0062334

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Post Office Box 967
303 Wellsian Way
Richland, Washington 99352-0967
(509) 946-6309
Fax (509) 946-6580

LETTER OF TRANSMITTAL

Date: March 30, 2004 Project No: 22-1-02073-001

To: Fluor Hanford, Inc.
P.O. Box 1000, MSIN A0-21
Richland, Washington 99352

Attention: Mr. Steve Trent

RE: Area C Barrow Study - Laboratory Test Results

We are sending the following items: ☒ Enclosed ☐ Under Separate Cover Via

☐ Report ☐ Proposal/SOQ ☐ Drawings ☐ Samples ☐ Specifications ☐ Letter ☒ Other

Quantity	Date	No.	Description
2	March 29, 2004	22-1-02073-001	Laboratory Test Results Data Package; Area C Barrow Study, Hanford Site, Washington

RECEIVED APR 1 2004

These are transmitted:

☐ For your retention ☐ For your use ☒ As Requested
☐ For review and comment ☐ For action specified below ☐ With correction
☐ Please return by ☐ Prints returned after use by us ☐ Other

Copies to: Project File

Transmitted for: Mr. Dee J. Burrie, P.E.

RECEIVED AUG 10 2004 EDMC

Transmitted By Cathie Melde
Cathie Melde
Administrative Assistant

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SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Shannon & Wilson, Inc.
303 Wellsian Way
P.O. Box 967
Richland, WA 99352

509•946•6309 Fax: 509•946•6580

MEMORANDUM

TO: Scott Petersen – Fluor Hanford
Steve Trent – Fluor Hanford

FROM: Dee J. Burrie, P.E.

DATE: March 29, 2004

RE: LABORATORY TEST RESULTS DATA PACKAGE; AREA C BARROW STUDY, HANFORD SITE, WASHINGTON

Enclosed are copies of the laboratory test results for the subject project. A summary of the work completed is also attached.

We have not completed the capillary moisture tests. We were unable to find a laboratory in St. Louis capable of doing that test. We are still looking for a lab to conduct those tests.

Please review the data and provide any comments you might have. When your comments are resolved, we will prepare a bound report.

Please contact me at 509-946-6309 with your response. Thank you.

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1 2004

22-1-02073-001

SPECIFIC GRAVITY OF SOILS by pycometer **ASTM D 854 - 92** **(-No. 10)**

SAMPLE: B183X3

PYCOMETER #7 185.11 gms

w/soil 259.84 gms — t oven dired soil: 74.73 gms

w/soil & water 729.97 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ' : 2.72 — SPECIFIC GRAVITY = 2.71

SAMPLE: B183X4

PYCOMETER #7 183.98 gms

w/soil 259.03 gms — t oven dired soil: 75.05 gms

w/soil & water 727.92 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ' : 2.51 — SPECIFIC GRAVITY = 2.51

SAMPLE: B183X5

PYCOMETER #7 181.76 gms

w/soil 256.87 gms — t oven dired soil: 75.11 gms

w/soil & water 726.94 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.44 — SPECIFIC GRAVITY = 2.44

SAMPLE: B183X6

PYCOMETER #7 184.20 gms

w/soil 234.49 gms — t oven dired soil: 50.29 gms

w/soil & water 714.44 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.72 — SPECIFIC GRAVITY = 2.72

Shannon Wilson, Inc.
2043 Westport Center Drive
St. Louis, MO 63146

Rachael Huson, Lab Manager
revised 1-19-04

SPECIFIC GRAVITY OF SOILS by pycometer **ASTM D 854 - 92 (-No. 10)**

SAMPLE: B183X7

PYCOMETER #7 182.38 gms

w/soil 255.39 gms — t oven dired soil: 73.01 gms

w/soil & water 726.84 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.54 — SPECIFIC GRAVITY = 2.53

SAMPLE: B183X8

PYCOMETER #7 180.70 gms

w/soil 255.86 gms — t oven dired soil: 75.16 gms

w/soil & water 727.14 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.45 — SPECIFIC GRAVITY = 2.45

SAMPLE: B183X9

PYCOMETER #7 181.77 gms

w/soil 256.77 gms — t oven dired soil: 75 gms

w/soil & water 727.47 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ' : 2.48 — SPECIFIC GRAVITY = 2.48

SAMPLE: B183Y0

PYCOMETER #7 178.07 gms

w/soil 253.12 gms — t oven dired soil: 75.05 gms

w/soil & water 724.18 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ' : 2.23 — SPECIFIC GRAVITY = 2.23

SPECIFIC GRAVITY OF SOILS by pycometer **ASTM D 854 - 92 (-No. 10)**

SAMPLE: B183Y1

PYCOMETER #7 184.20 gms

w/soil 259.36 gms — t oven dired soil: 75.16 gms

w/soil & water 729.99 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ' : 2.69 — SPECIFIC GRAVITY = 2.69

SAMPLE: B183Y2

PYCOMETER #7 181.75 gms

w/soil 256.93 gms — t oven dired soil: 75.18 gms

w/soil & water 727.26 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.46 — SPECIFIC GRAVITY = 2.46

SAMPLE: B183Y3

PYCOMETER #7 182.38 gms

w/soil 257.92 gms — t oven dired soil: 75.54 gms

w/soil & water 728.03 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ' : 2.50 — SPECIFIC GRAVITY = 2.50

SAMPLE: B183Y4

PYCOMETER #7 181.75 gms

w/soil 256.86 gms — t oven dired soil: 75.11 gms

w/soil & water 728.27 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ' : 2.54 — SPECIFIC GRAVITY = 2.54

SPECIFIC GRAVITY OF SOILS by pycometer **ASTM D 854 - 92 (-No. 10)**

SAMPLE: B183Y5

PYCOMETER #7 180.70 gms

w/soil 255.80 gms — t oven dired soil: 75.10 gms

w/soil & water 726.63 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ': 2.41 — SPECIFIC GRAVITY = 2.40

SAMPLE: B183Y6

PYCOMETER #7 182.38 gms

w/soil 257.55 gms — t oven dired soil: 75.17 gms

w/soil & water 728.38 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ': 2.55 — SPECIFIC GRAVITY = 2.54

SAMPLE: B183Y7

PYCOMETER #7 181.76 gms

w/soil 256.98 gms — t oven dired soil: 75.22 gms

w/soil & water 726.89 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ': 2.42 — SPECIFIC GRAVITY = 2.42

SAMPLE: B183Y8

PYCOMETER #7 178.07 gms

w/soil 253.16 gms — t oven dired soil: 75.09 gms

w/soil & water 723.90 gms

temperature 21

Calibrated wt of pycometer # 7 and water at a temperature of: 21 is 682.74

Specific Gravity ': 2.21 — SPECIFIC GRAVITY = 2.21

SPECIFIC GRAVITY OF SOILS by pycometer **ASTM D 854 - 92 (-No. 10)**

SAMPLE: B18403

PYCOMETER #7 184.20 gms

w/soil 259.47 gms — t oven dired soil: 75.27 gms

w/soil & water 729.80 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.68 — SPECIFIC GRAVITY = 2.68

SAMPLE: B18404

PYCOMETER #7 185.11 gms

w/soil 260.56 gms — t oven dired soil: 75.45 gms

w/soil & water 731.32 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.82 — SPECIFIC GRAVITY = 2.82

SAMPLE: B18405

PYCOMETER #7 178.07 gms

w/soil 253.16 gms — t oven dired soil: 75.09 gms

w/soil & water 722.60 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.14 — SPECIFIC GRAVITY = 2.14

SAMPLE: B18406

PYCOMETER #7 181.77 gms

w/soil 256.51 gms — t oven dired soil: 74.74 gms

w/soil & water 727.21 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.48 — SPECIFIC GRAVITY = 2.48

SPECIFIC GRAVITY OF SOILS by pycometer **ASTM D 854 - 92 (-No. 10)**

SAMPLE: B18407

PYCOMETER #7 180.70 gms

w/soil 256.40 gms

w/soil & water 727.23 gms

temperature 22

t oven dired soil: 75.70 gms

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.44

SPECIFIC GRAVITY = 2.43

SAMPLE: B18408

PYCOMETER #7 182.38 gms

w/soil 257.70 gms

w/soil & water 729.14 gms

temperature 22

t oven dired soil: 75.32 gms

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.62

SPECIFIC GRAVITY = 2.61

SAMPLE: B18409

PYCOMETER #7 181.75 gms

w/soil 256.80 gms

w/soil & water 726.46 gms

temperature 22

t oven dired soil: 75.05 gms

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.41

SPECIFIC GRAVITY = 2.40

SAMPLE: B18410

PYCOMETER #7 183.98 gms

w/soil 259.50 gms

w/soil & water 728.60 gms

temperature 22

t oven dired soil: 75.52 gms

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.56

SPECIFIC GRAVITY = 2.56

SPECIFIC GRAVITY OF SOILS by pycometer **ASTM D 854 - 92 (-No. 10)**

SAMPLE: B18411

PYCOMETER #7 184.24 gms

w/soil 259.34 gms — t oven dired soil: 75.10 gms

w/soil & water 729.22 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.64 — SPECIFIC GRAVITY = 2.63

SAMPLE: B18412

PYCOMETER #7 182.38 gms

w/soil 258.13 gms — t oven dired soil: 75.75 gms

w/soil & water 728.56 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.54 — SPECIFIC GRAVITY = 2.54

SAMPLE: B18414

PYCOMETER #7 184.52 gms

w/soil 259.92 gms — t oven dired soil: 75.4 gms

w/soil & water 730.25 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.72 — SPECIFIC GRAVITY = 2.71

SAMPLE: B18415

PYCOMETER #7 181.72 gms

w/soil 257.11 gms — t oven dired soil: 75.39 gms

w/soil & water 726.78 gms

temperature 22

Calibrated wt of pycometer # 7 and water at a temperature of: 22 is 682.61

Specific Gravity ' : 2.42 — SPECIFIC GRAVITY = 2.41

DRY DENSITY

Job Name	Hanford Site Area C	**Client**	
Job Number	22-1-02073-001	**Tested by**	RLH
Job Location		**Date**	
File Name			

SAMPLE BORING	C4285	B183X3	B183X4	B183X5	B183X6	B183X7	B183X8
SAMPLE NUMBER							
SAMPLE DEPTH							
HEIGHT (in)	4.772	4.496	3.771	3.515	1.079	2.468	2.978
DIAMETER (in)	2.445	2.445	2.445	2.445	2.871	2.445	2.445
WEIGHT (gms)	585.96	488.52	420.40	305.72	150.98	264.67	357.18
MOISTURE (%)	4.1	10.9	3	8.6	2.5	10.2	19.9
SQ AREA	4.70	4.70	4.70	4.70	6.47	4.70	4.70
VOLUME	22.41	21.11	17.71	16.50	6.99	11.59	13.98
VOLUME	0.013	0.012	0.010	0.010	0.004	0.007	0.008
VOLUME	367.16	345.92	290.14	270.44	114.47	189.89	229.13
Wet Density	**99.6**	**88.2**	**90.5**	**70.6**	**82.3**	**87.0**	**97.3**
DRY DENSITY	**95.7**	**79.5**	**87.8**	**65.0**	**80.3**	**79.0**	**81.2**

SAMPLE BORING	B183X9	B183Y0	B183Y1	B183Y2	B183Y3	B183Y4	B183Y5
SAMPLE NUMBER							
SAMPLE DEPTH							
HEIGHT (in)	3.621	3.517	3.574	2.882	2.705	1.355	3.808
DIAMETER (in)	2.445	2.445	2.445	2.445	2.445	2.871	2.445
WEIGHT (gms)	346.13	346.73	331.80	320.70	305.45	124.86	388.19
MOISTURE (%)	5	12.7	7.7	6.8	3.9	2.1	4.7
SQ AREA	4.70	4.70	4.70	4.70	4.70	6.47	4.70
VOLUME	17.00	16.51	16.78	13.53	12.70	8.77	17.88
VOLUME	0.010	0.010	0.010	0.008	0.007	0.005	0.010
VOLUME	278.60	270.60	274.98	221.74	208.12	143.75	292.99
Wet Density	**77.6**	**80.0**	**75.3**	**90.3**	**91.6**	**54.2**	**82.7**
DRY DENSITY	**73.9**	**71.0**	**69.9**	**84.5**	**88.2**	**53.1**	**79.0**

Shannon and Wilson, Inc.
2043 Westport Center Drive
St. Louis, MO 63146

Rachael Huson, Lab Manager
revised, 1-19-04

DRY DENSITY

Job Name	Hanford Site Area C	Client	0
Job Number	22-1-02073-001	Tested by	
Job Location	0	Date	
File Name	0		

SAMPLE BORING	B183Y6	B183Y7	B183Y8	B183Y9	B184Y00	B184Y01	B184Y02
SAMPLE NUMBER							
SAMPLE DEPTH							
HEIGHT (in)	3.647	2.446	3.656	2.238	2.286	1.931	3.455
DIAMETER (in)	2.445	2.445	2.445	2.445	2.445	2.445	2.445
WEIGHT (gms)	450.02	252.00	328.04	237.48	229.80	177.08	279.67
MOISTURE (%)	2.7	3.5	3.7	2.9	2.9	2.5	4
SQ AREA	4.70	4.70	4.70	4.70	4.70	4.70	4.70
VOLUME	17.12	11.48	17.17	10.51	10.73	9.07	16.22
VOLUME	0.010	0.007	0.010	0.006	0.006	0.005	0.009
VOLUME	280.60	188.19	281.29	172.19	175.88	148.57	265.83
Wet Density	**100.1**	**83.6**	**72.8**	**86.1**	**81.6**	**74.4**	**65.7**
DRY DENSITY	**97.5**	**80.8**	**70.2**	**83.7**	**79.3**	**72.6**	**63.2**

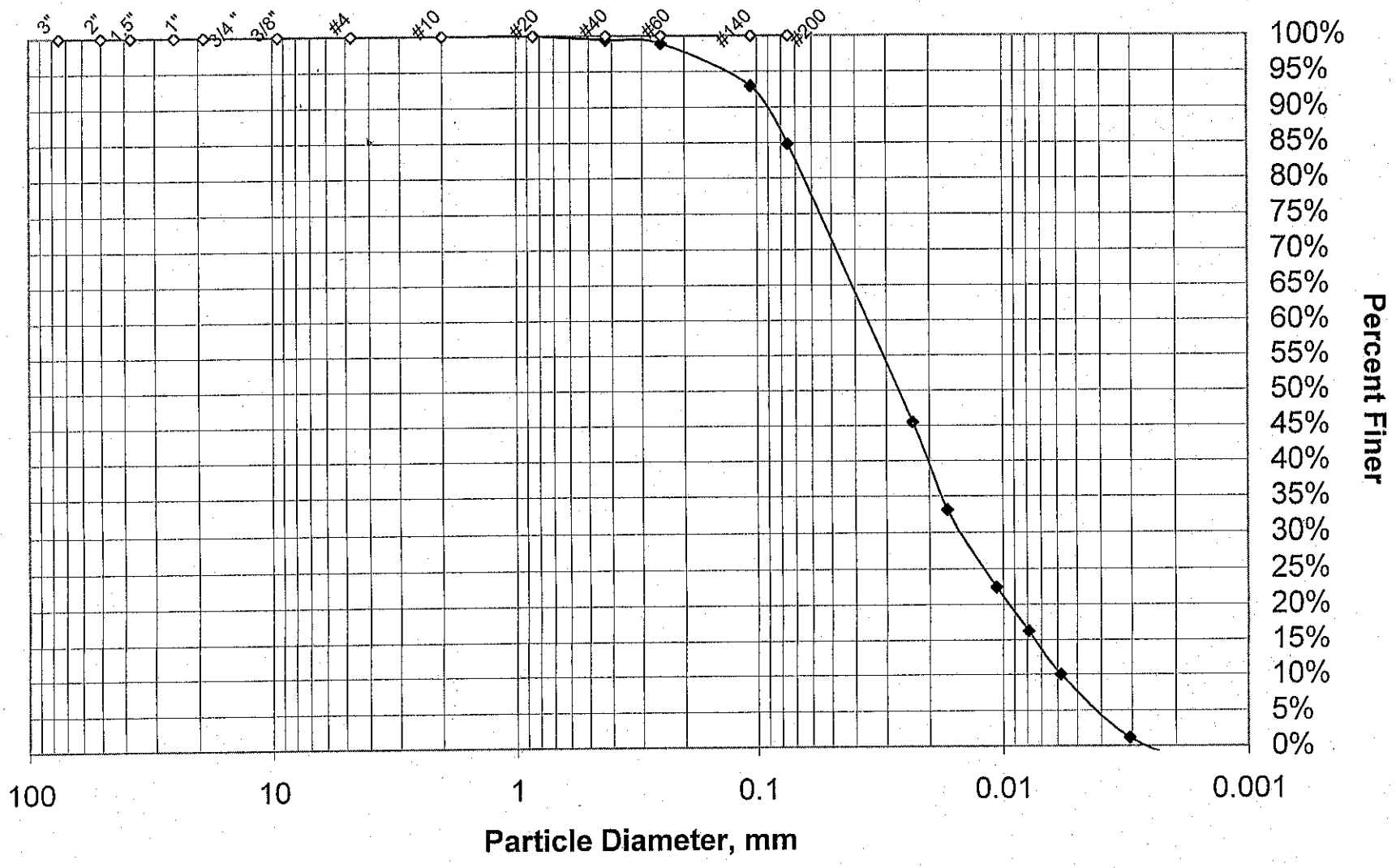
SAMPLE BORING	B18403	B18404	B18405	B18406	B18407	B18408	B18409
SAMPLE NUMBER							
SAMPLE DEPTH							
HEIGHT (in)	2.843	2.852	3.352	2.566	2.651	2.427	3.097
DIAMETER (in)	2.445	2.445	2.445	2.445	2.445	2.445	2.445
WEIGHT (gms)	314.60	302.11	338.61	366.17	298.84	275.78	301.43
MOISTURE (%)	2.4	3.8	5.5	8.6	4.7	6.2	8.7
SQ AREA	4.70	4.70	4.70	4.70	4.70	4.70	4.70
VOLUME	13.35	13.39	15.74	12.05	12.45	11.40	14.54
VOLUME	0.008	0.008	0.009	0.007	0.007	0.007	0.008
VOLUME	218.74	219.43	257.90	197.43	203.97	186.73	238.28
Wet Density	**89.8**	**85.9**	**82.0**	**115.8**	**91.5**	**92.2**	**79.0**
DRY DENSITY	**87.7**	**82.8**	**77.7**	**106.6**	**87.4**	**86.8**	**72.7**

DRY DENSITY

Job Name	Hanford Site Area C	Client	0
Job Number	22-1-02073-001	Tested by	
Job Location	0	Date	
File Name	0		

SAMPLE BORING	B18409	B18410	B18411	B18412	B18414	B18415	B18416
SAMPLE NUMBER							
SAMPLE DEPTH							
HEIGHT (in)	3.097	2.534	2.489	2.947	3.139	1.578	2.800
DIAMETER (in)	2.445	2.445	2.445	2.445	2.445	2.445	2.445
WEIGHT (gms)	301.43	239.49	219.59	345.04	338.24	206.79	271.71
MOISTURE (%)	8.7	8.7	4.9	2.4	2	9.5	5
SQ AREA	4.70	4.70	4.70	4.70	4.70	4.70	4.70
VOLUME	14.54	11.90	11.69	13.84	14.74	7.41	13.15
VOLUME	0.008	0.007	0.007	0.008	0.009	0.004	0.008
VOLUME	238.28	194.96	191.50	226.74	241.51	121.41	215.43
Wet Density	**79.0**	**76.7**	**71.6**	**95.0**	**87.4**	**106.3**	**78.7**
DRY DENSITY	**72.7**	**70.5**	**68.2**	**92.8**	**85.7**	**97.1**	**75.0**

SAMPLE BORING	B18417						
SAMPLE NUMBER							
SAMPLE DEPTH							
HEIGHT (in)	3.421						
DIAMETER (in)	2.445						
WEIGHT (gms)	345.49						
MOISTURE (%)	7						
SQ AREA	4.70						
VOLUME	16.06						
VOLUME	0.009						
VOLUME	263.21						
Wet Density	**81.9**						
DRY DENSITY	**76.6**						



SHANNON & WILSON, INC.
GEOTECHNICAL CONSULTANTS
SAINT LOUIS, MISSOURI

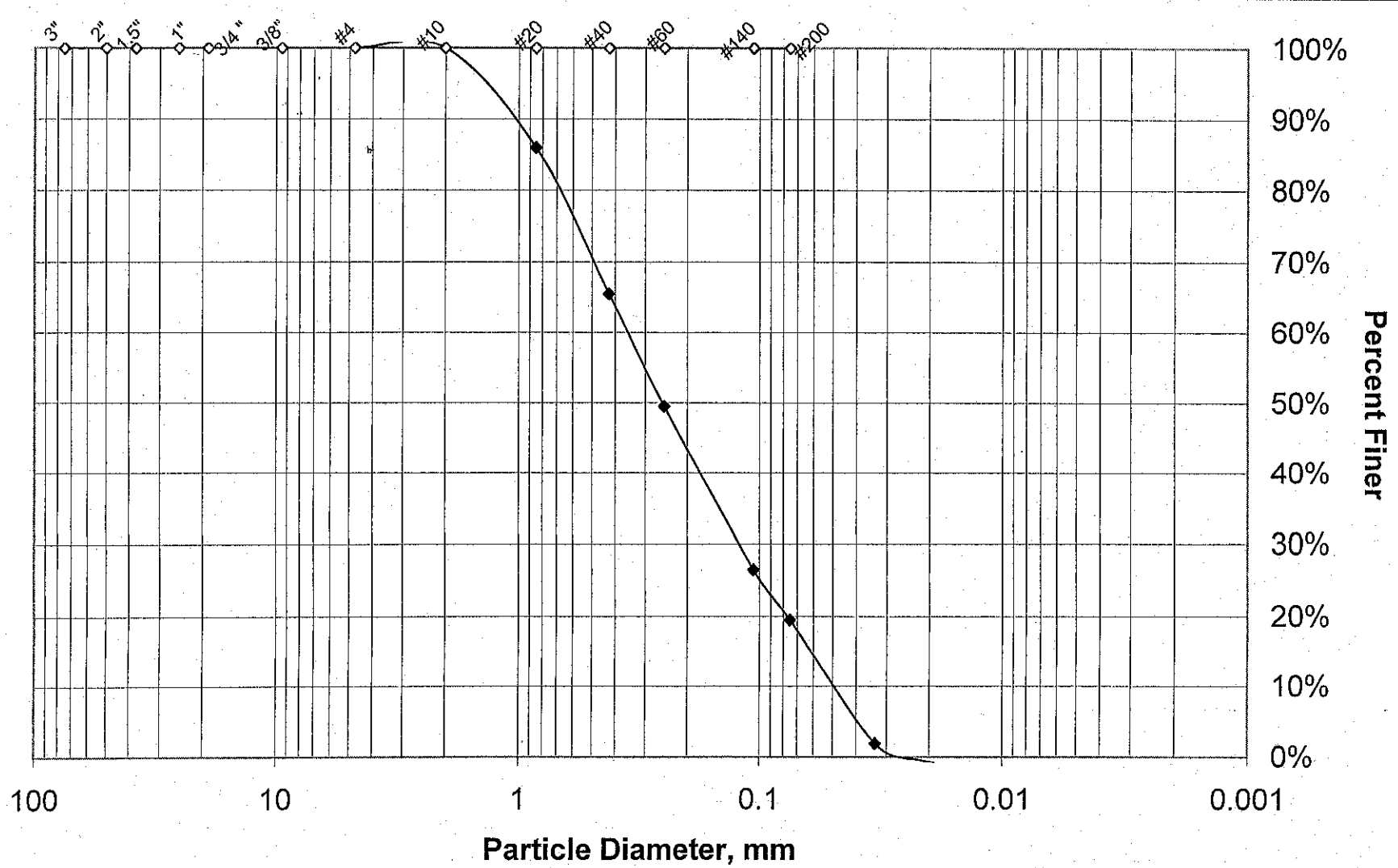
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

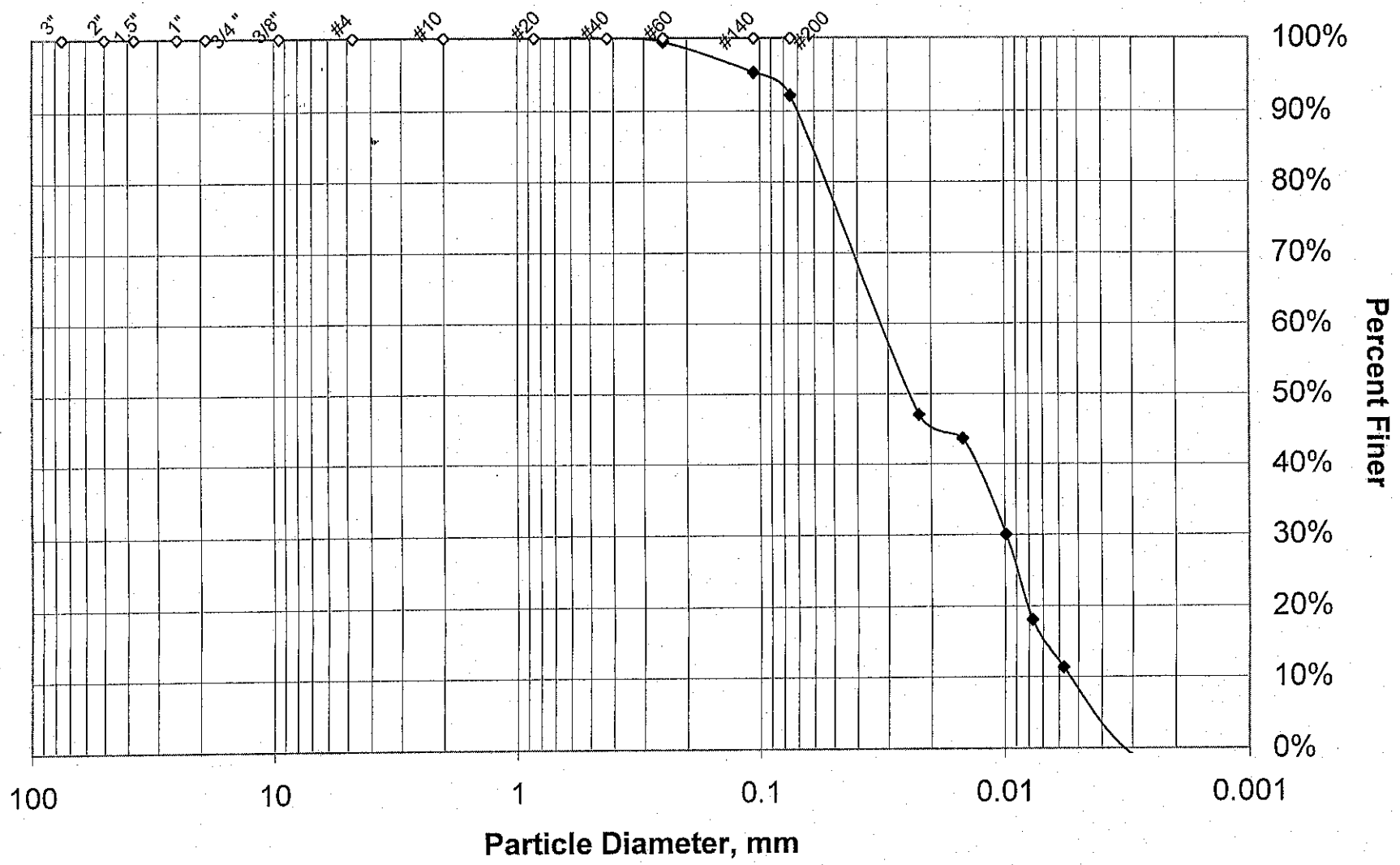
Boring : 0 **Sample : 183X3 at**

Init:_____ Date:_____



SHANNON & WILSON, INC. **GEOTECHNICAL CONSULTANTS** **SAINT LOUIS, MISSOURI** 22-1-02073-001	**PARTICLE SIZE ANALYSIS** **Hanford Site Area C** **Boring :** 0 **Sample : B183X4 at**

Init:_____ Date:_____



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GEOTECHNICAL CONSULTANTS
SAINT LOUIS, MISSOURI

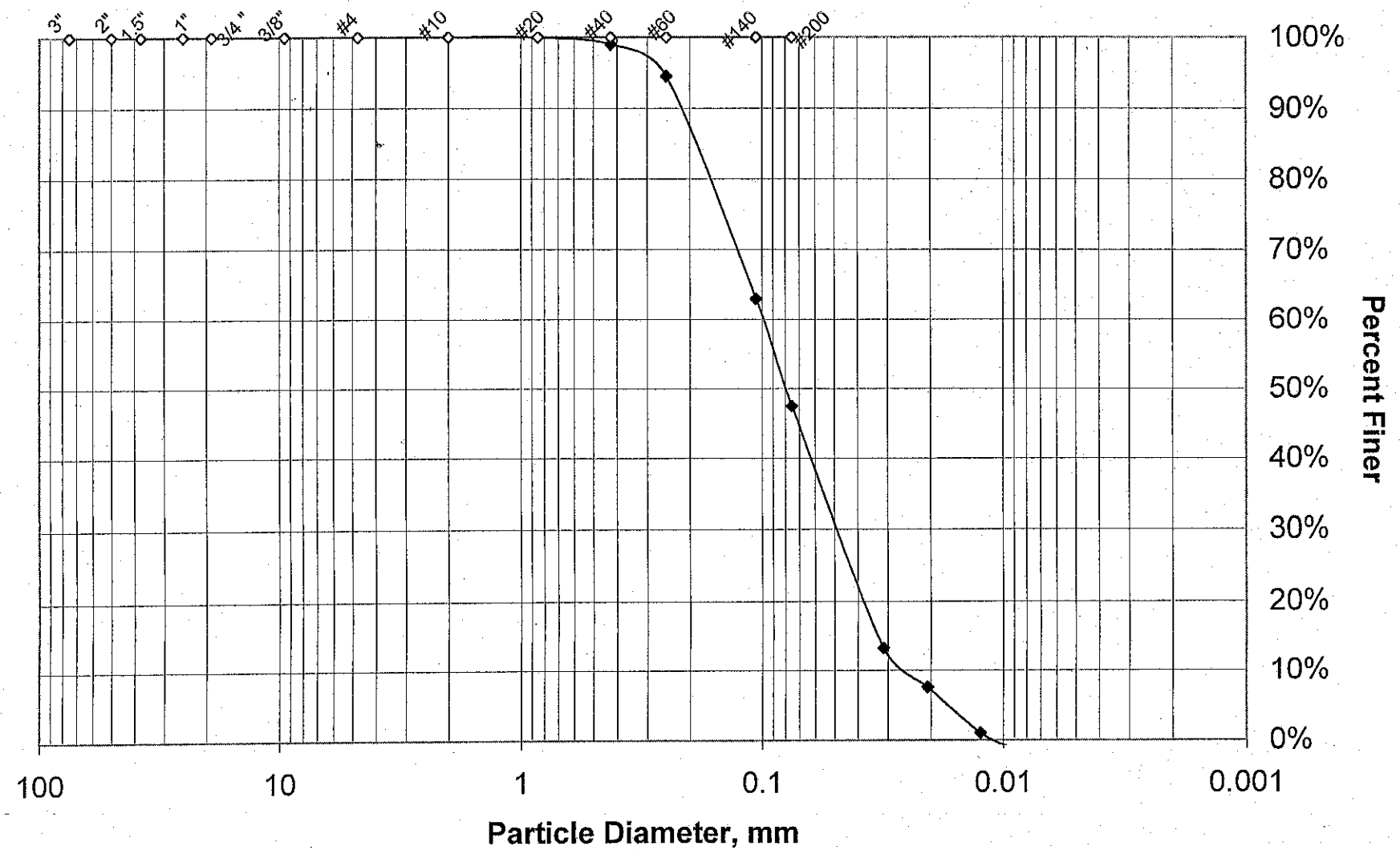
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B183X5 at**

