THE CONTENTS OF THIS SECTION ARE
THE HIGHEST QUALITY AVAILABLE

INITIAL [illegible] DATE 9/27/02

PAGE NUMBERING SEQUENCE IS INCONSISTENT

Appendix A

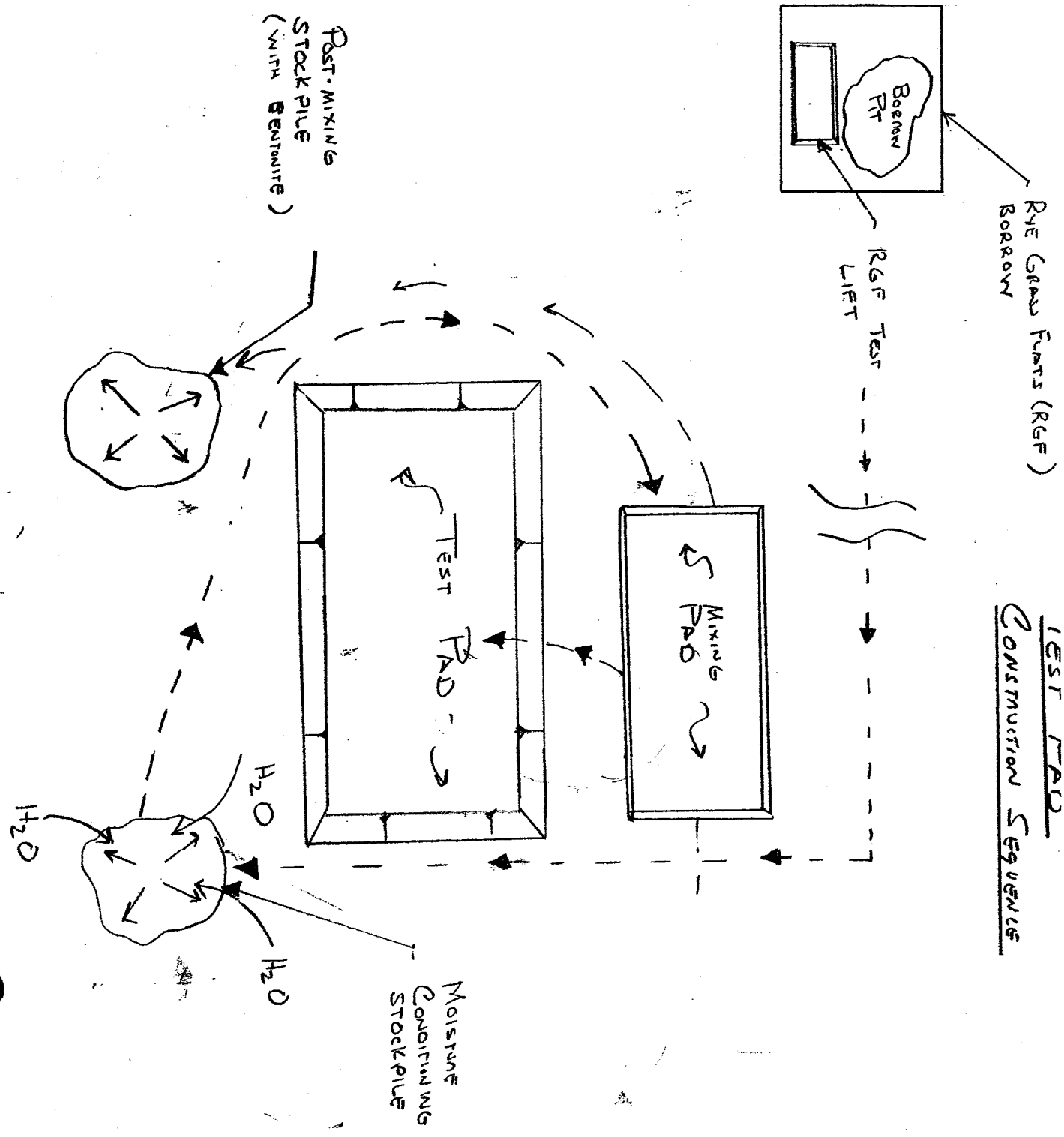
Geotechnical Test Results from Phase I Construction

Test Pad Layout Sketches

MONTGOMERY WATSON
Mining Group

Project Name: ICDF TEST PAD
Project Number:
Prepared By: P. CROUSE
Checked By: P. CROUSE

Sheet: 1 of 1
Date: 09/05/01
Date: 09/05/01

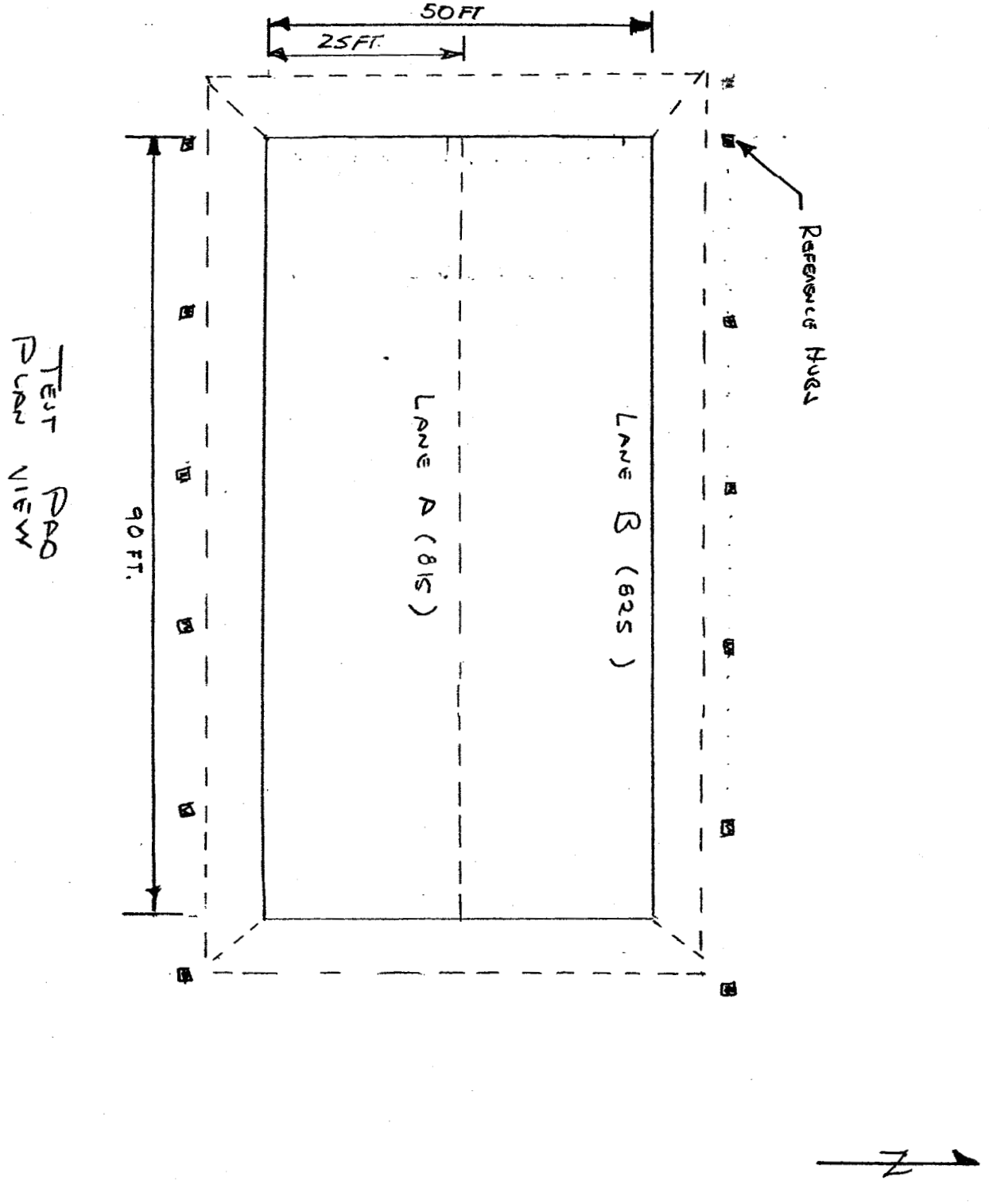


TEST PAD CONSTRUCTION SEQUENCE

MONTGOMERY WATSON
Mining Group

Project Name: ICDF TEST PAD
Project Number:
Prepared By: P. CROUSE
Checked By: P. CROUSE

Sheet: 1 of 1
Date: 09/05/01
Date: 09/05/01



Results of MW Field Tests

MOISTURE CONTENT OF SOIL

Sample Number	8-30	8-30	8-30	8-30		
Sample Depth	815 lare	825 lare	Same	Same		
Tare Number	Z-3	Z-1	A-1	Z-3	A-1	Z-1
Weight Wet Soil and Tare (g)	371.74	349.96	360.76	339.87	373.12	343.62
Weight Dry Soil and Tare (g)	352.26	325.10	335.84	318.80	348.26	322.63
Weight of Water (g)	25.48	24.86	24.92	21.07	24.86	20.99
Weight of Tare (g)	206.62	198.09	206.38	206.46	206.17	198.02
Weight of Dry Soil (g)	145.74	127.01	129.46	112.34	142.09	124.61
Moisture Content (%)	17.5	19.6	19.2	18.8	17.5	16.8

Sample Number						
Sample Depth	JP Repair	JP Repair				
Tare Number	Z-1	Z-3				
Weight Wet Soil and Tare (g)	351.49	360.63				
Weight Dry Soil and Tare (g)	330.02	338.00				
Weight of Water (g)	21.47	22.63				
Weight of Tare (g)	198.10	206.36				
Weight of Dry Soil (g)	131.92	131.64				
Moisture Content (%)	16.3	17.2				
	815	825				

Sample Number						
Sample Depth						
Tare Number						
Weight Wet Soil and Tare (g)						
Weight Dry Soil and Tare (g)						
Weight of Water (g)						
Weight of Tare (g)						
Weight of Dry Soil (g)						
Moisture Content (%)						

Sample Number						
Sample Depth						
Tare Number						
Weight Wet Soil and Tare (g)						
Weight Dry Soil and Tare (g)						
Weight of Water (g)						
Weight of Tare (g)						
Weight of Dry Soil (g)						
Moisture Content (%)						

Project Name:	
Sample Location:	
Sample Source:	
Sample Description:	
Technician:	
Project No:	Date:

MONTGOMERY WATSON

338.38
338.20
338.07

349.03
348.58

2454

330.53

Moisture Content Test Form.xls

MOISTURE CONTENT OF SOIL

Sample Number	8-28	8-28	8-28	8-28	8-28	8-29
Sample Depth	Mixing Pad	Mixing Pad	Batch #6	Batch 6	Batch #6	Batch #7
Tare Number	A-1	Z-3	A-1	Z-3	Z-1	A-1
Weight Wet Soil and Tare (g)	333.66	368.0	353.88	350.22	320.49	335.91
Weight Dry Soil and Tare (g)	317.78	344.4	336.50	332.62	303.57	316.72
Weight of Water (g)	15.88	23.6	17.38	17.60	16.92	19.19
Weight of Tare (g)	206.34	206.8	206.42	206.86	197.80	206.34
Weight of Dry Soil (g)	111.44	137.6	130.08	125.76	105.77	109.85
Moisture Content (%)	14.2	17.2	13.4	14.00	16.0	17.5

Sample Number	8-29	8-29	8-29	8-29	8-29	8-29
Sample Depth	815 lane	825 lane	Density	Batch #8	Test Pad	Batch #8
Tare Number	Z-3	Z-3	Z-3	Z-1	A-1	Z-3
Weight Wet Soil and Tare (g)	323.98	340.40	321.59	340.71	321.18	370.74
Weight Dry Soil and Tare (g)	306.83	321.35	307.15	321.61	305.86	345.52
Weight of Water (g)	17.15	19.05	12.44	18.56	15.32	25.22
Weight of Tare (g)	206.62	206.59	206.58	198.21	206.48	206.65
Weight of Dry Soil (g)	100.21	114.76	102.57	123.40	99.38	138.87
Moisture Content (%)	17.1	16.6	12.1	15.0	15.4	18.2

Sample Number	8-29	8-29	8-29	8-29	8-29	8-30
Sample Depth	Test Pad	815	825	After 825	Batch #8	815
Tare Number	Z-1	A-1	Z-1	Z-1	A-1	A-1
Weight Wet Soil and Tare (g)	352.26	363.83	381.70	398.10	334.62	366.06
Weight Dry Soil and Tare (g)	332.60	340.71	355.12	371.33	316.68	342.95
Weight of Water (g)	20.26	23.12	26.58	26.77	17.94	23.11
Weight of Tare (g)	198.20	206.40	198.20	198.26	206.33	206.19
Weight of Dry Soil (g)	133.80	134.31	156.92	173.07	110.35	136.76
Moisture Content (%)	15.1	17.2	16.94	15.5	16.3	16.96

Sample Number	8-30	8-30	8-30	8-30	8-30	8-30
Sample Depth	815	Recheck 825	825 lane	825 lane	825 lane	825 lane
Tare Number	Z-3	Z-1	A-1	Z-1	A-1	Z-1
Weight Wet Soil and Tare (g)	376.93	324.96	378.42	384.15	364.89	363.28
Weight Dry Soil and Tare (g)	350.88	304.80	349.34	359.93	339.30	336.80
Weight of Water (g)	26.05	20.16	29.08	34.22	25.59	26.48
Weight of Tare (g)	206.42	198.11	143.04	198.06	206.57	198.03
Weight of Dry Soil (g)	144.46	106.69	[illegible]	161.87	132.79	138.77
Moisture Content (%)	18.0	18.7	20.3	21.1	19.3	19.0

206.30
368.22
367.34

Project Name:	
Sample Location:	
Sample Source:	
Sample Desription:	
Technician:	
Project No:	Date:

MONTGOMERY WATSON

Moisture Content Test Form.xls

MOISTURE CONTENT OF SOIL

Sample Number	8-20	8-21	8-21	8-21	8-21	
Sample Depth	25' center	Density	center	W end	center	
Tare Number	Z-3	Z-1	A-1	Z-3	A-1	
Weight Wet Soil and Tare (g)		333.9	307.2	314.6	298.8	
Weight Dry Soil and Tare (g)		315.4	294.4	301.6	282.4	
Weight of Water (g)		18.5	12.8	13.0	11.4	
Weight of Tare (g)		197.9	206.1	206.3	206.1	
Weight of Dry Soil (g)		117.5	88.3	95.3	81.3	
Moisture Content (%)		15.7	14.6	13.6	13.5	

After 3 passes w/ Dump Truck

Sample Number	8-24	8-24	8-24	8-24	8-24	8-24-011
Sample Depth	12a@	Mixed	Density	Mixed Mat.	Mixed Mat	Mixed Mat
Tare Number	Z-3	Z-1	A-1	A-1	Z-1	Z-3
Weight Wet Soil and Tare (g)	347.63	335.21	347.3	328.8	324.3	3
Weight Dry Soil and Tare (g)	333.5	317.23	332.33	317.2	308.7	
Weight of Water (g)	14.13	17.98	14.97	12.6	15.6	
Weight of Tare (g)	206.48	198.09	206.3	206.3	197.9	206.6
Weight of Dry Soil (g)	127.02	119.14	126.03	110.9	110.8	
Moisture Content (%)	11.1%	15.09	11.9	11.4	14.0	

Sample Number	8-24-Q	8-27	8-27	8-27	8-27	8-27
Sample Depth	Mixed Mat	Mixed	Raw	Mixed	Mixed	Density
Tare Number	A-1	A-1	Z-1	Z-3	Z-3	A-1
Weight Wet Soil and Tare (g)	335.7	330.53	308.05	322.73	349.94	312.2
Weight Dry Soil and Tare (g)	318.3	316.96	297.34	309.15	331.95	301.0
Weight of Water (g)	17.4	13.57	10.71	13.58	17.99	11.2
Weight of Tare (g)	206.25	206.10	198.09	206.44	206.48	205.9
Weight of Dry Soil (g)	112.05	110.86	99.3	102.71	125.47	95.1
Moisture Content (%)	15.5%	12.2%	10.8%	13.2%	14.3	11.8%

Sample Number	8-27	8-27	8-27	8-28	8-28	8-28
Sample Depth	Batch #5	Batch #5	Batch #5	Batch #6	Mixed	Raw
Tare Number	Z-3	A-1	Z-1	A-1	Z-1	Z-3
Weight Wet Soil and Tare (g)	310.53	342.36	317.22	325.09	335.02	323.93
Weight Dry Soil and Tare (g)	300.05	324.66	304.23	309.82	314.65	311.15
Weight of Water (g)	10.48	17.7	13.0	15.27	20.37	12.78
Weight of Tare (g)	206.30	206.30	198.88	206.31	198.15	206.58
Weight of Dry Soil (g)	93.75	118.36	106.35	103.51	116.50	104.57
Moisture Content (%)	11.2	14.95%	12.2	14.75	17.5	12.2

Project Name:	
Sample Location:	
Sample Source:	
Sample Description:	
Technician:	
Project No:	Date:

MONTGOMERY WATSON

MOISTURE CONTENT OF SOIL

	8-10	8-10	8-13	8-13		
Sample Number	1	2	8-13	8-13	8-13 After All Bent	
Sample Depth						
Tare Number	G1	#26	#26	G1	G1	
Weight Wet Soil and Tare (g)	306.78	351.30	267.61	267.73	266.27	
Weight Dry Soil and Tare (g)	294.19	322.57	251.33	250.99	249.81	
Weight of Water (g)	12.59	28.73	16.28	16.74	16.46	
Weight of Tare (g)	134.01	134.50	133.81	134.83	134.28	
Weight of Dry Soil (g)	160.18	188.07	117.52	116.16	115.53	
Moisture Content (%)	7.86%	15.28%	13.85	14.41	14.24	

RGF

			Tarped	un-tarped		
Sample Number	8-16	8-16	8-16			
Sample Depth						
Tare Number	A-1	2-1	2-3			
Weight Wet Soil and Tare (g)	308.4	320.12	313.97			
Weight Dry Soil and Tare (g)		302.12	303.36			
Weight of Water (g)		13.0	10.61			
Weight of Tare (g)	206.47	198.23	206.63			
Weight of Dry Soil (g)		103.9	107.34			
Moisture Content (%)		11.9	9.9			

Sample Number BKC	8-17	8-17	8-17	8-17	8-17	8-17
Sample Depth	0.5ft	0.5ft	0.5ft	0.5ft SE	0.5ft SW	0.5ft NW
Tare Number	2-1	A-1	2-3	2-1	2-3	A-1
Weight Wet Soil and Tare (g)	309.90 311.20 BKC	317.10	311.20	304.37	334.70	310.62
Weight Dry Soil and Tare (g)	293.50	306.30	299.93	304.37	311.95	295.68
Weight of Water (g)	16.00	10.80	11.77	14.00	22.75	14.94
Weight of Tare (g)	198.23	206.47	206.63	198.23	206.63	206.63 BKC
Weight of Dry Soil (g)	95.27	99.83	92.80	104.14	105.32	89.20
Moisture Content (%)	16.79	10.8	12.68	10.0	21.6	16.75

BEFORE #7 ICDF

Sample Number	8-20	8-20	8-20	8-20	8-20	8-20
Sample Depth	0.5ft center	0.5ft NE	0.5 SE	0.5ft SE	0.5ft Sent	.5ft SE
Tare Number	2-1	2-3	A-1	A-1	2-3	2-3
Weight Wet Soil and Tare (g)	347.71	349.66	354.29	354.29	337.73	327.44
Weight Dry Soil and Tare (g)	330.78	330.13	334.47	334.47	319.18	311.15
Weight of Water (g)	16.93	19.53	19.82	19.82	18.55	18.29
Weight of Tare (g)	198.19	206.57	206.31	206.31	206.52	206.57
Weight of Dry Soil (g)	132.59	123.56	128.16	128.16	113.03	104.56
Moisture Content (%)	12.77	15.81	15.47	15.47	16.4	17.49

Project Name:	INEEL ICDF
Sample Location:	
Sample Source:	
Sample Description:	
Technician:	BGA
Project No:	Date:

MONTGOMERY WATSON

Moisture Content Test Form.xls

STRUCTURAL FILLS/SOILS NUCLEAR DENSITY TEST RESULTS

Test Number	Location	Depth Or Elevation	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Dry Density (pcf)	Moisture Density Content (%)	Compaction Act. (%)	Compaction Req. (%)	Proctor Number & Soil Description
1	200' N 200' W of E edge evap ponds	SG	123.1		118.5	8.5	96.2		
2	100' N 200' W evap pond	SG	123.1		120.5	6.5	97.9		
3	100' N 100' W evap pond	SG	123.1		126.8	8.2	103.0		
4	Mixing pad sacrificial layer	+1'	110.8	15.7	99.2	9.6	89.5		East end Modified
5	Mixing pad sacrificial layer	+½'	110.8	15.7	97.4	14.9	87.9		West end Proctor

PROCTOR No. 1 DATA:
Max Dry Density (pcf): 123.1 Soil Type: upper silt material (evap pond)
Optimum Moisture Content (%): 9.3

PROCTOR No. 2 DATA:
Max Dry Density (pcf): 110.8 Soil Type: Rye Grass Flats TP Comp 4H
Optimum Moisture Content (%): 15.7

GAUGE DATA:
Gauge No.: 24227 Standard Count Density: 2632
Gauge Correction Factor: — Standard Count Moisture: 639

NOTES:
BSG = Below Subgrade Grade
SG = Subgrade Grade
SBG = Subase Grade
BSBG = Below Subase Grade
BCG = Base Course Grade

MONTGOMERY WATSON
1475 Pine Grove Road
P.O. Box 774018
Steamboat Springs, Colorado 80477

Project Name: INEEL ICDF		
Project Location:		
Project No.:	Technician: BGM	Date: 8-15-01

STRUCTURAL FILLS/SOIL NUCLEAR DENSITY TEST RESULTS

STRUCTURAL FILLS/SOILS NUCLEAR DENSITY TEST RESULTS

Test Number	Location	Depth Or Elevation	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Dry Density (pcf)	Moisture Density Content (%)	Compaction Act. (%)	Compaction Req. (%)	Proctor Number & Soil Description
1	150' N 100' W evaporation ponds	SG	130.4		125.6	6.9	96.3		
2	200' N 150' W evaporation ponds	SG	123.1		117.9	6.8	95.8		
3	350' N 100' W evaporation ponds	SG	123.1		108.6	8.1	88.2		
4	400' N ~~100'~~ 200' W evap ponds	SG	123.1		121.3	6.8	98.6		
5	300' N ~~100~~ 150' W evaporation ponds	SG	123.1		117.6	9.1	95.5		
6	400' S 200' W evaporation ponds	SG	123.1		121.6	9.2	98.8		
7	150' S ~~100~~ 200' west evap ponds	SG	123.1		122.9	8.7	99.8		
8	Mixing Pad West end	Grade	110.8		101.9	10.7	92.0		Use Rye Grass Tests Modified Proctor from Soil Amendment Study w/ 0% Bent.
9	Mixing Pad East End	Grade	110.8		102.3	9.2	92.3		

PROCTOR No. 1 DATA:
Max Dry Density (pcf): 123.1 Soil Type: Upper silt material (evap ponds)
Optimum Moisture Content (%): _____

PROCTOR No. 2 DATA:
Max Dry Density (pcf): 130.4 Soil Type: lower silt/Gravel (evaporation Ponds)
Optimum Moisture Content (%): _____

GAUGE DATA:
Gauge No.: 24227 Standard Count Density: 2634
Gauge Correction Factor: — Standard Count Moisture: 632

NOTES:
BSG = Below Subgrade Grade
SG = Subgrade Grade
SBG = Subase Grade
BSBG = Below Subase Grade
BCG = Base Course Grade

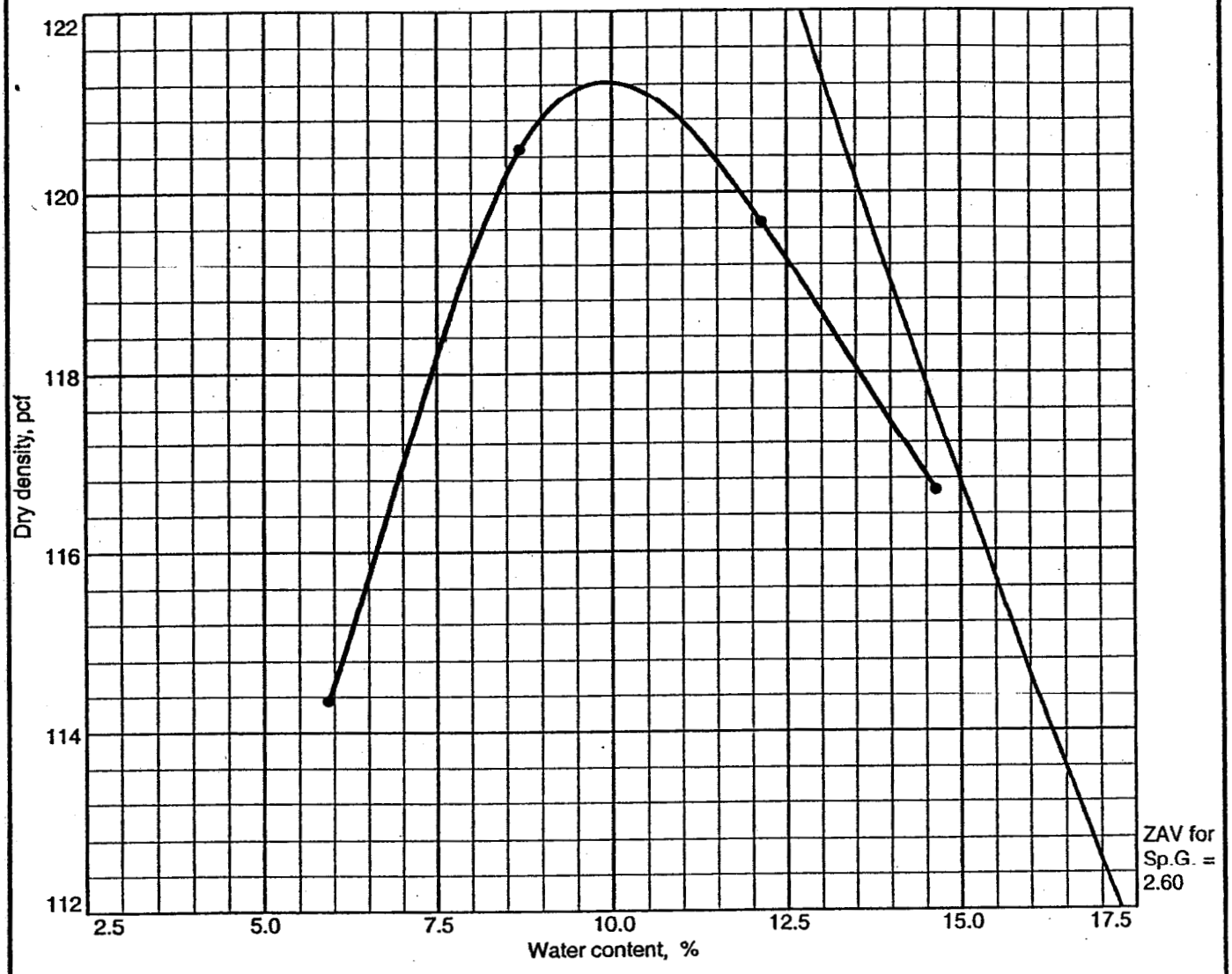
Project Name: INEEL ICDF		
Project Location:		
Project No.:	Technician: BGA	Date: 8-16-01

MONTGOMERY WATSON
1475 Pine Grove Road
P.O. Box 774018
Steamboat Springs, Colorado 80477

STRUCTURAL FILLS/SOIL NUCLEAR DENSITY TEST RESULTS

Construction Quality Assurance Laboratory Results

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Method C Standard
Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
Surface	SC-SM	A-2-4(0)	4.4%	2.60	23	5	5.9	33.9

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 123.1 pcf	121.2 pcf	Silty, clayey sand with gravel
Optimum moisture = 9.3 %	9.9 %	

Project No. S01-588058 **Client:** Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
• **Location:** SG-1 located at 75'south and 45' east of Sampling Well

Remarks:
Sampled on 8/1/01 by Stacey Lilya and Eric Olhoffer. Sample is surface soils on the Evap. Pond.
SG #1

COMPACTION TEST REPORT

INEL MATERIALS LAB

Plate

MOISTURE DENSITY TEST DATA

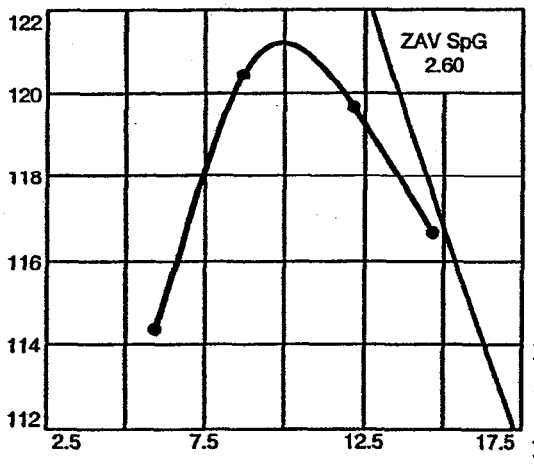
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Specimen Data

Source: Site Sampled soils from Evap Pond
Sample No.: #SG-1
Elev. or Depth: Surface **Sample Length (in./cm.):**
Location: SG-1 located at 75'south and 45' east of Sampling Well
Description: Silty, clayey sand with gravel
USCS Classification: SC-SM **AASHTO Classification:** A-2-4(0)
Natural Moisture: 4.4% **Liquid Limit:** 23 **Plasticity Index:** 5
Testing Remarks: Sampled on 8/1/01 by Stacey Lilya and Eric Olhoffer. Sample is surface soils on the Evap. Pond.
Percent retained on 3/4 in. sieve: 5.9
Percent passing No. 200 sieve: 33.9 **Specific gravity:** 2.60

Test Data And Results For Curve #1

Type of test: ASTM D 698-91 Method C Standard

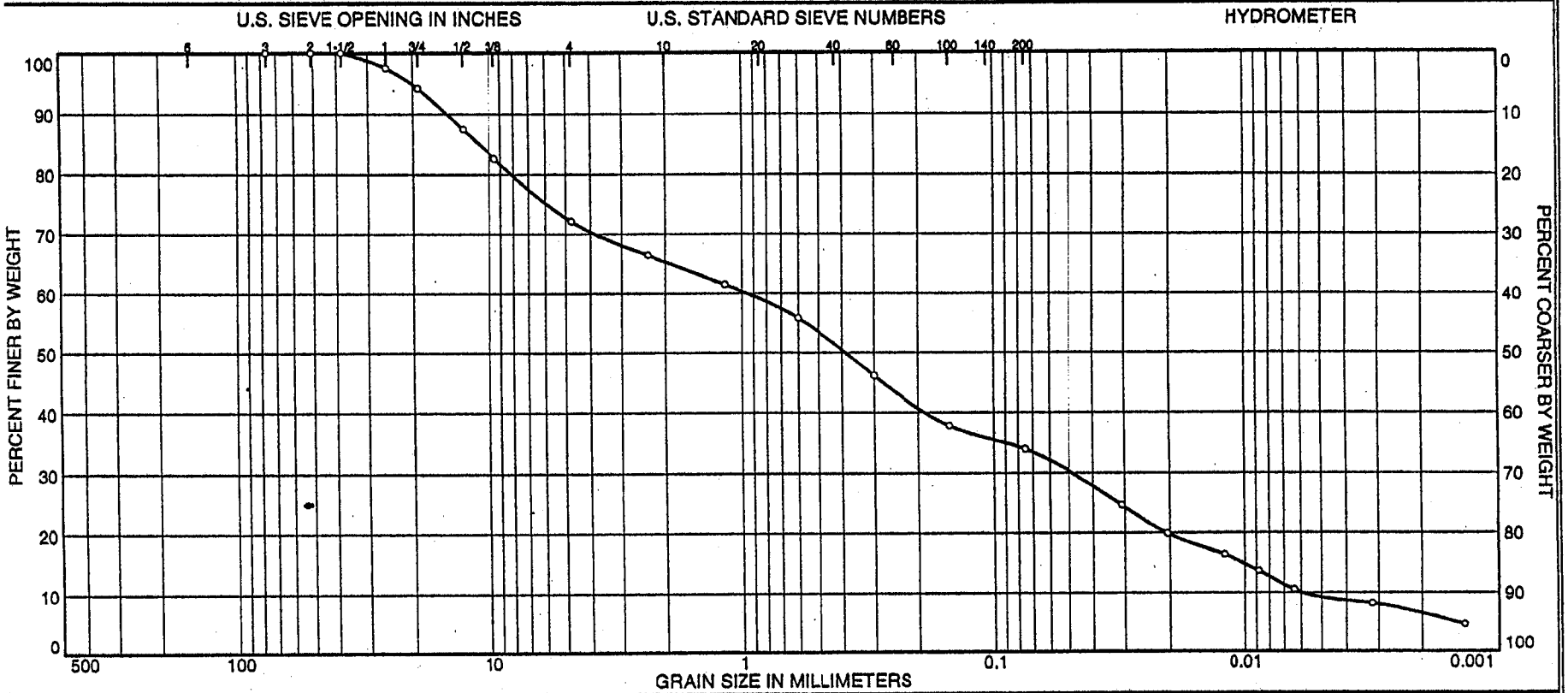


POINT NO.	1	2	3	4
WM + WS	10645.0	10980.0	11090.0	11075.0
WM	6525.0	6525.0	6525.0	6525.0
WW+T	466.00	391.30	453.80	458.80
WD+T	440.00	360.00	404.70	400.20
TARE	0.00	0.00	0.00	0.00
MOIST	5.9	8.7	12.1	14.6
MOISTURE	5.9	8.7	12.1	14.6
DRY DEN	114.4	120.5	119.7	116.7

Max dry den= 123.1 pcf **Opt moisture=** 9.3 %
Uncorrected Results: **Max dry den=** 121.2 pcf **Opt moisture=** 9.9 %

ASTM D 4718 Correction Data:
Bulk Specific Gravity of Oversize Material = 2.60
Moisture of Oversize Material = NA %
Corrections Applied to Calculated Maximum Density and Optimum Moisture Values

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
O	0.0	5.9	22.0	6.8	14.0	17.4	24.7	9.2

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
O	Site Sampled soils from Evap Pond	#SG-1	Surface	8/01/01	SC-SM	Silty, clayey sand with gravel	4.4%	23	18

Client Tom Borschel/ICDF Project
Project INTEC CERCLA Disposal Facility
CH2M Hill
Project No. S01-588058 Plate

INEL MATERIALS LAB

O Sampled by Stacey Lilya and Eric Olhoffer on 8/1/01. Sample is top 6-8" of existing soils.

