START

TEST REQUEST FORM

Sample/Specimen No. 0-075 Cost Code/Work Order No. ED 332

Requested By: Org. 81232 Person J. LINDBERG Date 2-19-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (IF REQ)
MOISTURE	1	ETAL-14
N/A	N/A	N/A

Remarks FIELD SAMPLE MW-2-1

Received By: R.G ALEXANDER Date 2-6-90

Approved By: R.G ALEXANDER Date 2-19-90

SIEVE ANALYSIS DATA SHEET

Sample ID 0-075 Page 1 of 1

Tested By R-G ALEXANDER Date 2-19-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0007	8-16-90
N/A	N/A	N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)

reduced by ☒ splitting ☒ quartering ☐ stockpile

(B) (A)

BEFORE TEST WT. N/A AFTER TEST WT. N/A $\frac{B-A}{B} \times 100$ = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A	2	4831.81	Ø	Ø	Ø	100	100
	1½		155.42	3.2	3.2	96.8	96.8
	1		787.35	16.3	16.3	83.7	83.7
	¾		1135.52	23.5	23.5	76.5	76.5
	½		1575.78	32.6	32.6	67.4	67.4
	⅜		1842.23	38.1	38.1	61.9	61.9
	#4		2293.06	47.5	47.5	52.5	52.5
	#10		2797.53	57.9	57.9	42.1	42.1
	#40	1386.7	80.48	58.0	58.0	42.0	17.7
	#60		99.38	71.7	71.7	28.3	11.9
	#100		110.08	79.4	79.4	20.6	8.7
	#200		118.77	85.6	85.6	14.4	6.1

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 14.4 %

D=Original Dry Weight of Sample 1386.7 g

E=Dry Weight of Sample After Washing/Sieve 118.77 g

C = <(D-E)/D> X 100

Remarks

WASH FINE GRADING

SMALL FIELD SAMPLE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

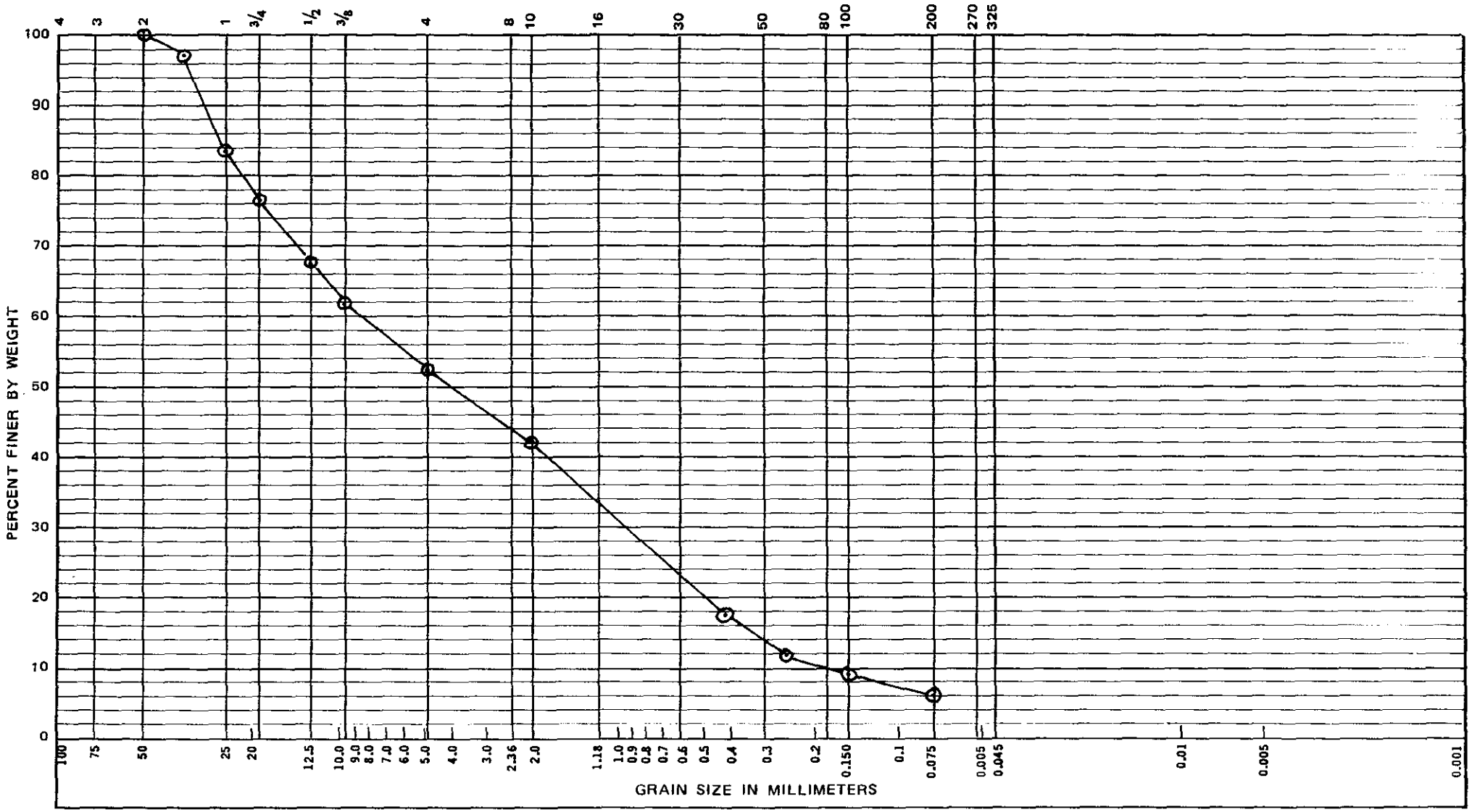
Checked By H C Benny Date 2-22-90

A-6400-204(2-87)

9212174

9 2 1 2 [illegible] 0 7 5

GRAIN SIZE ANALYSIS PLOT



Specimen No. D-075 Procedure No. ETAL-07 Rev. 1 Date Issued 11-15-89

Sample Description: SANDY GRAVEL
MW-2-1

Plotted by: R.G ALEXANDER
Date: 2-19-90

Checked by: H L Benny
Date: 2-22-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. Ø

THERMOMETER NO. 0007 CALIBRATION DUE DATE 8-16-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-075	5515.36	5409.87	578.06	4937.30	4831.81	2.18

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G. ALEXANDER DATE 2-19-90

Westinhouse Hanford Company	CHAIN OF CUSTODY

Company Contact Jon Lindberg Telephone 6-5005

Sample Collected by K.M. Singleton Date 1-25,26,29,30-90 Time NA

Sample Locations 1100 Em-1, MW2

Ice Chest No. NA Field Logbook and Page No. WHC-N-306-5 pgs 6-7

Remarks

Bill of Lading No. NA Offsite Property No. NA

Method of Shipment Jerry Alexander / Truck

Shipped to 2101-M, 200E

Sample Identification

1) MW-2-1, plastic bag soil; Test: Grain & Moisture

2) MW-2-2, plastic bag soil; Grain Size & Moisture Tests

3) MW-2-3, plastic bag soil; Grain Size Test

4) MW-2-4 1, plastic bag soil; Test: Grain Size, Moisture, permeameter Atberg Limits

