Volume 1

SUBSURFACE EXPLORATION & LABORATORY TESTING

Plant Site

Waste Isolation Pilot Plant

Bechtel Job No. 12484

[redacted]

SHB Job No. E78-1135

[redacted]

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May 11, 1979

Bechtel National, Inc.
Engineers-Constructors
P. O. Box 3965
San Francisco, California 94119

SHB Job No. E78-1135

Attention: Mr. S. S. Smucha

Re: Plant Site
Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing

Gentlemen:

This report is submitted pursuant to a program of subsurface exploration and laboratory testing performed by this firm and its subcontractors on the referenced project. The object of the investigation was to provide subsurface information to Bechtel National, Inc. for their engineering analysis and report on the project. The work was performed under Bechtel Contract 12484-SF-05, WBS No. 21.

The scope of our services included exploratory drilling and sampling of the subsurface soils and rock, in situ testing of the site soils, and laboratory testing of certain samples selected by Bechtel. All field work was performed under the observation and direction of Bechtel's site representatives

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Plant Site
Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

who selected the sample intervals, types of samples, and types of field tests to be performed at each exploratory location.

The work reported herein was performed in accordance with the approved SHB Quality Assurance Program, which was developed using the guidelines set forth in ANSI N45.2 (1977).

The report is presented in three volumes: Volume 1 contains reports of the field work and results of laboratory tests performed by Sergent, Hauskins & Beckwith; Volume 2 presents visual soil classifications of split-spoon and bulk samples delivered to the SHB laboratories; and the Dames & Moore report of results of laboratory tests performed on undisturbed samples which required soil mechanics testing shall be considered Volume 3.

If you have any questions regarding this report, please do not hesitate to contact us.

Respectfully submitted,
Sergent, Hauskins & Beckwith Engineers

By _____
Benny E. McMillan, P.E.
Project Manager

VOLUME 1

SERGENT, HAUSKINS & BECKWITH
CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • TUCSON • ALBUQUERQUE

Plant Site
Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing

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SHB Job No. E78-1135

Section 1

Site Plan, Logs of Test Borings B-1 through B-24 and B-26 through B-54, and Logs of Test Pits and Trenches TP-1 through TP-5

TEST DRILLING EQUIPMENT & PROCEDURES

Drilling Equipment

Truck-mounted CME-55 drill rigs powered with 6 cylinder Ford industrial engines were used in advancing test borings. The 6 cylinder engines are capable of delivering about 6,500 foot/pounds torque to the drill spindle. The spindle is advanced with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock was performed with 6 1/2 inch O.D., 3 1/4 inch I.D. hollow stem auger. Carbide insert teeth were used on the auger bits. Core drilling in bedrock was performed using NX size core bits with either diamond or carbide cutting faces and either air or water for drilling fluid.

Sampling Procedures

Dynamically driven tube samples were obtained at selected intervals in the borings by the ASTM D1586 procedure. Two inch O.D., 1 3/8 inch I.D. samplers were used to obtain the standard penetration resistance. The driving energy is recorded as the number of blows of a 140 pound, 30 inch free-fall drop hammer required to advance the samplers in 6 inch increments. These values are expressed in blows per foot on the logs.

Undisturbed Samples

Undisturbed samples were obtained from the borings by use of a Pitcher-type sampler. This sampler advances a 3 inch O.D., 2.875 inch I.D. thin wall, spring loaded tube by cutting the soil away from the outside with carbide toothed bits. Air was used as drilling fluid for these samples.

Boring Records

Drilling operations were observed by our field engineer or geologist who examined soil recovery and prepared boring logs. Soils were visually classified in accordance with the Unified Soil Classification System (ASTM D2487) with appropriate group symbols being shown on the logs. Visual description of soils is in accordance with ASTM D2488. Samples designated "BL" on the boring logs are large bulk samples obtained by hand from auger cuttings or open test pits; samples designated "S" were obtained with standard 2 inch O.D., 1 3/8 inch I.D. split-spoon samplers; undisturbed samples obtained with the Pitcher sampler are designated "P". Rock sampling by NX coring is so designated on the boring logs.

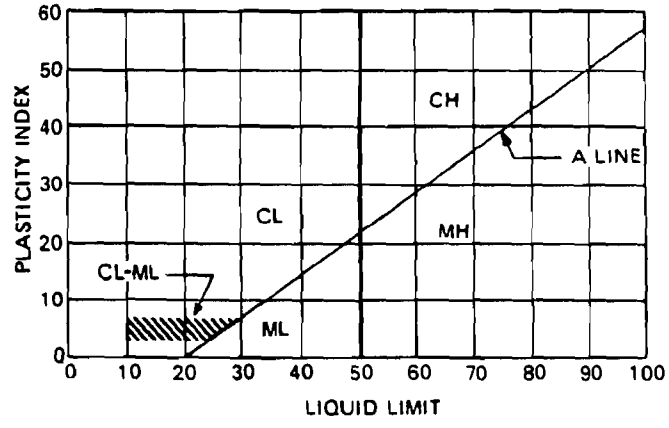
UNIFIED SOIL CLASSIFICATION SYSTEM

Soils are visually classified by the Unified Soil Classification system on the boring logs presented in this report. Grain-size analysis and Atterberg Limits Tests are often performed on selected samples to aid in classification. The classification system is briefly outlined on this chart. For a more detailed description of the system, see "The Unified Soil Classification System" Corp of Engineers, US Army Technical Memorandum No. 3-357 (Revised April 1960) or ASTM Designation: D2487-66T.

MAJOR DIVISIONS				GRAPHIC SYMBOL	GROUP SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (Less than 50% passes No. 200 sieve)	GRAVELS (50% or less of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (Less than 5% passes No. 200 sieve)			GW	Well graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
					GP	Poorly graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
		GRAVELS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart		GM	Silty gravels, gravel-sand-silt mixtures.
			Limits plot above "A" line & hatched zone on plasticity chart		GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction passes No. 4 sieve)	CLEAN SANDS (Less than 5% passes No. 200 seive)			SW	Well graded sands, gravelly sands.
					SP	Poorly graded sands, gravelly sands.
		SANDS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart		SM	Silty sands, sand-silt mixtures.
			Limits plot above "A" line & hatched zone on plasticity chart		SC	Clayey sands, sand-clay mixtures.
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS (LIMITS PLOT BELOW "A" LINE & HATCHED ZONE ON PLASTICITY CHART)	SILTS OF LOW PLASTICITY (Liquid Limit Less Than 50)			ML	Inorganic silts, clayey silts with slight plasticity.
		SILTS OF HIGH PLASTICITY (Liquid Limit More Than 50)			MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.
	CLAYS (LIMITS PLOT ABOVE "A" LINE & HATCHED ZONE ON PLASTICITY CHART)	CLAYS OF LOW PLASTICITY (Liquid Limit Less Than 50)			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		CLAYS OF HIGH PLASTICITY (Liquid Limit More Than 50)			CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

NOTE: Coarse grained soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with limits plotting in the hatched zone on the plasticity chart to have double symbol.

PLASTICITY CHART



DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to ¾ in.
Fine gravel	¾ in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve

TERMINOLOGY USED TO DESCRIBE THE RELATIVE DENSITY, CONSISTENCY OR FIRMNESS OF SOILS

The terminology used on the boring logs to describe the relative density, consistency or firmness of soils relative to the standard penetration resistance is presented below. The standard penetration resistance (N) in blows per foot is obtained by the ASTM D1586 procedure using 2" O.D., 1 3/8" I.D. samplers.

1. Relative Density. Terms for description of relative density of cohesionless, uncemented sands and sand-gravel mixtures.

N	Relative Density
0-4	Very loose
5-10	Loose
11-30	Medium dense
31-50	Dense
50+	Very dense

2. Relative Consistency. Terms for description of clays which are saturated or near saturation.

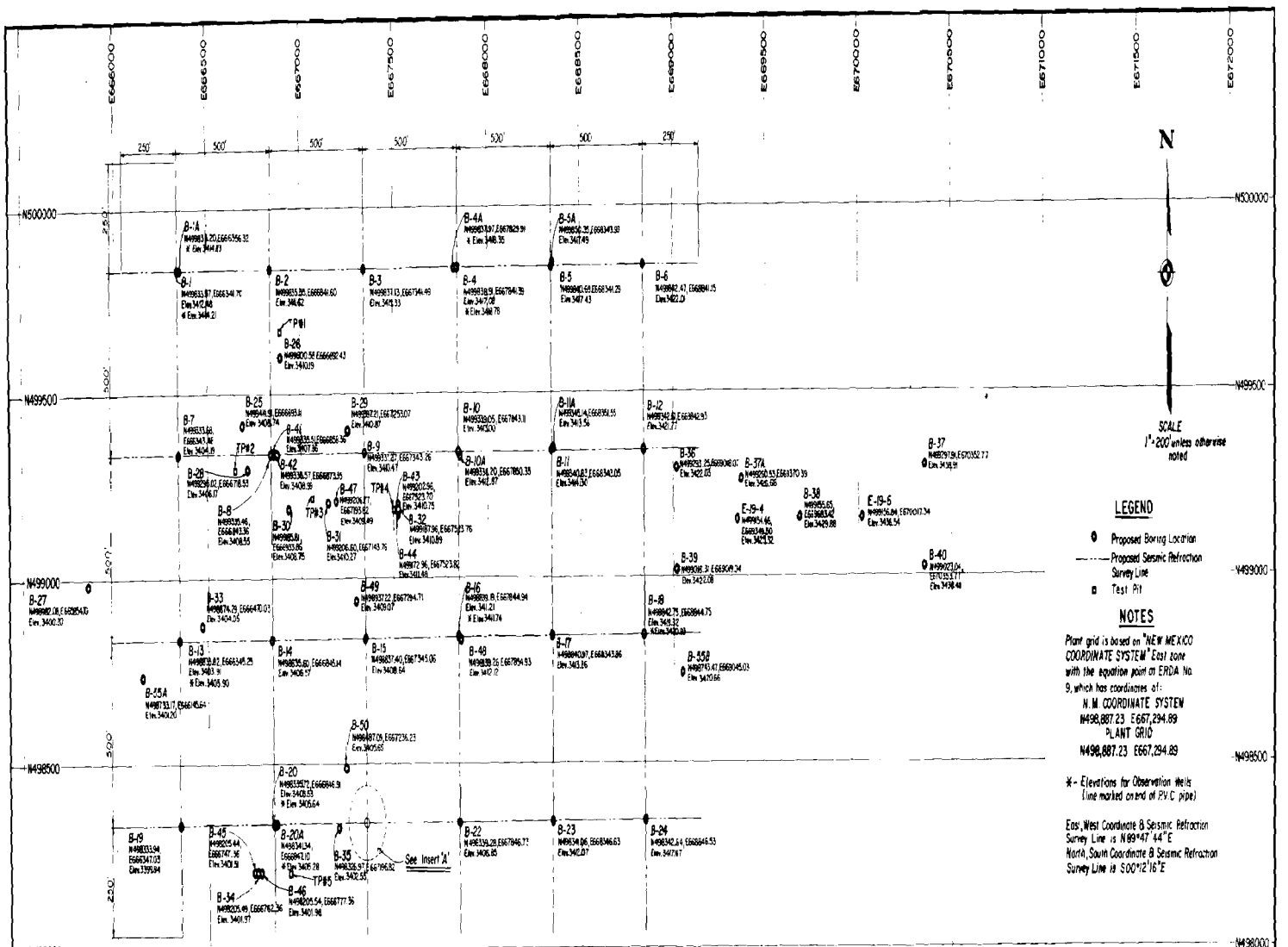
N	Relative Consistency	Remarks
0-2	Very soft	Easily penetrated several inches with fist.
3-4	Soft	Easily penetrated several inches with thumb.
5-8	Medium stiff	Can be penetrated several inches with thumb with moderate effort.
9-15	Stiff	Readily indented with thumb, but penetrated only with great effort.
16-30	Very stiff	Readily indented with thumbnail.
30+	Hard	Indented only with difficulty by thumbnail.

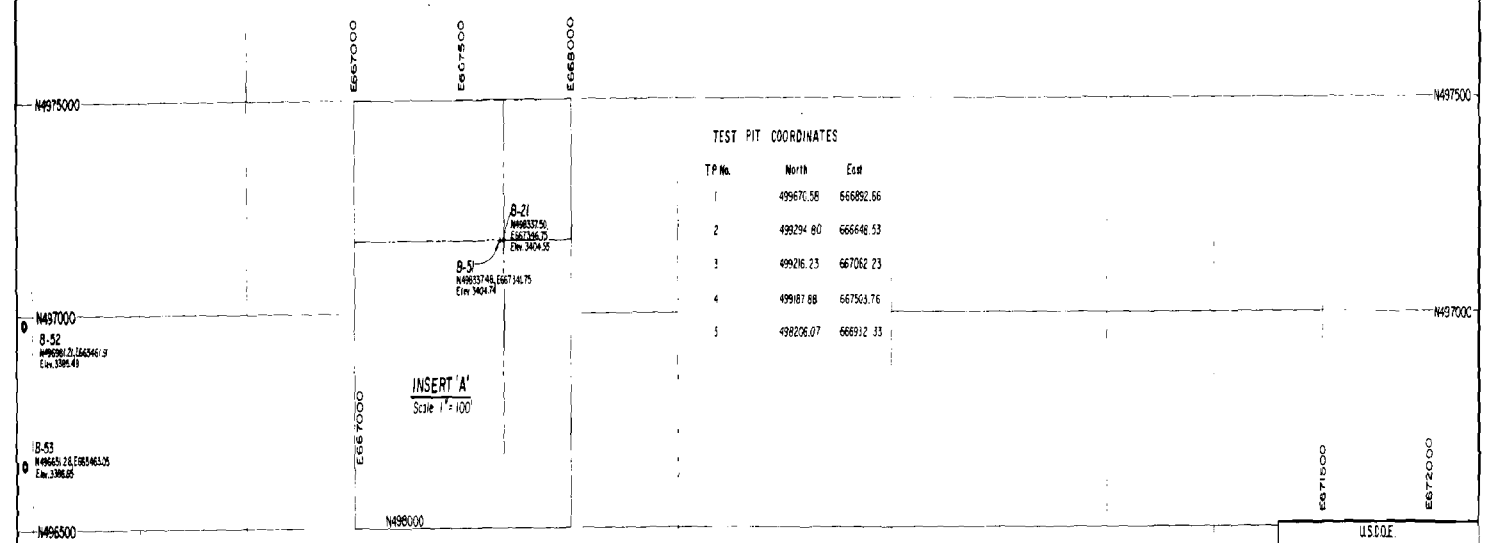
3. Relative Firmness. Terms for description of partially saturated and/or cemented soils which commonly occur in the Southwest including clays, cemented granular materials, silts and silty and clayey granular soils.

N	Relative Firmness
0-4	Very soft
5-8	Soft
9-15	Moderately firm
16-30	Firm
31-50	Very firm
50+	Hard

TERMINOLOGY FOR THE DESCRIPTION OF ROCK

General Property	Descriptive Term	Visual or Physical Properties
WEATHERING	VERY WEATHERED	Abundant fractures coated with oxides, carbonates, sulfates, mud, etc., thorough discoloration, rock disintegration, mineral decomposition
	MODERATELY WEATHERED	Some fracture coating, moderate or localized discoloration, little to no effect on cementation, slight mineral decomposition
	SLIGHTLY WEATHERED	A few stained fractures, slight discoloration, little to no effect on cementation, no mineral decomposition
	FRESH	Unaffected by weathering agents, no appreciable change with depth
FRACTURING	INTENSELY FRACTURED	less than 1" spacing
	VERY FRACTURED	1" to 6" spacing
	MODERATELY FRACTURED	6" to 12" spacing
	SLIGHTLY FRACTURED	12" to 36" spacing
	SOLID	36" spacing or greater
STRATIFICATION	THINLY LAMINATED	less than 1/10"
	LAMINATED	1/10" to 1/2"
	VERY THINLY BEDDED	1/2" to 2"
	THINLY BEDDED	2" to 2 feet
	THICKLY BEDDED	more than 2 feet
HARDNESS	SOFT	Can be dug by hand and crushed by fingers
	MODERATELY HARD	Friable, can be gouged deeply with knife and will crumble readily under light hammer blows
	HARD	Knife scratch leaves dust trace, will withstand a few hammer blows before breaking
	VERY HARD	Scratched with knife with difficulty, difficult to break with hammer blows





TEST PIT COORDINATES

TP No.	North	East
1	499670.58	666892.66
2	499294.80	666648.53
3	499216.23	667062.23
4	499187.88	667503.76
5	498206.07	666912.33

U.S.D.O.E.
WASTE ISOLATION PILOT PLANT

BORE HOLE & TEST PIT LOCATION PLAN
MAIN SITE AREA

MOLZEN-CORBIN & Associates
Consulting Engineers
Carlsbad New Mexico

Drawn R.W.C. | Checked | Sheet
File C-78-55 | Date 2-5-79 | of

Plant Site
Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

The drilling, sampling, and field engineering reported in Section 1 were performed in accordance with the following standards:

American Society for Testing and Materials:

ASTM D653-67(1973) - Terms and Symbols Relating to Soil and Rock Mechanics

ASTM D2113-70(1976) - Diamond Core Drilling for Site Investigation

ASTM D2487-69(1975) - Classification of Soils for Engineering Purposes

ASTM D2488-69(1975) - Description of Soils (Visual-Manual Procedure

PROJECT Waste Isolation Pilot Plant

JOB NO. E78-1135 DATE 12/27/78

LOG OF TEST BORING NO. B-1

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3412.48

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0				BL1	0-9'					loose	SILTY SAND, fine, sub-rounded, moist, nonplastic, reddish brown
				S2	2-2-3 (5)			SM-SP	18" / 18"	(1'-2'6")	
				S3	3-4-5 (9)				18" / 18"	(3'6"-5')	
5								SM		loose	SILTY SAND, fine, sub-rounded, moist, nonplastic, reddish brown
				S4	4-5-5 (10)				18" / 18"	(6'-7'6")	
								SP		medium dense	SAND, fine, sub-rounded, moist, nonplastic, reddish brown
				S5	4-5-35 (40)				18" / 18"	(8'6"-10')	
10				P6	Rejected by SHB				1" / 3"	(10'6"-10'9") hard	(Caliche) SILTY SAND, predominantly fine, sub-angular, some gravel, weakly calcareous cemented, dry, nonplastic, whitish to reddish brown
								SM			
				P7					13" / 20"	(12'1"-13'9")	
15				P8					10" / 24"	(13'9"-15'9")	(Gatuna) Intercalated SANDSTONE & CLAYSTONE, moderately weathered, moderately to slightly fractured, thickly bedded, moderately hard, reddish brown
				P9					9" / 24"	(15'9"-17'9")	
				P10	Rejected by SHB				3" / 4"	(17'9"-18'1")	
					Started Coring at 18.1'						
20	1.0' / 5.3'			NX					4.0' / 5.3'		note: occasional thin layers of gravel
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-1

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 12/27/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3412.48
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
	6.1' / 10.0'										
				NX					9.5' / 10.0'		
30											
35	2.2' / 4.6'			NX					3.0' / 4.6'		
40	1.1' / 5.5'			NX					5.7' * / 5.5'		(Santa Rosa) SANDSTONE, slightly weathered, solid, thickly bedded, moderately hard, whitish red to white
											* probable core pick-up of previous run
45				NX							
50											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

LOG OF TEST BORING NO. B-1

JOB NO. E78-1135 DATE 12/27/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3412.48
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv. REMARKS	VISUAL CLASSIFICATION
50										
	5.8'								9.9'	
	9.9'			NX					9.9'	
55										
				NX					4.8'	
									4.8'	
	3.4'									
	4.8'									
60										Stopped coring at 58.2'
										Converted to observation well 12/29/78
65										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

JOB NO. E78-1135 DATE 12/29/78

LOG OF TEST BORING NO. B-1A

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3412.48

DATUM Molzen-Corbin Survey

Depth in Feet	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								very loose	SAND, predominantly fine, some silt, moist, nonplastic, light brown
							SM-SP		
5									
10							SC	loose	CLAYEY SAND, predominantly fine, moist, low plasticity, reddish brown.
							SC	hard	(Caliche) CLAYEY SAND, predominantly fine, poorly graded, strongly to moderately lime cemented, low plasticity, white to light tan
15									Stopped auger at 12.9' B-1A converted to observation well 12/29/78
20									

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-2

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 11/22/78 to 11/29/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3411.62
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			S1	2-2-3 (5)				SM-SP	12" / 18"	loose (1'-2'6")	SAND, fine, sub-rounded, some silt, loose, moist, nonplastic, reddish brown
5			S2	3-5-6 (11)			12	SM	18" / 18"	moderately firm (4'-5'6")	SILTY SAND, fine, sub-rounded, some clay, moist, low plasticity, reddish brown
			S3	(100/2") no recovery				SM	0" / 2"	hard (8'-8'2")	(Caliche) SILTY SAND, predominantly fine, some clay and gravel, moist, low plasticity, reddish brown to whitish
10			S4	31-25-26 (51)			5		17" / 18"	(9'-10'6") hard	(Caliche) SILTY SAND, predominantly fine, sub-angular, some gravel, moist, nonplastic, whitish brown
15			S5	18-28-50 (78)				SM	13" / 18"	(14'-15'6")	
	0.8' / 2.7'			Started coring at 15.5' NX					2.7' / 3.7'		(Gatuna) SANDSTONE, very weathered, very fractured, moderately hard, reddish brown
20				NX					5.0' / 5.0'		
25											SILTSTONE, very weathered. very fractured, moderately, hard, reddish brown

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

JOB NO. E78-1135 DATE 11/22/78 to 11/29/78

LOG OF TEST BORING NO. B-2

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3411.62

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25				NX					4.0' / 4.3'		
30				NX					1.7' / 2.0'		
	1.5' / 3.3'			NX					3.3' / 3.9'		Intercalated SANDSTONE AND SILTSTONE, sandstone is very weathered, very fractured, thinly bedded, moderately hard, whitish to reddish brown, siltstone is very weathered, very fractured, thinly bedded, moderately hard, reddish brown
35											Stopped coring at 33.9'
40											15'6"-30'6½" cored with air 30'6½"-33'10½" cored with water

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-3

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 12/18/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3415.33
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv. REMARKS	VISUAL CLASSIFICATION
0				BL1	0-7'10"				very loose to loose	SAND, fine, sub-rounded, predominantly quartz, some silt, nonplastic, brown
			S1		1-1-1 (2)		3		18" 18"(1'-2'6")	
								SM-SP		
5			S2		2-2-3 (5)				17" 18"(4'6"-6')	
								SC	firm	CLAYEY SAND, fine, sub-rounded, predominantly quartz, low plasticity, brown
			S3		42-100/5"		19		11" 11"(7'10"-8'9")	
10								SM	hard	(Caliche) SILTY SAND, predominantly fine, strongly lime cemented, low plasticity to nonplastic, tan note: small amount to some gravel present throughout
			S4		24-34-39 (73)				14" 18"(13'-14'6")	
15			P1						17" 17"(15'2"-16'7")	(Gatuna) SANDSTONE, moderately to very weathered, very fractured, thickly bedded, moderately hard, reddish-tan
	0 1.1'		NX		Started coring at 16.6'				0.6' 1.1'	
			P2		Stopped coring at 17.8'				19" 19"(17'8"-19'4")	
20			P3						14" 14"(19'4"-20'6")	
			P4						18" 18"(20'6"-22')	
			NX		Started coring at 22.0'					
25										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-3

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 12/18/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3415.33
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	2.9' 5.6'			NX					5.3' 5.6'		SILTSTONE, slightly weathered, slightly fractured, thinly bedded, moderately hard to hard, light brown
	0.3' 1.4'			NX					1.4' 1.4'		SANDSTONE, moderately weathered to very weathered, slightly fractured, moderately hard, reddish-tan
30											SILTSTONE, moderately weathered, very fractured, moderately hard to hard
											Stopped coring at 29.0'
35											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

LOG OF TEST BORING NO. B-4

JOB NO. E78-1135 DATE 12/17/78 to 12/18/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3417.08
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv. REMARKS	VISUAL CLASSIFICATION
0			S1		1-2-2 (4)				loose 15" 18"(1'-2'6")	SILTY SAND, fine, sub-rounded, moist, nonplastic, reddish brown
				P1				SM	24" 24"(3'-5')	
5			S2		3-5-4 (9)		6		17" 18"(5'-6'6")	
			S3		50-29-30 (59)				17" 18"(8'5"-9'11")	(Caliche) SILTY SAND, predominantly fine, sub-angular, some gravel, weakly calcareously cemented, moist, nonplastic, whitish to reddish brown
10				P2					hard 20" 20"(10'6"-12'2")	
								SM		
15			S4		42-39-40 (79)				18" 18"(14'6"-16')	
20			S5		37-39-48 (87)		7		18" 18"(19'6"-21')	(Gatuna) SANDSTONE, moderately weathered, solid to moderately fractured, thickly bedded, moderately hard, reddish brown.
				P3					6" 6"(21'6"-22')	
				Started coring at 22.0'						
25										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-4

PROJECT Waste Isolation Pilot Plant

JOB NO. E78-1135 DATE 12/17/78 to 12/18/78

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamon

SURFACE ELEV. 3417.08

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec./Adv. REMARKS	VISUAL CLASSIFICATION
25										
	2.1' 6.8'			NX					5.8' 6.8'	
30										
				NX					9.4' 10.0'	
35	3.1' 10.0'									
										CLAYSTONE, moderately weathered, moderately fractured, thinly bedded, moderately hard, reddish brown
40										Stopped coring at 38.8' Converted to observation well 12/18/79
45										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/19/78

LOG OF TEST BORING NO. B-4A

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3417.08

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0											SILTY SAND, fine, sub-rounded, moist, nonplastic, reddish brown
5								SM			
10											
								SM			(Caliche) SILTY SAND, predominantly fine, sub-angular, some gravel, dry, nonplastic, whitish to reddish brown
15											Stopped auger at 13.6' Converted to observation well 12/19/79
20											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/17/78

LOG OF TEST BORING NO. B-5

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3417.43

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0				BL1	0-8'					loose	SILTY SAND, fine, sub-rounded, predominantly quartz, nonplastic, brown to tan note: some silt at 3'-7', small amount of clay at 7'-8'
			S1		2-2-3 (5)				18" / 18"	(1'-2'6")	
								SM			
5			S2		3-4-4 (8)		15		16" / 18"	(4'6"-6')	
10			S3		40-65-74 (139)		10		13" / 18"	hard (8'2"-9'10")	(Caliche) SILTY SAND, predominantly fine, moderately lime cemented, nonplastic, light tan note: small amount to some gravel present. color change from light tan to pink at about 14'
			P1						21" / 21"	(10'-11'9")	
			P2		rejected				3" / 3"	(11'9"-12')	
								SM			
15			S4		18-22-29 (51)				18" / 18"	(14'6"-16')	
			P3						18" / 18"	(16'6"-18')	(Gatuna) SANDSTONE, very to moderately weathered, intensely to very fractured, thickly bedded, moderately hard, red
			Started coring at 18.0'								
20	0 - 4.9'		NX						2.7' / 4.9'		
											SANDSTONE, moderately to slightly weathered, moderately fractured, thinly bedded, moderately hard, red
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/17/78

LOG OF TEST BORING NO. B-5

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3417.43

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											SANDSTONE, moderately to very weathered, intensely to very fractured, thinly bedded, moderately hard, tanish-green to reddish brown
				NX					8.2' / 9.4'		Intercalated SILTSTONE AND SANDSTONE, moderately weathered, very to moderately fractured, laminated moderately hard, greenish tan to reddish brown
30	3.4' / 9.4'										note: siltstone predominant sandstone approximately ½" to 1" laminations throughout
											Stopped coring at 32.3'
35											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/17/78

LOG OF TEST BORING NO. B-6

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3422.01

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0				BL1 0-4'						very loose	SILTY SAND, fine, sub-rounded, moist, nonplastic, reddish brown
			S1		1-1-1 (2)		3	SM	18" / 18"(1'-2'6")		
5			S2		100/4½"				4½" / 4½"(4'-4'4½")	hard	(Caliche) SILTY SAND, predominantly fine, sub-angular, some gravel, moist, nonplastic, whitish to reddish brown
								SM			
			P1						11" / 24"(6'6"-8'6")		
			P2		rejected by SHB				0" / 9" (8'6"-9'3")		
10			S3		24-33-43 (76)				18" / 18"(9'3"-10'9")		
			P3						20" / 20"(11'3"-12'11")		(Gatuna) SANDSTONE, moderately weathered, moderately fractured, thickly bedded, moderately hard to hard, reddish brown
			P4						12" / 13"(12'11"-13'10")		
15	1.6' / 9.7'			Started coring at 13.9'							
			NX						9.0' / 9.7'		(Gatuna) CLAYSTONE, moderately weathered, moderately fractured, thickly bedded, moderately hard to hard, reddish brown to bluish green
20											note: occasional thin layer of sandstone
	0.6' / 2.7'		NX						2.6' / 2.7'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/17/78

LOG OF TEST BORING NO. B-6

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3422.01

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
25										
										Stopped coring at 26.3'
30										
35										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 11/21/78

LOG OF TEST BORING NO. B-7

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3404.19

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0										loose	SAND, fine, sub-rounded, some silt, loose, moist, nonplastic, reddish brown
			S1		2-3-4 (7)				18" / 18"	(1'-2'6")	
								SM-SP			
			S2		7-(100/5½")				11½" / 11½"	(4'-4'11½")	
5											
								SM		hard	(Caliche) SILTY SAND, predominantly fine, some gravel, highly cemented with calcium carbonate, hard, nonplastic, whitish to reddish brown
			S3		21-29-43 (72)		12		17" / 18"	(9'-10'6")	
10				Started coring at 10.5'							
	0 / 5.0'			NX					0.4' / 5.0'		
15											
	0 / 5.0'			NX					2.2' / 5.0'		
20											
	0 / 6.8'			NX					6.8' / 6.8'		(Gatuna) SANDSTONE, very weathered, very fractured, moderately hard, reddish brown
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-7

JOB NO. E78-1135 DATE 11/21/78

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3404.19

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25				NX							SANDSTONE, slightly weathered, very fractured hard, whitish
	0								0.2'		
	0.2'								0.2'		note: changed carbide bit to diamond bit at 27'
											(Santa Rosa)
30	0.8'			NX					3.8'		Intercalated SANDSTONE AND SHALE, sandstone is fresh, thinly bedded, moderately hard, moderately fractured, whitish, shale is fresh, thinly bedded, moderately hard, moderately fractured, reddish brown
	7.9'								7.9'		
35											Stopped coring at 34.9'
40											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/3/79

LOG OF TEST BORING NO. B-8

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3408.55

DATUM Mozlen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1	0-6'						very loose to loose	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
			S2		1-1-2 (3)			SM-SP	18" / 18"(1'-2'6")		
			S3		2-4-6 (10)				16" / 18"(3'6"-5')		
5			S4		8-16-35 (51)			SC	18" / 18"(6'-7'6")	firm	CLAYEY SAND, fine, sub-rounded, moist, low plasticity, reddish brown
			P5					SM	21" / 24"(8'-10')	hard	(Caliche) SILTY SAND, predominantly fine, sub-angular, moist, weakly cemented, nonplastic, whitish to reddish white
10			P6						22" / 24"(10'-12')		
			P7						11" / 11"(12'-12'11")		(Gatuna) SANDSTONE, moderately weathered, very fractured, thickly bedded, moderately hard, whitish to reddish brown
			P8						7" / 7"(12'11"-13'6")		
				Started coring at 13.4'							
15			NX						3.3' / 5.8'		note: occasional traces of gravel
20	1.5' / 4.5'		NX						3.1' / 4.5'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/3/79

LOG OF TEST BORING NO. B-8

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3408.55

DATUM Mozlen Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
	4.9' / 10.0'			NX					8.8' / 10.0'		
30											
35											
				NX					6.9' / 8.6'		(Santa Rosa) SILTSTONE, slightly weathered, moderately to very fractured, thickly bedded, moderately hard to soft, whitish to reddish brown
40											(Dewey Lake) SILTSTONE, fresh, moderately fractured, moderately hard, dark red
				NX					0.9' / 1.4'		
45	0.5' / 2.5'			NX					2.5' / 2.5'		
				NX					1.1' / 1.7'		
	0.6' / 2.1'			NX					1.9' / 2.1'		
50											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-8

JOB NO. E78-1135 DATE 1/3/79

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3408.55

DATUM Mozlen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
50			Stopped coring at 50.0'								(Dewey Lake) Interbedded SILTSTONE AND CLAYSTONE, reddish brown to dark red.
55											
60											
65											
70											
75											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-8

JOB NO. E78-1135 DATE 1/3/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3408.55
DATUM Mozlen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
75											
80											
85											
90											
95											
100											Stopped auger at 100.0'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-9

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 12/19/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3410.47
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec./Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1	0-4'						very loose to medium dense	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
			S1		1-1-2 (3)		3		16" 18"	(1'-2'6")	
			P1					SM-SP	22" 24"	(3'-5')	
5			S2		5-7-7 (14)				18" 18"	(5'-6'6")	
10			P2						16" 19"	hard (8'8"-10'3")	(Caliche) SILTY SAND, predominantly fine, sub-angular, some gravel, moderate lime cemented, moist, nonplastic, white to light tan
								SM			
15			S3		16-23-49 (72)		11		15" 18"	(14'-15'6")	
20			P3						10" 12"	(19'-20')	(Gatuna) SANDSTONE, moderately weathered, moderately fractured, thickly bedded, moderately hard, reddish brown
			P4						9" 9"	(20'-20'9")	
					Started coring at 20.8'						
	3.5' 8.6'		NX						7.3' 8.6'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/19/78

LOG OF TEST BORING NO. B-9

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3410.47

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
30	0.9' / 4.5'			NX					4.0' / 4.5'		
											SILTSTONE, slightly weathered, moderately fractured, thinly bedded, moderately hard, reddish brown
35	3.4' / 4.9'			NX					4.6' / 4.9'		
											SANDSTONE, slightly weathered, moderately fractured, thickly bedded, moderately hard, reddish brown note: occasional seam of gravel
40											Stopped coring at 38.3'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/19/78

LOG OF TEST BORING NO. B-10

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3413.00

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1	0-6'						very loose to loose	SILTY SAND, fine, sub-rounded, predominantly quartz, moist, nonplastic, brown to tan note: thin lens of lime cemented sand at 4½'-5½'
			S1	1-1-1 (2)				SM	14" 18"(1'-2'6")		
5			S2	2-2-3 (5)			14		18" 18"(4'6"-6')		
								SP		loose	SAND, fine, sub-rounded, predominantly quartz, some lime cementation, moist, nonplastic, tan
10			S3	4-37-49 (86)				SM-SP	18" 18"(9'6"-11')	loose	SAND, fine, predominantly quartz, some silt, small amount of clay, moist, low plasticity to nonplastic, orange-brown
			P1						17" 17"(11'6"-12'11")		(Caliche)
								SM		hard	SILTY SAND, fine, moderately to strongly lime cemented, dry, nonplastic, light tan
15			S4	25-55-100/5½"					12" 17½"(14'-15'5½")		note: small amount of gravel throughout color change at 14' from light tan to reddish tan
			S5	35-76-100/3½"			12		12" 15½"(15'11½"-17'3")		
			S6	100/5½"					3" 5½"(17'9"-18'2½")		(Gatuna) SANDSTONE, moderately weathered, intensely fractured, to very fractured, thickly bedded, soft to moderately hard, light red
20	0.4' 4.4'		NX	Started coring at 18.6'					2.1' 4.4'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/19/78

LOG OF TEST BORING NO. B-10

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3413.00

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
	3.0' / 9.0'			NX					6.7' / 9.0'		SILTSTONE, very to moderately weathered, very to intensely fractured, thinly bedded, moderately hard, light brown
30											SANDSTONE, moderately weathered, slightly fractured, thickly bedded, moderately hard, red
											Stopped coring at 32.0'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-11

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 12/15/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3414.30
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0								SP			SAND, fine, sub-rounded, predominantly quartz, loose, moist, brown
			S1		2-2-2 (4)			SM	18" / 18"(1'-2'6")	very loose	SILTY SAND, fine, sub-rounded, predominantly quartz, loose, moist, brown
5			S2		84-100/2"				8" / 8"(4'6"-5'2")	hard	(Caliche) SILTY SAND, predominantly fine, some gravel, lime cemented, hard, dry, tan
			P1		rejected by Bechtel				4" / 5"(7'1"-7'6")		note: color change from tan to pinkish tan at approximately 10'
10			S3		68-61-76 (137)		15	SM	12" / 18"(9'-10'6")		
15			P2						23" / 25"(12'11"-15')		(Gatuna) SANDSTONE, moderately to very weathered, very to moderately fractured, thickly bedded, moderately hard to hard, light red to red
			P3						20" / 24"(15'-17')		
			P4						25" / 18"(17'-18'6")		
20	1.7' / 4.9'		NX		Started coring at 18.5'				4.3' / 4.9'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

LOG OF TEST BORING NO. B-11

JOB NO. E78-1135 DATE 12/15/78

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3414.30

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
25										
	2.8'–6.5'			NX					6.3' 6.5'	
30										Stopped coring at 30.0'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-12

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 12/1/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3421.77
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			S1		1-1-2 (3)				18" / 18"(1'-2'6")	very loose to loose	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
			P2					SM-SP	24" / 24"(3'-5')		
5			S3		3-3-90 (93)				18" / 18"(5'-6'6")		
			P4						8" / 24"(7'-9')	hard	(Caliche) SILTY SAND, fine, sub-rounded, strongly cemented, calcareous, moist, nonplastic, white to tan
10			S5		43-77-77 (154)			SM	18" / 18"(9'-10'6")		
15			S6		19-25-25 (50)				11" / 18"(14'-15'6")		(Gatuna) SANDSTONE, fine very weathered, nonplastic, reddish brown
20			S7		50-73-88 (161)				15" / 18"(19'-20'6")		
			NX		Started coring at 20.5'				1.0' / 2.8'		SANDSTONE, very weathered, moderately fractured, thickly bedded, moderately hard, reddish brown
			NX						0.9' / 2.2'		note: occasional white banding throughout sandstone
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/1/78

LOG OF TEST BORING NO. B-12

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3421.77

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	0.6' / 1.0'			NX					1.0' / 1.0'		
	1.5' / 1.8'			NX					1.8' / 1.8'		CLAYSTONE, slightly weathered, moderately fractured, thinly bedded, moderately hard, reddish brown
30	0.9' / 5.0'			NX					4.0' / 5.0'		SANDSTONE, slightly weathered, moderately fractured, thinly bedded, moderately hard, reddish brown
											CLAYSTONE, slightly weathered, moderately fractured, thinly bedded, moderately hard, reddish brown
35				NX					3.0' / 5.0'		SANDSTONE, slightly weathered, moderately fractured, thickly bedded, moderately hard, white to reddish brown
40				NX					2.9' / 3.7'		Intercalated SANDSTONE AND CLAYSTONE, sandstone is fresh, moderately fractured, thinly bedded, moderately hard, reddish brown to white. claystone is fresh, moderately fractured, thinly bedded, moderately hard, reddish brown
45											Stopped coring at 41.5'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/12 & 13/78

LOG OF TEST BORING NO. B-13

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3403.91

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0				BL3 0-7'						very loose	SAND, fine, sub-rounded, predominantly quartz, some silt, loose, moist, nonplastic, brown
				S1	1-1-3 (4)		2	SM-SP	16" / 18"	(1'-2'6")	
				P1					23" / 24"	(3'-5')	
5				S2	4-5-6 (11)			SM	14" / 18"	moderately firm (5'-6'6")	SILTY SAND, fine, sub-rounded, predominantly quartz, moist, low plasticity, brown
				S3	80-100/4"				8" / 10"	(6'10"-7'8")	(Caliche)
										hard	SILTY SAND, fine, lime cemented, dry, nonplastic, tan
10				S4	54-37-45 (82)			SM	16" / 18"	(9'-10'6")	note: some gravel present
	0 / 2.0'			Started coring at 10.5'							
				NX					0.4' / 2.8"		
15	0 / 5.0'			NX					2.6' / 5.0'		(Gatuna) SANDSTONE, extremely to very weathered, very fractured, thickly bedded, moderately hard to soft, light red
20	2.1' / 5.0'			NX					4.7' / 5.0'		(Gatuna) SANDSTONE, moderately weathered, slightly fractured, thinly bedded, moderately hard, light red
25											(Gatuna) SANDSTONE, extremely weathered, very fractured, thinly bedded, moderately hard to soft, light red

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-13

JOB NO. E78-1135 DATE 12/12 & 13/78

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3403.91

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
25	2.9' 5.0'			NX					4.7' 5.0'	(Gatuna) SANDSTONE, moderately weathered, slightly fractured, thickly bedded, moderately hard, light red
										CLAYSTONE, moderately weathered, moderately fractured, moderately hard, red
30										Stopped coring at 28.3'
										Converted to observation well 12/16/78

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/13/78

LOG OF TEST BORING NO. B-14

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3406.57

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			S1		1-2-2 (4)			SM-SP	18" / 18"(1'-2'6")	loose	SAND, fine, predominantly quartz, some silt, moist, loose, nonplastic, brown
5			S2		40-100/5½"			SM	11½" / 11½"(4'6"-5'5½")	firm	SILTY SAND, fine, predominantly quartz, moist, low plasticity, brown
								SM		hard	(Caliche) SILTY SAND AND GRAVEL, well graded, lime cemented, dry, nonplastic, tan
	0 / 1.6'		NX	Started coring at 7.2'					0.9' / 1.6'		
	0 / 1.0'		NX	Stopped coring at 9.8'					0.7' / 1.0'		
10			S3		10-17 (27)				12" / 12"(9'8"-10'8")		(Gatuna) SANDSTONE, very weathered, intensely to very fractured, thickly bedded, moderately hard, reddish tan
			P1						14" / 24"(10'8"-12'8")		
			P2						17" / 24"(12'8"-14'8")		
15				Started coring at 14.8'							(Gatuna) SANDSTONE, moderately weathered, very fractured, thickly bedded, moderately hard, light red
	2.0' / 8.1'		NX						6.1' / 8.1'		
20											CLAYSTONE, extremely weathered, intensely to very fractured, moderately hard
	0 / 1.6'		NX						1.0' / 1.6'		Stopped coring at 24.5'
25											

GROUND WATER

DEPTH	HOUR	DATE

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LOG OF TEST BORING NO. 15

JOB NO. E78-1135 DATE 11/16 to 11/17/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamon Core
SURFACE ELEV. 3408.64
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			S1		3-4-3 (7)				15½" / 18"(1'-2'6")	loose to medium dense	SAND, fine, some silt, non-plastic, reddish brown to brown
5			P2		rejected			SM-SP	1" / (3'-5'6")		
			S3		7-8-8 (16)		4		18" / 18"(5'6"-7')		
			P4		rejected				1½" / (7'6"-10')		
10			S5		(100/2")			SM	2" / 2"(10'-10'2")	hard	(Caliche) SILTY SAND, fine, highly cemented, nonplastic, light brown
15			S6		31-78-55 (133)		12		15" / 18"(14'-15'6")	hard	SILTY SAND, fine, occasional traces of clay, nonplastic, reddish brown
20			S7		80-(100-5½")		8	SM	11½" / 11½"(19'-19'11½")		
25			S8		(100/4")				0 / 4"(24'6"-24'10")	no recovery	

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 11/16 to 11/17/78

LOG OF TEST BORING NO. B-15

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3408.64

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv. REMARKS	VISUAL CLASSIFICATION
25					(100/0")			SM	0"	
			S9		no recovery				0"(26'-26')	(Gatuna) SANDSTONE, slightly weathered, slightly fractured, hard, reddish brown
			S10		(100/0") no recovery				0" 0"(29'-29')	
30										
			S11		(100/2½") no recovery				0" 2½"(34'-34'2½")	
35										
			S12		(100/1½")				1½" 1½"(39'-39'1½")	
40										
					Started coring at 41.5'					
	1.9' 2.3'			NX					2.3' 2.3'	
45										
	1.6' 5.0'			NX					4.0' 5.0'	
50										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-15

JOB NO. E78-1135 DATE 11/16 to 11/17/78

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3408.64

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
50											note: Sandstone layer approximately 1' thick at 50'8" hard, fresh, tan to white
	0.3' 4.7'			NX					4.7' 4.7'		(Santa Rosa) SANDSTONE, fresh, moderately fractured, hard, fine, reddish brown
55	2.6' 3.2'			NX					3.2' 3.2'		SHALE, fresh, moderately fractured, moderately hard, reddish brown
											Stopped coring at 56.8'
60											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/14/78

LOG OF TEST BORING NO. B-16

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3411.21

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec./Adv. REMARKS	VISUAL CLASSIFICATION
0			S1		2-3-4 (7)				loose 16" 18"(1'-2'6")	SAND, fine, some silt, moist, sub-rounded, nonplastic, reddish brown to brown
5			P1					SM-SP	22½" 24"(3'-5')	
10			P2						very firm 10" 10"(8'-8'10")	(Caliche) SILTY SAND, poorly graded, sub-angular, strongly calcareously cemented, some gravel, dry, nonplastic, whitish to reddish brown
			S2		15-17-19 (36)			SM	16" 18"(9'6"-11')	
15			S3		38-24-29 (53)				18" 18"(14'6"-16')	(Gatuna) SANDSTONE, very weathered, moderately fractured, thickly bedded, moderately hard, reddish brown
			P3						12" 14"(16'-17'2")	
			P4						10" 24"(17'2"-19'2")	
20					Started coring at 19.2'					
	4.0' 4.3'		NX						4.2' 4.3'	
25										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/14/78

LOG OF TEST BORING NO. B-16

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3411.21

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec./Adv.	REMARKS	VISUAL CLASSIFICATION
25	1.5' 7.1'			NX					4.9'/7.1'		
30											
35											Stopped coring at 31.0' Converted to observation well 12/15/78

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/13/78

LOG OF TEST BORING NO. B-17

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3413.26

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1		0-4'					loose	SILTY SAND, fine, sub-rounded, moist, nonplastic, reddish brown
			S1		1-3-6 (9)			SM	18" / 18"(1'-2'6")		
5			S2		4-3-13 (16)				18" / 18"(4'-5'6")		
			P1					SM	18" / 24"(6'-8')	firm to hard	(Caliche) SILTY SAND, predominantly fine, sub-angular, strongly calcareously cemented, trace of gravel, moist, nonplastic, whitish to reddish brown
10			P2		(100/4")				16" / 24"(8'-10') / 4"		
	1.4' / 2.5'		S3						4"(10'6"-10'10") / 2.1' / 2.5'		(Gatuna) SANDSTONE, very weathered, moderately fractured, thickly bedded, moderately hard, reddish brown
15			NX								note: occasional thin layer of siltstone
	4.2' / 10.0'		NX						8.5' / 10.0'		
20											
	1.3' / 2.5'		NX						2.5' / 2.5'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/13/78

LOG OF TEST BORING NO. B-17

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamon Core

SURFACE ELEV. 3413.26

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
											Stopped coring at 25.8'
30											
35											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/14/78

LOG OF TEST BORING NO. B-18

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3419.32

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0				BL1	0-3'					very loose	SAND, predominantly quartz, some silt, loose, moist, nonplastic, brown
			S1		1-1-2 (3)			SM-SP	18" / 18"	(1'-2'6")	
5			S2		5-6-5 (11)			SM.	17" / 18"	moderately firm (4'6"-6')	SILTY SAND, fine, predominantly quartz, loose, moist, low plasticity, brown
			S3		44-97-100/1"				13" / 16"	hard (7'3"-8'7")	(Caliche) SILTY SAND, predominantly fine, lime cemented, nonplastic, tan note: some gravel present
			P1		rejected 100/4"				4"	(8'7"-9'6")	
10			S4						4" / 1"	(9'6"-9'10")	
			S5		100/4"			SM	4"	(10'8"-11')	
			S6		40-53-59 (112)				12" / 18"	(12'6"-14')	
15			P2						24" / 24"	(14'-16')	(Gatuna) SANDSTONE, moderately weathered, moderately to very fractured, thickly bedded, moderately hard to hard, light red
			P3						17" / 24"	(16'-18')	
			P4						23" / 24"	(18'-20')	
20					Started coring at 20.3'						
	0.9' / 3.1'		NX						2.6' / 3.1'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/14/78

LOG OF TEST BORING NO. B-18

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3419.32

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec./Adv.	REMARKS	VISUAL CLASSIFICATION
25											(Gatuna) SANDSTONE, moderately to slightly weathered, slightly fractured, thickly bedded, hard, red
	8.9' 9.7'			NX					9.7' 9.7'		
30											
35											Stopped coring at 33.3' Converted to observation well 12/15/78
40											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 11/30/78

LOG OF TEST BORING NO. B-19

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3399.84

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. Adv. REMARKS	VISUAL CLASSIFICATION
0			S1		1-1-2 (3)		7	SM-SP	very loose 15" 18"(1'-2'6")	SAND, fine, sub-rounded, some silt, moisture, non-plastic, reddish brown
			S2		2-3-3 (6)				~~17"~~ 18"(4'-5'6")	
5								SM	loose	SILTY SAND, fine, sub-rounded, moist, nonplastic, brown to tan
			S3		51-(100/5")		11		10" 11"(9'-9'11")	hard
10										(Caliche) SILTY SAND, predominantly fine, sub-angular, weakly cemented, some clay and gravel, low plasticity, tan to white
			S4		(100-0")		no recovery	SM	(14'-14')	
15										
20			S5		48-67-(100/5")				14" 17"(19'-20'5")	(Gatuna) Sandstone, fine, nonplastic, reddish brown
			NX		Started coring at 21.2'				1.7' 2.6'	SANDSTONE, very weathered, moderately fractured, thickly bedded, moderately hard to hard, reddish brown to whitish
25										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 11/30/78

LOG OF TEST BORING NO. B-19

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3399.84

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	1.7' / 2.8'			NX					2.8' / 2.8'		
	1.1' / 2.2'			NX					2.2' / 2.2'		
30				NX					4.3' / 5.0'		
35	1.3' / 5.0'			NX					4.7' / 5.0'		SANDSTONE, slightly weathered, thickly bedded, moderately hard to hard, reddish brown to white note: occasional thin layers of siltstone
40											Stopped coring at 38.8'
45											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/12/78

LOG OF TEST BORING NO. B-20

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3403.53

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0				BL1	0-3'					very loose	SAND, fine, sub-rounded, some silt, moisture, non-plastic, reddish brown to brown
			S1		2-2-2 (4)				18"	18"(1'-2'6")	
			P1						24"	24"(3'-5')	
5								SM-SP			
			S2		5-12-50 (72)				18"	18"(9'-10'6")	
10										hard	(Caliche)
								SM			SILTY SAND, fine, sub-angular, weakly calcareously cemented, some gravel, dry, nonplastic, whitish to reddish brown
			S3		(100/1")				1"	1"(14'-14'1")	
15											Stopped auger at 14.0' Sampler refused at 14'1"
											Converted to observation well 12/16/78
20											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/12/78

LOG OF TEST BORING NO. B-20A

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3403.53

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0										very loose	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown to brown
5								SM-SP			
10											
15	0.7' 8.7'			NX	Started coring at 13.9'			SM	4.7' 8.7'	hard	(Caliche) SILTY SAND, fine, sub-angular, weakly calcareously cemented, some gravel, dry, nonplastic, whitish to reddish brown
20											(Gatuna) SANDSTONE, very weathered, moderately fractured, thickly bedded, moderately hard to soft, reddish brown to white
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/12/78

LOG OF TEST BORING NO. B-20A

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3403.53

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec./Adv. REMARKS	VISUAL CLASSIFICATION
25										
	3.4'			NX					8.2'	
	8.6'								8.6'	
30										
				NX					2.0'	
									3.0'	
35										Stopped coring at 34.2' Converted to observation well 12/16/78
40										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 11/17/78

LOG OF TEST BORING NO. B-21

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3404.55

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			S1		2-2-3 (5)		4	SM-SP	18" / 18"(1'-2'6")	loose	SAND, fine, sub-rounded, predominantly quartz, some silt, nonplastic, brown
5			S2		3-2-3 (5)			SM-SP	18" / 18"(4'-5'6")	loose	SAND, fine, sub-rounded, predominantly quartz, some silt, nonplastic, light brown
			S3		44-(100/2")		10	SM	8" / 8"(8'-8'8")		
10								SM		firm	SILTY SAND, fine, sub-angular, predominantly quartz, nonplastic, brown
										hard	(Caliche) SILTY SAND, predominantly fine, predominantly quartz, nonplastic, tan
15			S4		16-26-41 (67)			SM	12" / 18"(14'-15'6")	hard	(Caliche) SILTY SAND, predominantly fine, predominantly quartz, nonplastic, reddish brown
20			S5		41-70-(100/5")				17" / 17"(19'-20'5")		
25			S6		43-22-100/5½")		5		17½" / 17½"(24'-25'5½")		(Gatuna) SANDSTONE, moderately weathered, very fractured, moderately hard, reddish brown. note: occasional traces of gravel interbedded in the sandstone

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 11/17/77

LOG OF TEST BORING NO. B-21

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3404.55

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
				Started coring at 25.6'							
	1.4'								2.6'		
	3.3'			NX					3.3'		
30											
	0.7'			NX					4.3'		
	5.0'								5.0'		
35											SANDSTONE, slightly weathered, very fractured, hard, brownish red note: thin caliche layer at 36.5'
	0.0'			NX					4.3'		
	5.0'								5.0'		
40	0.0'			NX					2.3'		
	1.7'								5.0'		
45											Stopped coring at 40.4'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/11/78

LOG OF TEST BORING NO. B-22

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3406.85

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0				BL1	0-3'					very loose	SAND, fine, sub-rounded, predominantly quartz, some silt, moist, nonplastic, brown
				S1	2-1-2 (3)			SM-SP	18" / 18"	(1'-2'6")	
				P1					24" / 24"	(3'-5')	
5				S2	5-7-9 (16)		11	SC	18" / 18"	firm (5'2"-6'8")	CLAYEY SAND, fine, sub-rounded, predominantly quartz, moist, low plasticity, brown
				S3	100/2"				2" / 2"	(7'6"-7'8")	
				S4	100/2"				2" / 2"	hard (9'5"-9'7")	(Caliche) SILTY SAND, predominantly fine, predominantly quartz, lime cemented, dry, nonplastic, tan
10				P2	rejected			SM	7"	(9'8"-10'3")	
	0 / 2.4'			NX	Started coring at 10.5'				1.6' / 2.4'		
15	0 / 5.0'			NX					3.6' / 5.0'		(Gatuna) SANDSTONE, moderately weathered, very to intensely fractured, soft to moderately hard, thickly bedded, red
20	8.7' / 9.9'			NX					9.8' / 9.9'		(Gatuna) SANDSTONE, moderately to slightly weathered, slightly fractured, thickly bedded, hard, red
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/11/78

LOG OF TEST BORING NO. B-22

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3406.85

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
30											Stopped coring at 27.8'
35											

GROUND WATER

DEPTH	HOUR	DATE

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JOB NO. E78-1135 DATE 12/6/78

LOG OF TEST BORING NO. B-23

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3412.07

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			S1		4-5-4 (9)			SM-SP	15" / 18"	loose	SAND, fine, moist, sub-rounded, some silt, nonplastic, reddish brown
			P2						22" / 24"	(1'-2'6")	
5			S3		4-13-80 (93)				18" / 18"	(3'-5')	
										(5'-6'6")	
			P4						24" / 24"	hard (7'-9')	(Caliche) SILTY SAND, predominantly fine, sub-angular, weakly calcareously cemented, moist, nonplastic, whitish to reddish brown
			S5		51-(100/5")				11" / 11"	(9'-9'11")	
10			S6		30-(100/5½")	9		SM	10" / 11"	(10'-10'11½")	
15			S7		19-19-15 (34)				14" / 18"	(14'3"-15'9")	(Gatuna) SANDSTONE, fine, dry, nonplastic, reddish brown
20			S8		32-39-50 (89)				16" / 18"	(19'3"-20'9")	
25			S9		72-100-(100/2")				14" / 14"	(24'3"-25'5")	

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-23

JOB NO. E78-1135 DATE 12/6/78

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3412.07
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
				Started coring at 25.4'							(Gatuna)
	2.5' / 3.1'			NX					2.7' / 3.1'		SANDSTONE, moderately weathered, slightly fractured, thickly bedded, moderately hard, reddish brown to whitish
30				NX					2.5' / 5.0'		note: occasional traces of gravel
35	1.8' / 3.4'			NX					3.1' / 3.4'		
	1.2' / 3.6'			NX					2.1' / 3.6'		
40											
											Stopped coring at 40.5'
45											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/7/78

LOG OF TEST BORING NO. B-24

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3417.87

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0										loose	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
			S1		3-3-3 (6)				18" / 18"(1'-2'6")		
								SM-SP			
			P2						21" / 24"(3'-5')		
5											
			S3		4-37-40 (77)		16		18" / 18"(5'-6'6")		
										hard	(Caliche)
			P4						1" / 8"(7'-7'8")		SILTY SAND, predominantly fine, sub-angular, weakly calcareously cemented, moist, nonplastic, whitish to reddish brown
								SM			
			S5		(100/5")				4" / 5"(9'-9'5")		
10											
											(Gatuna)
									5½" / 5½"(14'-14'5½")		SANDSTONE, moderately weathered, thickly bedded, moderately hard, reddish brown
			S6		(100/5½")		12				
					Started coring at 14.3'						
15											note: occasional traces of gravel
	2.2' / 5.3'			NX					3.5' / 5.3'		
20											
	2.0' / 3.9'			NX					3.8' / 3.9'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-24

JOB NO. E78-1135 DATE 12/7/78

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3417.87

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	5.1' 5.8'			NX					5.8' 5.8'		
30											Stopped coring at 29.3'
35											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/3/79

LOG OF TEST BORING NO. B-26

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3410.19

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0				BL1	0-3'					very loose	SAND, fine, sub-angular, some silt, moist, nonplastic, light brown
				S2	1-2-2 (4)			SM-SP	17" 18"(1'-2'6")		
				S3	4-4-5 (9)			SC	18" 18"(3'6"-5')	loose	CLAYEY SAND, fine, sub-angular, moist, low plasticity, reddish brown
5				P4	rejected				2" 4"(5'-5'4")		
				S5	100/4½"				4½" 4½"(6'6"-6'10½")	hard	(Caliche) SILTY SAND, predominantly fine, some gravel, dry, nonplastic, tan to pinkish tan
				P6				SM	13" 24"(7'6"-9'6")		
10				P7					13" 24"(9'6"-11'6")		
				P8					10" 24"(11'6"-13'6")		(Gatuna) SANDSTONE, weakly cemented, very to moderately weathered, intensely to very fractured, thickly bedded, soft
15				P9					18" 24"(13'6"-15'6")		
				P10					12" 24"(15'6"-17'6")		
				Started coring at 17.5'							
20	0.0' 5.0'			NX					3.6' 5.0'		
25											SILTSTONE, moderately weathered, intensely to very fractured, thickly bedded,

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-26

JOB NO. E78-1135 DATE 1/3/79

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3410.19

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	0.3' 5.0'			NX					4.8' 5.0'		moderately hard, brown to brownish tan
											Stopped coring at 27.5'
30											
35											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/11/79

LOG OF TEST BORING NO. B-27

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3400.20

DATUM Molzen-Corbin Core

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION.
0				BL1 3-4'						very loose	SAND, fine, sub-rounded, predominantly quartz, some silt, moist, nonplastic, brown
			S2		1-1-1 (2)			SM-SP	16" / 18"(1'-2'6")		
								SM		firm	SILTY SAND, fine, sub-rounded, predominantly quartz, small amount of clay, moist, low plasticity, brown
5			S3		37-73-100/5"				16" / 17"(4'4"-5'9")		
										hard	(Caliche)
								SM			SILTY SAND, fine, lime cemented, small amount of gravel, dry, nonplastic, tan to pinkish tan
			P4						13" / 24"(6'8"-8'8")		
10			P5						11" / 22"(8'8"-10'6")		
			P6						11" / 23"(10'6"-12'5")		(Gatuna)
			P7						14" / 18"(12'5"-13'11")		SANDSTONE, very to moderately weathered, intensely to very fractured, thickly bedded, soft to moderately hard, reddish tan to red
				Started coring at 13.9'							
15											note: some calcareous cementation throughout
	1.3' / 4.5'		NX						3.5' / 4.5'		SANDSTONE, fresh, very fractured, thinly bedded, hard, greenish white
20											CLAYSTONE, very weathered, intensely to very fractured, thinly bedded, soft to moderately hard, brown
	1.6' / 7.4'		NX						5.8' / 7.4'		SANDSTONE, fresh, moderately fractured, thinly bedded, hard, light gray
											Intercallated SANDSTONE and CLAYSTONE, laminated, very weathered, intensely fractured, soft to moderately hard, reddish brown
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/11/79

LOG OF TEST BORING NO. B-27

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3400.20

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv. REMARKS	VISUAL CLASSIFICATION
25										
										Stopped coring at 25.8'
30										
35										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-28

JOB NO. E78-1135 DATE 1/4/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3408.17
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv. REMARKS	VISUAL CLASSIFICATION
0				BL1	0-4'				very loose	SAND, fine, predominantly quartz, some silt, moist, nonplastic, brown
				S2	1-1-1 (2)			SM-SP	15" 18"(1'-2'6")	
				S3	2-3-4 (7)			SC-SP	18" 18"(3'6"-5') loose	SAND, fine, some clay, moist, low plasticity, brown
5										
				S4	32-100/4"				10" 10"(6'6"-7'4")	(Caliche) SILTY SAND, predominantly fine, strongly to medium lime cemented, dry, low plasticity, light tan
				P5				SM	14" 24"(8'2"-10'2")	note: gravel present at 10'
10				P6					14" 20"(10'2"-11'10")	
				P7					8" 24"(11'10"-13'10")	(Gatuna) SANDSTONE, moderately to very weathered, intensely fractured, thickly bedded, soft to moderately hard, tan to reddish brown
15				P8					10" 24"(13'10"-15'10")	
				P9					12" 16"(15'10"-17'2")	note: calcareous material present from 12' to 15'
				Started coring at 17.2'						
20	1.9' 6.8'			NX					3.9' 6.8'	
										SANDSTONE, moderately weathered, moderately fractured, thickly bedded, moderately hard, red
25										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/4/79

LOG OF TEST BORING NO. B-28

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3408.17

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	1.4' / 3.0'		X	NX					2.7' / 3.0'		SANDSTONE, moderately to very weathered, very to moderately fractured, thickly bedded, moderately hard, reddish tan
											Stopped coring at 27.0'
30											
35											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/30/78

LOG OF TEST BORING NO. B-29

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3410.87

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1 0-6'							very loose to loose	SAND, fine, sub-angular, some silt, moist, nonplastic, light brown
			S2		1-1-1 (2)			SM-SP	16½" / 18"	(1'-2'6")	
5			S3		2-2-3 (5)				18" / 18"	(3'6"-5')	
			S4		5-7-7 (14)			SC	18" / 18"	firm (6'-7'6")	CLAYEY SAND, predominantly fine, sub-angular, moist, low plasticity, reddish brown
			S5		100/3"				3" / 3"	(8'6"-8'9")	(Caliche)
10			S6		60-100/6"			SC	12" / 12"	hard (10'6"-11'6")	CLAYEY SAND, predominantly fine, strongly to moderately lime cemented, dry, low plasticity, white to light tan
			P7						9" / 12"	(12'6"-13'6")	
15			P8						10" / 20"	(13'6"-15'2")	(Gatuna) SANDSTONE, weakly cemented, moderately weathered, intensely to very fractured, some lime streaks and lime nodules, thickly bedded, soft to moderately hard, reddish tan
	0 / 3.5'		NX		Started coring at 15.2'				0.8' / 3.5'		
20											
	1.0' / 10.0'		NX						8.5' / 10.0'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/30/78

LOG OF TEST BORING NO. B-29

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3410.87

DATUM Molzen -Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
											Stopped coring at 28.7'
30											
35											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/28/78

LOG OF TEST BORING NO. B-30

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3408.75

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv. REMARKS	VISUAL CLASSIFICATION
0				BL1 0-4'					very loose	SAND, fine, sub-angular, predominantly quartz, some silt, moist, nonplastic, light brown
			S2		1-1-1 (2)			SM-SP	17" 18"(1'-2'6")	
			S3		2-2-3 (5)				16½" 18"(2'6"-4')	
5			S4		3-6-6 (12)			SC	firm 17" 18"(4'6"-6')	CLAYEY SAND, predominantly fine, sub-angular, predominantly quartz, moist, low plasticity, reddish brown
10			P5					SC	22" 24"(7'6"-9'6")	(Caliche) CLAYEY SAND, predominantly fine, moderately lime cemented, moist to dry, low plasticity, light tan to white
			P6						13" 13"(9'6"-10'7")	
			P7						24" 24"(10'7"-12'7")	(Gatuna) SANDSTONE, weakly cemented, moderately weathered, very to intensely fractured, thickly bedded, soft to moderately hard, reddish tan
			P8						14" 14"(12'7"-13'9")	
15	0 4.0'		NX	Started coring at 13.8'					1.0' 4.0'	note: some streaks and occasional nodule of lime
20	4.8' 10.0'		NX						9.0' 10.0'	SANDSTONE, moderately weathered, moderately to slightly fractured, thickly bedded, moderately hard, reddish tan note: some streaks of lime
25										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-30

JOB NO. E78-1135 DATE 12/28/78

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3408.75

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv. REMARKS	VISUAL CLASSIFICATION
25										
30										Stopped coring at 27.8'
35										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-31

JOB NO. E78-1135 DATE 12/29/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3410.27
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1		0-4'3"					very loose	SAND, fine, sub-angular, some silt, moist, nonplastic, brown
				S2	½-½-1 (1½)			SM-SP	15" / 18"	(1'-2'6")	
				S3	2-2-4 (6)				18" / 18"	(3'-4'6")	
5				S4	4-4-4 (8)			SC	17" / 18"	loose (6'-7'6")	CLAYEY SAND, predominantly fine, sub-angular, moist, low plasticity, reddish brown
10				S5	27-14-35 (49)				16" / 18"	(8'6"-10')	(Caliche)
				P6	rejected			SC	2" / 2"	hard to very firm (10'6"-10'8")	CLAYEY SAND, predominantly fine, strongly to moderately lime cemented, dry, low plasticity, light tan to white
15				P7					12" / 23"	(13'6"-15'5")	(Gatuna)
				P8					11" / 15"	(15'5"-16'8")	SANDSTONE, weakly cemented, very to moderately weathered, intensely to moderately fractured, considerable lime streaks, and some lime nodules, soft to moderately hard, reddish tan to reddish brown
				P9					9" / 17"	(16'8"-18'1")	
20					Started coring at 18.05'						
	0.6' / 6.55'			NX					3.8' / 6.55'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/29/78

LOG OF TEST BORING NO. B-31

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3410.27

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	2.1' / 5.7'			NX					4.9' / 5.7'		
30											Stopped coring at 30.5'
35											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/7/79

LOG OF TEST BORING NO. B-32

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamon Core

SURFACE ELEV. 3410.89

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1		0-10'					loose	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
			S2		1-2-2 (4)				18" / 18"	(1'-2'6")	
								SM-SP			
5			S3		3-3-3 (6)				18" / 18"	(3'6"-5')	
			S4		2-2-1 (3)				18" / 18"	(6'-7'6")	
								SM		very loose	SILTY SAND, fine, sub-rounded, moist, nonplastic, tan to reddish brown
10			S5		3-3-5 (8)				18" / 18"	very firm (8'6"-10')	SAND, fine, sub-rounded, moist, some silt, nonplastic, tan to reddish brown
								SM-SP			
			S6		4-17-25 (42)				18" / 18"	(11'-12'6")	
15			P7						18" / 18"	very firm to hard (13'6"-15')	(Caliche) SILTY SAND, predominantly fine, sub-angular, weakly calcareous cemented, some gravel, dry, nonplastic, whitish to reddish white
			P8					SM	7" / 9"	(15'-15'9")	
			S9		35-100/4"				7" / 10"	(19'-19'10")	
20					Started coring at 21.0'						(Gatuna) SANDSTONE, moderately weathered, moderately fractured, thickly bedded, moderately hard, reddish brown
	0.4' / 2.1'		NX						1.9' / 2.1'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-32

JOB NO. E78-1135 DATE 1/7/79

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3410.89

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
	6.3' / 10.0			NX					9.0' / 10.0'		Interbedded SILTSTONE AND CLAYSTONE, moderately weathered, slightly fractured, thickly bedded, moderately hard, reddish brown to tan
30											
	1.7' / 2.0'			NX					1.8' / 2.0'		
35				Stopped coring at 35.1'							note: classification from auger cuttings
40											
45											(Santa Rosa) SANDSTONE & SILTSTONE, reddish brown
50											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/7/79

LOG OF TEST BORING NO. B-32

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamon Core

SURFACE ELEV. 3410.89

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
50										
55										(Dewey Lake) SILTSTONE AND CLAYSTONE, reddish brown to dark red
60										
65										
70										
75										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/7/79

LOG OF TEST BORING NO. B-32

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamon Core

SURFACE ELEV. 3410.89

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
75										
80										
85										note: started using water at 85'
90										
95										
100										Stopped auger at 100.0'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/29/79

LOG OF TEST BORING NO. B-33

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3404.05

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1		0-6'					very loose	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
			S2		1-2-2 (4)			SM-SP	16" / 18"	(1'-2'6")	
			S3		2-3-4 (7)				18" / 18"	(3'6"-5')	
5			S4		9-30-35 (65)			SC	18" / 18"	loose (6'-7'6")	CLAYEY SAND, fine, sub-rounded, moist, low plasticity, reddish brown
			P5						12"	hard	(Caliche) SILTY SAND, predominantly fine, sub-angular, weakly calcareous cemented, trace of gravel, dry, nonplastic, whitish to reddish brown
			P6						12" / 11"	(8'-9')	
10			P7					SM	13" / 6"	(9'-10'1")	
									6"	(10'1"-10'7")	
15			S8		36-70-95 (165)				12" / 18"	(14'6"-16')	
			P9						6" / 12"	(16'6"-17'6")	(Gatuna) SILTSTONE, moderately weathered, moderately to very fractured, thinly bedded, moderately hard, reddish brown
					Started coring at 17.5'						
20	2.5' / 6.2'		NX						4.6' / 6.2'		SANDSTONE, moderately weathered, moderately fractured, thickly bedded, moderately hard, reddish brown
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 12/29/79

LOG OF TEST BORING NO. B-33

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamon Core

SURFACE ELEV. 3404.05

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	3.5' 7.0'			NX					7.0' 7.0'		Intercalated SILTSTONE AND MUDSTONE, slightly weathered, slightly fractured, thickly bedded, moderately hard, reddish brown
30											SANDSTONE, slightly weathered, moderately fractured, moderately hard, whitish brown
											Stopped coring at 30.7'
35											
40											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/9/79

LOG OF TEST BORING NO. B-34

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3401.97

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1	0-6'						loose to medium dense	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
			S2		1-2-3 (5)				18" / 18"	(1'-2'6")	
								SM-SP			
			S3		5-7-7 (14)				18" / 18"	(3'6"-5')	
5											
			S4		4-6-8 (14)				18" / 18"	(6'-7'6"	
			S5		27-50-(100/5")				17" / 17"	(8'6"-10')	
10										hard	(Caliche) SILTY SAND, predominantly fine, poorly graded, subangular, strongly cemented, some clay and gravel, moist, nonplastic, whitish to reddish white
			P6					SM	16" / 16"	(11'-12'4")	
			P7		jar sample				5" / 24"	(12'4"-14'4")	
			P8						9" / 12"	(14'4"-15'4")	
15			P9						12" / 14"	(15'4"-16'6")	(Gatuna) SANDSTONE, moderately weathered, moderately to slightly fractured, thickly bedded, moderately hard, reddish brown
	2.1' / 7.0'				Started coring at 16.5'						
20			NX						5.7' / 7.0'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/9/79

LOG OF TEST BORING NO. B-34

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamon Core

SURFACE ELEV. 3401.97

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec./Adv.	REMARKS	VISUAL CLASSIFICATION
25	5.1' 6.5'			NX					6.1' 6.5'		
30				Stopped coring at 30.0'							note: classification from auger cuttings
35											
40											(Santa Rosa) SILTSTONE AND CLAYSTONE, reddish brown
45											
50											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/9/79

LOG OF TEST BORING NO. B-34

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3401.97

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
50										(Dewey Lake) SILTSTONE AND CLAYSTONE reddish brown to dark red
55										
60										
65										
70										
75										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-34

JOB NO. E78-1135 DATE 1/9/79

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamon Core

SURFACE ELEV. 3401.97

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
75										
80										
85										
90										
95										
100										Stopped auger at 100.0'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/5/79

LOG OF TEST BORING NO. B-35

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3402.55

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1	0-5'						very loose to loose	SAND, fine, predominantly quartz, sub-rounded, some silt, tan to brown
			S2		1-1-1 (2)			SM-SP	18" / 18"	(1'-2'6")	
5			S3		2-3-3 (6)				18" / 18"	(3'6"-5')	
			S4		6-8-34 (42)			SM-SP	18" / 18"	firm (6'-7'6")	SAND, fine, sub-rounded, some silt, moist, low plasticity to nonplastic, orangish brown
10			P5					SM	21" / 24"	(8'-10') hard	(Caliche) SILTY SAND, predominantly fine, moderately to strongly lime cemented, trace of gravel, dry, nonplastic, tan to pink
			P6						12" / 12"	(10'-11')	
			P7		rejected				5" / 8"	(11'-11'8")	
			P8						13" / 24"	(11'8"-13'8")	(Gatuna) SANDSTONE, very to moderately weathered, very fractured, thickly bedded, soft to moderately hard, reddish tan
15			P9						13" / 21"	(13'8"-15'5")	
			P10						13" / 16"	(15'5"-16'9")	note: calcareous material present
					Started coring at 16.8'						
20	0.75' / 10.1'		NX						3.5' / 10.1'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/5/79

LOG OF TEST BORING NO. B-35

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3402.55

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											SANDSTONE, moderately weathered, very to moderately fractured, thickly bedded, soft to moderately hard, red to reddish tan
30	0.38' 5.1'			NX					3.8' 5.1'		
											Stopped coring at 32.0'
35											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/7/79

LOG OF TEST BORING NO. B-36

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3422.03

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1	0-3½'						very loose	SAND, fine, predominantly quartz, some silt, loose to very loose, moist, nonplastic, brown
			S2		1-1-2 (3)			SM-SP	18" / 18"(1'-2'6")		
5			S3		4-6-15 (21)			SM-SP	18" / 18"(4'6"-6')	medium dense	SAND, fine, poorly graded, predominantly quartz, trace of clay and silt, moist, low plasticity to nonplastic, tan
			S4		100/2½"				2½" / 2½"(6'-6'2½")		(Caliche)
10			S5		57-60-70 (130)			SM	11" / 18"(8'11"-10'5")	hard	SILTY SAND, predominantly fine, lime cemented, trace of gravel, dry, very low plasticity to nonplastic, tan
15			S6		36-36-44 (80)				17" / 18"(13'2"-14'10")		(Gatuna) SANDSTONE, very to moderately weathered, intensely to very fractured, thickly bedded, soft to moderately hard, tanish red to red
			P7						12" / 24"(15'6"-17'6")		
			P8						24" / 24"(17'6"-19'6")		(Gatuna) SANDSTONE, moderately weathered, very fractured, thickly bedded, moderately hard, red
20	1.2' / 3.9'		NX		Started coring at 19.5'				2.1' / 3.9'		
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-36

JOB NO. E78-1135 DATE 1/7/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3422.03
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	2.3' 4.4'			NX					4.4' 4.4'		SILTSTONE, moderately to very weathered, intensely to very fractured, thinly bedded, moderately hard, brown, interbedded with sandstone, moderately weathered, intensely to very fractured, thinly bedded, moderately hard to soft, red
30											Stopped coring at 27.8'
35											
40											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/11/79

LOG OF TEST BORING NO. B-38

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3429.88

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0				BL1	0-3'6"					loose	SAND, fine, sub-rounded, predominantly quartz, some silt, moist, nonplastic, brown
			X	S2	1-1-2 (3)			SM-SP	18" 18"(1'-2'6")		
5			X	S3	4-20-30 (50)			SC-SM	18" 18"(4'3"-5'9")	medium dense	CLAYEY SAND, fine, predominantly quartz, sub-rounded, some silt, moist, low plasticity, brown
										hard	(Caliche) SILTY SAND, predominantly fine, lime cemented, dry, nonplastic, tan to pinkish tan
10			X	S4	25-35-45 (80)			SM	15" 18"(9'4"-10'10")		note: small amount of gravel present at 8'
			X	P5					13" 24"(11'5"-13'5")		
			X	P6					13" 21"(13'5"-15'2")		
15				Started coring at 15.2'							(Gatuna) SANDSTONE, very weathered, intensely fractured, thickly bedded, soft, reddish tan
20	2.0' 9.2'			NX					4.9' 9.2'		
25											SANDSTONE, weakly cemented, very weathered, moderately fractured, thickly bedded, some streaks of lime and some inclusions of lime nodules, moderately hard, reddish tan

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/8/79

LOG OF TEST BORING NO. B-37A

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3426.68

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1		0-3'					very loose	SAND, fine, predominantly quartz, some silt, moist, nonplastic, brown to light brown
			S2		1-1-1 (2)			SM-SP	15" / 18"(1'-2'6")		
5			S3		35-12-35 (47)			SM-SP	18" / 18"(4'2"-5'8")	medium dense to dense	SAND, fine, predominantly quartz, trace of clay and silt, moist, low plasticity to nonplastic, brown
										hard	(Caliche) SILTY SAND, predominantly fine, lime cemented, dry, nonplastic, tan to pinkish tan
10			S4		100/6"			SM	5" / 6"(9'2"-9'8")		note: small amount to some gravel from approximately 8'-13½'
15			S5		42-67-100/4"				12" / 16"(14'2"-15'6")		(Gatuna) SANDSTONE, moderately weathered, intensely fractured, thickly bedded, soft to moderately hard, tanish red to red
	0 / 1.9'		NX		Started coring at 15.5'				1.2' / 1.9'		
20	0 / 5.0'		NX						2.7' / 5.0'		
25											Stopped coring at 22.4'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-37

JOB NO. E78-1135 DATE 1/9/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3438.91
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
25	3.2' 3.9'			NX					3.9' 3.9'	note: some calcareous cementation present
										Stopped coring at 27.5'
30										
35										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/9/79

LOG OF TEST BORING NO. B-37

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3438.91

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1 0-3'							very loose	SAND, fine, predominantly quartz, some silt, moist, nonplastic, brown
				S2	1-1-1 (2)			SM-SP	18" / 18"(1'-2'6")		
5				S3	12-25-44 (69)			SM-SP	18" / 18"(4'6"-6')	firm	SAND, fine, predominantly quartz, trace of clay and silt, moist, low plasticity, brown
								SM		very firm to hard	(Caliche) SILTY SAND, predominantly fine, lime cemented, dry, nonplastic, tan to pinkish tan
10				S4	90-75-80 (155)				13" / 18"(9'6"-11')		note: trace to some gravel present at approximately 8'-12½'
				P5					15½" / 24"(11'4"-13'4")		(Gatuna) SANDSTONE, moderately weathered, moderately fractured, thickly bedded, soft to moderately hard, tanish red to red
15				P6					18" / 23"(13'4"-15'3")		
				P7	rejected				6" / 6"(15'3"-15'9")		
				P8	rejected				12" / 12"(15'9"-16'9")		note: some calcareous cementation present throughout
			Started coring at 16.8'								
20	0.5' / 6.8'			NX					6.6' / 6.8'		SILTSTONE, moderately weathered, very fractured, thinly bedded, moderately hard, brown
											SANDSTONE, moderately weathered, moderately fractured, thickly bedded, moderately hard, tanish red
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-38

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 1/11/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3429.88
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											note: occasional traces of gravel
	6.4' / 10.0'			NX					10.0' / 10.0'		
30											
35											
	3.6' / 9.0'			NX					8.6' / 9.0'		(Santa Rosa) SANDSTONE, moderately weathered, moderately to very fractured, thickly bedded, moderately hard, whitish to reddish brown
40											note: occasional traces of gravel (Dewey Lake) Interbedded MUDSTONE AND SILTSTONE, moderately weathered, thickly bedded, moderately to very fractured, moderately hard, reddish brown with some green streaks
45											
	1.4' / 6.6'			NX					5.6' / 6.6'		
50											Stopped coring at 50.0' Converted to observation well 1/23/79

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-39

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 1/6&7/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3422.08
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1	0-7'						very loose to loose	SAND, fine, predominantly quartz, some silt, moist, nonplastic, brown to light brown
			S2	1-1-1 (2)					17" / 18"(1'-2'6")		note: trace of clay present from approximately 2'-4'
								SM-SP			
5			S3	3-3-4 (7)					18" / 18"(4'6"-6')		
			S4	48-100/4"					9" / 10"(7'-7'10")		(Caliche)
			P5	rejected					7" / 7"(8'-8'7")	hard	SILTY SAND, predominantly fine, lime cemented, trace of gravel, dry, nonplastic, tan
10								SM			
			S6	9-34-54 (88)					12" / ~~18"(12'-13'6")~~		
											(Gatuna)
15			P7						6" / 24"(14'-16')		SANDSTONE, very to moderately weathered, intensely fractured, thickly bedded, soft to moderately hard, tanish red to red
			Started coring at 16.0'								
	0 / 6.7'		NX						2.6' / 6.7'		
20											
											(Gatuna)
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/6&7/79

LOG OF TEST BORING NO. B-39

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3422.08

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	3.2' / 4.9'			NX					4.9' / 4.9'		SANDSTONE, moderately weathered, moderately to slightly fractured, thickly bedded, moderately hard, red
											Stopped coring at 27.6'
30											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/10/79

LOG OF TEST BORING NO. B-40

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3438.48

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0			BL1	0-4'						very loose	SAND, fine, some silt, moist, nonplastic, brown
			S2	1-1-1 (2)				SM-SP	14" / 18"	(1'-2'6")	
5			S3	4-6-10 (16)				SC	18" / 18"	medium dense (4'6"-6')	CLAYEY SAND, fine, moist, low plasticity, reddish brown
			S4	20-30-50 (80)				SC	14" / 18"	hard (7'7"-9'1")	CLAYEY SAND, fine, weakly lime cemented, some lime stringers, slightly damp, low plasticity, mottled brown and white
			S5	37-100/4"					7" / 10"	(9'1"-9'11")	
10								SM		hard	(Caliche) SILTY SAND, fine, moderately to strongly lime cemented, dry, nonplastic, light tan to white
15			S6	23-54-100/4"					12" / 16"	(14'2"-15'6")	(Gatuna) SANDSTONE, weakly cemented, very weathered, intensely fractured, thickly bedded, soft to moderately hard, pinkish tan to red
				Started coring at 15.5'							
	0.7' / 7.9'		NX						4.9' / 7.9'		
20											SANDSTONE, moderately weathered, very fractured, thinly bedded, moderately hard, red
											SANDSTONE, very to moderately weathered, intensely to very fractured, thickly bedded, soft to moderately hard, red
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-40

JOB NO. E78-1135 DATE 1/10/79

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3438.48

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25	0.8' / 4.5'			NX					4.3' / 4.5'		
											Stopped coring at 27.9'
30											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-41

JOB NO. E78-1135 DATE 1/5/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3407.86
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0								SM-SP			SAND, fine, sub-rounded, moist, nonplastic, reddish brown
5								SC			CLAYEY SAND, fine, sub-rounded, moist, low plasticity, reddish brown
10								SM			(Caliche) SILTY SAND, predominantly fine, sub-angular, calcareously cemented, moist, whitish to reddish white
15											(Gatuna) SANDSTONE, reddish brown note: occasional traces of gravel
20											
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-41

JOB NO. E78-1135 DATE 1/5/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3407.86
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
30											
35											
40											
45											(Santa Rosa) SILTSTONE, reddish brown to whitish
50											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/5/79

LOG OF TEST BORING NO. B-41

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3407.86

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
50											(Dewey Lake) Interbedded SILTSTONE AND CLAYSTONE, dark red
55											
60											
65											
70											
75											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-41

JOB NO. E78-1135 DATE 1/5/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3407.86
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
75											
80											
85											
90											
95											
100											Stopped auger at 100.0'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-42

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 1/6/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3408.99
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0								SM-SP			SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
5								SC			CLAYEY SAND, fine, sub-rounded, moist, low plasticity, reddish brown
10								SM			(Caliche) SILTY SAND, predominantly fine, sub-angular, weakly calcareous cemented, non-plastic, whitish to reddish white
15											(Gatuna) SANDSTONE, reddish brown note: occasional traces of gravel
20											
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-42

JOB NO. E78-1135 DATE 1/6/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3408.99
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-foll drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
30											
35											
40											
45											(Santa Rosa) SANDSTONE AND SILTSTONE, brown to reddish brown
50											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-42

JOB NO. E78-1135 DATE 1/6/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3408.99
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
50											(Dewey Lake) SILTSTONE AND CLAYSTONE, dark red
55											
60											
65											
70											
75											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-42

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 1/6/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3408.99
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
75											
80											
85											
90											
95											
100											Stopped auger at 100.0'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

LOG OF TEST BORING NO. B-43

JOB NO. E78-1135 DATE 1/6/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3410.75
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
0											SAND, fine, sub-rounded, moist, some silt, nonplastic, reddish brown to brown
5								SM-SP			
10											
15								SM			(Caliche) SILTY SAND, predominantly fine, sub-angular, weakly calcareous cemented, traces of gravel, moist, nonplastic, tan to reddish white
20											(Gatuna) SANDSTONE, reddish brown note: occasional traces of gravel
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