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Site Sampled soils from Evap Pond
Sample No.: #SG-1
Elev. or Depth: Surface **Sample Length (in./cm.):**
Location: SG-1 located at 75'south and 45' east of Sampling Well
Description: Silty, clayey sand with gravel
Date: 8/01/01 **Natural Moisture:** 4.4%
Liquid Limit: 23 **Plastic Limit:** 18 **USCS Class.:** SC-SM
Testing Remarks: Sampled by Stacey Lilya and Eric Olhoffer on 8/1/01. Sample is top 6-8" of existing soils.

Mechanical Analysis Data

		Initial
Dry sample and tare	=	8090.00
Tare	=	0.00
Dry sample weight	=	8090.00

Sample split on number 4 sieve
Split sample data:
Sample and tare = 465.30 **Tare** = .00 **Sample weight** = 465.30

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
3 inch	0.00	0.00	100.0
2 inch	0.00	0.00	100.0
1.5 inch	0.00	0.00	100.0
1 inch	205.00	0.00	97.5
0.75 inch	275.00	0.00	94.1
0.50 inch	535.00	0.00	87.5
0.375 inch	390.00	0.00	82.6
# 4	850.00	0.00	72.1
# 8	36.10	0.00	66.5
# 16	32.40	0.00	61.5
# 30	35.80	0.00	55.9
# 50	63.60	0.00	46.1
# 100	53.60	0.00	37.8
# 200	24.80	0.00	33.9

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 65.2
Weight of hydrometer sample: 84.3
Calculated biased weight= 129.29
Automatic temperature correction
Composite correction at 20 deg C = -4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.60

Specific gravity correction factor= 1.012
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

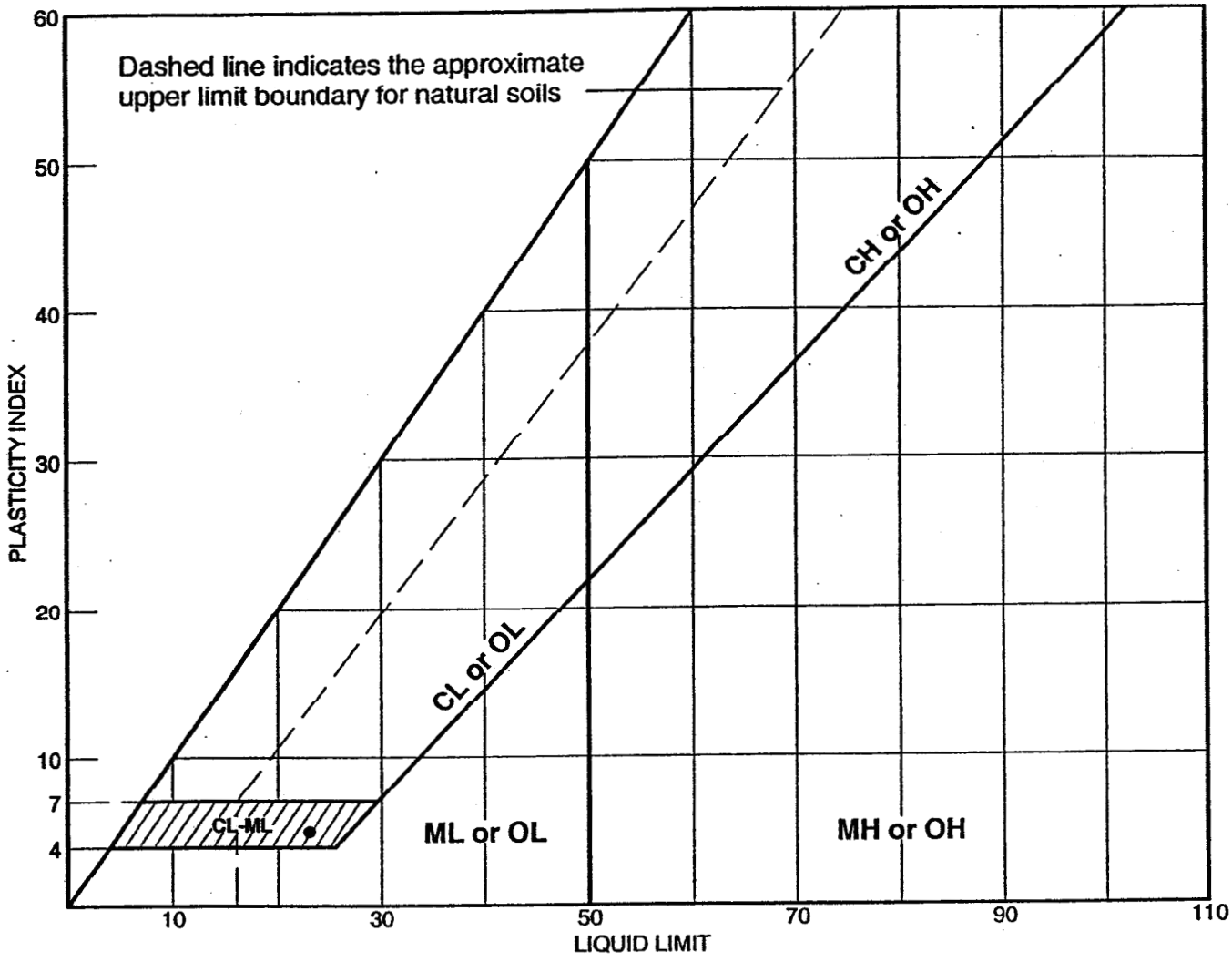
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.0	35.0	36.0	0.0135	36.0	10.4	0.0308	24.6
5.00	22.0	29.0	30.0	0.0135	30.0	11.4	0.0204	19.9
15.00	22.0	24.5	25.5	0.0135	25.5	12.1	0.0121	16.4
30.00	22.0	21.0	22.0	0.0135	22.0	12.7	0.0088	13.6
60.00	22.0	17.0	18.0	0.0135	18.0	13.3	0.0064	10.5
250.00	22.0	14.0	15.0	0.0135	15.0	13.8	0.0032	8.2
1440.00	22.0	9.5	10.5	0.0135	10.5	14.6	0.0014	4.6

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 27.9 (% coarse = 5.9 % fine = 22.0)
% SAND = 38.2 (% coarse = 6.8 % medium = 14.0 % fine = 17.4)
% SILT = 24.7 % CLAY = 9.2

D_{85}= 10.97 D_{60}= 0.95 D_{50}= 0.39
D_{30}= 0.05 D_{15}= 0.01 D_{10}= 0.01
C_c= 0.416 C_u= 160.9405

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Site Sampled	#SG-1	Surface	4.4%	18	23	5	SC-SM

LIQUID AND PLASTIC LIMITS TEST REPORT

INEL MATERIALS LAB

Client: Tom Borschel/ICDF Project

Project: INTEC CERCLA Disposal Facility
CH2M Hill

Project No.: S01-588058 **Plate**

LIQUID AND PLASTIC LIMIT TEST DATA

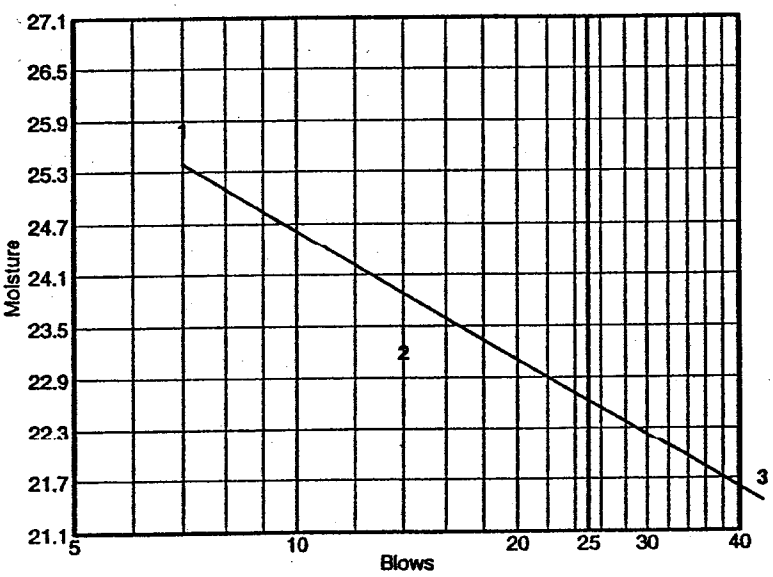
ient: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Site Sampled soils from Evap Pond
Sample No.: #SG-1
Elev. or Depth: Surface **Sample Length (in./cm.):**
Location: SG-1 located at 75'south and 45' east of Sampling Well
Description: Silty, clayey sand with gravel
Water Content: 4.4% **USCS:** SC-SM **AASHTO:** A-2-4(0)
Testing Remarks: Sample SG #1

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	29.53	28.67	28.79			
Dry+Tare	25.76	25.37	25.65			
Tare	11.15	11.17	11.16			
# Blows	7	14	43			
Moisture	25.8	23.2	21.7			

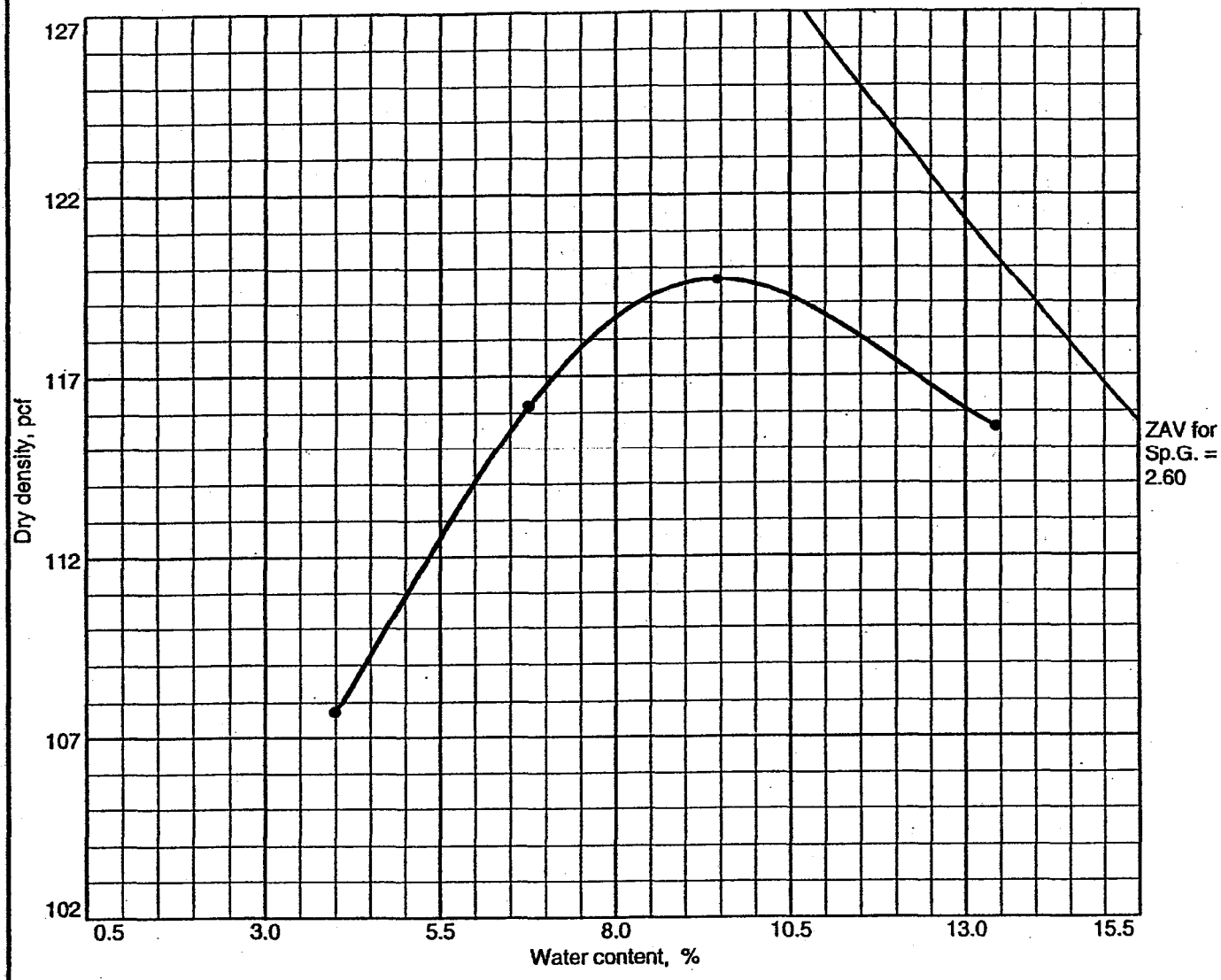


Liquid Limit= 23
Plastic Limit= 18
Plasticity Index= 5

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	8.62	8.72			
Dry+Tare	7.96	8.07			
Tare	4.37	4.36			
Moisture	18.4	17.5			

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Method C Standard
Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
Surface	SM	A-2-4(0)	4.4%	2.60	22	2	6.5	30.9

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 121.7 pcf	119.7 pcf	Silty sand with gravel
Optimum moisture = 8.8 %	9.5 %	

Project No. S01-588058 **Client:** Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Location: SG-2 located 75' west and 15' south of sampling well 19

Remarks:
SG-#2

COMPACTION TEST REPORT

INEL MATERIALS LAB

Plate

MOISTURE DENSITY TEST DATA

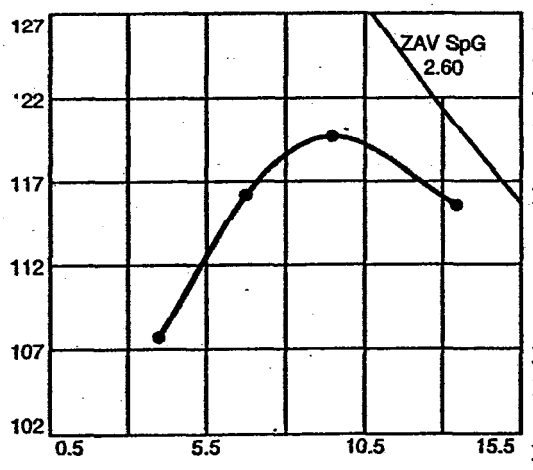
.ient: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Specimen Data

Source: Site Sampled soils from Evap Pond
Sample No.: #SG-2
Elev. or Depth: Surface **Sample Length (in./cm.):**
Location: SG-2 located 75' west and 15' south of sampling well 19
Description: Silty sand with gravel
USCS Classification: SM **AASHTO Classification:** A-2-4(0)
Natural Moisture: 4.4% **Liquid Limit:** 22 **Plasticity Index:** 2
Testing Remarks:
Percent retained on 3/4 in. sieve: 6.5
Percent passing No. 200 sieve: 30.9 **Specific gravity:** 2.60

Test Data And Results For Curve #2

Type of test: ASTM D 698-91 Method C Standard

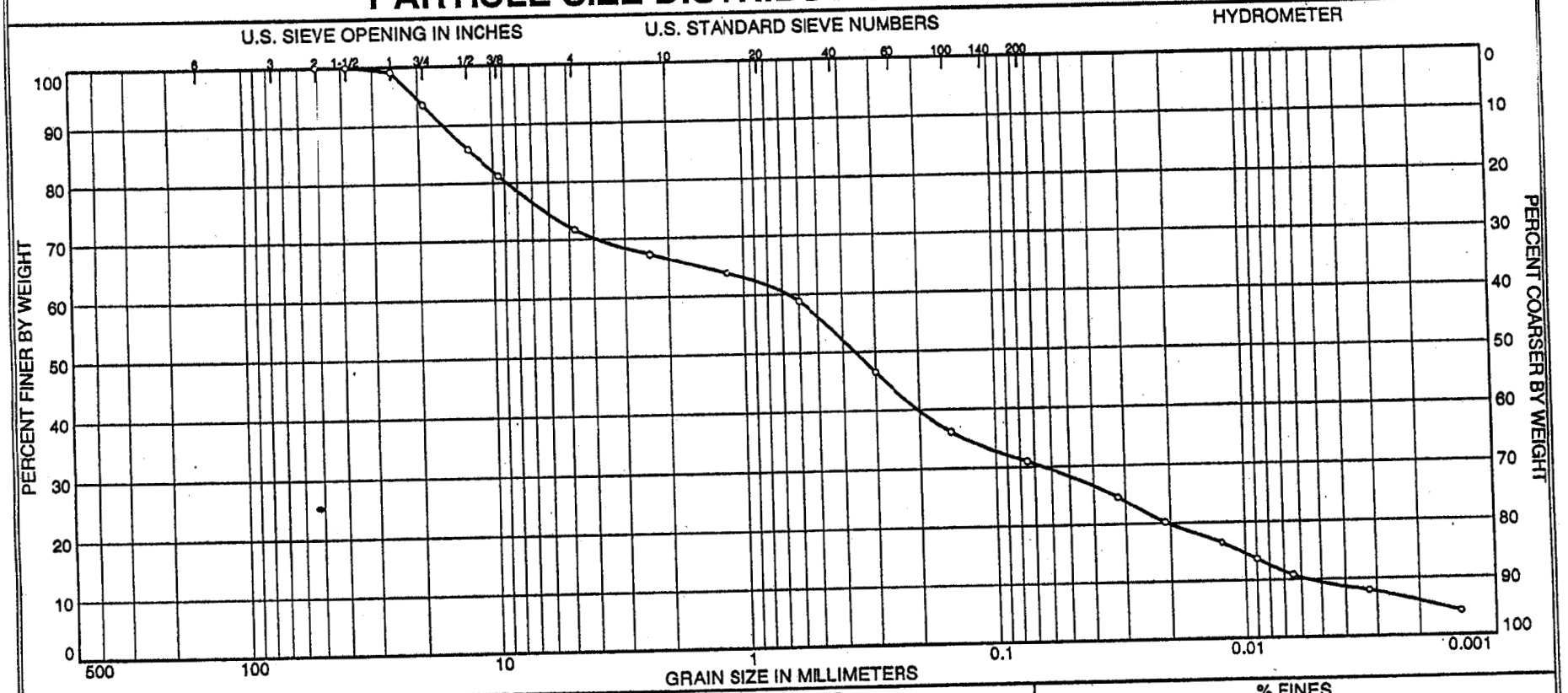


POINT NO.	1	2	3	4
WM + WS	10335.0	10745.0	10980.0	10985.0
WM	6525.0	6525.0	6525.0	6525.0
WW+T	437.40	423.00	447.00	461.10
WD+T	420.60	396.20	408.40	406.50
TARE	0.00	0.00	0.00	0.00
MOIST	4.0	6.8	9.5	13.4
MOISTURE	4.0	6.8	9.5	13.4
DRY DEN	107.7	116.2	119.6	115.6

Max dry den= 121.7 pcf **Opt moisture=** 8.8 %
Uncorrected Results: **Max dry den=** 119.7 pcf **Opt moisture=** 9.5 %

ASTM D 4718 Correction Data:
Bulk Specific Gravity of Oversize Material = 2.60
Moisture of Oversize Material = %
Corrections Applied to Calculated Maximum Density and Optimum Moisture Values

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
O	0.0	6.5	21.8	5.2	13.3	22.3	21.5	9.4

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
O	Site Sampled soils from Evap Pond	#SG-2	Surface	08/01/01	SM	Silty sand with gravel	4.4%	22	20

Client Tom Borschel/ICDF Project
Project INTEC CERCLA Disposal Facility
CH2M Hill
Project No. S01-588058 Plate

INEL MATERIALS LAB

O Sampled by Stacey Lilya and Eric Olhoffer.

Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.0	29.5	30.5	0.0135	30.5	11.3	0.0321	24.5
5.00	22.0	25.0	26.0	0.0135	26.0	12.0	0.0210	20.2
15.00	22.0	21.0	22.0	0.0135	22.0	12.7	0.0124	16.5
30.00	22.0	18.0	19.0	0.0135	19.0	13.2	0.0090	13.6
60.00	22.0	15.0	16.0	0.0135	16.0	13.7	0.0065	10.8
250.00	22.0	12.0	13.0	0.0135	13.0	14.2	0.0032	8.0
1440.00	22.0	8.0	9.0	0.0135	9.0	14.8	0.0014	4.2

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 28.3 (% coarse = 6.5 % fine = 21.8)
% SAND = 40.8 (% coarse = 5.2 % medium = 13.3 % fine = 22.3)
% SILT = 21.5 % CLAY = 9.4

D_{85}= 12.12 D_{60}= 0.66 D_{50}= 0.36
D_{30}= 0.06 D_{15}= 0.01 D_{10}= 0.01
C_c= 1.1219 C_u= 117.4869

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Site Sampled soils from Evap Pond
Sample No.: #SG-2
Elev. or Depth: Surface **Sample Length (in./cm.):**
Location: SG-2 located 75' west and 15' south of sampling well 19
Description: Silty sand with gravel
Date: 08/01/01 **Natural Moisture:** 4.4%
Liquid Limit: 22 **Plastic Limit:** 20 **USCS Class.:** SM
Testing Remarks: Sampled by Stacey Lilya and Eric Olhoffer.

Mechanical Analysis Data

	Initial
Dry sample and tare=	11050.00
Tare =	0.00
Dry sample weight =	11050.00

Sample split on number 4 sieve
Split sample data:
Sample and tare = 500.60 Tare = .00 Sample weight = 500.60

Sieve tare method

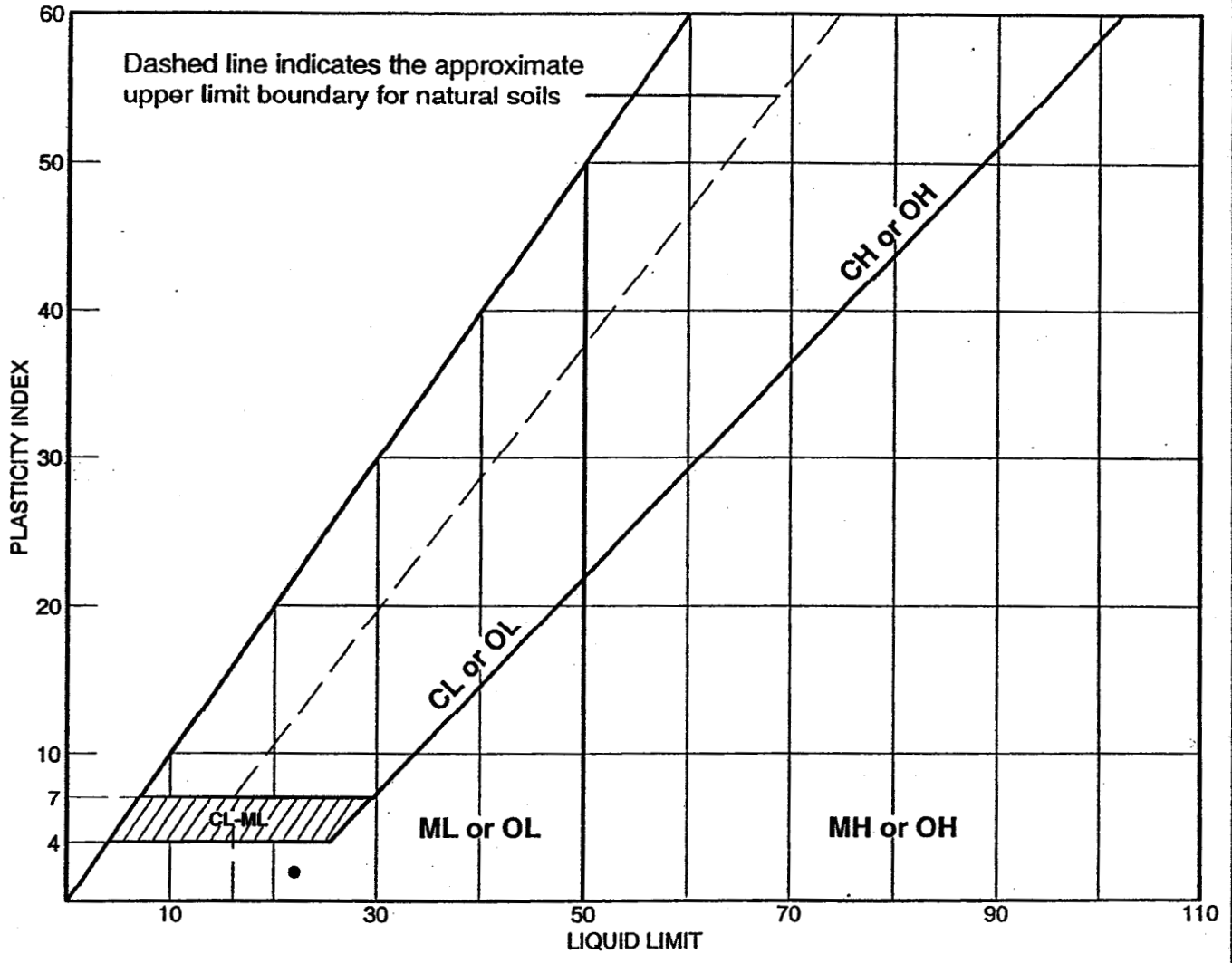
Sieve	Weight retained	Sieve tare	Percent finer
2.0 inch	0.00	0.00	100.0
1.5 inch	0.00	0.00	100.0
1.0 inch	95.00	0.00	99.1
0.75 inch	620.00	0.00	93.5
0.50 inch	860.00	0.00	85.8
0.375 inch	505.00	0.00	81.2
# 4	1045.00	0.00	71.7
# 8	30.80	0.00	67.3
# 16	23.50	0.00	63.9
# 30	36.00	0.00	58.8
# 50	85.50	0.00	46.5
# 100	73.10	0.00	36.1
# 200	36.30	0.00	30.9

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 69.3
Weight of hydrometer sample: 74.2
Calculated biased weight= 107.07
Automatic temperature correction
Composite correction at 20 deg C = -4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.60
Specific gravity correction factor= 1.012
Hydrometer type: 152H

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Site Sampled	#SG-2	Surface	4.4%	20	22	2	SM

LIQUID AND PLASTIC LIMITS TEST REPORT **INEL MATERIALS LAB**	**Client:** Tom Borschel/ICDF Project **Project:** INTEC CERCLA Disposal Facility CH2M Hill **Project No.:** S01-588058 **Plate**