Chain of Possession

Relinquised by:	Received by:	Date/Time:
K.M. Singleton	R.G. Alexander	2-6-90 / 0630
Relinquised by:	Received by:	Date/Time:
Relinquised by:	Received by:	Date/Time:
Relinquised by:	Received by:	Date/Time:

A-6000-407 (07/89)

9212177

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K.M. Singleton Date Sampled: 1-25,26,27-90 Time: NA hours

Company Contact Jon Lindberg Telephone ( ) 6-5005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW-2-1	1 plastic bag	soil	Grain Size & Moisture
MW-2-2	1 plastic bag	soil	Grain Size & Moisture
MW-2-3	1 plastic bag	soil	Grain Size
MW-2-4	1 plastic bag	soil	Grain Size, A. Limits & permeameter

Field Information ** MW-2 is also contained in a stainless steel liner

Special Handling and/or Storage

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

* Indicate Whether Sample is Soil, Sludge, Water, Etc.
** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on outside of bag.
MW 2-1

54-3000-022 (09/88)

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on all accessible surfaces outside of bag.
MW-2-2

54-3000-022 (09/88)

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on outside of bag.
MW-2-3

54-3000-022 (09/88)

SURVEYED BY RM FOR SHIPMENT

Dose rate – side of container	<D mr-hr
Max. dose rate through the container	mr-hr
Dose rate to handle container	mr-hr
Dose rate at nearest approach on conveyance	mr-hr
External contamination	
SWP and RSR required	Yes ☐ No ☒

SURVEYED BY TE Baldwin 6C670

DATE 1/30/90

MW-2-4

54-6800-009(1-88)

9212270

TEST REQUEST FORM

Sample/Specimen No. 0-076 Cost Code/Work Order No. ED332

Requested By: Org. 81232 Person J. LINDBERG Date 2-19-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (IF REQ)
MOISTURE	1	ETAL-14
N/A	N/A	N/A

Remarks FIELD SAMPLE MW-2-2

Received By: R.G ALEXANDER Date 2-6-90

Approved By: R.G ALEXANDER Date 2-19-90

9-21-330

SIEVE ANALYSIS DATA SHEET

Sample ID 0-076 Page 1 of 1

Tested By R.G. ALEXANDER Date 2-19-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0007	8-16-90
N/A	N/A	N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)

reduced by ☒ splitting ☒ quartering ☐ stockpile

(B) (A)

BEFORE TEST WT. N/A AFTER TEST WT. N/A $\frac{B-A}{B} \times 100$ = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A	2	4757.64	Ø	Ø	Ø	100	100
	1½		270.28	5.7	5.7	94.3	94.3
	1		674.42	14.2	14.2	85.8	85.8
	3/4		1115.97	23.5	23.5	76.5	76.5
	1/2		1620.26	34.1	31.4	68.6	68.6
	3/8		1891.39	39.8	39.8	60.2	60.2
	#4		2360.33	49.6	49.6	50.4	50.4
	#10	4757.64	2854.00	60.0	60.0	40.0	40.0
	#40	126.01	67.44	53.5	53.5	46.5	18.6
	#60		83.56	66.3	66.3	33.7	13.5
	#100		92.46	73.4	73.4	26.6	10.6
	#200		101.44	80.5	80.5	19.5	7.8

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 19.5 %

D=Original Dry Weight of Sample 126.01 g

E=Dry Weight of Sample After Washing/Sieve 101.44 g

C = <(D-E)/D> X 100

Remarks

WASH FINE GRADING

SMALL FIELD

SAMPLE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS.

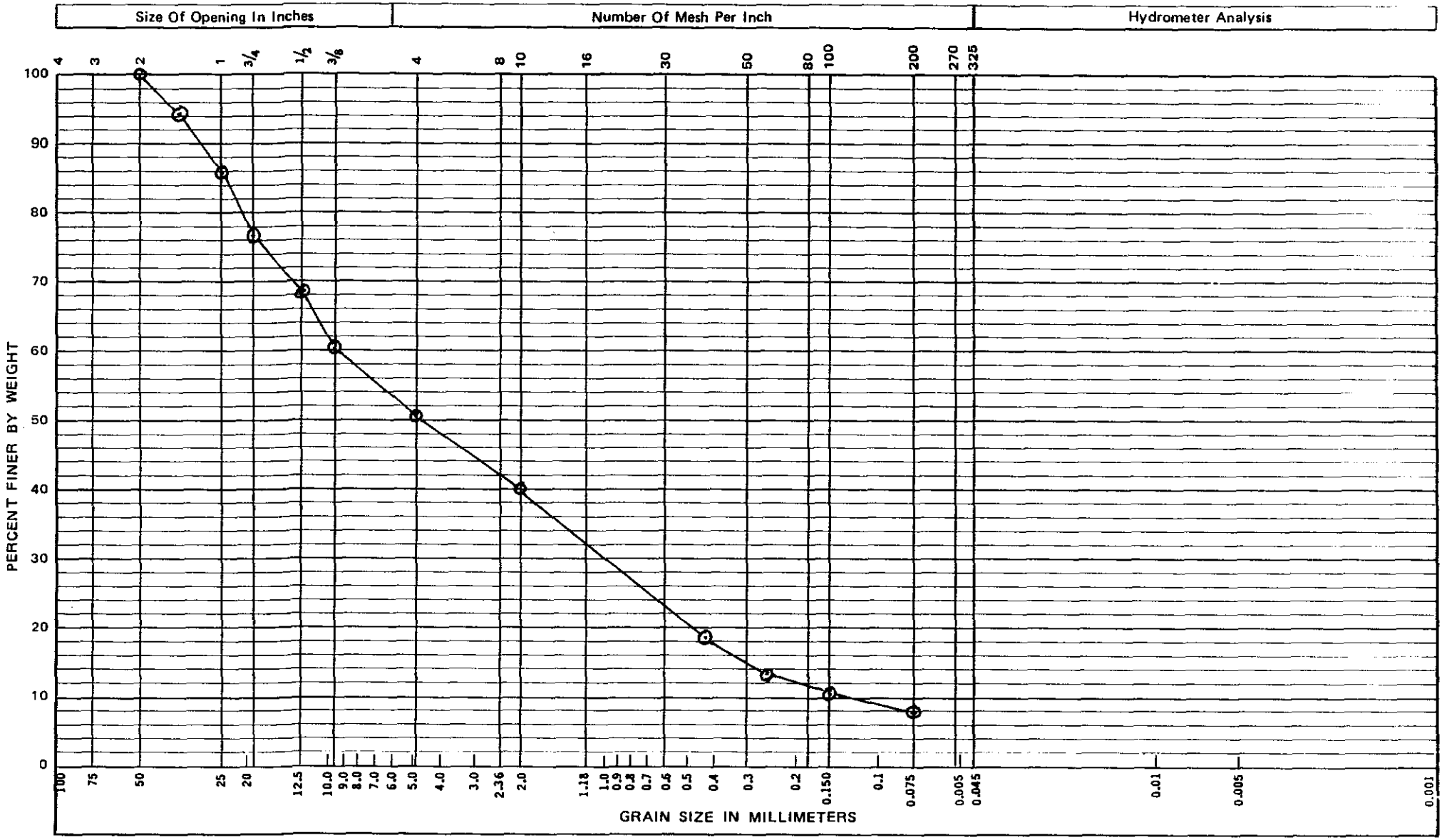
Checked By HCBarry Date 2/22/90

A-6400-204(2-87)