LOG OF TEST BORING NO. B-43

JOB NO. E78-1135 DATE 1/6/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3410.75
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
25											
30											
35											
40											
45											(Santa Rosa) SANDSTONE AND SILTSTONE, whitish to reddish brown
50											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

JOB NO. E78-1135 DATE 1/6/79

LOG OF TEST BORING NO. B-43

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3410.75

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. / Adv.	REMARKS	VISUAL CLASSIFICATION
50											
55											(Dewey Lake) SILTSTONE AND CLAYSTONE, brown to dark red
60											
65											
70											
75											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

LOG OF TEST BORING NO. B-43

JOB NO. E78-1135 DATE 1/6/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3410.75
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
75											
80											
85											
90											
95											
100											Stopped auger at 100.0'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/8/79

LOG OF TEST BORING NO. B-44

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3411.48

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0								SM-SP			SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown to brown
5											
10								SC			CLAYEY SAND, fine, sub-rounded, moist, low plasticity, brown
15								SP			SAND, fine, sub-rounded, moist, nonplastic, reddish brown to tan
20								SM			(Caliche) SILTY SAND, predominantly fine, sub-angular, some gravel, whitish to reddish white
25											(Gatuna) SANDSTONE, reddish brown note: occasional traces of gravel

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-44

JOB NO. E78-1135 DATE 1/8/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3411.48
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
25											
30											
35											
40											(Santa Rosa) SANDSTONE AND SILTSTONE, reddish brown
45											
50											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-44

JOB NO. E78-1135 DATE 1/8/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3411.48
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
50											
											(Dewey Lake) SILTSTONE AND CLAYSTONE, reddish brown to dark red
55											
60											
65											
70											
75											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/8/79

LOG OF TEST BORING NO. B-44

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3411.48

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
75											
80											
85											
90											
95											
100											Stopped auger at 100.0'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/10, 16, & 17/79

LOG OF TEST BORING NO. B-45

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3401.51

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0											SAND, predominantly fine, some silt, moist, nonplastic, brown
								SM-SP			
5											
10											(Caliche) SILTY SAND, predominantly fine, sub-angular, weakly calcareously cemented, some gravel, dry, nonplastic, whitish to pinkish white
								SM			
	0.0' 1.0'			Started coring at 12.5' NX					0.7' 1.0'		
15											
											(Gatuna) SANDSTONE, moderately weathered, moderately fractured, thickly bedded, moderately hard, reddish brown
	4.6' 10.0'			NX					8.4' 10.0'		
20											
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-45

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 1/10,16&17/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core
SURFACE ELEV. 3401.51
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
25											
	6.3' 10.0'			NX					9.6' 10.0'		
30											
											(Dewey Lake) SILTSTONE, moderately weathered, very fractured, laminated, moderately hard, reddish brown
35											note: ½" layer of light green siltstone at 43.7'
	0.4' 7.5'			NX					6.5' 7.5'		
40											
	0.0' 2.3'			NX					1.9' 2.3'		
45	0.6' 3.3'			NX					3.0' 3.3'		SANDSTONE, fresh, moderately fractured, thinly bedded, hard, light tan
											SILTSTONE, moderately weathered, very to moderately fractured, laminated, moderately hard, reddish brown
50											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/10,16,&17/79

LOG OF TEST BORING NO. B-45

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3401.51

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
50											SILTSTONE, moderately weathered, moderately fractured, moderately hard, reddish brown
	4.9' 6.7'			NX					6.5' 6.7'		note: 2" seam of very fine sandstone at 52' 4" seam of fine grained sandstone at 52.6'
55											
	1.2' 8.4'			NX					4.5' 8.4'		note: occasional thin layer of fine grained sandstone throughout 4" to 5" layer of broccia at 57.0' (core lost between 57.7' and 61.7')
60											
65	5.0' 6.9'			NX					6.6' 6.9'		
70											
	5.9' 10.0'			NX					9.9' 10.0'		
75											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/16/79

LOG OF TEST BORING NO. B-45

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3401.51

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
75											
80											
	3.5' 10.0'			NX					9.2' 10.0'		
85											
90											
	6.3' 8.6'			NX					8.6' 8.6'		note: fine grained sandstone between 98.0' and 99.7'
95											
	1.5' 2.8'			NX					2.7' 2.8'		Stopped coring at 100.0'
100											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/8/79

LOG OF TEST BORING NO. B-46

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3401.98

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0											SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
								SM-SP			
5											
											(Caliche) SILTY SAND, predominantly fine, sub-angular, some gravel, dry, nonplastic, white to reddish white
10								SM			
											(Gatuna) SANDSTONE, reddish brown
15											
20											
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

LOG OF TEST BORING NO. B-46

JOB NO. E78-1135 DATE 1/8/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3401.98
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
25											
30											
35											
40											
											(Santa Rosa) SANDSTONE AND SILTSTONE, reddish brown
45											
50											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

LOG OF TEST BORING NO. B-46

JOB NO. E78-1135 DATE 1/8/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3401.98
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
50											(Dewey Lake) SILTSTONE AND MUDSTONE, dark red to reddish brown
55											
60											
65											
70											
75											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-46

JOB NO. E78-1135 DATE E78-1135

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 3401.98
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
75											
80											
85											
90											
95											
100											Stopped auger at 100.0'

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/25/79

LOG OF TEST BORING NO. B-47

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3409.49

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0			S1		2-2-5 (7)			SM-SP	18" 18"(1'-2'6")	loose	SAND, fine, sub-rounded, predomiantly quartz, some silt, moist, nonplastic, brown
			S2		4-5-5 (10)			SC	18" 18"(3'6"-5')	moderately firm	CLAYEY SAND, fine, sub-rounded, predominantly quartz, moist, low plasticity, reddish brown
5			S3		2-3-6 (9)			SP	18" 18"(6'-7'6")	loose	SAND, fine, sub-rounded, predominantly quartz, moist, nonplastic, reddish brown
			S4		88-(100/5")				11" 11"(8'6"-9'5")		(Caliche)
10			P5						7" 8"(9'9"-10'5")		SILTY SAND, predominantly fine, sub-rounded, weakly calcareous cemented, some gravel, dry, nonplastic, brownish to whitish
			P6						6" 8"(10'5"-11'1")	hard	
			P7					SM	10" 12"(11'1"-12'1")		
			P8						8" 24"(12'1"-14'1")		
15			P9						9" 19"(14'1"-15'8")		(Gatuna)
			P10						6" 10"(15'8'-16'6")		SANDSTONE, moderately weathered, thickly bedded, moderately hard, reddish brown
			P11						11" 12"(16'6"-17'6")		
											Stopped sampling at 17.5'
20											
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/24/79

LOG OF TEST BORING NO. B-48

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3412.12

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0								SM-SP			SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
5											
								SC			CLAYEY SAND, fine, sub-rounded, moist, low plasticity, brown
10				P1					6½" 9"(9'5"-10'2")		(Caliche) SILTY SAND, predominantly fine, sub-angular, weakly calcareous cemented, some gravel, dry, nonplastic, whitish to pinkish white. note: caliche hard at 10.2'
				P2 rejected				SM	1" 18"(10'2"-11'8")		
				P3					10" 24"(11'8"-13'8")		
15				P4					10" 24"(13'8"-15'8")		
20											Stopped sampling at 15.7'
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/24/79

LOG OF TEST BORING NO. B-49

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3409.07

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0			S1		5-5-6 (11)				18" 18"(1'-2'6")	medium dense to loose	SAND, fine, sub-rounded, predominantly quartz, some silt, moist, nonplastic, brown
								SM-SP			
			S2		2-3-3 (6)				18" 18"(3'6"-5')		
5											
			S3		4-4-9 (13)			SC	18" 18"(6'-7'6")		CLAYEY SAND, fine, sub-rounded, predominantly quartz, moist, low plasticity, reddish brown
								SP		moderately firm	
10			P4					SC	24" 24"(8'6"-10'6")	medium dense	SAND, fine, sub-rounded, predominantly quartz, moist, nonplastic, brown
			P5						8" 8"(10'6"-11'2")		(Caliche)
			P6					SM	5" 24"(11'2"-13'2")	hard	CLAYEY SAND, predominantly fine, sub-rounded, weakly calcareous cemented, some gravel, moist, low plasticity, whitish to brownish white
			P7						11" 24"(13'2"-15'2")		
15			P8						17" 24"(15'2"-17'2")	medium dense	SILTY SAND, predominantly fine, sub-angular, weakly cemented, some gravel, dry, nonplastic, whitish to pinkish white
			P9						16" 24"(17'2"-19'2")		(Gatuna) SANDSTONE, very weathered, thickly bedded, moderately hard, reddish brown
20											Stopped sampling at 19'2"
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

JOB NO. E78-1135 DATE 1/26/79

LOG OF TEST BORING NO. B-50

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3405.65

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0			S1		1-3-3 (6)				18" 18"(1'-2'6")	loose	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown to brown
5			S2		4-3-5 (8)			SM-SP	18" 18"(3'6"-5')		
			S3		4-4-6 (10)				18" 18"(6'-7'6")		
								SC		firm	CLAYEY SAND, fine, sub-rounded, moist, low plasticity, brown
			S4		8-30-100/5"			SP	17" 17"(8'6"-9'11")	medium dense	SAND, fine, sub-rounded, moist, nonplastic, brown
10										hard	(Caliche)
								SM			SILTY SAND, predominantly fine, sub-rounded, weakly cemented (calcareous), some gravel, nonplastic, light tan
			P5						23" 24"(11'2"-13'2")		
			P6						7" 19"(13'2"-14'9")		
15			P7						10" 12"(14'9"-15'9")		(Gatuna)
			P8		no recovery				0" 15"(15'9"-17')		SANDSTONE, moderately weathered, moderately to very fractured, thickly bedded, moderately hard, reddish brown
			P9						9" 19"(17'-18'7")		
20					Started coring at 18.7'						
	0.3' 5.0'		NX						2.0' 5.0'		
											Stopped coring at 23.7'
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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PROJECT Waste Isolation Pilot Plant

JOB NO. E78-1135 DATE 1/25/79

LOG OF TEST BORING NO. B-51

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3404.74

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0										very loose	SAND, fine, sub-rounded, predominantly quartz, some silt, moist, nonplastic, brown
				S1	(1-9") (1-9")					6" 18"(1'-2'6")	
								SM-SP			
				S2	2-1-2 (3)					18" 18"(4'-5'6")	
5											
											(Caliche)
				P3						18" hard 18"(8'4"-9'10")	SILTY SAND, predominantly fine, sub-rounded, some gravel, dry, nonplastic, whitish to pinkish white
10				P4	rejected					4" 9"(9'10"-10'7")	
				P5				SM		6" 8"(10'7"-11'3")	
				P6						14" 15"(11'3"-12'6")	
				P7	rejected					3" 8"(12'6"-13'2")	
				P8						13" 24"(13'2"-15'2")	
15											(Gatuna) SANDSTONE, moderately weathered, thickly bedded, moderately hard, reddish brown
											Stopped sampling at 15.2'
20											
25											

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 1/26/79

LOG OF TEST BORING NO. B-52

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3385.48

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0										loose	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
				S1	2-2-4 (6)			SM-SP	18" 18"(1'-2'6")		
				S2	100/4"				4" 4"(3'1"-3'5")		(Caliche)
5				P3				SM	13" 16"(4'4"-5'8")	hard	SILTY SAND, predominantly fine, sub-angular, weakly cemented (calcareous), some gravel, dry, nonplastic, light tan to pinkish white
				P4					9" 24"(5'8"-7'8")		
				P5	no recovery				0" 24"(7'8"-9'8")		(Gatuna)
10				P6					8" 12"(9'8"-10'8")		SANDSTONE, weakly cemented, very weathered, moderately to very fractured, thinly bedded, soft, reddish brown
				P7					10" 12"(10'8"-11'8")		
				Started coring at 11.7'							note: interbedded calcium rich layers
15	0.0' 6.3'			NX					0.9' 6.3'		
20											(Dewey Lake)
	0.0' 7.0'			NX					2.4' 7.0'		SILTSTONE, slightly weathered, thinly bedded, moderately hard, dark red with some white banding
25											

GROUND WATER

DEPTH	HOUR	DATE

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LOG OF TEST BORING NO. B-52

JOB NO. E78-1135 DATE 1/26/79

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3385.48

DATUM Molzen Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
25											
	0.4' 5.0'			NX					4.7' 5.0'		
30											Stopped coring at 30.0'
35											

GROUND WATER

DEPTH	HOUR	DATE

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LOG OF TEST BORING NO. B-53

PROJECT Waste Isolation Pilot Plant
JOB NO. E78-1135 DATE 1/30/79

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger & NX Diamond
SURFACE ELEV. 3386.65
DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
0			S1		1-2-3 (5)				18" 18"(1'-2'6")	loose	SAND, fine, sub-rounded, some silt, moist, nonplastic, reddish brown
			P2					SM-SP	21" 24"(3'-5')		
5			S3		3-7-8 (15)			SC	18" 18"(5'6"-7')	firm	CLAYEY SAND, fine, sub-rounded, moist, low plasticity, reddish brown
			S4		27-33-(100/5")				13" 18"(8'-9'5")	hard	(Caliche) SILTY SAND, fine, sub-rounded, weakly cemented (calcareous), dry, nonplastic, whitish to pinkish white
10			P5					SM	7" 10"(10'-10'10")		
			P6						13" 24"(10'10"-12'10")		
			P7						10" 22"(12'10"-14'8")		
15			P8						11" 13"(14'8"-15'9")		
			P9						12" 24"(15'9"-17'9")		(Gatuna) SANDSTONE, weakly cemented, very weathered, moderately fractured, thickly bedded, moderately hard, reddish brown
			P10						5½" 13"(17'9"-18'10")		
20			P11 rejected						3" 16"(18'10"-20'2")		note: interbedded calcium rich layers
	1.4' 4.7'		NX		Started coring at 20.2'				4.7' 4.7'		
25											(Dewey Lake)

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-53

JOB NO. E78-1135 DATE 1/30/79

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger & NX Diamond Core

SURFACE ELEV. 3386.65

DATUM Molzen-Corbin Survey

Depth in Feet	RQD	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	Rec. Adv.	REMARKS	VISUAL CLASSIFICATION
25											MUDSTONE, slightly weathered, very fractured, thinly bedded, moderately hard, dark red to reddish brown
				NX					5.3' 5.3'		
30											
											Stopped coring at 30.2'
35											

GROUND WATER

DEPTH	HOUR	DATE

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LOG OF TEST BORING NO. B-54

JOB NO. E78-1135 DATE 2/13/79

RIG TYPE GD-2000
BORING TYPE 6½" Tricone Gear Bit
SURFACE ELEV. 3408.60
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SM		FILL (Caliche) SILTY SAND, predominantly fine, poorly graded, considerable lime, very low plasticity, light tan to white
								SM-SP		SAND, some silt, fine, poorly graded, sub-angular, non-plastic, tan
5										
								SM		(Caliche) SILTY SAND, predominantly fine, poorly graded, small amount of clay, moderately to strongly lime cemented, very low plasticity, white
10										
										(Gatuna) SANDSTONE, very weathered, poorly consolidated, soft, reddish tan
15										
20										
25										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-54

JOB NO. E78-1135 DATE 2/13/79

RIG TYPE GD-2000
BORING TYPE 6¼" Tricone Gear Bit
SURFACE ELEV. 3408.60
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
25										(Santa Rosa) SANDSTONE, moderately weathered, moderately consolidated soft to moderately hard, pink
30										(Dewey Lake) Intercalated SILTSTONE AND CLAYSTONE, occasional thin sandstone layer, moderately hard, reddish brown
35										
40										
45										
50										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-54

JOB NO. E78-1135 DATE 2/13/79

RIG TYPE GD-2000
BORING TYPE 6¼" Tricone Gear Bit
SURFACE ELEV. 3408.60
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
50										
55										
60										
65										
70										
75										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 2/13/79

LOG OF TEST BORING NO. B-54

RIG TYPE GD-2000

BORING TYPE 6¼" Tricone Gear Bit

SURFACE ELEV. 3408.60

DATUM

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
75										
80										
85										
90										
95										
100										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-54

JOB NO. E78-1135 DATE 2/13/79

RIG TYPE GD-2000

BORING TYPE 6¼" Tricone Gear Bit

SURFACE ELEV. 3408.60

DATUM

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
100										
105										
110										
115										
120										
125										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-54

JOB NO. E78-1135 DATE 2/13/79

RIG TYPE GD-2000
BORING TYPE 6¼" Tricone Gear Bit
SURFACE ELEV. 3408.60
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
125										
130										
135										
140										
145										
150										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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JOB NO. E78-1135 DATE 2/13/79

LOG OF TEST BORING NO. B-54

RIG TYPE GD-2000

BORING TYPE 6¼" Tricone Gear Bit

SURFACE ELEV. 3408.60

DATUM

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
150										
155										
160										
165										
170										
175										

GROUND WATER

DEPTH	HOUR	DATE
	none	

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LOG OF TEST BORING NO. B-54

JOB NO. E78-1135 DATE 2/13/79

RIG TYPE GD-2000
BORING TYPE 6¼" Tricone Gear Bit
SURFACE ELEV. 3408.60
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
175										
180										
185										
190										
195										
200										Stopped gear bit at 200.0' Redrilled to 210.0' 2/14/79 Observation well placed 2/14/79

GROUND WATER

DEPTH	HOUR	DATE
	none	

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Project: Waste Isolation Pilot Plant

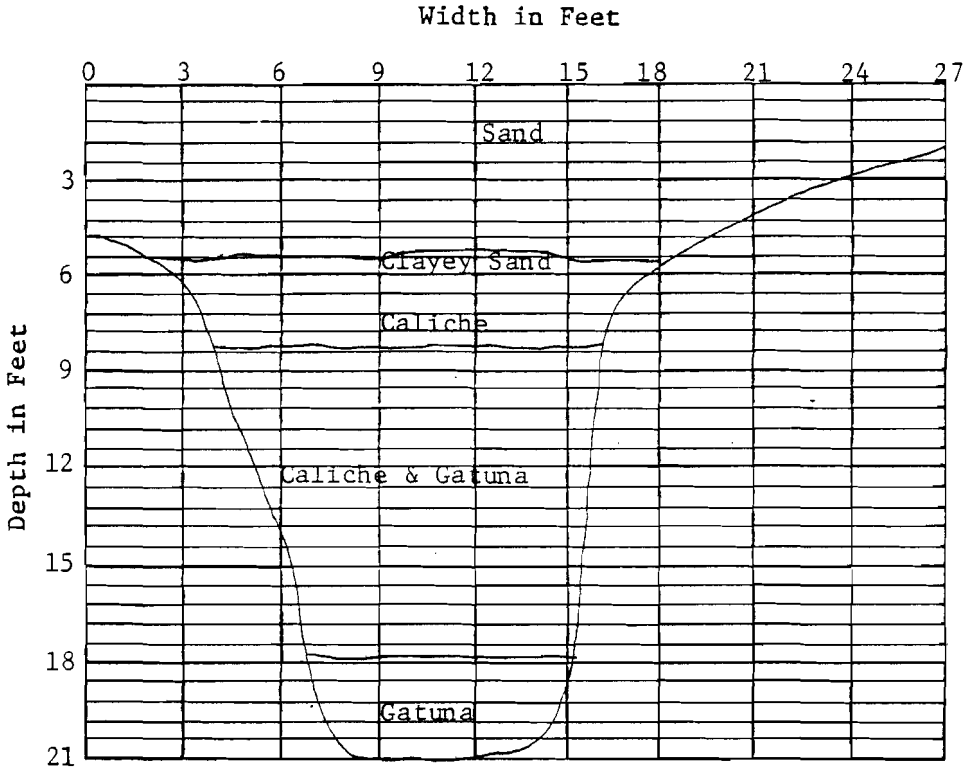
Log of Test Pit No.: TP-1

Job No.: E78-1135

Location: N499670.58 E666892.66

Date: 3/7/79 By WRW

Elevation: 3410.05'



FIELD DENSITY TESTS

Depth (ft.)	Density (pcf)	Moisture (%)
0	101.5	3.6
3.2	96.9	7.0
8.6	91.3	18.7
13.7	95.7	8.1
21.0	104.5	5.7

Depth (feet)	Sample	U.S. Class.	Visual Description	Remarks
0-5'	BLK 1 (3.2-3.7)	SM-SP	SAND, predominantly fine, some silt, subangular, nonplastic, tan	
5-7'		SC	CLAYEY SAND, predominantly fine, subangular, medium plasticity, reddish brown	
7-8'	BLK 2 (8.6-9.1)	SM	(CALICHE) SILTY SAND, predominantly fine, subangular, strongly lime cemented, small amount of clay, low plasticity, white to pinkish white	
8-18'	BLK3 (13.7-14.2)		(CALICHIFIED GATUNA), numerous stringers of caliche with isolated gatuna fragments, occasional mass of gatuna to 3½'	
18-21'	BLK 4 (21.0-21.5)		(GATUNA) SANDSTONE, very weathered, poorly consolidated, soft to moderately hard, brown	

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Project: Waste Isolation Pilot Plant

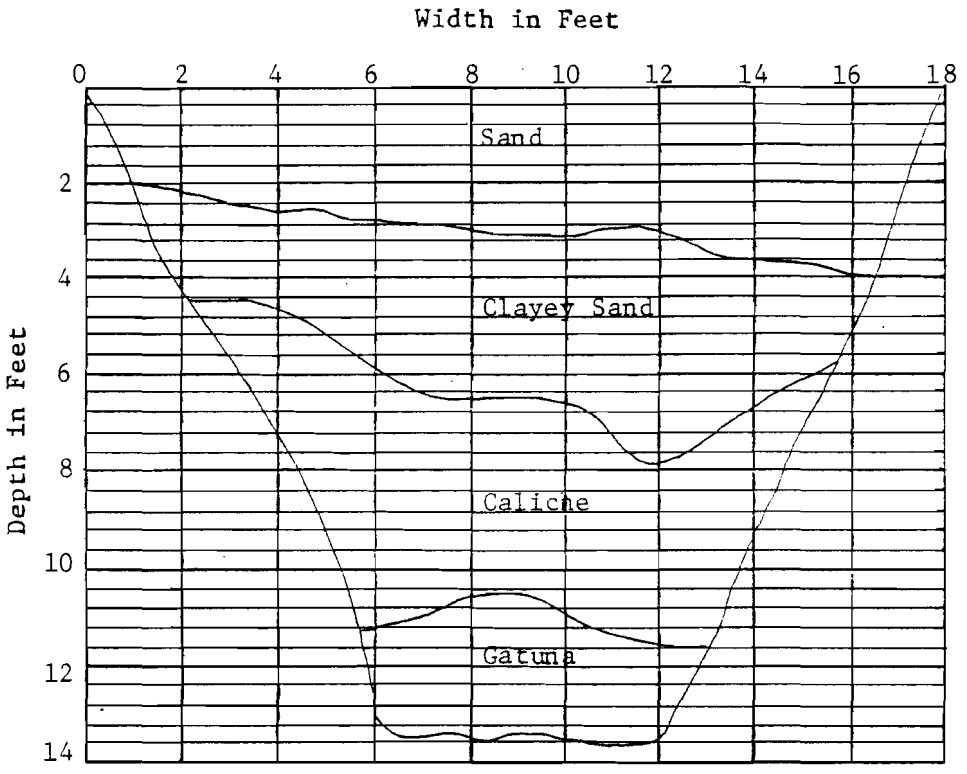
Log of Test Pit No.: TP-2

Job No.: E78-1135

Location: N499294.80 E666648.53

Date: 3/7/79 By WRW

Elevation: 3405.70



FIELD DENSITY TESTS

Depth (ft.)	Density (pcf)	Moisture (%)
0	102.1	3.0
3.5	110.0	7.2
5.5	93.7	17.3
10.5	103.3	13.7

Depth (feet)	Sample	U.S. Class.	Visual Description	Remarks
0-4'	BLK 1 (3.0-3.5)	SM-SP	SAND, predominantly fine, some silt, subangular, nonplastic, tan	caliche platey at top of stratum
4-8'		SC	CLAYEY SAND, predominantly fine, subangular, medium plasticity, reddish brown	
8-11'	BLK 2 (5.5-6.0)	SM	(CALICHE) SILTY SAND, predominantly fine, small amount of clay, low plasticity, white to pinkish white	
11-13.5'	BLK 3 (11.0-11.5)		(GATUNA) SANDSTONE, weakly consolidated, very weathered, some lime streaks, soft to moderately hard, reddish tan	

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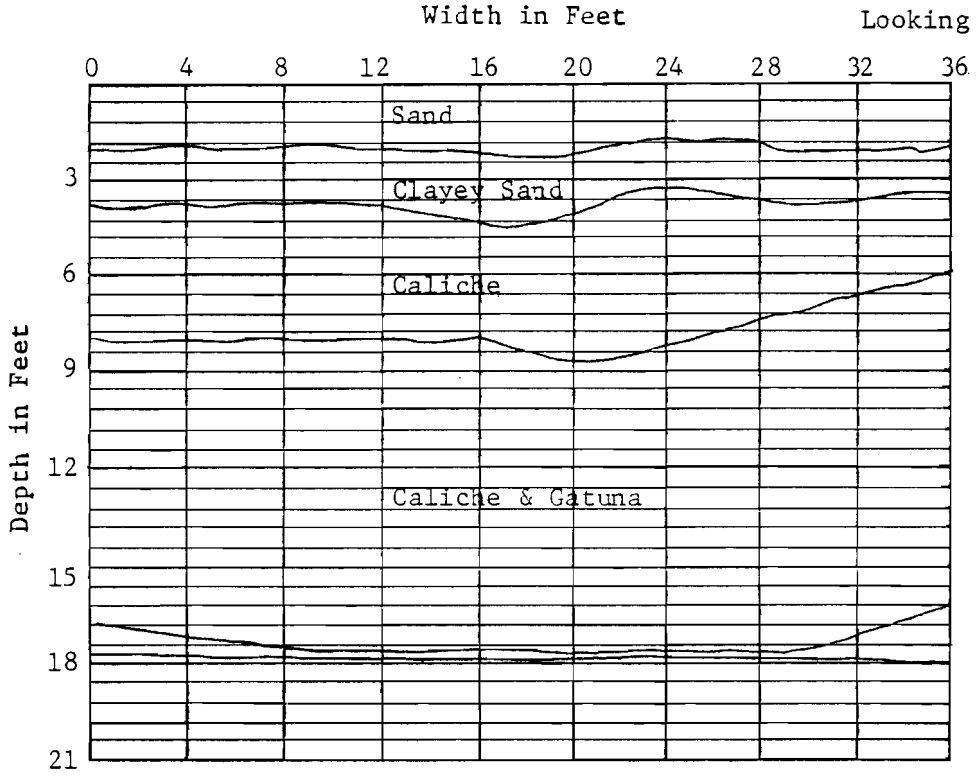
Project: Waste Isolation Pilot Plant Log of Test Trench No.: TP-3

Job No.: E78-1135 Location: N499216.23 E667062.23

Date: 3/22/79 By WRW Elevation: 3411.34



FIELD DENSITY TESTS

Depth (ft.)	Density (pcf)	Moisture (%)
0	108.6	3.5
3.2	115.5	3.6
5.5	98.8	11.0
6.0	96.2	12.8
8.5	101.3	11.3
9.2	109.5	5.7
16.2	101.3	12.6

Depth (feet)	Sample	U.S. Class.	Visual Description	Remarks
0-2.5'		SM-SP	SAND, predominantly fine, some silt, subangular, nonplastic, tan	
2.5-4'	BLK 1 (3.2-3.7)	SC	CLAYEY SAND, predominantly fine, subangular, low to medium plasticity, reddish brown	
4-8'	BLK 2 (5.5-6.0)	SM	(CALICHE) SILTY SAND, predominantly fine, strongly lime cemented, subangular, low plasticity white	caliche from 4-8' very hard and platey
8-17.9'	BLK 3 (6.0-6.5) BLK 5 (8.5-9.0) BLK 4 (9.2-9.7) BLK 6 (16.2-16.7)	SM	(CALICHE) SILTY SAND, predominantly fine, considerable uncalcified gatuna fragments, moderately lime cemented, subangular, low plasticity, tan to reddish tan	

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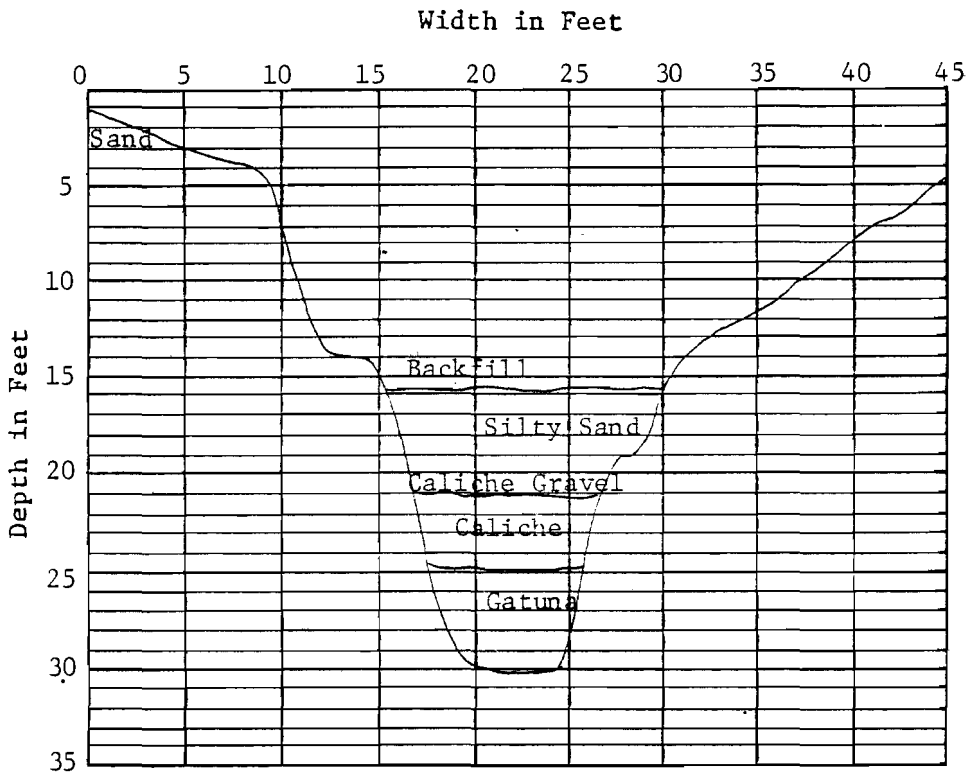
Project: Waste Isolation Pilot Plant Log of Test Pit No.: TP-4

Job No.: E78-1135 Location: N499187.88 E667503.76

Date: 3/11/79 By J. Mireles Elevation: 3409.92



FIELD DENSITY TESTS

Depth (ft.)	Density (pcf)	Moisture (%)
0	107.3	3.6
3.0	107.0	3.5
7.5	94.0	13.2
12.5	103.8	7.0
29.5	114.6	7.0

Depth (feet)	Sample	U.S. Class.	Visual Description	Remarks
0-4'	BLK 1 (3.0-3.5)	SM-SP	SAND, predominantly fine, some silt, nonplastic, tan	
5-19'	BLK 2 (7.5-8.0	SM	SILTY SAND, predominantly fine, trace of clay, subangular, very low plasticity to nonplastic, grayish green	1' of gravelly caliche at top of bed-gravel fine
19-25'	BLK 3 (13.5-14.0)	SM	(CALICHE) SILTY SAND, predominantly fine, some clay, subangular, low plasticity, white to reddish brown	Transition zone in caliche last 4 feet contains approximately 50% gatuna fragments which have been calichified
25-30'	BLK 4 (29.5-30.0)		(GATUNA) SANDSTONE, very to moderately weathered, occasional fracture filled with calcium carbonate, soft to medium hard, brown	

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Project: Waste Isolation Pilot Plant

Log of Test Trench No.: TP-5

Job No.: E78-1135

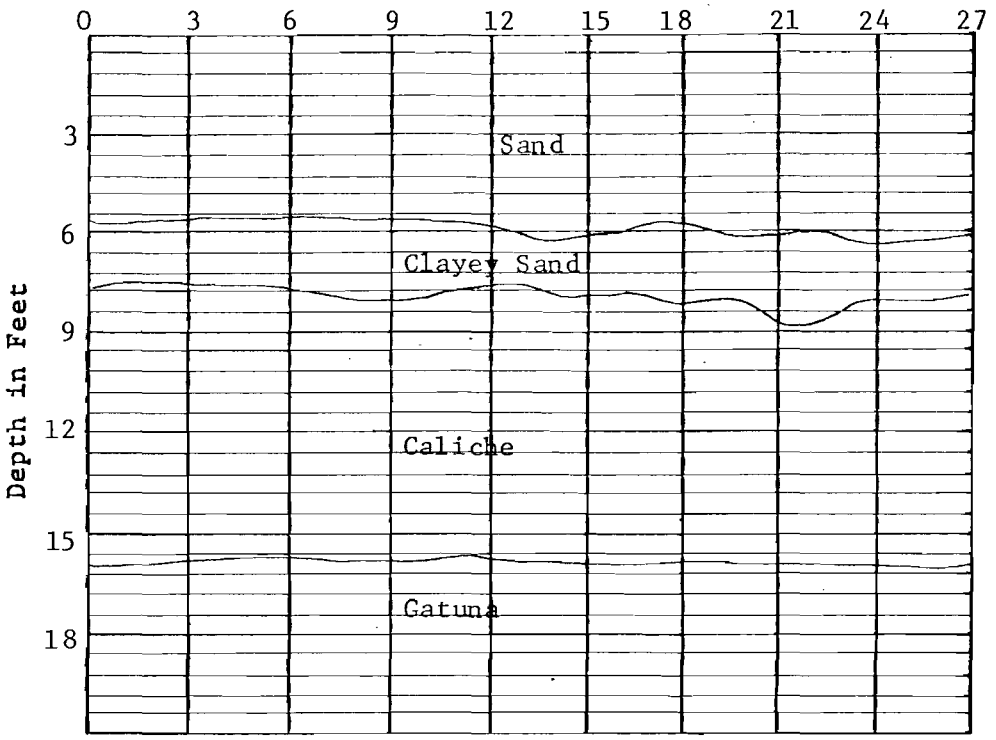
Location: N498206.07 E666932.33

Date: 3/24/79 By WRW

Elevation: 3403.72

Width in Feet

Looking West at center of Trench



FIELD DENSITY TESTS

Depth (ft.)	Density (pcf)	Moisture (%)
0	98.2	3.3
3.5	108.9	3.4
9.9	96.9	11.9
10.6	102.3	11.5
13.9	111.6	5.1
20.9	105.3	7.4

Depth (feet)	Sample	U.S. Class.	Visual Description	Remarks
0-6'	BLK 1 (3.5-4.0)	SM-SP	SAND, predominantly fine, some silt, subangular, nonplastic, tan	
6-8'	BLK 2 (10.6-11.1)	SC	CLAYEY SAND, predominantly fine, subangular, low to medium plasticity, reddish brown	
8-12'	BLK 3 (9.9-10.4)	SM	(CALICHE) SILTY SAND, predominantly fine, strongly cemented, platey, subangular, low plasticity, white	Caliche very hard from 8-12'
12-16'	BLK 4 (13.9-14.0) BLK 5 (20.9-21.4)	SM	(CALICHE) SILTY SAND, predominantly fine, moderately lime cemented, moderately friable, some gatuna fragments, subangular, low plasticity, white to reddish tan	moderately hard from 12-16'

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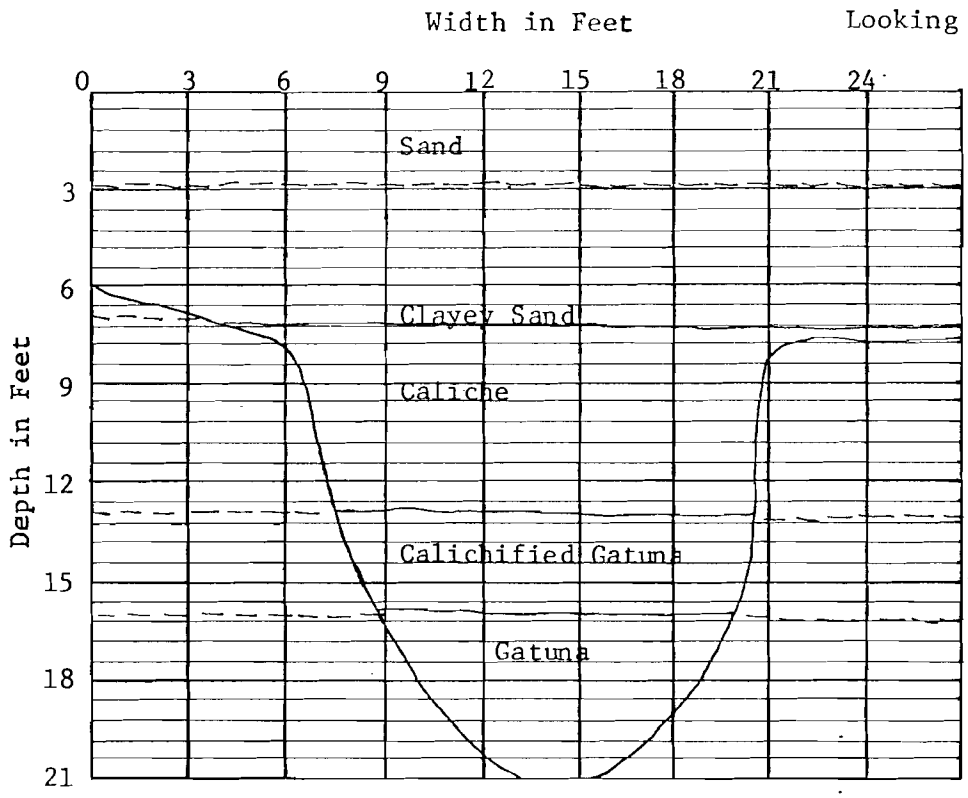
Project: Waste Isolation Pilot Plant Log of Test Trench No.: 5

Job No.: E78-1135 Location: N498206.07 E666932.33

Date: 3/16/79 By WRW Elevation: 3403.72



FIELD DENSITY TESTS

Depth (ft.)	Density (pcf)	Moisture (%)
0	98.2	3.3
3.5	108.9	3.4
9.9	96.9	11.9
10.6	102.3	11.5
13.9	111.6	5.1
20.9	105.3	7.4

Depth (feet)	Sample	U.S. Class.	Visual Description	Remarks
0-3'		SM-SP	SAND, predominantly fine, some silt, subangular, nonplastic, tan	
3-7'	BLK 1 (3.5-4.0)	SC	CLAYEY SAND, predominantly fine, subangular, low to medium plasticity, orange to reddish brown	
7-13'	BLK 2 (10.6-11.1) BLK 3 (9.9-10.4)	SM	(CALICHE) SILTY SAND, predominantly fine, strongly lime cemented, subangular, low plasticity, white to light tan	
13-16	BLK 4 (13.9-14.4)		CALICHIFIED GATUNA, very weathered moderately fractured with lime in fractures, moderately hard to hard, reddish tan	
16-21'	BLK 5 (20.9-21.4)		(GATUNA) SANDSTONE, very weathered, slightly fractured, thickly bedded, occasional lime streak, moderately hard to soft, dark brown	

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Section 2

Field Tests

Plant Site
Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

The field testing reported in Section 2 was performed in accordance with the following standards:

American Society for Testing and Materials:

ASTM D1196-64(1971) - Nonrepetitive Static Plate Load Tests of Soils and Flexible Pavement Components, For Use in Evaluation and Design of Airport and Highway Pavements

ASTM D1556-64(1974) - Density of Soil in Place by the Sand Cone Method

U. S. Department of the Interior, Bureau of Reclamation, Earth Manual, Second Edition, 1974:

Des. E-18 - Field Permeability Tests in Boreholes

Des. E-19 - Field Permeability Test (Well Permeameter Method)

Section 2a

Field Permeability Tests

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-1 Date: 12/28/78 Tested By: GW

Gauge Height (AGS) 3.5 feet Hole Size: 3" Nominal

Interval Tested: 39.0' to 58.2'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	2923.8			15
1	2928.4	(4.6)	0.62	15
2	2932.7	(4.3)	0.58	15
3	2936.8	(4.1)	0.55	15
4	2940.8	(4.0)	0.54	15
5	2944.7	(3.9)	0.52	15
6	2948.1	(3.4)	0.45	15
7	2951.2	(3.1)	0.41	15
8	2954.1	(2.9)	0.39	15
9	2957.0	(2.9)	0.39	15
10	2959.8	(2.8)	0.37	15
11	2962.8	(3.0)	0.40	15
12	2965.5	(2.7)	0.36	15
13	2968.3	(2.8)	0.37	15
14	2971.1	(2.8)	0.37	15
15	2973.9	(2.8)	0.37	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-1 Date: 12/28/78 Tested By: GW

Gauge Height (AGS) 3.5 feet Hole Size: 3" Nominal

Interval Tested: 39.0' to 58.2'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	2976.5			20
1	2979.5	(3.0)	0.40	20
2	2982.6	(3.1)	0.41	20
3	2985.6	(3.0)	0.40	20
4	2988.6	(3.0)	0.40	20
5	2996.5	(2.9)	0.39	20
6	2994.1	(2.6)	0.35	20
7	2996.8	(2.7)	0.36	20
8	2999.6	(2.8)		20
9		(2.6)	0.35	20
10	3004.9	Ave.	Ave.	20

* Gauge reading corrected for friction loss

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Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-1 Date: 12/28/79 Tested By: GW

Gauge Height (AGS) 3.5 feet Hole Size: 3" Nominal

Interval Tested: 39.0' to 58.2'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	3006.9		15
1	3008.5 (1.6)	0.21	15
2	3010.6 (2.1)	0.28	15
3	3012.8 (2.2)	0.29	15
4	3014.8 (2.0)	0.27	15
5	3016.8 (2.0)	0.27	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-1 Date: 12/28/78 Tested By: GW

Gauge Height (AGS) 3.5 feet Hole Size: 3" Nominal

Interval Tested: 29.0' to 58.2'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	3083.7			10
1	3104.7	(21.0)	2.81	10
2	3123.8	(19.1)	2.55	10
3	3142.2	(18.4)	2.46	10
4	3159.4	(17.2)	2.30	10
5	3176.8	(17.4)	2.33	10
6	3193.6	(16.8)	2.25	10
7	3210.4	(16.8)	2.25	10
8	3225.3	(14.9)	1.99	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-1 Date: 12/28/79 Tested By: GW

Gauge Height (AGS) 3.5 feet Hole Size: 3" Nominal

Interval Tested: 29.0' to 58.2'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	3242.1		25
1	3259.6 (17.5)	2.34	25
2	3277.3 (17.7)	2.37	25
3	3295.0 (17.7)	2.37	25
4	3312.6 (17.6)	2.35	25

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

DOUBLE PACKER TESTS

Boring No.: B-1 Date: 12/28/78 Tested By: GW

Gauge Height (AGS) 6.4 feet Hole Size: 3" Nominal

Interval Tested: 29.0' to 24.4'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	3443.6			10
1	3470.6	(27.0)	3.61	10
2	3497.2	(26.6)	3.56	10
3	3523.8	(26.6)	3.56	10
4	3550.3	(26.5)	3.54	10
5	3576.3	(26.0)	3.48	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-3 Date: 12/18/78 Tested By: PHW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 25.0' to 29.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	3126.1		10
1	3126.1 (0)	0	10
2	3126.1 (0)	0	10
3	3126.1 (0)	0	10
4	3126.1 (0)	0	10
5	3126.1 (0)	0	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-3 Date: 12/18/79 Tested By: PHW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 25.0' to 29.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	3216.15		15
1	3126.2 (0)	0	15
2	3126.2 (0)	0	15
3	3126.2 (0)	0	15
4	3126.2 (0)	0	15
5	3126.2 (0)	0	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

CONSTANT HEAD TESTS

Boring No.: B-4A Date: 12/18/78 Tested by: GW

Casing Height (AGS) 1.2 feet Casing Size: 3-1/8" I.D.

Total Head: 5.2 feet Remarks: Total depth of boring 4', Test conducted in sand

TIME (Hr., Min., Sec.)	TIME (sec.)	FLOW RATE (Seconds for 250mm)
4:11:05	665	0
4:12:58	778	113
4:14:27	867	89
4:15:53	953	86
4:17:28	1030	77
4:19:08	1148	118
4:20:52	1252	104
4:22:32	1352	100
4:24:31	1471	119
4:26:09	1569	98
4:27:52	1672	103
4:29:35	1775	103
4:31:34	1894	119
4:33:10	1990	96
4:34:54	2094	104
4:36:54	2214	120
4:38:39	2319	105
4:40:34	2434	115
4:42:36	2556	112
4:44:35	2675	119

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

CONSTANT HEAD TESTS

Boring No.: B-4A Date: 12/18/78 Tested by: GW

Casing Height (AGS) 1.2 feet Casing Size: 3-1/2" I.D.

Total Head: 5.2 feet Remarks: Total depth of hole 4', Test conducted in sand

TIME (Hr., Min., Sec.)	TIME (sec.)	FLOW RATE (Seconds for 250mm)
4:46:25	2785	110
4:48:27	2880	95
4:50:25	3025	145
4:52:28	3141	116
4:54:33	3273	132
4:56:38	3398	125
4:58:45	3525	127
5:00:59	3659	134
5:03:06	3780	111
5:05:07	3907	127
5:07:14	4034	127
5:09:30	4170	136
5:11:19	4279	109
5:13:21	4401	127

Waste Isolation Pilot Plant
Bechtel Job No. 12484
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CONSTANT HEAD TESTS

Boring No.: B-4A Date: 12/19/78 Tested by: GW

Casing Height (AGS) 1.7 feet Casing Size: 3-1/8" I.D., 6-1/2" O.D.

Total Head: 15.3 feet Remarks: Total depth of hole 13.6', Bottom of casing 2' in caliche

TIME (Hr., Min., Sec.)	TIME (sec.)	FLOW RATE (Seconds for 250mm)
8:27:11	1631	
8:34:14	2054	423
8:46:06	2766	712
9:00:53	3653	887
9:16:19	4579	926
9:33:19	5599	1020

Waste Isolation Pilot Plant
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SHB Job No. E78-1135

FALLING HEAD TEST

Boring No.: B-4A Date: 12/19/78 Tested by: GW

Casing Height (AGS): 1.7 feet Casing Size: 3-1/8" I.D. 6-1/2" O.D.

Total Head: 15.3 feet Remarks: Total depth of hole 13.6', Bottom of casing 2' in caliche

TIME (Min.)	DROP IN WATER (cm)	RATE OF DROP (cm)
0	5.0	
10	7.2	2.2
20	9.3	2.1
30	11.5	2.2
40	13.6	2.1
50	15.4	1.8
60	17.1	1.6

Waste Isolation Pilot Plant
Bechtel Job No. 12484
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SHB Job No. E78-1135

CONSTANT HEAD TESTS

Boring No.: B-4A Date: 12/19/79 Tested by: GW

Casing Height (AGS) 1.7 feet Casing Size: 3-1/8" I.D., 6-1.2" O.D.

Total Head: 15.3 feet Remarks: Total depth of hole 13.6', Bottom of casing 2' in caliche

TIME (Hr., Min., Sec.)	TIME (sec.)	FLOW RATE (Seconds for 250mm)
10:34:36	2076	
10:36:27	2187	111
10:39:24	2364	177
10:41:44	2504	140
10:44:15	2655	151
10:46:20	2780	125

Waste Isolation Pilot Plant
Bechtel Job No. 12484
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SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-5 Date: 12/17/79 Tested By: PHW

Gauge Height (AGS) 5.0 feet Hole Size: 3" Nominal

Interval Tested: 23.0' to 32.3'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	2809.2		10
1	2814.4 (5.2)	0.70	10
2	2819.8 (5.4)	0.72	10
3	2824.4 (4.6)	0.62	10
4	2829.7 (5.3)	0.71	10
5	2834.2 (4.5)	0.60	10
6	2838.9 (4.7)	0.63	10
7	2843.4 (4.5)	0.60	10
8	2848.0 (4.6)	0.62	10
9	2852.5 (4.5)	0.60	10
10	2856.9 (4.4)	0.59	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-5 Date: 12/17/78 Tested By: PHW

Gauge Height (AGS) 5.0 feet Hole Size: 3" Nominal

Interval Tested: 23.0' to 32.3'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	2883.1		15
1	2888.9 (5.8)	0.78	15
2	2894.5 (5.6)	0.75	15
3	2900.3 (5.8)	0.78	15
4	2905.9 (5.6)	0.75	15
5	2911.6 (5.7)	0.76	15
6	2917.4 (5.8)	0.78	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-5 Date: 12/17/79 Tested By: PHW

Gauge Height (AGS) 5.0 feet Hole Size: 3" Nominal

Interval Tested: 23.0' to 32.3'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	2927.2		10
1	2931.6 (4.4)	0.59	10
2	2936.0 (4.4)	0.59	10
3	2940.3 (4.3)	0.58	10
4	2944.5 (4.2)	0.56	10
5	2948.8 (4.3)	0.58	10
6	2953.2 (4.4)	0.59	10

* Gauge reading corrected for friction loss

ROJECT Waste Isolation Pilot Plant

JB NO. E78-1135 DATE 12/17/78

LOG OF TEST BORING NO. B-5A

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3417.43

DATUM Molzen-Corbin Survey

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SM		SILTY SAND, fine, sub-rounded, predominantly quartz, nonplastic, brown to tan note: some silt and small amount of clay from 3'-5'
5										
10								SM		(Caliche) SILTY SAND, predominantly fine, lime cemeted, nonplastic, light tan
										(Gatuna) SANDSTONE, red, soft
15										Stopped auger at 12.6'

FIELD PERMEABILITY TEST

E-18 CONSTANT HEAD TEST

OPEN-END

1st Run TIME	QUANTITY (ML)	2nd Run TIME	QUANTITY (ML)	TIME	READING (FT^3 OR IN)
2:31:00	0	3:32:00	0		
2:31:55	250	3:33:35	250		
2:33:00	250	3:40:25	250		
2:34:10	250	3:42:05	250		
2:35:20	250	3:43:50	250		
2:36:40	250	3:45:40	250		
2:38:00	250				
2:39:15	250				
2:40:40	250				
2:42:05	250				
2:43:30	250				

1st Run, Sand Strata

Bottom of casing = 3.8' below ground surface

Top of casing = 1.5' above ground surface

Head = 5.3'

Casing O.D.= 6-1/2"

I.D.= 3-1/8"

Note: At 2:43 p.m. allowed casing to drain Head drop 3' at 3:39 p.m.

2nd Run, 3.3 days old

Another test planned for caliche at 12.5' but gatuna was encountered.

GROUND WATER

DEPTH	HOUR	DATE

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SINGLE PACKER TESTS

Boring No.: B-6 Date: 12/17/78 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 16.0' to 26.3'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
1	2459.9	0	10
5	2459.9	0	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 41.0' to 50.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	3682.7	0	15
10	3682.7	0	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
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SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 41.0' to 50.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	3682.7	0	20
10	3682.7	0	20

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
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SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5' Hole Size: 3" Nominal

Interval Tested: 36.0' to 50'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	3740.0			15
1	3751.1	(11.1)	1.48	15
2	3761.2	(10.1)	1.35	15
3	3771.2	(10.0)	1.34	15
4	3780.6	(9.4)	1.26	15
5	3790.6	(10.0)	1.34	15
6	3798.6	(8.0)	1.07	15
7	3805.5	(6.9)	0.92	15
8	3812.4	(6.9)	0.92	15
9	3820.2	(7.8)	1.04	15
10	3827.1	(6.9)	0.92	15
11	3833.9	(6.8)	0.91	15
12	3840.8	(6.9)	0.92	15
13	3847.5	(6.7)	0.90	15
14	3854.1	(6.6)	0.88	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
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SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 36'0' to 50.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	3875.5		20
1	3883.3 (7.8)	1.04	20
2	3890.9 (7.6)	1.02	20
3	3898.5 (7.6)	1.02	20
4	3906.0 (7.5)	1.00	20
5	3913.5 (7.5)	1.00	20
6	3921.0 (7.5)	1.00	20

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
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SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 36.0' to 50.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	3927.5		17
1	3933.7 (6.2)	0.83	17
2	3939.9 (6.2)	0.83	17
3	3945.9 (6.0)	0.80	17
4	3951.9 (6.0)	0.80	17
5	3957.8 (5.9)	0.79	17
6	3963.9 (6.1)	0.82	17
7	3969.9 (6.0)	0.80	17

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
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SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 31'0' to 50'0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	4001.8			10
1	4007.2	(5.4)	0.72	10
2	4012.2	(5.0)	0.67	10
3	4017.0	(4.8)	0.64	10
4	4021.9	(4.9)	0.66	10
5	4026.6	(4.7)	0.63	10
6	4031.3	(4.7)	0.63	10
7	4035.8	(4.5)	0.60	10
8	4040.0	(4.2)	0.56	10
9	4044.2	(4.2)	0.56	10
10	4048.3	(4.1)	0.55	10
11	4052.5	(4.2)	0.56	10
12	4056.5	(4.0)	0.54	10
13	4060.3	(3.8)	0.51	10
14	4064.4	(4.1)	0.55	10
15	4068.3	(3.9)	0.52	10
16	4072.2	(3.9)	0.52	10
17	4075.9	(3.7)	0.49	10
18	4079.2	(3.3)	0.44	10
19	4083.3	(4.1)	0.55	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 31.0' to 50.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	4094.8			15
1	4099.8	(5.0)	0.67	15
2	4104.2	(4.4)	0.59	15
3	4108.8	(4.6)	0.62	15
4	4113.5	(4.7)	0.63	15
5	4118.2	(4.7)	0.63	15
6	4122.9	(4.7)	0.63	15
7	4127.6	(4.7)	0.63	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 31.0' to 50.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	4131.5			10
1	4135.0	(3.5)	0.47	10
2	4138.5	(3.5)	0.47	10
3	4142.2	(3.7)	0.49	10
4	4145.8	(3.6)	0.48	10
5	4149.2	(3.4)	0.45	10
6	4153.0	(3.8)	0.51	10
7	4156.4	(3.4)	0.45	10
8	4159.9	(3.5)	0.47	

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 16.0' to 50.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	4225.7		10
1	4228.9 (3.2)	0.43	10
2	4232.3 (3.4)	0.45	10
3	4235.7 (3.4)	0.45	10
4	4239.1 (3.4)	0.45	10
5	4242.5 (3.4)	0.45	10
6	4245.9 (3.4)	0.45	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3: Nominal

Interval Tested: 16.0' to 50.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	4249.7			15
1	4256.0	(6.3)	0.84	15
2	4262.1	(6.1)	0.82	15
3	4268.2	(6.1)	0.82	15
4	4274.0	(5.8)	0.78	15
5	4279.6	(5.6)	0.75	15
6	4285.3	(5.7)	0.76	15
7	4290.7	(5.4)	0.72	15
8	4296.2	(5.5)	0.74	15
9	4301.5	(5.3)	0.71	15
10	4306.8	(5.3)	0.71	15
11	4312.2	(5.4)	0.72	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 16.0' to 50.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	4321.3		10
1	4325.1 (3.8)	0.51	10
2	4328.7 (3.6)	0.48	10
3	4332.1 (3.4)	0.45	10
4	4335.2 (3.1)	0.41	10
5	4338.4 (3.2)	0.43	10
6	4341.4 (3.0)	0.40	10
7	4344.7 (3.3)	0.44	10
8	4348.2 (3.5)	0.47	10
9	4351.6 (3.4)	0.45	10
10	4355.0 (3.4)	0.45	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

DOUBLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 3.5 feet Hole Size: 3" Nominal

Interval Tested: 34.5' to 39.5'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	4365.8			15
1	4369.2	(3.4)	0.45	15
2	4372.7	(3.5)	0.47	15
3	4376.0	(3.3)	0.44	15
4	4378.7	(2.7)	0.36	15
5	4381.5	(2.8)	0.37	15
6	4384.2	(2.7)	0.36	15
7	4386.8	(2.6)	0.35	15
8	4389.4	(2.6)	0.35	15
9	4392.2	(2.8)	0.37	15
10	4394.7	(2.5)	0.33	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 3.5 feet Hole Size: 3" Nominal

Interval Tested: 34.5' to 39.5'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	4399.3			20
1	4402.7	(3.4)	0.45	20
2	4406.1	(3.4)	0.45	20
3	4409.6	(3.5)	0.47	20
4	4412.9	(3.3)	0.44	20

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-8 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 3.5 feet Hole Size: 3" Nominal

Interval Tested: 34.5' to 39.5'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	4415.9		15
1	4418.9 (3.0)	0.40	15
2	4422.3 (3.4)	0.45	15
3	4425.7 (3.4)	0.45	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-9 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 5.3 feet Hole Size: 3" Nominal

Interval Tested: 31.9' to 38.3'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	2612.8		10
1	2617.3 (4.5)	0.60	10
2	2622.2 (3.9)	0.52	10
3	2627.0 (4.8)	0.64	10
4	2631.6 (4.6)	0.62	10
5	2636.1 (4.5)	0.60	10
6	2640.4 (4.3)	0.58	10
7	2644.7 (4.3)	0.58	10
8	2649.0 (4.3)	0.58	10
9	2653.3 (4.3)	0.58	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-9 Date: 1/4/79 Tested By: GW

Gauge Height (AGS) 5.3 feet Hole Size: 3" Nominal

Interval Tested: 31.9' to 38.3'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	2658.5		15
1	2663.7 (5.2)	0.70	15
2	2669.1 (5.4)	0.72	15
3	2674.6 (5.5)	0.74	15
4	2679.8 (5.2)	0.70	15
5	2685.3 (5.5)	0.74	15
6	2690.6 (5.3	0.71	15
7	2696.1 (5.5)	0.74	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-9 Date: 12/20/78 Tested By: GW

Gauge Height (AGS) 5.3 feet Hole Size: 3" Nominal

Interval Tested: 31.9' to 38.3'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	2710.9			10
1	2715.2	(4.3)	0.58	10
2	2719.4	(4.2)	0.56	10
3	2724.1	(4.7)	0.63	10
4	2728.6	(4.5)	0.60	10
5	2732.8	(4.2)	0.56	10
6	2736.9	(4.1)	0.55	10
7	2740.9	(4.0)	0.54	10
8	2745.1	(4.2)	0.56	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-10 Date: 12/19/79 Tested By: PHW

Gauge Height (AGS) 2.2 feet Hole Size: 3" Nominal

Interval Tested: 25.8' to 32.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	3271.8			10
1	3278.9	(7.1)	0.95	10
2	3285.2	(6.3)	0.84	10
3	3291.3	(6.1)	0.82	10
4		(5.5)	0.74	10
5	3302.3	Ave.	Ave.	10
6	3307.7	(5.4)	0.72	10
7	3312.8	(5.1)	0.68	10
8	3317.9	(5.1)	0.68	10
9	3322.9	(5.0)	0.67	10
10	3327.9	(5.0)	0.67	10
11	3332.7	(4.8)	0.64	10
12	3337.3	(4.6)	0.62	10
13	3342.1	(4.8)	0.64	10
14	3346.5	(4.4)	0.59	10
15	3351.2	(4.7)	0.63	10
16	3355.4	(4.2)	0.56	10
17	3359.7	(4.3)	0.58	10
18	3364.0	(4.3)	0.58	10
19	3368.3	(4.3)	0.58	10
20	3372.6	(4.3)	0.58	10
21	3376.8	(4.2)	0.56	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-10 Date: 12/19/78 Tested By: PHW

Gauge Height (AGS) 2.2 feet Hole Size: 3" Nominal

Interval Tested: 25.8' to 32.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	3392.3			15
1	3397.7	(5.4)	0.72	15
2	3403.0	(5.3)	0.71	15
3	3408.1	(5.1)	0.68	15
4	3413.2	(5.1)	0.68	15
5	3418.1	(4.9)	0.66	15
6	3423.0	(4.9)	0.66	15
7	3427.7	(4.7)	0.63	15
8	3432.5	(4.8)	0.64	15
9	3437.2	(4.7)	0.63	15
10	3441.9	(4.7)	0.63	15
11	3446.8	(4.9)	0.66	15
12	3451.3	(4.5)	0.60	15
13	3455.8	(4.5)	0.60	15
14	3460.5	(4.7)	0.63	15
15	3465.2	(4.7)	0.63	15
16	3469.7	(4.5)	0.60	15
17		(4.7)		15
18	3479.1	Ave.	0.63	15
19	3483.7	(4.6)	0.62	15
20	3488.2	(4.5)	0.60	15

* Gauge reading corrected for friction loss

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Bechtel Job No. 12484
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SINGLE PACKER TESTS

Boring No.: B-10 Date: 12/19/78 Tested By: PHW

Gauge Height (AGS) 2.2 feet Hole Size: 3" Nominal

Interval Tested: 25.8' to 32.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	3500.2			10
1	3503.7	(3.5)	0.47	10
2	3507.2	(3.5)	0.47	10
3	3510.7	(3.5)	0.47	10
4	3513.9	(3.2)	0.43	10
5	3517.3	(3.4)	0.45	10
6	3520.9	(3.6)	0.48	10
7	3524.1	(3.2)	0.43	10
8	3527.4	(3.3)	0.44	10
9	3530.7	(3.3)	0.44	10
10	3533.8	(3.1)	0.41	10
11	3537.1	(3.3)	0.44	10
12	3540.4	(3.3)	0.44	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
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SINGLE PACKER TESTS

Boring No.: B-10 Date: 12/19/78 Tested By: PHW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 20.1' to 32.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	3560.2			10
1	3564.5	(4.3)	0.58	10
2	3568.5	(4.0)	0.54	10
3	3572.5	(4.0)	0.54	10
4	3576.4	(3.9)	0.52	10
5	3580.3	(3.9)	0.52	10
6	3584.2	(3.9)	0.52	10
7	3587.2	(3.0)	0.40	10
8	3591.4	(4.2)	0.56	10
9	3595.1	(2.7)	0.36	10
10	3597.8	(2.7)	0.36	10
11	3602.4	(4.6)	0.62	10
12	3606.0	(3.6)	0.48	10
13	3609.4	(3.4)	0.45	10
14	3613.0	(3.6)	0.48	10
15	3616.4	(3.4)	0.45	10
16	3620.0	(3.6)	0.48	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-10 Date: 12/19/78 Tested By: PAW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 20.1' to 32.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	3628.5			15
1	3633.3	(4.8)	0.64	15
2	3637.7	(4.4)	0.59	15
3	3642.2	(4.5)	0.60	15
4	3646.5	(4.3)	0.58	15
5	3651.0	(4.5)	0.60	15
6	3655.1	(4.1)	0.55	15
7	3659.4	(4.3)	0.58	15
8	3663.6	(4.2)	0.56	15
9	3667.7	(4.1)	0.55	15
10	3671.8	(4.1)	0.55	15
11	3675.9	(4.1)	0.55	15
12	3680.0	(4.1)	0.55	15
13	3684.0	(4.0)	0.54	15

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-10 Date: 12/19/78 Tested By: PAW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 20.1' to 32.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE	PRESSURE* (PSI)
0	3690.8			10
1	3693.8	(3.0)	0.40	10
2	3696.8	(3.0)	0.40	10
3	3699.8	(3.0)	0.40	10
4	3702.7	(2.9)	0.39	10
5	3705.6	(2.9)	0.39	10
6	3708.5	(2.9)	0.39	10
7	3712.2	(3.7)	0.49	10
8	3715.9	(3.7)	0.49	10
9	3718.7	(2.8)	0.37	10
10	3721.6	(2.9)	0.39	10
11	3724.3	(2.7)	0.36	10
12	3727.2	(2.9)	0.39	10
13	3730.0	(2.8)	0.37	10
14	3732.6	(2.6)	0.35	10
15	3735.2	(2.6)	0.35	10
16	3738.0	(2.8)	0.37	10
17	3740.9	(2.9)	0.39	10
18	3743.5	(2.6)	0.35	10

* Pressure adjusted for friction loss

PROJECT Waste Isolation Pilot Plant

JOB NO. E78-1135 DATE 12/20/78

LOG OF TEST BORING NO. B-10A

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3412.87

DATUM Molzen-Corbin Survey

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0										SILTY SAND, fine, sub-rounded, predominantly quartz, moist, nonplastic, brown to tan
5								SM		note: some lime cementation and silt throughout
10								SM		(Caliche) SILTY SAND, fine, lime cemented, dry, nonplastic, light tan
15										Stopped auger at 12.7'

FIELD PERMEABILITY TEST

E-18 CONSTANT AND FALLING HEAD

OPEN-END

1st Run TIME	QUANTITY (ML)	TIME	QUANTITY (ML)	2nd Run TIME	QUANTITY (ML)
CONSTANT HEAD		10:43:15	DROP 2.32'	CONSTANT TIME	HEAD ML
10:04:00	0	10:40:15	2.65'	12:25:00	0
10:05:15	250	CONSTANT TIME	HEAD ML	12:26:45	250
10:06:20	250	10:50:00	250	12:27:25	250
10:07:25	250	10:51:30	250	12:28:00	Case Leaked
10:08:35	250	10:53:50	250	12:43:00	0
10:09:45	250	10:54:20	250	12:43:45	250
10:10:55	250	10:55:40	250	12:44:35	250
10:12:10	250	10:57:10	250	12:45:00	250
10:13:25	250	10:58:30	250	12:46:35	250
10:14:40	250	11:00:00	250	12:47:30	250
10:15:50	250			12:48:50	250
10:17:00	250			12:49:35	250
10:18:15	250			12:50:20	250
FALLING TIME	HEAD TEST DROP			Casing leaked at 12:50, Test Ter-	
10:23:15	0.71'			minated on those grounds	
10:28:15	1.16'				
10:33:15	1.58'				
10:38:15	1.98'				

1st Run - Sand Strata

Bottom of casing = 5.25' below ground surface

Top of casing = 0.20' above ground surface

Head = 5.45'

Casing O.D. = 6-1/2"

I.D. = 0.26'

2nd Run - Caliche Strata

Bottom of casing = 12.7'

Top of casing = 2.55'

Head = 15.25'

GROUND WATER

DEPTH	HOUR	DATE

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Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-11 Date: 12/15/78 Tested By: PW

Gauge Height (AGS) 7.0 feet Hole Size: 3" Nominal

Interval Tested: 19'9" to 30'0"

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	2139.5			10
1	2160.0	(20.5)	2.74	10
2	2180.0	(20.0)	2.68	10
3	2200.0	(20.0)	2.68	10
4	2219.6	(19.6)	2.62	10
5	2239.1	(19.5)	2.61	10
6	2258.5	(19.4)	2.59	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-11 Date: 12/15/78 Tested By: PW

Gauge Height (AGS) 7.0 feet Hole Size: 3" Nominal

Interval Tested: 19'9" to 30'0"

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	2317.9		15
1	2345.1 (27.2)	3.64	15
2	2372.3 (27.2)	3.64	15
3	2398.8 (26.5)	3.54	15
4	2424.2 (25.4)	3.40	15
5	2450.2 (26.0)	3.48	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-11 Date: 12/15/78 Tested By: PW

Gauge Height (AGS) 7.0 feet Hole Size: 3" Nominal

Interval Tested: 19'9" to 30'0"

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	2544.6			10
1	2565.0	(20.4)	2.73	10
2	2585.3	(20.3)	2.72	10
3	2605.9	(20.6)	2.76	10
4	2626.5	(20.6)	2.76	10
5	2646.9	(20.4)	2.73	10

* Gauge reading corrected for friction loss

PROJECT Waste Isolation Pilot Plant

JOB NO. E78-1135 DATE 12/16/78

LOG OF TEST BORING NO. B-11A

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 3413.56

DATUM Molzen-Corbin Survey

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SP		SAND, fine, sub-rounded, predominantly quartz, moist, brown
								SM		SILTY SAND, fine, sub-rounded, predominantly quartz, moist, brown
5								SM		(Caliche) SILTY SAND, predominantly fine, lime cemented, dry, tan
10										Stopped auger at 6.0'
15										

FIELD PERMEABILITY TEST

E-18 CONSTANT HEAD TEST

SAND — OPEN-END — Caliche

1st Run TIME Sec.	QUANTITY (ML)	TIME Sec.	QUANTITY (ML)	2nd Run TIME	QUANTITY (ML)
11	300	290	300	1:43:00	0
25	300	300	300	1:45:00	250
40	300	320	300	1:48:20	250
50	300	330	300	1:51:30	250
60	300	350	300	1:54:45	250
80	300	360	300	1:57:00	250
90	300	370	300	2:01:35	250
105	300	390	300	2:05:25	250
110	300	415	300	2:09:05	250
130	300	430	300	2:13:20	250
140	300	445	300	2:17:55	250
180	300	470	300	2:22:40	250
190	300	485	300	2:28:55	250
200	300	500	300	2:33:35	250
220	300	520	300	2:37:15	250
235	300	540	300	2:42:40	250
245	300	560	300		
260	300	580	300		
275	300				

1st Run

Bottom of casing = 3' below ground surface

Top of casing = 6.0' below ground surface

Head = 5.45'

Casing O.D. = 6-1/2"

I.D. = 3-1/8' or 0.26'

2nd Run

Bottom of casing = 6.0' below ground surface

Top of casing = 2.2' above ground surface

Head = 8.2'

GROUND WATER

DEPTH	HOUR	DATE

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • TUCSON • ALBUQUERQUE • EL PASO

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-18 Date: 12/14/78 Tested By: PW

Gauge Height (AGS) 1.8 feet Hole Size: 3" Nominal

Interval Tested: 24.7' to 32.3'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	No Take	0	10

* Gauge reading corrected for friction loss

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SINGLE PACKER TESTS

Boring No.: B-18 Date: 12/14/78 Tested By: PW

Gauge Height (AGS) 1.8 feet Hole Size: 3" Nominal

Interval Tested: 24.7' to 32.3'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	1973.0			15
1	1975.0	(2.0)	0.27	15
2	1977.0	(2.0)	0.27	15
3	1978.9	(1.9)	0.25	15
4	1980.9	(2.0)	0.27	15
5	1982.8	(1.9)	0.25	15

* Gauge reading corrected for friction loss

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SINGLE PACKER TESTS

Boring No.: B-18 Date: 12/14/78 Tested By: PW

Gauge Height (AGS) 1.8 feet Hole Size: 3" Nominal

Interval Tested: 24.7' to 32.3'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	1983.1			10
1	1983.3	(0.2)	0.03	10
2	1984.3	(1.0)	0.13	10
3	1985.5	(1.2)	0.16	10
4	1986.2	(0.7)	0.09	10
5	1986.5	(0.3)	0.04	10
6	1987.0	(0.5)	0.07	10
7	1987.2	(0.2)	0.03	10
8	1987.4	(0.2)	0.03	10
9	1987.6	(0.2)	0.03	10
10	1987.8	(0.2)	0.03	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
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SINGLE PACKER TESTS

Boring No.: B-27 Date: 1/11/79 Tested By: PW

Gauge Height (AGS) 4.5 feet Hole Size: 3" Nominal

Interval Tested: 18.5 to 25.8

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	6280.0		10
1	6288.1 (8.1)	1.08	10
2	6295.7 (7.6)	1.02	10
3	6302.5 (6.8)	0.91	10
4	6308.5 (6.0)	0.80	10
5	6314.5 (6.0)	0.80	10
6	6319.9 (5.4)	0.72	10
7	6324.9 (5.0)	0.67	10
8	6329.4 (4.5)	0.61	10
9	6333.8 (4.4)	0.59	10
10	6337.2 (3.4)	0.45	10
11	6340.5 (3.3)	0.44	10
12	6344.5 (4.0)	0.54	10
13	6348.3 (3.8)	0.51	10
14	6352.3 (4.0)	0.54	10
15	6356.4 (4.1)	0.55	10

* Pressure adjusted for friction loss

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SINGLE PACKER TESTS

Boring No.: B-27 Date: 1/11/79 Tested By: PW

Gauge Height (AGS) 4.5 feet Hole Size: 3" Nominal

Interval Tested: 18.5' to 25.8'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	6361.4		15
1	6366.1 (4.7)	0.63	15
2	6370.9 (4.8)	0.64	15
3	6375.4 (4.5)	0.60	15
4	6379.9 (4.5)	0.60	15
5	6384.4 (4.5)	0.60	15

* Pressure adjusted for friction loss

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SINGLE PACKER TESTS

Boring No.: B-35 Date: 1/6/79 Tested By: PW

Gauge Height (AGS) 5.0 feet Hole Size:

Interval Tested: 19' to 32'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	4214.2			10
1	4234.1	(19.9)	2.66	10
2	4253.5	(19.4)	2.59	10
3	4271.2	(17.7)	2.37	10
4	4288.1	(16.9)	2.26	10
5	4304.4	(16.3)	2.18	10
6	4319.9	(15.5)	2.07	10
7	4335.4	(15.5)	2.07	10
8	4350.2	(14.8)	1.98	10
9	4365.3	(15.1)	2.02	10
10	4379.8	(14.5)	1.94	10
11	4387.7	(.9)	(out of water)	10

* Pressure adjusted for friction loss

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SINGLE PACKER TESTS

Boring No.: B-35 Date: 1/6/79 Tested By: PW

Gauge Height (AGS) 5.0' feet Hole Size:

Interval Tested: 19' to 32'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	4420.0			10
1	4434.1	(14.1)	1.89	10
2	4447.9	(13.8)	1.84	10
3	4461.5	(13.6)	1.82	10
4	4474.9	(13.4)	1.79	10
5	4488.4	(13.5)	1.81	10
6	4501.8	(13.4)	1.79	10
7	4515.0	(13.2)	1.76	10
8	4527.8	(12.8)	1.71	10
9	4539.0	(11.2)	1.50	10
10	4549.9	(10.9)	1.46	10
11	4560.7	(10.8)	1.44	10
12	4571.3	(10.6)	1.42	10
13	4582.0	(10.7	1.43	10
15	4592.4	(10.4)	1.39	10
16	4602.5	(10.1)	1.35	10
17	4612.7	(10.2)	1.36	10
18	4622.8	(10.1)	1.35	10
19	4632.9	(10.1)	1.35	10
20	4643.0	(10.1)	1.35	10

* Pressure adjusted for friction loss

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SINGLE PACKER TESTS

Boring No.: B-35 Date: 1/6/79 Tested By: PW

Gauge Height (AGS) 5.0 feet Hole Size:

Interval Tested: 19' to 32'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	4724.2			15
1	4737.5	(13.3)	1.78	15
2	4750.5	(13.0)	1.74	15
3	4762.2	(11.7)	1.56	15
4	4773.2	(11.0)	1.47	15
5	4784.1	(10.9)	1.46	15
6	4795.2	(11.1)	1.48	15
7	4806.4	(11.2)	1.50	15
8	4817.0	(9.4)	1.26	15
9	4826.8	(9.8)	1.31	15
10	4836.7	(9.9)	1.32	15
11	4846.6	(9.9)	1.32	15
12	4856.6	(10.0)	1.34	15
13	4866.0	(9.4)	1.26	15
14	4874.0	(8.0)	1.07	15
15	4882.9	(8.9)	1.19	15
16	4891.4	(8.5)	1.14	15
17	4899.8	(8.4)	1.12	15
18	4908.0	(8.2)	1.10	15
19	4916.4	(8.4)	1.12	15
20	4924.7	(8.3)	1.11	15

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
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SINGLE PACKER TESTS

Boring No.: B-35 Date: 1/6/79 Tested By: PW

Gauge Height (AGS) 5.0 feet Hole Size:

Interval Tested: 19' to 32'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	4941.5		10
1	4947.8 (6.3)	0.84	10
2	4954.0 (6.2)	0.83	10
3	4960.4 (6.4)	0.86	10
4	4966.7 (6.3)	0.84	10
5	4973.0 (6.3)	0.84	10

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
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SINGLE PACKER TESTS

Boring No.: B-35 Date: 1/6/79 Tested By: PW

Gauge Height (AGS) 3.5 feet Hole Size: _____

Interval Tested: 24' to 32'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	4991.5	0	10
1	4991.5	0	10
2	4991.5	0	10
3	4991.5	0	10
4	4991.5	0	10
5	4991.5 (no take)	0	10

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
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SINGLE PACKER TESTS

Boring No.: B-35 Date: 1/6/79 Tested By: PW

Gauge Height (AGS) 3.5 feet Hole Size:

Interval Tested: 24' to 32'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	4993.3		15
1	4996.0 (2.7)	0.36	15
2	4998.8 (2.8)	0.37	15
3	5001.8 (3.0)	0.40	15
4	5004.5 (2.7)	0.36	15
5	5007.3 (2.8)	0.37	15

* Pressure adjusted for friction loss

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SINGLE PACKER TESTS

Boring No.: B-35 Date: 1/6/79 Tested By: PW

Gauge Height (AGS) 3.5 feet Hole Size:

Interval Tested: 24' to 32'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5010.9		10
1	5013.2 (2.3)	0.31	10
2	5015.3 (2.1)	0.28	10
3	5017.2 (1.9)	0.25	10
4	5019.5 (2.3)	0.31	10
5	5021.4 (1.9)	0.25	10
6	5023.1 (1.7)	0.23	10
7	5024.8 (1.7)	0.23	10
8	5026.7 (1.9)	0.25	10
9	5078.2 (1.5)	0.20	10
10	5030.0 (1.8)	0.24	10
11	5031.8 (1.8)	0.24	10
12	5033.4 (1.6)	0.21	10
13	5035.0 (1.6)	0.21	10
14	5036.7 (1.7)	0.23	10
15	5038.3 (1.6)	0.21	10

Waste Isolation Pilot Plant
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SINGLE PACKER TESTS

Boring No.: B-36 Date: 1/8/79 Tested By: PW

Gauge Height (AGS) 5.5 feet Hole Size: 3" Nominal

Interval Tested: 22.0 to 27.8'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	5467.5			10
1	5477.1	(9.6)	1.28	10
2	5486.4	(9.3)	1.24	10
3	5494.5	(8.1)	1.08	10
4	5502.1	(7.6)	1.02	10
5	5509.2	(7.1)	0.95	10
6	5516.6	(7.4)	0.99	10
7	5523.6	(7.0)	0.94	10
8	5530.4	(6.8)	0.91	10
9	5536.9	(6.5)	0.87	10
10	5543.5	(6.6)	0.88	10
11	5549.8	(6.3)	0.84	10
12	5556.1	(6.3)	0.84	10
13	5561.7	(5.6)	0.75	10
14	5567.4	(5.7)	0.76	10
15	5572.8	(5.4)	0.72	10
16	5578.1	(5.3)	0.71	10
18	5583.4	(5.3)	0.71	10
19	5588.5	(5.1)	0.68	10
20	5593.8	(5.3)	0.71	10

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-36 Date: 1/8/79 Tested By: PW

Gauge Height (AGS) 5.5 feet Hole Size: 3" Nominal

Interval Tested: 22.0' to 27.8'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5622.2		15
1	5628.7 (6.5)	0.87	15
2	5635.1 (6.4)	0.86	15
3	5641.1 (6.0)	0.80	15
4	5646.8 (5.7)	0.76	15
5	5652.6 (5.8)	0.78	15
6	5658.1 (5.5)	0.74	15
7	5663.4 (5.3)	0.71	15
8	5668.9 (5.5)	0.74	15
9	5674.7 (5.8)	0.78	15
10	5680.3 (5.6)	0.75	15
11	5685.8 (5.5)	0.74	15

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
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SINGLE PACKER TESTS

Boring No.: B-37 Date: 1/9/79 Tested By: PW

Gauge Height (AGS) 6.0 feet Hole Size:

Interval Tested: 22.0' to 27.5'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	5839.8			10
1	5845.4	(5.6)	0.75	10
2	5850.4	(5.0)	0.67	10
3	5855.2	(4.8)	0.64	10
4	5859.5	(4.3)	0.58	10
5	5863.3	(3.8)	0.51	10
6	5866.8	(3.5)	0.47	10
7	5870.1	(3.3)	0.44	10
8	5873.4	(3.3)	0.44	10
9	5876.4	(3.0)	0.40	10
10	5879.4	(3.0)	0.40	10
11	5882.4	(3.0)	0.40	10
12	5885.2	(2.8)	0.37	10
13	5888.1	(2.9)	0.39	10

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
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SINGLE PACKER TESTS

Boring No.: B-37 Date: 1/9/79 Tested By: PW

Gauge Height (AGS) 6.0 feet Hole Size:

Interval Tested: 22.0' to 27.5'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5891.3		15
1	5894.4 (3.1)	0.41	15
2	5897.4 (3.0)	0.40	15
3	5900.5 (3.1)	0.41	15
4	5903.4 (2.9)	0.39	15
5	5906.3 (2.9	0.39	15

* Pressure adjusted for friction loss

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SINGLE PACKER TESTS

Boring No.: B-37 Date: 1/9/79 Tested By: PW

Gauge Height (AGS) 6.0 feet Hole Size:

Interval Tested: 19.5' to 27.5'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	5915.5			10
1	5918.3	(2.8)	0.37	10
2	5920.9	(2.6)	0.35	10
3	5923.5	(2.6)	0.35	10
4	5925.8	(2.3)	0.31	10
5	5927.9	(2.1)	0.28	10
6	5930.1	(2.2)	0.29	10
7	5932.2	(2.1)	0.28	10
8	5934.3	(2.1)	0.28	10

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
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SINGLE PACKER TESTS

Boring No.: B-38 Date: 1/22/79 Tested By: GW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 45.0' to 50.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	6704.6		15
5	6704.6	0	

* Pressure built up in hole

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

DOUBLE PACKER TESTS

Boring No.: B-38 Date: 1/22/79 Tested By: GW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 40.0' to 45.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	6704.6			18
1	6704.9	(. .3)	0.04	18
2	6705.1	(.2)	0.03	18
3	6705.2	(.1)	0.01	18
4	6705.2	(.1)	0.01	18
5	6705.2	(.1)	0.01	18

* PSI corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
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DOUBLE PACKER TESTS

Boring No.: B-38 Date: 1/22/79 Tested By: GW

Gauge Height (AGS) 8.0 feet Hole Size: 3" Nominal

Interval Tested: 35' to 40'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	6705.2		15
1	6706.4 (1.2)	0.16	15
2	6707.4 (1.0)	0.13	15
3	6708.4 (1.0)	0.13	15
4	6709.4 (1.0)	0.13	15
5	6710.2 (.8)	0.11	15
6	6711.1 (.9)	0.12	15
7	6711.9 (1.8)	0.11	15
8	6712.7 (.8)	0.11	15
9	6713.5 (.8)	0.11	15

* 16 PSI corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
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DOUBLE PACKER TESTS

Boring No.: B-38 Date: 1/22/79 Tested By: GW

Gauge Height (AGS) 8.0 feet Hole Size: 3" Nominal

Interval Tested: 35' to 40'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	6715.0			20
1	6716.9	(1.9)	0.25	20
2	6717.9	(1.0)	0.13	20
3	6719.1	(1.2)	0.16	20
4	6720.1	(1.0)	0.13	20
5	6721.1	(1.0)	0.13	20
6	6722.0	(.9)	0.12	20
7	6722.8	(.8)	0.11	20
8	6723.8	(1.0)	0.13	20
9	6724.6	(.8)	0.11	20
10	6725.3	(.7)	0.09	20

* 21 PSI corrected for friction loss

Waste Isolation Pilot Plant
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DOUBLE PACKER TESTS

Boring No.: B-38 Date: 1/23/79 Tested By: GW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 20' to 35'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	4973.1			15
1	4985.8	(12.7)	1.70	15
2	4997.3	(11.5)	1.54	15
3	5008.1	(10.8)	1.44	15
4	5018.6	(10.5)	1.40	15
5	5027.6	(9.0)	1.20	15
6	5036.0	(8.4)	1.12	15
7	5043.3	(7.3)	0.98	15
8	5049.9	(6.6)	0.88	15
9	5055.9	(6.0)	0.80	15
10	5061.6	(5.7)	0.76	15
11	5067.1	(5.5)	0.74	15
12	5072.4	(5.3)	0.71	15
13	5077.1	(4.7)	0.63	15
14	5080.5	(3.4)	0.45	15
15	5083.8	(3.3)	0.44	15
16	5087.1	(3.3)	0.44	15
17	5089.9	(2.8)	0.37	15
18	5092.7	(2.8)	0.37	15
19	5095.5	(2.8)	0.37	15
20	5098.1	(2.6)	0.35	15
21	5100.6	(2.5)	0.33	15

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

Boring No.: B-38 Date: 1/23/79 Tested By: GW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 20' to 35'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
22	5103.2 (2.6)	0.35	15
23	5105.5 (2.3)	0.31	15
24	5107.6 (2.1)	0.28	15
25	5109.7 (2.1)	0.28	15
26	5111.9 (2.2)	0.29	15
27	5113.9 (2.0)	0.27	15

* PSI corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

DOUBLE PACKER TESTS

Boring No.: B-38 Date: 1/23/79 Tested By: GW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 20' to 35'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5116.1		20
1	5118.3 (2.2)	0.29	20
2	5120.7 (2.4)	0.32	20
3	5123.2 (2.5)	0.33	20
4	5125.6 (2.4)	0.32	20
5	5127.9 (2.3)	0.31	20
6	5130.3 (2.4)	0.32	20

* PSI corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

DOUBLE PACKER TESTS

Boring No.: B-38 Date: 1/23/79 Tested By: GW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 20' to 35'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5134.2		15
1	5134.4 (.2)	0.03	15
2	5134.4 (0)	0	15
3	5134.4 (0)	0	15
4	5134.4 (0)	0	15
5	5134.4 (0)	0	15

* PSI corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

DOUBLE PACKER TESTS

Boring No.: B-38 Date: 1/23/79 Tested By: AW

Gauge Height (AGS) 5.0 feet Hole Size: 3" Nominal

Interval Tested: 18'2" to 23'2"