LIQUID AND PLASTIC LIMIT TEST DATA

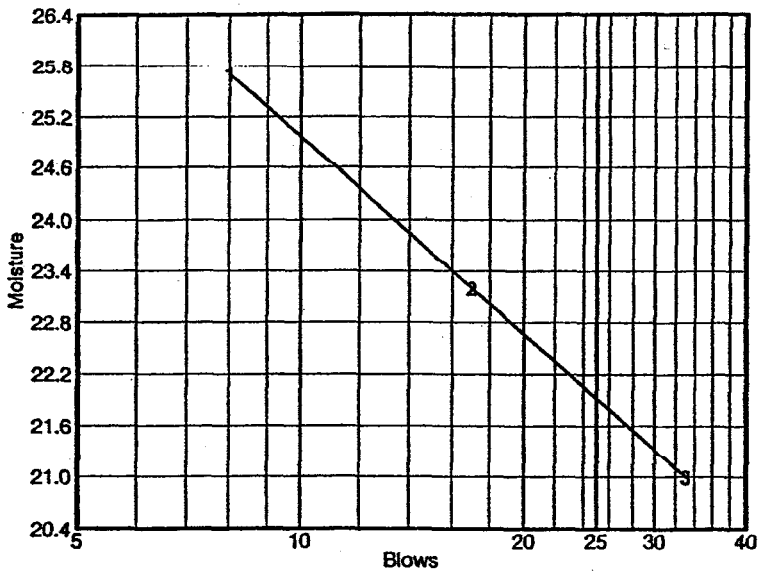
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Site Sampled soils from Evap Pond
Sample No.: #SG-2
Elev. or Depth: Surface **Sample Length (in./cm.):**
Location: SG-2 located 75' west and 15' south of sampling well 19
Description: Silty sand with gravel
Water Content: 4.4% **USCS:** SM **AASHTO:** A-2-4(0)
Testing Remarks:

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	29.67	30.11	29.35			
Dry+Tare	25.87	26.5292	26.19			
Tare	11.10	11.10	11.17			
# Blows	8	17	33			
Moisture	25.7	23.2	21.0			

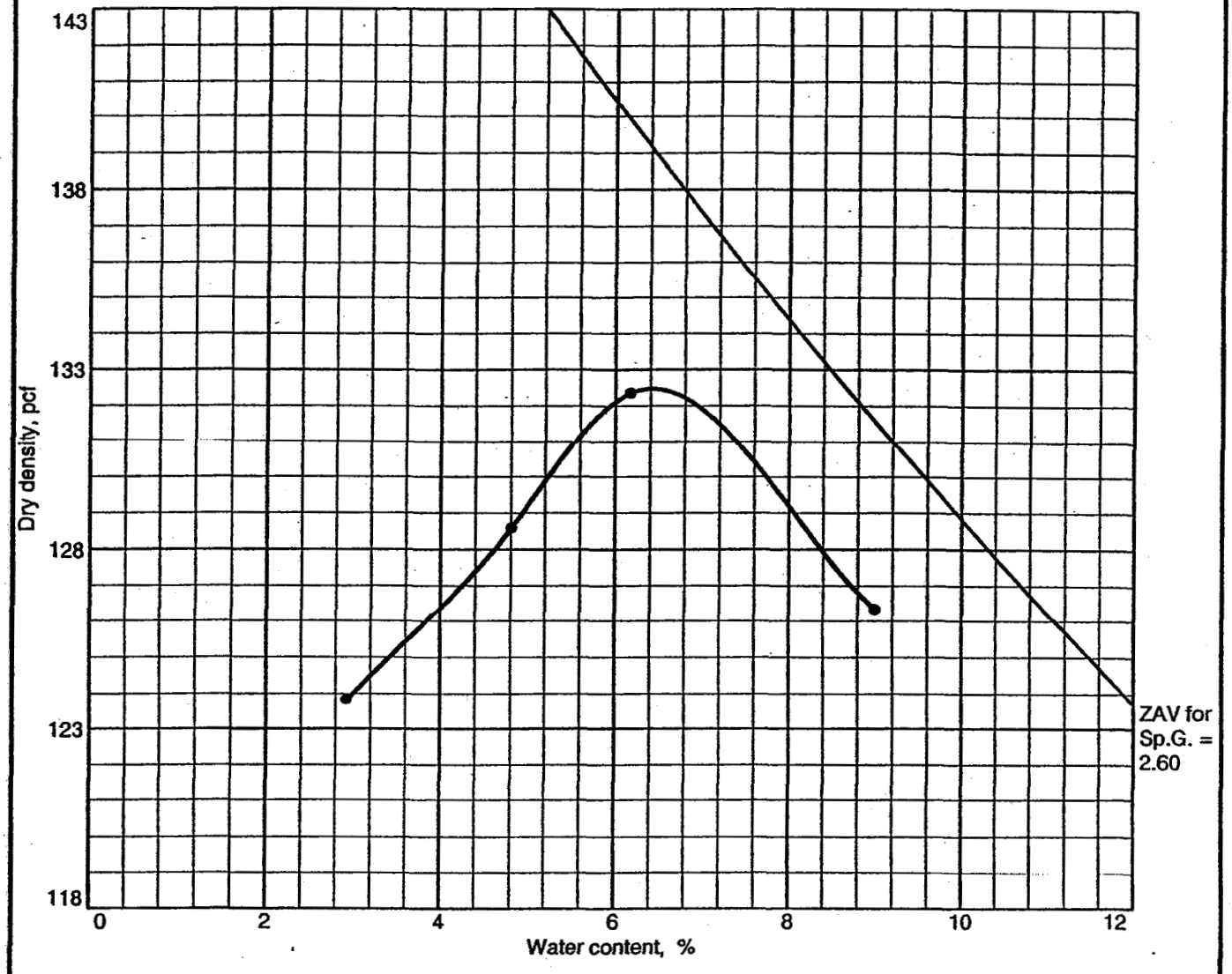


Liquid Limit= 22
Plastic Limit= 20
Plasticity Index= 2

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	9.10	8.93			
Dry+Tare	8.32	8.15			
Tare	4.34	4.34			
Moisture	19.6	20.5			

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Method C Standard
Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
3.0' below grade	GP	A-1-a	3.3%	2.60	NV		15.3	4.7

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 136.6 pcf	132.5 pcf	Poorly graded gravel with sand
Optimum moisture = 5.4 %	6.4 %	

Project No. S01-588058 **Client:** Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
● **Location:** Sampled from Test Pad

Remarks:
SG #3

COMPACTION TEST REPORT

INEL MATERIALS LAB

Plate

MOISTURE DENSITY TEST DATA

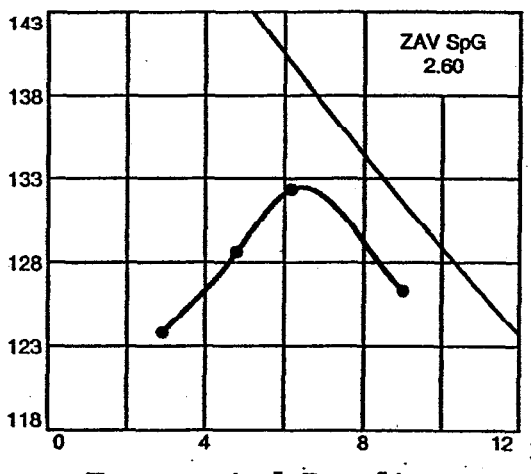
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Specimen Data

Source: Site Sampled gravels from Test Pad
Sample No.: # SG-3 Test Pad
Elev. or Depth: 3.0' below grade **Sample Length (in./cm.):** 0'-3.0'
Location: Sampled from Test Pad
Description: Poorly graded gravel with sand
USCS Classification: GP **AASHTO Classification:** A-1-a
Natural Moisture: 3.3% **Liquid Limit:** NV **Plasticity Index:**
Testing Remarks:
Percent retained on 3/4 in. sieve: 15.3
Percent passing No. 200 sieve: 4.7 **Specific gravity:** 2.60

Test Data And Results

Type of test: ASTM D 698-91 Method C Standard

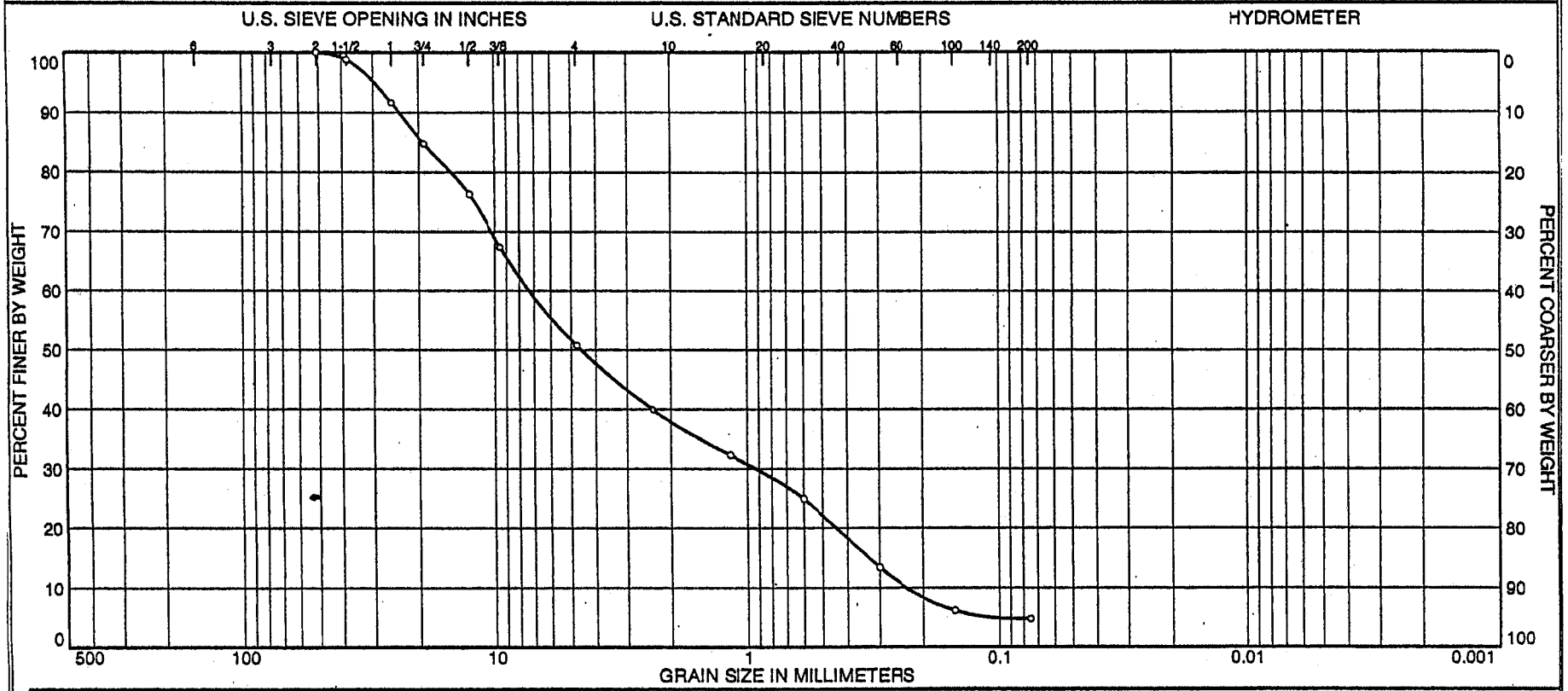


POINT NO.	1	2	3	4
WM + WS	10860.0	11110.0	11305.0	11210.0
WM	6525.0	6525.0	6525.0	6525.0
WW+T	768.00	765.10	858.80	923.30
WD+T	746.20	730.00	808.90	847.10
TARE	0.00	0.00	0.00	0.00
MOIST	2.9	4.8	6.2	9.0
MOISTURE	2.9	4.8	6.2	9.0
DRY DEN	123.8	128.6	132.3	126.4

Uncorrected Results: **Max dry den=** 136.6 pcf **Opt moisture=** 5.4 %
Max dry den= 132.5 pcf **Opt moisture=** 6.4 %

ASTM D 4718 Correction Data:
Bulk Specific Gravity of Oversize Material = 2.56
Moisture of Oversize Material = 1.0 %
Corrections Applied to Calculated Maximum Density and Optimum Moisture Values

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
O	0.0	15.3	34.0	12.8	18.6	14.6	4.7	

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
O	Site Sampled gravels from Test Pad	# SG-3 Test Pad	3.0' below grade	8/6/01	GP	Poorly graded gravel with sand	3.3%	NV	NP

Client Tom Borschel/ICDF Project
Project INTEC CERCLA Disposal Facility
CH2M Hill
Project No. S01-588058 Plate

INEL MATERIALS LAB

O Sample of combined gravels excavated from Test Pad site.

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Site Sampled gravels from Test Pad
Sample No.: # SG-3 Test Pad
Elev. or Depth: 3.0' below grade **Sample Length (in./cm.):** 0'-3.0'
Location: Sampled from Test Pad
Description: Poorly graded gravel with sand
Date: 8/6/01 **Natural Moisture:** 3.3%
Liquid Limit: NV **Plastic Limit:** NP **USCS Class.:** GP
Testing Remarks: Sample of combined gravels excavated from Test Pad site.

Mechanical Analysis Data

	Initial
Dry sample and tare=	8446.80
Tare =	0.00
Dry sample weight =	8446.80

Sample split on number 4 sieve
Split sample data:
Sample and tare = 443.00 **Tare** = .00 **Sample weight** = 443.00

Sieve tare method

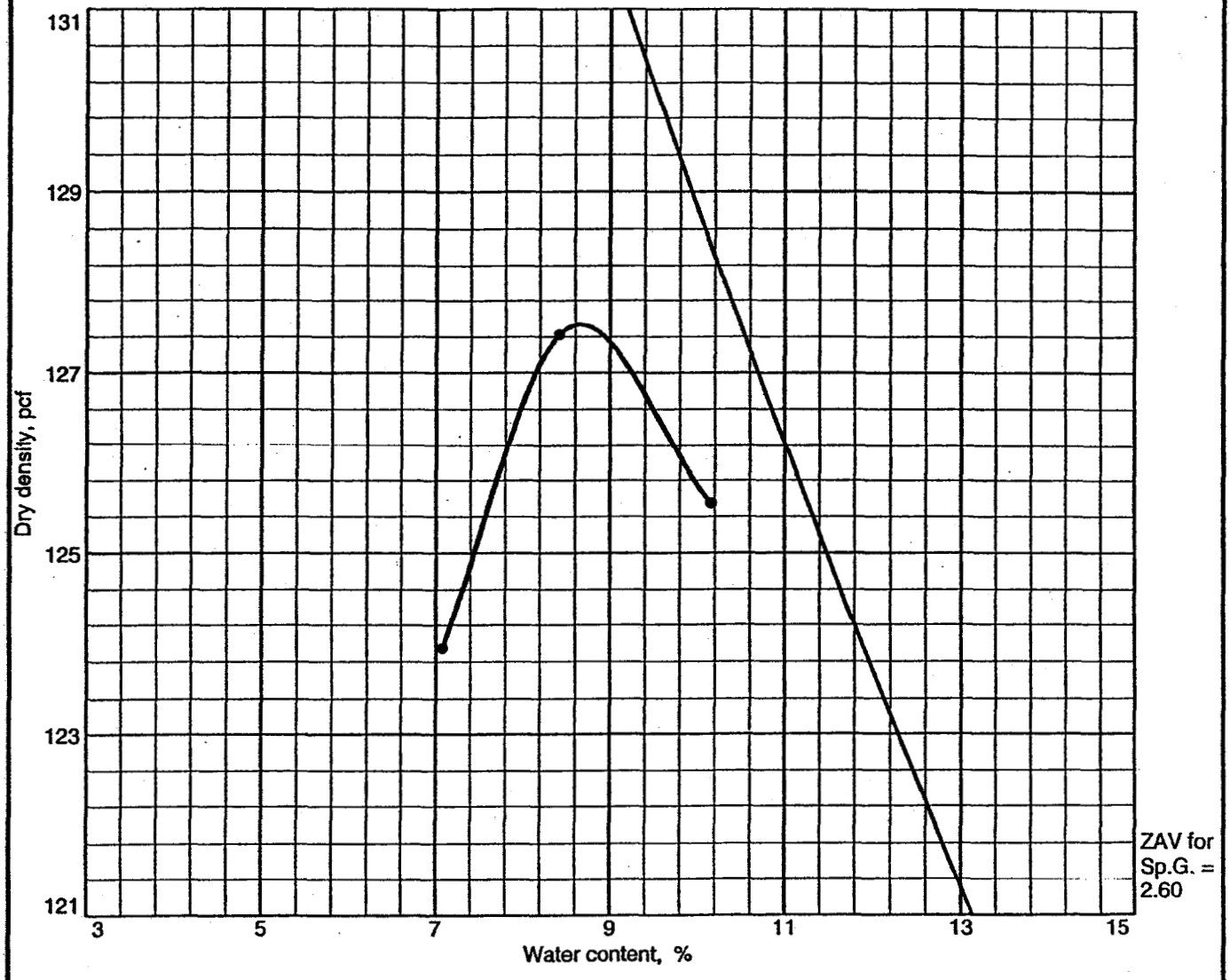
Sieve	Weight retained	Sieve tare	Percent finer
2 inch	0.00	0.00	100.0
1.5 inch	102.60	0.00	98.8
1 inch	611.30	0.00	91.6
0.75 inch	582.50	0.00	84.7
0.50 inch	716.60	0.00	76.2
0.375 inch	747.00	0.00	67.3
# 4	1401.80	0.00	50.7
# 8	94.74	0.00	39.9
# 16	66.10	0.00	32.3
# 30	64.74	0.00	24.9
# 50	100.70	0.00	13.4
# 100	63.19	0.00	6.1
# 200	12.63	0.00	4.7

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 **% GRAVEL** = 49.3 (**% coarse** = 15.3 **% fine** = 34.0)
% SAND = 46.0 (**% coarse** = 12.8 **% medium** = 18.6 **% fine** = 14.6)
% FINES = 4.7

D_{85}= 19.31 D_{60}= 7.34 D_{50}= 4.57
D_{30}= 0.93 D_{15}= 0.33 D_{10}= 0.23
C_c= 0.5027 C_u= 31.3581

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Method C Standard
Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
6"-12"	GM	A-2-4(0)	8.9%	2.60	23	3	10.6	29.6

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 130.4 pcf	127.5 pcf	Silty gravel with sand
Optimum moisture = 7.7 %	8.7 %	

Project No. S01-588058 **Client:** Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
• **Location:** SG#4 from Evap Pond subgrade

Remarks:
Sample SG-#4

COMPACTION TEST REPORT

INEL MATERIALS LAB

Plate

MOISTURE DENSITY TEST DATA

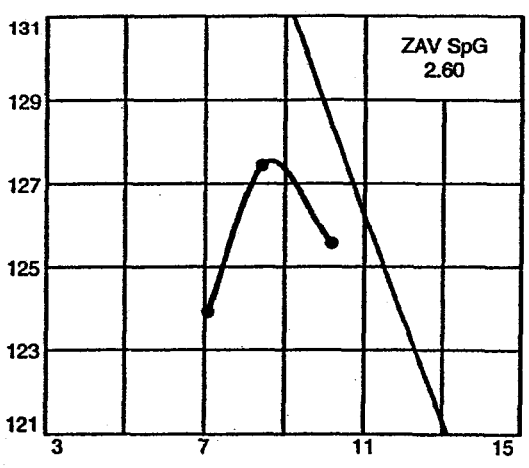
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Specimen Data

Source: Site Sampled soils from Evap Pond
Sample No.: SG#4 EP
Elev. or Depth: 6"-12" **Sample Length (in./cm.):**
Location: SG#4 from Evap Pond subgrade
Description: Silty gravel with sand
USCS Classification: GM **AASHTO Classification:** A-2-4(0)
Natural Moisture: 8.9% **Liquid Limit:** 23 **Plasticity Index:** 3
Testing Remarks: Sample SG-#4
Percent retained on 3/4 in. sieve: 10.6
Percent passing No. 200 sieve: 29.6 **Specific gravity:** 2.60

Test Data And Results For Curve #4

Type of test: ASTM D 698-91 Method C Standard

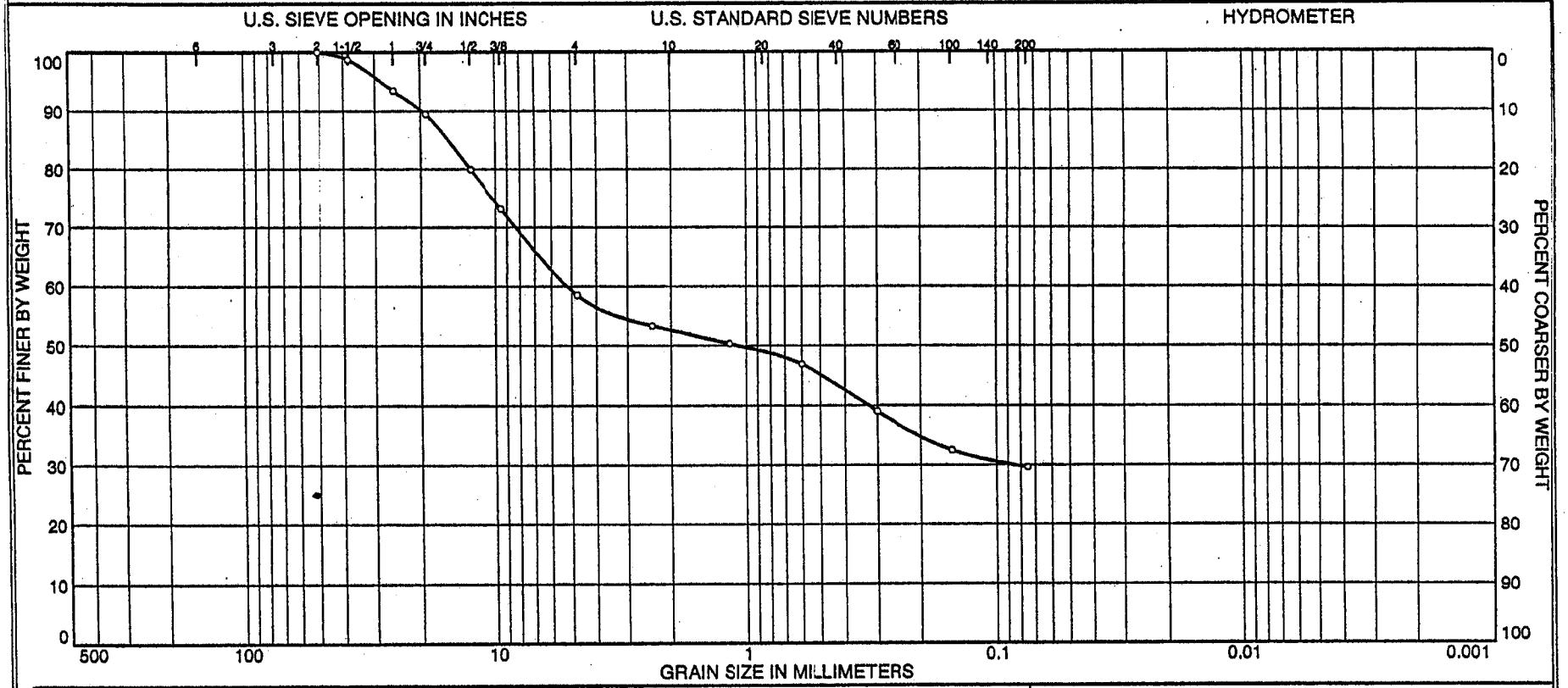


POINT NO.	1	2	3
WM + WS	11040.0	11225.0	11230.0
WM	6525.0	6525.0	6525.0
WW+T	729.30	700.40	801.10
WD+T	681.10	646.00	727.20
TARE	0.00	0.00	0.00
MOIST	7.1	8.4	10.2
MOISTURE	7.1	8.4	10.2
DRY DEN	123.9	127.4	125.5

Uncorrected Results: **Max dry den=** 130.4 pcf **Opt moisture=** 7.7 %
Max dry den= 127.5 pcf **Opt moisture=** 8.7 %

ASTM D 4718 Correction Data:
Bulk Specific Gravity of Oversize Material = 2.58
Moisture of Oversize Material = %
Corrections Applied to Calculated Maximum Density and Optimum Moisture Values

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	10.6	30.9	5.9	9.3	13.7	29.6	

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	Site Sampled soils from Evap Pond	SG#4 EP	6"-12"	8/9/01	GM	Silty gravel with sand	8.9%		

Client Tom Borschel/ICDF Project
Project INTEC CERCLA Disposal Facility
CH2M Hill
Project No. S01-588058 Plate

INEL MATERIALS LAB

○

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Site Sampled soils from Evap Pond
Sample No.: SG#4 EP
Elev. or Depth: 6"-12" **Sample Length (in./cm.):**
Location: SG#4 from Evap Pond subgrade
Description: Silty gravel with sand
Date: 8/9/01 **Natural Moisture:** 8.9%
Liquid Limit: **Plastic Limit:** **USCS Class.:** GM
Testing Remarks:

Mechanical Analysis Data

	Initial
Dry sample and tare=	7278.40
Tare =	0.00
Dry sample weight =	7278.40

Sample split on number 4 sieve
Split sample data:
Sample and tare = 561.50 Tare = .00 Sample weight = 561.50

Sieve tare method

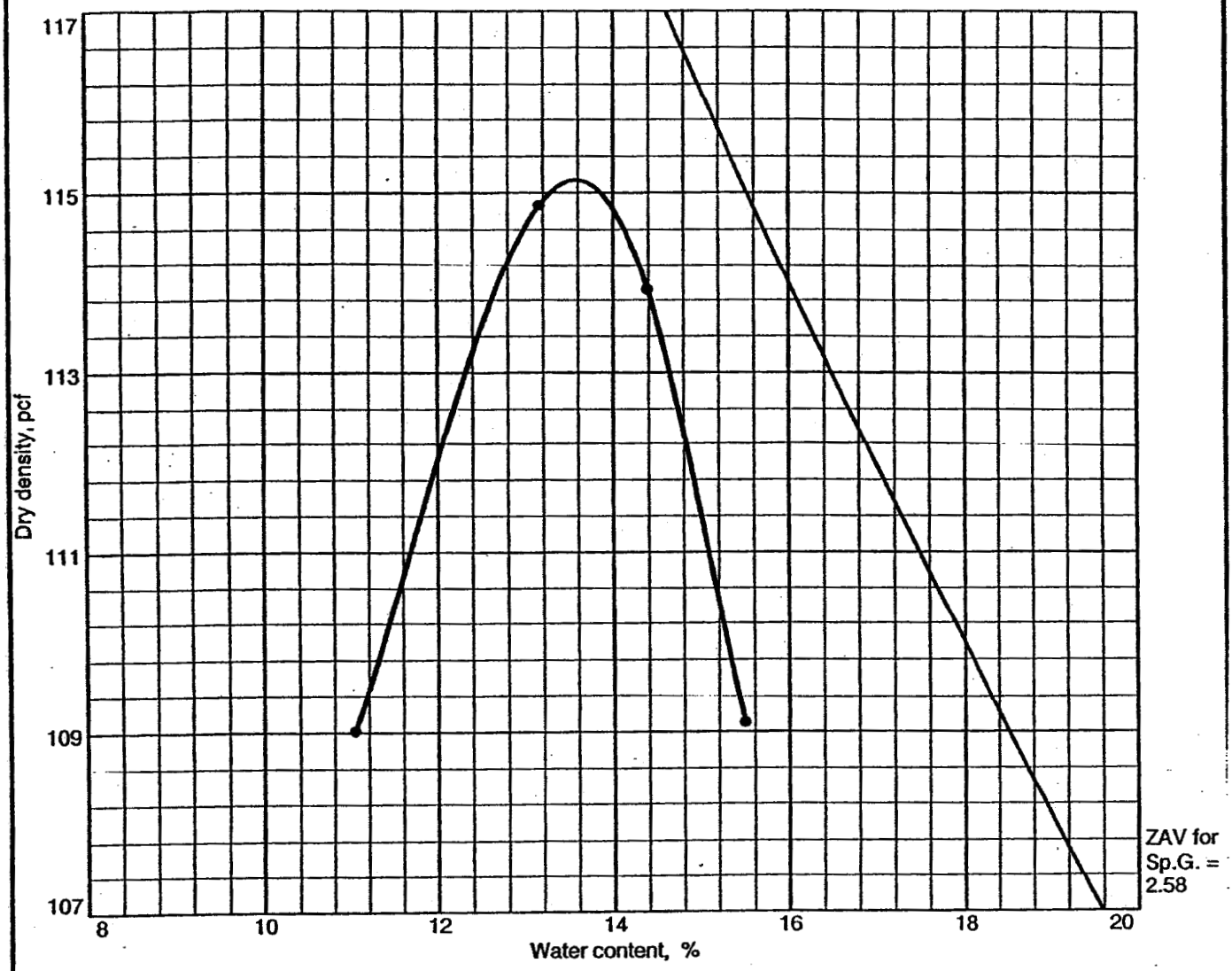
Sieve	Weight retained	Sieve tare	Percent finer
2 inch	0.00	0.00	100.0
1.5 inch	97.90	0.00	98.7
1 inch	380.60	0.00	93.4
0.75 inch	291.00	0.00	89.4
0.50 inch	694.50	0.00	79.9
0.375 inch	487.70	0.00	73.2
# 4	1071.70	0.00	58.5
# 8	50.40	0.00	53.3
# 16	28.00	0.00	50.3
# 30	33.30	0.00	46.9
# 50	74.20	0.00	39.1
# 100	63.40	0.00	32.5
# 200	27.70	0.00	29.6

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 41.5 (% coarse = 10.6 % fine = 30.9)
% SAND = 28.9 (% coarse = 5.9 % medium = 9.3 % fine = 13.7)
% FINES = 29.6

D_{85}= 15.56 D_{60}= 5.22 D_{50}= 1.09
D_{30}= 0.09

COMPACTION TEST REPORT



Test specification: ASTM D 698-78 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
6-8" below sub.	CL-ML	A-4(0)	10.7%	2.58	22	5	13.7	51.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 115.1 pcf Optimum moisture = 13.6 %	Sandy silty clay

Project No. S01-588058 **Client:** Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Location: 400' south and 50' east of North West Corner

Remarks:
Sample SG #5 E.P.