Init:_____ Date:_____



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SAINT LOUIS, MISSOURI

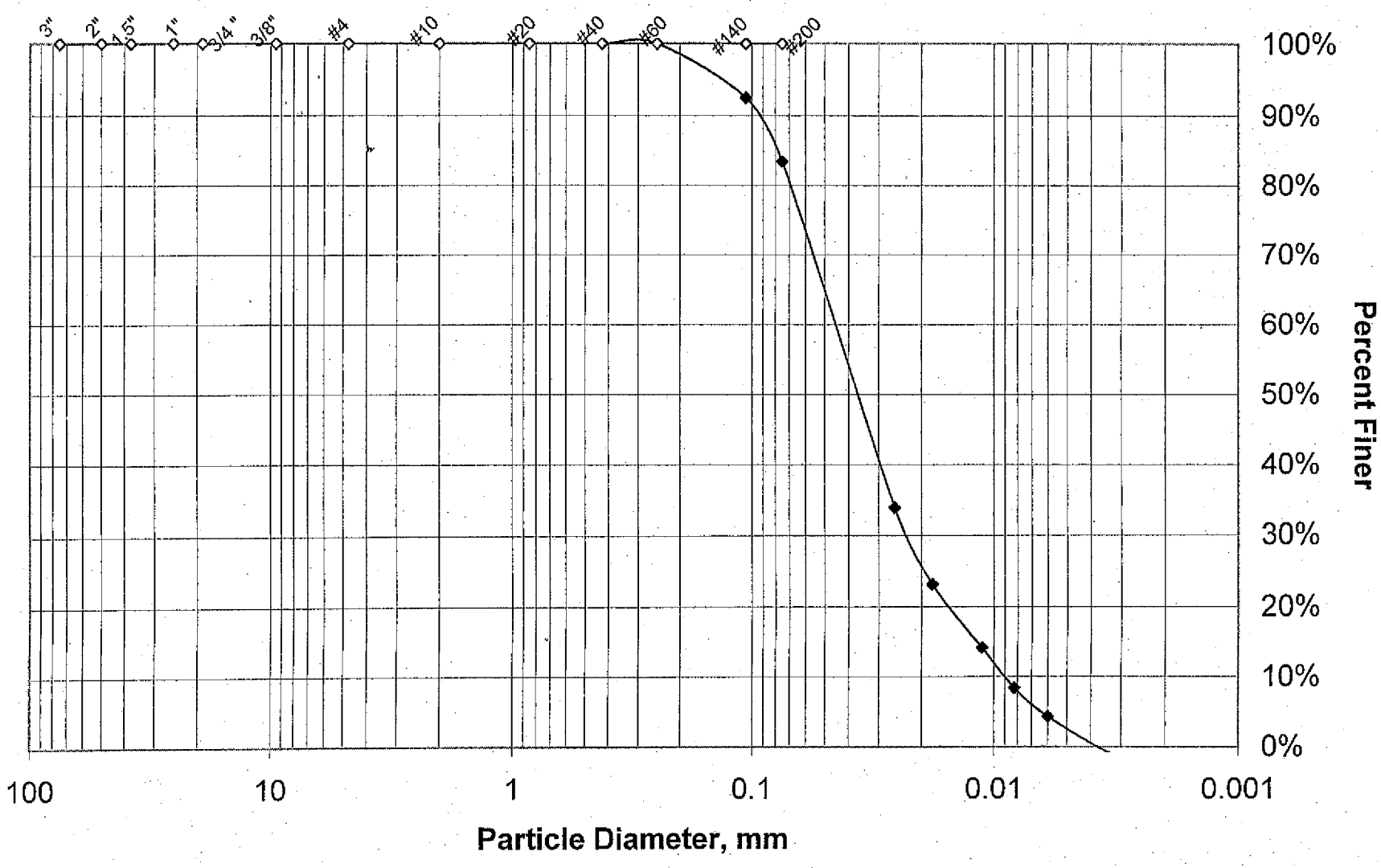
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B183X6 at**

Init:_____ Date:_____



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SAINT LOUIS, MISSOURI

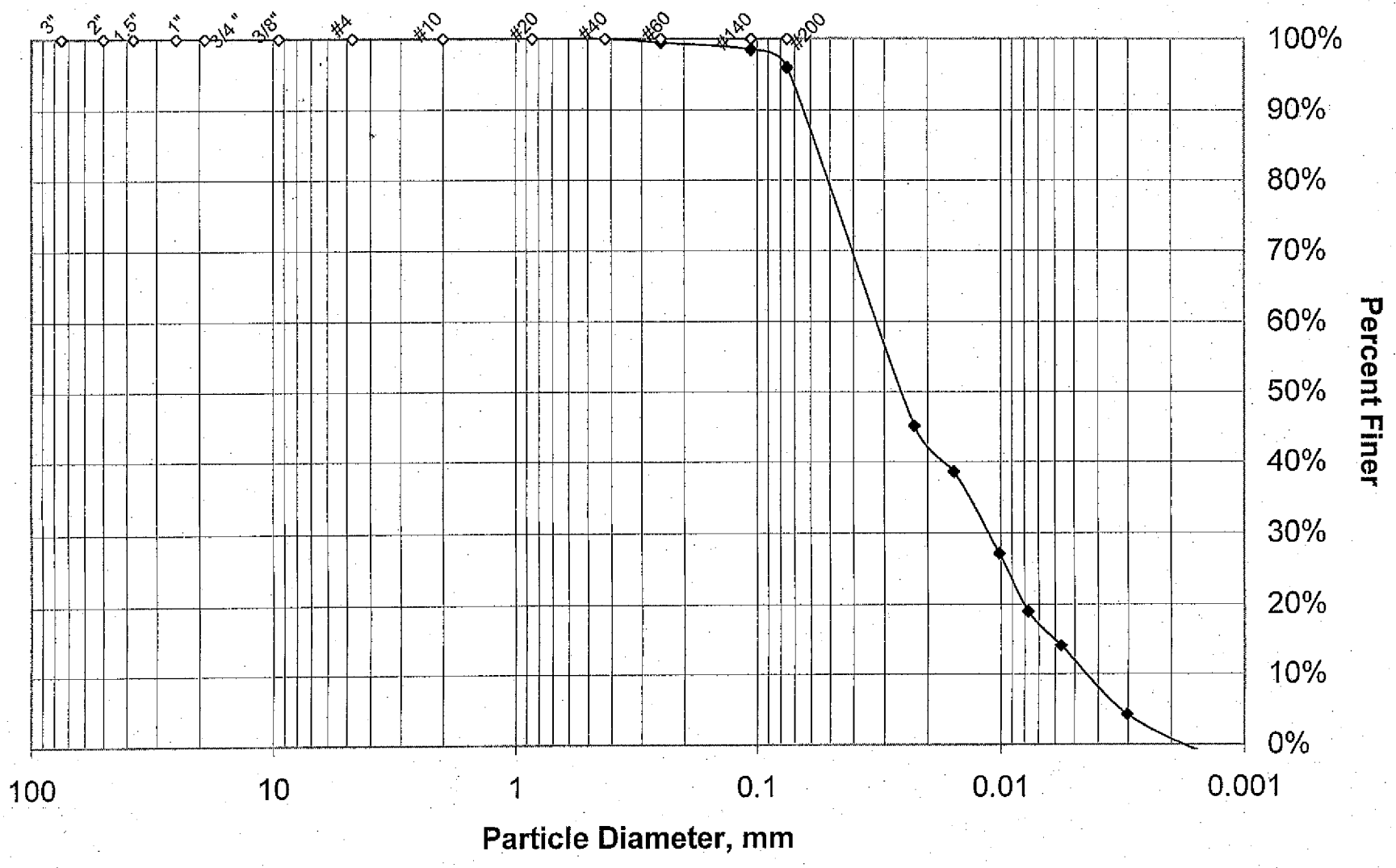
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B183X7 at**

Init:_____ Date:_____



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GEOTECHNICAL CONSULTANTS
SAINT LOUIS, MISSOURI

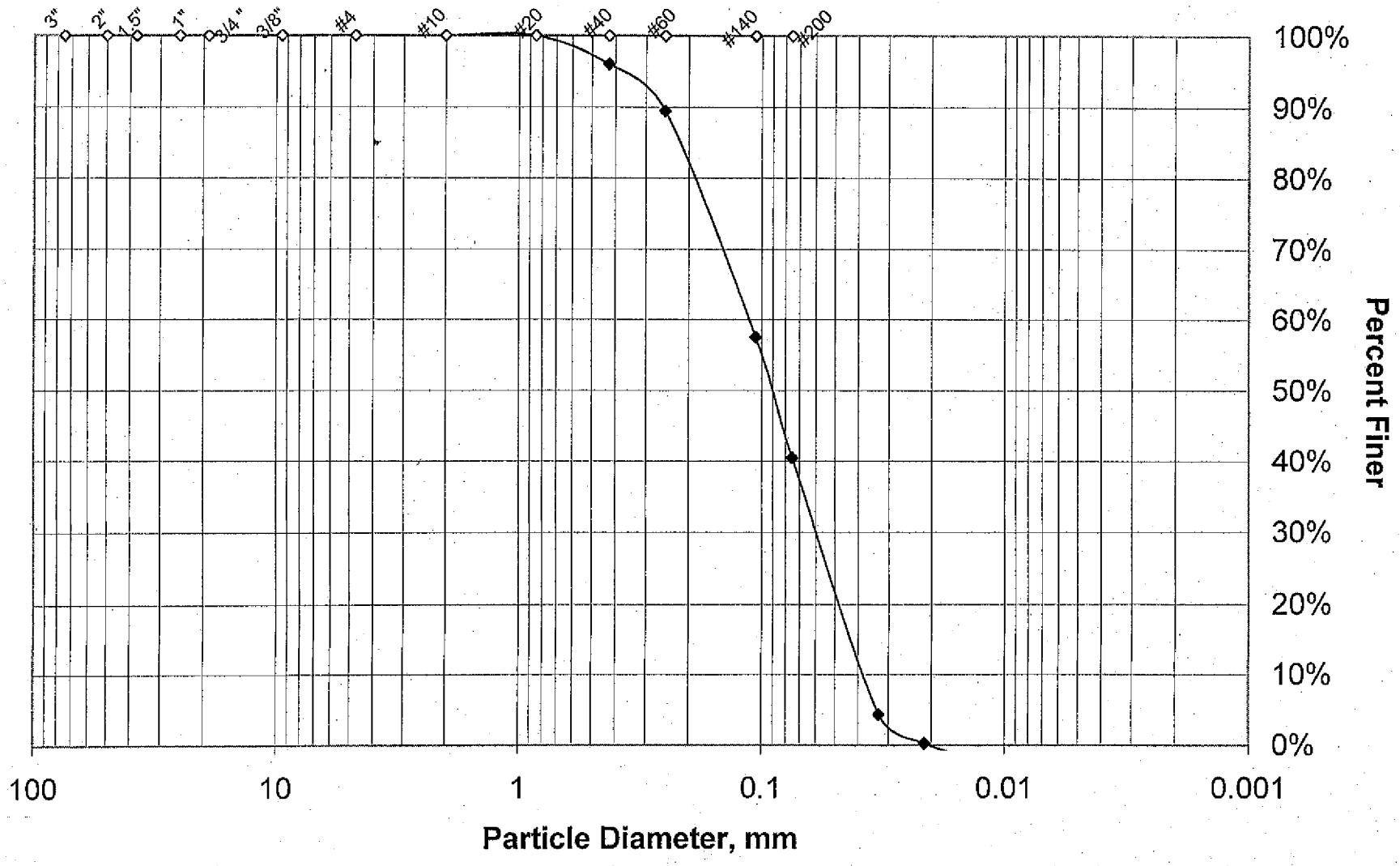
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

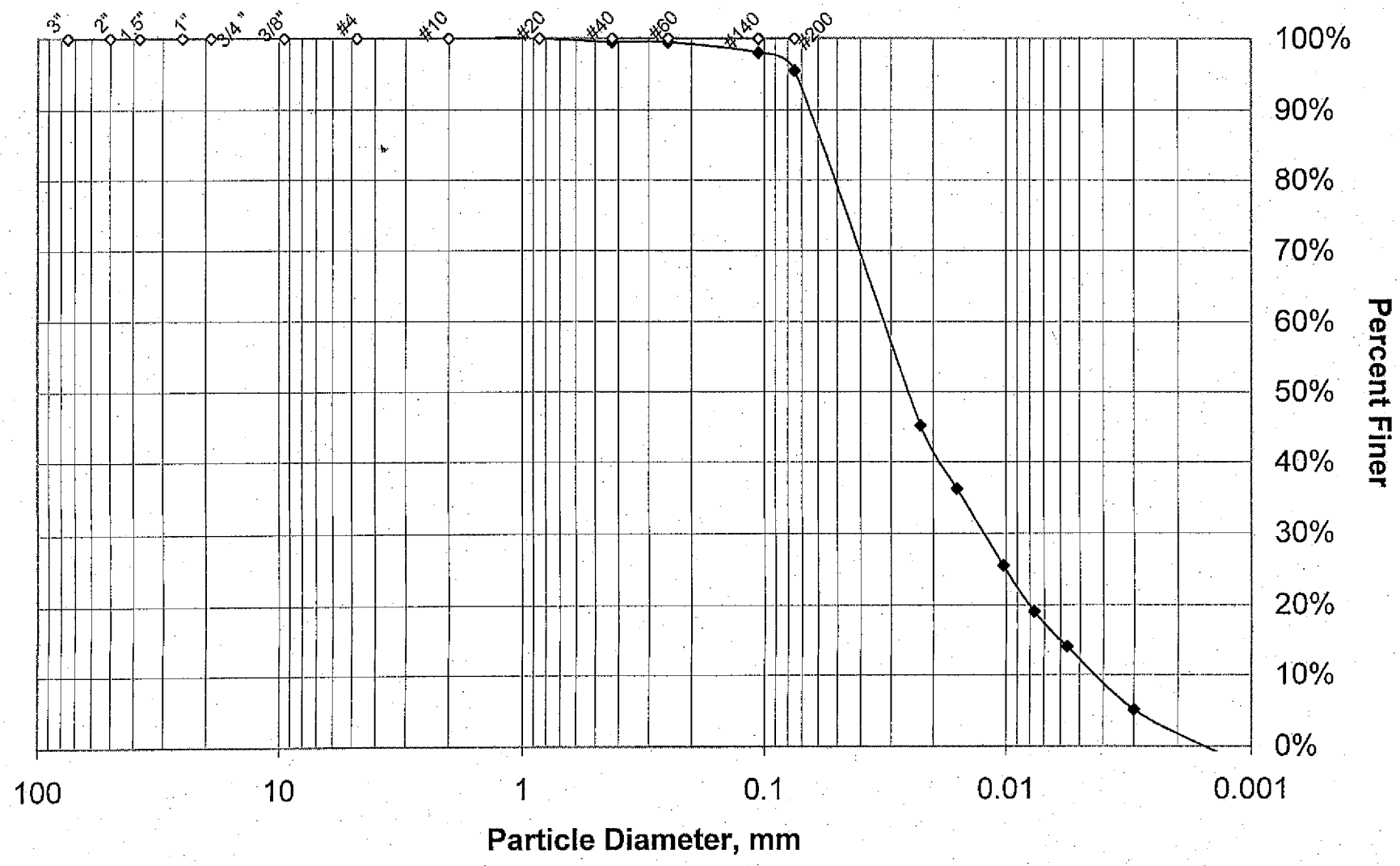
Boring : 0 **Sample : B183X8 at**

Init:_____ Date:_____



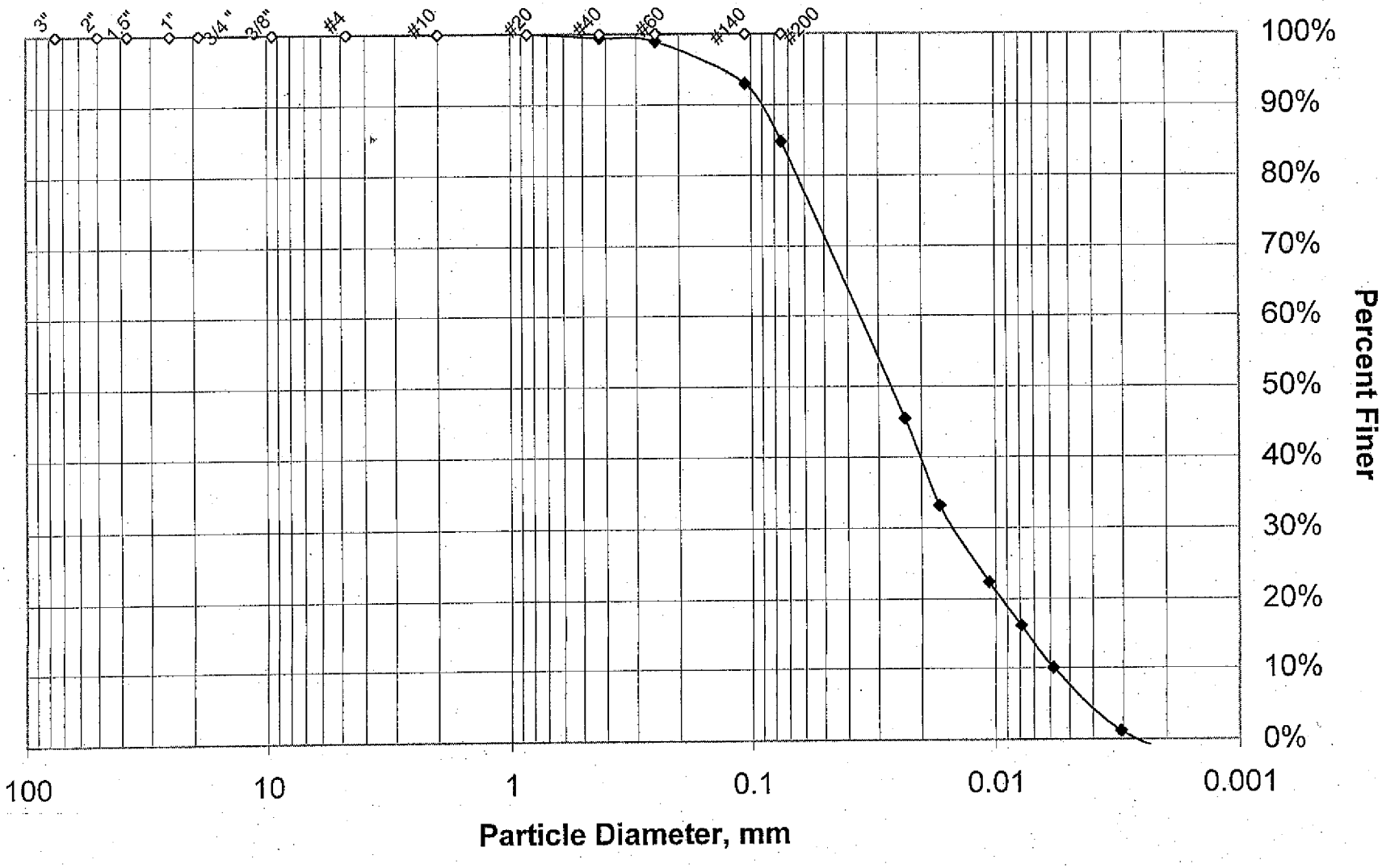
SHANNON & WILSON, INC. **GEOTECHNICAL CONSULTANTS** **SAINT LOUIS, MISSOURI**	**PARTICLE SIZE ANALYSIS** **Hanford Site Area C**
22-1-02073-001	**Boring :** 0 **Sample : B183X9 at**

Init:_____ Date:_____



SHANNON & WILSON, INC. GEOTECHNICAL CONSULTANTS SAINT LOUIS, MISSOURI 22-1-02073-001	**PARTICLE SIZE ANALYSIS** **Hanford Site Area C** **Boring :** 0 **Sample :** B183Y0 at

Init:_____ Date:_____



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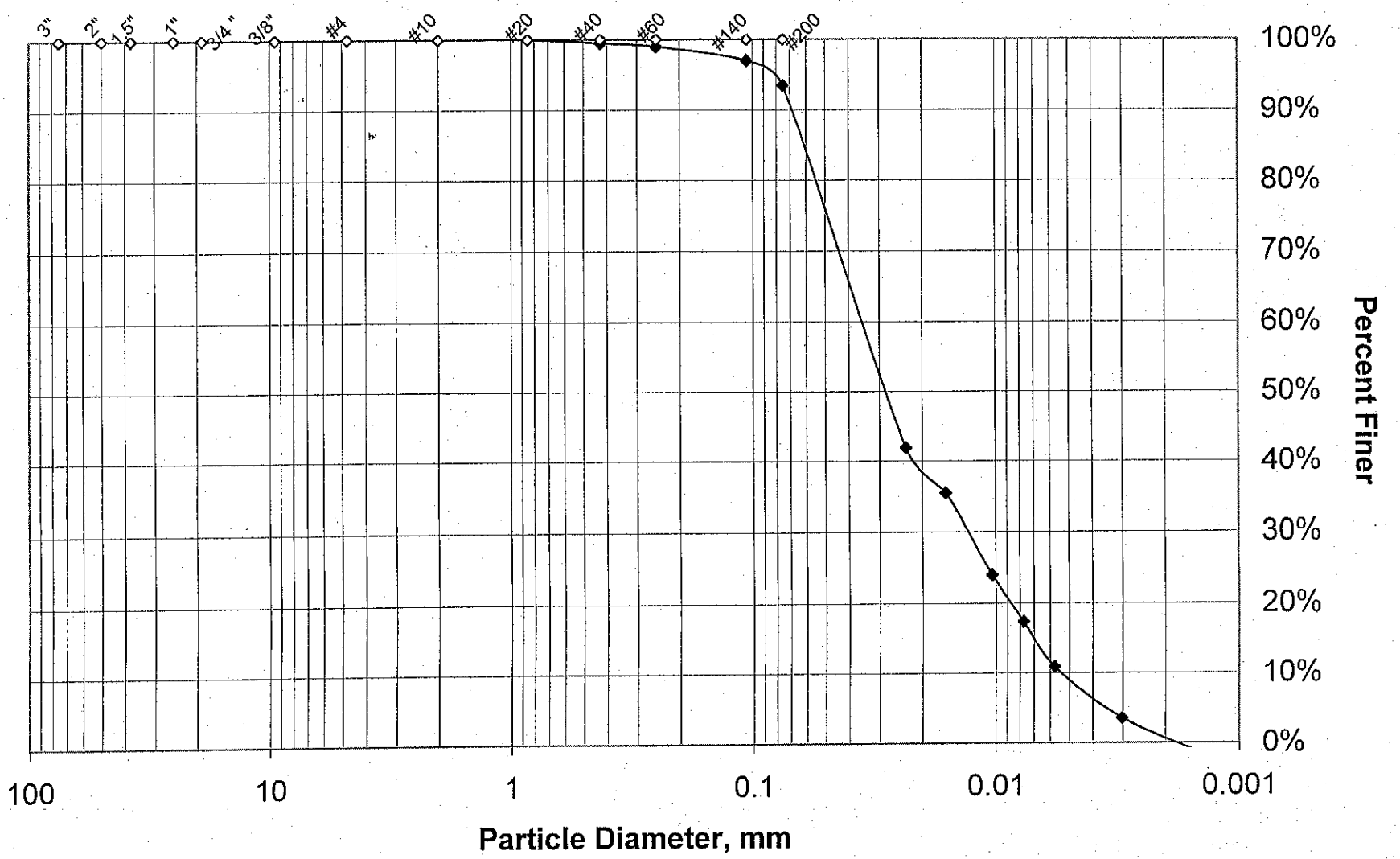
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B183Y1 at**

Init:_____ Date:_____



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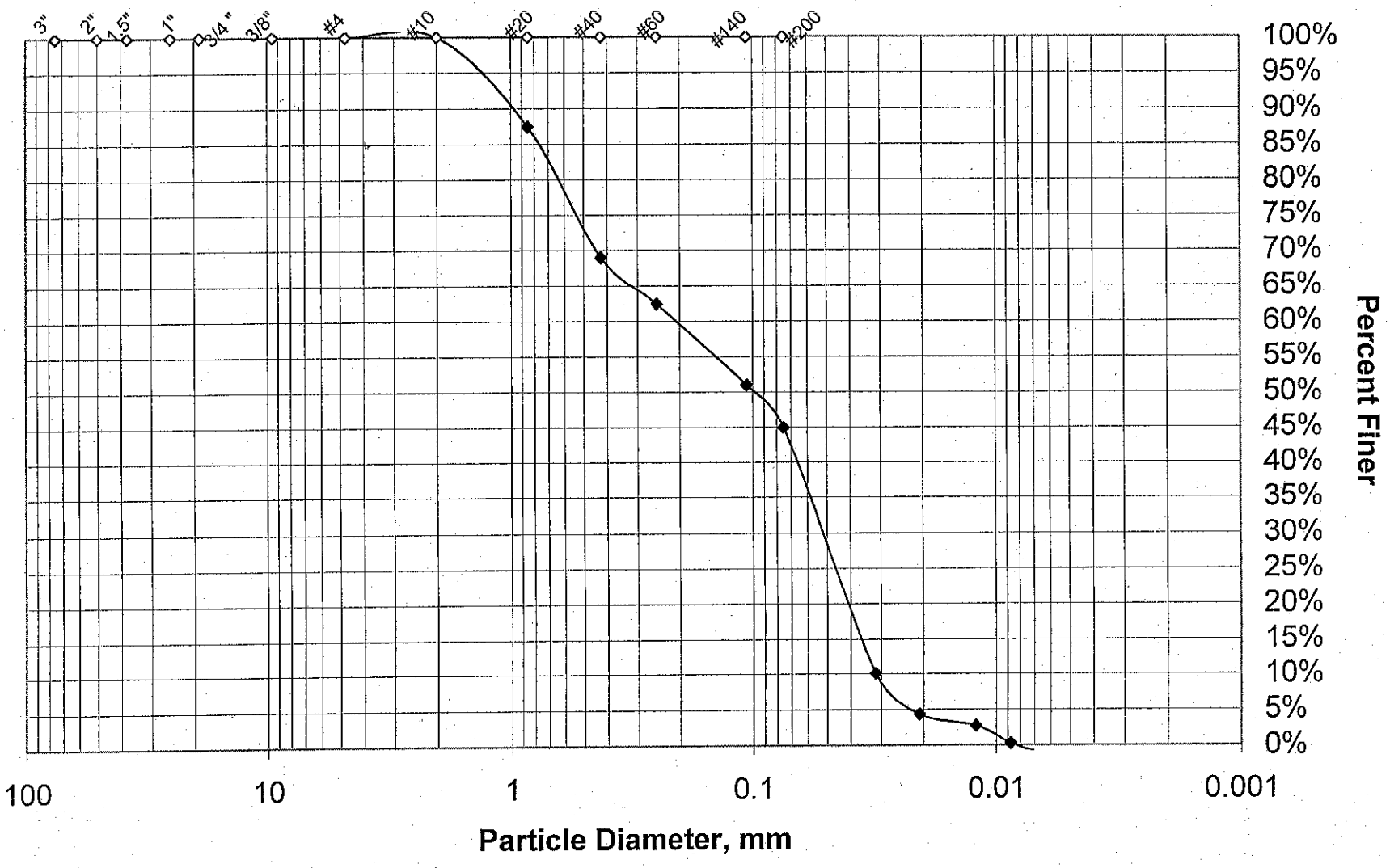
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B183Y2 at**

Init:_____ Date:_____



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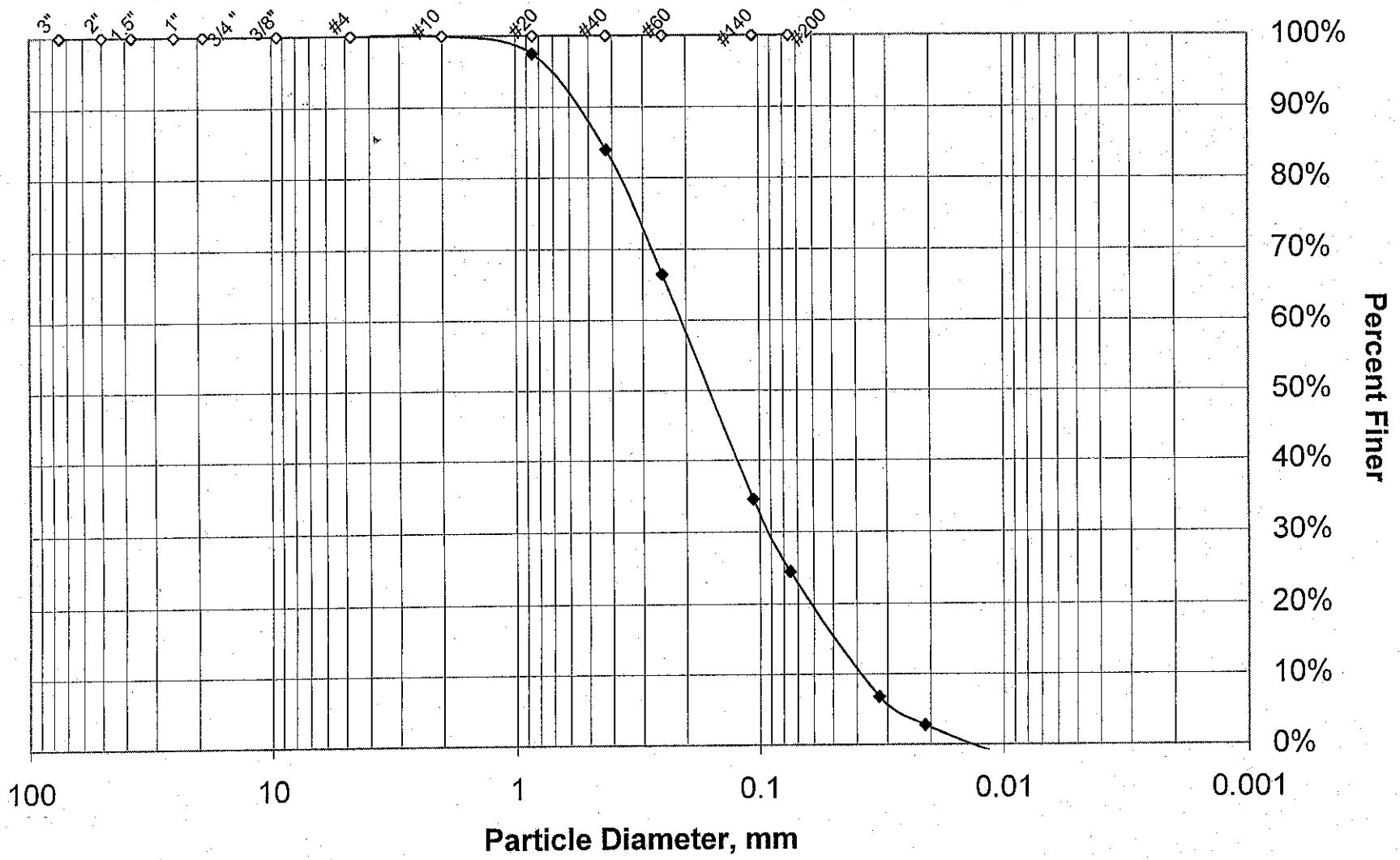
PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : 183Y3 at**

