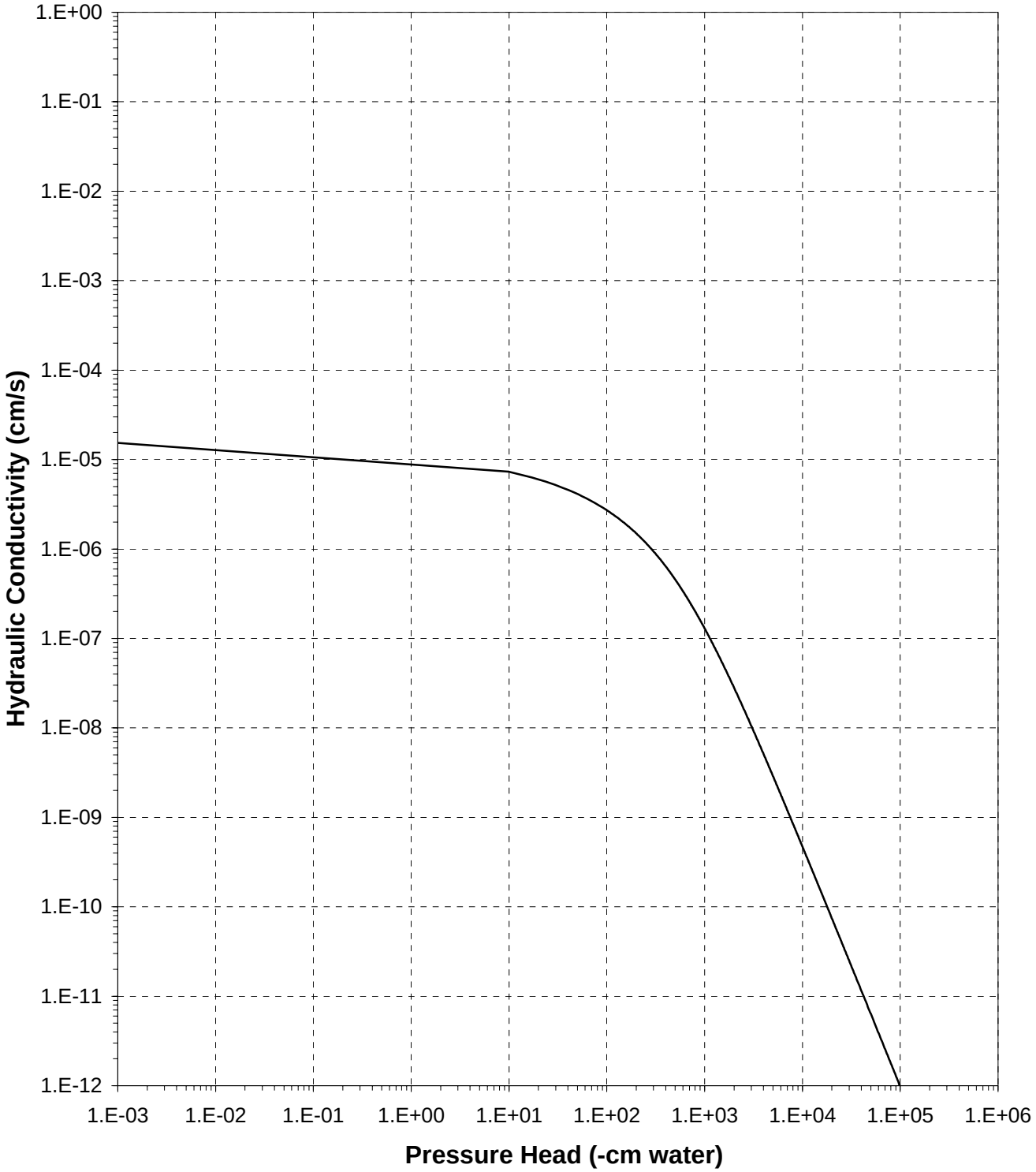
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (69-70)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (69-70)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (109-110)
Date Sampled: 12/7/2011
Depth: 109-110

Dry wt. of sample (g): 100.90
Tare wt., ring (g): 41.37
Tare wt., screen & clamp (g): 24.97
Initial sample volume (cm^3): 68.43
Initial dry bulk density (g/cm^3): 1.47
Measured particle density (g/cm^3): 2.75
Initial calculated total porosity (%): 46.33

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	18-Jan-12	12:40	198.94	0	46.33
	22-Jan-12	14:15	198.10	17.0	45.10
	3-Feb-12	10:40	197.73	50.0	44.56
	12-Mar-12	11:05	197.50	130.0	44.22
Pressure plate:	23-Feb-12	10:05	197.44	337	44.13

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	17.0	---	---	---	---
	50.0	---	---	---	---
	130.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (109-110)

Initial sample bulk density (g/cm^3)*:* 1.47
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 144.37
Tare weight, jar (g)*:* 116.35

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	16:15	150.22	5303	30.79
	22-Mar-12	15:20	148.65	21722	22.52
	16-Mar-12	14:05	147.49	96269	16.42

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	5303	---	---	---	---
	21722	---	---	---	---
	96269	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 72.32
Tare weight (g)*:* 39.93

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	10-Apr-12	8:25	74.66	855592	10.63

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

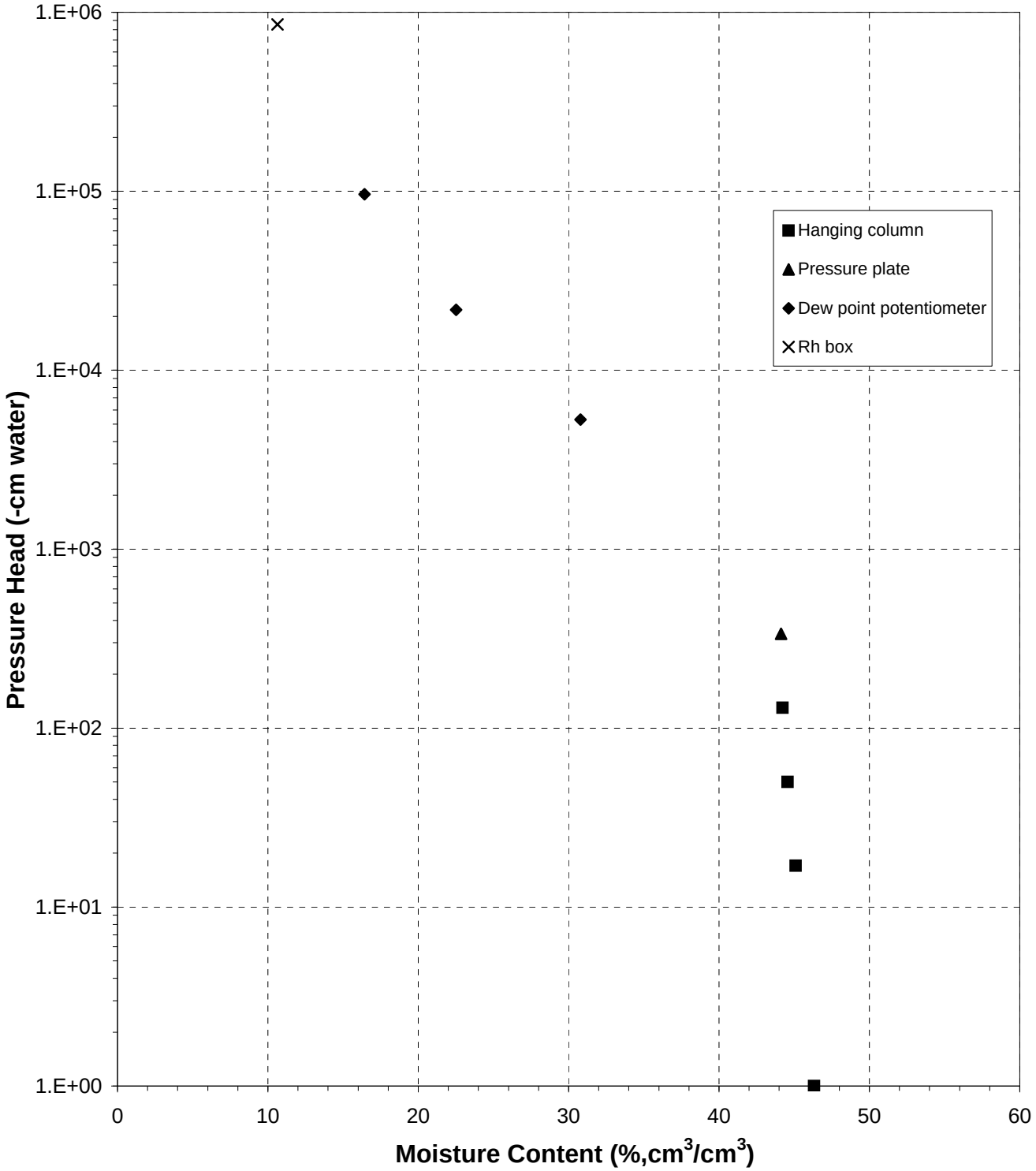
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

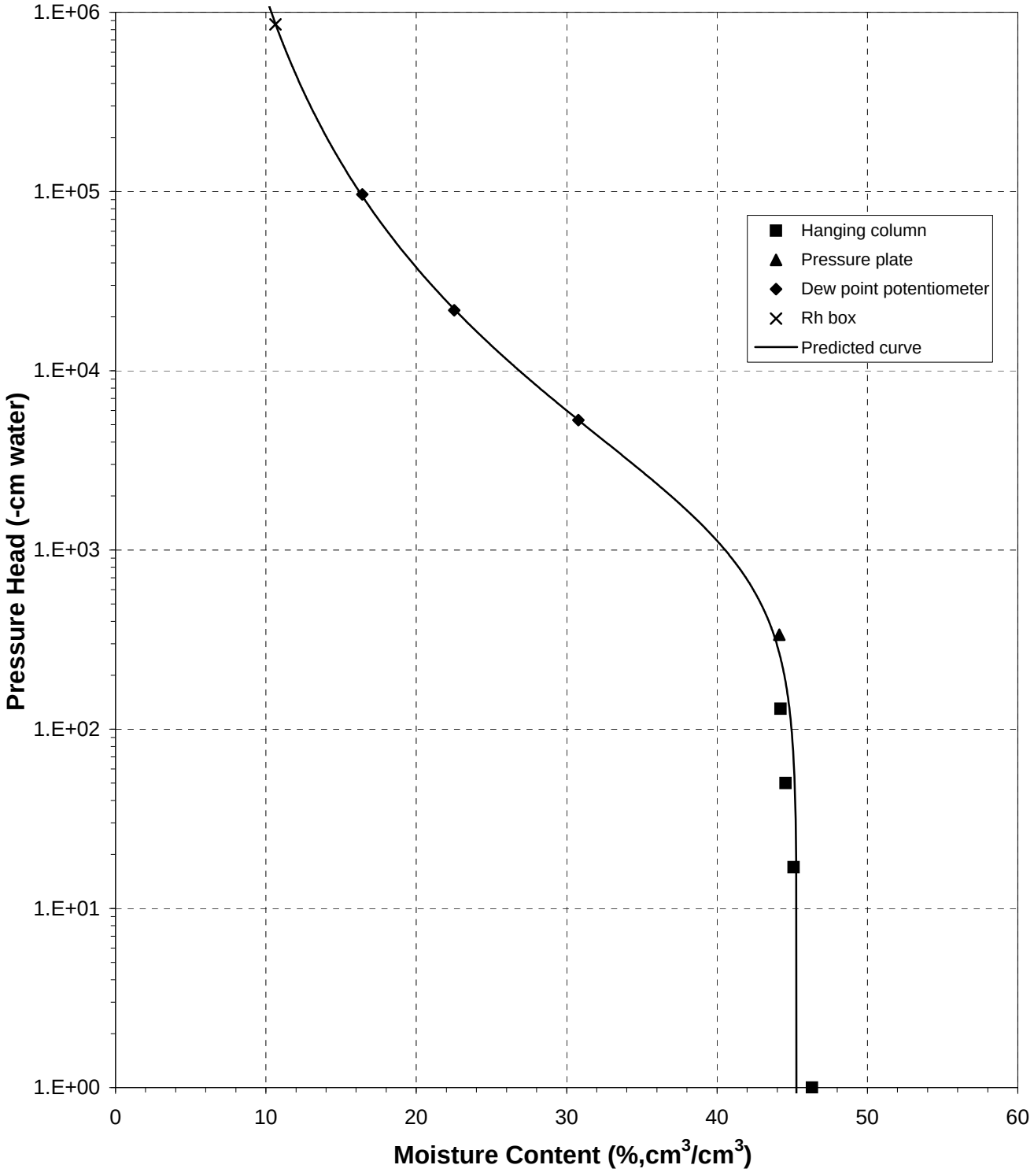
Water Retention Data Points

Sample Number: PB-12 (109-110)



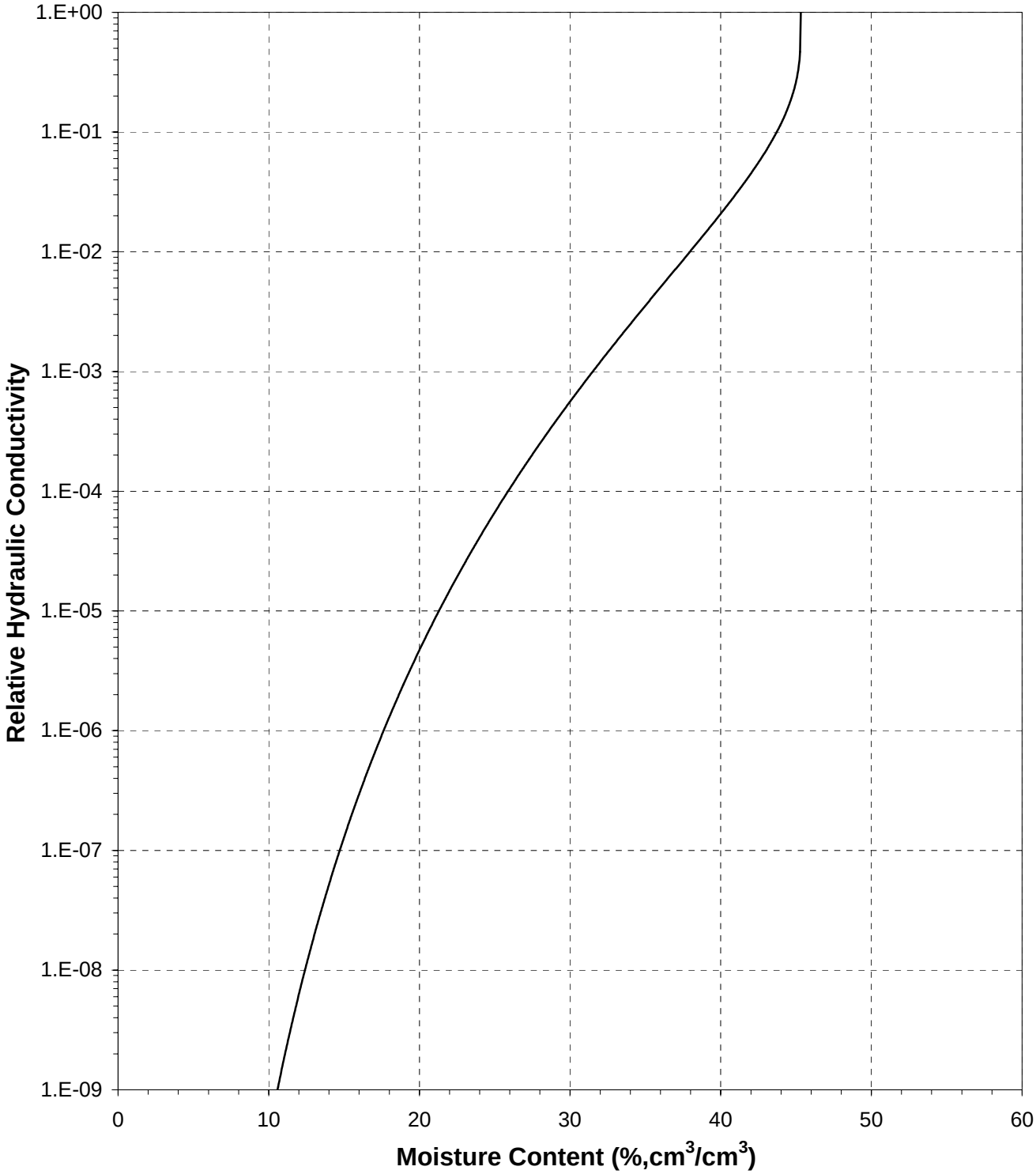
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (109-110)



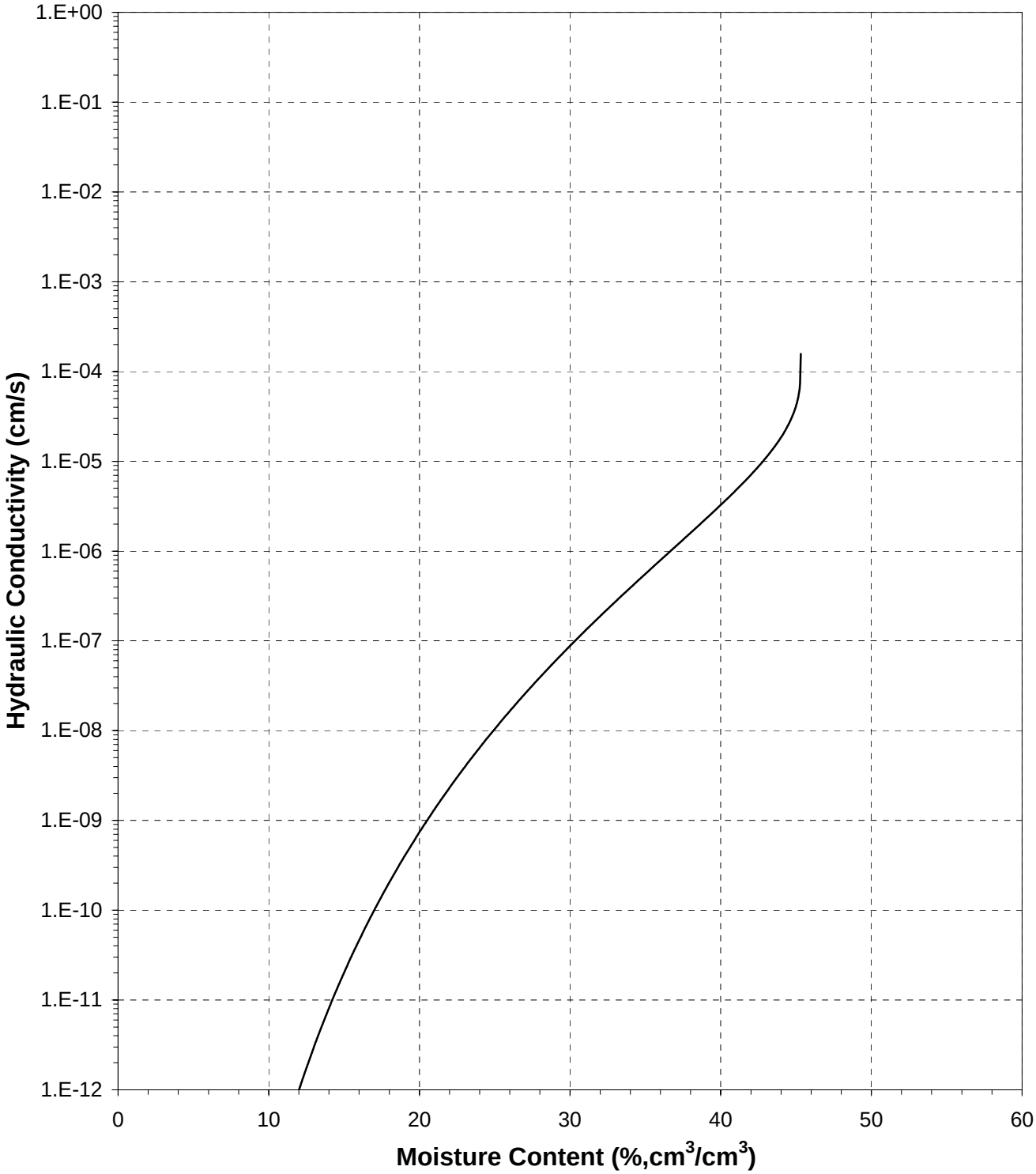
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (109-110)



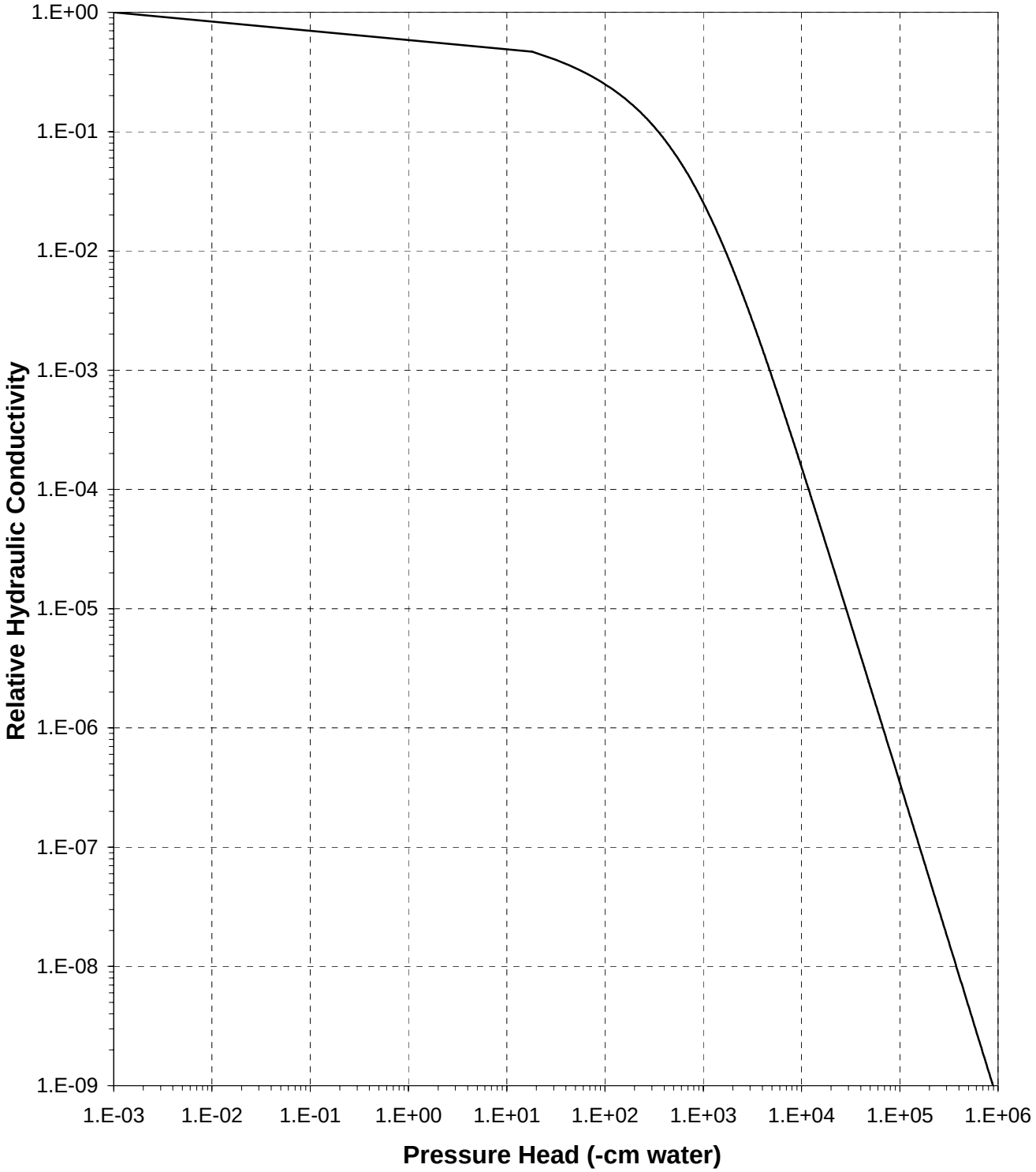
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (109-110)



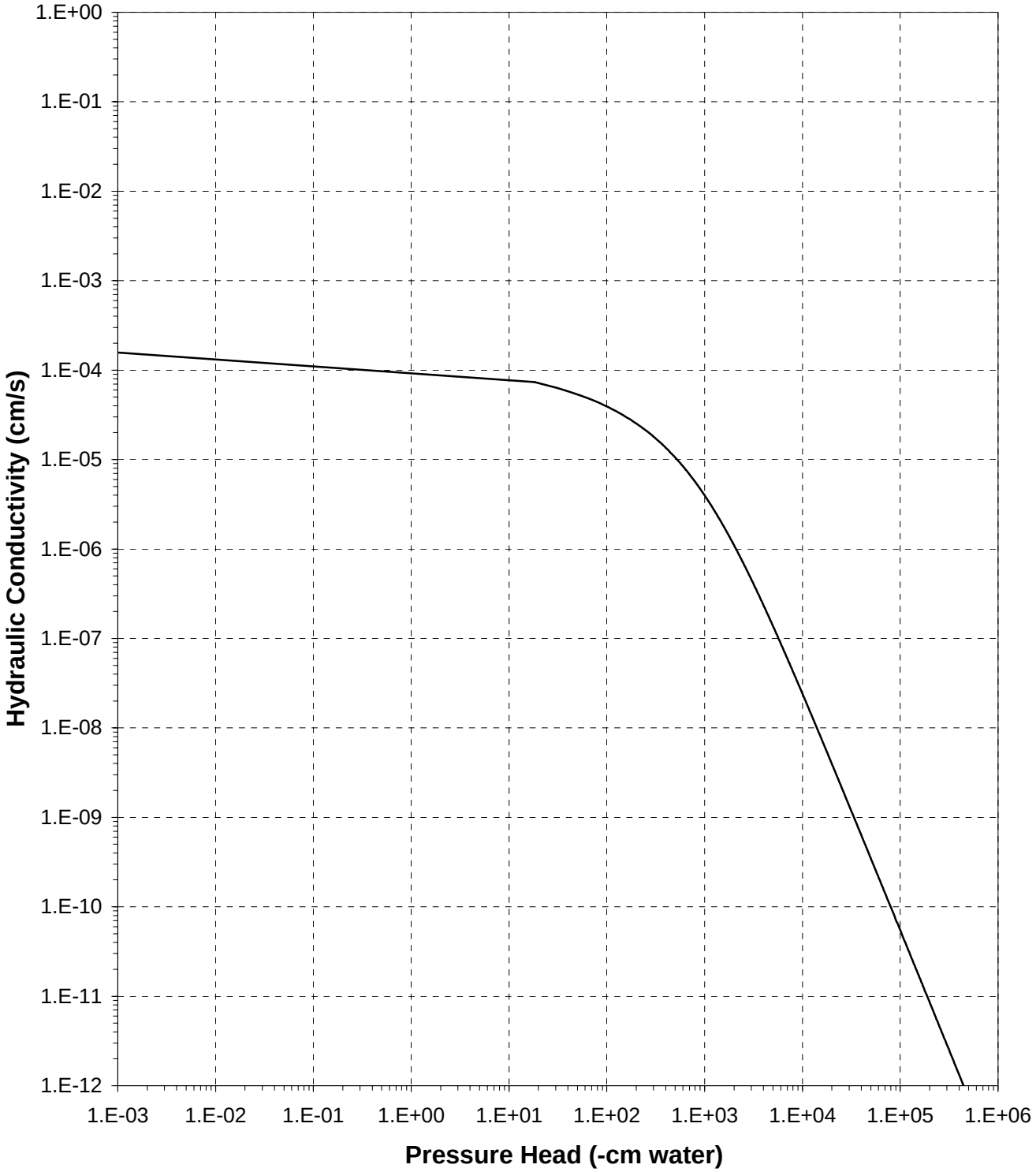
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (109-110)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (109-110)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

Dry wt. of sample (g): 220.23
Tare wt., ring (g): 89.72
Tare wt., screen & clamp (g): 24.21
Initial sample volume (cm^3): 135.65
Initial dry bulk density (g/cm^3): 1.62
Measured particle density (g/cm^3): 2.70
Initial calculated total porosity (%): 39.87

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	8-Feb-12	13:30	388.24	0	39.87
	15-Feb-12	9:20	388.20	52.0	39.84
	22-Feb-12	10:15	387.89	151.0	39.61
Pressure plate:	7-Mar-12	10:55	387.51	337	39.33
	21-Mar-12	8:15	387.16	1275	39.07

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	52.0	---	---	---	---
	151.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (154-155)

Initial sample bulk density (g/cm^3)*:* 1.62
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 146.70
Tare weight, jar (g)*:* 112.73

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	30-Mar-12	15:10	152.05	10708	25.57
	28-Mar-12	11:06	150.23	45075	16.87
	3-Apr-12	11:55	148.91	326744	10.56

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	10708	---	---	---	---
	45075	---	---	---	---
	326744	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 67.88
Tare weight (g)*:* 39.42

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	22-Mar-12	8:30	69.26	854159	7.85

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

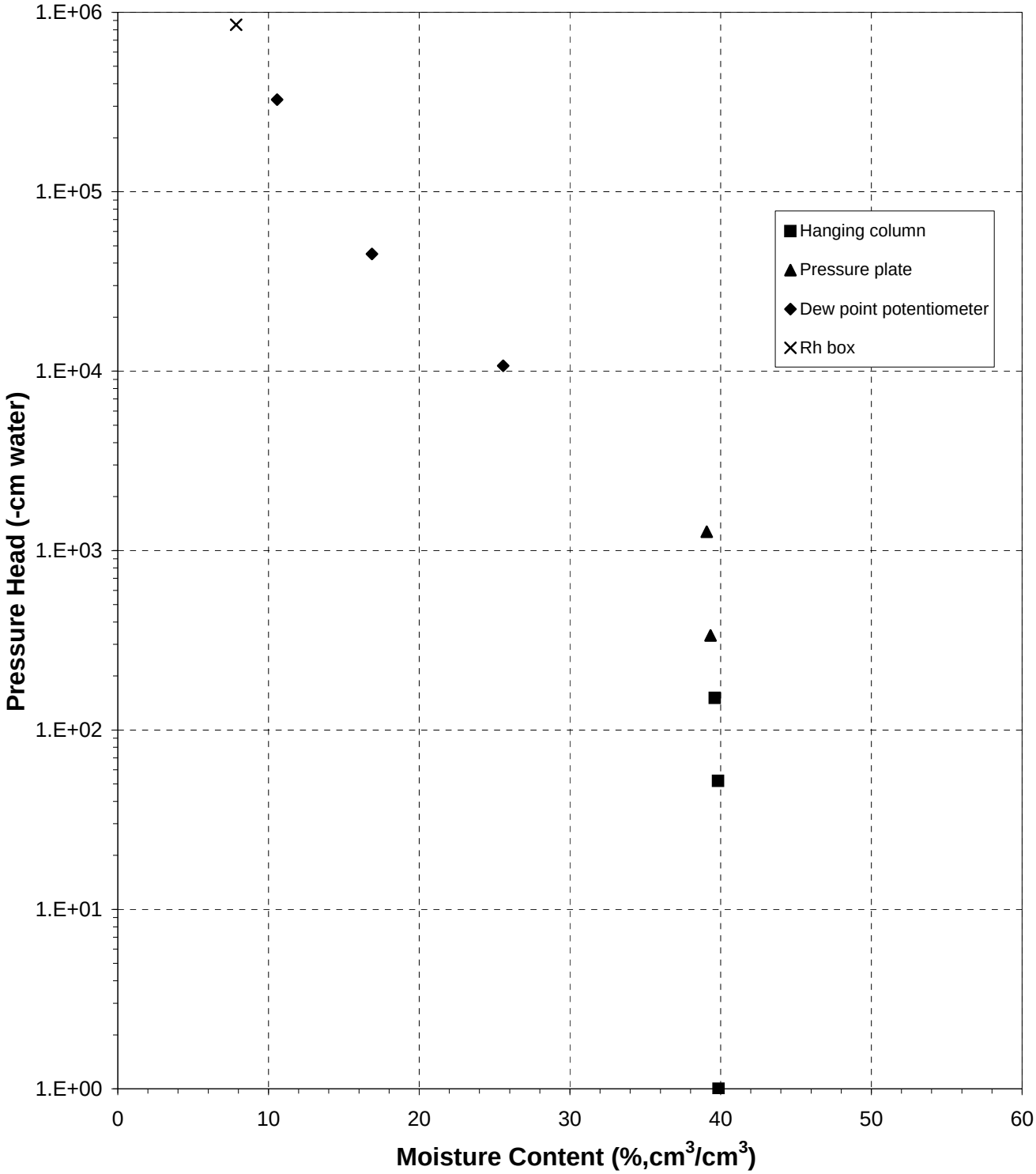
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

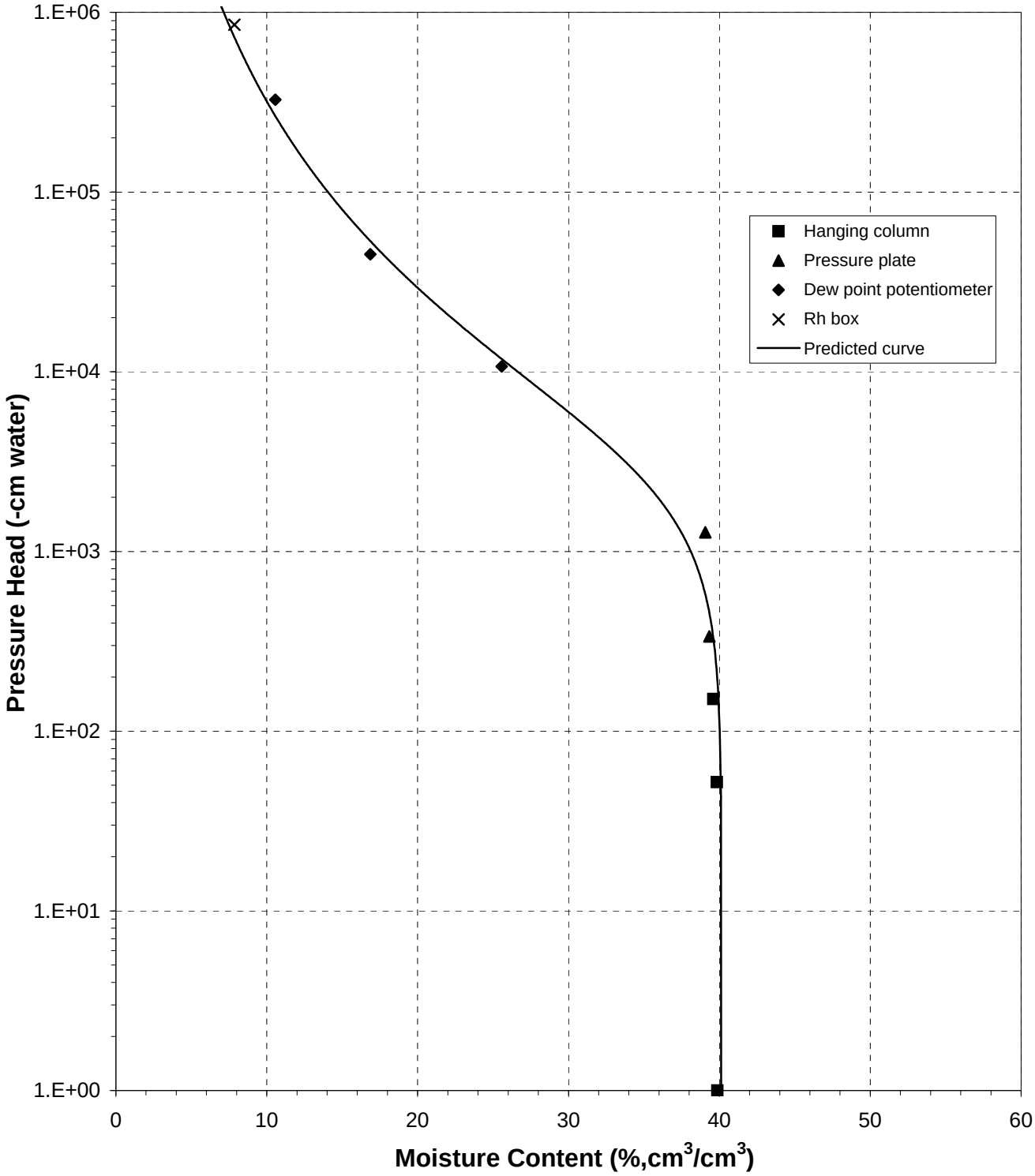
Water Retention Data Points

Sample Number: PB-12 (154-155)



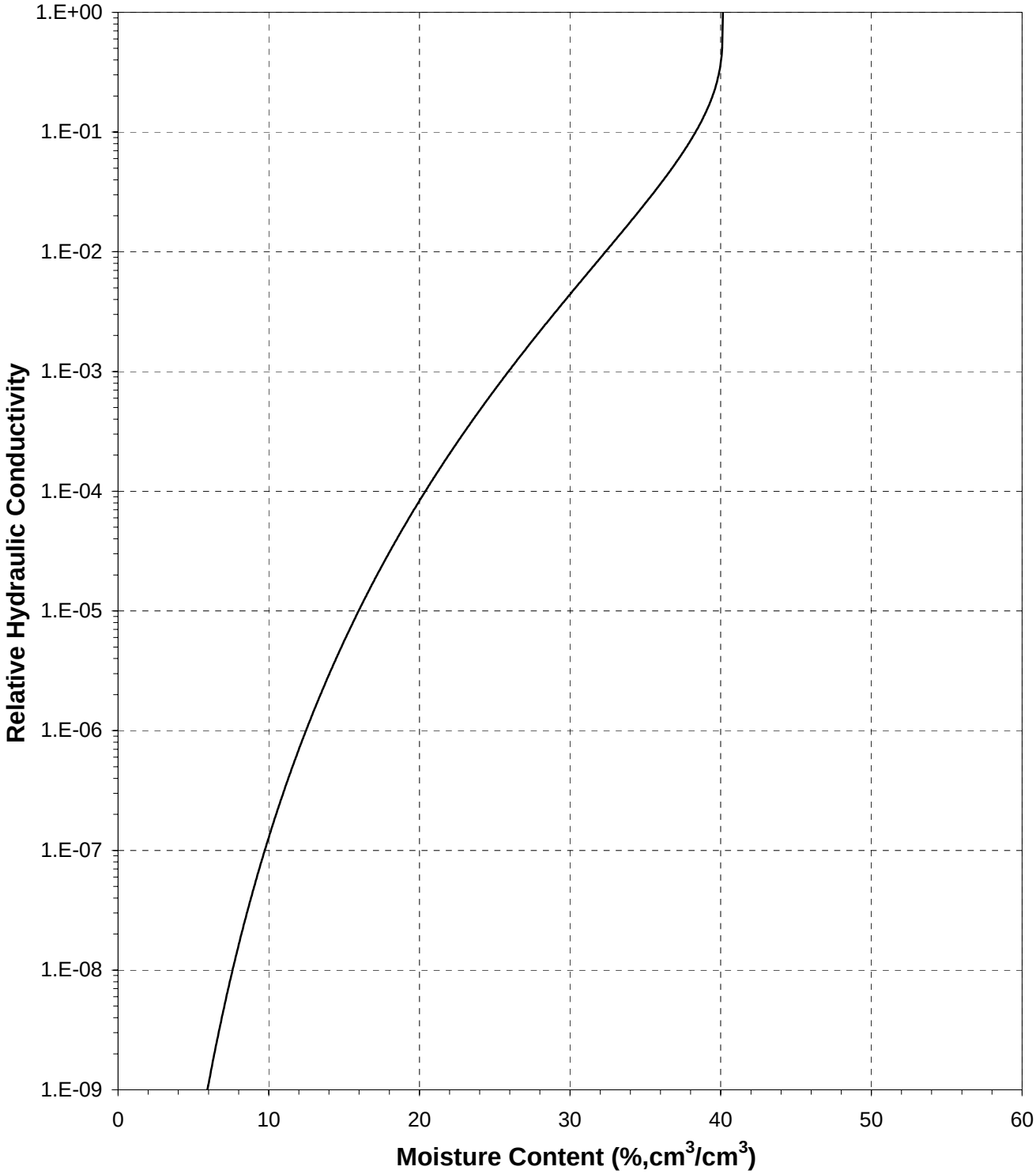
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (154-155)



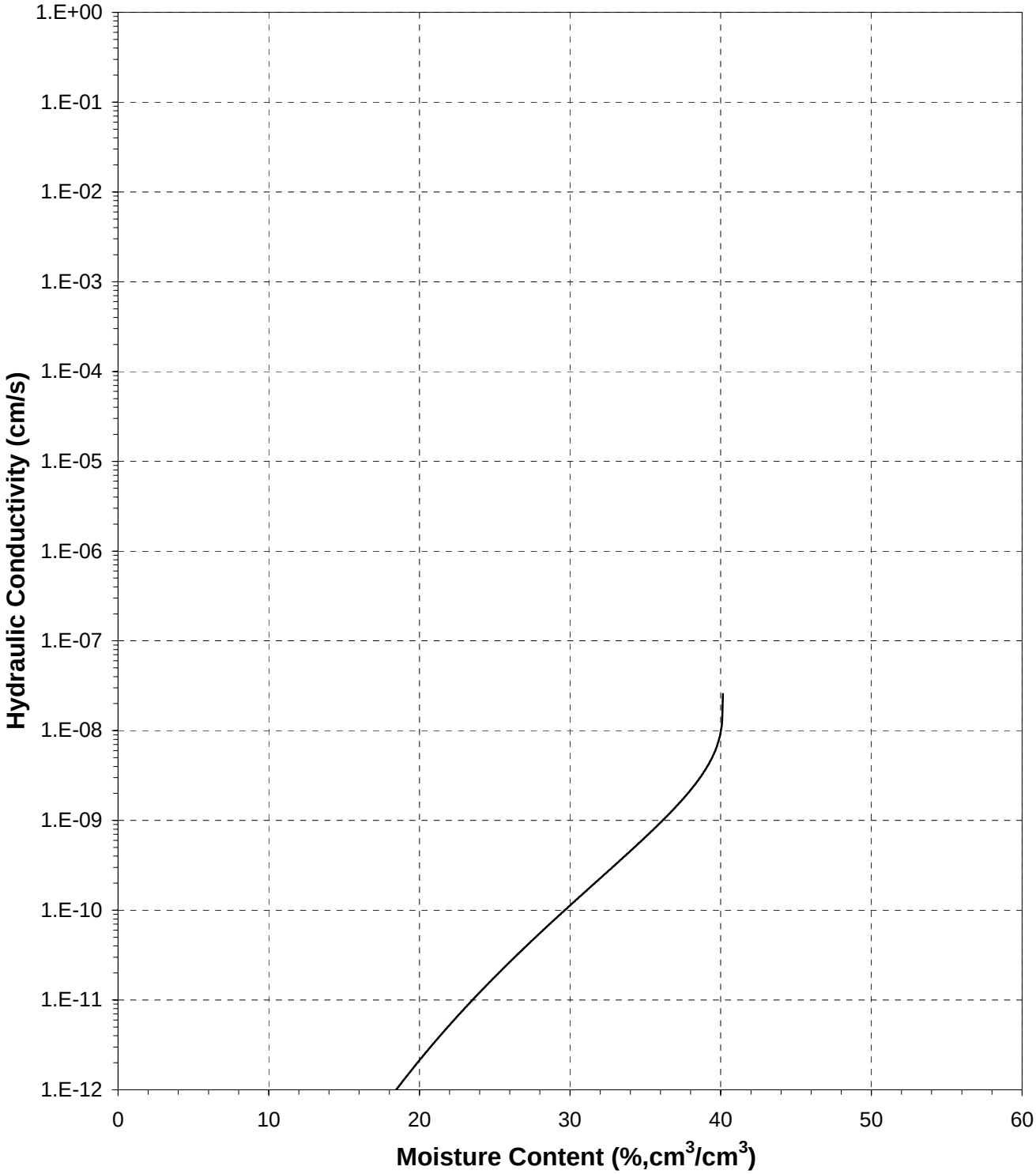
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (154-155)



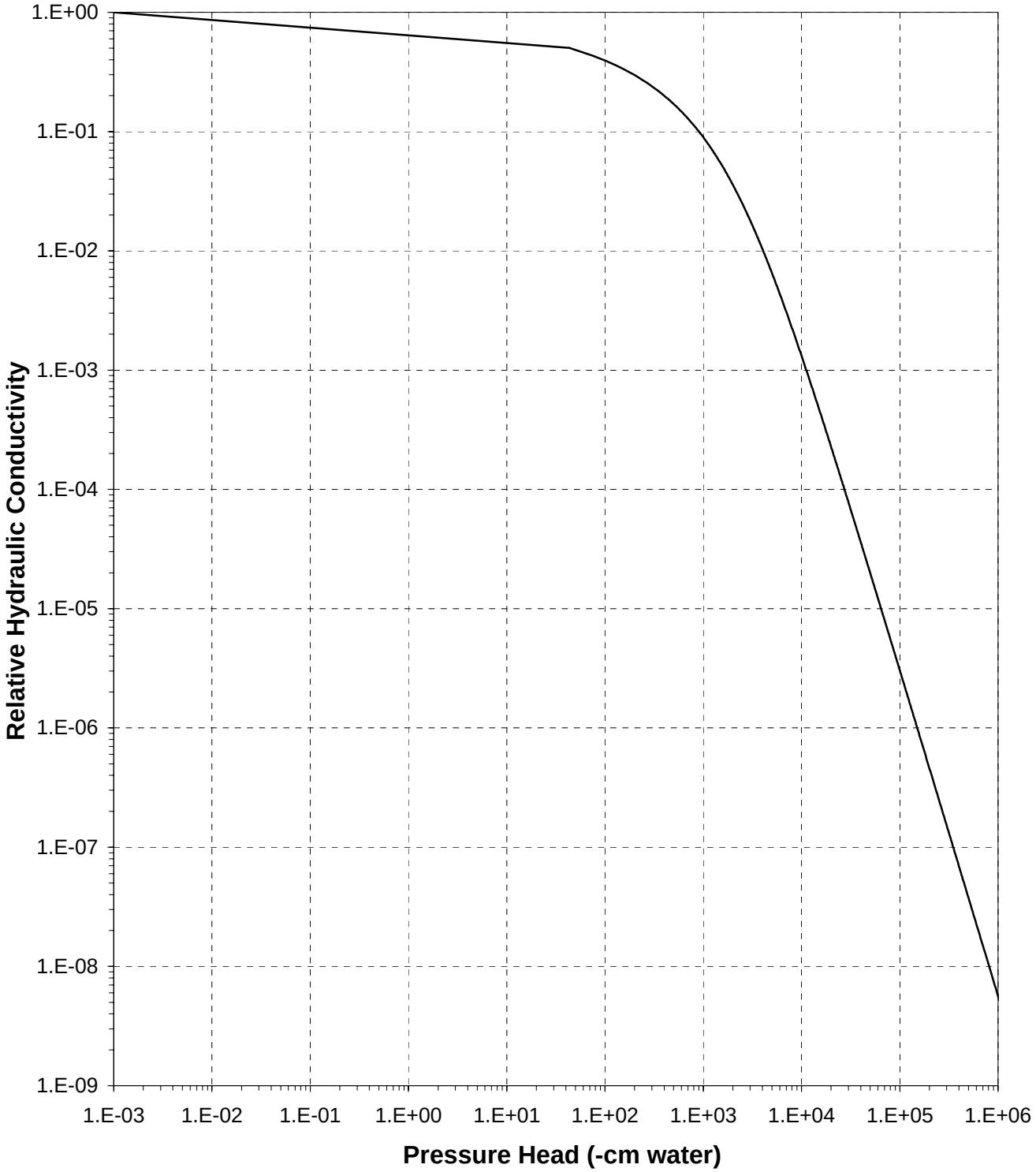
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (154-155)



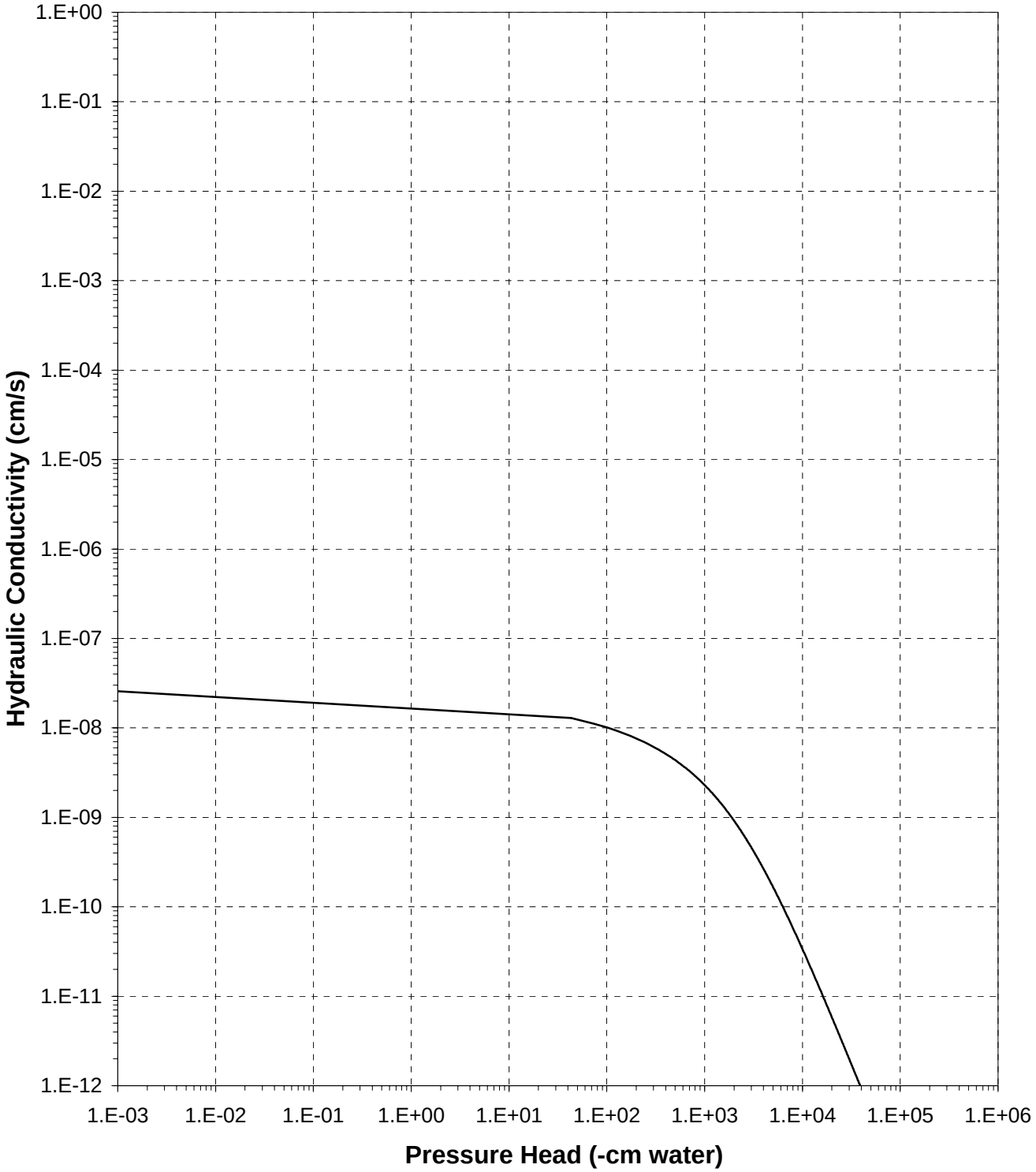
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (154-155)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (154-155)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (179-180)
Date Sampled: 12/7/2011
Depth: 179-180

Dry wt. of sample (g): 184.97
Tare wt., ring (g): 65.44
Tare wt., screen & clamp (g): 27.81
Initial sample volume (cm^3): 121.32
Initial dry bulk density (g/cm^3): 1.52
Measured particle density (g/cm^3): 2.69
Initial calculated total porosity (%): 43.37

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	23-Jan-12	14:00	330.84	0	43.37
	30-Jan-12	14:15	330.48	20.0	43.07
	6-Feb-12	9:15	329.85	69.0	42.56
	13-Feb-12	10:55	327.59	155.0	40.69
Pressure plate:	23-Feb-12	9:55	324.24	337	37.93

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	20.0	---	---	---	---
	69.0	---	---	---	---
	155.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (179-180)

Initial sample bulk density (g/cm^3)*:* 1.52
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 149.95
Tare weight, jar (g)*:* 117.74

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	22-Mar-12	13:28	154.61	13053	22.06
	15-Mar-12	11:20	153.30	36713	15.86
	27-Mar-12	13:58	152.53	118093	12.21

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	13053	---	---	---	---
	36713	---	---	---	---
	118093	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 70.87
Tare weight (g)*:* 40.70

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	22-Mar-12	8:30	72.31	854159	7.26

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

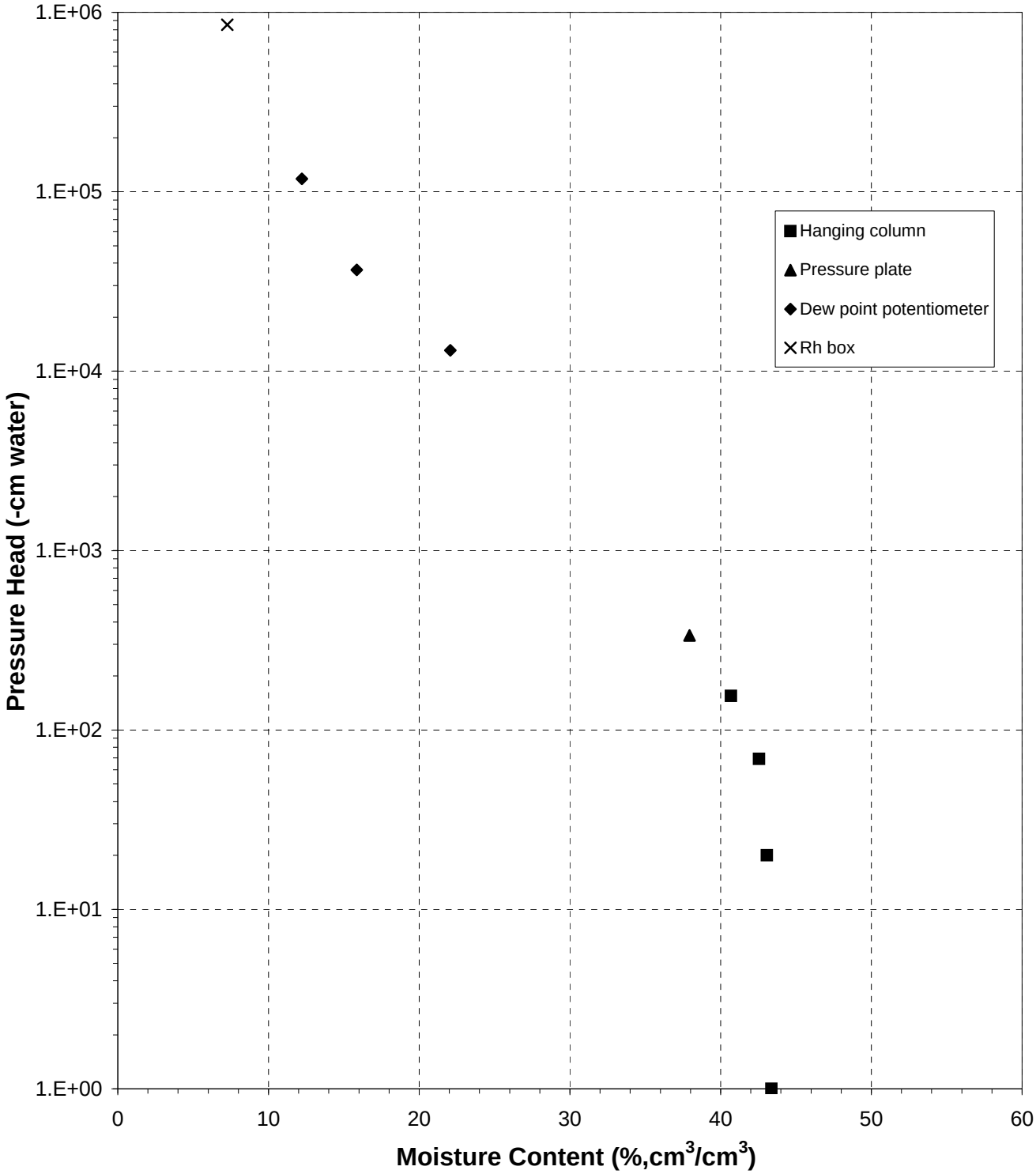
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

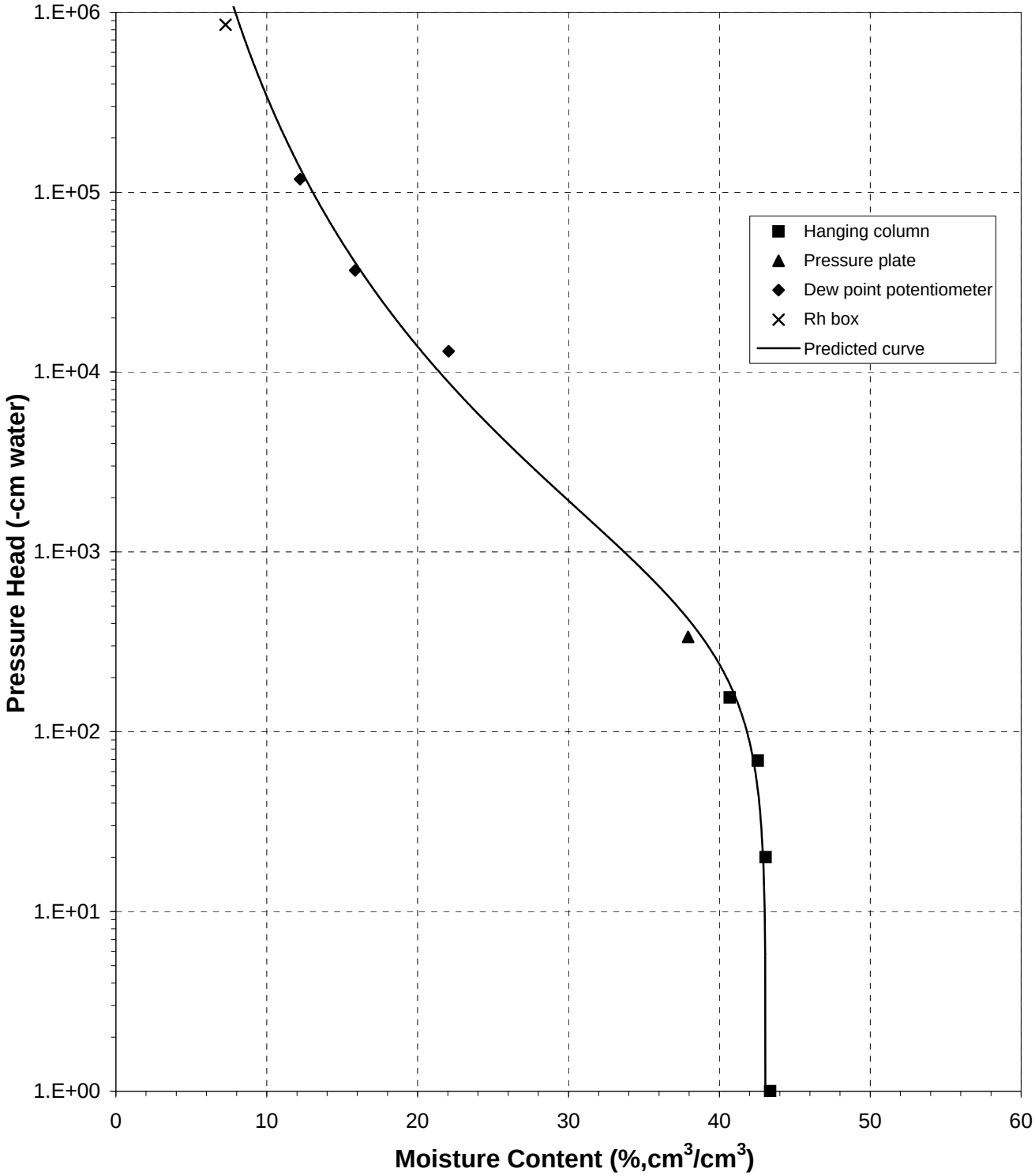
Water Retention Data Points

Sample Number: PB-12 (179-180)



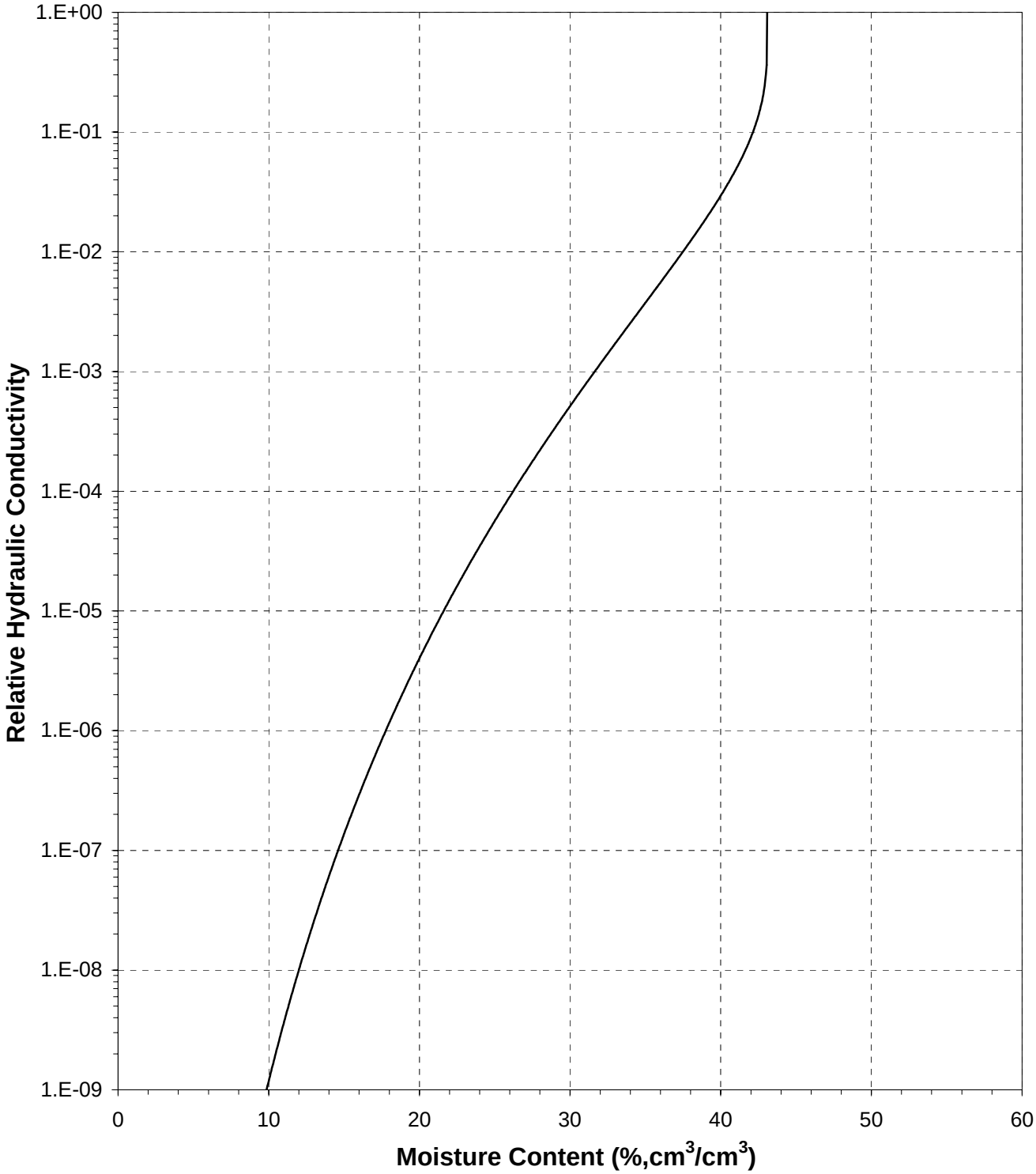
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (179-180)



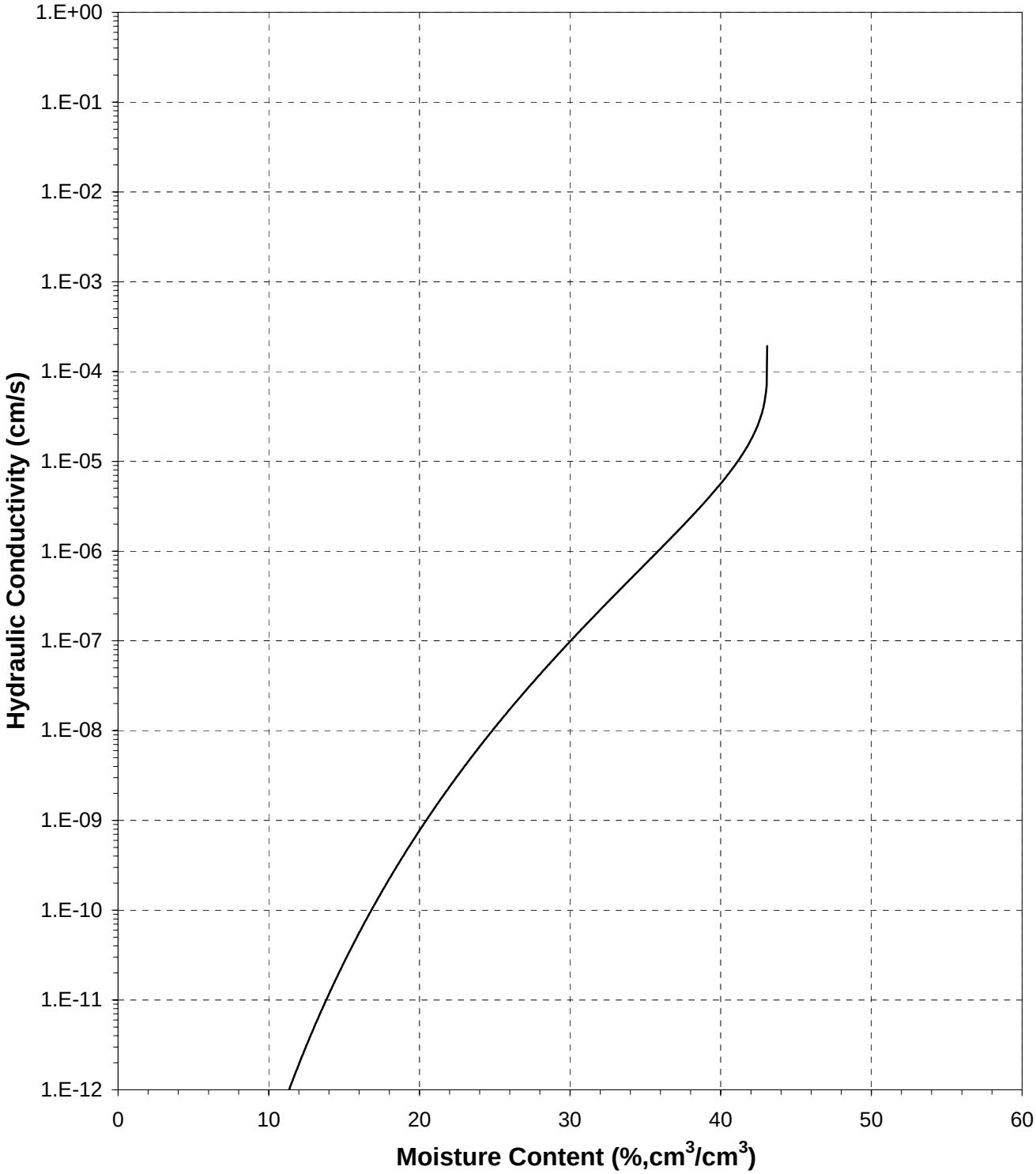
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (179-180)



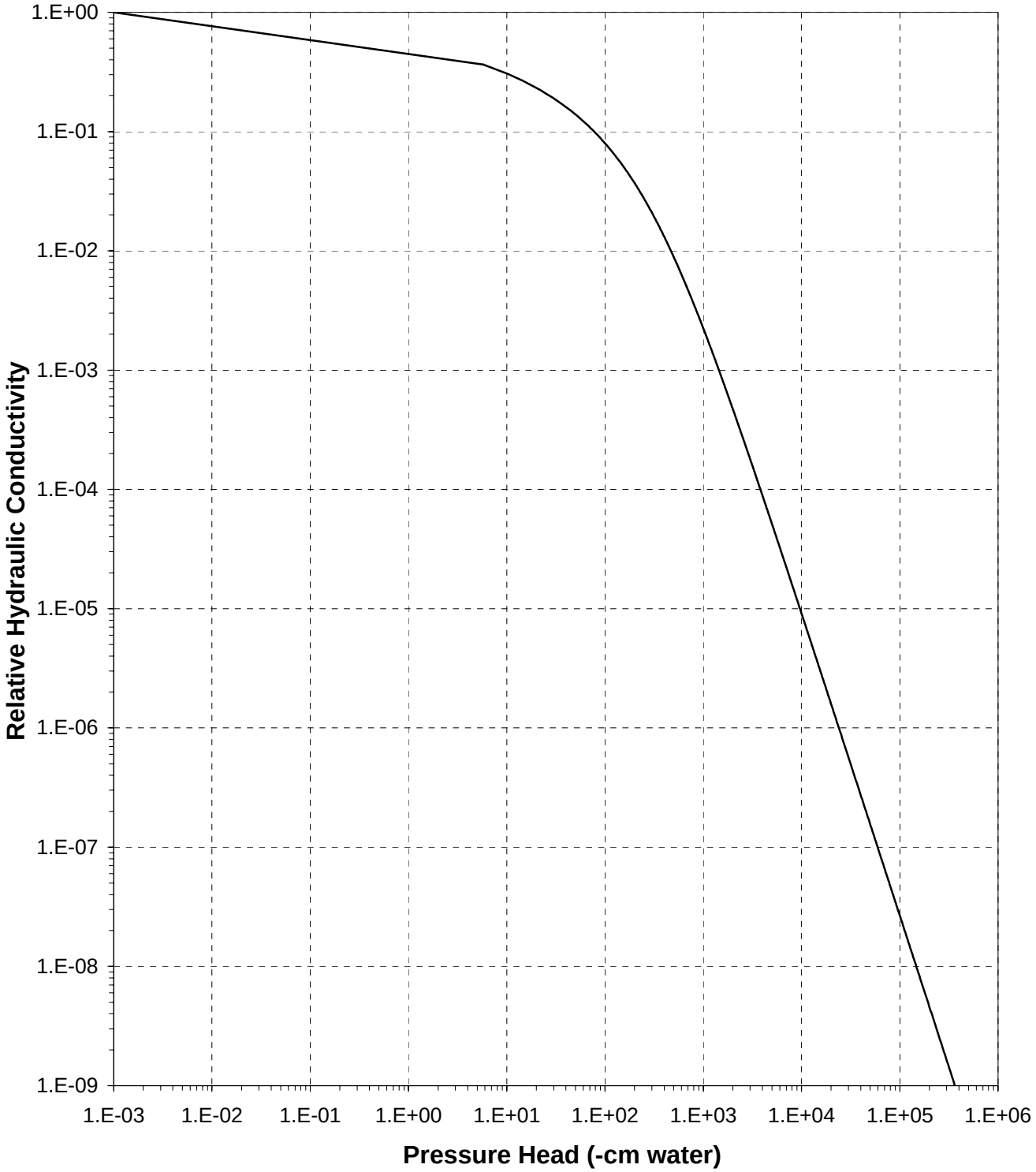
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (179-180)



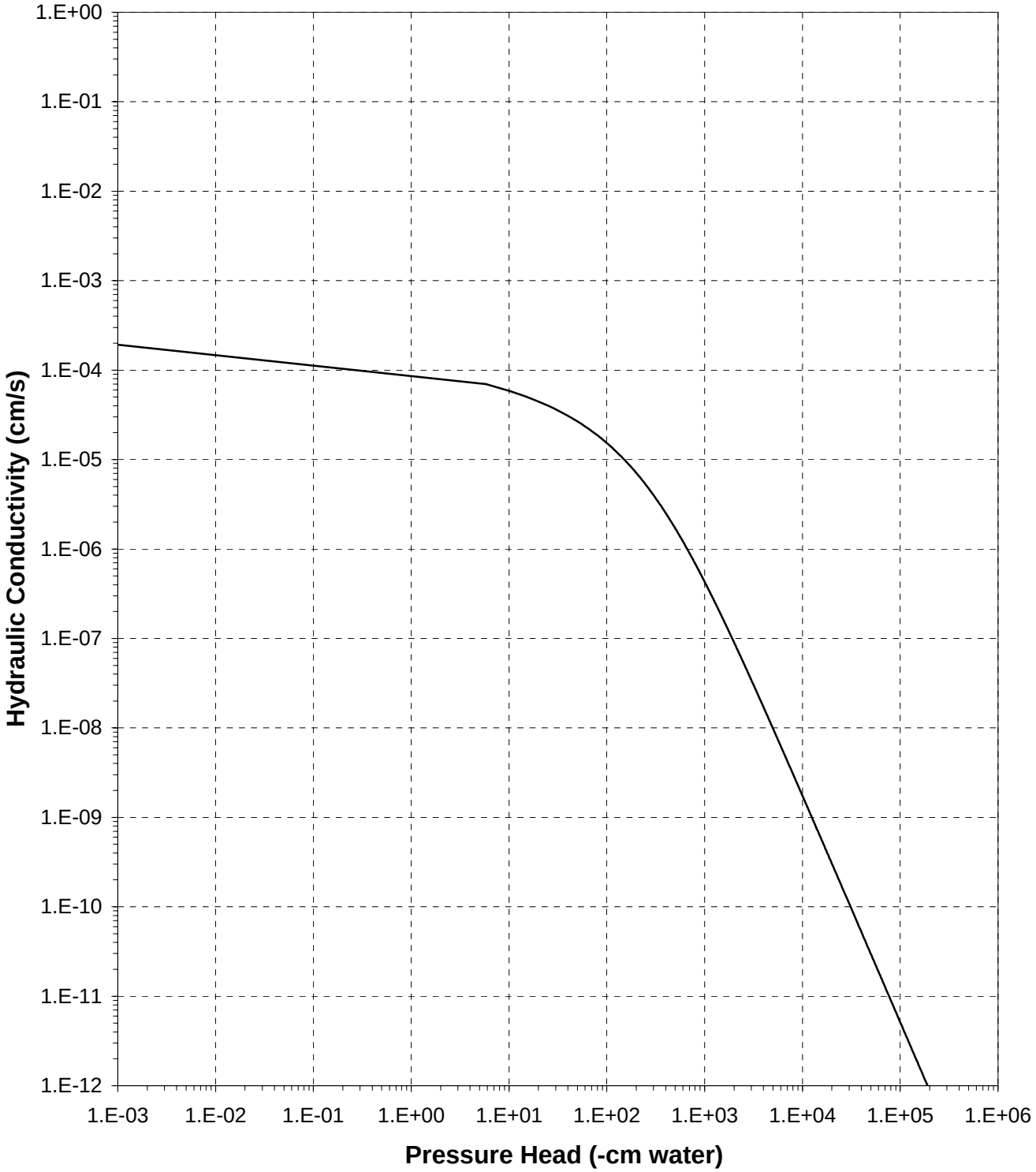
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (179-180)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (179-180)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (204-205)
Date Sampled: 12/7/2011
Depth: 204-205

Dry wt. of sample (g): 174.06
Tare wt., ring (g): 66.10
Tare wt., screen & clamp (g): 25.35
Initial sample volume (cm^3): 114.16
Initial dry bulk density (g/cm^3): 1.52
Measured particle density (g/cm^3): 2.67
Initial calculated total porosity (%): 42.93

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:25	314.52	0	42.93
	7-Feb-12	10:15	314.02	51.0	42.49
	14-Feb-12	8:05	313.58	150.0	42.11
Pressure plate:	28-Mar-12	8:05	312.29	337	40.98
	13-Mar-12	8:36	310.96	1275	39.81

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (204-205)

Initial sample bulk density (g/cm^3)*:* 1.52
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 156.62
Tare weight, jar (g)*:* 117.45

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	28-Mar-12	16:12	161.60	10810	19.38
	27-Mar-12	17:00	159.37	62106	10.70
	3-Apr-12	11:45	158.56	511226	7.55

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	10810	---	---	---	---
	62106	---	---	---	---
	511226	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 64.36
Tare weight (g)*:* 36.88

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	2-Mar-12	8:30	65.57	854159	6.73

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

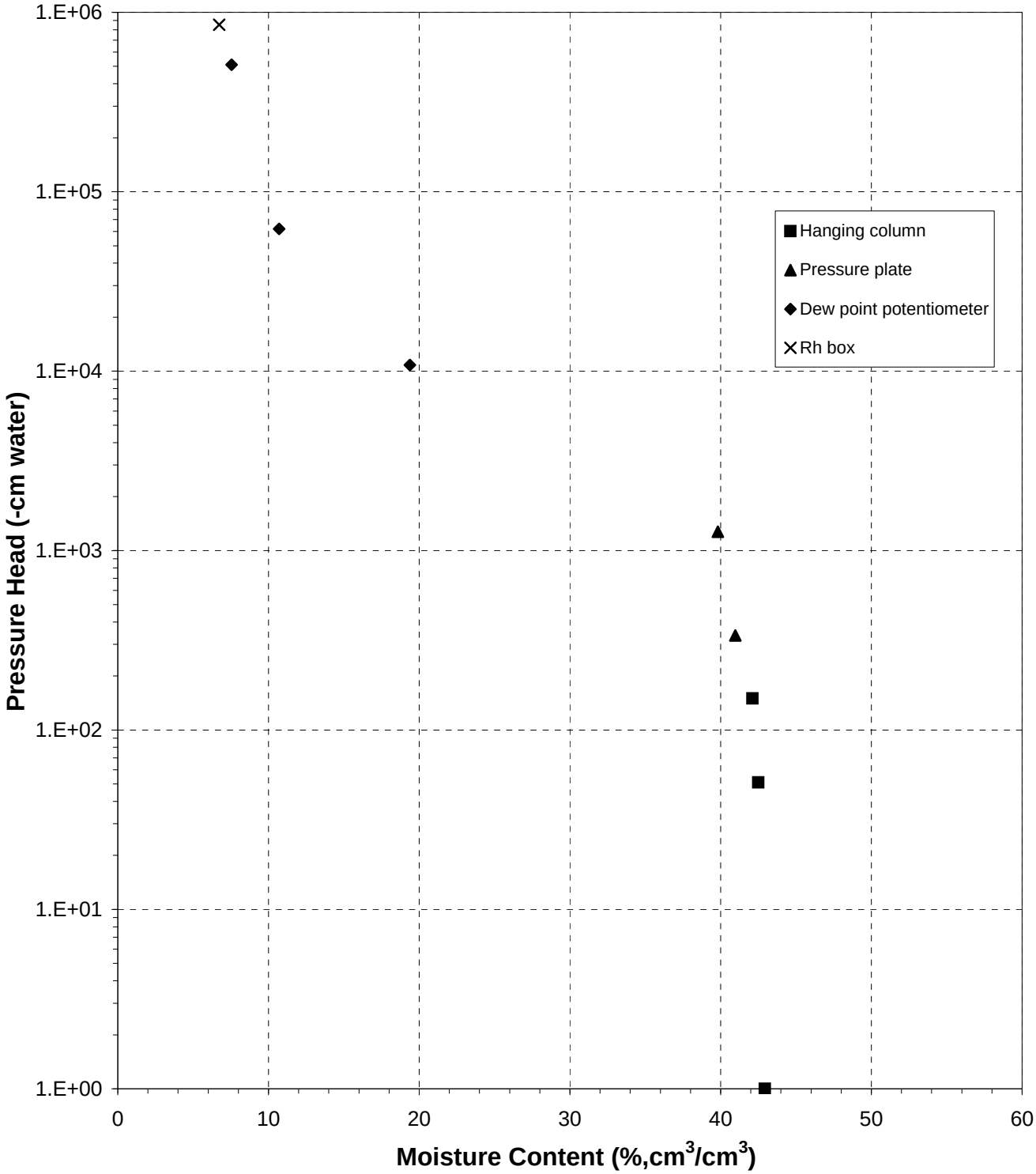
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

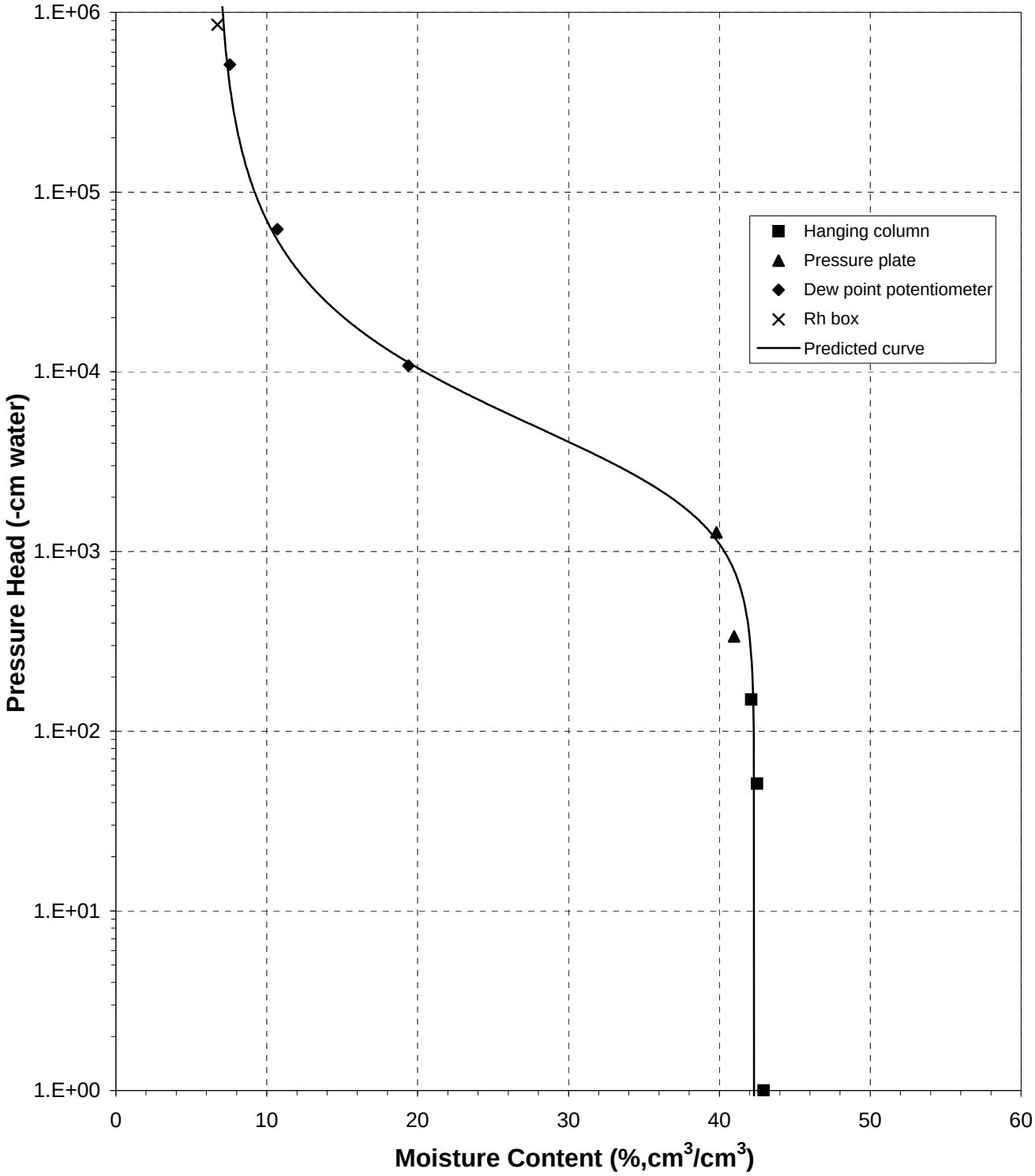
Water Retention Data Points

Sample Number: PB-12 (204-205)



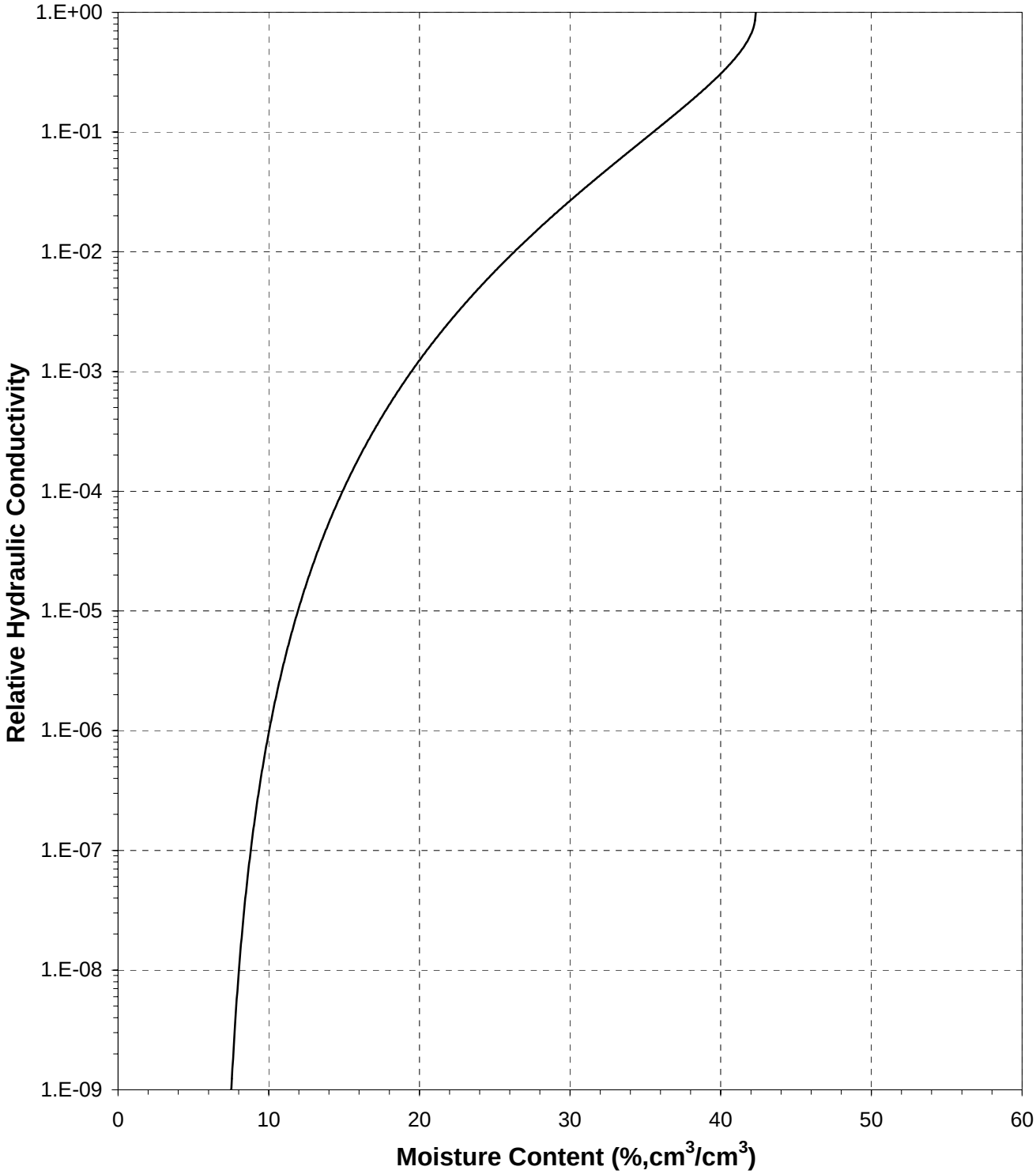
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (204-205)



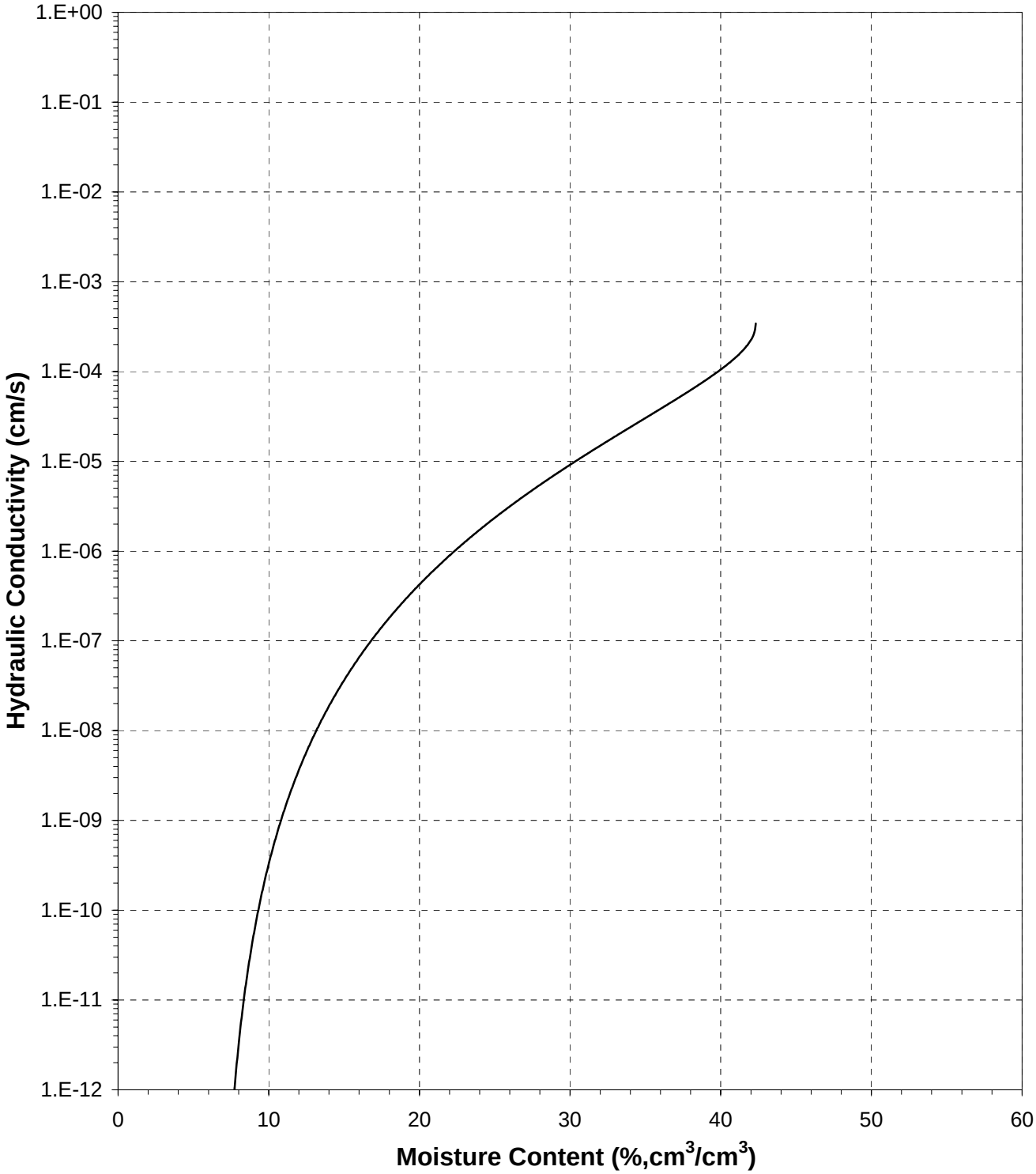
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (204-205)



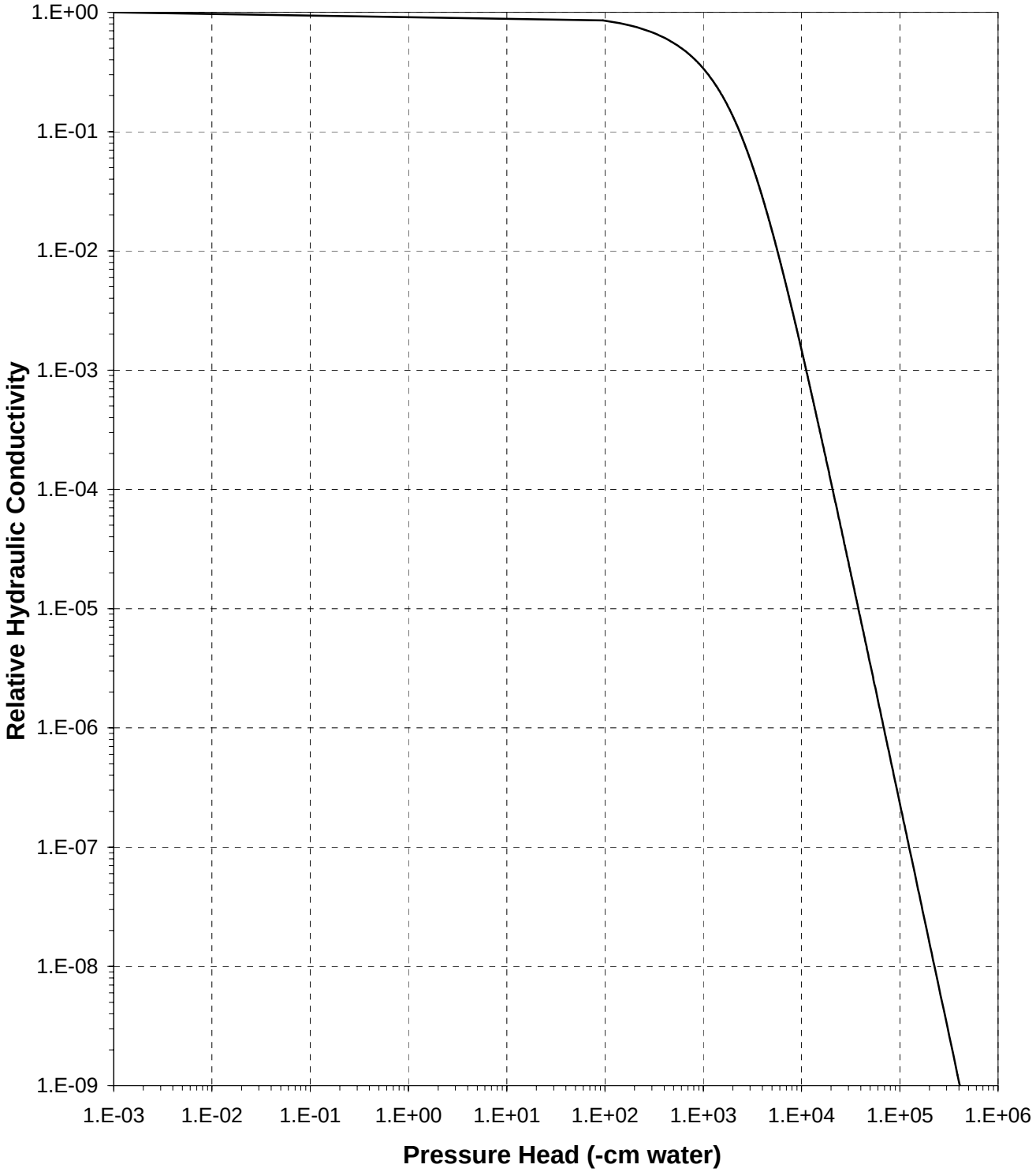
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (204-205)



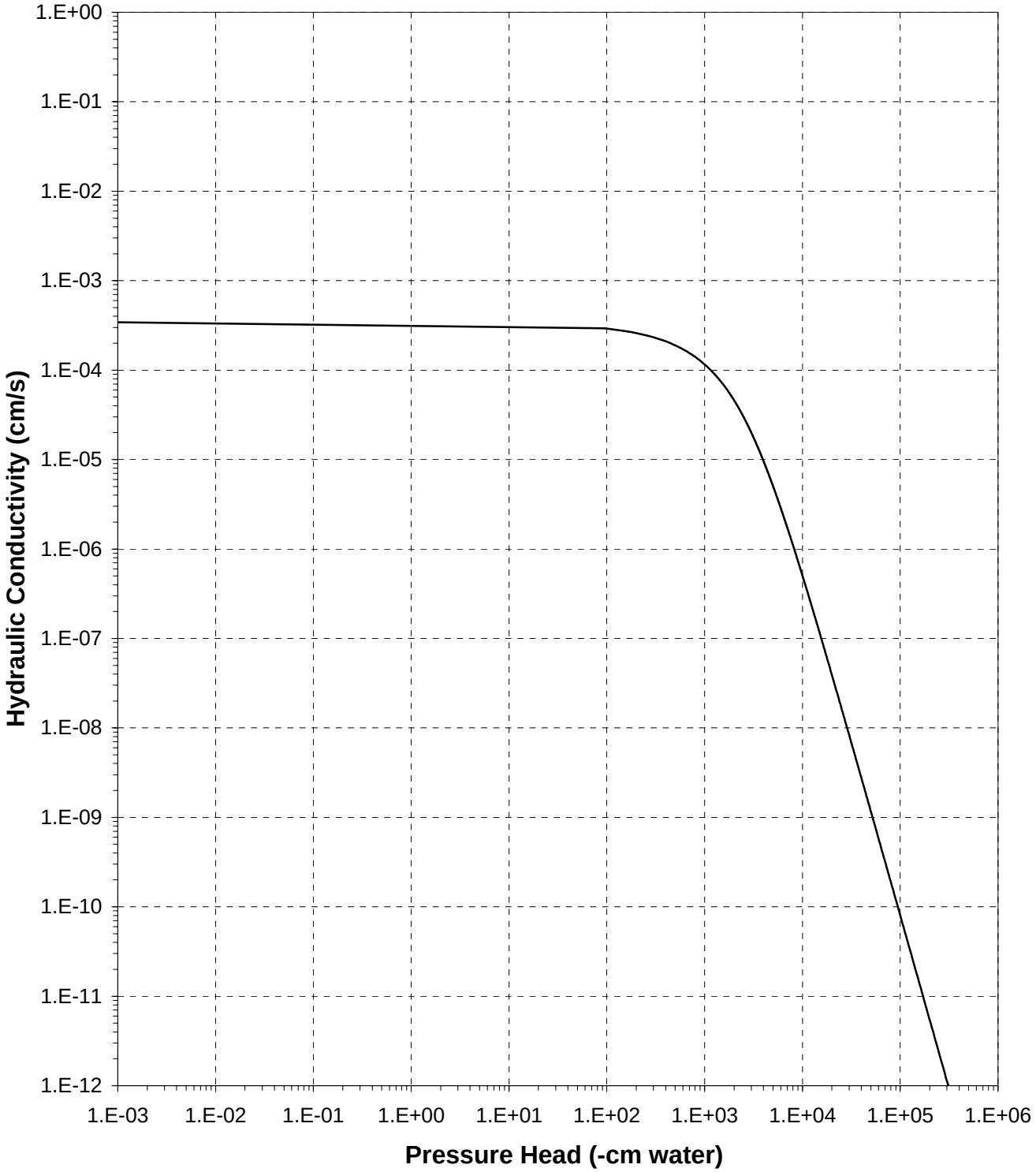
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (204-205)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (204-205)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (224-225)
Date Sampled: 12/7/2011
Depth: 224-225

Dry wt. of sample (g): 105.69
Tare wt., ring (g): 40.04
Tare wt., screen & clamp (g): 24.20
Initial sample volume (cm^3): 67.62
Initial dry bulk density (g/cm^3): 1.56
Measured particle density (g/cm^3): 2.70
Initial calculated total porosity (%): 42.01

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	8-Feb-12	14:10	198.34	0	42.01
	15-Feb-12	9:00	198.06	52.0	41.60
	22-Feb-12	10:40	197.85	151.0	41.29
Pressure plate:	7-Mar-12	11:05	197.64	337	40.98
	21-Mar-12	8:45	197.53	1275	40.81

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	52.0	---	---	---	---
	151.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (224-225)

Initial sample bulk density (g/cm^3)*:* 1.56
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 152.32
Tare weight, jar (g)*:* 112.71

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	2-Apr-12	17:00	158.14	14277	22.96
	3-Apr-12	11:20	156.26	64553	15.55
	28-Mar-12	13:22	155.19	131350	11.32

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	14277	---	---	---	---
	64553	---	---	---	---
	131350	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 72.80
Tare weight (g)*:* 42.10

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	22-Mar-12	8:30	74.36	854159	7.92

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

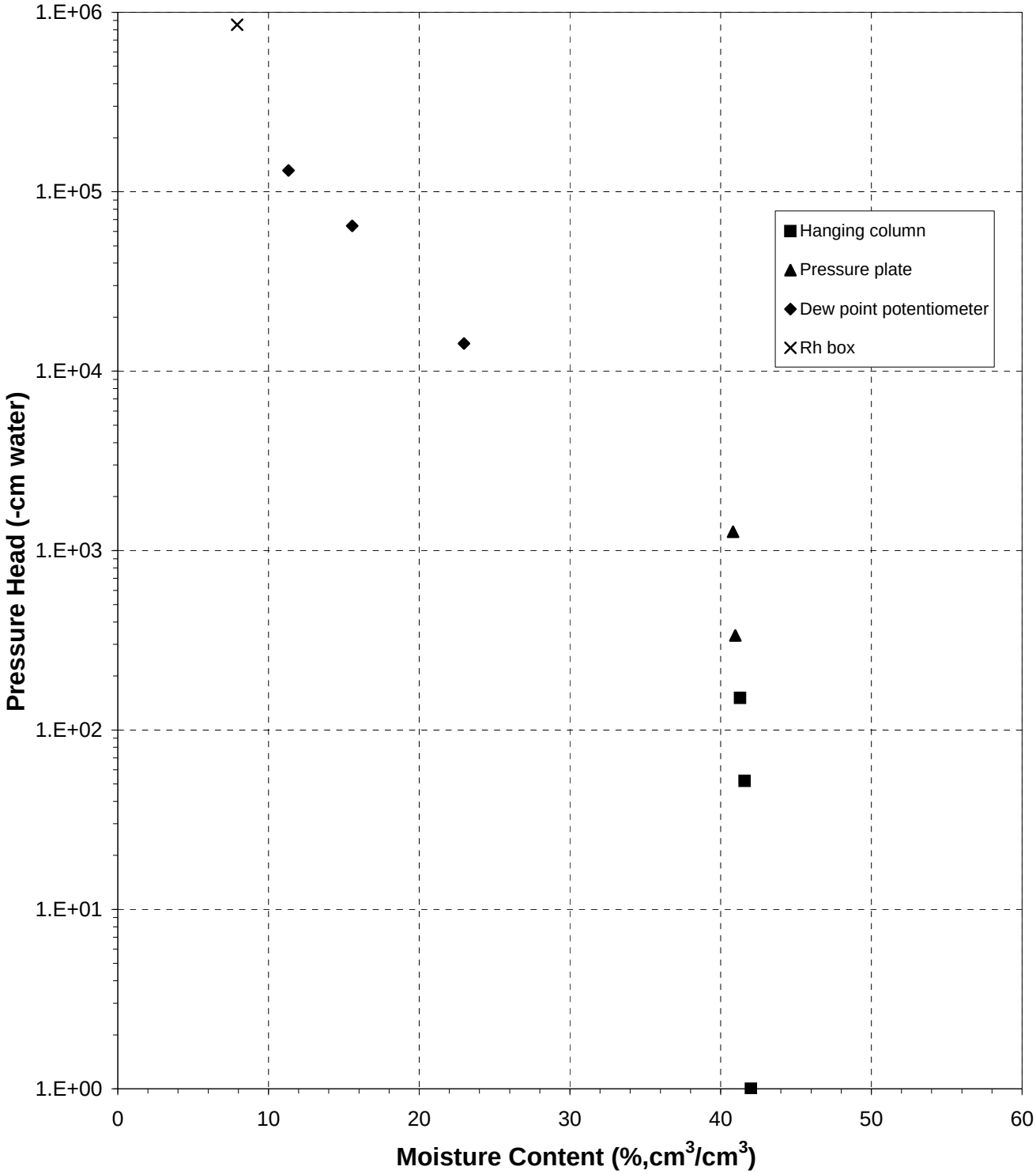
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

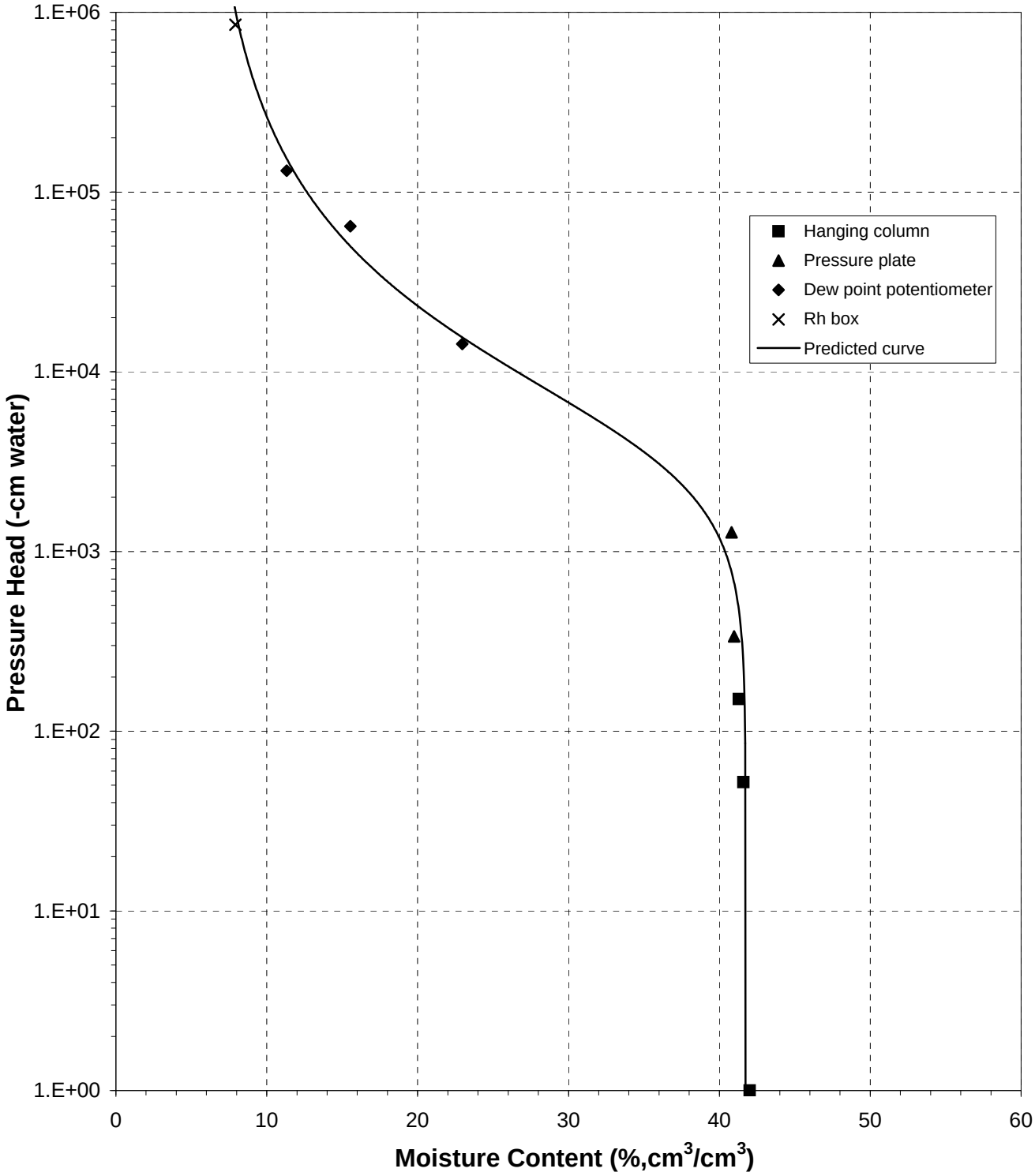
Water Retention Data Points

Sample Number: PB-12 (224-225)



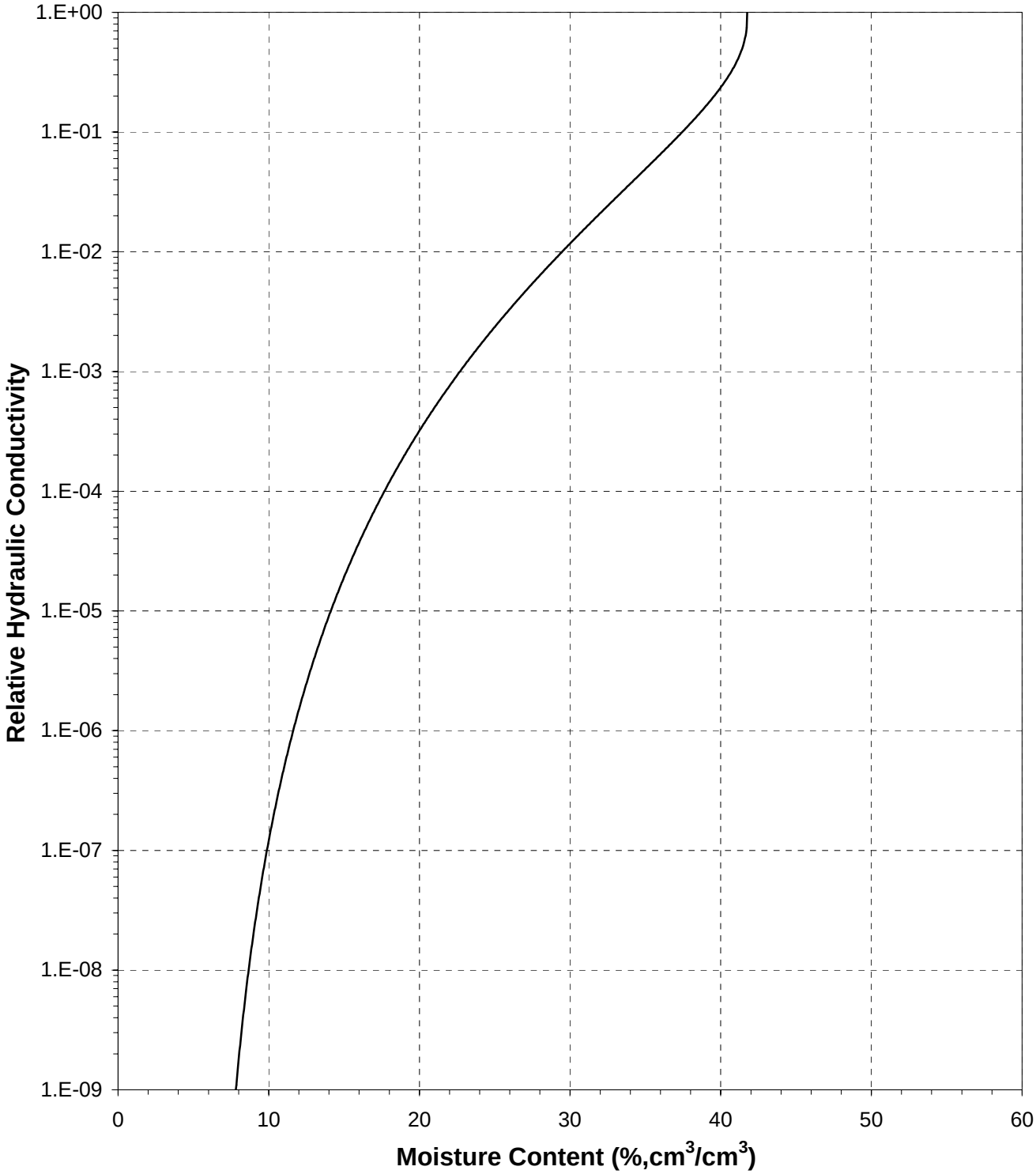
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (224-225)



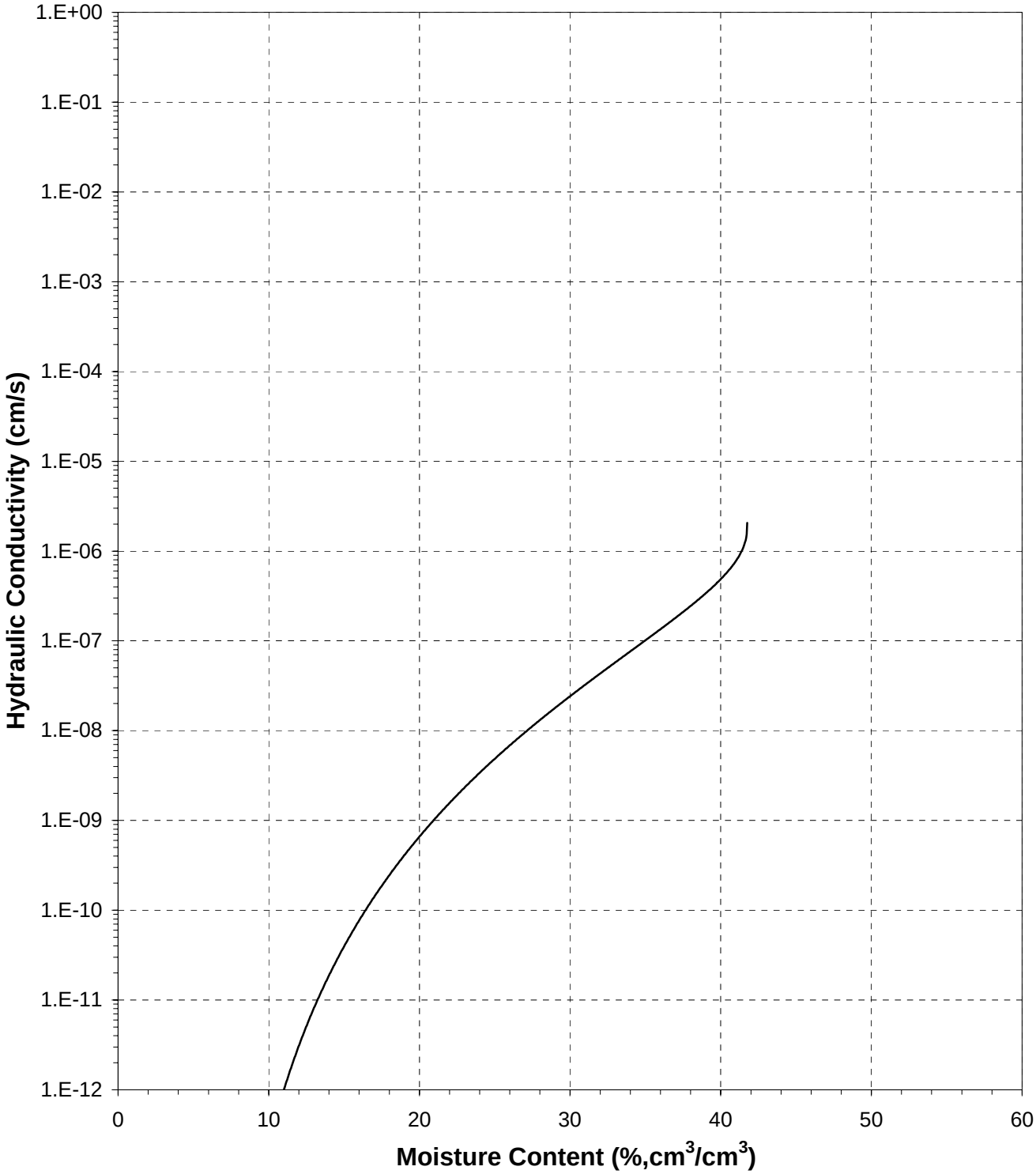
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (224-225)



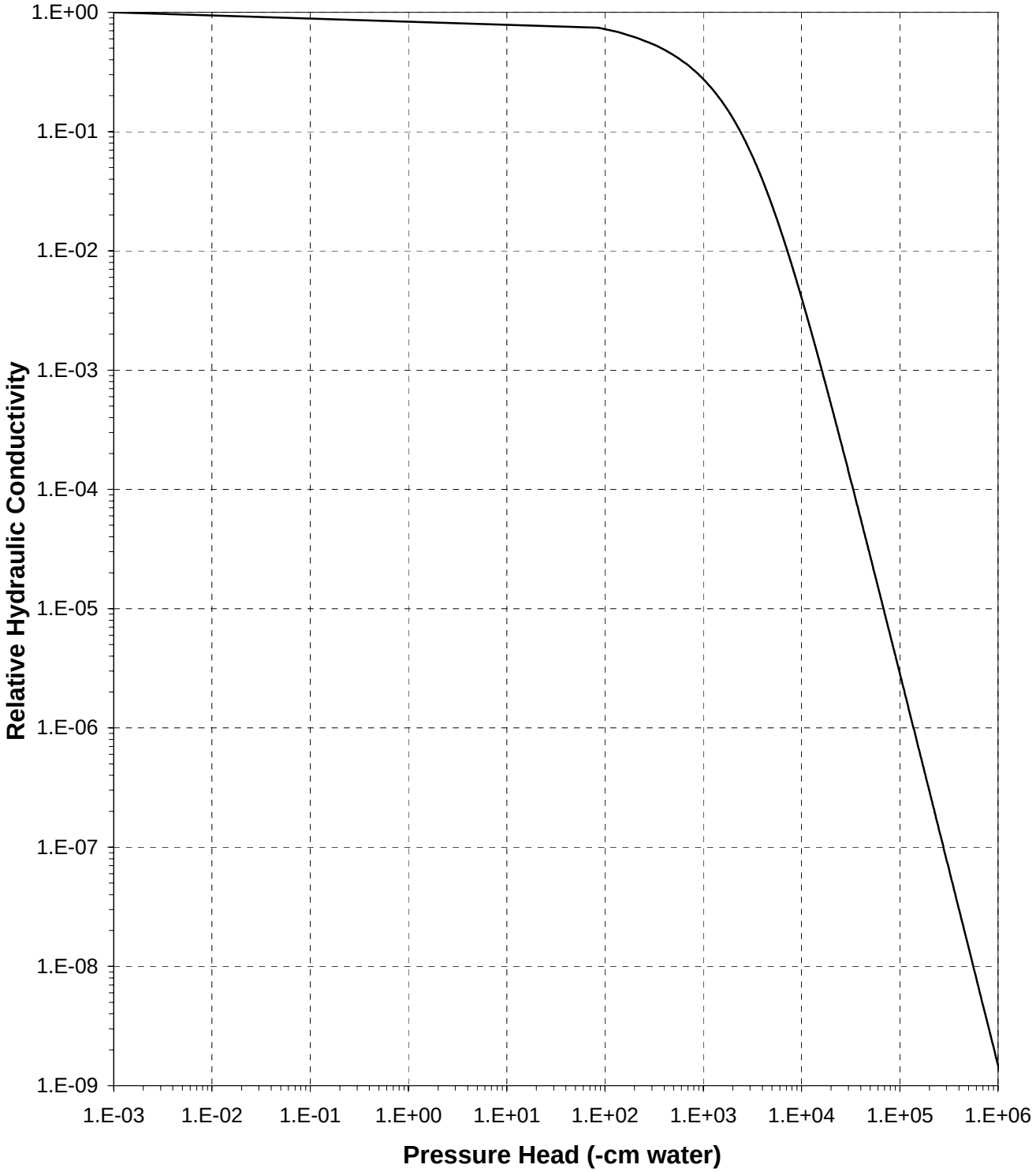
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (224-225)



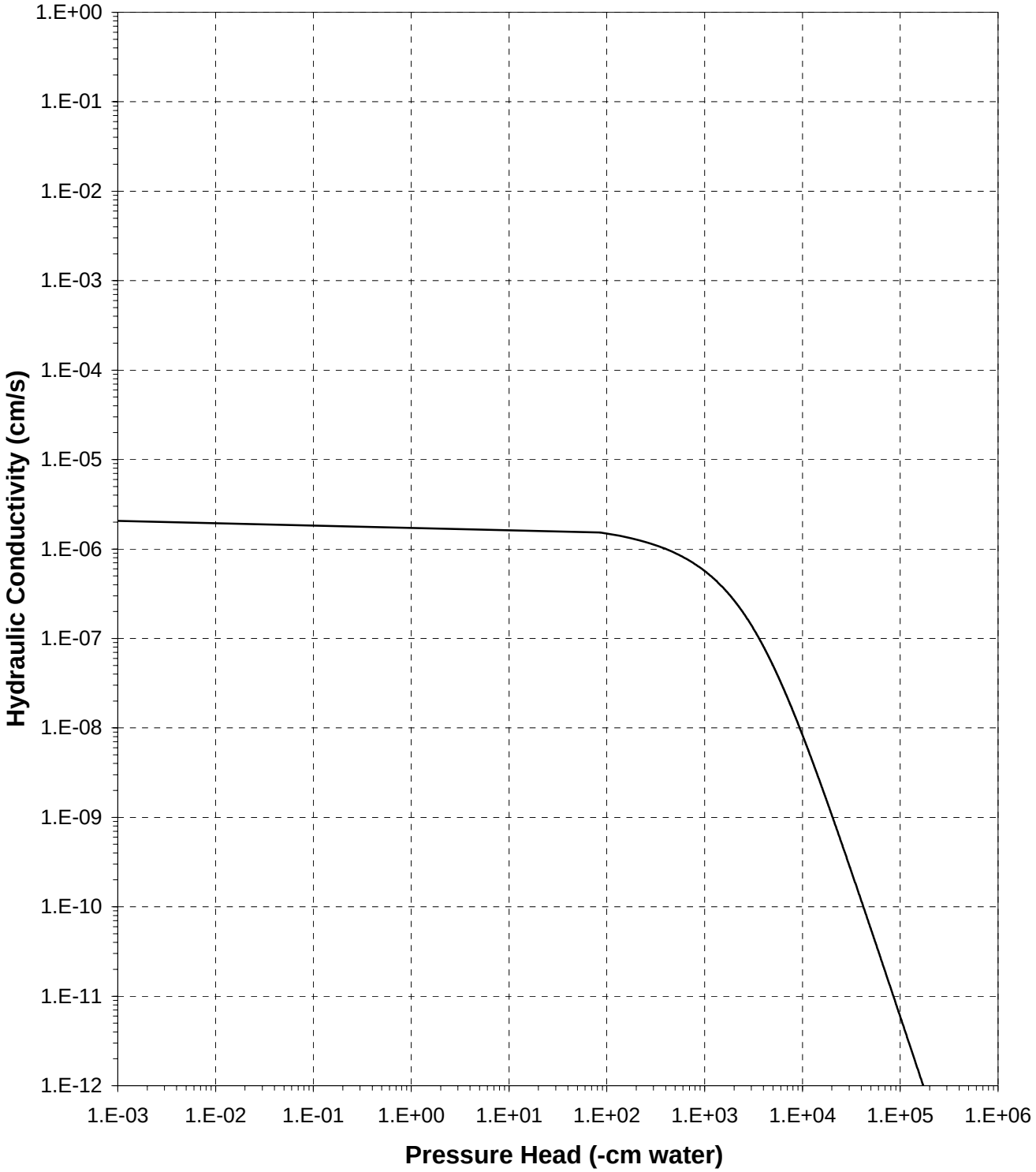
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (224-225)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (224-225)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (249-250)
Date Sampled: 12/7/2011
Depth: 249-250

Dry wt. of sample (g): 114.36
Tare wt., ring (g): 44.48
Tare wt., screen & clamp (g): 24.57
Initial sample volume (cm^3): 73.85
Initial dry bulk density (g/cm^3): 1.55
Measured particle density (g/cm^3): 2.70
Initial calculated total porosity (%): 42.57

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	8-Feb-12	13:50	214.85	0	42.57
	15-Feb-12	9:15	214.33	52.0	41.87
	22-Feb-12	10:30	214.15	151.0	41.62
Pressure plate:	17-Mar-12	11:00	213.76	337	41.10
	21-Mar-12	8:35	213.58	1275	40.85

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	52.0	---	---	---	---
	151.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (249-250)

Initial sample bulk density (g/cm^3)*:* 1.55
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 152.78
Tare weight, jar (g)*:* 114.18

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Dew point potentiometer:	2-Apr-12	15:20	158.59	16623	23.31
	2-Apr-12	11:10	156.58	72712	15.24
	28-Mar-12	11:30	154.84	427398	8.26

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	16623	---	---	---	---
	72712	---	---	---	---
	427398	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 80.09
Tare weight (g)*:* 39.52

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	22-Mar-12	8:30	82.13	854159	7.78

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

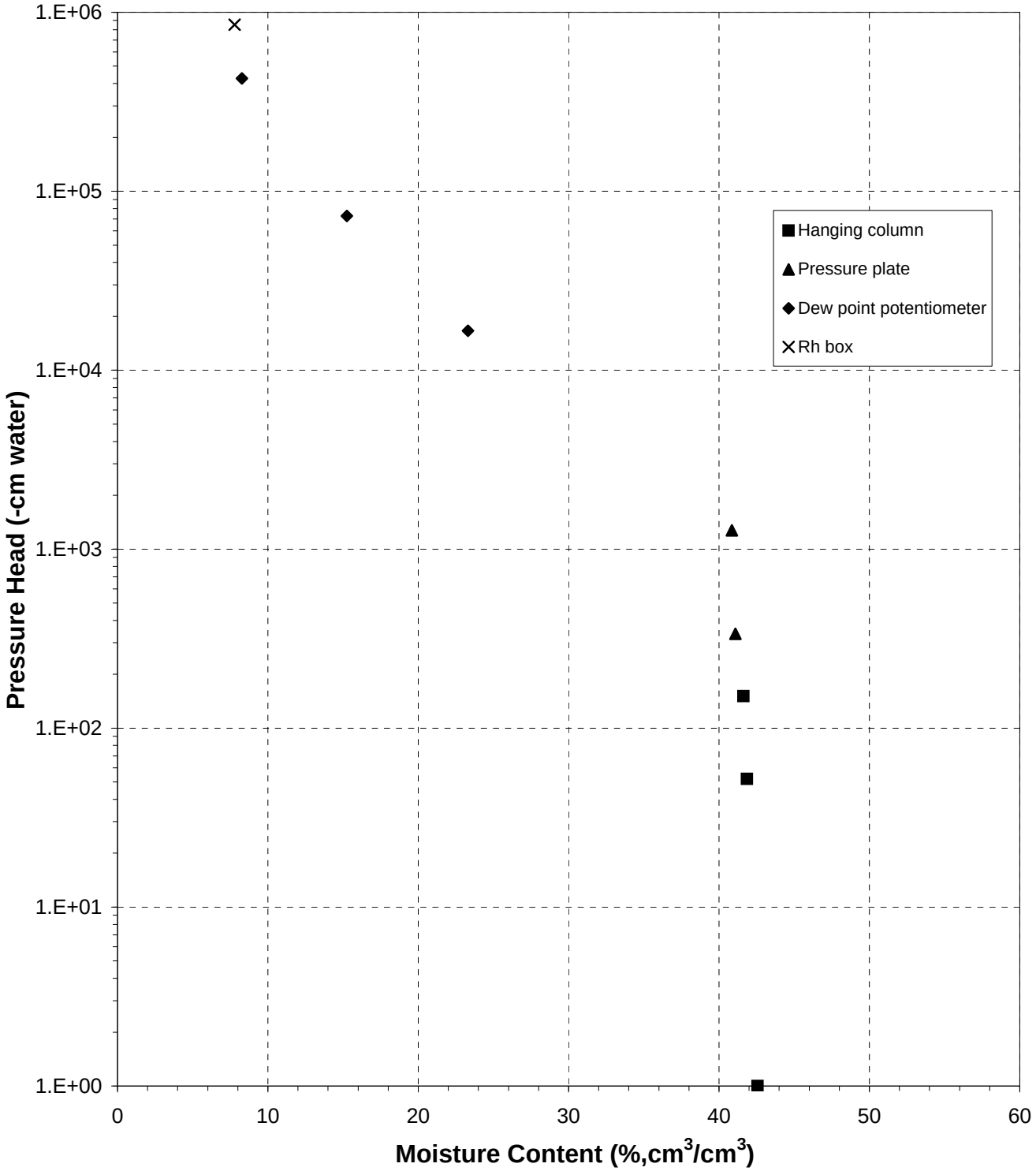
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

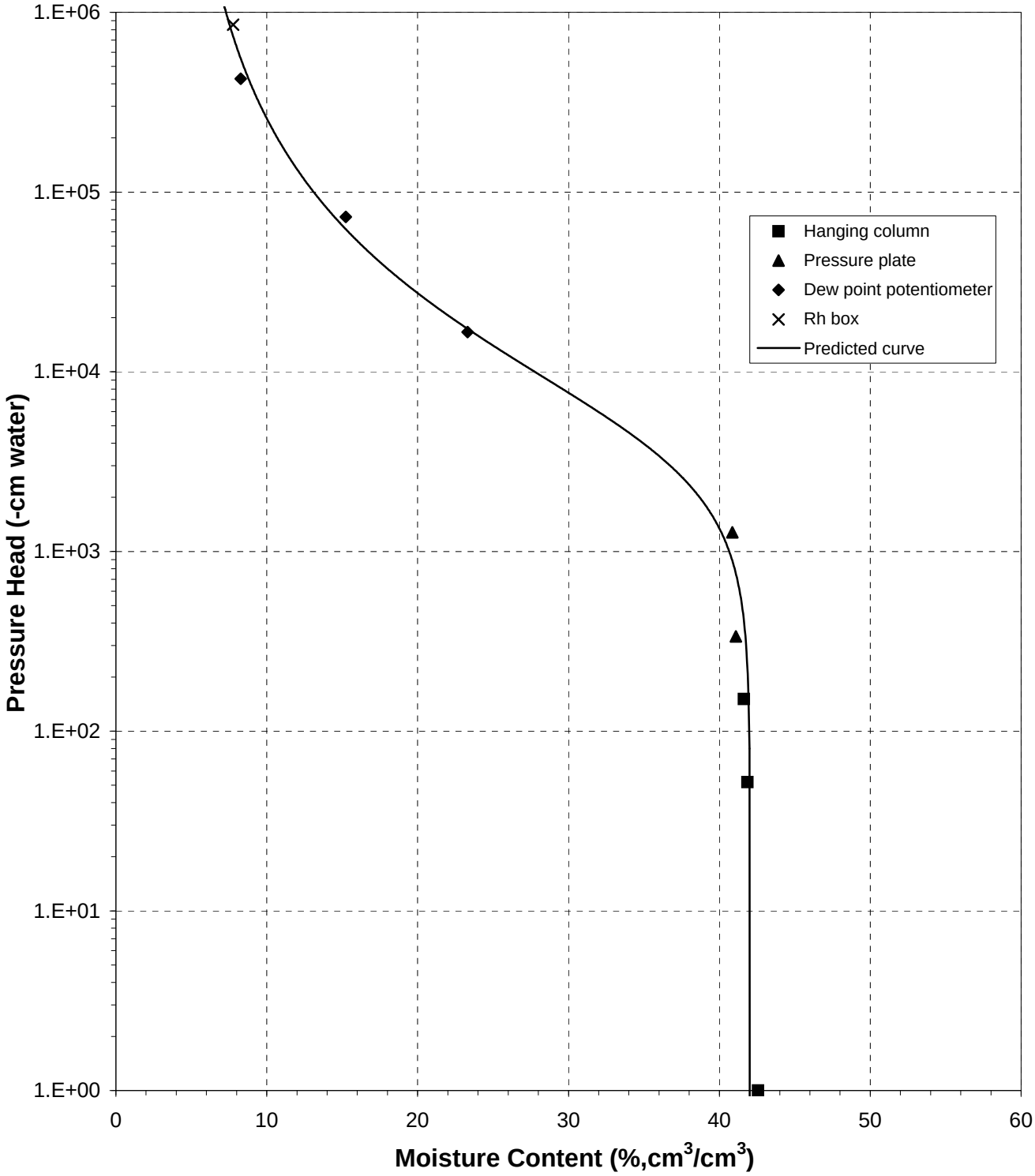
Water Retention Data Points

Sample Number: PB-12 (249-250)



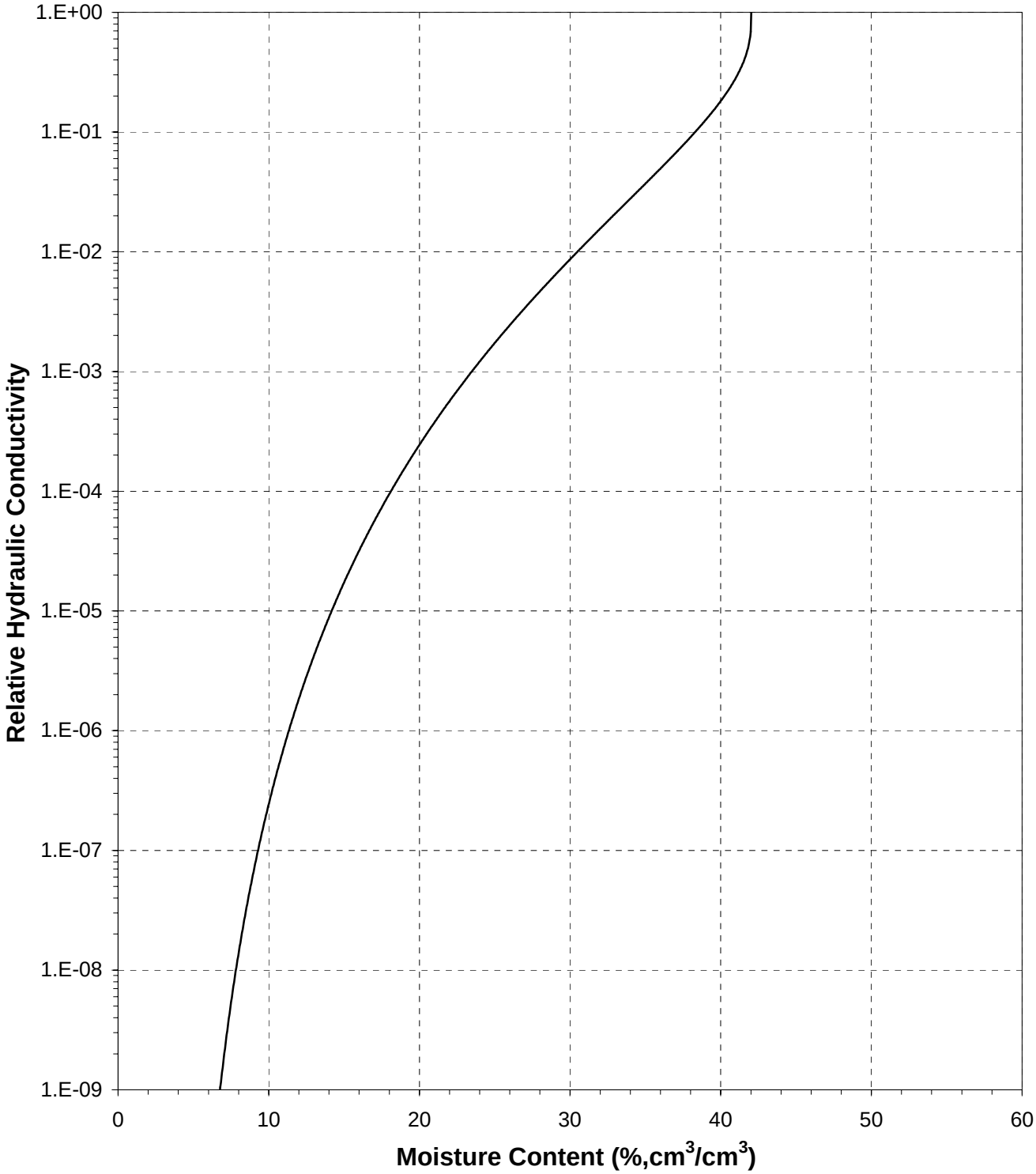
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (249-250)



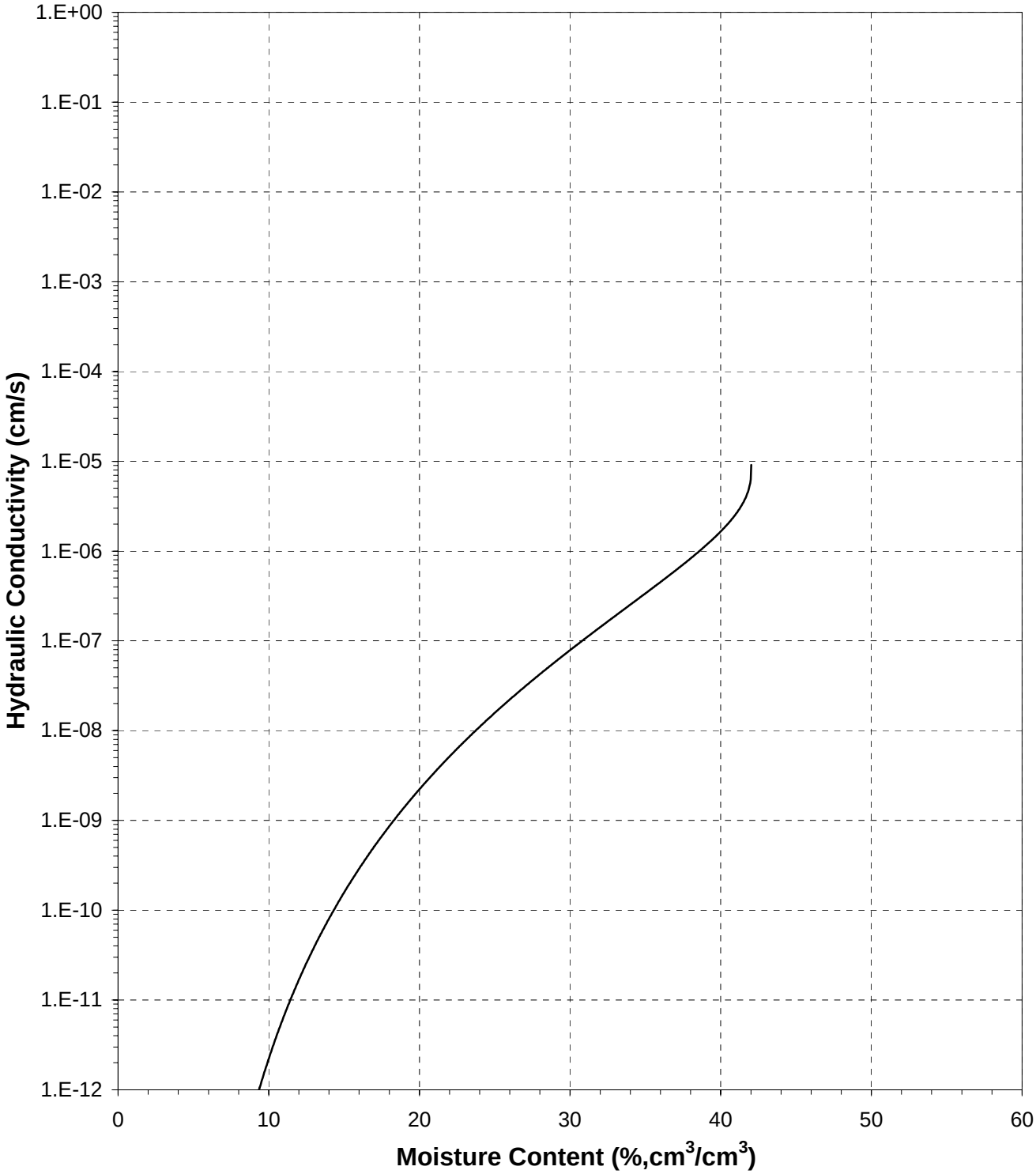
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (249-250)



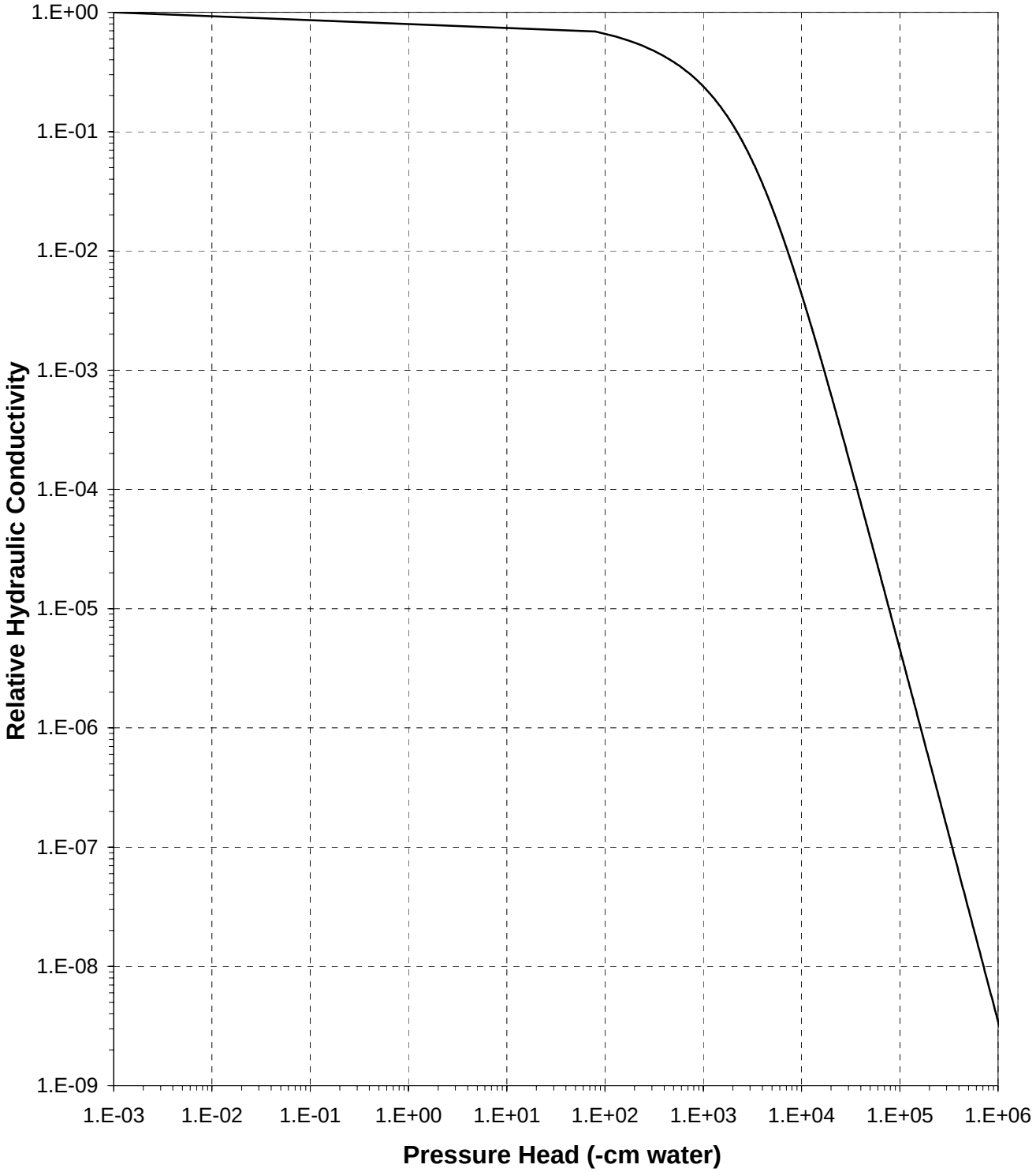
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (249-250)



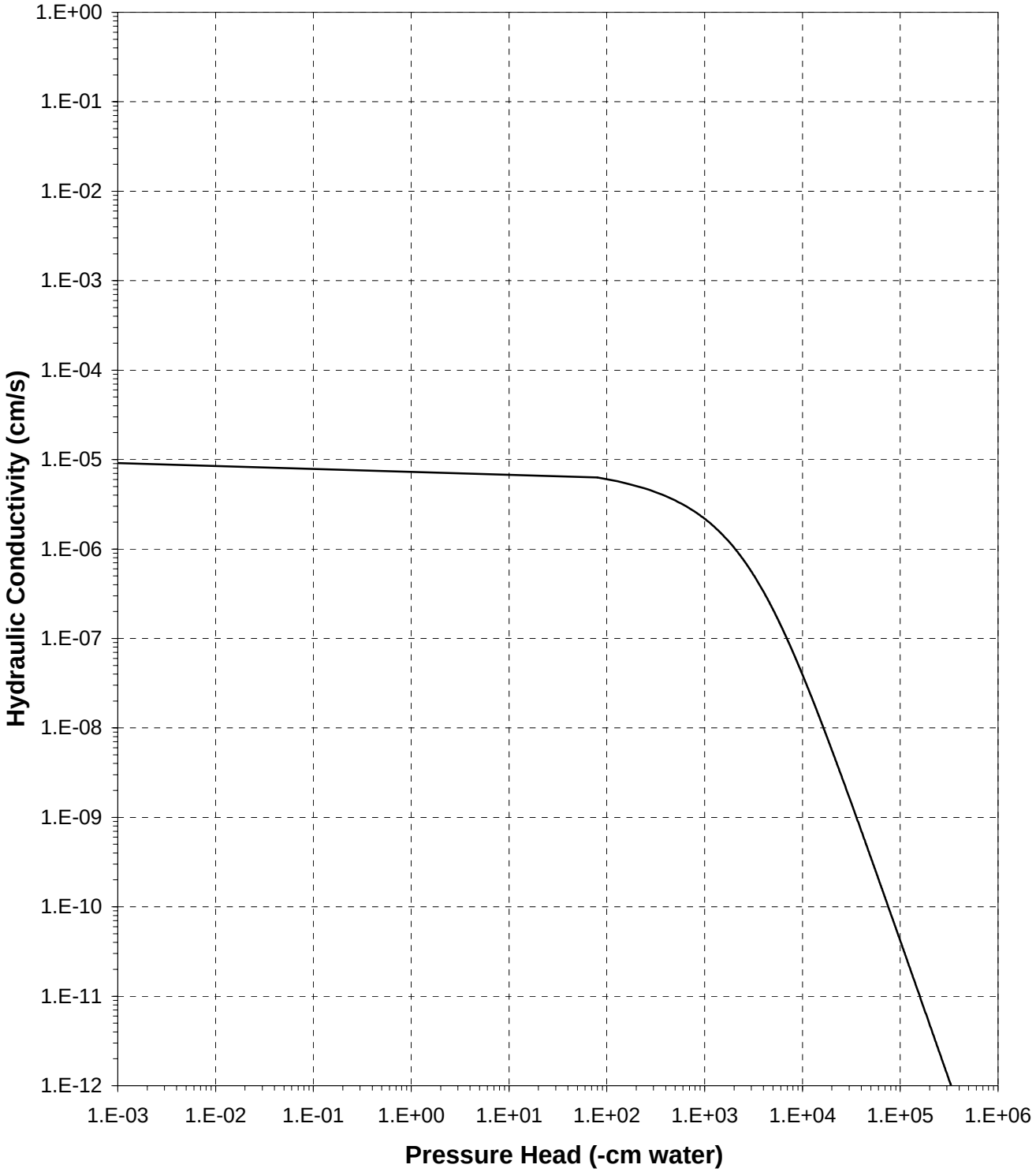
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (249-250)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (249-250)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (264-265)
Date Sampled: 12/7/2011
Depth: 264-265

Dry wt. of sample (g): 102.12
Tare wt., ring (g): 39.94
Tare wt., screen & clamp (g): 24.15
Initial sample volume (cm^3): 67.16
Initial dry bulk density (g/cm^3): 1.52
Measured particle density (g/cm^3): 2.68
Initial calculated total porosity (%): 43.18

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	8-Feb-12	14:00	195.21	0	43.18
	15-Feb-12	9:30	194.64	52.0	42.33
	22-Feb-12	10:45	194.55	151.0	42.20
Pressure plate:	7-Mar-12	11:00	194.08	337	41.50
	21-Mar-12	8:50	193.73	1275	40.98

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	52.0	---	---	---	---
	151.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (264-265)

Initial sample bulk density (g/cm^3)*:* 1.52
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 151.58
Tare weight, jar (g)*:* 112.62

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	3-Apr-12	12:10	158.01	14583	25.10
	2-Apr-12	13:10	156.08	31512	17.56
	30-Mar-12	15:00	154.34	220481	10.77

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	14583	---	---	---	---
	31512	---	---	---	---
	220481	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 68.28
Tare weight (g)*:* 38.33

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	2-Mar-12	8:30	69.81	854159	7.79

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

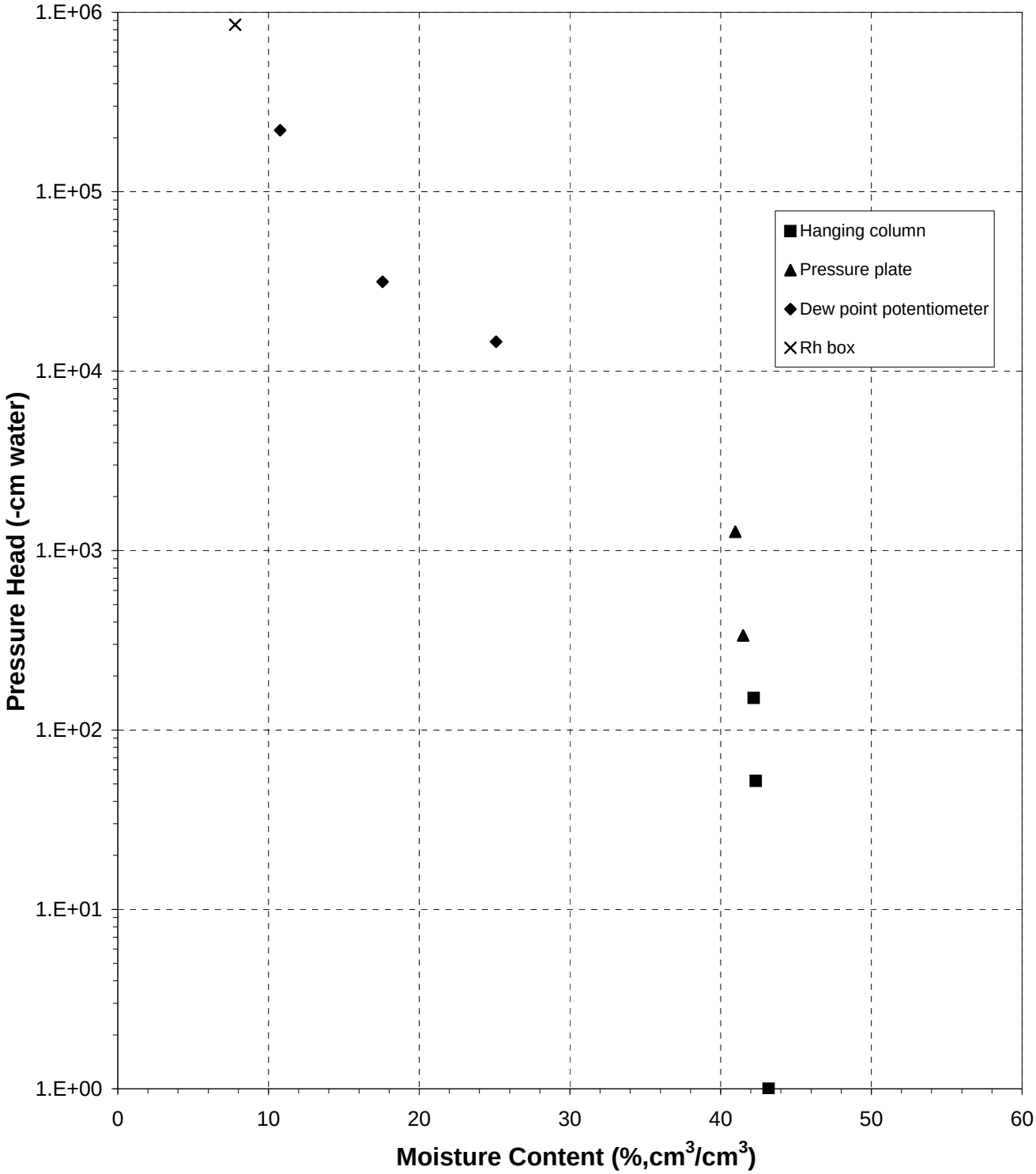
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

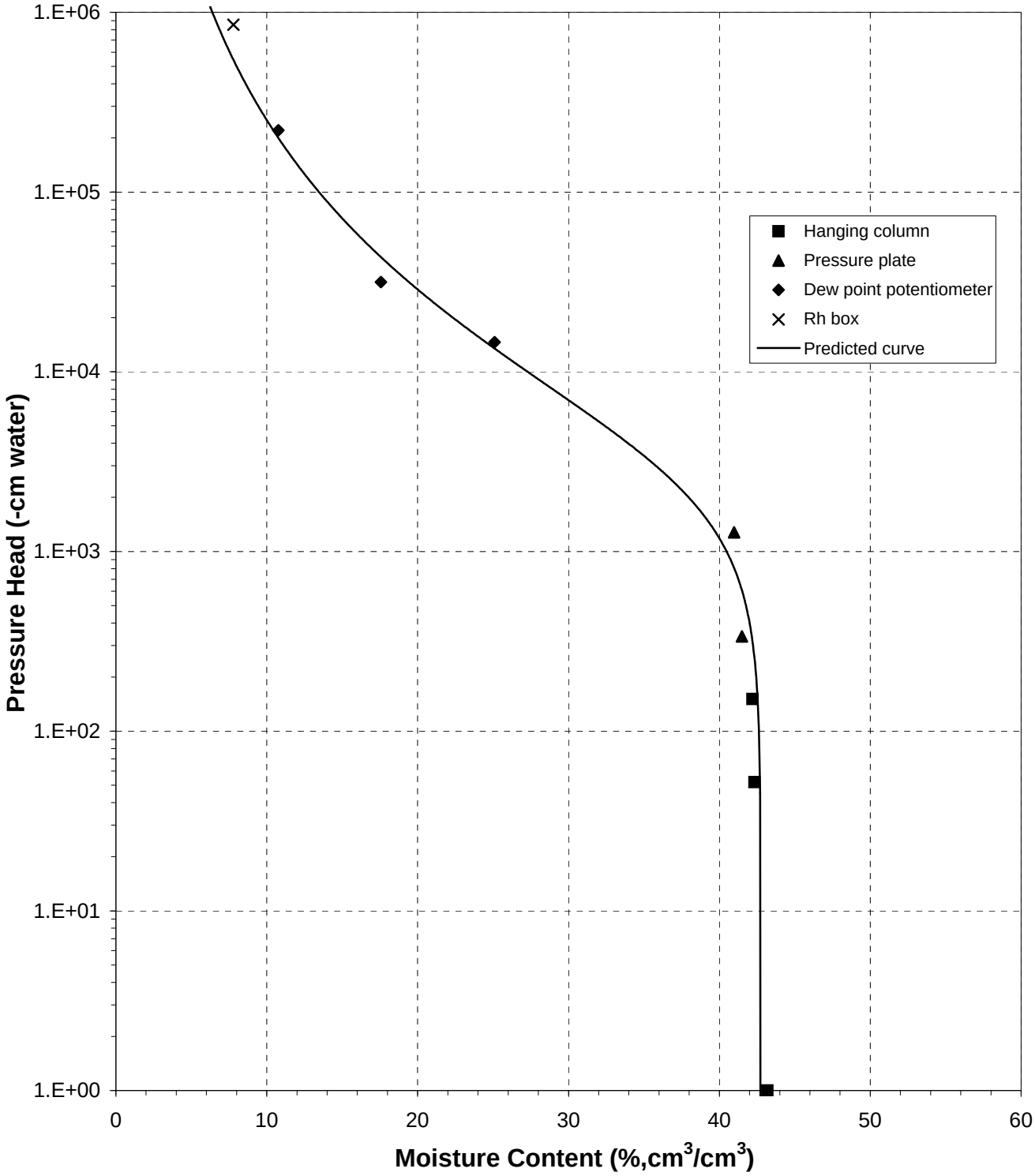
Water Retention Data Points

Sample Number: PB-12 (264-265)



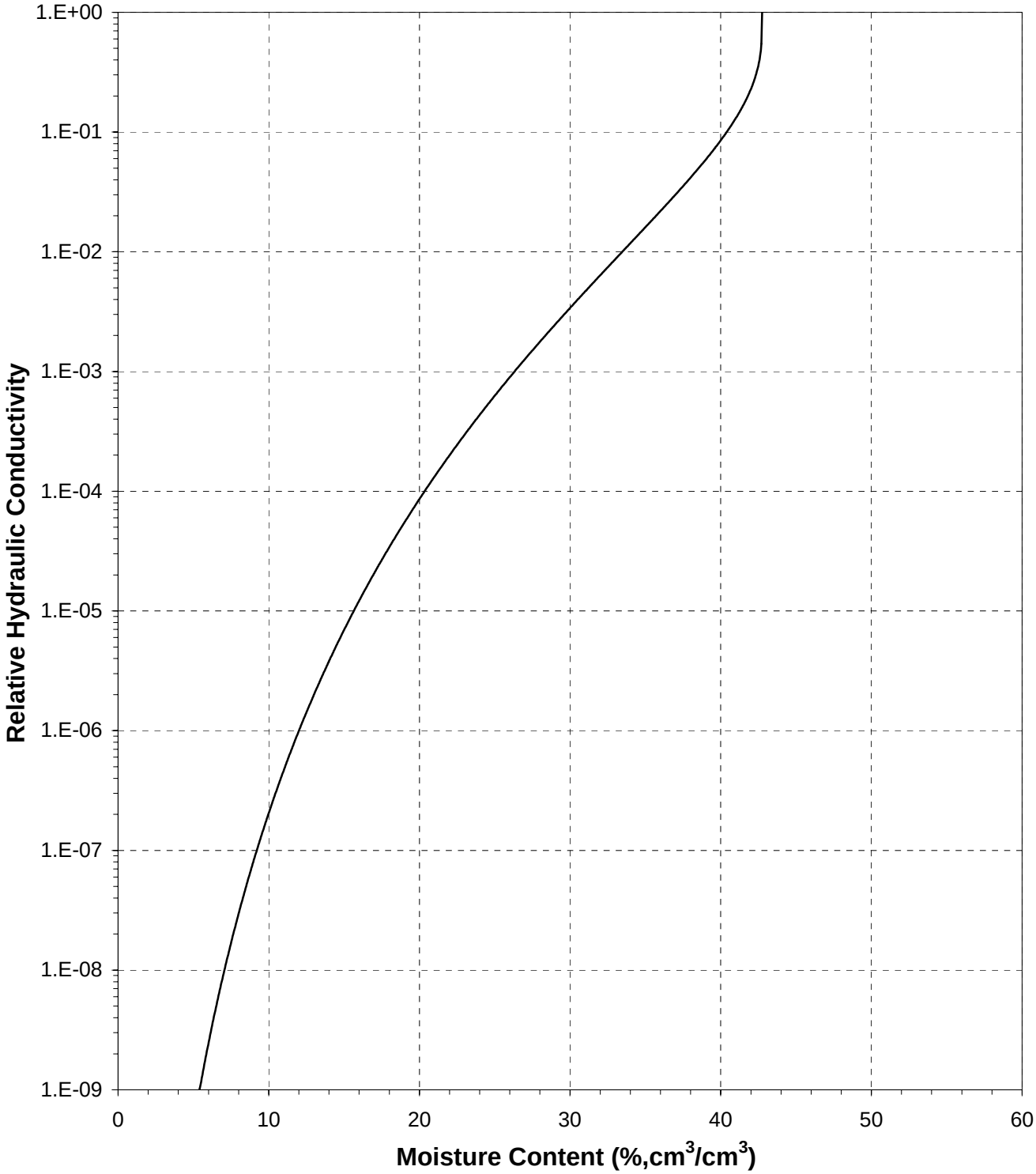
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (264-265)



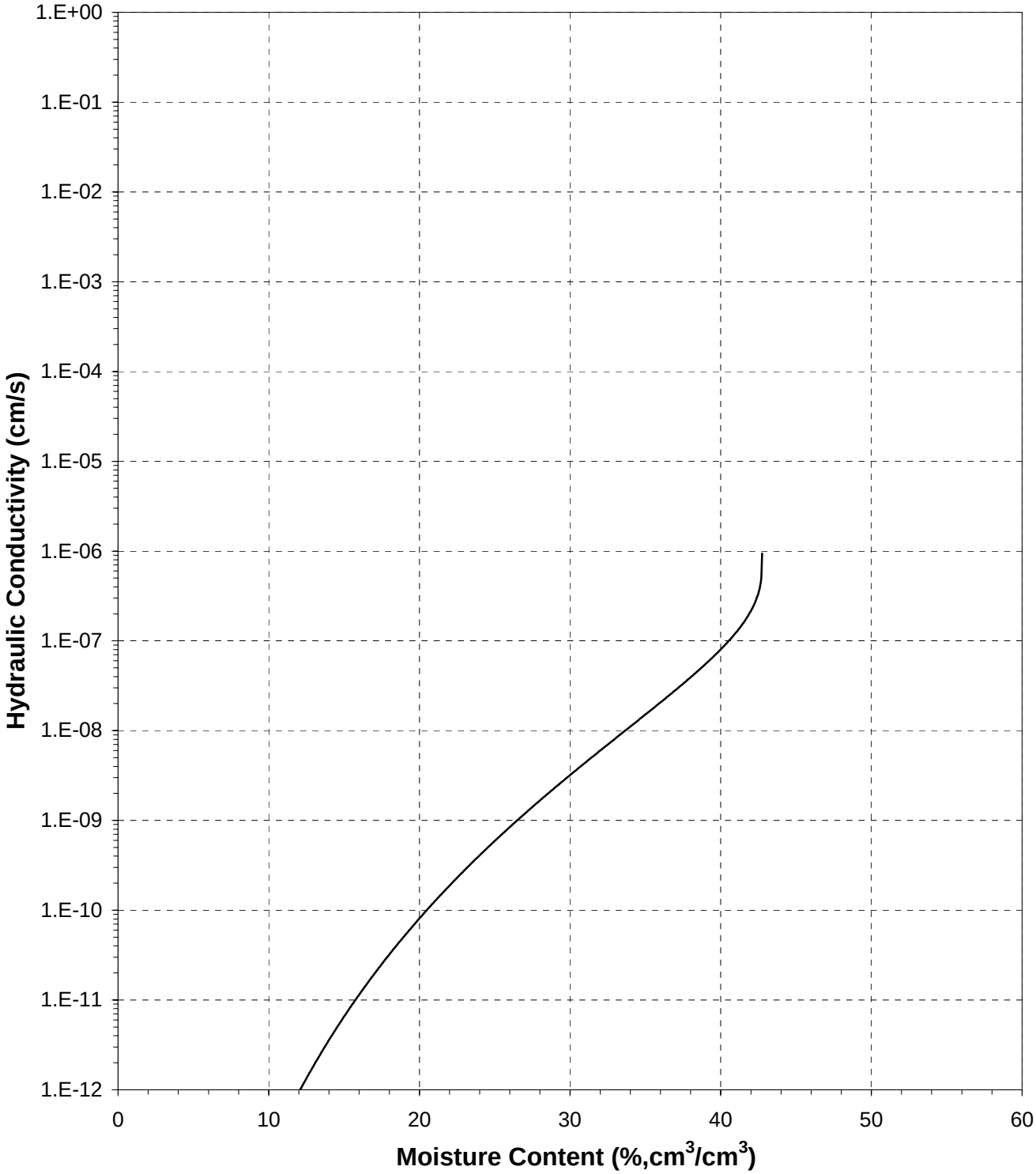
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (264-265)



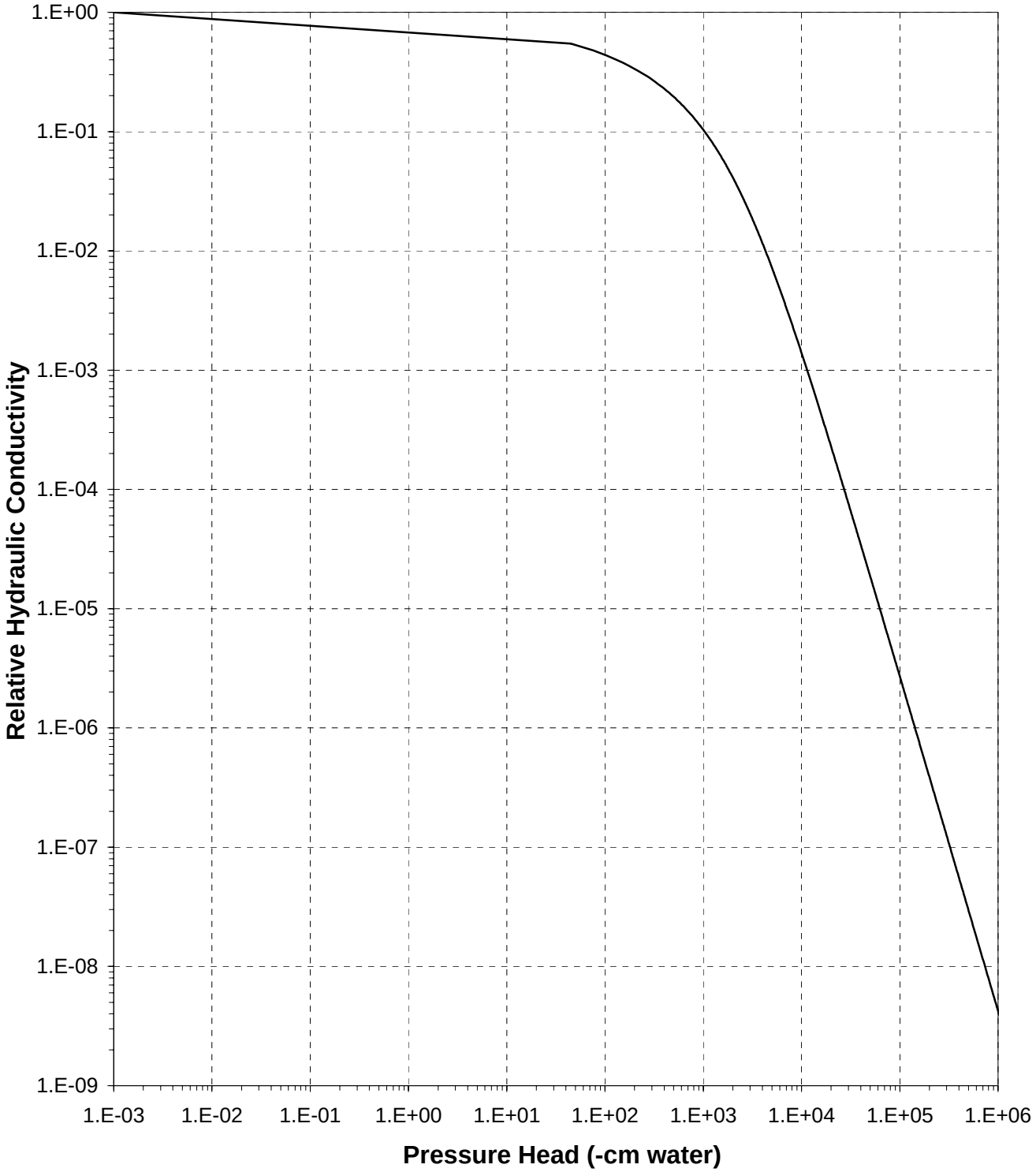
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (264-265)



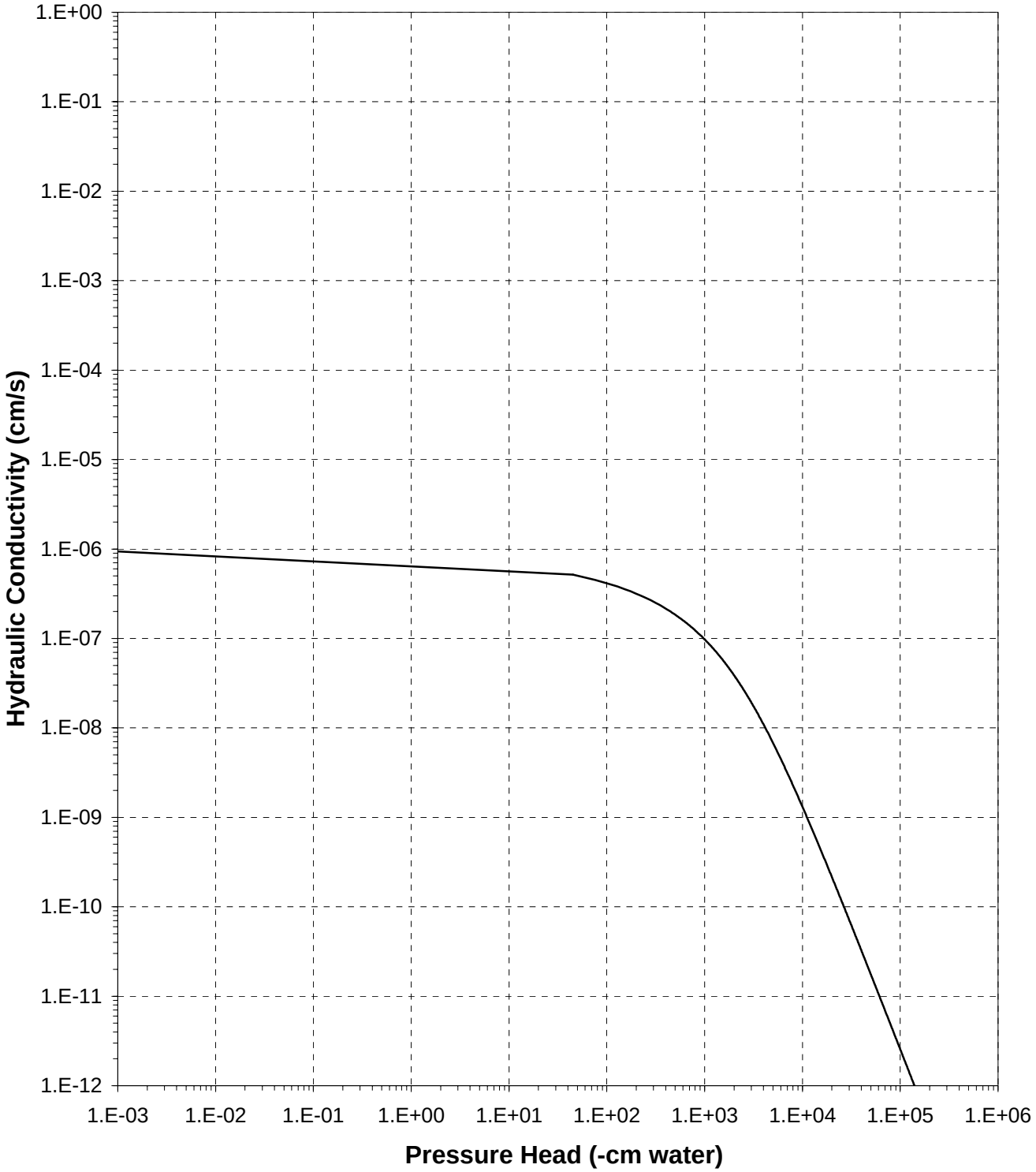
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (264-265)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (264-265)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (284-285)
Date Sampled: 12/7/2011
Depth: 284-285

Dry wt. of sample (g): 124.87
Tare wt., ring (g): 49.65
Tare wt., screen & clamp (g): 23.51
Initial sample volume (cm^3): 81.98
Initial dry bulk density (g/cm^3): 1.52
Measured particle density (g/cm^3): 2.73
Initial calculated total porosity (%): 44.26

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:35	234.31	0	44.26
	7-Feb-12	10:25	234.04	51.0	43.93
	14-Feb-12	1:22	233.94	150.0	43.81
Pressure plate:	28-Feb-12	8:00	233.76	337	43.59
	13-Mar-12	8:35	233.33	1275	43.06

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (284-285)

Initial sample bulk density (g/cm^3)*:* 1.52
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 145.34
Tare weight, jar (g)*:* 113.09

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	4-Apr-12	11:40	151.19	12951	27.63
	3-Apr-12	16:59	149.41	32940	19.22
	3-Apr-12	12:07	148.23	116359	13.65

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	12951	---	---	---	---
	32940	---	---	---	---
	116359	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 63.93
Tare weight (g)*:* 38.07

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	2-Mar-12	8:30	65.35	854159	8.35

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

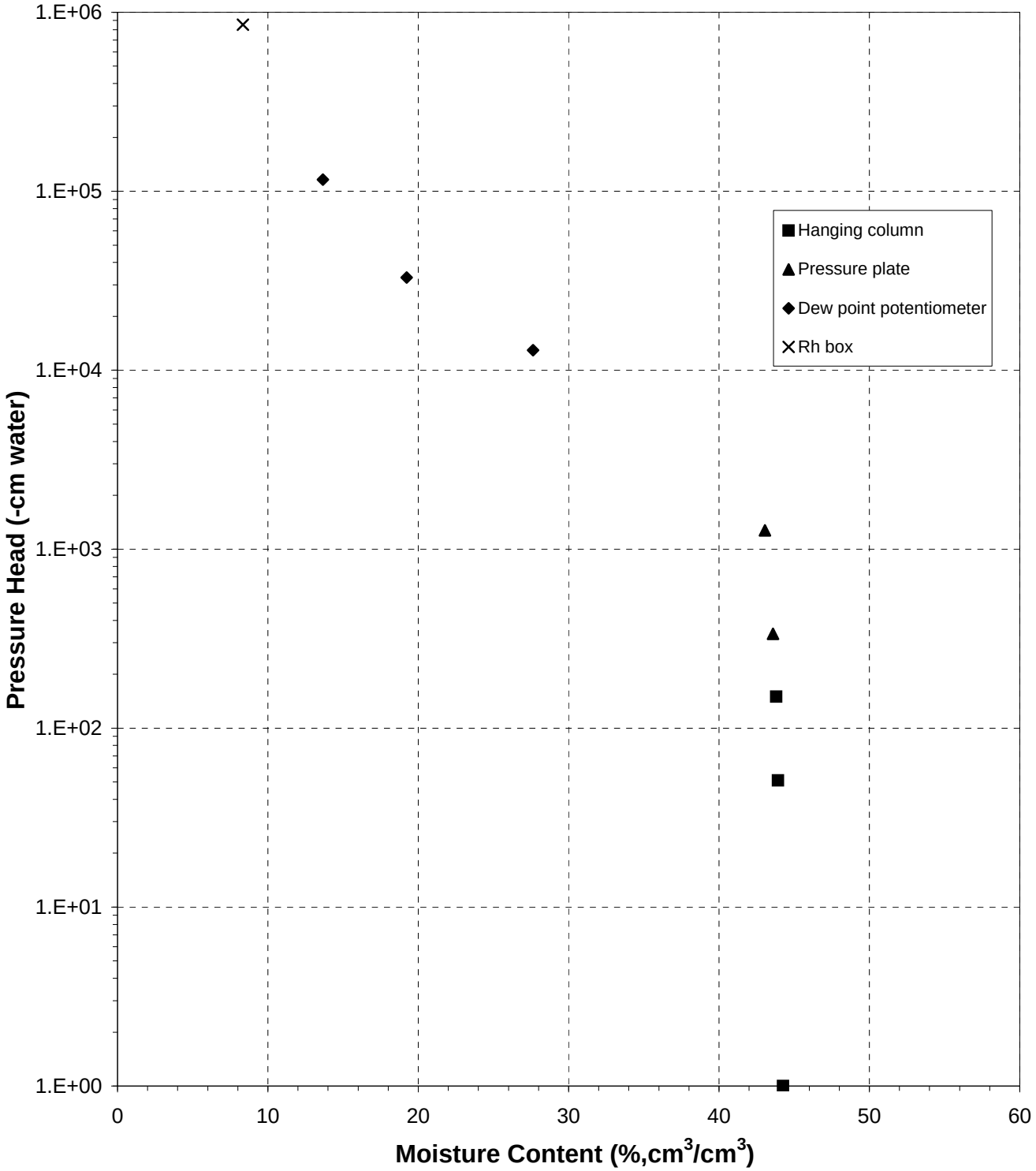
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

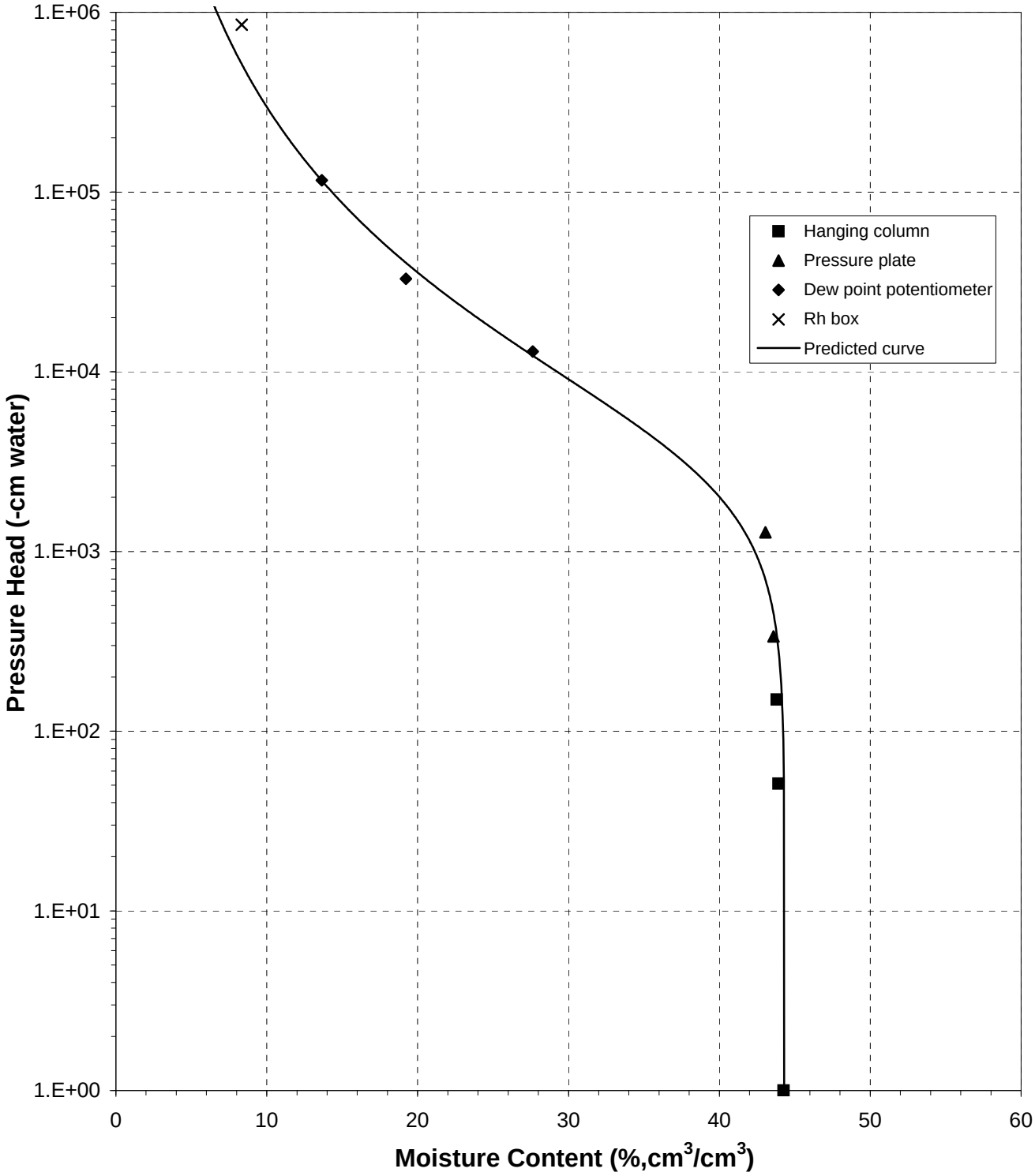
Water Retention Data Points

Sample Number: PB-12 (284-285)



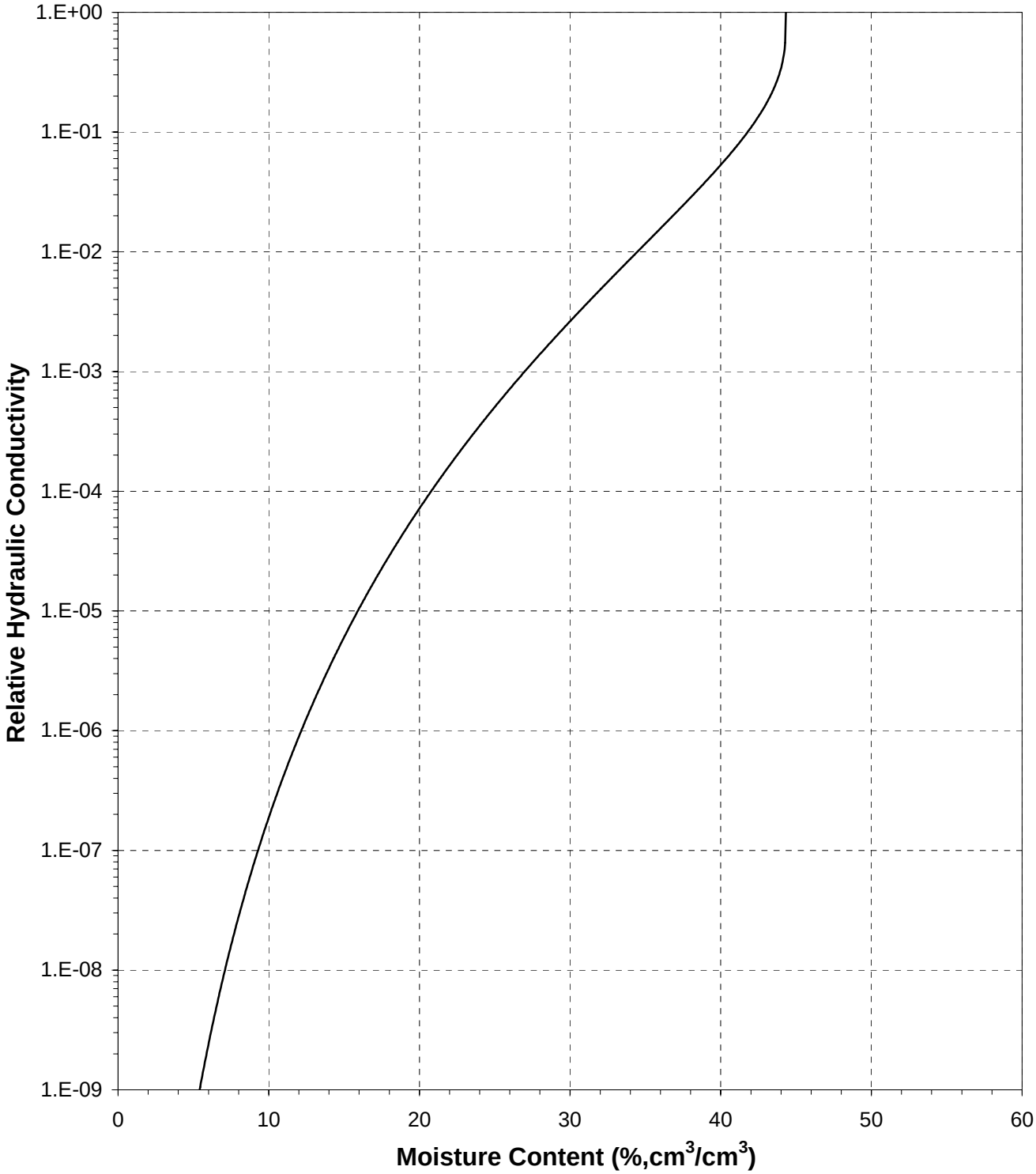
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (284-285)



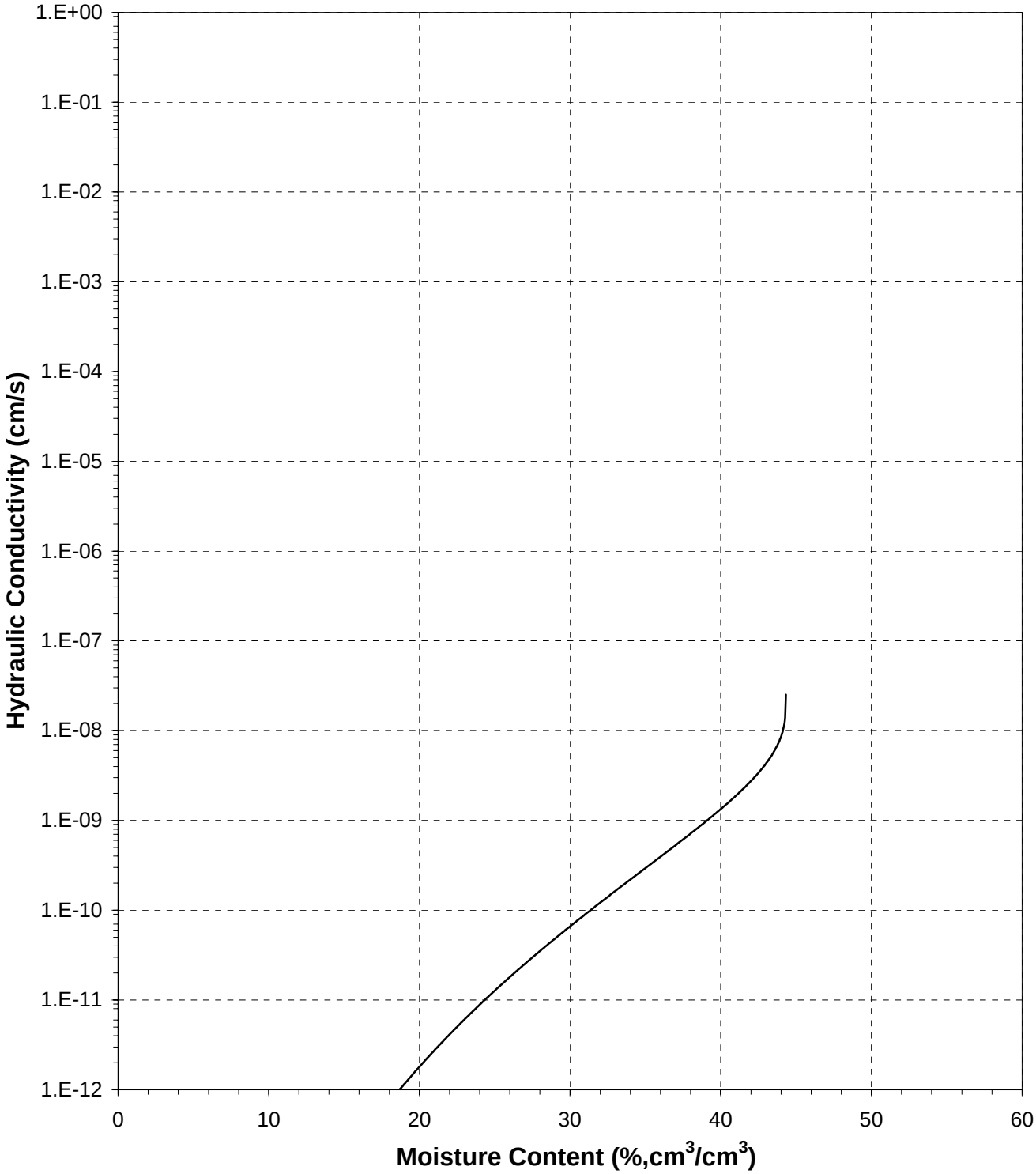
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (284-285)