COMPACTION TEST REPORT

INEL MATERIALS LAB

Plate

MOISTURE DENSITY TEST DATA

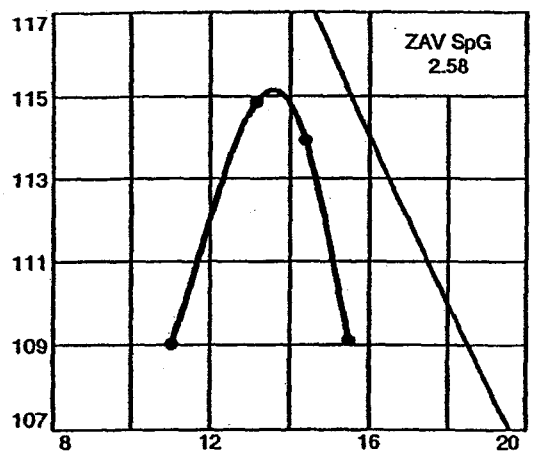
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Specimen Data

Source: Site Sampled soils from Evap Pond
Sample No.: SG #5 E.P.
Elev. or Depth: 6-8" below sub. **Sample Length (in./cm.):**
Location: 400' south and 50' east of North West Corner
Description: Sandy silty clay
USCS Classification: CL-ML **AASHTO Classification:** A-4(0)
Natural Moisture: 10.7% **Liquid Limit:** 22 **Plasticity Index:** 5
Testing Remarks: Sample SG #5 E.P.
Percent retained on No.4 sieve: 13.7
Percent passing No. 200 sieve: 51.9 **Specific gravity:** 2.58

Test Data And Results

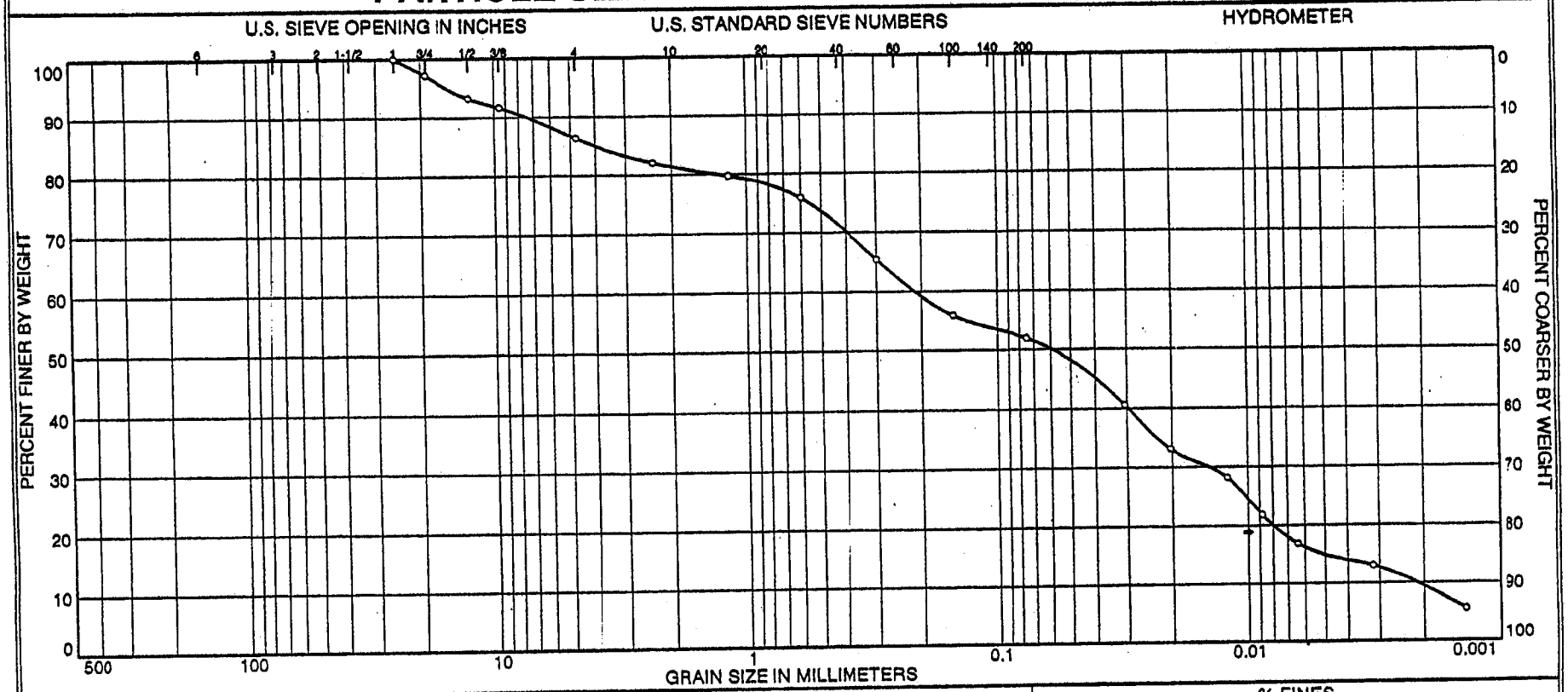
Type of test: ASTM D 698-78 Method A Standard



POINT NO.	1	2	3	4
WM + WS	6210.0	6075.0	6215.0	6150.0
WM	4245.0	4245.0	4245.0	4245.0
WW+T	264.90	298.80	333.90	349.60
WD+T	234.10	269.10	291.90	302.70
TARE	0.00	0.00	0.00	0.00
MOIST	13.2	11.0	14.4	15.5
MOISTURE	13.2	11.0	14.4	15.5
DRY DEN	114.9	109.0	113.9	109.1

Max dry den= 115.1 pcf **Opt moisture=** 13.6 %

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	2.8	10.9	5.0	10.1	19.3	37.0	14.9

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	Site Sampled soils from Evap Pond	SG #5 E.P.	6-8" below sub.	8/14/01	CL-ML	Sandy silty clay	10.7%	22	17

Client Tom Borschel/ICDF Project

Project INTEC CERCLA Disposal Facility

CH2M Hill

Project No. S01-588058 | Plate

INEL MATERIALS LAB

○ SG #5 E.P.

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Site Sampled soils from Evap Pond
Sample No.: SG #5 E.P.
Elev. or Depth: 6-8" below sub. **Sample Length (in./cm.):**
Location: 400' south and 50' east of North West Corner
Description: Sandy silty clay
Date: 8/14/01 **Natural Moisture:** 10.7%
Liquid Limit: 22 **Plastic Limit:** 17 **USCS Class.:** CL-ML
Testing Remarks: SG #5 E.P.

Mechanical Analysis Data

		Initial
Dry sample and tare	=	993.90
Tare	=	0.00
Dry sample weight	=	993.90

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
1 inch	0.00	0.00	100.0
0.75 inch	27.70	0.00	97.2
0.50 inch	38.90	0.00	93.3
0.375 inch	15.80	0.00	91.7
# 4	53.80	0.00	86.3
# 8	42.30	0.00	82.0
# 16	23.20	0.00	79.7
# 30	37.70	0.00	75.9
# 50	104.20	0.00	65.4
# 100	95.20	0.00	55.9
# 200	39.00	0.00	51.9

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 80.5
Weight of hydrometer sample: 65.0
Calculated biased weight= 80.75
Automatic temperature correction
Composite correction at 20 deg C = -4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.60
Specific gravity correction factor= 1.012
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

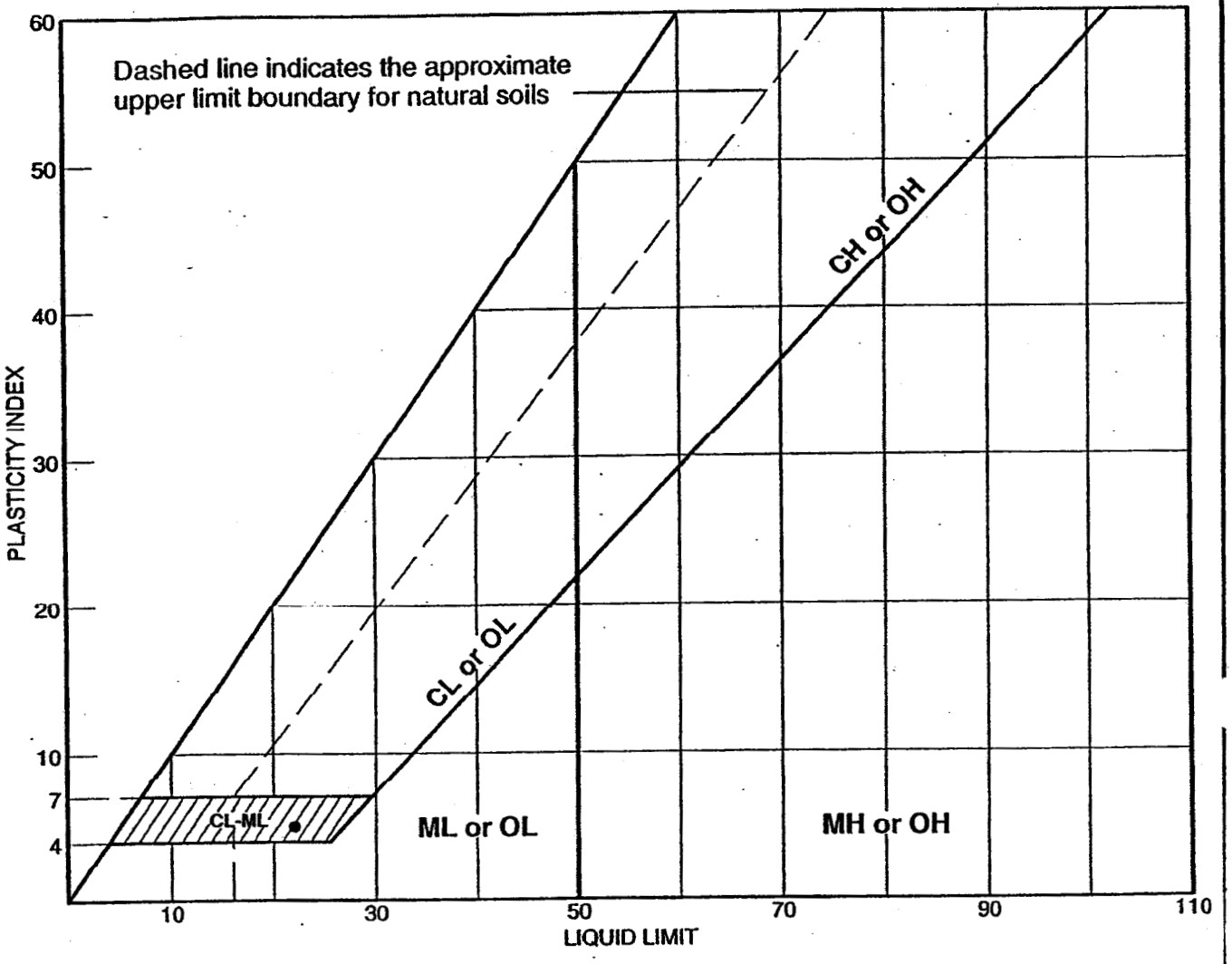
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.0	36.0	37.0	0.0135	37.0	10.2	0.0306	40.6
5.00	22.0	30.0	31.0	0.0135	31.0	11.2	0.0202	33.1
15.00	22.0	26.0	27.0	0.0135	27.0	11.9	0.0120	28.1
30.00	22.0	21.0	22.0	0.0135	22.0	12.7	0.0088	21.8
60.00	22.0	17.0	18.0	0.0135	18.0	13.3	0.0064	16.8
250.00	22.0	14.0	15.0	0.0135	15.0	13.8	0.0032	13.0
1440.00	22.0	8.0	9.0	0.0135	9.0	14.8	0.0014	5.5

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 13.7 (% coarse = 2.8 % fine = 10.9)
% SAND = 34.4 (% coarse = 5.0 % medium = 10.1 % fine = 19.3)
% SILT = 37.0 % CLAY = 14.9

D_{85}= 3.99 D_{60}= 0.21 D_{50}= 0.06
D_{30}= 0.01 D_{15}= 0.01 D_{10}= 0.00
C_c= 0.4425 C_u= 100.2272

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Site Sampled	SG #5 E.P.	6-8" below	10.7%	17	22	5	CL-ML

LIQUID AND PLASTIC LIMITS TEST REPORT

INEL MATERIALS LAB

Client: Tom Borschel/ICDF Project

Project: INTEC CERCLA Disposal Facility
CH2M Hill

Project No.: S01-588058

Plate

LIQUID AND PLASTIC LIMIT TEST DATA

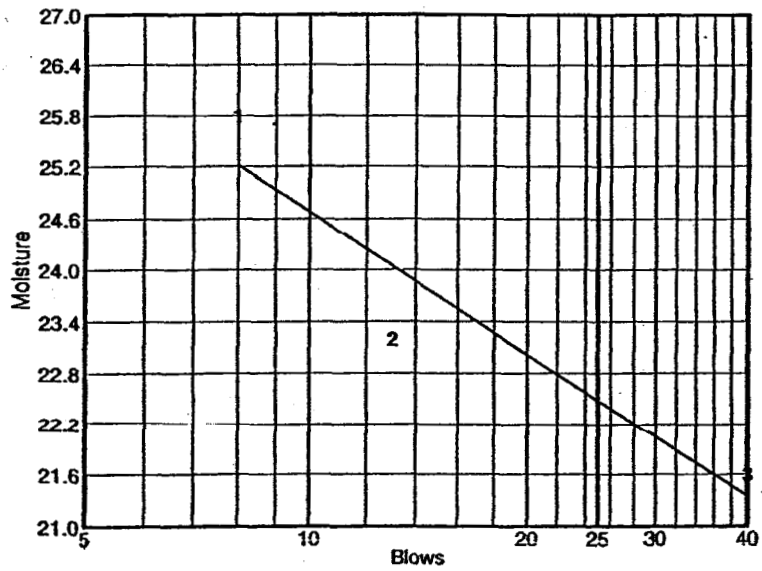
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Site Sampled soils from Evap Pond
Sample No.: SG #5 E.P.
Elev. or Depth: 6-8" below sub. **Sample Length (in./cm.):**
Location: 400' south and 50' east of North West Corner
Description: Sandy silty clay
Water Content: 10.7% **USCS:** CL-ML **AASHTO:** A-4(0)
Testing Remarks: SG #5 E.P.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	29.51	28.64	28.77			
Dry+Tare	25.74	25.35	25.64			
Tare	11.15	11.17	11.16			
# Blows	8	13	40			
Moisture	25.8	23.2	21.6			

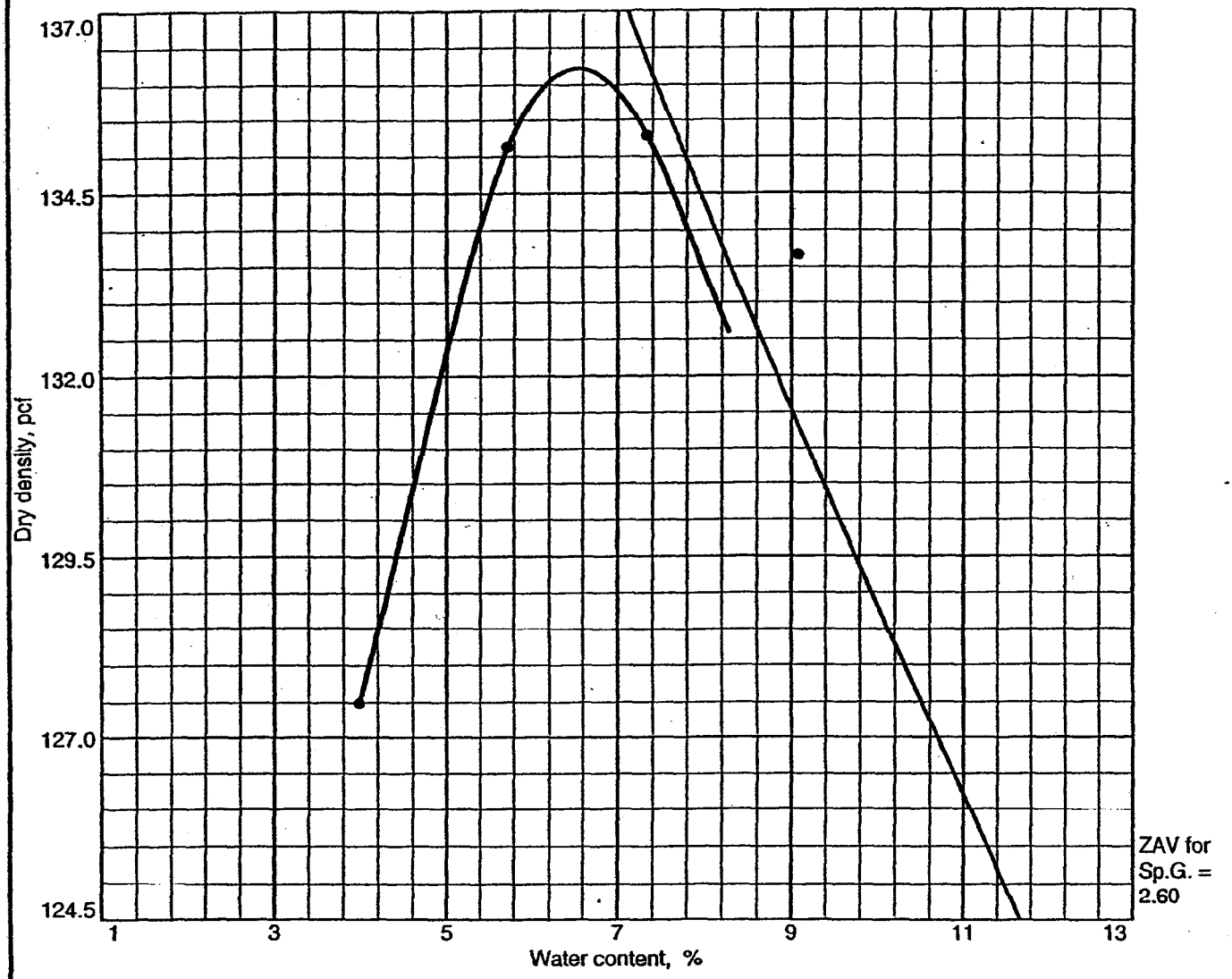


Liquid Limit= 22
Plastic Limit= 17
Plasticity Index= 5

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	8.52	8.70			
Dry+Tare	7.90	8.07			
Tare	4.35	4.36			
Moisture	17.5	17.0			

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Method C Standard
Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
	GW-GM	A-1-a		2.60	NV	NP	18.1	5.6

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 140.1 pcf	136.2 pcf	Well-graded gravel with silt and sand
Optimum moisture = 5.4 %	6.5 %	

Project No. S01-588058 **Client:** Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Location: Sample SG-6

Remarks:
Sample SG-#6

COMPACTION TEST REPORT

INEL MATERIALS LAB

Plate

MOISTURE DENSITY TEST DATA

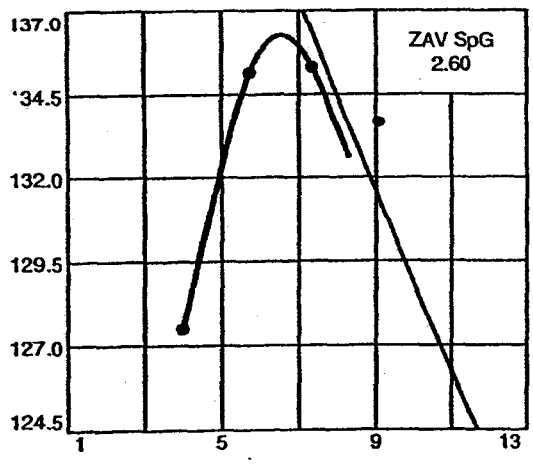
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Specimen Data

Source: Site Sampled soils from Evap Pond
Sample No.: SG #6 Evap. Pond
Elev. or Depth: Sample Length (in./cm.):
Location: Sample SG-6
Description: Well-graded gravel with silt and sand
USCS Classification: GW-GM AASHTO Classification: A-1-a
Natural Moisture: Liquid Limit: NV Plasticity Index: NP
Testing Remarks: Sample SG-#6
Percent retained on 3/4 in. sieve: 18.1
Percent passing No. 200 sieve: 5.6 Specific gravity: 2.60

Test Data And Results

Type of test: ASTM D 698-91 Method C Standard

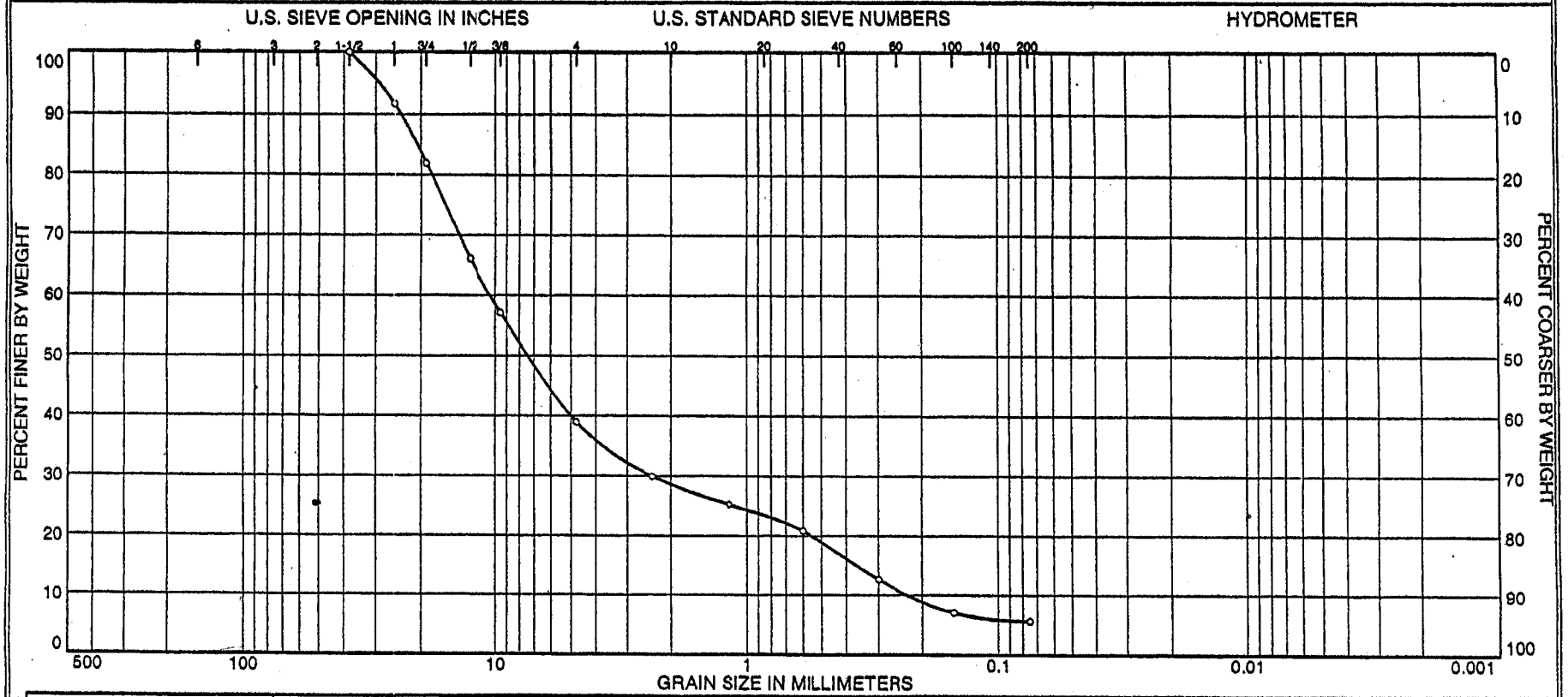


POINT NO.	1	2	3	4
WM + WS	11035.0	11385.0	11465.0	11485.0
WM	6525.0	6525.0	6525.0	6525.0
WW+T	680.80	861.00	600.00	598.40
WD+T	654.70	814.40	559.00	548.60
TARE	0.00	0.00	0.00	0.00
MOIST	4.0	5.7	7.3	9.1
MOISTURE	4.0	5.7	7.3	9.1
DRY DEN	127.5	135.1	135.3	133.7

Max dry den= 140.1 pcf Opt moisture= 5.4 %
Uncorrected Results: Max dry den= 136.2 pcf Opt moisture= 6.5 %

ASTM D 4718 Correction Data:
Bulk Specific Gravity of Oversize Material = 2.58
Moisture of Oversize Material = %
Corrections Applied to Calculated Maximum Density and Optimum Moisture Values

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
O	0.0	18.1	43.0	10.3	11.6	11.4	5.6	

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
O	Site Sampled soils from Evap Pond	SG #6 Evap. Pond		8/20/01	GW-GM	Well-graded gravel with silt and sand		NV	NP

Client Tom Borschel/ICDF Project

Project INTEC CERCLA Disposal Facility

CH2M Hill

Project No. S01-588058 Plate

INEL MATERIALS LAB

O Sample from SG #6//Evap. Pond

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Site Sampled soils from Evap Pond
Sample No.: SG #6 Evap. Pond
Elev. or Depth: **Sample Length (in./cm.):**
Location: Sample SG-6
Description: Well-graded gravel with silt and sand
Date: 8/20/01 **Natural Moisture:**
Liquid Limit: NV **Plastic Limit:** NP **USCS Class.:** GW-GM
Testing Remarks: Sample from SG #6//Evap. Pond

Mechanical Analysis Data

	Initial
Dry sample and tare=	7584.30
Tare =	0.00
Dry sample weight =	7584.30

Sample split on number 4 sieve
Split sample data:
Sample and tare = 561.00 Tare = .00 Sample weight = 561.00

Sieve tare method

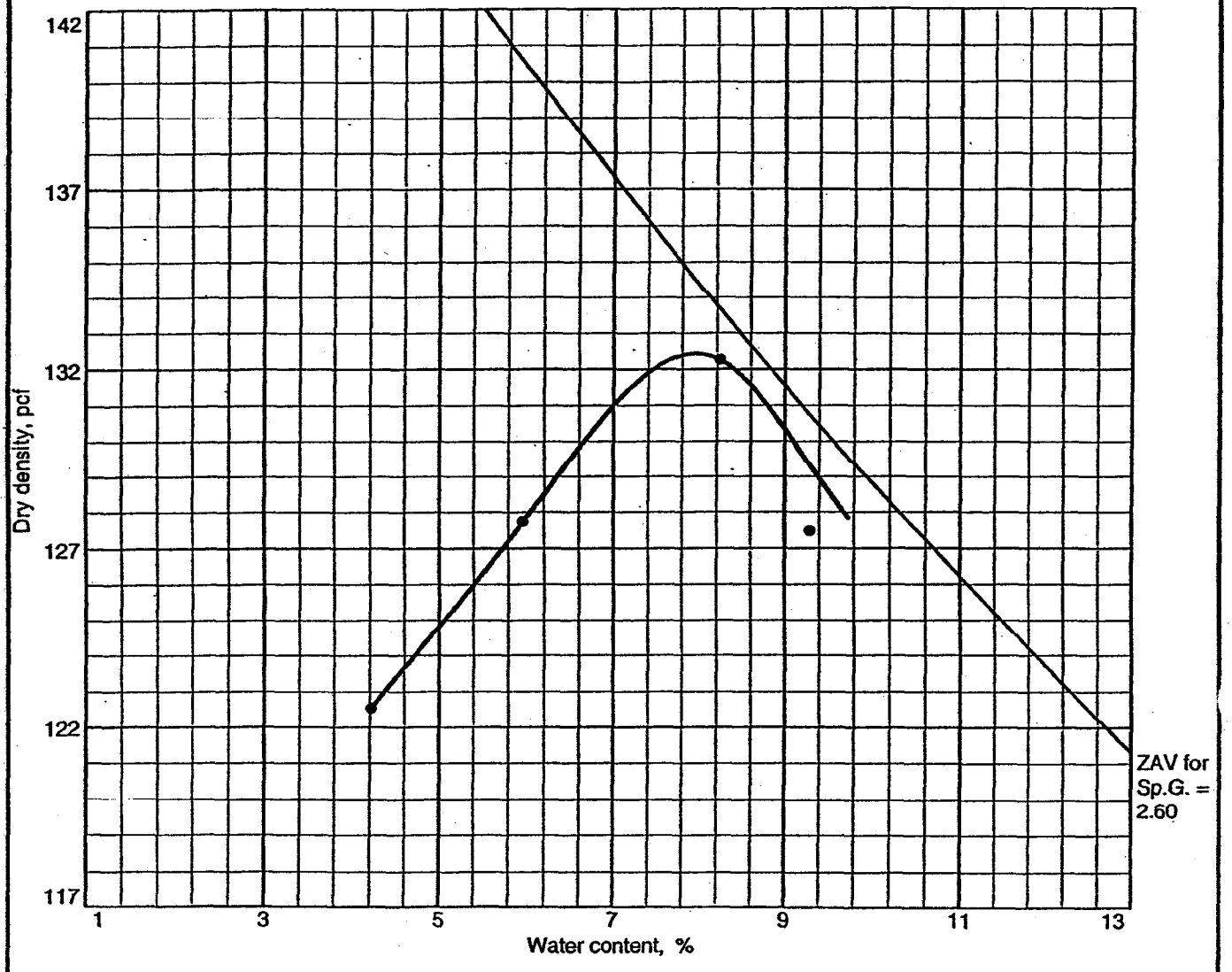
Sieve	Weight retained	Sieve tare	Percent finer
1.5 inch	0.00	0.00	100.0
1 inch	628.70	0.00	91.7
0.75 inch	744.50	0.00	81.9
0.50 inch	1200.00	0.00	66.1
0.375 inch	678.60	0.00	57.1
# 4	1382.50	0.00	38.9
# 8	130.30	0.00	29.9
# 16	68.00	0.00	25.2
# 30	63.40	0.00	20.8
# 50	116.10	0.00	12.7
# 100	82.30	0.00	7.0
# 200	20.50	0.00	5.6

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 61.1 (% coarse = 18.1 % fine = 43.0)
% SAND = 33.3 (% coarse = 10.3 % medium = 11.6 % fine = 11.4)
% FINES = 5.6

D_{85}= 20.68 D_{60}= 10.51 D_{50}= 7.45
D_{30}= 2.39 D_{15}= 0.36 D_{10}= 0.23
C_c= 2.3519 C_u= 45.5117

COMPACTION TEST REPORT



Test specification: ASTM D 698-91 Method C Standard
Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
Stockpile	GW-GM	A-1-a	NA	2.60	NV	NP	14.9	6.0

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 136.1 pcf	132.4 pcf	Well-graded gravel with silt and sand
Optimum moisture = 6.8 %	8.0 %	

Project No. S01-588058 **Client:** Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
• **Location:** Sampled from landfill excavation to Evap. Pond

Remarks:
Sampled from excavated materials used to build Evap. Pond

SG-7

COMPACTION TEST REPORT

INEL MATERIALS LAB

Plate

MOISTURE DENSITY TEST DATA

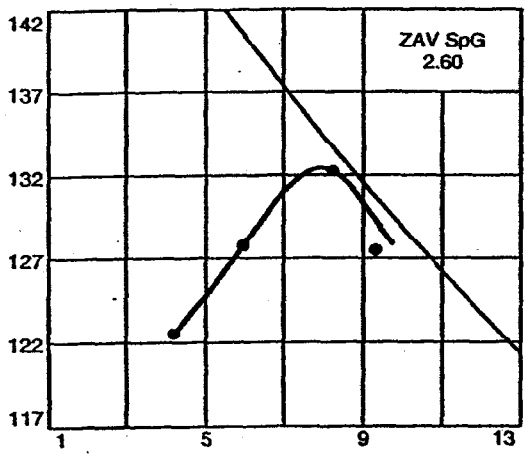
ient: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Specimen Data