Init:_____ Date:_____



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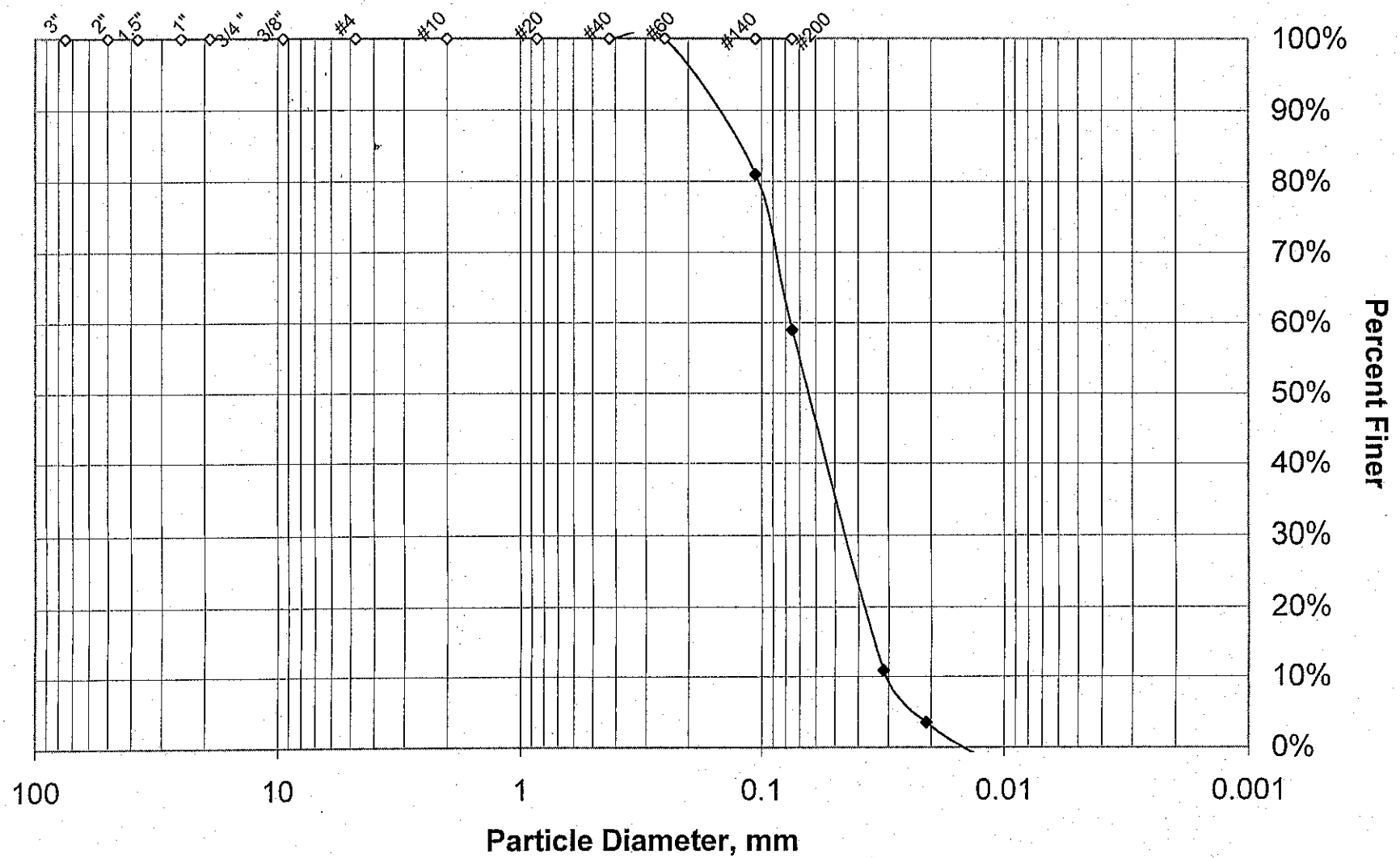
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample :** B183Y4 at

Init:_____ Date:_____



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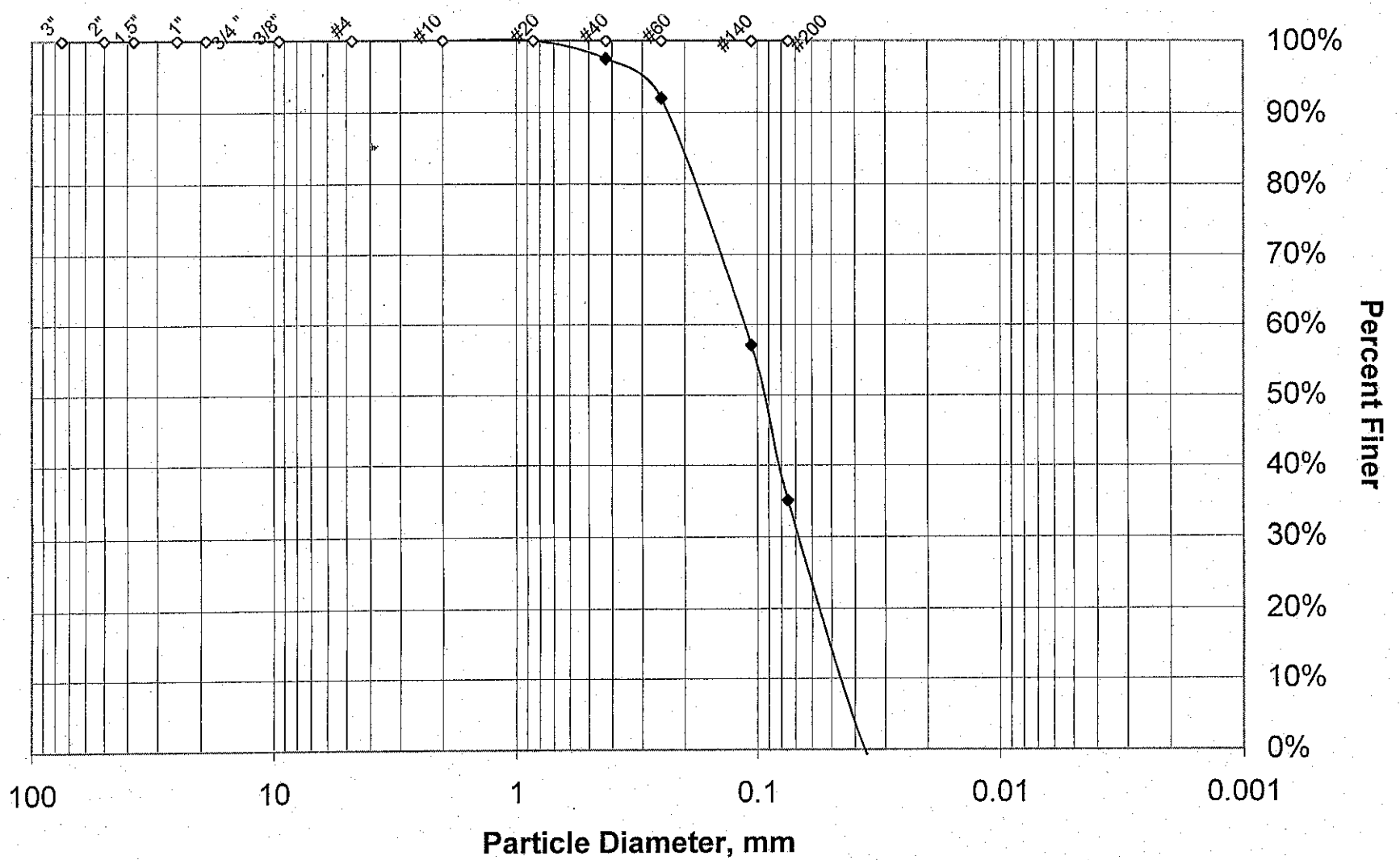
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B183y5 at**

Init:_____ Date:_____



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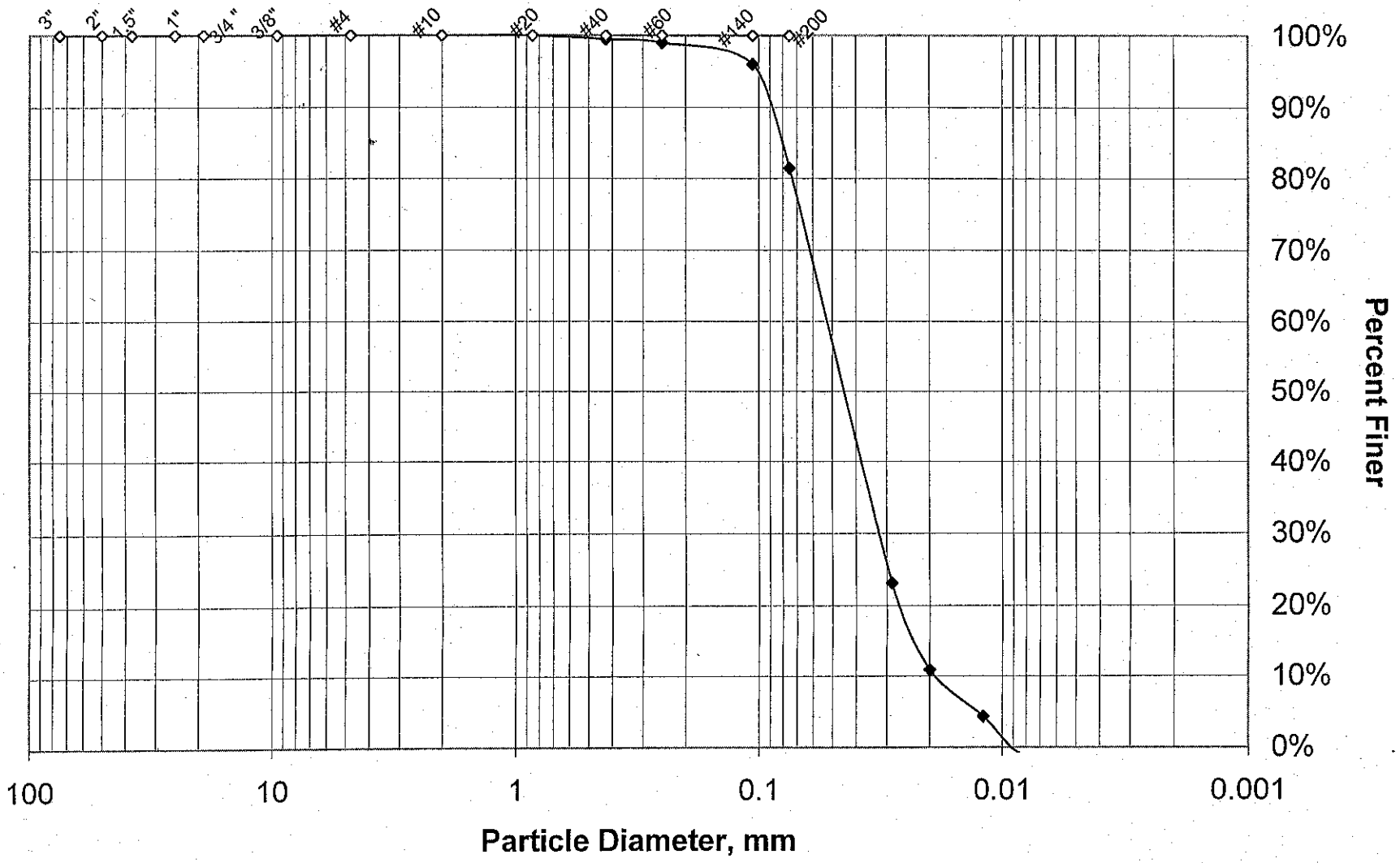
PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B183Y6 at**

Init:_____ Date:_____



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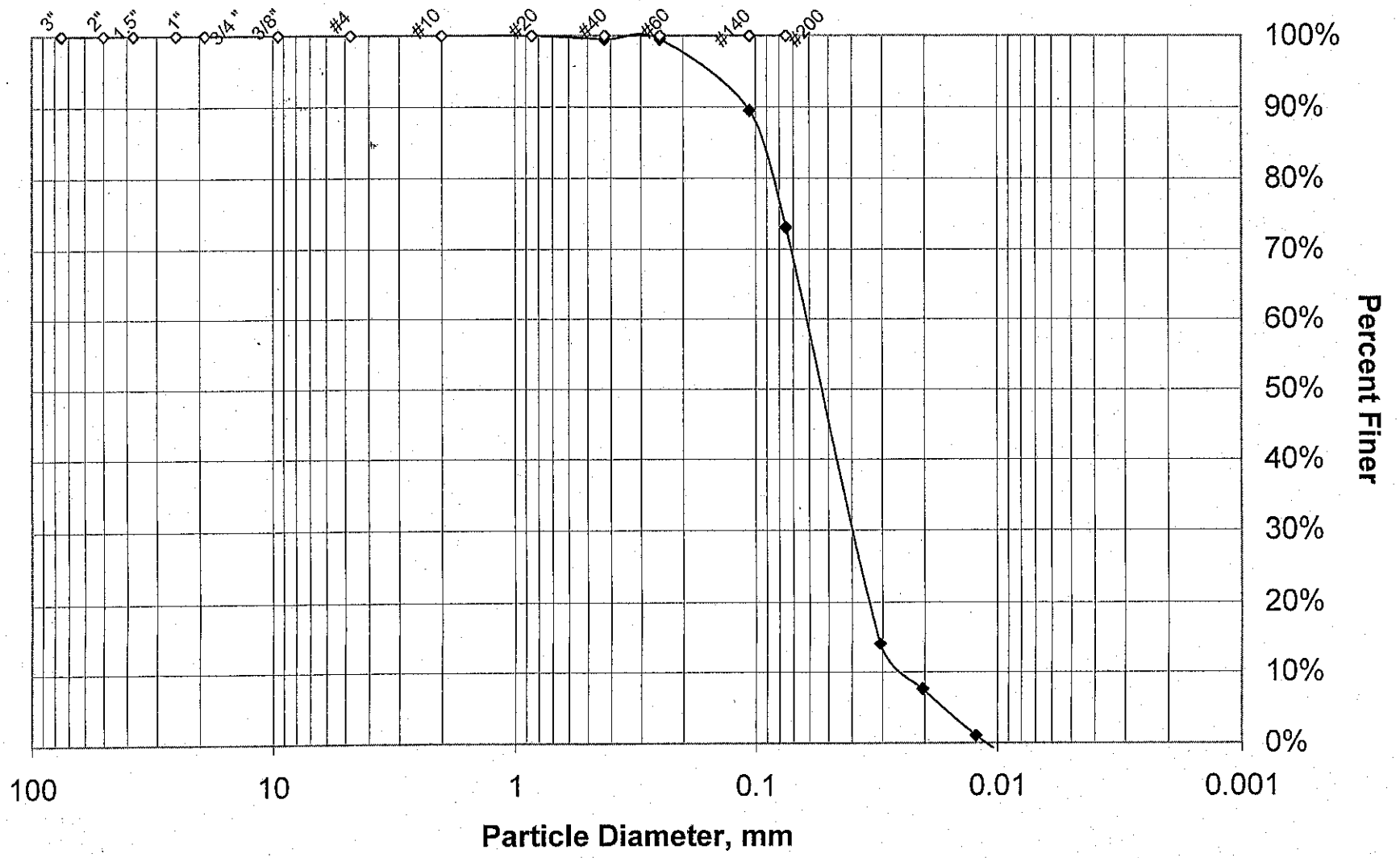
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B183Y7 at**

Init:_____ Date:_____



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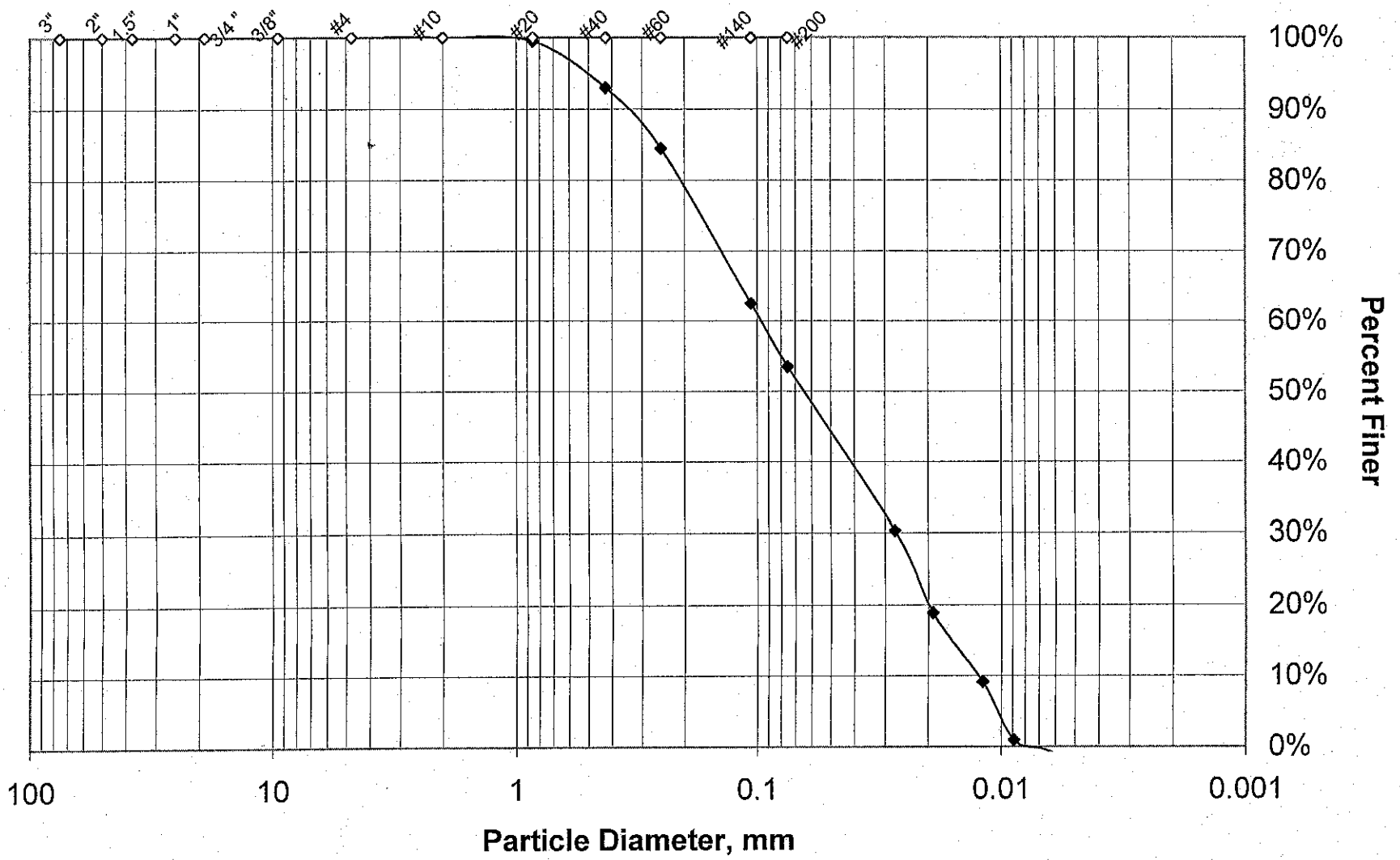
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B183Y8 at**

Init:_____ Date:_____



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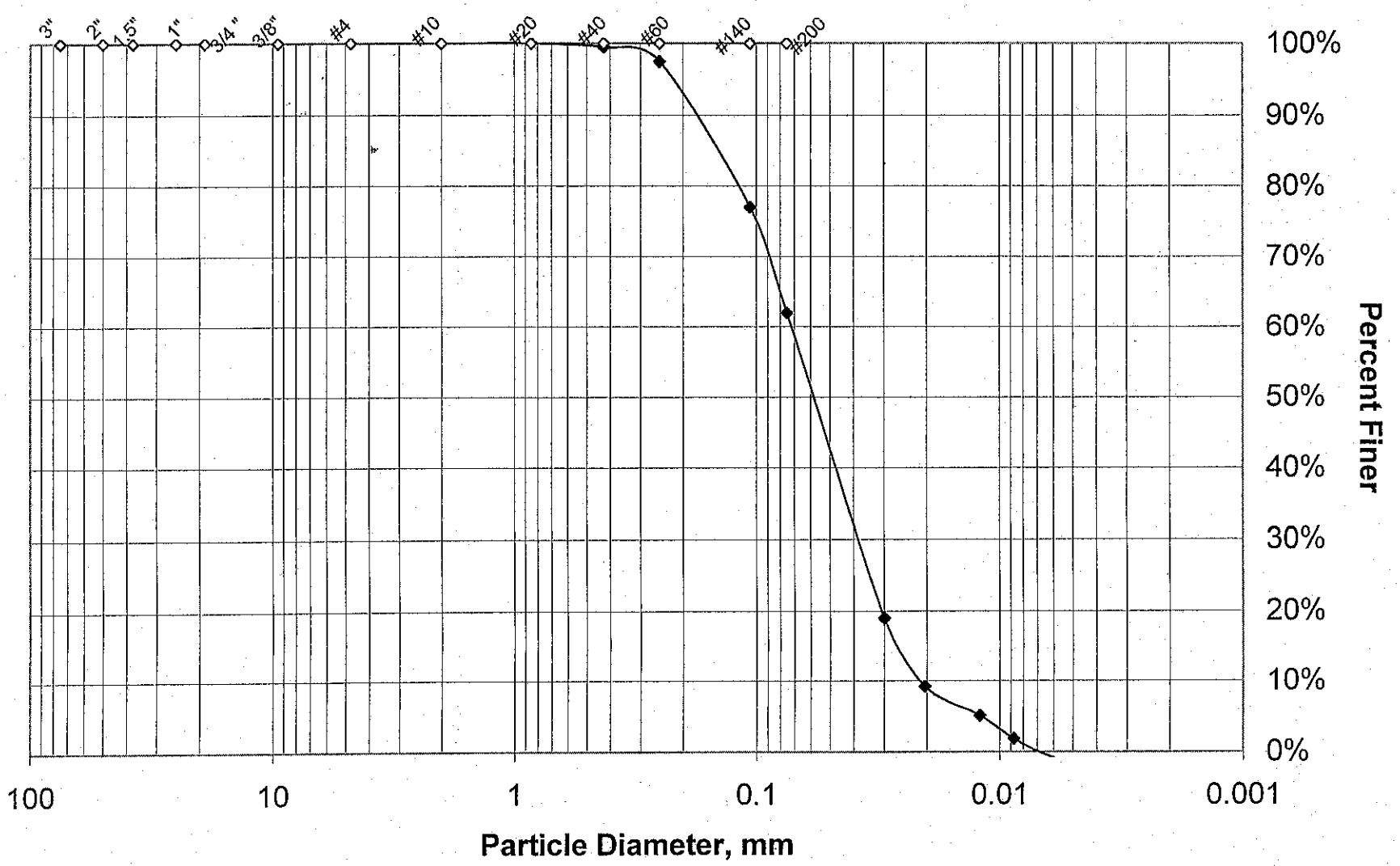
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B183y9 at**

Init:_____ Date:_____



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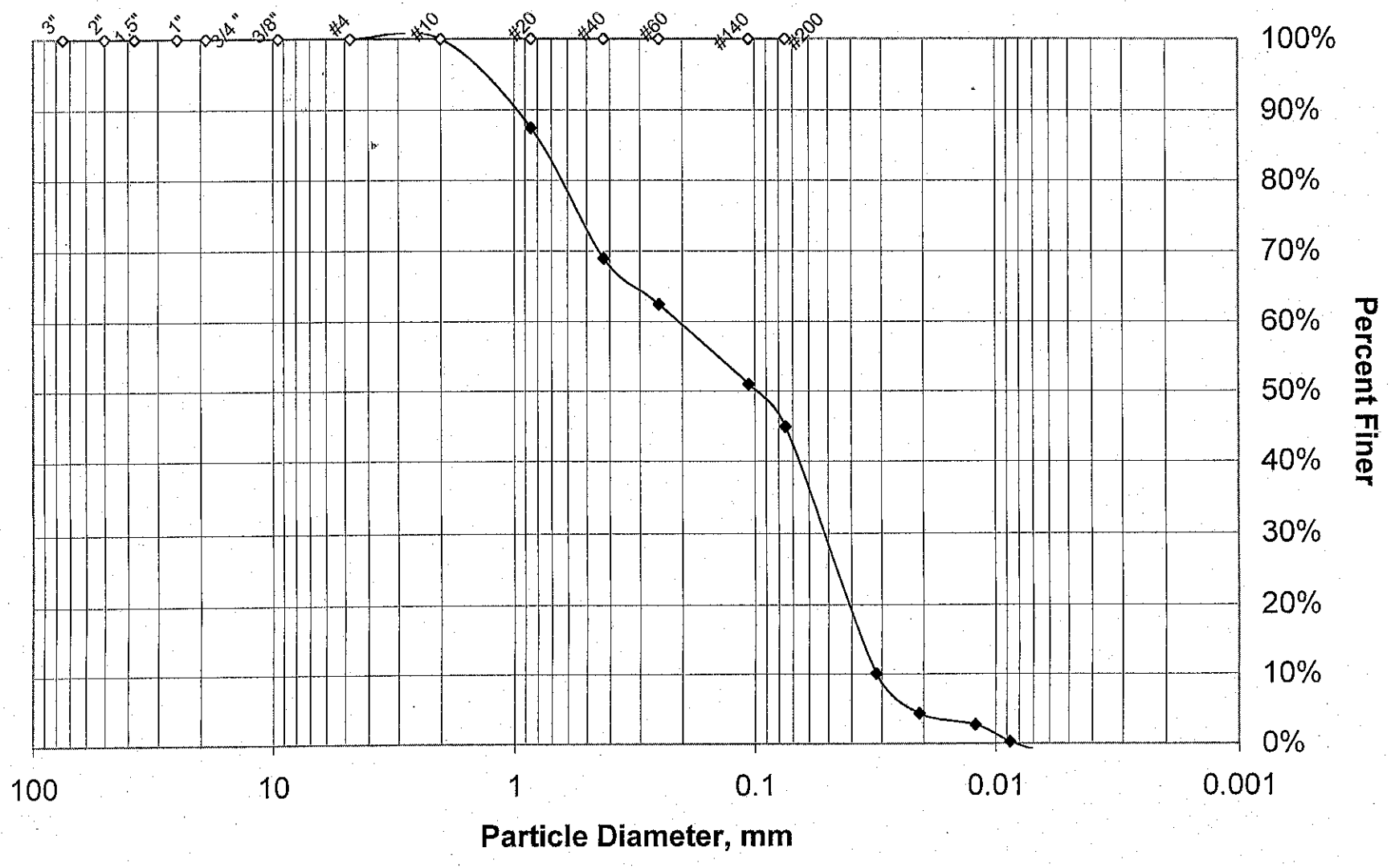
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B18400 at**

Init:_____ Date:_____



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SAINT LOUIS, MISSOURI

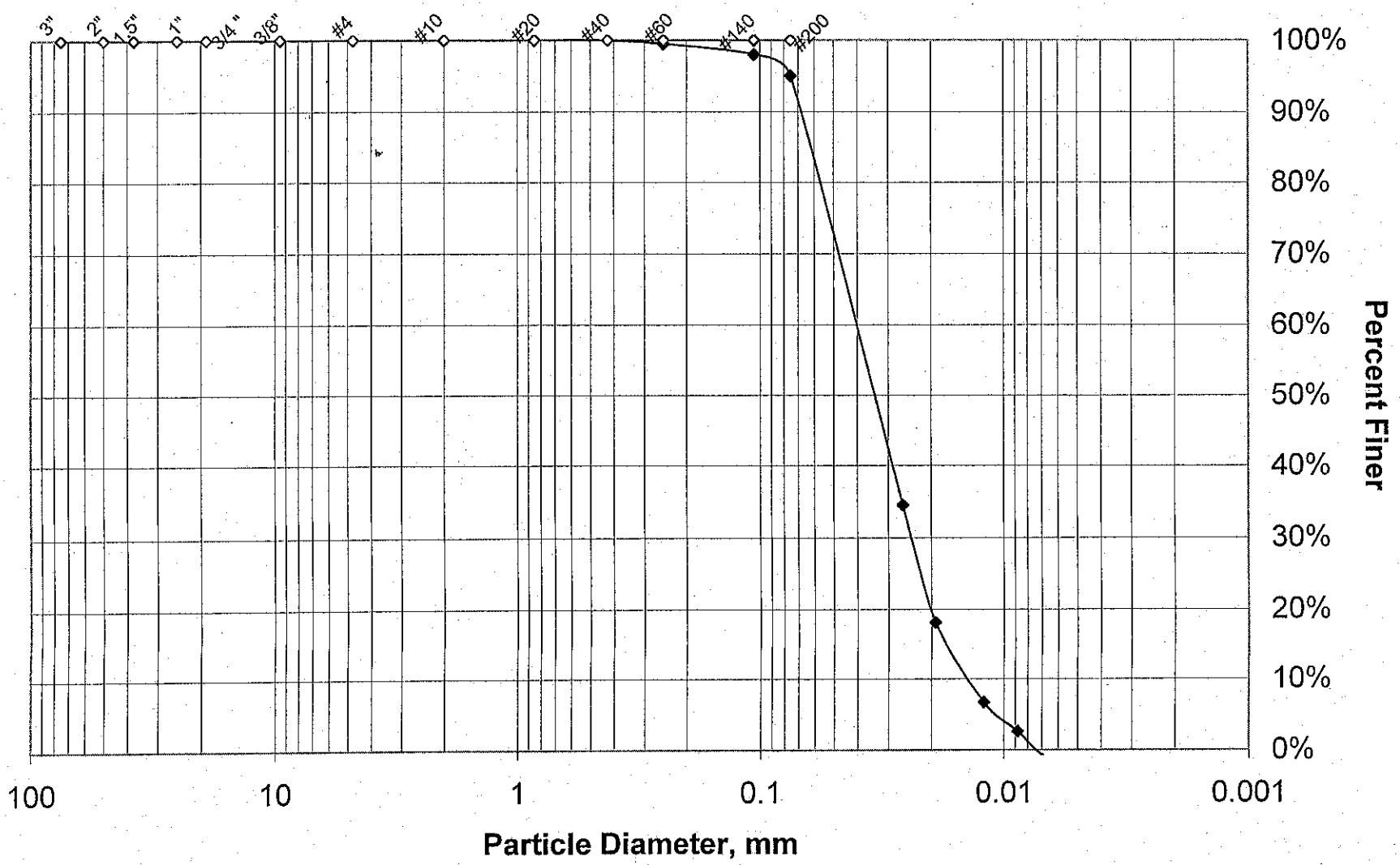
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B18401 at**

