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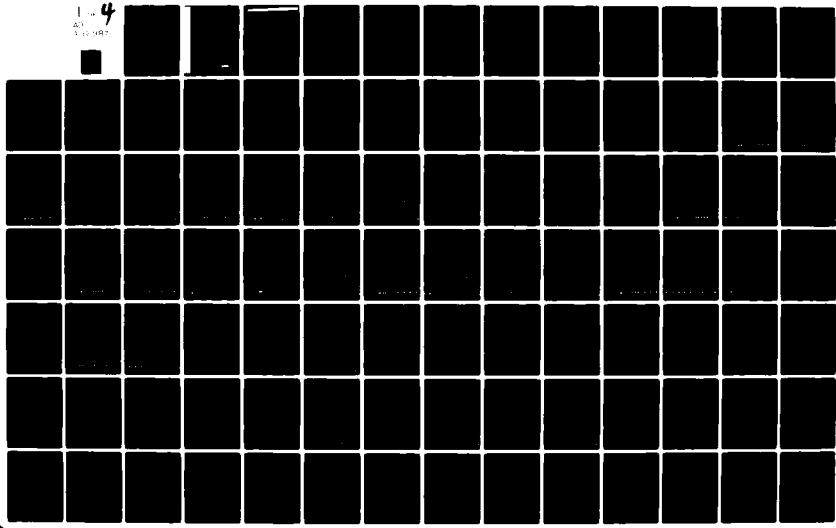
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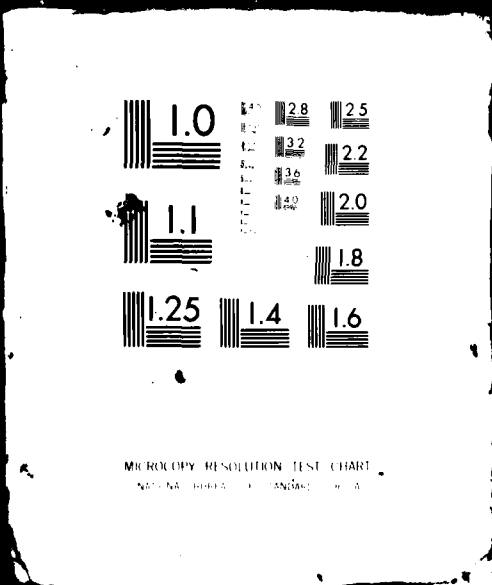
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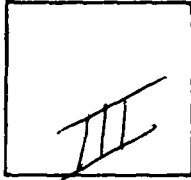
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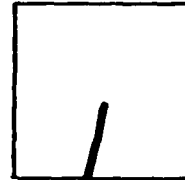
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**MX SITING INVESTIGATION
GEOTECHNICAL EVALUATION**

AD A112987

**PRELIMINARY GEOTECHNICAL
INVESTIGATION
PROPOSED OPERATIONAL BASE SITE
MILFORD, UTAH**

VOLUME II - GEOTECHNICAL DATA

**PREPARED FOR
BALLISTIC MISSILE OFFICE (BMO)
NORTON AIR FORCE BASE, CALIFORNIA**

FUGRO
NATIONAL, INC.
Consulting Engineers and Geologists

FN-TR-44

MX SITING INVESTIGATION
GEOTECHNICAL EVALUATION

PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED OPERATIONAL BASE SITE
MILFORD, UTAH

VOLUME II. - GEOTECHNICAL DATA

Prepared for:

U.S. Department of the Air Force
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Norton Air Force Base, California 92409

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report contains maps of boring, Trench and test pit logs locations. Seismic-refraction data and electrical resistivity data for the Milford, Utah operating base location described in Volume I of this report.		

FOREWORD

This volume of geotechnical data was compiled for the Department of the Air Force, Ballistic Missile Office (BMO), in compliance with Contract No. F04704-80-C-0006, CDRL Item 004A6. It contains the field data and laboratory test results from the investigation of the proposed Operational Base Site, Milford, Utah. A synthesis of these data is available in Volume I.

The data in each section of this volume are preceded by an explanation of the format and terms used in the compilation.

TABLE OF CONTENTS

	<u>Page</u>
FOREWORD	i
1.0 <u>ACTIVITY LOCATION MAP</u>	In Pocket
2.0 <u>EXPLANATION OF BORING, TRENCH, AND TEST PIT LOGS</u>	1
3.0 <u>EXPLANATION OF TRENCH LOGS</u>	24
4.0 <u>EXPLANATION OF TEST PIT LOGS</u>	57
5.0 <u>EXPLANATION OF LABORATORY TEST RESULTS</u>	112
6.0 <u>EXPLANATION OF CONE PENETROMETER TEST RESULTS</u>	155
7.0 <u>EXPLANATION OF SEISMIC-REFRACTION DATA</u>	182
8.0 <u>EXPLANATION OF ELECTRICAL RESISTIVITY DATA</u>	195

LIST OF FIGURES

Figure
No.

2.0 EXPLANATION OF BORING, TRENCH, AND TEST PIT LOGS

II-2-1	Log of Boring MD-B-1, Operational Base Site, Milford, Utah	7
II-2-2	Log of Boring MD-B-2, Operational Base Site, Milford, Utah	8
II-2-3	Log of Boring MD-B-3, Operational Base Site, Milford, Utah	9
II-2-4	Log of Boring MD-B-4, Operational Base Site, Milford, Utah	10
II-2-5	Log of Boring MD-B-5, Operational Base Site, Milford, Utah	11
II-2-6	Log of Boring MD-B-6, Operational Base Site, Milford, Utah	12
II-2-7	Log of Boring MD-B-7, Operational Base Site, Milford, Utah	13
II-2-8	Log of Boring MD-B-8, Operational Base Site, Milford, Utah	14
II-2-9	Log of Boring MD-B-9, Operational Base Site, Milford, Utah	15
II-2-10	Log of Boring MD-B-10, Operational Base Site, Milford, Utah	16

TABLE OF CONTENTS (Cont.)

LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-2-11	Log of Boring MD-B-11, Operational Base Site, Milford, Utah	17
II-2-12	Log of Boring MD-B-12, Operational Base Site, Milford, Utah	18
II-2-13	Log of Boring MD-B-13, Operational Base Site, Milford, Utah	19
II-2-14	Log of Boring MD-B-14, Operational Base Site, Milford, Utah	20
II-2-15	Log of Boring MD-B-15, Operational Base Site, Milford, Utah	21
II-2-16	Log of Boring BL-B-7, Operational Base Site, Milford, Utah	22
II-2-17	Log of Boring BL-B-10, Operational Base Site, Milford, Utah	23
 <u>3.0 EXPLANATION OF TRENCH LOGS</u> 		
II-3-1	Log of Trench MD-T-1, Operational Base Site, Milford, Utah	25
II-3-2	Log of Trench MD-T-2, Operational Base Site, Milford Utah	26
II-3-3	Log of Trench MD-T-3, Operational Base Site, Milford, Utah	27
II-3-4	Log of Trench MD-T-4, Operational Base Site, Milford, Utah	28
II-3-5	Log of Trench MD-T-5, Operational Base Site, Milford, Utah	29
II-3-6	Log of Trench MD-T-6, Operational Base Site, Milford, Utah	30
II-3-7	Log of Trench MD-T-7, Operational Base Site, Milford, Utah	31
II-3-8	Log of Trench MD-T-8, Operational Base Site, Milford, Utah	32
II-3-9	Log of Trench MD-T-9, Operational Base Site, Milford, Utah	33
II-3-10	Log of Trench MD-T-10, Operational Base site, Milford, Utah	34
II-3-11	Log of Trench MD-T-11, Operational Base Site, Milford, Utah	35
II-3-12	Log of Trench MD-T-12, Operational Base Site, Milford, Utah	36
II-3-13	Log of Trench MD-T-13, Operational Base Site, Milford, Utah	37
II-3-14	Log of Trench MD-T-14, Operational Base Site, Milford, Utah	38

TABLE OF CONTENTS (Cont.)

LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-3-15	Log of Trench MD-T-15, Operational Base Site, Milford, Utah	39
II-3-16	Log of Trench MD-T-16, Operational Base Site, Milford, Utah	40
II-3-17	Log of Trench MD-T-17, Operational Base Site, Milford, Utah	41
II-3-18	Log of Trench MD-T-18, Operational Base Site, Milford, Utah	42
II-3-19	Log of Trench MD-T-19, Operational Base Site, Milford, Utah	43
II-3-20	Log of Trench MD-T-20, Operational Base Site, Milford, Utah	44
II-3-21	Log of Trench BL-T-13, Operational Base Site, Milford, Utah	45
II-3-22	Log of Trench BL-T-14, Operational Base Site, Milford, Utah	46
II-3-23	Log of Trench BL-T-15, Operational Base Site, Milford, Utah	47
II-3-24	Log of Trench BL-T-16, Operational Base Site, Milford, Utah	48
II-3-25	Log of Trench BL-T-17, Operational Base Site, Milford, Utah	49
II-3-26	Log of Trench BL-T-18, Operational Base Site, Milford, Utah	50
II-3-27	Log of Trench BL-T-19, Operational Base Site, Milford, Utah	51
II-3-28	Log of Trench BL-T-20, Operational Base Site, Milford, Utah	52
II-3-29	Log of Trench BL-T-21, Operational Base Site, Milford, Utah	53
II-3-30	Log of Trench BL-T-22, Operational Base Site, Milford, Utah	54
II-3-31	Log of Trench BL-T-23, Operational Base Site, Milford, Utah	55
II-3-32	Log of Trench BL-T-24, Operational Base Site, Milford, Utah	56
 4.0 EXPLANATION OF TEST PIT LOGS 		
II-4-1	Log of Test Pit MD-P-1, Operational Base Site, Milford, Utah	58
II-4-2	Log of Test Pit MD-P-2, Operational Base Site, Milford, Utah	59
II-4-3	Log of Test Pit MD-P-3, Operational Base Site, Milford, Utah	60
II-4-4	Log of Test Pit MD-P-4, Operational Base Site, Milford, Utah	61

TABLE OF CONTENTS (Cont.)

LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-4-5	Log of Test Pit MD-P-5, Operational Base Site, Milford, Utah	62
II-4-6	Log of Test Pit MD-P-6, Operational Base Site, Milford, Utah	63
II-4-7	Log of Test Pit MD-P-7, Operational Base Site, Milford, Utah	64
II-4-8	Log of Test Pit MD-P-8, Operational Base Site, Milford, Utah	65
II-4-9	Log of Test Pit MD-P-9, Operational Base Site, Milford, Utah	66
II-4-10	Log of Test Pit MD-P-10, Operational Base Site, Milford, Utah	67
II-4-11	Log of Test Pit MD-P-11, Operational Base Site, Milford, Utah	68
II-4-12	Log of Test Pit MD-P-12, Operational Base Site, Milford, Utah	69
II-4-13	Log of Test Pit MD-P-13, Operational Base Site, Milford, Utah	70
II-4-14	Log of Test Pit MD-P-14, Operational Base Site, Milford, Utah	71
II-4-15	Log of Test Pit MD-P-15, Operational Base Site, Milford, Utah	72
II-4-16	Log of Test Pit MD-P-16, Operational Base Site, Milford, Utah	73
II-4-17	Log of Test Pit MD-P-17, Operational Base Site, Milford, Utah	74
II-4-18	Log of Test Pit MD-P-18, Operational Base Site, Milford, Utah	75
II-4-19	Log of Test Pit MD-P-19, Operational Base Site, Milford, Utah	76
II-4-20	Log of Test Pit MD-P-20, Operational Base Site, Milford, Utah	77
II-4-21	Log of Test Pit MD-P-21, Operational Base Site, Milford, Utah	78
II-4-22	Log of Test Pit MD-P-22, Operational Base Site, Milford, Utah	79
II-4-23	Log of Test Pit MD-P-23, Operational Base Site, Milford, Utah	80
II-4-24	Log of Test Pit MD-P-24, Operational Base Site, Milford, Utah	81
II-4-25	Log of Test Pit MD-P-25, Operational Base Site, Milford, Utah	82
II-4-26	Log of Test Pit MD-P-26, Operational Base Site, Milford, Utah	83
II-4-27	Log of Test Pit MD-P-27, Operational Base Site, Milford, Utah	84

TABLE OF CONTENTS (Cont.)

LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-4-28	Log of Test Pit MD-P-28, Operational Base Site, Milford, Utah	85
II-4-29	Log of Test Pit MD-P-29, Operational Base Site, Milford, Utah	86
II-4-30	Log of Test Pit MD-P-30, Operational Base Site, Milford, Utah	87
II-4-31	Log of Test Pit MD-P-31, Operational Base Site, Milford, Utah	88
II-4-32	Log of Test Pit MD-P-32, Operational Base Site, Milford, Utah	89
II-4-33	Log of Test Pit MD-P-33, Operational Base Site, Milford, Utah	90
II-4-34	Log of Test Pit MD-P-34, Operational Base Site, Milford, Utah	91
II-4-35	Log of Test Pit MD-P-35, Operational Base Site, Milford, Utah	92
II-4-36	Log of Test Pit MD-P-36, Operational Base Site, Milford, Utah	93
II-4-37	Log of Test Pit MD-P-37, Operational Base Site, Milford, Utah	94
II-4-38	Log of Test Pit MD-P-38, Operational Base Site, Milford, Utah	95
II-4-39	Log of Test Pit MD-P-39, Operational Base Site, Milford, Utah	96
II-4-40	Log of Test Pit MD-P-40, Operational Base Site, Milford, Utah	97
II-4-41	Log of Test Pit MD-P-41, Operational Base Site, Milford, Utah	98
II-4-42	Log of Test Pit MD-P-42, Operational Base Site, Milford, Utah	99
II-4-43	Log of Test Pit MD-P-43, Operational Base Site, Milford, Utah	100
II-4-44	Log of Test Pit MD-P-44, Operational Base Site, Milford, Utah	101
II-4-45	Log of Test Pit MD-P-45, Operational Base Site, Milford, Utah	102
II-4-46	Log of Test Pit MD-P-46, Operational Base Site, Milford, Utah	103
II-4-47	Log of Test Pit MD-P-47, Operational Base Site, Milford, Utah	104
II-4-48	Log of Test Pit BL-P-15, Operational Base Site, Milford, Utah	105
II-4-49	Log of Test Pit BL-P-16, Operational Base Site, Milford, Utah	106
II-4-50	Log of Test Pit BL-P-17, Operational Base Site, Milford, Utah	107

TABLE OF CONTENTS (Cont.)

LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-4-51	Log of Test Pit BL-P-18, Operational Base Site, Milford, Utah	108
II-4-52	Log of Test Pit BL-P-19, Operational Base Site, Milford, Utah	109
II-4-53	Log of Test Pit BL-P-20, Operational Base Site, Milford, Utah	110
II-4-54	Log of Test Pit BL-P-21, Operational Base Site, Milford, Utah	111
<u>5.0 EXPLANATION OF LABORATORY TEST RESULTS</u>		
II-5-1	Summary of Triaxial Compression Test Results, Operational Base Site, Milford, Utah	128
II-5-2	Summary of Direct Shear Test Results, Operational Base Site, Milfor Utah	130-134
II-5-3	Consolidation Test Results, Operational Base Site, Milford, Utah	135-144
II-5-4	Grain Size Curves, CBR Test, Operational Base Site, Milford, Utah	146-148
II-5-5	California Bearing Ratio (CBR) Curves, Operational Base Site, Milford, Utah	149-151
<u>6.0 EXPLANATION OF CONE PENETROMETER TEST RESULTS</u>		
II-6-1	Cone Penetrometer Test MD-C-1, 2 & 3 (through MD-C-66 & 67 and BL-C-27, 28 & 29 through BL-C-45 & 46) Operational Base Site, Milford, Utah	157-181
<u>7.0 EXPLANATION OF SEISMIC REFRACTION DATA</u>		
II-7-1	Seismic Refraction Line MD-S-1, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	184
II-7-2	Seismic Refraction Line MD-S-2, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	185
II-7-3	Seismic Refraction Line MD-S-3, Time Operational Base Site, Milford, Utah	186
II-7-4	Seismic Refraction Line MD-S-4, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	187
II-7-5	Seismic Refraction Line MD-S-5, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	188

TABLE OF CONTENTS (Cont.)

LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-7-6	Seismic Refraction Line MD-S-6, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	189
II-7-7	Seismic Refraction Line MD-S-7, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	190
II-7-8	Seismic Refraction Line MD-S-8, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	191
II-7-9	Seismic Refraction Line MD-S-9, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	192
II-7-10	Seismic Refraction Line BL-S-2, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	193

8.0 EXPLANATION OF ELECTRICAL
RESISTIVITY DATA

II-8-1	Resistivity Sounding MD-R-1, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	196
II-8-2	Resistivity Sounding MD-R-2, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	197
II-8-3	Resistivity Sounding MD-R-3, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	198
II-8-4	Resistivity Sounding MD-R-4, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	199
II-8-5	Resistivity Sounding MD-R-5, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	200
II-8-6	Resistivity Sounding MD-R-6, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	201
II-8-7	Resistivity Sounding MD-R-7, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	202
II-8-8	Resistivity Sounding MD-R-8, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	203
II-8-9	Resistivity Sounding MD-R-9, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	204

TABLE OF CONTENTS (Cont.)

LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-8-10	Resistivity Sounding MD-R-10, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	205
II-8-11	Resistivity Sounding MD-R-11, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	206
II-8-12	Resistivity Sounding BL-R-2, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	207

LIST OF TABLES

Table No.

	2.0 <u>EXPLANATION OF BORING, TRENCH, AND TEST PIT LOGS</u>	
II-2-1	Unified Soil Classification System	3
	5.0 <u>EXPLANATION OF LABORATORY TEST RESULTS</u>	
II-5-1	Summary of Laboratory Test Results, Operational Base Site, Milford, Utah	118-127
II-5-2	Summary of Unconfined Compression Test Results, Operational Base Site, Milford, Utah	129
II-5-3	Summary of Chemical Test Results, Operational Base Site, Milford, Utah	145
II-5-4	California Bearing Ratio (CBR) Test Results, Operational Base Site, Milford, Utah	152-154
	7.0 <u>EXPLANATION OF SEISMIC-REFRACTION DATA</u>	
II-7-1	Shallow Seismic Refraction Velocity Profile, Operational Base Site, Milford, Utah	194

FN-TR-44

SECTION 2.0

EXPLANATION OF BORING, TRENCH,
AND TEST PIT LOGS

2.0 EXPLANATIONS OF BORING, TRENCH, AND TEST PIT LOGS

All data from borings, trenches, and test pits are presented on standard Fugro National logs in Sections 2.0, 3.0, and 4.0. Explanations of the column headings on the logs are as follows:

A. Designations - Borings, trenches, and test pits are identified as follows:

MD-B-1 or BL-B-1

MD or BL - abbreviation for the site (e.g., MD-Milford and BL-Beryl)

B - abbreviation for activity (e.g., B-boring, T-trench, P-test pit)

1 - number of activity

All of the engineering activities for Option 1 OBTS are designated by BL (e.g., Beryl).

B. Sample Type - Different sampling techniques were used and the symbols are explained at the bottom of the boring logs. For details of sampling techniques, see Section A4.0 of Appendix in Volume I. Horizontal lines, to scale, indicate the depth where sampling was attempted.

C. Percent Recovery - The numbers shown represent the ratio (in percent) of the soil sample recovered in the sampler to the full penetration of the sampler.

D. N Value - Corresponds to standard penetration resistance which is the number of blows required to drive a standard split-spoon sampler for the second and third of three 6-inch (15-cm) increments with a 140-pound (63.5-kg) hammer falling 30 inches (76 cm) (ASTM D 1586-67).

- E. Depth - Corresponds to depth below ground surface in meters and feet.
- F. Lithology - Graphic representation of the soil and rock types.
- G. USCS - Unified Soil Classification System symbols (see Table II-2-1 for complete details).
- H. Soil Description - Except in cases where samples were classified based on laboratory test data, the descriptions are based on visual classification. The procedures outlined in ASTM D 2487-69, Classification of Soils for Engineering Purposes, and D 2488-69, Description of Soils (Visual-Manual Procedure), were followed. Solid lines across the column indicate known change in strata at the depth shown.

Definitions of some of the terms and criteria to describe soils and conditions encountered during the exploration follow.

Gradation : A coarse-grained soil is well graded if it has a wide range in grain size and substantial amounts of most intermediate particle sizes.

Poorly graded indicates that the soil consists predominantly of one size (uniformly graded) or has a wide range of sizes with some intermediate sizes obviously missing (gap-graded).

Moisture :	Dry	- no feel of moisture
	Slightly Moist	- much less than normal moisture
	Moist	- normal moisture for soil
	Very Moist	- much greater than normal moisture
	Wet	- for soils below the water table

Laboratory Classification Criteria	Information Required for Describing Soils	Typical Names	Group Symbols	Field Identification Procedures			Plasticity Chart
				(Excluding particles larger than 3 in. and being fractions on sieves)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)	
$C_u = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_c = \frac{D_{30} - D_{10}}{D_{60} - D_{10}}$ Between 1 and 3 Not meeting all gradation requirements for GW Atterberg limits below "A" line, or P_L less than 4, and 7 are greater than 7 Atterberg limits above "A" line, with P_L greater than 7	Give typical name; indicate approximate percentages of sand, gravel, maximum size, and hardness of the coarse grains; local or geologic name information; and symbols in parentheses. For undisturbed soils add information on stratification, degree of consolidation, moisture content, and drainage characteristics. Example: Silty sand, gravelly, about 10% silt, maximum size rounded to 1/2 in., maximum sand grains coarse to fine, about 15% non-plastic fines with low dry strength, well compacted and in place, alluvial sand. (SW)	Well graded gravel, gravel-sand mixtures, little or no fines Poorly graded gravels, gravel-sand mixtures, little or no fines Silty gravels, poorly graded gravel-sand-silt mixtures Clayey gravels, poorly graded gravel-sand-silt mixtures Well graded sands, gravelly sand, little or no fines Poorly graded sands, gravelly sand, little or no fines Silty sands, poorly graded sand-silt mixtures Clayey sands, poorly graded sand-clay mixtures	GW GP GM GC SW SP SM SC	Wide range in grain size and substantial amounts of all intermediate particle sizes Predominantly one size or a range of sizes with some intermediate sizes missing Nonplastic fines (for identification procedure, see ML below) Plastic fines (for identification procedure, see CL below) Wide range in grain sizes and substantial amounts of all intermediate particle sizes Predominantly one size or a range of sizes with some intermediate sizes missing Nonplastic fines (for identification procedure, see ML below) Plastic fines (for identification procedure, see CL below)	None Quick to slow None to very slow Slow Slow to none None to very slow High to medium Medium to high Slight to medium Slight to medium High to very high Medium to high Readily identified by colour, odour, spungy feel and frequently by fibrous texture	None Medium Slight Slight to medium High Slight to medium High to medium	

From Wagner, 1937.
 a boundary classification. Soils possessing characteristics of two groups are designated by combinations of group symbols. For example GW-GC, well graded gravel-sand mixture with clay binder.
 These procedures are to be performed on the minus No. 40 sieve size particles, approximately 1/2 in. For field classification purposes, screening is not intended, simply remove by hand the coarse particles that interfere with the tests.
 After removing particles larger than No. 40 sieve size, prepare a pat of soil about one-half cubic inch in size, is moulded to the consistency of putty. If too dry, water must be added and, if sticky, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. Then the specimen is rolled by hand on a smooth surface to a diameter of 1/8 in. The thread is then folded and re-rolled. During this manipulation the moisture content is gradually reduced and the specimen stiffens, finally loses its plasticity, and crumbles when the plastic limit is reached.
 A slight heading section continued until the lump crumbles, together and a tauter the thread near the plastic limit and the siltier the lump when it finally crumbles, the more potent is the colloidal clay fraction in the soil. Weakest of the thread at the plastic limit and quick loss of coherence of the lump below the plastic limit indicate either inorganic clays such as kaolin-type clays and organic clays which occur below the A-line.
 Highly organic clays have a very weak and spongy feel at the plastic limit.
 Field Identification Procedure for Fine Grained Soils at Fractional Dry Strength (Consistency characteristics):
 After removing particles larger than No. 40 sieve size, mould a pat of soil to the consistency of putty, adding water if necessary. Allow the pat to break and crumble by oven sun or air drying, and then test its strength by the method and quantity of the colloidal fraction contained in the soil. The reaction and quantity of the colloidal fraction contained in the soil is characteristic of the soil group. A typical inorganic silt possesses only very slight dry strength. Silty fine sands and silts have about the same slight dry strength, but can be distinguished by the feel when powdering the dried specimen. Fine sand feels gritty whereas a typical silt has the smooth feel of flour.
 After removing particles larger than No. 40 sieve size, prepare a pat of soil with a volume of about one-half cubic inch. Add enough water if necessary to make the soil soft but not sticky. Place the pat in the open palm of one hand and shake horizontally, striking vigorously against the other hand several times. Observe the changes to a lively consistency and becomes glossy. When the sample is squeezed between the fingers, the water and fines disappear from the surface, the pat stiffens and finally it crumbles. The rapidity of appearance of water during shaking and of its disappearance during squeezing are characteristic of the soil group.
 Very fine clean sands give the squeaky and most distinct reaction whereas a plastic clay has no reaction. Inorganic silts, such as a typical rock flour, show a moderately quick reaction.

UNIFIED SOIL CLASSIFICATION SYSTEM
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

TABLE
II-2-1

UGRO NATIONAL, INC.

Consistency: Consistency descriptions of coarse-grained soils (GW, GP, GM, GC, SW, SP, SM, SC) are as follows.

<u>Consistency</u>	<u>N Value (ASTM D 1586-67)</u>
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Consistency descriptions of fine-grained soils (ML, CL, MH, CH,) are as follows:

<u>Consistency</u>	<u>Shear Strength</u>		<u>Field Guide</u>
	<u>(ksf)</u>	<u>(kN/m²)</u>	
Very Soft	0.25	12	Sample with height equal to twice the diameter, sags under own weight
Soft	0.25- 0.50	12 - 24	Can be squeezed between thumb and forefinger
Firm	0.50- 1.00	24- 48	Can be molded easily with fingers
Stiff	1.00- 2.00	48- 96	Can be imprinted with slight pressure from fingers
Very Stiff	2.00- 4.00	96- 192	Can be imprinted with considerable pressure from fingers
Hard	over 4.00	over 192	Cannot be imprinted by fingers

Grain Shape: Angular - particles have sharp edges and relatively plane sides with unpolished surfaces.

Plasticity : Plasticity index is the range of water content, expressed as a percentage of the weight of the oven-dried soil, through which the soil

is plastic. It is defined as the liquid limit minus the plastic limit. Descriptive ranges used on the logs include:

Nonplastic	(PI, 0 - 4)
Slightly Plastic	(PI, 4 - 15)
Medium Plastic	(PI, 15 - 30)
Highly Plastic	(PI, >30)

Cobbles and
Boulders :

A cobble is a rock fragment, usually rounded by weathering or abrasion, with an average diameter ranging between 3 and 12 inches (8 and 30 cm).

A boulder is a rock fragment, usually rounded by weathering or abrasion, with an average diameter of 12 inches (30 cm) or more.

- I. Remarks - This column was provided on boring and trench logs for comments regarding drilling difficulty, number and size of cobbles or boulders encountered, loss of drilling fluid in the boring, trench wall stability, and other conditions encountered during drilling and excavations.
- J. Dry Density and Moisture Content - The boring logs include a graphical display of laboratory test results for dry density (ASTM D 2937-71) in pounds per cubic foot and kilograms per cubic meter and moisture content (ASTM D 2216-71) in percent from representative samples taken during drilling. The symbols are explained at the bottom of the boring logs.
- K. Sieve Analysis - The numbers represent the percentage by dry weight (ASTM D 422-63) of each of the following soil components:
- GR - Gravel, rock particles that will pass a 3-inch (76-mm) sieve and are retained on No. 4 (4.75 mm) sieve.

SA - Sand, soil particles passing No. 4 sieve and retained on No. 200 (0.075 mm) sieve.

FI - Fines, silt or clay, soil particles passing No. 200 sieve.

L. Atterberg Limits (LL and PI) -

LL - Liquid Limit, the water content corresponding to the arbitrary limit between the liquid and plastic states of consistency of a soil (ASTM D 423-66).

PL - Plastic Limit, the water content corresponding to an arbitrary limit between the plastic and the semisolid state of consistency of a soil (ASTM D 424-59).

PI - Plasticity Index, numerical difference between the liquid limit (LL) and the plastic limit (PL) indicating the range of moisture content within which a soil-water mixture is plastic.

NP - Nonplastic.

M. Miscellaneous Information -

Elevations - indicated elevations on the logs are estimated from topographic maps of the study area, within an accuracy of half the contour interval.

Surficial
Geologic Unit - indicates the surficial geologic unit in which the activity is located.

Date Drilled - indicates the period from beginning to completion of the activity.

Drilling
Method - signifies the type of drilling procedure used such as rotary wash.

Hole Diameter - nominal size of boring drilled.

Water Level - indicates depth from ground surface to water table where encountered.

Trench Length - length at ground surface of final trench excavation.

Trench
Orientation - bearing of longitudinal trench centerline.

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS											
									GR	SA	FI	LL PI								
	87	23	0	0			CLAYEY SAND, light brown to brown, fine to coarse, poorly graded, loose to dense, subangular to subrounded, calcareous; little to some non to slightly plastic clay.	cementation	80	90	100	110	120	130	140	GR	SA	FI	LL	PI
	100	51				SC										3	81	16		
	60	43	3	10			GRAVELLY SAND, brown, fine to coarse, well to poorly graded, dense to very dense, subangular to subrounded, calcareous; little to some fine to coarse gravel; trace non-to slightly plastic silt.									25	68	7		
	73	16				SP- SM										15	76	9		
	53		6	20																
	100		9	30		SW- SM														
	100																			
	100		12	40		SP- SM										28	64	8		
	100																			
	100		15	50		SM	SILTY SAND, brown, fine to medium, well-to poorly graded, very dense, subangular to subrounded, calcareous; little slightly plastic silt; sand (SW-SM) (49.0' - 50.2').									0	91	9		
	83					SW- SM														
			18	60			TOTAL DEPTH 50.2' (15.3m)													

-21 70
 -24 80
 -27 90
 -30 100
 -33 110

1400 1800 2200
 ▲ (kg/m³)

EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

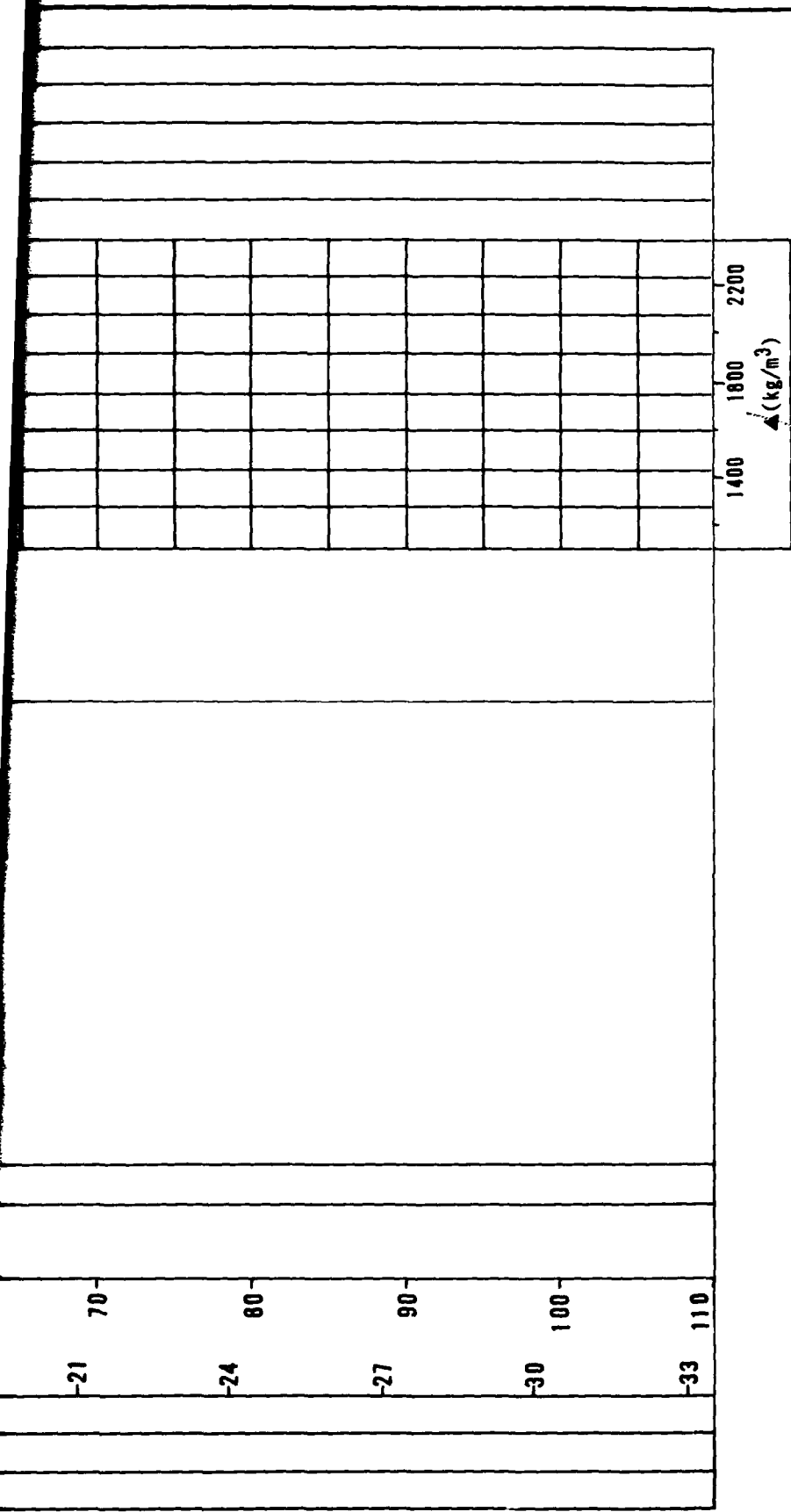
BORING DETAILS

ELEVATION : 5230' (1594m)
 SURFICIAL GEOLOGIC UNIT : A5i
 DATE DRILLED : 4-5 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

LOG OF BORING MD-B-1 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - BMO	FIGURE II-2-1

FUGRO NATIONAL, INC

2



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE

- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5300' (1615m)
 SURFICIAL GEOLOGIC UNIT : A5i
 DATE DRILLED : 10 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

LOG OF BORING MD-8-2
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

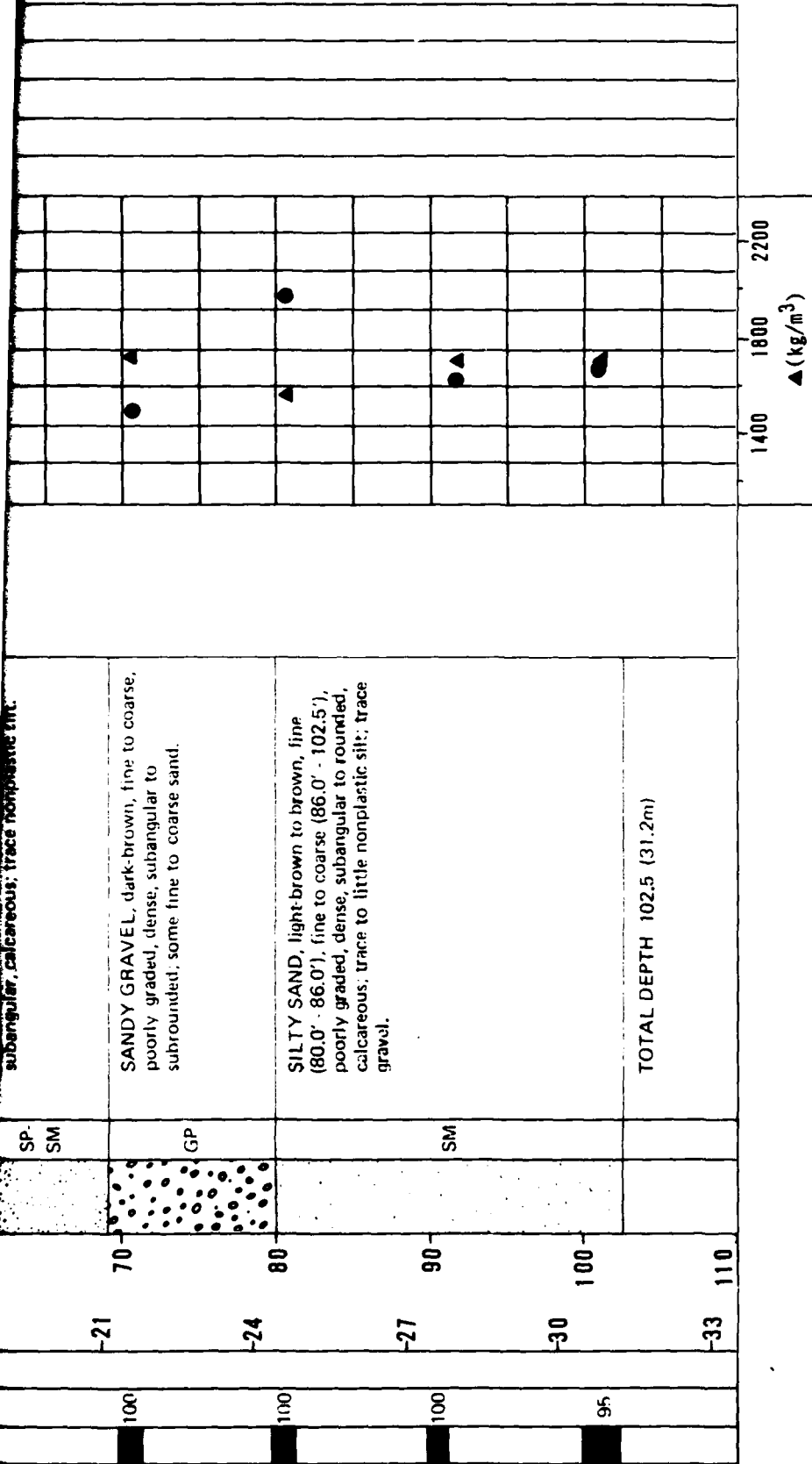
FIGURE
 II-2-2

FUGRO NATIONAL INC

2

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲ (pct)										SIEVE ANALYSIS				
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI			
CH	96	6	0	0		CH	CLAY, dark brown, soft to stiff, medium plastic, calcareous.	▲ 57.3											0	1	99	50	22
MH	93	19				MH	CLAYEY SILT, brown, stiff, medium plastic, calcareous.		▲	▲									0	3	97	61	26
CH	67	8	3	10		CH	CLAY, brown, stiff, medium plastic, calcareous.		▲	▲									0	1	99	56	30
	100		6	20			SILTY SAND, brown to dark brown, fine to medium, poorly graded, dense, subangular to subrounded, calcareous; some nonplastic silt.		▲	▲									0	62	38		NP
	93		9	30		SM			▲	▲									0	67	33		
	87								▲	▲									0	75	25		
	93		12	40		ML	CLAYEY SILT, SANDY SILT and SANDY CLAY, light-brown to brown, stiff slightly to medium plastic, calcareous; trace to some fine subangular to subrounded sand.		▲	▲									0	5	95	46	18
	91					CL			▲	▲									0	46	54	34	13
	100		15	50		ML			▲	▲									0	28	72	33	6
	100		18	60		SP, SM	SAND, brown, fine, poorly graded, dense, subangular, calcareous, trace nonplastic silt.		▲	▲									0	88	12		

subangular, calcareous; trace nonplastic silt.



EXPLANATION

- FUGRO DRIVE SAMPLE
- ▨ BULK SAMPLE
- PITCHER TUBE SAMPLE
- ▨ STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5100' (1554m)
 SURFICIAL GEOLOGIC UNIT : A1/A40
 DATE DRILLED : 11 November 1980
 DRILLING METHOD : Rotary wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

LOG OF BORING MD-B-3
 OPERATIONAL BASE SITE
 MILFORD, UTAH

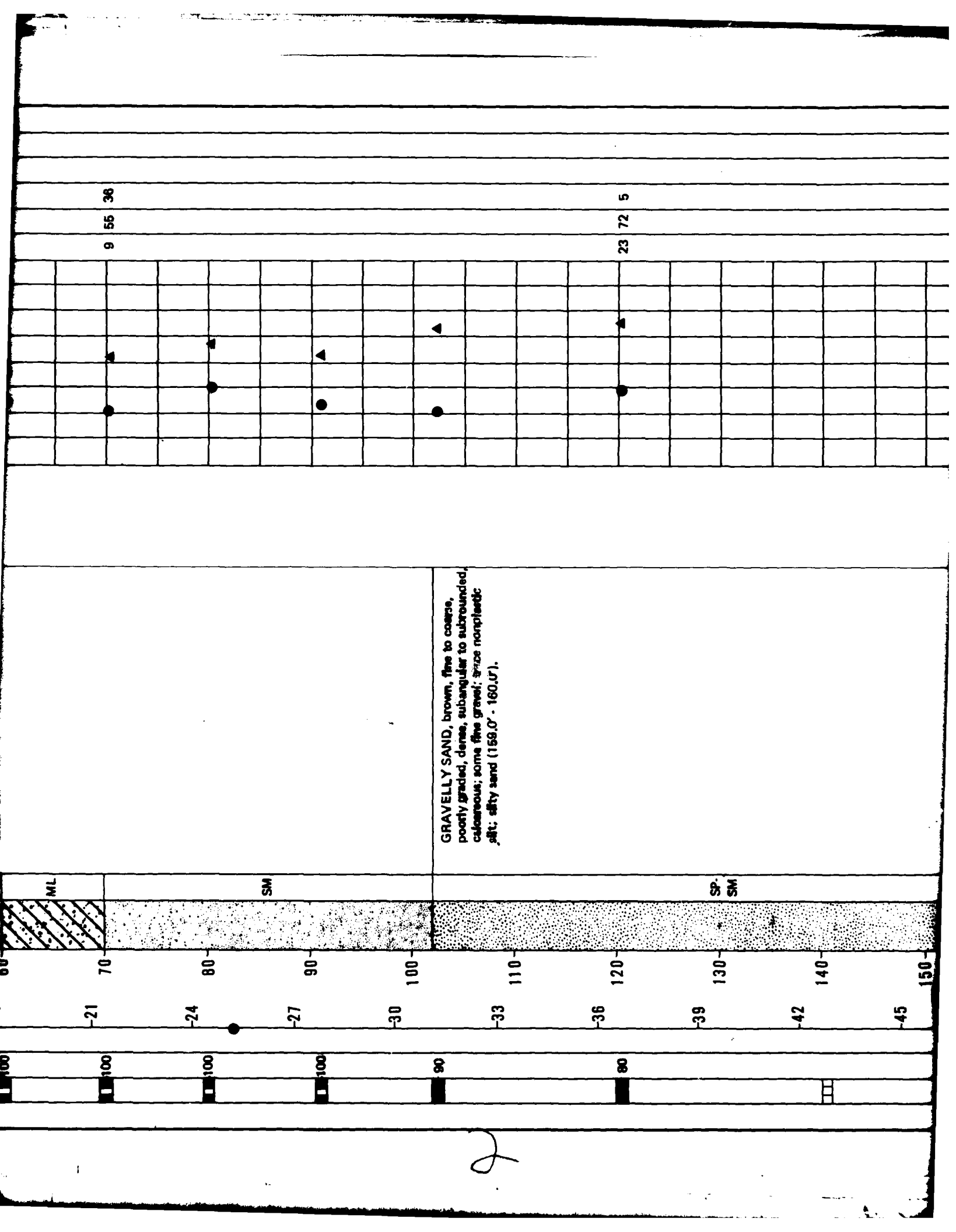
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

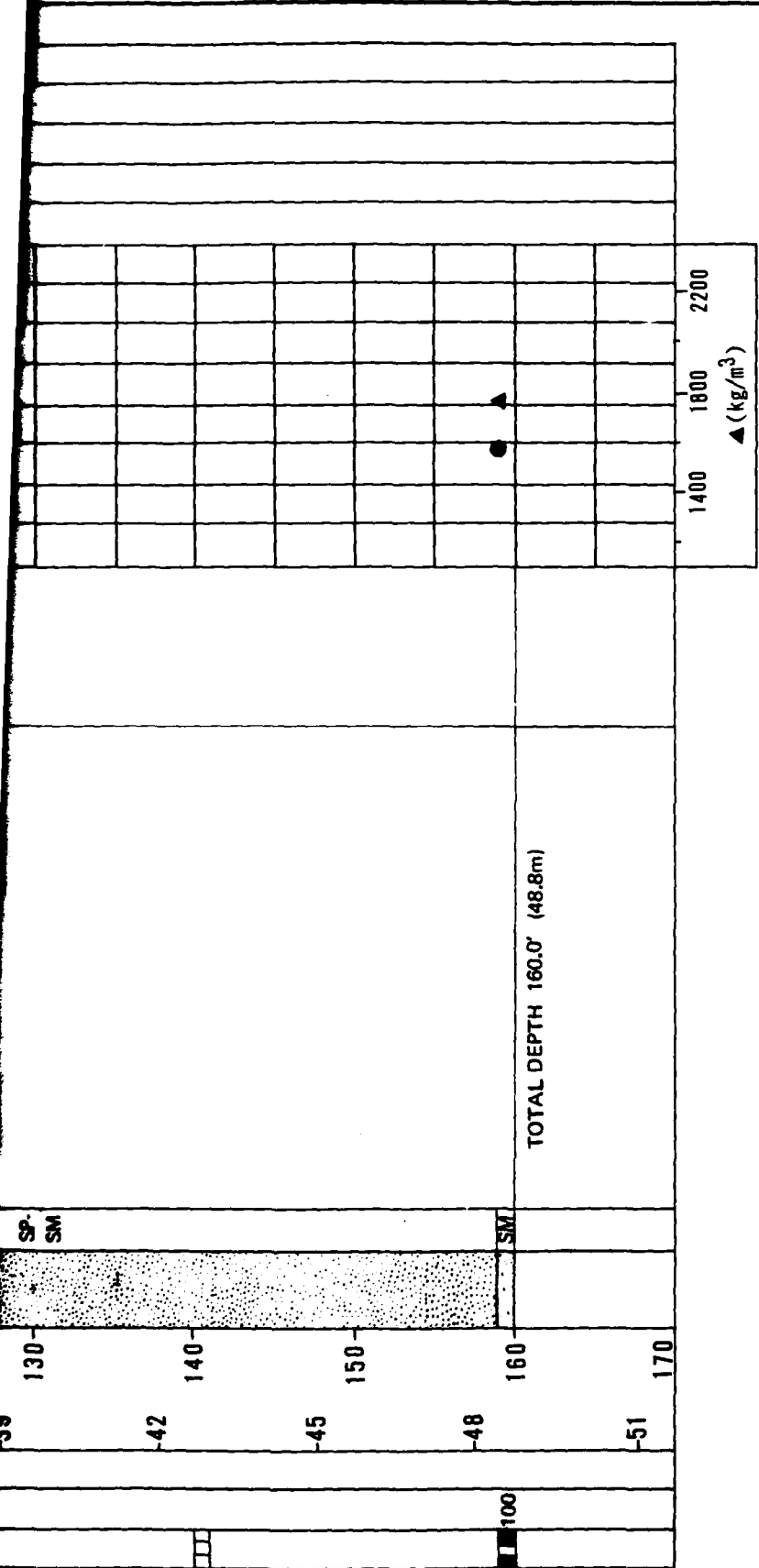
FIG II-2

FUGRO NATIONAL, INC.

2

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS														
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI			
	87		0	0		SM	SILTY SAND, light-brown to brown, fine to coarse, poorly graded, loose to dense, subangular to subrounded, calcareous; some slightly plastic silt; trace fine to coarse gravel; gravelly sand (5.5' - 9.0').		5	10	15	20	25	30	35								
	80					SP-SM																	
	100		3	10		SM																	
	96					ML	Interbedded layers of SILTY SAND and SANDY SILT.		5	10	15	20	25	30	35								
	100		6	20			SILTY SAND (SM): brown, fine to coarse, poorly graded, dense, subangular to subrounded, calcareous; little to some non-to slightly plastic silt; trace fine to coarse gravel; sandy gravel (51.0' - 60.0').		5	10	15	20	25	30	35								
	100																						
	100		9	30		SM	SANDY SILT (ML): brown, dense, nonplastic, calcareous; some fine to coarse subangular to subrounded sand; trace fine gravel.		5	10	15	20	25	30	35								
	100																						
	100		12	40																			
	87																						
	100		15	50		GP-GM																	
	100																						
	100		18	60																			





EXPLANATION

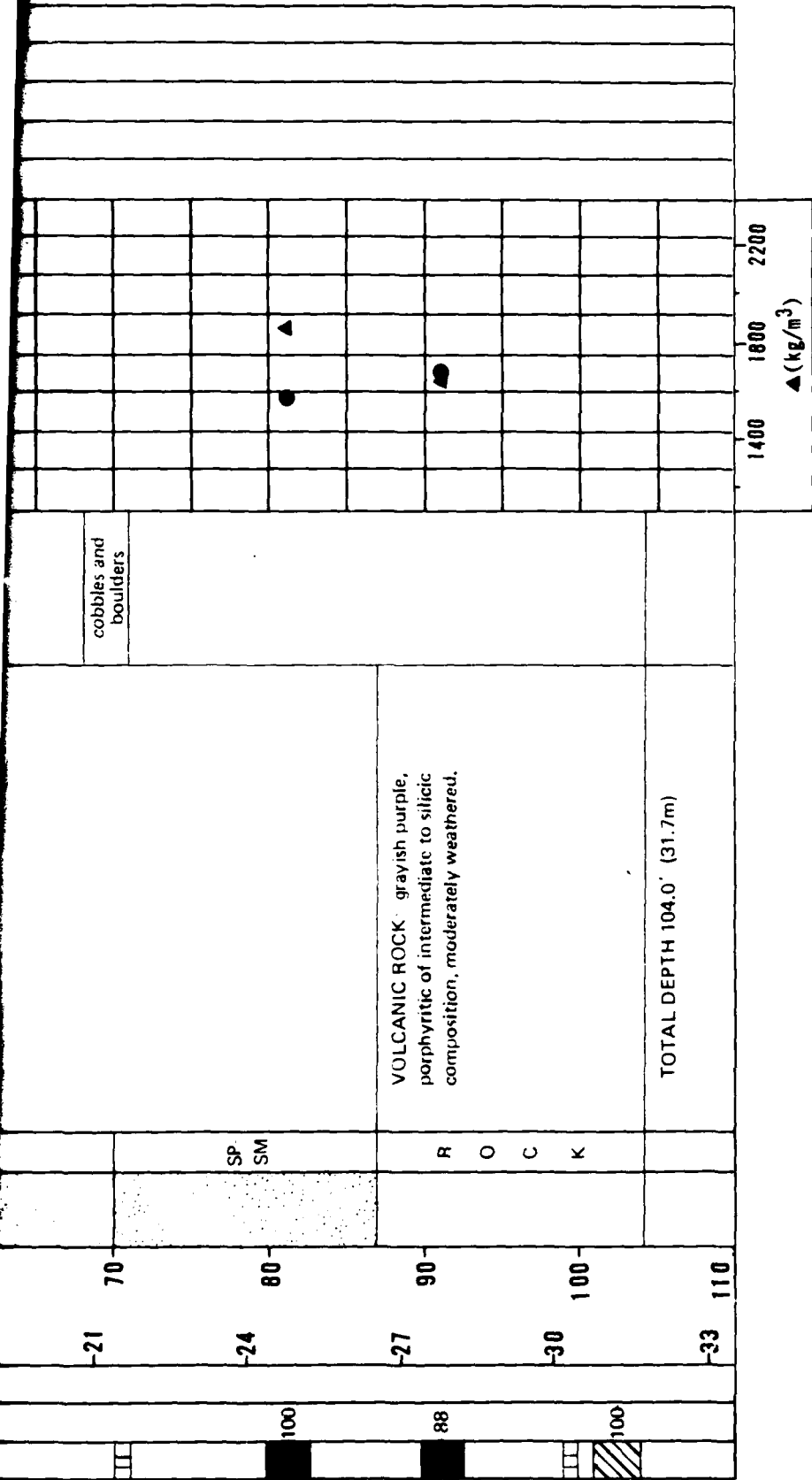
- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

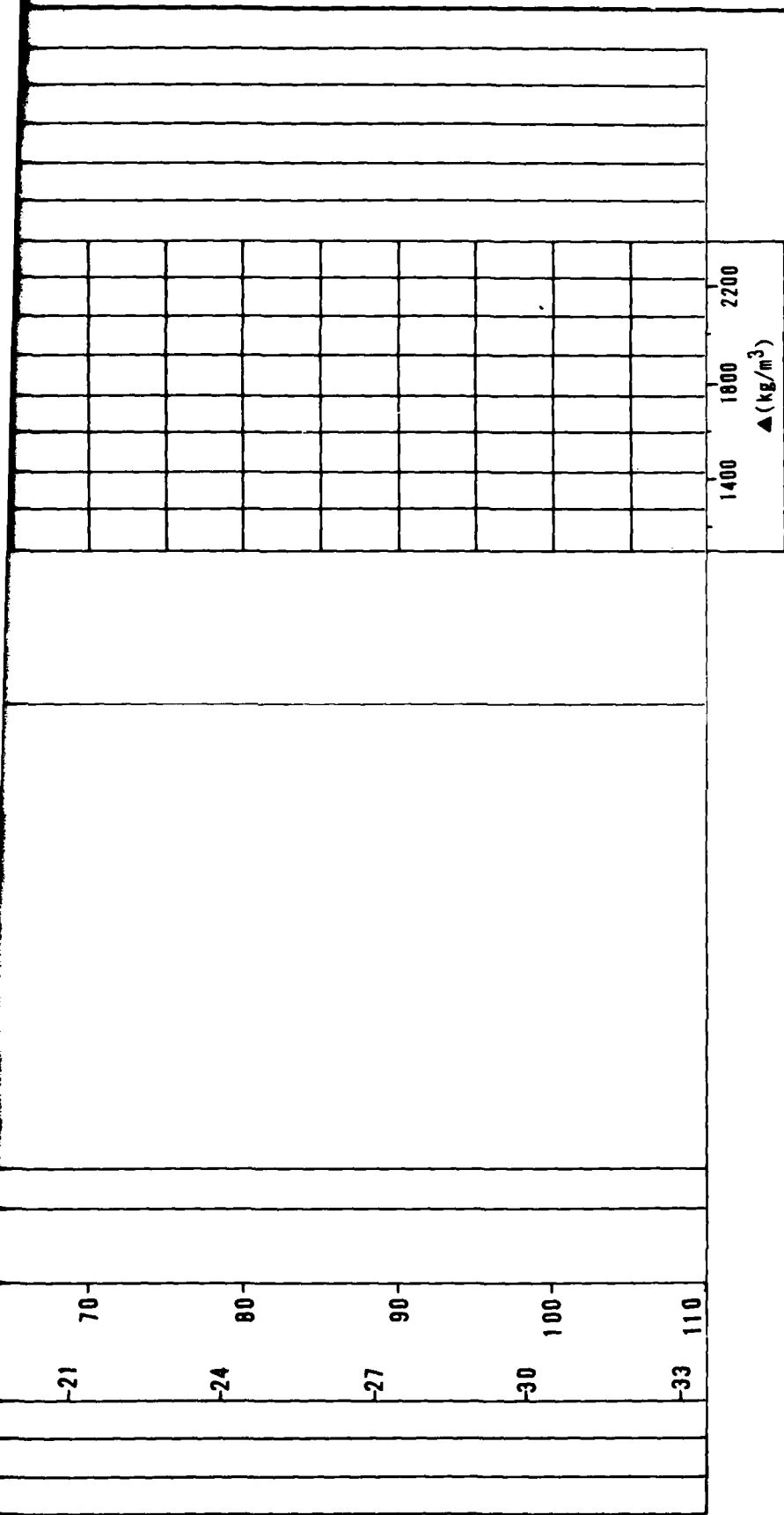
BORING DETAILS

- ELEVATION : 5190 (1582m)
- SURFICIAL GEOLOGIC UNIT : A5I
- DATE DRILLED : 12 November 1980
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4 7/8" (124mm)
- WATER LEVEL : Not Encountered

LOG OF BORING MD-B-4 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-2-4
FUGRO NATIONAL, INC.	

3





EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE

- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

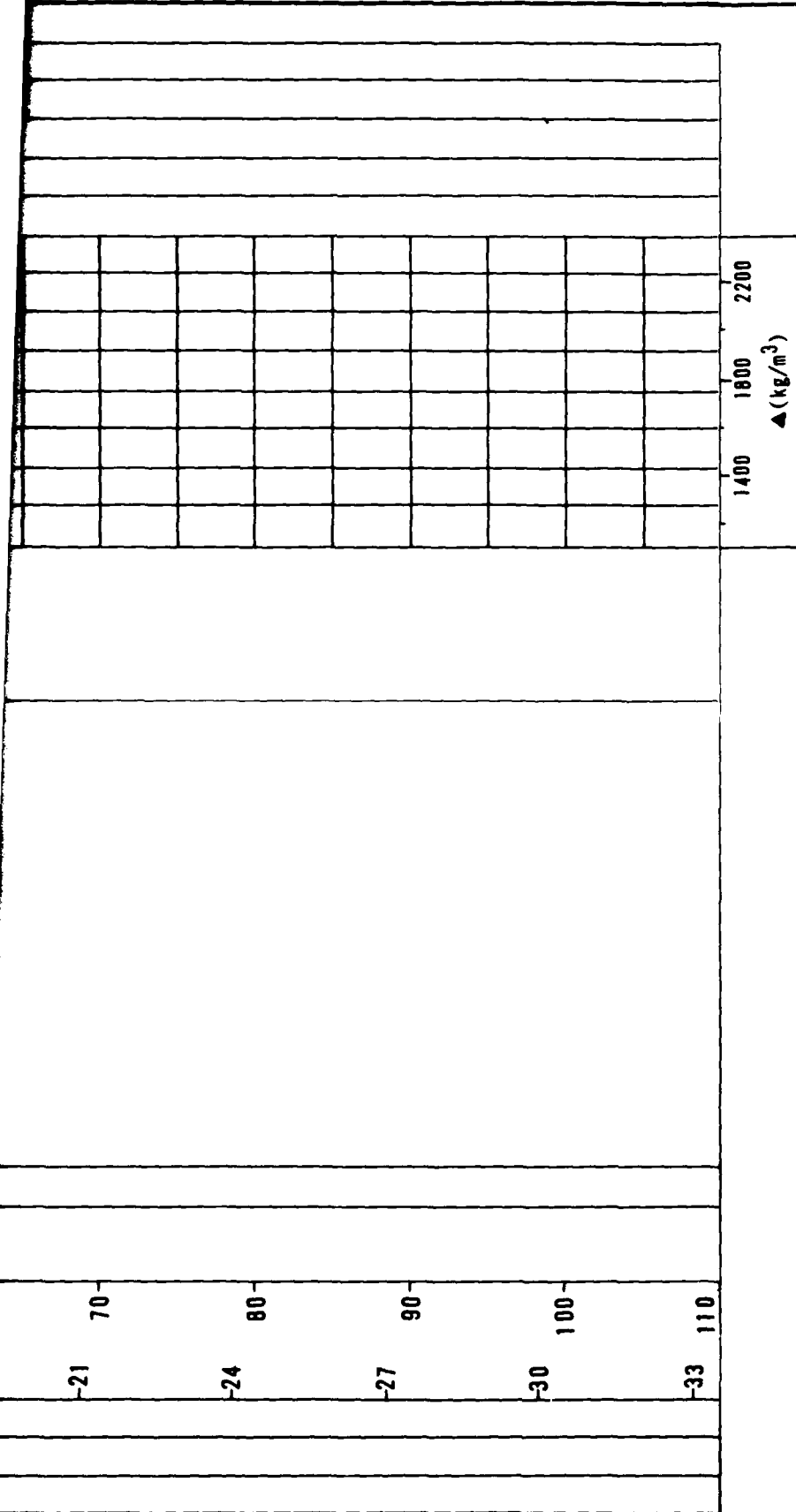
- ELEVATION : 5200' (1585m)
- SURFICIAL GEOLOGIC UNIT: A5i
- DATE DRILLED : 18 November 1980
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4 7/8" (124mm)
- WATER LEVEL : Not Encountered

LOG OF BORING MD-B-6 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - BMO	FIGURE II-2-6

FUGRO NATIONAL, INC.

AFV-

SAMPLE TYPE	% RECOVERY	N VALUE	METERS	FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS												
									GR	SA	FI	LL	PI	▲(pcf)							
									80	90	100	110	120	130	140						
100	100		0	0	Diagonal hatching	SC	Interbedded layers of SANDY GRAVEL and CLAYEY SAND: SANDY GRAVEL (GP): light-brown, fine to coarse, poorly graded, dense, subangular to subrounded, calcareous; some fine to coarse sand. CLAYEY SAND (SC): dark-to light-brown, fine to coarse, poorly graded, loose to dense, subangular to subrounded, calcareous, some slightly plastic clay; some fine gravel.	←	5	10	15	20	25	30	35	29	33	38	31	12	
100	100		3	10	GP Diagonal hatching	GP															
100	100		6	20	GP Dotted pattern	GP	GRAVELLY SAND, brown, fine to coarse, well-to poorly graded, dense, subangular to subrounded, calcareous; some fine to coarse gravel; trace non-to slightly plastic silt.	cementation throughout	5	10	15	20	25	30	35	44	45	11			
100	100		9	30	SP SM Dotted pattern	SP SM															
100	100		12	40	SP Dotted pattern	SP	TOTAL DEPTH 51.0' (15.5m)	boulder	5	10	15	20	25	30	35	44	47	9			
100	100		15	50	SW- SM Dotted pattern	SW- SM															
100	100		18	60																	



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5160' (1573m)
 SURFICIAL GEOLOGIC UNIT : A5i
 DATE DRILLED : 18 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

LOG OF BORING MD-B-7
 OPERATIONAL BASE SITE
 MILFORD, UTAH

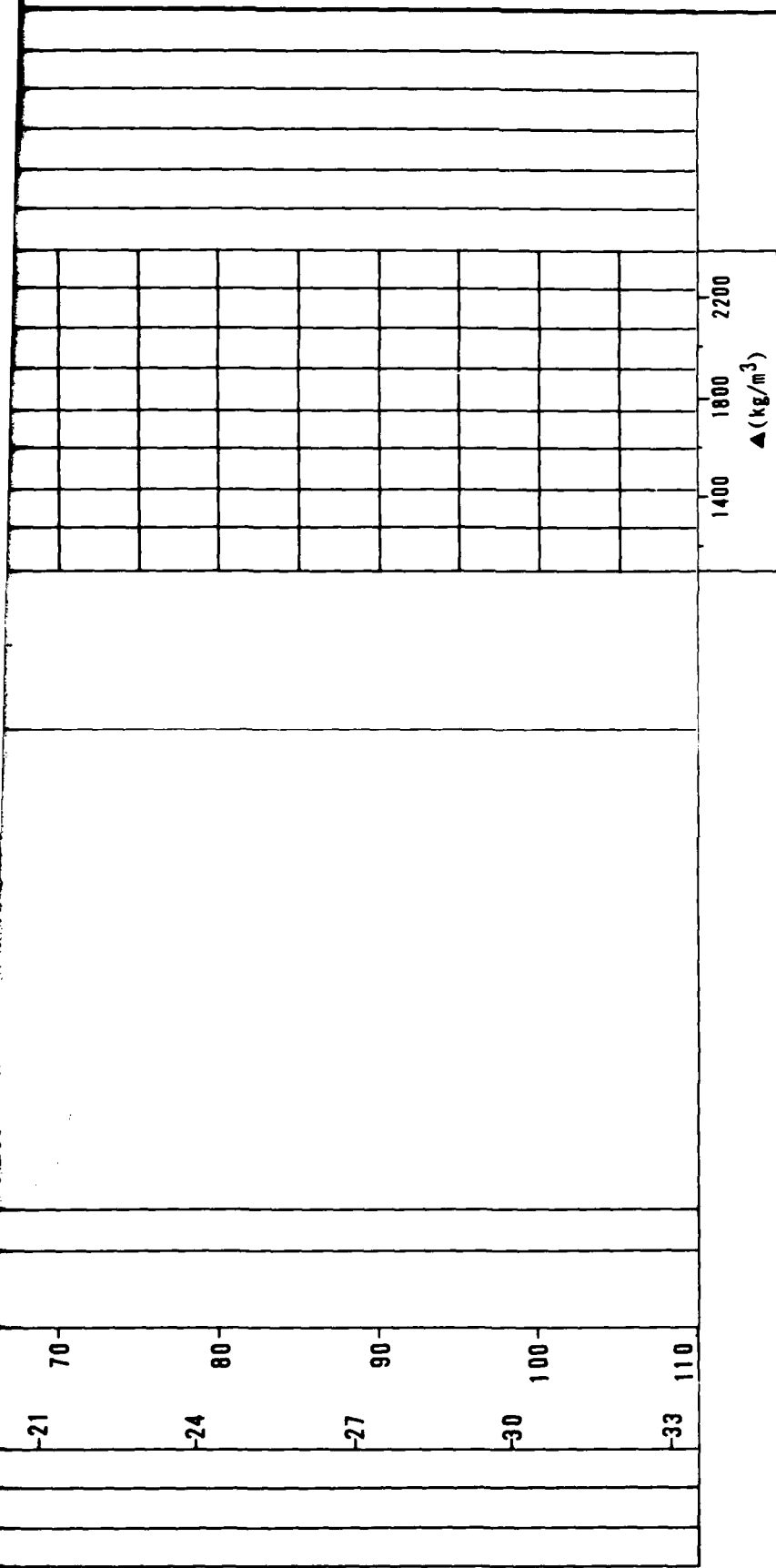
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-2-7

FUGRO NATIONAL, INC

AP

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS																
									GR	SA	FI	LL	PI	80	90	100	110	120	130	140					
100	100		0	0		SM	GRAVELLY SAND, light brown to brown, fine to coarse, poorly graded, loose to very dense, subangular to subrounded, calcareous; some fine to coarse gravel, trace to some slightly plastic silt.	cimentation	5	10	15	20	25	30	35										
100	100		3	10	SP SM				5	10	15	20	25	30	35										
100	100		6	20					5	10	15	20	25	30	35										
100	100		9	30		SP SM			5	10	15	20	25	30	35										
100	100		12	40					5	10	15	20	25	30	35										
100	100		15	50		SM			5	10	15	20	25	30	35										
100	100		18	60																					
									TOTAL DEPTH 51.5' (15.7m)																



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

- ELEVATION : 5060' (1542m)
- SURFICIAL GEOLOGIC UNIT : A5y
- DATE DRILLED : 19 November 1980
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4 7/8" (124mm)
- WATER LEVEL : Not Encountered

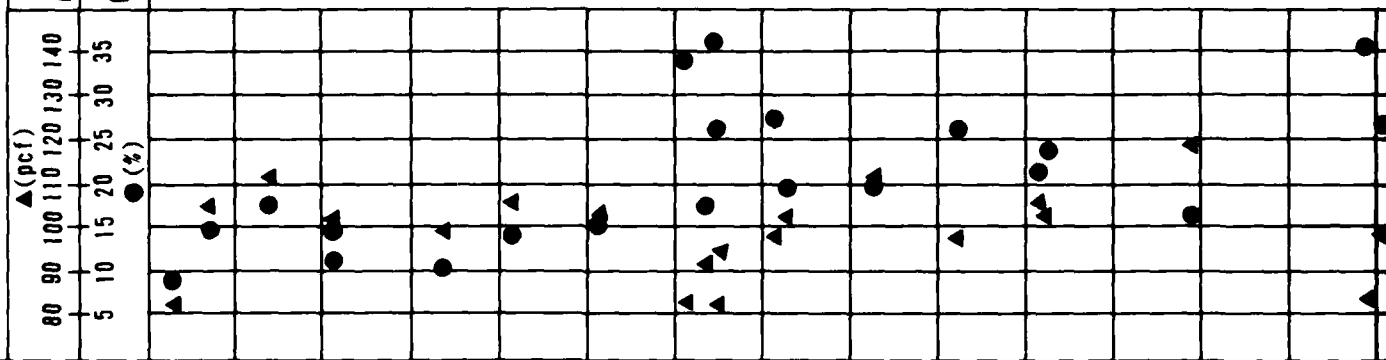
LOG OF BORING MD-B-8
 OPERATIONAL BASE SITE
 MILFORD, UTAH

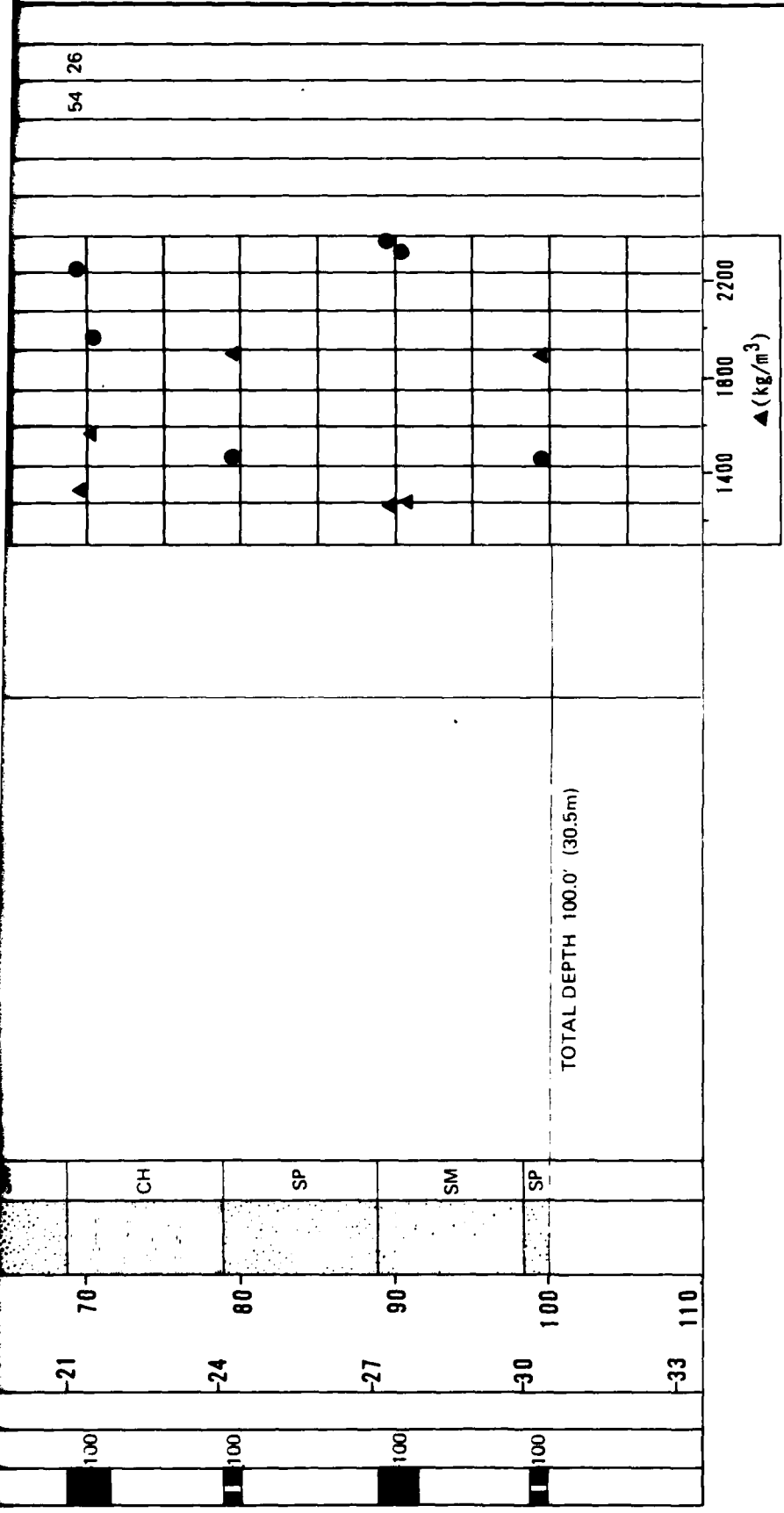
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-2-8

FUGRO NATIONAL, INC.

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
									GR	SA	FI	LL	PI		
	100		0	0	Diagonal hatching	SC	Interbedded layers of SAND and FINES: SAND: GRAVELLY SAND (SP, SP-SM): light-brown, fine to coarse, poorly graded, dense, subangular to subrounded; trace to some fine to coarse gravel; trace nonplastic silt; sand (SP-SM) (59.0' - 69.0').								
	100		3	10	Diagonal hatching with dots	ML									
	100		6	20	Diagonal hatching	SM	SILTY SAND (SM): brown, fine to medium, poorly graded, medium dense to dense, subangular to subrounded, calcareous; little to some slightly plastic silt; clayey sand (SC) (0.0' - 6.0') and (19.5' - 25.0').								
	100		9	30	Diagonal hatching	SC		FINES: SANDY SILT (ML): brown, stiff, nonplastic, calcareous; little fine to medium subangular to subrounded sand.							
	100		12	40	Diagonal hatching	CH	SANDY CLAY (CL-ML): light-brown, very stiff, slightly plastic, calcareous; some fine to medium subangular to subrounded sand.								
	100		15	50	Diagonal hatching	CL-ML									
	100		18	60	Diagonal hatching	SP-SM	CLAY (CH): light-brown, very stiff, medium plastic, calcareous; trace to little fine to medium subangular to subrounded sand.								
	100		21	70	Diagonal hatching	SM									





EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

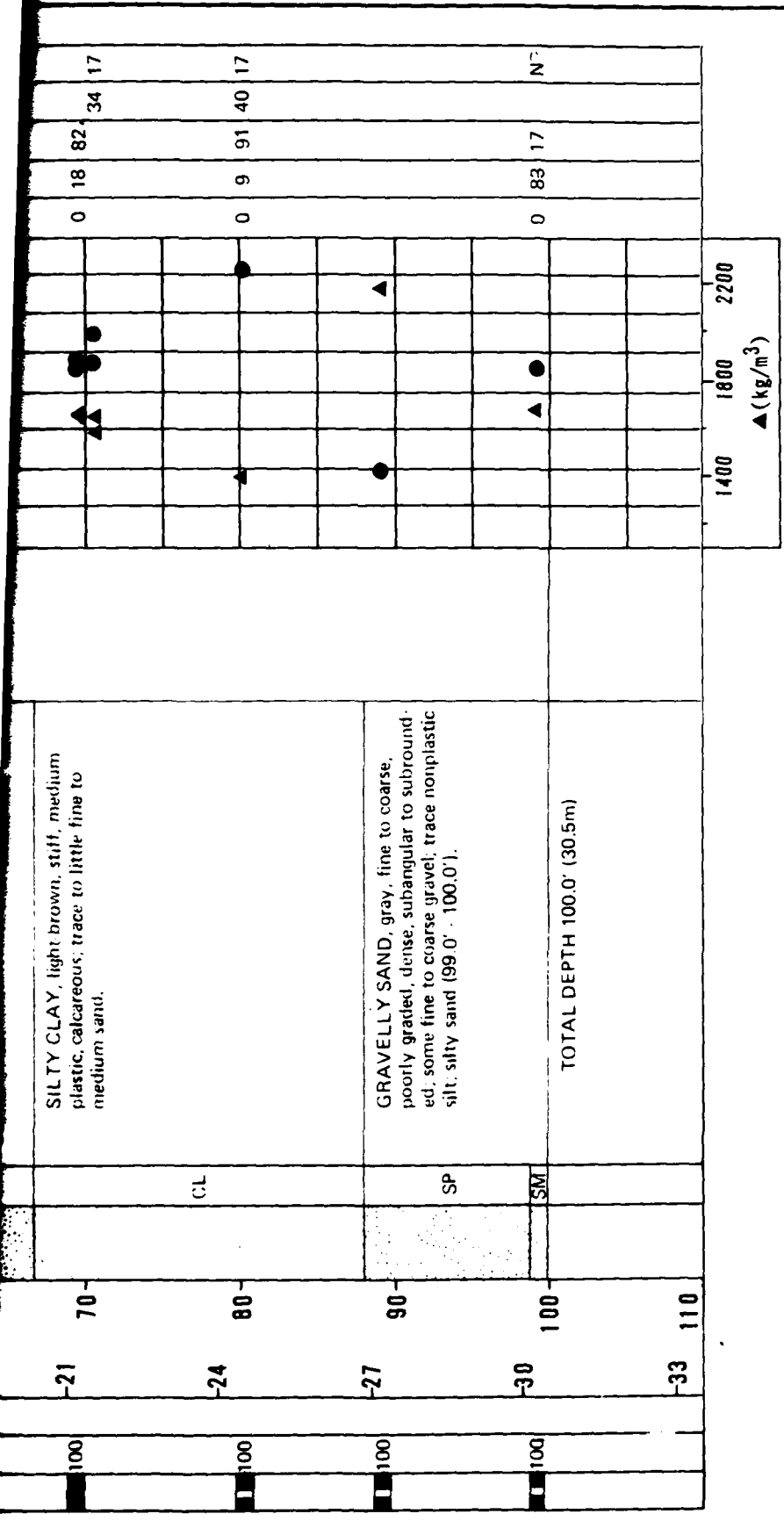
ELEVATION : 5020' (1508m)
 SURFICIAL GEOLOGIC UNIT : A5y/A40
 DATE DRILLED : 19 - 20 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

LOG OF BORING MD-B-9
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

FIGURE
 II-2-9

FUGRO NATIONAL, INC.



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

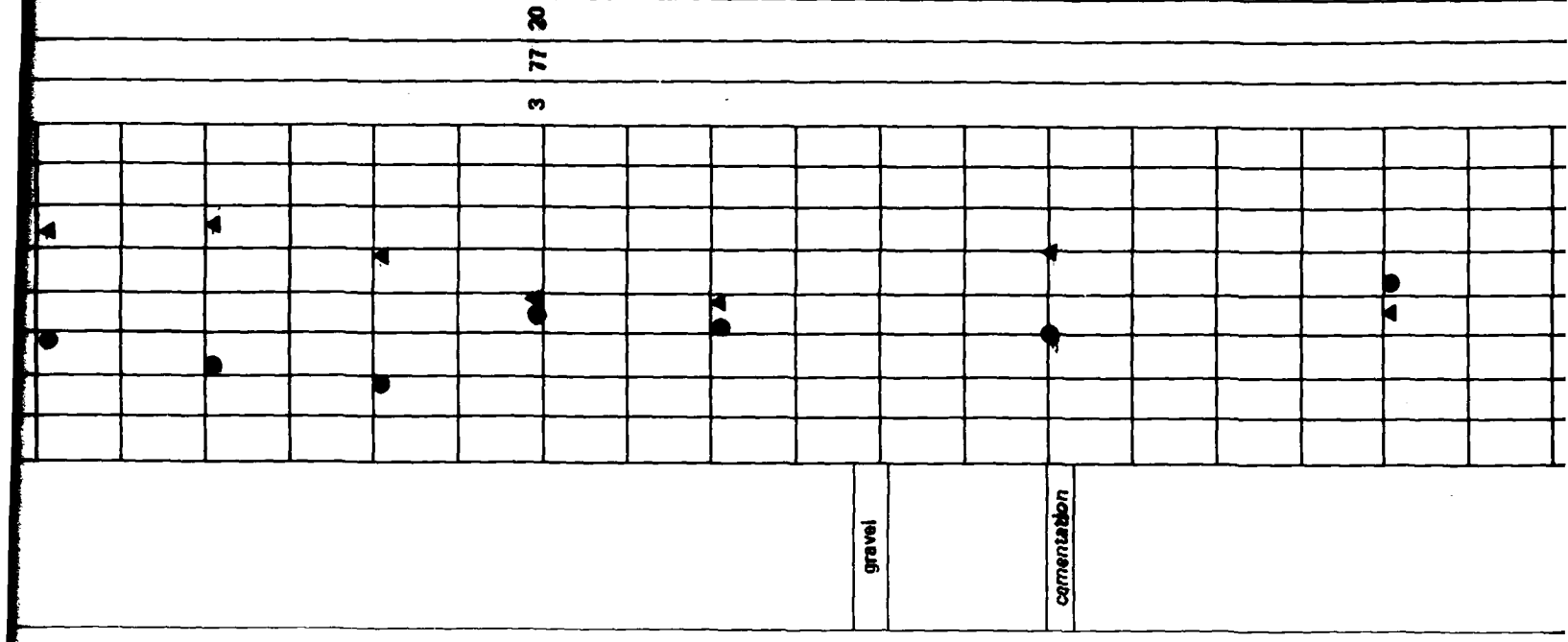
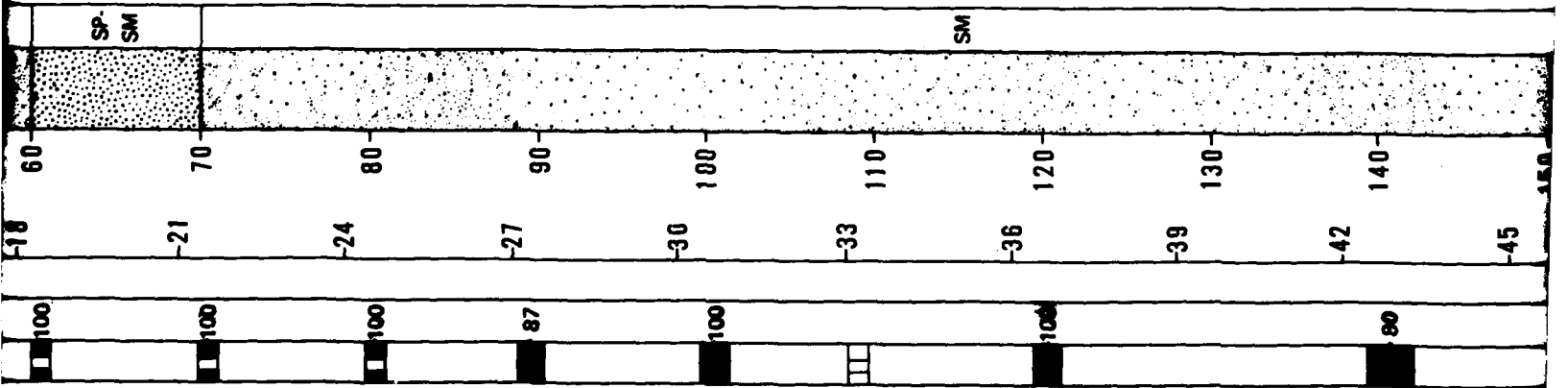
ELEVATION : 5040' (1514m)
 SURFICIAL GEOLOGIC UNIT : A5j/A40
 DATE DRILLED : 20 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" 124mm
 WATER LEVEL : Not Encountered

LOG OF BORING MD-B-10
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-2-10

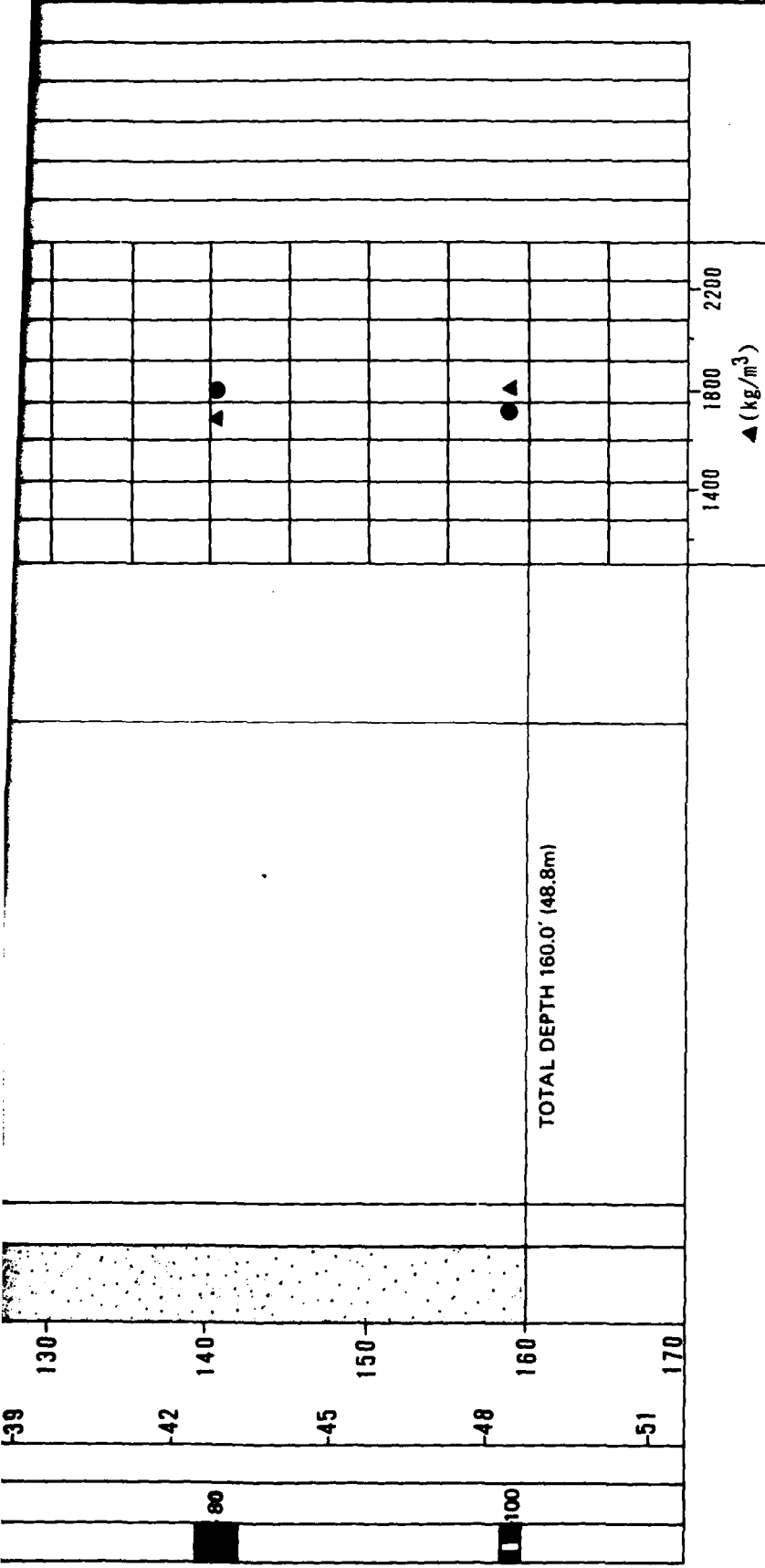
FUGRO NATIONAL, INC.



3 77 20

gravel

cementation



EXPLANATION

- FUGRO DRIVE SAMPLE
- ▨ BULK SAMPLE
- ▩ PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

- ELEVATION : 5100' (1532m)
- SURFICIAL GEOLOGIC UNIT : A5i /A5y
- DATE DRILLED : 21 November 1980
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4-7/8" (124mm)
- WATER LEVEL : 105' (32m)

LOG OF BORING MD-B-11 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-2-11
FUGRO NATIONAL, INC.	

-21 70
 -24 80
 -27 90
 -30 100
 -33 110

1400 1800 2200
 ▲ (kg/m³)

EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5300' (1593m)
 SURFICIAL GEOLOGIC UNIT : A5i
 DATE DRILLED : 22 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

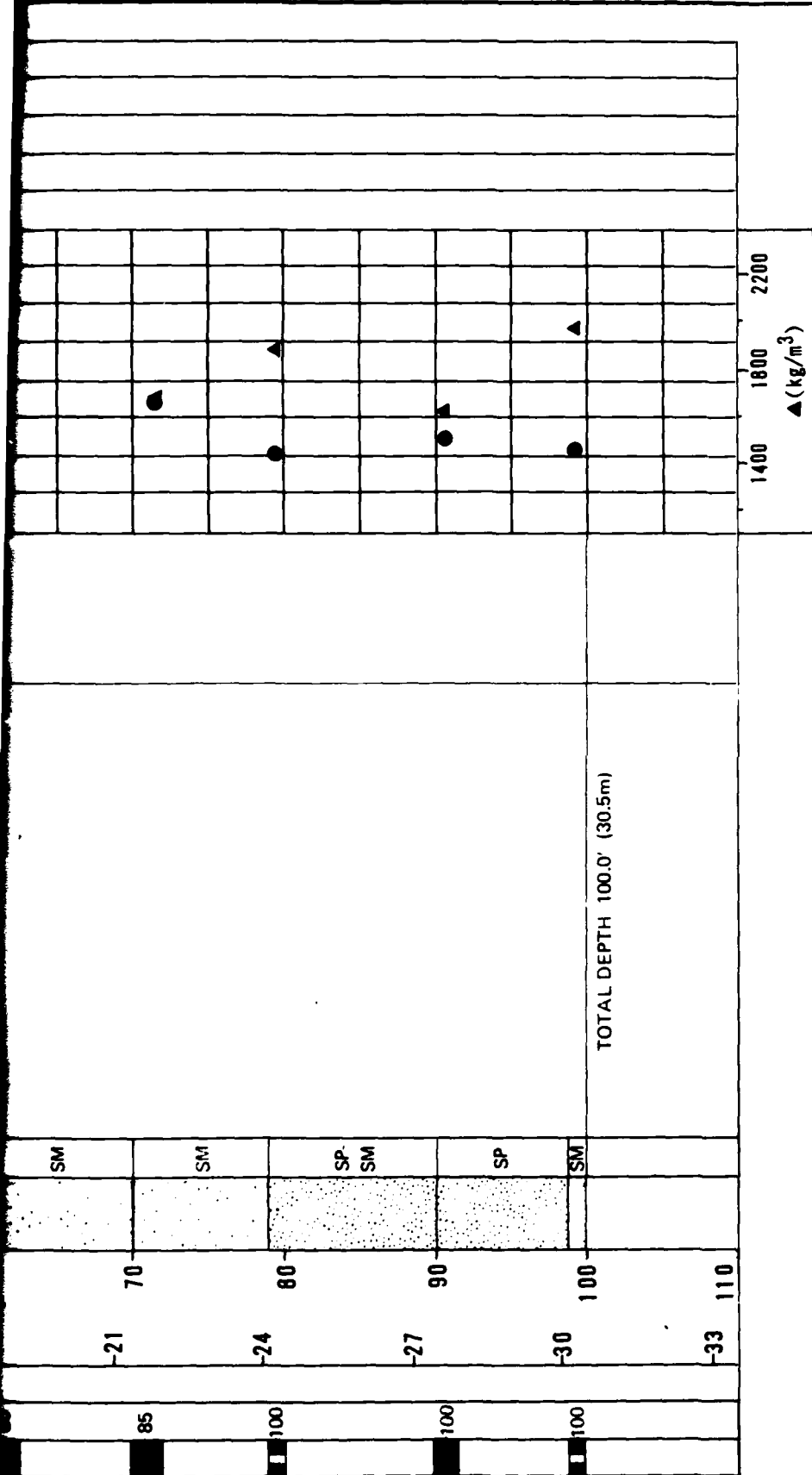
LOG OF BORING MD-B-12
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-2-6

FUGRO NATIONAL, INC.