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5153.8		10
1	5154.0 (.2)	0.03	10
2	5154.1 (.1)	0.01	10
3	5154.3 (.2)	0.03	10
4	5154.6 (.3)	0.04	10
5	5154.8 (.2)	0.03	10

* PSI corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

Boring No.: B-38 Date: 1/23/79 Tested By: AW

Gauge Height (AGS) 5.0 feet Hole Size: 3" Nominal

Interval Tested: 18'2" to 23'2"

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5156.7		15
1	5158.0 (1.3)	0.17	15
2	5159.2 (1.2)	0.16	15
3	5160.5 (1.3)	0.17	15
4	5161.9 (1.4)	0.19	15
5	5163.2 (1.3)	0.17	15

* PSI corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

DOUBLE PACKER TESTS

Boring No.: B-38 Date: 1/23/79 Tested By: AW

Gauge Height (AGS) 5.0 feet Hole Size: 3" Nominal

Interval Tested: 18'2" to 23'2"

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5165.8		10
1	5166.4 (1.6)	0.08	10
2	5167.0 (.6)	0.08	10
3	5167.2 (.2)	0.03	10
4	5167.4 (.2)	0.03	10
5	5167.6 (.2)	0.03	10

* PSI corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-39 Date: 1/7/79 Tested By: PW

Gauge Height (AGS) 4.0 feet Hole Size: 3" Nominal

Interval Tested: 18.5' to 27.6'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	5170.0			10
1	5179.1	(9.1)	1.22	10
2	5186.3	(7.2)	0.96	10
3	5192.6	(6.3)	0.84	10
4	5197.7	(5.1)	0.68	10
5	5202.2	(4.5)	0.60	10
6	5206.4	(4.2)	0.56	10
7	5210.7	(4.3)	0.58	10
8	5214.2	(3.5)	0.47	10
9	5218.2	(4.0)	0.54	10
10	5221.8	(3.6)	0.48	10
11	5225.6	(3.8)	0.51	10
12	5228.7	(3.1)	0.41	10
13	5231.3	(2.6)	0.35	10
14	5234.0	(2.7)	0.36	10
15	5236.6	(2.6)	0.35	10
16	5239.1	(2.5)	0.33	10
17	5241.5	(2.4)	0.32	10
18	5243.8	(2.3)	0.31	10
19	5246.3	(2.5)	0.33	10
20	5248.3	(2.0)	0.27	10
21	5250.4	(2.1)	0.28	10

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

Boring No.: B-39 Date: 1/7/79 Tested By: PW

Gauge Height (AGS) 4.0 feet Hole Size: 3" Nominal

Interval Tested: 18.5' to 27.6'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
22	5252.3 (1.9)	0.25	10
23	5254.2 (1.9)	0.25	10
24	5256.2 (2.0)	0.27	10
25	5258.0 (1.8)	0.24	10
26	5259.9 (1.9)	0.25	10

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-39 Date: 1/7/79 Tested By: PW

Gauge Height (AGS) 4.0 feet Hole Size: 3" Nominal

Interval Tested: 18.5' to 27.6'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5271.2		15
1	5273.7 (2.5)	0.33	15
2	5276.4 (2.7)	0.36	15
3	5278.9 (2.5)	0.33	15
4	5281.2 (2.3)	0.31	15
5	5283.2 (2.0)	0.27	15
6	5285.1 (1.9)	0.25	15
7	5287.1 (2.0)	0.27	15
8	5289.1 (2.0)	0.27	15
10	5291.1 (2.0)	0.27	15

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-39 Date: 1/7/79 Tested By: PW

Gauge Height (AGS) 4.0 feet Hole Size: 3" Nominal

Interval Tested: 18.5' to 27.6'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	5294.8			10
1	5296.4	(1.6)	0.21	10
2	5297.9	(1.5)	0.20	10
3	5299.3	(1.4)	0.19	10
4	5300.7	(1.4)	0.19	10
5	5301.5	(0.8)	Pressure Fluctuation	?
	5303.6	(2.1)	Pressure Fluctuation	?
8	5304.6	(1.0)	Pressure Fluctuation	?
9	5305.3	(0.7)	Pressure Fluctuation	?
10	5305.3	(0)	Pressure Fluctuation	?
11	5305.3	(0)	Pressure Fluctuation	?
12	5305.3	(0)	Pressure Fluctuation	?
13	5308.9	(3.6)	Pressure Fluctuation	?
14	5311.4	(2.5)	Pressure Fluctuation	?
16	5313.3	(1.9)	Pressure Fluctuation	?
15	5314.9	(1.6)	0.21	10
16	5316.5	(1.6)	0.21	10
17	5317.9	(1.4)	0.19	10

* Pressure adjusted for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-40 Date: 1/10/79 Tested By: PHW

Gauge Height (AGS) 4.5 feet Hole Size: 3" Nominal

Interval Tested: 18.5' to 27.9'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	5997.8			10
1	6003.0	(5.2)	0.70	10
2	6008.9	(5.9)	0.79	10
3	6013.7	(4.8)	0.64	10
4	6018.6	(4.9)	0.66	10
5	6023.5	(4.9)	0.66	10
6	6028.2	(4.7)	0.63	10
7	6032.8	(4.6)	0.62	10
8	6037.5	(4.7)	0.63	10
9	6042.3	(4.8)	0.64	10
10	6046.9	(4.6)	0.62	10
11	6051.5	(4.6)	0.62	10
12	6056.1	(4.6)	0.62	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-40 Date: 1/10/79 Tested By: PHW

Gauge Height (AGS) 4.5 feet Hole Size: 3" Nonimal

Interval Tested: 18.5' to 27.9'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	6062.5			15
1	6068.9	(6.4)	0.86	15
2	6075.0	(6.1)	0.82	15
3		(6.0)	0.80	15
4	6087.1	Ave.	Ave.	15
5	6093.3	(6.2)	0.83	15
6	6099.5	(6.2)	0.83	15
7	6105.8	(6.3)	0.84	15
8	6112.2	(6.4)	0.86	15
9	6119.7	(7.5)	1.00	15
10	6124.8	(5.1)	0.68	15
11	6131.1	(6.3)	0.84	15
12	6137.3	(6.2)	0.83	15
13	6143.8	(6.5)	0.87	15
14	6150.2	(6.4)	0.86	15
15	6156.6	(6.4)	0.86	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-40 Date: 1/10/79 Tested By: PHW

Gauge Height (AGS) 4.5 feet Hole Size: 3" Nominal

Interval Tested: 18.5' to 27.9'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	6166.2		10
1	6170.2 (4.0)	0.54	10
2	6174.5 (4.3)	0.58	10
3	6178.8 (4.3)	0.58	10
4	6183.2 (4.4)	0.59	10
5	6187.3 (4.1)	0.55	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-52 Date: 1/30/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 21.5' to 30.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5179.8		10
1	5183.7 (3.9)	0.52	10
2	5187.1 (3.4)	0.45	10
3	5190.4 (3.3)	0.44	10
4	5193.6 (3.2)	0.43	10
5	5196.3 (2.7)	0.36	10
6	5198.7 (2.4)	0.32	10
7	5201.7 (3.0)	0.40	10
8	5204.6 (2.9)	0.39	10
9	5207.2 (2.6)	0.35	10
10	5210.3 (3.1)	0.41	10
11	5213.8 (3.5)	0.47	10
12	5218.0 (4.2)	0.56	10
13	5222.4 (4.4)	0.59	10
14	5225.5 (3.1)	0.41	10
15	5228.6 (3.1)	0.41	10
16	5231.6 (3.0)	0.40	10
17	5234.5 (2.9)	0.39	10
18	5237.4 (2.9)	0.39	10
19	5240.5 (3.1)	0.41	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-52 Date: 1/30/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 21.5' to 30.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	5247.1			15
1	5249.8	(2.7)	0.36	15
2	5252.8	(3.0)	0.40	15
3	5256.0	(3.2)	0.43	15
4	5259.1	(3.1)	0.41	15
5	5262.5	(3.4)	0.45	15
6	5266.6	(4.1)	0.55	15
7	5270.8	(4.2)	0.56	15
8	5274.8	(4.0)	0.54	15
9	5278.5	(3.7)	0.49	15
10	5282.5	(4.0)	0.54	15
11	5286.3	(3.8)	0.51	15
12	5290.3	(4.0)	0.54	15
13	5294.5	(4.2)	0.56	15
14	5298.5	(4.0)	0.54	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-52 Date: 1/30/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 21.5' to 30.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5308.8		10
1	5310.8 (2.0)	0.27	10
2	5312.8 (2.0)	0.27	10
3	5314.6 (1.8)	0.24	10
4	5316.6 (2.0)	0.27	10
5	5318.7 (2.1)	0.28	10
6	5310.7 (2.0)	0.27	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

DOUBLE PACKER TESTS

Boring No.: B-52 Date: 1/30/79 Tested By: GW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 15.0' to 20.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5324.1		10
1	5324.1	0	10
2	5324.1	0	10
3	5324.1	0	10
4	5324.1	0	10
5	5324.1	0	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

DOUBLE PACKER TESTS

Boring No.: B-52 Date: 1/30/79 Tested By: GW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 15.0' to 20.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5325.3		15
1	5325.3	0	15
2	5325.3	0	15
3	5325.3	0	15
4	5325.3	0	15
5	5325.3	0	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

DOUBLE PACKER TESTS

Boring No.: B-52 Date: 1/30/79 Tested By: GW

Gauge Height (AGS) 3.0 feet Hole Size: 3" Nominal

Interval Tested: 15.0' to 20.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5325.4		10
1	5325.4	0	10
2	5325.4	0	10
3	5325.4	0	10
4	5325.4	0	10
5	5325.4	0	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-52 Date: 1/30/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 21.5' to 30.0'

TIME (Min.)	FLOW METER READING (Gal.)		FLOW RATE (CFM)	PRESSURE* (PSI)
0	5327.5			10
1	5328.8	(1.3)	0.17	10
2	5330.6	(1.8)	0.24	10
3	5332.8	(2.2)	0.29	10
4	5335.4	(2.6)	0.35	10
5	5338.2	(2.8)	0.37	10
6	5340.3	(2.1)	0.28	10
7	5342.5	(2.2)	0.29	10
8	5344.4	(1.9)	0.25	10
9	5346.3	(1.9)	0.25	10
10	5348.2	(1.9)	0.25	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-53 Date: 1/31/78 Tested By: GW

Gauge Height (AGS) 4.8 feet Hole Size: 3" Nominal

Interval Tested: 23.2' to 30.2'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5484.1		10
1	5486.1 (2.0)	0.27	10
2	5487.7 (1.6)	0.21	10
3	5489.2 (1.5)	0.20	10
4	5490.8 (1.6)	0.20	10
5	5492.4 (1.6)	0.21	10
6	5493.8 (1.4)	0.19	10

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-52 Date: 1/30/79 Tested By: GW

Gauge Height (AGS) 6.5 feet Hole Size: 3" Nominal

Interval Tested: 21.5' to 30.0'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5349.6		15
1	5351.0 (1.4)	0.19	15
2	5353.2 (2.2)	0.29	15
3	5356.2 (3.0)	0.40	15
4	5359.2 (3.0)	0.40	15
5	5362.6 (3.4)	0.45	15
6	5366.0 (3.4)	0.45	15
7	5368.8 (2.8)	0.37	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-53 Date: 1/31/79 Tested By: GW

Gauge Height (AGS) 4.8 feet Hole Size: 3" Nominal

Interval Tested: 23.2' to 30.2'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5495.5		15
1	5497.1 (1.6)	0.21	15
2	5498.6 (1.5)	0.20	15
3	5500.1 (1.5)	0.20	15
4	5501.6 (1.5)	0.20	15
5	5503.1 (1.5)	0.20	15

* Gauge reading corrected for friction loss

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

SINGLE PACKER TESTS

Boring No.: B-53 Date: 1/31/79 Tested By: GW

Gauge Height (AGS) 4.8 feet Hole Size: 3" Nominal

Interval Tested: 23.2' to 30.2'

TIME (Min.)	FLOW METER READING (Gal.)	FLOW RATE (CFM)	PRESSURE* (PSI)
0	5504.4		10
1	5505.5 (1.1)	0.15	10
2	5506.4 (.9)	0.12	10
3	5507.4 (1.0)	0.13	10
4	5508.4 (1.0)	0.13	10
5	5508.9 (.5)	0.07	10
6	5508.9 (0)	0	10
7	5508.9 (0)	0	10
8	5508.9 (0)	0	10
9	5508.9 (0)	0	10
10	5508.9 (0)	0	10

* Gauge reading corrected for friction loss

Section 2b

Monitoring Observation Wells

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-1

Elevations: Ground surface 3412.48
Reference mark 3414.21

Date	Time	Depth of Water (below reference mark)
2/01/79	1330	12.63'
2/09/79	1200	12.75'
3/24/79	1345	12.75'
4/05/79	1326	12.85'

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-1A

Elevations: Ground surface 3412.48
Reference mark 3414.83

Date	Time	Depth of Water (below reference mark)
2/02/79	0845	54.27'
2/09/79	1210	55.15'
3/24/79	1340	54.85'
4/05/79	1325	55.15'

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-4

Elevations: Ground surface 3417.08
Reference mark 3418.78

Date	Time	Depth of Water (below reference mark)
2/02/79	0905	32.83'
2/09/79	1150	33.15'
3/24/79	1135	33.40'
4/05/79	1336	33.65'

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-4A

Elevations: Ground surface 3417.08
Reference mark 3418.35

Date	Time	Depth of Water (below reference mark)
2/02/79	0900	13.17'
2/09/79	1155	13.45'
3/24/79	1140	13.50'
4/05/79	1334	13.70'

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-13

Elevations: Ground surface 3403.91
Reference mark 3405.90

Date	Time	Depth of Water (below reference mark)
2/02/79	0930	30.46'
2/09/79	1215	28.35'
3/24/79	1310	28.20'
4/05/79	1410	28.25'

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-16

Elevations: Ground surface 3411.21
Reference mark 3411.74

Date	Time	Depth of Water (below reference mark)
2/02/79	0920	30.33'
2/09/79	1147	30.40'
3/24/79	1150	30.70'
4/05/79	1345	31.03'

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-18

Elevations: Ground surface 3419.32
Reference mark 3420.93

Date	Time	Depth of Water (below reference mark)
2/01/79	1400	37.21'
2/09/79	1140	37.25'
3/24/79	1120	37.40'
4/05/79	1400	37.75'

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-20

Elevations: Ground surface 3403.53
Reference mark 3405.64

Date	Time	Depth of Water (below reference mark)
2/02/79	0940	11.88'
2/09/79	1220	11.95'
3/24/79	1330	11.80'
4/05/79	1413	34.00'

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-20A

Elevations: Ground surface 3403.53
Reference mark 3405.28

Date	Time	Depth of Water (below reference mark)
2/02/79	0950	36.63'
2/09/79	1225	33.75'
3/24/79	1320	33.70'
4/05/79	1414	12.05'

Waste Isolation Pilot Plant
Bechtel Job No. 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-25

Elevations: Ground surface 3408.74
Reference mark Top of casing (elevation unknown)

Date	Time	Depth of Water (below reference mark)
3/29/79	1420	359.5'
4/05/79	1219	370.2'

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-38

Elevations: Ground surface 3429.88
Reference mark 3431.54

Date	Time	Depth of Water (below reference mark)
2/01/79	1415	49.00'
2/09/79	1125	46.50'
3/24/79	1100	46.50'
4/05/79	1355	47.00'

Waste Isolation Pilot Plant
Bechtel Job 12484
SHB Job No. E78-1135

MONITORING OF OBSERVATION WELLS

Well No. B-54

Elevations: Ground surface 3408.60
Reference mark 3410.66

Date	Time	Depth of Water (below reference mark)
3/24/79	1420	191.5'
4/05/79	1310	196.6'

Section 2c

Plate Load Tests

ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Plant Site - Undisturbed Sand - 116' N & 55° E from B-25

Plate Load Test No. 1 @ 3.0' Plates + Ram + Spacer = 0.521 Kips

Computed by: Robert M. Anderson Date 3-19-79

30" Diameter Plate Test

SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
1.1	1.54	.026*		Note: Test hole was hand dug with a shovel, 3' below natural ground surface
2.2	3.1	.004		
3.3	4.6	.029		
4.4	6.2	.090		
6.6	9.3	.169		
8.8	12.4	.240		
11.0	15.5	.298		
15.4	21.7	.397		
19.8	27.9	.509		
24.2	34.1	.623		
35.3	49.7	.935		
46.3	65.2	1.228		
35.3	49.7	1.226	↓	Rebound
24.2	34.1	1.218	↓	
17.6	24.8	1.210	↓	
15.4	21.7	1.206	↓	
11.0	15.5	1.198	↓	
8.8	12.4	1.194	↓	
4.4	6.2	1.178	↓	
3.3	4.6	1.170	↓	
2.2	3.1	1.165	↓	
1.1	1.5	1.156	↓	
0.52	0.7	1.106		No Pressure on Ram

*Equal Zero Deflection

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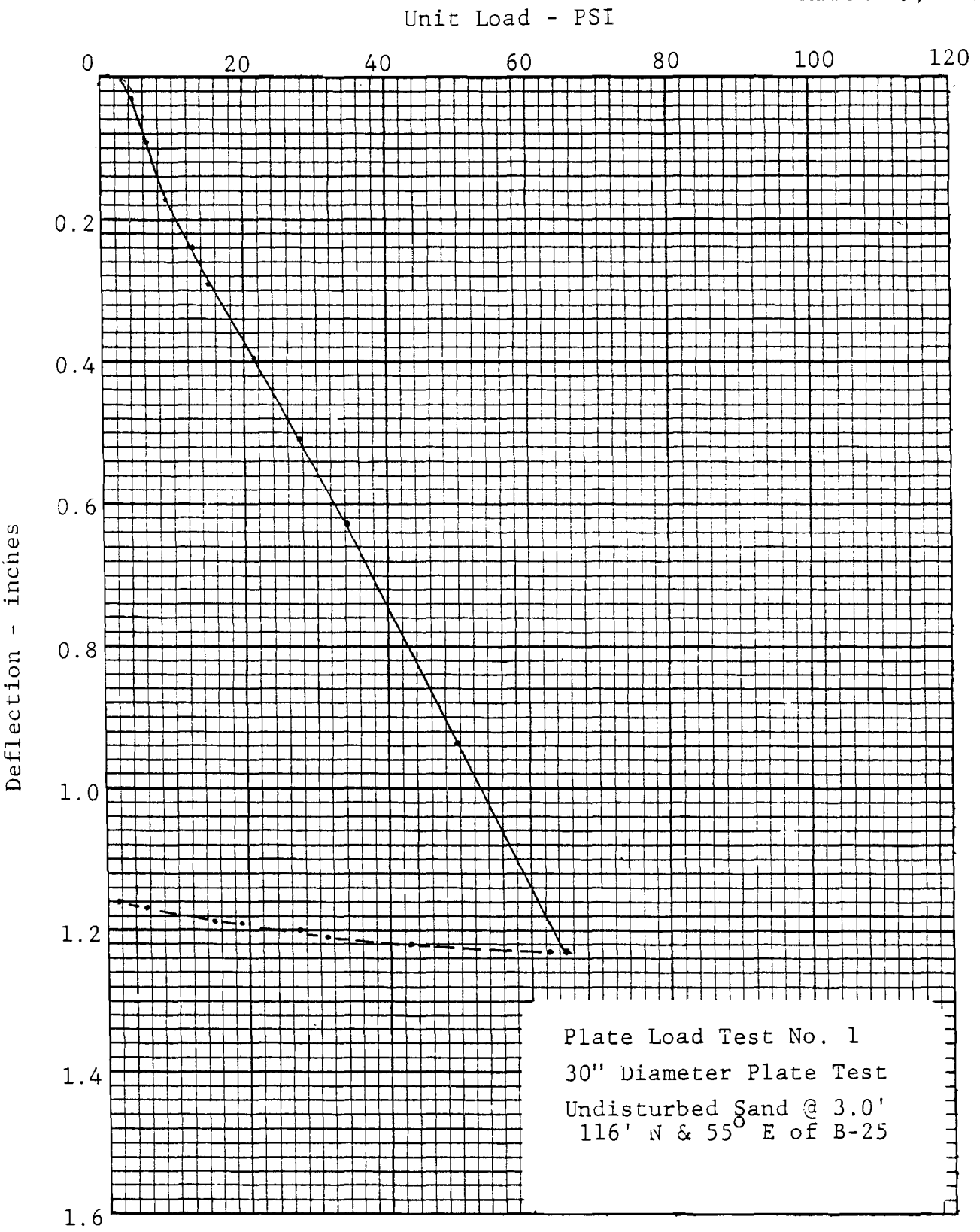
Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 19, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project: Waste Isolation Pilot Project, Bechtel Job No. 12484 — SHB Job No. LF79-3016

Location: Plant Site - Test Trench 3 @ 3.2'± — 30" Diameter Plate Test

Plate Load Test No. 1 (in sand) — Plates + Ram = 0.500 Kips

Computed by: Robert M. Anderson — Date 3-8-79

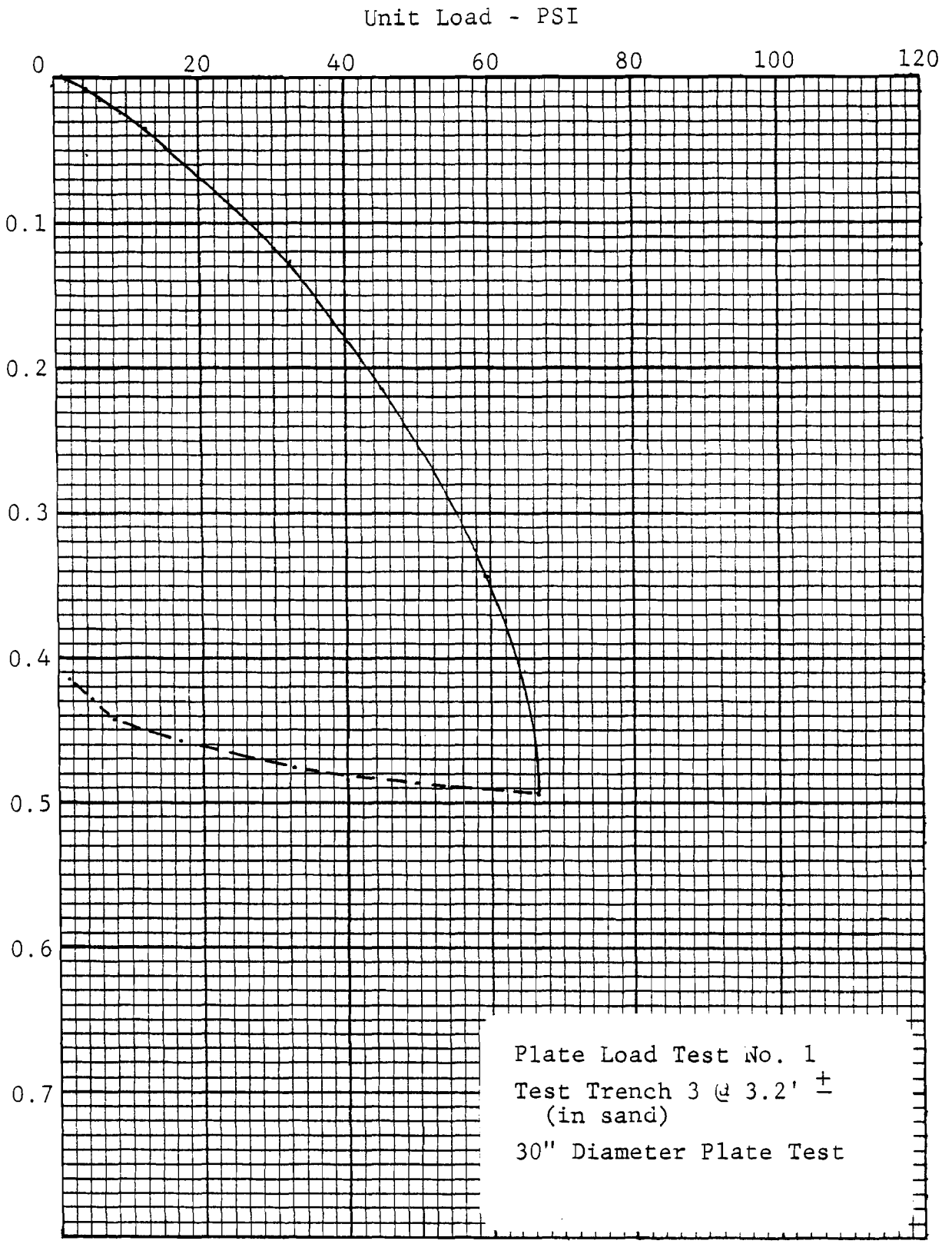
SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches	Remarks
1.1	1.54	.010*	
2.2	3.1	.001	
3.3	4.6	.008	
4.4	6.2	.016	
6.6	9.3	.024	
8.8	12.4	.035	
9.9	13.9	.044	
11.0	15.5	.049	
16.5	23.2	.083	
23.1	32.5	.127	
32.0	45.0	.215	
41.9	59.0	.342	
47.0	66.1	.492	
35.2	49.5	.488	↓ Rebound
23.1	32.5	.477	↓
12.1	17.0	.459	↓
5.5	7.7	.441	↓
3.3	4.6	.428	↓
1.1	1.5	.416	↓
0.5	0.7	.390	No Pressure on Ram

*Equal Zero Deflection

Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 8, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Plant Site - Test Trench 3 @ 3.2'± 18" Diameter Plate Test

Plate Load Test No. 2 (in sand) Plates + Ram = 0.151 Kips

Computed by: Robert M. Anderson Date 3-9-79

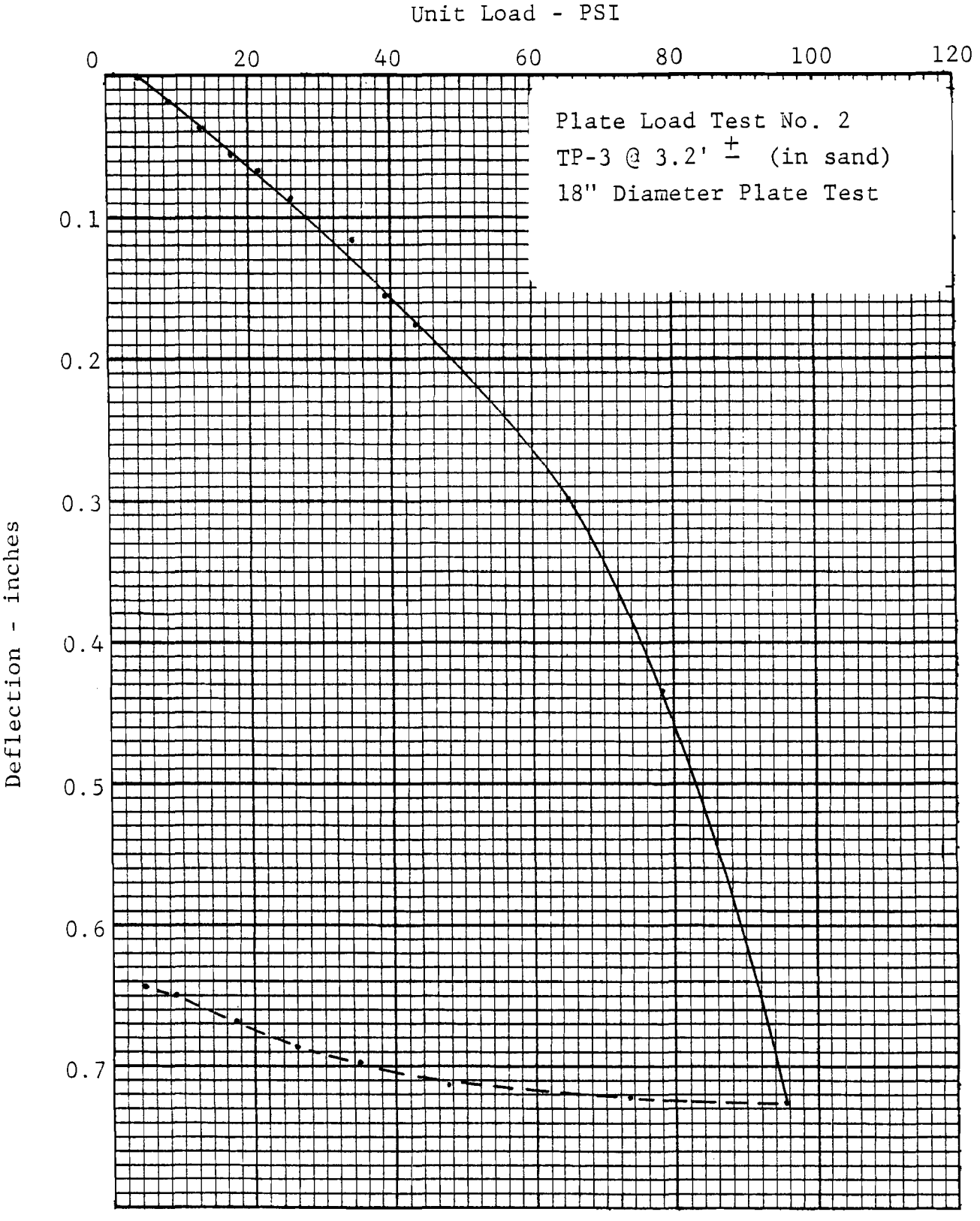
SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches	Remarks
1.1	4.3	.009*	
2.2	8.7	.019	
3.3	13.0	.038	
4.4	17.4	.057	Density Next to Test
5.5	21.7	.068	γ_d = 115.5 PCF
6.6	26.0	.087	W % = 3.6
8.8	34.7	.118	
9.9	39.0	.153	Blk. 1 (3.2'-3.7')
11.0	43.4	.175	
16.5	65.1	.299	
19.8	78.1	.434	
24.2	95.4	.723	
18.7	73.7	.721	↓ Rebound
12.1	47.7	.712	↓
8.8	34.7	.699	↓
6.6	26.0	.688	↓
4.4	17.4	.669	↓
2.2	8.7	.650	↓
1.1	4.3	.643	↓
0.15	0.6	.627	No Pressure on Ram

*Equal Zero Deflection

Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 9, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Plant Site - TP-3 @ 5.5' ± 18" Diameter Plate Test

Plate Load Test No. 3 (top of caliche) Plates + Ram = 0.151 Kips

Computed by: Robert M. Anderson Date 3-12-79

SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches	Remarks
3.3	13.0	.010*	
5.5	21.6	.005	
6.6	26.0	.007	
7.7	30.4	.008	
8.8	34.7	.009	
11.0	43.4	.012	
13.2	52.1	.014	
18.7	73.7	.022	
28.7	113.2	.046	
38.6	152.2	.063	
52.9	208.6	.083	
63.9	252.0	.098	
51.8	204.3	.097	↓ Rebound
33.1	130.5	.093	↓
16.5	65.1	.087	↓
5.5	21.7	.068	↓
1.1	4.3	.060	↓
0.15	0.6	.014	No Pressure on Ram

*Equal Zero Deflection

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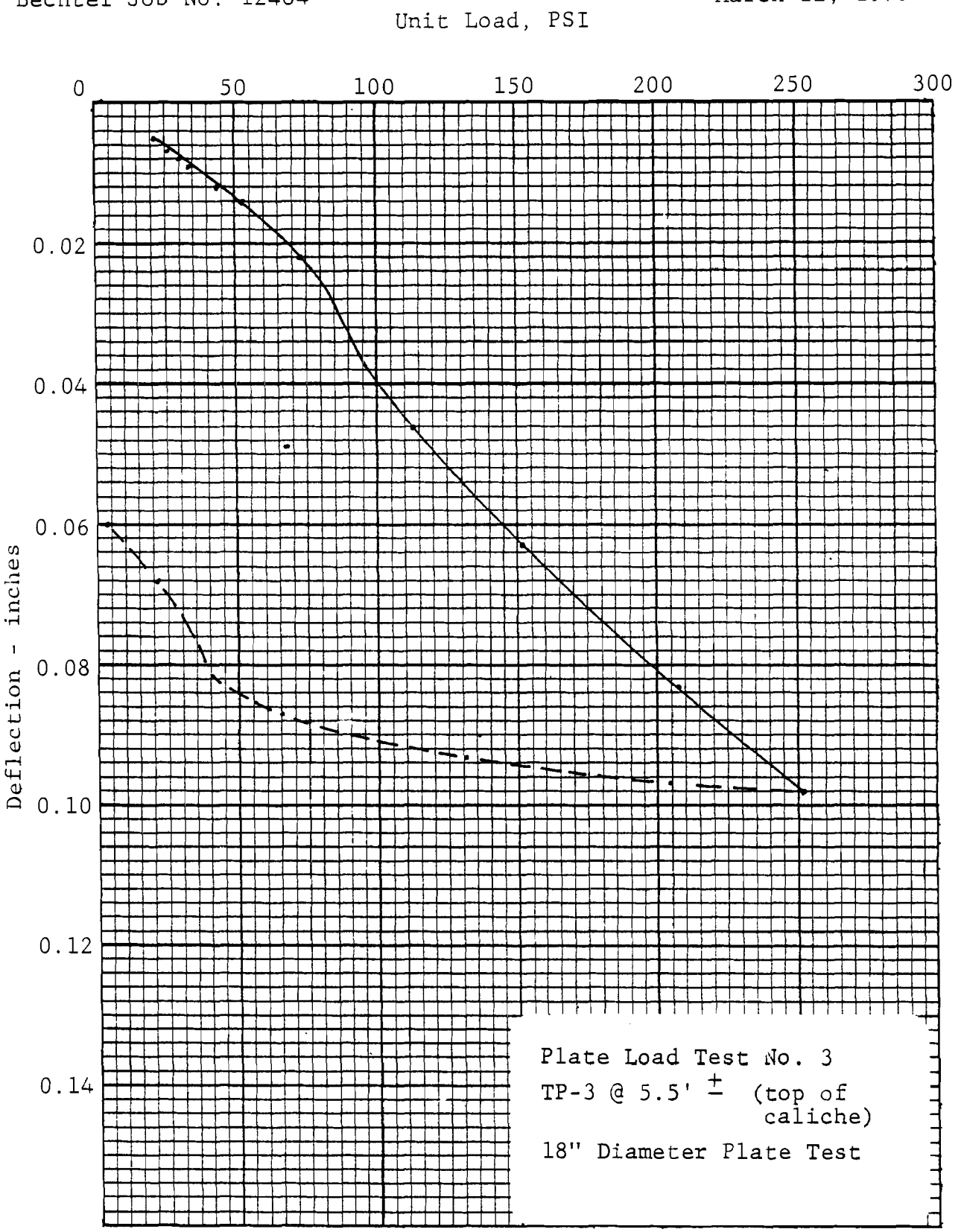
Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 12, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project: Waste Isolation Pilot Project, Bechtel Job No. 12484 — SHB Job No. LF79-3016

Location: Plant Site - TP-3 @ 5.2'± — 12" Diameter Plate Test

Plate Load Test No. 4 (top of caliche) — Plates + Ram = 0.092 Kips

Computed by: Robert M. Anderson — Date 3-13-79

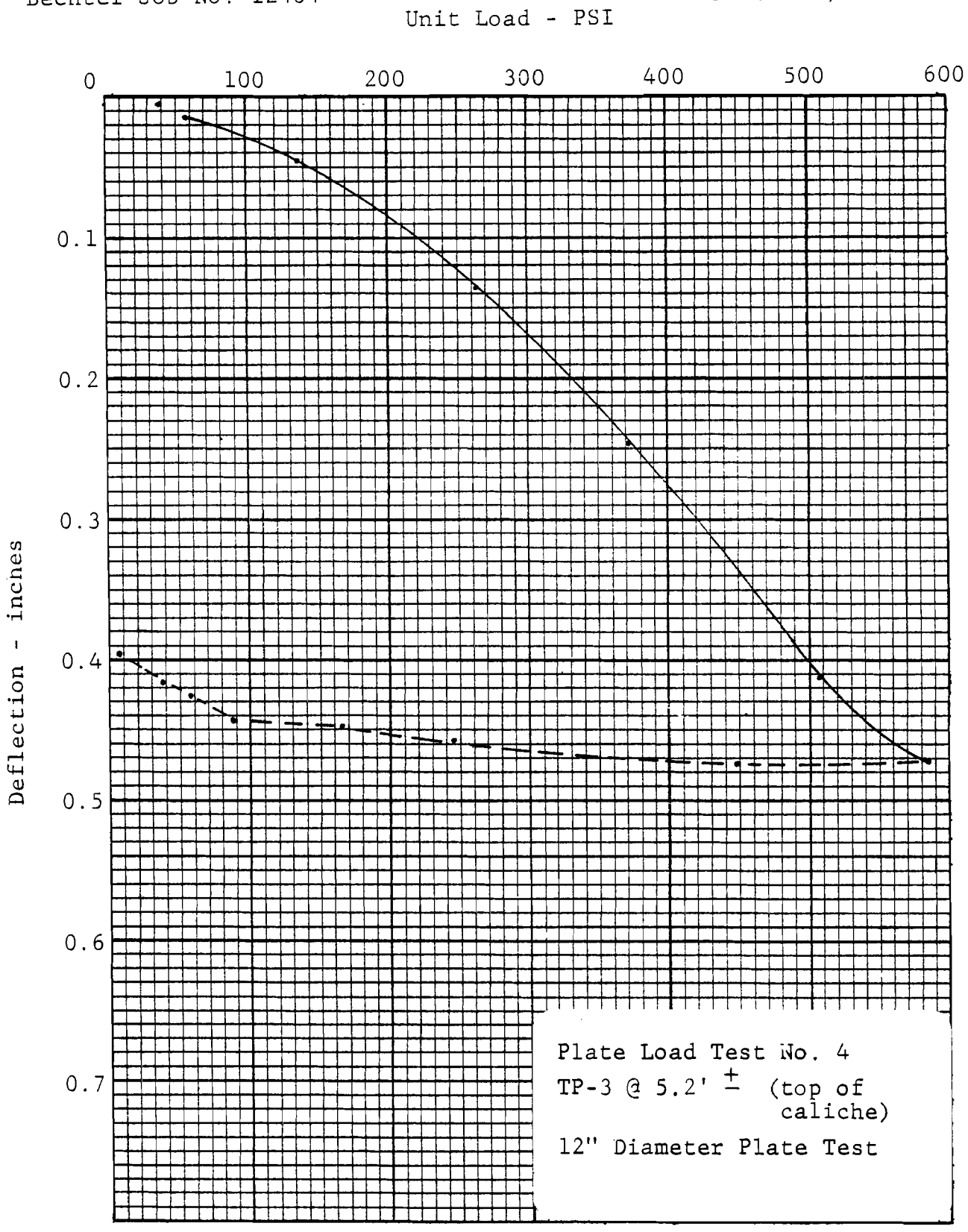
SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
2.2	19.5	.034*		
3.3	29.2	.001		
4.4	38.9	.003		
6.6	58.4	.013		
15.4	136.2	.046		
29.8	263.5	.137		
41.9	370.5	.247		
57.3	506.6	.411		
66.1	584.4	.471		
50.7	448.3	.472	↓	Rebound
27.6	244.0	.458	↓	
18.7	165.3	.449	↓	
9.9	87.5	.442	↓	
6.6	58.4	.427	↓	
4.4	38.9	.417	↓	
3.3	29.2	.413	↓	
1.1	9.7	.397	↓	
0.09	0.8	.364		No Pressure on Ram

*Equal Zero Deflection

Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 13, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Plant Site - TP-3 @ 9.2' 12" Diameter Plate Test

Plate Load Test No. 5 (top of caliche) Plates + Ram = 0.092 Kips

Computed by: Robert M. Anderson Date 3-15-79

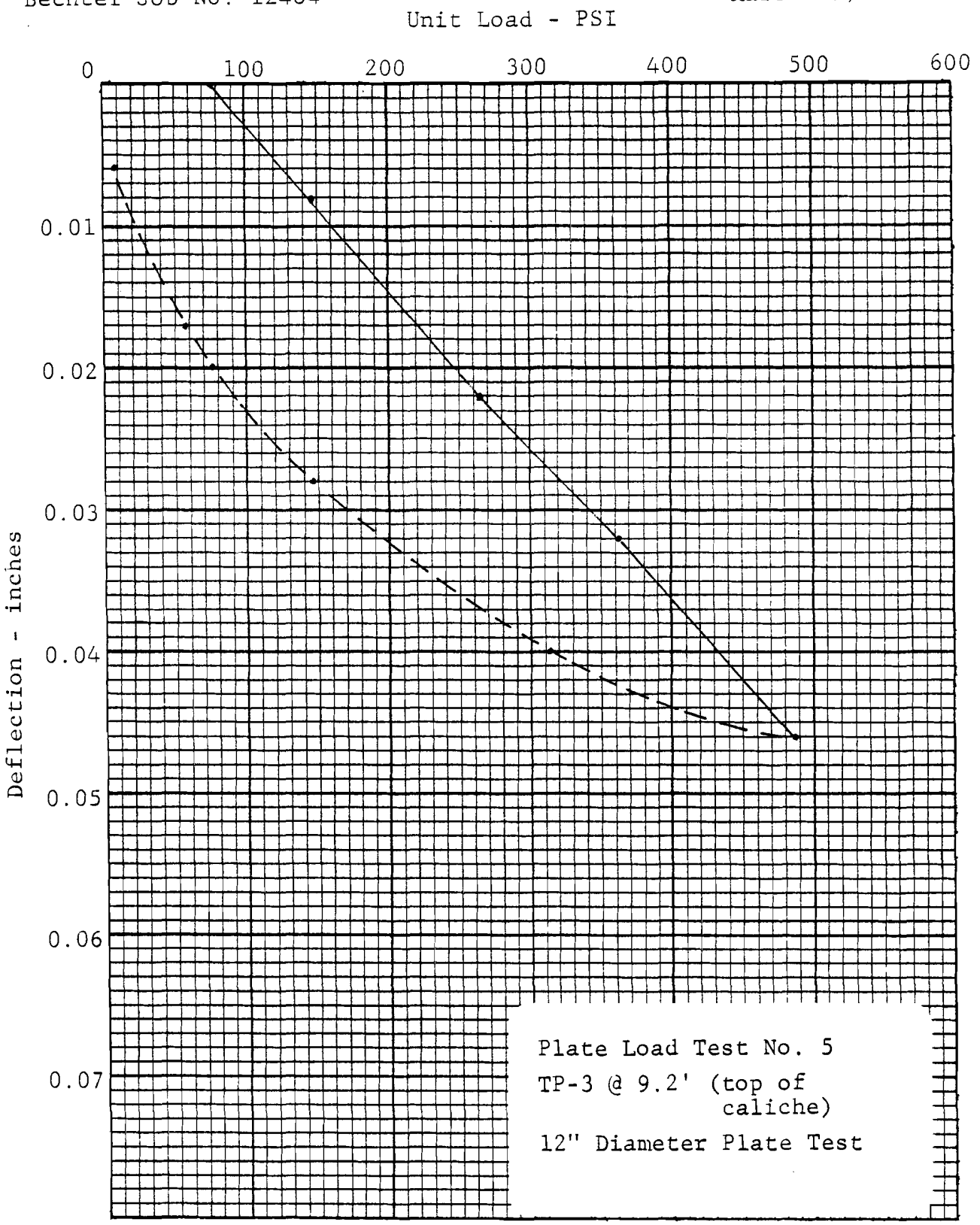
SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
4.4	38.9	.017*		
6.6	58.4	.000		
8.8	77.8	.000		
16.5	145.9	.008		
29.8	263.5	.022		
40.8	360.7	.032		
55.1	487.2	.046		
35.3	312.1	.040	↓	Rebound
16.5	145.9	.028	↓	
8.8	77.8	.020	↓	
6.6	58.4	.017	↓	
1.1	9.7	.006	↓	
0.09	0.8	.001		No Pressure on Ram

*Equal Zero Deflection

Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 15, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Plant Site - TP-3 @ 8.5' 12" Diameter Plate Test

Plate Load Test No. 6 (caliche) Plates + Ram + Spacers = 0.105 Kips

Computed by: Robert M. Anderson Date 3-16-79

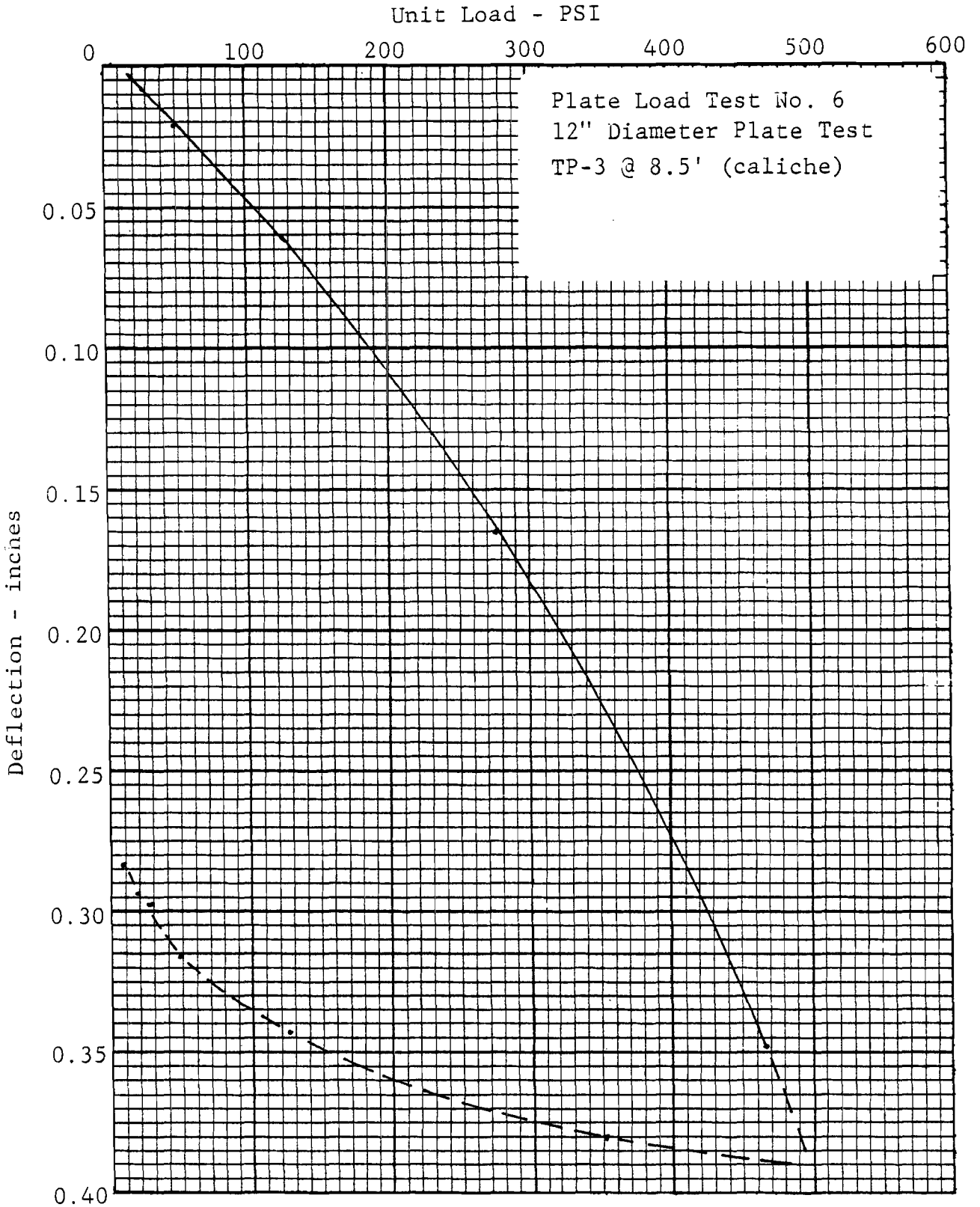
SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
1.1	9.7	.021*		
2.2	19.5	.003		
3.3	29.2	.008		
5.5	48.6	.021		
14.3	126.4	.061		
30.9	273.2	.165		
52.9	467.7	.348		
Exact Max. Load Unknown		.387		
39.7	351.0	.380	↓	Rebound
14.3	126.4	.343	↓	
5.5	48.6	.316	↓	
3.3	29.2	.298	↓	
2.2	19.5	.294	↓	
1.1	9.7	.283	↓	
0.11	0.9	.248		No Pressure on Ram

*Equal Zero Deflection

Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 16, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project: Waste Isolation Pilot Project, Bechtel Job No. 12484 — SHB Job No. LF79-3016

Location: Plant Site TP-3 @ Top of Gatuna — 12" Diameter Plate Test

Plate Load Test No. 7 — Plates + Ram = 0.092 Kips

Computed by: Robert M. Anderson — Date 3-21-79

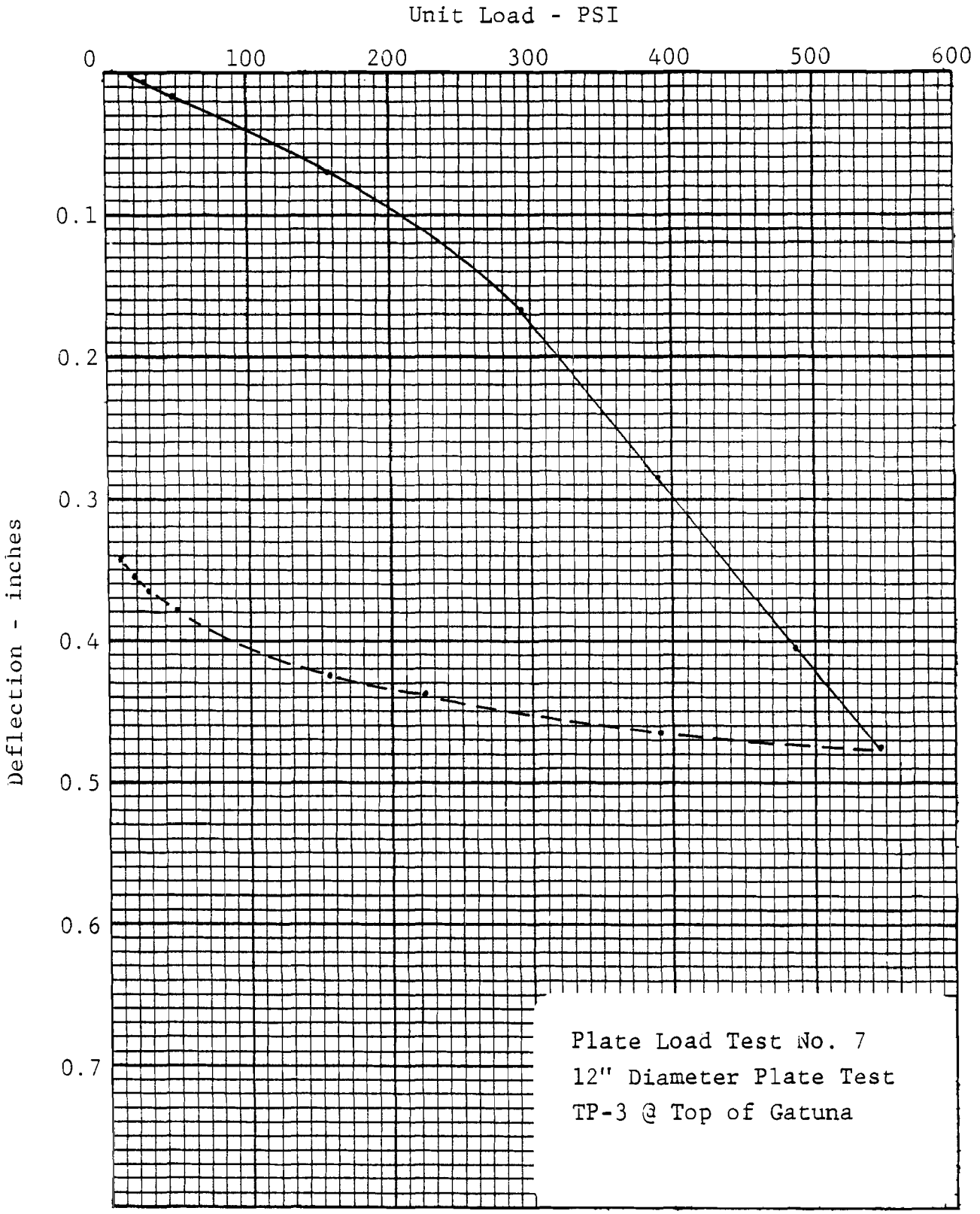
SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
1.1	9.7	.029*		
2.2	19.5	.003		
3.3	29.2	.006		
5.5	48.6	.017		
17.6	155.6	.070		
33.1	292.7	.168		
44.1	389.9	.283		
55.1	487.2	.403		
61.7	545.5	.473		
44.1	389.9	.464	↓	Rebound
25.3	223.7	.438	↓	
17.6	155.6	.423	↓	
5.5	48.6	.379	↓	
3.3	29.2	.364	↓	
2.2	19.5	.352	↓	
1.1	9.7	.341	↓	
0.09	0.8	.300		No Pressure on Ram

*Equal Zero Deflection

Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 21, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Plant Site - TP-3 @ 16' Top of Gatuna 12" Diameter Plate Test

Plate Load Test No. 8 Plates + Ram = 0.092 Kips

Computed by: Robert M. Anderson Date 3-21-79

SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
1.1	9.7	.019*		
2.2	19.5	.003		
3.3	29.2	.006		
5.5	48.6	.021		
18.7	165.3	.077		
33.1	292.7	.179		
44.1	389.9	.279		
56.2	496.9	.410		
61.7	545.5	.471		
44.1	389.9	.466	↓	Rebound
25.3	223.7	.446	↓	
17.6	155.6	.433	↓	
5.5	48.6	.405	↓	
3.3	29.2	.379	↓	
2.2	19.5	.371	↓	
1.1	9.7	.359	↓	
0.09	0.8	.324		No Pressure on Ram

*Equal Zero Deflection

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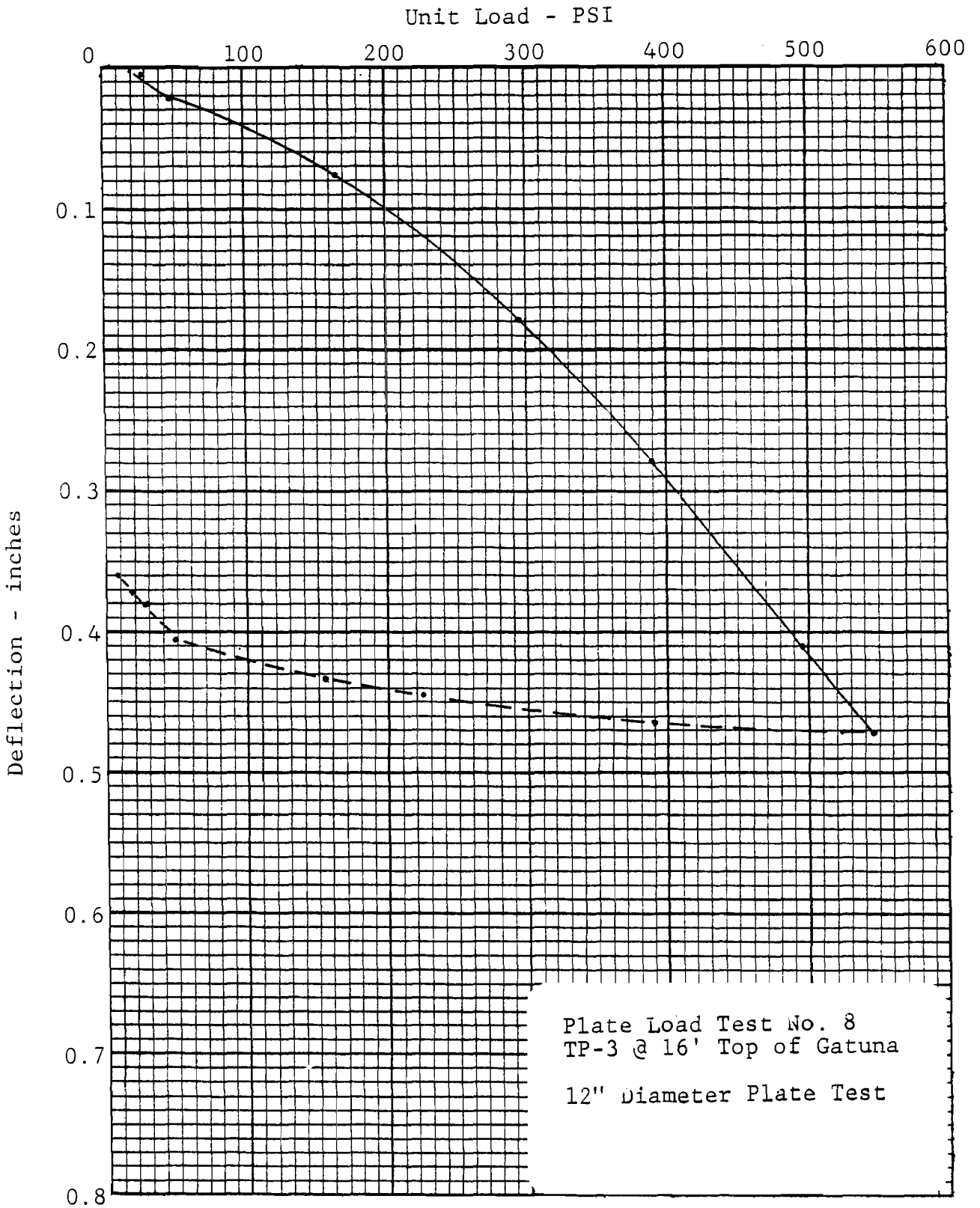
Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 21, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project: Waste Isolation Pilot Project
Bechtel Job No. 12484 — SHB Job No. LF79-3016

Location: Plant Site - TP-5 @ 3.8' — 30" Diameter Plate Test

Plate Load Test No. 1 (in sand) — Plates + Ram = 0.500 Kips

Computed by: Robert M. Anderson — Date 3-10-79

SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
1.1	1.5	.010*		
2.2	3.1	.003		
3.3	4.6	.012		
5.5	7.7	.034		
6.6	9.3	.041		
11.0	15.5	.085		
14.3	20.1	.124		
18.7	26.3	.167		
23.1	32.5	.225		
27.6	38.8	.293		
35.3	49.7	.454		
41.9	59.0	.689		
45.2	63.6	.879		
55.1	77.5	1.257		
41.9	59.0	1.264	↓	Rebound
27.5	38.7	1.254	↓	
18.7	26.3	1.245	↓	
9.9	13.9	1.229	↓	
7.7	10.8	1.222	↓	
3.3	4.6	1.205	↓	
2.2	3.1	1.197	↓	
1.1	1.5	1.186	↓	
0.5	0.7	1.157		No Pressure on Ram

*Equal Zero Deflection

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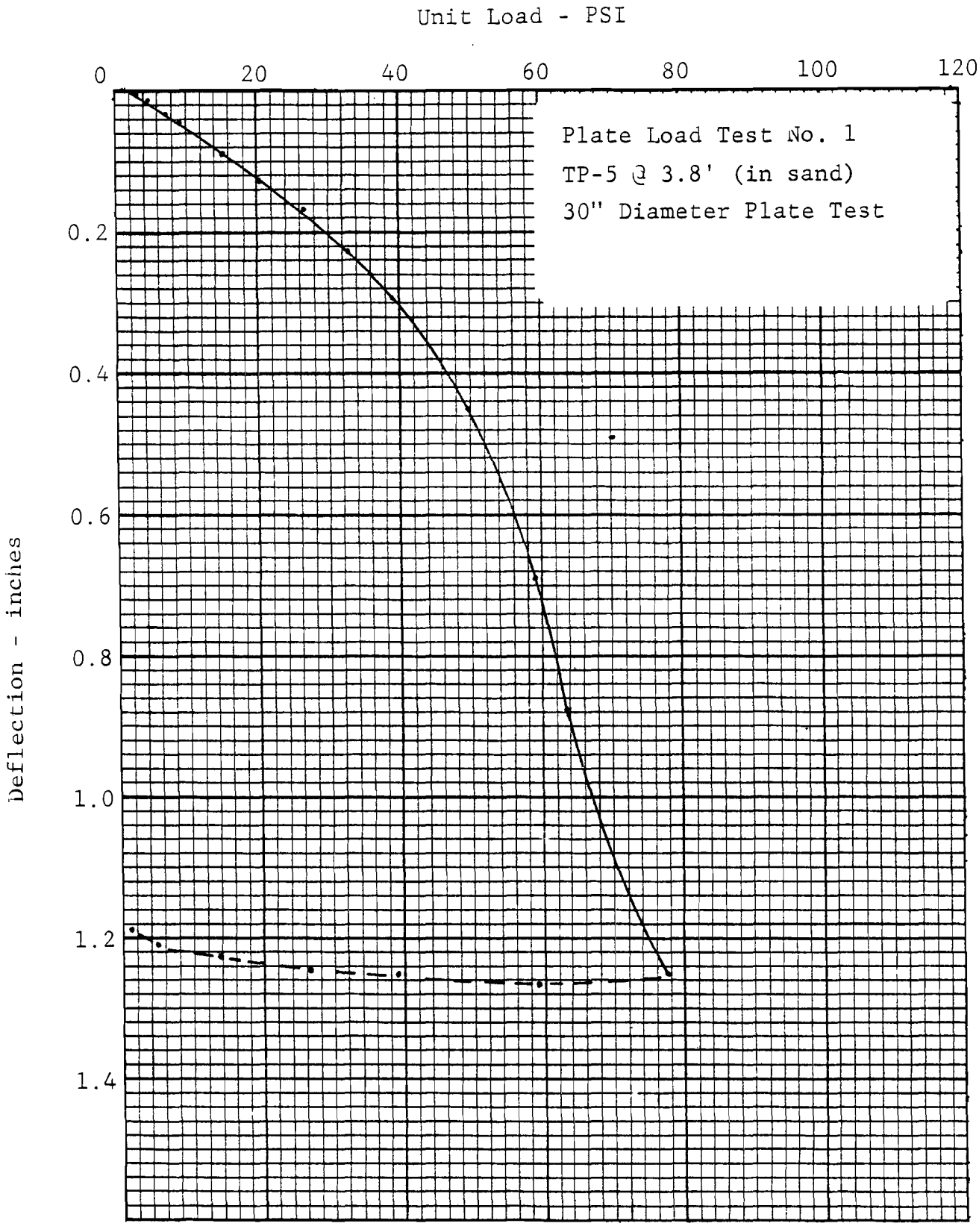
Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 10, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Test Trench TP-5 @ 3.6' 30" Diameter Plate Test

Plate Load Test No. 2 (in sand) Plates + Ram = 0.500 Kips

Computed by: Robert M. Anderson Date 3-11-79

SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
1.1	1.54	.010*		
2.2	3.1	.003		
3.3	4.6	.008		
4.4	6.2	.028		Next to Test - Field Density @ 3.5'
6.6	9.3	.051		Blk-1 (3.5'-4')
8.8	12.4	.064		
11.0	15.5	.086		
15.4	21.6	.137		
18.7	26.3	.176		
23.1	32.5	.227		
28.7	40.4	.320		
37.5	52.8	.489		
42.9	60.4	.675		
50.7	71.4	.933		
56.2	79.1	1.123		
41.8	58.8	1.126	↓	Rebound
27.5	38.7	1.108	↓	
18.7	26.3	1.091	↓	
9.9	13.9	1.061	↓	
7.7	10.8	1.053	↓	
3.3	4.6	1.023	↓	
2.2	3.1	1.010	↓	
1.1	1.5	.997	↓	
0.5	0.7	.953		No Pressure on Ram

*Equal Zero Deflection

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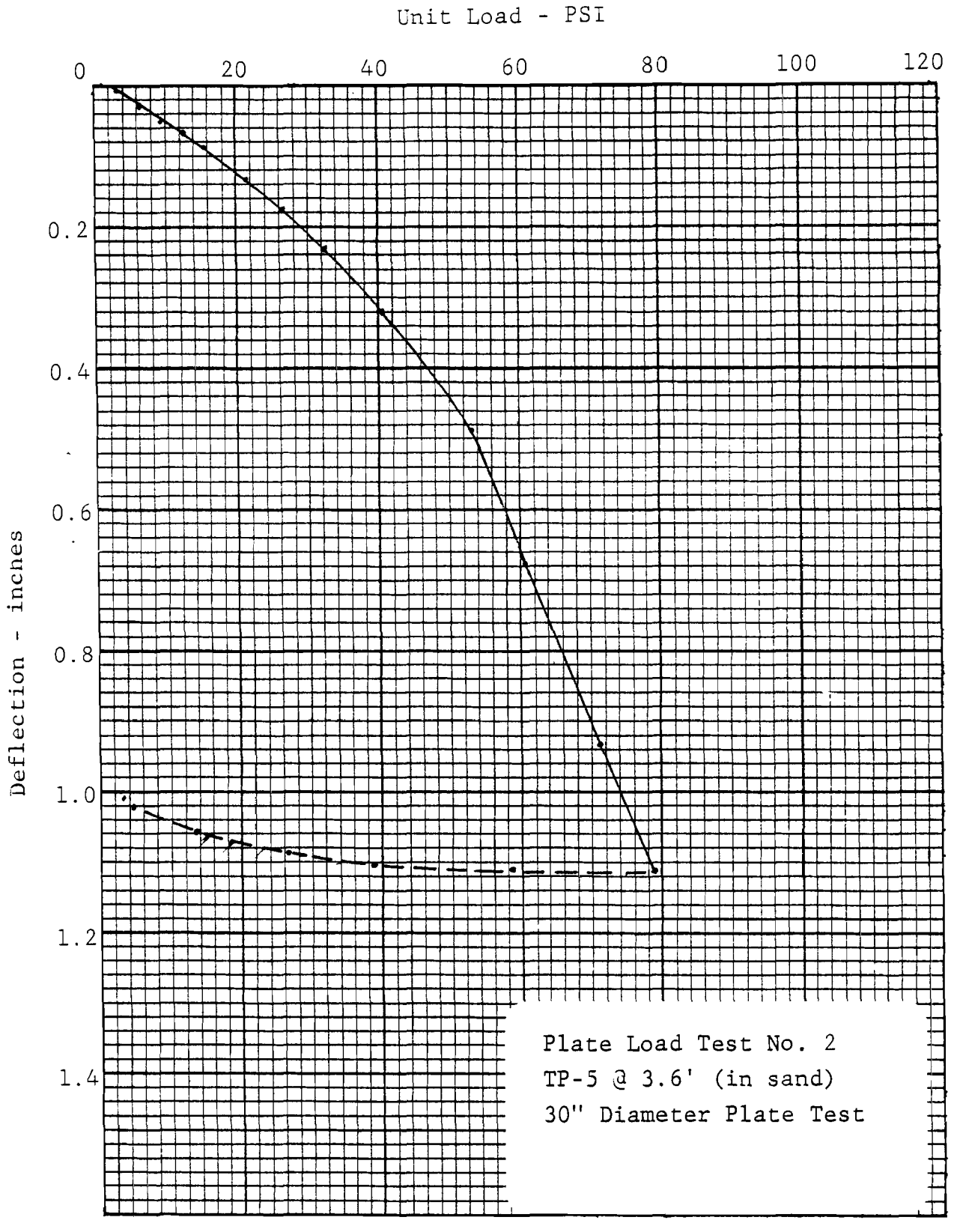
Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 11, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Plant Site - TP-5 @ 10.6' 12" Diameter Plate Test

Plate Load Test No. 3 (top of caliche) Plates + Ram = 0.092 Kips

Computed by: Robert M. Anderson Date 3-14-79

SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
1.1	9.7	.023*		
2.2	19.5	.005		
3.3	29.2	.012		
5.5	48.6	.024		
16.5	145.9	.112		
29.8	263.5	.316		
41.9	370.5	.585		
56.2	496.9	1.031		
39.7	351.0	1.030	↓	Rebound
17.6	155.6	.971	↓	
8.8	77.8	.969	↓	
5.5	48.6	.952	↓	
3.3	29.2	.935	↓	
2.2	19.5	.926	↓	
0.09	0.8	.869		No Pressure on Ram

*Equal Zero Deflection

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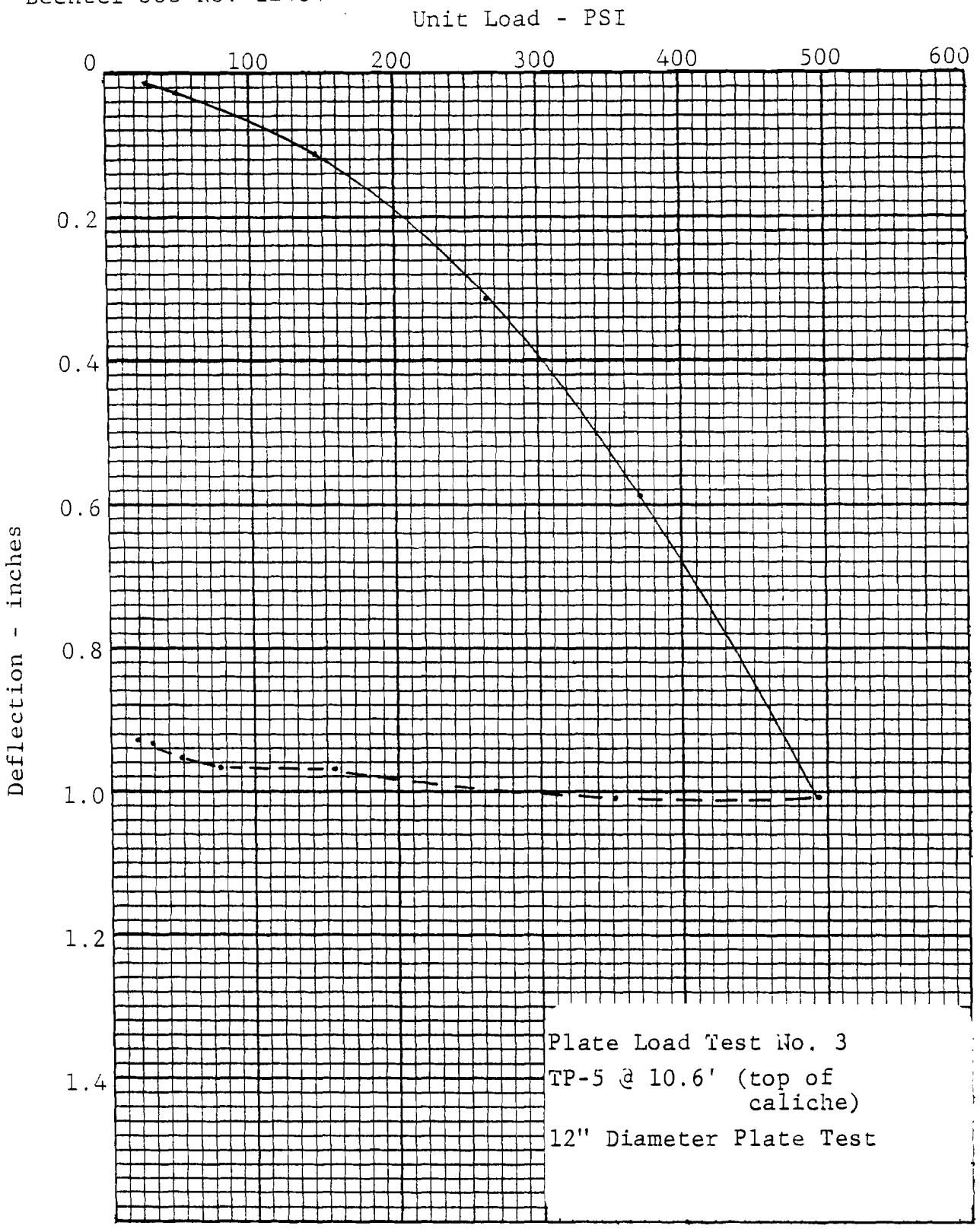
Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 14, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Plant Site - TP-5 @ 9.9' 12" Diameter Plate Test

Plate Load Test No. 4 (top of caliche) Plates + Ram = 0.092 Kips

Computed by: Robert M. Anderson Date 3-15-79

SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches	Remarks
1.1	9.7	.022*	
2.2	19.5	.002	
3.3	29.2	.004	
5.5	48.6	.013	
16.5	145.9	.042	
27.6	244.0	.073	
43.0	380.2	.128	
57.3	506.6	.213	
44.1	389.9	.208	↓ Rebound
27.6	244.0	.197	↓
16.5	145.9	.183	↓
5.5	48.6	.151	↓
3.3	29.2	.139	↓
2.2	19.5	.104	↓
1.1	9.7	.096	↓
0.09	0.8	.094	No Pressure on Ram

*Equal Zero Deflection

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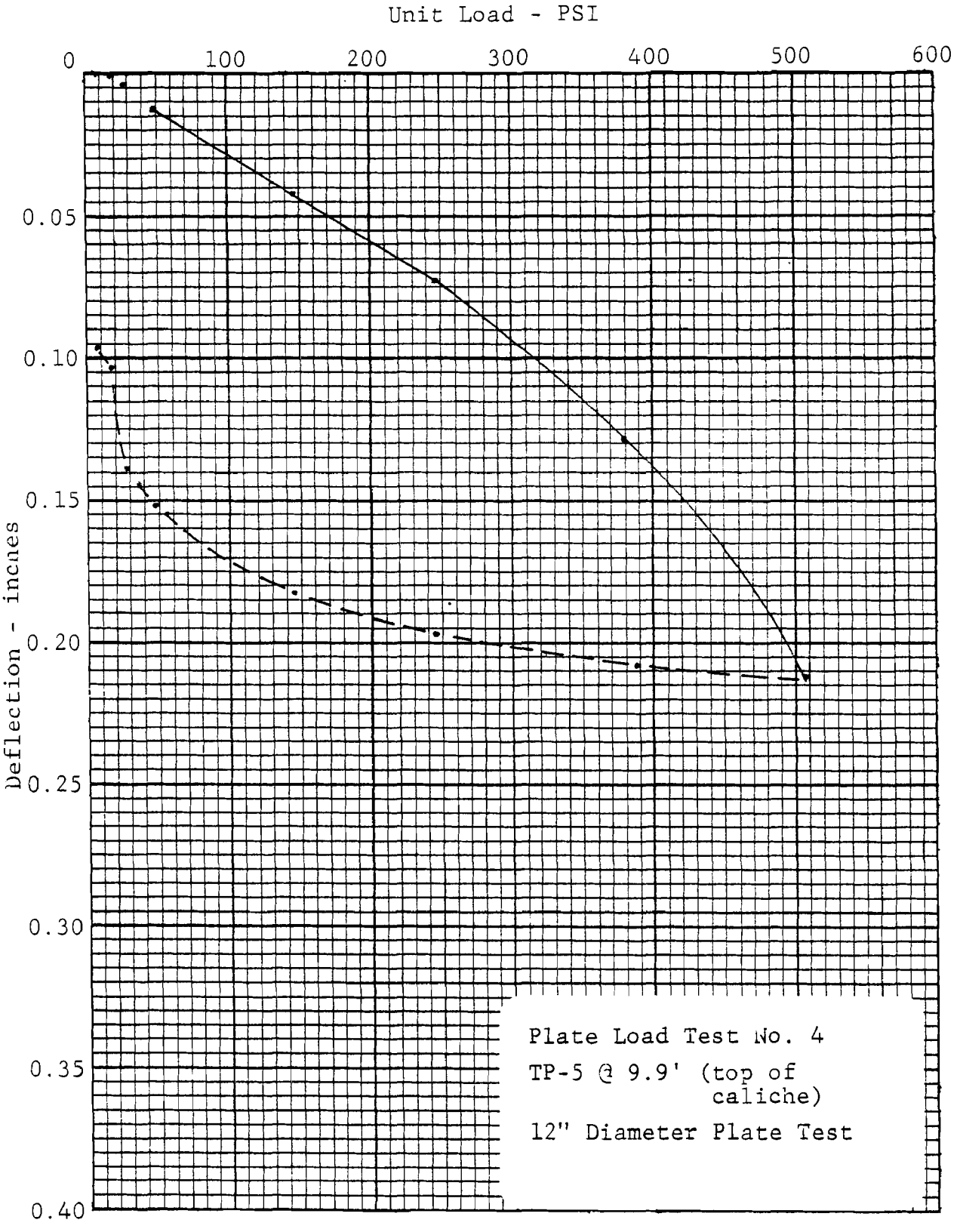
Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 15, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Plant Site - TP-5 @ 13.9' 12" Diameter Plate Test

Plate Load Test No. 5 (middle of caliche) Plates + Ram + Spacers = 0.100 Kips

Computed by: Robert M. Anderson Date 3-16-79

SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
1.1	9.7	.014*		
2.2	19.5	.001		
3.3	29.2	.002		
5.5	48.6	.007		
17.6	155.6	.034		
33.1	292.7	.094		
44.1	389.9	.149		
57.3	506.6	.229		
61.7	545.5	.267		
39.7	351.0	.259	↓	Rebound
17.6	155.6	.237	↓	
5.5	48.6	.205	↓	
3.3	29.2	.197	↓	
2.2	19.5	.193	↓	
1.1	9.7	.185	↓	
0.10	0.9	.148		No Pressure on Ram

*Equal Zero Deflection

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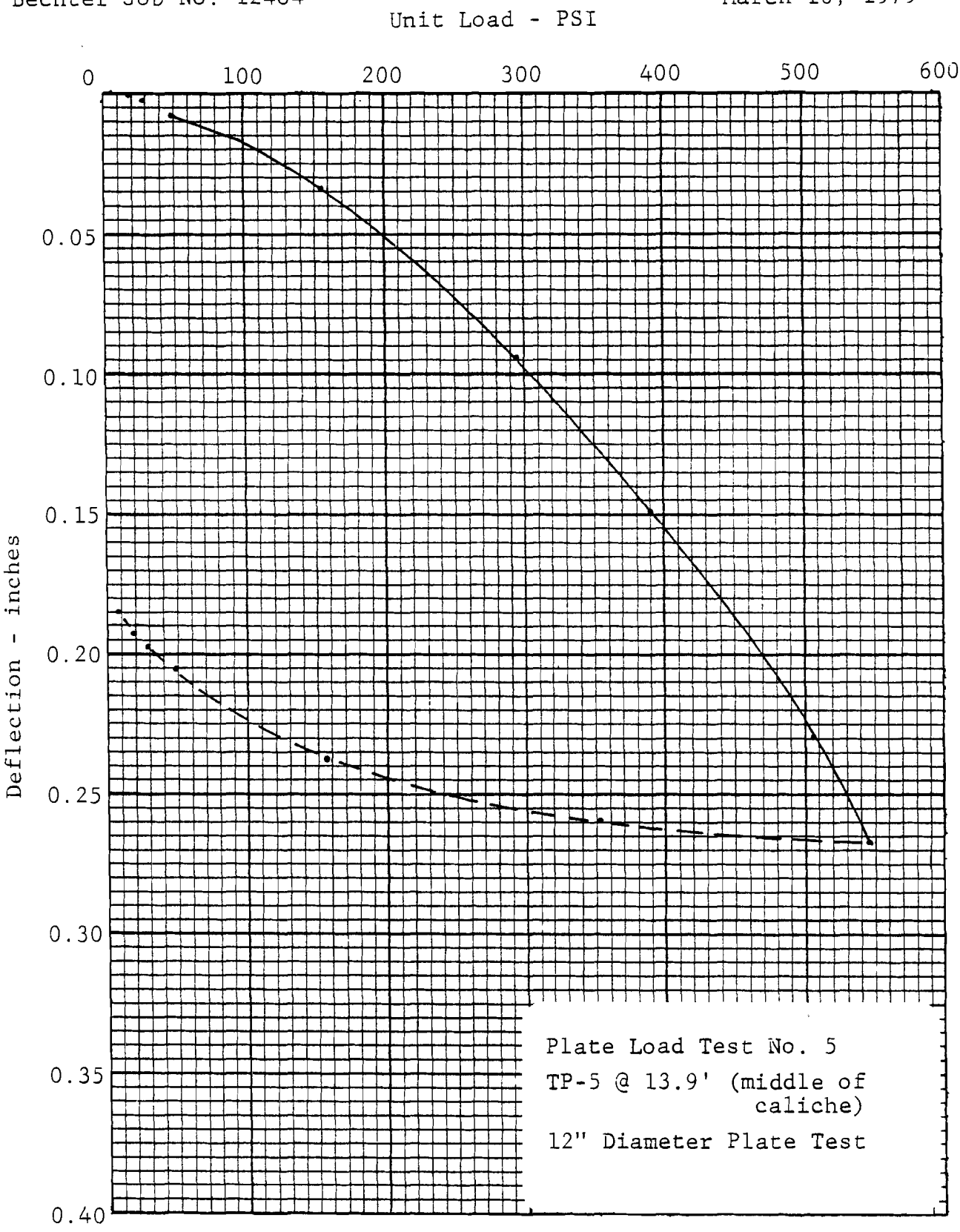
Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 16, 1979



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ASTM D1196 PLATE LOAD TESTS OF SOILS

Project Waste Isolation Pilot Project Bechtel Job No. 12484 SHB Job No. LF79-3016

Location Plant Site - TP-5 @ 13.9' 12" Diameter Plate Test

Plate Load Test No. 6 (middle of caliche) Plates + Ram + Spacers = 0.100 Kips

Computed by: Robert M. Anderson Date 3-17-79

SUMMARY OF RESULTS

Load Kips	Unit Load PSI	Deflection inches		Remarks
1.1	9.7	.018*		
2.2	19.5	.000		
4.4	38.9	.008		
6.6	58.4	.011		
17.6	155.6	.042		
33.1	292.7	.100		
44.1	389.9	.154		
57.3	506.6	.286 (.233)		
61.7 est.	545.5	.263		
38.6	341.3	.251	↓	Rebound
17.6	155.6	.226	↓	
5.5	48.6	.195	↓	
3.3	29.2	.186	↓	
2.2	19.5	.178	↓	
1.1	9.7	.157	↓	
0.10	0.9	.120		No Pressure on Ram

*Equal Zero Deflection

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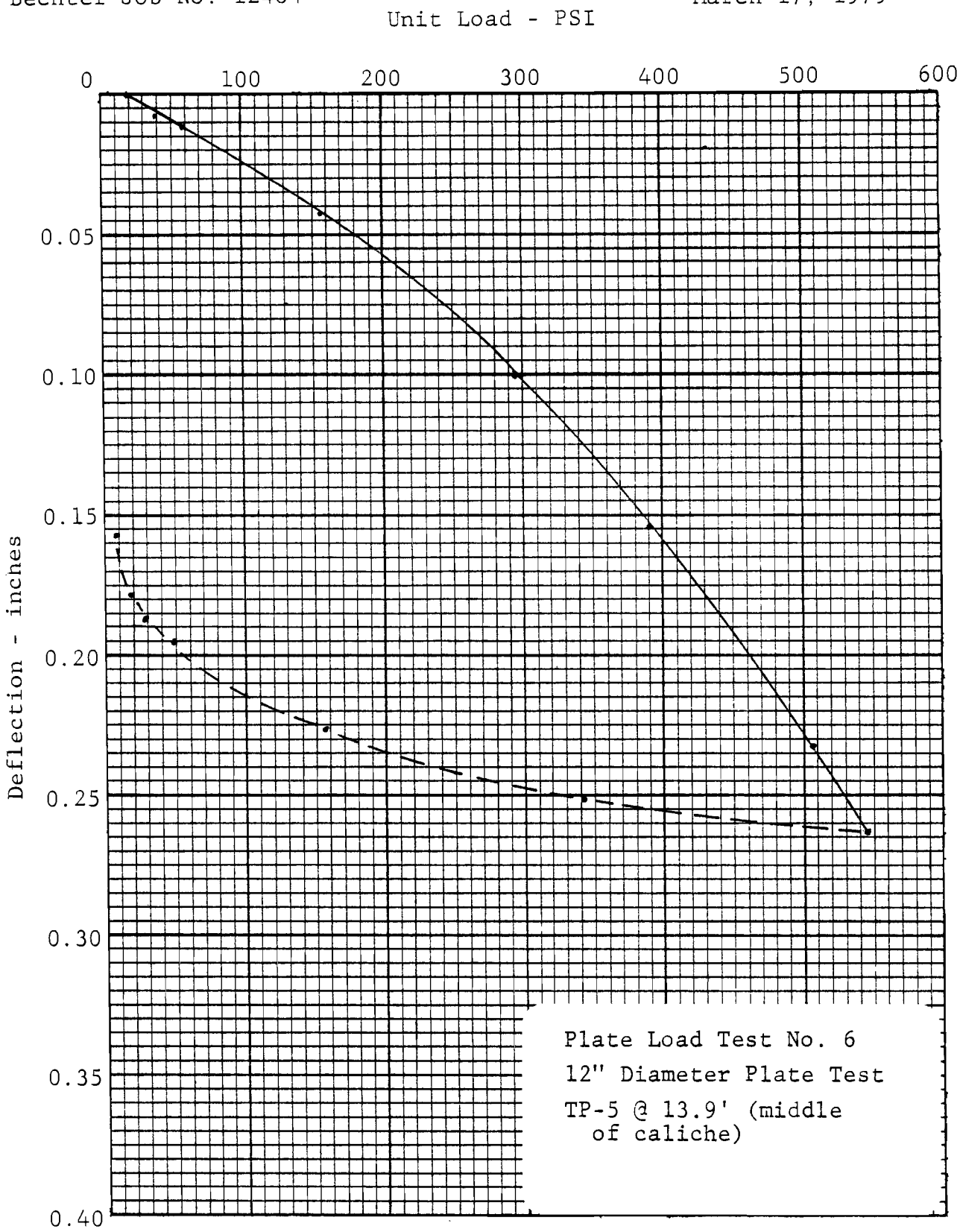
Waste Isolation Pilot Project
Bechtel Job No. 12484