9212110381

9 2 1 [illegible] 9 2

GRAIN SIZE ANALYSIS PLOT



Specimen No. D-076 Procedure No. ETAL-07 Rev. 1 Date Issued 11-15-89

Sample Description: SANDY GRAVEL MW-2-2

Plotted by: R.G. ALEXANDER Date: 2-19-90

Checked by: H L Benny Date: 2-22-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. Ø

THERMOMETER NO. 0007 CALIBRATION DUE DATE 8-16-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-076	5425.55	5341.64	584.00	4841.55	4757.64	1.76

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G. ALEXANDER DATE 2-19-90

Westinhouse Hanford Company	CHAIN OF CUSTODY

Company Contact Jon Lindberg Telephone 6-5005

Sample Collected by K.M. Singleton Date 1-25,26,29,30-90 Time NA

Sample Locations 1100 Em-1, MW2

Ice Chest No. NA Field Logbook and Page No. WHC-N-306-5 pgs 6-7

Remarks

Bill of Lading No. NA Offsite Property No. NA

Method of Shipment Jerry Alexander / Truck

Shipped to 2101-M, 200E

Sample Identification

1) MW-2-1, plastic bag soil; Test: Grain & Moisture

2) MW-2-2, plastic bag soil; Grain Size & Moisture Tests

3) MW-2-3, plastic bag soil; Grain Size Test

4) MW-2-4 1, plastic bag soil; Test: Grain Size, Moisture, permeamiter Atberg. limits

Chain of Possession

Relinquised by:	Received by:	Date/Time:
K.M. Singleton	R.G. ALEXANDER R.G. Alexander	2-6-90 / 0630
Relinquised by:	Received by:	Date/Time:
Relinquised by:	Received by:	Date/Time:
Relinquised by:	Received by:	Date/Time:

A-6000-407 (07/89)

9212034

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K.M. Singleton Date Sampled: 1-25, 26, 27-90 Time: NA hours

Company Contact Jon Lindberg Telephone ( ) 6-5005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW-2-1	1 plastic bag	soil	Grain Size & Moisture
MW-2-2	1 plastic bag	soil	Grain Size & Moisture
MW-2-3	1 plastic bag	soil	Grain Size
MW-2-4	1 plastic bag	soil	Grain Size, A. Limits & permeameter

Field Information ** MW-2 is also contained in a stainless steel liner

Special Handling and/or Storage

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

* Indicate Whether Sample is Soil, Sludge, Water, Etc.
** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on outside of bag.
MW 2-1

54-3000-022 (09/88)

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on outside of
bag.
MW-2-3

54-3000-022 (09/88)

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on all accessible
surfaces outside of bag.
MW-2-2

54-3000-022 (09/88)

SURVEYED BY RM FOR SHIPMENT

Dose rate – side of container	<D	mr-hr
Max. dose rate through the container		mr-hr
Dose rate to handle container		mr-hr
Dose rate at nearest approach on conveyance		mr-hr
External contamination		
SWP and RSR required	Yes ☐	No ☒

SURVEYED BY TE Baldwin 6C670

DATE 1/30/90

MW-2-4

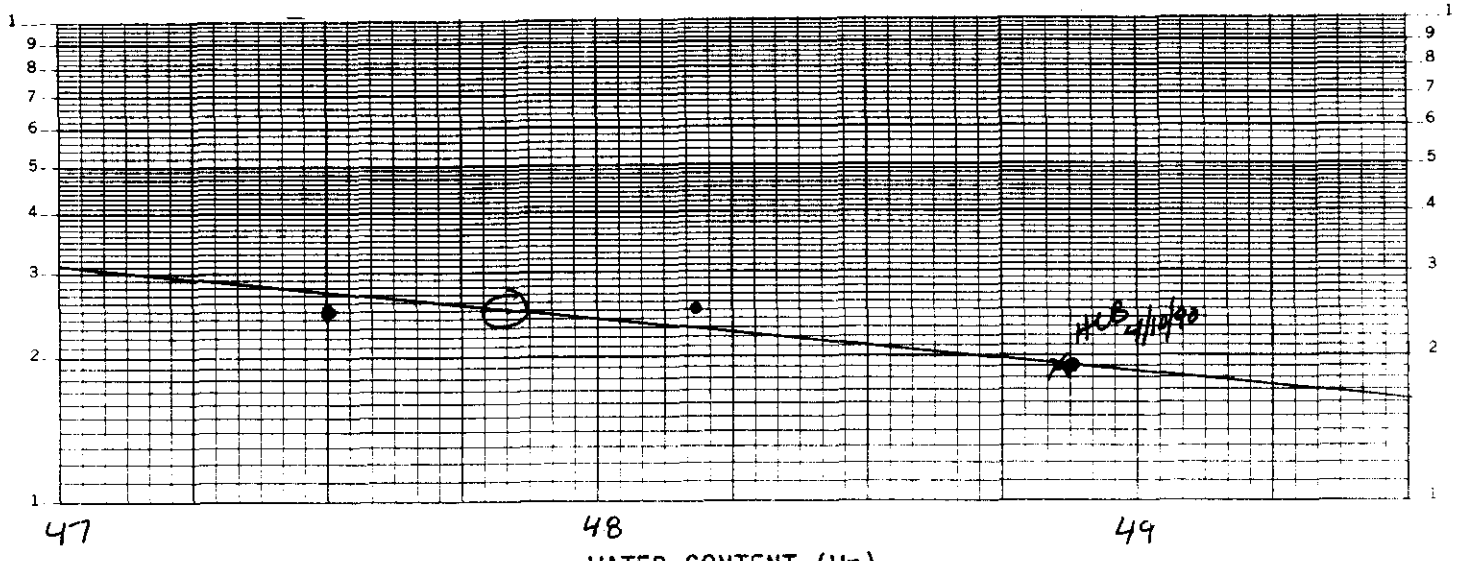
54-6800-009(1-88)

PLASTIC INDEX SOILS DATA SHEET

Sample No. O-076 Page 1 of 2

Test Operator HL Benny Date 4/10/90

Thermometer No. 0007 Calibration Date 8/16/90



Liquid Limit (LL) 47.84 Graph Plastic Limit (PL) 39.67 (Avg.)

Liquid Limit (LL) NA One Point Moisture (PL) 40.81% 40.43% 37.77%

Moisture (LL) 47.84 % Plastic Index (PI)* 8.17

*PI = LL − PL

Remarks

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPIATELY TRAINED AND ULITIZED CALIBRATED TEST INSTRUMENTS. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THIS DATA. HLB 4/14/90

9212187

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-018 REV. NO. Ø

THERMOMETER NO. 0007 CALIBRATION DUE DATE 8/16/90

Blows	SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
	0-076-1	16.55	15.04	11.34	5.21	3.70	40.81
	-2	13.91	13.15	11.27	2.64	1.88	40.43
	-3	15.90	14.68	11.45	4.45	3.23	37.77
					Average	% Water	39.67
25	0-076-4	23.96	19.87	11.26	12.70	8.61	47.50
19	-5	63.07	59.19	51.25	11.8½	7.94	48.87
25	-6	63.85	59.87	51.61	12.24	8.26	48.18