2



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

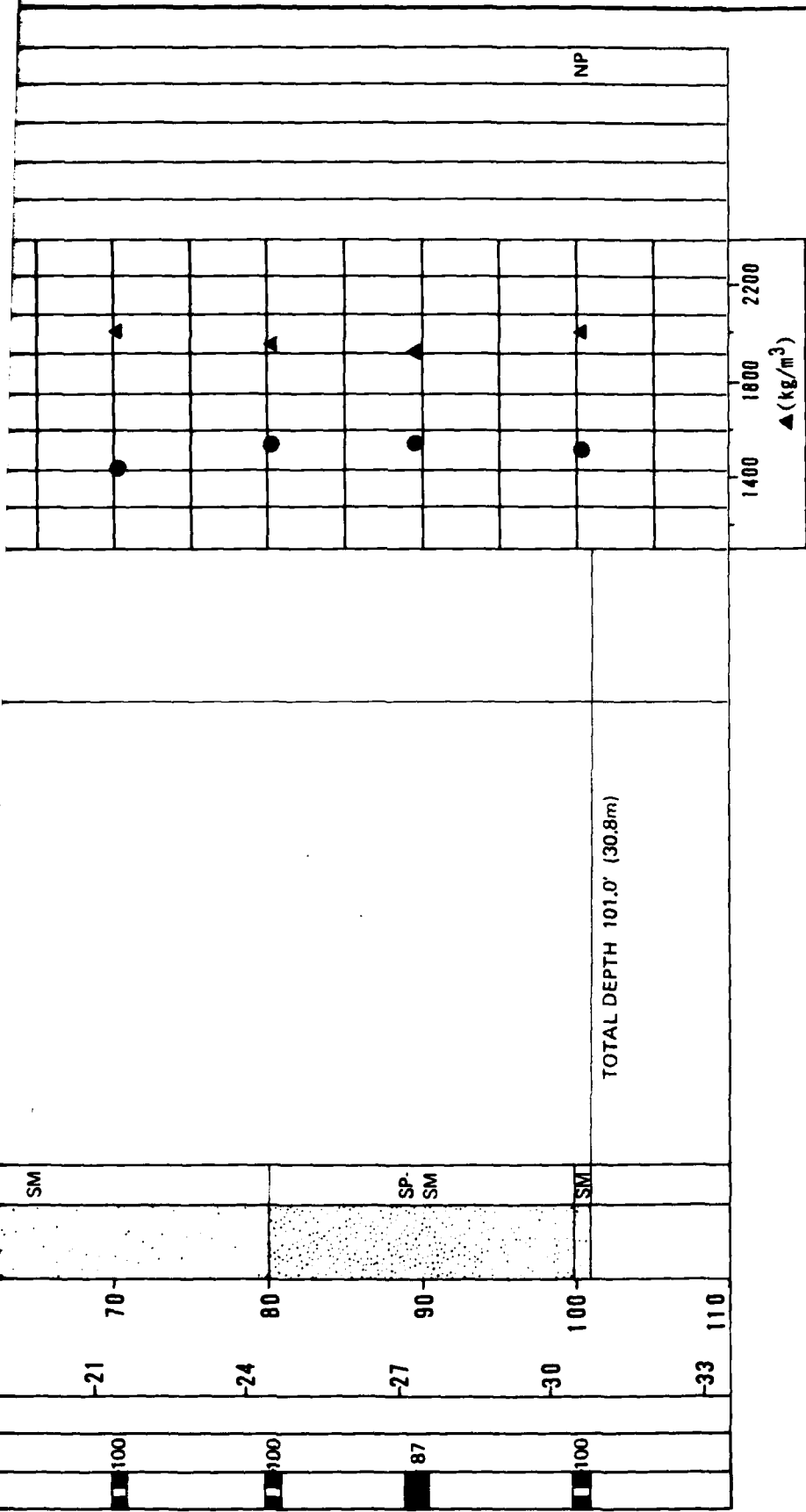
- ELEVATION : 5250' (1575m)
- SURFICIAL GEOLOGIC UNIT : A1
- DATE DRILLED : 22 November 1980
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4 7/8" (124mm)
- WATER LEVEL : Not Encountered

**LOG OF BORING MD-B-13
OPERATIONAL BASE SITE
MILFORD, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIG II-2

FUGRO NATIONAL, INC.



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- ▨ PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

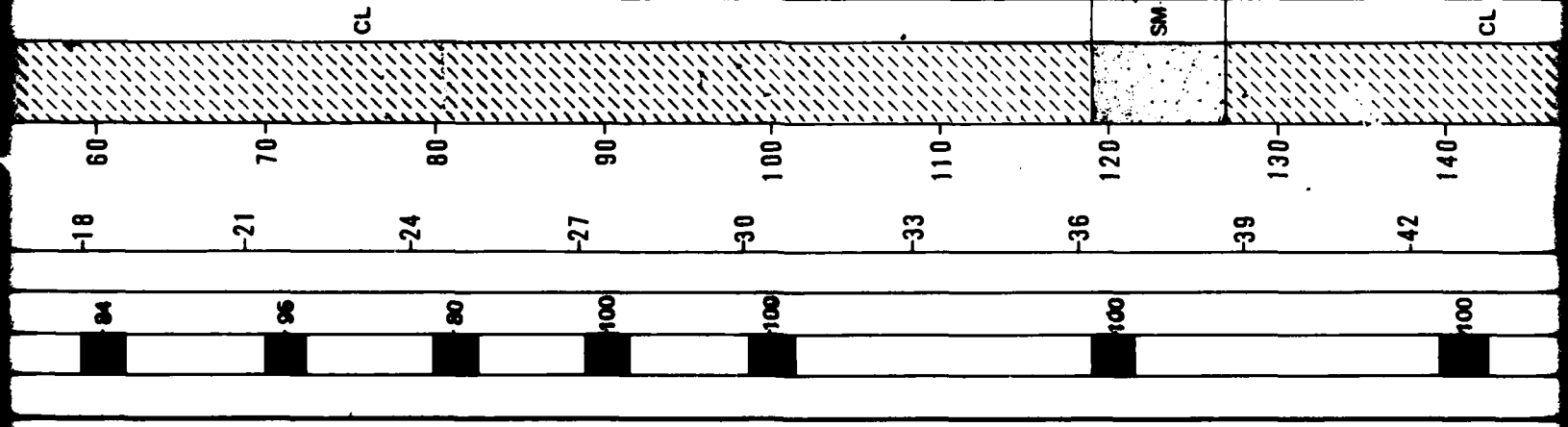
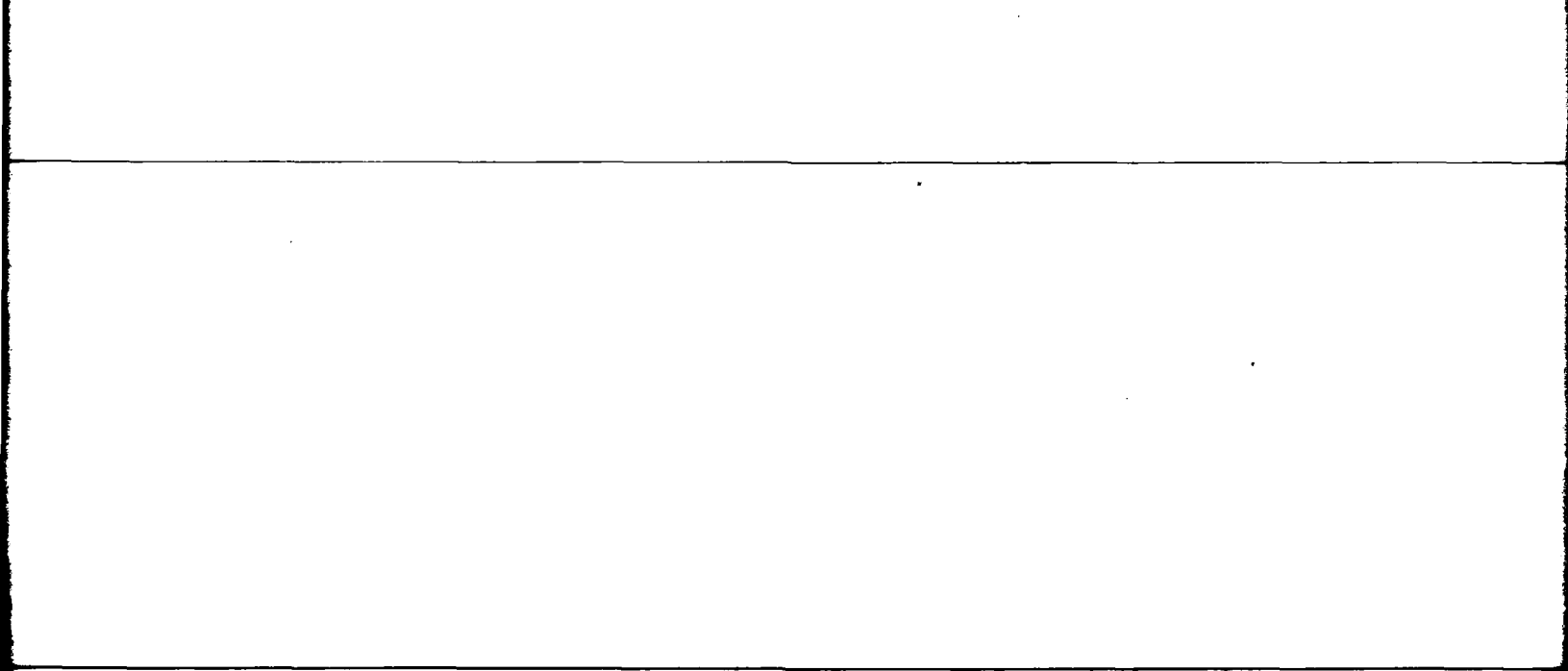
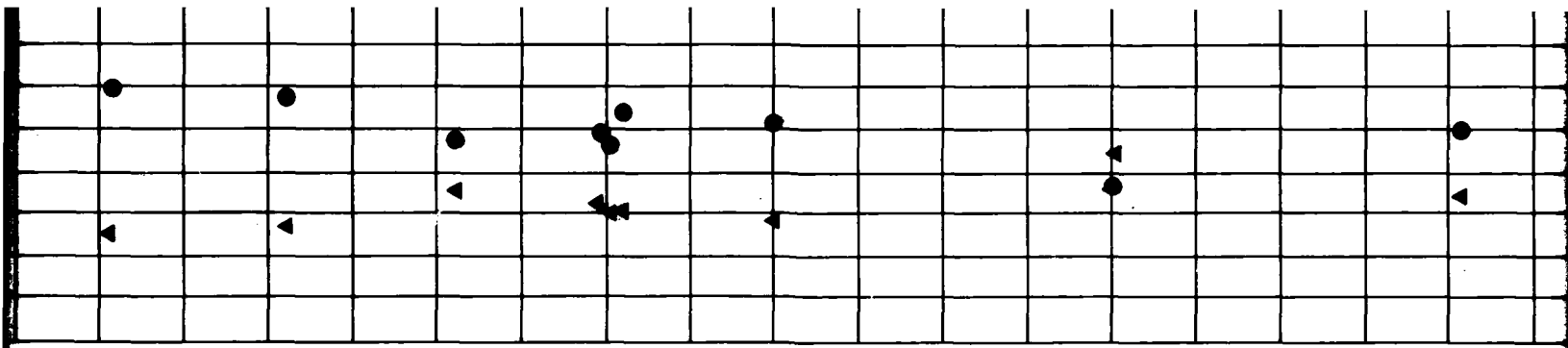
- ELEVATION : 5160' (1573m)
- SURFICIAL GEOLOGIC UNIT : A5y
- DATE DRILLED : 24 November 1980
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4 7/8" (124mm)
- WATER LEVEL : 90' (27m)

LOG OF BORING MD-B-14
OPERATIONAL BASE SITE
MILFORD, UTAH

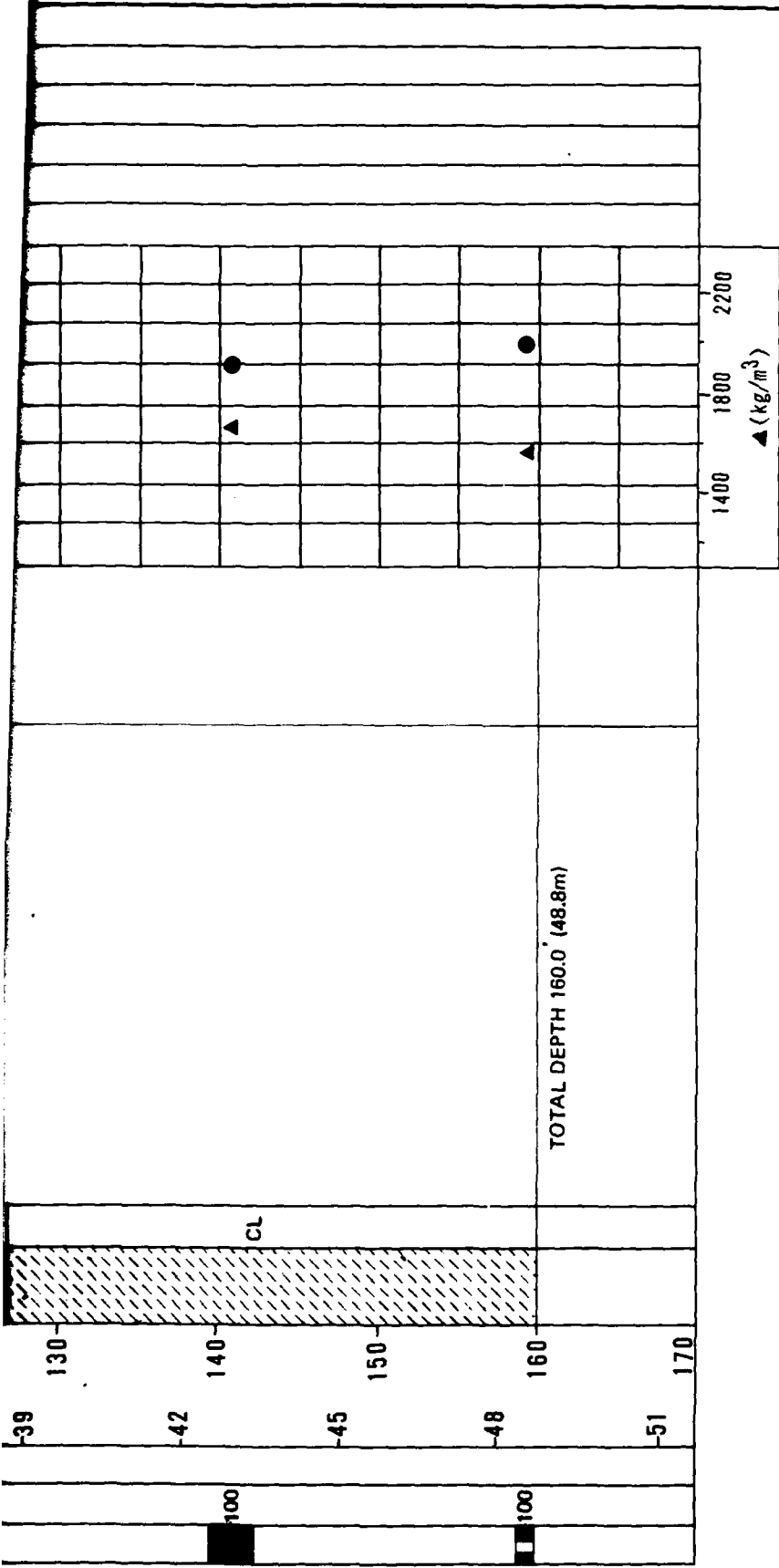
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-2-

FUGRO NATIONAL, INC.



7



EXPLANATION

- FUGRO DRIVE SAMPLE
- ▨ BULK SAMPLE
- ▩ PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

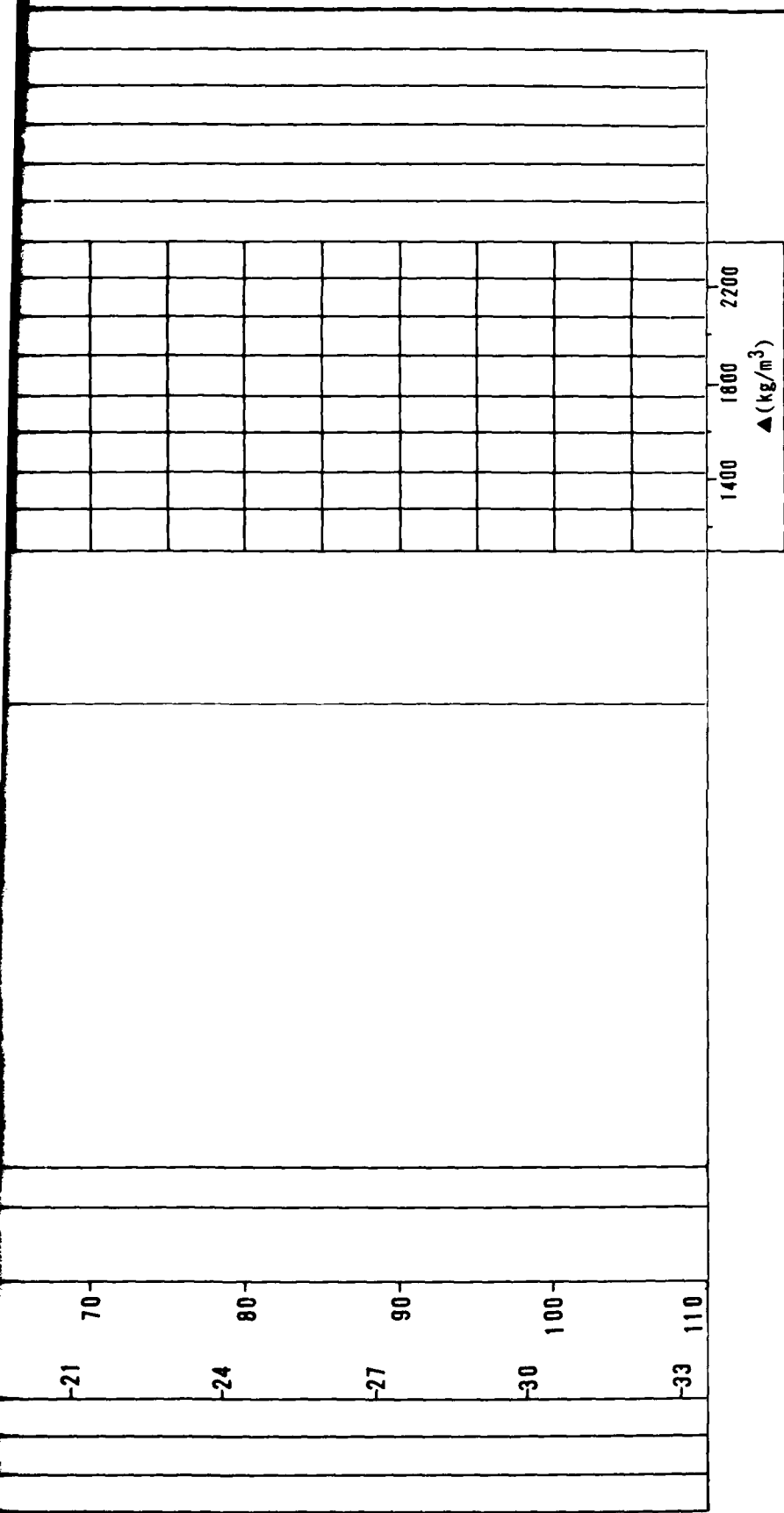
- ELEVATION : 5080' (1548m)
- SURFICIAL GEOLOGIC UNIT : A1/A40
- DATE DRILLED : 23 November 1980
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4 7/8" (124mm)
- WATER LEVEL : 8'(2m)

LOG OF BORING MD-B-15
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-2-15

FUGRO NATIONAL, INC.



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

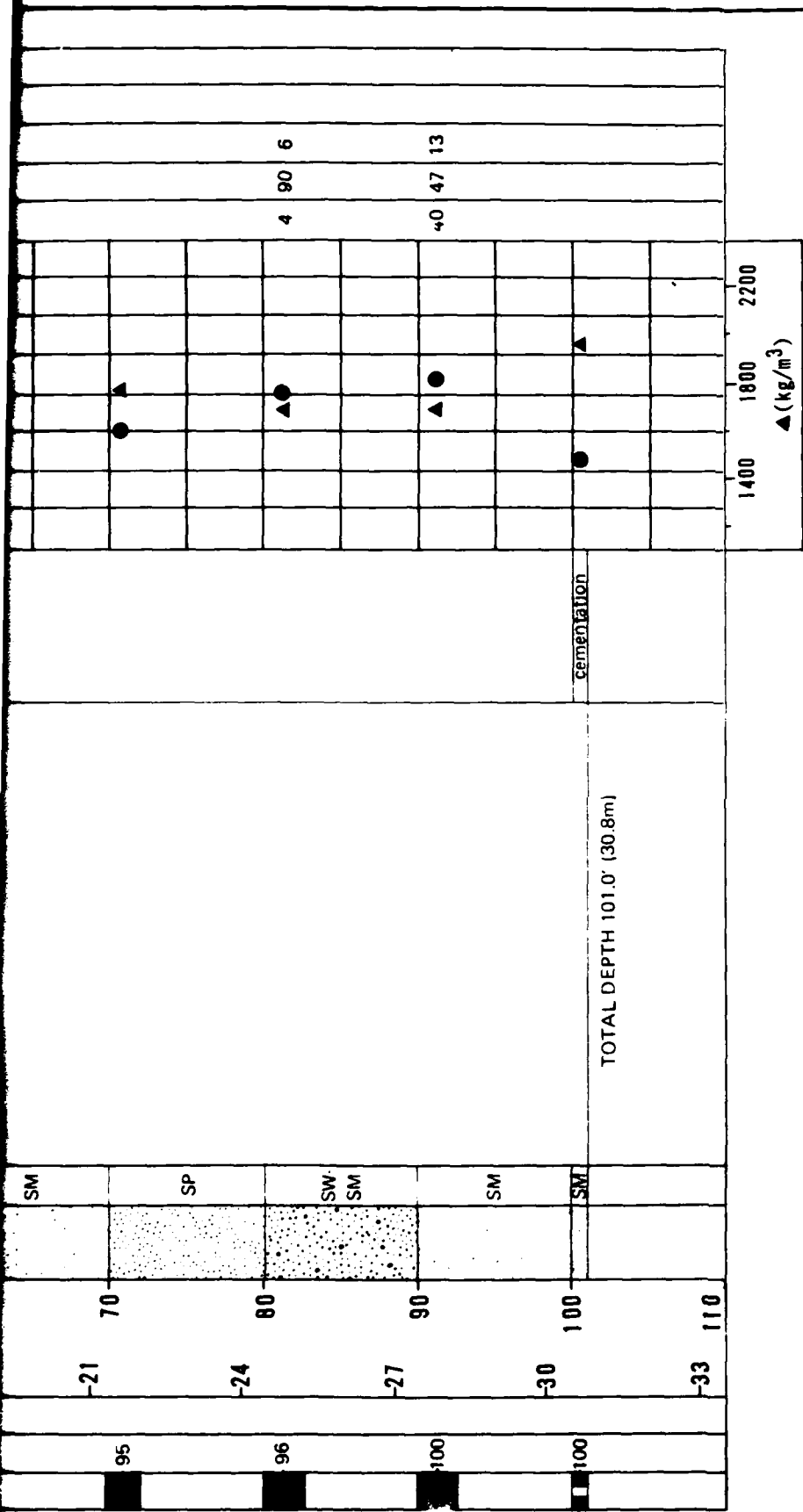
- ELEVATION : 5200' (1585m)
- SURFICIAL GEOLOGIC UNIT : A5i
- DATE DRILLED : 4 November 1980
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4 7/8" (124 mm)
- WATER LEVEL : Not Encountered

LOG OF BORING BL-B-7
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-2-16

FUGRO NATIONAL, INC.



BORING DETAILS

ELEVATION : 5340' (1628m)
 SURFICIAL GEOLOGIC UNIT : A5i
 DATE DRILLED : 16 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

EXPLANATION

- FUGRO DRIVE SAMPLE
- ▨ BULK SAMPLE
- ▩ PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

**LOG OF BORING BL-B-10
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-2-17

FUGRO NATIONAL, INC.

2

SECTION 3.0
EXPLANATION OF
TRENCH LOGS

3.0 EXPLANATION OF TRENCH LOGS

See Section 2.0, "Boring Logs", for explanations.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0	[Hatched pattern]	CL	firm	SILTY CLAY, brown, moist, medium plastic, calcareous; stage III caliche (2.5'-5.0').	↑							
	2													
	1				stiff									
	4													
	6	2	[Dotted pattern]	SM	medium dense	SILTY SAND, light-brown, fine to medium, poorly graded, slightly moist, subangular to subrounded, calcareous; little nonplastic silt; stage II caliche (5.0'-9.0').	vertical walls stable		1	85	14			
	8													
	10	3	[Dotted pattern]	SP	medium dense	SAND, light gray-brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous.	↓							
	12													
	14	4												
	18	5												
	20	6	TOTAL DEPTH 14.0' (4.3m)											

TRENCH DETAILS

SURFACE ELEVATION : 5080' (1548m)
 DATE EXCAVATED : 4 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A1/A4o
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-1 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - 000	FIGURE II-3-1
FUGRO NATIONAL INC.	

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS								
	METERS	FEET						GR	SA	FI	LL	PI				
	0	0	[Diagonal hatching pattern]	ML	firm	CLAYEY SILT, dark-brown, slightly moist, medium plastic, calcareous; stage I caliche (1.0'-3.0').	↑	0	1	99	49	18				
	2															
	4															
	8															
	2						vertical walls stable									
	8		[Dotted pattern]	SM	dense	SILTY SAND, light-brown, fine, poorly graded, slightly moist, subangular to subrounded; calcareous; some slightly plastic silt; stage II caliche (7.0'-10.5').		0	68	32						
	10															
	12		[Diagonal hatching pattern]	CL	firm	CLAY, dark gray-brown, slightly moist, medium plastic, calcareous; trace fine sand; stage I caliche (10.5'-12.5').										
	14		[Dotted pattern]	SM	dense	SILTY SAND, light-brown, fine to medium, poorly graded, slightly moist, subangular to subrounded, calcareous; some nonplastic silt; stage II caliche (12.5'-14.0').	↓									
						TOTAL DEPTH 14.0' (4.3m)										
	16															
	18															
	20															

TRENCH DETAILS

SURFACE ELEVATION : 5075' (1547m)
 DATE EXCAVATED : 4 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A1/A4o
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-3
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 0000

FIGURE
 II-3-3

JUBRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	dense	SILTY SAND, light-brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt; stage II caliche (1.5'-5.0').	↑					
	2											
	4											
	6											
	8	2	[Dotted pattern]	SP	medium dense	SAND, dark-brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; trace gravel; interbedded lenses of silty sand throughout.	vertical wells stable					
	10											
	12											
	14											
	16	3	[Dotted pattern]	SM	medium dense	SILTY SAND, brown, fine to medium, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt.	↓					
	18											
	20											
	22											
	24	4				TOTAL DEPTH 14.0' (4.3m)						
	26	5										
	28	6										

TRENCH DETAILS

SURFACE ELEVATION : 5280' (1609m)
 DATE EXCAVATED : 5 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A5I
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-4
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMB

FIGURE
 II-3-4

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[stippled pattern]	SM	medium dense	SILTY SAND, light-brown, fine to coarse, poorly graded, dry, subangular to sub-rounded, calcareous; some nonplastic silt; trace fine gravel; stage II caliche (2.0'-5.0'); occasional boulders to 16" size.	↑ vertical wells stable ↓	10	68	22		
	2											
	4		[stippled pattern]	SP-SM	medium dense	SAND, light-brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; trace nonplastic silt; trace gravel.						
	8											
	10					TOTAL DEPTH 9.0' (2.7m)	boulders at 9.0' exceeded capacity of case 580C backhoe					
	12											
	14											
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5350' (1631m)
 DATE EXCAVATED : 5 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A51
 TRENCH LENGTH : 12.0' (3.7m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-5
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-5

FUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0	[Dotted pattern]	SM	medium dense	SILTY SAND, light-brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some slightly plastic silt; little fine to coarse gravel; stage I caliche (0.0'-14.0').	↑	17	64	29		NP
	2										
	4	[Circular pattern]	GW-GM	dense medium	SANDY GRAVEL, light-brown, fine to coarse, well-graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace silt.	vertical wells stable	56	37	7		
	8										
	8	[Diagonal line pattern]	SC	medium dense	CLAYEY SAND, light-brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little medium plastic clay.	↓				36	17
	10										
	12	[Dotted pattern]	SM	medium dense	SILTY SAND, light-brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic silt; little fine to coarse gravel.						
	14										
	14	TOTAL DEPTH 14.0' (4.3m)									
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5080' (1548m)
 DATE EXCAVATED : 10 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-8
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-6

UGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS					
	METERS	FEET						GR	SA	FI	LL	PI	
	0	0	[Diagonal hatching pattern]	ML	firm	CLAYEY SILT, brown, slightly moist, medium plastic, calcareous; trace fine subangular to subrounded sand; stage I caliche (0.0'-4.0').	↑	7	6	94			
	2												
	4		[Diagonal hatching pattern]	SC	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded; calcareous; some fine to coarse gravel; little slightly plastic clay; stage II caliche (4.0'-14.0').	vertical walls stable						
	8												
	10												
	12												
	14					TOTAL DEPTH 14.0' (4.3m)	↓						
	16												
	18												
	20												

TRENCH DETAILS

SURFACE ELEVATION : 5085' (1550m)
 DATE EXCAVATED : 11 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A40/A5y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-7
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 8800

FIGURE
 II-3-7

UGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, sub-angular to subrounded, calcareous; some fine to coarse gravel; little slightly plastic silt-clay; stage II caliche (1.0'-4.0'); stage III caliche (4.0' - 4.5'); trace cobbles to 8" size.	vertical walls stable	34	47	19		
	2											
	4					TOTAL DEPTH 4.5' (1.4m)	cementation at 4.5' exceeded capacity of Case 580C backhoe					
	6											
	8											
	10											
	12											
	14											
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5500' (1676m)
 DATE EXCAVATED : 11 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A54
 TRENCH LENGTH : 12.0' (3.7m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-8
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-8

FUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0	[Dotted pattern]	MH	firm	SANDY SILT, light brown, slightly moist, medium plastic, calcareous; trace fine sub-angular to subrounded sand; stage I caliche (2.0'-4.0').	↑	0	12	88	70	21		
	2													
	4		[Horizontal line pattern]	CH	firm	CLAY, light olive to black, moist to dry, highly plastic, calcareous; stage I caliche (6.0'-10.0').	vertical walls stable	0	2	98	79	44		
	6													
	8													
	10													
	12		[Dotted pattern]	SM	medium dense	SILTY SAND, light brown, fine, poorly graded, dry, subangular to subrounded, calcareous; little nonplastic silt.	↓							
	14													
	14		TOTAL DEPTH 14.0' (4.3m)											
	16													
	18													
	20													

TRENCH DETAILS

SURFACE ELEVATION : 4990' (1521m)
 DATE EXCAVATED : 12 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A4a/A1
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-9
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 080

FIGURE
 II-3-9

FUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Pattern: Sandy Gravel]	GM	dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; little slightly plastic silt; stage II caliche (1.0'-4.5'); trace cobbles to 10" size.	↑	59	28	13		
	2	4										
	1	4	[Pattern: Gravelly Sand]	SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; little nonplastic silt; stage I caliche (4.5'-14.0').	vertical walls stable ↓	42	43	15		
	2	8										
	3	10										
	4	12										
	5	14	TOTAL DEPTH 14.0' (4.3m)									
	6	16										
	8	18										
	8	20										

TRENCH DETAILS

SURFACE ELEVATION : 5070' (1545m)
 DATE EXCAVATED : 13 NOVEMBER 1980
 SUBFICIAL GEOLOGIC UNIT : ASI
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-10 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - BMO	FIGURE II-3-10
FUGRO NATIONAL, INC.	

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some slightly plastic silt; some fine to coarse gravel; stage I caliche (1.0'-3.0').	vertical walls stable	29	39	32		
	2											
	1	4	[Diagonal hatching]	SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some slightly plastic clay; little fine gravel; stage II caliche (3.0'-5.0').		14	41	45		
	2	8	[Large dots pattern]	GP	very dense	SANDY GRAVEL, yellow brown, fine to coarse, poorly graded, dry, subangular, calcareous; little fine to coarse subangular to subrounded sand; stage III caliche (5.0'-14.0').						
	8											
	3	10										
	12											
	4	14				TOTAL DEPTH 14.0' (4.3m)						
	5	16										
		18										
	6	20										

TRENCH DETAILS

SURFACE ELEVATION : 5400' (1646m)
 DATE EXCAVATED : 13 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A51
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-11
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-11

JUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		GC	medium dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little to some fine to coarse sand; little slightly plastic clay; silty sand (4.0'-5.0'); stage I caliche (1.0'-4.0'); stage II caliche (5.0'-14.0'); trace cobbles to 10" size	↑	60	26	15		
	2	4										
	4	4		SM	medium dense			12	51	27	22	1
	6	8		GC	dense		vertical wells stable ↓	63	18	19		
	8	10										
	10	12										
	12	14										
	14	14				TOTAL DEPTH 14.0' (4.3m)						
	16	18										
	18	20										

TRENCH DETAILS

SURFACE ELEVATION : 5160' (1573m)
 DATE EXCAVATED : 14 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5v
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-12
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-12

FUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		GW-GM	dense	SANDY GRAVEL, light brown, fine to coarse, well to poorly graded, moist to dry, subangular to subrounded, calcareous; little to some fine to coarse sand; trace slightly plastic silt; stage II caliche (1.0'-10.5'); little cobbles to 12" size.	vertical wells stable	74	18	8		
	2											
	4											
	6											
	2	8		GP	very dense	TOTAL DEPTH 10.5' (3.2m)	cementation at 10.5' exceeded capacity of Case 580C backhoe					
	4											
	6											
	8											
	3	10										
	4	12										
	5	14										
	6	16										
	6	18										
	6	20										

TRENCH DETAILS

SURFACE ELEVATION : 5280' (1609m)
 DATE EXCAVATED : 14 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A5/A5y
 TRENCH LENGTH : 13.0' (4.0m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-13
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 900

FIGURE
 II-3-13

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Diagonal hatching pattern]	SC	medium dense	CLAYEY SAND, light brown to brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic clay; stage II caliche (1.0'-14.0').	↑	0	62	38	28	11
	2	2			dense							
	1	4	[Diagonal hatching pattern]	SC	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; little medium plastic clay to trace nonplastic silt.	vertical walls stable					
	2	8			dense							
	3	10	[Dotted pattern]	SP-SM	medium dense	TOTAL DEPTH 14.0' (4.3m)	↓					
	4	14			dense							
	5	18										
	6	20										

TRENCH DETAILS

SURFACE ELEVATION : 5110' (1558m)
 DATE EXCAVATED : 15 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5i
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-14
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-14

TUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern representing soil]	SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some slightly plastic silt; stage I caliche (1.0'-2.0').	↑ vertical walls stable ↓	2	64	34		
	2											
	1	4		dense								
	2	6		medium dense								
	3	8	SM	dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace slightly plastic silt; stage II caliche (2.0'-14.0').							
	4	10		medium dense								
	5	12		dense								
	6	14		medium dense		TOTAL DEPTH 14.0' (4.3m)						
	7	16										
	8	18										
	9	20										

TRENCH DETAILS

SURFACE ELEVATION : 5160' (1573m)
 DATE EXCAVATED : 15 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A3
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

**LOG OF TRENCH MD-T-15
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-15

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS					
	METERS	FEET						GR	SA	FI	LL	PI	
	0	0	[Pattern: Sandy Gravel]	SM	dense	Interbedded layers of SANDY GRAVEL and GRAVELLY SAND: SANDY GRAVEL (GP-GM): light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace nonplastic silt. GRAVELLY SAND (SM, SP): light brown, fine to coarse, poorly graded, dry to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace to little nonplastic silt; stage II caliche (1.0'-14.0').	↑ vertical wells stable ↓	27	57	16			
	2												
	4												
			[Pattern: Gravelly Sand]	GP-GM	dense			55	38	7			
			[Pattern: Silty Sand]	SP	medium dense								
	8		[Pattern: Silty Sand]	SM	dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some nonplastic silt; trace fine gravel.		10	58	32			
	10												
	12												
	14		TOTAL DEPTH 14.0' (4.3m)										
	16												
	18												
	20												

TRENCH DETAILS

SURFACE ELEVATION : 5340' (1628m)
 DATE EXCAVATED : 16 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : AS4
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-16
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-16

USRO NATIONAL INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0	[Diagonal hatching pattern]	SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some medium plastic clay; trace fine gravel; stage II caliche (1.0'-14.0').	↑	5	86	30	39	18		
	2	4												
	1	4	[Dotted pattern]	SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; trace nonplastic silt to little slightly plastic silt.	vertical walls stable	37	46	17				
	2	8												
	3	10												
	4	12												
	4	14	[Dotted pattern]	SP	medium dense		↓							
		14				TOTAL DEPTH 14.0' (4.3m)								
	5	18												
		18												
	8	20												

TRENCH DETAILS

SURFACE ELEVATION : 5340' (1628m)
 DATE EXCAVATED : 17 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A6i
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-17 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - 000	FIGURE II-3-17
FUGRO NATIONAL, INC.	

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS					
	METERS	FEET						GR	SA	FI	LL	PI	
	0	0	[stippled pattern]	SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some slightly plastic silt; trace fine gravel; stage II caliche (1.0'-6.0').	vertical walls stable	6	67	27			
	2	1	[diagonal hatching]	SC	dense			GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; little slightly plastic clay to trace nonplastic silt; stage I caliche (6.0'-14.0').				36	13
	4	1	[stippled pattern]	SP	medium dense								
	6	2	[stippled pattern]	SP	medium dense								
	8	2	[stippled pattern]										
	10	3	[stippled pattern]	SP-SM	medium dense								
	12	4	[stippled pattern]										
	14	4	[stippled pattern]										
	14	4				TOTAL DEPTH 14.0' (4.3m)							
	16	5											
	18	5											
	20	6											

TRENCH DETAILS

SURFACE ELEVATION : 5170' (1576m)
 DATE EXCAVATED : 18 NOVEMBER 1990
 SURFICIAL GEOLOGIC UNIT: AS4
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-18
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 600

FIGURE
 II-3-18

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Stippled pattern representing silty sand]	SM	dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt; little fine gravel; stage II caliche (1.0'-9.0'); stage III caliche (9.0').	↑ vertical walls stable ↓	10	44	46	37	6
	2											
	4											
	6											
	8											
	10											
	12											
	14											
	16											
	18											
	20											
	TOTAL DEPTH 9.0' (2.7m)						cementation at 9.0' exceeded capacity of Case 580C backhoe					

TRENCH DETAILS

SURFACE ELEVATION : 5350' (1631m)
 DATE EXCAVATED : 18 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A51
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-19
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-19

FURRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some medium plastic clay; trace fine gravel; stage II caliche (1.0'-14.0'); occasional cobbles to 12" size.	vertical wells stable	9	44	47		
	1	4		GW	dense	SANDY GRAVEL, light brown, fine to coarse, well graded, moist, subangular to subrounded, calcareous; some fine to coarse sand.		61	37	2		
	3	10		SP	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel.						
		14				TOTAL DEPTH 14.0' (4.3m)						
	5	18										
	6	20										

TRENCH DETAILS

SURFACE ELEVATION : 5500' (1676m)
 DATE EXCAVATED : 19 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A51
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-20
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-20

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		ML	stiff	SANDY SILT, brown, dry, medium plastic; calcareous; some fine to coarse subangular to subrounded sand; stage II caliche (2.5'-10.0').	↑					
	2											
	1	4		SM	dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little nonplastic silt.	vertical walls stable					
	8											
	2	8		SP-SM	dense	SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; trace nonplastic silt.	↓					
	10											
	12											
	14											
	5	18				TOTAL DEPTH 14.0' (4.3m)						
	6	18										
	8	20										

TRENCH DETAILS

SURFACE ELEVATION : 5420' (1652m)
 DATE EXCAVATED : 31 OCTOBER 1980
 SURFICIAL GEOLOGIC UNIT : ASI
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-13
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

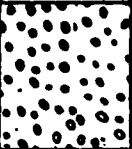
FIGURE
 II-3-21

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		GP-GM	dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, angular to subangular, calcareous; some fine to coarse sand; trace non-plastic silt; some cobbles to 6" size.	vertical walls stable	70	24	6		
	2											
	1	4				TOTAL DEPTH 2.5' (0.8m)	Rock at 2.5' exceeded capacity of case 580C backhoe					
	2	8										
	3	10										
	4	12										
	5	16										
	6	18										
	8	20										

TRENCH DETAILS

SURFACE ELEVATION : 5700' (1737m)
 DATE EXCAVATED : 1 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : I4
 TRENCH LENGTH : 10.0' (3.0m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-14
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-22

FUGRO NATIONAL INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS									
	METERS	FEET						GR	SA	FI	LL	PI					
	0	0	[Dotted pattern]	SM	dense	GRAVELLY SAND, brown to light brown, fine to coarse, poorly graded, dry, subangular calcareous; some fine to coarse gravel; little slightly plastic silt; stage III caliche (1.0'-3.5'); stage IV caliche (3.5'-4.0'); occasional cobbles to 6" size.	vertical walls stable	36	51	13							
	2	4									very dense						
	1	4				TOTAL DEPTH 4.0' (1.2m)	cementation at 4.0' exceeded capacity of Case 580C backhoe										
	2	8															
	3	10															
	4	12															
	5	14															
	6	16															
	8	18															
	8	20															

TRENCH DETAILS

SURFACE ELEVATION : 5520' (1682m)
 DATE EXCAVATED : 1 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A5I
 TRENCH LENGTH : 10.0' (3.0m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-15
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 8888

FIGURE
 II-3-23

FUGRO NATIONAL INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt; stage II caliche (1.0'-5.0').	vertical walls stable					
	2											
	4											
	6											
	8		[Dotted pattern]	SP	medium dense	GRAVELLY SAND, dark brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse gravel.						
	10											
	12											
	14											
						TOTAL DEPTH 14.0' (4.3m)						
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5375' (1638m)
 DATE EXCAVATED : 1 NOVEMBER 1990
 SURFICIAL GEOLOGIC UNIT: A51
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH BL-T-16
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-24

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS								
	METERS	FEET						GR	SA	FI	LL	PI				
	0	0	[Hatched pattern]	CL	firm	SILTY CLAY, brown to dark gray, very moist to saturated, slightly plastic, calcareous.	vertical wells stable	0	3	97	26	10				
	2															
	4															
	6															
	8															
	10															
	12															
	14															
	16															
	18															
	20															
						TOTAL DEPTH 10.0' (3.0m)	excavation terminated due to water level at 5.0'									

TRENCH DETAILS

SURFACE ELEVATION : 5080' (1548m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A1/A-2
 TRENCH LENGTH : 12.0 (3.7m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-17
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-25

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0	[Stippled Lithology]	MH	firm	SILT, brown to dark olive-gray, moist to saturated, medium plastic, calcareous; stage I caliche (1.0'-2.0'); stage III caliche (2.0'-5.0').	↑ vertical walls stable ↓	0	38	62	59	19		
	2													
	4													
	6													
	8				firm									
	10					TOTAL DEPTH 10.0' (3.0m)	terminated due to water level at 7.5'							
	12													
	14													
	16													
	18													
	20													

TRENCH DETAILS

SURFACE ELEVATION : 5090' (1561m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A4c
 TRENCH LENGTH : 12.0' (3.7m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-18
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-26

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0	[Diagonal hatching pattern]	ML	firm	SANDY SILT, light brown, moist, nonplastic, calcareous; little fine subrounded sand.	↑	0	20	80		NP		
	2													
		6	[Dotted pattern]	SP-SM	medium dense	SAND, brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; trace gravel; trace nonplastic silt.	vertical wells stable	7	87	6				
	8													
	10													
	12													
	14					TOTAL DEPTH 14.0' (4.3m)	↓							
	18													
	20													

TRENCH DETAILS

SURFACE ELEVATION : 5140' (1567m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH BL-T-20
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-28

TUGRO NATIONAL, INC.

USAF

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[diagonal hatching]	CL	firm	SILTY CLAY, brown, moist, medium plastic, calcareous; trace fine sand.	↑					
	2											
	4	4	[diagonal hatching with dots]	ML	firm	SILT, light brown, dry, slightly plastic, calcareous; trace fine subrounded sand.	vertical walls stable	0	8	92	30	6
	8											
	10											
	12	12	[stippled]	SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt.	↓					
	14											
	14	14	TOTAL DEPTH 14.0' (4.3m)									
	18	18										
	20	20										

TRENCH DETAILS

SURFACE ELEVATION : 5145' (1568m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5y/A4o
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH BL-T-21
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-29

UGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	medium dense	Interbedded layers of SILTY SAND and SANDY SILT: SILTY SAND (SM): brown to light brown, fine to coarse, poorly graded, slightly moist, sub-angular to subrounded, calcareous; little to some nonplastic silt; trace fine to coarse gravel; stage II caliche (1.0'-5.0'). SANDY SILT (ML): light brown, slightly moist slightly plastic, calcareous; some fine to medium subangular to subrounded sand.	↑	5	73	22		
	2											
	1	4	[Diagonal hatched pattern]	ML	stiff		vertical wells stable					
	8											
	3	10	[Dotted pattern]	SM	medium dense		↓	7	77	16		
	12											
	4	14			TOTAL DEPTH 14.0' (4.3m)							
	5	18										
	6	20										

TRENCH DETAILS

SURFACE ELEVATION : 5180' (1579m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5I
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-22
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-30

FUGRO NATIONAL INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS							
	METERS	FEET						GR	SA	FI	LL	PI			
	0	0		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to sub-rounded, calcareous; some nonplastic silt; stage II caliche (2.0'-5.0').	vertical wells stable								
	2														
	4														
	6														
	8														
	10														
	12														
	14														
	16														
	18														
	20														
TOTAL DEPTH 14.0' (4.3m)															

TRENCH DETAILS

SURFACE ELEVATION : 5200' (1586m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5I
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-23 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - 900	FIGURE II-3-31
TUBRO NATIONAL, INC.	

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM-SC	firm	SILTY SAND-CLAYEY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt-clay; stage I caliche (1.5'-5.0').	↑	1	49	50	26	7
	2											
	2	8	[Dotted pattern]	SP	medium dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some gravel.	vertical walls stable					
	8											
	3	10	[Diagonal hatching]	ML	firm	SANDY SILT, light brown, dry, slightly plastic, calcareous; some fine subangular to subrounded sand.	↓					
	12											
	4	14				TOTAL DEPTH 14.0' (4.3m)						
	5	18										
	6	20										

TRENCH DETAILS

SURFACE ELEVATION : 5175' (1577m)
 DATE EXCAVATED : 3 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A6y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-24
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-32

FUGRO NATIONAL, INC.

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USAF-37

SECTION 4.0
EXPLANATION OF
TEST PIT LOGS

4.0 EXPLANATION OF TEST PIT LOGS

See Section 2.0, "Boring Logs", for explanations.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						BR	SA	FI	LL	PI
	0	0		CH	firm	SANDY CLAY, dark brown, moist, highly plastic, calcareous; little fine sand; stage II caliche (1.5'-4.0').	↑					
	1							0	18	82	61	32
	2											
	3											
	4			SM	medium dense	SILTY SAND, dark brown, fine to medium, poorly graded, moist, subangular to sub-rounded, calcareous; little nonplastic silt.	vertical walls stable					
	5											
	6											
	7											
	8			SP	medium dense	SAND, dark brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous.	↓					
	9							0	82	18		
	10					TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5080' (1548m)
 SURFICIAL GEOLOGIC UNIT: A1/A4o

LOG OF TEST PIT MD-P-1 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-4-1

UBRO NATIONAL, INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						BR	SA	FI	LL	PI
	0	0	[Hatched pattern]	CL	firm	CLAY, brown, moist, medium plastic, calcareous.	↑ vertical wells stable ↓					
		1										
		2										
		3										
	1	4										
		5										
		6										
	2	7										
		8										
		9										
	3	10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5100' (1554m)
 SURFICIAL GEOLOGIC UNIT: A1/A4o

**LOG OF TEST PIT MD-P-3
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-4-3
--	-------------------------

FUGRO NATIONAL, INC.

AD-A112 987

FUGRO NATIONAL INC LONG BEACH CA
PRELIMINARY GEOTECHNICAL INVESTIGATION PROPOSED OPERATIONAL BAS--ETC(U)
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FN-TR-44-VOL-2

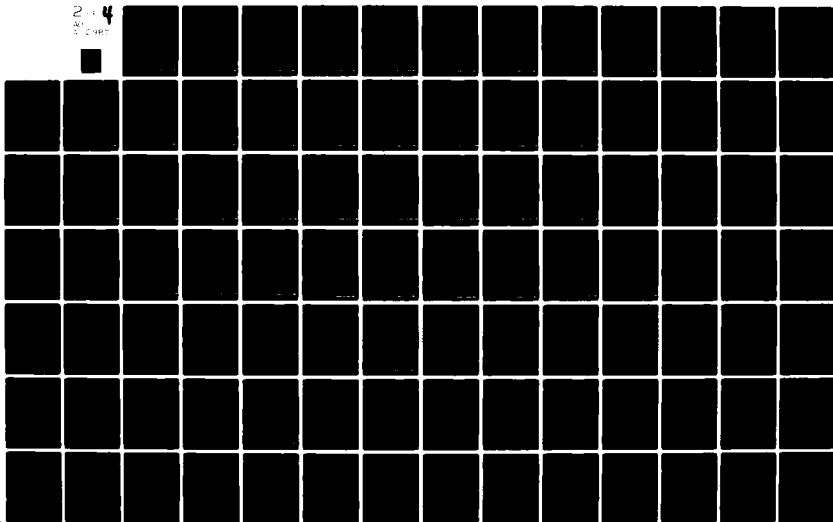
F/G 8/13

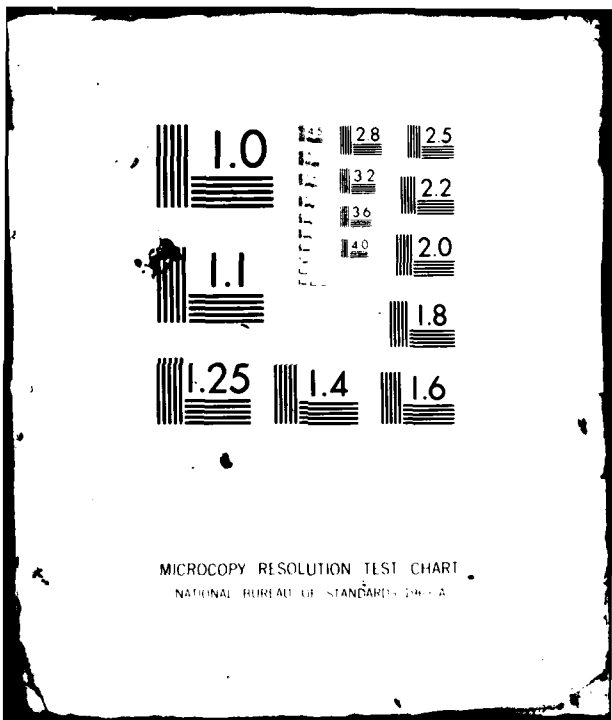
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2 of 4
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS							
	METERS	FEET						GR	SA	FI	LL	PI			
	0	0	[Diagonal hatching pattern]	SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, dry, subangular to sub-rounded, calcareous; some slightly plastic clay; little fine to coarse gravel; stage III caliche (1.0'-4.0').	↑	15	60	25	38	14			
	1														
	2														
	1	3	[Dotted pattern]	SM	dense	SILTY SAND, light brown, fine to medium, poorly graded, dry to moist, subangular to subrounded, calcareous; some nonplastic silt.	vertical wells stable								
	4														
	5														
	2	6													
	7														
	8														
	3	10			medium dense										
						TOTAL DEPTH 10.0' (3.0m)									

SURFACE ELEVATION: 5230' (1594m)
 SURFICIAL GEOLOGIC UNIT: A51

LOG OF TEST PIT MD-P-4
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II - 4 - 4

FUGRO NATIONAL, INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular, calcareous; some nonplastic silt; trace fine gravel.	↑ vertical walls stable ↓					
	1	1										
	2	2										
	3	3		SP-SM	dense	GRAVELLY SAND, light gray-brown, fine to coarse, poorly graded, dry, subangular, calcareous; trace fine gravel; trace nonplastic silt; stage III caliche (3.0'-8.0').	vertical walls stable ↓					
	4	4										
	5	5										
	6	6				TOTAL DEPTH 8.0' (2.4m)	cementation at 8.0' exceeded capacity of Case 580C backhoe					
	7	7										
	8	8										
	9	9										
	10	10										

SURFACE ELEVATION: 5360' (1634m)
 SURFICIAL GEOLOGIC UNIT: AS1

**LOG OF TEST PIT MD-P-5
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DND	FIGURE II-4-5
--	-------------------------

JUBRO NATIONAL, INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic silt; trace fine to coarse gravel; stage I caliche (1.0'-10.0'); occasional cobbles and boulders to 15" size.	vertical walls stable.					
	1											
	2											
	3		[Dotted pattern]	SP-SM	medium dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace silt.		42	49	9		
	4											
	5											
	6											
	7											
	8											
	9											
	10											
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5160' (1573m)
 SURFICIAL GEOLOGIC UNIT: A5y

**LOG OF TEST PIT MD-P-6
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-4-6

FUGRO NATIONAL, INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						BR	SA	FI	LL	PI		
	0	0	[Stippled pattern representing silty sand]	SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic silt; little fine to coarse gravel; gravelly sand (4.0'-5.0').	vertical walls stable.							
	1	1												
	2	2												
	3	3												
	4	4												
	5	5												
	6	6												
	7	7												
	8	8												
	9	9												
	10	10				TOTAL DEPTH 10.0' (3.0m)								

SURFACE ELEVATION: 5190' (1582m)
 SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT MD-P-7
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DND

FIGURE
 II-4-7

USRD NATIONAL, INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Diagonal hatching pattern]	SC	medium dense	CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic clay; trace fine gravel; stage I caliche (0.5'-1.5'); occasional cobbles to 10" size.	↑					
	1							12	58	30		
	2		[Dotted pattern]	SP-SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace nonplastic silt; stage II caliche (1.5'-10.0').	vertical walls stable					
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5320' (1622m)
 SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT MD-P-8 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DND	FIGURE II-4-8

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some medium plastic silt; stage I caliche (2.0'-10.0').	vertical walls stable					
		1										
		2										
		3										
	1	4										
		5										
		6										
		7										
		8		SP	medium dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little fine to coarse gravel.						
		9										
		10										
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5420' (1652m)
 SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT MD-P-9
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DND

FIGURE
 II-4-9

USARO NATIONAL, INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little slightly plastic silt; trace fine gravel; stage I caliche (1.0'-2.0').	vertical walls stable					
	1	1										
	2	2	[Dotted pattern]	SP-SM	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse gravel; trace to some slightly plastic silt; stage II caliche (2.0'-6.0'); stage III caliche (6.0'-8.0'); stage II caliche (8.0'-10.0').							
	3	3										
	4	4										
	5	5										
	6	6										
	7	7										
	8	8	SM	dense								
	9	9			28	50		22				
	10	10										
TOTAL DEPTH 10.0 (3.0m)												

SURFACE ELEVATION: 5380' (1634m)
 SURFICIAL GEOLOGIC UNIT: A5i/A5y

LOG OF TEST PIT MD-P-10
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II - 4 - 10

URS NATIONAL INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0		SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse gravel; little slightly plastic silt; stage II caliche (1.0'-10.0'); trace cobbles to 12" size.	vertical walls stable							
		1												
		2												
		3												
	1	4												
		5												
		6												
		7												
		8												
		9												
		10												
						TOTAL DEPTH 10.0' (3.0m)								

SURFACE ELEVATION: 5300' (1615m)
 SURFICIAL GEOLOGIC UNIT: A51

LOG OF TEST PIT MD-P-11 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DND	FIGURE II-4-11
FUGRO NATIONAL, INC.	

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0	[Diagonal hatching pattern]	CL	firm	CLAY, brown, slightly moist, medium plastic, calcareous; trace fine subangular to sub-rounded sand; stage I caliche (2.0'-10.0').	↑							
	1													
	2													
	3	1												
	4		[Diagonal hatching pattern]	SC	medium dense	CLAYEY SAND, dark brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some medium plastic clay; trace fine gravel.	vertical walls stable							
	5													
	6													
	7	2												
	8													
	9													
	10	3				TOTAL DEPTH 10.0' (3.0m)	↓							

SURFACE ELEVATION: 5010' (1527m)
 SURFICIAL GEOLOGIC UNIT: A1/A4o

LOG OF TEST PIT MD-P-12 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-4-12

FUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS								
							BR	SA	FI	LL	PI				
	0	[Diagonal hatching pattern]	CL	firm	CLAY, brown, slightly moist, medium plastic, calcareous; trace fine subangular to subrounded sand; stage I caliche (2.0'-10.0').	↑									
	1														
	2														
	3														
	4	[Diagonal hatching pattern]	SC	medium dense	CLAYEY SAND, dark brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some medium plastic clay; little fine gravel.	vertical walls stable									
	5														
	6														
	7														
	8														
	9														
	10				TOTAL DEPTH 10.0' (3.0m)	↓									

SURFACE ELEVATION: 5010' (1527m)
SURFICIAL GEOLOGIC UNIT: A1/A3

LOG OF TEST PIT MD-P-13
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-13

USBR NATIONAL INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0	[Diagonal hatching pattern]	CL	firm	SILTY CLAY, brown, slightly moist, slightly plastic, calcareous; trace fine subangular to subrounded sand; stage I caliche (2.0'-10.0').	vertical wells stable							
	1	1												
	2	2												
	3	3												
	4	4	[Dotted hatching pattern]	SC	CLAYEY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some medium plastic clay; little fine gravel.					29	11			
	5	5												
	6	6												
	7	7												
	8	8												
	9	9												
	10	10				TOTAL DEPTH 10.0' (3.0m)								

SURFACE ELEVATION: 4990' (1521m)
 SURFICIAL GEOLOGIC UNIT: A4o.A1

LOG OF TEST PIT MD-P-14
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - INO

FIGURE
 II-4-14

FUGRO NATIONAL, INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Diagonal hatching pattern]	SC	medium dense	CLAYEY SAND, light brown, fine, poorly graded, slightly moist, subangular to sub-rounded, calcareous; some slightly plastic clay.	↑ vertical walls stable					
	1											
	2											
	3											
	4	4	[Dotted pattern]	SM	loose	SILTY SAND, light brown, fine, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt.	↑ vertical walls caving					
	5											
	6											
	7											
	8											
	9											
	10	10	TOTAL DEPTH 10.0' (3.0m)									

SURFACE ELEVATION: 5000' (1524m)
 SURFICIAL GEOLOGIC UNIT: A4o/A1

**LOG OF TEST PIT MD-P-15
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-4-15
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FUBRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0		SM	medium dense	Interbedded layers of SANDY GRAVEL and GRAVELLY SAND:								
		1				SANDY GRAVEL (GW-GM): light brown, fine to coarse, well graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace slightly plastic silt; stage II caliche (2.0'-4.0').								
		2		GW-GM	dense	GRAVELLY SAND (SM, SC): light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; little to some slightly plastic clay and silt; stage I caliche (4.0'-10.0').								
		3												
	1	4												
		5		SC	medium dense		vertical walls stable							
		6												
	2	7												
		8		SM	dense									
		9												
	3	10												
						TOTAL DEPTH 10.0' (3.0m)								

SURFACE ELEVATION: 5120' (1561m)
 SURFICIAL GEOLOGIC UNIT: A5y/A5i

LOG OF TEST PIT MD-P-16
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II - 4 - 16

FUGRO NATIONAL, INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace to little slightly plastic silt; stage II caliche (1.0'-8.0').	↑					
	1											
	2											
	3											
	4	1	[Dotted pattern]	SW-SM	medium dense		vertical wells stable					
	5											
	6											
	7											
	8	2	[Dotted pattern]	SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt.	↓					
	9											
	10											
	10	3										
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5200' (1585m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-17 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-4-17
VERO NATIONAL, INC.	

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS					
	METERS	FEET						BR	SA	FI	LL	PI	
	0	0	[Dotted pattern]	SM	loose	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little fine to coarse gravel; little slightly plastic silt; stage I caliche (1.0'-3.0').	vertical wells unstable						
	1												
	2												
	3	1	[Dotted pattern]	GP-GC	dense	SANDY GRAVEL, dark brown, fine to coarse, poorly graded, dry, subangular, calcareous; little medium to coarse subangular to subrounded sand; trace medium plastic clay; stage II caliche (3.0'-10.0').	vertical wells stable	74	19	7			
	4												
	5												
	6												
	7												
	8												
	9												
	10	3											
TOTAL DEPTH 10.0' (3.0m)													

SURFACE ELEVATION: 5400' (1646m)
 SURFICIAL GEOLOGIC UNIT: A51

LOG OF TEST PIT MD-P-19
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - MDO

FIGURE
II-4-19

FUSRO NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Diagonal hatching pattern]	SC	medium dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, slightly moist to moist, subangular to subrounded, calcareous; some fine to coarse gravel; little to some medium plastic clay; stage II caliche (2.0'-10.0'); trace cobbles to 12" size (3.5'-6.0').	vertical walls stable	27	44	29		
	1											
	2											
	3											
	4	1			dense							
	5											
	6		[Circular pattern]	GC	dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse sand; little medium plastic clay.		54	31	15		
	7											
	8											
	9											
	10	3				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5180' (1573m)
 SURFICIAL GEOLOGIC UNIT: A5i

**LOG OF TEST PIT MD-P-20
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DND

FIGURE
 II - 4 - 20

FUGRO NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

DULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS					
	METERS	FEET						BR	SA	FI	LL	PI	
	0	0	[Dotted pattern]	SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt; stage I caliche (1.0'-4.0').	↑						
		1											
		2											
		3											
	1	4	[Dotted pattern with larger circles]	GM	dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse sand; trace to little slightly plastic silt; stage II caliche (4.0'-10.0'); trace cobbles to 12" size.	vertical walls stable						
		5											
		6											
	2	7	[Dotted pattern with larger circles]	GP	dense		↓						
		8											
		9											
		10											
	3					TOTAL DEPTH 10.0' (3.0m)							

SURFACE ELEVATION: 5050' (1539m)
 SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT MD-P-21
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - MO

FIGURE
II-4-21

FUGRO NATIONAL, INC.

20 FEB 91

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0		GP-GM	medium dense	<p>SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry to slightly moist, sub-angular to subrounded, calcareous; some fine to coarse sand; trace slightly plastic silt; stage I caliche (1.0'-8.0'); trace cobbles to 9" size.</p>	<p>vertical walls stable</p>							
	1	1												
	2	2												
	3	3												
	4	4												
	5	5												
	6	6												
	7	7												
	8	8												
	9	9												
	10	10												
TOTAL DEPTH 10.0' (3.0m)														

SURFACE ELEVATION: 5080' (1542m)
 SURFICIAL GEOLOGIC UNIT: A5y

**LOG OF TEST PIT MD-P-22
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II - 4 - 22

USARO NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; little slightly plastic clay; stage II caliche (1.0'-4.0' and 7.5'-10.0'); stage I caliche (4.0'-7.5').	vertical walls stable					
	1	1										
	2	2										
	3	3										
	4	4										
	5	5										
	6	6										
	7	7										
	8	8										
	9	9										
	10	10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5030' (1511m)
 SURFICIAL GEOLOGIC UNIT: A51

LOG OF TEST PIT MD-P-23
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MAXIMIZING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-4-23

FURRO NATIONAL, INC.
 USAF

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Diagonal hatching pattern]	SC	medium dense	CLAYEY SAND, brown, fine to medium, poorly graded, moist, subangular to sub-rounded, calcareous; some medium plastic clay.	↑					
	1											
	2											
	3	1										
	4		[Diagonal hatching pattern]	CL-ML	firm	SILTY CLAY-CLAYEY SILT, brown, moist, slightly plastic, calcareous; trace fine sub-angular to sub-rounded sand.	vertical walls stable ↓					
	5											
	6											
	7	2										
	8											
	9											
	10	3										
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5020' (1508m)
 SURFICIAL GEOLOGIC UNIT: A5y/A4o

**LOG OF TEST PIT MD-P-24
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 080

FIGURE
II - 4 - 24

USRO NATIONAL, INC.
 USAF-

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	medium dense	SILTY SAND, brown, fine, poorly graded, moist, subangular to subrounded, calcareous; some nonplastic silt.	↑	0	56	44	NP	
	1											
	2											
	3	1	[Diagonal lines]	CL	firm	SANDY CLAY, brown, moist, medium plastic, calcareous; little fine sand.	vertical wells stable	0	67	33		
	4											
	5											
	6	2	[Diagonal lines]	SC	dense	CLAYEY SAND, light brown, fine, poorly graded, moist, subangular to subrounded, calcareous; some medium plastic clay.	↓	0	67	33		
	7											
	8											
	9	3				TOTAL DEPTH 10.0' (3.0m)						
	10											

SURFACE ELEVATION: 5020' (1508m)
 SURFICIAL GEOLOGIC UNIT: A5y/A4o

LOG OF TEST PIT MD-P-25
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II - 4 - 25

FURRO NATIONAL, INC.

20 FEB 81

USAF-2

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS								
	METERS	FEET						GR	SA	FI	LL	PI				
	0	0	[Hatched pattern]	CL	firm	CLAY, brown, moist, slightly plastic, calcareous; trace fine subangular to sub-rounded sand.	↑ vertical walls stable ↓									
	1	1														
	2	2														
	3	3														
	4	4														
	5	5														
	6	6														
	7	7														
	8	8														
	9	9														
	10	10														
						TOTAL DEPTH 10.0' (3.0m)										

SURFACE ELEVATION: 5010' (1506m)
 SURFICIAL GEOLOGIC UNIT: A5y/A4o

LOG OF TEST PIT MD-P-26
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II - 4 - 26

FURRO NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Pattern: Interbedded layers of sand and silt]	SM	medium dense	Interbedded layers of SANDY GRAVEL and SILTY SAND: SANDY GRAVEL (GW-GM): light brown, fine to coarse, well graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace silt; stage II caliche (1.0'-2.5').	↑	3	65	32		
	1	1		GW-GM	medium dense			SILTY SAND (SM): light brown, fine to coarse, poorly graded, slightly moist to moist, subangular to subrounded, calcareous; little to some nonplastic silt; trace to little fine to coarse gravel; stage I caliche (2.5'-10.0').	52	40	8	
	2	2	[Pattern: Silty sand]				vertical walls stable	4	69	27		
	3	1		SM	medium dense							
	4	4										
	5	5										
	6	6										
	7	2										
	8	8										
	9	9										
	10	3										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5040'(1514m)
SURFICIAL GEOLOGIC UNIT: A5i/A4o

LOG OF TEST PIT MD-P-27
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 010

FIGURE
II-4-27

UGRO NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; little fine to coarse gravel; little nonplastic silt.	vertical walls stable					
	1	1				SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; stage II caliche (1.0'-10.0').						
	2	2		GP	medium dense							
	3	3										
	4	4										
	5	5										
	6	6										
	7	7		SC	medium dense	CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic clay; trace fine gravel.		5	58	37		
	8	8										
	9	9										
	10	10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5100' (1532m)
 SURFICIAL GEOLOGIC UNIT: A5i

**LOG OF TEST PIT MD-P-28
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II - 4 - 28

TUGRO NATIONAL, INC.

USAF-21

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						BR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some nonplastic silt; trace fine gravel; stage I caliche (1.0'-6.0').	vertical walls stable 	6	70	24		
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8	8		SP	loose	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel.	vertical walls caving 					
	9											
	10											
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5100' (1532m)
 SURFICIAL GEOLOGIC UNIT: A5i/A5y

LOG OF TEST PIT MD-P-29
 OPERATIONAL BASE SITE
 MILFORD, UTAH

WX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 220

FIGURE
 II - 4 - 29

FUGRO NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Diagonal hatching pattern]	SC	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist to moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; trace to little slightly to medium plastic clay; stage II caliche (1.0'-5.0'); stage I caliche (5.0'-10.0').	↑ vertical walls stable					
	1											
	2											
1	3											
	4											
	5		[Dotted pattern]	SP-SC	dense	TOTAL DEPTH 10.0' (3.0m)	↓ vertical walls unstable					
	6											
2	7											
	8											
	9		SP	loose								
	10											
3												

SURFACE ELEVATION: 5160' (1550m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-30
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II - 4 - 30

FUGRO NATIONAL, INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						BR	SA	FI	LL	PI
	0	0	GRAVELLY SAND, light brown, fine to coarse, poorly to well graded, slightly moist to moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace slightly plastic clay; stage II caliche (1.0'-4.5'); stage I caliche (4.5'-10.0').			GRAVELLY SAND, light brown, fine to coarse, poorly to well graded, slightly moist to moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace slightly plastic clay; stage II caliche (1.0'-4.5'); stage I caliche (4.5'-10.0').	vertical walls stable					
		1										
		2		SP-SC	dense							
		3										
	1	4										
		5										
		6		SW	medium dense							
	2	7										
		8										
		9		SW-SC	dense							
	3	10										
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5280' (1587m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-31
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DND

FIGURE
 II-4-31

FUGRO NATIONAL, INC.

USAF

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS							
	METERS	FEET						GR	SA	FI	LL	PI			
	0	0	GRAVELLY SAND, light brown to brown, fine to coarse, poorly graded, dry to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace nonplastic silt; stage II caliche (1.0'-10.0').	SP-SM	dense	GRAVELLY SAND, light brown to brown, fine to coarse, poorly graded, dry to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace nonplastic silt; stage II caliche (1.0'-10.0').	vertical walls stable								
		1													
		2													
		3													
	1	4													
		5													
		6													
	2	7								medium dense					
		8													
		9								dense					
	3	10													
						TOTAL DEPTH 10.0' (3.0m)									

SURFACE ELEVATION: 5440' (1635m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-32
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 010

FIGURE
 II-4-32

FUGRO NATIONAL, INC.

USAF-

FN-TR-44

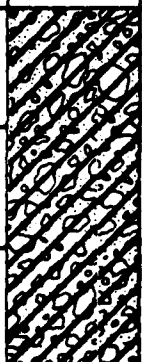
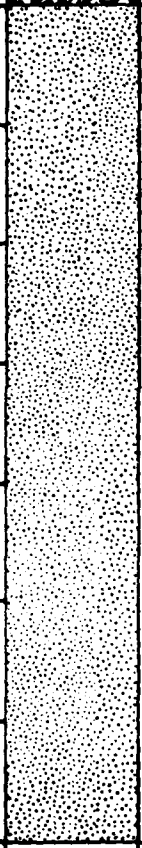
BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						BR	SA	FI	LL	PI
	0	0		GP. GM	dense	SANDY GRAVEL, gray, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace silt; stage II caliche (1.0'-8.0').	↑					
	1							52	40	8		
	2											
	3	1		SM	dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some nonplastic silt; some fine to coarse gravel; stage III caliche (6.0'-7.0').	vertical walls stable					
	4							22	45	33		
	5											
	6											
	7	2								very dense		
	8					TOTAL DEPTH 7.0' (2.1m)						
	9						cementation at 7.0' exceeded capacity of Case 580C backhoe					
	10	3										

SURFACE ELEVATION: 5440' (1635m)
 SURFICIAL GEOLOGIC UNIT: A51

LOG OF TEST PIT MD-P-33 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DND	FIGURE II-4-33
FUGRO NATIONAL, INC.	
USAF-	

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		GC	dense	CLAYEY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, sub-angular to subrounded, calcareous; some medium plastic clay; some fine to coarse sand; stage II caliche (1.0'-10.0').	↑					
	1							34	32	34		
	2											
	3	3		medium dense	dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, moist, subangular to sub-rounded, calcareous; some fine to coarse gravel; trace silt.	vertical walls stable					
	4											
	5											
	6											
	7	2		SP-SM								
	8											
	9											
	10	3										
TOTAL DEPTH 10.0' (3.0m).												

SURFACE ELEVATION: 5340' (1606m)
 SURFICIAL GEOLOGIC UNIT: A5i

**LOG OF TEST PIT MD-P-34
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - 810	FIGURE II-4-34
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TUBRO NATIONAL, INC.
 USAF-2

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt; stage II caliche (1.0'-3.0').	↑ vertical walls stable					
		1						4	67	29		
		2										
		3	[Dotted pattern]	SW-SM	dense	GRAVELLY SAND, light brown, fine to coarse, well graded, slightly moist, subangular to subrounded, calcareous; little fine gravel; trace silt; stage I caliche (3.0'-10.0').	↓ vertical walls stable					
		4						20	72	8		
		5			loose		↑ sloughing					
		6										
		7			dense	↑ vertical walls stable						
		8										
		9										
		10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5200' (1562m)
 SURFICIAL GEOLOGIC UNIT: A5i/A5v

**LOG OF TEST PIT MD-P-35
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II - 4 - 38

UGRO NATIONAL, INC.

USAF-

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SP-SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist to moist; subangular to subrounded, calcareous; some fine to coarse gravel; trace nonplastic silt to medium plastic clay; stage II caliche (1.0'-10.0').	vertical walls stable					
	1	1										
	2	2										
	3	3										
	4	4										
	5	5		SP-SC	dense							
	6	6										
	7	7										
	8	8										
	9	9										
	10	10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5200'(1562m)
 SURFICIAL GEOLOGIC UNIT: A5i/A5y

**LOG OF TEST PIT MD-P-36
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 2ND

FIGURE
II - 4 - 36

TUBRO NATIONAL INC.

USAF

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SP	loose	Interbedded layers of SANDY GRAVEL and GRAVELLY SAND: SANDY GRAVEL (GP): light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse sand. GRAVELLY SAND (SP): gray to light brown fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; stage I caliche (1.0'-10.0').	vertical walls unstable					
	1											
	2											
	3	1	[Large dots pattern]	GP	medium dense		vertical walls stable	61	35	4		
	4											
	5											
	6											
	7											
	8											
	9											
	10	3	[Dotted pattern]	SP	medium dense							
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5200' (1582m)
 SURFICIAL GEOLOGIC UNIT: A5i/A5y

**LOG OF TEST PIT MD-P-37
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - 010	FIGURE II - 4 - 37
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FURD NATIONAL INC.

USAF-

20 FEB 81

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS							
	METERS	FEET						GR	SA	FI	LL	PI			
	0	0	[Diagonal hatching pattern]	SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, moist, subangular to sub-rounded, calcareous; some medium plastic clay, stage II caliche (1.0'-2.0'); stage I caliche (2.0'-10.0').	↑	4	57	39					
	1	1													
	2	2													
	3	3	[Dotted pattern]	SP	medium dense	GRAVELLY SAND, gray, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel.	vertical walls stable								
	4	4													
	5	5													
	6	6													
	7	7													
	8	8													
	9	9													
	10	10													
TOTAL DEPTH 10.0' (3.0m)															

SURFACE ELEVATION: 5240' (1575m)
 SURFICIAL GEOLOGIC UNIT: A5i

**LOG OF TEST PIT MD-P-38
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DND	FIGURE II - 4 - 38
--	------------------------------

JORD NATIONAL INC.

USAF-2

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0	[Dotted pattern]	SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt; trace fine gravel; stage II caliche (1.0'-10.0').	↑ vertical wells stable ↓	7	62	31				
	1													
	2													
	3													
	4													
	5		[Dotted pattern]	SP-SM	medium dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; trace to some fine to coarse gravel; trace nonplastic silt to little medium plastic clay.								
	6													
	7													
	8		[Diagonal hatching]	SC	dense									
	9													
	10				TOTAL DEPTH 10.0' (3.0m)									

SURFACE ELEVATION: 5300' (1593m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-39 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II - 4 - 39
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USAF-8	

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Diagonal hatching pattern]	SC	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; little medium plastic clay and slightly plastic silt; stage II caliche (1.0'-10.0').	↑					
	1	1						25	61	14		
	2	2										
	3	3	[Dotted pattern]	SM	dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic silt; trace fine gravel.	vertical walls stable					
	4	4										
	5	5										
	6	6										
	7	7	[Dotted pattern]	SM	dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic silt; trace fine gravel.	↓					
	8	8										
	9	9										
	10	10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5185' (1552m)
 SURFICIAL GEOLOGIC UNIT: A5i

**LOG OF TEST PIT MD-P-40
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II - 4 - 40
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USAF-2

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						BR	SA	FI	LL	PI		
	0	0	[Diagonal hatching pattern]	SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some medium plastic clay; stage II caliche (1.0'-10.0').	↑							
		1										1	70	29
		2												
	1	3	[Dotted pattern]	SP-SC	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace medium plastic clay to slightly plastic silt.	vertical wells stable							
		4												
		5												
	2	6												
		7												
		8	[Dotted pattern]	SP-SM	dense		↓							
		9												
	3	10				TOTAL DEPTH 10.0' (3.0m)								

SURFACE ELEVATION: 5110' (1535m)
 SURFICIAL GEOLOGIC UNIT: A5i/A4a

**LOG OF TEST PIT MD-P41
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II - 4 - 41
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USAF-3

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						BR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some slightly to medium plastic silt; trace to some fine to coarse gravel; stage I caliche (1.0'-5.0').	vertical walls stable					
	1							27	41	32		
	2											
	3	1										
	4											
	5			GW-GM	dense	SANDY GRAVEL, light brown, fine to coarse, well graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse sand; trace silt; stage II caliche (5.0'-10.0'); trace cobbles to 12" size.	vertical walls stable					
	6							51	37	12		
	7	2										
	8											
	9											
	10	3										
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5210' (1568m)
 SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT MD-P-42
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 880

FIGURE
 II - 4 - 42

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20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Dotted pattern]		medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, moist, subangular to sub-rounded, calcareous; little slightly plastic silt; trace fine to coarse gravel; stage I caliche (1.0'-2.0'); stage II caliche (2.0'-10.0').	↑ vertical wells stable ↓					
		1										
		2										
		3										
	1	4		SM	dense							
		5										
		6										
		7										
	2	8	SP	medium dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel.							
		9										
		10										
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5250' (1575m)
 SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT MD-P-43 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-4-43
FUGRO NATIONAL, INC. USAF	

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	F1	LL	PI
	0	0	GRAVELLY SAND	SM	medium dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, sub-angular to subrounded, calcareous; little fine to coarse gravel; little nonplastic silt; stage I caliche (1.0'-2.5'); stage II caliche (2.5'-10.0'); occasional cobbles to 12" size.	vertical walls stable					
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5300' (1593m)
 SURFICIAL GEOLOGIC UNIT: A5i

**LOG OF TEST PIT MD-P-44
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II - 4 - 44

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20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[stippled pattern]	SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, moist, subangular to sub-rounded, calcareous; little slightly plastic silt; trace fine gravel; stage II caliche (1.0'-10.0').	vertical walls stable					
	1	1										
	2	2										
	3	3	[stippled pattern]	SP	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel.							
	4	4										
	5	5										
	6	6										
	7	7										
	8	8										
	9	9										
	10	10										
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5330' (1602m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-45
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DND

FIGURE
 II-4-45

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20 FEB 81

USAF-27

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS									
	METERS	FEET						GR	SA	FI	LL	PI					
	0	0		SC	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel; little medium plastic clay to trace silt; stage II caliche (1.0'-6.5'); stage I caliche (6.5'-10.0').	vertical wells stable										
	1	1						34	46	20							
	2	2															
	3	3															
	4	4															
	5	5															
	6	6															
	7	7							SP	medium dense							
	8	8															
	9	9															
	10	10															
						TOTAL DEPTH 10.0' (3.0m)											

SURFACE ELEVATION: 5450' (1638m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-46
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 6MO

FIGURE
 II - 4 - 46

JUBRO NATIONAL, INC.

20 FEB 81

USAF-2

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS					
	METERS	FEET						GR	SA	F1	LL	PI	
	0	0		GP-GM	medium dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse sand; trace nonplastic silt; stage I caliche (1.0'-10.0'); occasional cobbles to 6" size.	vertical walls stable	66	27	7			
	1	2											
		3		SM	medium dense	GRAVELLY SAND, light brown to grey, fine to coarse, poorly graded, slightly moist to moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; occasional to little slightly plastic silt.							
	4	5											
	6	8											
		7		SP	medium dense								
	8	9											
	10												
						TOTAL DEPTH 10.0' (3.0m)							

SURFACE ELEVATION: 5350' (1608m)
 SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT MD-P-47
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-4-47

JUBRO NATIONAL, INC.

20 FEB 81

USAF-3

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS					
	METERS	FEET						GR	SA	FI	LL	PI	
	0	0	[Stippled pattern]	SM	medium dense	SILTY SAND, light brown, fine to medium, poorly graded, slightly moist, subangular to subrounded, calcareous; some nonplastic silt; occasional cobbles and boulders at 10.0'.	↑ vertical walls stable ↓	1	74	25			
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	8												
	9												
	10												
						TOTAL DEPTH 10.0' (3.0m)							

SURFACE ELEVATION: 5340' (1628m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT BL-P-15
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 010

FIGURE
II-4-48

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20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Diagonal hatching pattern]	SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some slightly plastic clay; stage III caliche (1.0'-3.5').	vertical well stable					
	1											
	2											
	3											
	4	1	[Dotted pattern]	SP	dense	GRAVELLY SAND, dark brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse gravel.						
	5											
	6											
	7	2										
	8											
	9											
	10	3										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5490' (1670m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT BL-P-16 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-4-49
FUGRO NATIONAL, INC.	

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Diagonal hatching pattern]	SC	dense	CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist, angular to subangular, calcareous; some medium plastic clay; little fine gravel; stage III caliche (1.0'-2.5'); trace cobbles to 6" size.	↑ vertical walls stable	13	53	34		
	1											
	2											
	3											
	4											
	5		[Dotted pattern]	SP	medium dense	GRAVELLY SAND, dark brown, fine to coarse, poorly graded, dry, angular to sub-angular, calcareous; some fine to coarse gravel; trace cobbles to 10" size.	↑ vertical walls unstable					
	6											
	7											
	8											
	9											
	10		TOTAL DEPTH 10.0 (3.0m)									

SURFACE ELEVATION: 5600' (1707m)
SURFICIAL GEOLOGIC UNIT: A6i

LOG OF TEST PIT BL-P-17 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DND	FIGURE II-4-50
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20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						RR	SA	FI	LL	PI
	0	0	[Dotted pattern]	SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to sub-rounded, calcareous; some nonplastic silt.	vertical walls stable					
	1	1										
	2	2										
	3	3										
	4	4	[Dotted pattern]	SP	GRAVELLY SAND, dark brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine gravel; stage III caliche (3.5'-6.0').							
	5	5										
	6	6										
	7	7										
	8	8										
	9	9										
	10	10										
TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5350' (1631m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT BL-P-18 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-4-51
USARO NATIONAL INC.	

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS					
	METERS	FEET						GR	SA	FI	LL	PI	
	0	0	[Diagonal hatching pattern]	SC	dense	CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic clay; stage II caliche (1.5'-4.5').	vertical walls stable						
		1											
		2											
		3											
	1	4											
		5	[Dotted pattern]	SP	dense	GRAVELLY SAND, dark brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse subangular gravel; occasional cobbles to 6" size.							
		6											
		7											
		8											
	2	9											
		10											
						TOTAL DEPTH 10.0' (3.0m)							

SURFACE ELEVATION: 5300' (1615m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT BL-P-19 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - 200	FIGURE II-4-52
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20 FEB 81

98AF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little nonplastic silt; trace gravel.	vertical walls stable					
	1											
	2											
	3											
	4											
	5	5				TOTAL DEPTH 5.0' (1.5m)	rock at 5.0' exceeded capacity of case 580 C backhoe					
	6											
	7											
	8											
	9											
	10											

SURFACE ELEVATION: 5440' (1658m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT BL-P-20 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - 000	FIGURE II-4-53
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20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS					
	METERS	FEET						GR	SA	FI	LL	PI	
	0	0				SILTY SAND, light brown, fine to medium, poorly graded, moist, subangular to sub-rounded, calcareous; some nonplastic silt; stage II caliche (2.0'-5.0').	 vertical walls stable						
		1											
		2											
		3											
	1												
		4											
		5			SM			medium dense					
		6											
	2												
		7											
		8											
		8											
		9											
		10											
						TOTAL DEPTH 10.0' (3.0m)							

SURFACE ELEVATION: 5200' (1584m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT BL-P-21
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-4-54

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20 FEB 81

USAF-24

SECTION 5.0
EXPLANATION OF
LABORATORY TEST RESULTS

5.0 EXPLANATION OF LABORATORY TEST RESULTS

Laboratory test results are presented in this section. Table II-5-1 contains a summary of laboratory test results. This table contains results of sieve analysis; plasticity data; in-situ dry unit weight, moisture content, degree of saturation, and void ratio for drive and Pitcher samples; results of compaction tests; and specific gravity of solids. Other tests such as triaxial compression, unconfined compression, direct shear, consolidation, chemical, and California Bearing Ratio (CBR) are indicated on the table. Tables II-5-2 through II-5-4 and Figures II-5-1 through II-5-5 present results of triaxial compression, unconfined compression, direct shear, consolidation, chemical, and CBR tests.

All tests were performed in general accordance with the American Society for Testing and Materials (ASTM) procedures. The following list presents the ASTM designations for the tests performed during the investigation.

<u>Type of Test</u>	<u>ASTM Designations</u>
Particle Size Analysis	D 422-63
Liquid Limit	D 423-66
Plastic Limit	D 424-59
Unit Weight	D 2937-71
Moisture Content	D 2216-71
Compaction	D 1557-70
Specific Gravity of Solids	D 854-58
Triaxial	D 2850-70
Unconfined Compression	D 2166-66
Direct Shear	D 3080-72
Consolidation	D 2435-70
Test for Alkalinity (pH)	D 1067-70
Water Soluble Sodium	D 1428-64
Water Soluble Chloride	D 512-67
Water Soluble Sulphate	D 516-68
Water Soluble Calcium	D 511-72
Calcium Carbonate	D 1126-67
California Bearing Ratio (CBR)	D 1883-73

Explanation for the tables and figures presented in this section are as follows:

- A. Activity Number - Boring, trench, or test pit sample designation.
- B. Sample Number - Prefix indicates the type of sample; explanation is at the bottom of the table.
- C. Sample Interval - This is the depth range measured from ground surface over which the sample was obtained.
- D. Percent Finer by Weight - Presents the results of laboratory particle-size analysis (ASTM D 422-63) performed on representative soil samples at the depth indicated. The numbers represent the percent (by dry weight) of the total sample weight passing through each sieve size indicated.
- E. Atterberg Limits (ASTM D 423-66 and D 424-59) -
 - LL - Liquid Limit, the water content (as percent of soil dry weight) corresponding to the arbitrary limit between the liquid and plastic states of consistency of a soil (ASTM D 423-66).
 - PL - Plastic Limit, the water content corresponding to an arbitrary limit between the plastic and the semisolid state of consistency of a soil (ASTM D 424-59).
 - PI - Plasticity Index, numerical difference between the liquid limit (LL) and the plastic limit (PL) indicating the range of moisture content within which a soil-water mixture is plastic.
 - NP - Nonplastic.
- F. USCS - Unified Soil Classification Symbols are given here; see Table II-2-1 in Section 2.0, "Boring Logs", for complete details of USCS system.

G. In Situ - Presents results of tests on drive and Pitcher samples.

Dry Unit Weight - indicates dry unit weight of soil determined as per ASTM D 2937-71.

Moisture Content - weight of water reported in percent of dry weight of soil sample (ASTM D 2216-71).

Saturation - the degree of saturation in a soil sample is defined as the ratio (in percent) of the volume of water to the volume of all voids in the soil.

Void Ratio - the numerical ratio of the volume of voids to the volume of solids in a soil specimen.

H. Compacted - Indicates results of laboratory maximum dry density and optimum moisture content test as per ASTM D 1557-70.

I. Specific Gravity of Solids (ASTM D 854-58) - Indicates the ratio of 1) the weight in air of a given volume of soil solids at a stated temperature, to 2) the weight in air of an equal volume of distilled water at a stated temperature.

J. Triaxial - The triaxial compression tests were performed in accordance with the procedures of ASTM D 2850-70. The following explanations and definitions apply.

Triaxial Compression Test - a cylindrical specimen of soil is surrounded by a fluid in a pressure chamber and subjected to an isotropic pressure. An additional compressive load is then applied, directed along the axis of the specimen called the axial load.

Consolidated-Drained (CD) Test - a triaxial compression test in which the soil was first consolidated under an all-around confining stress (test chamber pressure) and was then compressed (and hence sheared) by increasing the vertical stress. "Drained" indicates that excess pore water

pressure generated by strains is permitted to dissipate by the free movement of pore water during consolidation and compression.

Consolidated-Undrained (CU) Test - a triaxial compression test in which essentially complete consolidation under the confining (chamber) pressure is followed by a shear test at constant water content.

Confining Pressure (σ_3) - the isotropic chamber pressure applied to the soil specimen during consolidation and compression.

Maximum Deviator Stress ($\sigma_1 - \sigma_3$) - the difference between the major and minor principal stresses in the specimen at failure. The major principal stress on the specimen is equal to the unit axial load plus the chamber pressure, and the minor principal stress on the specimen is equal to the chamber pressure.

Strain Rate - axial strain, ϵ , at a given stress level is defined as the ratio of the change in length (ΔL) of the specimen to the original length of the specimen (L_0). The rate of strain was controlled during the test so that this ratio increased at equal increments for each minute of testing.

Back Pressure - pressure in excess of atmospheric applied to the pore water of a soil sample. Back pressure is usually applied to 1) increase saturation of the sample, or 2) simulate the actual in situ pressure regime.

- K. Unconfined Compression - Test procedures were as described in ASTM D 2166-66. Unconfined compressive strength is defined as the load per unit area at which an unconfined prismatic or cylindrical specimen of soil will fail in a simple compression test. In these methods, unconfined compressive strength is taken as the maximum load attained per unit area or the load per unit area at 20 percent axial strain, whichever occurred first during the performance of a test.
- L. Direct Shear - The procedures of ASTM D 3080-72 were followed for direct shear testing. In this test, soil under an

applied normal load is stressed to failure by moving one section of the soil container (shear box) relative to the other section. Normal stress is the value of load per unit area acting perpendicular to the plane of shearing. Maximum shear strength is defined as the maximum resistance (ksf) of a soil to shearing (tangential) stresses.

- M. Consolidation (ASTM D 2435-70) - A consolidation test is a test in which a cylindrical soil specimen is laterally confined in a ring and compressed between porous plates. The term "consolidation", as used here, indicates the gradual reduction in volume of the soil mass resulting from an increase in compressive stress (axial load per unit area).
- N. Chemical - The chemical tests performed on soil samples included: pH; water soluble sodium, chloride, sulphate, calcium; and calcium carbonate content. pH is an index of the acidity or alkalinity of a soil in terms of the logarithm of the reciprocal of the hydrogen ion concentration. ASTM test procedure designations for these chemical tests are included in the list on the first page of these Explanations.
- O. CBR - California Bearing Ratio (CBR) is the ratio (in percent) of the resistance to penetration developed by a sub-grade soil to that developed by a standard crushed-rock base material. The procedures for conducting a CBR test were as outlined in ASTM D 1883-73. The materials tested

for CBR were also analyzed for particle-size distribution (ASTM D 422-63) and compaction characteristics (ASTM D 1557-70). The term "percentage of maximum density" indicates the ratio (as a percentage) of the compacted sample dry unit weight to maximum dry density obtained in the laboratory from ASTM D 1557-70, "Moisture-Density Relations of Soils Using 10-Pound (4.5-kg) Hammer and 18-inch (457-mm) Drop."