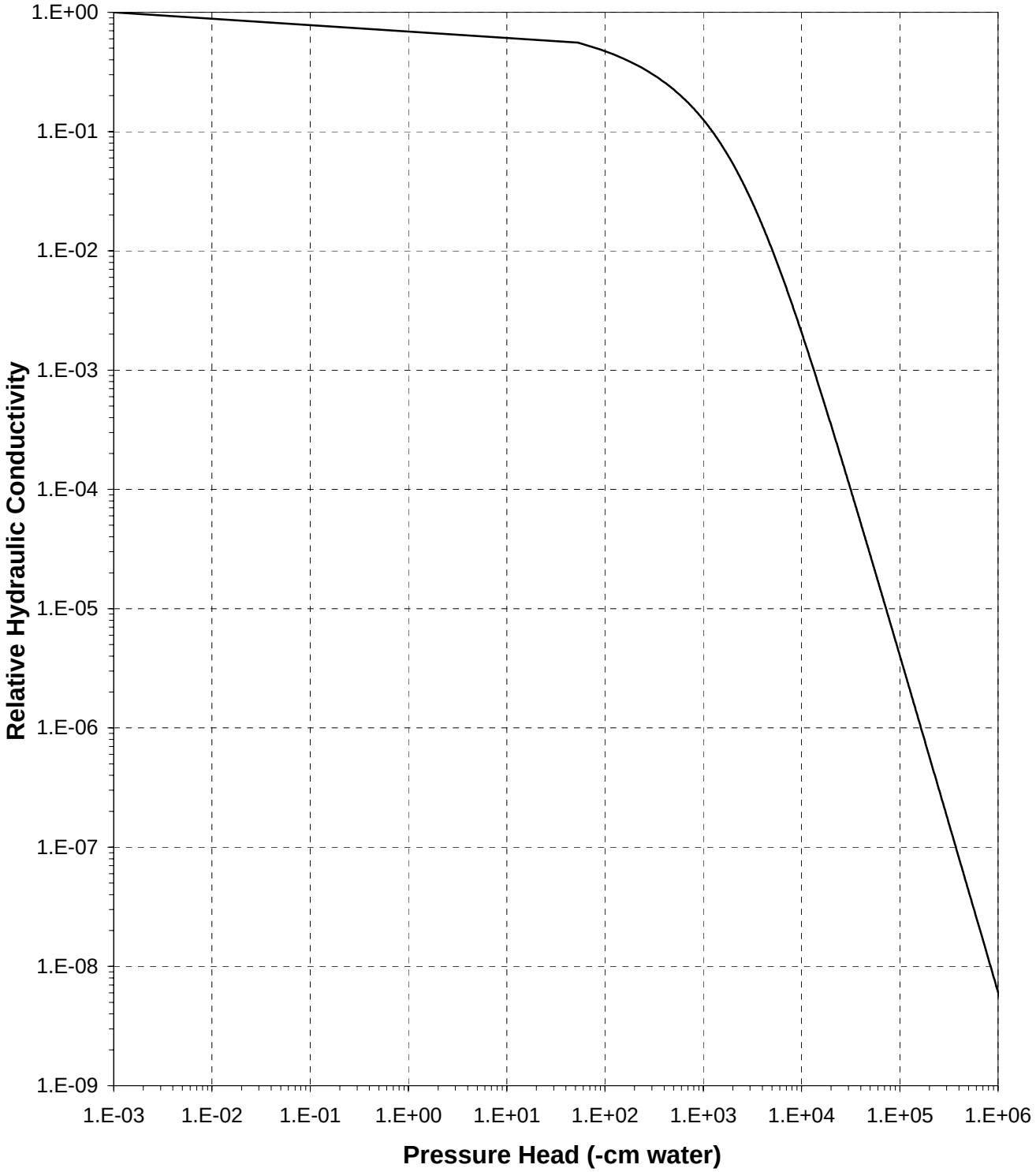
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (284-285)



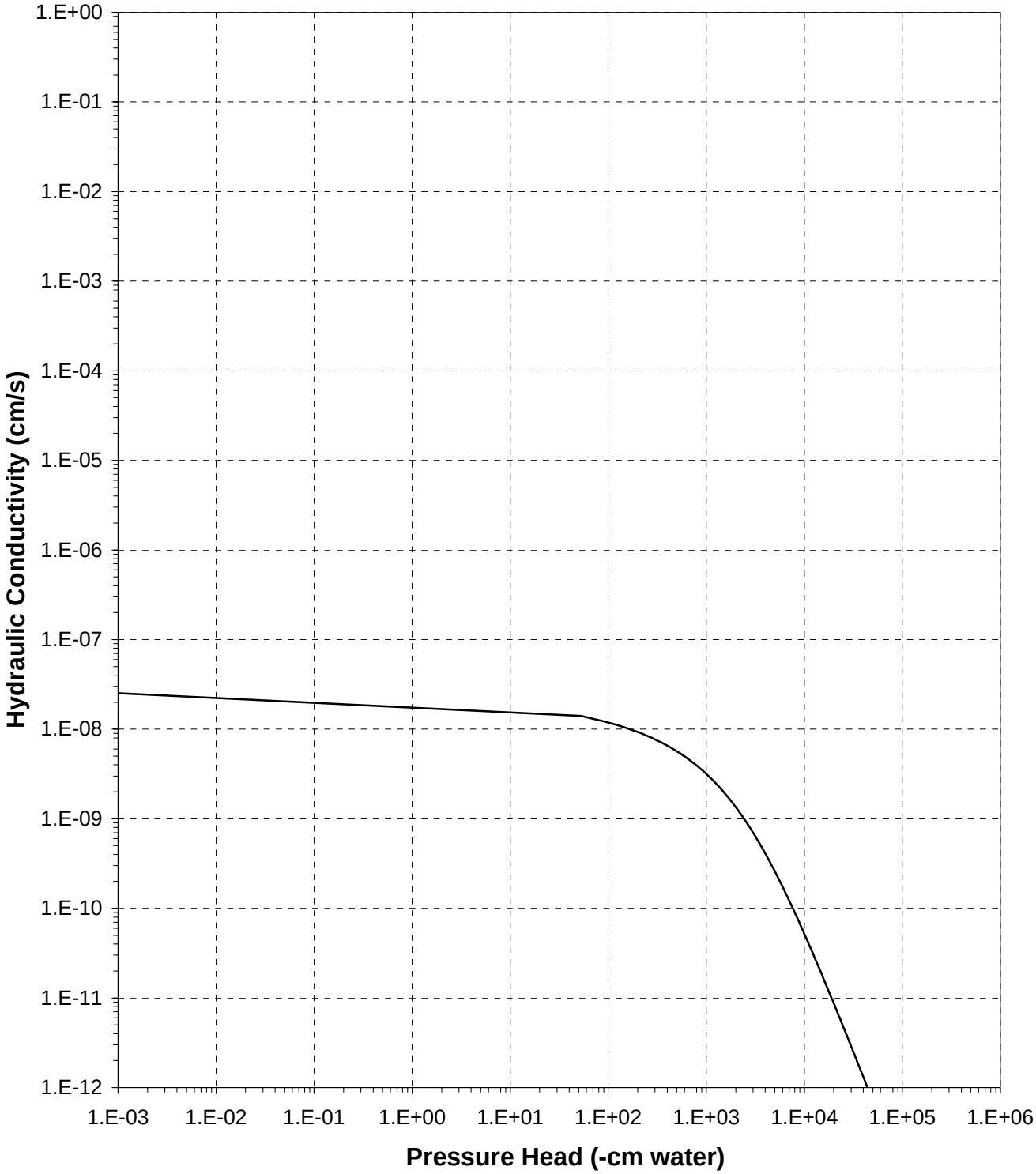
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (284-285)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (284-285)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

Dry wt. of sample (g): 103.50
Tare wt., ring (g): 41.12
Tare wt., screen & clamp (g): 27.19
Initial sample volume (cm^3): 68.41
Initial dry bulk density (g/cm^3): 1.51
Measured particle density (g/cm^3): 2.68
Initial calculated total porosity (%): 43.58

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:20	201.62	0	43.58
	7-Feb-12	10:10	201.02	51.0	42.70
	14-Feb-12	8:05	200.98	150.0	42.64
Pressure plate:	28-Feb-12	8:25	200.91	337	42.54
	13-Mar-12	8:50	200.80	1275	42.38

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (309-310)

Initial sample bulk density (g/cm^3)*:* 1.51
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 142.84
Tare weight, jar (g)*:* 112.98

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	4-Apr-12	12:10	147.69	18356	24.57
	3-Apr-12	15:15	145.94	68735	15.71
	2-Apr-12	16:00	145.11	245670	11.50

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	18356	---	---	---	---
	68735	---	---	---	---
	245670	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 63.74
Tare weight (g)*:* 38.03

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	22-Mar-12	8:30	65.17	854159	8.41

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

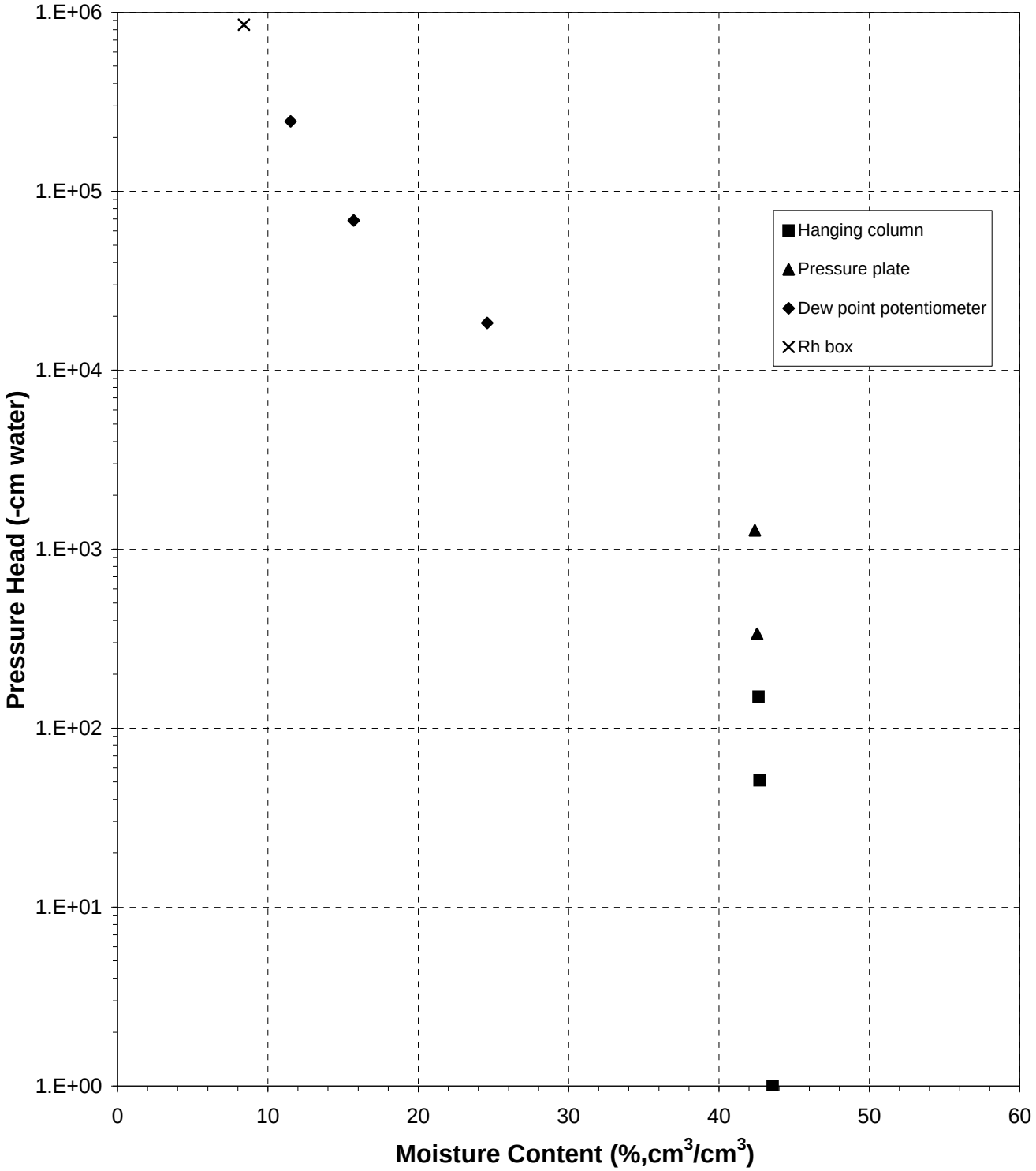
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

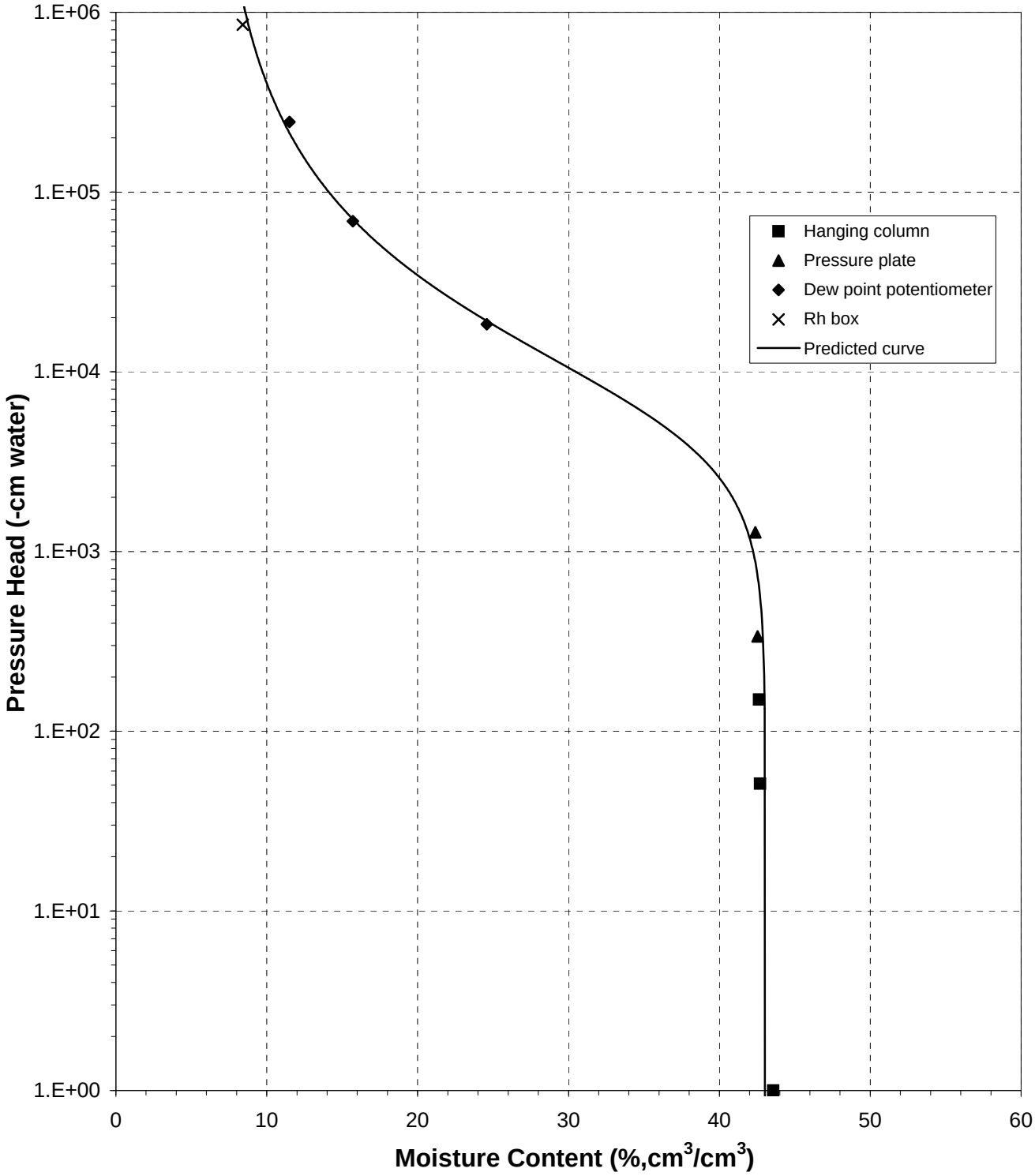
Water Retention Data Points

Sample Number: PB-12 (309-310)



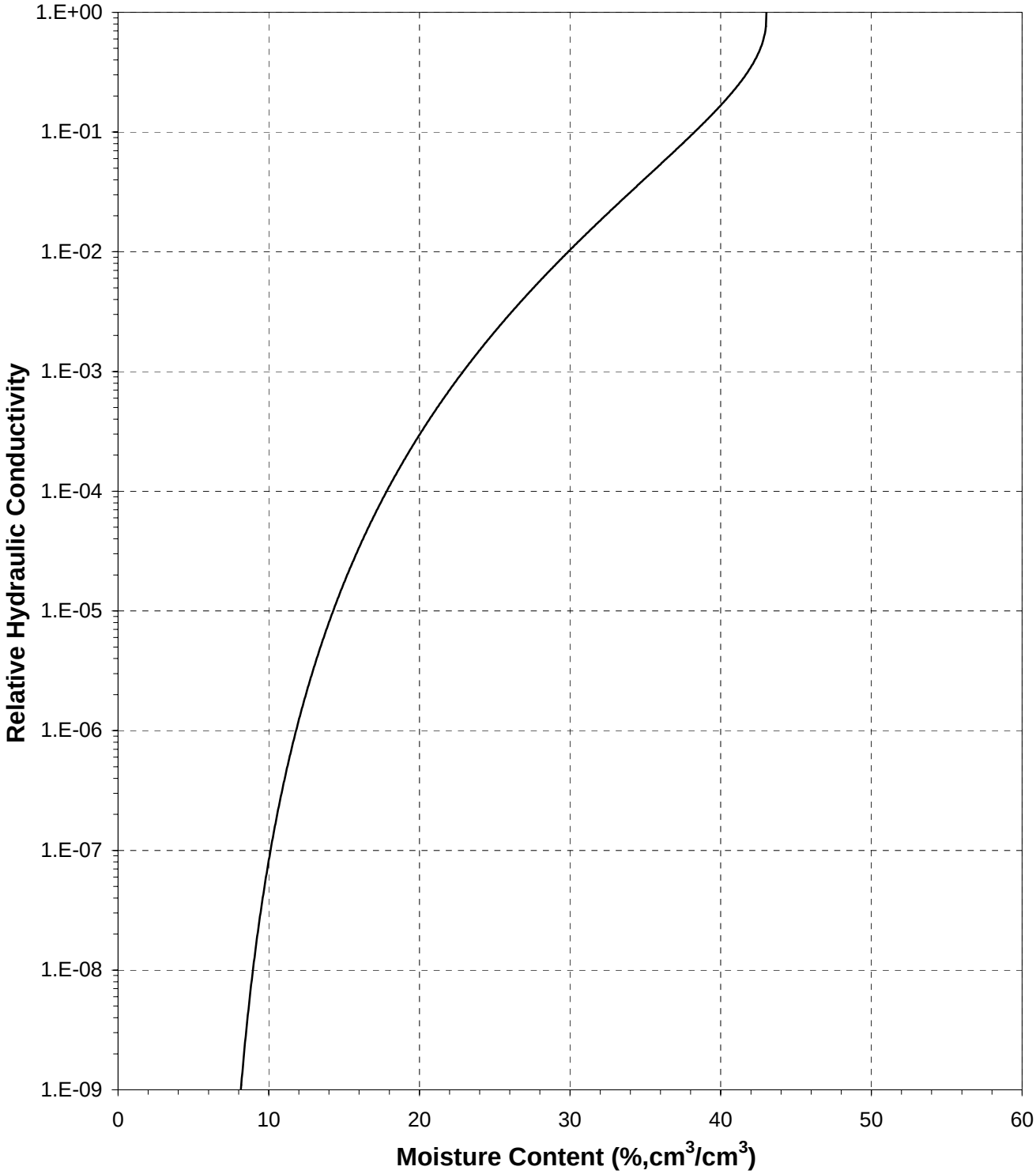
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (309-310)



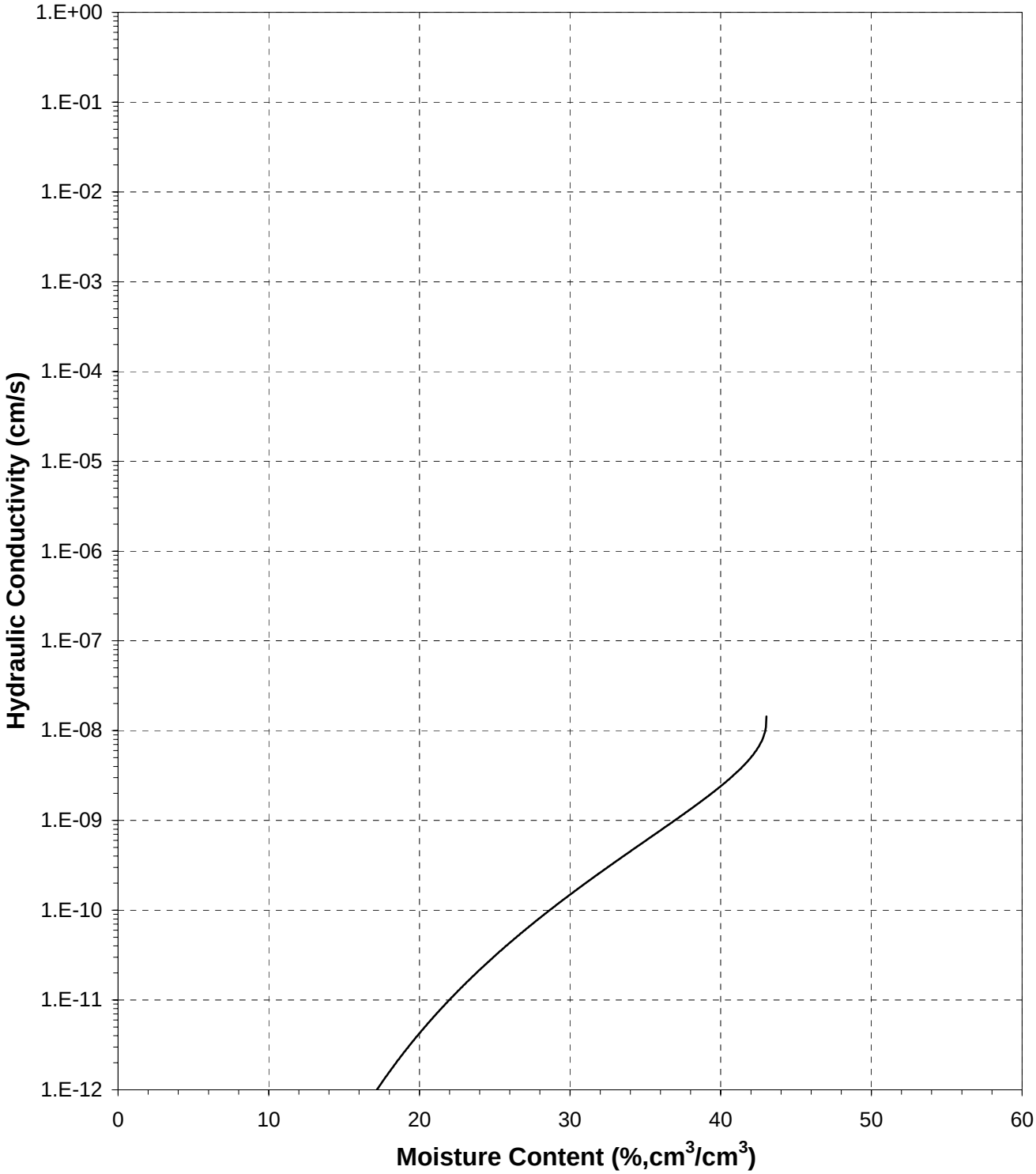
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (309-310)



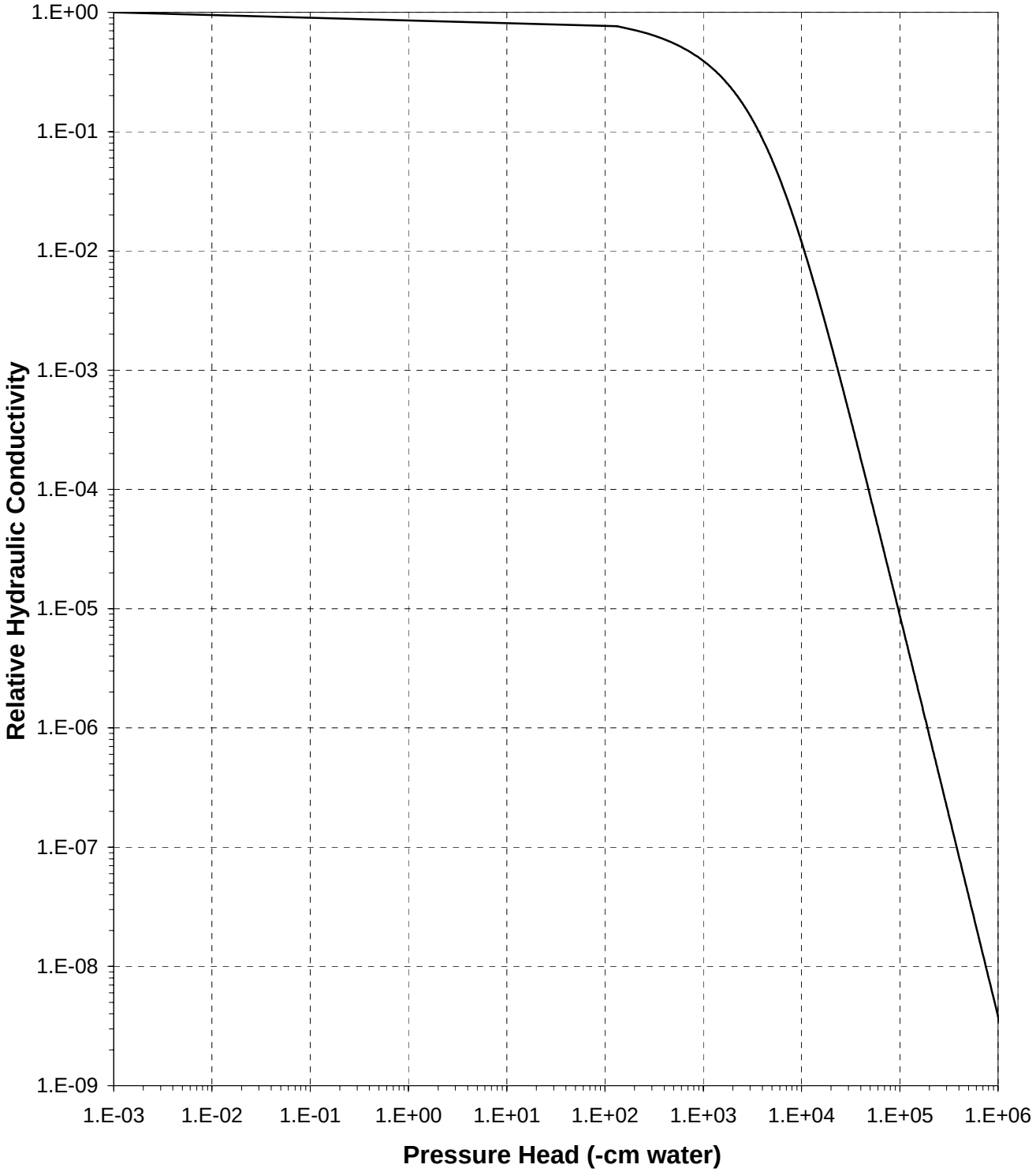
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (309-310)



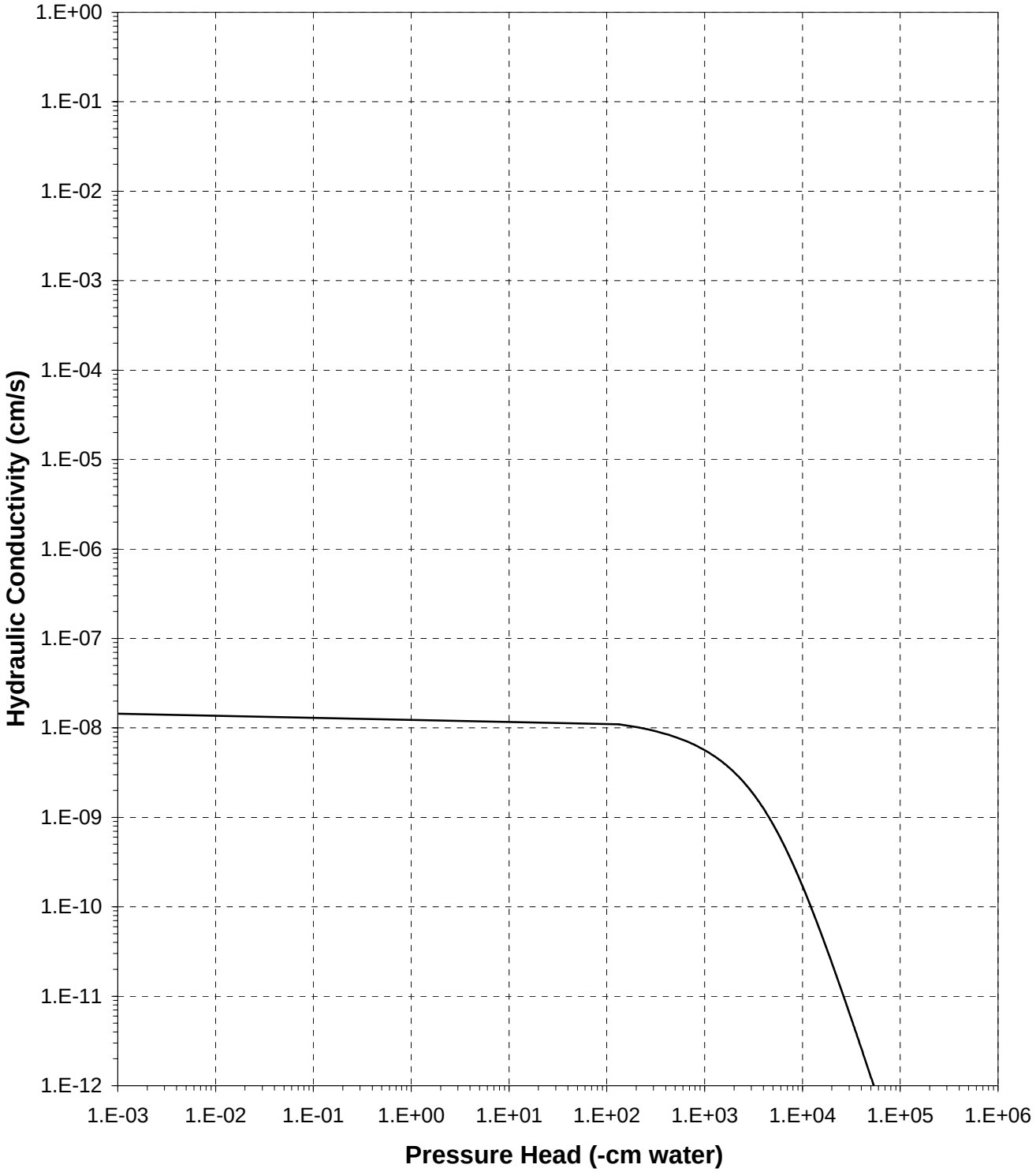
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (309-310)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (309-310)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

Dry wt. of sample (g): 110.32
Tare wt., ring (g): 42.35
Tare wt., screen & clamp (g): 24.11
Initial sample volume (cm^3): 71.30
Initial dry bulk density (g/cm^3): 1.55
Measured particle density (g/cm^3): 2.69
Initial calculated total porosity (%): 42.58

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	8-Feb-12	14:15	207.14	0	42.58
	15-Feb-12	9:05	206.22	52.0	41.29
	22-Feb-12	10:50	206.00	151.0	40.98
Pressure plate:	7-Mar-12	10:55	205.92	337	40.87
	21-Mar-12	8:40	205.86	1275	40.79

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	52.0	---	---	---	---
	151.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (334-335)

Initial sample bulk density (g/cm^3)*:* 1.55
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 141.13
Tare weight, jar (g)*:* 113.09

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	13:56	146.31	11014	28.58
	16-Mar-12	13:33	144.29	58129	17.44
	13-Mar-12	13:11	142.95	285646	10.04

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	11014	---	---	---	---
	58129	---	---	---	---
	285646	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 67.37
Tare weight (g)*:* 39.38

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	6-Mar-12	9:30	68.75	855592	7.63

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

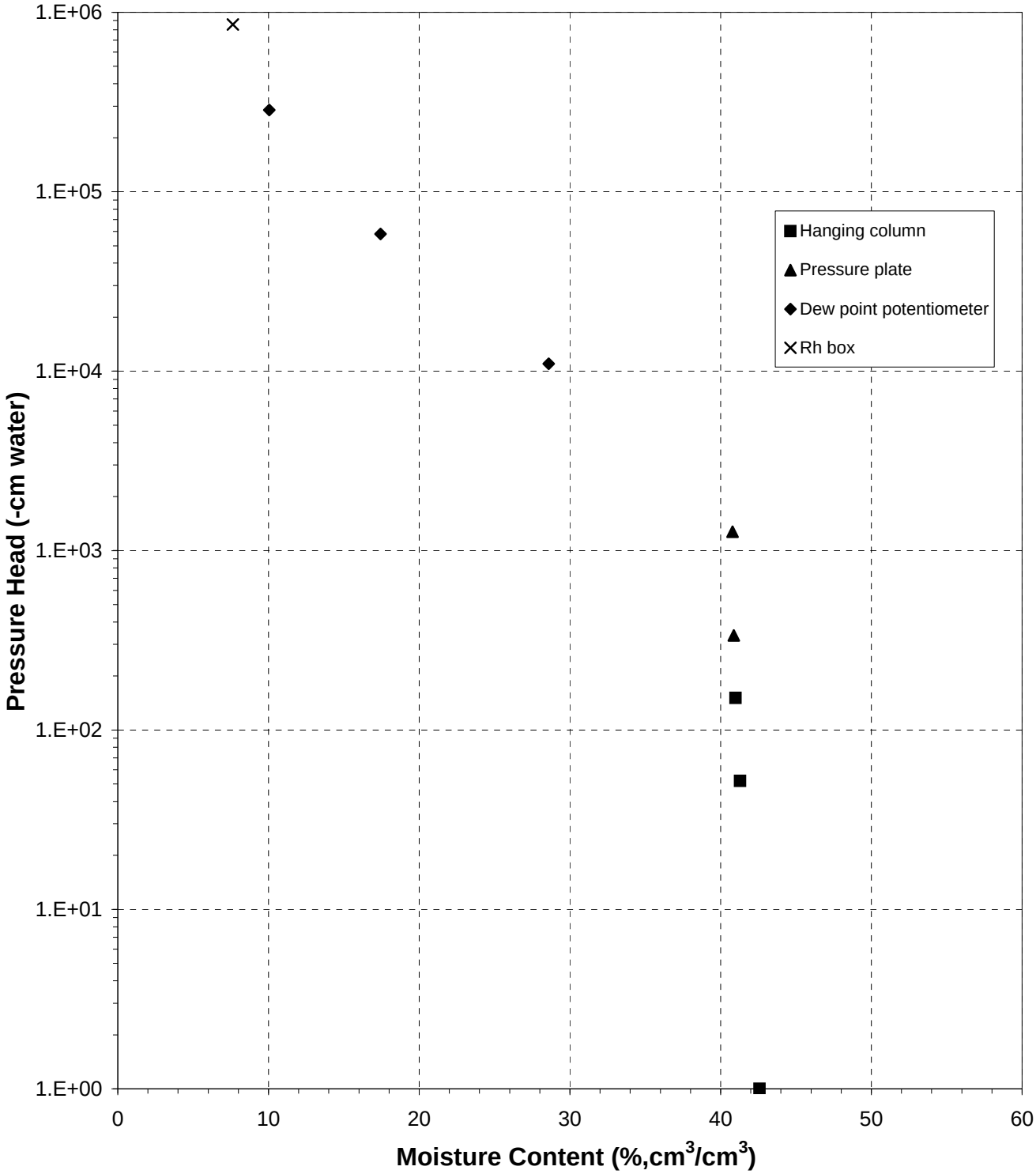
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

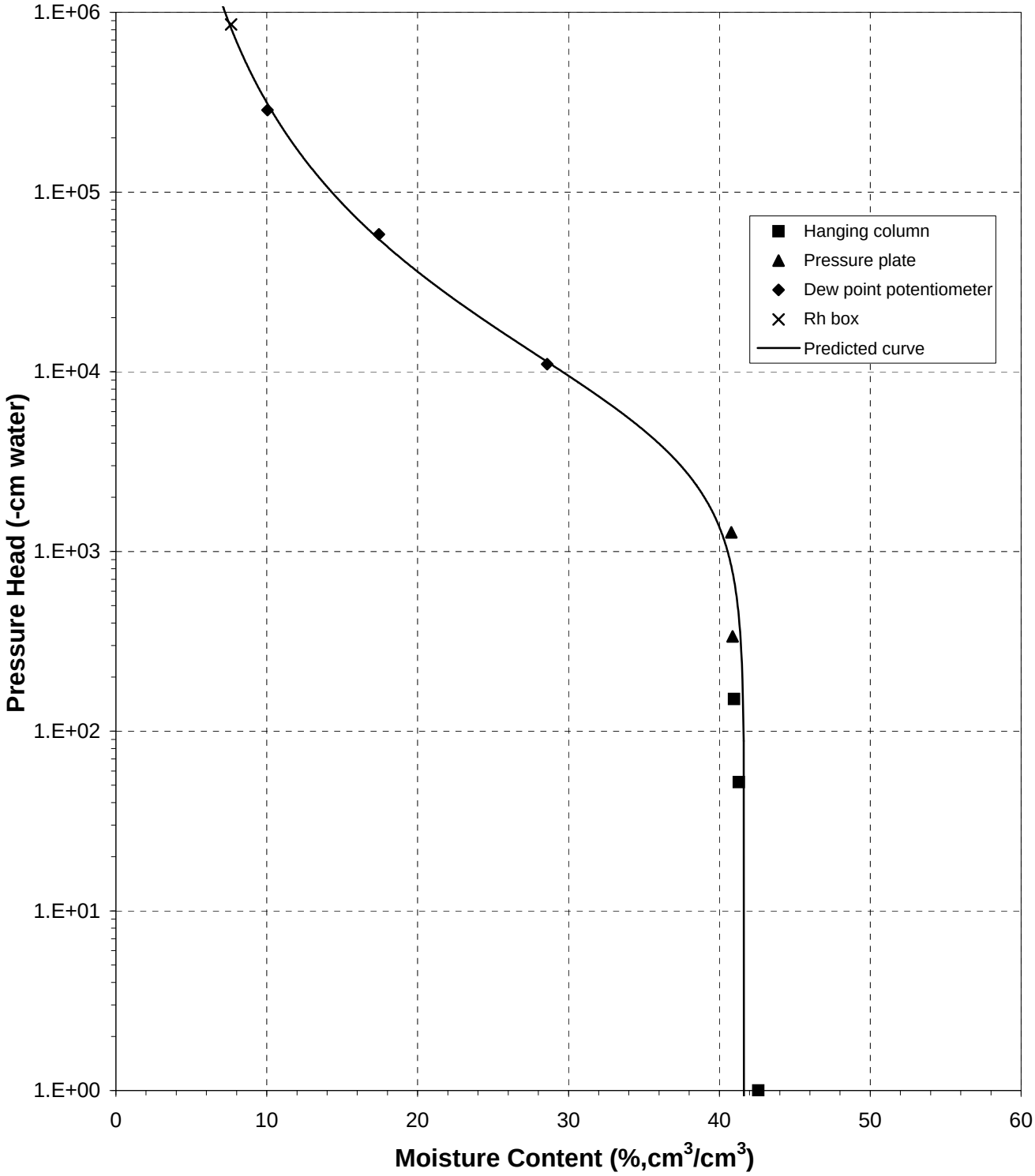
Water Retention Data Points

Sample Number: PB-12 (334-335)



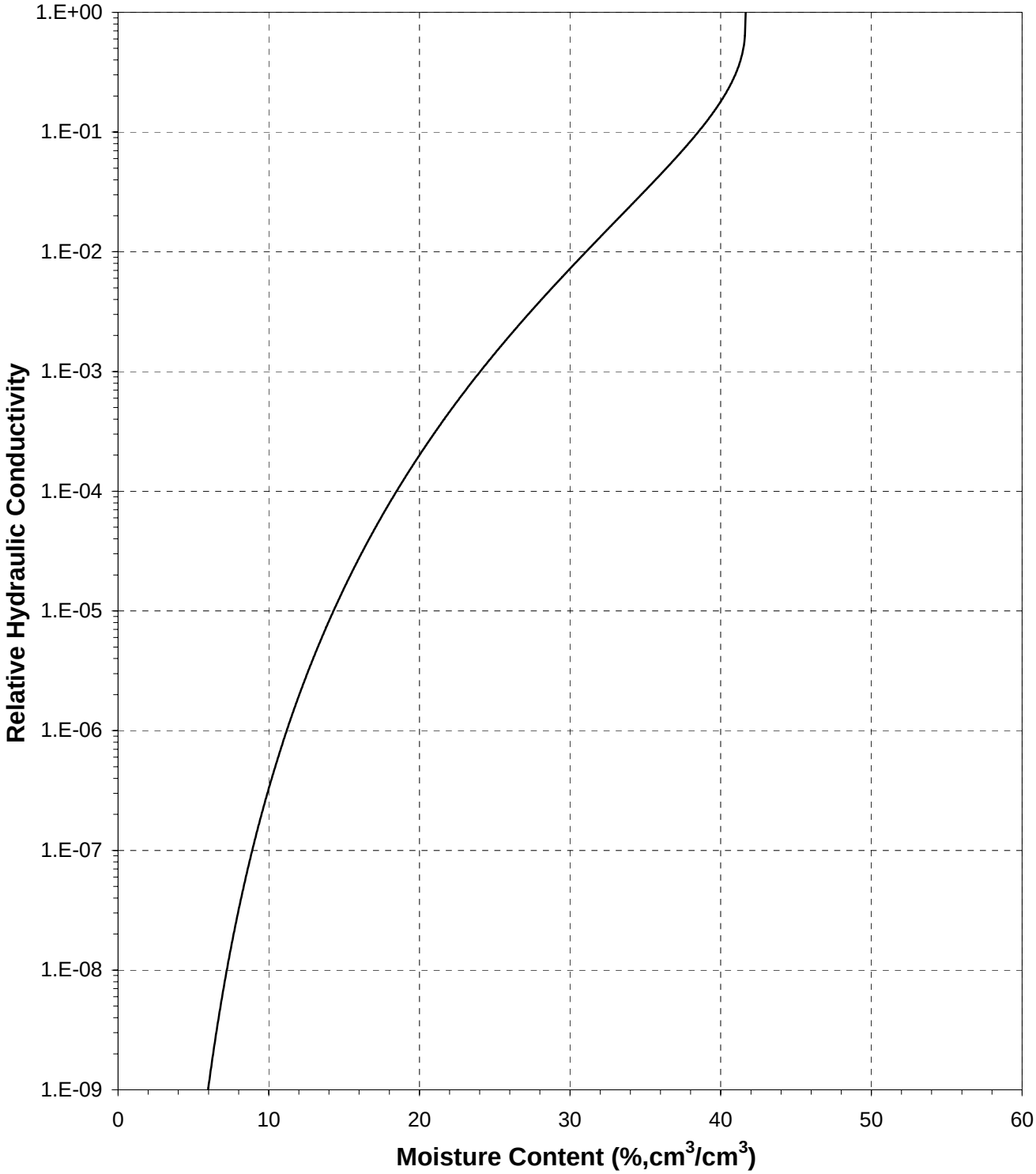
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (334-335)



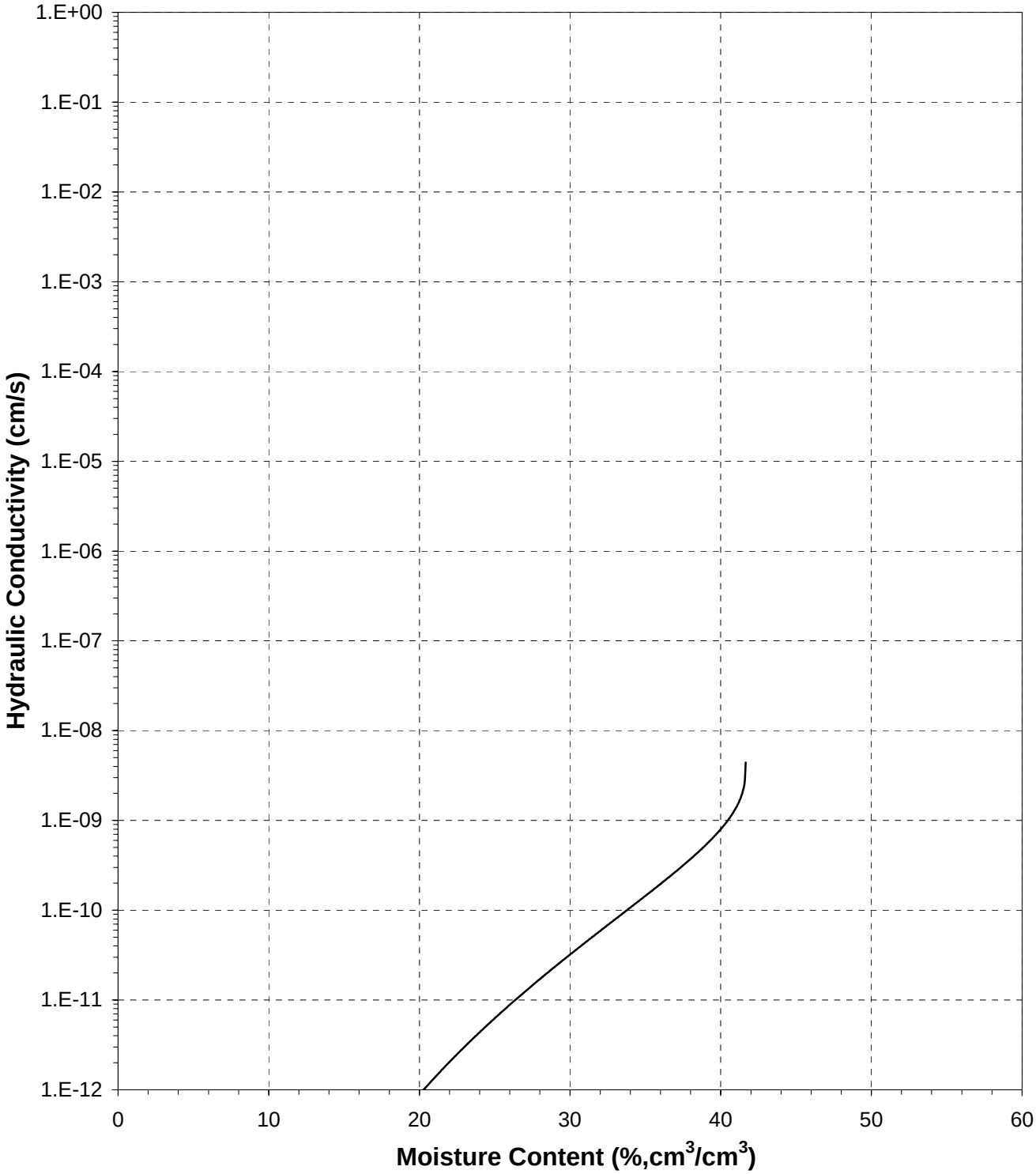
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (334-335)



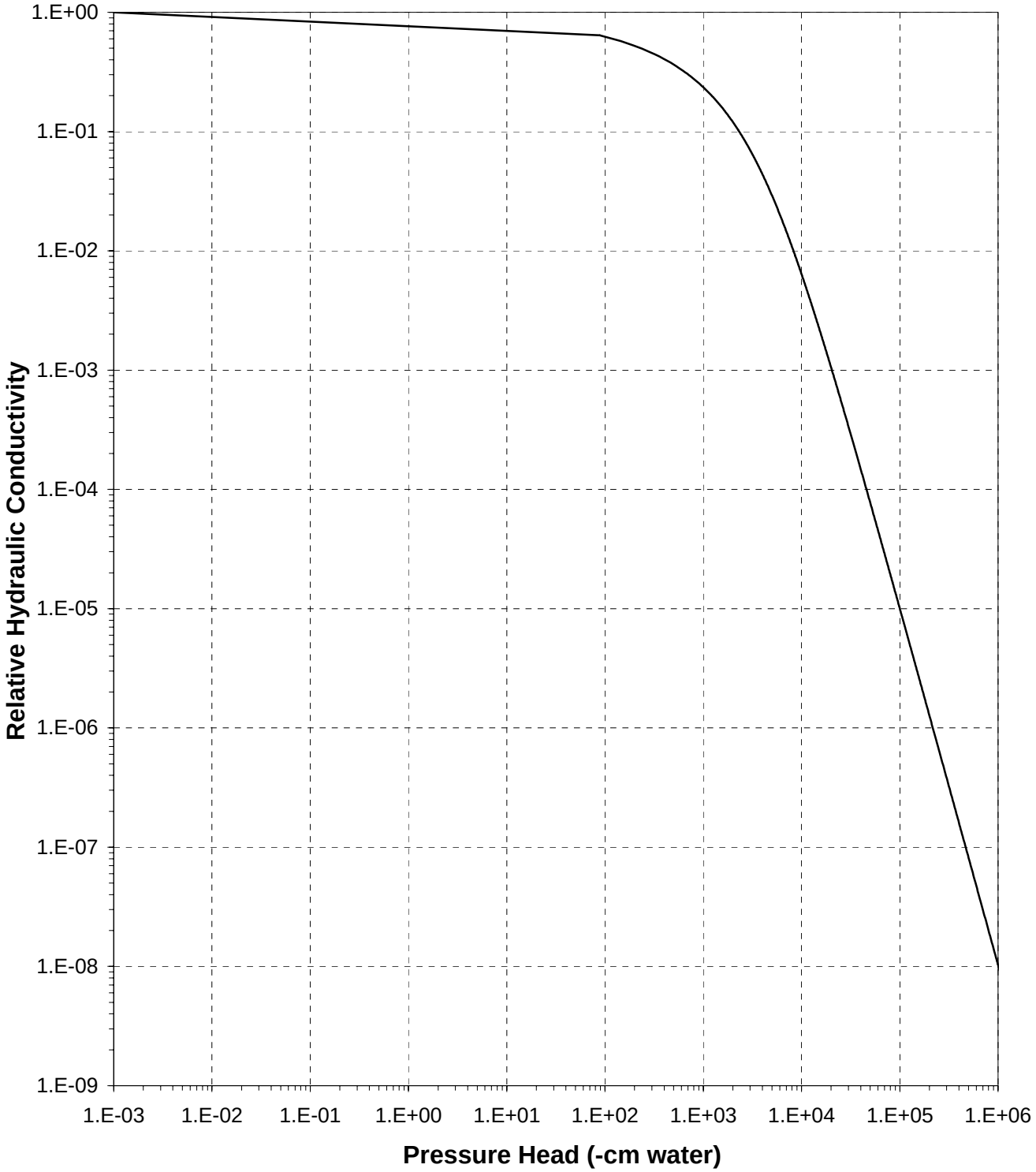
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (334-335)



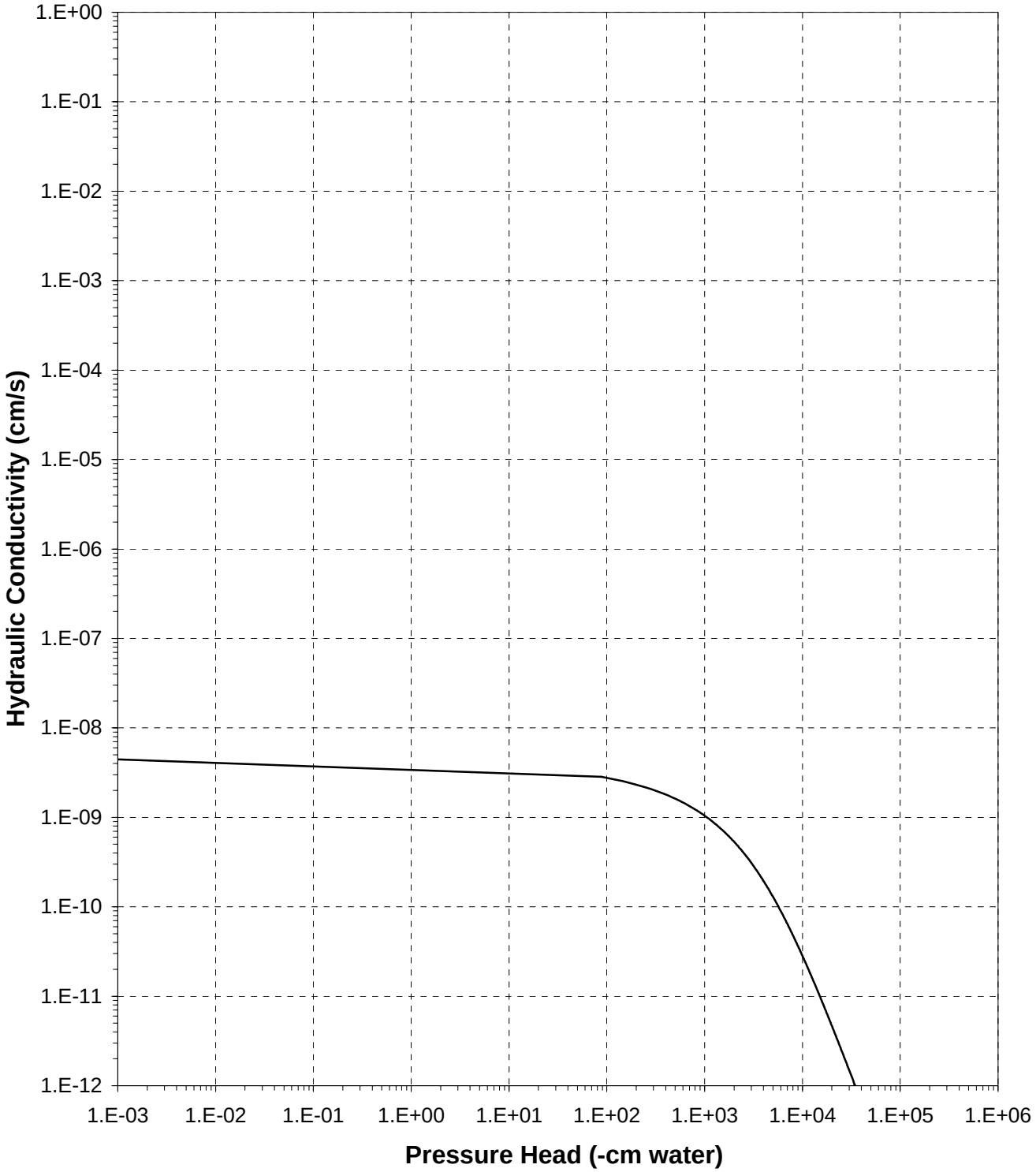
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (334-335)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (334-335)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

Dry wt. of sample (g): 106.25
Tare wt., ring (g): 40.17
Tare wt., screen & clamp (g): 24.06
Initial sample volume (cm^3): 73.93
Initial dry bulk density (g/cm^3): 1.44
Measured particle density (g/cm^3): 2.70
Initial calculated total porosity (%): 46.82

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	8-Feb-12	14:20	205.10	0	46.83
	20-Jan-00	9:10	205.05	52.0	46.76
	22-Feb-12	10:35	204.92	151.0	46.58
Pressure plate:	7-Mar-12	10:50	204.75	337	46.35
	21-Mar-12	8:20	204.32	1275	45.77

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	52.0	---	---	---	---
	151.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-12 (349-350)

Initial sample bulk density (g/cm^3)*:* 1.44
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 151.39
Tare weight, jar (g)*:* 114.27

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	13-Mar-12	10:15	157.42	19784	23.35
	12-Mar-12	15:53	155.74	49868	16.84
	12-Mar-12	14:00	154.64	106569	12.58

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	19784	---	---	---	---
	49868	---	---	---	---
	106569	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 71.12
Tare weight (g)*:* 42.91

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	10-Apr-12	8:25	72.65	855592	7.78

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

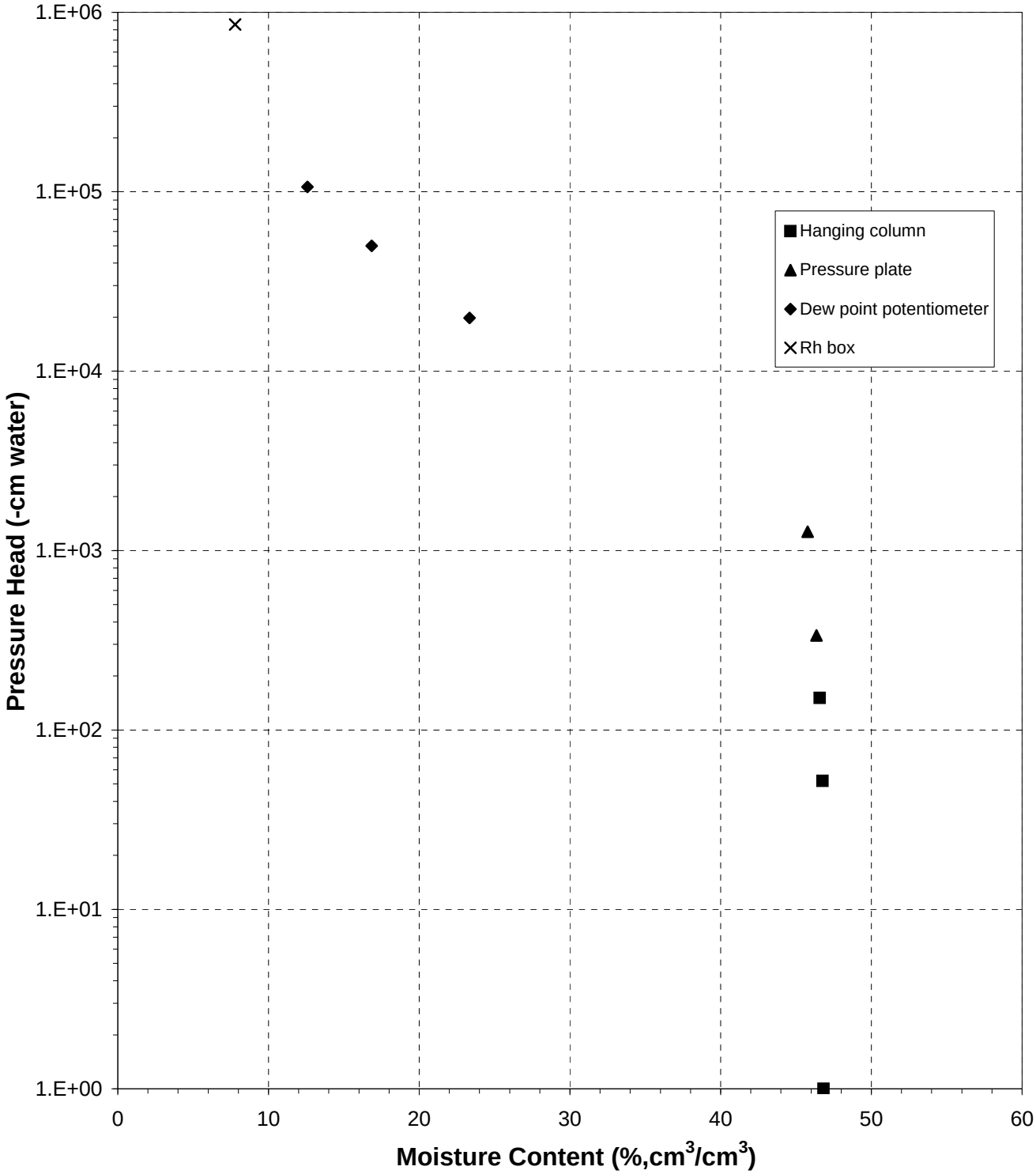
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

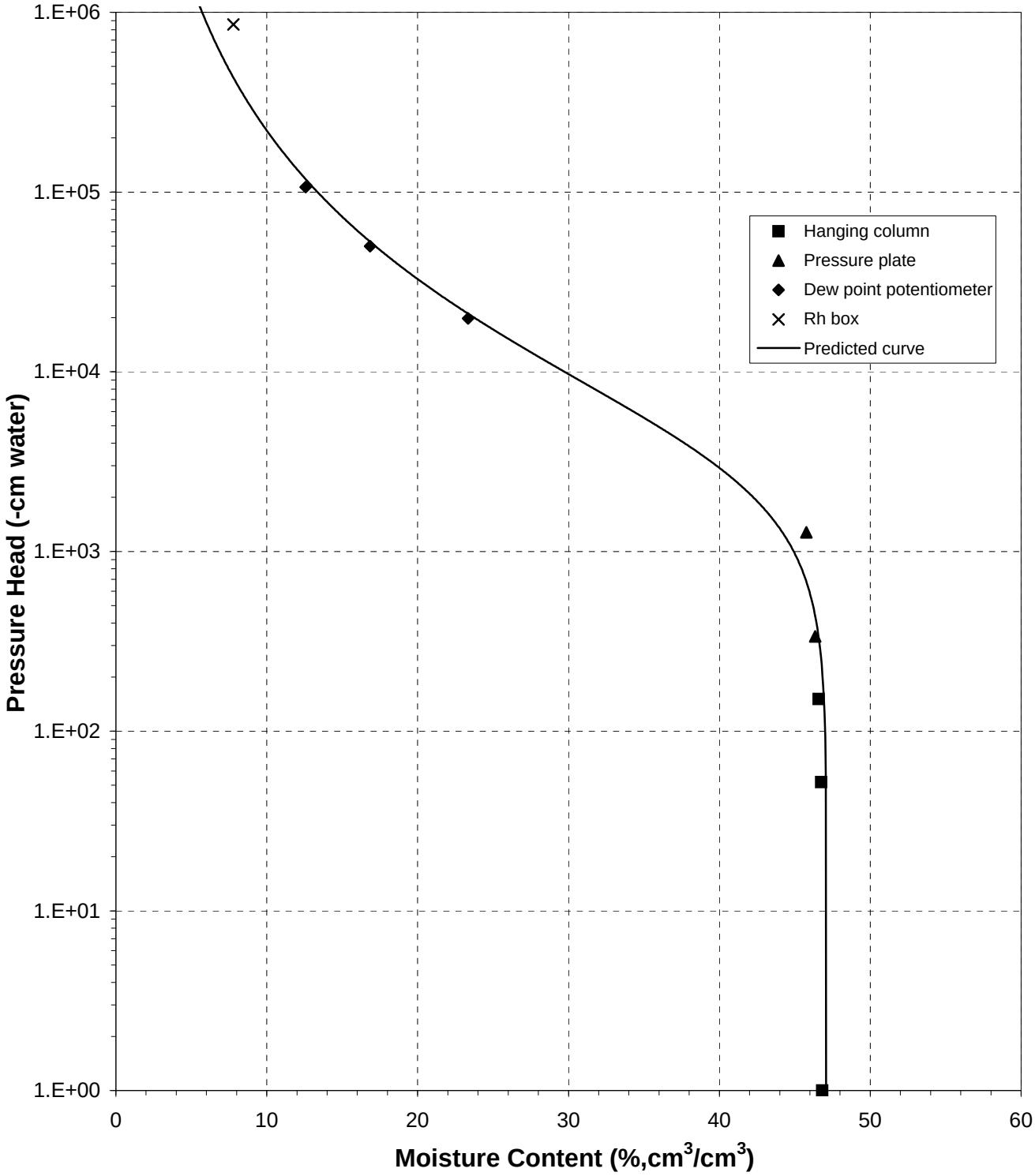
Water Retention Data Points

Sample Number: PB-12 (349-350)



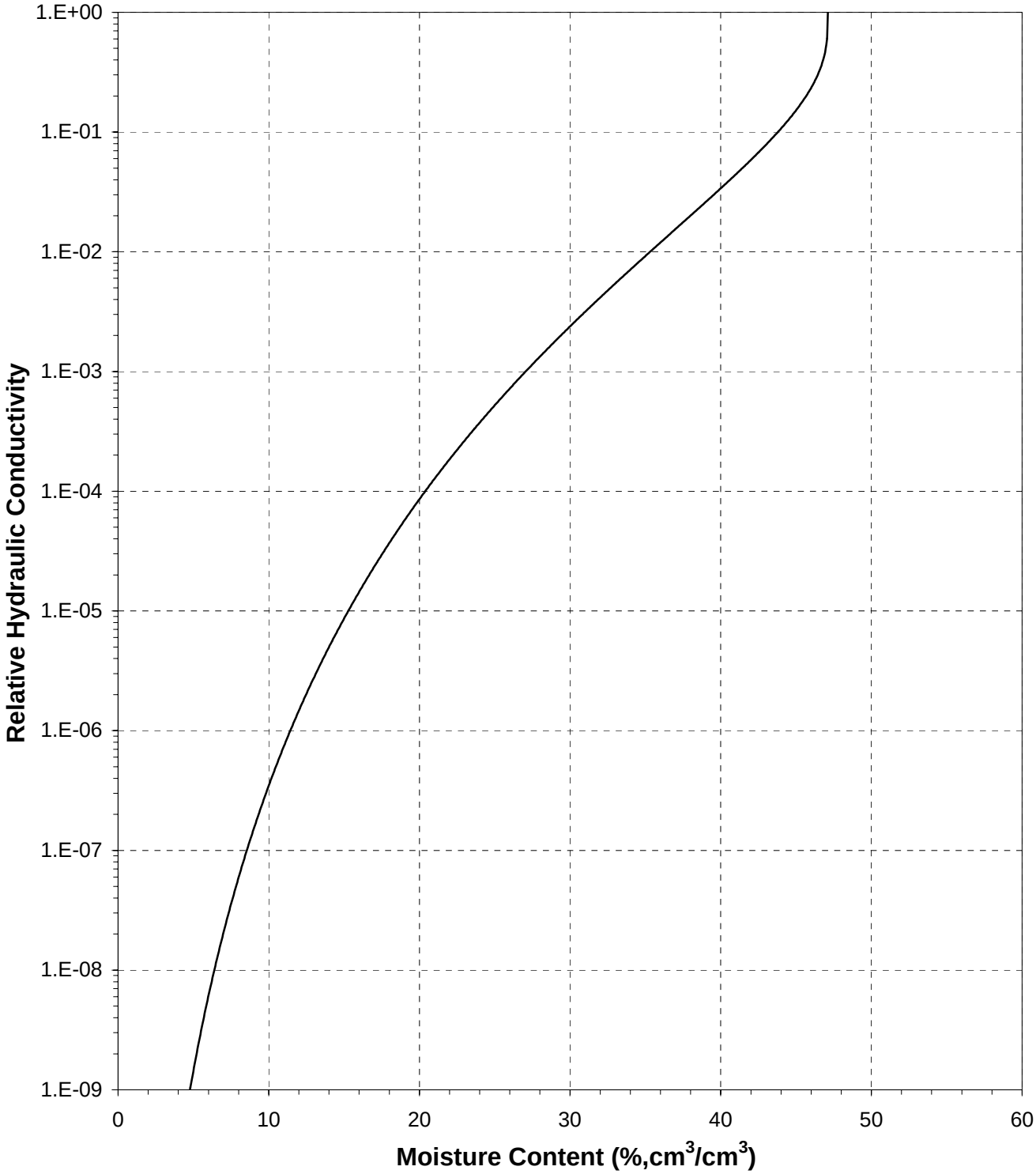
Predicted Water Retention Curve and Data Points

Sample Number: PB-12 (349-350)



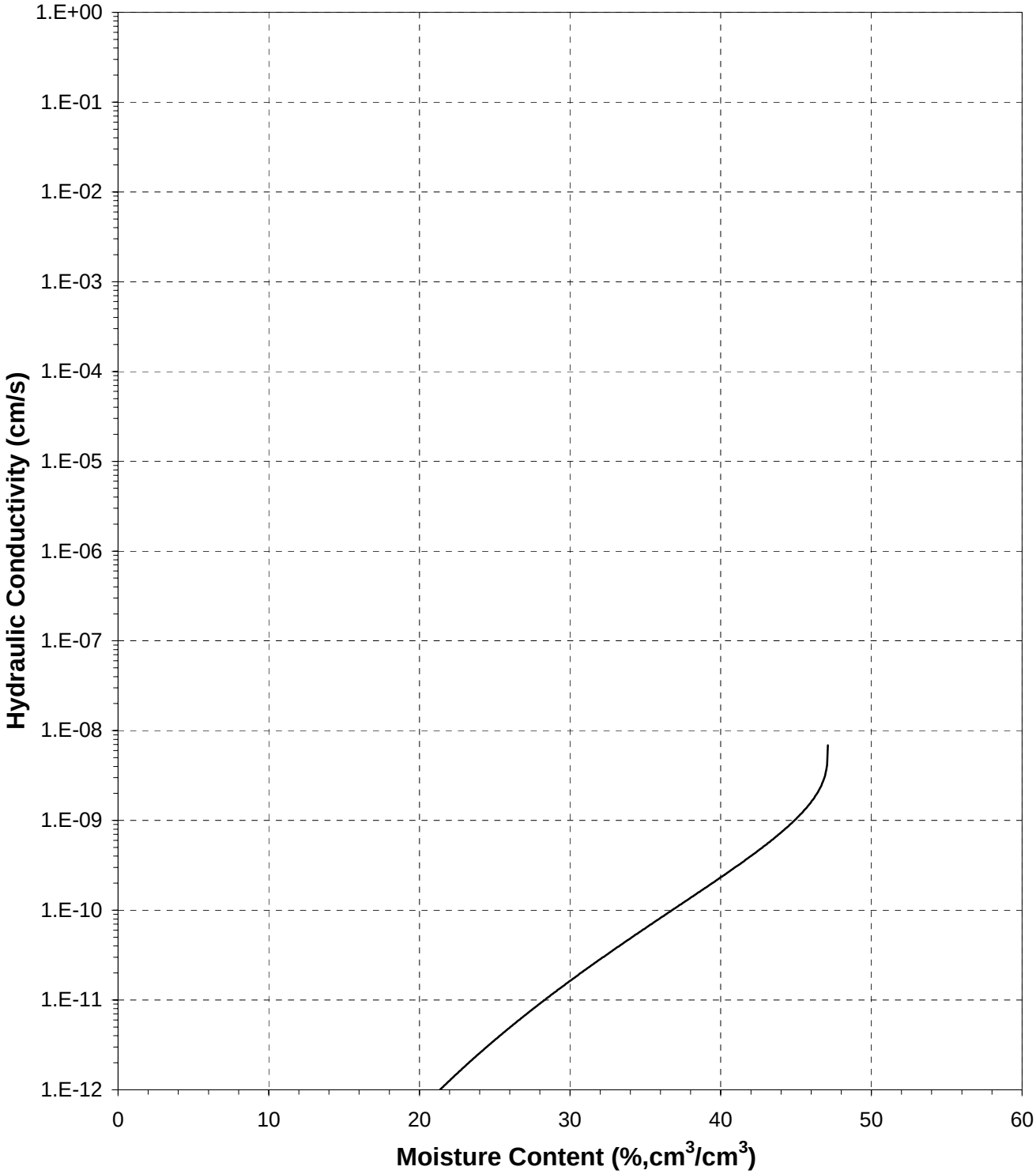
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (349-350)



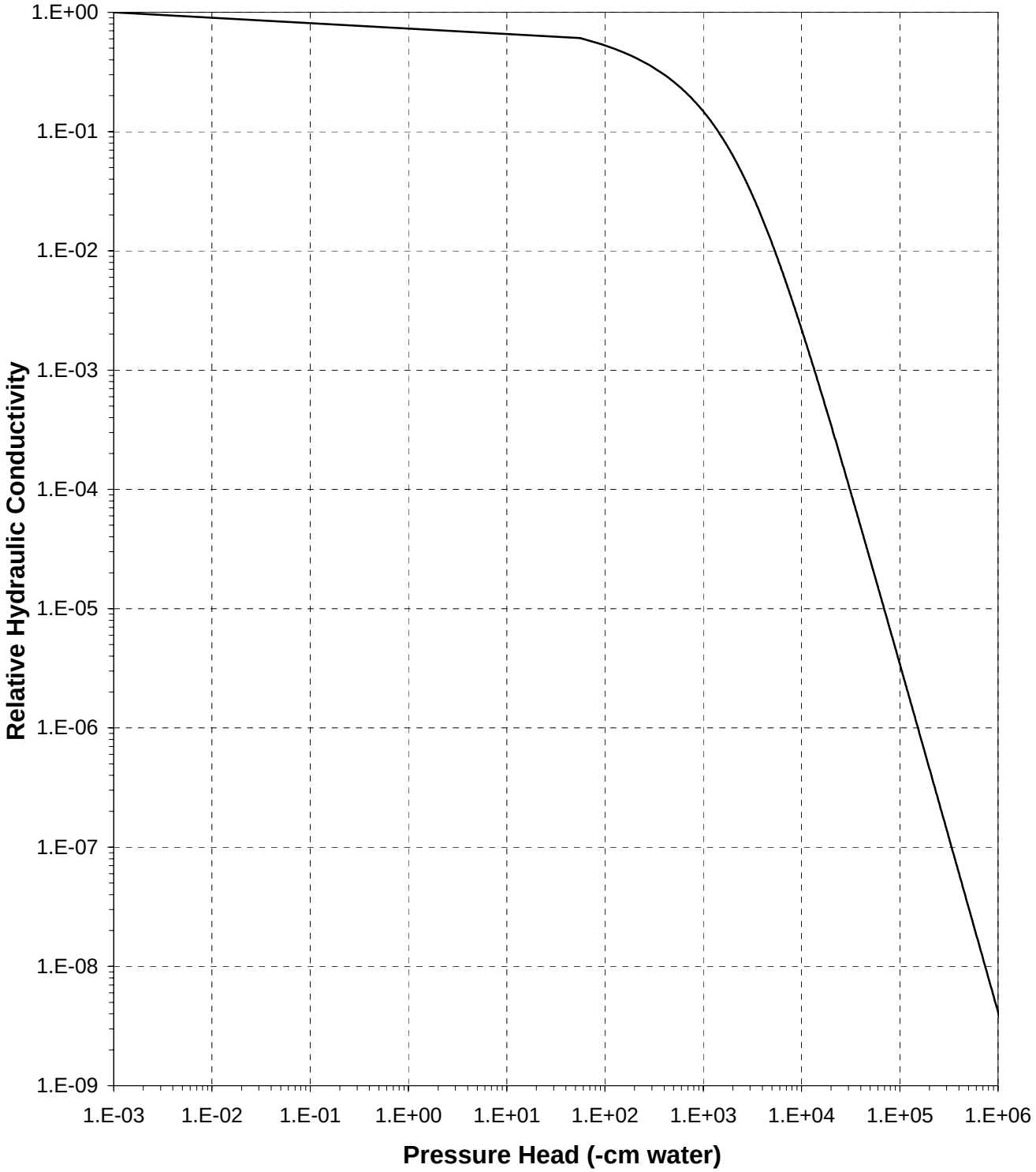
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-12 (349-350)



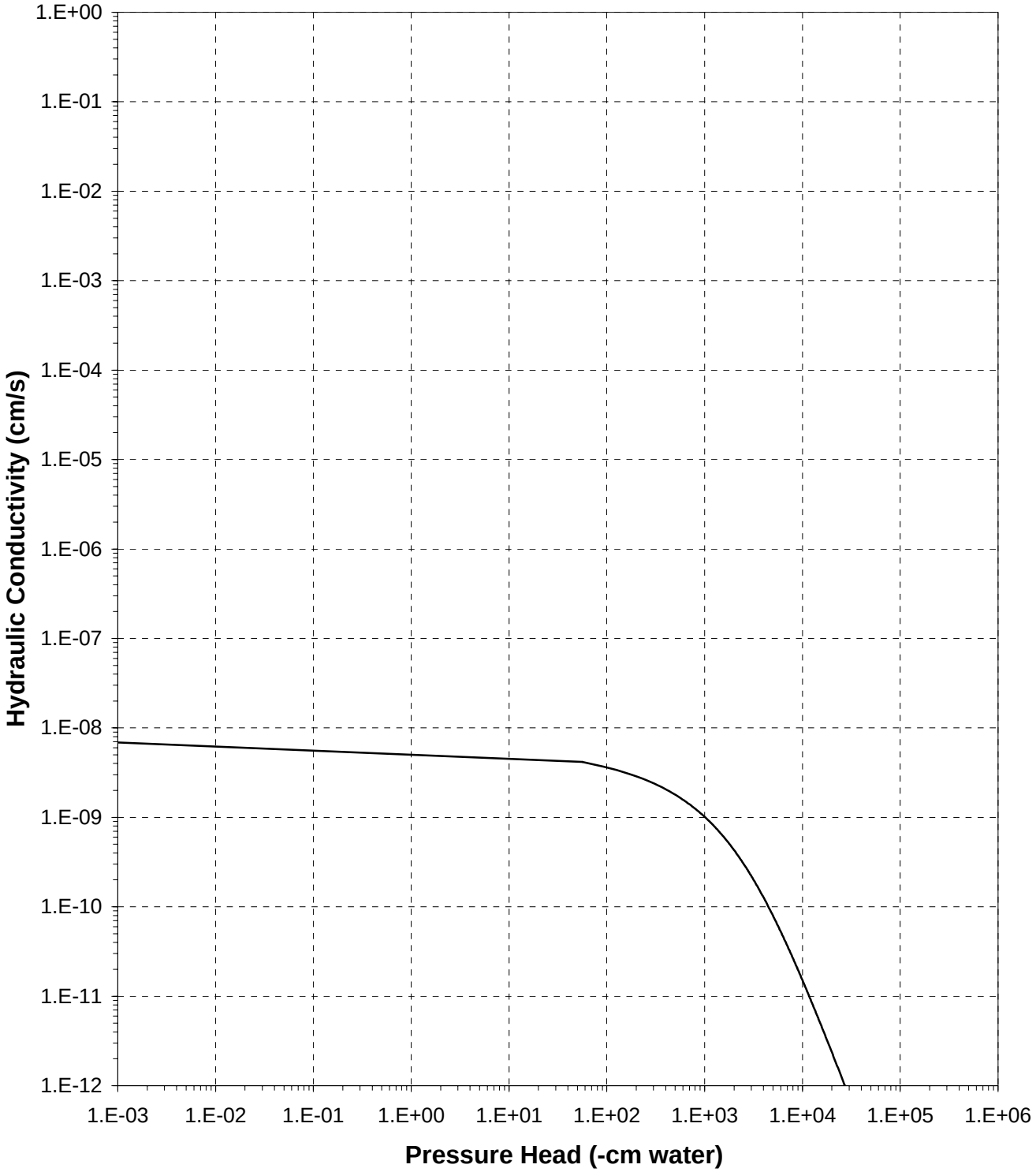
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (349-350)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-12 (349-350)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (279-280)
Date Sampled: 12/7/2011
Depth: 279-280

Dry wt. of sample (g): 109.70
Tare wt., ring (g): 43.60
Tare wt., screen & clamp (g): 25.36
Initial sample volume (cm^3): 71.94
Initial dry bulk density (g/cm^3): 1.52
Measured particle density (g/cm^3): 2.66
Initial calculated total porosity (%): 42.67

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	23-Jan-12	15:00	209.36	0	42.67
	30-Jan-12	13:00	209.29	16.0	42.58
	6-Feb-12	8:55	208.86	51.0	41.98
	13-Feb-12	10:40	207.95	127.0	40.71
Pressure plate:	23-Feb-12	10:30	205.46	337	37.25

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	51.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (279-280)

Initial sample bulk density (g/cm^3)*:* 1.52
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 142.08
Tare weight, jar (g)*:* 117.92

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	22-Mar-12	15:07	144.70	9178	16.54
	16-Mar-12	13:46	143.50	58639	8.96
	12-Mar-12	14:10	143.14	271165	6.69

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	9178	---	---	---	---
	58639	---	---	---	---
	271165	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 67.11
Tare weight (g)*:* 40.70

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	6-Mar-12	9:30	67.99	855592	5.07

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

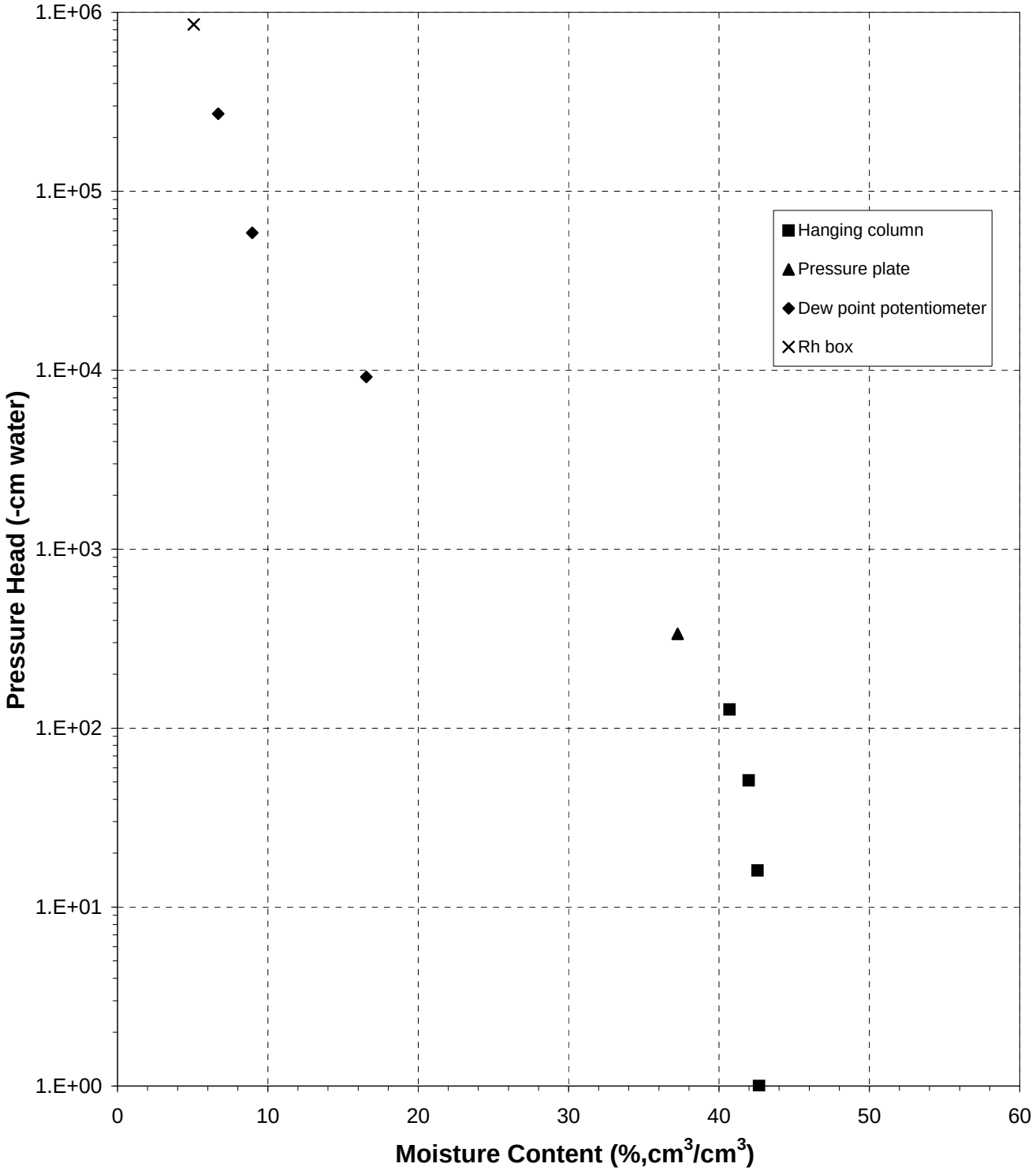
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

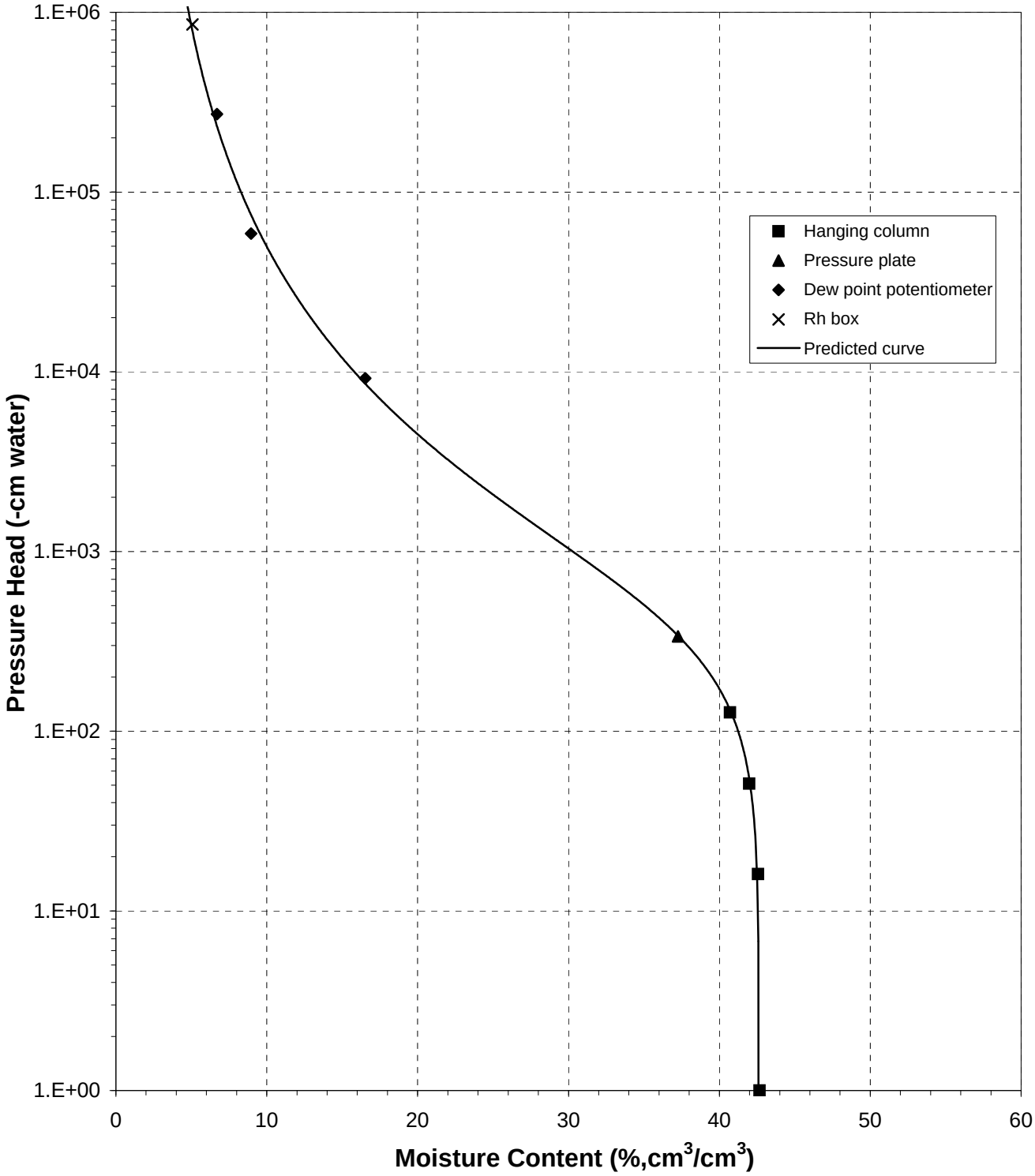
Water Retention Data Points

Sample Number: PB-13 (279-280)



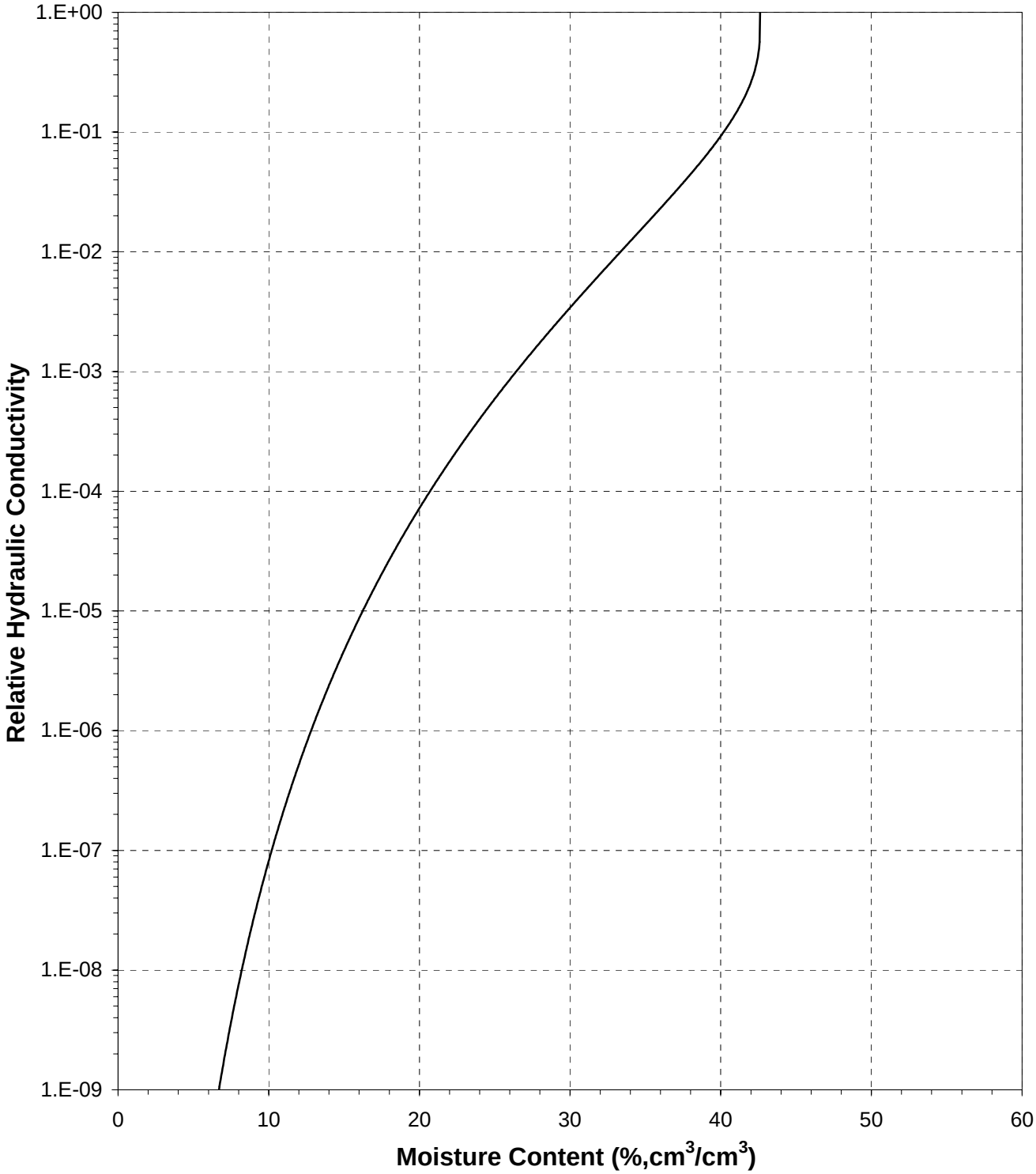
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (279-280)



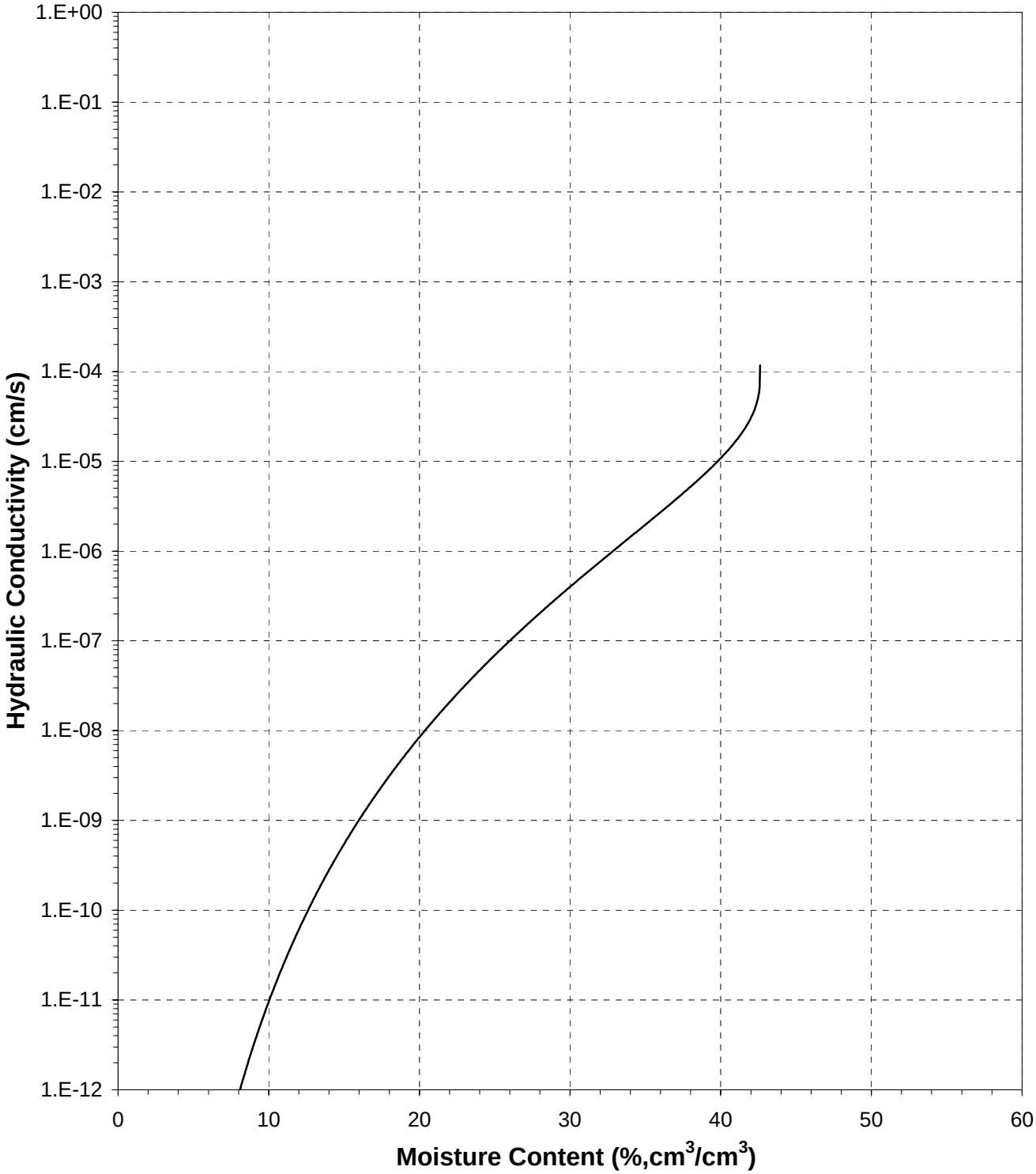
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (279-280)



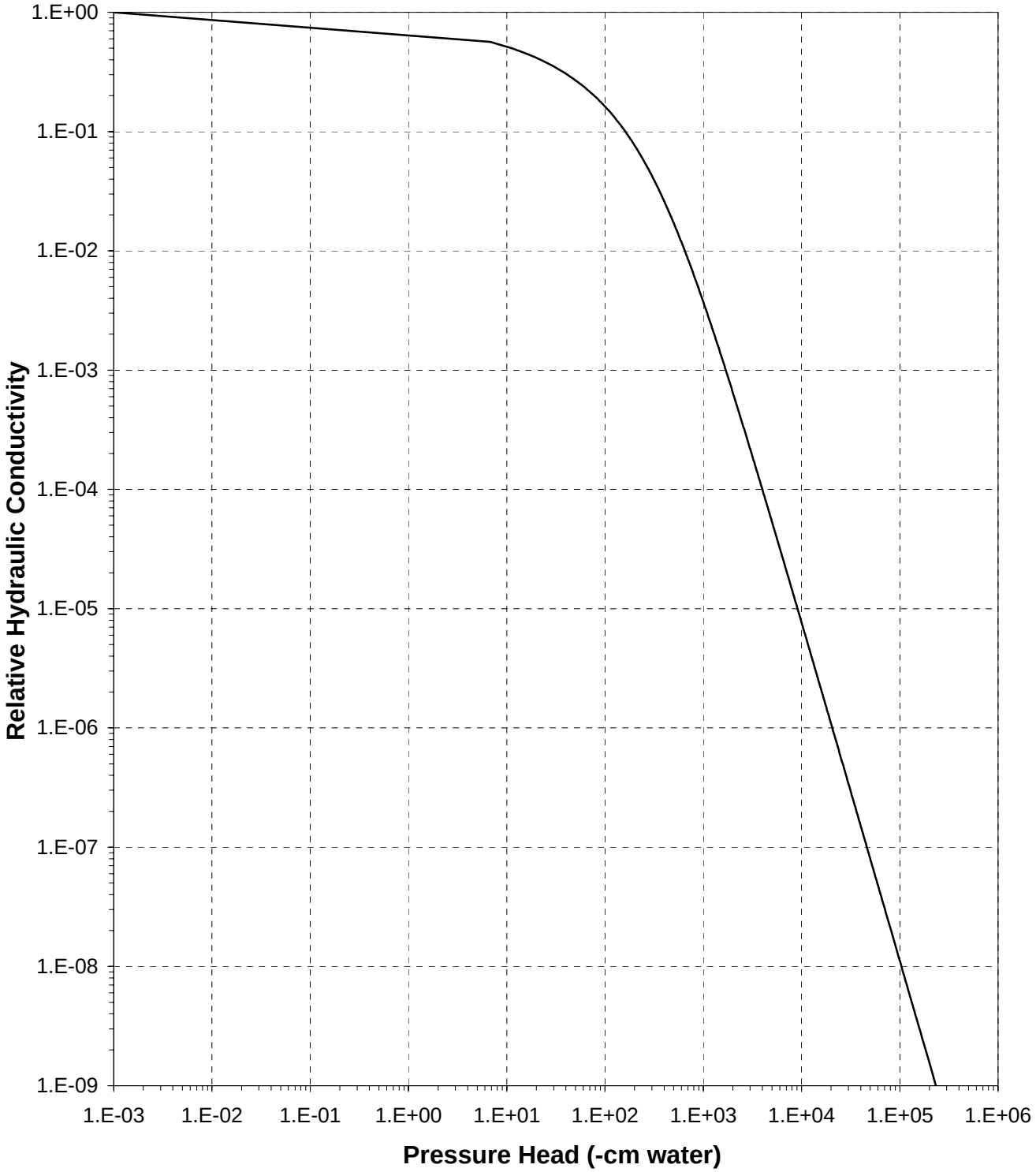
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (279-280)



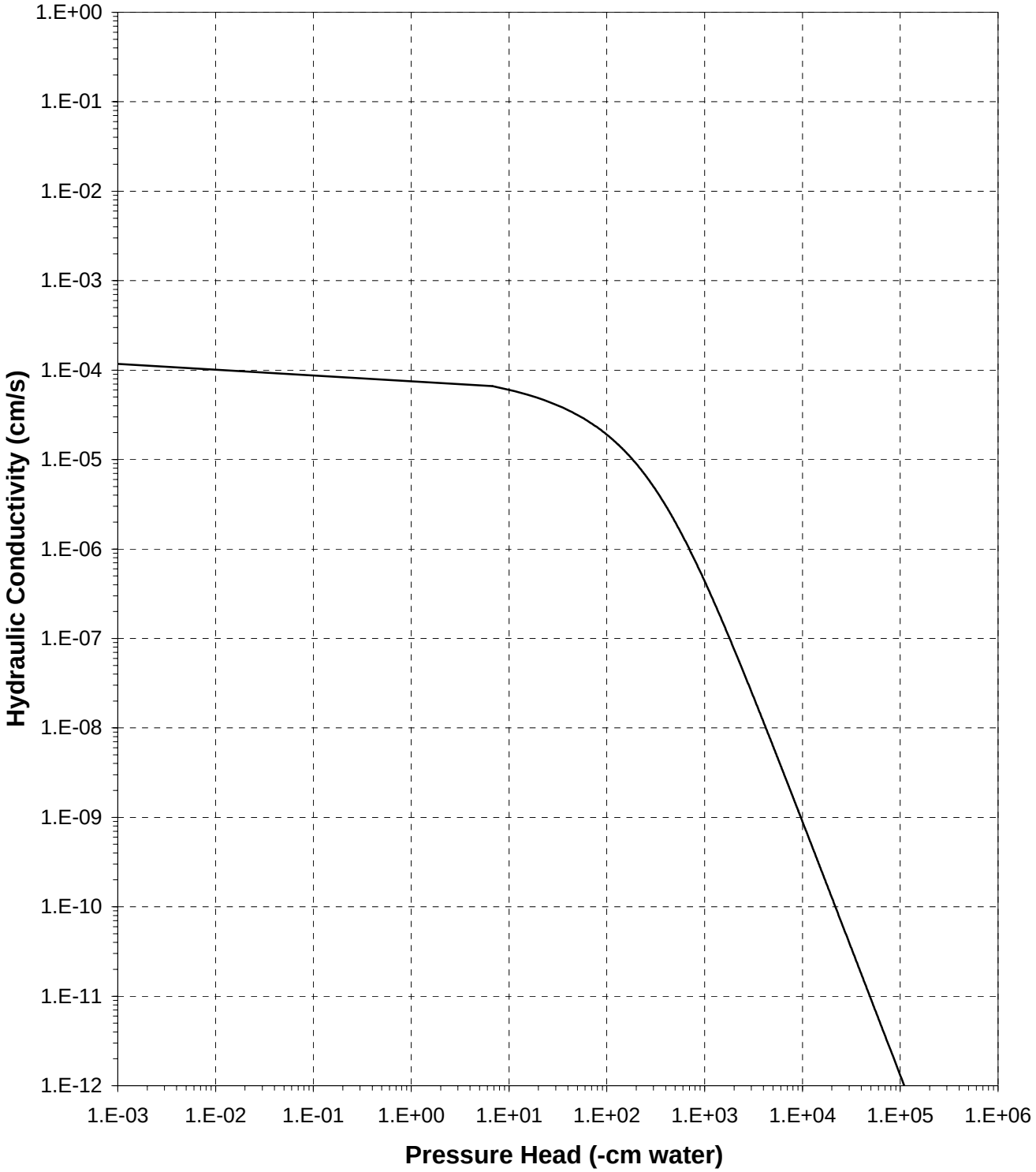
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (279-280)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (279-280)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

Dry wt. of sample (g): 115.10
Tare wt., ring (g): 46.23
Tare wt., screen & clamp (g): 27.69
Initial sample volume (cm^3): 77.71
Initial dry bulk density (g/cm^3): 1.48
Measured particle density (g/cm^3): 2.69
Initial calculated total porosity (%): 45.01

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	23-Jan-12	14:45	224.00	0	45.02
	30-Jan-12	12:50	223.81	16.0	44.77
	6-Feb-12	9:00	223.35	51.0	44.18
	13-Feb-12	10:45	222.67	127.0	43.30
Pressure plate:	23-Feb-12	10:20	221.92	337	42.34

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	51.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (349-350)

Initial sample bulk density (g/cm^3)*:* 1.48
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 147.88
Tare weight, jar (g)*:* 114.07

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	15:33	152.21	11014	18.97
	13-Mar-12	16:40	150.40	78831	11.04
	7-Mar-12	15:48	149.50	440962	7.10

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	11014	---	---	---	---
	78831	---	---	---	---
	440962	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 67.99
Tare weight (g)*:* 42.10

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	6-Mar-12	9:30	69.13	855592	6.50

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

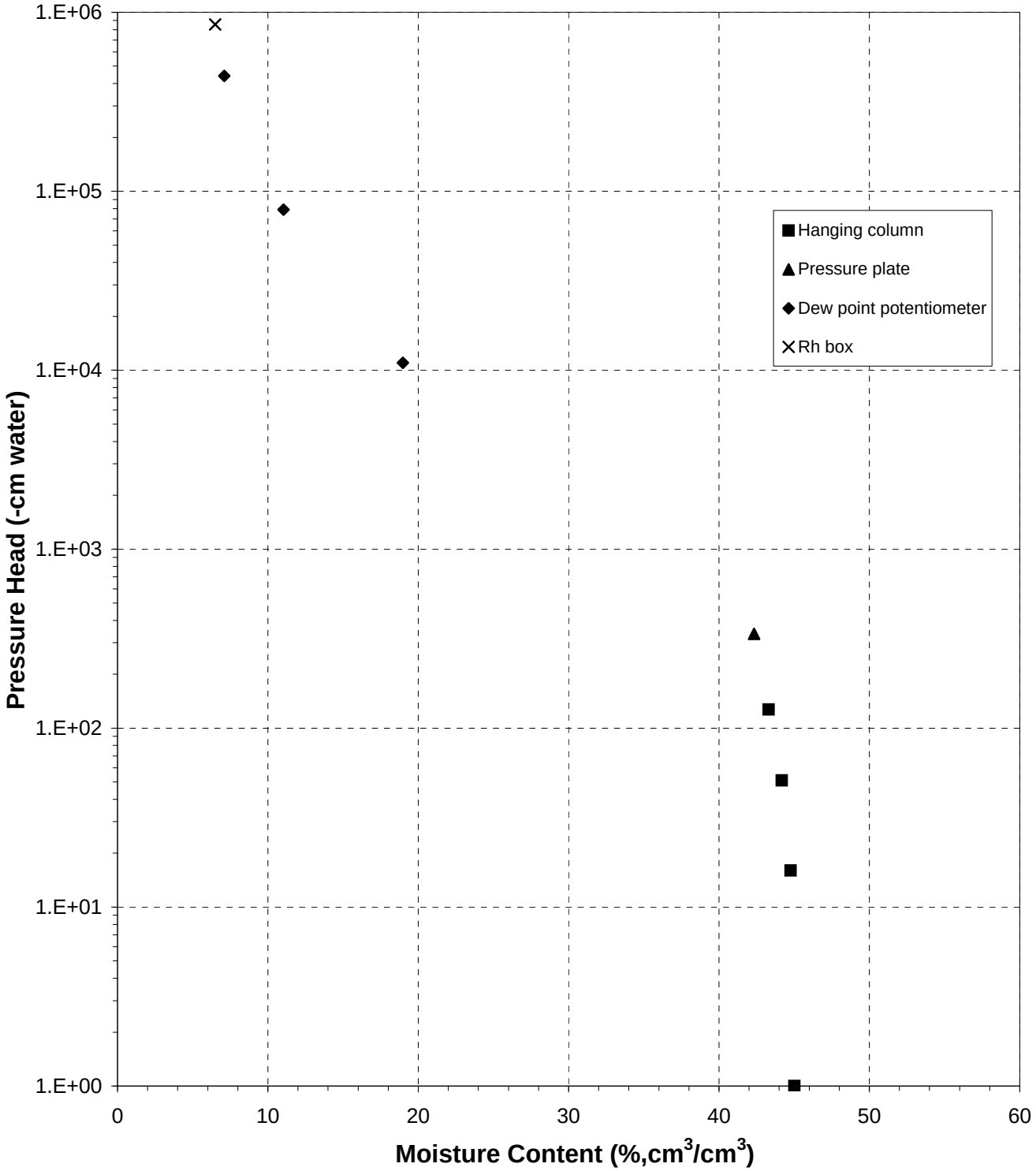
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

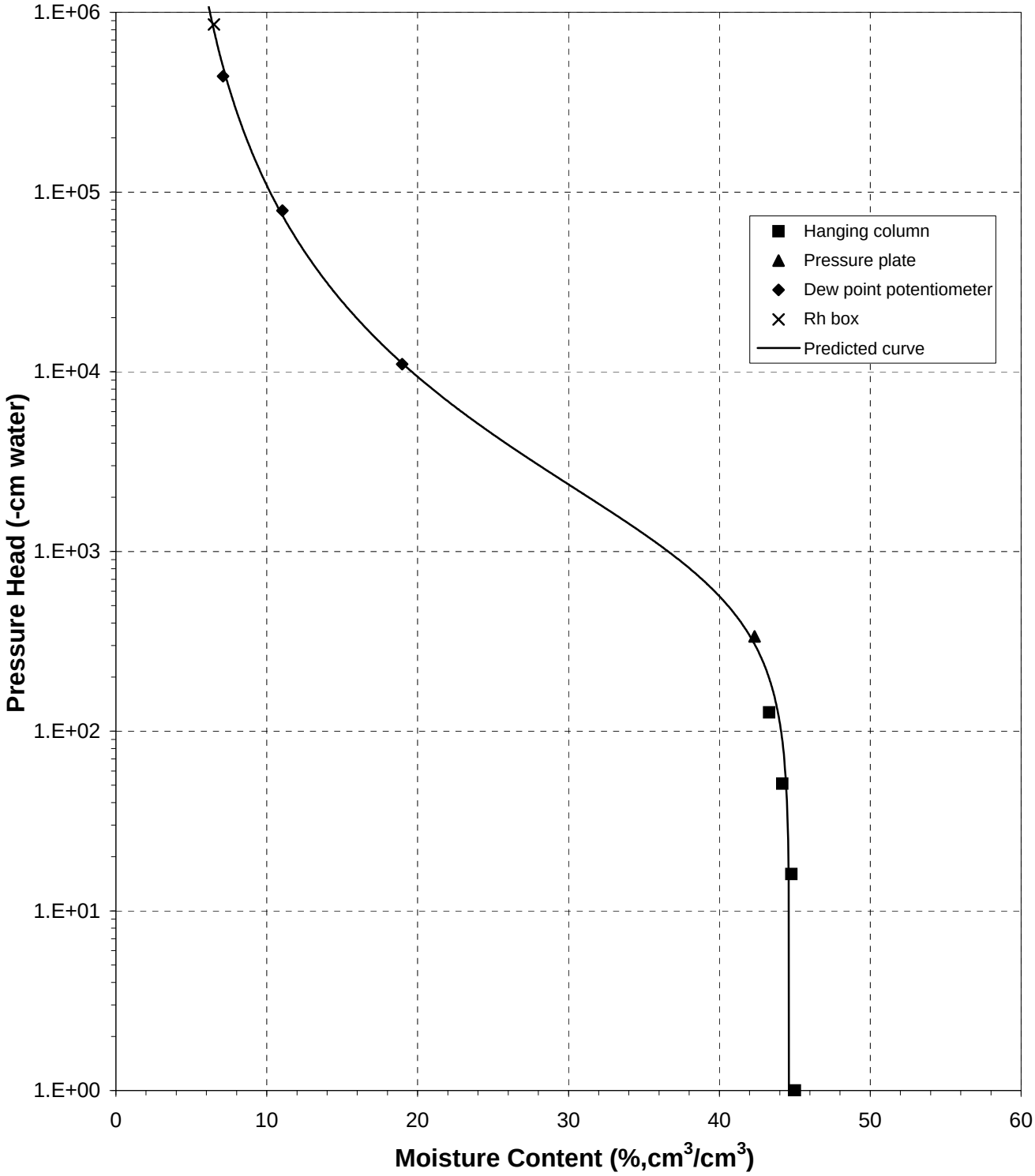
Water Retention Data Points

Sample Number: PB-13 (349-350)



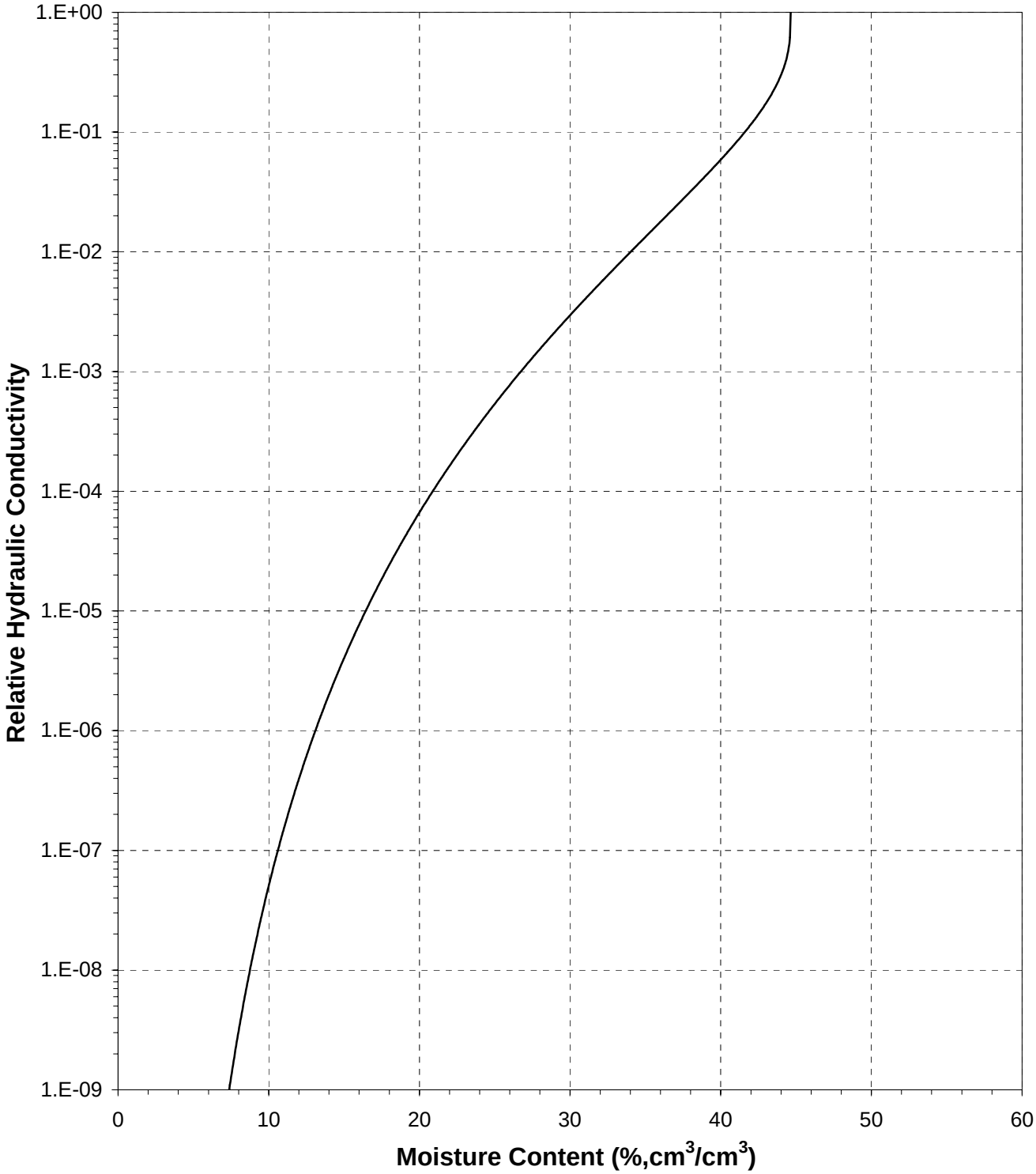
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (349-350)



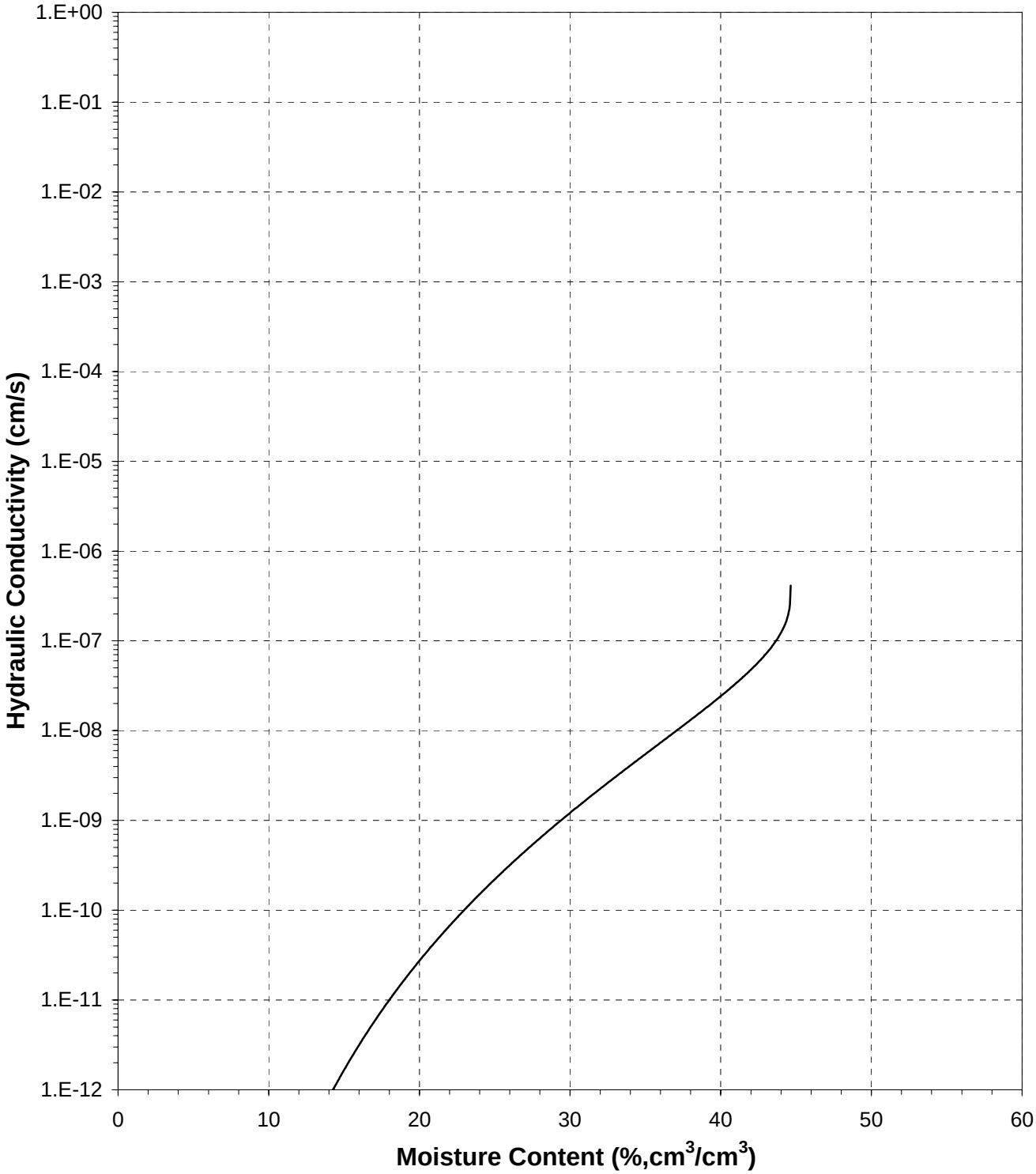
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (349-350)



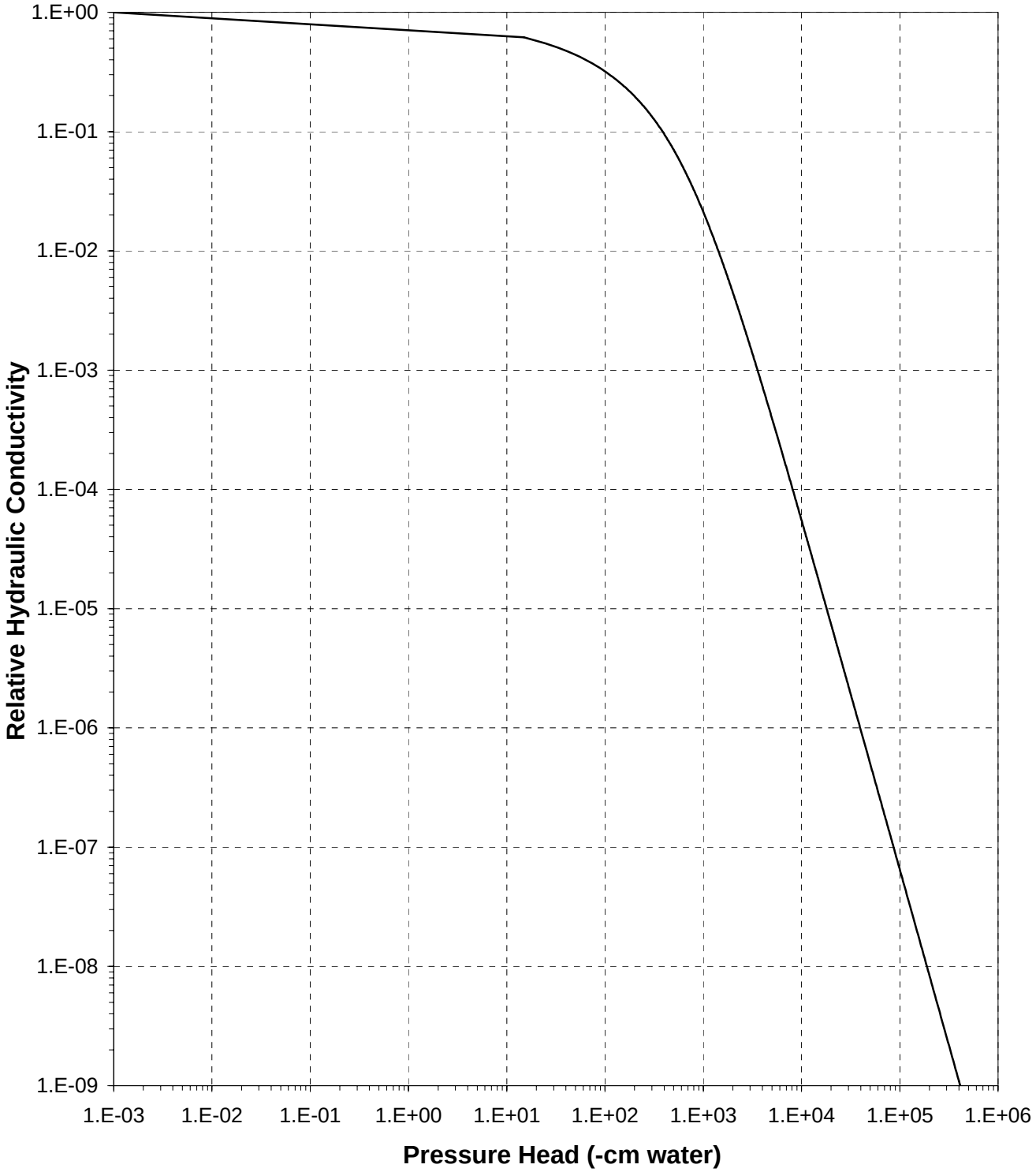
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (349-350)



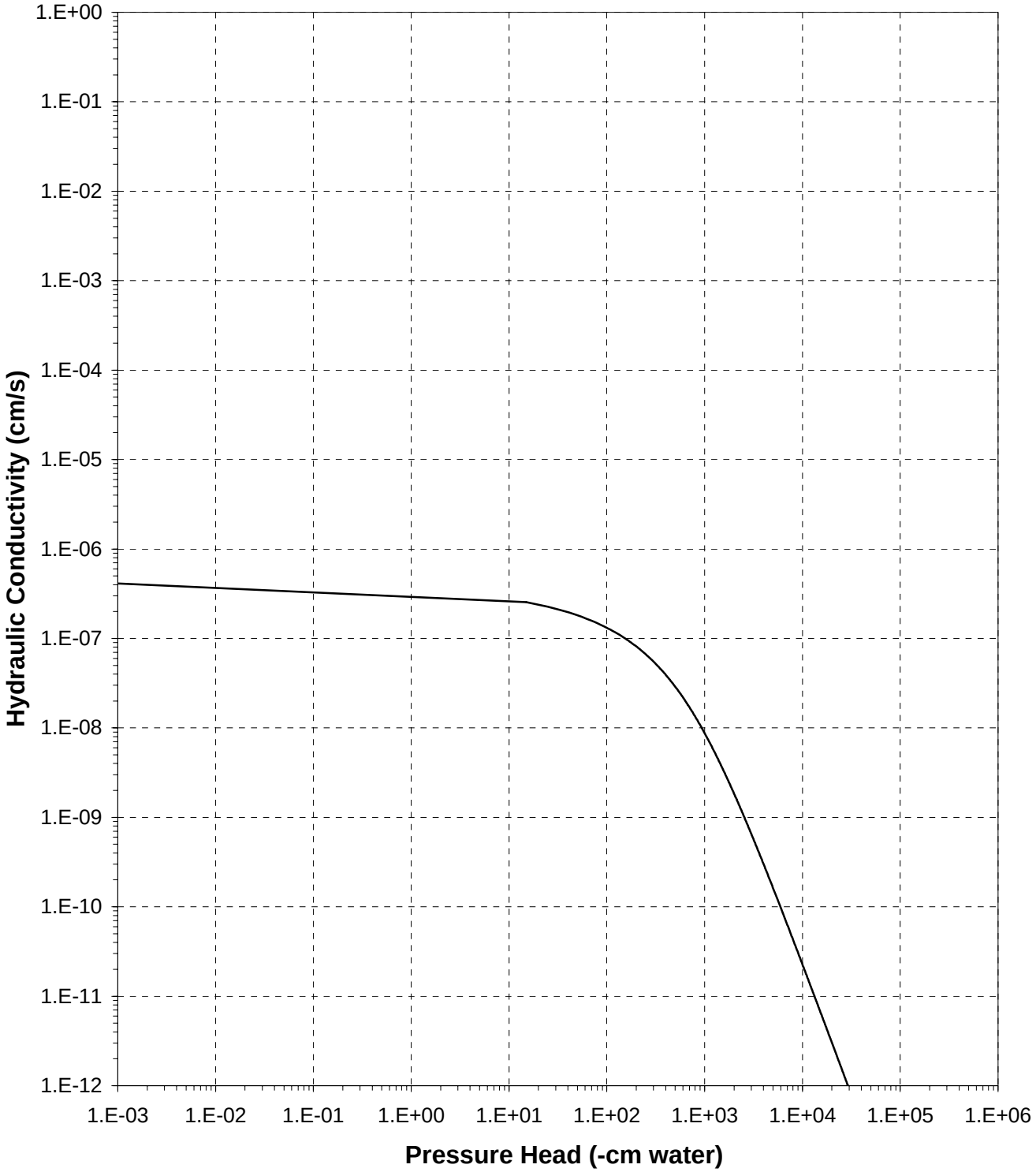
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (349-350)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (349-350)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (444-445)
Date Sampled: 12/7/2011
Depth: 444-445

Dry wt. of sample (g): 100.10
Tare wt., ring (g): 41.88
Tare wt., screen & clamp (g): 24.99
Initial sample volume (cm^3): 69.16
Initial dry bulk density (g/cm^3): 1.45
Measured particle density (g/cm^3): 2.71
Initial calculated total porosity (%): 46.67

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	23-Jan-12	13:50	199.25	0	46.67
	30-Jan-12	13:20	199.25	20.0	46.67
	6-Feb-12	9:10	198.77	69.0	45.98
	13-Feb-12	10:50	198.33	155.0	45.34
Pressure plate:	23-Feb-12	10:10	197.84	337	44.63

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	20.0	---	---	---	---
	69.0	---	---	---	---
	155.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (444-445)

Initial sample bulk density (g/cm^3)*:* 1.45
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 144.08
Tare weight, jar (g)*:* 112.75

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	15:08	149.54	9688	25.22
	15-Mar-12	15:48	147.81	37529	17.23
	12-Mar-12	15:35	146.56	274938	11.46

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	9688	---	---	---	---
	37529	---	---	---	---
	274938	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 67.30
Tare weight (g)*:* 39.94

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	6-Mar-12	9:30	68.96	855592	8.80

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

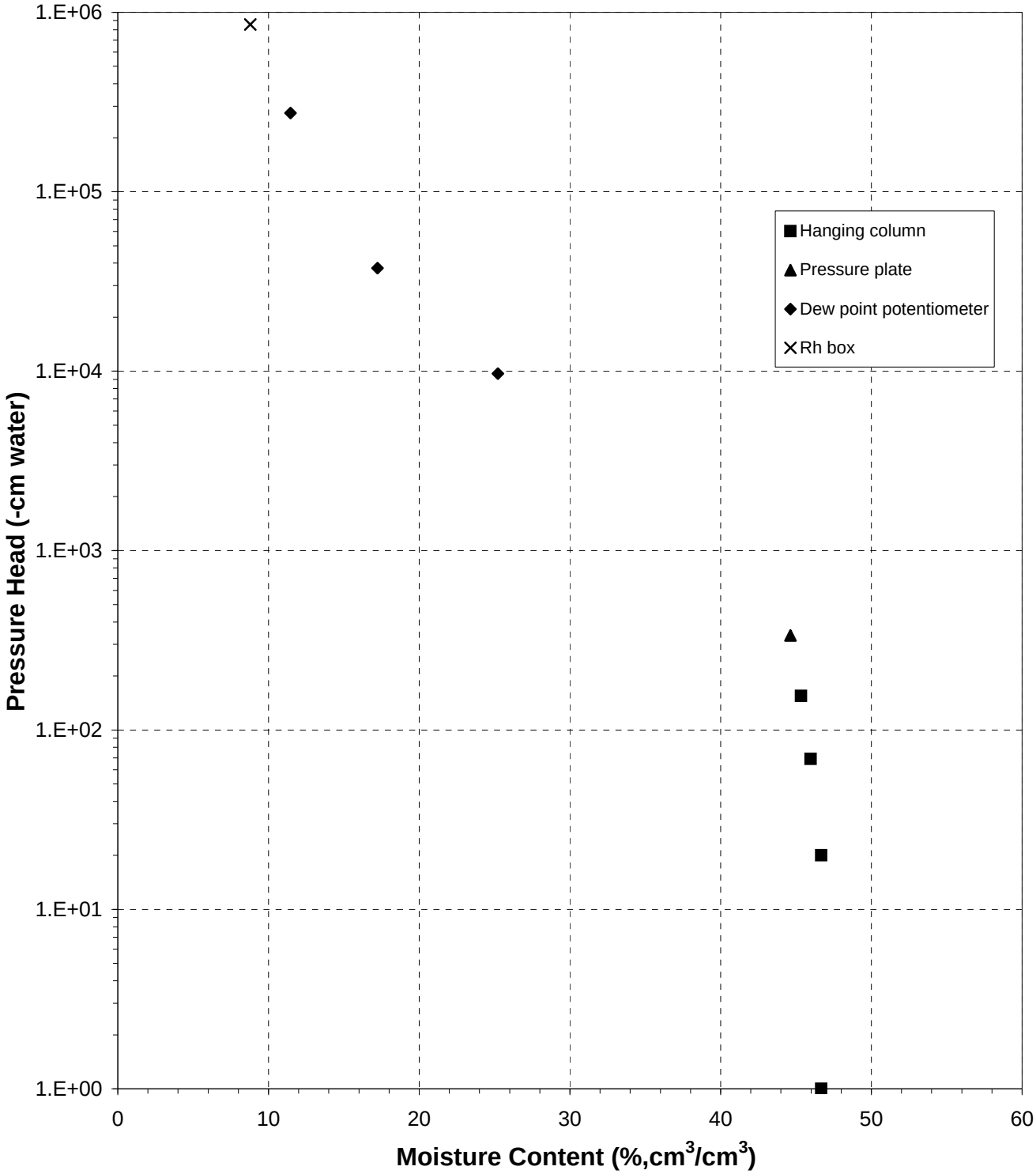
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

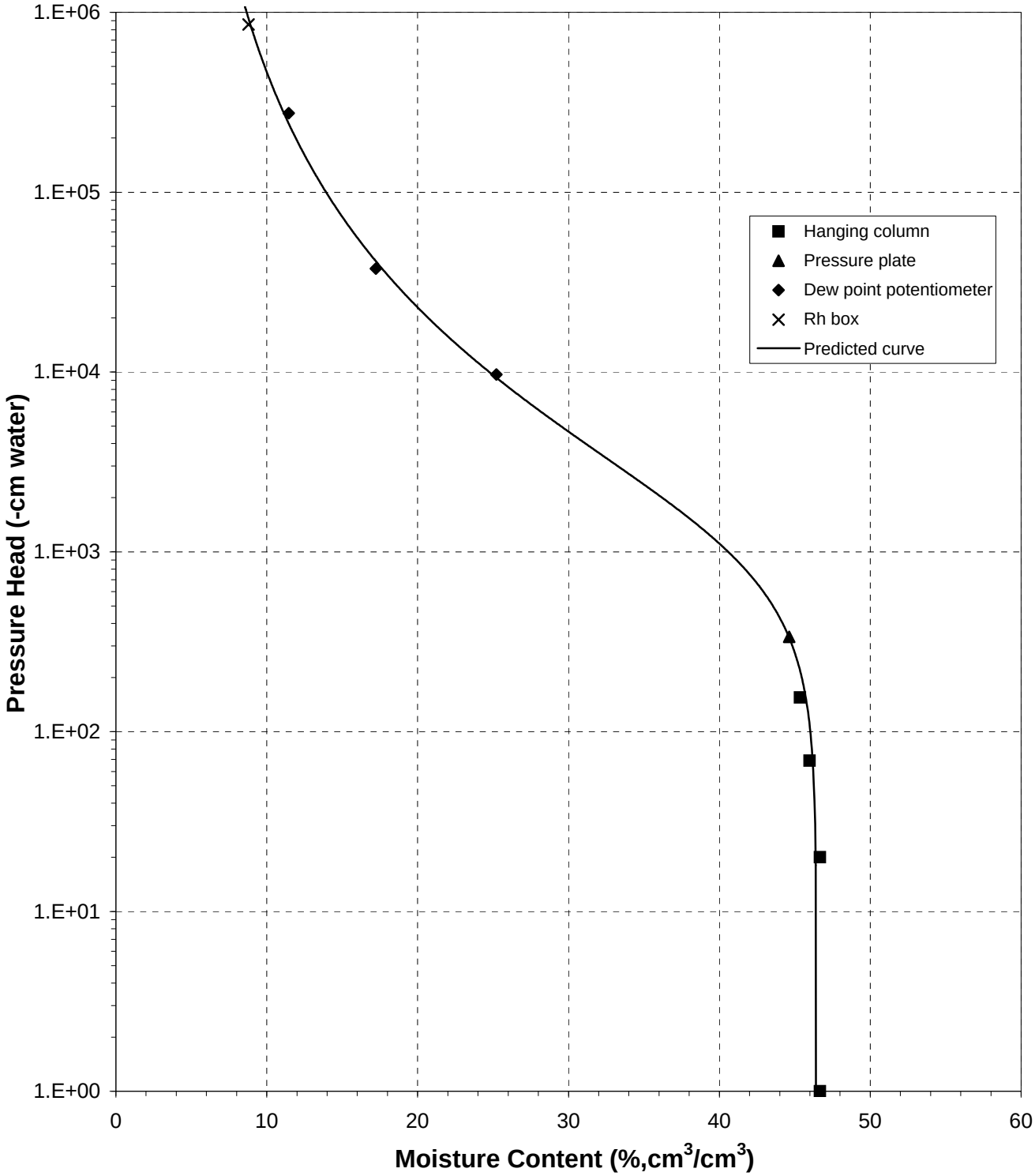
Water Retention Data Points

Sample Number: PB-13 (444-445)



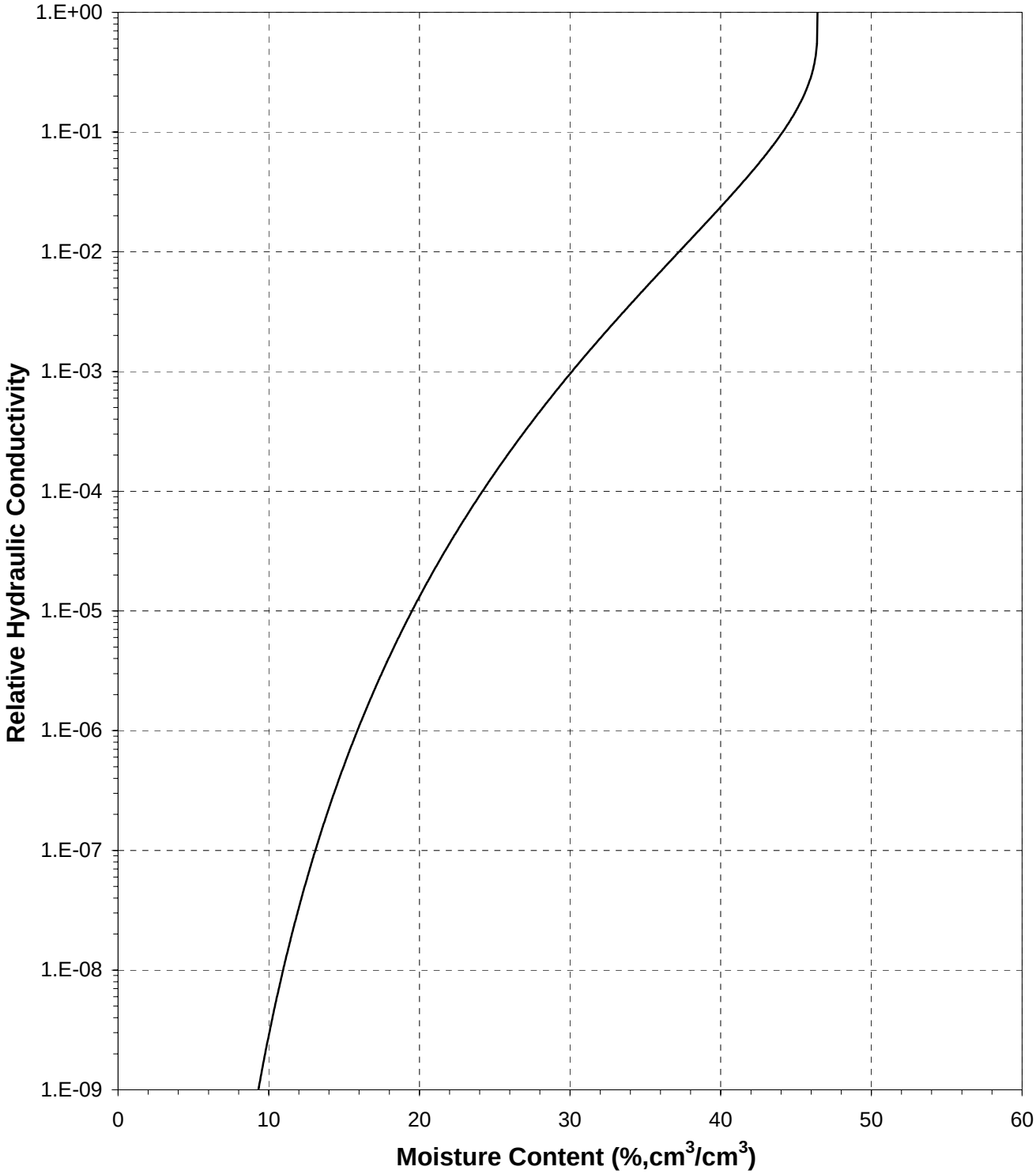
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (444-445)



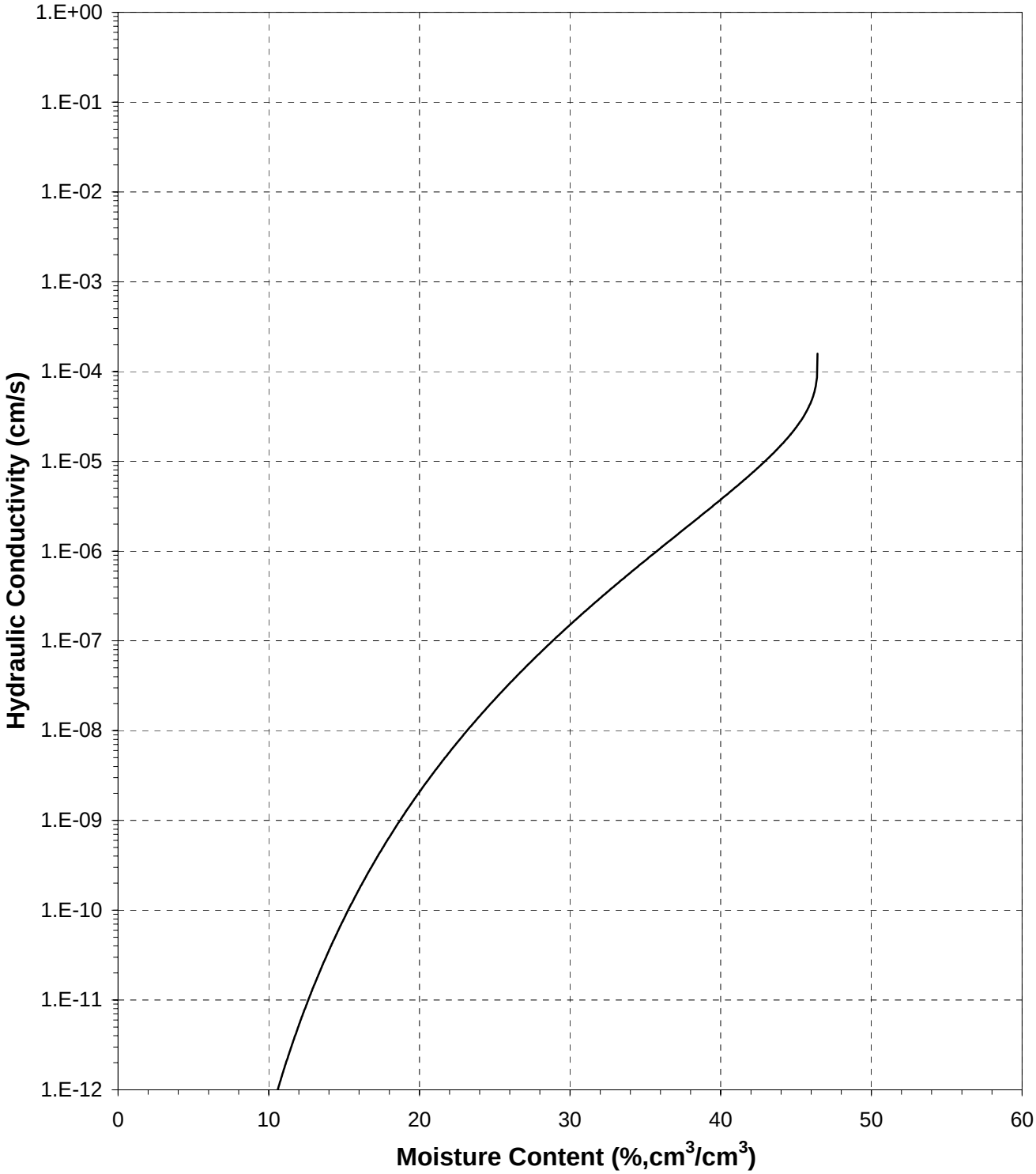
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (444-445)



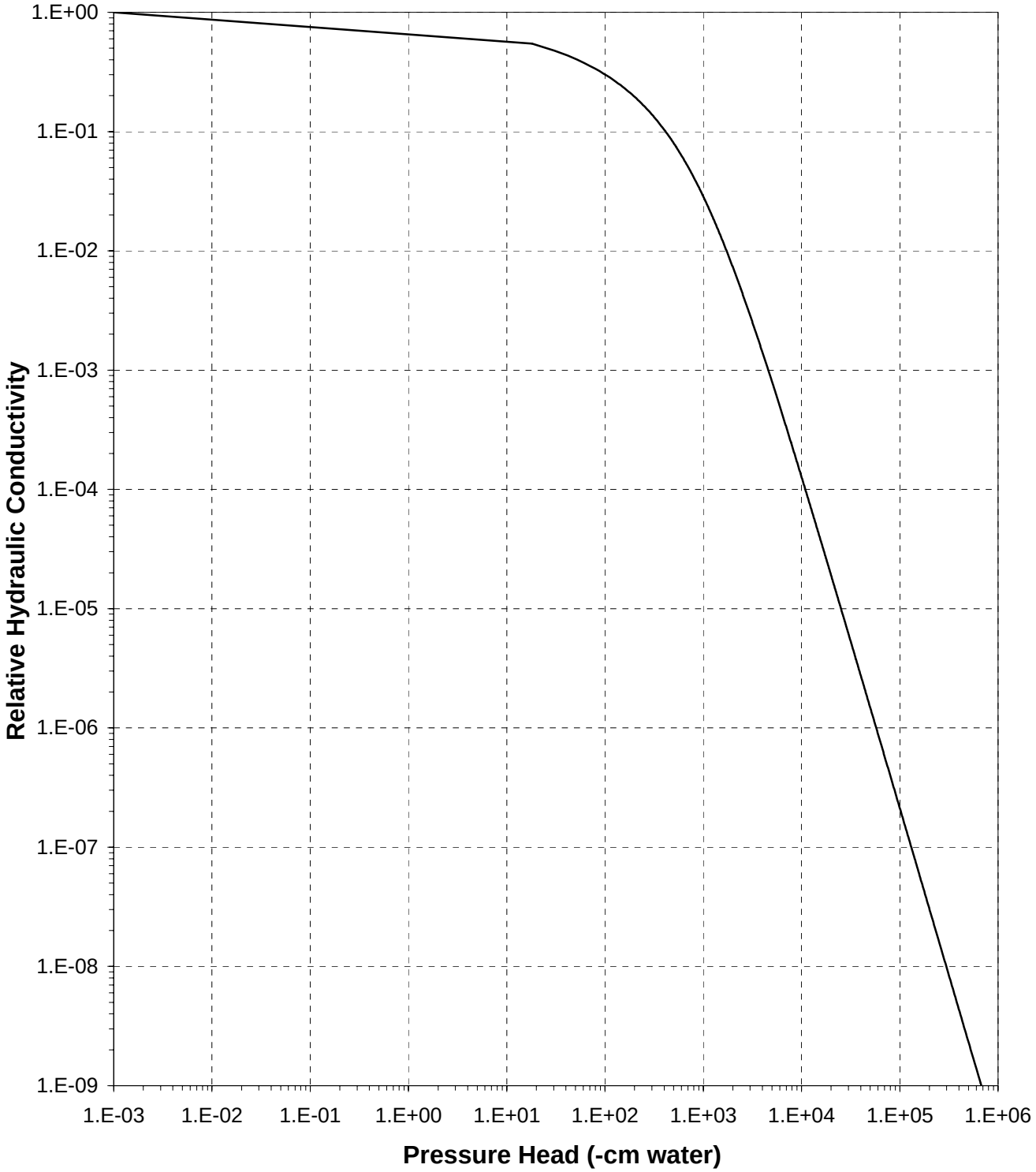
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (444-445)



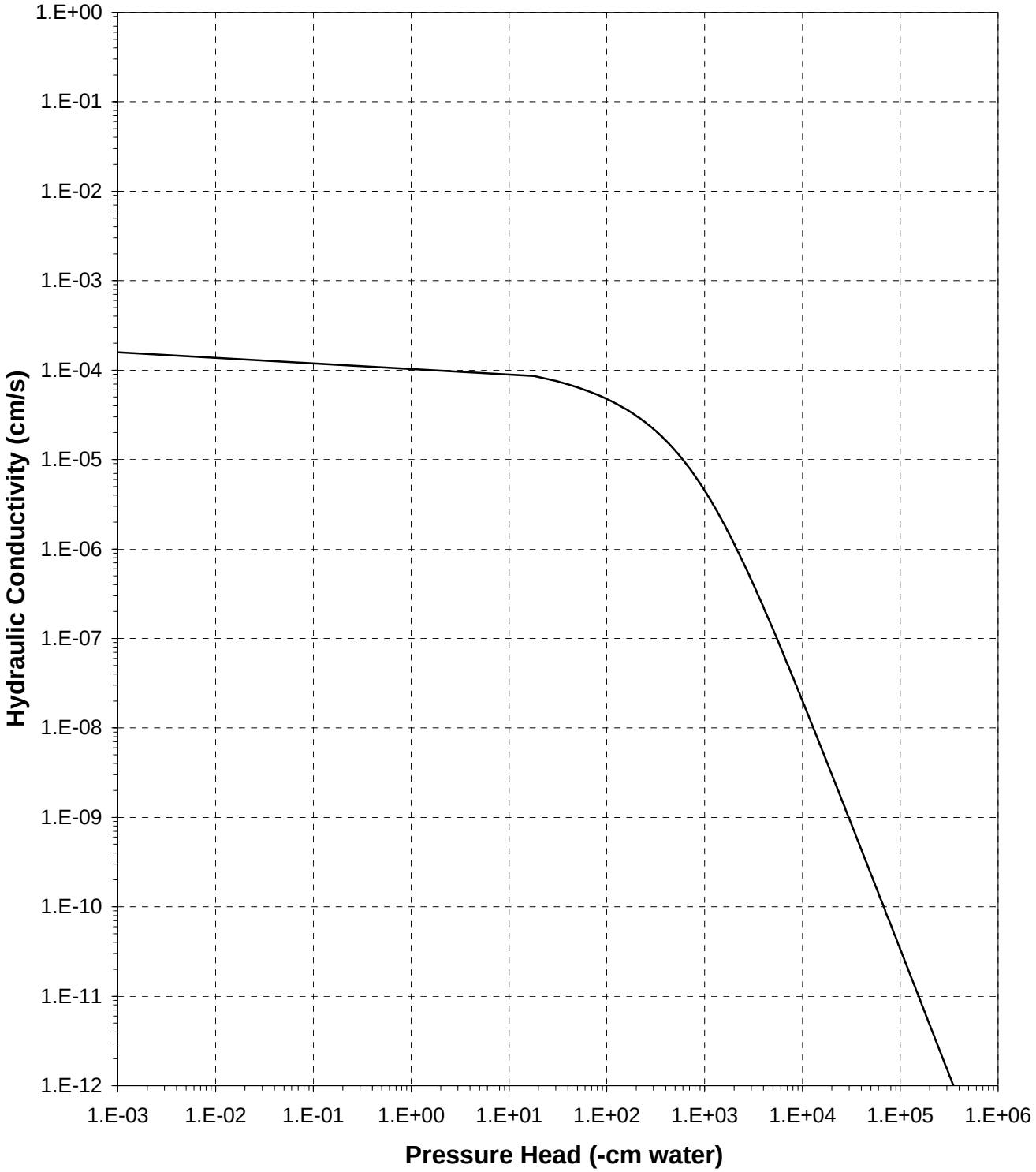
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (444-445)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (444-445)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (499-500)
Date Sampled: 12/7/2011
Depth: 499-500

Dry wt. of sample (g): 99.46
Tare wt., ring (g): 40.05
Tare wt., screen & clamp (g): 28.00
Initial sample volume (cm^3): 66.48
Initial dry bulk density (g/cm^3): 1.50
Measured particle density (g/cm^3): 2.70
Initial calculated total porosity (%): 44.57

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	23-Jan-12	14:20	197.14	0	44.57
	30-Jan-12	13:20	196.94	20.0	44.27
	6-Feb-12	9:25	196.62	69.0	43.79
	13-Feb-12	10:50	196.26	155.0	43.25
Pressure plate:	23-Feb-12	11:00	196.01	337	42.87

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	20.0	---	---	---	---
	69.0	---	---	---	---
	155.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (499-500)

Initial sample bulk density (g/cm^3)*:* 1.50
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 152.35
Tare weight, jar (g)*:* 118.12

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	13-Mar-12	10:22	156.96	13563	20.16
	12-Mar-12	16:02	155.50	45381	13.77
	12-Mar-12	14:14	155.26	59556	12.72

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	13563	---	---	---	---
	45381	---	---	---	---
	59556	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 69.70
Tare weight (g)*:* 39.42

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	10-Apr-12	8:25	71.24	855592	7.62

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

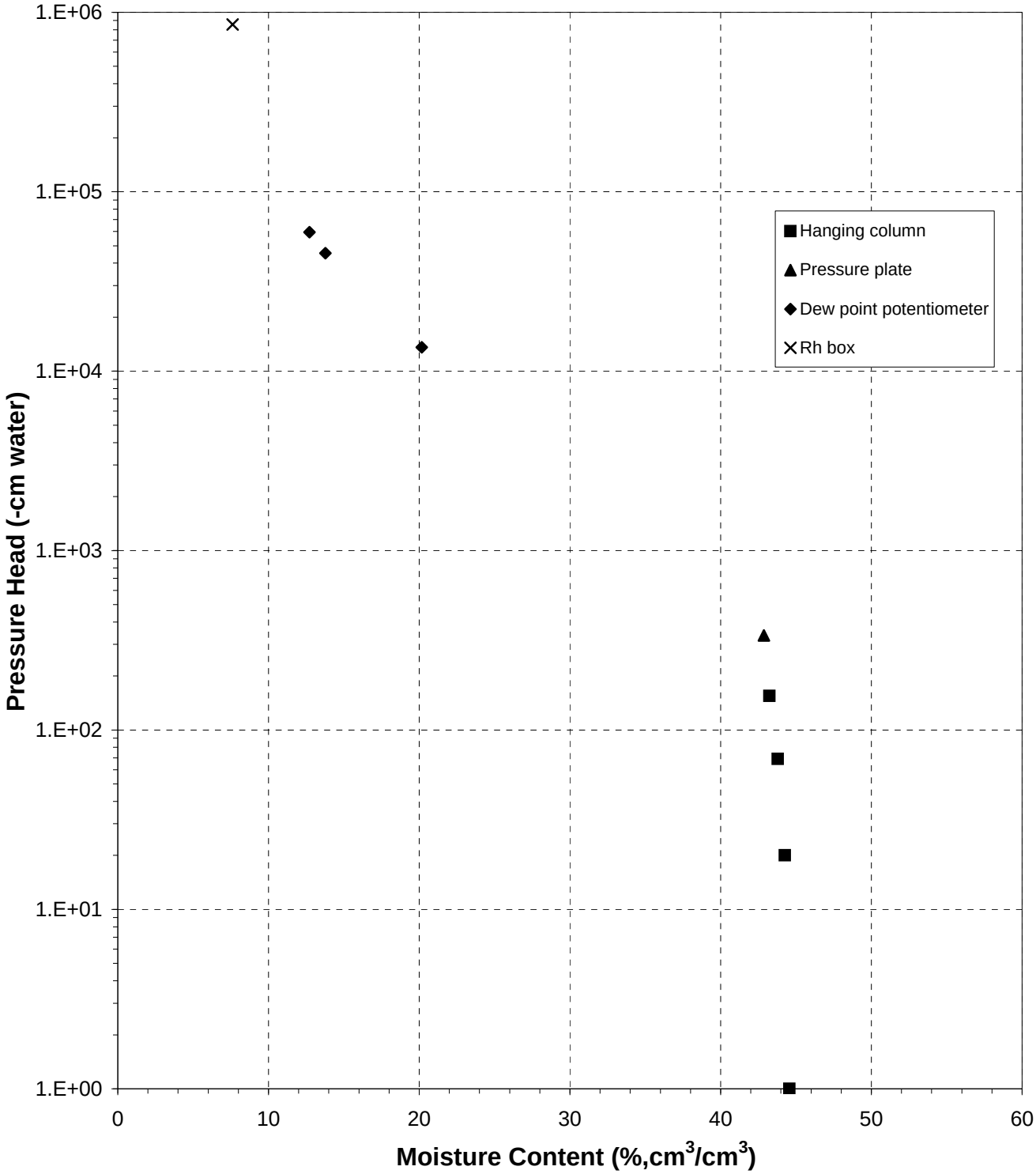
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

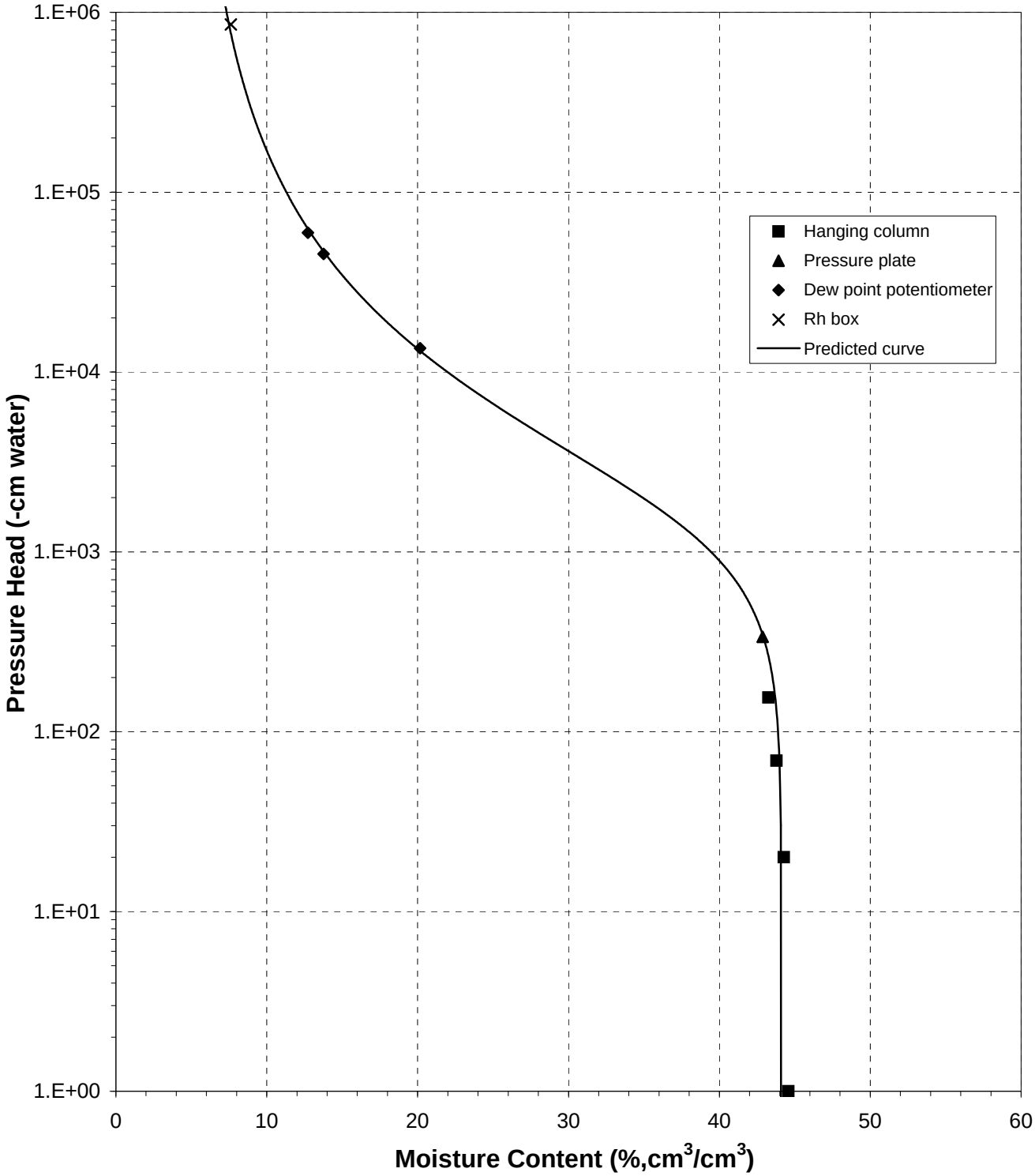
Water Retention Data Points

Sample Number: PB-13 (499-500)



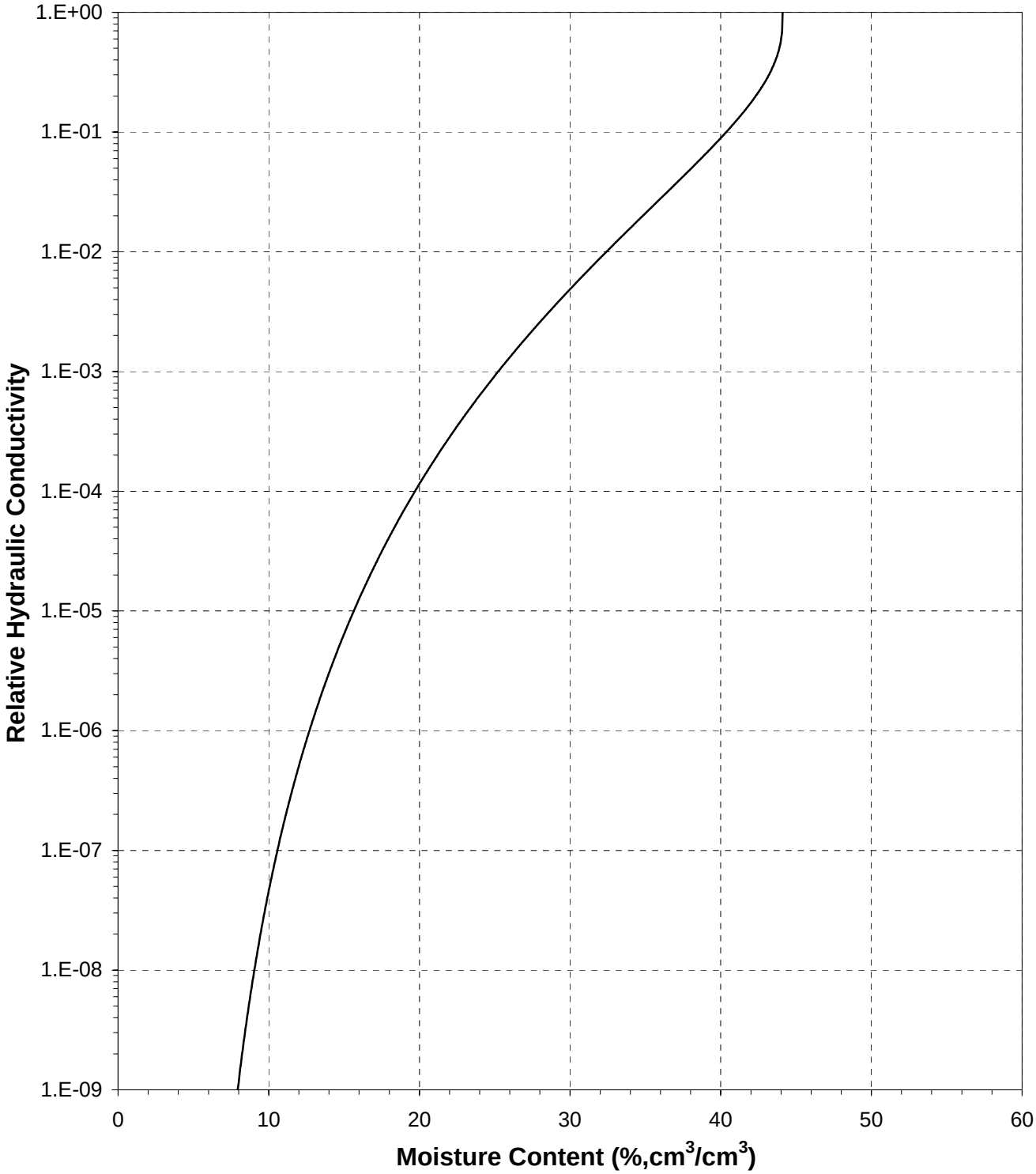
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (499-500)



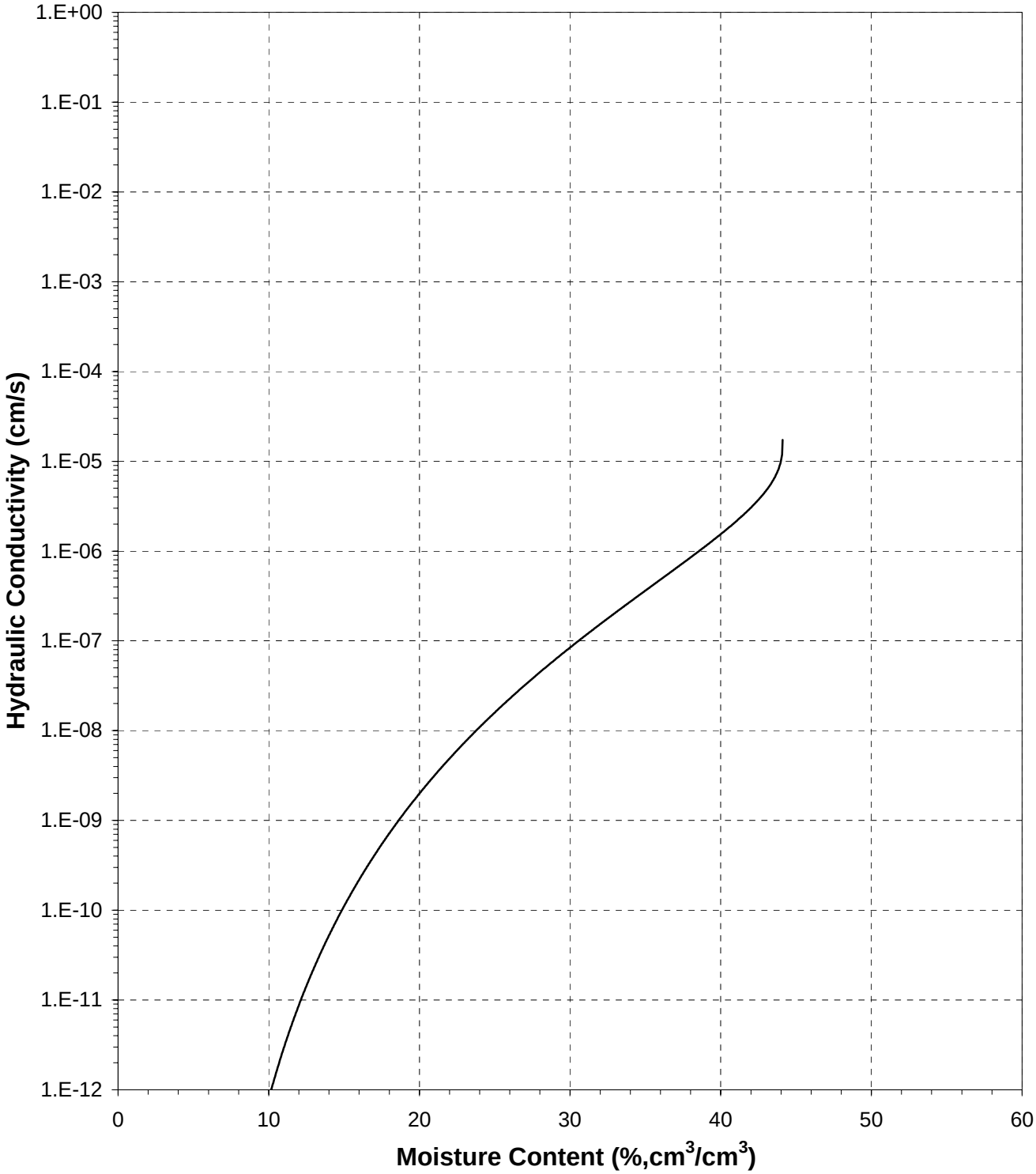
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (499-500)



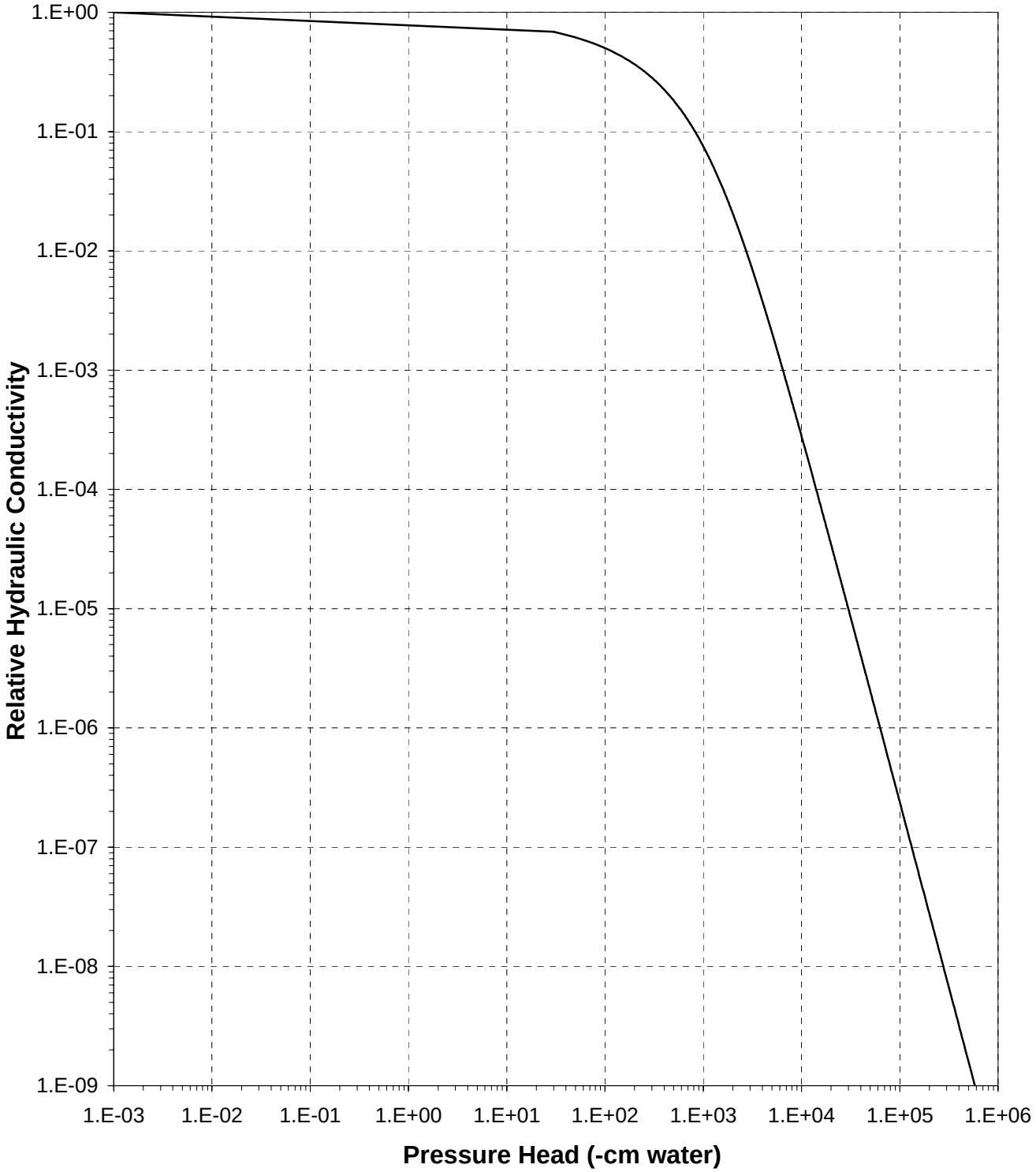
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (499-500)



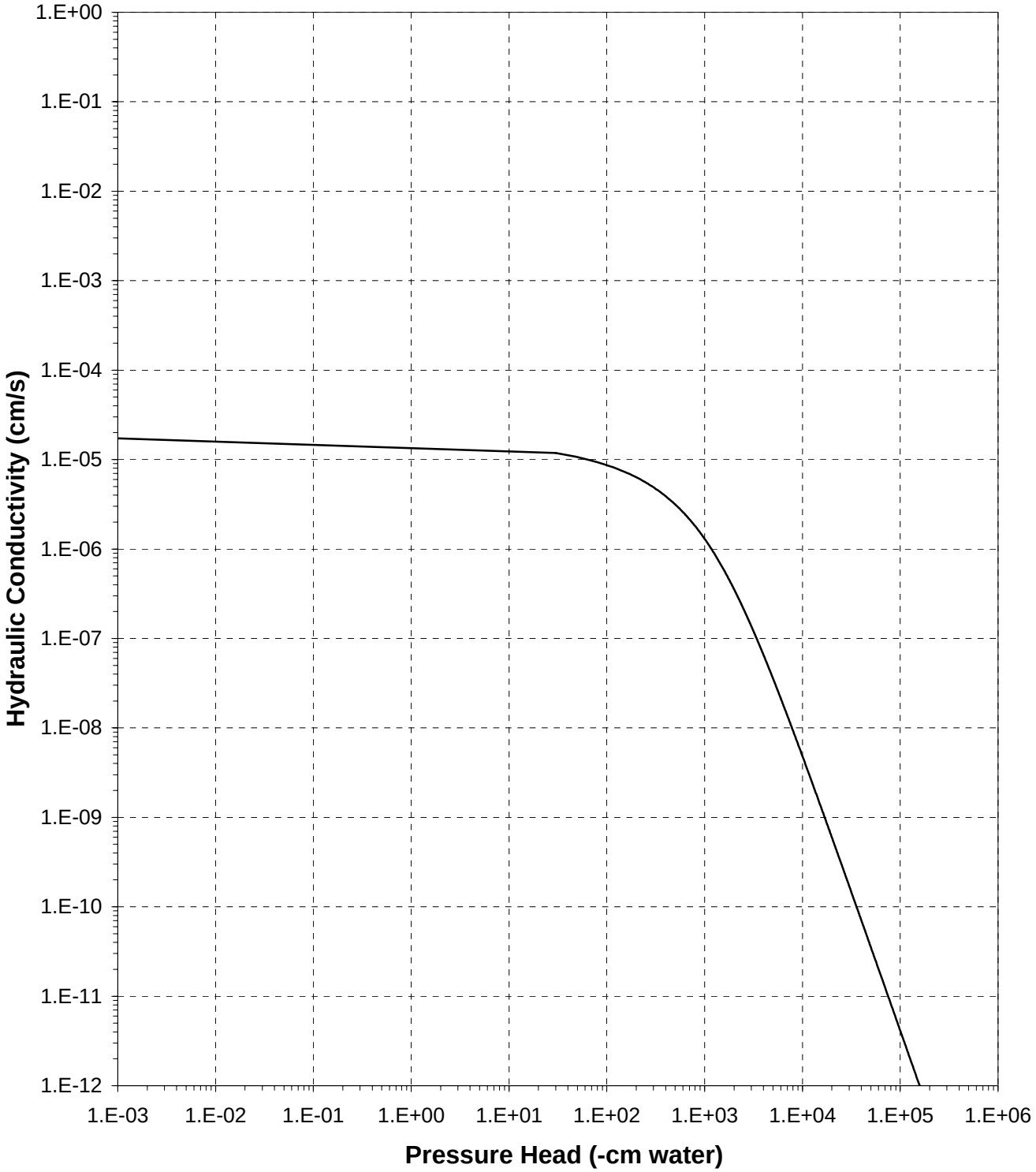
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (499-500)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (499-500)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (534-535)
Date Sampled: 12/7/2011
Depth: 534-535

Dry wt. of sample (g): 92.51
Tare wt., ring (g): 37.69
Tare wt., screen & clamp (g): 24.06
Initial sample volume (cm^3): 62.04
Initial dry bulk density (g/cm^3): 1.49
Measured particle density (g/cm^3): 2.68
Initial calculated total porosity (%): 44.34

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	1-Feb-12	14:00	181.77	0	44.35
	8-Feb-12	9:15	181.80	20.0	44.39
	15-Feb-12	8:55	181.63	73.0	44.12
	22-Feb-12	11:15	180.34	153.0	42.04
Pressure plate:	5-Mar-12	8:20	180.09	337	41.64

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	20.0	---	---	---	---
	73.0	---	---	---	---
	153.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (534-535)

Initial sample bulk density (g/cm^3)*:* 1.49
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 146.54
Tare weight, jar (g)*:* 118.40

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	12-Mar-12	16:11	150.02	14889	18.44
	13-Mar-12	11:43	148.98	58537	12.93
	13-Mar-12	10:40	148.07	527848	8.11

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	14889	---	---	---	---
	58537	---	---	---	---
	527848	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 80.95
Tare weight (g)*:* 41.90

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	82.85	857025	7.25

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

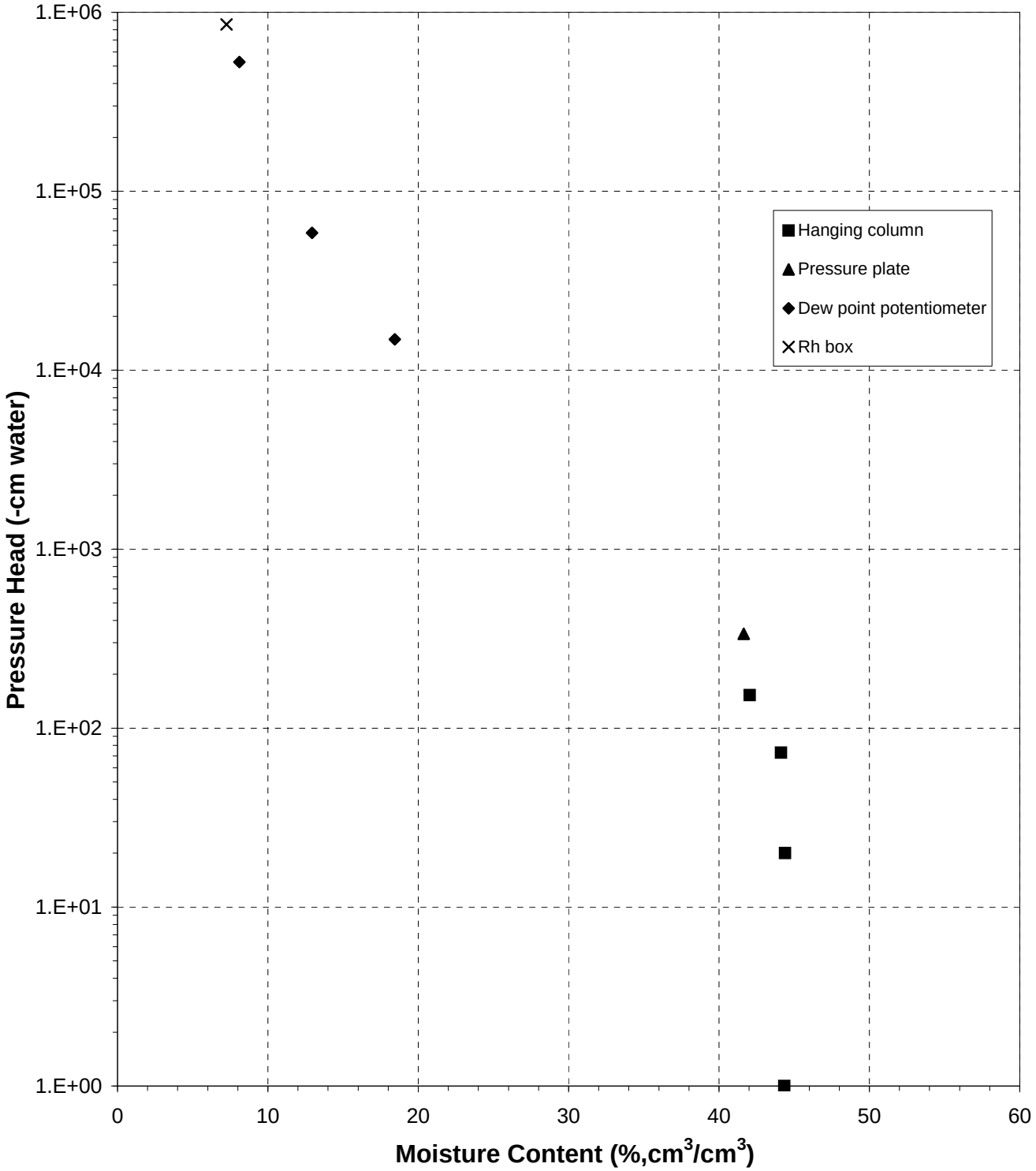
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

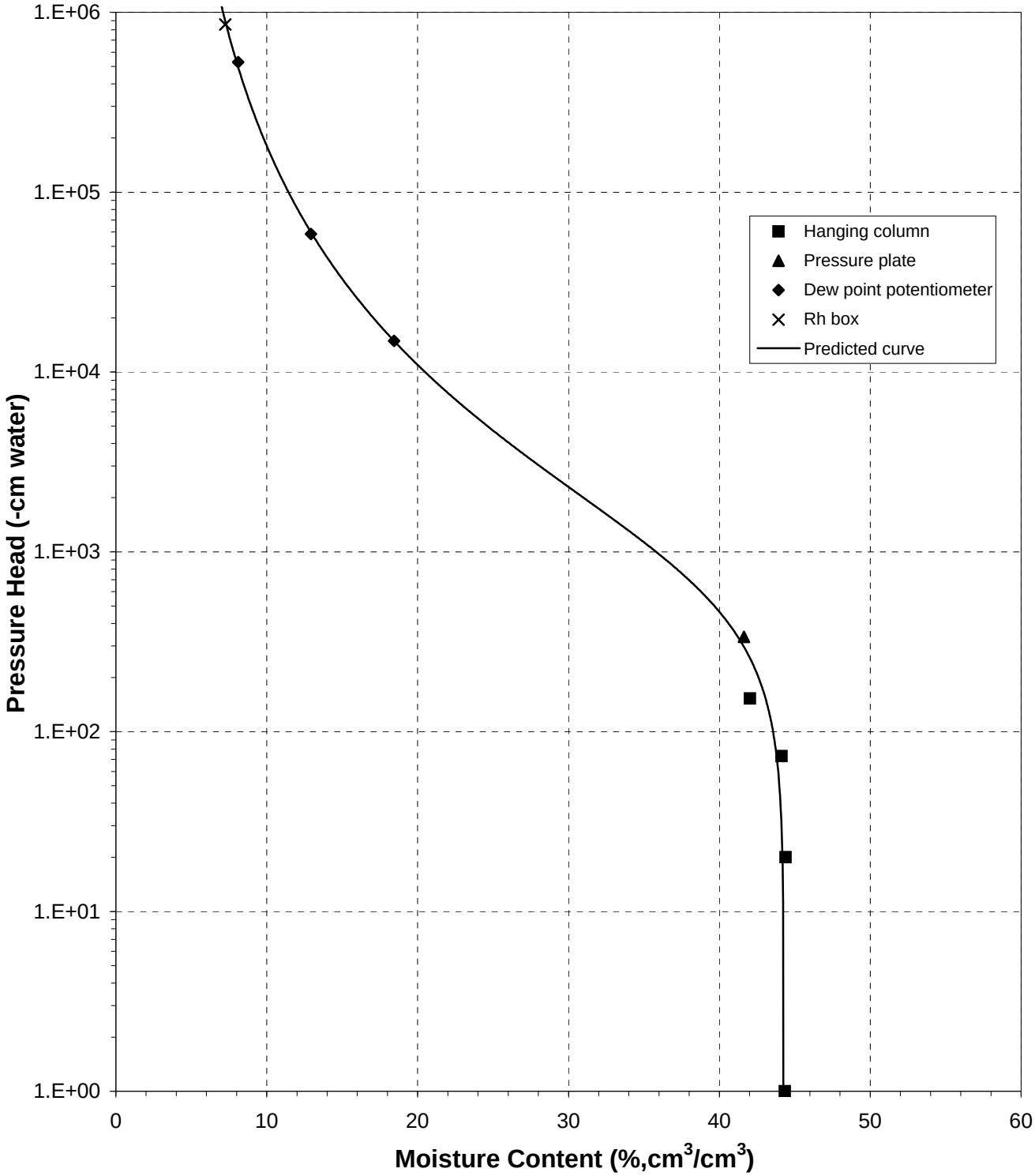
Water Retention Data Points

Sample Number: PB-13 (534-535)