LeB 4/16/90

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: HCBenny DATE 4/10/90

9211133

TEST REQUEST FORM

Sample/Specimen No. 0-077 Cost Code/Work Order No. ED332

Requested By: Org. 81232 Person J. LINDBERG Date 2-19-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
SIEVE ANALYSIS	1	ETAL-07
HYDROMETER	1	ETAL-07 (IF REQ)
N/A	N/A	N/A
N/A	N/A	N/A

Remarks FIELD SAMPLE MW-2-3

Received By: R.G. ALEXANDER Date 2-6-90

Approved By: RG ALEXANDER Date 2-19-90

9-21-89

SIEVE ANALYSIS DATA SHEET

Sample ID 0-077 Page 1 of 1

Tested By R.G. ALEXANDER Date 2-19-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-26-90
Thermometer	0007	8-16-90
N/A	N/A	N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)

reduced by ☒ splitting ☐ quartering ☐ stockpile

(B) (A)
BEFORE TEST WT. N/A AFTER TEST WT. N/A $\frac{B-A}{B} \times 100$ = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A	2	1769.74	Ø	Ø	Ø	100	100
	1½		121.45	6.9	6.9	93.1	93.1
	1		189.97	10.7	16.7	89.3	89.3
	3/4		235.98	13.3	13.3	86.7	86.7
	1/2		296.39	16.7	16.7	83.3	83.3
	3/8		338.66	18.9	18.9	81.1	81.1
	#4		386.32	21.8	21.8	78.2	78.2
	#10	1769.74	487.67	27.6	27.6	72.4	72.4
	#40	162.27	78.29	48.2	48.2	51.8	37.5
	#60		100.20	61.7	61.7	38.3	27.7
	#100		112.60	69.4	69.4	30.6	22.2
	#200		124.48	76.7	76.7	23.3	16.9

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve 23.3 %

D=Original Dry Weight of Sample 162.27 g

E=Dry Weight of Sample After Washing/Sieve 124.48 g

C = <(D-E)/D> X 100

Remarks
WASH FINE GRADING
SMALL FIELD
SAMPLE

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

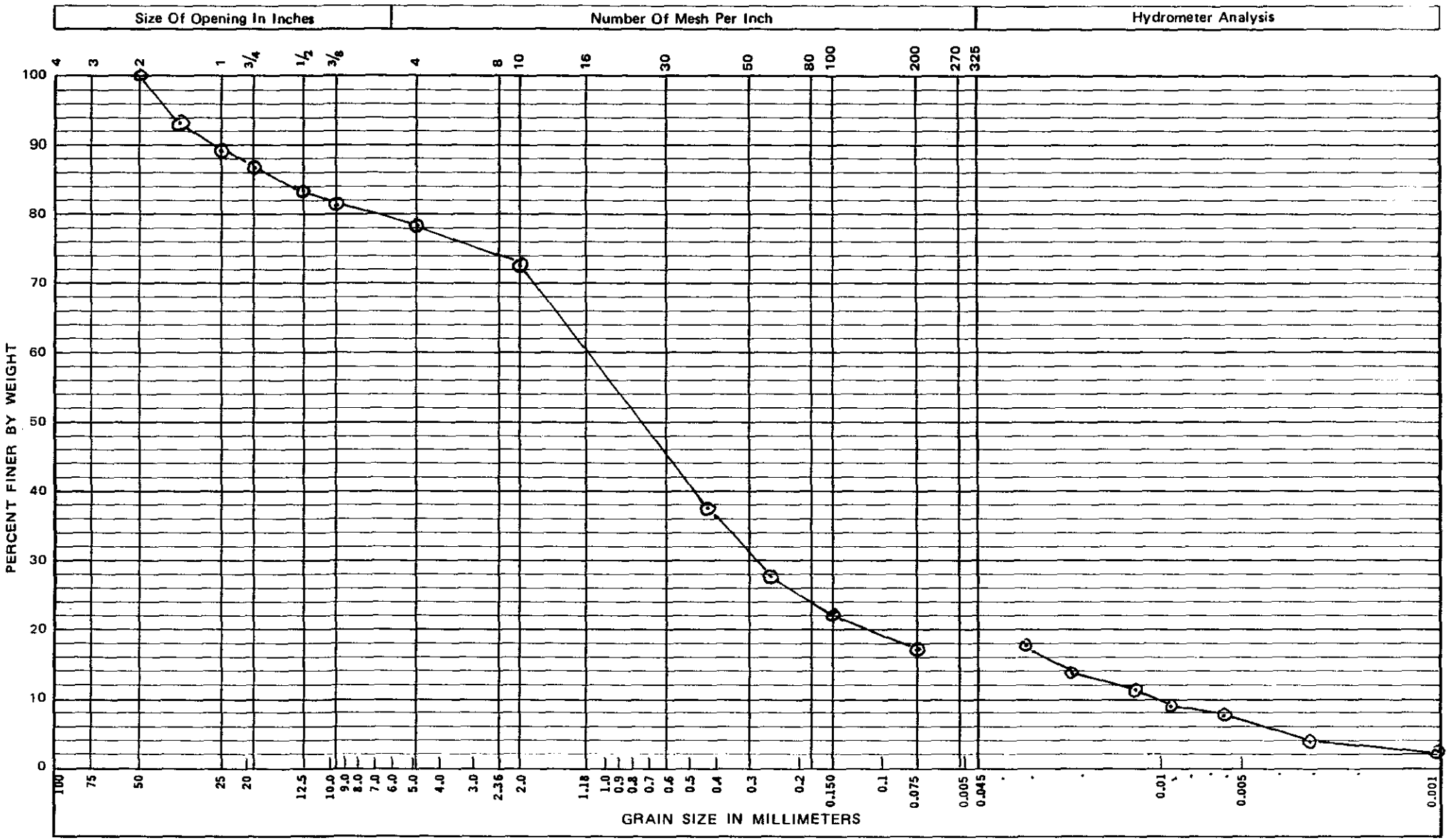
Checked By H.C. Benny Date 2-22-90

A-6400-204(2-87)

9212190

9212 [illegible] 91

GRAIN SIZE ANALYSIS PLOT



Specimen No. O-077 Procedure No. ETAL-07 Rev. 1 Date Issued 11-15-89

Sample Description: SANDY GRAVEL
MW-2-3

Plotted by: R.G. ALEXANDER
Date: 2-19-90

Checked by: HL Benny
Date: 2-22-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAC-14 REV. NO. Ø

THERMOMETER NO. 0007 CALIBRATION DUE DATE 8-16-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-077	2558.52	2359.13	589.39	1969.13	1769.74	11.27

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G. ALEXANDER DATE 2-19-90

HYDROMETER ANALYSIS DATA SHEET

Sample ID 0-077 Page 1 of 1

Tested By R.G ALEXANDER Date 3-19-90

Procedure ETAL -07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	NO.	CALIBRATION DUE DATE
Hydrometer	1000	2-16-91
Balance	3304	3-25-90
Thermometer/Thermocouple	0002	2-9-91

Specific gravity of Sample 2.75

% Passing No. 10 Sieve 72.4 (%)

Hygroscopic Correction Factor _____

WEIGHT OF SAMPLE

Wt. Container + Soil N/A (g)

Wt. Container N/A (g)

Wt. Soil 55.62 (g)

COMPOSITE CORRECTION

1st Reading 5 at 23.8 °C

2nd Reading 6 at 23.4 °C

HYGROSCOPIC MOISTURE CONTENT

Wt. Container + Air Dry Soil N/A (g)

Wt. Container + Oven Dry Soil N/A (g)

Wt. Container N/A (g)

Water Content N/A (%)

REMARKS

TUBE B

W=

PAN #9 117.55

Date	Clock time	Elapsed time (min)	Hydrometer reading	Hydrometer with composite correction	Temp. (°C)	Soil in suspension (%)	Particle diameter (mm)
3-19	0832	2.0	19	14	24.0	17.9	0.032
3-19	0835	5.0	16	11	24.1	14.0	0.021
3-19	0845	15.0	14	9	24.1	11.5	0.012
3-19	0900	30.0	12	7	24.0	8.9	0.009
3-19	0930	60.0	11	6	23.8	7.7	0.006
3-19	1240	250.00	8	3	24.1	3.8	0.003
3-20	0830	1,440.0	7	2	23.3	2.6	0.001

Formulas and Tables used to calculate percent Soil in suspension, particle diameter and hygroscopic correction factor are found in ASTM D422.