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT															
				STANDARD SIEVE OPENING						U S STANDARD SIEVE									
				BLDRS.		COBBLES		GRAVEL		SAND									
				24"	12"	8"	3"	1½"	¾"	⅜"	4	10	40	100					
		FEET	METERS																
MD-B-1	D-2	1.7 - 2.5	0.52 - 0.76																
	D-4	4.2 - 5.0*	1.28 - 1.52								100	97	90	51	23				
	D-7	8.2 - 9.0	2.50 - 2.74																
	D-9	15.2 - 16.0	4.63 - 4.88					100	91	86	75	62	29	11					
	D-11	22.2 - 23.0	6.77 - 7.01							100	93	85	68	26	12				
	D-12	28.2 - 29.0	8.60 - 8.84																
	D-13	32.2 - 33.0	9.81 - 10.06																
	D-14	37.2 - 38.0	11.34 - 11.58					100	90	82	72	60	27	12					
	D-15	41.2 - 42.0	12.56 - 12.80																
	D-16	45.2 - 46.0	13.78 - 14.02																
P-17	49.6 - 50.2	15.12 - 15.30									100	97	45	14					
P-17	49.6 - 50.2	15.12 - 15.30																	
MD-B-2	D-2	1.5 - 2.3	0.46 - 0.70																
	D-3	3.7 - 4.5	1.13 - 1.37							100	78	65	51	30	18				
	D-4	6.2 - 7.0	1.89 - 2.13							100	87	75	63	48	35				
	D-5	10.2 - 11.0	3.11 - 3.35																
	D-6	15.2 - 16.0	4.63 - 4.88																
	D-7	20.2 - 21.0	6.16 - 6.40																
	D-8	25.2 - 26.0	7.68 - 7.92					100	98	94	81	63	23	13					
	D-9	30.2 - 31.0	9.20 - 9.45																
	D-10	35.2 - 36.0	10.73 - 10.97																
	D-11	40.2 - 41.0	12.25 - 12.50					100	92	86	82	77	56	39					
D-13	50.2 - 51.0	15.30 - 15.54																	
MD-B-3	P-1	1.7 - 2.5	0.52 - 0.76																100
	P-4	6.2 - 7.0	1.89 - 2.13																100
	P-4	6.2 - 7.0	1.89 - 2.13																100
	P-7	10.5 - 11.1	3.20 - 3.38																100
	P-7	10.5 - 11.1	3.20 - 3.38																100
	P-7	11.1 - 11.7	3.38 - 3.57																100
	P-8	15.0 - 15.8	4.57 - 4.82									100	98	93	72				
	P-9	19.5 - 20.3	5.94 - 6.19																
	P-10	24.1 - 24.9	7.35 - 7.59																
	P-10	24.9 - 25.5	7.59 - 7.77																
	P-11	29.7 - 30.5	9.05 - 9.30										100	60	30				
	P-11	29.7 - 30.5	9.05 - 9.30										100	78	30				
	P-12	36.2 - 36.8	11.03 - 11.22																
	P-12	36.2 - 36.8	11.03 - 11.22										100	97	80				
P-13	40.2 - 41.0	12.25 - 12.50																	
P-13	41.0 - 41.8	12.50 - 12.74																	
P-14	45.0 - 45.8	13.72 - 13.96																	
P-14	45.0 - 45.8	13.72 - 13.96																100	

NOTES:

- (a) Sample types
 - SS - Standard split spoon
 - P - Pitcher
 - D - Fugro Drive
 - B, b - Bulk
- (b) NP - Not Plastic
- (c) USCS - Unified Soil Classification System
- (d) * Indicates that test has been performed and results are included in this report

											SC	107.2	1717	8.9	42.3	0.57	
90	97	90	51	23	16						SC	103.1	1650	10.8	46.1	0.63	
											SC	113.5	1818	4.7	26.0	0.49	
86	75	62	29	11	7						SP-SM	117.8	1887	9.5	59.9	0.43	
83	85	68	26	12	9						SW-SM	112.5	1802	6.4	34.9	0.50	
											SW-SM	110.4	1767	5.6	28.7	0.53	
											SW-SM	111.7	1789	4.9	28.8	0.51	
82	72	60	27	12	8						SP-SM	118.6	1900	8.9	57.0	0.42	
											SP-SM	109.7	1757	5.6	28.0	0.54	
											SM	109.	1754	17.8	89.2	0.54	
	100	97	45	14	9						SW-SM	109.6	1756	11.1	55.8	0.54	
											SW-SM	103.0	1650	7.9	33.4	0.64	
											SM	89.8	1439	7.5	23.1	0.88	
78	65	51	30	18	13					NP	SM	116.3	1863	4.9	29.9	0.45	
87	75	63	48	35	28		22	18	4		SM-SQ	114.7	1837	7.9	45.2	0.47	
										NP	SM	103.9	1664	5.1	22.1	0.62	
											SP	110.6	1772	8.0	41.6	0.52	
											SM	110.8	1775	9.9	51.2	0.52	
84	69	63	23	13	10						SW-SM	111.1	1780	8.4	43.9	0.52	
											SM	117.9	1889	7.0	43.9	0.43	
											SP	117.2	1878	9.3	57.5	0.44	
86	82	77	56	39	31						SM	112.8	1807	10.3	63.0	0.49	
											SP	113.8	1823	10.3	58.1	0.48	
				100	99		50	28	22		CH	57.3	918	18.6	25.9	1.94	
				100	98	97	61	35	26		MH	79.2	1269	22.4	53.8	1.13	
											MH	93.1	1491	22.0	73.4	0.81	
											CH	114.7	1837	10.6	60.9	0.47	
				100	99		56	26	30		CH	83.8	1342	27.0	72.0	1.01	
											CH	94.4	1512	22.1	76.1	0.78	
	100	98	93	72	38					NP	SM	105.0	1682	8.7	38.7	0.61	
											SM	95.7	1533	11.5	40.8	0.76	
											SM	106.9	1713	13.9	65.1	0.58	
											SM	106.6	1708	18.9	88.1	0.58	
		100	60	38	33						SM	98.7	1581	13.4	51.4	0.71	
		100	78	39	35						SM	103.0	1650	11.6	49.0	0.64	
											ML	102.5	1642	22.9	96.6	0.64	
		100	97	96	95	52	20	46	28	18	ML	85.3	1367	32.1	88.9	0.97	
								31	19	12	CL	92.4	1480	21.5	70.6	0.82	
											CL	99.3	1591	24.9	96.7	0.70	
											CL	100.1	1604	22.8	90.1	1.68	

28.0	0.54									
89.2	0.54									
55.8	0.54									
33.4	0.64						*			
23.1	0.88									
29.9	0.45									
45.2	0.47					*				
22.1	0.62								*	
41.6	0.52									
51.2	0.52									
43.9	0.52						*			
43.9	0.43									
57.5	0.44									
63.0	0.49						*			
58.1	0.48									
25.9	1.94									
53.8	1.13									
73.4	0.81					*				
60.9	0.47							*		
72.0	1.01				*				*	
76.1	0.78				*					
38.7	0.61									
40.8	0.76									
65.1	0.58									
88.1	0.58									
51.4	0.71						*			
49.0	0.64									
06.6	0.64							*		

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT											
				STANDARD SIEVE OPENING						U S STANDARD SIEVE M					
				BLDRS.	COBBLES		GRAVEL			SAND					
24"	12"	6"	3"	1½"	3/4"	3/8"	4	10	40	100					
		FEET	METERS												
MD-B-3	P-15	50.2 - 50.7	15.30 - 15.45												
	P-15	50.8 - 51.6	15.48 - 15.73									100	92	83	
	P-15	51.6 - 52.5	15.73 - 16.00												
	P-16	60.0 - 60.8	18.29 - 18.53										100	95	41
	P-16	60.8 - 61.5	18.53 - 18.75												
	P-17	70.0 - 70.8	21.34 - 21.58												
	P-18	80.0 - 80.8	24.38 - 24.63												
	P-19	91.0 - 91.8	27.74 - 27.98												
P-20	100.6 - 101.4	30.66 - 30.91													
MD-B-4	P-1	1.0 - 1.5	0.30 - 0.46												
	P-2	3.5 - 4.3	1.07 - 1.31												
	D-3	6.2 - 7.0	1.89 - 2.13												
	P-4	9.0 - 9.8	2.74 - 2.99												
	P-5	15.1 - 16.0	4.60 - 4.88						100	98	94	88	79	68	
	P-5	16.0 - 17.0	4.88 - 5.18						100	96	81	68	53	34	
	P-6	20.3 - 21.6	6.34 - 6.58					100	95	92	75	60	45	29	
	D-7	25.2 - 26.0	7.68 - 7.92												
	P-8	29.8 - 30.6	9.08 - 9.33												
	D-9	35.2 - 36.0	10.73 - 10.97						100	97	88	77	45	26	
	D-10	40.2 - 41.0	12.25 - 12.50												
	P-11	45.3 - 46.1	13.81 - 14.05												
	D-12	51.2 - 52.0	15.61 - 15.85												
	D-13	60.2 - 61.0	18.35 - 18.59								100	99	90	71	
	D-14	70.2 - 71.0	21.40 - 21.64						100	97	91	82	65	48	
	D-15	80.2 - 81.0	24.44 - 24.69												
	D-16	91.2 - 92.0	27.80 - 28.04												
	P-17	102.1 - 103.0	31.12 - 31.39												
	P-18	120.3 - 121.1	36.67 - 36.91						100	97	77	60	28	7	
	D-20	159.2 - 160.0	48.52 - 48.77												
MD-B-5	D-1	0.2 - 1.0	0.06 - 0.30												
	D-2	3.2 - 4.0	0.98 - 1.22												
	D-3	6.2 - 7.0	1.89 - 2.13						100	96	82	56	20	11	
	P-4	10.9 - 11.7	3.32 - 3.57							100	99	96	63	31	
	P-5	15.2 - 16.0	4.63 - 4.88												
	P-6	20.2 - 21.0	6.16 - 6.40					100	89	68	58	45	19	10	
	D-7	25.2 - 26.0	7.68 - 7.92					100	92	71	56	39	17	11	
	D-8	30.2 - 31.0	9.20 - 9.45												
	D-9	35.2 - 36.0	10.73 - 10.97												
	D-10	40.2 - 41.0	12.25 - 12.50												
	P-11	45.0 - 45.8	13.72 - 13.96												
	P-13	60.2 - 61.0	18.35 - 18.59												

NOTES:

- (a) Sample types
 - SS - Standard split spoon
 - P - Pitcher
 - D - Fugro Drive
 - B, b - Bulk
- (b) NP - Not Plastic
- (c) USCS - Unified Soil Classification System
- (d) * Indicates that test has been performed and results are included in this report

BY WEIGHT							ATTERBERG LIMITS (b)			USCS (c)	IN-SITU				COMPACTED		SPECIFIC GRAVITY OF SOLIDS		
U S STANDARD SIEVE NO.				PARTICLE SIZE (mm)							DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	
SAND			SILT OR CLAY								(pcf)	(kg/m ³)				(pcf)			(kg/m ³)
4	10	40	100	200	.005	.001	LL	PL	PI										
										ML	85.6	1371	35.0	101.5	0.90				
	100	92	83	72	26	7	33	27	6	ML	88.5	1418	29.3	87.6	0.84			2.61	
										ML	91.2	1461	28.2	93.2	0.79				
	100	95	41	12						SP-SM	112.4	1801	16.9	92.0	0.50				
										SP-SM	103.9	1665	21.1	91.7	0.62				
										GP	109.6	1756	12.0	60.3	0.54				
										SM	97.5	1562	26.6	98.7	0.73				
										SM	106.7	1709	16.4	76.7	0.58				
										SM	105.8	1695	16.7	76.1	0.59				
										SM	94.5	1514	12.3	42.3	0.78				
										SM	86.7	1389	18.9	54.1	0.94				
										SP-SM	106.7	1709	4.6	21.6	0.58				
										SM	86.0	1378	12.5	35.3	0.96				
94	88	79	68	57						ML	109.1	1748	5.8	28.8	0.55				
81	68	53	34	25						SM	109.2	1749	9.1	45.3	0.54				
75	60	45	29	20					NP	SM	112.4	1801	9.2	49.9	0.50				
										SM	110.2	1765	5.9	29.9	0.53				
										SM	105.4	1689	15.4	69.5	0.60				
88	77	45	26	19						SM	112.9	1809	5.2	28.6	0.49				
										SM	113.2	1813	8.1	47.8	0.49				
									NP	SM	104.9	1680	14.7	65.7	0.61				
										GP-GM	117.8	1887	7.8	49.2	0.43				
100	99	90	71	58						ML	104.8	1679	12.1	53.7	0.61				
91	82	65	48	36						SM	110.5	1770	9.6	49.7	0.52				
										SM	115.3	1847	14.0	81.8	0.46				
										SM	111.3	1783	11.0	57.6	0.51				
										SP-SM	121.2	1942	9.4	65.0	0.39				
77	60	28	7	5						SP-SM	123.4	1977	13.2	97.3	0.37				
										SM	111.5	1786	14.1	74.4	0.51				
										SM	110.5	1770	8.7	44.7	0.52				
										SM	106.5	1706	12.5	58.0	0.58				
82	56	20	11	6						SW-SM	104.5	1674	7.6	33.8	0.61				
99	96	63	31	22						SM	110.3	1767	15.3	78.2	0.53				
										SM	108.9	1745	11.8	58.2	0.55				
58	45	19	10	8						SP-SM	109.7	1757	9.2	46.6	0.54				
56	39	17	11	8						SW-SM	119.5	1914	4.3	28.6	0.41				
										SP-SM	110.5	1770	9.1	47.0	0.53				
										SP-SM	120.3	1927	8.8	59.4	0.40				
										SP-SM	121.6	1948	9.4	66.0	0.39				
										SM	108.6	1740	17.6	85.9	1.55				
										SM	114.7	1837	14.1	81.4	0.45				

ORG (b)	USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAxIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
		(pcf)	(kg/m ³)				(pcf)	(kg/m ³)								
	ML	85.6	1371	35.0	101.5	0.90										
6	ML	88.5	1418	29.3	87.6	0.84			2.61							
	ML	91.2	1461	28.2	93.2	0.79										
	SP-SM	112.4	1801	16.9	92.0	0.50										
	SP-SM	103.9	1665	21.1	91.7	0.62										
	GP	109.6	1756	12.0	60.3	0.54										
	SM	97.5	1562	26.6	98.7	0.73										
	SM	106.7	1709	16.4	76.7	0.58										
	SM	105.8	1695	16.7	76.1	0.59										
	SM	94.5	1514	12.3	42.3	0.78										
	SM	86.7	1389	18.9	54.1	0.94										
	SP-SM	106.7	1709	4.6	21.6	0.58										
	SM	86.0	1378	12.5	35.3	0.96										
	ML	109.1	1748	5.8	28.8	0.55										
	SM	109.2	1749	9.1	45.3	0.54										
NP	SM	112.4	1801	9.2	49.9	0.50										
	SM	110.2	1765	5.9	29.9	0.53										
	SM	105.4	1689	15.4	69.5	0.60										
	SM	112.9	1809	5.2	28.6	0.49										
	SM	113.2	1813	8.1	47.8	0.49										
NP	SM	104.9	1680	14.7	65.7	0.61										
	GP-GM	117.8	1887	7.8	49.2	0.43										
	ML	104.8	1679	12.1	53.7	0.61										
	SM	110.5	1770	9.6	49.7	0.52										
	SM	115.3	1847	14.0	81.8	0.46										
	SM	111.3	1783	11.0	57.6	0.51										
	SP-SM	121.2	1942	9.4	65.0	0.39										
	SP-SM	123.4	1977	13.2	97.3	0.37										
	SM	111.5	1786	14.1	74.4	0.51										
	SM	110.5	1770	8.7	44.7	0.52										
	SM	106.5	1706	12.5	58.0	0.58										
	SW-SM	104.5	1674	7.6	33.8	0.61										
	SM	110.3	1767	15.3	78.2	0.53										
	SM	108.9	1745	11.8	58.2	0.55										
	SP-SM	109.7	1757	9.2	46.6	0.54										
	SW-SM	119.5	1914	4.3	28.6	0.41										
	SP-SM	110.5	1770	9.1	47.0	0.53										
	SP-SM	120.3	1927	8.8	59.4	0.40										
	SP-SM	121.6	1948	9.4	66.0	0.39										
	SM	108.6	1740	17.6	85.9	0.55										
	SM	114.7	1837	14.1	81.4	0.45										

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

TABLE
II - 5 - 1
2 OF 10

FURRO NATIONAL, INC.

2

3

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT																			
				STANDARD SIEVE OPENING						U S STANDARD SIEVE #													
				BLDRS.		COBBLES		GRAVEL		SAND													
				24"	12"	6"	3"	1½"	¾"	⅜"	4	10	40	100									
		FEET	METERS																				
MD-B-5	P-15	80.8 - 81.6	24.63 - 24.87																				
	P-16	90.3 - 91.1	27.52 - 27.77																				
MD-B-6	D-2	1.7 - 2.5	0.52 - 0.76																				
	D-4	4.2 - 5.0	1.28 - 1.52						100	91	80	62	33	18									
	D-6	7.7 - 8.5	2.35 - 2.59																				
	D-8	16.2 - 17.0	4.94 - 5.18					100	87	71	57	39	20	12									
	P-9	21.0 - 21.7	6.40 - 6.61								100	99	98	93	85								
	P-9	21.0 - 21.7	6.40 - 6.61																				
	P-10	28.1 - 28.7	8.56 - 8.75																				
	D-11	34.2 - 35.0	10.42 - 10.67																				
	D-12	39.2 - 40.0	11.95 - 12.19					100	90	76	60	46	28	19									
	D-13	44.2 - 45.0	13.47 - 13.72																				
D-14	49.2 - 50.0	15.00 - 15.24																					
MD-B-7	D-1	0.7 - 1.5	0.21 - 0.46																				
	D-2	3.7 - 4.5	1.13 - 1.37					100	84	78	71	66	56	47									
	D-3	6.2 - 7.0	1.89 - 2.13																				
	D-4	10.2 - 11.0	3.11 - 3.35																				
	D-5	15.2 - 16.0	4.63 - 4.88																				
	D-6	20.2 - 21.0	6.16 - 6.40																				
	D-7	25.2 - 26.0	7.68 - 7.92					100	82	68	56	45	26	16									
	D-8	30.2 - 31.0	9.20 - 9.45																				
	D-9	35.2 - 36.0	10.73 - 10.97																				
	D-10	40.7 - 41.5	12.41 - 12.65																				
	D-11	45.2 - 46.0	13.78 - 14.02																				
	D-12	50.2 - 51.0	15.30 - 15.55					100	88	75	56	40	20	12									
MD-B-8	D-1	0.2 - 1.0	0.06 - 0.30																				
	D-2	3.2 - 4.0	0.98 - 1.22					100	94	77	67	59	52	41									
	D-3	6.2 - 7.0	1.89 - 2.13																				
	D-4	10.2 - 11.0	3.11 - 3.35							100	85	69	54	36	28								
	D-5	15.2 - 16.0	4.63 - 4.88																				
	D-6	20.2 - 21.0	6.16 - 6.40																				
	D-7	25.2 - 26.0	7.68 - 7.92																				
	D-10	40.2 - 41.0	12.25 - 12.50																				
D-12	50.7 - 51.5	15.45 - 15.70					100	97	77	66	57	47	36										
MD-B-9	P-1	0.8 - 1.6	0.24 - 0.49																				
	P-2	3.0 - 4.0	0.91 - 1.22																				
	P-3	6.0 - 6.6	1.83 - 2.01																				
	P-4	10.0 - 11.0	3.05 - 3.35																				
	P-4	10.0 - 11.0	3.05 - 3.35																				

NOTES:

- (a) Sample types
 - SS - Standard split spoon
 - P - Pitcher
 - D - Fugro Drive
 - Ø, b - Bulk
- (b) NP - Not Plastic
- (c) USCS - Unified Soil Classification System
- (d) * Indicates that test has been performed and results are included in this report

FINER BY WEIGHT							ATTERBERG LIMITS (b)			USCS (c)	IN-SITU				COMPACTED		SPECIFIC GRAVITY G _s	
U S STANDARD SIEVE NO.					PARTICLE SIZE (mm)		LL	PL	PI		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		
SAND			SILT OR CLAY		(pcf)	(kg/m ³)					(pcf)	(kg/m ³)				OPTIMUM		MOISTURE (%)
#/8"	4	10	40	100	200	.005	.001											
										SP-SM	114.0	1826	13.2	74.3	0.48			
										Rock	103.8	1663	17.1	74.0	0.62			
										SM	109.1	1748	7.2	35.7	0.54			
91	80	62	33	18	12					SW-SM	109.7	1757	12.5	63.2	0.54			
										SW-SM	113.9	1825	6.4	36.4	0.48			
71	57	39	20	12	9					SW-SM	118.1	1892	6.7	42.4	0.43			
100	99	98	93	85	70					ML	103.7	1661	17.5	75.6	0.63			
										ML	104.7	1677	18.7	83.1	0.61			
										SP-SM	111.0	1778	7.1	37.1	0.52			
										SP-SM	119.6	1916	6.2	40.9	0.41			
76	60	46	28	19	14					SM	125.5	2011	7.3	57.7	0.34			
										SM	120.5	1930	6.8	46.0	0.40			
										SP-SM	122.7	1966	7.3	52.6	0.37			
										SC	104.4	1672	10.3	45.5	0.61			
78	71	66	56	47	38			31	19	12	SC	118.9	1905	7.8	50.6	0.42		
										SC	126.3	2023	5.8	47.1	0.33			
										GP	117.3	1879	6.4	39.8	0.44			
										GP	121.5	1946	4.6	32.0	0.39			
										GP	128.3	2055	2.9	25.1	0.31			
68	56	45	26	16	11					SP-SM	125.9	2017	6.2	49.1	0.34			
										SP-SM	123.3	1975	7.0	51.9	0.37			
										SP	124.2	1990	7.6	57.3	0.36			
										SP	115.9	1857	14.1	84.0	0.45			
										SW-SM	127.6	2044	9.5	80.4	0.32			
75	56	40	20	12	9					SW-SM	129.5	2075	7.9	71.3	0.30			
										SM	88.2	1413	7.2	21.4	0.91			
77	67	59	52	41	28					SM	107.2	1717	8.2	38.7	0.57			
										SP-SM	111.2	1781	12.5	65.5	0.52			
85	69	54	36	28	22					SM	112.2	1797	10.3	55.7	0.50			
										SP-SM	131.3	2103	4.5	43.2	0.28			
										SP-SM	127.2	2038	4.6	38.7	0.33			
										SP-SM	128.1	2052	6.5	56.0	0.32			
										SP-SM	135.6	2172	6.8	75.4	0.24			
77	66	57	47	36	26					SM	132.2	2118	7.4	72.9	0.28			
										SC	81.7	1309	8.7	22.1	1.06			
										SC	105.7	1693	14.6	66.3	0.59			
		100	99	95	85					NP	ML	111.4	1785	17.1	90.5	0.51		2.7
		100	99	73	50						SM	101.1	1620	11.4	46.1	0.67		
										SM			14.4					

PI	USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
		(pcf)	(kg/m ³)				(pcf)	(kg/m ³)								
	SP-SM	114.0	1826	13.2	74.3	0.48										
	Rock	103.8	1663	17.1	74.0	0.62										
	SM	109.1	1748	7.2	35.7	0.54										
	SW-SM	109.7	1757	12.5	63.2	0.54										
	SW-SM	113.9	1825	6.4	36.4	0.48										
	SW-SM	118.1	1892	6.7	42.4	0.43										
	ML	103.7	1661	17.5	75.6	0.63										
	ML	104.7	1677	18.7	83.1	0.61										
	SP-SM	111.0	1778	7.1	37.1	0.52										
	SP-SM	119.6	1916	6.2	40.9	0.41										
	SM	125.5	2011	7.3	57.7	0.34										
	SM	120.5	1930	6.8	46.0	0.40										
	SP-SM	122.7	1966	7.3	52.6	0.37										
	SC	104.4	1672	10.3	45.5	0.61										
12	SC	118.9	1905	7.8	50.6	0.42					*					
	SC	126.3	2023	5.8	47.1	0.33										
	GP	117.3	1879	6.4	39.8	0.44										
	GP	121.5	1946	4.6	32.0	0.39										
	GP	128.3	2055	2.9	25.1	0.31										
	SP-SM	125.9	2017	6.2	49.1	0.34										
	SP-SM	123.3	1975	7.0	51.9	0.37										
	SP	124.2	1990	7.6	57.3	0.36										
	SP	115.9	1857	14.1	84.0	0.45										
	SW-SM	127.6	2044	9.5	80.4	0.32										
	SW-SM	129.5	2075	7.9	71.3	0.30										
	SM	88.2	1413	7.2	21.4	0.91										
	SM	107.2	1717	8.2	38.7	0.57										
	SP-SM	111.2	1781	12.5	65.5	0.52										
	SM	112.2	1797	10.3	55.7	0.50										
	SP-SM	131.3	2103	4.5	43.2	0.28										
	SP-SM	127.2	2038	4.6	38.7	0.33										
	SP-SM	128.1	2052	6.5	56.0	0.32										
	SP-SM	135.6	2172	6.8	75.4	0.24										
	SM	132.2	2118	7.4	72.9	0.28										
	SC	81.7	1309	8.7	22.1	1.06										
	SC	105.7	1693	14.6	66.3	0.59										
NP	ML	111.4	1785	17.1	90.5	0.51				2.73			*			
	SM	101.1	1620	11.4	46.1	0.67						*				
	SM			14.4												

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II - 5 - 1
3 OF 10

FUGRO NATIONAL, INC.

AFV-01

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT											
				STANDARD SIEVE OPENING						U S STANDARD SIEVE					
				BLDRS.	COBBLES		GRAVEL			SAND					
	24"	12"	6"	3"	1½"	3/4"	3/8"	4	10	40	100				
		FEET	METERS												
MD-B-9	P-5	16.0 - 16.6	4.88 - 5.06												
	D-6	20.2 - 21.0	6.16 - 6.40						100	99	98	96	92	75	
	P-7	25.0 - 25.6	7.62 - 7.80												
	P-8	31.0 - 31.6	9.45 - 9.63												
	P-8	31.6 - 32.2	9.63 - 9.81							100	99	97	94	92	
	P-8	32.2 - 32.8	9.81 - 10.00												
	P-8	32.8 - 33.4	10.00 - 10.18												
	P-9	35.0 - 37.5	10.67 - 11.43									100	95	89	
	P-9	36.6 - 37.5	11.16 - 11.43												
	P-10	40.8 - 41.6	12.44 - 12.68												
	P-11	45.6 - 46.3	13.90 - 14.11												
	P-12	50.8 - 51.6	15.48 - 15.73									100	99	95	57
	P-12	51.6 - 52.5	15.73 - 16.00												
	P-13	59.0 - 59.8	17.98 - 18.23												
	P-14	69.0 - 69.8	21.03 - 21.28												
	P-14	70.6 - 71.5	21.52 - 21.79												
	P-15	79.2 - 80.0	24.14 - 24.38												
	P-16	89.0 - 89.8	27.13 - 27.37												
	P-16	90.6 - 91.5	27.61 - 27.89												
	D-17	99.1 - 99.9	30.21 - 30.45												
MD-B-10	D-1	0.5 - 1.3	0.15 - 0.40												
	D-4	5.2 - 6.0	1.58 - 1.83						100	97	89	74	46	28	
	D-7	10.2 - 11.0	3.11 - 3.35												
	D-8	15.2 - 16.0	4.63 - 4.88					100	76	59	48	38	22	11	
	P-9	20.4 - 21.5	6.22 - 6.55												
	D-10	25.2 - 26.0	7.68 - 7.92					100	96	85	69	53	29	15	
	P-11	29.8 - 30.6	9.08 - 9.33												
	P-12	34.2 - 34.8	10.42 - 10.61						100	99	96	92	81	62	
	P-12	34.8 - 35.4	10.61 - 10.79												
	P-12	35.5 - 35.7	10.82 - 10.88												
	P-13	39.0 - 39.8	11.89 - 12.13												
	D-14	44.2 - 45.0	13.47 - 13.72												
	P-15	49.2 - 50.0	15.00 - 15.24												
	P-15	50.8 - 51.2	15.48 - 15.61												
	D-16	60.2 - 61.0	18.35 - 18.59							100	99	98	93	17	
	P-17	69.1 - 69.6	21.06 - 21.21								100	98	98	94	
	P-17	69.7 - 70.2	21.24 - 21.40												
	P-17	70.3 - 70.8	21.43 - 21.58												
	P-17	70.8 - 71.4	21.58 - 21.76												
	D-18	80.2 - 81.0	24.44 - 24.69									100	98	94	
	D-19	89.2 - 90.0	27.19 - 27.43												
	D-20	99.2 - 100.0	30.22 - 30.48										100	3	

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed and results are included in this report

	SM	102.8	1647	23.1
	SP-SM	119.1	1908	16.2
26	CH	83.2	1333	35.6
	CH	99.6	1596	26.0
	SP	119.5	1914	11.3
	SM	79.3	1270	38.7
	SM	80.6	1291	37.1
	SP	119.3	1911	11.8
	SM	96.8	1551	6.2
	SM	108.4	1737	11.1
	SP-SM	116.9	1873	4.9
	GP-GM	126.3	2023	6.3
	SM	98.3	1575	15.5
	SW-SM	111.2	1781	10.1
	SM	124.9	2001	4.3
13	SC	103.2	1653	18.4
	SC	98.9	1584	19.3
	SC	112.8	1807	13.6

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT																					
				STANDARD SIEVE OPENING							U S STANDARD SIEVE NO.														
				BLDRS.	COBBLES		GRAVEL				SAND														
					24"	12"	6"	3"	1 1/2"	3/4"	3/8"	4	10	40	100	200									
FEET	METERS																								
MD-B-11	P-1	1.0 - 1.8	0.30 - 0.55																						
	D-2	3.7 - 4.5	1.13 - 1.37							100	93	80	66	18	5										
	D-3	6.2 - 7.0	1.89 - 2.13																						
	D-4	10.7 - 11.5	3.26 - 3.51																						
	D-5	15.2 - 16.0	4.63 - 4.88																						
	P-6	20.2 - 21.0	6.16 - 6.40																						
	P-7	24.0 - 24.8	7.32 - 7.56								100	98	96	91	71	34									
	P-8	29.0 - 31.1	8.84 - 9.48																						
	P-9	35.4 - 36.2	10.79 - 11.03																						
	P-10	40.0 - 40.8	12.19 - 12.44																						
	D-11	45.1 - 45.9	13.75 - 13.99																						
	P-12	50.2 - 50.5	15.30 - 15.39											100	99	67									
	P-12	50.5 - 51.0	15.39 - 15.54																						
	D-13	60.2 - 61.0	18.35 - 18.59																						
	D-14	70.2 - 71.0	21.40 - 21.64																						
	D-15	80.2 - 81.0	24.44 - 24.69																						
	P-16	89.2 - 90.0	27.19 - 27.43									100	97	90	69	37									
	P-17	100.0 - 100.8	30.48 - 30.72																						
	P-19	120.0 - 120.8	36.58 - 36.82																						
	P-20	140.5 - 141.3	42.82 - 43.07																						
	D-21	159.2 - 160.0	48.52 - 48.77																						
MD-B-12	P-1	0.5 - 1.3	0.15 - 0.40																						
	P-2	3.3 - 4.1	1.01 - 1.25																						
	P-2	4.1 - 4.9	1.25 - 1.49																						
	D-3	6.7 - 7.5	2.04 - 2.29																						
	D-4	10.2 - 11.0	3.11 - 3.35									100	95	81	36	18									
	D-5	15.2 - 16.0	4.63 - 4.88																						
	D-6	20.2 - 21.0	6.16 - 6.40																						
	D-7	25.2 - 26.0	7.68 - 7.92							100	93	87	69	46	18	10									
	D-8	30.2 - 31.0	9.20 - 9.45																						
	D-9	35.2 - 36.0	10.73 - 10.97																						
	D-10	40.2 - 41.0	12.25 - 12.50																						
	D-11	45.2 - 46.0	13.78 - 14.02																						
	D-12	50.2 - 51.0	15.30 - 15.54																						
MD B-13	P-1	0.9 - 1.7	0.27 - 0.52																						
	D-2	3.7 - 4.5	1.13 - 1.37																						
	P-3	6.5 - 7.3	1.98 - 2.23								100	93	81	73	56	28									
	P-4	10.1 - 10.9	3.08 - 3.32									100	98	79	47										
	D-5	15.2 - 16.0	4.63 - 4.88																						
	D-6	20.2 - 21.0	6.16 - 6.40																						
	D-6	20.2 - 21.0	6.16 - 6.40																						
	P-8	30.2 - 31.0	9.20 - 9.45																						

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed and results are included in this report

TERBERG PTS (b)		USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
			DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
			(pcf)	(kg/m ³)				(pcf)	(kg/m ³)								
		SM	96.1	1540	4.9	17.4	0.75										
		SP	109.0	1746	8.0	39.7	0.55										
		SP	115.2	1846	6.2	36.3	0.46										
		SP	116.7	1870	7.0	42.6	0.44										
		SP	122.7	1966	6.2	45.3	0.37								*		
		SM	113.1	1812	13.1	68.6	0.51										
		SM	102.7	1645	8.1	34.1	0.64										
		SM	112.8	1807	7.7	42.4	0.49										
		SM	113.3	1815	12.1	67.0	0.49										
		SM	100.1	1604	16.5	65.3	0.68										
		SP-SM	113.8	1823	11.0	61.9	0.48										
		SM	100.3	1607	27.6	100.0	0.68										
		SM	114.9	1841	11.3	65.4	0.47										
		SP-SM	121.9	1953	12.7	89.8	0.38										
		SM	122.3	1954	10.1	72.3	0.38										
		SM	115.9	1857	7.4	43.8	0.45										
		SM	105.1	1684	17.3	77.8	0.60										
		SM	107.4	1721	15.4	73.1	0.57										
		SM	117.9	1889	13.9	87.3	0.43										
		SM	104.1	1668	21.1	92.1	0.62										
		SM	112.4	1801	18.3	99.3	0.50										
		SM	96.8	1551	5.5	19.9	0.74										
		SM	94.7	1517	13.8	48.0	0.78										
		SM	109.3	1751	11.6	58.1	0.54										
		SM	117.3	1879	7.1	43.7	0.44								*		
	NP	SW-SM	102.9	1648	8.2	34.8	0.64										
		SP-SM	113.1	1812	5.9	32.3	0.49										
		SM	118.9	1905	10.7	69.4	0.42										
		SW-SM	112.2	1797	7.2	38.7	0.50										
		SP-SM	112.8	1807	12.6	68.7	0.49										
		SP-SM	121.1	1940	7.0	48.3	0.39										
		SP	115.8	1855	7.7	45.6	0.46										
		SM	95.2	1525	17.1	60.1	0.77										
		SM	121.6	1948	8.9	62.4	0.39										
		SM	96.4	1544	9.2	33.4	0.75										
		SP-SM	116.3	1863	6.0	35.9	0.45										
		SM	101.2	1621	9.4	38.2	0.67										
		SM	106.5	1706	9.4	44.0	0.58										
		SP	114.9	1841	5.4	31.2	0.47										
		SP	113.9	1825	5.4	30.8	0.48										
		SP	109.7	1757	6.5	33.0	0.54										

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

TABLE
II-5-1
5 OF 10

FUSRO NATIONAL INC.

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT												
				STANDARD SIEVE OPENING						U S STANDARD SIEVE						
				BLDRS.	COBBLES		GRAVEL			SAND						
					24"	12"	8"	3"	1 1/2"	3/4"	3/8"	4	10	40	100	
FEET	METERS															
MD-B-13	D-9	35.2 - 36.0	10.73 - 10.97													
	P-10	40.2 - 40.8	12.25 - 12.44								100	97	83	59	46	
	P-10	40.2 - 40.8	12.25 - 12.44													
	D-11	45.2 - 46.0	13.78 - 14.02					100	97	78	62	44	23	13		
	P-12	50.0 - 50.8	15.24 - 15.48													
	P-13	60.0 - 62.5	18.29 - 19.05						100	92	76	57	26	18		
	P-13	60.5 - 61.3	18.44 - 18.68													
	P-13	61.3 - 62.1	18.68 - 18.93													
	P-14	71.1 - 72.0	21.67 - 21.95													
	D-15	79.2 - 80.0	24.14 - 24.38													
	P-16	90.0 - 90.8	27.43 - 27.68													
	D-17	99.2 - 100.0	30.24 - 30.48													
	MD-B-14	D-1	0.2 - 1.0	0.06 - 0.30												
		D-2	3.2 - 4.0	0.98 - 1.22												
D-3		6.2 - 7.0	1.89 - 2.13													
D-4		10.2 - 11.0	3.11 - 3.35							100	97	93	78	67		
D-5		15.2 - 16.0	4.63 - 4.88													
P-6		20.0 - 21.6	6.10 - 6.58													
D-7		25.2 - 26.0	7.68 - 7.92				100	72	68	60	55	45	27	17		
D-8		30.2 - 31.0	9.20 - 9.45													
D-9		35.2 - 36.0	10.73 - 10.97													
D-10		40.2 - 41.0	12.25 - 12.50													
D-11		45.2 - 46.0	13.78 - 14.02							100	98	92	85	71	60	
D-12		50.0 - 50.9	15.24 - 15.51						100	88	76	63	51	31	20	
P-13		58.0 - 58.5	17.68 - 17.83													
D-14		59.2 - 60.0	18.04 - 18.29													
D-15		70.2 - 71.0	21.40 - 21.64													
D-16		80.2 - 81.0	24.44 - 24.69													
P-17		89.0 - 89.8	27.13 - 27.37													
D-18		100.2 - 101.0	30.54 - 30.78													
MD-B-15	P-1	0.0 - 0.8	0.00 - 0.24													
	P-1	1.6 - 2.5	0.49 - 0.76													
	P-2	3.8 - 4.5	1.16 - 1.37													
	P-3	6.0 - 6.8	1.83 - 2.07													
	D-4	10.2 - 11.0	3.11 - 3.35							100	97	79	20			
	P-5	15.3 - 16.1	4.66 - 4.91													
	P-6	19.0 - 19.8	5.79 - 6.04													
	P-7	24.2 - 24.8	7.38 - 7.56												10	
	P-7	24.8 - 25.4	7.56 - 7.74													
	P-7	25.4 - 26.0	7.74 - 7.92													
P-7	26.0 - 26.5	7.92 - 8.08														

NOTES:

- (a) Sample types
 - SS - Standard split spoon
 - P - Pitcher
 - D - Fugro Drive
 - B, b - Bulk
- (b) NP - Not Plastic
- (c) USCS - Unified Soil Classification System
- (d) * Indicates that test has been performed and results are included in this report

											SM	106.1	1700	16.9	77.9	0.59		
											SP-SM	117.9	1889	10.2	64.0	0.43		
											SP	101.2	1621	12.1	49.3	0.66		
											SM	122.2	1958	10.8	77.0	0.38		
											SM	103.5	1658	7.9	33.9	0.63		
											SM	109.1	1748	6.6	32.8	0.54		
											SP-SM	118.2	1894	6.9	43.6	0.43		
	100	97	93	78	67	62		31	22	9	CL	104.3	1671	17.6	77.4	0.62		
											NP	SM	126.2	2022	11.7	94.6	0.34	
											SM	120.2	1926	12.4	83.2	0.40		
68	60	55	45	27	17	13					GM	95.3	1527	9.0	31.8	0.77		
											GM	120.9	1937	13.4	92.3	0.39		
											SM	116.9	1873	6.8	41.8	0.44		
											SM	122.0	1954	7.5	52.8	0.38		
100	98	92	85	71	60	52				NP	ML	107.5	1722	10.4	49.3	0.57		
88	76	63	51	31	20	16					SM	128.0	2051	8.9	76.4	0.32		
											SM	134.4	2153	7.5	80.2	0.25		
											SM	120.7	1934	8.6	58.3	0.40		
											SM	124.5	1994	10.1	77.2	0.35		
											SP-SM	121.6	1948	13.4	93.9	0.39		
											SP-SM	120.0	1922	13.4	89.6	0.40		
											NP	SM	124.6	1996	12.3	94.2	0.35	
											CH	90.9	1456	20.8	66.0	0.85		

0.43						
0.31						
0.42						
0.35						
0.72						
0.47						
0.64						*
0.38						*
0.59						
0.43						
0.66						
0.38						
0.63						
0.54						
0.43						
0.62						*
0.34						
0.40						
0.77						
0.39						
0.44						
0.38						
0.57						*
0.32						
0.25						
0.40						
0.35						
0.39						
0.40						
0.35						
0.85						
0.71						

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT																
				STANDARD SIEVE OPENING						U S STANDARD SIEVE										
				BLDRS.		COBBLES		GRAVEL		SAND										
				24"	12"	8"	3"	1 1/2"	3/4"	3/8"	4	10	40	100						
		FEET	METERS																	
MD-B-15	P-8		29.0 - 29.7	8.84 - 9.05																
	D-9		35.2 - 36.0	10.73 - 10.97																
	P-10		40.5 - 41.3	12.34 - 12.59																
	P-10		40.5 - 41.3	12.34 - 12.59														100	99	
	D-11		44.2 - 43.0	13.47 - 13.11																
	P-12		50.8 - 51.5	15.48 - 15.70																
	P-13		60.0 - 60.6	18.29 - 18.47																
	P-14		70.1 - 70.9	21.37 - 21.61																
	P-15		80.5 - 81.3	24.54 - 24.78																
	P-16		89.0 - 89.6	27.13 - 27.31																
	P-16		90.8 - 91.5	27.68 - 27.89																100
	P-16		90.6 - 90.7	27.61 - 27.65																
	P-17		100.6 - 101.5	30.66 - 30.94																
P-18		119.0 - 119.8	36.27 - 36.52											100	98	82	57			
P-19		140.8 - 141.6	42.92 - 43.16																	
D-20		159.2 - 160.0	48.52 - 48.77																	
BL-B-7	P-1		0.8 - 1.6	0.24 - 0.49																
	D-2		3.7 - 4.5	1.13 - 1.37																
	P-3		5.0 - 5.8	1.52 - 1.77																
	P-4		7.8 - 8.6	2.38 - 2.62																
	P-5		10.8 - 11.0	3.29 - 3.35				100	90	79	69	59	48	26	13					
	P-5		11.0 - 11.8	3.35 - 3.60																
	D-6		14.2 - 15.0	4.33 - 4.57																
	D-7		19.2 - 20.0	5.85 - 6.10				100	84	84	78	72	61	35	16					
	P-8		25.0 - 25.7	7.62 - 7.83																
	P-9		30.0 - 30.8	9.14 - 9.39																
	P-9		30.0 - 30.8	9.14 - 9.39							100	96	74	45	26					
	P-9		30.8 - 31.5	9.39 - 9.60																
	P-10		35.0 - 35.7	10.67 - 10.88							100	99	98	97	84	66				
	P-10		35.7 - 36.3	10.88 - 11.06																
P-10		36.3 - 36.6	11.06 - 11.16																	
P-11		39.0 - 39.6	11.89 - 12.07																	
P-12		45.2 - 45.8	13.78 - 13.96																	
P-13		49.0 - 49.7	14.94 - 15.15							100	99	97	88	66						
P-13		49.7 - 50.5	15.15 - 15.39																	
D-14		50.7 - 51.5	15.45 - 15.70																	
BL-B-10	P-1		0.5 - 1.2	0.15 - 0.37																
	D-2		3.2 - 4.0	0.98 - 1.22				100	90	87	81	68	46	30						
	P-3		6.5 - 7.7	1.98 - 2.35							100	96	86	53	35					
	P-3		7.7 - 8.5	2.35 - 2.59																
	D-4		10.2 - 11.0	3.11 - 3.35							100	91	73	52	24	13				

NOTES:

- (a) Sample types
 - SS - Standard split spoon
 - P - Pitcher
 - D - Fugro Drive
 - B, b - Bulk
- (b) NP - Not Plastic
- (c) USCS - Unified Soil Classification System
- (d) * Indicates that test has been performed and results are included in this report

PERCENT FINER BY WEIGHT										ATTERBERG LIMITS (b)			USCS (c)	IN-SITU				COMPACTED		OPTIMUM	
OPENING		U S STANDARD SIEVE NO.					PARTICLE SIZE (mm)		DRY UNIT WEIGHT					MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY				
GRAVEL		SAND			SILT OR CLAY			LL	PL	PI	(pcf)	(kg/m³)	(pcf)				(kg/m³)				
75"	3/4"	3/8"	4	10	40	100	200	.005	.001												
													SM	88.2	1413	37.5	100.0	0.91			
													CL	99.3	1591	26.6	100.0	0.70			
					100	99	98	59	32	42	19	23	CL	105.5	1690	21.1	95.5	0.60			
													CL	102.9	1648	22.4	94.7	0.64			
													CL	102.2	1637	25.9	100.0	0.65			
													CL	89.8	1439	31.4	96.8	0.88			
													CL	95.3	1527	29.5	100.0	0.77			
													CL	96.1	1540	28.2	100.0	0.75			
													CL	104.6	1676	23.9	100.0	0.61			
													CL	101.8	1631	24.7	101.8	0.66			
						100	95	50	31	41	16	25	CL	100.3	1607	23.8	94.3	0.68			
													CL	99.6	1596	26.3	102.9	0.69			
													CL	98.1	1572	25.9	97.5	0.72			
			100	98	82	57	40						NP	SM	114.0	1826	17.9	101.5	0.48		
													CL	103.9	1664	24.4	100.0	0.62			
													CL	98.1	1572	27.2	100.0	0.72			
													SM	86.8	1391	8.4	24.0	0.94			
													SM	102.6	1644	16.4	68.8	0.64			
													SM	89.9	1440	10.1	31.2	0.87			
												NP	SM	109.2	1749	7.8	38.9	0.54			
00	79	69	59	48	26	13	10						NP	GP-GM	113.1	1812	13.6	75.3	0.49		
														SP-SM	110.9	1777	15.6	80.9	0.52		
														SP-SM	114.2	1829	5.3	30.3	0.48		
04	84	78	72	61	35	16	12							SP-SM	114.4	1833	9.4	53.8	0.47		
														SP-SM	89.4	1432	17.6	53.8	0.89		
														SM	92.9	1488	15.9	52.6	0.81		
		100	96	74	45	26	19	5	2				NP	SM	99.9	1600	12.1	47.7	0.69		
														SM	104.9	1680	12.9	57.7	0.61		
	100	99	98	97	84	65	54			29	21	8	CL	94.5	1514	20.8	71.8	0.78			
													CL	106.7	1709	12.9	60.1	0.58			
													CL	111.1	1780	11.3	58.7	0.52			
													SM	108.2	1733	14.5	70.6	0.56			
													SM	98.9	1584	22.3	85.5	0.70			
		100	99	97	88	66	49						NP	SM	107.2	1717	11.8	55.7	0.57		
														SM	104.5	1674	13.7	60.3	0.61		
														SM	110.9	1777	13.0	67.8	0.52		
														SM	101.7	1629	7.2	29.7	0.66		
00	90	87	81	68	46	30	25							SM	109.3	1751	9.9	49.5	0.54		
		100	96	86	53	35	29							SM	95.7	1533	17.6	62.6	0.76		

BORBERG PTS (b)		USCS (c)	IN-SITU				COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAxIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR	
			DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY									OPTIMUM MOISTURE (%)
			(pcf)	(kg/m ³)				(pcf)	(kg/m ³)								
		SM	88.2	1413	37.5	100.0	0.91										
		CL	99.3	1591	26.6	100.0	0.70										
19	23	CL	105.5	1690	21.1	95.5	0.60										
		CL	102.9	1648	22.4	94.7	0.64										
		CL	102.2	1637	25.9	100.0	0.65										
		CL	89.8	1439	31.4	96.8	0.88										
		CL	95.3	1527	29.5	100.0	0.77										
		CL	96.1	1540	28.2	100.0	0.75										
		CL	104.6	1676	23.9	100.0	0.61										
		CL	101.8	1631	24.7	101.8	0.66										
16	25	CL	100.3	1607	23.8	94.3	0.68										
		CL	99.6	1596	26.3	102.9	0.69										
		CL	98.1	1572	25.9	97.5	0.72										
		NP SM	114.0	1826	17.9	101.5	0.48										
		CL	103.9	1664	24.4	100.0	0.62										
		CL	98.1	1572	27.2	100.0	0.72										
		SM	86.8	1391	8.4	24.0	0.94										
		SM	102.6	1644	16.4	68.8	0.64										
		SM	89.9	1440	10.1	31.2	0.87										
		NP SM	109.2	1749	7.8	38.9	0.54										
		NP GP-GM	113.1	1812	13.6	75.3	0.49										
		SP-SM	110.9	1777	15.6	80.9	0.52										
		SP-SM	114.2	1829	5.3	30.3	0.48										
		SP-SM	114.4	1833	9.4	53.8	0.47										
		SP-SM	89.4	1432	17.6	53.8	0.89										
		SM	92.9	1488	15.9	52.6	0.81										
		NP SM	99.9	1600	12.1	47.7	0.69										
		SM	104.9	1680	12.9	57.7	0.61										
21	8	CL	94.5	1514	20.8	71.8	0.78										
		CL	106.7	1709	12.9	60.1	0.58										
		CL	111.1	1780	11.3	58.7	0.52										
		SM	108.2	1733	14.5	70.6	0.56										
		SM	98.9	1584	22.3	85.5	0.70										
		NP SM	107.2	1717	11.8	55.7	0.57										
		SM	104.5	1674	13.7	60.3	0.61										
		SM	110.9	1777	13.0	67.8	0.52										
		SM	101.7	1629	7.2	29.7	0.66										
		SM	109.3	1751	9.9	49.5	0.54										
		SM	95.7	1533	17.6	62.6	0.76										
		SM	98.1	1572	13.2	49.7	0.72										
		NP SW-SM	113.7	1821	5.6	31.1	0.48										

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

TABLE
II - 5 - 1
7 OF 10

TUBRO NATIONAL, INC.

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT													
				STANDARD SIEVE OPENING						U S STANDARD SIEVE							
				BLDRS.		COBBLES		GRAVEL		SAND							
				24"	12"	6"	3"	1 1/2"	3/4"	3/8"	4	10	40	100			
		FEET	METERS														
BL-B-10	D-5	15.2 - 16.0	4.63 - 4.88														
	D-6	20.2 - 21.0	6.16 - 6.40														
	P-7	25.0 - 25.6	7.62 - 7.80														
	D-8	30.2 - 31.0	9.20 - 9.45														
	D-9	35.2 - 36.0	10.73 - 10.97						100	96	89	79	66	26	16		
	D-10	40.2 - 41.0	12.25 - 12.50														
	P-11	46.6 - 47.1	14.20 - 14.36														
	D-12	50.2 - 51.0	15.30 - 15.54														
	D-13	60.2 - 61.0	18.35 - 18.59														
	P-14	70.8 - 71.4	21.58 - 21.76														
	P-15	81.8 - 82.5	24.93 - 25.15								100	96	72	16	8		
	P-16	90.9 - 91.8	27.71 - 27.98						100	79	69	60	49	24	15		
	D-17	100.2 - 101.0	30.54 - 30.78														
MD-T-1	b-2	6.0 - 7.0	1.83 - 2.13								100	99	97	84	2		
MD-T-2	B-1	0.5 - 2.0	0.15 - 0.61								100	99	96	80	5		
	b-2	10.0 - 11.0	3.05 - 3.35														
	b-3	12.0 - 13.0	3.66 - 3.96										100	97	7		
MD-T-3	B-1	0.5 - 2.0	0.15 - 0.61														10
	b-2	8.0 - 9.0	2.44 - 2.74										100	98	4		
MD-T-5	B-1	0.5 - 2.0	0.15 - 0.61						100	98	96	90	81	48	3		
MD-T-6	B-1	0.5 - 2.0	0.15 - 0.61						100	97	89	83	75	59	3		
	b-2	4.0 - 5.0	1.22 - 1.52				100		89	81	58	44	32	17			
	b-3	8.0 - 9.0	2.44 - 2.74														
MD-T-7	B-1	0.5 - 2.0	0.15 - 0.61										100	99	9		
MD-T-8	B-1	0.5 - 2.0	0.15 - 0.61				100		95	89	77	66	55	33	2		
MD-T-9	B-1	0.5 - 2.0	0.15 - 0.61										100	97	8		
	b-2	5.0 - 6.0	1.52 - 1.83										100	99	8		
MD-T-10	B-1	0.5 - 2.0	0.15 - 0.61				100		85	69	50	41	33	24	1		
	b-2	5.5 - 6.5	1.68 - 1.98						100	85	71	58	46	30	2		
MD-T-11	B-1	0.5 - 2.0	0.15 - 0.61						100	92	80	71	58	43	3		
	b-2	3.0 - 4.0	0.91 - 1.22							100	93	86	76	61	5		
MD-T-12	B-1	0.5 - 2.0	0.15 - 0.61				100		76	58	47	40	36	30	2		
	b-2	4.0 - 5.0	1.22 - 1.52						100	96	93	88	84	76	3		
	b-3	8.0 - 9.0	2.44 - 2.74				100		69	46	40	37	33	28	3		
MD-T-13	B-1	0.5 - 2.0	0.15 - 0.61				100		73	52	34	26	22	17	3		
MD-T-14	B-1	0.5 - 2.0	0.15 - 0.61									100	96	81	3		
MD-T-15	B-1	0.5 - 2.0	0.15 - 0.61							100	99	98	93	77	3		
MD-T-16	B-1	0.5 - 2.0	0.15 - 0.61						100	89	81	73	60	31	3		
	b-2	4.0 - 5.0	1.22 - 1.52				100		81	61	51	45	38	22	3		
	b-4	9.0 - 10.0	2.74 - 3.05						100	97	96	90	75	49	3		
MD-T-17	B-1	0.5 - 2.0	0.15 - 0.61							100	98	95	89	67	3		
	b-2	5.0 - 6.0	1.52 - 1.83						100	86	72	63	54	37	3		

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed and results are included in this report

PERCENT FINER BY WEIGHT									ATTERBERG LIMITS (b)			USCS (c)	IN-SITU					COMPACTED		
NO. OF SAMPLES		U S STANDARD SIEVE NO.				PARTICLE SIZE (mm)							DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE
3/4"	3/8"	4	10	40	100	200	.005	.001	LL	PL	PI	(pcf)	(kg/m ³)	(pcf)				(kg/m ³)		
												SP	109.8	1759	8.5	43.1	0.53			
												SP-SM	115.3	1847	10.0	58.7	0.46			
												SP	107.8	1727	13.1	63.0	0.56			
												SP	113.6	1820	10.7	59.6	0.48			
96	89	79	66	26	16	13						SM	116.8	1871	10.3	63.0	0.44			
												SM	106.9	1713	14.1	66.2	0.58			
												SP-SM	112.0	1794	13.9	74.3	0.50			
												SP-SM	110.6	1772	9.6	49.7	0.52			
												SM	113.5	1818	7.7	43.1	0.48			
												SP	110.1	1764	14.7	75.0	0.53			
	100	96	72	16	8	6						SW-SM	104.8	1679	19.4	86.3	0.61			
79	69	60	49	24	15	13						SM	105.6	1692	21.7	98.6	0.60			
												SM	121.0	1938	10.9	75.7	0.39			
	100	99	97	84	20	14						SM								
	100	99	96	80	50	30						SC								
									55	25	30	CH								
			100	97	75	55						NP								
									49	32	18	ML								
												ML								
			100	98	44	32						SM								
98	96	90	81	48	31	22						SM						125.0	2003	10.2
97	89	83	75	59	39	29						NP						125.0	2003	11.6
81	58	44	32	17	9	7						GW-GM								
									35	18	17	SC								
			100	99	96	94						CL								
89	77	66	55	33	23	19						SM								
			100	97	91	88	17	4	70	49	21	MH					69.1	1107	49.0	
			100	99	98	98	58	34	79	35	44	CH								
69	50	41	33	24	17	13						GM								
85	71	58	46	30	20	15						SM								
92	80	71	58	43	35	32						SM								
100	93	86	76	61	52	45						SC								
58	47	40	36	30	21	15						GC						137.0	2195	7.0
96	93	88	84	76	59	37			22	21	1	SM								
46	40	37	33	28	23	19						GC								
52	34	26	22	17	12	8						GW-GM								
		100	96	81	52	38			28	17	11	SC					116.0	1858	15.0	
100	99	98	93	77	56	34						SM					126.9	2033	10.0	
89	81	73	60	31	20	16						SM								
61	51	45	38	22	10	7						GP-GM								
97	96	90	75	49	37	32						SM								
100	98	95	89	67	41	30			39	21	18	SC					112.0	1794	17.0	
86	72	63	54	37	24	17						SM								

System

performed
report

2

PI	USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CDR
		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
		(pcf)	(kg/m ³)				(pcf)	(kg/m ³)								
	SP	109.8	1759	8.5	43.1	0.53										
	SP-SM	115.3	1847	10.0	58.7	0.46										
	SP	107.8	1727	13.1	63.0	0.56										
	SP	113.6	1820	10.7	59.6	0.48										
	SM	116.8	1871	10.3	63.0	0.44										
	SM	106.9	1713	14.1	66.2	0.58										
	SP-SM	112.0	1794	13.9	74.3	0.50										
	SP-SM	110.6	1772	9.6	49.7	0.52										
	SM	113.5	1818	7.7	43.1	0.48										
	SP	110.1	1764	14.7	75.0	0.53										
	SW-SM	104.8	1679	19.4	86.3	0.61										
	SM	105.6	1692	21.7	98.6	0.60										
	SM	121.0	1938	10.9	75.7	0.39										
	SM															
	SC															
30	CH															
NP	ML															
18	ML															
	SM															
	SM						125.0	2003	10.7						*	
NP	SM						125.0	2003	11.0						*	
	GW-GM															
17	SC															
	CL															
	SM															
21	MH						69.1	1107	49.8						*	
44	CH															
	GM															
	SM															
	SM															
	SC															
	GC						137.0	2195	7.0						*	
1	SM															
	GC															
	GW-GM															
11	SC						116.0	1858	15.5						*	
	SM						126.9	2033	10.2						*	
	SM															
	GP-GM															
	SM															
18	SC						112.0	1794	17.2						*	
	SM															

SUMMARY OF LABORATORY TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DND

TABLE
 II - 5 1
 8 OF 10

FUGRO NATIONAL, INC.

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING						U S STANDARD SIEVE				
				BLDRS.	COBBLES		GRAVEL			SAND				
					24"	12"	6"	3"	1 1/2"	3/4"	3/8"	4	10	40
FEET	METERS													
MD-T-18	B-1	0.5 - 2.0	0.15 - 0.61						100	98	94	87	66	41
	b-2	2.5 - 3.5	0.76 - 1.07											
MD-T-19	B-1	0.5 - 2.0	0.15 - 0.61						100	94	90	83	69	55
MD-T-20	B-1	0.5 - 2.0	0.15 - 0.61					100	98	95	91	85	71	55
	b-2	4.0 - 5.0	1.22 - 1.52				100	87	74	54	39	23	8	3
BL-T-14	B-1	0.5 - 2.0	0.15 - 0.61				100	88	60	41	30	22	12	8
BL-T-15	B-1	0.5 - 2.0	0.15 - 0.61					100	96	73	64	52	28	16
BL-T-17	B-1	0.5 - 2.0	0.15 - 0.61										100	99
BL-T-18	B-1	0.5 - 2.0	0.15 - 0.61									100	90	70
BL-T-19	B-1	0.5 - 2.0	0.15 - 0.61									100	87	58
	b-3	7.0 - 8.0	2.13 - 2.44											
BL-T-20	B-1	0.5 - 2.0	0.15 - 0.61									100	99	94
	b-2	7.0 - 8.0	2.13 - 2.44						100	96	93	87	54	13
BL-T-21	b-2	4.0 - 5.0	1.22 - 1.52										100	98
BL-T-22	B-1	0.5 - 2.0	0.15 - 0.61						100	97	95	90	67	37
BL-T-22	b-3	11.0 - 12.0	3.35 - 3.66					100	96	94	93	91	66	23
	B-1	0.5 - 2.0	0.15 - 0.61							100	99	94	78	57
MD-P-1	B-1	0.5 - 2.0	0.15 - 0.61									100	98	89
	b-2	6.0 - 7.0	1.83 - 2.13									100	99	85
MD-P-2	b-1	0.5 - 2.0	0.15 - 0.61											
MD-P-4	B-1	0.5 - 2.0	0.15 - 0.61					100	94	91	85	78	56	34
	b-2	6.0 - 7.0	1.83 - 2.13							100	99	97	85	62
MD-P-6	b-2	4.0 - 5.0	1.22 - 1.52				100	87	81	70	58	46	26	13
MD-P-8	b-1	0.5 - 1.5	0.15 - 0.46						100	97	88	76	52	37
MD-P-10	b-3	8.0 - 9.0	2.44 - 2.74					100	92	81	72	63	37	26
MD-P-12	b-1	0.5 - 2.0	0.15 - 0.61											
MD-P-13	b-1	0.5 - 2.0	0.15 - 0.61											
MD-P-14	b-1	0.5 - 2.0	0.15 - 0.61											
MD-P-16	b-2	2.0 - 3.0	0.61 - 0.91					100	85	67	54	43	24	15
	b-4	9.0 - 10.0	2.44 - 3.05					100	88	78	68	58	46	31
MD-P-19	b-2	4.0 - 5.0	1.22 - 1.52				100	90	56	40	26	17	10	8
MD-P-20	b-1	0.5 - 2.0	0.15 - 0.61					100	88	81	73	65	53	30
	b-3	8.0 - 9.0	2.44 - 2.74				100	91	66	56	46	38	25	15
MD-P-21	b-1	0.5 - 2.0	0.15 - 0.61						100	99	96	93	86	67
	b-2	4.0 - 5.0	1.22 - 1.52			100	80	60	52	46	43	39	33	20
MD-P-24	b-2	5.0 - 6.0	1.52 - 1.83										100	90
MD-P-25	b-1	0.5 - 2.0	0.15 - 0.61									100	99	71
	b-3	7.0 - 8.0	2.13 - 2.44										100	40
MD-P-26	b-1	0.5 - 2.0	0.15 - 0.61											
MD-P-27	b-1	0.5 - 1.0	0.15 - 0.30							100	97	90	75	40
	b-2	1.0 - 2.0	0.30 - 0.61					100	91	67	48	33	21	11

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

D.b - Bulk

NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed and results are included in this report

	59	40	19	MH			
				SM			
	67	32	35	CH			
10			NP	ML			
				SP-SM			
	30	24	6	ML			
				SM			
				SM			
	26	19	7	SM - SC			
21	61	29	32	CH			
				SM			
	32	17	15	CL			
	36	22	14	SC			
				SM			
				SP-SM			
				SC			
				SM			
	30	11	19	CL			
	42	22	20	CL			
	29	18	11	CL			
				GW-GM			
				SM			
				GP-GC			

NO (b)	USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAxIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
		(pcf)	(kg/m ³)				(pcf)	(kg/m ³)								
	SM															
13	SC															
6	SM															
	SC															
	GW															
	GP-GM															
	SM															
10	CL								2.72							
19	MH															
	SM															
35	CH															
NP	ML															
	SP-SM															
6	ML															
	SM															
	SM															
7	SM - SC															
32	CH						102.0	1634	23.0							
	SM															
15	CL															
14	SC						122.5	1962	11.1							
	SM															
	SP-SM															
	SC															
	SM															
19	CL															
20	CL															
11	CL															
	GW-GM															
	SM															
	GP-GC															
	SC															
	GC															
	SM															
	GM															
7	CL-ML															
NP	SM															
	SC															
14	CL															
	SM															
	GW-GM															

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

TABLE
II - 5 - 1
9 OF 10

FUGRO NATIONAL, INC.

3

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT																
				STANDARD SIEVE OPENING						U S STANDARD SIEVE										
				BL JR.		SIBBL		GRAVEL		SAND										
				4"	2"	1"	3/4"	3/8"	5/16"	4	10	40	100							
		FEET	METERS																	
MD-P-27	b-3	3.0	4.0	1.37	1.22				100	96	96	96	84	50						
MD-P-28	b-3	6.0	7.0	1.35	1.1				100	96	96	87	74	53						
MD-P-29	B-1	0.5	2.0	1.15	1.37				100	96	94	91	71	39						
MD-P-33	b-1	1.5	2.0	1.15	1.37			100	96	92	86	76	64	48	39					
	b-2	3.5	4.5	1.07	1.37			100	96	91	86	76	64	48	39					
MD-P-34	B-1	0.5	2.0	1.15	1.37			100	96	91	86	76	64	48	39					
MD-P-35	B-1	0.5	2.0	1.15	1.37															
	B-2	4.0	5.0	1.22	1.32			100	96	94	80	55	23	12						
MD-P-37	b-2	3.0	4.0	1.17	1.22			100	96	91	86	76	64	48	39					
MD-P-38	B-1	0.5	2.0	1.15	1.37			100	96	91	86	76	64	48	39					
MD-P-39	B-1	0.5	2.0	1.15	1.37															
MD-P-40	B-1	0.5	2.0	1.15	1.37															
MD-P-41	B-1	0.5	2.0	1.15	1.37															
MD-P-42	B-1	0.5	2.0	1.15	1.37			100	96	91	86	76	64	48	39					
	b-3	7.0	8.0	1.13	1.44			100	96	91	86	76	64	48	39					
MD-P-46	b-1	0.5	2.0	1.15	1.37			100	96	91	86	76	64	48	39					
MD-P-47	B-1	0.5	2.0	1.15	1.37			100	96	91	86	76	64	48	39					
BL-P-15	B-1	0.5	2.0	1.15	1.37															
BL-P-17	b-1	0.5	2.0	1.15	1.37															
BL-P-21	B-1	0.5	2.0	1.15	1.37															

NOTES:

- (a) Sample types
 - SS - Standard split spoon
 - P - Pitcher
 - D - Fugro Drive
 - B, b - Bulk
 - (b) NP - Not Plastic
- (c) JSCS - In situ cone penetrometer system
- (d) * indicates test results were not performed and results are in error if the test was performed

SOILS (b)		USCS (c)	IN-SITU				COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAxIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR	
PL	PI		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY									OPTIMUM MOISTURE (%)
			(pcf)	(kg/m ³)				(pcf)	(kg/m ³)								
		SM															
		SC															
		SM															
		GP-GM															
		SM															
		GC															
		SM															
		SW-SM															
		GP															
		SC															
		SM															
		SC															
		SC															
		SM															
		GW-GM															
		SC															
		GP-GM															
		SM						125.0	2003	10.9						*	
		SC															
		SM						122.5	1962	11.5						*	

SUMMARY OF LABORATORY TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

TABLE II-5-1
 10 OF 10

URS NATIONAL INC.

2

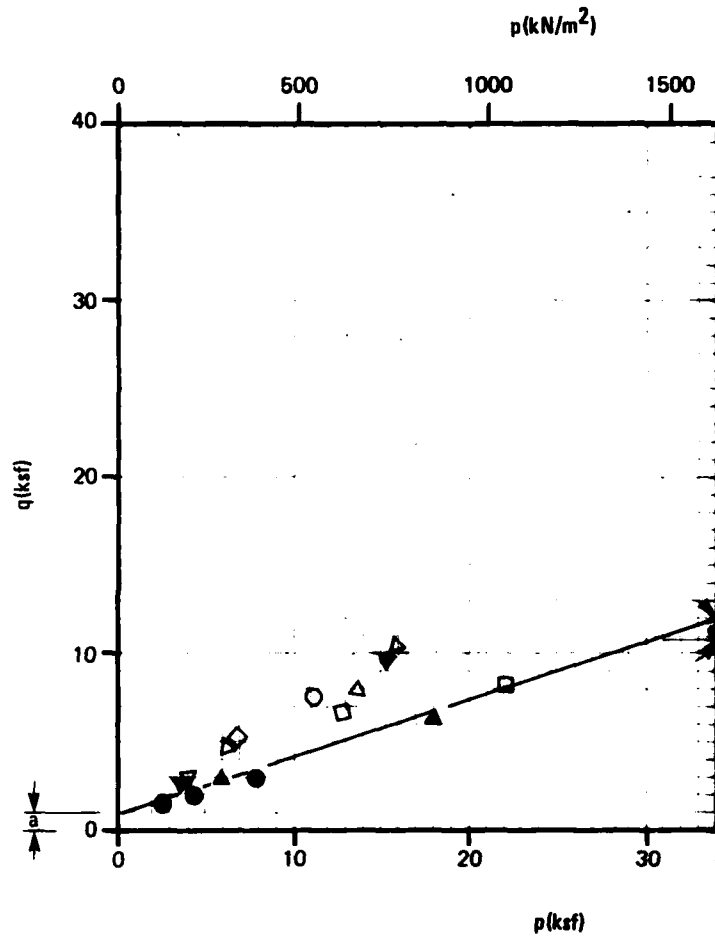
3

SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	TYPE OF TEST	DRY DENSITY		MOISTURE CONTENT (%)	CONFINING PRESSURE (σ_3)		MAXIMUM DEVIATOR STRESS ($\sigma_1 - \sigma_3$)		STRENGTH RA (%)
			FEET	METERS			pcf	kg/m ³		ksf	kN/m ²	ksf	kN/m ²	
	MD-B-3	P-7	10.5 - 11.1	3.20 - 3.38	CH	CD	83.8	1342	27.0	1.0	48	7.0	335	0
		P-7	11.1 - 11.7	3.38 - 3.57	CH	CD	94.4	1512	22.1	4.0	192	15.3	733	0
	MD-B-9	P-8	31.6 - 32.2	9.63 - 9.81	CH	CD	82.4	1320	34.1	1.6	77	6.7	321	0
		P-8	32.2 - 32.8	9.81 - 10.00	CH	CD	81.5	1306	35.5	3.0	144	9.0	431	0
		P-8	32.8 - 33.4	10.00 - 10.18	CH	CD	93.5	1498	26.5	6.0	287	15.8	757	0
7/	MD-B-10	P-12	34.2 - 34.8	10.42 - 10.61	SC	CD	103.2	1653	18.4	1.7	81	6.1	292	0
		P-12	34.8 - 35.4	10.61 - 10.79	SC	CD	98.9	1584	19.3	7.1	340	19.9	953	0
□	MD-B-10	P-17	69.1 - 69.6	21.06 - 21.21	CL	CD	101.0	1618	23.6	3.5	168	9.4	450	0
		P-17	69.7 - 70.2	21.24 - 21.46	CL	CD	99.9	1600	23.8	7.0	335	12.8	613	0
		P-17	70.3 - 70.8	21.43 - 21.58	CL	CD	100.1	1604	23.2	14.0	670	16.6	795	0
●	MD-B-15	P-7	25.4 - 26.0	7.74 - 7.92	ML	CD	99.3	1590	25.4	1.2	57	3.1	148	0
		P-7	24.8 - 25.4	7.56 - 7.74	ML	CD	91.2	1461	27.3	2.4	115	4.1	196	0
		P-7	24.2 - 24.8	7.38 - 7.56	ML	CD	93.1	1491	27.3	5.0	239	6.0	287	0
▲	MD-B-15	P-16	89.0 - 89.6	27.13 - 27.31	CL	CD	101.8	1631	24.7	3.0	144	6.0	287	0
		P-16	90.8 - 91.5	27.68 - 27.89	CL	CD	100.3	1607	23.8	12.1	579	12.7	608	0
▼	BL-B-7	P-10	35.0 - 35.7	10.67 - 10.88	CL	CD	94.5	1514	20.8	1.7	81	6.2	297	0
		P-10	35.7 - 36.3	10.88 - 11.06	CL	CD	106.7	1709	12.9	6.0	287	19.7	943	0

NOTES: $p = \frac{\sigma_1 + \sigma_3}{2}$, $q = \frac{\sigma_1 - \sigma_3}{2}$

$c = \frac{q}{\cos \phi}$, $\phi = \sin^{-1} (\tan \alpha)$

#	DENSITY kg/m ³	MOISTURE CONTENT (%)	CONFINING PRESSURE (σ ₃)		MAXIMUM DEVIATOR STRESS (σ ₁ -σ ₃)		STRAIN RATE (% min.)	COHESION (C)		FRICTION ANGLE (φ) DEGREES
			ksf	kN/m ²	ksf	kN/m ²		ksf	kN/m ²	
8	1342	27.0	1.0	48	7.0	335	0.05	1.2	57	35°
4	1512	22.1	4.0	192	15.3	733	0.05			
4	1320	34.1	1.6	77	6.7	321	0.05			
5	1306	35.5	3.0	144	9.0	431	0.04	1.0	48	30°
5	1498	26.5	6.0	287	15.8	757	0.05			
2	1653	18.4	1.7	81	6.1	292	0.05	0.5	24	34°
9	1584	19.3	7.1	340	19.9	963	0.05			
0	1618	23.6	3.5	168	9.4	450	0.07			
9	1600	23.8	7.0	335	12.8	613	0.07	1.3	62	15°
1	1604	23.2	14.0	670	16.6	795	0.07			
3	1590	25.4	1.2	57	3.1	148	0.07			
2	1461	27.3	2.4	115	4.1	196	0.07	0.8	38	16°
1	1491	27.3	5.0	239	6.0	287	0.07			
8	1631	24.7	3.0	144	6.0	287	0.05	1.5	72	15°
3	1607	23.8	12.1	579	12.7	608	0.05			
5	1514	20.8	1.7	81	6.2	297	0.05			
7	1709	12.9	6.0	287	19.7	943	0.05	0.3	14	37.5°



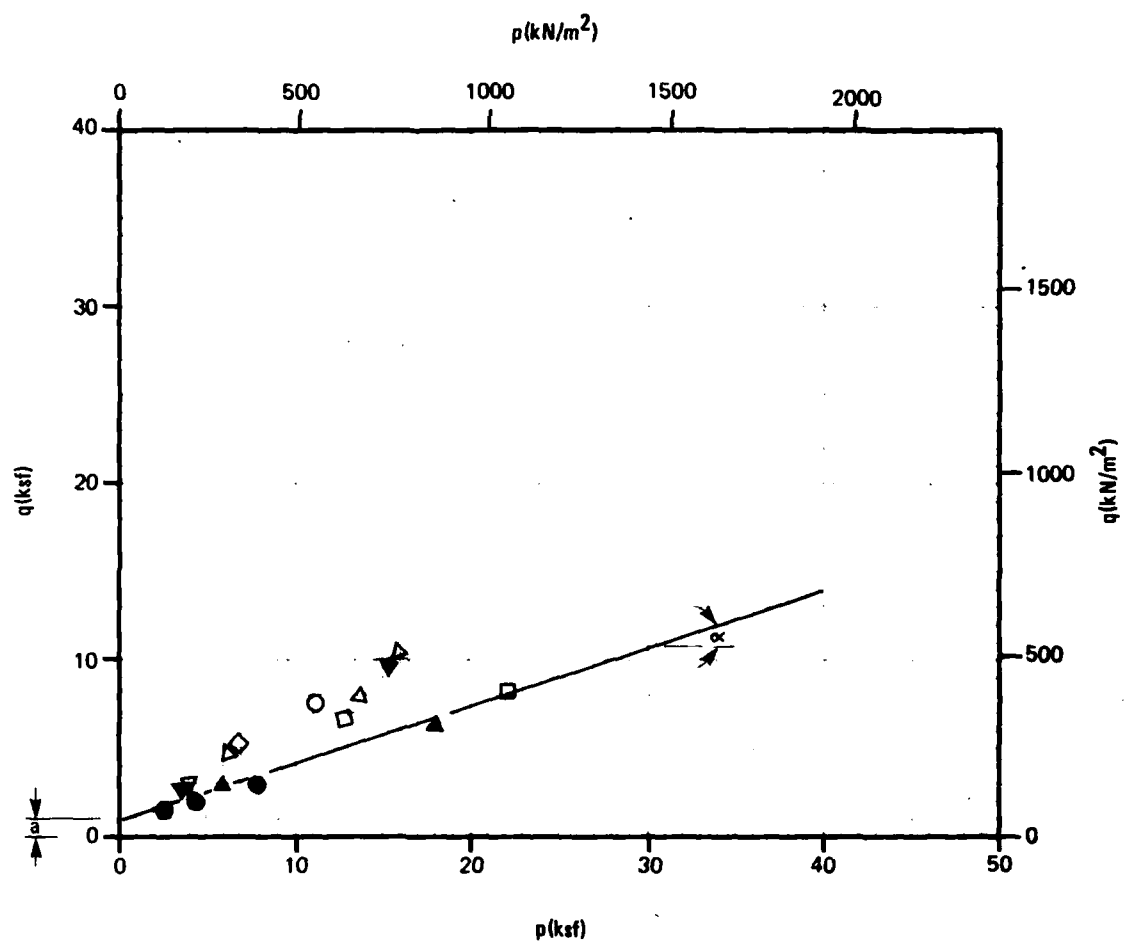
$$q = \frac{\sigma_1 - \sigma_3}{2}$$

$$\phi = \sin^{-1}(\tan \alpha)$$

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TEST NO.	STRAIN RATE (% min.)	COHESION (C)		FRICTION ANGLE (φ) DEGREES
		ksf	kN/m ²	
02	0.05	1.2	57	35°
03	0.05	1.0	48	30°
04	0.04	1.0	48	30°
07	0.05	0.5	24	34°
08	0.05	0.5	24	34°
10	0.07	1.3	62	15°
13	0.07	1.3	62	15°
15	0.07	0.8	38	16°
18	0.07	0.8	38	16°
19	0.07	0.8	38	16°
27	0.05	1.5	72	15°
28	0.05	1.5	72	15°
29	0.05	0.3	14	37.5°
33	0.05	0.3	14	37.5°



SUMMARY OF TRIAXIAL COMPRESSION
TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-1

FUGRO NATIONAL, INC.

2

3

BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	UNCONFINED COMP. STRENGTH		DRY DENSITY		MOISTURE CONTENT (%)	DEGREE OF SATURATION (%)	HEIGHT/DIAMETER
		FEET	METERS		ksf	kn/m ²	pcf	kg/m ³			
MD-B-2	D-4	6.2 - 7.0	1.89 - 2.13	SM-SC	0.9	43	114.7	1837	7.9	45.2	2.40
MD-B-3	P-4	6.2 - 7.0	1.89 - 2.13	MH	10.6	508	93.1	1491	22.0	73.4	2.09
	P-12	36.2 - 36.8	11.03 - 11.22	ML	4.7	225	85.3	1367	32.1	88.9	2.09
	P-14	45.0 - 45.8	13.72 - 13.96	CL	2.0	96	100.1	1604	22.8	90.1	2.09
	P-15	50.2 - 50.7	15.30 - 15.45	ML	2.1	101	85.6	1371	35.0	101.5	2.09
MD-B-7	D-2	3.7 - 4.5	1.13 - 1.37	SC	6.0	287	118.9	1905	7.8	50.6	2.40
MD-B-9	D-6	20.2 - 21.0	6.16 - 6.40	SC	2.0	96	106.1	1700	14.2	65.1	2.40
	P-9	36.6 - 37.5	11.16 - 11.43	CL-ML	2.7	129	101.1	1620	19.2	78.0	2.09
MD-B-10	D-18	80.2 - 81.0	24.44 - 24.69	CL	3.1	148	86.5	1386	34.7	99.0	2.40
MD-B-12	D-4	10.2 - 11.0	3.11 - 3.35	SW-SM	0.4	19	102.9	1648	8.2	34.8	2.40
MD-B-13	P-13	60.5 - 61.3	18.44 - 18.68	SM	0.3	14	103.0	1650	19.3	81.9	2.09
	P-13	61.3 - 62.1	18.68 - 18.93	SM	0.7	34	122.0	1954	12.6	89.4	2.09
MD-B-14	D-4	10.2 - 11.0	3.11 - 3.35	CL	3.3	158	104.3	1671	17.6	77.4	2.40
	D-11	45.2 - 46.0	13.78 - 14.02	ML	3.1	148	107.5	1722	10.4	49.3	2.40
MD-B-15	P-10	40.5 - 41.3	12.34 - 22.59	CL	2.1	101	102.9	1648	22.4	94.7	2.09
BL-B-7	P-5	11.0 - 11.8	3.35 - 3.60	SP-SM	1.3	62	110.9	1777	15.6	80.9	2.10
	P-9	30.0 - 30.8	9.14 - 9.39	SM	0.2	10	92.9	1488	15.9	52.6	2.00
	P-9	30.8 - 31.5	9.39 - 9.60	SM	0.5	24	104.9	1680	12.9	57.7	2.10
	P-13	49.7 - 50.5	15.15 - 15.39	SM	8.3	397	104.5	1674	13.7	60.3	2.10
BL-B-10	P-3	7.7 - 8.5	2.35 - 2.59	SM	0.5	24	98.1	1572	13.2	49.7	2.10

SUMMARY OF UNCONFINED COMPRESSION TEST RESULTS
OPERATIONAL BASE SITE MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 090

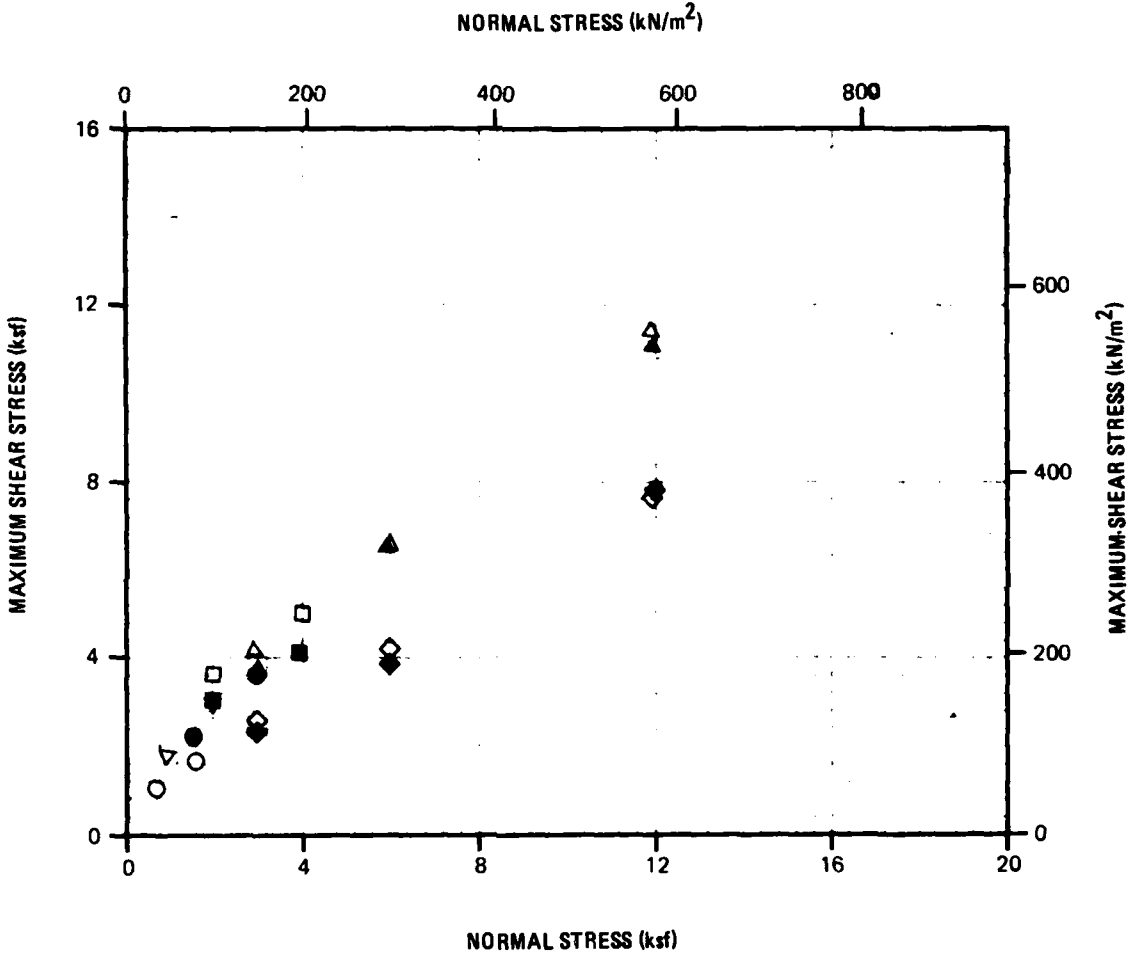
TABLE
 II-5-2

TUGRO NATIONAL, INC.

SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	TYPE OF TEST	DRY DENSITY		MOISTURE CONTENT (%)	COHESION (c)		FRICTION ANGLE (φ) DEGREES
			FEET	METERS			pcf	kg/m ³		ksf	kN/m ²	
●	MD B-1	D-9	15.2 - 16.0	4.6 - 4.9	SP-SM	CD	117.8	1887	9.5	0.1	5	46
●									21.8	0.9	43	41
□	MD-B-1	D-14	37.2 - 38.0	11.3 - 11.6	SP-SM	CD	118.6	1900	8.9	1.9	91	38
■									15.7	1.1	53	38
◇	MD-B-3	P-16	60.0 - 61.5	18.3 - 18.7	SP-SM	CD	103.9	1665	21.1	0.8	38	30
◆									24.0	0.6	29	30
△	MD-B-10	D-16	60.2 - 61.0	18.3 - 18.6	SP-SM	CD	106.8	1711	20.1	1.4	67	39
▲									24.7	1.0	48	40
▽	BL-B-7	D-7	19.2 - 20.0	5.6 - 6.1	SP-SM	CD	114.4	1833	9.4	0.5	24	45

○ □ ◇ △ ▽ - Tested at natural moisture content
 ● ■ ◆ ▲ - Tested in soaked condition

LOADING	FRICTION ANGLE (ϕ)
kN/m ²	DEGREES
5	46
43	41
91	38
53	38
38	30
29	30
67	39
48	40
24	45



SUMMARY OF DIRECT SHEAR TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

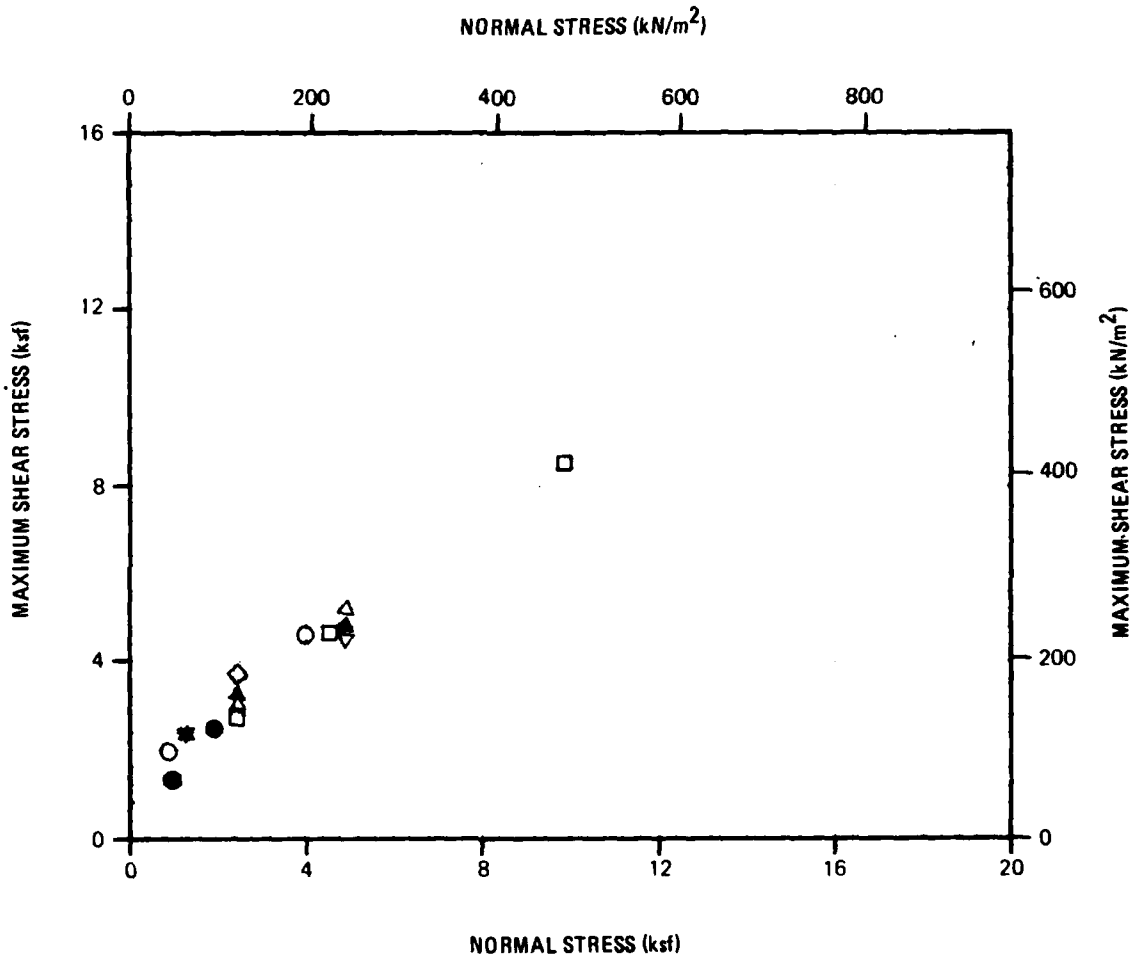
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - BMO	FIGURE II-5-2 1 of 5
--	-----------------------------------

FUGRO NATIONAL, INC.

SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	TYPE OF TEST	DRY DENSITY		MOISTURE CONTENT (%)	COHESION (c)		FRICTION ANGLE (φ) DEGREES
			FEET	METERS			pcf	kg/m ³		ksf	kN/m ²	
○	MD-B-1	D-11	22.2 - 23.0	6.8 - 7.0	SW-SM	CD	112.5	1802	6.4	0.9	43	44
●									16.9	0.1	5	50
□	MD-B-1	P-17	49.2 - 50.2	15.0 - 15.3	SW-SM	CD	103.0	1650	7.9	0.8	38	37
△	MD-B-2	D-8	25.2 - 26.0	7.7 - 7.9	SW-SM	CD	111.1	1780	8.4	0.9	43	40
▲									17.9	1.0	48	37
▽	MD-B-10	D-10	25.2 - 26.0	7.7 - 7.9	SW-SM	CD	111.2	1781	10.1	0.9	43	36
◇	MD-B-12	D-7	25.2 - 26.0	7.7 - 7.9	SW-SM	CD	112.2	1797	7.2	0.4	19	49

○, □, △, ▽, ◇ Tested at natural moisture content
 ●, ▲ Tested in soaked condition

CON	FRICTION ANGLE (ϕ)
N/m ²	DEGREES
43	44
5	50
38	37
43	40
48	37
43	36
19	49



SUMMARY OF DIRECT SHEAR TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-5-2
 2 of 5

FUGRO NATIONAL, INC.