Source: Site Sampled soils from Evap Pond
Sample No.: SG #7
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: Sampled from landfill excavation to Evap. Pond
Description: Well-graded gravel with silt and sand
USCS Classification: GW-GM **AASHTO Classification:** A-1-a
Natural Moisture: NA **Liquid Limit:** NV **Plasticity Index:** NP
Testing Remarks: Sampled from excavated materials used to build Evap. Pond
Percent retained on 3/4 in. sieve: 14.9
Percent passing No. 200 sieve: 6.0 **Specific gravity:** 2.60

Test Data And Results

Type of test: ASTM D 698-91 Method C Standard

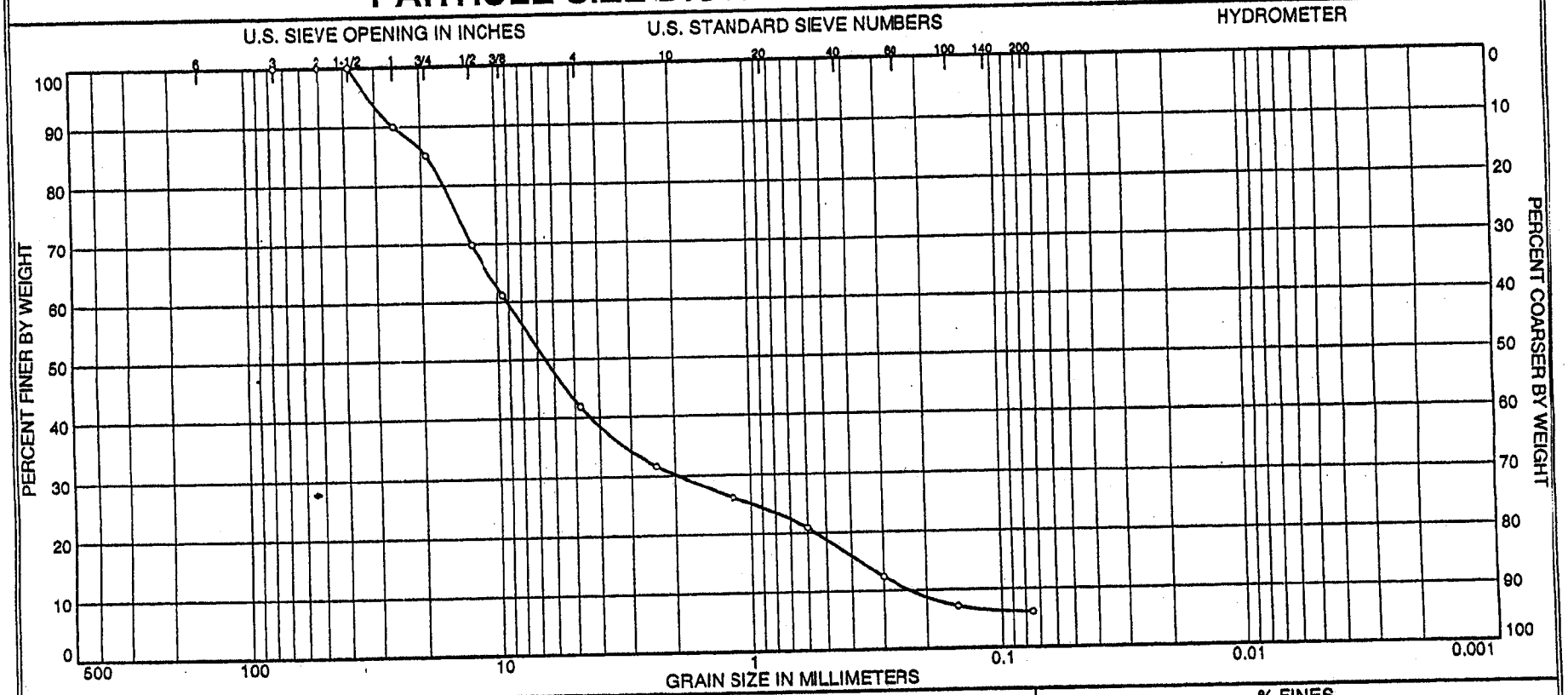


POINT NO.	1	2	3	4
WM + WS	10870.0	11130.0	11395.0	11265.0
WM	6525.0	6525.0	6525.0	6525.0
WW+T	627.70	621.60	705.50	853.60
WD+T	602.30	586.60	651.80	781.00
TARE	0.00	0.00	0.00	0.00
MOIST	4.2	6.0	8.2	9.3
MOISTURE	4.2	6.0	8.2	9.3
DRY DEN	122.6	127.7	132.3	127.5

Max dry den= 136.1 pcf **Opt moisture=** 6.8 %
Uncorrected Results: **Max dry den=** 132.4 pcf **Opt moisture=** 8.0 %

ASTM D 4718 Correction Data:
Bulk Specific Gravity of Oversize Material = 2.59
Moisture of Oversize Material = %
Corrections Applied to Calculated Maximum Density and Optimum Moisture Values

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	14.9	43.3	11.6	13.5	10.7	6.0	

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	Site Sampled soils from Evap Pond	SG #7	Stockpile	8/22/01	GW-GM	Well-graded gravel with silt and sand	NA	NV	NP

Client Tom Borschel/ICDF Project

Project INTEC CERCLA Disposal Facility

CH2M Hill

Project No. S01-588058 Plate

INEL MATERIALS LAB

○ Sampled from excavated gravels used to build Evap. Pond

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Site Sampled soils from Evap Pond
Sample No.: SG #7
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: Sampled from landfill excavation to Evap. Pond
Description: Well-graded gravel with silt and sand
Date: 8/22/01 **Natural Moisture:** NA
Liquid Limit: NV **Plastic Limit:** NP **USCS Class.:** GW-GM
Testing Remarks: Sampled from excavated gravels used to build Evap. Pond

Mechanical Analysis Data

	Initial
Dry sample and tare=	7080.00
Tare =	0.00
Dry sample weight =	7080.00

Sample split on number 4 sieve
Split sample data:
Sample and tare = 539.00 Tare = .00 Sample weight = 539.00

Sieve tare method

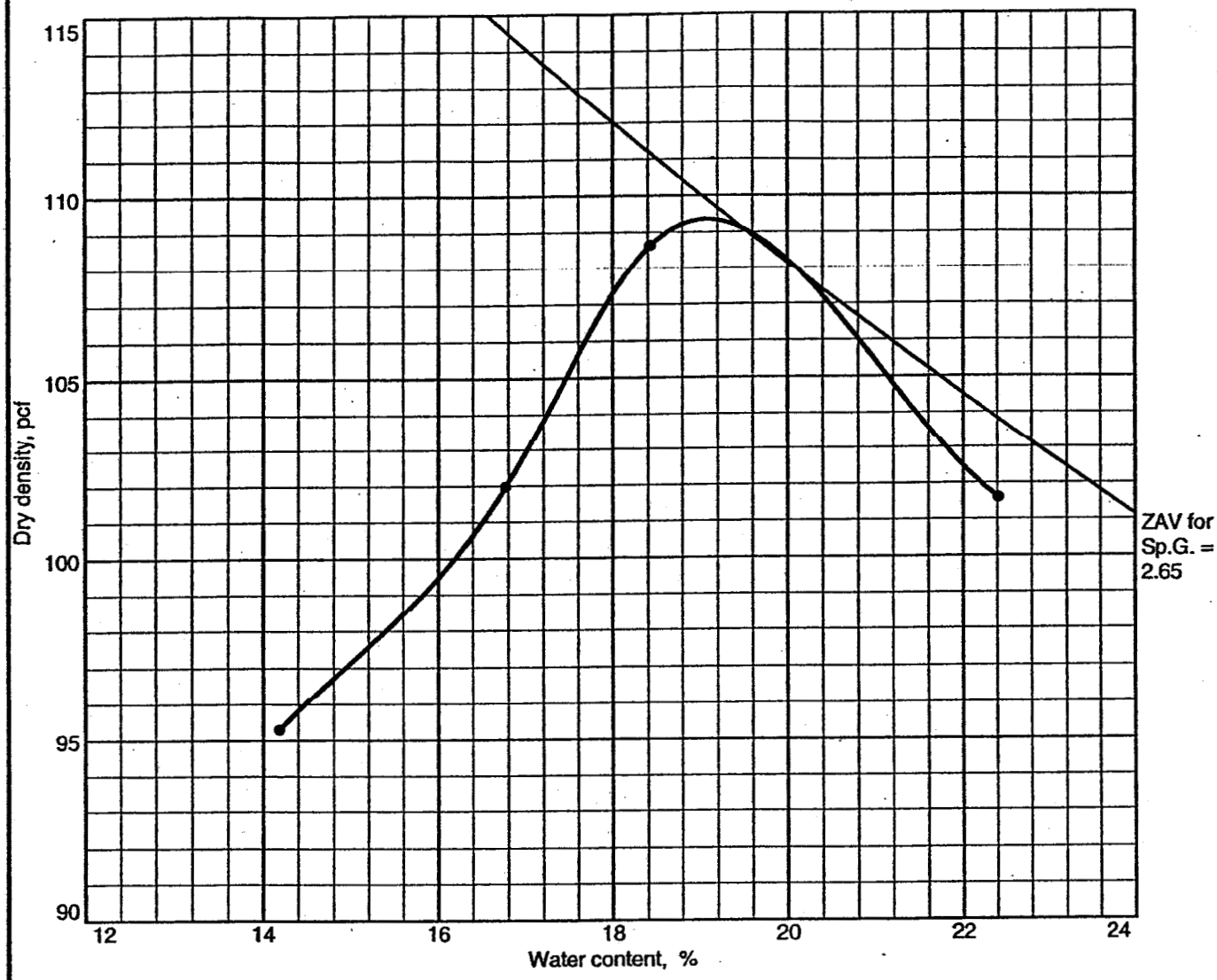
Sieve	Weight retained	Sieve tare	Percent finer
3 inch	0.00	0.00	100.0
2 inch	0.00	0.00	100.0
1.5 inch	0.00	0.00	100.0
1 inch	710.00	0.00	90.0
0.75 inch	348.30	0.00	85.1
0.50 inch	1081.60	0.00	69.8
0.375 inch	617.70	0.00	61.1
# 4	1360.00	0.00	41.8
# 8	129.70	0.00	31.7
# 16	71.50	0.00	26.2
# 30	68.20	0.00	20.9
# 50	110.00	0.00	12.4
# 100	66.20	0.00	7.2
# 200	16.20	0.00	6.0

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 58.2 (% coarse = 14.9 % fine = 43.3)
% SAND = 35.8 (% coarse = 11.6 % medium = 13.5 % fine = 10.7)
% FINES = 6.0

D_{85}= 18.98 D_{60}= 9.16 D_{50}= 6.51
D_{30}= 1.95 D_{15}= 0.37 D_{10}= 0.24
C_c= 1.7709 C_u= 38.9603

COMPACTION TEST REPORT



Test specification: ASTM D 1557-91 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
Stockpile	CL	A-6(19)	8.9%	2.65	38	22	0.0	89.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 109.3 pcf Optimum moisture = 19.1 %	Lean clay

Project No. S01-588058 **Client:** Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Location: RyeGrass Borrow Area

Remarks:
Sample NCL #1, Sampled on 8-09-01 by Stacey Lilya and Eric Olhoffer

COMPACTION TEST REPORT

INEL MATERIALS LAB

Plate

MOISTURE DENSITY TEST DATA

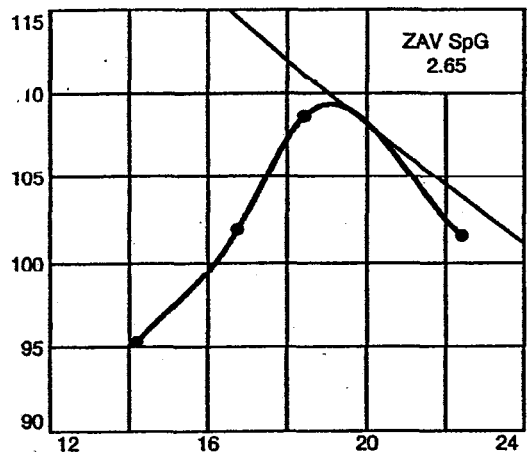
ient: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Specimen Data

Source: Ryegrass Flats Soil
Sample No.: NCL #1
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: RyeGrass Borrow Area
Description: Lean clay
USCS Classification: CL **AASHTO Classification:** A-6(19)
Natural Moisture: 8.9% **Liquid Limit:** 38 **Plasticity Index:** 22
Testing Remarks: Sample NCL #1, Sampled on 8-09-01 by Stacey Lilya and Eric Olhoffer
Percent retained on No.4 sieve: 0.0
Percent passing No. 200 sieve: 89.4 **Specific gravity:** 2.65

Test Data And Results

Type of test: ASTM D 1557-91 Method A Modified

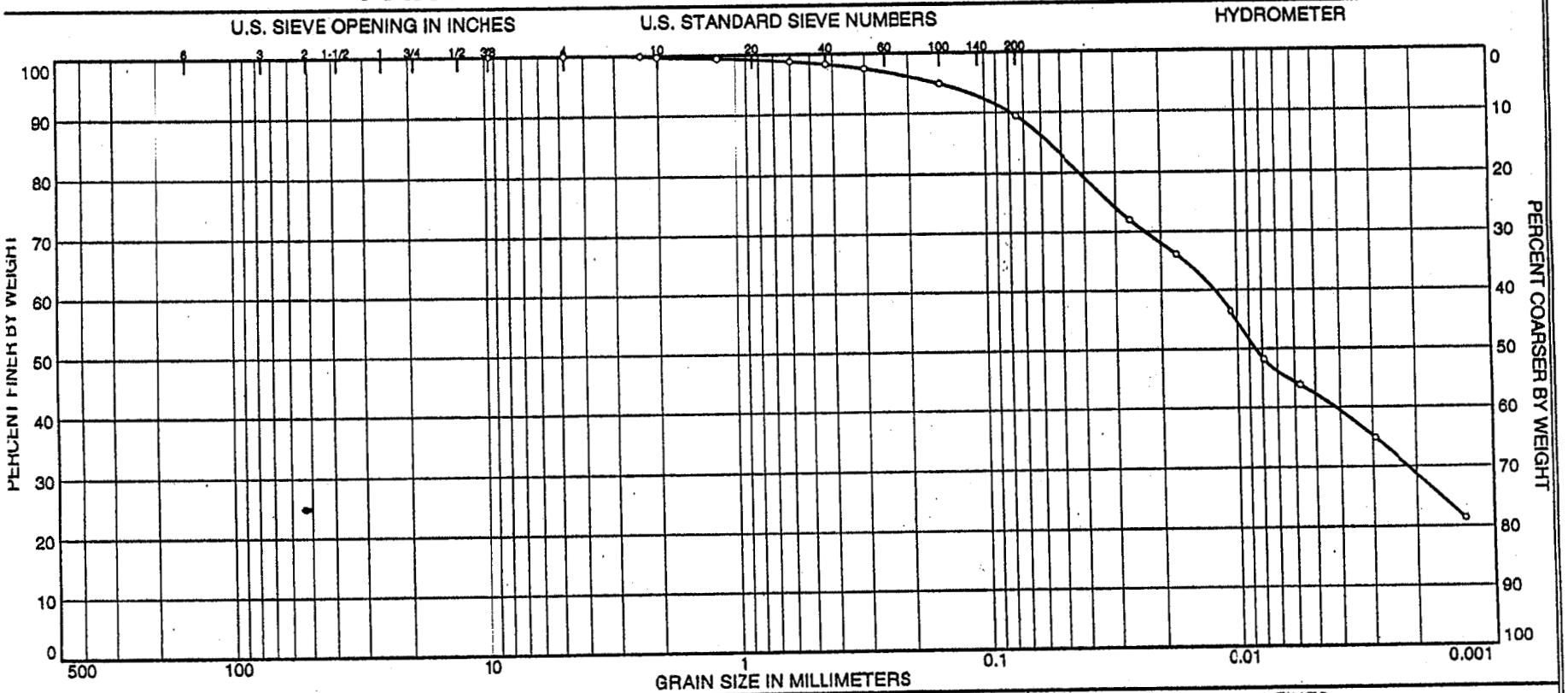


POINT NO.	1	2	3	4
WM + WS	5890.0	6045.0	6190.0	6125.0
WM	4245.0	4245.0	4245.0	4245.0
WW+T	268.90	337.10	244.20	261.10
WD+T	235.50	288.70	206.20	213.30
TARE	0.00	0.00	0.00	0.00
MOIST	14.2	16.8	18.4	22.4
MOISTURE	14.2	16.8	18.4	22.4
DRY DEN	95.3	102.0	108.6	101.6

Max dry den= 109.3 pcf **Opt moisture=** 19.1 %

Oversize Correction Not Applied

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
O	0.0	0.0	0.0	0.3	1.4	8.9	47.1	42.3

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
O	Ryegrass Flats Soil	NCL #1	Stockpile	8/13/01	CL	Lean clay	8.9%	38	16

Client Tom Borschel/ICDF Project
Project INTEC CERCLA Disposal Facility
CH2M Hill
Project No. S01-588058 | Plate

INEL MATERIALS LAB

O NCL #1

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Flats Soil
Sample No.: NCL #1
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: RyeGrass Borrow Area
Description: Lean clay
Date: 8/13/01 **Natural Moisture:** 8.9%
Liquid Limit: 38 **Plastic Limit:** 16 **USCS Class.:** CL
Testing Remarks: NCL #1

Mechanical Analysis Data

	Initial
Dry sample and tare=	504.50
Tare =	0.00
Dry sample weight =	504.50

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
3/8 inch	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 8	0.60	0.00	99.9
# 10	0.70	0.00	99.7
# 16	1.50	0.00	99.4
# 30	3.20	0.00	98.8
# 40	2.40	0.00	98.3
# 50	4.00	0.00	97.5
# 100	13.20	0.00	94.9
# 200	28.00	0.00	89.4

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 99.7
Weight of hydrometer sample: 67.8
Calculated biased weight= 68.00
Automatic temperature correction
Composite correction at 20 deg C = -4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.60
Specific gravity correction factor= 1.012
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.0	52.0	53.0	0.0135	53.0	7.6	0.0264	72.0
5.00	22.0	48.0	49.0	0.0135	49.0	8.3	0.0174	66.1
15.00	22.0	41.5	42.5	0.0135	42.5	9.3	0.0107	56.4

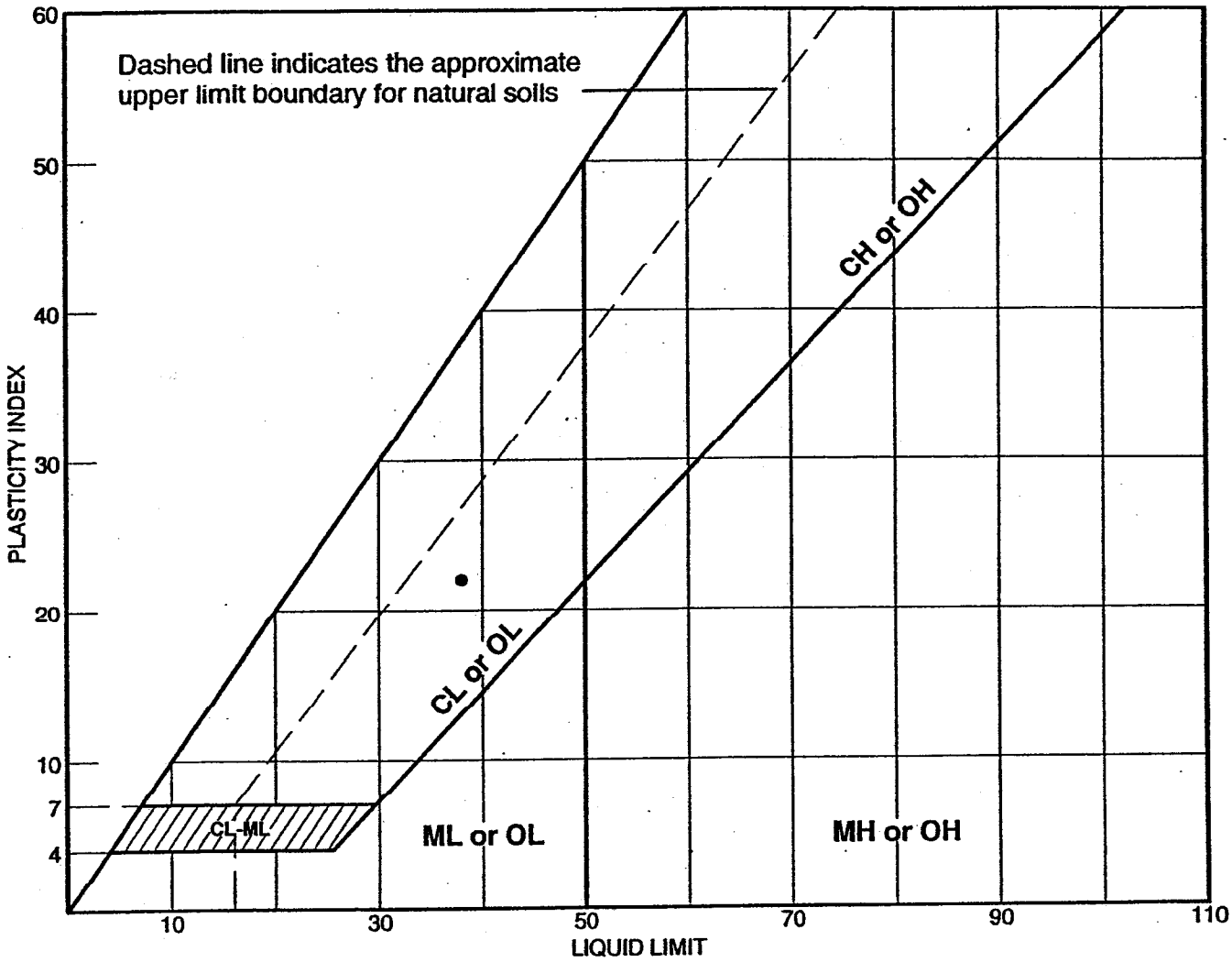
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
30.00	22.0	36.0	37.0	0.0135	37.0	10.2	0.0079	48.2
60.00	22.0	33.0	34.0	0.0135	34.0	10.7	0.0057	43.8
250.00	22.0	27.0	28.0	0.0135	28.0	11.7	0.0029	34.8
1440.00	22.0	18.0	19.0	0.0135	19.0	13.2	0.0013	21.4

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 0.0
% SAND = 10.6 (% coarse = 0.3 % medium = 1.4 % fine = 8.9)
% SILT = 47.1 % CLAY = 42.3

D_{85}= 0.06 D_{60}= 0.01 D_{50}= 0.01
D_{30}= 0.00

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Ryegrass Flats	NCL #1	Stockpile	8.9%	16	38	22	CL

LIQUID AND PLASTIC LIMITS TEST REPORT **INEL MATERIALS LAB**	**Client:** Tom Borschel/ICDF Project **Project:** INTEC CERCLA Disposal Facility CH2M Hill **Project No.:** S01-588058 **Plate**

LIQUID AND PLASTIC LIMIT TEST DATA

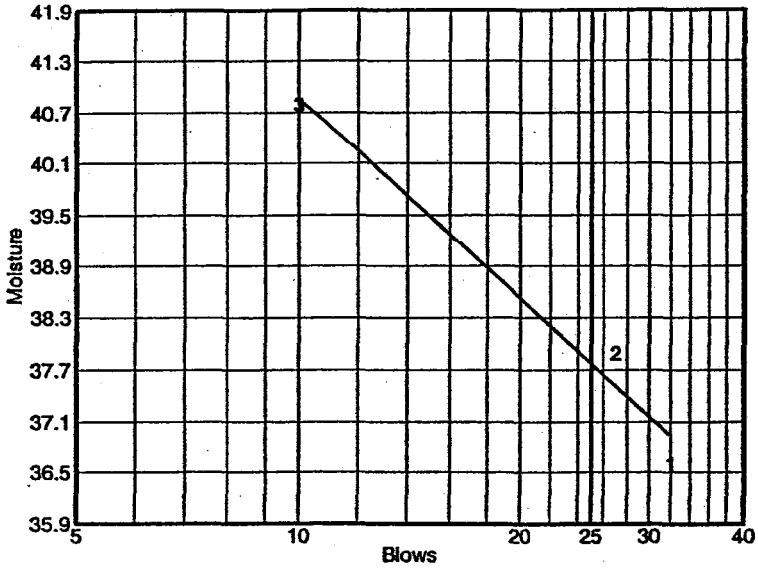
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Flats Soil
Sample No.: NCL #1
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: RyeGrass Borrow Area
Description: Lean clay
Water Content: 8.9% **USCS:** CL **AASHTO:** A-6(19)
Testing Remarks: NCL #1

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	26.22	26.84	30.72			
Dry+Tare	22.18	22.53	25.05			
Tare	11.15	11.17	11.16			
# Blows	32	27	10			
Moisture	36.6	37.9	40.8			

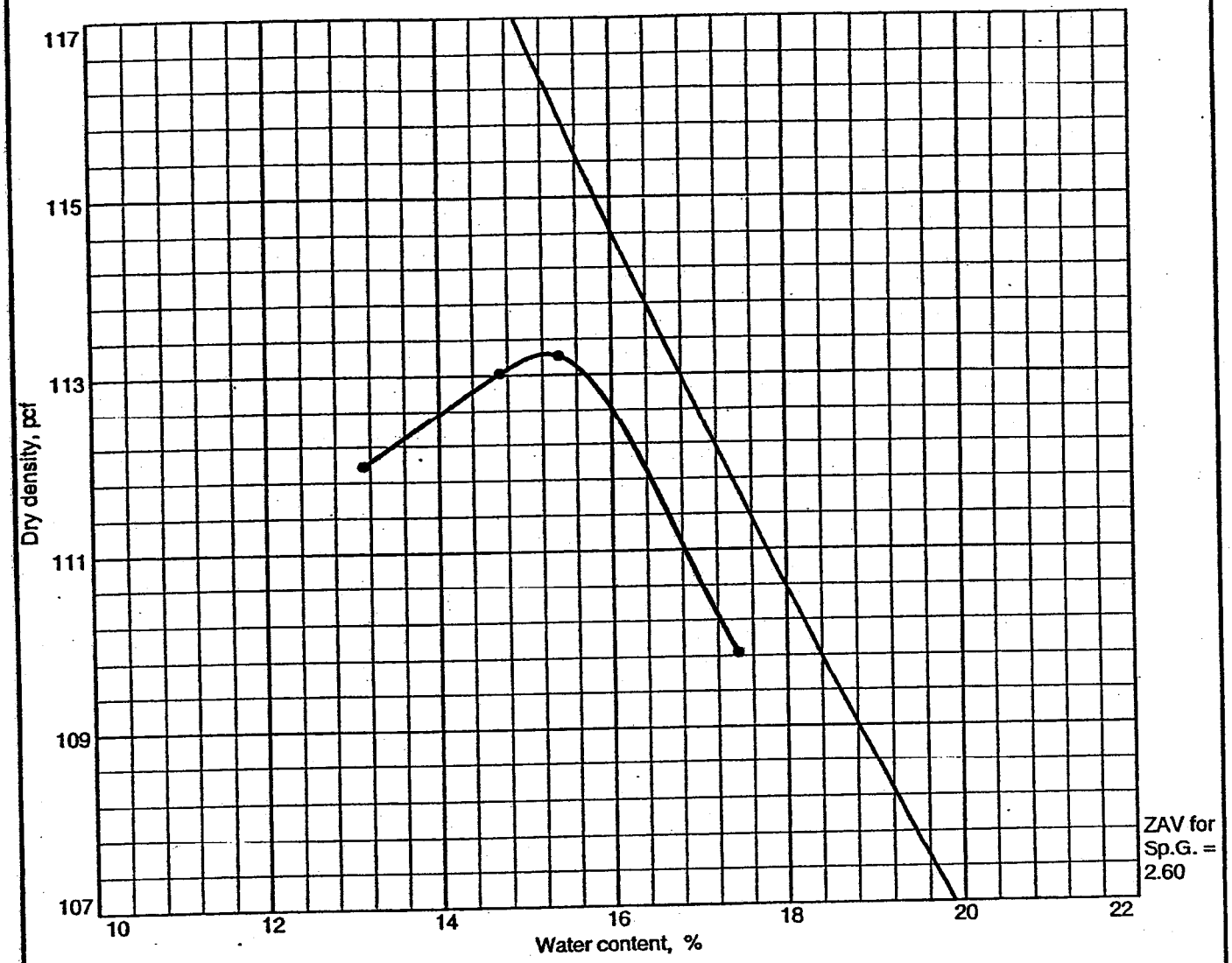


Liquid Limit= 38
Plastic Limit= 16
Plasticity Index= 22

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	7.52	6.65			
Dry+Tare	7.08	6.32			
Tare	4.37	4.36			
Moisture	16.2	16.8			

COMPACTION TEST REPORT



Test specification: ASTM D 1557-91 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
Stockpile	CL		15.7%	2.60	40	20	0.0	89.0

TEST RESULTS

Maximum dry density = 113.2 pcf

Optimum moisture = 15.3 %

MATERIAL DESCRIPTION

Project No. S01-588058 **Client:** Tom Borschel/ICDF Project

Project: INTEC CERCLA Disposal Facility

CH2M Hill

Location: Sampled from Mixing Pad

Remarks:

Sampled from the Test Liner mixing pad..fisrt sample.