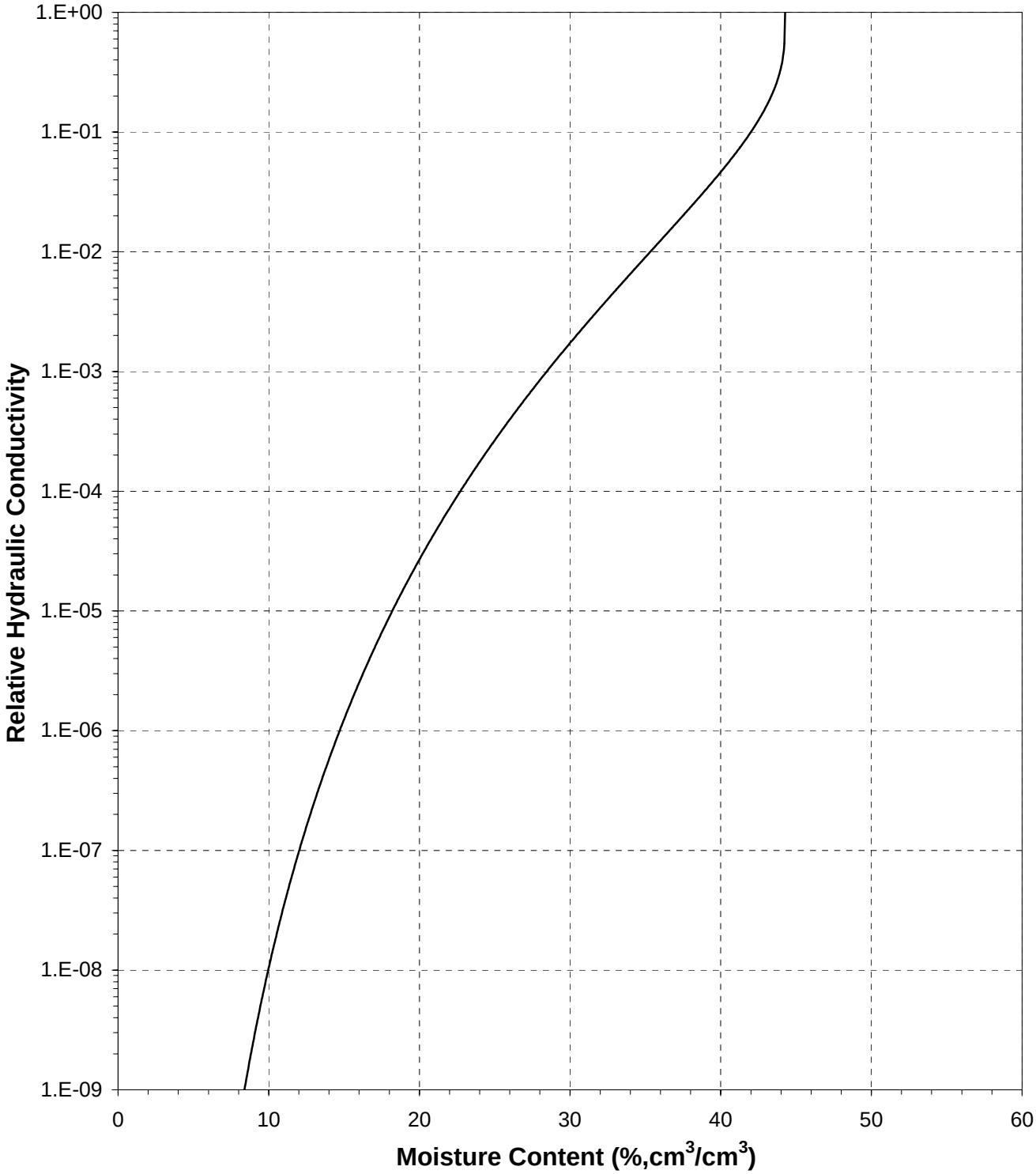
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (534-535)



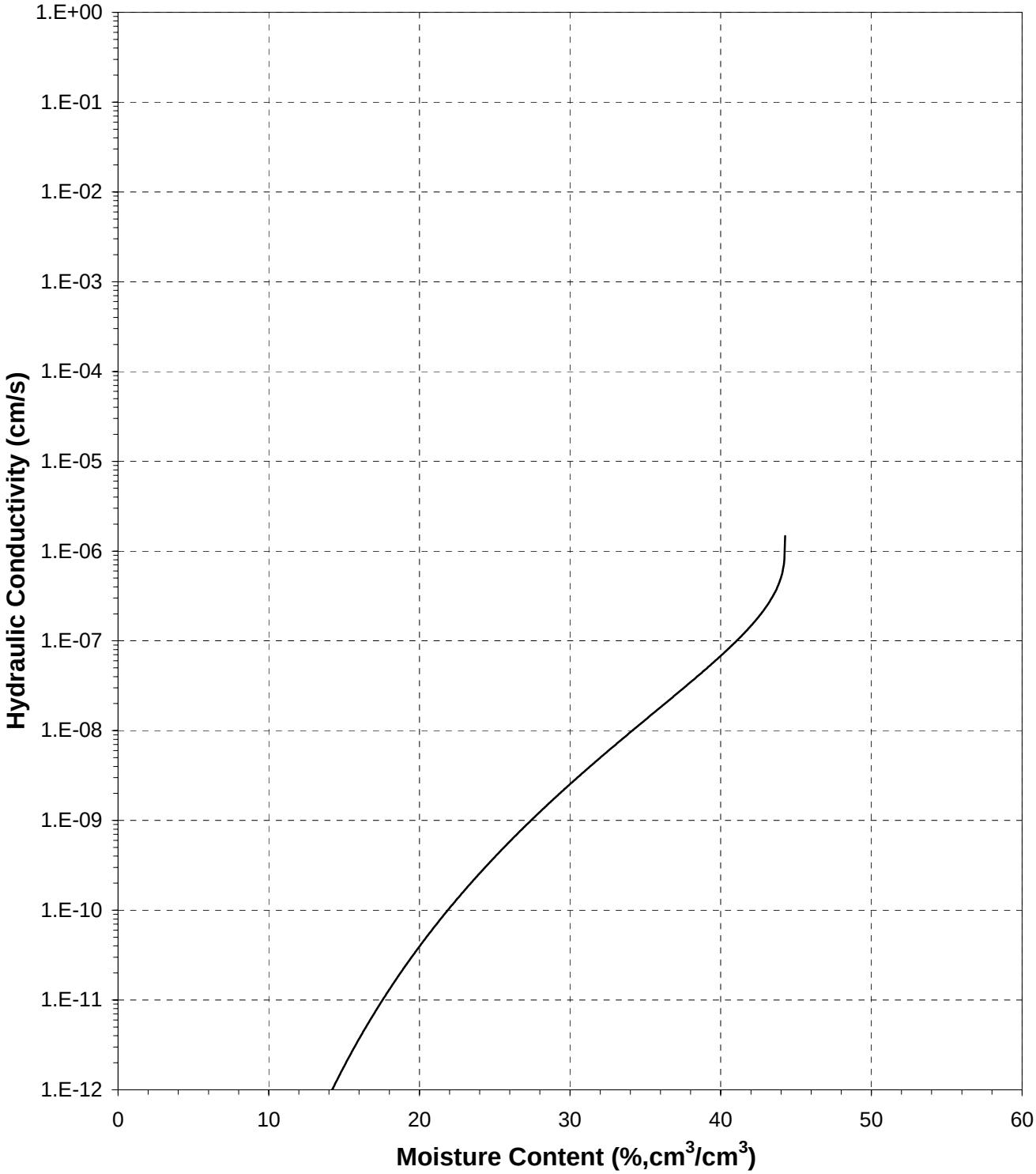
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (534-535)



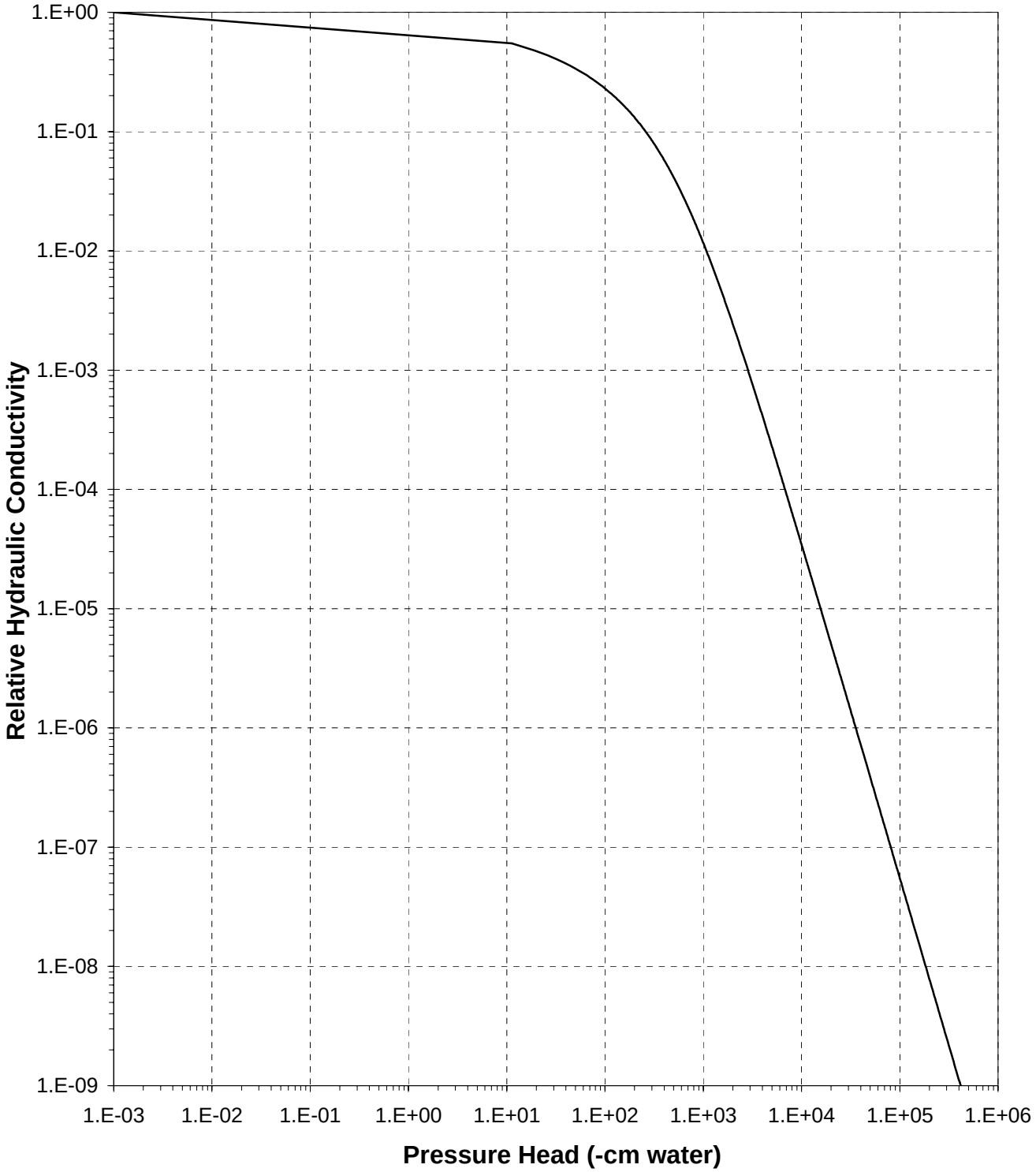
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (534-535)



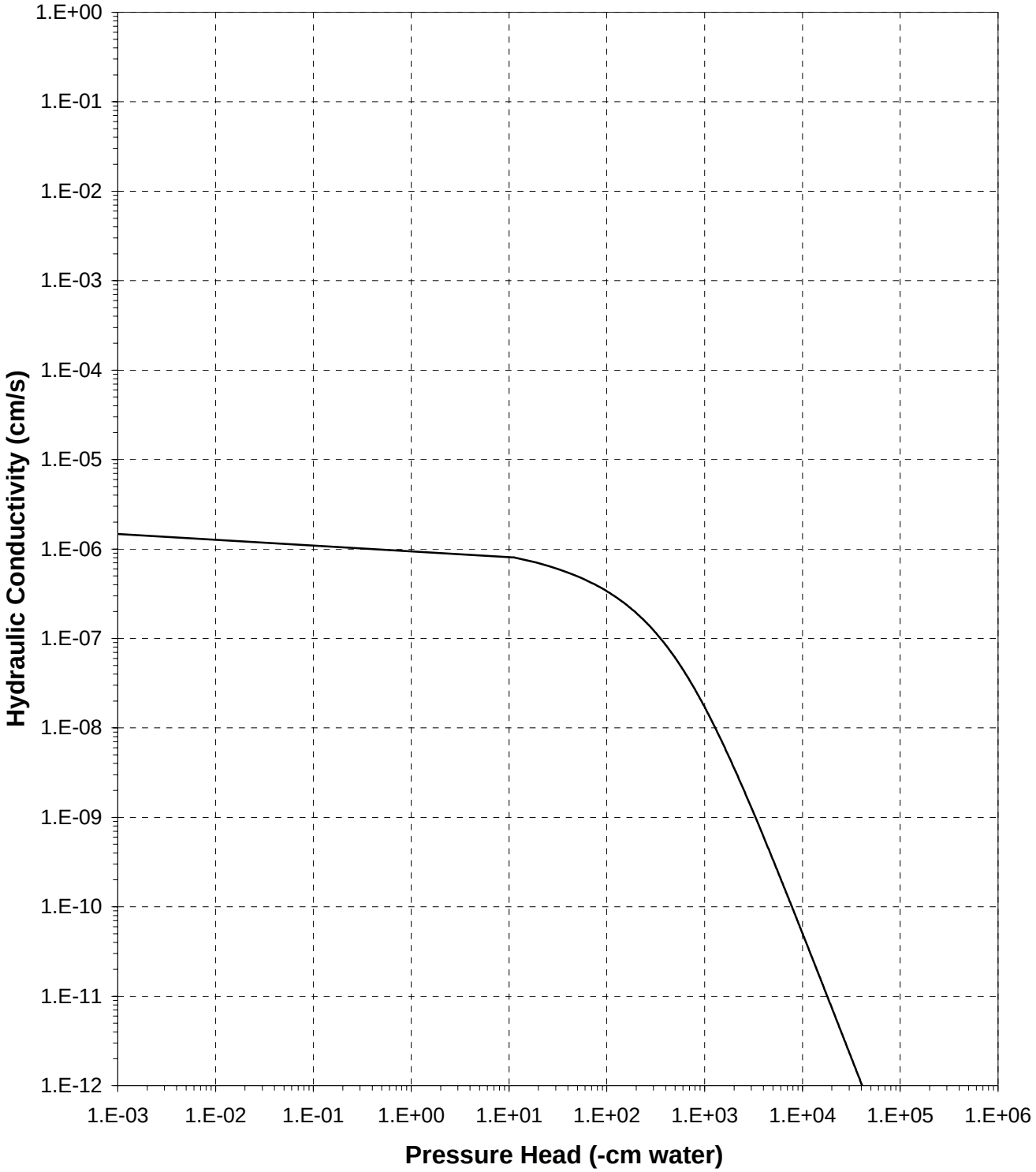
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (534-535)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (534-535)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (554-555)
Date Sampled: 12/7/2011
Depth: 554-555

Dry wt. of sample (g): 148.65
Tare wt., ring (g): 45.69
Tare wt., screen & clamp (g): 28.11
Initial sample volume (cm^3): 101.96
Initial dry bulk density (g/cm^3): 1.46
Measured particle density (g/cm^3): 2.66
Initial calculated total porosity (%): 45.17

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	23-Jan-12	14:10	268.50	0	45.16
	30-Jan-12	13:25	268.20	20.0	44.87
	6-Feb-12	9:20	267.92	69.0	44.60
	13-Feb-12	11:00	266.79	155.0	43.49
Pressure plate:	23-Feb-12	10:15	265.56	337	42.28

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	20.0	---	---	---	---
	69.0	---	---	---	---
	155.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (554-555)

Initial sample bulk density (g/cm^3)*:* 1.46
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 144.88
Tare weight, jar (g)*:* 117.02

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	4-Apr-12	10:25	148.62	18152	19.57
	3-Apr-12	14:05	147.65	45993	14.50
	2-Apr-12	16:22	147.12	148993	11.72

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	18152	---	---	---	---
	45993	---	---	---	---
	148993	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 71.46
Tare weight (g)*:* 41.39

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	2-Mar-12	8:30	73.05	854159	7.70

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

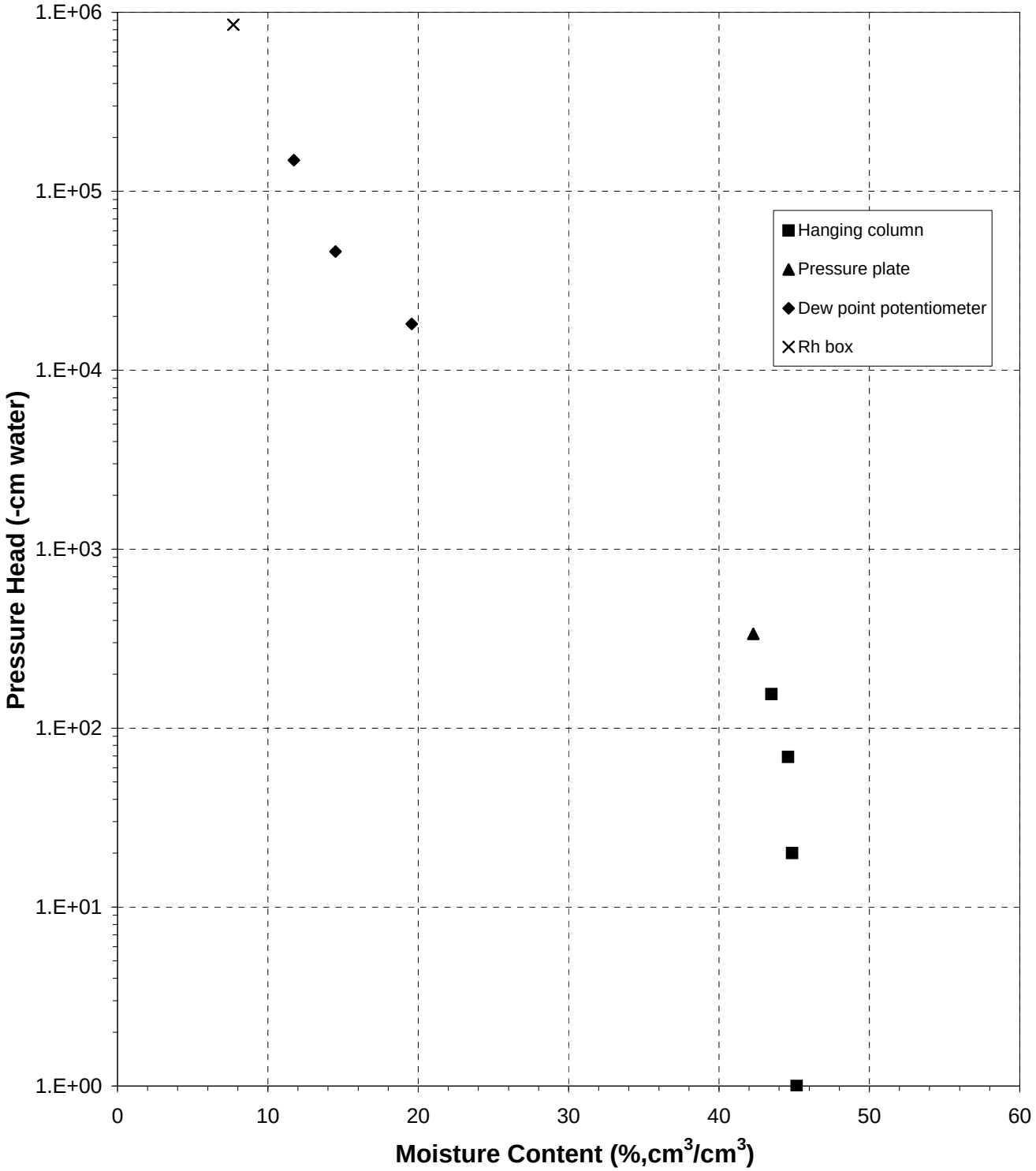
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

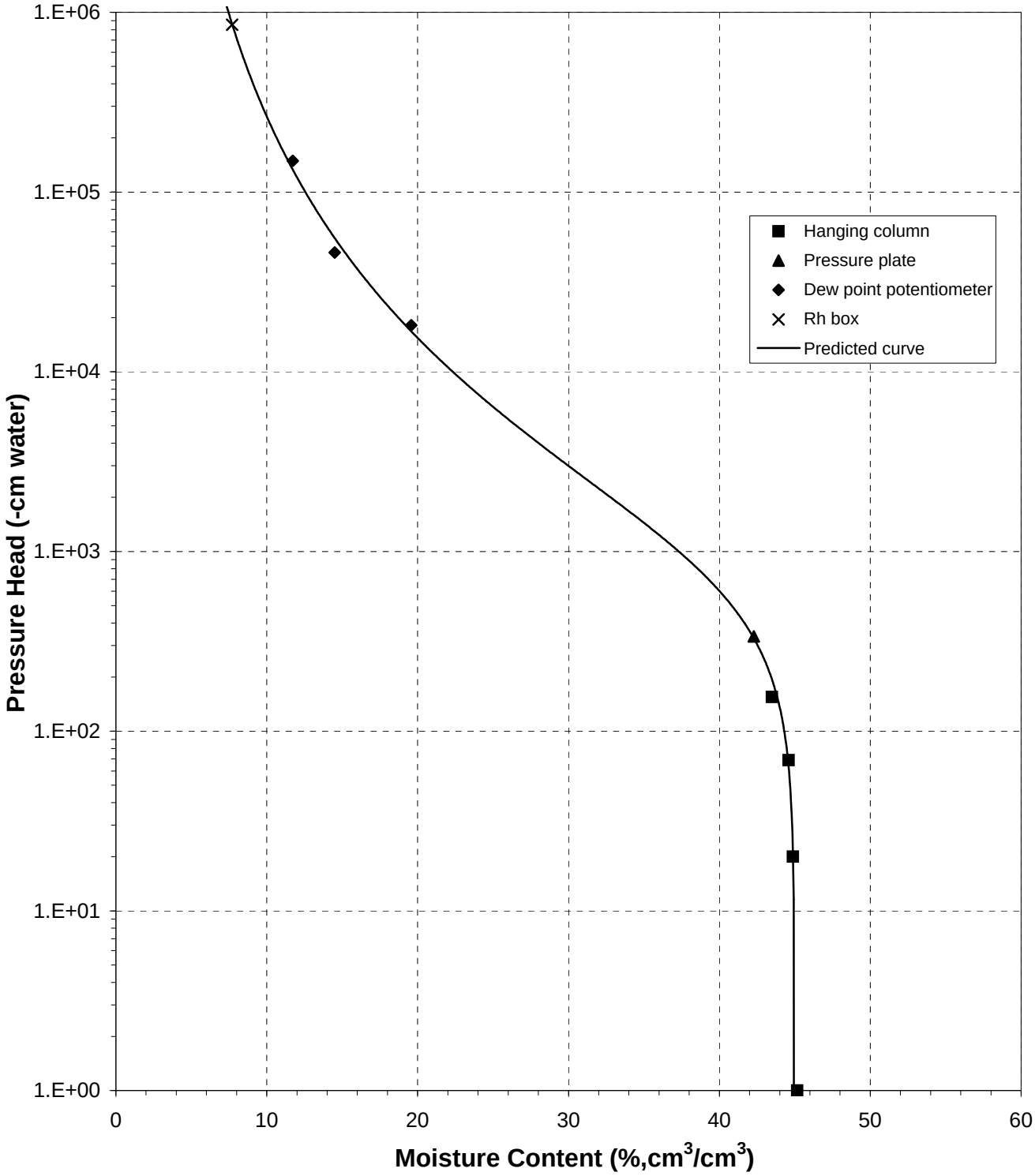
Water Retention Data Points

Sample Number: PB-13 (554-555)



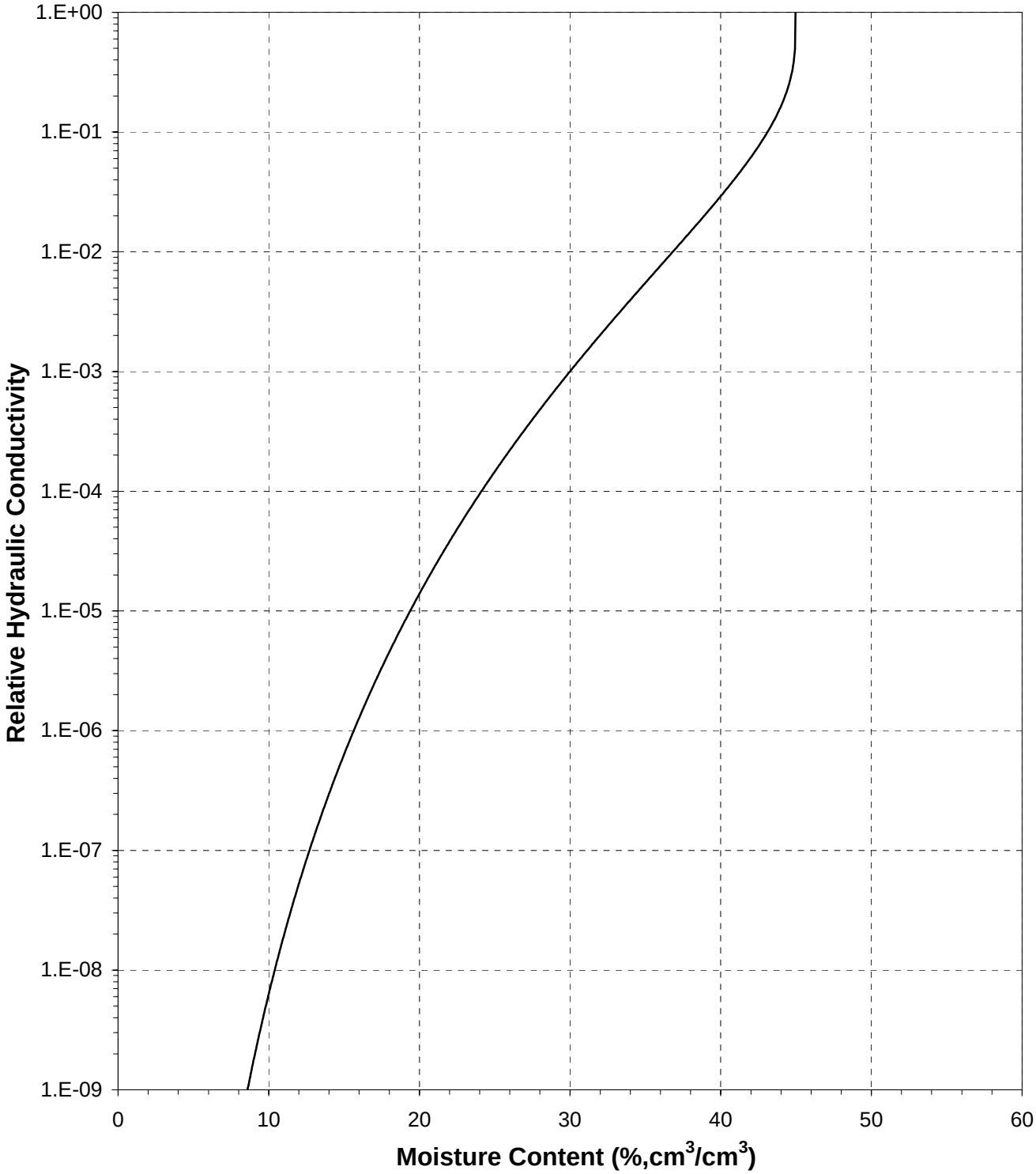
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (554-555)



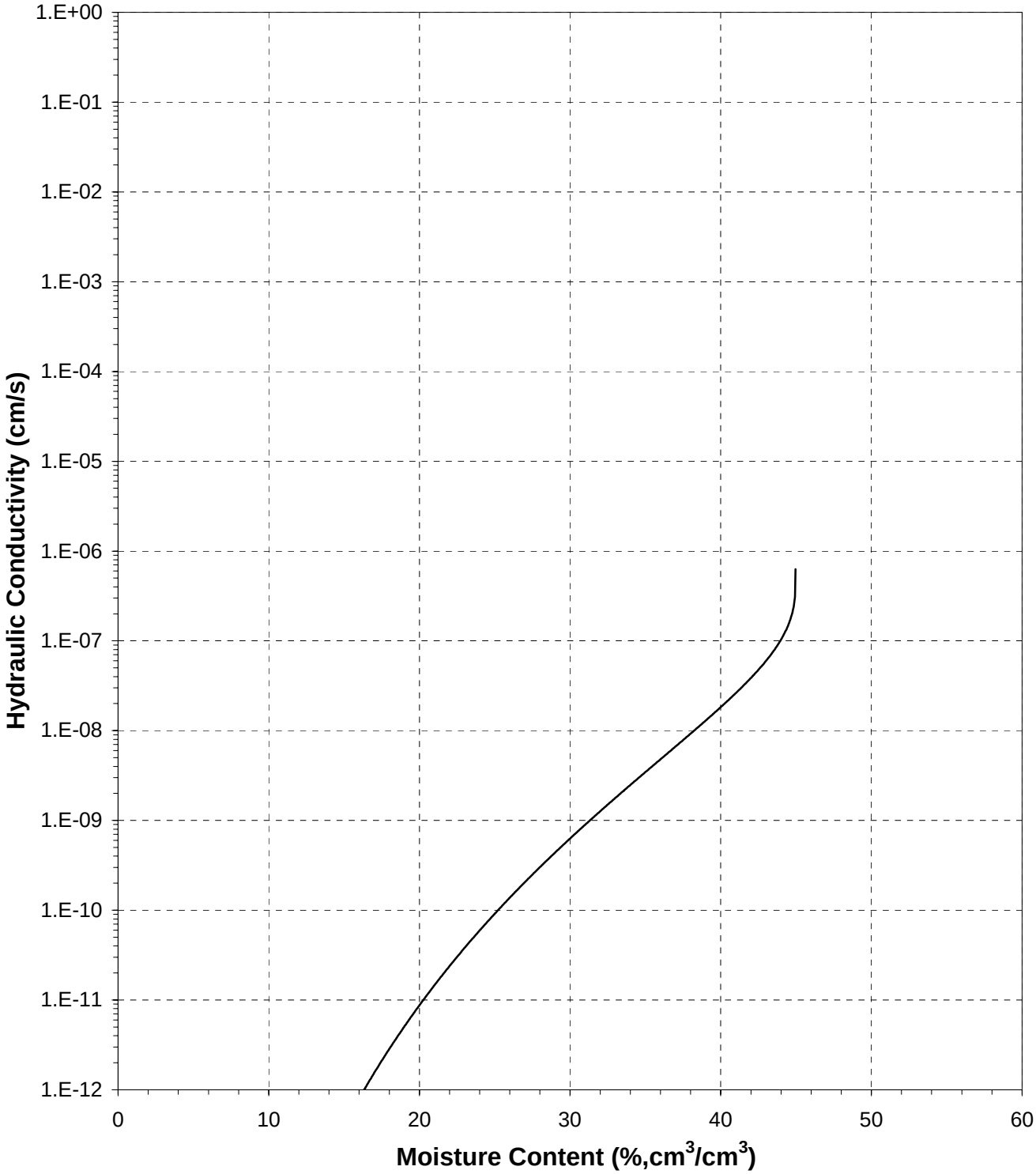
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (554-555)



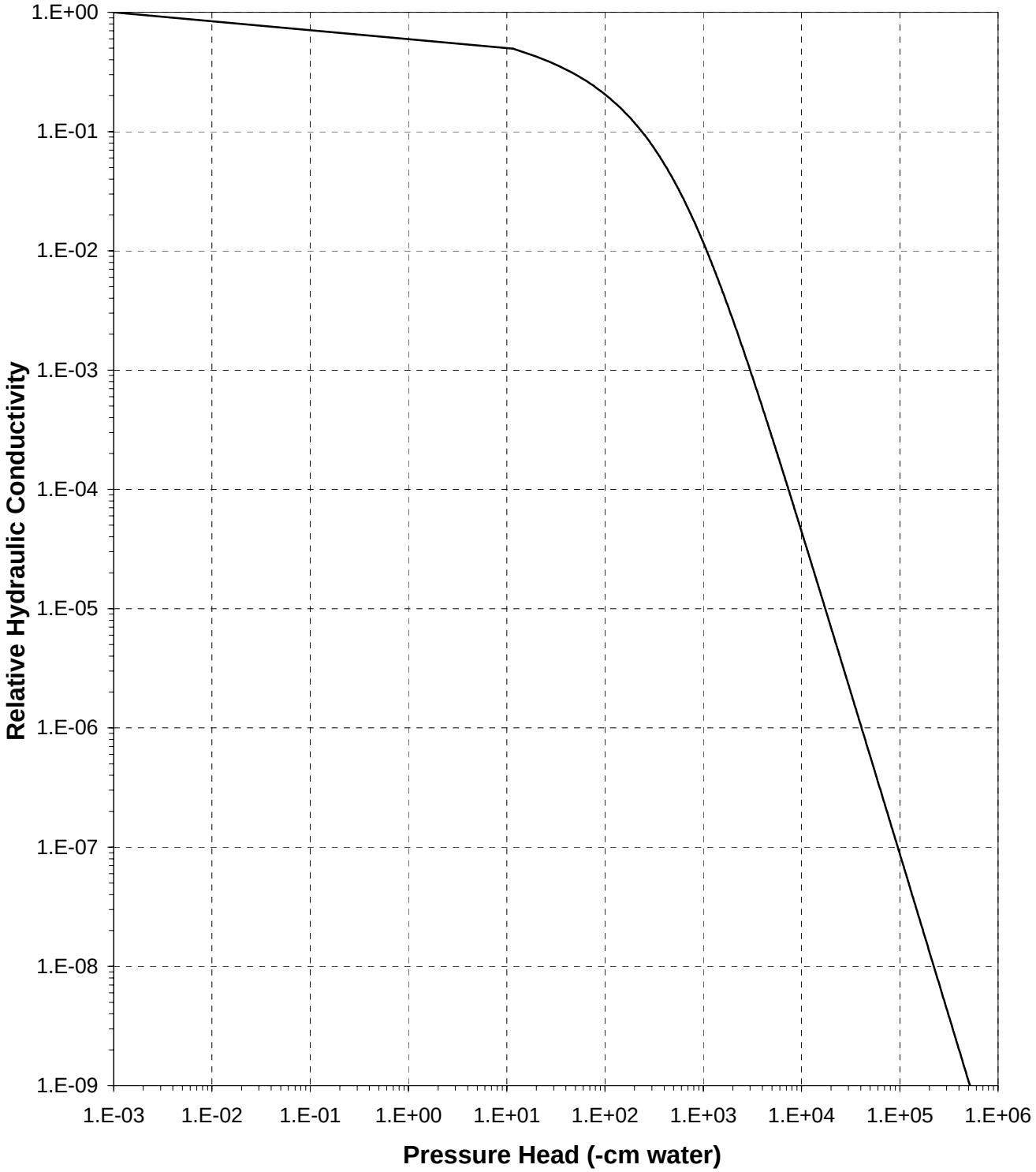
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (554-555)



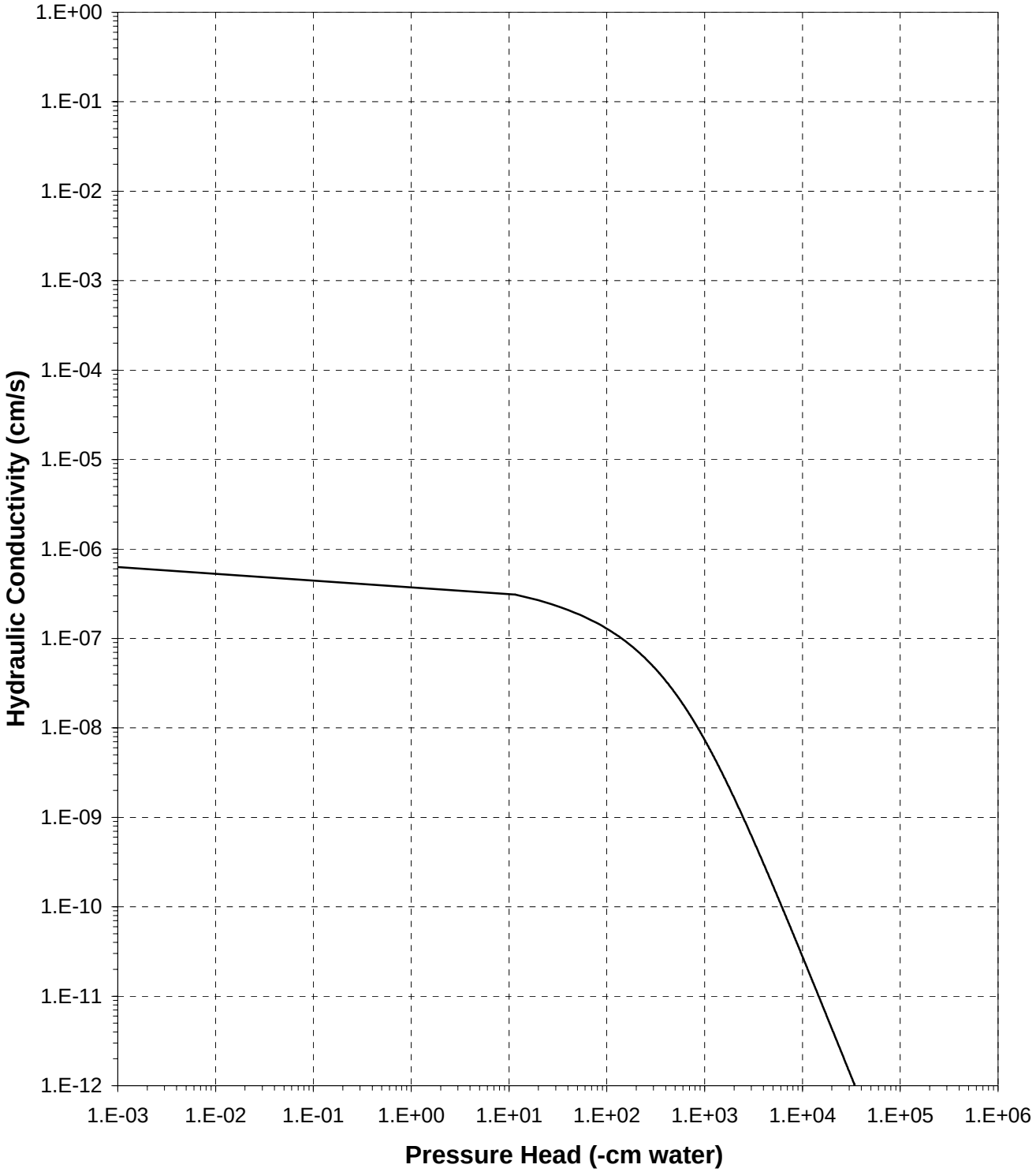
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (554-555)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (554-555)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (563-564)
Date Sampled: 12/7/2011
Depth: 563-564

Dry wt. of sample (g): 97.25
Tare wt., ring (g): 36.05
Tare wt., screen & clamp (g): 24.23
Initial sample volume (cm^3): 66.27
Initial dry bulk density (g/cm^3): 1.47
Measured particle density (g/cm^3): 2.65
Initial calculated total porosity (%): 44.60

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:00	187.09	0	44.60
	7-Feb-12	10:00	186.72	51.0	44.04
	14-Feb-12	7:55	186.66	150.0	43.95
Pressure plate:	28-Feb-12	8:30	186.51	337	43.73
	13-Mar-12	8:55	186.31	1275	43.43

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (563-564)

Initial sample bulk density (g/cm^3)*:* 1.47
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 147.84
Tare weight, jar (g)*:* 117.89

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	12-Mar-12	16:49	151.69	19886	18.86
	13-Mar-12	15:52	150.79	56803	14.45
	13-Mar-12	10:56	149.78	388952	9.51

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	19886	---	---	---	---
	56803	---	---	---	---
	388952	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 72.27
Tare weight (g)*:* 42.29

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	73.68	857025	6.89

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

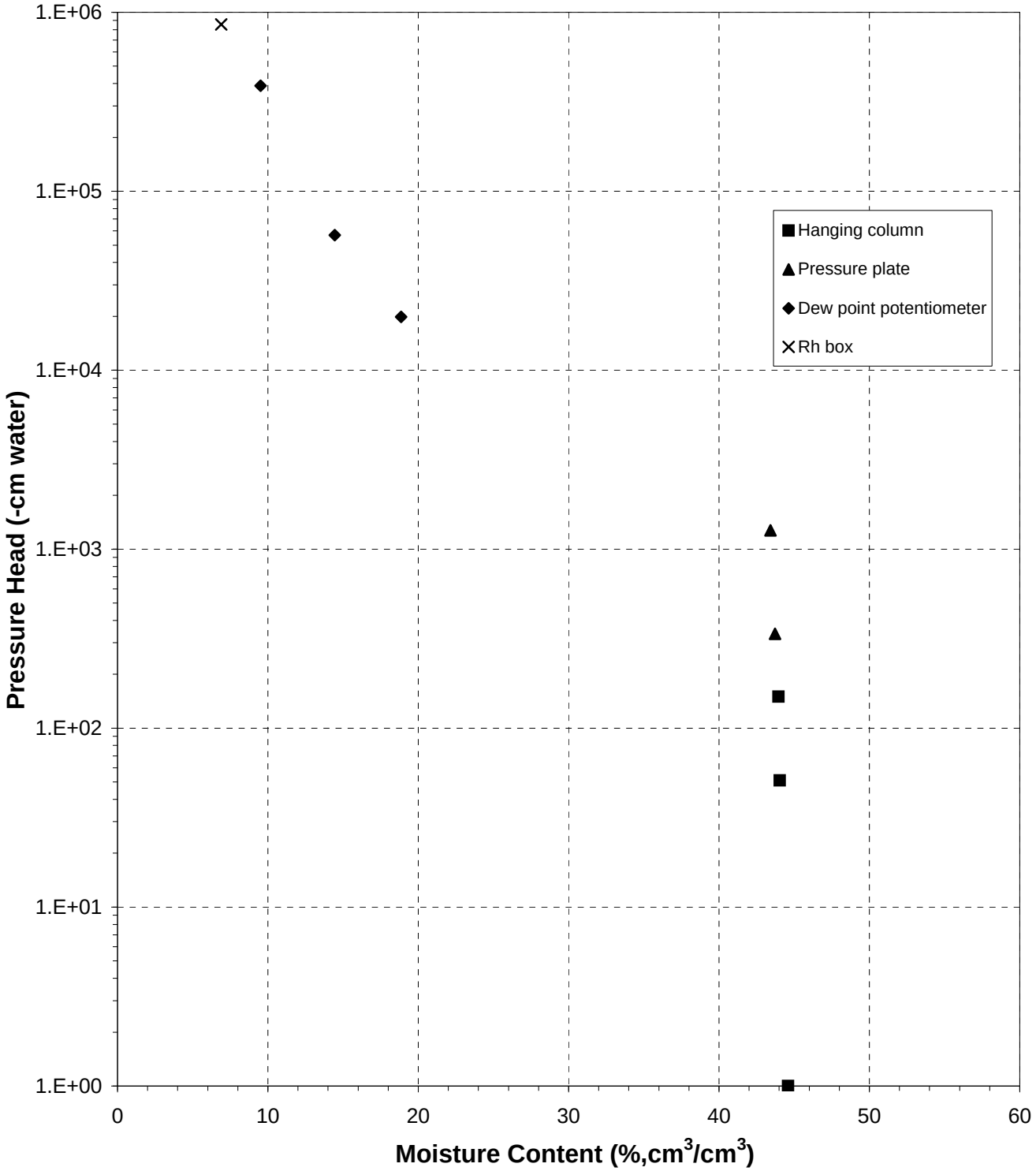
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

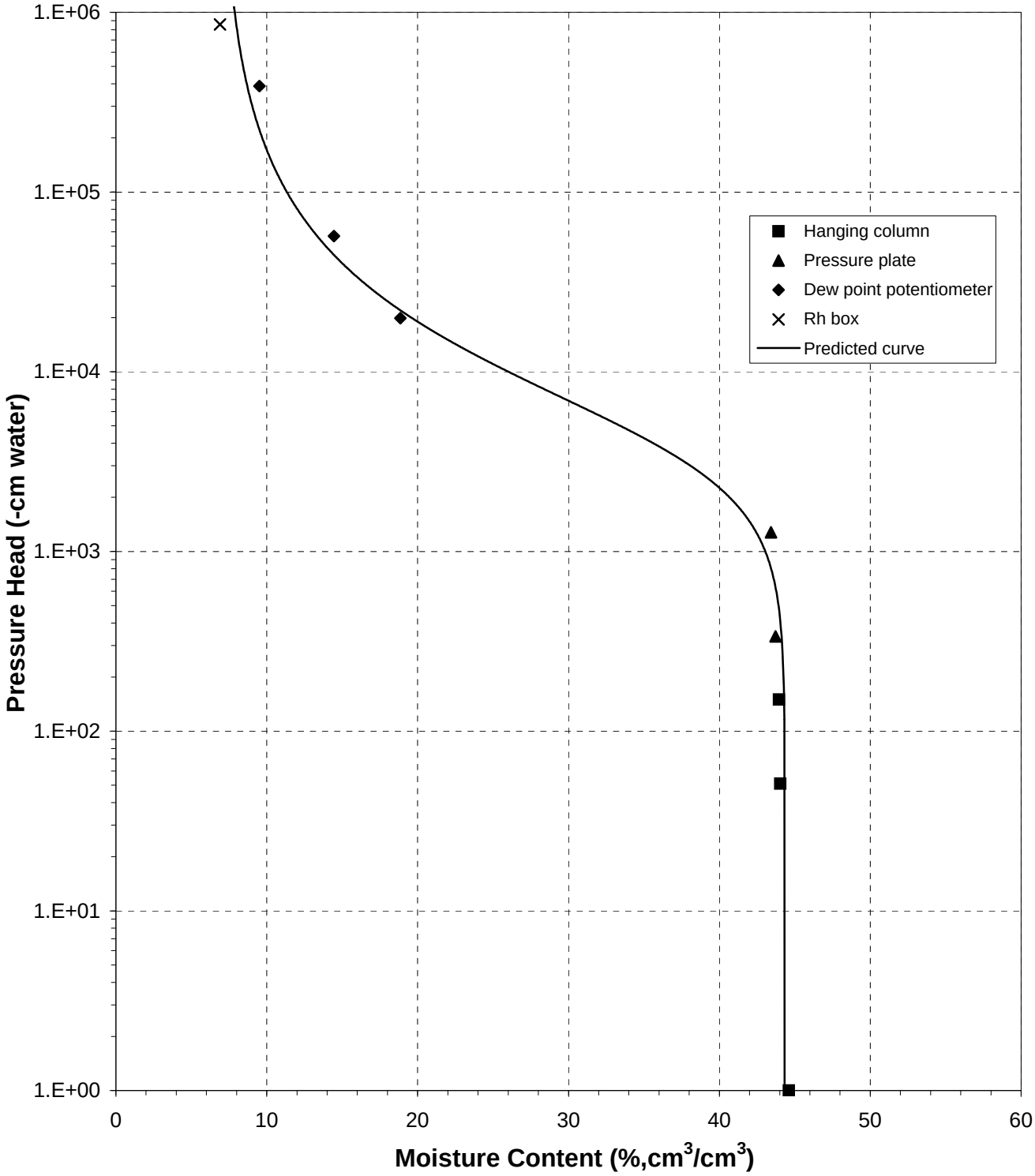
Water Retention Data Points

Sample Number: PB-13 (563-564)



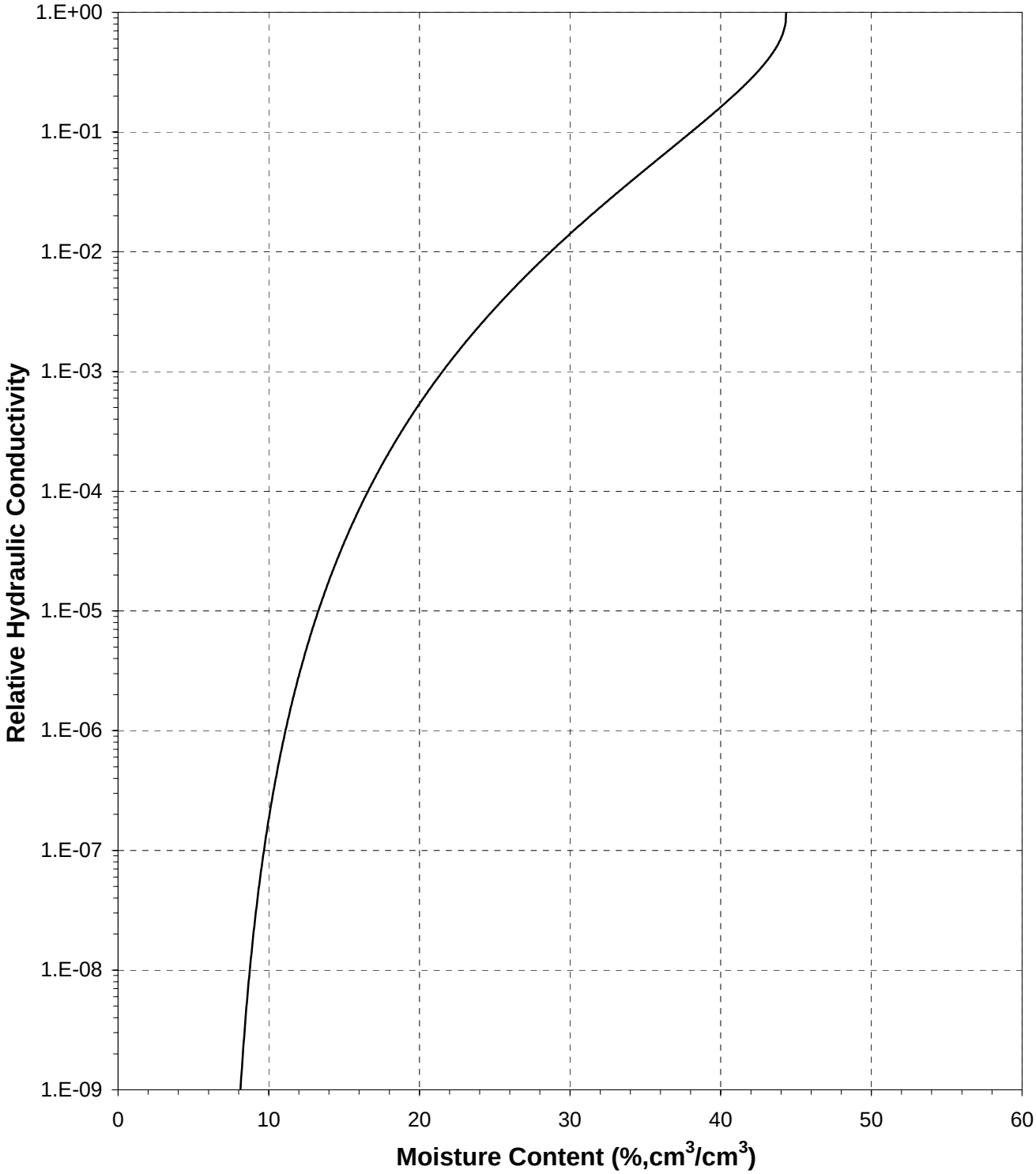
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (563-564)



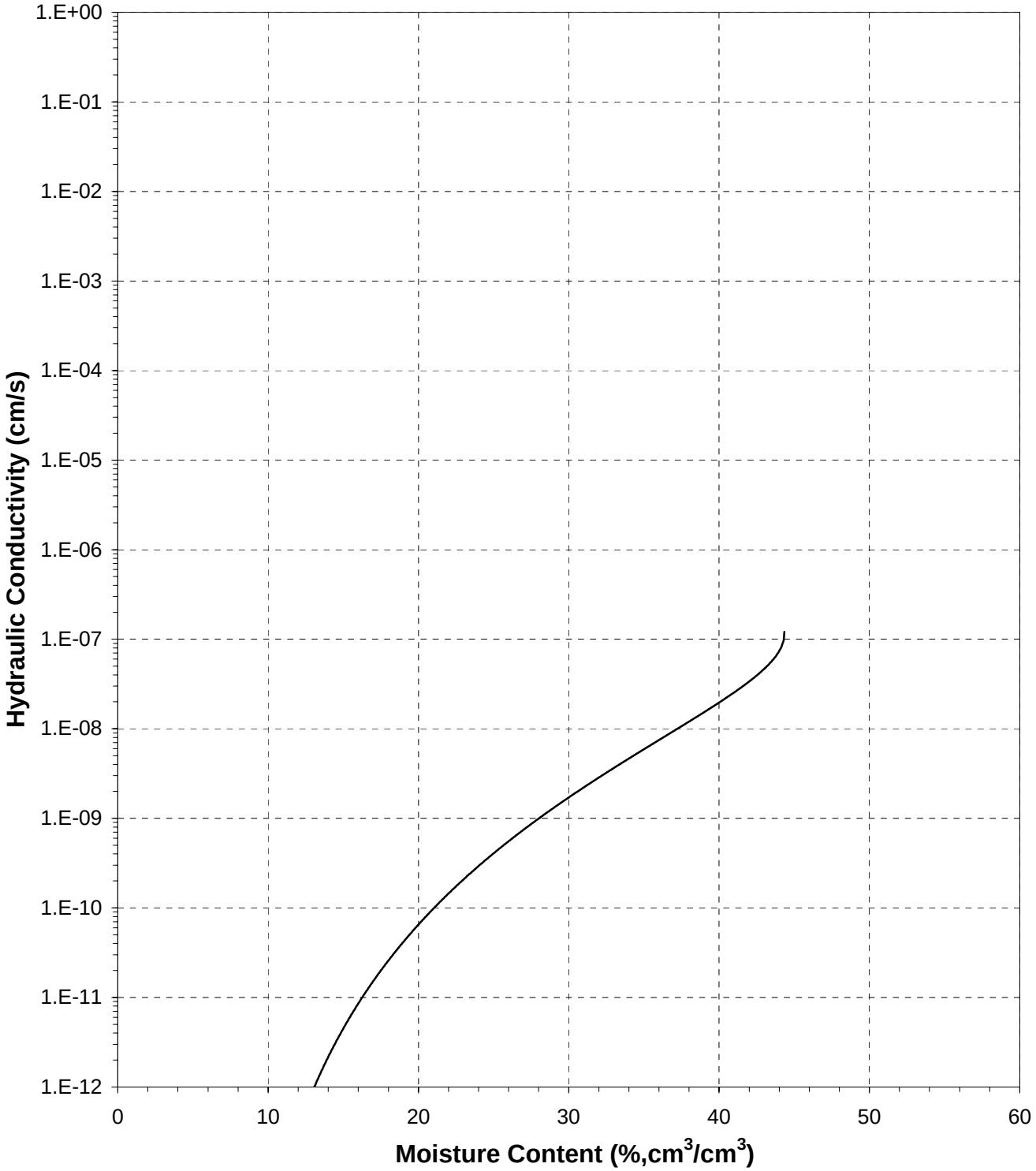
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (563-564)



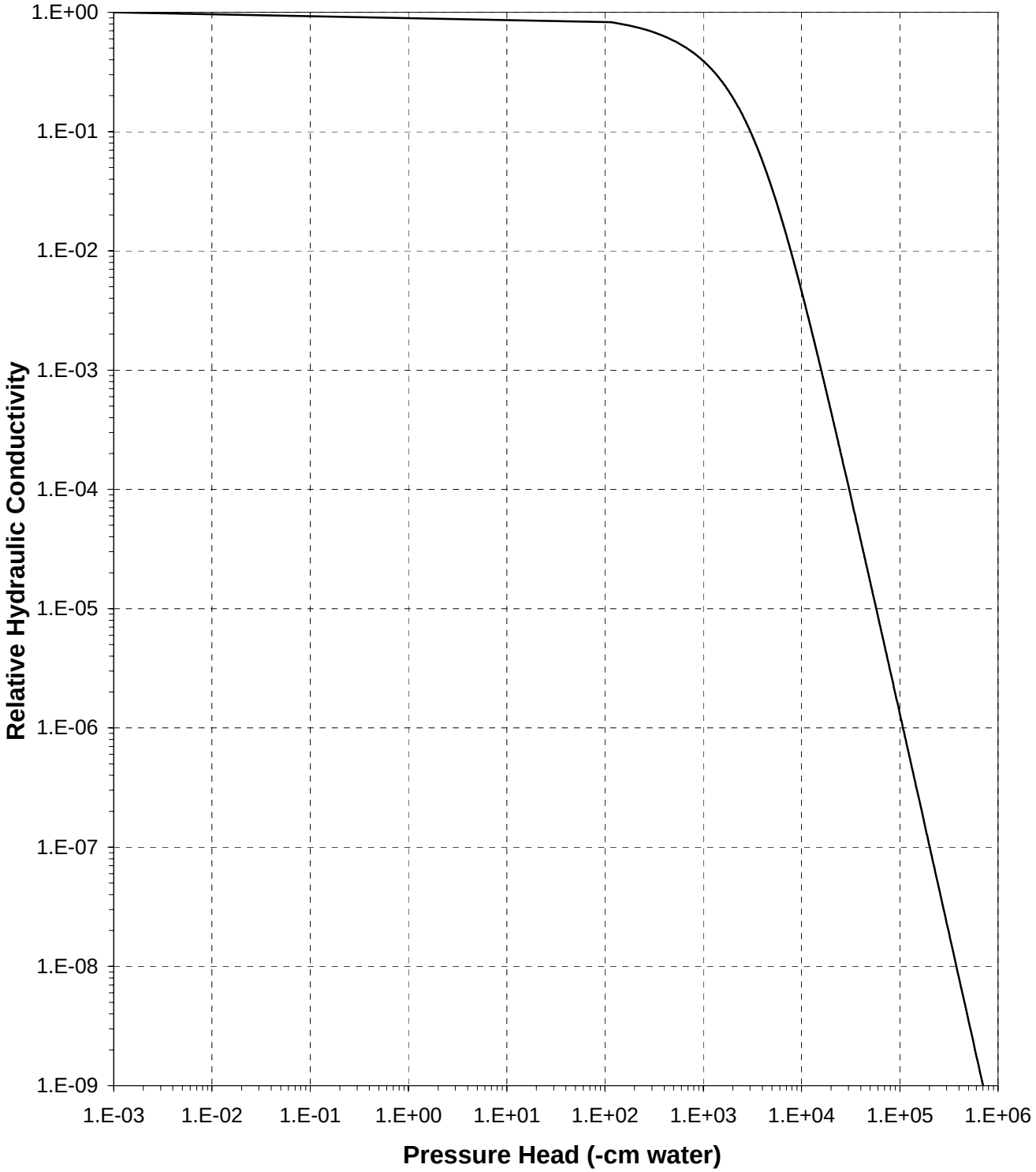
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (563-564)



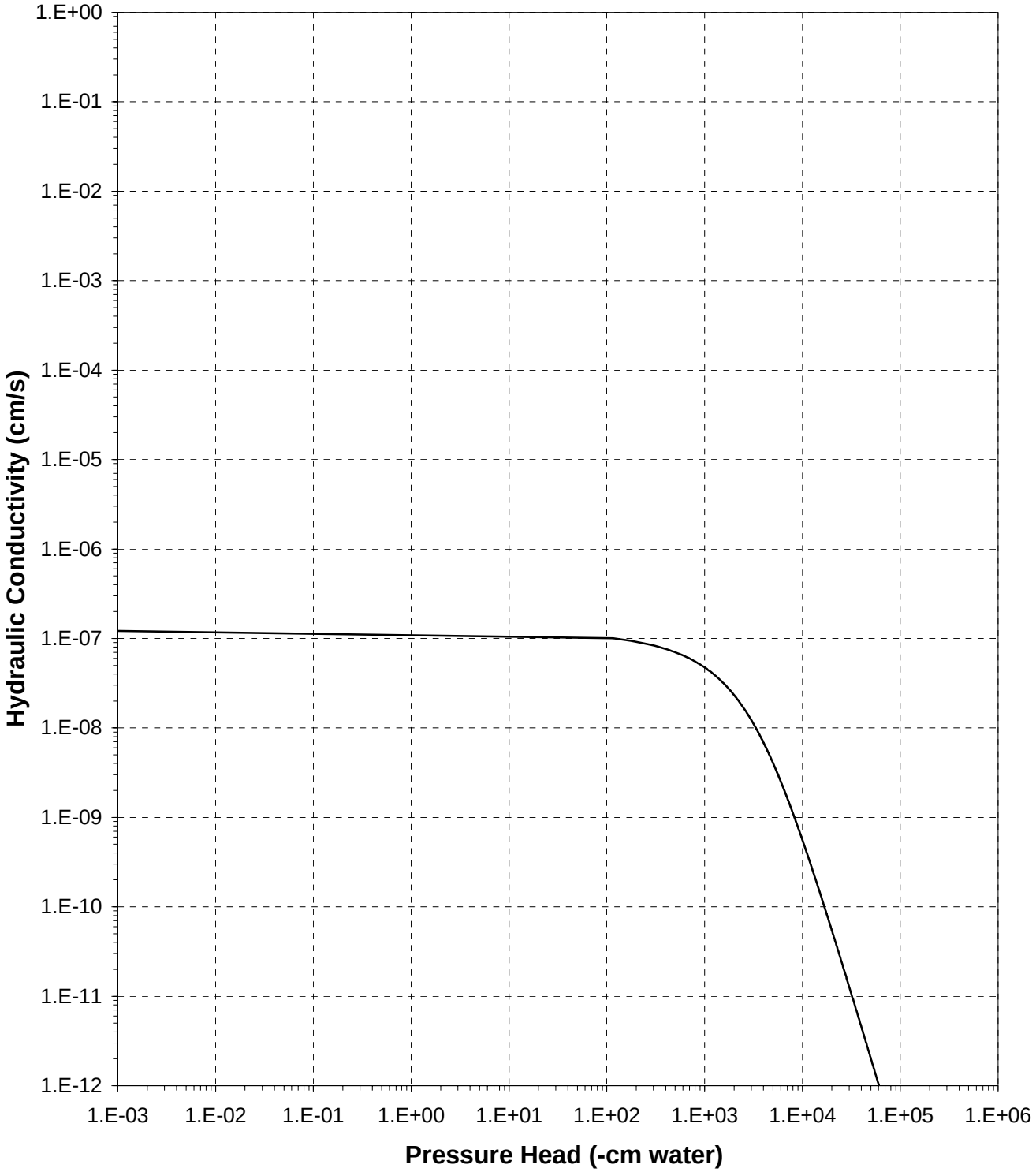
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (563-564)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (563-564)



Daniel B. Stephens & Associates, Inc.

Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (585-586)
Date Sampled: NA
Depth: 585-586

Dry wt. of sample (g): 174.61
Tare wt., ring (g): 52.60
Tare wt., screen & clamp (g): 28.19
Initial sample volume (cm^3): 120.16
Initial dry bulk density (g/cm^3): 1.45
Measured particle density (g/cm^3): 2.68
Initial calculated total porosity (%): 45.77

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	1-Feb-12	13:30	310.39	0	45.76
	8-Feb-12	9:10	310.29	20.0	45.68
	15-Feb-12	8:35	309.45	73.0	44.98
	22-Feb-12	11:00	309.17	153.0	44.75
Pressure plate:	5-Mar-12	8:35	308.47	337	44.17

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	20.0	---	---	---	---
	73.0	---	---	---	---
	153.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (585-586)

Initial sample bulk density (g/cm^3)*:* 1.45
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 144.98
Tare weight, jar (g)*:* 117.47

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	4-Apr-12	9:20	148.55	17439	18.86
	3-Apr-12	14:25	147.27	55375	12.10
	2-Apr-12	16:49	146.84	179485	9.83

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	17439	---	---	---	---
	55375	---	---	---	---
	179485	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 63.62
Tare weight (g)*:* 36.82

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	2-Mar-12	8:30	64.85	854159	6.66

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

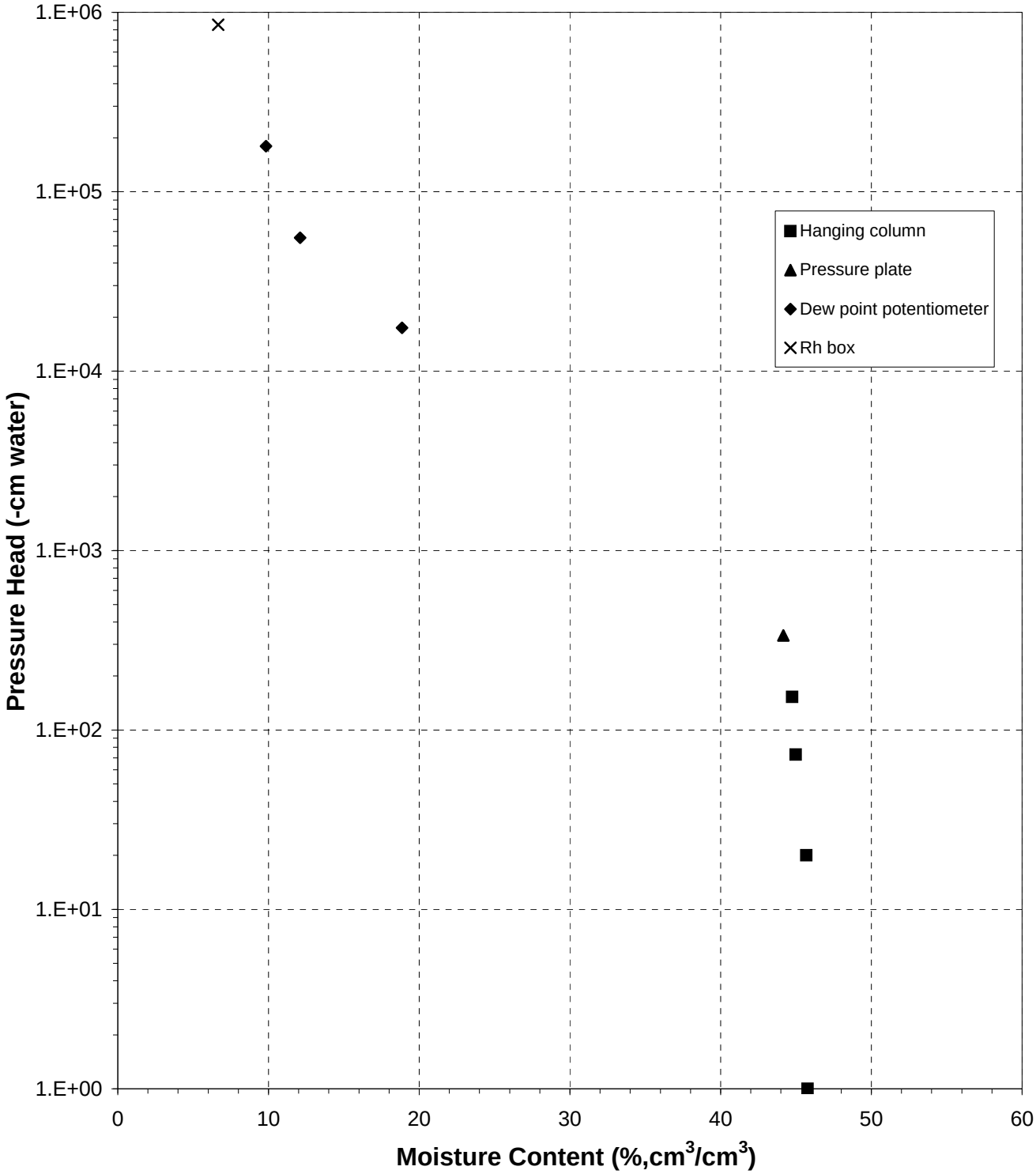
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/ C. Krous/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

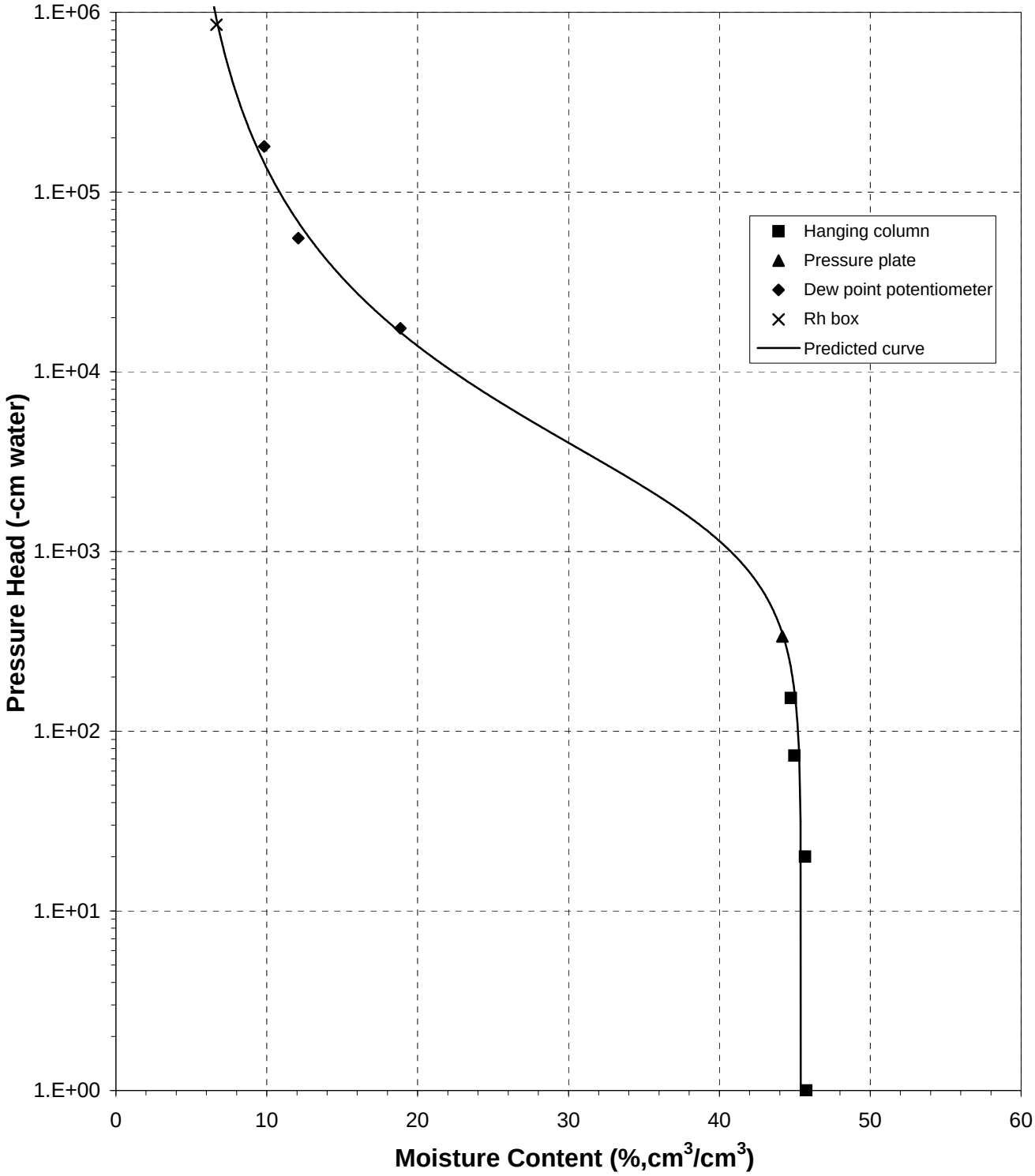
Water Retention Data Points

Sample Number: PB-13 (585-586)



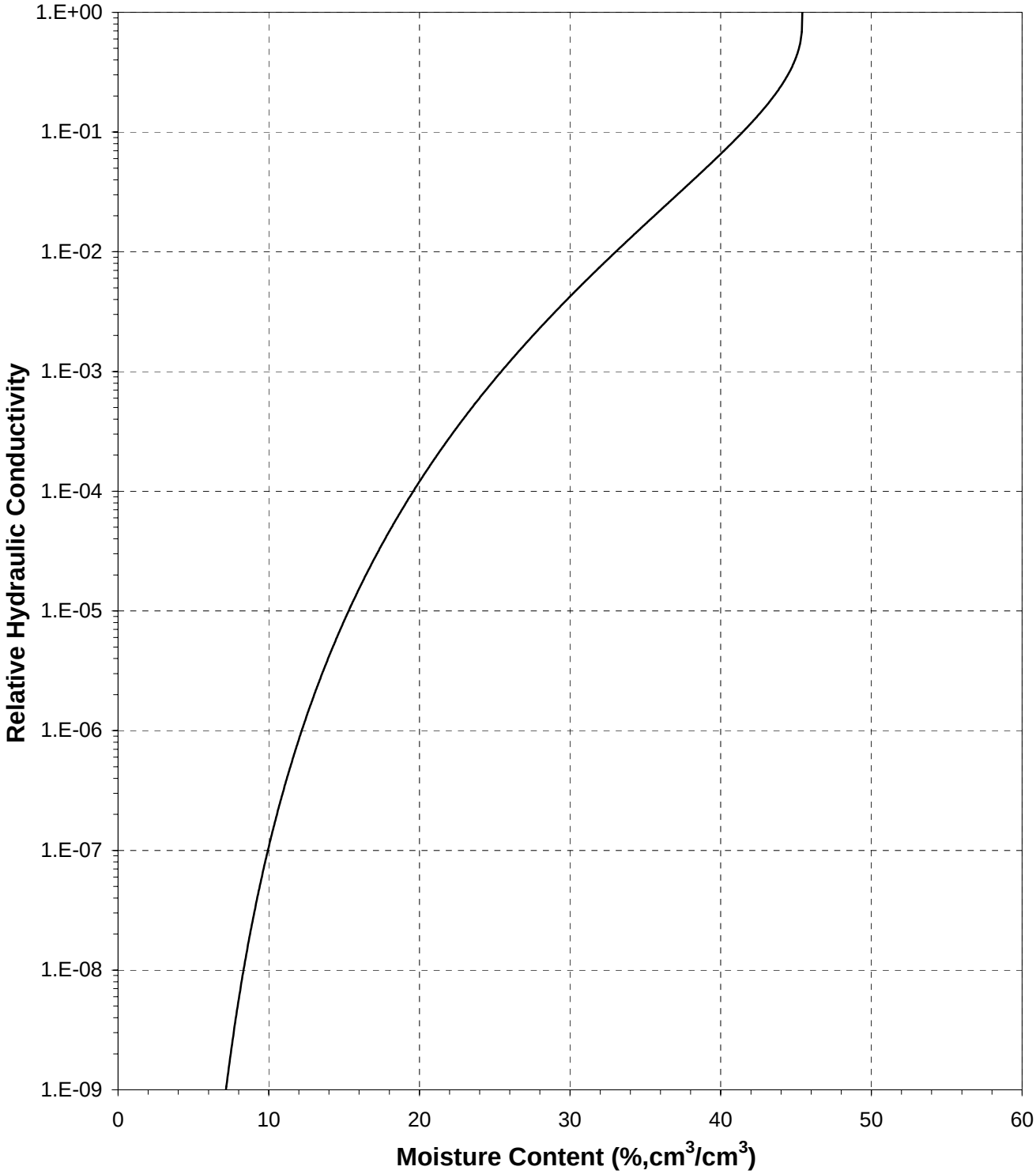
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (585-586)



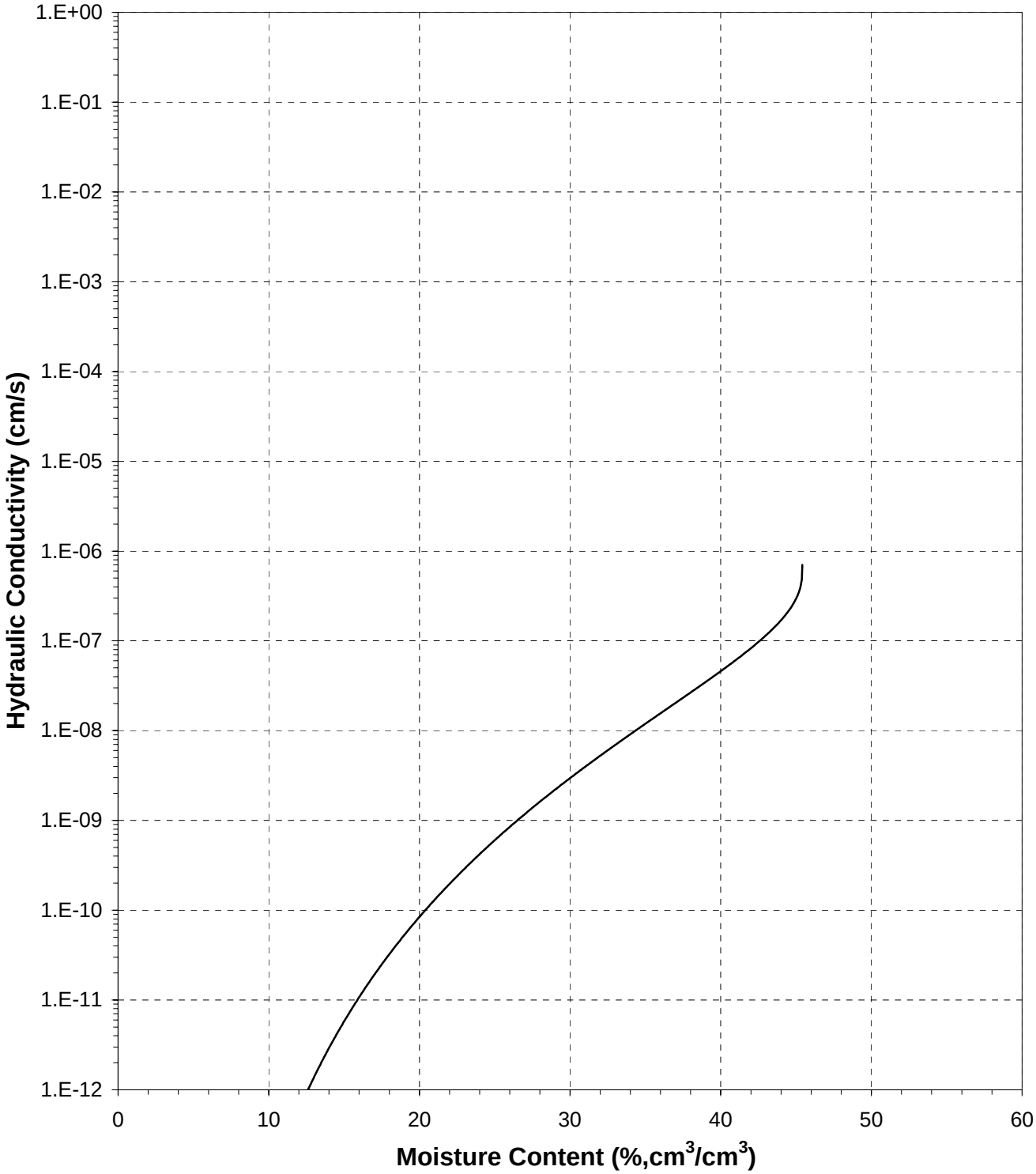
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (585-586)



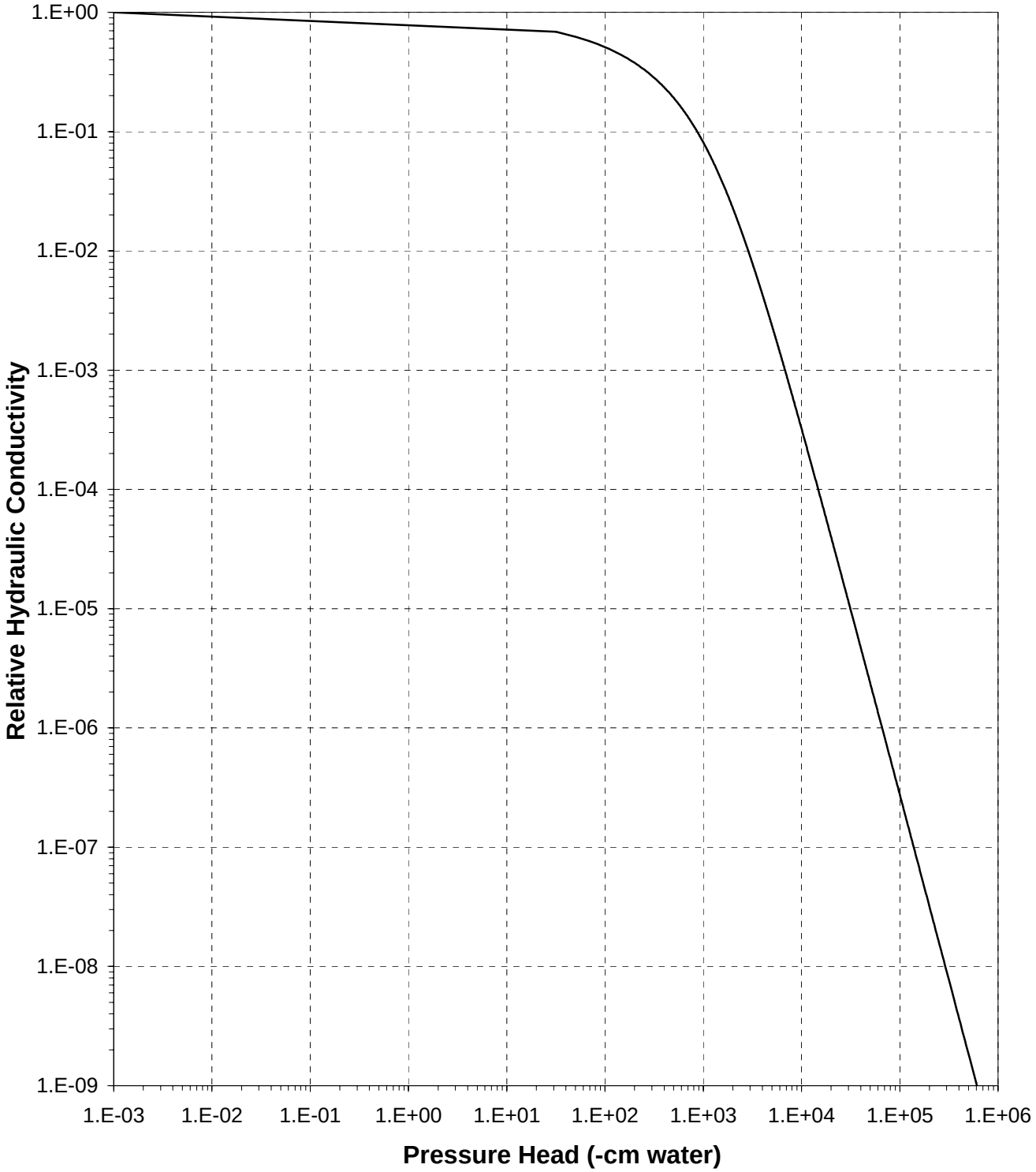
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (585-586)



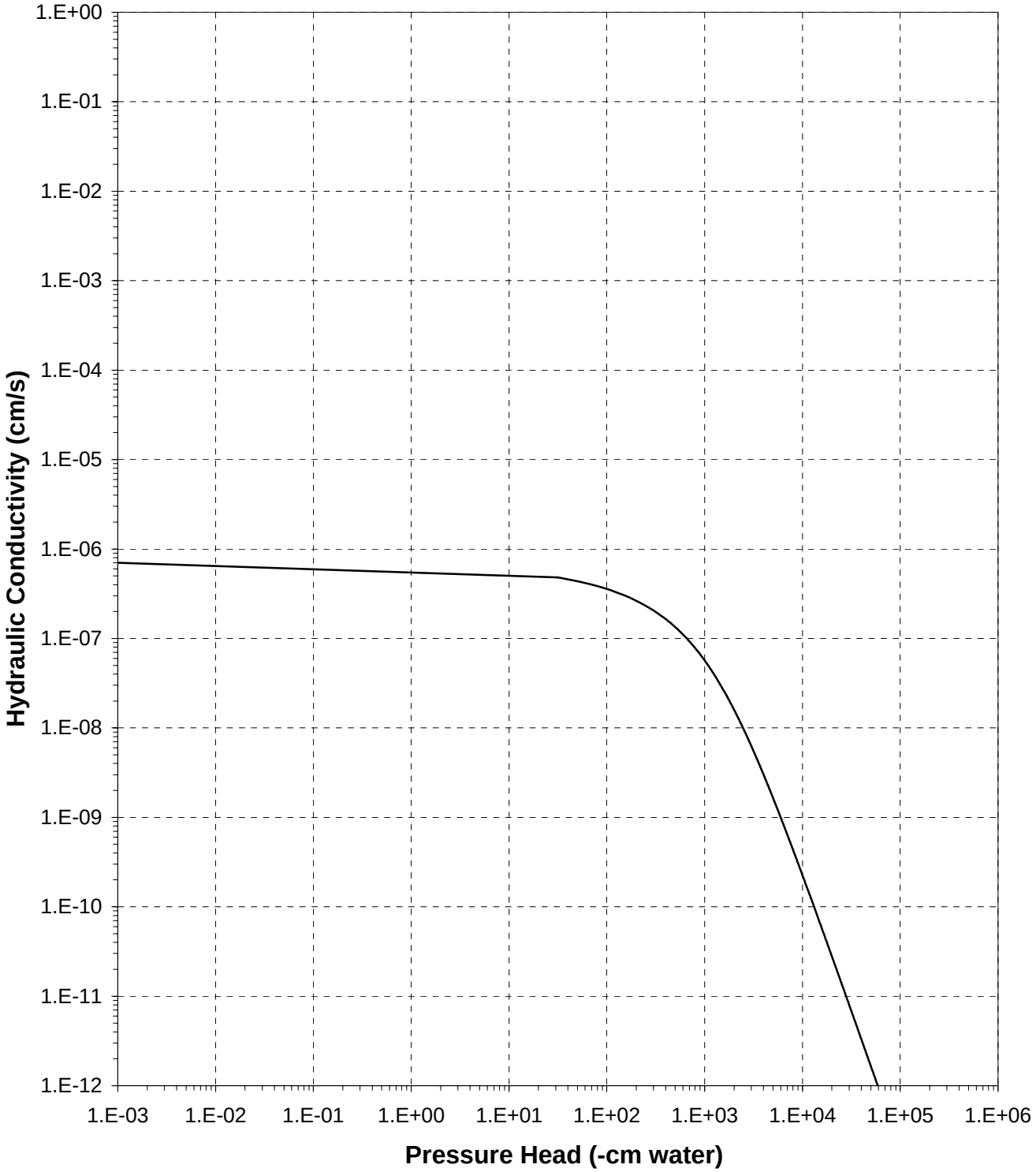
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (585-586)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (585-586)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (604-605)
Date Sampled: NA
Depth: 604-605

Dry wt. of sample (g): 124.67
Tare wt., ring (g): 48.24
Tare wt., screen & clamp (g): 24.11
Initial sample volume (cm^3): 88.06
Initial dry bulk density (g/cm^3): 1.42
Measured particle density (g/cm^3): 2.65
Initial calculated total porosity (%): 46.57

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	8-Feb-12	13:55	238.03	0	46.57
	15-Feb-12	8:55	237.41	52.0	45.87
	22-Feb-12	10:20	237.24	151.0	45.67
Pressure plate:	7-Mar-12	10:40	236.92	337	45.31
	21-Mar-12	8:40	236.61	1275	44.96

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	52.0	---	---	---	---
	151.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (604-605)

Initial sample bulk density (g/cm^3)*:* 1.42
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 144.66
Tare weight, jar (g)*:* 114.80

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	9-Apr-12	11:57	148.98	18866	20.48
	6-Apr-12	16:30	147.34	62106	12.71
	6-Apr-12	13:10	146.41	262700	8.30

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	18866	---	---	---	---
	62106	---	---	---	---
	262700	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 65.68
Tare weight (g)*:* 39.38

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	67.00	857025	7.08

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

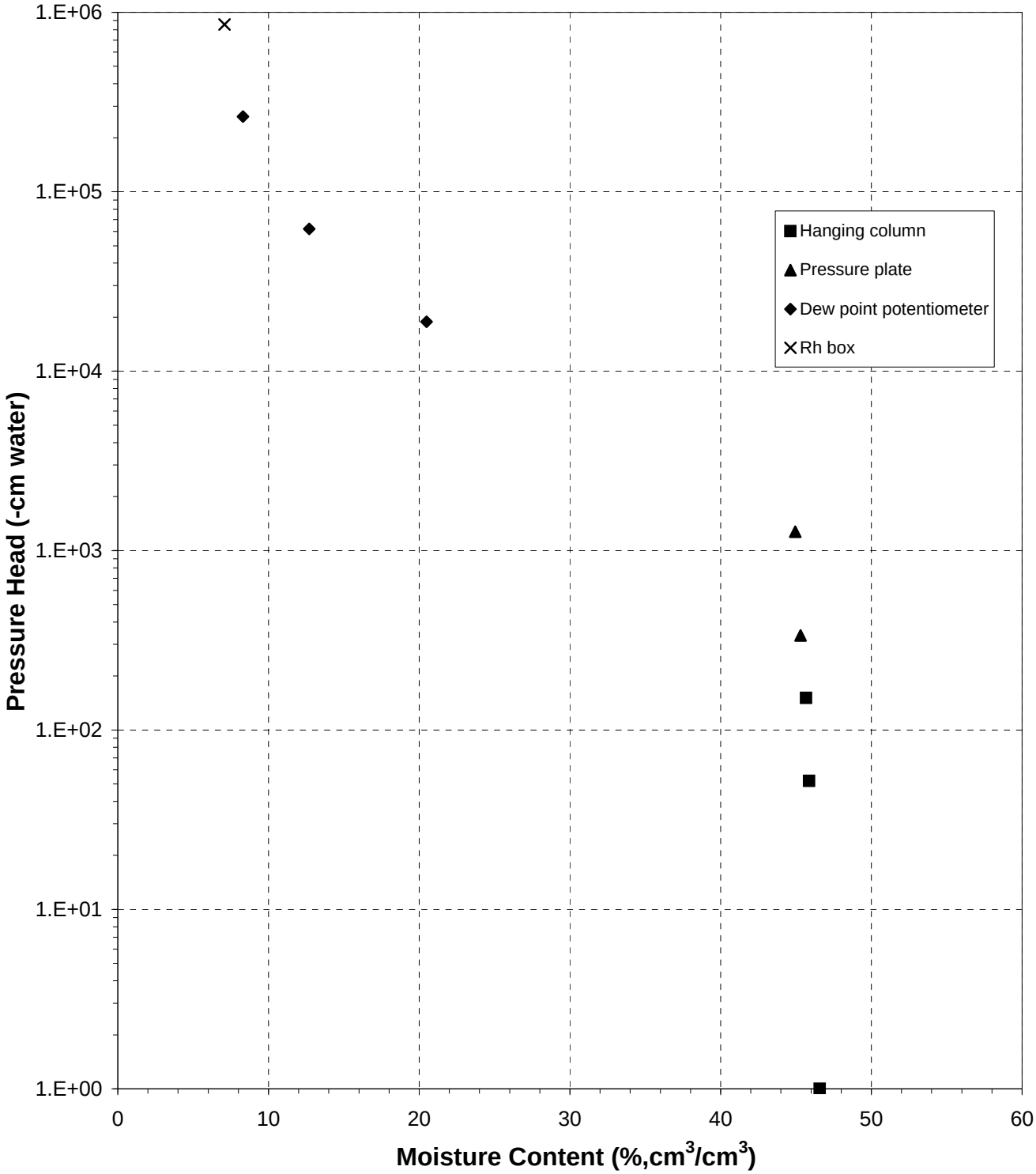
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

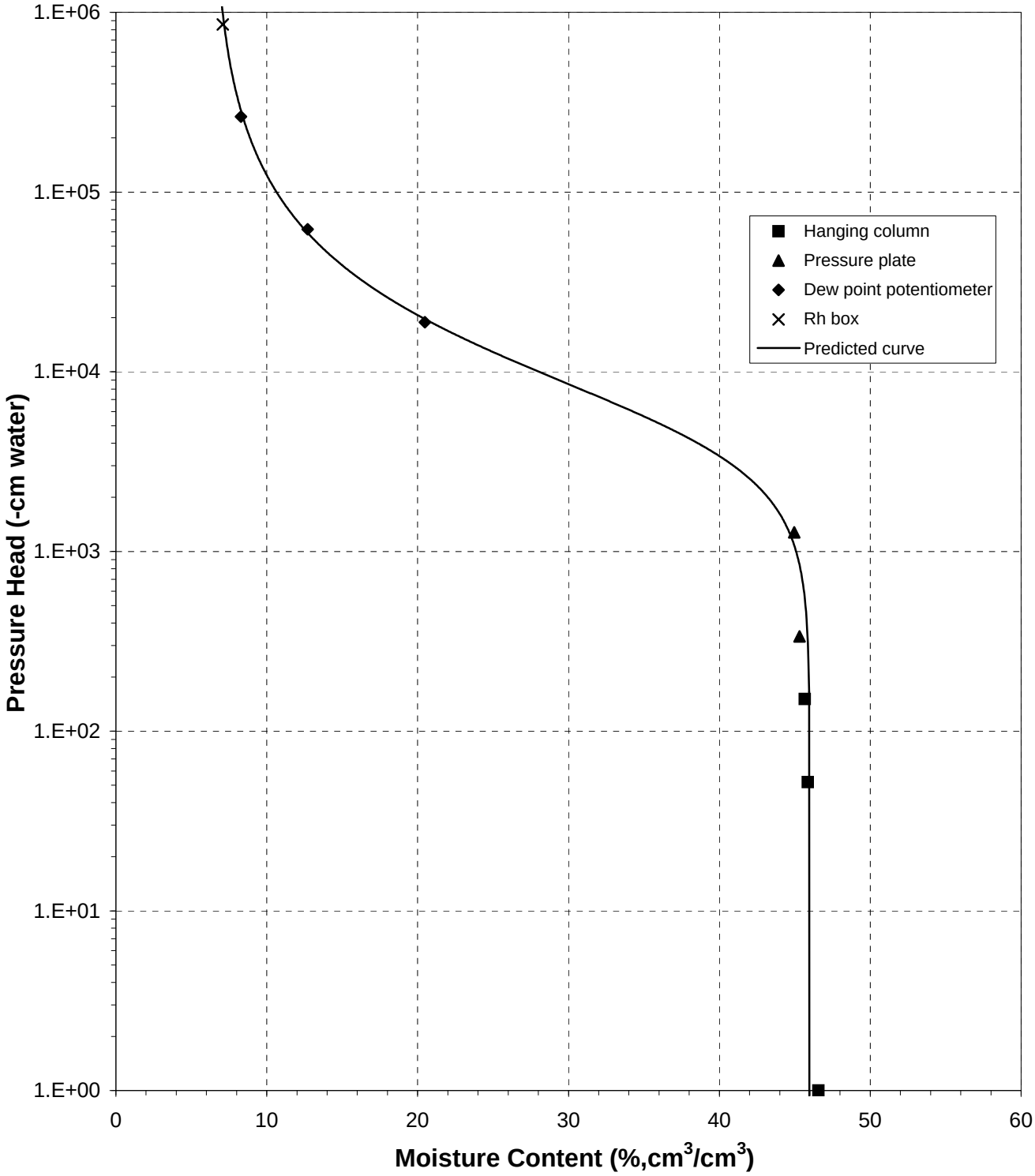
Water Retention Data Points

Sample Number: PB-13 (604-605)



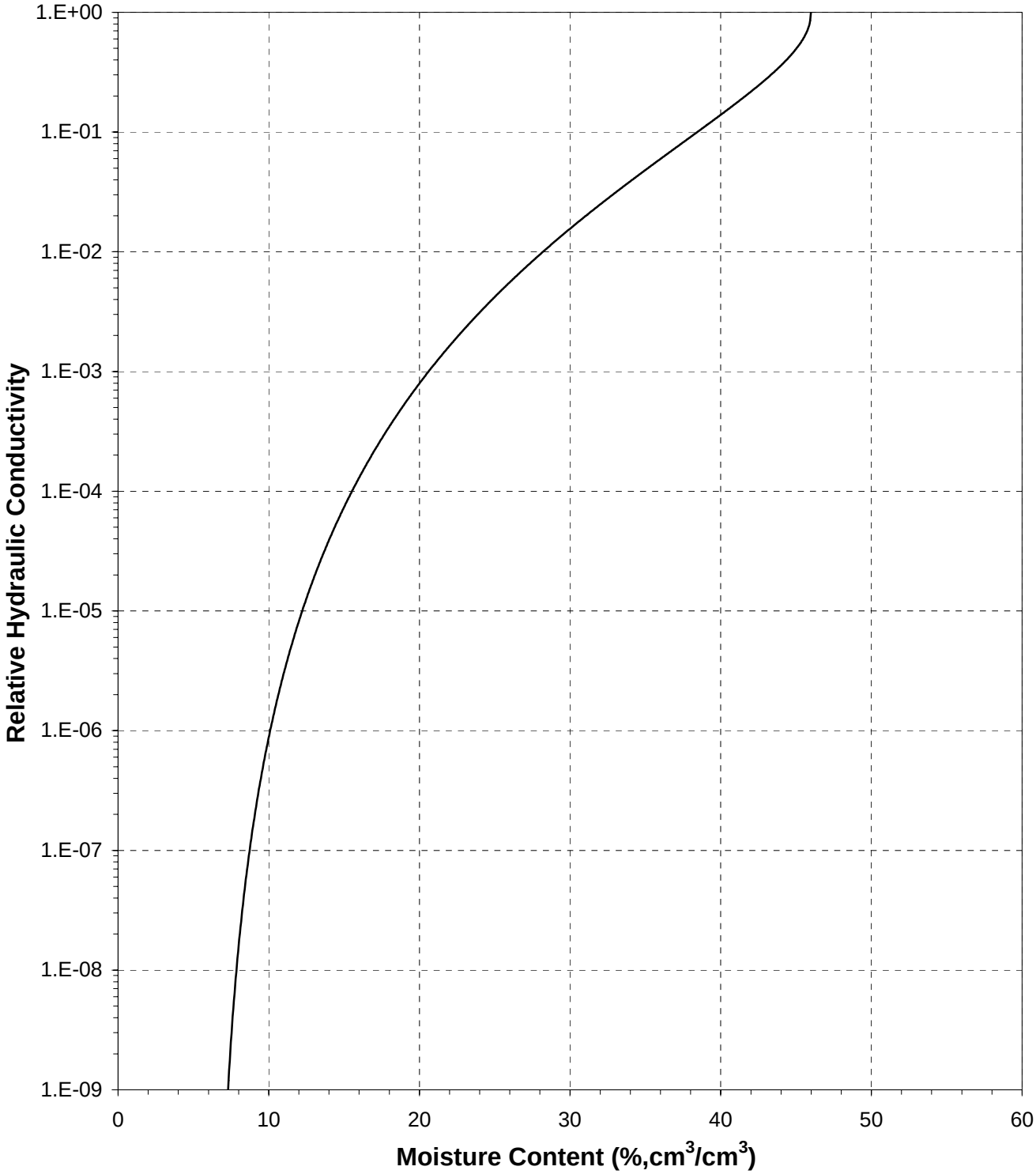
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (604-605)



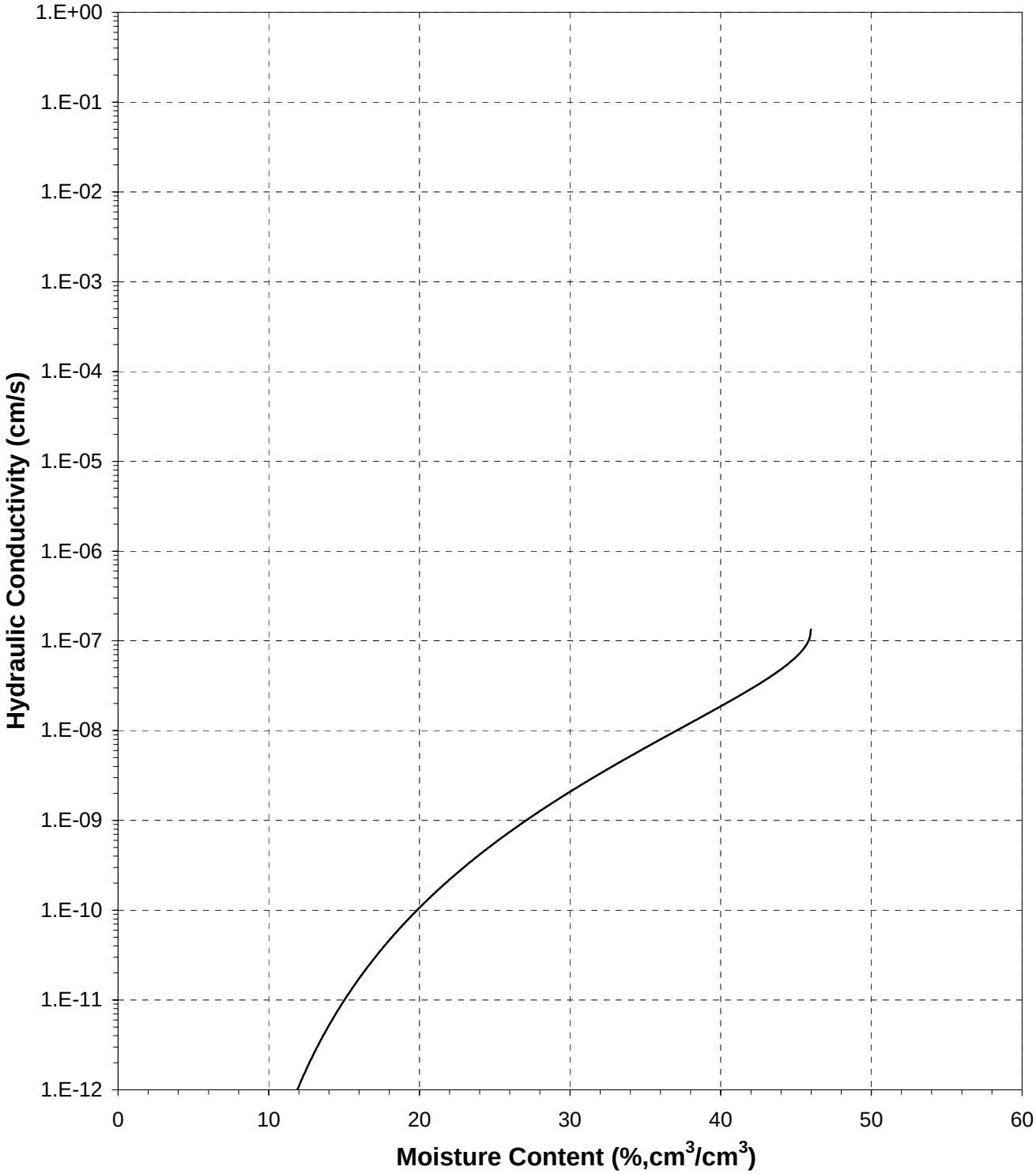
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (604-605)



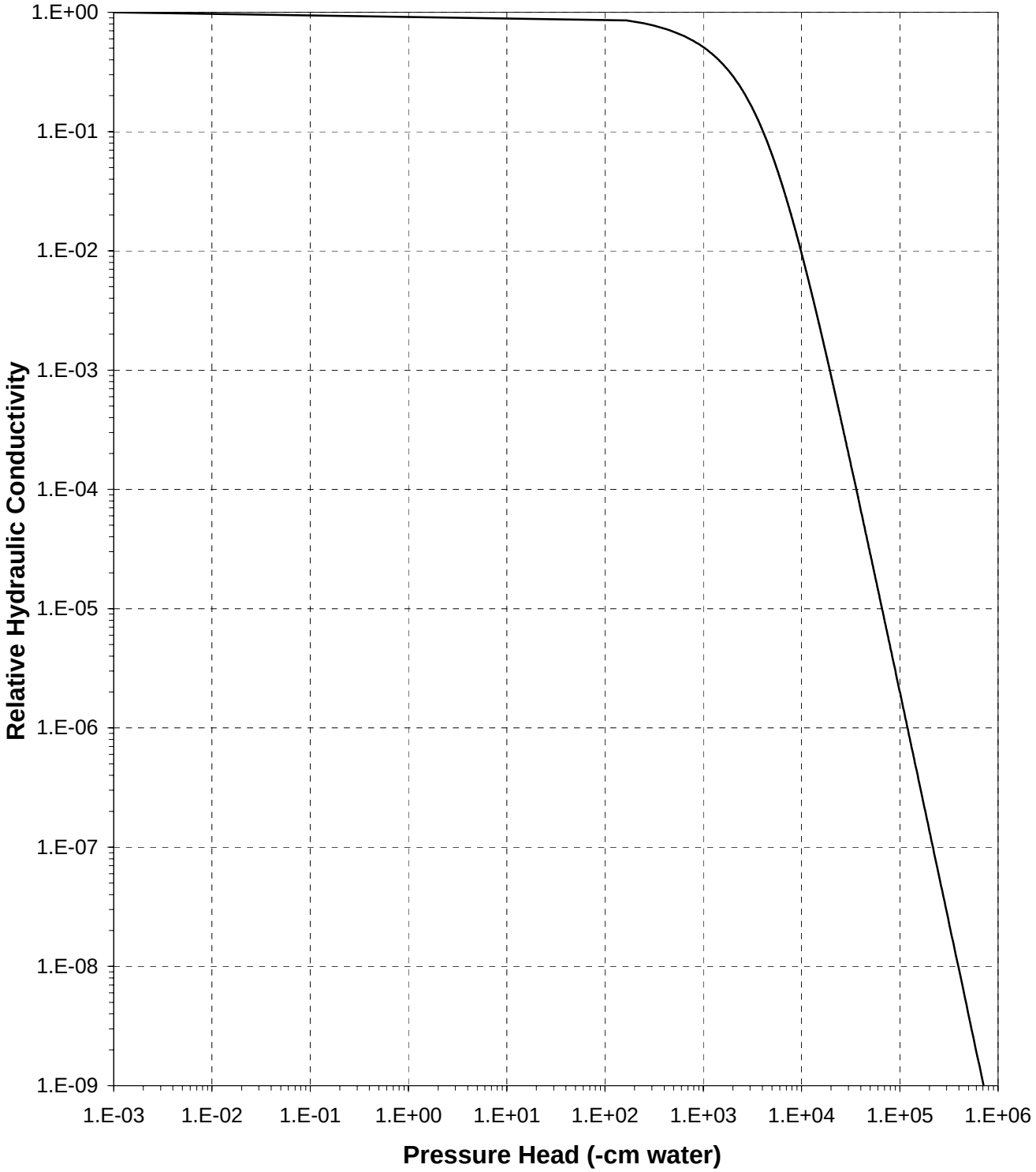
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (604-605)



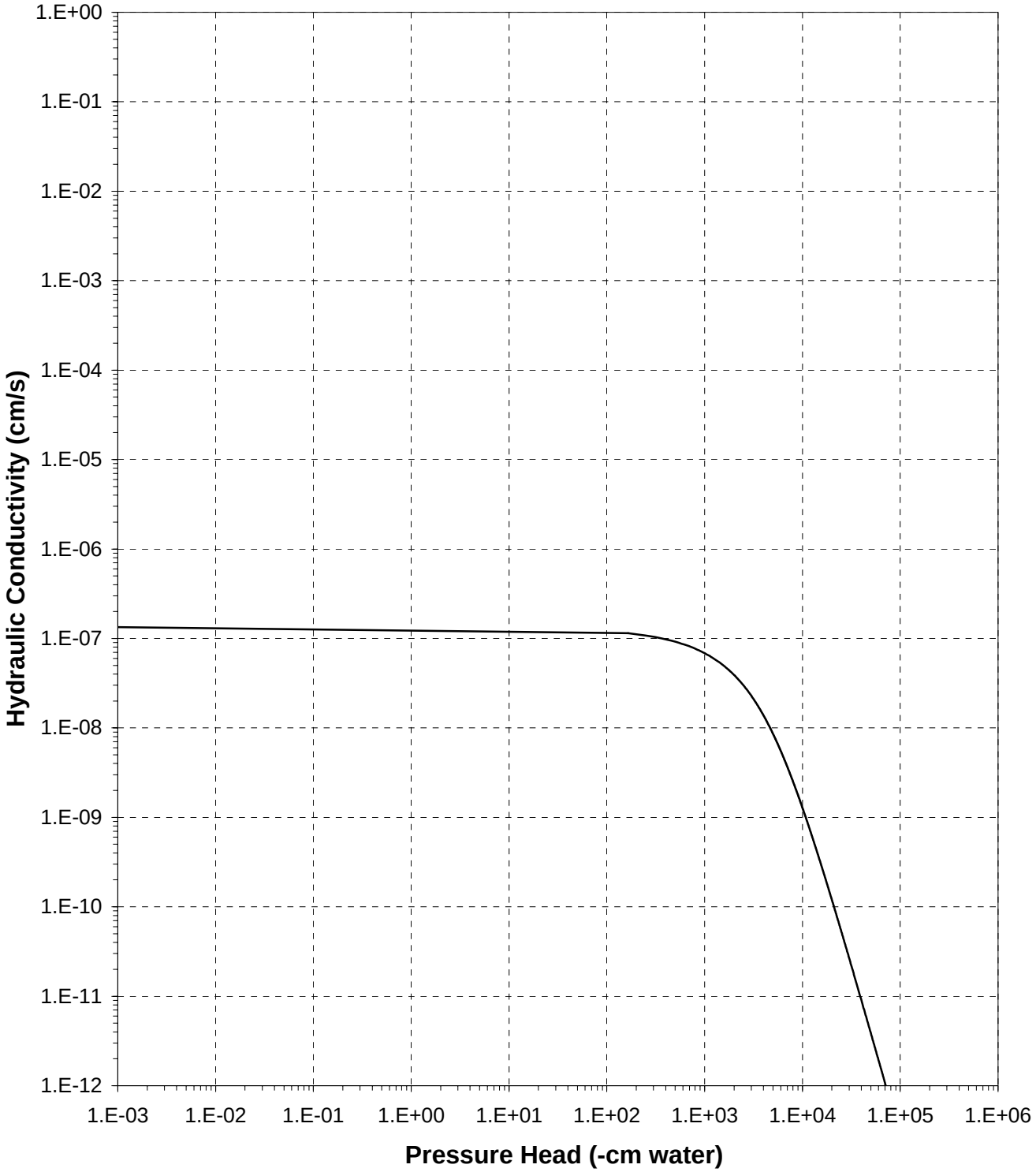
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (604-605)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (604-605)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (625-626)
Date Sampled: NA
Depth: 625-626

Dry wt. of sample (g): 103.59
Tare wt., ring (g): 38.67
Tare wt., screen & clamp (g): 23.60
Initial sample volume (cm^3): 70.85
Initial dry bulk density (g/cm^3): 1.46
Measured particle density (g/cm^3): 2.62
Initial calculated total porosity (%): 44.17

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:30	197.15	0	44.17
	7-Feb-12	10:15	195.88	51.0	42.37
	14-Feb-12	8:10	195.76	150.0	42.20
Pressure plate:	28-Feb-12	8:25	195.61	337	41.99
	13-Mar-12	8:40	195.35	1275	41.63

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (625-626)

Initial sample bulk density (g/cm^3)*:* 1.46
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 134.58
Tare weight, jar (g)*:* 113.21

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	12-Mar-12	15:22	138.21	10504	24.84
	13-Mar-12	13:30	136.97	32430	16.35
	13-Mar-12	11:14	135.74	629523	7.94

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	10504	---	---	---	---
	32430	---	---	---	---
	629523	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 66.07
Tare weight (g)*:* 42.91

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	67.23	857025	7.35

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

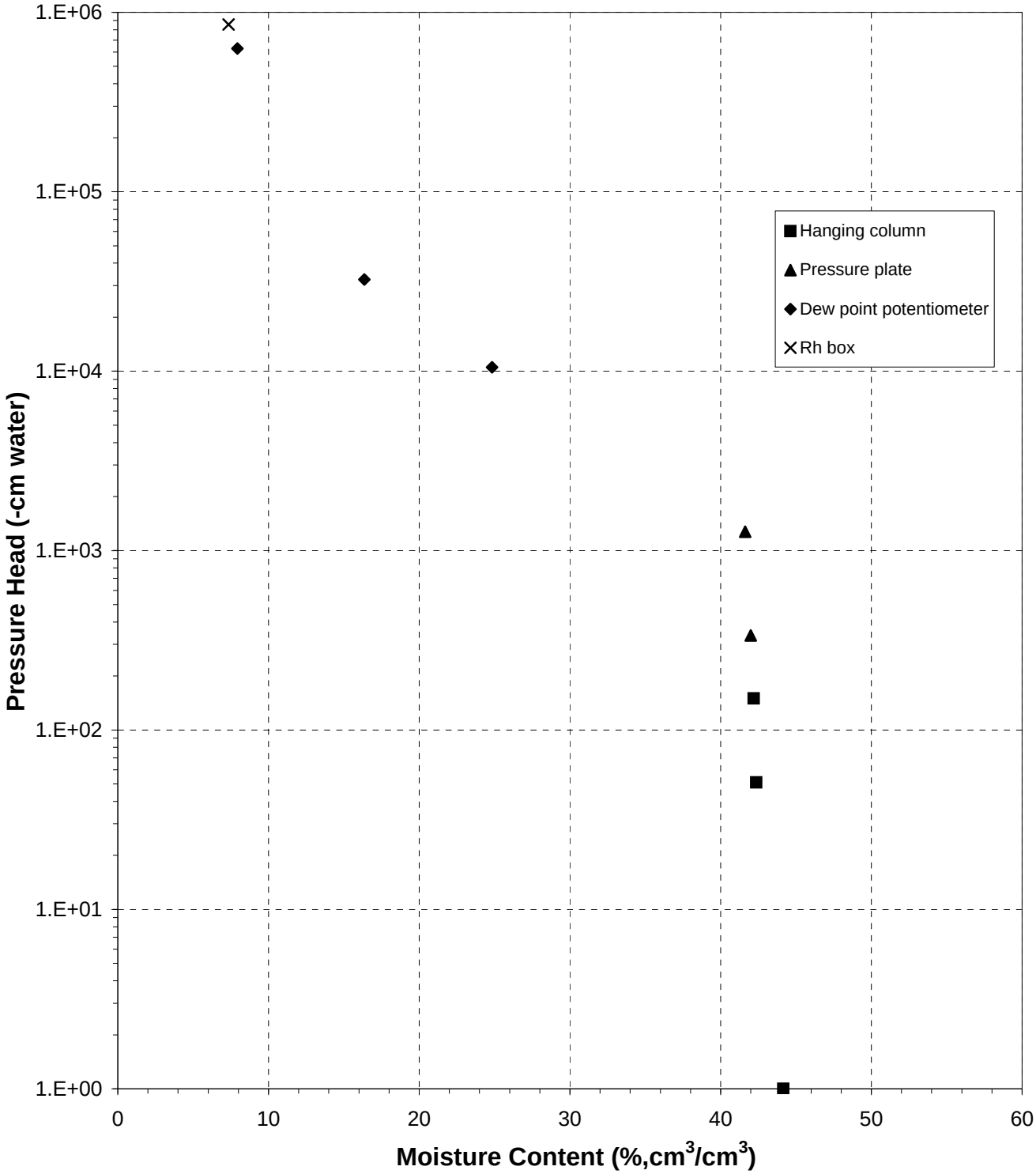
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

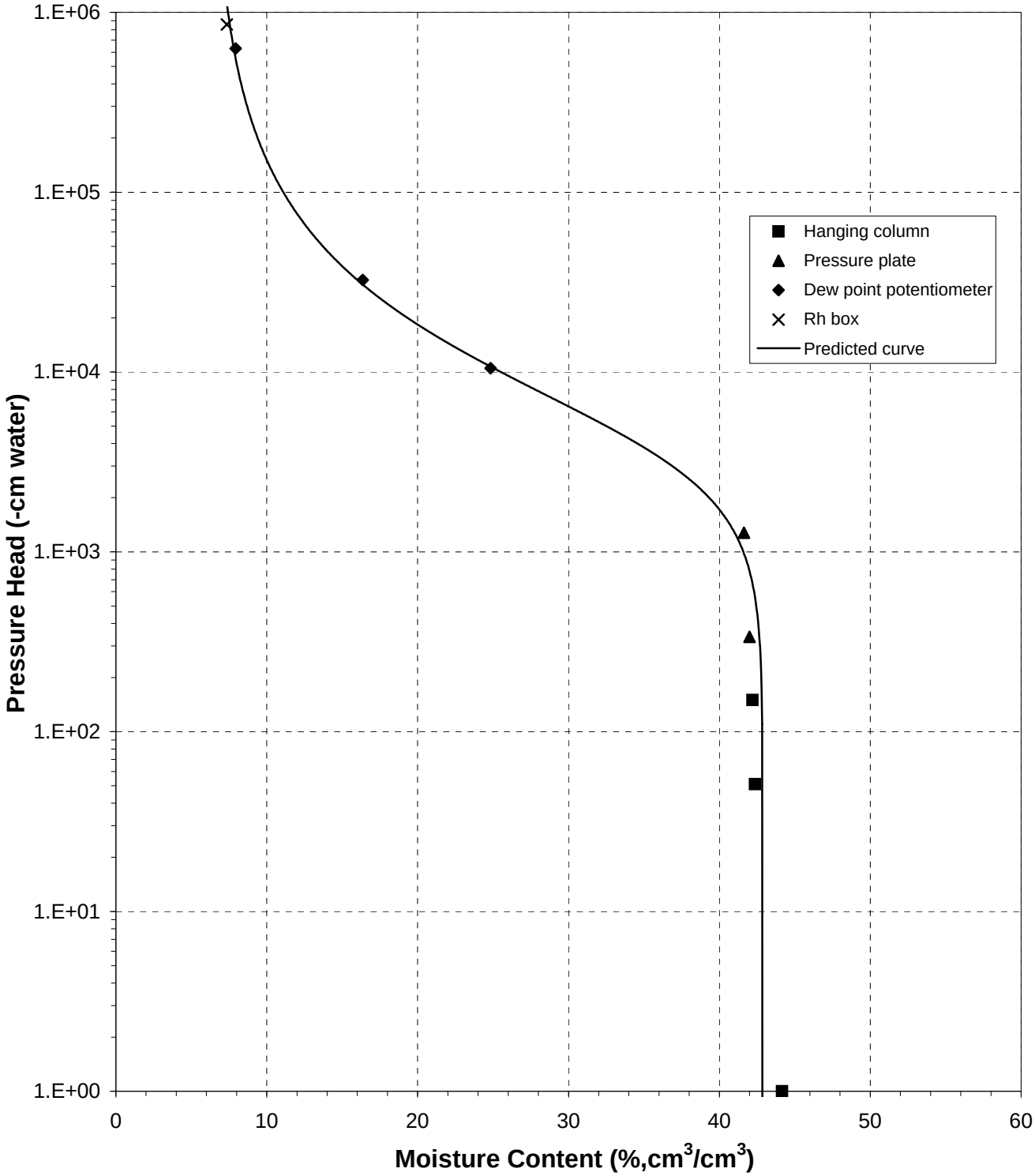
Water Retention Data Points

Sample Number: PB-13 (625-626)



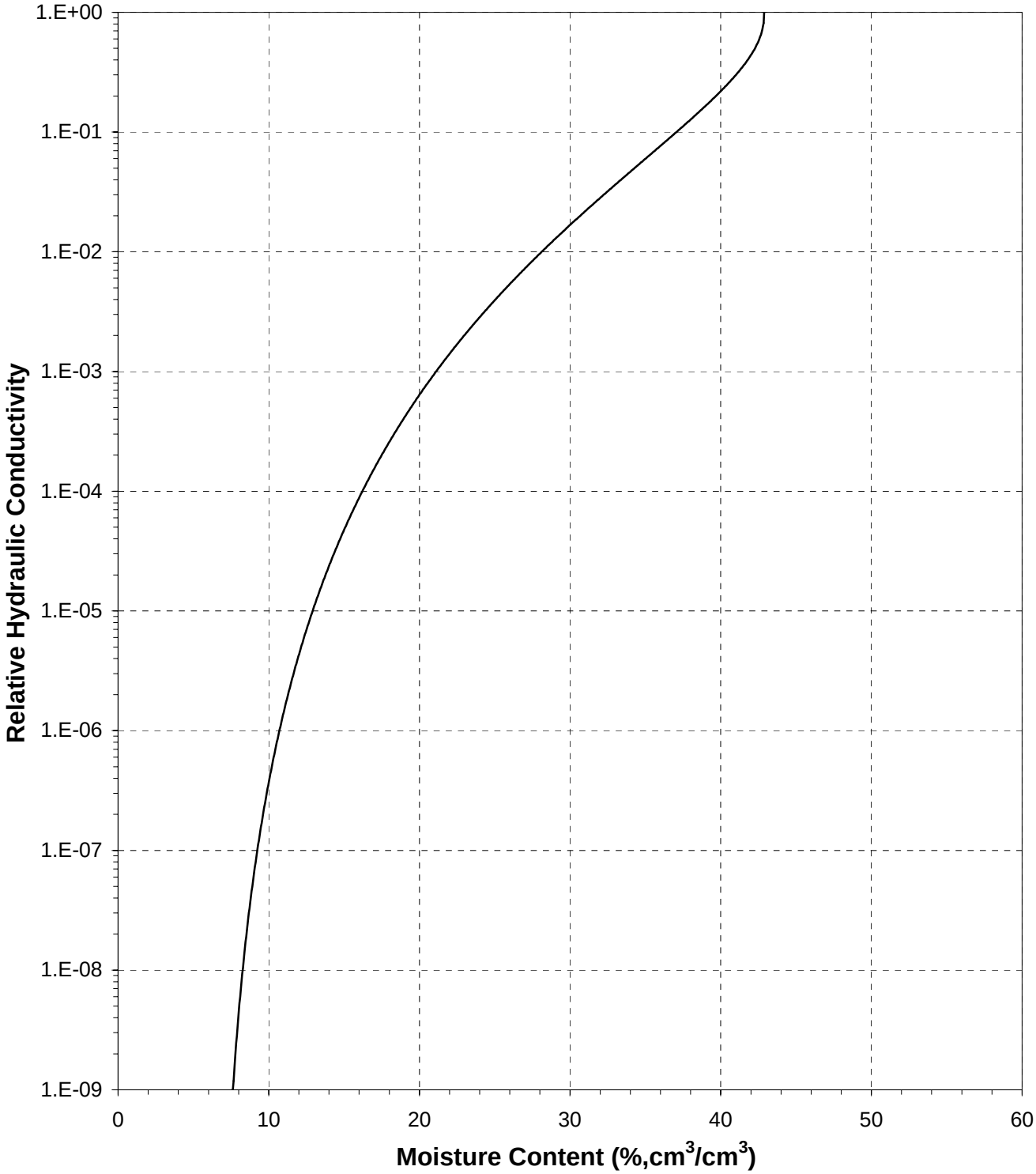
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (625-626)



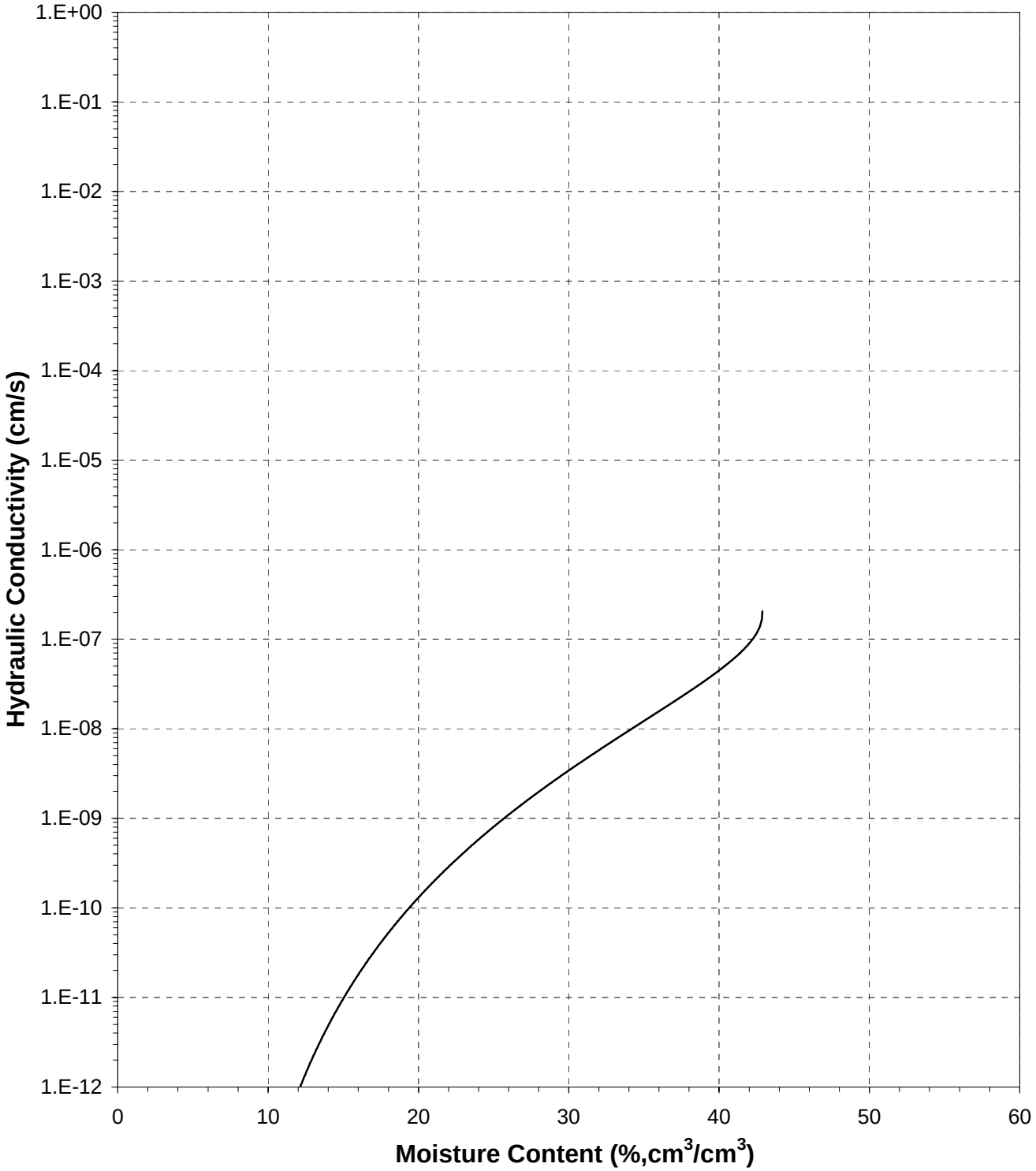
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (625-626)



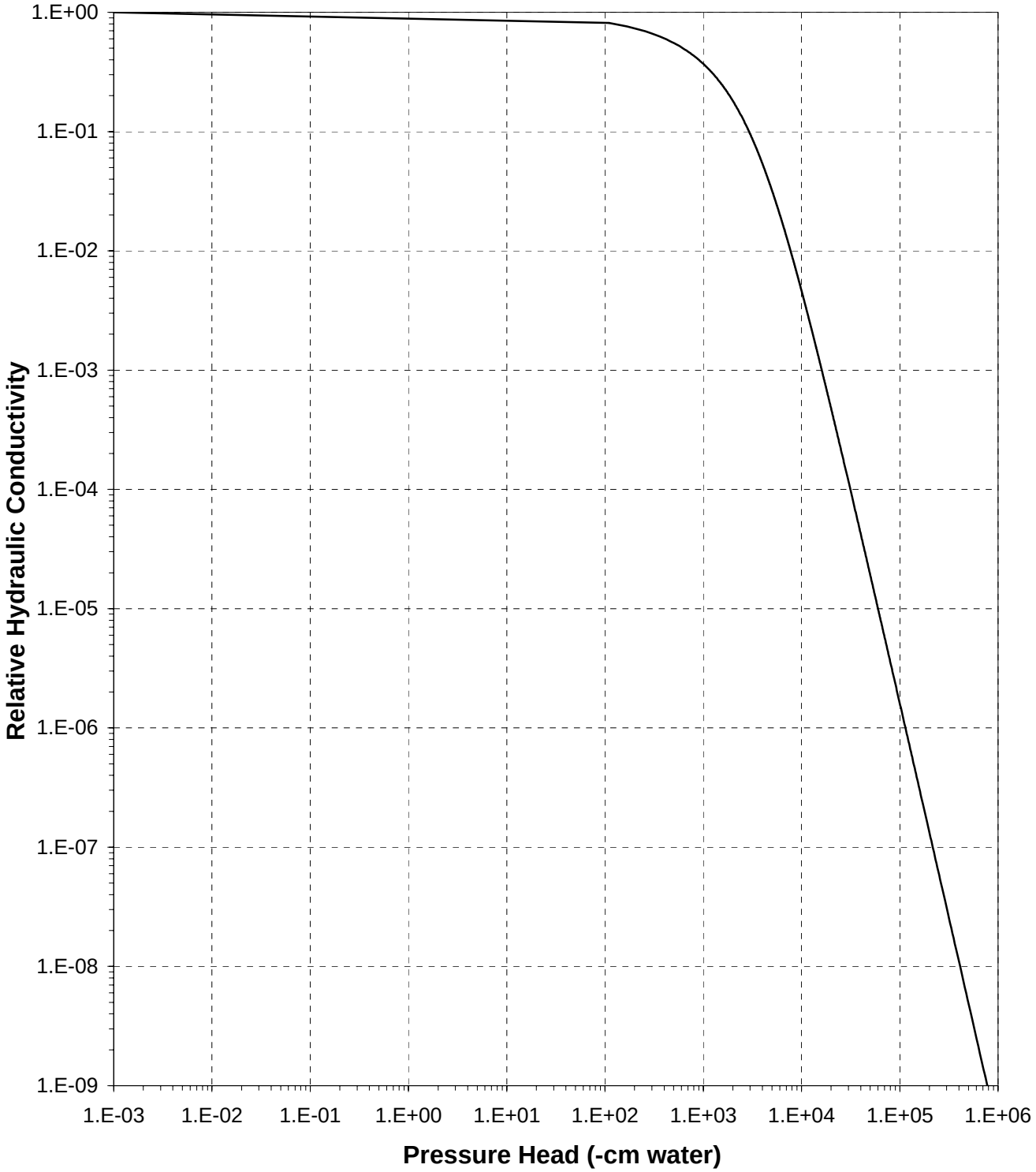
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (625-626)



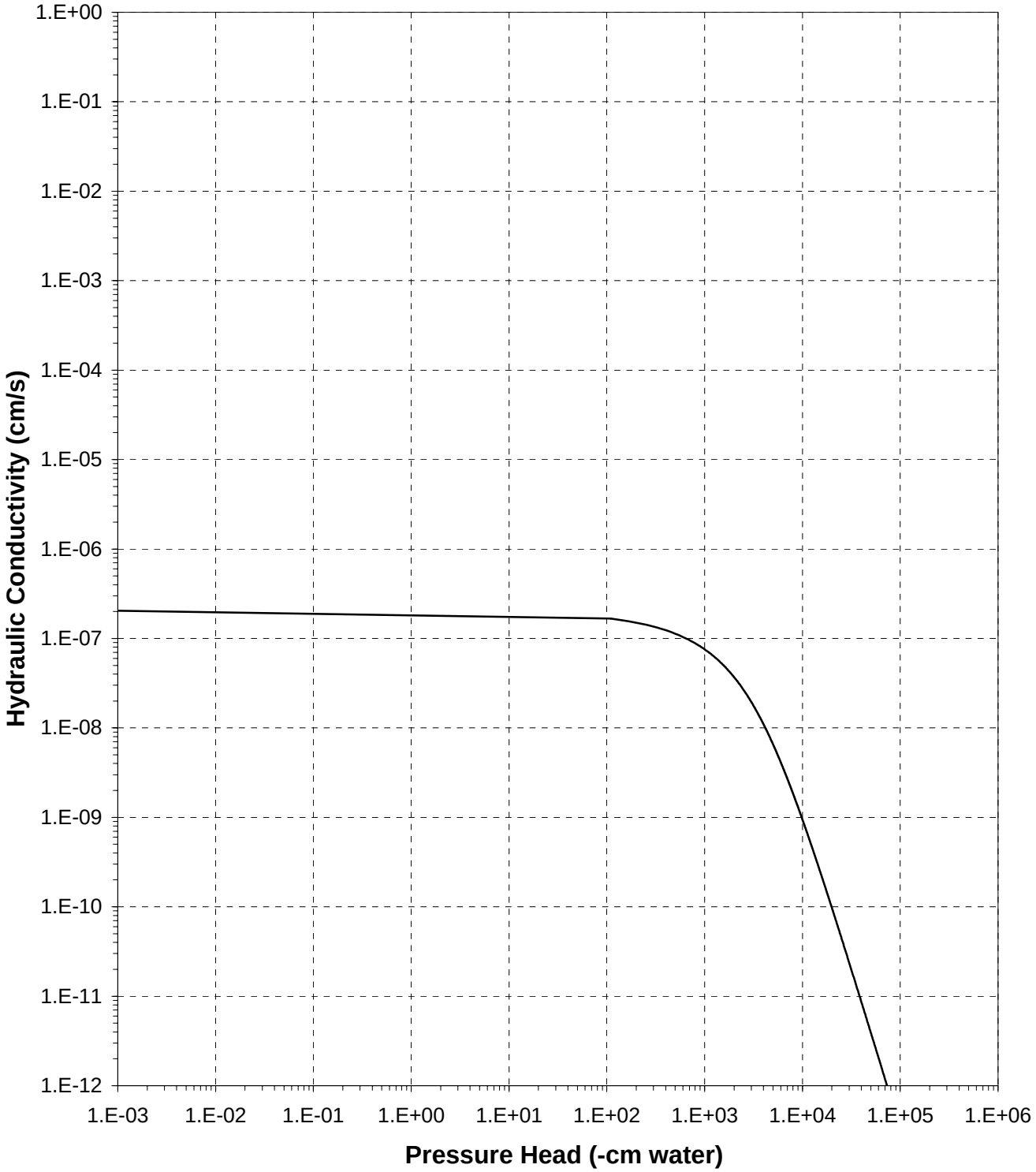
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (625-626)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (625-626)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (639-640)
Date Sampled: NA
Depth: 639-640

Dry wt. of sample (g): 224.97
Tare wt., ring (g): 279.42
Tare wt., screen & clamp (g): 29.48
Initial sample volume (cm^3): 156.78
Initial dry bulk density (g/cm^3): 1.43
Measured particle density (g/cm^3): 2.64
Initial calculated total porosity (%): 45.69

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	13-Feb-12	12:30	605.50	0	45.69
	20-Feb-12	11:25	604.03	51.0	44.75
	27-Feb-12	9:55	603.81	152.0	44.61

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	152.0	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (639-640)

Initial sample bulk density (g/cm^3)*:* 1.43
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 151.72
Tare weight, jar (g)*:* 115.55

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	4-Apr-12	13:00	157.84	13665	24.28
	4-Apr-12	10:00	156.45	31818	18.77
	3-Apr-12	13:30	154.73	135837	11.94

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	13665	---	---	---	---
	31818	---	---	---	---
	135837	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 71.68
Tare weight (g)*:* 38.82

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	22-Mar-12	8:30	73.55	854159	8.18

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

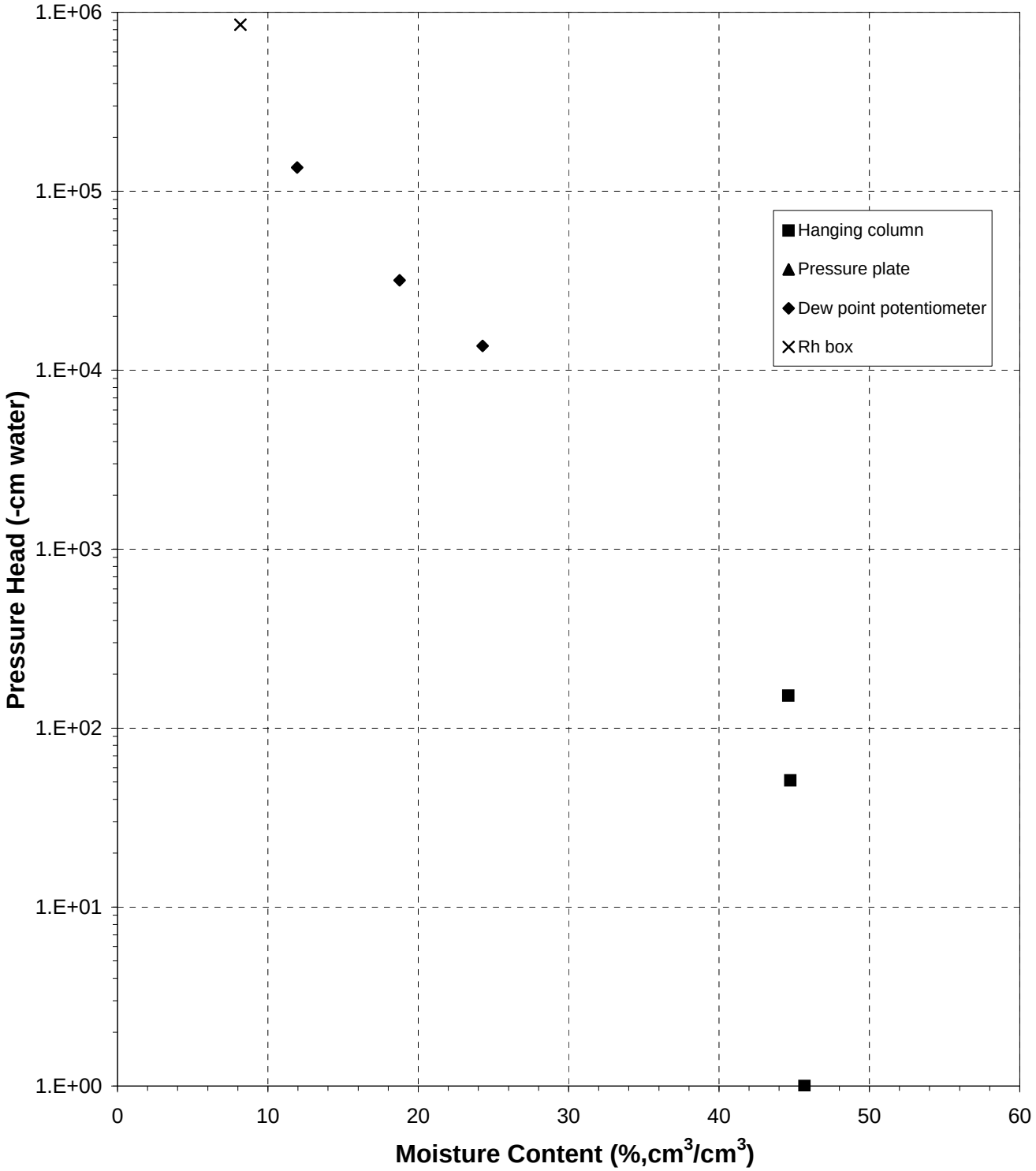
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

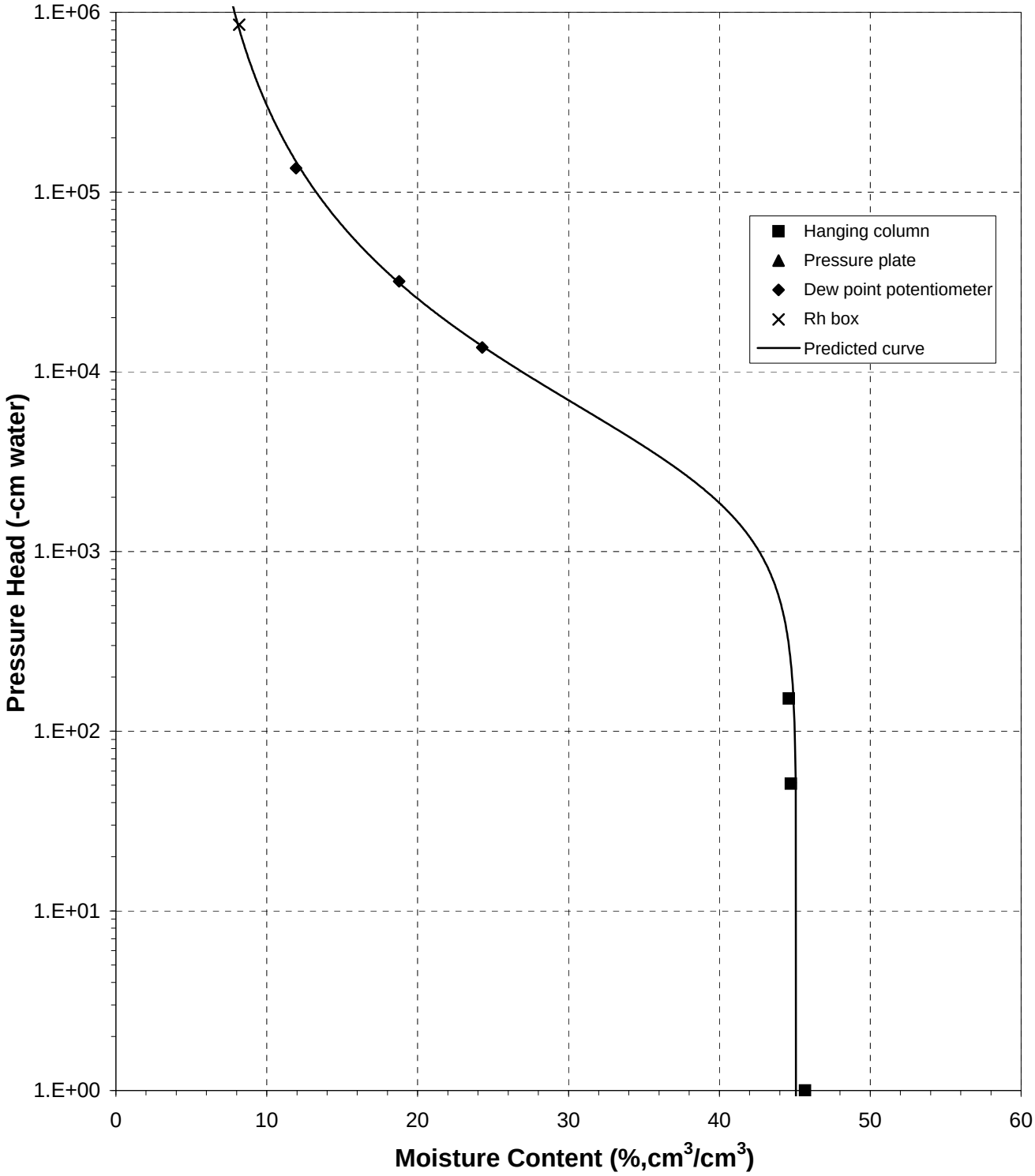
Water Retention Data Points

Sample Number: PB-13 (639-640)



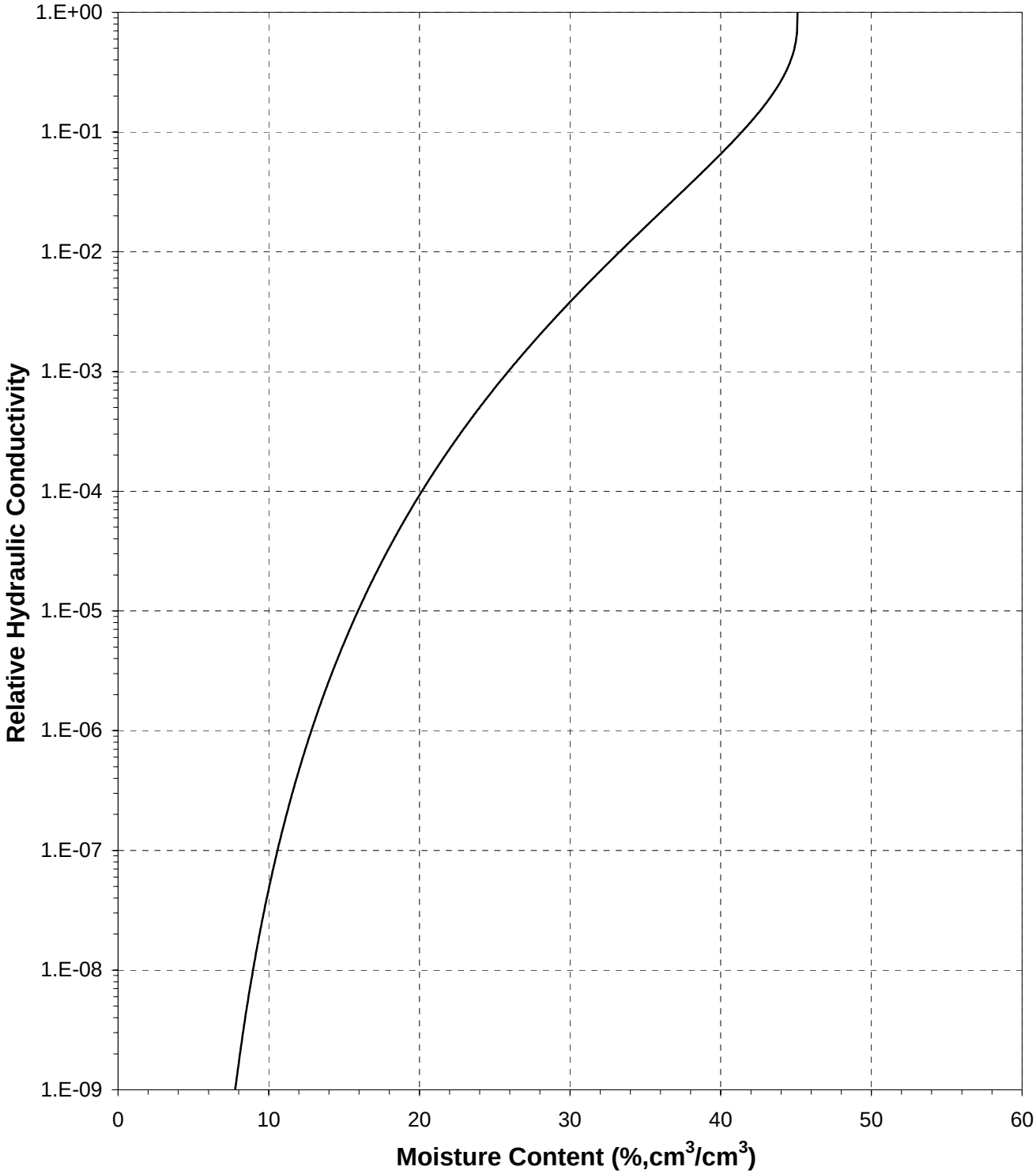
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (639-640)



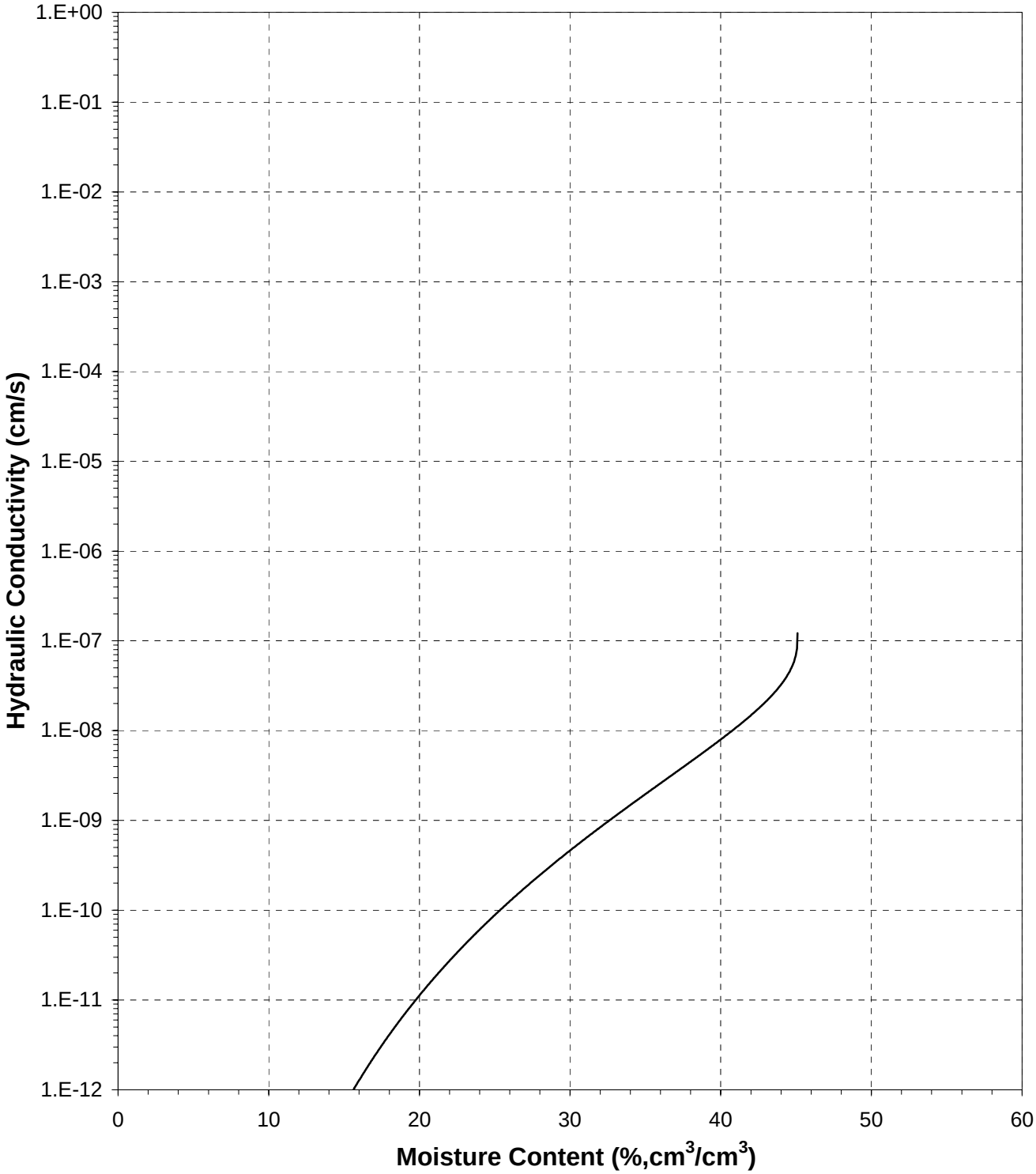
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (639-640)



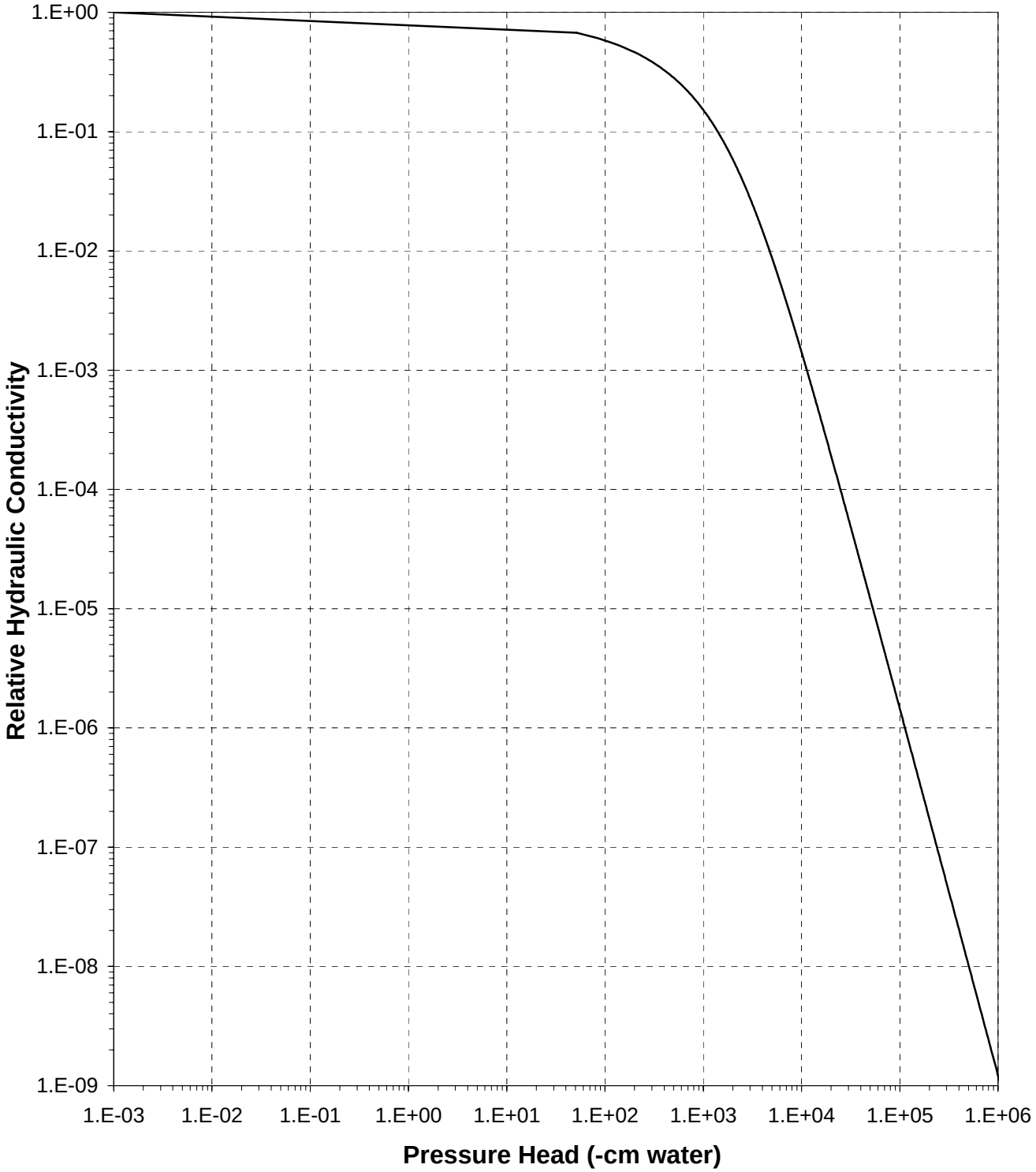
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (639-640)



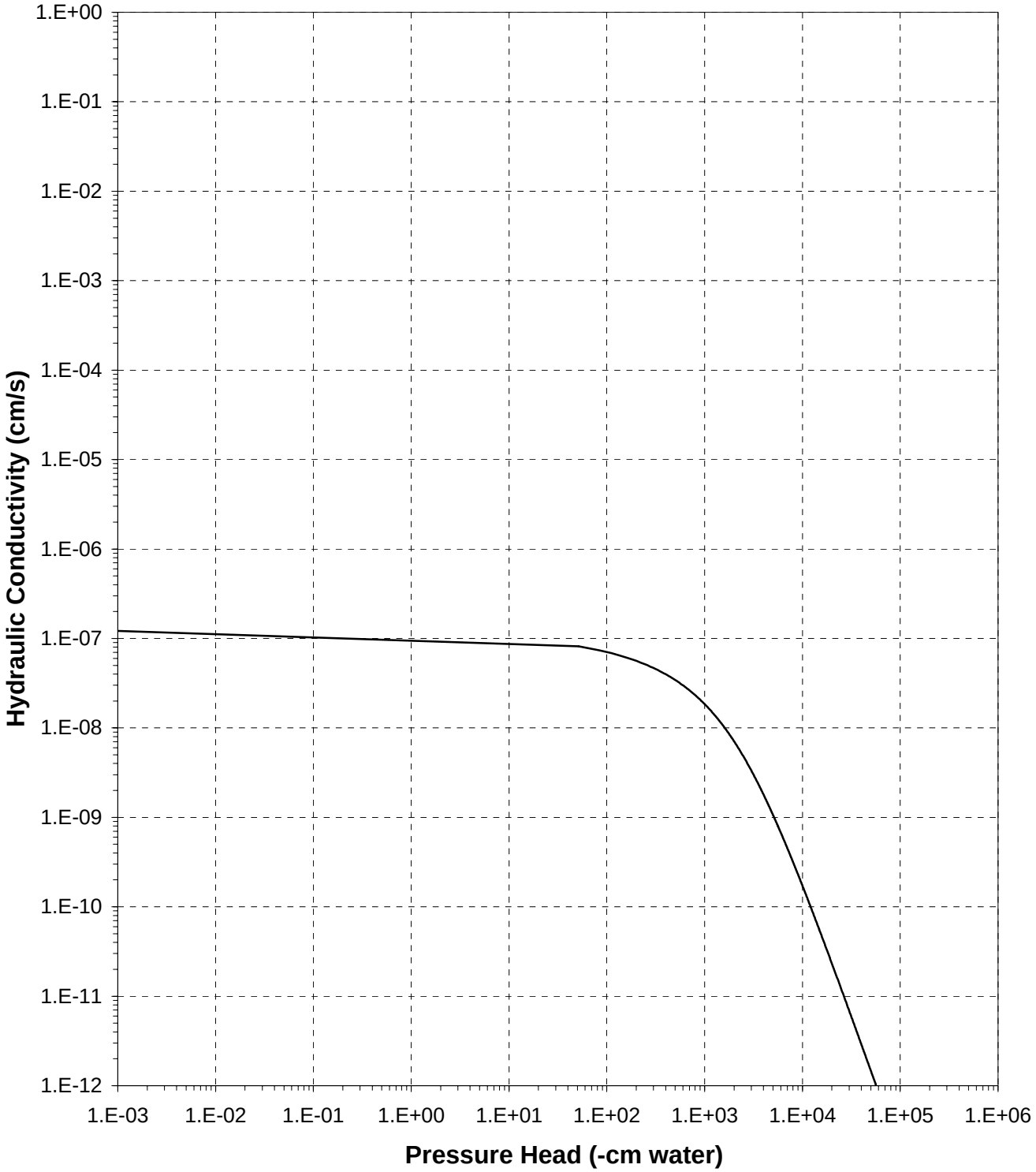
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (639-640)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (639-640)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (660-661)
Date Sampled: NA
Depth: 660-661

Dry wt. of sample (g): 177.67
Tare wt., ring (g): 190.37
Tare wt., screen & clamp (g): 31.92
Initial sample volume (cm^3): 120.67
Initial dry bulk density (g/cm^3): 1.47
Measured particle density (g/cm^3): 2.66
Initial calculated total porosity (%): 44.70

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	8-Feb-12	14:25	453.90	0	44.70
	15-Feb-12	9:25	453.09	52.0	44.03
	22-Feb-12	10:25	452.71	151.0	43.71
Pressure plate:	7-Mar-12	10:45	452.60	337	43.62
	21-Mar-12	8:25	452.12	1275	43.22

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	52.0	---	---	---	---
	151.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-13 (660-661)

Initial sample bulk density (g/cm^3)*:* 1.47
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 157.59
Tare weight, jar (g)*:* 124.12

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	23-Mar-12	12:30	163.10	10402	24.24
	16-Mar-12	13:13	160.92	46503	14.65
	13-Mar-12	10:40	159.89	197841	10.12

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	10402	---	---	---	---
	46503	---	---	---	---
	197841	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 67.81
Tare weight (g)*:* 41.74

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	6-Mar-12	9:30	69.07	855592	7.12

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

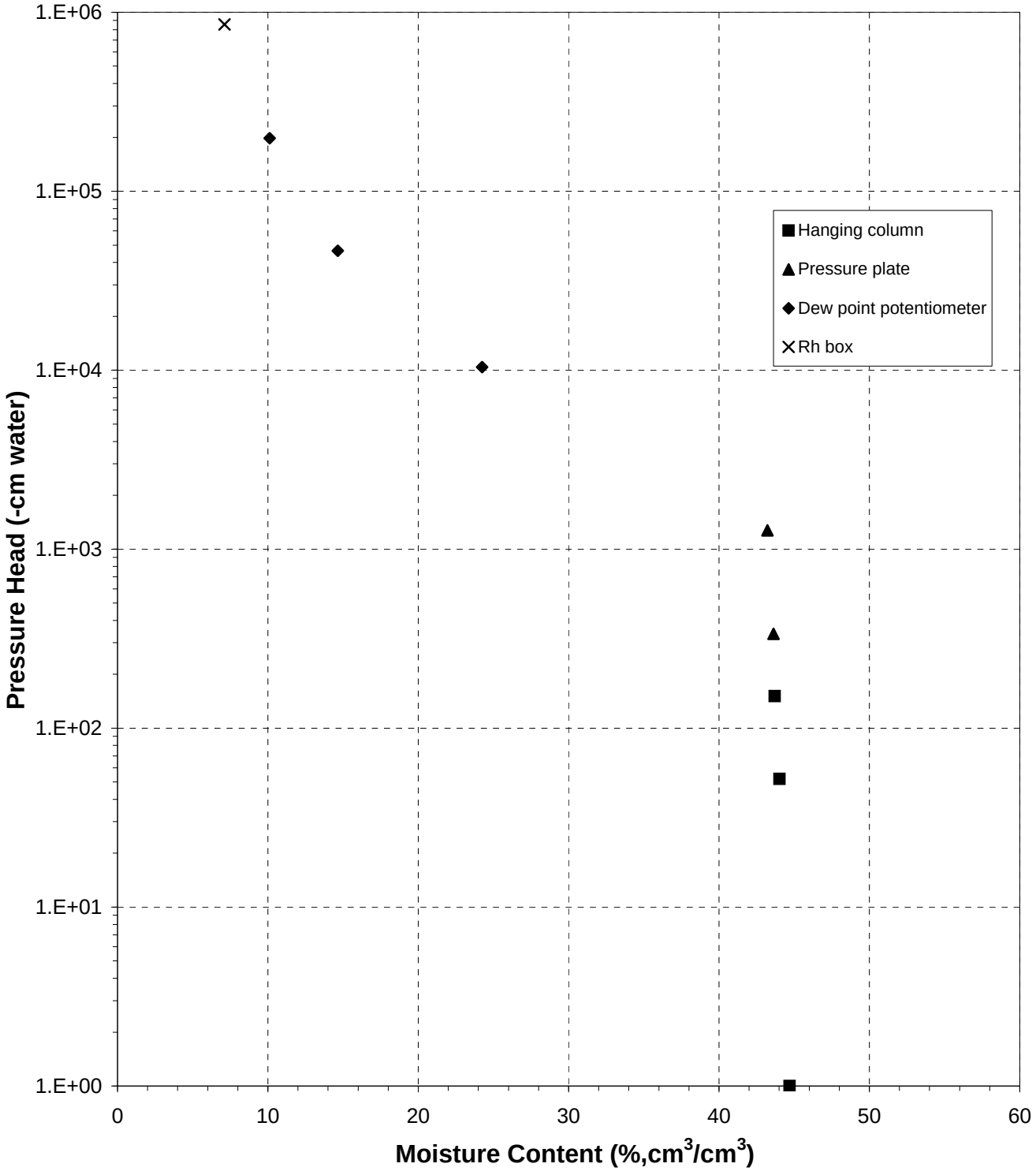
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

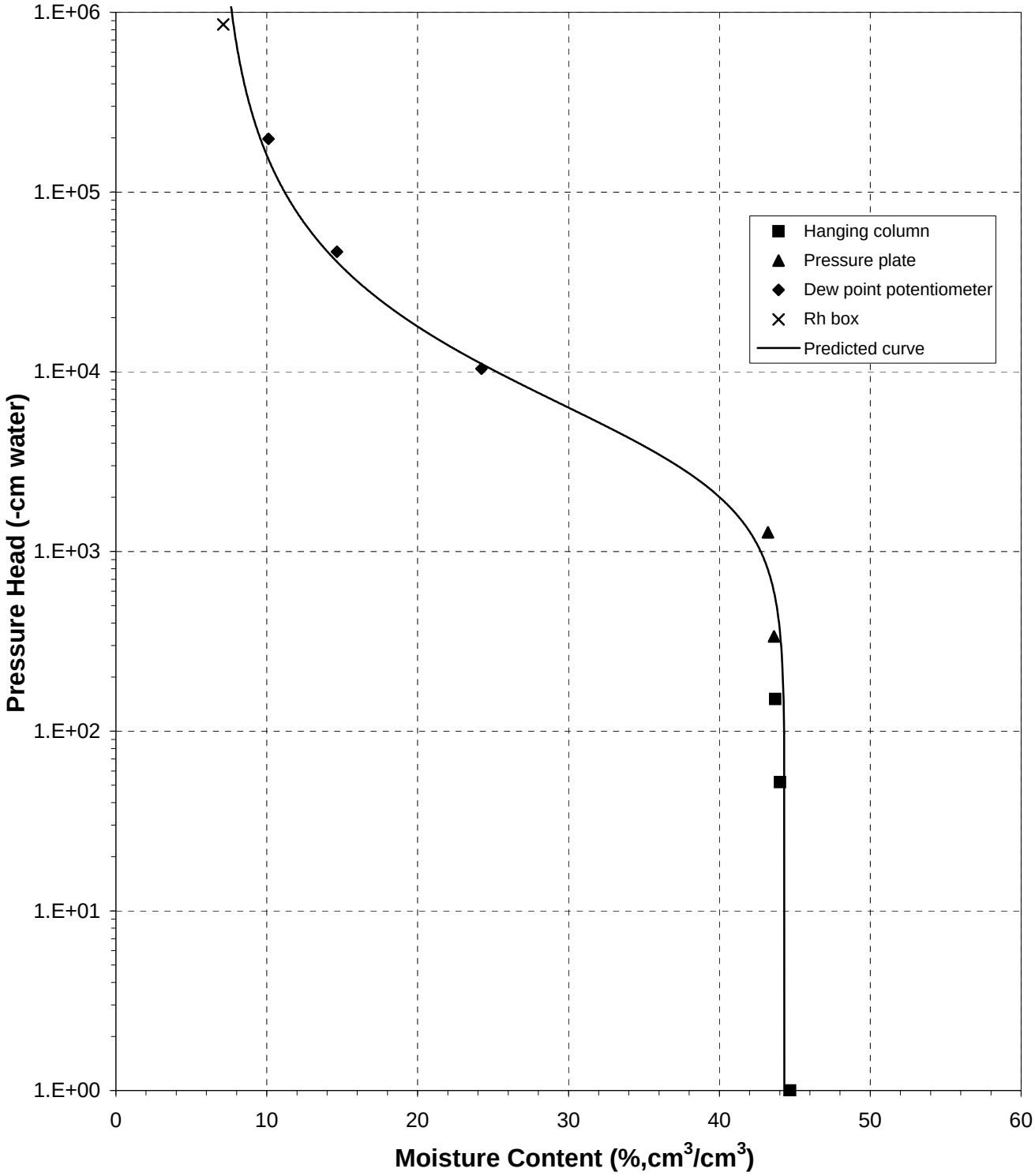
Water Retention Data Points

Sample Number: PB-13 (660-661)



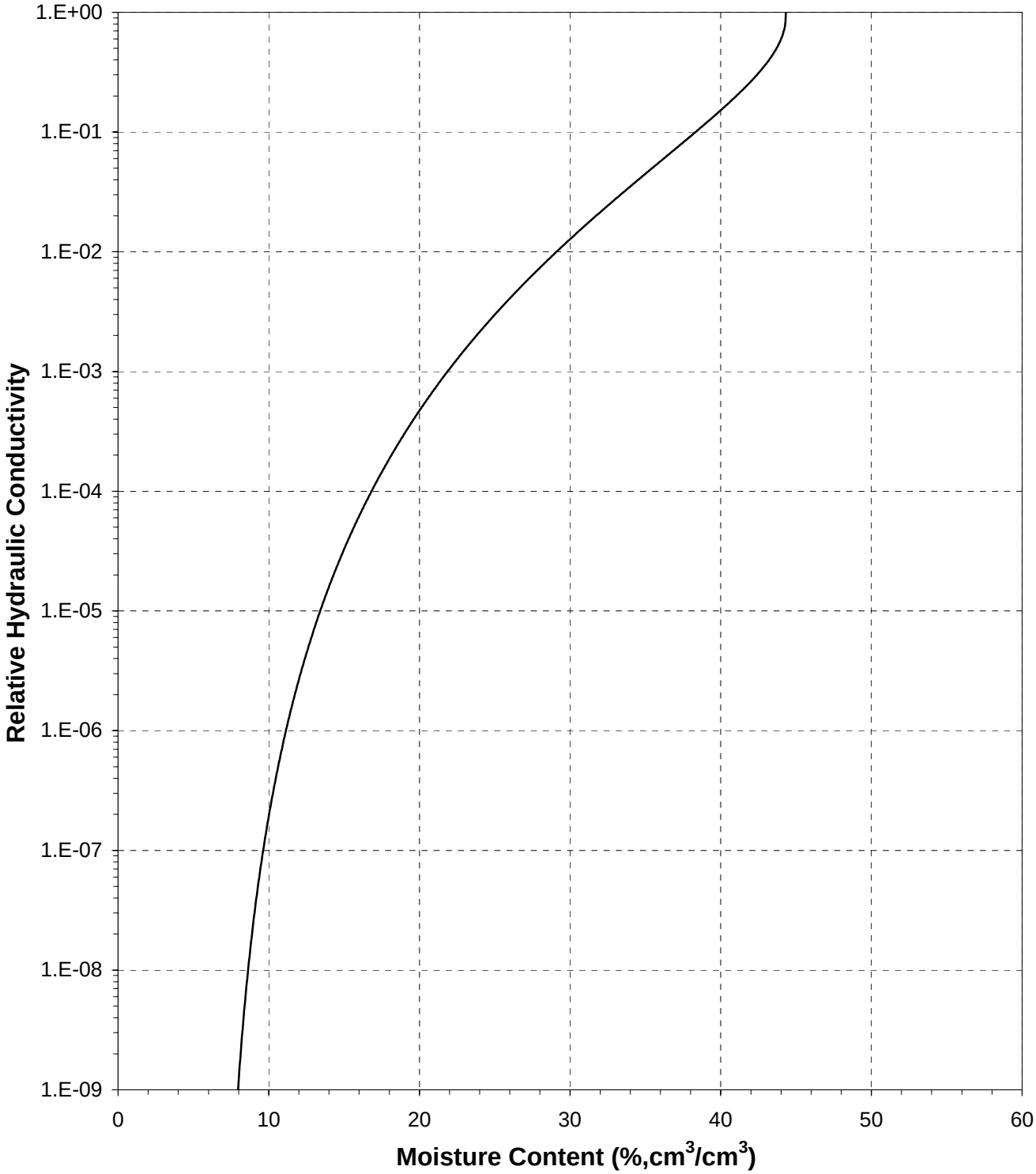
Predicted Water Retention Curve and Data Points

Sample Number: PB-13 (660-661)



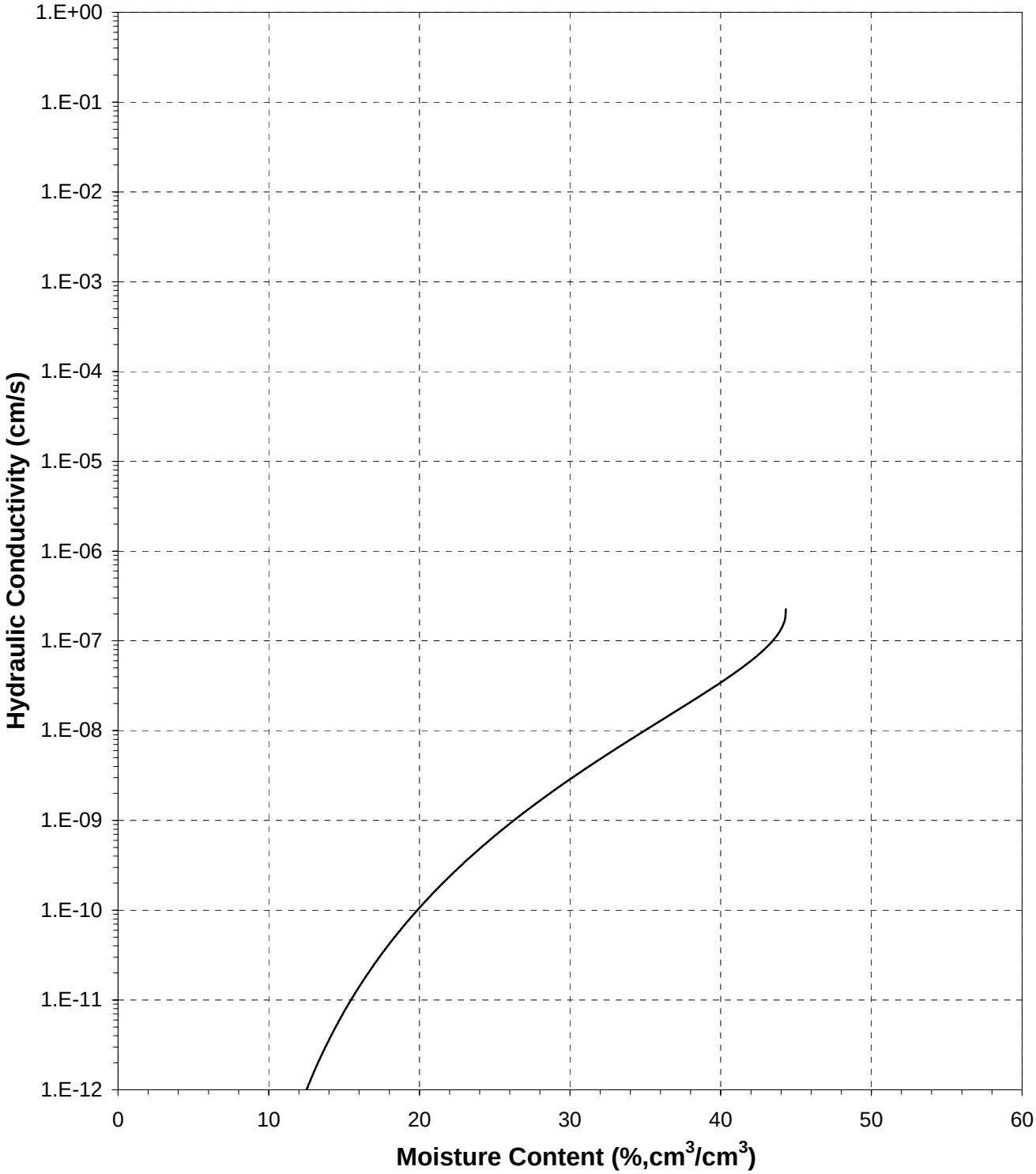
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (660-661)



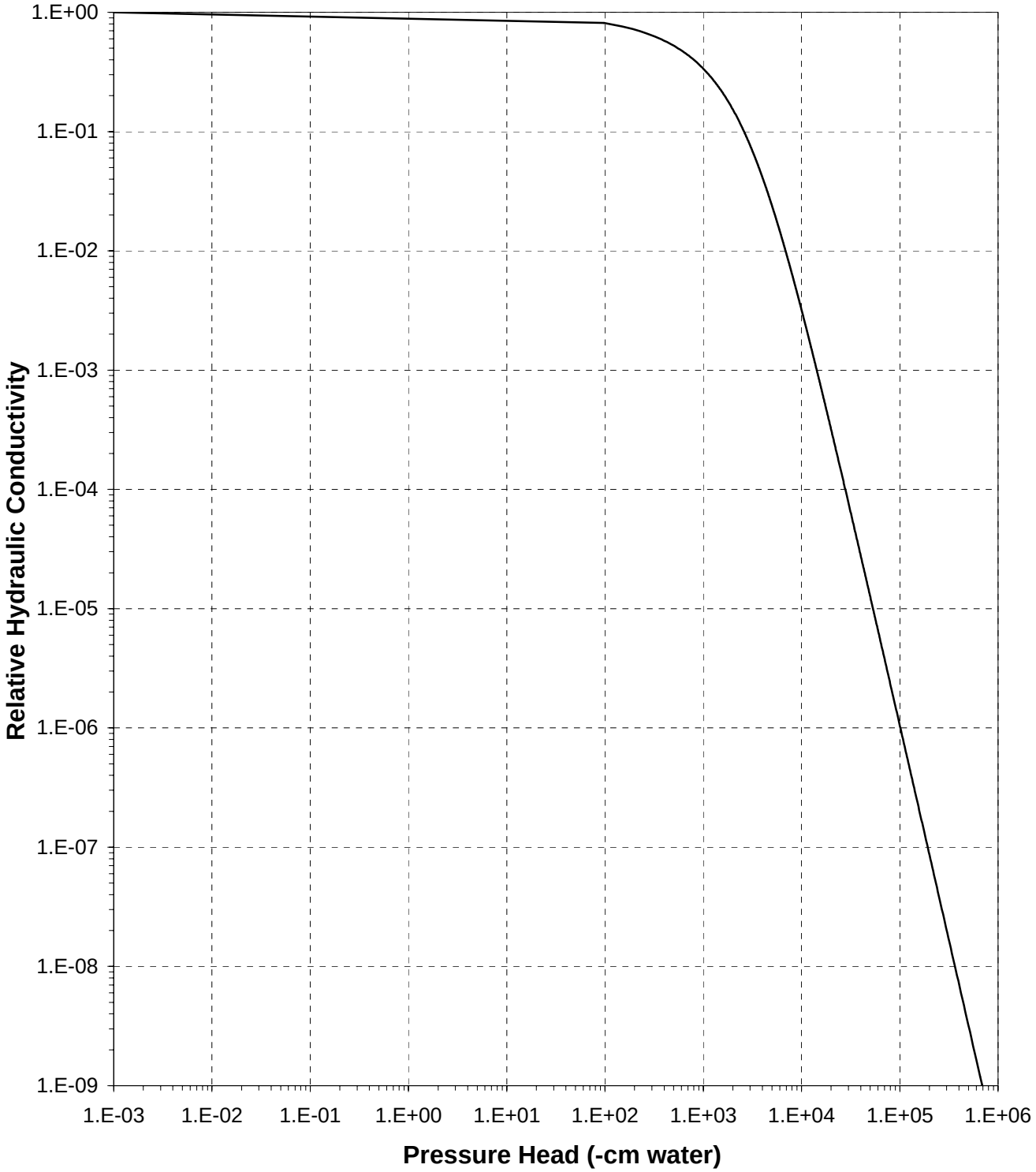
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-13 (660-661)



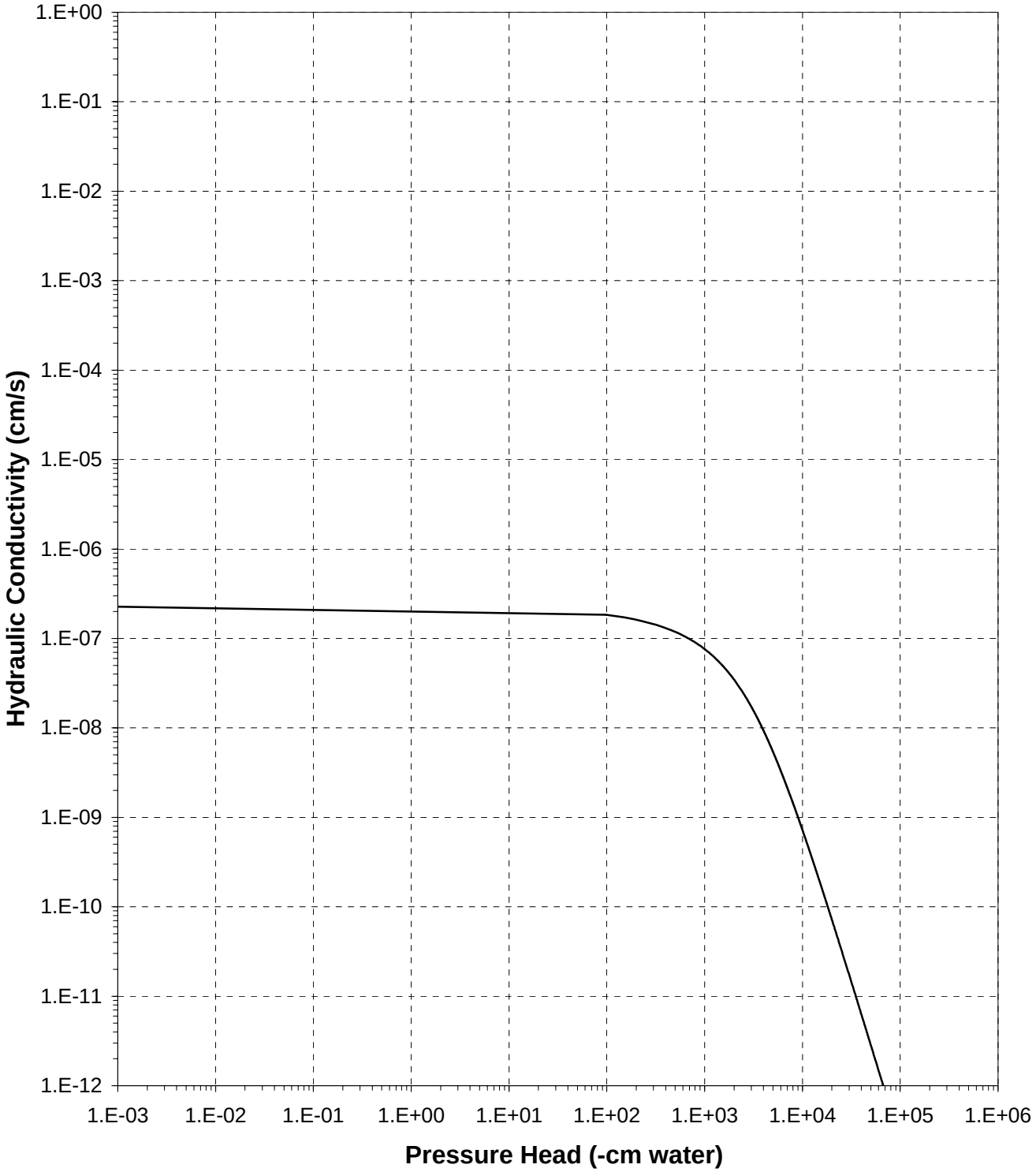
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (660-661)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-13 (660-661)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (294-295)
Date Sampled: 12/8/2011
Depth: 294-295

Dry wt. of sample (g): 85.85
Tare wt., ring (g): 37.54
Tare wt., screen & clamp (g): 25.33
Initial sample volume (cm^3): 62.16
Initial dry bulk density (g/cm^3): 1.38
Measured particle density (g/cm^3): 2.72
Initial calculated total porosity (%): 49.15

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	26-Jan-12	14:30	179.27	0	49.15
	2-Feb-12	14:30	177.91	16.0	46.96
	9-Feb-12	11:00	177.46	50.0	46.23
	16-Feb-12	10:20	177.22	127.0	45.85
Pressure plate:	27-Feb-12	9:10	176.89	337	45.32

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	50.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (294-295)

Initial sample bulk density (g/cm^3)*:* 1.38
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 137.83
Tare weight, jar (g)*:* 113.25

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	5-Mar-12	12:22	141.91	12442	22.92
	27-Feb-12	11:00	140.87	32226	17.08
	23-Feb-12	10:55	139.63	243222	10.11

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	12442	---	---	---	---
	32226	---	---	---	---
	243222	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 62.91
Tare weight (g)*:* 38.34

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	24-Feb-12	9:30	64.33	852726	7.97

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	852726	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

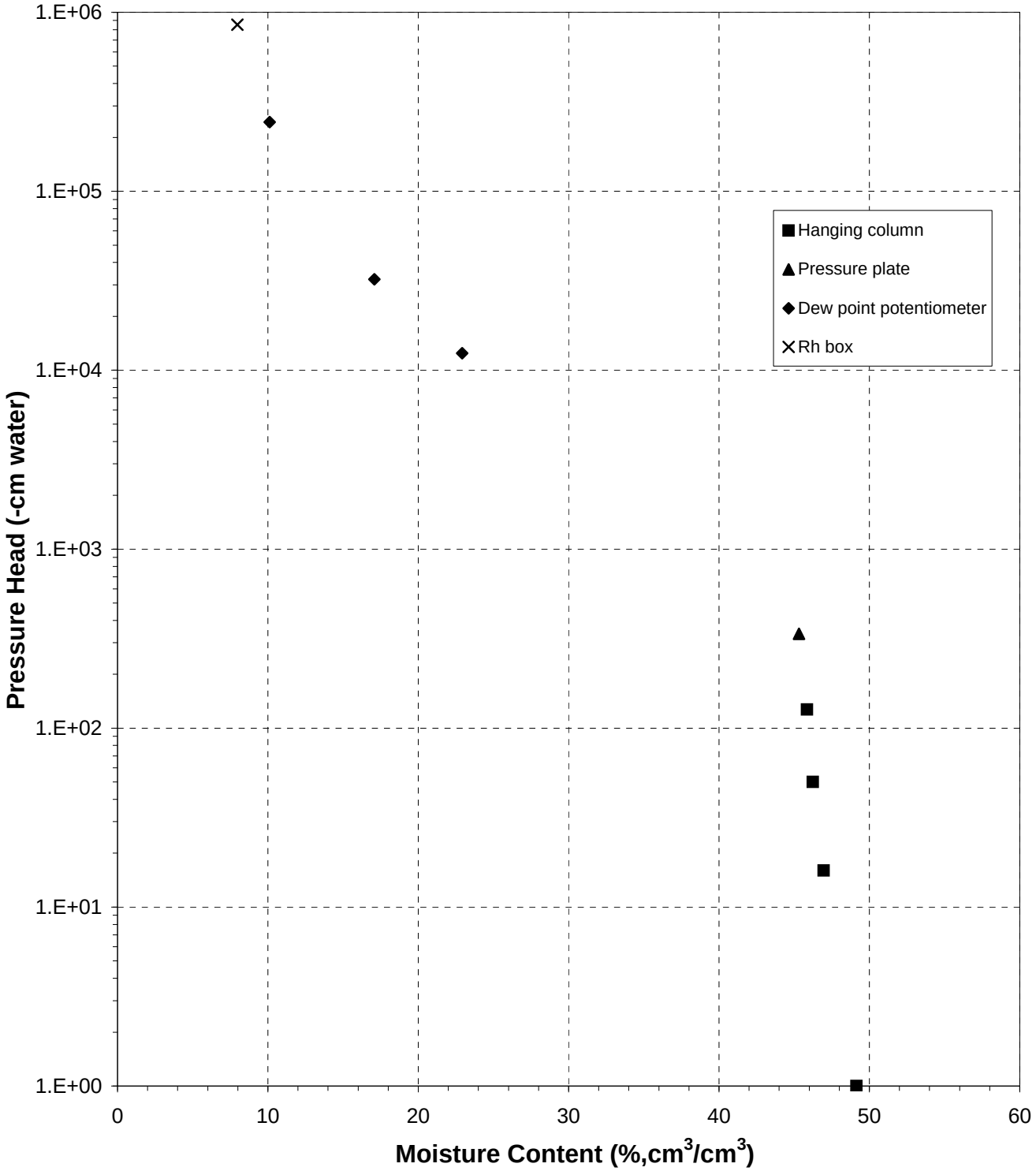
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/ C. Krous/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