Init:_____ Date:_____



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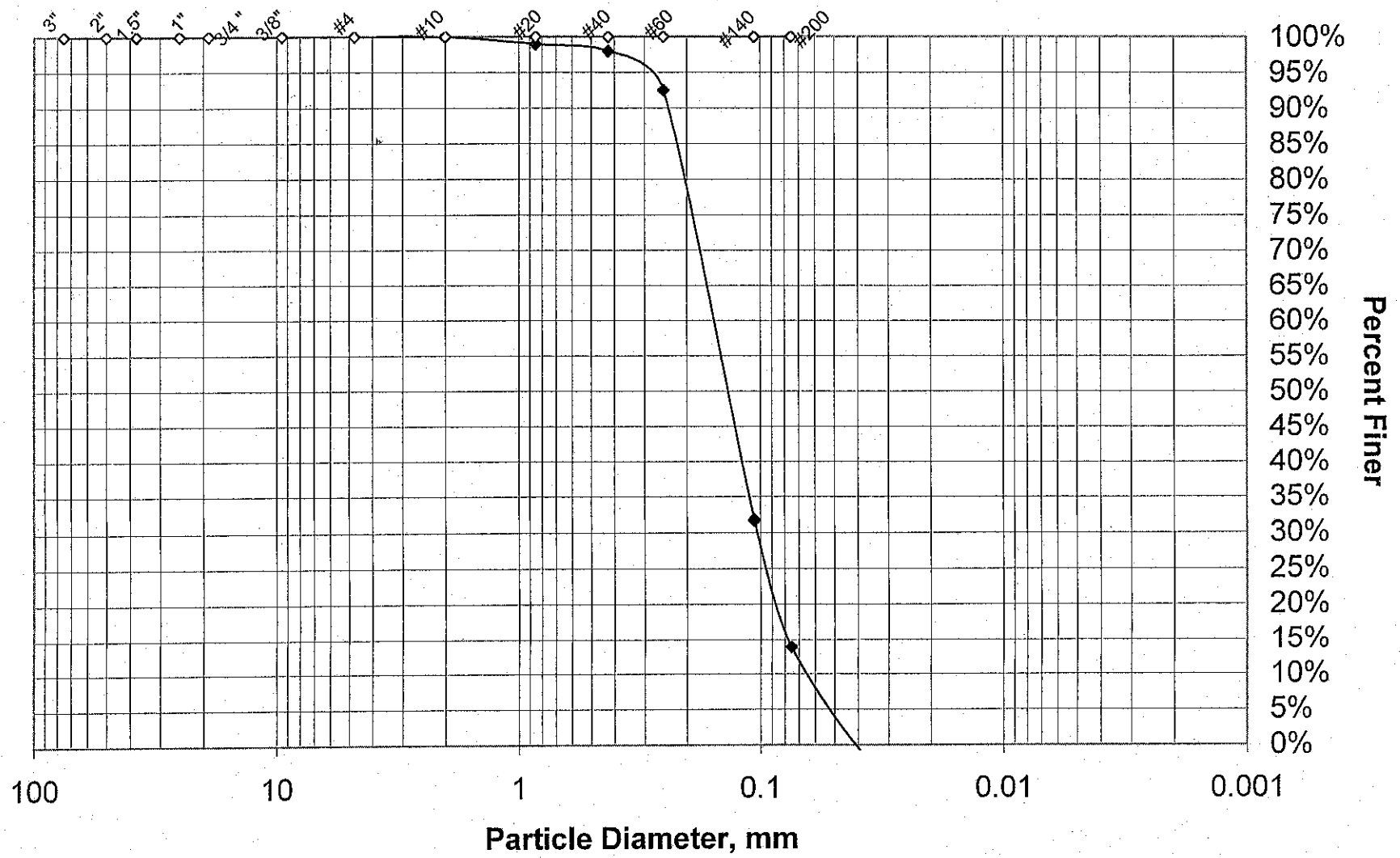
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B18402 at**

Init:_____ Date:_____



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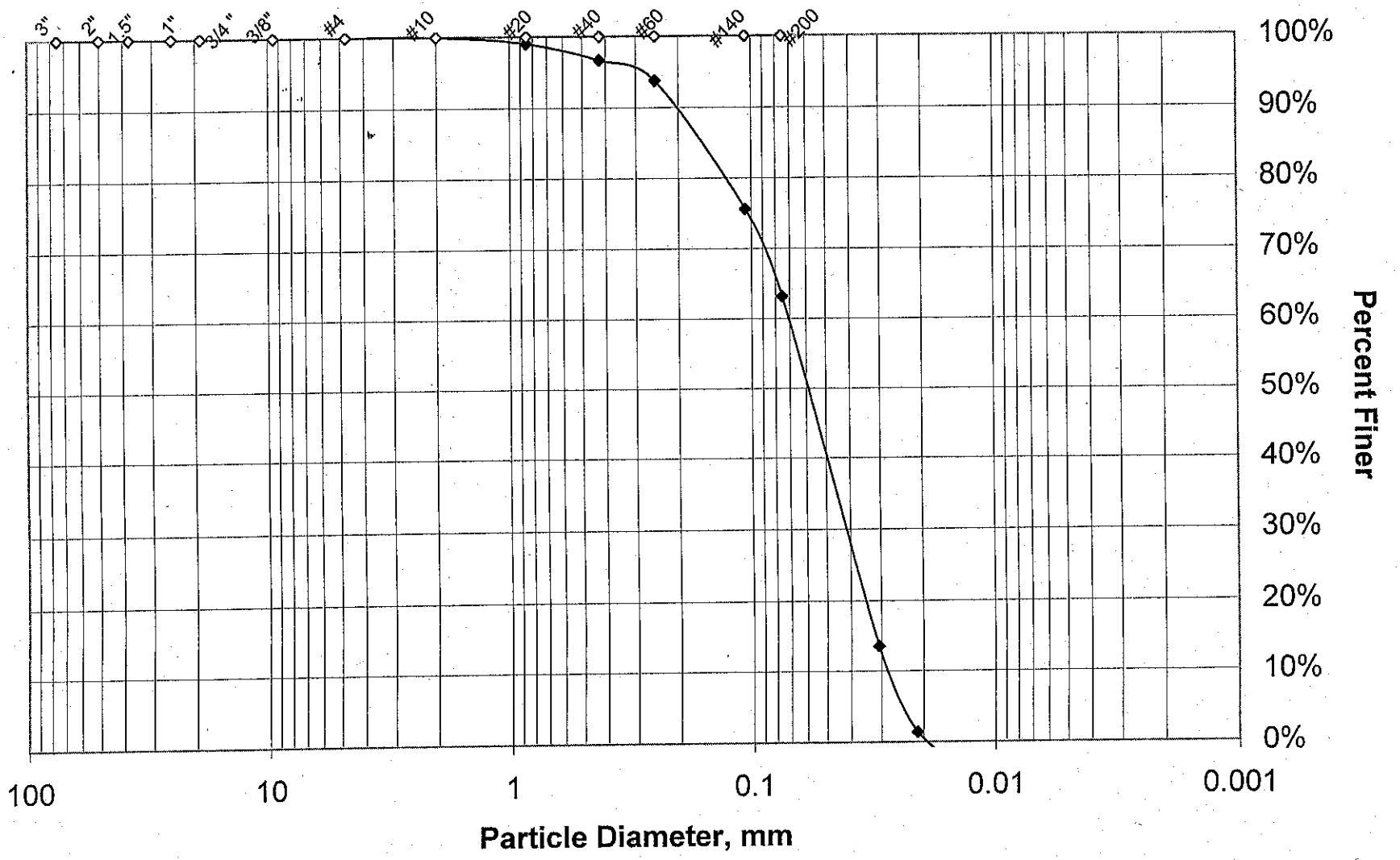
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : **0** **Sample : 18403 at**

Init:_____ Date:_____



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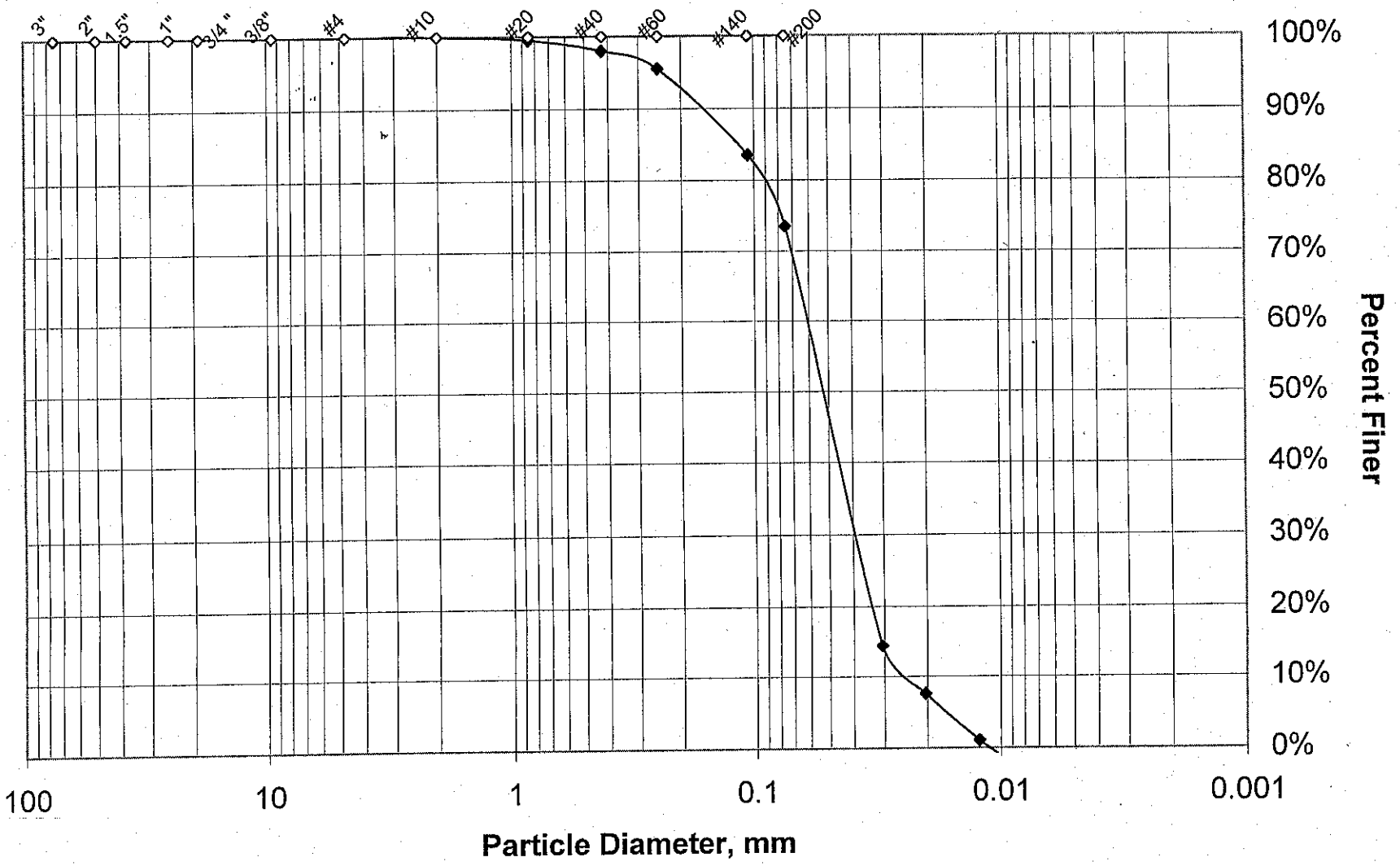
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B18404 at**

Init:_____ Date:_____



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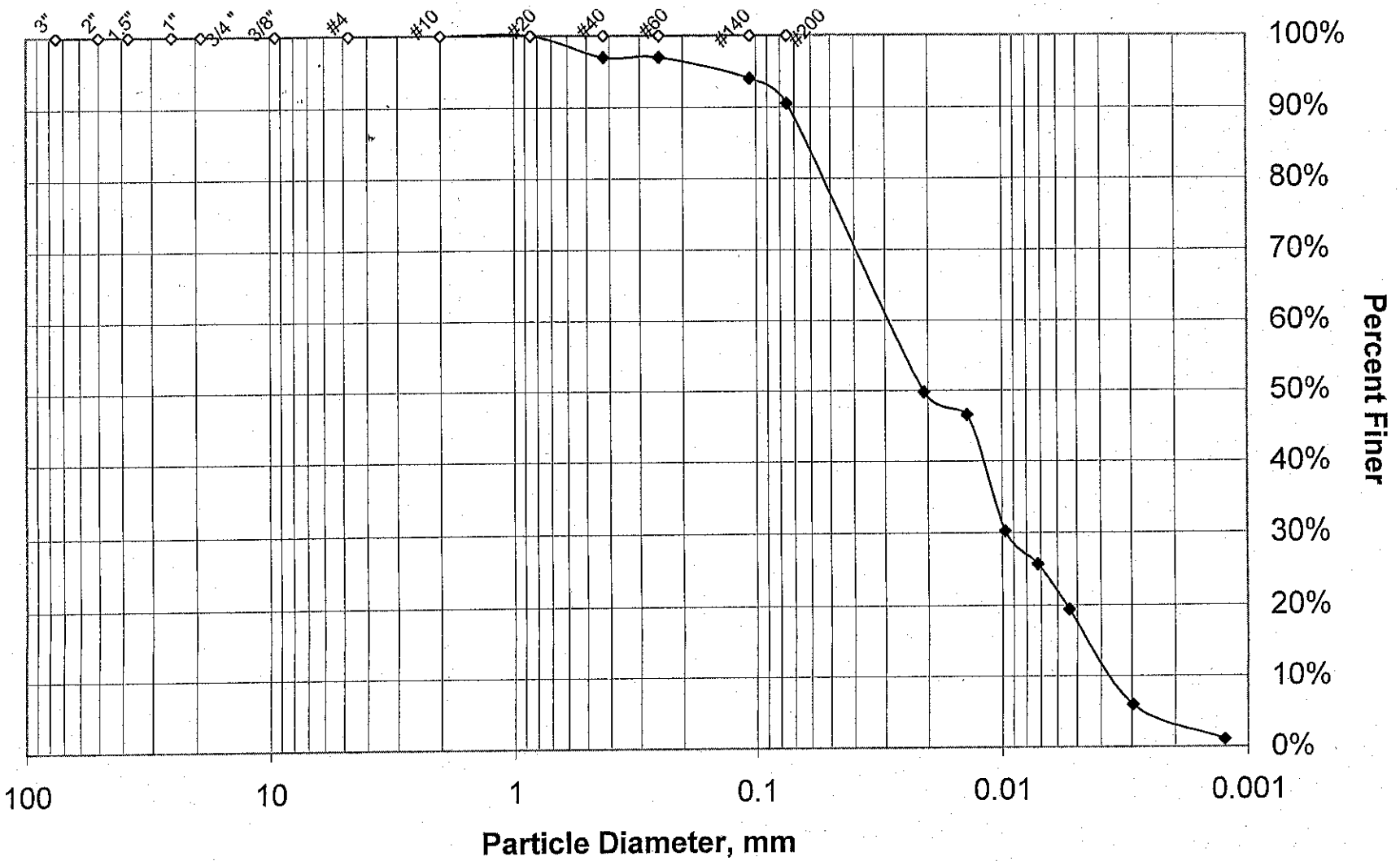
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 Sample : B18405 at

Init:_____ Date:_____



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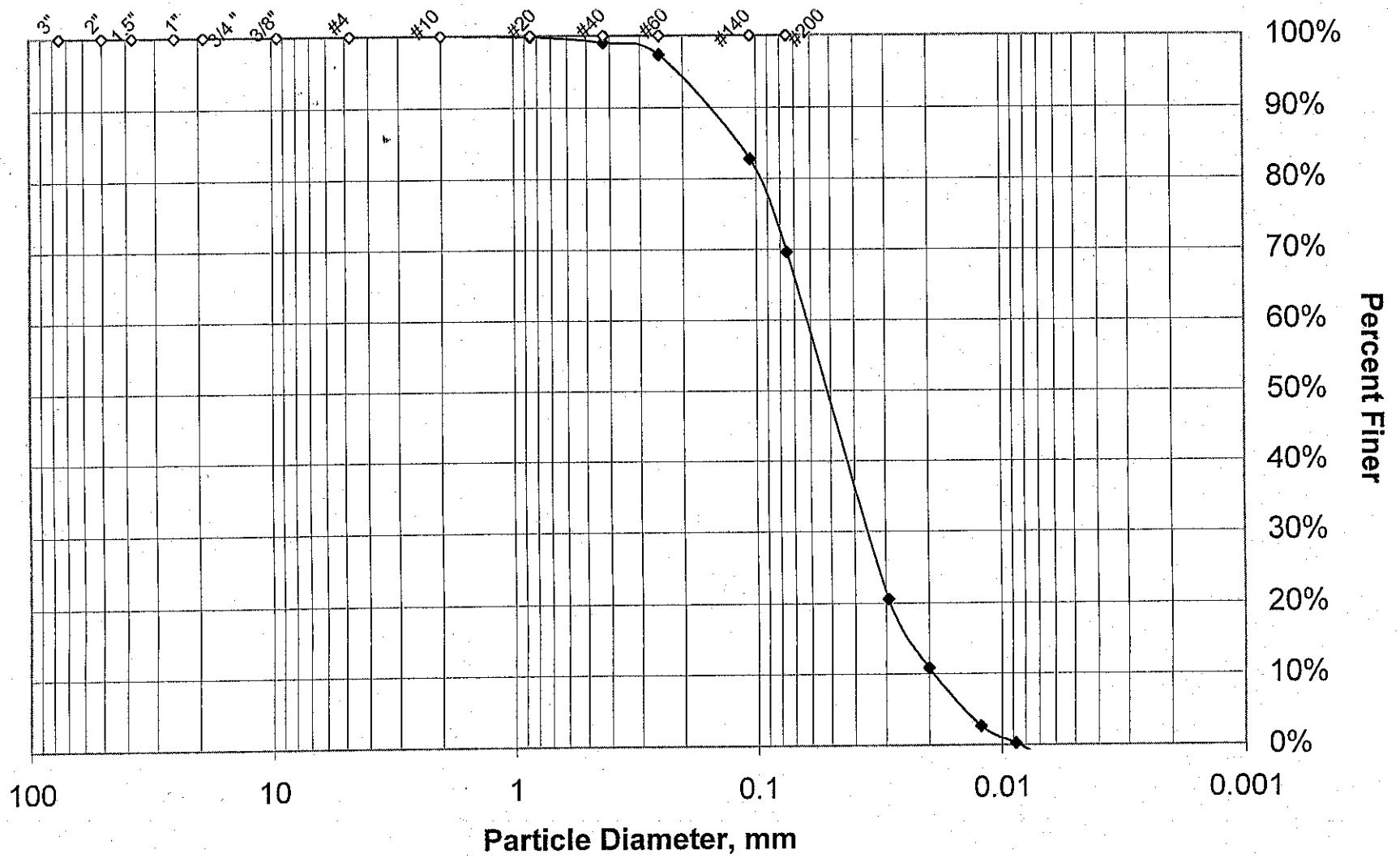
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B18406 at**

Init:_____ Date:_____



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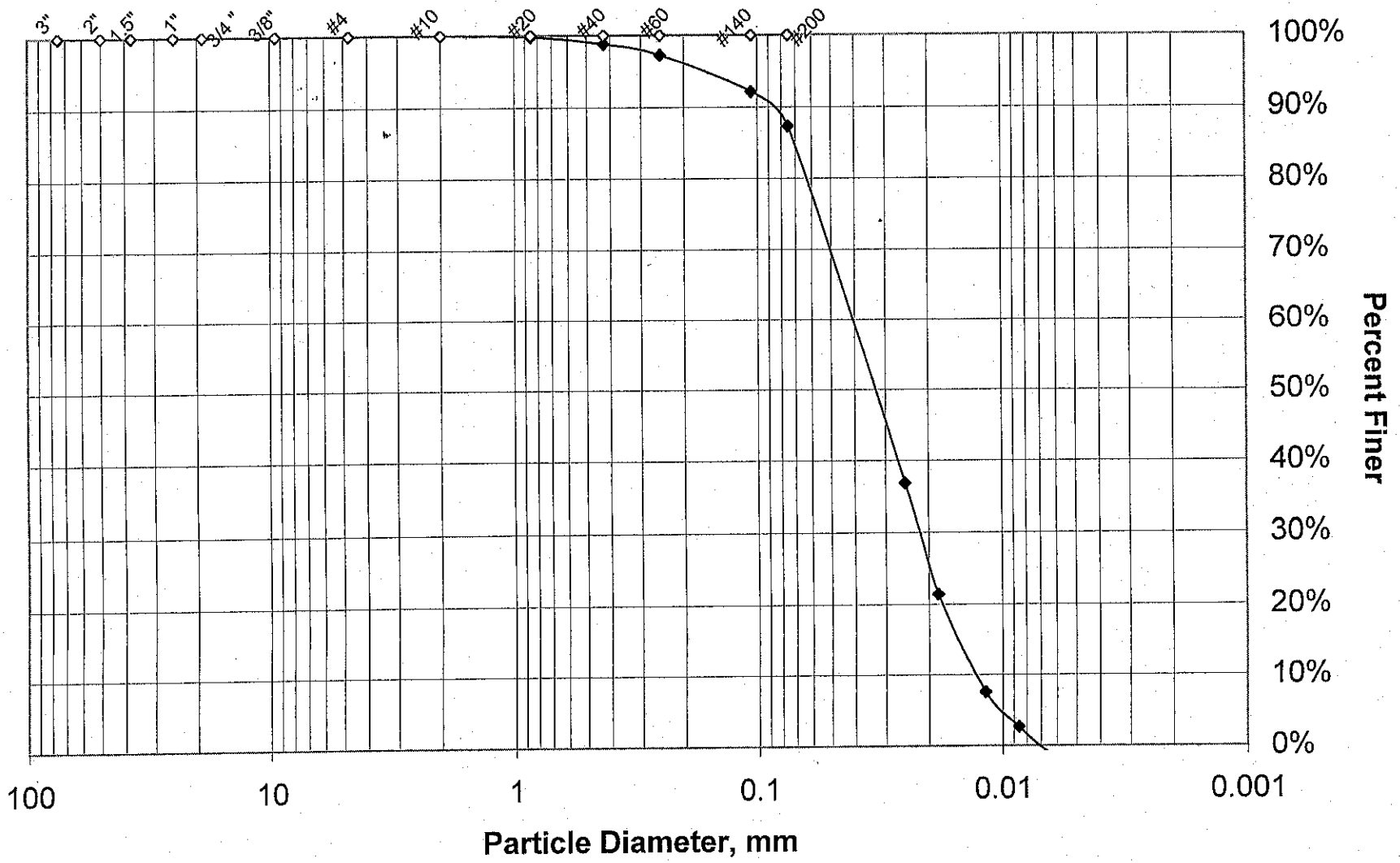
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B18407 at**

Init:_____ Date:_____



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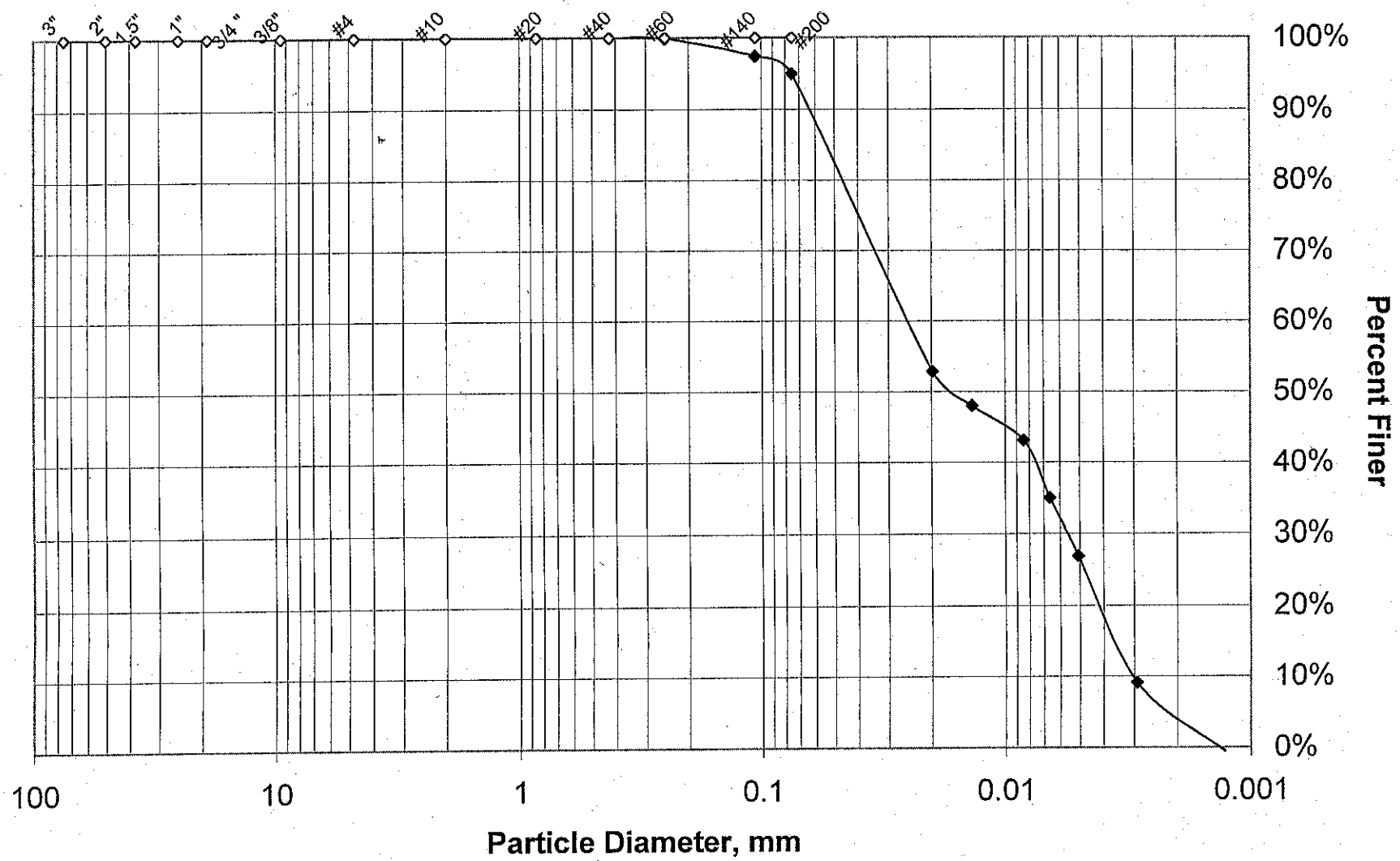
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B18408 at**

Init:_____ Date:_____



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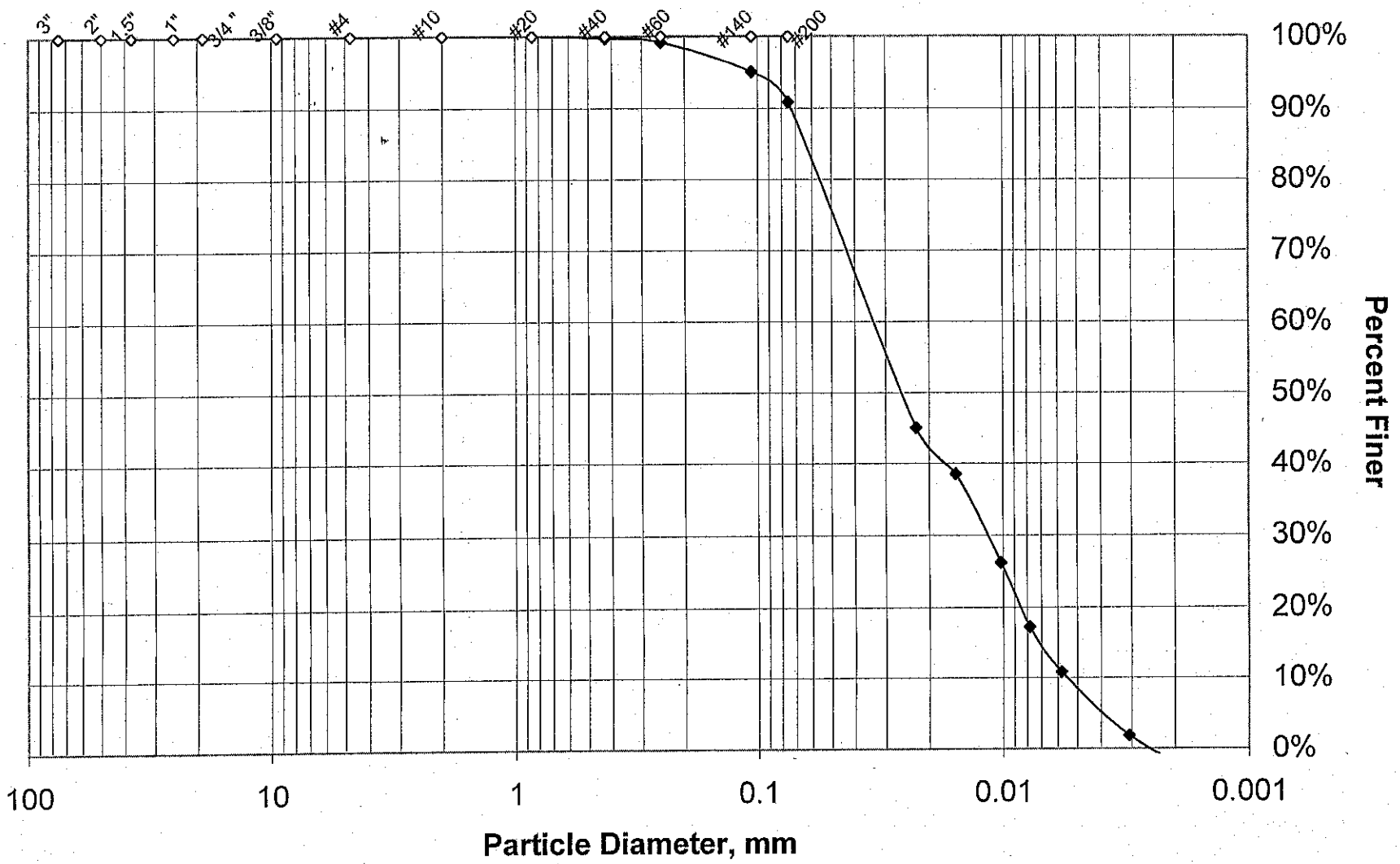
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B18409 at**