BCL #1

COMPACTION TEST REPORT

INEL MATERIALS LAB

Plate

MOISTURE DENSITY TEST DATA

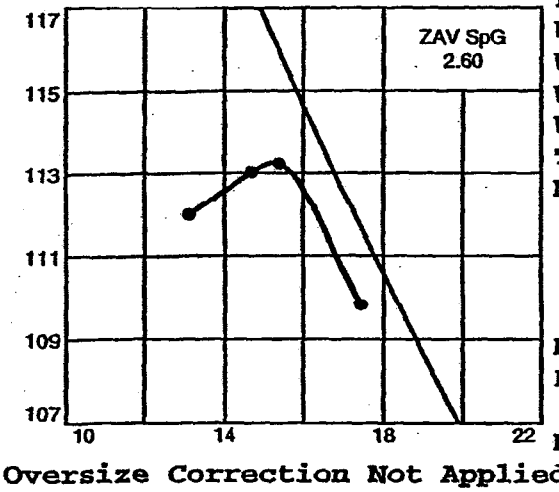
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Specimen Data

Source: Ryegrass Clay with 5% Bentonite
Sample No.: BCL #1
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: Sampled from Mixing Pad
Description:
USCS Classification: CL **AASHTO Classification:**
Natural Moisture: 15.7% **Liquid Limit:** 40 **Plasticity Index:** 20
Testing Remarks: Sampled from the Test Liner mixing pad..fisrt sample.
Percent retained on No.4 sieve: 0.0
Percent passing No. 200 sieve: 89.0 **Specific gravity:** 2.60

Test Data And Results

Type of test: ASTM D 1557-91 Method A Modified

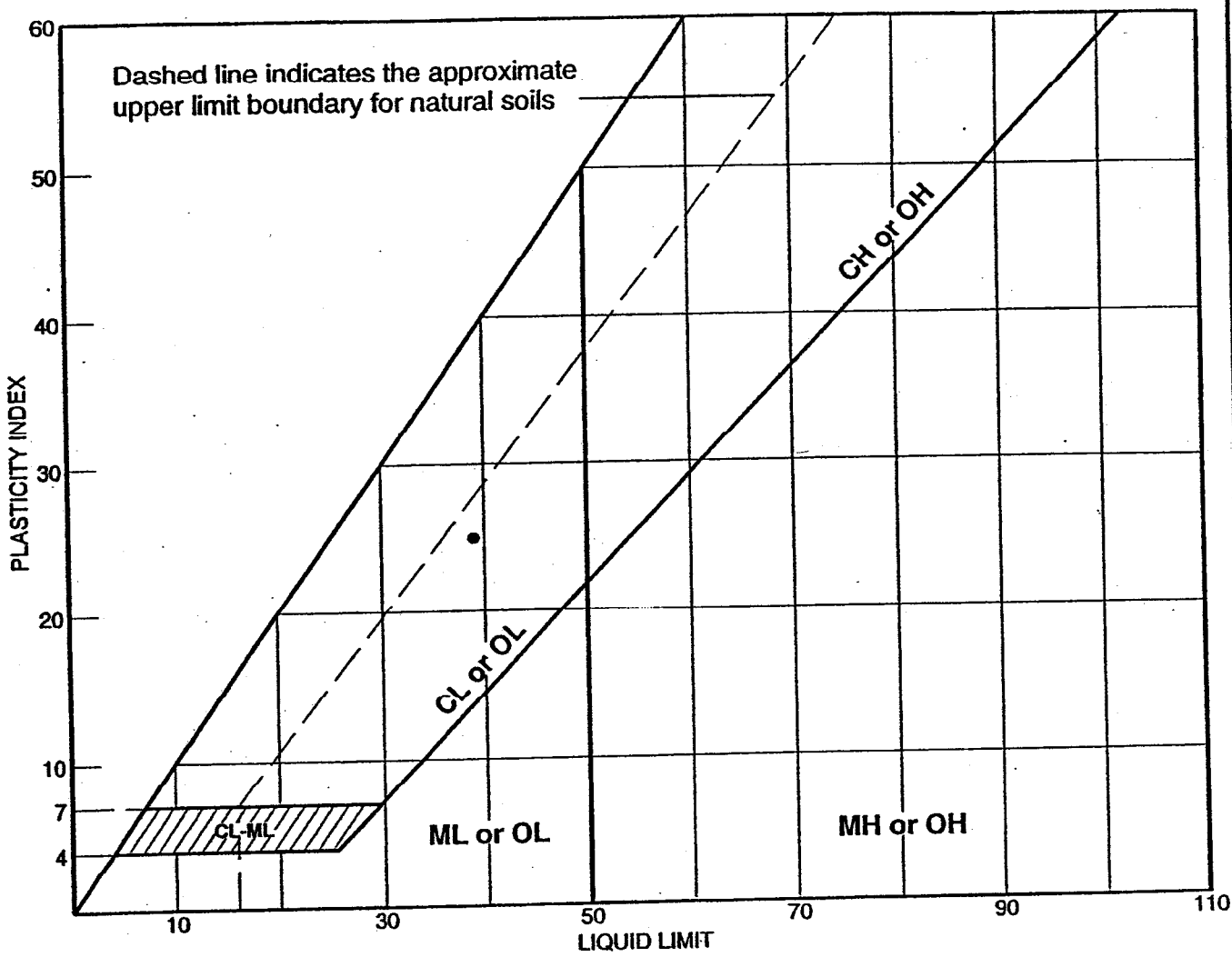


POINT NO.	1	2	3	4
WM + WS	6220.0	6205.0	6160.0	6195.0
WM	4245.0	4245.0	4245.0	4245.0
WW+T	203.20	231.60	288.80	276.20
WD+T	176.10	201.90	255.30	235.20
TARE	0.00	0.00	0.00	0.00
MOIST	15.4	14.7	13.1	17.4
MOISTURE	15.4	14.7	13.1	17.4
DRY DEN	113.2	113.0	112.0	109.8

Max dry den= 113.2 pcf **Opt moisture=** 15.3 %

Oversize Correction Not Applied

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Ryegrass Clay	BCL #1	Stockpile	15.7%	14	39	25	CL

LIQUID AND PLASTIC LIMITS TEST REPORT

INEL MATERIALS LAB

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project No.: S01-588058

Plate

LIQUID AND PLASTIC LIMIT TEST DATA

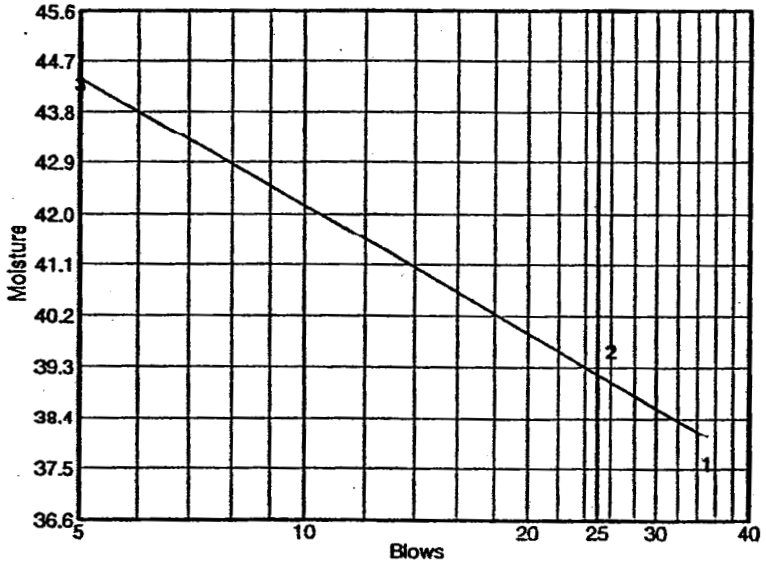
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Clay with 5% Bentonite
Sample No.: BCL #1
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: Sampled from Mixing Pad
Description: Lean clay
Water Content: 15.7% **USCS:** CL **AASHTO:** A-6(22)
Testing Remarks: Sample BCL #1 from mix pad at ICDF

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	24.77	26.22	26.56			
Dry+Tare	21.06	21.95	21.82			
Tare	11.18	11.16	11.12			
# Blows	35	26	5			
Moisture	37.6	39.6	44.3			

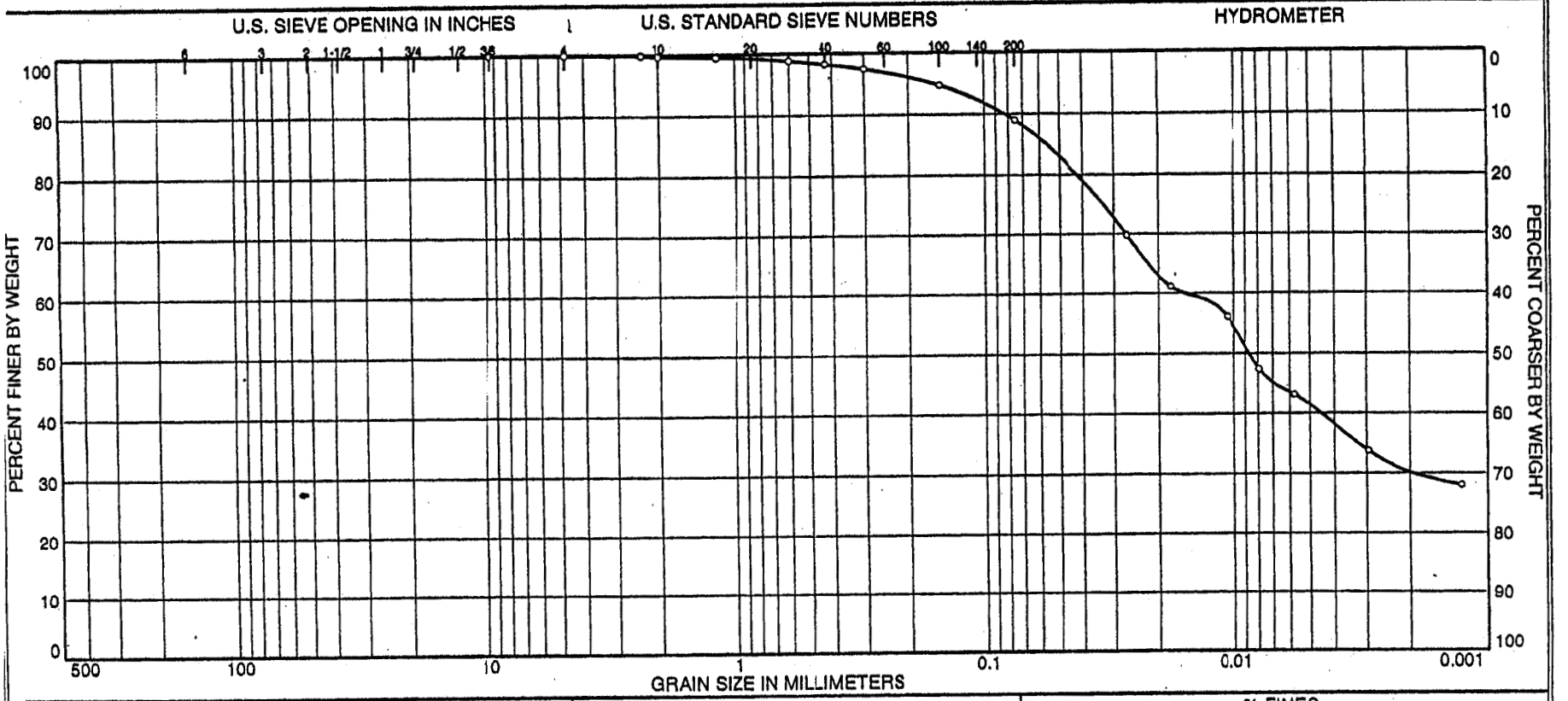


Liquid Limit= 39
Plastic Limit= 14
Plasticity Index= 25

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	8.56	10.05			
Dry+Tare	8.03	9.35			
Tare	4.41	4.31			
Moisture	14.6	13.9			

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
O	0.0	0.0	0.0	0.3	1.4	9.4	47.4	41.5

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
O	Ryegrass Clay with 5% Bentonite	BCL #1	Stockpile	8/21/01	CL	Lean clay	15.7%	39	14

Client Tom Borschel/ICDF Project
Project INTEC CERCLA Disposal Facility
CH2M Hill
Project No. S01-588058 Plate

INEL MATERIALS LAB

O Sample BCL #1

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Clay with 5% Bentonite
Sample No.: BCL #1
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: Sampled from Mixing Pad
Description: Lean clay
Date: 8/21/01 **Natural Moisture:** 15.7%
Liquid Limit: 39 **Plastic Limit:** 14 **USCS Class.:** CL
Testing Remarks: Sample BCL #1

Mechanical Analysis Data

	Initial
Dry sample and tare=	505.60
Tare =	0.00
Dry sample weight =	505.60

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
3/8 inch	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 8	0.70	0.00	99.9
# 10	0.70	0.00	99.7
# 16	1.30	0.00	99.5
# 30	3.00	0.00	98.9
# 40	2.90	0.00	98.3
# 50	4.30	0.00	97.5
# 100	14.10	0.00	94.7
# 200	29.20	0.00	88.9

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 99.7
Weight of hydrometer sample: 70
Calculated biased weight= 70.21
Automatic temperature correction
Composite correction at 20 deg C = -3.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.60
Specific gravity correction factor= 1.012
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.0	51.0	52.0	0.0135	52.0	7.8	0.0266	69.8
5.00	22.0	45.0	46.0	0.0135	46.0	8.8	0.0179	61.1
15.00	22.0	41.5	42.5	0.0135	42.5	9.3	0.0107	56.1

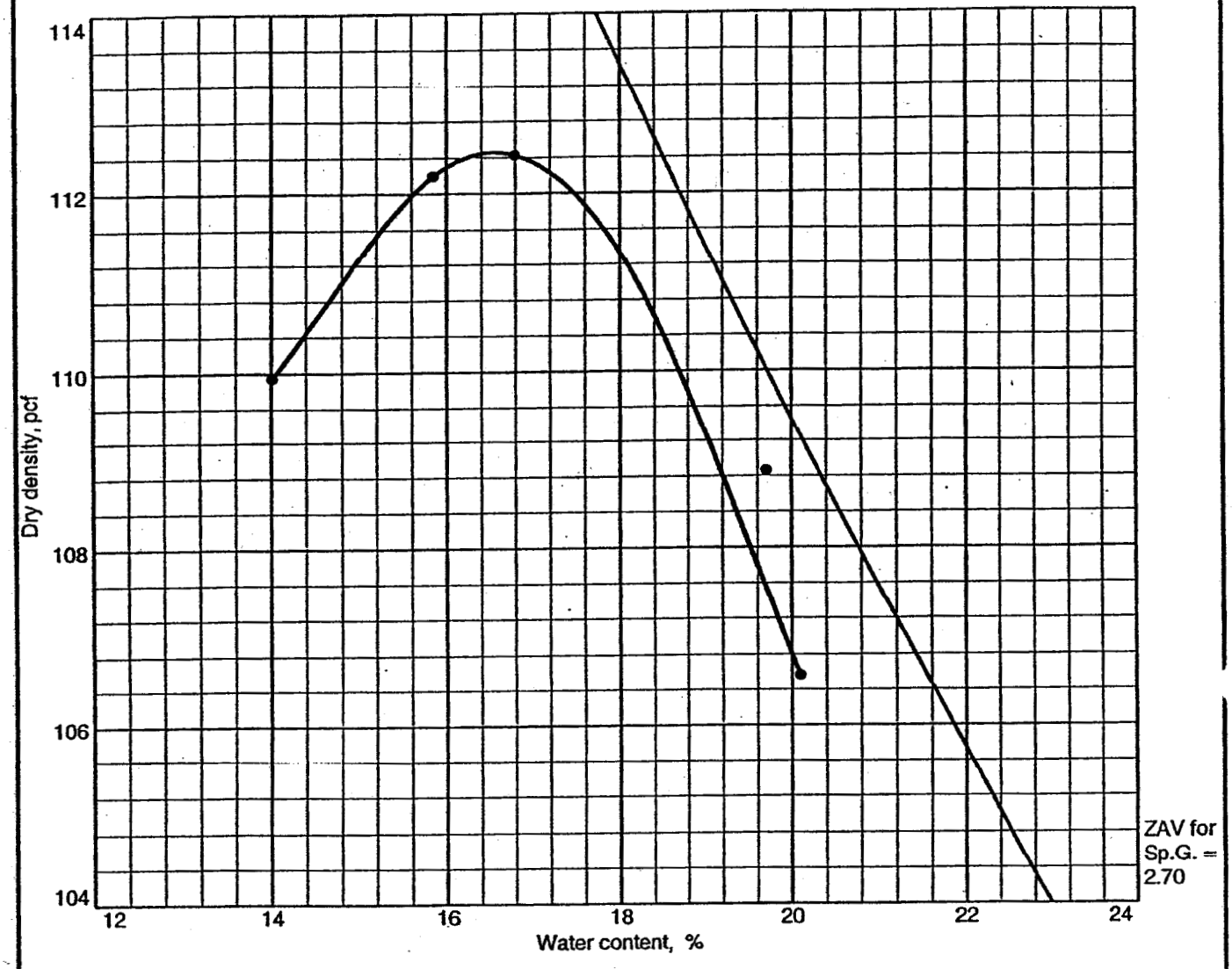
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
30.00	22.0	35.5	36.5	0.0135	36.5	10.3	0.0079	47.4
60.00	22.0	32.5	33.5	0.0135	33.5	10.8	0.0057	43.1
250.00	22.0	26.0	27.0	0.0135	27.0	11.9	0.0029	33.7
1440.00	22.0	22.0	23.0	0.0135	23.0	12.5	0.0013	28.0

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 0.0
% SAND = 11.1 (% coarse = 0.3 % medium = 1.4 % fine = 9.4)
% SILT = 47.4 % CLAY = 41.5

D_{85}= 0.06 D_{60}= 0.02 D_{50}= 0.01
D_{30}= 0.00

COMPACTION TEST REPORT



Test specification: ASTM D 1557-91 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
Stockpile	CL	A-6(24)	18.5%	2.70	40	28	0.0	89.4

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 112.5 pcf Optimum moisture = 16.5 %	Lean clay

Project No. S01-588058 **Client:** Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Location: CCI #3 Ryegrass

Remarks:
Sample CCI #3, with 5% bentonite added.

COMPACTION TEST REPORT

INEL MATERIALS LAB

Plate

MOISTURE DENSITY TEST DATA

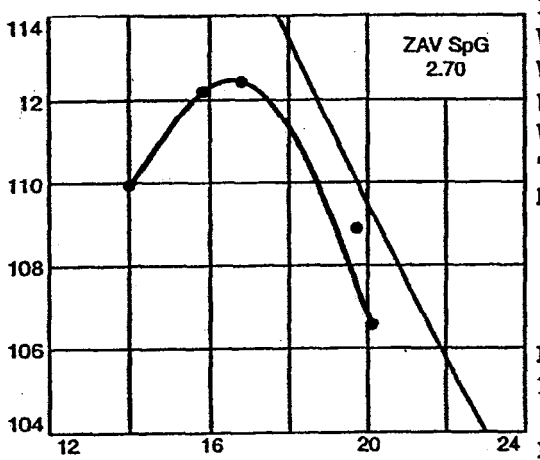
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Specimen Data

Source: Ryegrass Flats Soil
Sample No.: CCI #3 Ryegrass
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: CCI #3 Ryegrass
Description: Lean clay
USCS Classification: CL **AASHTO Classification:** A-6(24)
Natural Moisture: 18.5% **Liquid Limit:** 40 **Plasticity Index:** 28
Testing Remarks: Sample CCI #3, with 5% bentonite added.
Percent retained on No.4 sieve: 0.0
Percent passing No. 200 sieve: 89.4 **Specific gravity:** 2.70

Test Data And Results

Type of test: ASTM D 1557-91 Method A Modified

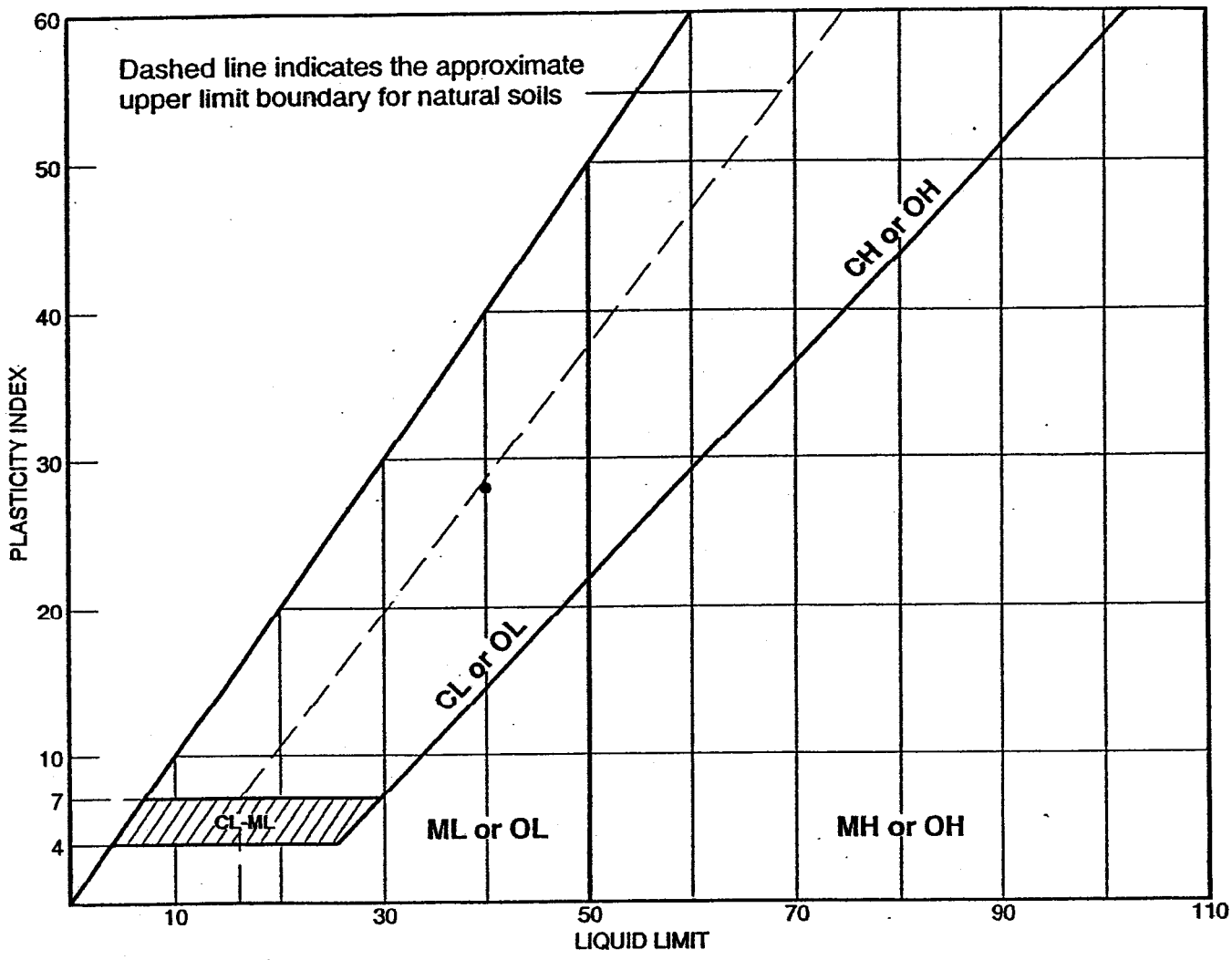


POINT NO.	1	2	3	4	5
WM + WS	6180.0	6215.0	6230.0	6210.0	6140.0
WM	4245.0	4245.0	4245.0	4245.0	4245.0
WW+T	218.10	243.00	256.00	258.80	293.80
WD+T	181.60	203.00	219.20	223.40	257.70
TARE	0.00	0.00	0.00	0.00	0.00
MOIST	20.1	19.7	16.8	15.8	14.0
MOISTURE	20.1	19.7	16.8	15.8	14.0
DRY DEN	106.6	108.9	112.4	112.2	109.9

Max dry den= 112.5 pcf **Opt moisture=** 16.5 %

Oversize Correction Not Applied

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Ryegrass Flats	CCI #3	Stockpile	18.5%	12	40	28	CL

LIQUID AND PLASTIC LIMITS TEST REPORT **INEL MATERIALS LAB**	**Client:** Tom Borschel/ICDF Project **Project:** INTEC CERCLA Disposal Facility CH2M Hill **Project No.:** S01-588058 Plate

LIQUID AND PLASTIC LIMIT TEST DATA

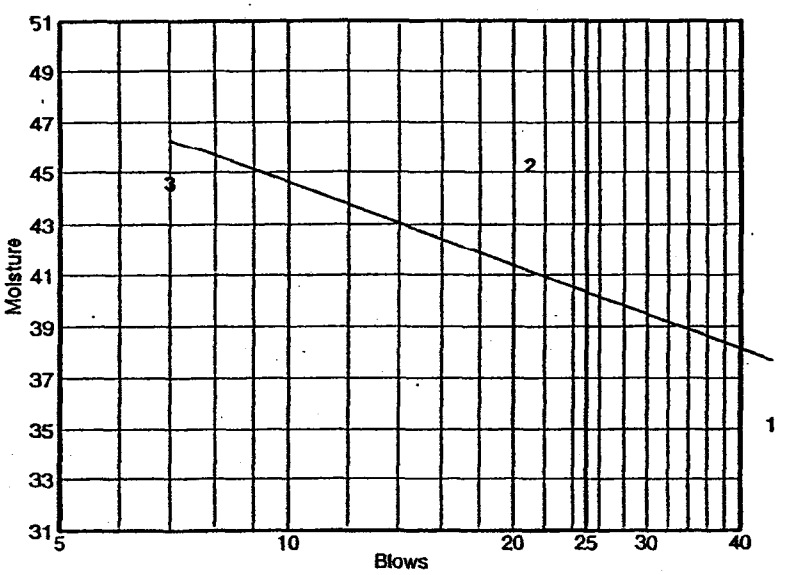
. Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Flats Soil
Sample No.: CCI #3 Ryegrass
Elev. or Depth: Stockpile Sample Length (in./cm.):
Location: CCI #3 Ryegrass
Description: Lean clay
Water Content: 18.5% USCS: CL AASHTO: A-6(24)
Testing Remarks: Sample # CCI-3

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.40	26.75	27.57			
Dry+Tare	21.68	21.88	22.52			
Tare	11.12	11.13	11.19			
# Blows	44	21	7			
Moisture	35.2	45.3	44.6			

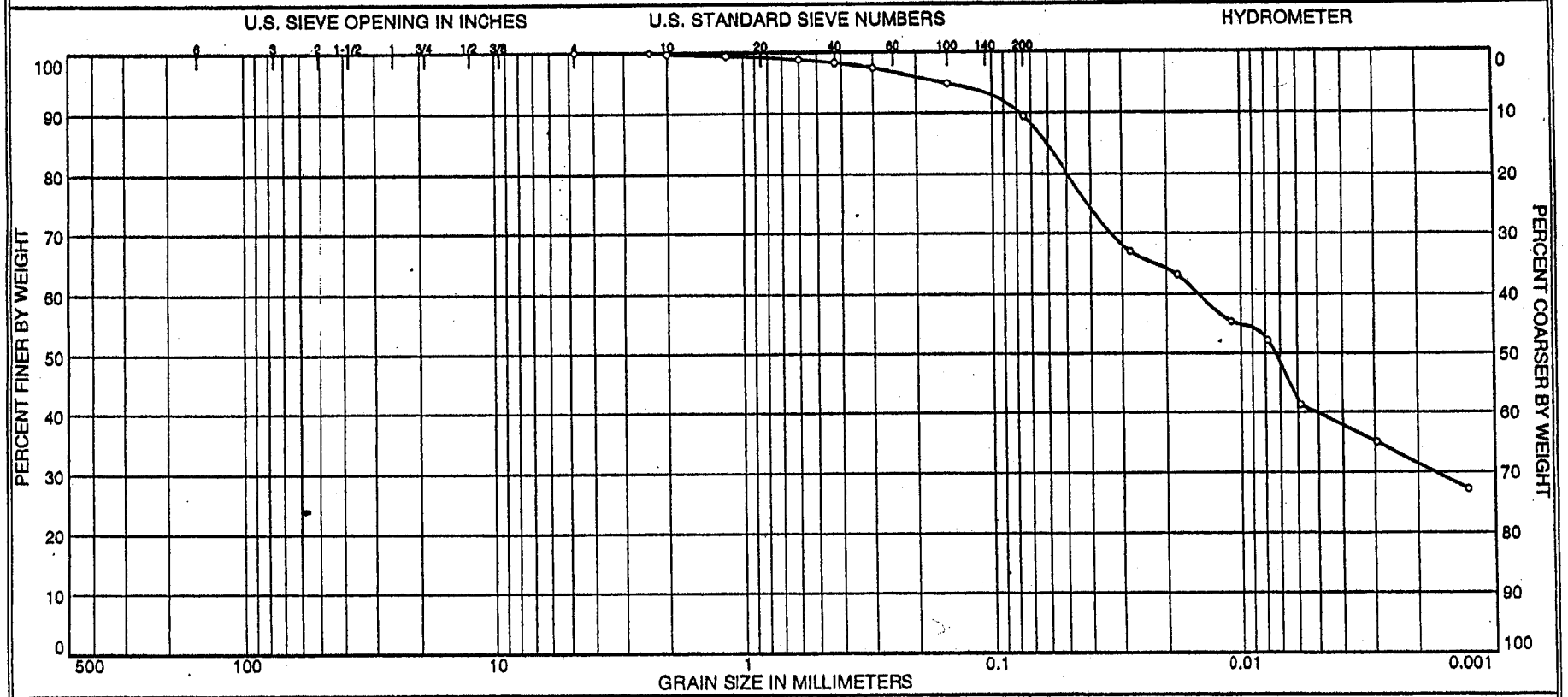


Liquid Limit= 40
Plastic Limit= 12
Plasticity Index= 28

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	6.76	6.20			
Dry+Tare	6.51	6.00			
Tare	4.31	4.32			
Moisture	11.4	11.9			

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.3	1.4	8.9	49.5	39.9

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	Ryegrass Flats Soil	CCI #3	Stockpile	8/16/01	CL	Lean clay	18.5%	40	12
		Ryegrass							

Client Tom Borschel/ICDF Project
Project INTEC CERCLA Disposal Facility
CH2M Hill
Project No. S01-588058 Plate

INEL MATERIALS LAB

○ Sample #CCI-3, 5% bentonite

GRAIN SIZE DISTRIBUTION TEST DATA

ient: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Flats Soil
Sample No.: CCI #3 Ryegrass
Elev. or Depth: Stockpile Sample Length (in./cm.):
Location: CCI #3 Ryegrass
Description: Lean clay
Date: 8/16/01 Natural Moisture: 18.5%
Liquid Limit: 40 Plastic Limit: 12 USCS Class.: CL
Testing Remarks: Sample #CCI-3, 5% bentonite

Mechanical Analysis Data

	Initial
Dry sample and tare=	504.50
Tare =	0.00
Dry sample weight =	504.50

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
# 4	0.00	0.00	100.0
# 8	0.60	0.00	99.9
# 10	0.70	0.00	99.7
# 16	1.50	0.00	99.4
# 30	3.20	0.00	98.8
# 40	2.40	0.00	98.3
# 50	4.00	0.00	97.5
# 100	13.20	0.00	94.9
# 200	28.00	0.00	89.4

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 99.7
Weight of hydrometer sample: 64.6
Calculated biased weight= 64.79
Automatic temperature correction
Composite correction at 20 deg C = -4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.60
Specific gravity correction factor= 1.012
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.0	46.5	47.5	0.0135	47.5	8.5	0.0279	67.0
5.00	22.0	44.0	45.0	0.0135	45.0	8.9	0.0181	63.1
15.00	22.0	39.0	40.0	0.0135	40.0	9.7	0.0109	55.3
30.00	22.0	37.0	38.0	0.0135	38.0	10.1	0.0078	52.2