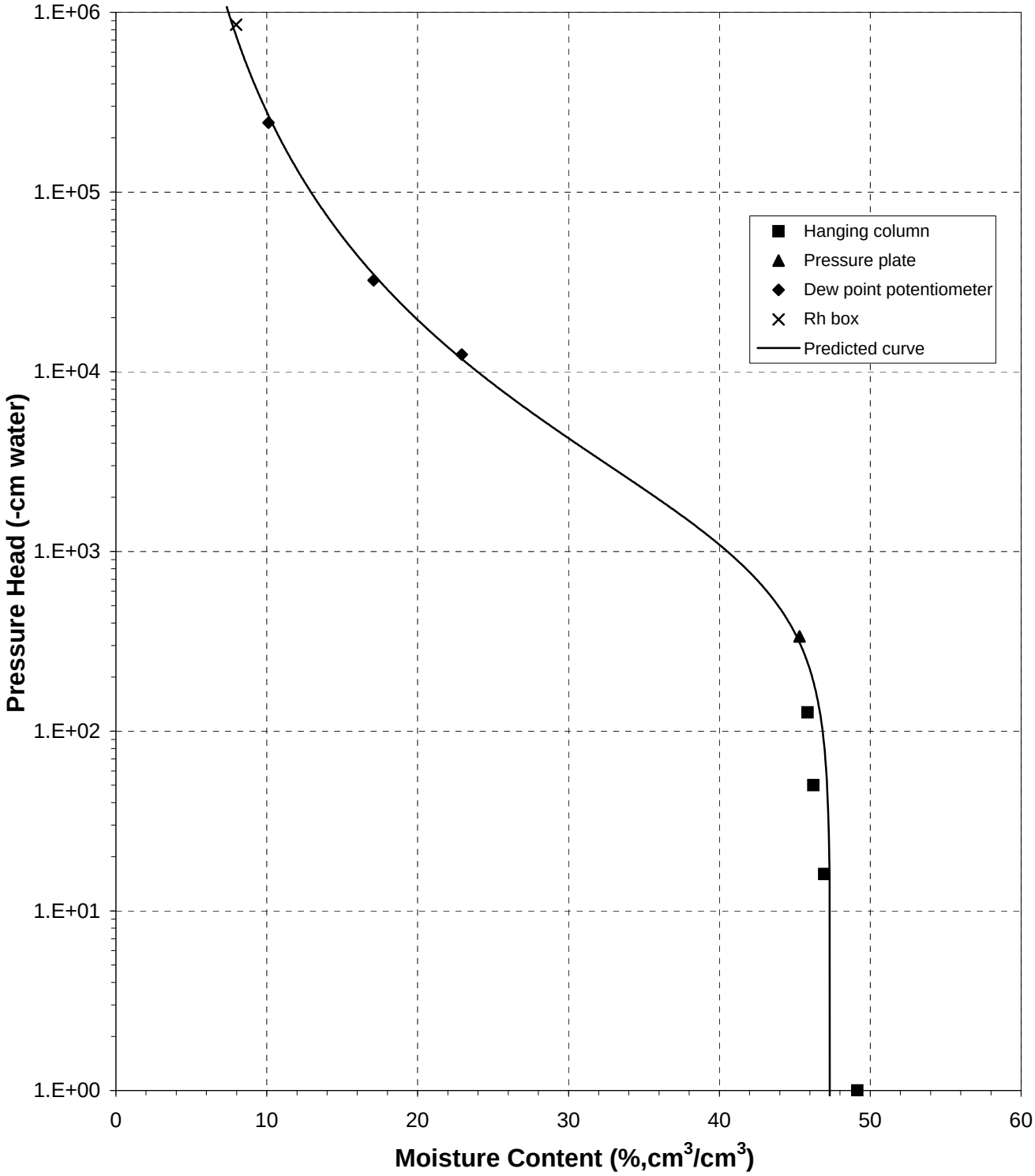
Water Retention Data Points

Sample Number: PB-14 (294-295)



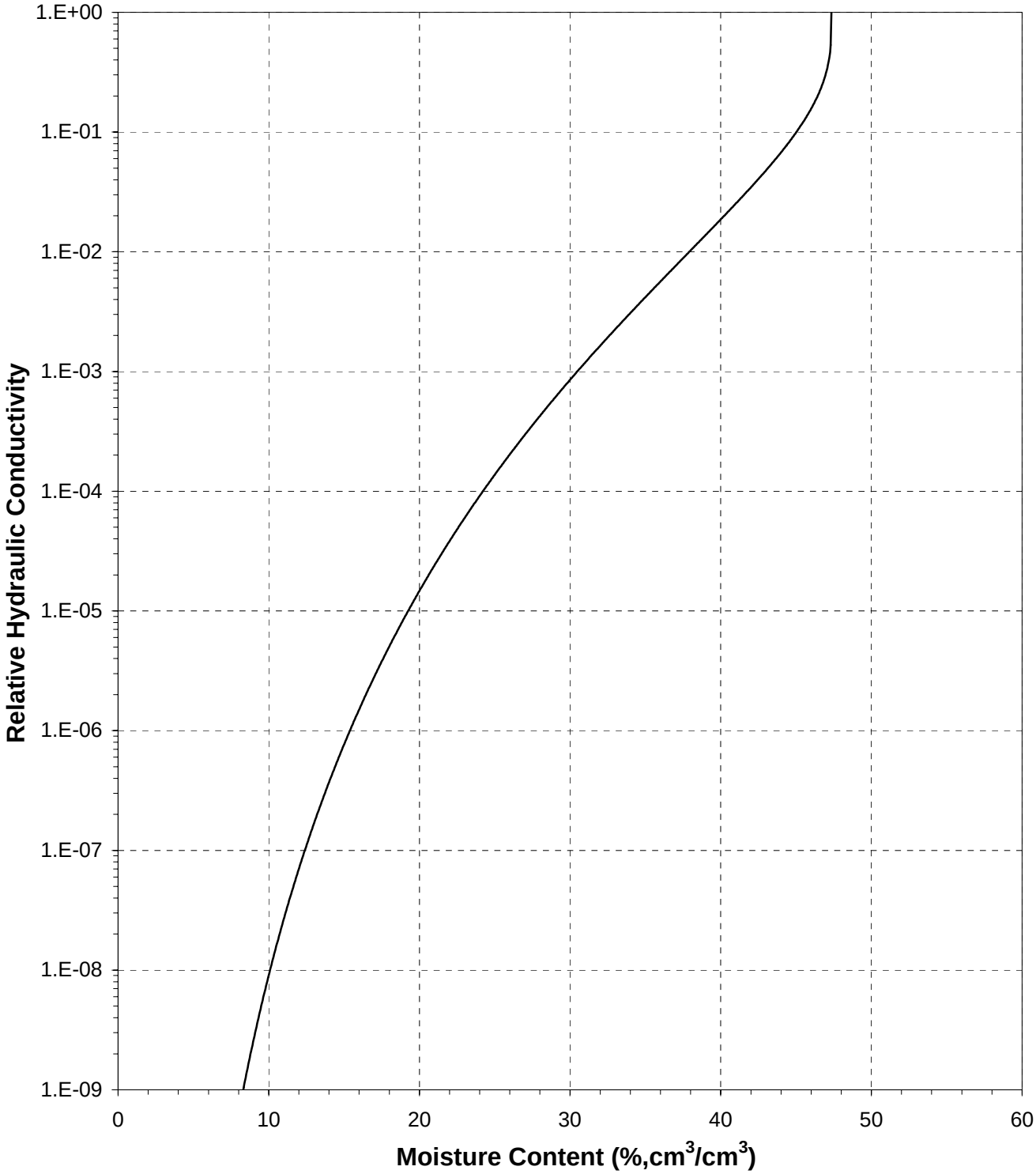
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (294-295)



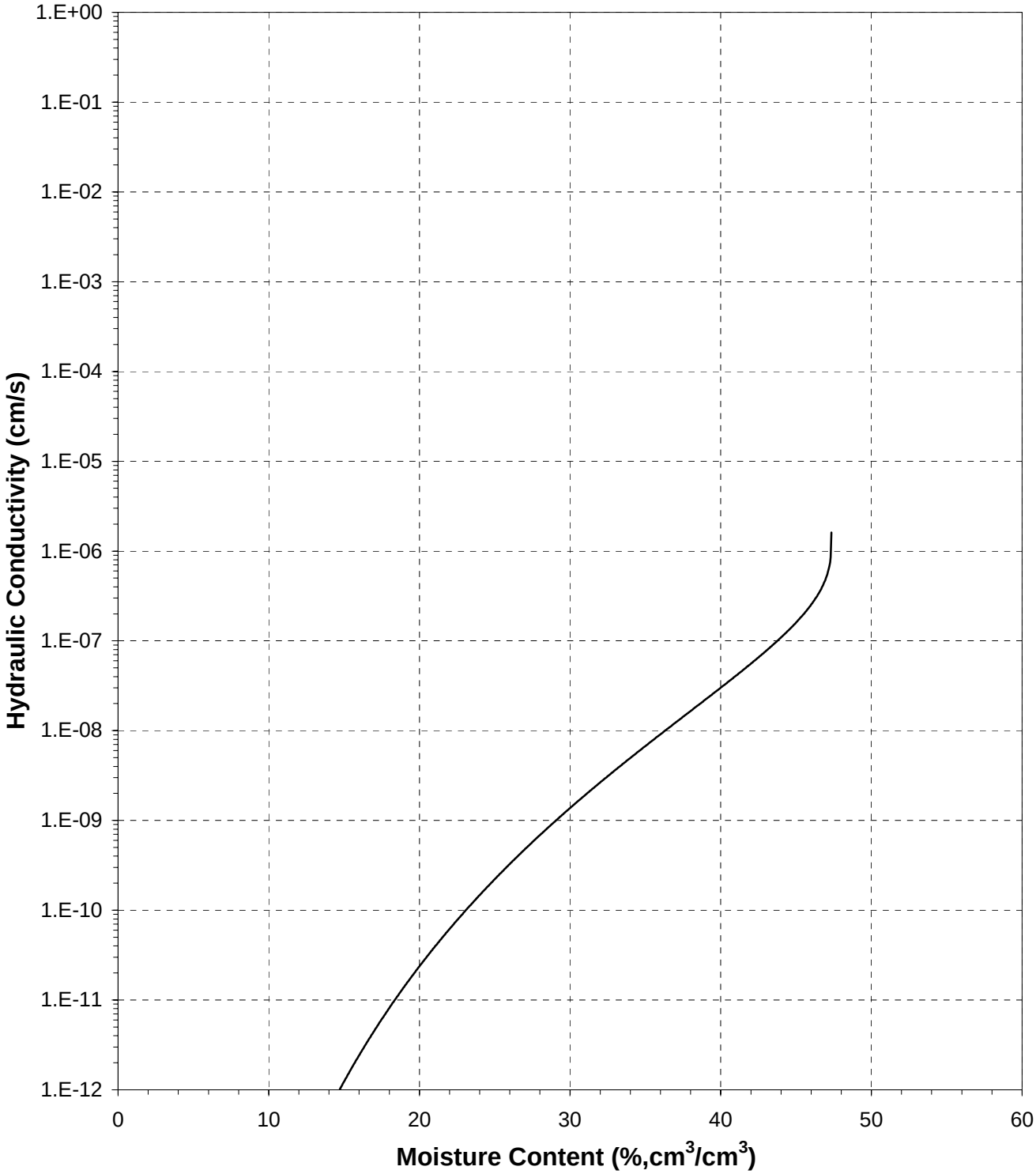
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (294-295)



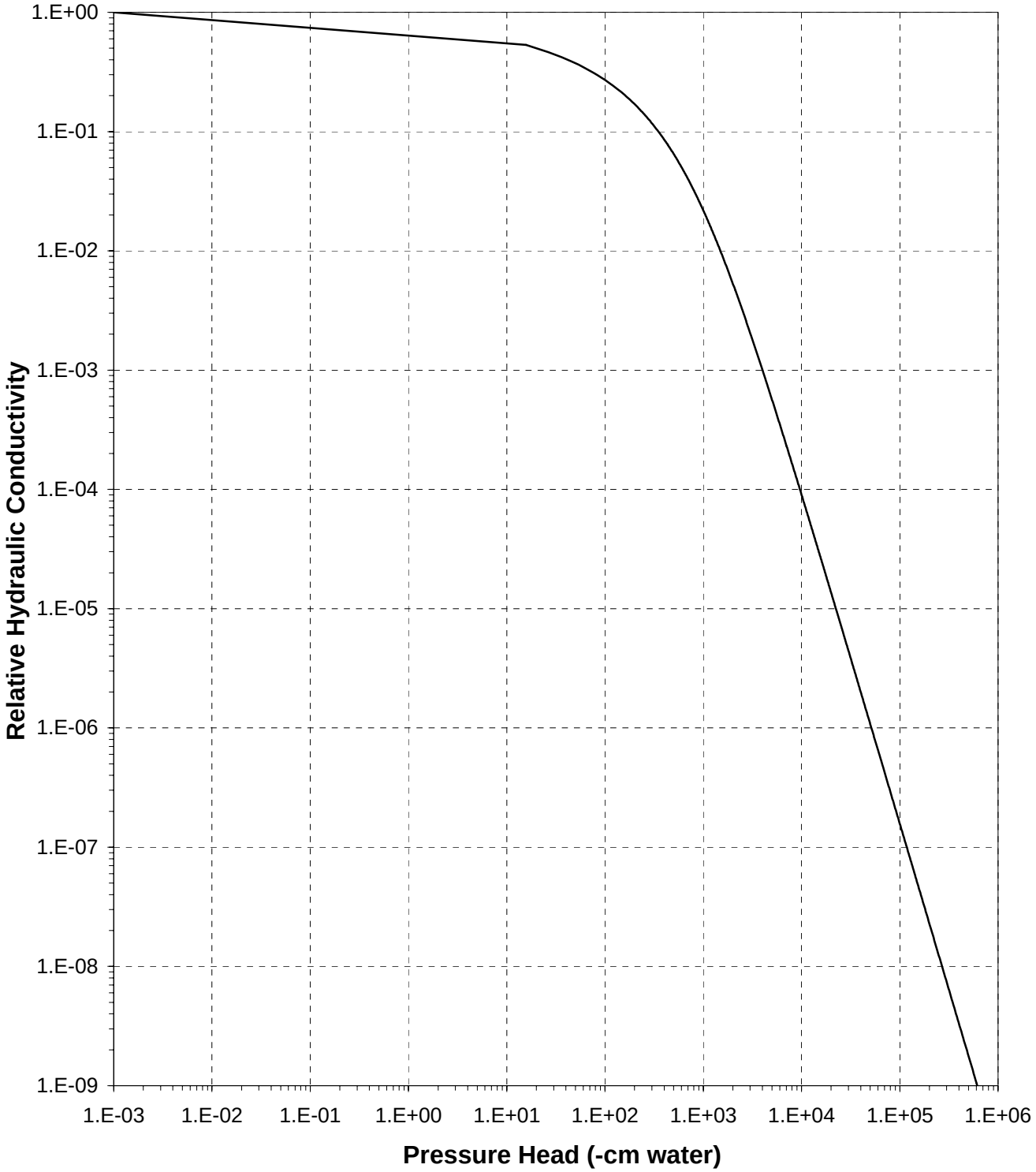
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (294-295)



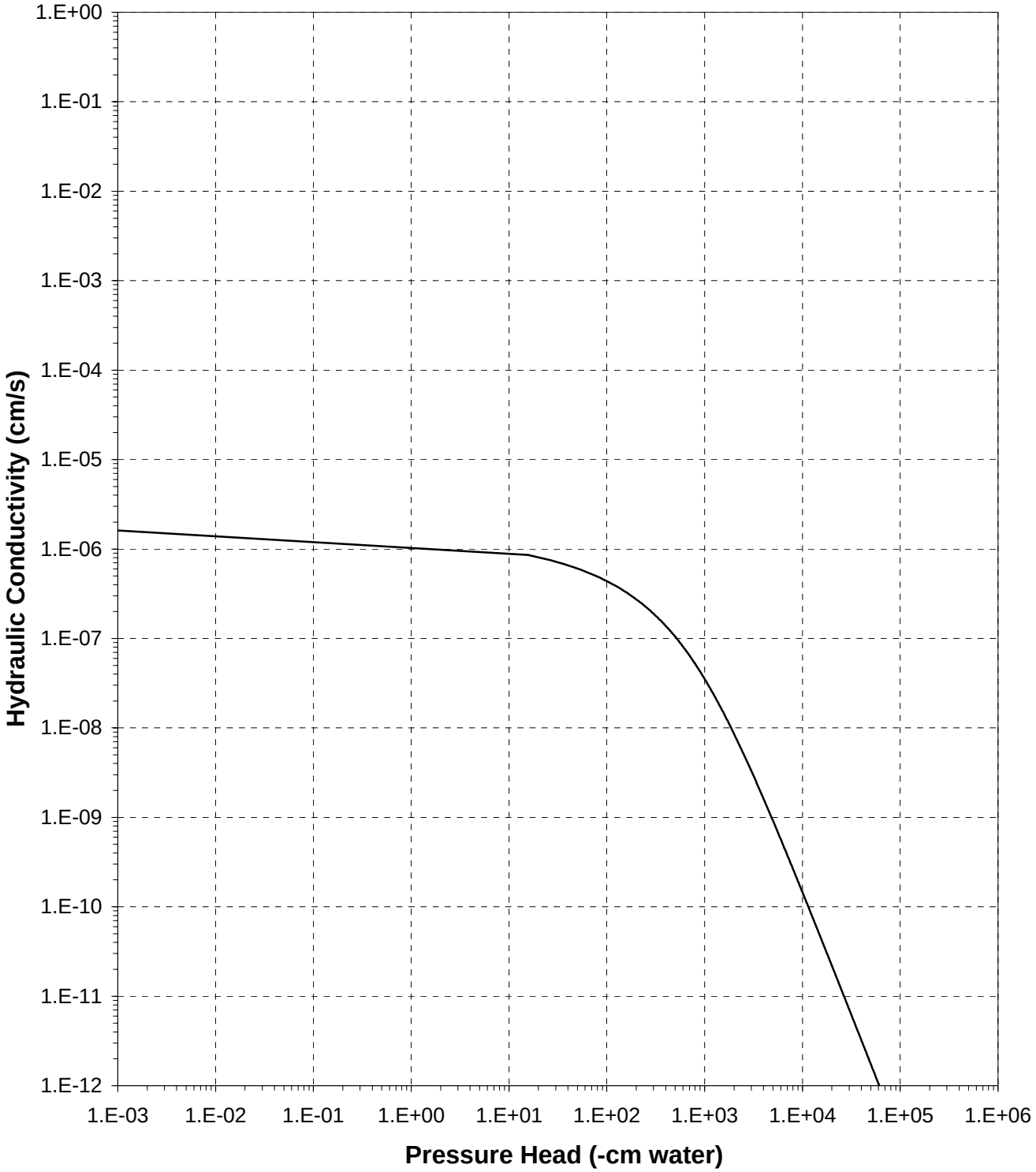
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (294-295)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (294-295)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (304-305)
Date Sampled: 12/8/2011
Depth: 304-305

Dry wt. of sample (g): 154.78
Tare wt., ring (g): 66.63
Tare wt., screen & clamp (g): 29.56
Initial sample volume (cm^3): 112.48
Initial dry bulk density (g/cm^3): 1.38
Measured particle density (g/cm^3): 2.68
Initial calculated total porosity (%): 48.74

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	26-Jan-12	14:40	305.79	0	48.74
	2-Feb-12	14:40	304.88	16.0	47.93
	9-Feb-12	10:55	303.67	50.0	46.85
	16-Feb-12	10:25	303.13	127.0	46.37
Pressure plate:	27-Feb-12	9:15	293.11	337	37.47

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	50.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (304-305)

Initial sample bulk density (g/cm^3)*:* 1.38
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 147.89
Tare weight, jar (g)*:* 117.62

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Dew point potentiometer:	4-Apr-12	10:20	152.29	23965	20.00
	3-Apr-12	17:28	151.34	48237	15.68
	3-Apr-12	14:50	150.40	225988	11.41

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	23965	---	---	---	---
	48237	---	---	---	---
	225988	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 65.03
Tare weight (g)*:* 38.34

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	2-Mar-12	8:30	66.73	854159	8.78

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

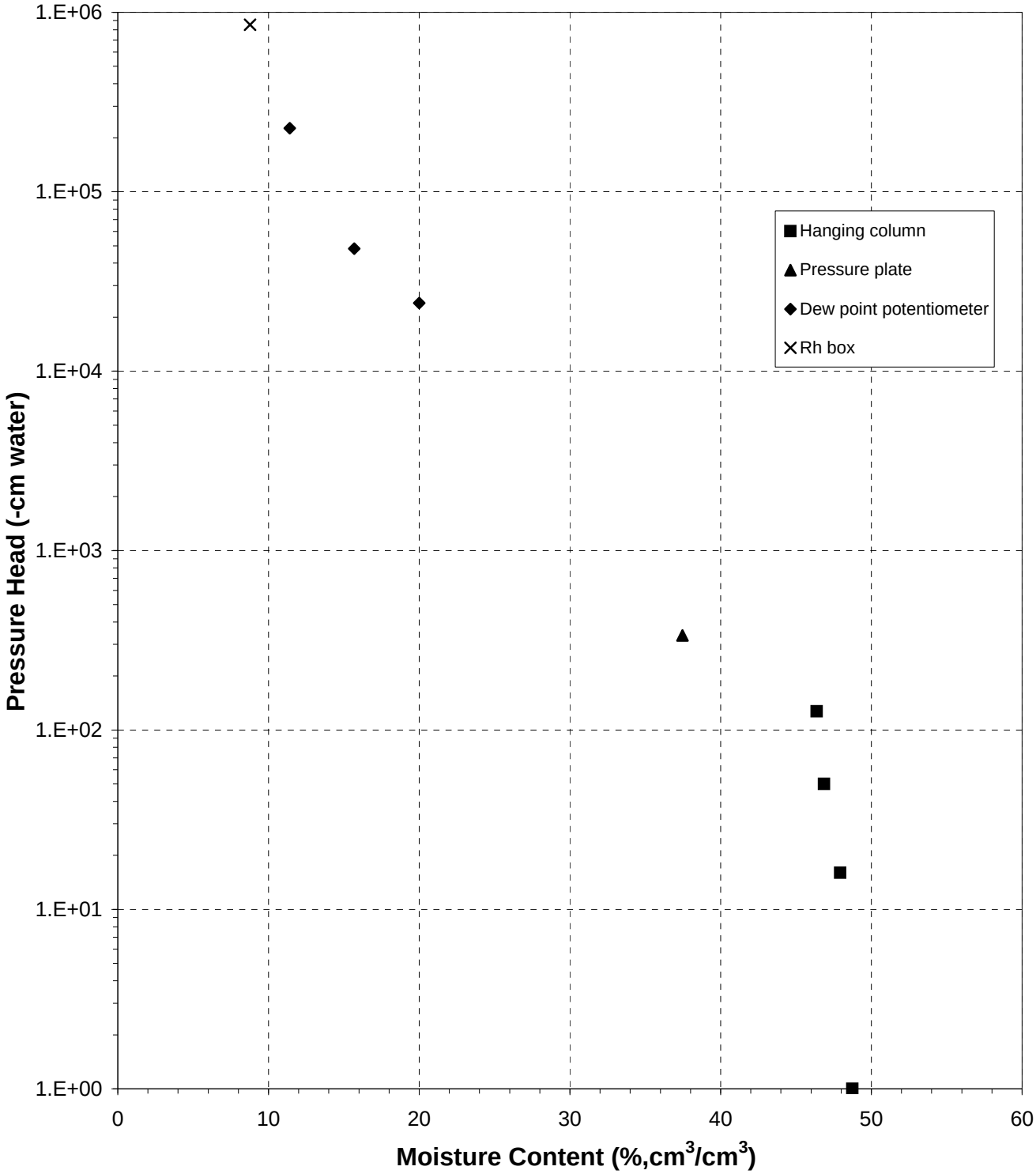
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

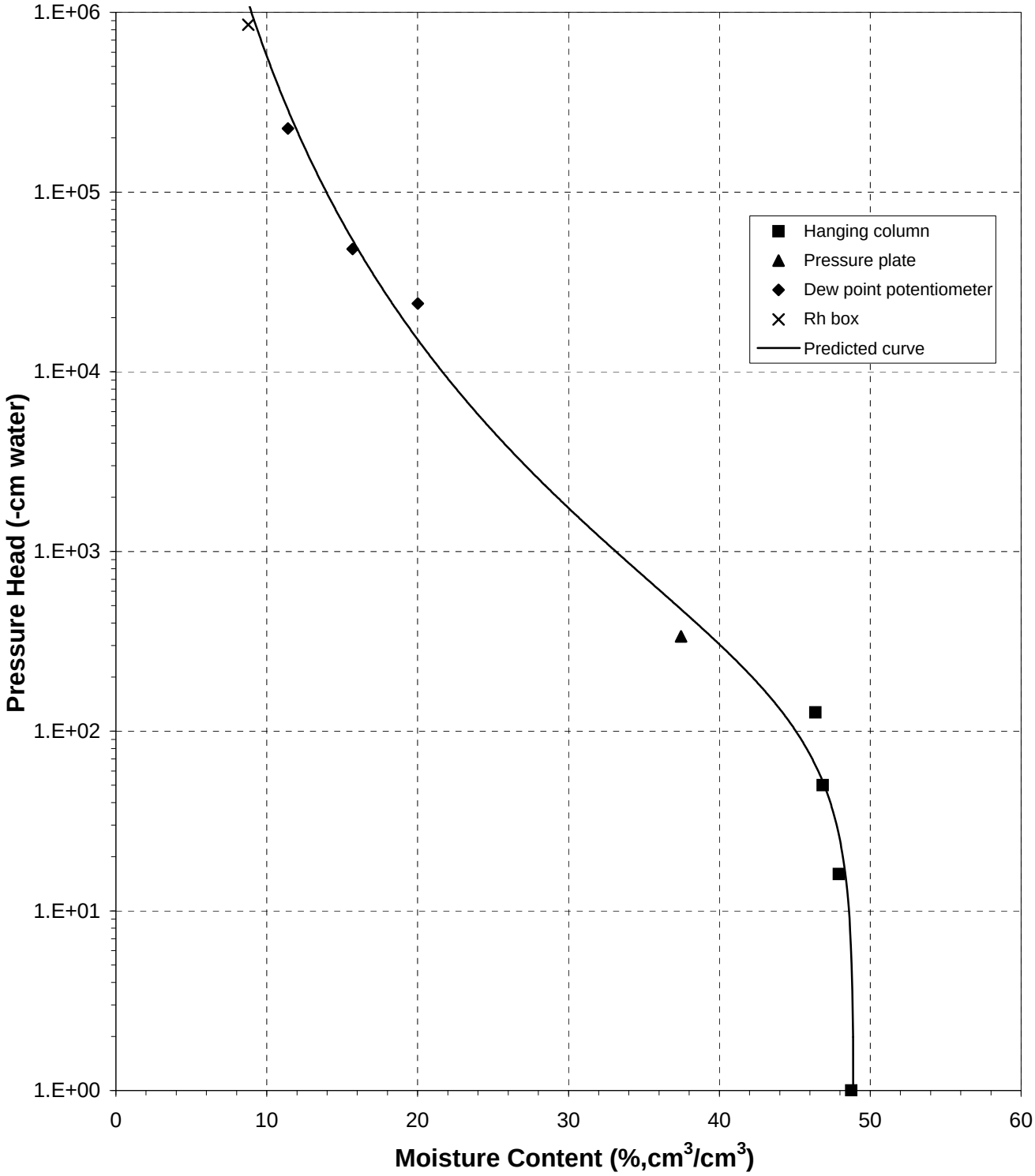
Water Retention Data Points

Sample Number: PB-14 (304-305)



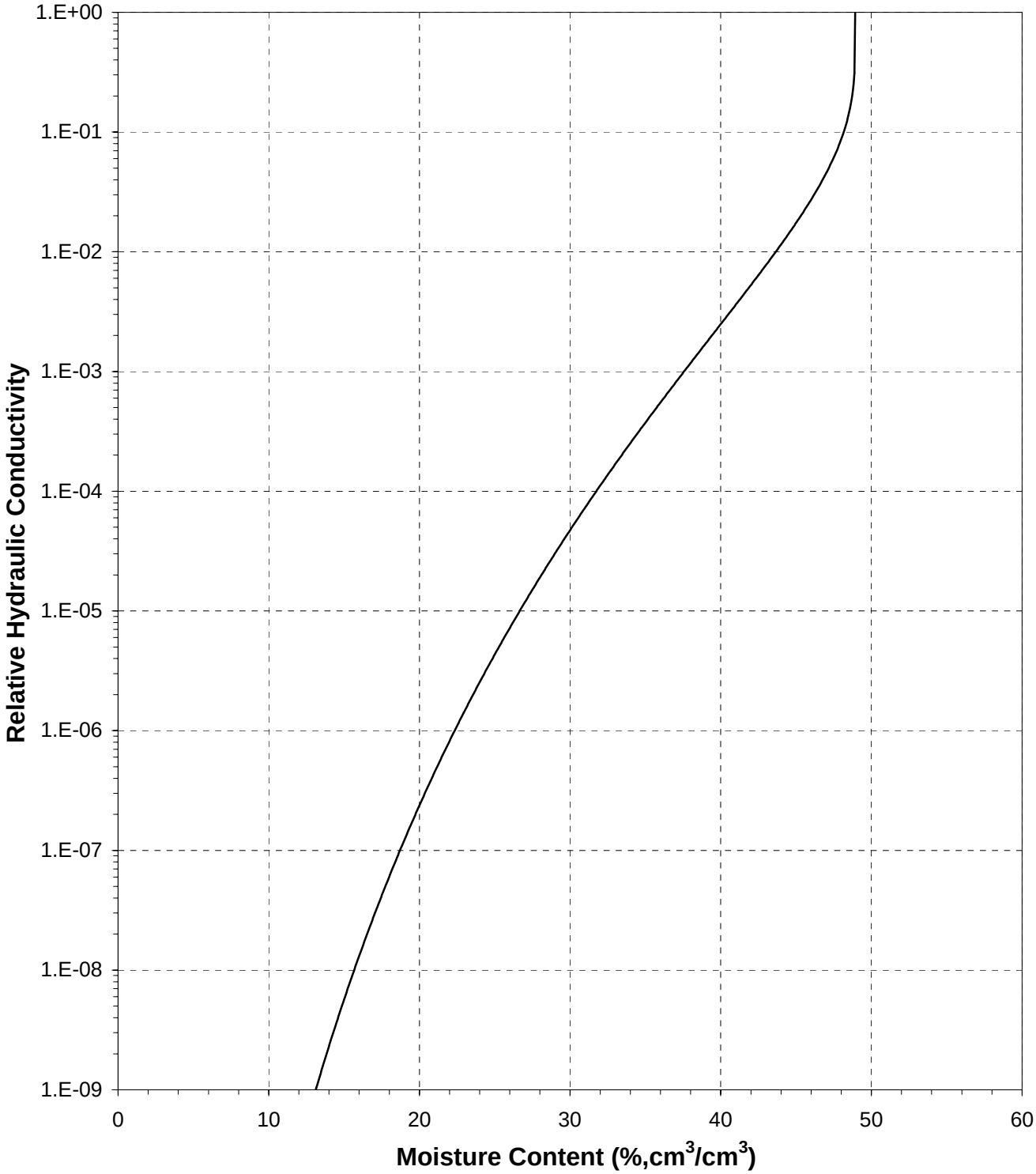
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (304-305)



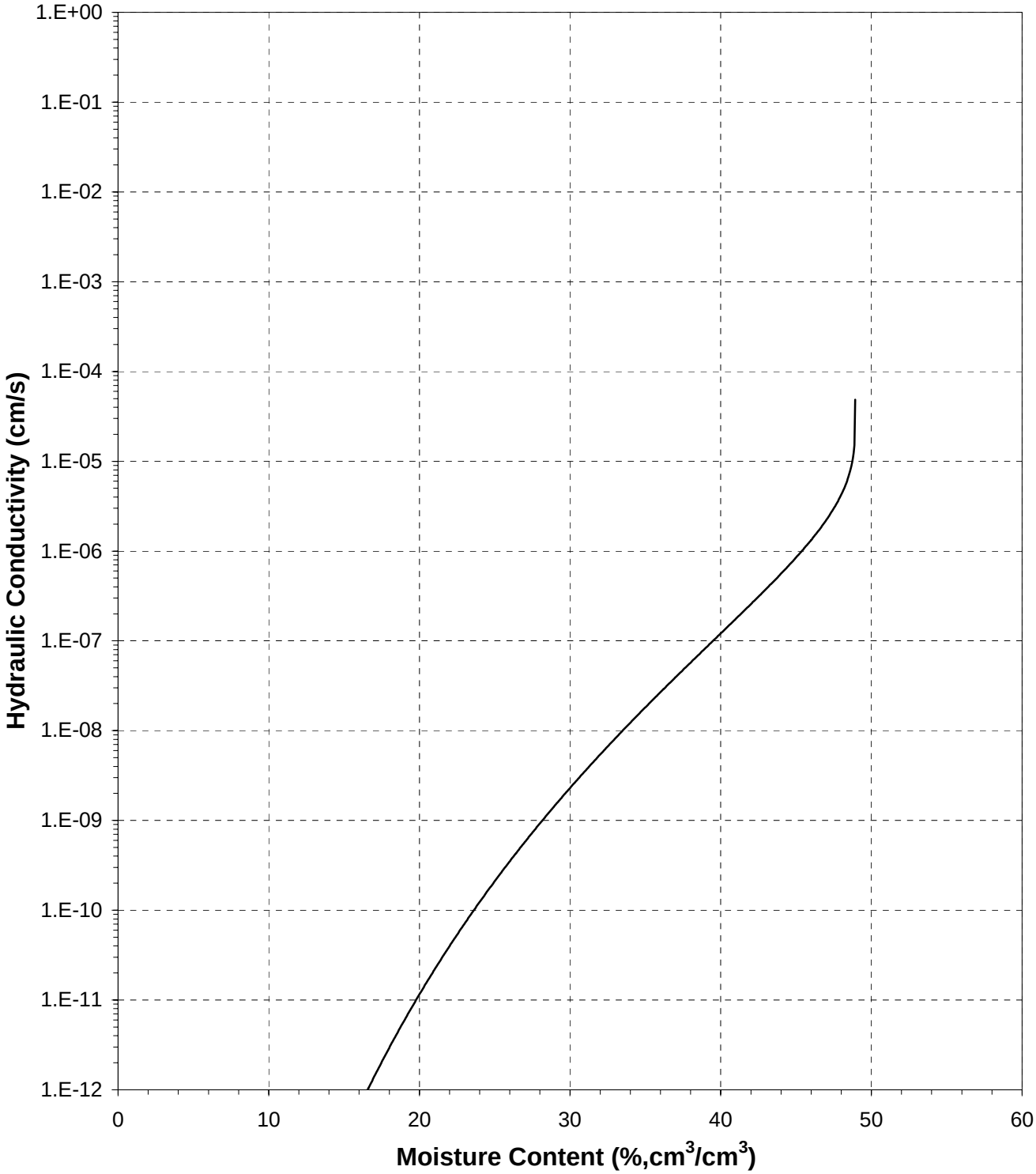
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (304-305)



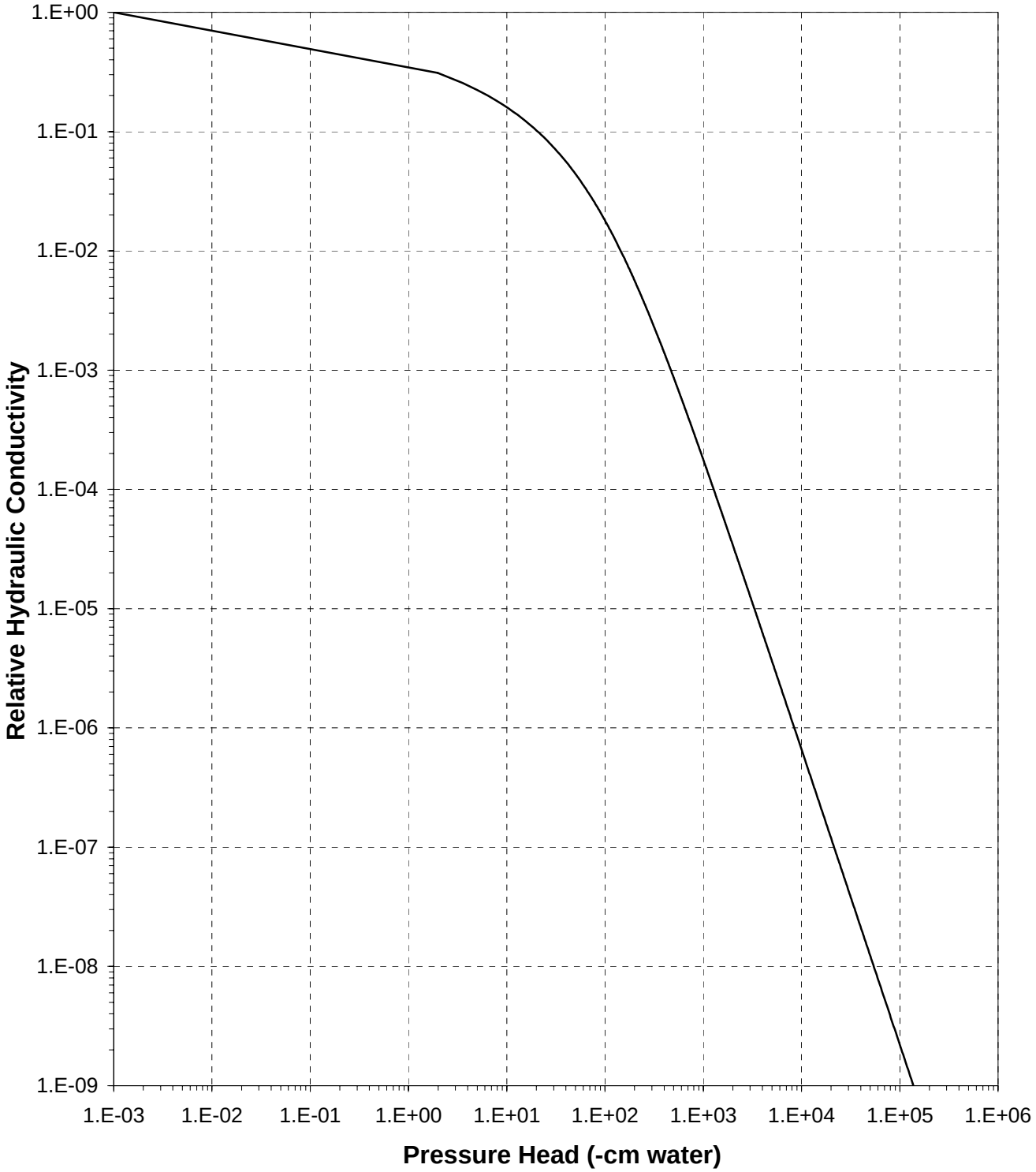
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (304-305)



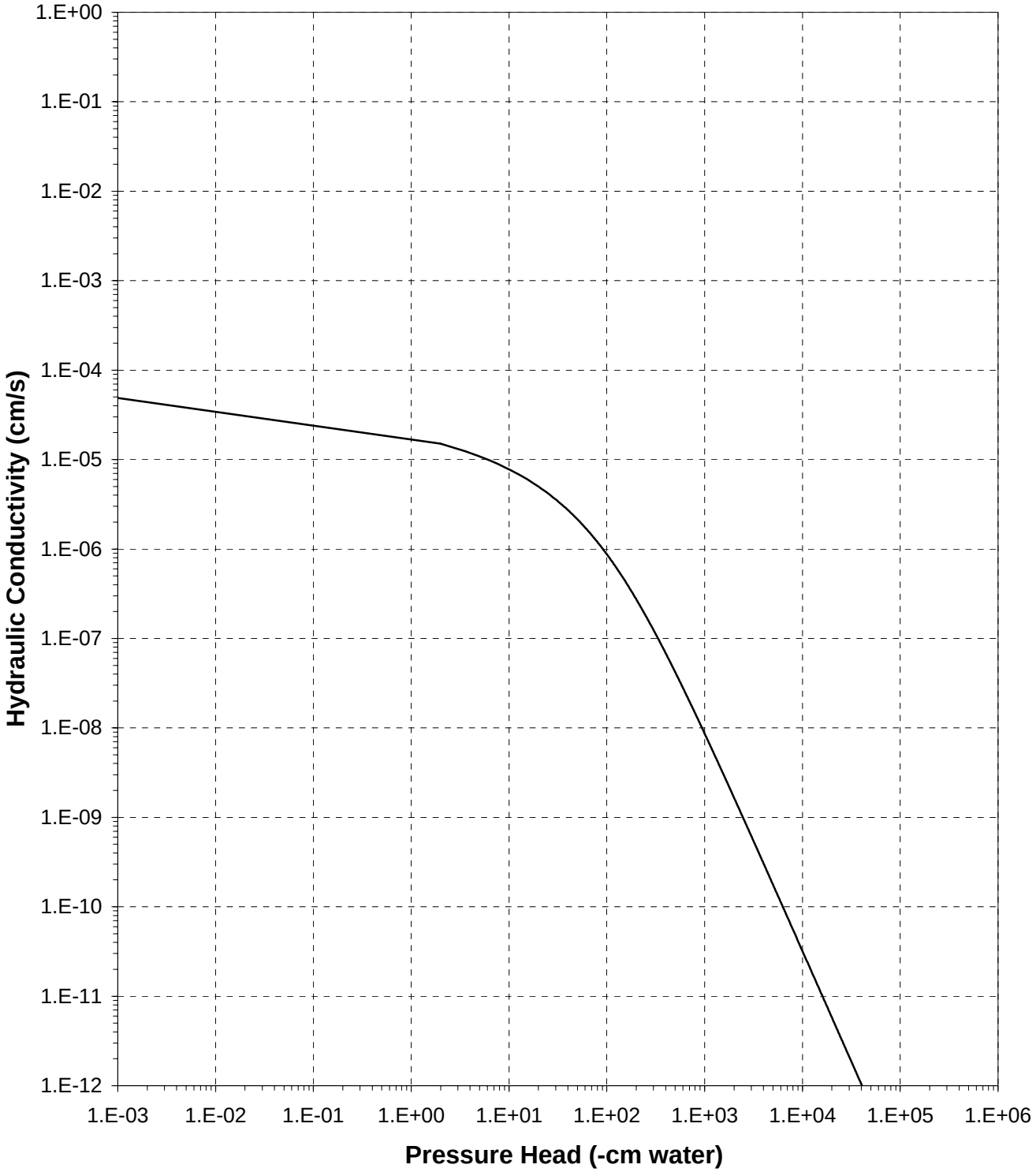
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (304-305)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (304-305)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (532-533)
Date Sampled: 12/8/2011
Depth: 532-533

Dry wt. of sample (g): 140.36
Tare wt., ring (g): 57.53
Tare wt., screen & clamp (g): 28.01
Initial sample volume (cm^3): 100.92
Initial dry bulk density (g/cm^3): 1.39
Measured particle density (g/cm^3): 2.67
Initial calculated total porosity (%): 47.88

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	26-Jan-12	15:10	274.22	0	47.88
	2-Feb-12	14:15	272.16	12.0	45.84
	9-Feb-12	9:10	271.81	31.0	45.49
	16-Feb-12	9:55	271.18	99.0	44.87
Pressure plate:	27-Feb-12	8:55	269.30	337	43.01

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	12.0	---	---	---	---
	31.0	---	---	---	---
	99.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (532-533)

Initial sample bulk density (g/cm^3)*:* 1.39
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 150.88
Tare weight, jar (g)*:* 117.14

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	4-Apr-12	15:50	155.25	19886	18.01
	4-Apr-12	11:07	153.81	57007	12.08
	5-Apr-12	12:52	153.26	231393	9.81

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	19886	---	---	---	---
	57007	---	---	---	---
	231393	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 72.20
Tare weight (g)*:* 47.61

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	22-Mar-12	8:30	73.54	854159	7.60

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

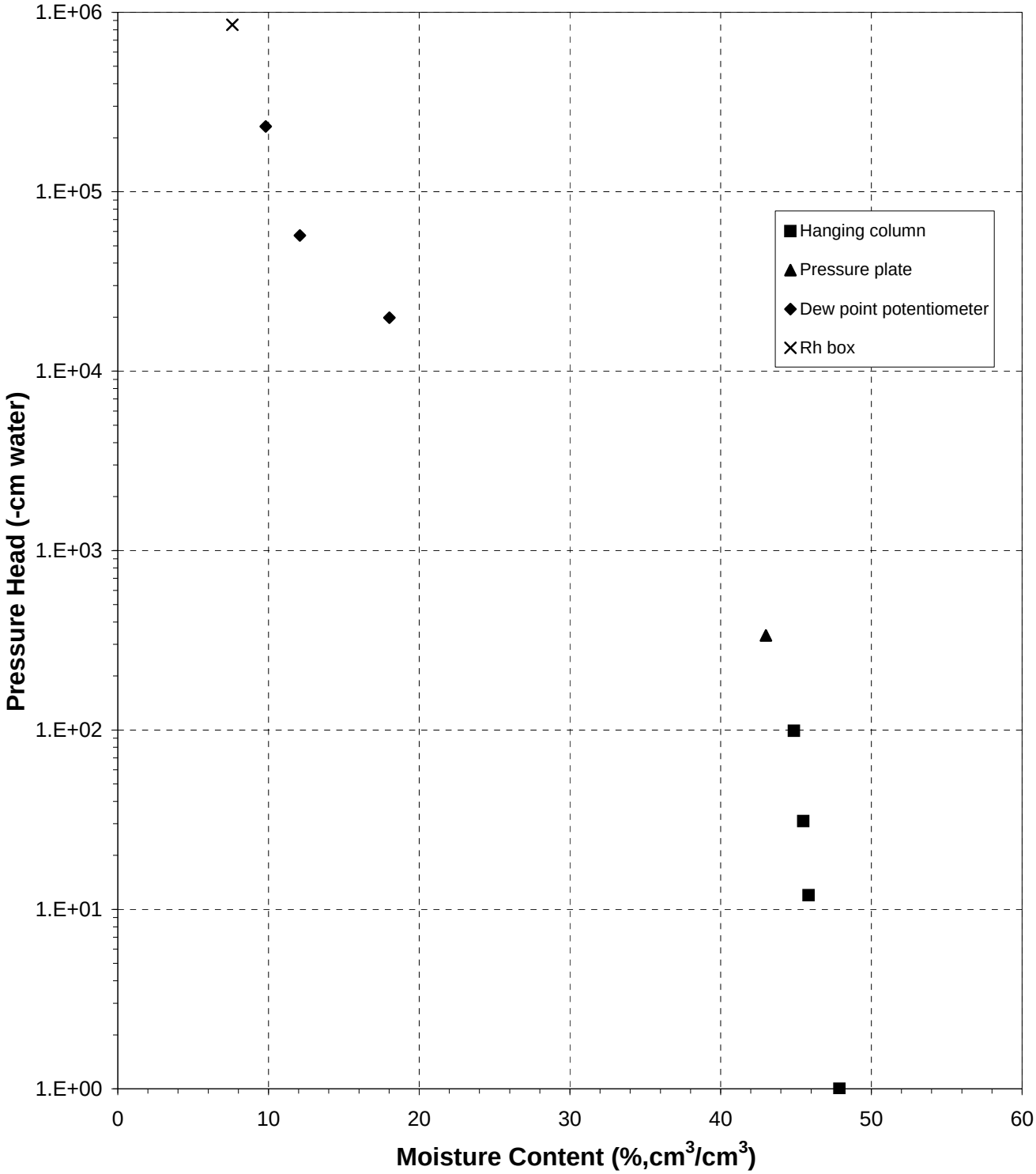
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: K. Wright/ C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

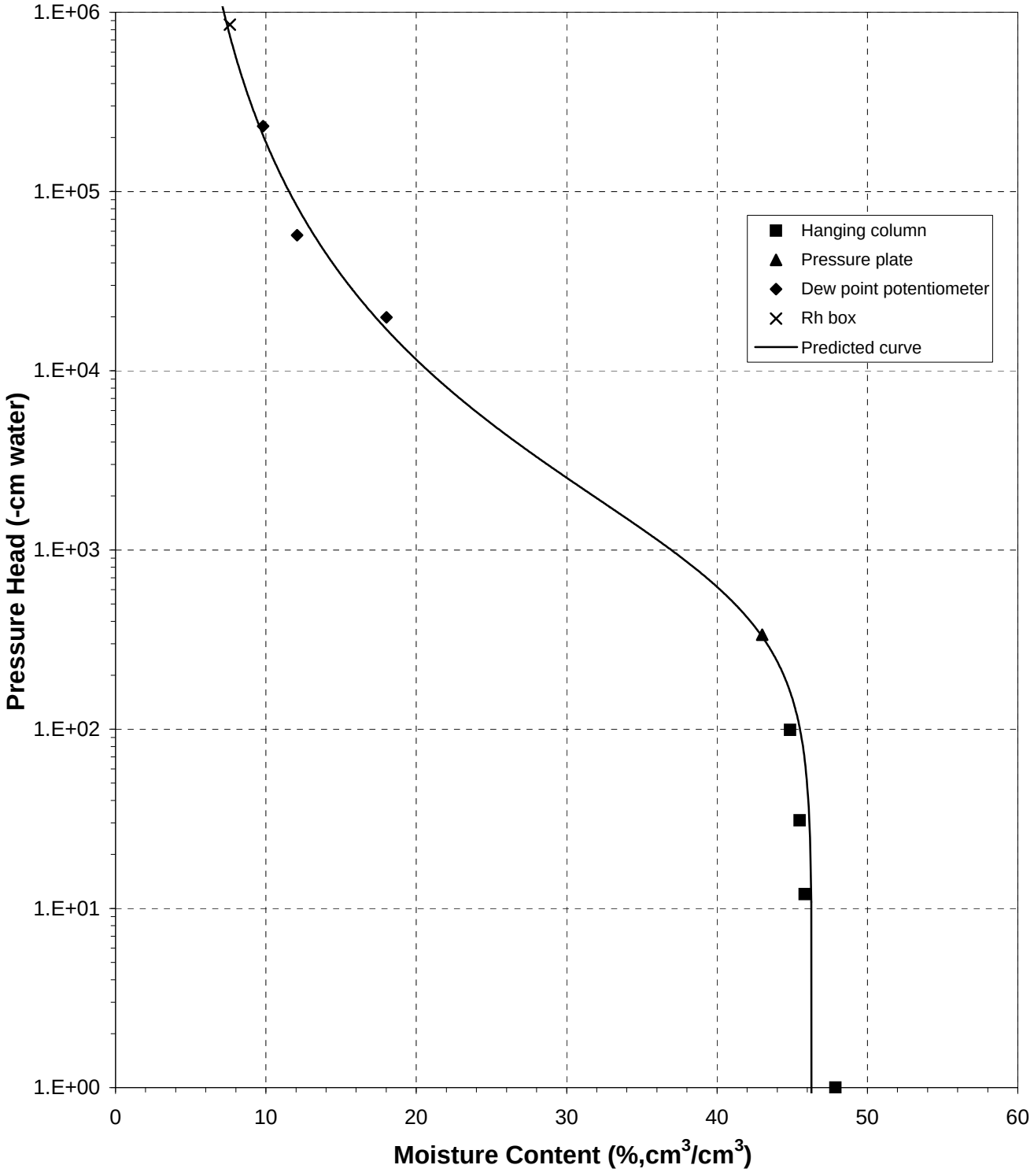
Water Retention Data Points

Sample Number: PB-14 (532-533)



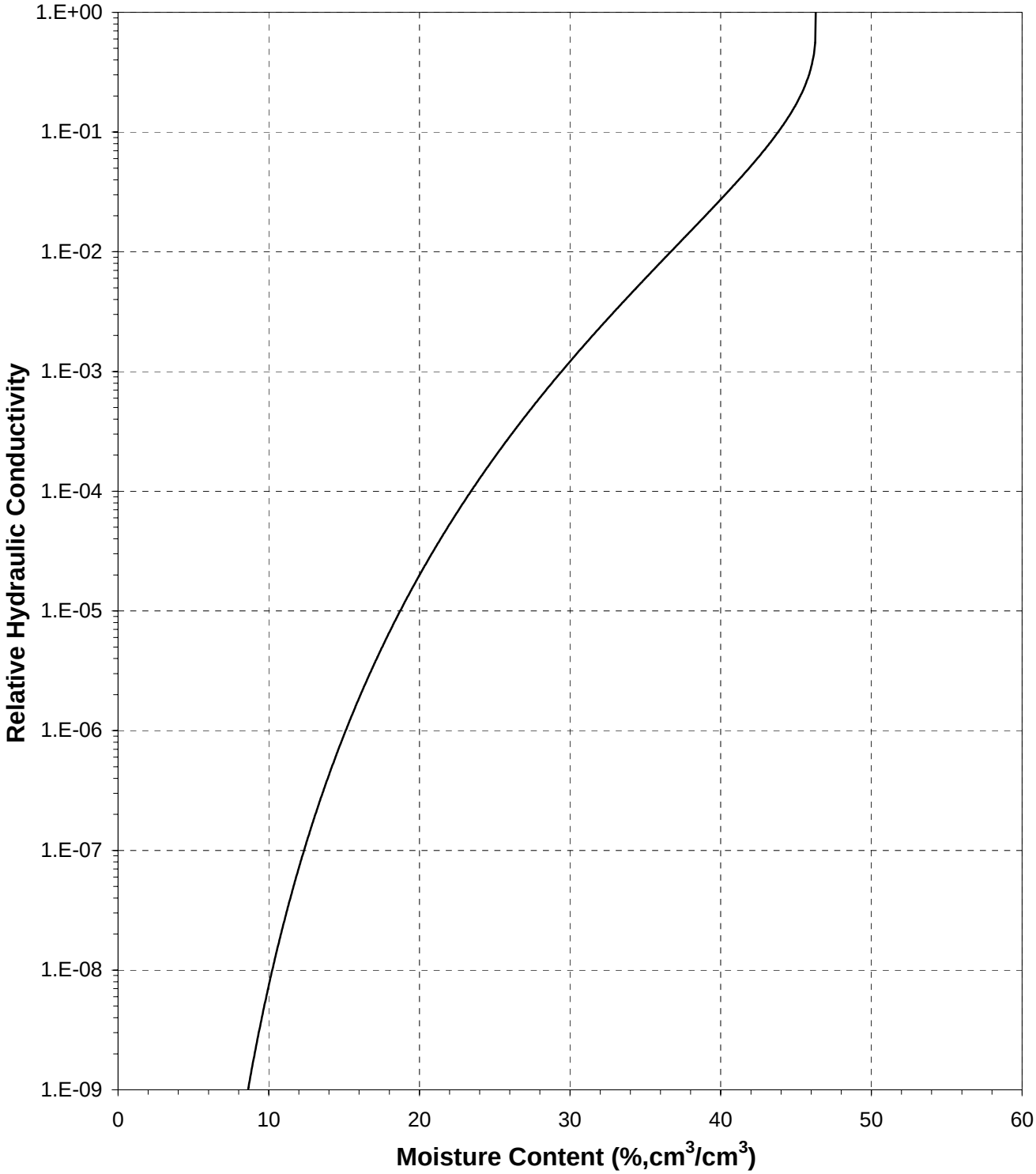
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (532-533)



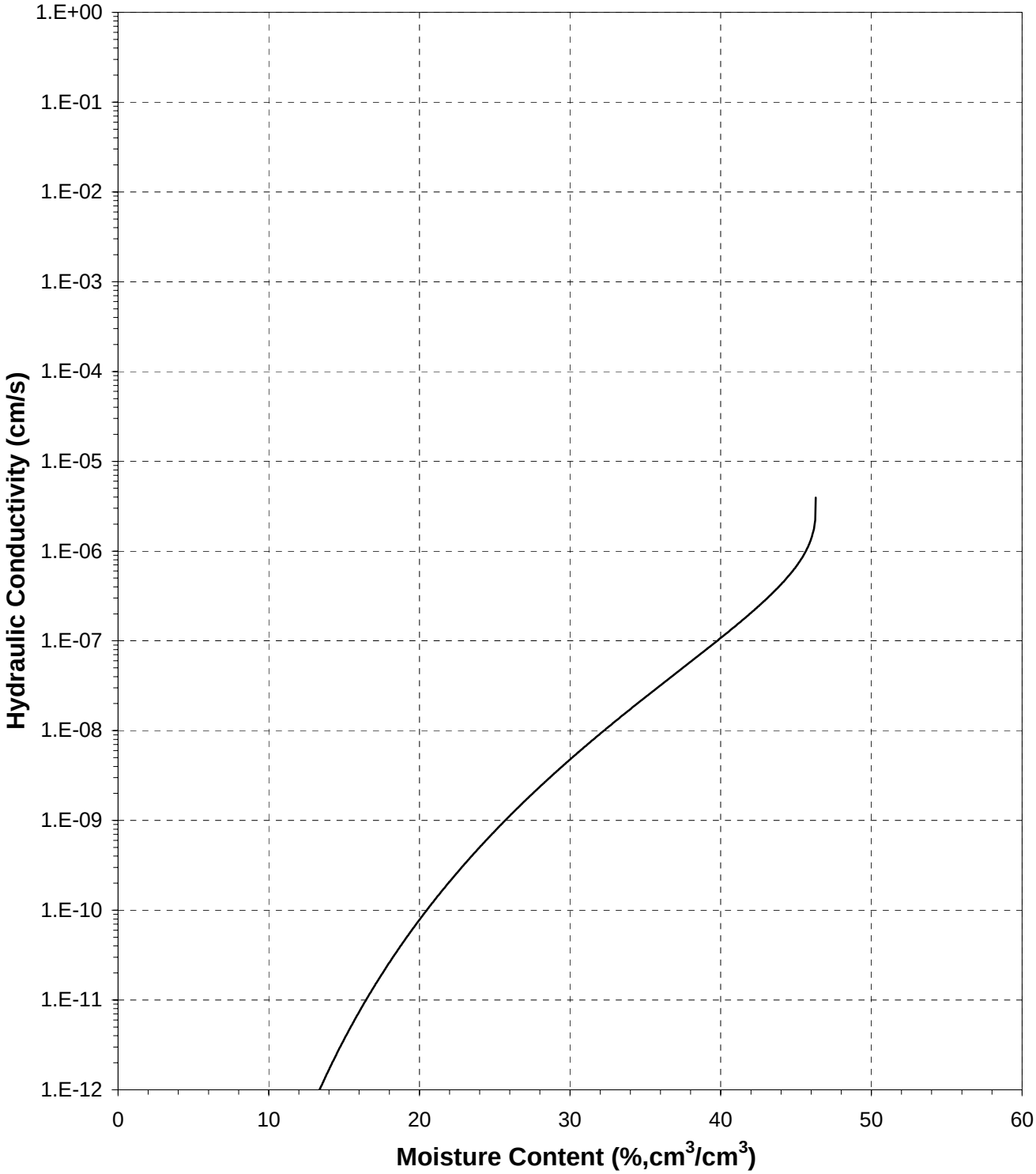
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (532-533)



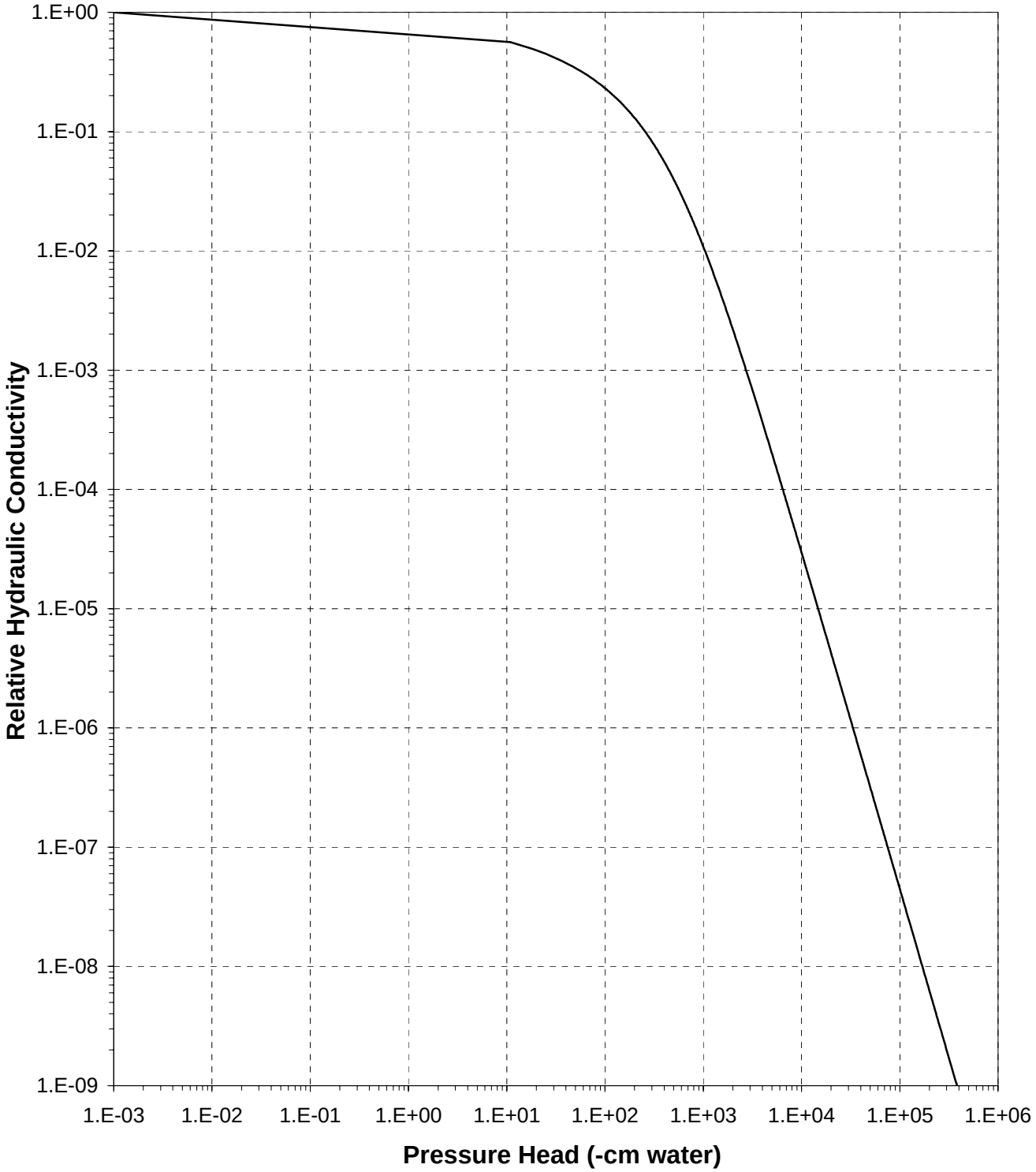
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (532-533)



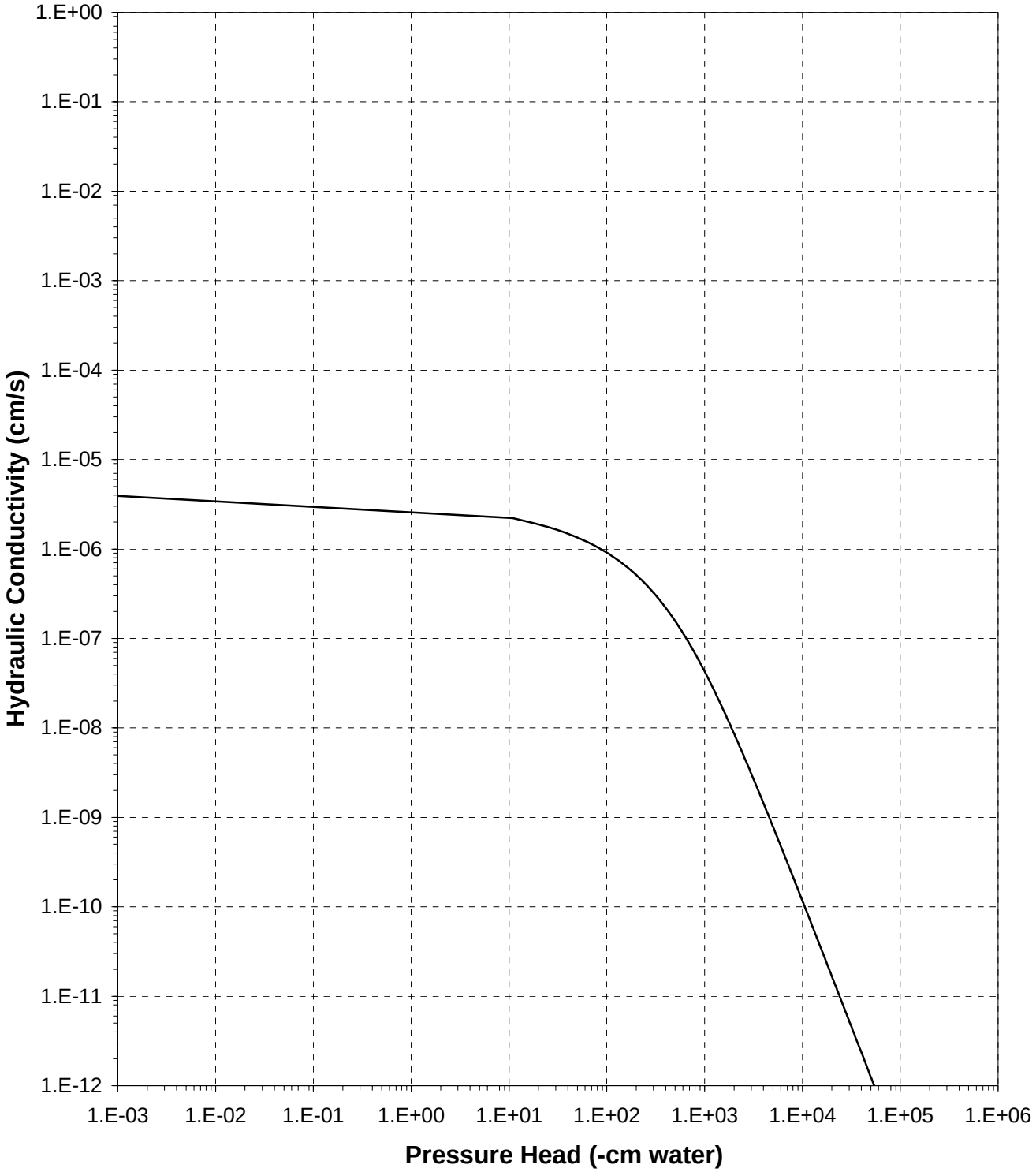
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (532-533)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (532-533)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (549-550)
Date Sampled: 12/8/2011
Depth: 549-550

Dry wt. of sample (g): 157.56
Tare wt., ring (g): 48.35
Tare wt., screen & clamp (g): 27.62
Initial sample volume (cm^3): 109.24
Initial dry bulk density (g/cm^3): 1.44
Measured particle density (g/cm^3): 2.64
Initial calculated total porosity (%): 45.47

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	26-Jan-12	15:00	283.20	0	45.47
	2-Feb-12	14:10	282.66	12.0	44.97
	9-Feb-12	9:05	282.54	31.0	44.86
	16-Feb-12	10:00	282.32	99.0	44.66
Pressure plate:	27-Feb-12	8:50	281.22	337	43.65

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	12.0	---	---	---	---
	31.0	---	---	---	---
	99.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (549-550)

Initial sample bulk density (g/cm^3)*:* 1.44
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 140.85
Tare weight, jar (g)*:* 113.16

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	5-Mar-12	12:33	144.59	15501	19.48
	27-Feb-12	11:15	143.94	32634	16.09
	23-Feb-12	11:00	142.82	164290	10.26

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	15501	---	---	---	---
	32634	---	---	---	---
	164290	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 60.28
Tare weight (g)*:* 39.52

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	61.35	857025	7.44

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

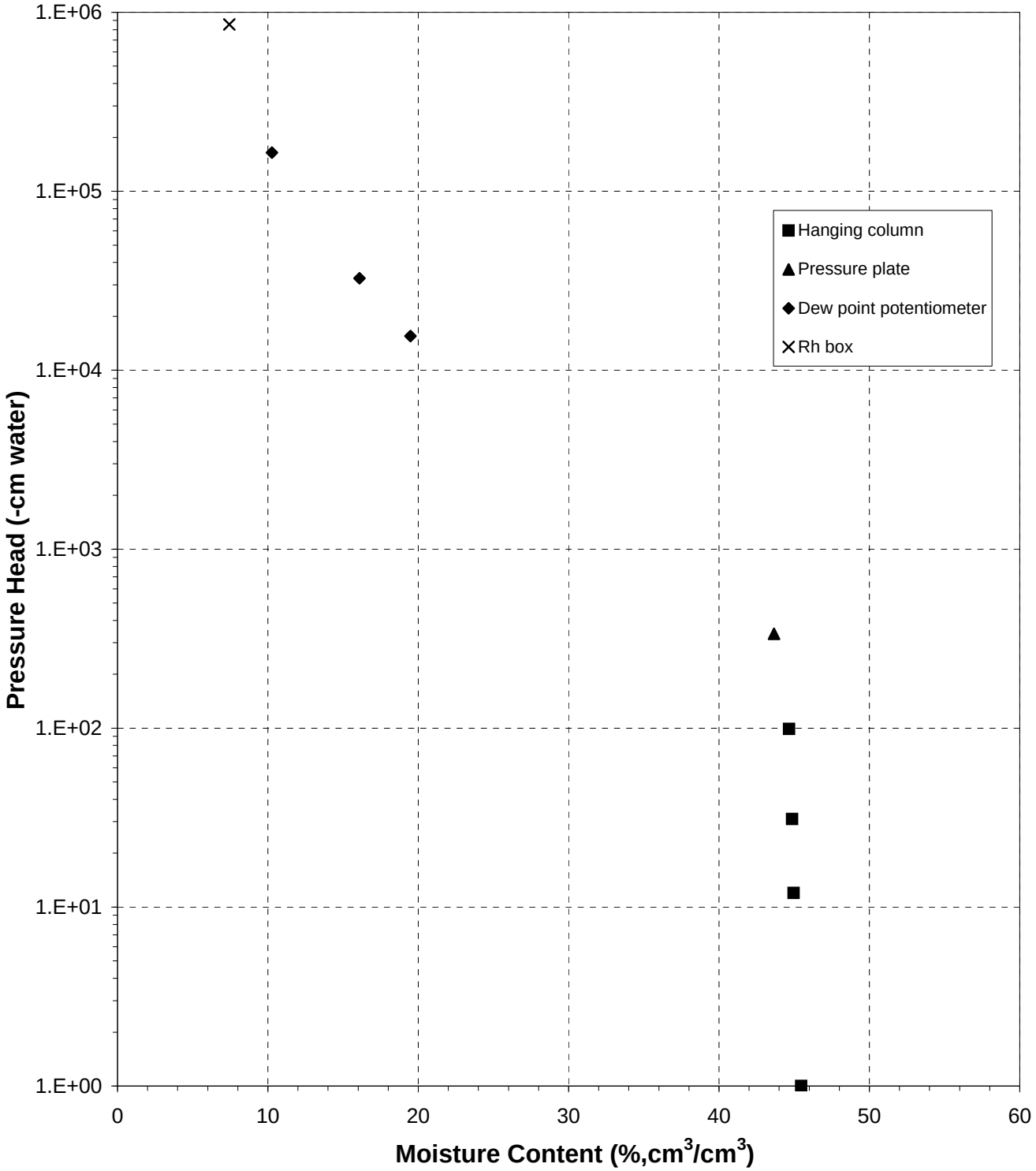
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/ C. Krous/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

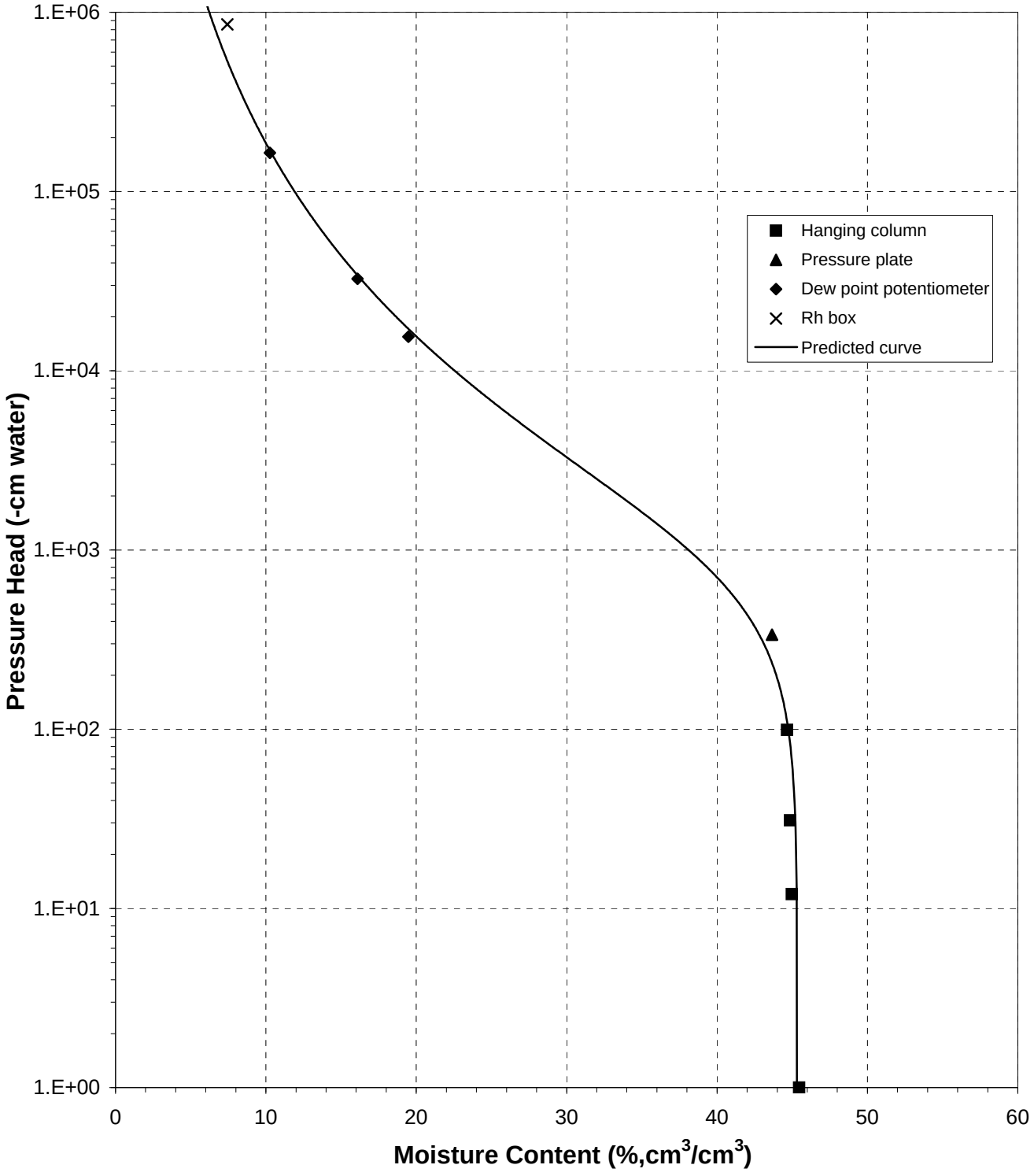
Water Retention Data Points

Sample Number: PB-14 (549-550)



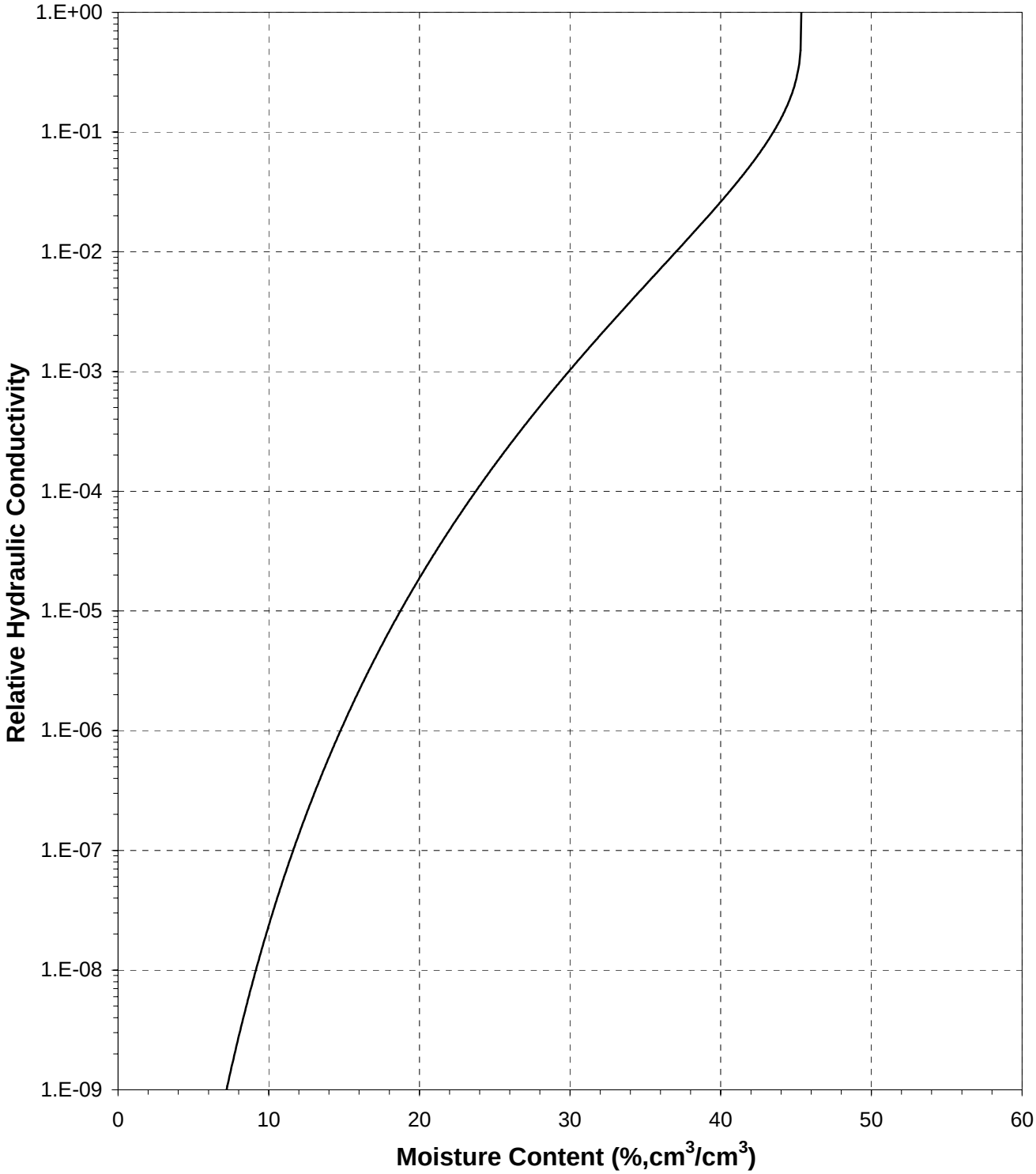
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (549-550)



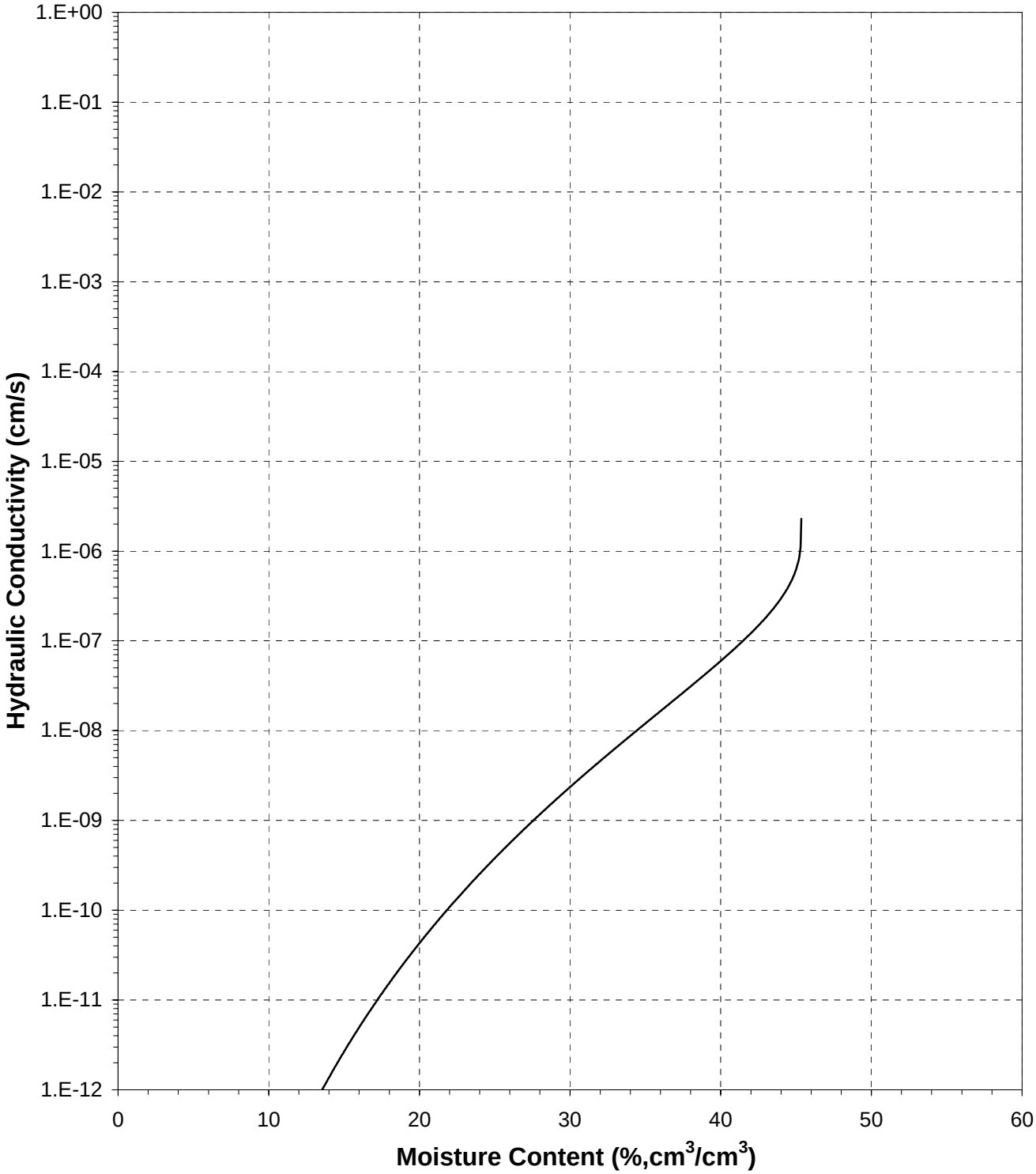
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (549-550)



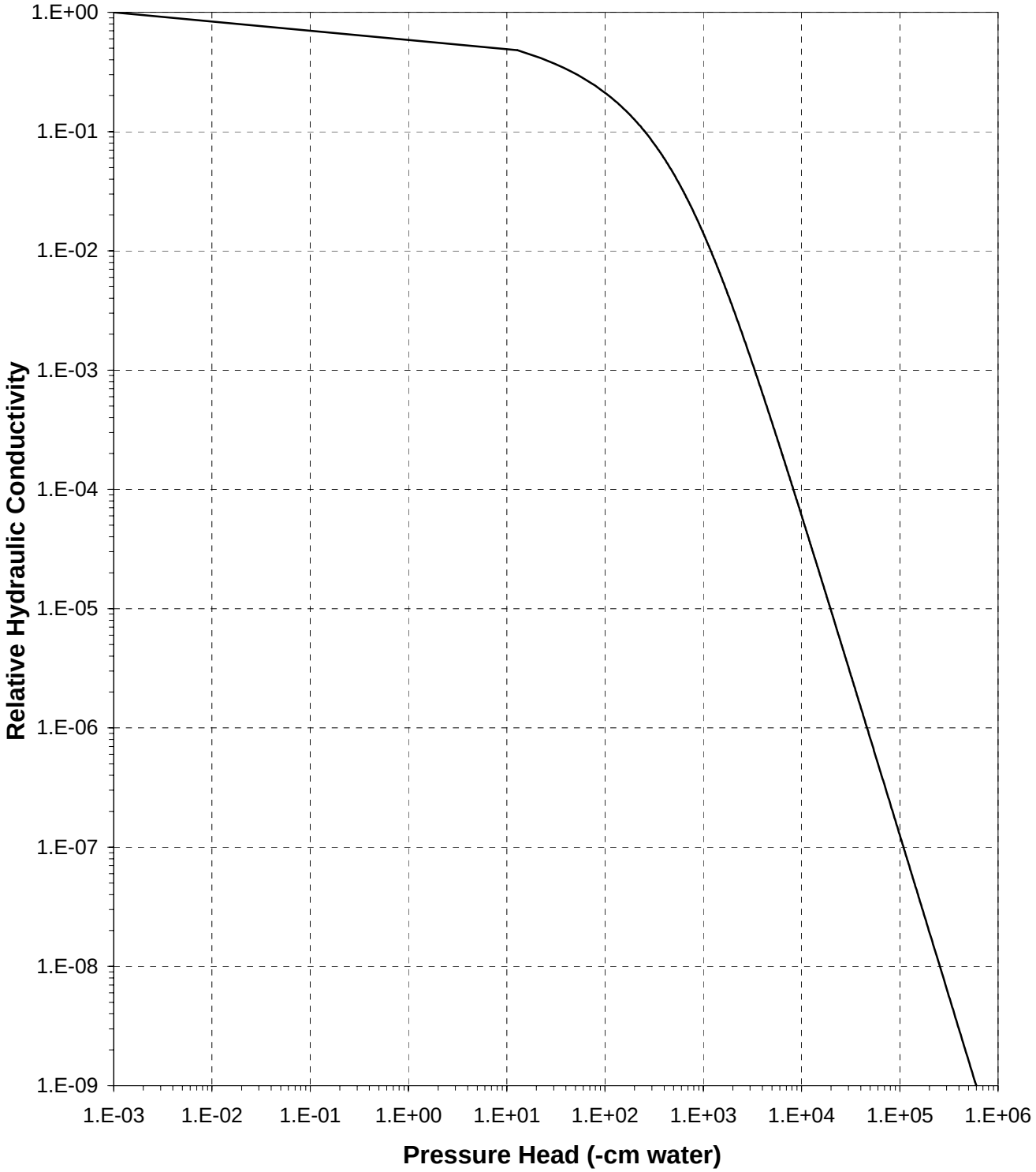
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (549-550)



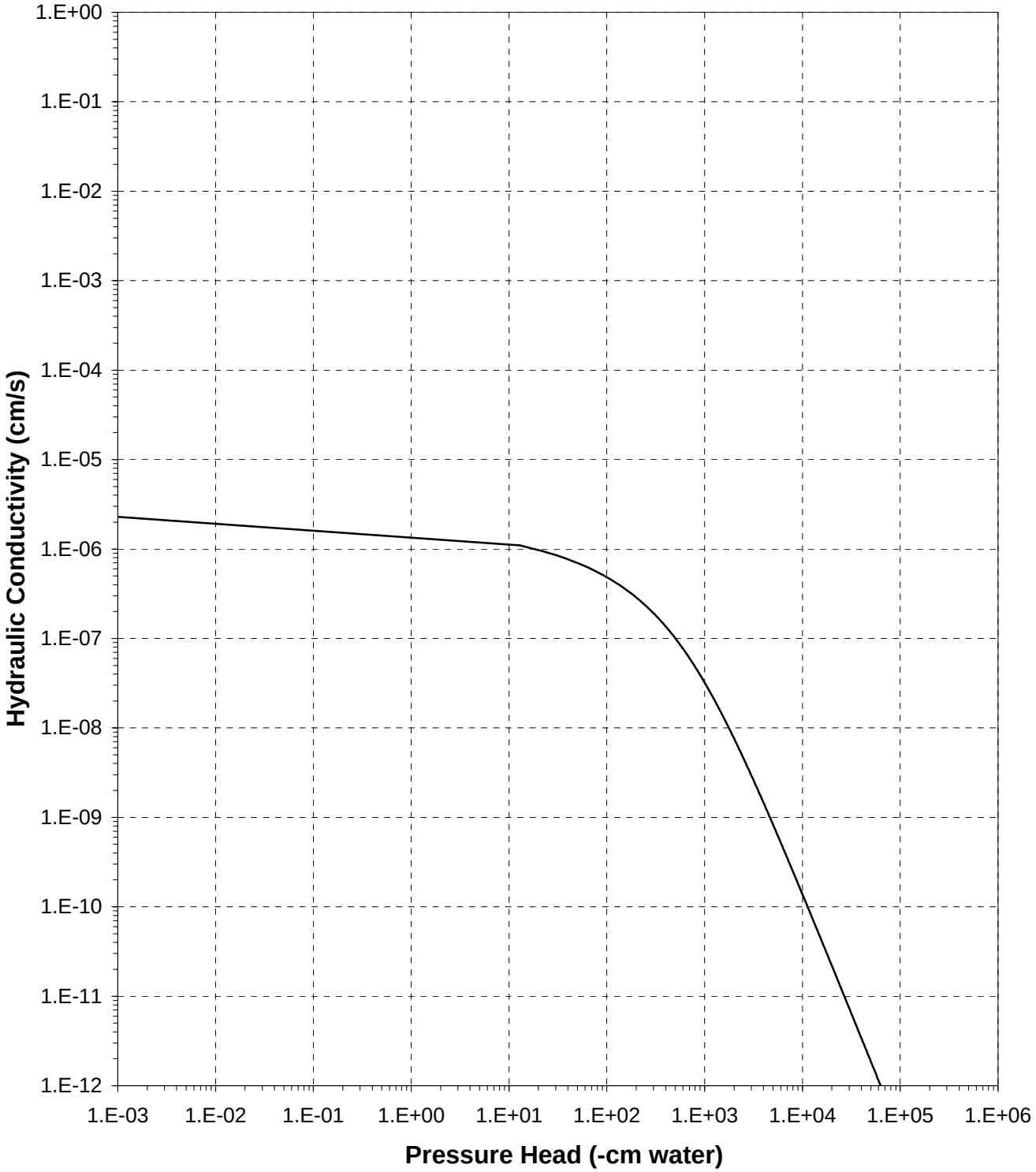
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (549-550)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (549-550)



Daniel B. Stephens & Associates, Inc.

Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (569-570)
Date Sampled: 12/8/2011
Depth: 569-570

Dry wt. of sample (g): 168.20
Tare wt., ring (g): 63.48
Tare wt., screen & clamp (g): 24.28
Initial sample volume (cm^3): 114.45
Initial dry bulk density (g/cm^3): 1.47
Measured particle density (g/cm^3): 2.68
Initial calculated total porosity (%): 45.18

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	1-Feb-12	13:40	307.67	0	45.18
	8-Feb-12	8:55	306.83	20.0	44.45
	15-Feb-12	8:45	305.98	73.0	43.70
	22-Feb-12	11:10	305.86	153.0	43.60
Pressure plate:	5-Mar-12	8:25	305.44	337	43.23

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	20.0	---	---	---	---
	73.0	---	---	---	---
	153.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (569-570)

Initial sample bulk density (g/cm^3)*:* 1.47
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 148.23
Tare weight, jar (g)*:* 116.39

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	5-Mar-12	13:20	152.87	15093	21.42
	23-Feb-12	13:25	151.30	41812	14.17
	7-Mar-12	14:53	150.82	126761	11.95

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	15093	---	---	---	---
	41812	---	---	---	---
	126761	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 70.06
Tare weight (g)*:* 41.90

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	10-Apr-12	8:25	71.46	855592	7.30

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

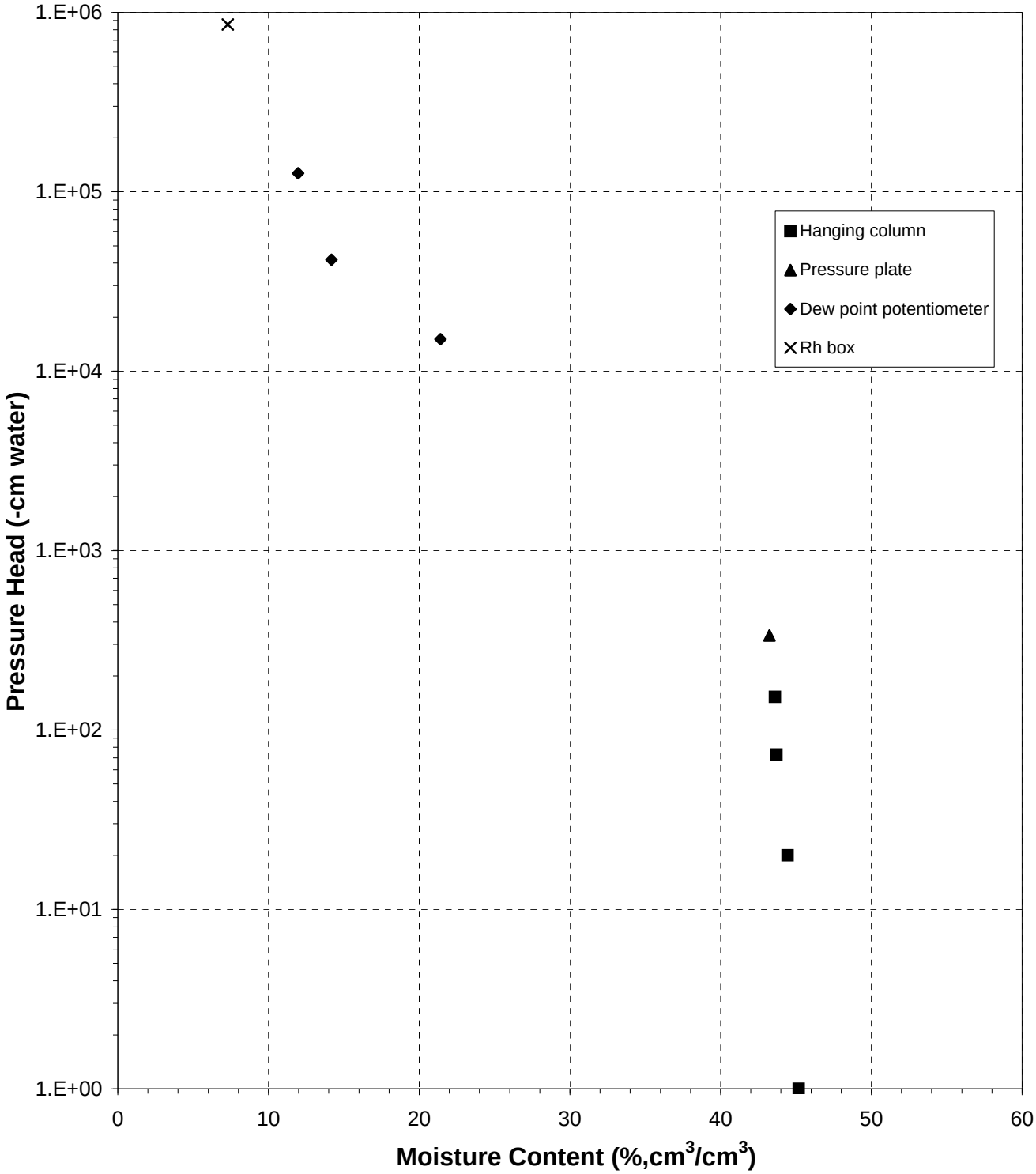
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/ C. Krous/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

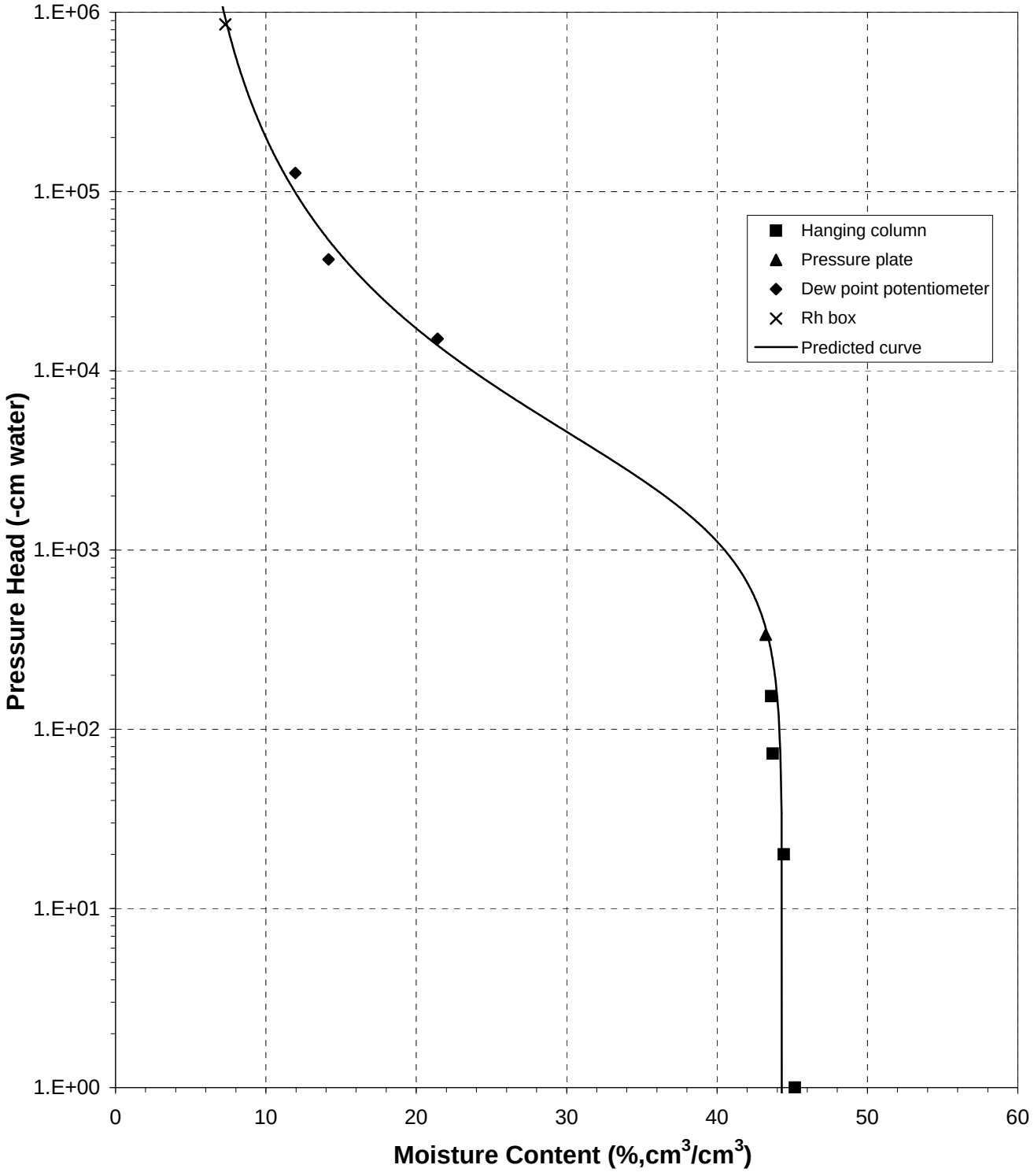
Water Retention Data Points

Sample Number: PB-14 (569-570)



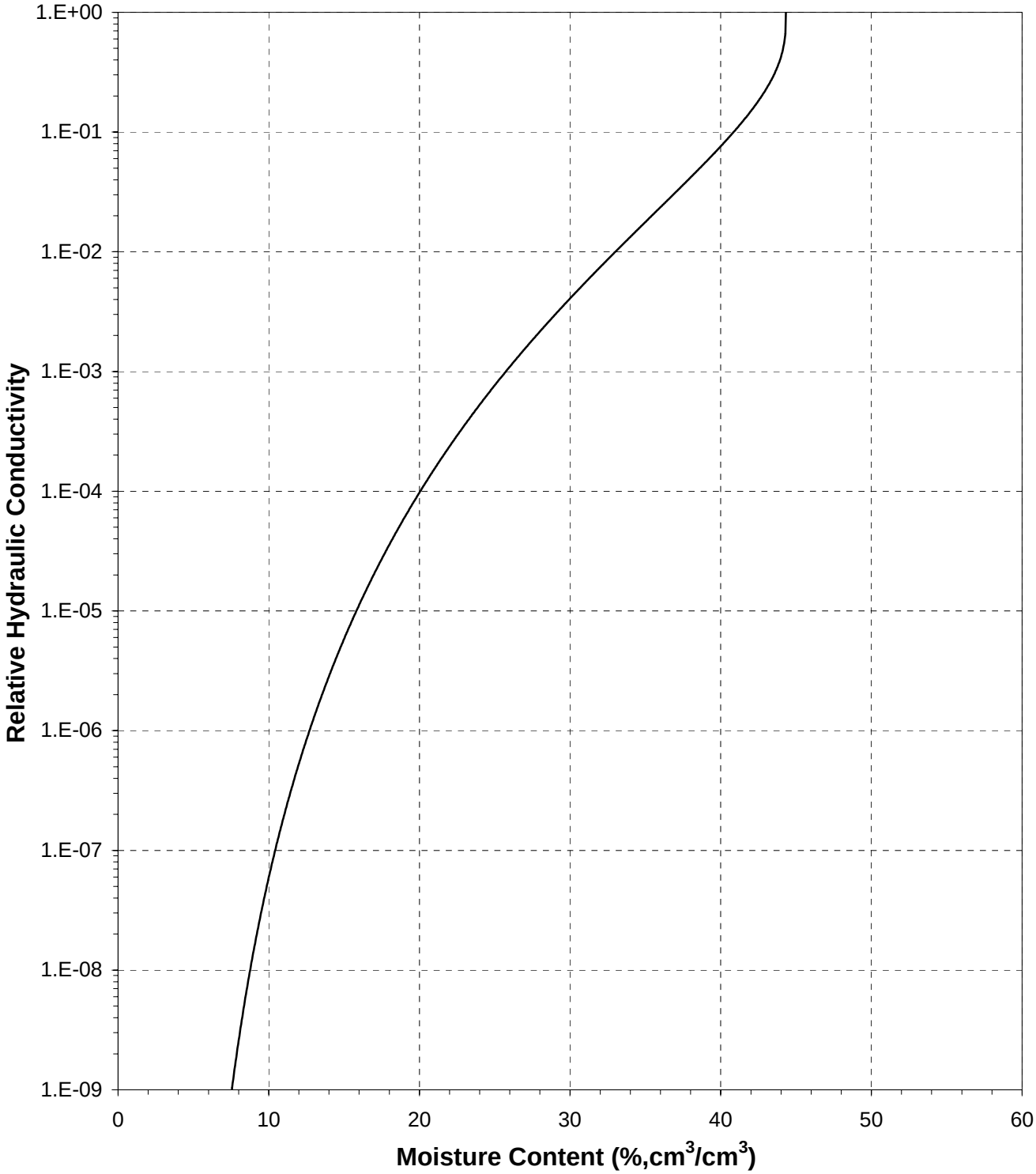
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (569-570)



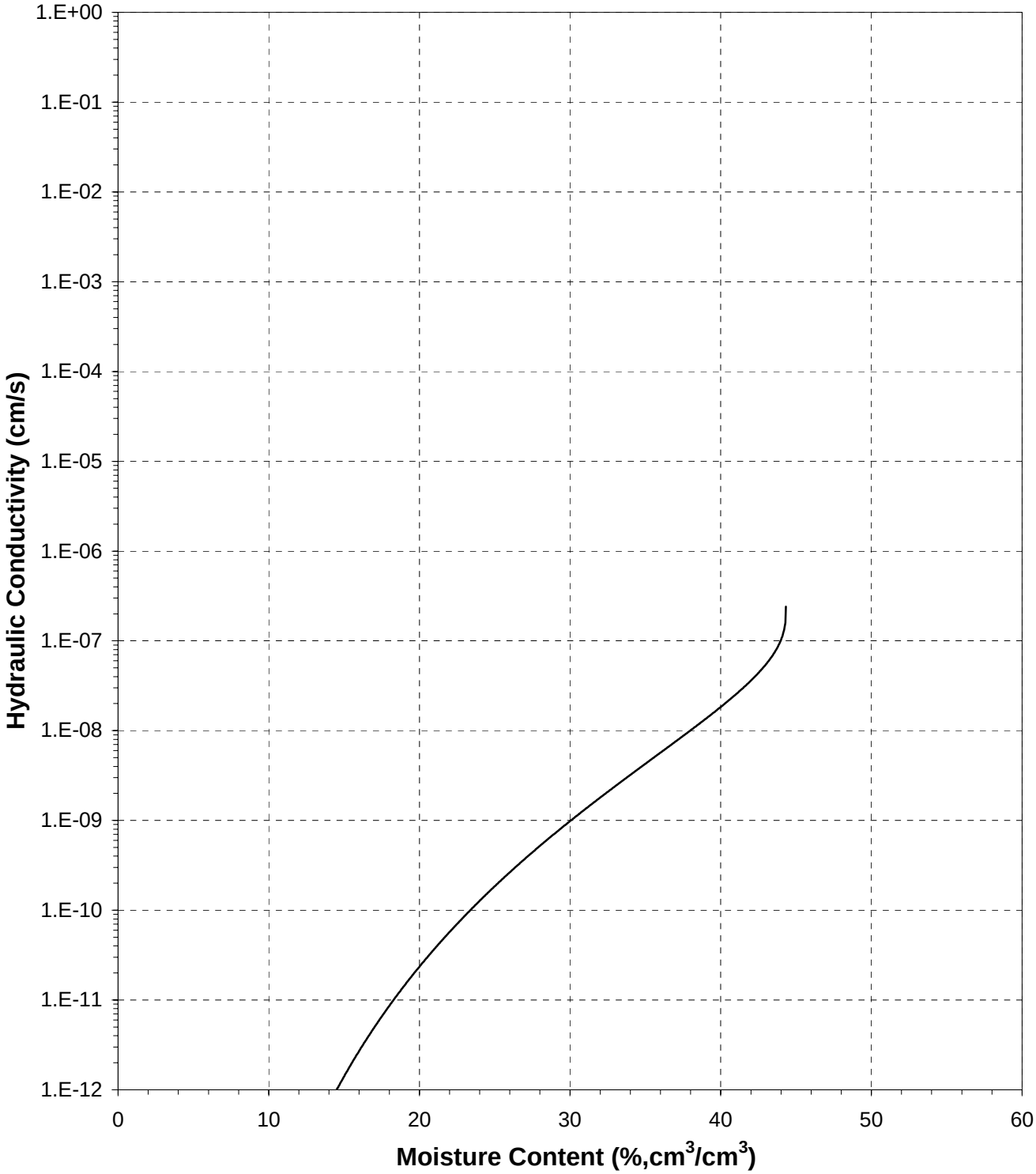
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (569-570)



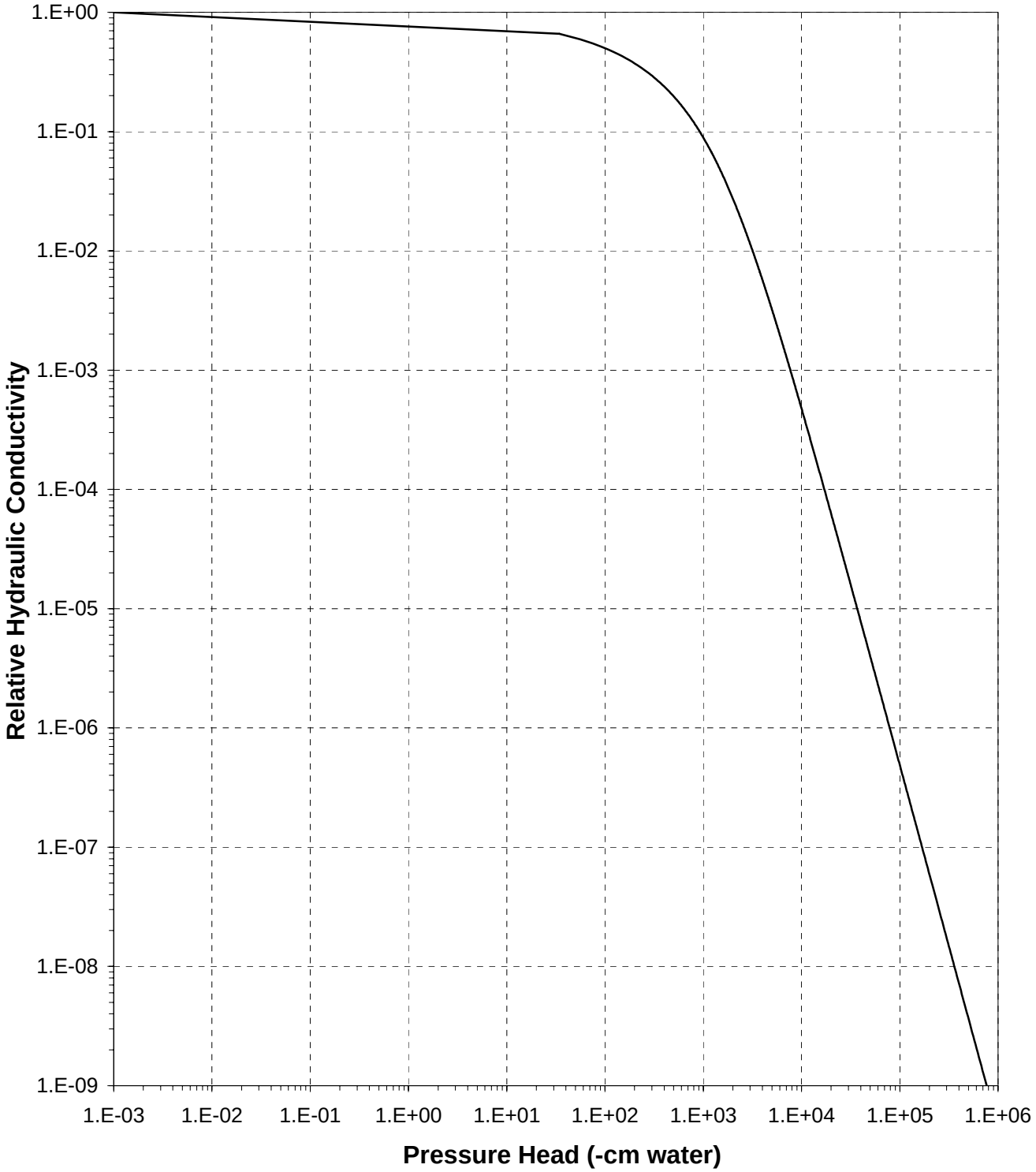
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (569-570)



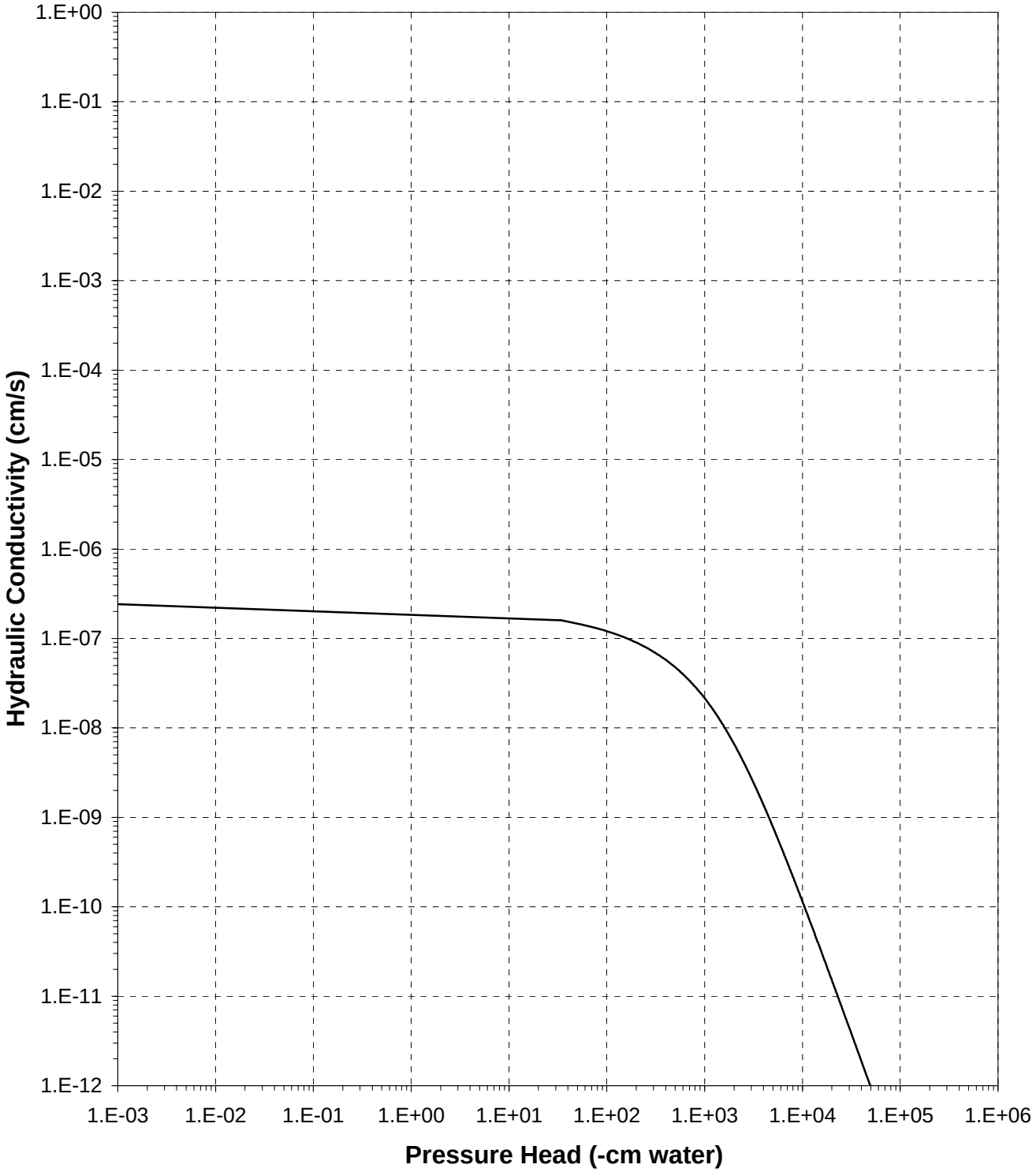
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (569-570)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (569-570)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (594-595)
Date Sampled: 12/8/2011
Depth: 594-595

Dry wt. of sample (g): 107.00
Tare wt., ring (g): 46.77
Tare wt., screen & clamp (g): 27.70
Initial sample volume (cm^3): 77.92
Initial dry bulk density (g/cm^3): 1.37
Measured particle density (g/cm^3): 2.63
Initial calculated total porosity (%): 47.81

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	26-Jan-12	14:20	218.72	0	47.81
	2-Feb-12	14:30	217.47	16.0	46.20
	9-Feb-12	10:50	216.86	50.0	45.42
	16-Feb-12	10:20	216.51	127.0	44.97
Pressure plate:	27-Feb-12	9:10	216.26	337	44.65

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	50.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (594-595)

Initial sample bulk density (g/cm^3)*:* 1.37
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 144.13
Tare weight, jar (g)*:* 114.02

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	9-Mar-12	12:56	148.94	4385	21.94
	5-Mar-12	13:30	146.93	37223	12.77
	6-Mar-12	15:47	146.08	164800	8.89

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	4385	---	---	---	---
	37223	---	---	---	---
	164800	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 65.97
Tare weight (g)*:* 39.41

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	67.02	857025	5.42

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

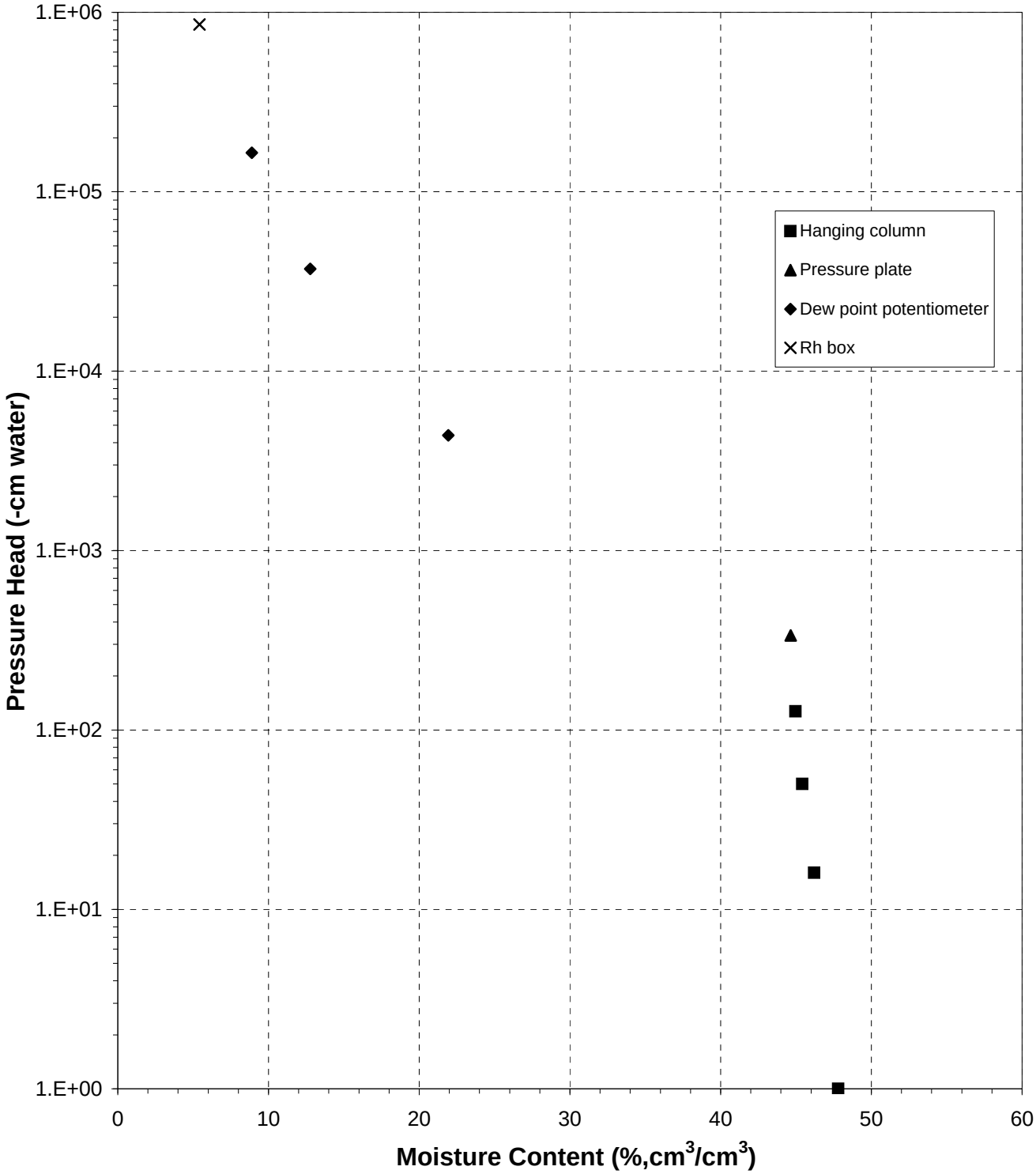
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/ C. Krous/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

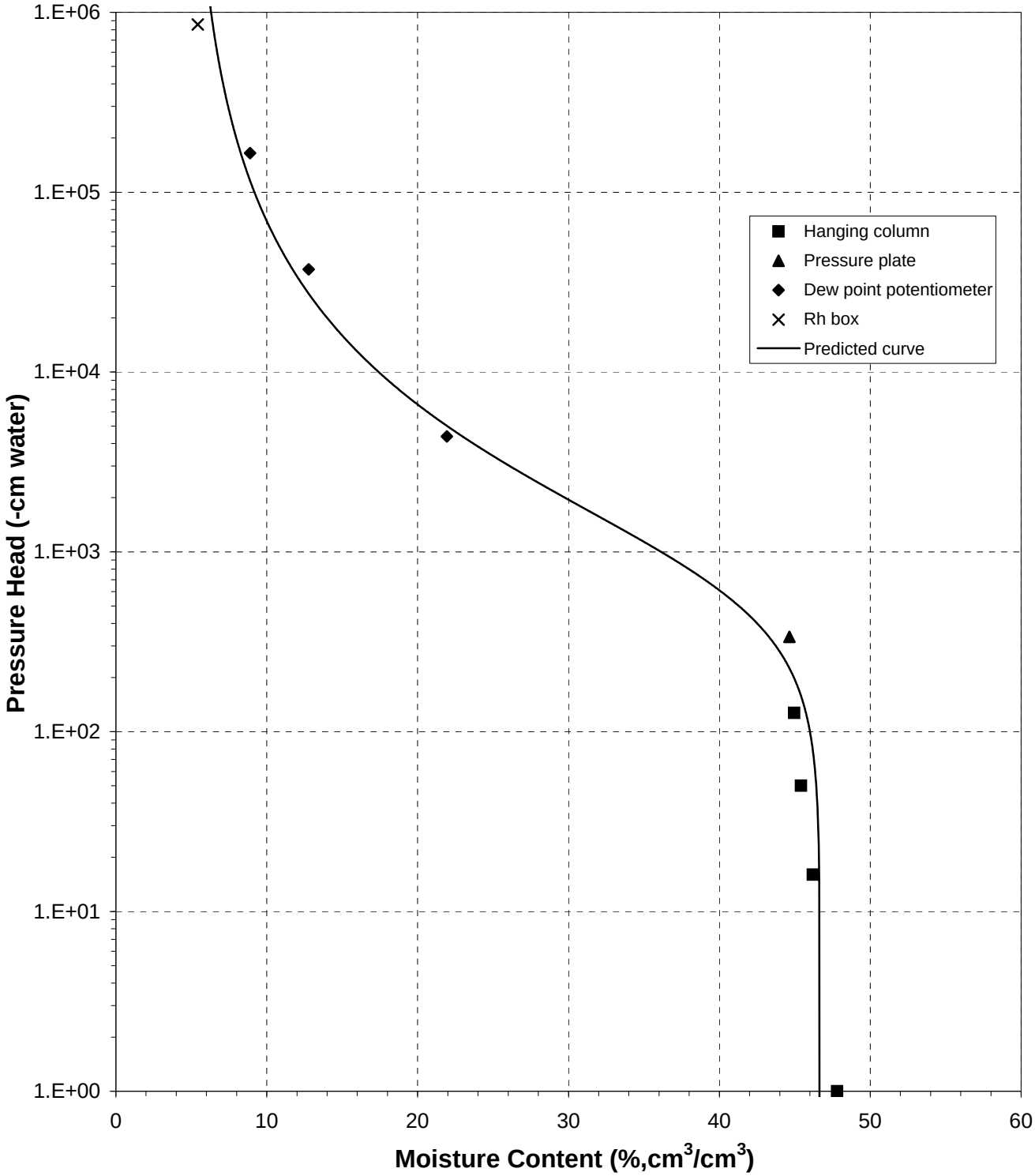
Water Retention Data Points

Sample Number: PB-14 (594-595)



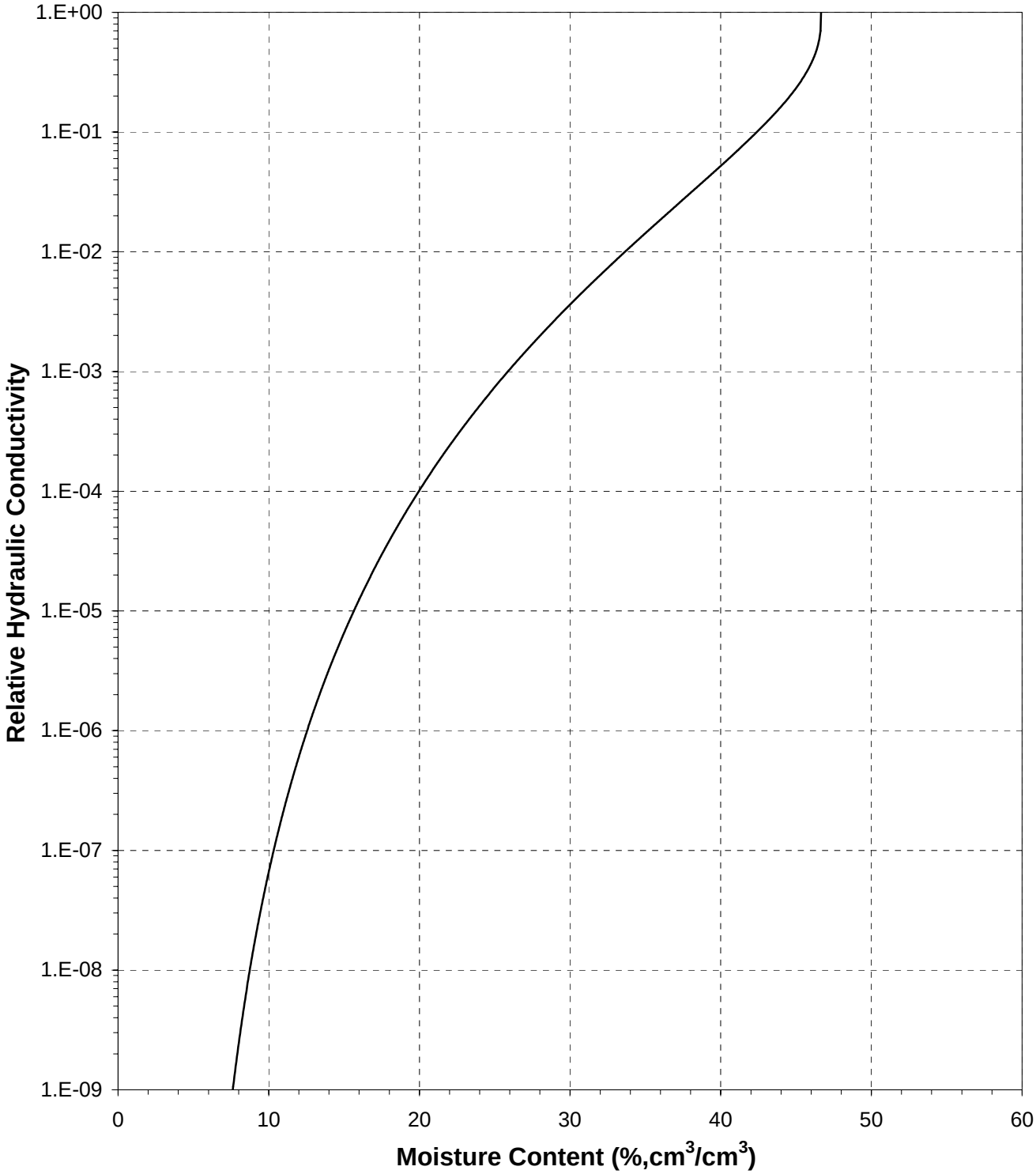
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (594-595)



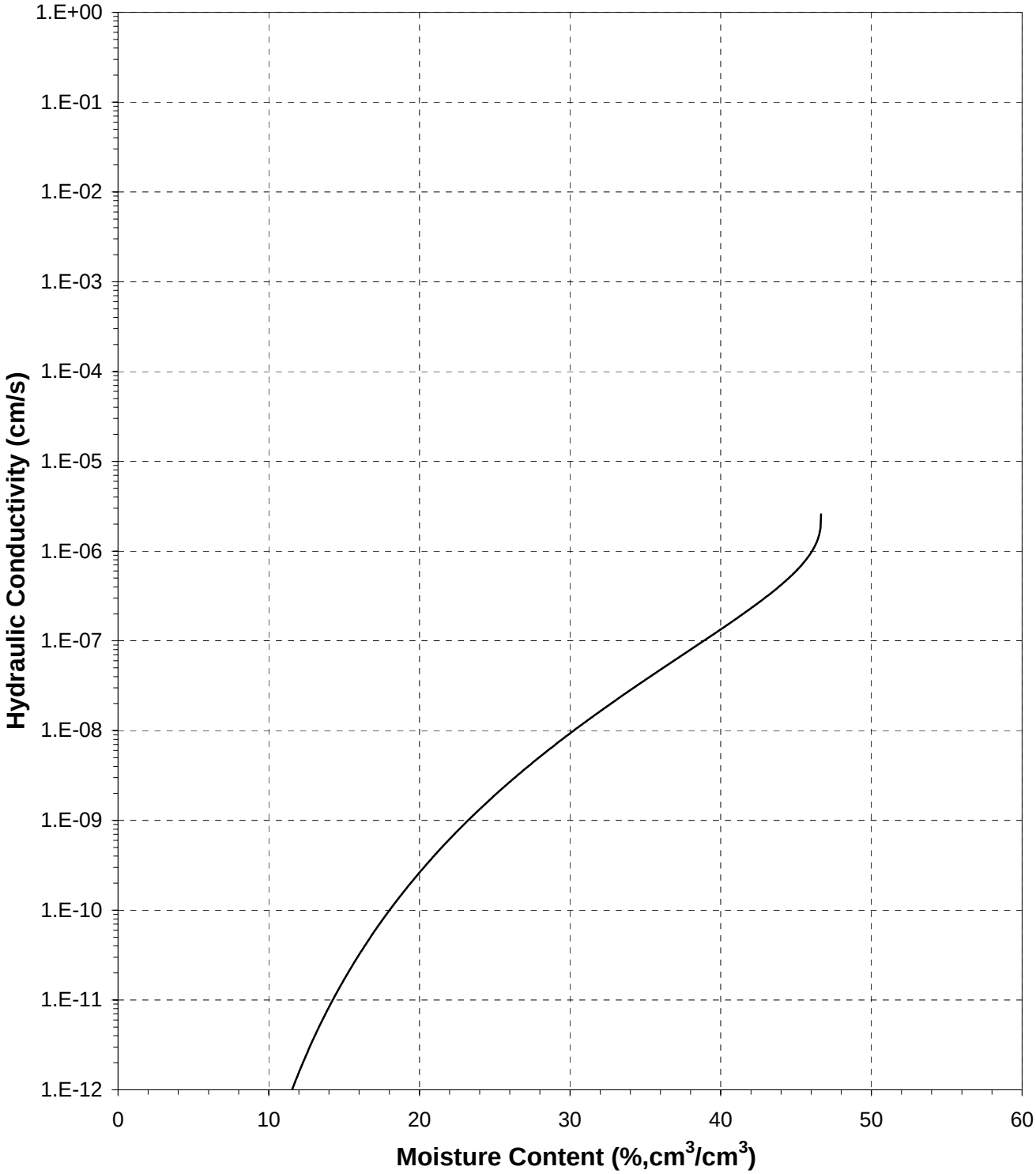
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (594-595)



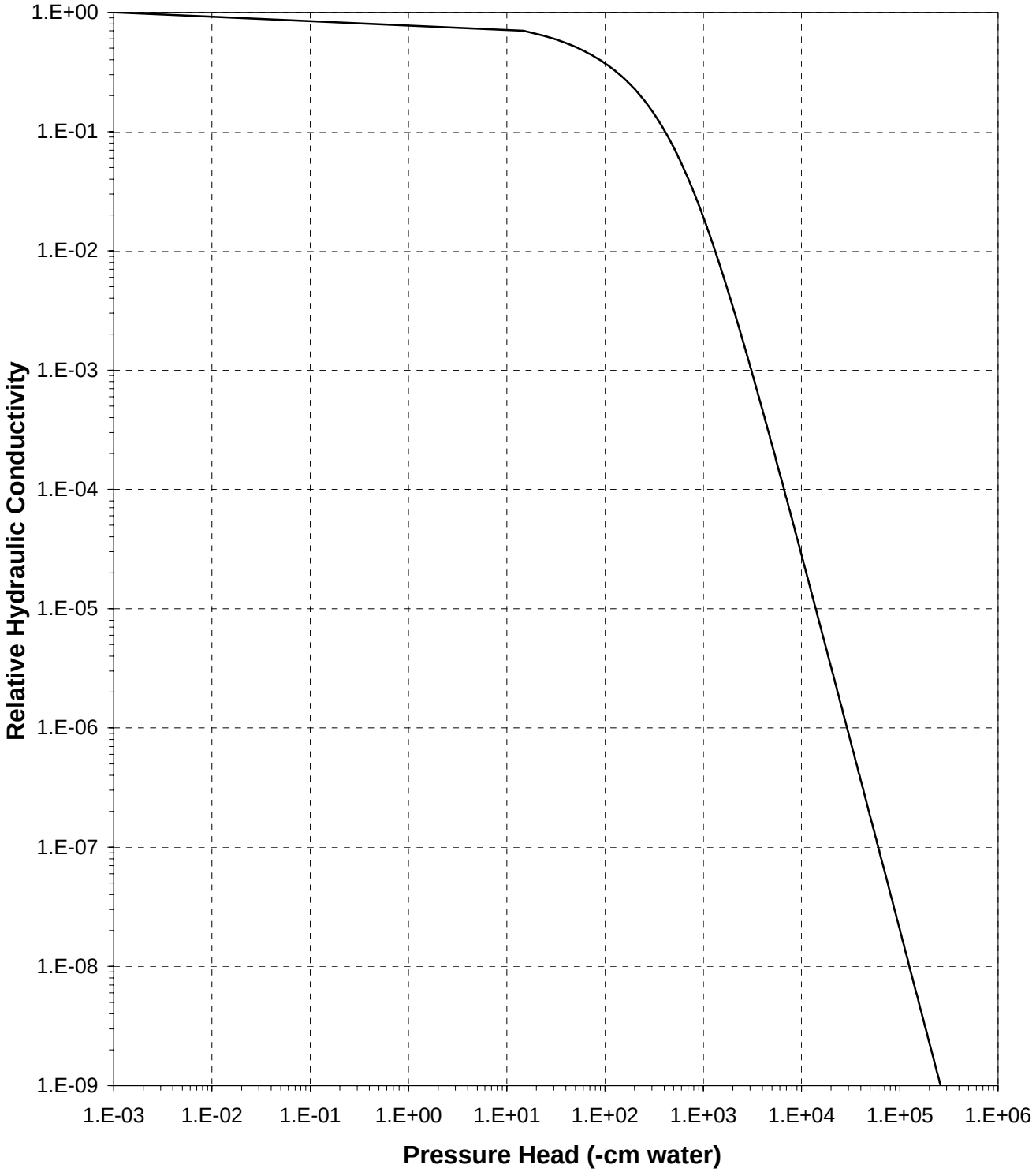
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (594-595)



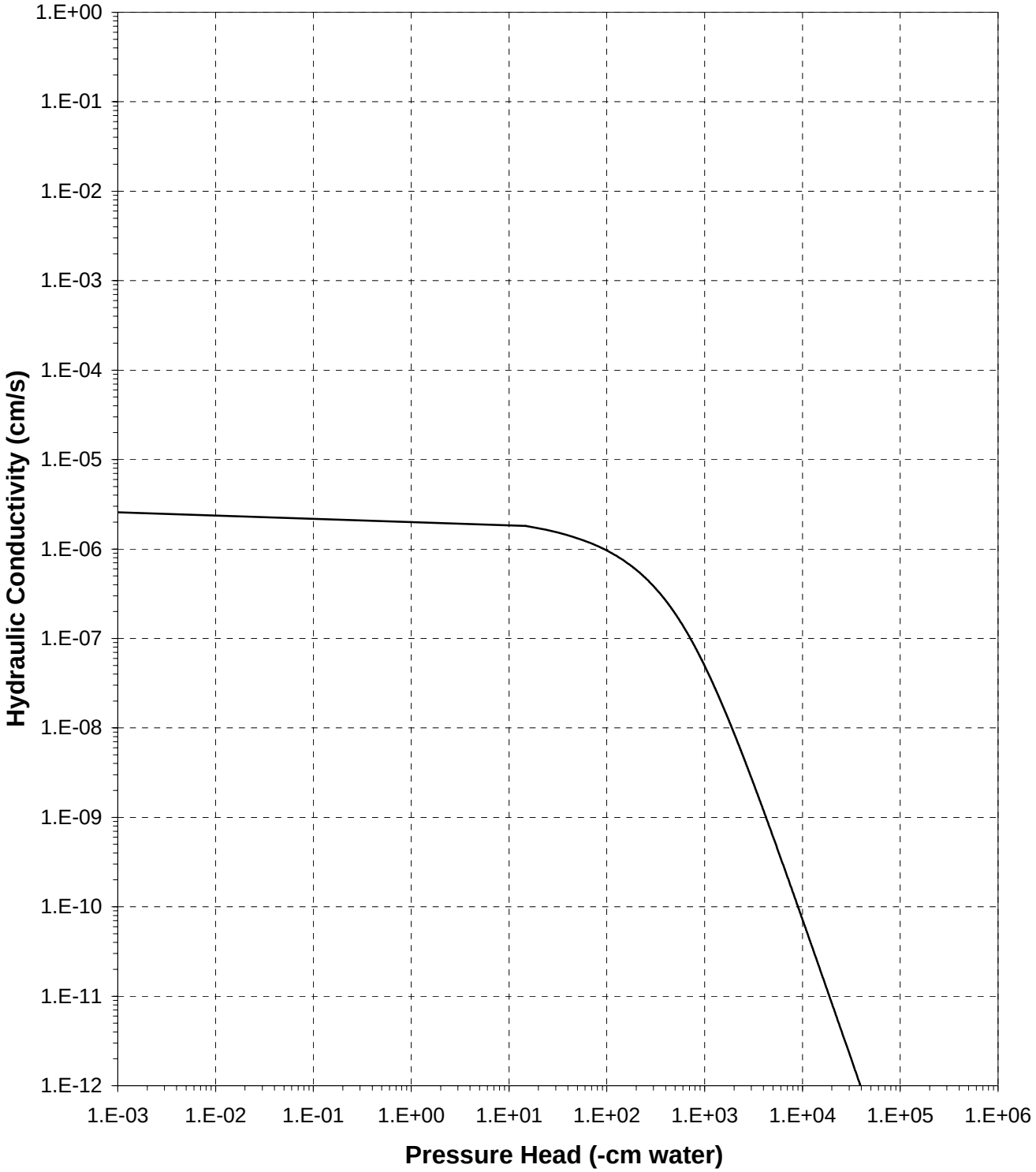
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (594-595)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (594-595)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (620-623)
Date Sampled: 12/8/2011
Depth: 620-623

Dry wt. of sample (g): 189.37
Tare wt., ring (g): 140.81
Tare wt., screen & clamp (g): 31.59
Initial sample volume (cm^3): 127.53
Initial dry bulk density (g/cm^3): 1.48
Measured particle density (g/cm^3): 2.64
Initial calculated total porosity (%): 43.82

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	11-Feb-12	9:45	417.66	0	43.82
	20-Feb-12	10:50	414.81	17.0	41.59
	27-Feb-12	10:05	414.18	50.0	41.09
	5-Mar-12	9:25	413.13	127.0	40.27
Pressure plate:	15-Mar-12	13:30	411.87	337	39.28

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	17.0	---	---	---	---
	50.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (620-623)

Initial sample bulk density (g/cm^3)*:* 1.48
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 144.95
Tare weight, jar (g)*:* 115.58

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	5-Mar-12	15:35	150.10	6221	26.04
	9-Mar-12	11:30	148.10	42118	15.93
	12-Mar-12	10:00	147.12	173876	10.97

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	6221	---	---	---	---
	42118	---	---	---	---
	173876	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 69.89
Tare weight (g)*:* 41.71

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	24-Feb-12	9:40	71.12	852726	6.47

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	852726	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

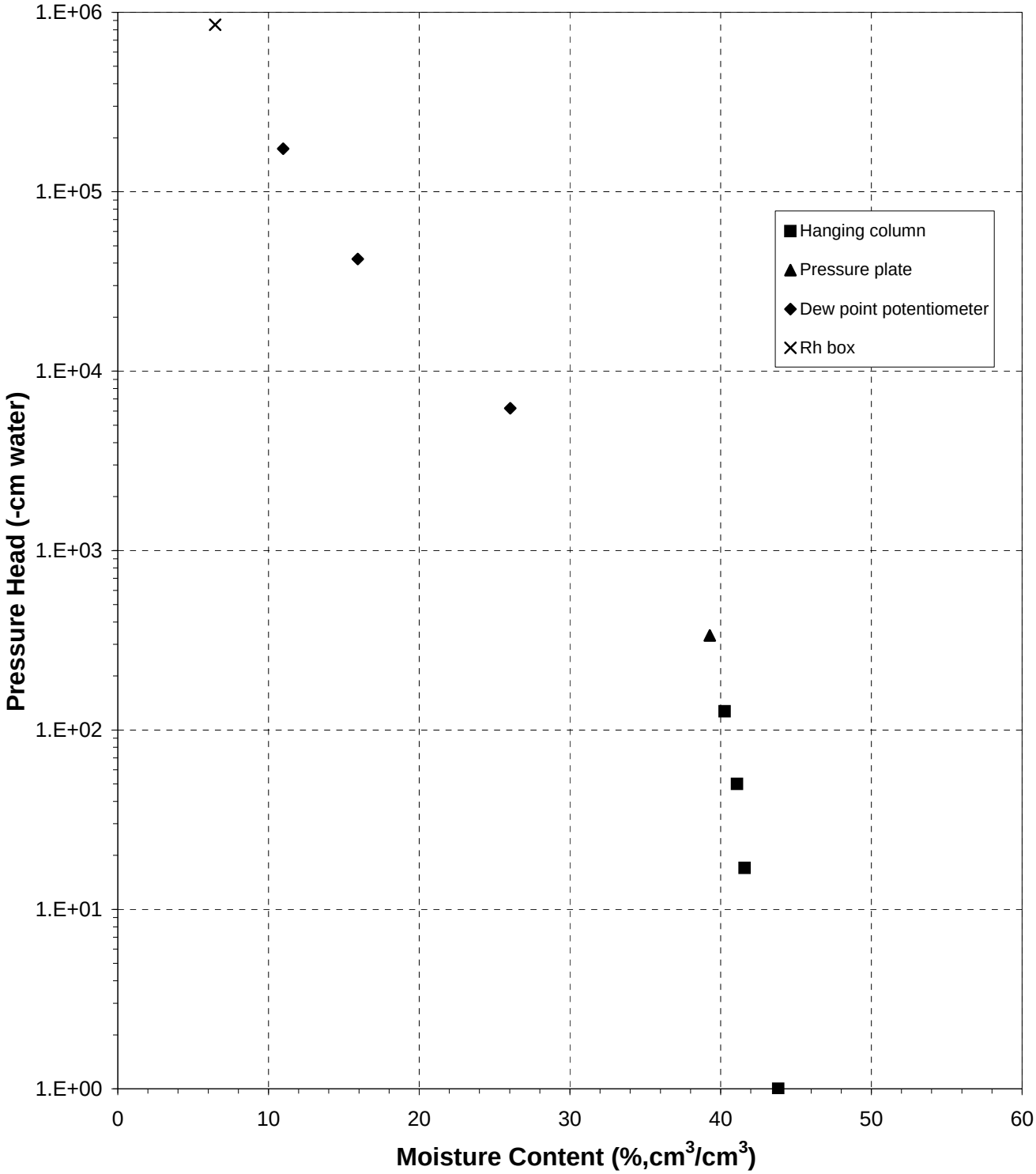
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/ C. Krous/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

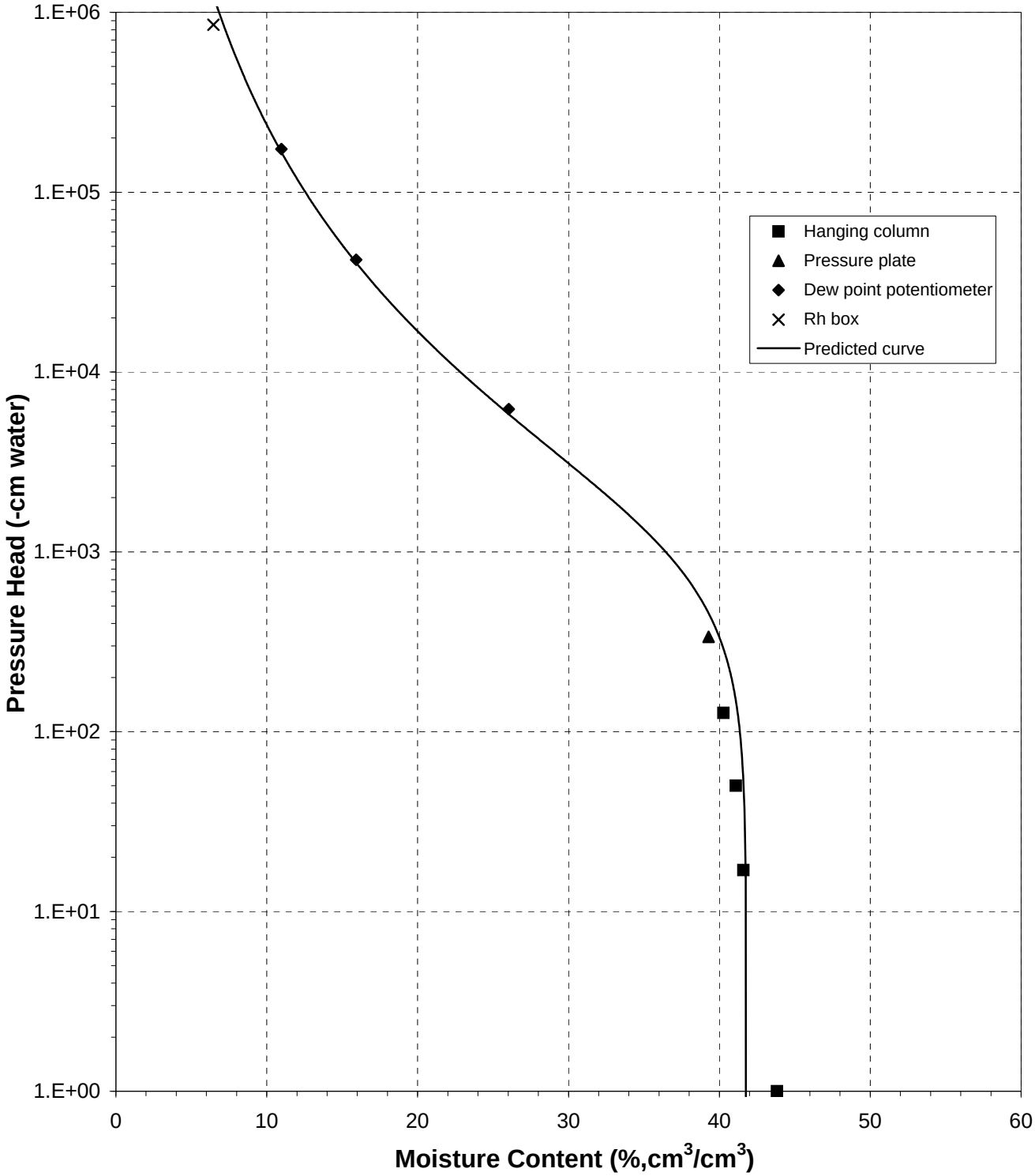
Water Retention Data Points

Sample Number: PB-14 (620-623)



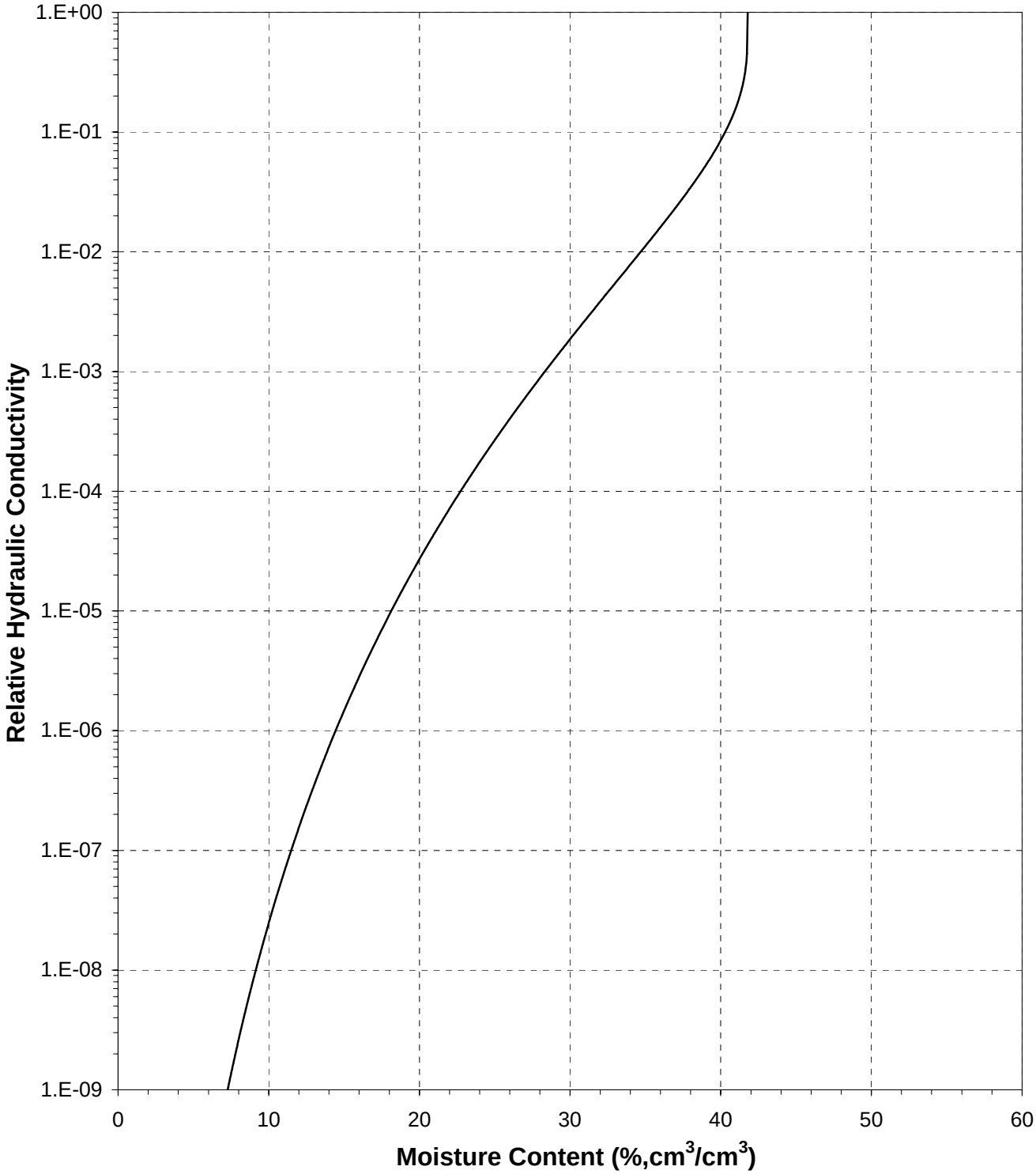
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (620-623)



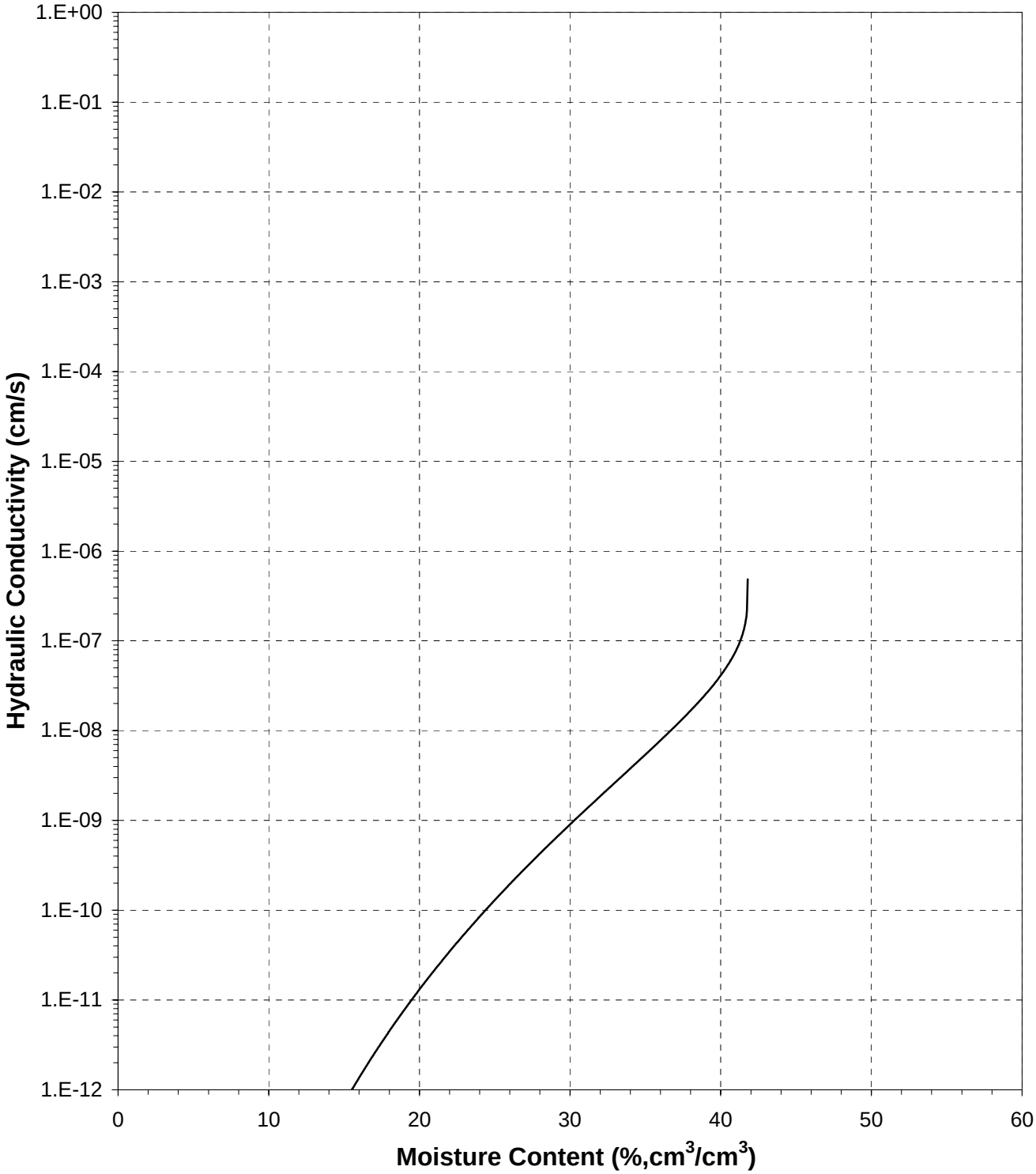
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (620-623)



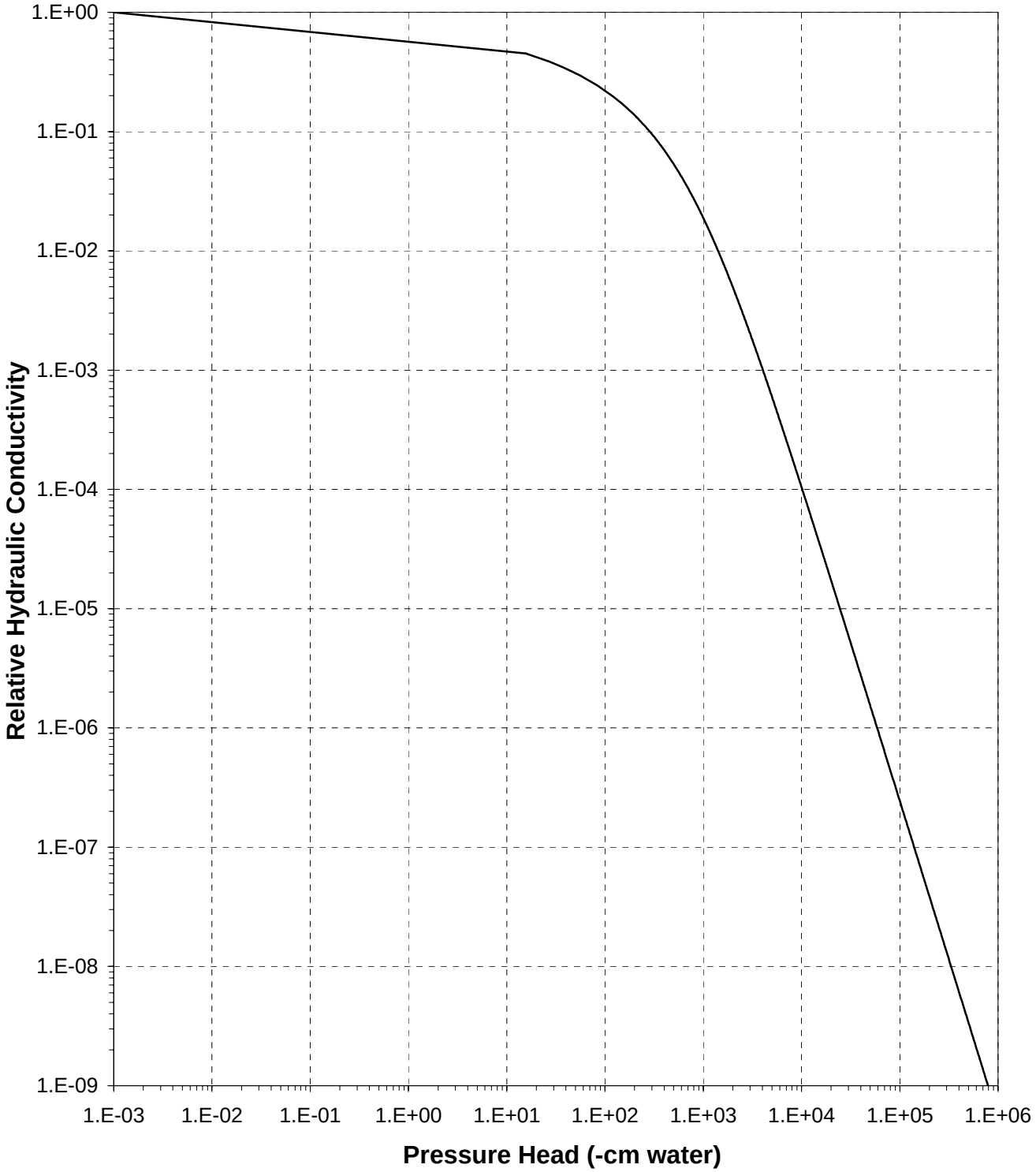
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (620-623)



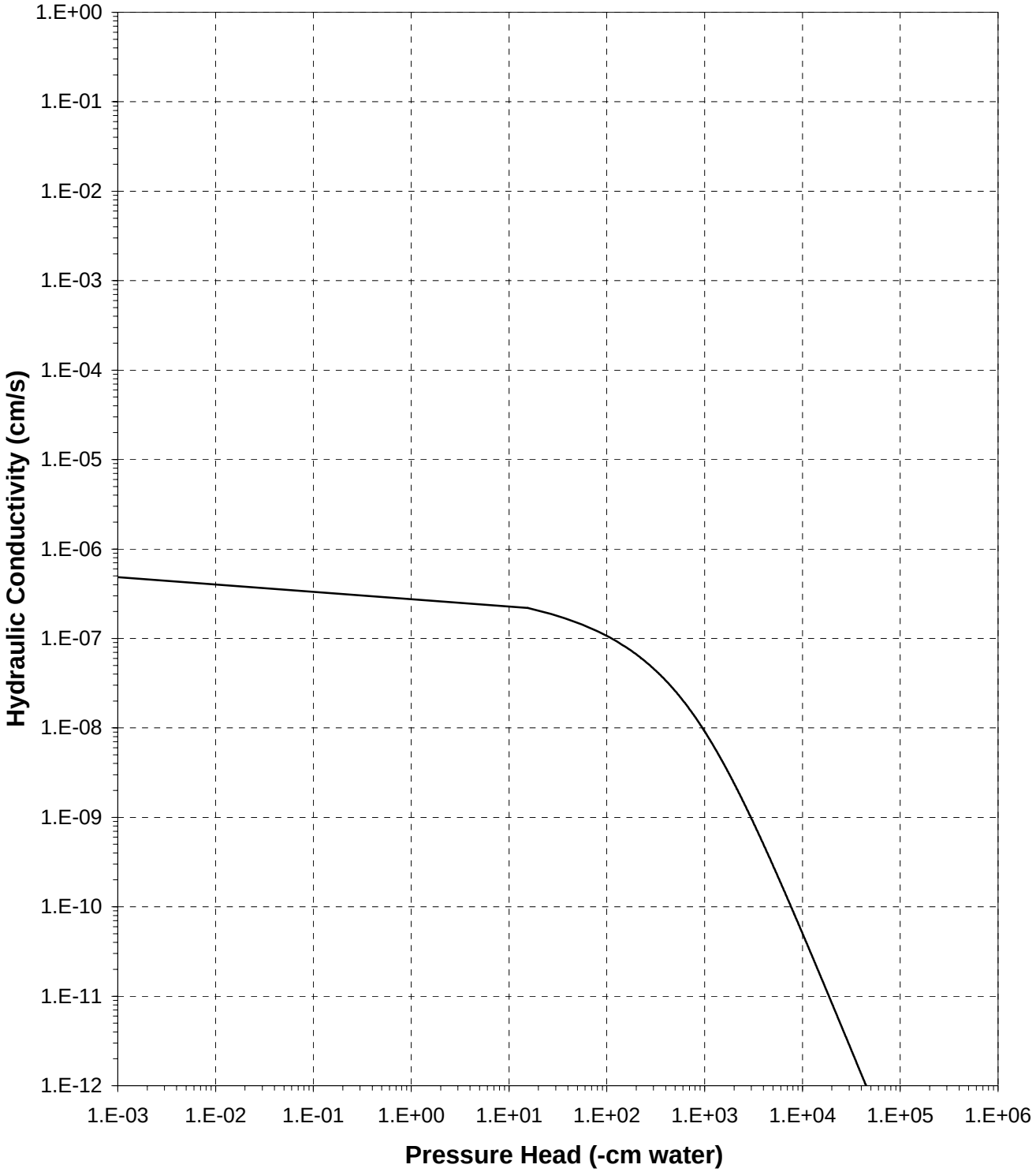
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (620-623)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (620-623)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (635-636)
Date Sampled: 12/8/2011
Depth: 635-636

Dry wt. of sample (g): 52.11
Tare wt., ring (g): 25.90
Tare wt., screen & clamp (g): 20.06
Initial sample volume (cm^3): 36.96
Initial dry bulk density (g/cm^3): 1.41
Measured particle density (g/cm^3): 2.65
Initial calculated total porosity (%): 46.86

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	1-Feb-12	13:55	115.39	0	46.86
	8-Feb-12	9:05	114.74	20.0	45.10
	15-Feb-12	8:50	114.34	73.0	44.02
	22-Feb-12	11:05	114.28	153.0	43.86
Pressure plate:	5-Mar-12	8:30	114.14	337	43.48

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	20.0	---	---	---	---
	73.0	---	---	---	---
	153.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (635-636)

Initial sample bulk density (g/cm^3)*:* 1.41
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 147.08
Tare weight, jar (g)*:* 114.23

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	4-Apr-12	10:10	151.80	13869	20.26
	3-Apr-12	16:58	150.35	36611	14.03
	3-Apr-12	14:45	149.69	105651	11.20

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	13869	---	---	---	---
	36611	---	---	---	---
	105651	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 74.04
Tare weight (g)*:* 40.79

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	22-Mar-12	8:30	75.64	854159	6.78

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

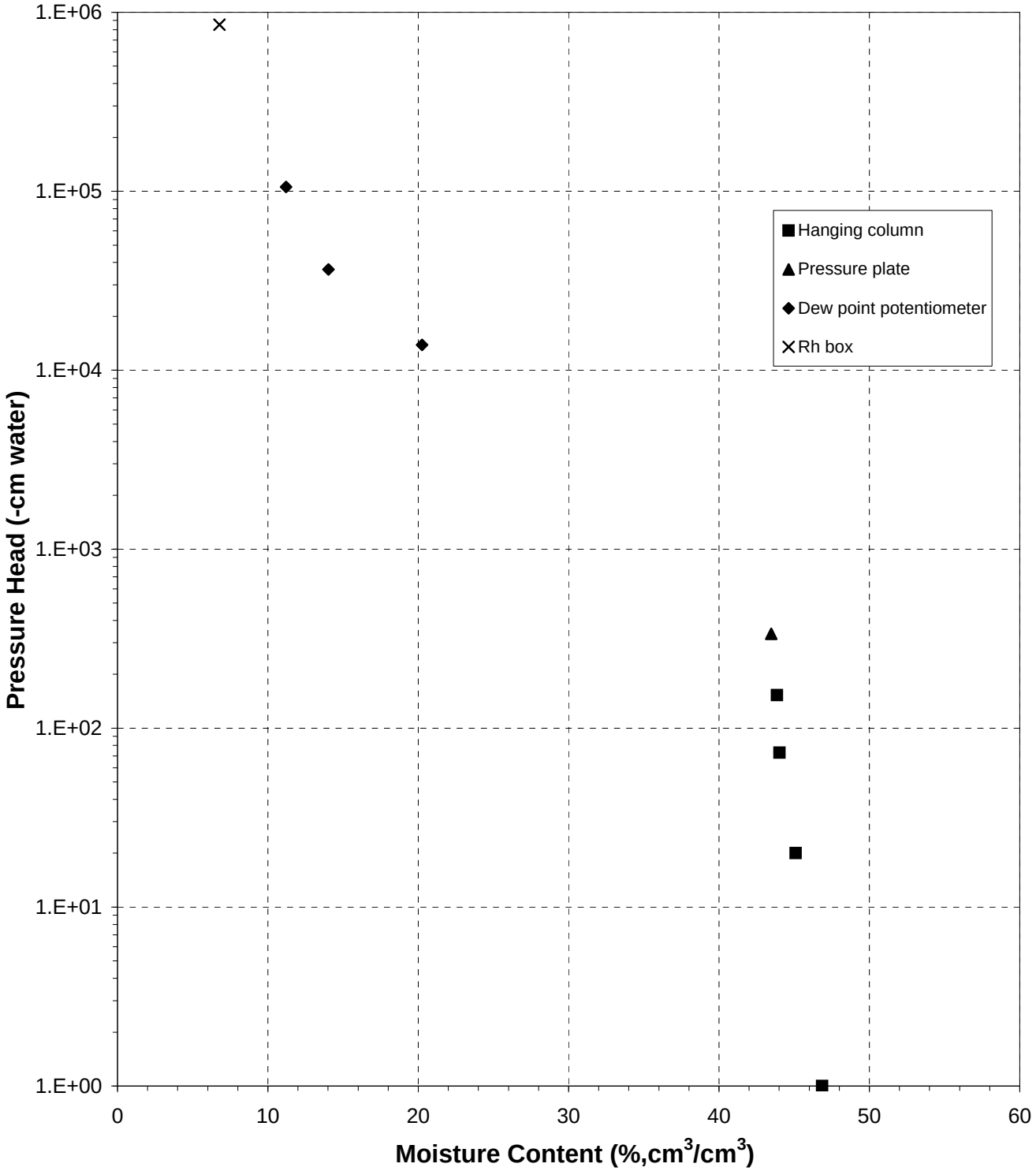
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

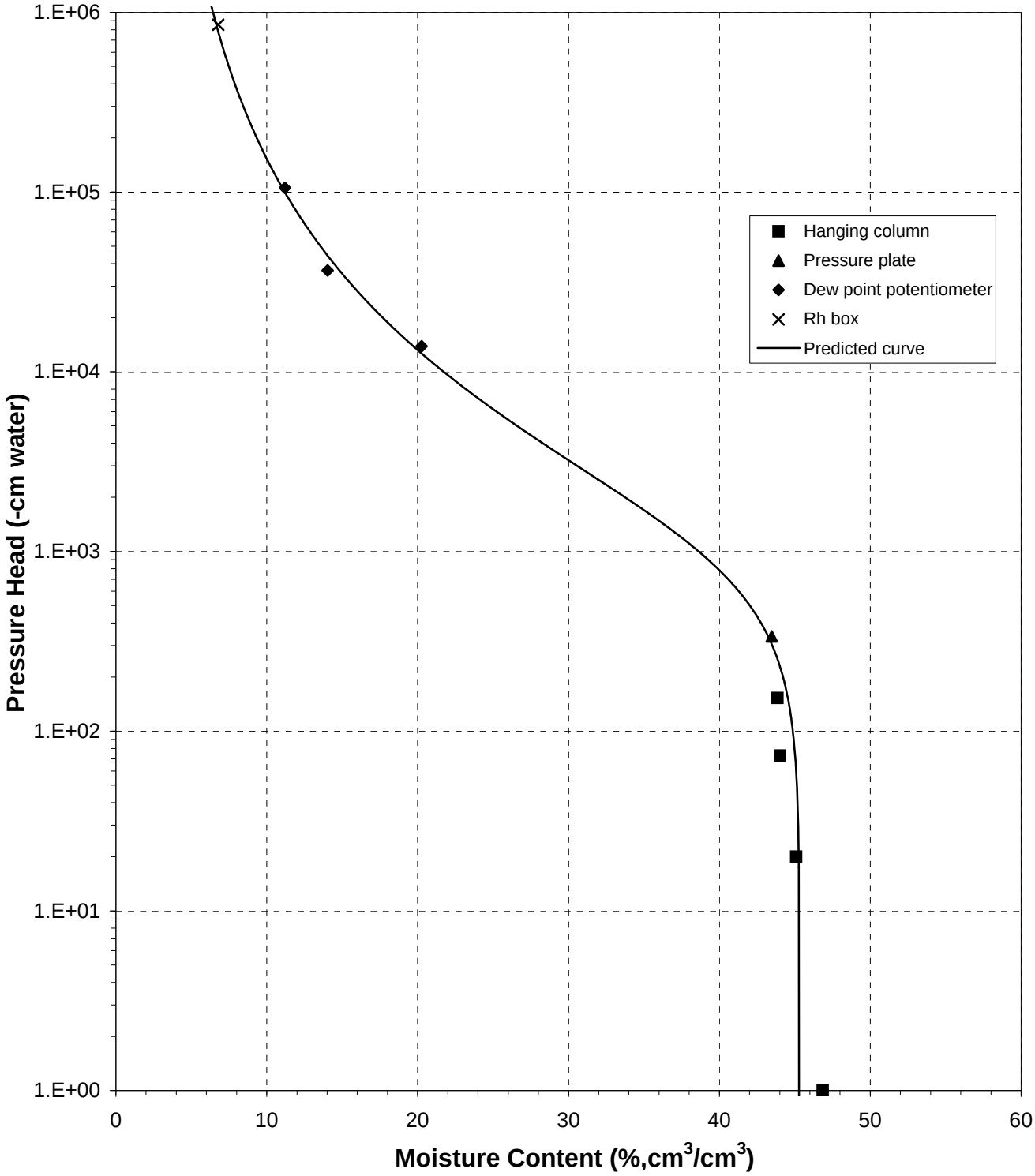
Water Retention Data Points

Sample Number: PB-14 (635-636)



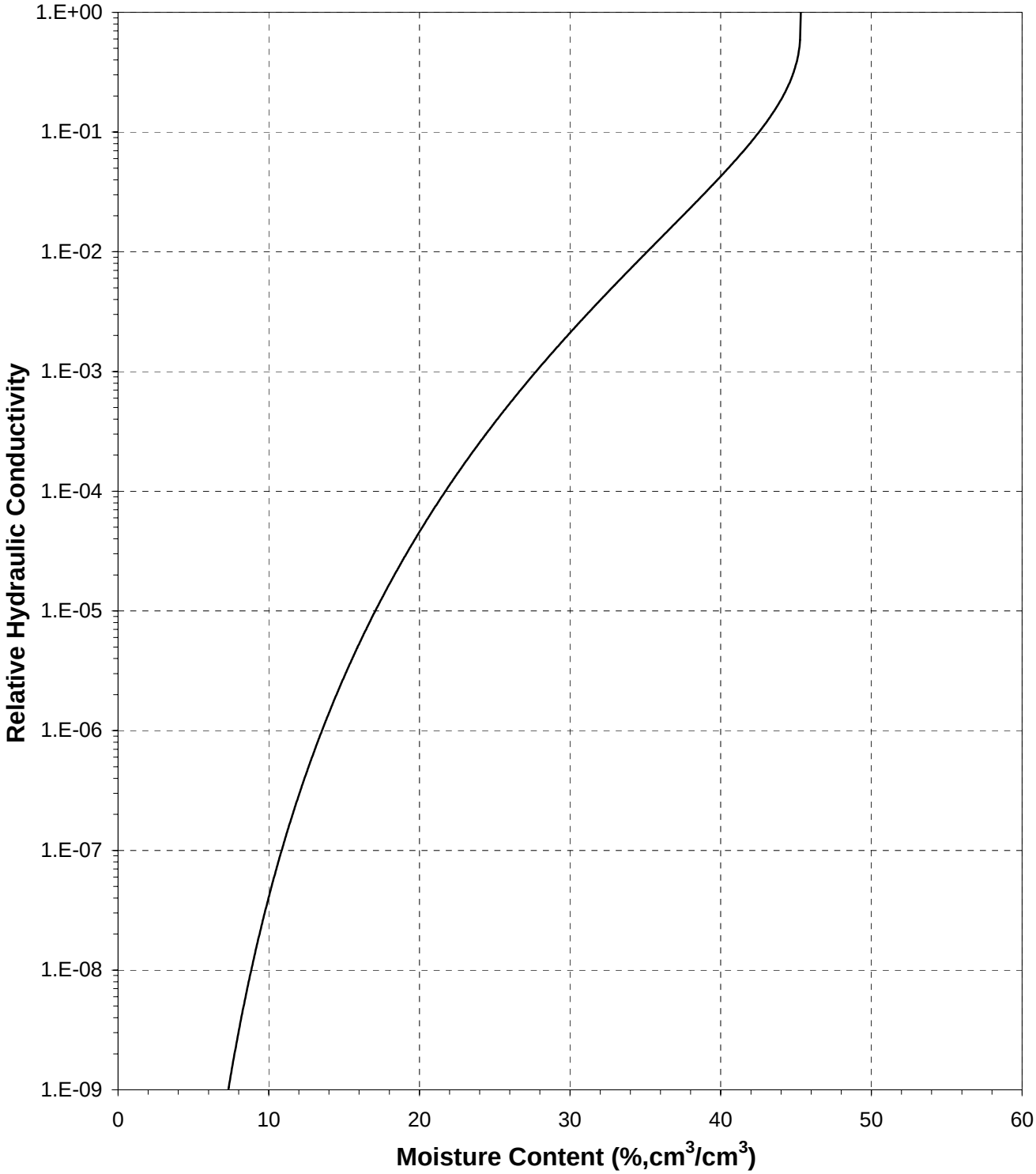
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (635-636)



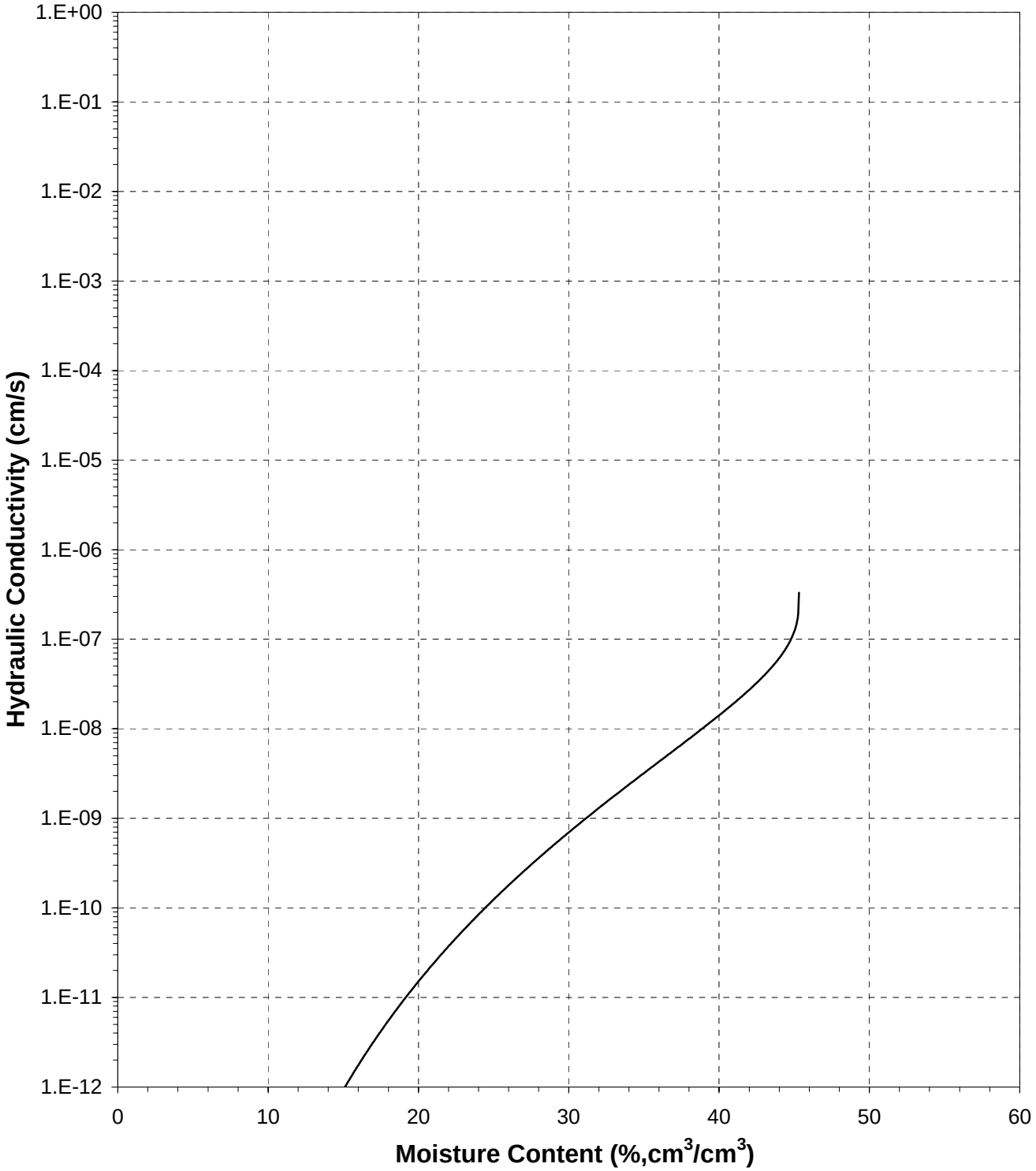
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (635-636)



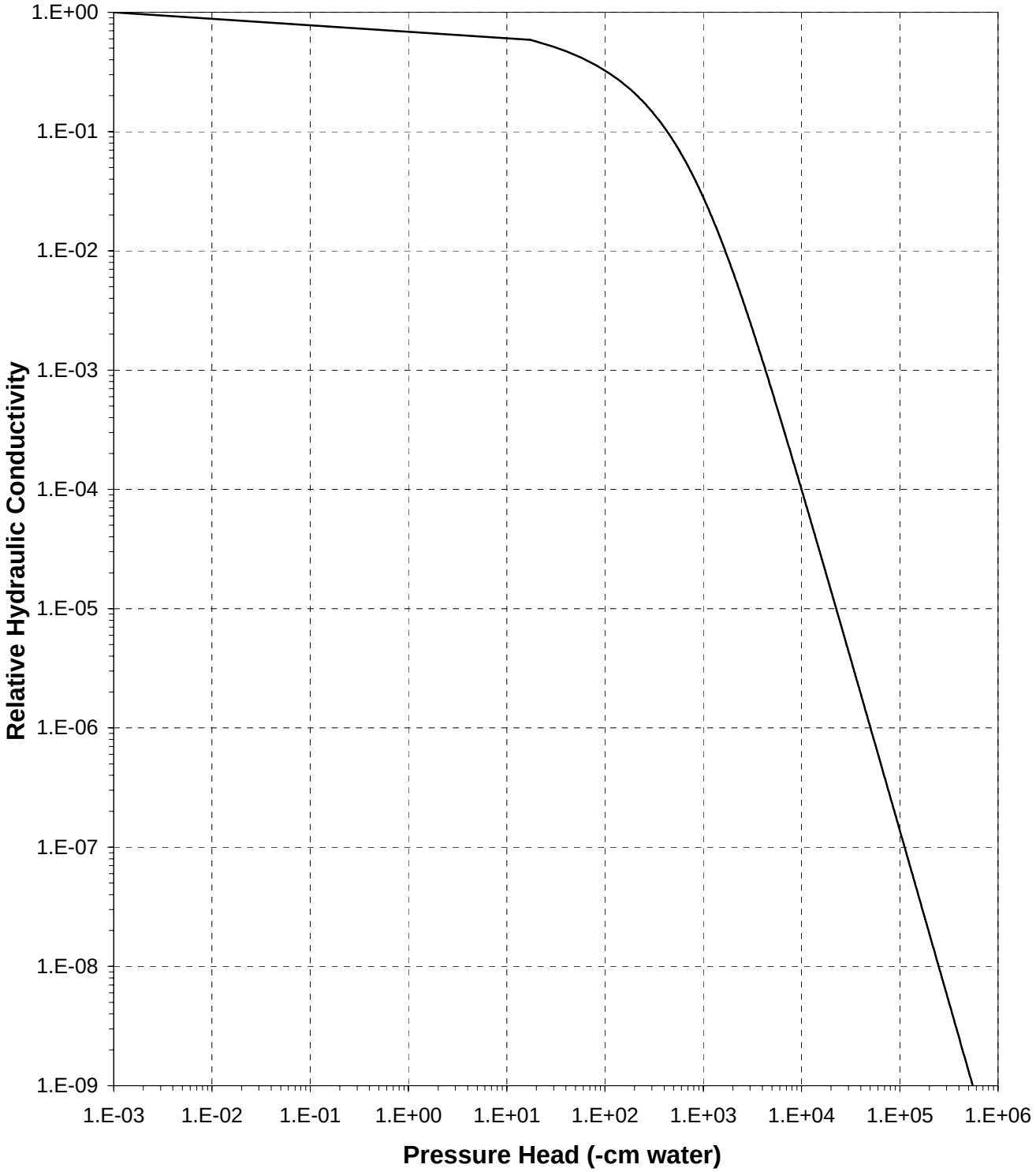
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (635-636)