SHB Job No. LF79-3016
March 17, 1979



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Section 2d

Field Density Tests

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

FIELD DENSITY TESTS
ASTM D1556

Location	Depth (ft.)	Density (pcf)	Moisture (%)
Plant site, 116 feet N, 55° E of Boring B-25 (undisturbed native soils)	3.0-3.5'	100.5	4.1
TP-1	0	101.5	3.6
	3.2	96.9	7.0
	8.6	91.3	18.7
	13.7	95.7	8.1
	21.0	104.5	5.7
TP-2	0	102.1	3.0
	3.5	110.0	7.2
	5.5	93.7	17.3
	10.5	103.3	13.7
TP-3	0	108.6	3.5
	3.2	115.5	3.6
	5.5	98.8	11.0
	6.0	96.2	12.8
	8.5	101.3	11.3
	9.2	109.5	5.7
	16.2	101.3	12.6
TP-4	0	107.3	3.6
	3.0	107.0	3.5
	7.5	94.0	13.2
	12.5	103.8	7.0
	29.5	114.6	7.0

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

FIELD DENSITY TESTS

ASTM D1556

Location	Depth (ft.)	Density (pcf)	Moisture (%)
TP-5	0	98.2	3.3
	3.5	108.9	3.4
	9.9	96.9	11.9
	10.6	102.3	11.5
	13.9	111.6	5.1
	20.9	105.3	7.4

Section 2e

Field Resistivity Tests

Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

Date: March 11, 1979

FIELD RESISTIVITY SURVEY

Test No.	Location	Reading - Ohms	Distance	Resistivity (Ohms/CM^3)
R - 1 (a)	South Side of Waste	0.12×10^2	5'	11,490
R - 1 (b)	Handling Building	0.065×10^2	10'	12,448
R - 2 (a)	Emergency Generator	0.405×10^2	5'	38,781
R - 2 (b)	Building - West Side	0.11×10^2	10'	21,066
R - 3 (a)	Warehouse - Shops	0.145×10^2	5'	13,884
R - 3 (b)	Building - Northwest Cor.	0.056×10^2	10'	12,448
R - 4 (a)	Vehicle Maintenance	0.30×10^2	5'	28,726
R - 4 (b)	Building - South Side	0.08×10^2	10'	15,321
R - 5 (a)	Administration	0.47×10^2	5'	45,005
R - 5 (b)	Building - East Side	0.09×10^2	10'	17,236
R - 6 (a)	Sewerage Pump	0.20×10^2	5'	19,151
R - 6 (b)	House - North Side	0.065×10^2	10'	12,448

Section 3

Laboratory Tests

Plant Site
Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

The laboratory tests reported in Section 3 were performed in accordance with the following standards:

American Society for Testing and Materials:

ASTM D421-58(1972)	- Dry Preparation of Soil Samples for Grain-Size Analysis and Determination of Soil Constants
ASTM D422-63(1972	- Particle Size Analysis of Soils
ASTM D423-66(1972)	- Liquid Limit of Soils
ASTM D424-59(1971)	- Plastic Limit and Plasticity Index of Soils
ASTM D854-58(1972)	- Specific Gravity of Soils
ASTM D1557-(1970)	- Moisture-Density Relations of Soils, Using 10 lb. Rammer and 18 in. Drop
ASTM D2049-(1969)	- Relative Density of Cohesionless Soils
ASTM D2216-(1971)	- Laboratory Determination of Moisture Content of Soil
ASTM D2434-68(1974)	- Permeability of Granular Soils (Constant Head)
ASTM D2435-(1970)	- One Dimensional Consolidation Properties of Soils
ASTM D2487-69(1975)	- Classification of Soils for Engineering Purposes

California Highway Department Test Procedures:

TP 643, Part 4	- Laboratory Method of Determining Minimum Resistivity
TP 643, Part 3	- Method of Determining PH of Soil
TP 417	- Method of Testing Soils and Waters for Sulfate Content
TP 422	- Method of Testing Soils and Waters for Chloride Content

Section 3a

Sieve and Hydrometer Analysis,
Atterberg Limits, and Moisture
Content Determination

SUMMARY OF SOIL TEST RESULTS

Job No. E78-1135

ASTM D422 - Sieve Analysis
ASTM D423 - Liquid Limit
ASTM D424 - Plasticity Index
ASTM D2216 - Moisture Content

Project Waste Isolation Pilot Plant

Material

Source

HOLE NO	SAMPLE NO.	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS – ACCUM. % PASSING											Mois. (%)	LAB. NO.
						200	100	40	16	10	4	¼	⅜	¾	1	1½		
B-1	BL-1	0 -9'				12	33	99		100								35-45
B-2	S-1	1 -2½'				8	27	97		100								35-1
B-2	S-2	4 -5½'	SM	22	NP	22	39	97		100							12	35-2
B-2	S-4	9 -10½'	SM	31	NP	29	44	76		91	98		100				5	35-3
B-3	S-1	1 -2½'				7	26	98		100							3	35-24
B-3	S-3	7'10"-8'9"	SM	NV	NP	33	40	61		76	94		100				19	35-25
B-4	P-1	3 -5'	SM			13	33	98		100								35-1
B-4	S-2	5 -6½'	SM	NV	NP	14	33	97		100							6	35-32
B-4	S-5	19½-21'				31	44	87		97	100						7	35-33
B-4	P-3	21'6"-22'				21	33	85		94	98		98	100				35-2
B-5	BL-1	0 -8'				17	35	97		100								35-37
B-5	S-2	4½-6'				24	42	97		100							15	35-26
B-5	S-3	8'2"-9'10"	SM	25	NP	41	51	90		95	99		100				10	35-27
B-6	BL-1	0 -4'				13	34	98		100								35-46
B-6	S-1	1 -2½'	SM	NV	NP	12	29	97		100							3	35-34

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TABULATION OF TEST RESULTS

Job No. E78-1135

ASTM D422 - Sieve Analysis
ASTM D423 - Liquid Limit
ASTM D424 - Plasticity Index
ASTM D2216 - Moisture Content

Project Waste Isolation Pilot Plant

Material

Source

HOLE NO	SAMPLE NO.	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS – ACCUM. % PASSING											Mois (%)	LAB. NO.
						200	100	40	16	10	4	¼	⅜	¾	1	1½		
B-7	S-3	9 -10½'	SM	42	NP	25	41	80		88	97		99	100			12	35-4
B-8	BL-1	0 -6'				10	33	98		100								35-47
B-9	BL-1	0 -4'				10	29	96		100								35-38
B-9	S-1	1 -2½'				11	29	97		100							3	35-28
B-9	S-3	14-15½'	SM	36	NP	23	42	89		95	98		99	100			11	35-29
B-10	BL-1	0 -6'				12	21	98		100								35-39
B-10	S-2	4½-6'	SM	NV	NP	25	44	97		100							14	35-30
B-10	S-5	15'11½"-17'3"	SM	36	NP	27	40	78		89	99		99	100			12	35-31
B-11	S-1	1 -2½'				17	34	97		100								35-35
B-11	S-3	9 -10½'				28	40	74		88	99		100				15	35-36
B-12	P-2	3 -5'				16	35	98		99	100							35-3
B-13	BL-3	0 -7'	SM	NV	NP	16	33	98		100								35-23
B-13	BL-3	0 -7'				11	30	98		100								35-40
B-13	S-1	1 -2½'				8	25	98		100							2	35-22
B-15	S-1	1 -2½'				9	30	98		100								35-5

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TABULATION OF TEST RESULTS

Job No. E78-1135

ASTM D422 - Sieve Analysis
ASTM D423 - Liquid Limit
ASTM D424 - Plasticity Index
ASTM D2216 - Moisture Content

Project Waste Isolation Pilot Plant

Material

Source

HOLE NO	SAMPLE NO.	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS – ACCUM. % PASSING											Mois. (%)	LAB. NO.
						200	100	40	16	10	4	¼	⅜	¾	1	1½		
B-15	S-3	5½-7'				13	33	98		100							4	35-6
B-15	S-6	14-15½'	SM	NV	NP	24	41	81		88	99		100				12	35-7
B-15	S-7	19'-19'11½"	SM	31	NP	28	47	92		100							8	35-8
B-17	BL-1	0 -4'				15	31	97		100								35-41
B-18	BL-1	0 -3'				10	27	97		100								35-42
B-19	S-1	1 -2½'	SM-SP	NV	NP	9	31	97		100							7	35-9
B-19	S-3	9 -9'11"	SM	NV	NP	37	49	76		95	100						11	35-10
B-20	BL-1	0 -3'				9	24	97		100								35-21
B-20	BL-1	0 -3'				10	29	98		100								35-43
B-20	P-1	3 -5'				10	36	98		100								35-73
B-21	S-1	1 -2½'				11	34	98		100							4	35-11
B-21	S-3	8 -8'8"	SM	NV	NP	24	42	92		97	99		100				10	35-12
B-21	S-4	14-15½'				33	43	66		78	88		93	100				35-13
B-21	S-6	24-25'5½"				19	38	96		99	99		100				5	35-14
B-22	BL-1	0 -3'				11	29	97		100								35-19

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Job No. E78-1135

ASTM D422 - Sieve Analysis
ASTM D423 - Liquid Limit
ASTM D424 - Plasticity Index
ASTM D2216 - Moisture Content

Project Waste Isolation Pilot Plant

Material

Source

HOLE NO	SAMPLE NO.	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS – ACCUM. % PASSING											Mois. (%)	LAB. NO.
						200	100	40	16	10	4	¼	⅜	¾	1	1½		
B-22	BL-1	0 -3'				12	31	98		100								35-44
B-22	P-1	3 -5'				15	30	98		99	100							35-6
B-22	S-2	5'2"-6'8"	SC	29	9	29	41	97		99	99		100				11	35-20
B-23	P-2	3 -5'				15	29	97		99	99		100					35-7
B-23	S-6	10'-10'11½"	SM	24	NP	29	46	92		98	100						9	35-15
B-24	S-1	1 -2½'				9	27	97		100								35-16
B-24	S-3	5 -6½'	SM	25	NP	32	44	77		88	94		98	100			16	35-17
B-24	S-6	14-14'5½"															12	35-18
B-26	BL-1	0 -3'				9	29	97		100								35-48
B-27	BL-1	3 -4'				16	35	97		100								35-49
B-28	BL-1	0 -4'				9	31	97		100								35-50
B-29	BL-1	0 -6'				8	28	97		100								35-51
B-30	BL-1	0 -4'				10	32	99		100								35-52
B-31	BL-1	0 -4'3"				11	33	97		100								35-53
B-32	BL-1	0 -10'				36	52	99		100								35-54

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TABULATION OF TEST RESULTS

Job No. E78-1135

ASTM D422 - Sieve Analysis
ASTM D423 - Liquid Limit
ASTM D424 - Plasticity Index
ASTM D2216 - Moisture Content

Project Waste Isolation Pilot Plant

Material

Source

HOLE NO	SAMPLE NO.	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS -- ACCUM. % PASSING											Mois. (%)	LAB. NO.
						200	100	40	16	10	4	1/4	3/8	3/4	1	1 1/2		
B-33	BL-1	0 -6'				9	31	98		100								35-55
B-34	BL-1	0 -6'				11	29	97		100								35-56
B-35	BL-1	0 -5'				12	35	98		100								35-57
B-36	BL-1	0 -3'6"				11	32	98		100								35-58
B-37	BL-1	0 -3'				9	28	98		100								35-59
B-37A	BL-1	0 -3'				11	32	98		99	100							35-60
B-38	BL-1	0 -3'6"				11	31	96		100								35-61
B-39	BL-1	0 -7'				12	32	98		100								35-62
B-40	BL-1	0 -4'				11	30	98		100								35-63

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TABULATION OF TEST RESULTS

Job No. E78-1135

ASTM D422 - Sieve Analysis

Project Waste Isolation Pilot Plant

Material

Source

HOLE NO.	LOCATION	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS – ACCUM. % PASSING												LAB. NO.
						200	100	40	16	10	4	¼	⅜	¾	1	1½	2	
TP-1	BLK 1	3.2-3.7'				10	30	99		100								Phx.-9
TP-2	BLK 1	3.0-3.5'				13	33	97		100								Phx.-10
TP-2	BLK 2	5.5-6.0'				21	30	49		59	83		95	100				35-69
TP-2	BLK 3	11.0-11.5'				15	30	65		70	96		99	100				35-70
TP-3	BLK 1	3.2-3.7'				19	39	98		100								Phx.-11
TP-4	BLK 1	3.0-3.5'				9	30	98		100								Phx.-12
TP-4	BLK 2	7.5-8.0'				21	46	99		100								Phx.-13
TP-4	BLK 3	13.5-14.0'				14	24	46		54	69		81	100				35-71
TP-4	BLK 4	29.5-30.0'				13	27	64		69	89		95	100				35-72
TP-5	BLK 1	3.5-4.0'				11	33	98		100								Phx.-14

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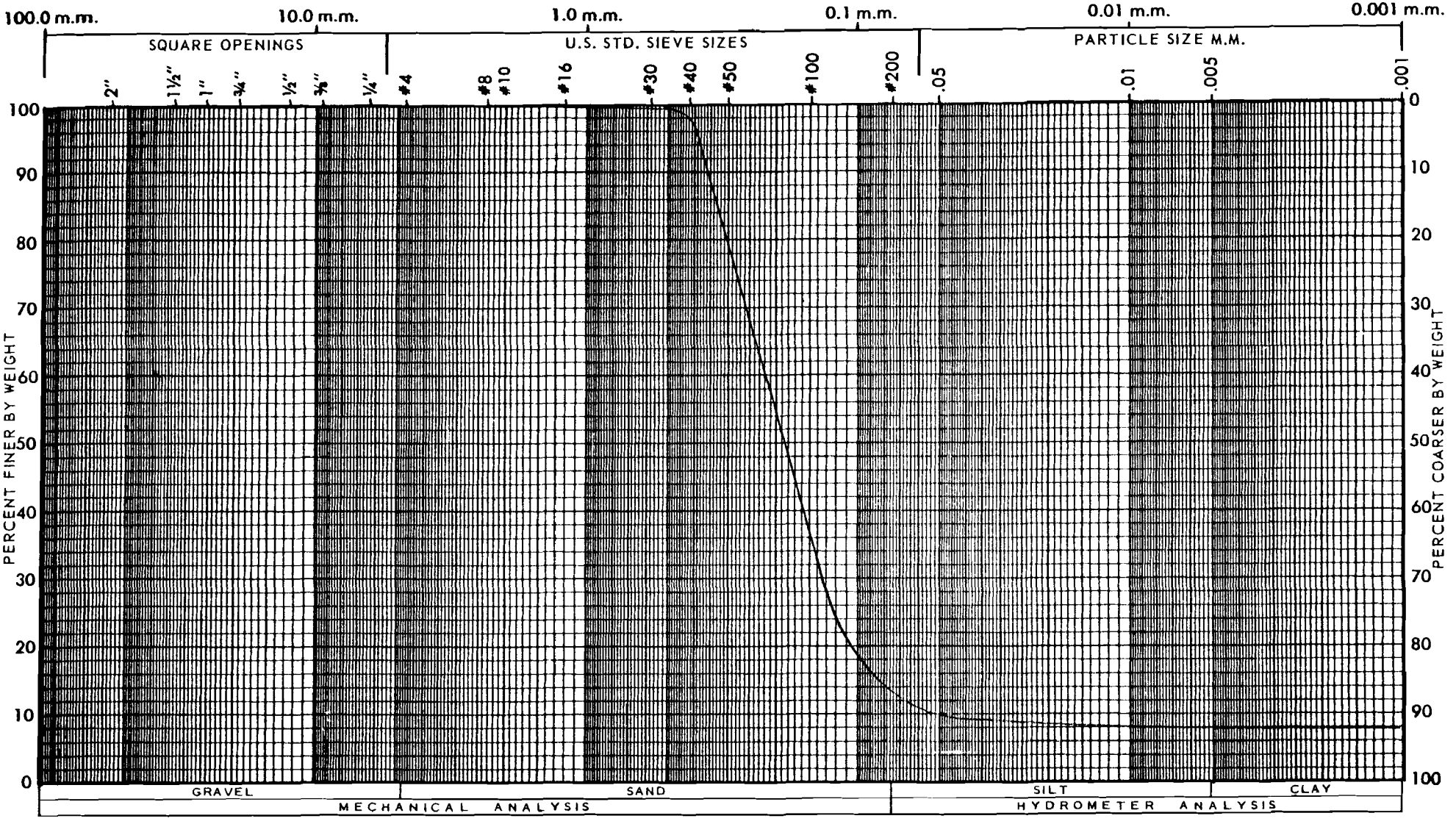
JOB NO. 78-[illegible]5

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-1 @ 0-9' (BL-1)					35-45

ASTM D854
Sp. Gr. = 2.585

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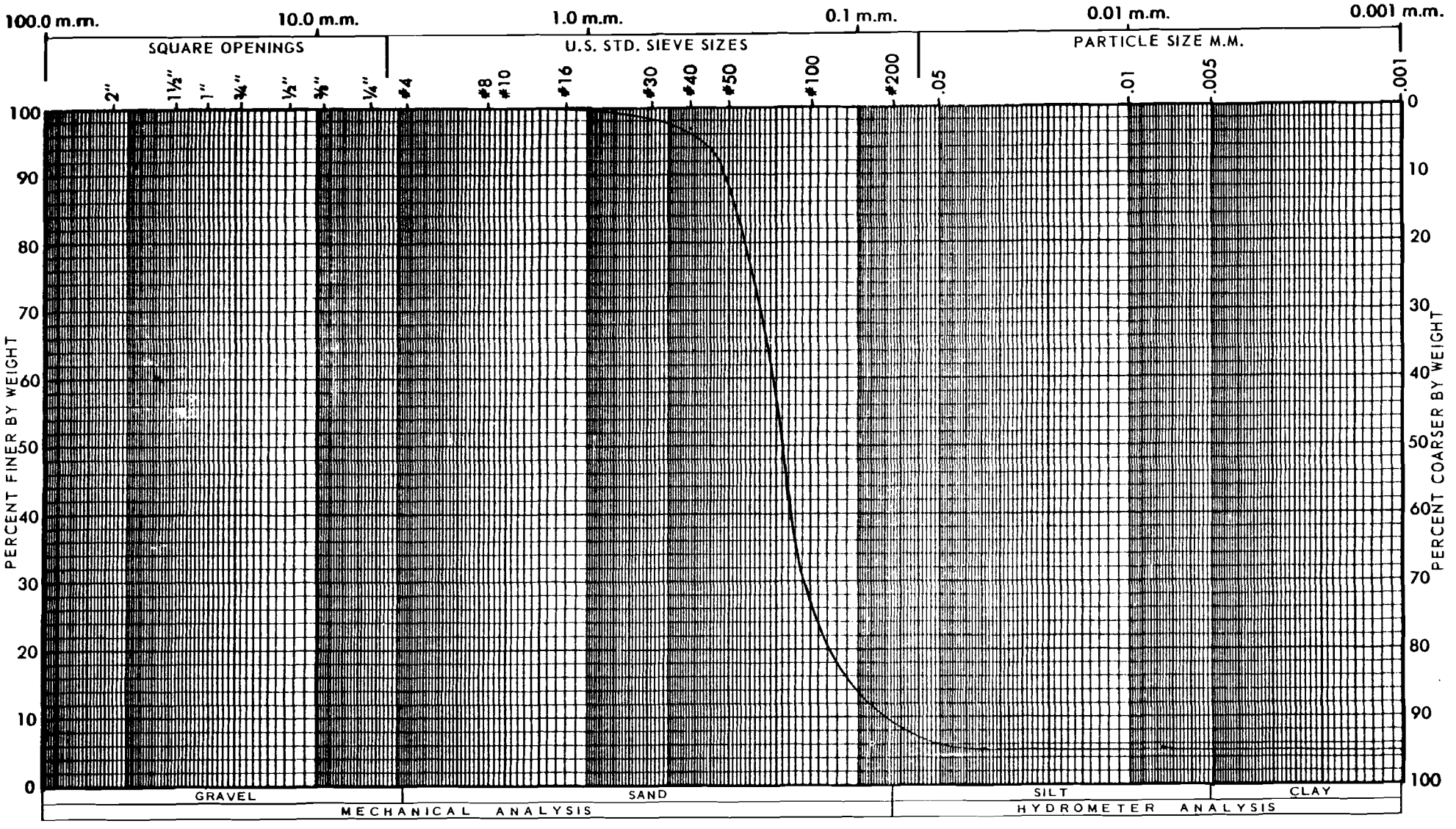
JOB NO. 78- 5

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-2 @ 1-2½' (S-1)					35-1

ASTM D854
Sp. Gr. = 2.629

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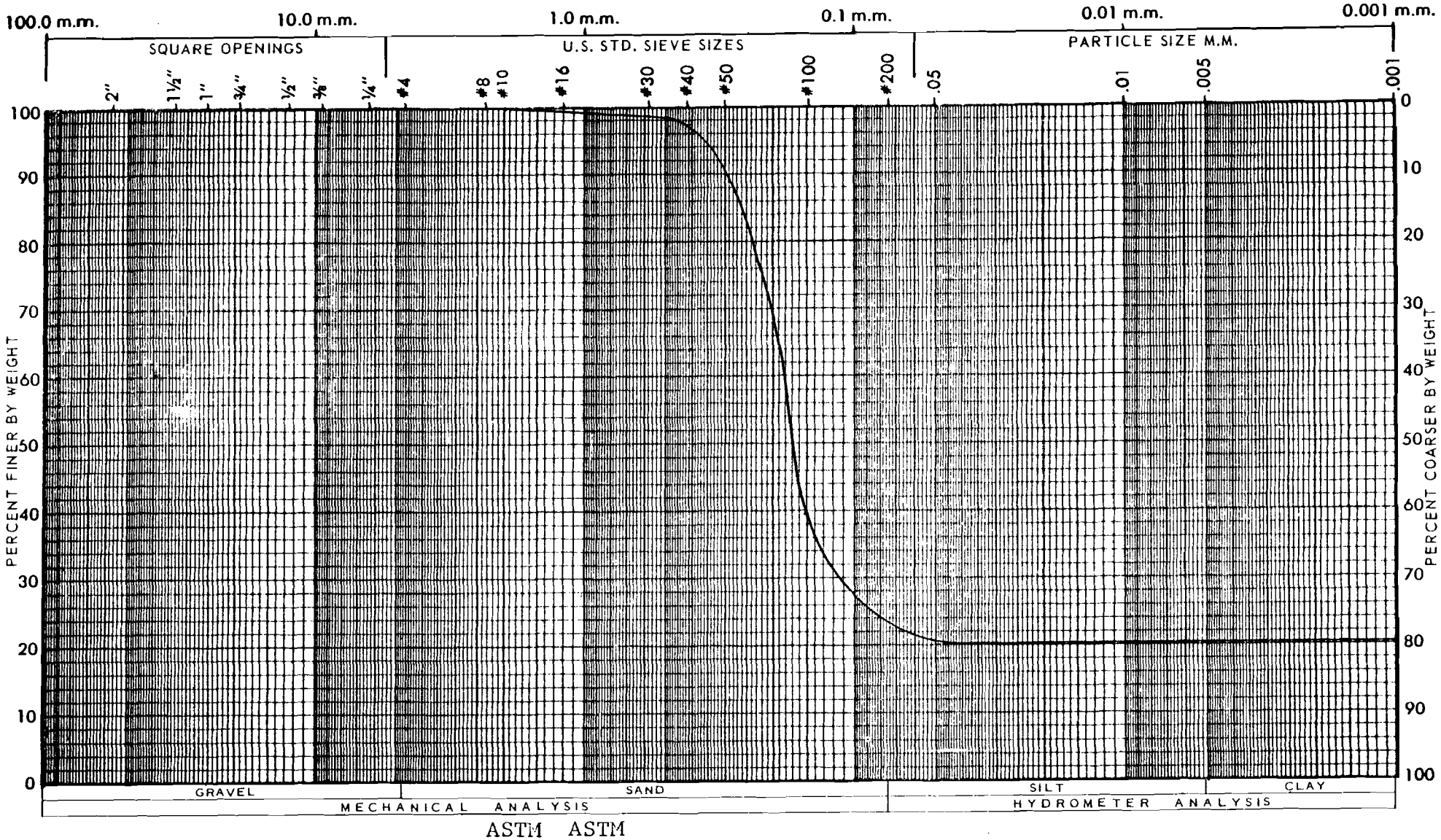
JOB NO. 78-[illegible]5

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT (ASTM D423)	PLASTICITY INDEX (ASTM D424)	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-2 @ 4-5½' (S-2)	22	NP		SM	35-2

ASTM D854
Sp. Gr. = 2.470

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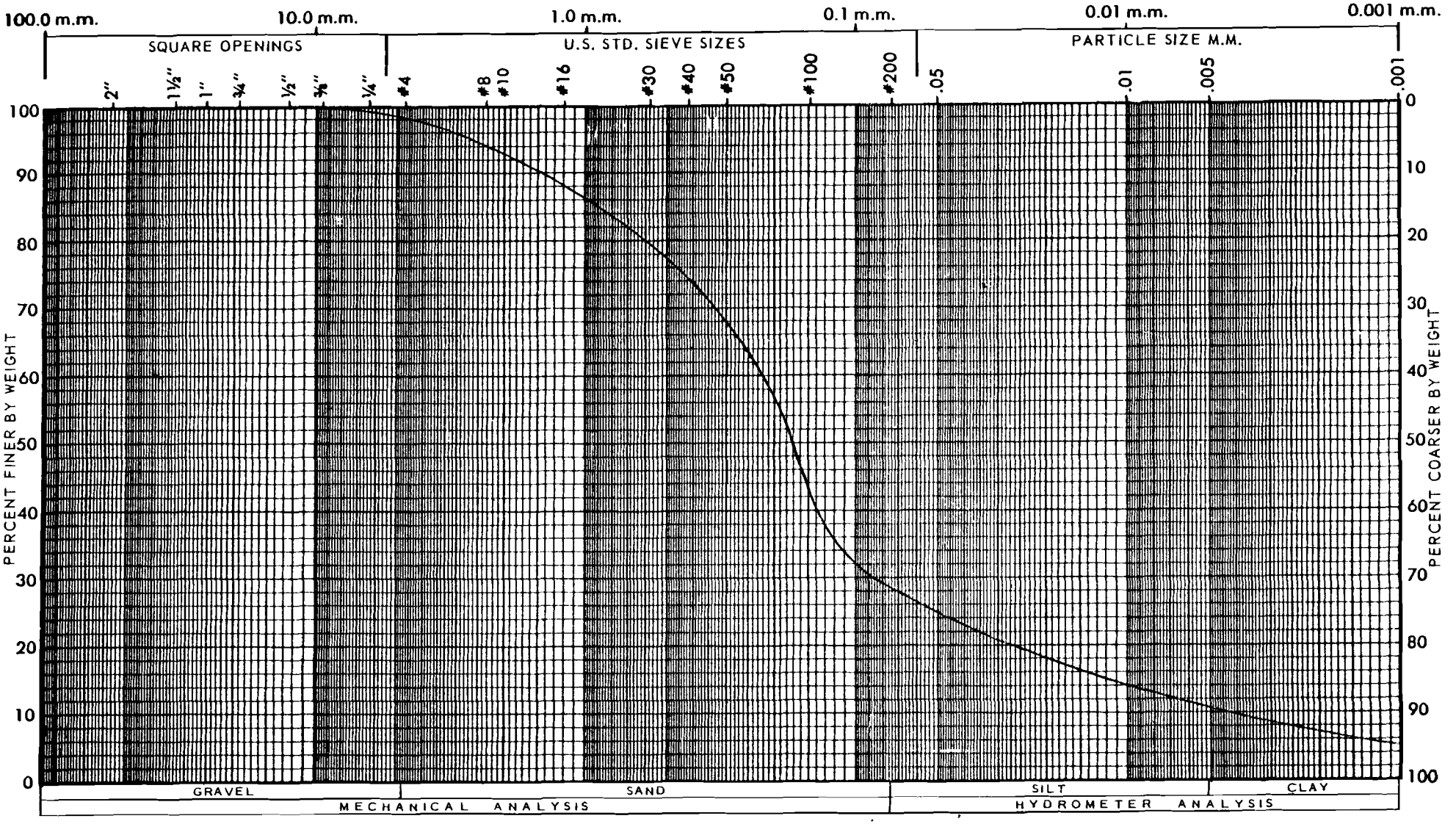
JOB NO. 28-1[illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	ASTM D423 LIQUID LIMIT	ASTM D424 PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-2 @ 9-10½'(S-4)	31	NP		SM	35-3

ASTM D854
Sp. Gr. 2.649

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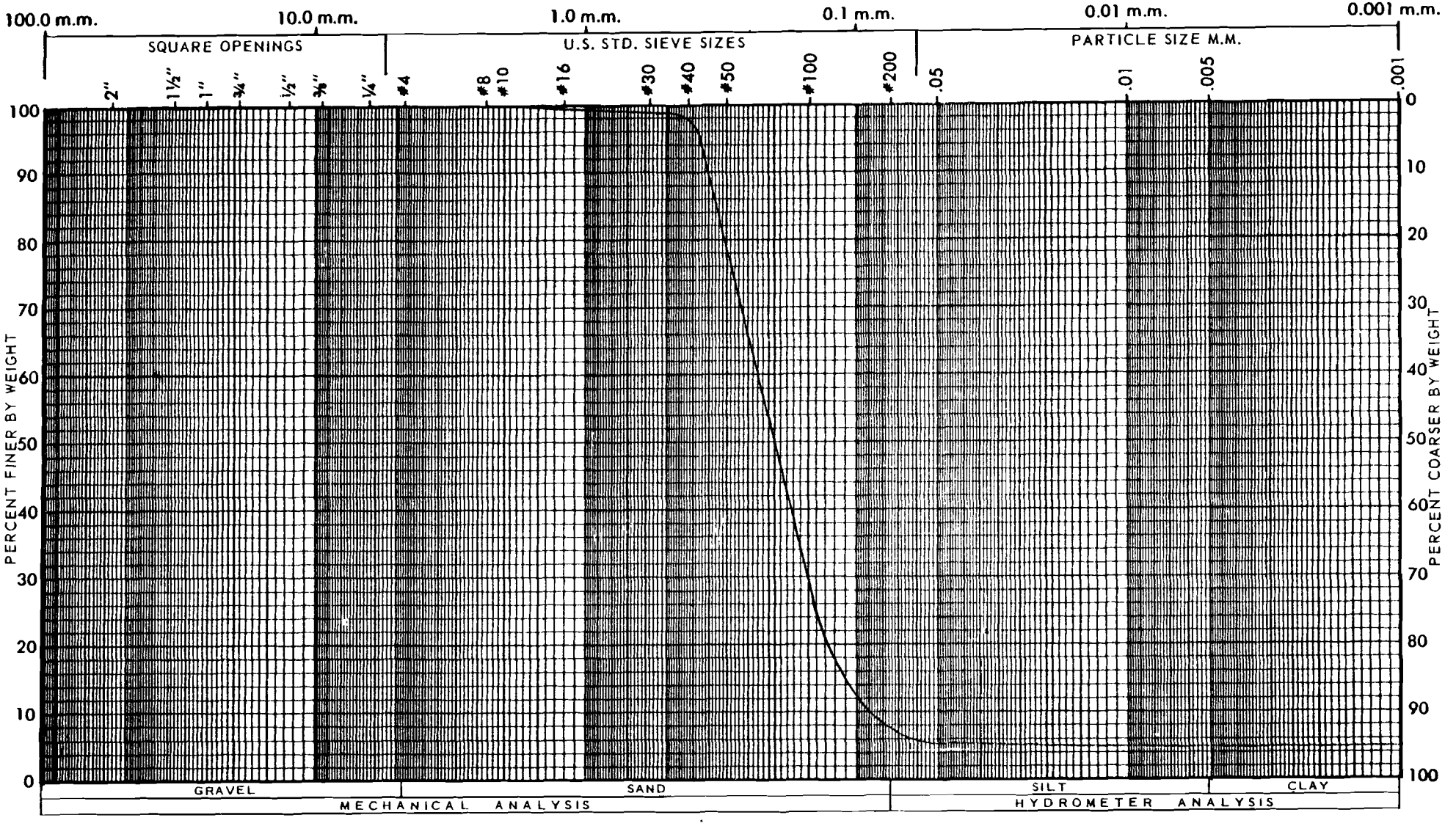
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-3 @ 1-2½' (S-1)					35-24

ASTM D854
Sp. Gr. = 2.651

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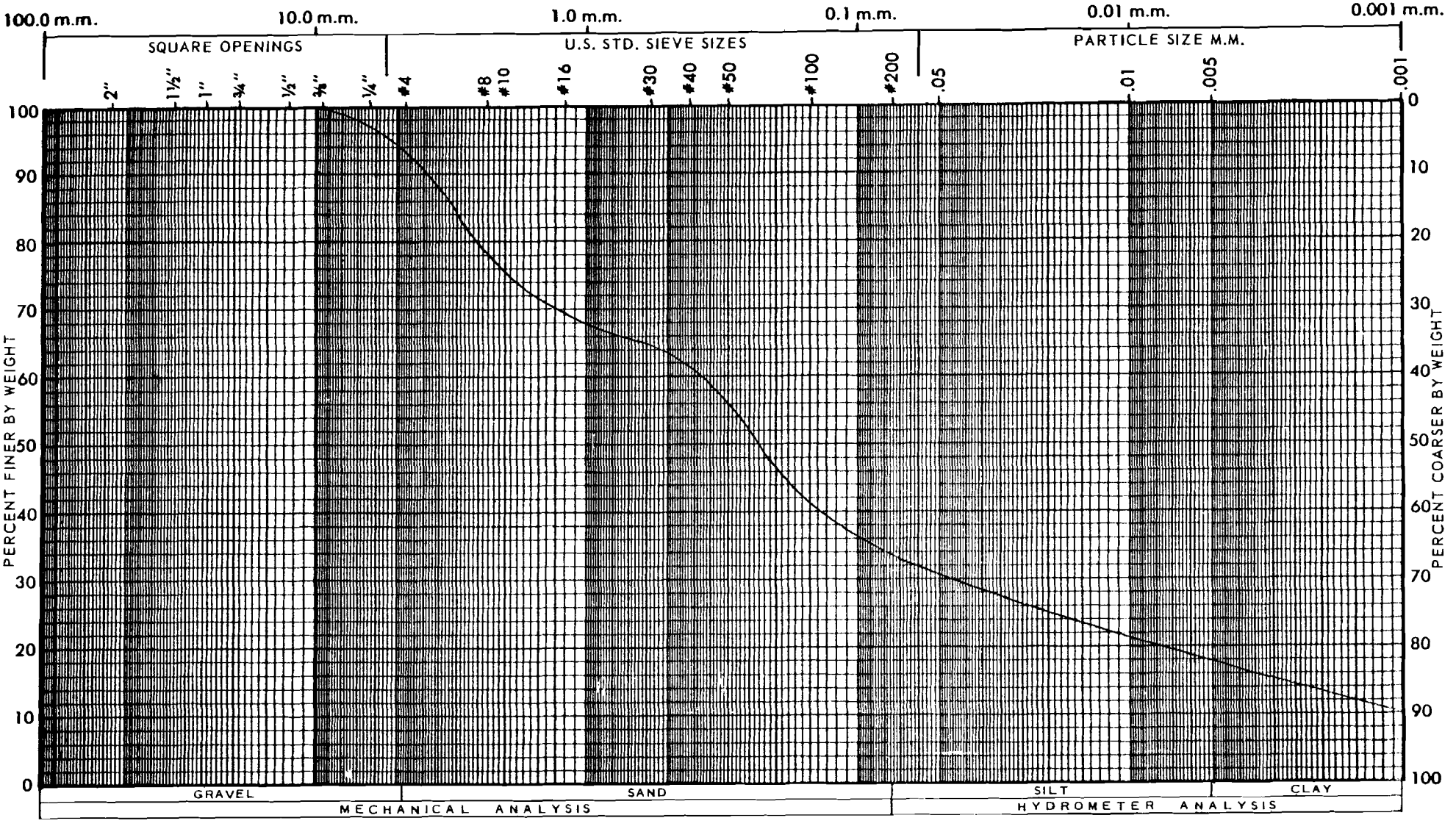
JOB NO. [illegible]3-1[illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	ASTM D423 LIQUID LIMIT	ASTM D424 PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-3 @ 7'10"-8'9"	NV	NP		SM	35-25
	(S-3)					

ASTM D854
Sp. Gr. 2.783

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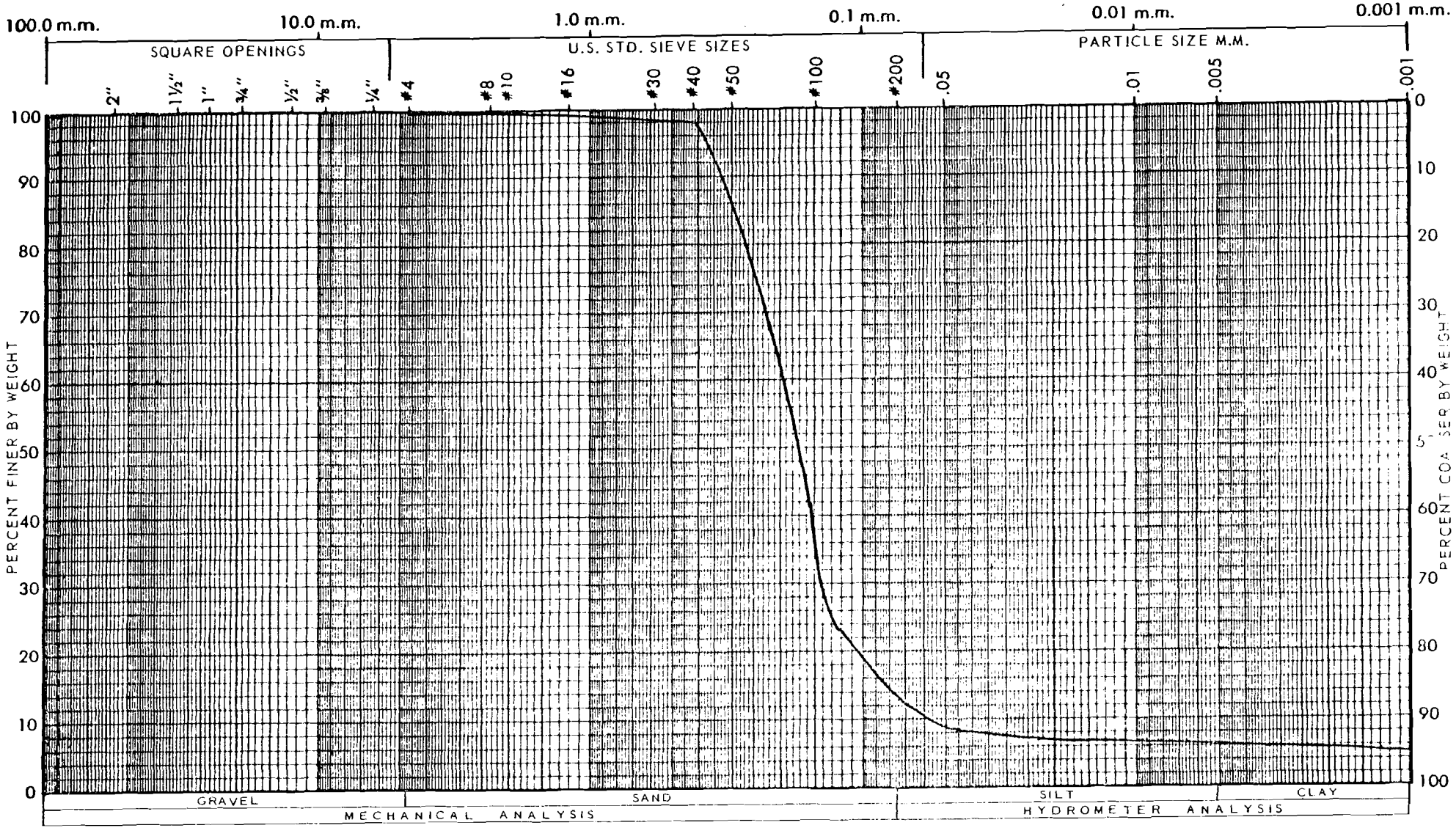
3 NO. 78-1125

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Tube cut 3'11" to 4'4"					
	B-4 P1 @ 3'-5'				SM	1135-1
	(3'11" to 4'½" portion this test)					

ASTM D854
Sp. Gr. = 2.650

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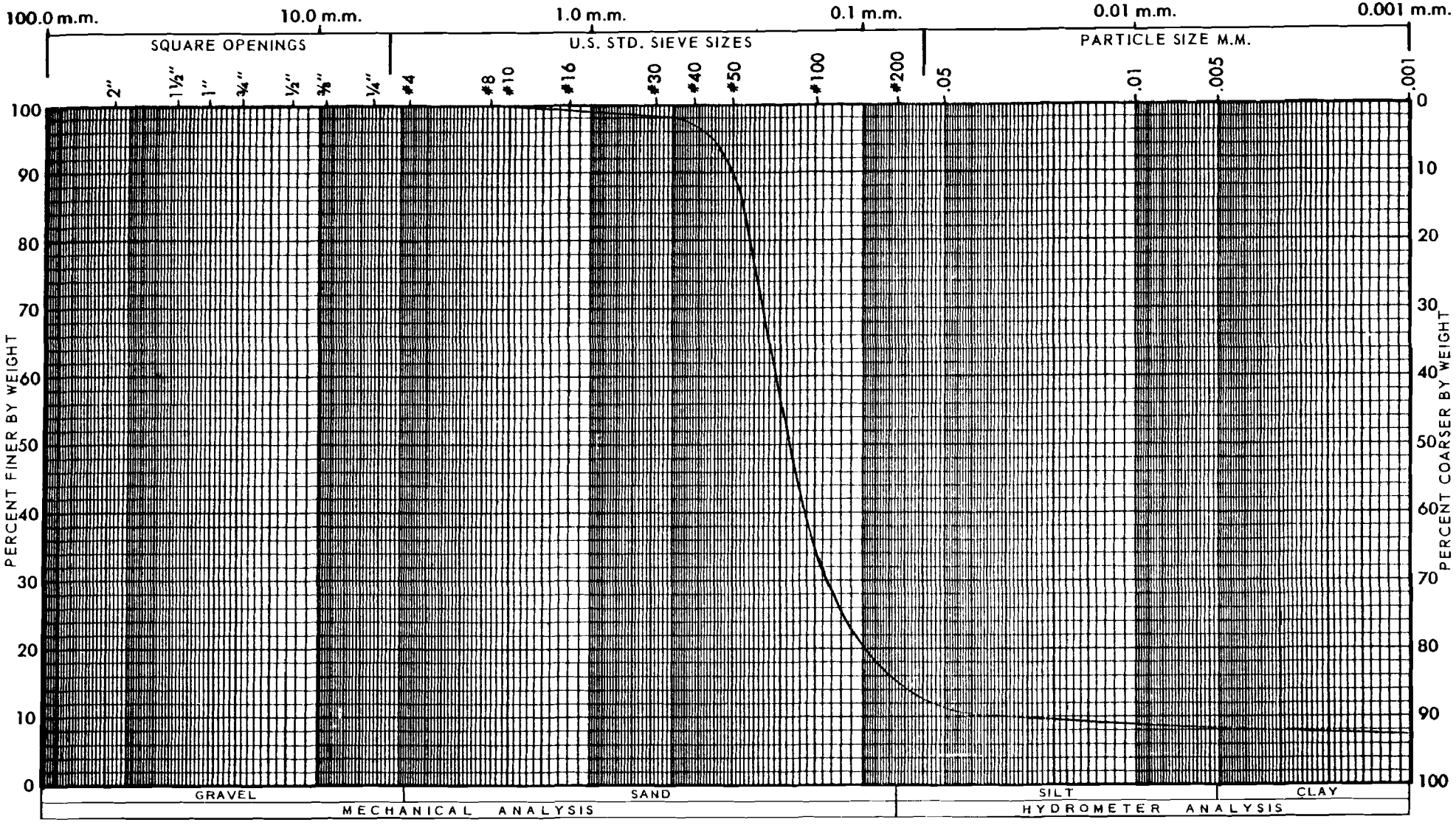
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT (ASTM D423)	PLASTICITY INDEX (ASTM D424)	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-4 @ 5-6½' (S-2)	NV	NP		SM	35-32

ASTM D854
Sp. Gr. = 2.657

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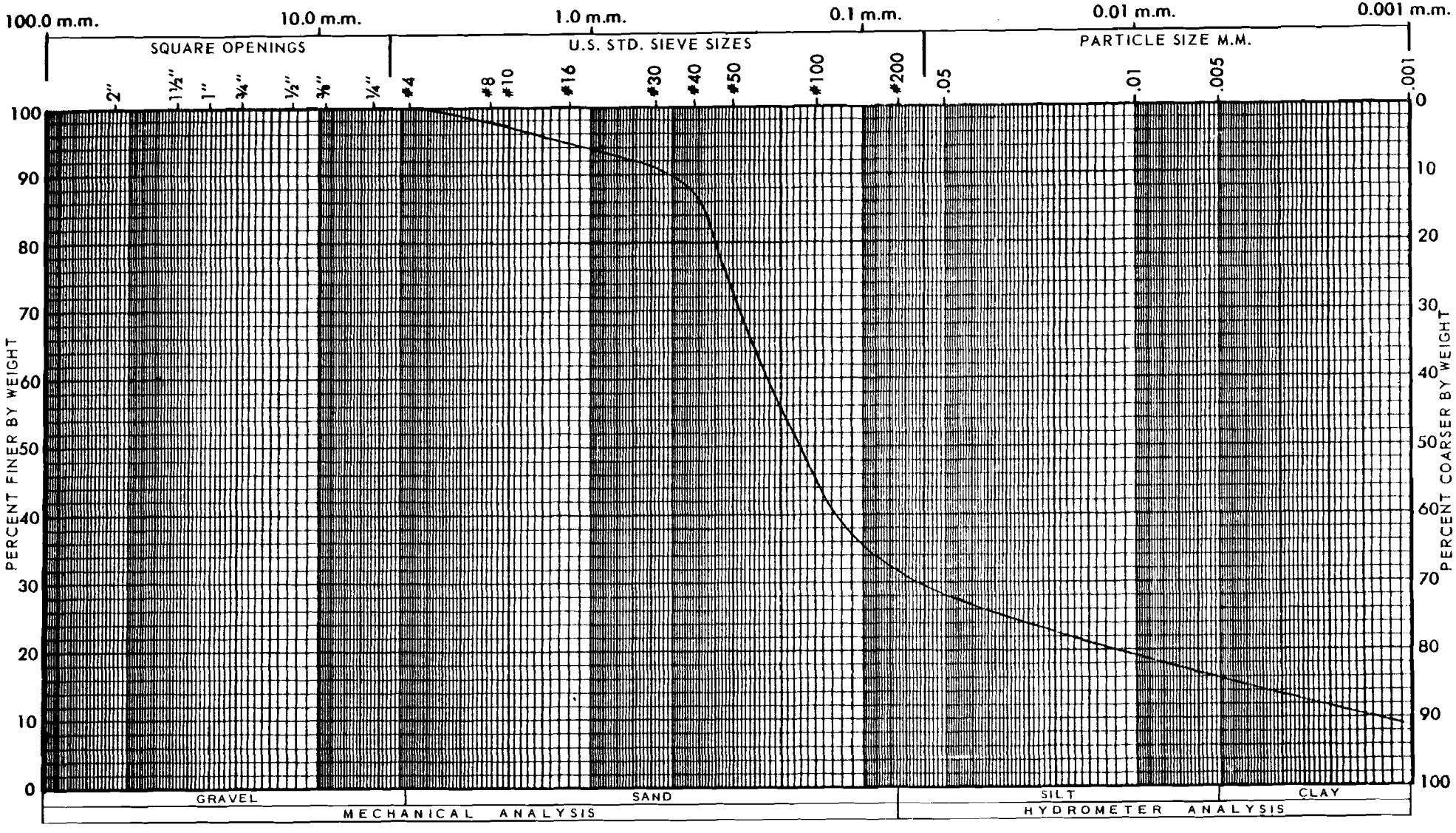
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-4 @ 19½-21' (S-5)					35-33

ASTM D854
Sp. Gr. = 2.662

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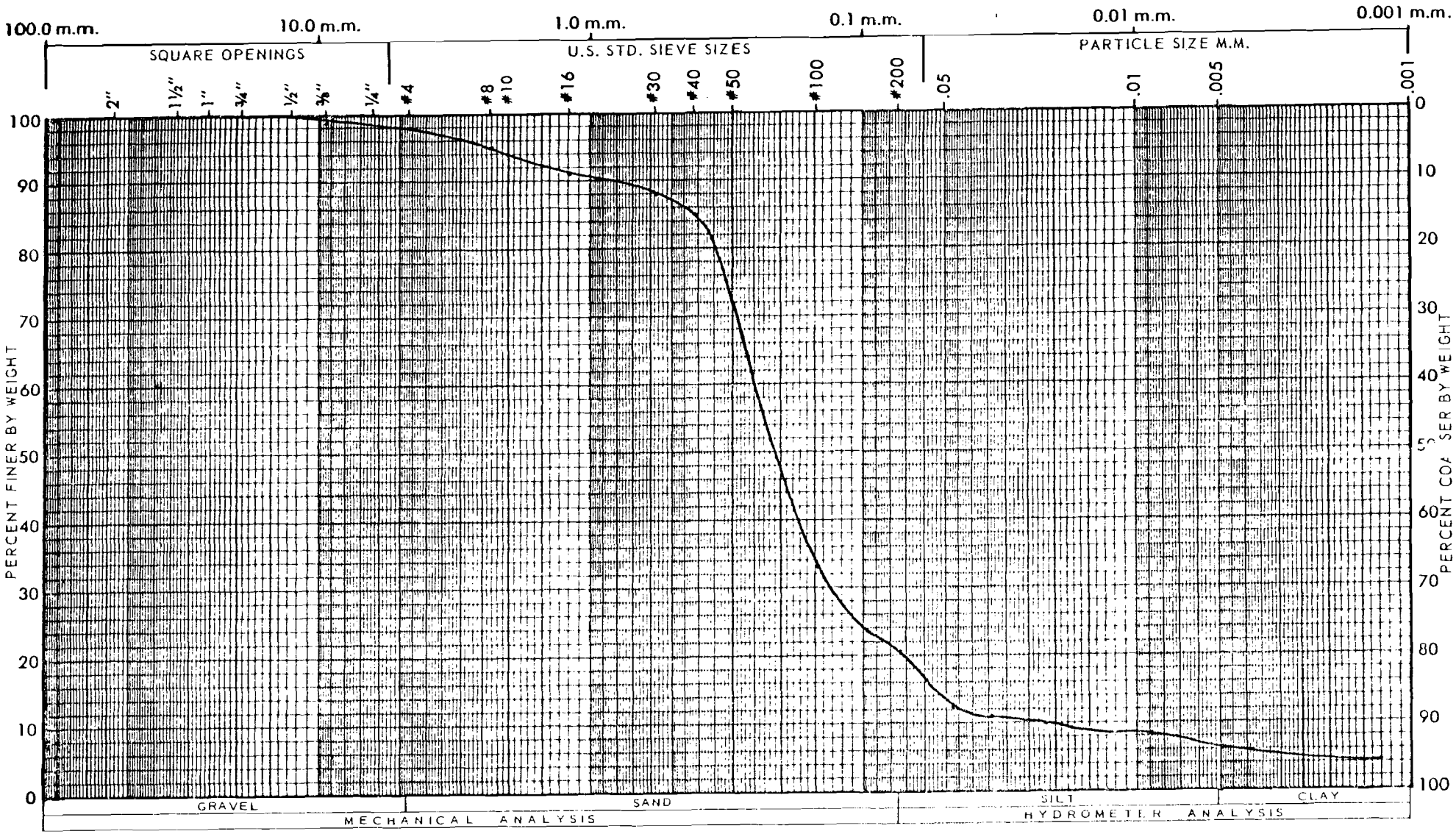
S NO. 78-[illegible]5

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



ASTM D422 on soil fraction of sample obtained

CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Tube sampler contained ±3' of material					
	B-4 P_3 @ 21'6"-22'				SM	1135-2

ASTM D854
Sp. Gr. = 2.675

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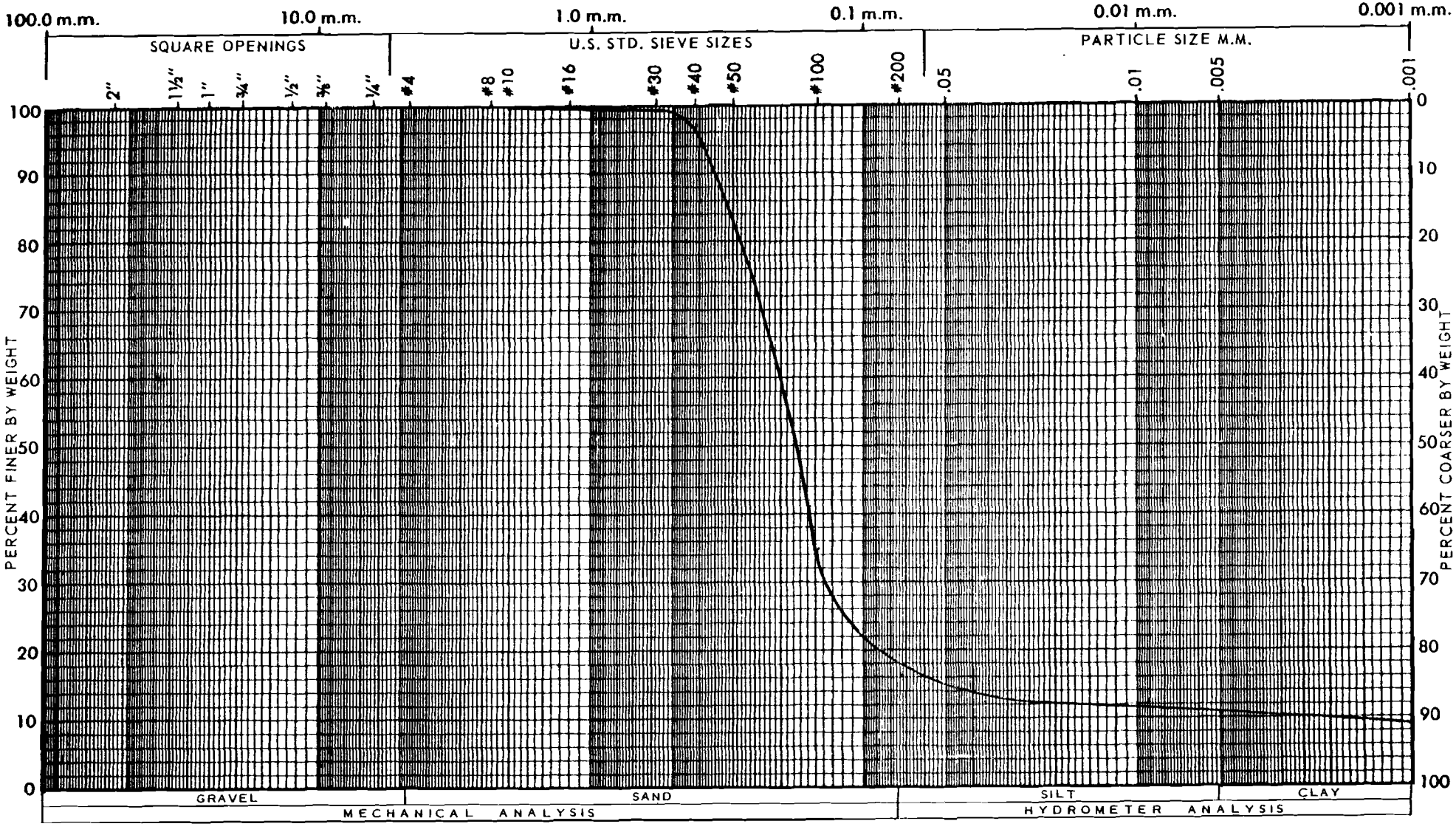
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-5 @ 0-8' (BL-1)					35-37

ASTM D854
Sp. Gr. = 2.618

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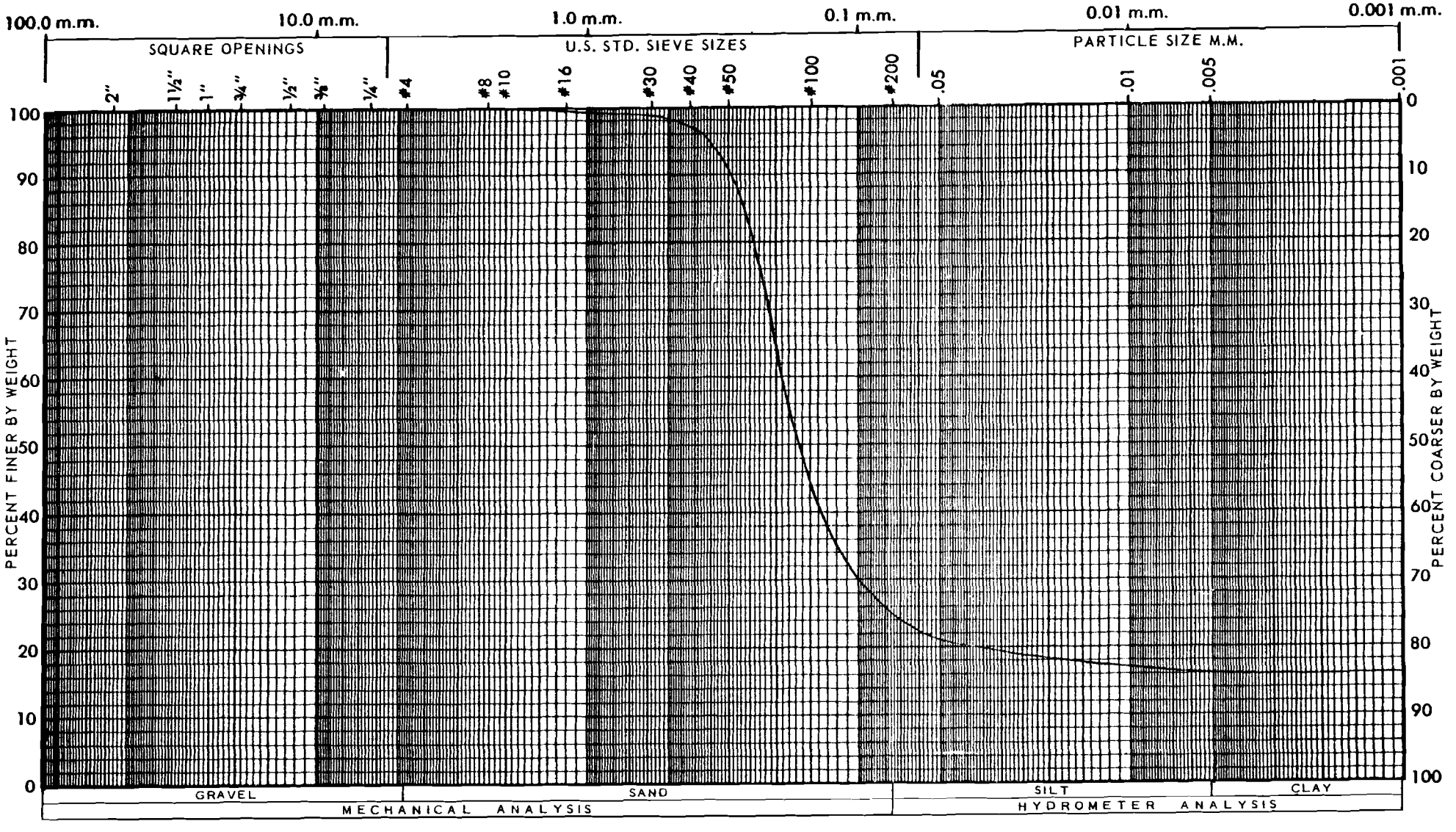
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-5 @ 4½-6' (S-2)					35-26

ASTM D854
Sp. Gr. = 2.661

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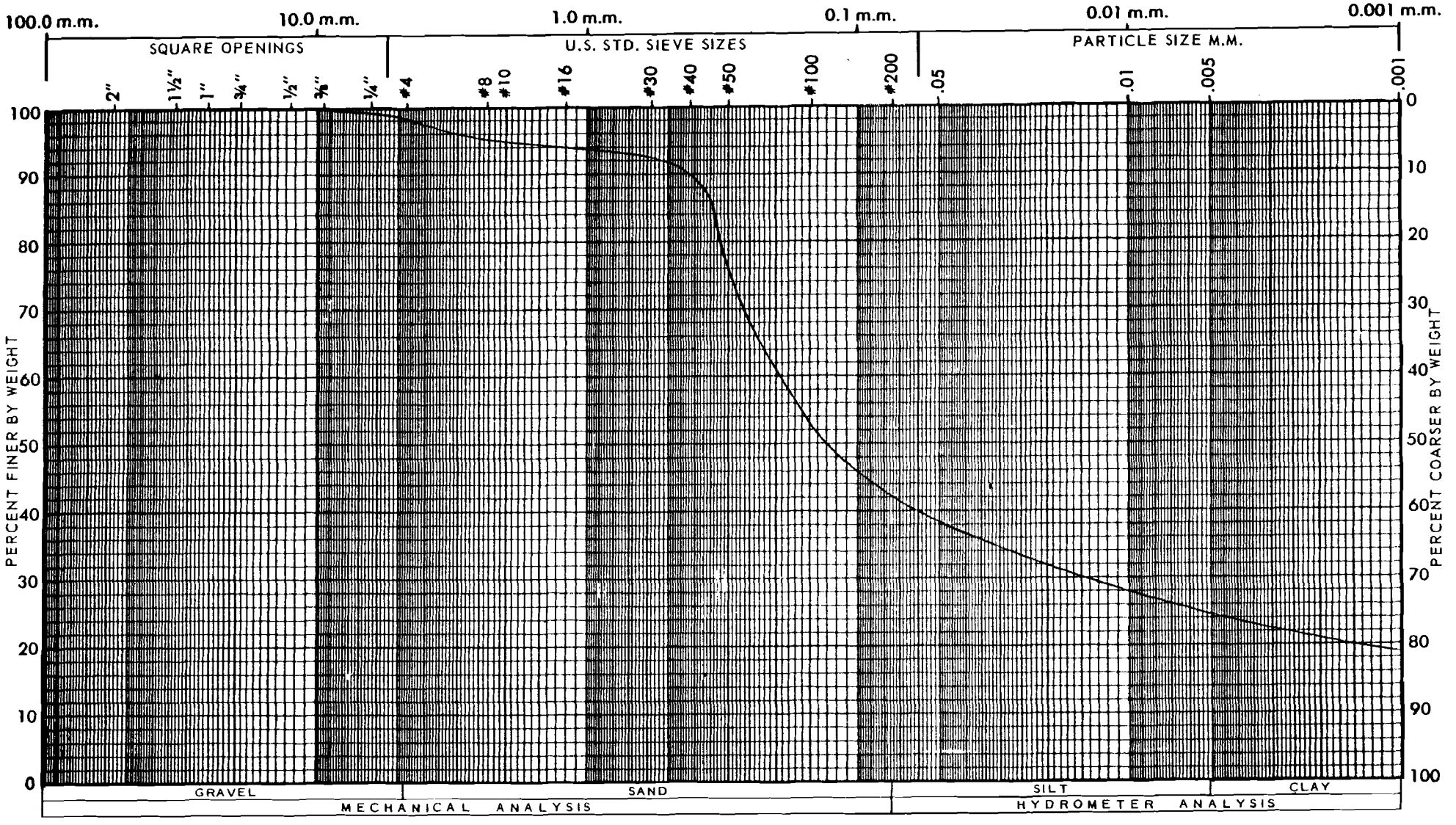
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	ASTM D423 LIQUID LIMIT	ASTM D424 PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-5 @ 8'2"-9'10"	25	NP		SM	35-27

ASTM D854
Sp. Gr. = 2.714

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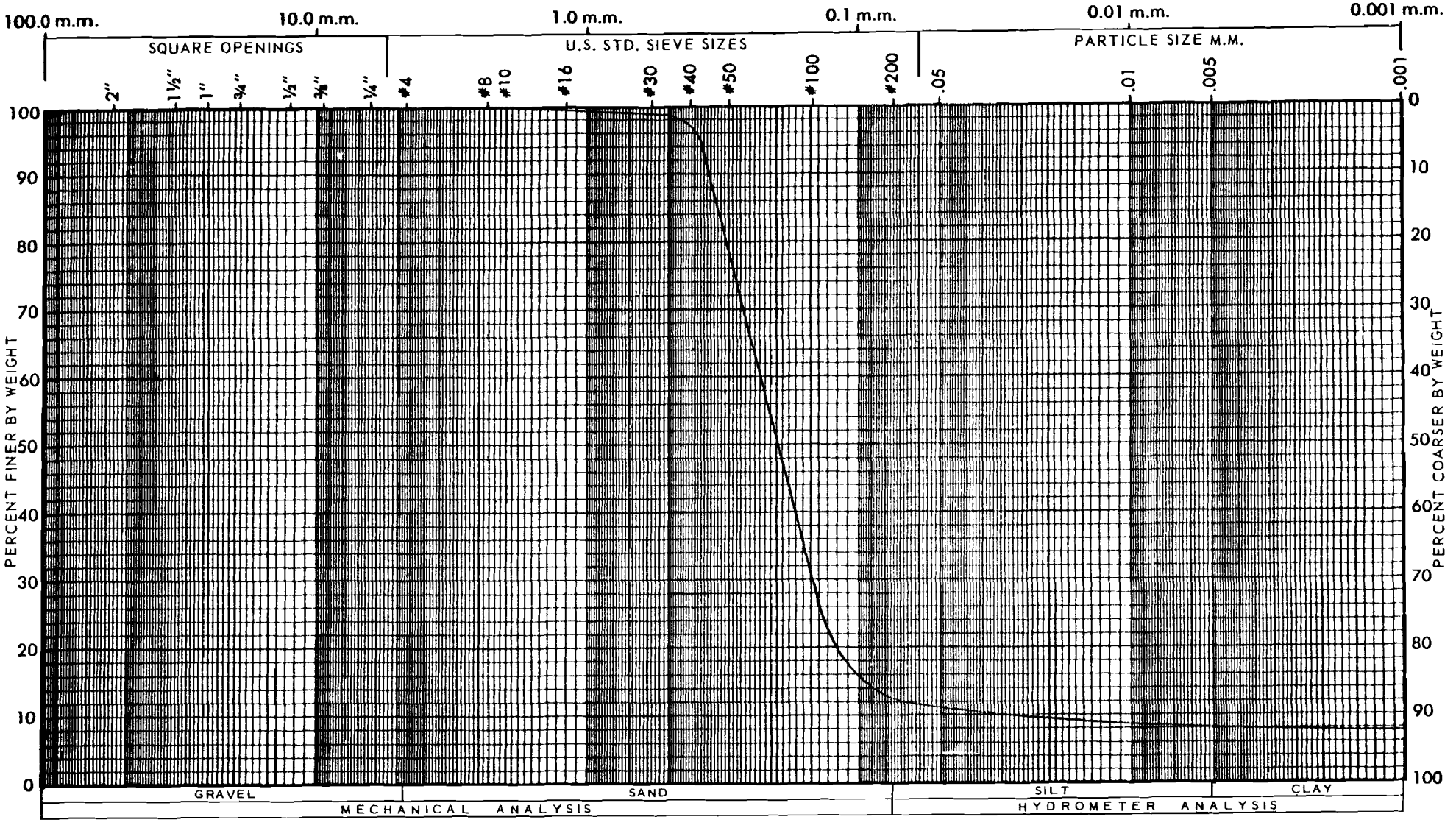
JOB NO. E78-1155

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	ASTM D423 LIQUID LIMIT	ASTM D424 PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-6 @ 1-2½' (S-1)	NV	NP		SM	35-34

ASTM D854
Sp. Gr. = 2.708

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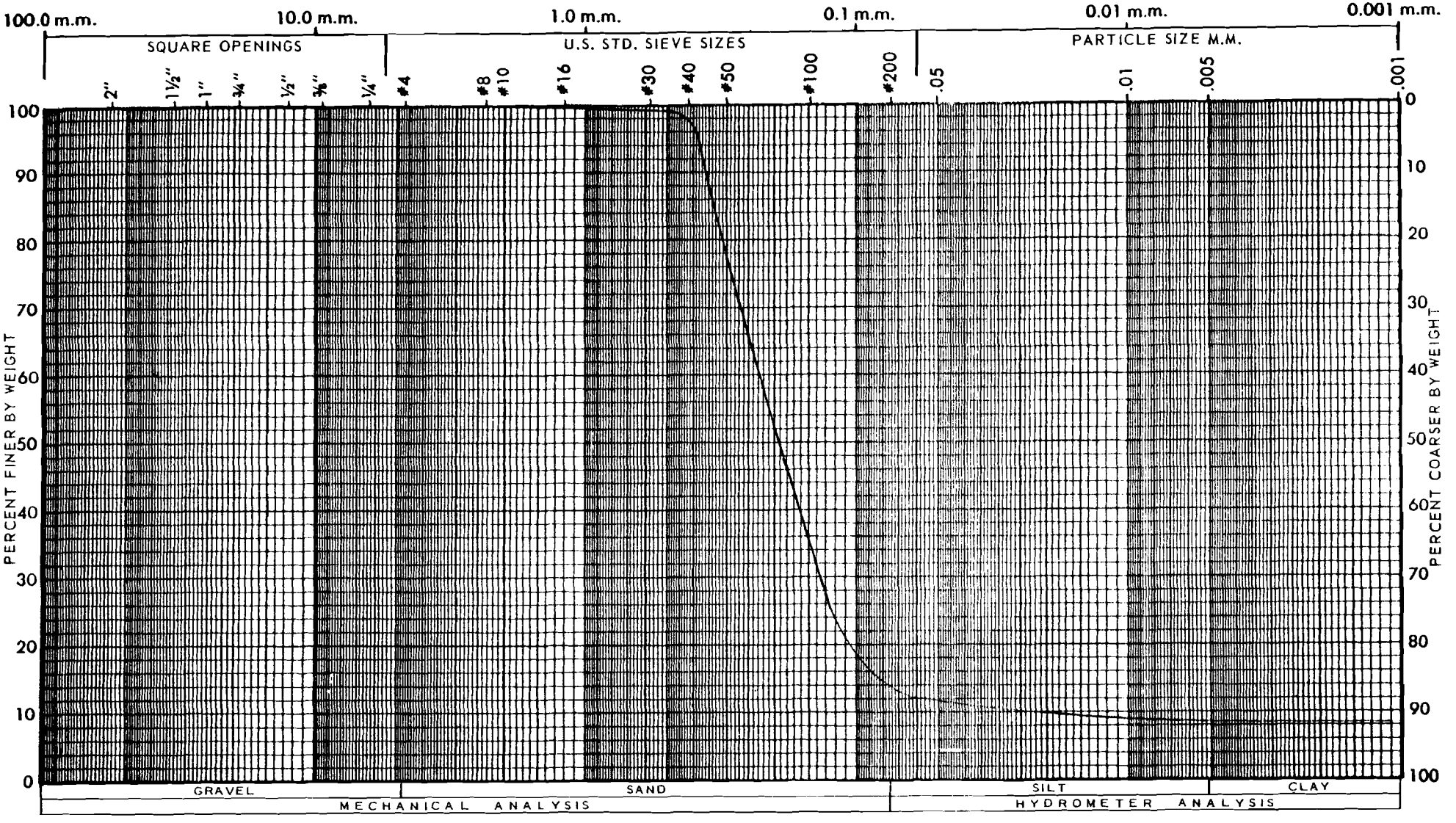
JOB NO. '8-[illegible]5

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-6 @ 0-4'					35-46
	(BL-1)					

ASTM D854
Sp. Gr. = 2.849

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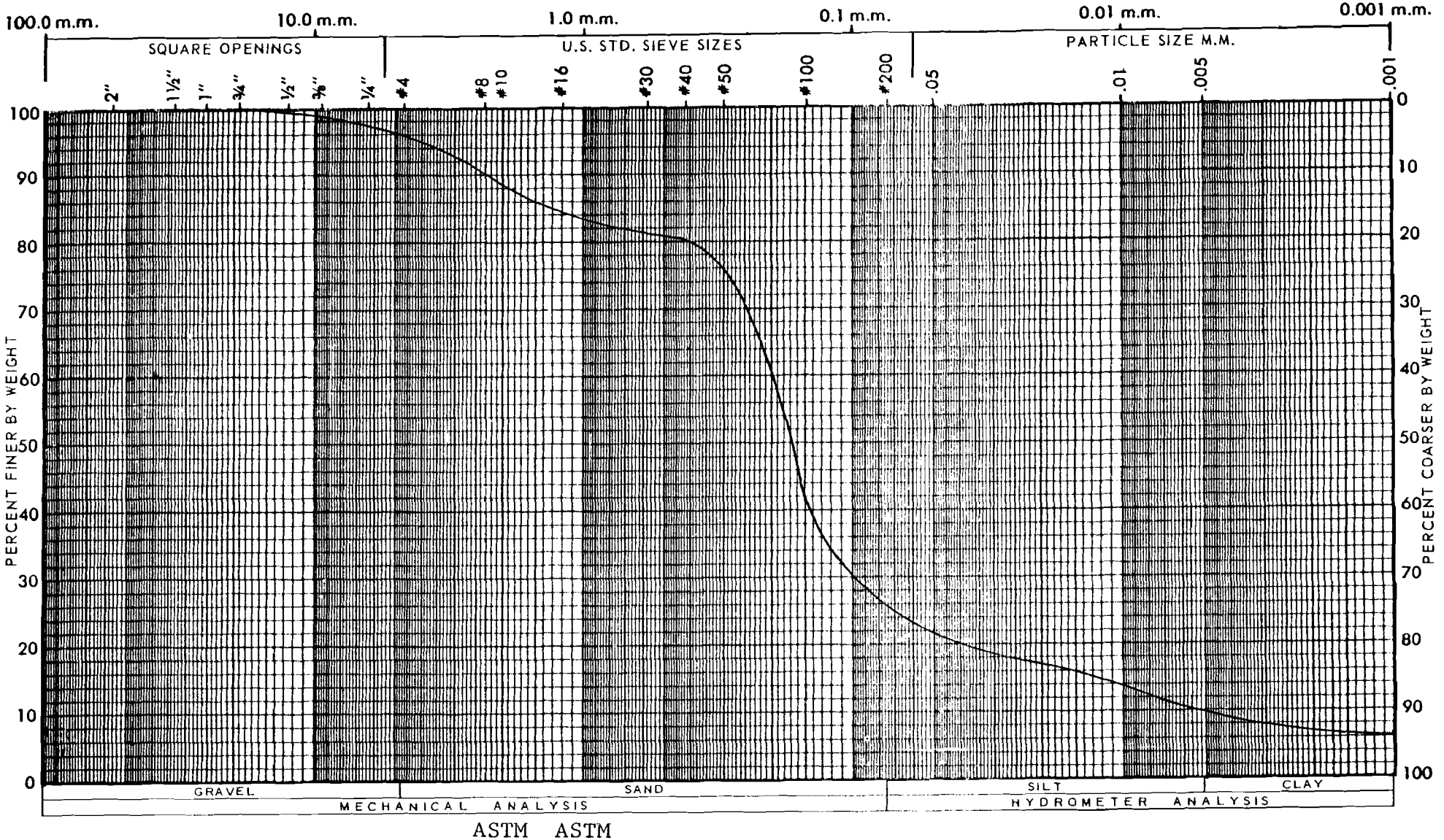
JOB NO. 8-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT (ASTM D423)	PLASTICITY INDEX (ASTM D424)	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-7 @ 9-10½' (S-3)	42	NP		SM	35-4

ASTM D854
Sp. Gr. = 2.790

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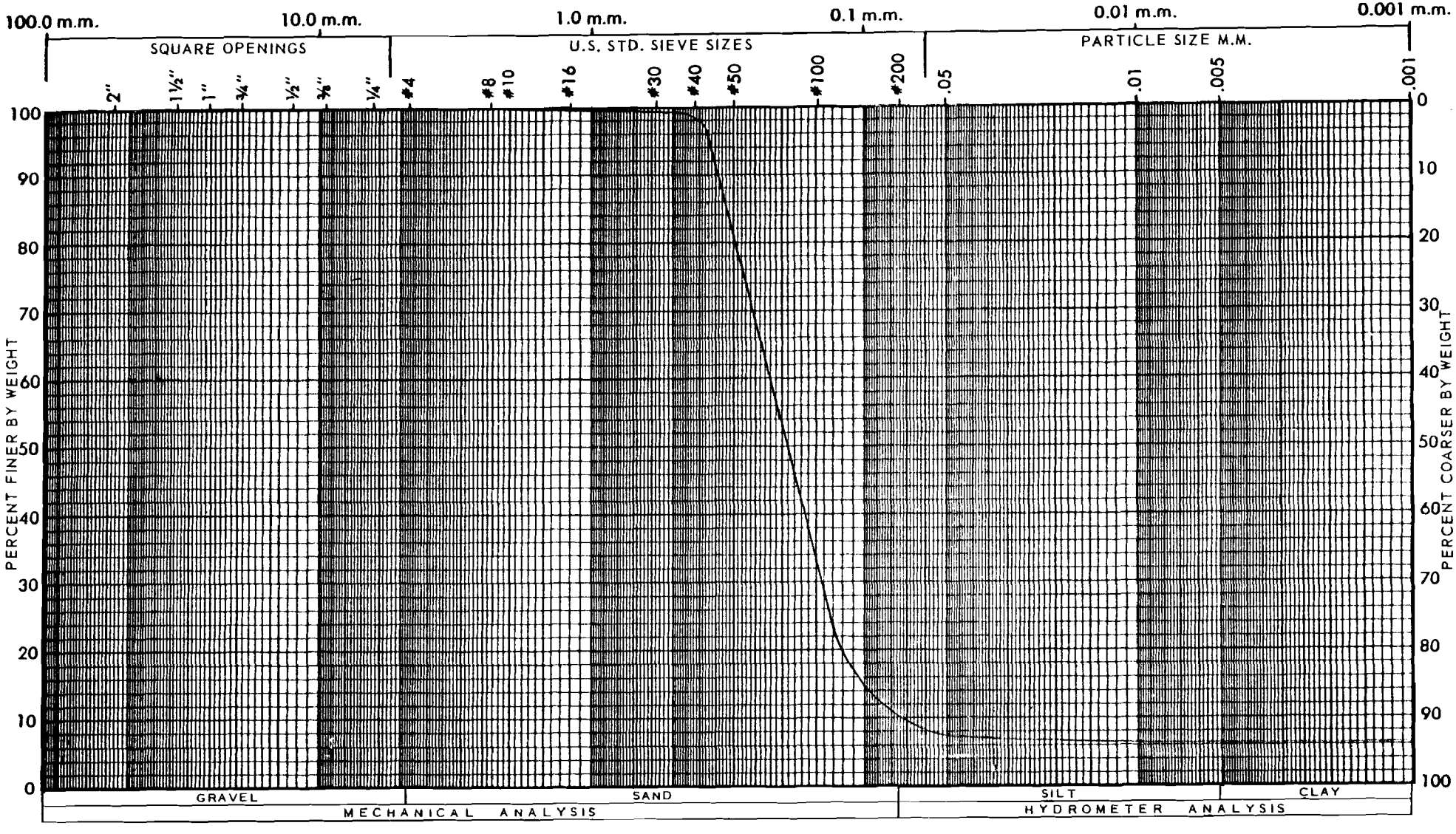
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-8 @ 0-6'(BL-1)					35-47

ASTM D854
Sp. Gr. = 2.822

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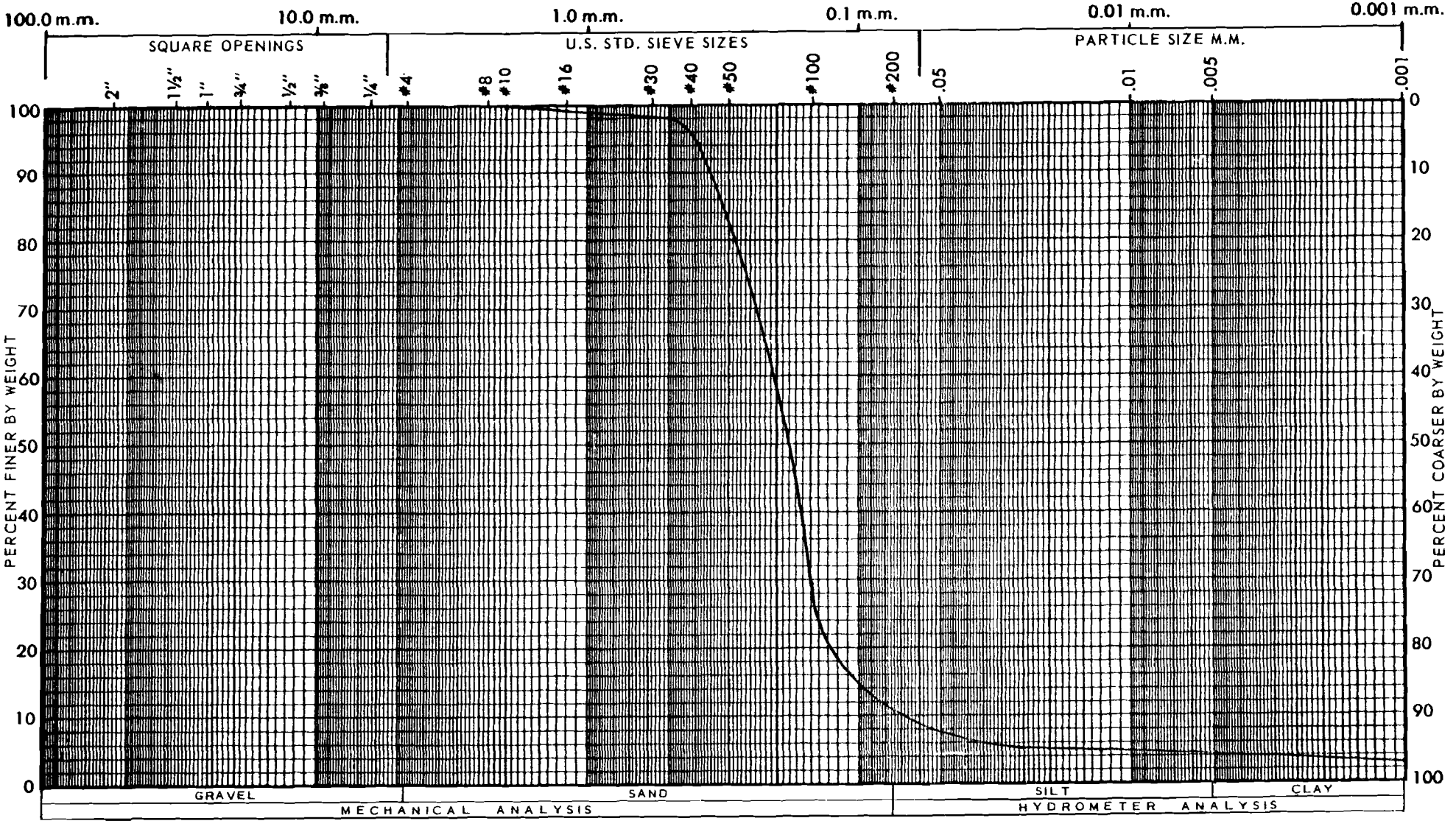
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring # B-9 @ 0-4' (BL-1)					35-38

ASTM D854
Sp. Gr. = 2.679

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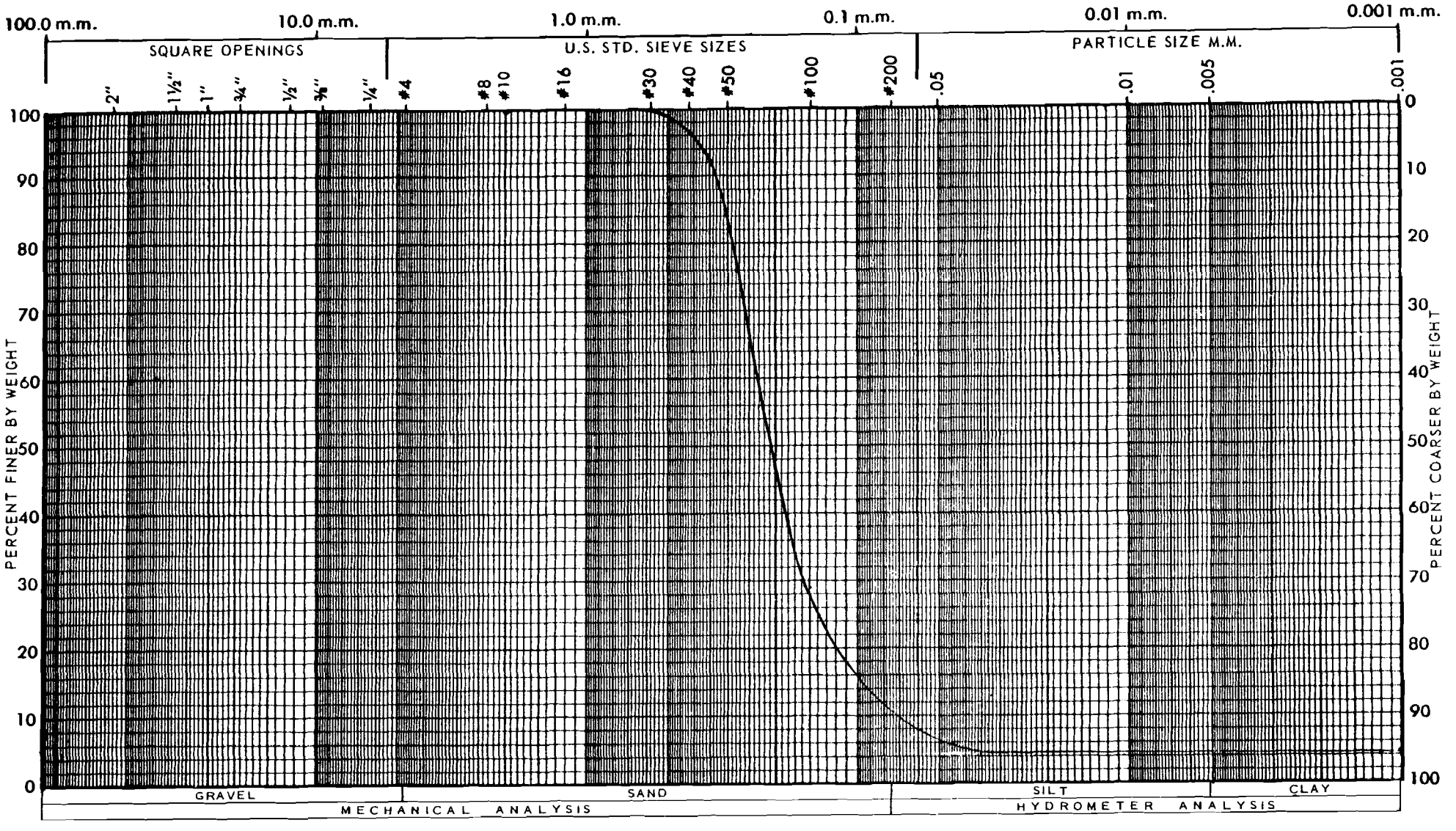
JOB NO. F78-1125