Init:_____ Date:_____



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SAINT LOUIS, MISSOURI

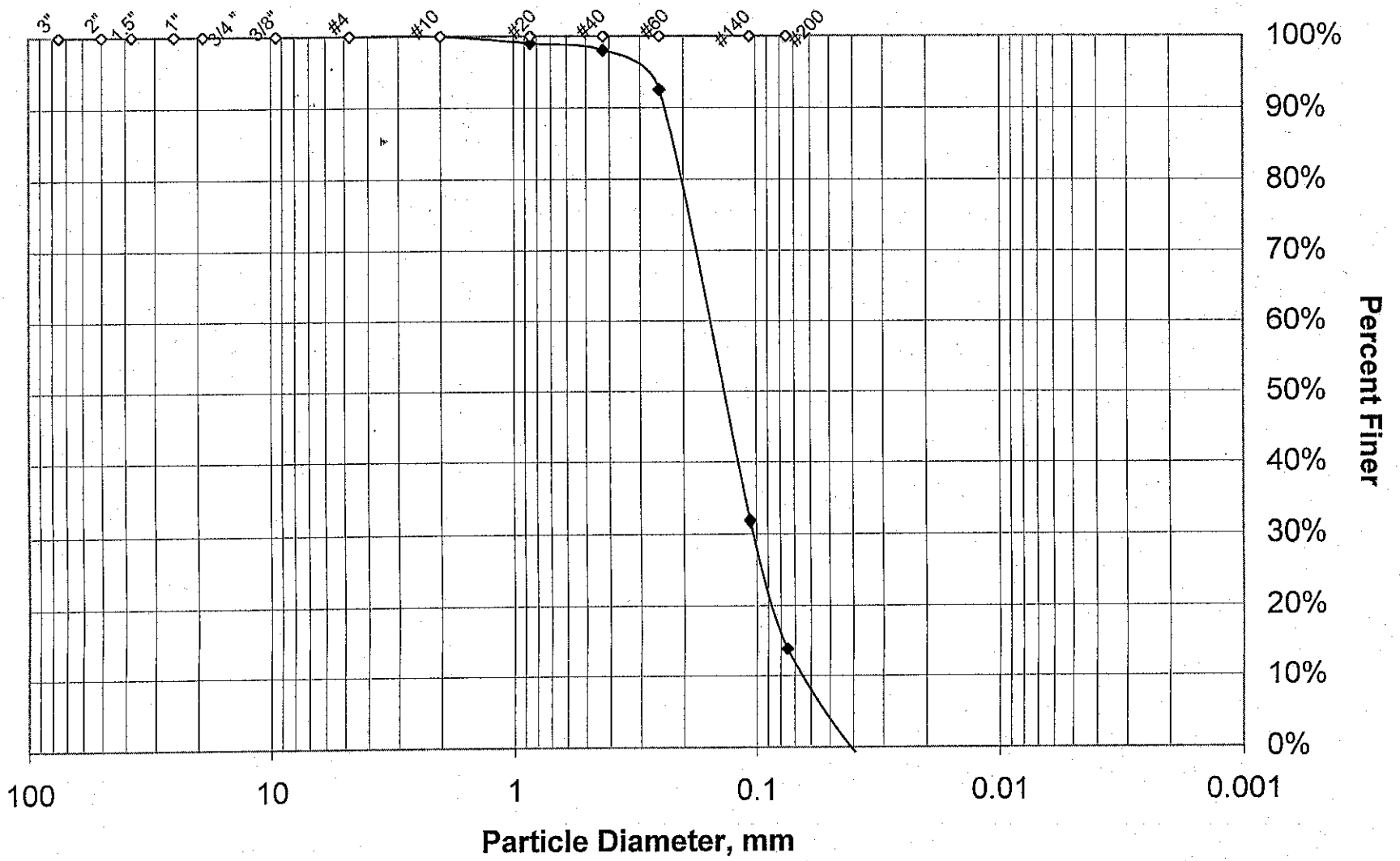
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

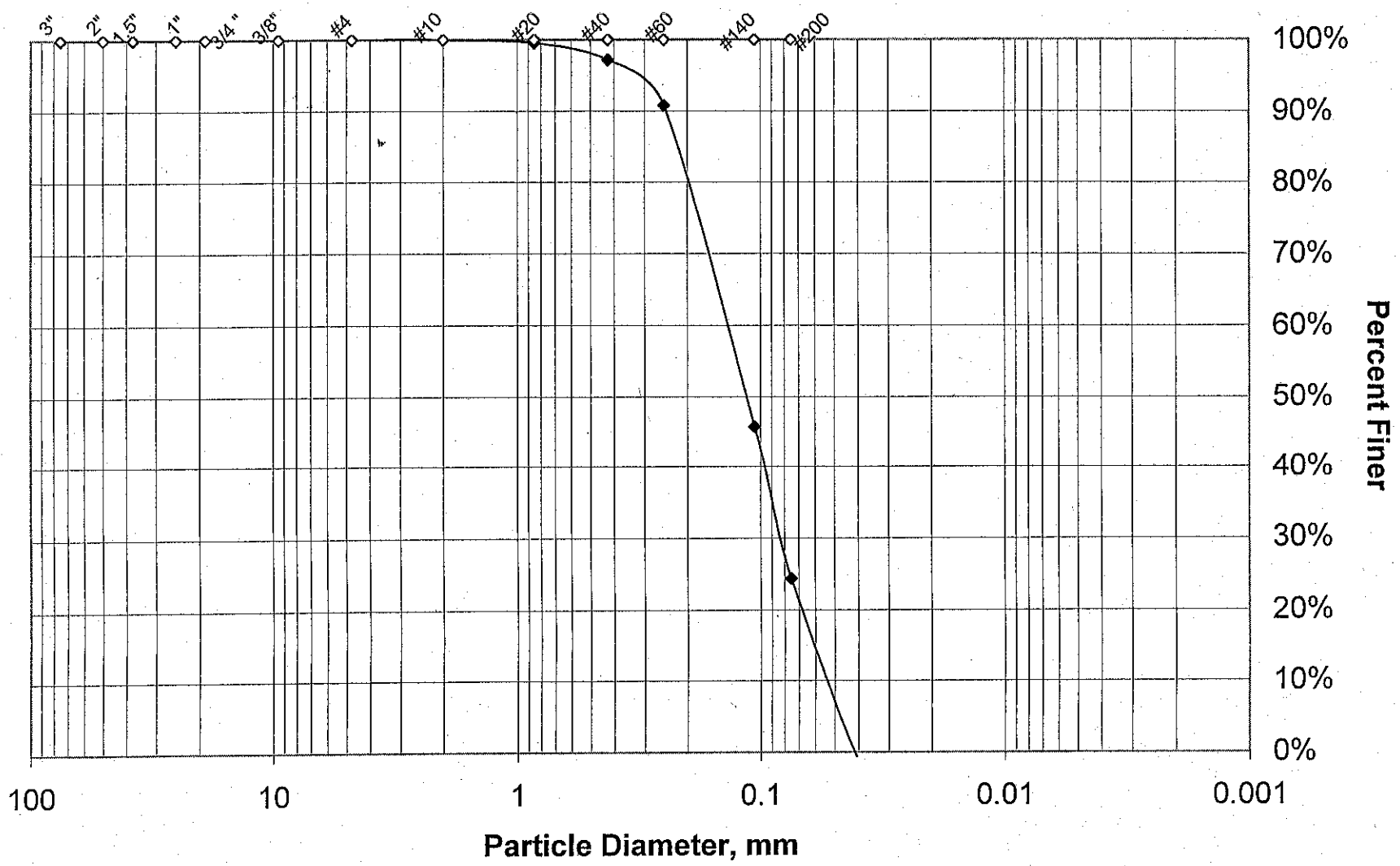
Boring : 0 **Sample : B18410 at**

Init:_____ Date:_____



SHANNON & WILSON, INC. GEOTECHNICAL CONSULTANTS SAINT LOUIS, MISSOURI 22-1-02073-001	**PARTICLE SIZE ANALYSIS** **Hanford Site Area C** **Boring :** 0 **Sample : B18411 at**

Init:_____ Date:_____



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SAINT LOUIS, MISSOURI

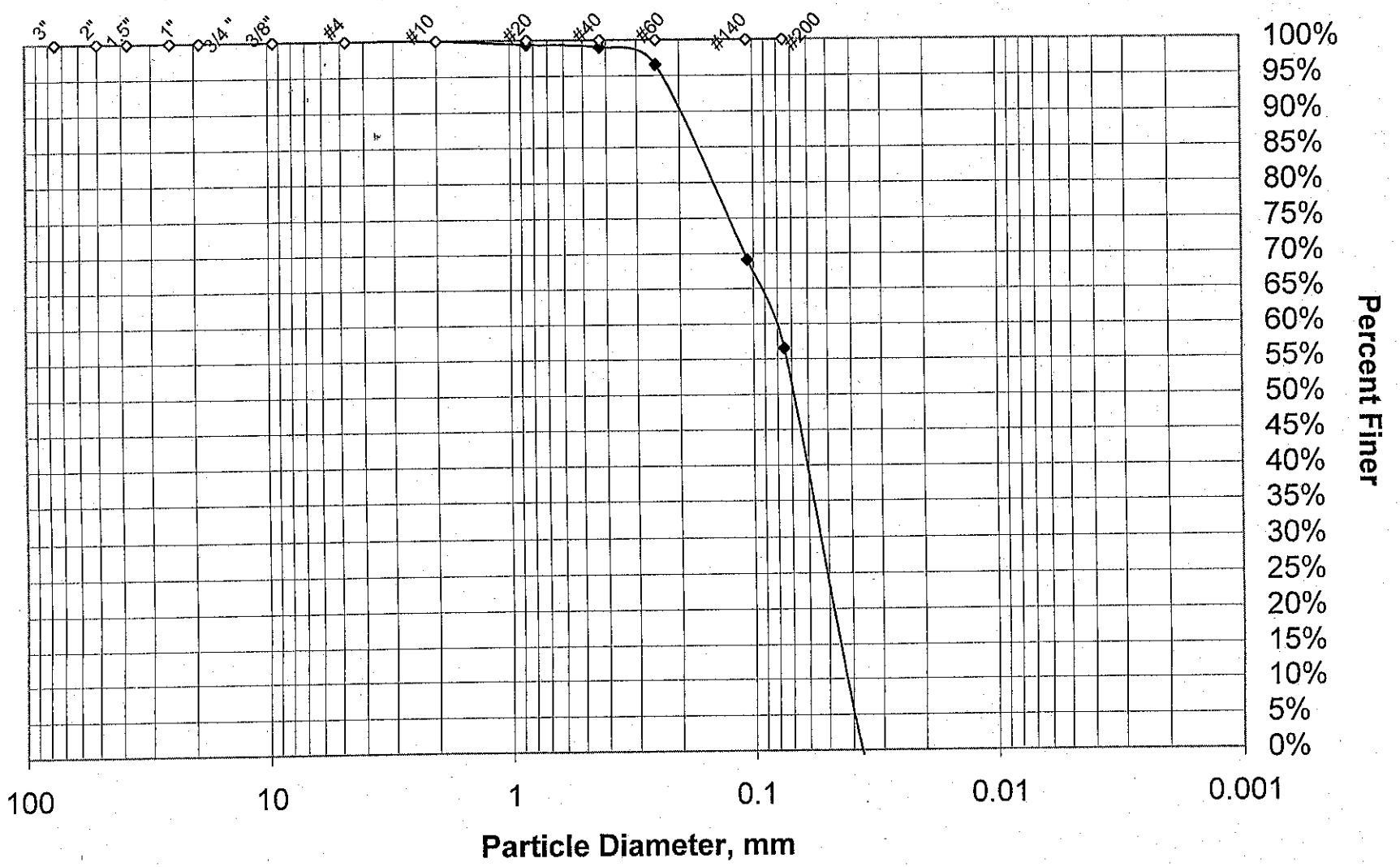
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B18412 at**

Init:_____ Date:_____



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SAINT LOUIS, MISSOURI

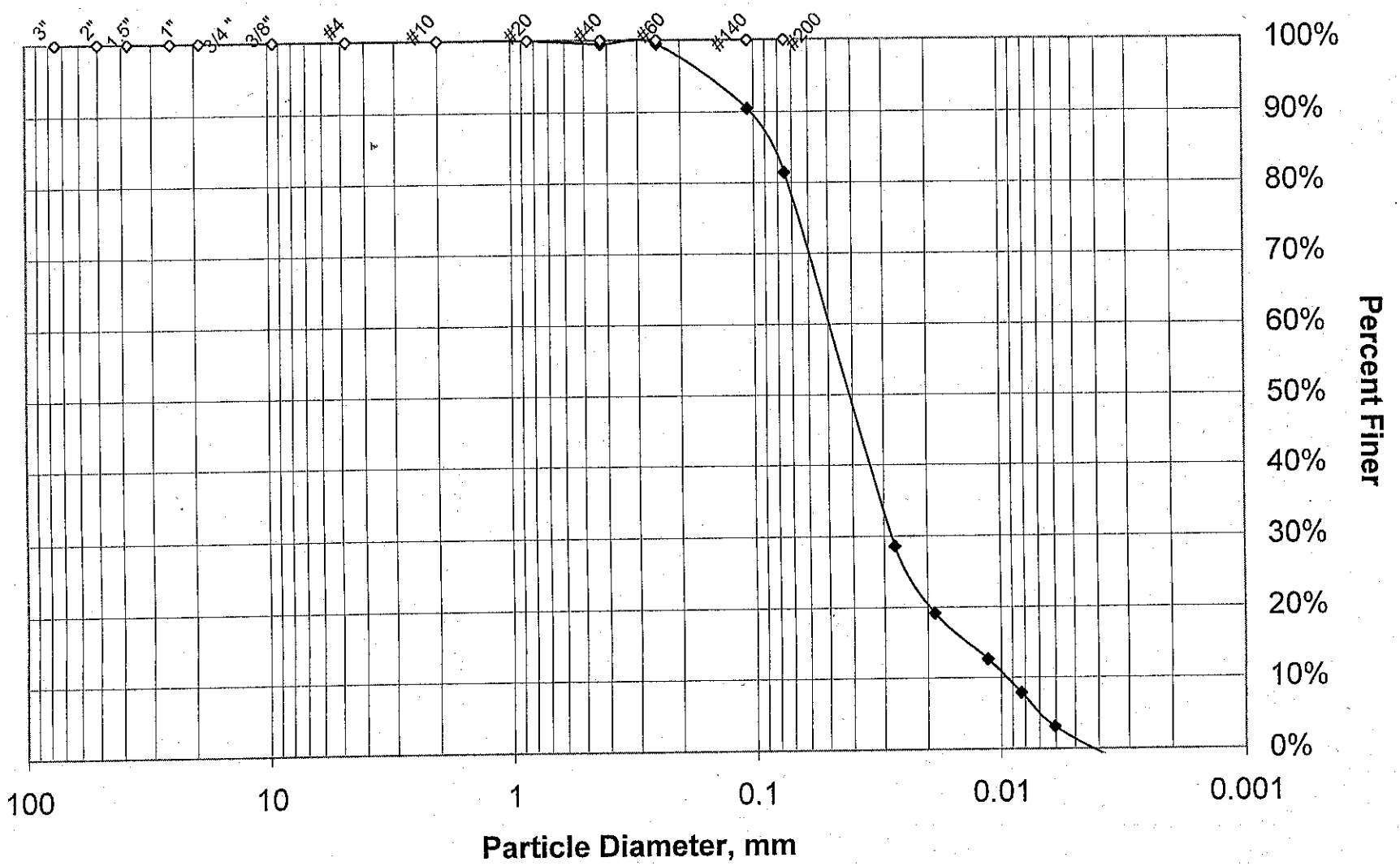
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample :** 18414 at

Init:_____ Date:_____



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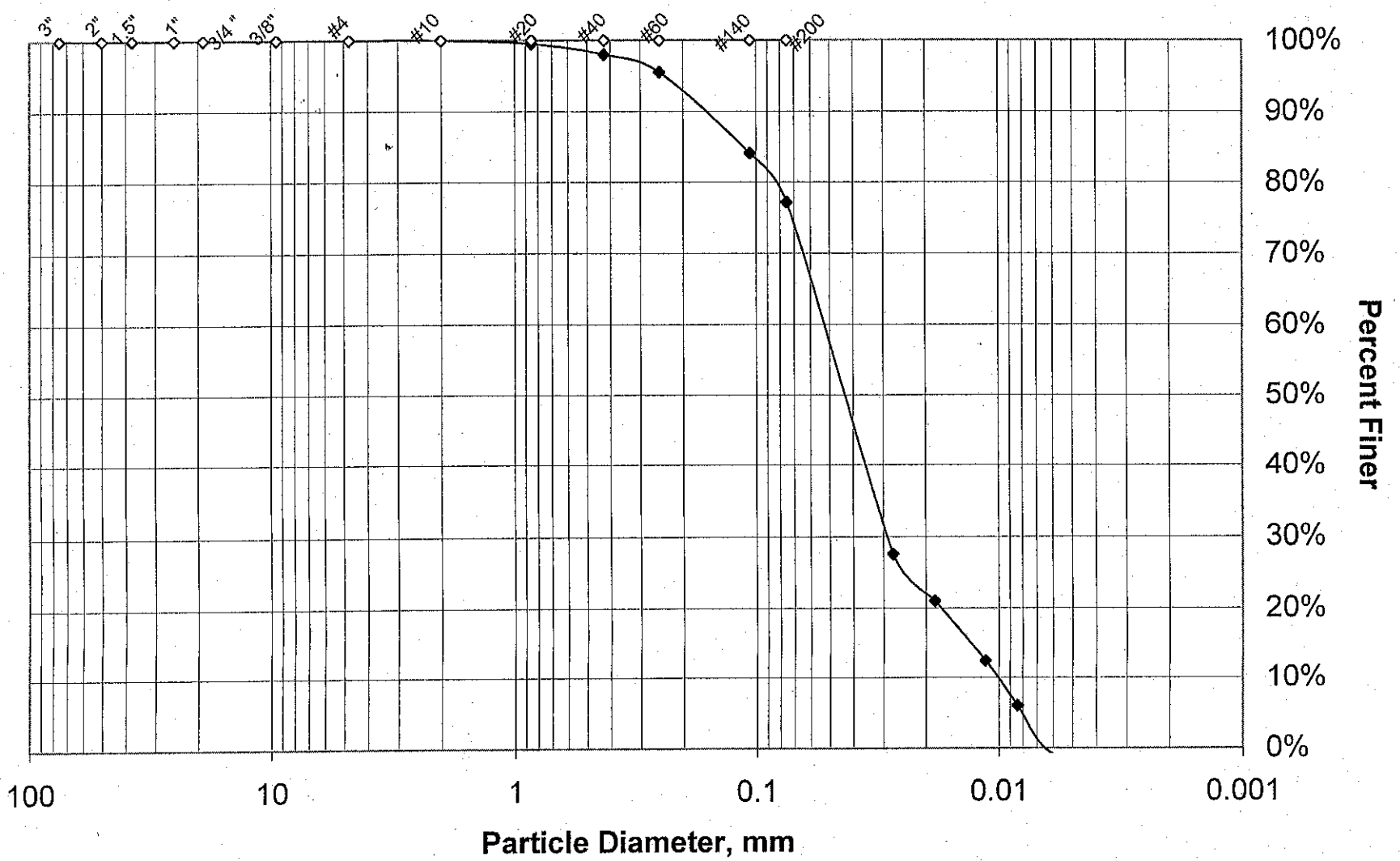
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample :** B18415 at

Init:_____ Date:_____



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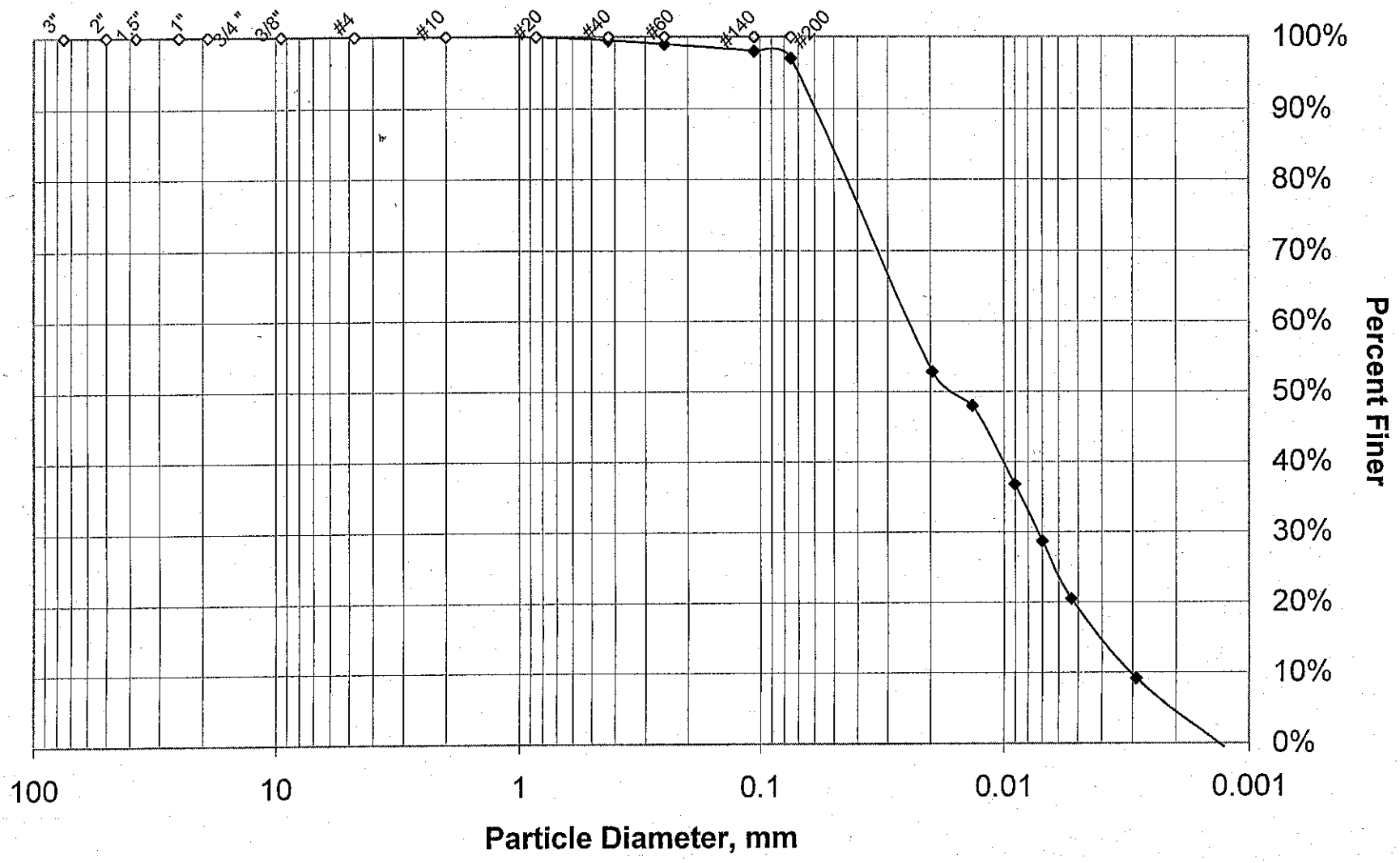
22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample : B18416 at**

Init:_____ Date:_____



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SAINT LOUIS, MISSOURI

22-1-02073-001

PARTICLE SIZE ANALYSIS

Hanford Site Area C

Boring : 0 **Sample :** B18417 at

Init:_____ Date:_____

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	183X4	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No. 14 Standpipe Vol (cc/cm) Inflow: 1.307 Outflow: 1.292

	Before Test	After Test		Before Test	After Test
Sample Diameter (in)	2.248	2.170	Tare No.	183x4	77
Sample Length (in)	3.801	4.383	Tare Wt. (g)	2.55	79.50
Sample Area (cm^2)	25.61	23.86	Wet Soil + Tare (g)	40.15	506.64
Sample Volume (CC)	247.22	265.63	Dry Soil + Tare (g)	39.45	406.78
Sample Wt. (g)	328.64	427.14	Water Content (%)	1.9	30.5
Wet Density (pcf)	83.0	100.3	Porosity	0.513	
Dry Density (pcf)	81.4	76.9	Pore Volume (CC)	126.87	
Effective				Degree of Saturation	70
Consolidation (psi)	3 min	5 max		Specific Gravity	2.68 (estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	11	6	90	87	85	91.6	37.7	---	---	---	---	20.2	---
1	11	16	90	87	85	85.2	51.1	-0.07	0.14	0.07	0.14	18.1	4.4E-05
1	11	26	90	87	85	80.4	60.2	-0.05	0.09	0.04	0.23	16.7	3.4E-05
1	11	36	90	87	85	76.0	70.2	-0.05	0.10	0.06	0.33	15.2	3.8E-05
1	11	41	90	87	85	74.0	74.4	-0.02	0.04	0.02	0.37	14.5	3.5E-05
1	11	46	90	87	85	72.8	79.0	-0.01	0.05	0.03	0.42	13.9	3.4E-05
1	11	51	90	87	85	70.7	83.6	-0.02	0.05	0.03	0.47	13.2	4.2E-05

Average Hydraulic Conductivity at Completion (m/s)	3.7E-07
Average Hydraulic Conductivity at Completion (cm/s)	3.7E-05

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C			Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	183X5	File		
Depth (ft)		Permeant	Deionized Water	
Description		ASTM	5084-90	

Permeameter No.	14	Standpipe Vol (cc/cm)	Inflow:	1.307	Outflow	1.292	
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.248	2.287	Tare No.	183x5		101	
Sample Length (in)	4.265	5.161	Tare Wt. (g)	2.55		84.93	
Sample Area (cm^2)	25.61	26.50	Wet Soil + Tare (g)	36.43		583.30	
Sample Volume (CC)	277.40	347.42	Dry Soil + Tare (g)	35.07		468.26	
Sample Wt. (g)	409.66	469.33	Water Content (%)	4.2		30.0	
Wet Density (pcf)	92.2	84.3	Porosity	0.471			
Dry Density (pcf)	88.5	64.8	Pore Volume (CC)	130.68			
Effective				Degree of Saturation		51	
Consolidation (psi)	3 min	5 max		Specific Gravity		2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	13	34	90	87	85	98.3	33.9	---	---	---	---	18.9	---
1	13	39	90	87	85	95.4	36.8	-0.03	0.03	0.00	0.03	18.4	2.6E-05
1	13	44	90	87	85	92.5	39.3	-0.03	0.02	0.00	0.05	17.9	2.5E-05
1	13	49	90	87	85	90.1	41.8	-0.02	0.02	0.00	0.08	17.4	2.3E-05
1	13	54	90	87	85	87.5	44.2	-0.03	0.02	0.00	0.10	17.0	2.5E-05
1	13	59	90	87	85	85.0	46.7	-0.03	0.02	0.00	0.13	16.5	2.5E-05
1	14	4	90	87	85	82.5	49.1	-0.03	0.02	0.00	0.15	16.1	2.5E-05

Average Hydraulic Conductivity at Completion (m/s)	2.5E-07
Average Hydraulic Conductivity at Completion (cm/s)	2.5E-05

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	183X7	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No.	14	Standpipe Vol (cc/cm)	Inflow:	1.307	Outflow	1.292	
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.245	2.176	Tare No.	183x7		106	
Sample Length (in)	4.235	4.853	Tare Wt. (g)	2.55		82.99	
Sample Area (cm^2)	25.54	23.99	Wet Soil + Tare (g)	23.29		585.93	
Sample Volume (CC)	274.71	295.75	Dry Soil + Tare (g)	22.00		473.06	
Sample Wt. (g)	409.76	502.94	Water Content (%)	6.6		28.9	
Wet Density (pcf)	93.1	106.1	Porosity	0.478			
Dry Density (pcf)	87.3	82.3	Pore Volume (CC)	131.33			
Effective			Degree of Saturation			75	
Consolidation (psi)	3 min	5 max	Specific Gravity			2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	13	50	90	87	85	94.2	33.8	---	---	---	---	18.7	---
1	13	53	90	87	85	86.4	41.4	-0.08	0.07	0.00	0.07	17.3	1.2E-04
1	13	56	90	87	85	79.5	48.4	-0.07	0.07	0.00	0.14	16.0	1.2E-04
1	13	59	90	87	85	72.5	55.8	-0.07	0.07	0.00	0.22	14.6	1.3E-04
1	14	3	90	87	85	65.0	63.5	-0.07	0.08	0.00	0.29	13.2	1.2E-04
1	14	6	90	87	85	60.0	68.5	-0.05	0.05	0.00	0.34	12.3	1.1E-04
1	14	9	90	87	85	55.1	73.8	-0.05	0.05	0.00	0.39	11.3	1.2E-04

Average Hydraulic Conductivity at Completion (m/s)	1.2E-06
Average Hydraulic Conductivity at Completion (cm/s)	1.2E-04

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	183X8	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No.	15		Standpipe Vol (cc/cm)	Inflow:	1.280	Outflow	1.28
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.245	2.242		Tare No.	183x8	EI	
Sample Length (in)	4.316	4.773		Tare Wt. (g)	2.55	84.27	
Sample Area (cm^2)	25.54	25.47		Wet Soil + Tare (g)	39.88	597.80	
Sample Volume (CC)	279.97	308.78		Dry Soil + Tare (g)	31.58	473.14	
Sample Wt. (g)	410.03	513.53		Water Content (%)	28.6	32.1	
Wet Density (pcf)	91.4	103.8		Porosity	0.575		
Dry Density (pcf)	71.1	78.6		Pore Volume (CC)	160.99		
Effective				Degree of Saturation		76	
Consolidation (psi)	3 min	10 max		Specific Gravity		2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	13	14	90	87	80	81.1	36.5	---	---	---	---	49.0	---
1	13	23	90	87	80	78.8	38.7	-0.02	0.02	0.00	0.02	48.6	4.3E-06
1	13	28	90	87	80	78.0	39.8	-0.01	0.01	0.00	0.03	48.4	3.3E-06
1	13	33	90	87	80	77.0	40.7	-0.01	0.01	0.00	0.03	48.2	3.3E-06
1	13	37	90	87	80	76.2	41.5	-0.01	0.01	0.00	0.04	48.1	3.5E-06
1	13	42	90	87	80	75.1	42.6	-0.01	0.01	0.00	0.05	47.9	3.8E-06
1	13	48	90	87	80	74.2	43.7	-0.01	0.01	0.00	0.06	47.7	2.9E-06