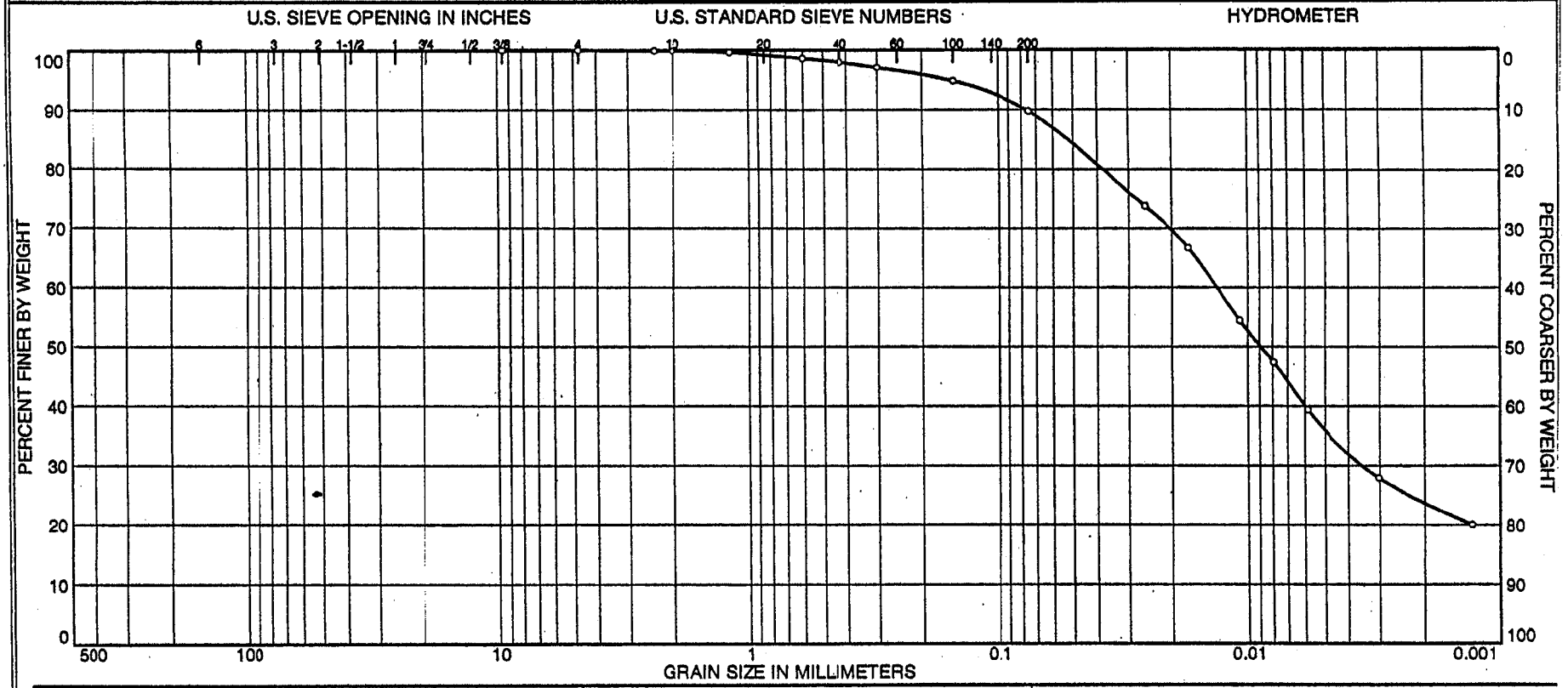
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
60.00	22.0	30.0	31.0	0.0135	31.0	11.2	0.0058	41.3
250.00	22.0	26.0	27.0	0.0135	27.0	11.9	0.0029	35.0
1440.00	22.0	21.0	22.0	0.0135	22.0	12.7	0.0013	27.2

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 0.0
% SAND = 10.6 (% coarse = 0.3 % medium = 1.4 % fine = 8.9)
% SILT = 49.5 % CLAY = 39.9

D_{85}= 0.06 D_{60}= 0.01 D_{50}= 0.01
D_{30}= 0.00

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.1	1.9	8.3	53.8	35.9

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	Ryegrass Flats Soil	NCL #2	Stockpile	8/21/01	CL	Lean clay	8.8%	29	14

Client Tom Borschel/ICDF Project
Project INTEC CERCLA Disposal Facility
CH2M Hill
Project No. S01-588058 Plate

INEL MATERIALS LAB

○ Sampled from Ryegrass stockpile at ICDF site

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Flats Soil
Sample No.: NCL #2
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: NCL #2 Ryegrass Material
Description: Lean clay
Date: 8/21/01 **Natural Moisture:** 8.8%
Liquid Limit: 29 **Plastic Limit:** 14 **USCS Class.:** CL
Testing Remarks: Sampled from Ryegrass stockpile at ICDF site

Mechanical Analysis Data

		Initial
Dry sample and tare	=	471.50
Tare	=	0.00
Dry sample weight	=	471.50

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
3/8 inch	0.00	0.00	100.0
# 4	0.10	0.00	100.0
# 8	0.30	0.00	99.9
# 10	0.30	0.00	99.9
# 16	1.30	0.00	99.6
# 30	4.70	0.00	98.6
# 40	2.80	0.00	98.0
# 50	4.00	0.00	97.1
# 100	11.20	0.00	94.8
# 200	24.10	0.00	89.7

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 99.9
Weight of hydrometer sample: 70.4
Calculated biased weight= 70.47
Automatic temperature correction
Composite correction at 20 deg C = -3.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.60
Specific gravity correction factor= 1.012
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.0	54.0	55.0	0.0135	55.0	7.3	0.0258	73.8
5.00	22.0	49.0	50.0	0.0135	50.0	8.1	0.0172	66.7
15.00	22.0	40.5	41.5	0.0135	41.5	9.5	0.0108	54.4

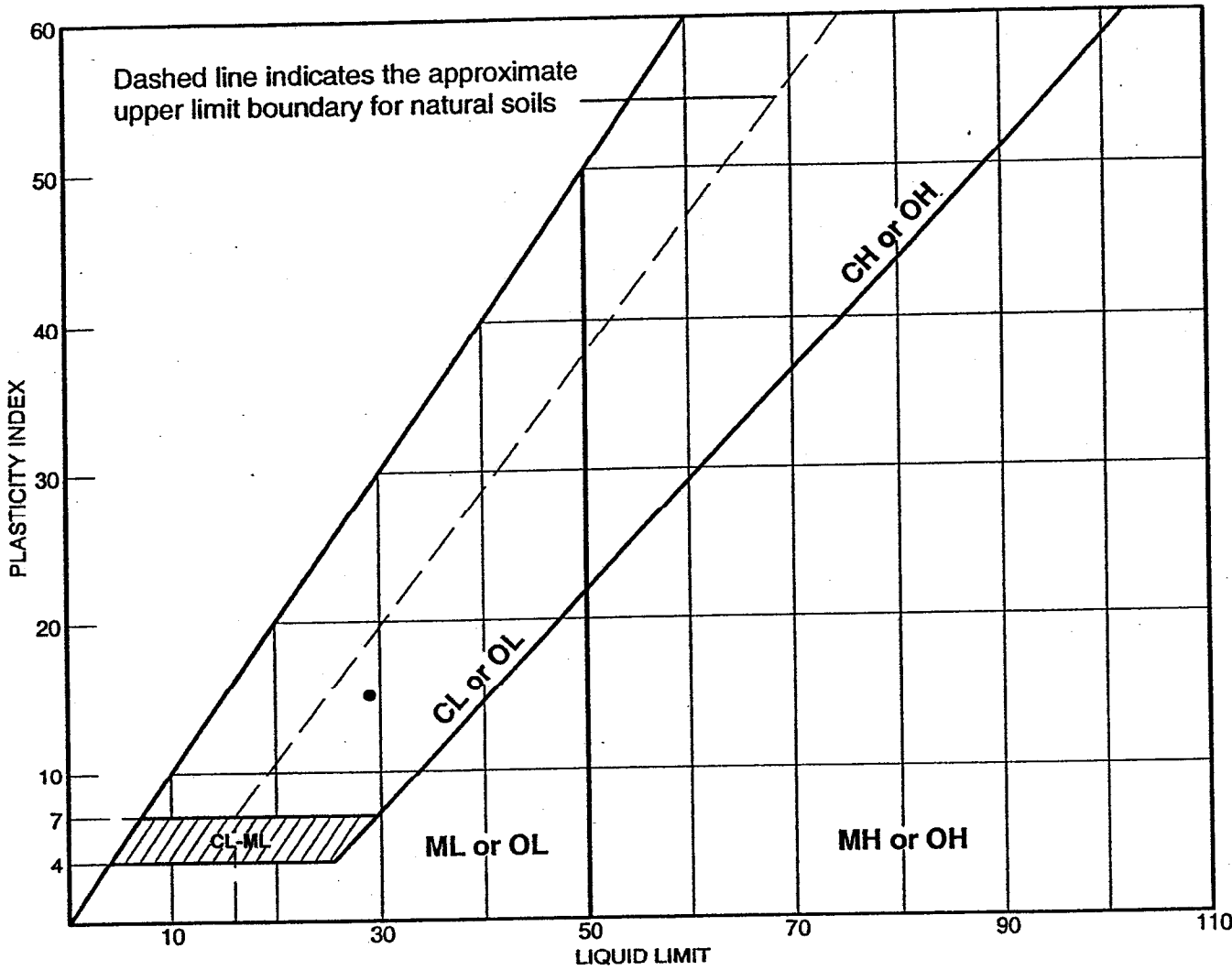
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	[illegible]	[illegible]	[illegible] depth	[illegible] mm	[illegible] finer
30.00	22.0	35.5	36.5	0.0135	36.5	10.3	0.0079	47.3
60.00	22.0	30.0	31.0	0.0135	31.0	11.2	0.0058	39.4
250.00	22.0	22.0	23.0	0.0135	23.0	12.5	0.0030	27.9
1440.00	22.0	16.5	17.5	0.0135	17.5	13.4	0.0013	20.0

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 0.0
% SAND = 10.3 (% coarse = 0.1 % medium = 1.9 % fine = 8.3)
% SILT = 53.8 % CLAY = 35.9

D_{85}= 0.05 D_{60}= 0.01 D_{50}= 0.01
D_{30}= 0.00

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Ryegrass Flats	NCL #2	Stockpile	8.8%	14	29	15	CL

LIQUID AND PLASTIC LIMITS TEST REPORT

INEL MATERIALS LAB

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project No.: S01-588058

Plate

LIQUID AND PLASTIC LIMIT TEST DATA

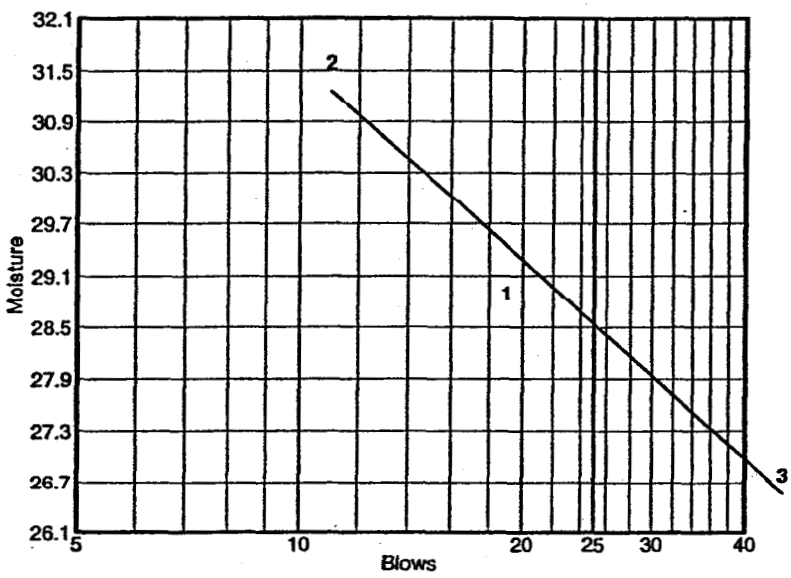
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Flats Soil
Sample No.: NCL #2
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: NCL #2 Ryegrass Material
Description: Lean clay
Water Content: 8.8% **USCS:** CL **AASHTO:** A-6(12)
Testing Remarks: Sampled from Ryegrass stocpiled materials located on test site.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	27.55	25.30	27.28			
Dry+Tare	23.86	21.90	23.88			
Tare	11.10	11.15	11.19			
# Blows	19	11	45			
Moisture	28.9	31.6	26.8			

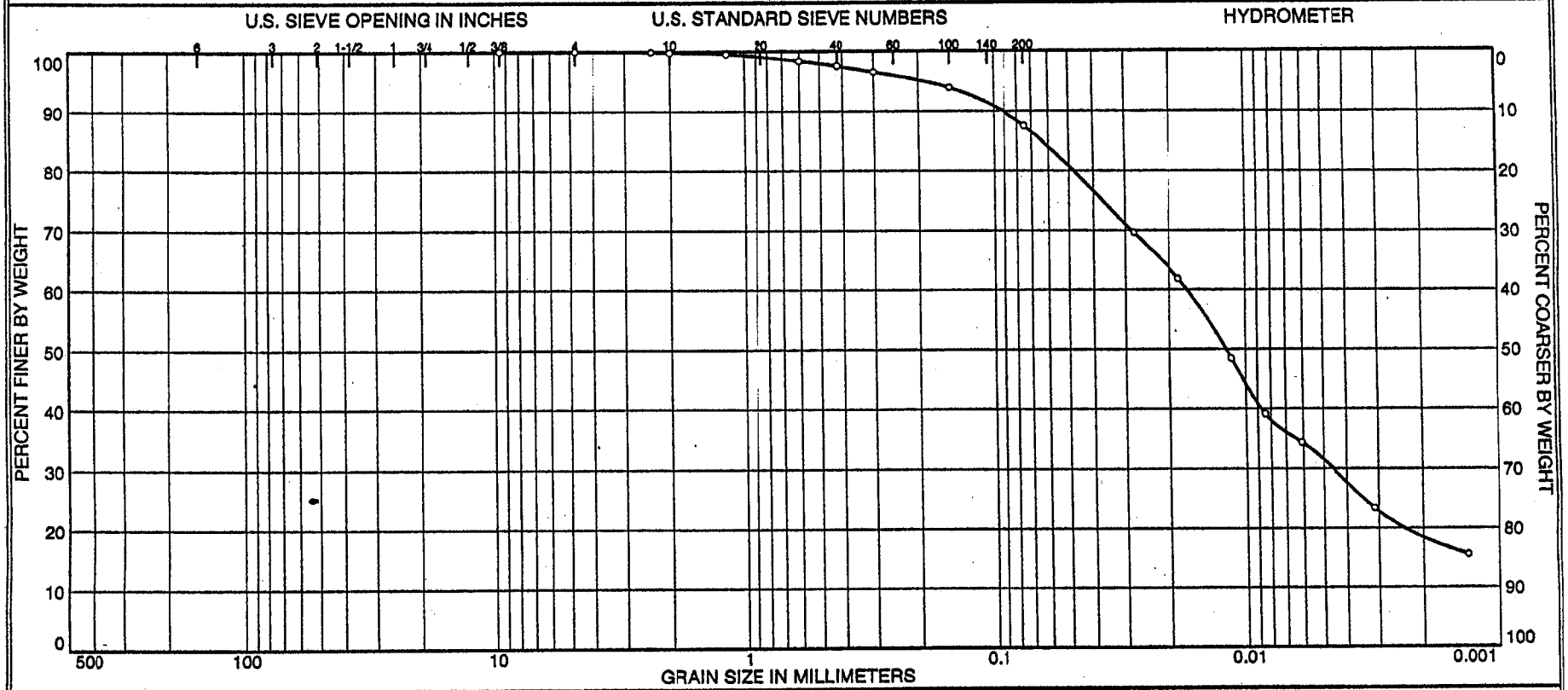


Liquid Limit= 29
Plastic Limit= 14
Plasticity Index= 15

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	8.61	7.99			
Dry+Tare	8.09	7.52			
Tare	4.36	4.34			
Moisture	13.9	14.8			

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.0	0.2	2.2	10.1	56.0	31.5

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	Ryegrass Flats Soil	NCL #3	stockpile	8/21/01	CL	Lean clay	8.6%	28	15

Client Tom Borschel/ICDF Project

Project INTEC CERCLA Disposal Facility

CH2M Hill

Project No. S01-588058 | Plate

INEL MATERIALS LAB

○ Sampled from Ryegrass Stockpile at ICDF.

Client: Tom Borschel/ICDF Project
oject: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Flats Soil
Sample No.: NCL #3
Elev. or Depth: stockpile Sample Length (in./cm.):
Location: NCL #3 Ryegrass clays
Description: Lean clay
Date: 8/21/01 Natural Moisture: 8.6%
Liquid Limit: 28 Plastic Limit: 15 USCS Class.: CL
Testing Remarks: Sampled from Ryegrass Stockpile at ICDF.

Mechanical Analysis Data

	Initial
Dry sample and tare=	484.20
Tare =	0.00
Dry sample weight =	484.20

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
3/8 inch	0.00	0.00	100.0
# 4	0.00	0.00	100.0
# 8	0.50	0.00	99.9
# 10	0.40	0.00	99.8
# 16	1.50	0.00	99.5
# 30	5.50	0.00	98.4
# 40	3.80	0.00	97.6
# 50	4.80	0.00	96.6
# 100	13.30	0.00	93.9
# 200	30.60	0.00	87.5

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 99.8
Weight of hydrometer sample: 64.4
Calculated biased weight= 64.53
Automatic temperature correction
Composite correction at 20 deg C = -3.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.60
Specific gravity correction factor= 1.012
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.0	47.0	48.0	0.0135	48.0	8.4	0.0277	69.6
5.00	22.0	42.0	43.0	0.0135	43.0	9.2	0.0184	61.8
15.00	22.0	33.5	34.5	0.0135	34.5	10.6	0.0114	48.5

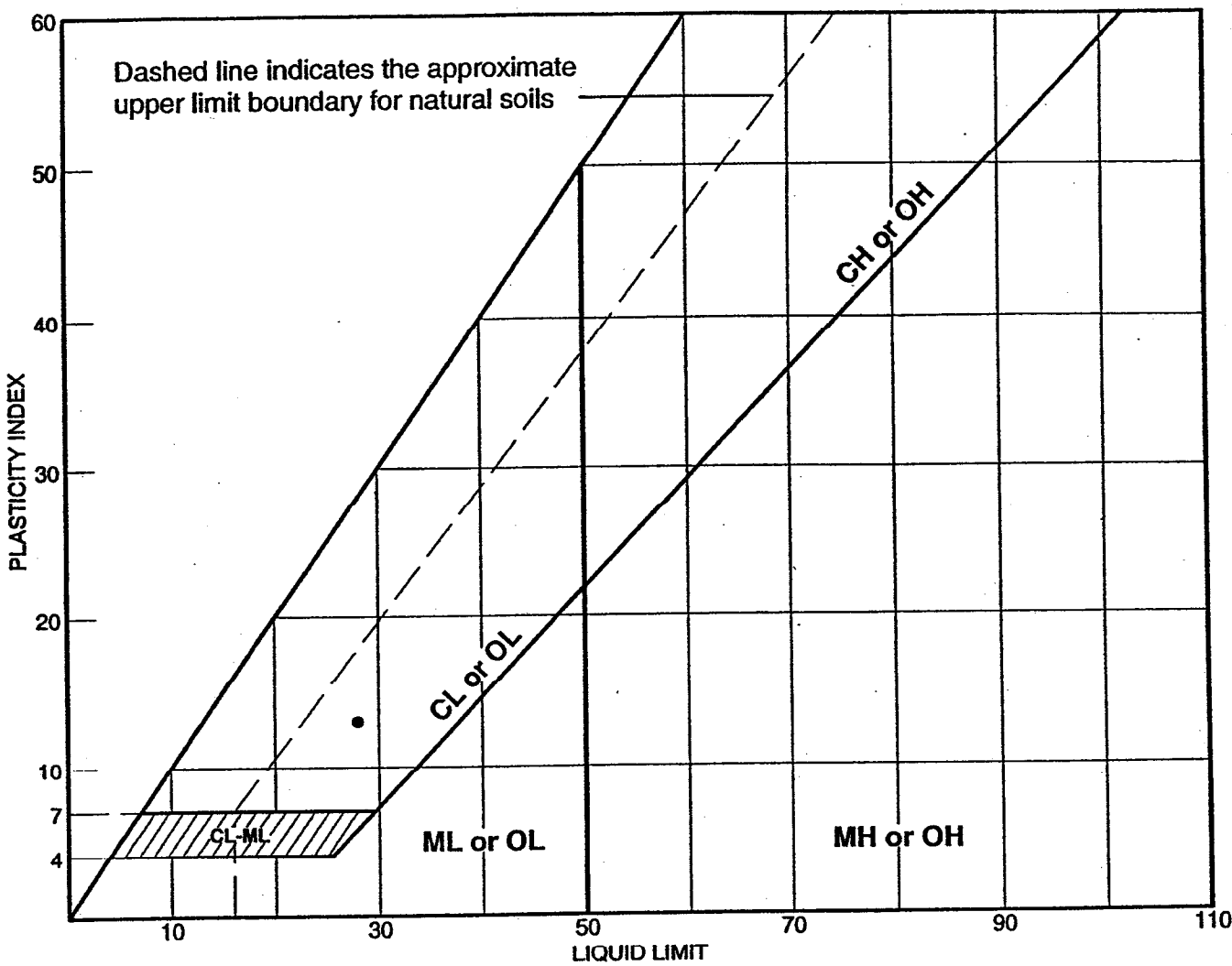
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	[illegible]	[illegible] depth	[illegible] mm	[illegible] finer
30.00	22.0	27.5	28.5	0.0135	28.5	11.6	0.0084	39.1
60.00	22.0	24.5	25.5	0.0135	25.5	12.1	0.0061	34.4
250.00	22.0	17.5	18.5	0.0135	18.5	13.3	0.0031	23.4
1440.00	22.0	12.5	13.5	0.0135	13.5	14.1	0.0013	15.5

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 0.0
% SAND = 12.5 (% coarse = 0.2 % medium = 2.2 % fine = 10.1)
% SILT = 56.0 % CLAY = 31.5

D_{85}= 0.06 D_{60}= 0.02 D_{50}= 0.01
D_{30}= 0.00

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Ryegrass Flats	NCL #3	stockpile	8.6%	15	28	13	CL

LIQUID AND PLASTIC LIMITS TEST REPORT **INEL MATERIALS LAB**	**Client:** Tom Borschel/ICDF Project **Project:** INTEC CERCLA Disposal Facility CH2M Hill **Project No.:** S01-588058 **Plate**

LIQUID AND PLASTIC LIMIT TEST DATA

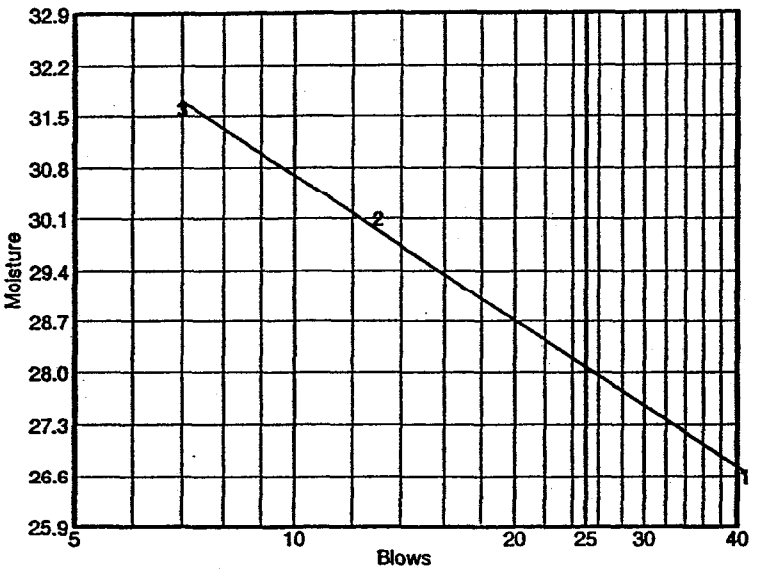
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Flats Soil
Sample No.: NCL #3
Elev. or Depth: stockpile **Sample Length (in./cm.):**
Location: NCL #3 Ryegrass clays
Description: Lean clay
Water Content: 8.6% **USCS:** CL **AASHTO:** A-6(10)
Testing Remarks: Sampled from stcokpiled Ryegrass clays on ICDF site.

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	28.02	25.93	28.24			
Dry+Tare	24.46	22.51	24.15			
Tare	11.06	11.13	11.19			
# Blows	41	13	7			
Moisture	26.6	30.1	31.6			

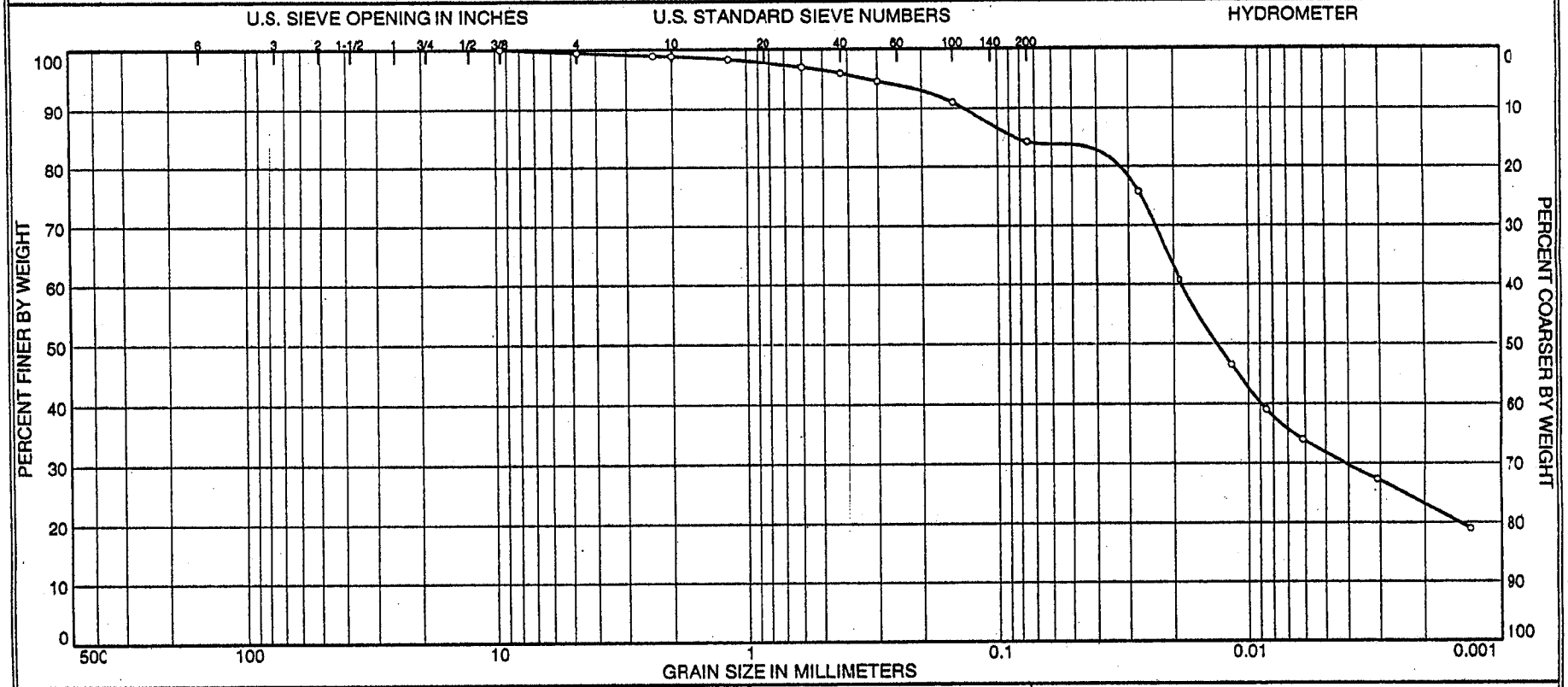


Liquid Limit= 28
Plastic Limit= 15
Plasticity Index= 13

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	8.14	7.55			
Dry+Tare	7.65	7.13			
Tare	4.30	4.33			
Moisture	14.6	15.0			

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL		% SAND			% FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.6	0.6	2.8	11.8	52.5	31.7

	SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
○	Ryegrass Flats Soil	NCL #4	Stockpile	8/21/01	CL	Lean clay with sand	8.3%	28	15

Client Tom Borschel/ICDF Project
Project INTEC CERCLA Disposal Facility
CH2M Hill
Project No. S01-588058 Plate

INEL MATERIALS LAB

○ Sampled from Ryegrass stockpile at ICDF

GRAIN SIZE DISTRIBUTION TEST DATA

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Flats Soil
Sample No.: NCL #4
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: NCL #4 Ryegrass Material
Description: Lean clay with sand
Date: 8/21/01 **Natural Moisture:** 8.3%
Liquid Limit: 28 **Plastic Limit:** 15 **USCS Class.:** CL
Testing Remarks: Sampled from Ryegrass stockpile at ICDF

Mechanical Analysis Data

		Initial
Dry sample and tare	=	478.70
Tare	=	0.00
Dry sample weight	=	478.70

Sieve tare method

Sieve	Weight retained	Sieve tare	Percent finer
3/8 inch	0.00	0.00	100.0
# 4	3.10	0.00	99.4
# 8	2.00	0.00	98.9
# 10	0.80	0.00	98.8
# 16	2.10	0.00	98.3
# 30	6.60	0.00	97.0
# 40	4.50	0.00	96.0
# 50	6.80	0.00	94.6
# 100	17.30	0.00	91.0
# 200	32.60	0.00	84.2

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 98.8
Weight of hydrometer sample: 60.0
Calculated biased weight= 60.73
Automatic temperature correction
Composite correction at 20 deg C = -3.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.60
Specific gravity correction factor= 1.012
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
2.00	22.0	48.0	49.0	0.0135	49.0	8.3	0.0275	75.7
5.00	22.0	39.0	40.0	0.0135	40.0	9.7	0.0189	60.7
15.00	22.0	30.5	31.5	0.0135	31.5	11.1	0.0116	46.5