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FUGRO NATIONAL INC LONG BEACH CA
PRELIMINARY GEOTECHNICAL INVESTIGATION PROPOSED OPERATIONAL BAS--ETC(U)
FEB 81
FN-TR-44-VOL-2

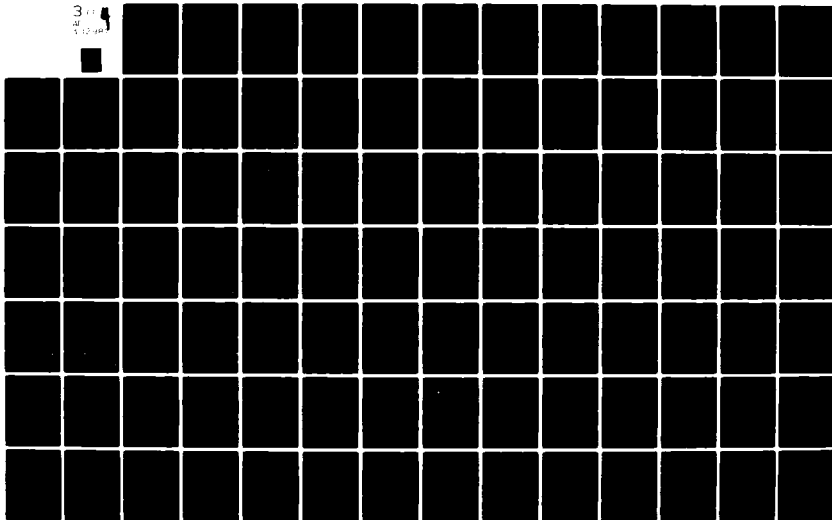
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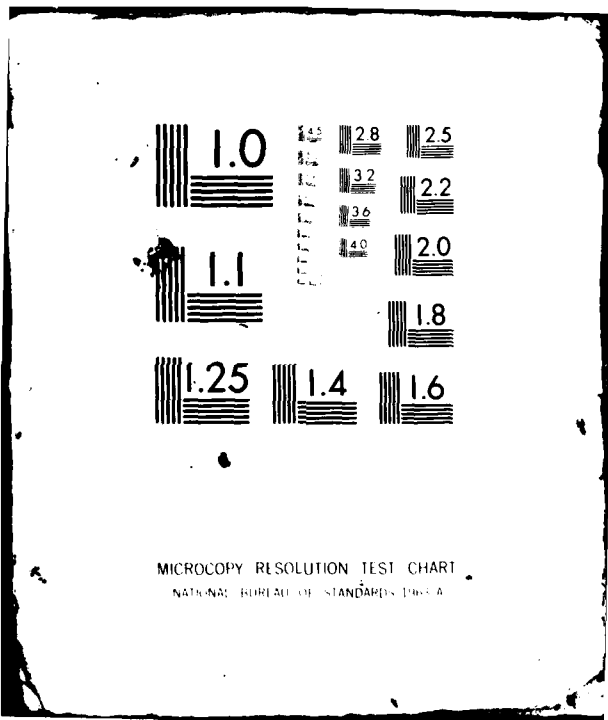
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

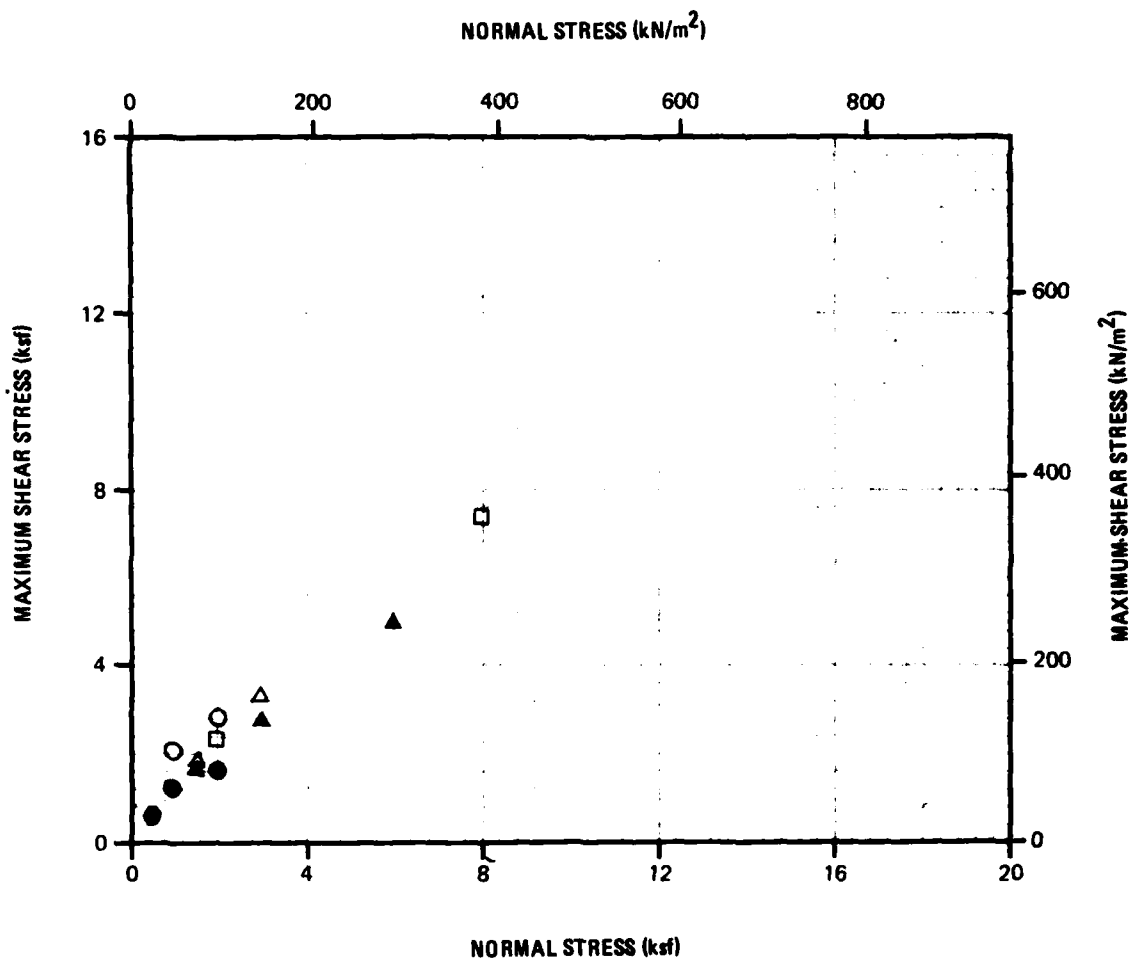
SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	TYPE OF TEST	DRY DENSITY		MOISTURE CONTENT (%)	COHESION (c)		FRICTION ANGLE (φ) DEGREES
			FEET	METERS			pcf	kg/m ³		ksf	kN/m ²	
○	MD-B-2	D-3	3.7 - 4.5	1.1 - 1.4	SM	CD	116.3	1863	4.9	1.2	57	39
●									16.6	0.3	14	33
□	MD-B-2	D-11	40.2 - 41.0	12.3 - 12.5	SM	CD	112.8	1807	11.5	1.0	49	38
△	MD-B-3	P-11	29.7 - 30.5	9.1 - 9.3	SM	CD	98.7	1581	13.4	0.2	10	45
▲									25.7	0.4	19	37

CONTINUED ON NEXT PAGE

○, □, △ - Tested in natural moisture content

●, ▲ - Tested in soaked condition

FRICITION ANGLE (ϕ) DEGREES
39
33
38
45
37



**SUMMARY OF DIRECT SHEAR TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH**

**MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO**

**FIGURE
II-5-2
3 of 5**

FUGRO NATIONAL, INC.

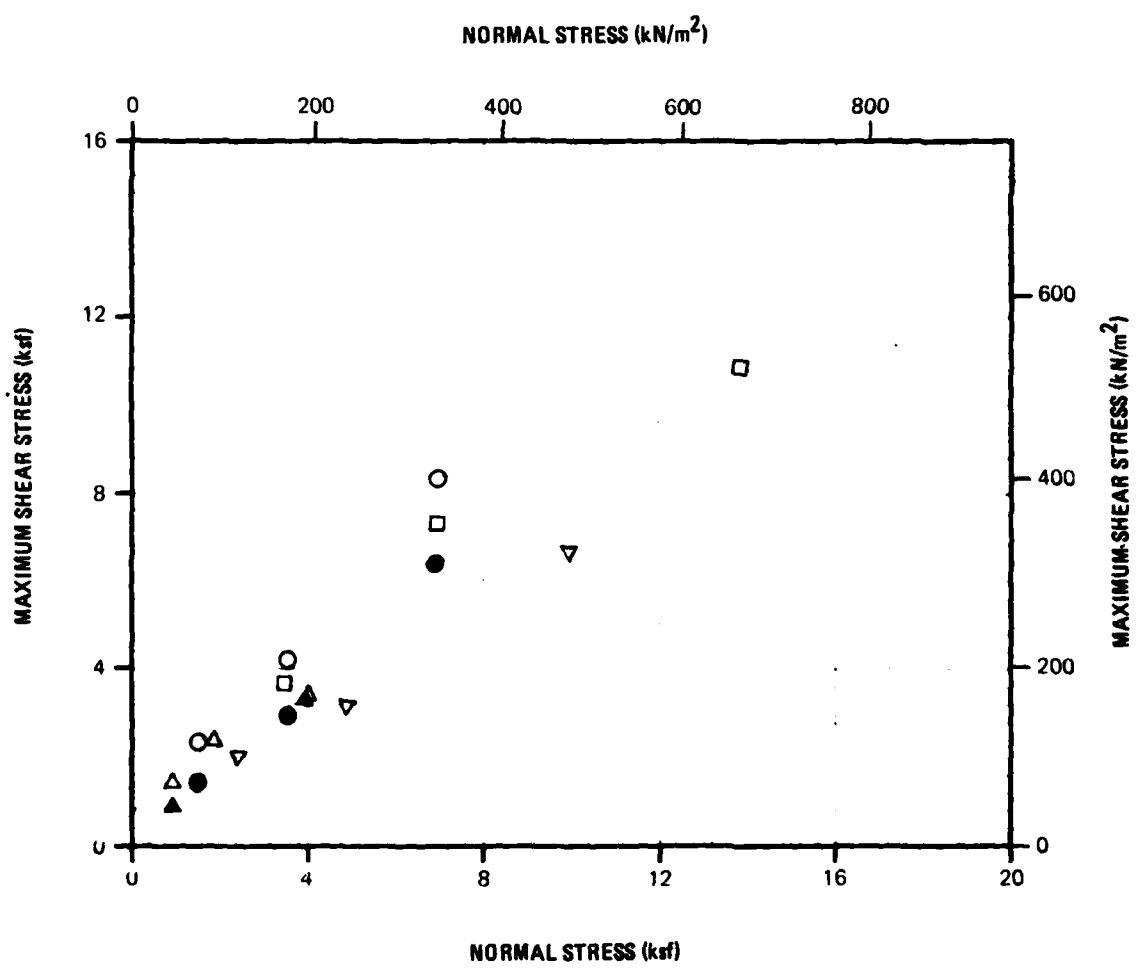
2

SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	TYPE OF TEST	DRY DENSITY		MOISTURE CONTENT (%)	COHESION (c)		FRICTION ANGLE (ϕ) DEGREES
			FEET	METERS			pcf	kg/m ³		ksf	kN/m ²	
○	MD-B-4	D-9	35.2 - 36.0	10.7 - 11.0	SM	CD	112.9	1809	5.2	0.8	38	46
●									17.0	0.1	5	40
□	MD-B-4	D-14	70.2 - 71.0	21.4 - 21.6	SM	CD	110.5	1770	9.6	1.4	67	35
△	MD-B-9	P-4	10.0 - 11.0	3.0 - 3.4	SM	CD	101.1	1620	11.4	0.5	24	36
▲									26.2	0.0	0	37
▽	MD-B-9	P-12	51.6 - 52.5	15.7 - 16.0	SM	CD	102.8	1647	22.5	0.2	10	33

○, □, △, ▽ - Tested at natural moisture content

●, ▲ - Tested in soaked condition

2	FRICION ANGLE (ϕ) DEGREES
	46
	40
	35
	36
	37
	33



SUMMARY OF DIRECT SHEAR TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

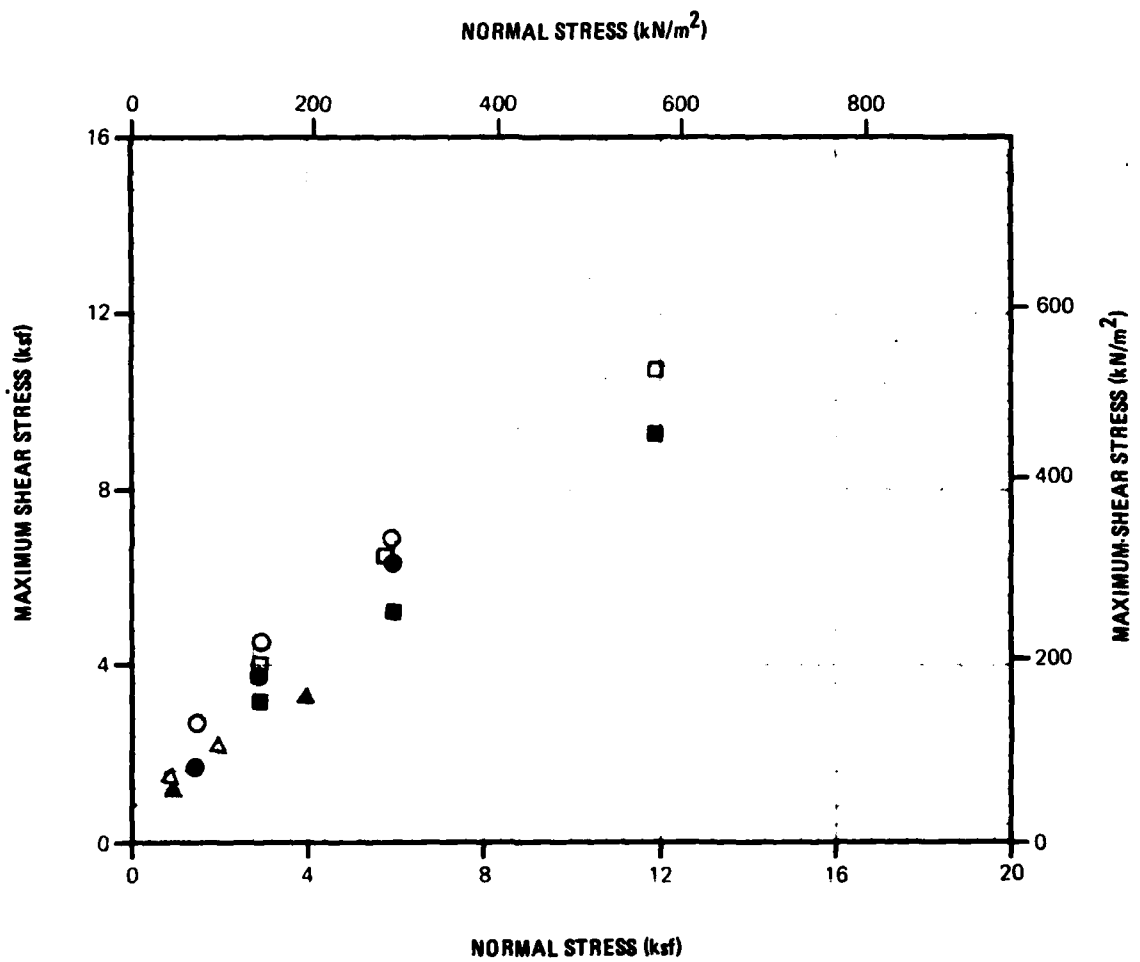
FIGURE
II-5-2
4 of 5

FUGRO NATIONAL, INC.

SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	TYPE OF TEST	DRY DENSITY		MOISTURE CONTENT (%)	COHESION (c)		FRICTION ANGLE (φ) DEGREES
			FEET	METERS			pcf	kg/m ³		ksf	kN/m ²	
○	MD-B-4	P-5	15.1 - 17.0	4.6 - 5.2	ML	CD	109.1	1748	7.5	1.6	77	41
●									22.4	0.2	10	46
□	MD B-1	D-13	60.2 - 61.0	18.3 - 18.6	ML	CD	104.8	1679	12.1	1.6	77	37
■									20.8	1.2	57	34
△	MD B-6	P-9	21.0 - 21.7	6.4 - 6.6	ML	CD	104.2	1669	18.1	0.7	34	35
▲									22.4	0.4	19	36

○, □, △ - Tested at natural moisture content
●, ■, ▲ - Tested in soaked condition

DN	FRICION ANGLE (ϕ)
kN/m^2	DEGREES
77	41
10	46
77	37
57	34
34	35
19	36



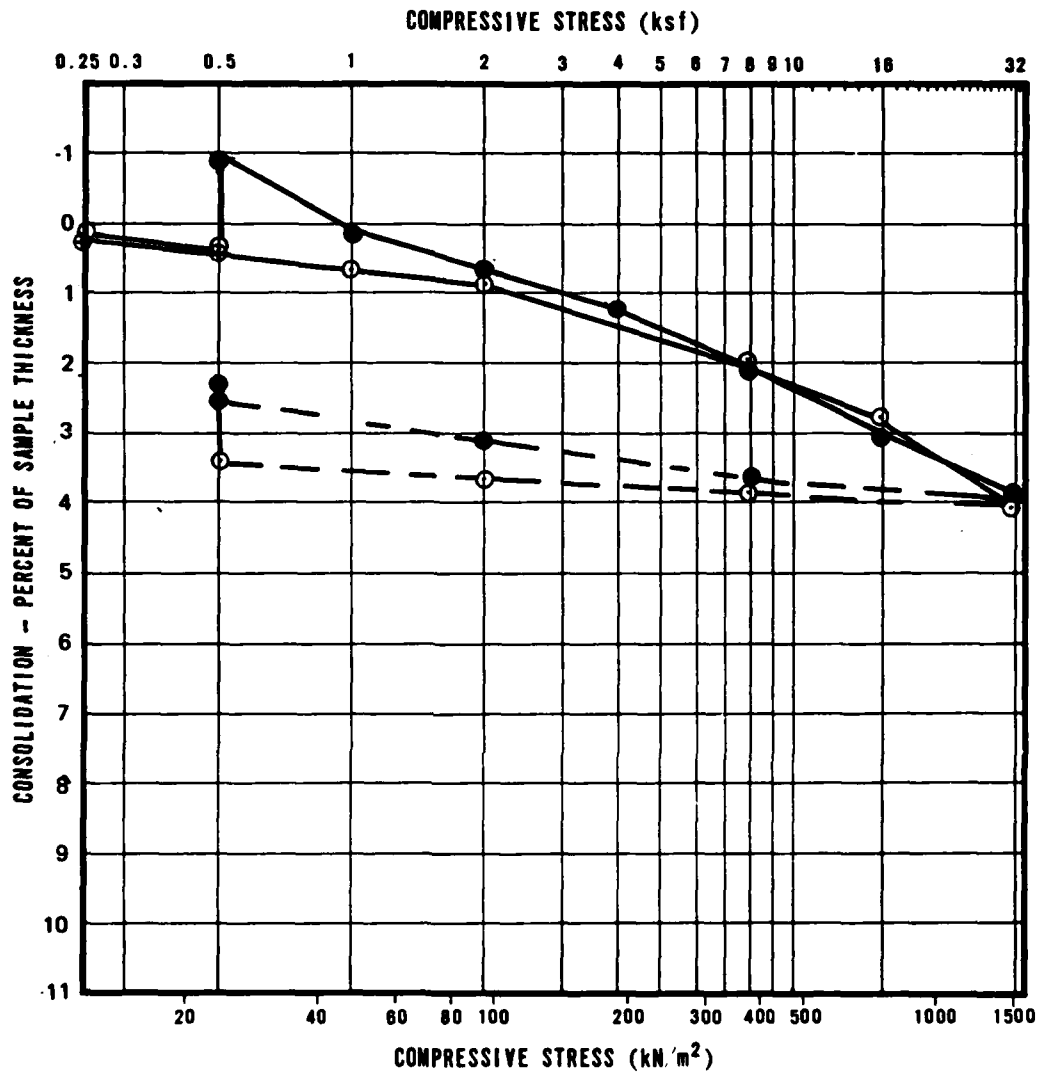
SUMMARY OF DIRECT SHEAR TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE II-5-2
 5 of 8

TUGRO NATIONAL, INC.

2



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m^3			
○,●	MD-B-3	P-7	10.5 - 11.1	3.20 - 3.38	CH	114.7	1837	10.6	0.47	60.9
⊙,●	MD-B-3	P-7	10.5 - 11.1	3.20 - 3.38	CH	115.8	1855	10.4	0.45	65.4

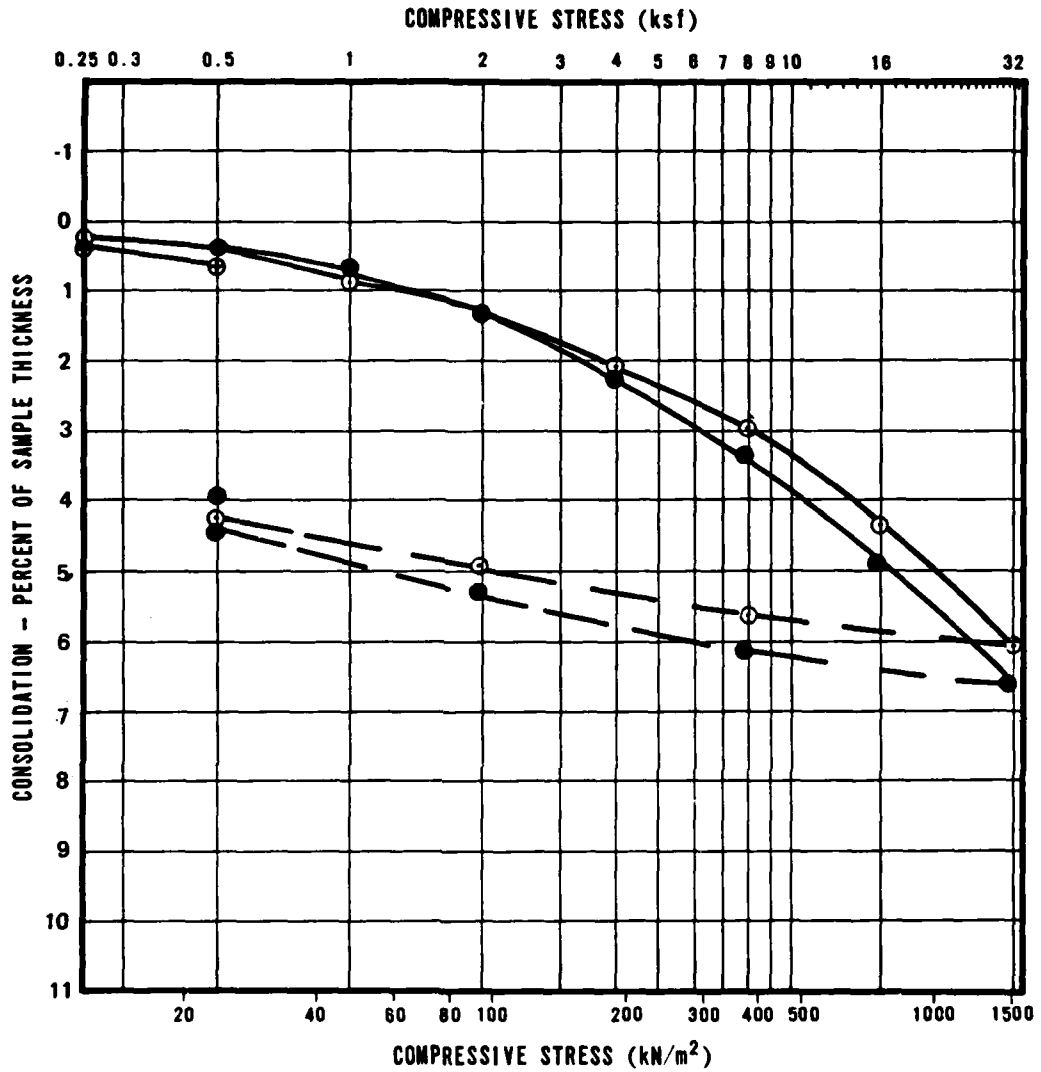
⊙,○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 ——— COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-5-3
 1 OF 10

FUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m³			
○, ●	MD-B-3	P-12	36.2 - 36.8	11.03 - 11.22	ML	102.5	1642	22.9	0.64	96.6
●, ●	MD-B-3	P-12	36.2 - 36.8	11.03 - 11.22	ML	104.7	1677	21.7	0.62	97.2

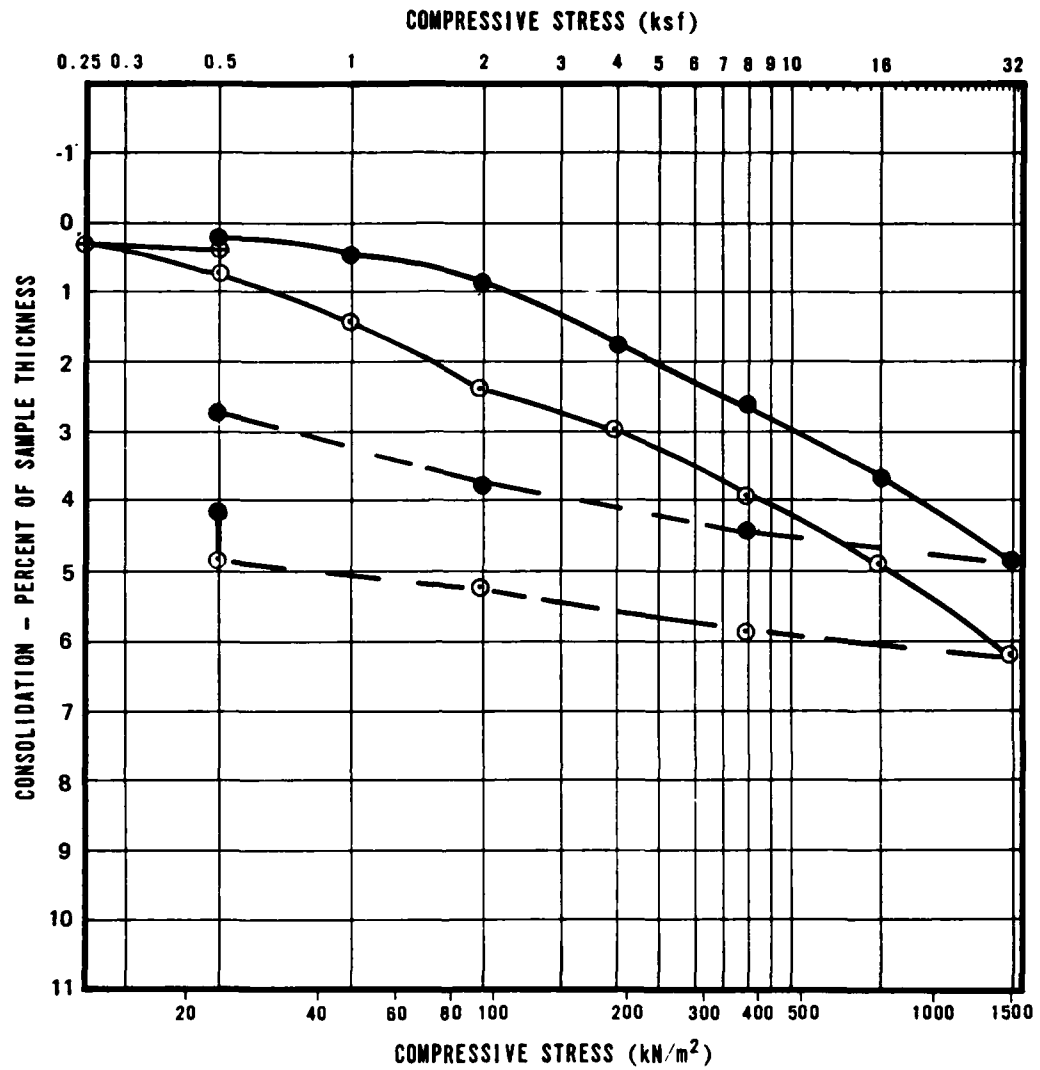
- ⊕, ○ AT FIELD MOISTURE
- AFTER ADDITION OF WATER
- COMPRESSION
- - - - REBOUND

CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-3
 2 OF 10

JUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m^3			
○, ●	MD-B-9	P-3	6.0 - 6.6	1.83 - 2.01	ML	111.4	1785	17.1	0.51	90.5
⊕, ●	MD-B-9	P-3	6.0 - 6.6	1.83 - 2.01	ML	111.7	1789	16.1	0.51	87.3

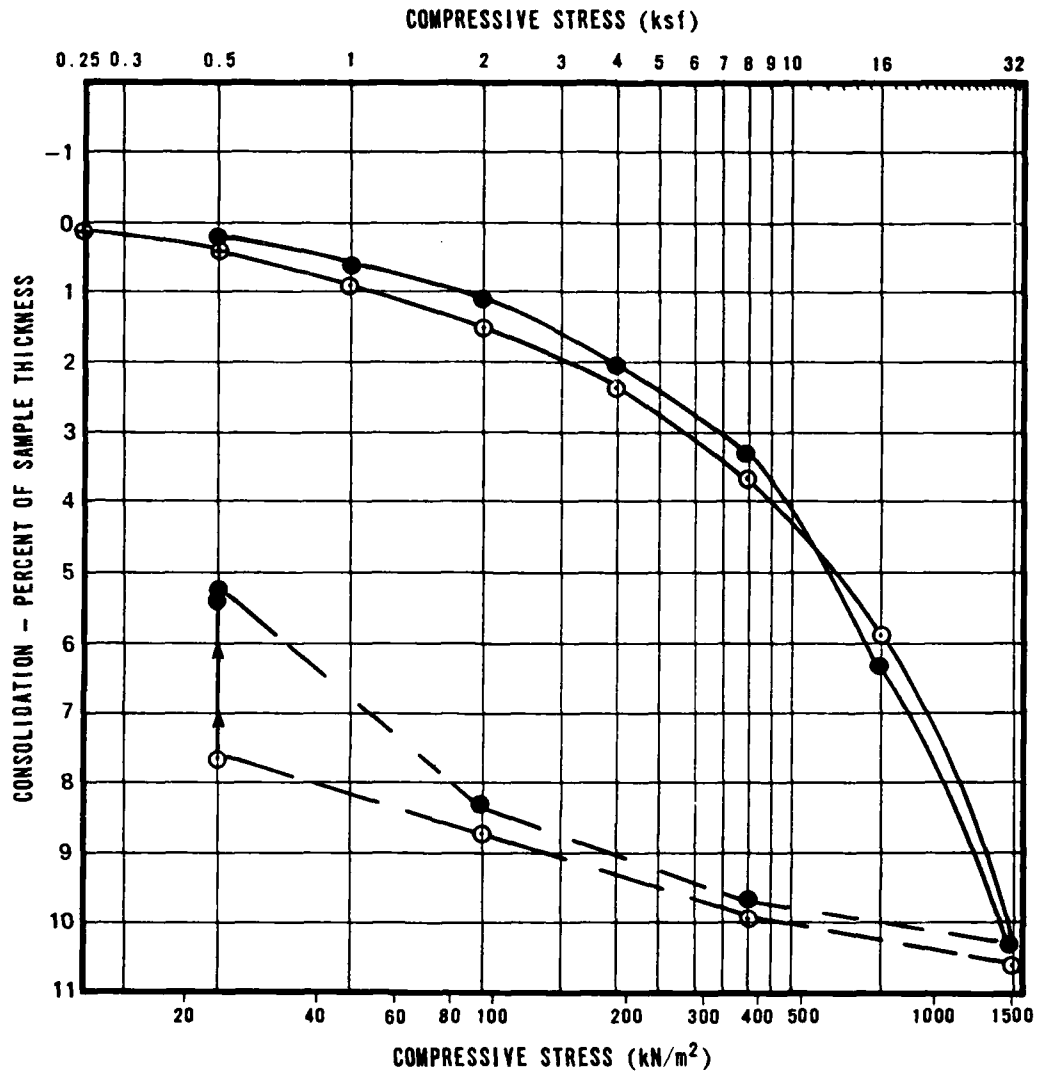
⊕, ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 ——— COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-3
 3 OF 10

UGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m ³			
○, ●	MD-B-9	P-8	31.0 - 31.6	9.45 - 9.63	CH	91.4	1464	30.2	0.84	97.1
⊕, ●	MD-B-9	P-8	31.0 - 31.6	9.45 - 9.63	CH	90.1	1443	31.5	0.87	96.8

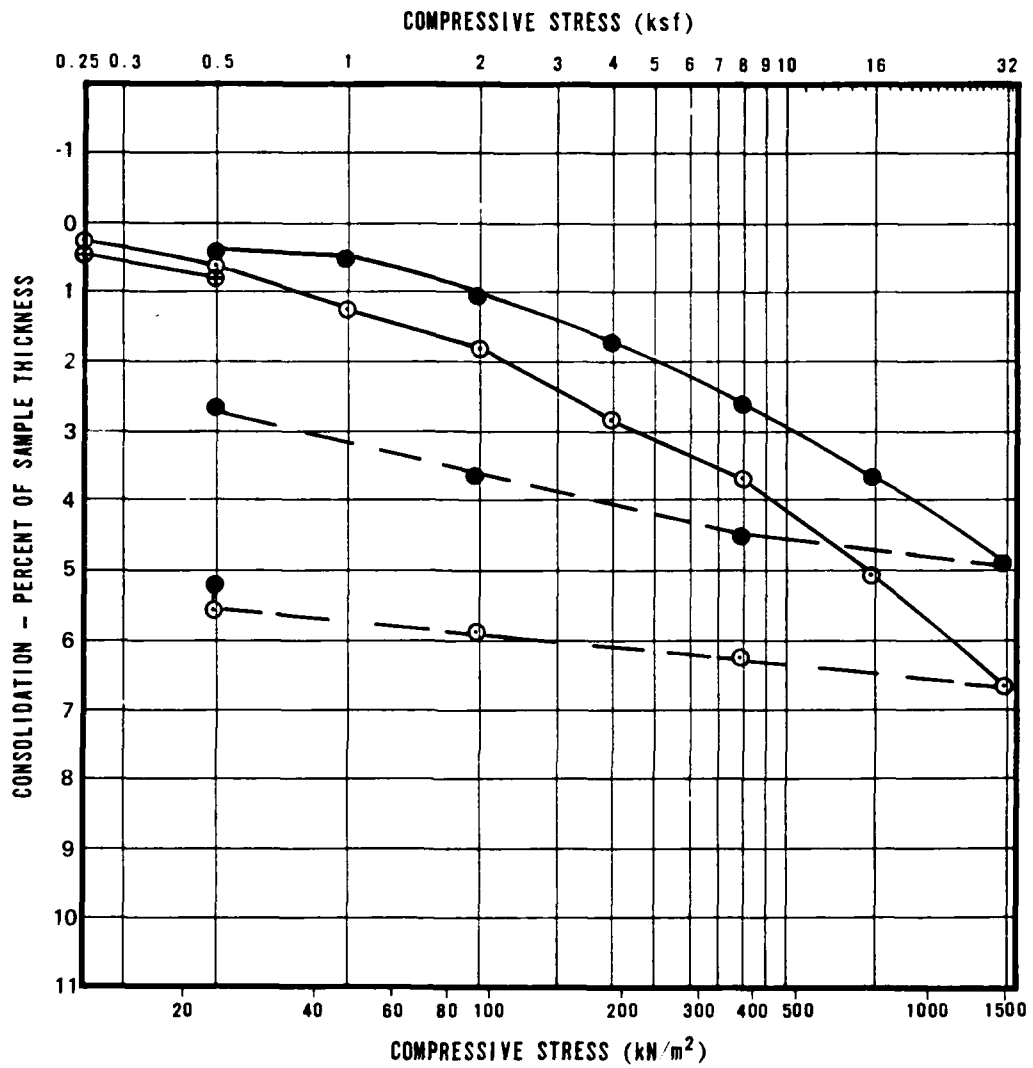
- ⊕, ○ AT FIELD MOISTURE
- AFTER ADDITION OF WATER
- COMPRESSION
- - - - REFUND

CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-5-3
4 OF 10

FUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m ³			
○, ●	MD-B-10	P-12	35.5 - 35.7	10.82 - 10.88	SC	112.8	1807	13.6	0.49	74.9
⊕, ●	MD-B-10	P-12	35.5 - 35.7	10.82 - 10.88	SC	115.0	1842	14.3	0.47	90.1

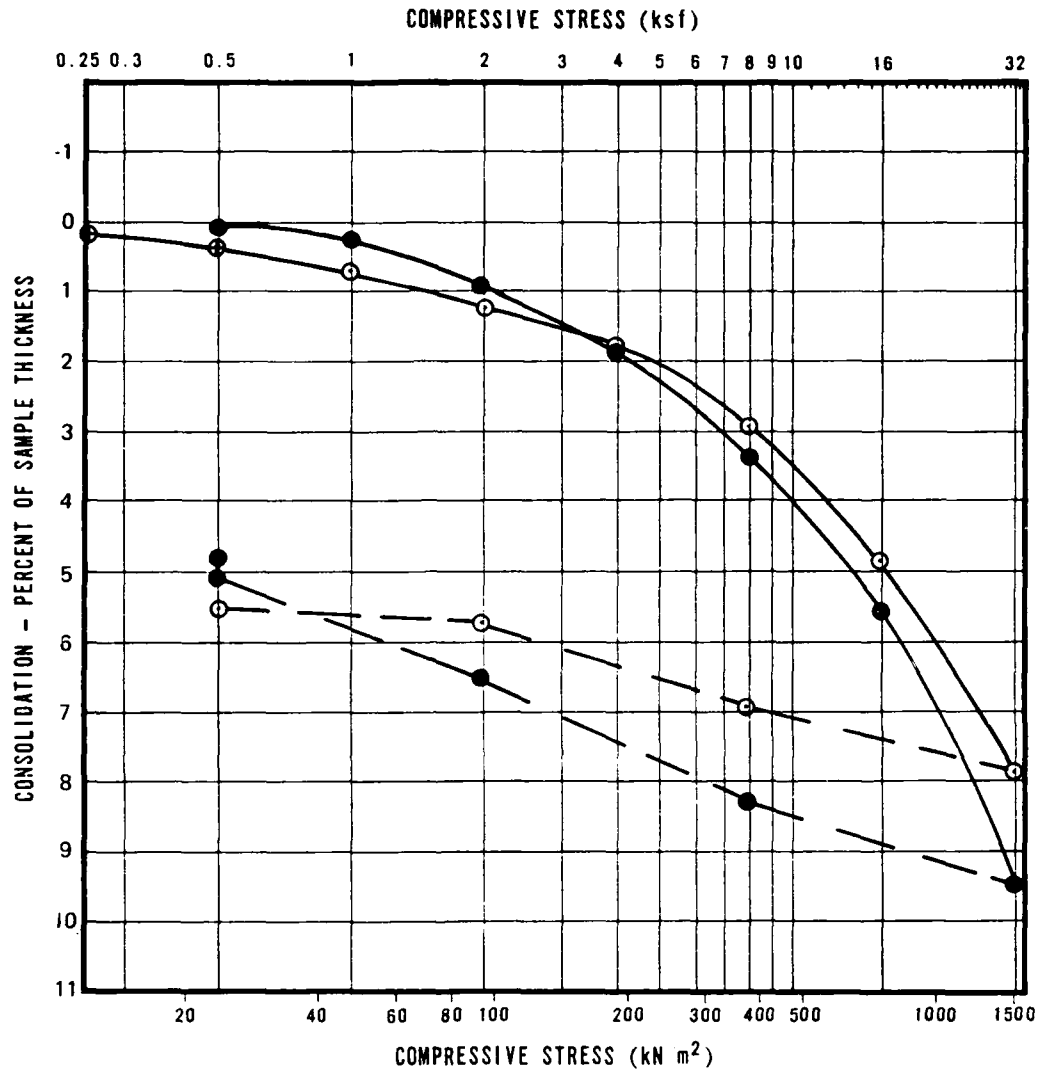
- ⊕, ○ AT FIELD MOISTURE
- AFTER ADDITION OF WATER
- COMPRESSION
- - - - REBOUND

CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-5-3
 5 OF 10

FUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m^3			
○, ●	MD-B-10	P-17	70.8 - 71.4	21.58 - 21.76	CL	99.4	1592	26.4	0.69	103.3
⊕, ●	MD-B-10	P-17	70.8 - 71.4	21.58 - 21.76	CL	96.9	1552	28.3	0.71	96.2

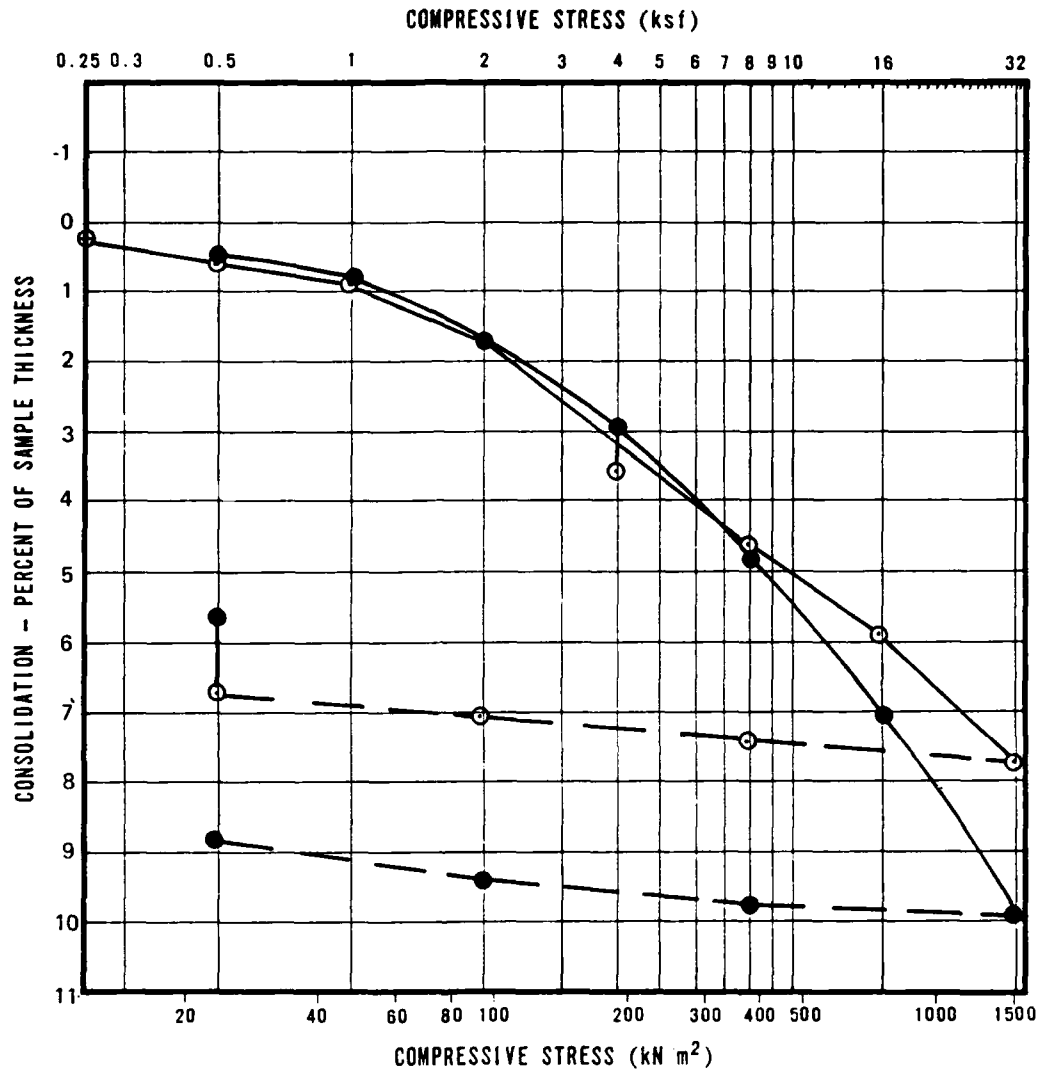
- ⊕, ○ AT FIELD MOISTURE
- AFTER ADDITION OF WATER
- COMPRESSION
- - - - REBOUND

CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE BMO

FIGURE
II-5-3
6 OF 10

UGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m ³			
○, ●	MD-B-13	P-10	40.2 - 40.8	12.25 - 12.44	SM	118.7	1902	11.3	0.42	88.7
⊕, ●	MD-B-13	P-10	40.2 - 40.8	12.25 - 12.44	SM	111.9	1792	9.8	0.47	61.9

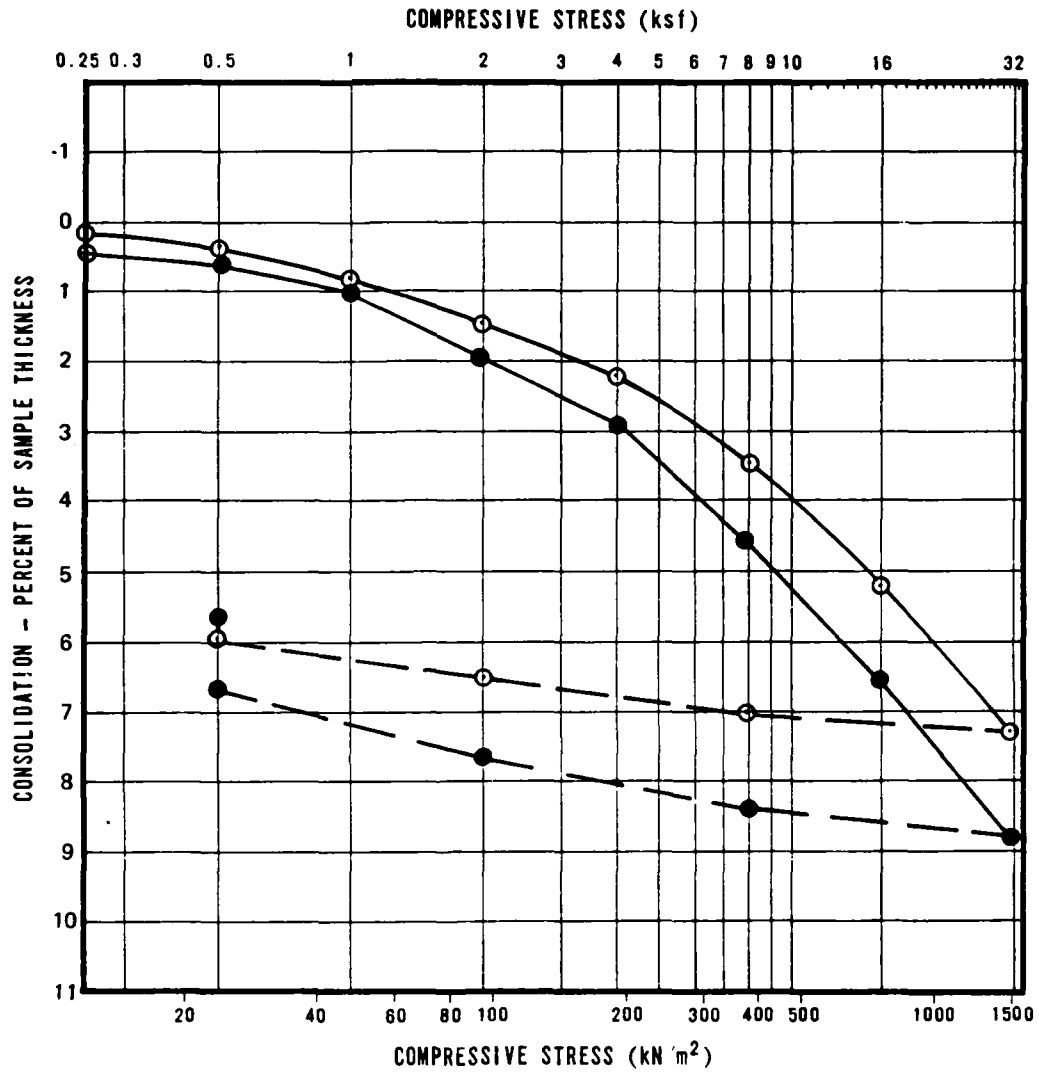
- ⊕, ○ AT FIELD MOISTURE
- AFTER ADDITION OF WATER
- COMPRESSION
- - - - REBOUND

CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE BMO

FIGURE
II-5-3
7 OF 10

FUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m ³			
○, ●	MD-B-15	P-7	26.0 - 26.5	7.92 - 8.08	ML	97.2	1557	24.8	0.73	91.7
⊕, ●	MD-B-15	P-7	26.0 - 26.5	7.92 - 8.08	ML	97.5	1562	27.9	0.73	95.4

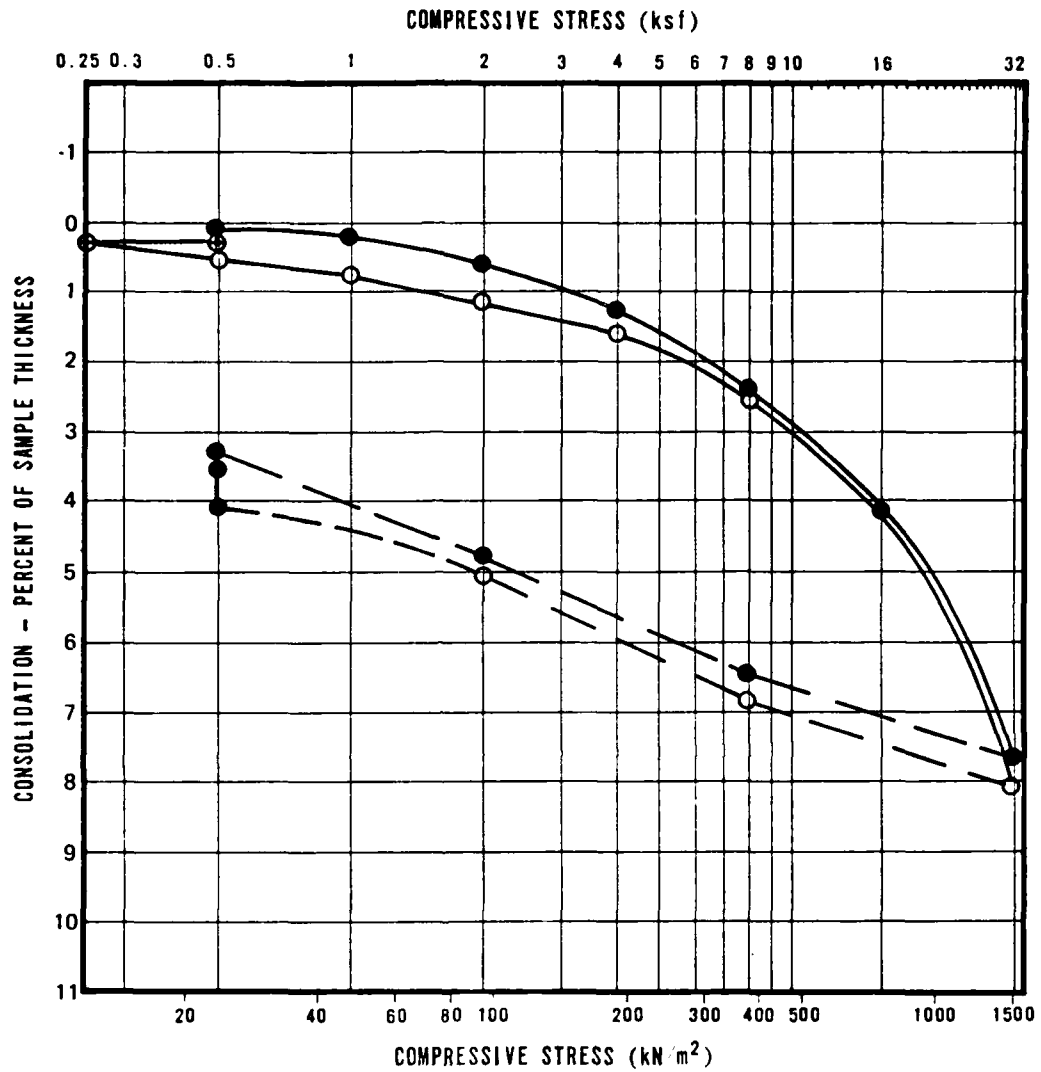
⊕, ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 ——— COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

WX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE SMO

FIGURE
II-5-3
 8 OF 10

FUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m ³			
○ ●	MD-B-15	P-16	90.6 - 90.7	27.61 - 27.65	CL	99.6	1596	26.3	0.69	102.9
⊕ ●	MD-B-15	P-16	90.6 - 90.7	27.61 - 27.65	CL	102.4	1640	24.1	0.65	96.3

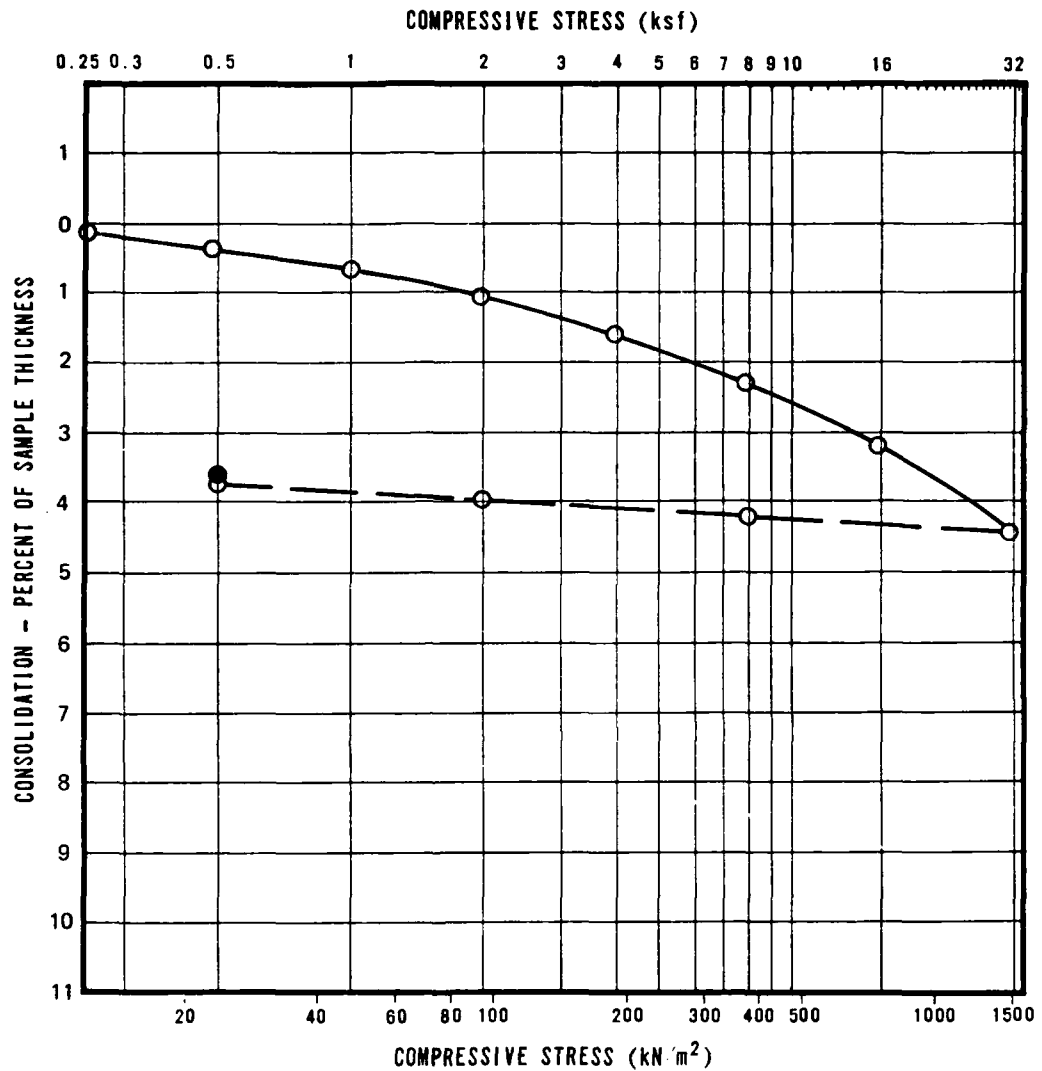
⊕ ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 ——— COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

FIGURE
 II-5-3
 9 OF 10

UGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m ³			
○, ●	BL-3-7	P-10	36.3 - 36.5	11.06 - 11.15	CL	111.1	1780	11.3	0.52	58.7

- AT FIELD MOISTURE
- AFTER ADDITION OF WATER
- COMPRESSION
- - - REBOUND

CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

FIGURE
II-5-3
 10 OF 10

TUGRO NATIONAL, INC.

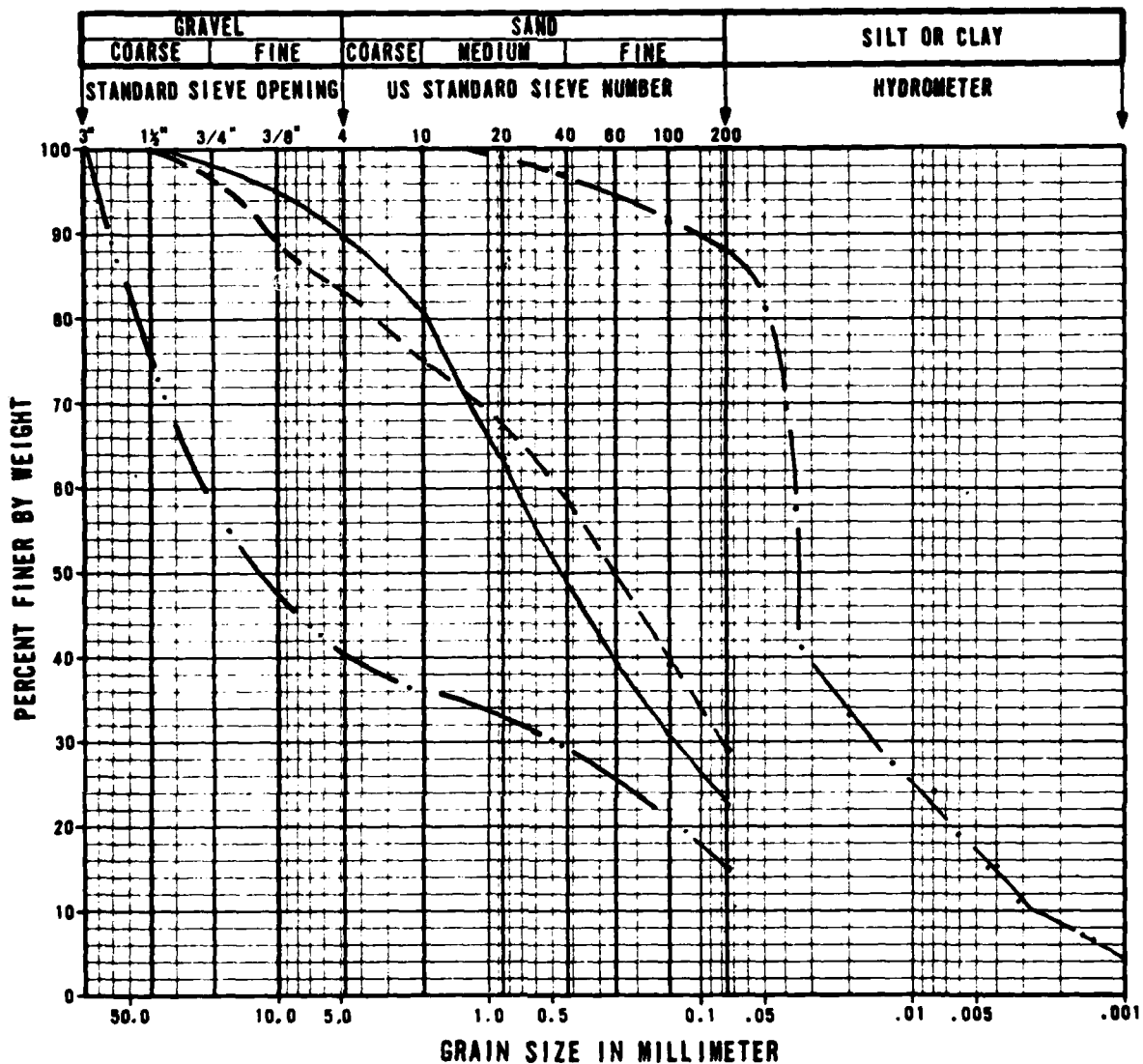
ACTIVITY NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	PH	WATER SOLUBLE				CALCIUM CARBONATE mg/kg
		FEET	METERS			SODIUM mg/kg	CHLORIDE mg/kg	SULPHATE mg/kg	CALCIUM mg/kg	
MD-B-1	D-2	1.7 - 2.5	0.52 - 0.76	SM	8.5	231	344	48	76	337
	D-11	22.2 - 23.0	6.77 - 7.01	SW-SM	8.3	89	247.	42	92	410
MD-B-2	D-5	10.2 - 11.0	3.11 - 3.35	SM	9.0	984	470	188	30	191
MD-B-3	P-7	10.5 - 11.1	3.20 - 3.38	CH	7.9	4365	6660	714	706	4240
MD-B-4	D-14	70.2 - 71.0	21.40 - 21.64	SM	9.1	268	55	37	75	319
MD-B-6	D-2	1.7 - 2.5	0.52 - 0.76	SM	8.9	111	40	5	68	272
MD-B-7	D-4	10.2 - 11.0	3.11 - 3.35	GP	9.7	495	177	117	35	183
MD-B-8	D-6	20.2 - 21.0	6.16 - 6.40	SP-SM	8.2	443	520	875	169	874
MD-B-9	P-12	50.0 - 52.5	15.24 - 16.00	SM	8.9	100	56	49	133	370
	P-14	69.0 - 71.5	21.03 - 21.79	CH	8.8	175	56	75	95	341
MD-B-11	D-5	15.2 - 16.0	4.63 - 4.88	SP	8.6	178	146	206	98	326
MD-B-12	D-3	6.7 - 7.5	2.04 - 2.29	SM	8.6	732	488	133	73	259
MD-B-13	D-5	15.2 - 16.0	4.63 - 4.88	SP	9.0	807	357	62	39	167
MD-B-15	P-12	50.0 - 51.0	15.24 - 15.54	CL	8.3	5010	2750	1395	112	664
BL-B-7	D-7	19.1 - 19.9	5.82 - 6.07	SP-SM	8.4	193	291	1440	95	368
BL-B-10	D-9	35.2 - 36.0	10.73 - 10.97	SM	8.6	96	92	37	48	261
BL-T-10	b-2	4.0 - 5.0	1.22 - 1.52	GP-GM	9.0	32	26	48	65	289
BL-T-17	B-1	0.5 - 2.0	0.15 - 0.61	CL	8.2	1780	261	157	2420	7175

SUMMARY OF CHEMICAL TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-5-3

TUBRO NATIONAL, INC.

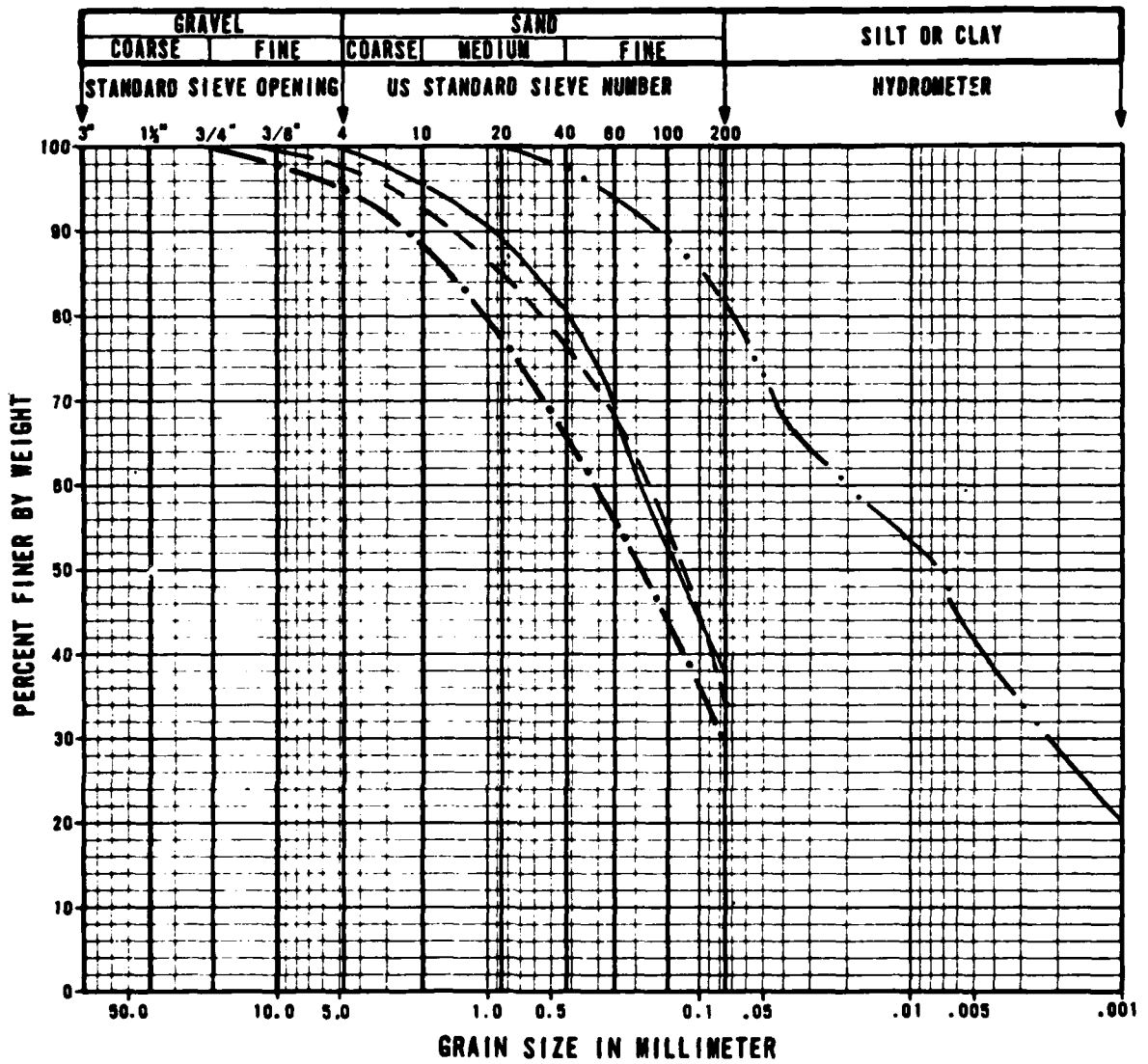


SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
—	A	MD-T-5	0.5 - 2.0	0.15 - 0.61	SM
- - -	B	MD-T-6	0.5 - 2.0	0.15 - 0.61	SM
· · · ·	C	MD-T-9	0.5 - 2.0	0.15 - 0.61	MH
· · · ·	D	MD-T-12	0.5 - 2.0	0.15 - 0.61	GC

GRAIN SIZE CURVES, CBR TESTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-5-4 1 OF 3
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JUGRO NATIONAL, INC.



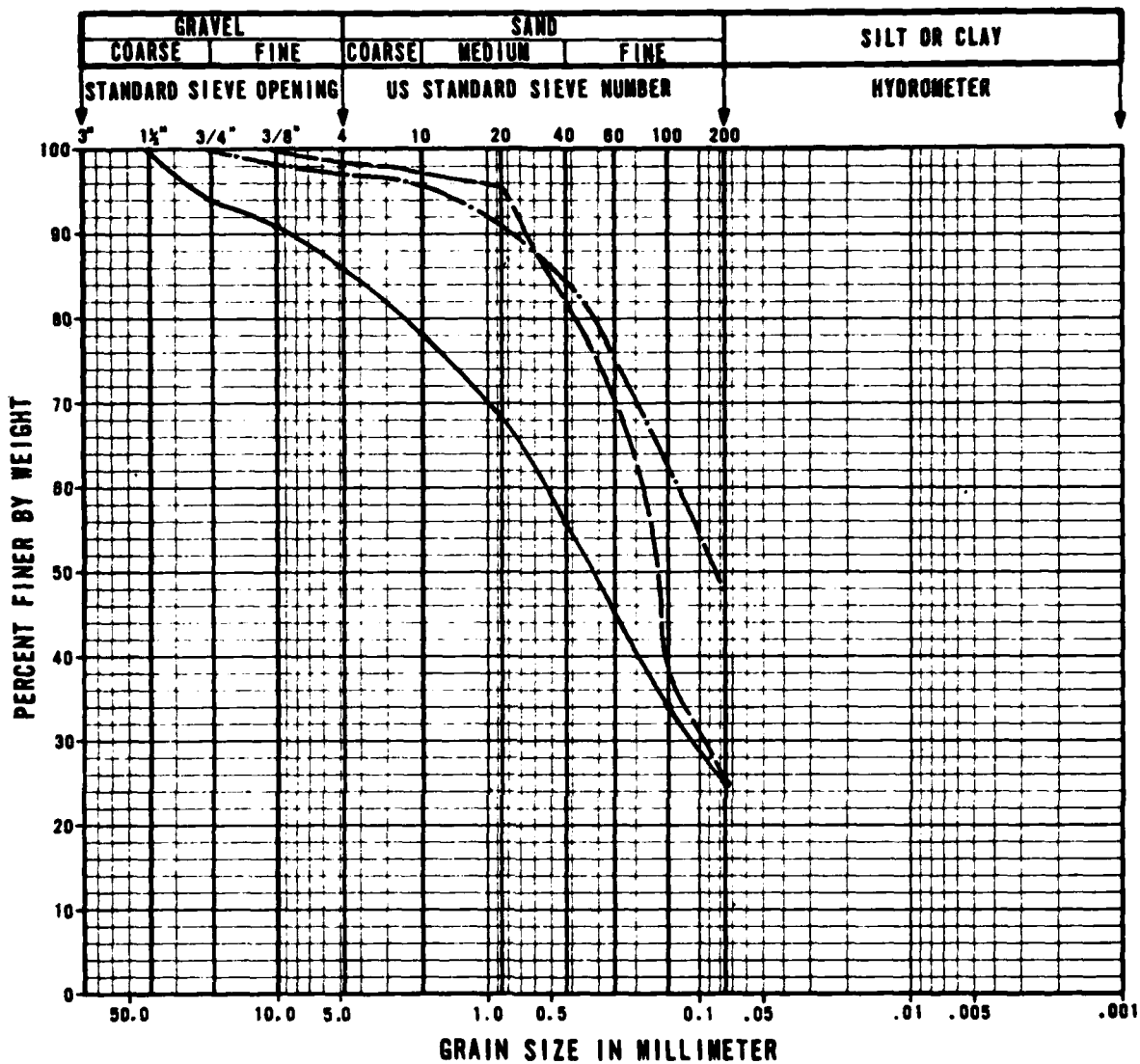
SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
—	E	MD-T-14	0.5 - 2.0	0.15 - 0.61	SC
- - -	F	MD-T-15	0.5 - 2.0	0.15 - 0.61	SM
- · - ·	G	MD-T-17	0.5 - 2.0	0.15 - 0.61	SC
- · · -	H	MD-P-1	0.5 - 2.0	0.15 - 0.61	CH

GRAIN SIZE CURVES, CBR TESTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DND

FIGURE
 II-5-4
 2 OF 3

FUGRO NATIONAL, INC.



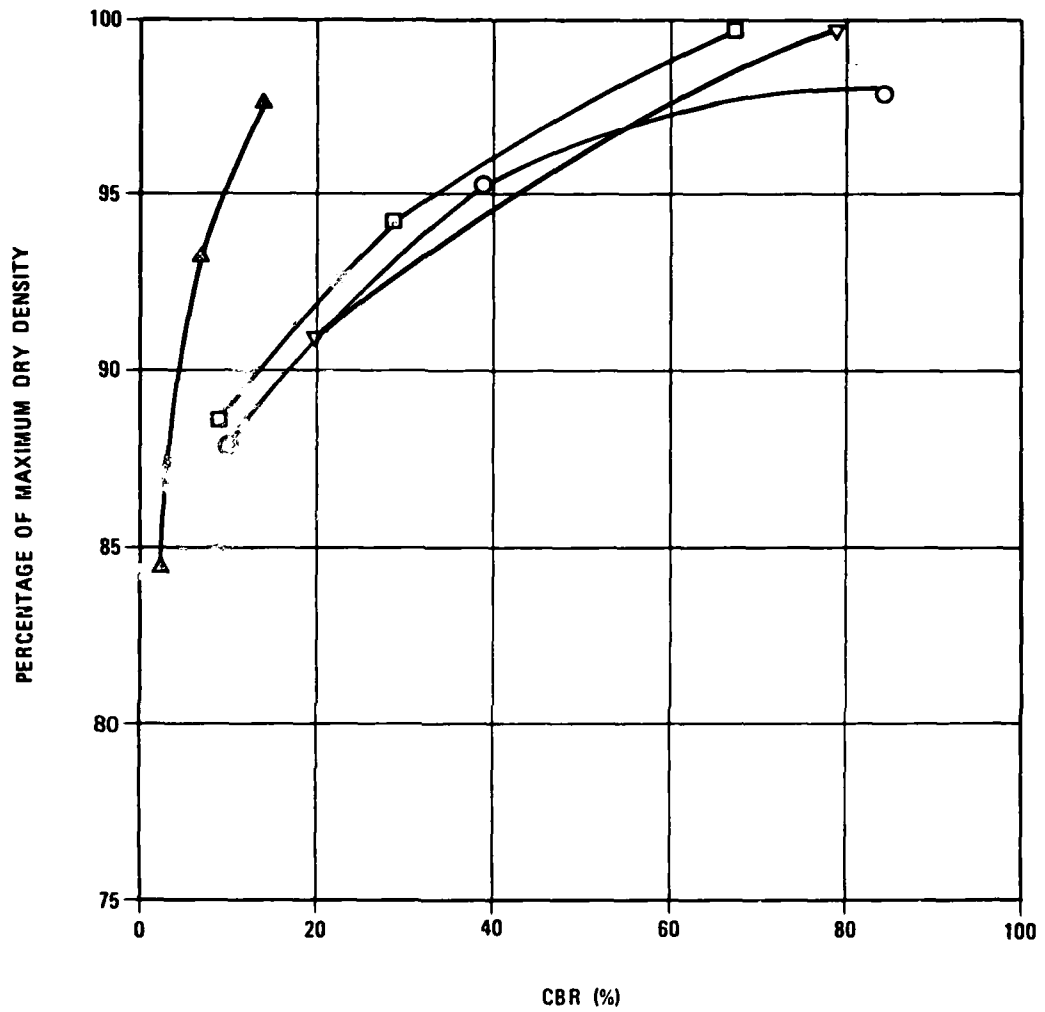
SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
—	I	MD-P-4	0.5 - 2.0	0.15 - 0.61	SC
- - -	J	BL-P-15	0.5 - 2.0	0.15 - 0.61	SM
- · - ·	K	BL-P-21	0.5 - 2.0	0.15 - 0.61	SM

**GRAIN-SIZE CURVES, CBR TESTS
OPERATIONAL BASE SITE
MILFORD, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

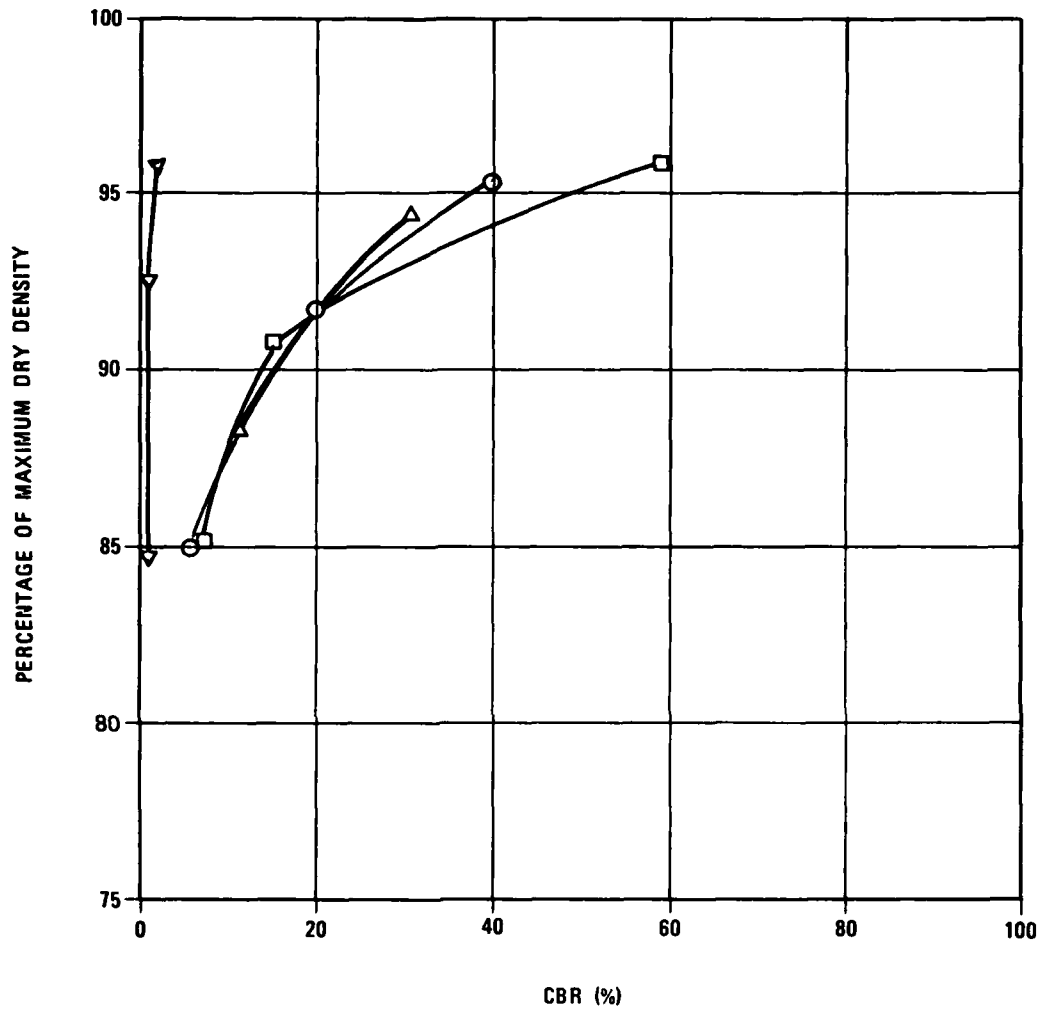
FIGURE
II-5-4
3 OF 3

FUGRO NATIONAL, INC.



SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	A	SM
□	B	SM
△	C	MH
▽	D	GC

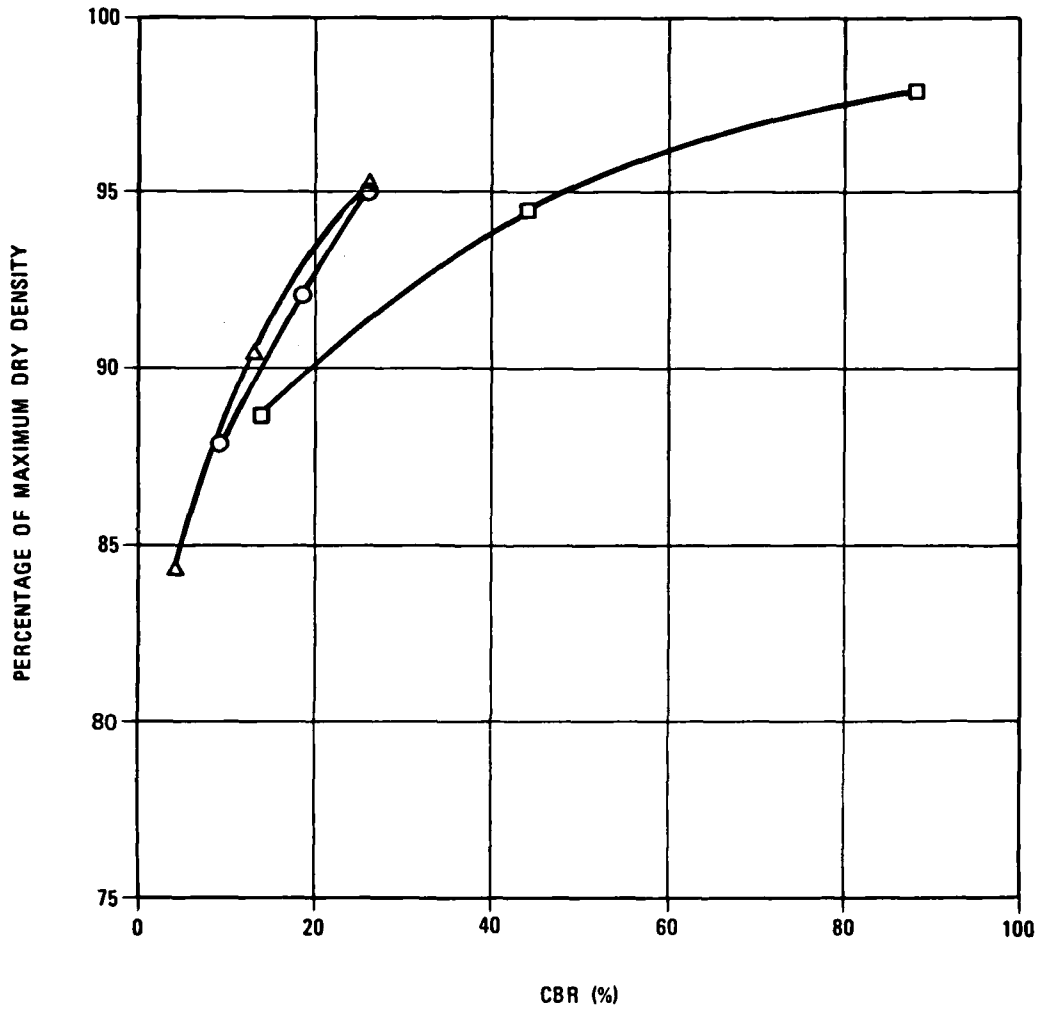
CALIFORNIA BEARING RATIO (CBR) CURVES OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - BMD	FIGURE II-5-5 1 OF 3
FUGRO NATIONAL, INC.	



SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	E	SC
□	F	SM
△	G	SC
▽	H	CH

**CALIFORNIA BEARING RATIO (CBR) CURVES
OPERATIONAL BASE SITE
MILFORD, UTAH**

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - BMO	FIGURE II-5-5 2 OF 3
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SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	I	SC
□	J	SM
Δ	K	SM

CALIFORNIA BEARING RATIO (CBR) CURVES
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-5-5
 3 OF 3

UGRO NATIONAL, INC.

COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m ³		pcf	kg/m ³			
A	SM	22				125.0	2003	10.7	122.7	1966	11.4	98.2	84
									119.0	1906	10.2	95.2	39
									110.4	1769	10.9	88.3	10
B	SM	29		NP	125.0	2003	11.0	124.5	1994	11.1	99.6	67	
								117.8	1887	11.2	94.2	29	
								110.7	1773	12.2	88.6	9	
C	MH	88	70	21	69.1	1107	49.8	67.4	1080	51.1	97.5	14	
								64.4	1032	51.0	93.2	7	
								58.7	940	51.1	84.5	3	
D	GC	15			137.0	2195	7.0	136.7	2190	6.2	99.8	79	
								124.6	1996	6.7	90.9	20	

CALIFORNIA BEARING RATIO (CBR)
TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	TABLE II-5-4 1 OF 3
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FUGRO NATIONAL, INC.

COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m ³		pcf	kg/m ³			
E	SC	38	28	11		116.0	1858	15.5	110.4	1769	15.9	95.2	40
									106.2	1701	15.5	91.6	20
									98.6	1580	15.5	85.0	6
F	SM	34			126.9	2033	10.2	121.7	1950	10.8	95.9	59	
								115.1	1844	9.7	90.7	15	
								108.0	1730	10.6	85.1	7	
G	SC	30			112.0	1794	17.2	105.7	1693	17.1	94.4	31	
								98.9	1584	17.2	88.3	11	
H	CH	82	61	32	102.0	1634	23.0	97.6	1564	22.5	95.7	2	
								94.3	1511	22.5	92.5	1	
								86.4	1384	22.4	84.7	1	

**CALIFORNIA BEARING RATIO (CBR)
TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-5-4
2 OF 3

TUBRO NATIONAL, INC.

COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m ³		pcf	kg/m ³			
I	SC	25	36	14		122.5	1962	11.1	116.4	1865	11.7	95.0	26
									112.7	1805	11.3	92.0	19
									107.8	1727	11.0	88.0	10
J	SM	25			125.0	2003	10.9	122.2	1958	11.1	97.8	87	
								118.3	1895	11.1	94.6	43	
								110.7	1773	11.1	88.6	14	
K	SM	48			122.5	1962	11.5	116.8	1871	11.6	95.3	26	
								110.8	1775	11.9	90.4	13	
								103.2	1653	12.3	84.2	4	

CALIFORNIA BEARING RATIO (CBR)
TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-5-4
3 OF 3

TUBRO NATIONAL, INC.

SECTION 6.0
EXPLANATION OF
CONE PENETROMETER TEST RESULTS

FN-TR-44

SECTION 1.0
ACTIVITY LOCATION MAP
(IN POCKET)

6.0 EXPLANATION OF CONE PENETROMETER TEST RESULTS

The results of all cone penetrometer tests are presented in this section. Explanations of the test results are as follows:

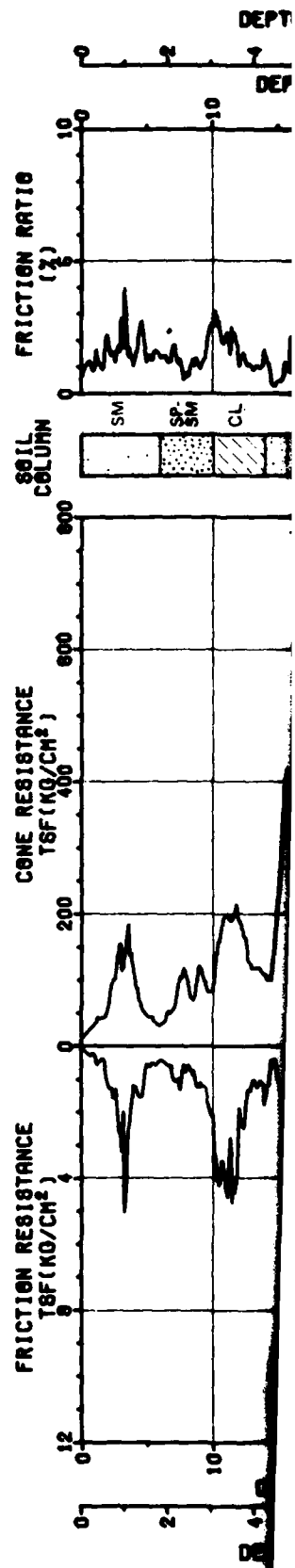
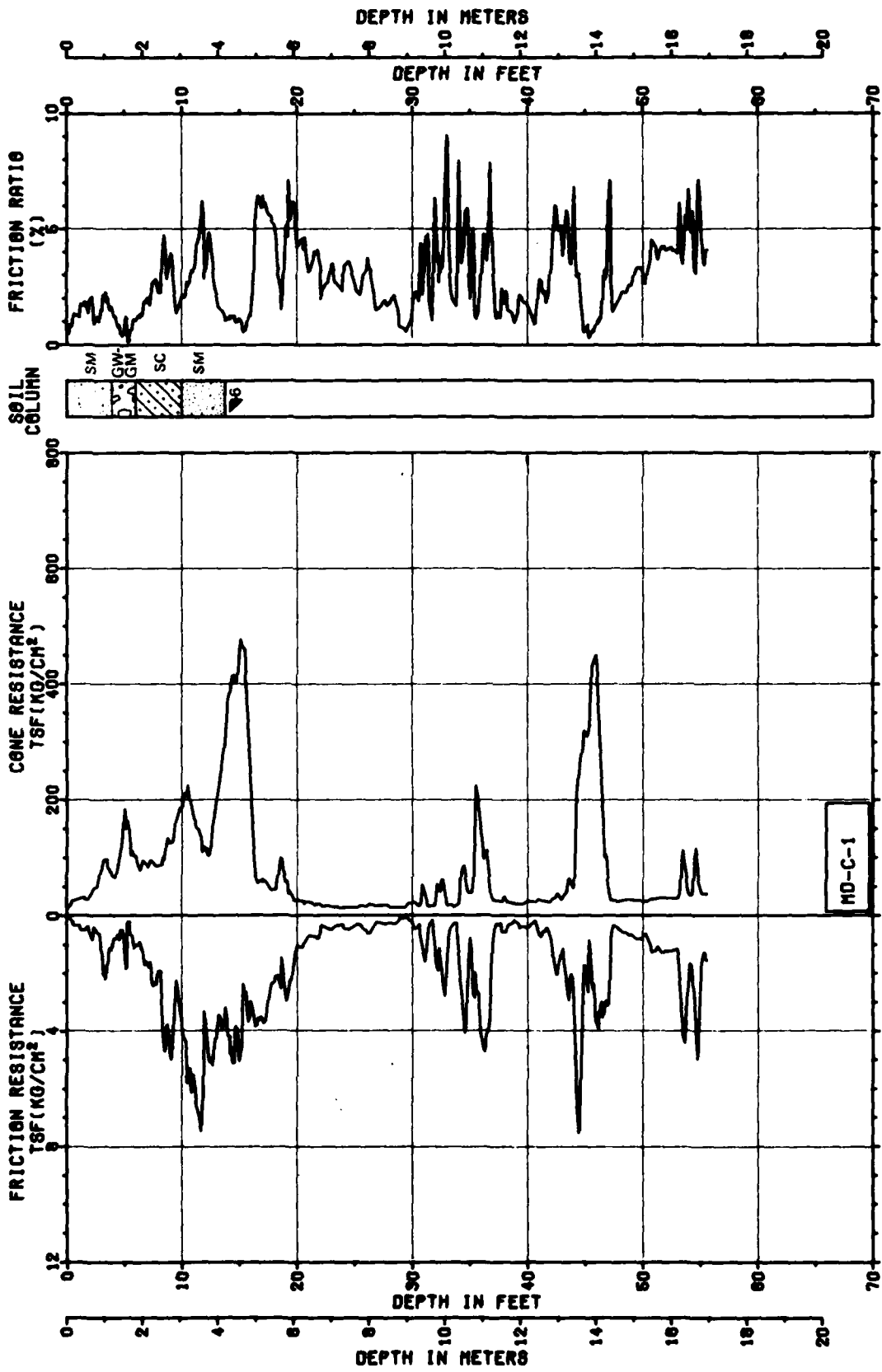
- A. Friction Resistance - The resistance to penetration developed by the friction sleeve, equal to the vertical force applied to the sleeve divided by its surface area. This resistance is the sum of friction and adhesion.
- B. Cone Resistance - The resistance to penetration developed by the cone, equal to the vertical force applied to the cone, divided by its horizontally projected area.
- C. Friction Ratio - The ratio of friction resistance to cone resistance.
- D. Designation - Each cone penetrometer test is identified by a number: for example MD-C-1 or BL-C-1.