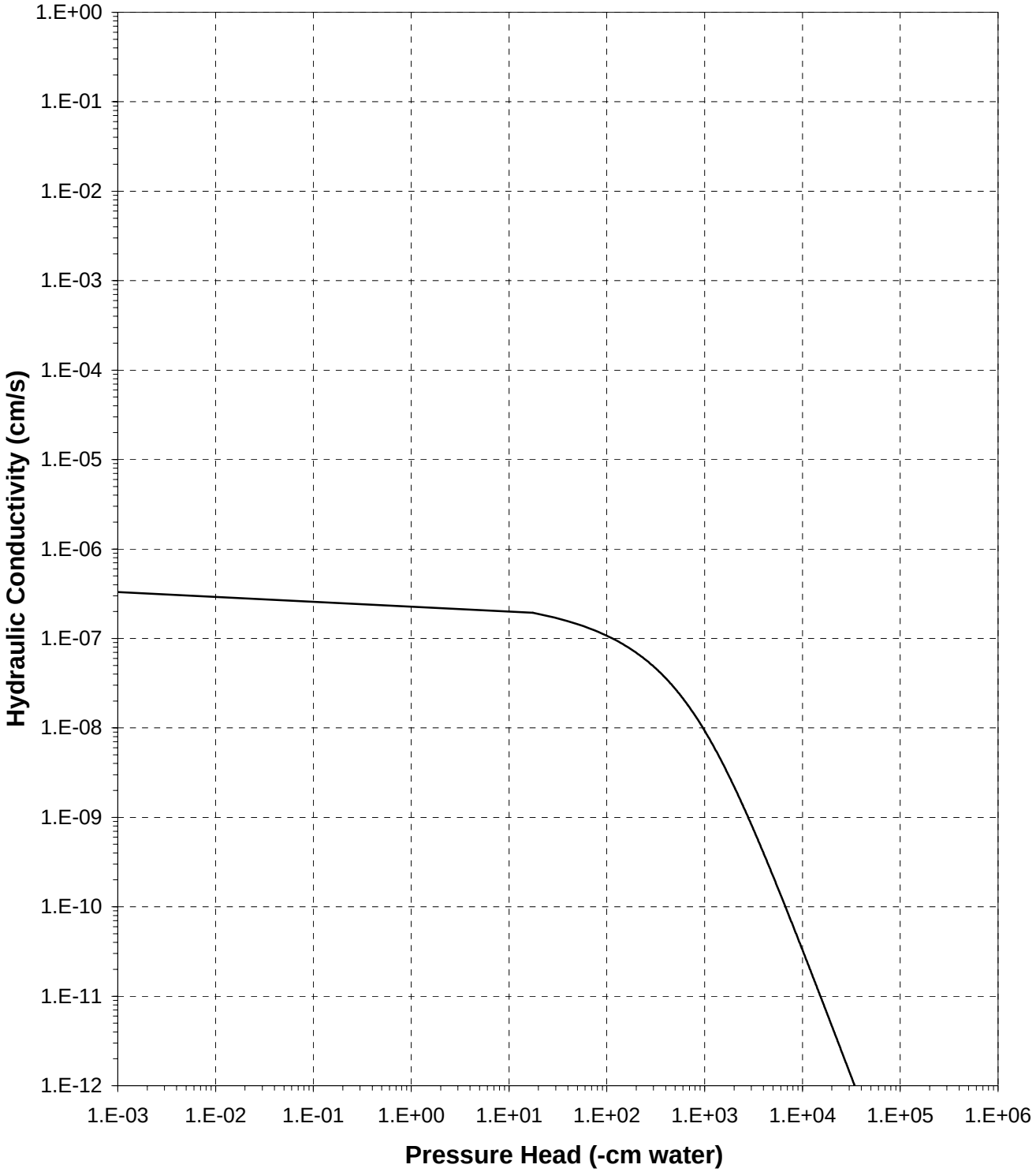
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (635-636)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (635-636)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (709-710)
Date Sampled: 12/8/2011
Depth: 709-710

Dry wt. of sample (g): 59.90
Tare wt., ring (g): 30.36
Tare wt., screen & clamp (g): 20.15
Initial sample volume (cm^3): 42.62
Initial dry bulk density (g/cm^3): 1.41
Measured particle density (g/cm^3): 2.67
Initial calculated total porosity (%): 47.40

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	31-Jan-12	14:10	130.61	0	47.40
	7-Feb-12	10:05	130.61	51.0	47.40
	14-Feb-12	8:00	130.45	150.0	47.02
Pressure plate:	28-Feb-12	8:35	129.87	337	45.66
	13-Mar-12	8:35	129.41	1275	44.58

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	150.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (709-710)

Initial sample bulk density (g/cm^3)*:* 1.41
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 151.84
Tare weight, jar (g)*:* 112.44

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	5-Apr-12	8:35	156.91	13053	18.09
	3-Apr-12	16:17	155.01	59352	11.31
	6-Apr-12	14:07	154.30	136653	8.78

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	13053	---	---	---	---
	59352	---	---	---	---
	136653	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 77.84
Tare weight (g)*:* 39.94

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	22-Mar-12	8:30	79.53	854159	6.26

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

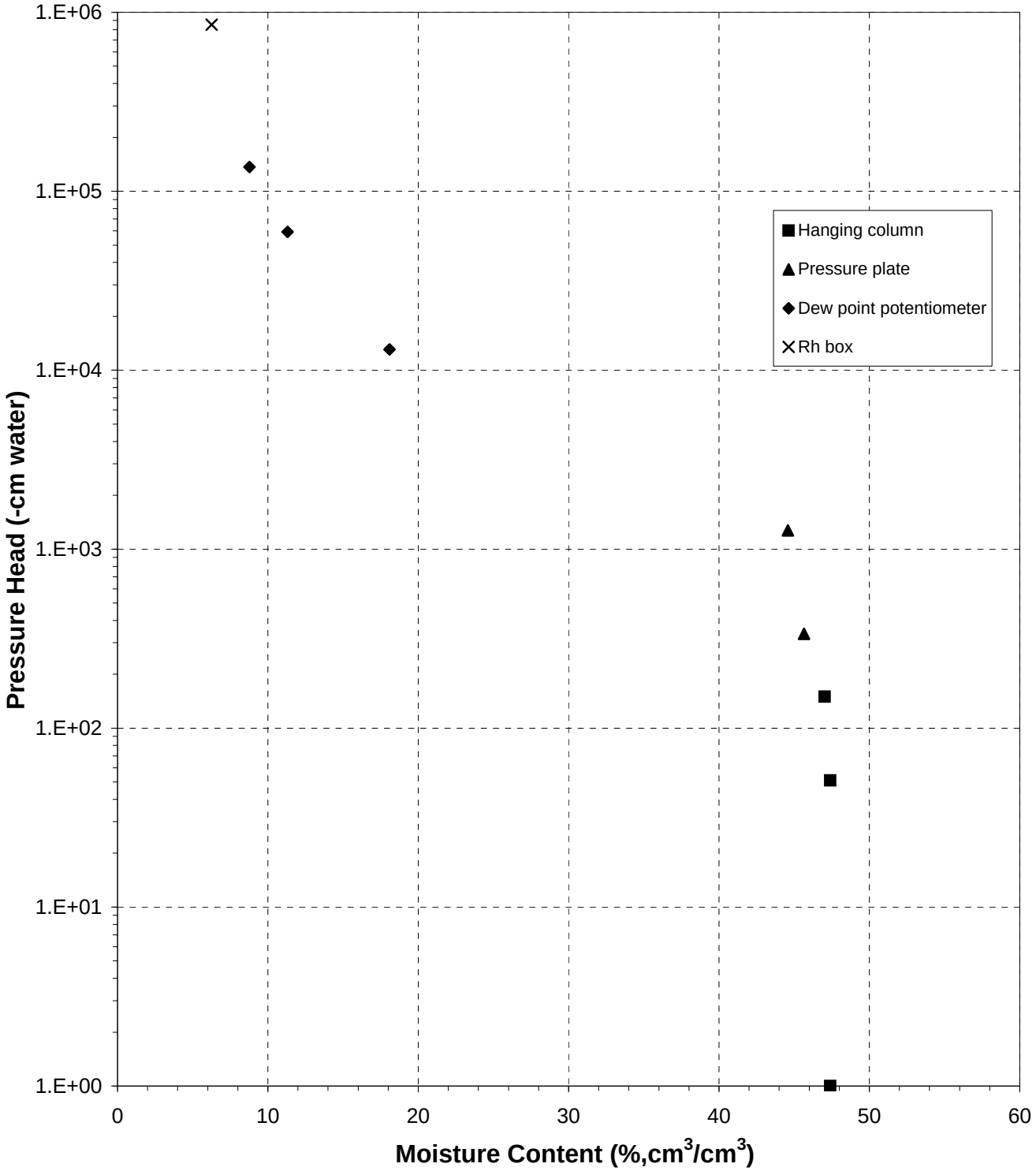
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: K. Wright/ C. Sessa
Data entered by: C. Krous
Checked by: J. Hines

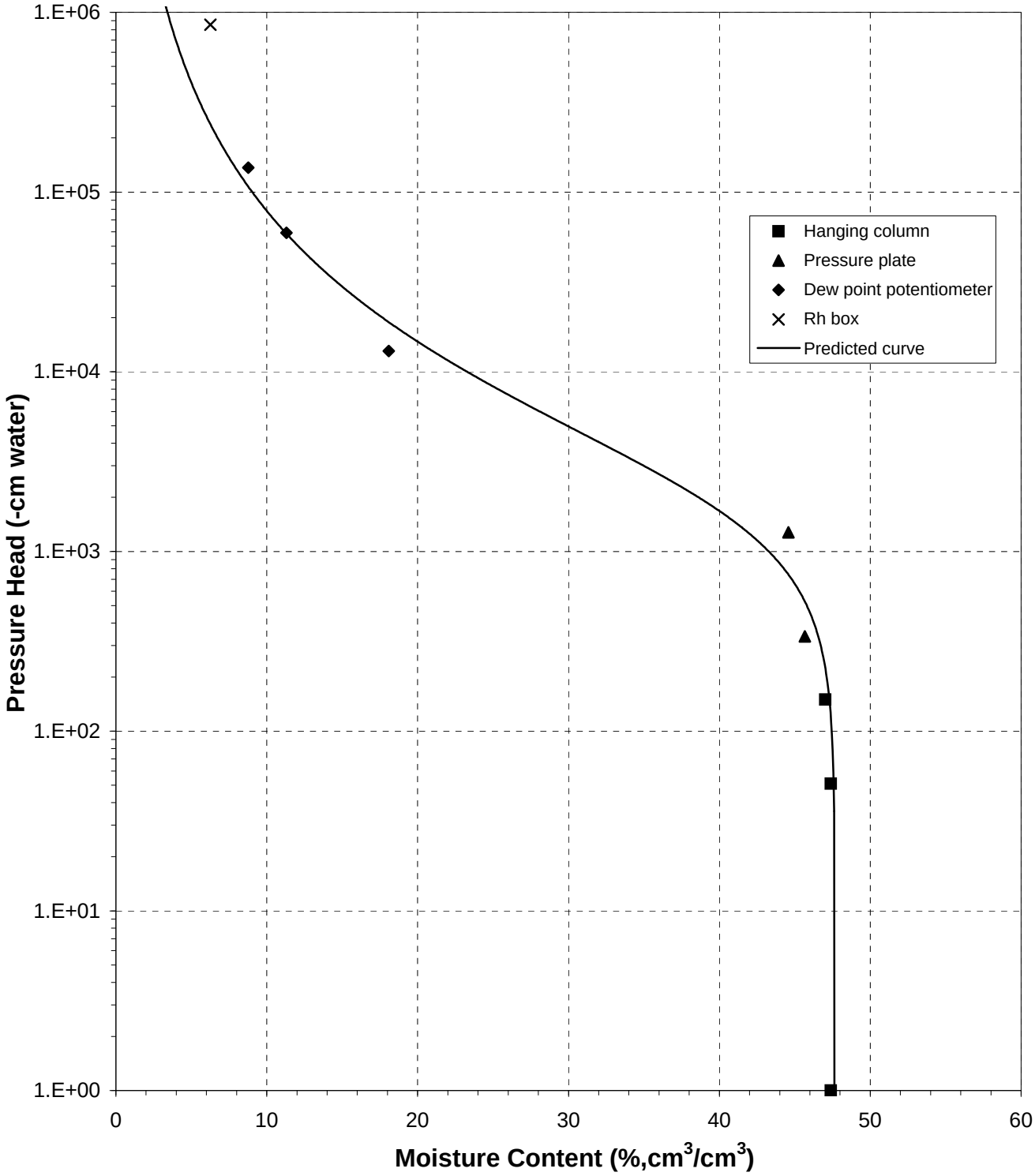
Water Retention Data Points

Sample Number: PB-14 (709-710)



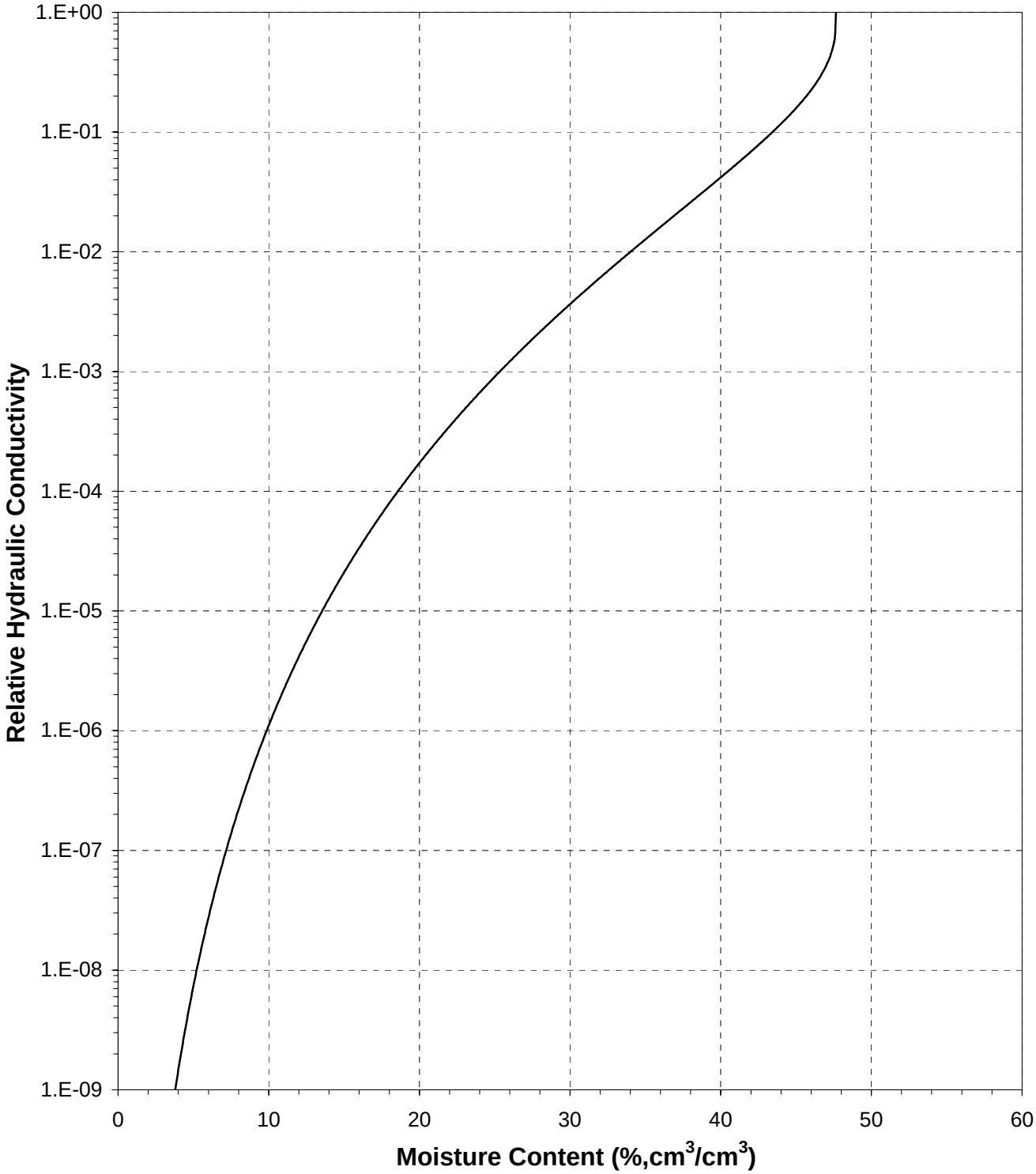
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (709-710)



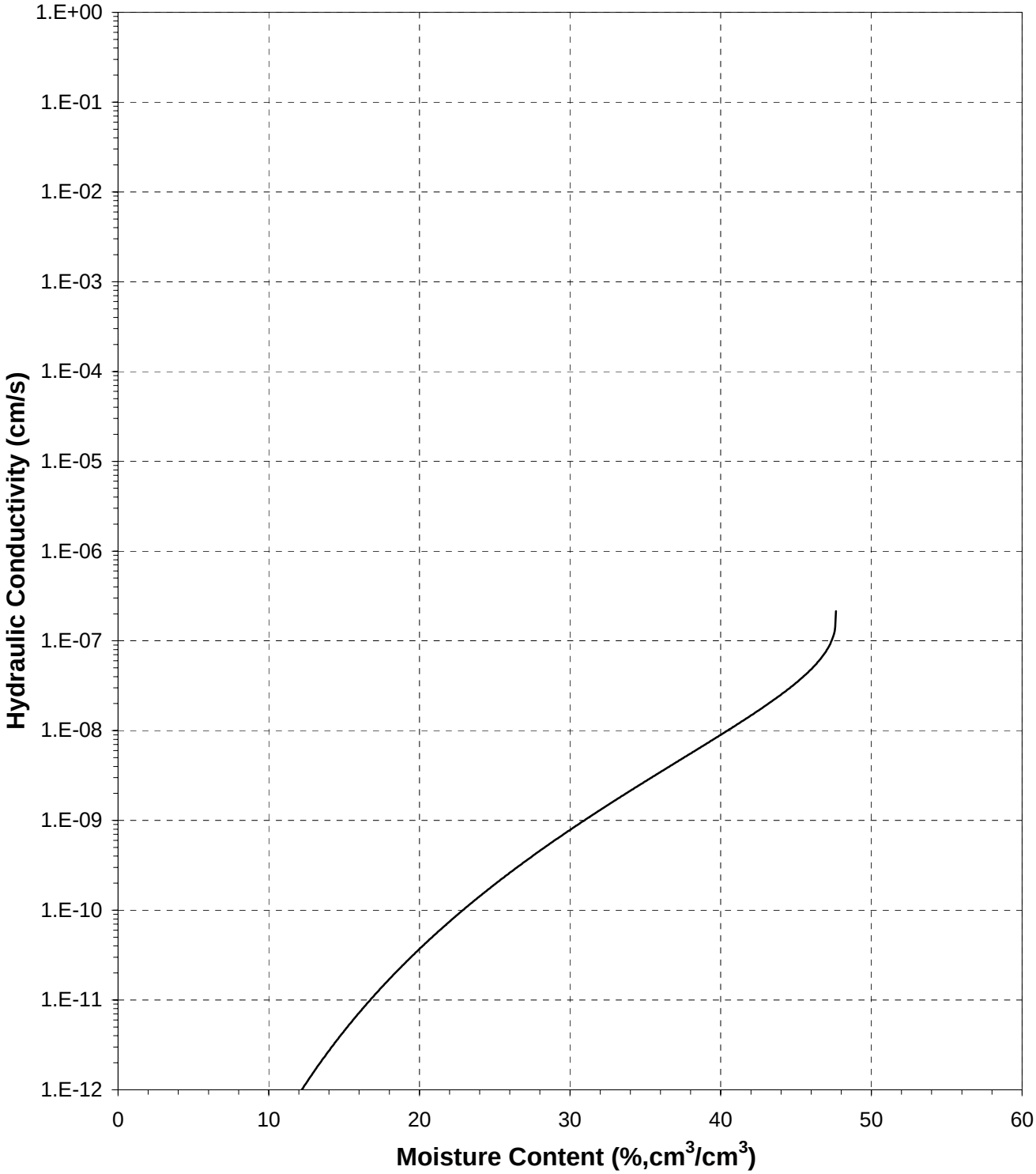
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (709-710)



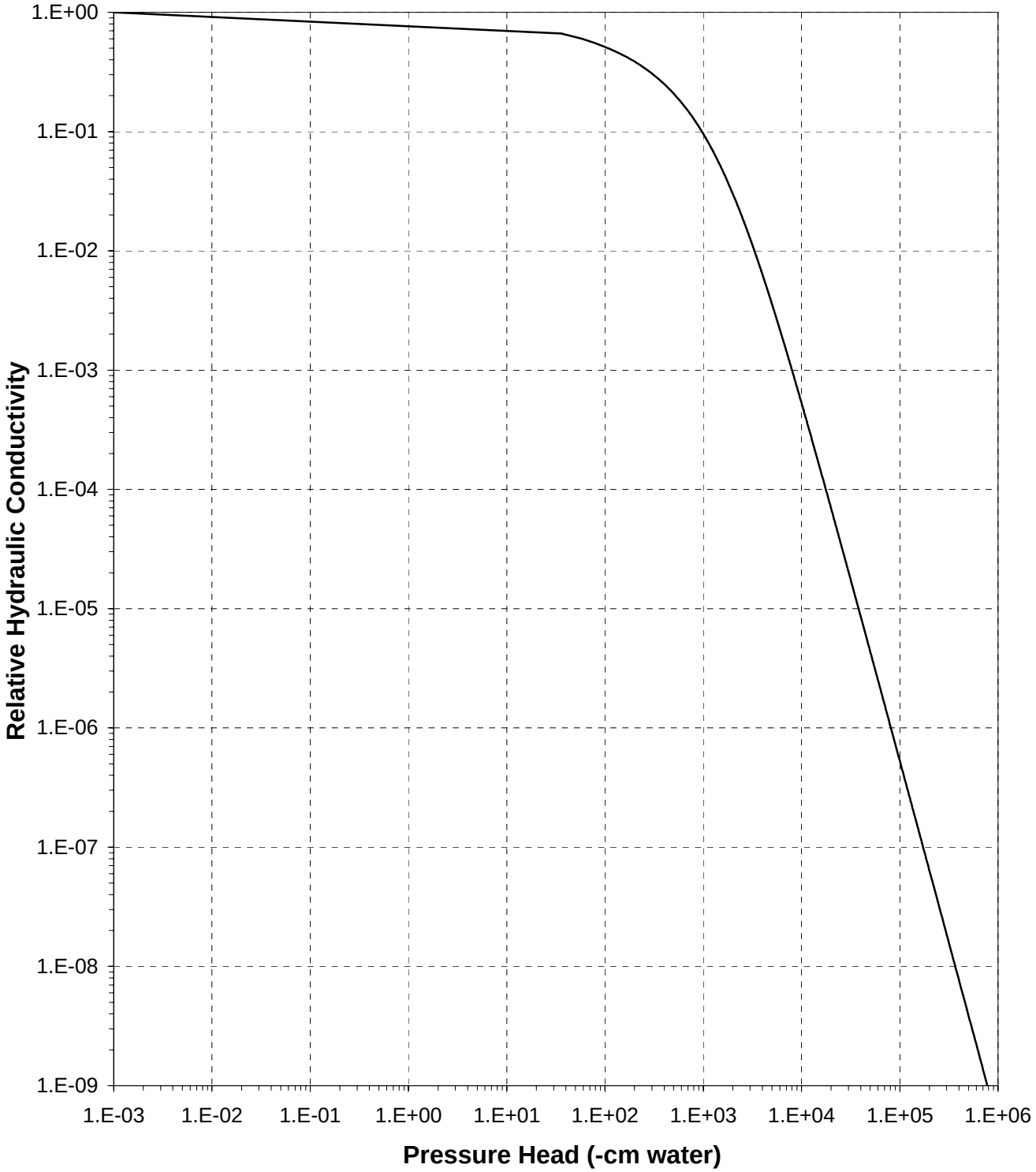
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (709-710)



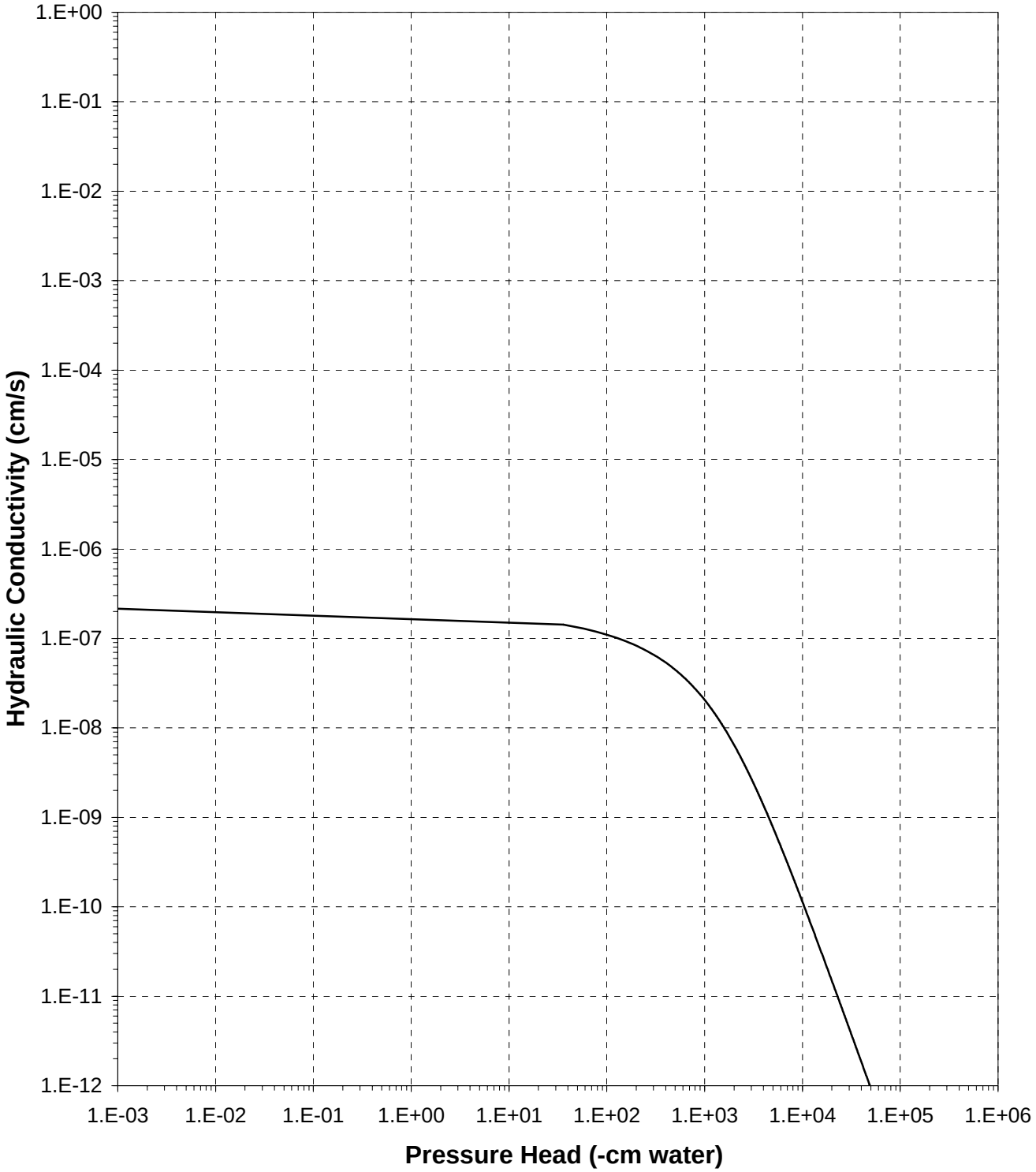
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (709-710)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (709-710)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (727-728)
Date Sampled: 12/8/2011
Depth: 727-728

Dry wt. of sample (g): 69.87
Tare wt., ring (g): 81.08
Tare wt., screen & clamp (g): 24.11
Initial sample volume (cm^3): 47.06
Initial dry bulk density (g/cm^3): 1.48
Measured particle density (g/cm^3): 2.67
Initial calculated total porosity (%): 44.29

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	4-Feb-12	9:50	195.90	0	44.29
	20-Feb-12	10:45	194.23	17.0	40.74
	27-Feb-12	12:00	193.96	50.0	40.16
	5-Mar-12	9:35	193.81	127.0	39.85
Pressure plate:	15-Mar-12	13:20	193.23	337	38.61

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	17.0	---	---	---	---
	50.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (727-728)

Initial sample bulk density (g/cm^3)*:* 1.48
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 142.76
Tare weight, jar (g)*:* 116.11

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	6-Mar-12	14:10	146.91	10504	23.12
	12-Mar-12	11:45	145.27	52214	13.98
	9-Mar-12	16:06	144.56	212730	10.03

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	10504	---	---	---	---
	52214	---	---	---	---
	212730	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 68.78
Tare weight (g)*:* 41.08

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	24-Feb-12	9:30	69.94	852726	6.21

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	852726	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

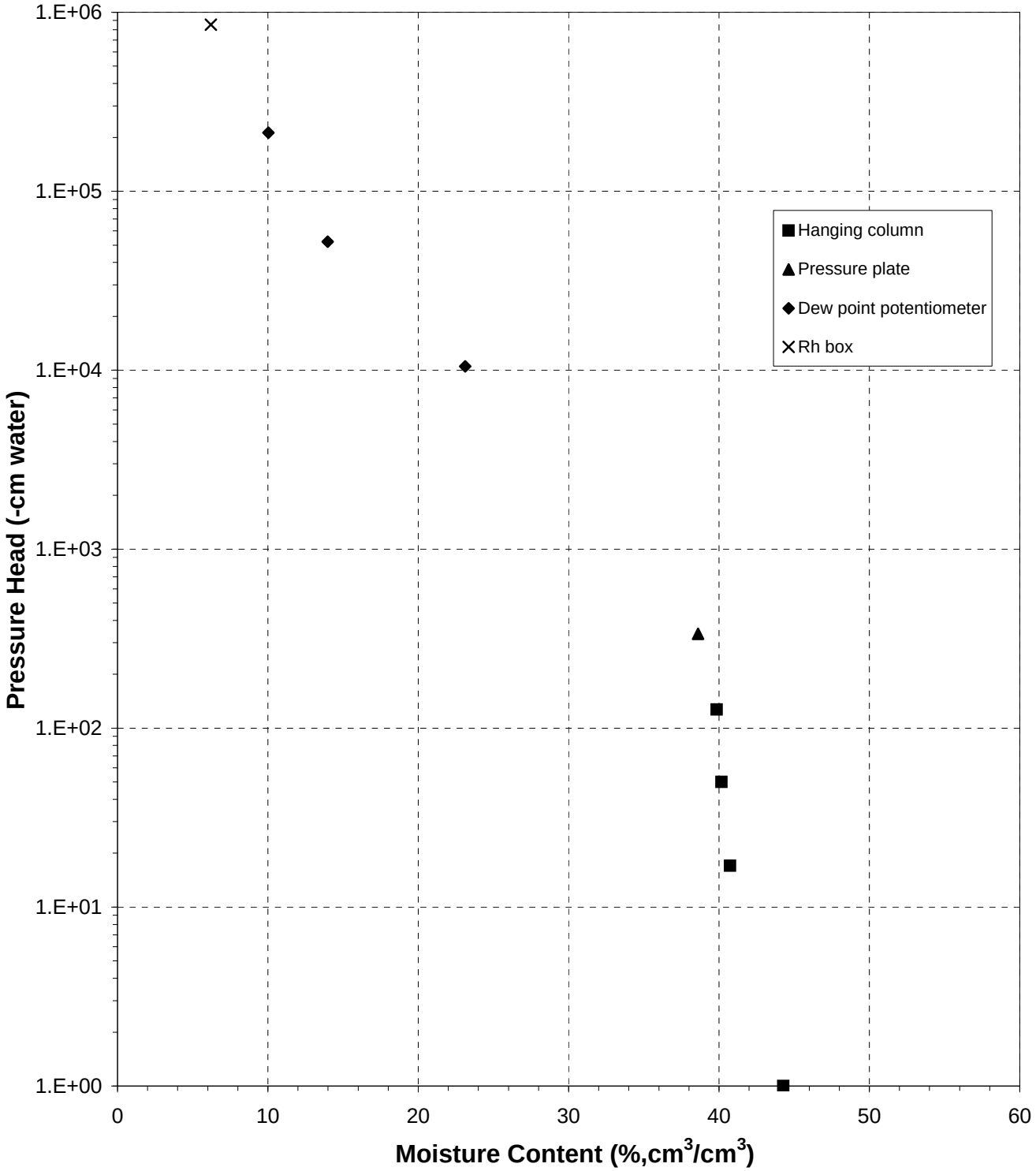
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/ C. Krous/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

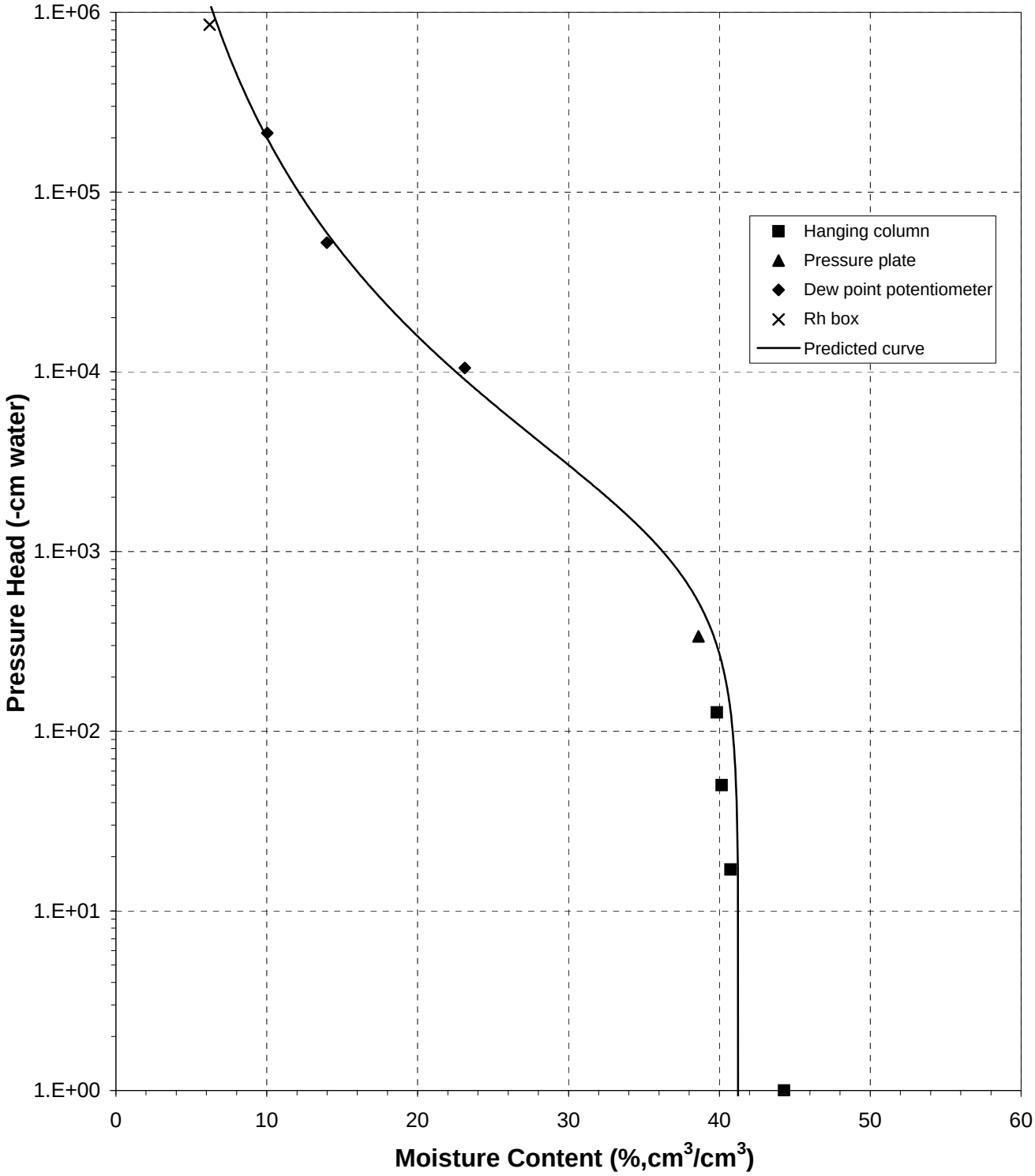
Water Retention Data Points

Sample Number: PB-14 (727-728)



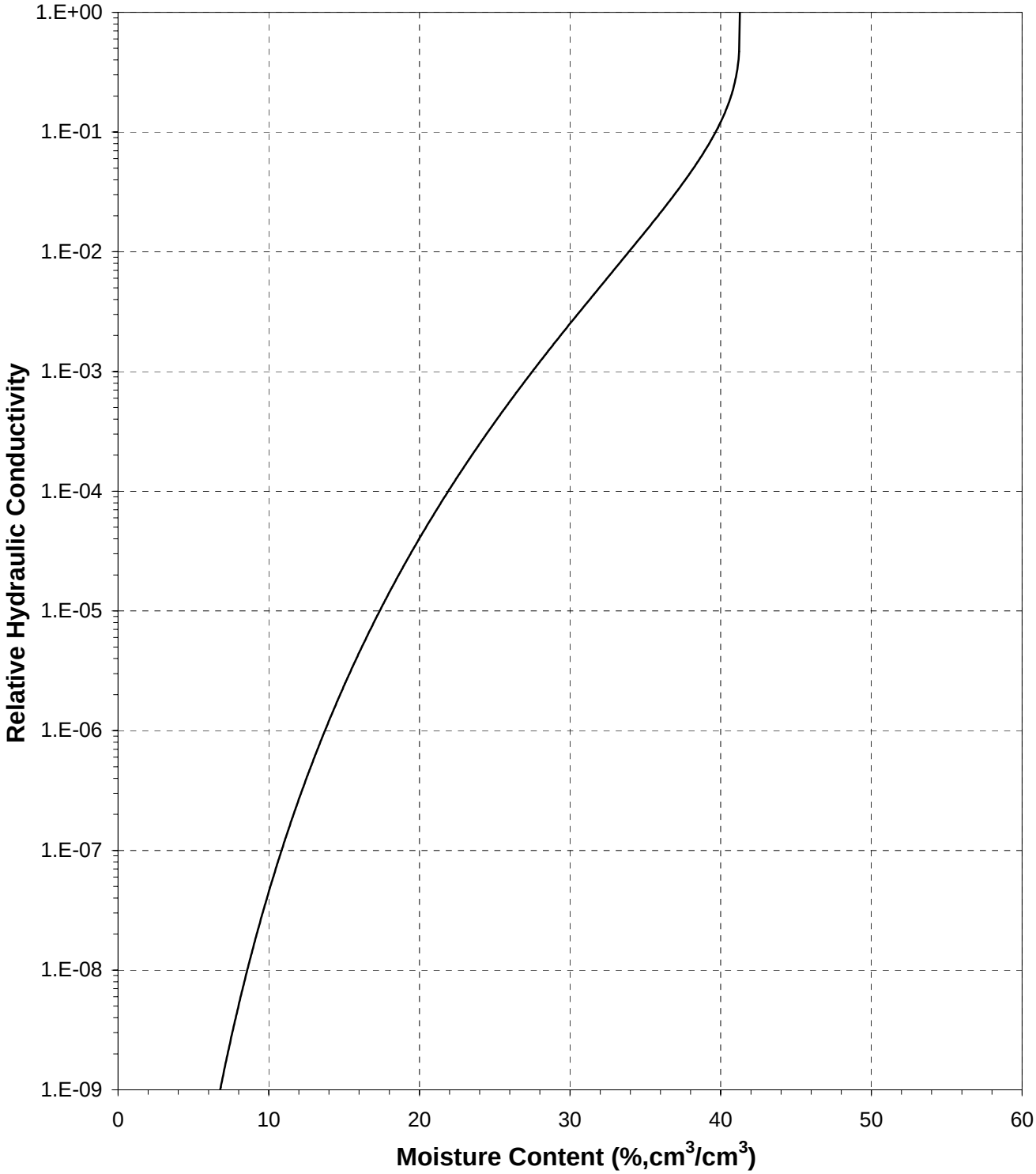
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (727-728)



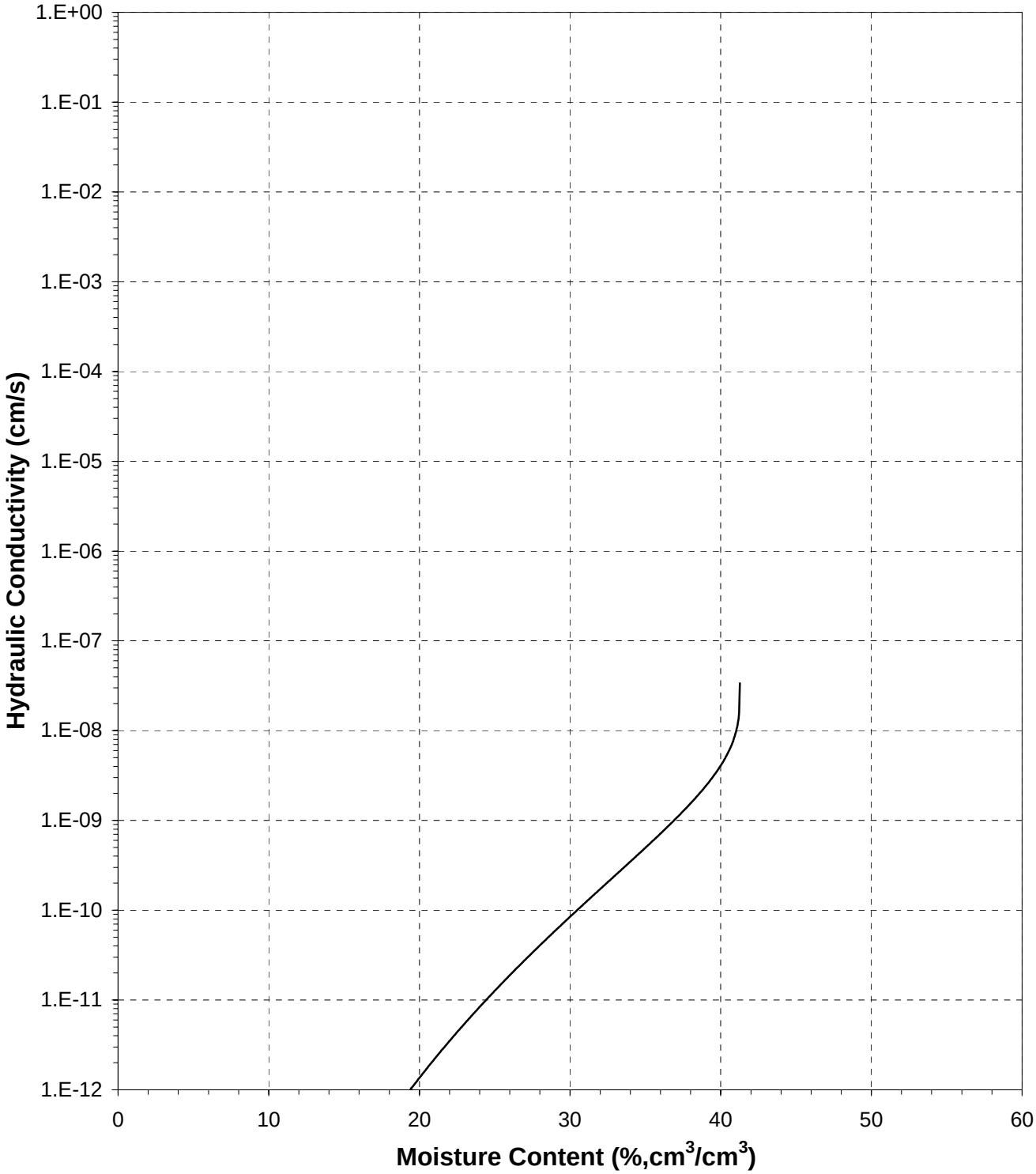
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (727-728)



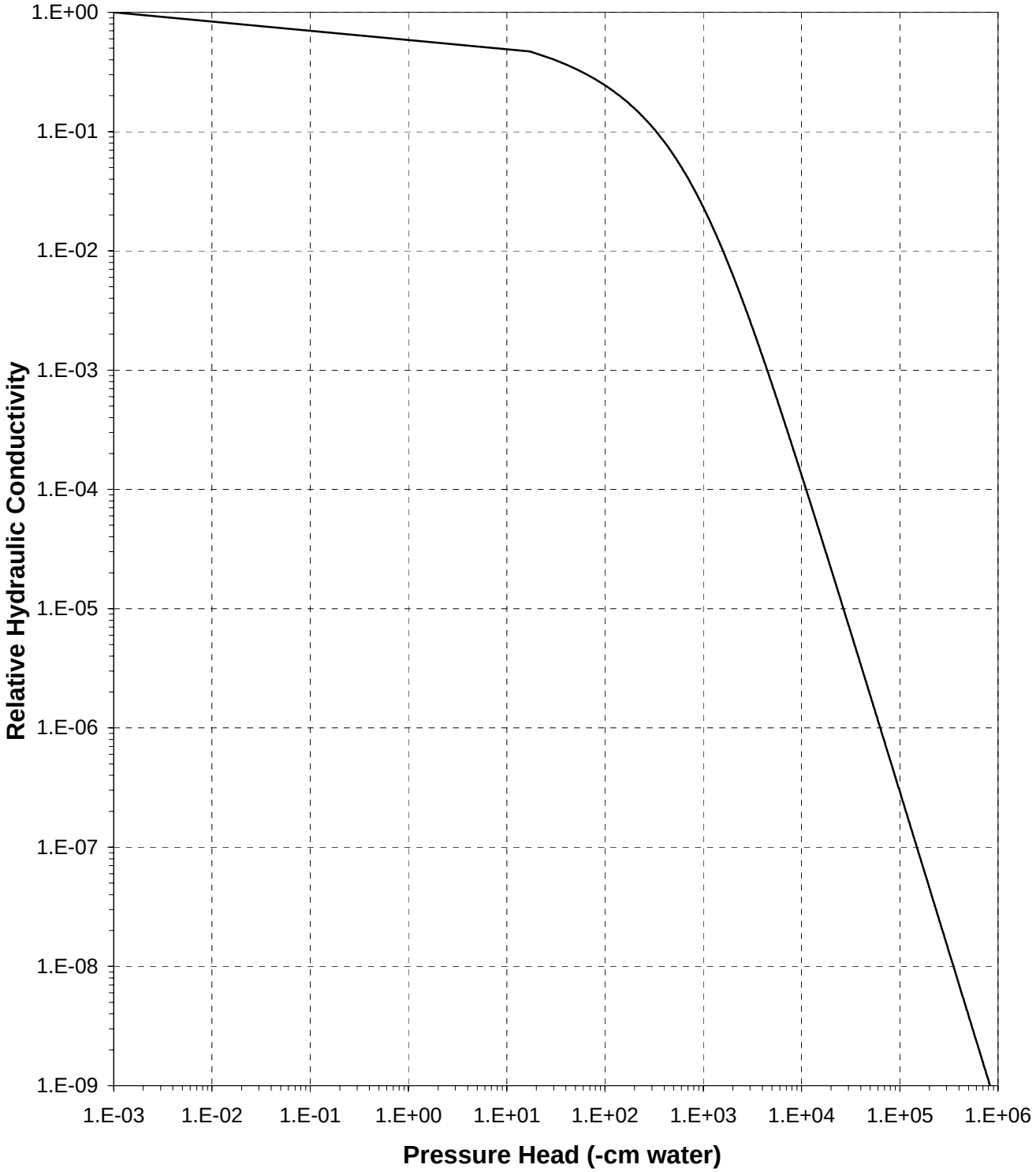
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (727-728)



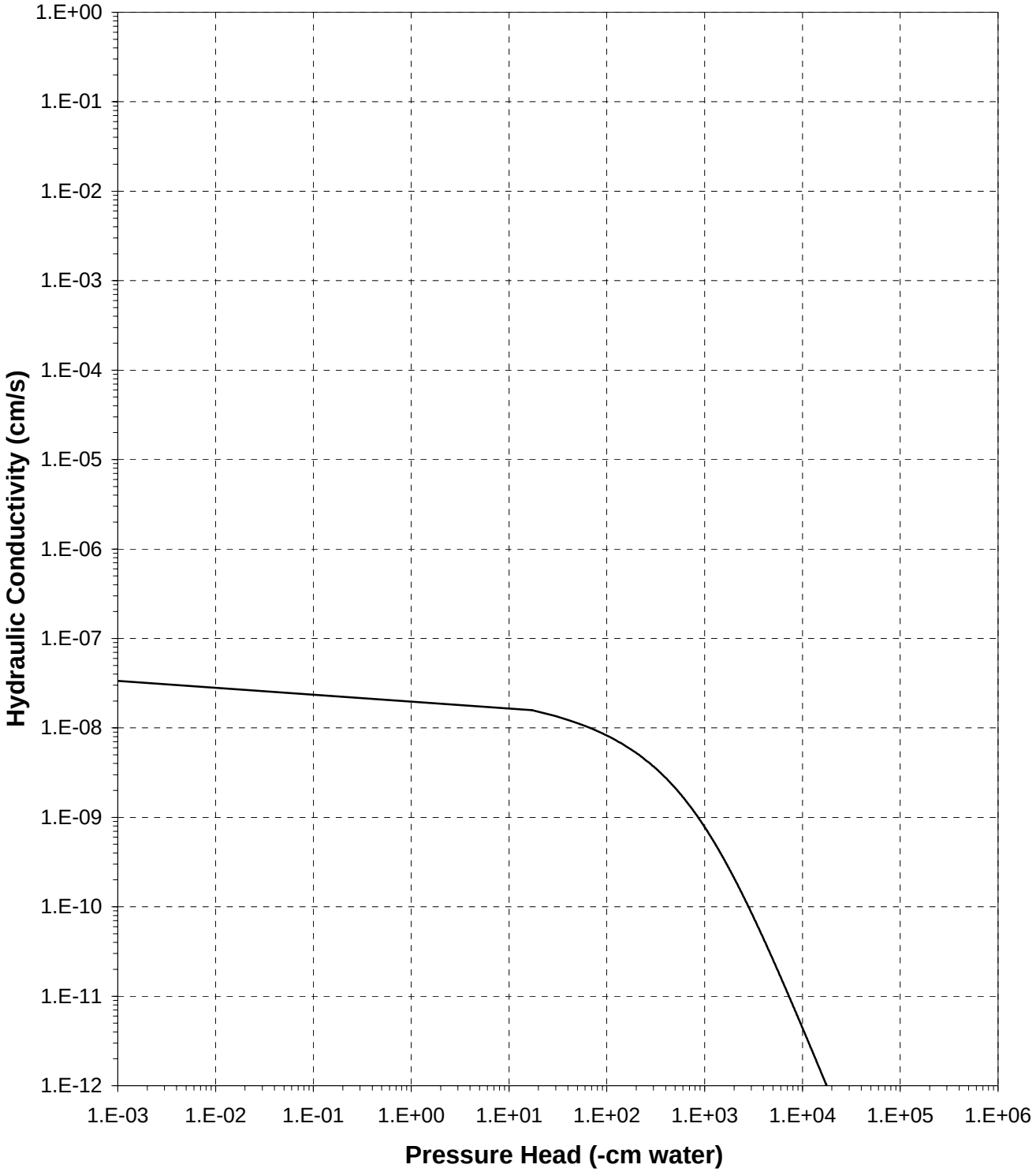
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (727-728)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (727-728)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (741-742)
Date Sampled: 12/8/2011
Depth: 741-742

Dry wt. of sample (g): 57.36
Tare wt., ring (g): 26.26
Tare wt., screen & clamp (g): 20.03
Initial sample volume (cm^3): 38.95
Initial dry bulk density (g/cm^3): 1.47
Measured particle density (g/cm^3): 2.65
Initial calculated total porosity (%): 44.45

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	13-Feb-12	12:50	120.96	0	44.44
	20-Feb-12	10:55	120.63	51.0	43.60
	27-Feb-12	10:00	120.53	152.0	43.34
Pressure plate:	13-Mar-12	13:05	120.38	337	42.96
	27-Mar-12	8:20	120.24	1275	42.60

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	152.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (741-742)

Initial sample bulk density (g/cm^3)*:* 1.47
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 150.89
Tare weight, jar (g)*:* 112.77

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	13-Mar-12	15:11	156.32	18866	20.98
	13-Mar-12	10:53	155.78	32634	18.89
	14-Mar-12	15:58	154.93	68531	15.61

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	18866	---	---	---	---
	32634	---	---	---	---
	68531	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 68.17
Tare weight (g)*:* 41.63

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	24-Feb-12	9:40	69.46	852726	7.13

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	852726	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

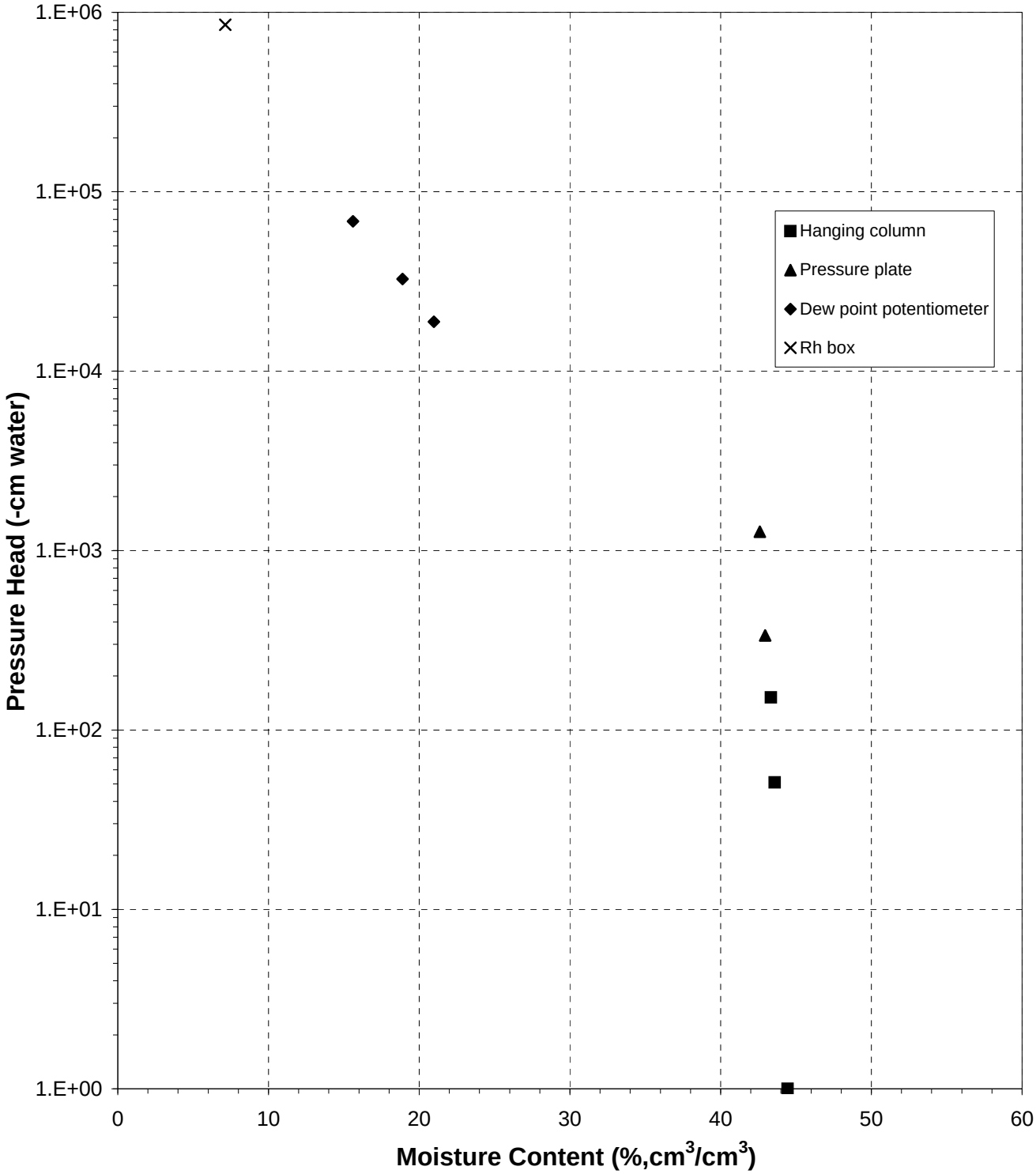
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

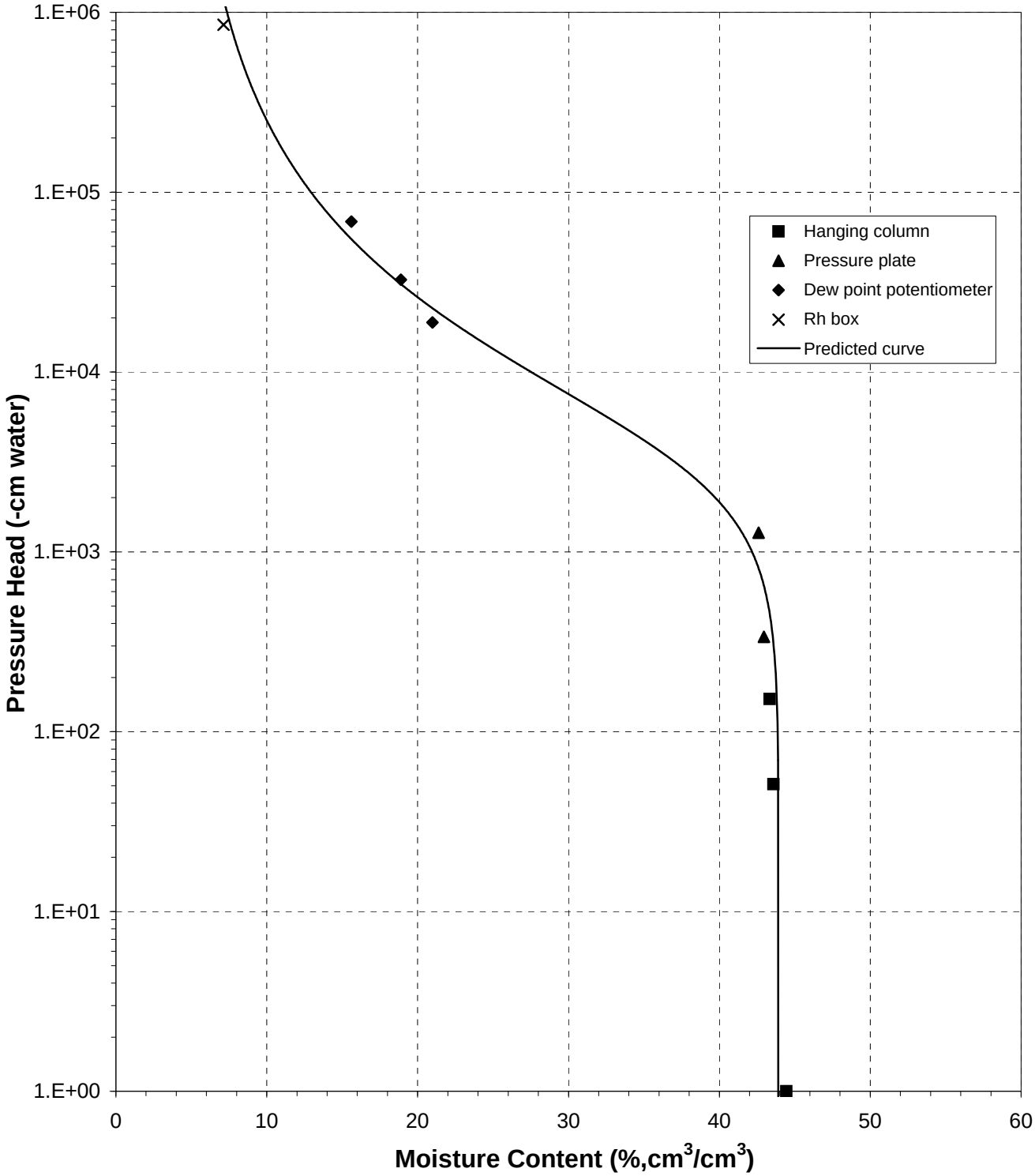
Water Retention Data Points

Sample Number: PB-14 (741-742)



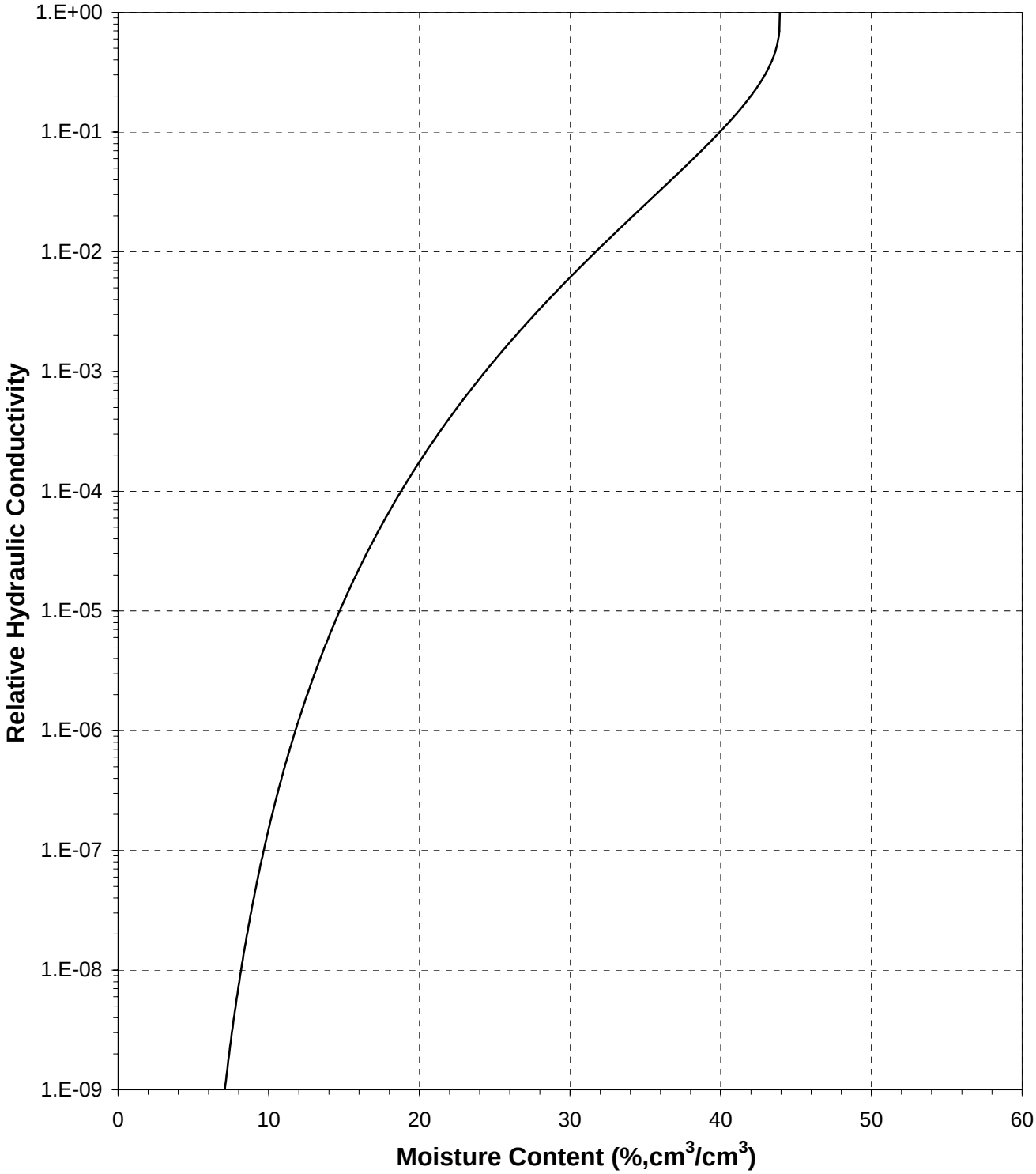
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (741-742)



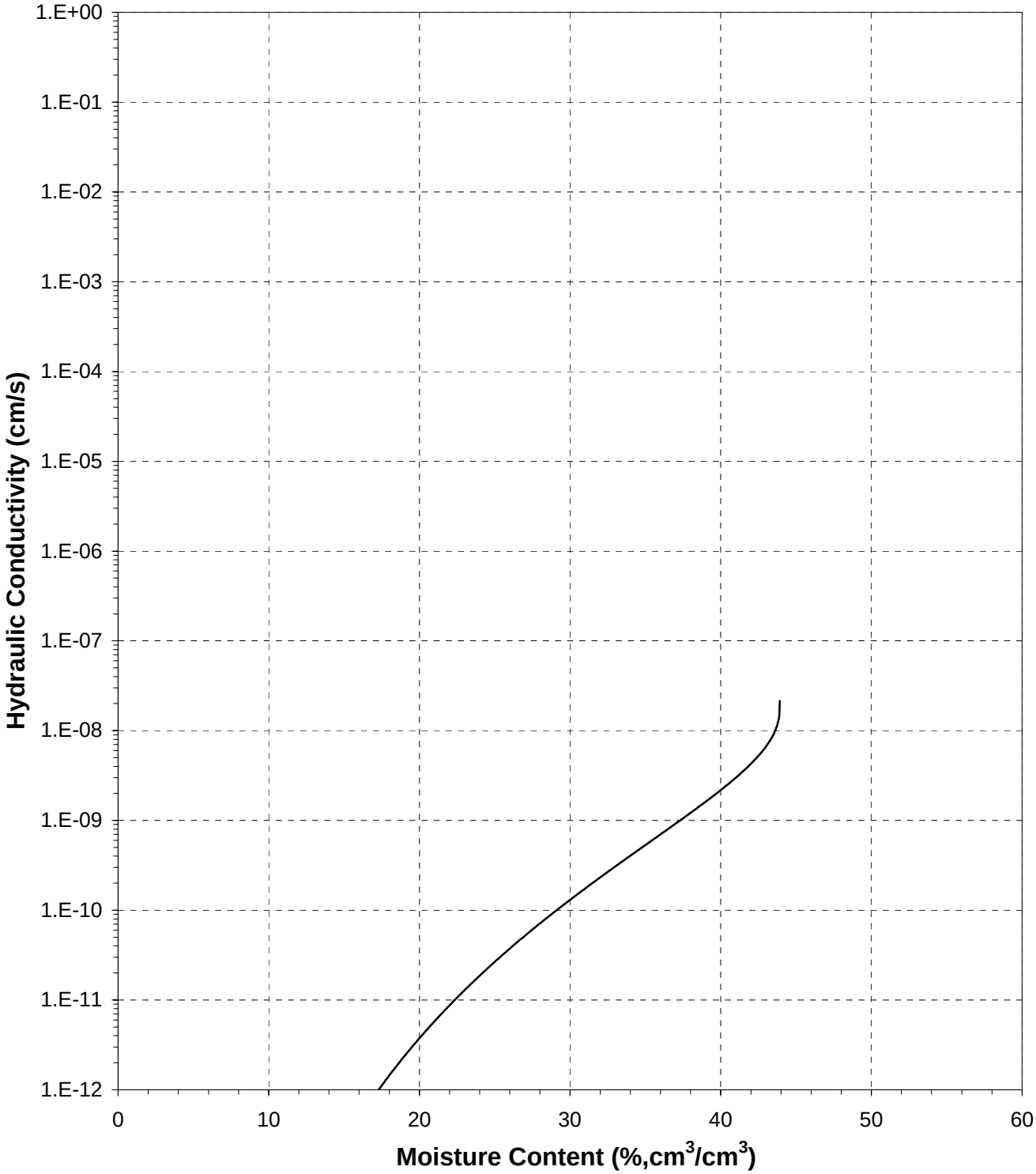
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (741-742)



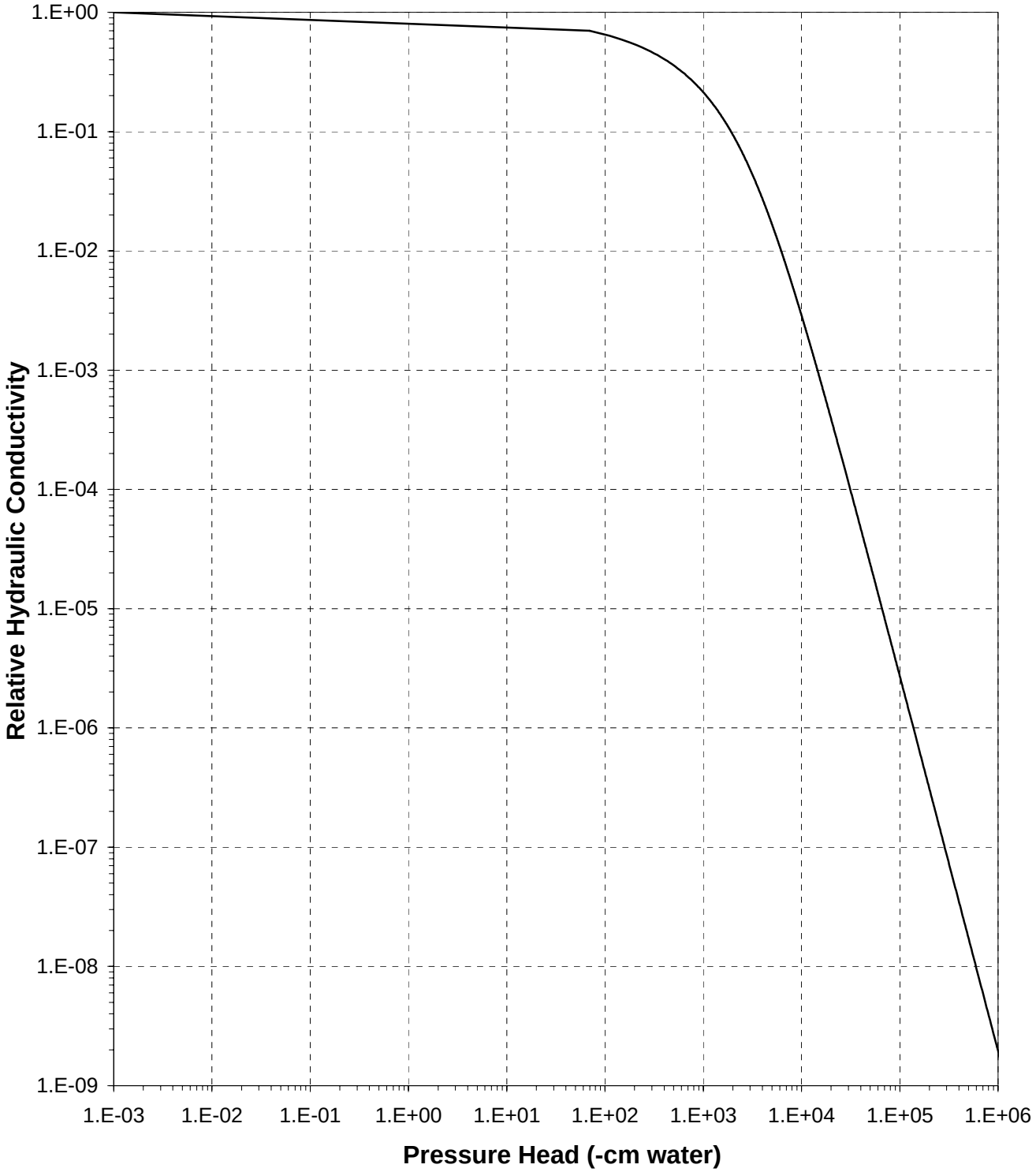
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (741-742)



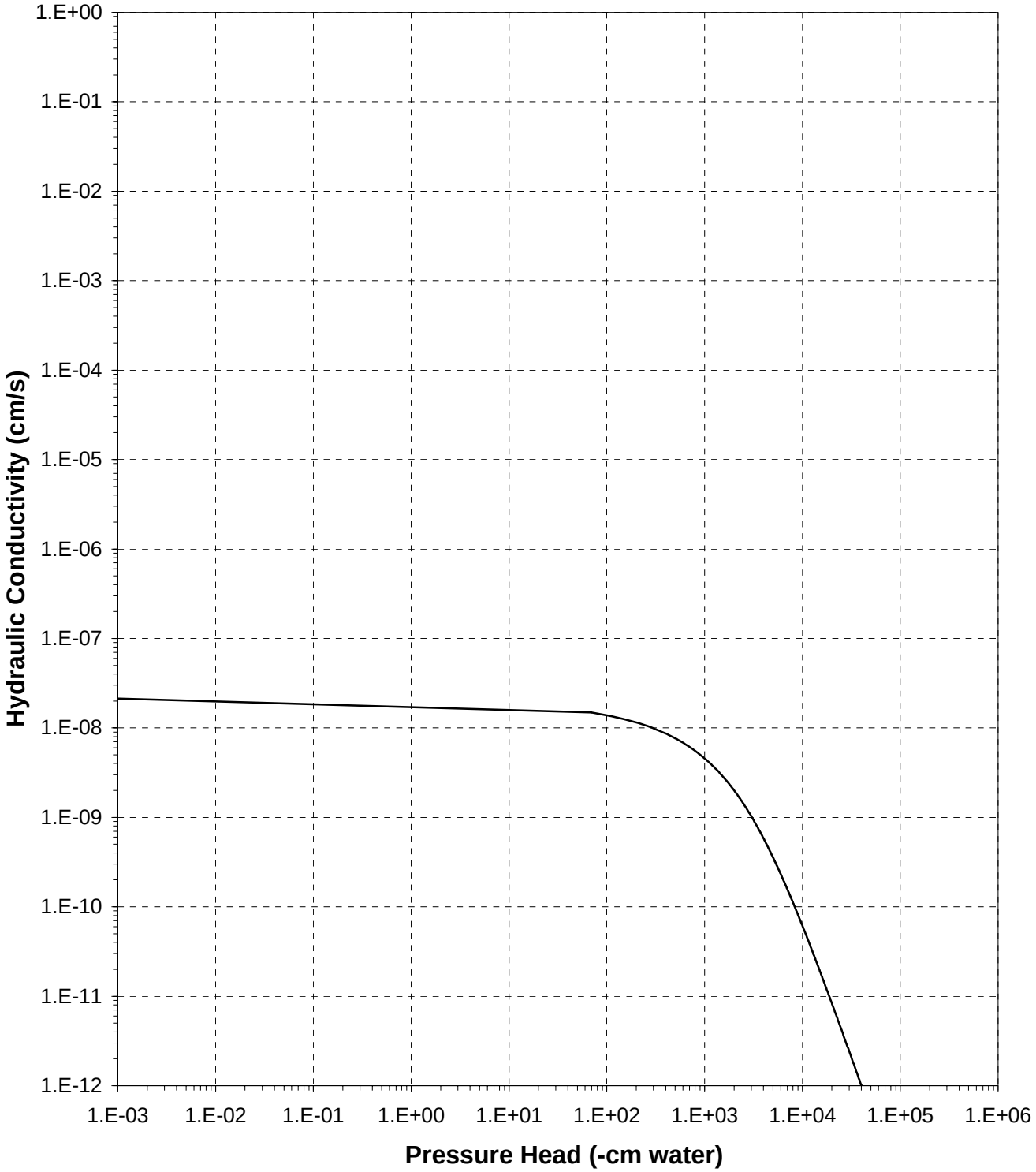
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (741-742)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (741-742)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (749-750)
Date Sampled: 12/8/2011
Depth: 749-750

Dry wt. of sample (g): 65.02
Tare wt., ring (g): 31.50
Tare wt., screen & clamp (g): 21.88
Initial sample volume (cm^3): 44.55
Initial dry bulk density (g/cm^3): 1.46
Measured particle density (g/cm^3): 2.66
Initial calculated total porosity (%): 45.14

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	8-Feb-12	13:45	138.51	0	45.14
	15-Feb-12	9:10	137.59	52.0	43.07
	22-Feb-12	10:25	137.42	151.0	42.69
Pressure plate:	7-Mar-12	10:50	137.17	337	42.13
	21-Mar-12	8:25	136.90	1275	41.52

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	52.0	---	---	---	---
	151.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-14 (749-750)

Initial sample bulk density (g/cm^3)*:* 1.46
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 142.74
Tare weight, jar (g)*:* 113.78

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	14-Mar-12	11:10	146.59	19172	19.40
	14-Mar-12	16:30	145.71	43036	14.97
	16-Mar-12	12:10	145.24	73936	12.60

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	19172	---	---	---	---
	43036	---	---	---	---
	73936	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 66.35
Tare weight (g)*:* 40.97

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	24-Feb-12	9:30	67.50	852726	6.62

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	852726	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

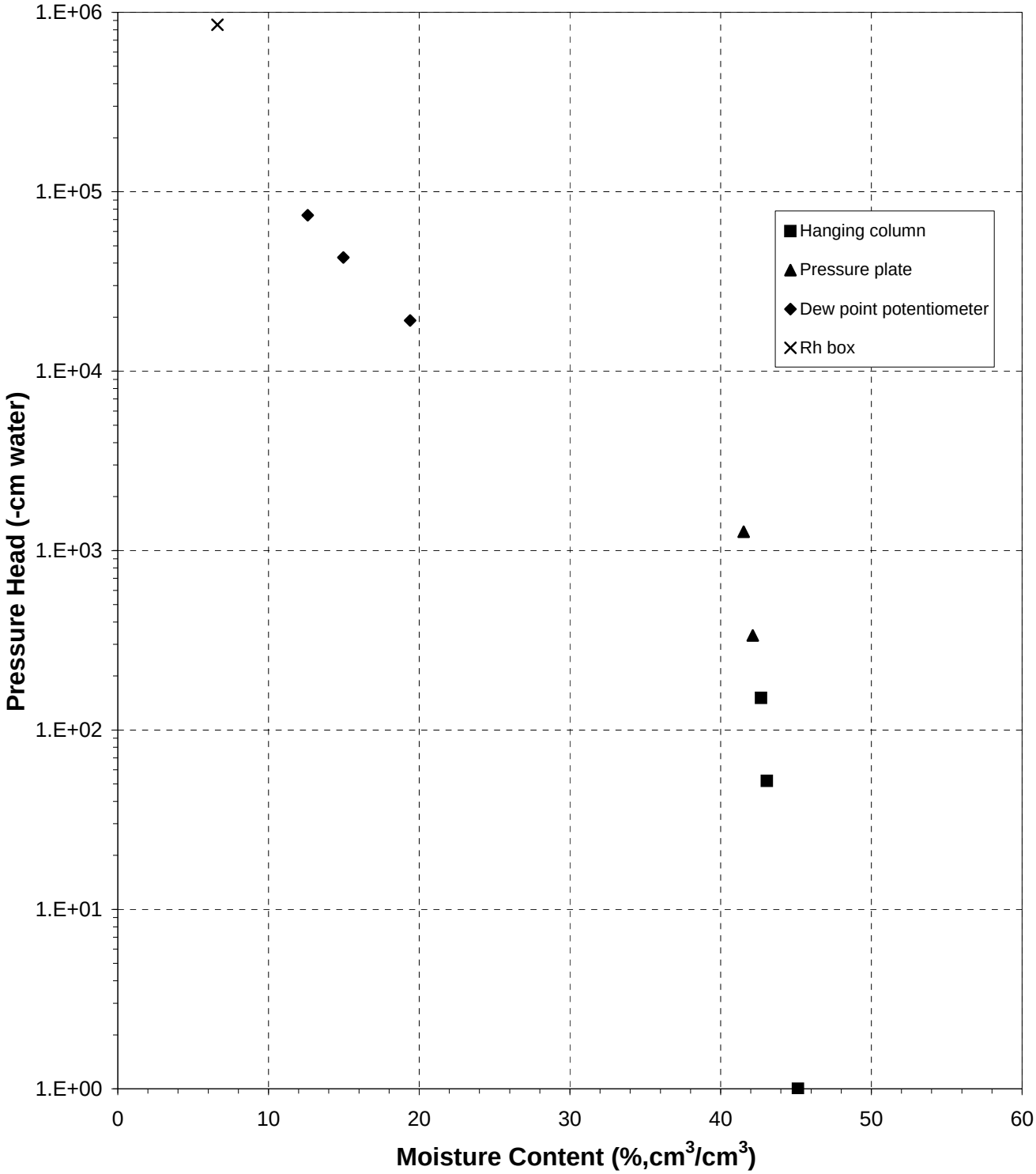
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

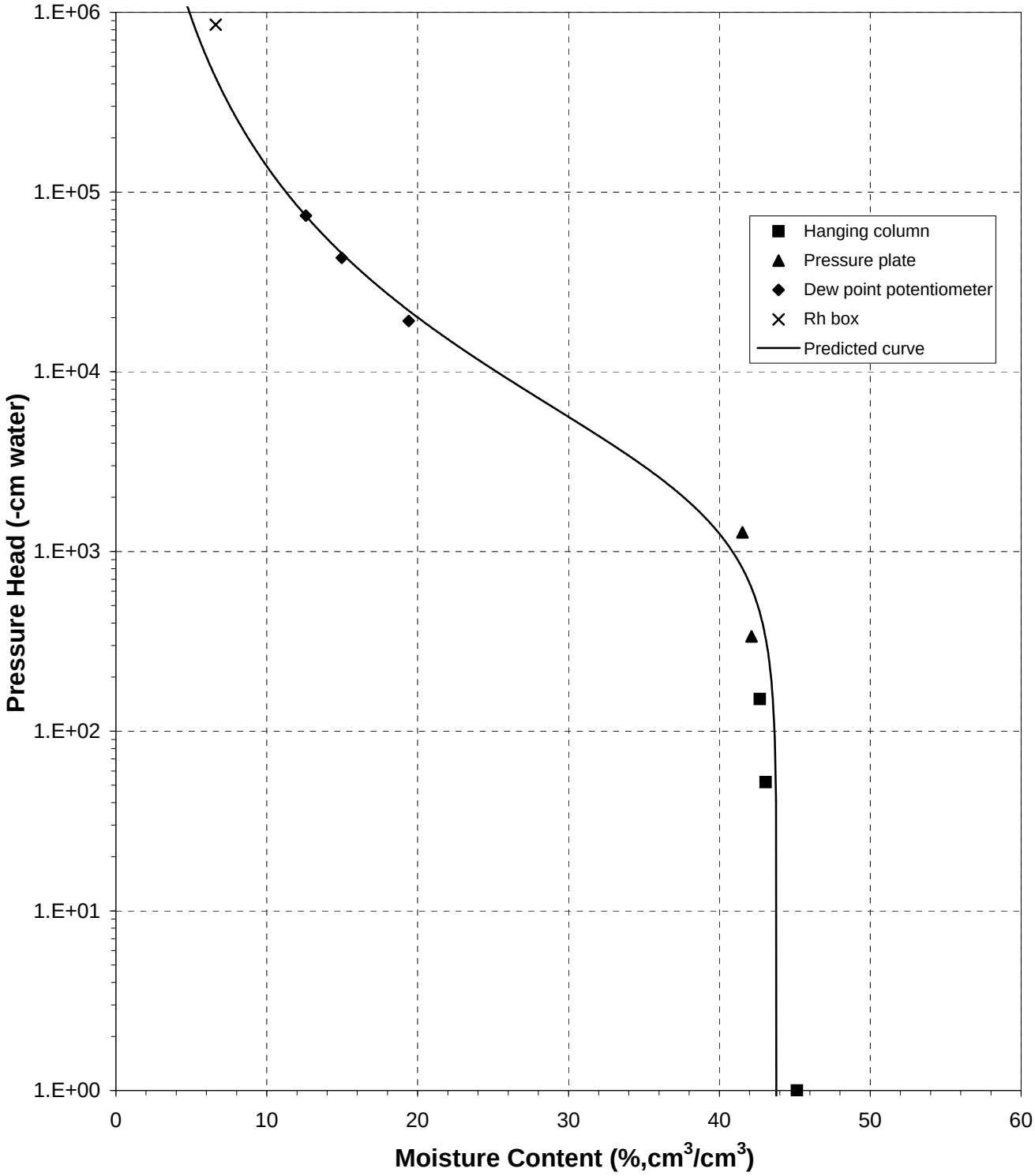
Water Retention Data Points

Sample Number: PB-14 (749-750)



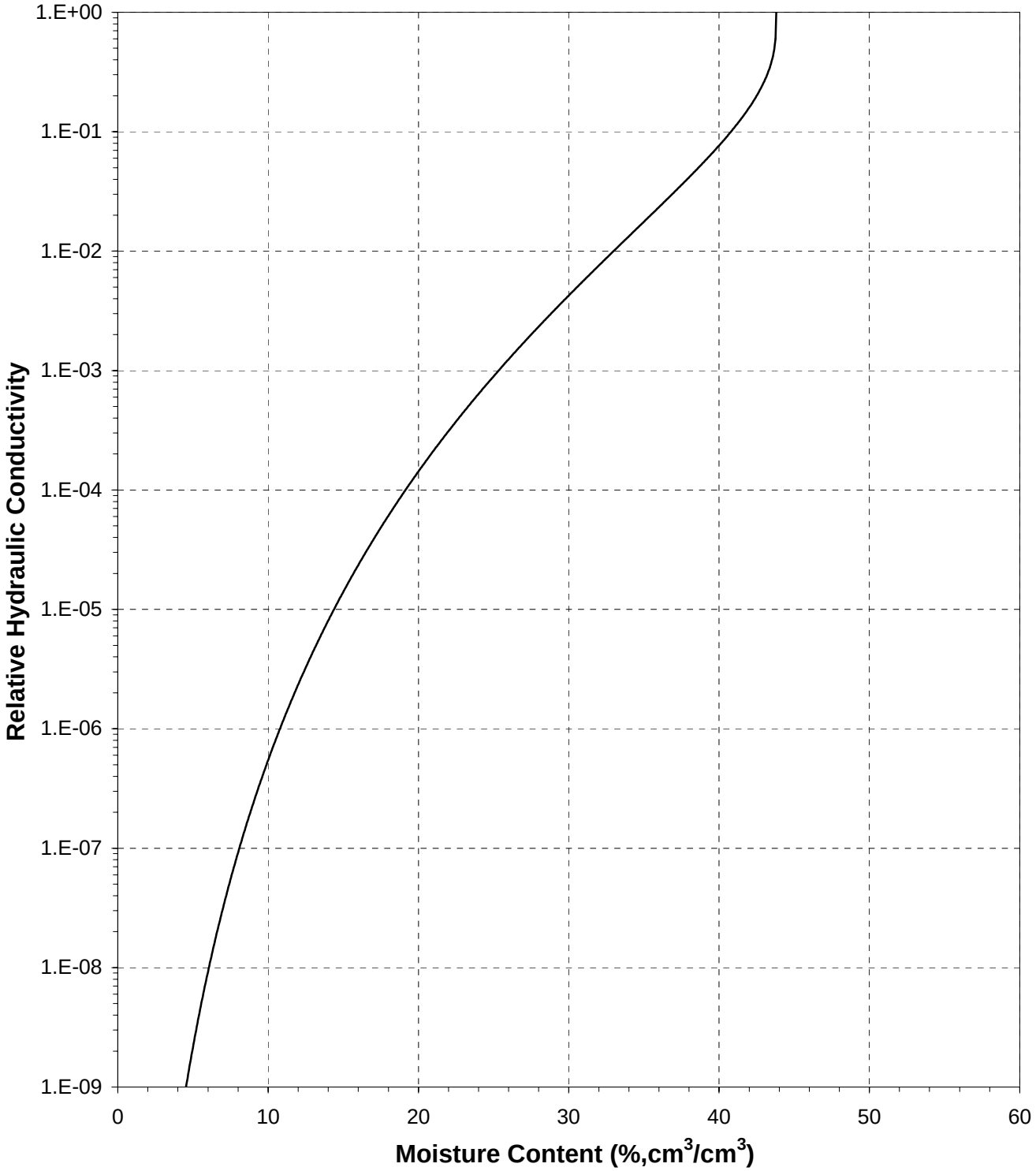
Predicted Water Retention Curve and Data Points

Sample Number: PB-14 (749-750)



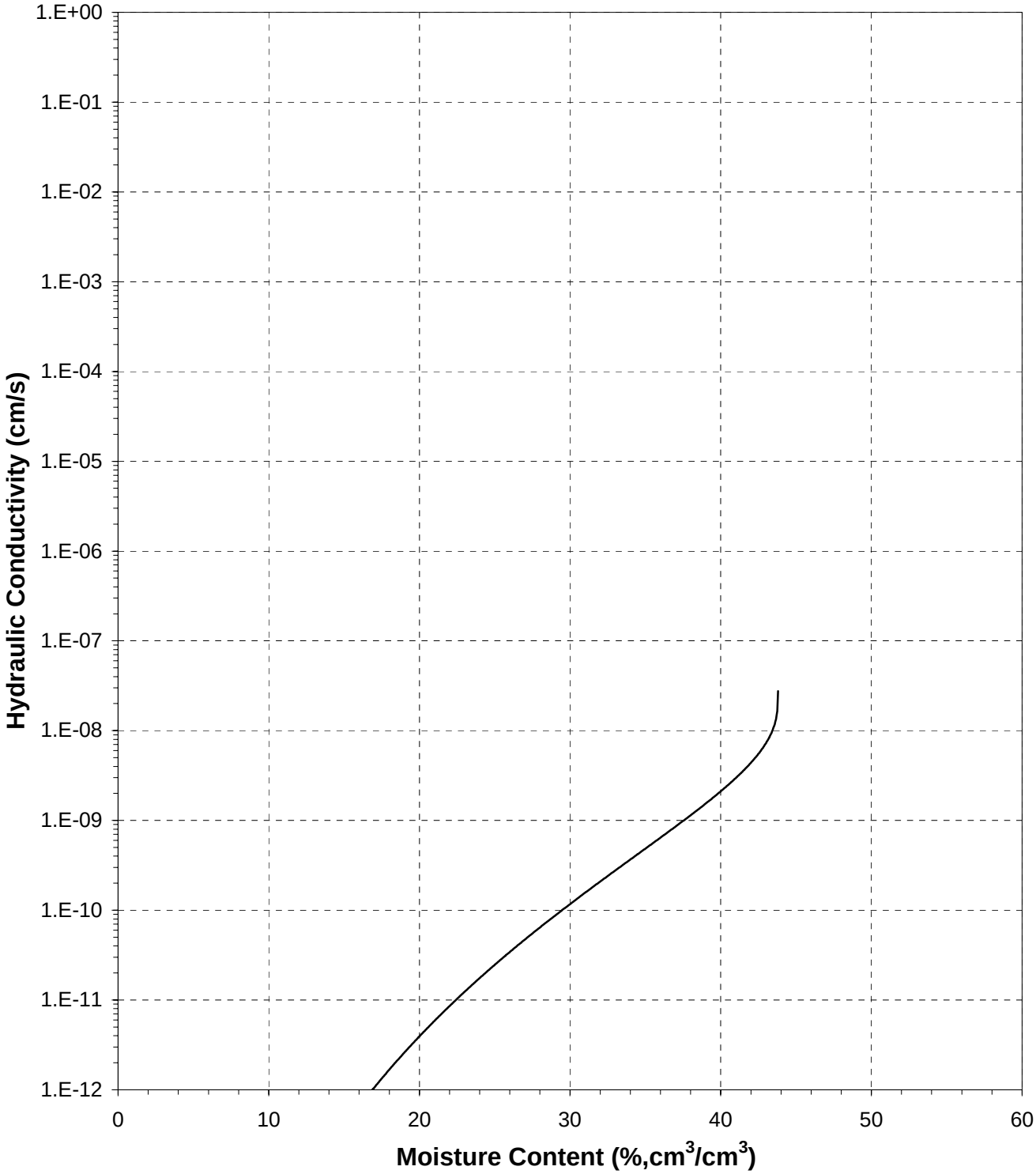
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (749-750)



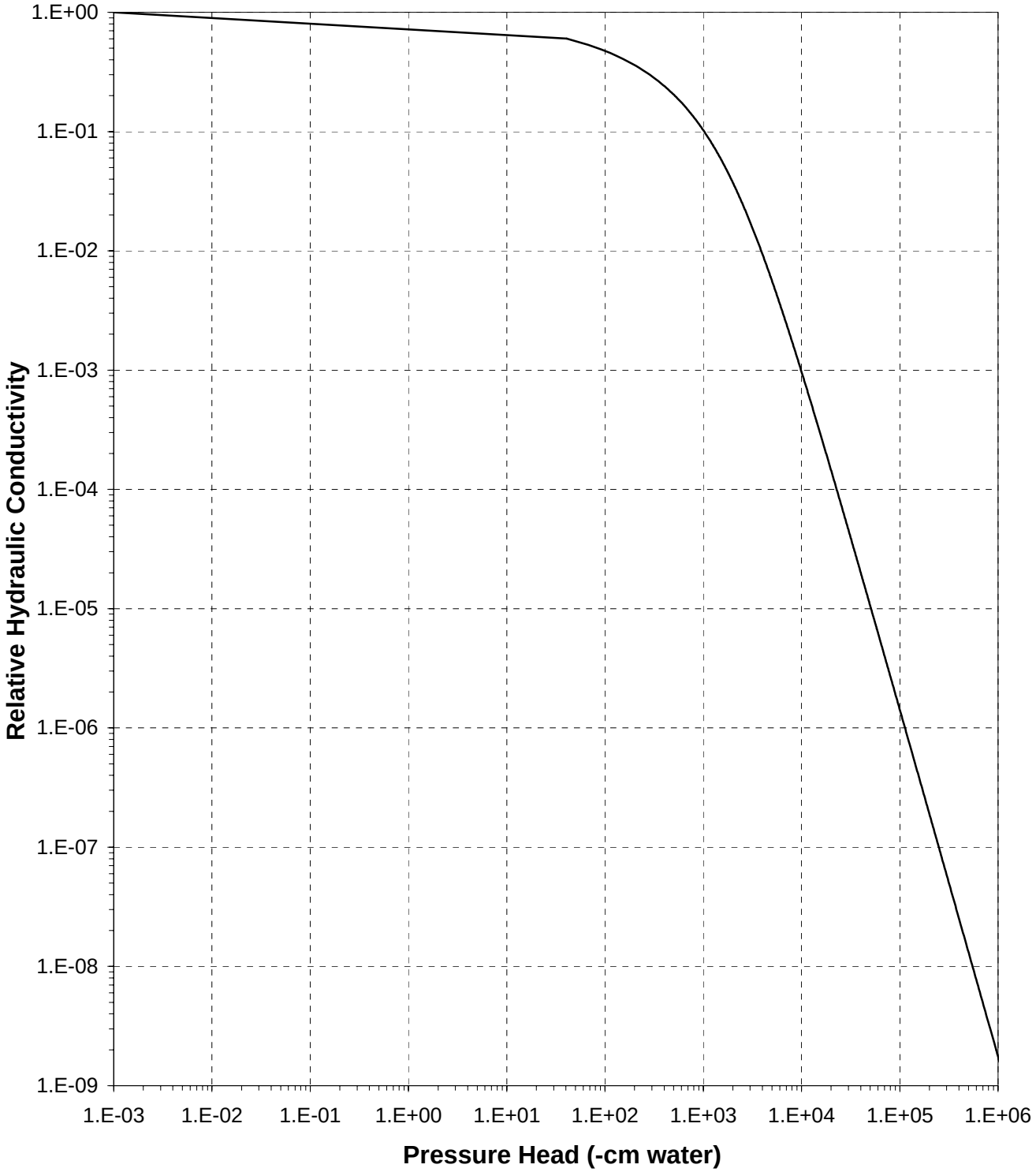
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-14 (749-750)



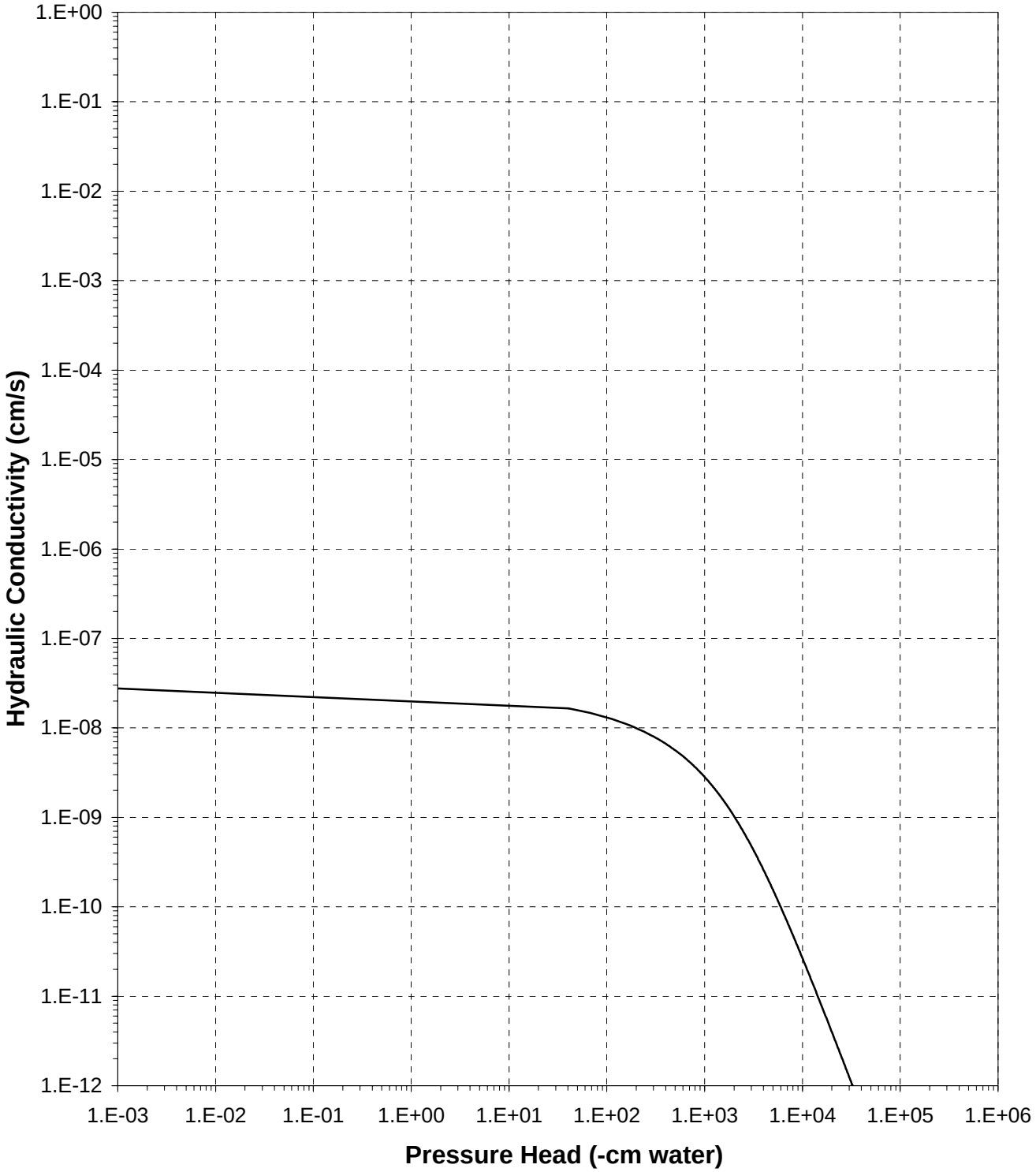
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (749-750)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-14 (749-750)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (435-436)
Date Sampled: NA
Depth: 435-436

Dry wt. of sample (g): 149.09
Tare wt., ring (g): 61.30
Tare wt., screen & clamp (g): 29.38
Initial sample volume (cm^3): 106.16
Initial dry bulk density (g/cm^3): 1.40
Measured particle density (g/cm^3): 2.68
Initial calculated total porosity (%): 47.52

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	26-Jan-12	14:10	290.22	0	47.52
	2-Feb-12	14:20	287.12	16.0	44.60
	9-Feb-12	9:15	286.41	50.0	43.93
	16-Feb-12	10:15	286.04	127.0	43.58
Pressure plate:	27-Feb-12	9:00	285.32	337	42.91

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	50.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-15 (435-436)

Initial sample bulk density (g/cm^3)*:* 1.40
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 139.30
Tare weight, jar (g)*:* 113.34

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	13-Mar-12	15:43	143.84	5405	24.56
	13-Mar-12	14:35	142.32	22946	16.34
	16-Mar-12	12:37	141.81	59556	13.58

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	5405	---	---	---	---
	22946	---	---	---	---
	59556	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 72.59
Tare weight (g)*:* 41.39

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	24-Feb-12	9:40	74.12	852726	6.86

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	852726	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

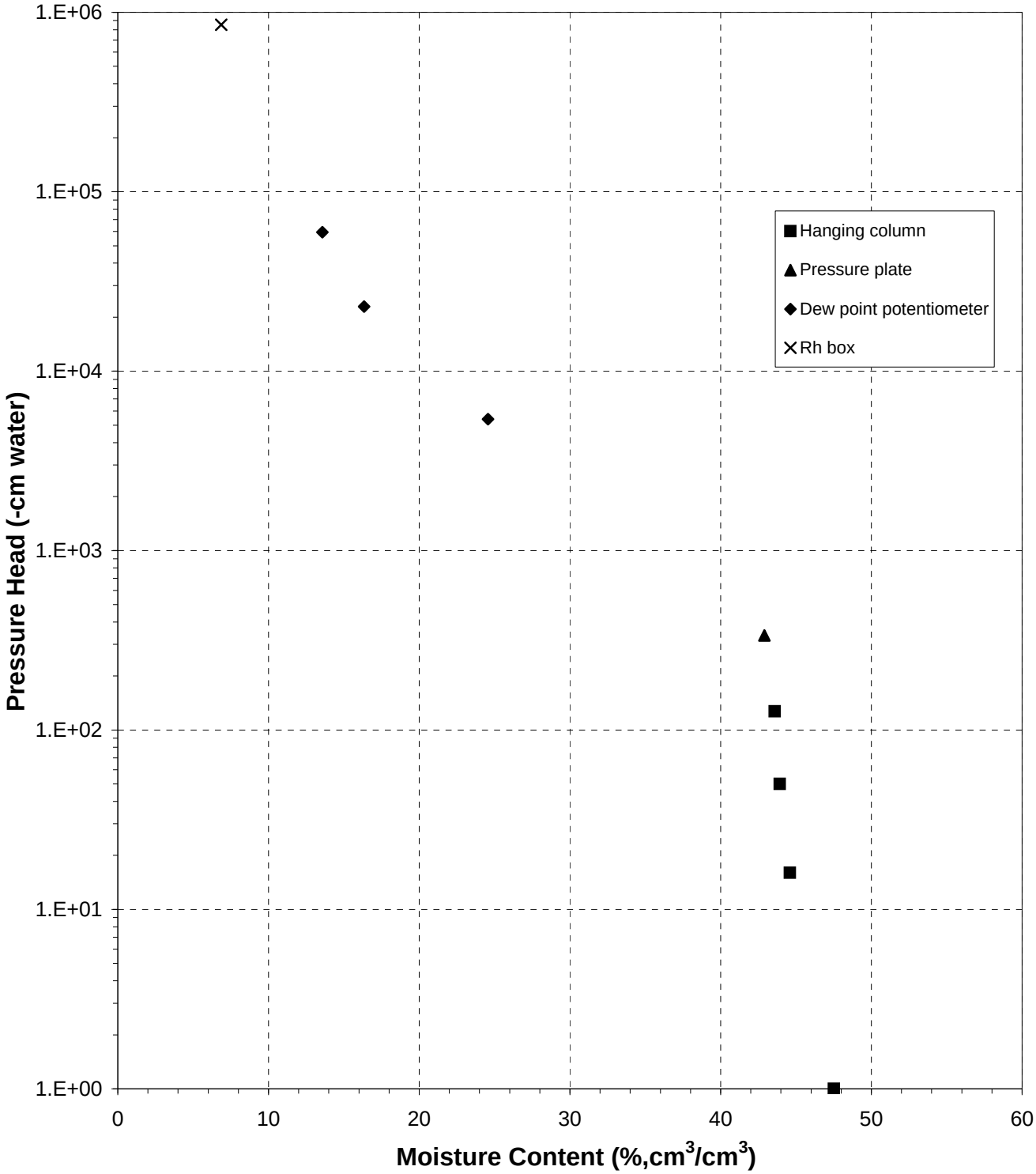
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

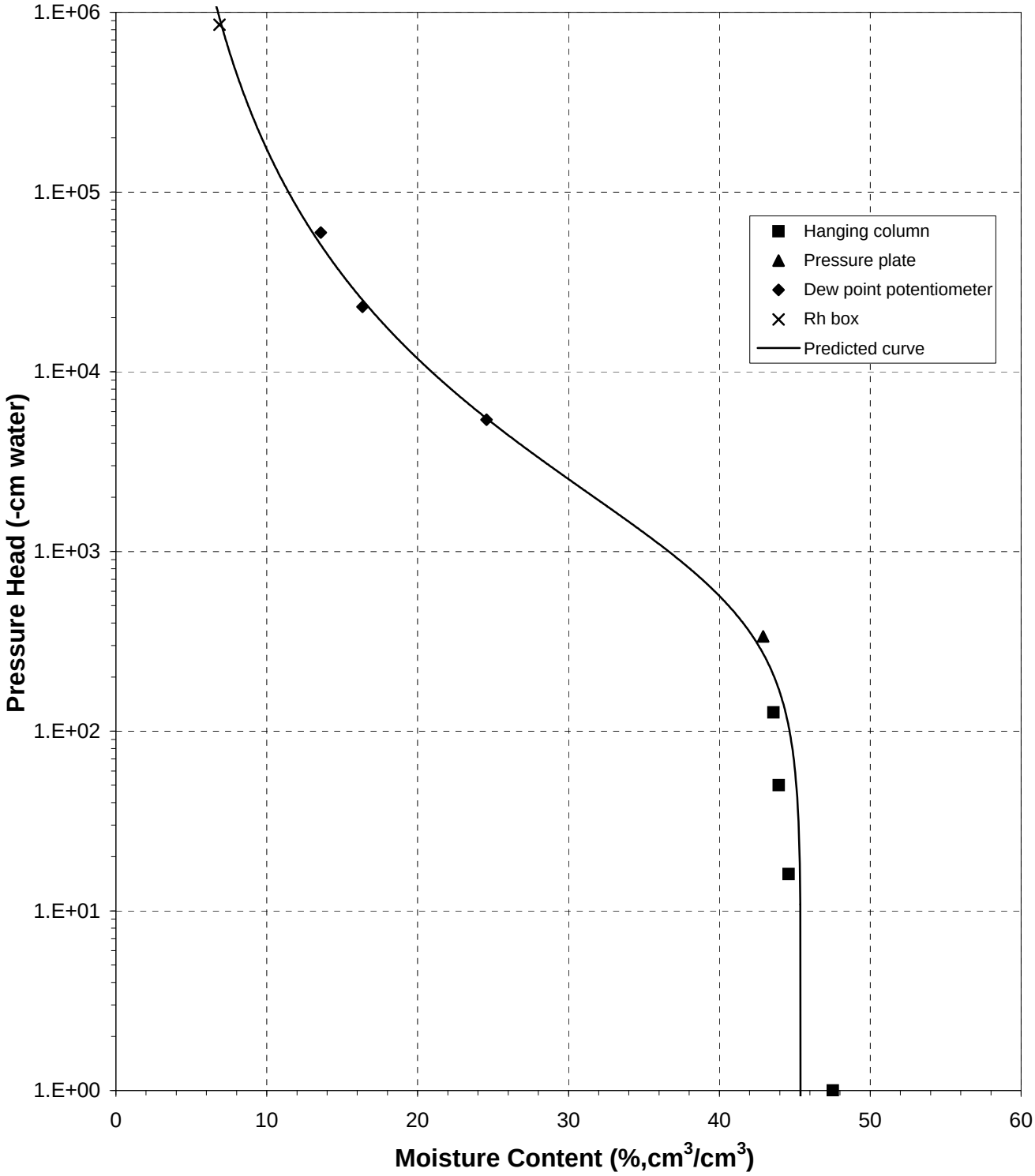
Water Retention Data Points

Sample Number: PB-15 (435-436)



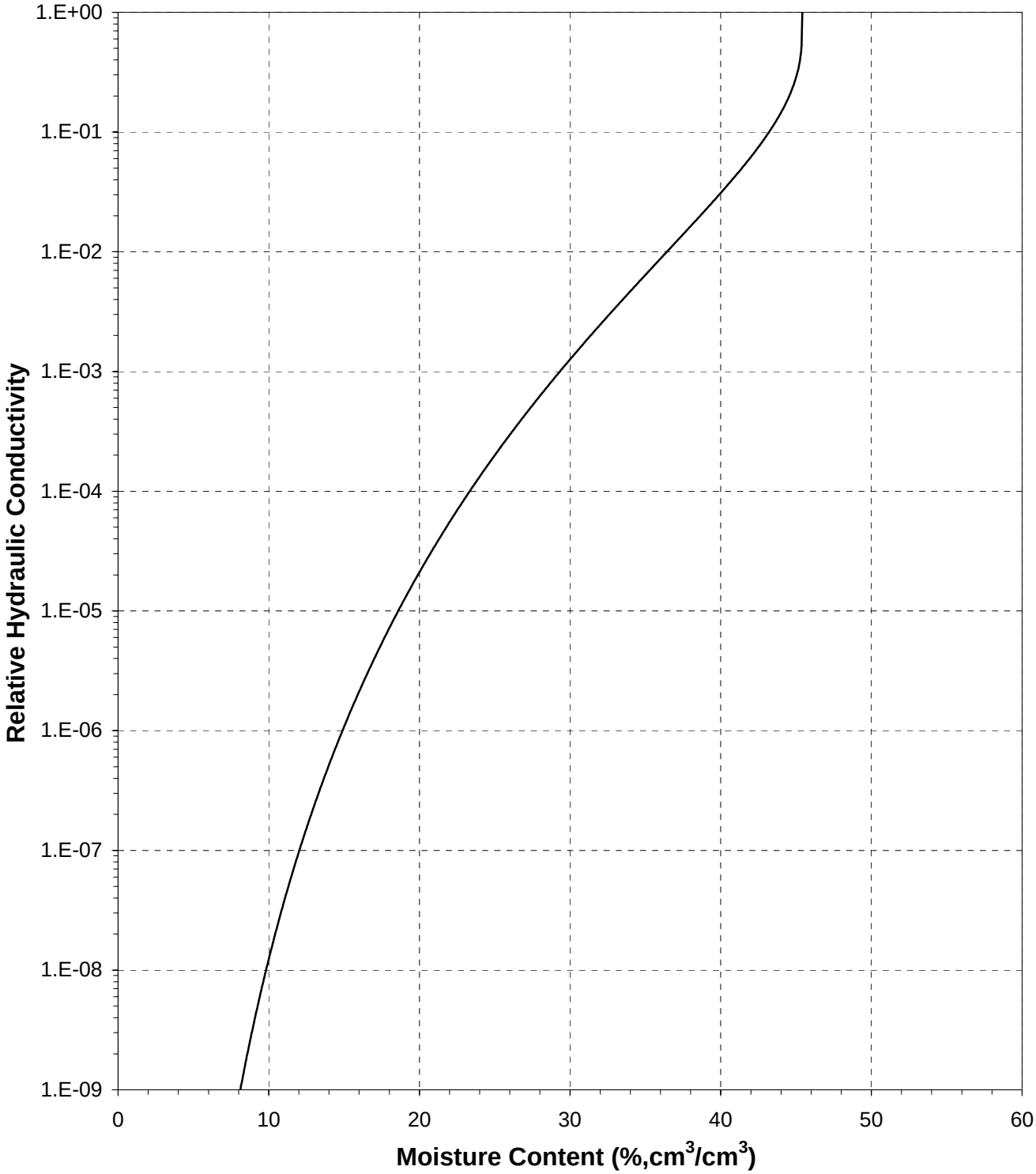
Predicted Water Retention Curve and Data Points

Sample Number: PB-15 (435-436)



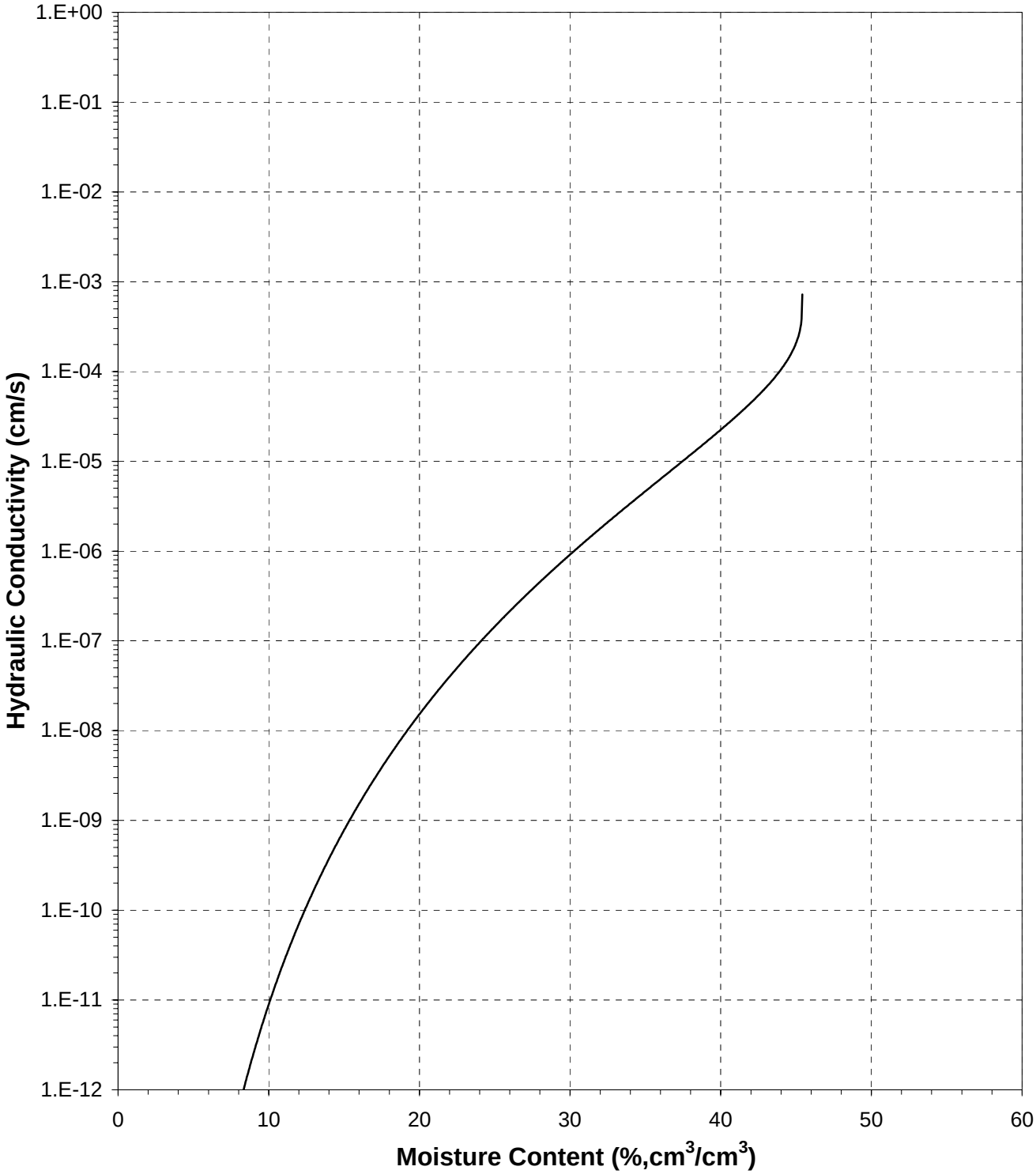
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (435-436)



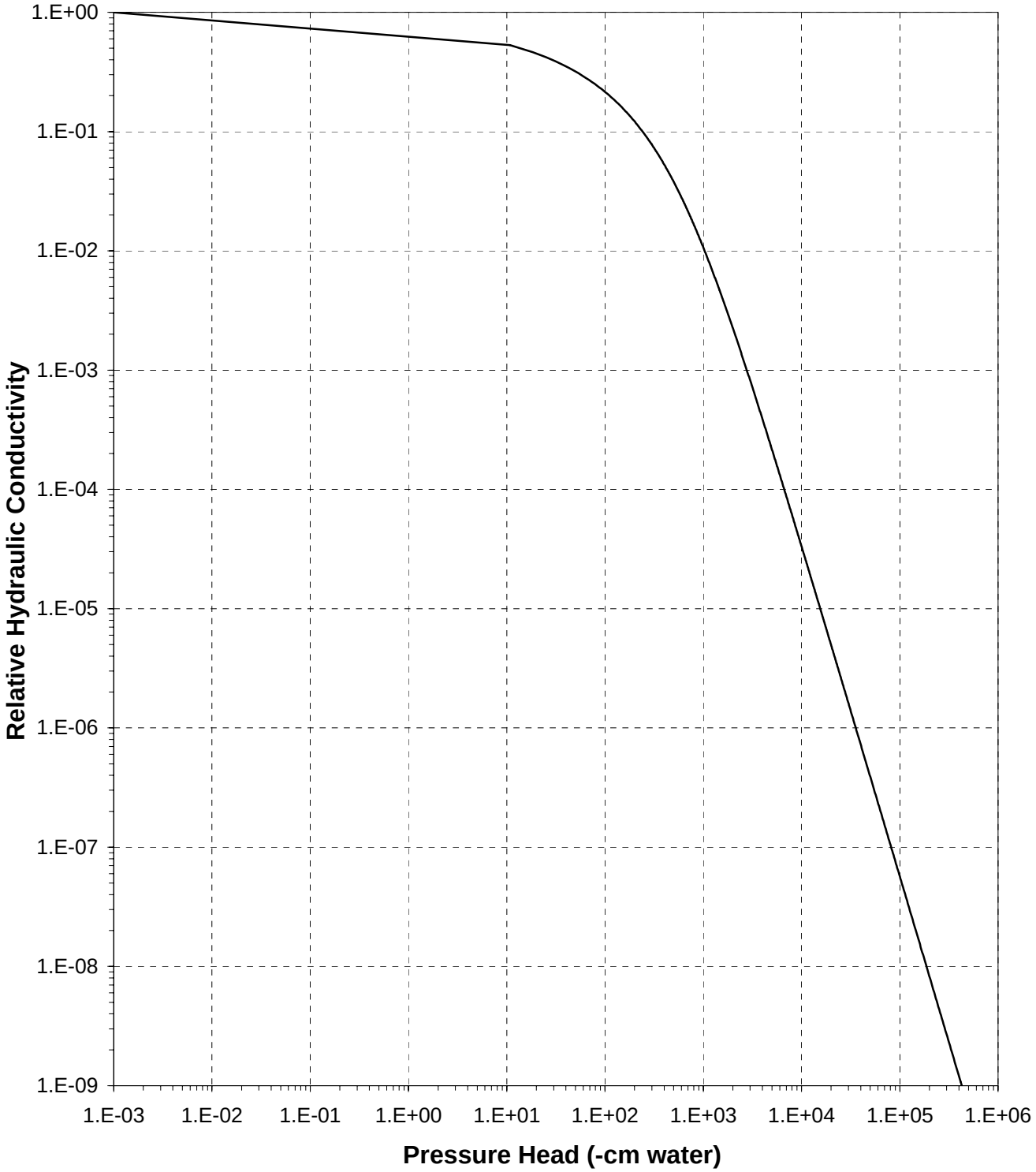
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (435-436)



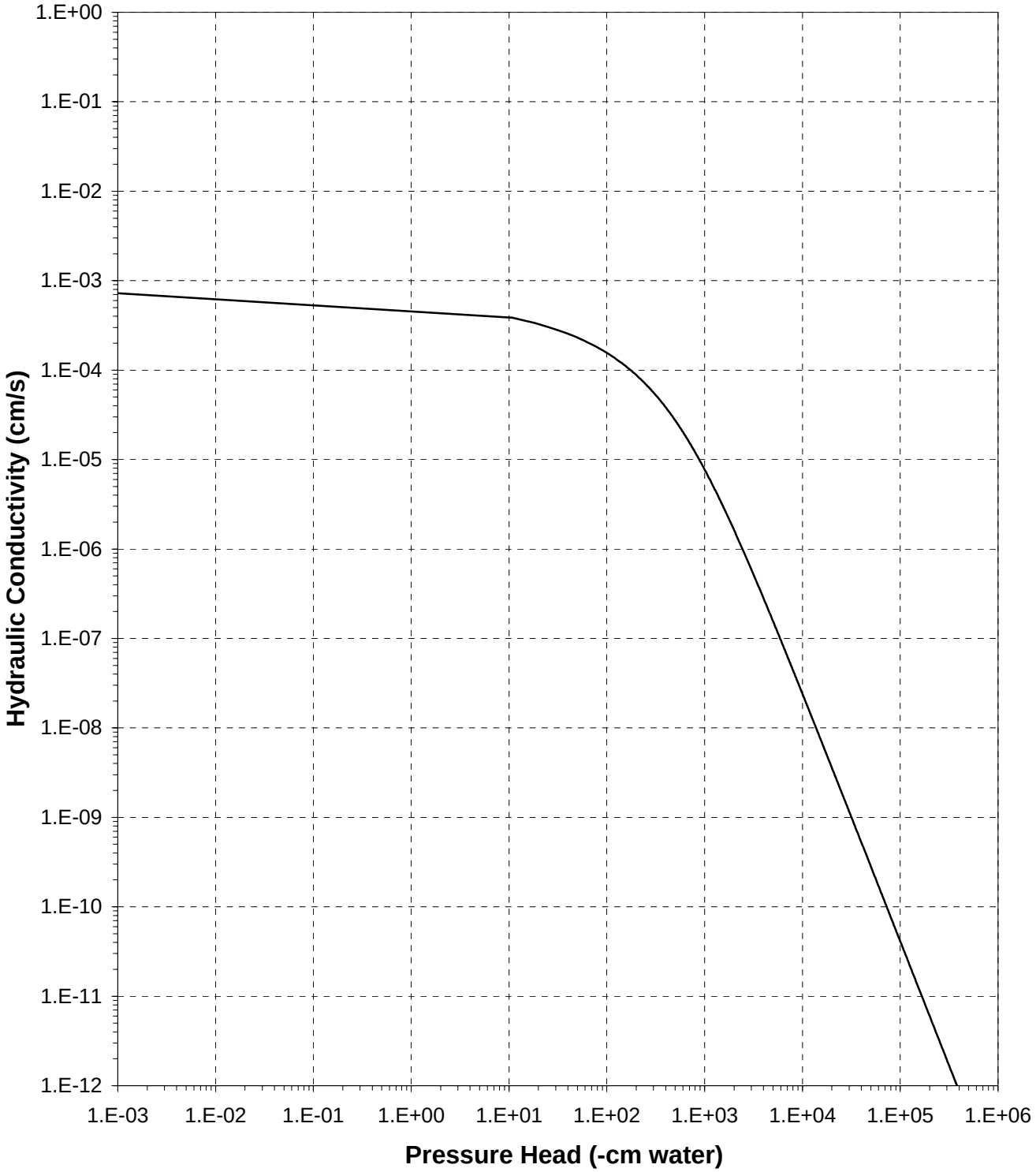
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (435-436)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (435-436)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (464-465)
Date Sampled: NA
Depth: 464-465

Dry wt. of sample (g): 130.66
Tare wt., ring (g): 52.95
Tare wt., screen & clamp (g): 26.50
Initial sample volume (cm^3): 94.30
Initial dry bulk density (g/cm^3): 1.39
Measured particle density (g/cm^3): 2.67
Initial calculated total porosity (%): 48.15

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	1-Feb-12	13:50	255.52	0	48.16
	8-Feb-12	9:00	255.30	20.0	47.92
	15-Feb-12	8:45	254.98	73.0	47.58
	22-Feb-12	11:20	254.83	153.0	47.42
Pressure plate:	5-Mar-12	8:30	254.54	337	47.12

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	20.0	---	---	---	---
	73.0	---	---	---	---
	153.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-15 (464-465)

Initial sample bulk density (g/cm^3)*:* 1.39
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 142.35
Tare weight, jar (g)*:* 112.36

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	15-Mar-12	16:10	146.20	18458	17.79
	16-Mar-12	16:13	145.42	50378	14.18
	14-Mar-12	12:30	144.70	129719	10.86

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	18458	---	---	---	---
	50378	---	---	---	---
	129719	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 69.75
Tare weight (g)*:* 40.73

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	71.29	857025	7.34

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

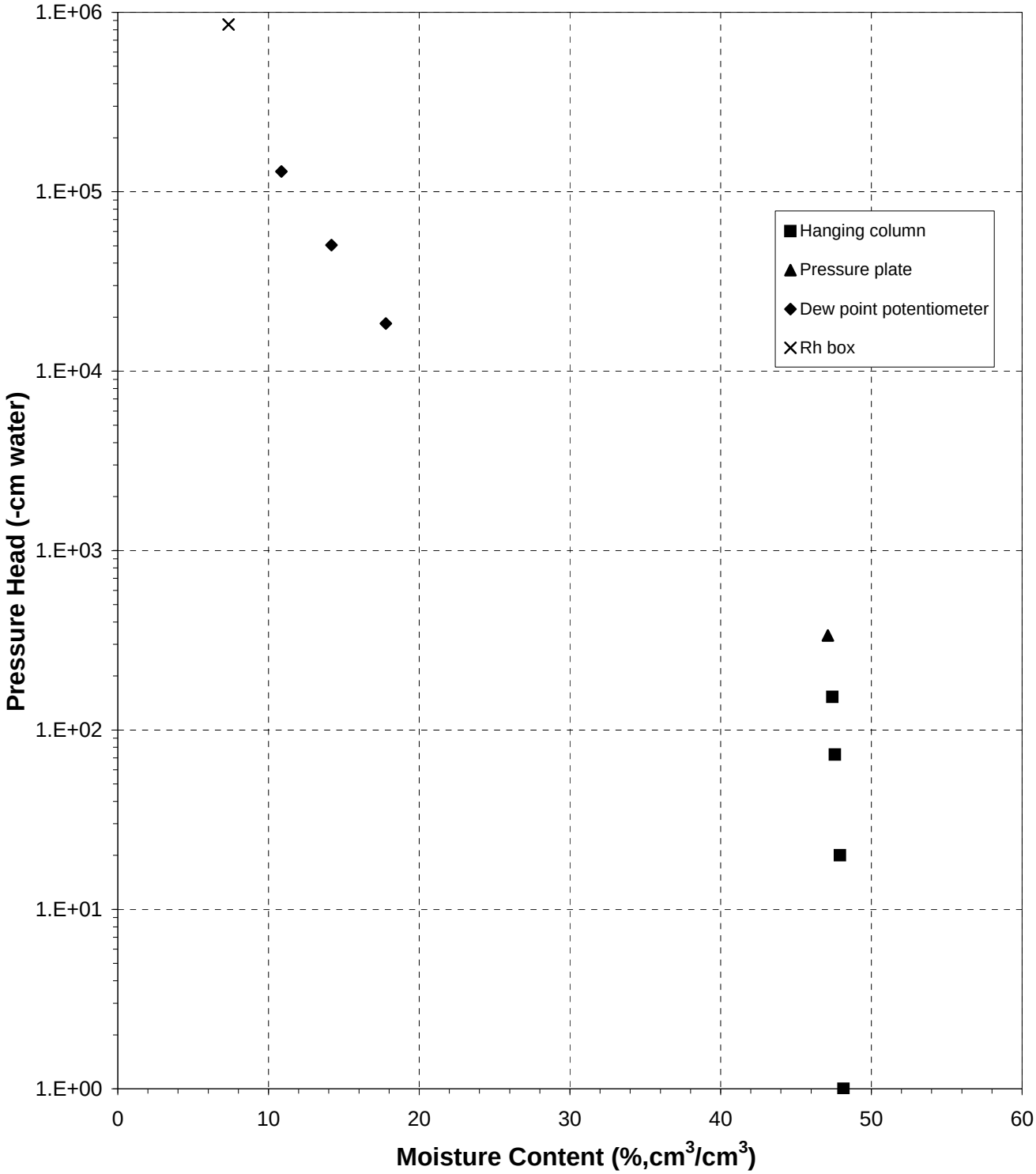
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

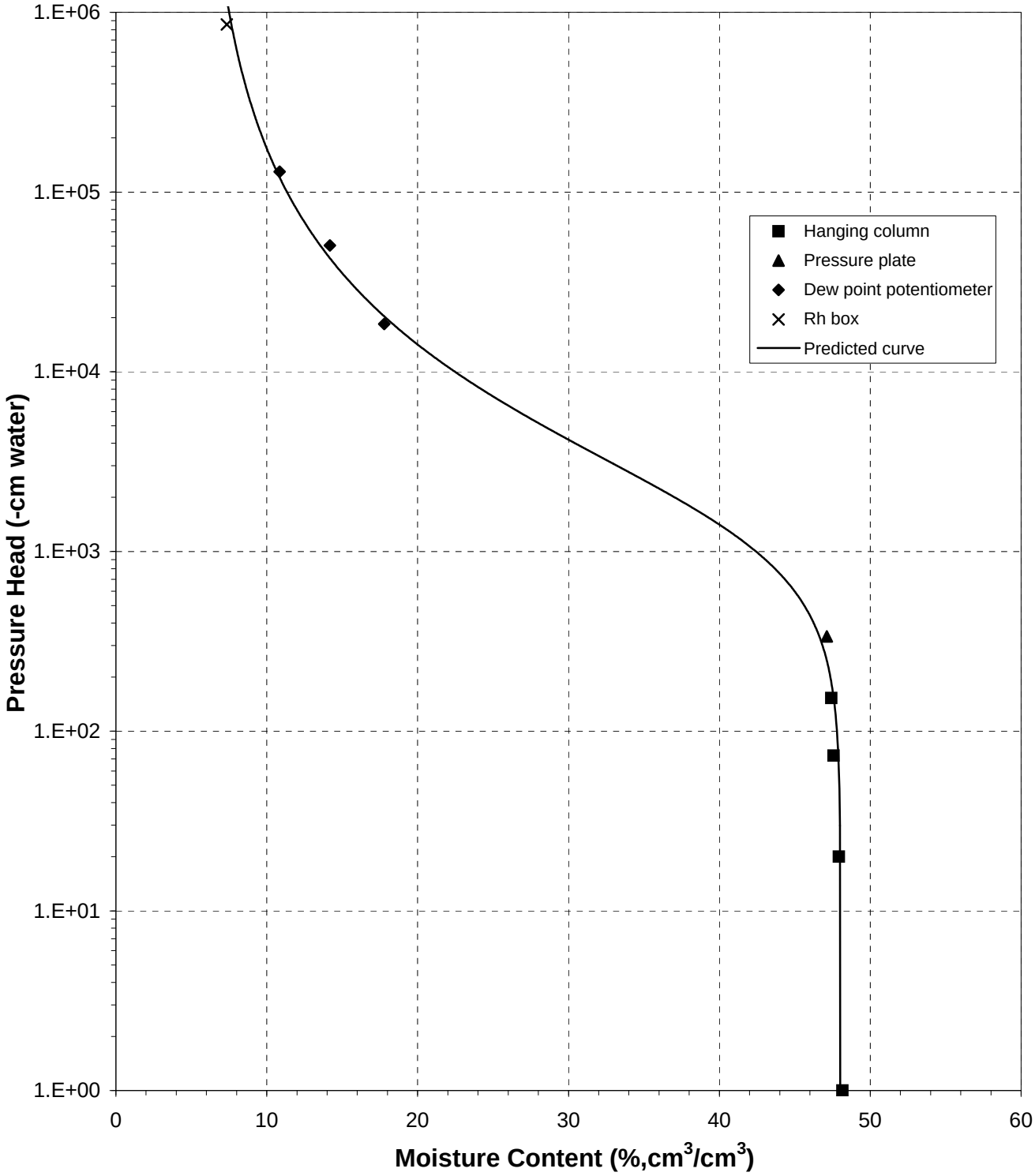
Water Retention Data Points

Sample Number: PB-15 (464-465)



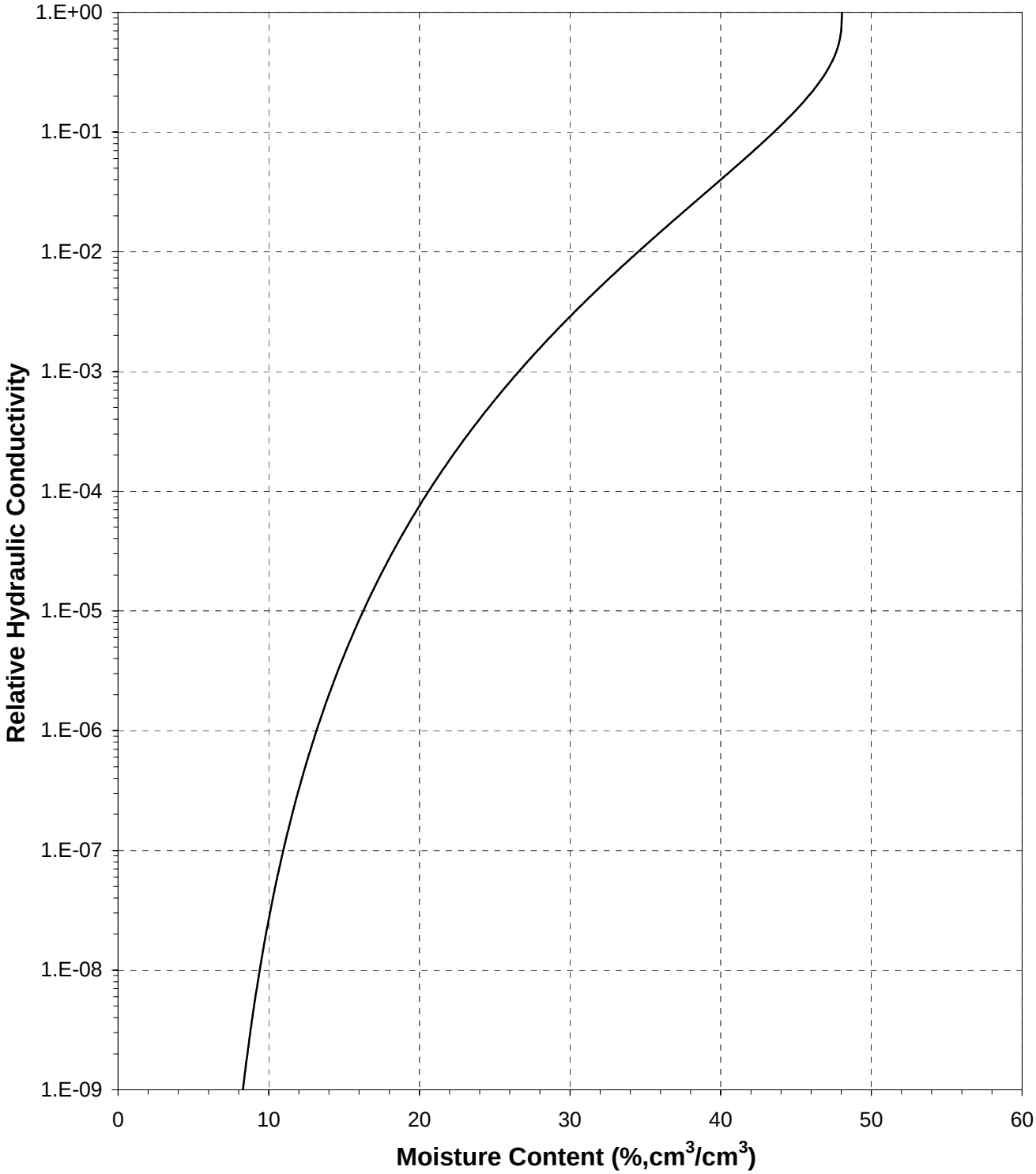
Predicted Water Retention Curve and Data Points

Sample Number: PB-15 (464-465)



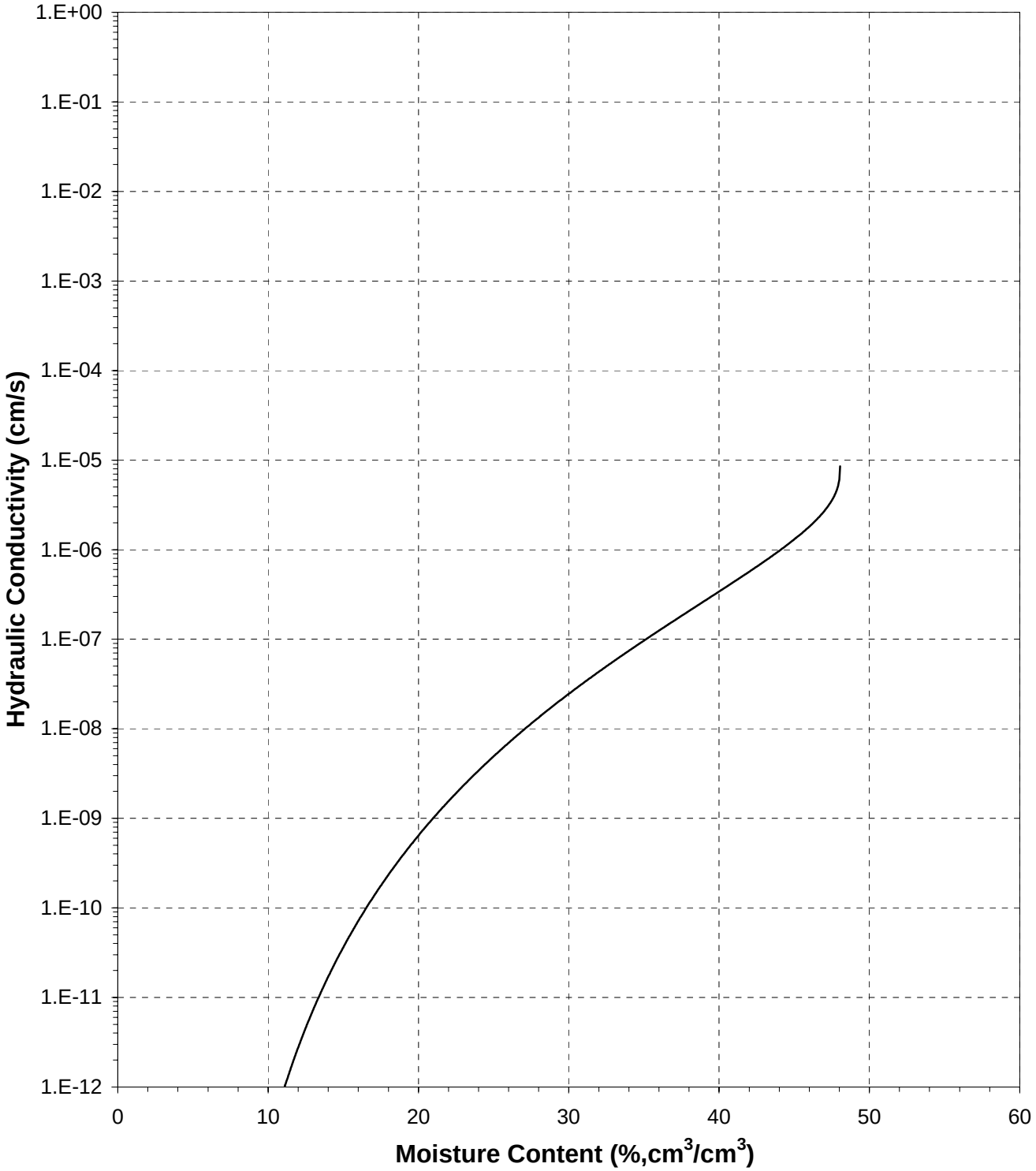
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (464-465)



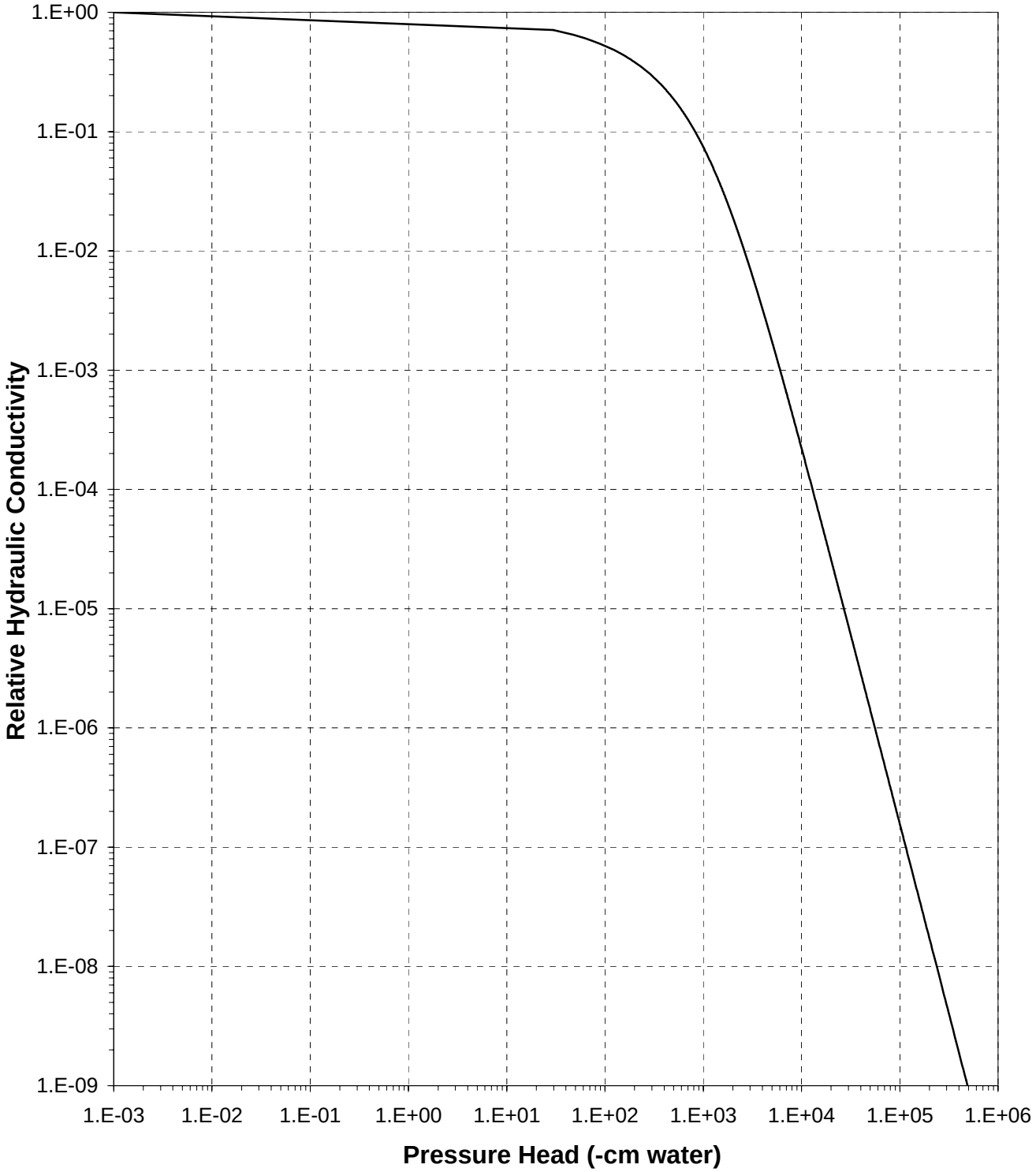
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (464-465)



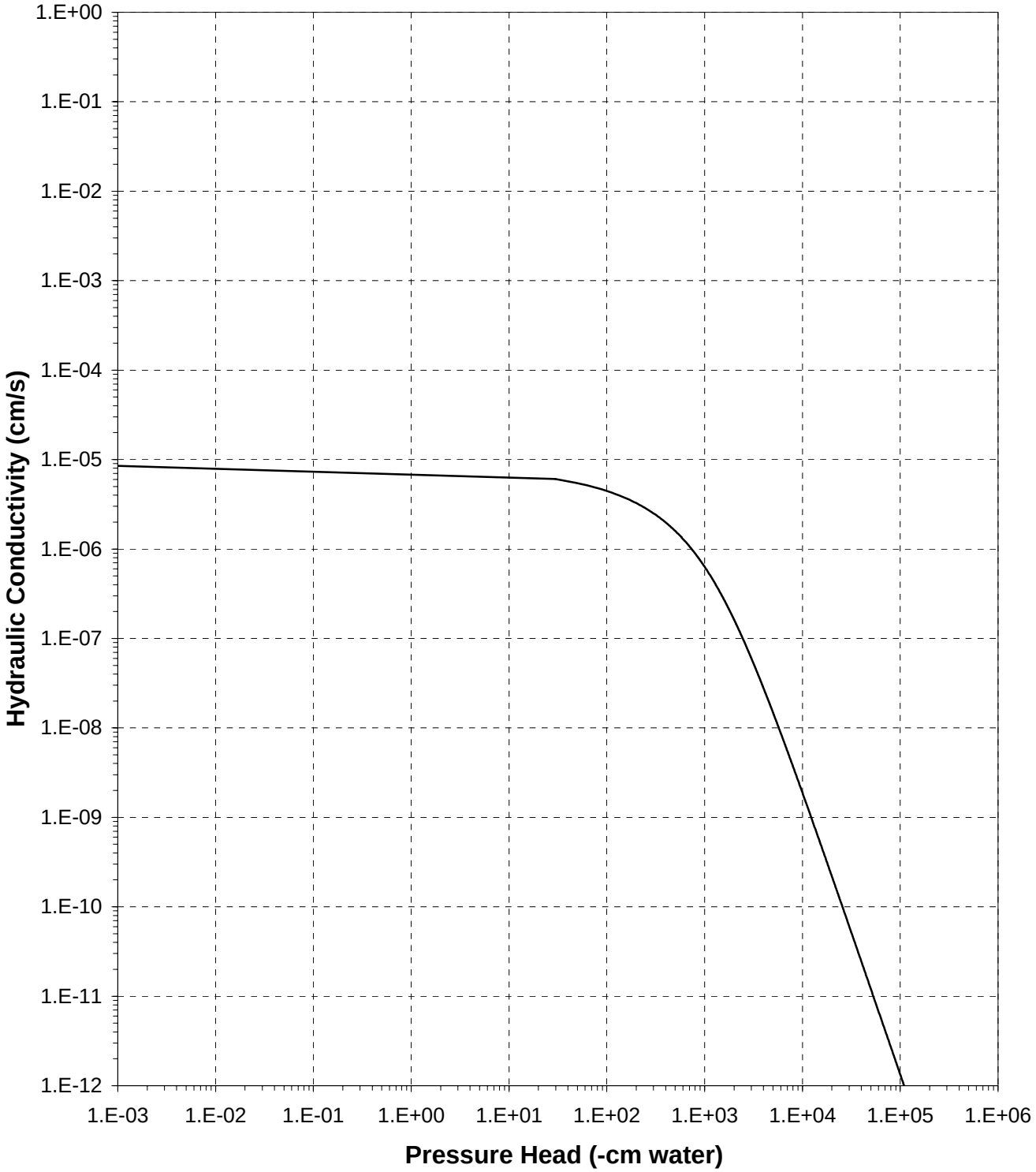
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (464-465)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (464-465)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (483-484)
Date Sampled: NA
Depth: 483-484

Dry wt. of sample (g): 116.46
Tare wt., ring (g): 43.23
Tare wt., screen & clamp (g): 27.62
Initial sample volume (cm^3): 78.84
Initial dry bulk density (g/cm^3): 1.48
Measured particle density (g/cm^3): 2.69
Initial calculated total porosity (%): 45.04

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	13-Feb-12	13:00	222.82	0	45.04
	20-Feb-12	10:50	222.05	51.0	44.07
	27-Feb-12	10:05	221.98	152.0	43.98
Pressure plate:	13-Mar-12	13:20	221.67	337	43.58
	27-Mar-12	8:30	221.20	1275	42.99

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	152.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-15 (483-484)

Initial sample bulk density (g/cm^3)*:* 1.48
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 151.60
Tare weight, jar (g)*:* 115.58

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	14-Mar-12	15:51	156.36	21314	19.52
	16-Mar-12	16:20	155.70	37325	16.81
	19-Mar-12	12:37	155.06	121866	14.19

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	21314	---	---	---	---
	37325	---	---	---	---
	121866	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 70.57
Tare weight (g)*:* 30.07

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	24-Feb-12	9:40	72.50	852726	7.03

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	852726	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

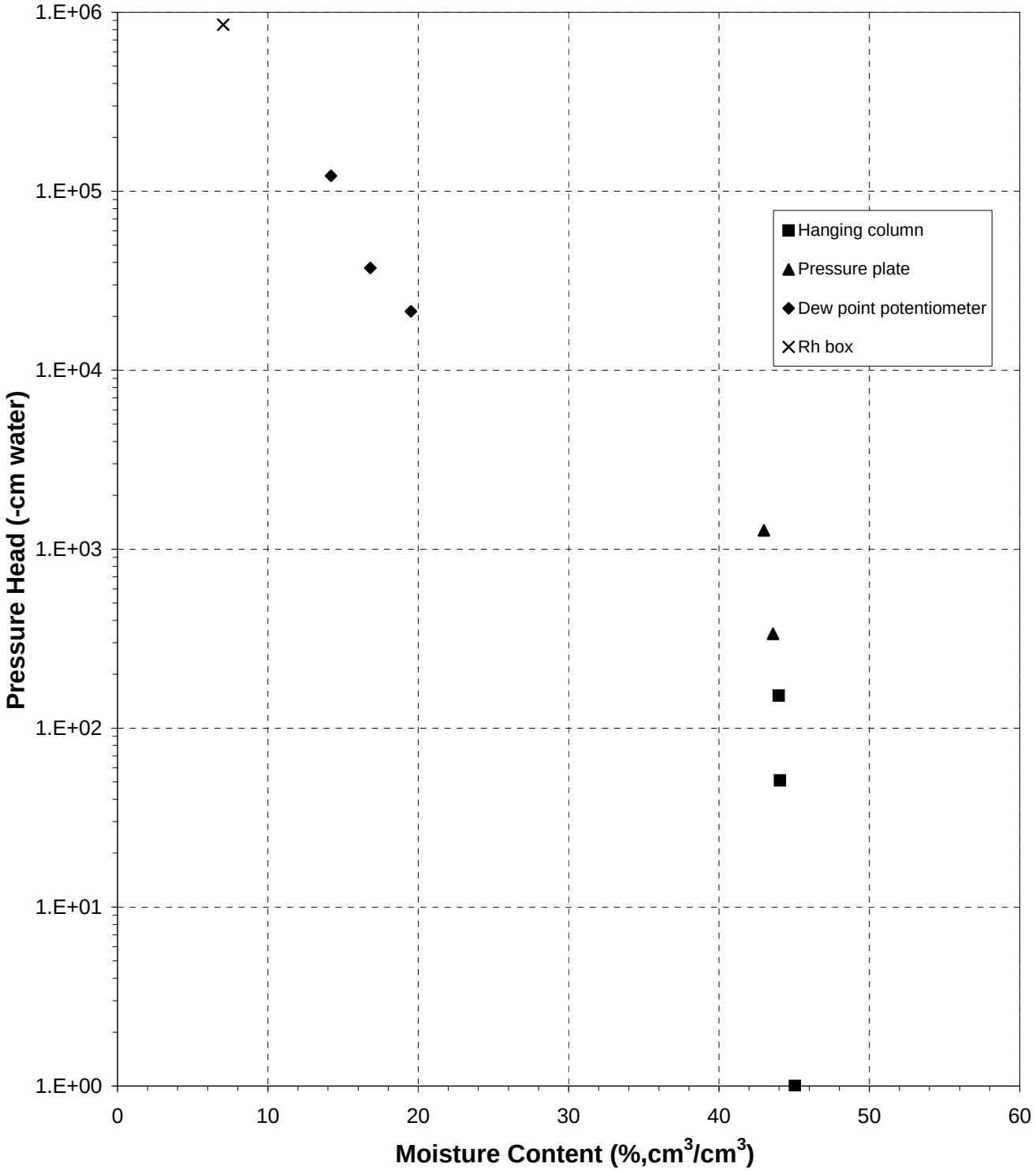
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

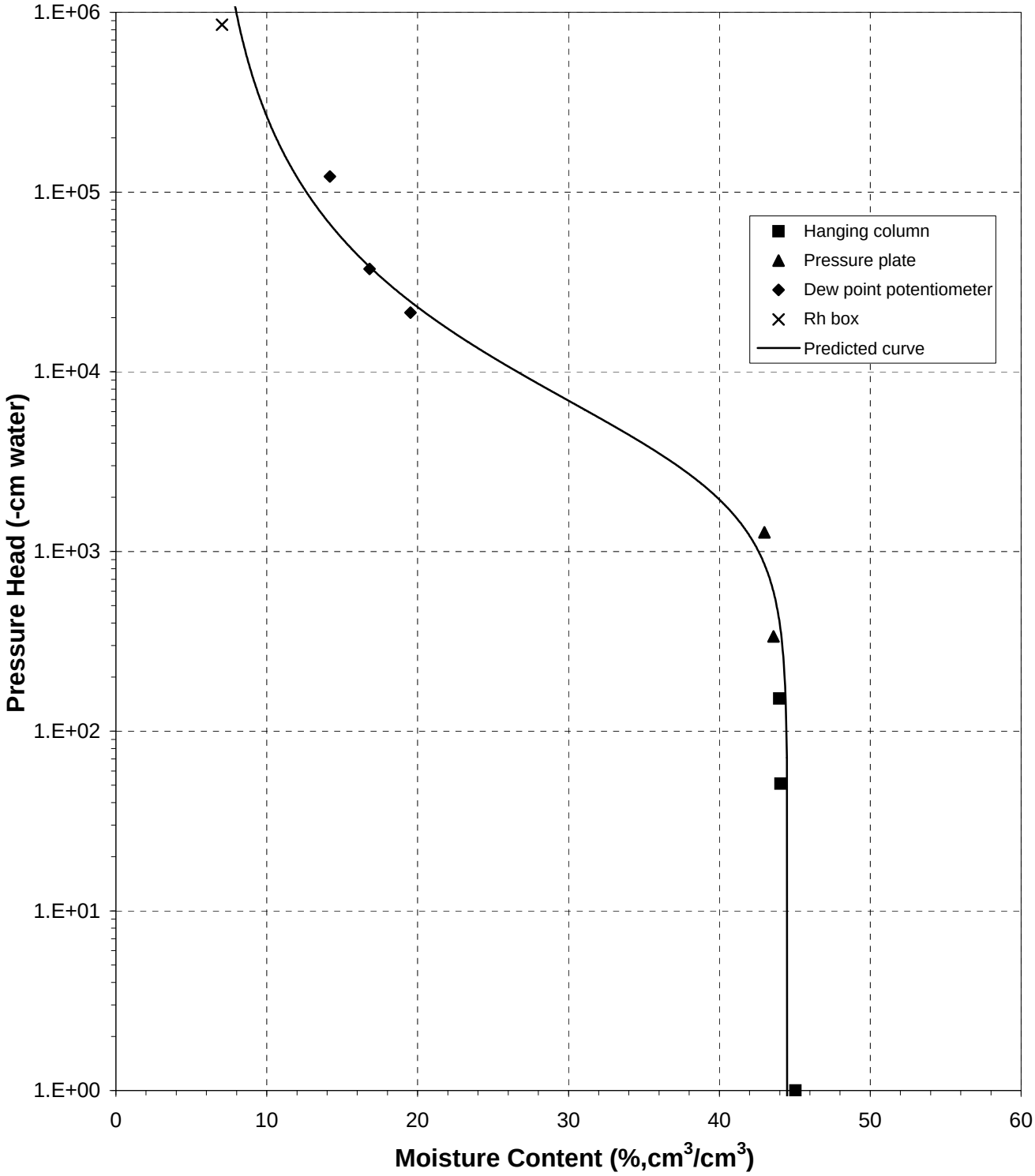
Water Retention Data Points

Sample Number: PB-15 (483-484)



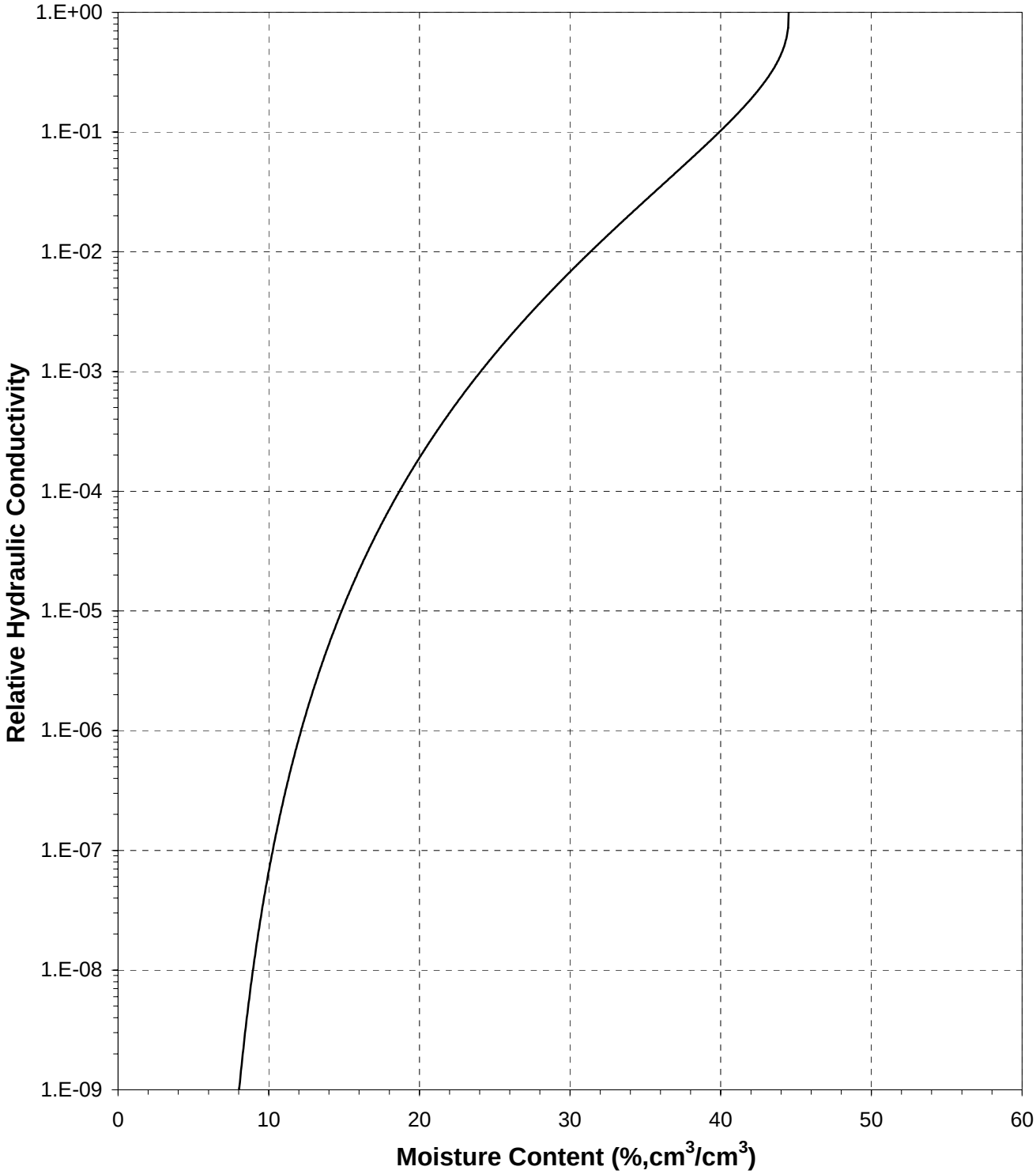
Predicted Water Retention Curve and Data Points

Sample Number: PB-15 (483-484)



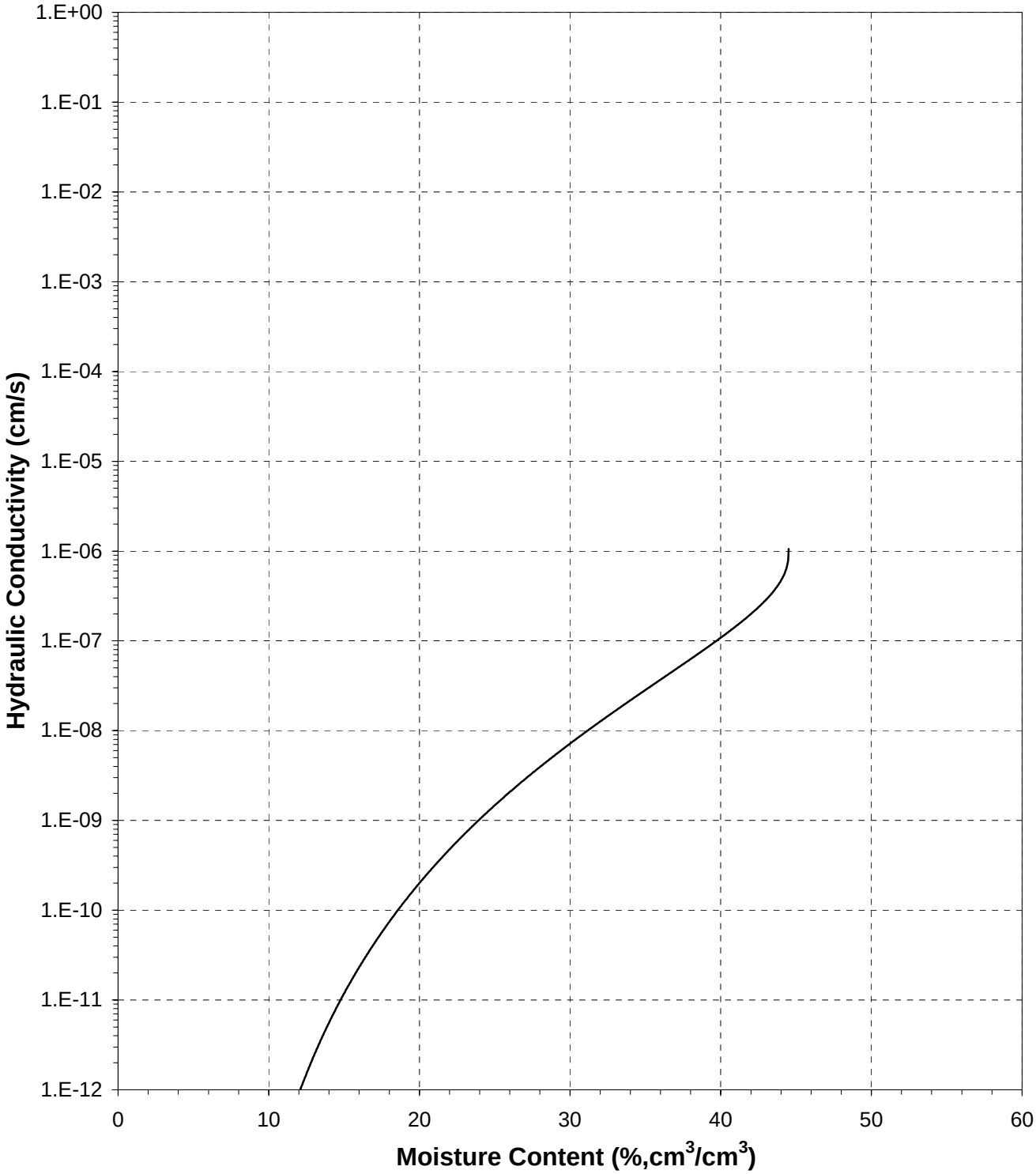
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (483-484)



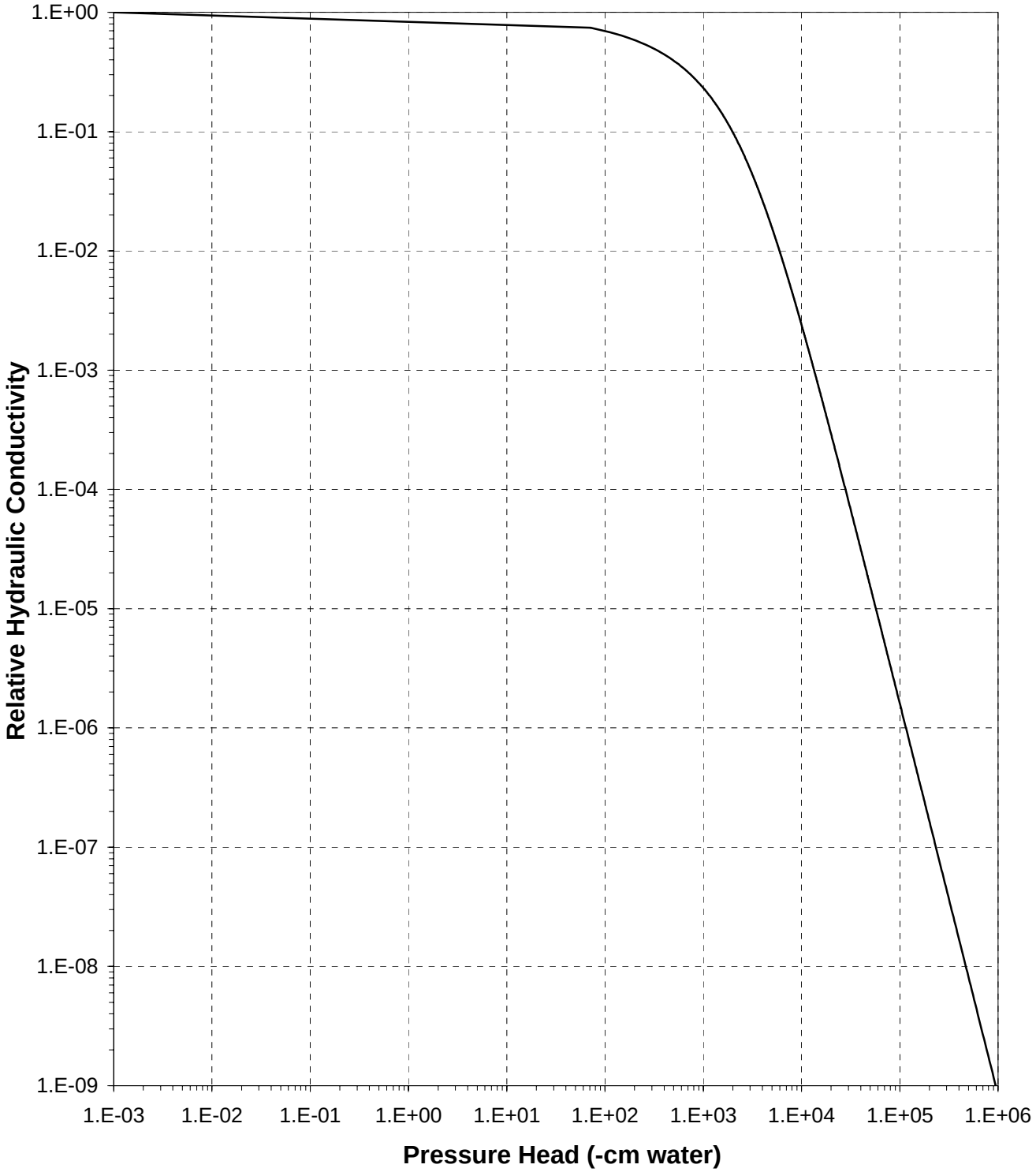
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (483-484)



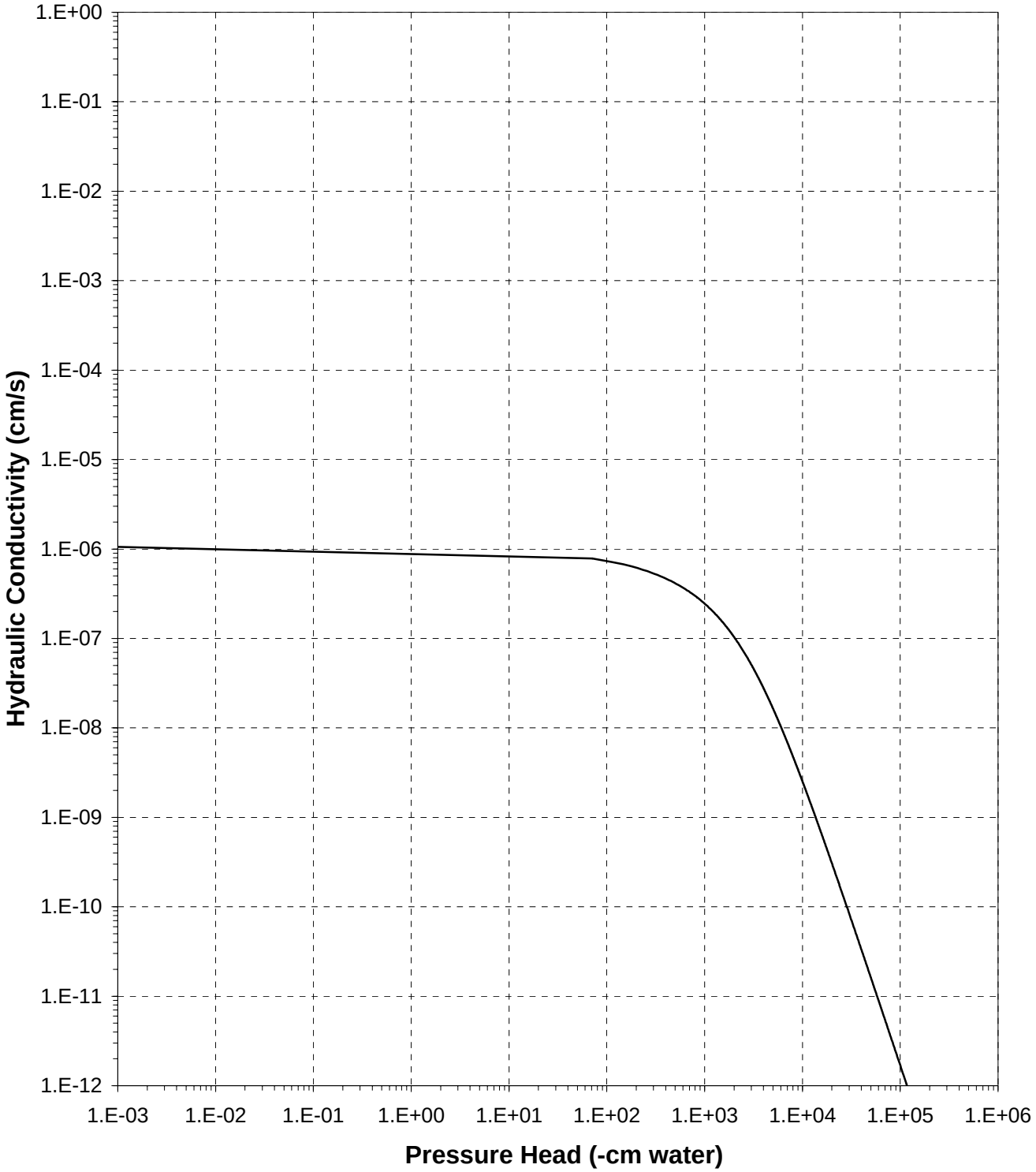
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (483-484)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (483-484)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (502-503)
Date Sampled: NA
Depth: 502-503

Dry wt. of sample (g): 155.62
Tare wt., ring (g): 48.50
Tare wt., screen & clamp (g): 28.14
Initial sample volume (cm^3): 108.90
Initial dry bulk density (g/cm^3): 1.43
Measured particle density (g/cm^3): 2.69
Initial calculated total porosity (%): 46.90

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	23-Jan-12	14:35	283.33	0	46.89
	30-Jan-12	13:10	282.48	16.0	46.11
	6-Feb-12	9:00	281.50	51.0	45.21
	13-Feb-12	10:45	280.50	127.0	44.30
Pressure plate:	23-Feb-12	10:25	278.95	337	42.87

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	51.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-15 (502-503)

Initial sample bulk density (g/cm^3)*:* 1.43
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 145.11
Tare weight, jar (g)*:* 112.61

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	4-Apr-12	9:00	149.45	17235	19.08
	3-Apr-12	15:40	148.49	41812	14.86
	3-Apr-12	14:40	148.01	80156	12.75

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	17235	---	---	---	---
	41812	---	---	---	---
	80156	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 69.03
Tare weight (g)*:* 39.42

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	6-Mar-12	9:30	70.64	855592	7.75

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	855592	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

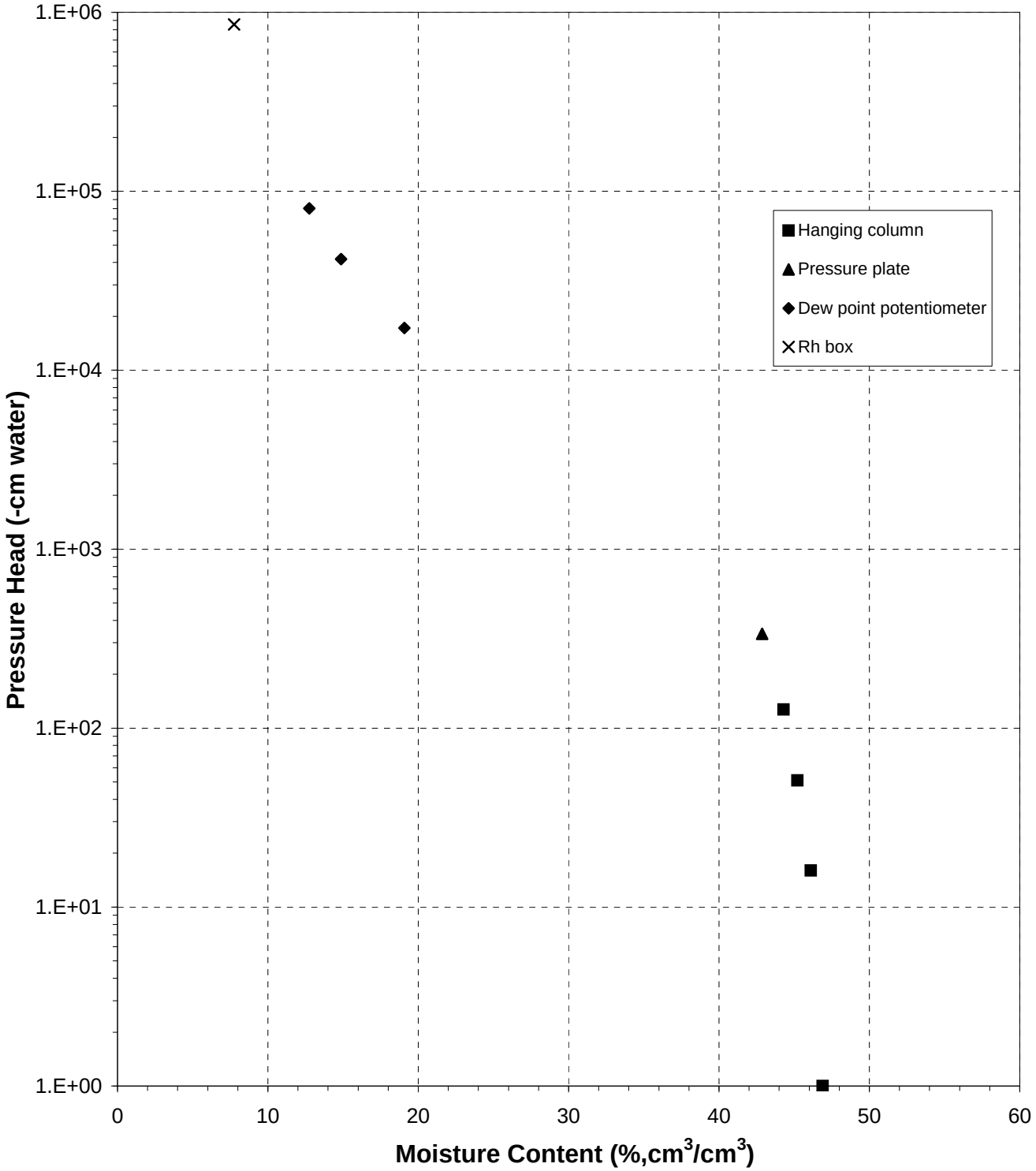
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

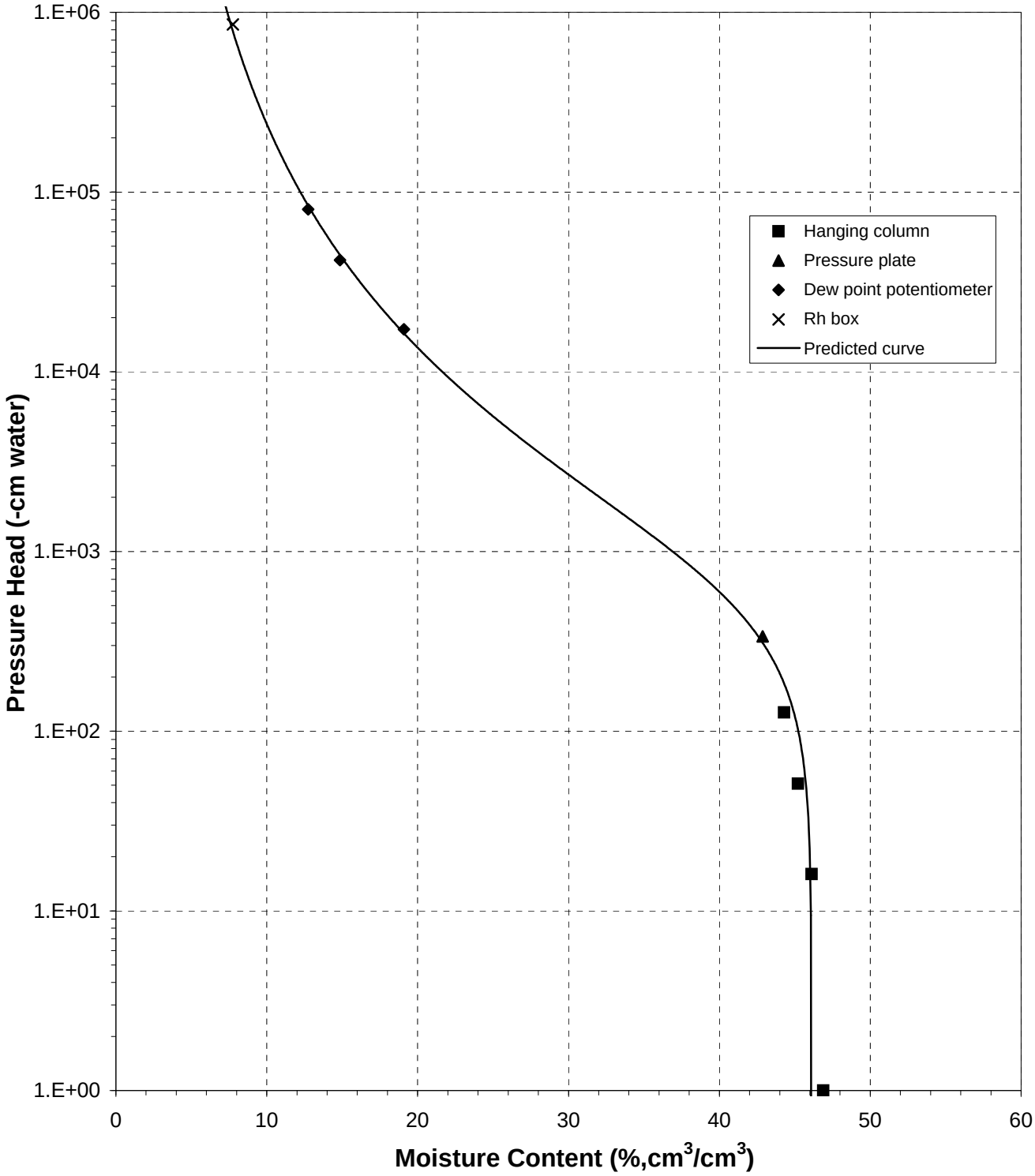
Water Retention Data Points

Sample Number: PB-15 (502-503)



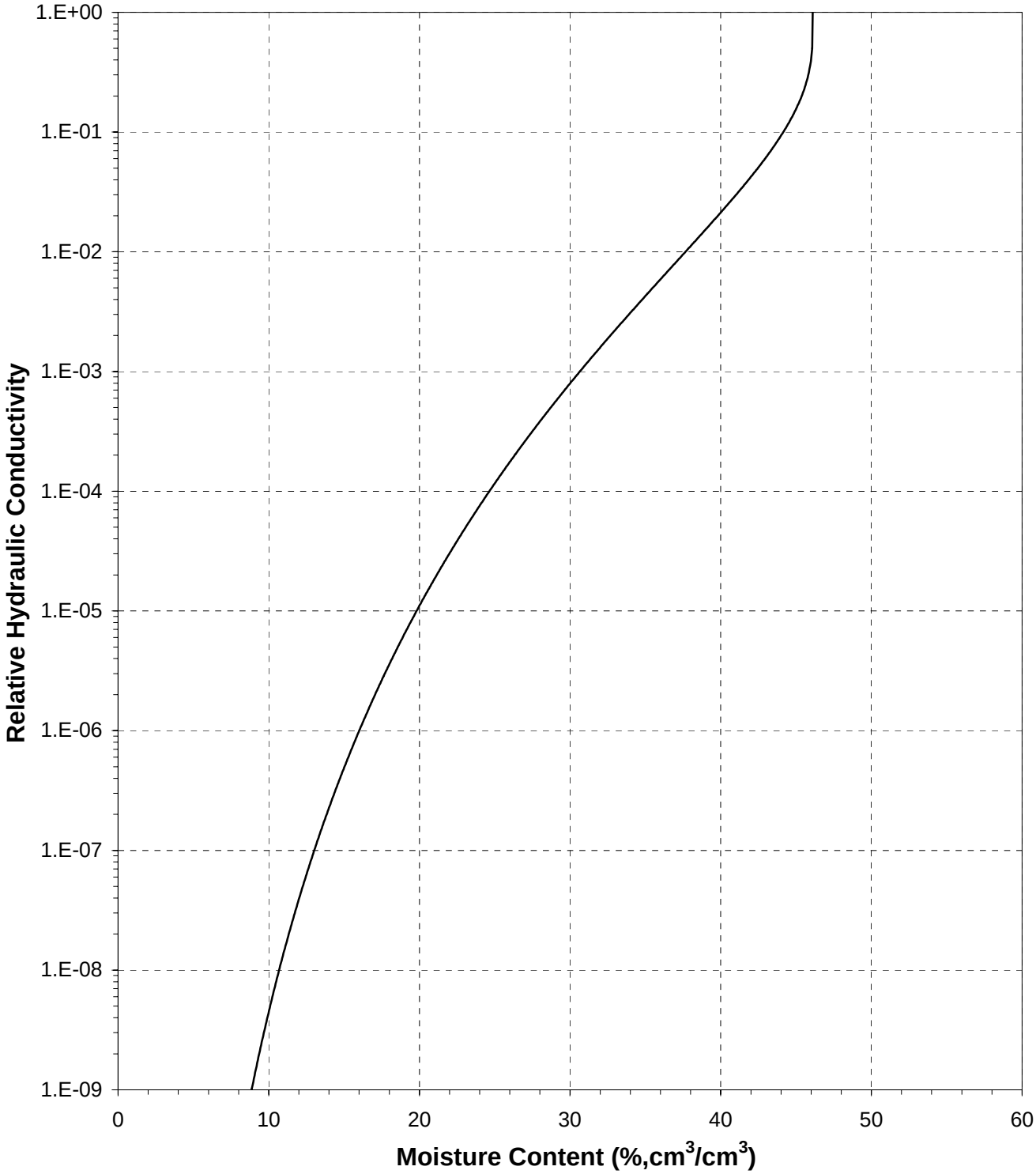
Predicted Water Retention Curve and Data Points

Sample Number: PB-15 (502-503)



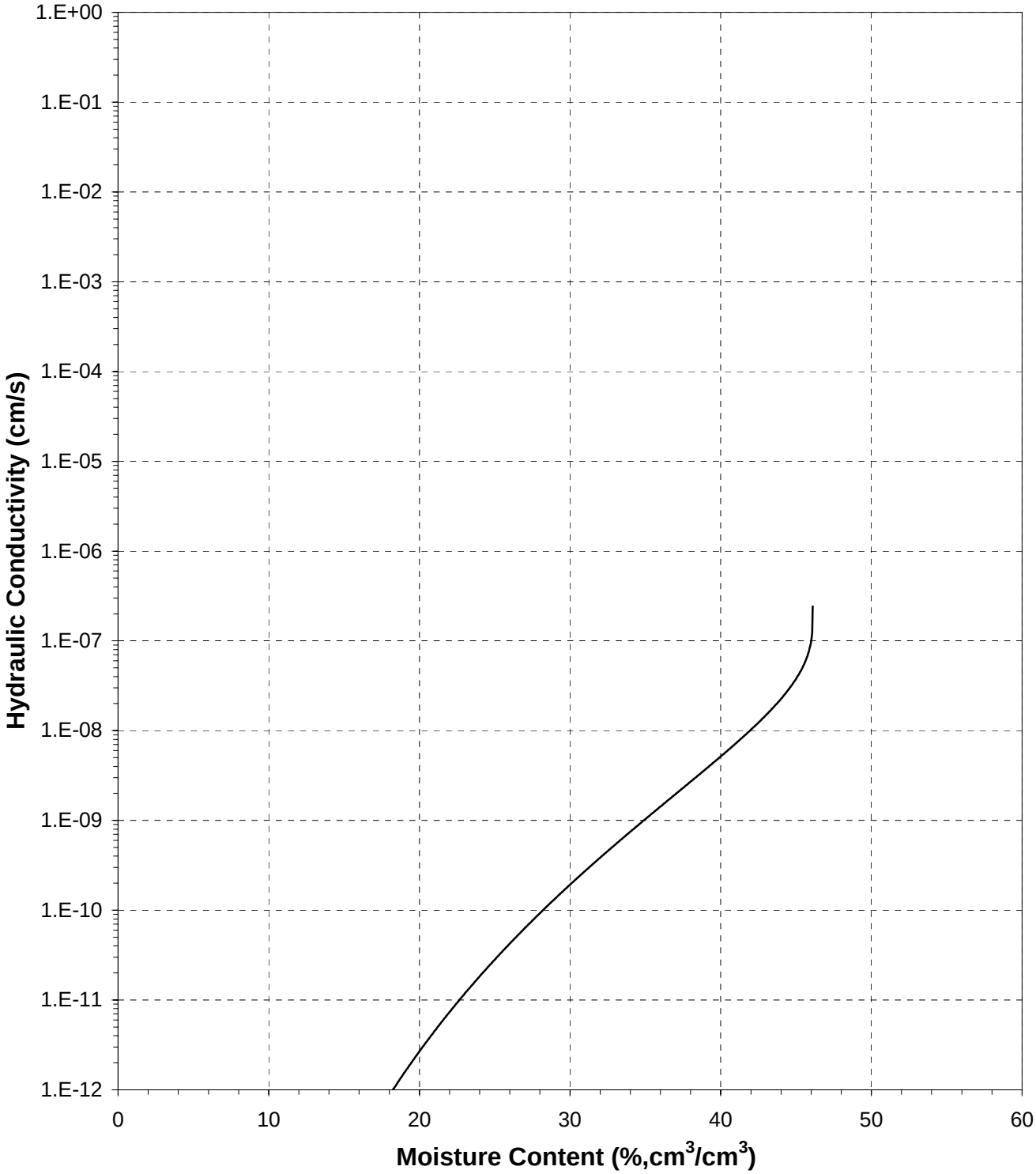
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (502-503)