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-9 @ 1-2½' (S-1)					35-28

ASTM D854
Sp. Gr. = 2.736

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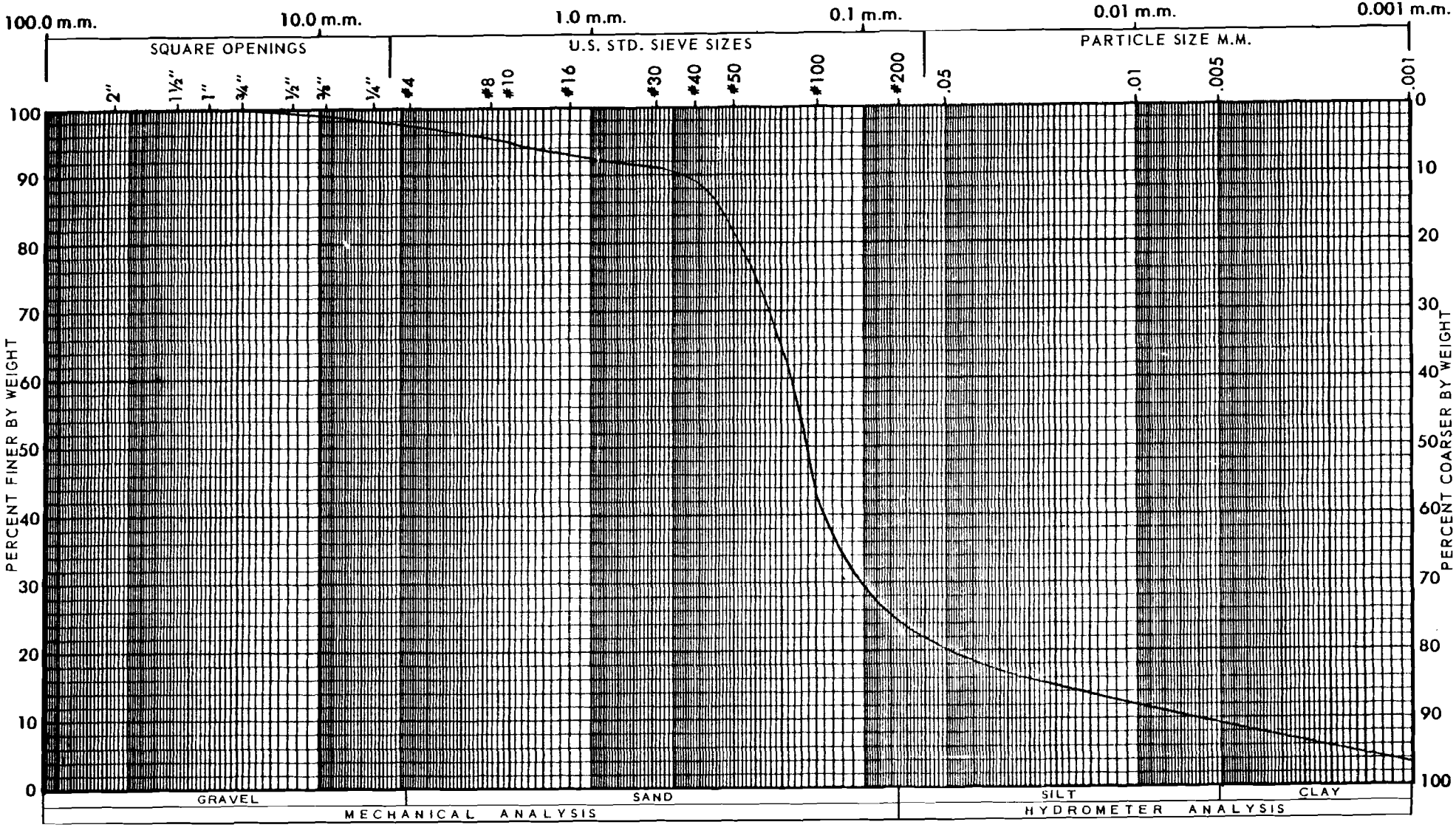
JOB NO. 478-1122

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-9 @ 14-15½' (S-3)	36	NP		SM	35-29

ASTM D854
Sp. Gr. = 2.692

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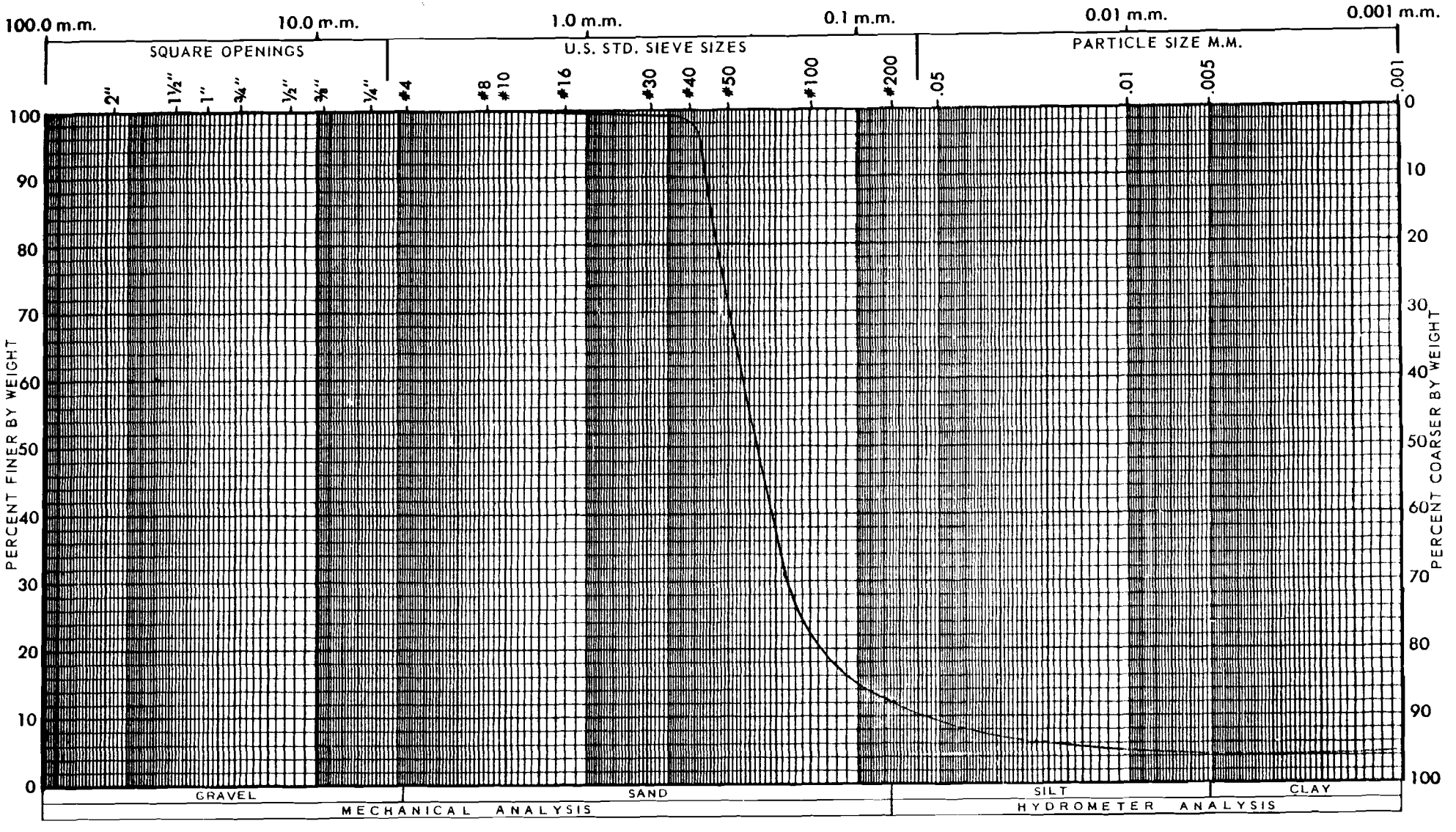
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-10 @ 0-6' (BL-1)					35-39

ASTM D854
Sp. Gr. = 2.652

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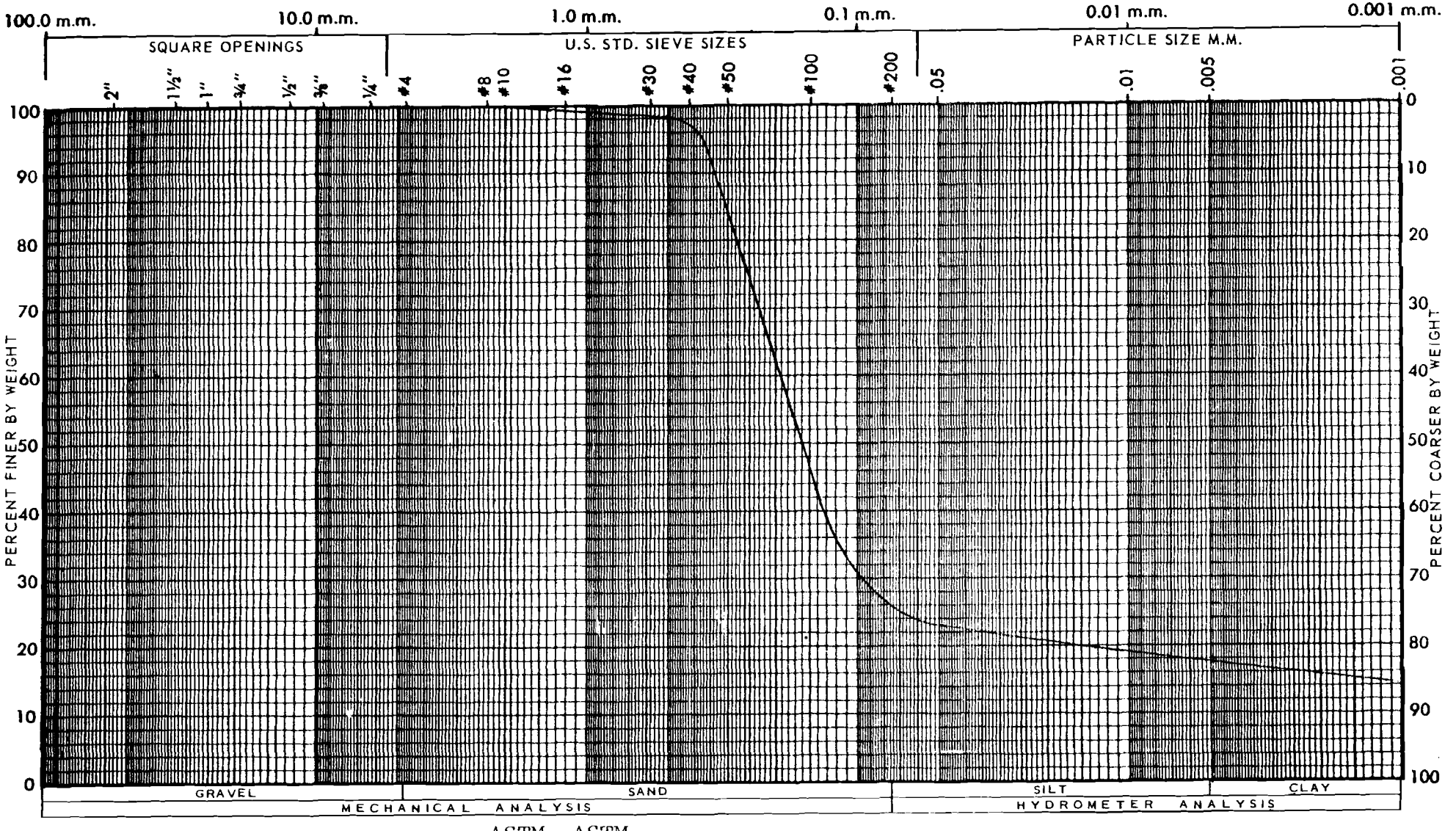
JOB NO. L--11--

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	ASTM D423 LIQUID LIMIT	ASTM D424 PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-10 @ 4½-6' (S-2)	NV	NP		SM	35-30

ASTM D854
Sp. Gr. = 2.656

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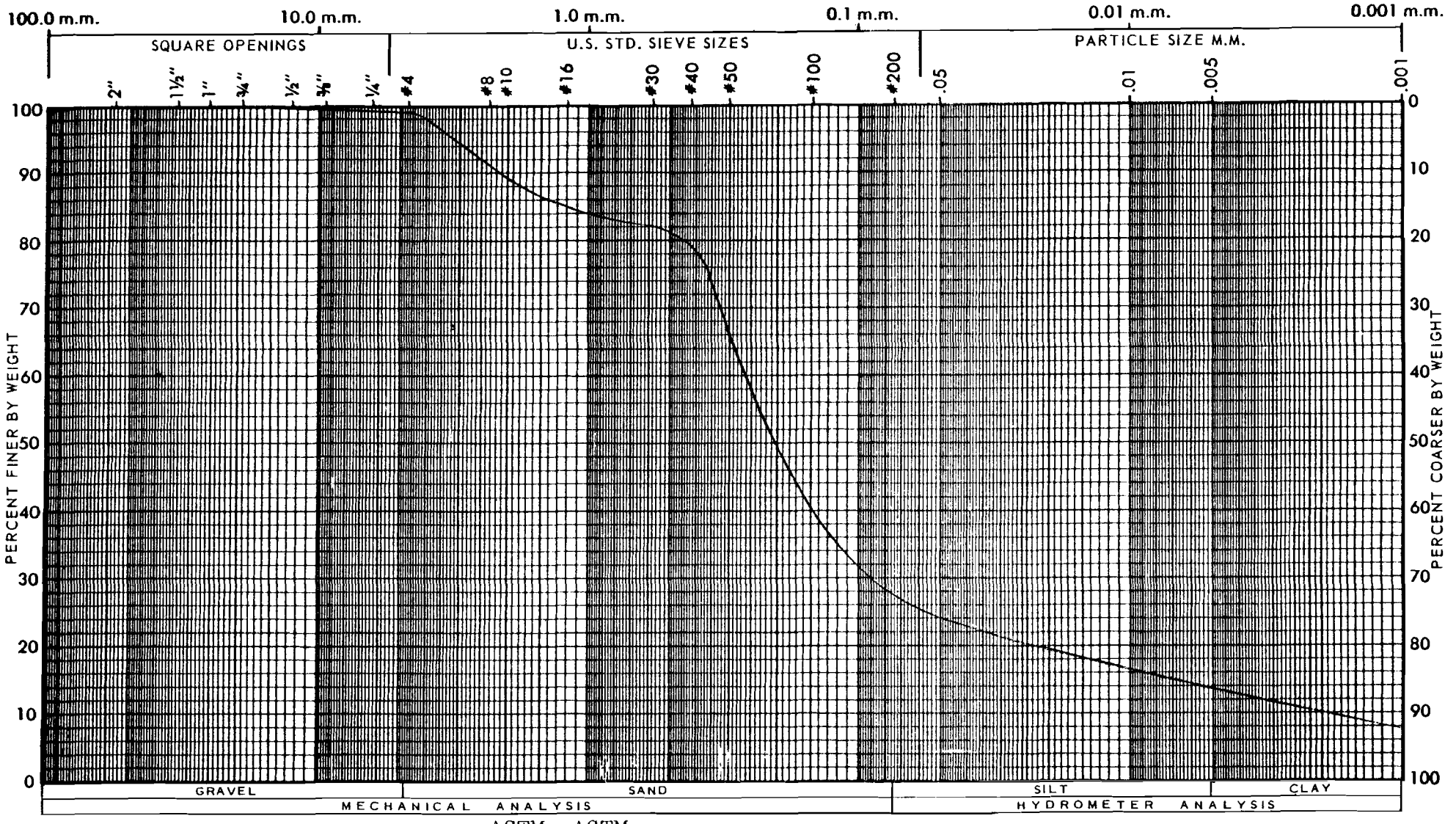
JOB NO. E78-1135

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT (ASTM D423)	PLASTICITY INDEX (ASTM D424)	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-10 @ 15'11½"-	36	NP		SM	35-31
	17'3" (S-5)					

ASTM D854
Sp. Gr. = 2.712

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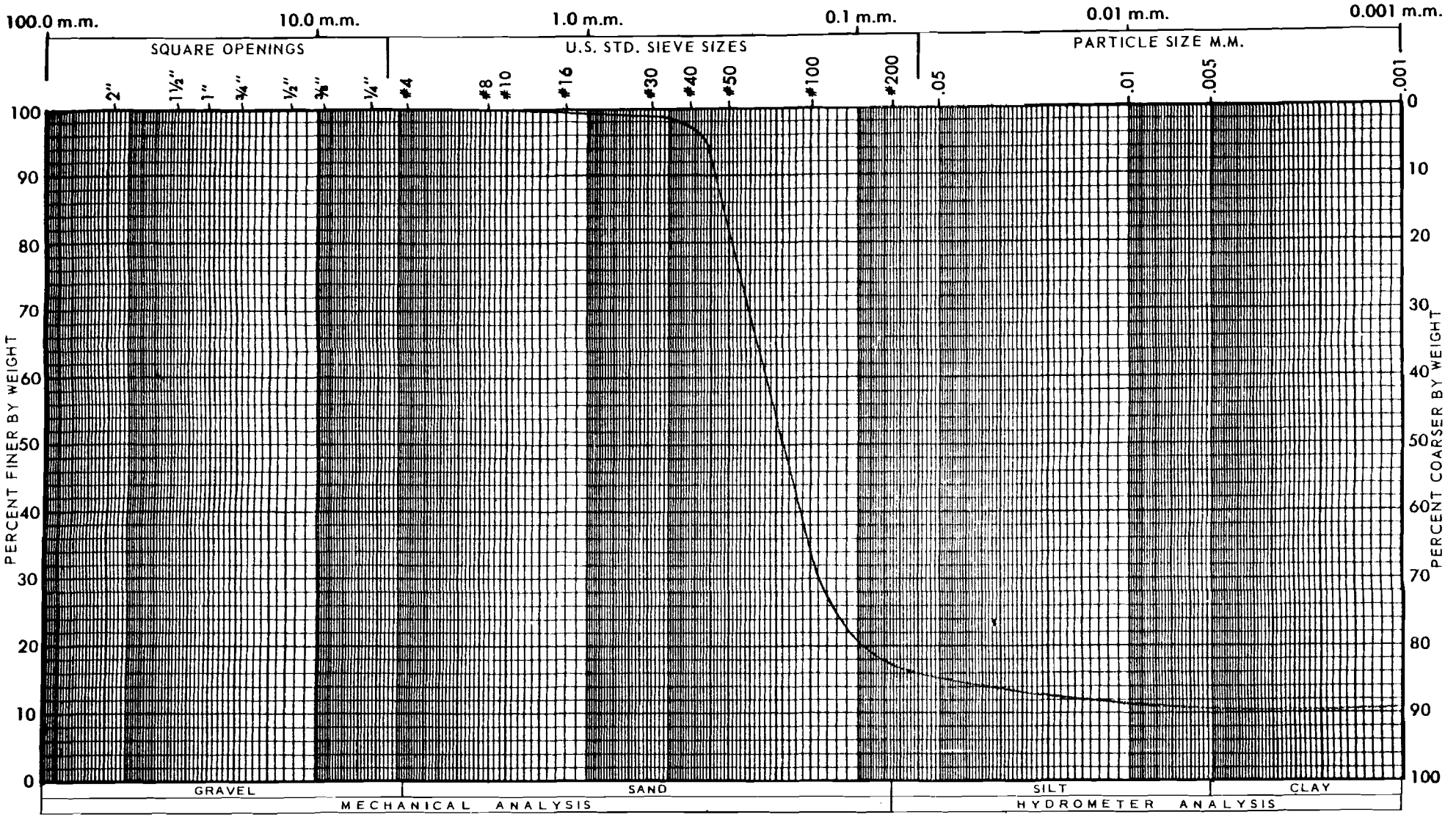
JOB NO. [illegible]-11[illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-11 @ 1-2½' (S-1)					35-35

ASTM D854
Sp. Gr. = 2.782

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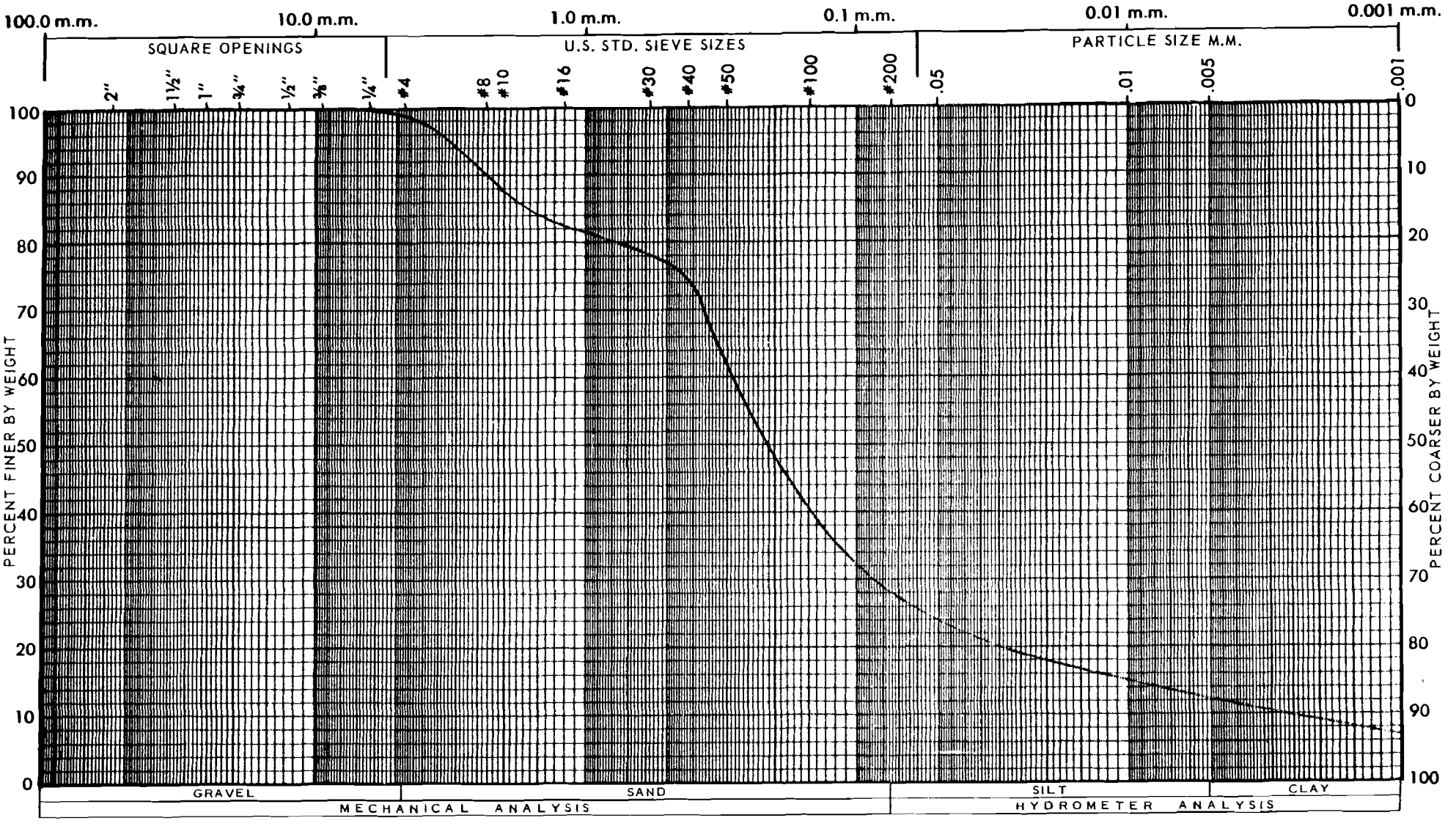
JOB NO. 3-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-11 @ 9-10½' (S-3)					35-36

ASTM D854
Sp. Gr. = 2.793

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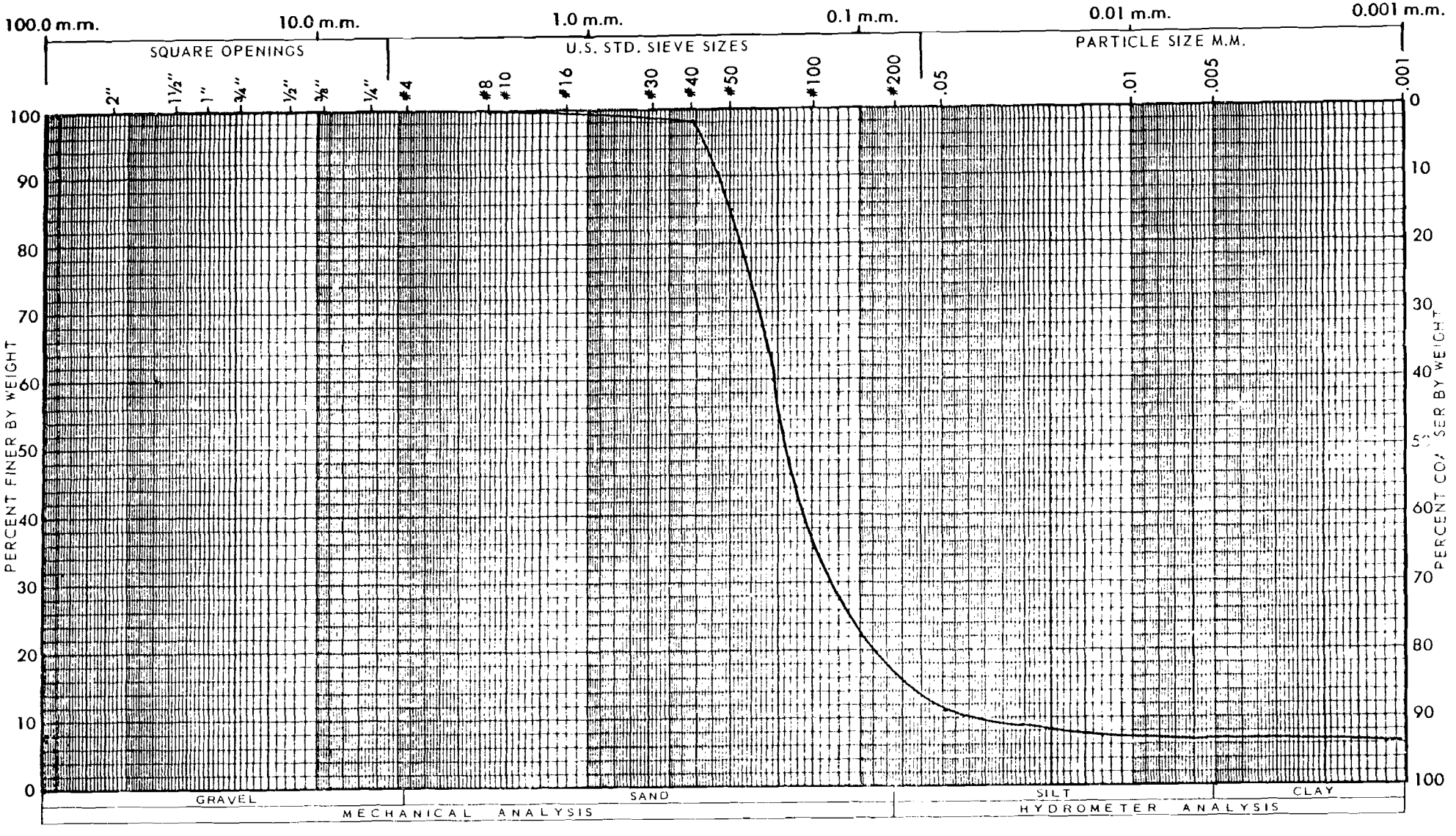
NO F78-1125

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Tube cut 3'6" to 4'0"					
	B-12 P2 @ 3'-5'					1135-3
	(3'6½" to 3'8" portion for	this	test)			

ASTM D854
Sp. Gr. = 2.654

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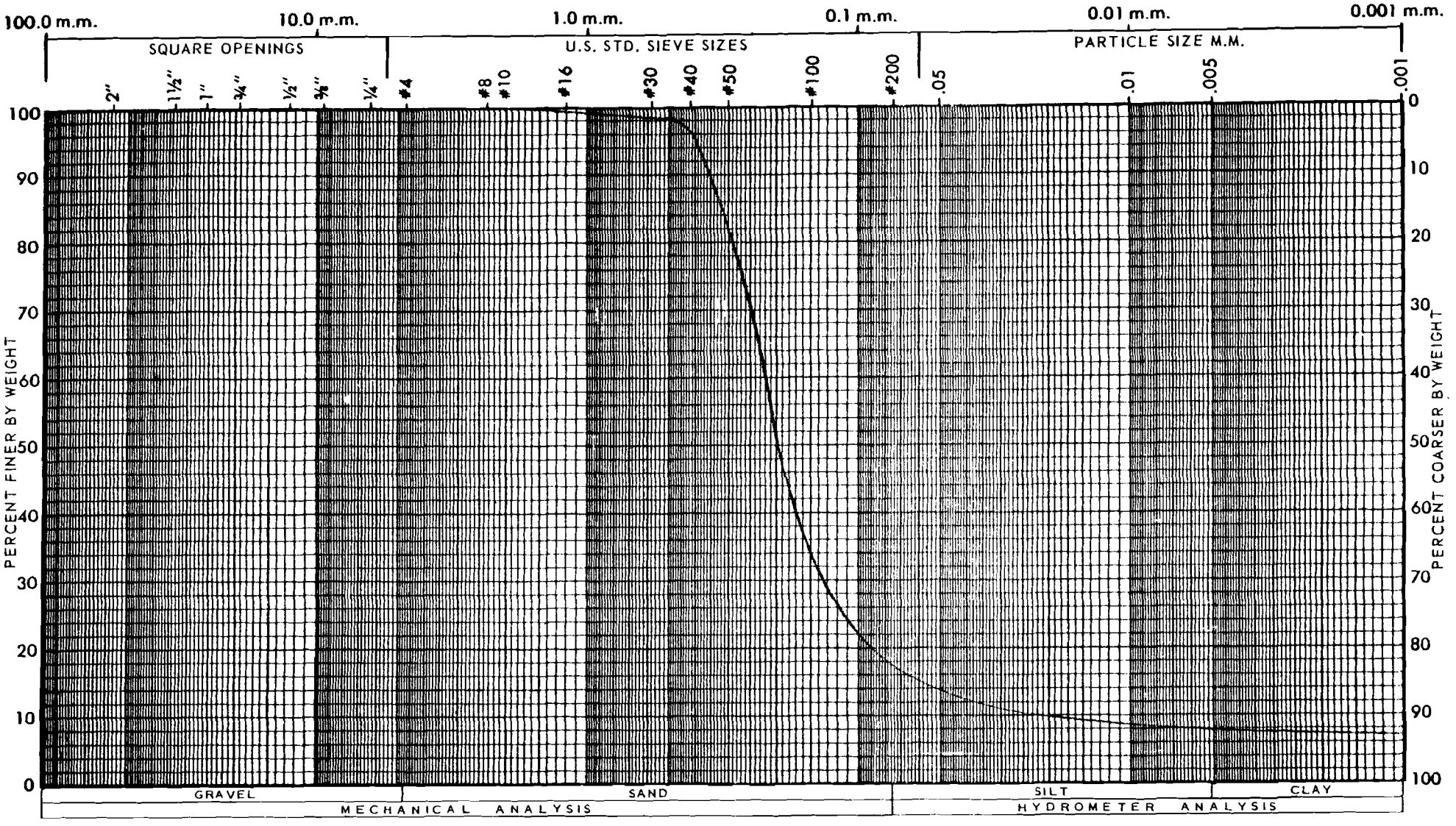
10. E78-1135

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT (ASTM D423)	PLASTICITY INDEX (ASTM D424)	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-13 @ 0-7'	NV	NP		SM	35-23
	(BL-3)					

ASTM D854
Sp. Gr. = 2.785

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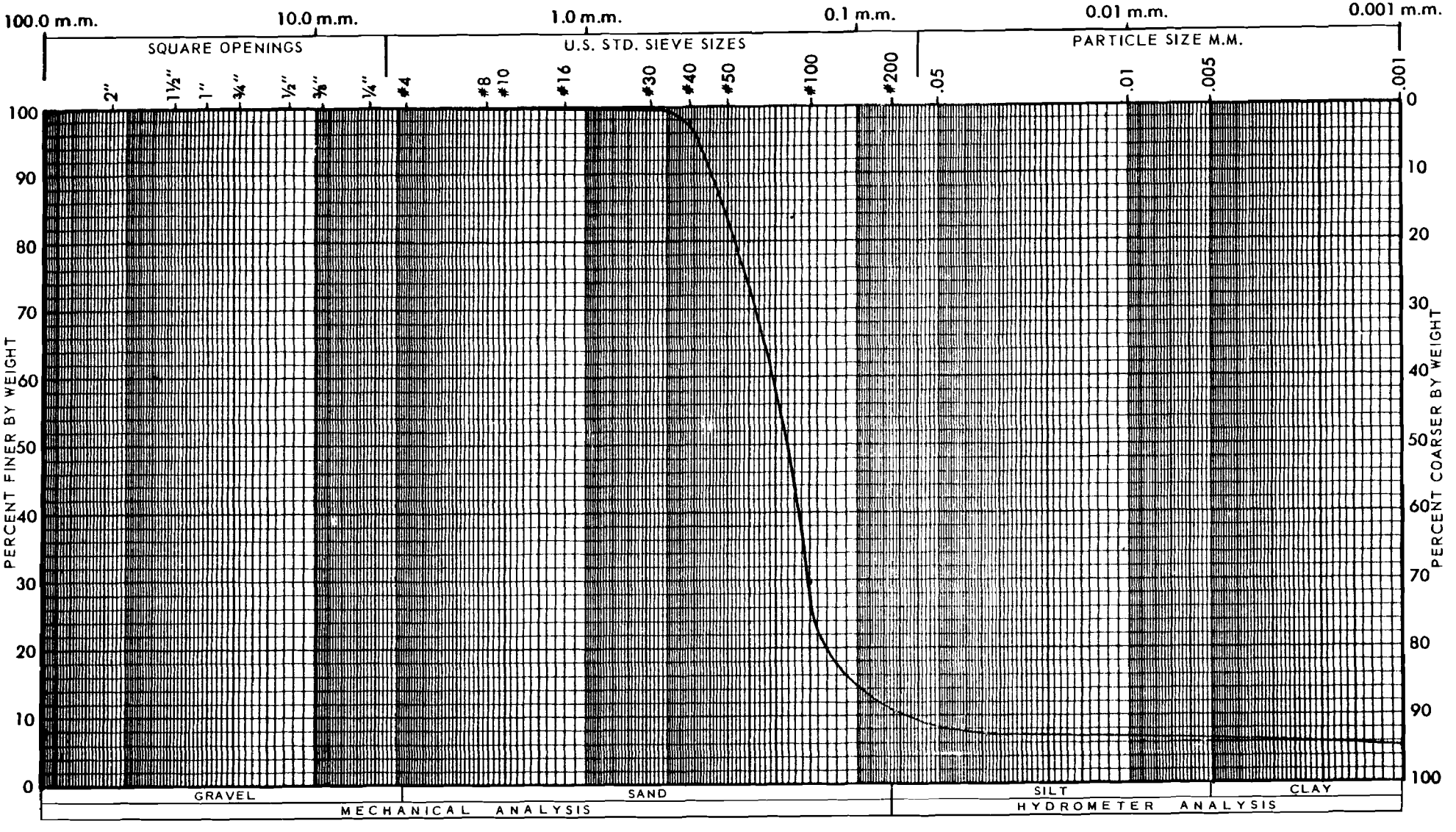
JOB NO. 278 -35

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-13 @ 0-7' (BL-3)					35-40

ASTM D854
Sp. Gr. 2.785

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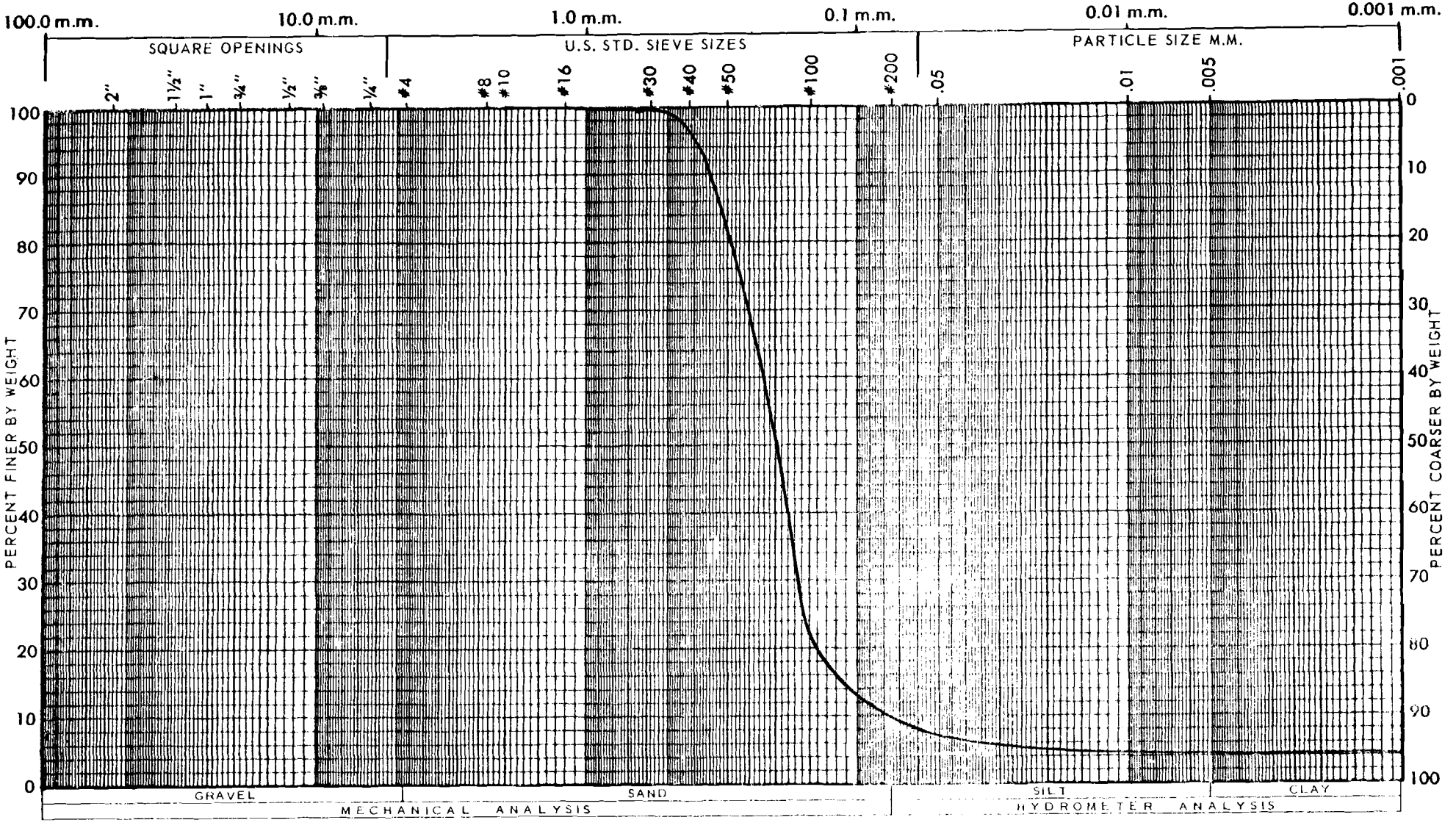
NO. E78-1125

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	
	Boring #B-13 @ 1-2½' (S-1)					35-22

ASTM D854
Sp. Gr. = 2.736

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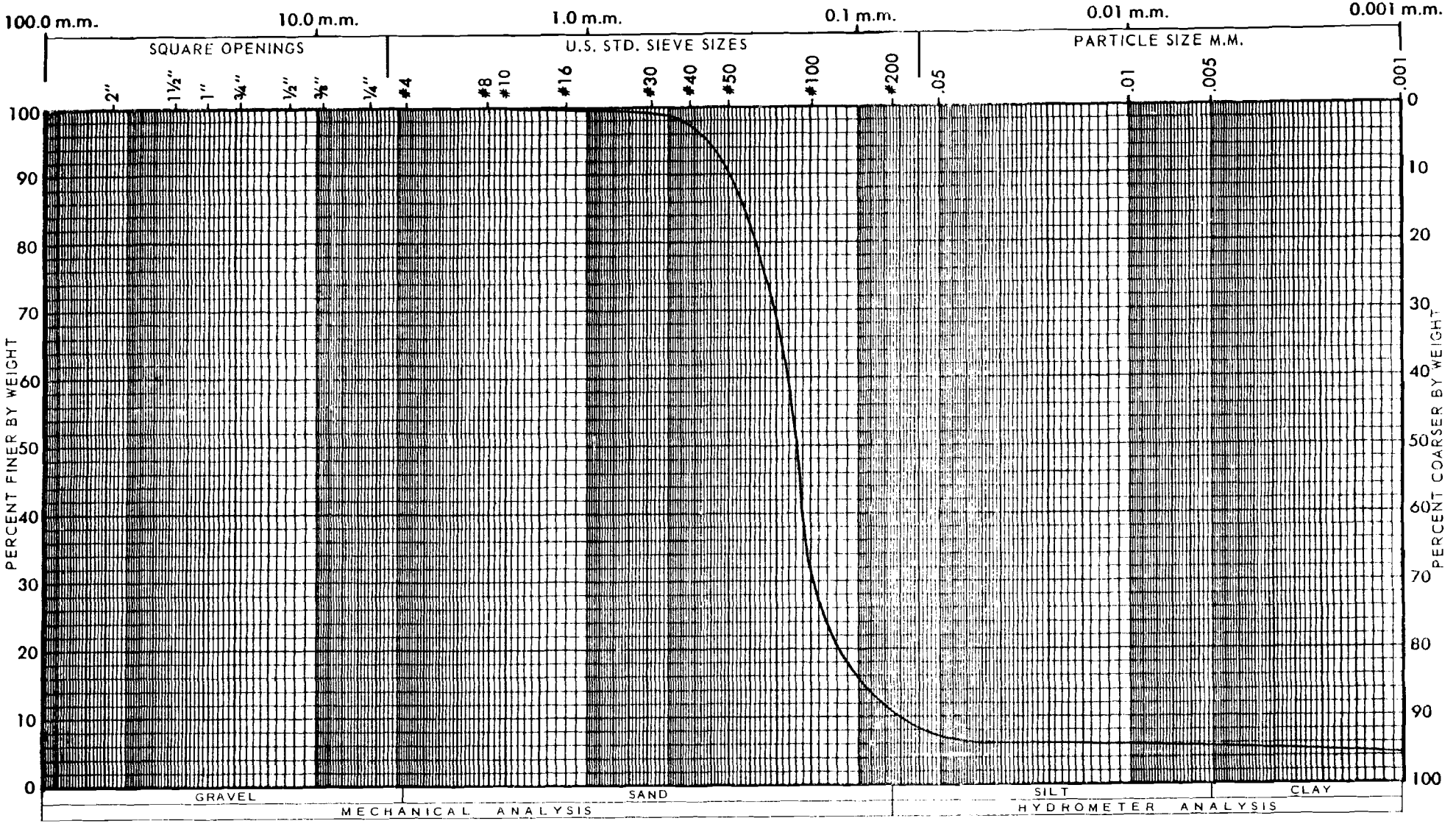
NO. F78-1135

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-15 @ 1-2½' (S-1)					35-5

ASTM D854
Sp. Gr. = 2.701

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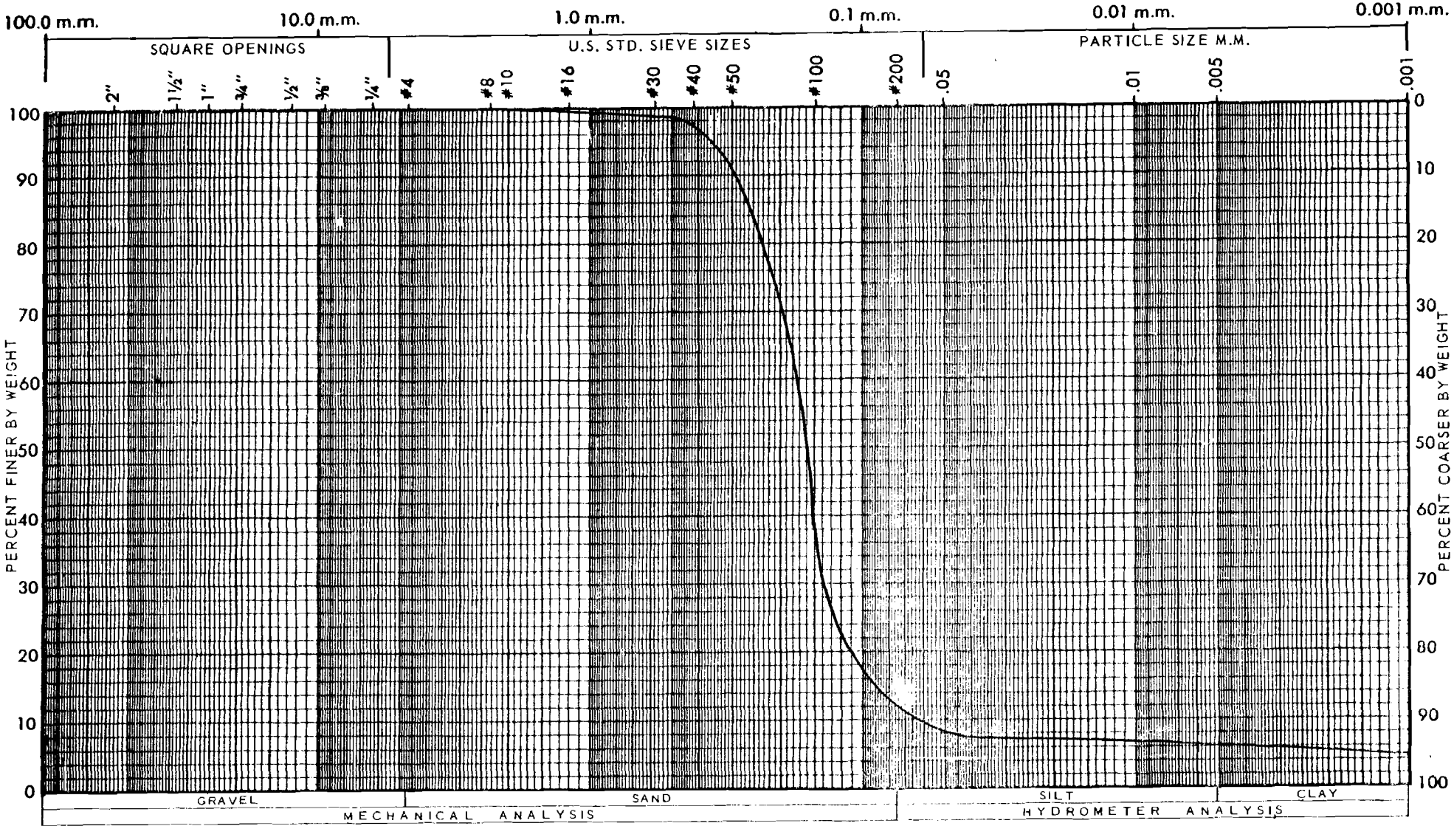
NO. 78-[illegible]5

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-15 @ 5½-7' (S-3)					35-6

ASTM D854
Sp. Gr =.2.701

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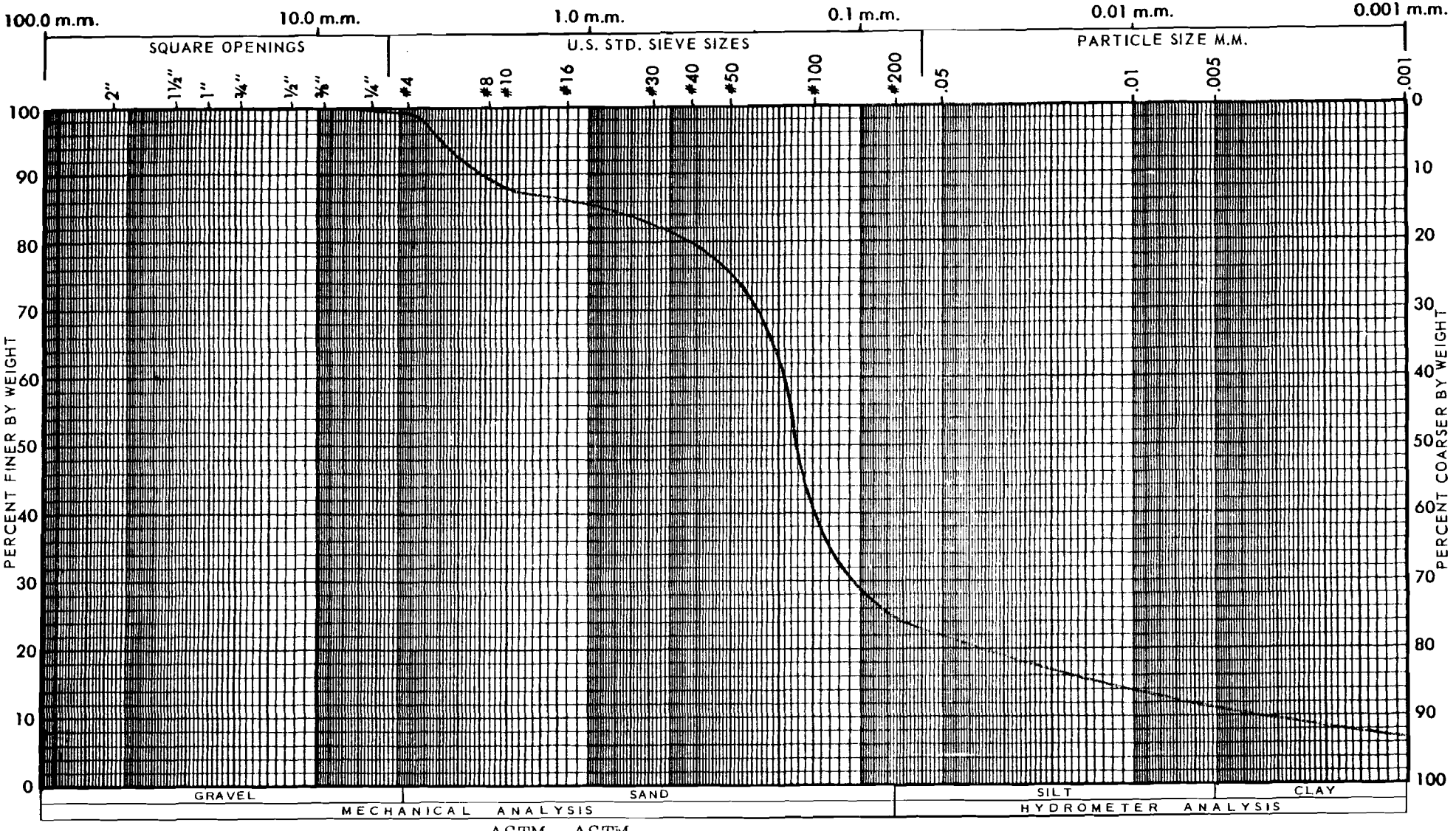
NO. 8-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT (ASTM D423)	PLASTICITY INDEX (ASTM D424)	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-15 @ 14-15½'	NV	NP		SM	35-7
	(S-6)					

ASTM D854
Sp. Gr. = 2.521

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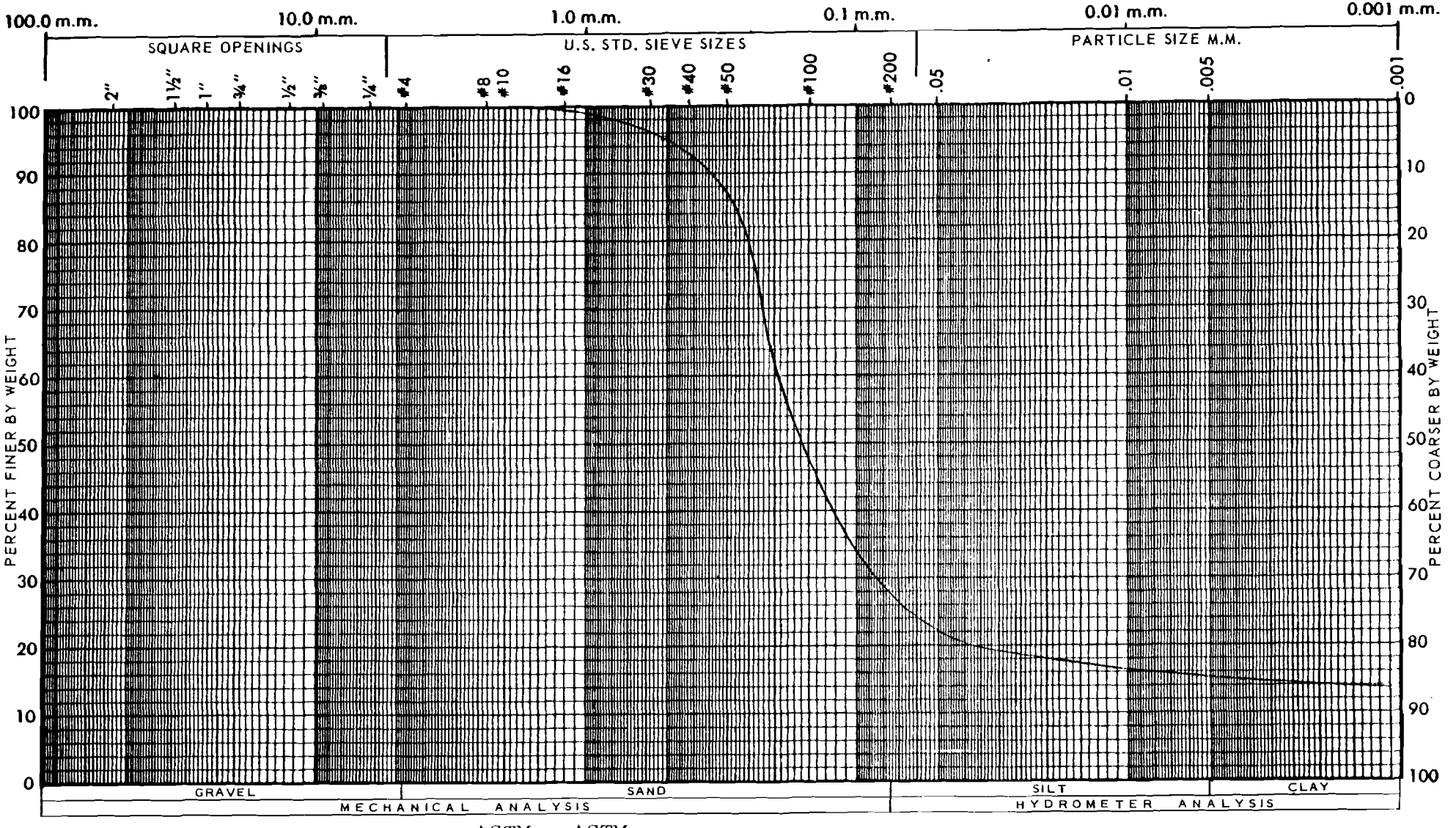
NO. 3-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	ASTM D423 LIQUID LIMIT	ASTM D424 PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-15 @ 19-19'11½"	31	NP		SM	35-8
	(S-7)					

ASTM D854
Sp. Gr. = 2.771

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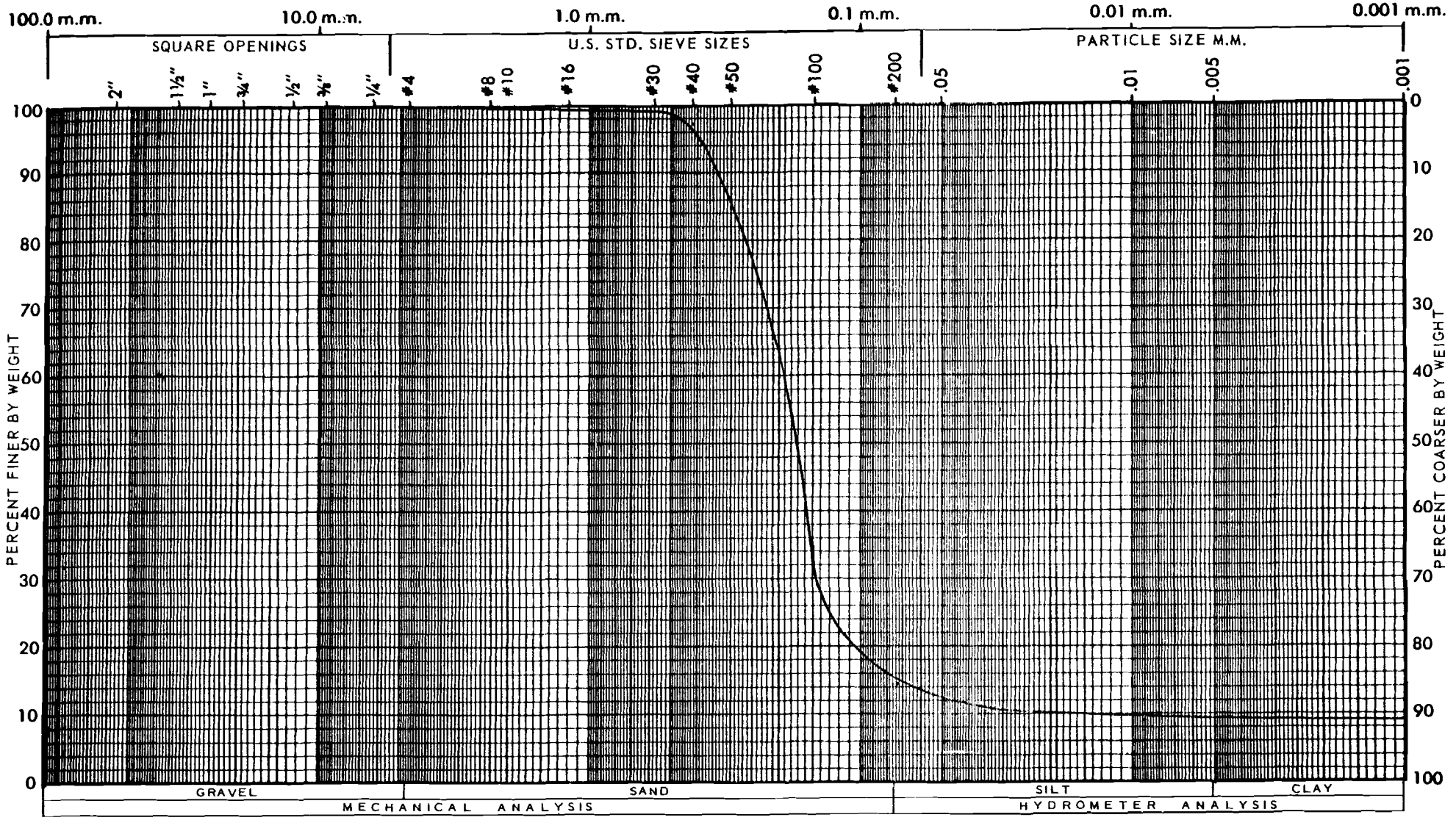
JOB NO. 8-[illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-17 @ 0-4' (BL-1)					35-41

ASTM D854
Sp. Gr. = 2.701

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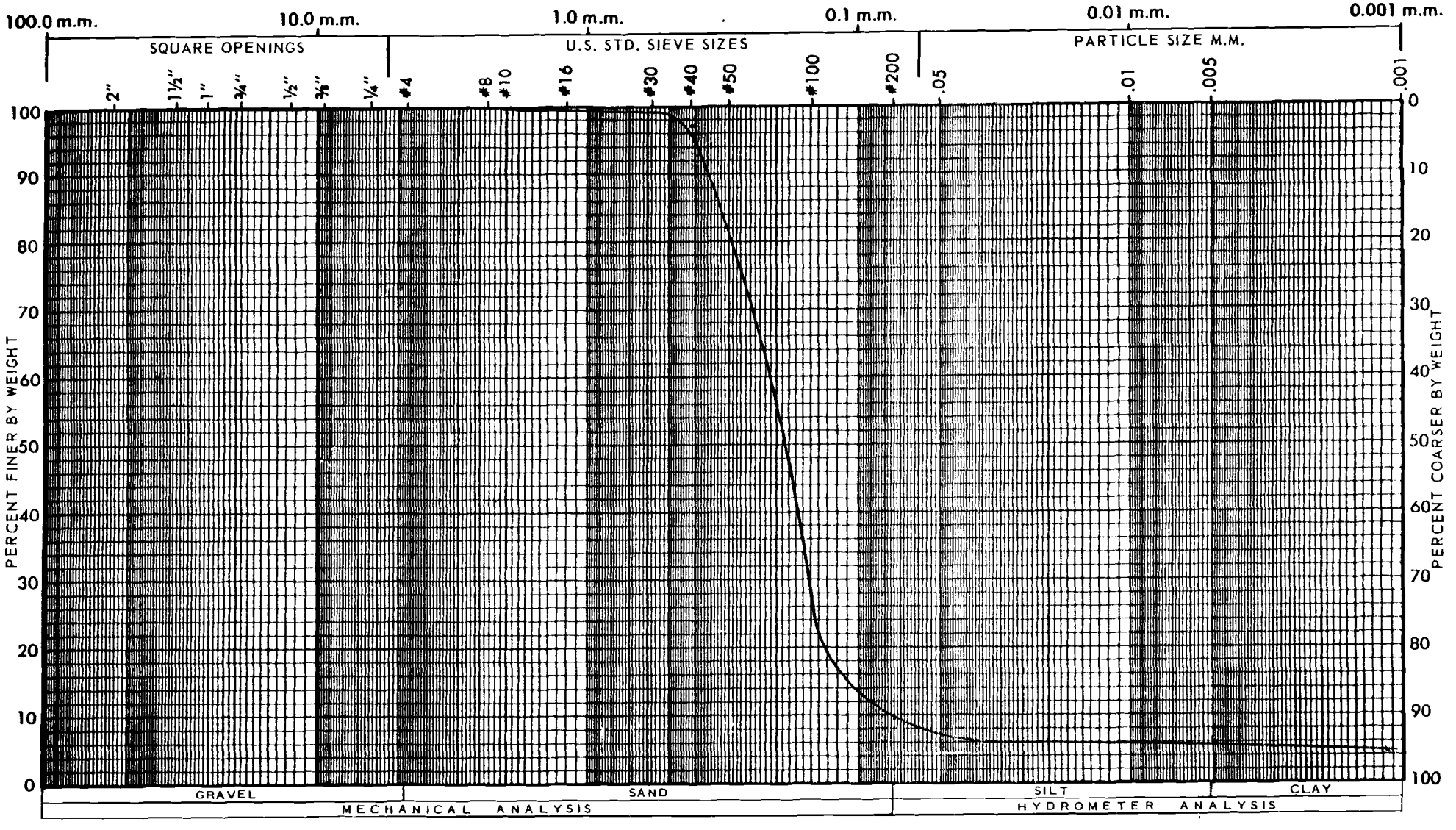
JOB NO. [illegible]-11[illegible]

PARTICLE SIZE DISTRIBUTION CURVE

ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring B-18 @ 0-3' (BL-1)					35-42

ASTM D854

Sp. Gr. = 2.742

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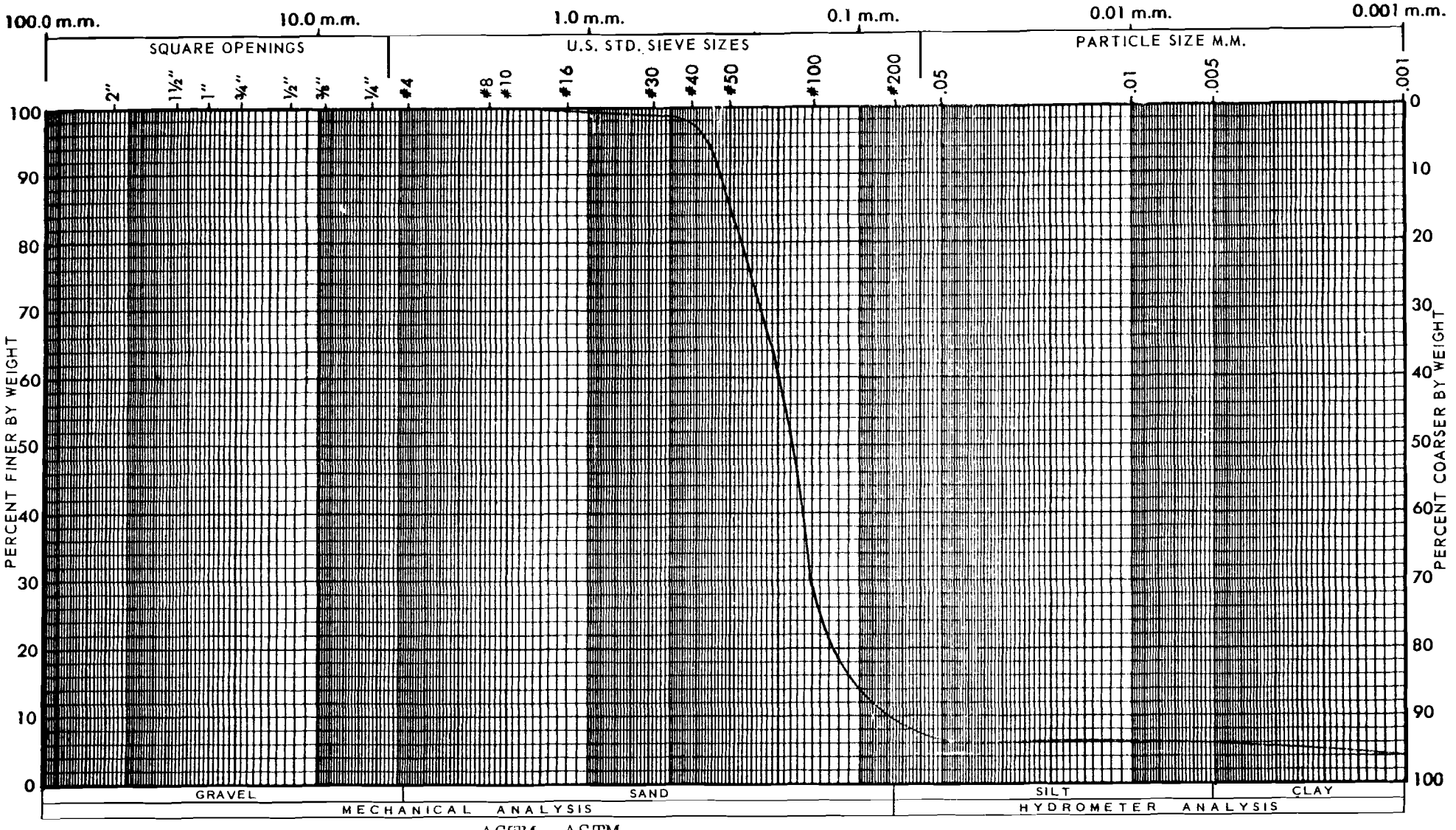
JOB NO. 2.3-1...

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT (ASTM D423)	PLASTICITY INDEX (ASTM D424)	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-19 @ 1-2½' (S-1)	NV	NP		SM-SP	35-9

ASTM D854
Sp. Gr. = 2.606

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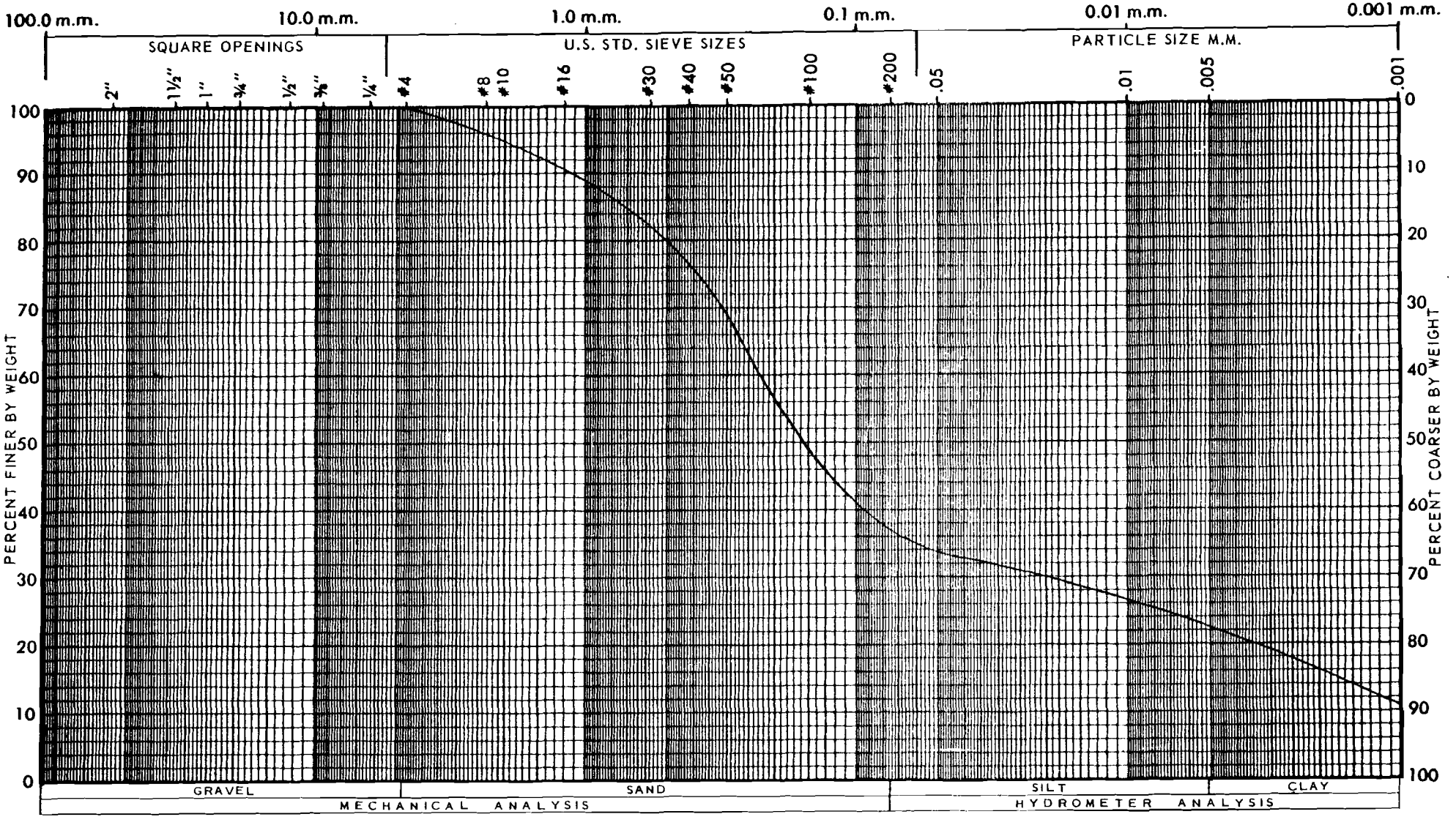
JOB NO. 3-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	ASTM D423 LIQUID LIMIT	ASTM D424 PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-19 @ 9'-9'11"	NV	NP		SM	35-10
	(S-3)					

ASTM D854
Sp. Gr. = 2.665

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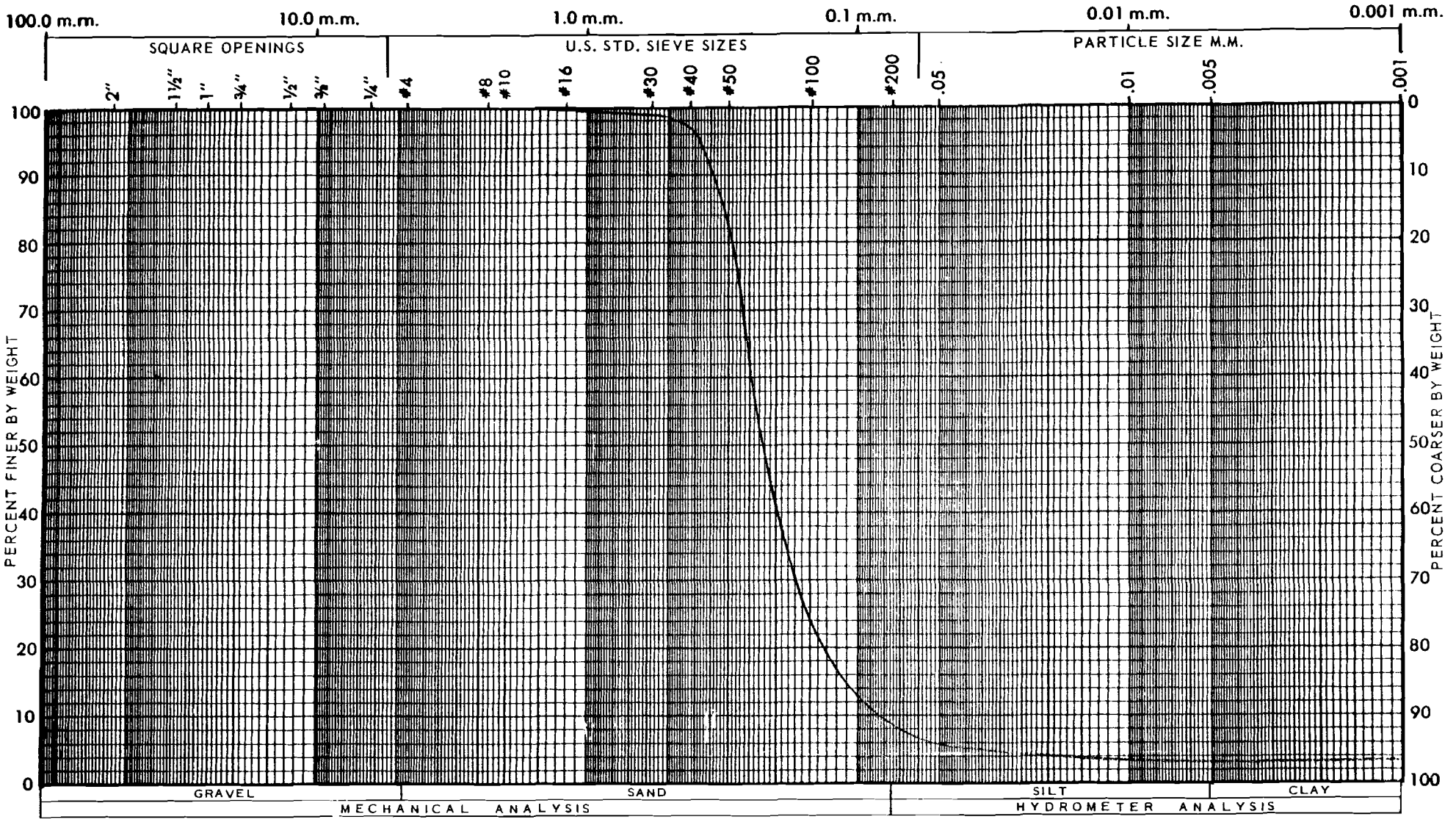
JOB NO. 278-1135

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-20 @ 0-3'(BL-1)					35-21

ASTM D854
Sp. Gr. = 2.678

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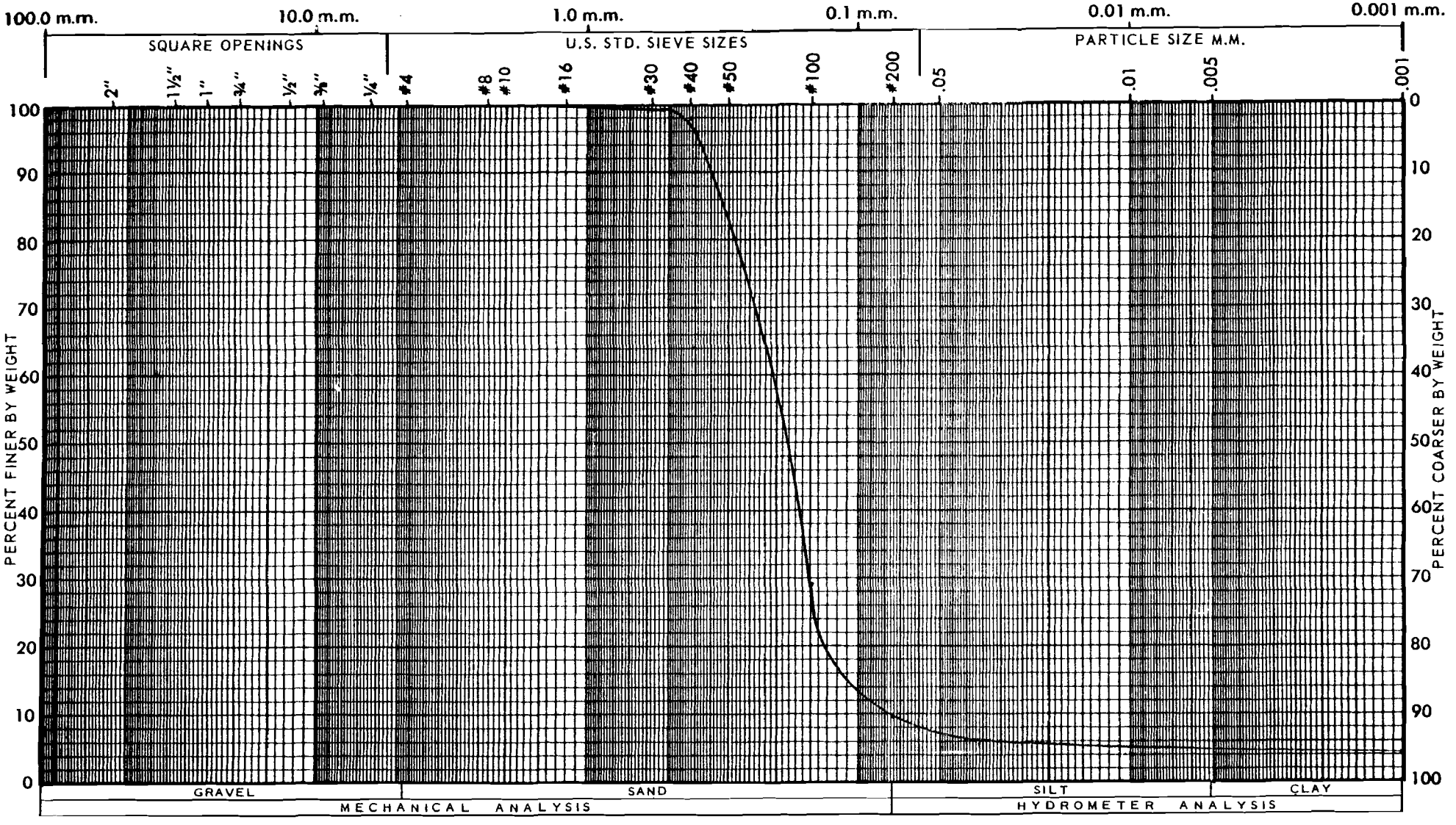
JOB NO. 3-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-20 @ 0-3' (BL-1)					35-43

ASTM D854
Sp. Gr. = 2.698

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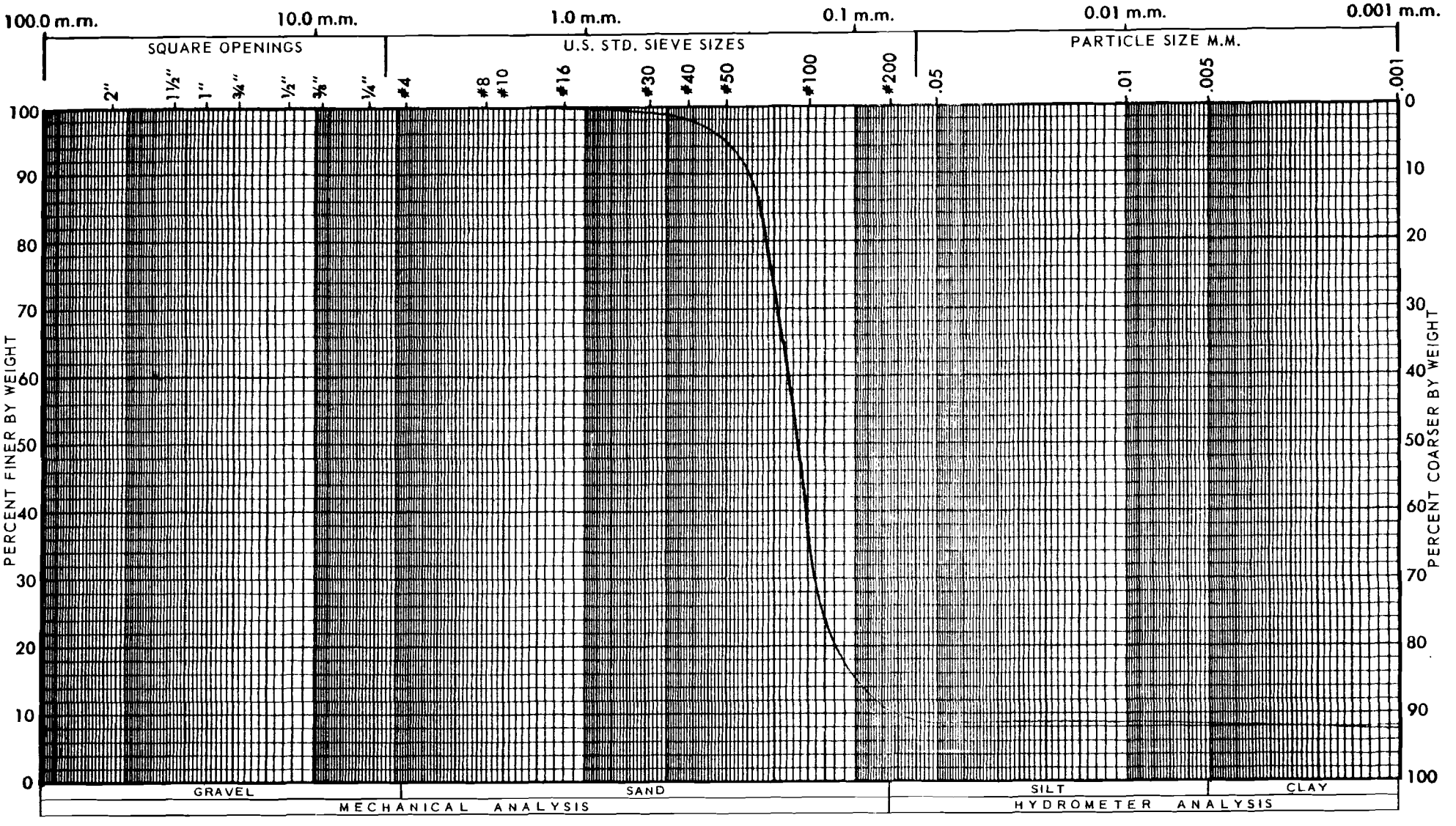
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-20 @ 3-5' (P-1)					35-73