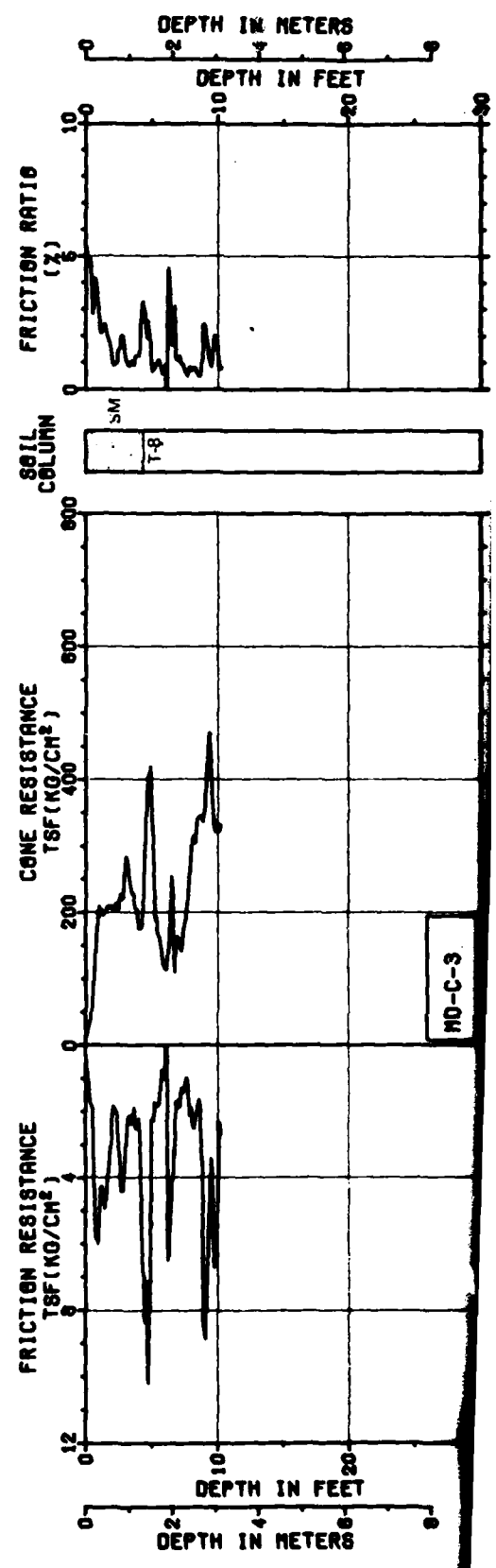
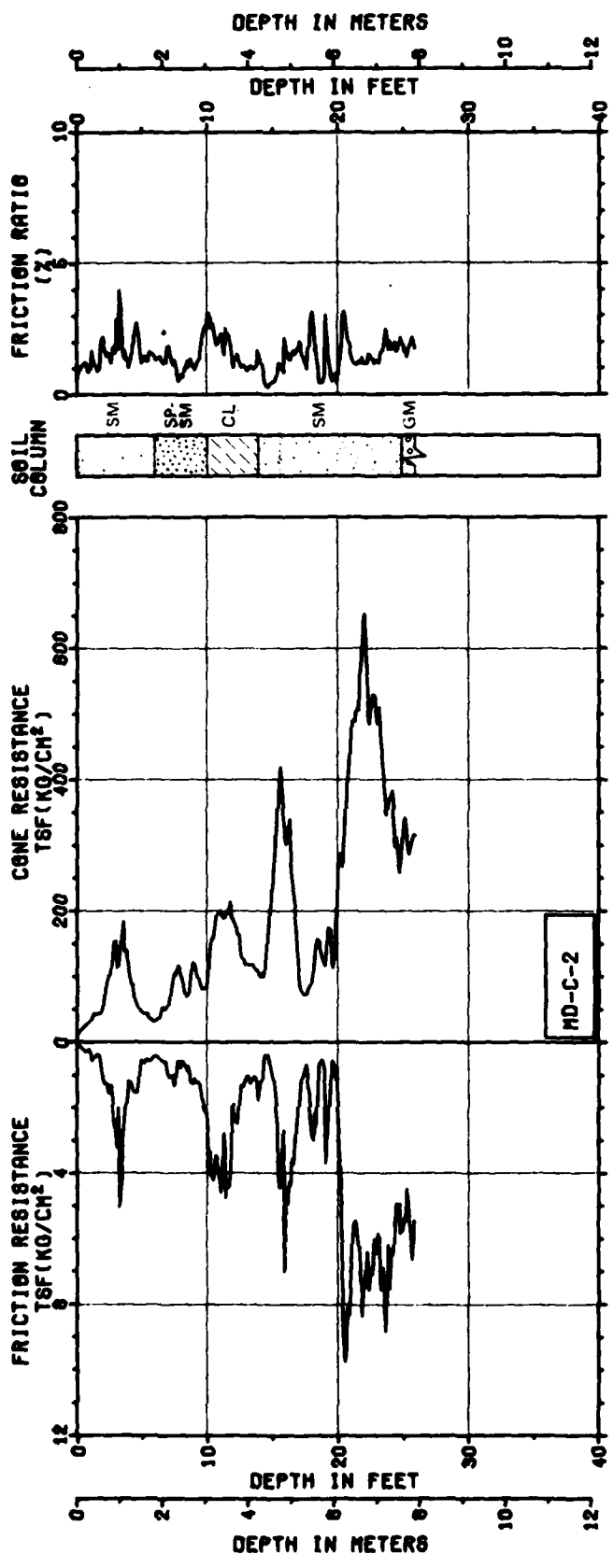
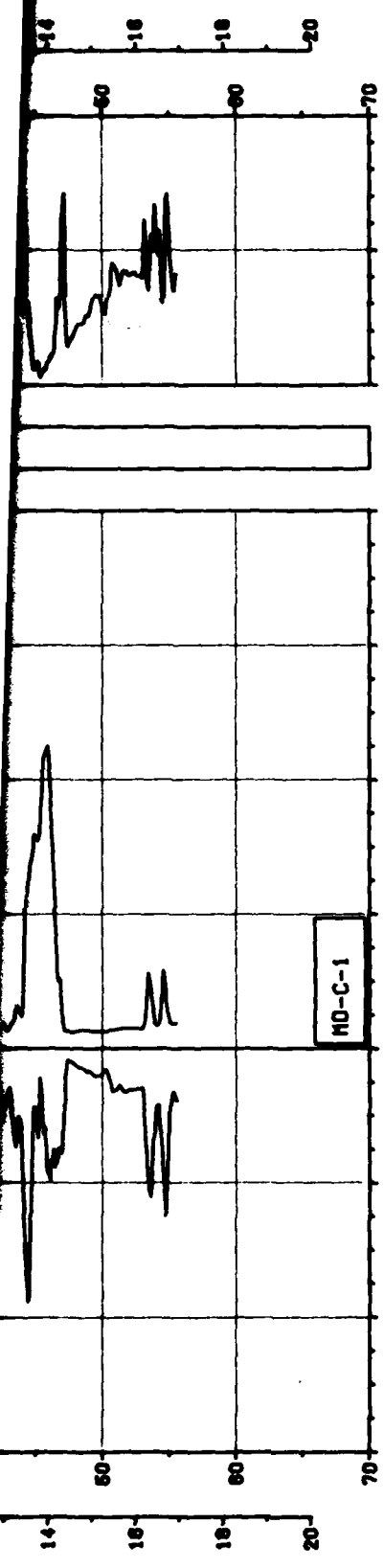
MD or BL - abbreviation for the site (e.g., MD-Milford and BL-Beryl)
C - abbreviation for the CPT
1 - number of the test

All of the engineering activities for Option 1 OBTS are designated by BL (e.g., Beryl).

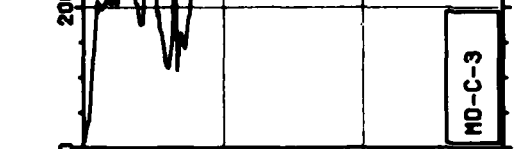
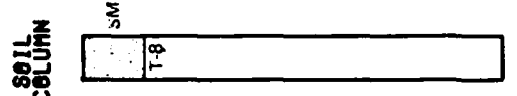
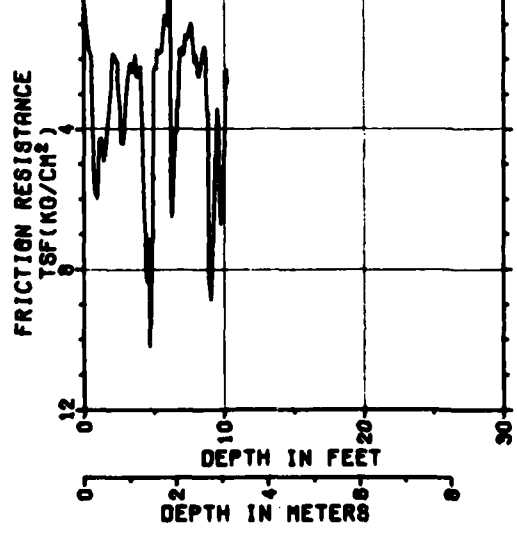
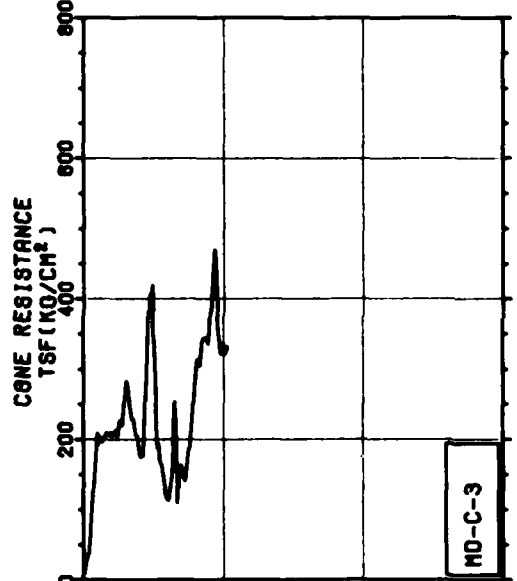
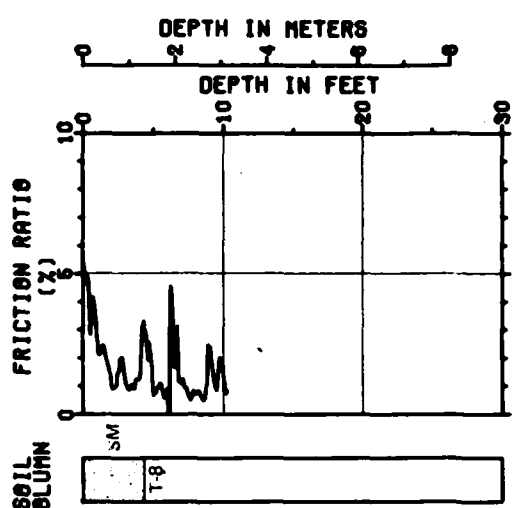
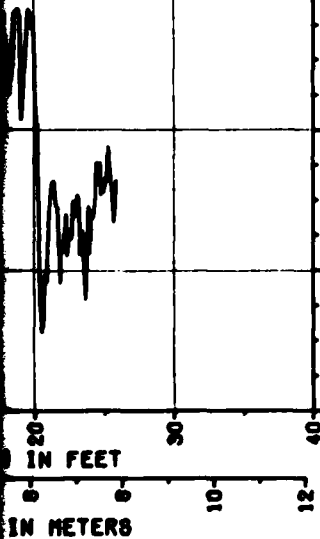
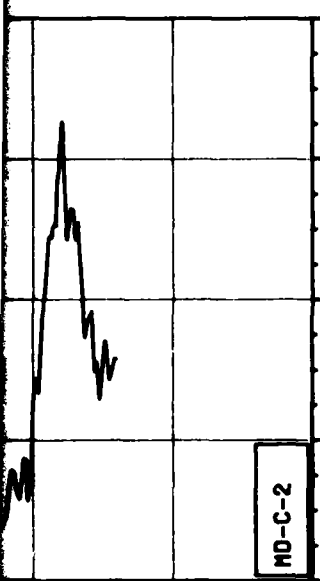
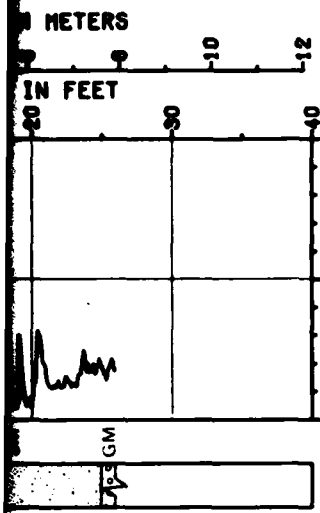
- E. Soil Column - A graphical presentation of the soil type versus depth at each cone penetrometer test location where either a boring, trench, or test pit was performed. The Unified Soil Classification Symbol for each different soil type is listed immediately to the right of the soil column.

Immediately below the soil column, the activity number for the corresponding boring, trench, or test pit at each CPT location is given.





2



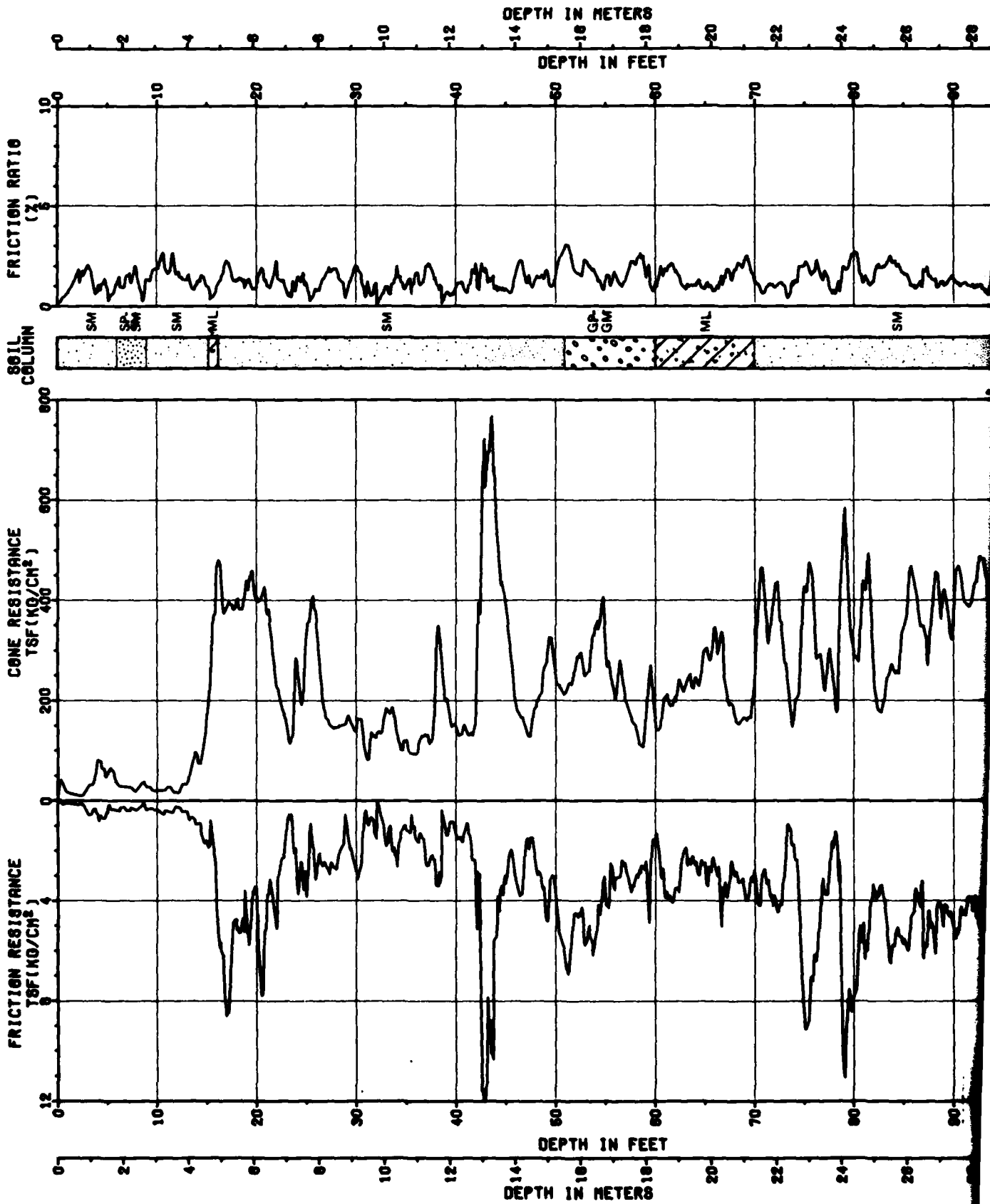
CONE PENETROMETER TEST MD-C-1, 2 & 3
 OPERATIONAL BASE SITE
 MILFORD, UTAH

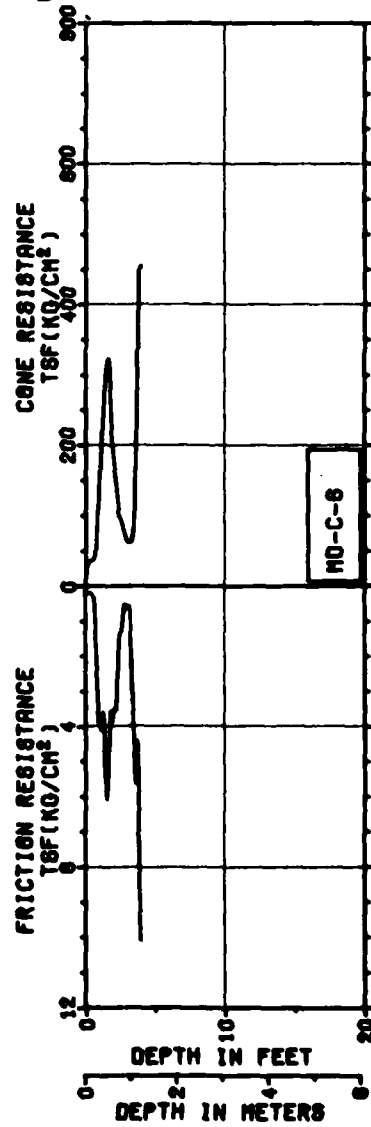
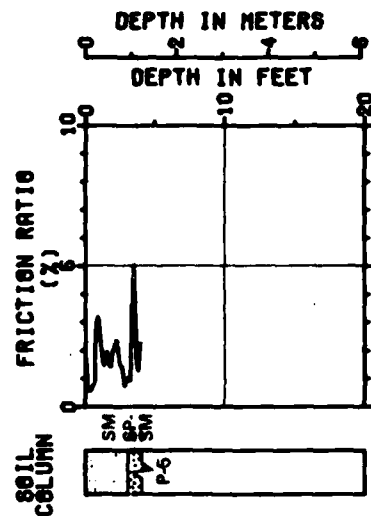
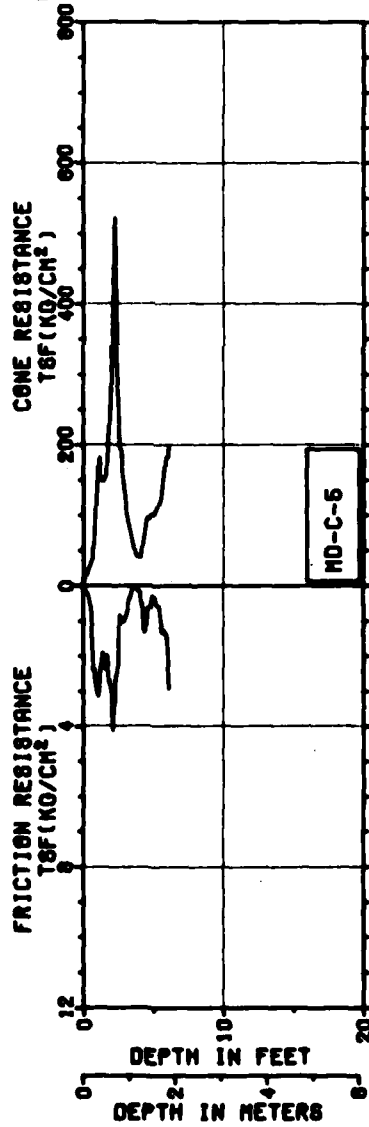
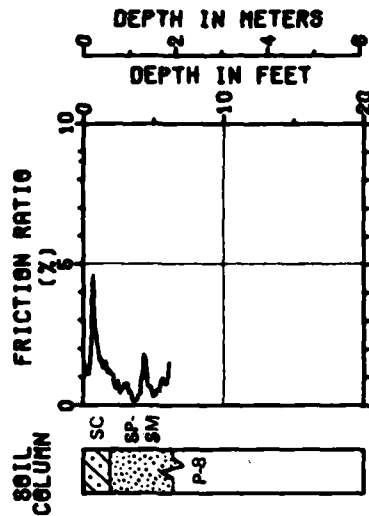
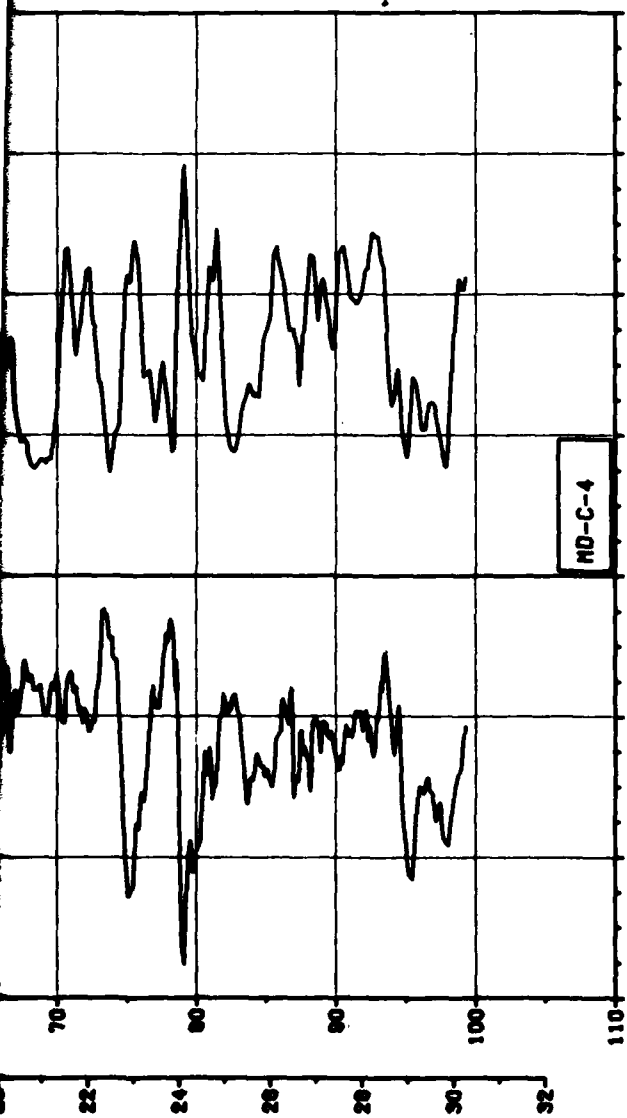
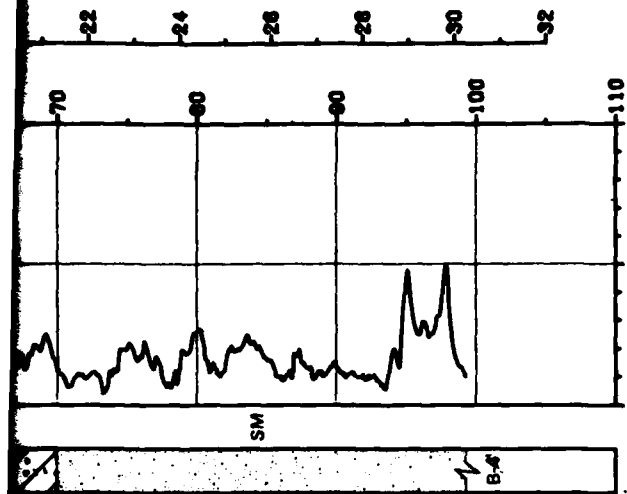
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-6-1
 1 OF 25

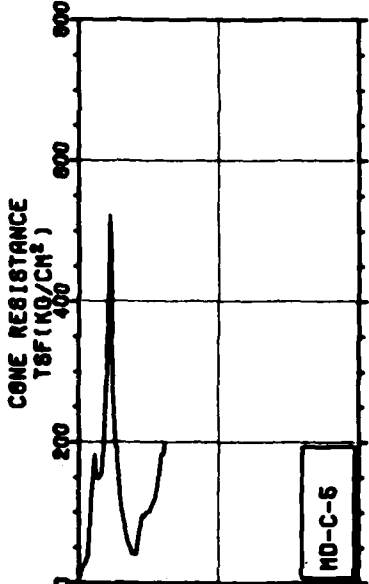
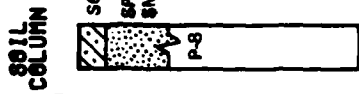
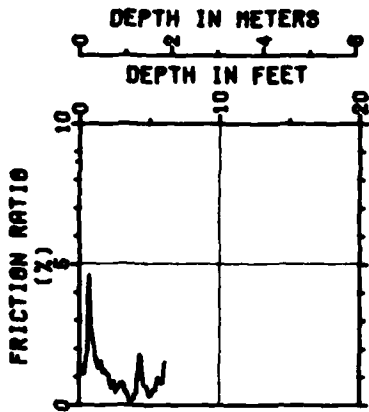
FUGRO NATIONAL, INC.

2

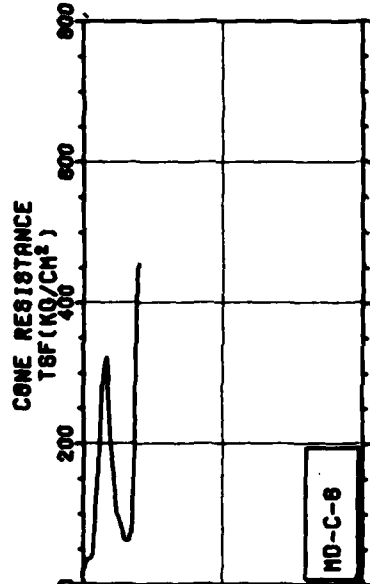
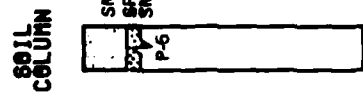
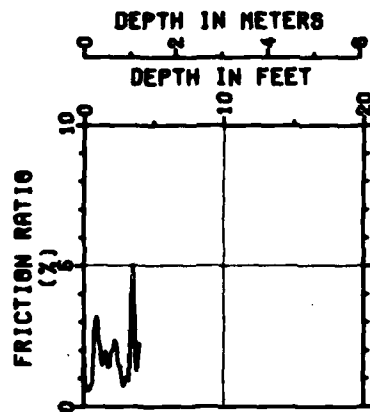
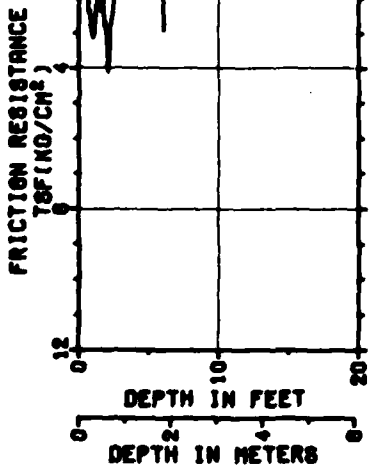




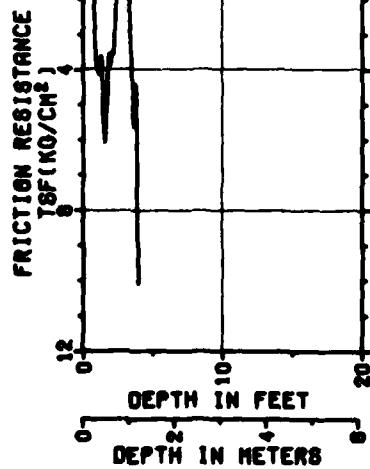
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MD-C-5



MD-C-6



CONE PENETROMETER TEST MD-C-5 & 6
 OPERATIONAL BASE SITE
 HANFORD, UTAH

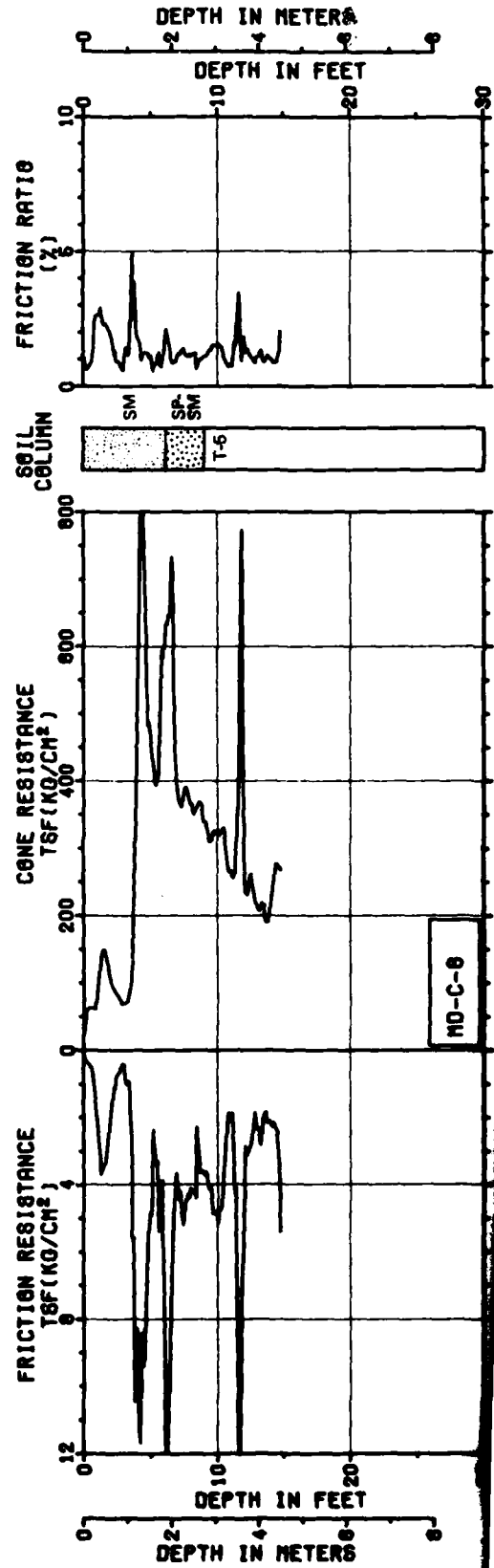
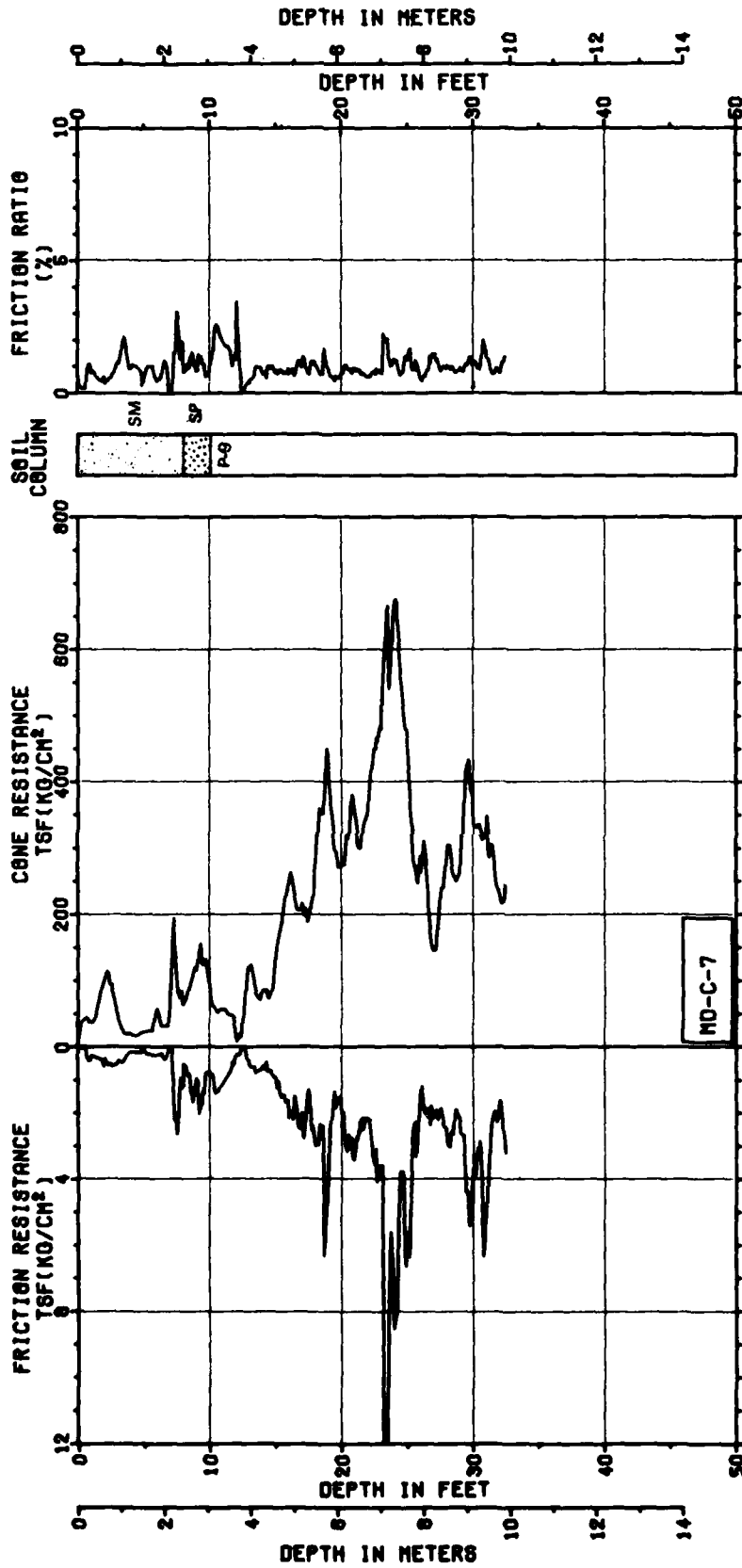
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

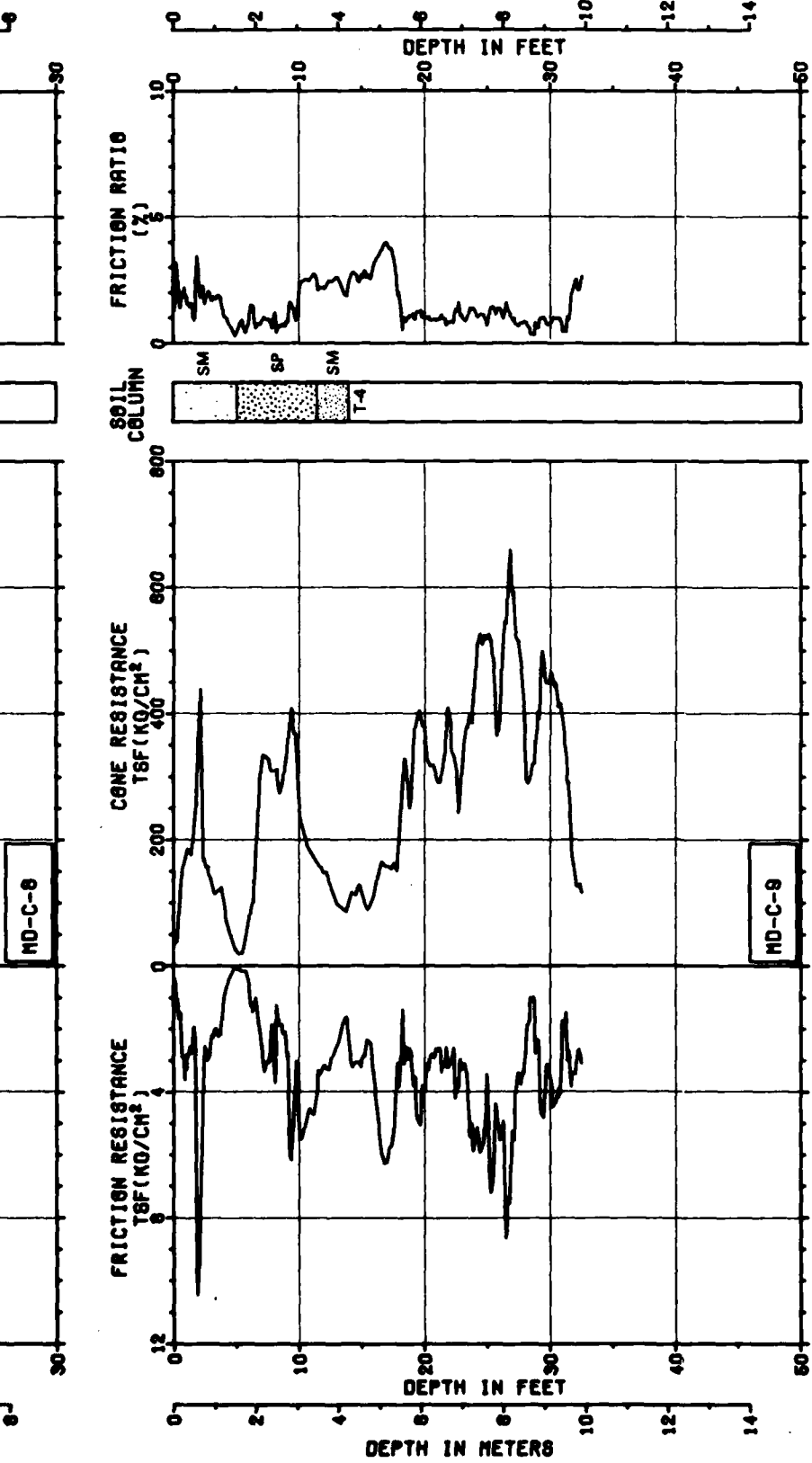
FIGURE
 II-6-1
 100%

FUGRO NATIONAL, INC.

2

2





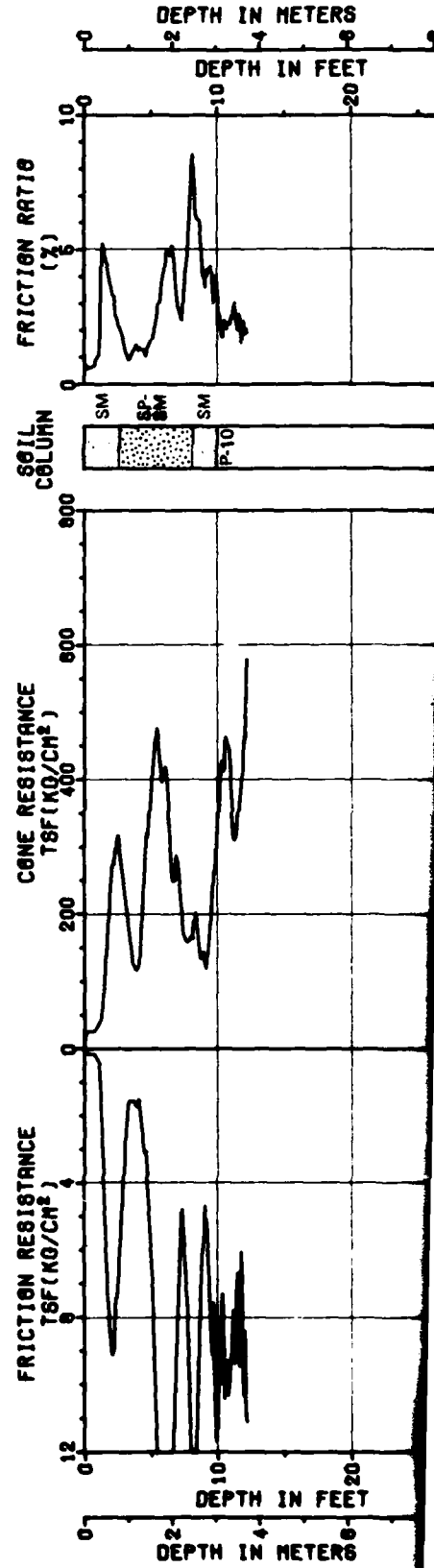
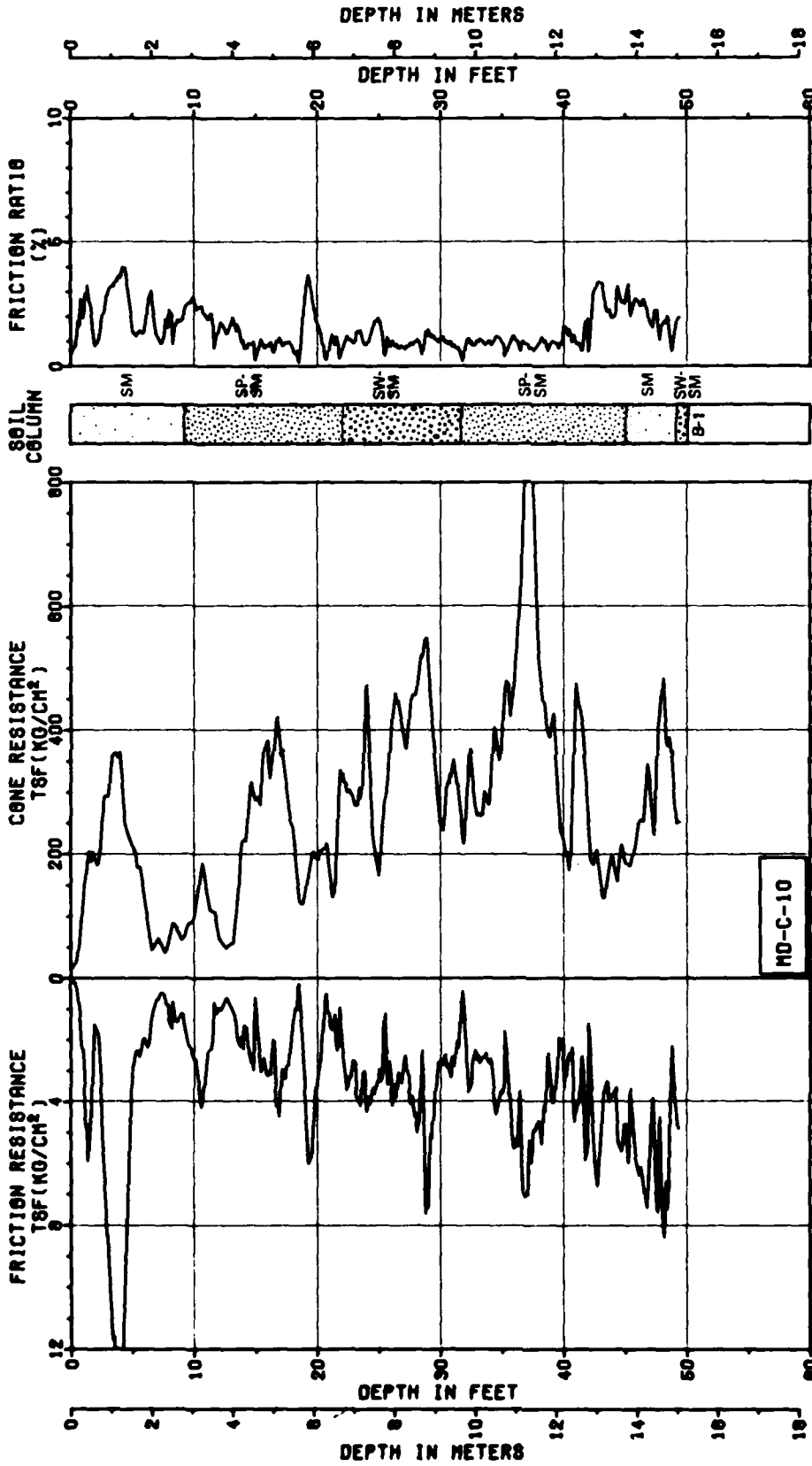
CONE PENETROMETER TEST MD-C-7, 8 & 9
 OPERATIONAL BASE SITE
 MILFORD, UTAH

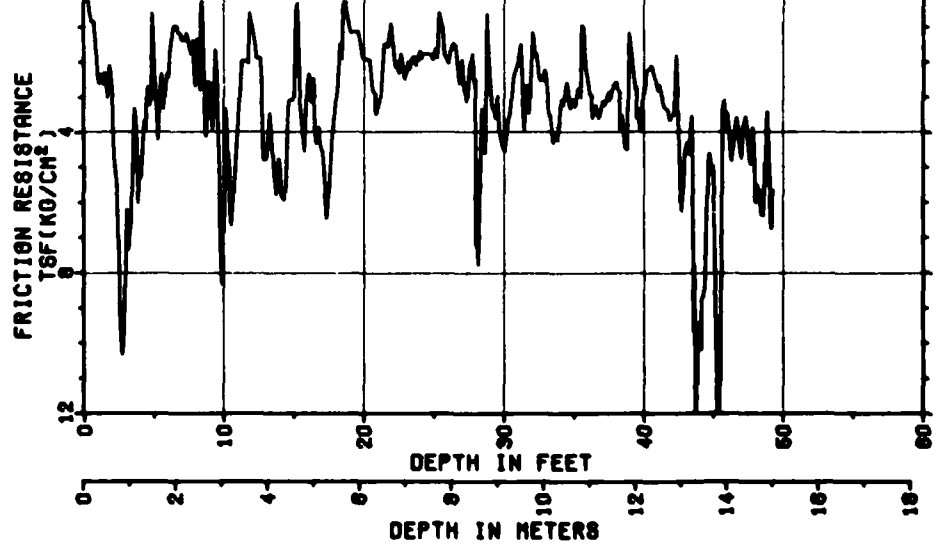
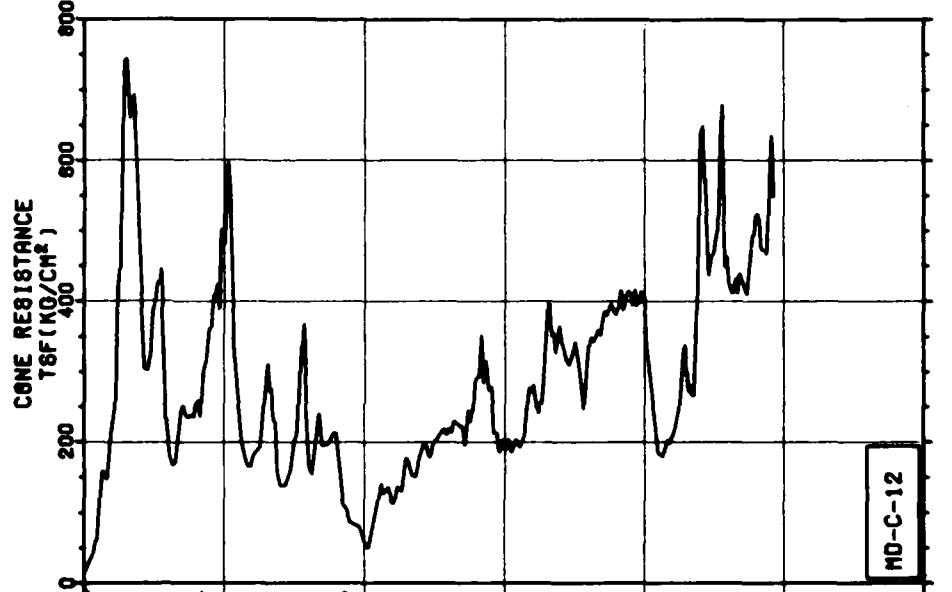
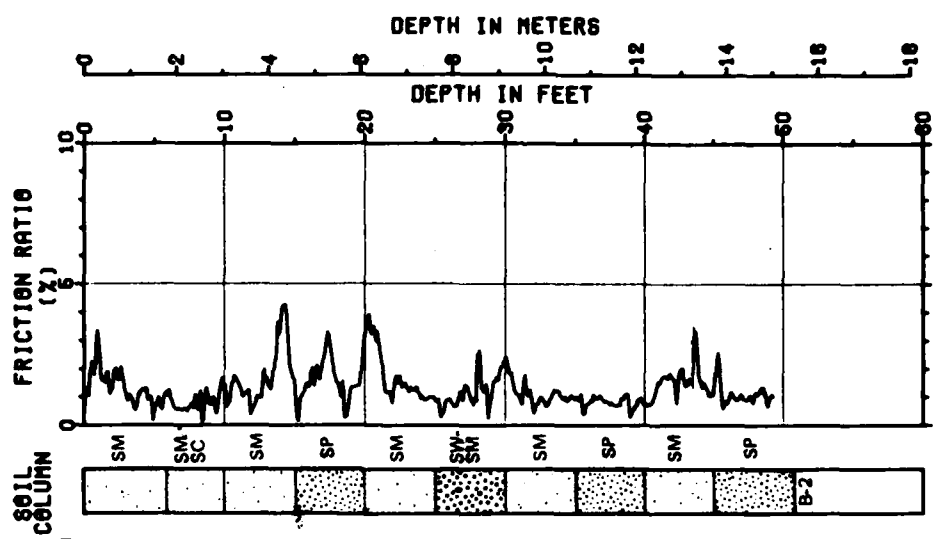
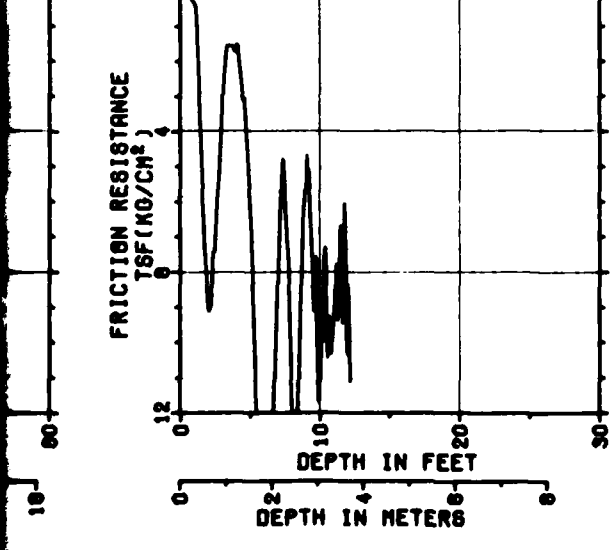
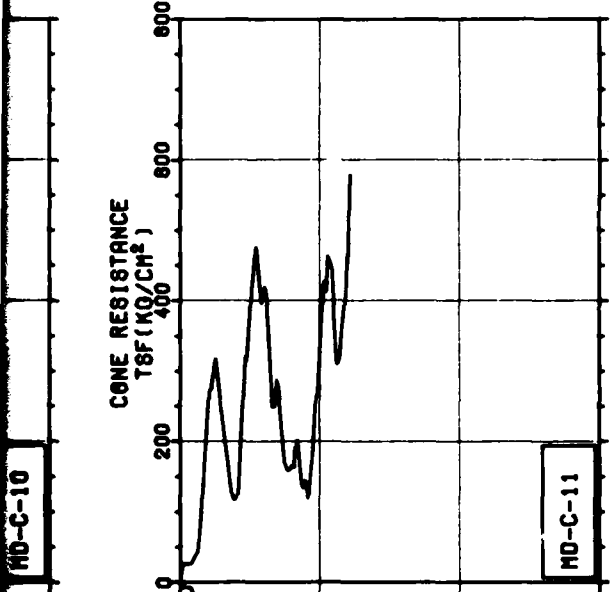
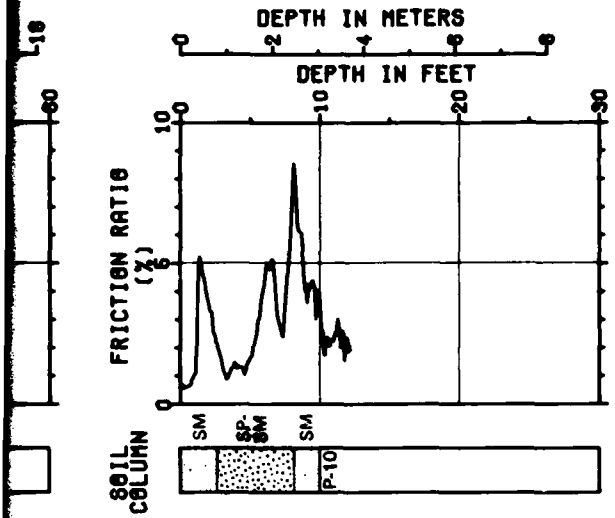
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - SMO

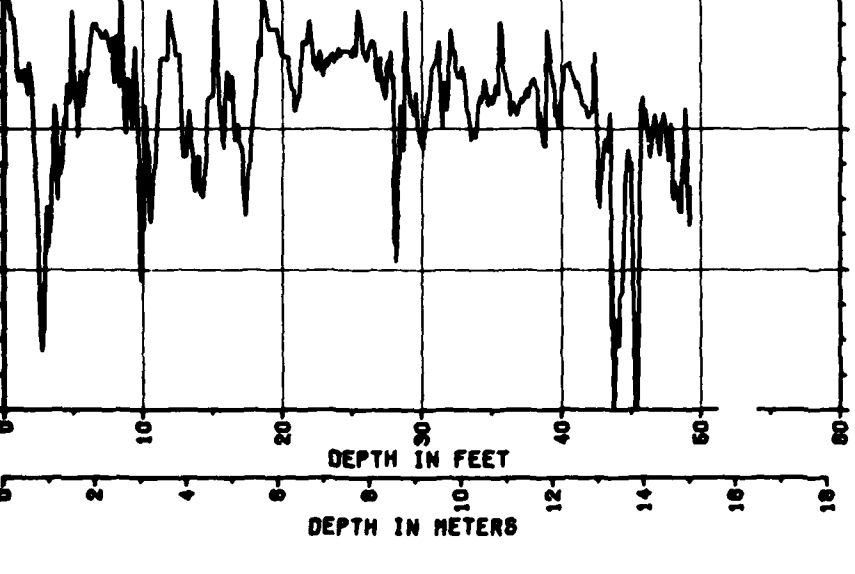
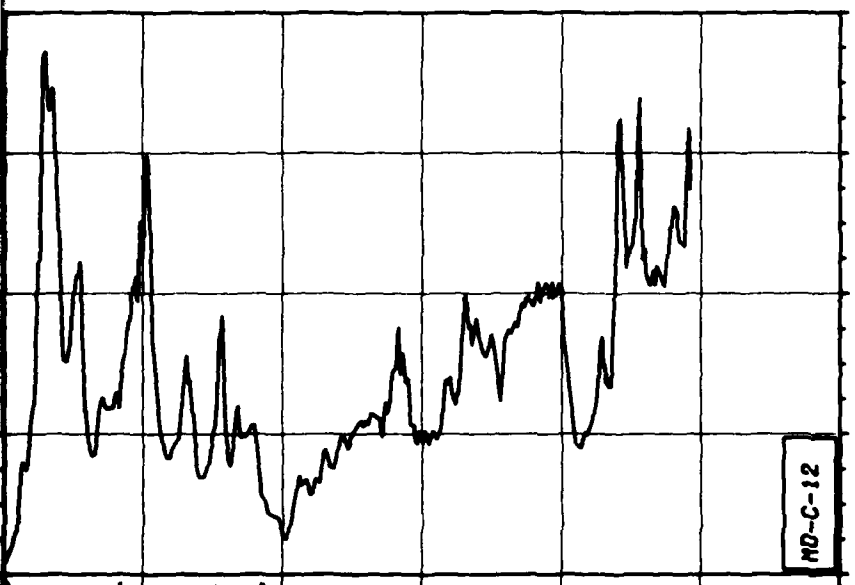
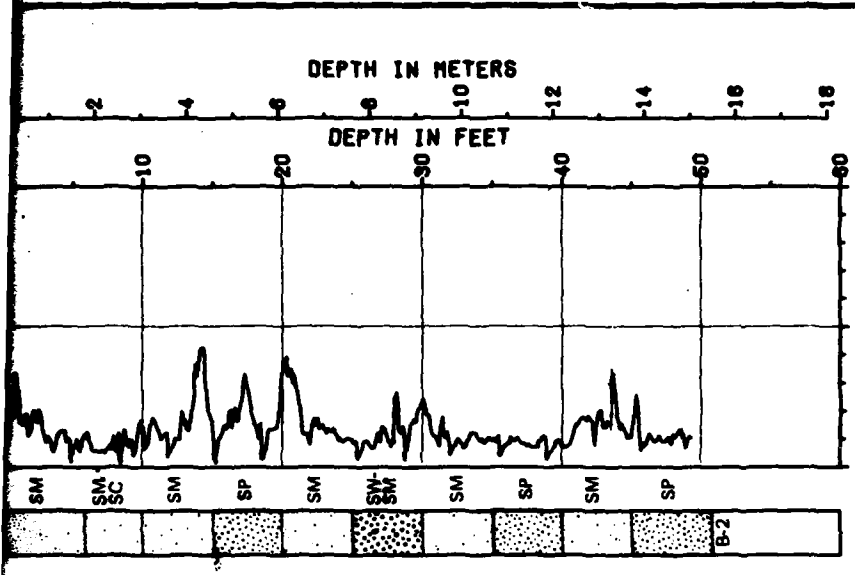
FIGURE
 II-6
 307

FUGRO NATIONAL, INC

2





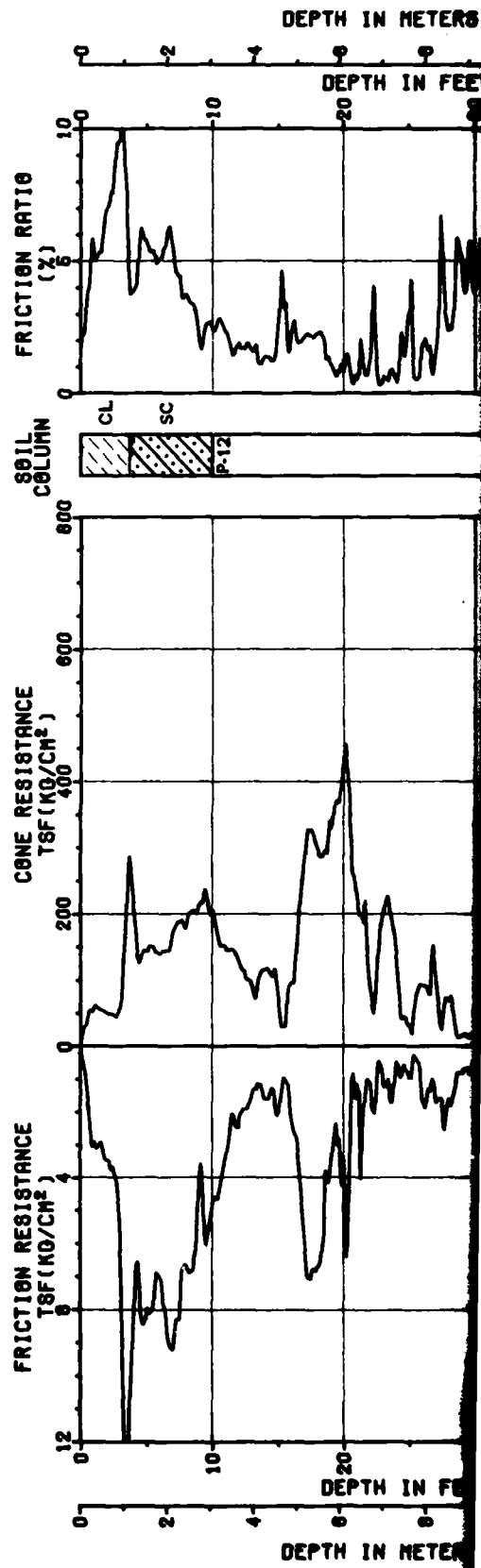
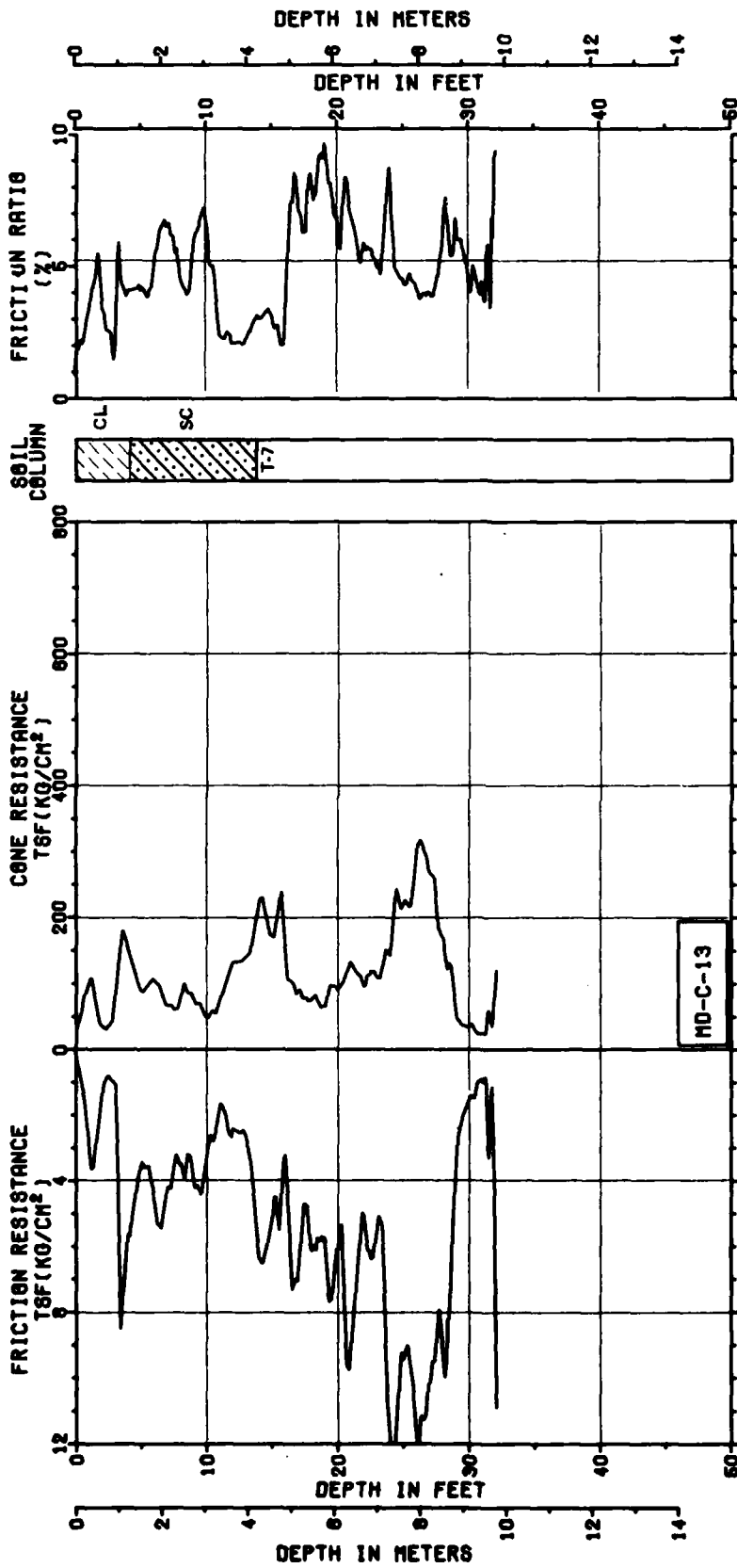


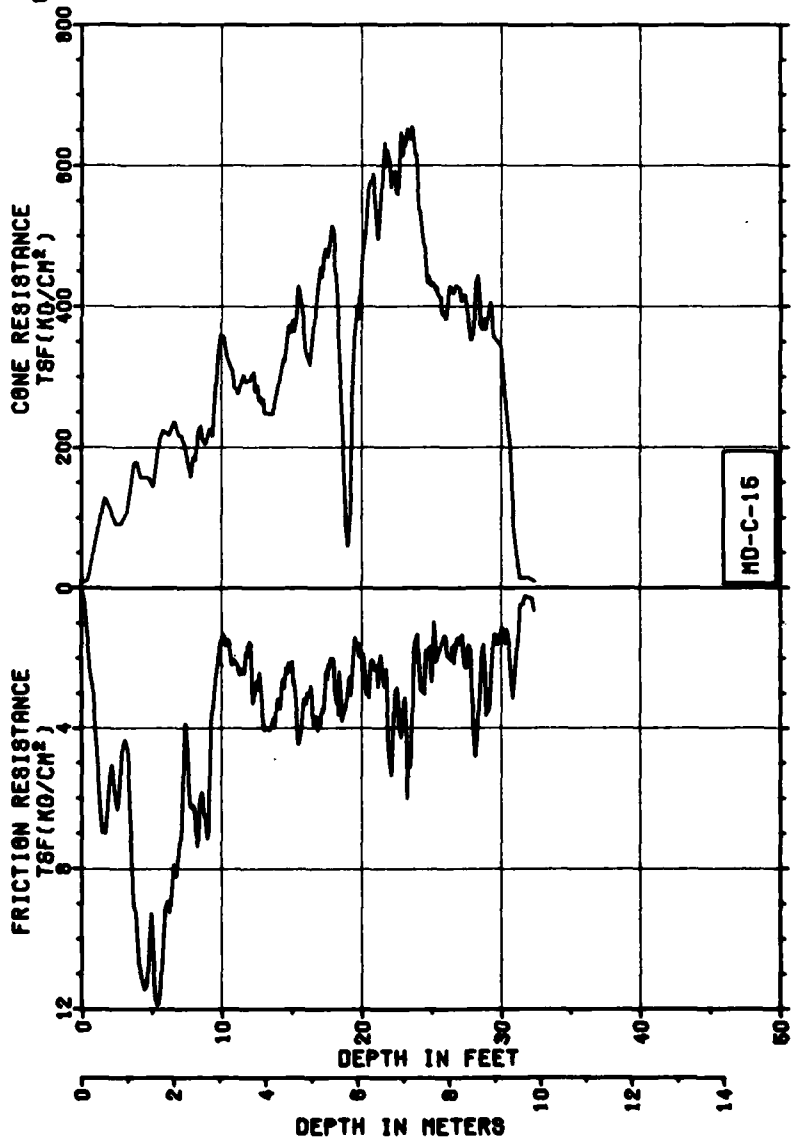
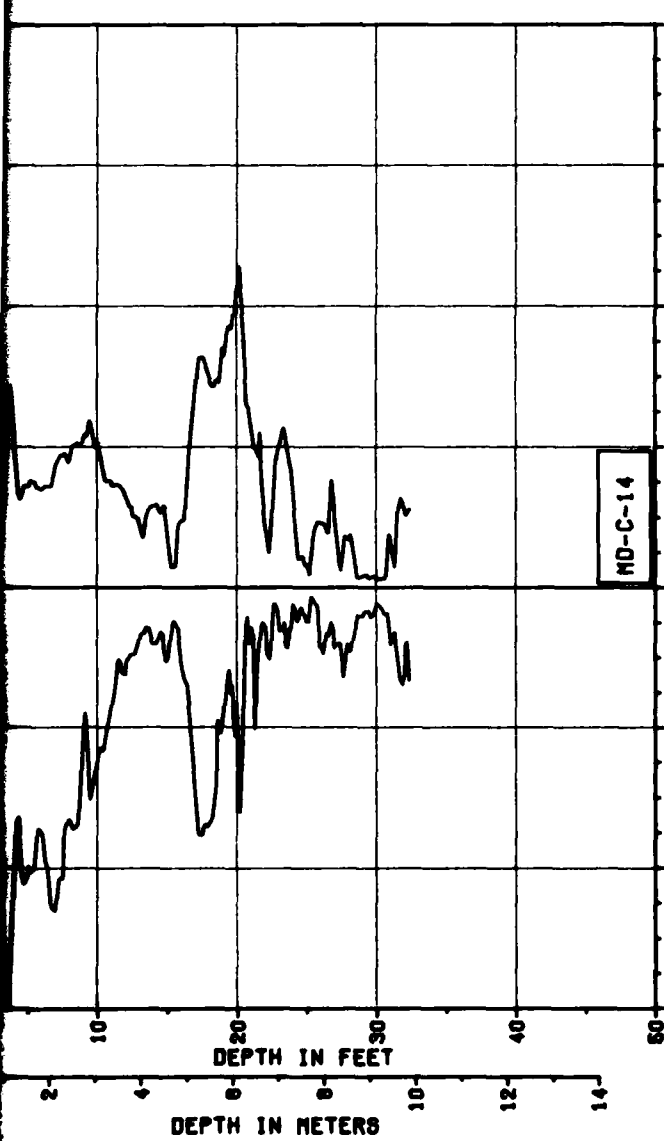
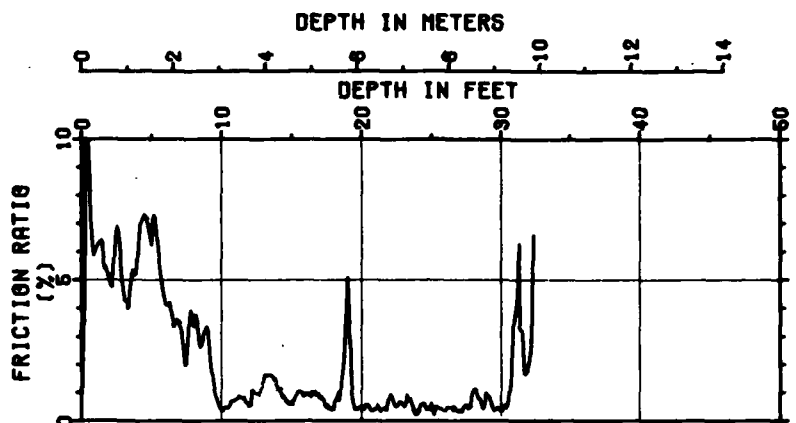
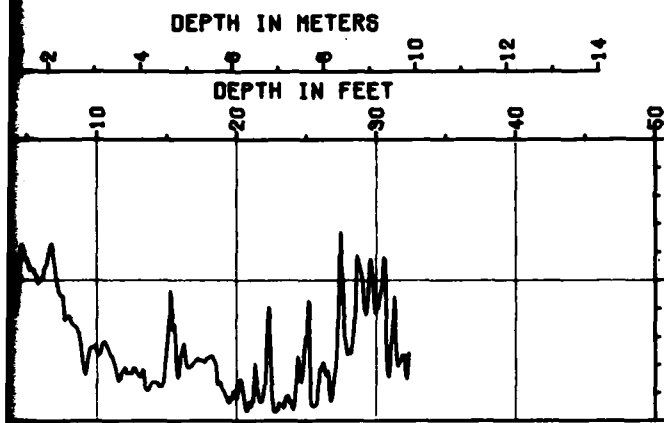
CONE PENETROMETER TEST MD-C-10, 11 & 12
 OPERATIONAL BASE SITE
 MIDFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - SMO

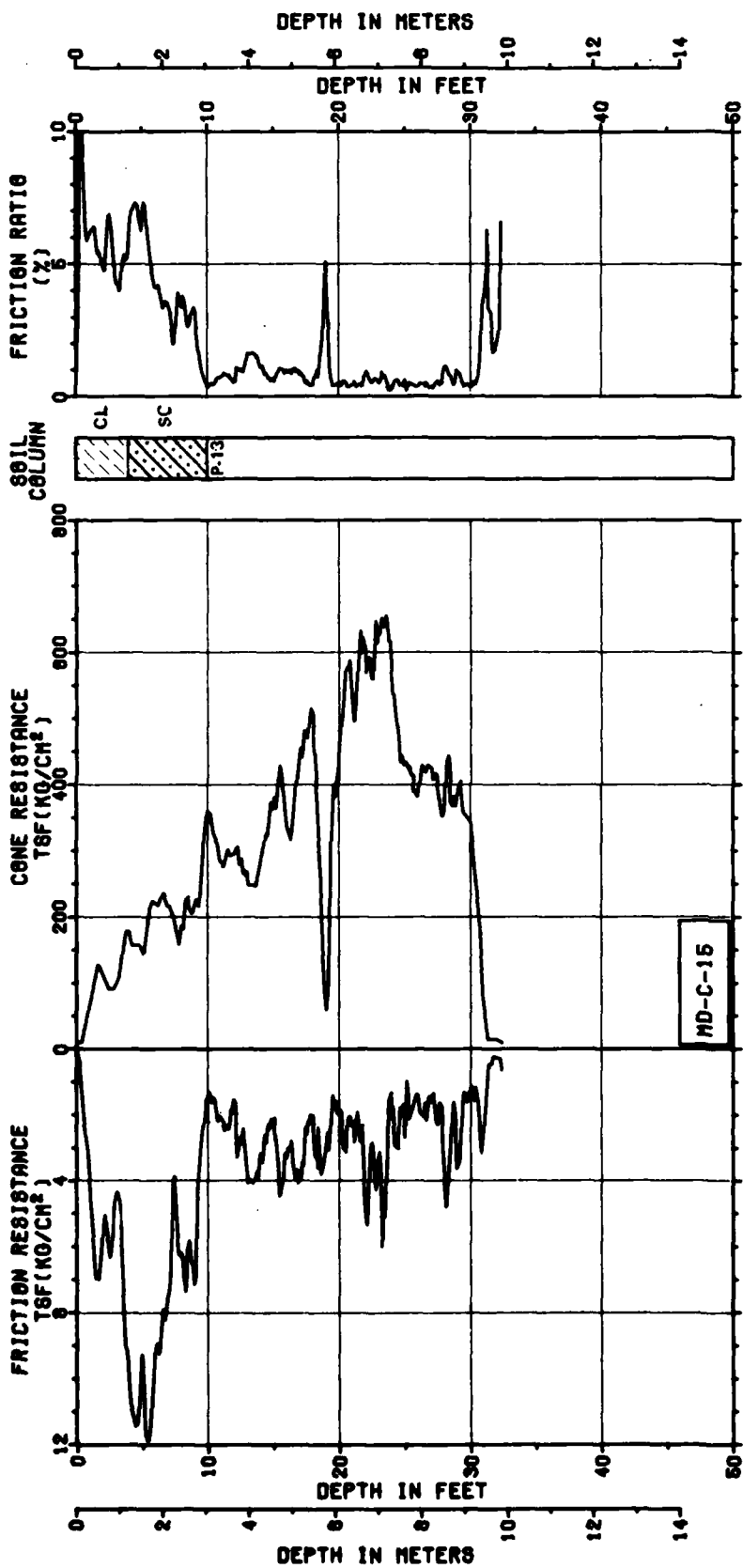
FIGURE
 II-6-1
 4 OF 25

UGRO NATIONAL, INC.





2

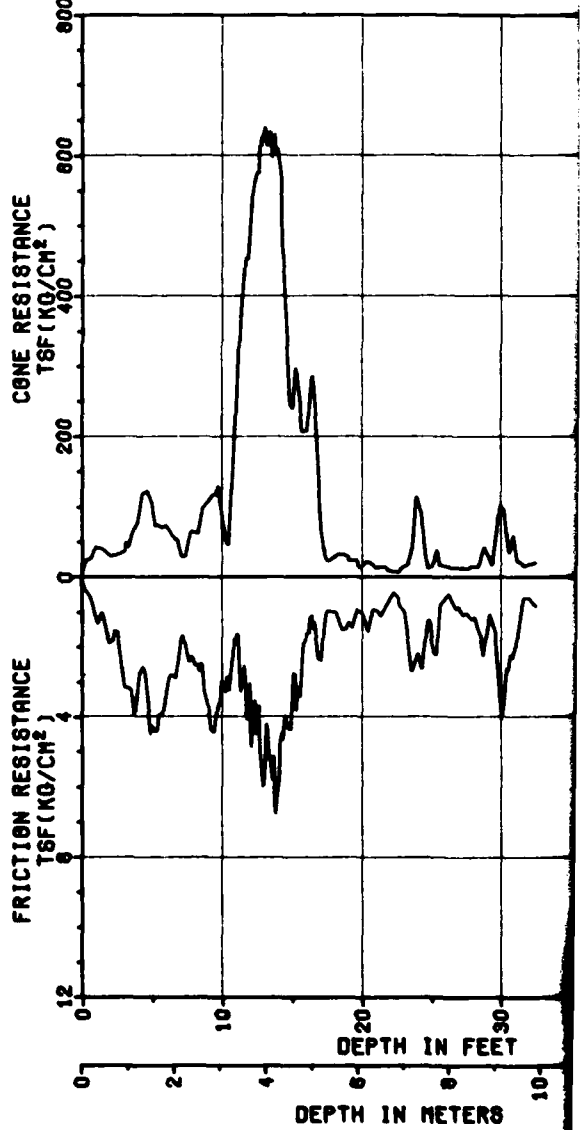
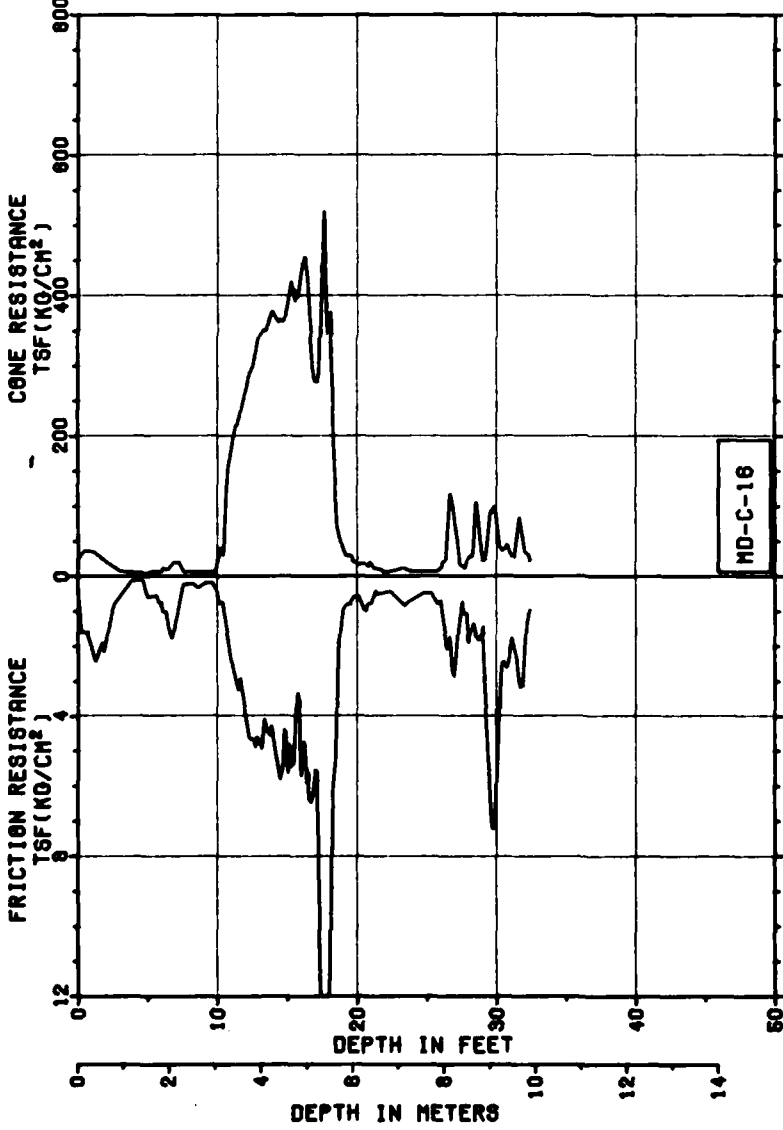
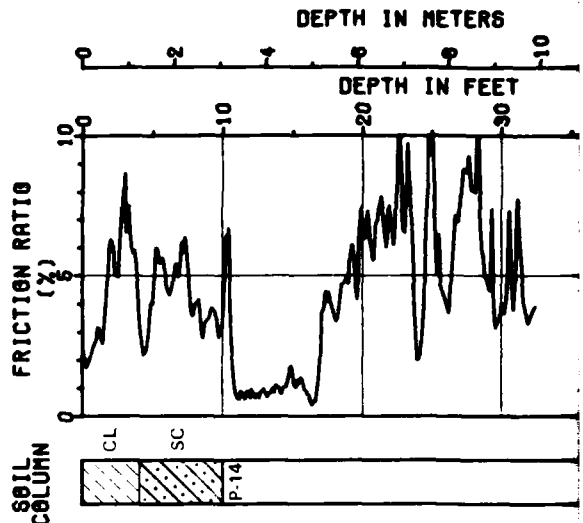
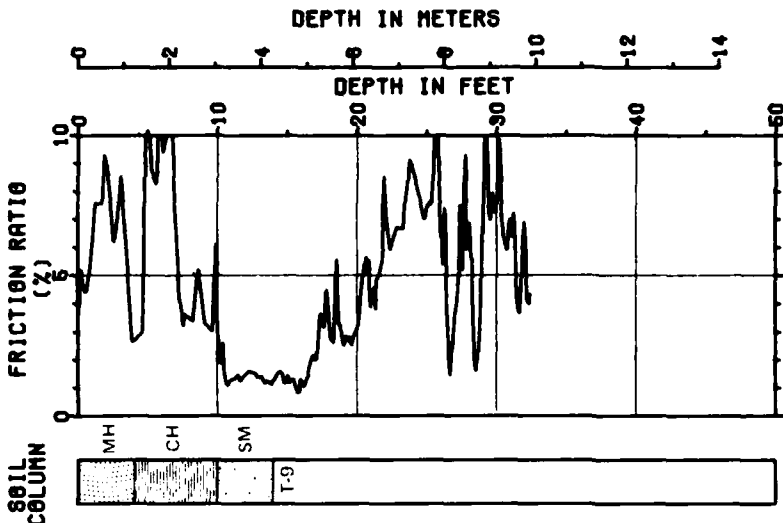


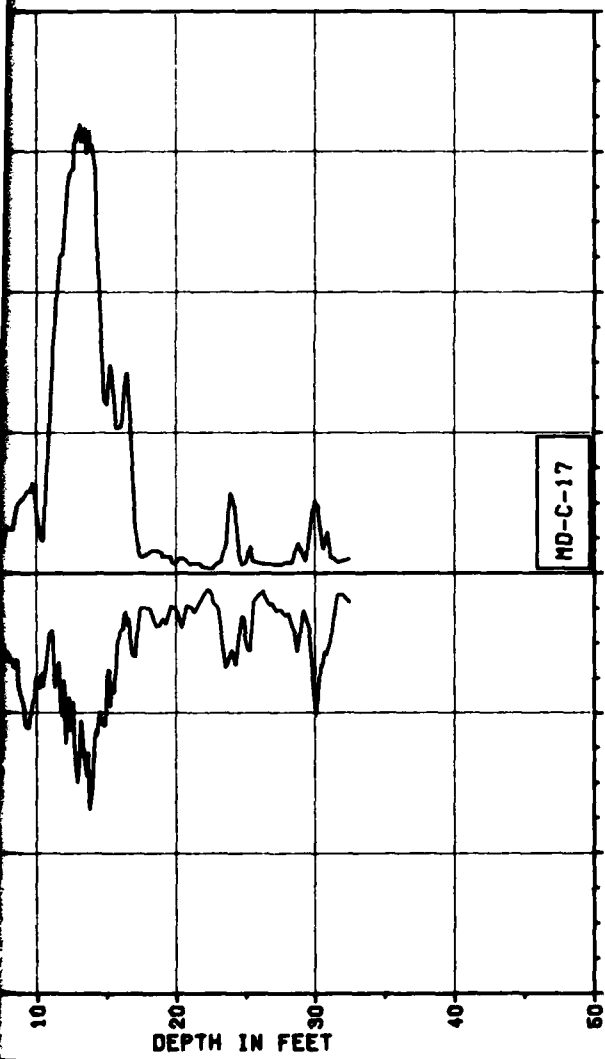
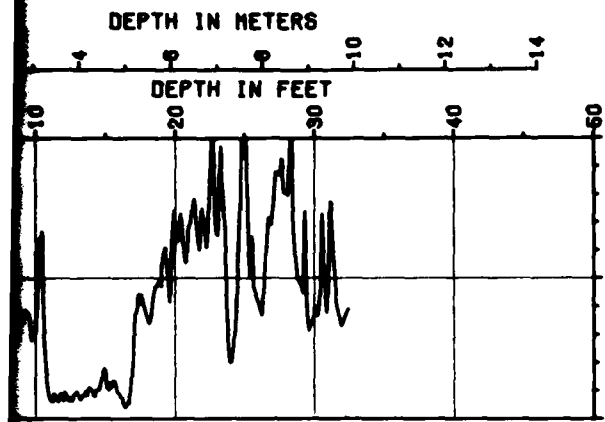
CONE PENETROMETER TEST MD-C-13, 14 & 15
 OPERATIONAL BASE CENS
 MEAFORS, USAF

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

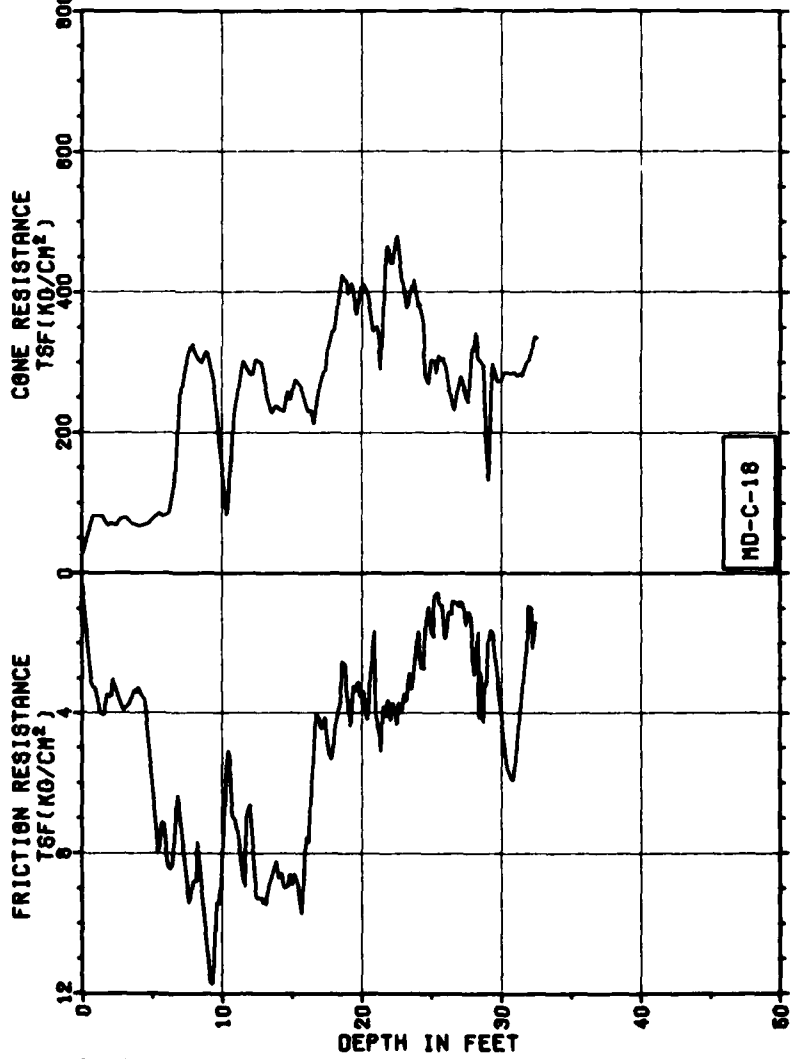
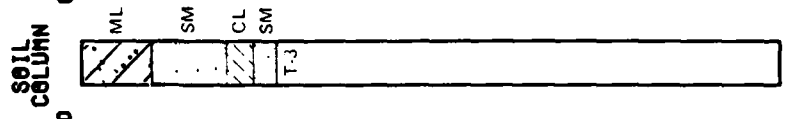
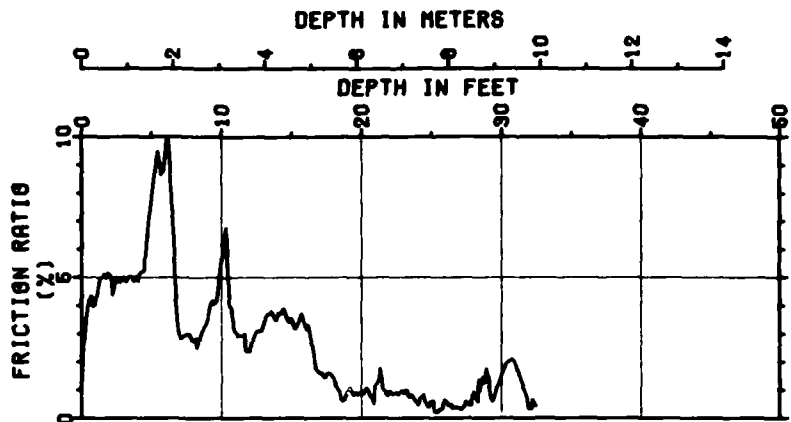
FIGURE
 II-1
 1 OF 2

TUGRO NATIONAL, INC.