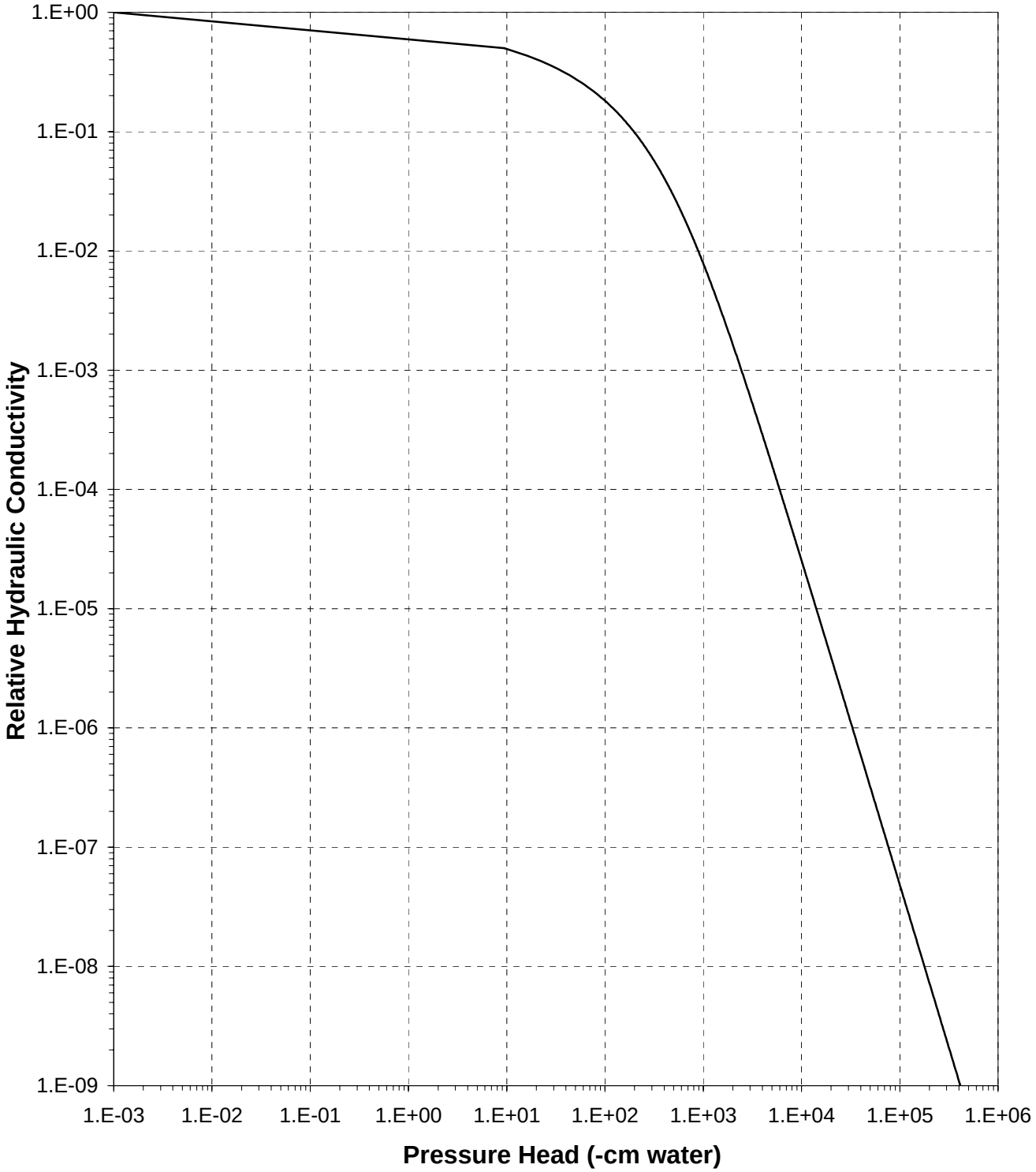
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (502-503)



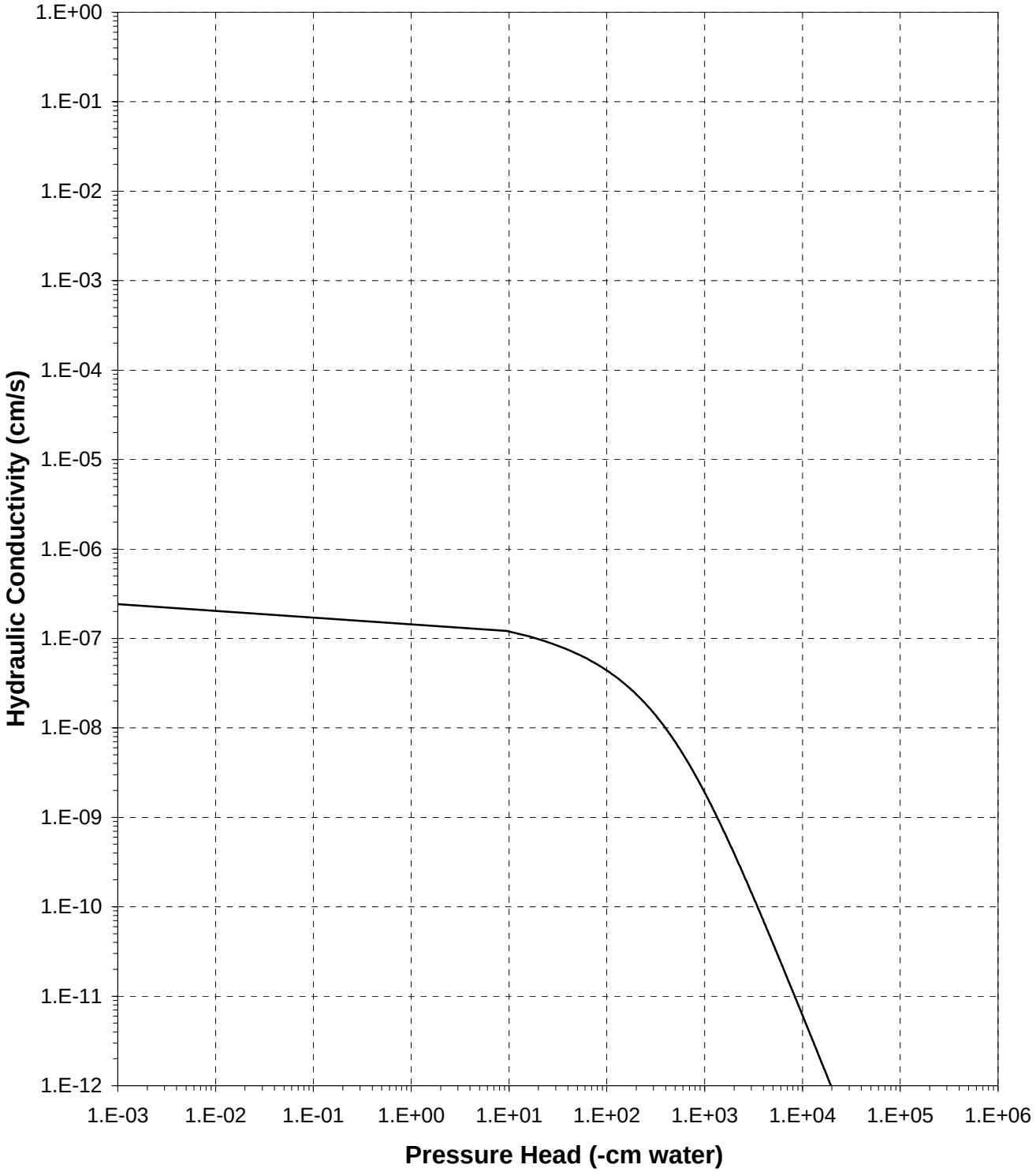
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (502-503)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (502-503)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (524-525)
Date Sampled: 12/7/2011
Depth: 524-525

Dry wt. of sample (g): 159.34
Tare wt., ring (g): 59.63
Tare wt., screen & clamp (g): 27.56
Initial sample volume (cm^3): 108.33
Initial dry bulk density (g/cm^3): 1.47
Measured particle density (g/cm^3): 2.66
Initial calculated total porosity (%): 44.78

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	26-Jan-12	14:15	295.04	0	44.78
	2-Feb-12	14:25	294.53	16.0	44.31
	9-Feb-12	10:45	294.20	50.0	44.01
	16-Feb-12	10:20	294.13	127.0	43.94
Pressure plate:	27-Feb-12	9:05	291.51	337	41.52

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	16.0	---	---	---	---
	50.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-15 (524-525)

Initial sample bulk density (g/cm^3)*:* 1.47
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 145.38
Tare weight, jar (g)*:* 116.24

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Dew point potentiometer:	14-Mar-12	13:50	149.81	4895	22.36
	19-Mar-12	12:28	148.60	15195	16.25
	19-Mar-12	11:21	147.52	93312	10.80

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	4895	---	---	---	---
	15195	---	---	---	---
	93312	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 67.76
Tare weight (g)*:* 38.33

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)
Relative humidity box:	24-Feb-12	9:30	69.09	852726	6.63

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	852726	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

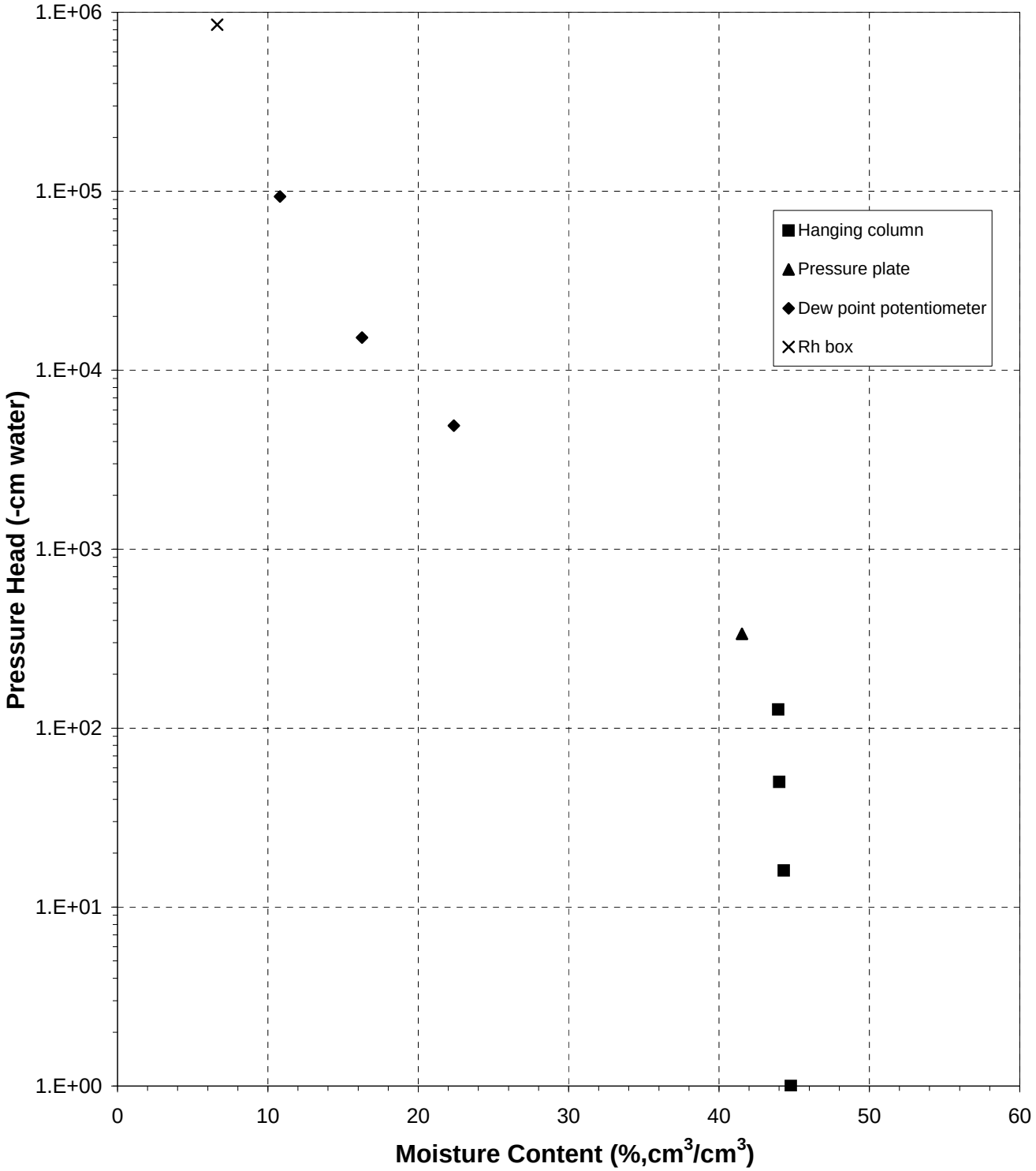
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

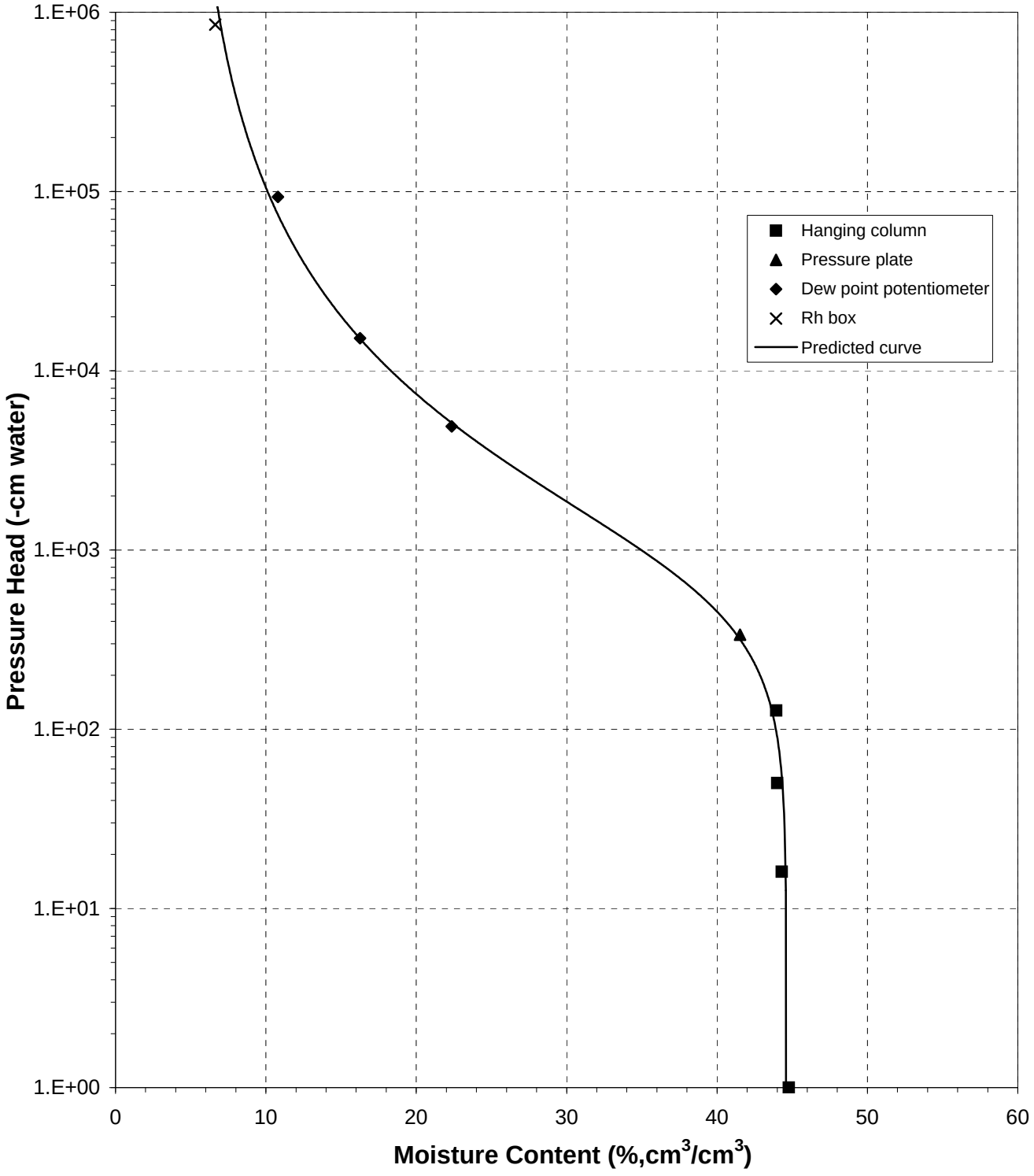
Water Retention Data Points

Sample Number: PB-15 (524-525)



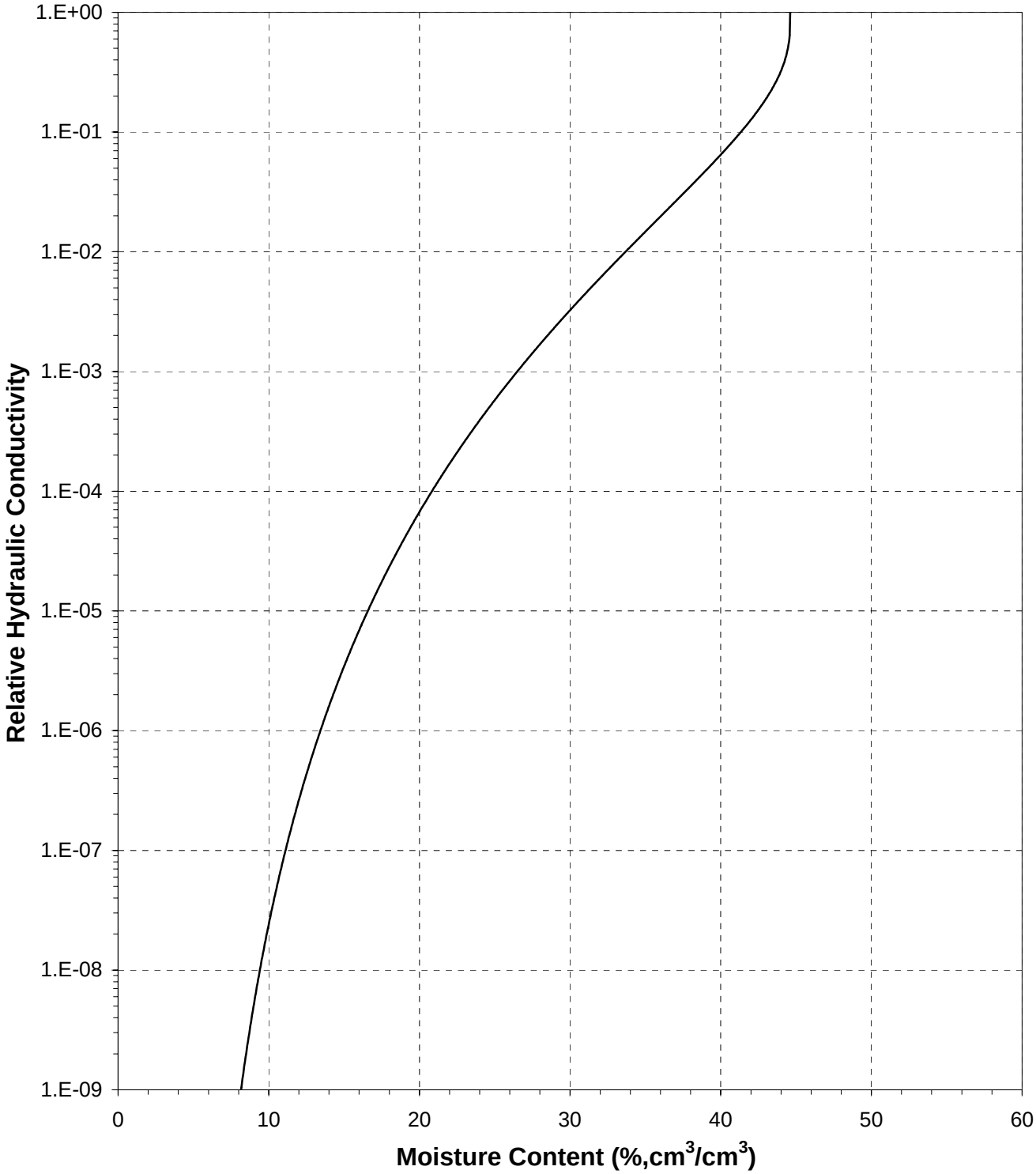
Predicted Water Retention Curve and Data Points

Sample Number: PB-15 (524-525)



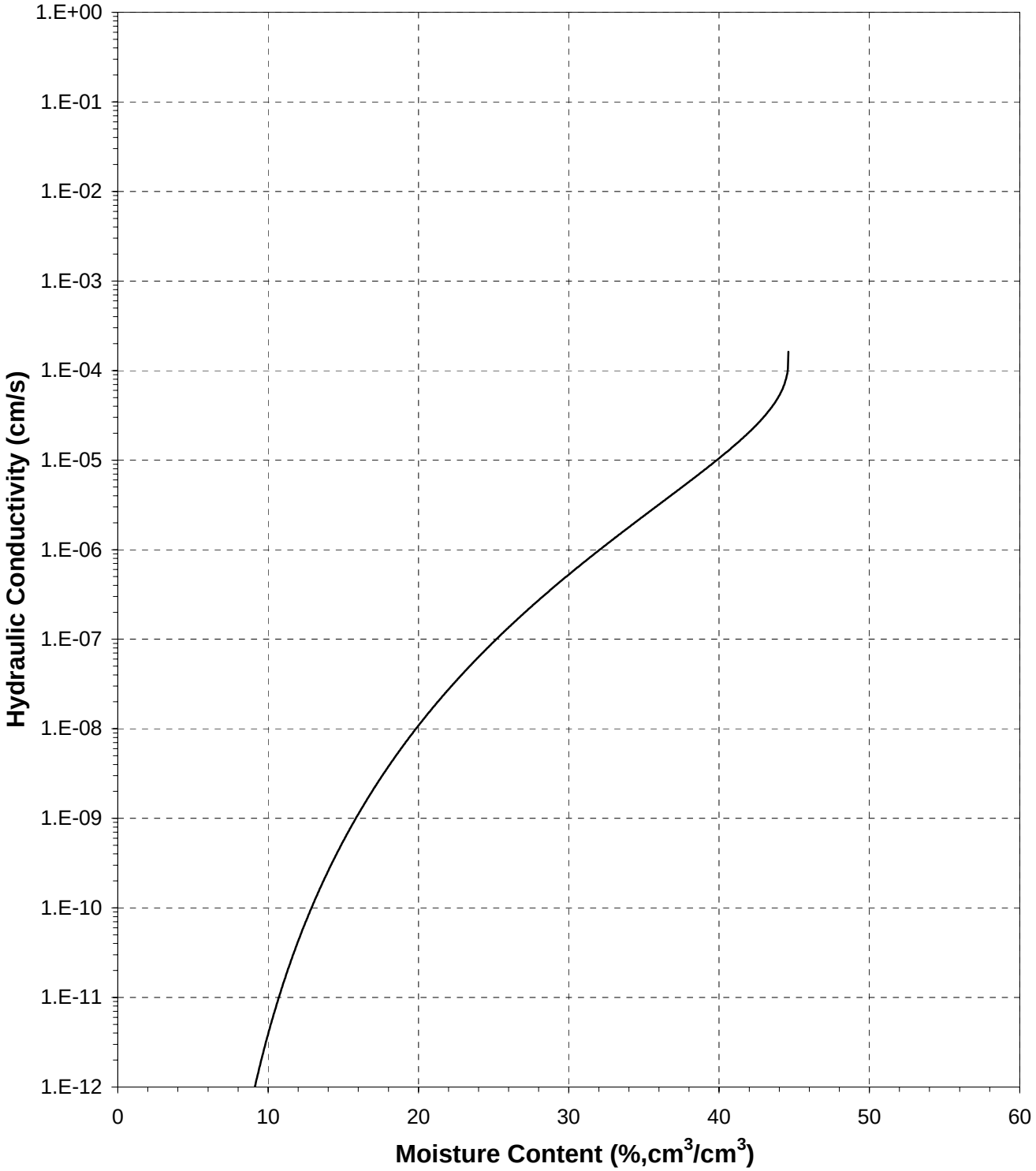
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (524-525)



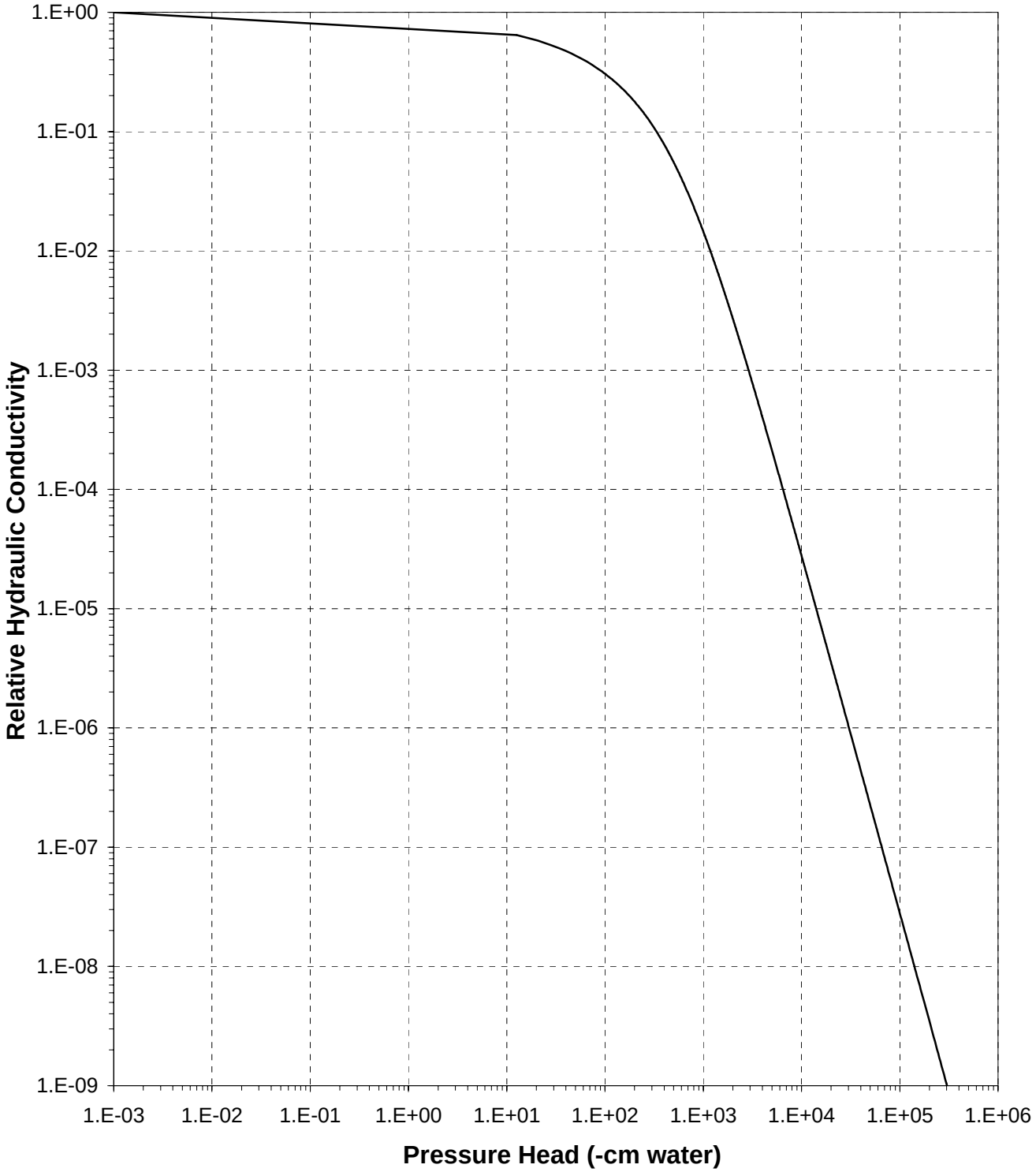
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (524-525)



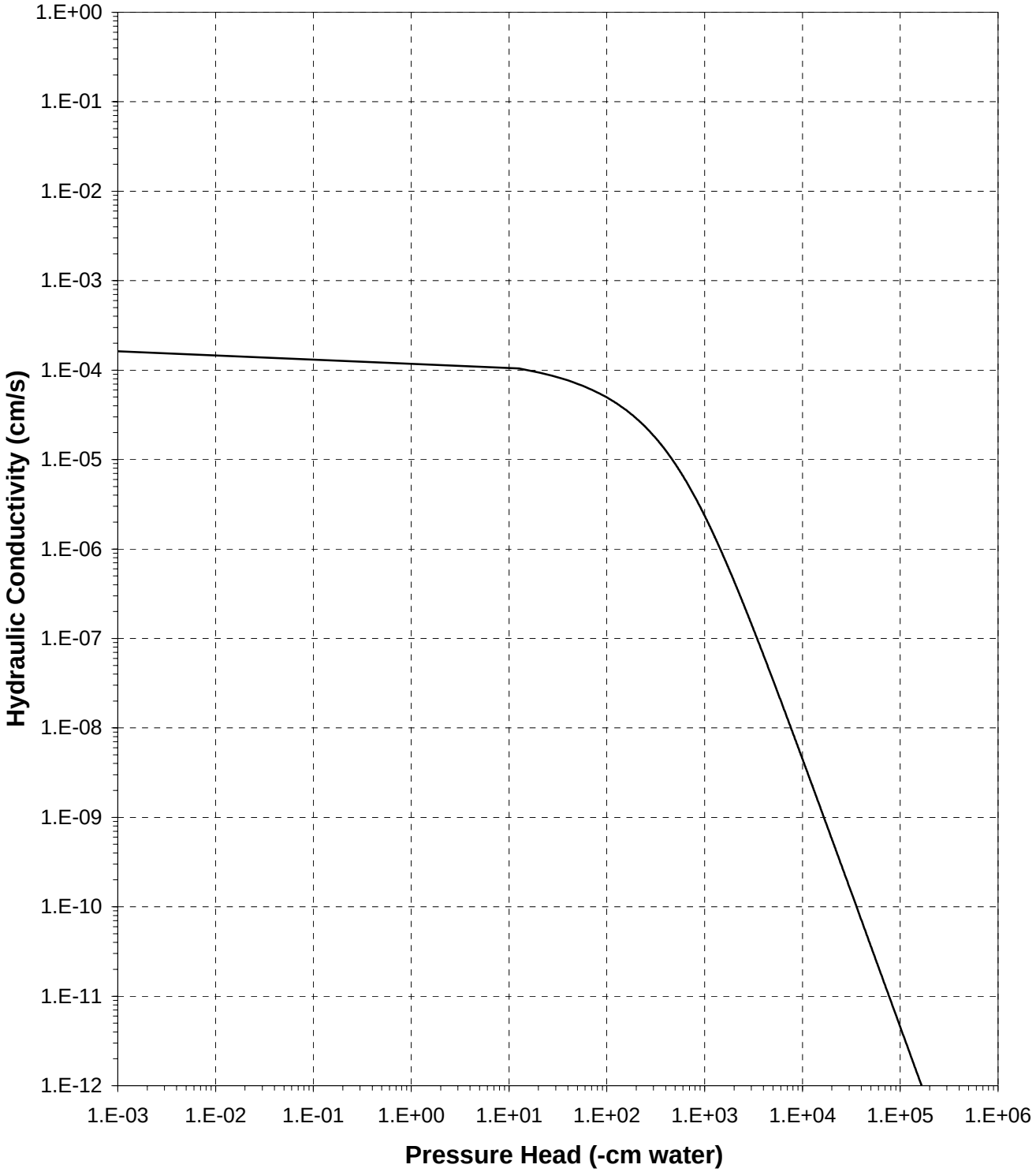
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (524-525)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (524-525)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (539-540)
Date Sampled: 12/7/2011
Depth: 539-540

Dry wt. of sample (g): 151.35
Tare wt., ring (g): 58.66
Tare wt., screen & clamp (g): 27.25
Initial sample volume (cm^3): 103.85
Initial dry bulk density (g/cm^3): 1.46
Measured particle density (g/cm^3): 2.65
Initial calculated total porosity (%): 44.94

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	26-Jan-12	15:15	283.93	0	44.94
	2-Feb-12	14:20	282.96	12.0	44.01
	9-Feb-12	9:10	282.63	31.0	43.69
	16-Feb-12	10:05	282.21	99.0	43.29
Pressure plate:	27-Feb-12	8:55	274.24	337	35.61

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	12.0	---	---	---	---
	31.0	---	---	---	---
	99.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-15 (539-540)

Initial sample bulk density (g/cm^3)*:* 1.46
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 150.63
Tare weight, jar (g)*:* 113.88

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	14-Mar-12	14:06	154.30	9076	14.55
	21-Mar-12	11:00	153.53	21926	11.50
	16-Mar-12	16:35	152.47	165106	7.30

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	9076	---	---	---	---
	21926	---	---	---	---
	165106	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 69.77
Tare weight (g)*:* 36.82

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	24-Feb-12	9:40	70.88	852726	4.91

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	852726	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

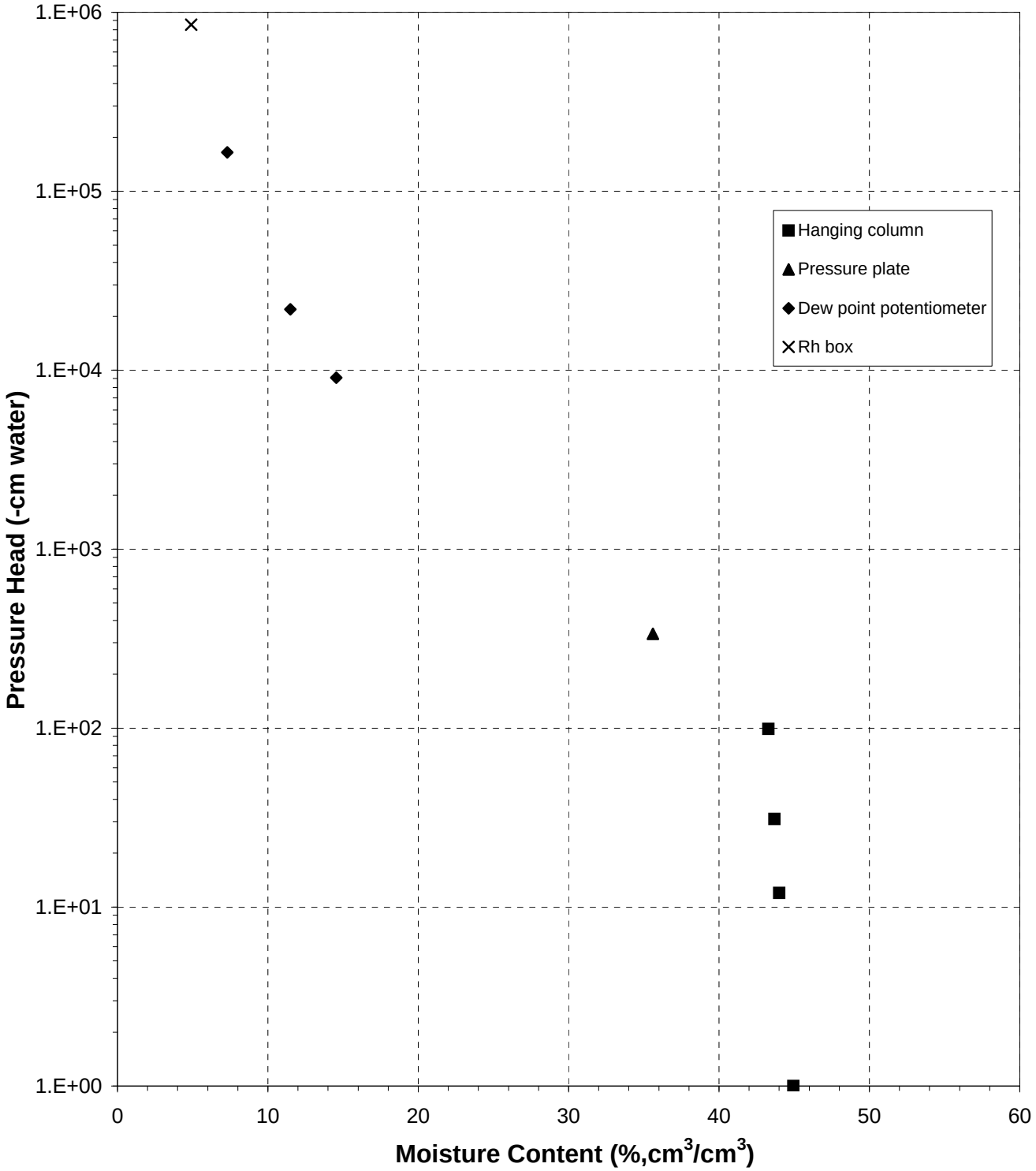
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: C. Krous
Checked by: J. Hines

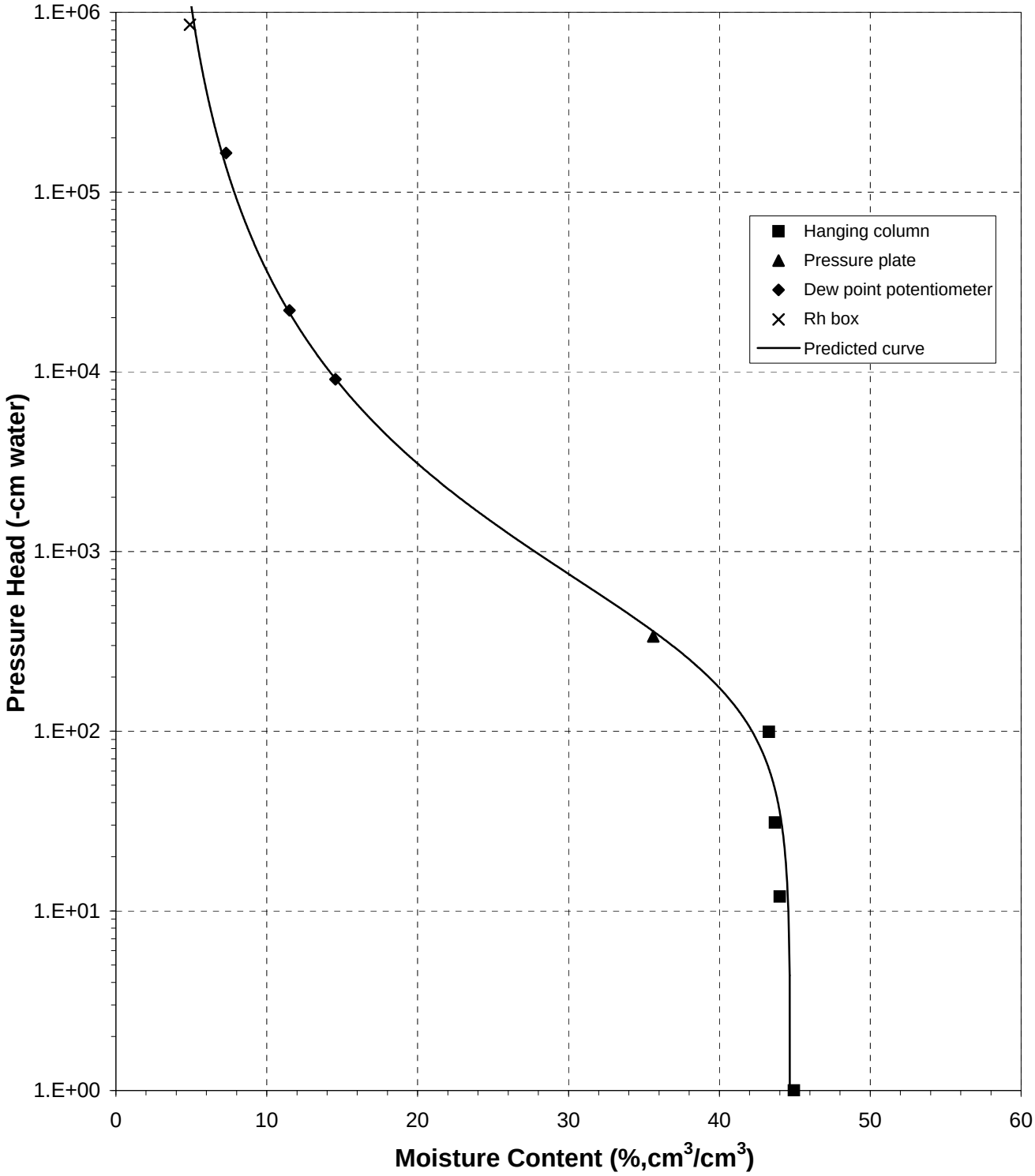
Water Retention Data Points

Sample Number: PB-15 (539-540)



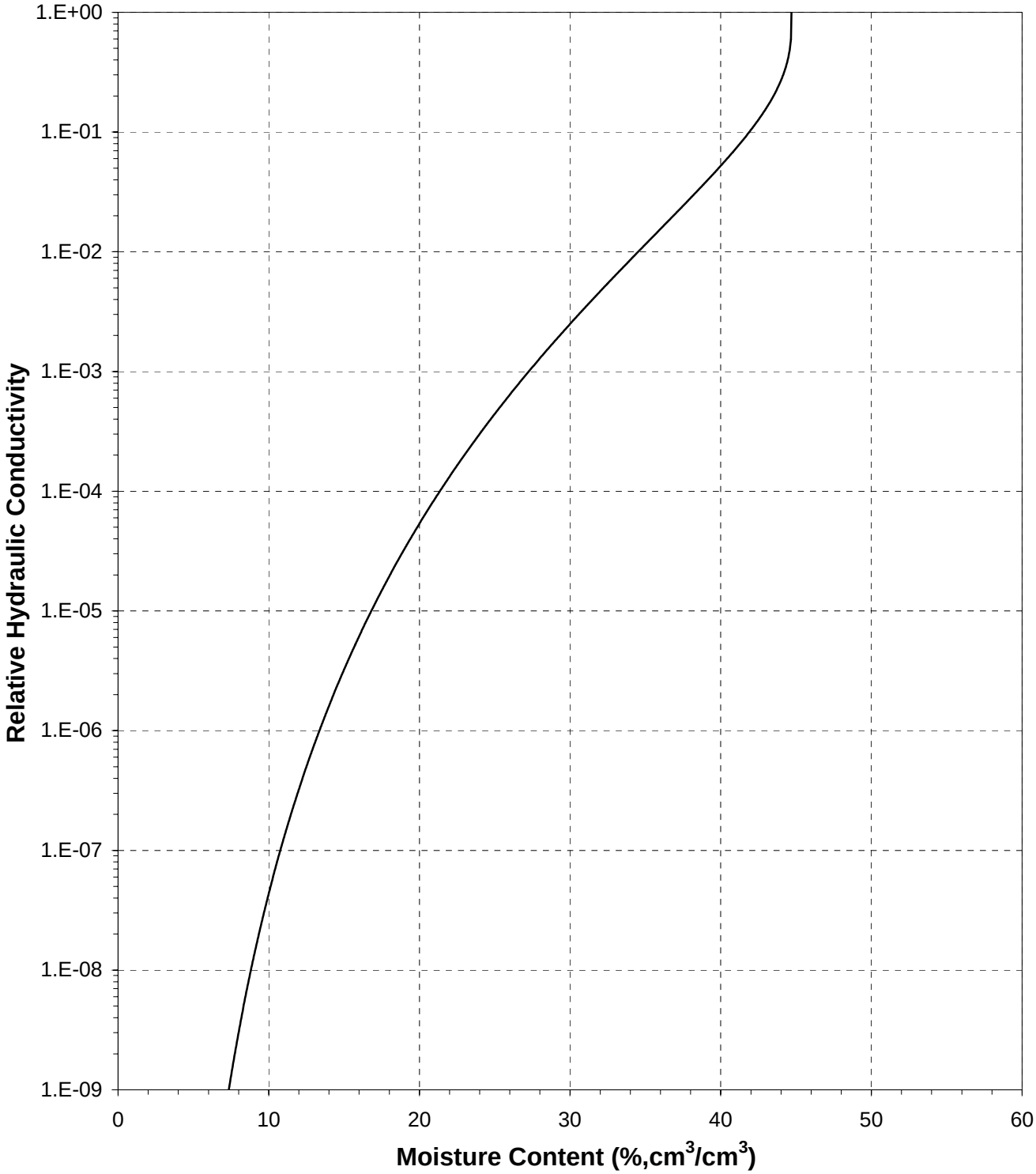
Predicted Water Retention Curve and Data Points

Sample Number: PB-15 (539-540)



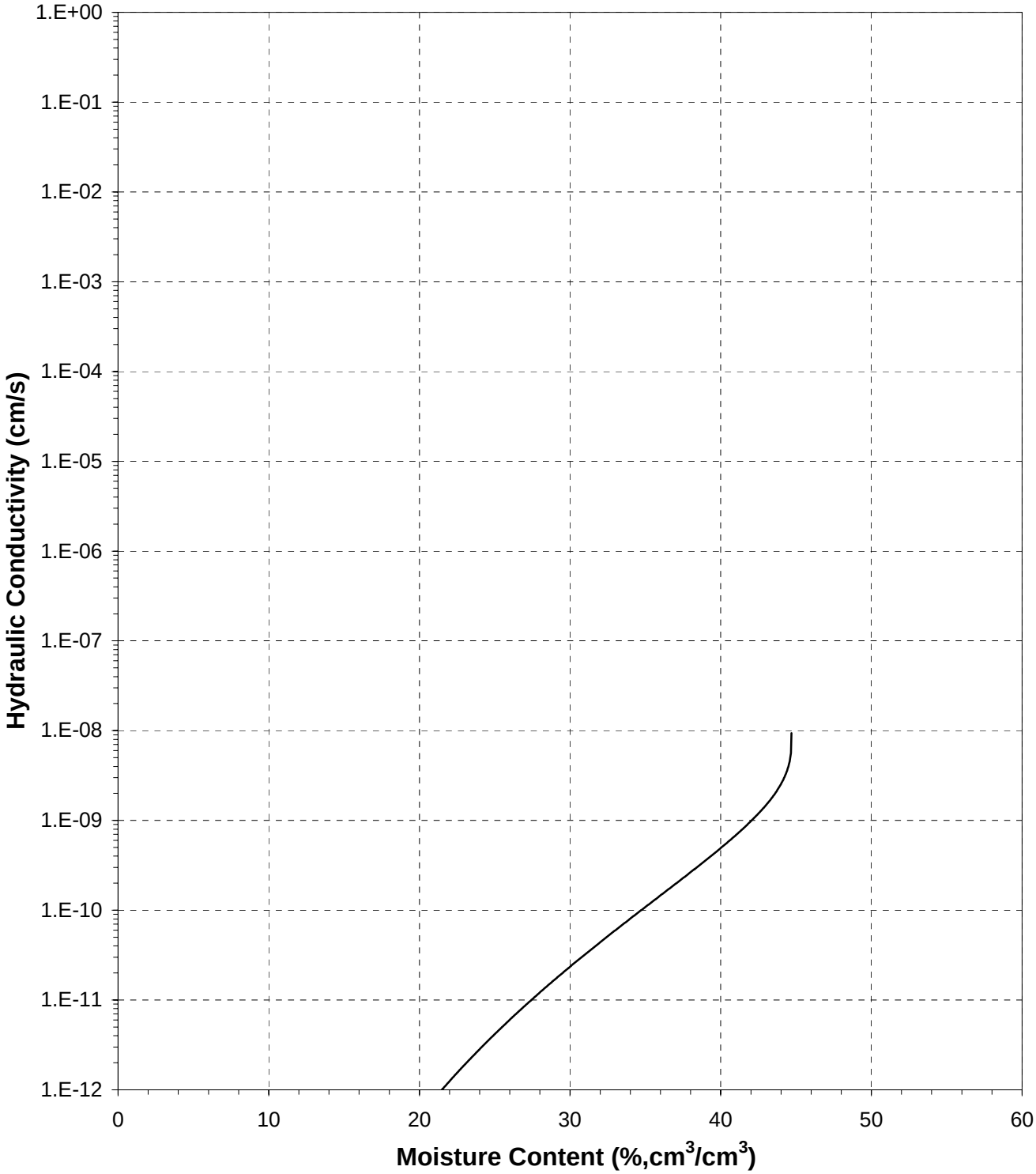
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (539-540)



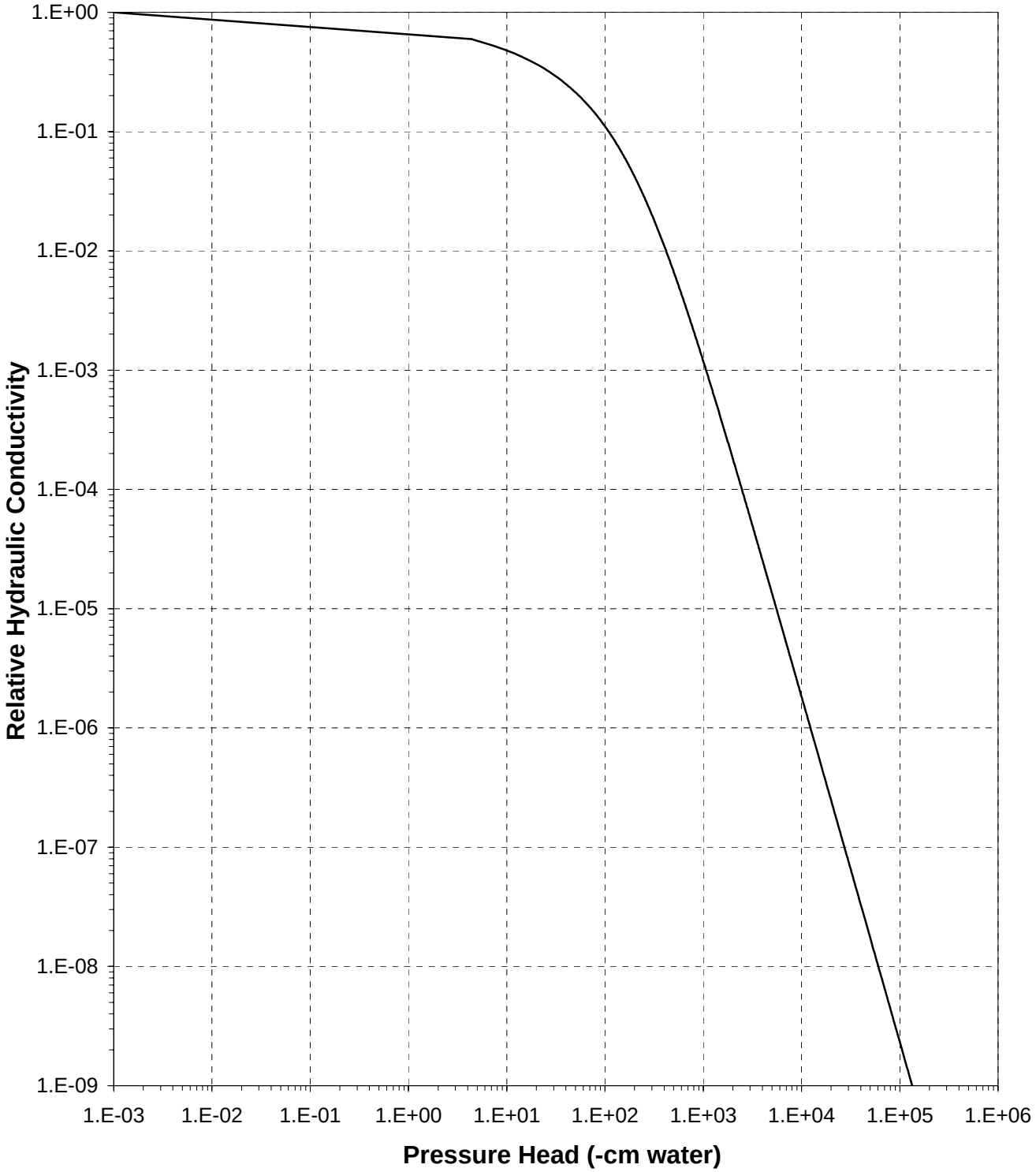
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (539-540)



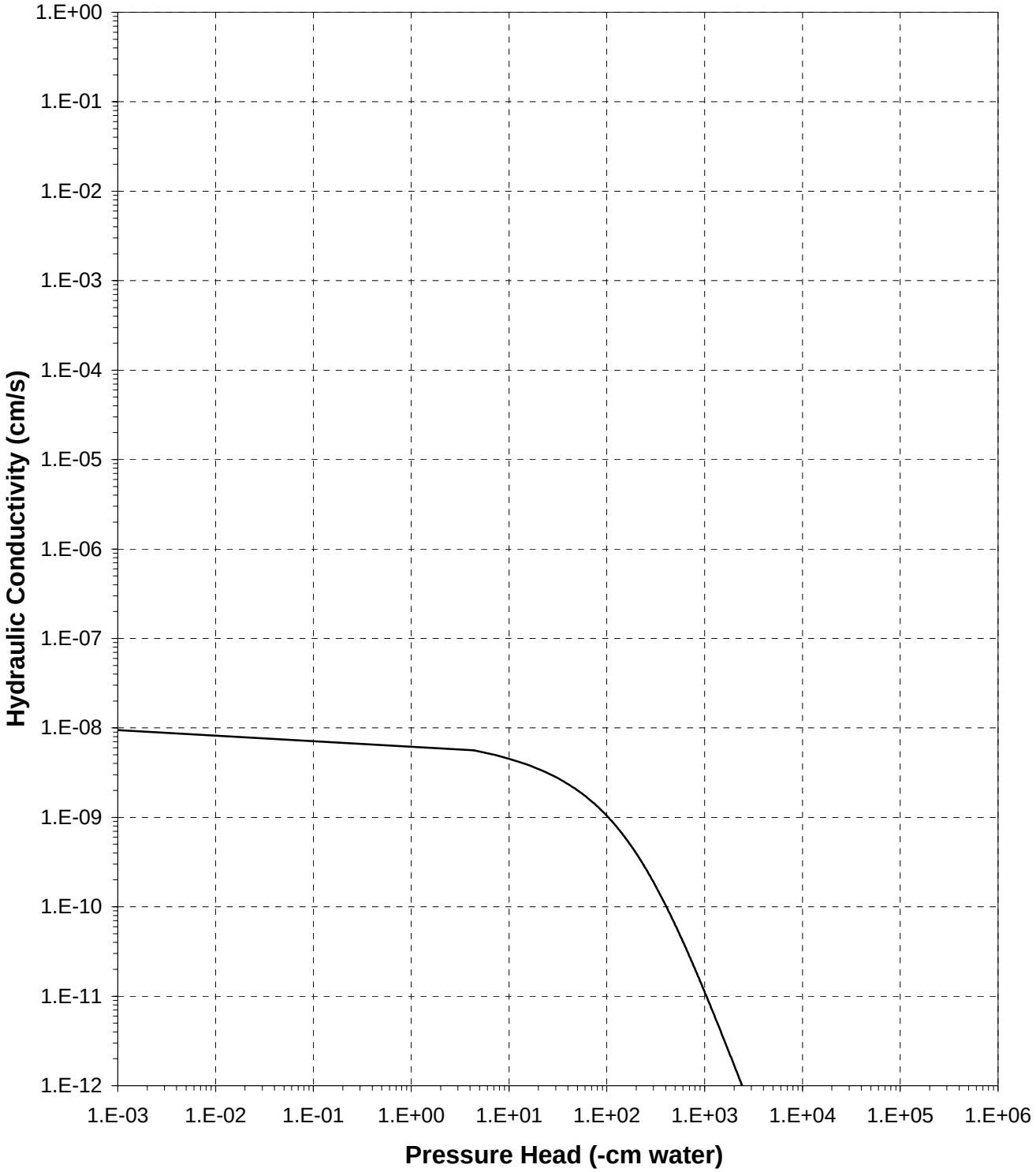
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (539-540)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (539-540)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (559-560)
Date Sampled: 12/7/2011
Depth: 559-560

Dry wt. of sample (g): 172.32
Tare wt., ring (g): 68.51
Tare wt., screen & clamp (g): 28.42
Initial sample volume (cm^3): 116.59
Initial dry bulk density (g/cm^3): 1.48
Measured particle density (g/cm^3): 2.66
Initial calculated total porosity (%): 44.43

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	21-Feb-12	13:20	321.05	0	44.43
	8-Feb-12	8:50	320.60	20.0	44.04
	15-Feb-12	8:40	320.00	73.0	43.53
	22-Feb-12	10:55	319.80	153.0	43.36
Pressure plate:	5-Mar-12	8:35	319.53	337	43.12

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	20.0	---	---	---	---
	73.0	---	---	---	---
	153.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-15 (559-560)

Initial sample bulk density (g/cm^3)*:* 1.48
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 142.10
Tare weight, jar (g)*:* 114.23

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	4-Apr-12	10:25	146.14	15501	21.42
	13-Apr-12	14:40	144.99	45993	15.33
	4-Apr-12	9:00	144.57	97085	13.10

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	15501	---	---	---	---
	45993	---	---	---	---
	97085	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 67.06
Tare weight (g)*:* 41.10

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	2-Mar-12	8:30	68.39	854159	7.59

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	854159	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

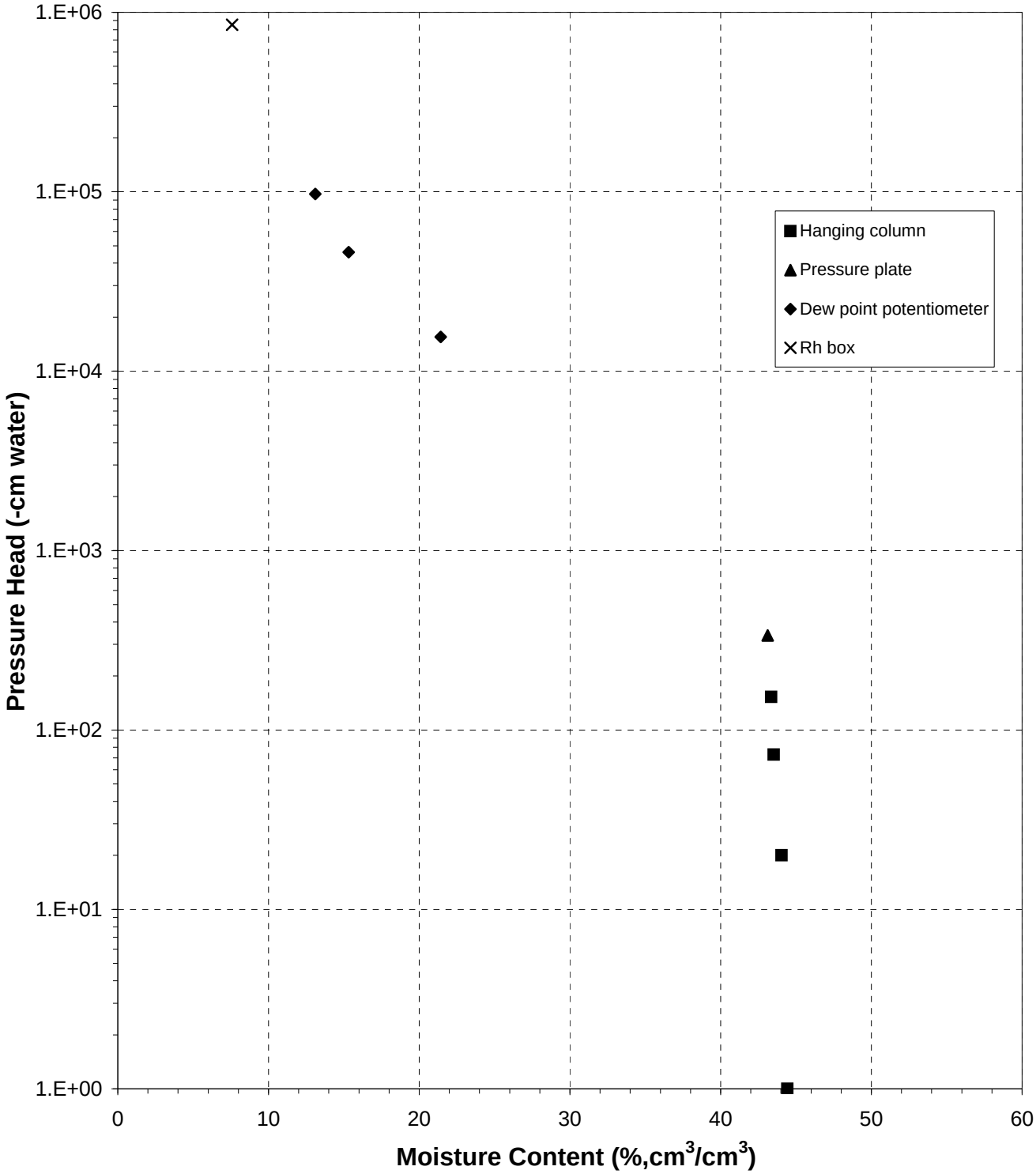
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

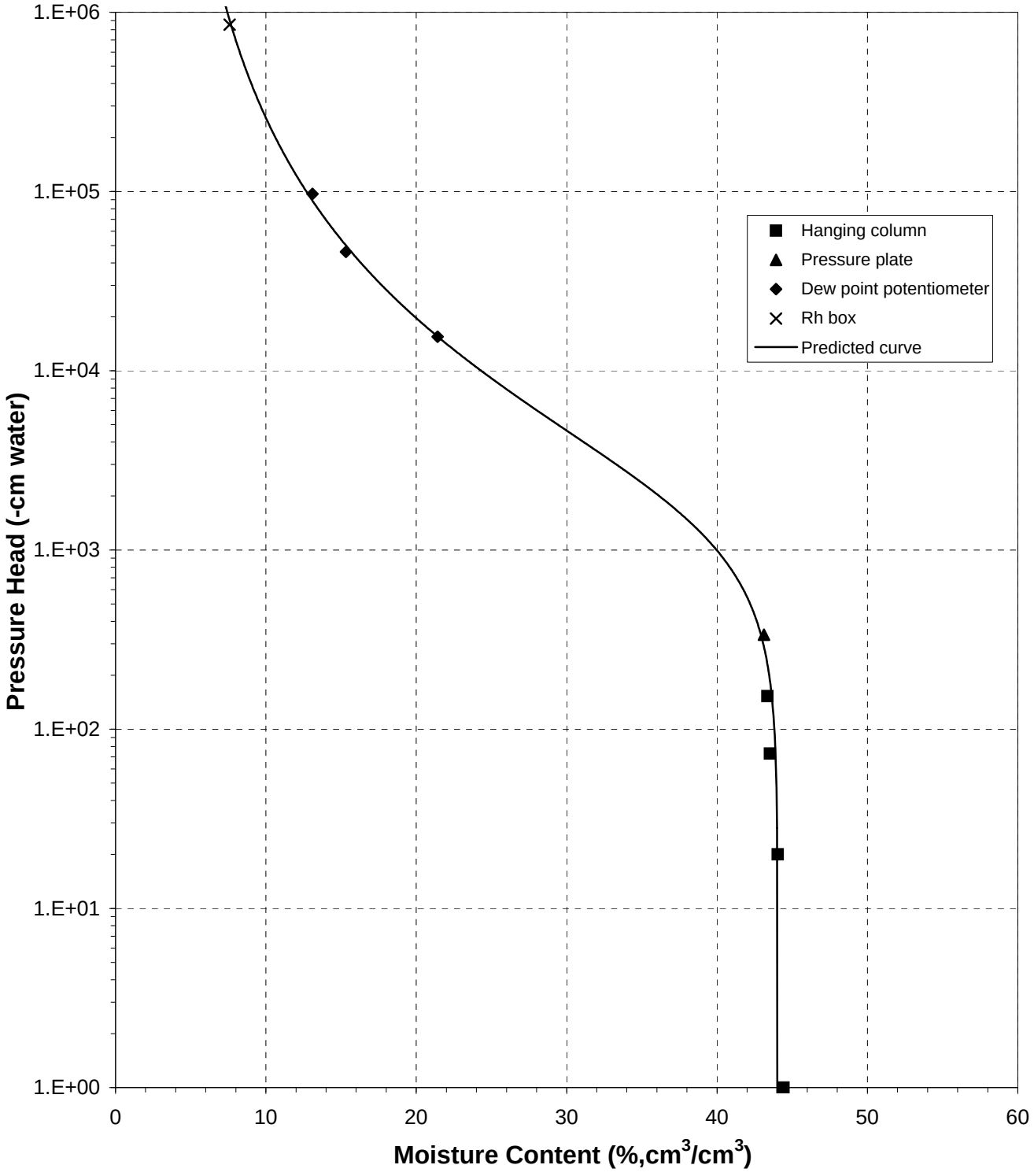
Water Retention Data Points

Sample Number: PB-15 (559-560)



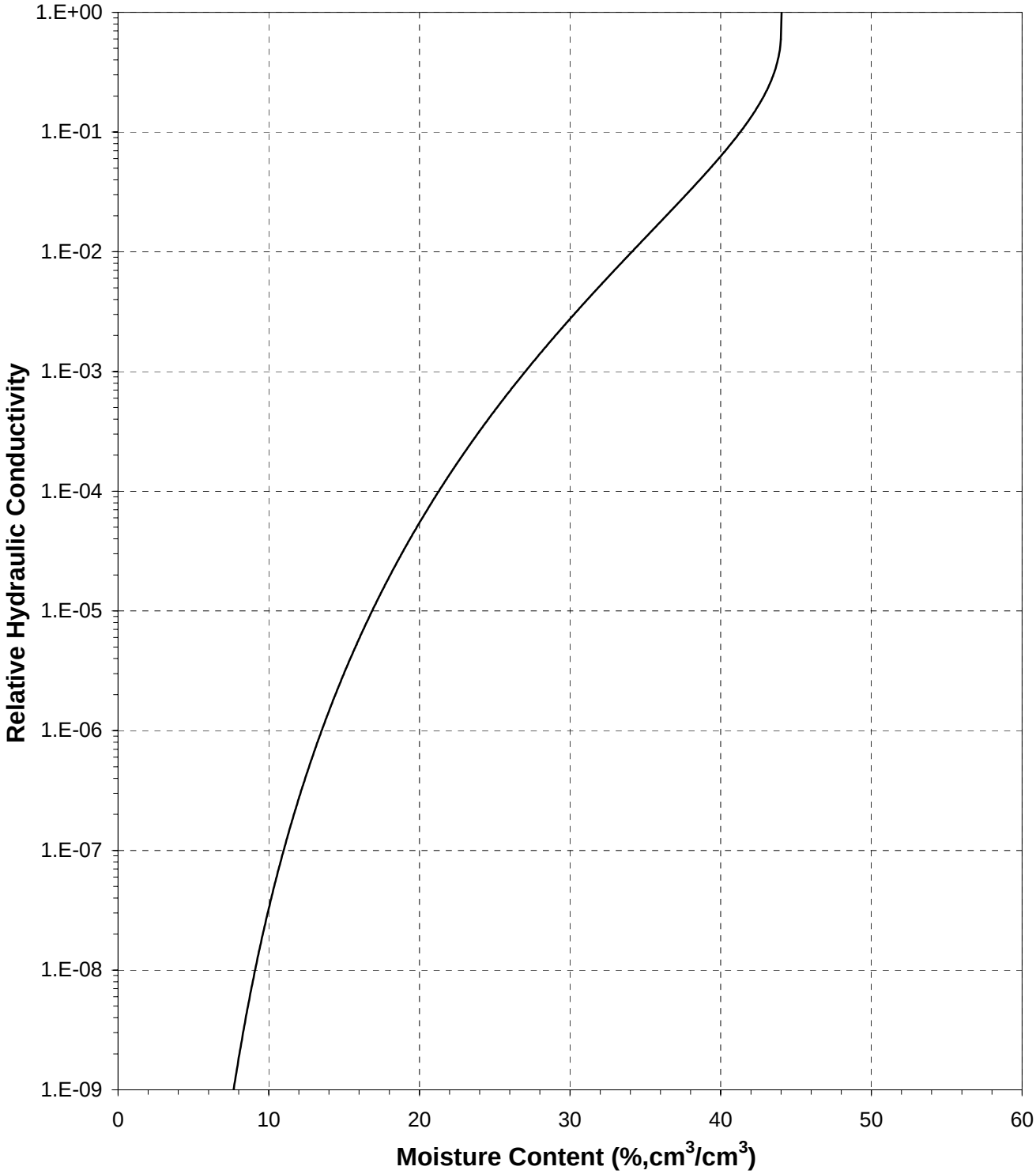
Predicted Water Retention Curve and Data Points

Sample Number: PB-15 (559-560)



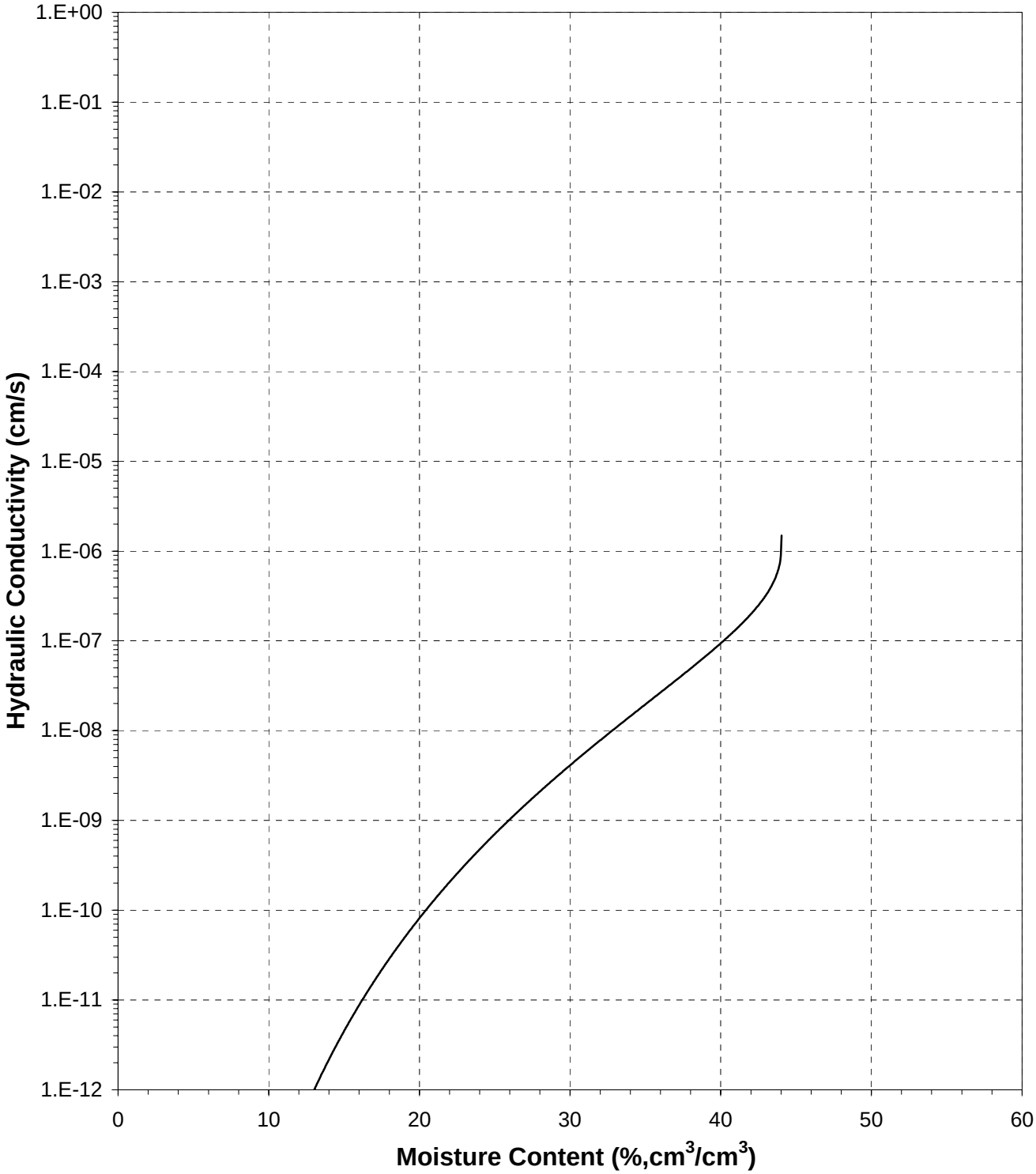
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (559-560)



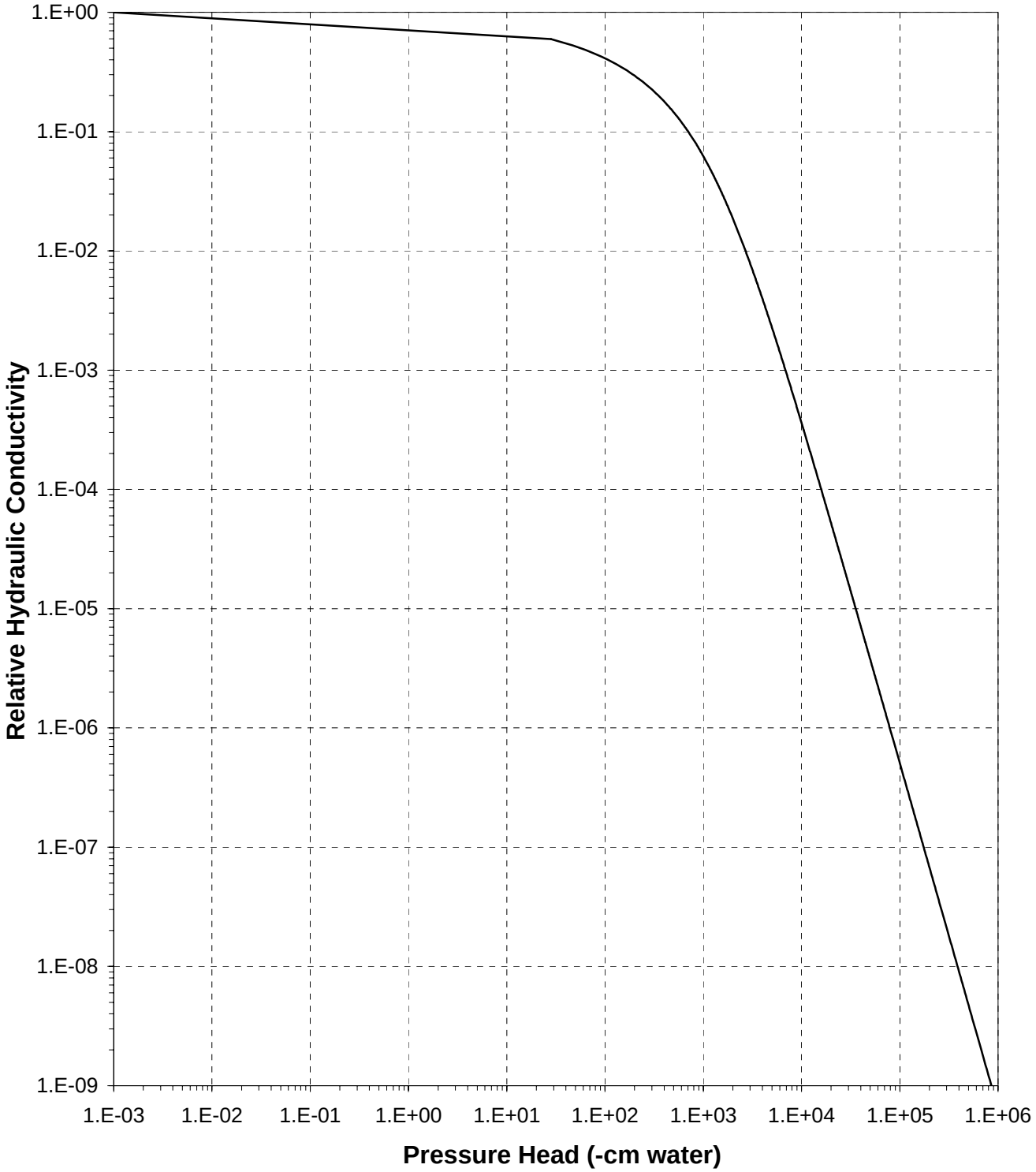
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (559-560)



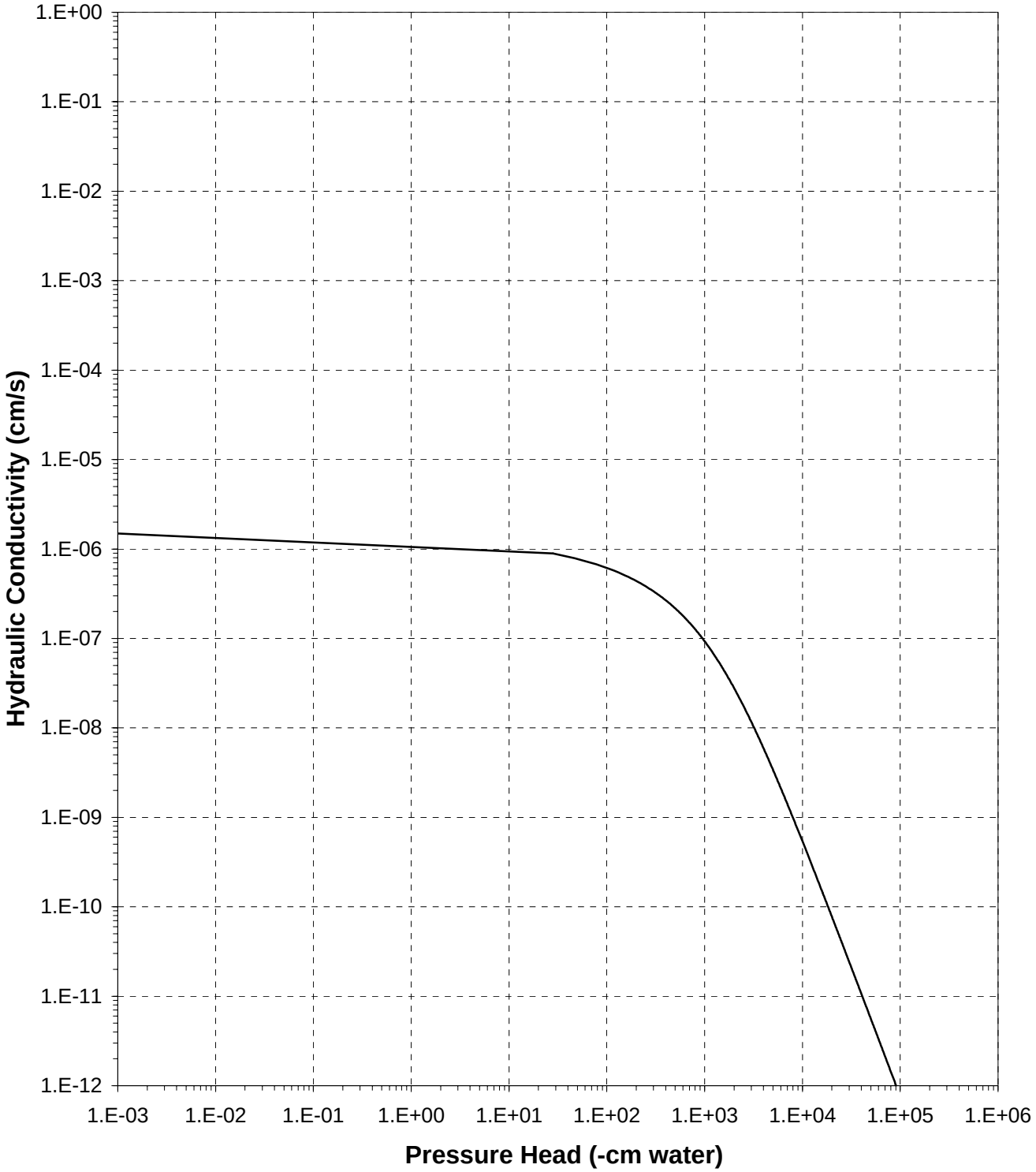
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (559-560)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (559-560)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (574-575)
Date Sampled: 12/7/2011
Depth: 574-575

Dry wt. of sample (g): 117.30
Tare wt., ring (g): 49.38
Tare wt., screen & clamp (g): 22.93
Initial sample volume (cm^3): 81.76
Initial dry bulk density (g/cm^3): 1.43
Measured particle density (g/cm^3): 2.62
Initial calculated total porosity (%): 45.25

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	13-Feb-12	12:45	226.61	0	45.26
	20-Feb-12	1:10	226.35	51.0	44.94
	27-Feb-12	9:40	226.20	152.0	44.75
Pressure plate:	13-Mar-12	13:10	225.95	337	44.45
	27-Mar-12	8:35	225.48	1275	43.87

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	51.0	---	---	---	---
	152.0	---	---	---	---
Pressure plate:	337	---	---	---	---
	1275	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-15 (574-575)

Initial sample bulk density (g/cm^3)*:* 1.43
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 142.16
Tare weight, jar (g)*:* 112.12

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	16-Mar-12	16:50	146.54	15501	20.92
	21-Mar-12	11:07	145.53	42628	16.10
	21-Mar-12	14:52	144.78	92598	12.51

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	15501	---	---	---	---
	42628	---	---	---	---
	92598	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 70.64
Tare weight (g)*:* 39.94

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	72.08	857025	6.73

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

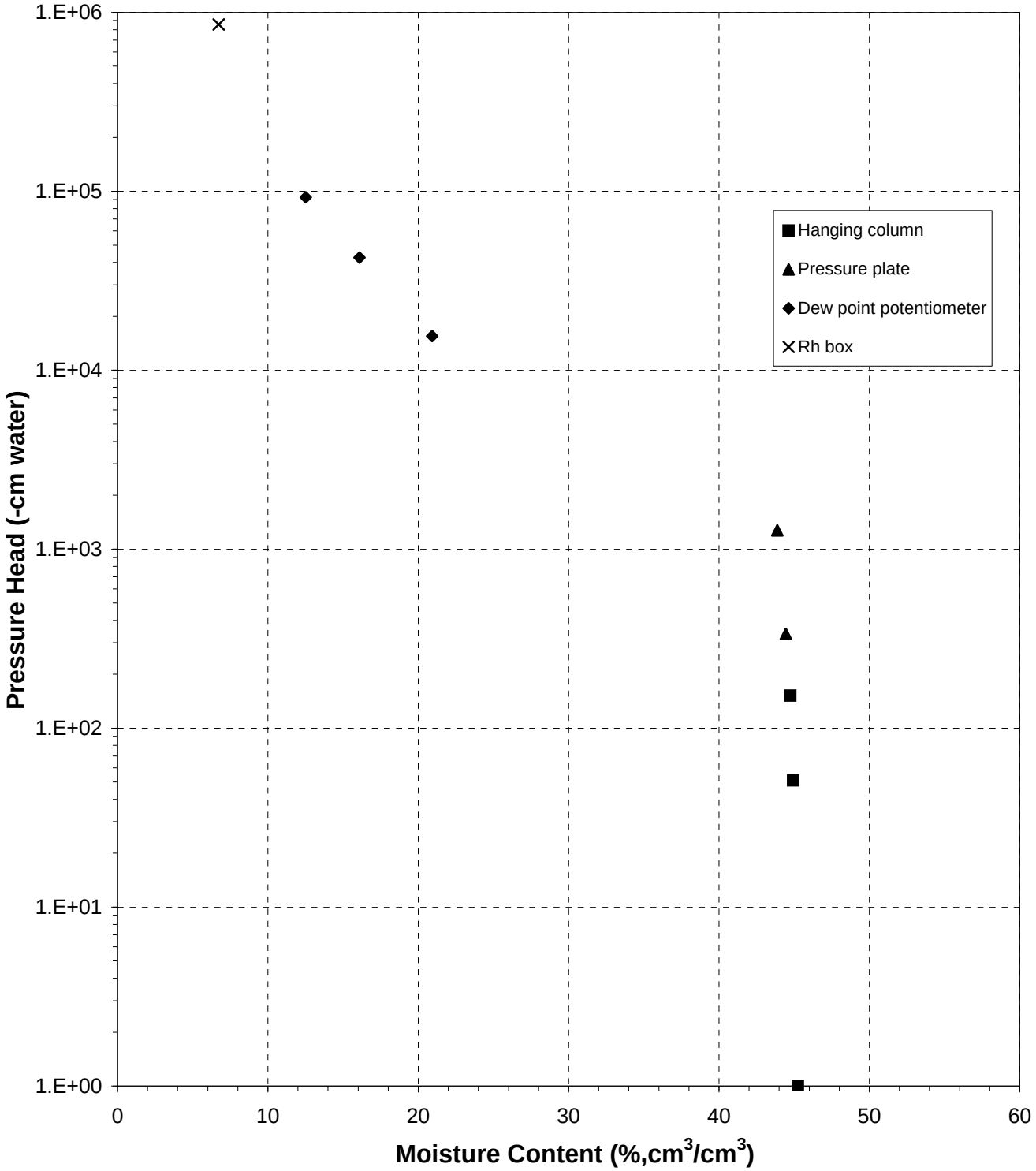
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

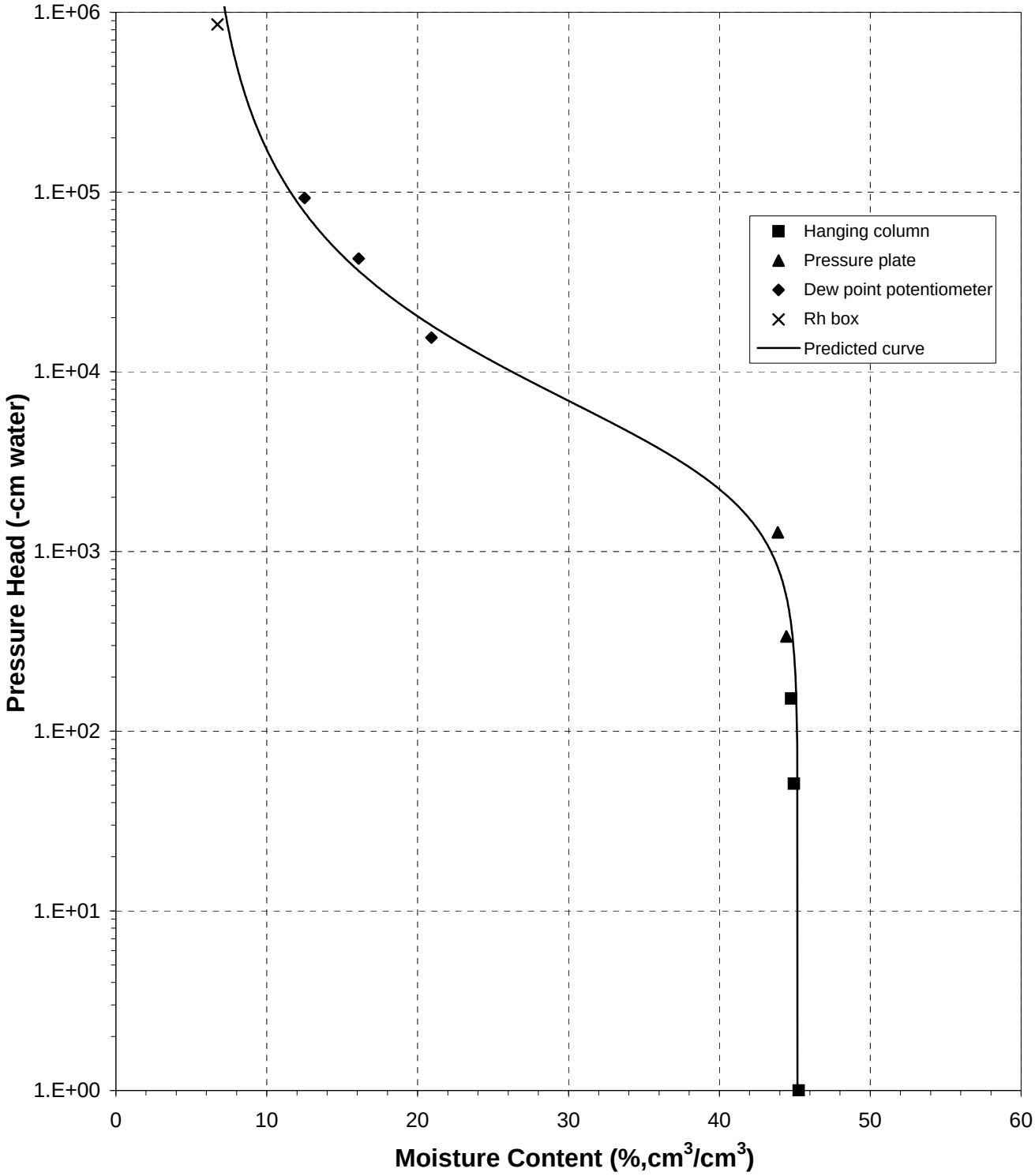
Water Retention Data Points

Sample Number: PB-15 (574-575)



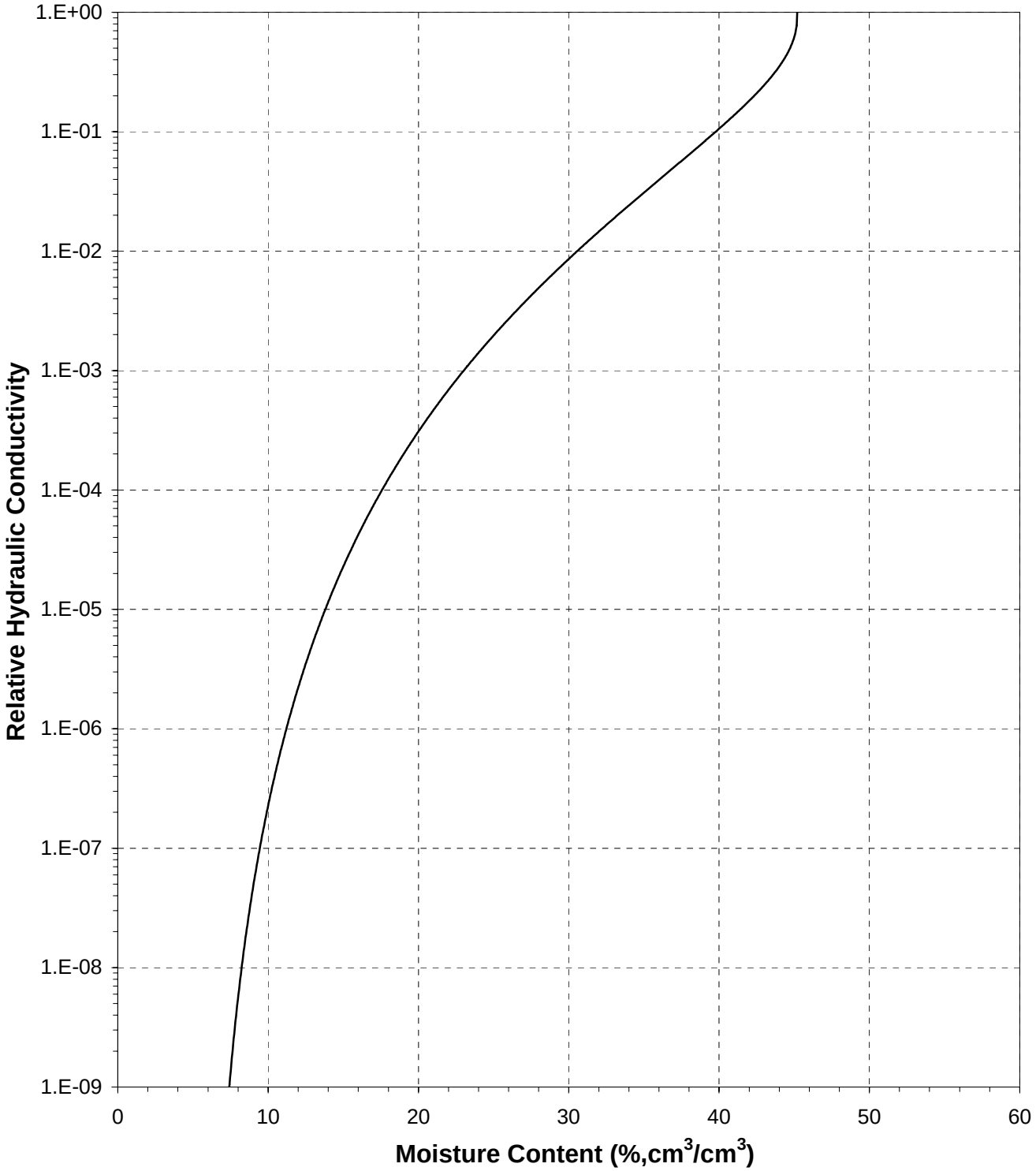
Predicted Water Retention Curve and Data Points

Sample Number: PB-15 (574-575)



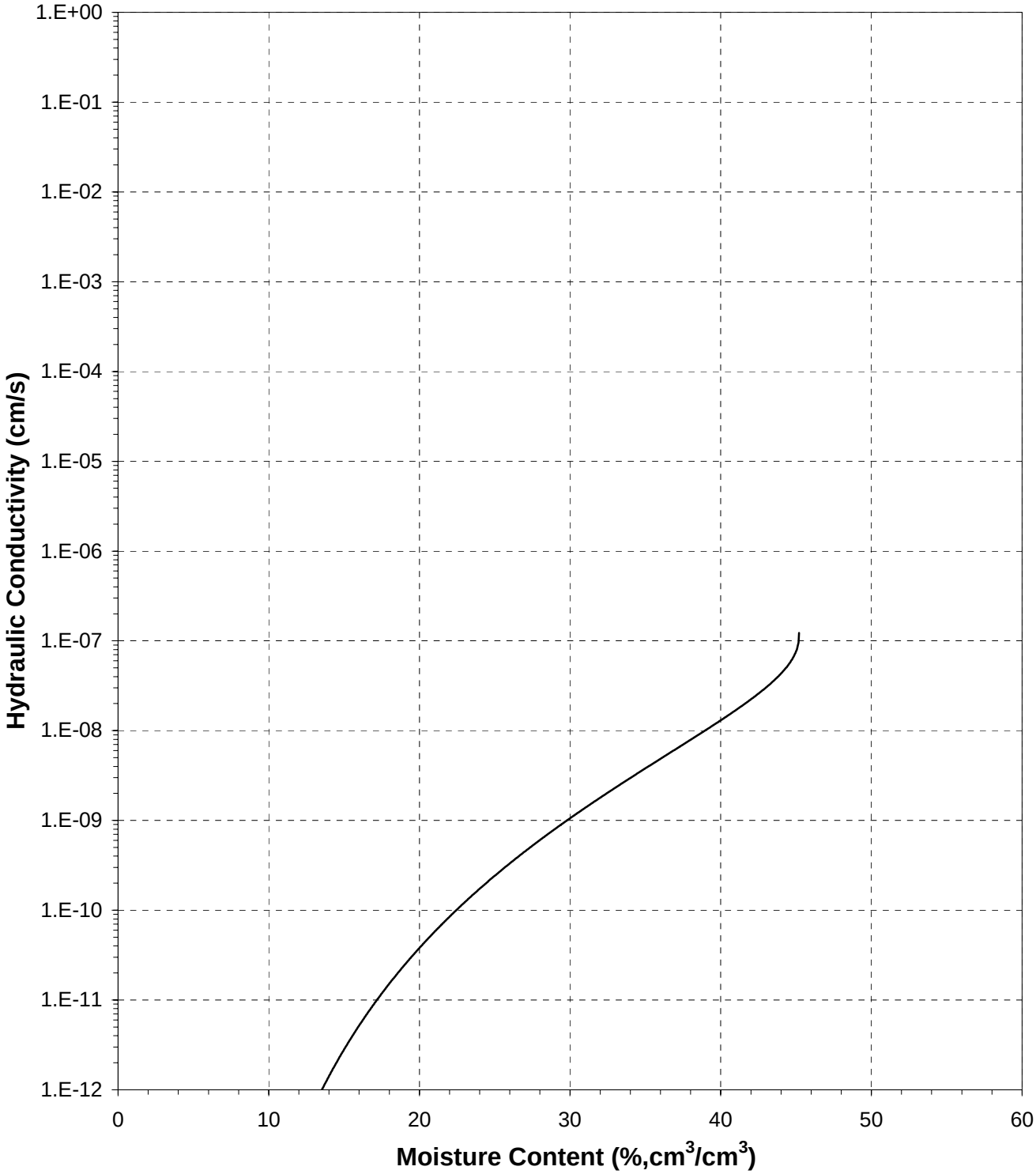
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (574-575)



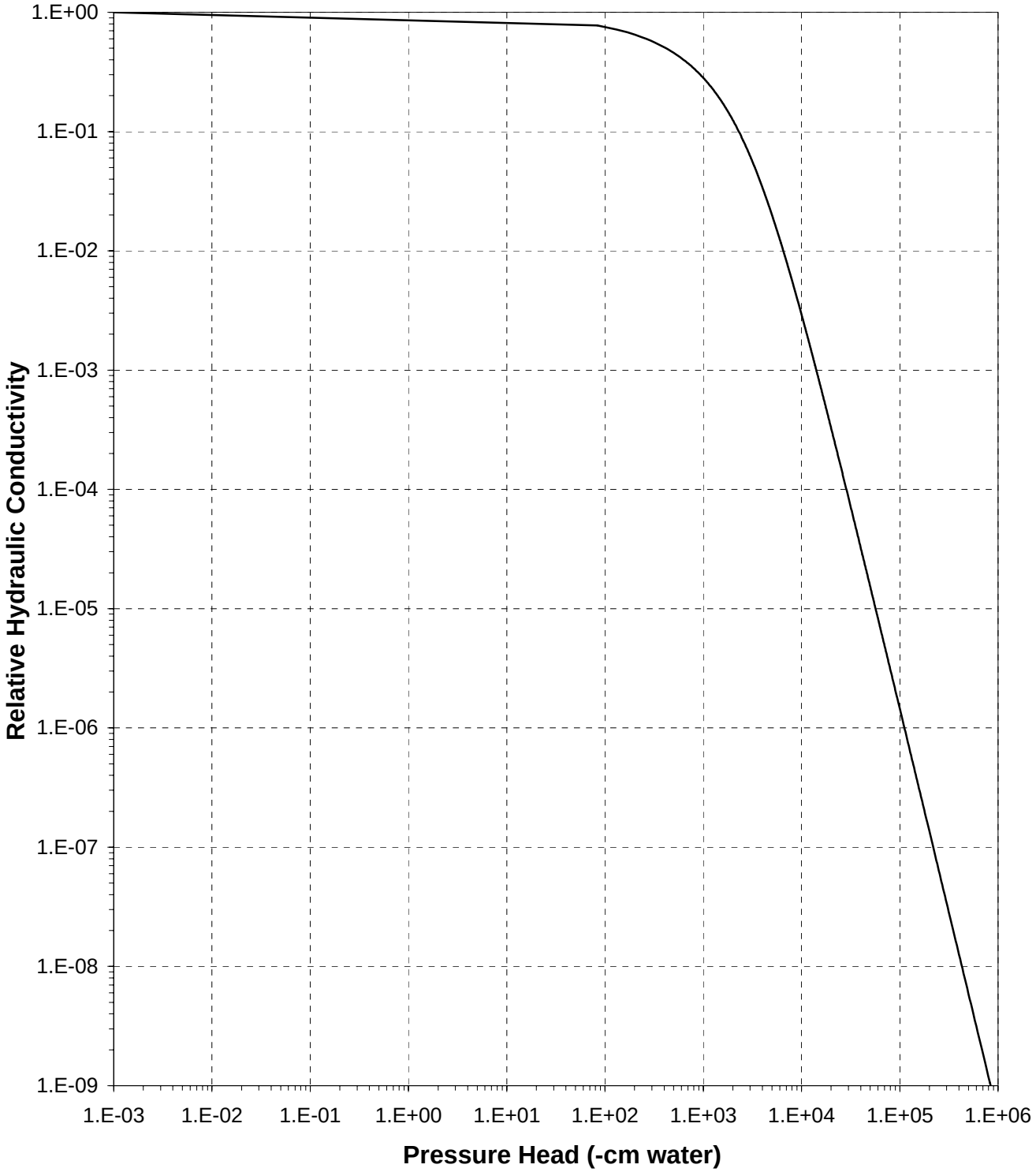
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (574-575)



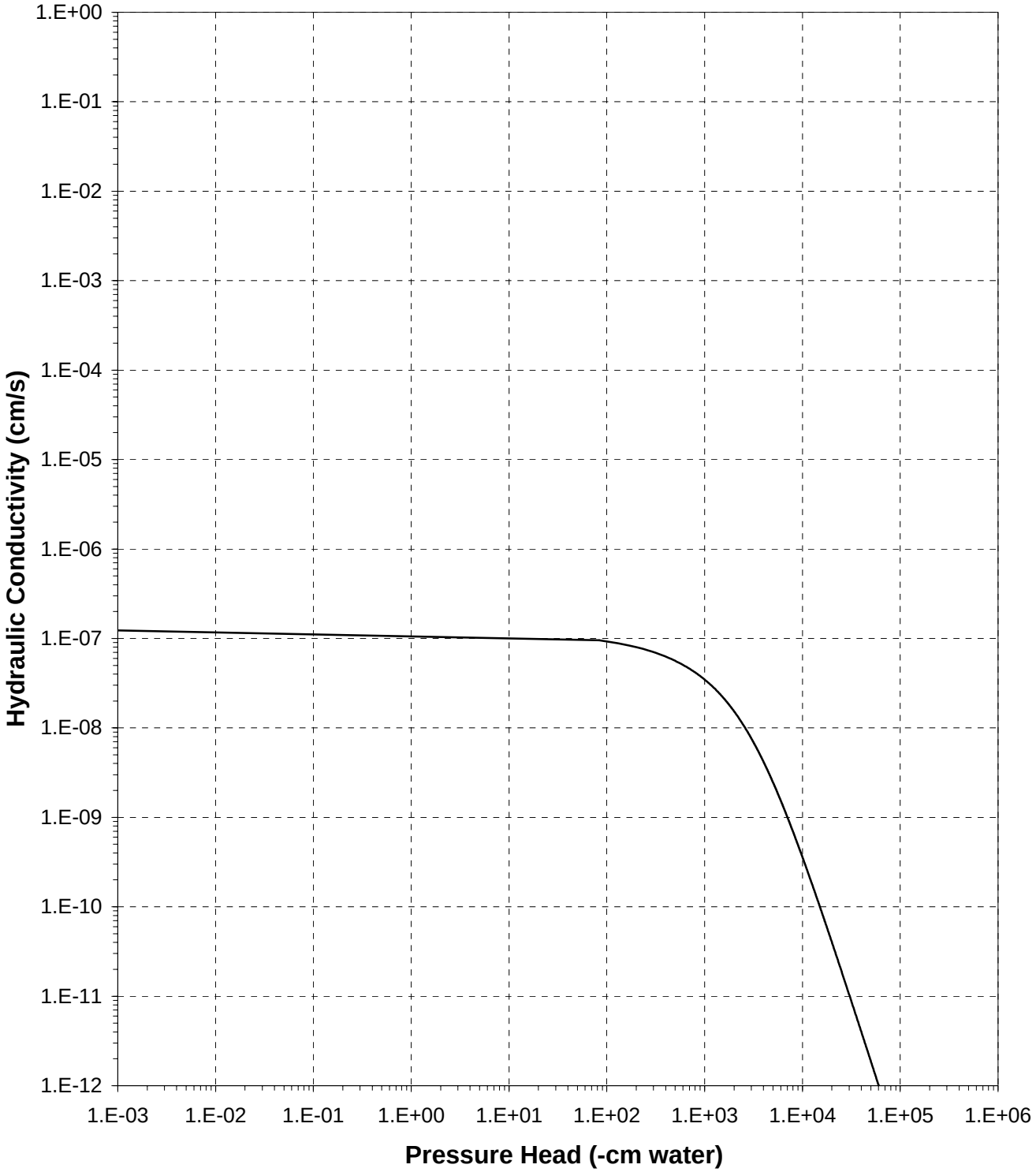
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (574-575)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (574-575)



Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (604-605)
Date Sampled: 12/7/2011
Depth: 604-605

Dry wt. of sample (g): 103.66
Tare wt., ring (g): 38.40
Tare wt., screen & clamp (g): 24.05
Initial sample volume (cm^3): 68.67
Initial dry bulk density (g/cm^3): 1.51
Measured particle density (g/cm^3): 2.69
Initial calculated total porosity (%): 43.91

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)
Hanging column:	1-Feb-12	10:00	196.26	0	43.91
	20-Feb-12	10:40	194.49	17.0	41.33
	22-Feb-12	12:00	194.11	50.0	40.78
	15-Mar-12	9:30	193.74	127.0	40.24
Pressure plate:	15-Mar-12	12:00	192.78	337	38.84

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	---	---	---	---
	17.0	---	---	---	---
	50.0	---	---	---	---
	127.0	---	---	---	---
Pressure plate:	337	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: K. Wright
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: PB-15 (604-605)

Initial sample bulk density (g/cm^3)*:* 1.51
Fraction of bulk sample used (<2.00mm fraction) (%): 100.00

Dry weight of dew point potentiometer sample* (g)*:* 149.02
Tare weight, jar (g)*:* 111.71

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Dew point potentiometer:	19-Mar-12	13:10	153.92	10810	19.83
	22-Mar-12	15:24	151.66	107487	10.68
	16-Mar-12	17:06	150.95	320829	7.81

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	10810	---	---	---	---
	107487	---	---	---	---
	320829	---	---	---	---

Dry weight of relative humidity box sample* (g)*:* 75.26
Tare weight (g)*:* 44.09

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)
Relative humidity box:	28-Feb-12	9:00	76.63	857025	6.65

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	857025	---	---	---	---

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

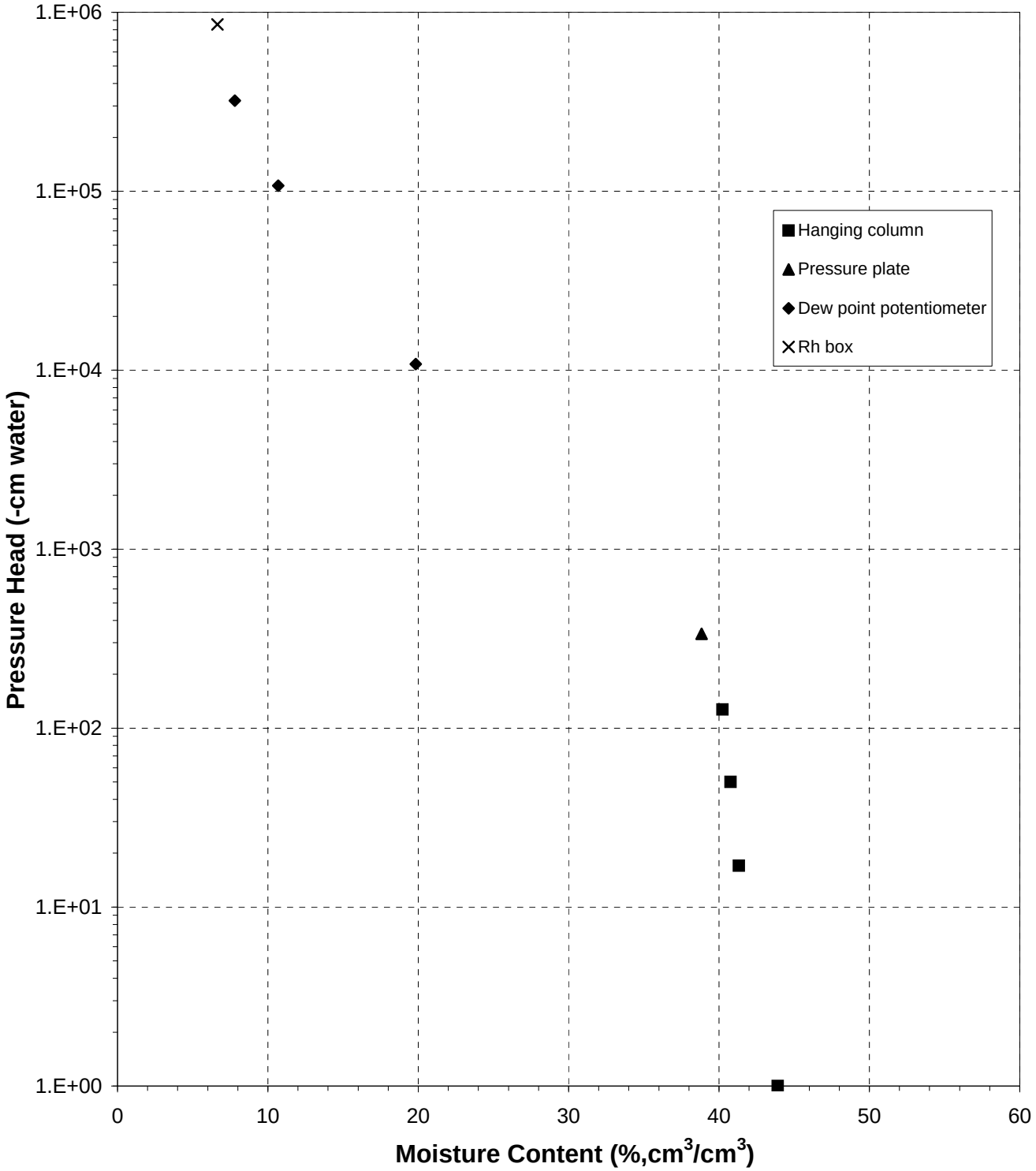
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: C. Sessa/K. Wright
Data entered by: J. Hines
Checked by: C. Krous

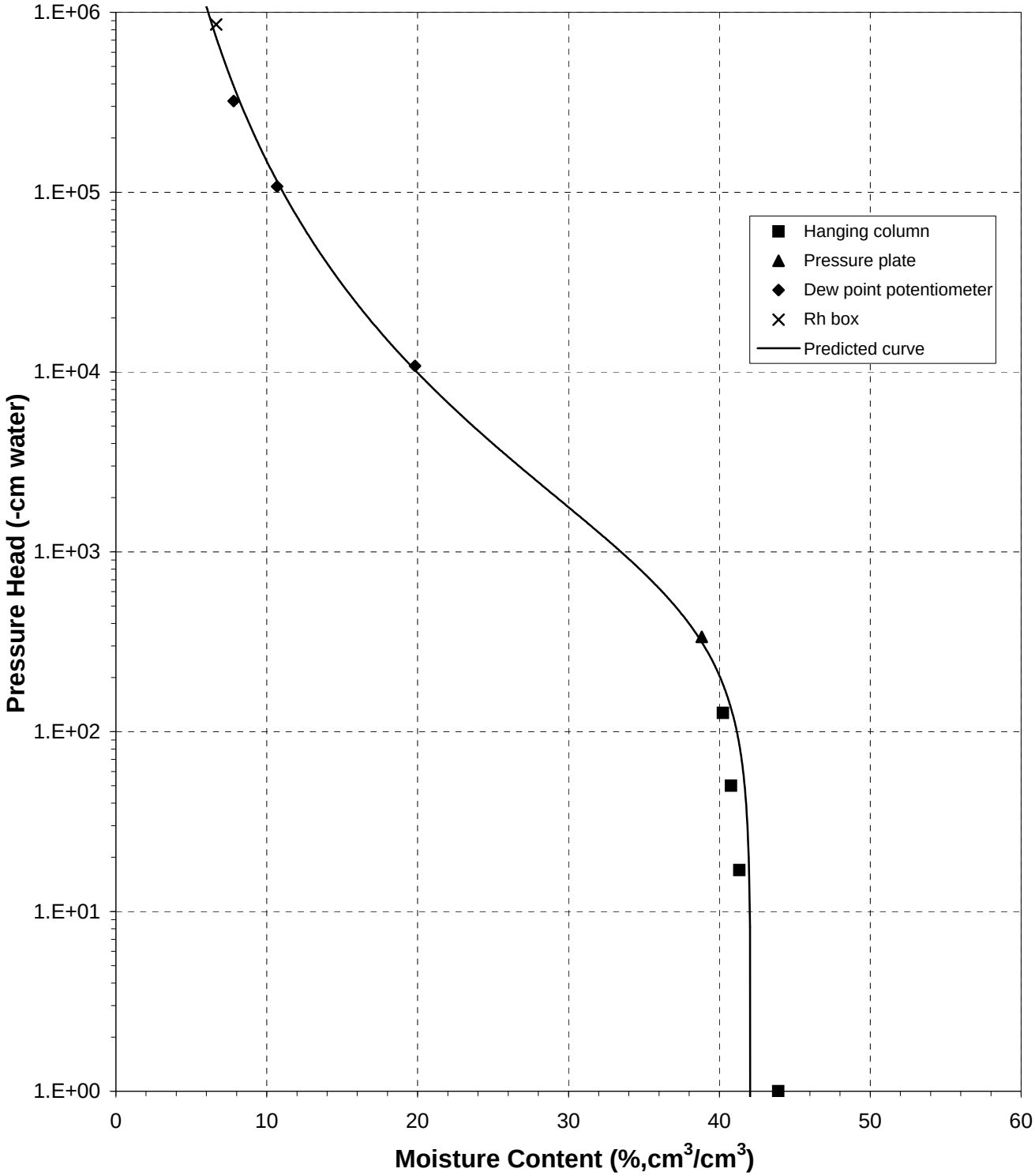
Water Retention Data Points

Sample Number: PB-15 (604-605)



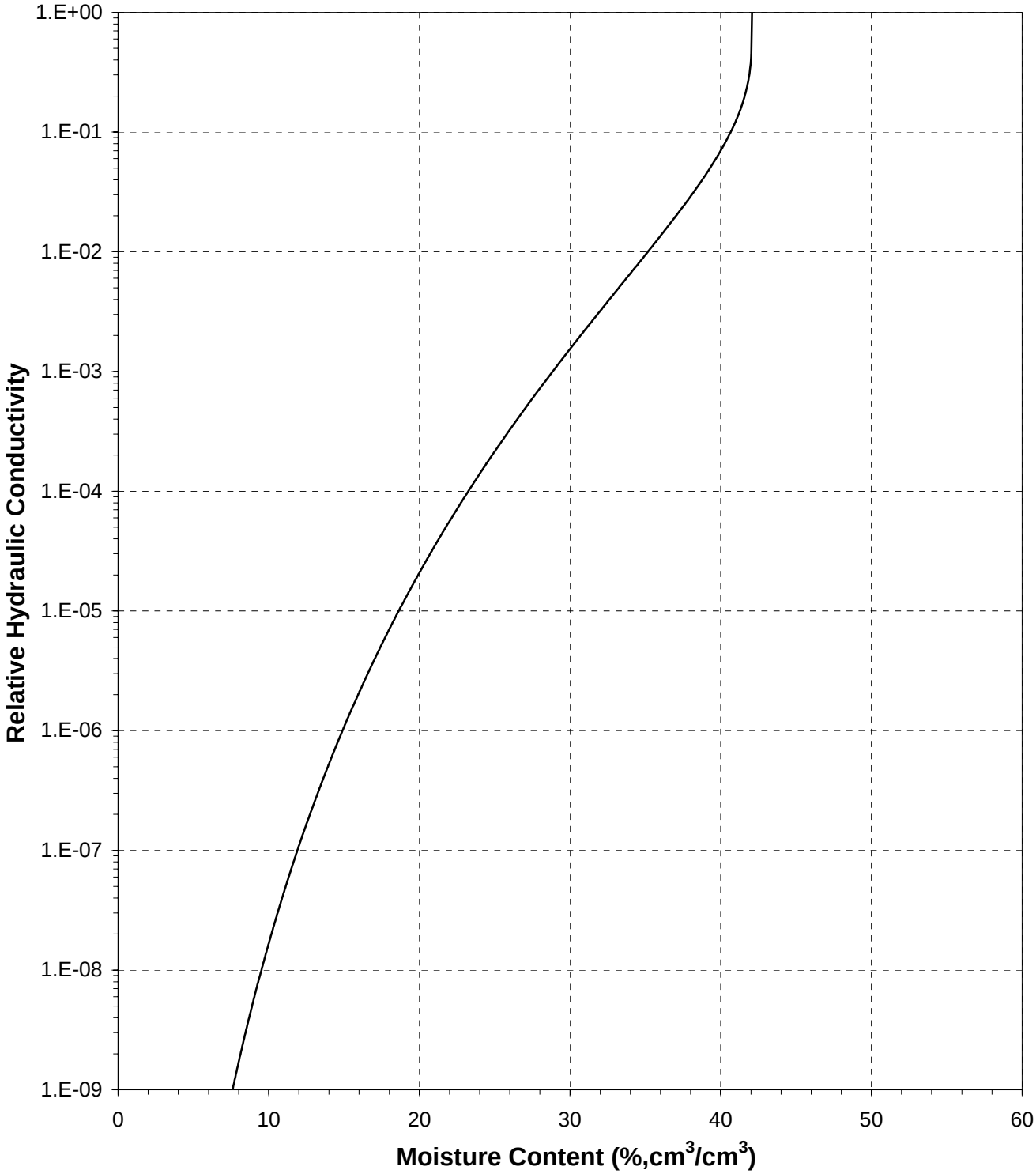
Predicted Water Retention Curve and Data Points

Sample Number: PB-15 (604-605)



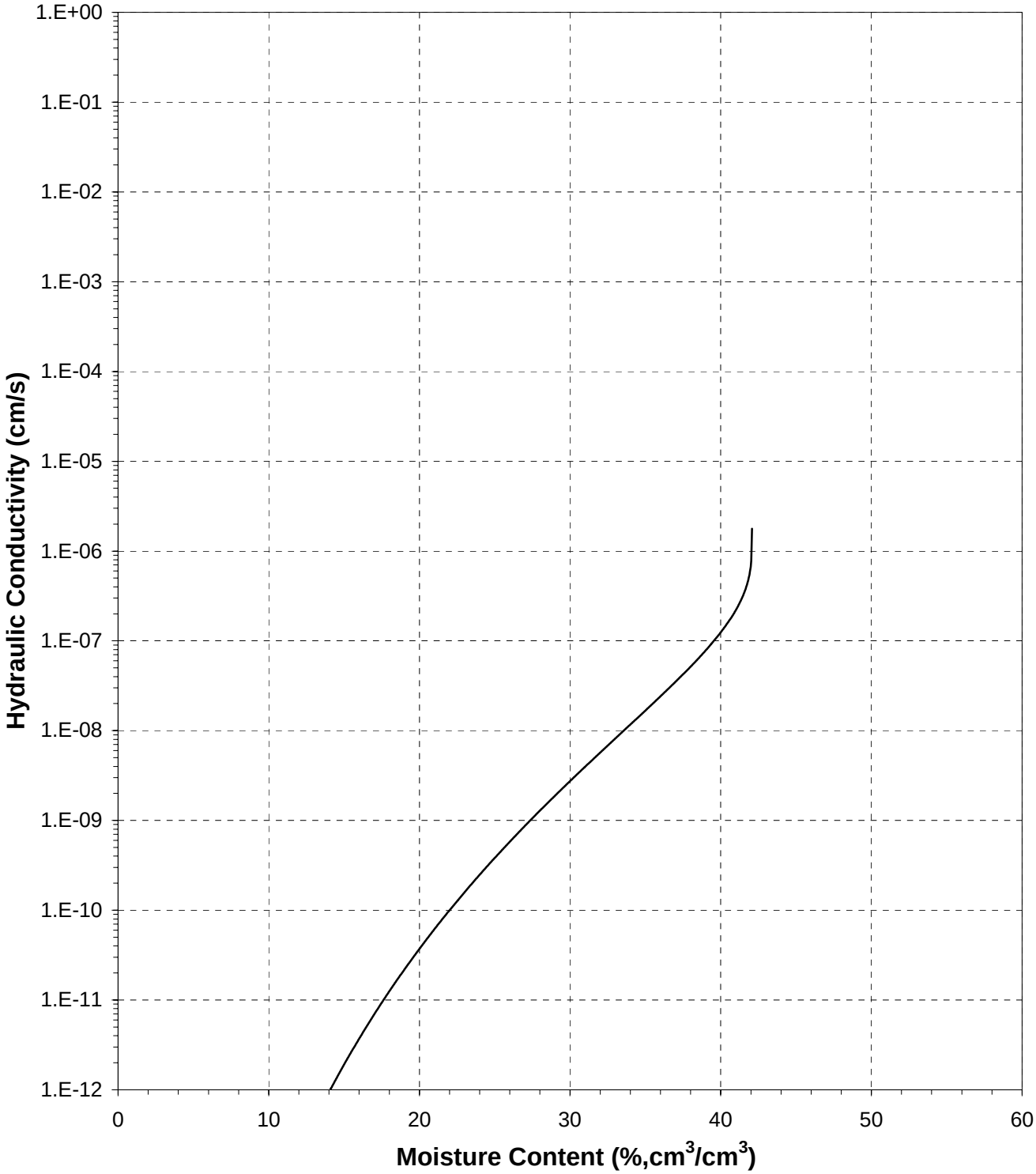
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (604-605)



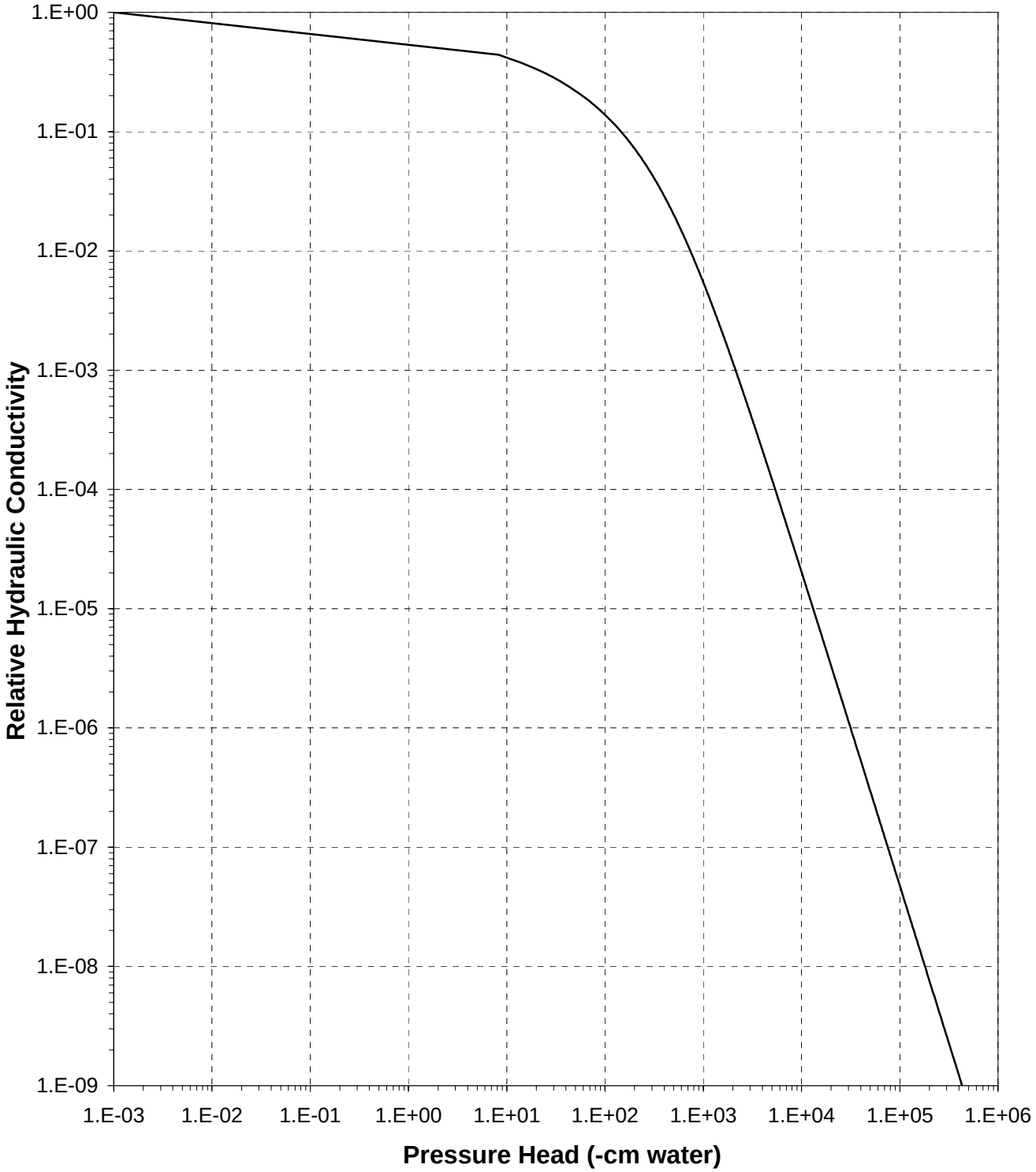
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: PB-15 (604-605)



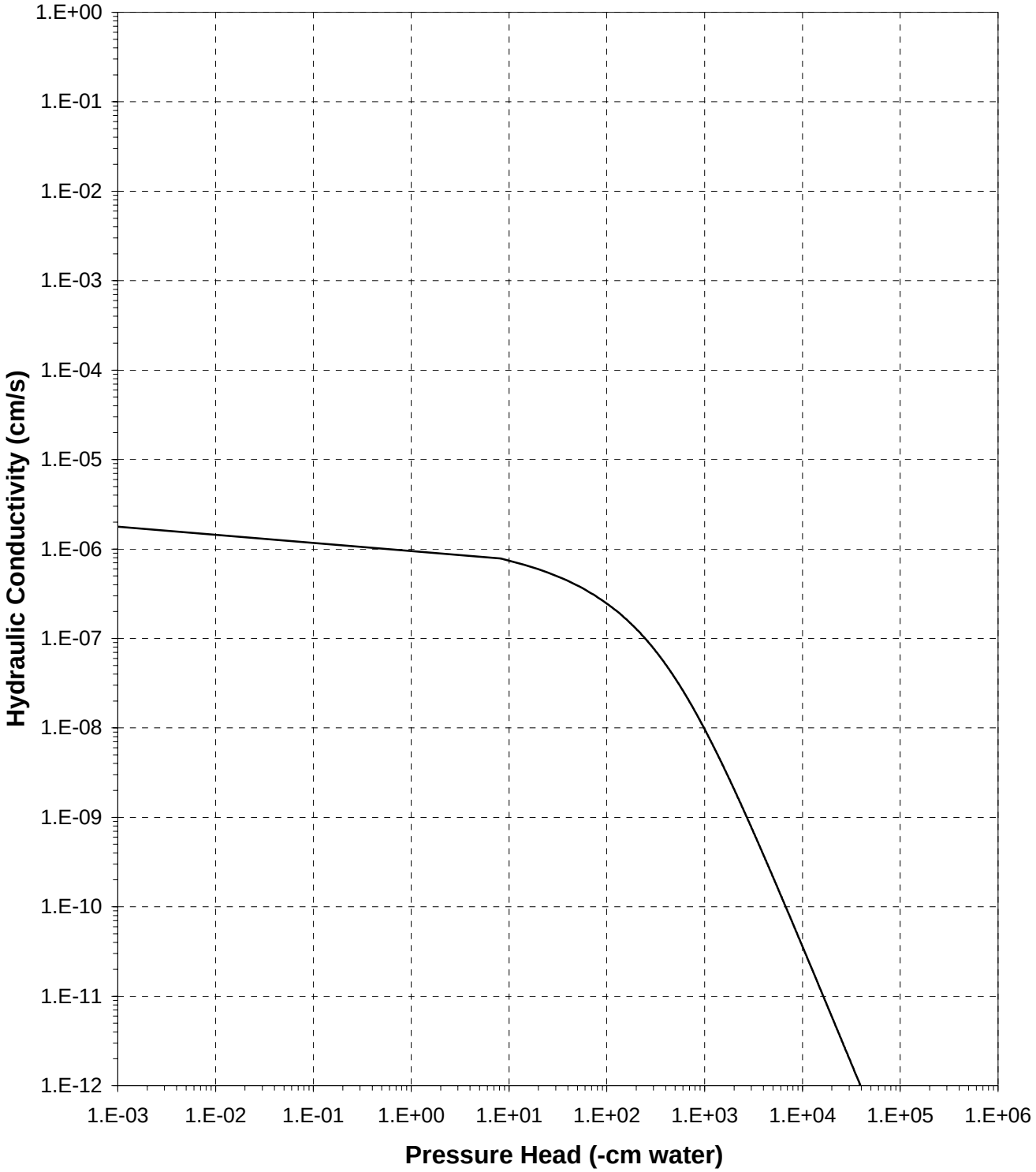
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (604-605)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: PB-15 (604-605)



Particle Size Analysis

Summary of Particle Size Characteristics

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
PB-11 (39-40)	0.00095	0.017	0.026	27	2.0	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (154-155)	0.00076	0.020	0.027	36	1.8	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (184-185)	0.00061	0.021	0.031	51	2.0	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (209-210)	0.00080	0.012	0.017	21	1.9	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (229-230)	0.0011	0.025	0.042	38	1.2	WS/H	Lean clay with sand (CL)s	Loam	(Est)
PB-11 (248-249)	0.00068	0.0082	0.011	16	1.3	WS/H	Fat clay (CH)	Silt Loam	(Est)
PB-11 (274-275)	0.0011	0.020	0.028	25	1.1	WS/H	Lean clay with sand (CL)s	Silt Loam	(Est)
PB-11 (294-295)	0.00059	0.0095	0.013	22	2.3	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (309-310)	0.00054	0.012	0.016	30	2.6	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (334-335)	0.00064	0.0093	0.015	23	0.88	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-11 (359-360)	0.00045	0.0087	0.013	29	1.2	WS/H	Lean clay (CL)	Silty Clay Loam	(Est)

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Summary of Particle Size Characteristics (Continued)

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
PB-12 (69-70)	0.0017	0.019	0.029	17	2.0	WS/H	Silt (ML)	Silt Loam	
PB-12 (109-110)	0.00086	0.011	0.016	19	1.3	WS/H	Fat clay (CH)	Silt Loam	(Est)
PB-12 (154-155)	0.00059	0.011	0.017	29	2.3	WS/H	Silt (ML)	Silt Loam	(Est)
PB-12 (179-180)	0.0012	0.016	0.022	18	1.6	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-12 (204-205)	0.0011	0.025	0.035	32	2.2	WS/H	Silt (ML)	Silt Loam	(Est)
PB-12 (224-225)	0.00090	0.010	0.018	20	1.2	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-12 (249-250)	0.00083	0.012	0.017	20	1.1	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-12 (264-265)	0.00060	0.011	0.016	27	1.8	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-12 (284-285)	0.00045	0.0082	0.011	24	2.1	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-12 (309-310)	0.00041	0.0092	0.012	29	1.7	WS/H	Fat clay (CH)	Silt Loam	(Est)
PB-12 (334-335)	0.00056	0.0073	0.011	20	0.94	WS/H	Fat clay (CH)	Silty Clay Loam	(Est)

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Summary of Particle Size Characteristics (Continued)

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
PB-12 (349-350)	0.00070	0.0083	0.012	17	1.1	WS/H	Fat clay (CH)	Silt Loam	(Est)
PB-13 (279-280)	0.0064	0.062	0.079	12	2.6	WS/H	Sandy silt s(ML)	Sandy Loam	
PB-13 (349-350)	0.0023	0.030	0.039	17	1.6	WS/H	Silt with sand (ML)s	Silt Loam	
PB-13 (444-445)	0.00097	0.012	0.017	18	1.7	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-13 (499-500)	0.0012	0.018	0.023	19	1.7	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-13 (534-535)	0.0013	0.016	0.024	18	1.4	WS/H	Silt (ML)	Silt Loam	(Est)
PB-13 (554-555)	0.0011	0.013	0.018	16	2.1	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-13 (563-564)	0.0011	0.013	0.017	15	2.6	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-13 (585-586)	0.00088	0.015	0.019	22	3.8	WS/H	Silt (ML)	Silt Loam	(Est)
PB-13 (604-605)	0.0019	0.016	0.020	11	1.9	WS/H	Silt (ML)	Silt Loam	
PB-13 (625-626)	0.0022	0.016	0.020	9.1	2.0	WS/H	Silt (ML)	Silt	

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Summary of Particle Size Characteristics (Continued)

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
PB-13 (639-640)	0.0032	0.027	0.037	12	1.4	WS/H	Silt with sand (ML)s	Silt Loam	
PB-13 (660-661)	0.0017	0.017	0.022	13	2.2	WS/H	Silt (ML)	Silt Loam	
PB-14 (294-295)	0.0010	0.011	0.015	15	2.4	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-14 (304-305)	0.00078	0.0094	0.012	15	2.7	WS/H	Lean clay (CL)	Silt Loam	(Est)
PB-14 (532-533)	0.0037	0.028	0.035	9.5	1.7	WS/H	Silt (ML)	Silt Loam	
PB-14 (549-550)	0.0050	0.027	0.035	7.0	1.5	WS/H	Silt (ML)	Silt Loam	
PB-14 (569-570)	0.0025	0.017	0.027	11	1.8	WS/H	Silt (ML)	Silt Loam	
PB-14 (594-595)	0.0045	0.027	0.032	7.1	2.0	WS/H	Silt (ML)	Silt Loam	
PB-14 (620-623)	0.0021	0.018	0.024	11	2.4	WS/H	Silt (ML)	Silt Loam	
PB-14 (635-636)	0.0026	0.021	0.028	11	2.3	WS/H	Silt (ML)	Silt Loam	
PB-14 (709-710)	0.0014	0.017	0.024	17	2.4	WS/H	Silt (ML)	Silt Loam	

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Summary of Particle Size Characteristics (Continued)

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
PB-14 (727-728)	0.0021	0.018	0.024	11	1.9	WS/H	Silt (ML)	Silt Loam	
PB-14 (741-742)	0.0011	0.015	0.019	17	3.1	WS/H	Silt (ML)	Silt Loam	(Est)
PB-14 (749-750)	0.0025	0.025	0.033	13	2.0	WS/H	Silt (ML)	Silt Loam	
PB-15 (435-436)	0.0041	0.028	0.039	9.5	1.4	WS/H	Silt with sand (ML)s	Silt Loam	
PB-15 (464-465)	0.0038	0.023	0.028	7.4	1.8	WS/H	Silt (ML)	Silt Loam	
PB-15 (483-484)	0.0016	0.019	0.027	17	1.5	WS/H	Lean clay (CL)	Silt Loam	
PB-15 (502-503)	0.0024	0.018	0.023	9.6	1.5	WS/H	Silt (ML)	Silt Loam	
PB-15 (524-525)	0.0061	0.036	0.045	7.4	2.1	WS/H	Silt (ML)	Silt Loam	
PB-15 (539-540)	0.0095	0.065	0.081	8.5	1.9	WS/H	Sandy silt s(ML)	Sandy Loam	
PB-15 (559-560)	0.0033	0.025	0.031	9.4	1.7	WS/H	Silt (ML)	Silt Loam	
PB-15 (574-575)	0.0027	0.022	0.028	10	1.9	WS/H	Silt (ML)	Silt Loam	
PB-15 (604-605)	0.0025	0.026	0.038	15	1.5	WS/H	Silt with sand (ML)s	Silt Loam	

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Percent Gravel, Sand, Silt and Clay*

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
PB-11 (39-40)	0.0	4.9	79.0	16.1
PB-11 (154-155)	0.0	10.0	72.1	18.0
PB-11 (184-185)	0.0	10.7	68.9	20.4
PB-11 (209-210)	0.0	8.0	73.9	18.0
PB-11 (229-230)	0.0	24.2	61.1	14.7
PB-11 (248-249)	0.0	0.7	74.6	24.7
PB-11 (274-275)	0.0	19.0	65.2	15.8
PB-11 (294-295)	0.0	1.4	76.9	21.6
PB-11 (309-310)	0.0	2.9	77.9	19.2
PB-11 (334-335)	0.0	1.3	75.1	23.6
PB-11 (359-360)	0.0	6.3	66.2	27.5
PB-12 (69-70)	0.0	3.7	85.4	10.9
PB-12 (109-110)	0.0	6.4	73.3	20.3
PB-12 (154-155)	0.0	5.1	75.7	19.2
PB-12 (179-180)	0.0	4.1	80.9	15.0
PB-12 (204-205)	0.0	12.8	73.9	13.3

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Summary of Particle Size Characteristics (Continued)

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
PB-12 (224-225)	0.0	4.6	75.8	19.6
PB-12 (249-250)	0.0	2.1	76.7	21.1
PB-12 (264-265)	0.0	2.2	77.5	20.3
PB-12 (284-285)	0.0	1.8	74.9	23.3
PB-12 (309-310)	0.0	0.5	75.2	24.3
PB-12 (334-335)	0.0	2.2	70.5	27.3
PB-12 (349-350)	0.0	1.2	74.1	24.6
PB-13 (279-280)	0.0	42.8	51.4	5.8
PB-13 (349-350)	0.0	15.6	75.5	8.9
PB-13 (444-445)	0.0	3.6	78.8	17.6
PB-13 (499-500)	0.0	2.5	84.6	13.0
PB-13 (534-535)	0.0	5.6	80.4	13.9
PB-13 (554-555)	0.0	5.5	80.1	14.4
PB-13 (563-564)	0.0	2.0	85.0	13.0
PB-13 (585-586)	0.0	2.0	85.0	13.0
PB-13 (604-605)	0.0	6.4	83.2	10.4

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Summary of Particle Size Characteristics (Continued)

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
PB-13 (625-626)	0.0	1.5	89.0	9.5
PB-13 (639-640)	0.0	16.5	75.3	8.2
PB-13 (660-661)	0.0	3.6	85.6	10.8
PB-14 (294-295)	0.0	2.6	81.8	15.6
PB-14 (304-305)	0.0	0.4	82.3	17.2
PB-14 (532-533)	0.0	13.0	80.3	6.7
PB-14 (549-550)	0.0	10.2	83.2	6.5
PB-14 (569-570)	0.0	7.0	85.1	7.9
PB-14 (594-595)	0.0	3.1	90.6	6.3
PB-14 (620-623)	0.0	3.4	86.8	9.8
PB-14 (635-636)	0.0	4.9	86.3	8.8
PB-14 (709-710)	0.0	7.4	80.3	12.3
PB-14 (727-728)	0.0	5.7	84.5	9.8
PB-14 (741-742)	0.0	2.6	85.6	11.8
PB-14 (749-750)	0.0	12.0	79.3	8.7
PB-15 (435-436)	0.0	17.1	76.8	6.2

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Summary of Particle Size Characteristics (Continued)

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
PB-15 (464-465)	0.0	3.6	90.0	6.4
PB-15 (483-484)	0.0	9.5	79.0	11.5
PB-15 (502-503)	0.0	5.0	86.0	9.1
PB-15 (524-525)	0.0	13.6	82.5	3.9
PB-15 (539-540)	0.0	44.3	51.2	4.5
PB-15 (559-560)	0.0	4.6	87.2	8.1
PB-15 (574-575)	0.0	5.1	86.2	8.6
PB-15 (604-605)	0.0	19.5	71.3	9.2

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (39-40)
Date Sampled: 12/7/2011
Depth: 39-40
Test Date: 14-Mar-12

Initial Dry Weight of Sample (g): 365.85
Weight Passing #10 (g): 365.85
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.20
Calculated Weight of Sieve Sample (g): 50.20

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	365.85	100.00
	2"	50	0.00	0.00	365.85	100.00
	1.5"	38.1	0.00	0.00	365.85	100.00
	1"	25	0.00	0.00	365.85	100.00
	3/4"	19.0	0.00	0.00	365.85	100.00
	3/8"	9.5	0.00	0.00	365.85	100.00
	4	4.75	0.00	0.00	365.85	100.00
	10	2.00	0.00	0.00	365.85	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	50.20	100.00
	40	0.425	0.01	0.01	50.19	99.98
	60	0.250	0.01	0.02	50.18	99.96
	140	0.106	0.42	0.44	49.76	99.12
	200	0.075	2.00	2.44	47.76	95.14
	dry pan		0.56	3.00	47.20	
	wet pan			47.20	0.00	

d_{10} (mm): 0.00095
d_{16} (mm): 0.0020
d_{30} (mm): 0.0071
d_{50} (mm): 0.017
d_{60} (mm): 0.026
d_{84} (mm): 0.052

Median Particle Diameter --d_{50} (mm): 0.017
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 27
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 2.0
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.024

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Sessa
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (39-40)
Date Sampled: 12/7/2011
Depth: 39-40
Test Date: 23-Feb-12
Start Time: 9:42

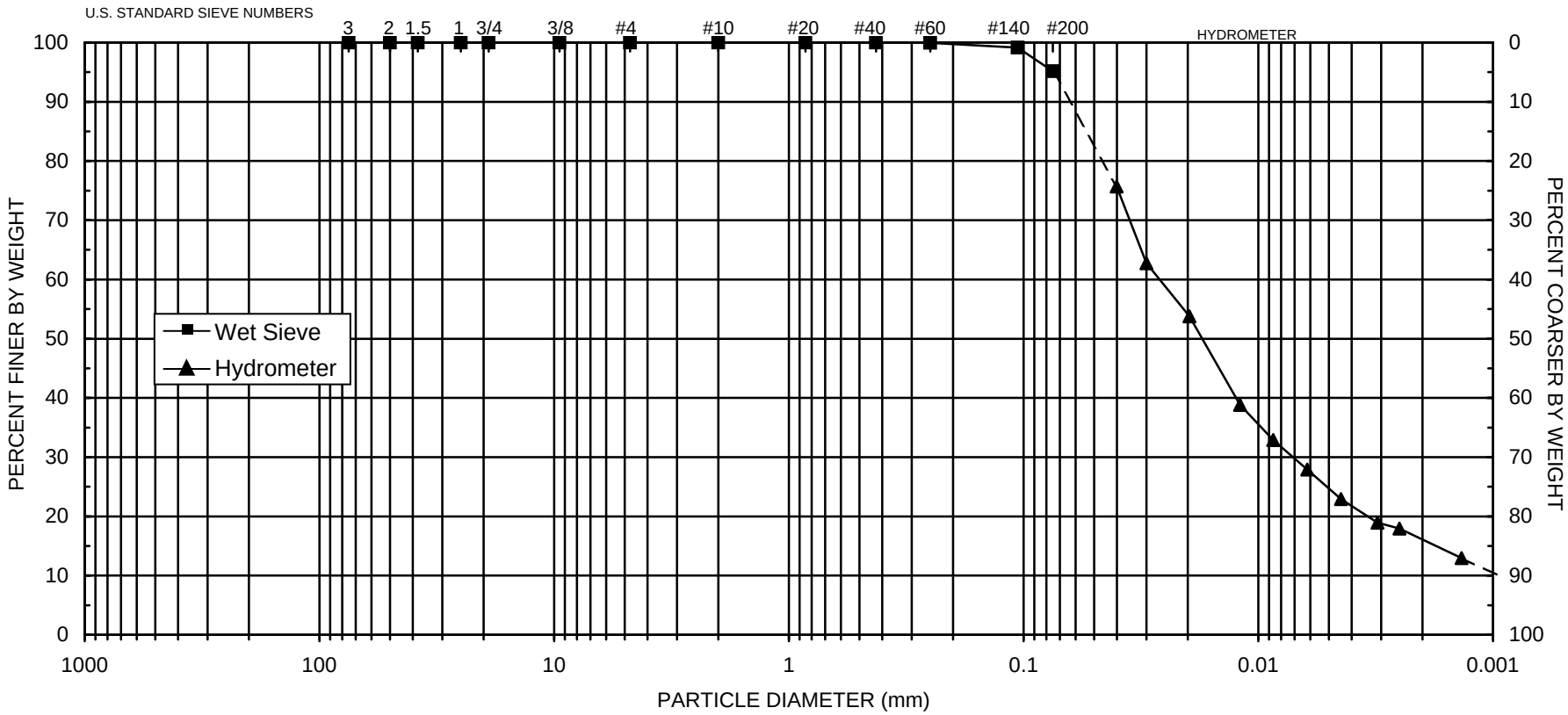
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.67
Initial Wt. (g)*:* 50.20
Total Sample Wt. (g)*:* 365.85
Wt. Passing #10 (g): 365.85

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
23-Feb-12	1	21.0	44.5	6.5	38.0	9.0	0.04011	75.7	75.7
	2	21.0	38.0	6.5	31.5	10.1	0.02999	62.7	62.7
	5	21.0	33.5	6.5	27.0	10.8	0.01965	53.8	53.8
	15	21.0	26.0	6.5	19.5	12.0	0.01197	38.8	38.8
	30	21.0	23.0	6.5	16.5	12.5	0.00864	32.9	32.9
	60	21.2	20.5	6.5	14.0	12.9	0.00619	27.9	27.9
	120	21.3	18.0	6.5	11.5	13.3	0.00444	22.9	22.9
	250	21.9	15.5	6.0	9.5	13.8	0.00310	18.9	18.9
	385	22.0	15.0	6.0	9.0	13.8	0.00250	17.9	17.9
24-Feb-12	1345	21.7	13.0	6.5	6.5	14.2	0.00136	12.9	12.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Sessa
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00095**	d_{30} = **0.0071**	d_{50} = **0.017**	d_{60} = **0.026**	C_u = **27**	C_c = **2.0**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (39-40)	**39-40**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155
Test Date: 27-Feb-12

Initial Dry Weight of Sample (g): 187.56
Weight Passing #10 (g): 187.56
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.65
Calculated Weight of Sieve Sample (g): 50.65

Shape: Rounded
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	187.56	100.00
	2"	50	0.00	0.00	187.56	100.00
	1.5"	38.1	0.00	0.00	187.56	100.00
	1"	25	0.00	0.00	187.56	100.00
	3/4"	19.0	0.00	0.00	187.56	100.00
	3/8"	9.5	0.00	0.00	187.56	100.00
	4	4.75	0.00	0.00	187.56	100.00
	10	2.00	0.00	0.00	187.56	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	50.64	99.98
	40	0.425	0.03	0.04	50.61	99.92
	60	0.250	0.01	0.05	50.60	99.90
	140	0.106	1.80	1.85	48.80	96.35
	200	0.075	3.20	5.05	45.60	90.03
	dry pan		0.77	5.82	44.83	
	wet pan			44.83	0.00	

d_{10} (mm): 0.00076
d_{16} (mm): 0.0016
d_{30} (mm): 0.0060
d_{50} (mm): 0.020
d_{60} (mm): 0.027
d_{84} (mm): 0.061

Median Particle Diameter --d_{50} (mm): 0.020
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 36
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.8
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.028

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155
Test Date: 23-Feb-12
Start Time: 9:18

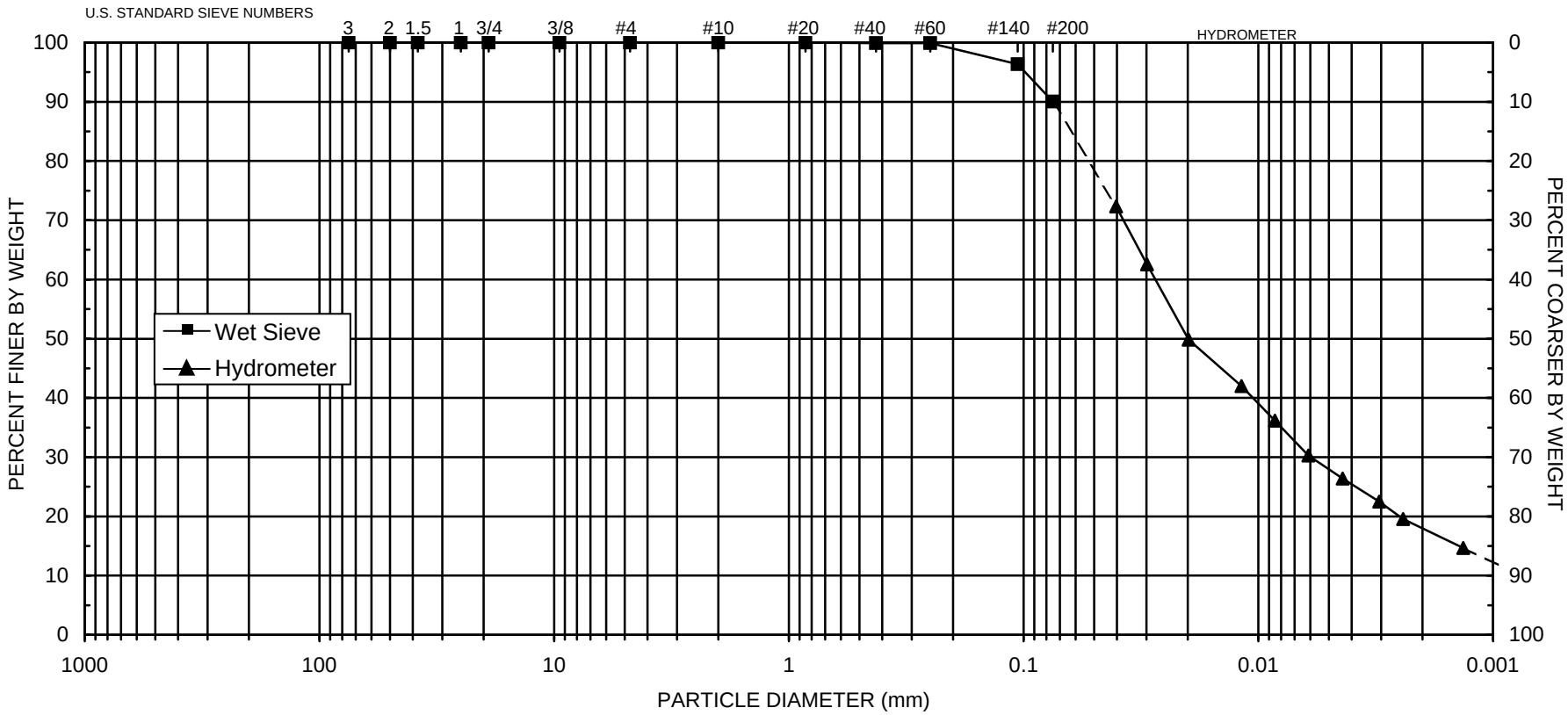
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.68
Initial Wt. (g)*:* 50.65
Total Sample Wt. (g)*:* 187.56
Wt. Passing #10 (g): 187.56

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
23-Feb-12	1	20.9	43.5	6.5	37.0	9.2	0.04038	72.3	72.3
	2	20.9	38.5	6.5	32.0	10.0	0.02981	62.5	62.5
	5	20.9	32.0	6.5	25.5	11.1	0.01983	49.8	49.8
	15	20.9	28.0	6.5	21.5	11.7	0.01178	42.0	42.0
	30	21.0	25.0	6.5	18.5	12.2	0.00850	36.2	36.2
	60	21.0	22.0	6.5	15.5	12.7	0.00613	30.3	30.3
	120	21.2	20.0	6.5	13.5	13.0	0.00438	26.4	26.4
	250	21.8	17.5	6.0	11.5	13.4	0.00306	22.5	22.5
	405	22.0	16.0	6.0	10.0	13.7	0.00242	19.5	19.5
24-Feb-12	1365	21.7	14.0	6.5	7.5	14.0	0.00134	14.7	14.7

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00076**	d_{30} = **0.0060**	d_{50} = **0.020**	d_{60} = **0.027**	C_u = **36**	C_c = **1.8**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (154-155)	**154-155**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (184-185)
Date Sampled: 12/7/2011
Depth: 184-185
Test Date: 27-Feb-12

Initial Dry Weight of Sample (g): 242.97
Weight Passing #10 (g): 242.97
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.12
Calculated Weight of Sieve Sample (g): 50.12
Shape: Rounded
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	242.97	100.00
	2"	50	0.00	0.00	242.97	100.00
	1.5"	38.1	0.00	0.00	242.97	100.00
	1"	25	0.00	0.00	242.97	100.00
	3/4"	19.0	0.00	0.00	242.97	100.00
	3/8"	9.5	0.00	0.00	242.97	100.00
	4	4.75	0.00	0.00	242.97	100.00
	10	2.00	0.00	0.00	242.97	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	50.12	100.00
	40	0.425	0.02	0.02	50.10	99.96
	60	0.250	0.01	0.03	50.09	99.94
	140	0.106	1.80	1.83	48.29	96.35
	200	0.075	3.55	5.38	44.74	89.27
	dry pan		0.63	6.01	44.11	
	wet pan			44.11	0.00	

d_{10} (mm): 0.00061
d_{16} (mm): 0.0012
d_{30} (mm): 0.0062
d_{50} (mm): 0.021
d_{60} (mm): 0.031
d_{84} (mm): 0.062

Median Particle Diameter --d_{50} (mm): 0.021
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 51
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 2.0
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.028

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (184-185)
Date Sampled: 12/7/2011
Depth: 184-185
Test Date: 22-Feb-12
Start Time: 9:12

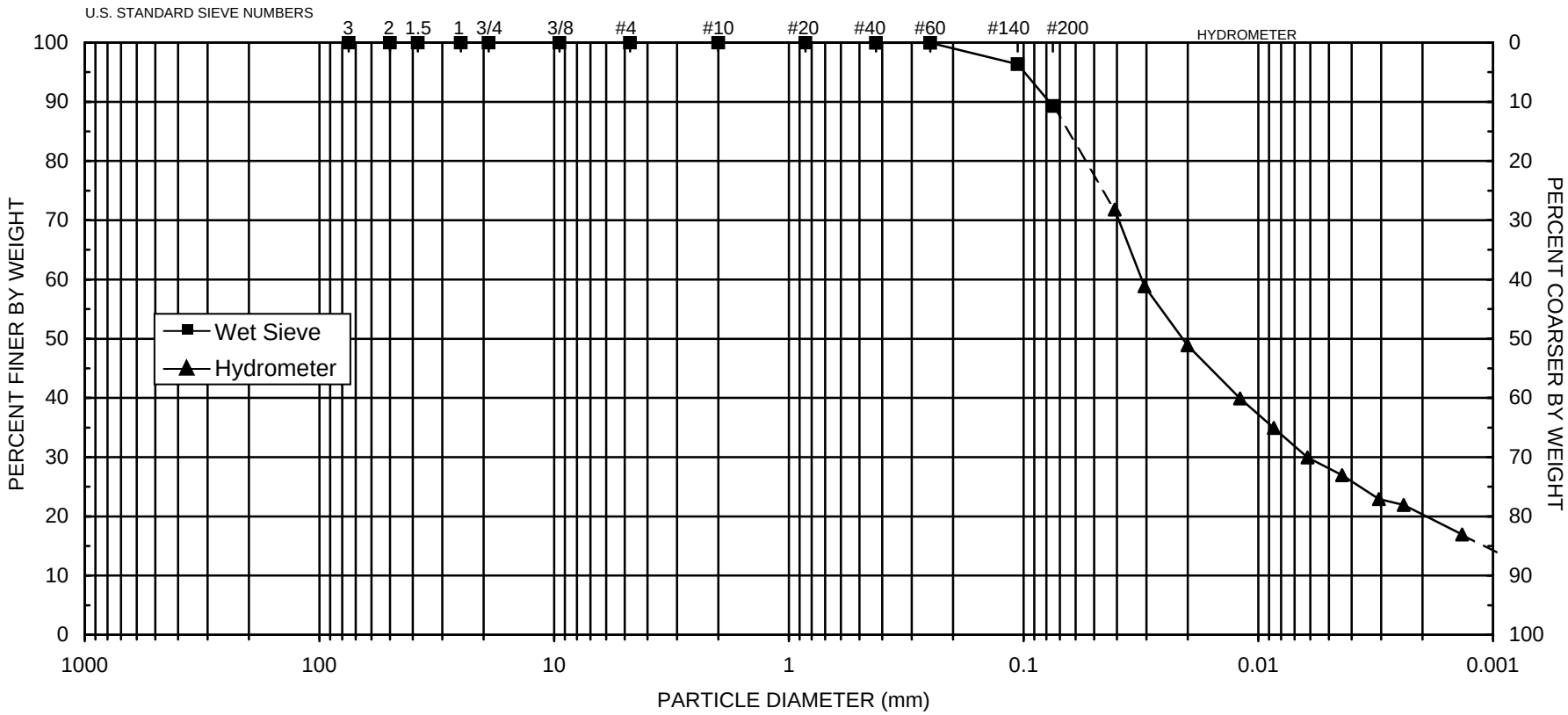
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.67
Initial Wt. (g)*:* 50.12
Total Sample Wt. (g)*:* 242.97
Wt. Passing #10 (g): 242.97

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
22-Feb-12	1	20.9	42.5	6.5	36.0	9.3	0.04091	71.8	71.8
	2	20.9	36.0	6.5	29.5	10.4	0.03053	58.9	58.9
	5	20.9	31.0	6.5	24.5	11.2	0.02006	48.9	48.9
	15	20.9	26.5	6.5	20.0	12.0	0.01195	39.9	39.9
	30	21.0	24.0	6.5	17.5	12.4	0.00859	34.9	34.9
	60	21.0	21.5	6.5	15.0	12.8	0.00617	29.9	29.9
	120	21.1	20.0	6.5	13.5	13.0	0.00440	26.9	26.9
	250	21.7	18.0	6.5	11.5	13.3	0.00306	22.9	22.9
	410	21.9	17.0	6.0	11.0	13.5	0.00240	21.9	21.9
23-Feb-12	1370	20.3	15.0	6.5	8.5	13.8	0.00136	17.0	17.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00061**	d_{30} = **0.0062**	d_{50} = **0.021**	d_{60} = **0.031**	C_u = **51**	C_c = **2.0**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (184-185)	**184-185**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (209-210)
Date Sampled: 12/7/2011
Depth: 209-210
Test Date: 14-Mar-12

Initial Dry Weight of Sample (g): 244.51
Weight Passing #10 (g): 244.51
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 47.66
Calculated Weight of Sieve Sample (g): 47.66

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	244.51	100.00
	2"	50	0.00	0.00	244.51	100.00
	1.5"	38.1	0.00	0.00	244.51	100.00
	1"	25	0.00	0.00	244.51	100.00
	3/4"	19.0	0.00	0.00	244.51	100.00
	3/8"	9.5	0.00	0.00	244.51	100.00
	4	4.75	0.00	0.00	244.51	100.00
	10	2.00	0.00	0.00	244.51	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	47.66	100.00
	40	0.425	0.01	0.01	47.65	99.98
	60	0.250	0.03	0.04	47.62	99.92
	140	0.106	2.33	2.37	45.29	95.03
	200	0.075	1.46	3.83	43.83	91.96
	dry pan		0.27	4.10	43.56	
	wet pan			43.56	0.00	

d_{10} (mm): 0.00080
d_{16} (mm): 0.0016
d_{30} (mm): 0.0051
d_{50} (mm): 0.012
d_{60} (mm): 0.017
d_{84} (mm): 0.049

Median Particle Diameter --d_{50} (mm): 0.012
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 21
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.9
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.021

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (209-210)
Date Sampled: 12/7/2011
Depth: 209-210
Test Date: 23-Feb-12
Start Time: 9:24

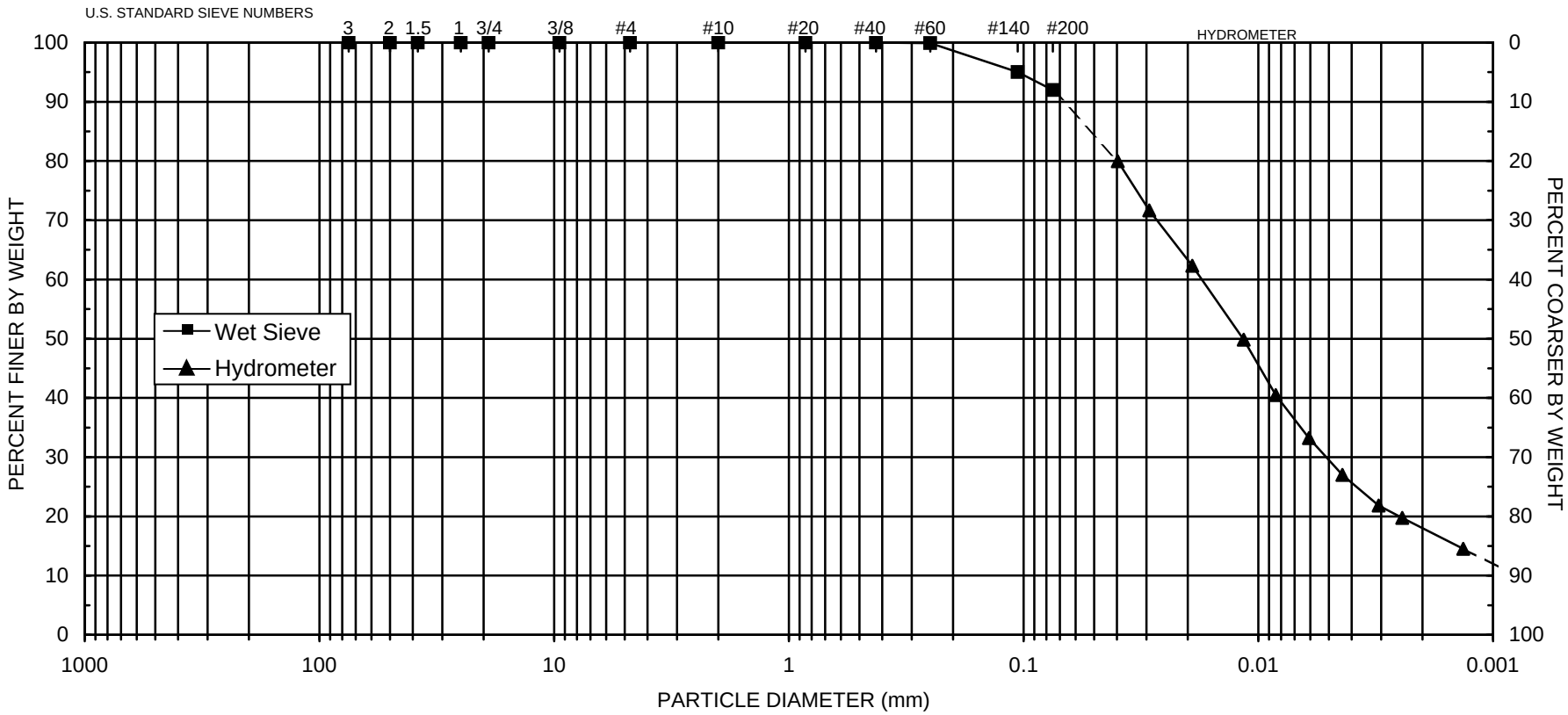
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.69
Initial Wt. (g)*:* 47.66
Total Sample Wt. (g)*:* 244.51
Wt. Passing #10 (g): 244.51

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
23-Feb-12	1	20.9	45.0	6.5	38.5	8.9	0.03974	80.0	80.0
	2	20.9	41.0	6.5	34.5	9.6	0.02912	71.7	71.7
	5	20.9	36.5	6.5	30.0	10.3	0.01911	62.3	62.3
	15	20.9	30.5	6.5	24.0	11.3	0.01155	49.9	49.9
	30	21.0	26.0	6.5	19.5	12.0	0.00842	40.5	40.5
	60	21.1	22.5	6.5	16.0	12.6	0.00609	33.2	33.2
	120	21.2	19.5	6.5	13.0	13.1	0.00438	27.0	27.0
	250	21.8	16.5	6.0	10.5	13.6	0.00307	21.8	21.8
	400	22.0	15.5	6.0	9.5	13.8	0.00244	19.7	19.7
24-Feb-12	1360	21.7	13.5	6.5	7.0	14.1	0.00134	14.5	14.5

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00080**	d_{30} = **0.0051**	d_{50} = **0.012**	d_{60} = **0.017**	C_u = **21**	C_c = **1.9**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (209-210)	**209-210**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (229-230)
Date Sampled: 12/7/2011
Depth: 229-230
Test Date: 28-Feb-12

Initial Dry Weight of Sample (g): 307.18
Weight Passing #10 (g): 307.18
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 51.46
Calculated Weight of Sieve Sample (g): 51.46

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	307.18	100.00
	2"	50	0.00	0.00	307.18	100.00
	1.5"	38.1	0.00	0.00	307.18	100.00
	1"	25	0.00	0.00	307.18	100.00
	3/4"	19.0	0.00	0.00	307.18	100.00
	3/8"	9.5	0.00	0.00	307.18	100.00
	4	4.75	0.00	0.00	307.18	100.00
	10	2.00	0.00	0.00	307.18	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.03	0.03	51.43	99.94
	40	0.425	0.04	0.07	51.39	99.86
	60	0.250	0.04	0.11	51.35	99.79
	140	0.106	7.19	7.30	44.16	85.81
	200	0.075	5.13	12.43	39.03	75.85
	dry pan		0.61	13.04	38.42	
	wet pan			38.42	0.00	

d_{10} (mm): 0.0011
d_{16} (mm): 0.0023
d_{30} (mm): 0.0073
d_{50} (mm): 0.025
d_{60} (mm): 0.042
d_{84} (mm): 0.100

Median Particle Diameter --d_{50} (mm): 0.025
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 38
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.2
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.042

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay with sand (CL)s
USDA Soil Classification: Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (229-230)
Date Sampled: 12/7/2011
Depth: 229-230
Test Date: 22-Feb-12
Start Time: 9:24

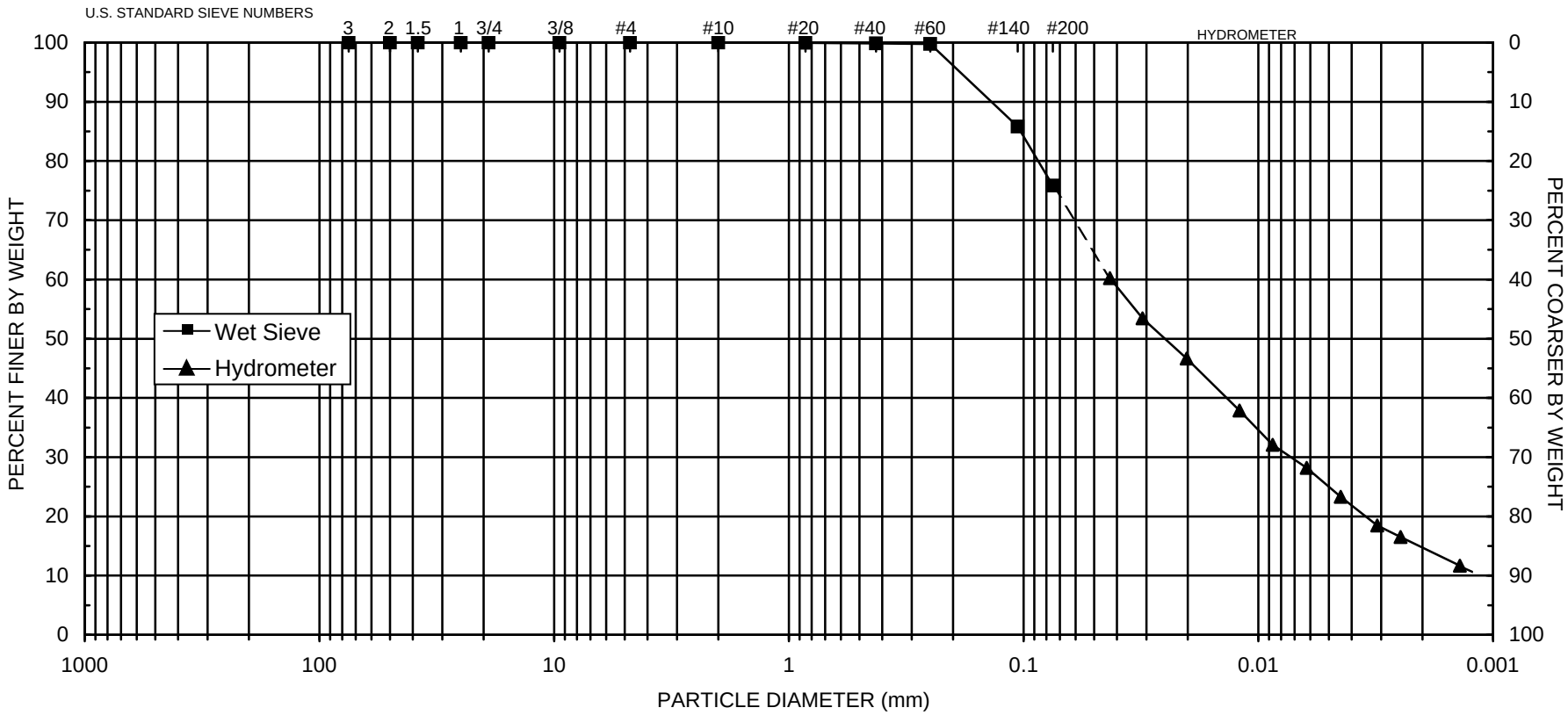
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.66
Initial Wt. (g)*:* 51.46
Total Sample Wt. (g)*:* 307.18
Wt. Passing #10 (g): 307.18

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
22-Feb-12	1	20.9	37.5	6.5	31.0	10.2	0.04283	60.2	60.2
	2	20.9	34.0	6.5	27.5	10.7	0.03113	53.4	53.4
	5	20.9	30.5	6.5	24.0	11.3	0.02021	46.6	46.6
	15	20.9	26.0	6.5	19.5	12.0	0.01204	37.9	37.9
	30	21.0	23.0	6.5	16.5	12.5	0.00868	32.1	32.1
	60	21.0	21.0	6.5	14.5	12.9	0.00622	28.2	28.2
	120	21.2	18.5	6.5	12.0	13.3	0.00445	23.3	23.3
	250	21.7	16.0	6.5	9.5	13.7	0.00311	18.5	18.5
	400	21.9	14.5	6.0	8.5	13.9	0.00248	16.5	16.5
23-Feb-12	1360	20.3	12.5	6.5	6.0	14.3	0.00139	11.7	11.7

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0011**	d_{30} = **0.0073**	d_{50} = **0.025**	d_{60} = **0.042**	C_u = **38**	C_c = **1.2**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (229-230)	**229-230**	**Lean clay with sand (CL)s**	**Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (248-249)
Date Sampled: 12/7/2011
Depth: 248-249
Test Date: 20-Mar-12

Initial Dry Weight of Sample (g): 219.10
Weight Passing #10 (g): 219.10
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 48.86
Calculated Weight of Sieve Sample (g): 48.86
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	219.10	100.00
	2"	50	0.00	0.00	219.10	100.00
	1.5"	38.1	0.00	0.00	219.10	100.00
	1"	25	0.00	0.00	219.10	100.00
	3/4"	19.0	0.00	0.00	219.10	100.00
	3/8"	9.5	0.00	0.00	219.10	100.00
	4	4.75	0.00	0.00	219.10	100.00
	10	2.00	0.00	0.00	219.10	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	48.86	100.00
	40	0.425	0.01	0.01	48.85	99.98
	60	0.250	0.01	0.02	48.84	99.96
	140	0.106	0.11	0.13	48.73	99.73
	200	0.075	0.22	0.35	48.51	99.28
	dry pan		0.06	0.41	48.45	
	wet pan			48.45	0.00	

d_{10} (mm): 0.00068
d_{16} (mm): 0.0011
d_{30} (mm): 0.0031
d_{50} (mm): 0.0082
d_{60} (mm): 0.011
d_{84} (mm): 0.022

Median Particle Diameter --d_{50} (mm): 0.0082
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 16
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.3
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.010

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CH

ASTM Soil Classification: Fat clay (CH)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (248-249)
Date Sampled: 12/7/2011
Depth: 248-249
Test Date: 13-Mar-12
Start Time: 9:54

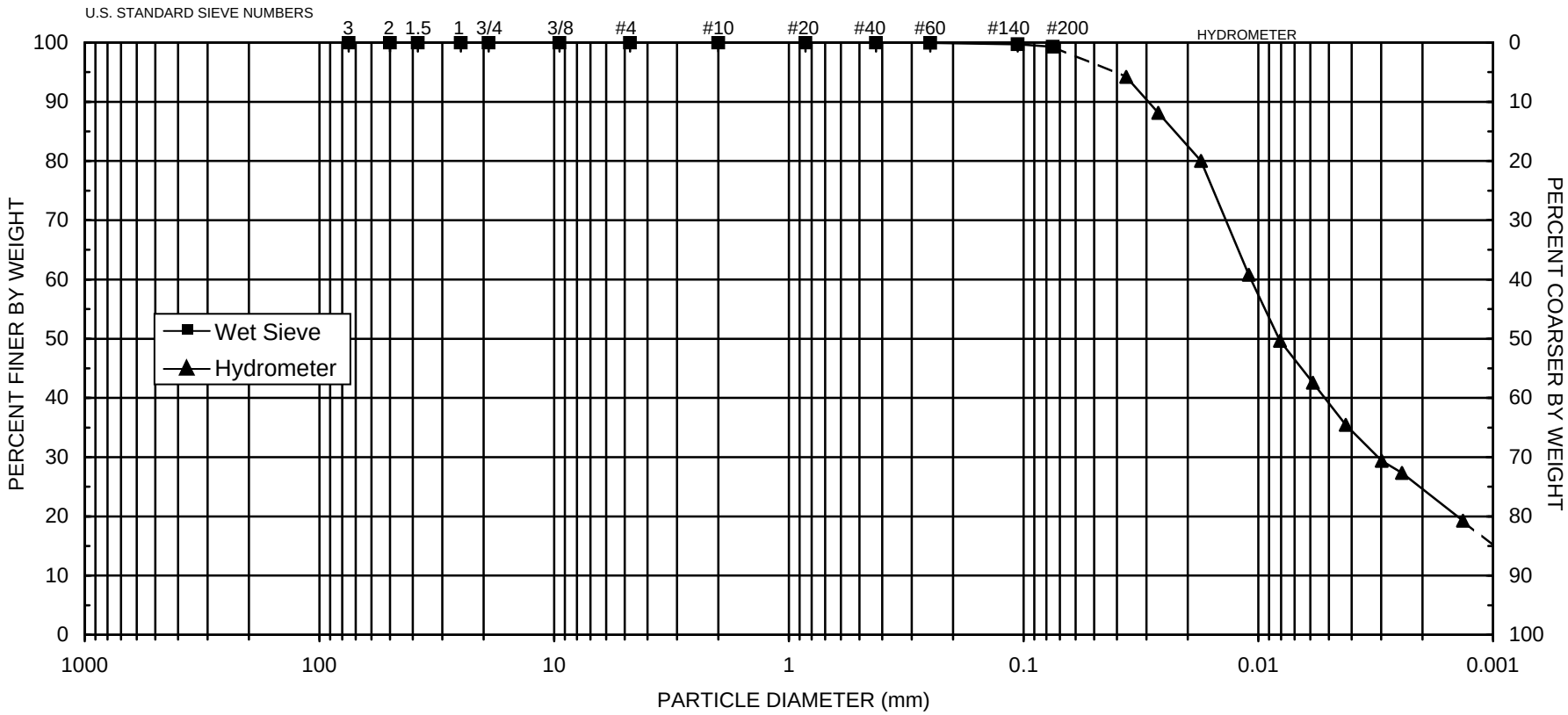
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.71
Initial Wt. (g)*:* 48.86
Total Sample Wt. (g)*:* 219.10
Wt. Passing #10 (g): 219.10

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
13-Mar-12	1	20.9	53.0	6.5	46.5	7.6	0.03654	94.2	94.2
	2	20.9	50.0	6.5	43.5	8.1	0.02666	88.1	88.1
	5	20.9	46.0	6.5	39.5	8.8	0.01753	80.0	80.0
	15	20.9	36.5	6.5	30.0	10.3	0.01098	60.8	60.8
	30	21.0	31.0	6.5	24.5	11.2	0.00809	49.6	49.6
	60	21.1	27.5	6.5	21.0	11.8	0.00586	42.6	42.6
	120	21.2	24.0	6.5	17.5	12.4	0.00424	35.5	35.5
	250	21.8	20.5	6.0	14.5	12.9	0.00298	29.4	29.4
	375	22.1	19.5	6.0	13.5	13.1	0.00244	27.4	27.4
14-Mar-12	1335	20.7	16.0	6.5	9.5	13.7	0.00134	19.2	19.2

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00068**	d_{30} = **0.0031**	d_{50} = **0.0082**	d_{60} = **0.011**	C_u = **16**	C_c = **1.3**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (248-249)	**248-249**	**Fat clay (CH)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (274-275)
Date Sampled: 12/7/2011
Depth: 274-275
Test Date: 28-Feb-12

Initial Dry Weight of Sample (g): 271.39
Weight Passing #10 (g): 271.39
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 53.57
Calculated Weight of Sieve Sample (g): 53.57
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	271.39	100.00
	2"	50	0.00	0.00	271.39	100.00
	1.5"	38.1	0.00	0.00	271.39	100.00
	1"	25	0.00	0.00	271.39	100.00
	3/4"	19.0	0.00	0.00	271.39	100.00
	3/8"	9.5	0.00	0.00	271.39	100.00
	4	4.75	0.00	0.00	271.39	100.00
	10	2.00	0.00	0.00	271.39	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	53.57	100.00
	40	0.425	0.01	0.01	53.56	99.98
	60	0.250	0.02	0.03	53.54	99.94
	140	0.106	5.58	5.61	47.96	89.53
	200	0.075	4.57	10.18	43.39	81.00
	dry pan		0.83	11.01	42.56	
	wet pan			42.56	0.00	

d_{10} (mm): 0.0011
d_{16} (mm): 0.0020
d_{30} (mm): 0.0059
d_{50} (mm): 0.020
d_{60} (mm): 0.028
d_{84} (mm): 0.085

Median Particle Diameter --d_{50} (mm): 0.020
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 25
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.1
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.036

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay with sand (CL)s
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (274-275)
Date Sampled: 12/7/2011
Depth: 274-275
Test Date: 23-Feb-12
Start Time: 9:06

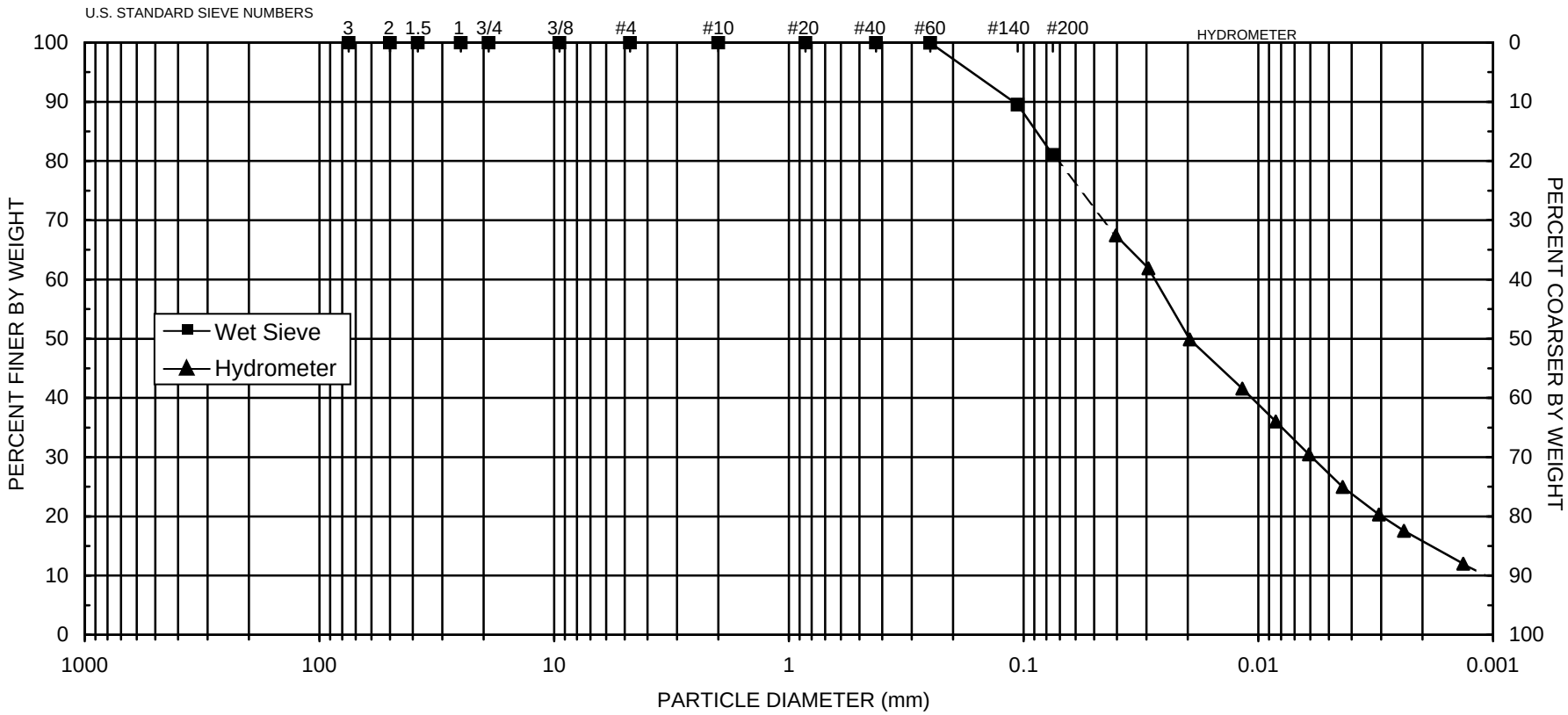
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.69
Initial Wt. (g)*:* 53.57
Total Sample Wt. (g)*:* 271.39
Wt. Passing #10 (g): 271.39

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
23-Feb-12	1	20.9	43.0	6.5	36.5	9.3	0.04052	67.5	67.5
	2	20.9	40.0	6.5	33.5	9.7	0.02940	61.9	61.9
	5	20.9	33.5	6.5	27.0	10.8	0.01959	49.9	49.9
	15	20.9	29.0	6.5	22.5	11.5	0.01169	41.6	41.6
	30	20.9	26.0	6.5	19.5	12.0	0.00844	36.0	36.0
	60	21.0	23.0	6.5	16.5	12.5	0.00608	30.5	30.5
	120	21.2	20.0	6.5	13.5	13.0	0.00437	24.9	24.9
	250	21.8	17.0	6.0	11.0	13.5	0.00306	20.3	20.3
	415	22.0	15.5	6.0	9.5	13.8	0.00239	17.6	17.6
24-Feb-12	1375	21.7	13.0	6.5	6.5	14.2	0.00134	12.0	12.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0011**	d_{30} = **0.0059**	d_{50} = **0.020**	d_{60} = **0.028**	C_u = **25**	C_c = **1.1**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (274-275)	**274-275**	**Lean clay with sand (CL)s**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (294-295)
Date Sampled: 12/7/2011
Depth: 294-295
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 296.44
Weight Passing #10 (g): 296.44
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.47
Calculated Weight of Sieve Sample (g): 50.47
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	296.44	100.00
	2"	50	0.00	0.00	296.44	100.00
	1.5"	38.1	0.00	0.00	296.44	100.00
	1"	25	0.00	0.00	296.44	100.00
	3/4"	19.0	0.00	0.00	296.44	100.00
	3/8"	9.5	0.00	0.00	296.44	100.00
	4	4.75	0.00	0.00	296.44	100.00
	10	2.00	0.00	0.00	296.44	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.02	0.02	50.45	99.96
	40	0.425	0.02	0.04	50.43	99.92
	60	0.250	0.03	0.07	50.40	99.86
	140	0.106	0.23	0.30	50.17	99.41
	200	0.075	0.42	0.72	49.75	98.57
	dry pan		0.06	0.78	49.69	
	wet pan			49.69	0.00	

d_{10} (mm): 0.00059
d_{16} (mm): 0.0011
d_{30} (mm): 0.0042
d_{50} (mm): 0.0095
d_{60} (mm): 0.013
d_{84} (mm): 0.029

Median Particle Diameter --d_{50} (mm): 0.0095
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 22
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.3
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.013

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (294-295)
Date Sampled: 12/7/2011
Depth: 294-295
Test Date: 25-Feb-12
Start Time: 8:24