ASTM D854
Sp. Gr. = 2.691

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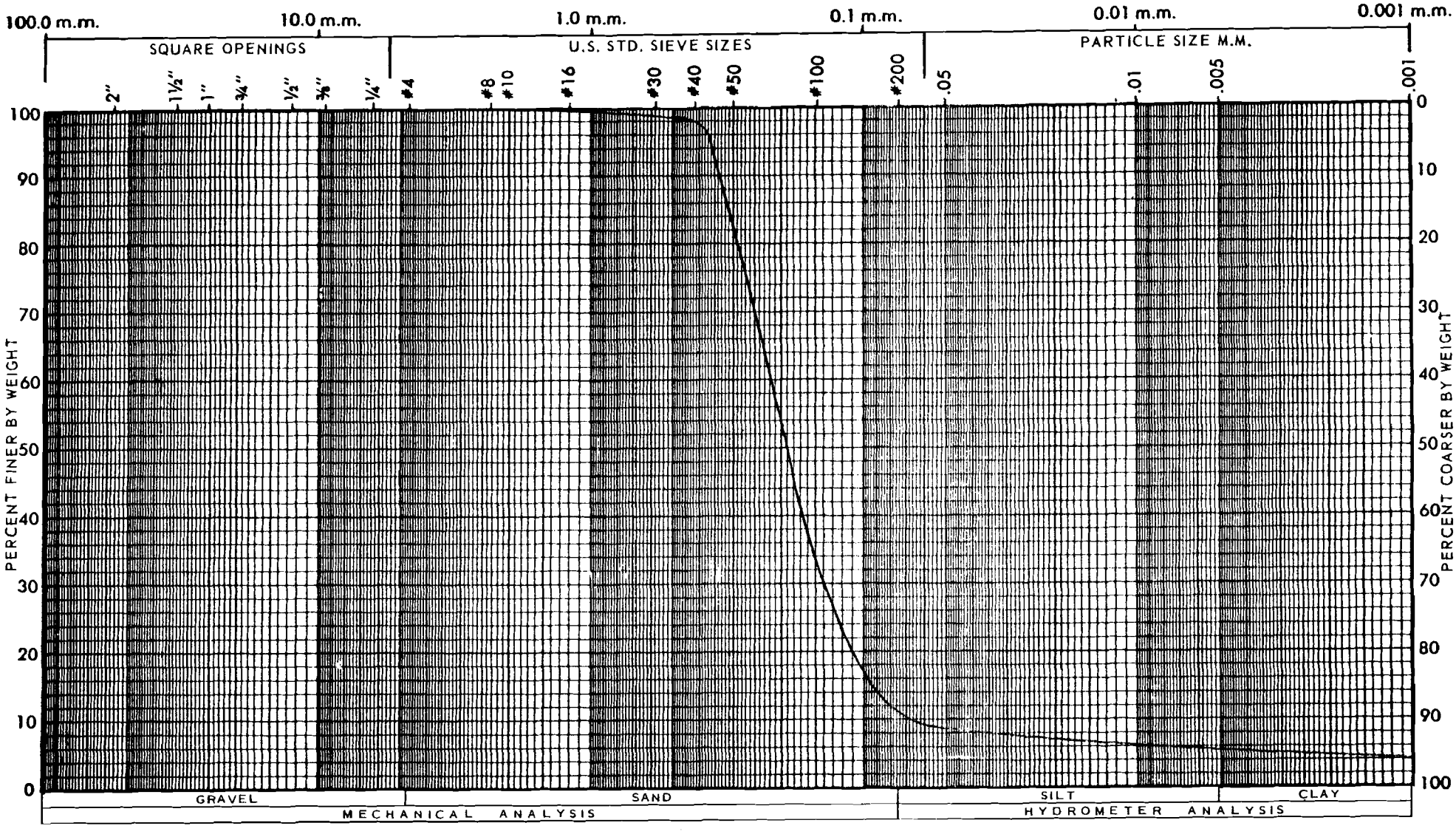
JOB NO. 8-[illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-21 @ 1-2½' (S-1)					35-11

ASTM D854
Sp. Gr. = 2.677

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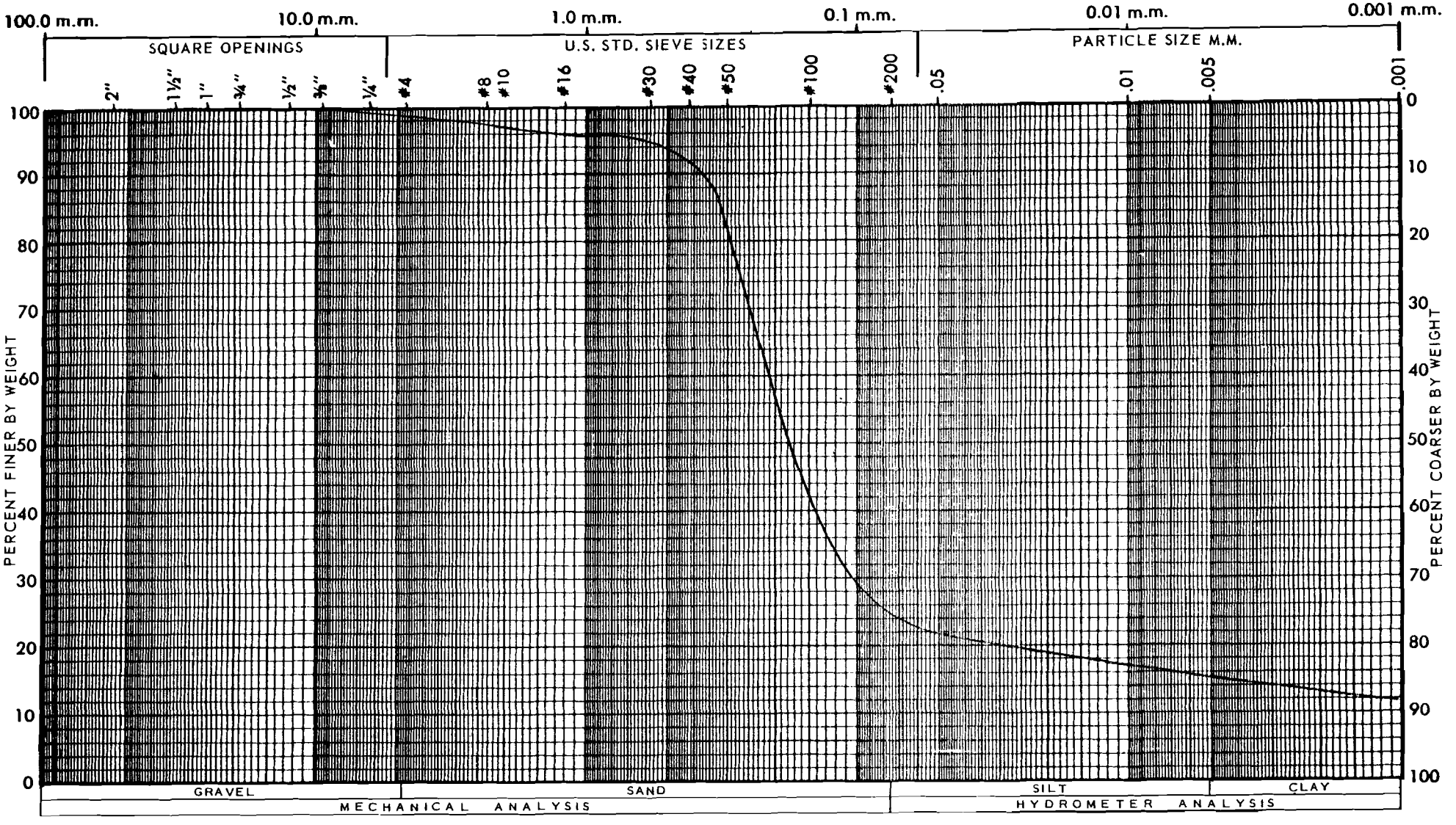
JOB NO. 8-[illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	ASTM D423 LIQUID LIMIT	ASTM D424 PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-21 @ 8-8'8" (S-3)	NV	NP		SM	35-12

ASTM D854
Sp. Gr. = 2.782

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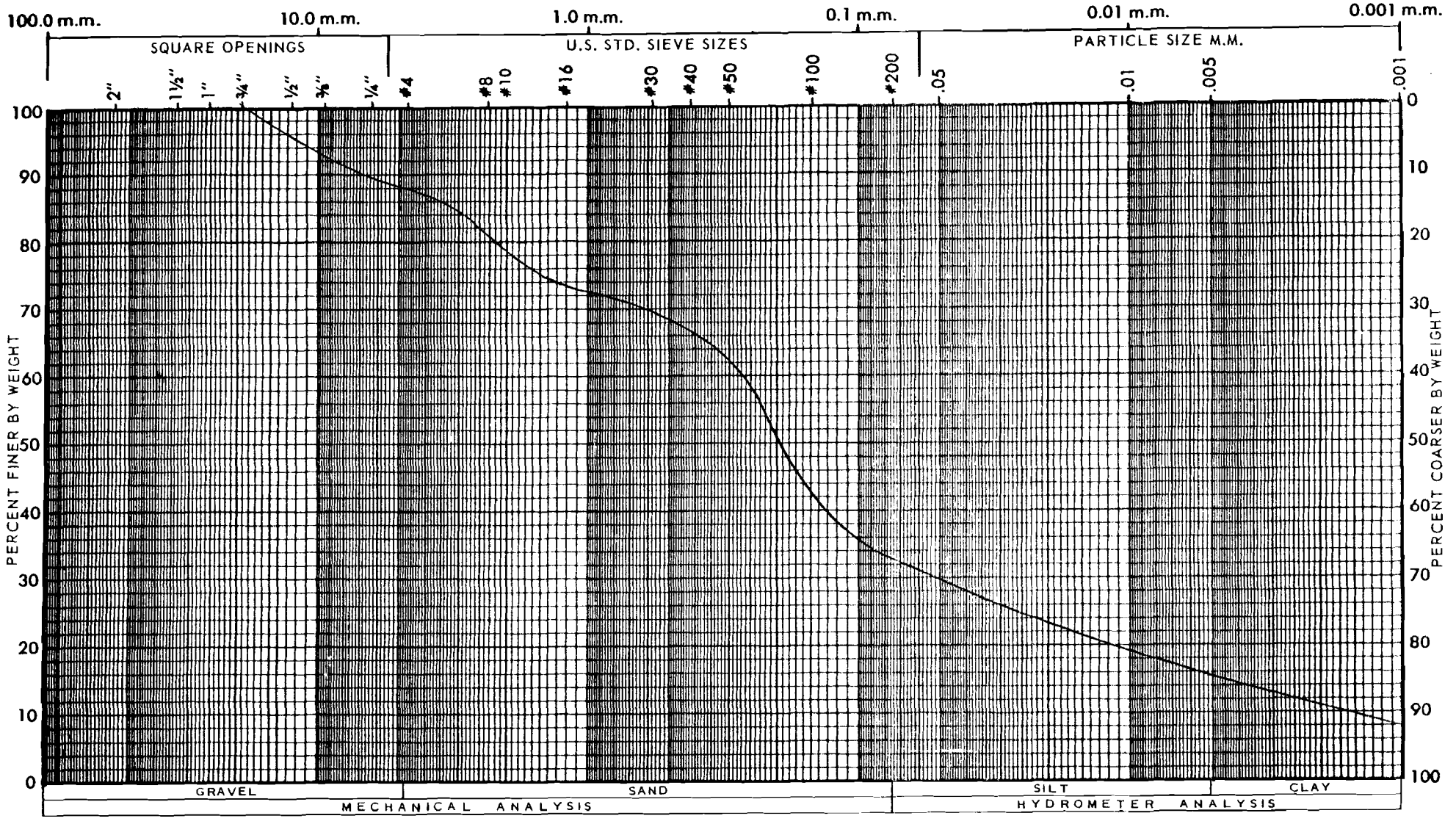
JOB NO. 73-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-21 @ 14-15½'					35-13
	(S-4)					

ASTM D854
Sp. Gr. = 2.747

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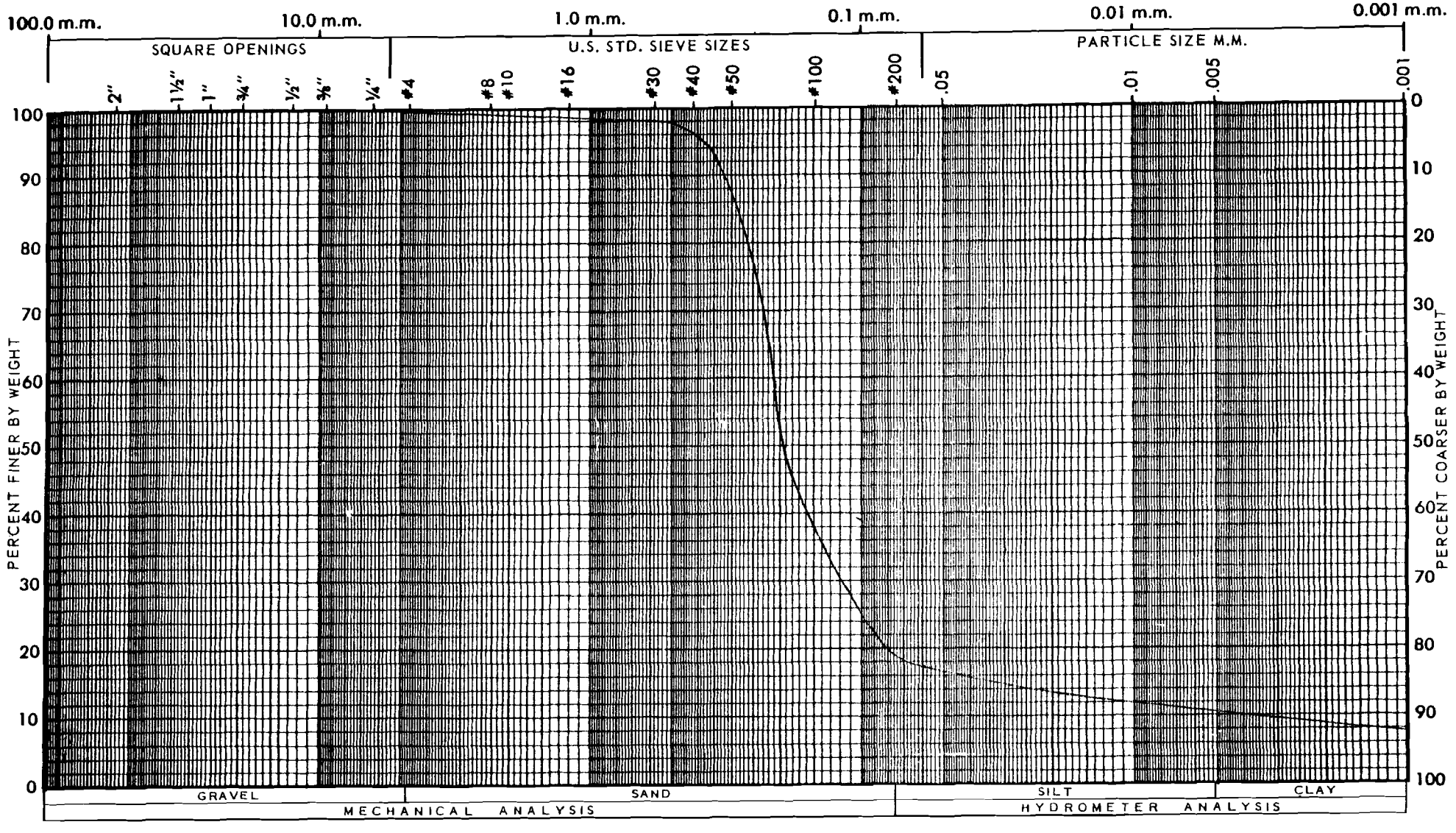
JOB NO. [illegible]3-1[illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-21 @ 24-25'5½"					35-14
	(S-6)					

ASTM D854
Sp. Gr. = 2.650

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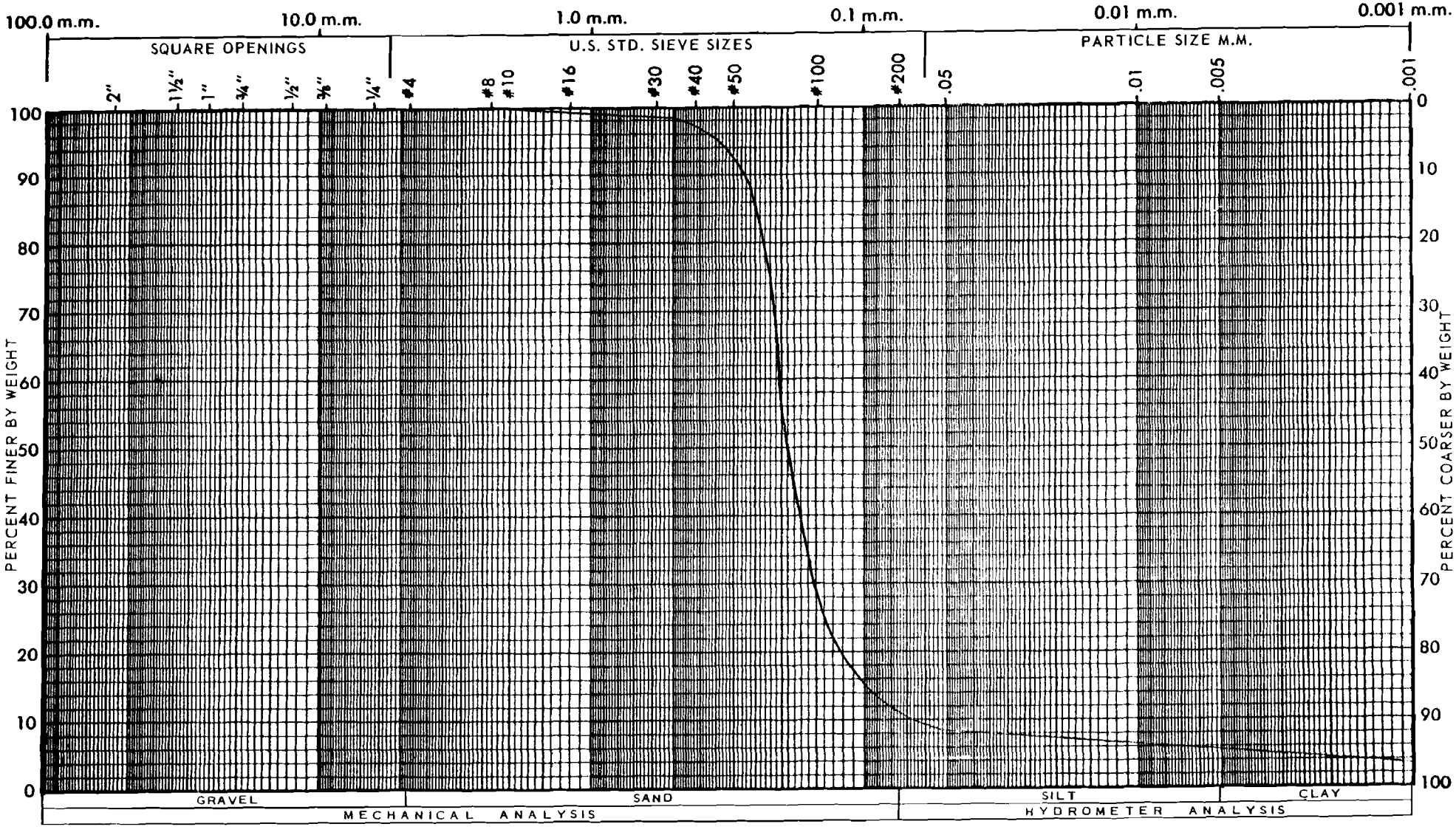
JOB NO. 3-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-22 @ 0-3' (BL-1)					35-19

ASTM D854
Sp. Gr. = 2.783

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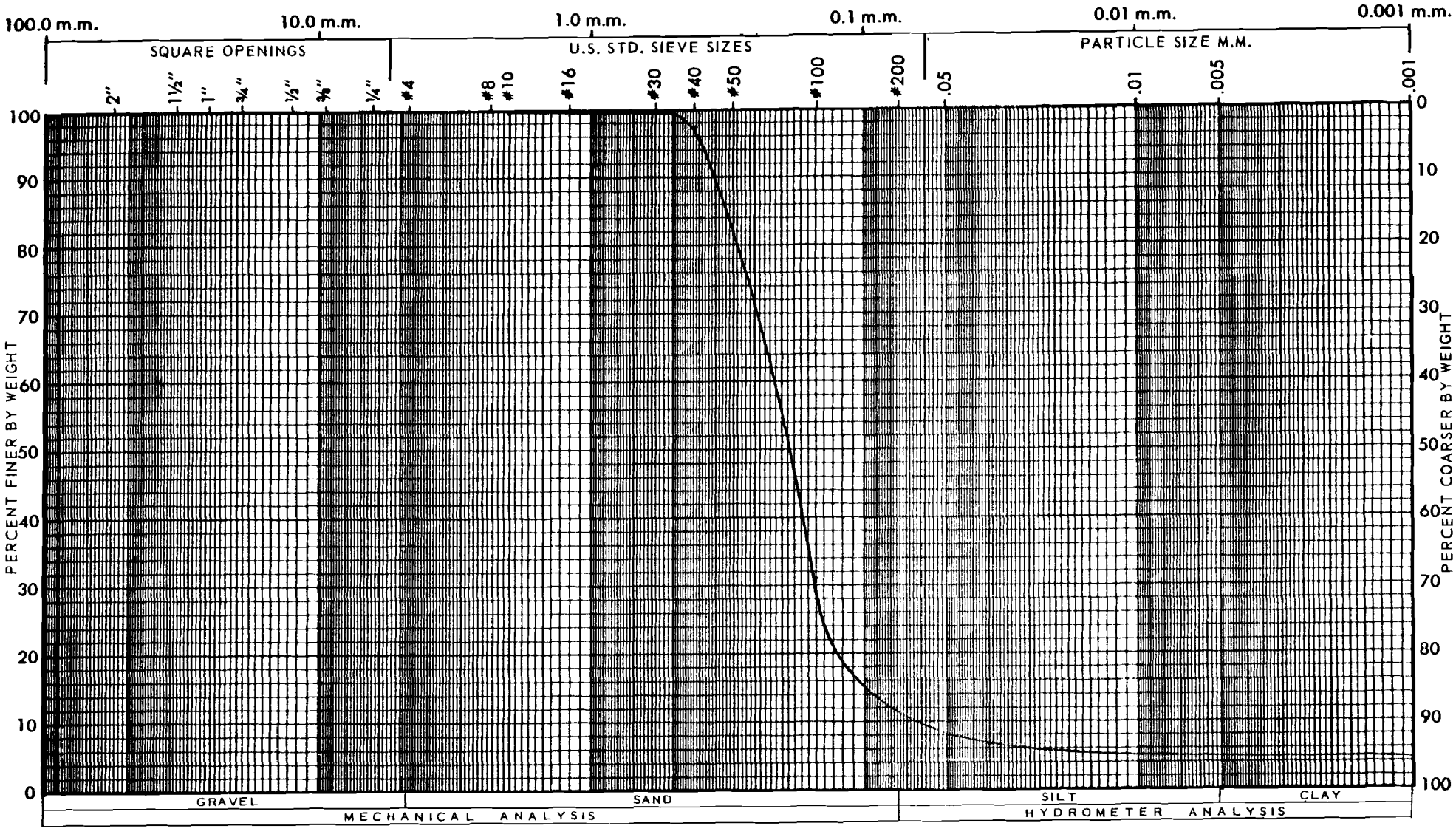
NO. 8-1

PARTICLE SIZE DISTRIBUTION CURVE

ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-22 @ 0-3' (BL-1)					35-44

ASTM D854
Sp. Gr. = 2.783

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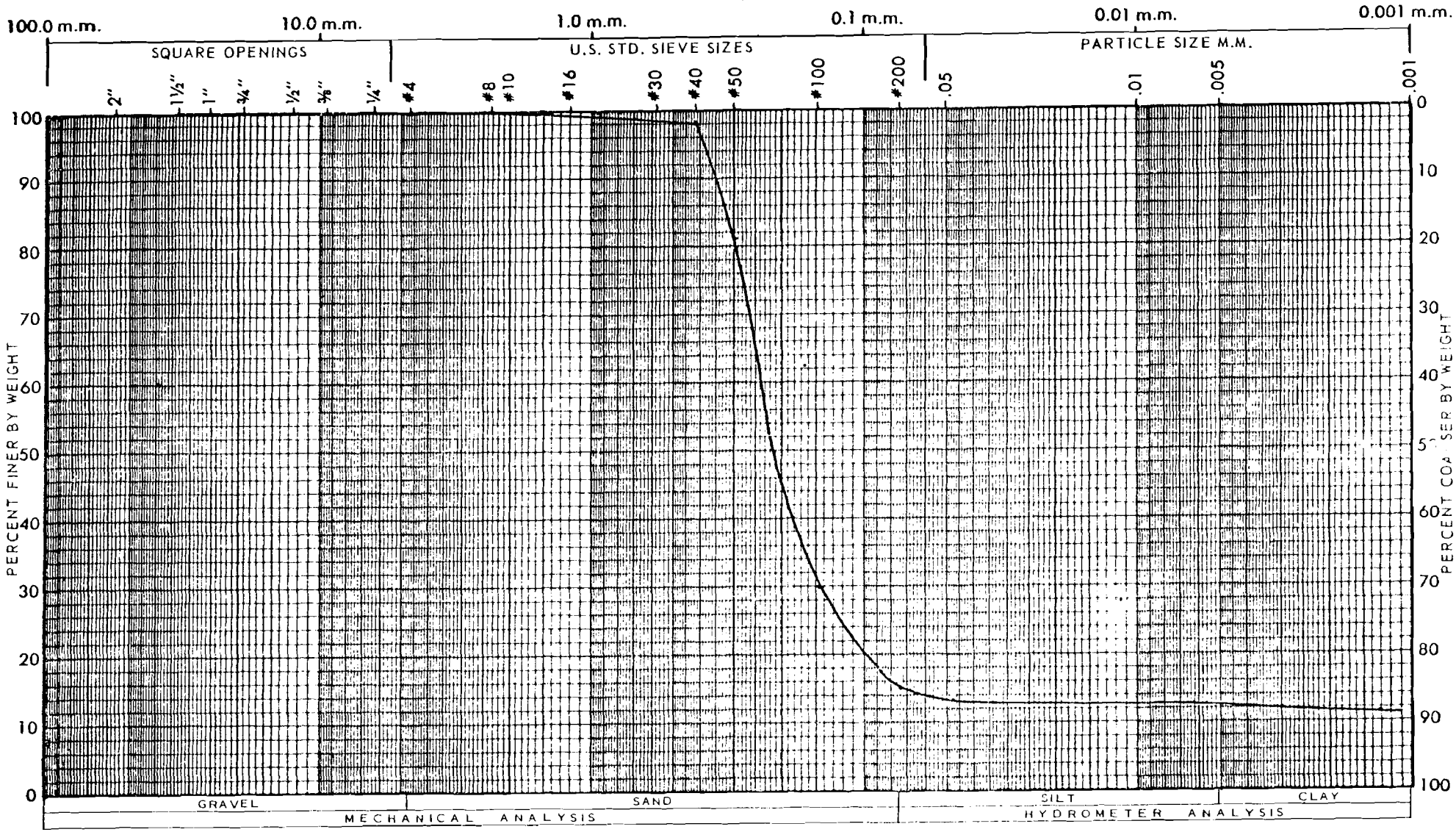
NO 78-1125

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Tube cut at 3'4" to 3'9"					
	B-22 P_1 @ 3'-5'					1135-6
	(3'4" to 3'5.3" portion this test)					

ASTM D854
Sp. Gr. = 2.677

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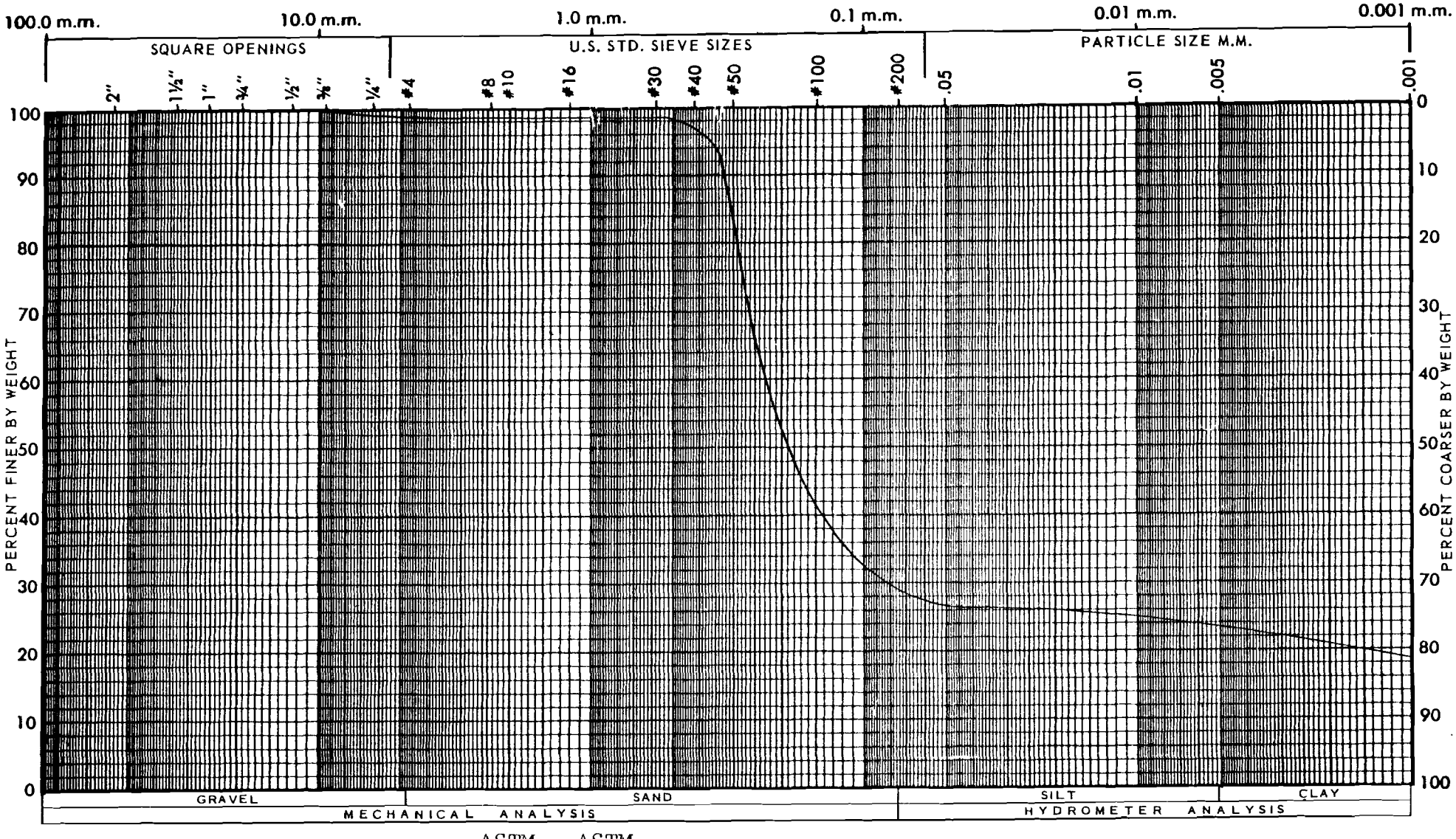
JOB NO. 28-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	ASTM D423 LIQUID LIMIT	ASTM D424 PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-22 @ 5'2"-6'8"	29	9		SC	35-20
	(S-2)					

ASTM D854
Sp. Gr. - 2.866

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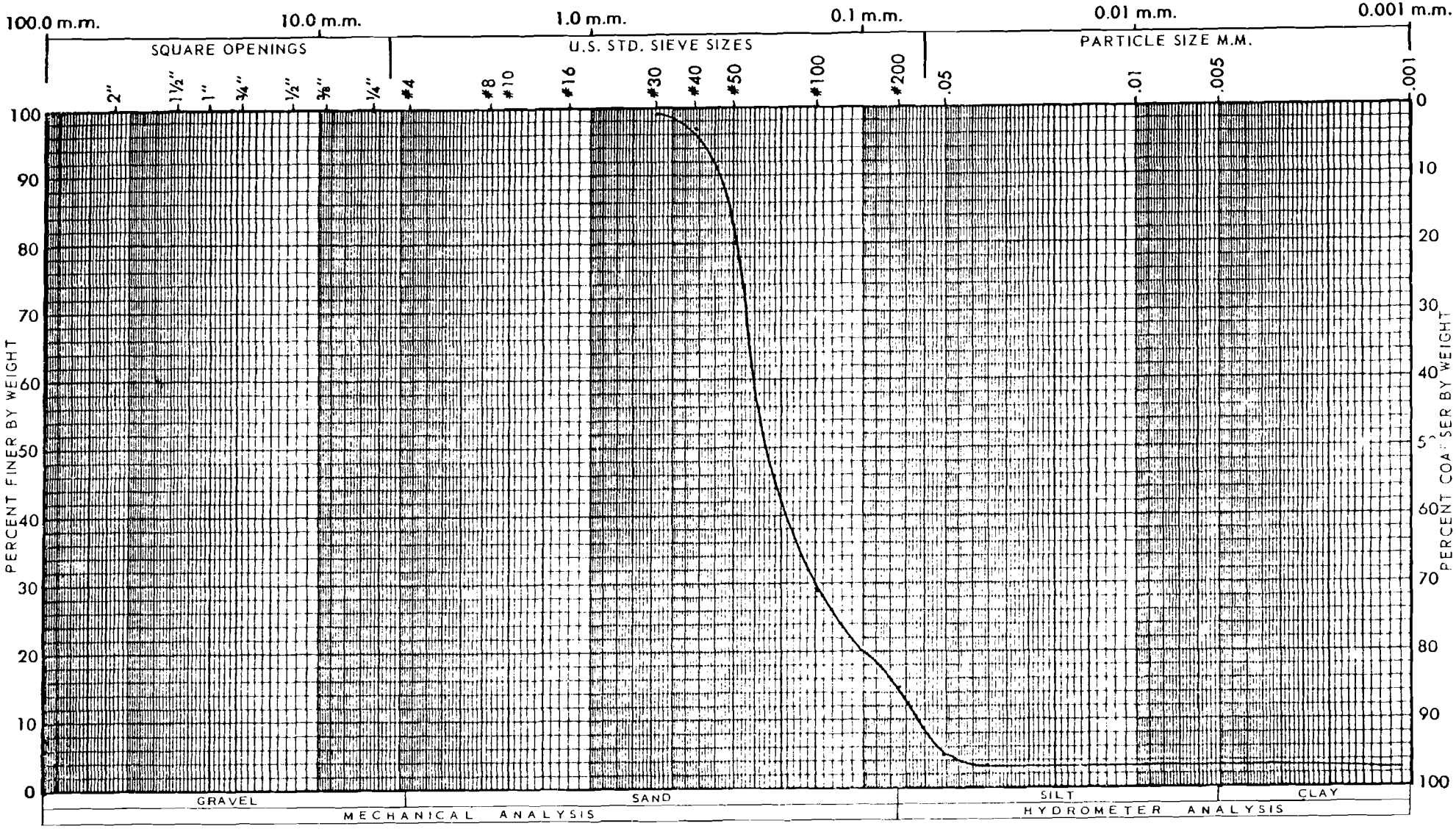
B NO. E78 135

PARTICLE SIZE DISTRIBUTION CURVE

ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Tube cut at 3'5" to 3'10"					
	B-23 P_2 @ 3'-5'					1135-7
	(3'5" to 3'6.3" portion this test)					

ASTM D854
Sp. Gr. = 2.658

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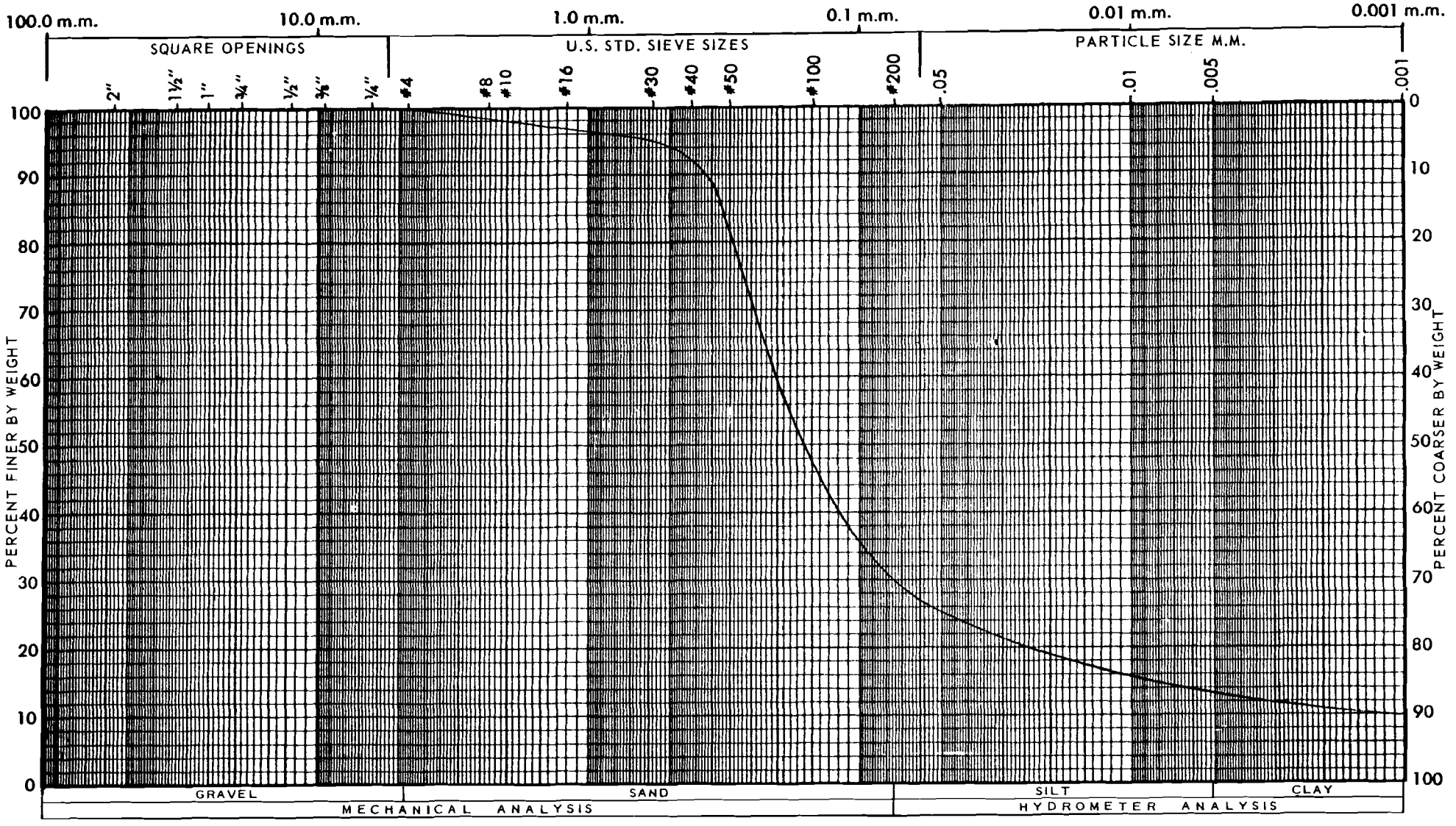
PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT (ASTM D423)	PLASTICITY INDEX (ASTM D424)	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-23 @ 10-10'11½"	24	NP		SM	35-15
	(S-6)					

ASTM D854
Sp. Gr. = 2.571

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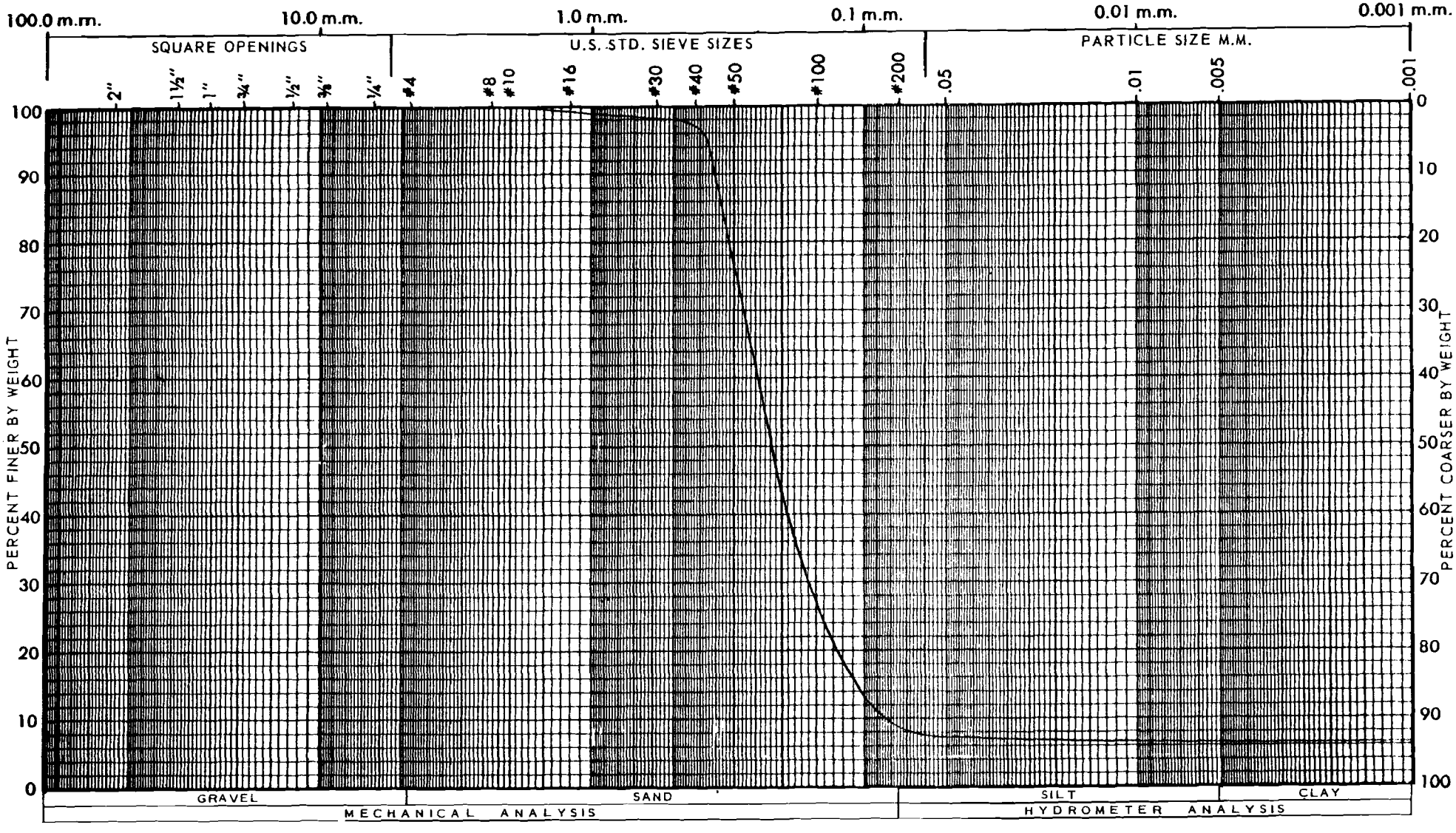
NO. 78-1125

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-24 @ 1-2½' (S-1)					35-16

ASTM D854
Sp. Gr. = 2.668

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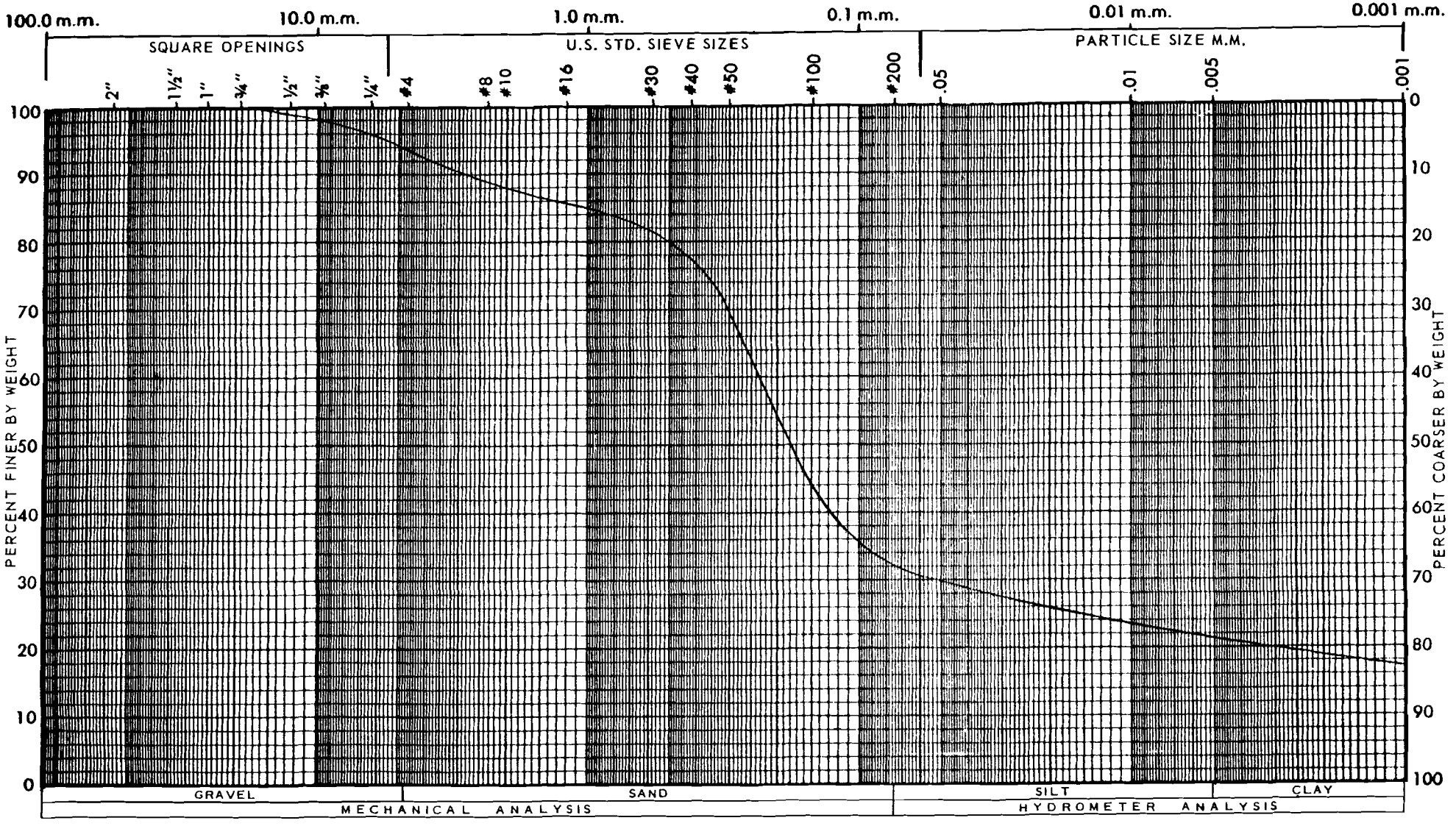
NO. 3-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	ASTM D423 LIQUID LIMIT	ASTM D424 PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-24 @ 5-6½' (S-3)	25	NP		SM	35-17

ASTM D854
Sp. Gr. = 2.757

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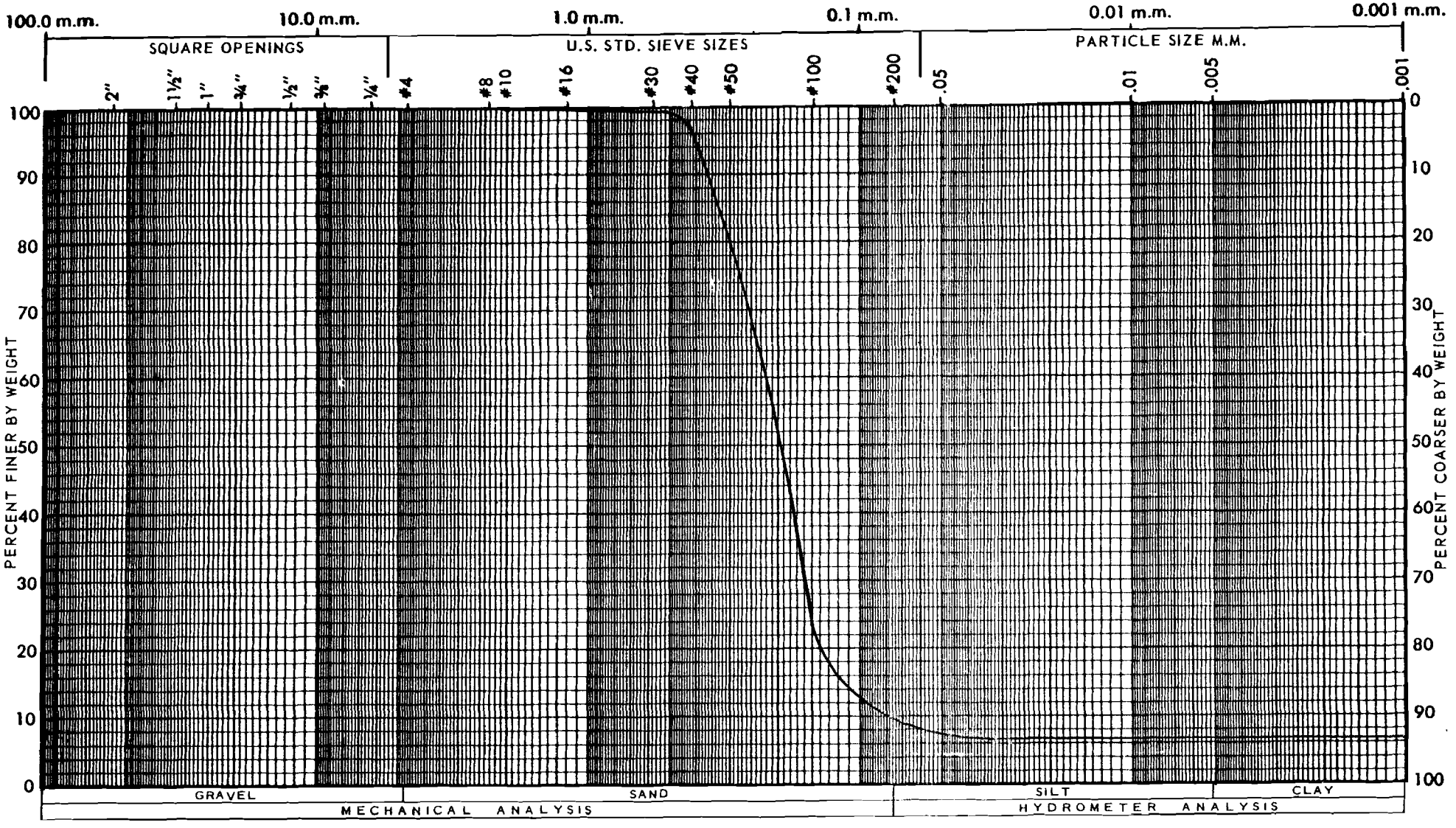
JOB NO. 8-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-26 @ 0-3' (BL-1)					35-48

ASTM D854
Sp. Gr. = 2.746

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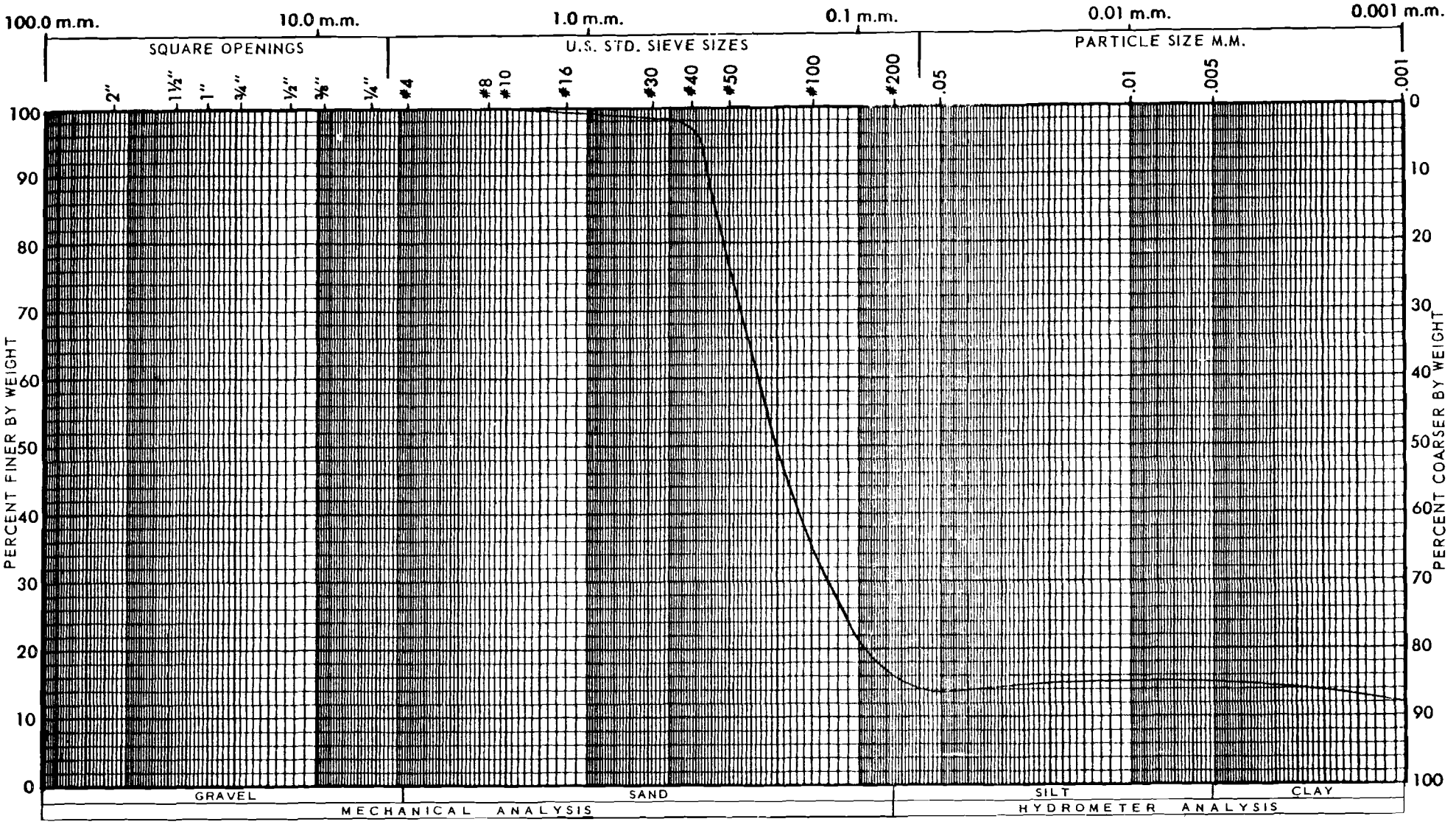
JOB NO. 678-1155

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-27 @ 3-4' (BL-1)					35-49

ASTM D854
Sp. Gr. = 2.873

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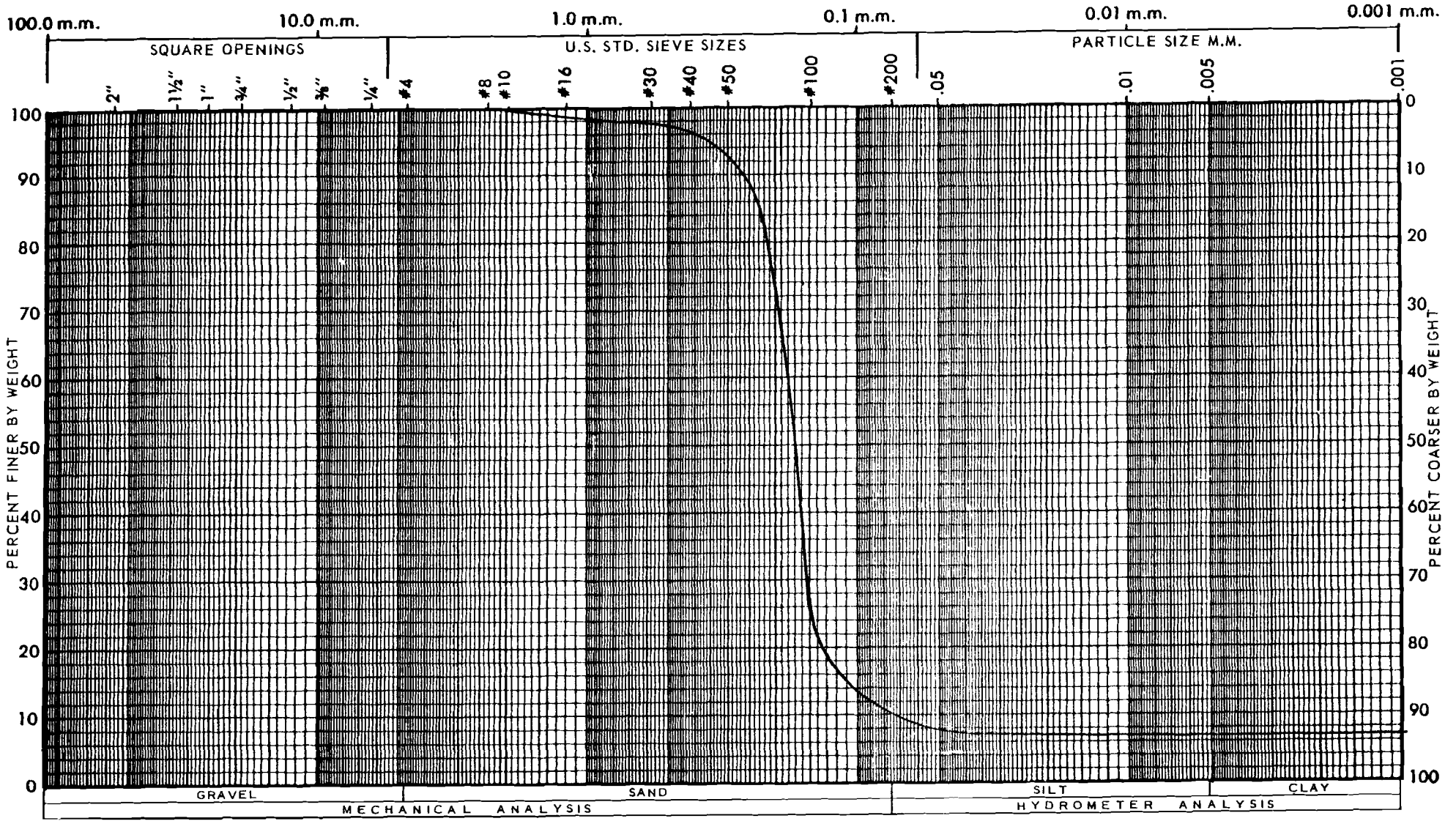
JOB NO. 4,8-1

PARTICLE SIZE DISTRIBUTION CURVE

ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-28 @ 0-4' (BL-1)					35-50

ASTM D854
Sp. Gr. = 2.687

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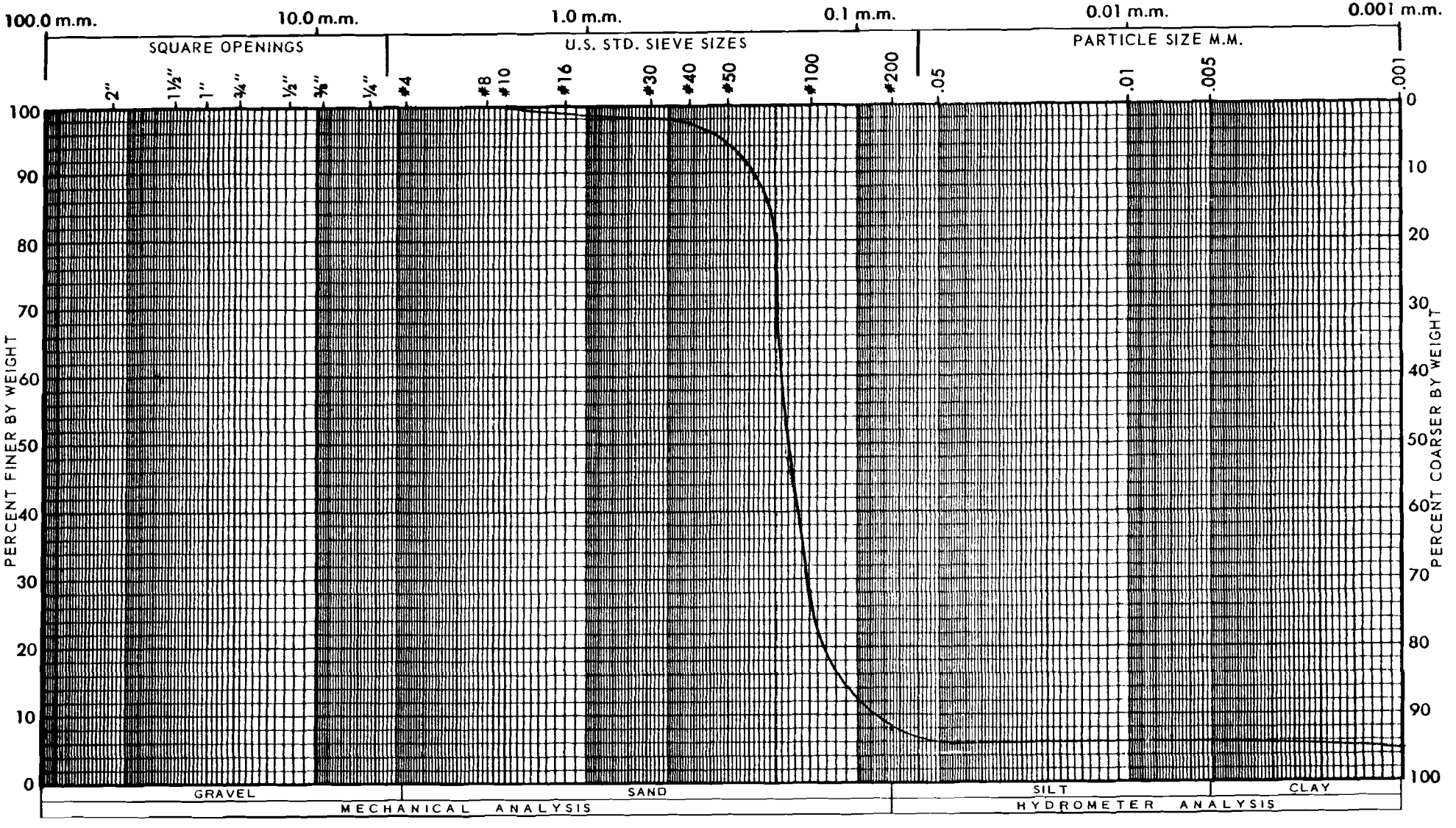
PARTICLE SIZE DISTRIBUTION CURVE

ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-29 @ 0-6' (BL-1)					35-51

ASTM D854
Sp. Gr. = 2.537

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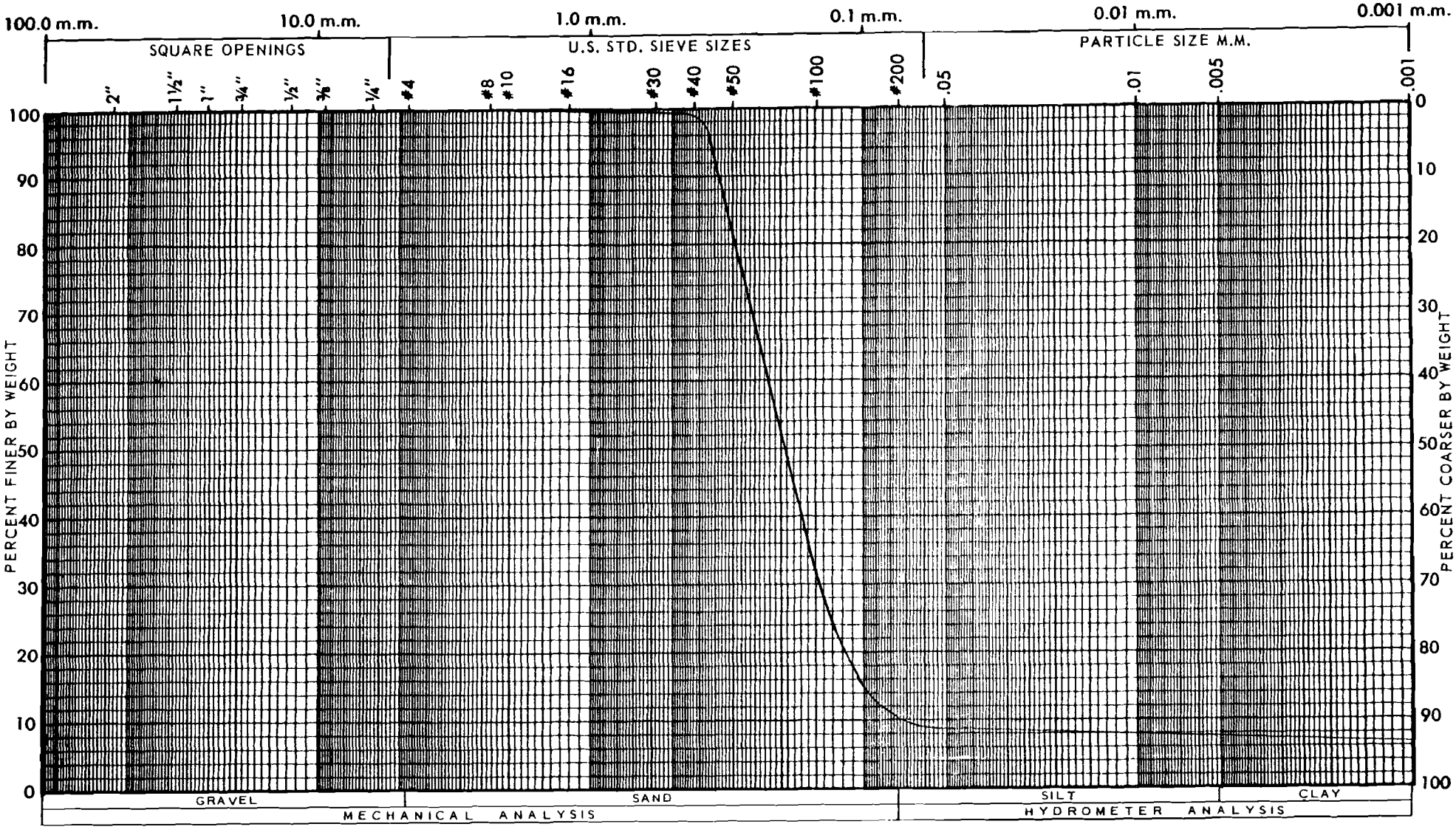
JOB NO. B73-1133

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-30 @ 0-4' (BL-1)					35-52

ASTM D854
Sp. Gr. = 2.483

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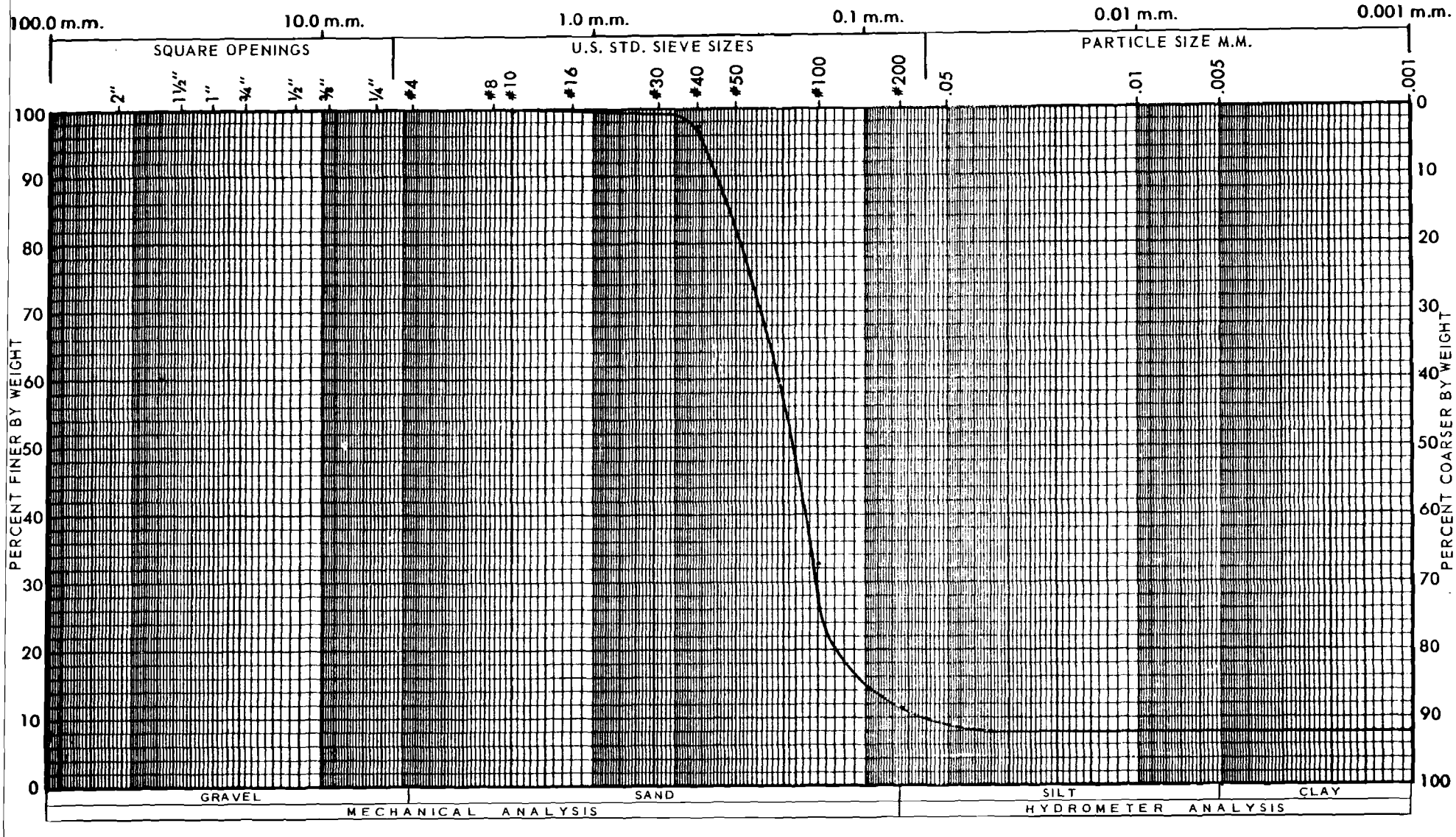
JOB NO. [illegible]8-1[illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-31 @ 0-4'3"					35-53
	(BL-1)					

ASTM D854
Sp. Gr. = 2.655

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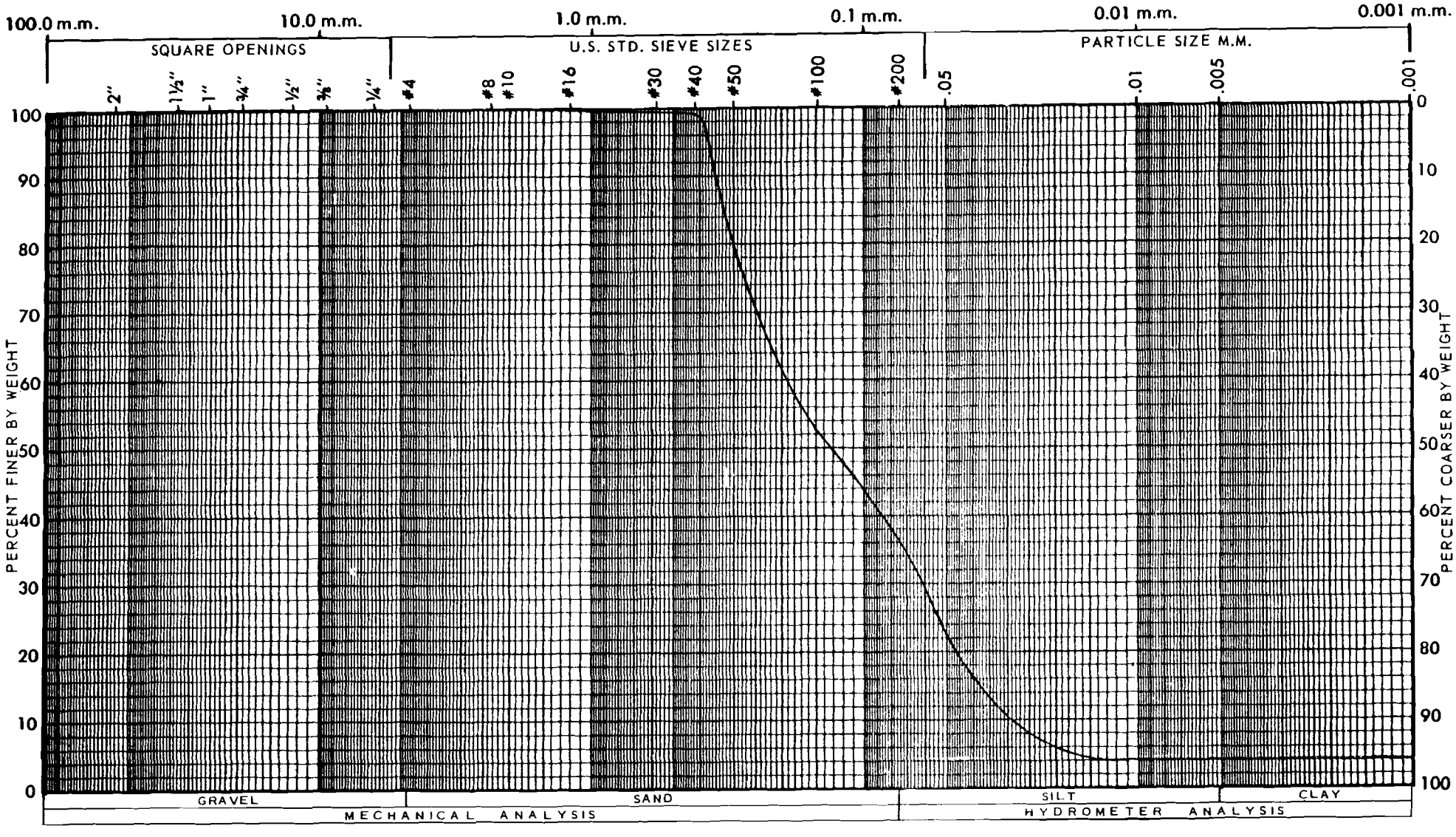
JOB NO. -11

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-32 @ 0-10' (BL-1)					35-54

ASTM D854
Sp. Gr. = 2.720

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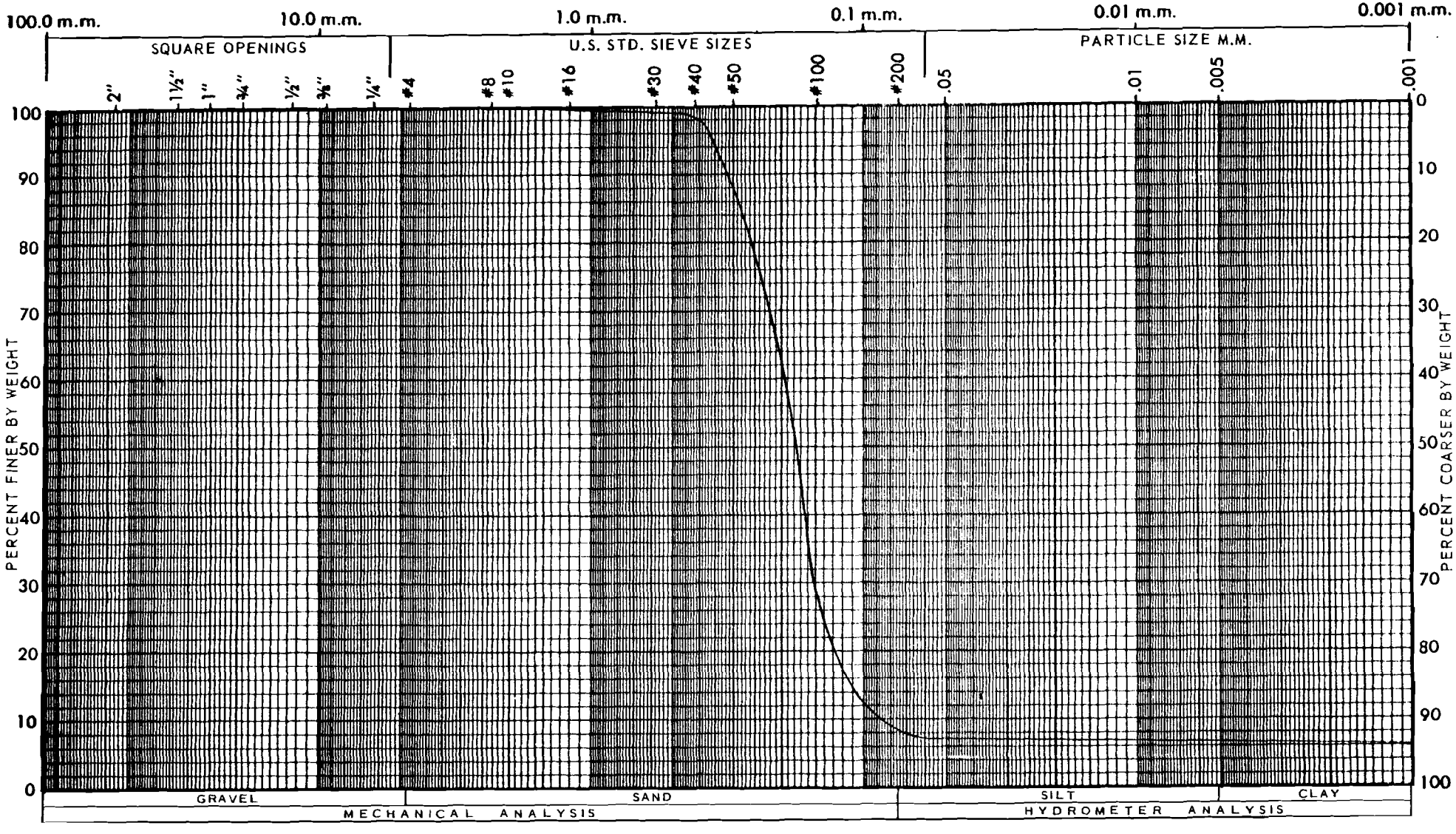
PARTICLE SIZE DISTRIBUTION CURVE ASTM D 422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-33 @ 0-6' (BL-1)					35-55

ASTM D854
Sp. Gr. = 2.726

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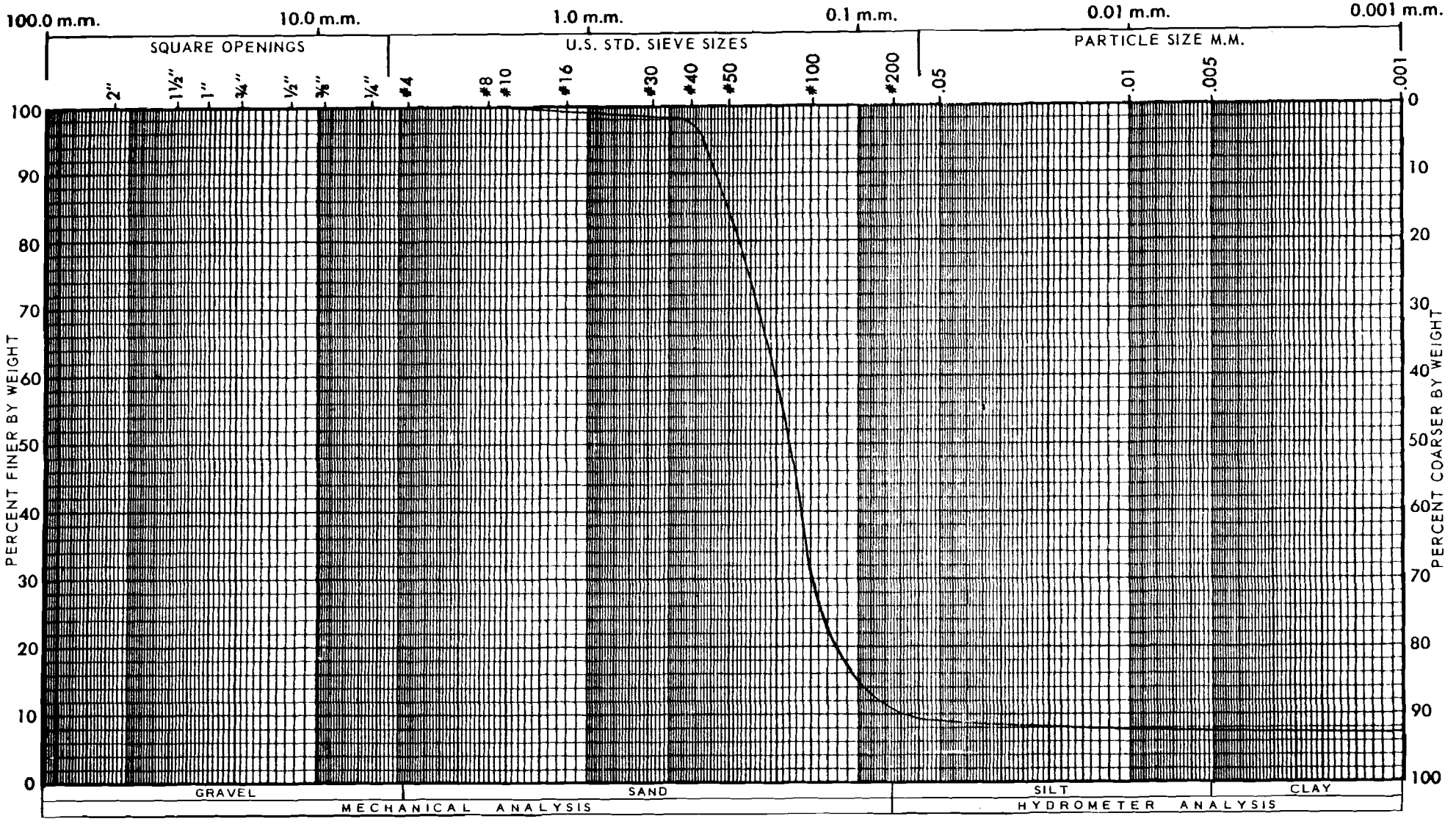
JOB NO. 8-1

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-34 @ 0-6' (BL-1)					35-56

ASTM D854
Sp. Gr. = 2.736

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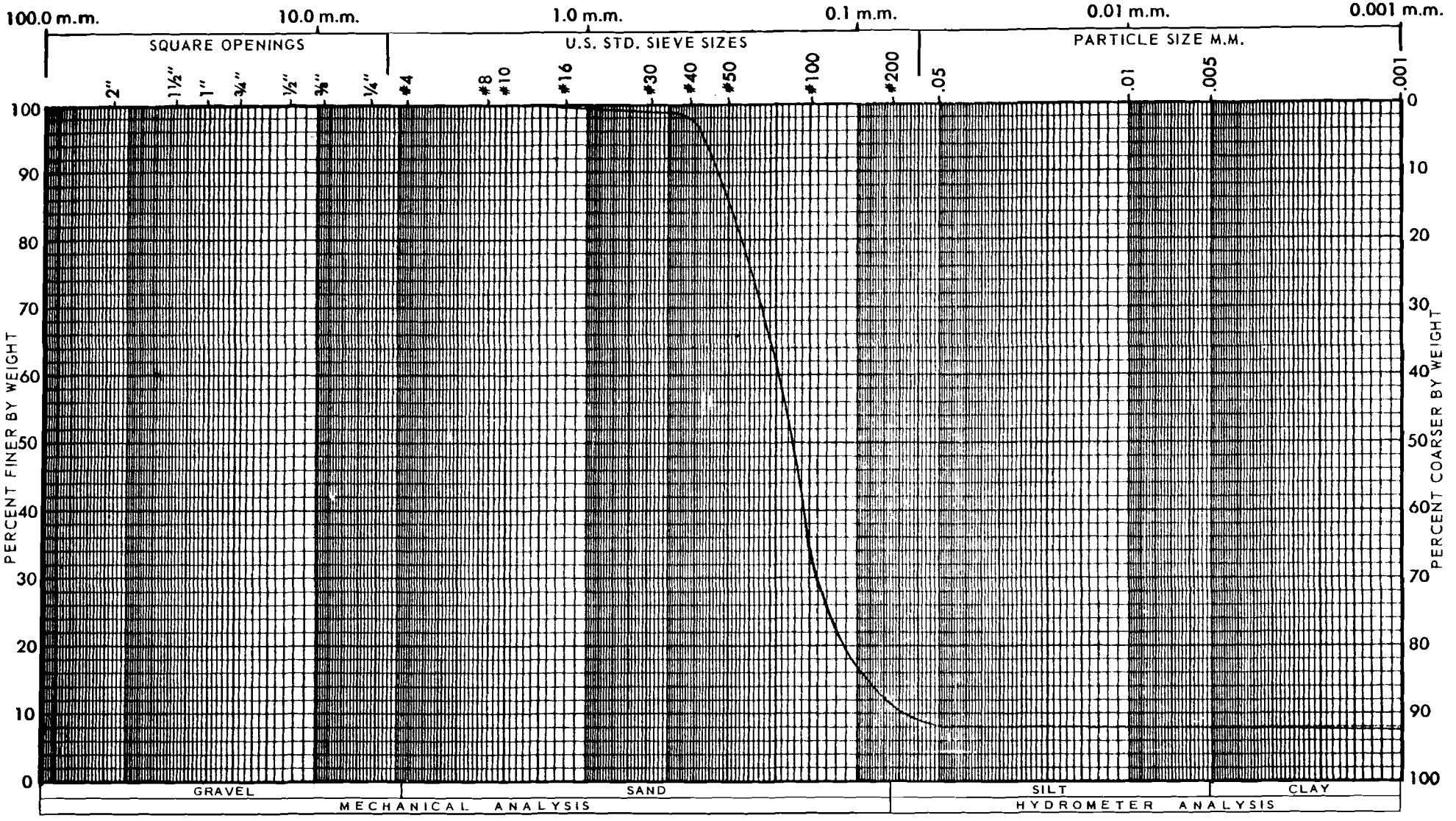
JOB NO. 78-5