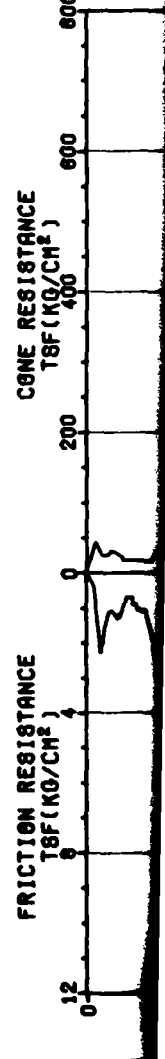
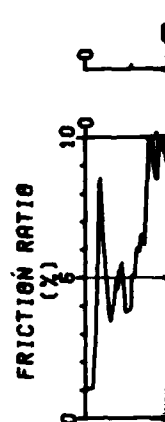




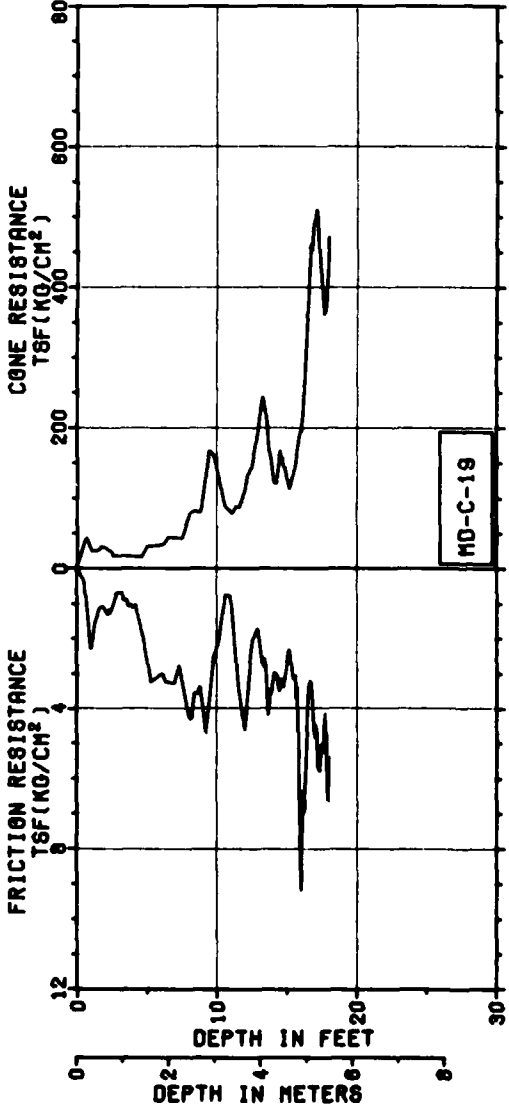
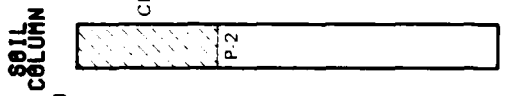
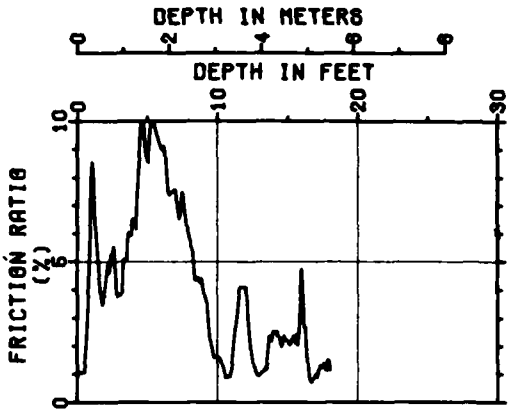
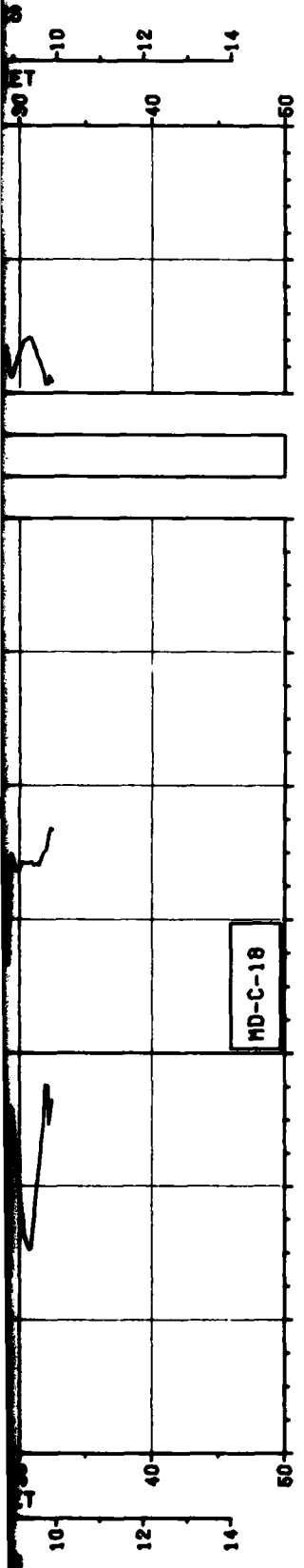
MD-C-17



MD-C-18



2

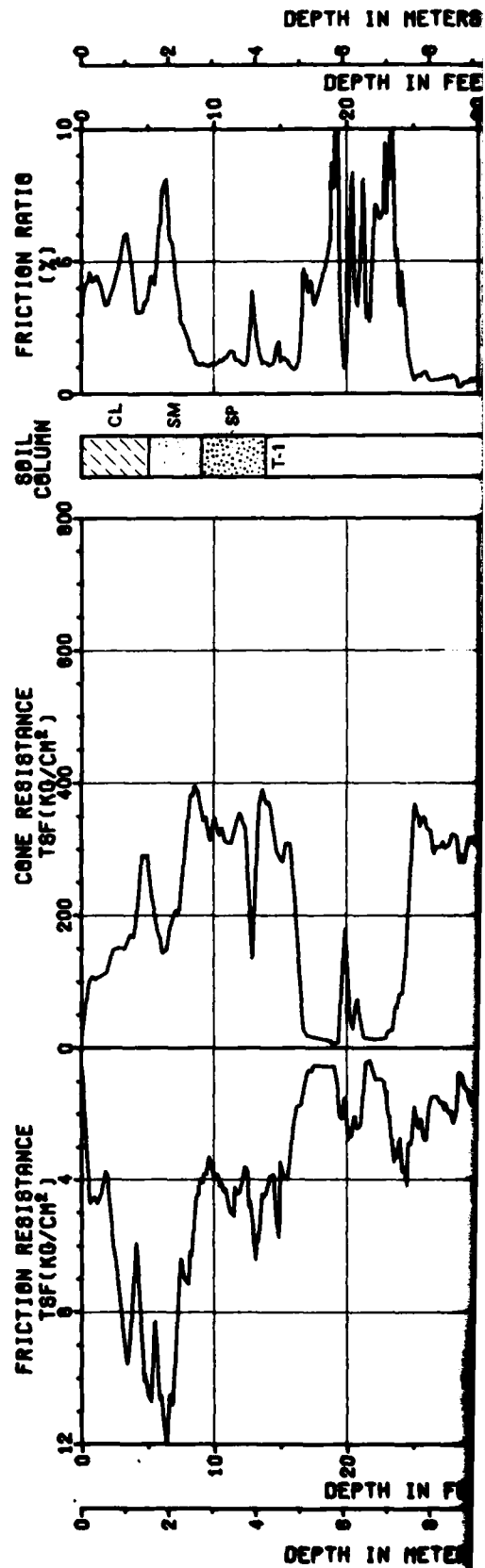
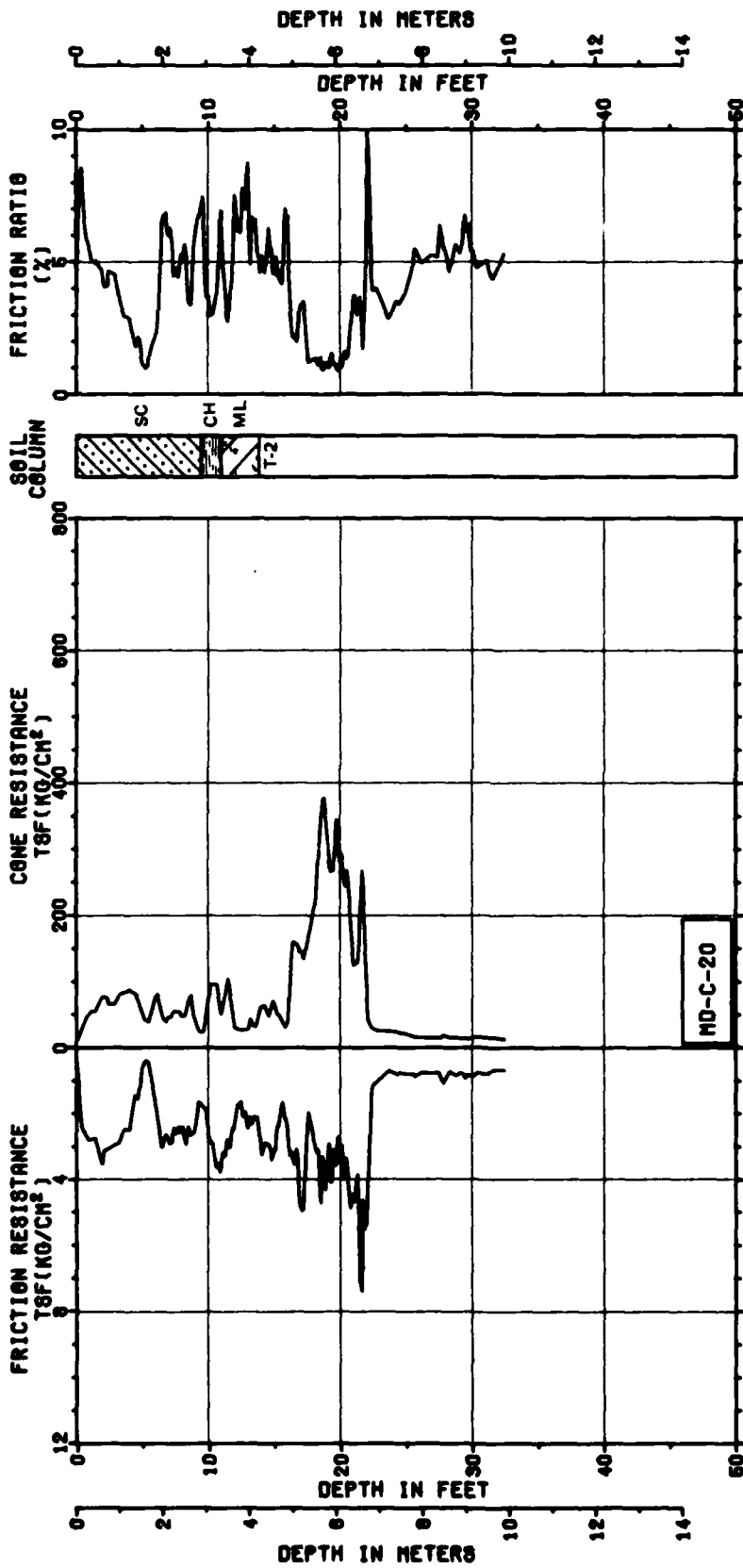


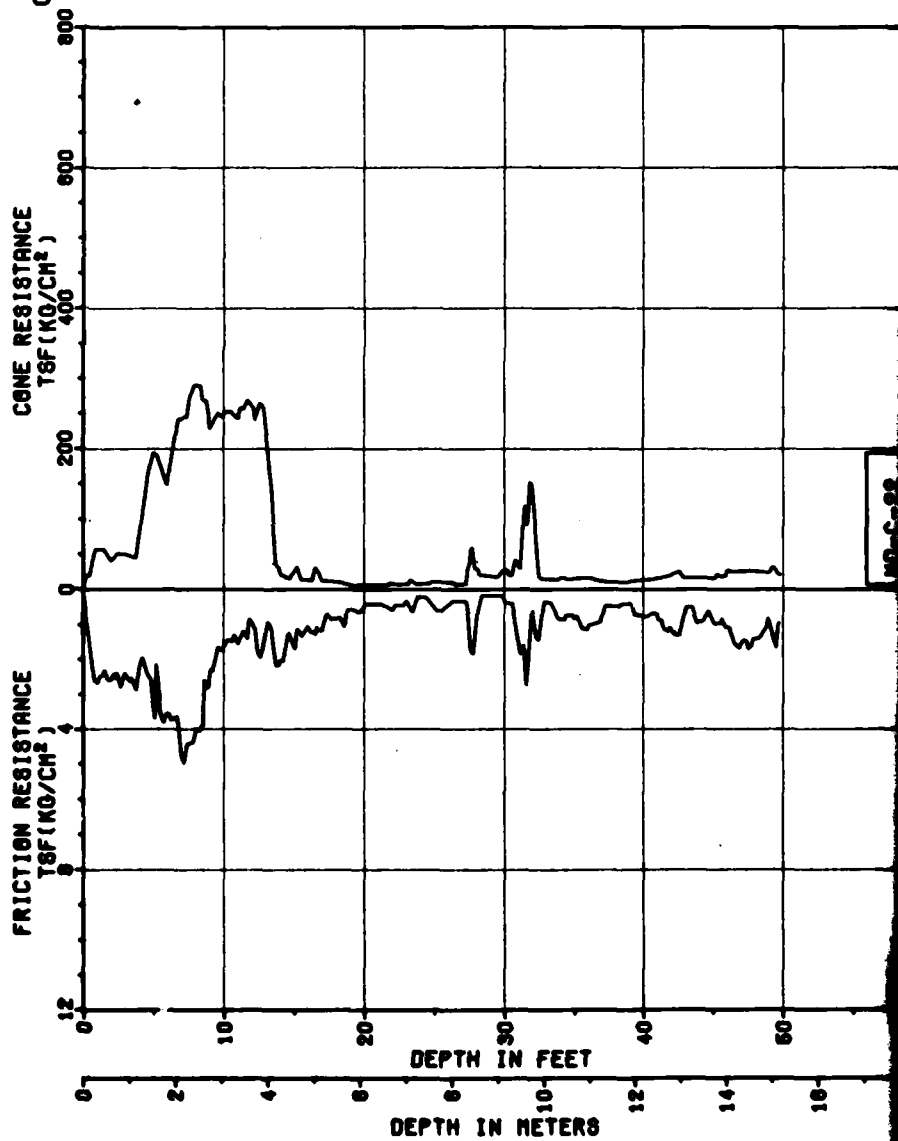
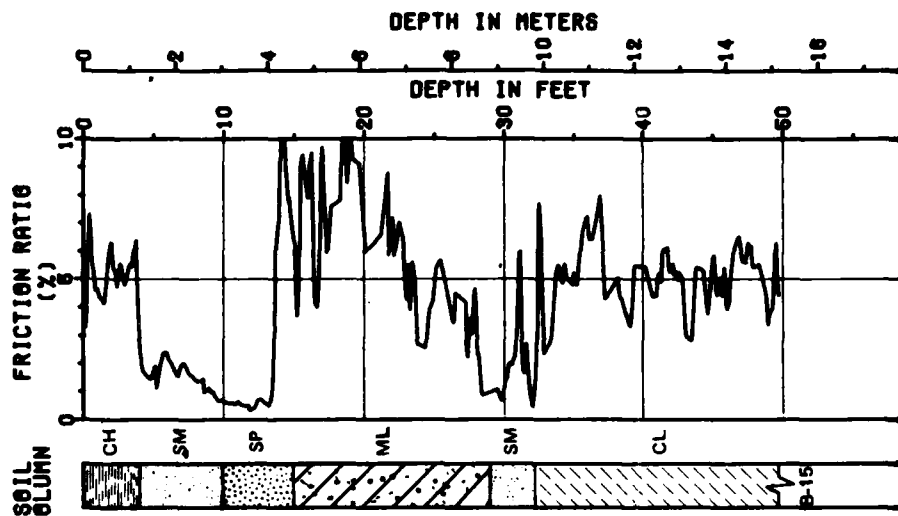
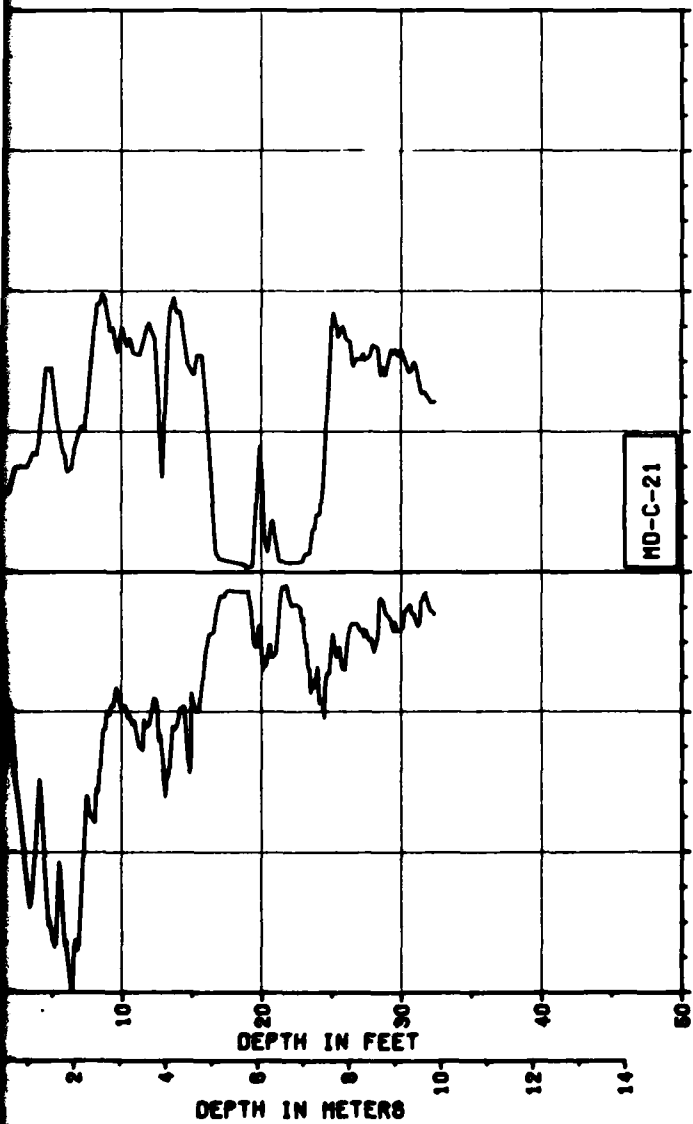
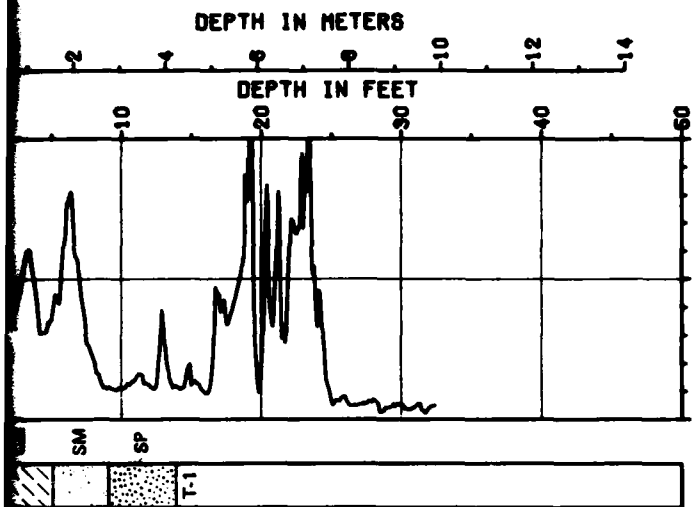
CONE PENETROMETER TEST MD-C-16, 17, 18 & 19
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-6-1
 6 OF 25

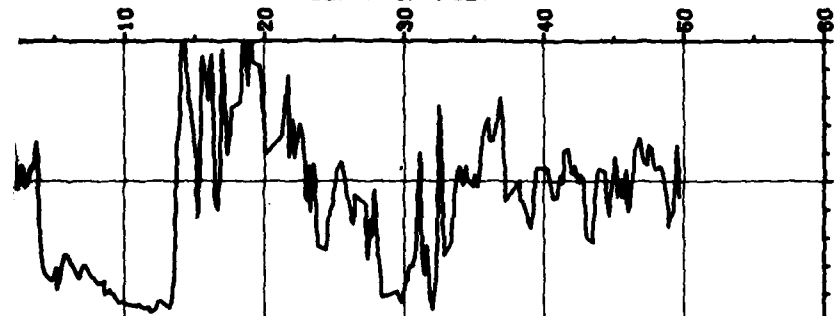
FUGRO NATIONAL, INC.





DEPTH IN METERS

DEPTH IN FEET



MD-C-22

DEPTH IN FEET

DEPTH IN METERS



CONE PENETROMETER TEST, MD-C-20, 21 & 22
 OPERATIONAL BASE SITES
 MILFORD, UTAH

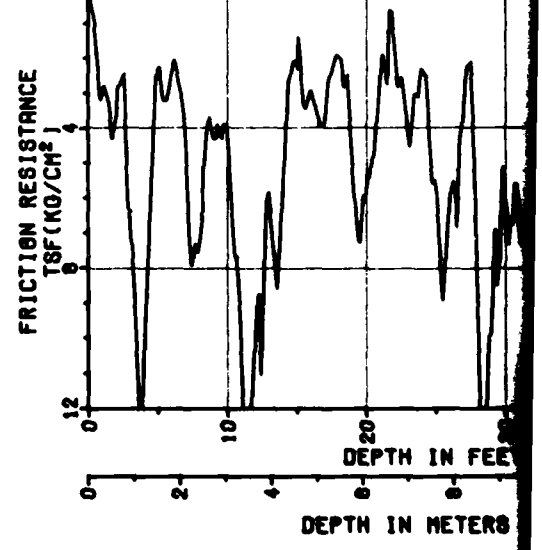
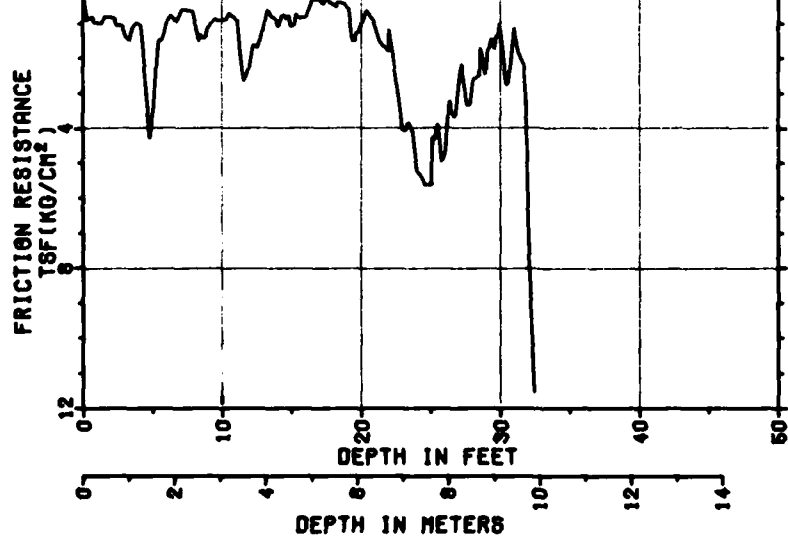
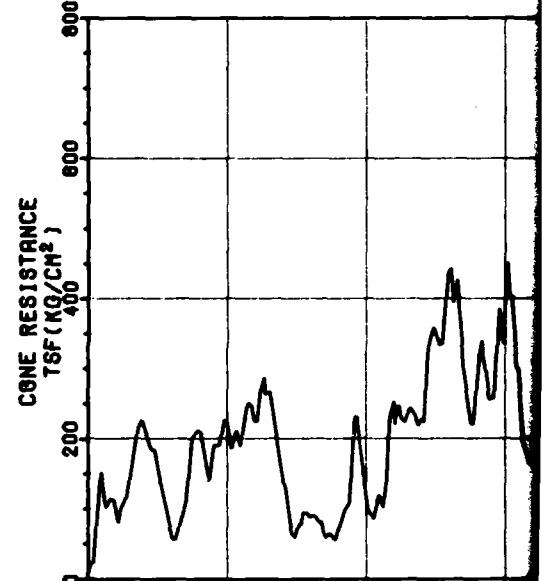
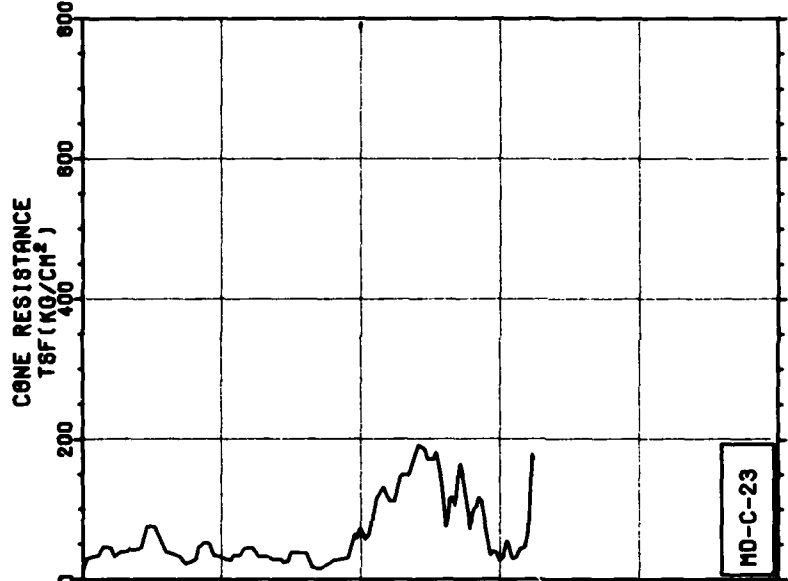
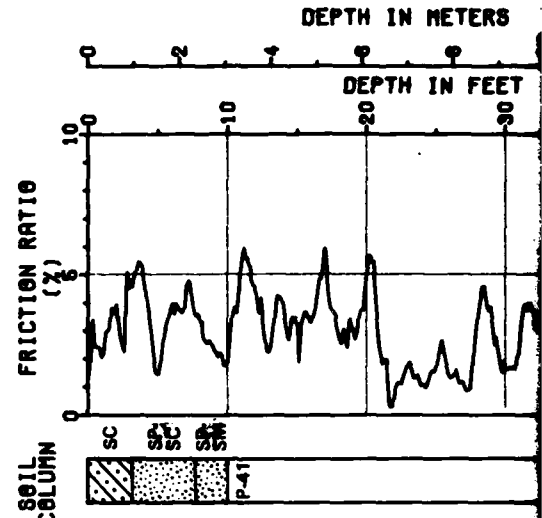
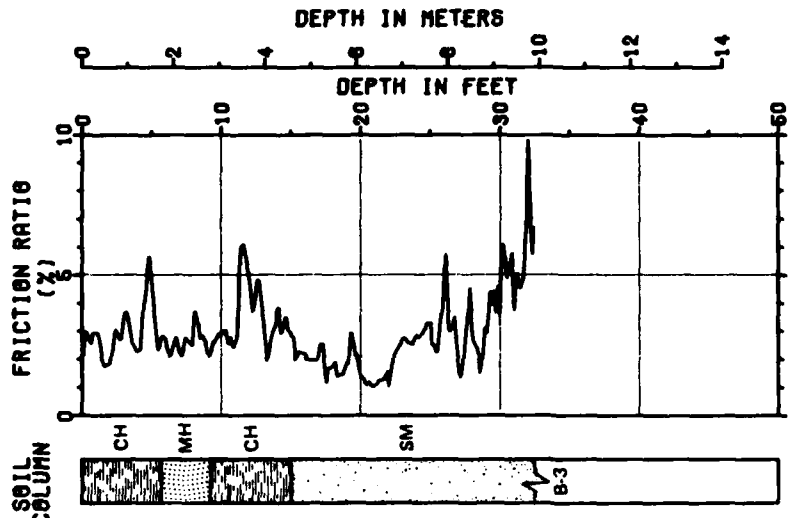
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-6-1
 7 OF 25

FUGRO NATIONAL, INC.

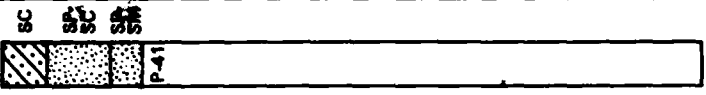
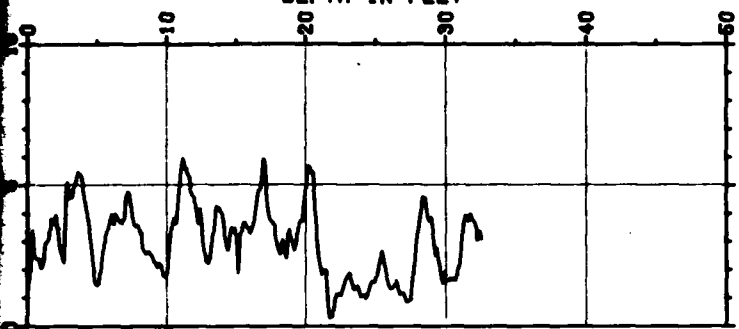
2

3



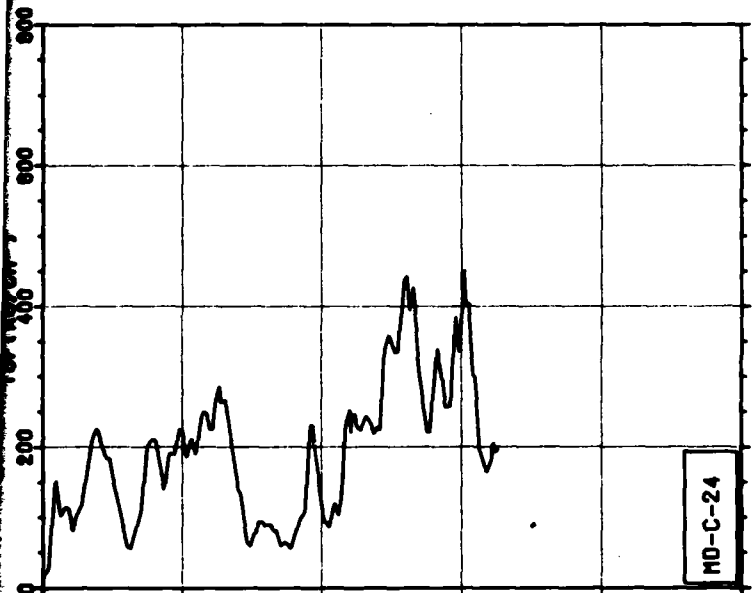
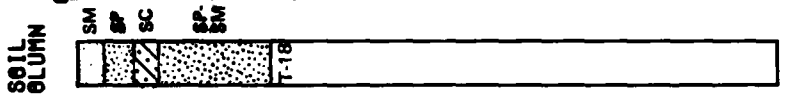
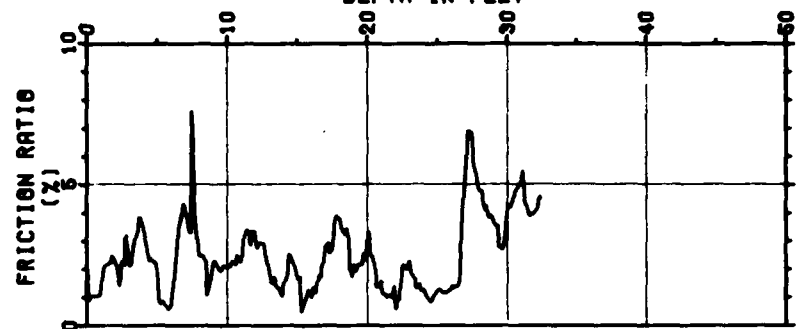
DEPTH IN METERS

DEPTH IN FEET

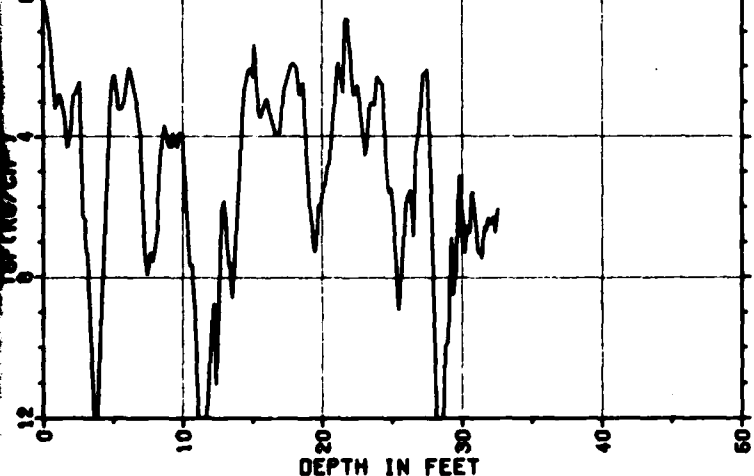


DEPTH IN METERS

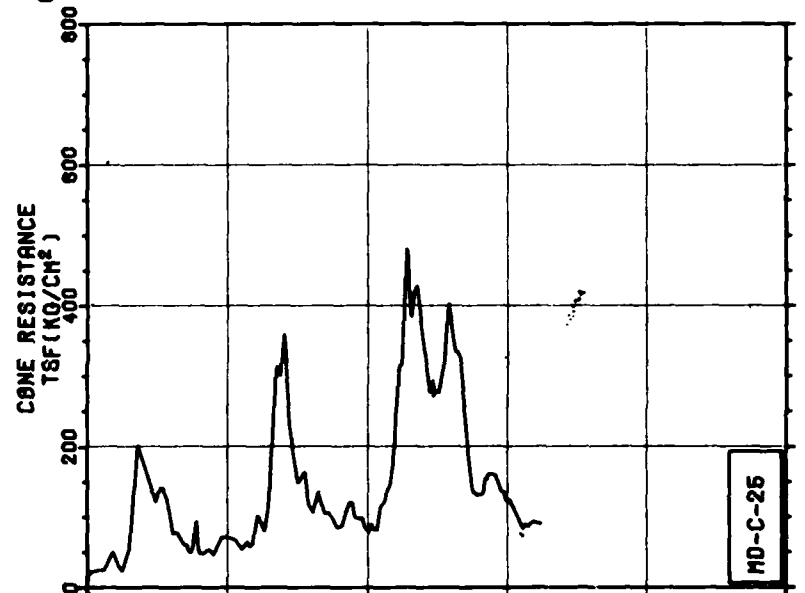
DEPTH IN FEET



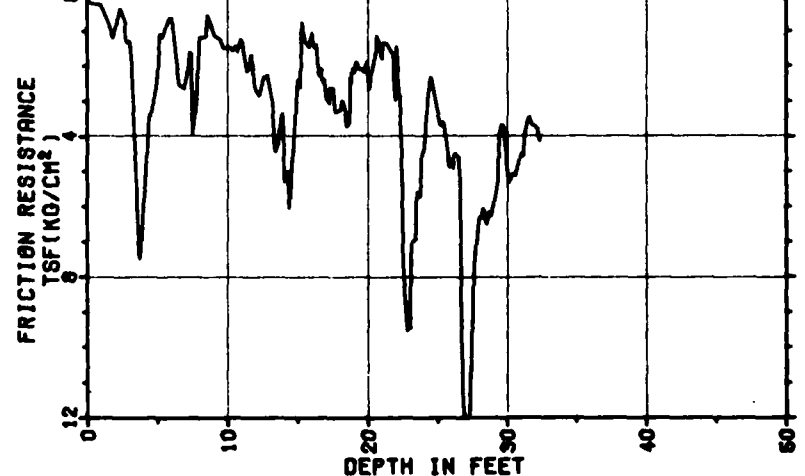
MD-C-24



DEPTH IN METERS

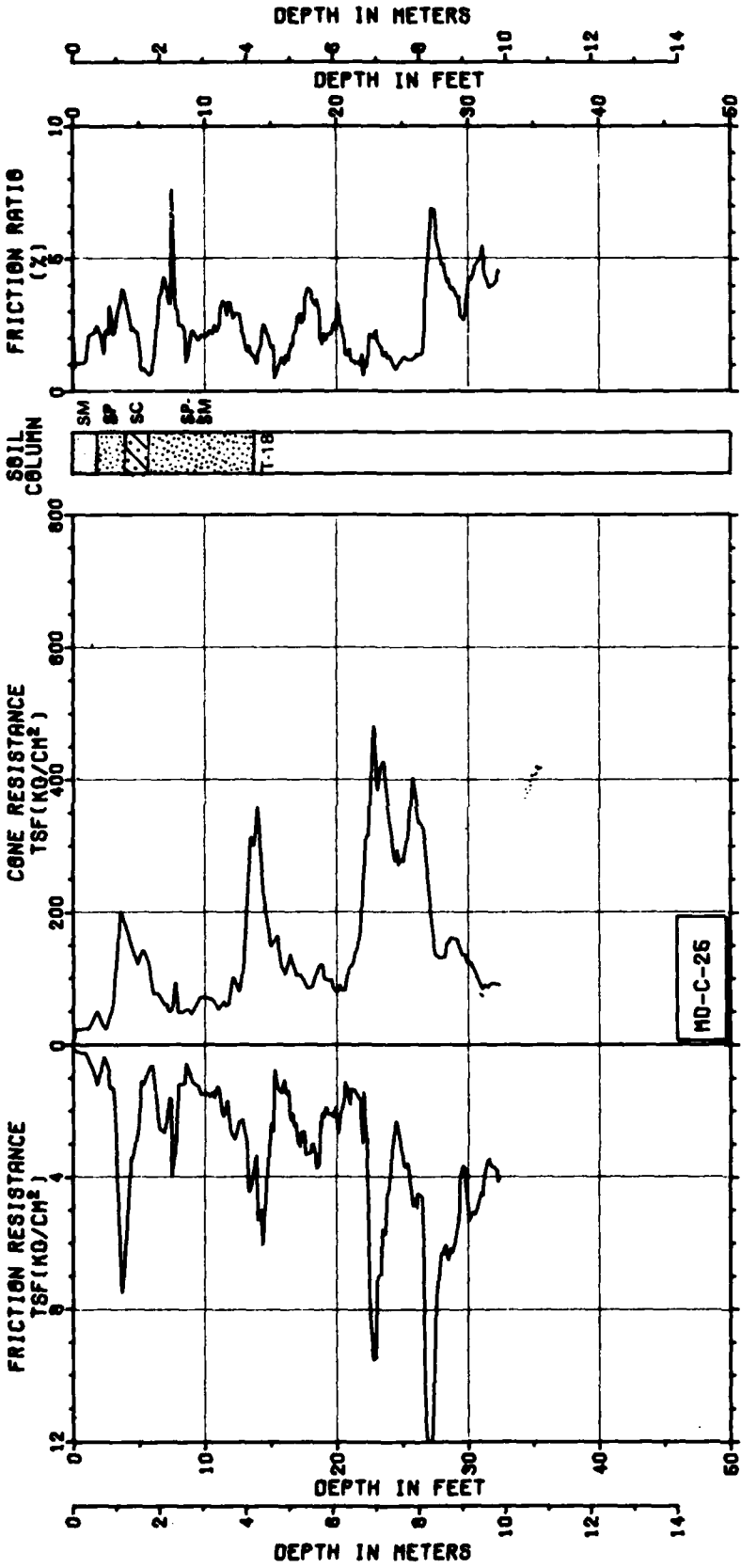


MD-C-25



DEPTH IN METERS

Handwritten signature or mark at the bottom center of the page.

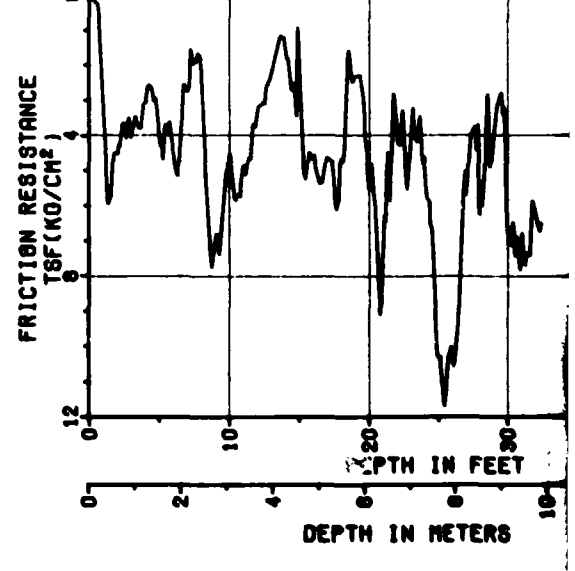
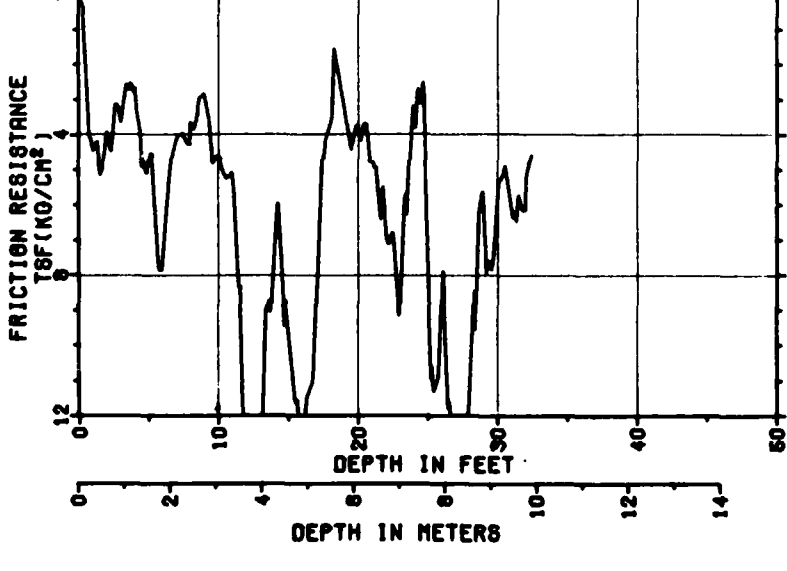
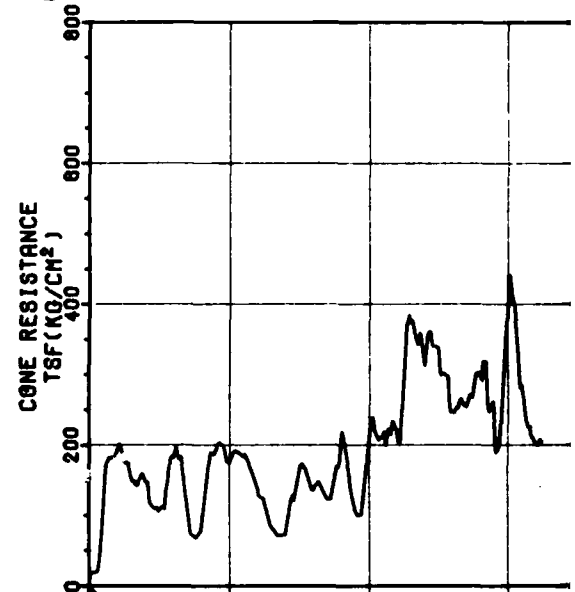
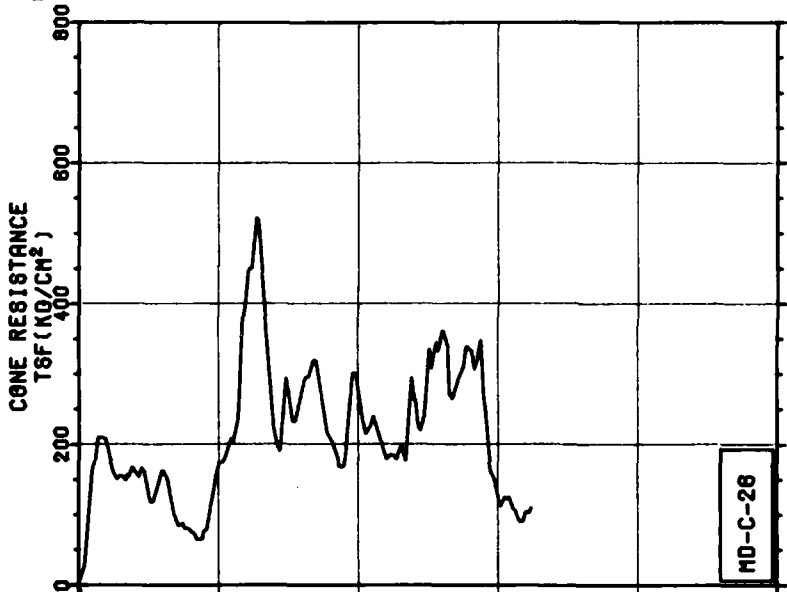
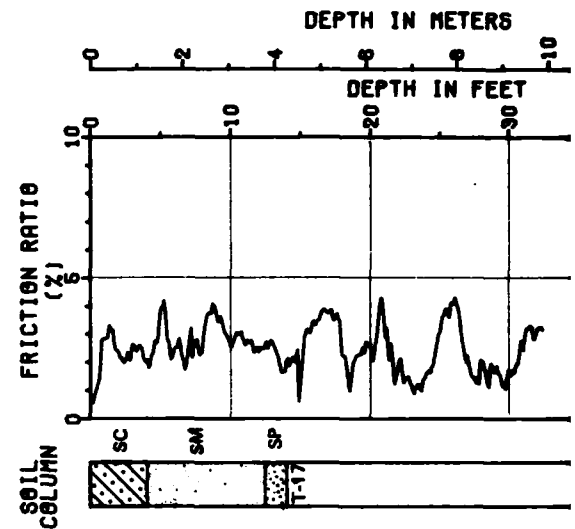
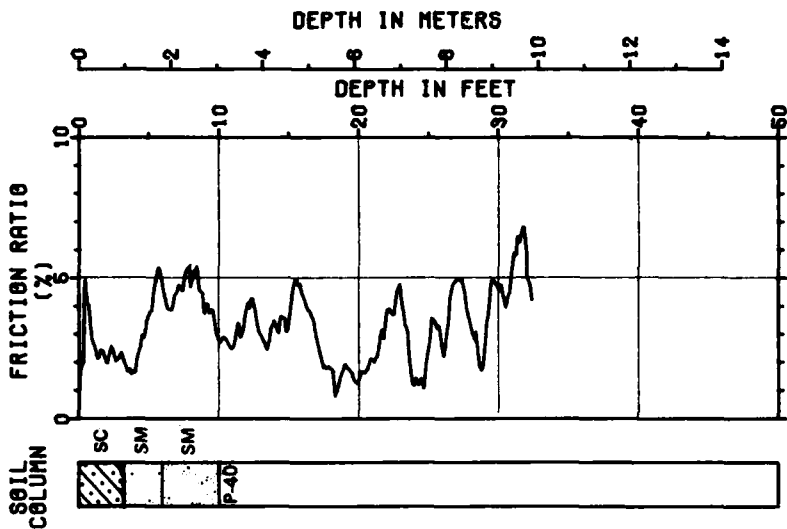


CONE PENETROMETER TEST MD-C-23, 24 & 25
 OPERATIONS BARS
 MELBORN, USAM

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - SMO

FIGURE
 II-1
 8 OF 25

FUGRO NATIONAL, INC.

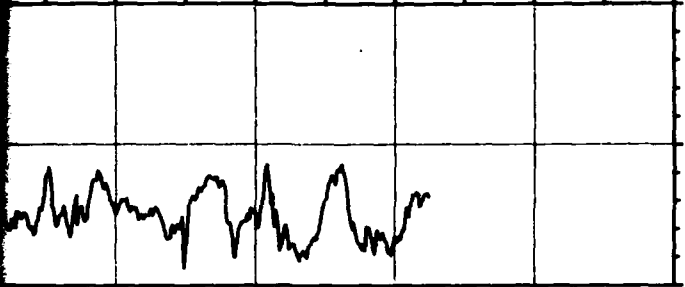


DEPTH IN METERS

2 4 6 8 10 12 14

DEPTH IN FEET

10 20 30 40 50



SM SP



MD-C-27

DEPTH IN FEET

2 4 6 8 10 12 14

DEPTH IN METERS

10 20 30 40 50



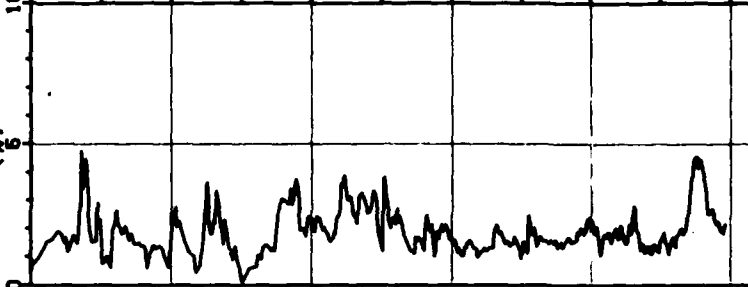
DEPTH IN METERS

2 4 6 8 10 12 14 16

DEPTH IN FEET

10 20 30 40 50

FRICITION RATIO (%)



SM SW SM SC SM SM SP SM

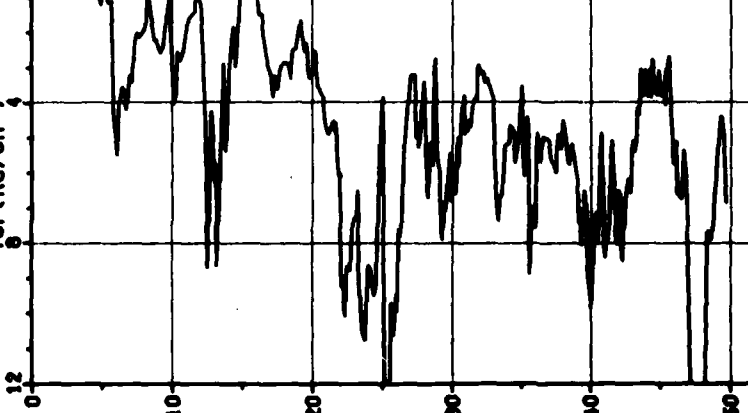


CONE RESISTANCE TSF (KG/CM²)

0 200 400 600 800

FRICITION RESISTANCE TSF (KG/CM²)

0 4 8 12

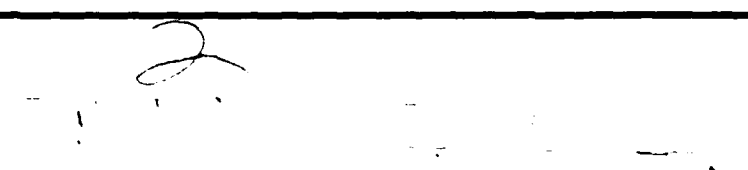


DEPTH IN FEET

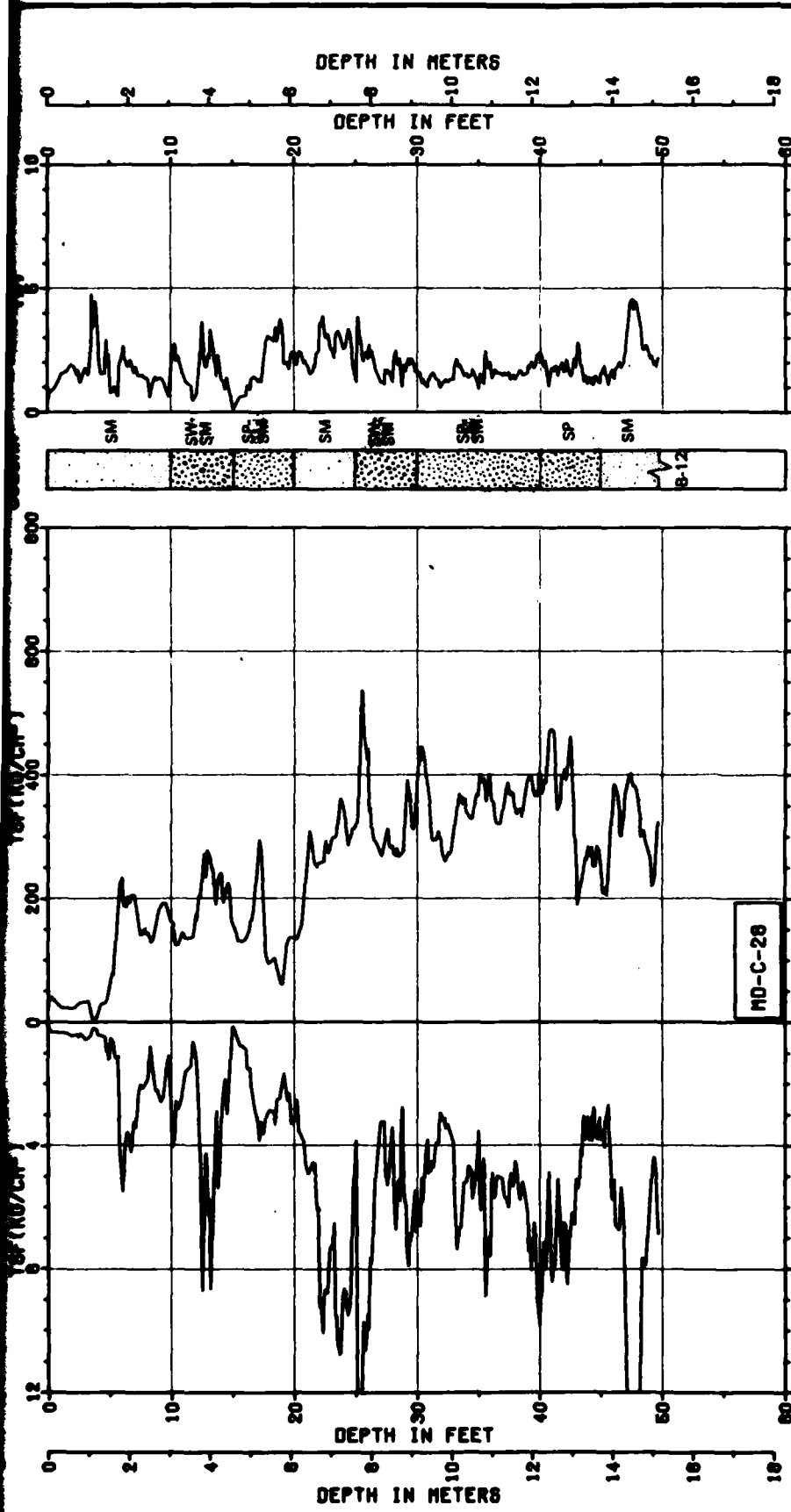
2 4 6 8 10 12 14 16

DEPTH IN METERS

10 20 30 40 50



Handwritten mark resembling the number '2'.



CONE PENETROMETER TEST MD-C-28, 27 & 29
 OPERATIONAL BAPS
 MILFORD, CONNECTICUT

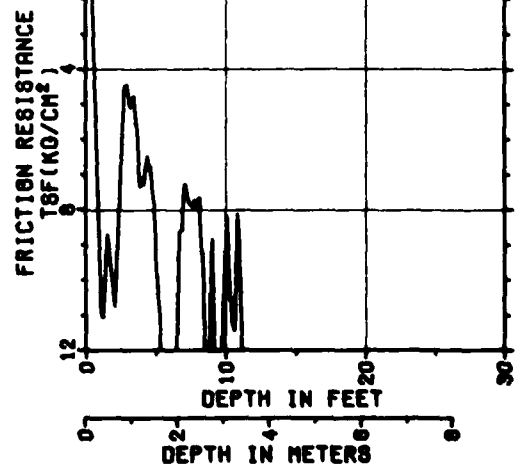
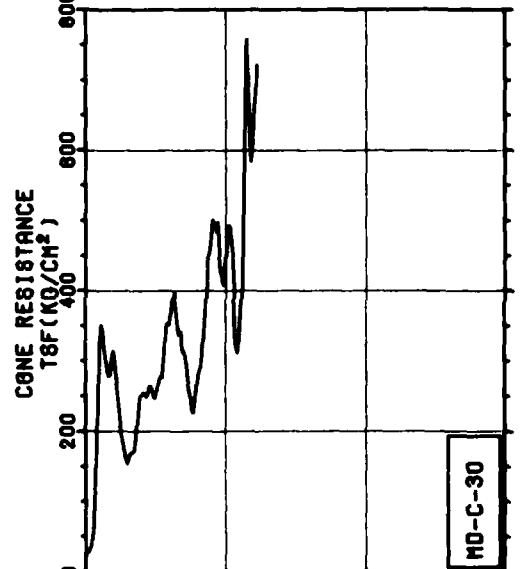
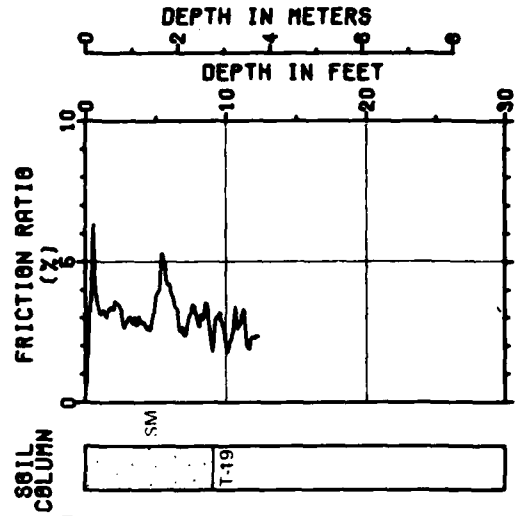
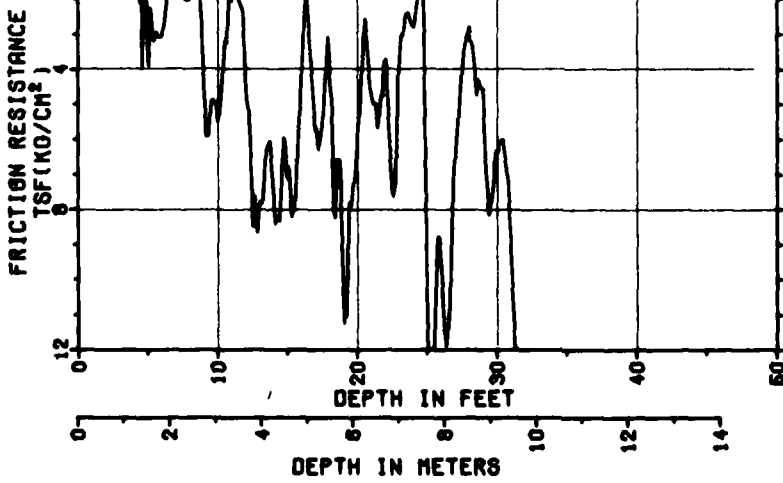
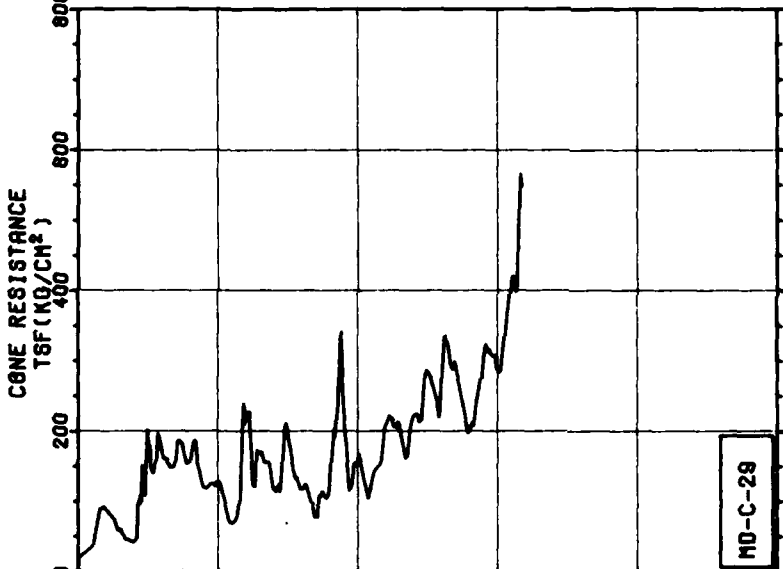
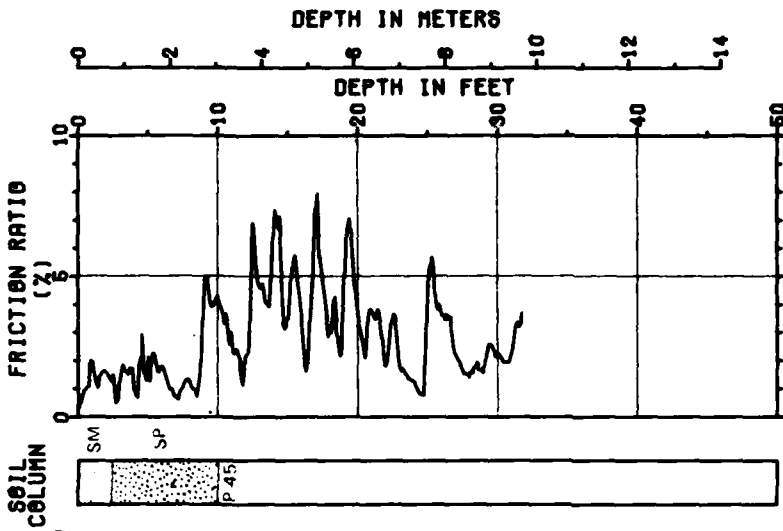
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - SMO

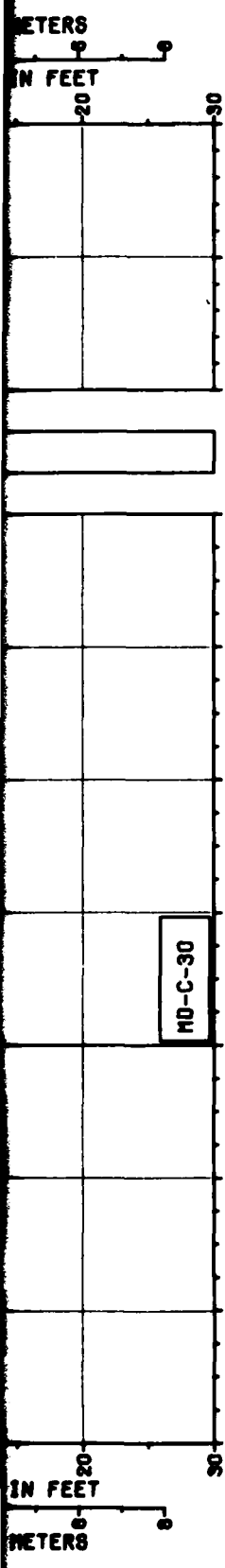
FIGURE
 1B.1
 1052

FUGRO NATIONAL, INC.

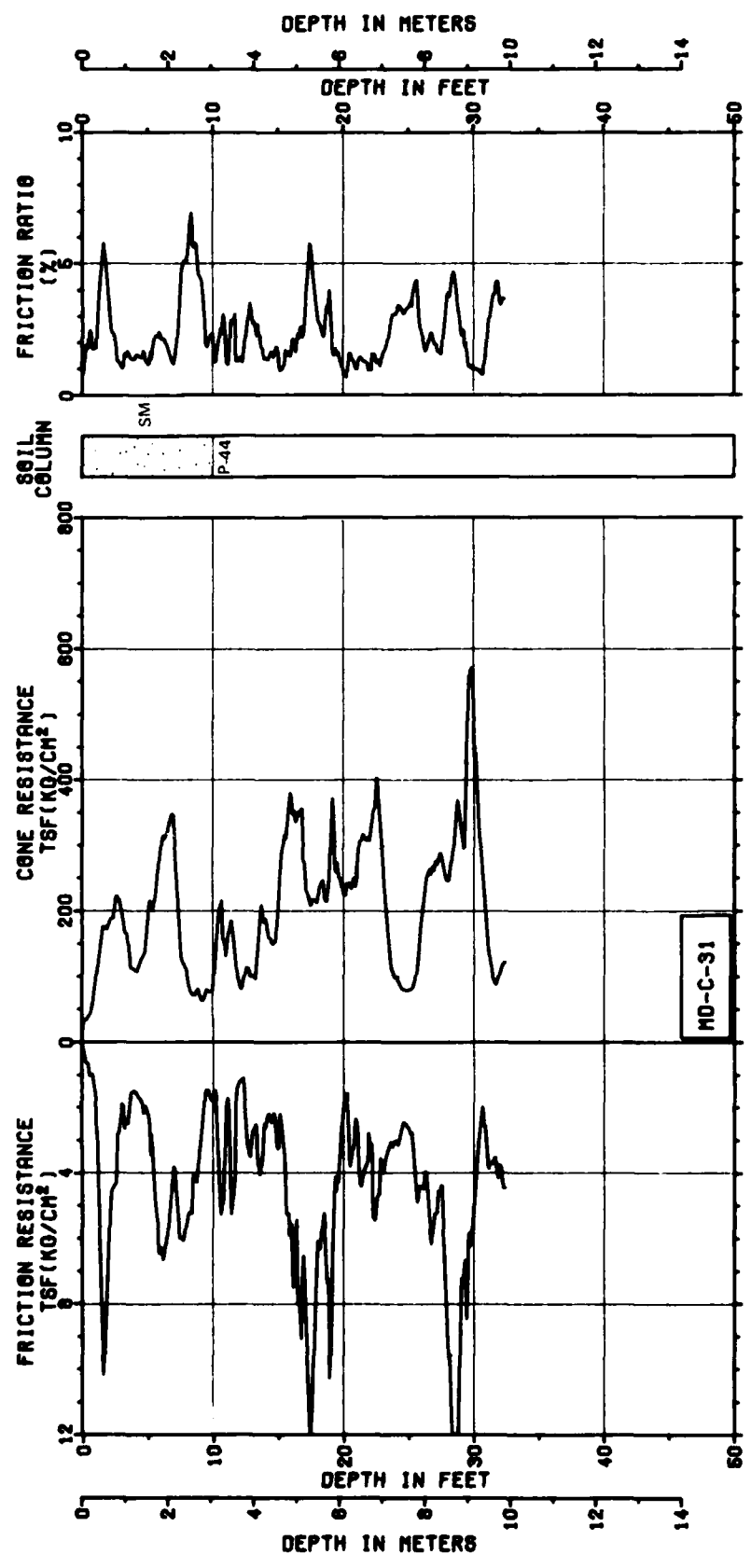
2

3

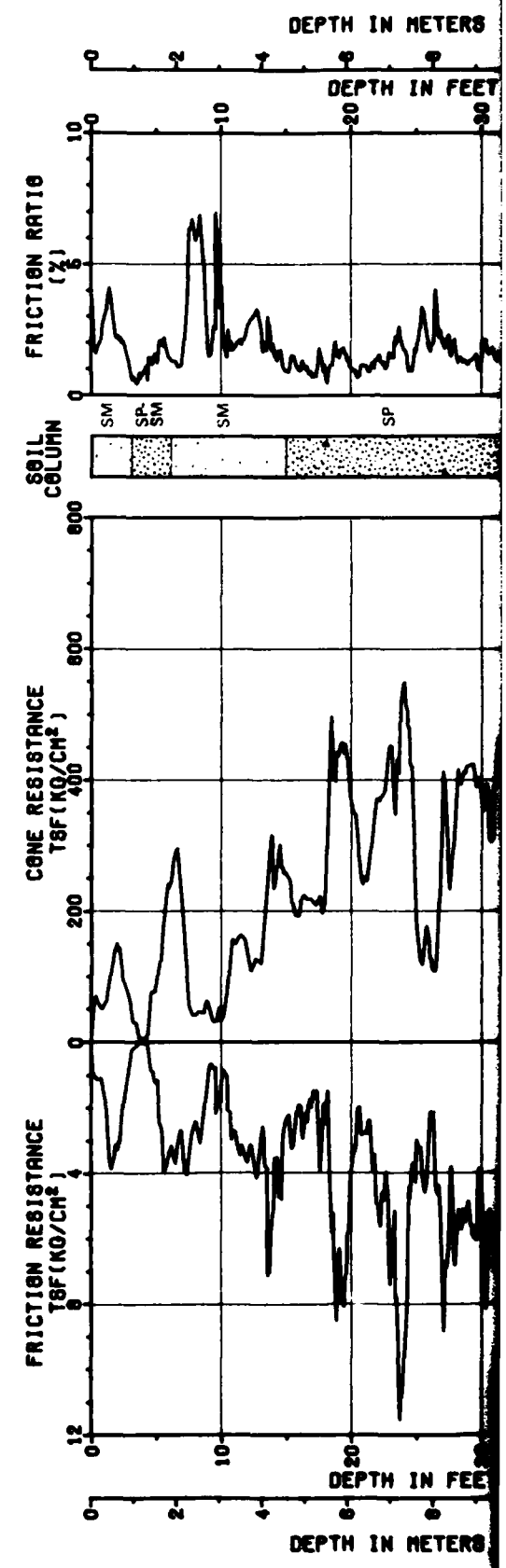


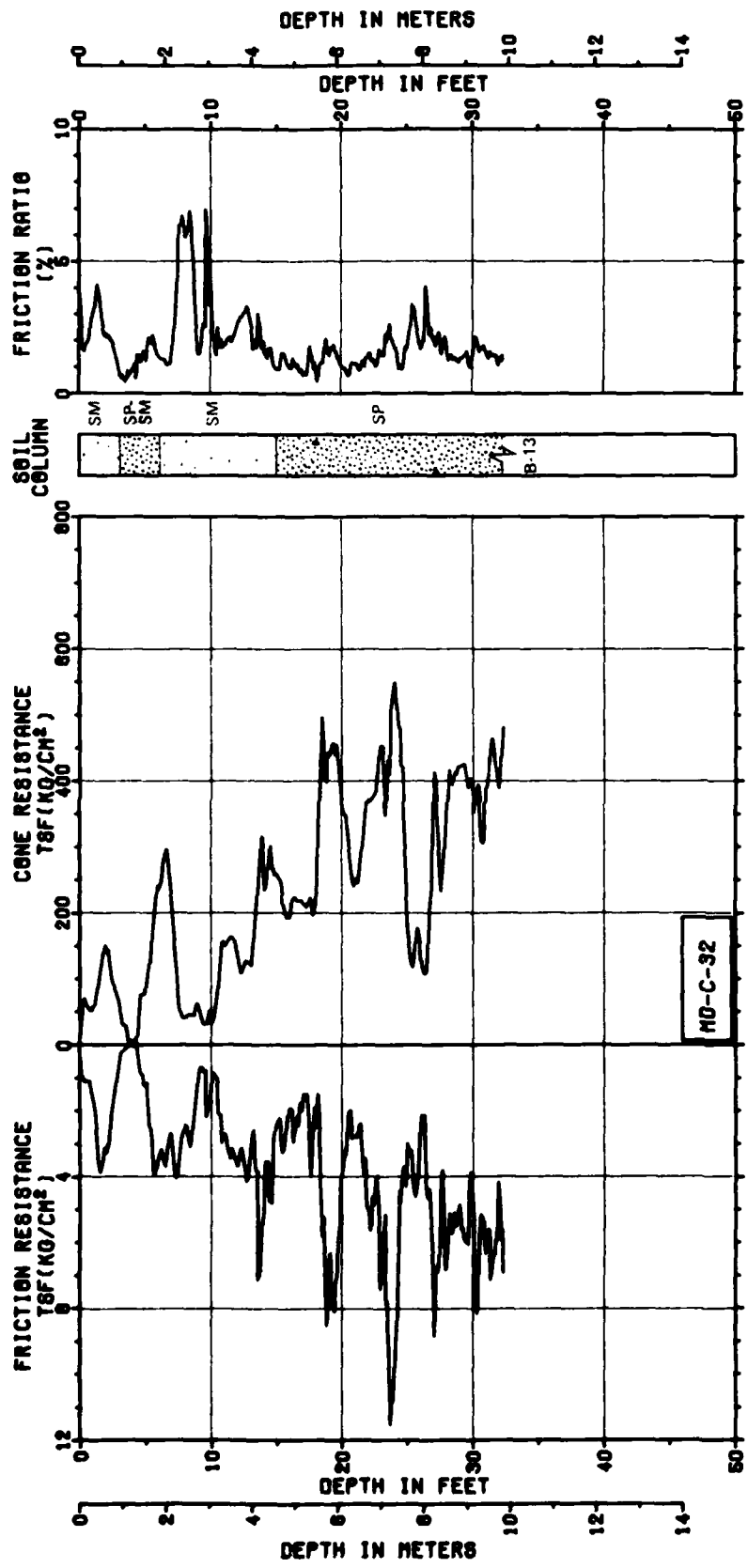


MD-C-30



MD-C-31





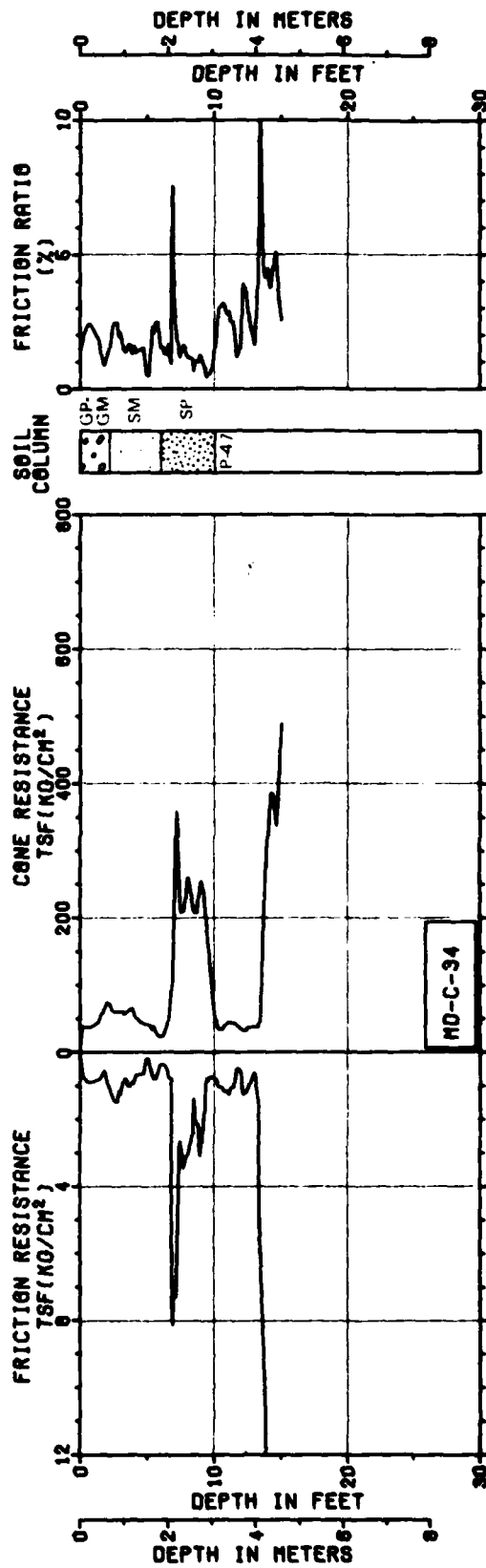
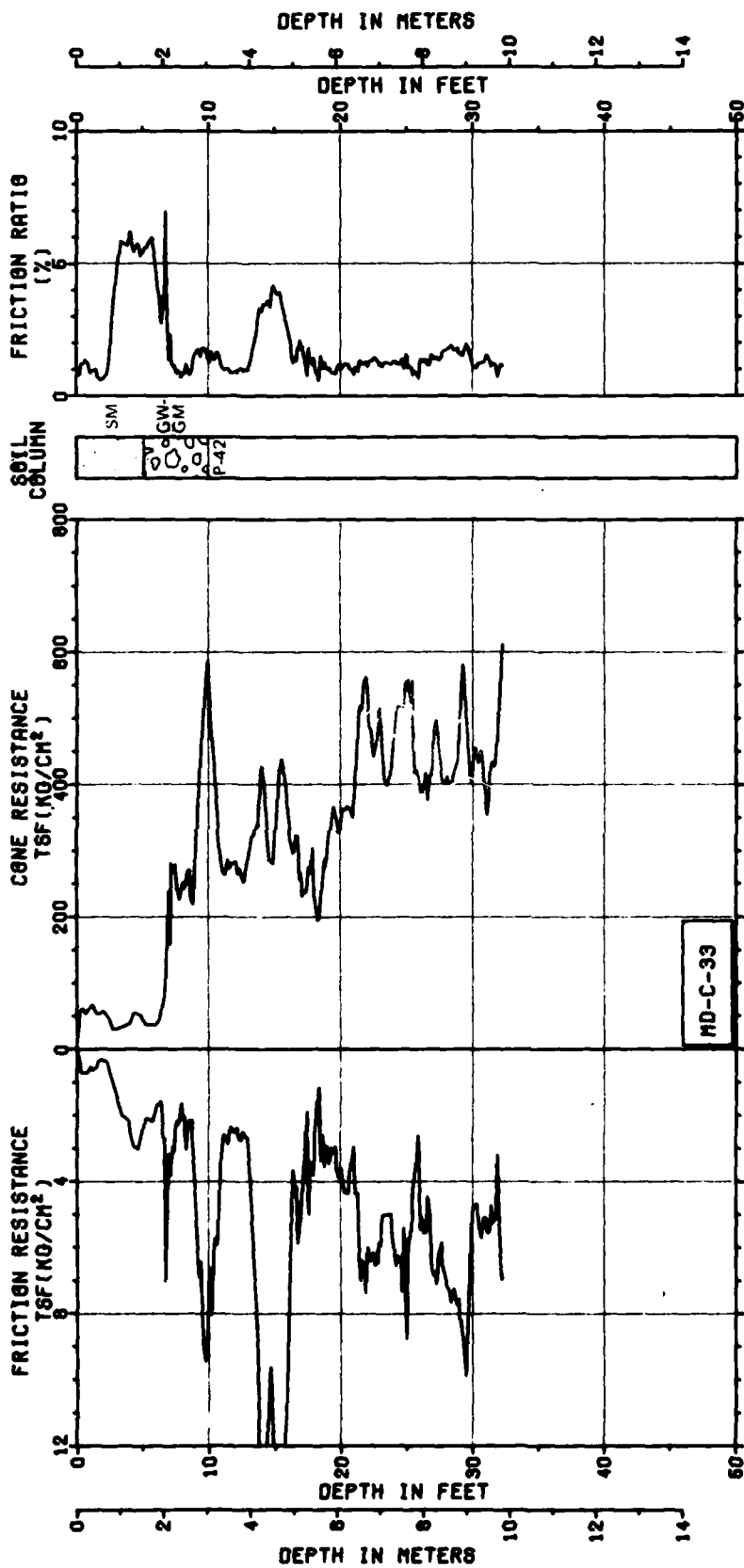
CONE PENETROMETER TEST MD-C-29, 30, 31 & 32
OPERATIONAL BASE SITE
MILFORD, UTAH

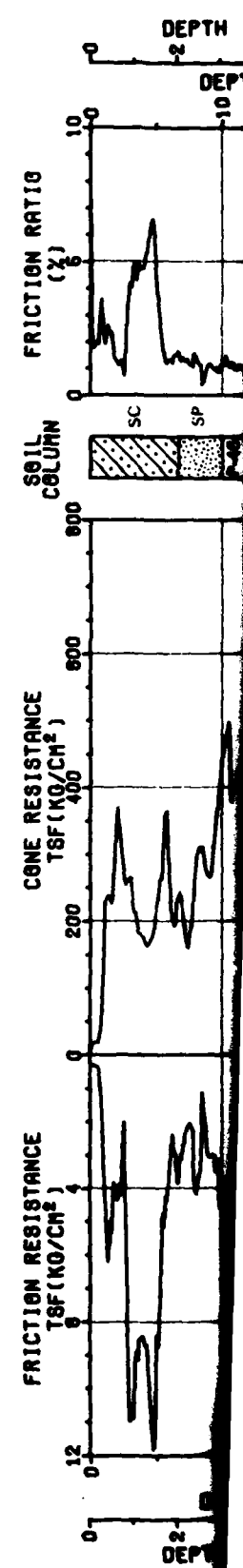
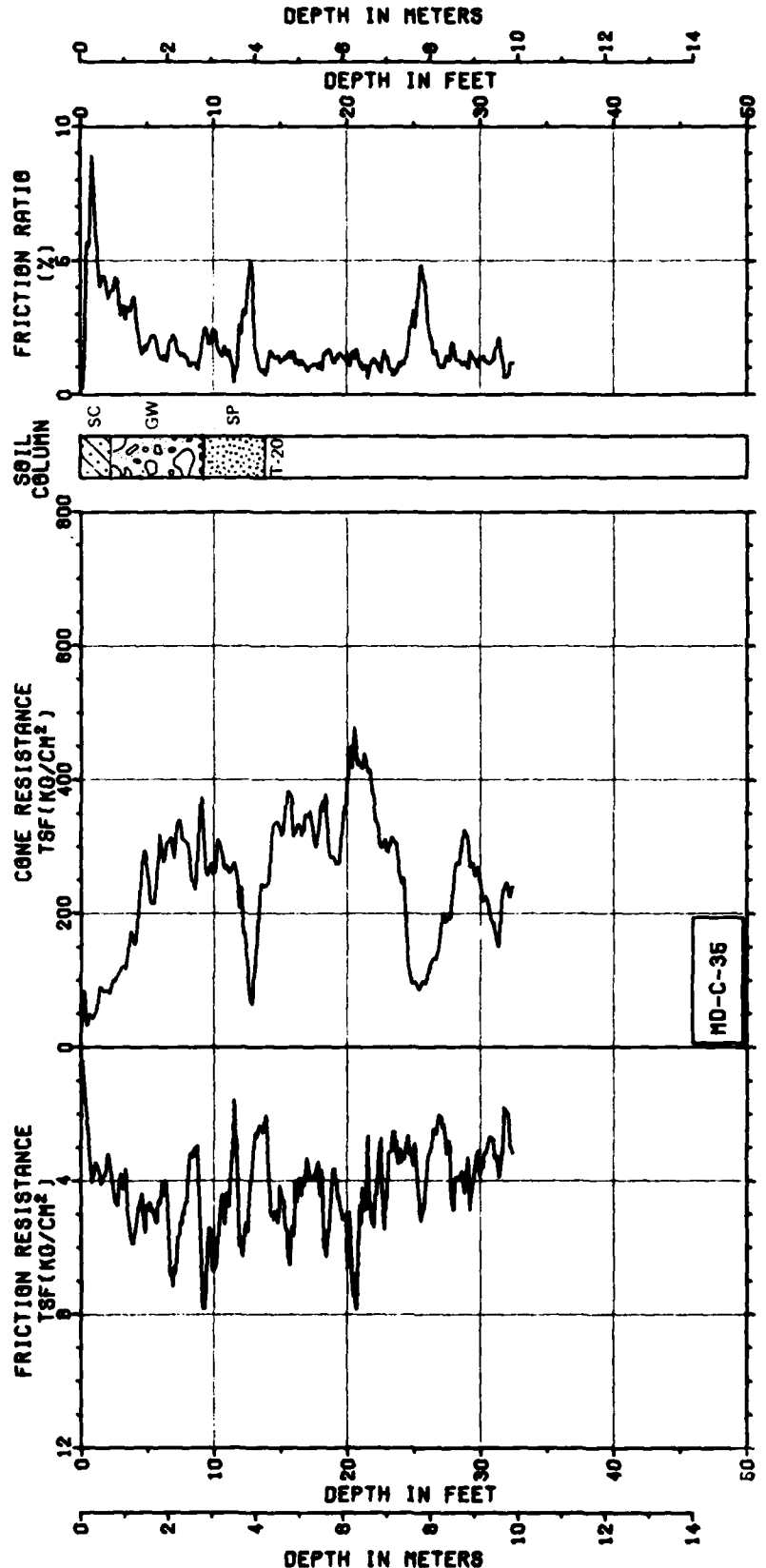
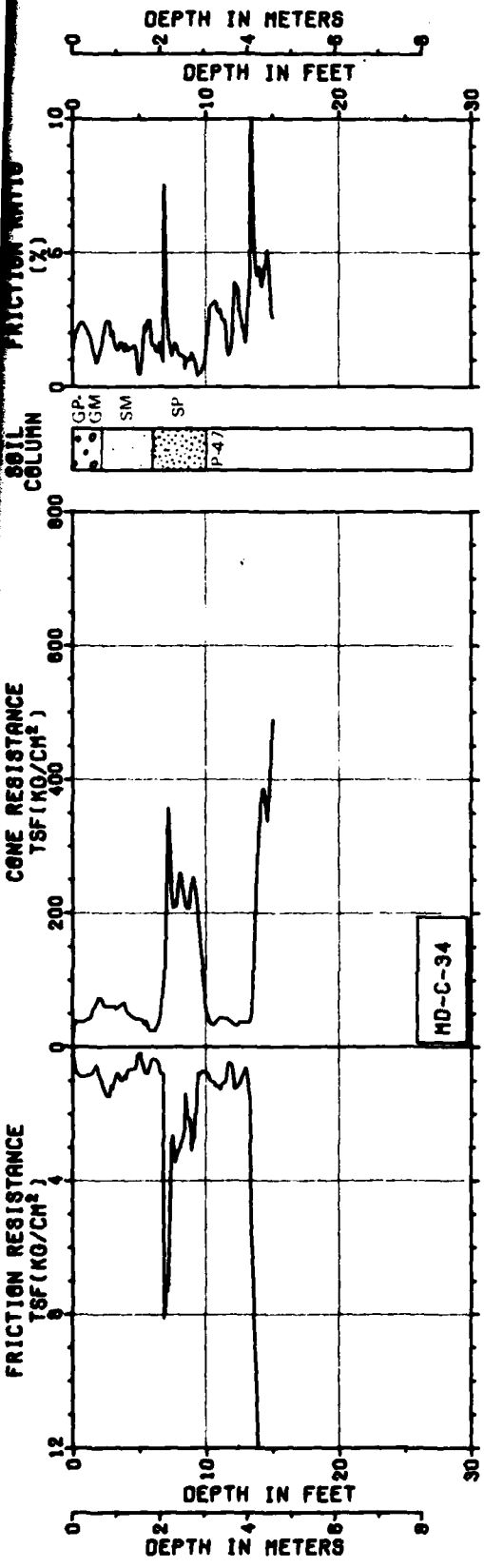
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-6-1
10 OF 25

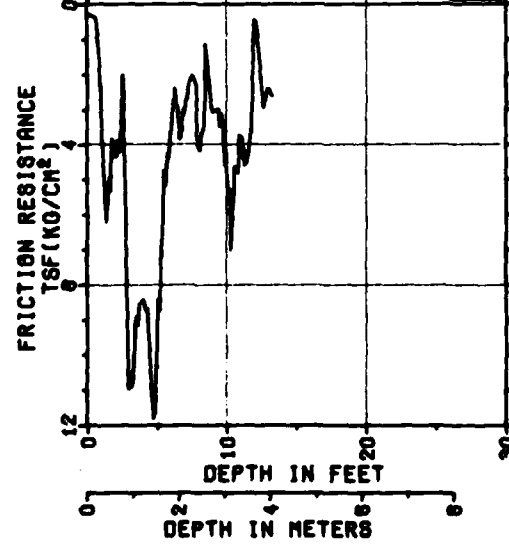
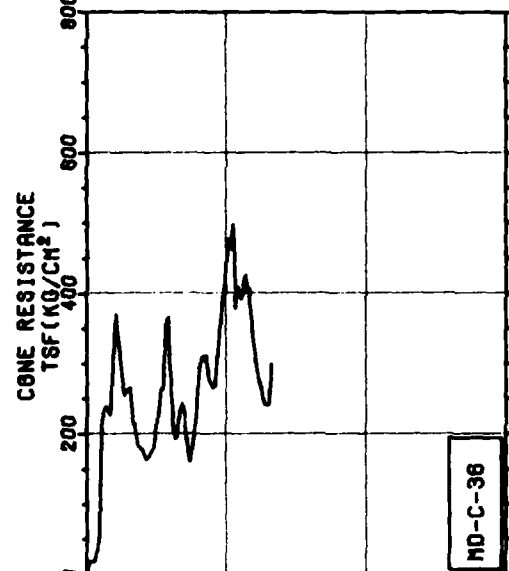
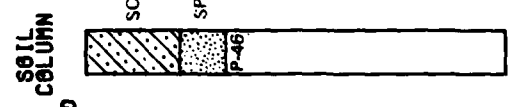
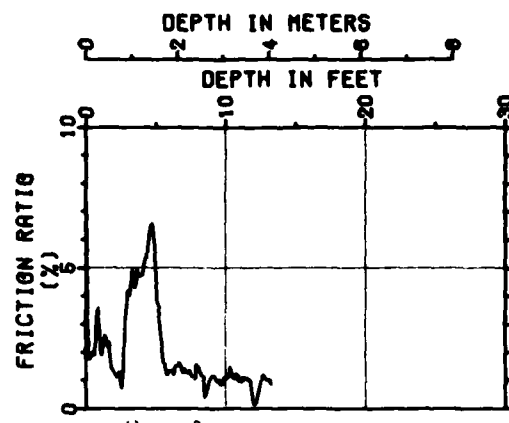
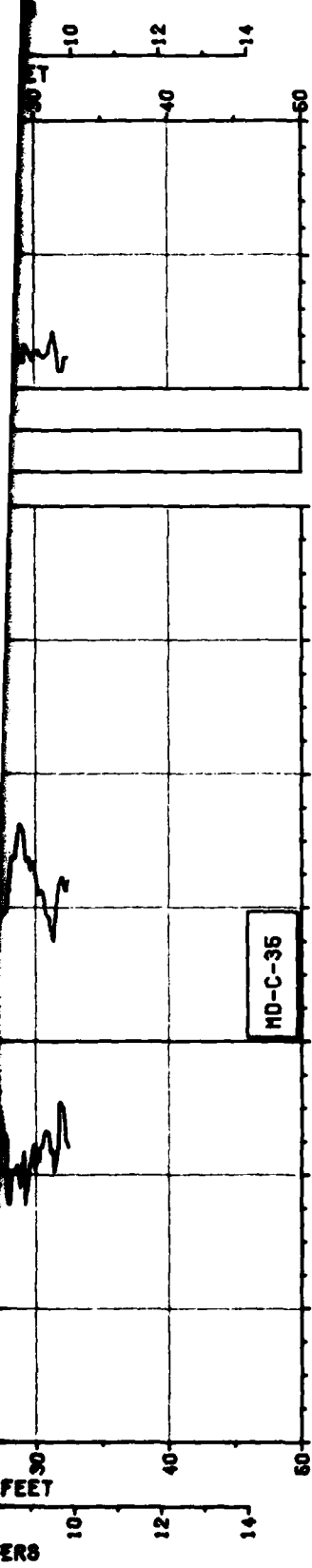
FUGRO NATIONAL, INC.