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By J.A. Belyea Date 3-21-90

A-6400-205 (1-87)

SPECIFIC GRAVITY OF SOILS DATA SHEET

Specimen/Sample No. O-077 Page 1 of 1

Test Operator R.G. ALEXANDER 3-5-90

EQUIPMENT ITEM	NO.	DATE DUE
Balance	3304	3-25-90
Oven Thermometer	0007	8-16-90
Thermometer	0002	2-9-91
Pycnometer	2554	N/A

Wetting Agent "Q" WATER

	DETERMINATION NO.	1	2	3
	Drying Container No.	N/A	N/A	N/A
	Wt. Container + Oven Dry Soil, ± 0.01g	N/A .__	.__	.__
	Wt. Container, ± 0.01g	N/A .__	.__	.__
W_o	Wt. Oven Dry Soil, g	40.00	.__	.__
	Pycnometer No.	2554		
	Wt. Pycnometer, g	138.72	.__	.__
W_a	Wt. Pycnometer + Wetting Agent, g	387.12	.__	.__
W_b	Wt. Pycnometer + Wetting Agent + Soil, g	412.62	.__	.__
	Temperature, T_x at W_b, °C	26.4C		
G_w	Specific Gravity of Wetting Agent at T_x	1.00	_.__	_.__
G_t	Specific Gravity of Soil at T_x	2.76	_.__	_.__
G_s	Specific Gravity of Soil at 20°C	2.75	_.__	_.__

$$G_t = \frac{G_{w^*} \gamma_{w^*} W_o}{W_o + (W_a - W_b)}$$

γ_w = Unit Weight Of Water (g/cc)

*$G_s = K \cdot G_t$

K values found in ASTM D854-58, Table 1

*NOTE $G_s = G_t$ When Test Run at 20 °c

Average Specific Gravity At 20°c	2.75

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By HLBenny Date 3-7-90

A-6400-235 (9-86)

9 2 1 2 - 1 0 9 4

Westinhouse Hanford Company	CHAIN OF CUSTODY

Company Contact Jon Lindberg Telephone 6-5005

Sample Collected by K.M. Singleton Date 1-25,26,29,30-90 Time NA

Sample Locations 1100 Em-1, MW2

Ice Chest No. NA Field Logbook and Page No. WHC-N-306-5 pgs 6-7

Remarks

Bill of Lading No. NA Offsite Property No. NA

Method of Shipment Jerry Alexander / Truck

Shipped to 2101-M, 200E

Sample Identification

1) MW-2-1, plastic bag soil; Test: Grain & Moisture

2) MW-2-2, plastic bag soil; Grain Size & Moisture Tests

3) MW-2-3, plastic bag soil; Grain Size Test

4) MW-2-4 1, plastic bag soil; Test: Grain Size, Moisture, permeamiter Atberg. limits

Chain of Possession

Relinquished by:	Received by:	Date/Time:
K.M. Singleton	R.G Alexander	2-6-90 / 0630
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

A-6000-407 (07/89)

9212105

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K.M. Singleton Date Sampled: 1-25, 26, 27, 30-90 Time: N/A hours

Company Contact Jon Lindberg Telephone ( ) 6-5005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW-2-1	1 plastic bag	soil	Grain Size & Moisture
MW-2-2	1 plastic bag	soil	Grain Size & Moisture
MW-2-3	1 plastic bag	soil	Grain Size
MW-2-4	1 plastic bag	soil	Grain Size, A. Limits & permeameter

Field Information ** MW-2 is also contained in a stainless steel liner

Special Handling and/or Storage _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

* Indicate Whether Sample is Soil, Sludge, Water, Etc.

** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on outside of bag.
MW 2-1

54-3000-022 (09/88)

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on all accessible surfaces outside of bag.
MW-2-2

54-3000-022 (09/88)

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on outside of bag.
MW-2-3

54-3000-022 (09/88)

SURVEYED BY RM FOR SHIPMENT

Dose rate – side of container	<D	mr-hr
Max. dose rate through the container		mr-hr
Dose rate to handle container		mr-hr
Dose rate at nearest approach on conveyance		mr-hr
External contamination		
SWP and RSR required	Yes ☐	No ☒

SURVEYED BY TE Baldwin 6C670

DATE 1/30/90

MW-2-4

54-6800-009(1-86)

9213197

TEST REQUEST FORM

Sample/Specimen No. 0-078 Cost Code/Work Order No. ED 332

Requested By: Org. 80232 Person J. LINDBERG Date 2-14-90

Test Requested	No. of Samples	Test Lab Information (Instruction Used)
HYD. CONDUCTIVITY	1	ETAL-09
ATTERBERG LIMITS	1	ETAL-18
N/A	N/A	N/A
N/A	N/A	N/A

Remarks FIELD SAMPLE MW-2-4 Received By: R.G ALEXANDER Date 2-6-90

Approved By: R.G ALEXANDER Date 2-14-90

SIEVE ANALYSIS DATA SHEET

Sample ID D-078 Page 1 of 1

Tested By R.G ALEXANDER Date 2-20-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	CALIBRATION NO.	DATE DUE
Balance	3304	3-25-90
Thermometer	0007	8-16-90
N/A	N/A	N/A

Sample Description SANDY SILT Sieve Time ____ (min)

reduced by ☒ splitting ☐ quartering ☐ stockpile

(B) (A)

BEFORE TEST WT. N/A AFTER TEST WT. N/A $\frac{B-A}{B} \times 100$ = N/A % LOSS

Sieve ID Number	Sieve Size	Sample Weight	Cumulative Wt. Retained (g)	% Retained	Cumulative % Retained	Cumulative % Pass	% Pass
N/A							
	#4	98.53	0				
	#10		0	0	0	100	100
	#40		1.67	1.7	1.7	98.3	98.3
	#60		4.51	4.6	4.6	95.4	95.4
	#100		11.28	11.4	11.4	88.6	88.6
	#200		32.40	32.9	32.9	67.1	67.1

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C=Percentage of Material Passing a 200 Sieve ____ %