Average Hydraulic Conductivity at Completion (m/s)	3.4E-08
Average Hydraulic Conductivity at Completion (cm/s)	3.4E-06

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	183Y2	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No.	14	Standpipe Vol (cc/cm)	Inflow:	1.307	Outflow	1.292	
	Before Test	After Test		Before Test	After Test		
Sample Diameter (in)	2.245	2.213	Tare No.	183y2	105		
Sample Length (in)	4.365	4.547	Tare Wt. (g)	2.55	82.82		
Sample Area (cm^2)	25.54	24.82	Wet Soil + Tare (g)	35.69	578.13		
Sample Volume (CC)	283.14	286.60	Dry Soil + Tare (g)	32.85	473.39		
Sample Wt. (g)	409.22	495.31	Water Content (%)	9.4	26.8		
Wet Density (pcf)	90.2	107.8	Porosity	0.507			
Dry Density (pcf)	82.5	85.0	Pore Volume (CC)	143.54			
Effective			Degree of Saturation		74		
Consolidation (psi)	3 min	10 max	Specific Gravity		2.68	(estimated)	

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	13	2	90	87	80	94.1	38.5	---	---	---	---	49.4	---
1	13	12	90	87	80	92.6	39.2	-0.01	0.01	0.00	0.01	49.2	1.9E-06
1	13	22	90	87	80	91.6	40.0	-0.01	0.01	0.00	0.01	49.1	1.6E-06
1	13	33	90	87	80	90.7	40.6	-0.01	0.01	0.00	0.02	48.9	1.2E-06
1	13	43	90	87	80	90.0	41.3	-0.01	0.01	0.00	0.03	48.8	1.2E-06
1	13	53	90	87	80	89.2	42.0	-0.01	0.01	0.00	0.03	48.7	1.3E-06
1	14	3	90	87	80	88.4	42.7	-0.01	0.01	0.00	0.04	48.5	1.3E-06
							Average Hydraulic Conductivity at Completion (m/s)						1.3E-08
							Average Hydraulic Conductivity at Completion (cm/s)						1.3E-06

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	
Job No.	22-1-02073-001	Calculated by	Mar-04
Boring		Checked by	Mar-04
Sample	183Y3	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No. 14 | Standpipe Vol (cc/cm) Inflow: 1.307 Outflow 1.292

	Before Test	After Test		Before Test	After Test
Sample Diameter (in)	2.229	2.245	Tare No.	183y3	73
Sample Length (in)	3.682	4.328	Tare Wt. (g)	2.55	84.41
Sample Area (cm^2)	25.18	25.54	Wet Soil + Tare (g)	52.50	539.84
Sample Volume (CC)	235.45	280.74	Dry Soil + Tare (g)	51.52	478.92
Sample Wt. (g)	408.20	455.43	Water Content (%)	2.0	15.4
Wet Density (pcf)	108.2	101.2	Porosity	0.366	
Dry Density (pcf)	106.1	87.7	Pore Volume (CC)	86.12	
Effective			Degree of Saturation		46
Consolidation (psi)	3 min	8 max	Specific Gravity		2.68 (estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	15	29	90	87	82	87.6	40.8	---	---	---	---	42.6	---
1	15	40	90	87	82	81.2	50.7	-0.10	0.15	0.05	0.15	40.9	1.5E-05
1	15	55	90	87	82	73.1	63.0	-0.12	0.18	0.06	0.33	38.7	1.5E-05
1	16	6	90	87	82	68.0	70.8	-0.08	0.12	0.04	0.45	37.3	1.3E-05
1	16	16	90	87	82	63.0	77.8	-0.08	0.11	0.03	0.56	36.0	1.4E-05
1	16	26	90	87	82	58.3	84.3	-0.07	0.10	0.03	0.65	34.8	1.4E-05
1	16	36	90	87	82	54.6	90.8	-0.06	0.10	0.04	0.75	33.7	1.3E-05

Average Hydraulic Conductivity at Completion (m/s)	1.3E-07
Average Hydraulic Conductivity at Completion (cm/s)	1.3E-05

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	183Y5	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No.	15		Standpipe Vol (cc/cm)	Inflow:	1.280	Outflow	1.28
	Before Test	After Test			Before Test	After Test	
Sample Diameter (in)	2.245	2.205		Tare No.	183y5	69	
Sample Length (in)	4.268	5.203		Tare Wt. (g)	2.55	84.92	
Sample Area (cm^2)	25.54	24.64		Wet Soil + Tare (g)	49.30	579.93	
Sample Volume (CC)	276.85	325.58		Dry Soil + Tare (g)	48.25	472.68	
Sample Wt. (g)	409.27	495.01		Water Content (%)	2.3	27.7	
Wet Density (pcf)	92.2	94.9		Porosity	0.461		
Dry Density (pcf)	90.2	74.3		Pore Volume (CC)	127.57		
Effective						Degree of Saturation	59
Consolidation (psi)	3 min	5 max				Specific Gravity	2.68 (estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	11	5	90	87	85	93.1	40.2	---	---	---	---	17.9	---
1	11	10	90	87	85	92.0	41.9	-0.01	0.02	0.00	0.02	17.6	1.3E-05
1	11	18	90	87	85	90.2	44.6	-0.02	0.03	0.00	0.04	17.2	1.4E-05
1	11	23	90	87	85	89.1	46.2	-0.01	0.02	0.00	0.06	16.9	1.3E-05
1	11	28	90	87	85	88.1	47.8	-0.01	0.02	0.00	0.08	16.7	1.3E-05
1	11	33	90	87	85	87.2	49.1	-0.01	0.01	0.00	0.09	16.5	1.1E-05
1	11	38	90	87	85	86.1	50.6	-0.01	0.02	0.00	0.10	16.3	1.3E-05
1	11	43	90	87	85	85.2	52.1	-0.01	0.02	0.00	0.12	16.0	1.2E-05

Average Hydraulic Conductivity at Completion (m/s)	1.3E-07
Average Hydraulic Conductivity at Completion (cm/s)	1.3E-05

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C			Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	183Y6	File		
Depth (ft)		Permeant	Deionized Water	
Description		ASTM	5084-90	

Permeameter No. 14 Standpipe Vol (cc/cm) Inflow: 1.307 Outflow: 1.292

	Before Test	After Test		Before Test	After Test
Sample Diameter (in)	2.245	2.243	Tare No.	119.00	119
Sample Length (in)	4.183	4.717	Tare Wt. (g)	82.95	82.92
Sample Area (cm^2)	25.54	25.49	Wet Soil + Tare (g)	116.46	586.70
Sample Volume (CC)	271.34	305.43	Dry Soil + Tare (g)	115.14	476.24
Sample Wt. (g)	414.22	503.78	Water Content (%)	4.1	28.1
Wet Density (pcf)	95.3	102.9	Porosity	0.453	
Dry Density (pcf)	91.5	80.4	Pore Volume (CC)	122.87	
Effective Consolidation (psi)	3 min	5 max	Degree of Saturation	70	
			Specific Gravity	2.68 (estimated)	

Read Time day	hr	min	Pcell psi	Pin psi	Pout psi	Readings (cm) hin	hout	Inflow PV	Outflow PV	Storage PV	Total PV	i	K cm/s
1	13	38	90	87	85	62.3	36.0	---	---	---	---	15.7	---
1	13	43	90	87	85	60.1	40.9	-0.02	0.05	0.03	0.05	15.0	3.9E-05
1	13	49	90	87	85	58.8	45.0	-0.01	0.04	0.03	0.09	14.5	2.6E-05
1	13	53	90	87	85	57.4	47.9	-0.01	0.03	0.02	0.13	14.1	3.2E-05
1	14	1	90	87	85	55.4	53.2	-0.02	0.06	0.03	0.18	13.4	2.8E-05
1	14	9	90	87	85	53.4	58.2	-0.02	0.05	0.03	0.23	12.8	2.8E-05
1	14	15	90	87	85	52.0	61.8	-0.01	0.04	0.02	0.27	12.3	2.8E-05

Average Hydraulic Conductivity at Completion (m/s)	2.9E-07
Average Hydraulic Conductivity at Completion (cm/s)	2.9E-05

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revised 1-15-04

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C			Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	183Y8	File		
Depth (ft)		Permeant	Deionized Water	
Description		ASTM	5084-90	

Permeameter No.	14		Standpipe Vol (cc/cm)	Inflow:	1.307	Outflow	1.292
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.229	2.115		Tare No.	183y8	te-3	
Sample Length (in)	4.033	4.203		Tare Wt. (g)	2.55	83.79	
Sample Area (cm^2)	25.18	22.67		Wet Soil + Tare (g)	35.49	544.79	
Sample Volume (CC)	257.89	241.98		Dry Soil + Tare (g)	33.27	456.90	
Sample Wt. (g)	411.22	461.00		Water Content (%)	7.2	23.6	
Wet Density (pcf)	99.5	118.9		Porosity	0.445		
Dry Density (pcf)	92.8	96.2		Pore Volume (CC)	114.79		
Effective				Degree of Saturation		86	
Consolidation (psi)	3 min	10 max		Specific Gravity		2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	13	11	90	87	80	77.0	54.0	---	---	---	---	50.3	---
1	13	36	90	87	80	76.0	54.9	-0.01	0.01	0.00	0.01	50.1	6.5E-07
1	14	6	90	87	80	74.6	56.0	-0.02	0.01	0.00	0.02	49.9	7.2E-07
1	14	36	90	87	80	73.4	57.2	-0.01	0.01	0.00	0.04	49.6	6.9E-07
1	15	8	90	87	80	72.1	58.5	-0.01	0.01	0.00	0.05	49.4	7.1E-07
1	15	38	90	87	80	71.0	59.6	-0.01	0.01	0.00	0.06	49.2	6.4E-07
1	16	10	90	87	80	69.6	61.0	-0.02	0.02	0.00	0.08	48.9	7.7E-07

Average Hydraulic Conductivity at Completion (m/s)	7.0E-09
Average Hydraulic Conductivity at Completion (cm/s)	7.0E-07

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C			Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18400	File		
Depth (ft)		Permeant	Deionized Water	
Description		ASTM	5084-90	

Permeameter No.	15		Standpipe Vol (cc/cm)	Inflow:	1.280	Outflow	1.28
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.245	2.119		Tare No.	184oo	108	
Sample Length (in)	3.973	5.118		Tare Wt. (g)	2.55	81.19	
Sample Area (cm^2)	25.54	22.75		Wet Soil + Tare (g)	47.81	550.52	
Sample Volume (CC)	257.72	295.77		Dry Soil + Tare (g)	46.65	454.44	
Sample Wt. (g)	408.58	469.33		Water Content (%)	2.6	25.7	
Wet Density (pcf)	98.9	99.0		Porosity	0.424		
Dry Density (pcf)	96.4	78.7		Pore Volume (CC)	109.17		
Effective				Degree of Saturation		61	
Consolidation (psi)	3 min	5 max		Specific Gravity		2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	13	33	90	87	85	96.5	36.6	---	---	---	---	19.9	---
1	13	38	90	87	85	86.2	47.0	-0.12	0.12	0.00	0.12	17.8	9.2E-05
1	13	44	90	87	85	76.0	57.2	-0.12	0.12	0.00	0.24	15.8	8.5E-05
1	13	49	90	87	85	68.5	65.2	-0.09	0.09	0.00	0.34	14.3	8.6E-05
1	13	54	90	87	85	61.0	72.8	-0.09	0.09	0.00	0.42	12.8	9.3E-05
1	13	59	90	87	85	54.3	79.4	-0.08	0.08	0.00	0.50	11.5	9.2E-05
1	14	4	90	87	85	48.3	85.8	-0.07	0.08	0.00	0.58	10.2	9.6E-05

Average Hydraulic Conductivity at Completion (m/s)	9.2E-07
Average Hydraulic Conductivity at Completion (cm/s)	9.2E-05

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18402	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No.	15	Standpipe Vol (cc/cm)	Inflow:	1.280	Outflow	1.28	
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.245	2.208	Tare No.	184-02		84	
Sample Length (in)	4.126	4.686	Tare Wt. (g)	2.55		83.47	
Sample Area (cm^2)	25.54	24.70	Wet Soil + Tare (g)	40.95		568.61	
Sample Volume (CC)	267.64	294.03	Dry Soil + Tare (g)	38.81		474.69	
Sample Wt. (g)	409.58	485.00	Water Content (%)	5.9		24.0	
Wet Density (pcf)	95.5	102.9	Porosity	0.461			
Dry Density (pcf)	90.2	83.0	Pore Volume (CC)	123.33			
Effective			Degree of Saturation			63	
Consolidation (psi)	3 min	10 max	Specific Gravity			2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	11	37	90	87	80	88.6	49.5	---	---	---	---	50.7	---
1	11	47	90	87	80	87.0	51.3	-0.02	0.02	0.00	0.02	50.4	2.8E-06
1	11	57	90	87	80	85.3	53.6	-0.02	0.02	0.00	0.04	50.0	3.3E-06
1	12	7	90	87	80	83.4	55.5	-0.02	0.02	0.00	0.06	49.6	3.2E-06
1	12	17	90	87	80	81.7	57.2	-0.02	0.02	0.00	0.08	49.3	2.9E-06
1	12	27	90	87	80	80.1	58.9	-0.02	0.02	0.00	0.10	49.0	2.8E-06
1	12	37	90	87	80	78.4	60.6	-0.02	0.02	0.00	0.12	48.7	2.9E-06

Average Hydraulic Conductivity at Completion (m/s)	2.9E-08
Average Hydraulic Conductivity at Completion (cm/s)	2.9E-06

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18403	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No.	14	Standpipe Vol (cc/cm)	Inflow:	1.307	Outflow	1.292	
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.245	2.660	Tare No.	184-03		71	
Sample Length (in)	4.030	4.772	Tare Wt. (g)	2.55		85.76	
Sample Area (cm^2)	25.54	35.85	Wet Soil + Tare (g)	46.21		562.44	
Sample Volume (CC)	261.41	434.56	Dry Soil + Tare (g)	45.38		462.79	
Sample Wt. (g)	408.57	476.68	Water Content (%)	1.9		26.4	
Wet Density (pcf)	97.5	68.4	Porosity	0.428			
Dry Density (pcf)	95.7	54.1	Pore Volume (CC)	111.86			
Effective					Degree of Saturation	34	
Consolidation (psi)	3 min	5 max			Specific Gravity	2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	16	28	90	87	85	81.0	29.0	---	---	---	---	18.8	---
1	16	38	90	87	85	70.0	40.1	-0.13	0.13	0.00	0.13	16.7	5.3E-05
1	16	44	90	87	85	62.2	47.4	-0.09	0.08	0.00	0.21	15.2	6.7E-05
1	16	49	90	87	85	57.1	52.2	-0.06	0.06	0.00	0.27	14.2	5.7E-05
1	16	54	90	87	85	52.0	57.4	-0.06	0.06	0.00	0.33	13.2	6.4E-05
1	16	59	90	87	85	49.5	59.8	-0.03	0.03	0.00	0.36	12.7	3.2E-05
1	17	4	90	87	85	45.5	63.6	-0.05	0.04	0.00	0.40	12.0	5.4E-05
1	17	13	90	87	85	39.0	70.2	-0.08	0.08	0.00	0.48	10.7	5.5E-05
1	17	16	90	87	85	37.0	72.0	-0.02	0.02	0.00	0.50	10.3	5.1E-05
1	17	21	90	87	85	34.0	75.0	-0.04	0.03	0.00	0.53	9.7	5.1E-05

Average Hydraulic Conductivity at Completion (m/s)	5.2E-07
Average Hydraulic Conductivity at Completion (cm/s)	5.2E-05

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18404	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No.	14	Standpipe Vol (cc/cm)	Inflow:	1.307	Outflow	1.292	

	Before Test	After Test		Before Test	After Test
Sample Diameter (in)	2.245	2.046	Tare No.	184-04	205
Sample Length (in)	4.253	4.113	Tare Wt. (g)	2.55	83.39
Sample Area (cm^2)	25.54	21.21	Wet Soil + Tare (g)	49.99	533.29
Sample Volume (CC)	275.88	221.60	Dry Soil + Tare (g)	48.70	452.37
Sample Wt. (g)	409.61	449.90	Water Content (%)	2.8	21.9
Wet Density (pcf)	92.6	126.7	Porosity	0.461	
Dry Density (pcf)	90.1	103.9	Pore Volume (CC)	127.20	
Effective			Degree of Saturation		96
Consolidation (psi)	3 min	10 max	Specific Gravity		2.68 (estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	9	46	90	87	80	89.1	47.0	---	---	---	---	49.5	---
1	9	51	90	87	80	85.2	50.8	-0.04	0.04	0.00	0.04	48.8	1.3E-05
1	9	56	90	87	80	78.6	56.4	-0.07	0.06	-0.01	0.10	47.6	2.1E-05
1	10	1	90	87	80	74.1	61.0	-0.05	0.05	0.00	0.14	46.8	1.6E-05
1	10	6	90	87	80	70.6	64.5	-0.04	0.04	0.00	0.18	46.1	1.3E-05
1	10	14	90	87	80	63.0	72.0	-0.08	0.08	0.00	0.25	44.7	1.8E-05
1	10	21	90	87	80	55.4	79.4	-0.08	0.08	0.00	0.33	43.4	2.1E-05

Average Hydraulic Conductivity at Completion (m/s)	1.7E-07
Average Hydraulic Conductivity at Completion (cm/s)	1.7E-05

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18405	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No.	14	Standpipe Vol (cc/cm)	Inflow:	1.307	Outflow	1.292	
	Before Test	After Test		Before Test	After Test		
Sample Diameter (in)	2.245	2.214	Tare No.	184-05	78		
Sample Length (in)	4.214	4.438	Tare Wt. (g)	2.55	83.06		
Sample Area (cm^2)	25.54	24.84	Wet Soil + Tare (g)	48.73	582.09		
Sample Volume (CC)	273.35	279.98	Dry Soil + Tare (g)	41.93	472.13		
Sample Wt. (g)	410.64	499.03	Water Content (%)	17.3	28.3		
Wet Density (pcf)	93.7	111.2	Porosity	0.522			
Dry Density (pcf)	79.9	86.7	Pore Volume (CC)	142.69			
Effective			Degree of Saturation	82			
Consolidation (psi)	3 min	10 max	Specific Gravity	2.68	(estimated)		

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	11	31	90	87	80	89.0	39.0	---	---	---	---	50.7	---
1	12	0	90	87	80	87.4	40.2	-0.01	0.01	0.00	0.01	50.4	8.1E-07
1	12	33	90	87	80	85.8	41.4	-0.01	0.01	0.00	0.02	50.1	7.2E-07
1	12	45	90	87	80	85.2	42.0	-0.01	0.01	0.00	0.03	50.0	8.5E-07
1	12	57	90	87	80	84.6	42.5	-0.01	0.00	0.00	0.03	49.9	7.8E-07
1	13	13	90	87	80	84.0	43.3	-0.01	0.01	0.00	0.04	49.8	7.4E-07
1	13	28	90	87	80	83.2	44.0	-0.01	0.01	0.00	0.05	49.7	8.5E-07

Average Hydraulic Conductivity at Completion (m/s)	8.1E-09
Average Hydraulic Conductivity at Completion (cm/s)	8.1E-07

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C			Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18406	File		
Depth (ft)		Permeant	Deionized Water	
Description		ASTM	5084-90	

Permeameter No.	14		Standpipe Vol (cc/cm)	Inflow:	1.307	Outflow	1.292
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.245	2.199	Tare No.	184-06		63	
Sample Length (in)	4.032	4.227	Tare Wt. (g)	2.55		84.38	
Sample Area (cm^2)	25.54	24.50	Wet Soil + Tare (g)	31.42		578.01	
Sample Volume (CC)	261.54	263.07	Dry Soil + Tare (g)	29.63		479.20	
Sample Wt. (g)	414.84	493.63	Water Content (%)	6.6		25.0	
Wet Density (pcf)	99.0	117.1	Porosity	0.445			
Dry Density (pcf)	92.8	93.7	Pore Volume (CC)	116.35			
Effective				Degree of Saturation		85	
Consolidation (psi)	3 min	10 max		Specific Gravity		2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	15	12	90	87	80	62.0	33.2	---	---	---	---	50.9	---
1	15	23	90	87	80	58.2	37.0	-0.04	0.04	0.00	0.04	50.1	5.8E-06
1	15	29	90	87	80	56.0	39.0	-0.02	0.02	0.00	0.06	49.7	5.9E-06
1	15	34	90	87	80	54.2	40.6	-0.02	0.02	0.00	0.08	49.4	5.8E-06
1	15	39	90	87	80	52.5	42.4	-0.02	0.02	0.00	0.10	49.1	6.0E-06
1	15	44	90	87	80	50.7	44.1	-0.02	0.02	0.00	0.12	48.7	6.1E-06
1	15	50	90	87	80	48.8	46.2	-0.02	0.02	0.00	0.14	48.3	5.8E-06

Average Hydraulic Conductivity at Completion (m/s)	5.9E-08
Average Hydraulic Conductivity at Completion (cm/s)	5.9E-06

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C			Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18407	File		
Depth (ft)		Permeant	Deionized Water	
Description		ASTM	5084-90	

Permeameter No.	12	Standpipe Vol (cc/cm)		Inflow:	1.266	Outflow	1.279
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.245	2.087		Tare No.	184-07	67	
Sample Length (in)	4.726	5.564		Tare Wt. (g)	2.55	85.07	
Sample Area (cm^2)	25.54	22.07		Wet Soil + Tare (g)	37.34	586.50	
Sample Volume (CC)	306.56	311.91		Dry Soil + Tare (g)	35.71	473.82	
Sample Wt. (g)	417.88	501.43		Water Content (%)	4.9	29.0	
Wet Density (pcf)	85.1	100.3		Porosity	0.515		
Dry Density (pcf)	81.1	77.8		Pore Volume (CC)	157.94		
Effective				Degree of Saturation		68	
Consolidation (psi)	3 min	5 max		Specific Gravity		2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	13	36	90	87	85	102.1	29.4	---	---	---	---	17.8	---
1	13	41	90	87	85	98.8	33.8	-0.03	0.04	0.00	0.04	17.1	3.7E-05
1	13	46	90	87	85	96.8	34.8	-0.02	0.01	0.00	0.04	16.9	1.5E-05
1	13	51	90	87	85	94.2	37.4	-0.02	0.02	0.00	0.06	16.4	2.6E-05
1	13	56	90	87	85	92.0	39.8	-0.02	0.02	0.00	0.08	16.1	2.3E-05
1	14	1	90	87	85	89.8	41.9	-0.02	0.02	0.00	0.10	15.7	2.2E-05
1	14	6	90	87	85	87.5	44.4	-0.02	0.02	0.00	0.12	15.3	2.6E-05

Average Hydraulic Conductivity at Completion (m/s)	2.4E-07
Average Hydraulic Conductivity at Completion (cm/s)	2.4E-05

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C			Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18408	File		
Depth (ft)		Permeant	Deionized Water	
Description		ASTM	5084-90	

Permeameter No. 14 | Standpipe Vol (cc/cm) Inflow: 1.307 Outflow 1.292

	Before Test	After Test		Before Test	After Test
Sample Diameter (in)	2.245	2.155	Tare No.	184-08	tf-1
Sample Length (in)	4.107	5.193	Tare Wt. (g)	2.55	84.08
Sample Area (cm^2)	25.54	23.53	Wet Soil + Tare (g)	38.68	575.66
Sample Volume (CC)	266.41	310.39	Dry Soil + Tare (g)	37.30	470.33
Sample Wt. (g)	409.81	491.58	Water Content (%)	4.0	27.3
Wet Density (pcf)	96.0	98.8	Porosity	0.448	
Dry Density (pcf)	92.3	77.7	Pore Volume (CC)	119.34	
Effective				Degree of Saturation	63
Consolidation (psi)	3 min	5 max		Specific Gravity	2.68 (estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	11	18	90	87	85	77.1	40.6	---	---	---	---	17.0	---
1	11	23	90	87	85	71.0	47.6	-0.07	0.08	0.00	0.08	15.7	6.8E-05
1	11	28	90	87	85	63.2	55.4	-0.09	0.08	0.00	0.16	14.2	8.8E-05
1	11	33	90	87	85	57.8	60.5	-0.06	0.06	0.00	0.22	13.2	6.5E-05
1	11	38	90	87	85	51.8	66.5	-0.07	0.06	0.00	0.28	12.1	8.1E-05
1	11	43	90	87	85	46.8	71.4	-0.05	0.05	0.00	0.33	11.1	7.2E-05
1	11	50	90	87	85	41.3	76.8	-0.06	0.06	0.00	0.39	10.1	6.2E-05

Average Hydraulic Conductivity at Completion (m/s)	7.0E-07
Average Hydraulic Conductivity at Completion (cm/s)	7.0E-05

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C			Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18410	File		
Depth (ft)		Permeant	Deionized Water	
Description		ASTM	5084-90	

Permeameter No. 14 Standpipe Vol (cc/cm) Inflow: 1.307 Outflow 1.292

	Before Test	After Test		Before Test	After Test
Sample Diameter (in)	2.245	2.251	Tare No.	184-10	80
Sample Length (in)	4.160	4.622	Tare Wt. (g)	2.55	83.52
Sample Area (cm^2)	25.54	25.67	Wet Soil + Tare (g)	35.78	578.44
Sample Volume (CC)	269.85	301.42	Dry Soil + Tare (g)	34.02	473.45
Sample Wt. (g)	408.98	494.92	Water Content (%)	5.6	26.9
Wet Density (pcf)	94.6	102.5	Porosity	0.464	
Dry Density (pcf)	89.6	80.7	Pore Volume (CC)	125.32	
Effective				Degree of Saturation	67
Consolidation (psi)	3 min	7 max		Specific Gravity	2.68 (estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	16	10	90	87	83	84.1	38.2	---	---	---	---	31.0	---
1	16	21	90	87	83	83.2	39.8	-0.01	0.02	0.00	0.02	30.7	3.1E-06
1	16	30	90	87	83	82.5	40.1	-0.01	0.00	0.00	0.02	30.6	1.5E-06
1	16	40	90	87	83	81.7	42.4	-0.01	0.02	0.02	0.04	30.3	4.3E-06
1	16	50	90	87	83	80.8	43.6	-0.01	0.01	0.00	0.06	30.1	2.9E-06
1	17	1	90	87	83	80.0	45.0	-0.01	0.01	0.00	0.07	29.9	2.8E-06
1	17	11	90	87	83	79.1	46.1	-0.01	0.01	0.00	0.08	29.7	2.8E-06
1	17	23	90	87	83	78.3	47.4	-0.01	0.01	0.00	0.09	29.5	2.5E-06

Average Hydraulic Conductivity at Completion (m/s)	2.8E-08
Average Hydraulic Conductivity at Completion (cm/s)	2.8E-06

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18412	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No.	14	Standpipe Vol (cc/cm)	Inflow:	1.307	Outflow	1.292	
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.245	2.142	Tare No.	184-12		57	
Sample Length (in)	4.132	5.101	Tare Wt. (g)	2.55		83.83	
Sample Area (cm^2)	25.54	23.25	Wet Soil + Tare (g)	48.35		556.46	
Sample Volume (CC)	268.03	301.22	Dry Soil + Tare (g)	47.48		459.52	
Sample Wt. (g)	409.50	472.63	Water Content (%)	1.9		25.8	
Wet Density (pcf)	95.3	97.9	Porosity	0.441			
Dry Density (pcf)	93.5	77.8	Pore Volume (CC)	118.13			
Effective					Degree of Saturation	60	
Consolidation (psi)	3 min	4 max			Specific Gravity	2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	17	45	90	87	86	97.2	30.8	---	---	---	---	13.0	---
1	17	46	90	87	86	92.6	35.2	-0.05	0.05	0.00	0.05	12.2	6.1E-04
1	17	46	90	87	86	89.0	38.4	-0.04	0.03	0.00	0.08	11.5	4.9E-04
1	17	47	90	87	86	85.8	42.0	-0.04	0.04	0.00	0.12	10.9	5.2E-04
1	17	47	90	87	86	83.0	45.0	-0.03	0.03	0.00	0.16	10.3	4.6E-04
1	17	48	90	87	86	79.9	48.0	-0.03	0.03	0.00	0.19	9.7	5.2E-04
1	17	48	90	87	86	77.1	50.3	-0.03	0.03	0.00	0.21	9.3	4.6E-04

Average Hydraulic Conductivity at Completion (m/s)	4.9E-06
Average Hydraulic Conductivity at Completion (cm/s)	4.9E-04

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C			Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18413	File		
Depth (ft)		Permeant	Deionized Water	
Description		ASTM	5084-90	

Permeameter No.	15	Standpipe Vol (cc/cm)	Inflow:	1.280	Outflow	1.28	
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.245	2.233	Tare No.	184-13		81	
Sample Length (in)	4.153	4.656	Tare Wt. (g)	2.55		82.77	
Sample Area (cm^2)	25.54	25.27	Wet Soil + Tare (g)	44.56		569.52	
Sample Volume (CC)	269.39	298.80	Dry Soil + Tare (g)	43.37		474.88	
Sample Wt. (g)	410.40	486.75	Water Content (%)	2.9		24.1	
Wet Density (pcf)	95.1	101.7	Porosity	0.448			
Dry Density (pcf)	92.4	81.9	Pore Volume (CC)	120.60			
Effective				Degree of Saturation		62	
Consolidation (psi)	7 min	12 max		Specific Gravity		2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	17	35	97	90	85	90.4	59.0	---	---	---	---	36.3	---
1	17	41	97	90	85	85.6	64.8	-0.05	0.06	0.01	0.06	35.3	2.1E-05
1	17	45	97	90	85	83.7	68.0	-0.02	0.03	0.01	0.10	34.8	1.5E-05
1	17	50	97	90	85	79.2	71.8	-0.05	0.04	0.00	0.14	34.0	2.0E-05
1	17	55	97	90	85	75.5	76.0	-0.04	0.04	0.00	0.18	33.3	2.0E-05
1	18	0	97	90	85	72.2	79.8	-0.04	0.04	0.00	0.22	32.6	1.8E-05
1	18	5	97	90	85	69.0	83.4	-0.03	0.04	0.00	0.26	32.0	1.8E-05

Average Hydraulic Conductivity at Completion (m/s)	1.9E-07
Average Hydraulic Conductivity at Completion (cm/s)	1.9E-05