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-35 @ 0-5' (BL-1)					35-57

ASTM D854
Sp. Gr. = 2.465

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JOB NO.] -11

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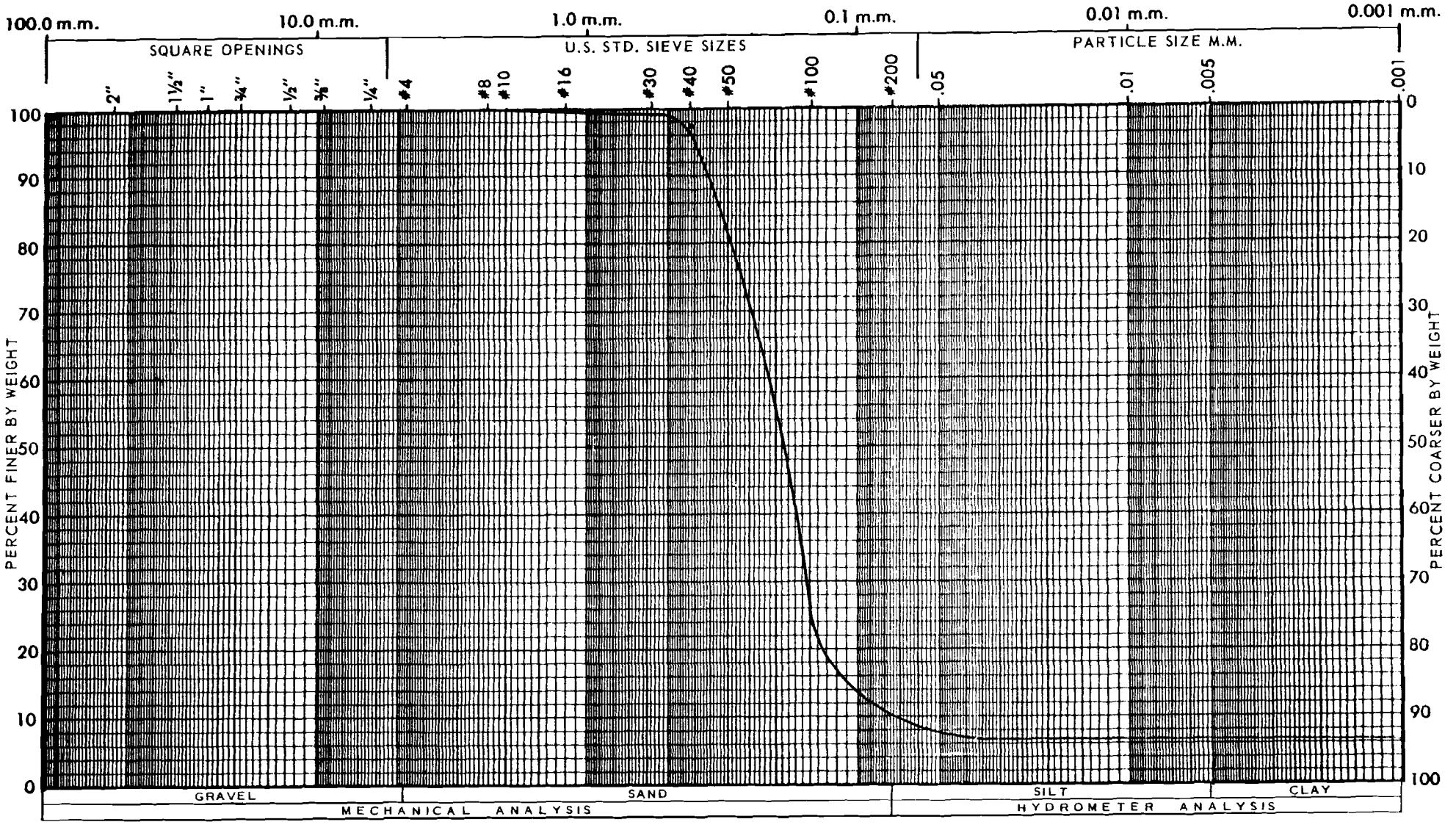
PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-36 @ 0-3'6"					35-58
	(BL-1)					

ASTM D854
Sp. Gr. = 2.548

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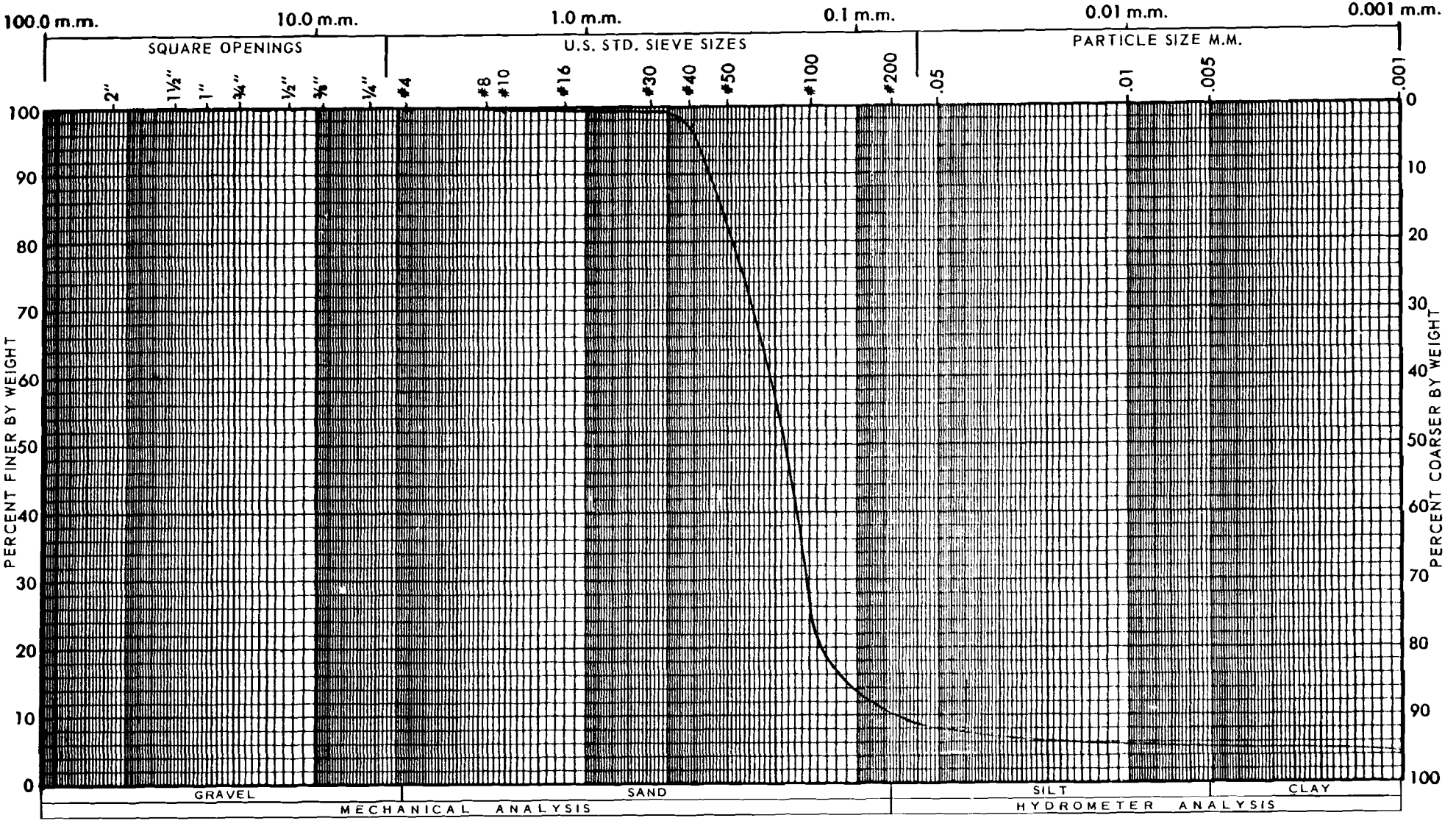
PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-37 @ 0-3' (BL-1)					35-59

ASTM D854
Sp. Gr. = 2.813

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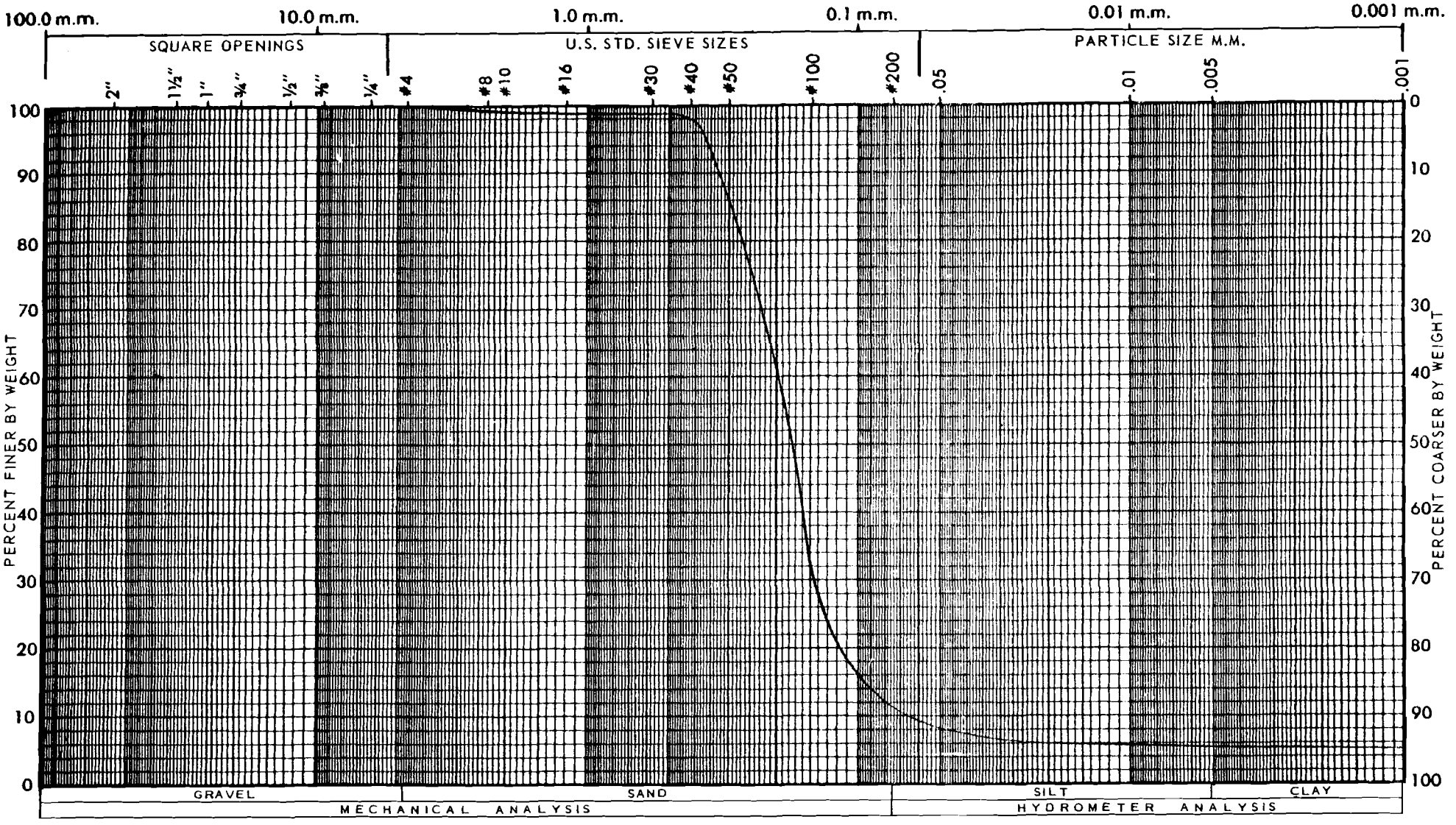
PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-37A @ 0-3' (BL-1)					35-60

ASTM D854
Sp. Gr. = 2.782

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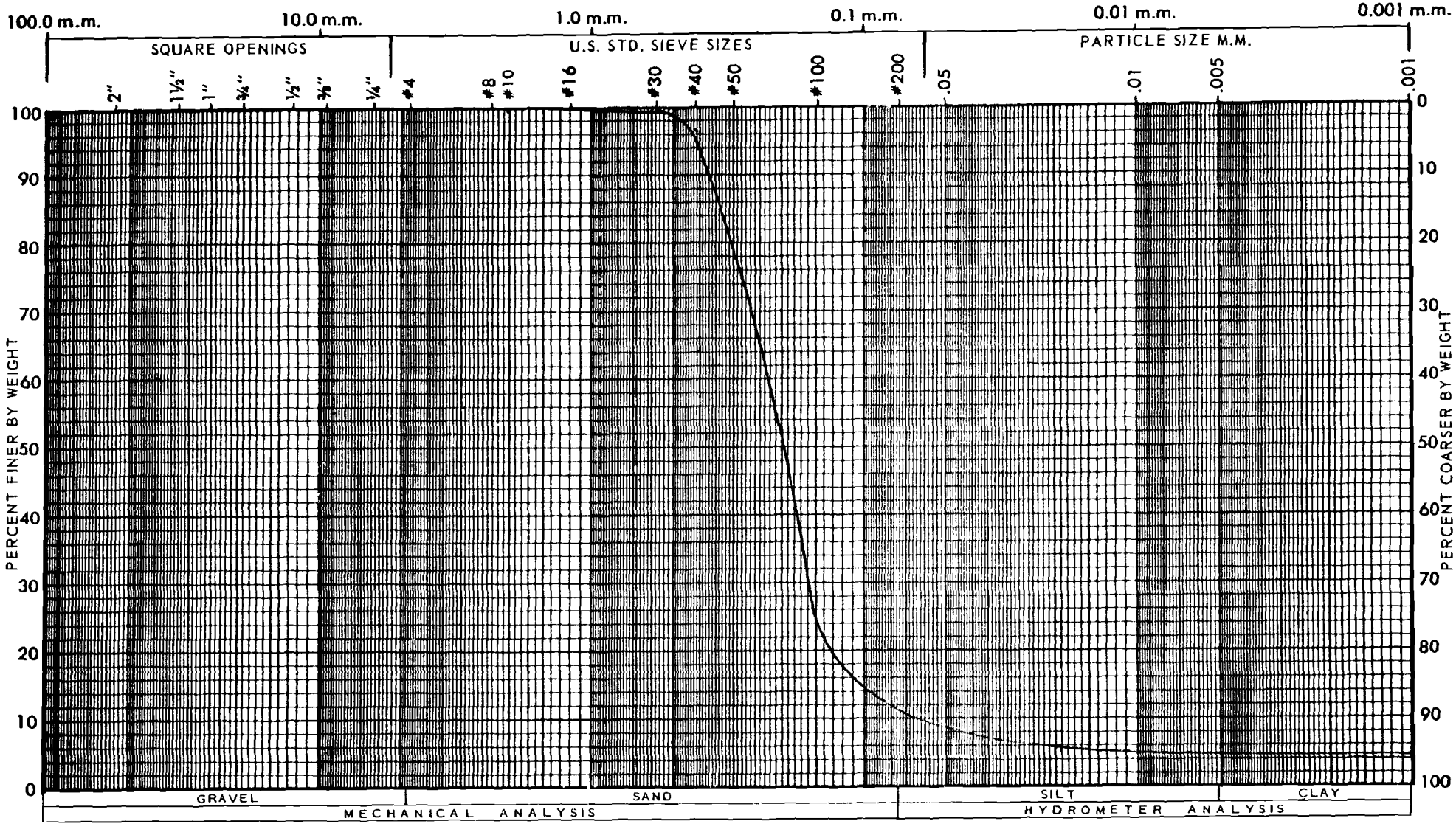
JOB NO. 78-[illegible]5

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-38 @ 0-3'6"					35-61
	(BL-1)					

ASTM D854
Sp. Gr. = 2.724

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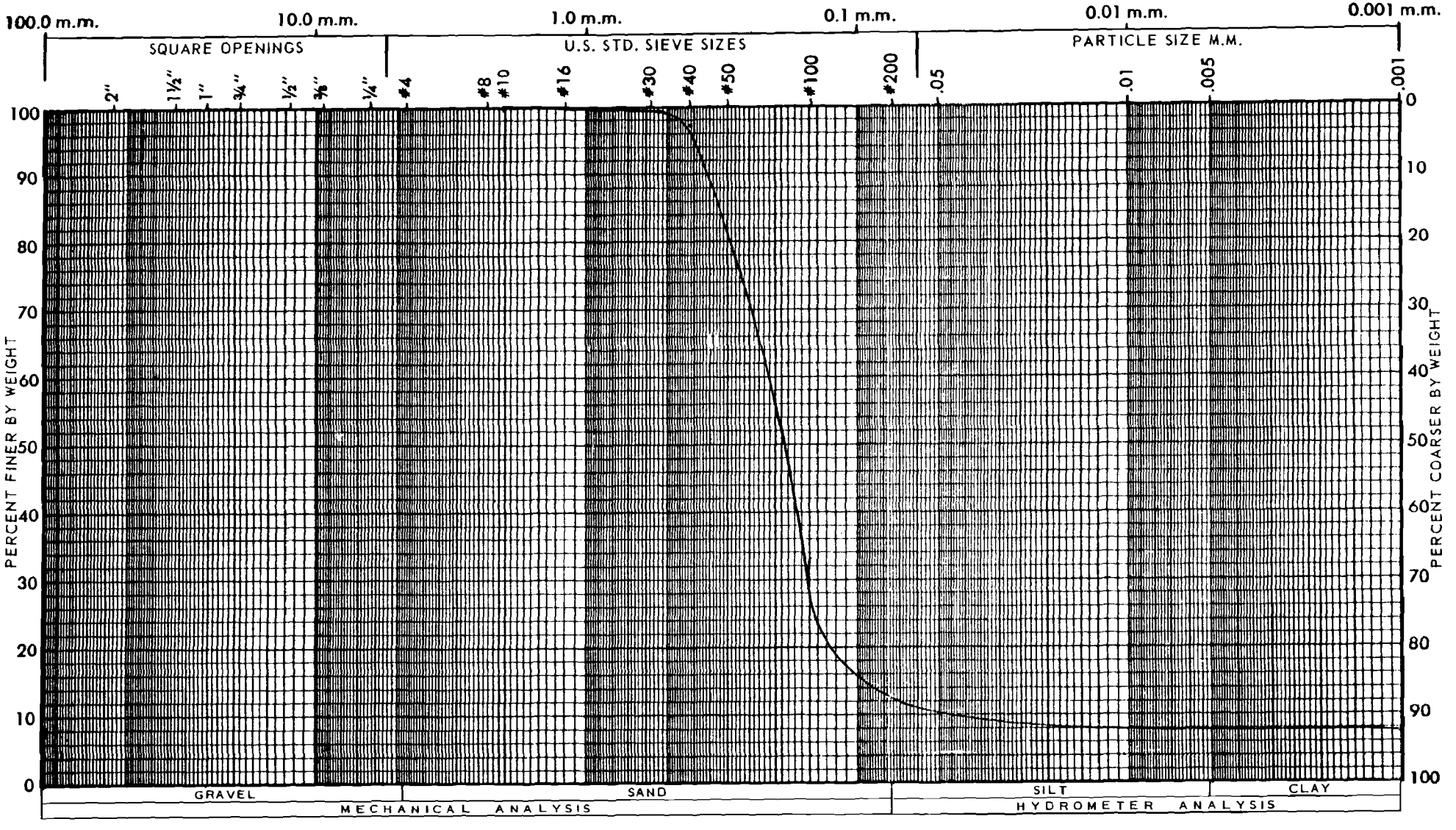
ASTM D422

JOB NO. 78-[illegible]

PARTICLE SIZE DISTRIBUTION CURVE

PROJECT Waste Isolation Pilot Plant

LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-39 @ 0-7' (BL-1)					35-62

ASTM D854
Sp. Gr. = 2.535

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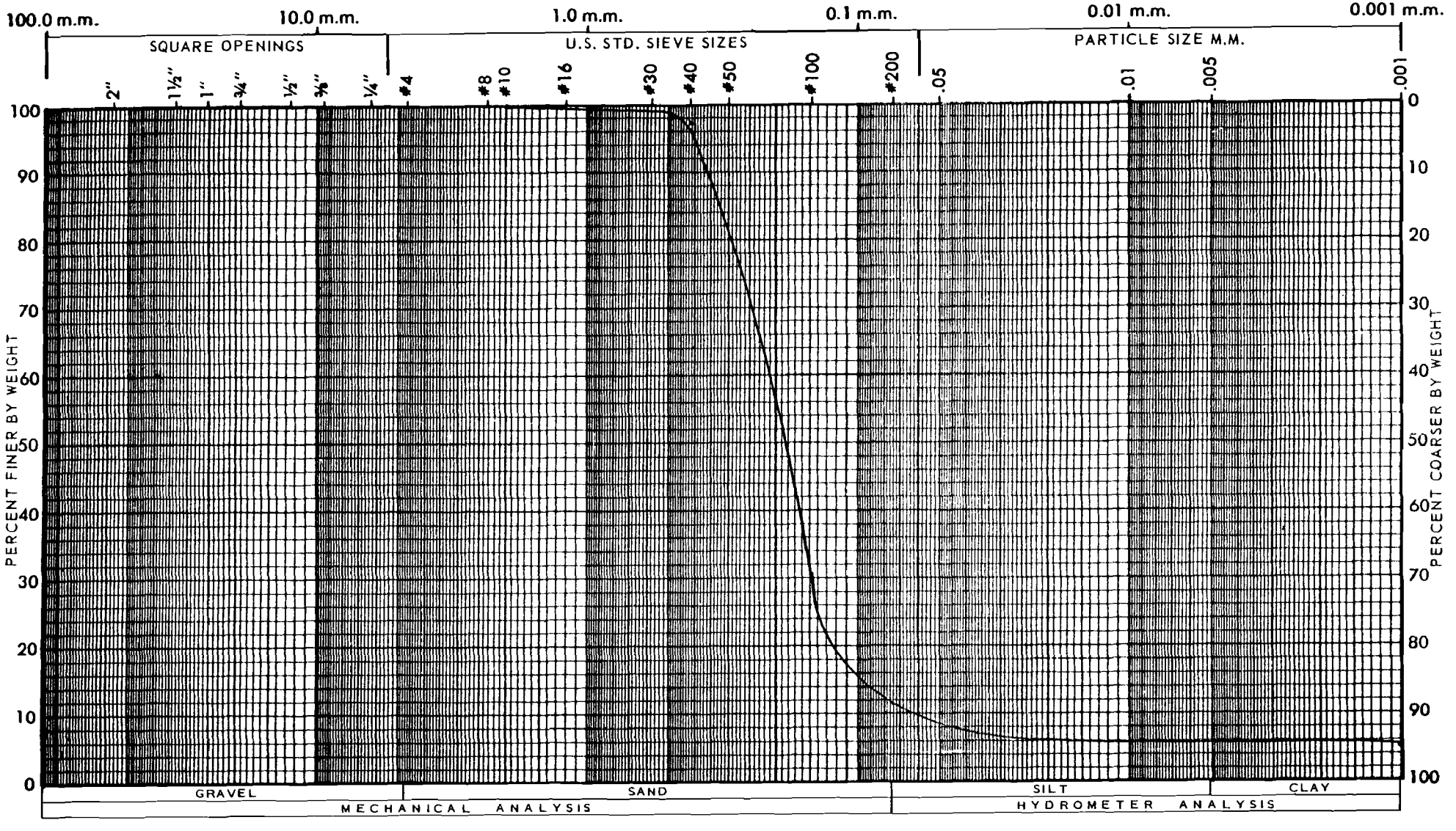
PARTICLE SIZE DISTRIBUTION CURVE

ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	Boring #B-40 @ 0-4'					35-63
	(BL-1)					

ASTM D854
Sp. Gr. = 2.670

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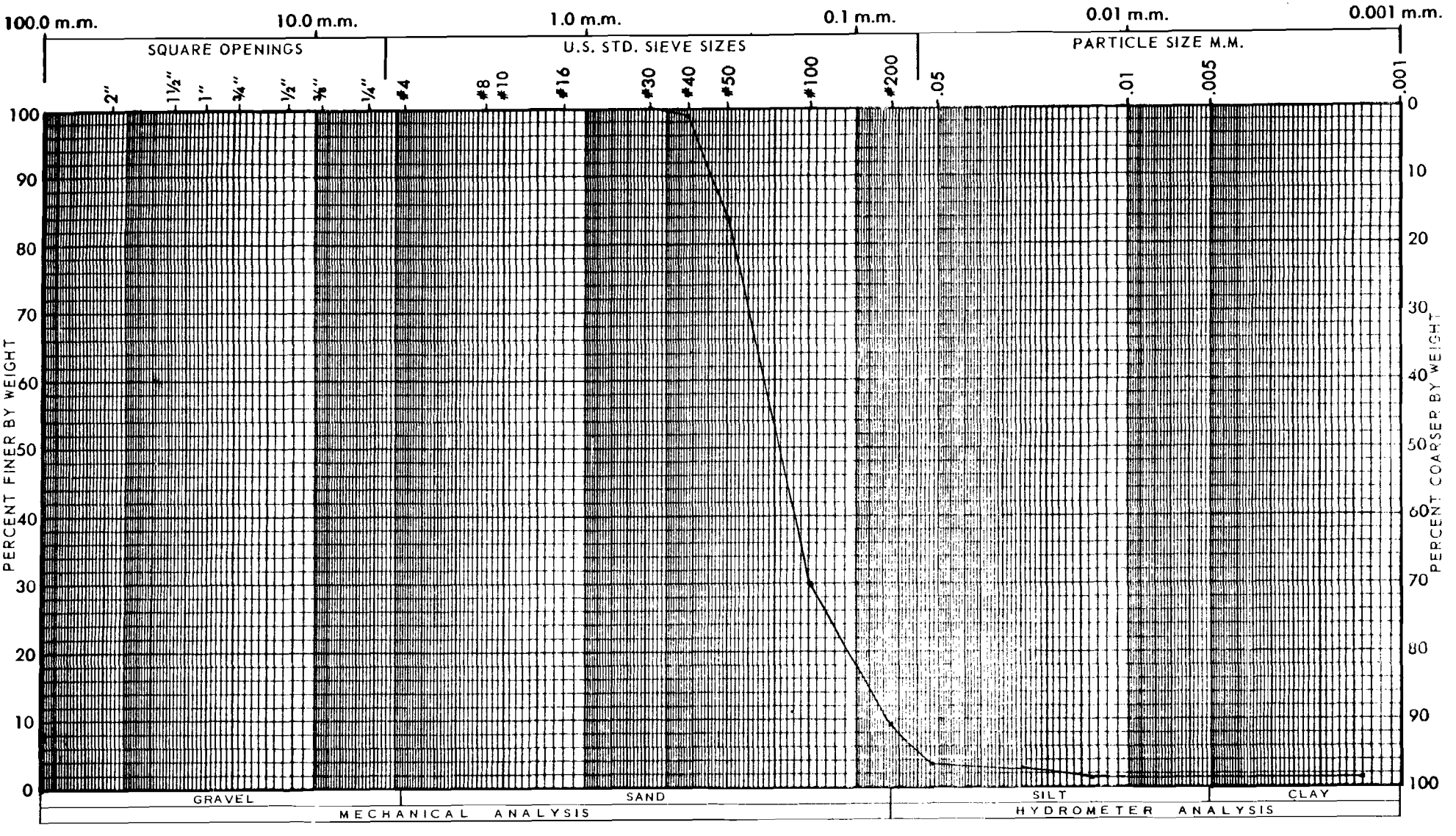
PARTICLE SIZE DISTRIBUTION CURVE

ASTM D422

PROJECT Waste Isolation Pilot Project **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	TP-1 #1 @ 3.2'-3.7'					1135-9 Phx.

ASTM D854
Specific Gravity: 2.637

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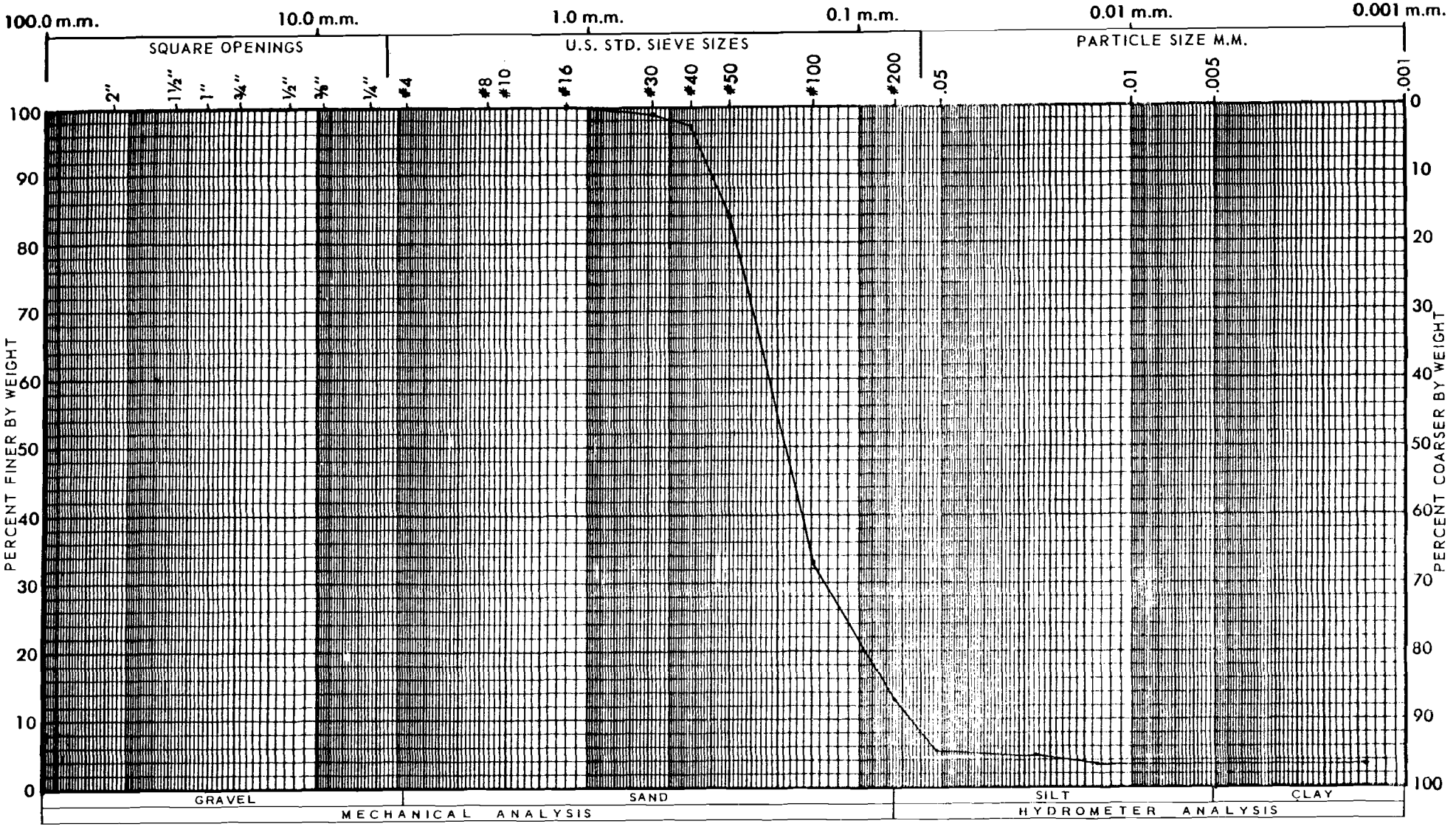
JOB NO. 78-1135

PARTICLE SIZE DISTRIBUTION CURVE

ASTM D422

PROJECT Waste Isolation Pilot Project **LOCATION** Carlsbad, New Mexico



ASTM D854
Specific Gravity: 2.639

CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	TP-2 #1 @ 3.0'-3.5'					1135-10 Phx

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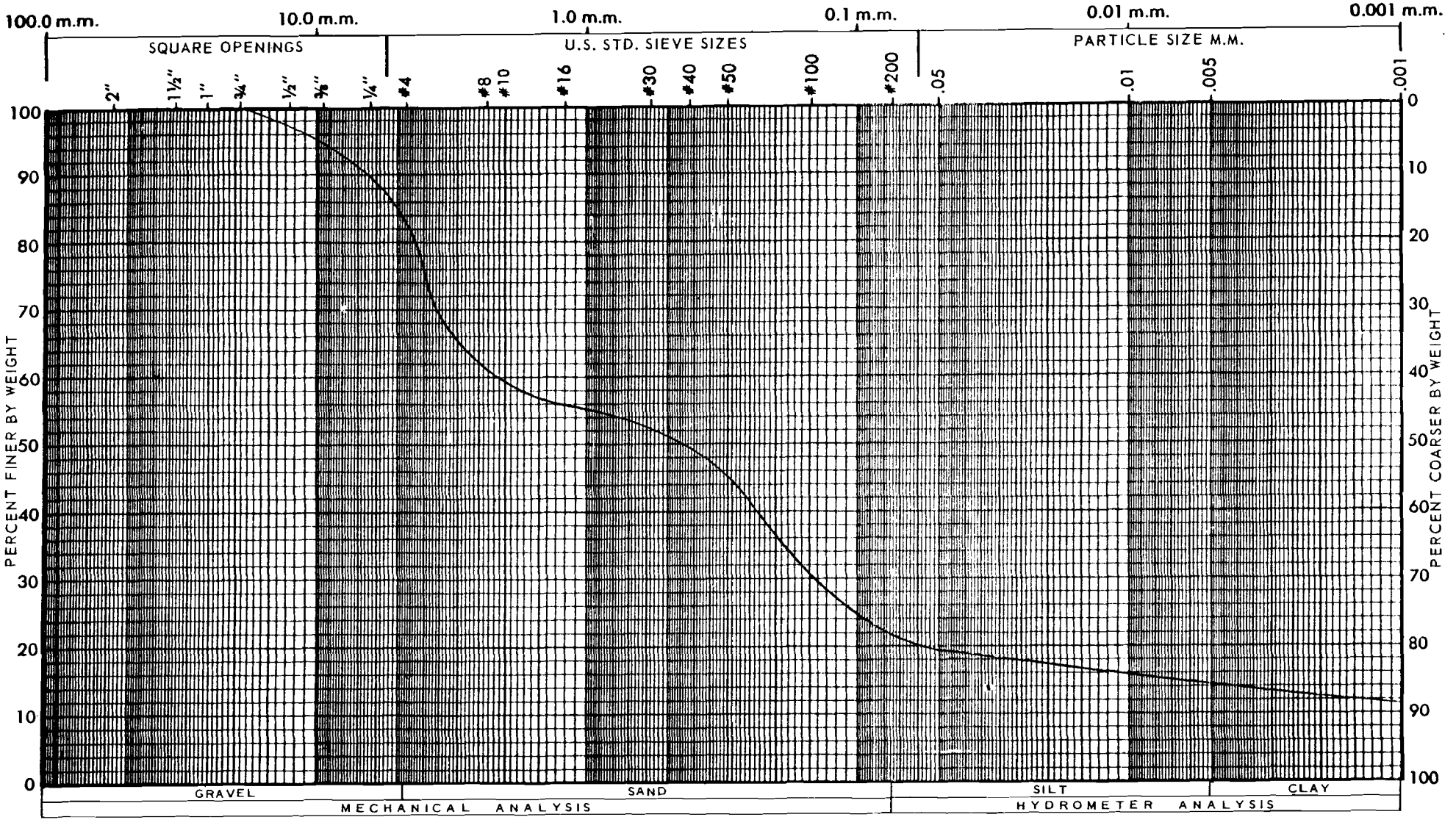
JOB NO. 23-1[illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	TP-2 #2 @ 5.5'-6.0'					35-69

ASTM D854
Sp. Gr. = 2.693

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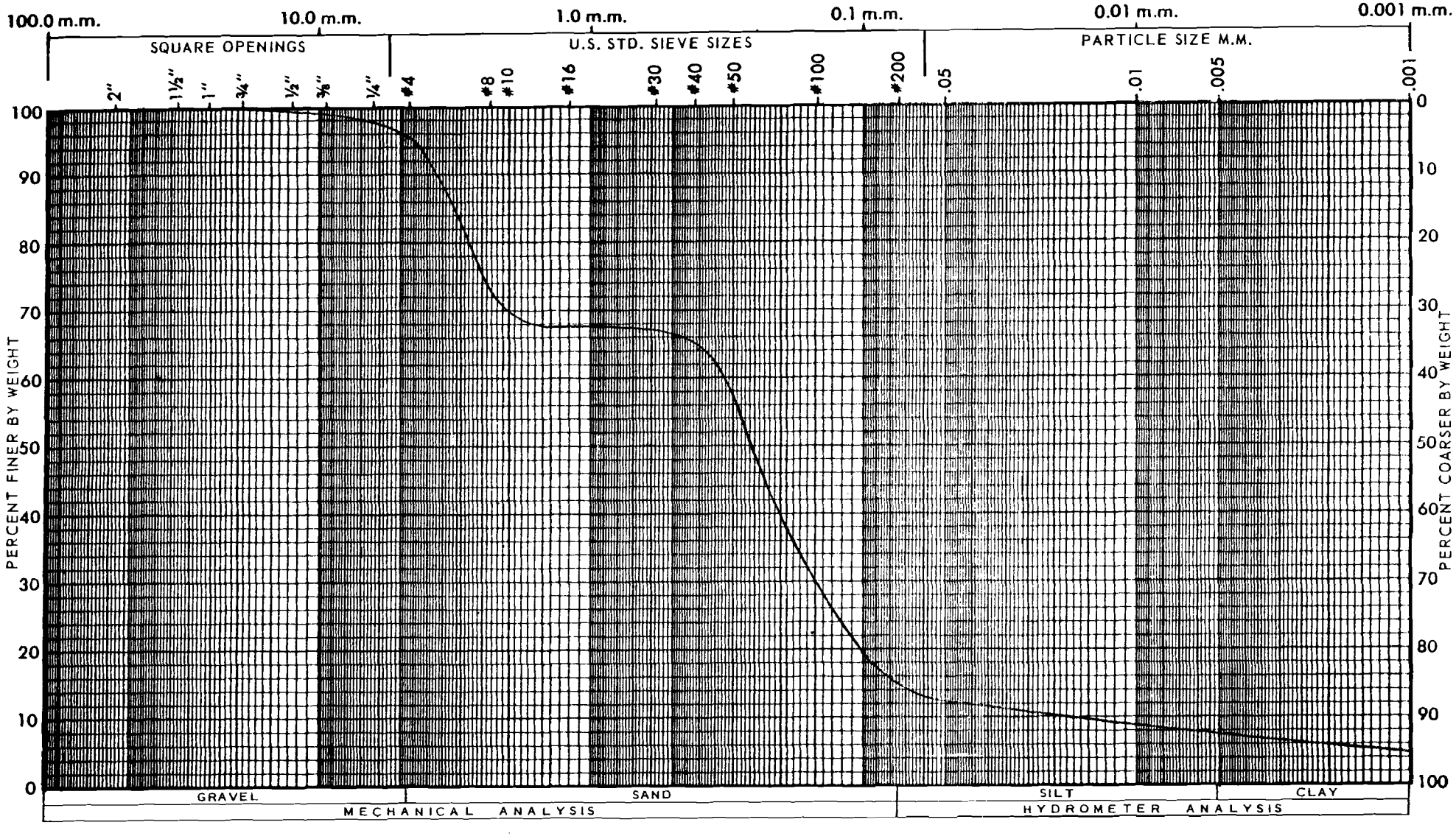
PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	TP-2 #3 @ 11.0'-11.5'					35-70

ASTM D854
Sp. Gr. = 2.793

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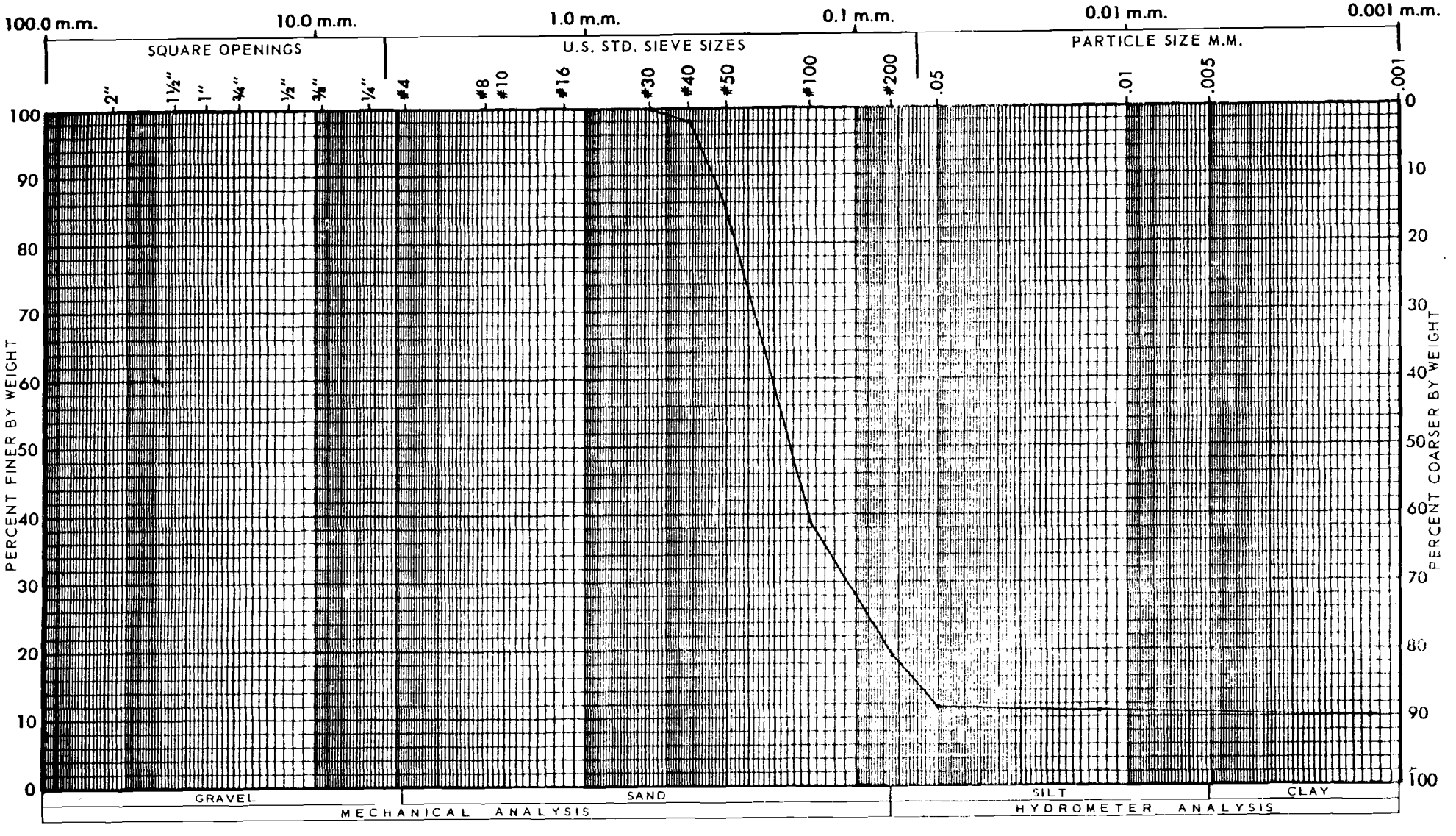
JOB NO. F78-1135

PARTICLE SIZE DISTRIBUTION CURVE

ASTM D422

PROJECT Waste Isolation Pilot Project **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	TP-3 #1 @ 3.2'-3.7'					1135-11 Phx

ASTM D854
Spec. Gravity: 2.650

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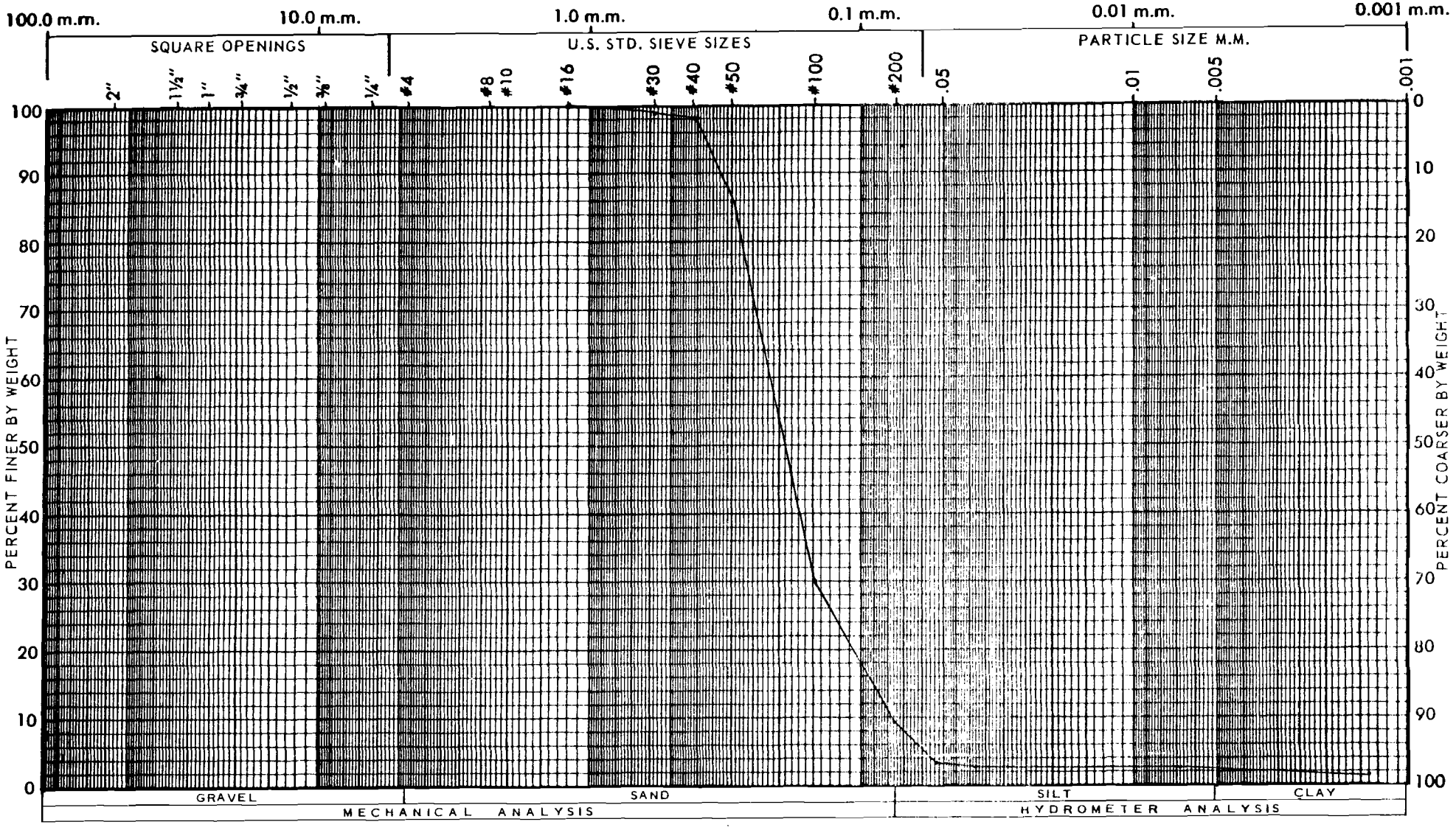
PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Project LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	TP-4 #1 @ 3.0'-3.5'					1135-12 Phx

ASTM D854
Specific Gravity: 2.634

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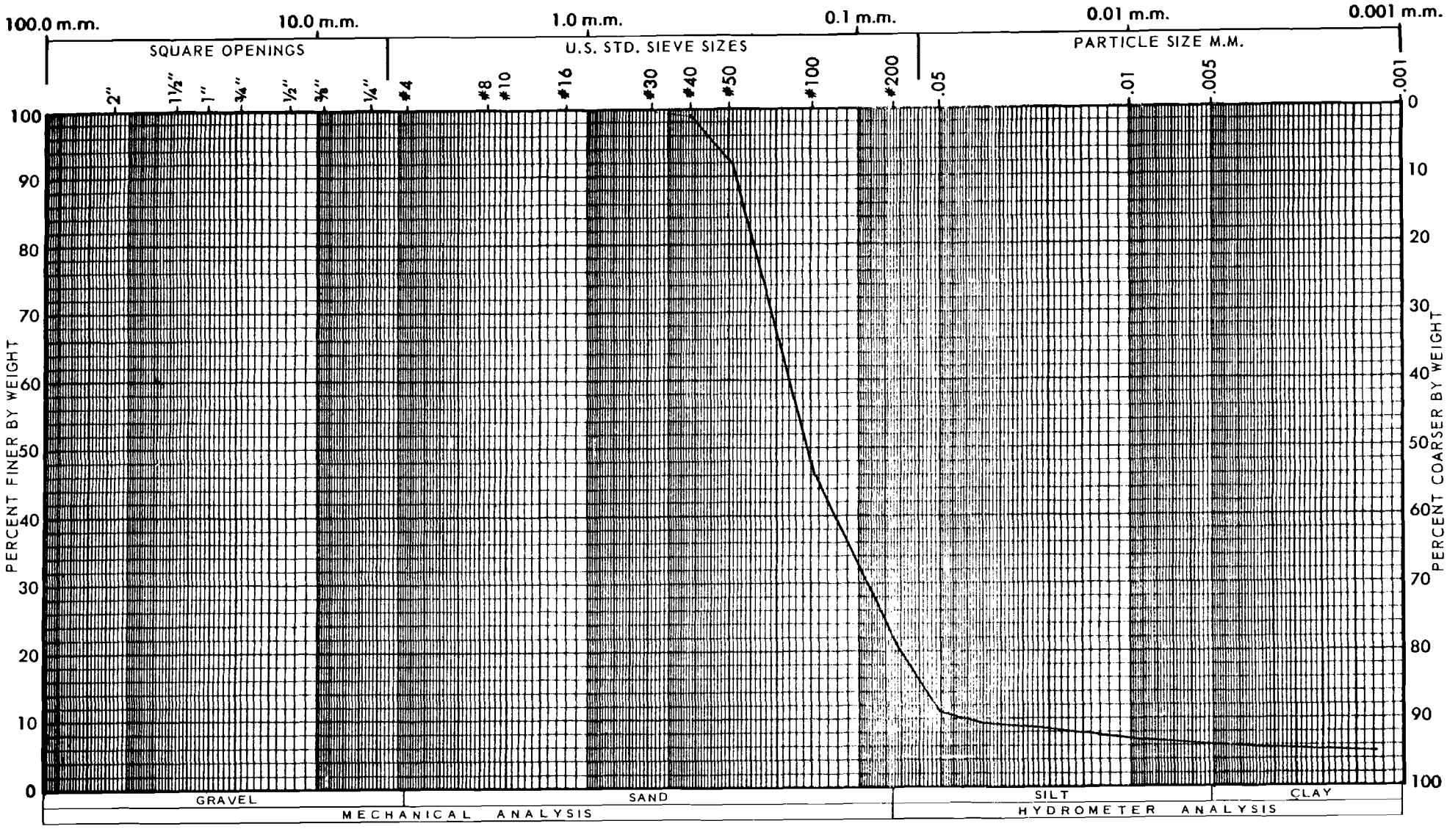
PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Project **LOCATION** Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	TP-4 #2 @ 7.5'-8.0'					1135-13 Phx

ASTM D854
Specific Gravity: 2.653

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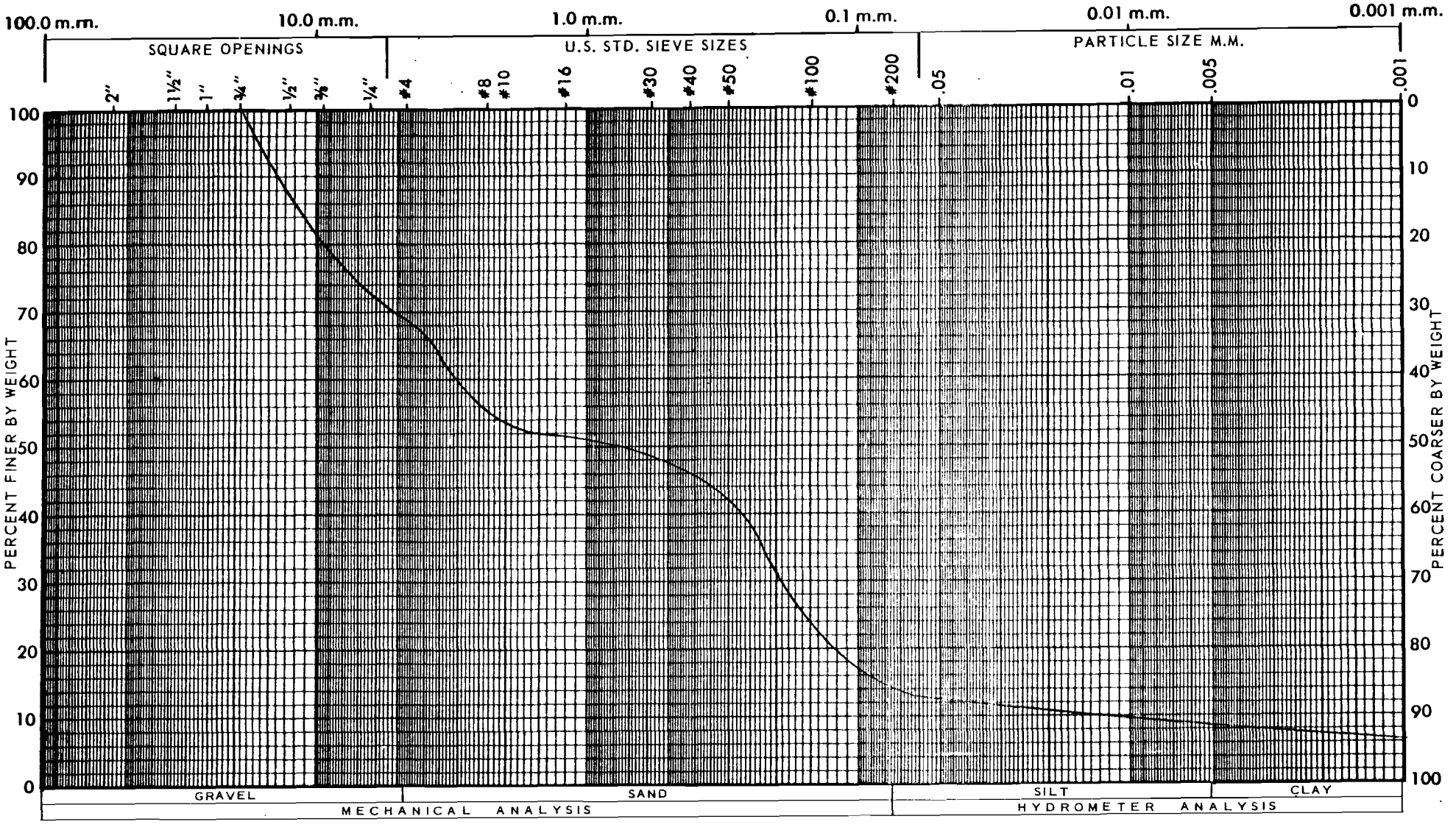
JOB NO. [illegible]

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	TP-4 #3 @ 13.5'-14.0'					35-71

ASTM D854
Sp. Gr. = 2.721

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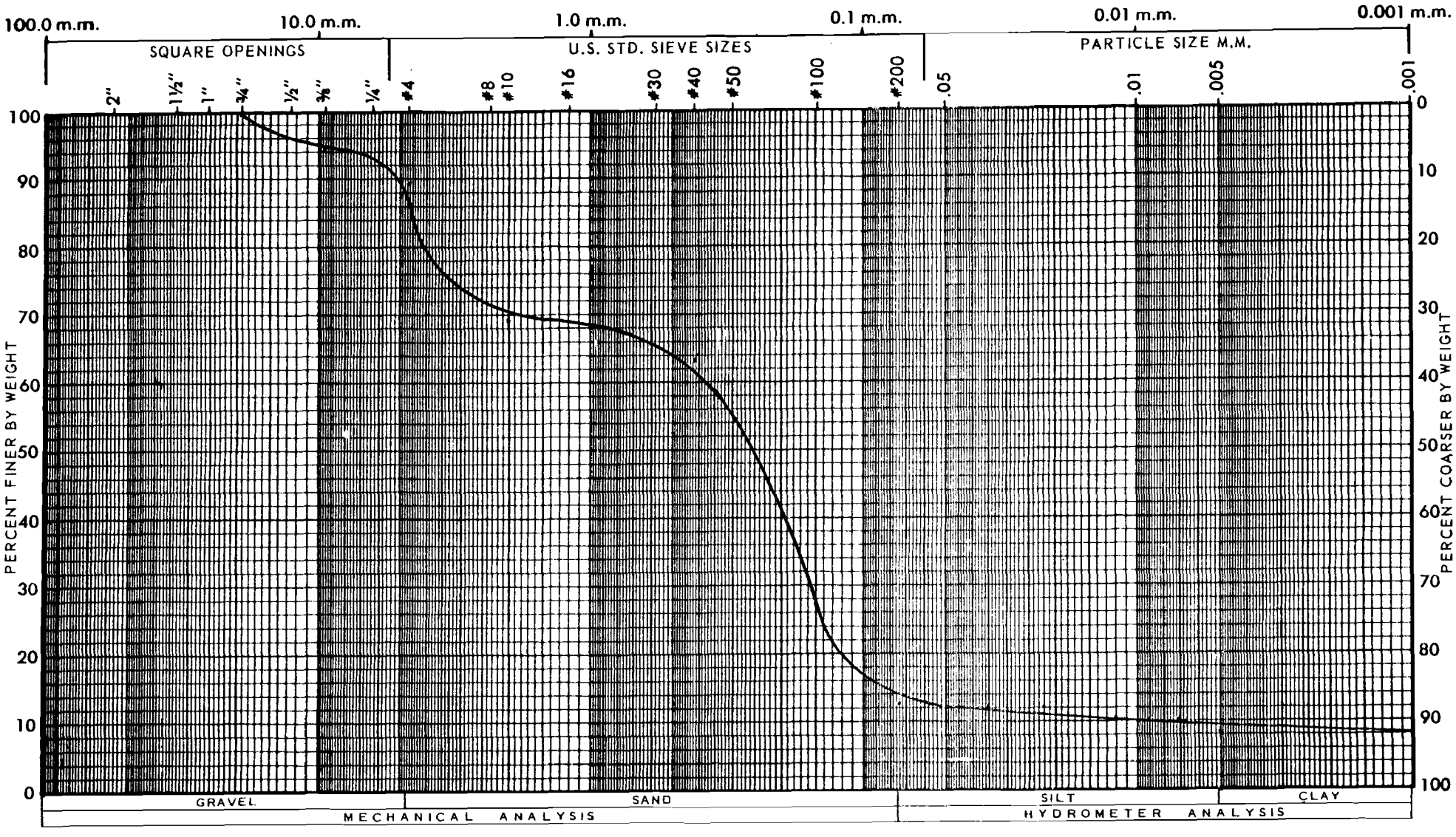
JOB NO. 2,3-11..

PARTICLE SIZE DISTRIBUTION CURVE ASTM D422

PROJECT Waste Isolation Pilot Plant **LOCATION** Carlsbad, New Mexico



ASTM D854
Specific Gravity: 2.640

CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	TP-4 #4 @ 29.5'-30.0'					35-72

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JOB NO. F78-1135

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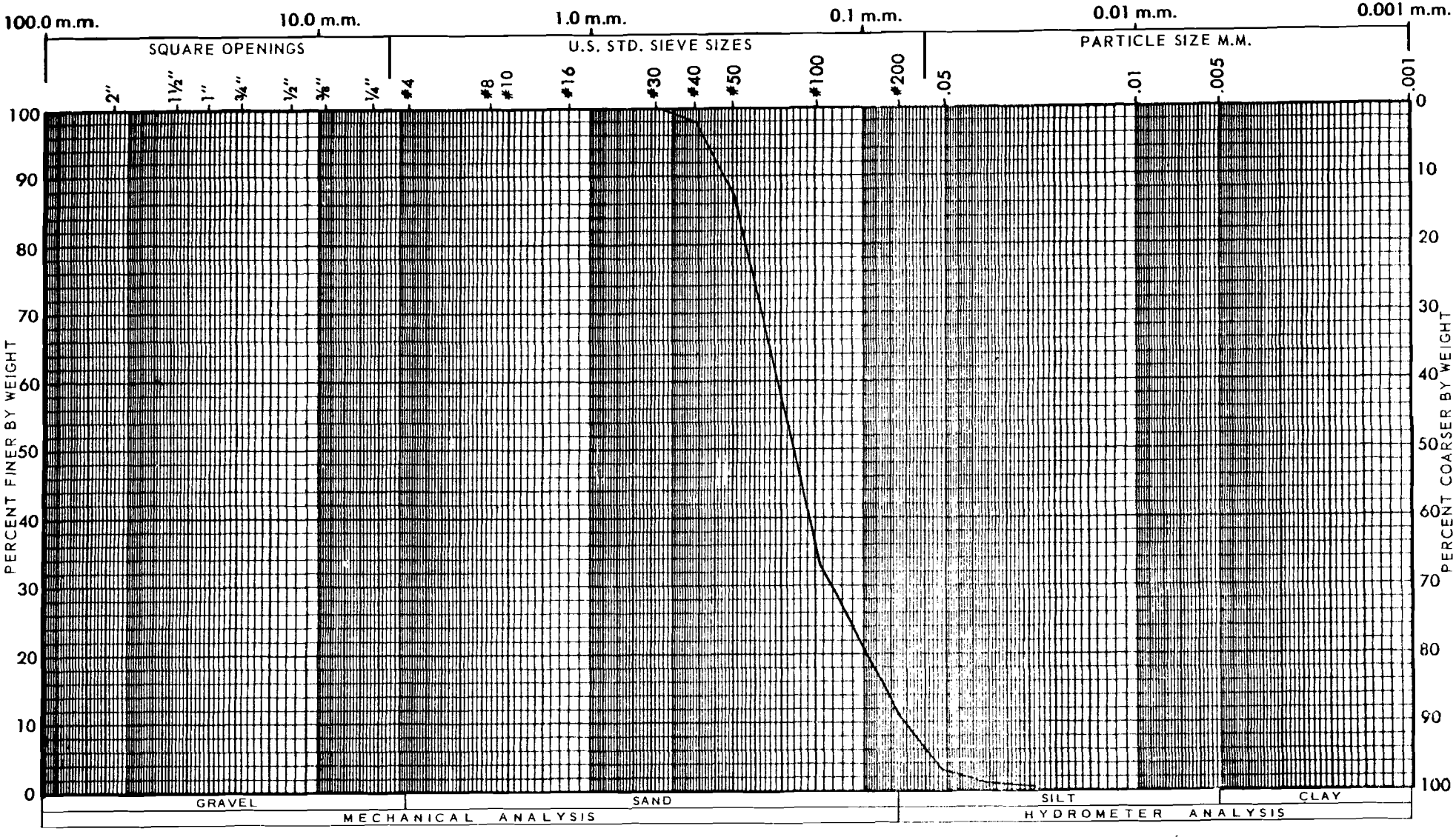
PROJECT Waste Isolation Pilot Project LOCATION Carlsbad, New Mexico



CURVE	SAMPLE	LIQUID LIMIT	PLASTICITY INDEX	ACTIVITY	UNIFIED SOIL CLASSIFICATION	LAB NO.
	TP-5 #1 @ 3.5'-4.0'				Visual	1135-14 Phx

ASTM D854
Specific Gravity: 2.621

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Section 3b

Laboratory Permeability Tests

REPORT ON LABORATORY TESTS

DATE _____

PROJECT Subsurface Exploration & Laboratory Testing Waste Isolation Pilot Plant — JOB NO. E78-1135

LOCATION Near Carlsbad, New Mexico — LAB NO. 8-1135-1

LABORATORY PERMEABILITY TEST
UNDISTURBED SAMPLE
(Pressurized Permeameter)

ASTM D2434

Sample Boring B-4 Tube P_1 @ 3'-5' (4'½" to 4'4") Tube = Mold

Remolded to - % of Maximum Density - PCF at - %

Diameter 7.303 cm Length 9.055 cm Area 41.888 cm^2 Vol. 379.3 cc

W_s 607.7 grms. w_o 4.0 % w_f 22.1 % G_s 2.650 V_s 229.32 cc

Void Ratio 0.6540 Dry Density 100.0 PCF Trials below

S_o = 16.2% S_f = 89.5%

Pressure (PSI)	Head (inches)	Q (cc)	Time (min.)	K (cm/sec)	K (ft/yr)	Remarks	Trials
0	44.0	41	0.27	4.91×10^{-3}	5069	Flow	1
0	44.0	42	0.29	4.64×10^{-3}	4801	Flow	4
0	44.0	44.5	0.32	4.48×10^{-3}	4642	Flow	5
0	44.0	42.5	0.325	4.22×10^{-3}	4365	Flow	6
0	44.0	42.0	0.35	3.87×10^{-3}	4005	Flow	1
0	44.0	42.5	0.38	3.58×10^{-3}	3704	Flow	4
0	44.0	41.5	0.42	3.18×10^{-3}	3298	Flow	5
Constant Head	70.8	830	5	3.32×10^{-3}	3440	Flow	1
"	70.8	810	5	3.24×10^{-3}	3357	Flow	1
"	70.8	775	5	3.10×10^{-3}	3212	Flow	1
"	70.8	765	5	3.06×10^{-3}	3171	Flow	1
"	70.8	760	5	3.04×10^{-3}	3150	Flow	1
"	70.8	755	5	3.03×10^{-3}	3132	Flow	1
"	70.8	910	6	3.04×10^{-3}	3143	Flow	2
"	70.8	1065	7	3.06×10^{-3}	3156	Flow	1

REPORT ON LABORATORY TESTS

DATE _____

PROJECT Subsurface Exploration & Laboratory Testing Waste Isolation Pilot Plant JOB NO. E78-1135

LOCATION Near Carlsbad, New Mexico LAB NO. 8-1135-3

LABORATORY PERMEABILITY TEST
UNDISTURBED SAMPLE
(Pressurized Permeameter)

ASTM D2434

Sample Boring B-12 Tube P_2 @ 3'-5' (3'8" to 4') Tube = Mold

Remolded to - % of Maximum Density - PCF at - %

Diameter 7.303 cm Length 10.079 cm Area 41.888 cm^2 Vol. 422.19 cc

W_s 698.3 grms. w_o 7.0 % w_f 19.4 % G_s 2.654 V_s 263.112 cc

Void Ratio 0.6046 Dry Density 103.2 PCF Trials below

S_o = 30.7% S_f = 85.1%

Pressure (PSI)	Head (inches)	Q (cc)	Time (min.)	K (cm/sec)	K (ft/yr)	Remarks	Trials
0	44.0	42	1.18	1.26×10^{-3}	1307	Flow	3
0	44.0	41.5	1.33	1.12×10^{-3}	1159	Flow	3
0	44.0	41.5	1.45	1.03×10^{-3}	1063	Flow	4
0	44.0	41.5	1.56	9.55×10^{-4}	988	Flow	4
0	44.0	42.0	1.71	8.82×10^{-4}	912	Flow	6
Constant Head	70.8	310	8	8.64×10^{-4}	895	Flow	1
"	70.8	370	10	8.25×10^{-4}	854	Flow	2
"	70.8	340	10	7.58×10^{-4}	785	Flow	1
"	70.8	335	10	7.47×10^{-4}	773	Flow	1
"	70.8	320	10	7.14×10^{-4}	739	Flow	3

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REPORT ON LABORATORY TESTS

DATE _____

PROJECT Subsurface Exploration & Laboratory Testing Waste Isolation Pilot Plant JOB NO. E78-1135

LOCATION Near Carlsbad, New Mexico LAB NO. 8-1135-4

LABORATORY PERMEABILITY TEST UNDISTURBED SAMPLE (Pressurized Permeameter)

ASTM D2434

Sample Boring B-13 Tube P_1 @ 3' to 5' (3'11.4" to 4'3") Tube = Mold

Remolded to - % of Maximum Density - PCF at - %

Diameter 7.303 cm Length 9.220 cm Area 41.888 cm^2 Vol. 386.21cc

W_s 703.3 grms. w_o 12.4 % w_f 16.4 % G_s *2.650 V_s 265.396 cc

Void Ratio 0.4552 Dry Density 113.6 PCF Trials below

S_o = 72.2% S_f = 95.5% *Assumed

Pressure (PSI)	Head (inches)	Q (cc)	Time (min.)	K (cm/sec)	K (ft/yr)	Remarks	Trials
0	44.0	41	41.88	3.22×10^{-5}	33	Flow	1
0	44.0	42	450.84	2.86×10^{-5}	30	Flow	2
0	44.0	42	84.0	1.64×10^{-5}	17	Flow	1
Constant Head	70.8	590	97	1.24×10^{-4}	128	Flow	1
"	70.8	935	128	1.49×10^{-4}	154	Flow	3
"	70.8	670	100	1.37×10^{-4}	142	Flow	4
"	70.8	440	68	1.32×10^{-4}	137	Flow	1

Note: Tube cut at 3'10" to 4'3" to equal mold

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REPORT ON LABORATORY TESTS

DATE _____

PROJECT Subsurface Exploration & Laboratory Testing Waste Isolation Pilot Plant JOB NO. E78-1135

LOCATION Near Carlsbad, New Mexico LAB NO. 8-1135-5

LABORATORY PERMEABILITY TEST
UNDISTURBED SAMPLE
(Pressurized Permeameter)

ASTM D2434

Sample Boring B-16 Tube P_1 @ 3' to 5' (3'11½" to 4'3") Tube = Mold

Remolded to - % of Maximum Density - PCF at - %

Diameter 7.303 cm Length 9.525 cm Area 41.888 cm^2 Vol. 398.99 cc

W_s 678.1 grms. w_o 8.0 % w_f 19.7 % G_s* 2.650 V_s 255.887 cc

Void Ratio 0.5592 Dry Density 106.1 PCF Trials below

S_o = 37.9% S_f = 93.4% *Assumed

Pressure (PSI)	Head (inches)	Q (cc)	Time (min.)	K (cm/sec)	K (ft/yr)	Remarks	Trials
0	44.0	42.0	3.33	4.28×10^{-4}	443	Flow	2
0	44.0	42.0	3.56	4.00×10^{-4}	414	Flow	3
0	44.0	43.0	3.72	3.92×10^{-4}	406	Flow	3
0	44.0	43.0	3.96	3.68×10^{-4}	381	Flow	2
Constant Head	70.8	210	10	4.43×10^{-4}	458	Flow	6
"	70.8	340	16	4.48×10^{-4}	463	Flow	3
"	70.8	45	10	9.49×10^{-5}	98	Flow	3
"	70.8	500	97	1.09×10^{-4}	112	Flow	6
"	70.8	620	131	9.98×10^{-5}	103	Flow	1
"	70.8	370	68	1.15×10^{-4}	119	Flow	3

Note: Tube cut at 3'10" to 4'3" to equal mold

REPORT ON LABORATORY TESTS

DATE _____

PROJECT Subsurface Exploration & Laboratory Testing Waste Isolation Pilot Plant JOB NO. E78-1135

LOCATION Near Carlsbad, New Mexico LAB NO. 8-1135-6

LABORATORY PERMEABILITY TEST
UNDISTURBED SAMPLE
(Pressurized Permeameter)

ASTM D2434

Sample Boring B-22 Tube P_1 @ 3' to 5' (3'5.3" to 3'9") Tube = Mold

Remolded to - % of Maximum Density - PCF at - %

Diameter 7.303 cm Length 9.167 cm Area 41.888 cm^2 Vol. 383.99 cc

W_s 645.8 grms. w_o 6.1 % w_f 20.7 % G_s 2.671 V_s 241.78 cc

Void Ratio 0.5881 Dry Density 105.0 PCF Trials below

S_o = 27.7% S_f = 94.0%

Pressure (PSI)	Head (inches)	Q (cc)	Time (min.)	K (cm/sec)	K (ft/yr)	Remarks	Trials
0	43.0	42.0	1.18	1.19×10^{-3}	1231	Flow	4
0	43.0	41.5	2.53	5.48×10^{-4}	567	Flow	4
0	43.0	42.0	2.65	5.30×10^{-4}	548	Flow	3
0	43.0	41.5	2.67	5.19×10^{-4}	537	Flow	4
Constant Head	70.8	5	240	9.74×10^{-4}	1008	Flow	4
"	70.8	4830	91	1.08×10^{-3}	1114	Flow	1
"	70.8	3330	49	1.38×10^{-3}	1427	Flow	1

REPORT ON LABORATORY TESTS

DATE _____

PROJECT: Subsurface Exploration & Laboratory Testing Waste Isolation Pilot Plant — JOB NO. E78-1135

LOCATION: Near Carlsbad, New Mexico — LAB NO. 8-1135-7

LABORATORY PERMEABILITY TEST
UNDISTURBED SAMPLE
(Pressurized Permeameter)

ASTM D2434

Sample Boring B-23 Tube P_2 @ 3' to 5' (3'6.5" to 3'10") Tube = Mold

Remolded to - % of Maximum Density - PCF at - %

Diameter 7.303 cm Length 8.890 cm Area 41.888 cm^2 Vol. 372.39 cc

W_s 585.2 grms. w_o 5.3 % w_f 23.6 % G_s 2.658 V_s 220.17 cc

Void Ratio 0.6913 Dry Density 98.1 PCF Trials below

S_o = 20.4% S_f = 90.7%

Pressure (PSI)	Head (inches)	Q (cc)	Time (min.)	K (cm/sec)	K (ft/yr)	Remarks	Trials
0	43.0	43.0	0.48	2.90×10^{-3}	3004	Flow	1
0	43.0	42.5	0.50	2.72×10^{-3}	2817	Flow	4
0	43.0	42.0	0.54	2.52×10^{-3}	2608	Flow	3
0	43.0	42.0	0.71	1.92×10^{-3}	1984	Flow	2
0	43.0	42.0	0.80	1.70×10^{-3}	1760	Flow	3
0	43.0	42.0	1.40	9.72×10^{-4}	1006	Flow	5
0	43.0	42.0	1.40	9.72×10^{-4}	1006	Flow	2
Constant Head	70.8	5	365	1.44×10^{-3}	1487	Flow	2
"	70.8	5	460	1.81×10^{-3}	1873	Flow	6
"	70.8	42	5160	2.42×10^{-3}	2502	Flow	1
"	70.8	36	5290	2.89×10^{-3}	2992	Flow	1
"	70.8	37	6220	3.30×10^{-3}	3423	Flow	1

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REPORT ON LABORATORY TESTS

DATE _____

PROJECT Subsurface Exploration & Laboratory Testing Waste Isolation Pilot Plant JOB NO. E78-1135

LOCATION Near Carlsbad, New Mexico LAB NO. 8-1135-8

LABORATORY PERMEABILITY TEST
UNDISTURBED SAMPLE
(Pressurized Permeameter)

ASTM D2434

Sample Boring B-33 Tube P_7 @ 10'1" to 10'7" (cut at 10'2" to 10'7")

Remolded to - % of Maximum Density - PCF at - %

Diameter 7.303 cm Length 9.517 cm Area 41.888 cm^2 Vol. 398.65 cc

W_s 613.3 grms. w_o 3.8 % w_f 21.2 % G_s * 2.65 V_s 231.43 cc

Void Ratio 0.7225 Dry Density 96.0 PCF Trials below

*Assumed Test Section: 10'3.3" to 10'7"

Pressure (PSI)	Head (inches)	Q (cc)	Time (min.)	K (cm/sec)	K (ft/yr)	Remarks	Trials
0	43.0	43.0	2.47	5.90×10^{-4}	610	Flow	7
0	43.0	43.0	2.95	5.06×10^{-4}	523	Flow	3
0	43.0	43.0	2.83	5.27×10^{-4}	545	Flow	3
Constant Head	70.8	5	165	6.74×10^{-4}	698	Flow	3
"	70.8	5	165	6.95×10^{-4}	719	Flow	2
"	70.8	5	170	7.16×10^{-4}	741	Flow	1
"	70.8	5	175	7.37×10^{-4}	763	Flow	3
"	70.8	35	1000	6.02×10^{-4}	623	Flow	1
"	70.8	40	1100	5.79×10^{-4}	600	Flow	1
"	70.8	34	950	5.89×10^{-4}	609	Flow	1
"	70.8	23	690	6.32×10^{-4}	654	Flow	1

Note: Tube = Mold

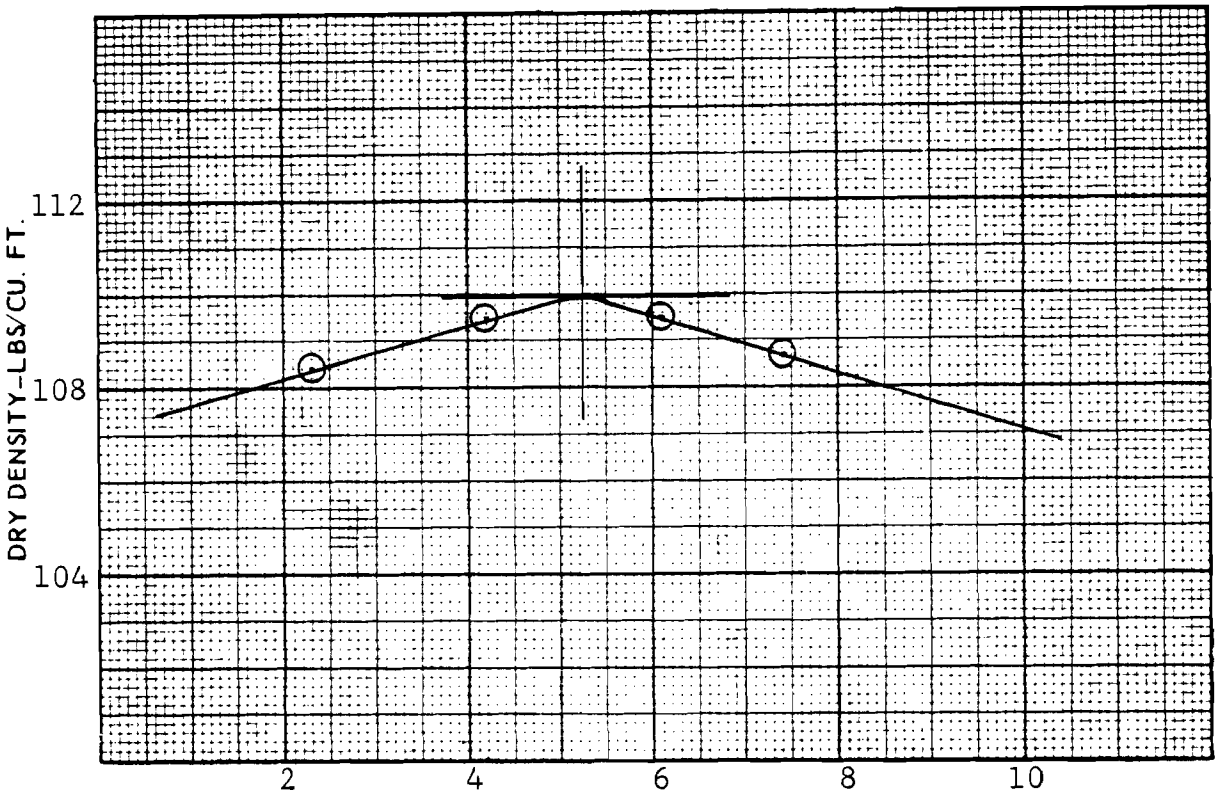
Section 3c

Moisture-Density Relationship

SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-23



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	Boring #B-13 @ 0-7'	5.3	110.0	D1557	C	35-23

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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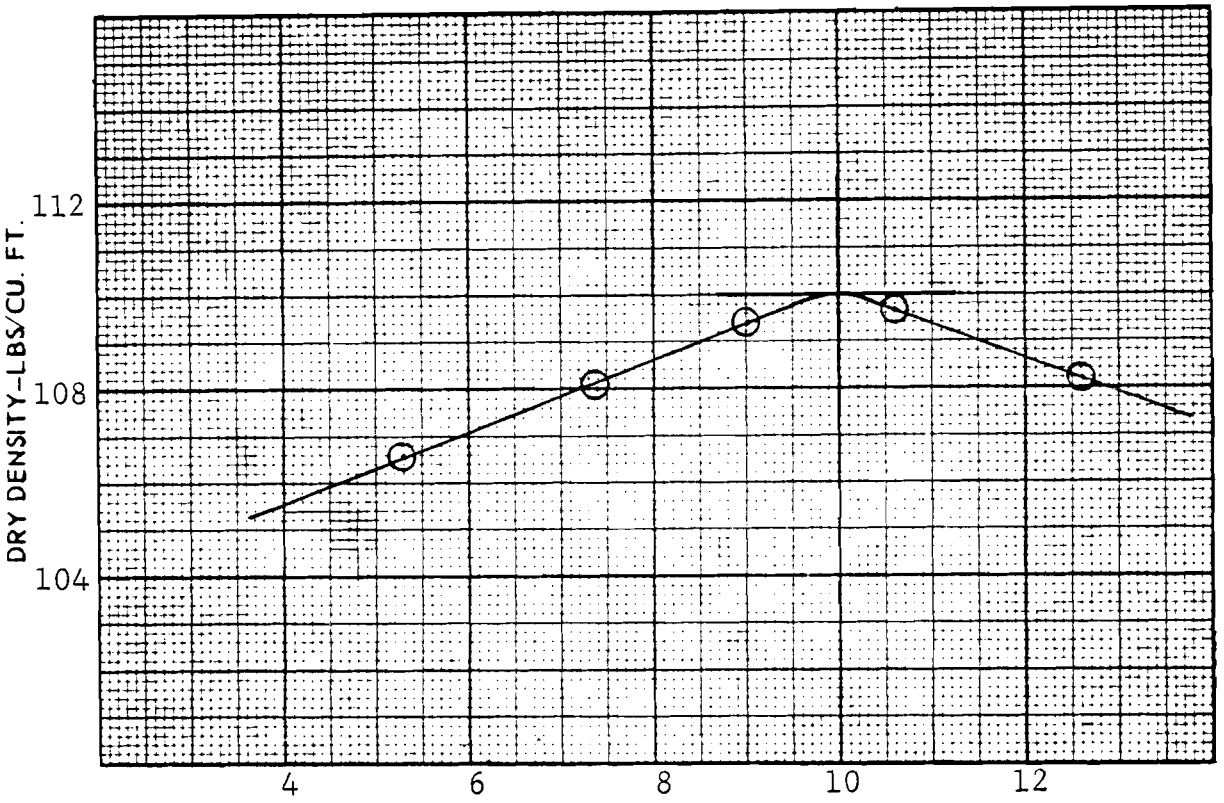
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-21



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS/CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	Boring #B-20 @ 0-3'	10.0	110.0	D1557	C	35-21
	(BL-1)					

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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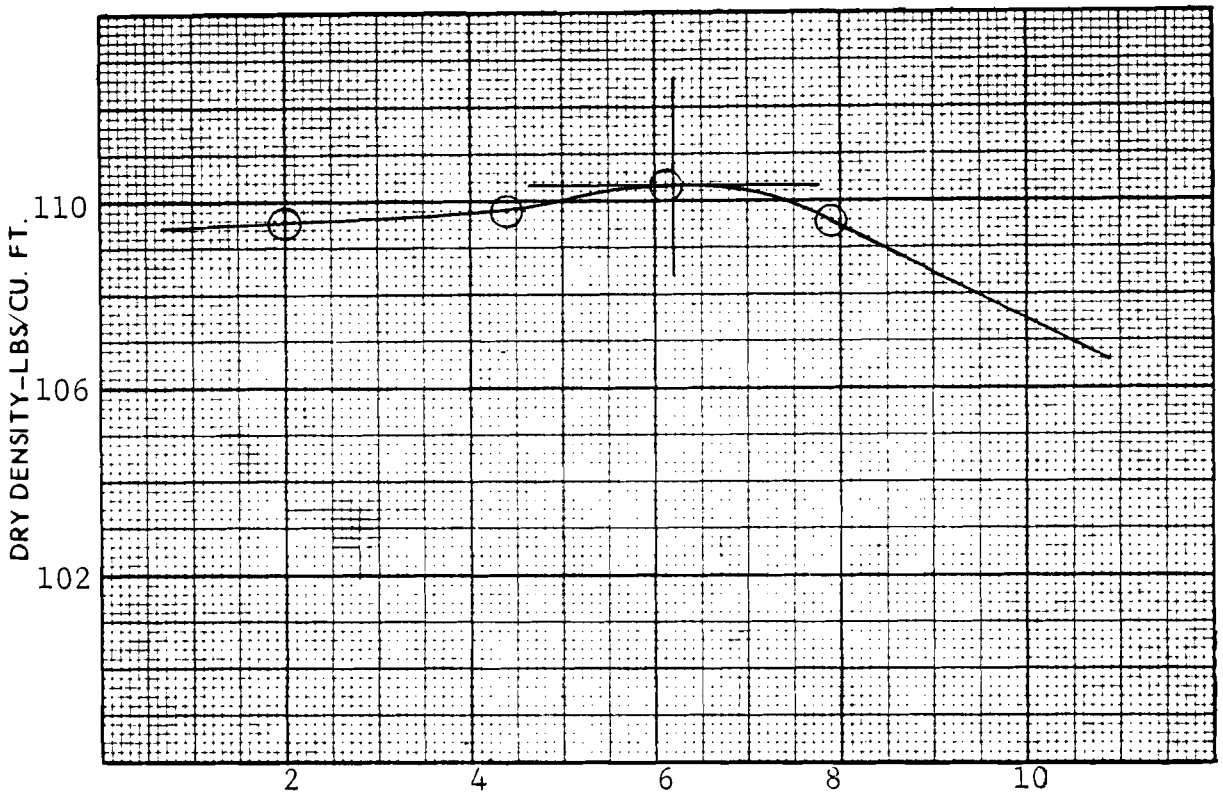
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-19



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	Boring #B-22 @ 0-3'	6.2	110.3	D1557	C	35-19
	(BL-1)					