D=Original Dry Weight of Sample 98.53 g

E=Dry Weight of Sample After Washing/Sieve 32.40 g

C = <(D-E)/D> X 100

Remarks

WASH GRADING

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS TRAINED AND USED CALIBRATED INSTRUMENTS

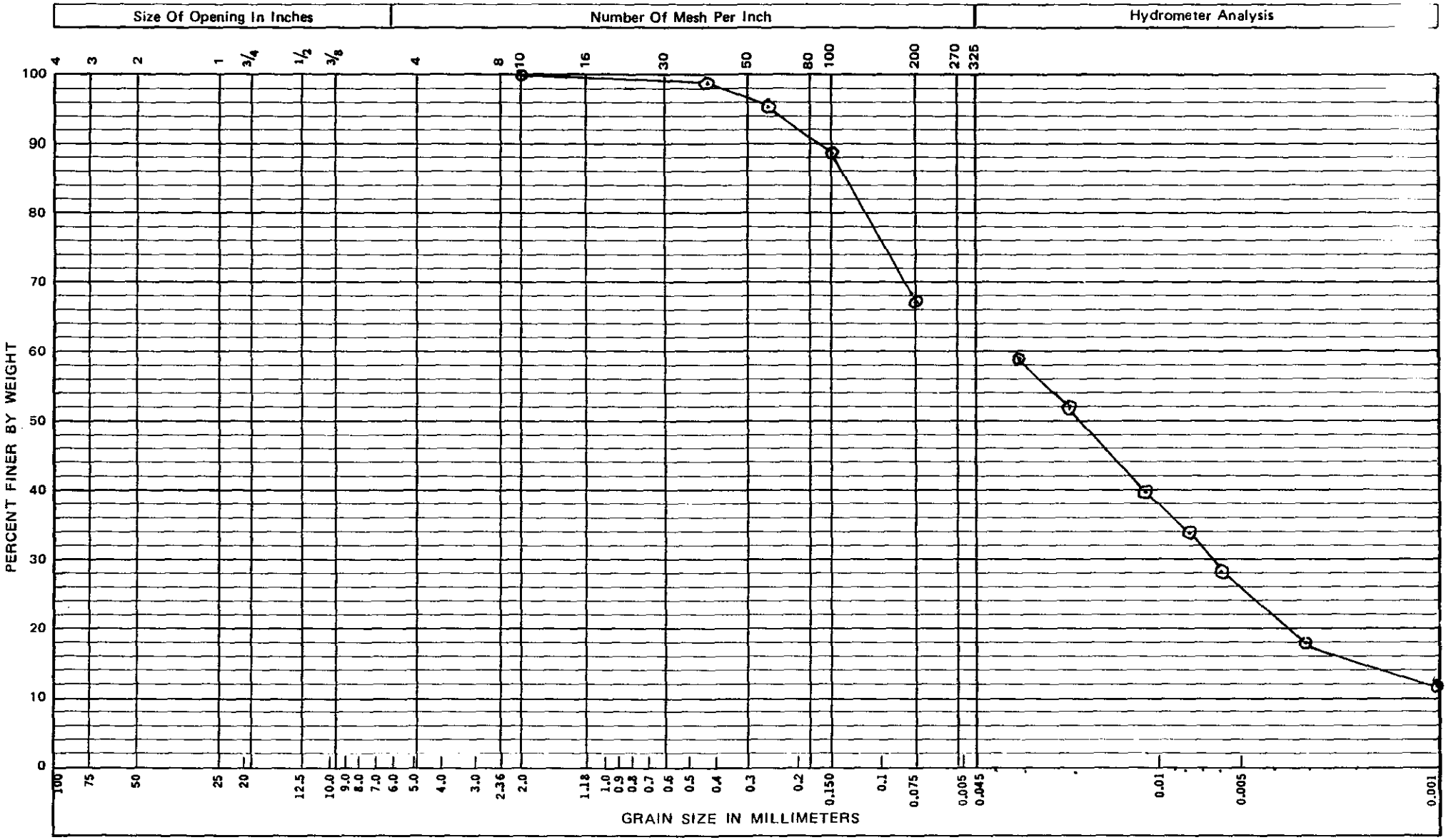
Checked By H C Benny Date 3-3-90

A-6400-204(2-87)

9 2 1 2 1 1 0 6 9

9 2 1 [illegible] 0 1 0 0

GRAIN SIZE ANALYSIS PLOT



Specimen No. O-078 Procedure No. ETHL-07 Rev. 1 Date Issued 11-15-89

Sample Description: Silty Sand
MW-2-4

Plotted by: R.G Alexander
Date: 2-21-90

Checked by: H.L Benny
Date: 3-3-90

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-14 REV. NO. Ø

THERMOMETER NO. 0007 CALIBRATION DUE DATE 8-16-90

SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
0-078	248.94	214.76	116.23	132.71	98.53	34.69

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: R.G ALEXANDER DATE 2-21-90

HYDROMETER ANALYSIS DATA SHEET

Sample ID 0-078 Page 1 of 1

Tested By R.G ALEXANDER Date 3-19-90

Procedure ETAL-07 Rev 1 Date Issued 11-15-89

EQUIPMENT ITEM	NO.	CALIBRATION DUE DATE
Hydrometer	1000	2-16-91
Balance	3304	3-25-90
Thermometer/Thermocouple	0002	2-9-91

Specific gravity of Sample 2.69

% Passing No. 10 Sieve 100 (%)

Hygroscopic Correction Factor _____

WEIGHT OF SAMPLE

Wt. Container + Soil N/A (g)

Wt. Container N/A (g)

Wt. Soil 67.11 (g)

COMPOSITE CORRECTION

1st Reading 5 at 23.8 °C

2nd Reading 5 at 23.4 °C

HYGROSCOPIC MOISTURE CONTENT

Wt. Container + Air Dry Soil N/A (g)

Wt. Container + Oven Dry Soil N/A (g)

Wt. Container N/A (g)

Water Content N/A (%)

REMARKS

TUBE A

W=

Pan # 7 116.11

Date	Clock time	Elapsed time (min)	Hydrometer reading	Hydrometer with composite correction	Temp. (°C)	Soil in suspension (%)	Particle diameter (mm)
3-19	0820	2.0	45	40	24.0	59.0	0.027
3-19	0825	5.0	39	34	24.1	50.2	0.018
3-19	0837	15.0	32	27	24.1	39.8	0.011
3-19	0848	30.0	28	23	24.0	33.9	0.008
3-19	0918	60.0	24	19	23.8	28.0	0.006
3-19	1228	250.00	17	12	24.2	17.7	0.003
3-20	0818	1,440.0	13	8	23.4	11.8	0.001

Formulas and Tables used to calculate percent Soil in suspension, particle diameter and hygroscopic correction factor are found in ASTM D422.