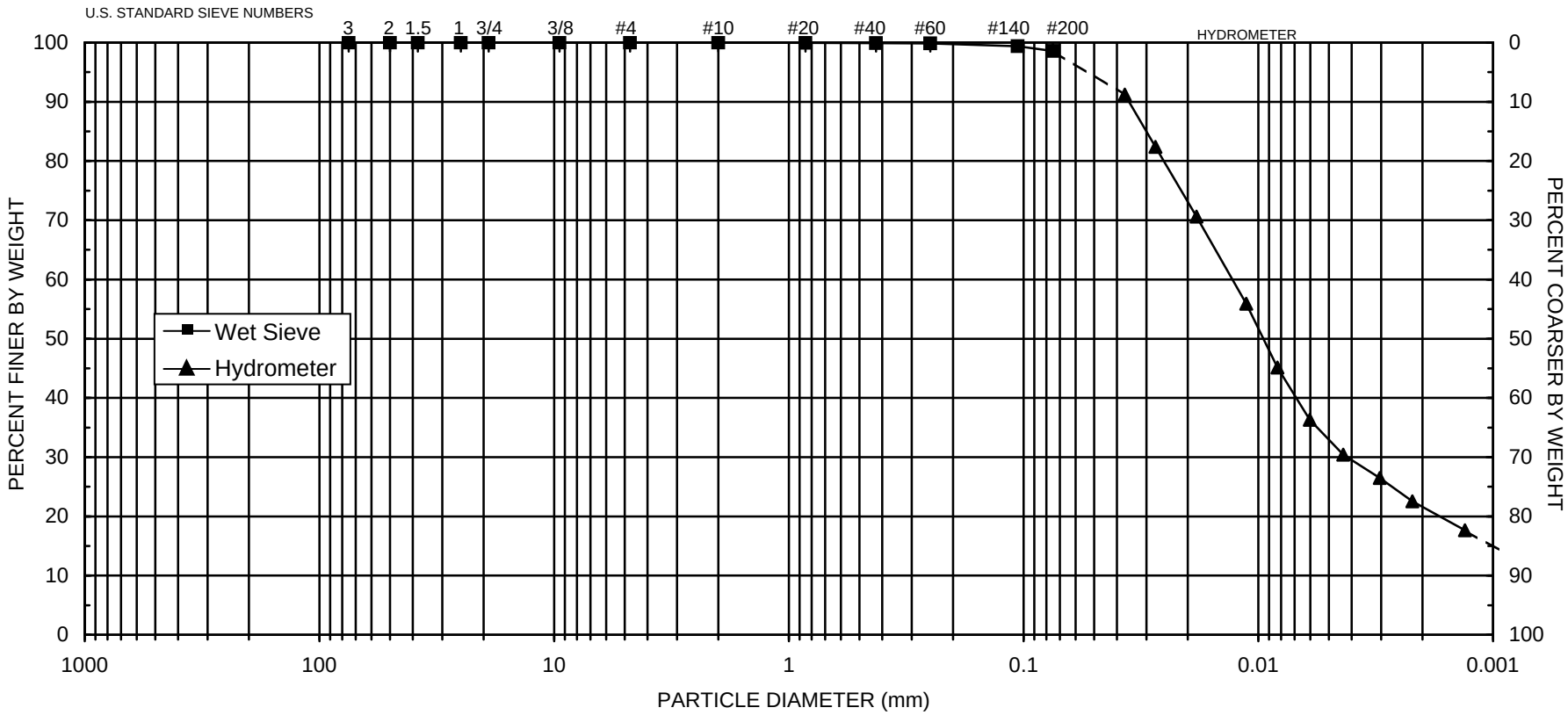
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.68
Initial Wt. (g)*:* 50.47
Total Sample Wt. (g)*:* 296.44
Wt. Passing #10 (g): 296.44

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
25-Feb-12	1	20.5	53.0	6.5	46.5	7.6	0.03702	91.2	91.2
	2	20.5	48.5	6.5	42.0	8.3	0.02742	82.4	82.4
	5	20.5	42.5	6.5	36.0	9.3	0.01833	70.6	70.6
	15	20.5	35.0	6.5	28.5	10.6	0.01126	55.9	55.9
	30	20.6	29.5	6.5	23.0	11.5	0.00829	45.1	45.1
	60	20.7	25.0	6.5	18.5	12.2	0.00604	36.3	36.3
	120	20.8	22.0	6.5	15.5	12.7	0.00435	30.4	30.4
	250	21.1	20.0	6.5	13.5	13.0	0.00304	26.5	26.5
	480	22.0	17.5	6.0	11.5	13.4	0.00220	22.6	22.6
26-Feb-12	1420	20.7	15.5	6.5	9.0	13.8	0.00132	17.7	17.7

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00059**	d_{30} = **0.0042**	d_{50} = **0.0095**	d_{60} = **0.013**	C_u = **22**	C_c = **2.3**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (294-295)	**294-295**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310
Test Date: 21-Mar-12

Initial Dry Weight of Sample (g): 193.58
Weight Passing #10 (g): 193.58
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 48.28
Calculated Weight of Sieve Sample (g): 48.28

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	193.58	100.00
	2"	50	0.00	0.00	193.58	100.00
	1.5"	38.1	0.00	0.00	193.58	100.00
	1"	25	0.00	0.00	193.58	100.00
	3/4"	19.0	0.00	0.00	193.58	100.00
	3/8"	9.5	0.00	0.00	193.58	100.00
	4	4.75	0.00	0.00	193.58	100.00
	10	2.00	0.00	0.00	193.58	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.02	0.02	48.26	99.96
	40	0.425	0.02	0.04	48.24	99.92
	60	0.250	0.06	0.10	48.18	99.79
	140	0.106	0.41	0.51	47.77	98.94
	200	0.075	0.89	1.40	46.88	97.10
	dry pan		0.23	1.63	46.65	
	wet pan			46.65	0.00	

d_{10} (mm): 0.00054
d_{16} (mm): 0.0013
d_{30} (mm): 0.0047
d_{50} (mm): 0.012
d_{60} (mm): 0.016
d_{84} (mm): 0.037

Median Particle Diameter --d_{50} (mm): 0.012
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 30
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.6
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.017

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310
Test Date: 19-Mar-12
Start Time: 9:12

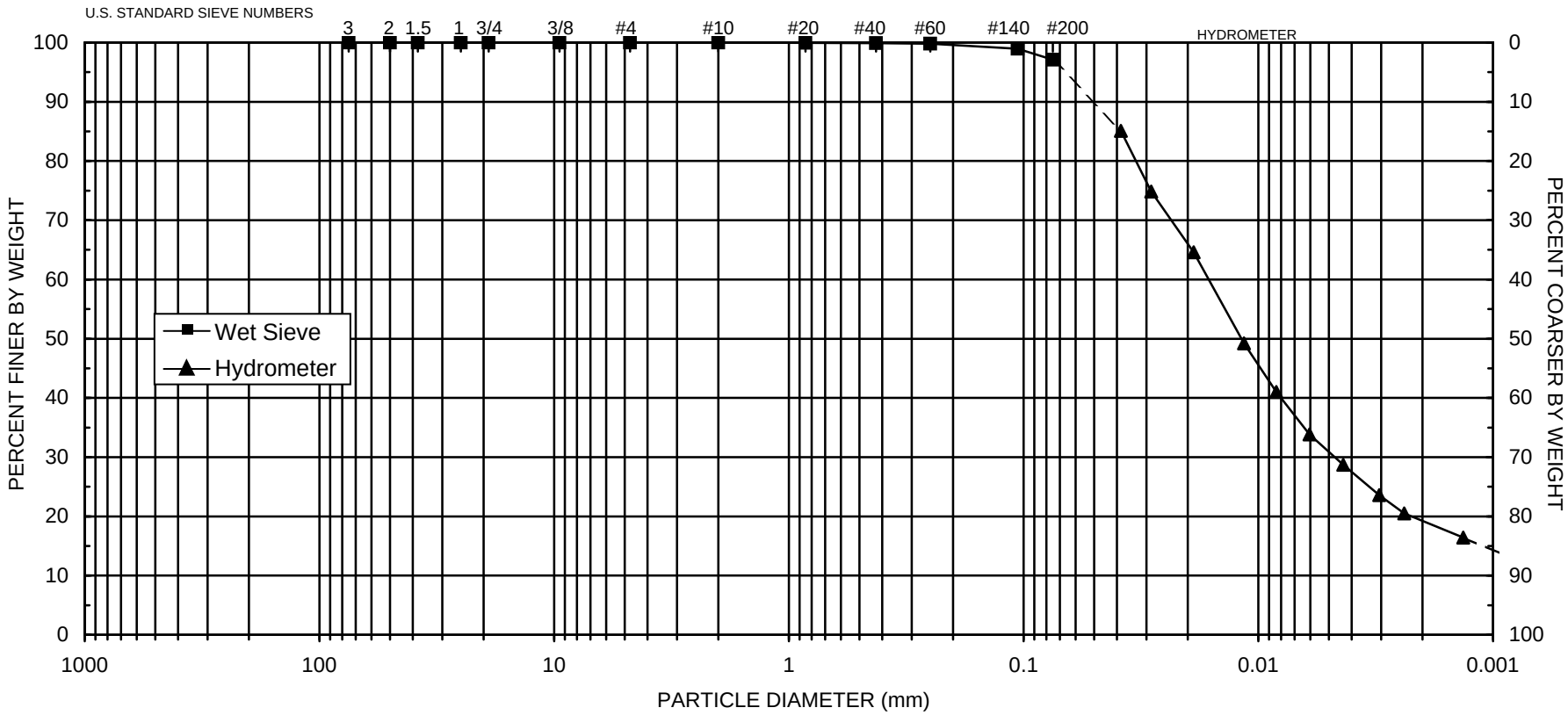
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.69
Initial Wt. (g)*:* 48.28
Total Sample Wt. (g)*:* 193.58
Wt. Passing #10 (g): 193.58

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
19-Mar-12	1	21.0	48.0	6.5	41.5	8.4	0.03855	85.1	85.1
	2	21.0	43.0	6.5	36.5	9.3	0.02856	74.8	74.8
	5	21.0	38.0	6.5	31.5	10.1	0.01884	64.6	64.6
	15	21.0	30.5	6.5	24.0	11.3	0.01152	49.2	49.2
	30	21.1	26.5	6.5	20.0	12.0	0.00837	41.0	41.0
	60	21.1	23.0	6.5	16.5	12.5	0.00606	33.8	33.8
	120	21.2	20.5	6.5	14.0	12.9	0.00435	28.7	28.7
	250	21.6	17.5	6.0	11.5	13.4	0.00306	23.6	23.6
	410	22.2	16.0	6.0	10.0	13.7	0.00239	20.5	20.5
20-Mar-12	1370	21.0	14.5	6.5	8.0	13.9	0.00134	16.4	16.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00054**	d_{30} = **0.0047**	d_{50} = **0.012**	d_{60} = **0.016**	C_u = **30**	C_c = **2.6**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (309-310)	**309-310**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335
Test Date: 21-Mar-12

Initial Dry Weight of Sample (g): 219.29
Weight Passing #10 (g): 219.29
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.42
Calculated Weight of Sieve Sample (g): 50.42
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	219.29	100.00
	2"	50	0.00	0.00	219.29	100.00
	1.5"	38.1	0.00	0.00	219.29	100.00
	1"	25	0.00	0.00	219.29	100.00
	3/4"	19.0	0.00	0.00	219.29	100.00
	3/8"	9.5	0.00	0.00	219.29	100.00
	4	4.75	0.00	0.00	219.29	100.00
	10	2.00	0.00	0.00	219.29	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.04	0.04	50.38	99.92
	40	0.425	0.02	0.06	50.36	99.88
	60	0.250	0.01	0.07	50.35	99.86
	140	0.106	0.08	0.15	50.27	99.70
	200	0.075	0.50	0.65	49.77	98.71
	dry pan		0.16	0.81	49.61	
	wet pan			49.61	0.00	

d_{10} (mm): 0.00064
d_{16} (mm): 0.0011
d_{30} (mm): 0.0029
d_{50} (mm): 0.0093
d_{60} (mm): 0.015
d_{84} (mm): 0.037

Median Particle Diameter --d_{50} (mm): 0.0093
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 23
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 0.88
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.016

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335
Test Date: 19-Mar-12
Start Time: 9:18

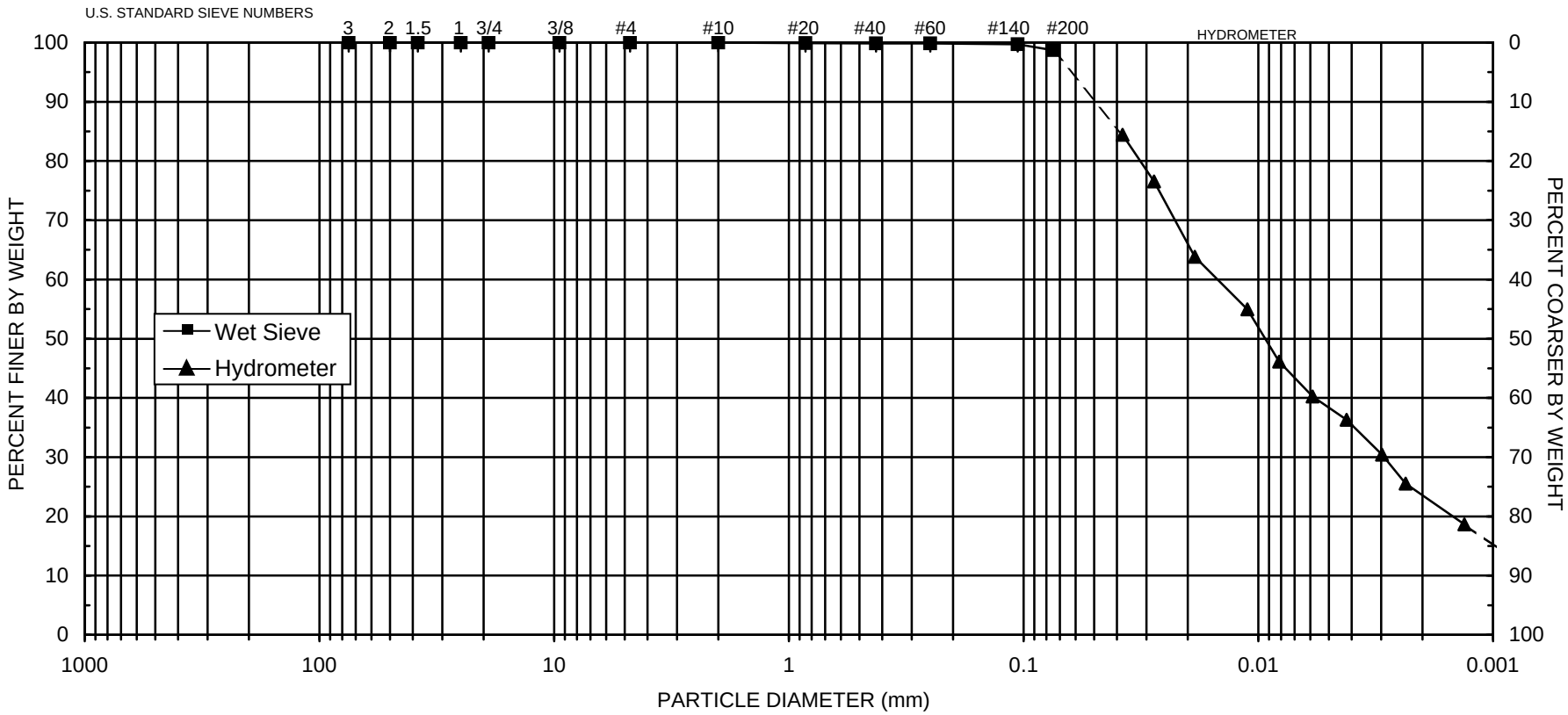
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.71
Initial Wt. (g)*:* 50.42
Total Sample Wt. (g)*:* 219.29
Wt. Passing #10 (g): 219.29

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
19-Mar-12	1	21.0	49.5	6.5	43.0	8.2	0.03787	84.4	84.4
	2	21.0	45.5	6.5	39.0	8.8	0.02783	76.6	76.6
	5	21.0	39.0	6.5	32.5	9.9	0.01863	63.8	63.8
	15	21.0	34.5	6.5	28.0	10.6	0.01115	55.0	55.0
	30	21.1	30.0	6.5	23.5	11.4	0.00814	46.1	46.1
	60	21.1	27.0	6.5	20.5	11.9	0.00588	40.3	40.3
	120	21.2	25.0	6.5	18.5	12.2	0.00421	36.3	36.3
	250	21.6	21.5	6.0	15.5	12.8	0.00297	30.4	30.4
	405	22.2	19.0	6.0	13.0	13.2	0.00235	25.5	25.5
20-Mar-12	1365	21.0	16.0	6.5	9.5	13.7	0.00132	18.7	18.7

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00064**	d_{30} = **0.0029**	d_{50} = **0.0093**	d_{60} = **0.015**	C_u = **23**	C_c = **0.88**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (334-335)	**334-335**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (359-360)
Date Sampled: 12/7/2011
Depth: 359-360
Test Date: 20-Mar-12

Initial Dry Weight of Sample (g): 232.40
Weight Passing #10 (g): 232.40
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.44
Calculated Weight of Sieve Sample (g): 50.44
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	232.40	100.00
	2"	50	0.00	0.00	232.40	100.00
	1.5"	38.1	0.00	0.00	232.40	100.00
	1"	25	0.00	0.00	232.40	100.00
	3/4"	19.0	0.00	0.00	232.40	100.00
	3/8"	9.5	0.00	0.00	232.40	100.00
	4	4.75	0.00	0.00	232.40	100.00
	10	2.00	0.00	0.00	232.40	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.92	0.92	49.52	98.18
	40	0.425	0.57	1.49	48.95	97.05
	60	0.250	0.29	1.78	48.66	96.47
	140	0.106	0.81	2.59	47.85	94.87
	200	0.075	0.59	3.18	47.26	93.70
	dry pan		0.10	3.28	47.16	
	wet pan			47.16	0.00	

d_{10} (mm): 0.00045
d_{16} (mm): 0.00075
d_{30} (mm): 0.0027
d_{50} (mm): 0.0087
d_{60} (mm): 0.013
d_{84} (mm): 0.035

Median Particle Diameter --d_{50} (mm): 0.0087
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 29
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.2
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.015

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silty Clay Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (359-360)
Date Sampled: 12/7/2011
Depth: 359-360
Test Date: 13-Mar-12
Start Time: 9:36

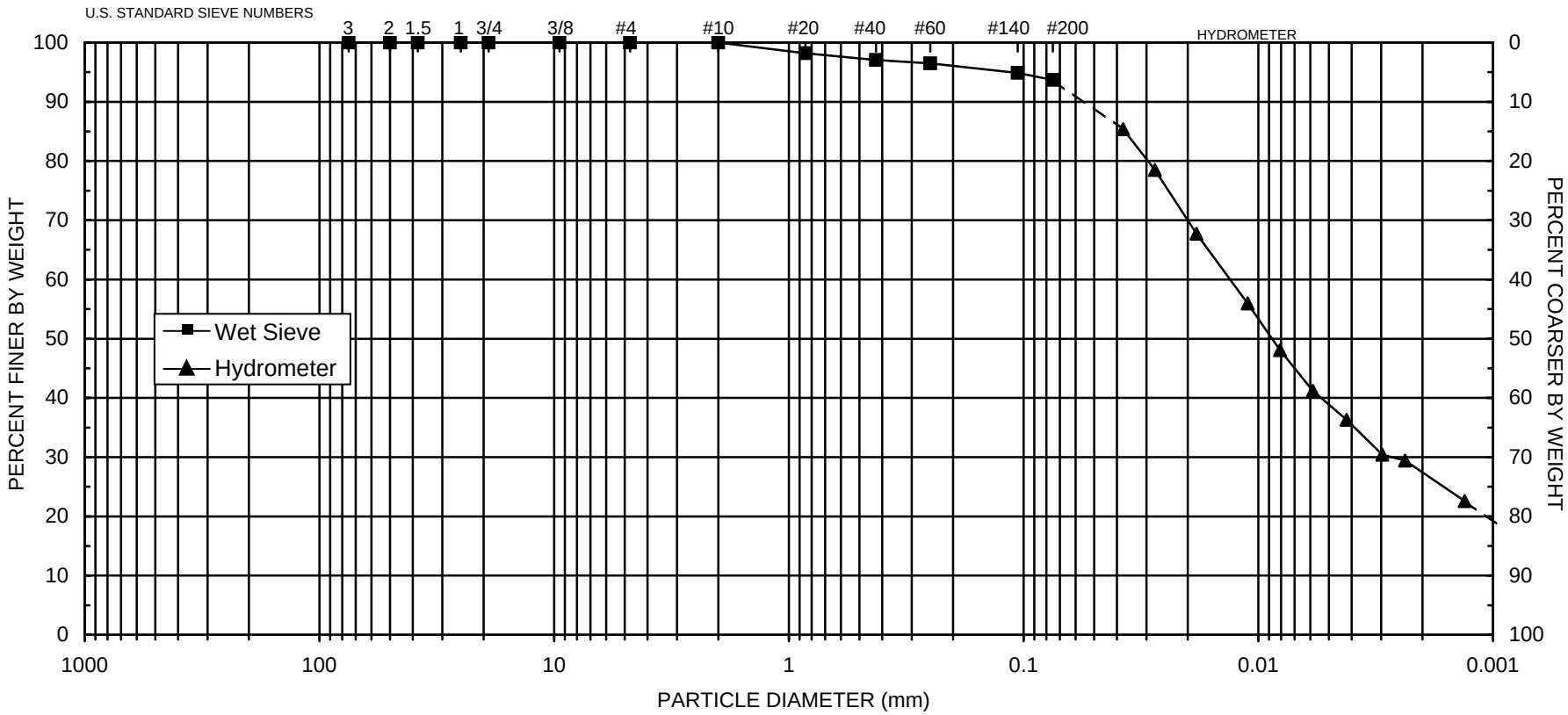
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.71
Initial Wt. (g)*:* 50.44
Total Sample Wt. (g)*:* 232.40
Wt. Passing #10 (g): 232.40

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
13-Mar-12	1	20.8	50.0	6.5	43.5	8.1	0.03772	85.4	85.4
	2	20.8	46.5	6.5	40.0	8.7	0.02760	78.5	78.5
	5	20.8	41.0	6.5	34.5	9.6	0.01834	67.7	67.7
	15	20.9	35.0	6.5	28.5	10.6	0.01111	55.9	55.9
	30	20.9	31.0	6.5	24.5	11.2	0.00809	48.1	48.1
	60	21.0	27.5	6.5	21.0	11.8	0.00586	41.2	41.2
	120	21.2	25.0	6.5	18.5	12.2	0.00421	36.3	36.3
	250	21.7	21.5	6.0	15.5	12.8	0.00296	30.4	30.4
	390	22.1	21.0	6.0	15.0	12.9	0.00237	29.4	29.4
14-Mar-12	1350	20.7	18.0	6.5	11.5	13.3	0.00132	22.6	22.6

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00045**	d_{30} = **0.0027**	d_{50} = **0.0087**	d_{60} = **0.013**	C_u = **29**	C_c = **1.2**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-11 (359-360)	**359-360**	**Lean clay (CL)**	**Silty Clay Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (69-70)
Date Sampled: 12/7/2011
Depth: 69-70
Test Date: 21-Mar-12

Initial Dry Weight of Sample (g): 242.93
Weight Passing #10 (g): 242.93
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.88
Calculated Weight of Sieve Sample (g): 49.88

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	242.93	100.00
	2"	50	0.00	0.00	242.93	100.00
	1.5"	38.1	0.00	0.00	242.93	100.00
	1"	25	0.00	0.00	242.93	100.00
	3/4"	19.0	0.00	0.00	242.93	100.00
	3/8"	9.5	0.00	0.00	242.93	100.00
	4	4.75	0.00	0.00	242.93	100.00
	10	2.00	0.00	0.00	242.93	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	49.88	100.00
	40	0.425	0.01	0.01	49.87	99.98
	60	0.250	0.02	0.03	49.85	99.94
	140	0.106	0.61	0.64	49.24	98.72
	200	0.075	1.22	1.86	48.02	96.27
	dry pan		0.26	2.12	47.76	
	wet pan			47.76	0.00	

d_{10} (mm): 0.0017
d_{16} (mm): 0.0038
d_{30} (mm): 0.010
d_{50} (mm): 0.019
d_{60} (mm): 0.029
d_{84} (mm): 0.048

Median Particle Diameter --d_{50} (mm): 0.019
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 17
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 2.0
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.024

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (69-70)
Date Sampled: 12/7/2011
Depth: 69-70
Test Date: 19-Mar-12
Start Time: 9:06

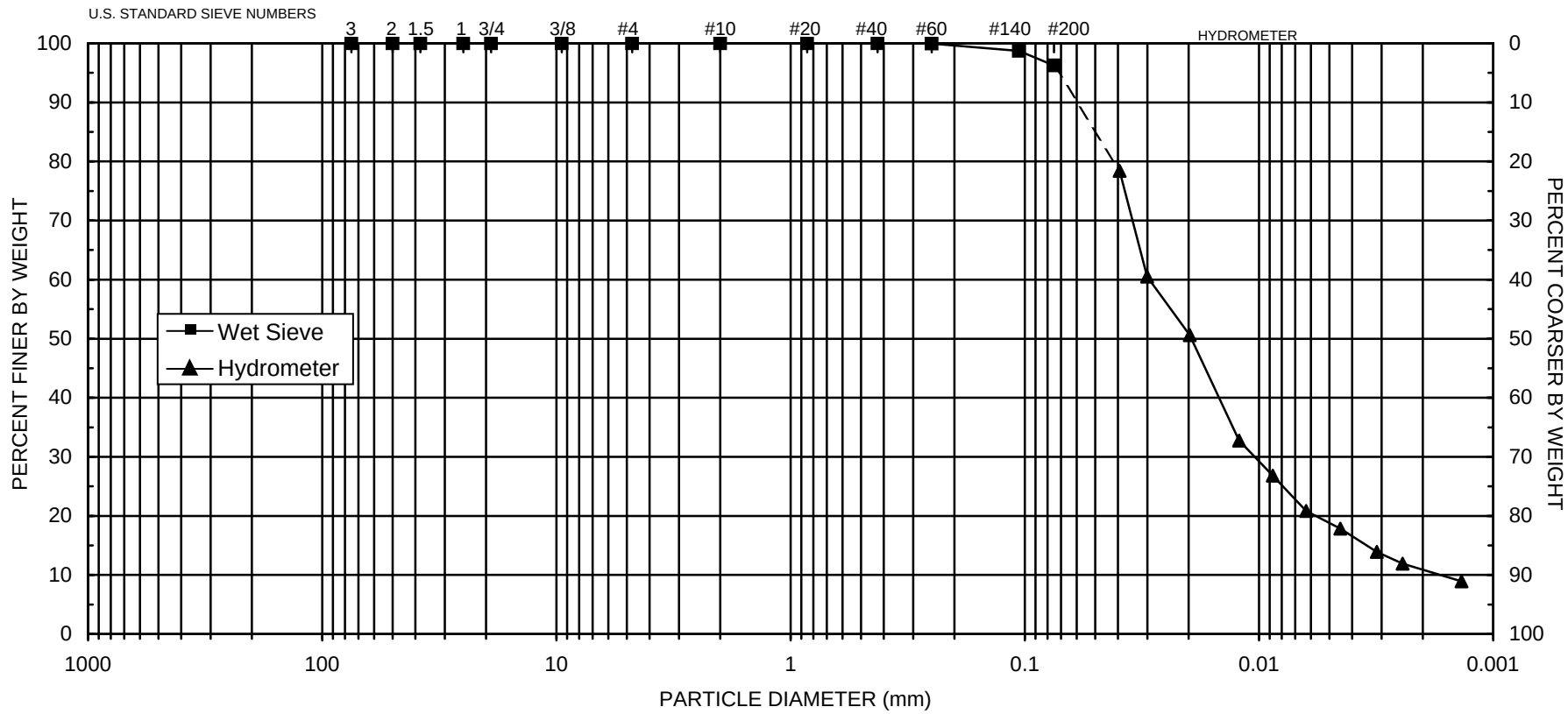
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.69
Initial Wt. (g)*:* 49.88
Total Sample Wt. (g)*:* 242.93
Wt. Passing #10 (g): 242.93

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
19-Mar-12	1	21.0	46.0	6.5	39.5	8.8	0.03934	78.4	78.4
	2	21.0	37.0	6.5	30.5	10.2	0.03007	60.5	60.5
	5	21.0	32.0	6.5	25.5	11.1	0.01976	50.6	50.6
	15	21.0	23.0	6.5	16.5	12.5	0.01215	32.7	32.7
	30	21.1	20.0	6.5	13.5	13.0	0.00875	26.8	26.8
	60	21.1	17.0	6.5	10.5	13.5	0.00630	20.8	20.8
	120	21.2	15.5	6.5	9.0	13.8	0.00449	17.9	17.9
	250	21.6	13.0	6.0	7.0	14.2	0.00314	13.9	13.9
	415	22.2	12.0	6.0	6.0	14.3	0.00244	11.9	11.9
20-Mar-12	1375	21.0	11.0	6.5	4.5	14.5	0.00136	8.9	8.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0017**	d_{30} = **0.010**	d_{50} = **0.019**	d_{60} = **0.029**	C_u = **17**	C_c = **2.0**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (69-70)	**69-70**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (109-110)
Date Sampled: 12/7/2011
Depth: 109-110
Test Date: 6-Mar-12

Initial Dry Weight of Sample (g): 216.47
Weight Passing #10 (g): 216.47
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 47.76
Calculated Weight of Sieve Sample (g): 47.76
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	216.47	100.00
	2"	50	0.00	0.00	216.47	100.00
	1.5"	38.1	0.00	0.00	216.47	100.00
	1"	25	0.00	0.00	216.47	100.00
	3/4"	19.0	0.00	0.00	216.47	100.00
	3/8"	9.5	0.00	0.00	216.47	100.00
	4	4.75	0.00	0.00	216.47	100.00
	10	2.00	0.00	0.00	216.47	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.82	0.82	46.94	98.28
	40	0.425	0.65	1.47	46.29	96.92
	60	0.250	0.40	1.87	45.89	96.08
	140	0.106	0.75	2.62	45.14	94.51
	200	0.075	0.43	3.05	44.71	93.61
	dry pan		0.10	3.15	44.61	
	wet pan			44.61	0.00	

d_{10} (mm): 0.00086
d_{16} (mm): 0.0014
d_{30} (mm): 0.0043
d_{50} (mm): 0.011
d_{60} (mm): 0.016
d_{84} (mm): 0.038

Median Particle Diameter --d_{50} (mm): 0.011
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 19
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.3
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.017

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CH

ASTM Soil Classification: Fat clay (CH)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (109-110)
Date Sampled: 12/7/2011
Depth: 109-110
Test Date: 19-Mar-12
Start Time: 9:42

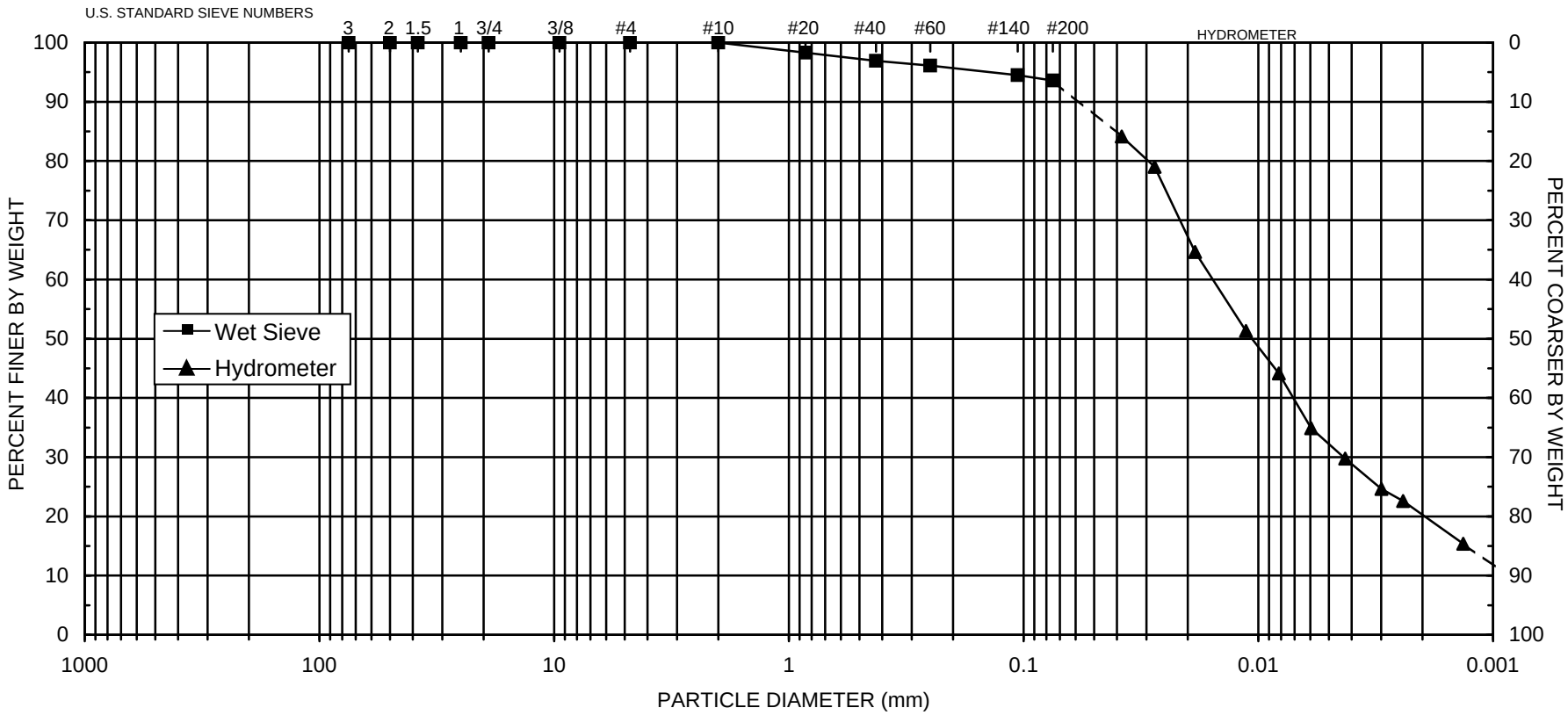
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.75
Initial Wt. (g)*:* 47.76
Total Sample Wt. (g)*:* 216.47
Wt. Passing #10 (g): 216.47

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
1-Mar-12	1	20.8	47.5	6.5	41.0	8.5	0.03825	84.1	84.1
	2	20.8	45.0	6.5	38.5	8.9	0.02769	79.0	79.0
	5	20.8	38.0	6.5	31.5	10.1	0.01860	64.6	64.6
	15	20.9	31.5	6.5	25.0	11.1	0.01128	51.3	51.3
	30	20.9	28.0	6.5	21.5	11.7	0.00818	44.1	44.1
	60	21.0	23.5	6.5	17.0	12.4	0.00596	34.9	34.9
	120	21.3	21.0	6.5	14.5	12.9	0.00427	29.8	29.8
	250	21.9	18.0	6.0	12.0	13.3	0.00299	24.6	24.6
	385	22.1	17.0	6.0	11.0	13.5	0.00242	22.6	22.6
2-Mar-12	1345	20.7	14.0	6.5	7.5	14.0	0.00134	15.4	15.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00086**	d_{30} = **0.0043**	d_{50} = **0.011**	d_{60} = **0.016**	C_u = **19**	C_c = **1.3**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (109-110)	**109-110**	**Fat clay (CH)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155
Test Date: 22-Mar-12

Initial Dry Weight of Sample (g): 169.12
Weight Passing #10 (g): 169.12
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 45.68
Calculated Weight of Sieve Sample (g): 45.68

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	169.12	100.00
	2"	50	0.00	0.00	169.12	100.00
	1.5"	38.1	0.00	0.00	169.12	100.00
	1"	25	0.00	0.00	169.12	100.00
	3/4"	19.0	0.00	0.00	169.12	100.00
	3/8"	9.5	0.00	0.00	169.12	100.00
	4	4.75	0.00	0.00	169.12	100.00
	10	2.00	0.00	0.00	169.12	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	45.68	100.00
	40	0.425	0.02	0.02	45.66	99.96
	60	0.250	0.02	0.04	45.64	99.91
	140	0.106	1.08	1.12	44.56	97.55
	200	0.075	1.20	2.32	43.36	94.92
	dry pan		0.16	2.48	43.20	
	wet pan			43.20	0.00	

d_{10} (mm): 0.00059
d_{16} (mm): 0.0013
d_{30} (mm): 0.0048
d_{50} (mm): 0.011
d_{60} (mm): 0.017
d_{84} (mm): 0.047

Median Particle Diameter --d_{50} (mm): 0.011
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 29
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.3
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.020

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155
Test Date: 19-Mar-12
Start Time: 9:18

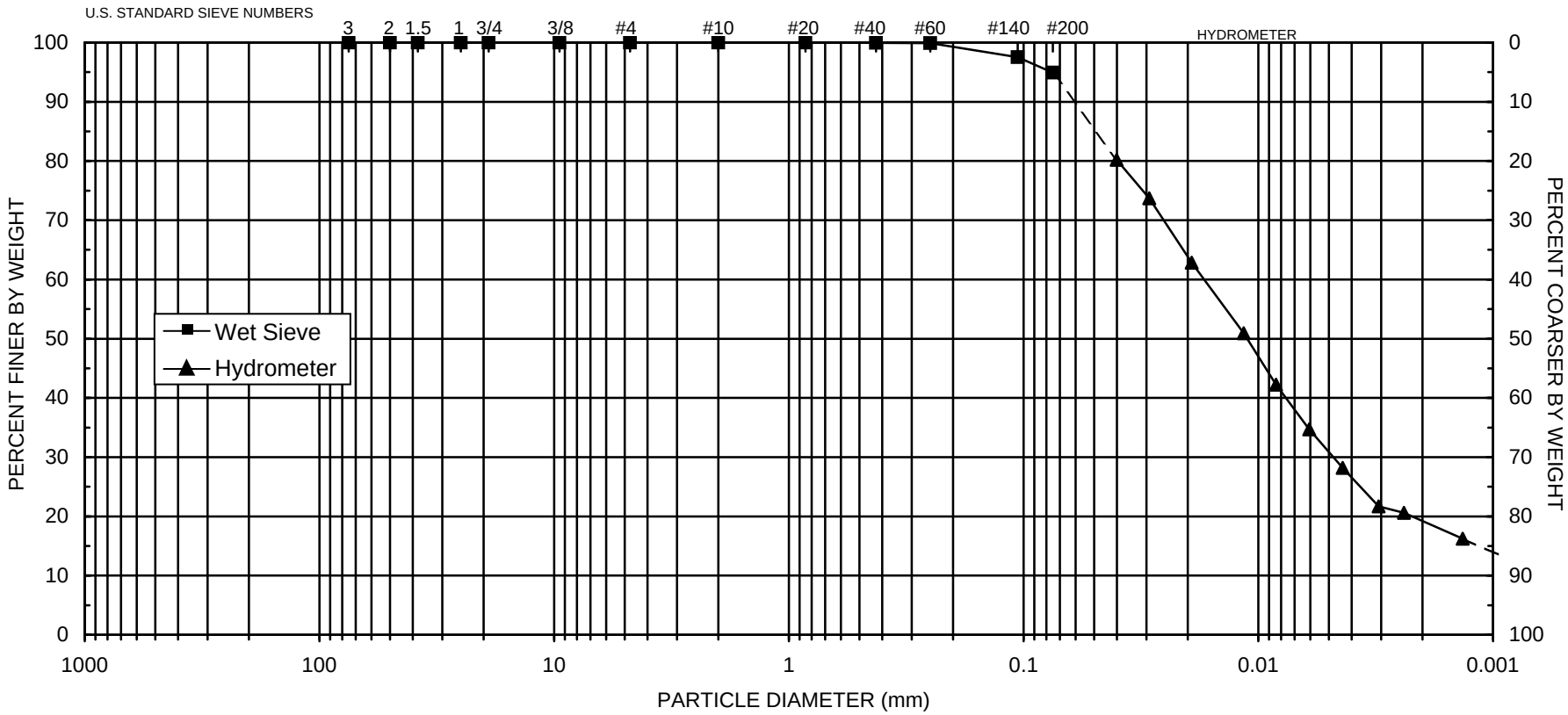
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.70
Initial Wt. (g)*:* 45.68
Total Sample Wt. (g)*:* 169.12
Wt. Passing #10 (g): 169.12

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Mar-12	1	20.9	43.5	6.5	37.0	9.2	0.04019	80.2	80.2
	2	20.9	40.5	6.5	34.0	9.7	0.02917	73.7	73.7
	5	20.9	35.5	6.5	29.0	10.5	0.01922	62.9	62.9
	15	21.0	30.0	6.5	23.5	11.4	0.01155	50.9	50.9
	30	21.0	26.0	6.5	19.5	12.0	0.00840	42.3	42.3
	60	21.1	22.5	6.5	16.0	12.6	0.00607	34.7	34.7
	120	21.2	19.5	6.5	13.0	13.1	0.00437	28.2	28.2
	250	21.8	16.0	6.0	10.0	13.7	0.00307	21.7	21.7
	410	22.2	15.5	6.0	9.5	13.8	0.00239	20.6	20.6
21-Mar-12	1365	20.7	14.0	6.5	7.5	14.0	0.00135	16.3	16.3

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00059**	d_{30} = **0.0048**	d_{50} = **0.011**	d_{60} = **0.017**	C_u = **29**	C_c = **2.3**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (154-155)	**154-155**	**Silt (ML)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (179-180)
Date Sampled: 12/7/2011
Depth: 179-180
Test Date: 20-Mar-12

Initial Dry Weight of Sample (g): 215.25
Weight Passing #10 (g): 215.25
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.36
Calculated Weight of Sieve Sample (g): 49.36
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	215.25	100.00
	2"	50	0.00	0.00	215.25	100.00
	1.5"	38.1	0.00	0.00	215.25	100.00
	1"	25	0.00	0.00	215.25	100.00
	3/4"	19.0	0.00	0.00	215.25	100.00
	3/8"	9.5	0.00	0.00	215.25	100.00
	4	4.75	0.00	0.00	215.25	100.00
	10	2.00	0.00	0.00	215.25	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	49.36	100.00
	40	0.425	0.02	0.02	49.34	99.96
	60	0.250	0.12	0.14	49.22	99.72
	140	0.106	0.75	0.89	48.47	98.20
	200	0.075	1.15	2.04	47.32	95.87
	dry pan		0.30	2.34	47.02	
	wet pan			47.02	0.00	

d_{10} (mm): 0.0012 d_{50} (mm): 0.016
d_{16} (mm): 0.0022 d_{60} (mm): 0.022
d_{30} (mm): 0.0065 d_{84} (mm): 0.047

Median Particle Diameter --d_{50} (mm): 0.016
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 18
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.6
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.022

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (179-180)
Date Sampled: 12/7/2011
Depth: 179-180
Test Date: 13-Mar-12
Start Time: 9:24

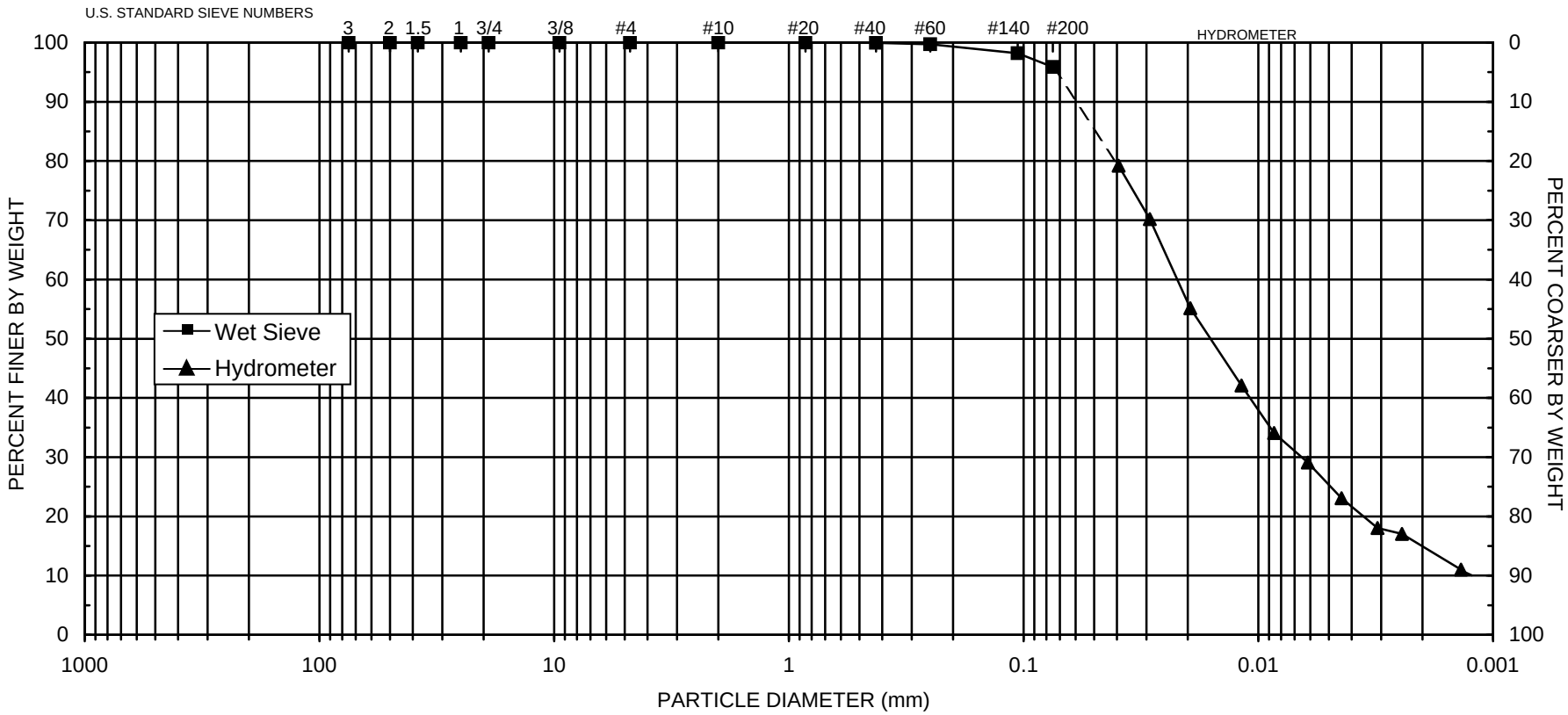
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.69
Initial Wt. (g)*:* 49.36
Total Sample Wt. (g)*:* 215.25
Wt. Passing #10 (g): 215.25

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
13-Mar-12	1	20.8	46.0	6.5	39.5	8.8	0.03942	79.2	79.2
	2	20.8	41.5	6.5	35.0	9.5	0.02903	70.2	70.2
	5	20.8	34.0	6.5	27.5	10.7	0.01951	55.2	55.2
	15	20.8	27.5	6.5	21.0	11.8	0.01181	42.1	42.1
	30	20.9	23.5	6.5	17.0	12.4	0.00857	34.1	34.1
	60	21.0	21.0	6.5	14.5	12.9	0.00615	29.1	29.1
	120	21.2	18.0	6.5	11.5	13.3	0.00442	23.1	23.1
	250	21.6	15.0	6.0	9.0	13.8	0.00310	18.1	18.1
	400	22.1	14.5	6.0	8.5	13.9	0.00245	17.0	17.0
14-Mar-12	1360	20.7	12.0	6.5	5.5	14.3	0.00137	11.0	11.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0012**	d_{30} = **0.0065**	d_{50} = **0.016**	d_{60} = **0.022**	C_u = **18**	C_c = **1.6**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (179-180)	**179-180**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (204-205)
Date Sampled: 12/7/2011
Depth: 204-205
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 215.63
Weight Passing #10 (g): 215.63
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.81
Calculated Weight of Sieve Sample (g): 49.81
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	215.63	100.00
	2"	50	0.00	0.00	215.63	100.00
	1.5"	38.1	0.00	0.00	215.63	100.00
	1"	25	0.00	0.00	215.63	100.00
	3/4"	19.0	0.00	0.00	215.63	100.00
	3/8"	9.5	0.00	0.00	215.63	100.00
	4	4.75	0.00	0.00	215.63	100.00
	10	2.00	0.00	0.00	215.63	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	49.81	100.00
	40	0.425	0.06	0.06	49.75	99.88
	60	0.250	0.02	0.08	49.73	99.84
	140	0.106	2.30	2.38	47.43	95.22
	200	0.075	3.98	6.36	43.45	87.23
	dry pan		0.73	7.09	42.72	
	wet pan			42.72	0.00	

d_{10} (mm): 0.0011
d_{16} (mm): 0.0031
d_{30} (mm): 0.0092
d_{50} (mm): 0.025
d_{60} (mm): 0.035
d_{84} (mm): 0.069

Median Particle Diameter --d_{50} (mm): 0.025
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 32
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.2
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.032

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (204-205)
Date Sampled: 12/7/2011
Depth: 204-205
Test Date: 25-Feb-12
Start Time: 8:18

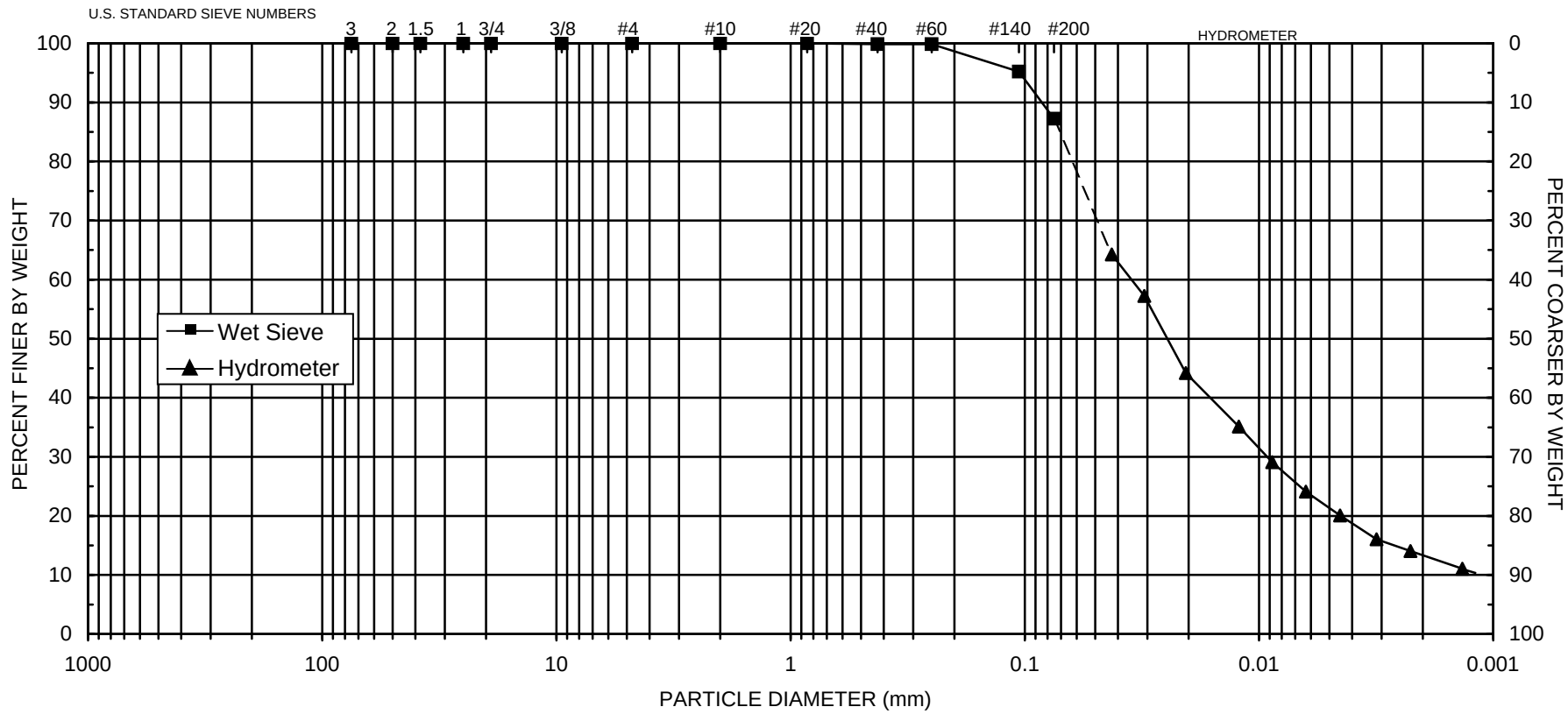
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.67
Initial Wt. (g)*:* 49.81
Total Sample Wt. (g)*:* 215.63
Wt. Passing #10 (g): 215.63

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
25-Feb-12	1	20.5	38.5	6.5	32.0	10.0	0.04251	64.2	64.2
	2	20.5	35.0	6.5	28.5	10.6	0.03091	57.2	57.2
	5	20.5	28.5	6.5	22.0	11.6	0.02051	44.2	44.2
	15	20.5	24.0	6.5	17.5	12.4	0.01221	35.1	35.1
	30	20.6	21.0	6.5	14.5	12.9	0.00879	29.1	29.1
	60	20.6	18.5	6.5	12.0	13.3	0.00632	24.1	24.1
	120	20.8	16.5	6.5	10.0	13.6	0.00451	20.1	20.1
	250	21.1	14.5	6.5	8.0	13.9	0.00315	16.1	16.1
	485	22.0	13.0	6.0	7.0	14.2	0.00226	14.1	14.1
26-Feb-12	1425	20.2	12.0	6.5	5.5	14.3	0.00135	11.0	11.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0011**	d_{30} = **0.0092**	d_{50} = **0.025**	d_{60} = **0.035**	C_u = **32**	C_c = **2.2**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (204-205)	**204-205**	**Silt (ML)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (224-225)
Date Sampled: 12/7/2011
Depth: 224-225
Test Date: 21-Mar-12

Initial Dry Weight of Sample (g): 301.01
Weight Passing #10 (g): 301.01
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.88
Calculated Weight of Sieve Sample (g): 49.88
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	301.01	100.00
	2"	50	0.00	0.00	301.01	100.00
	1.5"	38.1	0.00	0.00	301.01	100.00
	1"	25	0.00	0.00	301.01	100.00
	3/4"	19.0	0.00	0.00	301.01	100.00
	3/8"	9.5	0.00	0.00	301.01	100.00
	4	4.75	0.00	0.00	301.01	100.00
	10	2.00	0.00	0.00	301.01	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	49.88	100.00
	40	0.425	0.01	0.01	49.87	99.98
	60	0.250	0.02	0.03	49.85	99.94
	140	0.106	0.78	0.81	49.07	98.38
	200	0.075	1.49	2.30	47.58	95.39
	dry pan		0.32	2.62	47.26	
	wet pan			47.26	0.00	

d_{10} (mm): 0.00090
d_{16} (mm): 0.0015
d_{30} (mm): 0.0044
d_{50} (mm): 0.010
d_{60} (mm): 0.018
d_{84} (mm): 0.046

Median Particle Diameter --d_{50} (mm): 0.010
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 20
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.2
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.019

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (224-225)
Date Sampled: 12/7/2011
Depth: 224-225
Test Date: 19-Mar-12
Start Time: 9:24

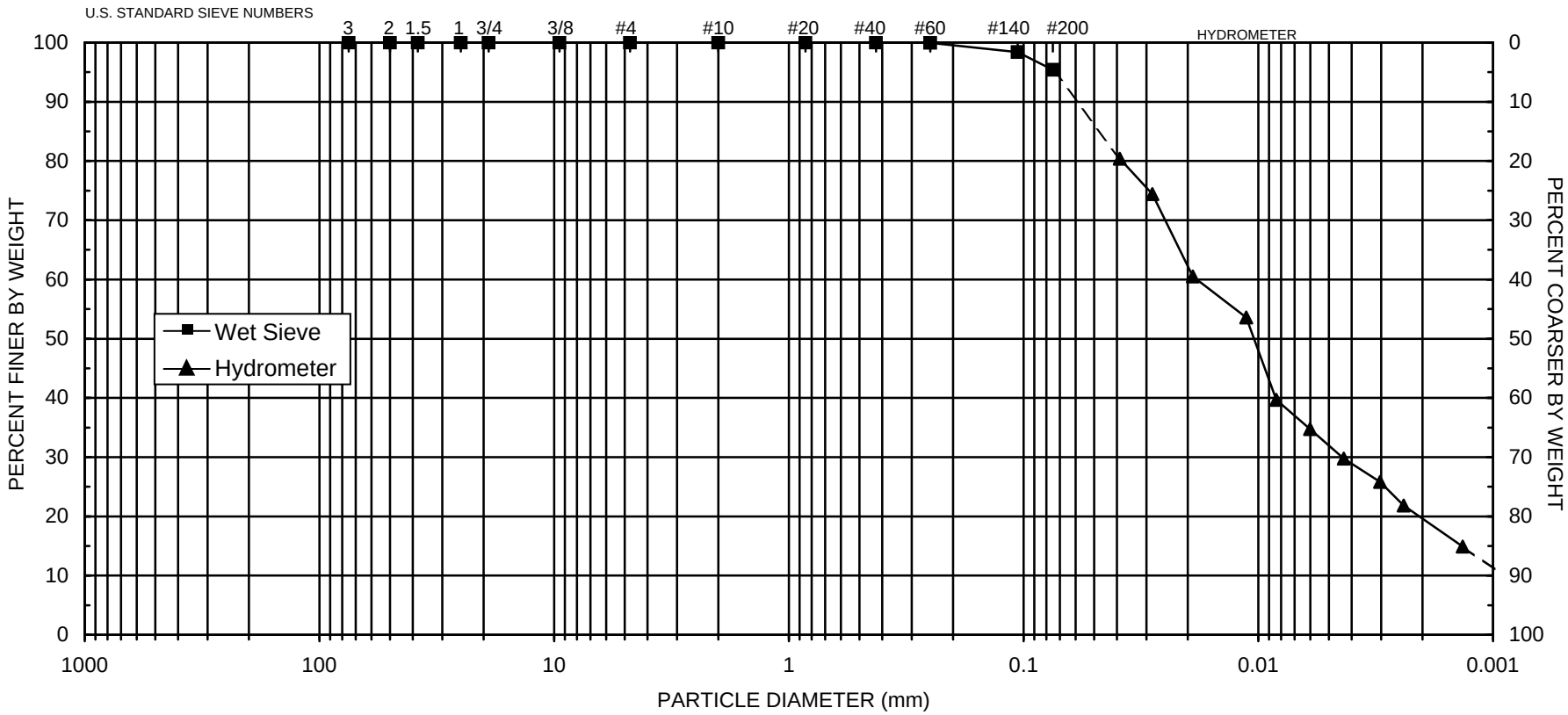
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.70
Initial Wt. (g)*:* 49.88
Total Sample Wt. (g)*:* 301.01
Wt. Passing #10 (g): 301.01

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
19-Mar-12	1	21.0	47.0	6.5	40.5	8.6	0.03892	80.4	80.4
	2	21.0	44.0	6.5	37.5	9.1	0.02830	74.4	74.4
	5	21.0	37.0	6.5	30.5	10.2	0.01899	60.5	60.5
	15	21.0	33.5	6.5	27.0	10.8	0.01127	53.6	53.6
	30	21.1	26.5	6.5	20.0	12.0	0.00837	39.7	39.7
	60	21.1	24.0	6.5	17.5	12.4	0.00602	34.7	34.7
	120	21.2	21.5	6.5	15.0	12.8	0.00432	29.8	29.8
	250	21.6	19.0	6.0	13.0	13.2	0.00303	25.8	25.8
	400	22.2	17.0	6.0	11.0	13.5	0.00241	21.8	21.8
20-Mar-12	1360	21.0	14.0	6.5	7.5	14.0	0.00135	14.9	14.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00090**	d_{30} = **0.0044**	d_{50} = **0.010**	d_{60} = **0.018**	C_u = **20**	C_c = **1.2**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (224-225)	**224-225**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (249-250)
Date Sampled: 12/7/2011
Depth: 249-250
Test Date: 22-Mar-12

Initial Dry Weight of Sample (g): 286.05
Weight Passing #10 (g): 286.05
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.31
Calculated Weight of Sieve Sample (g): 49.31
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	286.05	100.00
	2"	50	0.00	0.00	286.05	100.00
	1.5"	38.1	0.00	0.00	286.05	100.00
	1"	25	0.00	0.00	286.05	100.00
	3/4"	19.0	0.00	0.00	286.05	100.00
	3/8"	9.5	0.00	0.00	286.05	100.00
	4	4.75	0.00	0.00	286.05	100.00
	10	2.00	0.00	0.00	286.05	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	49.30	99.98
	40	0.425	0.01	0.02	49.29	99.96
	60	0.250	0.07	0.09	49.22	99.82
	140	0.106	0.61	0.70	48.61	98.58
	200	0.075	0.36	1.06	48.25	97.85
	dry pan		0.08	1.14	48.17	
	wet pan			48.17	0.00	

d_{10} (mm): 0.00083
d_{16} (mm): 0.0013
d_{30} (mm): 0.0040
d_{50} (mm): 0.012
d_{60} (mm): 0.017
d_{84} (mm): 0.038

Median Particle Diameter --d_{50} (mm): 0.012
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 20
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.1
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.017

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (249-250)
Date Sampled: 12/7/2011
Depth: 249-250
Test Date: 20-Mar-12
Start Time: 9:06

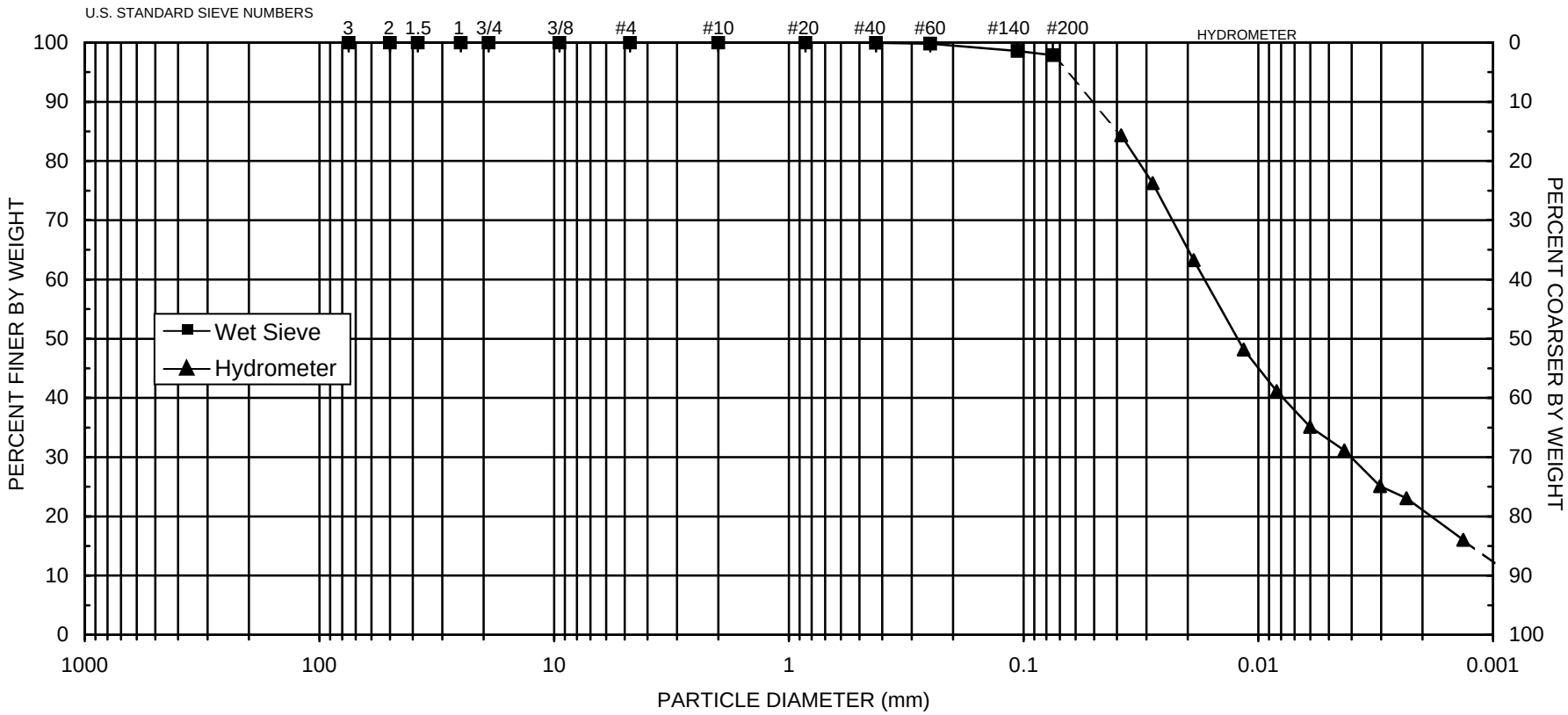
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.70
Initial Wt. (g)*:* 49.31
Total Sample Wt. (g)*:* 286.05
Wt. Passing #10 (g): 286.05

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Mar-12	1	20.8	48.5	6.5	42.0	8.3	0.03844	84.3	84.3
	2	20.9	44.5	6.5	38.0	9.0	0.02820	76.3	76.3
	5	20.9	38.0	6.5	31.5	10.1	0.01886	63.2	63.2
	15	20.9	30.5	6.5	24.0	11.3	0.01153	48.2	48.2
	30	21.0	27.0	6.5	20.5	11.9	0.00835	41.2	41.2
	60	21.0	24.0	6.5	17.5	12.4	0.00602	35.1	35.1
	120	21.2	22.0	6.5	15.5	12.7	0.00431	31.1	31.1
	250	21.8	18.5	6.0	12.5	13.3	0.00303	25.1	25.1
	420	22.2	17.5	6.0	11.5	13.4	0.00234	23.1	23.1
21-Mar-12	1375	20.7	14.5	6.5	8.0	13.9	0.00134	16.1	16.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00083**	d_{30} = **0.0040**	d_{50} = **0.012**	d_{60} = **0.017**	C_u = **20**	C_c = **1.1**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (249-250)	**249-250**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (264-265)
Date Sampled: 12/7/2011
Depth: 264-265
Test Date: 6-Mar-12

Initial Dry Weight of Sample (g): 288.03
Weight Passing #10 (g): 288.03
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.75
Calculated Weight of Sieve Sample (g): 49.75
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	288.03	100.00
	2"	50	0.00	0.00	288.03	100.00
	1.5"	38.1	0.00	0.00	288.03	100.00
	1"	25	0.00	0.00	288.03	100.00
	3/4"	19.0	0.00	0.00	288.03	100.00
	3/8"	9.5	0.00	0.00	288.03	100.00
	4	4.75	0.00	0.00	288.03	100.00
	10	2.00	0.00	0.00	288.03	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	49.75	100.00
	40	0.425	0.01	0.01	49.74	99.98
	60	0.250	0.01	0.02	49.73	99.96
	140	0.106	0.14	0.16	49.59	99.68
	200	0.075	0.92	1.08	48.67	97.83
	dry pan		0.26	1.34	48.41	
	wet pan			48.41	0.00	

d_{10} (mm): 0.00060
d_{16} (mm): 0.0012
d_{30} (mm): 0.0041
d_{50} (mm): 0.011
d_{60} (mm): 0.016
d_{84} (mm): 0.038

Median Particle Diameter --d_{50} (mm): 0.011
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 27
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.8
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.017

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (264-265)
Date Sampled: 12/7/2011
Depth: 264-265
Test Date: 1-Mar-12
Start Time: 9:18

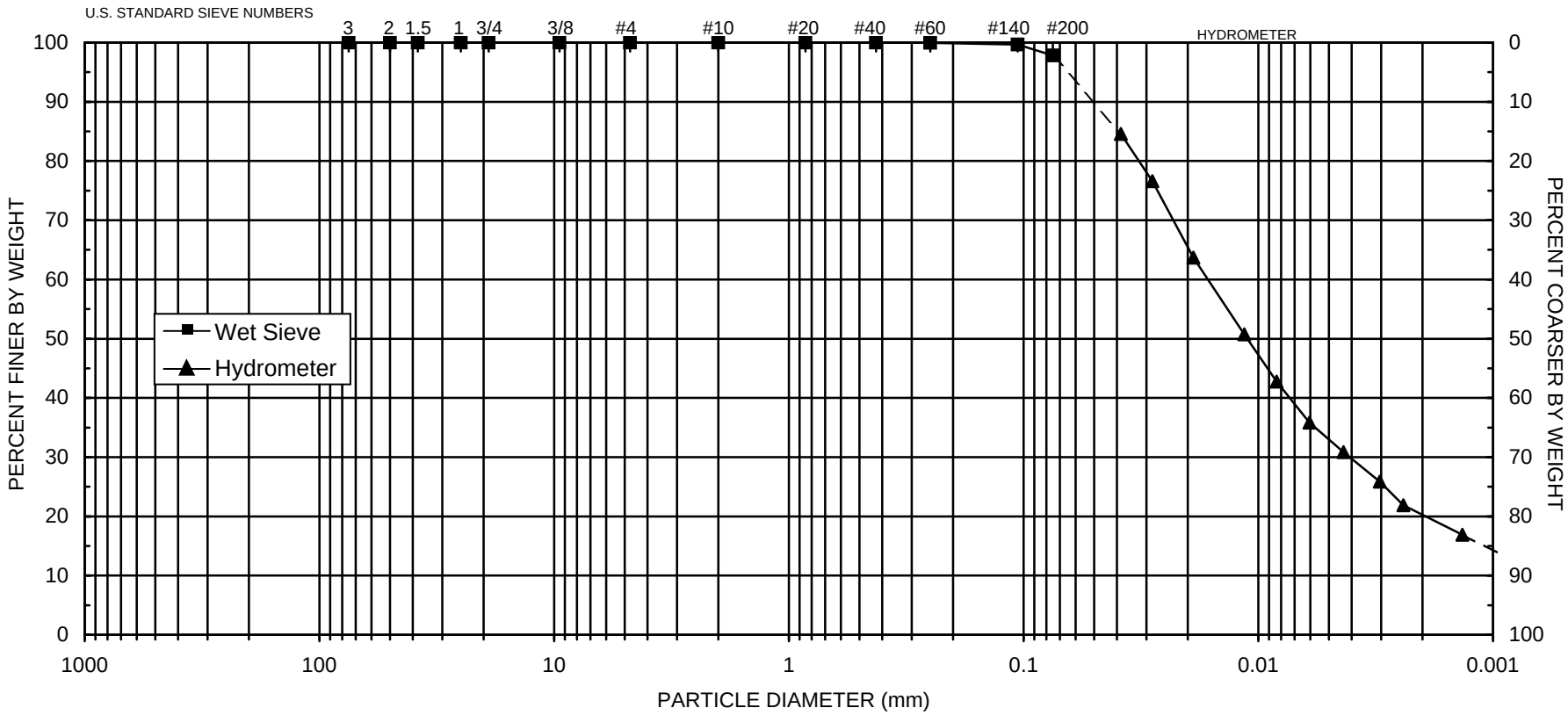
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.68
Initial Wt. (g)*:* 49.75
Total Sample Wt. (g)*:* 288.03
Wt. Passing #10 (g): 288.03

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
1-Mar-12	1	20.8	49.0	6.5	42.5	8.3	0.03848	84.6	84.6
	2	20.8	45.0	6.5	38.5	8.9	0.02827	76.6	76.6
	5	20.8	38.5	6.5	32.0	10.0	0.01892	63.7	63.7
	15	20.8	32.0	6.5	25.5	11.1	0.01149	50.7	50.7
	30	20.8	28.0	6.5	21.5	11.7	0.00836	42.8	42.8
	60	20.9	24.5	6.5	18.0	12.3	0.00605	35.8	35.8
	120	21.2	22.0	6.5	15.5	12.7	0.00433	30.8	30.8
	250	21.8	19.0	6.0	13.0	13.2	0.00304	25.9	25.9
	405	22.1	17.0	6.0	11.0	13.5	0.00241	21.9	21.9
2-Mar-12	1365	20.7	15.0	6.5	8.5	13.8	0.00135	16.9	16.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00060**	d_{30} = **0.0041**	d_{50} = **0.011**	d_{60} = **0.016**	C_u = **27**	C_c = **1.8**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (264-265)	**264-265**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (284-285)
Date Sampled: 12/7/2011
Depth: 284-285
Test Date: 6-Mar-12

Initial Dry Weight of Sample (g): 177.31
Weight Passing #10 (g): 177.31
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 47.57
Calculated Weight of Sieve Sample (g): 47.57
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	177.31	100.00
	2"	50	0.00	0.00	177.31	100.00
	1.5"	38.1	0.00	0.00	177.31	100.00
	1"	25	0.00	0.00	177.31	100.00
	3/4"	19.0	0.00	0.00	177.31	100.00
	3/8"	9.5	0.00	0.00	177.31	100.00
	4	4.75	0.00	0.00	177.31	100.00
	10	2.00	0.00	0.00	177.31	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	47.56	99.98
	40	0.425	0.02	0.03	47.54	99.94
	60	0.250	0.01	0.04	47.53	99.92
	140	0.106	0.30	0.34	47.23	99.29
	200	0.075	0.51	0.85	46.72	98.21
	dry pan		0.08	0.93	46.64	
	wet pan			46.64	0.00	

d_{10} (mm): 0.00045
d_{16} (mm): 0.00088
d_{30} (mm): 0.0032
d_{50} (mm): 0.0082
d_{60} (mm): 0.011
d_{84} (mm): 0.025

Median Particle Diameter --d_{50} (mm): 0.0082
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 24
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.1
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.011

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (284-285)
Date Sampled: 12/7/2011
Depth: 284-285
Test Date: 1-Mar-12
Start Time: 9:12

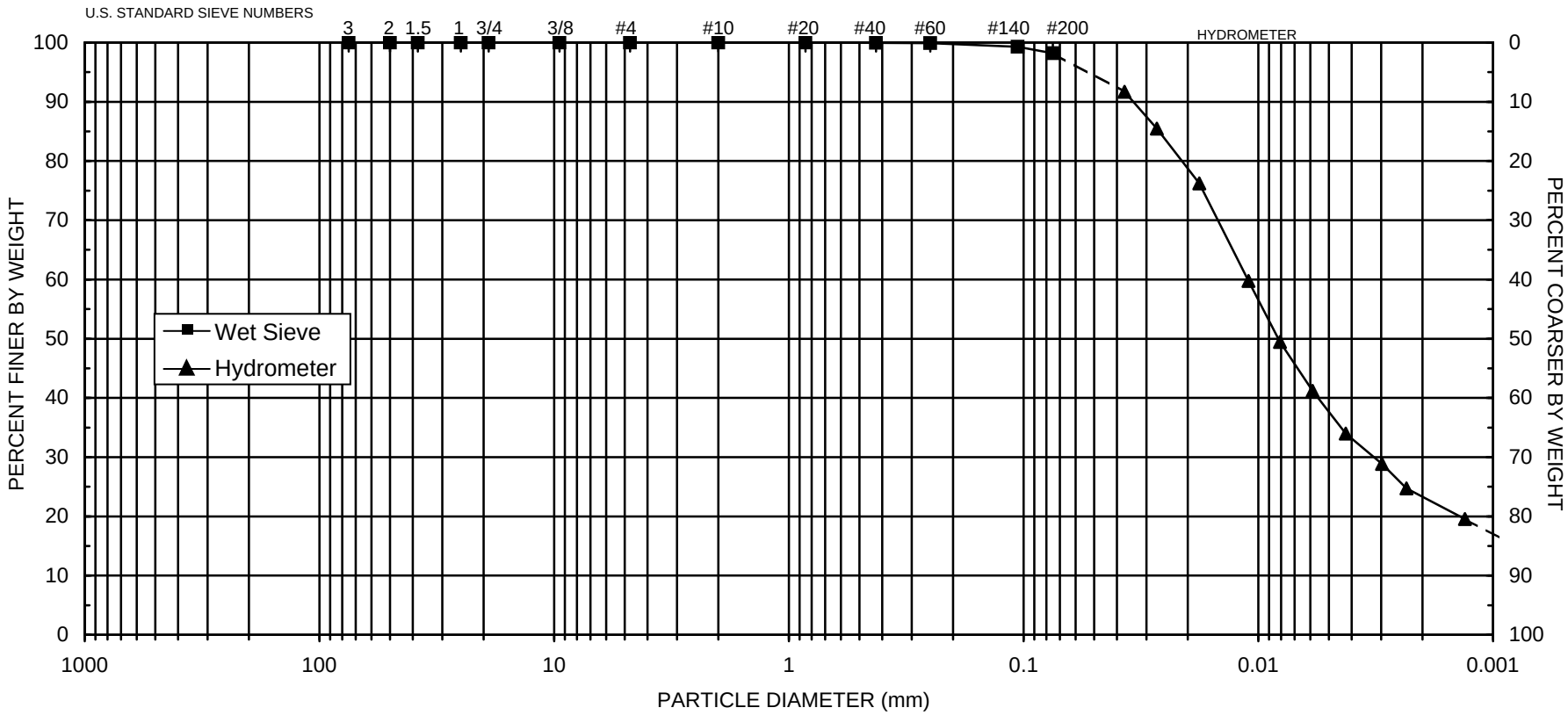
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.73
Initial Wt. (g)*:* 47.57
Total Sample Wt. (g)*:* 177.31
Wt. Passing #10 (g): 177.31

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
1-Mar-12	1	20.7	51.0	6.5	44.5	7.9	0.03714	91.7	91.7
	2	20.7	48.0	6.5	41.5	8.4	0.02706	85.5	85.5
	5	20.8	43.5	6.5	37.0	9.2	0.01783	76.2	76.2
	15	20.8	35.5	6.5	29.0	10.5	0.01100	59.7	59.7
	30	20.8	30.5	6.5	24.0	11.3	0.00808	49.4	49.4
	60	20.9	26.5	6.5	20.0	12.0	0.00587	41.2	41.2
	120	21.1	23.0	6.5	16.5	12.5	0.00424	34.0	34.0
	250	21.8	20.0	6.0	14.0	13.0	0.00297	28.8	28.8
	410	22.1	18.0	6.0	12.0	13.3	0.00234	24.7	24.7
2-Mar-12	1370	20.7	16.0	6.5	9.5	13.7	0.00132	19.6	19.6

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00045**	d_{30} = **0.0032**	d_{50} = **0.0082**	d_{60} = **0.011**	C_u = **24**	C_c = **2.1**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (284-285)	**284-285**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310
Test Date: 22-Mar-12

Initial Dry Weight of Sample (g): 175.20
Weight Passing #10 (g): 175.20
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 47.95
Calculated Weight of Sieve Sample (g): 47.95
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	175.20	100.00
	2"	50	0.00	0.00	175.20	100.00
	1.5"	38.1	0.00	0.00	175.20	100.00
	1"	25	0.00	0.00	175.20	100.00
	3/4"	19.0	0.00	0.00	175.20	100.00
	3/8"	9.5	0.00	0.00	175.20	100.00
	4	4.75	0.00	0.00	175.20	100.00
	10	2.00	0.00	0.00	175.20	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	47.94	99.98
	40	0.425	0.01	0.02	47.93	99.96
	60	0.250	0.03	0.05	47.90	99.90
	140	0.106	0.11	0.16	47.79	99.67
	200	0.075	0.08	0.24	47.71	99.50
	dry pan		0.01	0.25	47.70	
	wet pan			47.70	0.00	

d_{10} (mm): 0.00041
d_{16} (mm): 0.00080
d_{30} (mm): 0.0029
d_{50} (mm): 0.0092
d_{60} (mm): 0.012
d_{84} (mm): 0.027

Median Particle Diameter --d_{50} (mm): 0.0092
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 29
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.7
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.012

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CH

ASTM Soil Classification: Fat clay (CH)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310
Test Date: 20-Mar-12
Start Time: 9:12

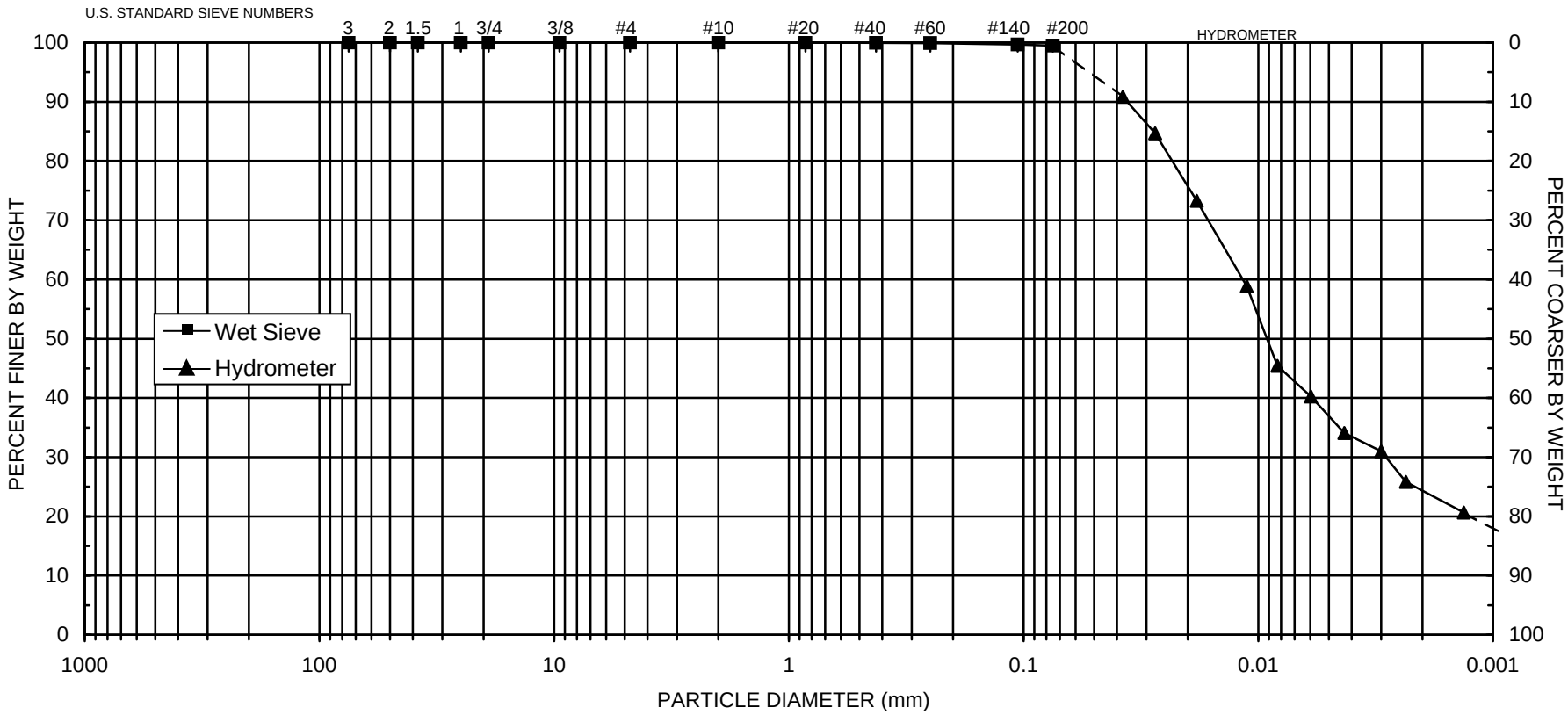
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.68
Initial Wt. (g)*:* 47.95
Total Sample Wt. (g)*:* 175.20
Wt. Passing #10 (g): 175.20

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Mar-12	1	20.9	50.5	6.5	44.0	8.0	0.03780	90.8	90.8
	2	20.9	47.5	6.5	41.0	8.5	0.02754	84.7	84.7
	5	20.9	42.0	6.5	35.5	9.4	0.01831	73.3	73.3
	15	21.0	35.0	6.5	28.5	10.6	0.01119	58.8	58.8
	30	21.0	28.5	6.5	22.0	11.6	0.00830	45.4	45.4
	60	21.1	26.0	6.5	19.5	12.0	0.00596	40.3	40.3
	120	21.2	23.0	6.5	16.5	12.5	0.00430	34.1	34.1
	250	21.8	21.0	6.0	15.0	12.9	0.00299	31.0	31.0
	415	22.2	18.5	6.0	12.5	13.3	0.00235	25.8	25.8
21-Mar-12	1370	20.7	16.5	6.5	10.0	13.6	0.00133	20.6	20.6

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00041**	d_{30} = **0.0029**	d_{50} = **0.0092**	d_{60} = **0.012**	C_u = **29**	C_c = **1.7**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (309-310)	**309-310**	**Fat clay (CH)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335
Test Date: 20-Mar-12

Initial Dry Weight of Sample (g): 170.58
Weight Passing #10 (g): 170.58
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.16
Calculated Weight of Sieve Sample (g): 50.16

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	170.58	100.00
	2"	50	0.00	0.00	170.58	100.00
	1.5"	38.1	0.00	0.00	170.58	100.00
	1"	25	0.00	0.00	170.58	100.00
	3/4"	19.0	0.00	0.00	170.58	100.00
	3/8"	9.5	0.00	0.00	170.58	100.00
	4	4.75	0.00	0.00	170.58	100.00
	10	2.00	0.00	0.00	170.58	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	50.15	99.98
	40	0.425	0.02	0.03	50.13	99.94
	60	0.250	0.01	0.04	50.12	99.92
	140	0.106	0.27	0.31	49.85	99.38
	200	0.075	0.77	1.08	49.08	97.85
	dry pan		0.21	1.29	48.87	
	wet pan			48.87	0.00	

d_{10} (mm): 0.00056
d_{16} (mm): 0.00087
d_{30} (mm): 0.0024
d_{50} (mm): 0.0073
d_{60} (mm): 0.011
d_{84} (mm): 0.030

Median Particle Diameter --d_{50} (mm): 0.0073
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 20
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 0.94
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.013

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CH

ASTM Soil Classification: Fat clay (CH)
USDA Soil Classification: Silty Clay Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335
Test Date: 13-Mar-12
Start Time: 9:30

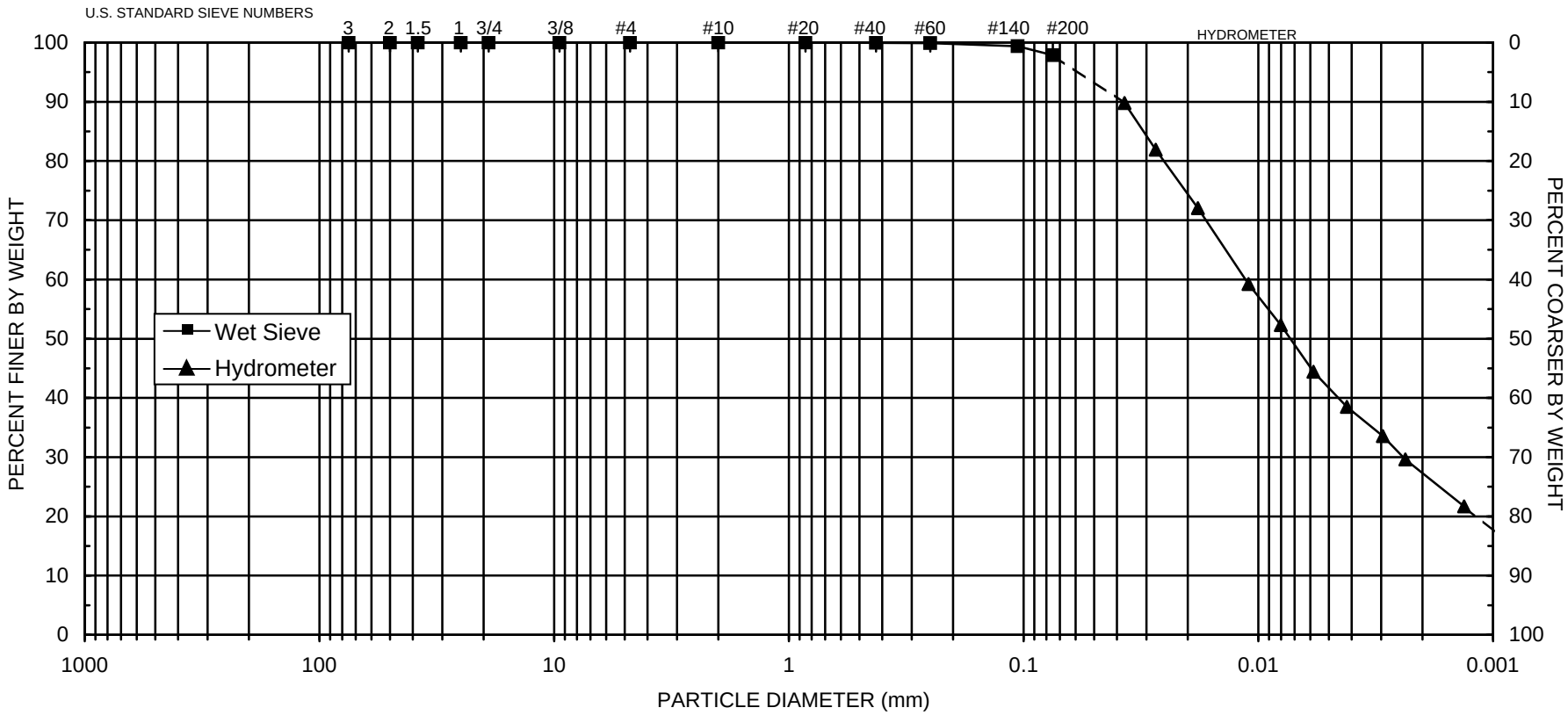
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.69
Initial Wt. (g)*:* 50.16
Total Sample Wt. (g)*:* 170.58
Wt. Passing #10 (g): 170.58

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
13-Mar-12	1	20.8	52.0	6.5	45.5	7.8	0.03712	89.8	89.8
	2	20.8	48.0	6.5	41.5	8.4	0.02733	81.9	81.9
	5	20.8	43.0	6.5	36.5	9.3	0.01811	72.0	72.0
	15	20.9	36.5	6.5	30.0	10.3	0.01103	59.2	59.2
	30	20.9	33.0	6.5	26.5	10.9	0.00801	52.3	52.3
	60	21.0	29.0	6.5	22.5	11.5	0.00582	44.4	44.4
	120	21.2	26.0	6.5	19.5	12.0	0.00420	38.5	38.5
	250	21.6	23.0	6.0	17.0	12.5	0.00295	33.6	33.6
	395	22.1	21.0	6.0	15.0	12.9	0.00236	29.6	29.6
14-Mar-12	1355	20.7	17.5	6.5	11.0	13.4	0.00133	21.7	21.7

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00056**	d_{30} = **0.0024**	d_{50} = **0.0073**	d_{60} = **0.011**	C_u = **20**	C_c = **0.94**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (334-335)	**334-335**	**Fat clay (CH)**	**Silty Clay Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350
Test Date: 20-Mar-12

Initial Dry Weight of Sample (g): 208.06
Weight Passing #10 (g): 208.06
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.13
Calculated Weight of Sieve Sample (g): 50.13

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	208.06	100.00
	2"	50	0.00	0.00	208.06	100.00
	1.5"	38.1	0.00	0.00	208.06	100.00
	1"	25	0.00	0.00	208.06	100.00
	3/4"	19.0	0.00	0.00	208.06	100.00
	3/8"	9.5	0.00	0.00	208.06	100.00
	4	4.75	0.00	0.00	208.06	100.00
	10	2.00	0.00	0.00	208.06	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	50.12	99.98
	40	0.425	0.01	0.02	50.11	99.96
	60	0.250	0.01	0.03	50.10	99.94
	140	0.106	0.24	0.27	49.86	99.46
	200	0.075	0.35	0.62	49.51	98.76
	dry pan		0.09	0.71	49.42	
	wet pan			49.42	0.00	

d_{10} (mm): 0.00070
d_{16} (mm): 0.0011
d_{30} (mm): 0.0031
d_{50} (mm): 0.0083
d_{60} (mm): 0.012
d_{84} (mm): 0.032

Median Particle Diameter --d_{50} (mm): 0.0083
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 17
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.1
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.014

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CH

ASTM Soil Classification: Fat clay (CH)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350
Test Date: 23-Feb-12
Start Time: 9:00

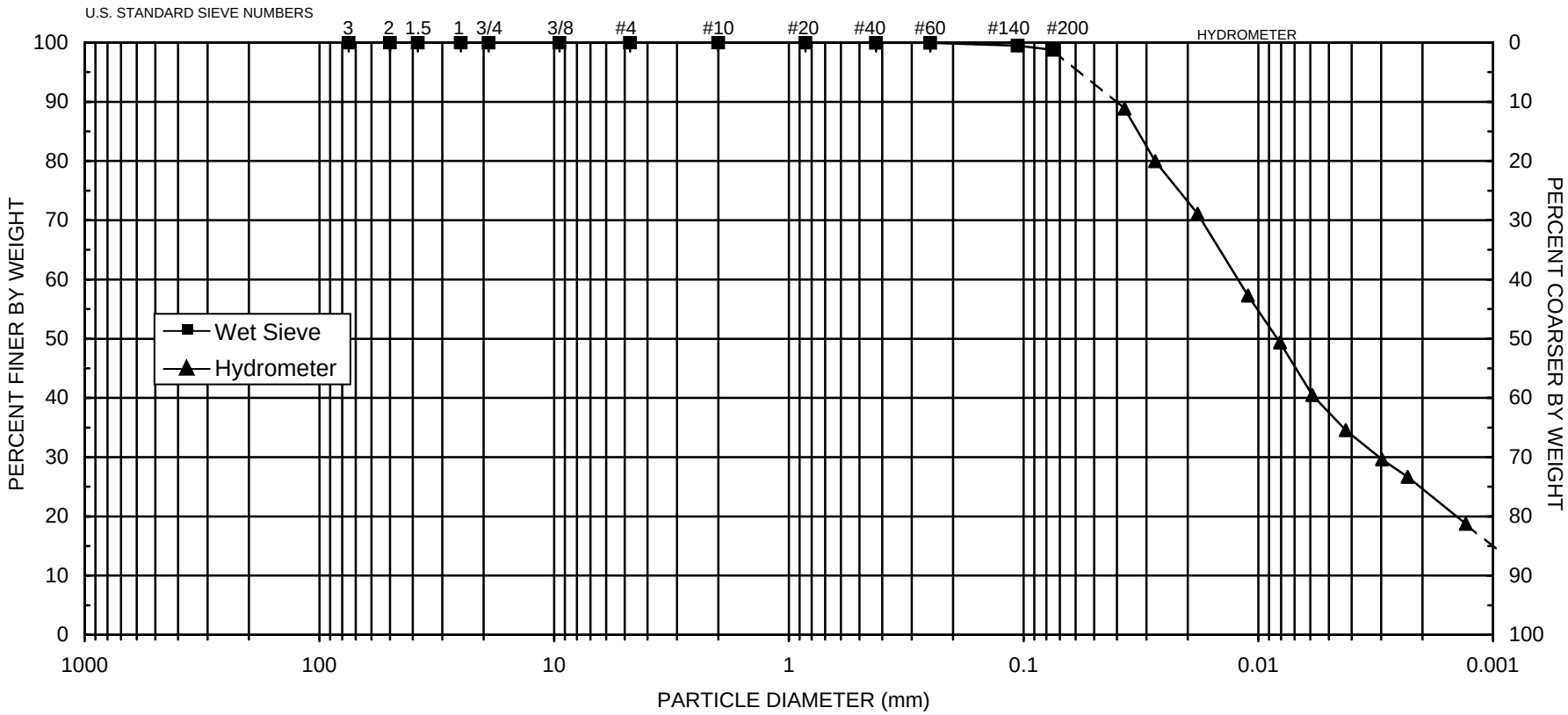
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.70
Initial Wt. (g)*:* 50.13
Total Sample Wt. (g)*:* 208.06
Wt. Passing #10 (g): 208.06

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
23-Feb-12	1	20.9	51.5	6.5	45.0	7.9	0.03718	88.9	88.9
	2	20.9	47.0	6.5	40.5	8.6	0.02750	80.0	80.0
	5	20.9	42.5	6.5	36.0	9.3	0.01812	71.1	71.1
	15	20.9	35.5	6.5	29.0	10.5	0.01109	57.3	57.3
	30	20.9	31.5	6.5	25.0	11.1	0.00808	49.4	49.4
	60	21.0	27.0	6.5	20.5	11.9	0.00589	40.5	40.5
	120	21.2	24.0	6.5	17.5	12.4	0.00424	34.6	34.6
	250	21.8	21.0	6.0	15.0	12.9	0.00298	29.6	29.6
	420	22.0	19.5	6.0	13.5	13.1	0.00231	26.7	26.7
24-Feb-12	1380	21.7	16.0	6.5	9.5	13.7	0.00131	18.8	18.8

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00070**	d_{30} = **0.0031**	d_{50} = **0.0083**	d_{60} = **0.012**	C_u = **17**	C_c = **1.1**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-12 (349-350)	**349-350**	**Fat clay (CH)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (279-280)
Date Sampled: 12/7/2011
Depth: 279-280
Test Date: 6-Mar-12

Initial Dry Weight of Sample (g): 183.24
Weight Passing #10 (g): 183.24
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 48.57
Calculated Weight of Sieve Sample (g): 48.57

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	183.24	100.00
	2"	50	0.00	0.00	183.24	100.00
	1.5"	38.1	0.00	0.00	183.24	100.00
	1"	25	0.00	0.00	183.24	100.00
	3/4"	19.0	0.00	0.00	183.24	100.00
	3/8"	9.5	0.00	0.00	183.24	100.00
	4	4.75	0.00	0.00	183.24	100.00
	10	2.00	0.00	0.00	183.24	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.03	0.03	48.54	99.94
	40	0.425	0.09	0.12	48.45	99.75
	60	0.250	0.28	0.40	48.17	99.18
	140	0.106	10.84	11.24	37.33	76.86
	200	0.075	9.54	20.78	27.79	57.22
	dry pan		1.74	22.52	26.05	
	wet pan			26.05	0.00	

d_{10} (mm): 0.0064
d_{16} (mm): 0.015
d_{30} (mm): 0.036
d_{50} (mm): 0.062
d_{60} (mm): 0.079
d_{84} (mm): 0.14

Median Particle Diameter --d_{50} (mm): 0.062
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 12
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 2.6
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.072

Classification of fines (visual method): ML

ASTM Soil Classification: Sandy silt s(ML)
USDA Soil Classification: Sandy Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (279-280)
Date Sampled: 12/7/2011
Depth: 279-280
Test Date: 1-Mar-12
Start Time: 9:06

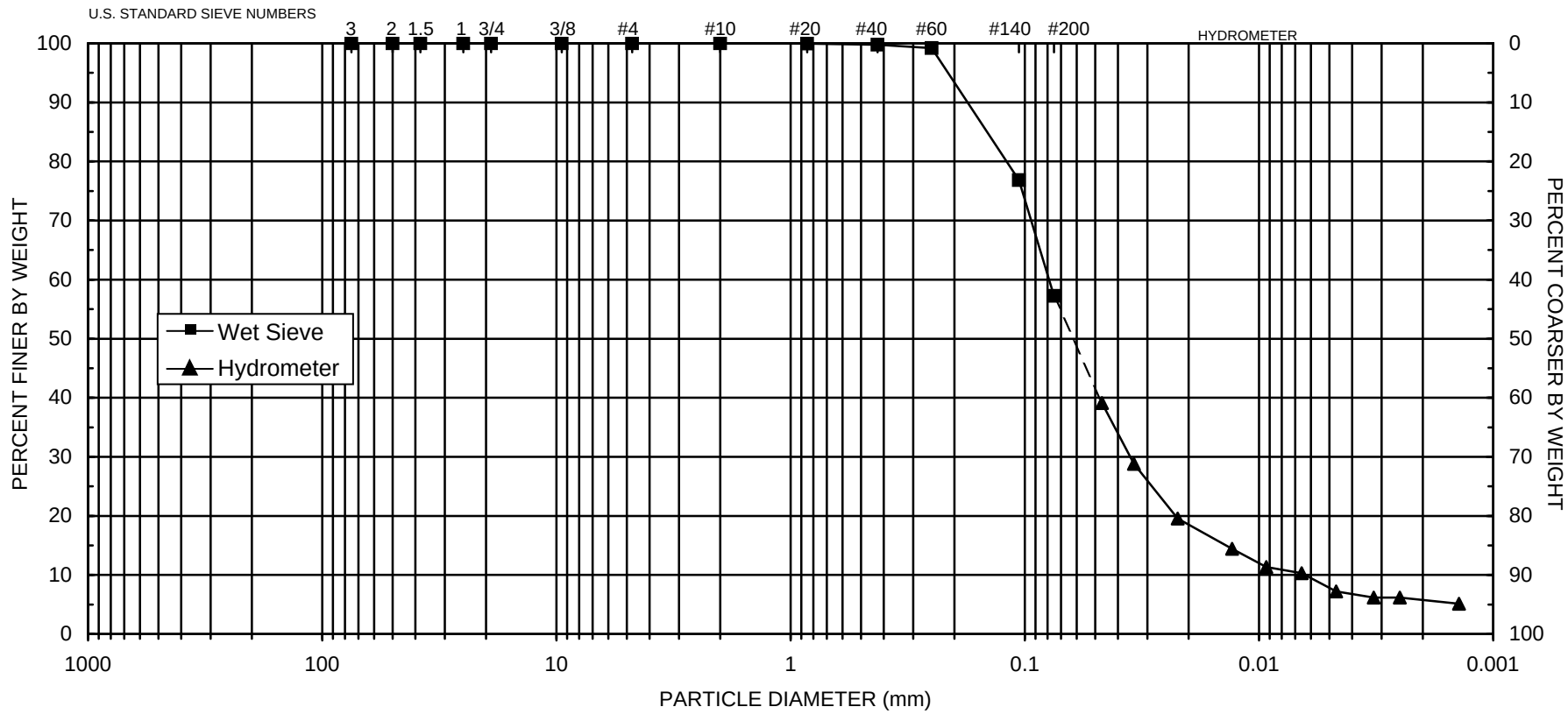
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.66
Initial Wt. (g)*:* 48.57
Total Sample Wt. (g)*:* 183.24
Wt. Passing #10 (g): 183.24

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
1-Mar-12	1	20.7	25.5	6.5	19.0	12.1	0.04688	39.1	39.1
	2	20.7	20.5	6.5	14.0	12.9	0.03425	28.8	28.8
	5	20.7	16.0	6.5	9.5	13.7	0.02227	19.6	19.6
	15	20.8	13.5	6.5	7.0	14.1	0.01303	14.4	14.4
	30	20.8	12.0	6.5	5.5	14.3	0.00930	11.3	11.3
	60	20.9	11.5	6.5	5.0	14.4	0.00658	10.3	10.3
	120	21.1	10.0	6.5	3.5	14.7	0.00468	7.2	7.2
	250	21.8	9.0	6.0	3.0	14.8	0.00324	6.2	6.2
	415	22.1	9.0	6.0	3.0	14.8	0.00250	6.2	6.2
2-Mar-12	1375	20.7	9.0	6.5	2.5	14.8	0.00140	5.1	5.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0064**	d_{30} = **0.036**	d_{50} = **0.062**	d_{60} = **0.079**	C_u = **12**	C_c = **2.6**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (279-280)	**279-280**	**Sandy silt s(ML)**	**Sandy Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350
Test Date: 20-Mar-12

Initial Dry Weight of Sample (g): 213.91
Weight Passing #10 (g): 213.91
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.92
Calculated Weight of Sieve Sample (g): 49.92

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	213.91	100.00
	2"	50	0.00	0.00	213.91	100.00
	1.5"	38.1	0.00	0.00	213.91	100.00
	1"	25	0.00	0.00	213.91	100.00
	3/4"	19.0	0.00	0.00	213.91	100.00
	3/8"	9.5	0.00	0.00	213.91	100.00
	4	4.75	0.00	0.00	213.91	100.00
	10	2.00	0.00	0.00	213.91	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	49.92	100.00
	40	0.425	0.01	0.01	49.91	99.98
	60	0.250	0.01	0.02	49.90	99.96
	140	0.106	2.21	2.23	47.69	95.53
	200	0.075	5.57	7.80	42.12	84.38
	dry pan		1.17	8.97	40.95	
	wet pan			40.95	0.00	

d_{10} (mm): 0.0023
d_{16} (mm): 0.0050
d_{30} (mm): 0.012
d_{50} (mm): 0.030
d_{60} (mm): 0.039
d_{84} (mm): 0.074

Median Particle Diameter --d_{50} (mm): 0.030
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 17
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.6
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.036

Classification of fines (visual method): ML

ASTM Soil Classification: Silt with sand (ML)s
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350
Test Date: 13-Mar-12
Start Time: 9:48

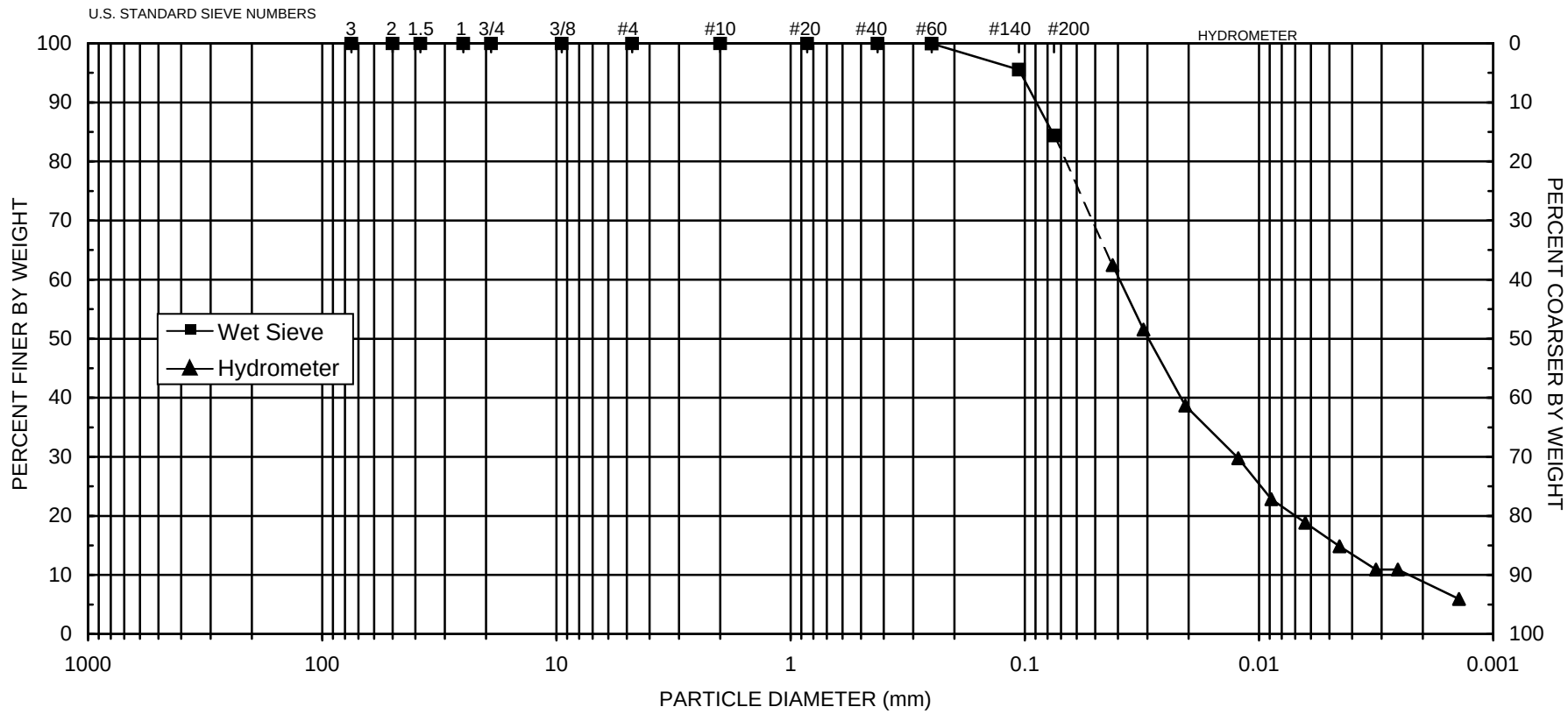
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.69
Initial Wt. (g)*:* 49.92
Total Sample Wt. (g)*:* 213.91
Wt. Passing #10 (g): 213.91

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
13-Mar-12	1	20.9	38.0	6.5	31.5	10.1	0.04220	62.5	62.5
	2	20.9	32.5	6.5	26.0	11.0	0.03115	51.6	51.6
	5	20.9	26.0	6.5	19.5	12.0	0.02063	38.7	38.7
	15	20.9	21.5	6.5	15.0	12.8	0.01227	29.7	29.7
	30	21.0	18.0	6.5	11.5	13.3	0.00886	22.8	22.8
	60	21.0	16.0	6.5	9.5	13.7	0.00634	18.8	18.8
	120	21.2	14.0	6.5	7.5	14.0	0.00453	14.9	14.9
	250	21.7	11.5	6.0	5.5	14.4	0.00316	10.9	10.9
	380	22.1	11.5	6.0	5.5	14.4	0.00255	10.9	10.9
14-Mar-12	1340	20.7	9.5	6.5	3.0	14.7	0.00140	5.9	5.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0023**	d_{30} = **0.012**	d_{50} = **0.030**	d_{60} = **0.039**	C_u = **17**	C_c = **1.6**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (349-350)	**349-350**	**Silt with sand (ML)s**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (444-445)
Date Sampled: 12/7/2011
Depth: 444-445
Test Date: 6-Mar-12

Initial Dry Weight of Sample (g): 195.37
Weight Passing #10 (g): 195.37
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 47.66
Calculated Weight of Sieve Sample (g): 47.66
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	195.37	100.00
	2"	50	0.00	0.00	195.37	100.00
	1.5"	38.1	0.00	0.00	195.37	100.00
	1"	25	0.00	0.00	195.37	100.00
	3/4"	19.0	0.00	0.00	195.37	100.00
	3/8"	9.5	0.00	0.00	195.37	100.00
	4	4.75	0.00	0.00	195.37	100.00
	10	2.00	0.00	0.00	195.37	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.03	0.03	47.63	99.94
	40	0.425	0.03	0.06	47.60	99.87
	60	0.250	0.09	0.15	47.51	99.69
	140	0.106	0.53	0.68	46.98	98.57
	200	0.075	1.03	1.71	45.95	96.41
	dry pan		0.18	1.89	45.77	
	wet pan			45.77	0.00	

d_{10} (mm): 0.00097
d_{16} (mm): 0.0017
d_{30} (mm): 0.0053
d_{50} (mm): 0.012
d_{60} (mm): 0.017
d_{84} (mm): 0.054

Median Particle Diameter --d_{50} (mm): 0.012
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 18
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.7
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.023

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (444-445)
Date Sampled: 12/7/2011
Depth: 444-445
Test Date: 1-Mar-12
Start Time: 9:36

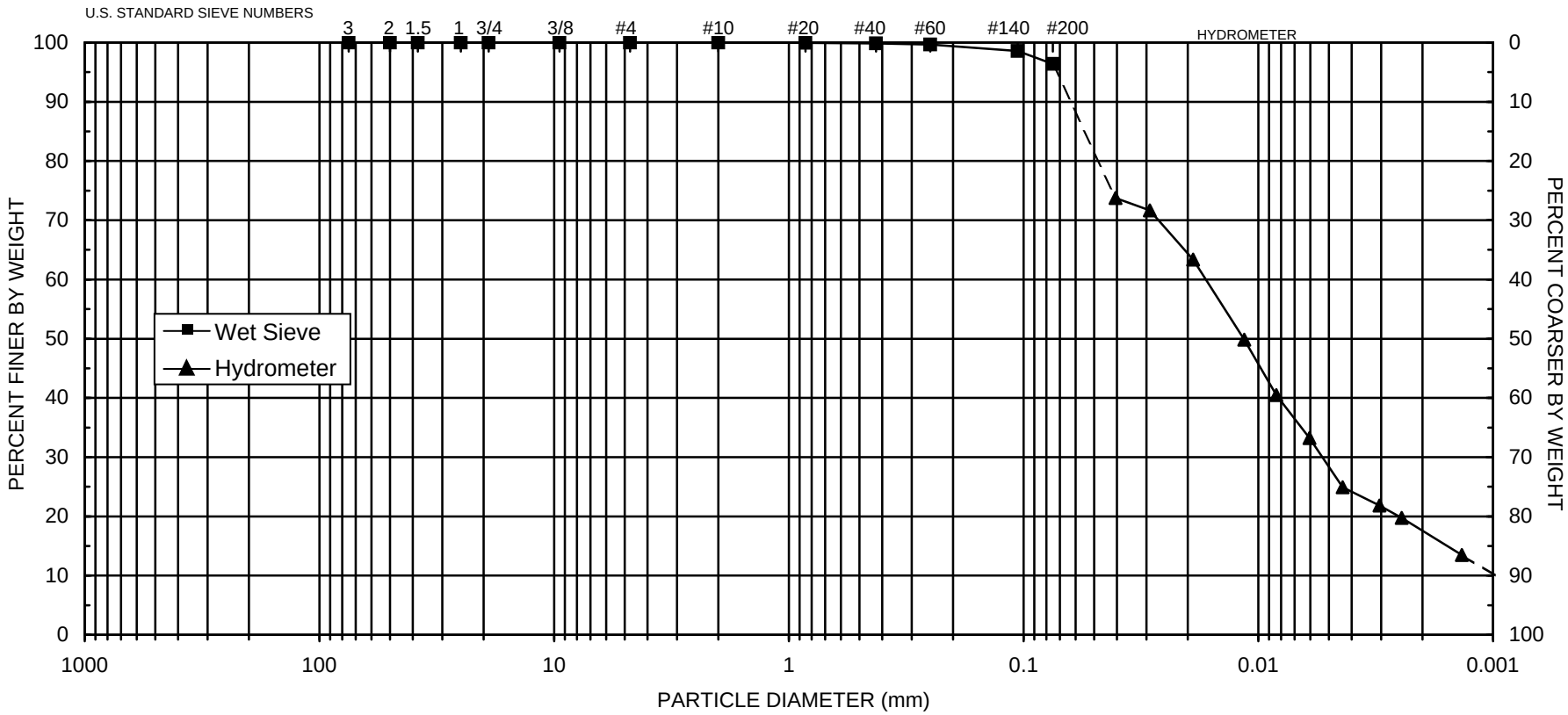
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.71
Initial Wt. (g)*:* 47.66
Total Sample Wt. (g)*:* 195.37
Wt. Passing #10 (g): 195.37

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
1-Mar-12	1	20.8	42.0	6.5	35.5	9.4	0.04061	73.7	73.7
	2	20.8	41.0	6.5	34.5	9.6	0.02897	71.7	71.7
	5	20.8	37.0	6.5	30.5	10.2	0.01894	63.4	63.4
	15	20.8	30.5	6.5	24.0	11.3	0.01149	49.9	49.9
	30	20.9	26.0	6.5	19.5	12.0	0.00837	40.5	40.5
	60	21.0	22.5	6.5	16.0	12.6	0.00605	33.2	33.2
	120	21.3	18.5	6.5	12.0	13.3	0.00437	24.9	24.9
	250	21.9	16.5	6.0	10.5	13.6	0.00305	21.8	21.8
	390	22.1	15.5	6.0	9.5	13.8	0.00245	19.7	19.7
2-Mar-12	1350	20.7	13.0	6.5	6.5	14.2	0.00136	13.5	13.5

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00097**	d_{30} = **0.0053**	d_{50} = **0.012**	d_{60} = **0.017**	C_u = **18**	C_c = **1.7**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (444-445)	**444-445**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (499-500)
Date Sampled: 12/7/2011
Depth: 499-500
Test Date: 21-Mar-12

Initial Dry Weight of Sample (g): 203.96
Weight Passing #10 (g): 203.96
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 46.52
Calculated Weight of Sieve Sample (g): 46.52
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	203.96	100.00
	2"	50	0.00	0.00	203.96	100.00
	1.5"	38.1	0.00	0.00	203.96	100.00
	1"	25	0.00	0.00	203.96	100.00
	3/4"	19.0	0.00	0.00	203.96	100.00
	3/8"	9.5	0.00	0.00	203.96	100.00
	4	4.75	0.00	0.00	203.96	100.00
	10	2.00	0.00	0.00	203.96	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	46.51	99.98
	40	0.425	0.02	0.03	46.49	99.94
	60	0.250	0.05	0.08	46.44	99.83
	140	0.106	0.31	0.39	46.13	99.16
	200	0.075	0.75	1.14	45.38	97.55
	dry pan		0.25	1.39	45.13	
	wet pan			45.13	0.00	

d_{10} (mm): 0.0012
d_{16} (mm): 0.0027
d_{30} (mm): 0.0069
d_{50} (mm): 0.018
d_{60} (mm): 0.023
d_{84} (mm): 0.047

Median Particle Diameter --d_{50} (mm): 0.018
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 19
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.7
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.023

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (499-500)
Date Sampled: 12/7/2011
Depth: 499-500
Test Date: 21-Feb-12
Start Time: 9:12

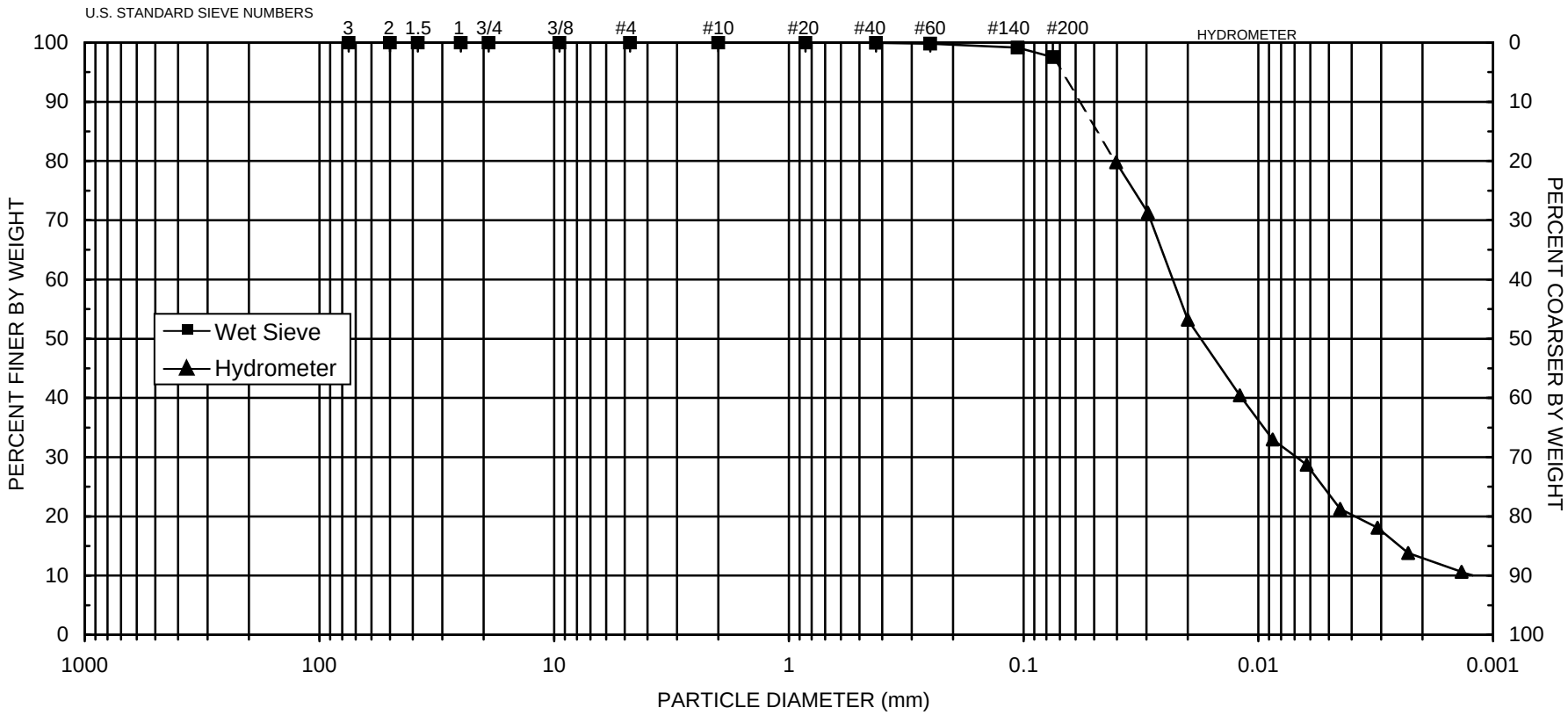
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.70
Initial Wt. (g)*:* 46.52
Total Sample Wt. (g)*:* 203.96
Wt. Passing #10 (g): 203.96

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
21-Feb-12	1	20.3	44.0	6.5	37.5	9.1	0.04031	79.8	79.8
	2	20.3	40.0	6.5	33.5	9.7	0.02952	71.3	71.3
	5	20.3	31.5	6.5	25.0	11.1	0.01996	53.2	53.2
	15	20.4	25.5	6.5	19.0	12.1	0.01201	40.4	40.4
	30	20.5	22.0	6.5	15.5	12.7	0.00868	33.0	33.0
	60	20.5	20.0	6.5	13.5	13.0	0.00622	28.7	28.7
	120	20.7	16.5	6.5	10.0	13.6	0.00448	21.3	21.3
	250	21.3	15.0	6.5	8.5	13.8	0.00311	18.1	18.1
	462	21.8	13.0	6.5	6.5	14.2	0.00230	13.8	13.8
22-Feb-12	1370	20.8	11.5	6.5	5.0	14.4	0.00136	10.6	10.6

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0012**	d_{30} = **0.0069**	d_{50} = **0.018**	d_{60} = **0.023**	C_u = **19**	C_c = **1.7**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (499-500)	**499-500**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (534-535)
Date Sampled: 12/7/2011
Depth: 534-535
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 260.53
Weight Passing #10 (g): 260.53
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.18
Calculated Weight of Sieve Sample (g): 50.18
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	260.53	100.00
	2"	50	0.00	0.00	260.53	100.00
	1.5"	38.1	0.00	0.00	260.53	100.00
	1"	25	0.00	0.00	260.53	100.00
	3/4"	19.0	0.00	0.00	260.53	100.00
	3/8"	9.5	0.00	0.00	260.53	100.00
	4	4.75	0.00	0.00	260.53	100.00
	10	2.00	0.00	0.00	260.53	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	50.18	100.00
	40	0.425	0.01	0.01	50.17	99.98
	60	0.250	0.07	0.08	50.10	99.84
	140	0.106	0.95	1.03	49.15	97.95
	200	0.075	1.79	2.82	47.36	94.38
	dry pan		0.34	3.16	47.02	
	wet pan			47.02	0.00	

d_{10} (mm): 0.0013
d_{16} (mm): 0.0025
d_{30} (mm): 0.0067
d_{50} (mm): 0.016
d_{60} (mm): 0.024
d_{84} (mm): 0.053

Median Particle Diameter --d_{50} (mm): 0.016
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 18
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.4
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.024

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines (visual method): ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (534-535)
Date Sampled: 12/7/2011
Depth: 534-535
Test Date: 22-Feb-12
Start Time: 9:30

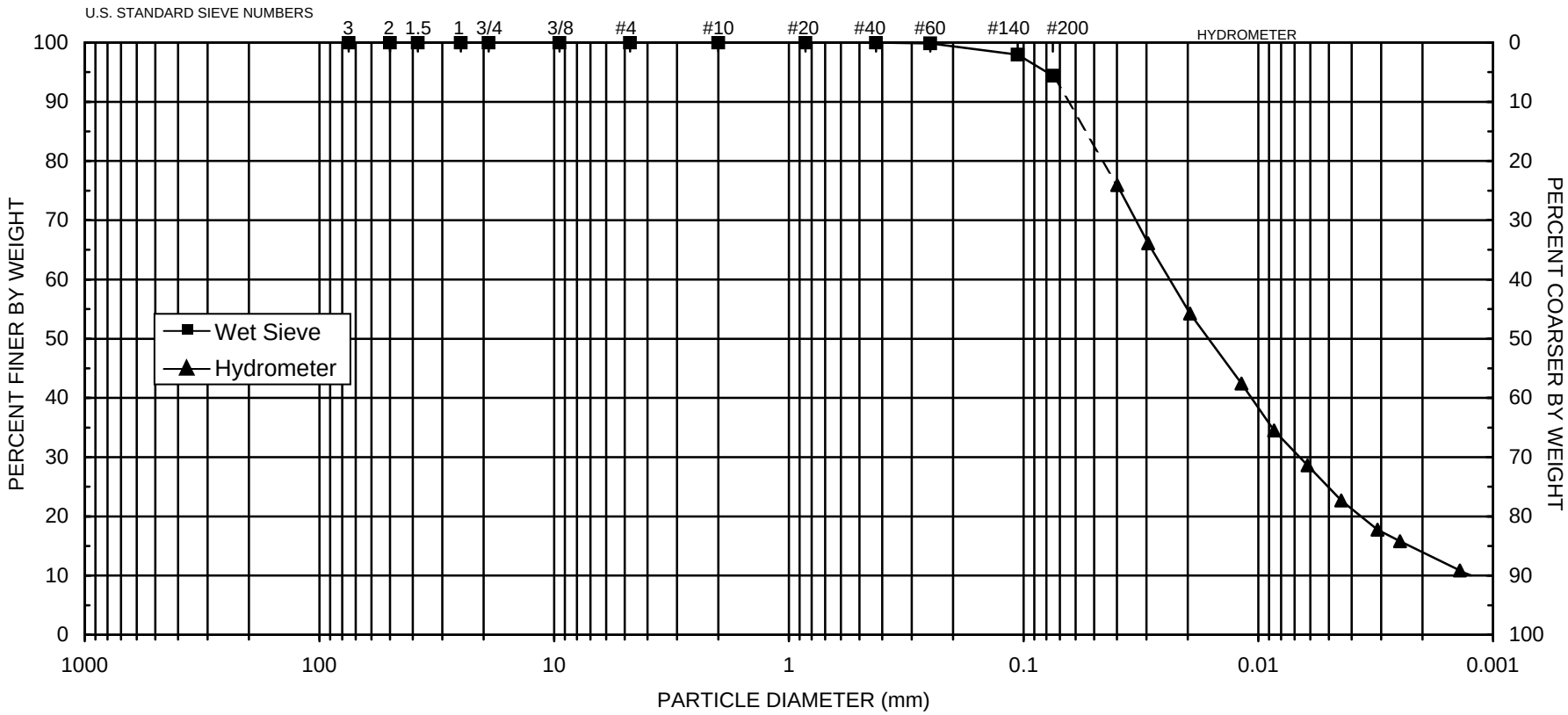
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.68
Initial Wt. (g)*:* 50.18
Total Sample Wt. (g)*:* 260.53
Wt. Passing #10 (g): 260.53

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
22-Feb-12	1	20.9	45.0	6.5	38.5	8.9	0.03989	76.0	76.0
	2	20.9	40.0	6.5	33.5	9.7	0.02948	66.1	66.1
	5	20.9	34.0	6.5	27.5	10.7	0.01956	54.3	54.3
	15	21.0	28.0	6.5	21.5	11.7	0.01179	42.4	42.4
	30	21.0	24.0	6.5	17.5	12.4	0.00856	34.5	34.5
	60	21.0	21.0	6.5	14.5	12.9	0.00617	28.6	28.6
	120	21.2	18.0	6.5	11.5	13.3	0.00444	22.7	22.7
	250	21.7	15.5	6.5	9.0	13.8	0.00310	17.8	17.8
	394	21.9	14.0	6.0	8.0	14.0	0.00249	15.8	15.8
23-Feb-12	1355	20.3	12.0	6.5	5.5	14.3	0.00138	10.9	10.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0013**	d_{30} = **0.0067**	d_{50} = **0.016**	d_{60} = **0.024**	C_u = **18**	C_c = **1.4**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (534-535)	**534-535**	**Silt (ML)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (554-555)
Date Sampled: 12/7/2011
Depth: 554-555
Test Date: 21-Mar-12

Initial Dry Weight of Sample (g): 211.29
Weight Passing #10 (g): 211.29
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 52.01
Calculated Weight of Sieve Sample (g): 52.01

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	211.29	100.00
	2"	50	0.00	0.00	211.29	100.00
	1.5"	38.1	0.00	0.00	211.29	100.00
	1"	25	0.00	0.00	211.29	100.00
	3/4"	19.0	0.00	0.00	211.29	100.00
	3/8"	9.5	0.00	0.00	211.29	100.00
	4	4.75	0.00	0.00	211.29	100.00
	10	2.00	0.00	0.00	211.29	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	52.01	100.00
	40	0.425	0.02	0.02	51.99	99.96
	60	0.250	0.05	0.07	51.94	99.87
	140	0.106	1.51	1.58	50.43	96.96
	200	0.075	1.28	2.86	49.15	94.50
	dry pan		0.15	3.01	49.00	
	wet pan			49.00	0.00	

d_{10} (mm): 0.0011
d_{16} (mm): 0.0024
d_{30} (mm): 0.0065
d_{50} (mm): 0.013
d_{60} (mm): 0.018
d_{84} (mm): 0.039

Median Particle Diameter --d_{50} (mm): 0.013
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 16
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.1
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.018

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (554-555)
Date Sampled: 12/7/2011
Depth: 554-555
Test Date: 25-Feb-12
Start Time: 8:36

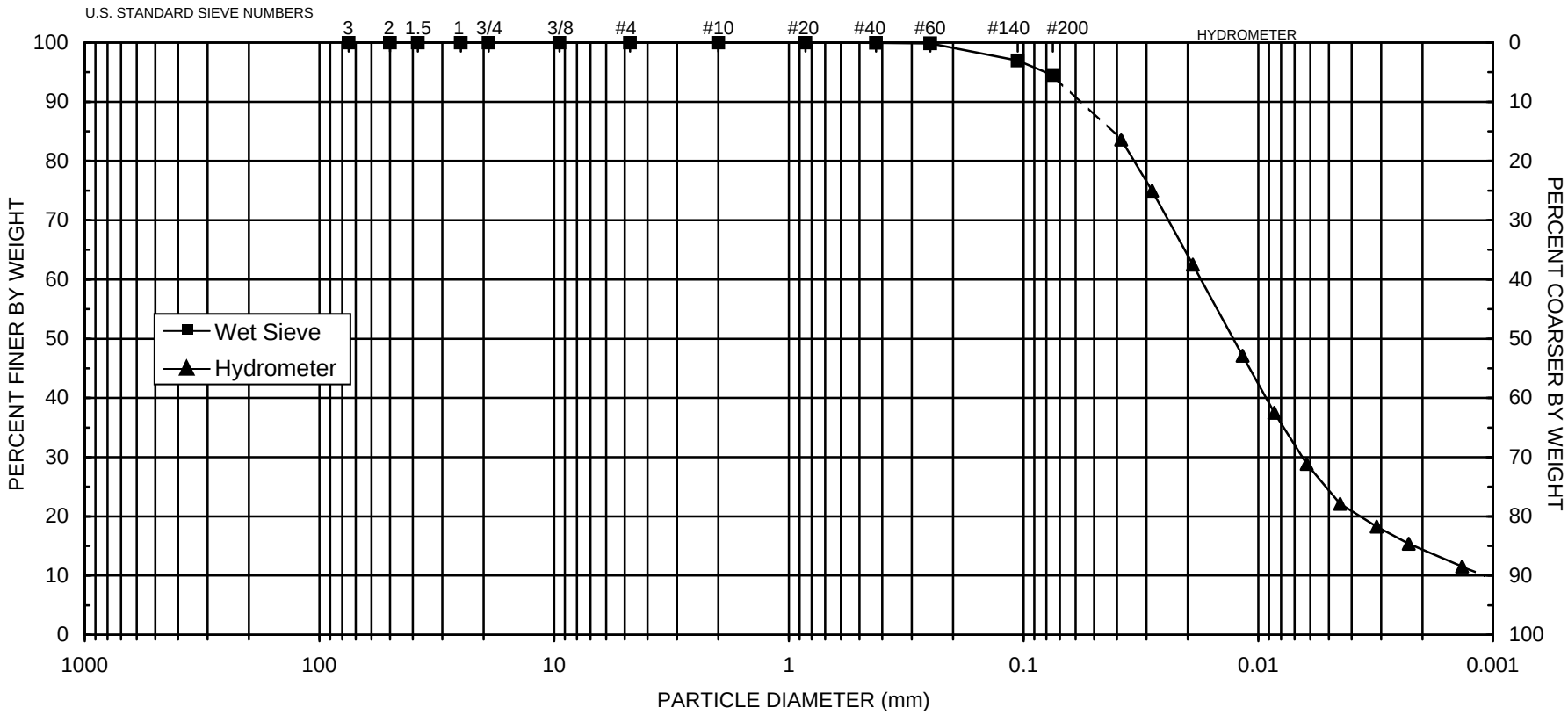
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.66
Initial Wt. (g)*:* 52.01
Total Sample Wt. (g)*:* 211.29
Wt. Passing #10 (g): 211.29

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
25-Feb-12	1	20.5	50.0	6.5	43.5	8.1	0.03844	83.6	83.6
	2	20.5	45.5	6.5	39.0	8.8	0.02839	75.0	75.0
	5	20.5	39.0	6.5	32.5	9.9	0.01901	62.5	62.5
	15	20.6	31.0	6.5	24.5	11.2	0.01166	47.1	47.1
	30	20.6	26.0	6.5	19.5	12.0	0.00854	37.5	37.5
	60	20.7	21.5	6.5	15.0	12.8	0.00622	28.8	28.8
	120	20.8	18.0	6.5	11.5	13.3	0.00449	22.1	22.1
	250	21.1	16.0	6.5	9.5	13.7	0.00314	18.3	18.3
	470	22.0	14.0	6.0	8.0	14.0	0.00229	15.4	15.4
26-Feb-12	1410	20.7	12.5	6.5	6.0	14.3	0.00135	11.5	11.5

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0011**	d_{30} = **0.0065**	d_{50} = **0.013**	d_{60} = **0.018**	C_u = **16**	C_c = **2.1**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (554-555)	**554-555**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (563-564)
Date Sampled: 12/7/2011
Depth: 563-564
Test Date: 20-Mar-12

Initial Dry Weight of Sample (g): 223.49
Weight Passing #10 (g): 223.49
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.75
Calculated Weight of Sieve Sample (g): 49.75
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	223.49	100.00
	2"	50	0.00	0.00	223.49	100.00
	1.5"	38.1	0.00	0.00	223.49	100.00
	1"	25	0.00	0.00	223.49	100.00
	3/4"	19.0	0.00	0.00	223.49	100.00
	3/8"	9.5	0.00	0.00	223.49	100.00
	4	4.75	0.00	0.00	223.49	100.00
	10	2.00	0.00	0.00	223.49	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	49.74	99.98
	40	0.425	0.02	0.03	49.72	99.94
	60	0.250	0.02	0.05	49.70	99.90
	140	0.106	0.39	0.44	49.31	99.12
	200	0.075	0.55	0.99	48.76	98.01
	dry pan		0.19	1.18	48.57	
	wet pan			48.57	0.00	

d_{10} (mm): 0.0011
d_{16} (mm): 0.0031
d_{30} (mm): 0.0070
d_{50} (mm): 0.013
d_{60} (mm): 0.017
d_{84} (mm): 0.033

Median Particle Diameter --d_{50} (mm): 0.013
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 15
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.6
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.016

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (563-564)
Date Sampled: 12/7/2011
Depth: 563-564
Test Date: 23-Feb-12
Start Time: 9:12

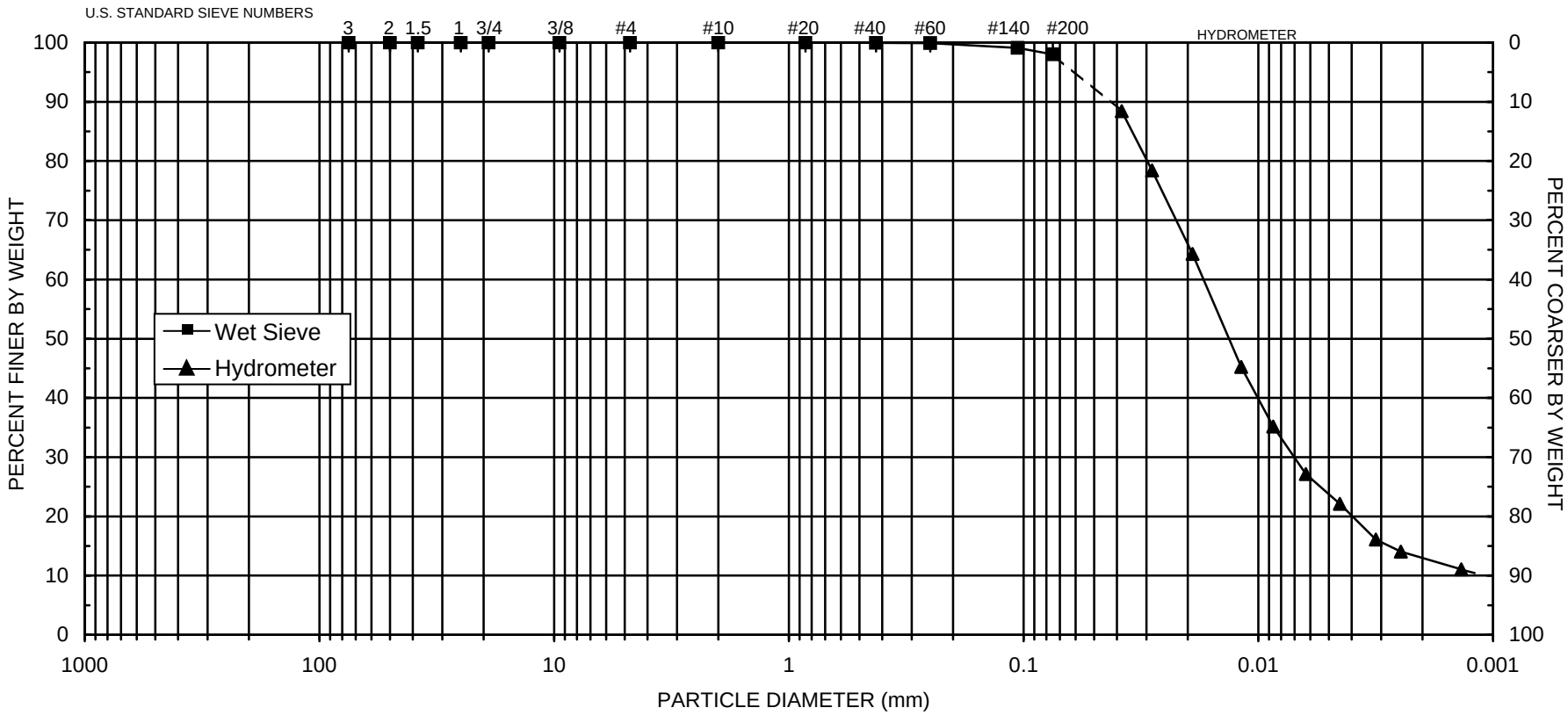
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.65
Initial Wt. (g)*:* 49.75
Total Sample Wt. (g)*:* 223.49
Wt. Passing #10 (g): 223.49

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
23-Feb-12	1	20.9	50.5	6.5	44.0	8.0	0.03817	88.4	88.4
	2	20.9	45.5	6.5	39.0	8.8	0.02834	78.4	78.4
	5	20.9	38.5	6.5	32.0	10.0	0.01905	64.3	64.3
	15	20.9	29.0	6.5	22.5	11.5	0.01182	45.2	45.2
	30	21.0	24.0	6.5	17.5	12.4	0.00864	35.2	35.2
	60	21.0	20.0	6.5	13.5	13.0	0.00627	27.1	27.1
	120	21.2	17.5	6.5	11.0	13.4	0.00449	22.1	22.1
	250	21.8	14.0	6.0	8.0	14.0	0.00316	16.1	16.1
	410	22.0	13.0	6.0	7.0	14.2	0.00247	14.1	14.1
24-Feb-12	1370	21.7	12.0	6.5	5.5	14.3	0.00137	11.1	11.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0011**	d_{30} = **0.0070**	d_{50} = **0.013**	d_{60} = **0.017**	C_u = **15**	C_c = **2.6**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (563-564)	**563-564**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (585-586)
Date Sampled: NA
Depth: 585-586
Test Date: 21-Mar-12

Initial Dry Weight of Sample (g): 228.68
Weight Passing #10 (g): 228.68
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 51.44
Calculated Weight of Sieve Sample (g): 51.44
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	228.68	100.00
	2"	50	0.00	0.00	228.68	100.00
	1.5"	38.1	0.00	0.00	228.68	100.00
	1"	25	0.00	0.00	228.68	100.00
	3/4"	19.0	0.00	0.00	228.68	100.00
	3/8"	9.5	0.00	0.00	228.68	100.00
	4	4.75	0.00	0.00	228.68	100.00
	10	2.00	0.00	0.00	228.68	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	51.44	100.00
	40	0.425	0.01	0.01	51.43	99.98
	60	0.250	0.01	0.02	51.42	99.96
	140	0.106	0.31	0.33	51.11	99.36
	200	0.075	0.69	1.02	50.42	98.02
	dry pan		0.21	1.23	50.21	
	wet pan			50.21	0.00	

d_{10} (mm): 0.00088
d_{16} (mm): 0.0028
d_{30} (mm): 0.0080
d_{50} (mm): 0.015
d_{60} (mm): 0.019
d_{84} (mm): 0.039

Median Particle Diameter --d_{50} (mm): 0.015
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 22
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 3.8
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.019

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines (visual method): ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (585-586)
Date Sampled: NA
Depth: 585-586
Test Date: 25-Feb-12
Start Time: 8:42

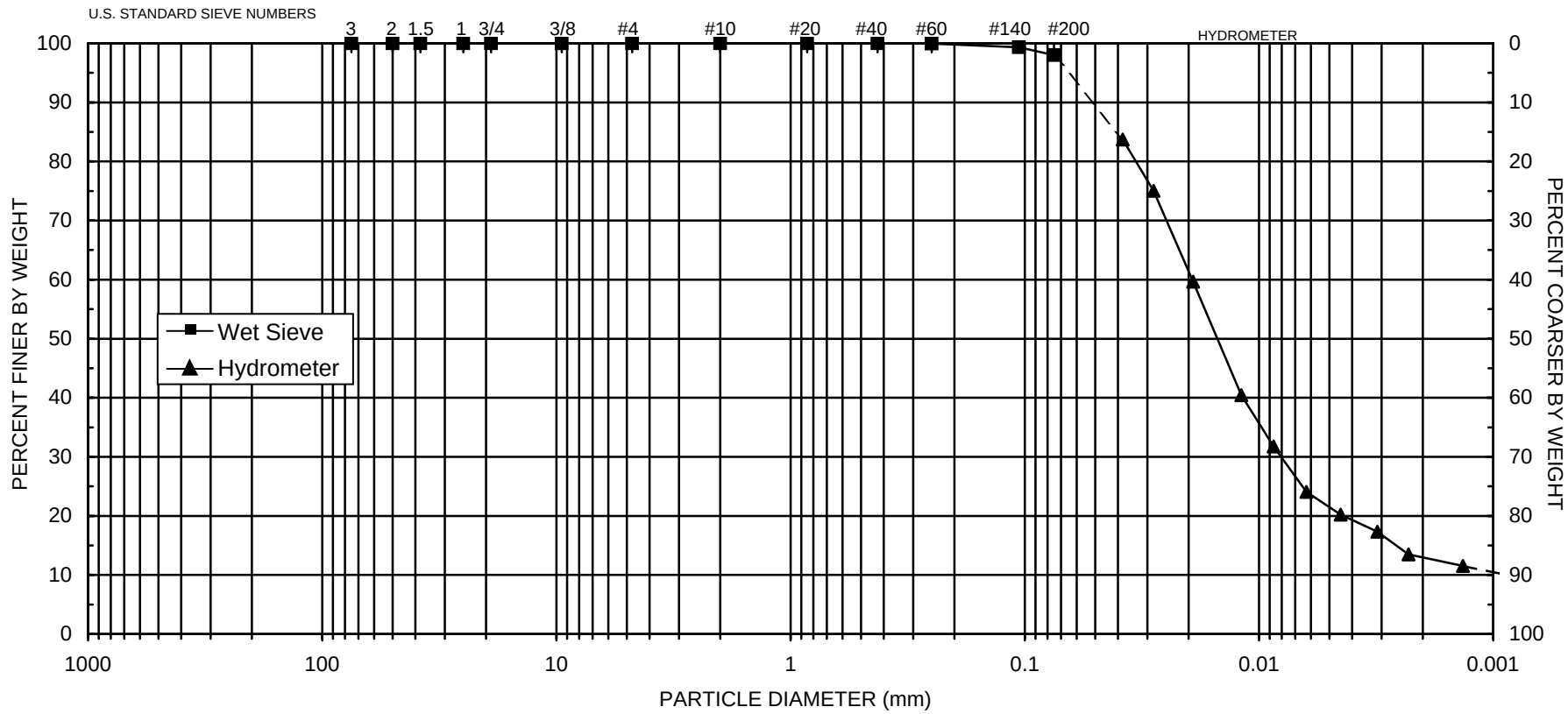
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.68
Initial Wt. (g)*:* 51.44
Total Sample Wt. (g)*:* 228.68
Wt. Passing #10 (g): 228.68

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
25-Feb-12	1	20.5	50.0	6.5	43.5	8.1	0.03820	83.7	83.7
	2	20.5	45.5	6.5	39.0	8.8	0.02821	75.1	75.1
	5	20.6	37.5	6.5	31.0	10.2	0.01910	59.7	59.7
	15	20.6	27.5	6.5	21.0	11.8	0.01188	40.4	40.4
	30	20.6	23.0	6.5	16.5	12.5	0.00866	31.8	31.8
	60	20.7	19.0	6.5	12.5	13.2	0.00628	24.1	24.1
	120	20.8	17.0	6.5	10.5	13.5	0.00449	20.2	20.2
	250	21.1	15.5	6.5	9.0	13.8	0.00313	17.3	17.3
	465	22.0	13.0	6.0	7.0	14.2	0.00230	13.5	13.5
26-Feb-12	1405	20.7	12.5	6.5	6.0	14.3	0.00135	11.5	11.5

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00088**	d_{30} = **0.0080**	d_{50} = **0.015**	d_{60} = **0.019**	C_u = **22**	C_c = **3.8**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (585-586)	**585-586**	**Silt (ML)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (604-605)
Date Sampled: NA
Depth: 604-605
Test Date: 21-Mar-12

Initial Dry Weight of Sample (g): 235.57
Weight Passing #10 (g): 235.57
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 47.42
Calculated Weight of Sieve Sample (g): 47.42

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	235.57	100.00
	2"	50	0.00	0.00	235.57	100.00
	1.5"	38.1	0.00	0.00	235.57	100.00
	1"	25	0.00	0.00	235.57	100.00
	3/4"	19.0	0.00	0.00	235.57	100.00
	3/8"	9.5	0.00	0.00	235.57	100.00
	4	4.75	0.00	0.00	235.57	100.00
	10	2.00	0.00	0.00	235.57	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	47.42	100.00
	40	0.425	0.02	0.02	47.40	99.96
	60	0.250	0.02	0.04	47.38	99.92
	140	0.106	1.22	1.26	46.16	97.34
	200	0.075	1.79	3.05	44.37	93.57
	dry pan		0.42	3.47	43.95	
	wet pan			43.95	0.00	

d_{10} (mm): 0.0019
d_{16} (mm): 0.0040
d_{30} (mm): 0.0086
d_{50} (mm): 0.016
d_{60} (mm): 0.020
d_{84} (mm): 0.044

Median Particle Diameter --d_{50} (mm): 0.016
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 11
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.9
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.021

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (604-605)
Date Sampled: NA
Depth: 604-605
Test Date: 21-Feb-12
Start Time: 9:00

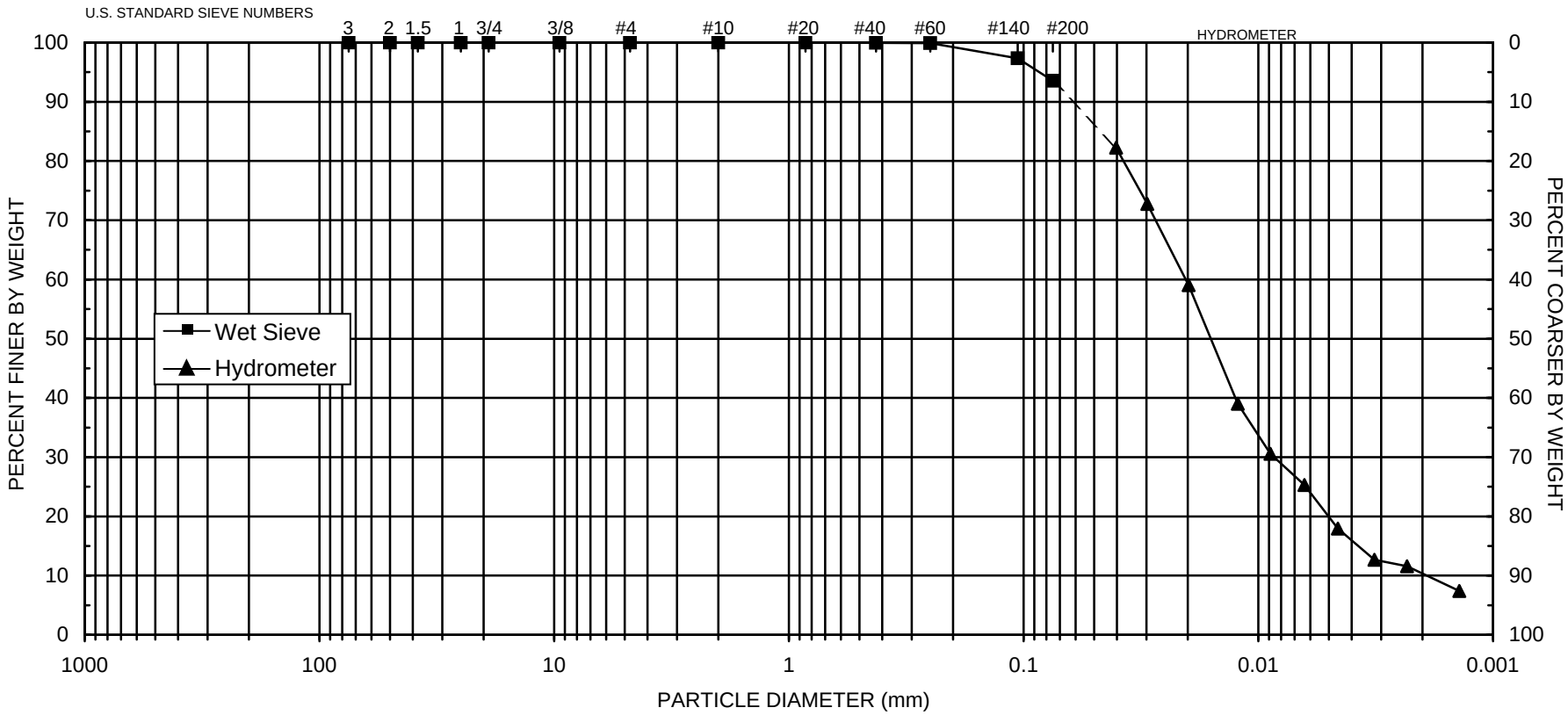
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.65
Initial Wt. (g)*:* 47.42
Total Sample Wt. (g)*:* 235.57
Wt. Passing #10 (g): 235.57

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
21-Feb-12	1	20.3	45.5	6.5	39.0	8.8	0.04036	82.2	82.2
	2	20.3	41.0	6.5	34.5	9.6	0.02970	72.8	72.8
	5	20.3	34.5	6.5	28.0	10.6	0.01980	59.0	59.0
	15	20.3	25.0	6.5	18.5	12.2	0.01224	39.0	39.0
	30	20.4	21.0	6.5	14.5	12.9	0.00887	30.6	30.6
	60	20.5	18.5	6.5	12.0	13.3	0.00637	25.3	25.3
	120	20.7	15.0	6.5	8.5	13.8	0.00459	17.9	17.9
	250	21.2	12.5	6.5	6.0	14.3	0.00321	12.7	12.7
	470	21.8	12.0	6.5	5.5	14.3	0.00233	11.6	11.6
22-Feb-12	1380	20.8	10.0	6.5	3.5	14.7	0.00139	7.4	7.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0019**	d_{30} = **0.0086**	d_{50} = **0.016**	d_{60} = **0.020**	C_u = **11**	C_c = **1.9**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (604-605)	**604-605**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (625-626)
Date Sampled: NA
Depth: 625-626
Test Date: 28-Feb-12

Initial Dry Weight of Sample (g): 151.78
Weight Passing #10 (g): 151.78
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 47.05
Calculated Weight of Sieve Sample (g): 47.05

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	151.78	100.00
	2"	50	0.00	0.00	151.78	100.00
	1.5"	38.1	0.00	0.00	151.78	100.00
	1"	25	0.00	0.00	151.78	100.00
	3/4"	19.0	0.00	0.00	151.78	100.00
	3/8"	9.5	0.00	0.00	151.78	100.00
	4	4.75	0.00	0.00	151.78	100.00
	10	2.00	0.00	0.00	151.78	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	47.05	100.00
	40	0.425	0.01	0.01	47.04	99.98
	60	0.250	0.03	0.04	47.01	99.91
	140	0.106	0.23	0.27	46.78	99.43
	200	0.075	0.43	0.70	46.35	98.51
	dry pan		0.18	0.88	46.17	
	wet pan			46.17	0.00	

d_{10} (mm): 0.0022
d_{16} (mm): 0.0046
d_{30} (mm): 0.0093
d_{50} (mm): 0.016
d_{60} (mm): 0.020
d_{84} (mm): 0.039

Median Particle Diameter --d_{50} (mm): 0.016
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 9.1
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.0
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.020

Classification of fines (visual method): ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (625-626)
Date Sampled: NA
Depth: 625-626
Test Date: 22-Feb-12
Start Time: 9:00

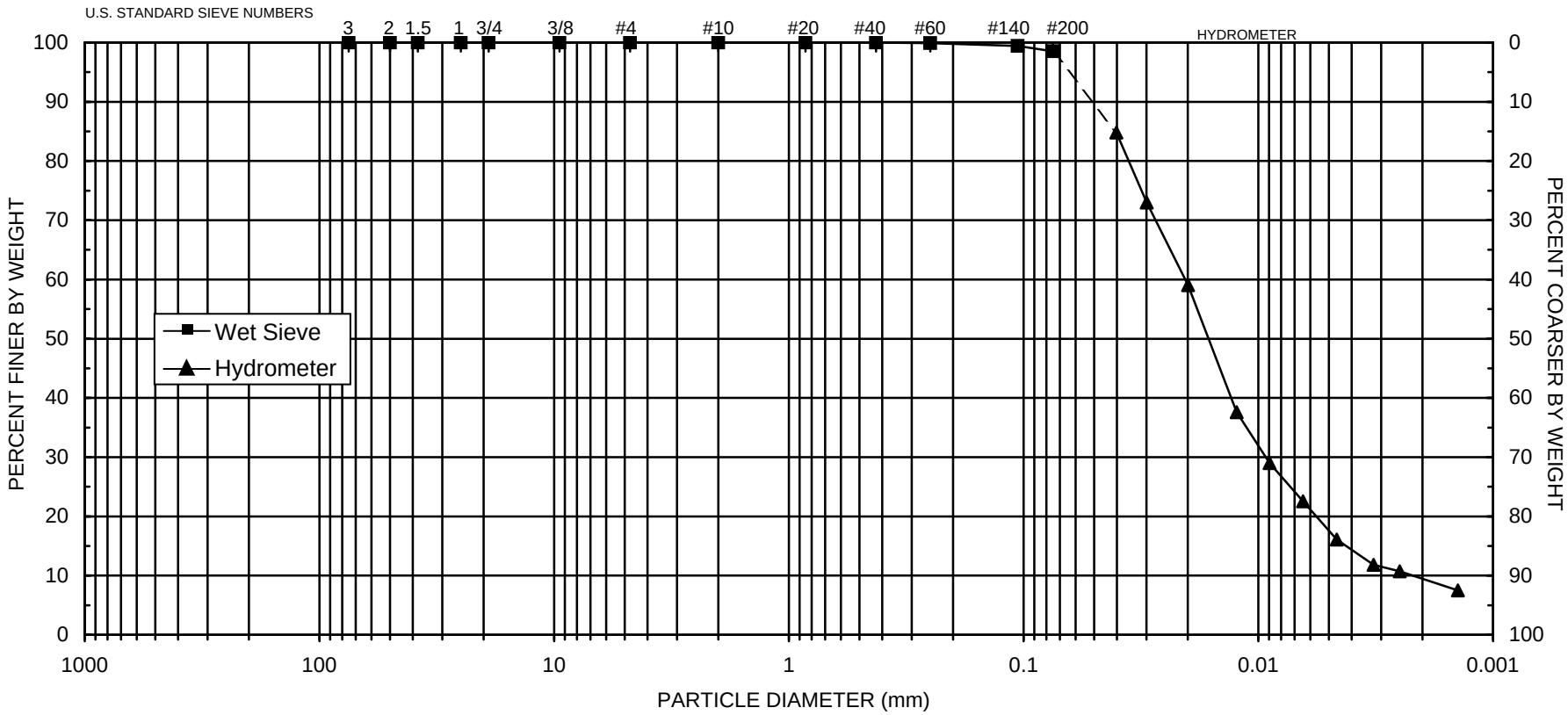
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.62
Initial Wt. (g)*:* 47.05
Total Sample Wt. (g)*:* 151.78
Wt. Passing #10 (g): 151.78

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
22-Feb-12	1	20.9	46.0	6.5	39.5	8.8	0.04026	84.8	84.8
	2	20.9	40.5	6.5	34.0	9.7	0.02990	73.0	73.0
	5	20.9	34.0	6.5	27.5	10.7	0.01992	59.0	59.0
	15	20.9	24.0	6.5	17.5	12.4	0.01235	37.6	37.6
	30	20.9	20.0	6.5	13.5	13.0	0.00896	29.0	29.0
	60	21.0	17.0	6.5	10.5	13.5	0.00645	22.5	22.5
	120	21.1	14.0	6.5	7.5	14.0	0.00464	16.1	16.1
	250	21.6	12.0	6.5	5.5	14.3	0.00323	11.8	11.8
	420	21.9	11.0	6.0	5.0	14.5	0.00250	10.7	10.7
23-Feb-12	1380	20.3	10.0	6.5	3.5	14.7	0.00141	7.5	7.5

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0022**	d_{30} = **0.0093**	d_{50} = **0.016**	d_{60} = **0.020**	C_u = **9.1**	C_c = **2.0**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (625-626)	**625-626**	**Silt (ML)**	**Silt**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (639-640)
Date Sampled: NA
Depth: 639-640
Test Date: 22-Mar-12

Initial Dry Weight of Sample (g): 317.52
Weight Passing #10 (g): 317.52
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.98
Calculated Weight of Sieve Sample (g): 49.98

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	317.52	100.00
	2"	50	0.00	0.00	317.52	100.00
	1.5"	38.1	0.00	0.00	317.52	100.00
	1"	25	0.00	0.00	317.52	100.00
	3/4"	19.0	0.00	0.00	317.52	100.00
	3/8"	9.5	0.00	0.00	317.52	100.00
	4	4.75	0.00	0.00	317.52	100.00
	10	2.00	0.00	0.00	317.52	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.76	0.76	49.22	98.48
	40	0.425	0.61	1.37	48.61	97.26
	60	0.250	0.34	1.71	48.27	96.58
	140	0.106	2.94	4.65	45.33	90.70
	200	0.075	3.60	8.25	41.73	83.49
	dry pan		0.38	8.63	41.35	
	wet pan			41.35	0.00	

d_{10} (mm): 0.0032
d_{16} (mm): 0.0065
d_{30} (mm): 0.013
d_{50} (mm): 0.027
d_{60} (mm): 0.037
d_{84} (mm): 0.077

Median Particle Diameter --d_{50} (mm): 0.027
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 12
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.4
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.037

Classification of fines: ML

ASTM Soil Classification: Silt with sand (ML)s
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (639-640)
Date Sampled: NA
Depth: 639-640
Test Date: 20-Mar-12
Start Time: 9:30

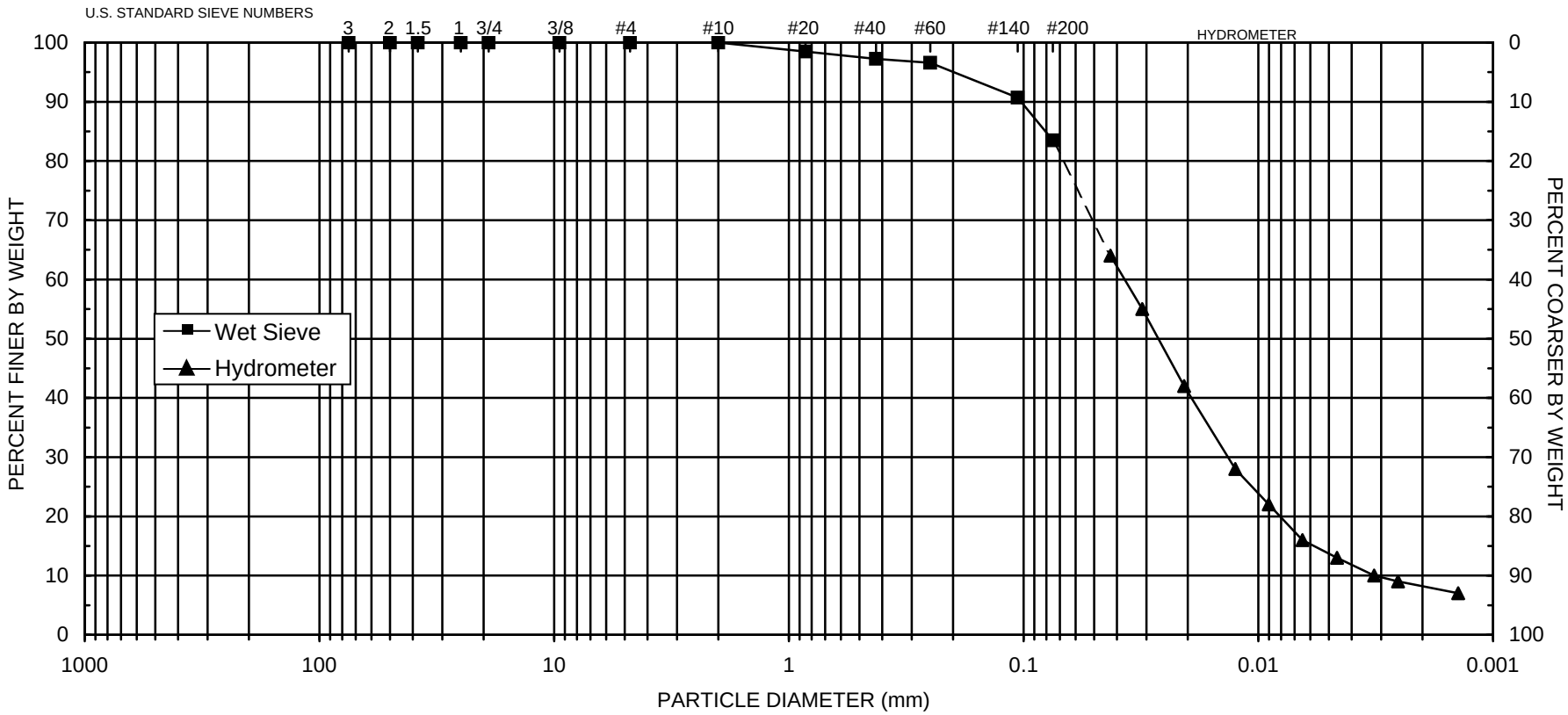
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.64
Initial Wt. (g)*:* 49.98
Total Sample Wt. (g)*:* 317.52
Wt. Passing #10 (g): 317.52

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Mar-12	1	21.0	38.5	6.5	32.0	10.0	0.04263	64.0	64.0
	2	21.0	34.0	6.5	27.5	10.7	0.03124	55.0	55.0
	5	21.0	27.5	6.5	21.0	11.8	0.02072	42.0	42.0
	15	21.0	20.5	6.5	14.0	12.9	0.01253	28.0	28.0
	30	21.0	17.5	6.5	11.0	13.4	0.00903	22.0	22.0
	60	21.1	14.5	6.5	8.0	13.9	0.00649	16.0	16.0
	120	21.2	13.0	6.5	6.5	14.2	0.00462	13.0	13.0
	250	21.9	11.0	6.0	5.0	14.5	0.00321	10.0	10.0
	400	22.2	10.5	6.0	4.5	14.6	0.00254	9.0	9.0
21-Mar-12	1355	20.7	10.0	6.5	3.5	14.7	0.00141	7.0	7.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND					SILT	CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0032**	d_{30} = **0.013**	d_{50} = **0.027**	d_{60} = **0.037**	C_u = **12**	C_c = **1.4**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (639-640)	**639-640**	**Silt with sand (ML)s**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (660-661)
Date Sampled: NA
Depth: 660-661
Test Date: 20-Mar-12

Initial Dry Weight of Sample (g): 203.67
Weight Passing #10 (g): 203.67
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.80
Calculated Weight of Sieve Sample (g): 49.80

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	203.67	100.00
	2"	50	0.00	0.00	203.67	100.00
	1.5"	38.1	0.00	0.00	203.67	100.00
	1"	25	0.00	0.00	203.67	100.00
	3/4"	19.0	0.00	0.00	203.67	100.00
	3/8"	9.5	0.00	0.00	203.67	100.00
	4	4.75	0.00	0.00	203.67	100.00
	10	2.00	0.00	0.00	203.67	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.04	0.04	49.76	99.92
	40	0.425	0.04	0.08	49.72	99.84
	60	0.250	0.05	0.13	49.67	99.74
	140	0.106	0.50	0.63	49.17	98.73
	200	0.075	1.16	1.79	48.01	96.41
	dry pan		0.19	1.98	47.82	
	wet pan			47.82	0.00	

d_{10} (mm): 0.0017
d_{16} (mm): 0.0041
d_{30} (mm): 0.0090
d_{50} (mm): 0.017
d_{60} (mm): 0.022
d_{84} (mm): 0.044

Median Particle Diameter --d_{50} (mm): 0.017
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 13
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 2.2
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.022

Classification of fines (visual method): ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (660-661)
Date Sampled: NA
Depth: 660-661
Test Date: 13-Mar-12
Start Time: 9:42

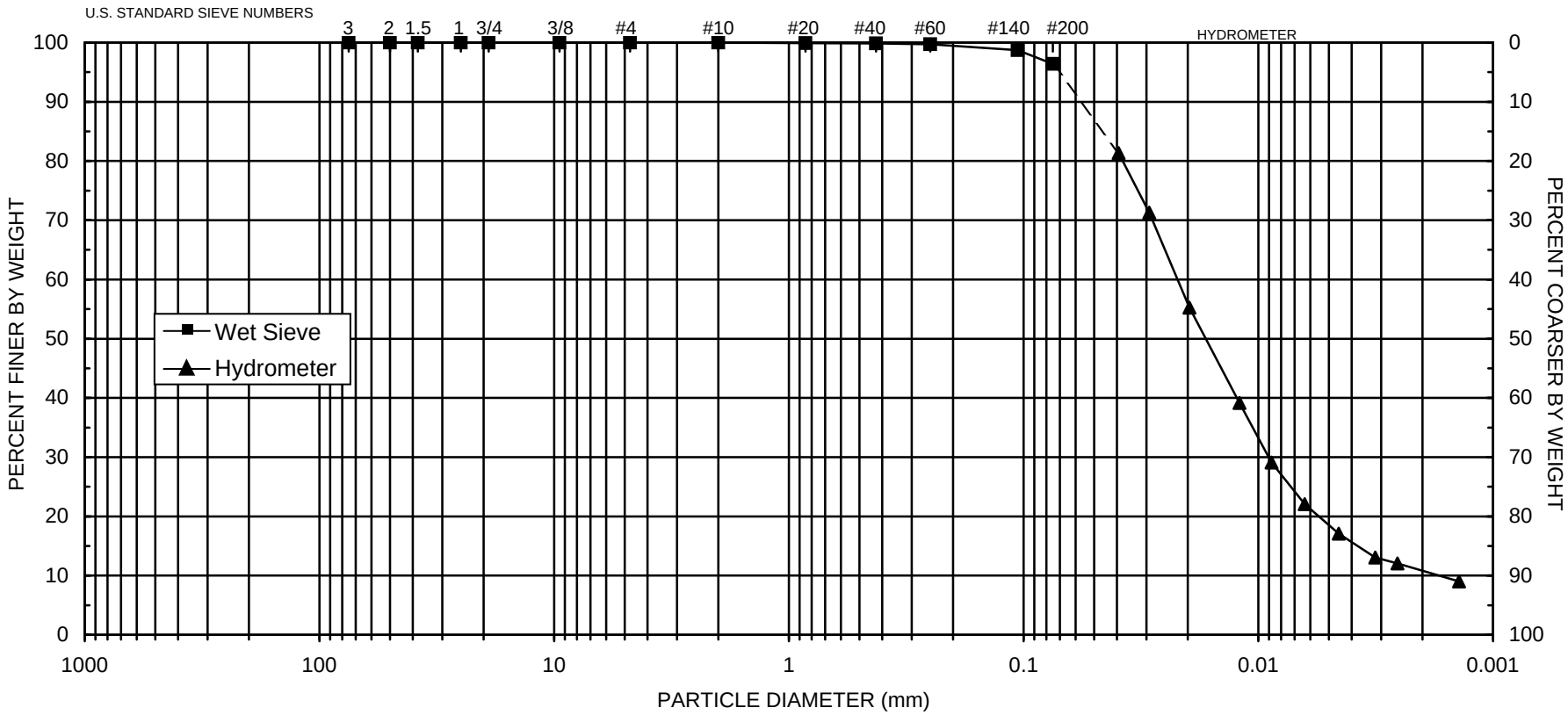
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.66
Initial Wt. (g)*:* 49.80
Total Sample Wt. (g)*:* 203.67
Wt. Passing #10 (g): 203.67

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
13-Mar-12	1	20.9	47.0	6.5	40.5	8.6	0.03935	81.3	81.3
	2	20.9	42.0	6.5	35.5	9.4	0.02912	71.3	71.3
	5	20.9	34.0	6.5	27.5	10.7	0.01966	55.2	55.2
	15	20.9	26.0	6.5	19.5	12.0	0.01202	39.2	39.2
	30	21.0	21.0	6.5	14.5	12.9	0.00878	29.1	29.1
	60	21.0	17.5	6.5	11.0	13.4	0.00634	22.1	22.1
	120	21.2	15.0	6.5	8.5	13.8	0.00454	17.1	17.1
	250	21.7	12.5	6.0	6.5	14.3	0.00317	13.1	13.1
	385	22.1	12.0	6.0	6.0	14.3	0.00255	12.0	12.0
14-Mar-12	1345	20.7	11.0	6.5	4.5	14.5	0.00140	9.0	9.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0017**	d_{30} = **0.0090**	d_{50} = **0.017**	d_{60} = **0.022**	C_u = **13**	C_c = **2.2**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-13 (660-661)	**660-661**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (294-295)
Date Sampled: 12/8/2011
Depth: 294-295
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 183.76
Weight Passing #10 (g): 183.76
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 52.45
Calculated Weight of Sieve Sample (g): 52.45
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	183.76	100.00
	2"	50	0.00	0.00	183.76	100.00
	1.5"	38.1	0.00	0.00	183.76	100.00
	1"	25	0.00	0.00	183.76	100.00
	3/4"	19.0	0.00	0.00	183.76	100.00
	3/8"	9.5	0.00	0.00	183.76	100.00
	4	4.75	0.00	0.00	183.76	100.00
	10	2.00	0.00	0.00	183.76	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.04	0.04	52.41	99.92
	40	0.425	0.02	0.06	52.39	99.89
	60	0.250	0.05	0.11	52.34	99.79
	140	0.106	0.36	0.47	51.98	99.10
	200	0.075	0.90	1.37	51.08	97.39
	dry pan		0.12	1.49	50.96	
	wet pan			50.96	0.00	

d_{10} (mm): 0.0010
d_{16} (mm): 0.0021
d_{30} (mm): 0.0060
d_{50} (mm): 0.011
d_{60} (mm): 0.015
d_{84} (mm): 0.031

Median Particle Diameter --d_{50} (mm): 0.011
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 15
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.4
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.015

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (294-295)
Date Sampled: 12/8/2011
Depth: 294-295
Test Date: 20-Feb-12
Start Time: 9:00

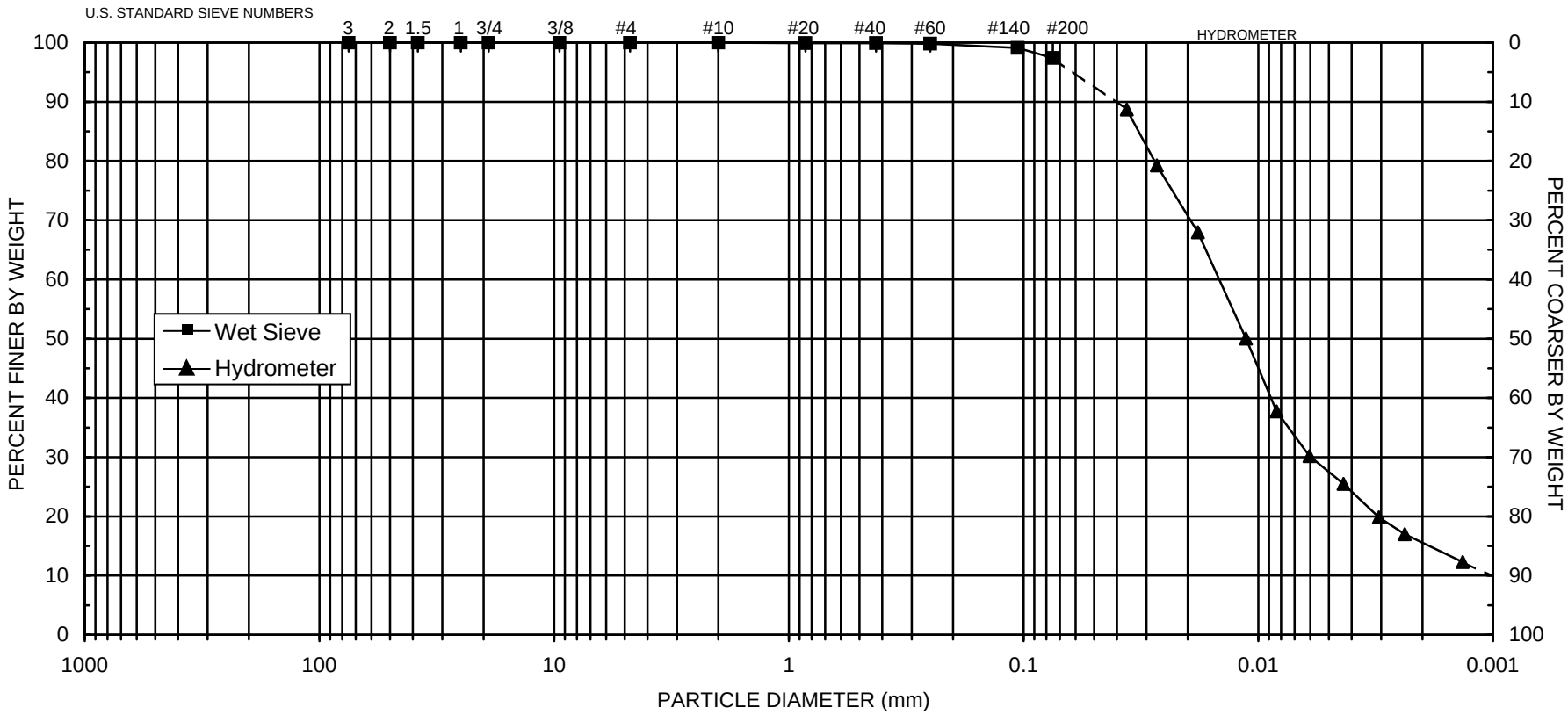
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.72
Initial Wt. (g)*:* 52.45
Total Sample Wt. (g)*:* 183.76
Wt. Passing #10 (g): 183.76

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-12	1	20.7	53.5	6.5	47.0	7.5	0.03634	88.7	88.7
	2	20.7	48.5	6.5	42.0	8.3	0.02706	79.3	79.3
	5	20.7	42.5	6.5	36.0	9.3	0.01809	68.0	68.0
	15	20.7	33.0	6.5	26.5	10.9	0.01128	50.0	50.0
	30	20.8	26.5	6.5	20.0	12.0	0.00835	37.8	37.8
	60	20.9	22.5	6.5	16.0	12.6	0.00606	30.2	30.2
	120	21.1	20.0	6.5	13.5	13.0	0.00434	25.5	25.5
	250	21.2	17.0	6.5	10.5	13.5	0.00306	19.8	19.8
	420	21.7	15.0	6.0	9.0	13.8	0.00238	17.0	17.0
21-Feb-12	1380	20.5	13.0	6.5	6.5	14.2	0.00135	12.3	12.3

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0010**	d_{30} = **0.0060**	d_{50} = **0.011**	d_{60} = **0.015**	C_u = **15**	C_c = **2.4**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (294-295)	**294-295**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (304-305)
Date Sampled: 12/8/2011
Depth: 304-305
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 194.21
Weight Passing #10 (g): 194.21
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.17
Calculated Weight of Sieve Sample (g): 49.17
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	194.21	100.00
	2"	50	0.00	0.00	194.21	100.00
	1.5"	38.1	0.00	0.00	194.21	100.00
	1"	25	0.00	0.00	194.21	100.00
	3/4"	19.0	0.00	0.00	194.21	100.00
	3/8"	9.5	0.00	0.00	194.21	100.00
	4	4.75	0.00	0.00	194.21	100.00
	10	2.00	0.00	0.00	194.21	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.04	0.04	49.13	99.92
	40	0.425	0.01	0.05	49.12	99.90
	60	0.250	0.02	0.07	49.10	99.86
	140	0.106	0.04	0.11	49.06	99.78
	200	0.075	0.11	0.22	48.95	99.55
	dry pan		0.04	0.26	48.91	
	wet pan			48.91	0.00	

d_{10} (mm): 0.00078
d_{16} (mm): 0.0017
d_{30} (mm): 0.0050
d_{50} (mm): 0.0094
d_{60} (mm): 0.012
d_{84} (mm): 0.023

Median Particle Diameter --d_{50} (mm): 0.0094
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 15
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.7
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.011

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (304-305)
Date Sampled: 12/8/2011
Depth: 304-305
Test Date: 25-Feb-12
Start Time: 8:30

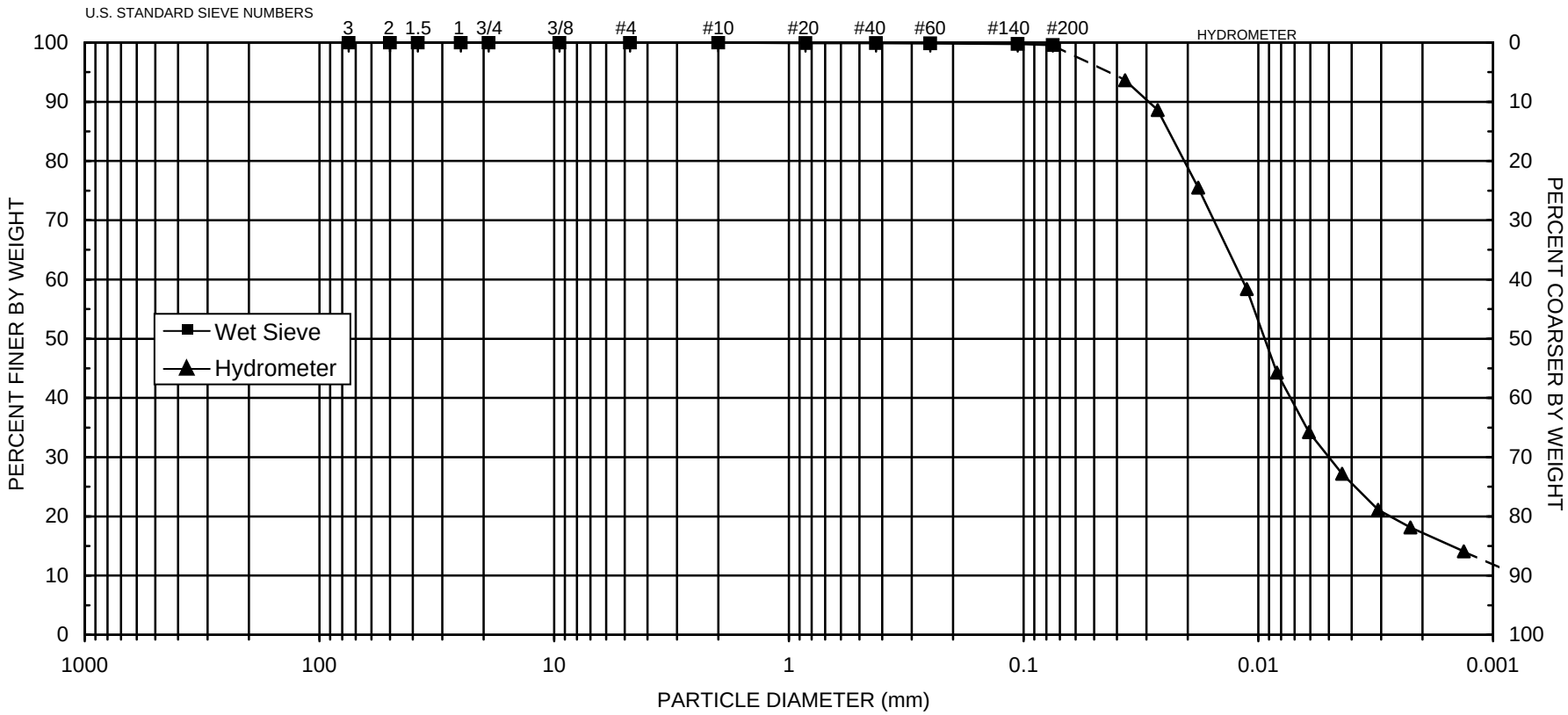
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.68
Initial Wt. (g)*:* 49.17
Total Sample Wt. (g)*:* 194.21
Wt. Passing #10 (g): 194.21

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
25-Feb-12	1	20.5	53.0	6.5	46.5	7.6	0.03697	93.6	93.6
	2	20.5	50.5	6.5	44.0	8.0	0.02683	88.6	88.6
	5	20.5	44.0	6.5	37.5	9.1	0.01806	75.5	75.5
	15	20.5	35.5	6.5	29.0	10.5	0.01120	58.4	58.4
	30	20.6	28.5	6.5	22.0	11.6	0.00833	44.3	44.3
	60	20.7	23.5	6.5	17.0	12.4	0.00609	34.2	34.2
	120	20.8	20.0	6.5	13.5	13.0	0.00440	27.2	27.2
	250	21.1	17.0	6.5	10.5	13.5	0.00309	21.1	21.1
	475	22.0	15.0	6.0	9.0	13.8	0.00225	18.1	18.1
26-Feb-12	1415	20.7	13.5	6.5	7.0	14.1	0.00133	14.1	14.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.00078**	d_{30} = **0.0050**	d_{50} = **0.0094**	d_{60} = **0.012**	C_u = **15**	C_c = **2.7**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (304-305)	**304-305**	**Lean clay (CL)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (532-533)
Date Sampled: 12/8/2011
Depth: 532-533
Test Date: 21-Mar-12

Initial Dry Weight of Sample (g): 195.09
Weight Passing #10 (g): 195.09
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.26
Calculated Weight of Sieve Sample (g): 49.26
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	195.09	100.00
	2"	50	0.00	0.00	195.09	100.00
	1.5"	38.1	0.00	0.00	195.09	100.00
	1"	25	0.00	0.00	195.09	100.00
	3/4"	19.0	0.00	0.00	195.09	100.00
	3/8"	9.5	0.00	0.00	195.09	100.00
	4	4.75	0.00	0.00	195.09	100.00
	10	2.00	0.00	0.00	195.09	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.05	0.05	49.21	99.90
	40	0.425	0.14	0.19	49.07	99.61
	60	0.250	0.60	0.79	48.47	98.40
	140	0.106	2.64	3.43	45.83	93.04
	200	0.075	2.98	6.41	42.85	86.99
	dry pan		0.55	6.96	42.30	
	wet pan			42.30	0.00	

d_{10} (mm): 0.0037
d_{16} (mm): 0.0063
d_{30} (mm): 0.015
d_{50} (mm): 0.028
d_{60} (mm): 0.035
d_{84} (mm): 0.067

Median Particle Diameter --d_{50} (mm): 0.028
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 9.5
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.7
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.034

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (532-533)
Date Sampled: 12/8/2011
Depth: 532-533
Test Date: 19-Mar-12
Start Time: 9:00