3





2



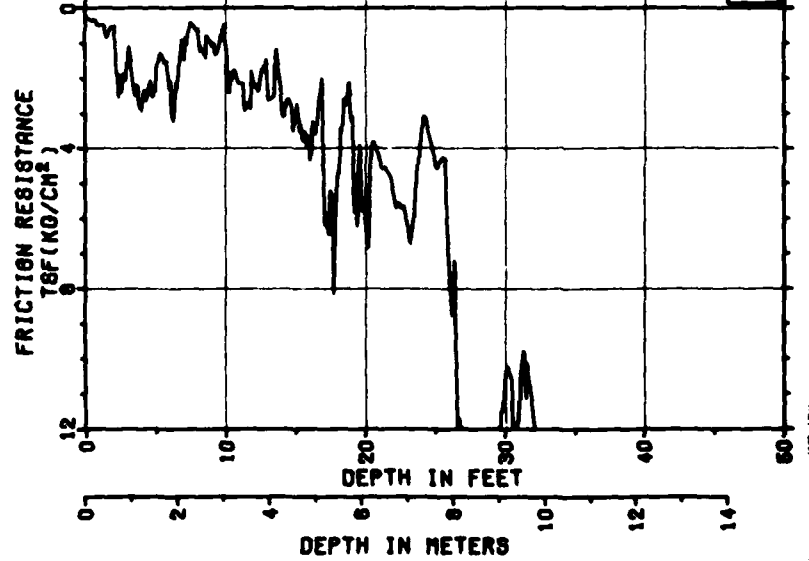
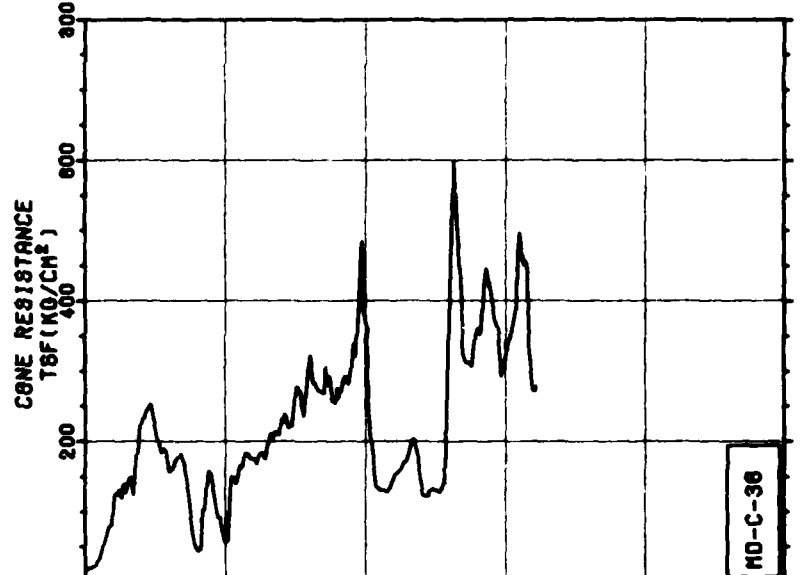
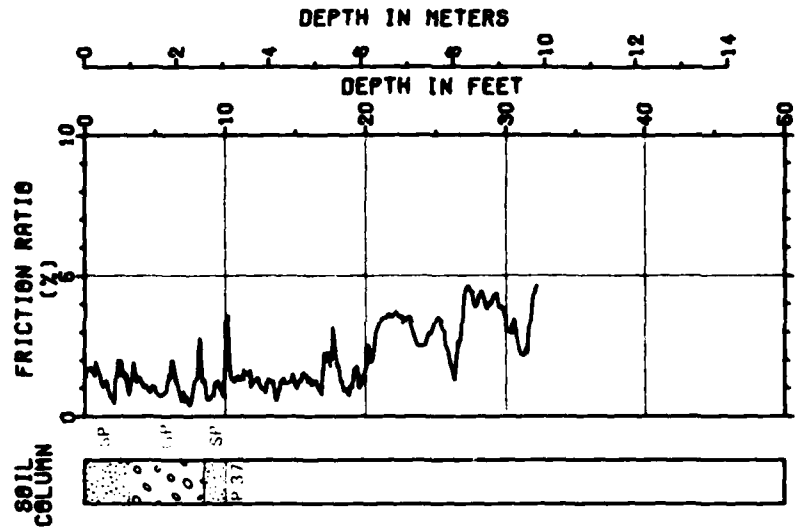
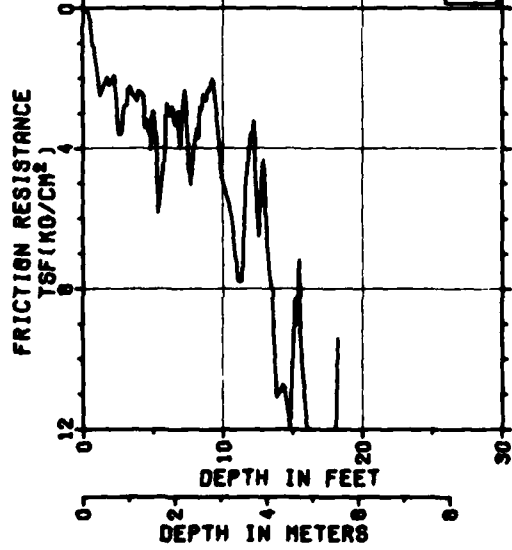
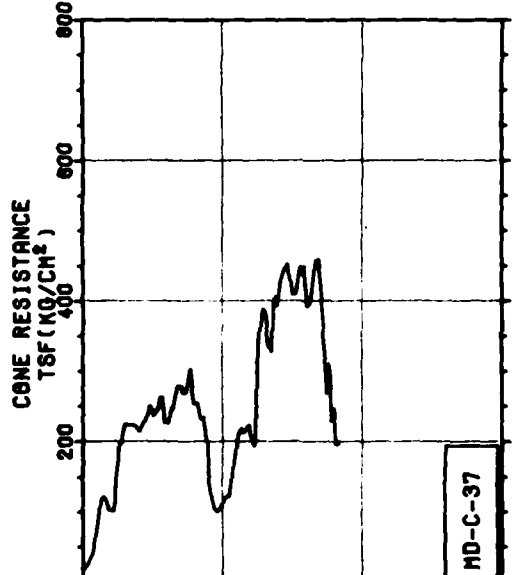
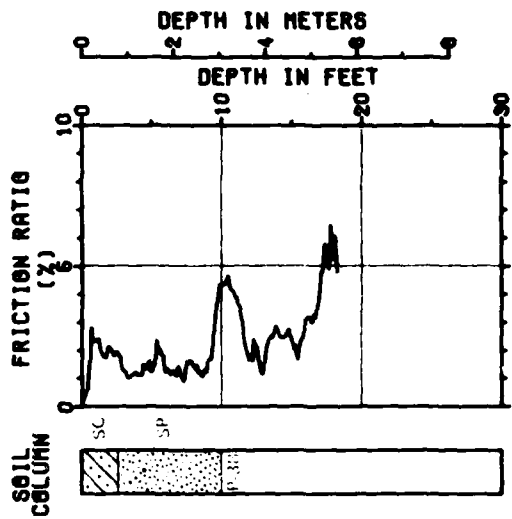
CONE PENETROMETER TEST MD-C-33, 34, 35 & 36
 OPERATIONAL BASE SITE
 MILFORD, UTAH

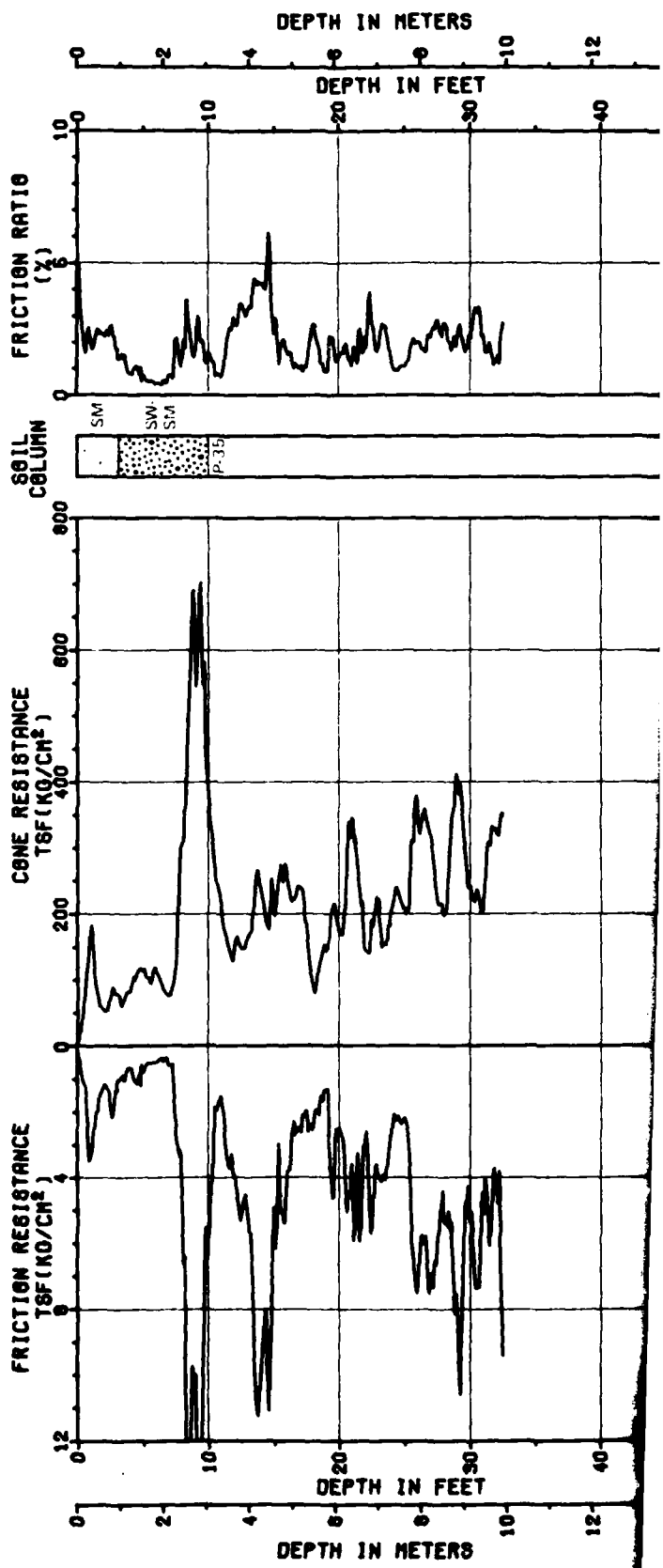
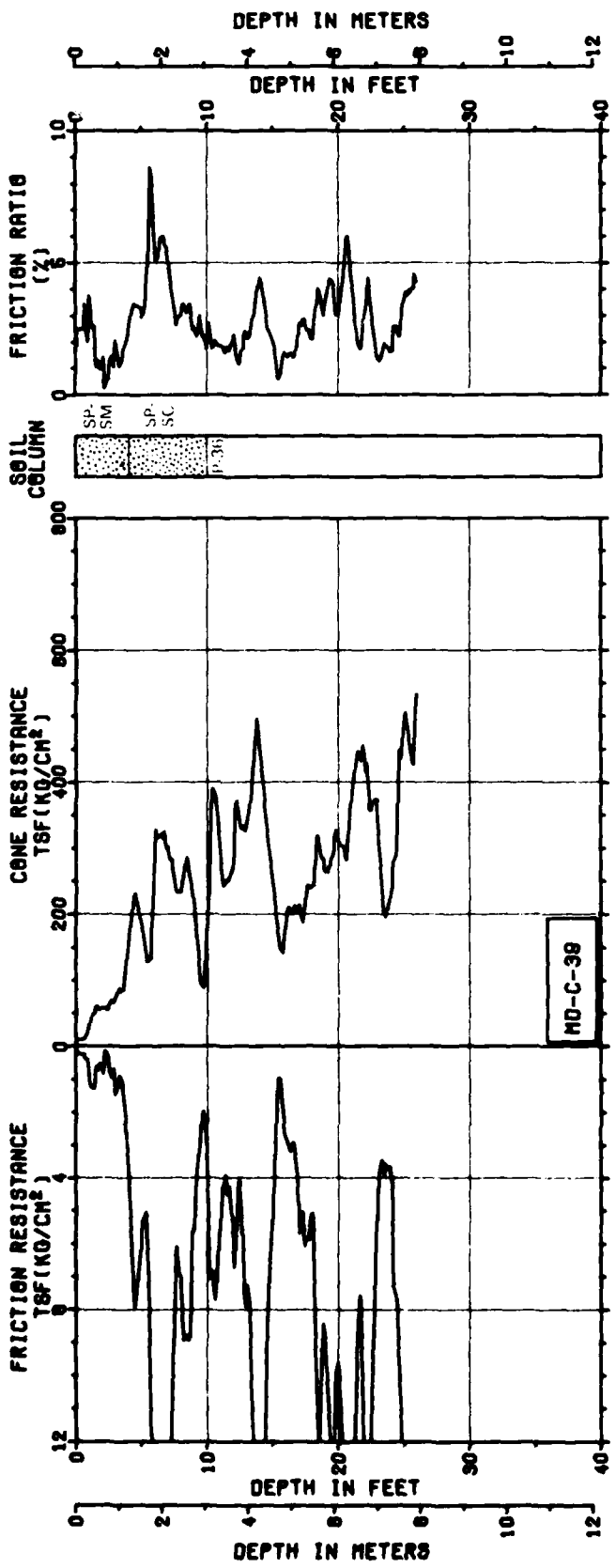
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-6-1
 11 OF 25

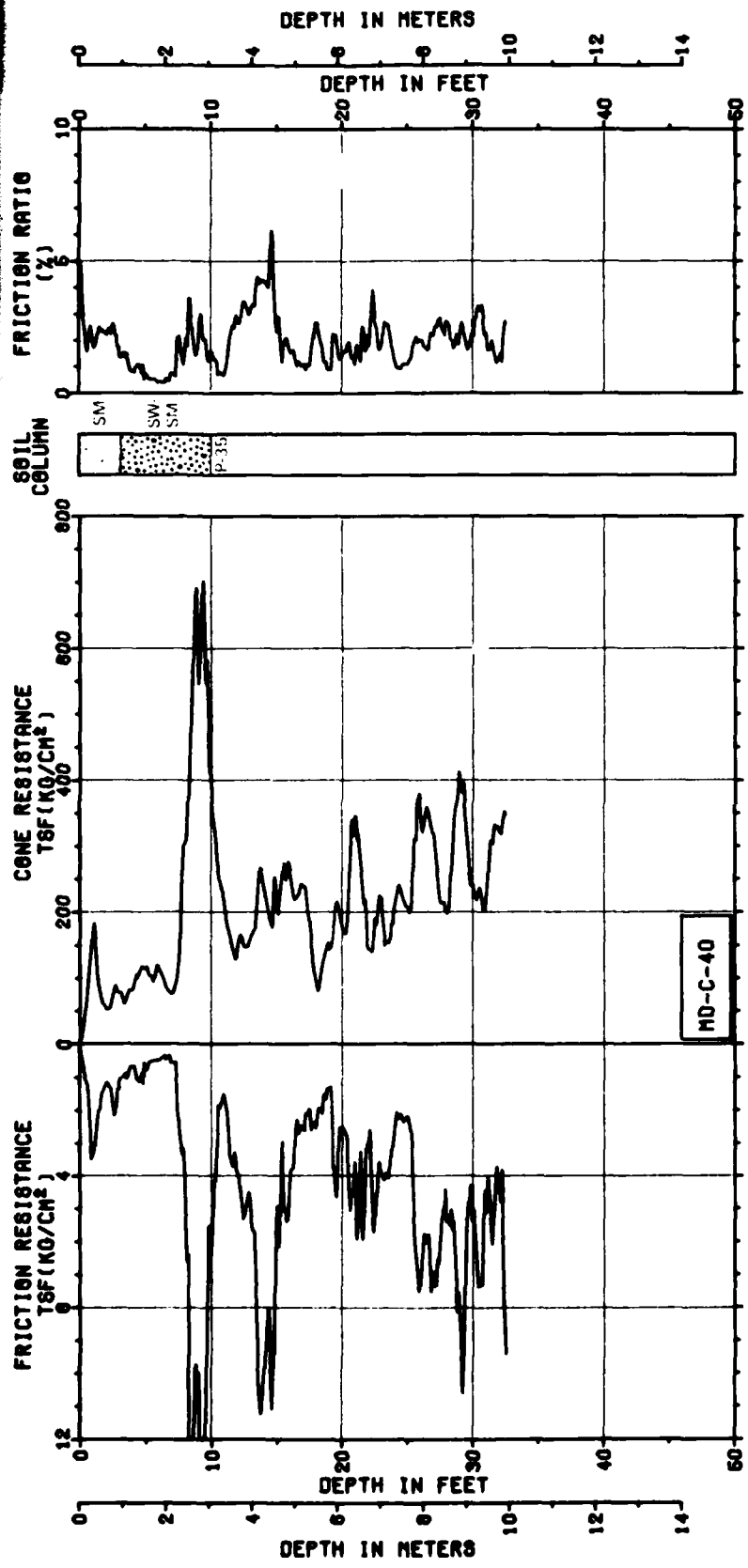
FUGRO NATIONAL, INC.

3





2

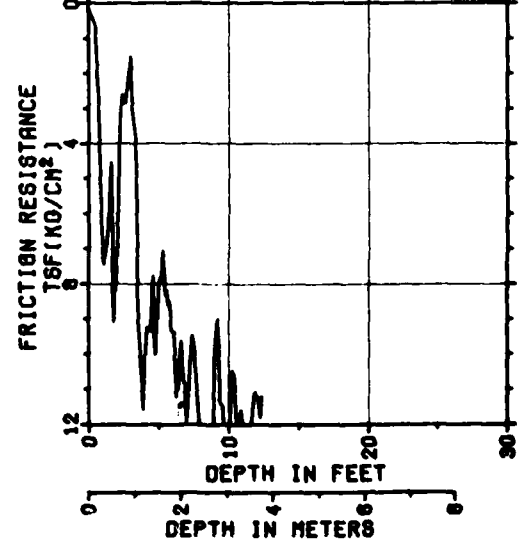
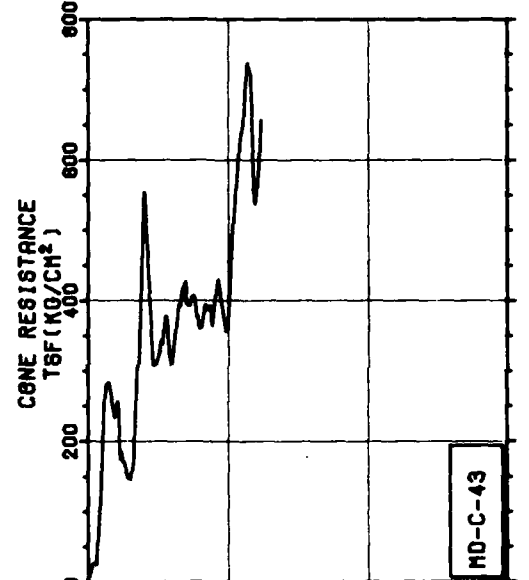
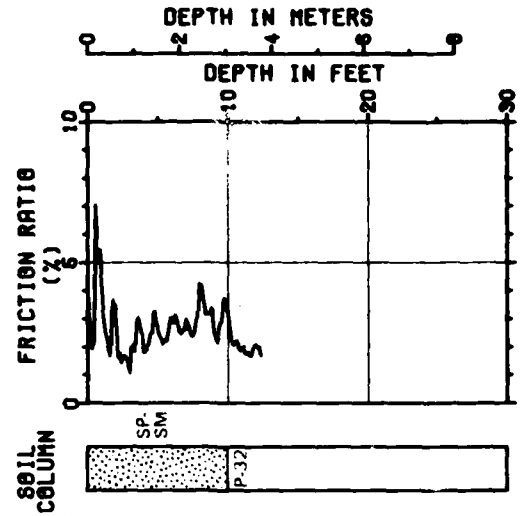
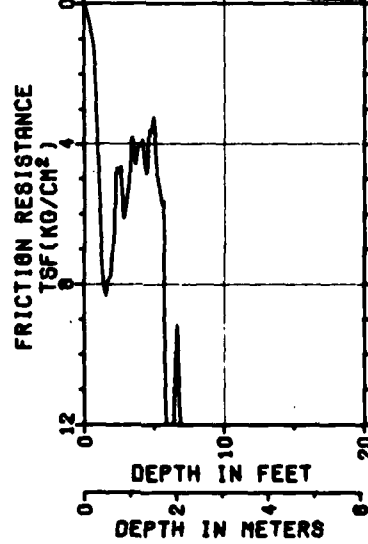
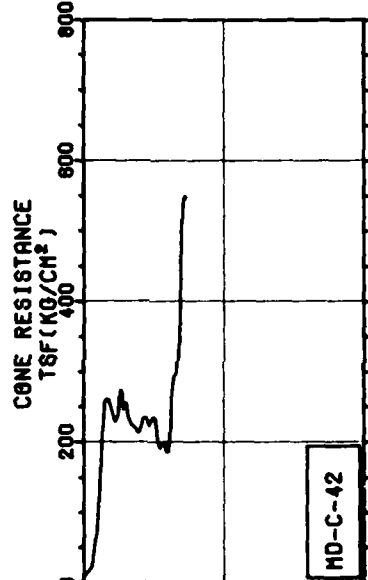
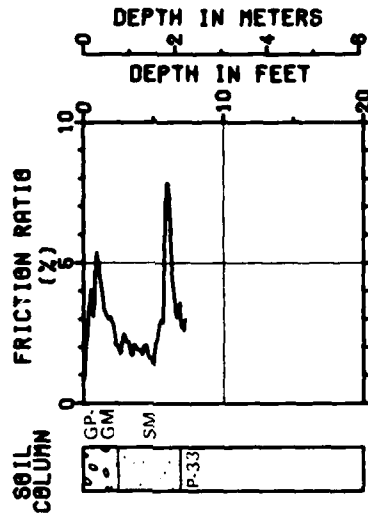
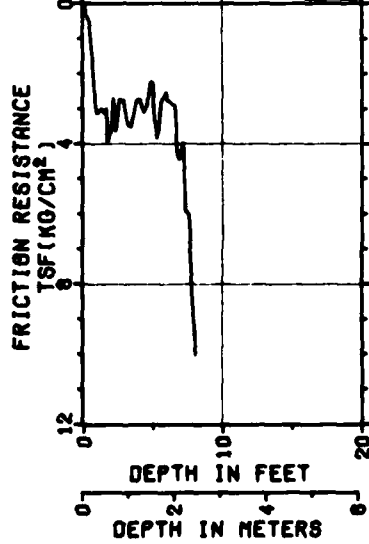
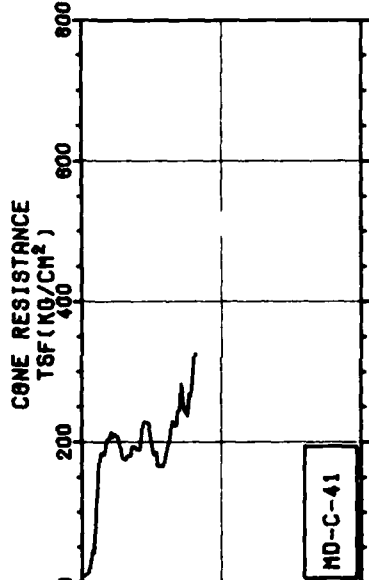
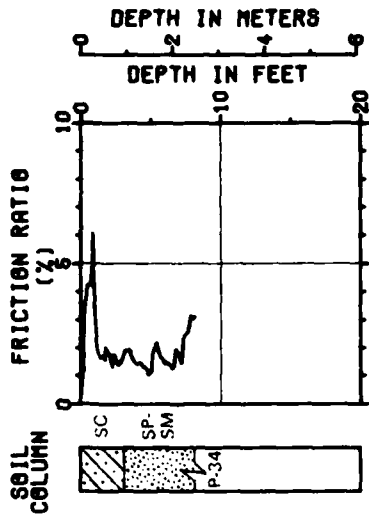


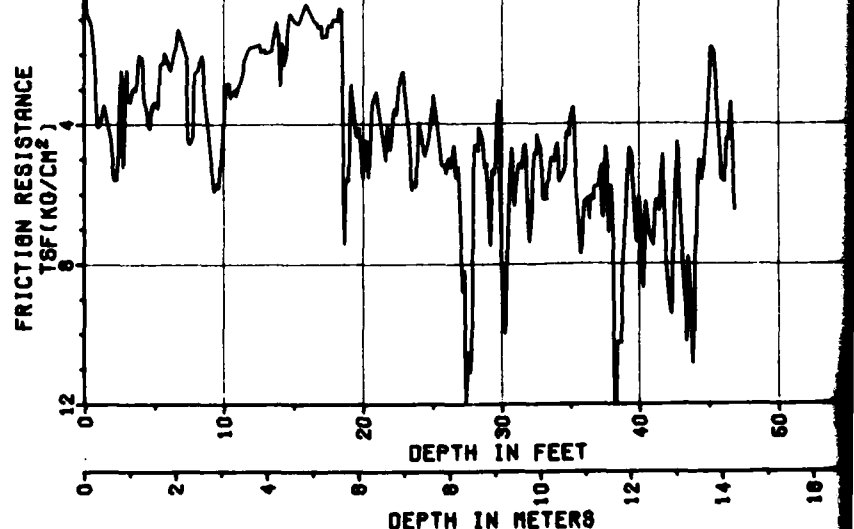
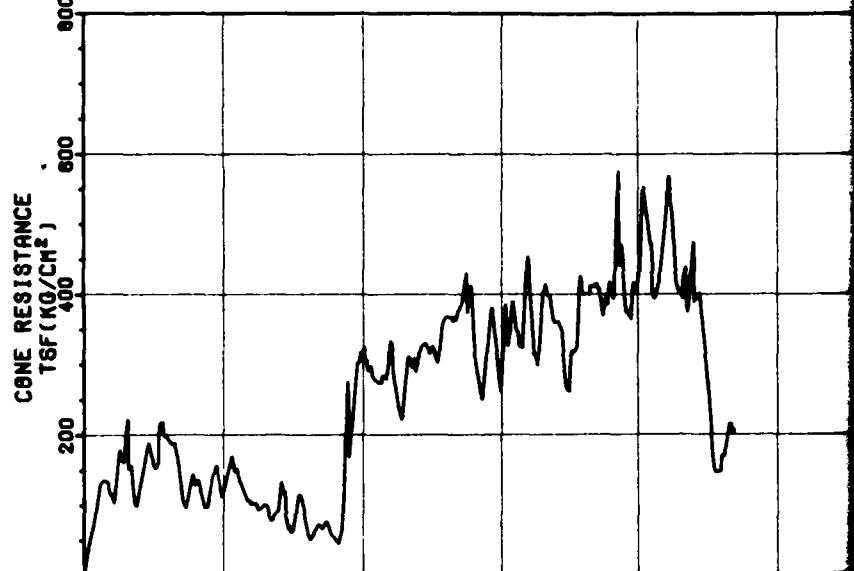
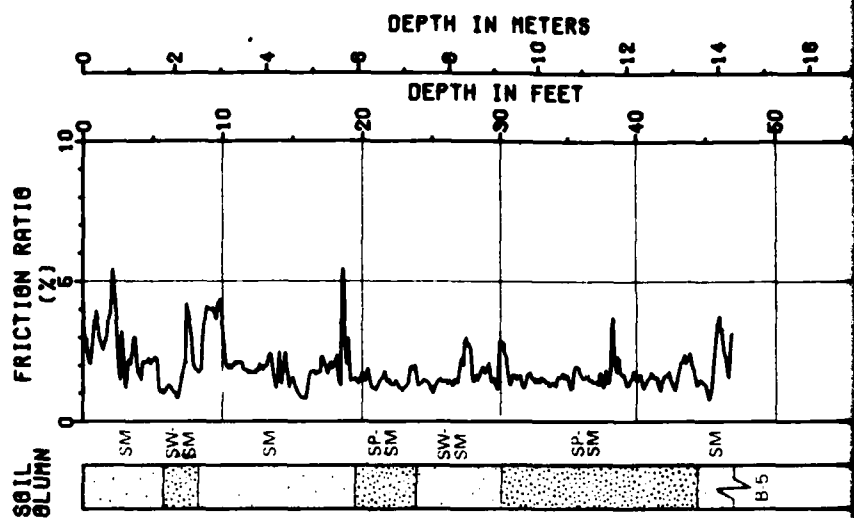
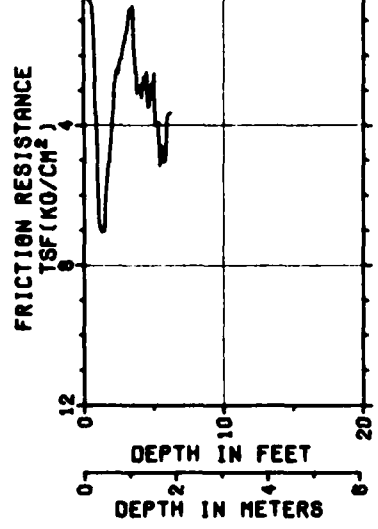
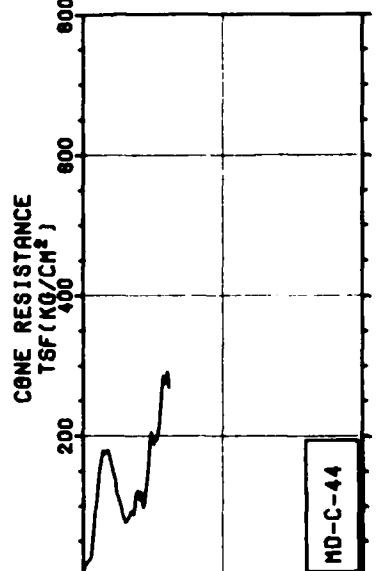
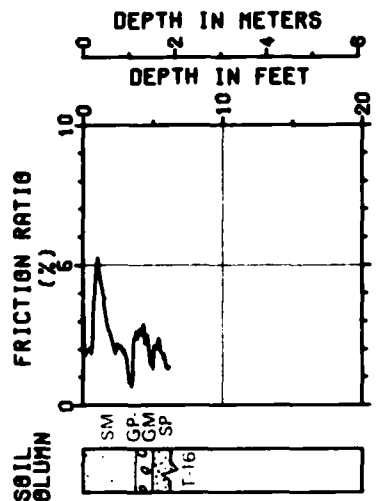
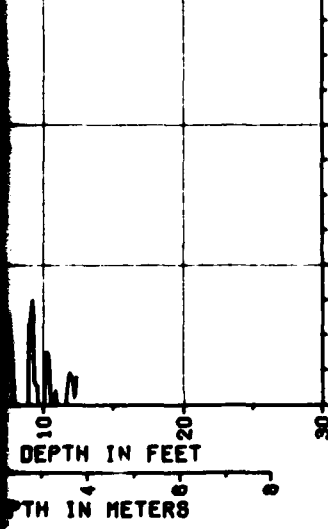
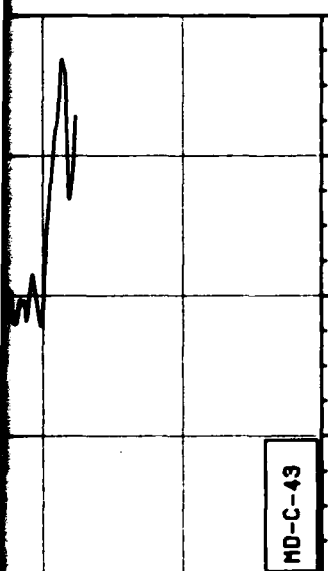
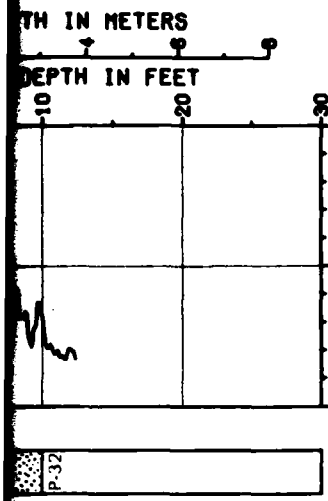
CONE PENETROMETER TEST MD-C-37, 38, 39 & 40
 OPERATIONAL BASE SITE
 MILFORD, UTAH

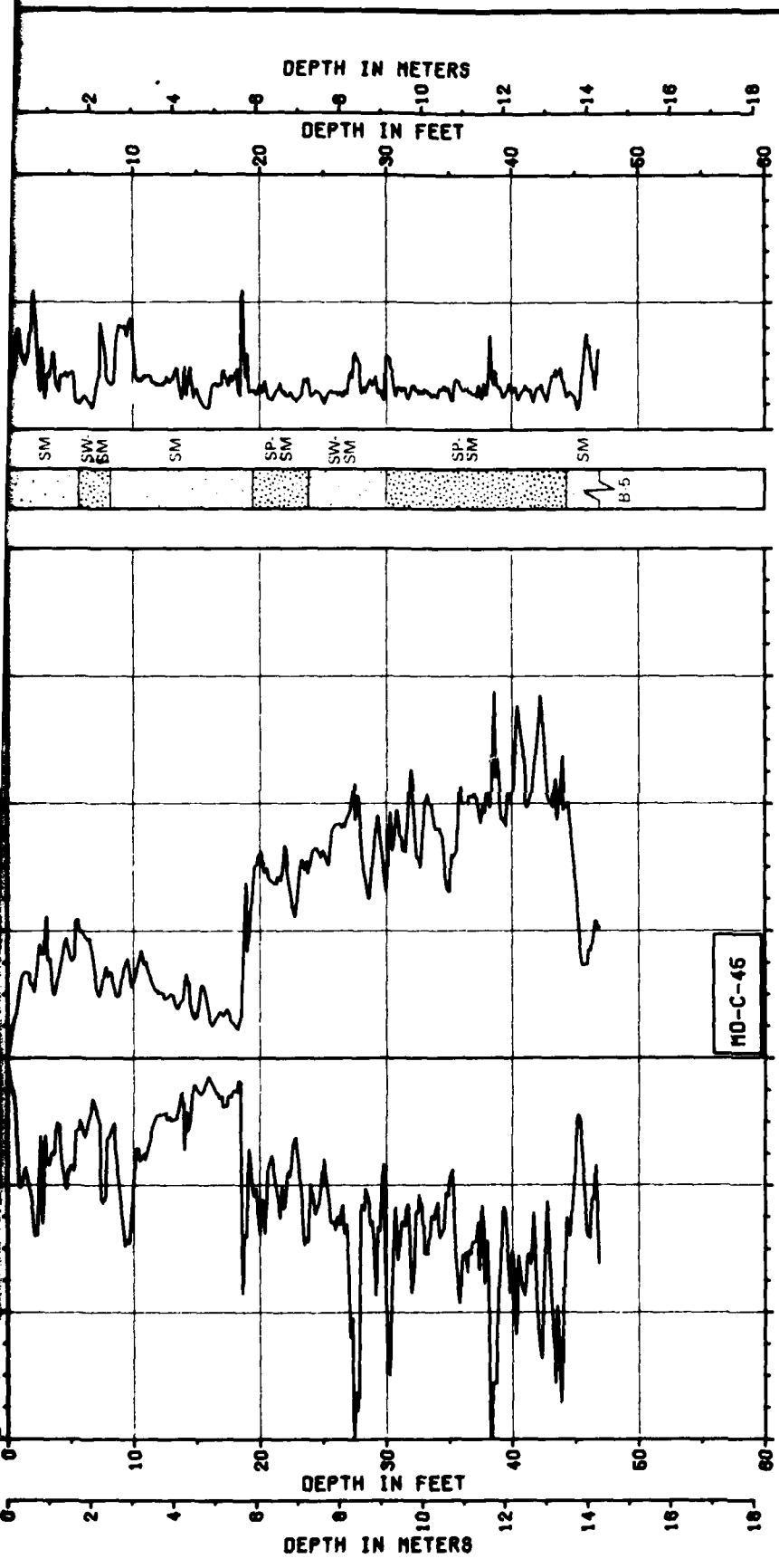
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

FIGURE
 II-6-1
 12 OF 25

FUGRO NATIONAL, INC.





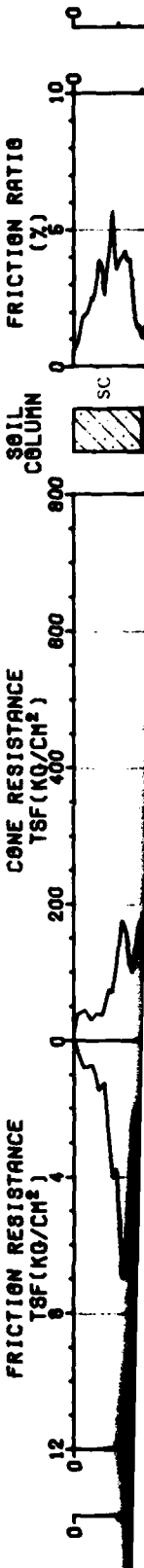
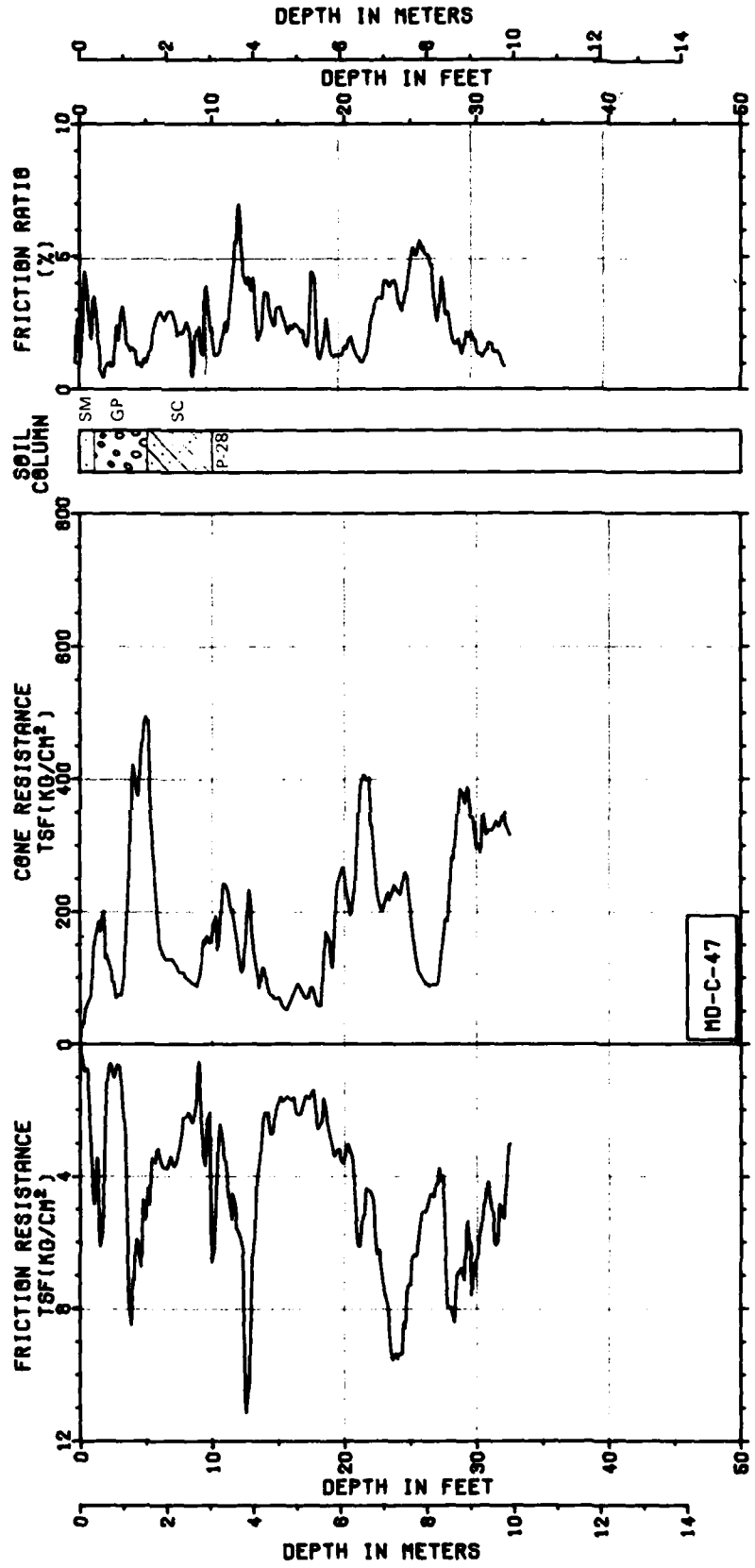
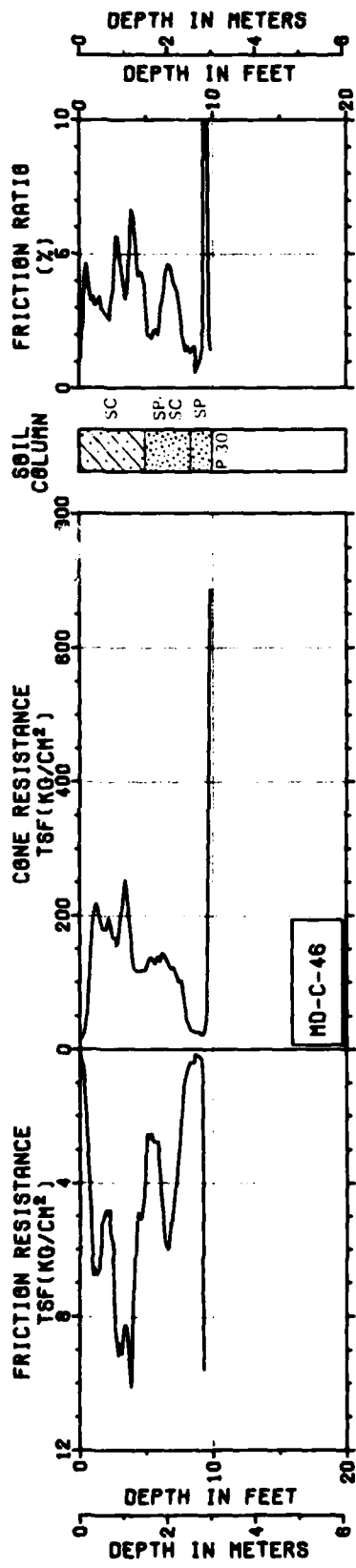


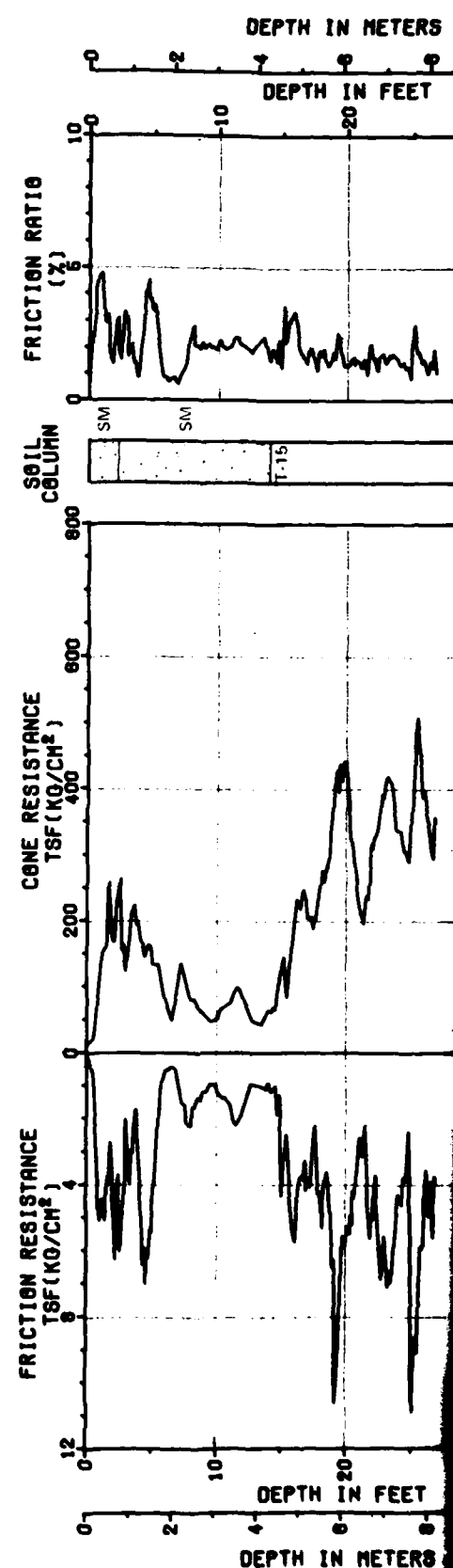
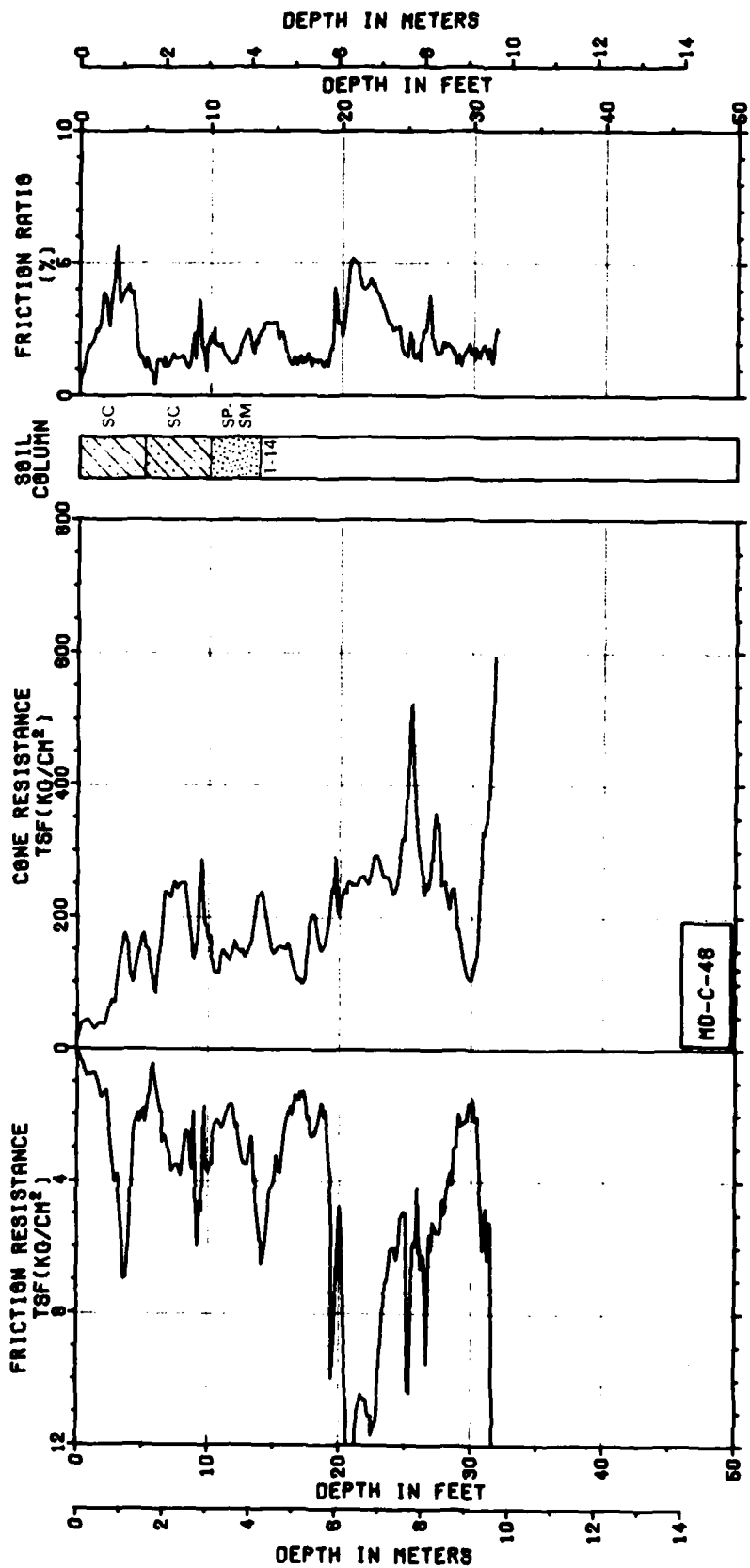
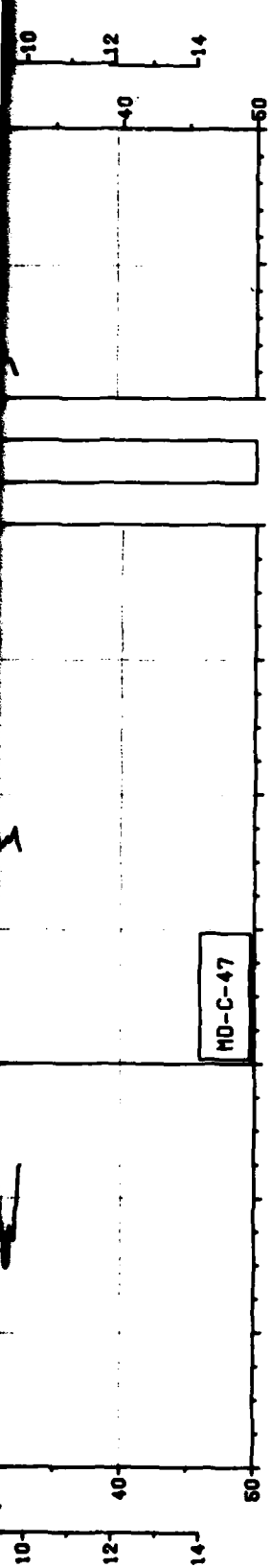
CONE PENETROMETER TEST MD-C-41, 42, 43, 44 & 45
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

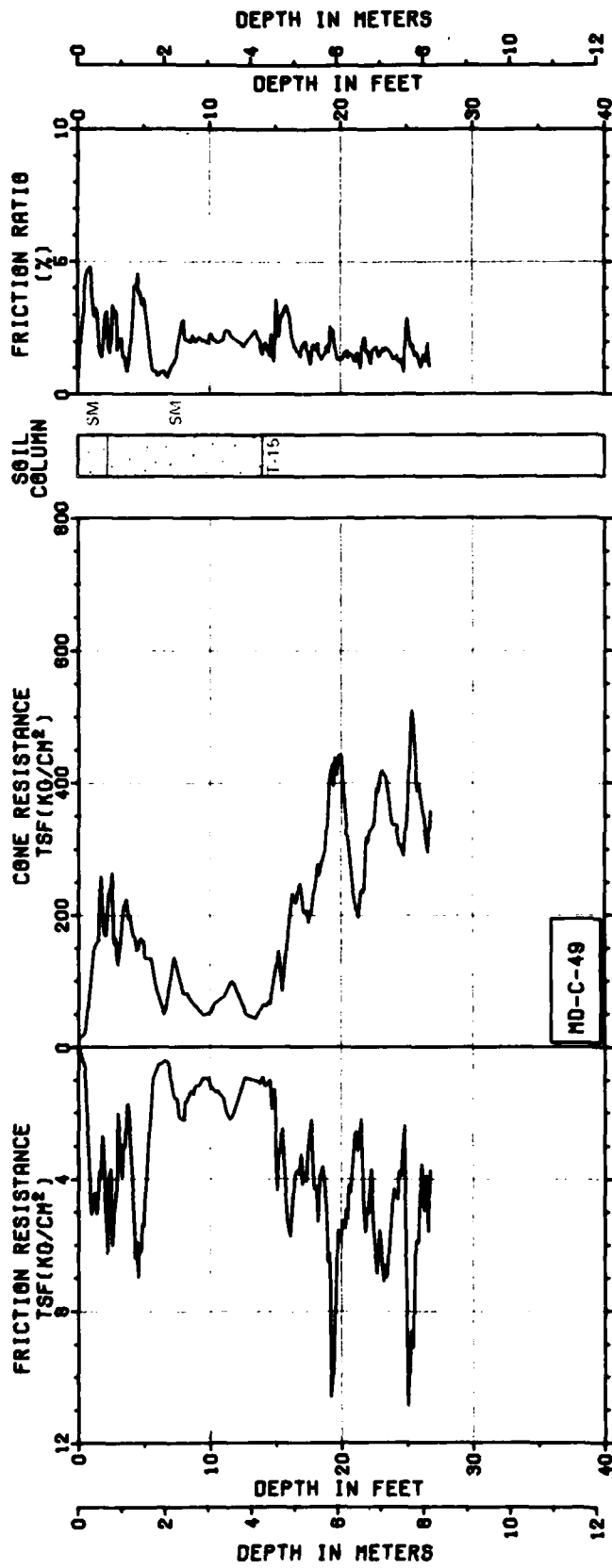
FIGURE
II-6-1
13 OF 28

FUGRO NATIONAL, INC.





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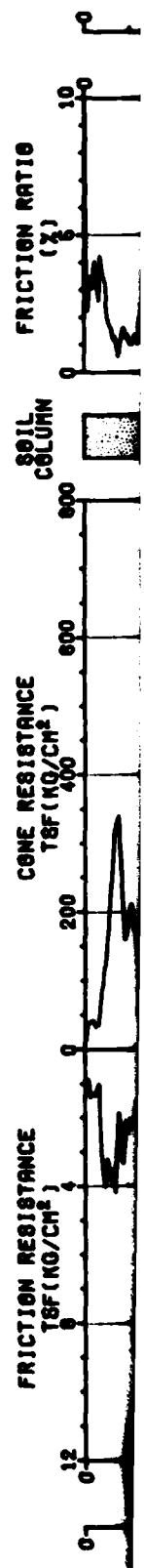
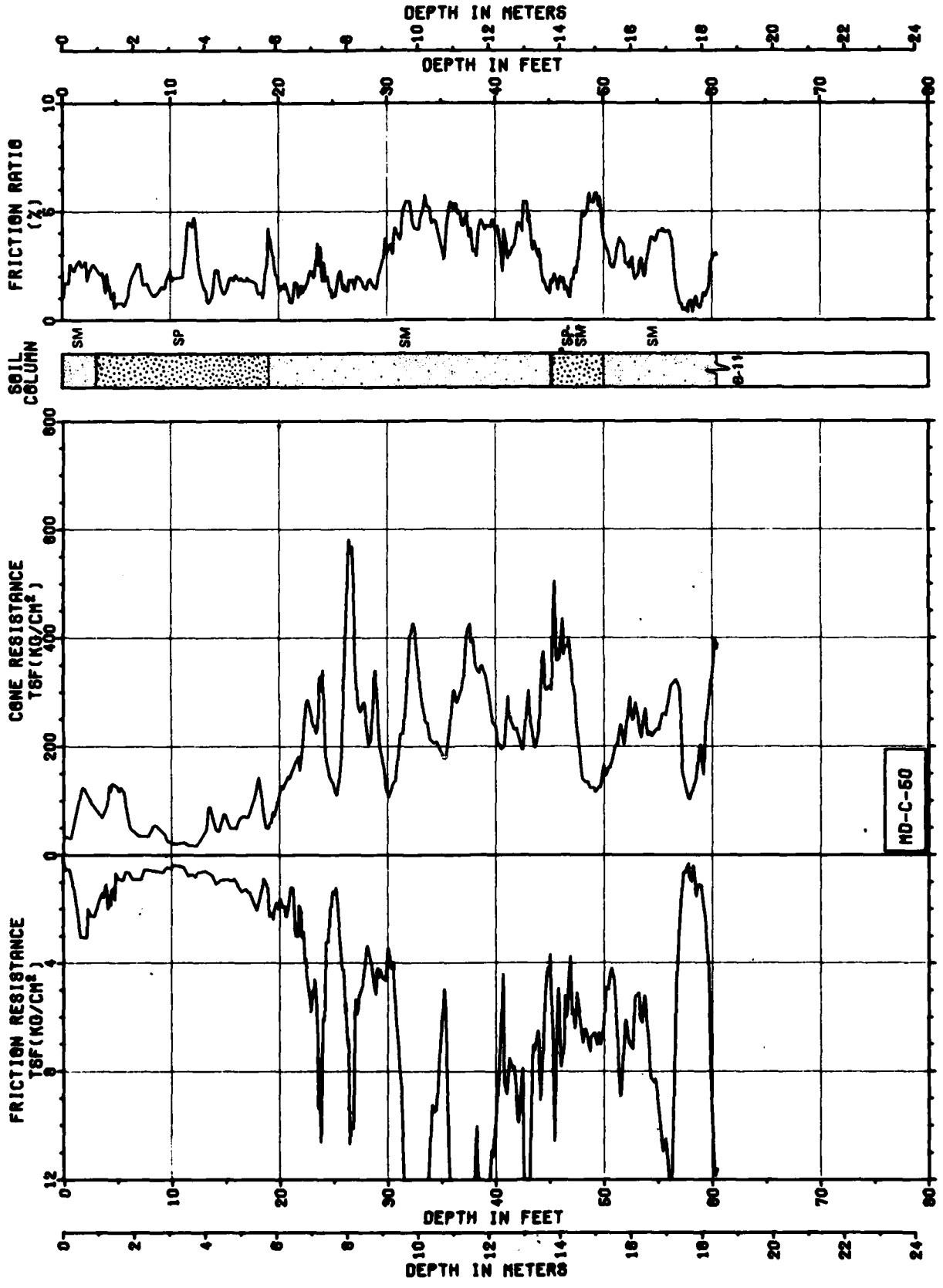


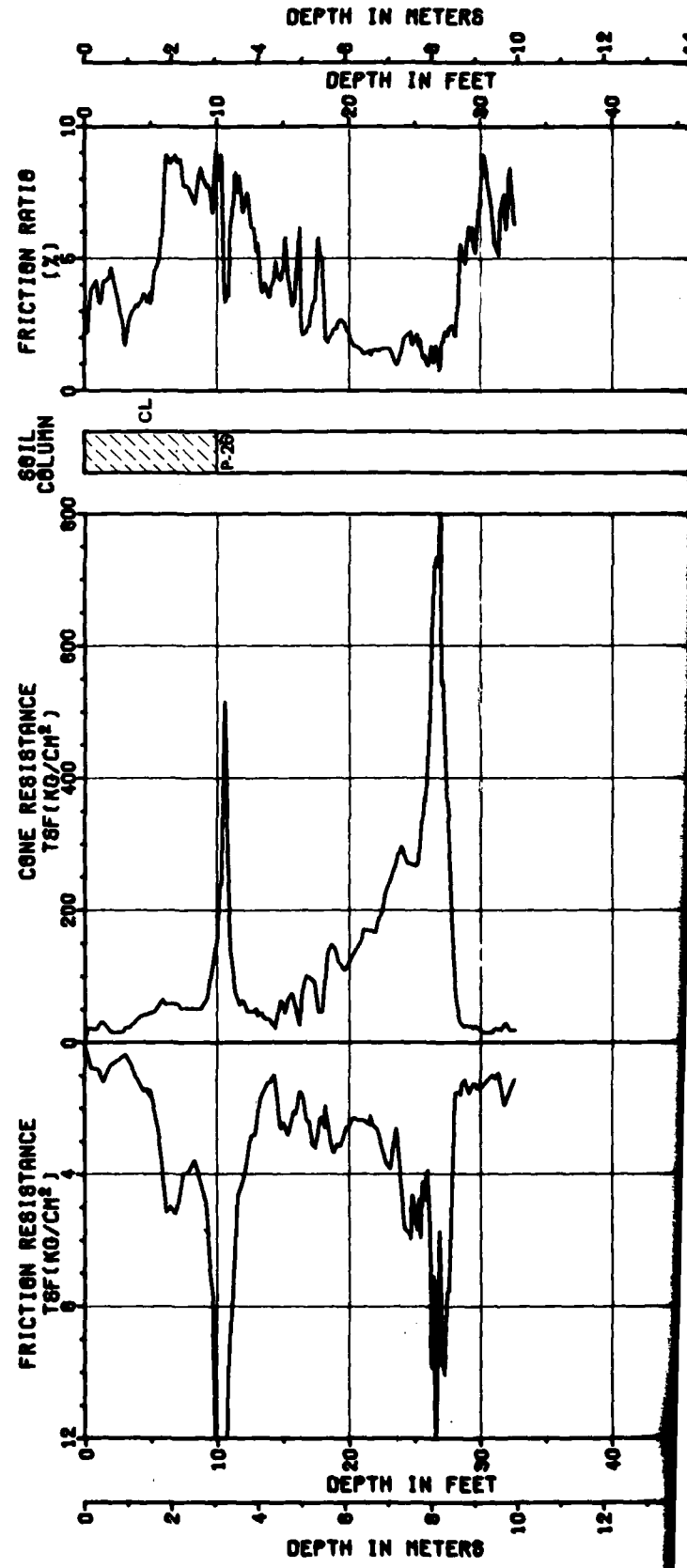
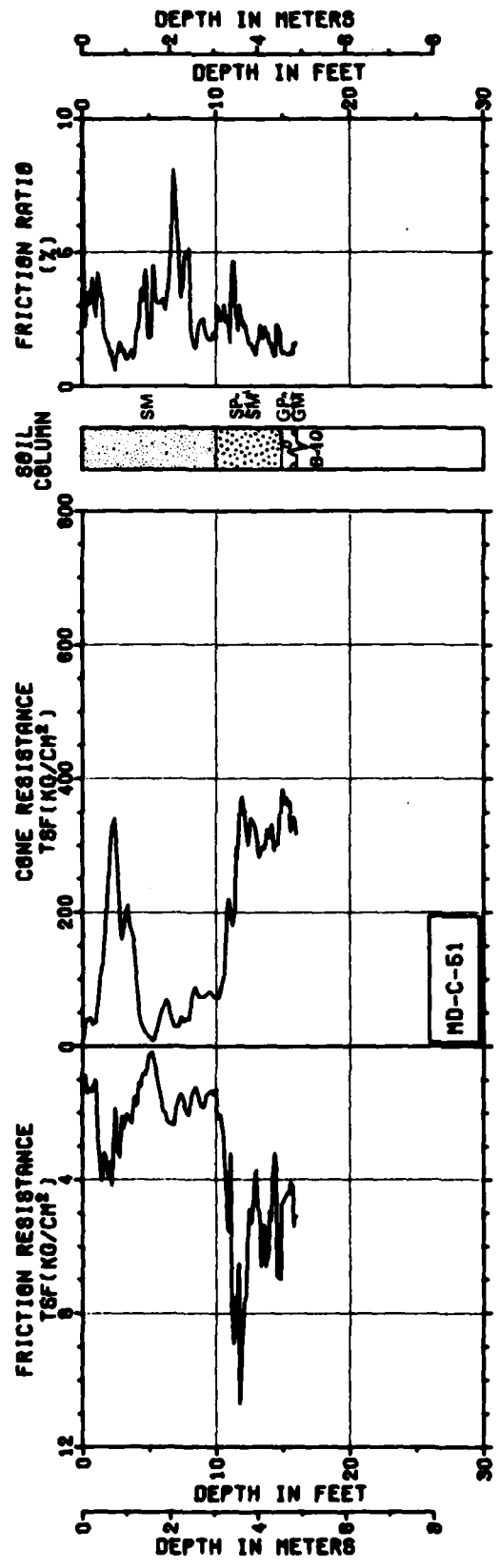
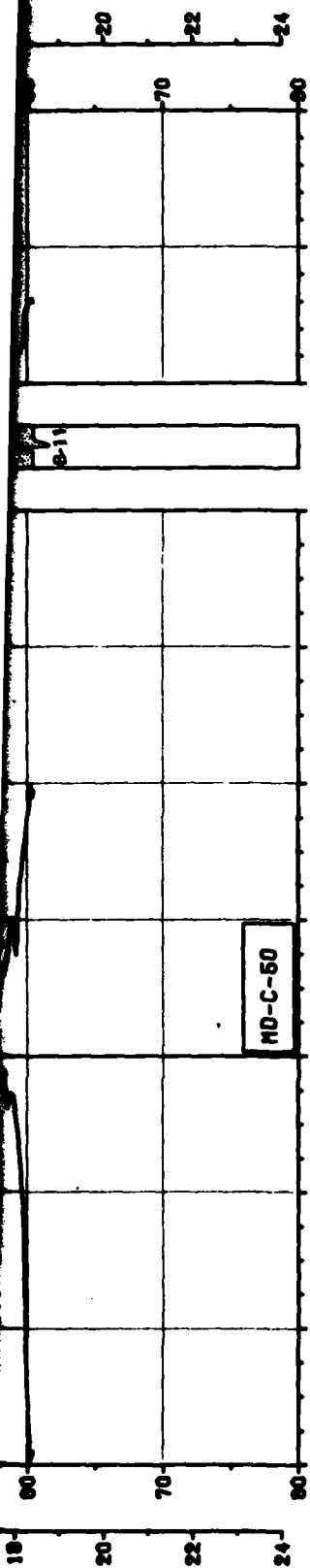
CONE PENETROMETER TEST MD-C-46, 47, 48 & 49
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

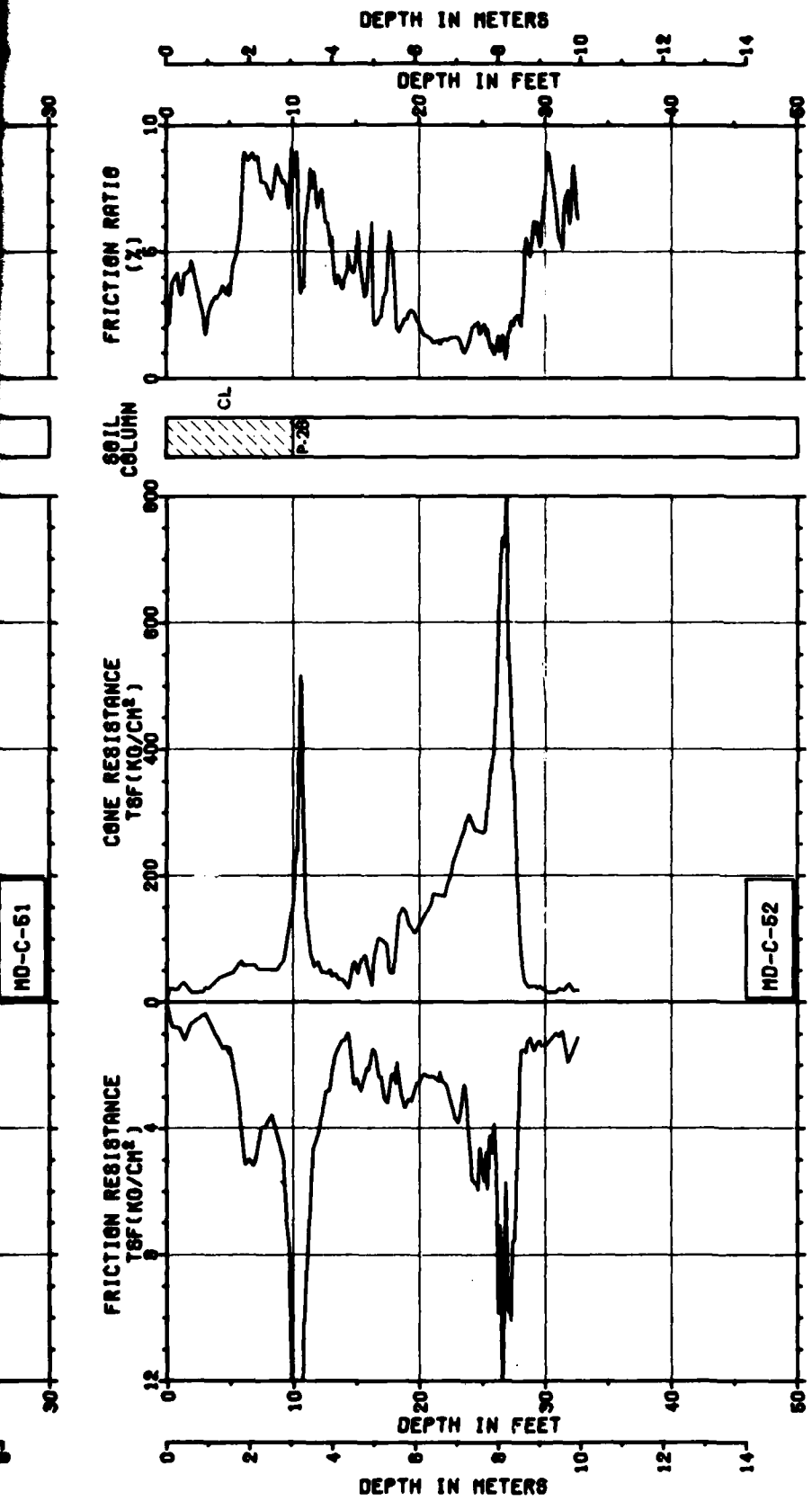
FIGURE
 II-6-1
 14 OF 25

FUGRO NATIONAL, INC.





2

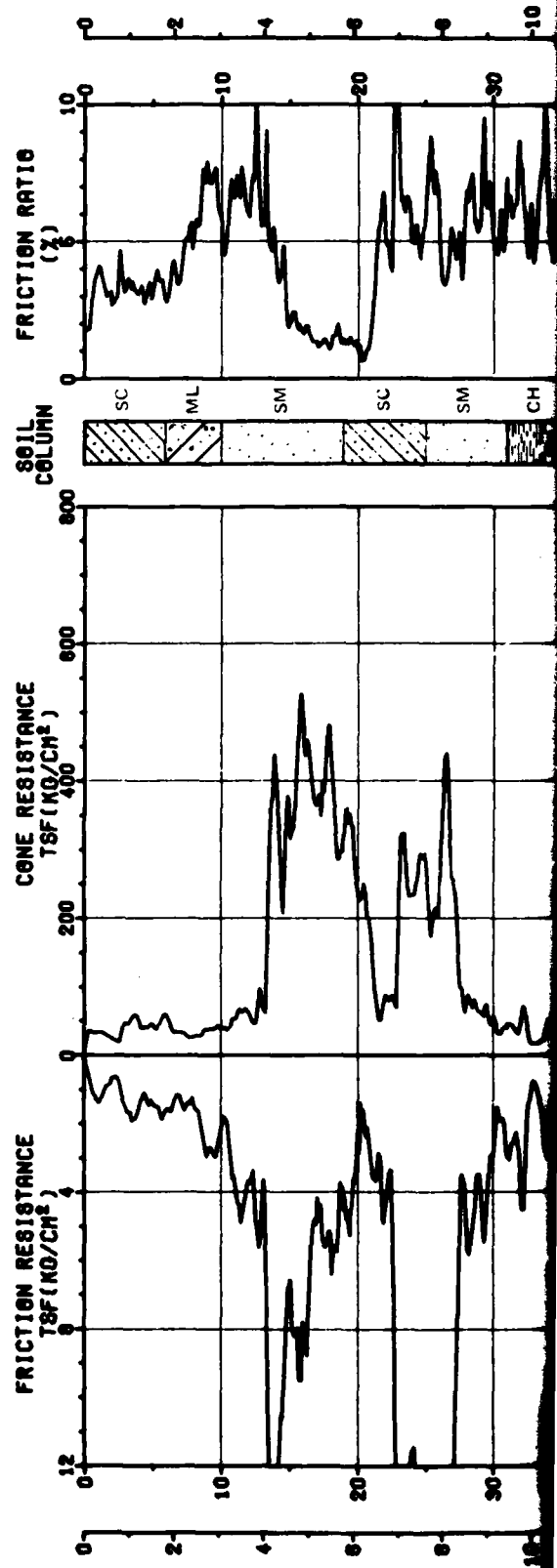
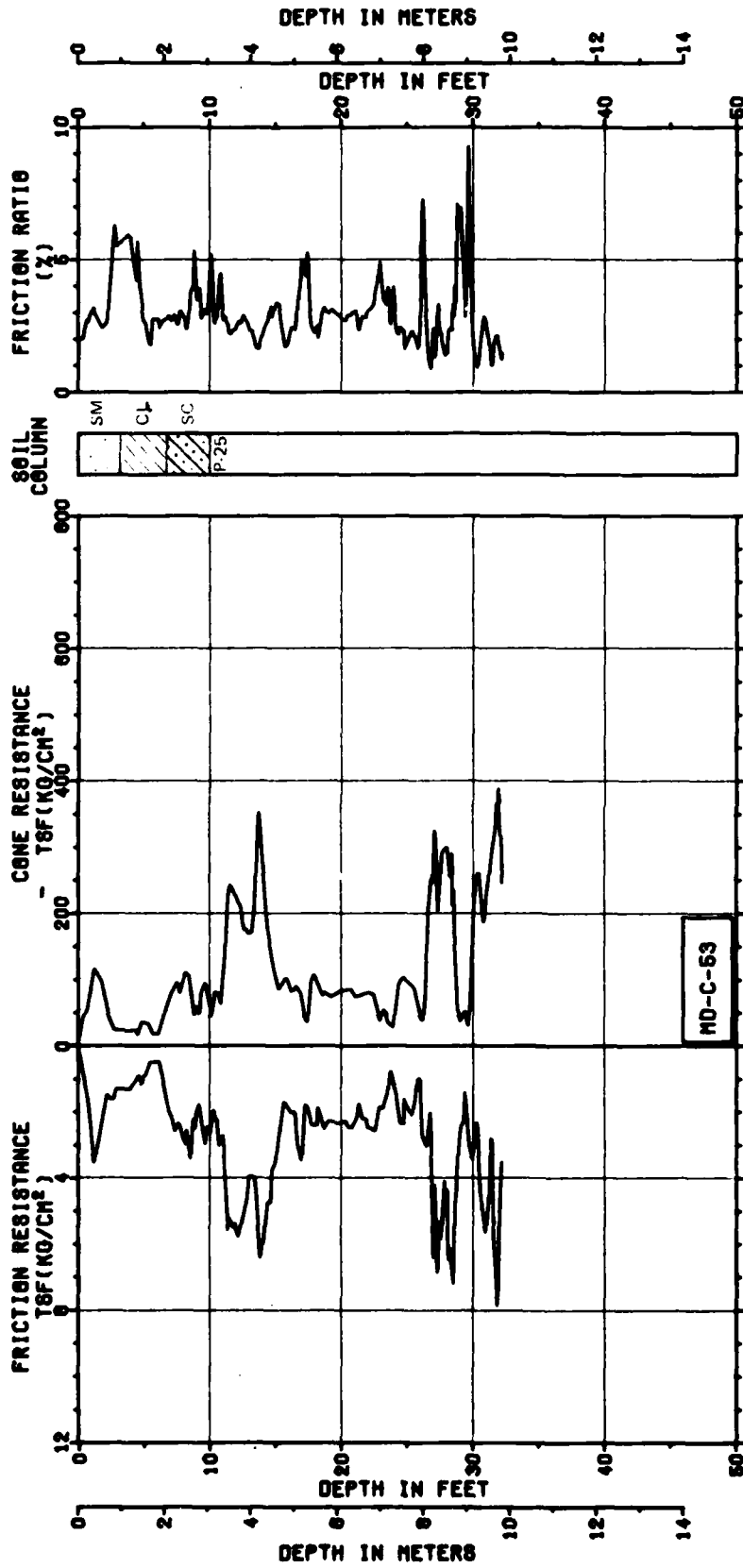


CONE PENETROMETER TEST MD-C-61, 62
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

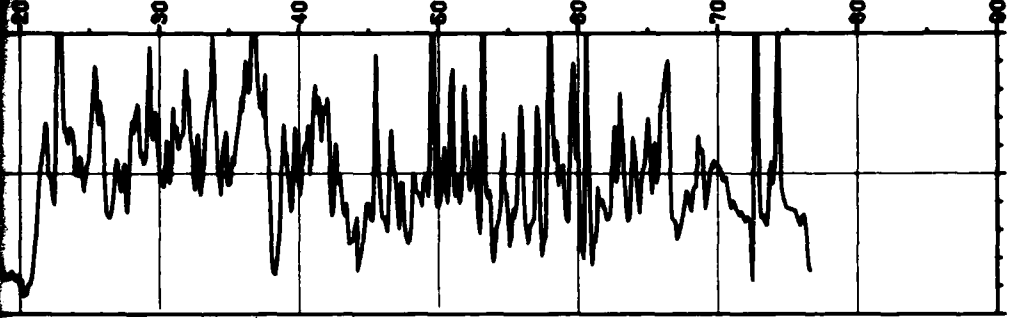
FIGURE
 101
 18 OCT 78

TUBRO NATIONAL, INC.



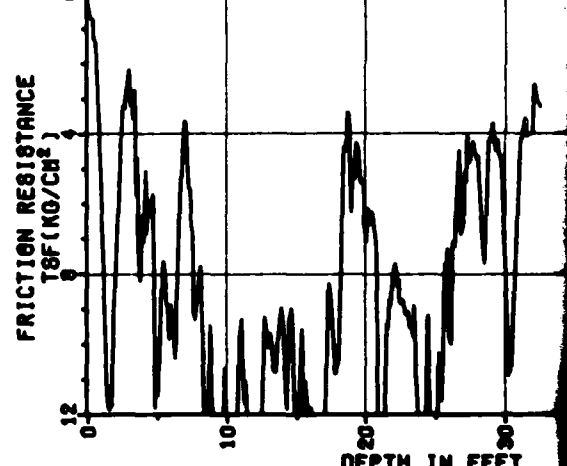
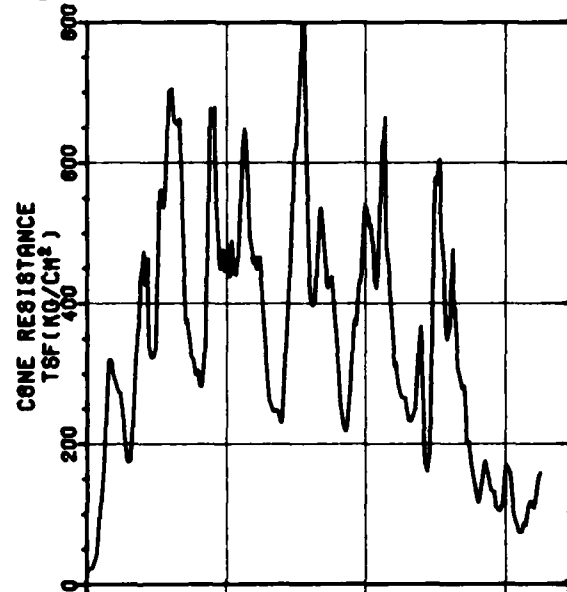
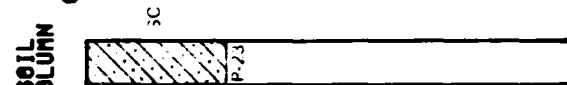
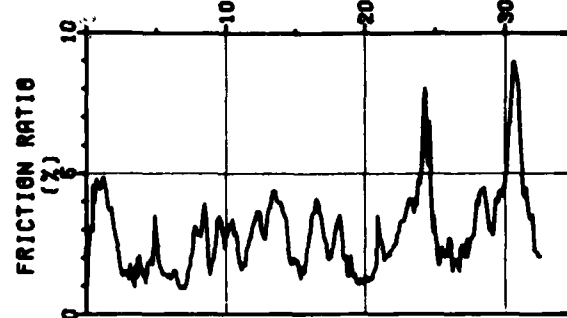
DEPTH IN METERS

DEPTH IN FEET



DEPTH IN METERS

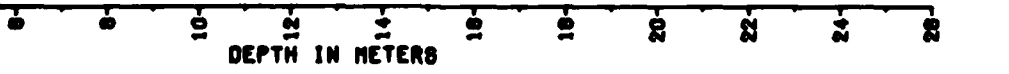
DEPTH IN FEET



NO-C-54

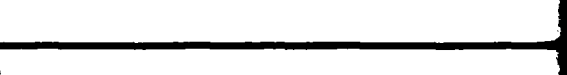
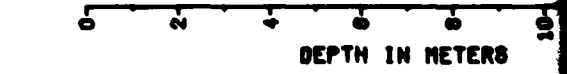
DEPTH IN FEET

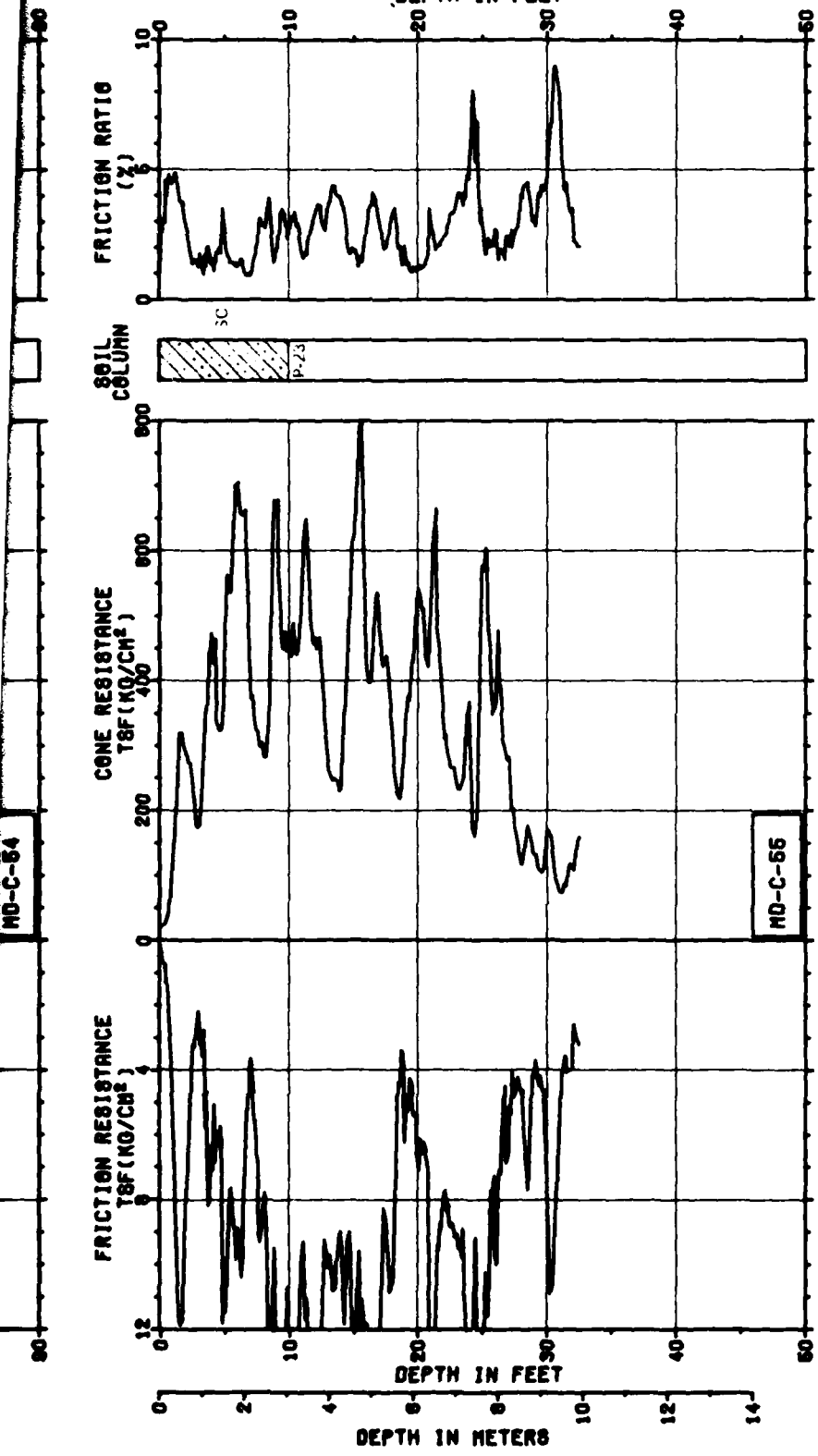
DEPTH IN METERS



DEPTH IN FEET

DEPTH IN METERS



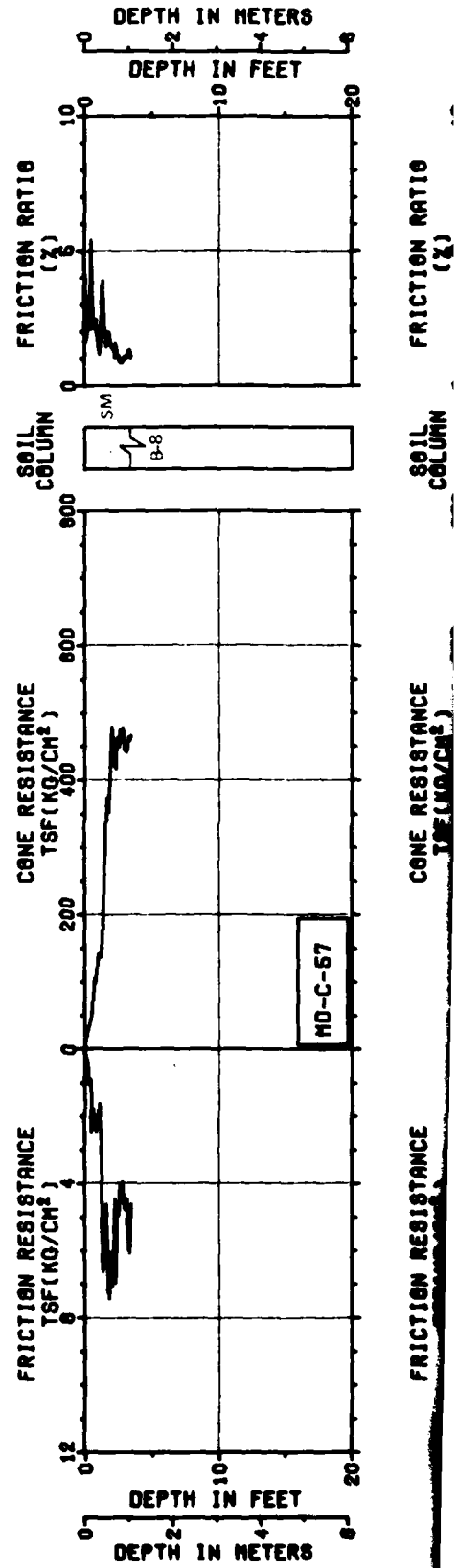
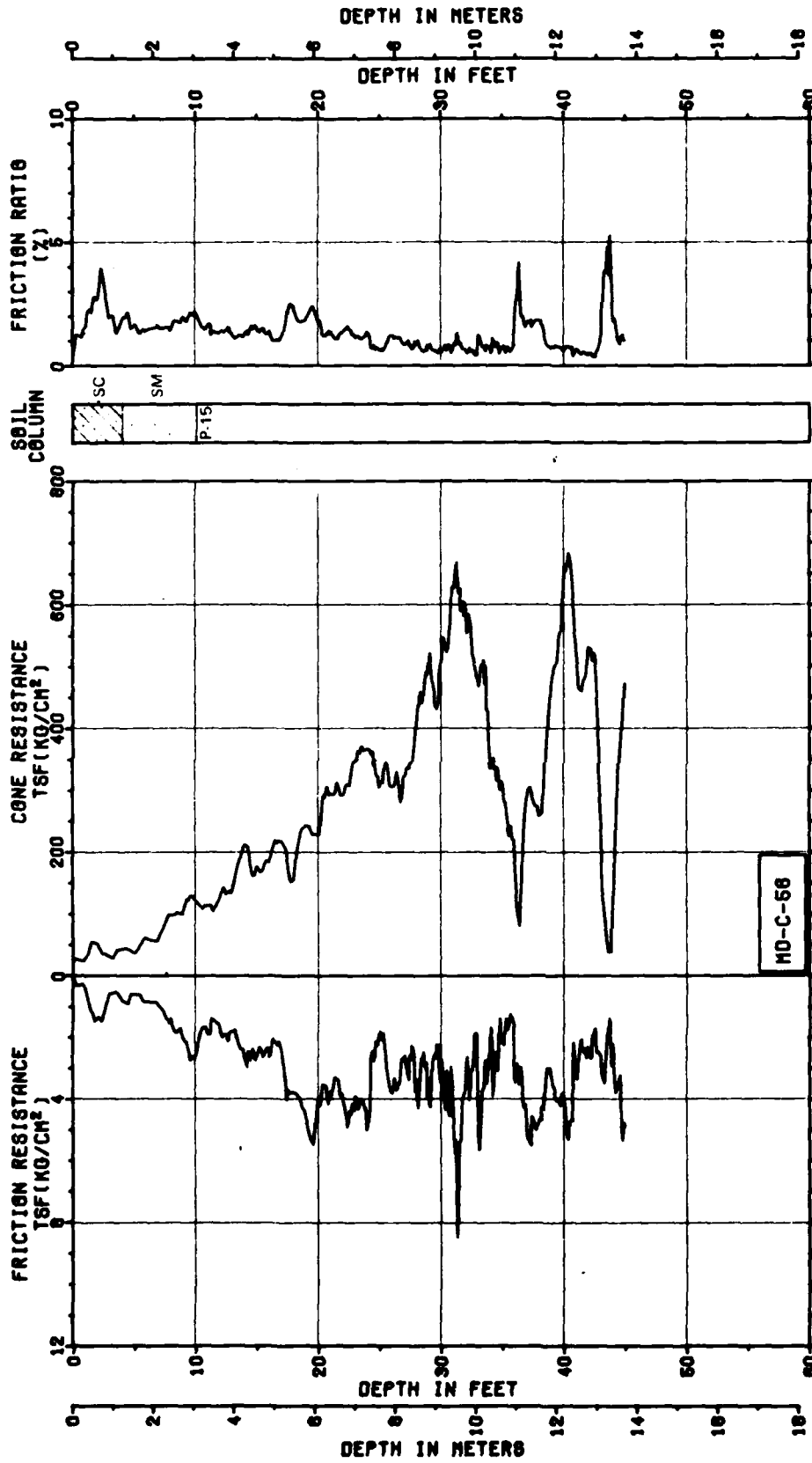


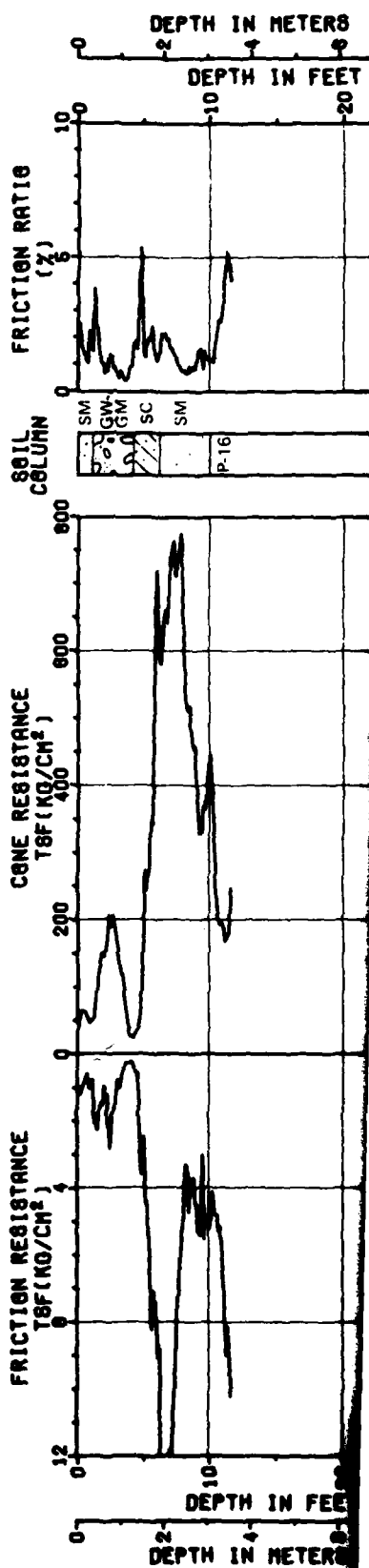
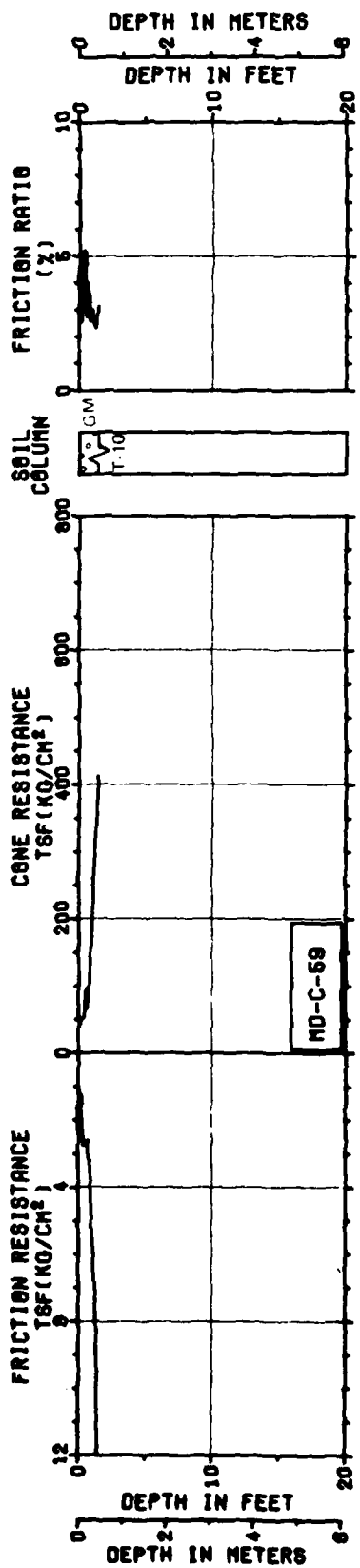
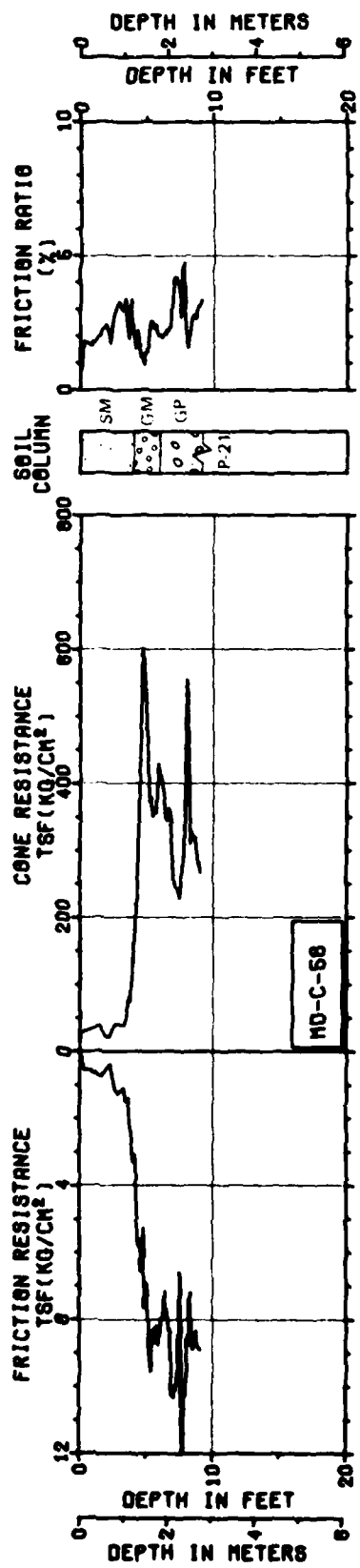
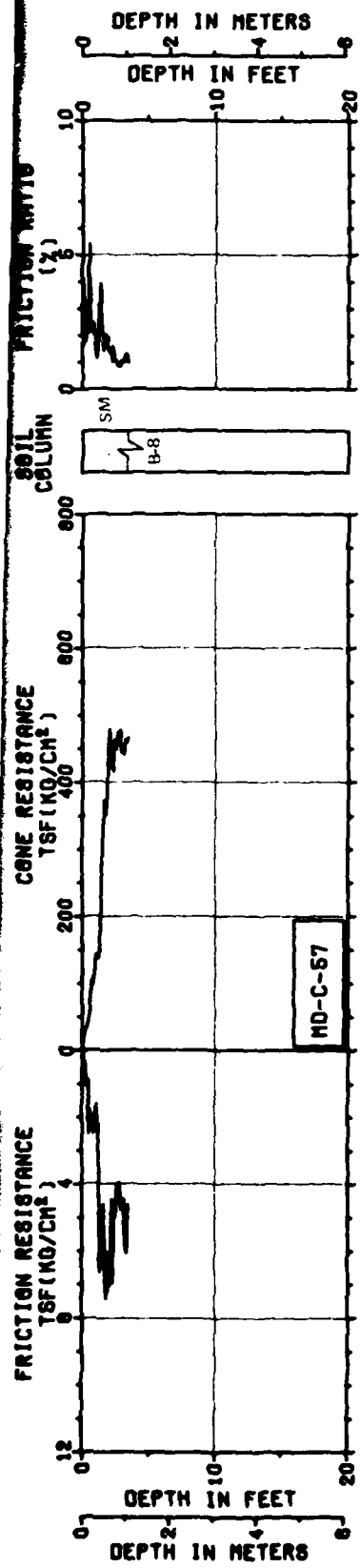
CONE PENETROMETER TEST MD-C-53, 54 & 55
 OPERATIONAL BASE SITE
 MILFORD, UTAH

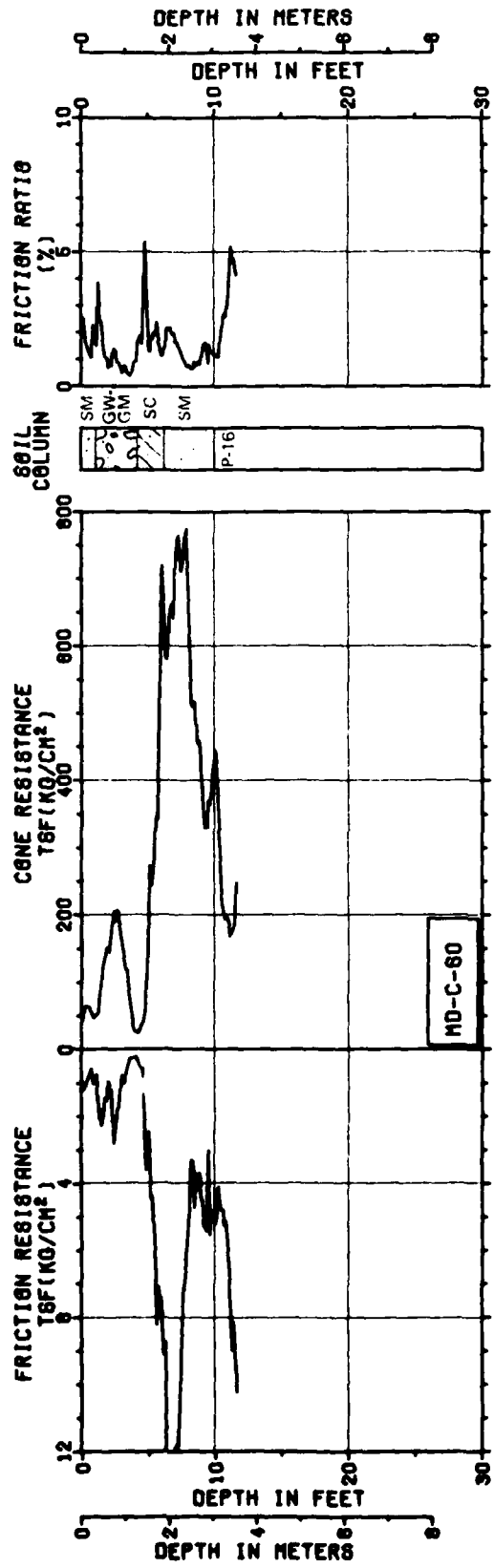
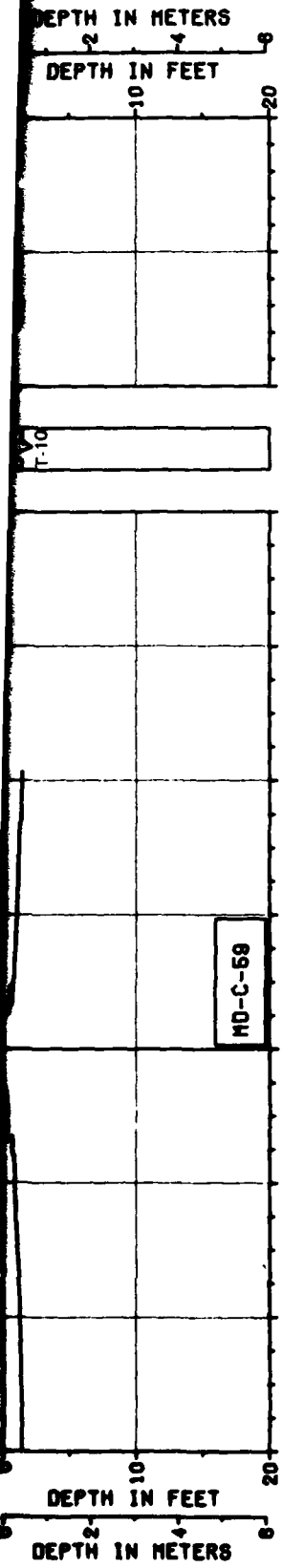
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-6-1
 16 OF 25

FUGRO NATIONAL, INC.