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By J J Relyea Date 3-21-90

SPECIFIC GRAVITY OF SOILS DATA SHEET

Specimen/Sample No. O-078 Page 1 of 1

Test Operator R.G. ALEXANDER 3-6-90

EQUIPMENT ITEM	NO.	DATE DUE
Balance	3304	3-25-90
Oven Thermometer	0007	8-16-90
Thermometer	0002	2-9-91
Pycnometer	2554	N/A

Wetting Agent "Q" WATER

	DETERMINATION NO.	1	2	3
	Drying Container No.	N/A	N/A	N/A
	Wt. Container + Oven Dry Soil, ± 0.01g	N/A .---	.---	.---
	Wt. Container, ± 0.01g	N/A .---	.---	.---
W_o	Wt. Oven Dry Soil, g	40 .00	.---	.---
	Pycnometer No.	2554		
	Wt. Pycnometer, g	135 .72	.---	.---
W_a	Wt. Pycnometer + Wetting Agent, g	387 .09	.---	.---
W_b	Wt. Pycnometer + Wetting Agent + Soil, g	412 .23	.---	.---
	Temperature, T_x at W_b, °C	23.2 C		
G_w	Specific Gravity of Wetting Agent at T_x	1.00	_.---	_.---
G_t	Specific Gravity of Soil at T_x	2.69	_.---	_.---
G_s	Specific Gravity of Soil at 20°C	2.69	_.---	_.---

$$G_t = \frac{G_{w^*} \gamma_{w^*} W_o}{W_o + (W_a - W_b)}$$

γ_w = Unit Weight Of Water (g/cc)

*$G_s = K \cdot G_t$

K values found in ASTM D854-58, Table 1

*NOTE $G_s = G_t$ When Test Run at 20 °c

Average Specific Gravity At 20°c	2.69

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By HCBenny Date 3-7-90

A-6400-235 (9-86)

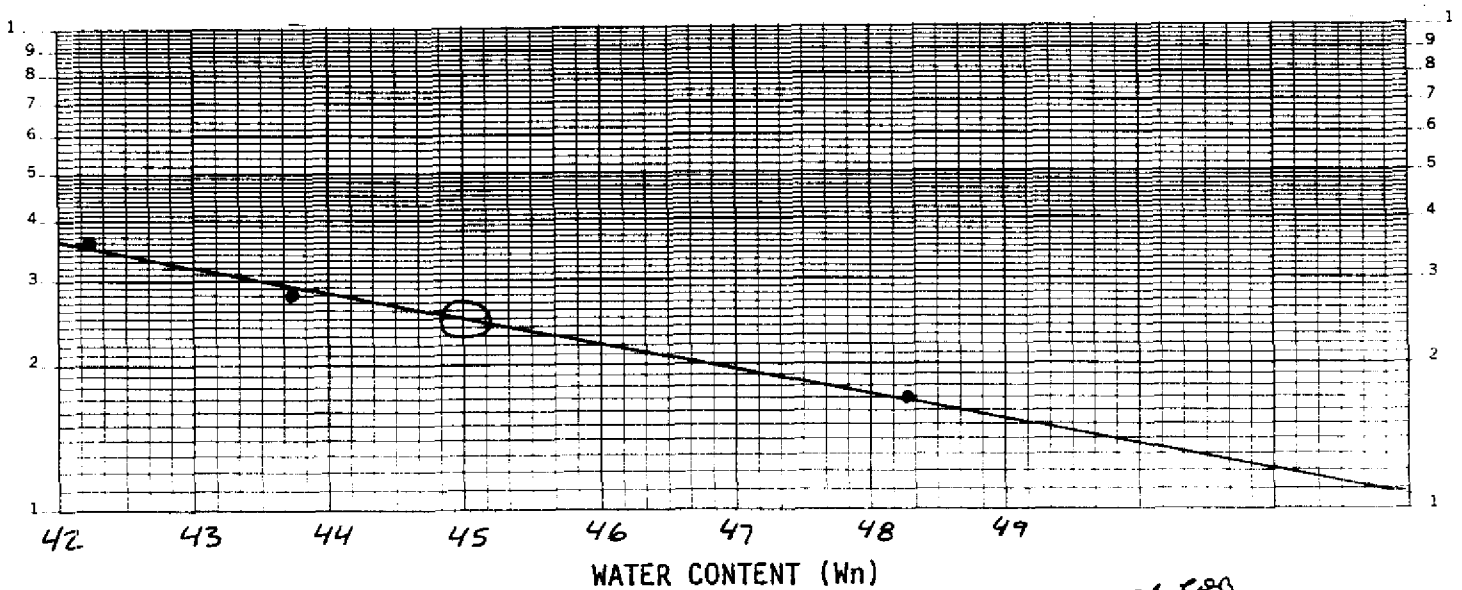
9211103

PLASTIC INDEX SOILS DATA SHEET

Sample No. O-078 Page 1 of 2

Test Operator HCBenny Date 4/9/90

Thermometer No. 0007 Calibration Date 8/16/90



Liquid Limit (LL) 45.0 Graph

Liquid Limit (LL) NA One Point

Moisture (LL) 45.0 %

Plastic Limit (PL) 41.33 (Avg.) 54 ZDB

Moisture (PL) 41.79 % 41.09 % 41.75 %

Plastic Index (PI)* 3.67 46 ZDB

*PI = LL − PL

Remarks

ALL DATA ARE ACCURATELY AND COMPLETELY RECORDED. ZDB 4/11/90
THE TEST OPERATOR WAS APPROPIATELY TRAINED AND ULITIZED CALIBRATED TEST INSTRUMENTS. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THIS DATA.

9211104

SOIL MOISTURE DATA SHEET

PROCEDURE NO. ETAL-018 REV. NO. Ø

THERMOMETER NO. 0007 CALIBRATION DUE DATE 8/16/90

Blows	SAMPLE NO.	WET WT. + CAN	DRY WT. + CAN	CAN WT.	WET WT. SOIL	DRY WT. SOIL	% WATER
	0-078-1	24.45	23.05	19.70	4.75	3.35	41.79
	-2	23.04	21.98	19.40	3.64	2.58	41.09
	-3	26.61	24.56	19.65	6.96	4.91	41.75
						Ave. % Water	41.3354 LDS
28	0-078-4	32.94	28.95	19.82	13.12	9.13	43.76
36	-5	32.80	28.94	19.79	13.01	9.15	42.19
17	-6	34.80	29.92	19.81	14.99	10.11	48.27
						Ave. % Water	44.72

LDS 4/16/90

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND TEST PROCEDURES FOLLOWED TO PRODUCE THE ABOVE DATA

TEST OPERATOR: DATE

HYDRAULIC CONDUCTIVITY OF SOILS DATA SHEET

Sample No. O-078 Page 1 of 5

Test Operator R.G. ALEXANDER Date 2-15-90

EQUIPMENT ITEM	NO.	DATE DUE
Balance	3304	3-25-90
Oven Thermometer	0007	8-16-90
Thermometer	N/A	N/A
Thermocouple		
Temperature Controller		
Pressure Gauge		
Pressure Transducer		
Pressure Transducer		
Back Pressure Gauge		
Pressure Transducer		
Pressure Transducer		
Calipers	5623	8-16-90
Load Frame	N/A	N/A
Data Logger		
N/A		
N/A		
N/A		

☐ Immediate (User) Calibration Performed. (Documentation To Be Attached)

Sample Preparation

PARTICLE SIZE (Sieve Mesh Range)

N/A	To	N/A
	To	
	To	
	To	
	To	
	To	
	To	

WEIGHT

N/A	%
	%
	%
	%
	%
	%
	%
Total	100 %

OTHER COMPONENTS

N/A	

N/A	%
	%
	%
Total	100 %

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By H.C. Benny Date 3-3-90

SAMPLE PREPARATION

Determine Weight of Samples in Container

Container No.	28
Wt. of Sample + Container, g	248.94
Wt. of Container, g	116.23
Wt. of Sample, g	132.71