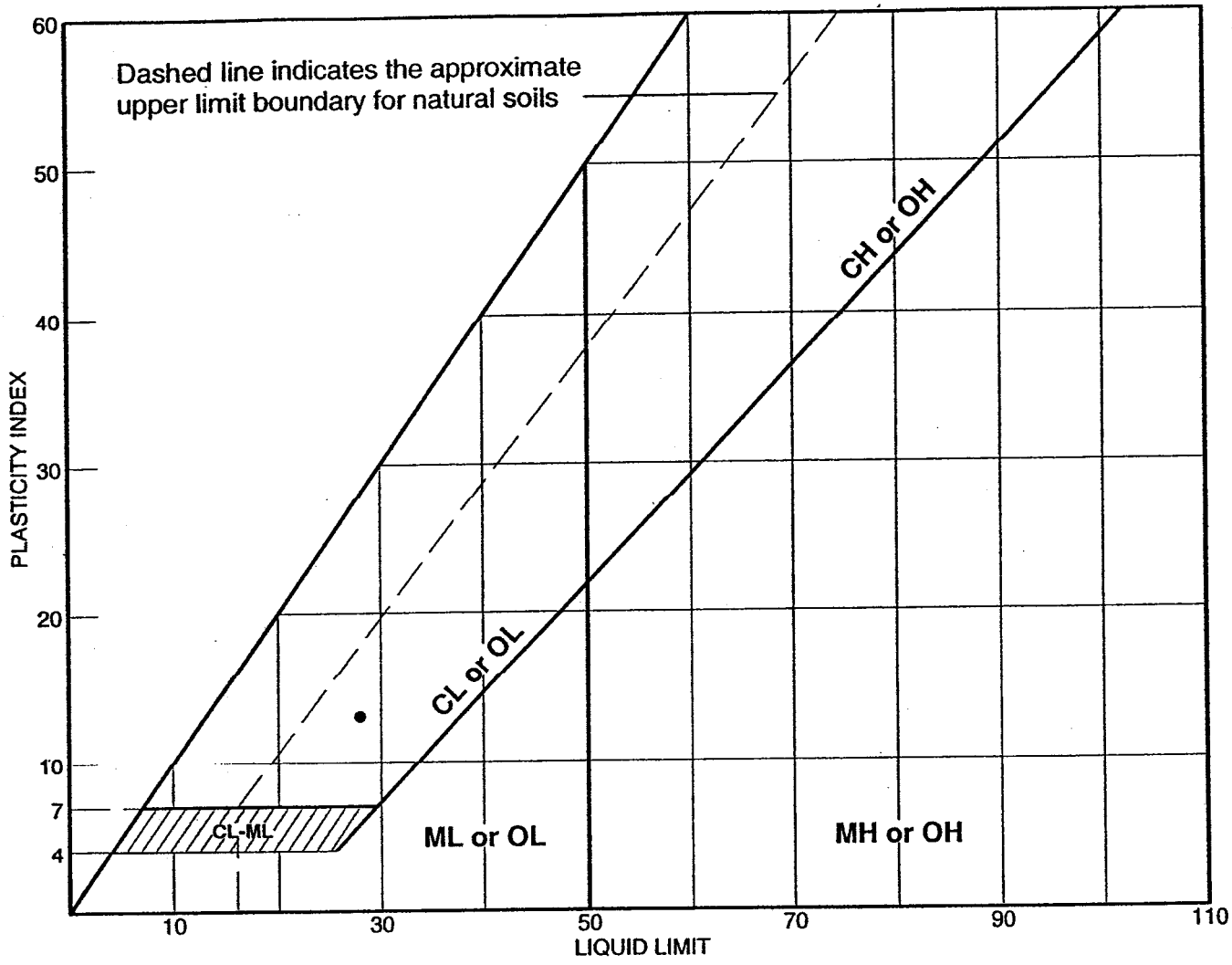
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	[illegible]	[illegible] depth	[illegible] mm	[illegible] finer
30.00	22.0	26.0	27.0	0.0135	27.0	11.9	0.0085	39.0
60.00	22.0	23.0	24.0	0.0135	24.0	12.4	0.0061	34.0
250.00	22.0	19.0	20.0	0.0135	20.0	13.0	0.0031	27.3
1440.00	22.0	14.0	15.0	0.0135	15.0	13.8	0.0013	19.0

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% + 3" = 0.0 % GRAVEL = 0.6 (% coarse = 0.0 % fine = 0.6)
% SAND = 15.2 (% coarse = 0.6 % medium = 2.8 % fine = 11.8)
% SILT = 52.5 % CLAY = 31.7

D_{85}= 0.09 D_{60}= 0.02 D_{50}= 0.01
D_{30}= 0.00

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Ryegrass Flats	NCL #4	Stockpile	8.3%	15	28	13	CL

LIQUID AND PLASTIC LIMITS TEST REPORT

INEL MATERIALS LAB

Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project No.: S01-588058 **Plate**

LIQUID AND PLASTIC LIMIT TEST DATA

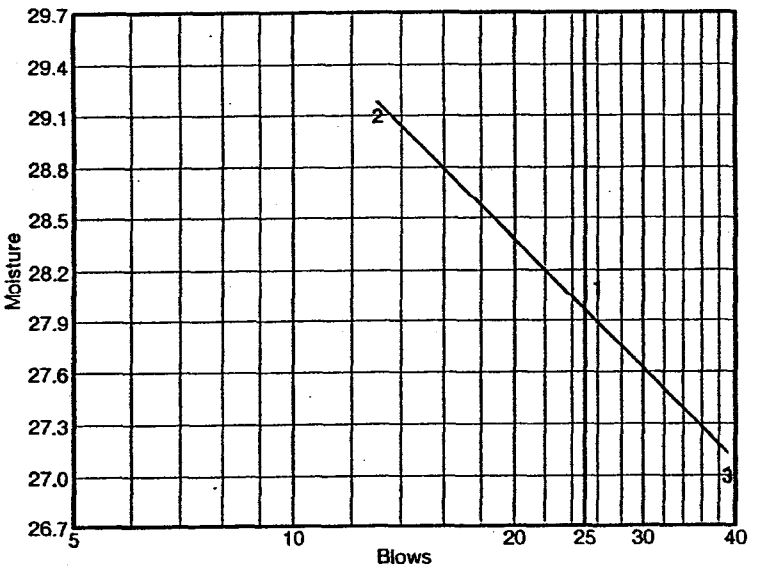
Client: Tom Borschel/ICDF Project
Project: INTEC CERCLA Disposal Facility
CH2M Hill
Project Number: S01-588058

Sample Data

Source: Ryegrass Flats Soil
Sample No.: NCL #4
Elev. or Depth: Stockpile **Sample Length (in./cm.):**
Location: NCL #4 Ryegrass Material
Description: Lean clay with sand
Water Content: 8.3% **USCS:** CL **AASHTO:** A-6(9)
Testing Remarks: Sampled from Ryegrass stockpile at ICDF

Liquid Limit Data

Run No.	1	2	3	4	5	6
Wet+Tare	25.96	27.79	29.18			
Dry+Tare	22.70	24.03	25.34			
Tare	11.11	11.10	11.10			
# Blows	26	13	39			
Moisture	28.1	29.1	27.0			



Liquid Limit= 28
Plastic Limit= 15
Plasticity Index= 13

Plastic Limit Data

Run No.	1	2	3	4	
Wet+Tare	9.60	8.34			
Dry+Tare	8.94	7.80			
Tare	4.42	4.35			
Moisture	14.6	15.7			

CH2M HILL Construction Laboratory Results

MATERIALS TESTING & INSPECTION

PAGE # 1
REVISION DATE
AUGUST 8, 2001

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☐ Environmental Services ☐ Geotechnical Engineering ☐ Construction Materials Testing ☐ Special Inspections

Fax Transmittal

RECEIVED AUG 21 2001

To:	CH2Mhill (Brian Corb)	**From:**	Dan King (MTI)
Fax:	526-6740	**Pages:**	3 including cover
Phone:	526-6734	**Date:**	Aug 20, 2001
Re:	Sample CCI-004, 005	**CC:**	MTI file #E10005c

☐ Urgent ☑ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Gentlemen,

As requested, MTI preformed moisture density curves (ASTM D-1557) and Atterberg limits (ASTM D-4318) on two samples delivered to our office on August 15, 2001. Transmitted herein are the results of the aforementioned laboratory testing. If you have any questions regarding these results please contact our office at 529-8242.

Respectfully Submitted;
MATERIALS TESTING & INSPECTION, INC.

"Assuring the Strength, Safety and Security of Your Future"

1230 North Skyline Drive, Ste. C, Idaho Falls, Idaho 83402 208 529-8242 Fax 208 529-6911

MATERIALS TESTING & INSPECTION

MOISTURE DENSITY PROCTOR TEST REPORT

PAGE # 1
REVISION DATE
AUGUST 20, 2001

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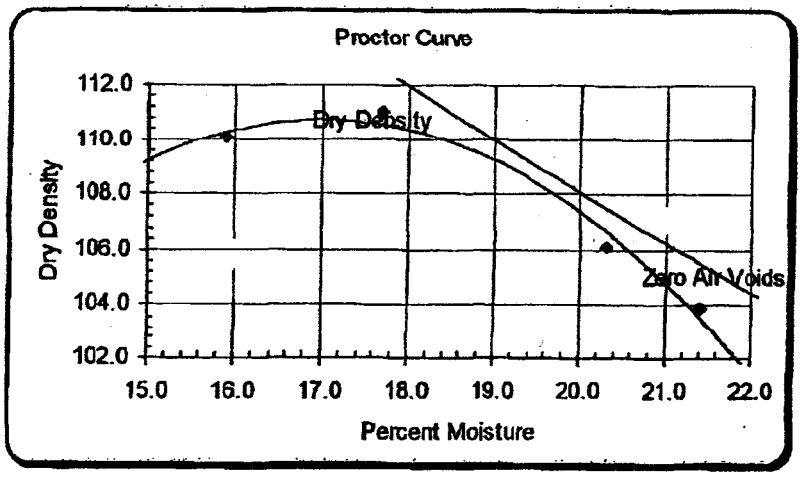
☐ Environmental Services ☐ Geotechnical Engineering ☐ Construction Materials Testing ☐ Special Inspections

CERCLA Disposal Facility (ICDF)
CH2M Hill
1020 Landbank Street
Idaho Falls, ID 83402

As requested MTI has performed a proctor on the sample referenced below. The testing was performed in accordance with current AASHTO or ASTM standards. The results obtained in our laboratory were as follows:

Project:	CERCLA Disposal Facility (ICDF)
Source:	Rye Grass Flats 5% Admix
Date Obtained:	August 15, 2001
Sample ID:	219-S CCI-005
Atterberg Limits:	Liquid Limit 29.6 Plastic Limit 22.1 Plasticity Index 7.5
ASTM D 2487 Classification:	Lean Clay with Sand (CL)
Sample Prepared:	Moist: X Manual: X Dry: Mechanical:
Test Standard:	AASHTO T 99: AASHTO T 180: Method ASTM D 698: ASTM D 1557: X A

Assumed Sp. Gr.	Point Number	Percent Moisture	Dry Density	Maximum Dry Density	Optimum % Moisture
2.65	1	15.9	110.1	110.7 lbs/ft^3	17.1 %
	2	17.7	111.0	ASTM D-4718, Correction	
	3	20.3	106.1	for Oversize Particles	
	4	21.4	103.9	110.7 lbs/ft^3	



Sieve Size	Percent Passing	Sample Specs
3.0"		
1.5"		
1.25"		
1.0"		
7/8"		
3/4"		
5/8"		
1/2"		
3/8"		
1/4"		
#4		
#8	100	
#10		
#16	99	
#20		
#30	98	
#40	97	
#50	96	
#60		
#80		
#100	93	
#200	84.4	

Note:

Respectfully submitted,
MATERIALS TESTING & INSPECTION INC.

Reviewed by: Dan King
Eastern Idaho Division Manager

1230 North Skyline Drive, Ste. C, Idaho Falls, ID 83402 208 529-8242 Fax 208 529-6911

MATERIALS TESTING & INSPECTION

MOISTURE DENSITY PROCTOR TEST REPORT

REVISION DATE
AUGUST 20, 2001

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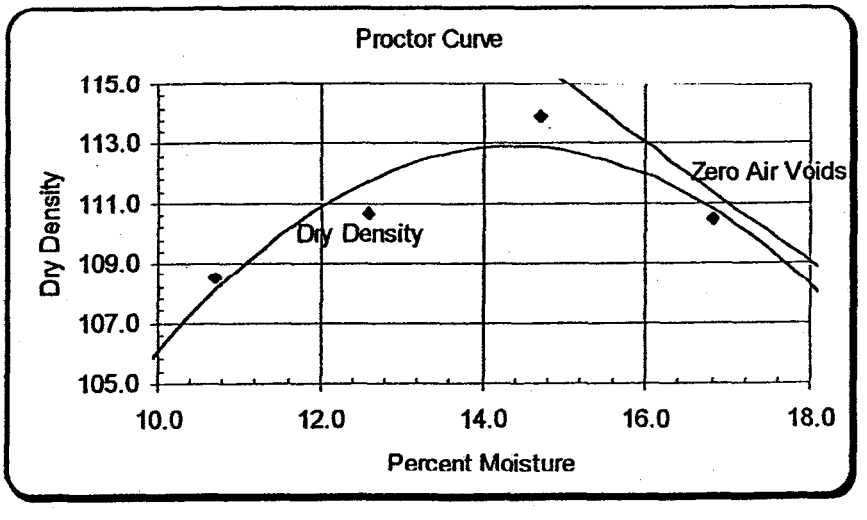
☐ Environmental Services ☐ Geotechnical Engineering ☐ Construction Materials Testing ☐ Special Inspections

CERCLA Disposal Facility (ICDF)
CH2M Hill
1020 Landbank Street
Idaho Falls, ID 83402

As requested MTI has performed a proctor on the sample referenced below. The testing was performed in accordance with current AASHTO or ASTM standards. The results obtained in our laboratory were as follows:

Project:	CERCLA Disposal Facility (ICDF)
Source:	Rye Grass Flats Base Material
Date Obtained:	August 15, 2001
Sample ID:	220-S CCI-004
Atterberg Limit:	Liquid Limit 29.0 Plastic Limit 19.3 Plasticity Index 9.5
ASTM D 2487 Classification:	Sandy Lean Clay (CL)
Sample Prepared:	Moist: X Manual: X Dry: Mechanical:
Test Standard:	AASHTO T 99: AASHTO T 180: Method ASTM D 698: ASTM D 1557: X A

Assumed Sp. Gr.	Point Number	Percent Moisture	Dry Density	Maximum Dry Density	Optimum % Moisture
2.55	1	10.7	108.5	112.9 lbs/ft^3	14.3 %
	2	12.6	110.7	ASTM D-4718, Correction	
	3	14.7	113.9	for Oversize Particles	
	4	16.8	110.5	112.9 lbs/ft^3	



Sieve Size	Percent Passing	Sample Specs
3.0"		
1.5"		
1.25"		
1.0"		
7/8"		
3/4"		
5/8"		
1/2"		
3/8"		
1/4"		
#4		
#8	100	
#10		
#16	99	
#20		
#30	97	
#40	93	
#50	89	
#60		
#80		
#100	78	
#200	64.0	

Note:

Respectfully submitted,
MATERIALS TESTING & INSPECTION INC.

Dan King

Reviewed by: Dan King
Eastern Idaho Division Manager

22-08-01P12:36 RCVD

MATERIALS TESTING & INSPECTION

MOISTURE DENSITY PROCTOR TEST REPORT

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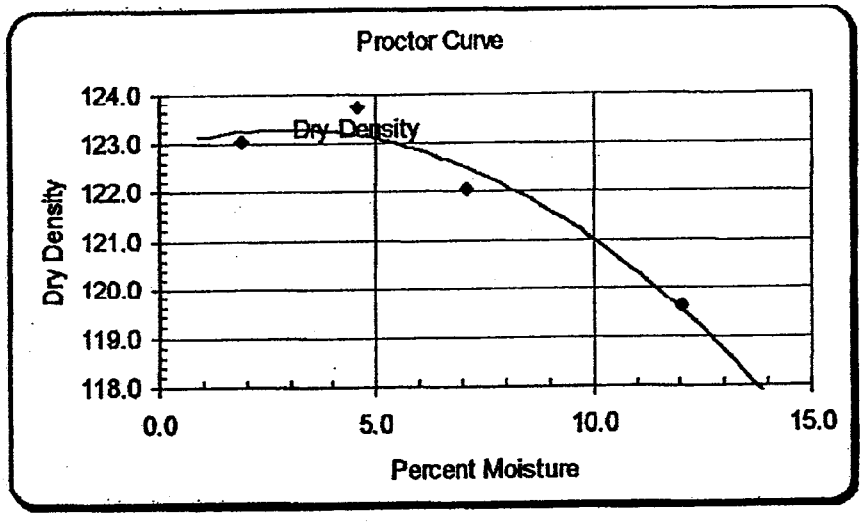
CERCLA Disposal Facility (ICDF)
CH2M Hill
1020 Landbank Street
Idaho Falls, ID 83402

As requested MTI has performed a proctor on the sample referenced below. The testing was performed in accordance with current AASHTO or ASTM standards. The results obtained in our laboratory were as follows:

Project:	CERCLA Disposal Facility (ICDF)		
Source:	ICDF Cell Aluminum Material		
Date Obtained:	August 21, 2001		
Sample ID:	230-S CCI-007		
ASTM D 2487 Classification:	Poorly Graded Gravel with Sand (GP)		
Sample Prepared:	Moist: X Dry:	Manual: X Mechanical:	
Test Standard:	AASHTO T 99: ASTM D 698: X	AASHTO T 180: ASTM D 1557:	Method C

Assumed Sp. Gr.	Point Number	Percent Moisture	Dry Density	Maximum Dry Density	Optimum % Moisture
2.60	1	1.9	123.0	123.3 lbs/ft^3	2.9 %
	2	4.5	123.7	ASTM D-4718, Correction	
	3	7.1	122.0	for Oversize Particles	
	4	12.0	119.6	130.8 lbs/ft^3	2.3%



Sieve Size	Percent Passing	Sample Specs
3.0"	100	
2.0"	99	
1.5"	98	
1.0"	87	
7/8"		
3/4"	76	
5/8"		
1/2"	61	
3/8"	52	
1/4"		
#4	34	
#8	24	
#10		
#16	18	
#20		
#30	12	
#40	7	
#50	3	
#60		
#80		
#100	1	
#200	0.5	

Note:

Respectfully submitted,
MATERIALS TESTING & INSPECTION INC.

Reviewed by: Dan King
Eastern Idaho Division Manager

MATERIALS TESTING & INSPECTION

MOISTURE DENSITY PROCTOR TEST REPORT

PAGE # 1
REVISION DATE
AUGUST 22, 2001

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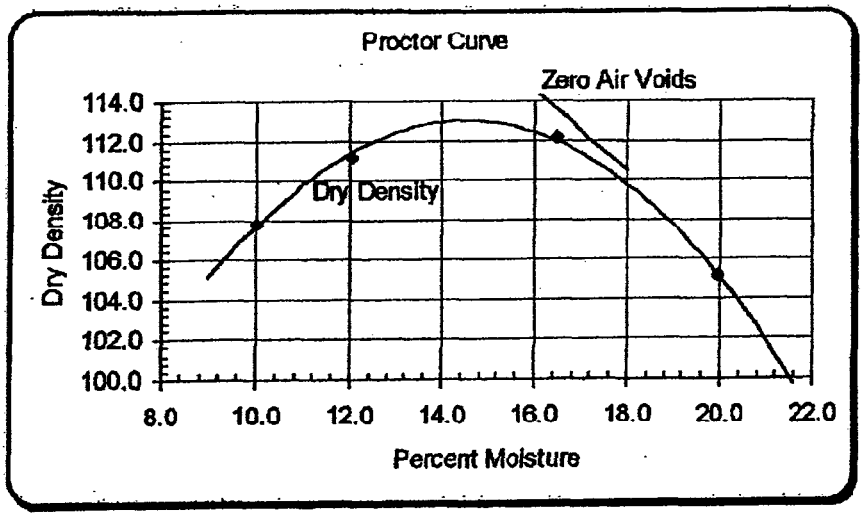
CERCLA Disposal Facility (ICDF)
CH2M Hill
1020 Landbank Street
Idaho Falls, ID 83402

As requested MTI has performed a proctor on the sample referenced below. The testing was performed in accordance with current AASHTO or ASTM standards. The results obtained in our laboratory were as follows:

Project:	CERCLA Disposal Facility (ICDF)
Source:	Rye Grass Flats Base Material
Date Obtained:	August 21, 2001
Sample ID:	229-S CCI-006
Atterberg Limits:	Liquid Limit 26.88 Plastic Limit 18.92 Plasticity Index 7.89
ASTM D 2487 Classification:	Lean Clay with Sand (CL)
Sample Prepared:	Moist: X Manual: X Dry: Mechanical:
Test Standard:	AASHTO T 99: AASHTO T 180: Method ASTM D 698: ASTM D 1557: X A

Assumed Sp. Gr.	Point Number	Percent Moisture	Dry Density	Maximum Dry Density	Optimum % Moisture
2.60	1	10.0	107.8	113.0 lbs/ft^3	14.4 %
	2	12.0	111.2	ASTM D-4718, Correction	
	3	16.5	112.1	for Oversize Particles	
	4	19.9	105.2	113.0 lbs/ft^3	



Sieve Size	Percent Passing	Sample Specs
3.0"		
1.5"		
1.25"		
1.0"		
7/8"		
3/4"		
5/8"		
1/2"		
3/8"		
1/4"		
#4		
#8	100	
#10		
#16	99	
#20		
#30	97	
#40	95	
#50	93	
#60		
#80		
#100	88	
#200	79.0	

Note:

Respectfully submitted,
MATERIALS TESTING & INSPECTION INC.

Reviewed by: Dan King

MATERIALS TESTING & INSPECTION

MOISTURE DENSITY PROCTOR TEST REPORT

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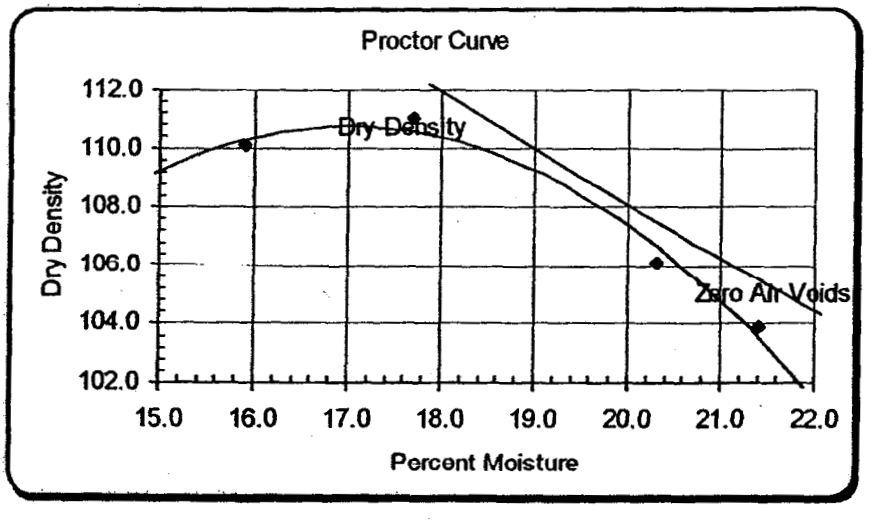
CERCLA Disposal Facility (ICDF)
CH2M Hill
1020 Landbank Street
Idaho Falls, ID 83402

CORRECTED
Atterberg Limits

As requested MTI has performed a proctor on the sample referenced below. The testing was performed in accordance with current AASHTO or ASTM standards. The results obtained in our laboratory were as follows:

Project:	CERCLA Disposal Facility (ICDF)
Source:	Rye Grass Flats 5% Admix
Date Obtained:	August 15, 2001
Sample ID:	219-S CCI-005
Atterberg Limits:	Liquid Limit 37.97 Plastic Limit 20.71 Plasticity Index 17.27
ASTM D 2487 Classification:	Lean Clay with Sand (CL)
Sample Prepared:	Moist: X Manual: X Dry: Mechanical:
Test Standard:	AASHTO T 99: AASHTO T 180: Method ASTM D 698: ASTM D 1557: X A

Assumed Sp. Gr.	Point Number	Percent Moisture	Dry Density	Maximum Dry Density	Optimum % Moisture
2.65	1	15.9	110.1	110.7 lbs/ft^3	17.1 %
	2	17.7	111.0	ASTM D-4718, Correction	
	3	20.3	106.1	for Oversize Particles	
	4	21.4	103.9	110.7 lbs/ft^3	



Sieve Size	Percent Passing	Sample Specs
3.0"		
1.5"		
1.25"		
1.0"		
7/8"		
3/4"		
5/8"		
1/2"		
3/8"		
1/4"		
#4		
#8	100	
#10		
#16	99	
#20		
#30	98	
#40	97	
#50	96	
#60		
#80		
#100	93	
#200	84.4	

Note:

Respectfully submitted,
MATERIALS TESTING & INSPECTION INC.

Reviewed by: Dan King
Eastern Idaho Division Manager

MATERIALS TESTING & INSPECTION

MOISTURE DENSITY PROCTOR TEST REPORT

PAGE # 1
REVISION DATE
AUGUST 22, 2001

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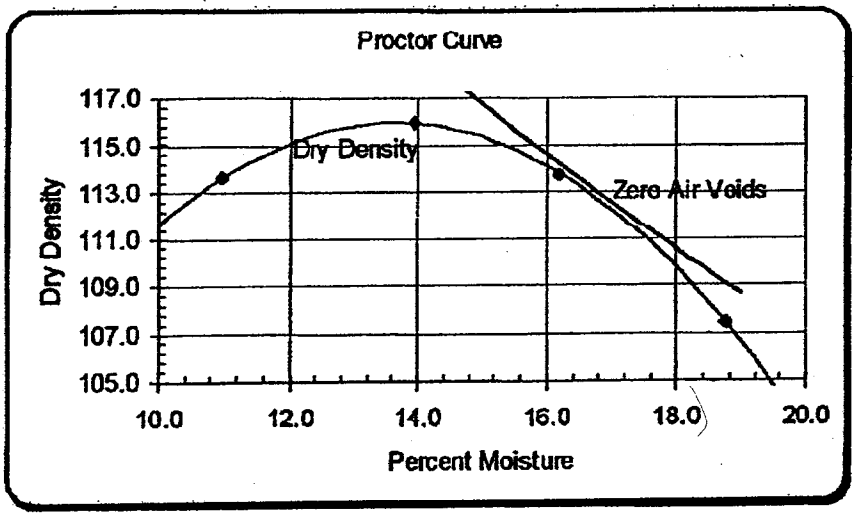
CERCLA Disposal Facility (ICDF)
CH2M Hill
1020 Landbank Street
Idaho Falls, ID 83402

As requested MTI has performed a proctor on the sample referenced below. The testing was performed in accordance with current AASHTO or ASTM standards. The results obtained in our laboratory were as follows:

Project:	CERCLA Disposal Facility (ICDF)
Source:	
Date Obtained:	August 21, 2001
Sample ID:	231-S CCI-008
Atterberg Limits:	Liquid Limit 34.88 Plastic Limit 11.12 Plasticity Index 23.6
ASTM D 2487 Classification:	Lean Clay with Sand (CL)
Sample Prepared:	Moist: X Manual: X Dry: Mechanical:
Test Standard:	AASHTO T 99: AASHTO T 180: Method ASTM D 698: ASTM D 1557: X A

Assumed Sp. Gr.	Point Number	Percent Moisture	Dry Density	Maximum Dry Density	Optimum % Moisture
2.60	1	11.0	113.7	115.9 lbs/ft^3	13.6 %
	2	13.9	116.0	ASTM D-4718, Correction	
	3	16.2	113.7	for Oversize Particles	
	4	18.7	107.5	115.9 lbs/ft^3	



Sieve Size	Percent Passing	Sample Specs
3.0"		
1.5"		
1.25"		
1.0"		
7/8"		
3/4"		
5/8"		
1/2"		
3/8"		
1/4"		
#4		
#8	100	
#10		
#16	98	
#20		
#30	95	
#40	93	
#50	90	
#60		
#80		
#100	84	
#200	74.8	

Note:

Respectfully submitted,
MATERIALS TESTING & INSPECTION INC.

Dan King

Reviewed by: Dan King

CH2M Hill
INEEL

Flexible Wall Hydraulic Conductivity of Shelby Tube Specimens
Table 1

Sample Identification	Water Content %		Wet Density (Pcf)		Saturation①		Hydraulic Conductivity② (cm/sec)
	Before	After	Before	After	Before	After	
RGF-1A③	17	22	127	127	.81	.96	4×10^{-8}
RGF-1B④	17	23	126	126	.81	.96	5×10^{-8}
RGF-2A③	19	23	128	129	.91	1.0	3×10^{-8}
RGF-2B④	19	23	126	127	.87	.99	6×10^{-8}

① Specific gravity assumed 2.7
② Average Saturated Hydraulic Conductivity Using Tap Water
③ Constant volume Hydraulic Conductivity
④ Falling head Rising Tail Hydraulic Conductivity;

Flexible Wall Hydraulic Conductivity Test Parameters
Table 2

Exploration Number	Triaxial Pressure (psi)			Average Effective Confining Stress (psi)	Gradient (*i*)
	Cell	HW	TW		
RGF-1A③	35	30	30	5	13
RGF-1B④	35	30.5	29.5	5	10
RGF-2A③	35	30	30	5	26
RGF-2B④	35	30.5	29.5	5	12

HW = Head Water; TW = Tail Water; i = h/l

Soil Technology, Inc.
J-1421
Page 1

CH2M Hill
INEEL

Flexible Wall Hydraulic Conductivity of Shelby Tube Specimens
Table 1

Sample Identification	Water Content %		Wet Density (Pcf)		Saturation①		Hydraulic Conductivity② (cm/sec)
	Before	After	Before	After	Before	After	
CCI-TP-001③	15	22	126	128	.77	.96	2×10^{-7}
ICDF-TP-2A ③	16	19	132	131	.89	.97	2×10^{-8}
ICDF-TP-3 ③	15	19	133	134	.89	1.0	2×10^{-8}
ICDF-TP-4 ③	18	22	124	126	.8	.95	3×10^{-8}
ICDF-TP-5A ③	15	22	125	127	.74	.95	1×10^{-7}
ICDF-TP-7A③	17	19	132	133	.91	1.0	7×10^{-9}

① Specific gravity assumed 2.7
② Average Saturated Hydraulic Conductivity Using Tap Water
③ Constant volume Hydraulic Conductivity

Flexible Wall Hydraulic Conductivity Test Parameters
Table 2

Exploration Number	Triaxial Pressure (psi)			Average Effective Confining Stress (psi)	Gradient (*i*)
	Cell	HW	TW		
CCI-TP-001	35	30	30	5	21
ICDF-TP-2A	35	30	30	5	30
ICDF-TP-3	35	30	30	5	30
ICDF-TP-4	35	30	30	5	19
ICDF-TP-5A	35	30	30	5	25
ICDF-TP-7A	35	30	30	5	20

HW = Head Water; TW = Tail Water; i = h/l

Soil Technology, Inc.
J-1421
Page 1