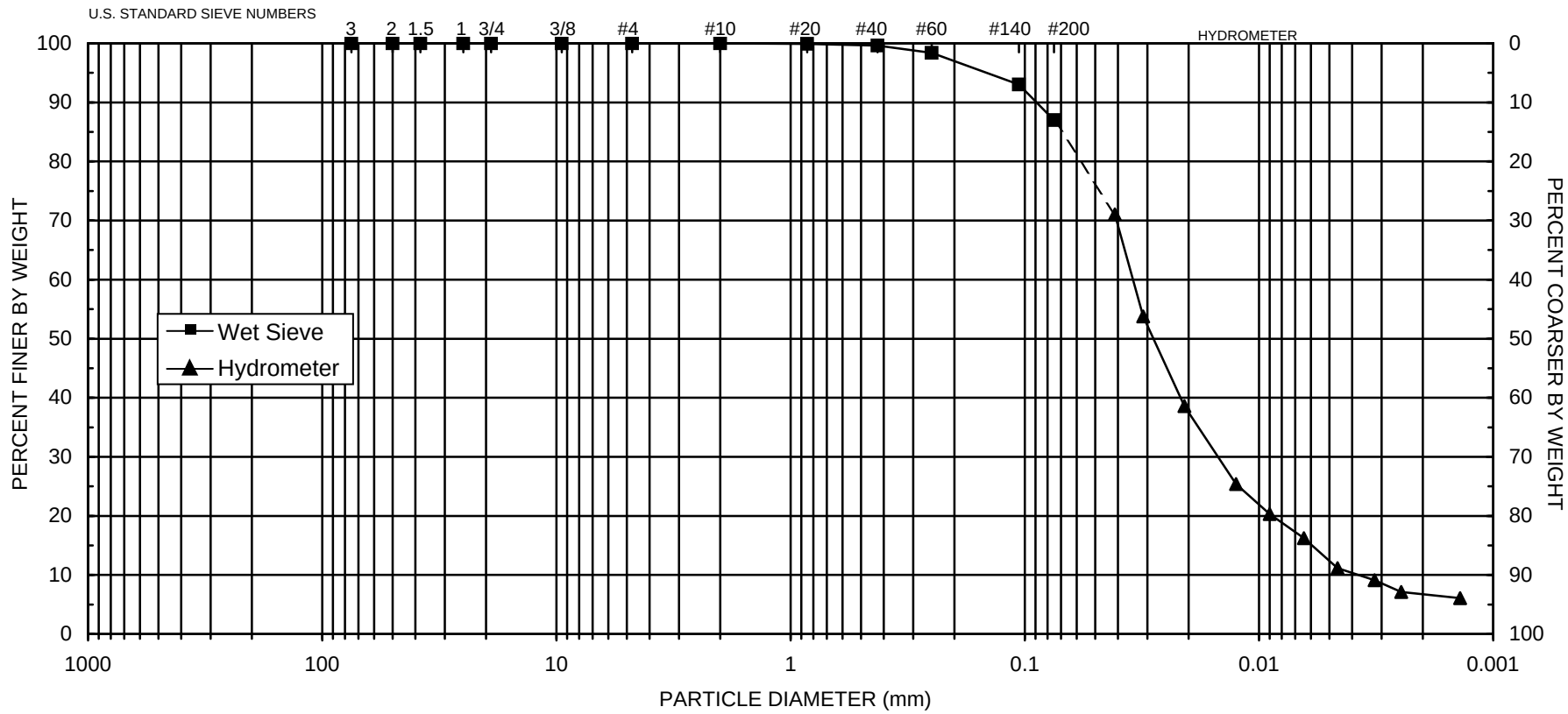
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.67
Initial Wt. (g)*:* 49.26
Total Sample Wt. (g)*:* 195.09
Wt. Passing #10 (g): 195.09

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
19-Mar-12	1	21.0	41.5	6.5	35.0	9.5	0.04124	71.1	71.1
	2	21.0	33.0	6.5	26.5	10.9	0.03123	53.8	53.8
	5	21.0	25.5	6.5	19.0	12.1	0.02083	38.6	38.6
	15	21.0	19.0	6.5	12.5	13.2	0.01255	25.4	25.4
	30	21.0	16.5	6.5	10.0	13.6	0.00901	20.3	20.3
	60	21.1	14.5	6.5	8.0	13.9	0.00644	16.2	16.2
	120	21.1	12.0	6.5	5.5	14.3	0.00462	11.2	11.2
	250	21.6	10.5	6.0	4.5	14.6	0.00321	9.1	9.1
	420	22.2	9.5	6.0	3.5	14.7	0.00247	7.1	7.1
20-Mar-12	1380	21.0	9.5	6.5	3.0	14.7	0.00138	6.1	6.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0037**	d_{30} = **0.015**	d_{50} = **0.028**	d_{60} = **0.035**	C_u = **9.5**	C_c = **1.7**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (532-533)	**532-533**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (549-550)
Date Sampled: 12/8/2011
Depth: 549-550
Test Date: 27-Feb-12

Initial Dry Weight of Sample (g): 197.08
Weight Passing #10 (g): 197.08
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 47.71
Calculated Weight of Sieve Sample (g): 47.71
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	197.08	100.00
	2"	50	0.00	0.00	197.08	100.00
	1.5"	38.1	0.00	0.00	197.08	100.00
	1"	25	0.00	0.00	197.08	100.00
	3/4"	19.0	0.00	0.00	197.08	100.00
	3/8"	9.5	0.00	0.00	197.08	100.00
	4	4.75	0.00	0.00	197.08	100.00
	10	2.00	0.00	0.00	197.08	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.02	0.02	47.69	99.96
	40	0.425	0.05	0.07	47.64	99.85
	60	0.250	0.14	0.21	47.50	99.56
	140	0.106	1.41	1.62	46.09	96.60
	200	0.075	3.27	4.89	42.82	89.75
	dry pan		0.73	5.62	42.09	
	wet pan			42.09	0.00	

d_{10} (mm): 0.0050
d_{16} (mm): 0.0082
d_{30} (mm): 0.016
d_{50} (mm): 0.027
d_{60} (mm): 0.035
d_{84} (mm): 0.064

Median Particle Diameter --d_{50} (mm): 0.027
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 7.0
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.5
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.033

Classification of fines (visual method): ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (549-550)
Date Sampled: 12/8/2011
Depth: 549-550
Test Date: 22-Feb-12
Start Time: 9:06

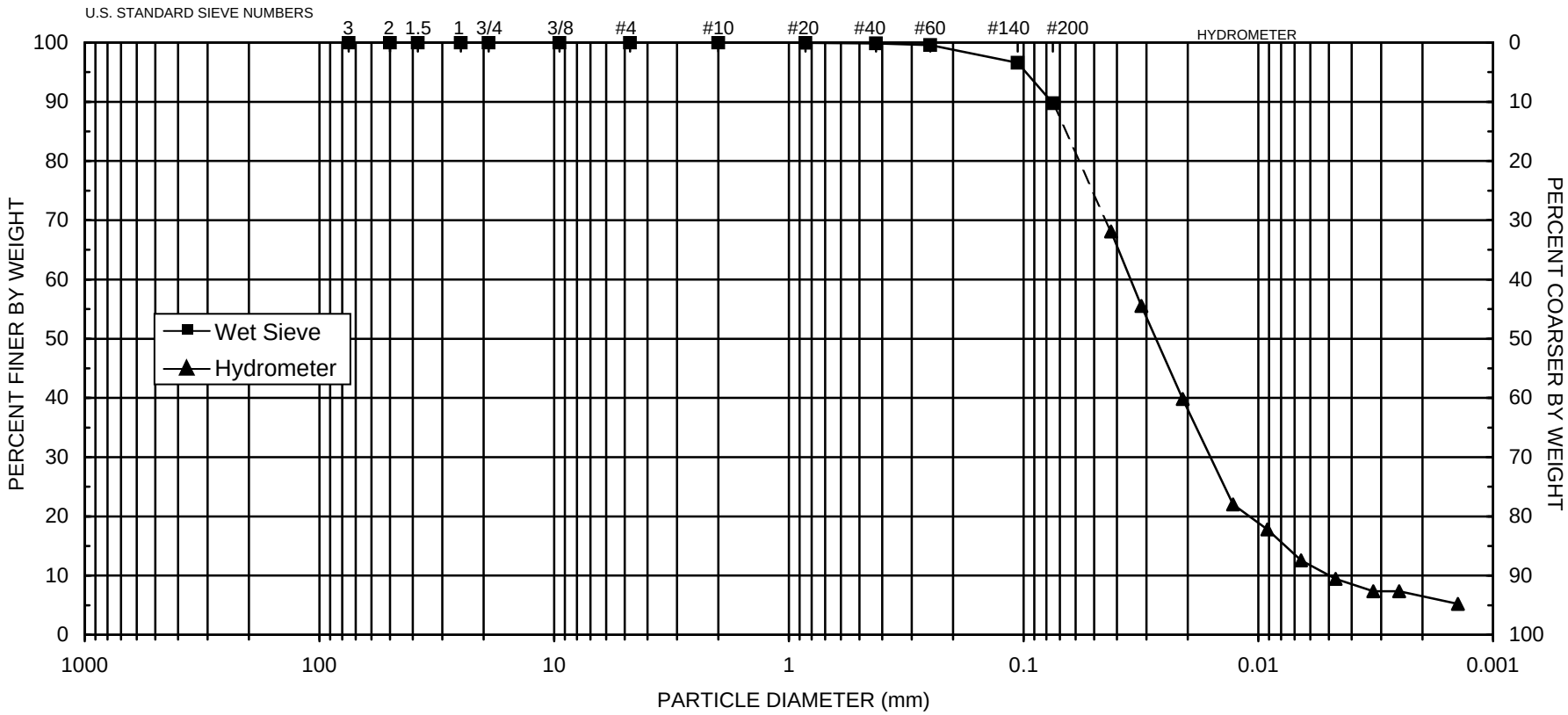
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.64
Initial Wt. (g)*:* 47.71
Total Sample Wt. (g)*:* 197.08
Wt. Passing #10 (g): 197.08

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
22-Feb-12	1	20.9	39.0	6.5	32.5	9.9	0.04247	68.1	68.1
	2	20.9	33.0	6.5	26.5	10.9	0.03149	55.5	55.5
	5	20.9	25.5	6.5	19.0	12.1	0.02101	39.8	39.8
	15	20.9	17.0	6.5	10.5	13.5	0.01281	22.0	22.0
	30	20.9	15.0	6.5	8.5	13.8	0.00917	17.8	17.8
	60	21.0	12.5	6.5	6.0	14.3	0.00657	12.6	12.6
	120	21.1	11.0	6.5	4.5	14.5	0.00468	9.4	9.4
	250	21.6	10.0	6.5	3.5	14.7	0.00324	7.3	7.3
	415	21.9	9.5	6.0	3.5	14.7	0.00251	7.3	7.3
23-Feb-12	1375	20.3	9.0	6.5	2.5	14.8	0.00141	5.2	5.2

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0050**	d_{30} = **0.016**	d_{50} = **0.027**	d_{60} = **0.035**	C_u = **7.0**	C_c = **1.5**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (549-550)	**549-550**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (569-570)
Date Sampled: 12/8/2011
Depth: 569-570
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 260.21
Weight Passing #10 (g): 260.21
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 47.50
Calculated Weight of Sieve Sample (g): 47.50

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	260.21	100.00
	2"	50	0.00	0.00	260.21	100.00
	1.5"	38.1	0.00	0.00	260.21	100.00
	1"	25	0.00	0.00	260.21	100.00
	3/4"	19.0	0.00	0.00	260.21	100.00
	3/8"	9.5	0.00	0.00	260.21	100.00
	4	4.75	0.00	0.00	260.21	100.00
	10	2.00	0.00	0.00	260.21	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.02	0.02	47.48	99.96
	40	0.425	0.04	0.06	47.44	99.87
	60	0.250	0.08	0.14	47.36	99.71
	140	0.106	1.03	1.17	46.33	97.54
	200	0.075	2.14	3.31	44.19	93.03
	dry pan		0.59	3.90	43.60	
	wet pan			43.60	0.00	

d_{10} (mm): 0.0025
d_{16} (mm): 0.0056
d_{30} (mm): 0.011
d_{50} (mm): 0.017
d_{60} (mm): 0.027
d_{84} (mm): 0.062

Median Particle Diameter --d_{50} (mm): 0.017
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 11
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.8
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.028

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (569-570)
Date Sampled: 12/8/2011
Depth: 569-570
Test Date: 21-Feb-12
Start Time: 9:48

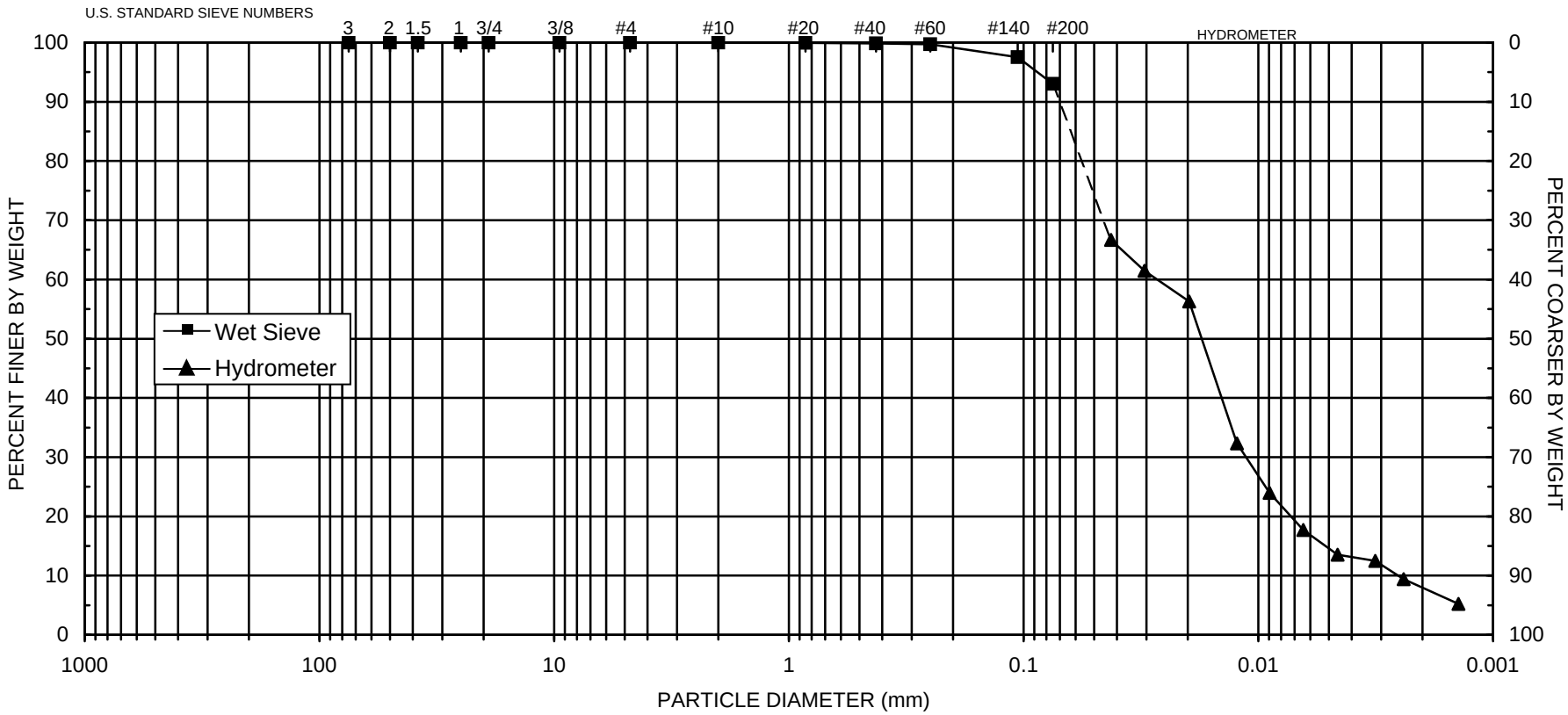
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.68
Initial Wt. (g)*:* 47.50
Total Sample Wt. (g)*:* 260.21
Wt. Passing #10 (g): 260.21

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
21-Feb-12	1	20.5	38.5	6.5	32.0	10.0	0.04239	66.7	66.7
	2	20.5	36.0	6.5	29.5	10.4	0.03058	61.5	61.5
	5	20.5	33.5	6.5	27.0	10.8	0.01972	56.3	56.3
	15	20.5	22.0	6.5	15.5	12.7	0.01234	32.3	32.3
	30	20.5	18.0	6.5	11.5	13.3	0.00895	24.0	24.0
	60	20.6	15.0	6.5	8.5	13.8	0.00643	17.7	17.7
	120	20.7	13.0	6.5	6.5	14.2	0.00460	13.5	13.5
	250	21.3	12.5	6.5	6.0	14.3	0.00317	12.5	12.5
	437	21.8	11.0	6.5	4.5	14.5	0.00241	9.4	9.4
22-Feb-12	1340	20.8	9.0	6.5	2.5	14.8	0.00141	5.2	5.2

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0025**	d_{30} = **0.011**	d_{50} = **0.017**	d_{60} = **0.027**	C_u = **11**	C_c = **1.8**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (569-570)	**569-570**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (594-595)
Date Sampled: 12/8/2011
Depth: 594-595
Test Date: 14-Mar-12

Initial Dry Weight of Sample (g): 190.73
Weight Passing #10 (g): 190.73
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.07
Calculated Weight of Sieve Sample (g): 49.07

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	190.73	100.00
	2"	50	0.00	0.00	190.73	100.00
	1.5"	38.1	0.00	0.00	190.73	100.00
	1"	25	0.00	0.00	190.73	100.00
	3/4"	19.0	0.00	0.00	190.73	100.00
	3/8"	9.5	0.00	0.00	190.73	100.00
	4	4.75	0.00	0.00	190.73	100.00
	10	2.00	0.00	0.00	190.73	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	49.06	99.98
	40	0.425	0.02	0.03	49.04	99.94
	60	0.250	0.01	0.04	49.03	99.92
	140	0.106	0.28	0.32	48.75	99.35
	200	0.075	1.20	1.52	47.55	96.90
	dry pan		0.59	2.11	46.96	
	wet pan			46.96	0.00	

d_{10} (mm): 0.0045
d_{16} (mm): 0.0082
d_{30} (mm): 0.017
d_{50} (mm): 0.027
d_{60} (mm): 0.032
d_{84} (mm): 0.053

Median Particle Diameter --d_{50} (mm): 0.027
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 7.1
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.0
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.029

Classification of fines (visual method): ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (594-595)
Date Sampled: 12/8/2011
Depth: 594-595
Test Date: 22-Feb-12
Start Time: 9:18

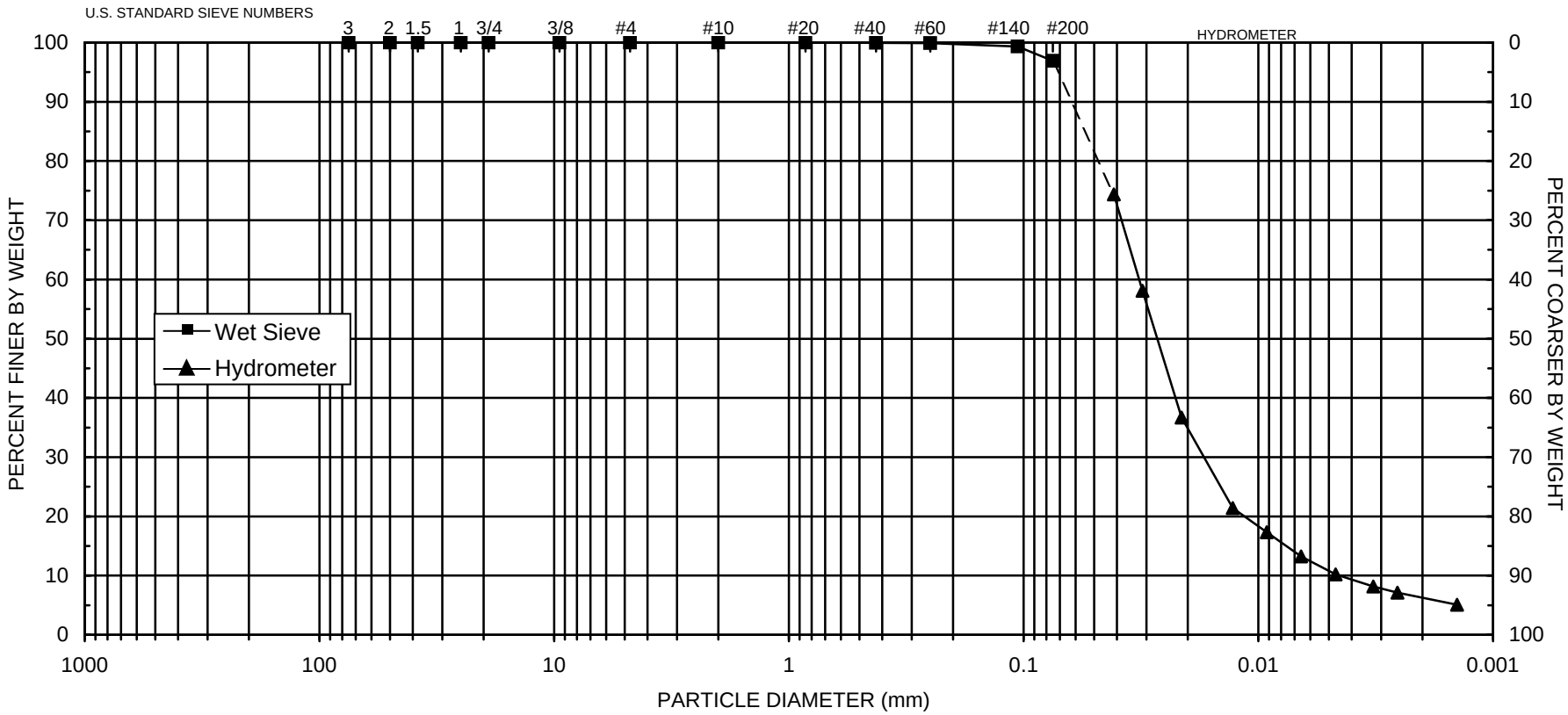
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.63
Initial Wt. (g)*:* 49.07
Total Sample Wt. (g)*:* 190.73
Wt. Passing #10 (g): 190.73

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
22-Feb-12	1	20.9	43.0	6.5	36.5	9.3	0.04122	74.4	74.4
	2	20.9	35.0	6.5	28.5	10.6	0.03114	58.1	58.1
	5	20.9	24.5	6.5	18.0	12.3	0.02124	36.7	36.7
	15	20.9	17.0	6.5	10.5	13.5	0.01286	21.4	21.4
	30	21.0	15.0	6.5	8.5	13.8	0.00919	17.3	17.3
	60	21.0	13.0	6.5	6.5	14.2	0.00658	13.2	13.2
	120	21.2	11.5	6.5	5.0	14.4	0.00468	10.2	10.2
	250	21.7	10.5	6.5	4.0	14.6	0.00324	8.2	8.2
	405	21.9	9.5	6.0	3.5	14.7	0.00255	7.1	7.1
23-Feb-12	1365	20.3	9.0	6.5	2.5	14.8	0.00142	5.1	5.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0045**	d_{30} = **0.017**	d_{50} = **0.027**	d_{60} = **0.032**	C_u = **7.1**	C_c = **2.0**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (594-595)	**594-595**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (620-623)
Date Sampled: 12/8/2011
Depth: 620-623
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 290.73
Weight Passing #10 (g): 290.73
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.17
Calculated Weight of Sieve Sample (g): 50.17
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	290.73	100.00
	2"	50	0.00	0.00	290.73	100.00
	1.5"	38.1	0.00	0.00	290.73	100.00
	1"	25	0.00	0.00	290.73	100.00
	3/4"	19.0	0.00	0.00	290.73	100.00
	3/8"	9.5	0.00	0.00	290.73	100.00
	4	4.75	0.00	0.00	290.73	100.00
	10	2.00	0.00	0.00	290.73	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	50.17	100.00
	40	0.425	0.02	0.02	50.15	99.96
	60	0.250	0.02	0.04	50.13	99.92
	140	0.106	0.45	0.49	49.68	99.02
	200	0.075	1.24	1.73	48.44	96.55
	dry pan		0.36	2.09	48.08	
	wet pan			48.08	0.00	

d_{10} (mm): 0.0021
d_{16} (mm): 0.0050
d_{30} (mm): 0.011
d_{50} (mm): 0.018
d_{60} (mm): 0.024
d_{84} (mm): 0.045

Median Particle Diameter --d_{50} (mm): 0.018
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 11
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 2.4
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.023

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (620-623)
Date Sampled: 12/8/2011
Depth: 620-623
Test Date: 20-Feb-12
Start Time: 9:24

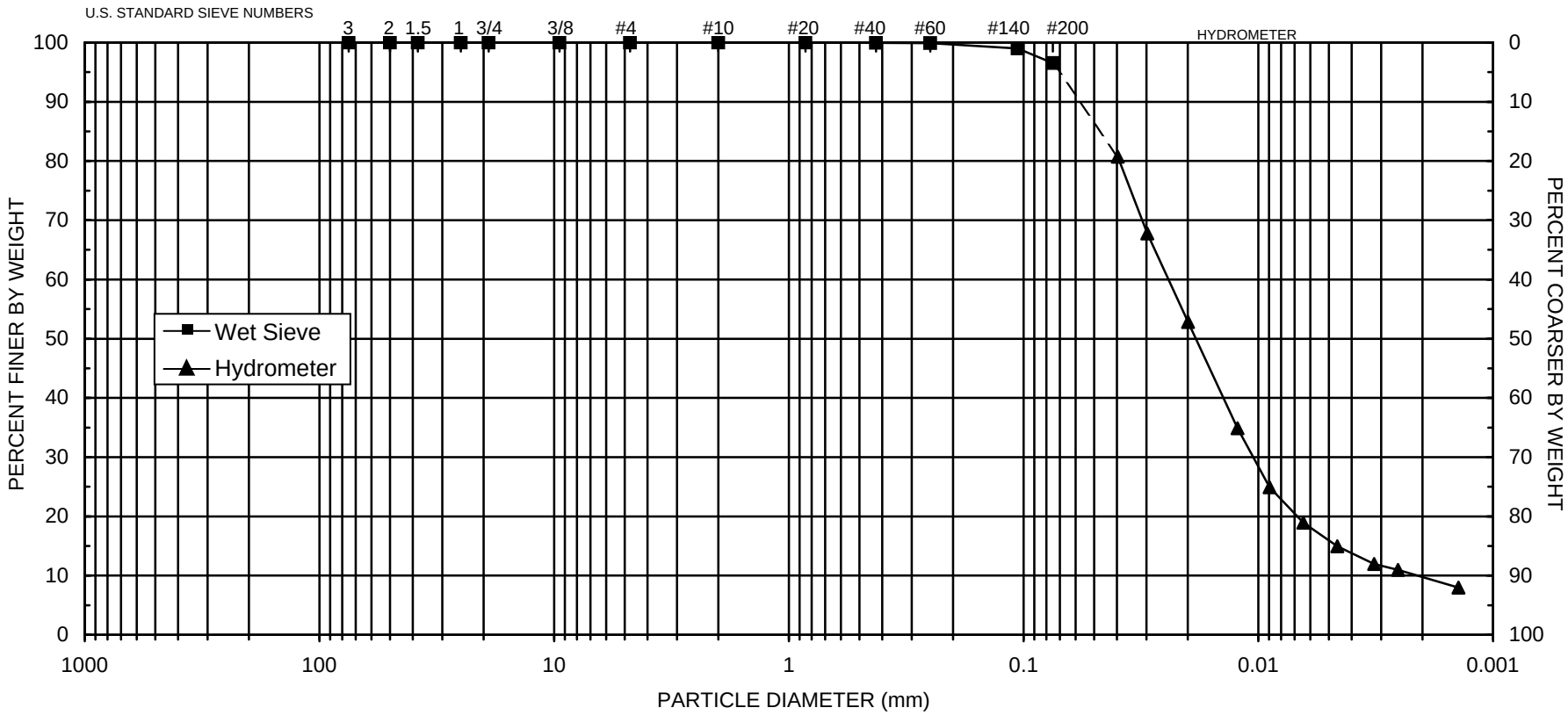
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.64
Initial Wt. (g)*:* 50.17
Total Sample Wt. (g)*:* 290.73
Wt. Passing #10 (g): 290.73

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-12	1	20.7	47.0	6.5	40.5	8.6	0.03968	80.7	80.7
	2	20.7	40.5	6.5	34.0	9.7	0.02974	67.8	67.8
	5	20.8	33.0	6.5	26.5	10.9	0.01995	52.8	52.8
	15	20.8	24.0	6.5	17.5	12.4	0.01227	34.9	34.9
	30	20.9	19.0	6.5	12.5	13.2	0.00895	24.9	24.9
	60	21.0	16.0	6.5	9.5	13.7	0.00644	18.9	18.9
	120	21.1	14.0	6.5	7.5	14.0	0.00460	14.9	14.9
	250	21.4	12.0	6.0	6.0	14.3	0.00321	12.0	12.0
	400	21.7	11.5	6.0	5.5	14.4	0.00254	11.0	11.0
21-Feb-12	1360	20.5	10.5	6.5	4.0	14.6	0.00140	8.0	8.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0021**	d_{30} = **0.011**	d_{50} = **0.018**	d_{60} = **0.024**	C_u = **11**	C_c = **2.4**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (620-623)	**620-623**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (635-636)
Date Sampled: 12/8/2011
Depth: 635-636
Test Date: 22-Mar-12

Initial Dry Weight of Sample (g): 224.33
Weight Passing #10 (g): 224.33
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.97
Calculated Weight of Sieve Sample (g): 50.97

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	224.33	100.00
	2"	50	0.00	0.00	224.33	100.00
	1.5"	38.1	0.00	0.00	224.33	100.00
	1"	25	0.00	0.00	224.33	100.00
	3/4"	19.0	0.00	0.00	224.33	100.00
	3/8"	9.5	0.00	0.00	224.33	100.00
	4	4.75	0.00	0.00	224.33	100.00
	10	2.00	0.00	0.00	224.33	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.08	0.08	50.89	99.84
	40	0.425	0.13	0.21	50.76	99.59
	60	0.250	0.11	0.32	50.65	99.37
	140	0.106	0.78	1.10	49.87	97.84
	200	0.075	1.42	2.52	48.45	95.06
	dry pan		0.33	2.85	48.12	
	wet pan			48.12	0.00	

d_{10} (mm): 0.0026
d_{16} (mm): 0.0061
d_{30} (mm): 0.013
d_{50} (mm): 0.021
d_{60} (mm): 0.028
d_{84} (mm): 0.052

Median Particle Diameter --d_{50} (mm): 0.021
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 11
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.3
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.026

Classification of fines (visual method): ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (635-636)
Date Sampled: 12/8/2011
Depth: 635-636
Test Date: 20-Mar-12
Start Time: 9:00

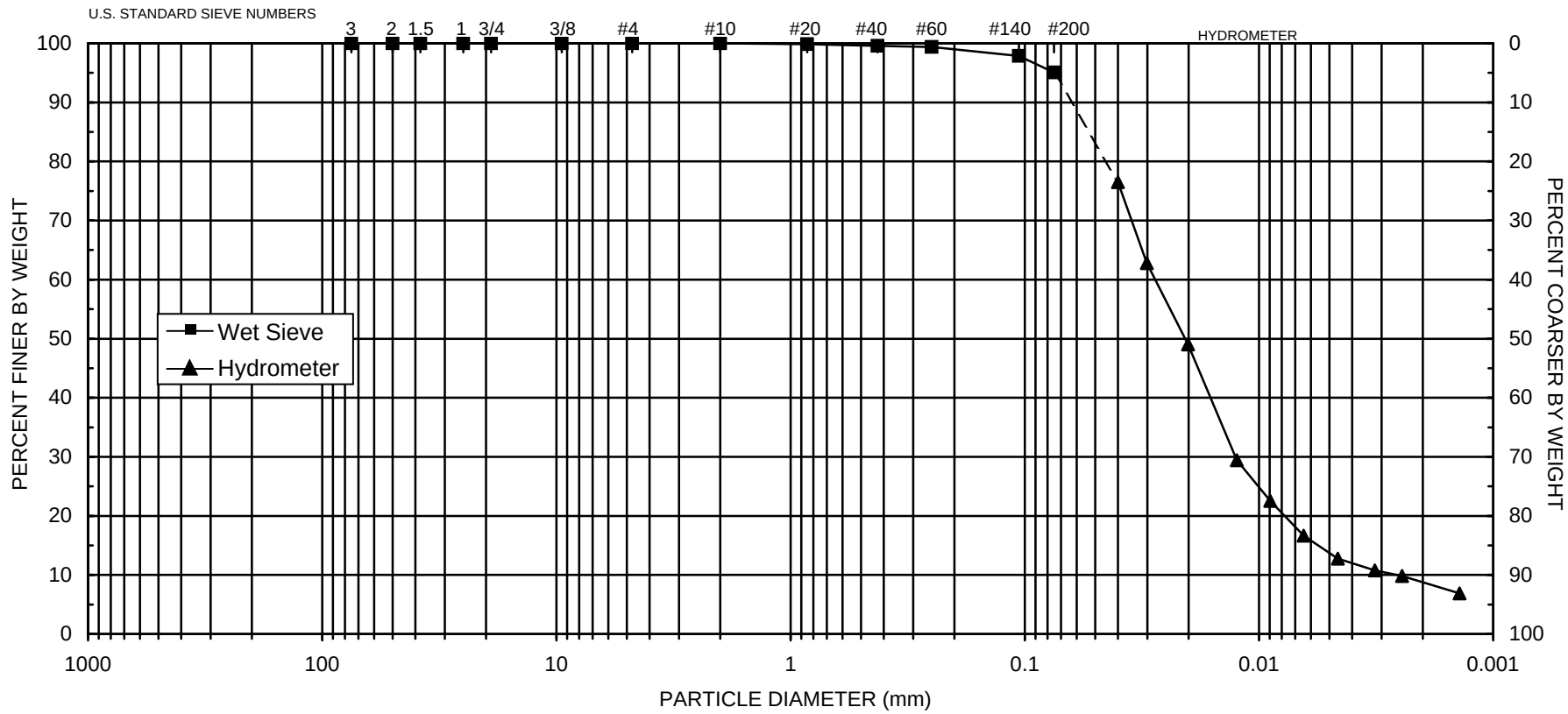
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.65
Initial Wt. (g)*:* 50.97
Total Sample Wt. (g)*:* 224.33
Wt. Passing #10 (g): 224.33

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Mar-12	1	20.8	45.5	6.5	39.0	8.8	0.04007	76.5	76.5
	2	20.8	38.5	6.5	32.0	10.0	0.03012	62.8	62.8
	5	20.8	31.5	6.5	25.0	11.1	0.02011	49.0	49.0
	15	20.9	21.5	6.5	15.0	12.8	0.01242	29.4	29.4
	30	21.0	18.0	6.5	11.5	13.3	0.00897	22.6	22.6
	60	21.0	15.0	6.5	8.5	13.8	0.00646	16.7	16.7
	120	21.2	13.0	6.5	6.5	14.2	0.00461	12.8	12.8
	250	21.8	11.5	6.0	5.5	14.4	0.00320	10.8	10.8
	425	22.2	11.0	6.0	5.0	14.5	0.00245	9.8	9.8
21-Mar-12	1380	20.7	10.0	6.5	3.5	14.7	0.00139	6.9	6.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0026**	d_{30} = **0.013**	d_{50} = **0.021**	d_{60} = **0.028**	C_u = **11**	C_c = **2.3**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (635-636)	**635-636**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (709-710)
Date Sampled: 12/8/2011
Depth: 709-710
Test Date: 22-Mar-12

Initial Dry Weight of Sample (g): 257.07
Weight Passing #10 (g): 257.07
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 51.01
Calculated Weight of Sieve Sample (g): 51.01

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	257.07	100.00
	2"	50	0.00	0.00	257.07	100.00
	1.5"	38.1	0.00	0.00	257.07	100.00
	1"	25	0.00	0.00	257.07	100.00
	3/4"	19.0	0.00	0.00	257.07	100.00
	3/8"	9.5	0.00	0.00	257.07	100.00
	4	4.75	0.00	0.00	257.07	100.00
	10	2.00	0.00	0.00	257.07	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	51.00	99.98
	40	0.425	0.02	0.03	50.98	99.94
	60	0.250	0.04	0.07	50.94	99.86
	140	0.106	1.47	1.54	49.47	96.98
	200	0.075	2.23	3.77	47.24	92.61
	dry pan		0.37	4.14	46.87	
	wet pan			46.87	0.00	

d_{10} (mm): 0.0014
d_{16} (mm): 0.0033
d_{30} (mm): 0.0089
d_{50} (mm): 0.017
d_{60} (mm): 0.024
d_{84} (mm): 0.053

Median Particle Diameter --d_{50} (mm): 0.017
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 17
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 2.4
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.024

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (709-710)
Date Sampled: 12/8/2011
Depth: 709-710
Test Date: 20-Mar-12
Start Time: 9:24

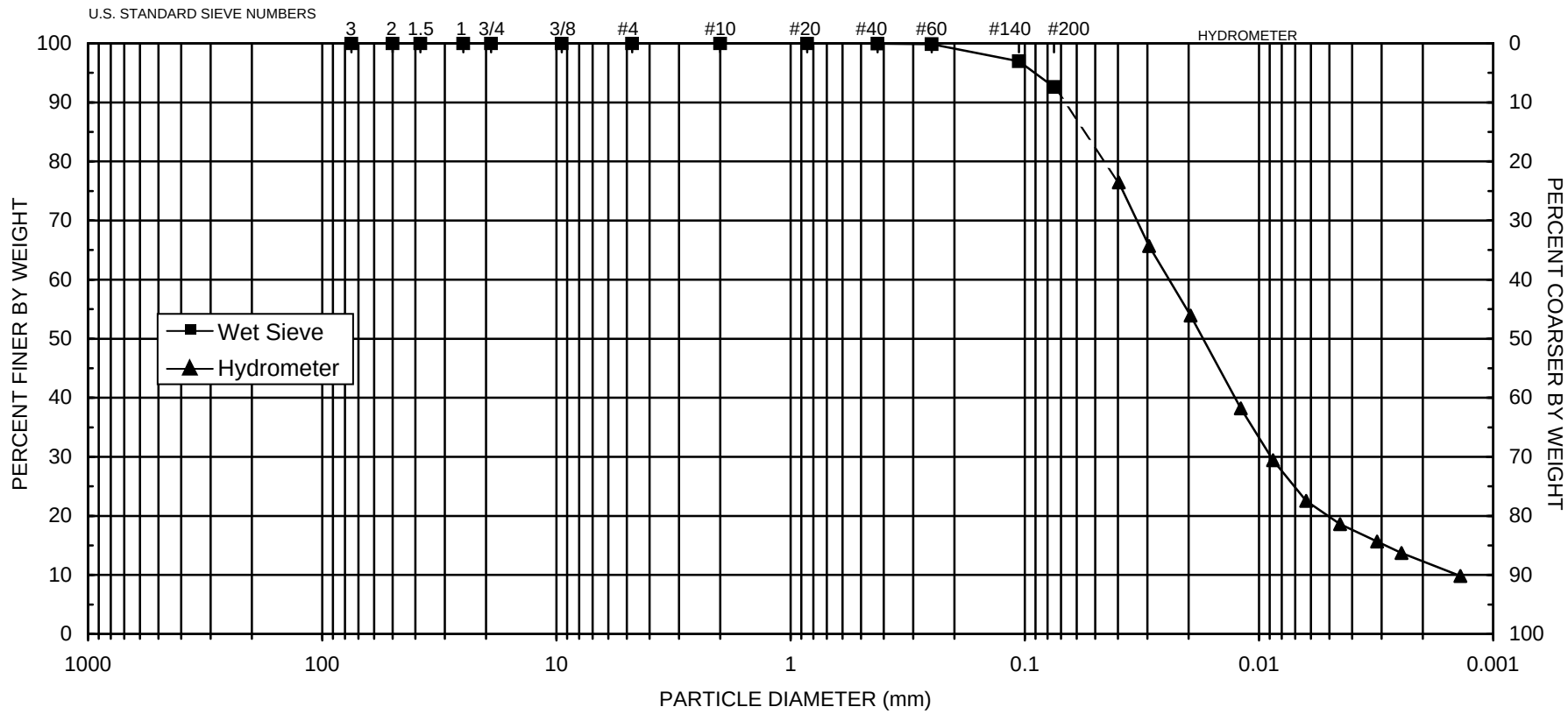
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.67
Initial Wt. (g)*:* 51.01
Total Sample Wt. (g)*:* 257.07
Wt. Passing #10 (g): 257.07

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Mar-12	1	21.0	45.5	6.5	39.0	8.8	0.03975	76.5	76.5
	2	21.0	40.0	6.5	33.5	9.7	0.02951	65.7	65.7
	5	21.0	34.0	6.5	27.5	10.7	0.01958	53.9	53.9
	15	21.0	26.0	6.5	19.5	12.0	0.01198	38.2	38.2
	30	21.0	21.5	6.5	15.0	12.8	0.00872	29.4	29.4
	60	21.1	18.0	6.5	11.5	13.3	0.00630	22.5	22.5
	120	21.2	16.0	6.5	9.5	13.7	0.00450	18.6	18.6
	250	21.8	14.0	6.0	8.0	14.0	0.00313	15.7	15.7
	405	22.2	13.0	6.0	7.0	14.2	0.00247	13.7	13.7
21-Mar-12	1360	20.7	11.5	6.5	5.0	14.4	0.00138	9.8	9.8

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0014**	d_{30} = **0.0089**	d_{50} = **0.017**	d_{60} = **0.024**	C_u = **17**	C_c = **2.4**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (709-710)	**709-710**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name:	Pickles Butte No-Migration Petition	*Initial Dry Weight of Sample (g):*	306.03
Job Number:	ES09.0154.12	*Weight Passing #10 (g):*	306.03
Sample Number:	PB-14 (727-728)	*Weight Retained #10 (g):*	0.00
Date Sampled:	12/8/2011	*Weight of Hydrometer Sample (g):*	48.75
Depth:	727-728	*Calculated Weight of Sieve Sample (g):*	48.75
Test Date:	29-Feb-12	*Shape:*	Angular
		Hardness:	Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	306.03	100.00
	2"	50	0.00	0.00	306.03	100.00
	1.5"	38.1	0.00	0.00	306.03	100.00
	1"	25	0.00	0.00	306.03	100.00
	3/4"	19.0	0.00	0.00	306.03	100.00
	3/8"	9.5	0.00	0.00	306.03	100.00
	4	4.75	0.00	0.00	306.03	100.00
	10	2.00	0.00	0.00	306.03	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	48.74	99.98
	40	0.425	0.02	0.03	48.72	99.94
	60	0.250	0.04	0.07	48.68	99.86
	140	0.106	0.78	0.85	47.90	98.26
	200	0.075	1.93	2.78	45.97	94.30
	dry pan		0.41	3.19	45.56	
	wet pan			45.56	0.00	

d_{10} (mm):	0.0021	d_{50} (mm):	0.018
d_{16} (mm):	0.0048	d_{60} (mm):	0.024
d_{30} (mm):	0.0097	d_{84} (mm):	0.053

Median Particle Diameter --d_{50} (mm): 0.018

Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 11

Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.9

Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.025

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (727-728)
Date Sampled: 12/8/2011
Depth: 727-728
Test Date: 20-Feb-12
Start Time: 9:06

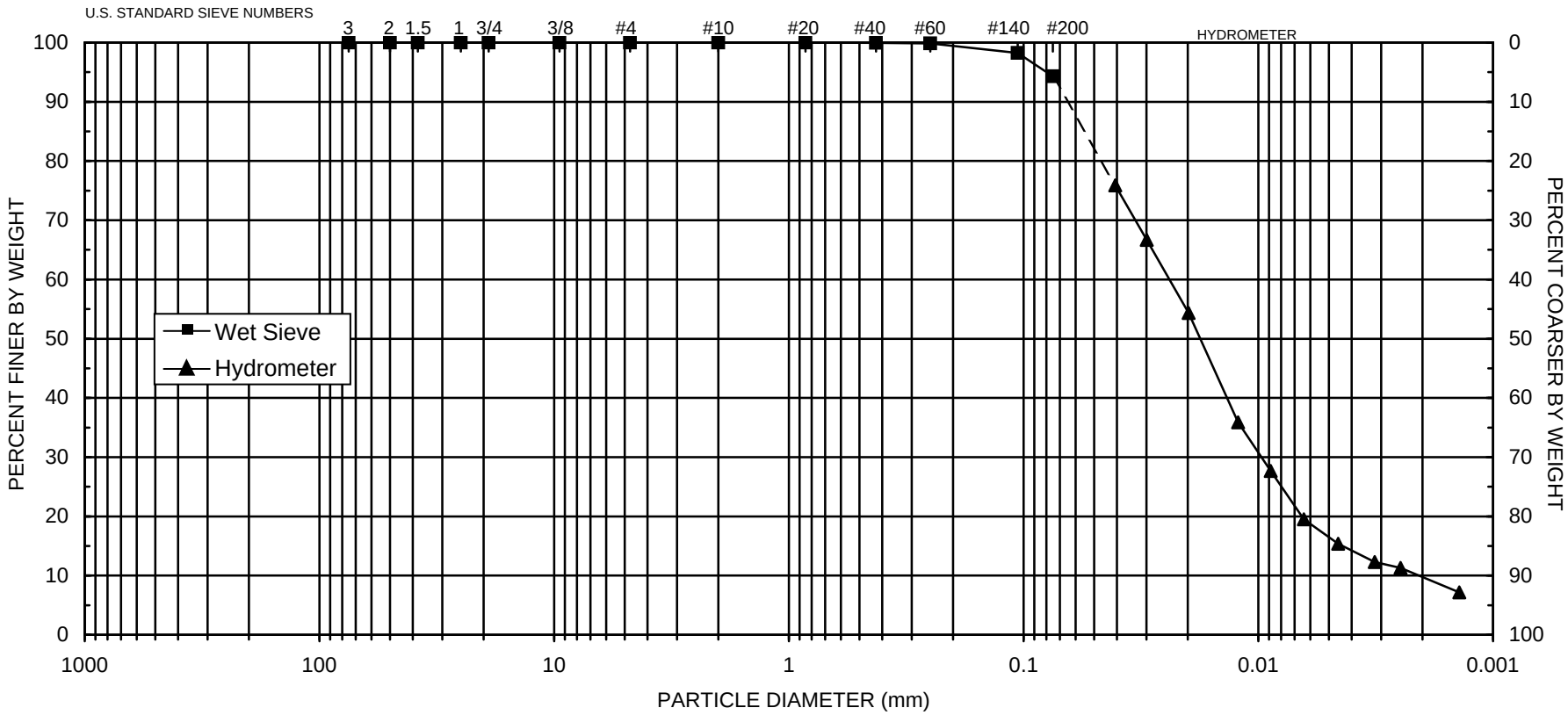
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.67
Initial Wt. (g)*:* 48.75
Total Sample Wt. (g)*:* 306.03
Wt. Passing #10 (g): 306.03

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-12	1	20.7	43.5	6.5	37.0	9.2	0.04071	75.9	75.9
	2	20.7	39.0	6.5	32.5	9.9	0.02992	66.7	66.7
	5	20.7	33.0	6.5	26.5	10.9	0.01984	54.4	54.4
	15	20.7	24.0	6.5	17.5	12.4	0.01221	35.9	35.9
	30	20.8	20.0	6.5	13.5	13.0	0.00885	27.7	27.7
	60	20.9	16.0	6.5	9.5	13.7	0.00640	19.5	19.5
	120	21.1	14.0	6.5	7.5	14.0	0.00457	15.4	15.4
	250	21.2	12.5	6.5	6.0	14.3	0.00319	12.3	12.3
	415	21.7	11.5	6.0	5.5	14.4	0.00248	11.3	11.3
21-Feb-12	1375	20.5	10.0	6.5	3.5	14.7	0.00139	7.2	7.2

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0021**	d_{30} = **0.0097**	d_{50} = **0.018**	d_{60} = **0.024**	C_u = **11**	C_c = **1.9**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (727-728)	**727-728**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (741-742)
Date Sampled: 12/8/2011
Depth: 741-742
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 222.90
Weight Passing #10 (g): 222.90
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 51.66
Calculated Weight of Sieve Sample (g): 51.66
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	222.90	100.00
	2"	50	0.00	0.00	222.90	100.00
	1.5"	38.1	0.00	0.00	222.90	100.00
	1"	25	0.00	0.00	222.90	100.00
	3/4"	19.0	0.00	0.00	222.90	100.00
	3/8"	9.5	0.00	0.00	222.90	100.00
	4	4.75	0.00	0.00	222.90	100.00
	10	2.00	0.00	0.00	222.90	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	51.65	99.98
	40	0.425	0.02	0.03	51.63	99.94
	60	0.250	0.02	0.05	51.61	99.90
	140	0.106	0.44	0.49	51.17	99.05
	200	0.075	0.87	1.36	50.30	97.37
	dry pan		0.22	1.58	50.08	
	wet pan			50.08	0.00	

d_{10} (mm): 0.0011
d_{16} (mm): 0.0035
d_{30} (mm): 0.0080
d_{50} (mm): 0.015
d_{60} (mm): 0.019
d_{84} (mm): 0.042

Median Particle Diameter --d_{50} (mm): 0.015
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 17
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 3.1
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.020

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (741-742)
Date Sampled: 12/8/2011
Depth: 741-742
Test Date: 20-Feb-12
Start Time: 9:36

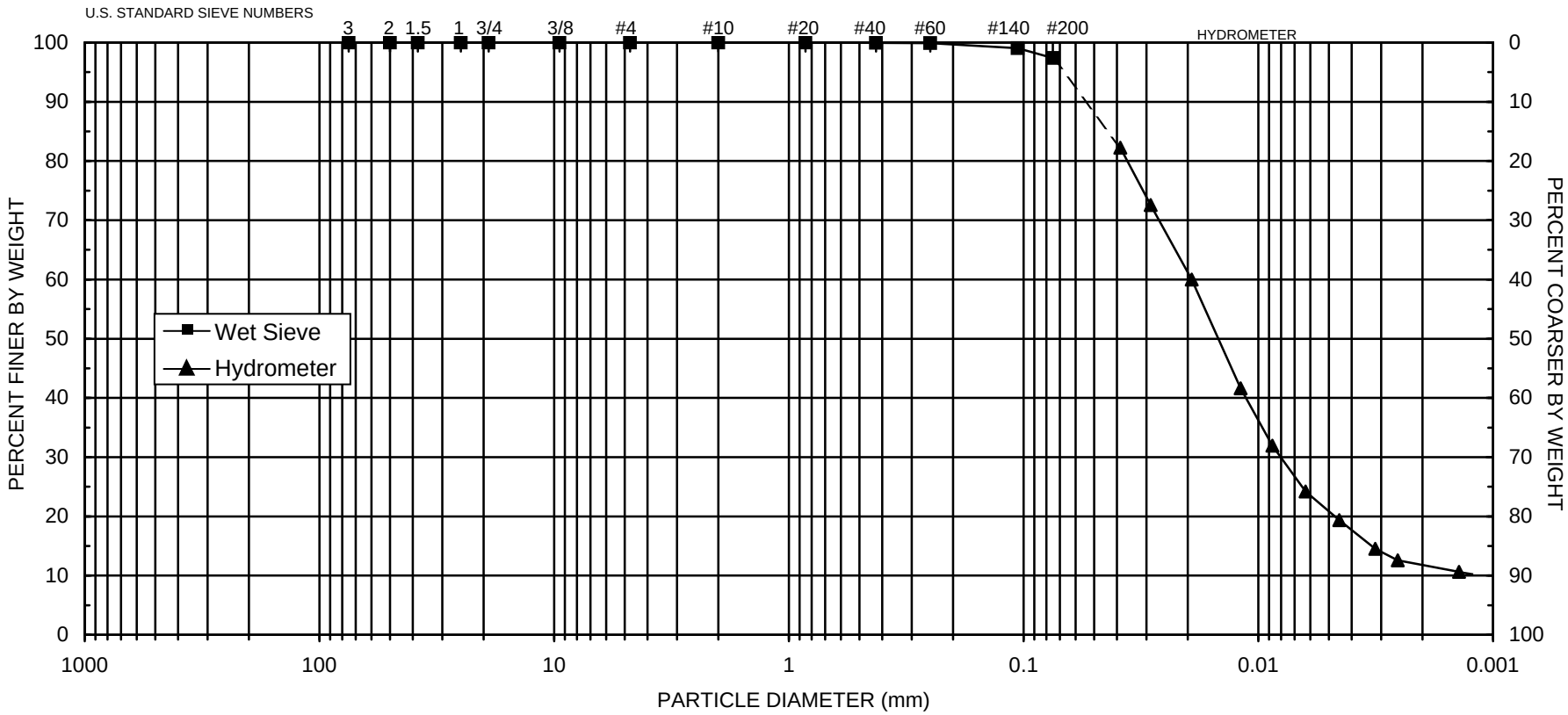
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.65
Initial Wt. (g)*:* 51.66
Total Sample Wt. (g)*:* 222.90
Wt. Passing #10 (g): 222.90

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-12	1	20.8	49.0	6.5	42.5	8.3	0.03877	82.3	82.3
	2	20.8	44.0	6.5	37.5	9.1	0.02874	72.6	72.6
	5	20.8	37.5	6.5	31.0	10.2	0.01922	60.0	60.0
	15	20.9	28.0	6.5	21.5	11.7	0.01190	41.6	41.6
	30	20.9	23.0	6.5	16.5	12.5	0.00870	31.9	31.9
	60	21.1	19.0	6.5	12.5	13.2	0.00630	24.2	24.2
	120	21.1	16.5	6.5	10.0	13.6	0.00452	19.4	19.4
	250	21.4	13.5	6.0	7.5	14.1	0.00318	14.5	14.5
	390	21.7	12.5	6.0	6.5	14.3	0.00255	12.6	12.6
21-Feb-12	1350	20.5	12.0	6.5	5.5	14.3	0.00139	10.6	10.6

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0011**	d_{30} = **0.0080**	d_{50} = **0.015**	d_{60} = **0.019**	C_u = **17**	C_c = **3.1**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (741-742)	**741-742**	**Silt (ML)**	**Silt Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (749-750)
Date Sampled: 12/8/2011
Depth: 749-750
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 241.46
Weight Passing #10 (g): 241.46
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 54.42
Calculated Weight of Sieve Sample (g): 54.42

Shape: Angular
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	241.46	100.00
	2"	50	0.00	0.00	241.46	100.00
	1.5"	38.1	0.00	0.00	241.46	100.00
	1"	25	0.00	0.00	241.46	100.00
	3/4"	19.0	0.00	0.00	241.46	100.00
	3/8"	9.5	0.00	0.00	241.46	100.00
	4	4.75	0.00	0.00	241.46	100.00
	10	2.00	0.00	0.00	241.46	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.11	0.11	54.31	99.80
	40	0.425	0.14	0.25	54.17	99.54
	60	0.250	0.17	0.42	54.00	99.23
	140	0.106	2.59	3.01	51.41	94.47
	200	0.075	3.50	6.51	47.91	88.04
	dry pan		0.73	7.24	47.18	
	wet pan			47.18	0.00	

d_{10} (mm): 0.0025
d_{16} (mm): 0.0056
d_{30} (mm): 0.013
d_{50} (mm): 0.025
d_{60} (mm): 0.033
d_{84} (mm): 0.065

Median Particle Diameter --d_{50} (mm): 0.025
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 13
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.0
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.032

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (749-750)
Date Sampled: 12/8/2011
Depth: 749-750
Test Date: 20-Feb-12
Start Time: 9:12

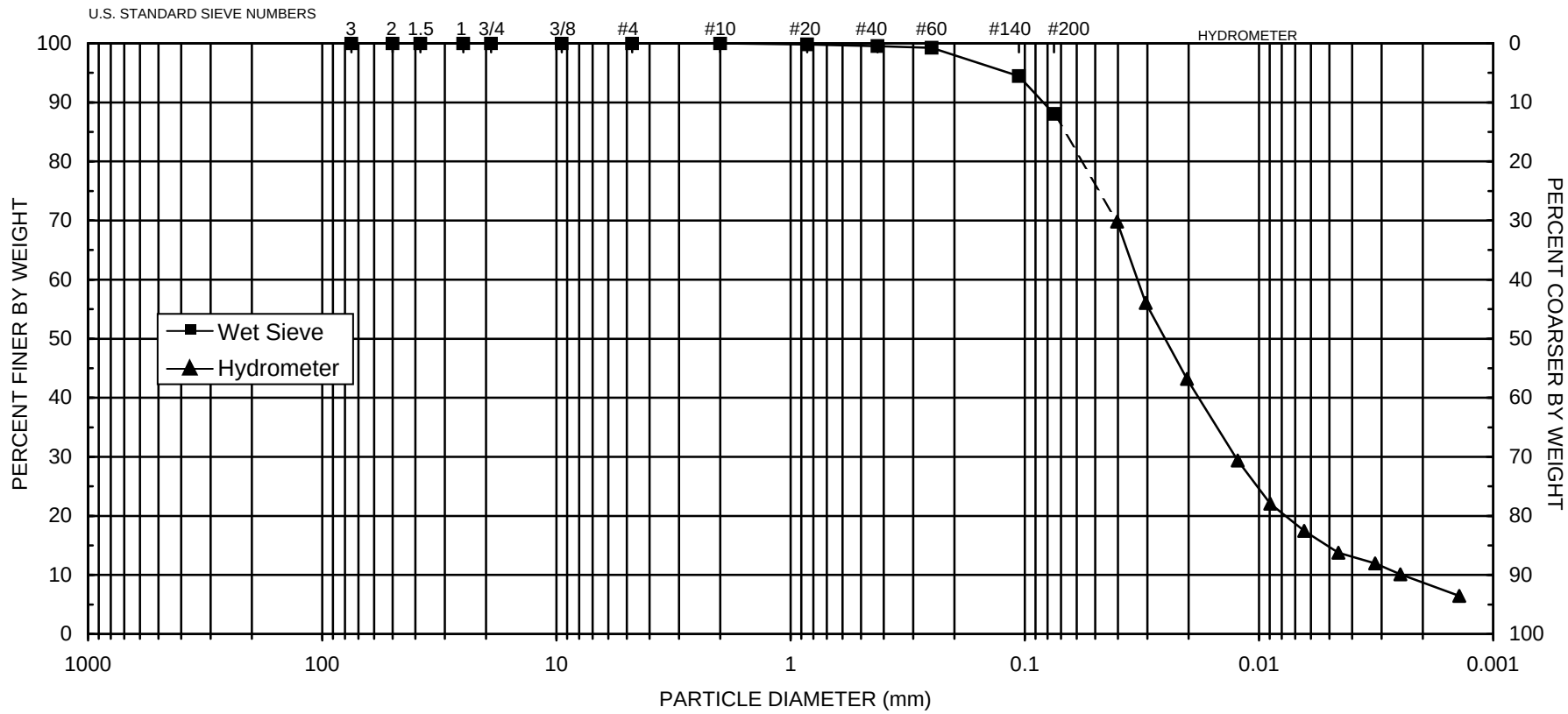
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.66
Initial Wt. (g)*:* 54.42
Total Sample Wt. (g)*:* 241.46
Wt. Passing #10 (g): 241.46

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-12	1	20.7	44.5	6.5	38.0	9.0	0.04041	69.8	69.8
	2	20.7	37.0	6.5	30.5	10.2	0.03046	56.0	56.0
	5	20.7	30.0	6.5	23.5	11.4	0.02032	43.2	43.2
	15	20.8	22.5	6.5	16.0	12.6	0.01233	29.4	29.4
	30	20.8	18.5	6.5	12.0	13.3	0.00894	22.1	22.1
	60	20.9	16.0	6.5	9.5	13.7	0.00641	17.5	17.5
	120	21.1	14.0	6.5	7.5	14.0	0.00458	13.8	13.8
	250	21.3	12.5	6.0	6.5	14.3	0.00319	11.9	11.9
	410	21.7	11.5	6.0	5.5	14.4	0.00249	10.1	10.1
21-Feb-12	1370	20.5	10.0	6.5	3.5	14.7	0.00140	6.4	6.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0025**	d_{30} = **0.013**	d_{50} = **0.025**	d_{60} = **0.033**	C_u = **13**	C_c = **2.0**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-14 (749-750)	**749-750**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (435-436)
Date Sampled: NA
Depth: 435-436
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 188.66
Weight Passing #10 (g): 188.66
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.44
Calculated Weight of Sieve Sample (g): 49.44

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	188.66	100.00
	2"	50	0.00	0.00	188.66	100.00
	1.5"	38.1	0.00	0.00	188.66	100.00
	1"	25	0.00	0.00	188.66	100.00
	3/4"	19.0	0.00	0.00	188.66	100.00
	3/8"	9.5	0.00	0.00	188.66	100.00
	4	4.75	0.00	0.00	188.66	100.00
	10	2.00	0.00	0.00	188.66	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.31	0.31	49.13	99.37
	40	0.425	0.23	0.54	48.90	98.91
	60	0.250	0.51	1.05	48.39	97.88
	140	0.106	3.94	4.99	44.45	89.91
	200	0.075	3.45	8.44	41.00	82.93
	dry pan		0.64	9.08	40.36	
	wet pan			40.36	0.00	

d_{10} (mm): 0.0041 d_{50} (mm): 0.028
d_{16} (mm): 0.0083 d_{60} (mm): 0.039
d_{30} (mm): 0.015 d_{84} (mm): 0.079

Median Particle Diameter --d_{50} (mm): 0.028
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 9.5
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.4
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.038

Classification of fines: ML

ASTM Soil Classification: Silt with sand (ML)s
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (435-436)
Date Sampled: NA
Depth: 435-436
Test Date: 20-Feb-12
Start Time: 9:42

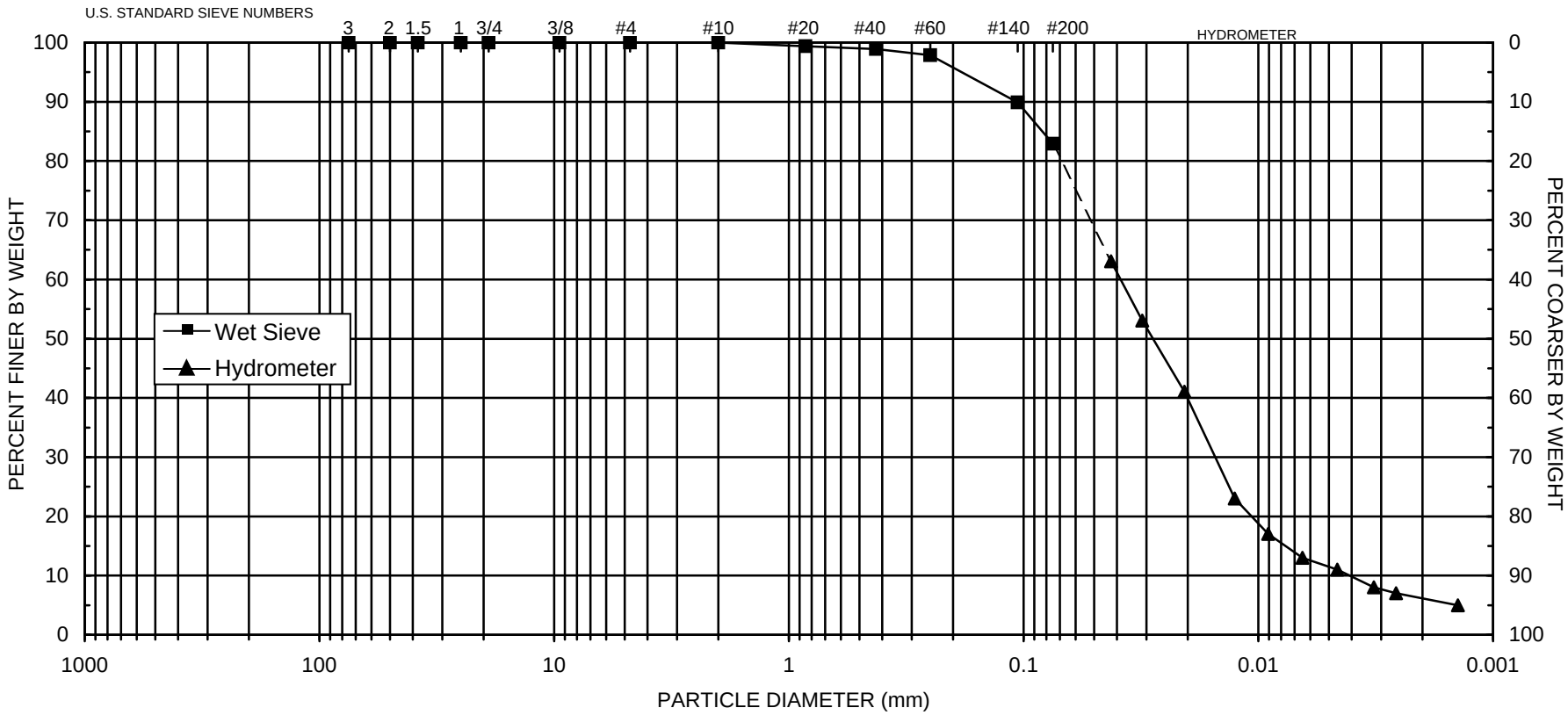
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.68
Initial Wt. (g)*:* 49.44
Total Sample Wt. (g)*:* 188.66
Wt. Passing #10 (g): 188.66

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-12	1	20.8	38.0	6.5	31.5	10.1	0.04247	63.1	63.1
	2	20.8	33.0	6.5	26.5	10.9	0.03123	53.1	53.1
	5	20.8	27.0	6.5	20.5	11.9	0.02063	41.0	41.0
	15	20.9	18.0	6.5	11.5	13.3	0.01261	23.0	23.0
	30	20.9	15.0	6.5	8.5	13.8	0.00908	17.0	17.0
	60	21.1	13.0	6.5	6.5	14.2	0.00648	13.0	13.0
	120	21.1	12.0	6.5	5.5	14.3	0.00461	11.0	11.0
	250	21.4	10.0	6.0	4.0	14.7	0.00322	8.0	8.0
	385	21.7	9.5	6.0	3.5	14.7	0.00259	7.0	7.0
21-Feb-12	1345	20.5	9.0	6.5	2.5	14.8	0.00141	5.0	5.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND					SILT	CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0041**	d_{30} = **0.015**	d_{50} = **0.028**	d_{60} = **0.039**	C_u = **9.5**	C_c = **1.4**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-15 (435-436)	**435-436**	**Silt with sand (ML)s**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (464-465)
Date Sampled: NA
Depth: 464-465
Test Date: 21-Mar-12

Initial Dry Weight of Sample (g): 298.37
Weight Passing #10 (g): 298.37
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.74
Calculated Weight of Sieve Sample (g): 49.74
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	298.37	100.00
	2"	50	0.00	0.00	298.37	100.00
	1.5"	38.1	0.00	0.00	298.37	100.00
	1"	25	0.00	0.00	298.37	100.00
	3/4"	19.0	0.00	0.00	298.37	100.00
	3/8"	9.5	0.00	0.00	298.37	100.00
	4	4.75	0.00	0.00	298.37	100.00
	10	2.00	0.00	0.00	298.37	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.03	0.03	49.71	99.94
	40	0.425	0.08	0.11	49.63	99.78
	60	0.250	0.11	0.22	49.52	99.56
	140	0.106	0.49	0.71	49.03	98.57
	200	0.075	1.09	1.80	47.94	96.38
	dry pan		0.38	2.18	47.56	
	wet pan			47.56	0.00	

d_{10} (mm): 0.0038
d_{16} (mm): 0.0064
d_{30} (mm): 0.014
d_{50} (mm): 0.023
d_{60} (mm): 0.028
d_{84} (mm): 0.050

Median Particle Diameter --d_{50} (mm): 0.023
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 7.4
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.8
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.026

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (464-465)
Date Sampled: NA
Depth: 464-465
Test Date: 21-Feb-12
Start Time: 9:06

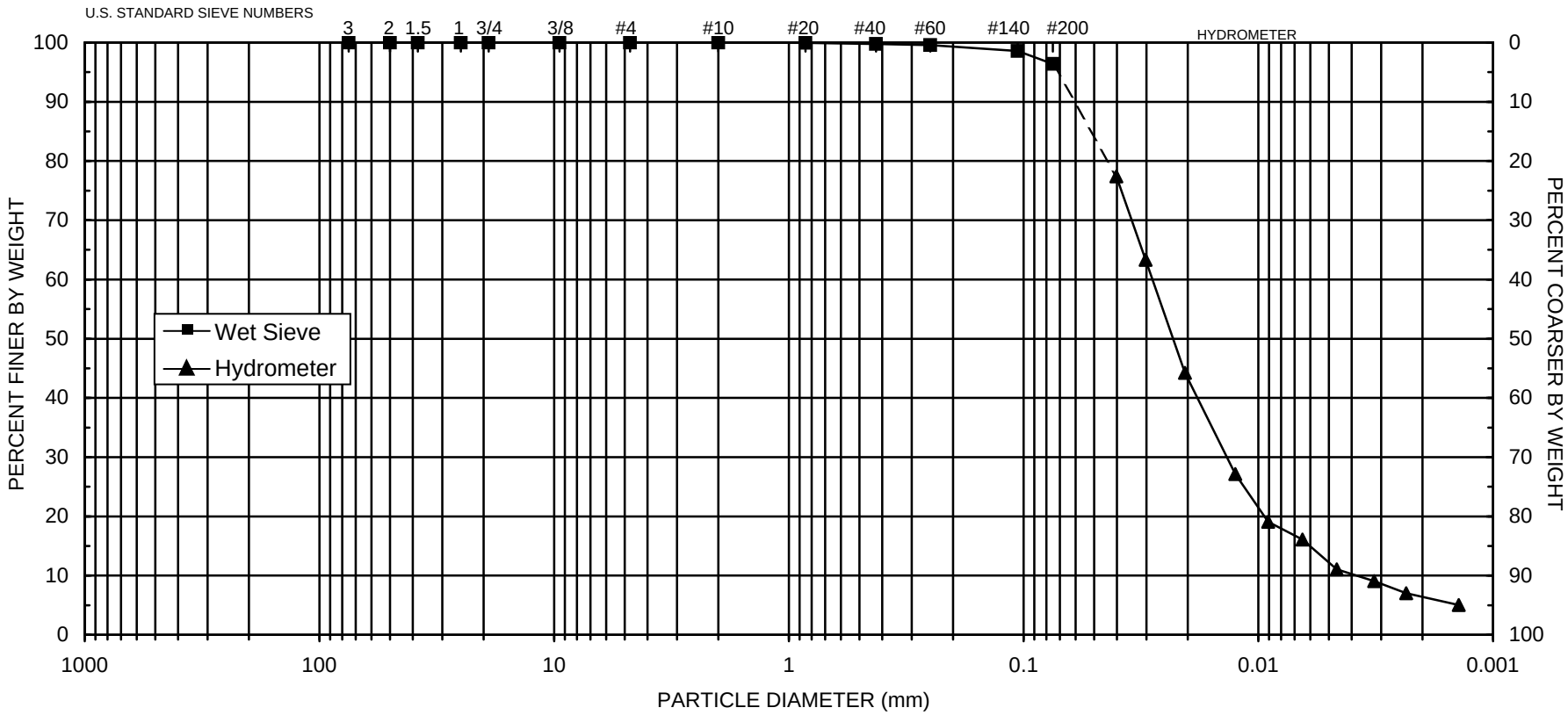
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.67
Initial Wt. (g)*:* 49.74
Total Sample Wt. (g)*:* 298.37
Wt. Passing #10 (g): 298.37

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
21-Feb-12	1	20.3	45.0	6.5	38.5	8.9	0.04027	77.4	77.4
	2	20.3	38.0	6.5	31.5	10.1	0.03025	63.3	63.3
	5	20.3	28.5	6.5	22.0	11.6	0.02056	44.2	44.2
	15	20.4	20.0	6.5	13.5	13.0	0.01254	27.1	27.1
	30	20.4	16.0	6.5	9.5	13.7	0.00909	19.1	19.1
	60	20.5	14.5	6.5	8.0	13.9	0.00648	16.1	16.1
	120	20.7	12.0	6.5	5.5	14.3	0.00464	11.1	11.1
	250	21.2	11.0	6.5	4.5	14.5	0.00321	9.0	9.0
	467	21.8	10.0	6.5	3.5	14.7	0.00235	7.0	7.0
22-Feb-12	1375	20.2	9.0	6.5	2.5	14.8	0.00140	5.0	5.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0038**	d_{30} = **0.014**	d_{50} = **0.023**	d_{60} = **0.028**	C_u = **7.4**	C_c = **1.8**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-15 (464-465)	**464-465**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (483-484)
Date Sampled: NA
Depth: 483-484
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 290.84
Weight Passing #10 (g): 290.84
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.27
Calculated Weight of Sieve Sample (g): 49.27
Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	290.84	100.00
	2"	50	0.00	0.00	290.84	100.00
	1.5"	38.1	0.00	0.00	290.84	100.00
	1"	25	0.00	0.00	290.84	100.00
	3/4"	19.0	0.00	0.00	290.84	100.00
	3/8"	9.5	0.00	0.00	290.84	100.00
	4	4.75	0.00	0.00	290.84	100.00
	10	2.00	0.00	0.00	290.84	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.02	0.02	49.25	99.96
	40	0.425	0.03	0.05	49.22	99.90
	60	0.250	0.16	0.21	49.06	99.57
	140	0.106	1.79	2.00	47.27	95.94
	200	0.075	2.66	4.66	44.61	90.54
	dry pan		0.77	5.43	43.84	
	wet pan			43.84	0.00	

d_{10} (mm): 0.0016
d_{16} (mm): 0.0031
d_{30} (mm): 0.0081
d_{50} (mm): 0.019
d_{60} (mm): 0.027
d_{84} (mm): 0.060

Median Particle Diameter --d_{50} (mm): 0.019
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 17
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.5
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.027

Classification of fines: CL

ASTM Soil Classification: Lean clay (CL)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (483-484)
Date Sampled: NA
Depth: 483-484
Test Date: 20-Feb-12
Start Time: 9:30

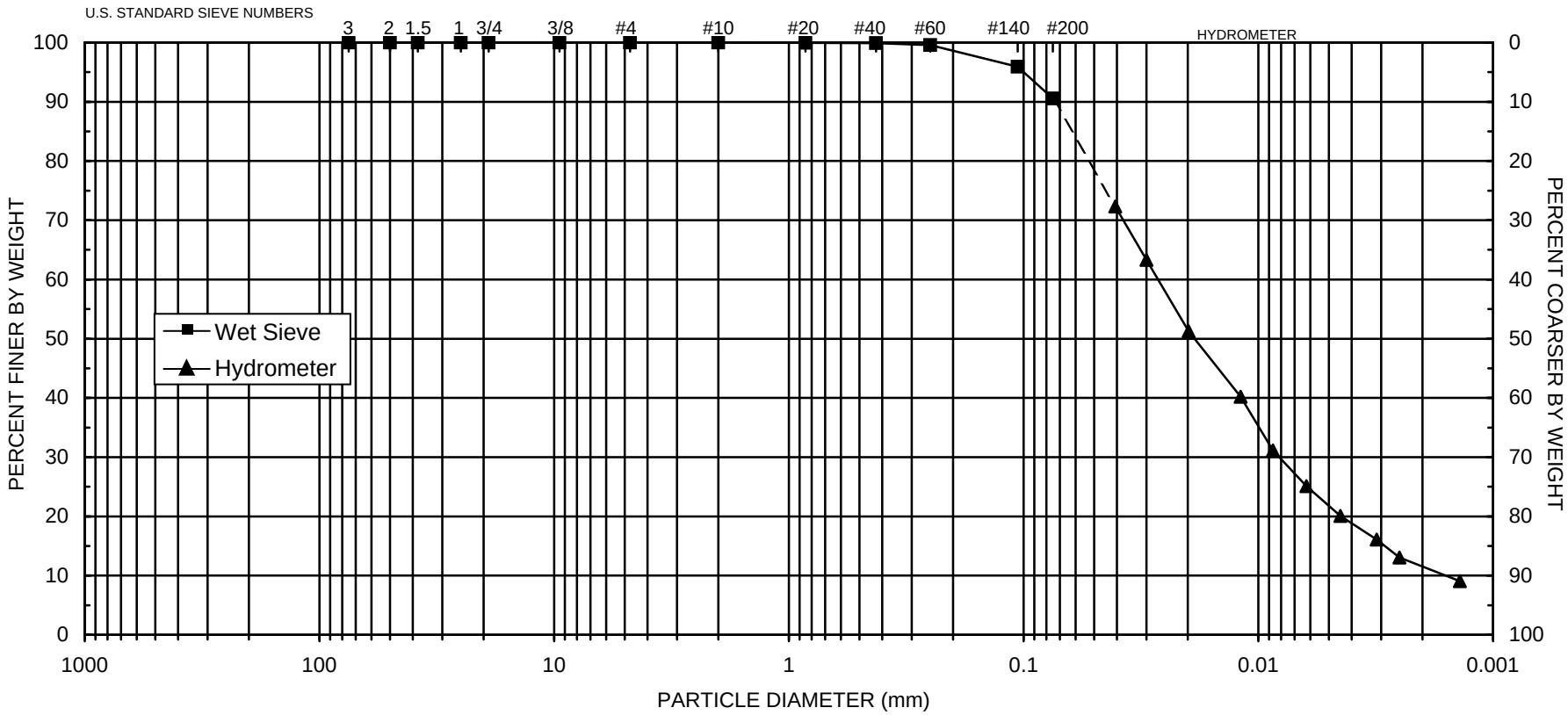
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.69
Initial Wt. (g)*:* 49.27
Total Sample Wt. (g)*:* 290.84
Wt. Passing #10 (g): 290.84

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-12	1	20.8	42.5	6.5	36.0	9.3	0.04075	72.3	72.3
	2	20.8	38.0	6.5	31.5	10.1	0.02993	63.3	63.3
	5	20.8	32.0	6.5	25.5	11.1	0.01983	51.2	51.2
	15	20.8	26.5	6.5	20.0	12.0	0.01191	40.2	40.2
	30	20.9	22.0	6.5	15.5	12.7	0.00867	31.1	31.1
	60	21.0	19.0	6.5	12.5	13.2	0.00624	25.1	25.1
	120	21.1	16.5	6.5	10.0	13.6	0.00447	20.1	20.1
	250	21.4	14.0	6.0	8.0	14.0	0.00313	16.1	16.1
	395	21.7	12.5	6.0	6.5	14.3	0.00251	13.1	13.1
21-Feb-12	1355	20.5	11.0	6.5	4.5	14.5	0.00138	9.0	9.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0016**	d_{30} = **0.0081**	d_{50} = **0.019**	d_{60} = **0.027**	C_u = **17**	C_c = **1.5**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-15 (483-484)	**483-484**	**Lean clay (CL)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (502-503)
Date Sampled: NA
Depth: 502-503
Test Date: 6-Mar-12

Initial Dry Weight of Sample (g): 237.08
Weight Passing #10 (g): 237.08
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 48.25
Calculated Weight of Sieve Sample (g): 48.25

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	237.08	100.00
	2"	50	0.00	0.00	237.08	100.00
	1.5"	38.1	0.00	0.00	237.08	100.00
	1"	25	0.00	0.00	237.08	100.00
	3/4"	19.0	0.00	0.00	237.08	100.00
	3/8"	9.5	0.00	0.00	237.08	100.00
	4	4.75	0.00	0.00	237.08	100.00
	10	2.00	0.00	0.00	237.08	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	48.24	99.98
	40	0.425	0.03	0.04	48.21	99.92
	60	0.250	0.06	0.10	48.15	99.79
	140	0.106	0.68	0.78	47.47	98.38
	200	0.075	1.61	2.39	45.86	95.05
	dry pan		0.31	2.70	45.55	
	wet pan			45.55	0.00	

d_{10} (mm): 0.0024
d_{16} (mm): 0.0043
d_{30} (mm): 0.0091
d_{50} (mm): 0.018
d_{60} (mm): 0.023
d_{84} (mm): 0.051

Median Particle Diameter --d_{50} (mm): 0.018
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 9.6
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.5
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.024

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (502-503)
Date Sampled: NA
Depth: 502-503
Test Date: 1-Mar-12
Start Time: 9:30

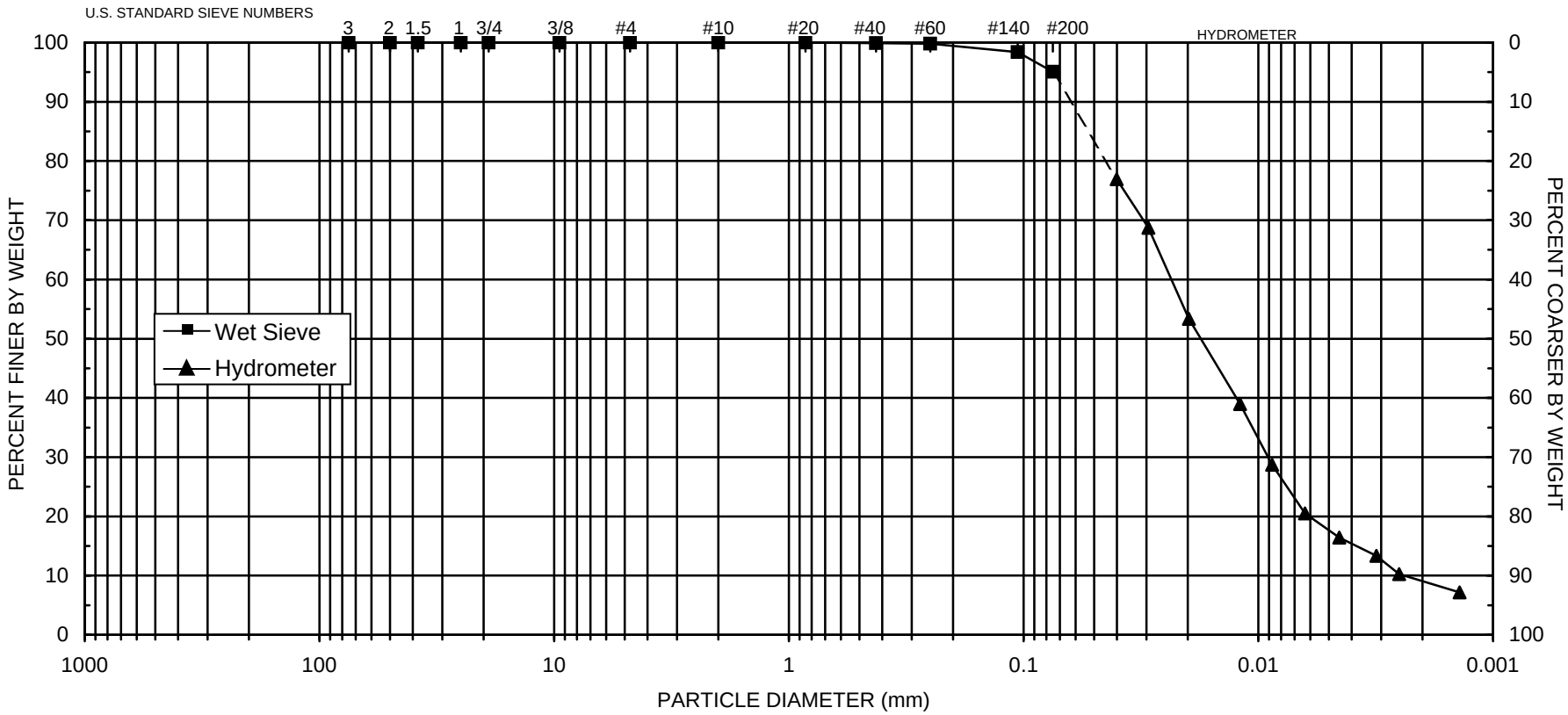
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.69
Initial Wt. (g)*:* 48.25
Total Sample Wt. (g)*:* 237.08
Wt. Passing #10 (g): 237.08

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
1-Mar-12	1	20.8	44.0	6.5	37.5	9.1	0.04017	76.9	76.9
	2	20.8	40.0	6.5	33.5	9.7	0.02941	68.7	68.7
	5	20.8	32.5	6.5	26.0	11.0	0.01974	53.3	53.3
	15	20.8	25.5	6.5	19.0	12.1	0.01198	39.0	39.0
	30	20.9	20.5	6.5	14.0	12.9	0.00874	28.7	28.7
	60	21.0	16.5	6.5	10.0	13.6	0.00633	20.5	20.5
	120	21.2	14.5	6.5	8.0	13.9	0.00452	16.4	16.4
	250	21.9	12.5	6.0	6.5	14.3	0.00314	13.3	13.3
	395	22.1	11.0	6.0	5.0	14.5	0.00251	10.3	10.3
2-Mar-12	1355	20.7	10.0	6.5	3.5	14.7	0.00139	7.2	7.2

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0024**	d_{30} = **0.0091**	d_{50} = **0.018**	d_{60} = **0.023**	C_u = **9.6**	C_c = **1.5**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-15 (502-503)	**502-503**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (524-525)
Date Sampled: 12/7/2011
Depth: 524-525
Test Date: 28-Feb-12

Initial Dry Weight of Sample (g): 263.90
Weight Passing #10 (g): 263.90
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 47.44
Calculated Weight of Sieve Sample (g): 47.44

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	263.90	100.00
	2"	50	0.00	0.00	263.90	100.00
	1.5"	38.1	0.00	0.00	263.90	100.00
	1"	25	0.00	0.00	263.90	100.00
	3/4"	19.0	0.00	0.00	263.90	100.00
	3/8"	9.5	0.00	0.00	263.90	100.00
	4	4.75	0.00	0.00	263.90	100.00
	10	2.00	0.00	0.00	263.90	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.01	0.01	47.43	99.98
	40	0.425	0.03	0.04	47.40	99.92
	60	0.250	0.09	0.13	47.31	99.73
	140	0.106	2.12	2.25	45.19	95.26
	200	0.075	4.20	6.45	40.99	86.40
	dry pan		1.07	7.52	39.92	
	wet pan			39.92	0.00	

d_{10} (mm): 0.0061
d_{16} (mm): 0.014
d_{30} (mm): 0.024
d_{50} (mm): 0.036
d_{60} (mm): 0.045
d_{84} (mm): 0.072

Median Particle Diameter --d_{50} (mm): 0.036
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 7.4
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 2.1
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.041

Classification of fines (visual method): ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (524-525)
Date Sampled: 12/7/2011
Depth: 524-525
Test Date: 21-Feb-12
Start Time: 9:18

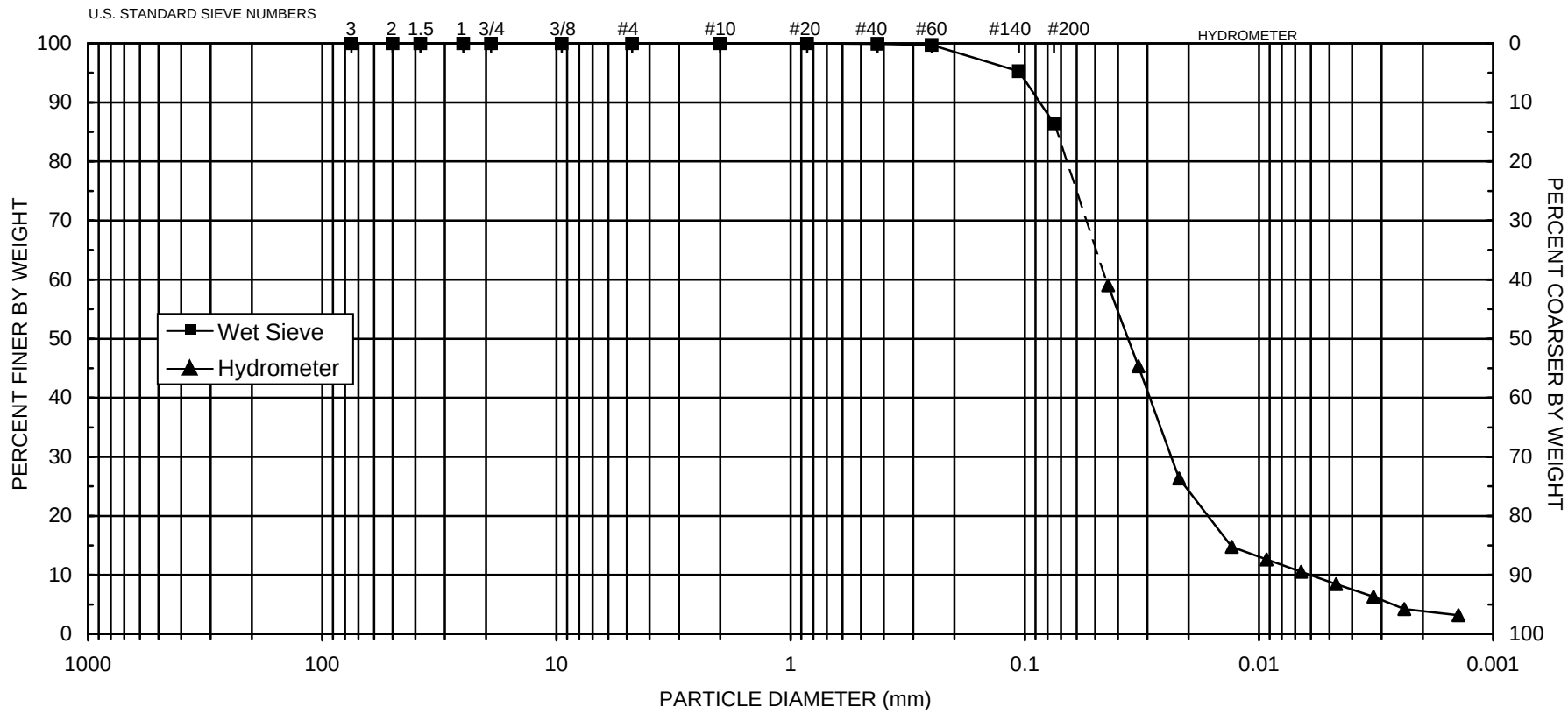
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.66
Initial Wt. (g)*:* 47.44
Total Sample Wt. (g)*:* 263.90
Wt. Passing #10 (g): 263.90

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
21-Feb-12	1	20.3	34.5	6.5	28.0	10.6	0.04409	59.0	59.0
	2	20.3	28.0	6.5	21.5	11.7	0.03270	45.3	45.3
	5	20.4	19.0	6.5	12.5	13.2	0.02192	26.3	26.3
	15	20.4	13.5	6.5	7.0	14.1	0.01308	14.8	14.8
	30	20.5	12.5	6.5	6.0	14.3	0.00929	12.6	12.6
	60	20.5	11.5	6.5	5.0	14.4	0.00661	10.5	10.5
	120	20.7	10.5	6.5	4.0	14.6	0.00469	8.4	8.4
	250	21.3	9.5	6.5	3.0	14.7	0.00324	6.3	6.3
	457	21.8	8.5	6.5	2.0	14.9	0.00240	4.2	4.2
22-Feb-12	1365	20.8	8.0	6.5	1.5	15.0	0.00141	3.2	3.2

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0061**	d_{30} = **0.024**	d_{50} = **0.036**	d_{60} = **0.045**	C_u = **7.4**	C_c = **2.1**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-15 (524-525)	**524-525**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (539-540)
Date Sampled: 12/7/2011
Depth: 539-540
Test Date: 29-Feb-12

Initial Dry Weight of Sample (g): 230.86
Weight Passing #10 (g): 230.86
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.71
Calculated Weight of Sieve Sample (g): 50.71
Shape: Angular
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	230.86	100.00
	2"	50	0.00	0.00	230.86	100.00
	1.5"	38.1	0.00	0.00	230.86	100.00
	1"	25	0.00	0.00	230.86	100.00
	3/4"	19.0	0.00	0.00	230.86	100.00
	3/8"	9.5	0.00	0.00	230.86	100.00
	4	4.75	0.00	0.00	230.86	100.00
	10	2.00	0.00	0.00	230.86	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.09	0.09	50.62	99.82
	40	0.425	0.13	0.22	50.49	99.57
	60	0.250	0.29	0.51	50.20	98.99
	140	0.106	11.43	11.94	38.77	76.45
	200	0.075	10.52	22.46	28.25	55.71
	dry pan		2.30	24.76	25.95	
	wet pan			25.95	0.00	

d_{10} (mm): 0.0095
d_{16} (mm): 0.019
d_{30} (mm): 0.038
d_{50} (mm): 0.065
d_{60} (mm): 0.081
d_{84} (mm): 0.14

Median Particle Diameter --d_{50} (mm): 0.065
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 8.5
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.9
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.075

Classification of fines (visual method): ML

ASTM Soil Classification: Sandy silt s(ML)
USDA Soil Classification: Sandy Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (539-540)
Date Sampled: 12/7/2011
Depth: 539-540
Test Date: 20-Feb-12
Start Time: 9:18

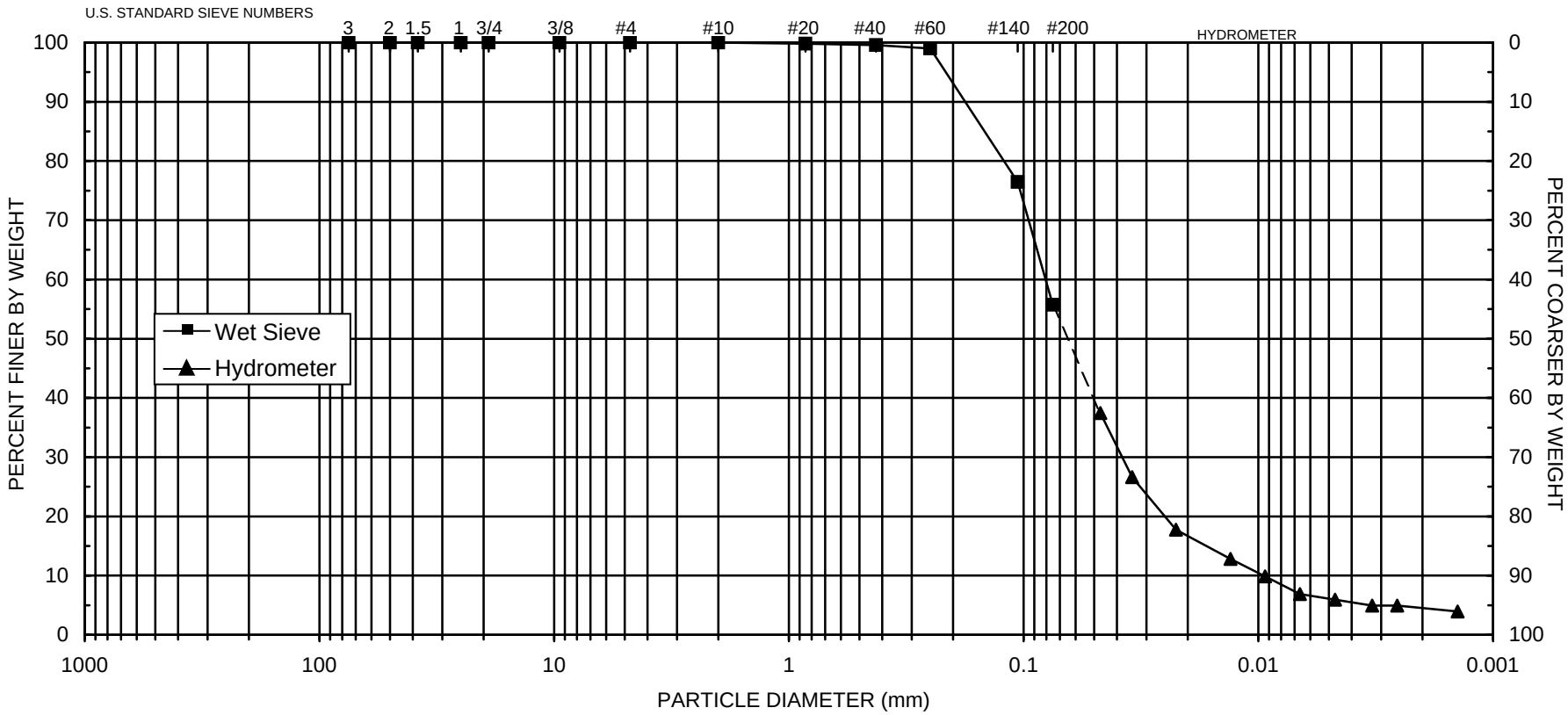
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.65
Initial Wt. (g)*:* 50.71
Total Sample Wt. (g)*:* 230.86
Wt. Passing #10 (g): 230.86

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-12	1	20.7	25.5	6.5	19.0	12.1	0.04706	37.5	37.5
	2	20.7	20.0	6.5	13.5	13.0	0.03449	26.6	26.6
	5	20.7	15.5	6.5	9.0	13.8	0.02242	17.7	17.7
	15	20.8	13.0	6.5	6.5	14.2	0.01312	12.8	12.8
	30	20.8	11.5	6.5	5.0	14.4	0.00936	9.9	9.9
	60	21.0	10.0	6.5	3.5	14.7	0.00666	6.9	6.9
	120	21.1	9.5	6.5	3.0	14.7	0.00472	5.9	5.9
	250	21.3	8.5	6.0	2.5	14.9	0.00328	4.9	4.9
	405	21.7	8.5	6.0	2.5	14.9	0.00256	4.9	4.9
21-Feb-12	1365	20.5	8.5	6.5	2.0	14.9	0.00142	3.9	3.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0095**	d_{30} = **0.038**	d_{50} = **0.065**	d_{60} = **0.081**	C_u = **8.5**	C_c = **1.9**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-15 (539-540)	**539-540**	**Sandy silt s(ML)**	**Sandy Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (559-560)
Date Sampled: 12/7/2011
Depth: 559-560
Test Date: 6-Mar-12

Initial Dry Weight of Sample (g): 204.38
Weight Passing #10 (g): 204.38
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 50.50
Calculated Weight of Sieve Sample (g): 50.50

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	204.38	100.00
	2"	50	0.00	0.00	204.38	100.00
	1.5"	38.1	0.00	0.00	204.38	100.00
	1"	25	0.00	0.00	204.38	100.00
	3/4"	19.0	0.00	0.00	204.38	100.00
	3/8"	9.5	0.00	0.00	204.38	100.00
	4	4.75	0.00	0.00	204.38	100.00
	10	2.00	0.00	0.00	204.38	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.00	0.00	50.50	100.00
	40	0.425	0.01	0.01	50.49	99.98
	60	0.250	0.02	0.03	50.47	99.94
	140	0.106	0.48	0.51	49.99	98.99
	200	0.075	1.83	2.34	48.16	95.37
	dry pan		0.46	2.80	47.70	
	wet pan			47.70	0.00	

d_{10} (mm): 0.0033
d_{16} (mm): 0.0061
d_{30} (mm): 0.013
d_{50} (mm): 0.025
d_{60} (mm): 0.031
d_{84} (mm): 0.052

Median Particle Diameter --d_{50} (mm): 0.025
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 9.4
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.7
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.028

Classification of fines (visual method): ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (559-560)
Date Sampled: 12/7/2011
Depth: 559-560
Test Date: 1-Mar-12
Start Time: 9:24

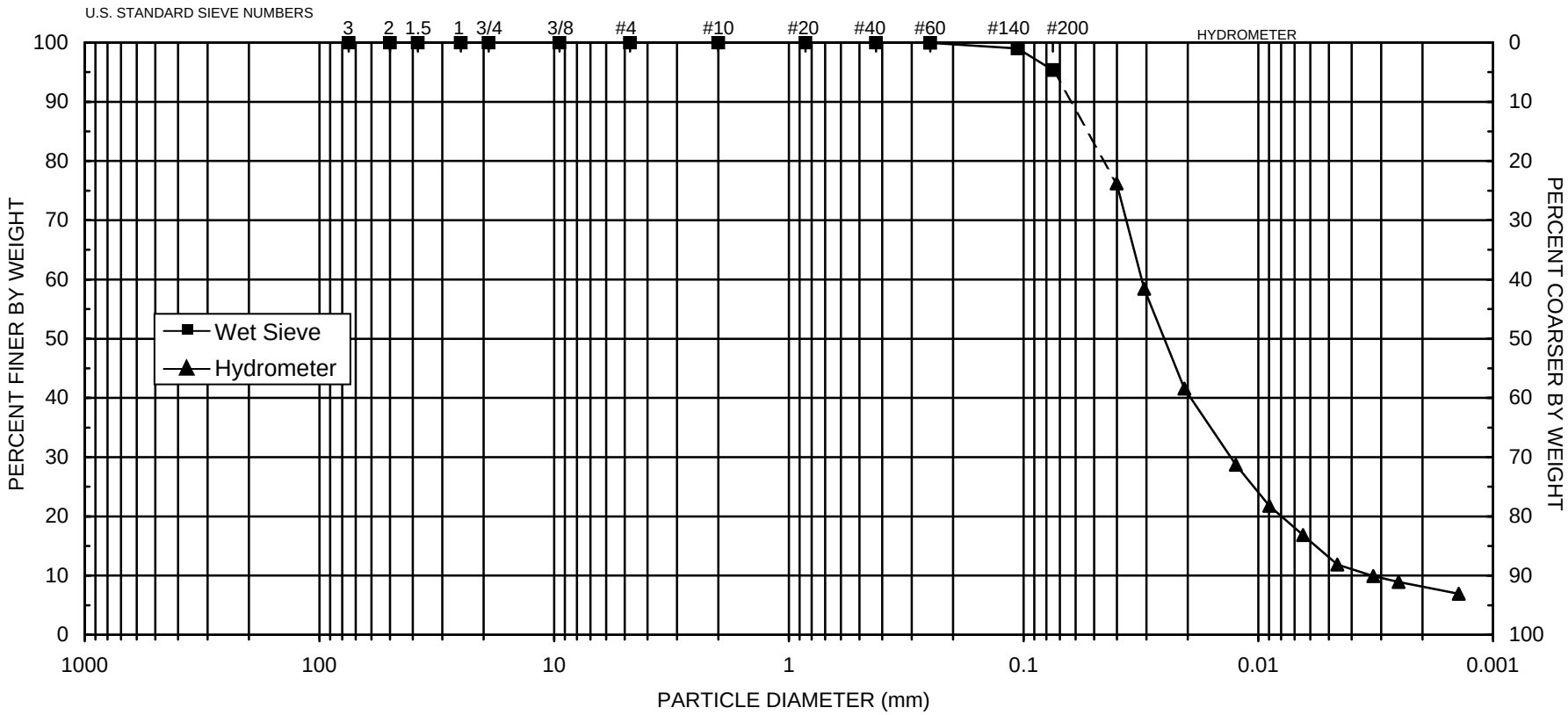
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.66
Initial Wt. (g)*:* 50.50
Total Sample Wt. (g)*:* 204.38
Wt. Passing #10 (g): 204.38

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
1-Mar-12	1	20.8	45.0	6.5	38.5	8.9	0.04018	76.2	76.2
	2	20.8	36.0	6.5	29.5	10.4	0.03067	58.4	58.4
	5	20.8	27.5	6.5	21.0	11.8	0.02066	41.6	41.6
	15	20.8	21.0	6.5	14.5	12.9	0.01245	28.7	28.7
	30	20.9	17.5	6.5	11.0	13.4	0.00899	21.8	21.8
	60	21.0	15.0	6.5	8.5	13.8	0.00644	16.8	16.8
	120	21.2	12.5	6.5	6.0	14.3	0.00461	11.9	11.9
	250	20.8	11.0	6.0	5.0	14.5	0.00324	9.9	9.9
	400	22.1	10.5	6.0	4.5	14.6	0.00253	8.9	8.9
2-Mar-12	1360	20.7	10.0	6.5	3.5	14.7	0.00140	6.9	6.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0033**	d_{30} = **0.013**	d_{50} = **0.025**	d_{60} = **0.031**	C_u = **9.4**	C_c = **1.7**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-15 (559-560)	**559-560**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (574-575)
Date Sampled: 12/7/2011
Depth: 574-575
Test Date: 14-Mar-12

Initial Dry Weight of Sample (g): 307.29
Weight Passing #10 (g): 307.29
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 51.34
Calculated Weight of Sieve Sample (g): 51.34

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	307.29	100.00
	2"	50	0.00	0.00	307.29	100.00
	1.5"	38.1	0.00	0.00	307.29	100.00
	1"	25	0.00	0.00	307.29	100.00
	3/4"	19.0	0.00	0.00	307.29	100.00
	3/8"	9.5	0.00	0.00	307.29	100.00
	4	4.75	0.00	0.00	307.29	100.00
	10	2.00	0.00	0.00	307.29	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.05	0.05	51.29	99.90
	40	0.425	0.07	0.12	51.22	99.77
	60	0.250	0.07	0.19	51.15	99.63
	140	0.106	0.89	1.08	50.26	97.90
	200	0.075	1.56	2.64	48.70	94.86
	dry pan		0.36	3.00	48.34	
	wet pan			48.34	0.00	

d_{10} (mm): 0.0027
d_{16} (mm): 0.0061
d_{30} (mm): 0.012
d_{50} (mm): 0.022
d_{60} (mm): 0.028
d_{84} (mm): 0.053

Median Particle Diameter --d_{50} (mm): 0.022
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 10
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.9
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.027

Classification of fines: ML

ASTM Soil Classification: Silt (ML)
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (574-575)
Date Sampled: 12/7/2011
Depth: 574-575
Test Date: 23-Feb-12
Start Time: 9:30

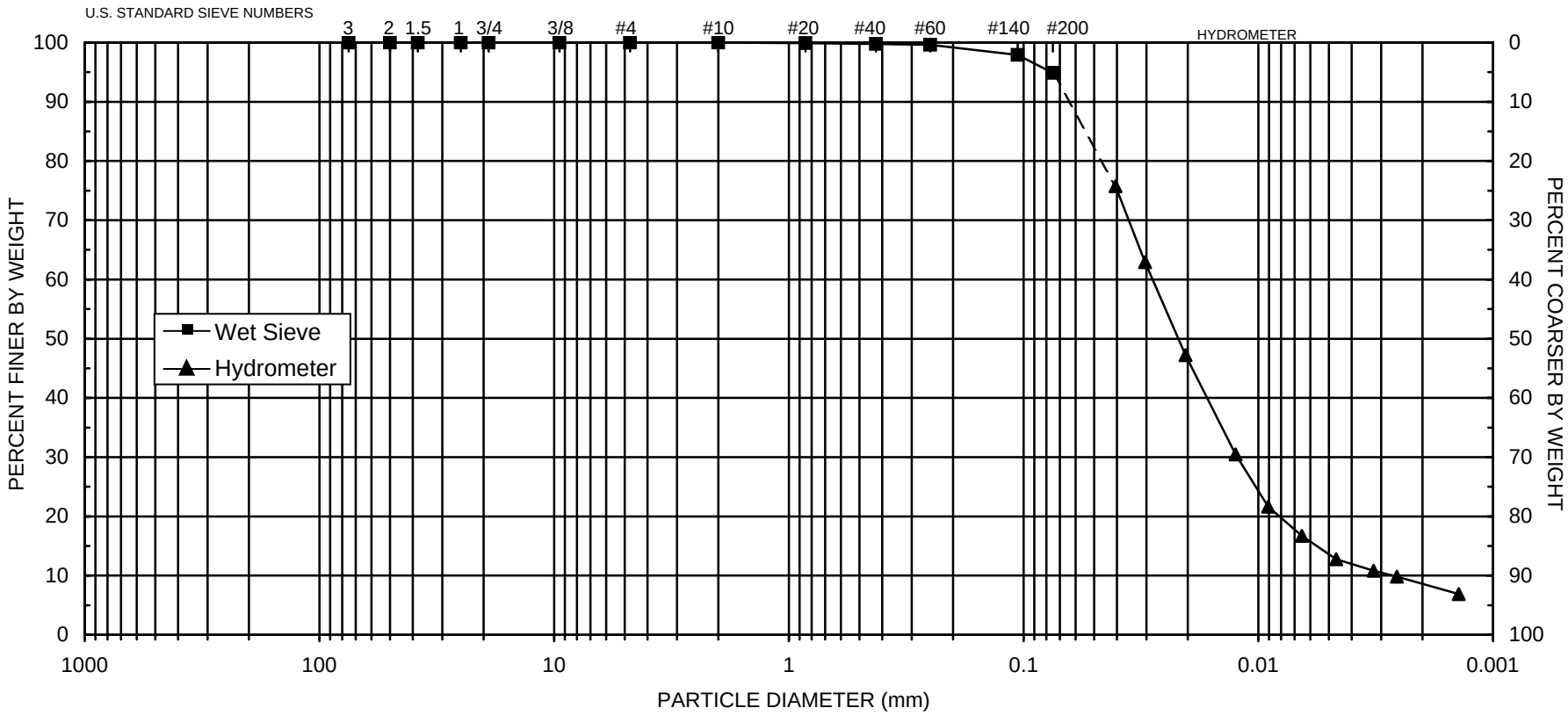
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.62
Initial Wt. (g)*:* 51.34
Total Sample Wt. (g)*:* 307.29
Wt. Passing #10 (g): 307.29

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
23-Feb-12	1	20.9	45.0	6.5	38.5	8.9	0.04061	75.7	75.7
	2	20.9	38.5	6.5	32.0	10.0	0.03038	63.0	63.0
	5	20.9	30.5	6.5	24.0	11.3	0.02044	47.2	47.2
	15	21.0	22.0	6.5	15.5	12.7	0.01249	30.5	30.5
	30	21.0	17.5	6.5	11.0	13.4	0.00909	21.6	21.6
	60	21.1	15.0	6.5	8.5	13.8	0.00651	16.7	16.7
	120	21.2	13.0	6.5	6.5	14.2	0.00465	12.8	12.8
	250	21.9	11.5	6.0	5.5	14.4	0.00323	10.8	10.8
	395	22.0	11.0	6.0	5.0	14.5	0.00257	9.8	9.8
24-Feb-12	1355	21.7	10.0	6.5	3.5	14.7	0.00140	6.9	6.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT		CLAY	
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0027**	d_{30} = **0.012**	d_{50} = **0.022**	d_{60} = **0.028**	C_u = **10**	C_c = **1.9**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-15 (574-575)	**574-575**	**Silt (ML)**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (604-605)
Date Sampled: 12/7/2011
Depth: 604-605
Test Date: 14-Mar-12

Initial Dry Weight of Sample (g): 280.95
Weight Passing #10 (g): 280.95
Weight Retained #10 (g): 0.00
Weight of Hydrometer Sample (g): 49.74
Calculated Weight of Sieve Sample (g): 49.74

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	280.95	100.00
	2"	50	0.00	0.00	280.95	100.00
	1.5"	38.1	0.00	0.00	280.95	100.00
	1"	25	0.00	0.00	280.95	100.00
	3/4"	19.0	0.00	0.00	280.95	100.00
	3/8"	9.5	0.00	0.00	280.95	100.00
	4	4.75	0.00	0.00	280.95	100.00
	10	2.00	0.00	0.00	280.95	100.00
-10			(Based on calculated sieve wt.)			
	20	0.85	0.11	0.11	49.63	99.78
	40	0.425	0.15	0.26	49.48	99.48
	60	0.250	0.12	0.38	49.36	99.24
	140	0.106	4.65	5.03	44.71	89.89
	200	0.075	4.67	9.70	40.04	80.50
	dry pan		0.73	10.43	39.31	
	wet pan			39.31	0.00	

d_{10} (mm): 0.0025 d_{50} (mm): 0.026
d_{16} (mm): 0.0052 d_{60} (mm): 0.038
d_{30} (mm): 0.012 d_{84} (mm): 0.085

Median Particle Diameter --d_{50} (mm): 0.026
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 15
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.5
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.039

Classification of fines (visual method): ML

ASTM Soil Classification: Silt with sand (ML)s
USDA Soil Classification: Silt Loam

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (604-605)
Date Sampled: 12/7/2011
Depth: 604-605
Test Date: 23-Feb-12
Start Time: 9:36

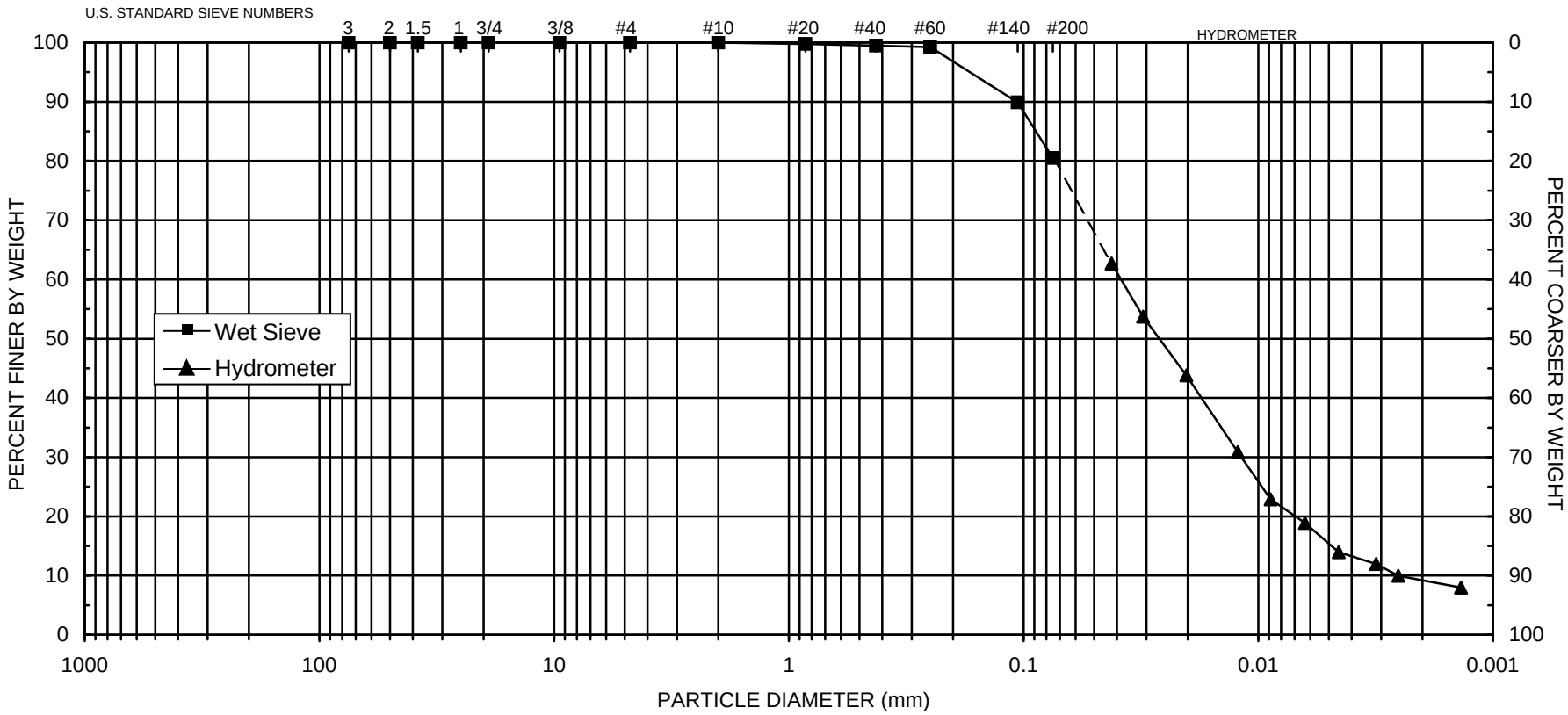
Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Measured particle density: 2.69
Initial Wt. (g)*:* 49.74
Total Sample Wt. (g)*:* 280.95
Wt. Passing #10 (g): 280.95

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
23-Feb-12	1	20.9	38.0	6.5	31.5	10.1	0.04223	62.7	62.7
	2	20.9	33.5	6.5	27.0	10.8	0.03094	53.7	53.7
	5	21.0	28.5	6.5	22.0	11.6	0.02027	43.8	43.8
	15	21.0	22.0	6.5	15.5	12.7	0.01223	30.9	30.9
	30	21.0	18.0	6.5	11.5	13.3	0.00887	22.9	22.9
	60	21.2	16.0	6.5	9.5	13.7	0.00633	18.9	18.9
	120	21.2	13.5	6.5	7.0	14.1	0.00454	13.9	13.9
	250	21.9	12.0	6.0	6.0	14.3	0.00315	11.9	11.9
	390	22.0	11.0	6.0	5.0	14.5	0.00253	10.0	10.0
24-Feb-12	1350	21.7	10.5	6.5	4.0	14.6	0.00137	8.0	8.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY				
		Coarse	Fine	Coarse	Medium	Fine					
USDA	COBBLES	GRAVEL		SAND				SILT			CLAY
				Very coarse	Coarse	Medium	Fine	Very fine			

d_{10} = **0.0025**	d_{30} = **0.012**	d_{50} = **0.026**	d_{60} = **0.038**	C_u = **15**	C_c = **1.5**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
PB-15 (604-605)	**604-605**	**Silt with sand (ML)s**	**Silt Loam**

Daniel B. Stephens & Associates, Inc.

Atterberg Limits/ Identification of Fines

Summary of Atterberg Tests

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
PB-11 (39-40)	46	22	24	CL
PB-11 (154-155)	45	23	22	CL
PB-11 (184-185)	42	23	19	CL
PB-11 (209-210)	45	24	21	CL
PB-11 (229-230)	37	21	16	CL
PB-11 (248-249)	52	23	29	CH
PB-11 (274-275)	40	22	18	CL
PB-11 (294-295)	46	21	25	CL
PB-11 (309-310)	45	23	22	CL
PB-11 (334-335)	47	19	28	CL
PB-11 (359-360)	49	20	29	CL
PB-12 (69-70)	40	28	12	ML
PB-12 (109-110)	52	24	28	CH
PB-12 (154-155)	40	28	12	ML
PB-12 (179-180)	39	24	15	CL
PB-12 (204-205)	34	26	8	ML
PB-12 (224-225)	42	22	20	CL
PB-12 (249-250)	44	26	18	CL
PB-12 (264-265)	44	23	21	CL
PB-12 (284-285)	47	26	21	CL

--- = Soil requires visual-manual classification due to non-plasticity

Summary of Atterberg Tests (Continued)

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
PB-12 (309-310)	58	27	31	CH
PB-12 (334-335)	54	20	34	CH
PB-12 (349-350)	52	27	25	CH
PB-13 (279-280)	---	---	---	ML
PB-13 (349-350)	---	---	---	ML
PB-13 (444-445)	47	23	24	CL
PB-13 (499-500)	43	26	17	CL
PB-13 (534-535)	---	---	---	ML
PB-13 (554-555)	44	26	18	CL
PB-13 (563-564)	47	26	21	CL
PB-13 (585-586)	---	---	---	ML
PB-13 (604-605)	46	28	18	ML
PB-13 (625-626)	---	---	---	ML
PB-13 (639-640)	47	36	11	ML
PB-13 (660-661)	---	---	---	ML
PB-14 (294-295)	45	25	20	CL
PB-14 (304-305)	48	25	23	CL
PB-14 (532-533)	43	32	11	ML
PB-14 (549-550)	---	---	---	ML
PB-14 (569-570)	42	31	11	ML

--- = Soil requires visual-manual classification due to non-plasticity

Summary of Atterberg Tests (Continued)

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
PB-14 (594-595)	---	---	---	ML
PB-14 (620-623)	43	34	9	ML
PB-14 (635-636)	---	---	---	ML
PB-14 (709-710)	38	28	10	ML
PB-14 (727-728)	43	31	12	ML
PB-14 (741-742)	46	28	18	ML
PB-14 (749-750)	41	35	6	ML
PB-15 (435-436)	40	32	8	ML
PB-15 (464-465)	42	33	9	ML
PB-15 (483-484)	45	26	19	CL
PB-15 (502-503)	42	29	13	ML
PB-15 (524-525)	---	---	---	ML
PB-15 (539-540)	---	---	---	ML
PB-15 (559-560)	---	---	---	ML
PB-15 (574-575)	45	35	10	ML
PB-15 (604-605)	---	---	---	ML

--- = Soil requires visual-manual classification due to non-plasticity

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (39-40)
Date Sampled: 12/7/2011
Depth: 39-40

Test Date: 28-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	33	24	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	128.55	132.68	126.61
Weight of pan plus dry soil (g)	124.88	127.94	122.15
Weight of pan (g):	116.57	117.77	113.26
Gravimetric moisture content (% g/g):	44.16	46.61	50.17
Liquid Limit:	46		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	121.06	119.18
Weight of pan plus dry soil (g)	120.23	118.01
Weight of pan (g):	116.52	112.59
Gravimetric moisture content (% g/g):	22.37	21.59
Plastic Limit:	22	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 46
Plastic Limit: 22
Plasticity Index: 24

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

Test Date: 28-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	25	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	121.97	129.88	130.48
Weight of pan plus dry soil (g)	119.36	125.95	125.68
Weight of pan (g):	113.31	117.26	115.61
Gravimetric moisture content (% g/g):	43.14	45.22	47.67
Liquid Limit:	45		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.70	122.98
Weight of pan plus dry soil (g)	121.52	121.75
Weight of pan (g):	116.54	116.42
Gravimetric moisture content (% g/g):	23.69	23.08
Plastic Limit:	23	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 45
Plastic Limit: 23
Plasticity Index: 22

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (184-185)
Date Sampled: 12/7/2011
Depth: 184-185

Test Date: 28-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	30	24	19
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	126.92	131.27	129.96
Weight of pan plus dry soil (g)	124.29	127.27	126.31
Weight of pan (g):	117.96	117.88	118.02
Gravimetric moisture content (% g/g):	41.55	42.60	44.03
Liquid Limit:	42		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	121.01	125.17
Weight of pan plus dry soil (g)	119.97	123.78
Weight of pan (g):	115.31	117.70
Gravimetric moisture content (% g/g):	22.32	22.86
Plastic Limit:	23	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 42
Plastic Limit: 23
Plasticity Index: 19

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (209-210)
Date Sampled: 12/7/2011
Depth: 209-210

Test Date: 28-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	23	15
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.10	129.64	129.80
Weight of pan plus dry soil (g)	120.63	125.95	125.98
Weight of pan (g):	112.65	117.88	117.85
Gravimetric moisture content (% g/g):	43.48	45.72	46.99
Liquid Limit:	45		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	121.86	122.92
Weight of pan plus dry soil (g)	120.76	121.83
Weight of pan (g):	116.28	117.32
Gravimetric moisture content (% g/g):	24.55	24.17
Plastic Limit:	24	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 45
Plastic Limit: 24
Plasticity Index: 21

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (229-230)
Date Sampled: 12/7/2011
Depth: 229-230

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	24	18
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	130.35	129.92	127.74
Weight of pan plus dry soil (g)	126.83	125.63	123.56
Weight of pan (g):	116.86	114.02	112.57
Gravimetric moisture content (% g/g):	35.31	36.95	38.03

Liquid Limit: 37

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.58	124.08
Weight of pan plus dry soil (g)	122.34	122.75
Weight of pan (g):	116.38	116.43
Gravimetric moisture content (% g/g):	20.81	21.04

Plastic Limit: 21

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 37
Plastic Limit: 21
Plasticity Index: 16

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (248-249)
Date Sampled: 12/7/2011
Depth: 248-249

Test Date: 20-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	28	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	118.23	126.08	127.24
Weight of pan plus dry soil (g)	115.72	122.86	123.14
Weight of pan (g):	110.70	116.58	115.50
Gravimetric moisture content (% g/g):	50.00	51.27	53.66

Liquid Limit: 52

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.36	124.15
Weight of pan plus dry soil (g)	122.27	122.97
Weight of pan (g):	117.46	117.77
Gravimetric moisture content (% g/g):	22.66	22.69

Plastic Limit: 23

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 52
Plastic Limit: 23
Plasticity Index: 29

Classification: CH

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (274-275)
Date Sampled: 12/7/2011
Depth: 274-275

Test Date: 27-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	25	18
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.74	131.83	133.59
Weight of pan plus dry soil (g)	120.84	127.04	128.28
Weight of pan (g):	110.70	115.00	115.50
Gravimetric moisture content (% g/g):	38.46	39.78	41.55
Liquid Limit:	40		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.25	123.18
Weight of pan plus dry soil (g)	122.20	122.21
Weight of pan (g):	117.46	117.77
Gravimetric moisture content (% g/g):	22.15	21.85
Plastic Limit:	22	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 40
Plastic Limit: 22
Plasticity Index: 18

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (294-295)
Date Sampled: 12/7/2011
Depth: 294-295

Test Date: 27-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	31	25	20
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	125.14	129.78	126.43
Weight of pan plus dry soil (g)	122.49	125.70	121.78
Weight of pan (g):	116.58	116.89	112.14
Gravimetric moisture content (% g/g):	44.84	46.31	48.24
Liquid Limit:	46		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.01	121.81
Weight of pan plus dry soil (g)	121.01	120.58
Weight of pan (g):	116.40	114.80
Gravimetric moisture content (% g/g):	21.69	21.28
Plastic Limit:	21	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 46
Plastic Limit: 21
Plasticity Index: 25

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	29	21
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	126.33	130.29	137.18
Weight of pan plus dry soil (g)	122.23	126.48	131.04
Weight of pan (g):	112.65	117.88	117.85
Gravimetric moisture content (% g/g):	42.80	44.30	46.55
Liquid Limit:	45		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	119.12	123.67
Weight of pan plus dry soil (g)	118.00	122.49
Weight of pan (g):	113.08	117.32
Gravimetric moisture content (% g/g):	22.76	22.82
Plastic Limit:	23	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 45
Plastic Limit: 23
Plasticity Index: 22

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

Test Date: 20-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	26	20
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	122.06	124.79	124.05
Weight of pan plus dry soil (g)	119.19	121.66	120.19
Weight of pan (g):	112.93	115.00	112.14
Gravimetric moisture content (% g/g):	45.85	47.00	47.95

Liquid Limit: 47

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.34	118.55
Weight of pan plus dry soil (g)	119.70	117.94
Weight of pan (g):	116.40	114.80
Gravimetric moisture content (% g/g):	19.39	19.43

Plastic Limit: 19

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 47
Plastic Limit: 19
Plasticity Index: 28

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (359-360)
Date Sampled: 12/7/2011
Depth: 359-360

Test Date: 20-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	29	22
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	126.08	130.31	124.65
Weight of pan plus dry soil (g)	123.41	125.99	120.56
Weight of pan (g):	117.67	116.89	112.30
Gravimetric moisture content (% g/g):	46.52	47.47	49.52
Liquid Limit:	49		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	119.43	118.53
Weight of pan plus dry soil (g)	118.93	117.96
Weight of pan (g):	116.38	115.16
Gravimetric moisture content (% g/g):	19.61	20.36
Plastic Limit:	20	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 49
Plastic Limit: 20
Plasticity Index: 29

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (69-70)
Date Sampled: 12/7/2011
Depth: 69-70

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	28	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	130.22	128.15	134.76
Weight of pan plus dry soil (g)	126.82	124.45	129.12
Weight of pan (g):	117.96	115.00	115.50
Gravimetric moisture content (% g/g):	38.37	39.15	41.41
Liquid Limit:	40		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.91	125.15
Weight of pan plus dry soil (g)	122.51	123.54
Weight of pan (g):	117.46	117.77
Gravimetric moisture content (% g/g):	27.72	27.90
Plastic Limit:	28	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 40
Plastic Limit: 28
Plasticity Index: 12

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (109-110)
Date Sampled: 12/7/2011
Depth: 109-110

Test Date: 21-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	26	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.27	125.28	126.92
Weight of pan plus dry soil (g)	121.79	121.48	121.91
Weight of pan (g):	116.86	114.02	112.57
Gravimetric moisture content (% g/g):	50.30	50.94	53.64

Liquid Limit: 52

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	118.41	123.23
Weight of pan plus dry soil (g)	117.44	122.27
Weight of pan (g):	113.45	118.37
Gravimetric moisture content (% g/g):	24.31	24.62

Plastic Limit: 24

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 52
Plastic Limit: 24
Plasticity Index: 28

Classification: CH

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	32	26	21
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	125.18	123.76	122.11
Weight of pan plus dry soil (g)	123.01	121.78	119.21
Weight of pan (g):	117.46	116.89	112.14
Gravimetric moisture content (% g/g):	39.10	40.49	41.02

Liquid Limit: 40

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.75	121.86
Weight of pan plus dry soil (g)	119.78	120.35
Weight of pan (g):	116.40	114.80
Gravimetric moisture content (% g/g):	28.70	27.21

Plastic Limit: 28

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 40
Plastic Limit: 28
Plasticity Index: 12

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (179-180)
Date Sampled: 12/7/2011
Depth: 179-180

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	27	21
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	120.56	129.04	129.42
Weight of pan plus dry soil (g)	117.86	125.58	125.48
Weight of pan (g):	110.70	116.58	115.50
Gravimetric moisture content (% g/g):	37.71	38.44	39.48
Liquid Limit:	39		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.28	124.53
Weight of pan plus dry soil (g)	121.97	123.23
Weight of pan (g):	116.40	117.77
Gravimetric moisture content (% g/g):	23.52	23.81
Plastic Limit:	24	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 39
Plastic Limit: 24
Plasticity Index: 15

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (204-205)
Date Sampled: 12/7/2011
Depth: 204-205

Test Date: 27-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	32	27	22
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	125.74	126.44	129.45
Weight of pan plus dry soil (g)	122.62	123.08	125.31
Weight of pan (g):	113.26	113.16	113.18
Gravimetric moisture content (% g/g):	33.33	33.87	34.13
Liquid Limit:	34		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	125.26	124.32
Weight of pan plus dry soil (g)	123.74	122.69
Weight of pan (g):	117.97	116.43
Gravimetric moisture content (% g/g):	26.34	26.04
Plastic Limit:	26	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 34
Plastic Limit: 26
Plasticity Index: 8

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (224-225)
Date Sampled: 12/7/2011
Depth: 224-225

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	22	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	123.59	130.25	135.18
Weight of pan plus dry soil (g)	119.83	126.54	129.93
Weight of pan (g):	110.70	117.88	118.02
Gravimetric moisture content (% g/g):	41.18	42.84	44.08
Liquid Limit:	42		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.38	125.72
Weight of pan plus dry soil (g)	121.10	124.25
Weight of pan (g):	115.31	117.70
Gravimetric moisture content (% g/g):	22.11	22.44
Plastic Limit:	22	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 42
Plastic Limit: 22
Plasticity Index: 20

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (249-250)
Date Sampled: 12/7/2011
Depth: 249-250

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	28	20
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	130.73	130.69	134.05
Weight of pan plus dry soil (g)	126.89	126.57	130.90
Weight of pan (g):	117.83	116.95	123.83
Gravimetric moisture content (% g/g):	42.38	42.83	44.55
Liquid Limit:	44		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.91	118.89
Weight of pan plus dry soil (g)	121.44	117.52
Weight of pan (g):	115.72	112.17
Gravimetric moisture content (% g/g):	25.70	25.61
Plastic Limit:	26	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 44
Plastic Limit: 26
Plasticity Index: 18

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (264-265)
Date Sampled: 12/7/2011
Depth: 264-265

Test Date: 27-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	31	21	15
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	129.56	125.73	127.56
Weight of pan plus dry soil (g)	126.00	122.97	122.81
Weight of pan (g):	117.67	116.78	112.30
Gravimetric moisture content (% g/g):	42.74	44.59	45.20
Liquid Limit:	44		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	119.55	121.98
Weight of pan plus dry soil (g)	118.35	120.73
Weight of pan (g):	113.08	115.16
Gravimetric moisture content (% g/g):	22.77	22.44
Plastic Limit:	23	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 44
Plastic Limit: 23
Plasticity Index: 21

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (284-285)
Date Sampled: 12/7/2011
Depth: 284-285

Test Date: 22-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	27	19
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	122.65	126.43	122.79
Weight of pan plus dry soil (g)	120.73	123.37	119.35
Weight of pan (g):	116.58	116.89	112.14
Gravimetric moisture content (% g/g):	46.27	47.22	47.71
Liquid Limit:	47		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	121.13	120.28
Weight of pan plus dry soil (g)	120.14	119.16
Weight of pan (g):	116.40	114.80
Gravimetric moisture content (% g/g):	26.47	25.69
Plastic Limit:	26	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 47
Plastic Limit: 26
Plasticity Index: 21

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	24	19
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	126.36	130.57	123.31
Weight of pan plus dry soil (g)	123.25	125.46	119.20
Weight of pan (g):	117.67	116.78	112.30
Gravimetric moisture content (% g/g):	55.73	58.87	59.57

Liquid Limit: 58

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.82	121.03
Weight of pan plus dry soil (g)	119.85	119.80
Weight of pan (g):	116.28	115.16
Gravimetric moisture content (% g/g):	27.17	26.51

Plastic Limit: 27

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 58
Plastic Limit: 27
Plasticity Index: 31

Classification: CH

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

Test Date: 20-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	33	27	18
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	122.28	125.17	124.59
Weight of pan plus dry soil (g)	119.54	122.24	120.95
Weight of pan (g):	114.28	116.78	114.40
Gravimetric moisture content (% g/g):	52.09	53.66	55.57
Liquid Limit:	54		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	117.28	117.30
Weight of pan plus dry soil (g)	116.57	116.61
Weight of pan (g):	113.08	113.24
Gravimetric moisture content (% g/g):	20.34	20.47
Plastic Limit:	20	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 54
Plastic Limit: 20
Plasticity Index: 34

Classification: CH

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

Test Date: 27-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	33	24	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	127.38	132.57	128.58
Weight of pan plus dry soil (g)	124.04	127.36	124.32
Weight of pan (g):	117.46	117.48	116.50
Gravimetric moisture content (% g/g):	50.76	52.73	54.48
Liquid Limit:	52		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	117.51	117.47
Weight of pan plus dry soil (g)	116.65	116.59
Weight of pan (g):	113.47	113.20
Gravimetric moisture content (% g/g):	27.04	25.96
Plastic Limit:	27	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 52
Plastic Limit: 27
Plasticity Index: 25

Classification: CH

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (279-280)
Date Sampled: 12/7/2011
Depth: 279-280

Test Date: 21-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (279-280)
Date Sampled: 12/7/2011
Depth: 279-280

Test Date: 21-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Dark Yellowish Brown (10YR 4/4)
Odor: None
Moisture Condition: Moist
HCl Reaction: Strong

Preliminary Identification:

Dry Strength: Low
Dilatency: Rapid
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

Test Date: 20-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

Test Date: 20-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Brown (10YR 5/3)
Odor: None
Moisture Condition: Moist
HCl Reaction: Strong

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (444-445)
Date Sampled: 12/7/2011
Depth: 444-445

Test Date: 22-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	33	28	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	120.56	121.84	124.57
Weight of pan plus dry soil (g)	118.28	119.10	120.86
Weight of pan (g):	113.26	113.16	113.18
Gravimetric moisture content (% g/g):	45.42	46.13	48.31
Liquid Limit:	47		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.37	122.83
Weight of pan plus dry soil (g)	122.35	121.64
Weight of pan (g):	117.97	116.43
Gravimetric moisture content (% g/g):	23.29	22.84
Plastic Limit:	23	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 47
Plastic Limit: 23
Plasticity Index: 24

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (499-500)
Date Sampled: 12/7/2011
Depth: 499-500

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	32	25	20
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	118.91	126.20	129.05
Weight of pan plus dry soil (g)	117.24	123.51	124.96
Weight of pan (g):	113.31	117.26	115.61
Gravimetric moisture content (% g/g):	42.49	43.04	43.74

Liquid Limit: 43

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.69	119.16
Weight of pan plus dry soil (g)	121.41	117.82
Weight of pan (g):	116.54	112.59
Gravimetric moisture content (% g/g):	26.28	25.62

Plastic Limit: 26

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 43
Plastic Limit: 26
Plasticity Index: 17

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (534-535)
Date Sampled: 12/7/2011
Depth: 534-535

Test Date: 28-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (534-535)
Date Sampled: 12/7/2011
Depth: 534-535

Test Date: 28-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Brown (10YR 4/3)
Odor: None
Moisture Condition: Moist
HCl Reaction: Strong

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (554-555)
Date Sampled: 12/7/2011
Depth: 554-555

Test Date: 27-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	31	27	20
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	127.15	124.57	129.61
Weight of pan plus dry soil (g)	124.02	121.35	124.34
Weight of pan (g):	116.86	114.02	112.57
Gravimetric moisture content (% g/g):	43.72	43.93	44.77
Liquid Limit:	44		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.59	124.14
Weight of pan plus dry soil (g)	121.32	122.95
Weight of pan (g):	116.38	118.37
Gravimetric moisture content (% g/g):	25.71	25.98
Plastic Limit:	26	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 44
Plastic Limit: 26
Plasticity Index: 18

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (563-564)
Date Sampled: 12/7/2011
Depth: 563-564

Test Date: 27-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	29	22
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.84	124.29	128.41
Weight of pan plus dry soil (g)	121.55	120.71	123.92
Weight of pan (g):	114.28	112.93	114.40
Gravimetric moisture content (% g/g):	45.25	46.02	47.16
Liquid Limit:	47		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	119.41	119.59
Weight of pan plus dry soil (g)	118.16	118.29
Weight of pan (g):	113.45	113.24
Gravimetric moisture content (% g/g):	26.54	25.74
Plastic Limit:	26	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 47
Plastic Limit: 26
Plasticity Index: 21

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (585-586)
Date Sampled: NA
Depth: 585-586

Test Date: 27-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (585-586)
Date Sampled: NA
Depth: 585-586

Test Date: 27-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Very Dark Grayish Brown (10YR 4/2)
Odor: None
Moisture Condition: Moist
HCl Reaction: Strong

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (604-605)
Date Sampled: NA
Depth: 604-605

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	31	27	21
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	125.85	130.15	126.63
Weight of pan plus dry soil (g)	122.93	126.25	122.41
Weight of pan (g):	116.57	117.77	113.26
Gravimetric moisture content (% g/g):	45.91	45.99	46.12
Liquid Limit:	46		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.51	122.23
Weight of pan plus dry soil (g)	121.20	120.96
Weight of pan (g):	116.52	116.42
Gravimetric moisture content (% g/g):	27.99	27.97
Plastic Limit:	28	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 46
Plastic Limit: 28
Plasticity Index: 18

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (625-626)
Date Sampled: NA
Depth: 625-626

Test Date: 28-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (625-626)
Date Sampled: NA
Depth: 625-626

Test Date: 28-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Very Dark Grayish Brown (10YR 4/2)
Odor: None
Moisture Condition: Moist
HCl Reaction: Strong

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (639-640)
Date Sampled: NA
Depth: 639-640

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	30	26	18
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	122.25	124.68	126.03
Weight of pan plus dry soil (g)	119.40	121.01	121.85
Weight of pan (g):	113.26	113.16	113.18
Gravimetric moisture content (% g/g):	46.42	46.75	48.21
Liquid Limit:	47		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	124.15	125.60
Weight of pan plus dry soil (g)	122.53	123.69
Weight of pan (g):	117.97	118.37
Gravimetric moisture content (% g/g):	35.53	35.90
Plastic Limit:	36	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 47
Plastic Limit: 36
Plasticity Index: 11

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (660-661)
Date Sampled: NA
Depth: 660-661

Test Date: 20-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (660-661)
Date Sampled: NA
Depth: 660-661

Test Date: 20-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Dark Gray (10YR 4/1)
Odor: None
Moisture Condition: Moist
HCl Reaction: Strong

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (294-295)
Date Sampled: 12/8/2011
Depth: 294-295

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	27	21
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.59	127.33	131.10
Weight of pan plus dry soil (g)	122.62	124.40	126.99
Weight of pan (g):	117.96	117.88	118.02
Gravimetric moisture content (% g/g):	42.27	44.94	45.82
Liquid Limit:	45		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	121.74	124.38
Weight of pan plus dry soil (g)	120.44	123.04
Weight of pan (g):	115.31	117.70
Gravimetric moisture content (% g/g):	25.34	25.09
Plastic Limit:	25	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 45
Plastic Limit: 25
Plasticity Index: 20

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (304-305)
Date Sampled: 12/8/2011
Depth: 304-305

Test Date: 22-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	36	25	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.01	122.26	124.28
Weight of pan plus dry soil (g)	120.95	119.23	120.98
Weight of pan (g):	114.28	112.93	114.40
Gravimetric moisture content (% g/g):	45.88	48.10	50.15
Liquid Limit:	48		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.33	118.88
Weight of pan plus dry soil (g)	121.13	117.74
Weight of pan (g):	116.36	113.24
Gravimetric moisture content (% g/g):	25.16	25.33
Plastic Limit:	25	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 48
Plastic Limit: 25
Plasticity Index: 23

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (532-533)
Date Sampled: 12/8/2011
Depth: 532-533

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	24	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	126.07	128.80	125.90
Weight of pan plus dry soil (g)	123.27	125.52	122.02
Weight of pan (g):	116.57	117.77	113.26
Gravimetric moisture content (% g/g):	41.79	42.32	44.29
Liquid Limit:	43		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	124.28	119.99
Weight of pan plus dry soil (g)	122.38	118.18
Weight of pan (g):	116.52	112.59
Gravimetric moisture content (% g/g):	32.42	32.38
Plastic Limit:	32	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 43
Plastic Limit: 32
Plasticity Index: 11

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (549-550)
Date Sampled: 12/8/2011
Depth: 549-550

Test Date: 28-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (549-550)
Date Sampled: 12/7/2011
Depth: 549-550

Test Date: 28-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Brown (10YR 4/3)
Odor: None
Moisture Condition: Moist
HCl Reaction: Weak

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (569-570)
Date Sampled: 12/8/2011
Depth: 569-570

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	33	26	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	126.96	128.80	136.22
Weight of pan plus dry soil (g)	124.31	125.31	132.49
Weight of pan (g):	117.83	116.95	123.83
Gravimetric moisture content (% g/g):	40.90	41.75	43.07
Liquid Limit:	42		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.55	119.31
Weight of pan plus dry soil (g)	120.91	117.61
Weight of pan (g):	115.72	112.17
Gravimetric moisture content (% g/g):	31.60	31.25
Plastic Limit:	31	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 42
Plastic Limit: 31
Plasticity Index: 11

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (594-595)
Date Sampled: 12/8/2011
Depth: 594-595

Test Date: 28-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (594-595)
Date Sampled: 12/7/2011
Depth: 594-595

Test Date: 28-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Very Dark Grayish Brown (2.5Y 3/2)
Odor: None
Moisture Condition: Moist
HCl Reaction: Strong

Preliminary Identification:

Dry Strength: Low
Dilatency: Rapid
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (620-623)
Date Sampled: 12/8/2011
Depth: 620-623

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	32	25	19
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	126.83	128.88	130.01
Weight of pan plus dry soil (g)	124.07	125.60	126.32
Weight of pan (g):	117.46	117.88	117.85
Gravimetric moisture content (% g/g):	41.75	42.49	43.57
Liquid Limit:	43		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	124.09	121.37
Weight of pan plus dry soil (g)	122.10	119.31
Weight of pan (g):	116.28	113.20
Gravimetric moisture content (% g/g):	34.19	33.72
Plastic Limit:	34	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 43
Plastic Limit: 34
Plasticity Index: 9

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (635-636)
Date Sampled: 12/8/2011
Depth: 635-636

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (635-636)
Date Sampled: 12/8/2011
Depth: 635-636

Test Date: 29-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Dark Grayish Brown (2.5Y 4/2)
Odor: None
Moisture Condition: Moist
HCl Reaction: Weak

Preliminary Identification:

Dry Strength: Low
Dilatency: Rapid
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (709-710)
Date Sampled: 12/8/2011
Depth: 709-710

Test Date: 29-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	28	18
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	125.95	128.44	125.60
Weight of pan plus dry soil (g)	123.44	125.40	123.03
Weight of pan (g):	116.58	117.48	116.50
Gravimetric moisture content (% g/g):	36.59	38.38	39.36
Liquid Limit:	38		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.41	121.81
Weight of pan plus dry soil (g)	118.89	119.93
Weight of pan (g):	113.47	113.20
Gravimetric moisture content (% g/g):	28.04	27.93
Plastic Limit:	28	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 38
Plastic Limit: 28
Plasticity Index: 10

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (727-728)
Date Sampled: 12/8/2011
Depth: 727-728

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	26	15
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.31	127.77	131.40
Weight of pan plus dry soil (g)	120.93	124.67	126.84
Weight of pan (g):	112.65	117.48	116.50
Gravimetric moisture content (% g/g):	40.82	43.12	44.10
Liquid Limit:	43		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.83	123.85
Weight of pan plus dry soil (g)	119.09	122.32
Weight of pan (g):	113.47	117.32
Gravimetric moisture content (% g/g):	30.96	30.60
Plastic Limit:	31	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 43
Plastic Limit: 31
Plasticity Index: 12

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (741-742)
Date Sampled: 12/8/2011
Depth: 741-742

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	26	20
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	126.52	129.81	125.48
Weight of pan plus dry soil (g)	123.77	125.71	121.26
Weight of pan (g):	117.67	116.89	112.30
Gravimetric moisture content (% g/g):	45.08	46.49	47.10
Liquid Limit:	46		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	125.09	124.03
Weight of pan plus dry soil (g)	123.17	122.06
Weight of pan (g):	116.38	115.16
Gravimetric moisture content (% g/g):	28.28	28.55
Plastic Limit:	28	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 46
Plastic Limit: 28
Plasticity Index: 18

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (749-750)
Date Sampled: 12/8/2011
Depth: 749-750

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	22	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.09	125.57	125.52
Weight of pan plus dry soil (g)	120.97	121.91	121.83
Weight of pan (g):	113.26	113.16	113.18
Gravimetric moisture content (% g/g):	40.47	41.83	42.66
Liquid Limit:	41		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	128.12	124.62
Weight of pan plus dry soil (g)	125.50	122.52
Weight of pan (g):	117.97	116.43
Gravimetric moisture content (% g/g):	34.79	34.48
Plastic Limit:	35	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 41
Plastic Limit: 35
Plasticity Index: 6

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (435-436)
Date Sampled: NA
Depth: 435-436

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	33	23	19
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	124.91	126.48	126.29
Weight of pan plus dry soil (g)	122.65	123.66	122.83
Weight of pan (g):	116.86	116.78	114.40
Gravimetric moisture content (% g/g):	39.03	40.99	41.04
Liquid Limit:	40		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	118.60	124.04
Weight of pan plus dry soil (g)	117.34	122.65
Weight of pan (g):	113.45	118.37
Gravimetric moisture content (% g/g):	32.39	32.48
Plastic Limit:	32	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 40
Plastic Limit: 32
Plasticity Index: 8

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (464-465)
Date Sampled: NA
Depth: 464-465

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	30	24	18
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	125.69	122.13	128.52
Weight of pan plus dry soil (g)	122.36	119.69	123.69
Weight of pan (g):	114.28	114.02	112.57
Gravimetric moisture content (% g/g):	41.21	43.03	43.44
Liquid Limit:	42		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.59	120.68
Weight of pan plus dry soil (g)	118.70	118.83
Weight of pan (g):	113.08	113.24
Gravimetric moisture content (% g/g):	33.63	33.09
Plastic Limit:	33	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 42
Plastic Limit: 33
Plasticity Index: 9

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (483-484)
Date Sampled: NA
Depth: 483-484

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	26	20
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	123.07	123.75	124.76
Weight of pan plus dry soil (g)	119.96	121.05	120.80
Weight of pan (g):	112.93	115.00	112.14
Gravimetric moisture content (% g/g):	44.24	44.63	45.73
Liquid Limit:	45		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	125.56	123.09
Weight of pan plus dry soil (g)	123.90	121.41
Weight of pan (g):	117.46	114.80
Gravimetric moisture content (% g/g):	25.78	25.42
Plastic Limit:	26	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 45
Plastic Limit: 26
Plasticity Index: 19

Classification: CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (502-503)
Date Sampled: NA
Depth: 502-503

Test Date: 22-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	26	15
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	125.13	126.36	123.58
Weight of pan plus dry soil (g)	122.98	123.53	120.16
Weight of pan (g):	117.67	116.78	112.30
Gravimetric moisture content (% g/g):	40.49	41.93	43.51
Liquid Limit:	42		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	118.61	121.95
Weight of pan plus dry soil (g)	117.39	120.43
Weight of pan (g):	113.08	115.16
Gravimetric moisture content (% g/g):	28.31	28.84
Plastic Limit:	29	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 42
Plastic Limit: 29
Plasticity Index: 13

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (524-525)
Date Sampled: 12/7/2011
Depth: 524-525

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (524-525)
Date Sampled: 12/7/2011
Depth: 524-525

Test Date: 14-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Grayish Brown (10YR 5/2)
Odor: None
Moisture Condition: Moist
HCl Reaction: Weak

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (539-540)
Date Sampled: 12/7/2011
Depth: 539-540

Test Date: 14-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (539-540)
Date Sampled: 12/7/2011
Depth: 539-540

Test Date: 14-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Dark Grayish Brown (10YR 4/2)
Odor: None
Moisture Condition: Moist
HCl Reaction: Strong

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (559-560)
Date Sampled: 12/7/2011
Depth: 559-560

Test Date: 27-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (559-560)
Date Sampled: 12/7/2011
Depth: 559-560

Test Date: 27-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Brown (7.5YR 4/2)
Odor: None
Moisture Condition: Moist
HCl Reaction: Weak

Preliminary Identification:

Dry Strength: Low
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (574-575)
Date Sampled: 12/7/2011
Depth: 574-575

Test Date: 27-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	33	22	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	128.52	128.35	133.67
Weight of pan plus dry soil (g)	125.24	124.83	130.59
Weight of pan (g):	117.83	116.95	123.83
Gravimetric moisture content (% g/g):	44.26	44.67	45.56
Liquid Limit:	45		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.01	118.66
Weight of pan plus dry soil (g)	120.38	116.99
Weight of pan (g):	115.72	112.17
Gravimetric moisture content (% g/g):	34.98	34.65
Plastic Limit:	35	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: 45
Plastic Limit: 35
Plasticity Index: 10

Classification: ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (604-605)
Date Sampled: 12/7/2011
Depth: 604-605

Test Date: 28-Mar-12

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (604-605)
Date Sampled: 12/7/2011
Depth: 604-605

Test Date: 28-Mar-12

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Dark Grayish Brown (10YR 4/2)
Odor: None
Moisture Condition: Moist
HCl Reaction: Strong

Preliminary Identification:

Dry Strength: Medium
Dilatency: Slow
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Specific Gravity

Summary of Specific Gravity Tests

	<4.75mm Material		>4.75mm Material		Bulk Sample
Sample Number	Specific Gravity	Percent of Bulk Sample	Specific Gravity	Percent of Bulk Sample	Specific Gravity
PB-11 (39-40)	2.68	100	---	0	2.68
PB-11 (154-155)	2.69	100	---	0	2.69
PB-11 (184-185)	2.68	100	---	0	2.68
PB-11 (209-210)	2.70	100	---	0	2.70
PB-11 (229-230)	2.66	100	---	0	2.66
PB-11 (248-249)	2.71	100	---	0	2.71
PB-11 (274-275)	2.69	100	---	0	2.69
PB-11 (294-295)	2.68	100	---	0	2.68
PB-11 (309-310)	2.70	100	---	0	2.70
PB-11 (334-335)	2.71	100	---	0	2.71
PB-11 (359-360)	2.71	100	---	0	2.71
PB-12 (69-70)	2.70	100	---	0	2.70
PB-12 (109-110)	2.75	100	---	0	2.75
PB-12 (154-155)	2.70	100	---	0	2.70
PB-12 (179-180)	2.70	100	---	0	2.70
PB-12 (204-205)	2.68	100	---	0	2.68
PB-12 (224-225)	2.70	100	---	0	2.70
PB-12 (249-250)	2.70	100	---	0	2.70
PB-12 (264-265)	2.68	100	---	0	2.68
PB-12 (284-285)	2.74	100	---	0	2.74
PB-12 (309-310)	2.69	100	---	0	2.69

--- = Unnecessary since specified fraction <5% of composite mass

* = Based on specific gravity of material < 4.75 mm

Summary of Specific Gravity Tests

	<4.75mm Material		>4.75mm Material		Bulk Sample
Sample Number	Specific Gravity	Percent of Bulk Sample	Specific Gravity	Percent of Bulk Sample	Specific Gravity
PB-12 (334-335)	2.70	100	---	0	2.70
PB-12 (349-350)	2.71	100	---	0	2.71
PB-13 (279-280)	2.66	100	---	0	2.66
PB-13 (349-350)	2.70	100	---	0	2.70
PB-13 (444-445)	2.72	100	---	0	2.72
PB-13 (499-500)	2.70	100	---	0	2.70
PB-13 (534-535)	2.68	100	---	0	2.68
PB-13 (554-555)	2.66	100	---	0	2.66
PB-13 (563-564)	2.65	100	---	0	2.65
PB-13 (585-586)	2.68	100	---	0	2.68
PB-13 (604-605)	2.65	100	---	0	2.65
PB-13 (625-626)	2.62	100	---	0	2.62
PB-13 (639-640)	2.65	100	---	0	2.65
PB-13 (660-661)	2.67	100	---	0	2.67
PB-14 (294-295)	2.72	100	---	0	2.72
PB-14 (304-305)	2.69	100	---	0	2.69
PB-14 (532-533)	2.67	100	---	0	2.67
PB-14 (549-550)	2.65	100	---	0	2.65
PB-14 (569-570)	2.69	100	---	0	2.69
PB-14 (594-595)	2.64	100	---	0	2.64
PB-14 (620-623)	2.65	100	---	0	2.65

--- = Unnecessary since specified fraction <5% of composite mass

* = Based on specific gravity of material < 4.75 mm

Summary of Specific Gravity Tests

	<4.75mm Material		>4.75mm Material		Bulk Sample
Sample Number	Specific Gravity	Percent of Bulk Sample	Specific Gravity	Percent of Bulk Sample	Specific Gravity
PB-14 (635-363)	2.66	100	---	0	2.66
PB-14 (709-710)	2.68	100	---	0	2.68
PB-14 (727-728)	2.67	100	---	0	2.67
PB-14 (741-742)	2.66	100	---	0	2.66
PB-14 (749-750)	2.66	100	---	0	2.66
PB-15 (435-436)	2.68	100	---	0	2.68
PB-15 (464-465)	2.68	100	---	0	2.68
PB-15 (483-484)	2.69	100	---	0	2.69
PB-15 (502-503)	2.70	100	---	0	2.70
PB-15 (524-525)	2.67	100	---	0	2.67
PB-15 (539-540)	2.65	100	---	0	2.65
PB-15 (559-560)	2.66	100	---	0	2.66
PB-15 (574-575)	2.63	100	---	0	2.63
PB-15 (604-605)	2.70	100	---	0	2.70

--- = Unnecessary since specified fraction <5% of composite mass

* = Based on specific gravity of material < 4.75 mm

Data for Specific Gravity for Sample: PB-11 (39-40)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (39-40)
Date Sampled: 12/7/2011
Depth: 39-40

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	90.60	91.32
Weight of pycnometer filled w/soil (g):	140.42	141.14
Weight of pycnometer filled w/soil & water (g):	371.19	371.89
Weight of pycnometer filled w/water (g):	339.94	340.71
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.68	2.67
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.68	2.67
Average Specific Gravity at 20°C (g/g):	2.68	
Average Particle Density at 20°C (g/cm^3):	2.67	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.68**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.67	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-11 (154-155)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	94.39	92.68
Weight of pycnometer filled w/soil (g):	139.37	140.00
Weight of pycnometer filled w/soil & water (g):	371.95	371.75
Weight of pycnometer filled w/water (g):	343.73	341.99
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.68	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.68	2.69
Average Specific Gravity at 20°C (g/g):	2.69	
Average Particle Density at 20°C (g/cm^3):	2.68	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.69**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.68	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-11 (184-185)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (184-185)
Date Sampled: 12/7/2011
Depth: 184-185

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	95.92	94.21
Weight of pycnometer filled w/soil (g):	145.95	145.66
Weight of pycnometer filled w/soil & water (g):	376.54	375.72
Weight of pycnometer filled w/water (g):	345.23	343.47
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.67	2.68
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.67	2.68
Average Specific Gravity at 20°C (g/g):	2.68	
Average Particle Density at 20°C (g/cm^3):	2.67	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.68**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.67	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-11 (209-210)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (209-210)
Date Sampled: 12/7/2011
Depth: 209-210

ASTM D854 (<4.75mm Fraction)

Test Date:	26-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.90	94.21
Weight of pycnometer filled w/soil (g):	144.68	146.88
Weight of pycnometer filled w/soil & water (g):	374.84	376.56
Weight of pycnometer filled w/water (g):	342.24	343.43
Observed temperature (°C):	21.10	21.10
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.70	2.69
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.70	2.69
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.69	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.69	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-11 (229-230)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (229-230)
Date Sampled: 12/7/2011
Depth: 229-230

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.97	93.69
Weight of pycnometer filled w/soil (g):	142.88	142.70
Weight of pycnometer filled w/soil & water (g):	373.82	373.65
Weight of pycnometer filled w/water (g):	343.28	343.05
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.66	2.66
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.66	2.66
Average Specific Gravity at 20°C (g/g):	2.66	
Average Particle Density at 20°C (g/cm^3):	2.66	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.66**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.66	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-11 (248-249)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (248-249)
Date Sampled: 12/7/2011
Depth: 248-249

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.99	93.69
Weight of pycnometer filled w/soil (g):	143.97	143.08
Weight of pycnometer filled w/soil & water (g):	374.82	374.21
Weight of pycnometer filled w/water (g):	343.26	343.02
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.71	2.71
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.71	2.71
Average Specific Gravity at 20°C (g/g):	2.71	
Average Particle Density at 20°C (g/cm^3):	2.71	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.71**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.71	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-11 (274-275)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (274-275)
Date Sampled: 12/7/2011
Depth: 274-275

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.72	92.28
Weight of pycnometer filled w/soil (g):	144.38	140.82
Weight of pycnometer filled w/soil & water (g):	375.00	372.09
Weight of pycnometer filled w/water (g):	343.15	341.57
Observed temperature (°C):	21.10	21.10
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.69	2.69
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.69	2.69
Average Specific Gravity at 20°C (g/g):	2.69	
Average Particle Density at 20°C (g/cm^3):	2.69	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.69**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.69	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-11 (294-295)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (294-295)
Date Sampled: 12/7/2011
Depth: 294-295

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.68	90.53
Weight of pycnometer filled w/soil (g):	144.43	140.53
Weight of pycnometer filled w/soil & water (g):	374.52	371.26
Weight of pycnometer filled w/water (g):	342.02	339.91
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.69	2.68
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.69	2.68
Average Specific Gravity at 20°C (g/g):	2.68	
Average Particle Density at 20°C (g/cm^3):	2.68	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.68**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.68	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-11 (309-310)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	91.35	93.99
Weight of pycnometer filled w/soil (g):	139.09	141.09
Weight of pycnometer filled w/soil & water (g):	370.70	372.96
Weight of pycnometer filled w/water (g):	340.66	343.28
Observed temperature (°C):	21.10	21.10
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.70	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.70	2.70
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.69	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.69	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-11 (334-335)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	91.14	94.24
Weight of pycnometer filled w/soil (g):	139.15	146.02
Weight of pycnometer filled w/soil & water (g):	370.76	376.22
Weight of pycnometer filled w/water (g):	340.51	343.49
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.70	2.72
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.70	2.72
Average Specific Gravity at 20°C (g/g):	2.71	
Average Particle Density at 20°C (g/cm^3):	2.71	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.71**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.71	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-11 (359-360)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-11 (359-360)
Date Sampled: 12/7/2011
Depth: 359-360

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.06	94.52
Weight of pycnometer filled w/soil (g):	143.38	145.88
Weight of pycnometer filled w/soil & water (g):	373.74	376.28
Weight of pycnometer filled w/water (g):	341.35	343.81
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.71	2.72
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.71	2.72
Average Specific Gravity at 20°C (g/g):	2.71	
Average Particle Density at 20°C (g/cm^3):	2.71	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.71**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.71	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (69-70)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (69-70)
Date Sampled: 12/7/2011
Depth: 69-70

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.27	93.36
Weight of pycnometer filled w/soil (g):	143.42	144.97
Weight of pycnometer filled w/soil & water (g):	374.08	375.09
Weight of pycnometer filled w/water (g):	342.55	342.60
Observed temperature (°C):	21.10	21.10
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.69	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.69	2.70
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.69	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.69	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (109-110)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (109-110)
Date Sampled: 12/7/2011
Depth: 109-110

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	94.99	93.26
Weight of pycnometer filled w/soil (g):	145.39	142.66
Weight of pycnometer filled w/soil & water (g):	376.39	373.95
Weight of pycnometer filled w/water (g):	344.28	342.51
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.76	2.75
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.75	2.75
Average Specific Gravity at 20°C (g/g):	2.75	
Average Particle Density at 20°C (g/cm^3):	2.75	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.75**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.75	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (154-155)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (154-155)
Date Sampled: 12/7/2011
Depth: 154-155

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.88	90.97
Weight of pycnometer filled w/soil (g):	141.17	136.81
Weight of pycnometer filled w/soil & water (g):	372.95	369.11
Weight of pycnometer filled w/water (g):	343.14	340.21
Observed temperature (°C):	21.10	21.10
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.70	2.71
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.70	2.71
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.70	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.70	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (179-180)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (179-180)
Date Sampled: 12/7/2011
Depth: 179-180

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	91.98	93.43
Weight of pycnometer filled w/soil (g):	136.85	138.63
Weight of pycnometer filled w/soil & water (g):	369.49	371.14
Weight of pycnometer filled w/water (g):	341.31	342.64
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.69	2.71
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.69	2.71
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.69	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.69	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (204-205)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (204-205)
Date Sampled: 12/7/2011
Depth: 204-205

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.90	93.69
Weight of pycnometer filled w/soil (g):	144.58	143.94
Weight of pycnometer filled w/soil & water (g):	374.65	374.51
Weight of pycnometer filled w/water (g):	342.28	343.04
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.68	2.68
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.68	2.68
Average Specific Gravity at 20°C (g/g):	2.68	
Average Particle Density at 20°C (g/cm^3):	2.67	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.68**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.67	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (224-225)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (224-225)
Date Sampled: 12/7/2011
Depth: 224-225

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	94.23	93.27
Weight of pycnometer filled w/soil (g):	145.08	142.41
Weight of pycnometer filled w/soil & water (g):	375.54	373.52
Weight of pycnometer filled w/water (g):	343.49	342.61
Observed temperature (°C):	21.10	21.10
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.71	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.70	2.70
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.70	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.70	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (249-250)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (249-250)
Date Sampled: 12/7/2011
Depth: 249-250

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	90.53	93.55
Weight of pycnometer filled w/soil (g):	140.73	143.20
Weight of pycnometer filled w/soil & water (g):	371.54	374.20
Weight of pycnometer filled w/water (g):	339.92	342.93
Observed temperature (°C):	21.10	21.10
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.70	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.70	2.70
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.70	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.70	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (264-265)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (264-265)
Date Sampled: 12/7/2011
Depth: 264-265

ASTM D854 (<4.75mm Fraction)

Test Date:	1-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.94	93.74
Weight of pycnometer filled w/soil (g):	141.57	144.38
Weight of pycnometer filled w/soil & water (g):	372.80	374.93
Weight of pycnometer filled w/water (g):	342.29	343.19
Observed temperature (°C):	20.70	20.70
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.68	2.68
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.68	2.68
Average Specific Gravity at 20°C (g/g):	2.68	
Average Particle Density at 20°C (g/cm^3):	2.68	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.68**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.68	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (284-285)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (284-285)
Date Sampled: 12/7/2011
Depth: 284-285

ASTM D854 (<4.75mm Fraction)

Test Date:	1-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	102.67	107.66
Weight of pycnometer filled w/soil (g):	144.22	149.95
Weight of pycnometer filled w/soil & water (g):	378.30	383.69
Weight of pycnometer filled w/water (g):	351.96	356.80
Observed temperature (°C):	21.70	21.60
Density of water at observed temperature (g/cm^3):	0.9978	0.9979
Specific Gravity (g/g):	2.73	2.75
Correction factor, K:	0.9996	0.9997
Specific Gravity at 20°C (g/g):	2.73	2.74
Average Specific Gravity at 20°C (g/g):	2.74	
Average Particle Density at 20°C (g/cm^3):	2.73	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.74**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.73	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (309-310)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (309-310)
Date Sampled: 12/7/2011
Depth: 309-310

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	90.59	91.50
Weight of pycnometer filled w/soil (g):	133.12	134.18
Weight of pycnometer filled w/soil & water (g):	366.64	367.58
Weight of pycnometer filled w/water (g):	339.90	340.83
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.69	2.68
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.69	2.68
Average Specific Gravity at 20°C (g/g):	2.69	
Average Particle Density at 20°C (g/cm^3):	2.68	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.69**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.68	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (334-335)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (334-335)
Date Sampled: 12/7/2011
Depth: 334-335

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.58	95.13
Weight of pycnometer filled w/soil (g):	143.59	144.23
Weight of pycnometer filled w/soil & water (g):	374.38	375.26
Weight of pycnometer filled w/water (g):	342.89	344.35
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.70	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.70	2.70
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.69	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.69	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-12 (349-350)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-12 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	109.85	91.98
Weight of pycnometer filled w/soil (g):	161.65	143.09
Weight of pycnometer filled w/soil & water (g):	391.77	373.50
Weight of pycnometer filled w/water (g):	359.05	341.31
Observed temperature (°C):	20.90	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.71	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.71	2.70
Average Specific Gravity at 20°C (g/g):	2.71	
Average Particle Density at 20°C (g/cm^3):	2.70	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.71**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.70	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (279-280)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (279-280)
Date Sampled: 12/7/2011
Depth: 279-280

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	95.80	92.11
Weight of pycnometer filled w/soil (g):	141.33	136.89
Weight of pycnometer filled w/soil & water (g):	373.47	369.46
Weight of pycnometer filled w/water (g):	345.03	341.47
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.66	2.67
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.66	2.67
Average Specific Gravity at 20°C (g/g):	2.66	
Average Particle Density at 20°C (g/cm^3):	2.66	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.66**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.66	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (349-350)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (349-350)
Date Sampled: 12/7/2011
Depth: 349-350

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.89	95.94
Weight of pycnometer filled w/soil (g):	143.15	147.05
Weight of pycnometer filled w/soil & water (g):	373.88	377.39
Weight of pycnometer filled w/water (g):	342.23	345.22
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.70	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.70	2.70
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.69	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.69	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (444-445)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (444-445)
Date Sampled: 12/7/2011
Depth: 444-445

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.80	93.60
Weight of pycnometer filled w/soil (g):	144.44	142.93
Weight of pycnometer filled w/soil & water (g):	375.09	374.02
Weight of pycnometer filled w/water (g):	343.05	342.85
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.72	2.72
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.72	2.72
Average Specific Gravity at 20°C (g/g):	2.72	
Average Particle Density at 20°C (g/cm^3):	2.71	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.72**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.71	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (499-500)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (499-500)
Date Sampled: 12/7/2011
Depth: 499-500

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.48	93.36
Weight of pycnometer filled w/soil (g):	139.94	142.43
Weight of pycnometer filled w/soil & water (g):	371.79	373.61
Weight of pycnometer filled w/water (g):	341.93	342.64
Observed temperature (°C):	20.30	20.30
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.70	2.71
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.70	2.71
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.70	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.70	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (534-535)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (534-535)
Date Sampled: 12/7/2011
Depth: 534-535

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.89	93.08
Weight of pycnometer filled w/soil (g):	144.19	148.09
Weight of pycnometer filled w/soil & water (g):	374.41	376.92
Weight of pycnometer filled w/water (g):	342.21	342.41
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.69	2.68
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.69	2.68
Average Specific Gravity at 20°C (g/g):	2.68	
Average Particle Density at 20°C (g/cm^3):	2.68	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.68**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.68	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (554-555)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (554-555)
Date Sampled: 12/7/2011
Depth: 554-555

ASTM D854 (<4.75mm Fraction)

Test Date:	1-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.67	90.53
Weight of pycnometer filled w/soil (g):	142.06	137.00
Weight of pycnometer filled w/soil & water (g):	372.92	368.85
Weight of pycnometer filled w/water (g):	341.99	339.90
Observed temperature (°C):	20.70	20.70
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.68	2.65
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.67	2.65
Average Specific Gravity at 20°C (g/g):	2.66	
Average Particle Density at 20°C (g/cm^3):	2.66	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.66**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.66	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (563-564)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (563-564)
Date Sampled: 12/7/2011
Depth: 563-564

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	91.38	91.07
Weight of pycnometer filled w/soil (g):	142.53	141.55
Weight of pycnometer filled w/soil & water (g):	372.56	371.81
Weight of pycnometer filled w/water (g):	340.71	340.33
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.65	2.66
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.65	2.66
Average Specific Gravity at 20°C (g/g):	2.65	
Average Particle Density at 20°C (g/cm^3):	2.65	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.65**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.65	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (585-586)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (585-586)
Date Sampled: NA
Depth: 585-586

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	94.31	90.23
Weight of pycnometer filled w/soil (g):	140.73	135.45
Weight of pycnometer filled w/soil & water (g):	372.79	367.87
Weight of pycnometer filled w/water (g):	343.68	339.48
Observed temperature (°C):	21.10	21.10
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.68	2.69
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.68	2.69
Average Specific Gravity at 20°C (g/g):	2.68	
Average Particle Density at 20°C (g/cm^3):	2.68	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.68**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.68	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (604-605)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (604-605)
Date Sampled: NA
Depth: 604-605

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	94.31	90.23
Weight of pycnometer filled w/soil (g):	142.80	138.92
Weight of pycnometer filled w/soil & water (g):	373.93	369.82
Weight of pycnometer filled w/water (g):	343.69	339.49
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.66	2.65
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.66	2.65
Average Specific Gravity at 20°C (g/g):	2.65	
Average Particle Density at 20°C (g/cm^3):	2.65	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.65**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.65	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (625-626)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (625-626)
Date Sampled: NA
Depth: 625-626

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.80	95.42
Weight of pycnometer filled w/soil (g):	140.49	140.21
Weight of pycnometer filled w/soil & water (g):	371.71	372.41
Weight of pycnometer filled w/water (g):	342.19	344.69
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.62	2.62
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.62	2.62
Average Specific Gravity at 20°C (g/g):	2.62	
Average Particle Density at 20°C (g/cm^3):	2.62	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.62**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.62	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (639-640)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (639-640)
Date Sampled: NA
Depth: 639-640

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	91.38	91.08
Weight of pycnometer filled w/soil (g):	142.74	138.61
Weight of pycnometer filled w/soil & water (g):	372.64	369.87
Weight of pycnometer filled w/water (g):	340.67	340.30
Observed temperature (°C):	21.10	21.10
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.65	2.65
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.65	2.65
Average Specific Gravity at 20°C (g/g):	2.65	
Average Particle Density at 20°C (g/cm^3):	2.64	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.65**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.64	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-13 (660-661)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-13 (660-661)
Date Sampled: NA
Depth: 660-661

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.69	94.21
Weight of pycnometer filled w/soil (g):	144.29	146.20
Weight of pycnometer filled w/soil & water (g):	374.60	375.98
Weight of pycnometer filled w/water (g):	343.00	343.44
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.66	2.67
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.66	2.67
Average Specific Gravity at 20°C (g/g):	2.67	
Average Particle Density at 20°C (g/cm^3):	2.66	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.67**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.66	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (294-295)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (294-295)
Date Sampled: 12/8/2011
Depth: 294-295

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	94.23	93.26
Weight of pycnometer filled w/soil (g):	143.82	139.51
Weight of pycnometer filled w/soil & water (g):	374.85	371.82
Weight of pycnometer filled w/water (g):	343.46	342.58
Observed temperature (°C):	21.50	21.40
Density of water at observed temperature (g/cm^3):	0.9979	0.9979
Specific Gravity (g/g):	2.72	2.72
Correction factor, K:	0.9997	0.9997
Specific Gravity at 20°C (g/g):	2.72	2.72
Average Specific Gravity at 20°C (g/g):	2.72	
Average Particle Density at 20°C (g/cm^3):	2.72	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.72**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.72	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (304-305)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (304-305)
Date Sampled: 12/8/2011
Depth: 304-305

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	94.25	92.29
Weight of pycnometer filled w/soil (g):	144.40	142.24
Weight of pycnometer filled w/soil & water (g):	375.07	372.88
Weight of pycnometer filled w/water (g):	343.53	341.54
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.69	2.68
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.69	2.68
Average Specific Gravity at 20°C (g/g):	2.69	
Average Particle Density at 20°C (g/cm^3):	2.68	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.69**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.68	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (532-533)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (532-533)
Date Sampled: 12/8/2011
Depth: 532-533

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	94.81	92.49
Weight of pycnometer filled w/soil (g):	145.59	142.41
Weight of pycnometer filled w/soil & water (g):	375.92	373.13
Weight of pycnometer filled w/water (g):	344.12	341.89
Observed temperature (°C):	21.10	21.10
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.68	2.67
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.68	2.67
Average Specific Gravity at 20°C (g/g):	2.67	
Average Particle Density at 20°C (g/cm^3):	2.67	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.67**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.67	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (549-550)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (549-550)
Date Sampled: 12/8/2011
Depth: 549-550

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.07	94.52
Weight of pycnometer filled w/soil (g):	140.43	136.19
Weight of pycnometer filled w/soil & water (g):	371.46	369.82
Weight of pycnometer filled w/water (g):	341.39	343.84
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.64	2.66
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.64	2.66
Average Specific Gravity at 20°C (g/g):	2.65	
Average Particle Density at 20°C (g/cm^3):	2.64	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.65**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.64	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (569-570)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (569-570)
Date Sampled: 12/8/2011
Depth: 569-570

ASTM D854 (<4.75mm Fraction)

Test Date:	20-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.90	93.09
Weight of pycnometer filled w/soil (g):	144.05	144.05
Weight of pycnometer filled w/soil & water (g):	374.30	374.38
Weight of pycnometer filled w/water (g):	342.19	342.39
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.69	2.69
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.69	2.69
Average Specific Gravity at 20°C (g/g):	2.69	
Average Particle Density at 20°C (g/cm^3):	2.68	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.69**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.68	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (594-595)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (594-595)
Date Sampled: 12/8/2011
Depth: 594-595

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.42	90.55
Weight of pycnometer filled w/soil (g):	141.67	144.86
Weight of pycnometer filled w/soil & water (g):	372.67	373.61
Weight of pycnometer filled w/water (g):	342.66	339.98
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.64	2.63
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.64	2.63
Average Specific Gravity at 20°C (g/g):	2.64	
Average Particle Density at 20°C (g/cm^3):	2.63	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.64**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.63	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (620-623)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (620-623)
Date Sampled: 12/8/2011
Depth: 620-623

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.93	92.00
Weight of pycnometer filled w/soil (g):	140.97	138.34
Weight of pycnometer filled w/soil & water (g):	372.20	370.11
Weight of pycnometer filled w/water (g):	342.27	341.29
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.65	2.64
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.65	2.64
Average Specific Gravity at 20°C (g/g):	2.65	
Average Particle Density at 20°C (g/cm^3):	2.64	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.65**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.64	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (635-363)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (635-363)
Date Sampled: 12/8/2011
Depth: 635-636

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.94	92.00
Weight of pycnometer filled w/soil (g):	142.01	140.62
Weight of pycnometer filled w/soil & water (g):	372.92	371.59
Weight of pycnometer filled w/water (g):	342.28	341.29
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.66	2.65
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.66	2.65
Average Specific Gravity at 20°C (g/g):	2.66	
Average Particle Density at 20°C (g/cm^3):	2.65	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.66**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.65	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (709-710)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (709-710)
Date Sampled: 12/8/2011
Depth: 709-710

ASTM D854 (<4.75mm Fraction)

Test Date:	22-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.79	95.43
Weight of pycnometer filled w/soil (g):	140.34	141.54
Weight of pycnometer filled w/soil & water (g):	371.94	373.56
Weight of pycnometer filled w/water (g):	342.15	344.67
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.68	2.68
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.68	2.68
Average Specific Gravity at 20°C (g/g):	2.68	
Average Particle Density at 20°C (g/cm^3):	2.67	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.68**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.67	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (727-728)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (727-728)
Date Sampled: 12/8/2011
Depth: 727-728

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.90	90.98
Weight of pycnometer filled w/soil (g):	142.80	138.57
Weight of pycnometer filled w/soil & water (g):	373.72	370.04
Weight of pycnometer filled w/water (g):	343.17	340.23
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.66	2.68
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.66	2.68
Average Specific Gravity at 20°C (g/g):	2.67	
Average Particle Density at 20°C (g/cm^3):	2.67	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.67**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.67	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-14 (741-742)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (741-742)
Date Sampled: 12/8/2011
Depth: 741-742

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	91.35	93.97
Weight of pycnometer filled w/soil (g):	141.59	142.71
Weight of pycnometer filled w/soil & water (g):	371.99	373.67
Weight of pycnometer filled w/water (g):	340.67	343.27
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.66	2.66
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.65	2.66
Average Specific Gravity at 20°C (g/g):	2.66	
Average Particle Density at 20°C (g/cm^3):	2.65	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.66**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.65	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Data for Specific Gravity for Sample: PB-14 (749-750)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-14 (749-750)
Date Sampled: 12/8/2011
Depth: 749-750

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.80	95.43
Weight of pycnometer filled w/soil (g):	141.79	143.44
Weight of pycnometer filled w/soil & water (g):	372.74	374.71
Weight of pycnometer filled w/water (g):	342.17	344.68
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.66	2.67
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.66	2.67
Average Specific Gravity at 20°C (g/g):	2.66	
Average Particle Density at 20°C (g/cm^3):	2.66	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.66**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.66	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Data for Specific Gravity for Sample: PB-15 (435-436)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (435-436)
Date Sampled: NA
Depth: 435-436

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	94.82	93.28
Weight of pycnometer filled w/soil (g):	143.48	141.27
Weight of pycnometer filled w/soil & water (g):	374.66	372.65
Weight of pycnometer filled w/water (g):	344.14	342.57
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.68	2.68
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.68	2.68
Average Specific Gravity at 20°C (g/g):	2.68	
Average Particle Density at 20°C (g/cm^3):	2.68	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.68**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.68	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-15 (464-465)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (464-465)
Date Sampled: NA
Depth: 464-465

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	91.37	91.07
Weight of pycnometer filled w/soil (g):	139.49	141.23
Weight of pycnometer filled w/soil & water (g):	370.86	371.69
Weight of pycnometer filled w/water (g):	340.67	340.30
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.68	2.67
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.68	2.67
Average Specific Gravity at 20°C (g/g):	2.68	
Average Particle Density at 20°C (g/cm^3):	2.67	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.68**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.67	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Data for Specific Gravity for Sample: PB-15 (483-484)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (483-484)
Date Sampled: NA
Depth: 483-484

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	90.54	93.56
Weight of pycnometer filled w/soil (g):	139.72	141.51
Weight of pycnometer filled w/soil & water (g):	370.81	373.14
Weight of pycnometer filled w/water (g):	339.94	342.95
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.69	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.69	2.70
Average Specific Gravity at 20°C (g/g):	2.69	
Average Particle Density at 20°C (g/cm^3):	2.69	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.69**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.69	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-15 (502-503)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (502-503)
Date Sampled: NA
Depth: 502-503

ASTM D854 (<4.75mm Fraction)

Test Date:	26-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	95.81	93.98
Weight of pycnometer filled w/soil (g):	145.62	143.92
Weight of pycnometer filled w/soil & water (g):	376.35	374.70
Weight of pycnometer filled w/water (g):	345.04	343.25
Observed temperature (°C):	21.00	21.00
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.69	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.69	2.70
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.69	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.69	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-15 (524-525)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (524-525)
Date Sampled: 12/7/2011
Depth: 524-525

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	93.73	92.30
Weight of pycnometer filled w/soil (g):	138.94	139.64
Weight of pycnometer filled w/soil & water (g):	371.43	371.22
Weight of pycnometer filled w/water (g):	343.17	341.60
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.67	2.67
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.67	2.67
Average Specific Gravity at 20°C (g/g):	2.67	
Average Particle Density at 20°C (g/cm^3):	2.66	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.67**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.66	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-15 (539-540)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (539-540)
Date Sampled: 12/7/2011
Depth: 539-540

ASTM D854 (<4.75mm Fraction)

Test Date:	15-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	90.61	91.52
Weight of pycnometer filled w/soil (g):	139.69	140.27
Weight of pycnometer filled w/soil & water (g):	370.54	371.18
Weight of pycnometer filled w/water (g):	339.92	340.85
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.66	2.65
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.66	2.65
Average Specific Gravity at 20°C (g/g):	2.65	
Average Particle Density at 20°C (g/cm^3):	2.65	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.65**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.65	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Data for Specific Gravity for Sample: PB-15 (559-560)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (559-560)
Date Sampled: 12/7/2011
Depth: 559-560

ASTM D854 (<4.75mm Fraction)

Test Date:	1-Mar-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	91.98	93.42
Weight of pycnometer filled w/soil (g):	138.00	138.11
Weight of pycnometer filled w/soil & water (g):	370.08	370.56
Weight of pycnometer filled w/water (g):	341.32	342.65
Observed temperature (°C):	20.70	20.70
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.67	2.66
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.67	2.66
Average Specific Gravity at 20°C (g/g):	2.66	
Average Particle Density at 20°C (g/cm^3):	2.66	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.66**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.66	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-15 (574-575)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (574-575)
Date Sampled: 12/7/2011
Depth: 574-575

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	92.00	93.73
Weight of pycnometer filled w/soil (g):	143.04	144.87
Weight of pycnometer filled w/soil & water (g):	372.85	374.93
Weight of pycnometer filled w/water (g):	341.32	343.20
Observed temperature (°C):	20.40	20.40
Density of water at observed temperature (g/cm^3):	0.9981	0.9981
Specific Gravity (g/g):	2.62	2.64
Correction factor, K:	0.9999	0.9999
Specific Gravity at 20°C (g/g):	2.62	2.64
Average Specific Gravity at 20°C (g/g):	2.63	
Average Particle Density at 20°C (g/cm^3):	2.62	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.63**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.62	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Data for Specific Gravity for Sample: PB-15 (604-605)

Job Name: Pickles Butte No-Migration Petition
Job Number: ES09.0154.12
Sample Number: PB-15 (604-605)
Date Sampled: 12/7/2011
Depth: 604-605

ASTM D854 (<4.75mm Fraction)

Test Date:	24-Feb-12	
Percent of Test Sample (% g/g):	100.00	
Percent of Bulk Sample (% g/g):	100.00	
	Trial 1	*Trial 2*
Weight of pycnometer filled w/air (g):	94.99	93.26
Weight of pycnometer filled w/soil (g):	143.39	139.52
Weight of pycnometer filled w/soil & water (g):	374.74	371.62
Weight of pycnometer filled w/water (g):	344.29	342.52
Observed temperature (°C):	20.90	20.90
Density of water at observed temperature (g/cm^3):	0.9980	0.9980
Specific Gravity (g/g):	2.70	2.70
Correction factor, K:	0.9998	0.9998
Specific Gravity at 20°C (g/g):	2.70	2.70
Average Specific Gravity at 20°C (g/g):	2.70	
Average Particle Density at 20°C (g/cm^3):	2.69	

ASTM C127 (>4.75mm Fraction)

Test Date:	---	
Percent of Test Sample (% g/g):	0.00	
Percent of Bulk Sample (% g/g):	0.00	
Tare Weight (g):	---	--- = Test unnecessary since specified fraction <5% of composite mass.
Saturated Surface Dry (SSD) mass in Air & Tare (g):	---	
Saturated Apparent mass in Water & Tare (g):	---	
Oven Dry (OD) mass in Air & Tare (g):	---	
Observed Temperature (°C):	---	
Density of water at observed temperature (g/m^3):	---	
SSD Specific Gravity (g/g):	---	
Apparent Specific Gravity (g/g):	---	
OD Specific Gravity (g/g):	---	
Percent Absorption (%):	---	
Correction Factor, K:	---	
Average Specific Gravity (Apparent) at 20°C:*	---	
Average Particle Density (Apparent) at 20°C (g/cm^3)*:*	---	
Specific Gravity (Apparent) at 20°C*:	**2.70**	** Weighted harmonic average, if more than one fraction used.*
Particle Density (Apparent) at 20°C (g/cm^3)* :	2.69	

Laboratory analysis by: K. Wright
Data entered by: C. Krous
Checked by: J. Hines

Laboratory Tests and Methods

Tests and Methods

Dry Bulk Density:	ASTM D7263
Moisture Content:	ASTM D7263
Calculated Porosity:	ASTM D7263
Saturated Hydraulic Conductivity:	
Constant Head: (Rigid Wall)	ASTM D 2434 (modified apparatus)
Falling Head: (Rigid Wall)	Klute, A. and C. Dirkson. 1986. Hydraulic Conductivity and Diffusivity: Laboratory Methods.Chp. 28, pp. 700-703, in A. Klute (ed.), Methods of Soil Analysis, Part 1, American Society of Agronomy, Madison, WI
Falling Head Rising Tail: (Flexible Wall)	ASTM D5084
Hanging Column Method:	ASTM D6836 (modified apparatus)
Pressure Plate Method:	ASTM D6836 (modified apparatus)
Water Potential (Dewpoint Potentiometer) Method:	ASTM D6836
Relative Humidity (Box) Method:	Campbell, G. and G. Gee. 1986. Water Potential: Miscellaneous Methods. Chp. 25, pp. 631-632, in A. Klute (ed.), Methods of Soil Analysis. Part 1. American Society of Agronomy, Madison, WI; Karathanasis & Hajek. 1982. Quantitative Evaluation of Water Adsorption on Soil Clays. SSA Journal 46:1321-1325
Moisture Retention Characteristics & Calculated Unsaturated Hydraulic Conductivity:	ASTM D6836; van Genuchten, M.T. 1980. A closed-form equation for predicting the hydraulic conductivity of unsaturated soils. SSSAJ 44:892-898; van Genuchten, M.T., F.J. Leij, and S.R. Yates. 1991. The RETC code for quantifying the hydraulic functions of unsaturated soils. Robert S. Kerr Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Ada, Oklahoma. EPA/600/2091/065. December 1991
Specific Gravity Fine	ASTM D854
Particle Size Analysis:	ASTM D422
USCS (ASTM) Classification:	ASTM D422, ASTM D2487
USDA Classification:	ASTM D422, USDA Soil Textural Triangle
Atterberg Limits:	ASTM D4318
Visual-Manual Description:	ASTM D2488