HYDRAULIC CONDUCTIVITY

Project	Hanford Site Area C		Date
Location		Setup by	RLH	Mar-04
Job No.	22-1-02073-001	Calculated by	RLH	Mar-04
Boring		Checked by		Mar-04
Sample	18416	File	
Depth (ft)		Permeant	Deionized Water
Description		ASTM	5084-90

Permeameter No.	15	Standpipe Vol (cc/cm)	Inflow:	1.280	Outflow	1.28	
	Before Test	After Test		Before Test		After Test	
Sample Diameter (in)	2.245	2.142	Tare No.	184-16		61	
Sample Length (in)	4.126	4.723	Tare Wt. (g)	2.55		82.75	
Sample Area (cm^2)	25.54	23.25	Wet Soil + Tare (g)	34.40		561.88	
Sample Volume (CC)	267.64	278.90	Dry Soil + Tare (g)	33.28		475.51	
Sample Wt. (g)	411.80	479.13	Water Content (%)	3.6		22.0	
Wet Density (pcf)	96.0	107.2	Porosity	0.446			
Dry Density (pcf)	92.6	87.9	Pore Volume (CC)	119.39			
Effective					Degree of Saturation	65	
Consolidation (psi)	3 min	5 max			Specific Gravity	2.68	(estimated)

Read Time			Pcell	Pin	Pout	Readings (cm)		Inflow	Outflow	Storage	Total	i	K
day	hr	min	psi	psi	psi	hin	hout	PV	PV	PV	PV		cm/s
1	14	48	90	87	85	94.8	40.7	---	---	---	---	18.6	---
1	14	58	90	87	85	86.4	48.6	-0.09	0.08	0.00	0.08	17.0	3.8E-05
1	15	8	90	87	85	78.0	57.1	-0.09	0.09	0.00	0.18	15.4	4.4E-05
1	15	18	90	87	85	71.4	63.6	-0.07	0.07	0.00	0.25	14.2	3.7E-05
1	15	28	90	87	85	65.3	69.8	-0.07	0.07	0.00	0.31	13.0	3.8E-05
1	15	38	90	87	85	59.2	76.0	-0.07	0.07	0.00	0.38	11.8	4.1E-05
1	15	50	90	87	85	52.4	83.0	-0.07	0.08	0.00	0.45	10.5	4.3E-05

Average Hydraulic Conductivity at Completion (m/s)	4.0E-07
Average Hydraulic Conductivity at Completion (cm/s)	4.0E-05

WATER CONTENT DETERMINATION

Form SWTR-16

Project	Hanford Site Area C	Client		
Location		Page	1 of 2	
Job No.	22-1-02073-001	Tested by / Date	RLH	Feb-04
File	-18997927-FL-001-B183X3	Calculated	RLH	Mar-04
Procedure	ASTM D 2216/SWTP-16	Checked by		

	Boring Number	Sample Number	Wet wt. & Tare (gm)	Dry wt. & Tare (gm)	Tare	Moisture Content %	Remarks
1	FL-001	B183X3	67.92	63.16	2.55	7.9	
2		B183X4	90.73	88.41	2.55	2.7	
3		B183X5	52.59	48.55	2.55	8.8	
4		B183X7	68.00	62.62	2.55	9.0	
5		B183X8	53.54	43.33	2.55	25.0	
6		B183X9	65.14	62.99	2.55	3.6	
7		B183Y0	72.62	63.30	2.55	15.3	
8		B183Y1	69.05	66.16	2.55	4.5	
9		B183Y2	66.86	61.39	2.55	9.3	
10		B183Y3	84.79	82.34	2.55	3.1	
11		B183Y5	65.09	63.20	2.55	3.1	
12		B183Y6	76.65	75.00	2.55	2.3	
13		B183Y7	67.47	64.36	2.55	5.0	
14		B183Y8	70.08	66.86	2.55	5.0	
15		B183Y9	54.10	52.33	2.55	3.6	
16		B18400	58.61	56.59	2.55	3.7	
17		B18401	61.96	59.57	2.55	4.2	
18		B18402	70.75	67.87	2.55	4.4	
19		B18403	395.74	388.49	81.14	2.4	
20		B18404	385.92	374.74	83.81	3.8	
21		B18405	422.77	405.12	84.16	5.5	
22		B18406	349.14	328.02	82.96	8.6	
23		B18407	381.67	368.37	82.73	4.7	
24		B18408	358.51	342.34	82.73	6.2	
25		B18410	323.28	304.10	83.79	8.7	

Shannon Wilson, Inc.
2043 Westport Center Dr.
St. Louis, MO 63146

Rachael Huson, Lab Manager
Revised 1-19-04

WATER CONTENT DETERMINATION

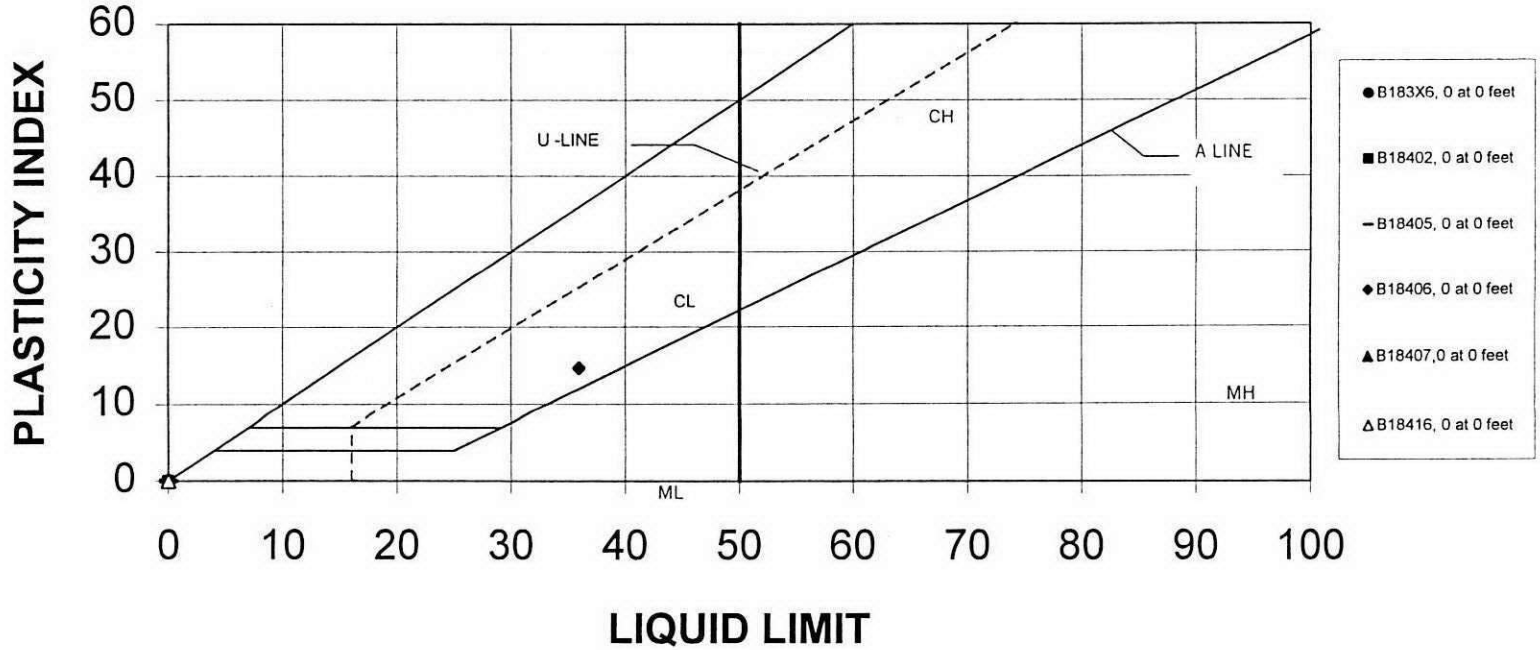
Form SWTR-16

Project	Hanford Site Area C	Client		
Location		Page	2 of 2	
Job No.	22-1-02073-001	Tested by / Date	RLH	Feb-04
File	-18997927-FL-001-B183X3	Calculated	RLH	Mar-04
Procedure	ASTM D 2216/SWTP-16	Checked by		

	Boring Number	Sample Number	Wet wt. & Tare (gm)	Dry wt. & Tare (gm)	Tare	Moisture Content %	Remarks
1	FL-001	B18411	302.01	291.74	2.55	3.6	
2		B18412	428.63	420.42	2.55	2.0	
3		B18414	419.25	412.48	2.55	1.7	
4		B18415	291.70	273.75	2.55	6.6	
5		B18416	354.61	341.64	2.55	3.8	
6		B18417	428.56	405.97	2.55	5.6	

Shannon Wilson, Inc.
2043 Westport Center Dr.
St. Louis, MO 63146

Tom Wescott, Lab Manager
Revised 2-20-02



SHANNON & WILSON, INC. 2043 Westport Center Drive SAINT LOUIS, MISSOURI 63146 22-1-02073-001	PLASTICITY CHART (multi-point method) **Hanford Site Area C**

Init:_____ Date:_____

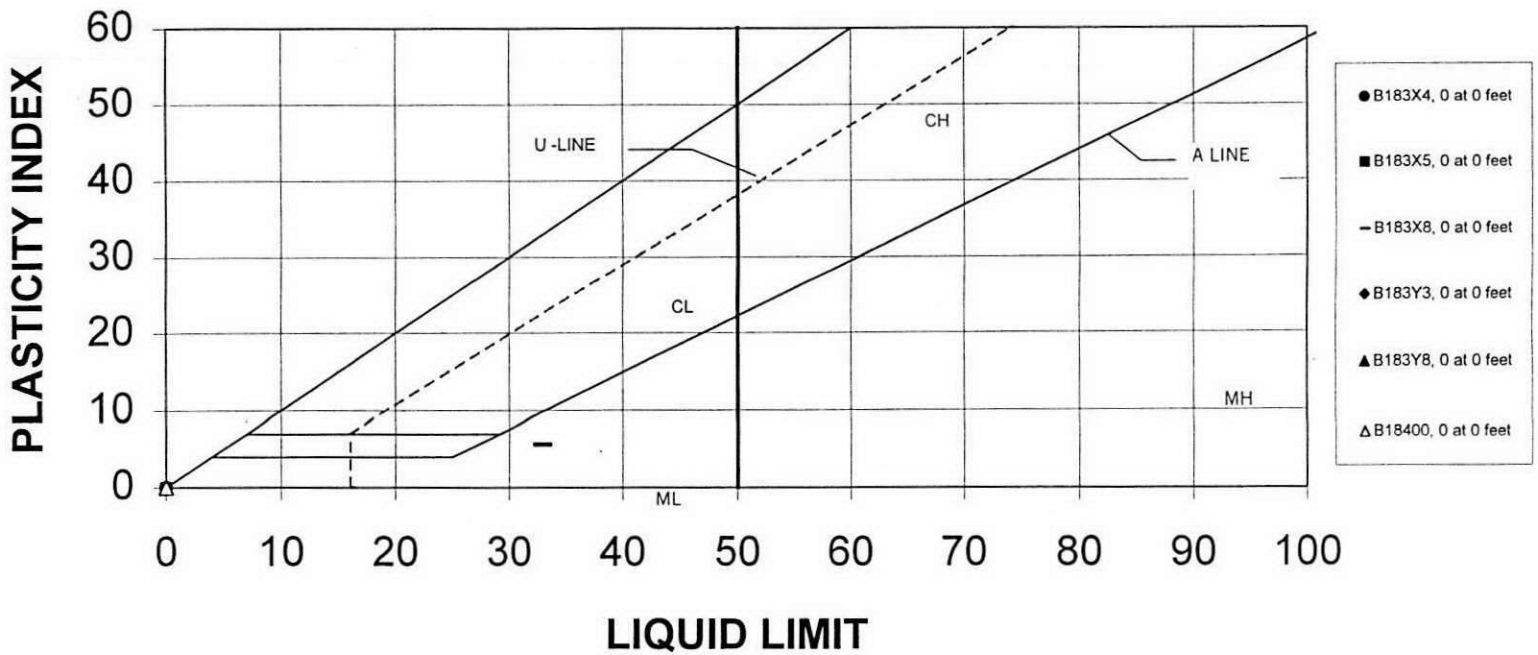
LIQUID & PLASTIC LIMITS & PLASTICITY INDEX OF SOILS

Form SWTR-11

Project	Hanford Site Area C	Client Name		
Job No.	22-1-02073-001	Tested by	ALW	Feb-04
Procedure	ASTM D 4318/SWTP-11 (single point method)	Calculated by	RLH	Mar-04
File	#VALUE!	Checked/Issued by		

BORING SAMPLE DEPTH (ft)	TEST TYPE	BLOW COUNT	WET & TARE	DRY & TARE	TARE	LL & PL	DELTA	FINAL VALUES	
	1							B183X6	
B183X6								#VALUE!	#VALUE!
								#VALUE!	#VALUE!
Remarks:	attempted, non-plastic					% Retained:			
								B18402	
B18402								#VALUE!	#VALUE!
								#VALUE!	#VALUE!
Remarks:	attempted, non-plastic					% Retained:			
								B18405	
B18405								#VALUE!	#VALUE!
								#VALUE!	#VALUE!
Remarks:	attempted, non-plastic					% Retained:			
	4							B18406	
B18406	LL	19	24.71	18.37	0.74	34.8			
	LL	21	24.68	18.40	0.74	34.8		LL =	36
	LL	31	24.67	18.25	0.74	37.6		PL =	21
	PL		6.91	5.86	0.74	20.5		PI =	15
	PL		6.70	5.62	0.74	22.1	1.6	USC =	CL
Remarks:						% Retained:	<5%		
B18407								B18407	
								#VALUE!	#VALUE!
								#VALUE!	#VALUE!
	attempted, non-plastic								
								B18416	
B18416								#VALUE!	#VALUE!
								#VALUE!	#VALUE!
Remarks:	attempted, non-plastic					% Retained:			

NOTE: % retained is an estimate of the percent sample retained on the No. 40 screen (rev. 4.8.99)



SHANNON & WILSON, INC. 2043 Westport Center Drive SAINT LOUIS, MISSOURI 63146 22-1-02073-001	PLASTICITY CHART (multi-point method) **Hanford Site Area C**

Init:_____ Date:_____

LIQUID & PLASTIC LIMITS & PLASTICITY INDEX OF SOILS

Form SWTR-11

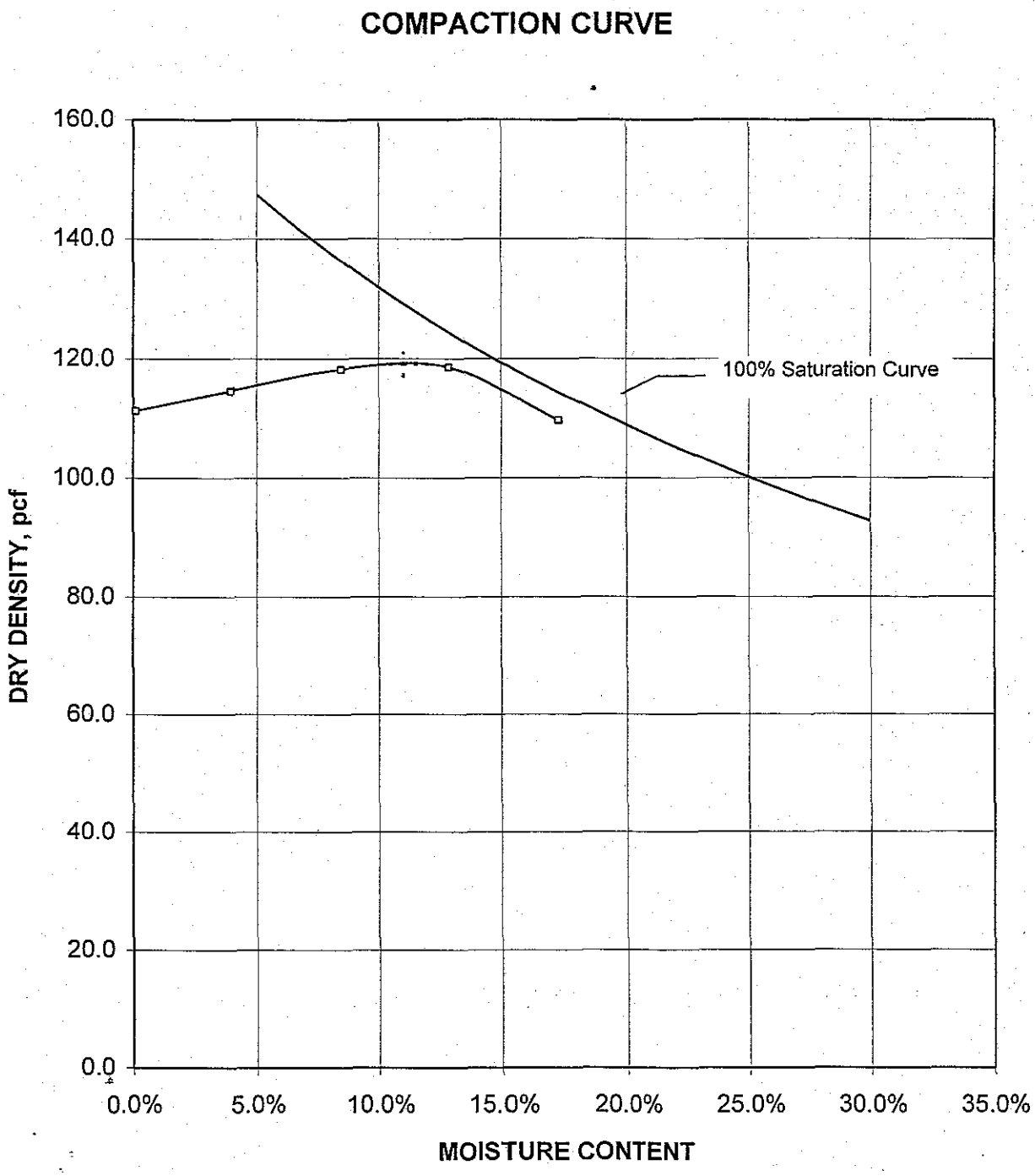
Project	Hanford Site Area C	Client Name		
Job No.	22-1-02073-001	Tested by	ALW	Feb-04
Procedure	ASTM D 4318/SWTP-11 (single point method)	Calculated by	RLH	Mar-04
File	#VALUE!	Checked/Issued by		

BORING SAMPLE DEPTH (ft)	TEST TYPE	BLOW COUNT	WET & TARE	DRY & TARE	TARE	LL & PL	DELTA	FINAL VALUES	
	1							B183X4	
B183X4								#VALUE!	#VALUE!
								#VALUE!	#VALUE!
Remarks:	attempted, non-plastic					% Retained:			
								B183X5	
B183X5								#VALUE!	#VALUE!
								#VALUE!	#VALUE!
Remarks:	attempted, non-plastic					% Retained:			
	3							B183X8	
B183X8	LL	25	23.05	17.52	0.74	33.0			
	LL	30	25.16	19.05	0.74	34.1		LL =	33
	LL	33	18.57	14.24	0.74	33.2		PL =	27
	PL		8.77	7.05	0.74	27.3		PI =	6
	PL		7.95	6.40	0.74	27.4	0.1	USC =	ML
Remarks:						% Retained:	<5%		
								B183Y3	
B183Y3								#VALUE!	#VALUE!
								#VALUE!	#VALUE!
Remarks:	attempted, non-plastic					% Retained:			
								B183Y8	
B183Y8								#VALUE!	#VALUE!
								#VALUE!	#VALUE!
Remarks:	attempted, non-plastic					% Retained:			
								B18400	
B18400								#VALUE!	#VALUE!
								#VALUE!	#VALUE!
Remarks:	attempted, non-plastic					% Retained:			

NOTE: % retained is an estimate of the percent sample retained on the No. 40 screen (rev. 4.8.99)

Shannon & Wilson, Inc. 2043 Westport Center Dr. St. Louis, MO 63146

AL_B183X3-B18400.xls Revised 1-16-04
Rachael Huson, Lab Manager

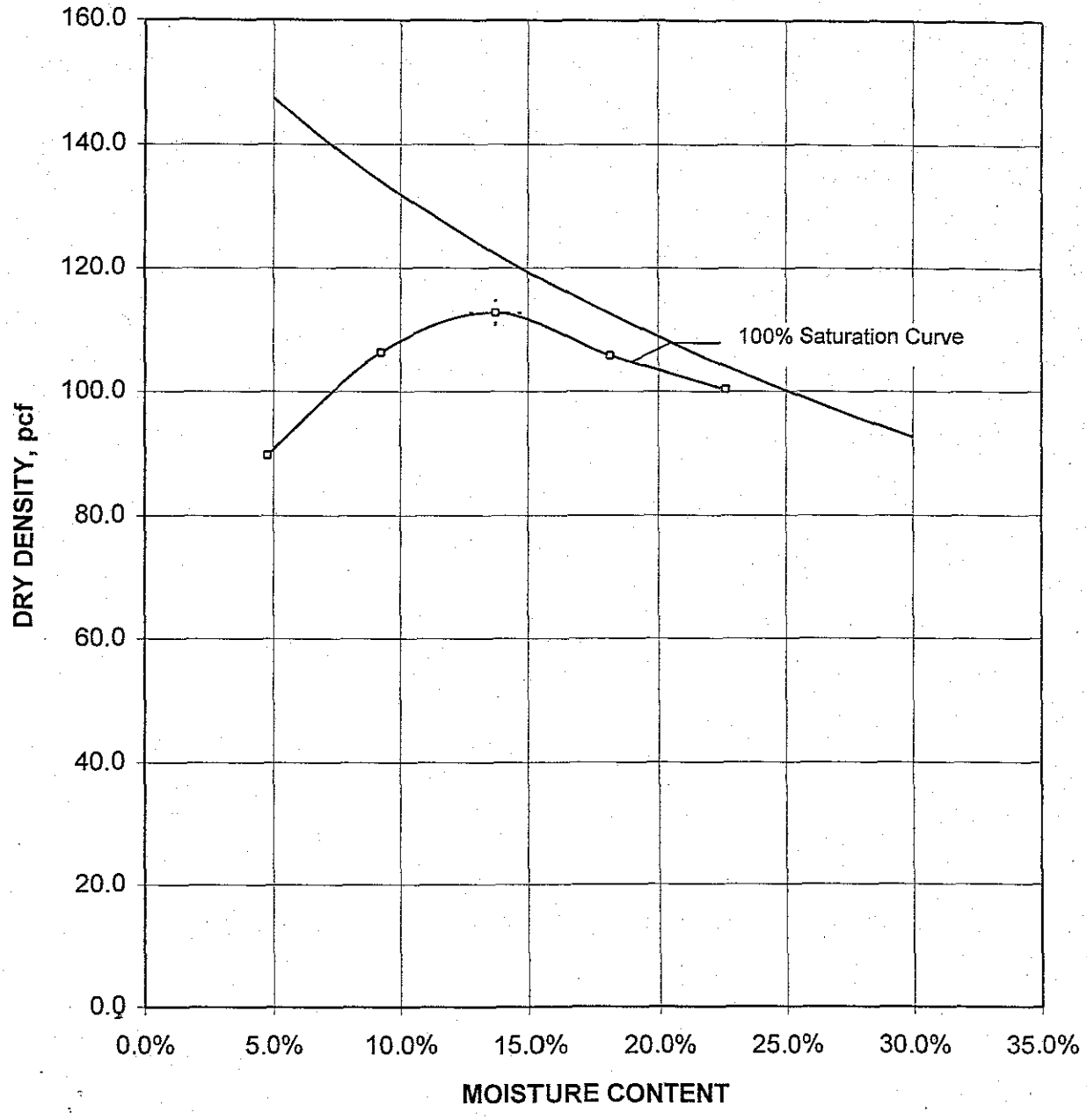


Sample	, B18418 at	Test Method	ASTM D 698/SWTP-10
Description	soil	Max. Density	119.0
		Optimum Moisture	11.0%

SHANNON & WILSON, INC. 2043 WESTPORT CENTER DR. SAINT LOUIS, MISSOURI 63146 22-1-02073-001	COMPACTION TEST RESULTS Hanford Site Area C

Init:_____ Date:_____

COMPACTION CURVE

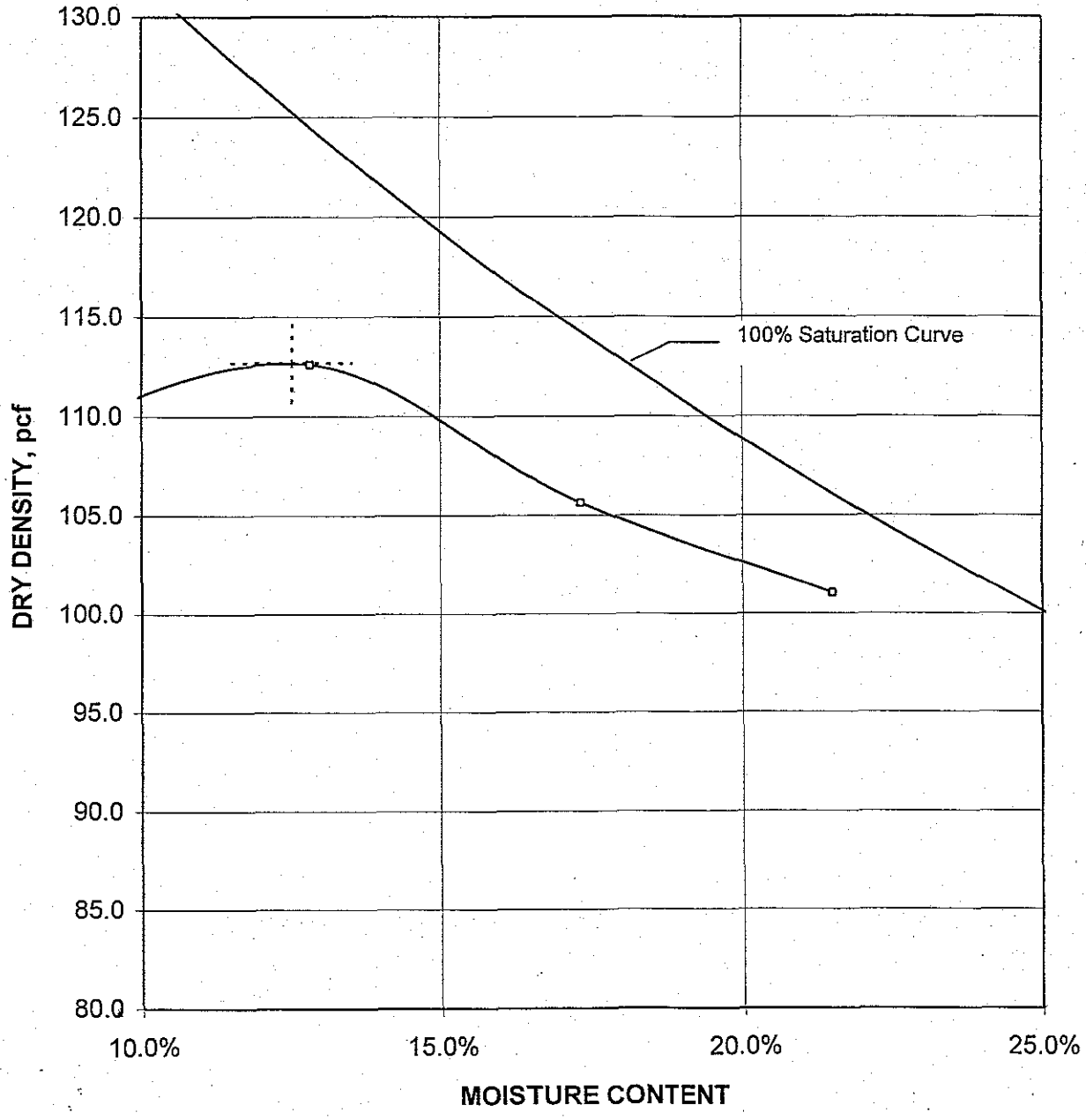


Sample	, B18419 at	Test Method	ASTM D 698/SWTP-10
Description	soil	Max. Density	112.7
		Optimum Moisture	13.7%

SHANNON & WILSON, INC. 2043 WESTPORT CENTER DR. SAINT LOUIS, MISSOURI 63146 22-1-02073-001	COMPACTION TEST RESULTS Hanford Site Area C

Init:_____ Date:_____

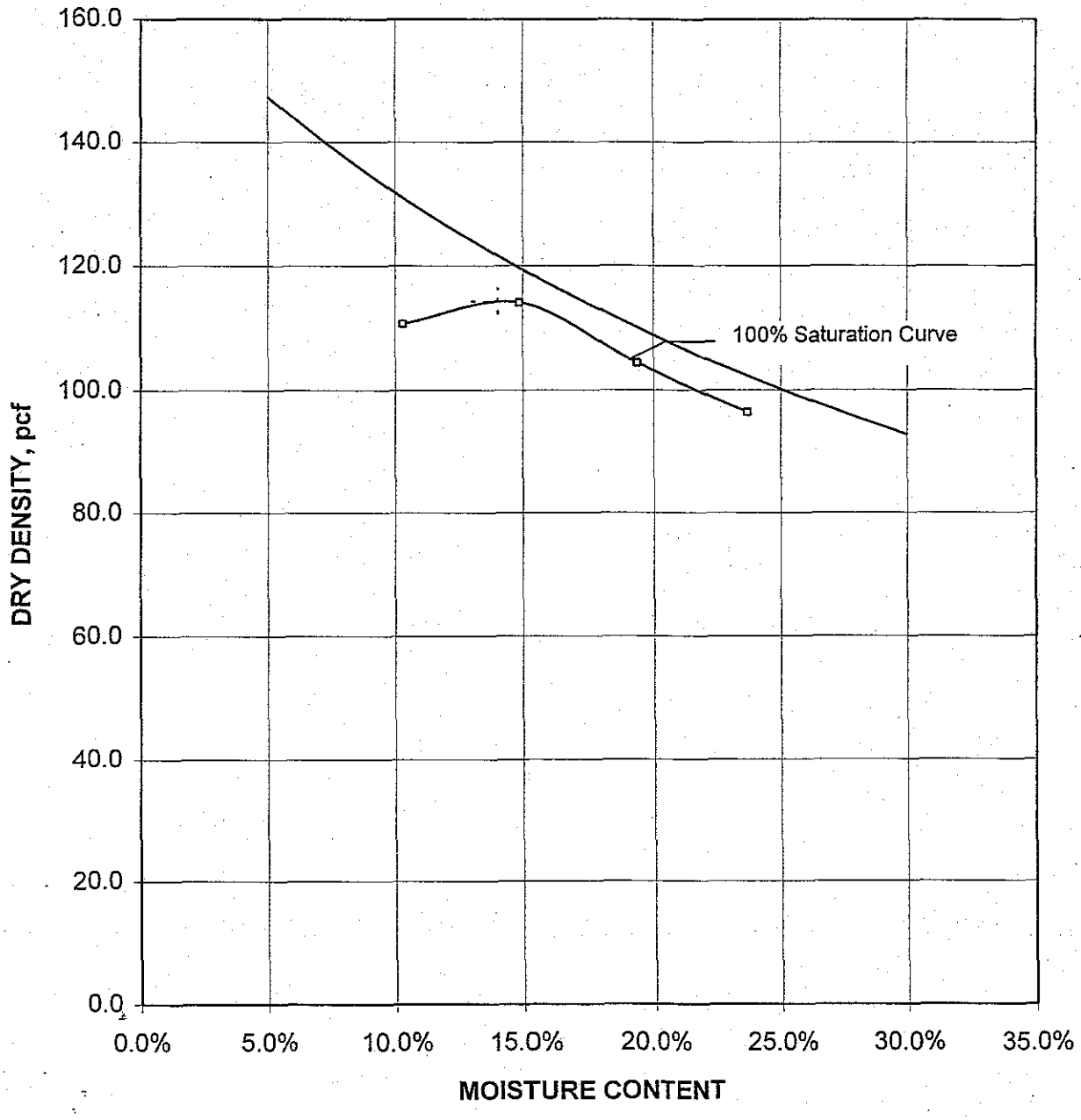
COMPACTION CURVE



Sample	, B18420 at	Test Method	ASTM D 698/SWTP-10
Description	soil	Max. Density	112.7
		Optimum Moisture	12.5%