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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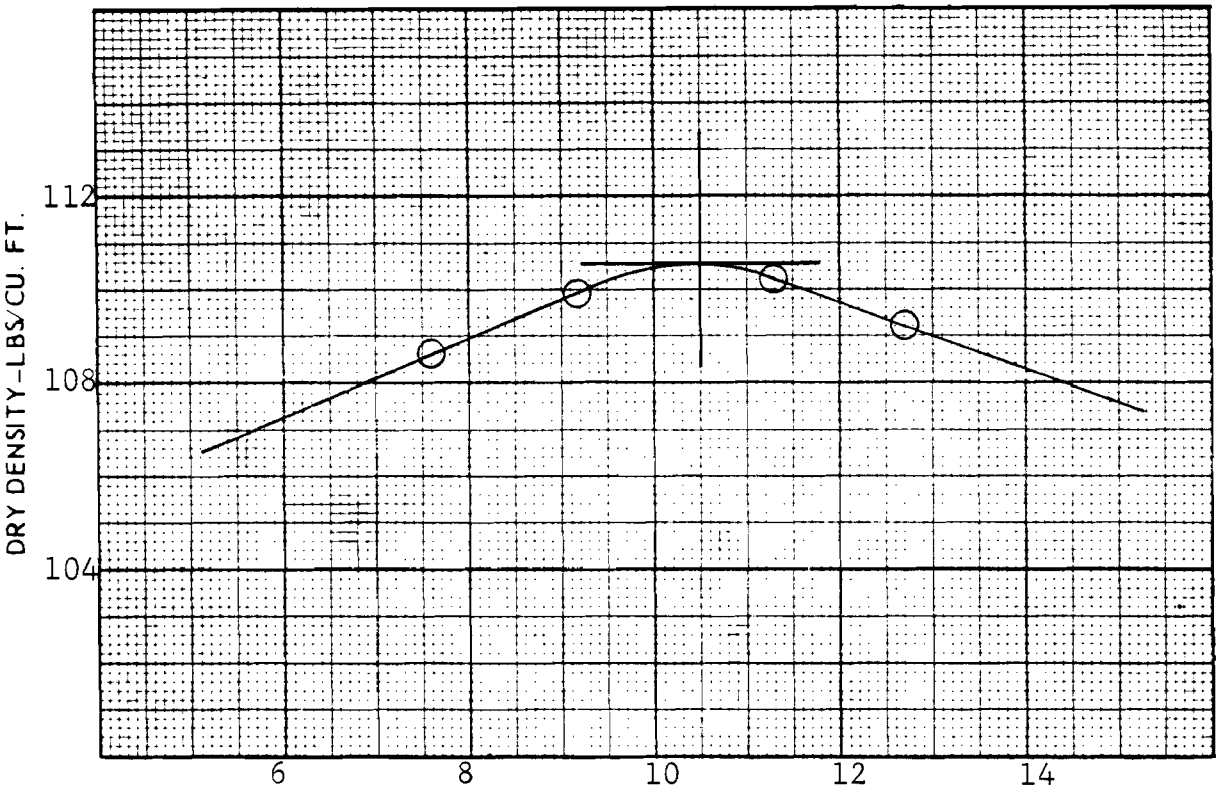
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-64



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	Boring #B-28 @ 0-4'	10.5	110.6	D1557	C	35-64
	(BL-1)					

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD DIAMETER	MOLD HEIGHT	NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD DIAMETER	MOLD HEIGHT	NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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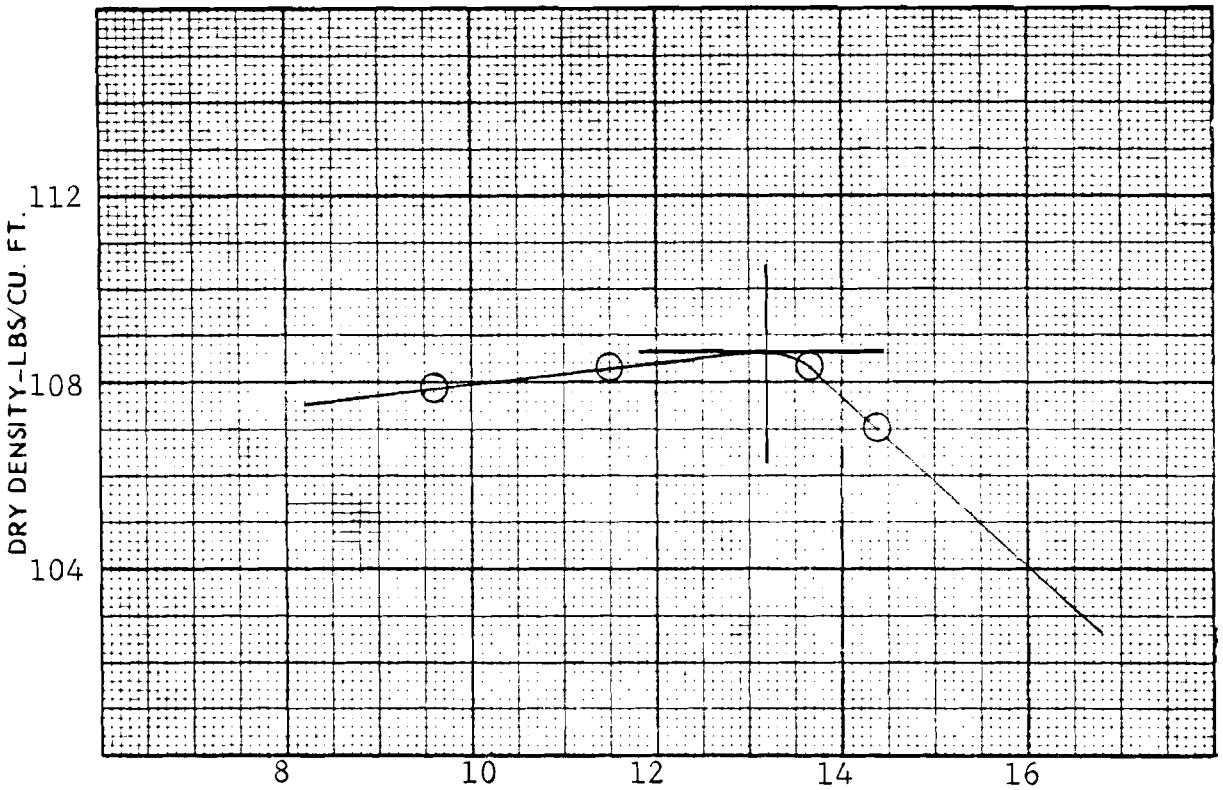
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-65



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS. CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	Boring #B-29 @ 0-6'	13.2	108.6	D1557	C	35-65
	(BL-1)					

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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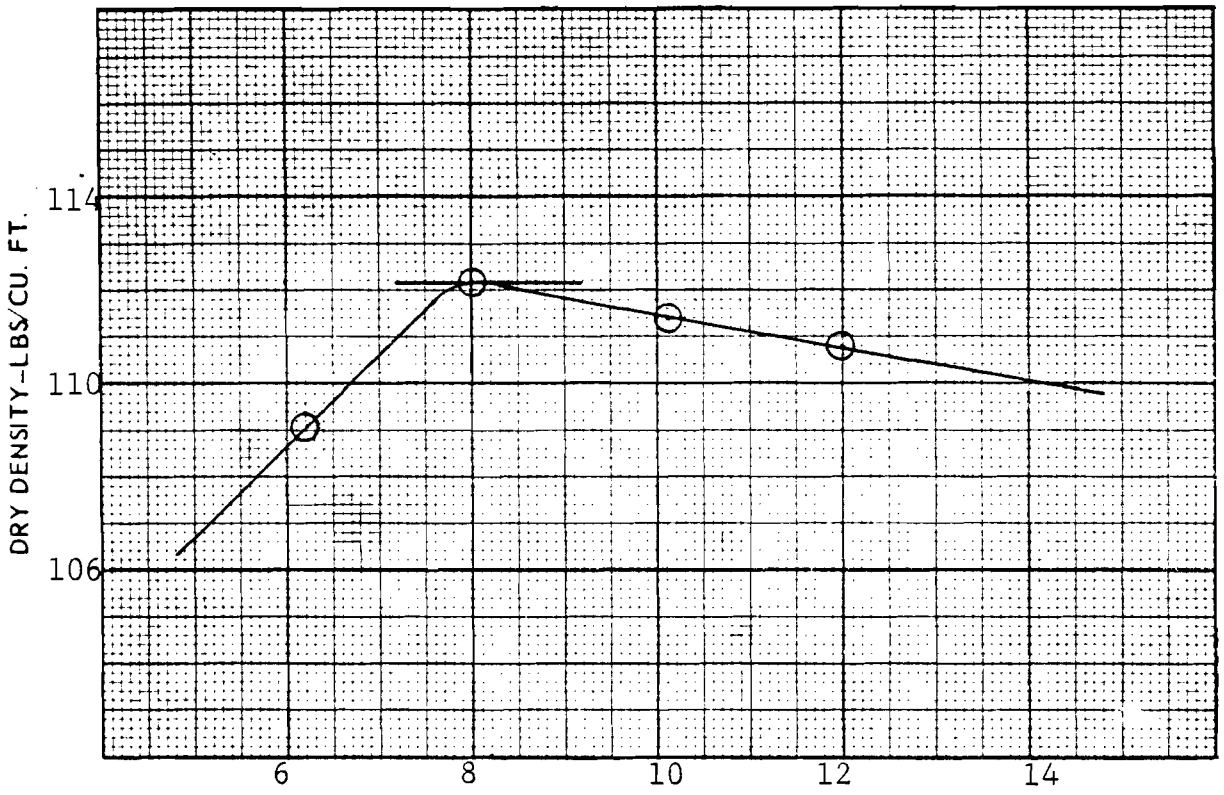
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-66



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	Boring #B-31 @ 0-4'3"	8.0	112.2	D1557	C	35-66
	(BL-1)					

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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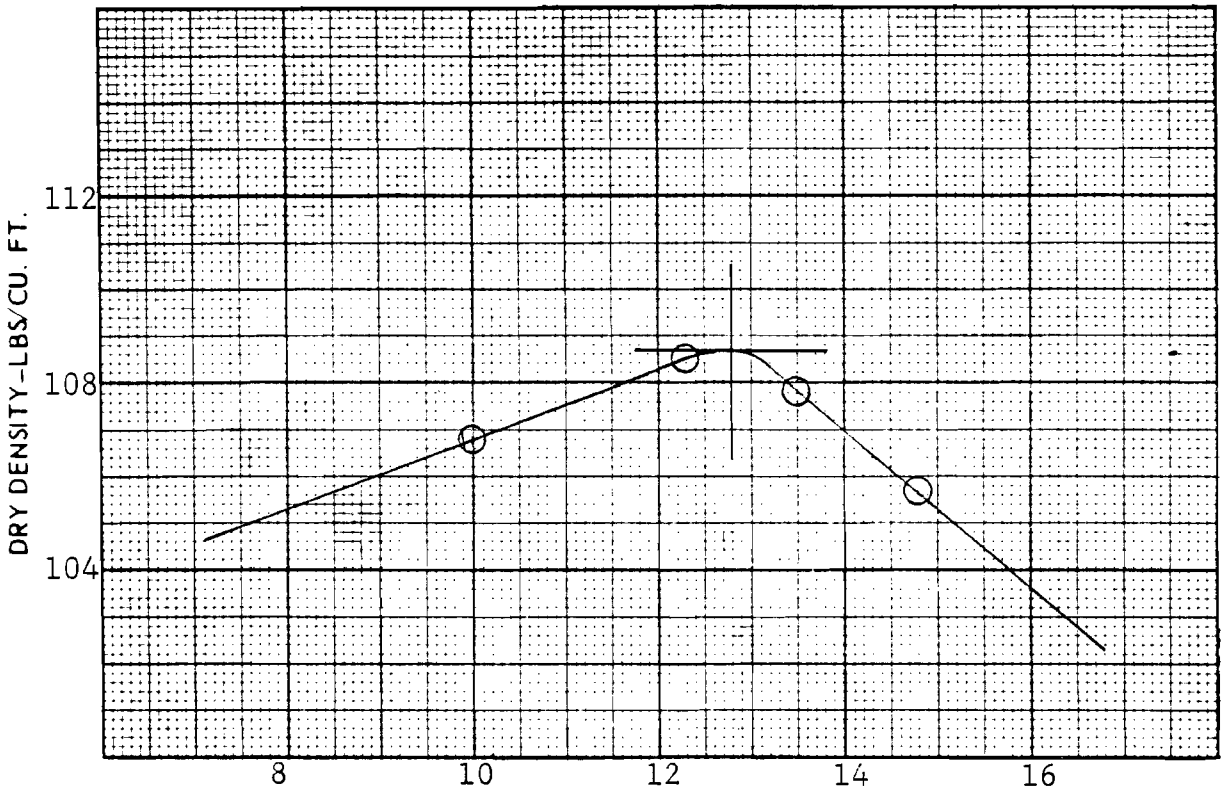
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-67



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	Boring #B-32 @ 0-10'	12.8	108.7	D1557	C	35-67
	(BL-1)					

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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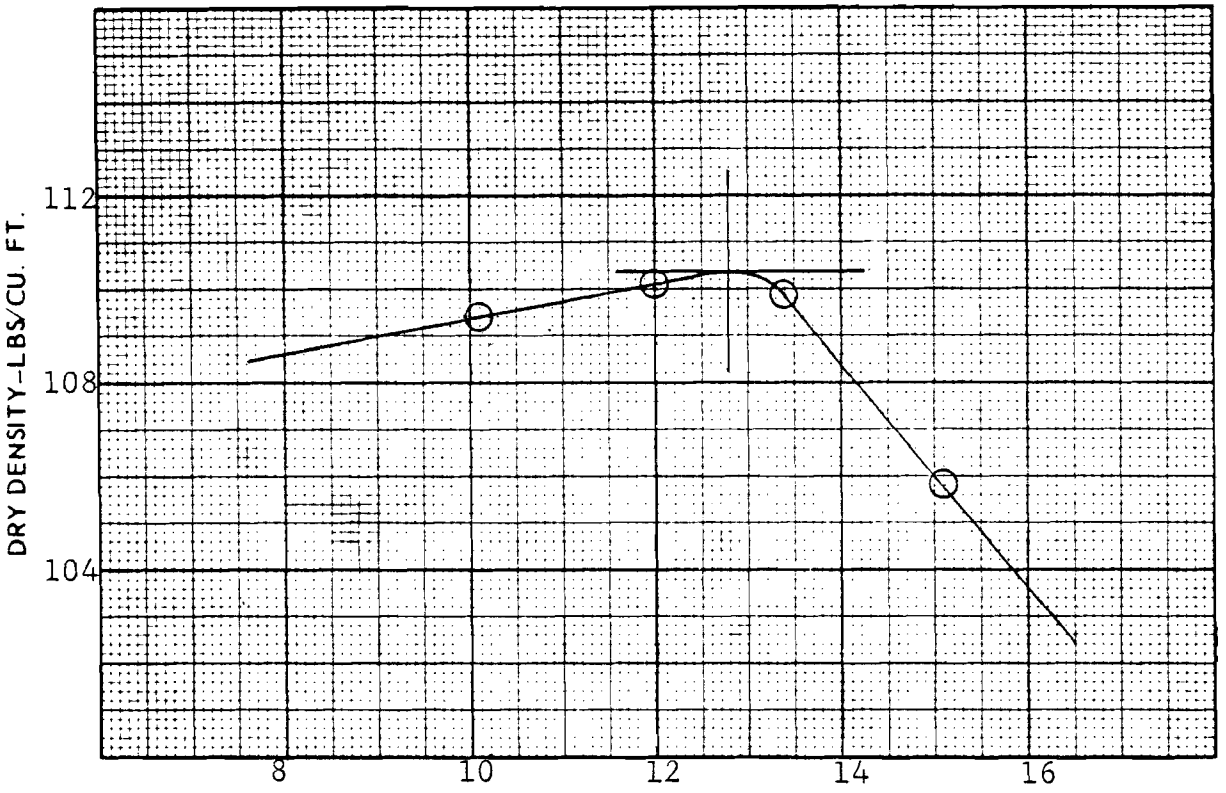
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-68



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	Boring #B-34 @ 0-6'	12.8	110.4	D1557	C	35-68
	(BL-1)					

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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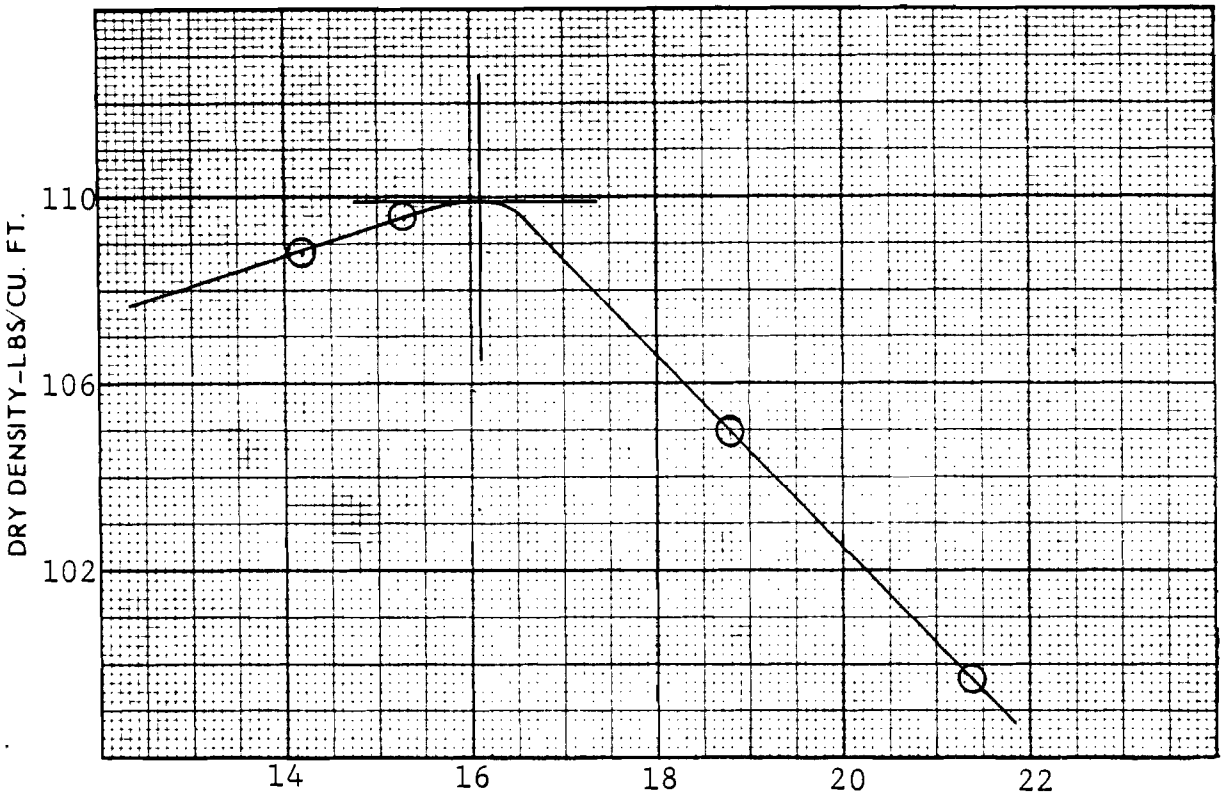
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-69



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	TP-2 #2 @ 5.5'-6.0'	16.1	109.9	D1557	D	35-69

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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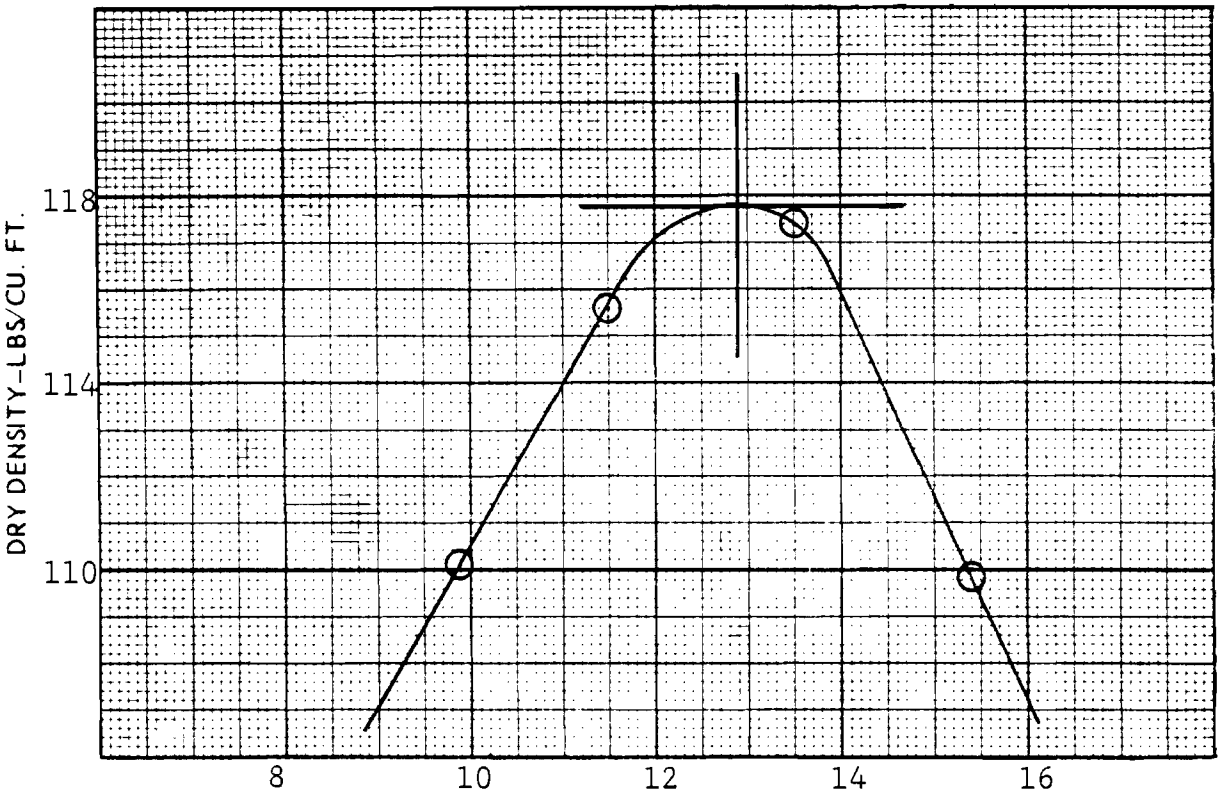
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-70



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	TP-2 #3 @ 11.0'-11.5'	12.9	117.8	D1557	D	35-70

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA								
AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)								
METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)								
METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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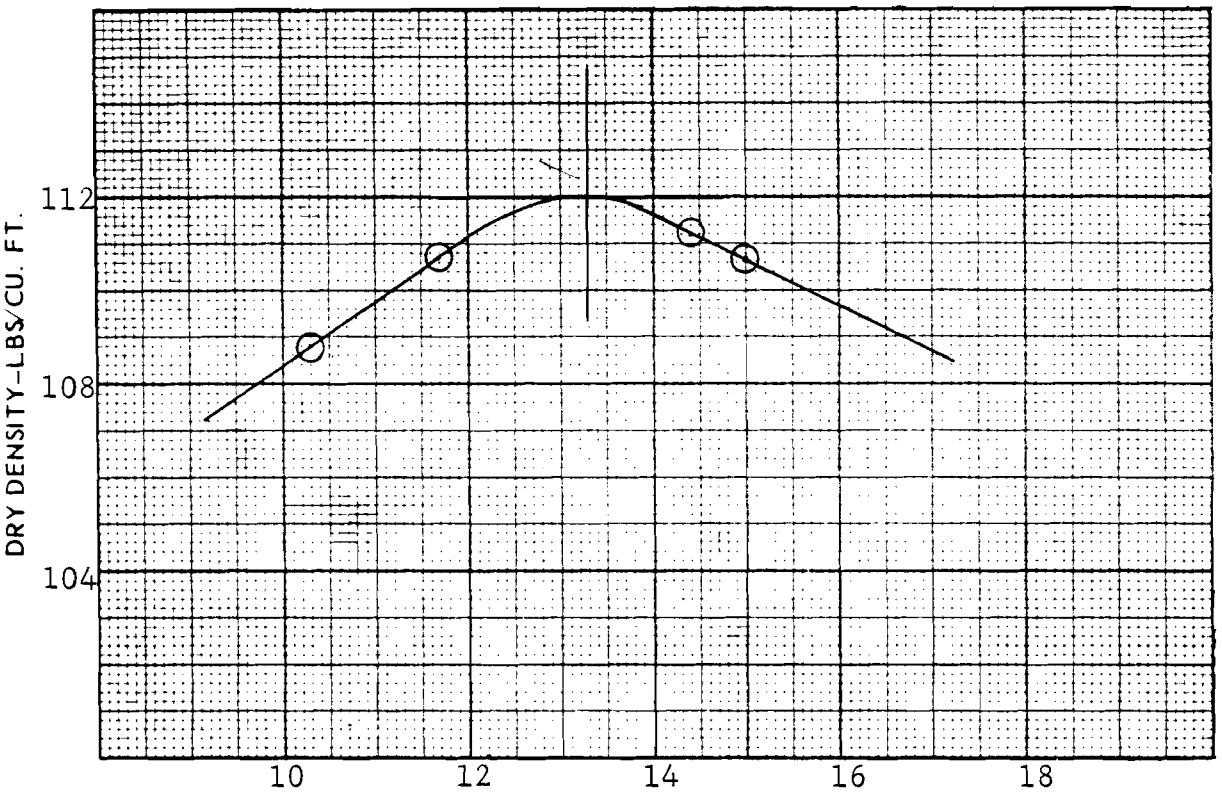
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel Inc. **LAB NO.** 35-71



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT	MAXIMUM DRY DENSITY LBS. CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	TP-4 #3 @ 13.5'-14.0'	13.3	112.0	D1557	D	35-71

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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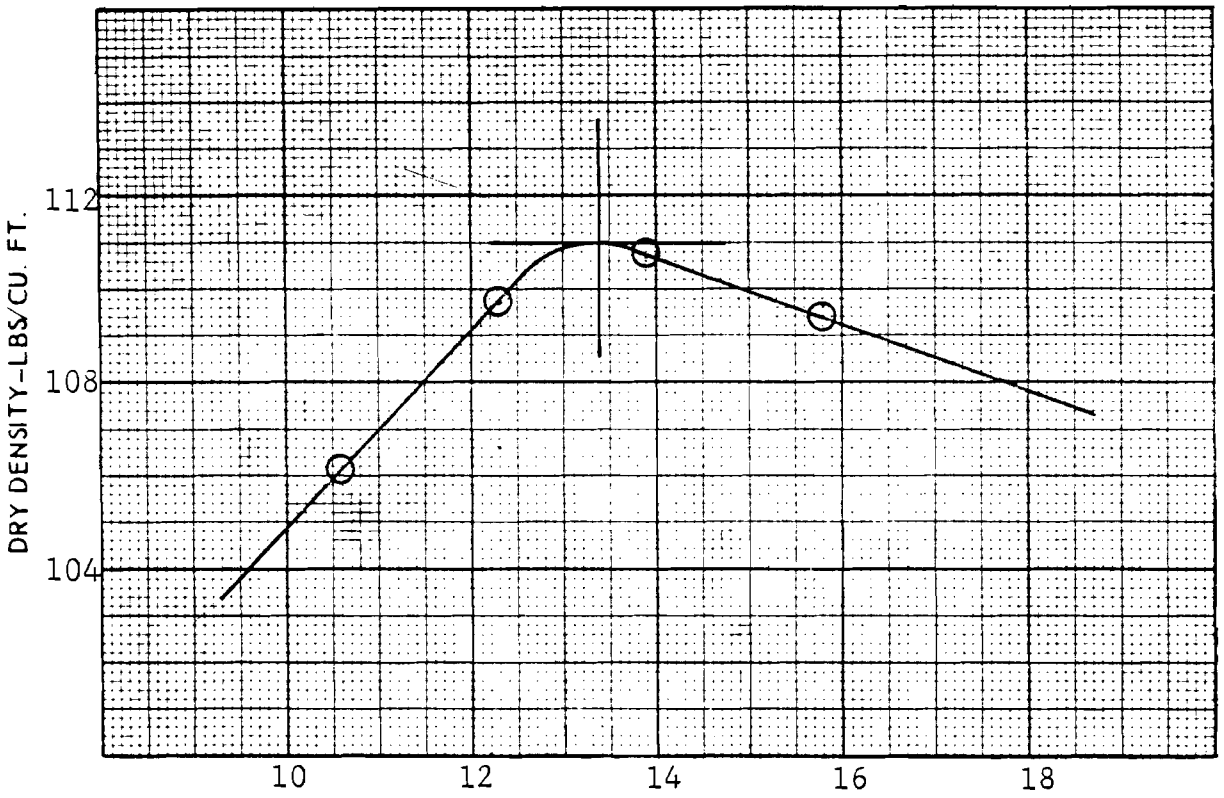
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

CLIENT Bechtel, Inc. **LAB NO.** 35-72



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	TP-4 #4 @ 29.5'-30.0'	13.4	111.0	D1557	D	35-72

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHTO T 99-74 and ASTM D 698-70 (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHTO T 180-74 and ASTM D 1557-70 (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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Section 3d

Laboratory Tests of Resistivity Samples

Plant Site
Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

LABORATORY RESISTIVITY*

Resistivity Test No.	Sample Origin & Depth		Laboratory Resistivity (ohms/cm)
R-1	Test Trench TP-3	0 -2½'	10,253
		2½-4'	4,638
		4 -8'	4,964
		8 -12'	3,137
R-2	Test Pit TP-4	0 -4'	13,920
		4 -11'	9,275
		11 -18'	6,729
		18 -24'	4,246
		24 -30'	3,395
R-3	Boring B-13, BL-3	0 -7'	6,401
	S-2	5 -6½'	insufficient sample
	S-4	9 -10½'	insufficient sample
R-4	Boring B-14, S-1	1 -2½'	insufficient sample
	S-2	4½-5½'	insufficient sample
R-5	Test Trench TP-5	0 -3'	14,368
		3 -7'	3,005
		7 -13'	3,984
		13 -16'	1,763
		16 -18'	1,763
R-6	Boring B-53, S-1	1 -2½'	insufficient sample
	S-3	5½-7'	insufficient sample
	S-4	8 -9'5"	insufficient sample

* California Highway Department Test Procedure 643, Part 4, Laboratory Method of Determining Minimum Resistivity.

Plant Site
Waste Isolation Pilot Plant
Bechtel Job No. 12484
Subsurface Exploration & Laboratory Testing
SHB Job No. E78-1135

pH SULPHATES & CHLORIDES *
(Samples from Resistivity Test Locations)

Resistivity Test No.	Sample Origin & Depth		pH	Sulphates (ppm)	Chlorides (ppm)
R-1	TP-3,	0 -2½'	7.7	8.75	53.3
		2½-4'	8.8	2.50	16.6
		4 -8'	8.6	17.50	23.3
		8 -12'	9.2	18.80	13.3
R-2	TP-4,	0 -4'	7.1	2.50	20.0
		4 -11'	8.8	0.25	33.3
		11-18'	9.2	0.80	33.3
		18-24'	8.4	7.50	20.0
		24-30'	9.1	16.20	60.0
R-3	B-13,	BL-3, 0 -7'	8.0	1.75	46.6
		S-2, 5 -6½'	7.8	1.00	86.6
		S-4, 9 -10½'	9.3	20.00	20.0
R-4	B-14,	S-1, 1 -2½'	9.1	5.00	80.0
		S-2, 4½-5½'	8.6	7.50	13.3
R-5	TP-5,	0 -3'	7.6	5.00	26.6
		3 -7'	8.4	0.50	20.0
		7 -13'	8.4	15.80	13.3
		13-16'	8.5	150.00	36.6
		16-18'	8.4	5.00	20.0
R-6	B-53,	S-1, 1 -2½'	8.0	6.25	33.3
		S-3, 5½-7'	7.4	2.50	33.3
		S-4, 8 -9'5"	8.5	33.80	20.0

* California Highway Department Test Procedure 643, Part 3, Method of Determining pH of Soil.

California Highway Department Test Procedure 417, Method of Testing Soils and Waters for Sulphate Content.

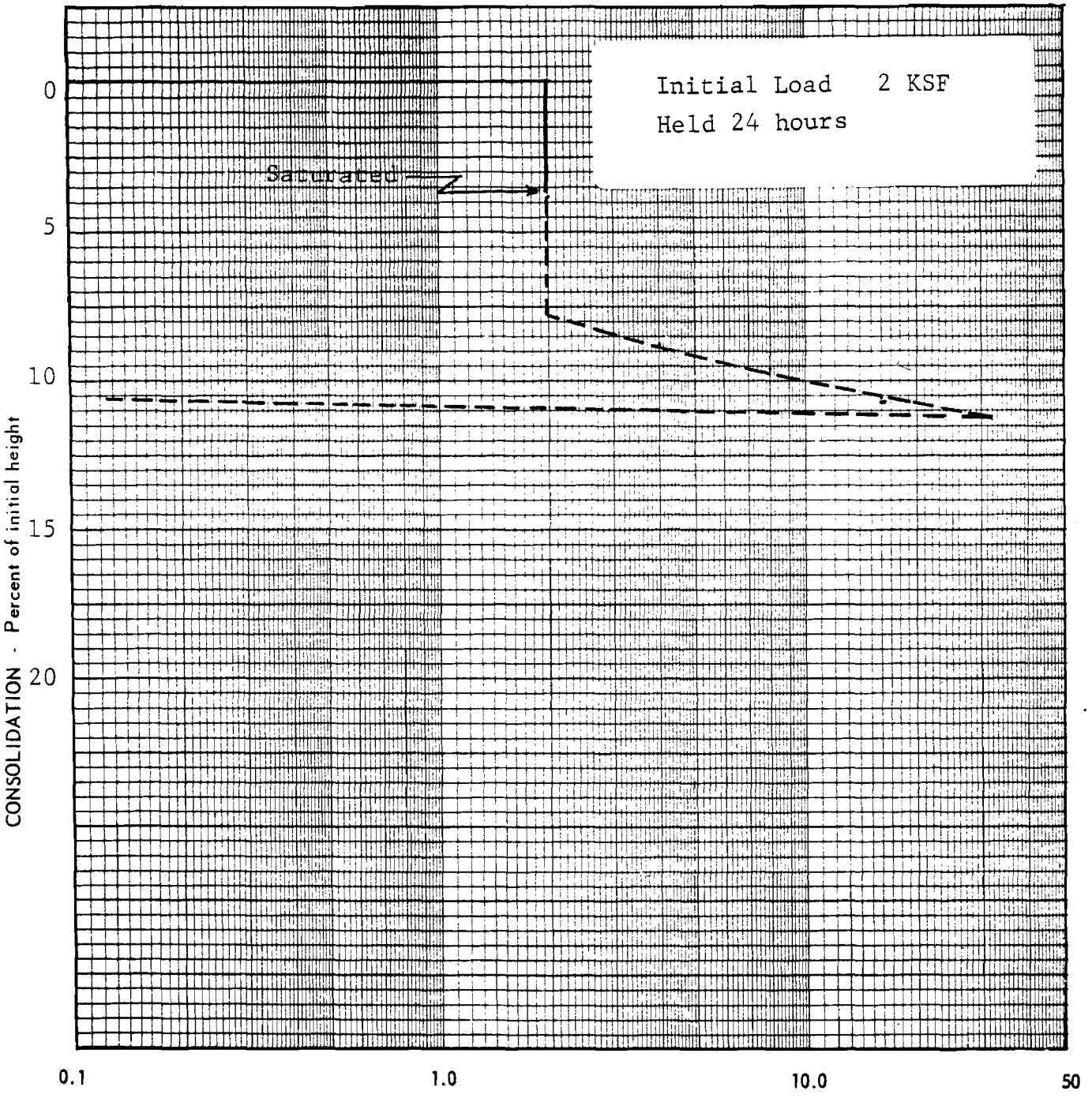
California Highway Department Test Procedure 422, Method of Testing Soils and Waters for Chloride Content.

Section 3e

Consolidation Test Results

SUMMARY OF CONSOLIDATION TESTS ASTM D2435

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135



CURVE	SAMPLE	INITIAL DRY DENSITY LBS./CU. FT.	MOISTURE CONTENT % DRY WEIGHT		UNIFIED SOIL CLASSIFICATION
			INITIAL	FINAL	
	Boring #B-20 @ 3-5' (P-1)	91.6	4.7	23.0	

SOIL MOISTURE CONDITION

——— INSITU
– – – – SUBMERGED

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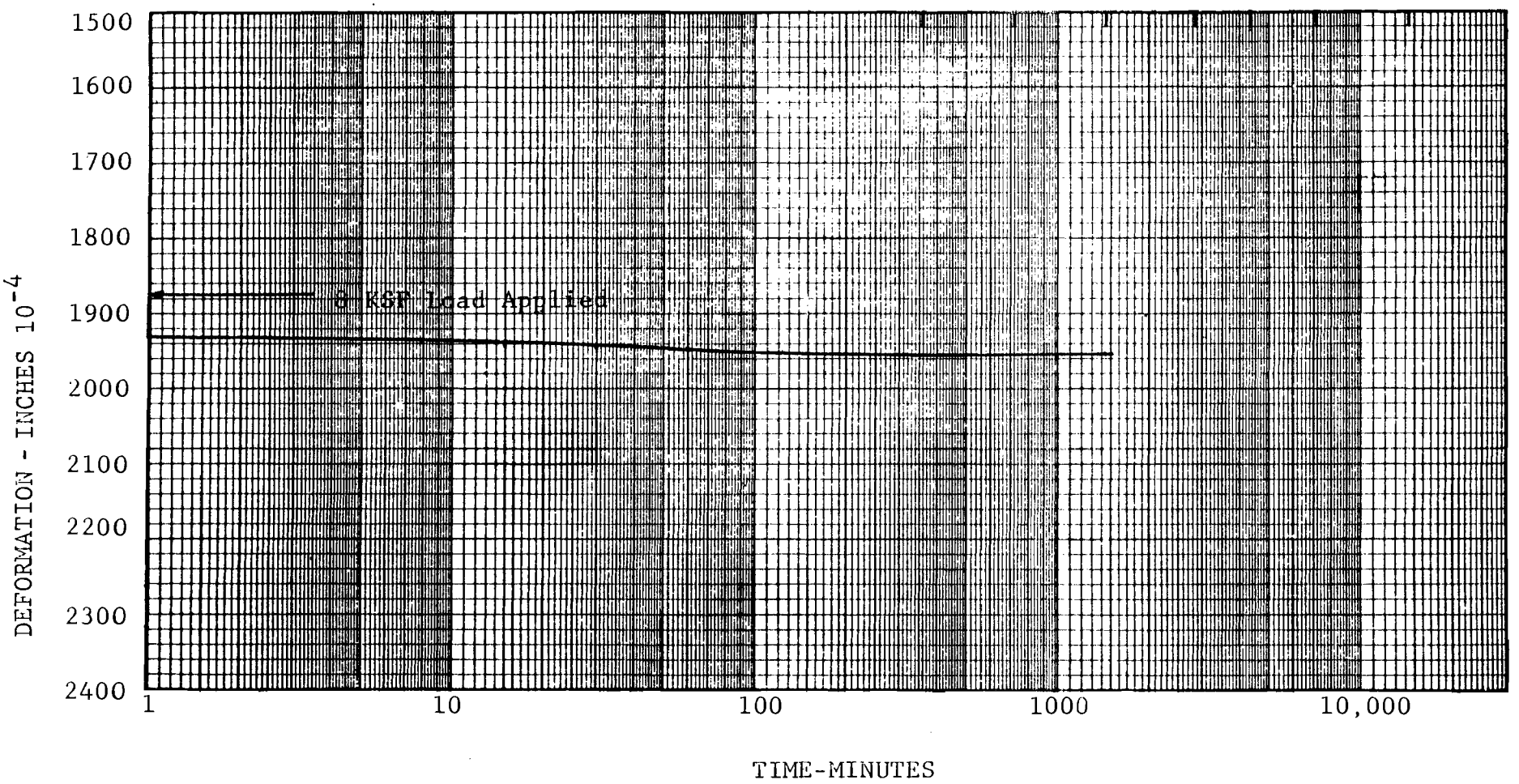
SUMMARY OF CONSOLIDATION TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

Boring B-20, Sample P-1 @ 3-5'



8 KSF
Submerged

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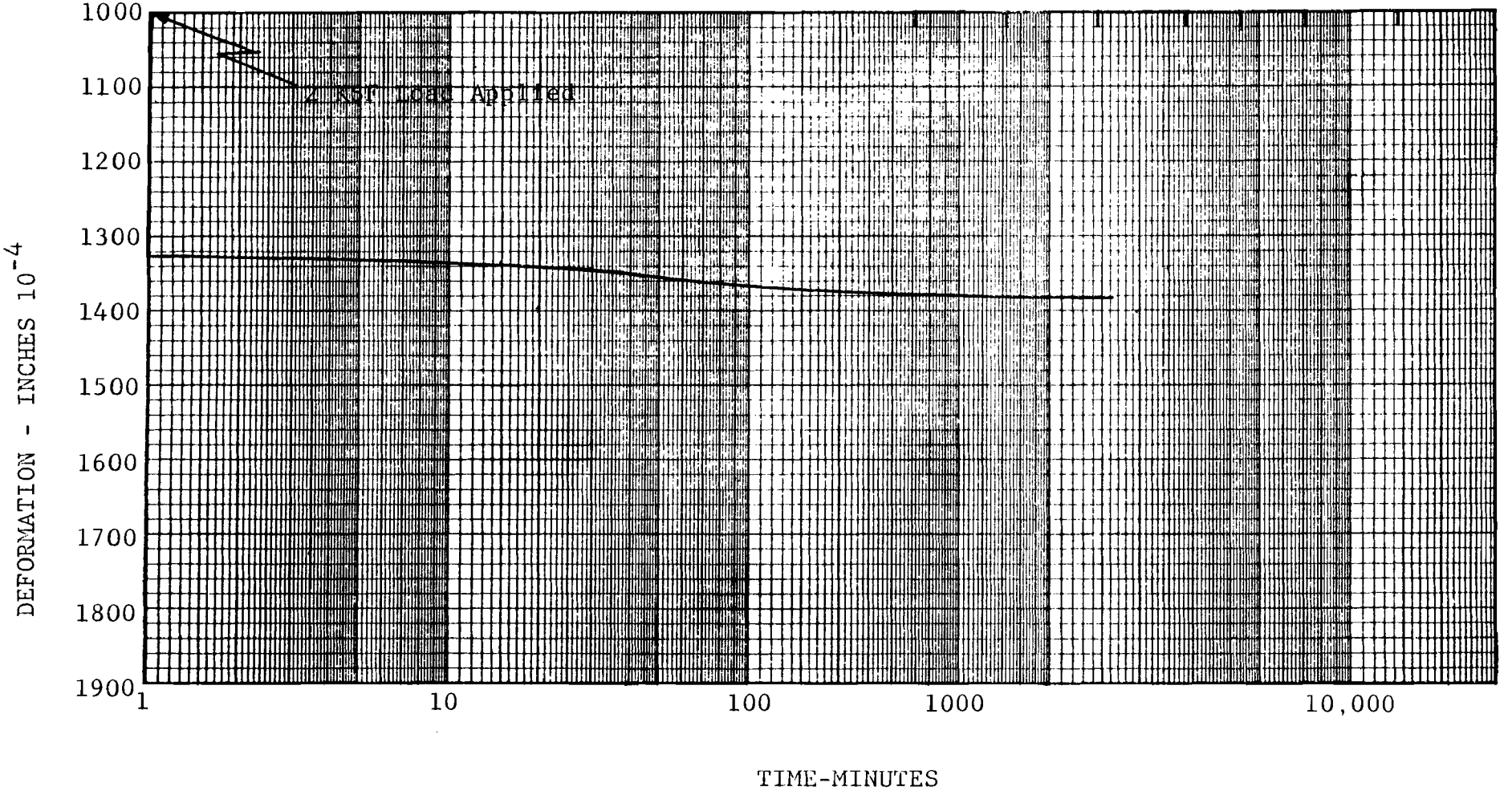
SUMMARY OF CONSOLIDATION TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

Boring B-20, Sample P-1 @ 3-5'



2 KSF
In situ moisture

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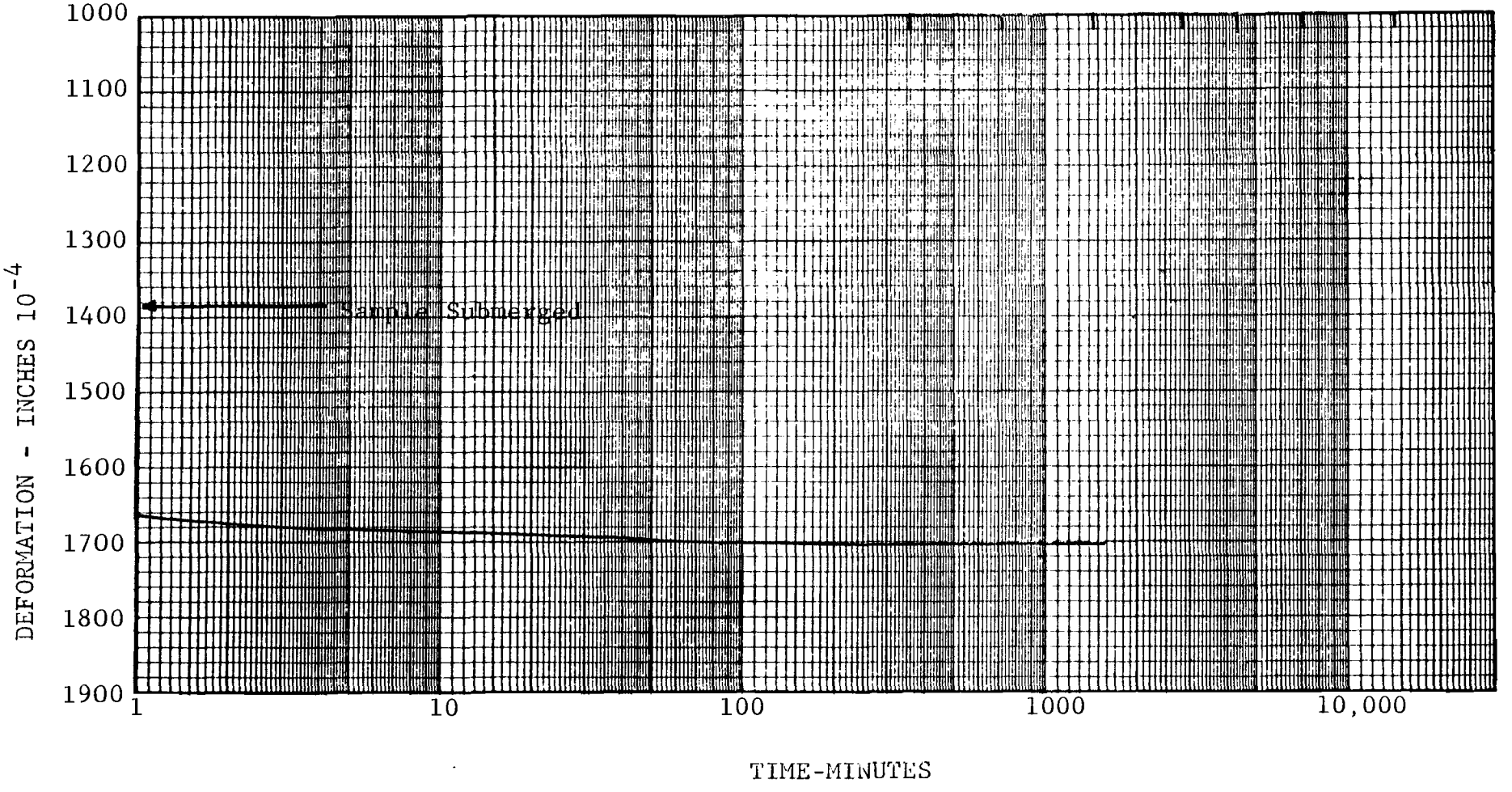
SUMMARY OF CONSOLIDATION TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135
Boring B-20, Sample P-1 @ 3-5'



2 KSF
Submerged

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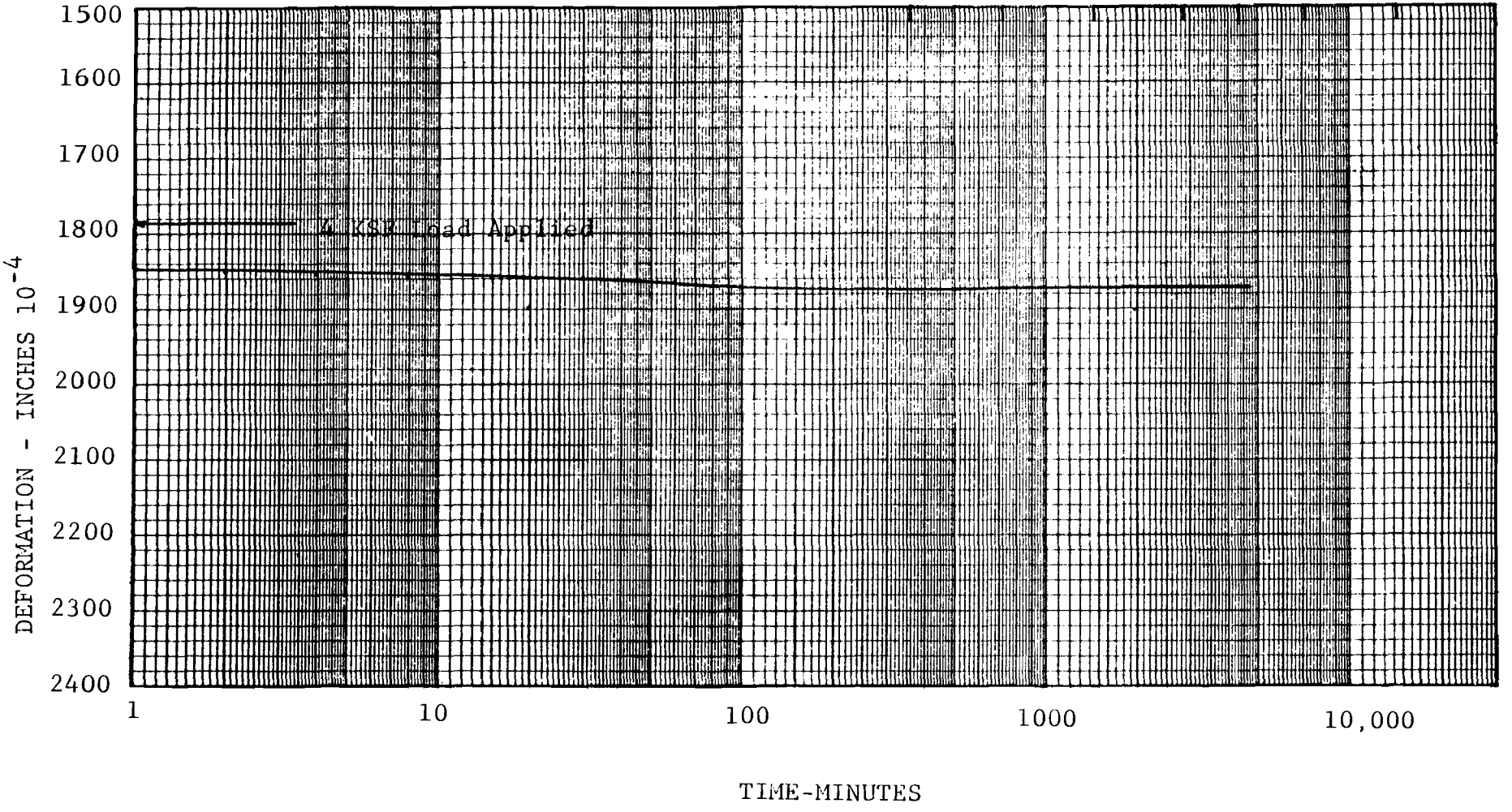
SUMMARY OF CONSOLIDATION TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

Boring B-20, Sample P-1 @ 3-5'



4 KSF
Submerged

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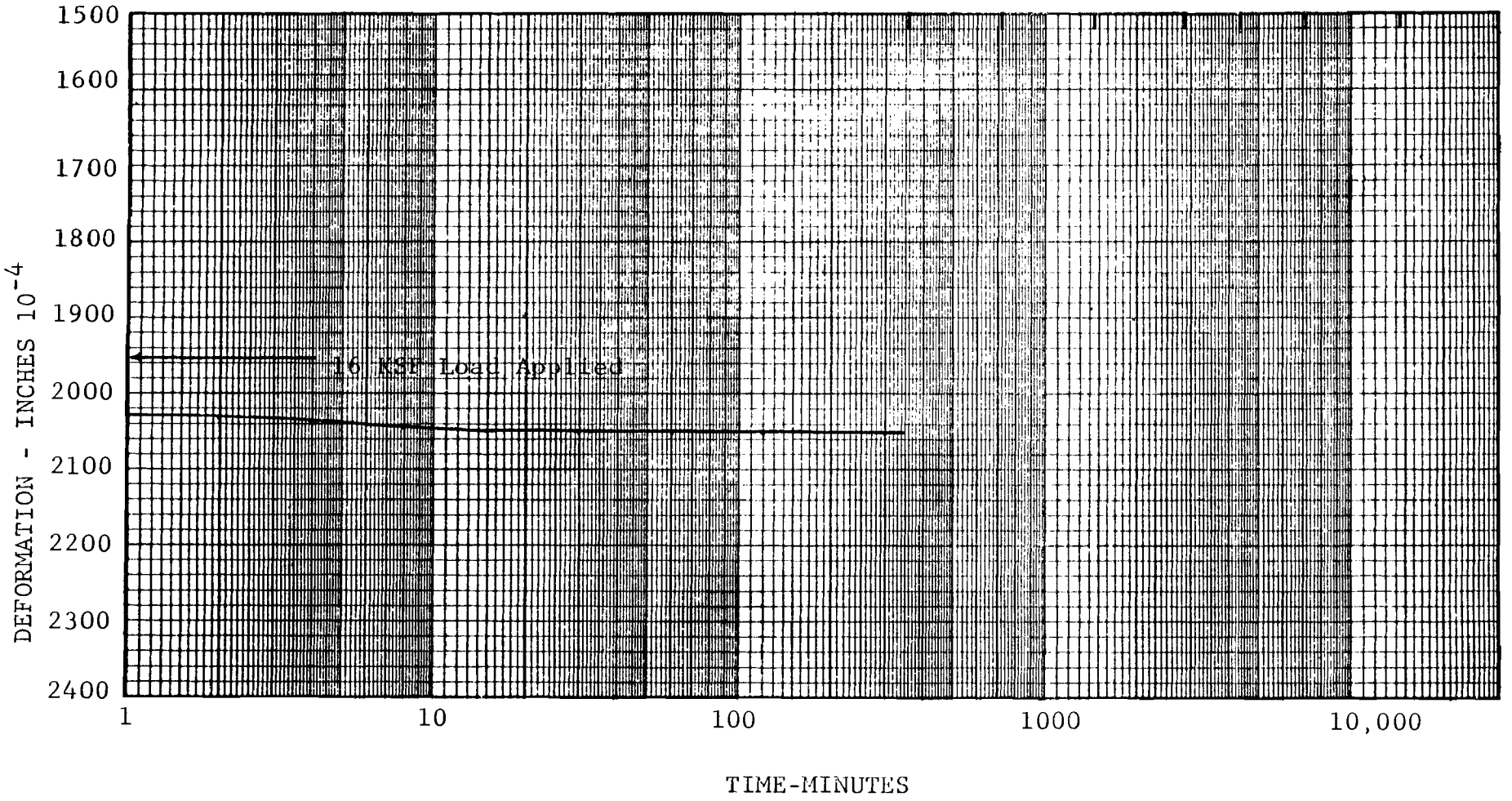
SUMMARY OF CONSOLIDATION TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

Boring B-20, Sample P-1 @ 3-5'



16 KSF
Submerged

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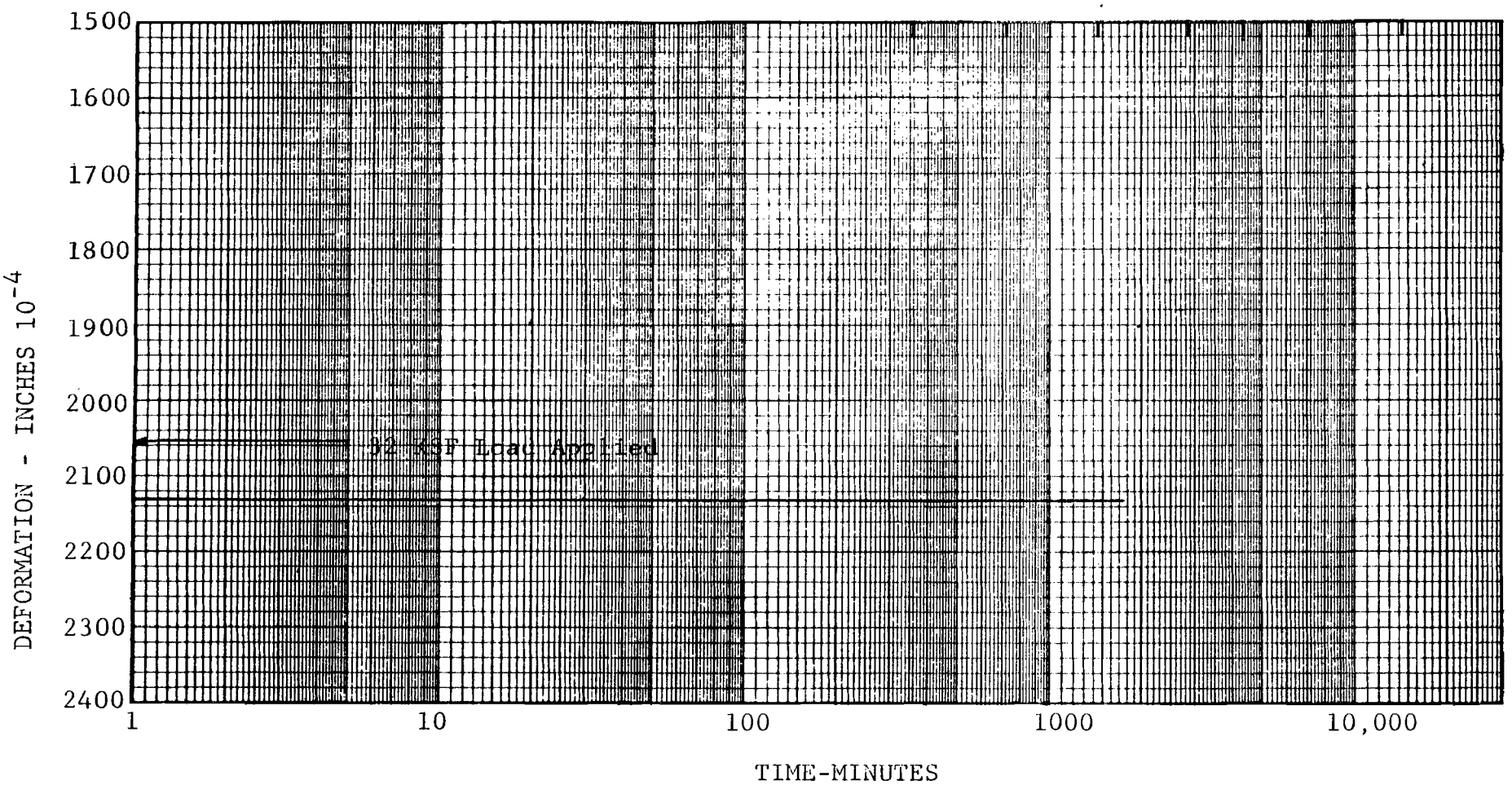
SUMMARY OF CONSOLIDATION TESTS

PROJECT Waste Isolation Pilot Plant **JOB NO.** E78-1135

Boring B-20, Sample P-1 @ 3-5'



32 KSF
Submerged

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Section 3f

Relative Density

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CONSULTING SOIL AND FOUNDATION ENGINEERS
MATERIALS TESTING ENGINEERS
ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

REPORT ON LABORATORY TESTS

DATE _____

PROJECT Waste Isolation Pilot Project-Bechtel Job No. 12484 JOB NO. E78-1135

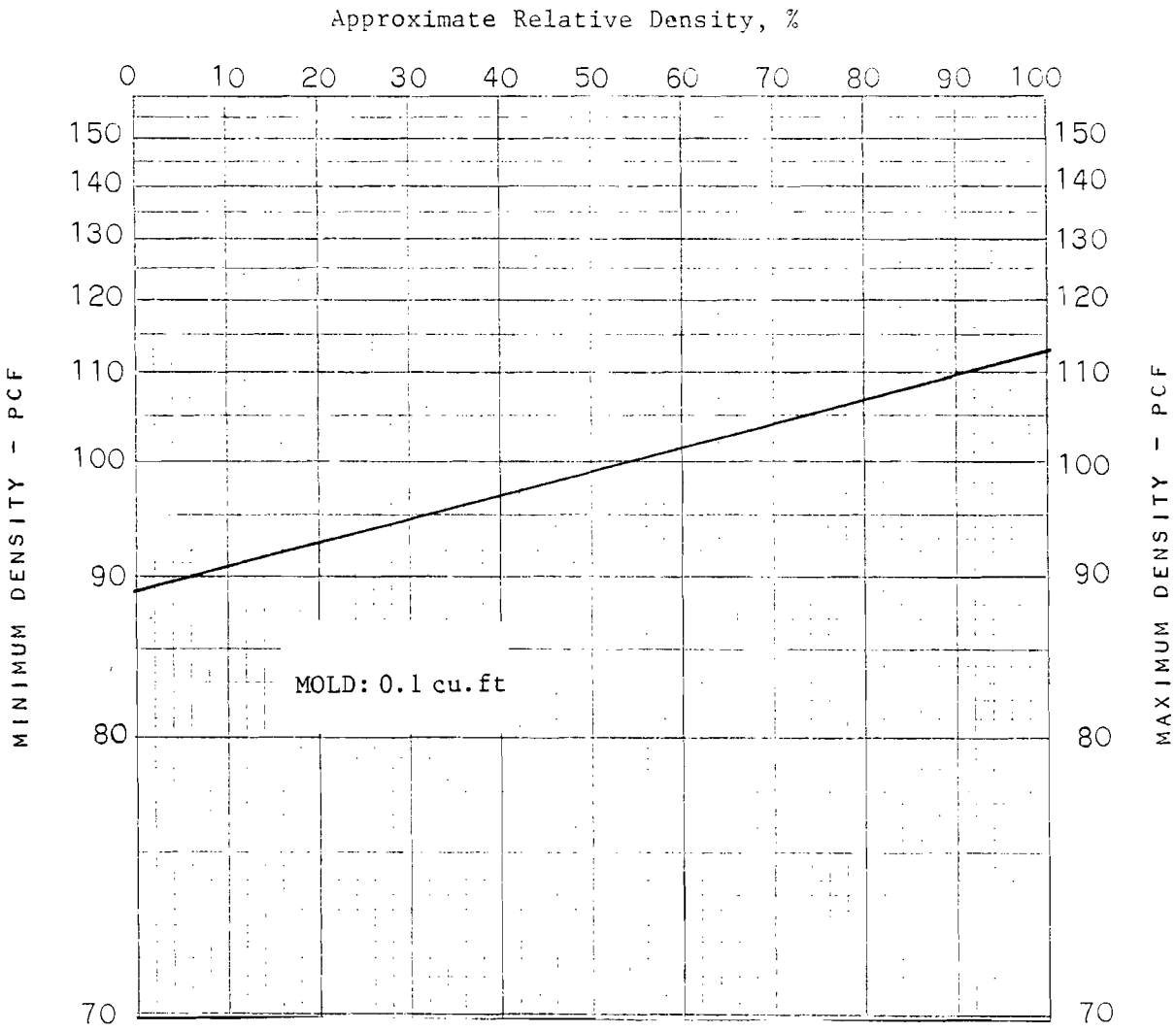
MATERIAL TP-1 #1 @ 3.2'-3.7' LAB NO. 8-1135-9 Phx.

RELATIVE DENSITY (ASTM D2049)

MINIMUM DRY DENSITY - PCF 88.8

MAXIMUM DRY DENSITY - PCF 113.0 PREPARATION METHOD - (WET) - DRY

$$\% \text{ Relative Density} = \frac{\gamma \text{ max.} (\gamma - \gamma \text{ min.})}{\gamma \ (\gamma \text{ max.} - \gamma \text{ min.})} \times 100$$



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PROJECT Waste Isolation Pilot Project-Bechtel Job No. 12484 JOB NO. E78-1135

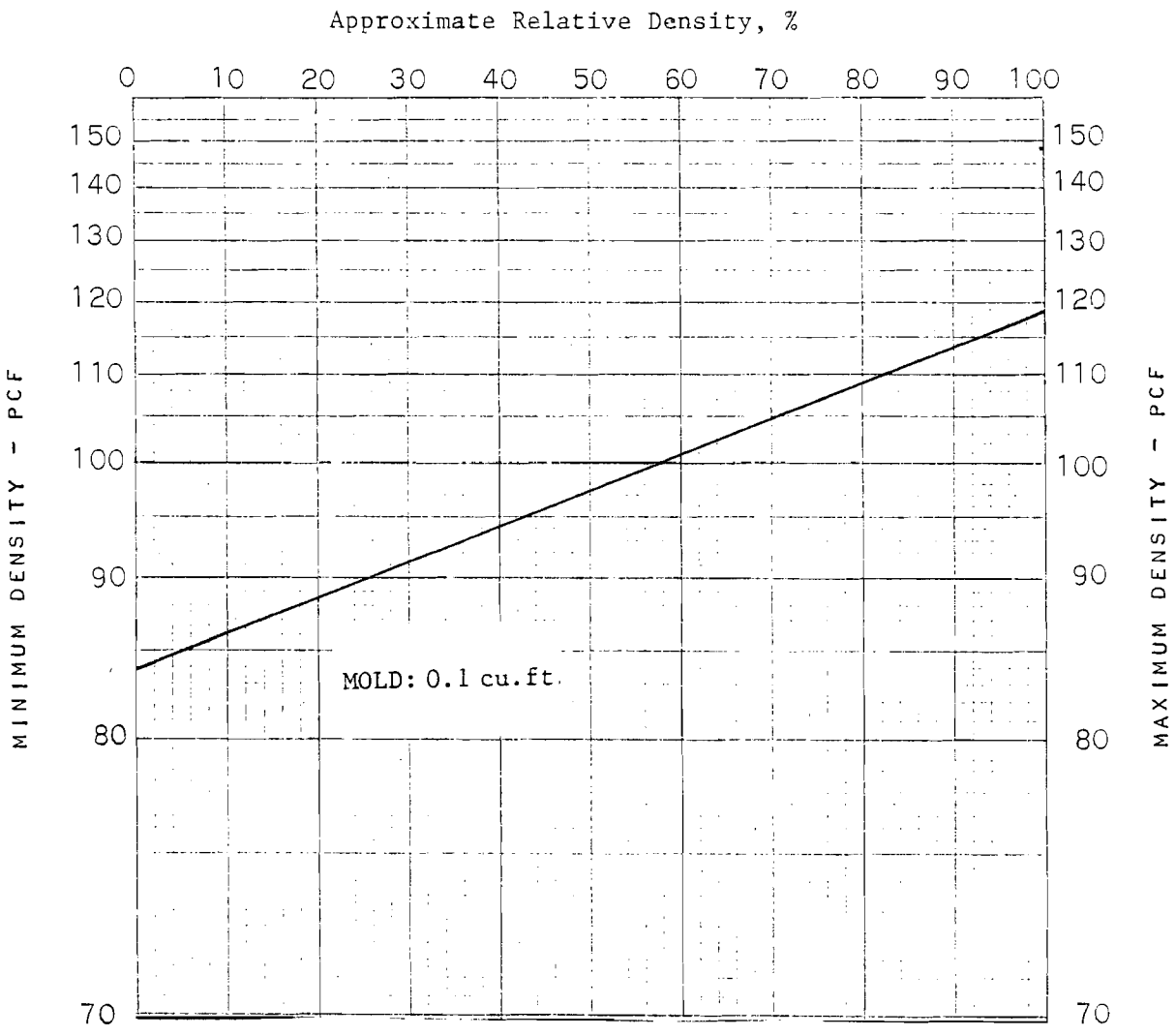
MATERIAL TP-2 #1 @ 3.0'-3.5' LAB NO. 8-1135-10 Phx/

RELATIVE DENSITY (ASTM D2049)

MINIMUM DRY DENSITY - PCF 84.1

MAXIMUM DRY DENSITY - PCF 118.6 PREPARATION METHOD - (WET) - DRY

$$\% \text{ Relative Density} = \frac{\gamma \text{ max.} (\gamma - \gamma \text{ min.})}{\gamma \ (\gamma \text{ max.} - \gamma \text{ min.})} \times 100$$



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PROJECT Waste Isolation Pilot Project - Bechtel Job No. 12484 JOB NO. E78-1135

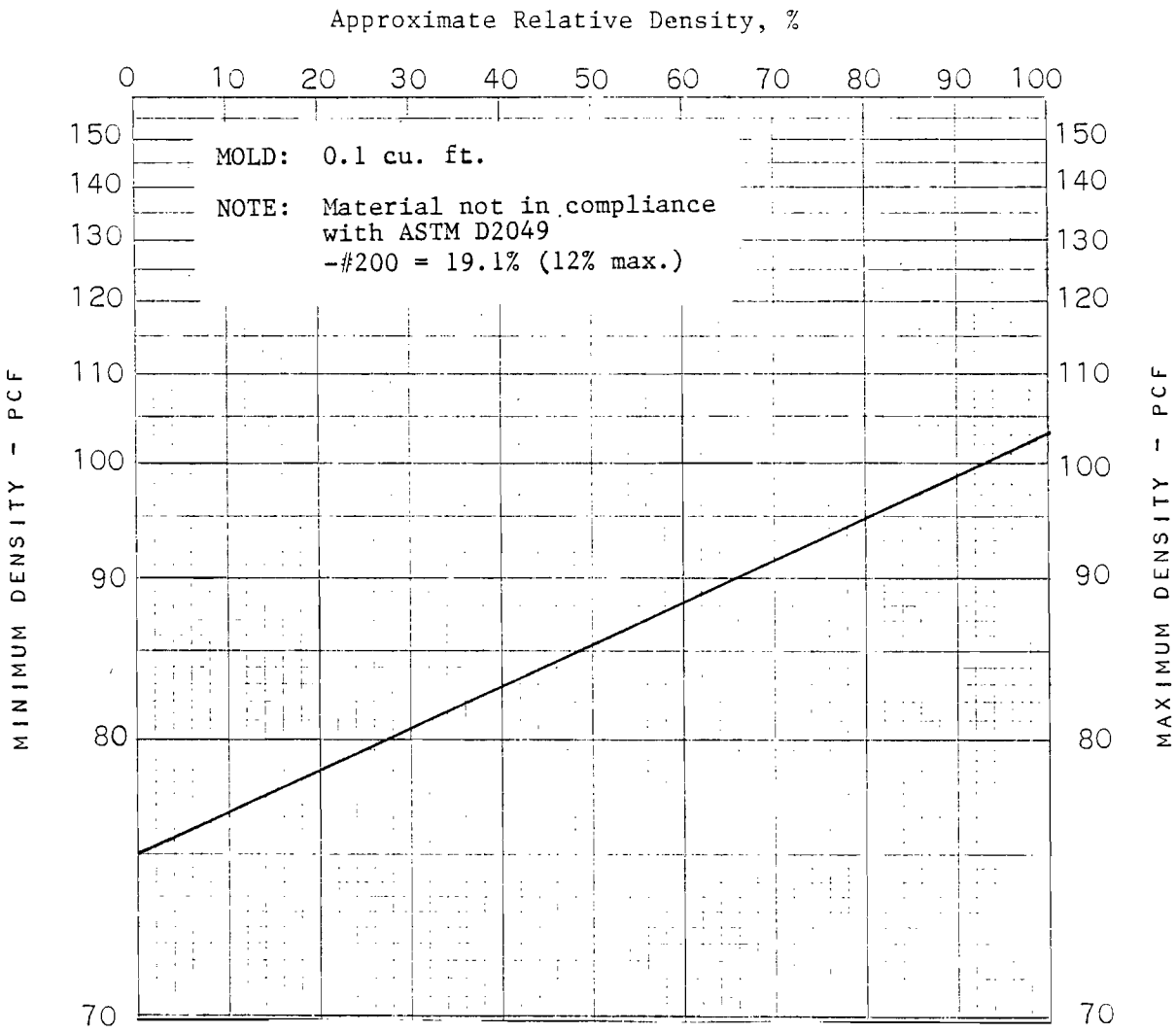
MATERIAL TP-3 #1 @ 3.2'-3.7' LAB NO. 1135-11 Phx.

RELATIVE DENSITY (ASTM D2049)

MINIMUM DRY DENSITY - PCF 74.7

MAXIMUM DRY DENSITY - PCF 103.3 PREPARATION METHOD - (WET) - DRY

$$\% \text{ Relative Density} = \frac{\gamma \text{ max. } (\gamma - \gamma \text{ min.})}{\gamma \ (\gamma \text{ max.} - \gamma \text{ min.})} \times 100$$



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PROJECT Waste Isolation Pilot Project-Bechtel Job No. 12484 JOB NO. E78-1135

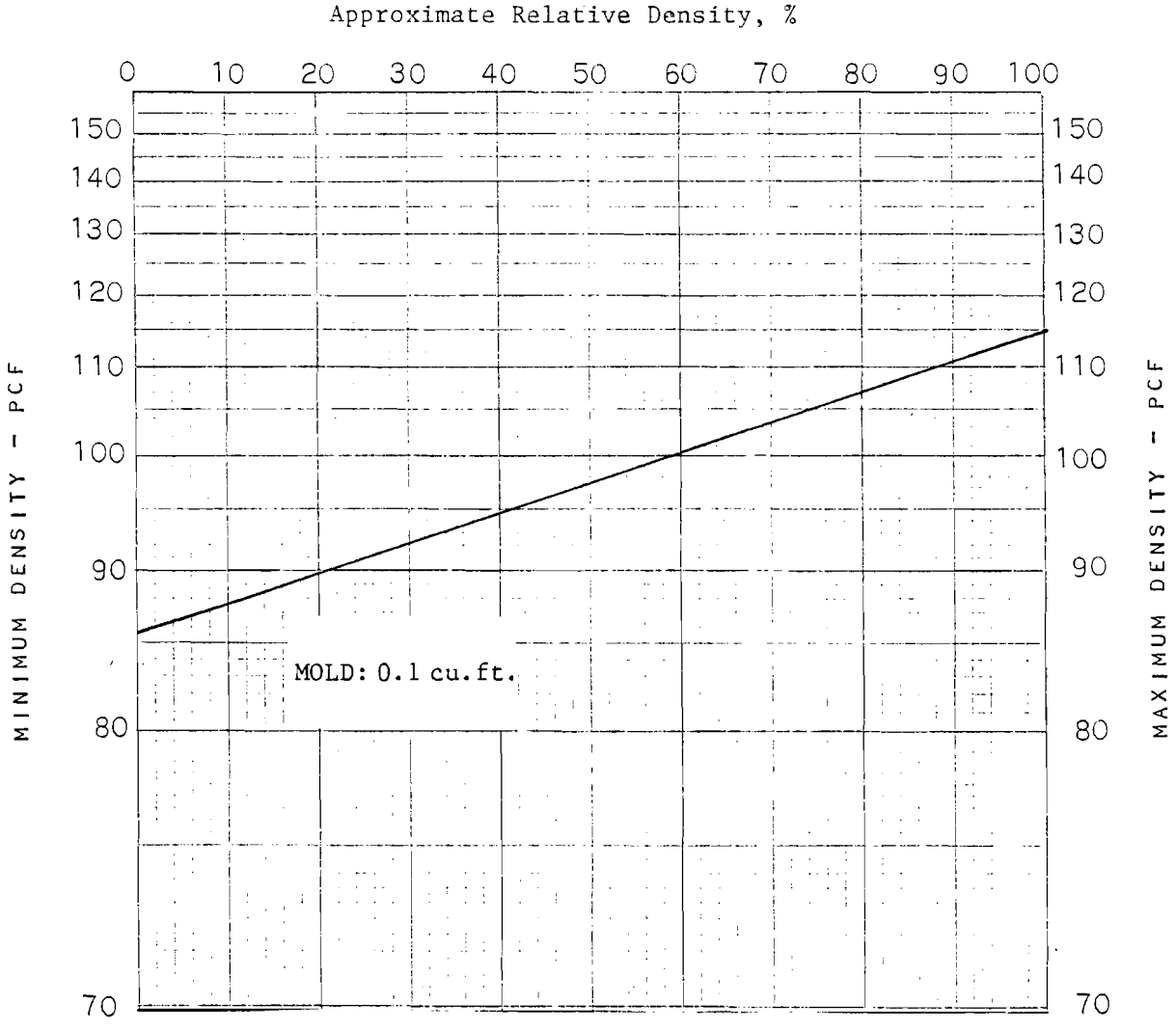
MATERIAL TP-4 #1 @ 3.0'-3.5' LAB NO. 8-1135-12 Phx.

RELATIVE DENSITY (ASTM D2049)

MINIMUM DRY DENSITY - PCF 85.6

MAXIMUM DRY DENSITY - PCF 115.2 PREPARATION METHOD - WET - DRY

$$\% \text{ Relative Density} = \frac{\gamma \text{ max.} (\gamma - \gamma \text{ min.})}{\gamma \ (\gamma \text{ max.} - \gamma \text{ min.})} \times 100$$



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PROJECT Waste Isolation Pilot Project-Bechtel Job No. 12484 JOB NO. E78-1135

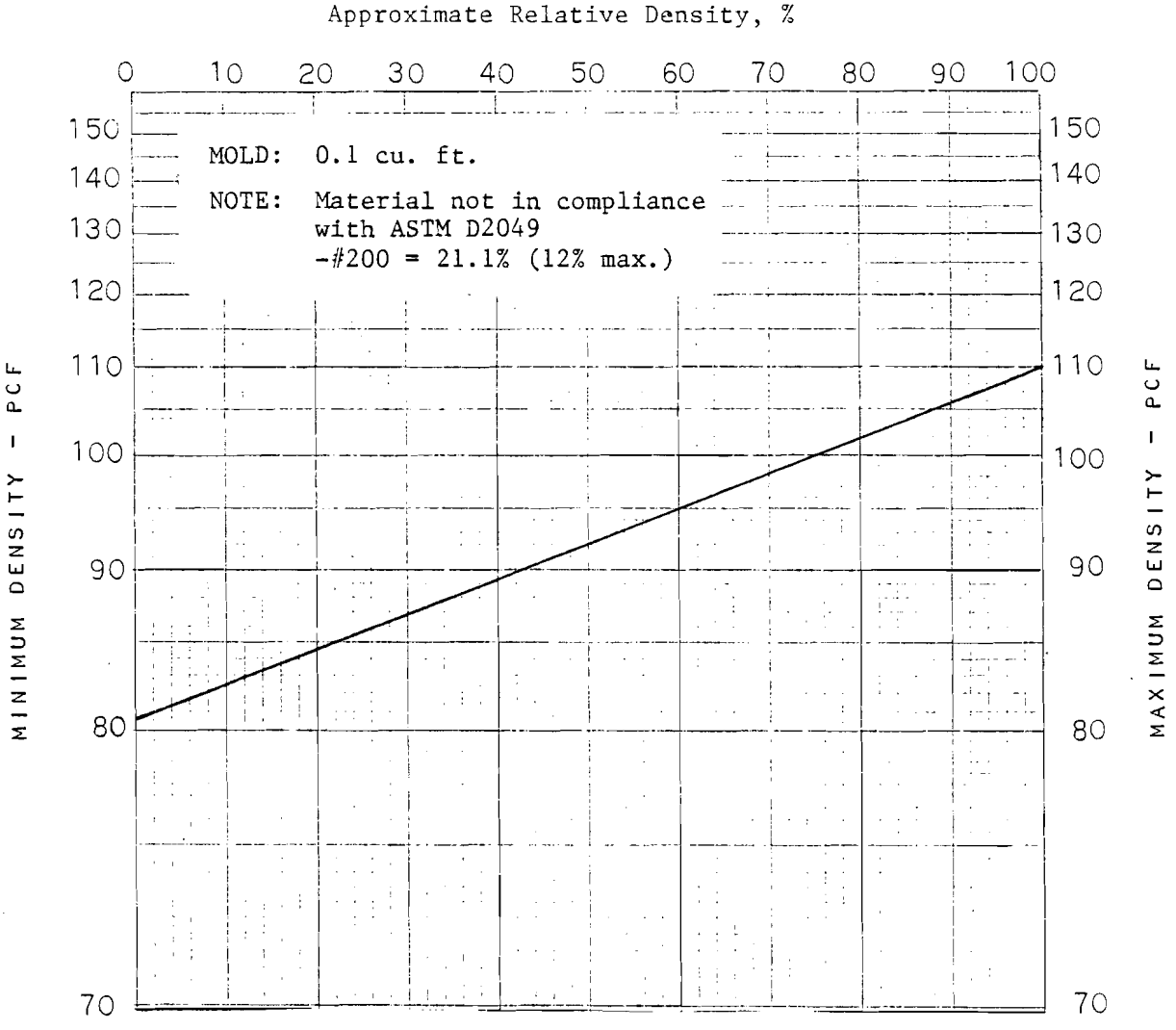
MATERIAL TP-4 #2 @ 7.5'-8.0' LAB NO. 8-1135-13 Phx.

RELATIVE DENSITY (ASTM D2049)

MINIMUM DRY DENSITY - PCF 80.6

MAXIMUM DRY DENSITY - PCF 109.5 PREPARATION METHOD - (WET) - DRY

$$\% \text{ Relative Density} = \frac{\gamma \text{ max.} (\gamma - \gamma \text{ min.})}{\gamma \ (\gamma \text{ max.} - \gamma \text{ min.})} \times 100$$



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PROJECT Waste Isolation Pilot Project
Bechtel Job No. 12484 JOB NO. E78-1135

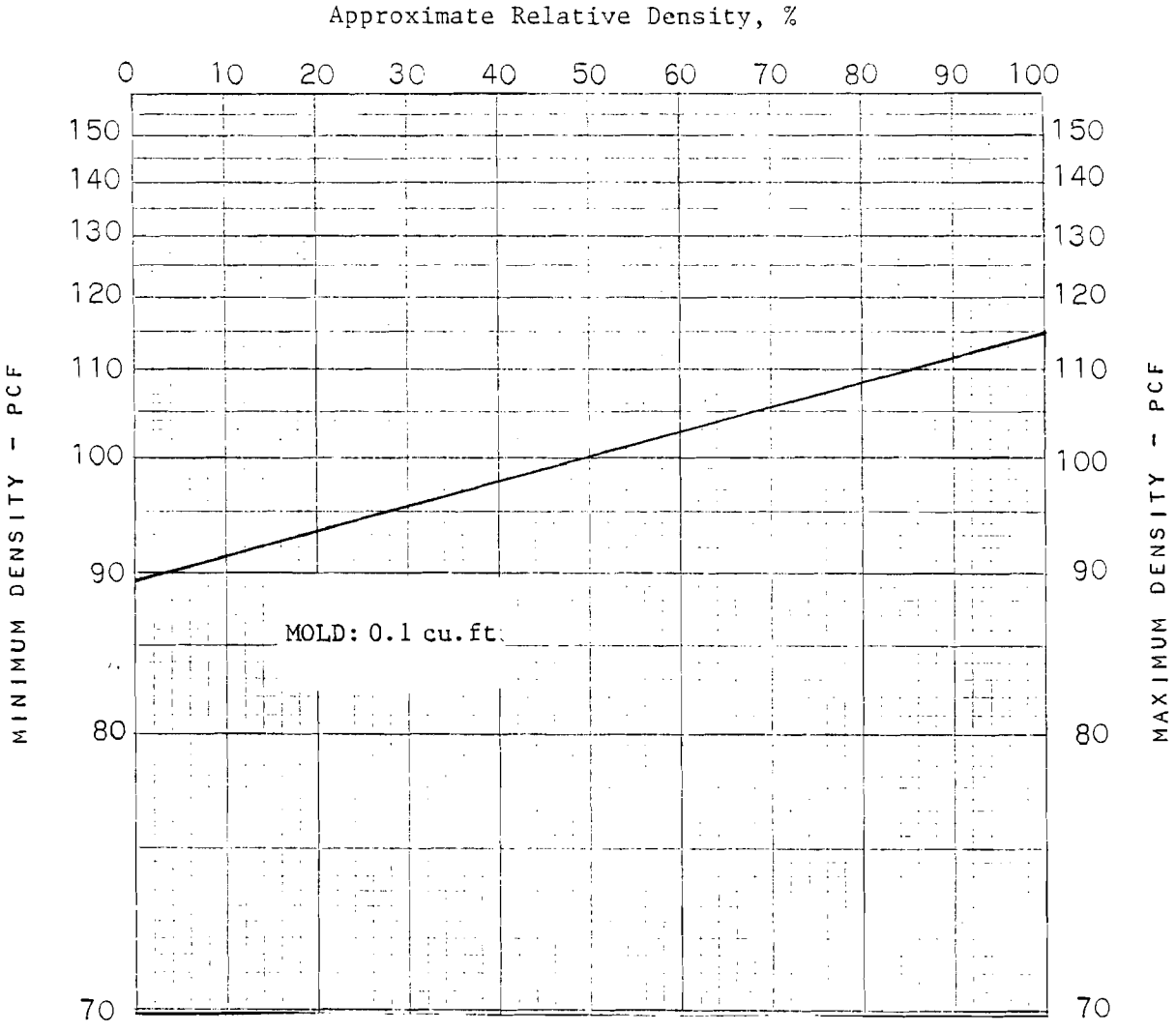
MATERIAL TP-5 #1 @ 3.5'-4.0' LAB NO. 8-1135-14 Phx.

RELATIVE DENSITY (ASTM D2049)

MINIMUM DRY DENSITY - PCF 89.7

MAXIMUM DRY DENSITY - PCF 114.5 PREPARATION METHOD - (WET) - DRY

$$\% \text{ Relative Density} = \frac{\gamma \text{ max.} (\gamma - \gamma \text{ min.})}{\gamma \ (\gamma \text{ max.} - \gamma \text{ min.})} \times 100$$



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