Determine the Water Content of the "Air Dry" Sample

Container No.	28
Wt. Container & Wet Soil (A), g	248.94
Wt. Container & Dry Soil (B), g	214.76
Wt. of Water, g	34.18
Wt. of Container (C), g	116.23
Wt. of Dry Soil, W_s, g	98.53
Water Content (W), %	34.69

$$W = \left(\frac{A - B}{B - C}\right) 100$$

SAMPLE COMPONENT	SPECIFIC GRAVITY, G	LABORATORY NOTEBOOK DATA LOCATION
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By H L Benny Date 3-3-90

Sample No. O-078

SAMPLE COMPACTION

Compaction Method Static [N]/A Tamping [N]/A

STATIC or TAMPING	Load Applied, g/ Layer length, cm / No. Tamps per Layer/ Layer Length, cm	Layer 1	N/A	11	N/A
		2		12	
		3		13	
		4		14	
		5		15	
		6		16	
		7		17	
		8		18	
		9		19	
		10		20	

Total No. of Layers N/A

INTACT SAMPLE CUT FROM 4" STEEL LINER

Tamper Foot Diameter cm	N/A
Tamper Applied Load, g	N/A
Sample Diameter, (d), cm	9.82
Sample Length, (L), cm	6.12
Sample Mold or Permeameter Weight & Compacted Sample, g	1151.25
Sample Mold or Permeameter Weight, g	246.08
Weight of Compacted Sample, (E), g	905.17
Weight of Container & Uncompacted Wet Sample, (A), g	248.94
Weight of Container & Uncompacted Dry Sample, (B), g	214.76
Weight of Water, g	34.18
Weight of Container, (C), g	116.23
Weight of Dry Soil, (WS), g	98.53
Water Content, %	34.69
Compacted Bulk Density of Sample, (γm), g/cc	1.95
Compacted Sample Dry Density, (γd), g/cc	1.45

$$\gamma m = \frac{E}{(\pi)\,(d/2)^2 (L)}$$

$$\gamma d = \left(\frac{\gamma m}{W + 100}\right) 100$$

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By H. Benay Date 3-3-90

HYDRAULIC CONDUCTIVITY DATA SHEET

Sample ID. O-078 Page 4 of 5

Procedure No. ETAL-09 Date Issued 12-1-89

DATE	TIME			VOLUME DETERMINANTS							
				Effluent		Container			Pressure		
Year 90 (Mo/Day)	System Down (Hr: Min)	System Up (Hr: Min)	Time Change (Hr: Min)	Temp (°C)	Weight (±0.1g)	Tare (±0.1g)	Tare & Effluent (±0.1g)	System Temp (°C)	Pore H_2O ~~(psi)~~	Back H_2O (psi)	Operator Initials
2-22	—	0900	—	—	—	61.09	—	—	50	N/A	RGA
2-22	1320	1325	4:20	22	16.10	61.09	77.19	22	50	N/A	RGA
2-22	1500	1500	1:35	22	5.48	61.09	66.57	22	50	N/A	RGA
2-23	1000	1000	19:00	21	81.26	150.48	231.74	21	50	N/A	RGA
2-23	1445	1445	4.45	22	19.53	61.09	80.62	22	50	N/A	RGA
2-26	0745	0755	65:00	21	348.02	150.48	498.50	21	60	N/A	RGA
2-26	1810	STOP	5:15	22	29.91	61.09	90.00	22	60	N/A	RGA
2-26	STOP	TEST	—	—	—	—	—	—	—	—	RGA

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By H L Benny Date 3-3-90

A-6400-234.2 (7-86)

9211-1-0009

HYDRAULIC CONDUCTIVITY DATA SHEET

Sample ID 0-078 Page 5 of 5

Procedure No. ETAC-09 Date Issued 12-1-89

Date Year 90 (Mo/Day)	Hydraulic Conductivity (cm/sec)	Hydraulic Gradient (cm/cm)	Effluent Analysis (Sample Number)	Effluent Analysis Lab. Notebook Location	Effluent Description	Operator Initials
2-22	START	TEST	—	—	CLEAR	RGA
2-22	2.37×10^{-8}	574.71	—	—	CLEAR	RGA
2-22	2.21×10^{-8}	574.71	—	—	CLEAR	RGA
2-23	2.73×10^{-8}	594.71	—	—	CLEAR	RGA
2-23	2.62×10^{-8}	594.71	—	—	CLEAR	RGA
2-26	2.85×10^{-8}	689.66	—	—	CLEAR	RGA
2-26	2.93×10^{-8}	689.66	—	—	CLEAR	RGA
STOP	TEST	2.7 +/- 0.3 $\times 10^{-8}$ CM/SEC			—	RGA

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By H C Benny Date 3-3-90

Westinhouse Hanford Company	CHAIN OF CUSTODY

Company Contact Jon Lindberg Telephone 6-5005

Sample Collected by K.M. Singleton Date 1-25,26,29,30-90 Time NA

Sample Locations 1100 Em-1, MW2

Ice Chest No. NA Field Logbook and Page No. WHC-N-306-5 pgs 6-7

Remarks

Bill of Lading No. NA Offsite Property No. NA

Method of Shipment Jerry Alexander / Truck

Shipped to 2101-M, 200E

Sample Identification

1) MW-2-1, plastic bag soil; Test: Grain & Moisture

2) MW-2-2, plastic bag soil; Grain Size & Moisture Tests

3) MW-2-3, plastic bags soil; Grain Size Test

4) MW-2-4 1, plastic bag soil; Test: Grain Size, Moisture, permeameter Atberg. Limits

Chain of Possession

Relinquised by:	Received by:	Date/Time:
K.M. Singleton	R.G. ALEXANDER R.G. Alexander	2-6-90 / 0630
Relinquised by:	Received by:	Date/Time:
Relinquised by:	Received by:	Date/Time:
Relinquised by:	Received by:	Date/Time:

A-6000-407 (07/89)

Westinghouse
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector: K.M. Singleton Date Sampled: 1-25, 26, 27, 28-90 Time: NA hours

Company Contact Jon Lindberg Telephone ( ) 6-5005

SAMPLE NUMBER	NUMBER & TYPE OF SAMPLE CONTAINERS	TYPE OF SAMPLE *	ANALYSIS REQUESTED
MW-21	1 plastic bag	soil	Grain Size & Moisture
MW-22	1 plastic bag	soil	Grain Size & Moisture
MW-23	1 plastic bag	soil	Grain Size
MW-24	1 plastic bag	soil	Grain Size, A. Limits & permeameter

Field Information **: MW-2 is also contained in a stainless steel liner

Special Handling and/or Storage

PART II: LABORATORY SECTION

Received by Title Date

Analysis Required

* Indicate Whether Sample Is Soil, Sludge, Water, Etc.
** Use Back of Page for Additional Information Relative to Sample Location.

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on outside of bag.
MW 2-1

54-3000-022 (09/88)

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on all accessible surfaces outside of bag.
MW-2-2

54-3000-022 (09/88)

RADIATION RELEASE

~~Bldg.~~ MW-2 Date 1-26-90

Released By Boyd
Operational Health Physics

Remarks <D on outside of bag.
MW-2-3

54-3000-022 (09/88)

SURVEYED BY RM FOR SHIPMENT

Dose rate – side of container	<D mr-hr
Max. dose rate through the container	mr-hr
Dose rate to handle container	mr-hr
Dose rate at nearest approach on conveyance	mr-hr
External contamination	
SWP and RSR required	Yes ☐ No ☒

SURVEYED BY TE Baldwin 6C670

DATE 1/30/90

MW-2-4

54-6800-009(1-86)