SHANNON & WILSON, INC. 2043 WESTPORT CENTER DR. SAINT LOUIS, MISSOURI 63146 22-1-02073-001	COMPACTION TEST RESULTS Hanford Site Area C 0

Init:_____ Date:_____

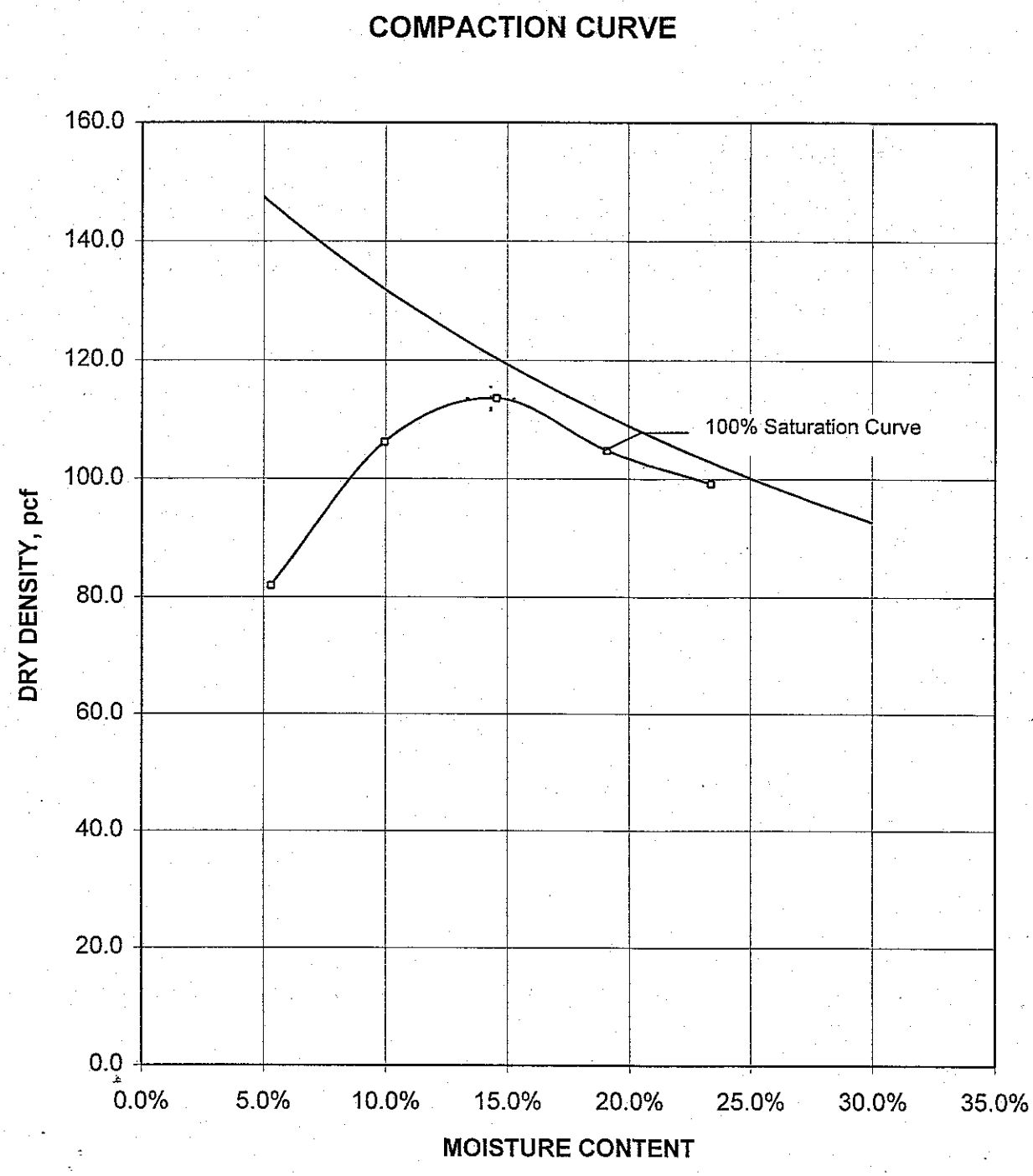


Sample	, B18421 at	Test Method	ASTM D 698/SWTP-10
Description	soil	Max. Density	114.3
		Optimum Moisture	14.0%

SHANNON & WILSON, INC. 2043 WESTPORT CENTER DR. SAINT LOUIS, MISSOURI 63146 22-1-02073-001	COMPACTION TEST RESULTS Hanford Site Area C

Init:_____ Date:_____

0000086



Sample	, B18422 at	Test Method	ASTM D 698/SWTP-10
Description	soil	Max. Density	113.5
		Optimum Moisture	14.3%

SHANNON & WILSON, INC. 2043 WESTPORT CENTER DR. SAINT LOUIS, MISSOURI 63146 22-1-02073-001	COMPACTION TEST RESULTS Hanford Site Area C

Init:_____ Date:_____

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE • RICHLAND • FAIRBANKS • ANCHORAGE • ST. LOUIS • BOSTON

2043 WESTPORT CENTER DRIVE
ST. LOUIS, MISSOURI 63146-3564
314-392-0050 FAX 314-392-0051

FAX TRANSMISSION

Attn	Steve Trent	Fax	1-866-252-5816
Company		Phone	
Location		Date	
From	Rachael Huson	Time	
Subject	Chain of Custody / Assignment sheet		

TOTAL NUMBER OF PAGES (including cover sheet) 12

The original of this fax _____ *will* X *will not* be mailed.

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Laboratory Testing Program

Tracking # FL-001

Date assignment sheet turned into lab: 1/30/04 Date testing due: _____ PM: _____ Assigned by: _____

Project Name: Hanford Site Area C Project Location: _____ Job Number: 22-1-02073001

	Drawing or Test Pit No.	Sample No.	Depth, ft	1 NC	2 Perm	3 Unconfined	4 AL	6 Specific gravity	7 Bulk Density	8 Particle size (hydro)	9 Particle size (dry)	10 Proctor (std)	11 Capillary-Moisture	12	13	14	15	Storage Code
1	B-403			X	/			/	X	/	/		/					
2	04			X	/			/	X	/	/		/					
3	05			X	/	/	/	/	X	/	/		/					
4	06			X	/	/	/	/	X	/	/		/					
5	07			X	/	/	/	/	X	/	/		/					
6	08			X	/			/	X	/	/		/					
7	09							/	X	/	/		/					
8	10			X	/			/	X	/	/		/					
9	11			X				/	X	/	/		/					
10	12			X	/			/	X	/	/		/					
11	13				/													
12	14			X				/	X	/	/		/					
13	15			X				/	X	/	/		/					
14	16			X	/	/	/	/	X	X	/		/					
15	17			X				/	X	/	/		/					
16	18											X						
17	19											X						
18	20											X						
19	21											X						
20	22											X						

Status symbols: / assigned • / in progress X completed

SHANNON & WILSON, INC.

02/11/2004 10:37 FAX 314 392 0051 SHANNON & WILSON 002

02/11/2004 10:37 FAX 314 392 0051 SHANNON & WILSON 003

Laboratory Testing Program

Tracking # FL-001

Date assignment sheet turned into lab: 1/30/04 Date testing due: _____ PM: _____ Assigned by: _____

Project Name: ~~Flour~~ Hanford Site Area C- grained soils Characterization Project Location: _____ Job Number: 22-1-02073-001

	Boring or Test Pit No.	Sample No.	Depth, ft.	1 Moisture content D2216	2 Perm (constant head)	3 Unconfined Compression	AL (3pt)	Specific Gravity (D 854)	Bulk D2937 Density	Particle Size (hydro)	Particle Size (dry sieve)	Proctor (mod)	Proctor (standard)	11 Capillary-moisture Relationship	12	13	14	15	Storage Code
1	B183X3			X				X	X	X	/			/					
2	X4			X	/	/	X	X	X	X	X			/					
3	X5			X	/	/	X	/	X	X	X			/					
4	X6			~~X~~	/	/	X	X	X	X	/			/					
5	X7			X	/			/	X	X	X			/					
6	X8			X	/	/	X	/	X	X	/			/					
7	X9			X				X	X	X	/			/					
8	Y0			X				X	X	X	/			/					
9	Y1			X				X	X	X	/			/					
10	Y2			X	/			/	X	X	/			/					
11	Y3			X	/	/	X	/	X	X	/			/					
12	Y4							X	/	X	X			/					
13	Y5			X	/			X	X	X	X			/					
14	Y6			X		/		X	X	X	X			/					
15	Y7			X				/	X	X	/			/					
16	Y8			X	/	/	X	/	X	X	/			/					
17	Y9			X				/	X	X	/			/					
18	18400 ~~10~~			X	/	/	X	/	X	X	/			/					
19	18400			X				/	X	X	/			/					
20	18402			X	/	/	X	/	X	X	/			/					

Status symbols: / assigned • / in progress • X completed

SHANNON & WILSON, INC.

Test is Not Applicable NG Information was Not Given

Tracking # FL-001

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F04-008-001	Page 1 of 1
Collector: DAVE WEEKES	Company Contact: SW PETERSEN	Telephone No.: 372-9126	Project Coordinator: TRENT, SJ	Price Code: Air Quality ☐ / Data Turnaround: 45 Days
Project Designation: Hanford Site Area C Fine-Grained Soils - Characterization	Sampling Location: AREA C BARROW STUDY		SAF No.: F04-008	
Ice Chest No.	Field Logbook No.	COA: 119138ES10	Method of Shipment: FEDERAL EXPRESS	
Shipped To: Shannon & Wilson	Offsite Property No.		Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Samples Did not originate in radiologically controlled area

Preservation	None	None	None	None	None					
Type of Container	Plastic Bucket	Split Spoon Liner	Split Spoon Liner	Split Spoon Liner	Moisture Resistant					
No. of Container(s)	1	2	2	2	1					
Volume	5gal	1000g	1000g	1000g	250g					
SAMPLE ANALYSIS	Proctor Compaction ASTM D1557; Compaction - D698	See Item (1) in Special Instructions.	Compression - D2166; Plasticity - D4318	Saturated Hydraulic Conductivity; Permeability - D2434	Moisture Content - D2216					

Sample No.	Matrix *	Sample Date	Sample Time										
~~B183X2~~	~~SOIL~~	~~12/16/03~~	~~—~~		~~1~~			~~1~~	DCW				
✓ B183X3	SOIL	12/16/03	—		1			1					
✓ B183X4	SOIL	12/16/03	—		1	1	1	1					
✓ B183X5	SOIL	12/11/03	1150		1	1	1	1					
✓ B183X6	SOIL	12/10/03	0935		1	1	1						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DC Weekes	1/27/04 1655	Dee Burrie	1/27/04 1655
		Rachael Huson	1/30/04 11:30

SPECIAL INSTRUCTIONS

** Geotechnical laboratory is to determine the most appropriate method for permeability measurement (ASTM 2434 or ASTM 5084) based on sample material and configuration.

(1) Capillary-Moisture Relationship - D2325; Particle Density - D854; Bulk Density - D2937; Particle Size (Hydrometer) - D422; Particle Size (Dry Sieve) - D422

DCW
SAR

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By: Rachael Huson	Title: Lab Manager	Date/Time: 1/30/04 11:30
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

02/11/2004 10:38 FAX 314 392 0051 SHANNON & WILSON 004

Trucking #FL-00

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F04-008-002	Page 1 of 1

Collector DAVE WEEKES	Company Contact SW PETERSEN	Telephone No. 372-9126	Project Coordinator TRENT, SJ	Price Code Air Quality ☐	Data Turnaround 45 Days
Project Designation Hanford Site Area C Fine-Grained Soils - Characterization	Sampling Location AREA C BARROW STUDY		SAF No. F04-008		
Ice Chest No.	Field Logbook No.	COA 119138ES10	Method of Shipment FEDERAL EXPRESS		
Shipped To Shannon & Wilson	Offsite Property No.		Bill of Lading/Air Bill No.		

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
Samples Did NOT originate in radiologically controlled area

Preservation	None	None	None	None	None						
Type of Container	Plastic Bucket	Split Spoon Liner	Split Spoon Liner	Split Spoon Liner	Moisture Resistant						
No. of Container(s)	1	2	2	2	1						
Volume	5gal	1000g	1000g	1000g	250g						
SAMPLE ANALYSIS	Proctor Compaction ASTM D1557; Compaction - D698	See item (1) in Special Instructions.	Compression - D2166; Plasticity - D4318	Saturated Hydraulic Conductivity; Permeability - D2434	Moisture Content - D2216						
Sample No. / Matrix * / Sample Date / Sample Time											
B183X7 / SOIL / 12/10/03 / 1215		1		1	1						
B183X8 / SOIL / 12/10/03 / 1230		1	1	1	1						
B183X9 / SOIL / 12/11/03 / 1355		1			1						
B183Y0 / SOIL / 12/11/03 / —		1			1						
B183Y1 / SOIL / 12/12/03 / 1240		1			1						

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: RC Weekes / Date/Time: 1/27/04 1655	Received By/Stored In: Dee Barnes / Date/Time: 1/27/04 1655	
Relinquished By/Removed From / Date/Time	Received By/Stored In: Rachael Huson / Date/Time: 1/30/04 11:30	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	

SPECIAL INSTRUCTIONS
** Geotechnical laboratory is to determine the most appropriate method for permeability measurement (ASTM 2434 or ASTM 5084) based on sample material and configuration.

(1) Capillary-Moisture Relationship - D2325; Particle Density - D854; Bulk Density - D2937; Particle Size (Hydrometer) - D422; Particle Size (Dry Sieve) - D422

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By: Rachael Huson	Title: Lab Manager	Date/Time: 1/30/04 11:30
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

02/11/2004 10:39 FAX 314 392 0051 SHANNON & WILSON 005

Trucking # FL-a

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F04-008-003	Page 1 of 1
Collector: DAVE WEEKES	Company Contact: SW PETERSEN; Telephone No.: 372-9126	Project Coordinator: TRENT, SJ	Price Code: Air Quality ☐
Project Designation: Hanford Site Area C Fine-Grained Soils - Characterization	Sampling Location: AREA C BARROW STUDY	SAF No.: F04-008	Date Turnaround: 45 Days
Ice Chest No.	Field Logbook No.; COA: 119138ES10	Method of Shipment: FEDERAL EXPRESS	
Shipped To: Shannon & Wilson	Offsite Property No.	Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Samples did not originate in radiologically controlled area

Preservation	None	None	None	None	None						
Type of Container	Plastic Bucket	Split Spoon Liner	Split Spoon Liner	Split Spoon Liner	Moisture Resistant						
No. of Container(s)	1	2	2	2	1						
Volume	5gal	1000g	1000g	1000g	250g						
SAMPLE ANALYSIS	Proctor Compaction ASTM D1557; Compaction - D698	See item (1) in Special Instructions.	Compression - D2166; Plasticity - D4318	Saturated Hydraulic Conductivity; Permeability - D2434	Moisture Content - D2216						
Sample No. / Matrix * / Sample Date / Sample Time											
B183Y2 / SOIL / 12/18/03 / —	1	1		1	1						
B183Y3 / SOIL / 12/17/03		1	1	1	1						
B183Y4 / SOIL / 12/19/03		1									
B183Y5 / SOIL / 12/19/03		1		1	1						
B183Y6 / SOIL / 12/19/03		1		1	1						

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: DC Weekes Dwaldes	1/27/04 1655	Dave Burgess / [illegible]	1655 / 1/27/04
Relinquished By/Removed From	Date/Time	Received By/Stored In: Rachael Huson / Rachael Huson	11:30 / 1/30/04
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

** Geotechnical laboratory is to determine the most appropriate method for permeability measurement (ASTM 2434 or ASTM 5084) based on sample material and configuration.

(1) Capillary-Moisture Relationship - D2325; Particle Density - D854; Bulk Density - D2937; Particle Size (Hydrometer) - D422; Particle Size (Dry Sieve) - D422

Matrix *
S=Soil
SD=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By: Rachael Huson	Title: Lab Manager	Date/Time: 1/30/04 11:30
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

02/11/2004 10:40 FAX 314 392 0051 SHANNON & WILSON 006

Tracking # FL-001

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F04-008-004	Page 1 of 1
Collector: DAVE WEEKES	Company Contact: SW PETERSEN; Telephone No.: 372-9126	Project Coordinator: TRENT, SJ	Price Code: Air Quality ☐
Project Designation: Hanford Site Area C Fine-Grained Soils - Characterization	Sampling Location: AREA C BARROW STUDY	SAF No.: F04-008	Data Turnaround: 45 Days
Ice Chest No.	Field Logbook No.; COA: 119138ES10	Method of Shipment: FEDERAL EXPRESS	
Shipped To: Shannon & Wilson	Offsite Property No.	Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Samples did not originate in a radiologically controlled area

Preservation	None	None	None	None	None						
Type of Container	Plastic Bucket	Split Spoon Liner	Split Spoon Liner	Split Spoon Liner	Moisture Resistant						
No. of Container(s)	1	2	2	2	1						
Volume	5gal	1000g	1000g	1000g	250g						
SAMPLE ANALYSIS	Proctor Compaction ASTM D1557; Compaction - D698	See item (1) in Special Instructions.	Compression - D2166; Plasticity - D4318	Saturated Hydraulic Conductivity; Permeability - D2434	Moisture Content - D2216						
Sample No. / Matrix * / Sample Date / Sample Time											
B183Y7 / SOIL / 12/9/03 / —											
B183Y8 / SOIL / 12/9/03 / 1310											
B183Y9 / SOIL / 12/8/03 / 1008											
B18400 / SOIL / 12/8/03 / 0850											
B18401 / SOIL / 12/8/03 / —											

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MC Upchurch	1/27/04 1655	Dee Burrie	1655
		[illegible]	1/27/04
		Rachael Hudson	11:30
		Rachael Hudson	1/30/04

SPECIAL INSTRUCTIONS

** Geotechnical laboratory is to determine the most appropriate method for permeability measurement (ASTM 2434 or ASTM 5084) based on sample material and configuration.

(1) Capillary-Moisture Relationship - D2325; Particle Density - D854; Bulk Density - D2937; Particle Size (Hydrometer) - D422; Particle Size (Dry Sieve) - D422

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By: Rachael Hudson	Title: Lab Manager	Date/Time: 1/30/04 11:30
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

02/11/2004 10:40 FAX 314 392 0051 SHANNON & WILSON 007

Tracking # FL-001

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F04-008-005	Page 1 of 1
Collector: DAVE WEEKES	Company Contact: SW PETERSEN	Telephone No.: 372-9126	Project Coordinator: TRENT, SJ	Price Code: Air Quality ☐ / Data Turnaround: 45 Days
Project Designation: Hanford Site Area C Fine-Grained Soils - Characterization	Sampling Location: AREA C BARROW STUDY		SAF No.: F04-008	
Ice Chest No.	Field Logbook No.	COA: 119138ES10	Method of Shipment: FEDERAL EXPRESS	
Shipped To: Shannon & Wilson	Offsite Property No.		Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
Samples did not originate in a radiologically ~~contaminated~~ area controlled PCW

Preservation	None	None	None	None	None					
Type of Container	Plastic Bucket	Split Spoon Liner	Split Spoon Liner	Split Spoon Liner	Moisture Resistant					
No. of Container(s)	1	2	2	2	1					
Volume	5gal	1000g	1000g	1000g	250g					
SAMPLE ANALYSIS	Proctor Compaction ASTM D1557; Compaction - D698	See item (1) in Special Instructions.	Compression - D2166; Plasticity - D4318	Saturated Hydraulic Conductivity; Permeability - D2434	Moisture Content - D2216					

Sample No.	Matrix *	Sample Date	Sample Time										
✓ B18402	SOIL	12/9/03	—		1	1	1	1					
✓ B18403	SOIL	12/5/03	—		1		1	1					
✓ B18404	SOIL	12/8/03	1124		1		1	1					
✓ B18405	SOIL	12/8/03	1145		1	1	1	1					
✓ B18406	SOIL	12/8/03	1230		1	1	1	1					

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DC Weekes	DC Weekes 1/27/04 1655	Doe Burnie	1/27/04 1655
		Rachael Huson	1/30/04 11:30

SPECIAL INSTRUCTIONS
** Geotechnical laboratory is to determine the most appropriate method for permeability measurement (ASTM 2434 or ASTM 5084) based on sample material and configuration.

(1) Capillary-Moisture Relationship - D2325; Particle Density - D854; Bulk Density - D2937; Particle Size (Hydrometer) - D422; Particle Size (Dry Sieve) - D422

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By: Rachael Huson	Title: Lab Manager	Date/Time: 1/30/04 11:30
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

02/11/2004 10:41 FAX 314 392 0051 SHANNON & WILSON 008

Tracking # FL-001

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F04-008-006	Page 1 of 1

Collector DAVE WEEKES	Company Contact SW PETERSEN	Telephone No. 372-9126	Project Coordinator TRENT, SJ
Project Designation Hanford Site Area C Fine-Grained Soils - Characterization	Sampling Location AREA C BARROW STUDY		SAF No. F04-008
Ice Chest No.	Field Logbook No.	COA 119138ES10	Method of Shipment FEDERAL EXPRESS
Shipped To Shannon & Wilson	Offsite Property No.		Bill of Lading/Air Bill No.

Price Code: Air Quality ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
Samples did not originate in a controlled radiologically ~~contaminated~~ area

Preservation	None	None	None	None	None						
Type of Container	Plastic Bucket	Split Spoon Liner	Split Spoon Liner	Split Spoon Liner	Moisture Resistant						
No. of Container(s)	1	2	2	2	1						
Volume	5gal	1000g	1000g	1000g	250g						
SAMPLE ANALYSIS	Proctor Compaction ASTM D1557; Compaction - D698	See item (1) in Special Instructions.	Compression - D2166; Plasticity - D4318	Saturated Hydraulic Conductivity; Permeability - D2434	Moisture Content - D2216						
Sample No. / Matrix * / Sample Date / Sample Time											
B18407 / SOIL / 12/17/03 / —		/	/	/	/						
B18408 / SOIL / 12/17/03 / —		/		/	/						
B18409 / SOIL / 12/18/03 / —		/									
B18410 / SOIL / 12/15/03 / —		/		/	/						
B18411 / SOIL / 12/15/03 /		/			/						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DC Weekes DCWeekes	1/27/04 1655	Des Burcalow	1655 1/27/04
		Rachael Husen	1130 1/30/04

SPECIAL INSTRUCTIONS
** Geotechnical laboratory is to determine the most appropriate method for permeability measurement (ASTM 2434 or ASTM 5084) based on sample material and configuration.

(1) Capillary-Moisture Relationship - D2325; Particle Density - D854; Bulk Density - D2937; Particle Size (Hydrometer) - D422; Particle Size (Dry Sieve) - D422

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By: Rachael Husen	Title: Lab Manager	Date/Time: 1/30/04 11:30
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

02/11/2004 10:42 FAX 314 392 0051 SHANNON & WILSON 009

Tracking # FL-001

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F04-008-007	Page 1 of 1

Collector: DAVE WEEKES	Company Contact: SW PETERSEN	Telephone No.: 372-9126	Project Coordinator: TRENT, SJ
Price Code: Air Quality ☐	Data Turnaround: 45 Days		
Project Designation: Hanford Site Area C Fine-Grained Soils - Characterization	Sampling Location: AREA C BARROW STUDY		SAF No.: F04-008
Ice Chest No.	Field Logbook No.	COA: 119138ES10	Method of Shipment: FEDERAL EXPRESS
Shipped To: Shannon & Wilson	Offsite Property No.		Bill of Lading/Air Bill No.

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Samples did not originate in a radiologically ~~contaminated~~ controlled area

Preservation	None	None	None	None	None						
Type of Container	Plastic Bucket	Split Spoon Liner	Split Spoon Liner	Split Spoon Liner	Moisture Resistant						
No. of Container(s)	1	2	2	2	1						
Volume	5gal	1000g	1000g	1000g	250g						
SAMPLE ANALYSIS	Proctor Compaction ASTM D1557; Compaction - D698	See item (1) in Special Instructions.	Compression - D2166; Plasticity - D4318	Saturated Hydraulic Conductivity; Permeability - D2434	Moisture Content - D2216						
Sample No. / Matrix * / Sample Date / Sample Time											
✓B18412 / SOIL / 12/16/03 / —		1		1	1						
✓B18413 / SOIL / 12/16/03 / —				1							
✓B18414 / SOIL / 12/15/03 / —		1			1						
✓B18415 / SOIL / 12/15/03 / —		1			1						
✓B18416 / SOIL / 12/12/03 / 0800		1	1	1	1						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JC Wheeler / Michelle	1/27/04 1655	Dee Burr / [signature]	1/27/04 1655
		Rachael / Rachael Huson Huson	11:30 4/30/04

SPECIAL INSTRUCTIONS

** Geotechnical laboratory is to determine the most appropriate method for permeability measurement (ASTM 2434 or ASTM 5084) based on sample material and configuration.

(1) Capillary-Moisture Relationship - D2325; Particle Density - D854; Bulk Density - D2937; Particle Size (Hydrometer) - D422; Particle Size (Dry Sieve) - D422

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By: Rachael Huson	Title: Lab Manager	Date/Time: 1/30/04 11:30
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

02/11/2004 10:43 FAX 314 392 0051 SHANNON & WILSON 010

Tracking # FL-001

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F04-008-008	Page 1 of 1
Collector: DAVE WEEKES	Company Contact: SW PETERSEN	Telephone No.: 372-9126	Project Coordinator: TRENT, SJ	Price Code: Air Quality ☐ / Data Turnaround: 45 Days
Project Designation: Hanford Site Area C Fine-Grained Soils - Characterization	Sampling Location: AREA C BARROW STUDY		SAF No.: F04-008	
Ice Chest No.	Field Logbook No.	COA: 119138ES10	Method of Shipment: FEDERAL EXPRESS	
Shipped To: Shannon & Wilson	Offsite Property No.		Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Samples did not originate in a radiologically controlled area

Preservation	None	None	None	None	None					
Type of Container	Plastic Bucket	Split Spoon Liner	Split Spoon Liner	Split Spoon Liner	Moisture Resistant					
No. of Container(s)	1	2	2	2	1					
Volume	5gal	1000g	1000g	1000g	250g					
SAMPLE ANALYSIS	Proctor Compaction ASTM D1557; Compaction - D698	See item (1) in Special Instructions.	Compression - D2166; Plasticity - D4318	Saturated Hydraulic Conductivity; Permeability - D2434	Moisture Content - D2216					

Sample No.	Matrix *	Sample Date	Sample Time										
✓ B18417	SOIL	12/12/03	1100		1			1					
✓ B18418	SOIL	12/18/03	—	1									
✓ B18419	SOIL	12/15/03	—	1									
✓ B18420	SOIL	12/09/03	—	1									
✓ B18421	SOIL	12/12/03	—	1									

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DC Weekes DC Weekes	1/27/04 1655	Dee Burns [signature]	1655 1/27/04
		Rachael Huson Rachael Huson	11:30 1/30/04

SPECIAL INSTRUCTIONS

** Geotechnical laboratory is to determine the most appropriate method for permeability measurement (ASTM 2434 or ASTM 5084) based on sample material and configuration.

(1) Capillary-Moisture Relationship - D2325; Particle Density - D854; Bulk Density - D2937; Particle Size (Hydrometer) - D422; Particle Size (Dry Sieve) - D422

Matrix *: S=Soil, SE=Sediment, SO=Solid, SI=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By: Rachael Huson	Title: Lab Manager	Date/Time: 1/30/04 11:30
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

SHANNON & WILSON 02/11/2004 10:43 FAX 314 392 0051 011

Tracking # FL-001

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F04-008-009	Page 1 of 1
Collector: DAVE WEEKES	Company Contact: SW PETERSEN	Telephone No.: 372-9126	Project Coordinator: TRENT, SJ	Price Code: Air Quality ☐
Project Designation: Hanford Site Area C Fine-Grained Soils - Characterization	Sampling Location: AREA C BARROW STUDY		SAF No.: F04-008	Data Turnaround: 45 Days
Ice Chest No.	Field Logbook No.	COA: 119138ES10	Method of Shipment: FEDERAL EXPRESS	
Shipped To: Shannon & Wilson	Offsite Property No.		Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
Samples did not originate in a radiologically controlled area

Preservation	None	None	None	None	None					
Type of Container	Plastic Bucket	Split Spoon Liner	Split Spoon Liner	Split Spoon Liner	Moisture Resistant					
No. of Container(s)	1	2	2	2	1					
Volume	5gal	1000g	1000g	1000g	250g					
SAMPLE ANALYSIS	Proctor Compaction ASTM D1557; Compaction - D698	See item (1) in Special Instructions.	Compression - D2166; Plasticity - D4318	Saturated Hydraulic Conductivity; Permeability - D2434	Moisture Content - D2216					

Sample No:	Matrix *	Sample Date	Sample Time										
B18422	SOIL	12/17/03	—	1									
B18423	SOIL												
B18424	SOIL												
B18425	SOIL												
B18426	SOIL												

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DC Weekes DC Weekes	1/27/04 1655	Dee Burr [signature]	1655 1/27/04
		Rachael Huson Rachael Huson	1/30/04 11:30

SPECIAL INSTRUCTIONS
** Geotechnical laboratory is to determine the most appropriate method for permeability measurement (ASTM 2434 or ASTM 5084) based on sample material and configuration.

(1) Capillary-Moisture Relationship - D2325; Particle Density - D854; Bulk Density - D2937; Particle Size (Hydrometer) - D422; Particle Size (Dry Sieve) - D422

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
	Rachael Huson	Lab Manager	1/30/04 11:30
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

SHANNON & WILSON 02/11/2004 10:44 FAX 314 392 0051 012