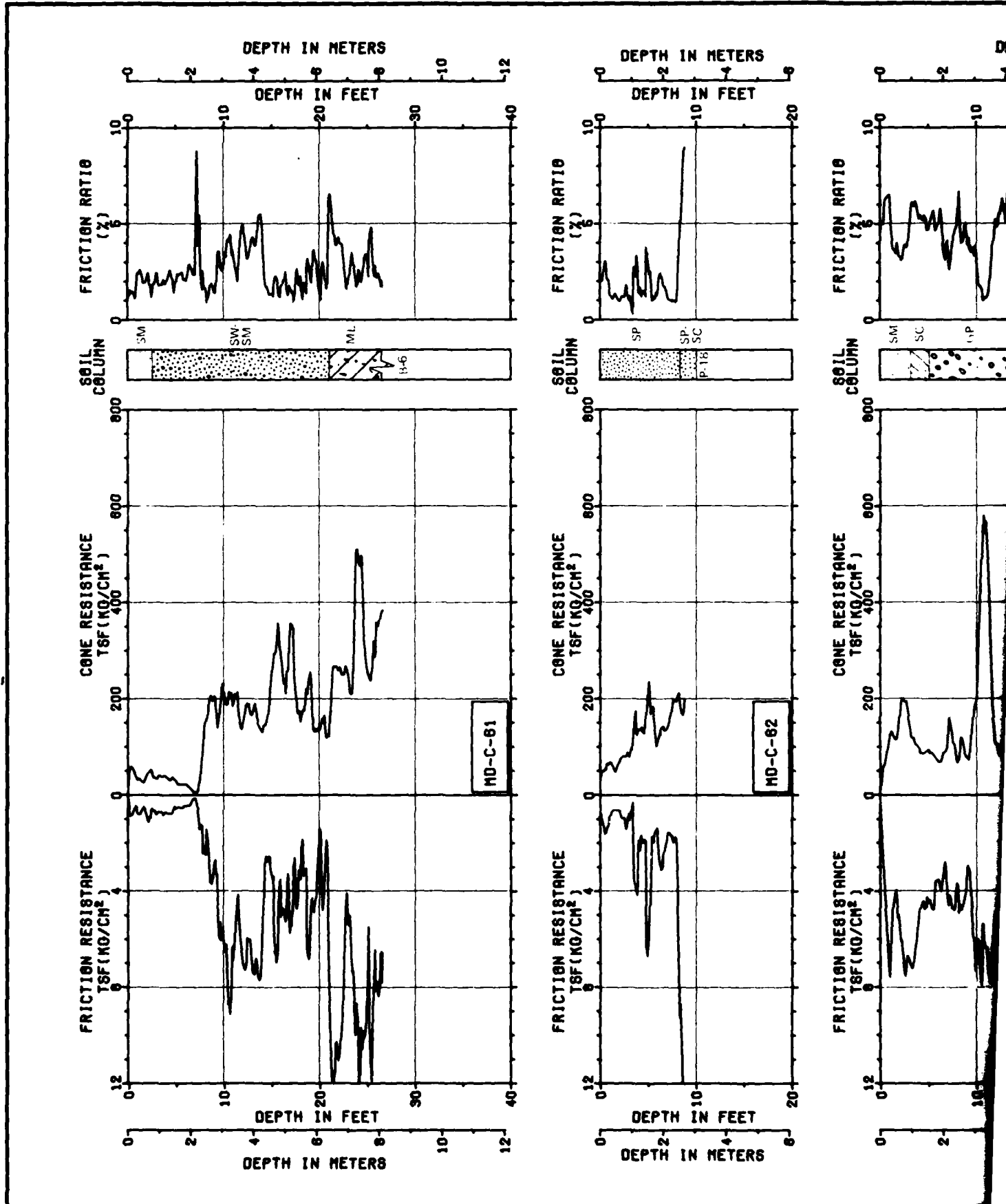


CONE PENETROMETER TEST MD-C-56, 57, 58, 59 & 60
OPERATIONAL BASE SITE
MILFORD, UTAH

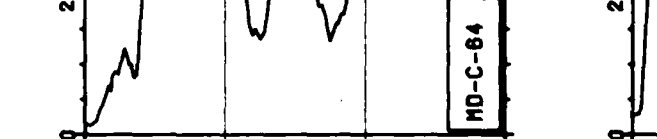
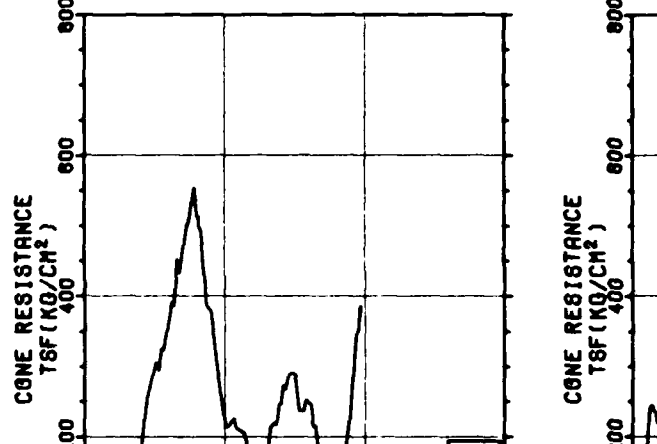
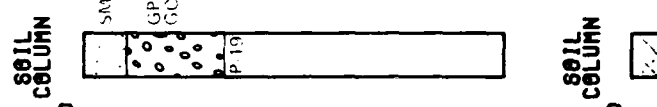
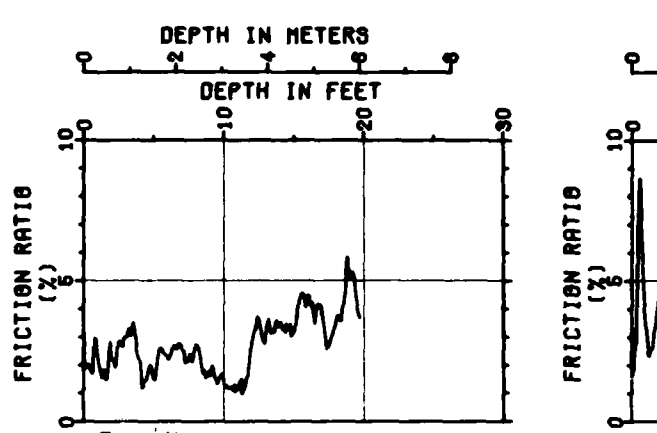
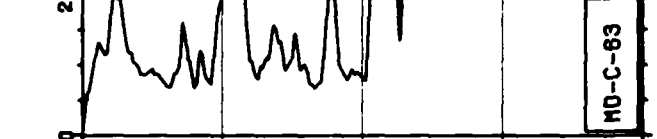
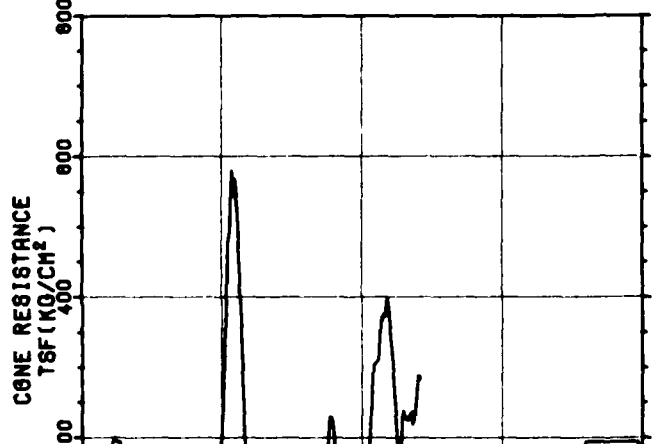
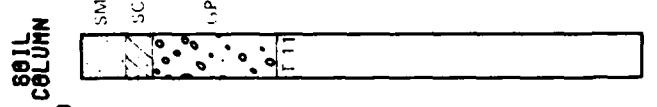
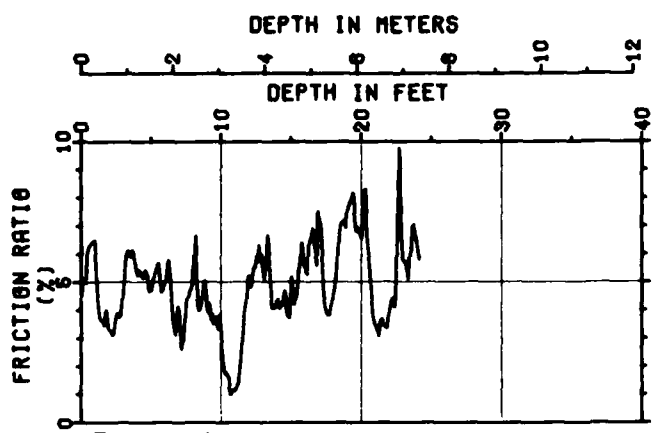
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE BMO

FIGURE
II-6-1
17 OF 25

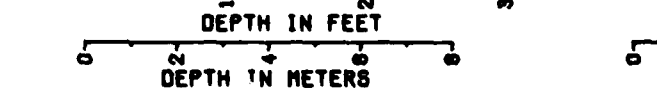
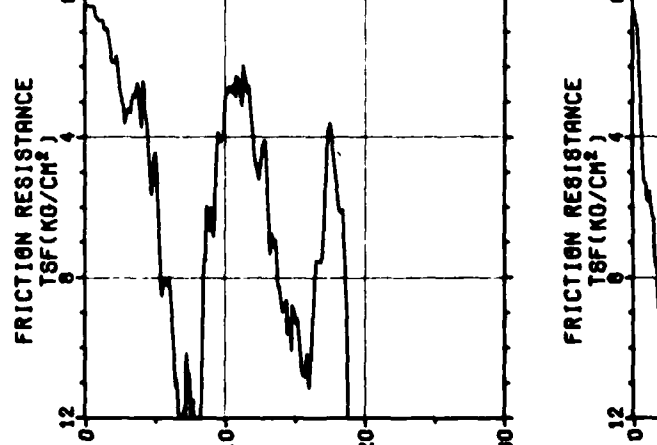
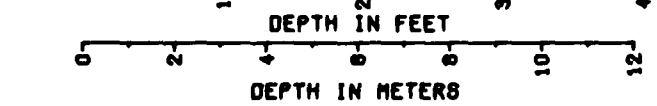
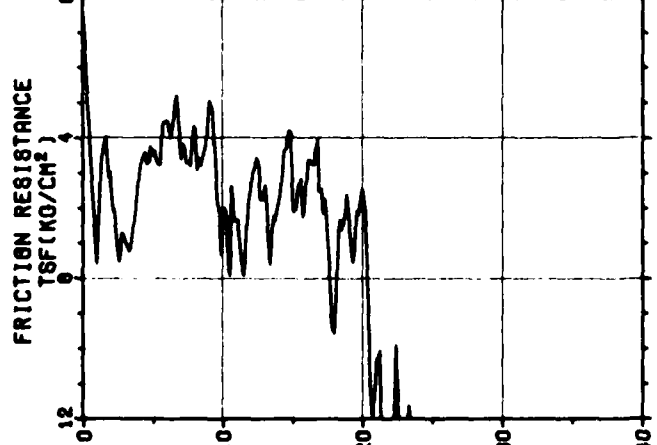
FUGRO NATIONAL, INC.

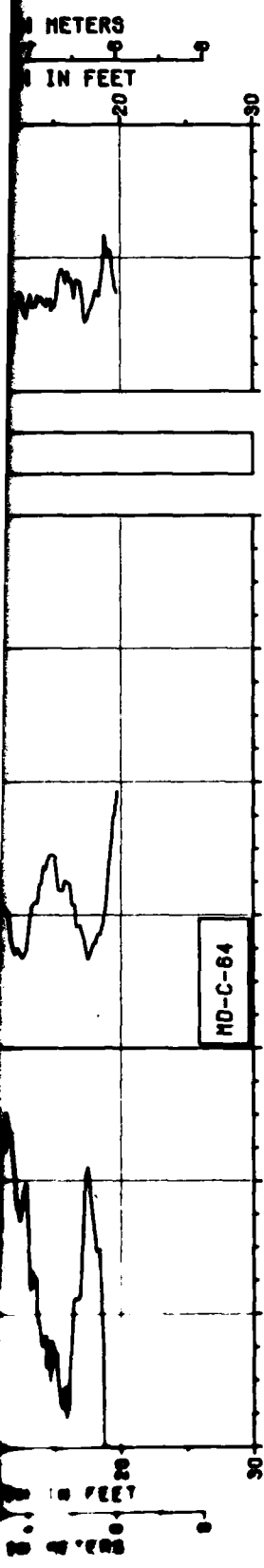


METERS
FEET

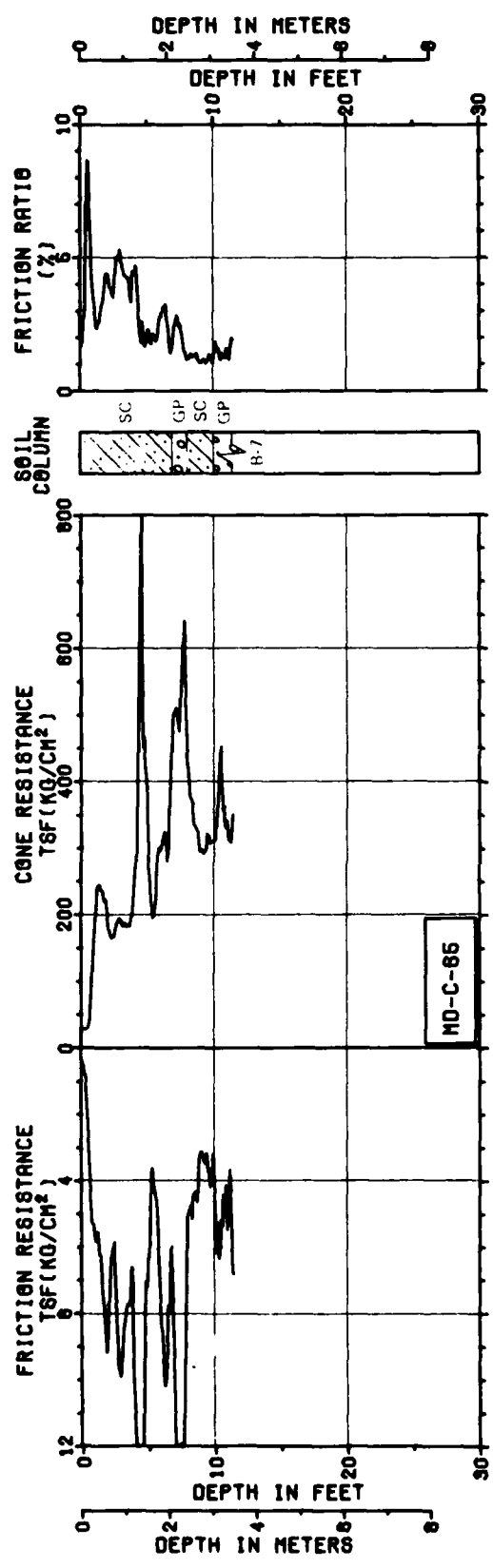


METERS
FEET





MD-C-64



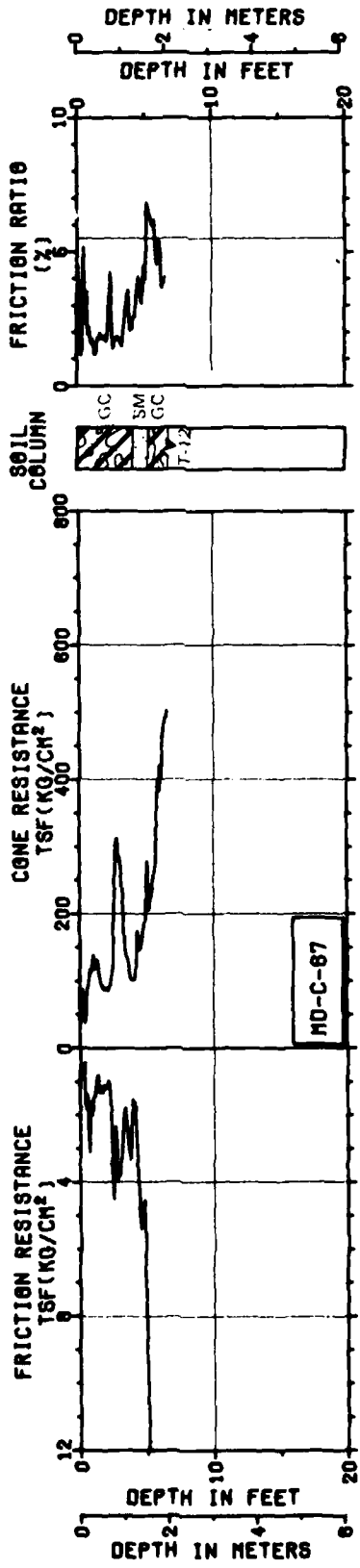
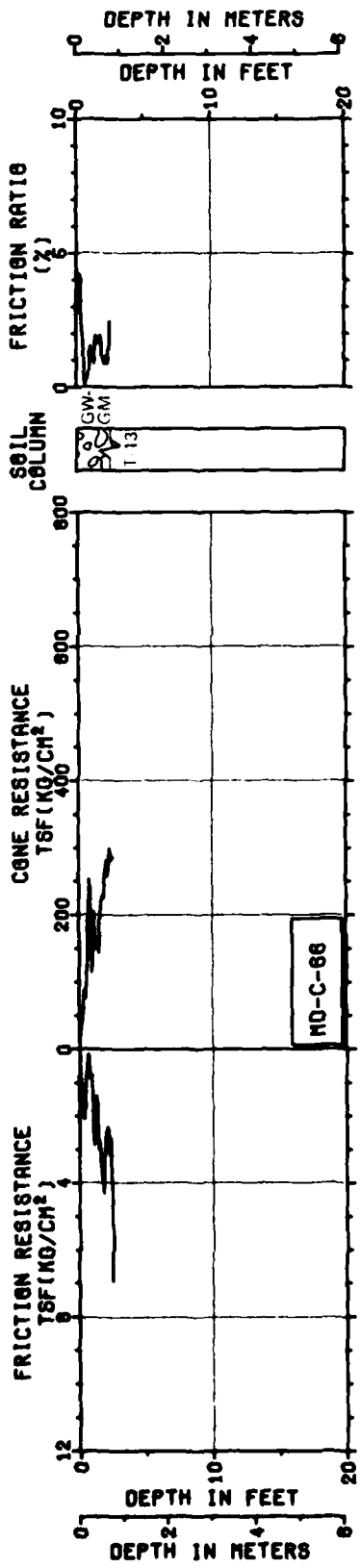
MD-C-66

CONE PENETROMETER TEST MD-C-61, 62, 63, 64 & 66
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-6-1
 18 OF 26

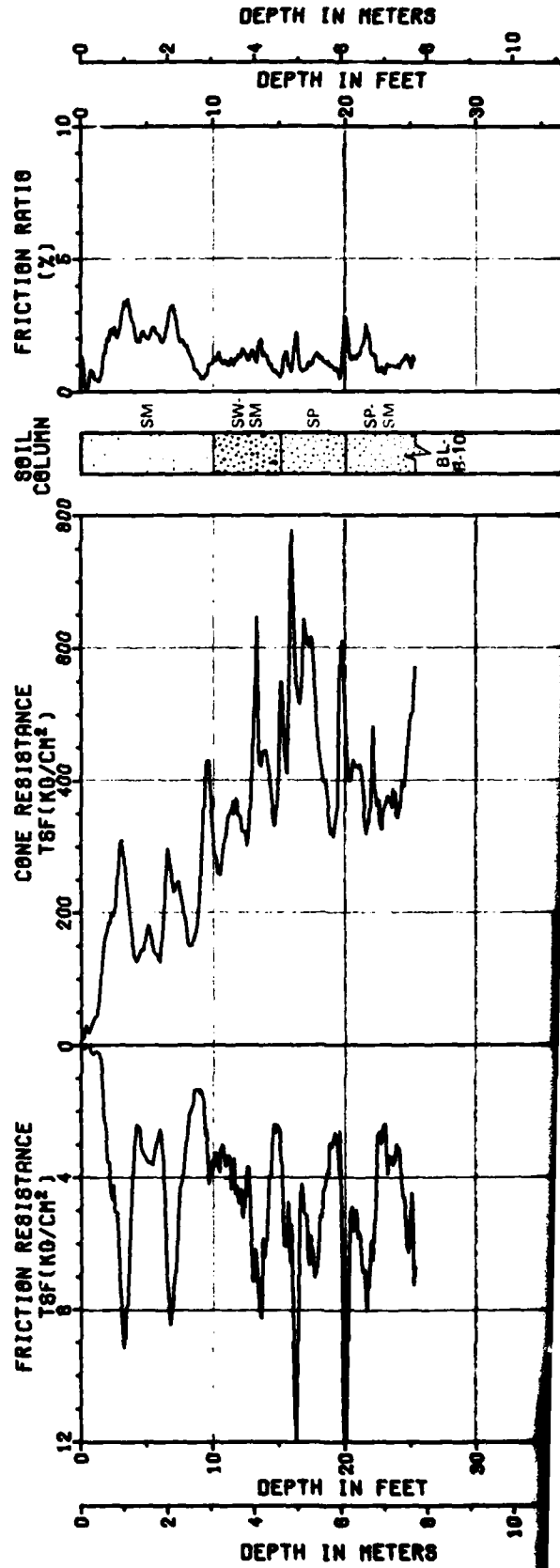
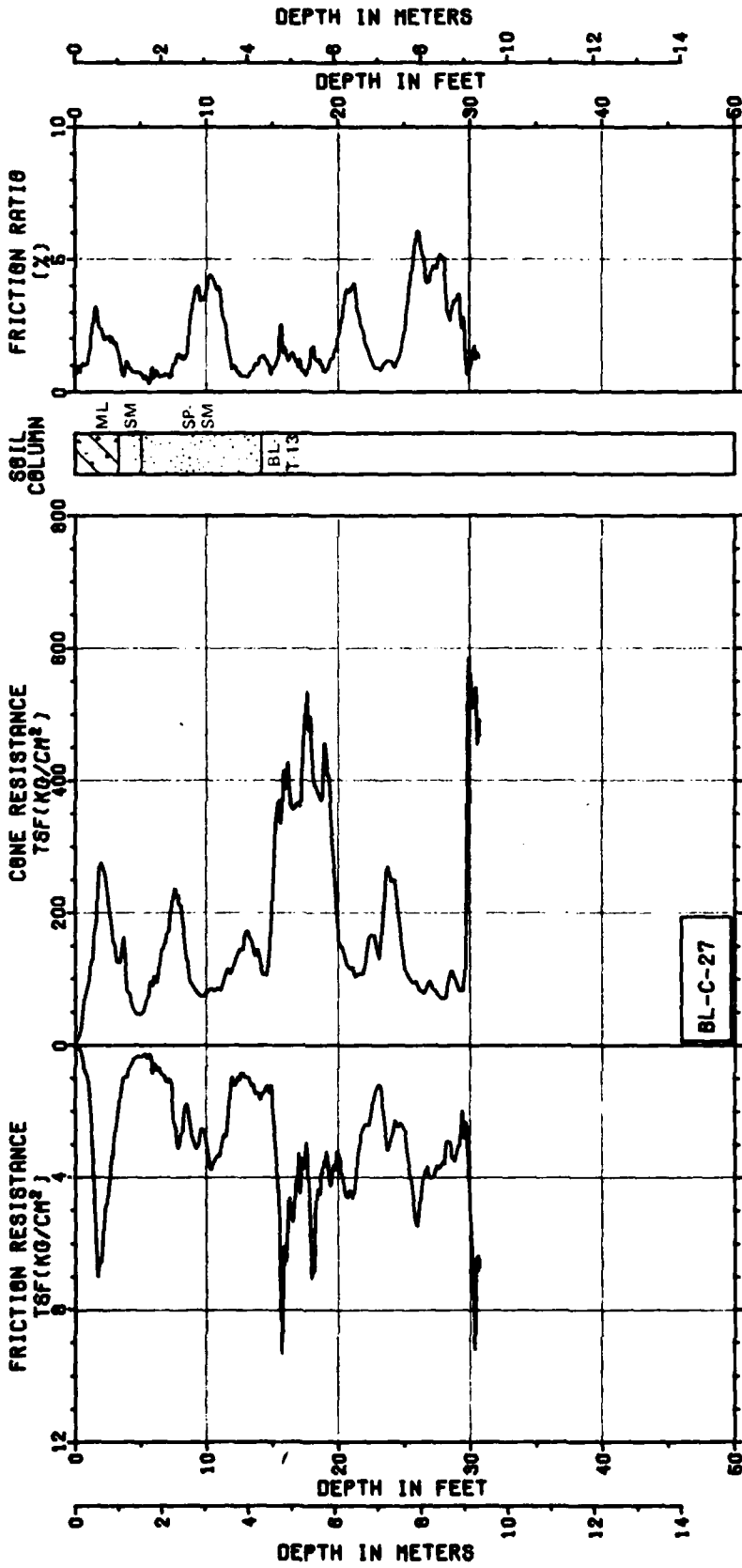
FUGRO NATIONAL, INC.

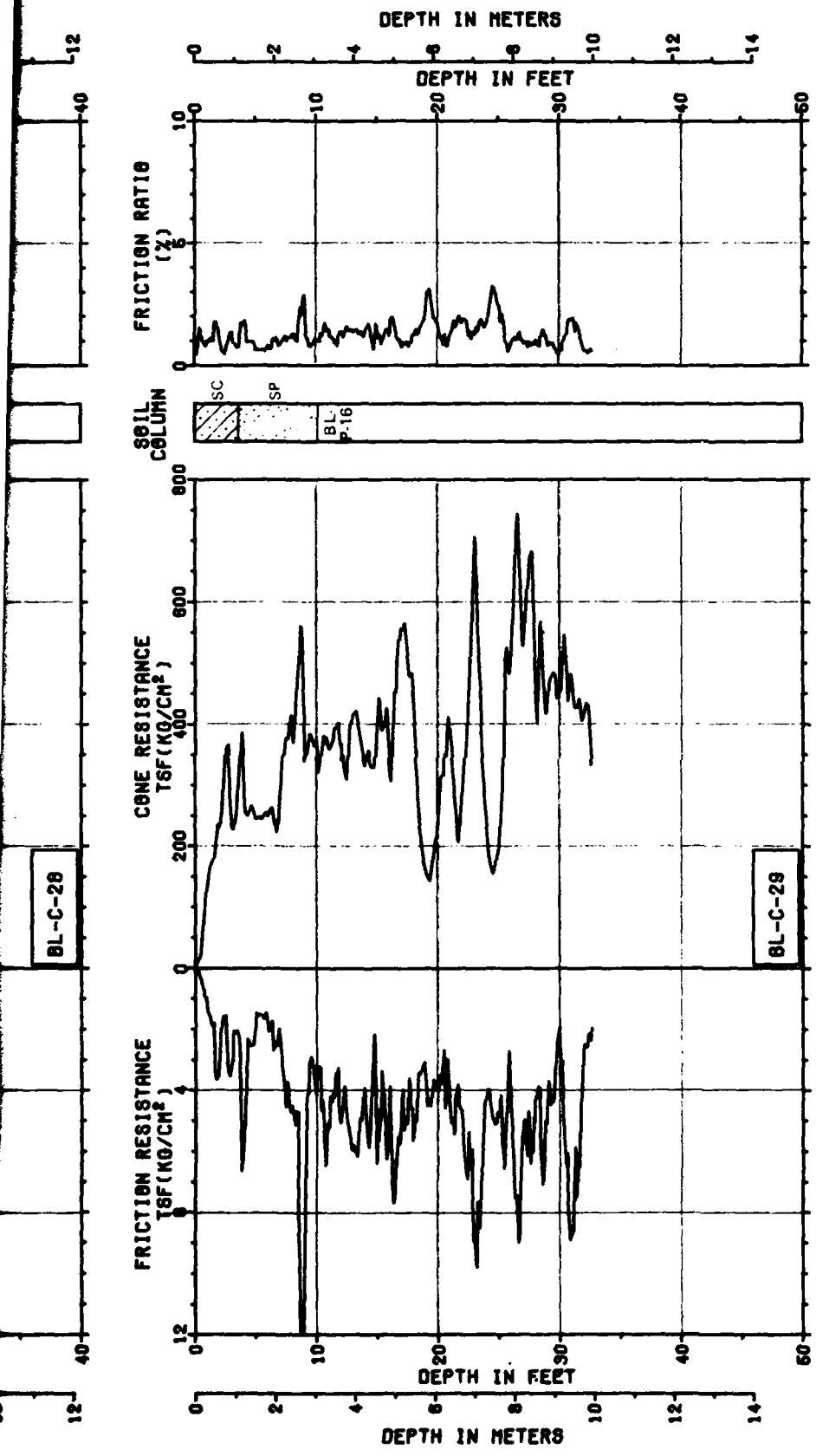


CONE PENETROMETER TEST MD-C-66 & 67
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

UGRO NATIONAL, INC.





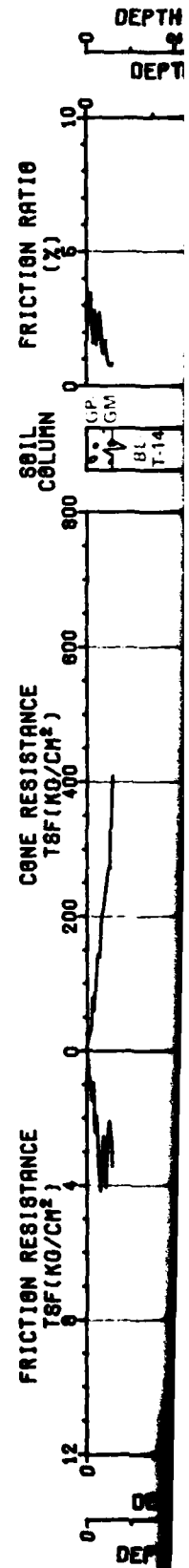
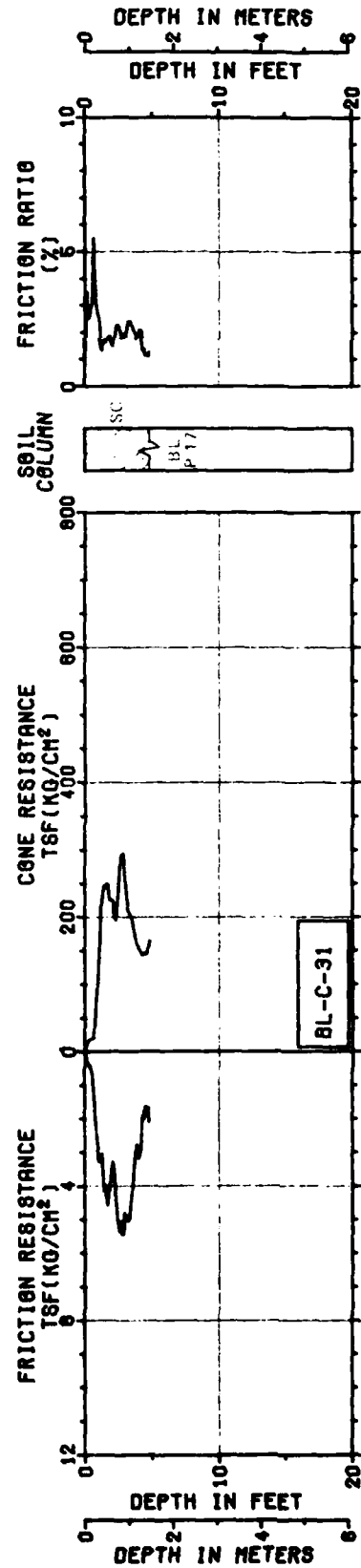
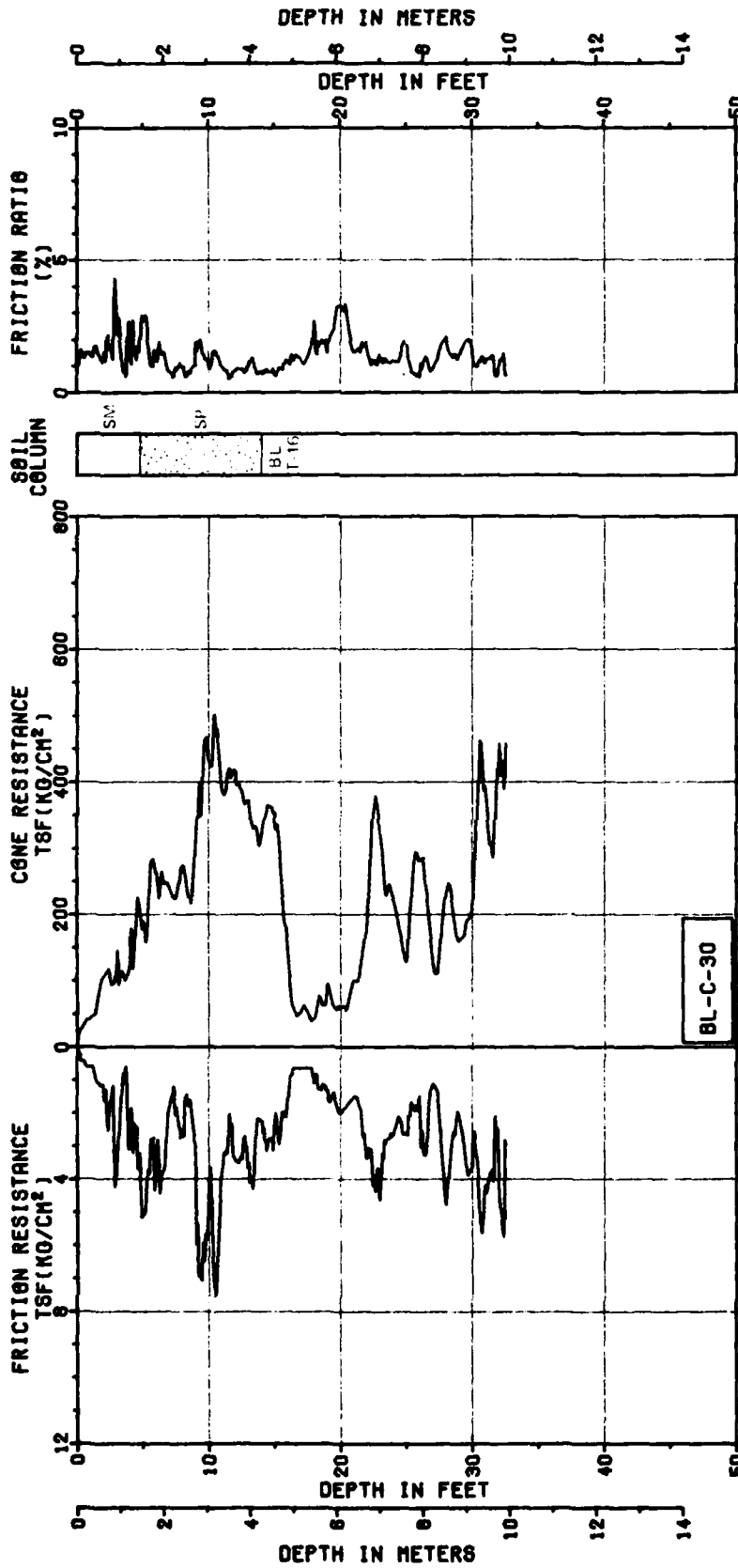
CONE PENETROMETER TEST BL-C-27, 28 & 29
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-6-1
 2002

FUGRO NATIONAL, INC.

2



DEPTH IN METERS
DEPTH IN FEET

FRICITION RATIO (%)

DEPTH IN METERS
DEPTH IN FEET

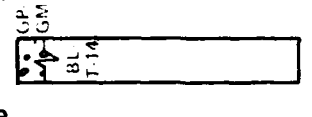
FRICITION RATIO (%)

DEPTH IN METERS
DEPTH IN FEET

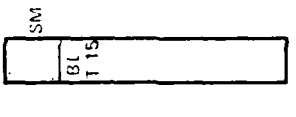
FRICITION RATIO (%)

DEPTH IN METERS
DEPTH IN FEET

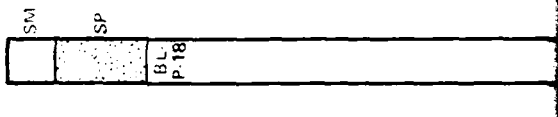
SOIL COLUMN



SOIL COLUMN



SOIL COLUMN



BL-C-31

BL-C-32

BL-C-33

CONE RESISTANCE TSF (KG/CM²)

CONE RESISTANCE TSF (KG/CM²)

CONE RESISTANCE TSF (KG/CM²)

FRICITION RESISTANCE TSF (KG/CM²)

FRICITION RESISTANCE TSF (KG/CM²)

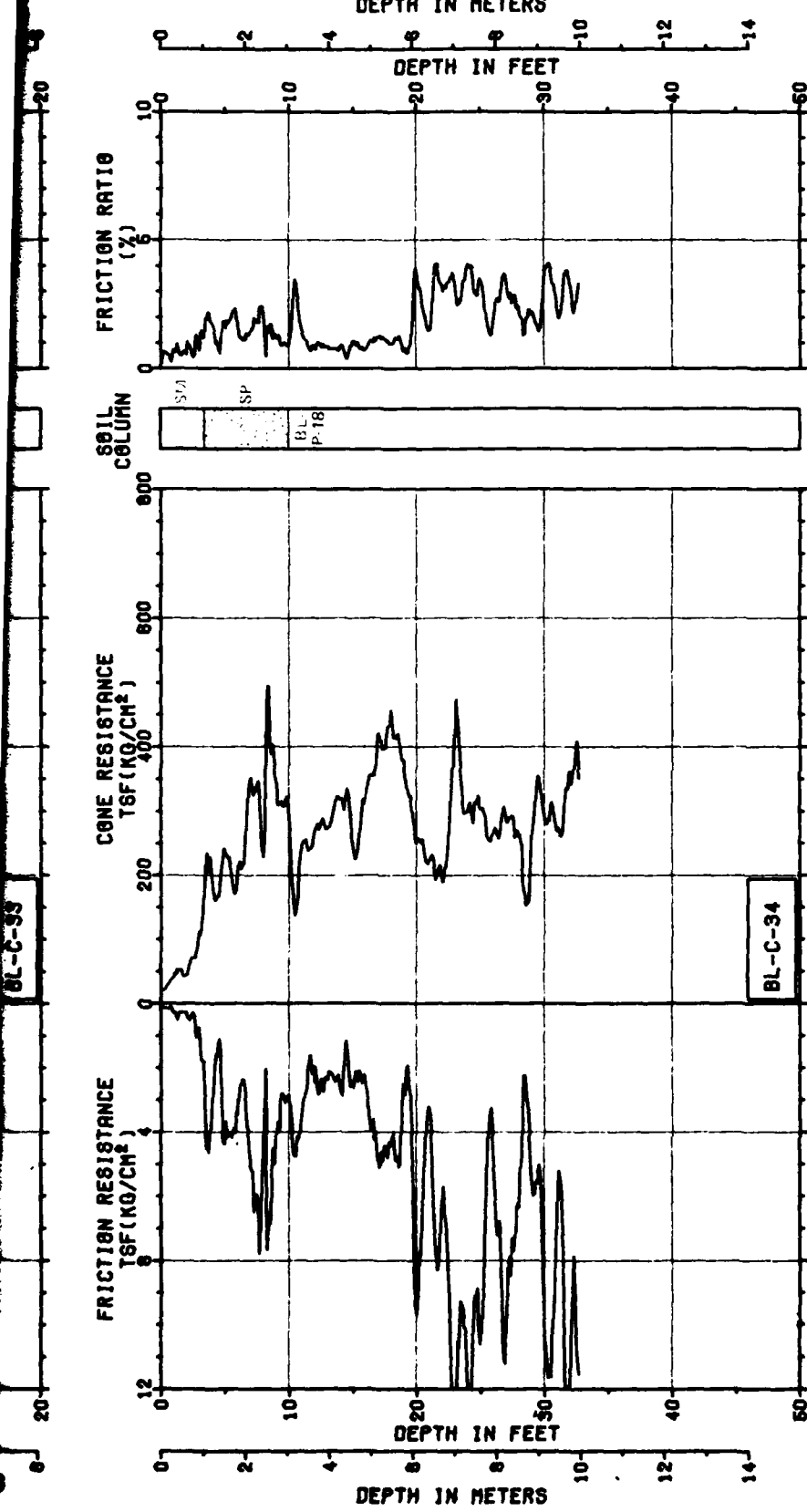
FRICITION RESISTANCE TSF (KG/CM²)

DEPTH IN METERS
DEPTH IN FEET

DEPTH IN METERS
DEPTH IN FEET

DEPTH IN METERS
DEPTH IN FEET

DEPTH IN METERS
DEPTH IN FEET

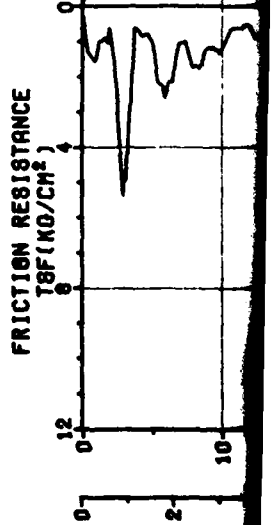
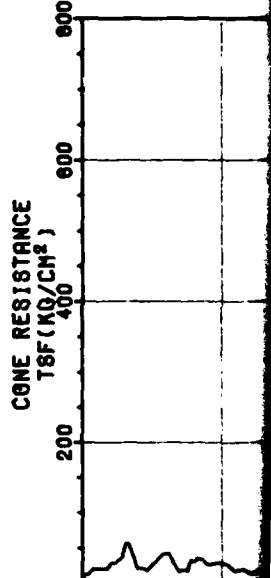
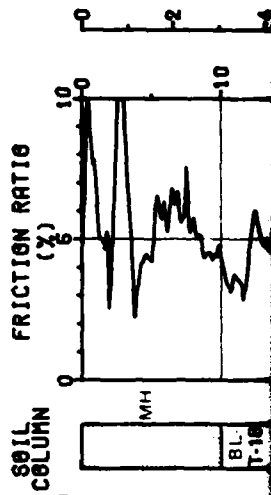
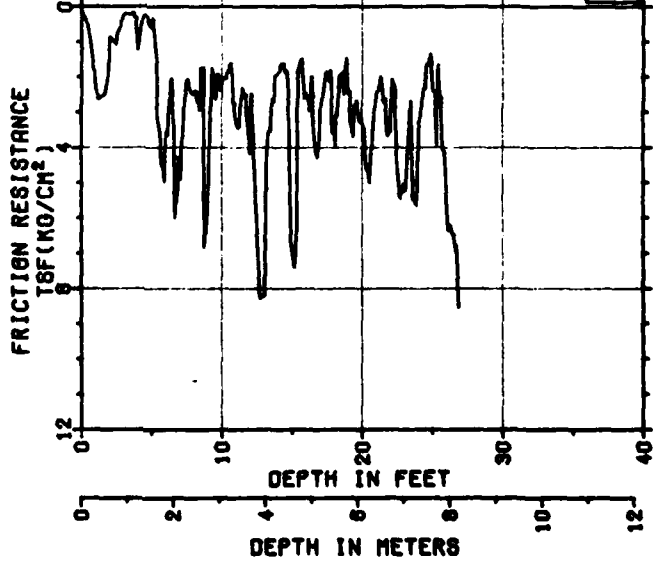
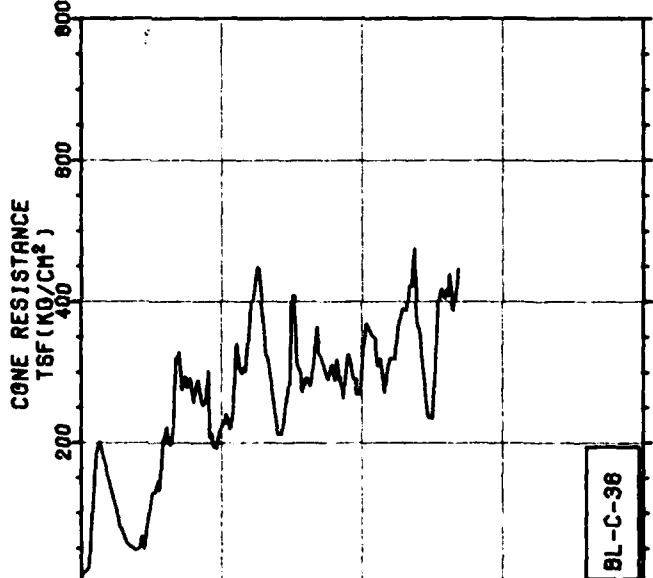
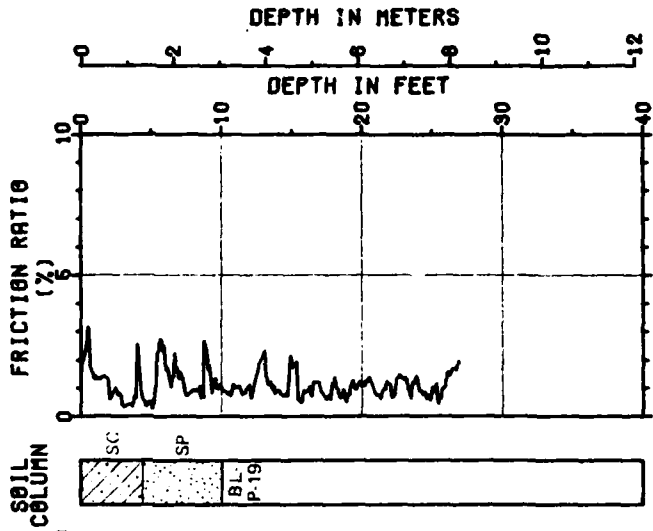
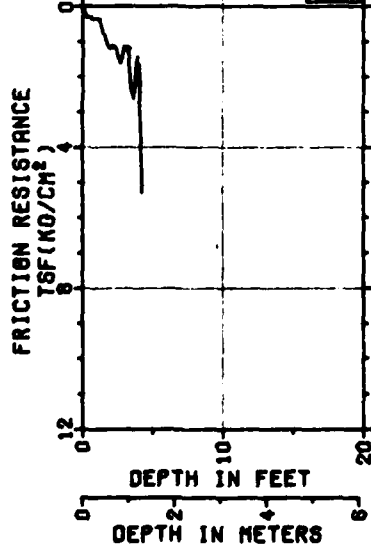
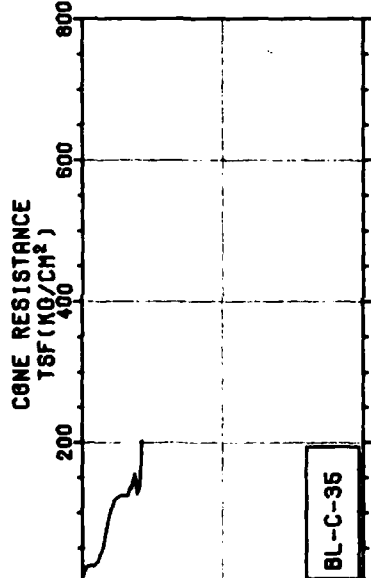
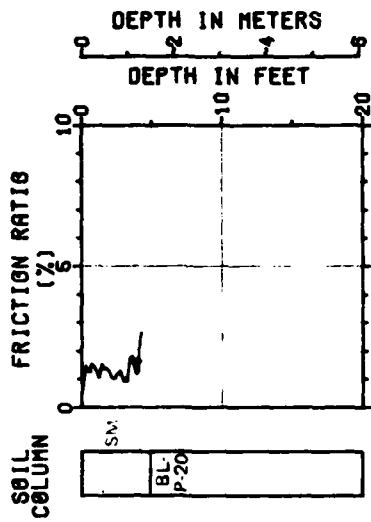


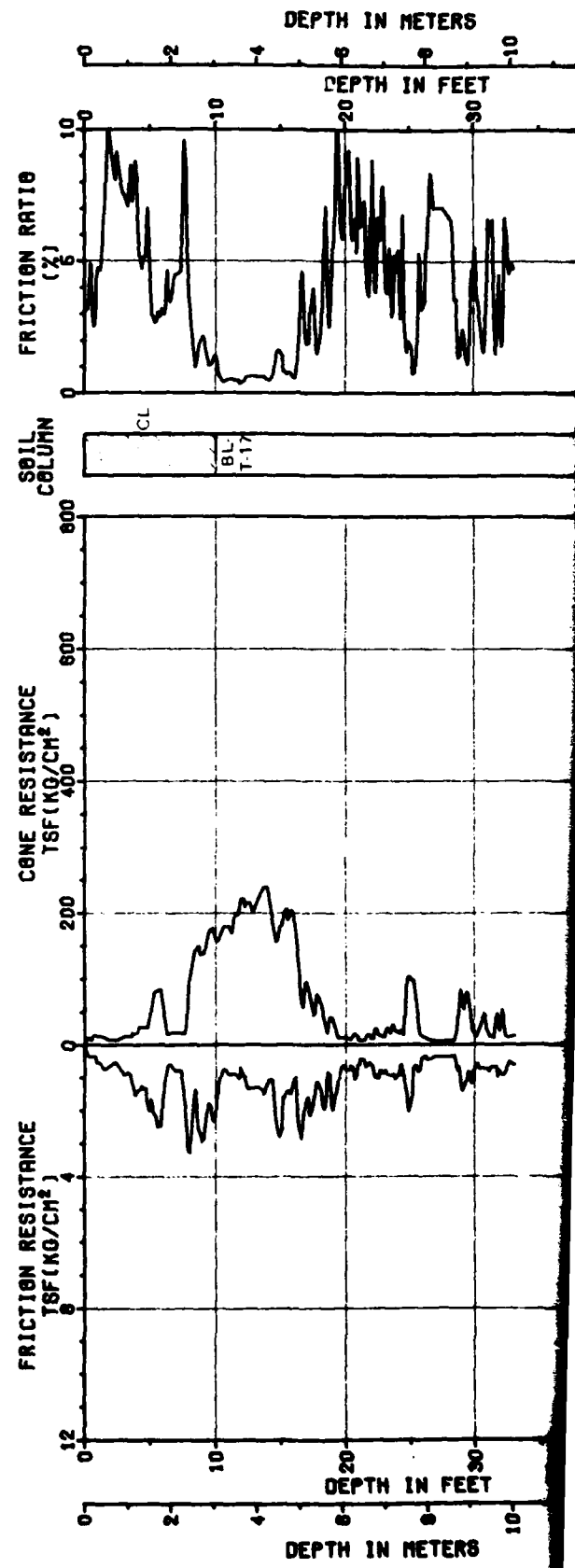
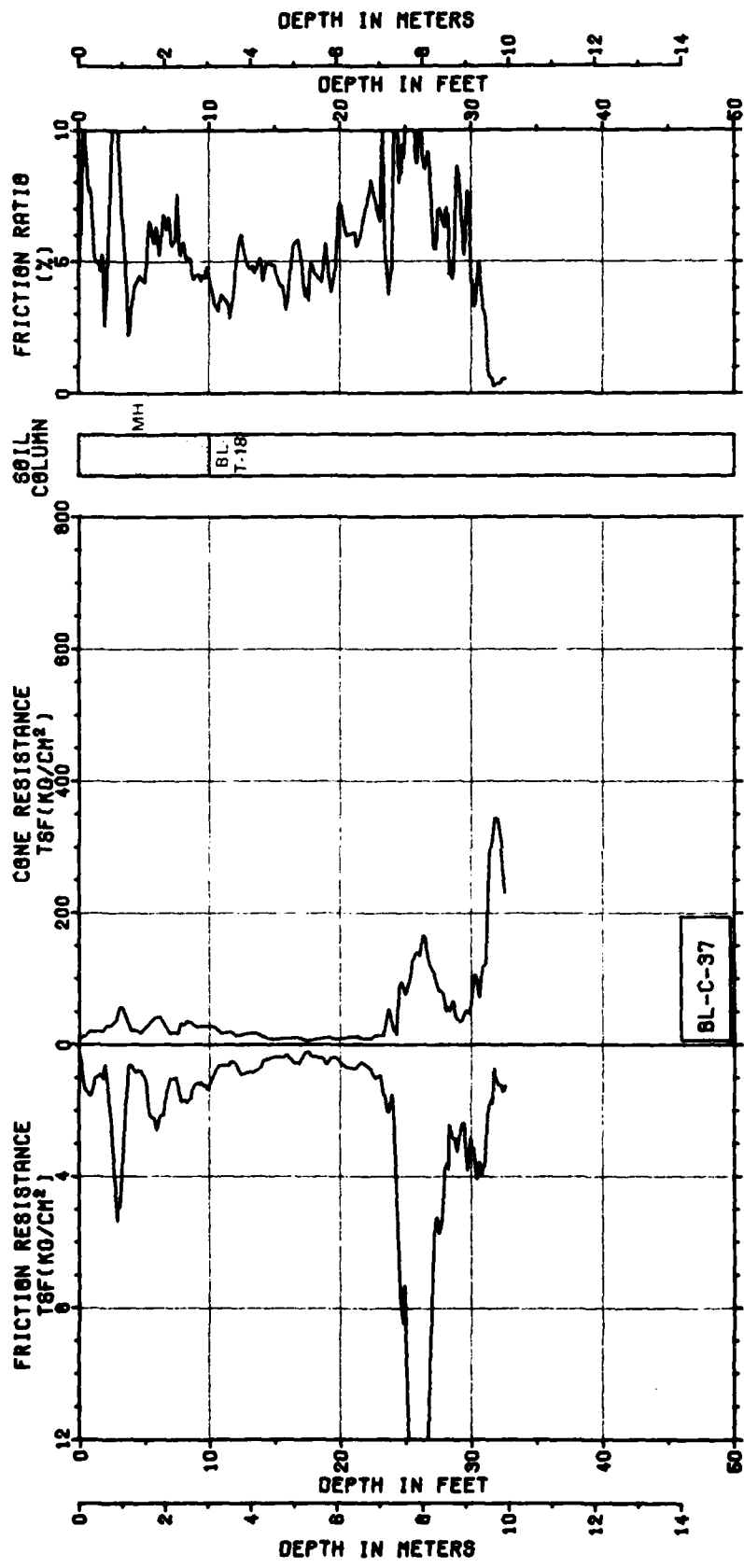
CONE PENETROMETER TEST BL-C-30, 31, 32, 33 & 34
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-6-1
 21 OF 25

FUGRO NATIONAL, INC.





2

DEPTH IN METERS

DEPTH IN FEET

FRICITION RATIO (%)

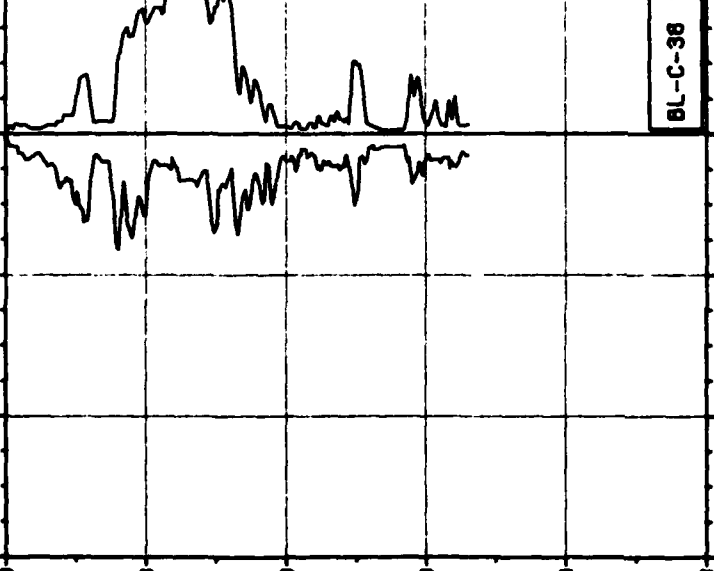
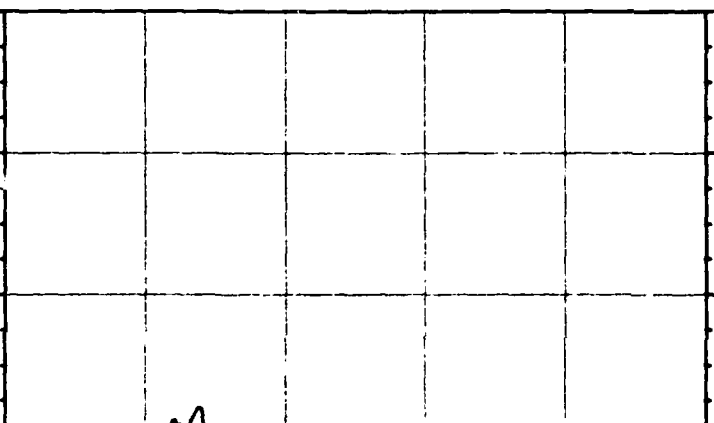
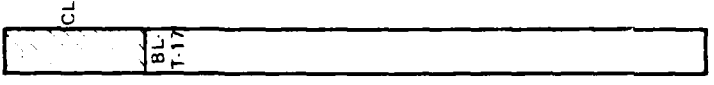
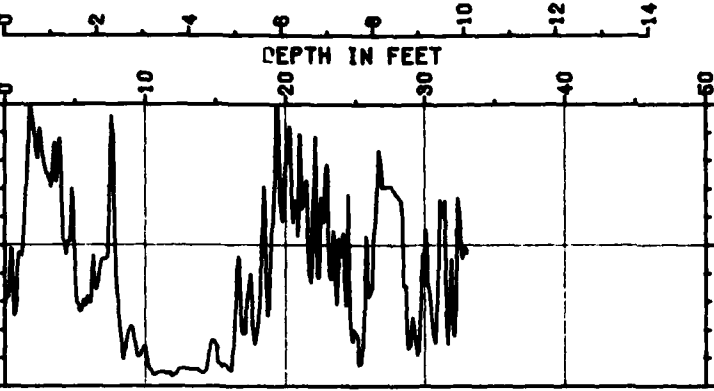
SOIL COLUMN

CONE RESISTANCE TSF (KG/CM²)

FRICITION RESISTANCE TSF (KG/CM²)

DEPTH IN FEET

DEPTH IN METERS



BL-C-37

BL-C-38

CONE PENETROMETER TEST BL-C-35, 36, 37 & 38
 OPERATIONAL BASE SITE
 MILFORD, UTAH

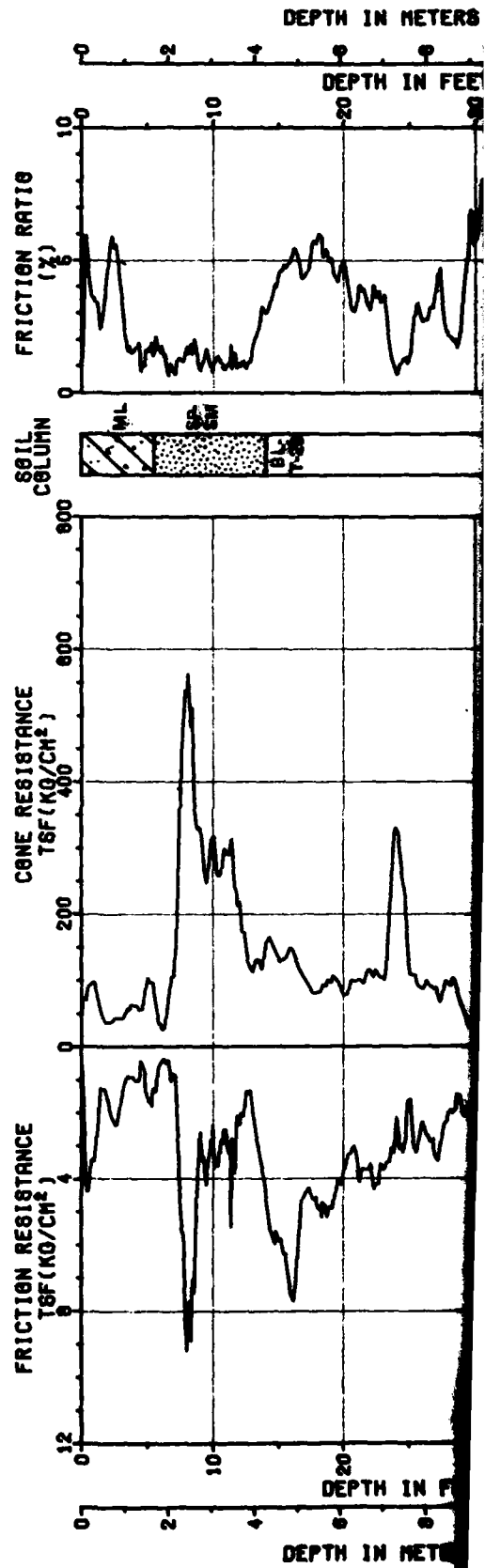
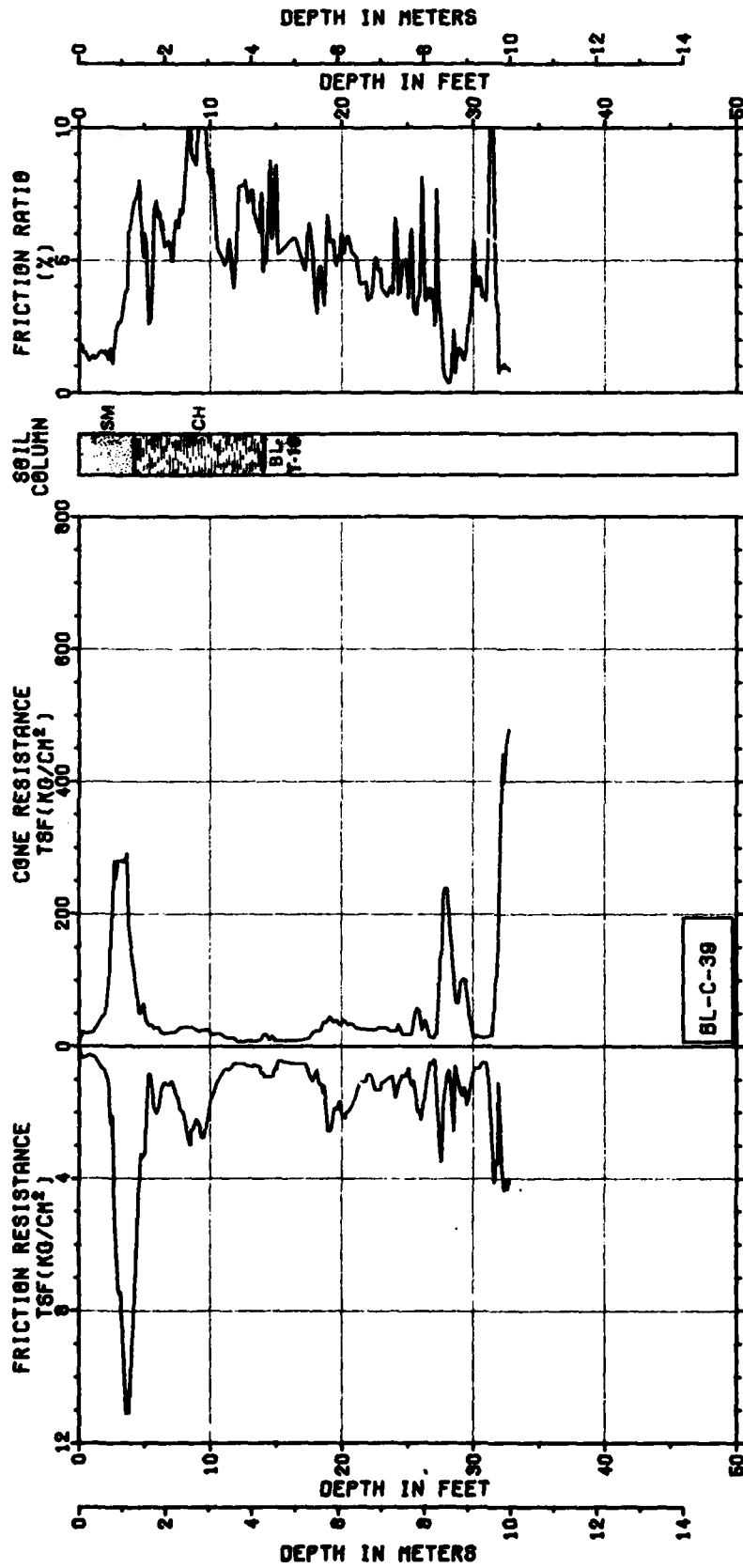
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMD

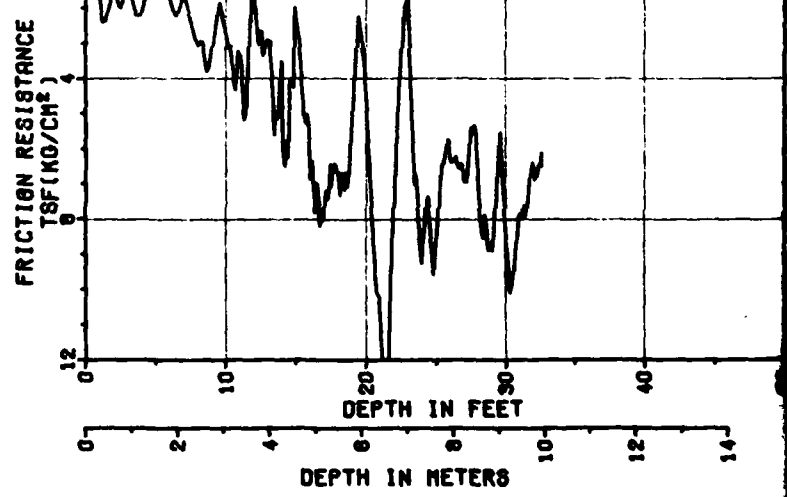
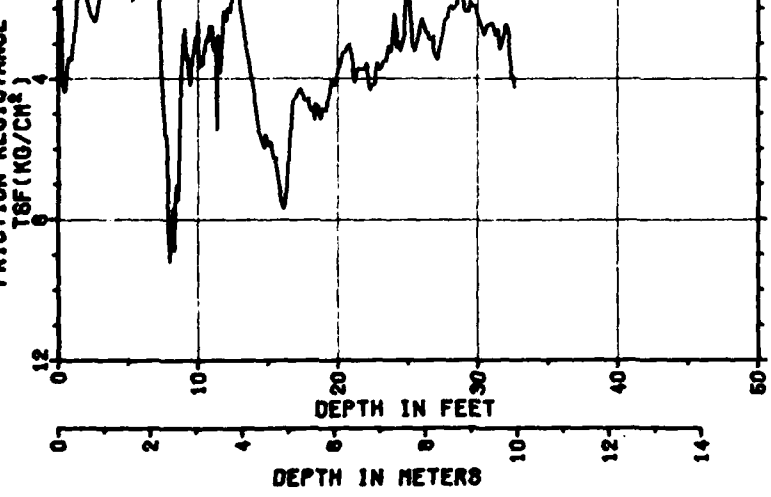
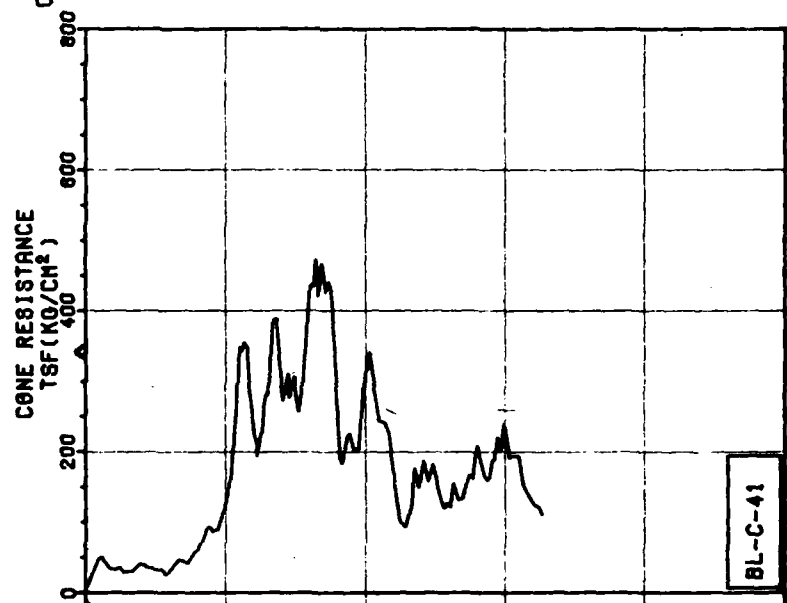
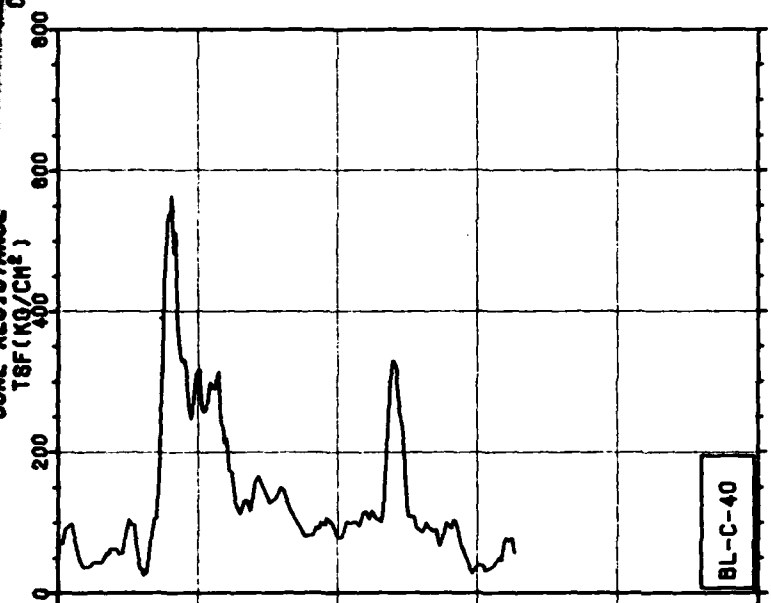
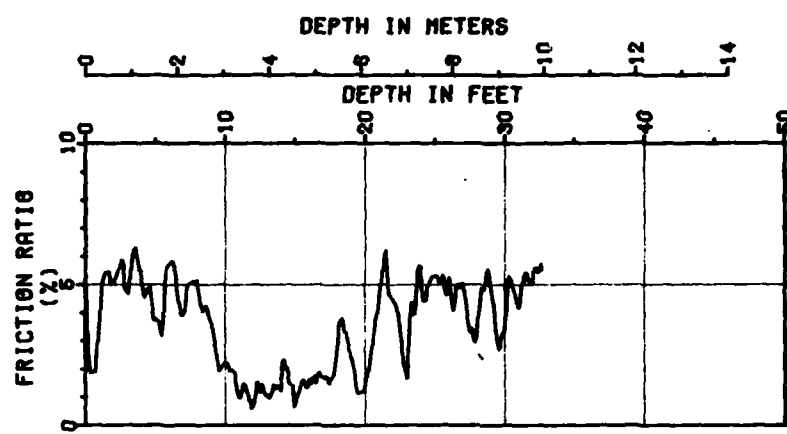
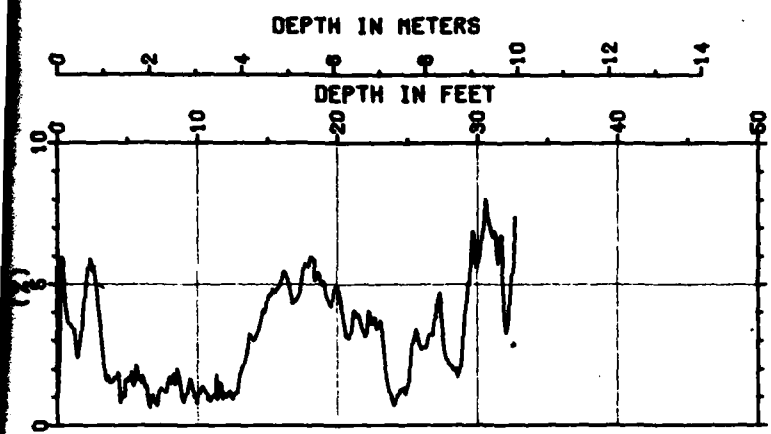
FIGURE
 IE-1
 22 OF 25

FUGRO NATIONAL, INC.

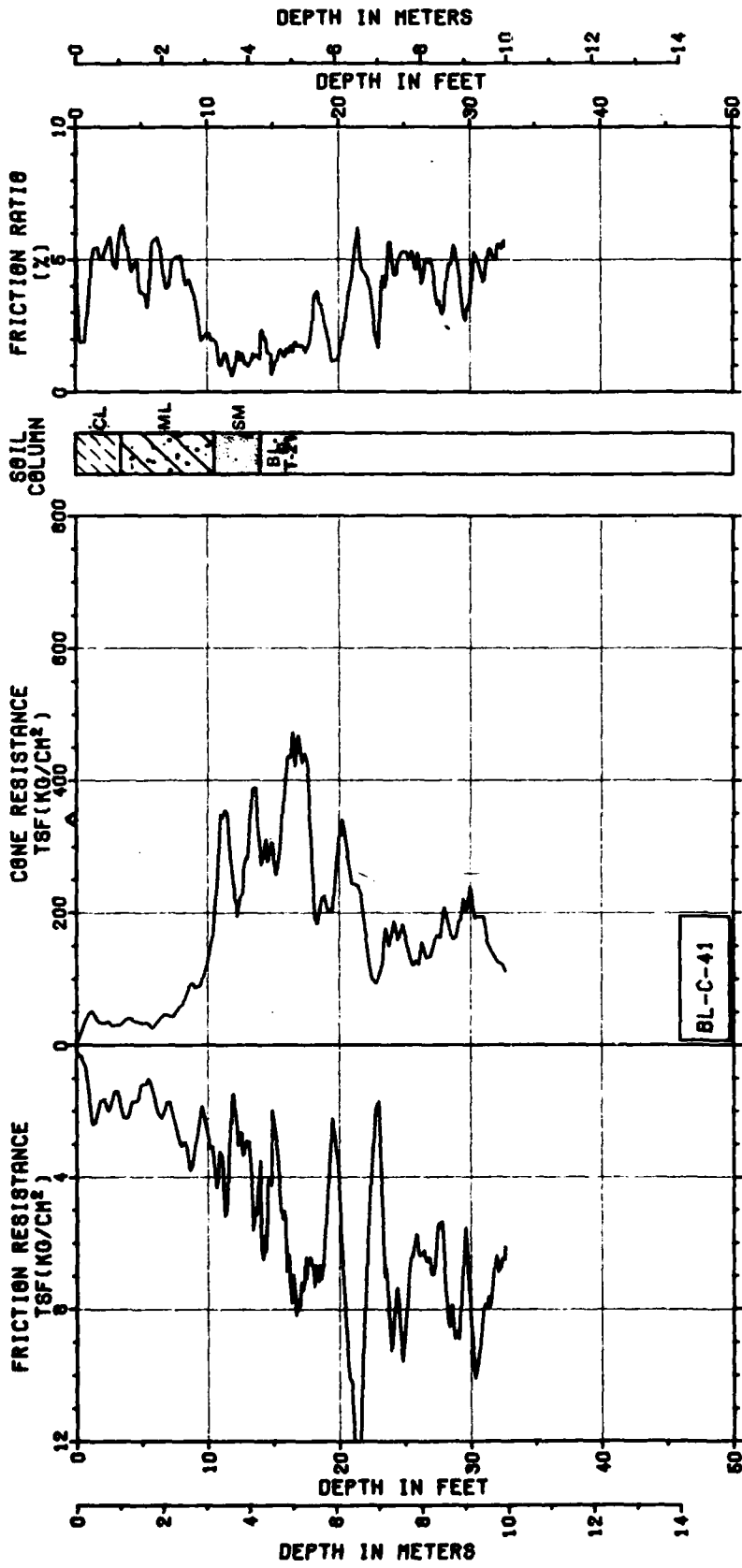
2

3





2



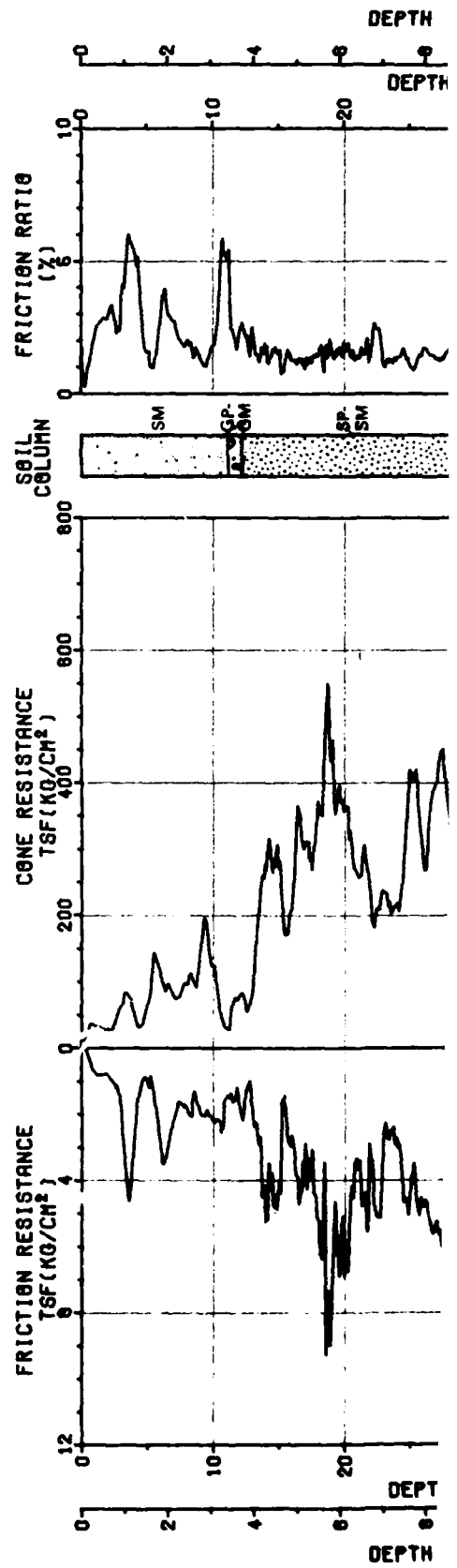
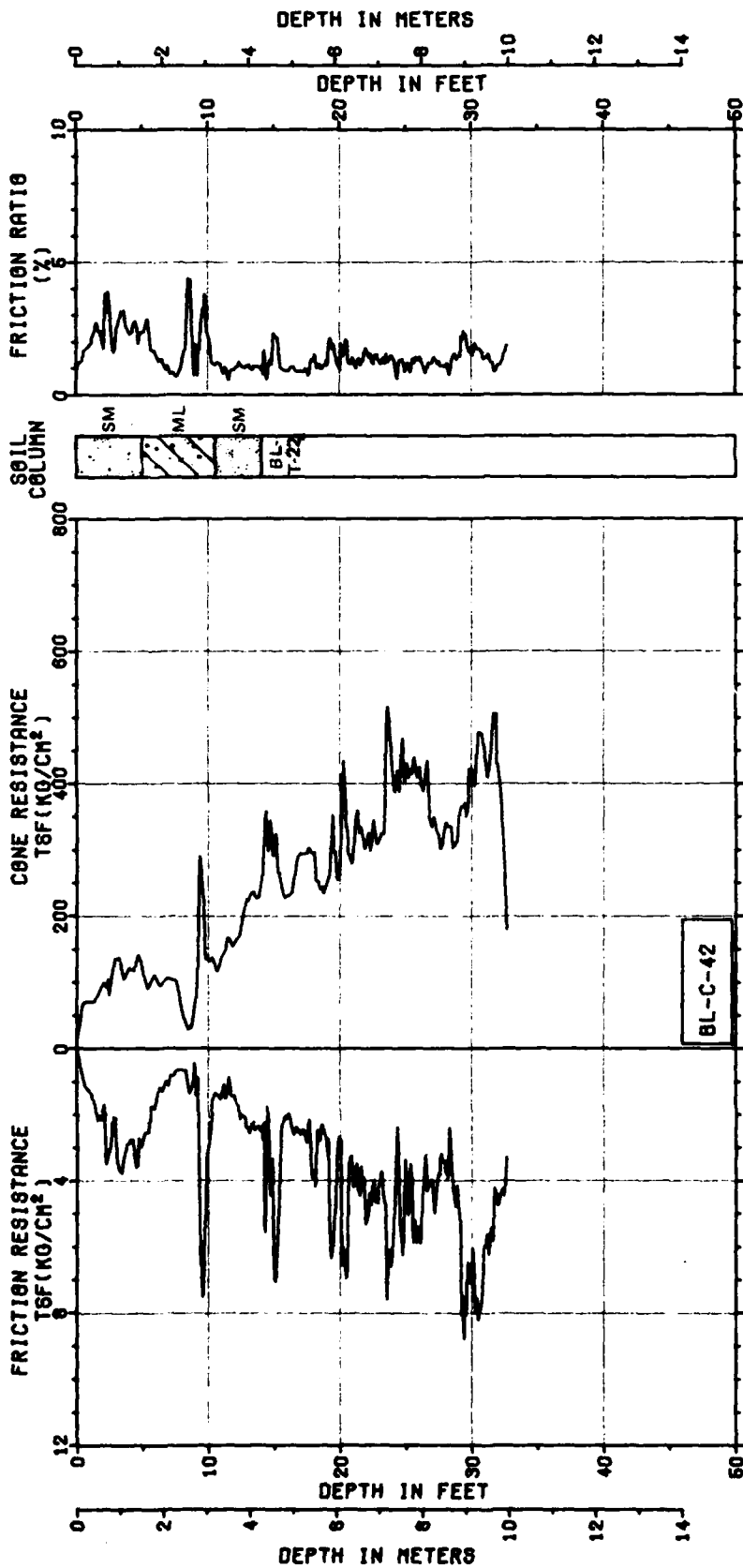
BL-C-41

CONE PENETROMETER TEST BL-C-39, 40 & 41
 OPERATIONAL BASE SITE
 MORGAN, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 10-1
 10025

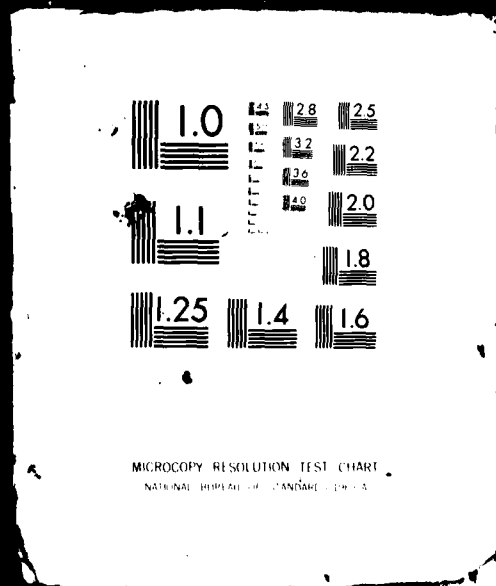
TUGRO NATIONAL, INC.

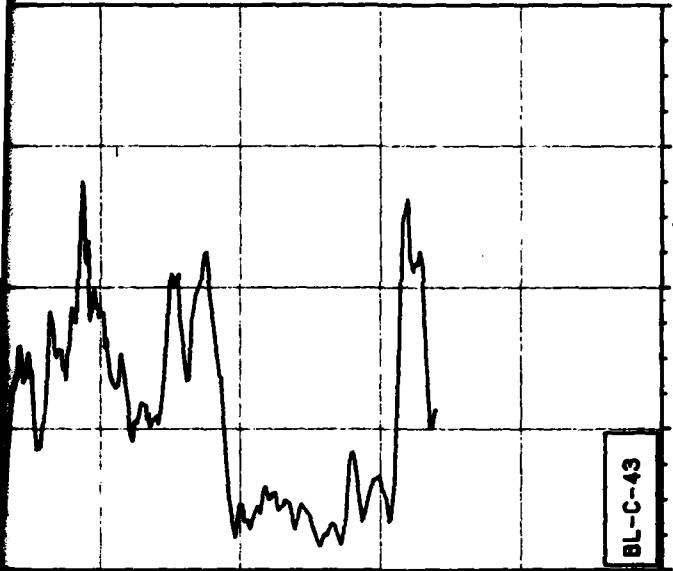
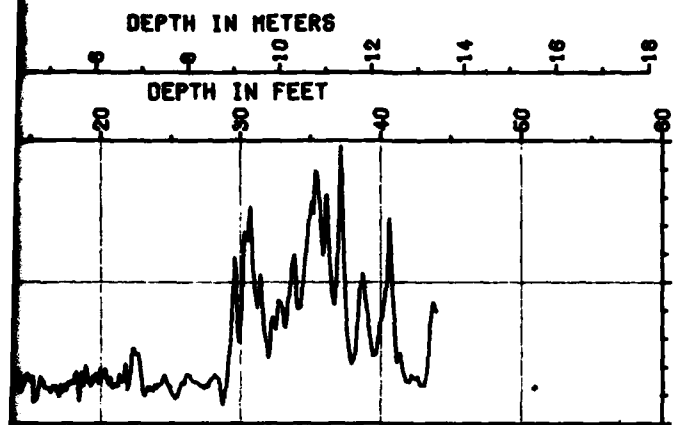


4 OF 4

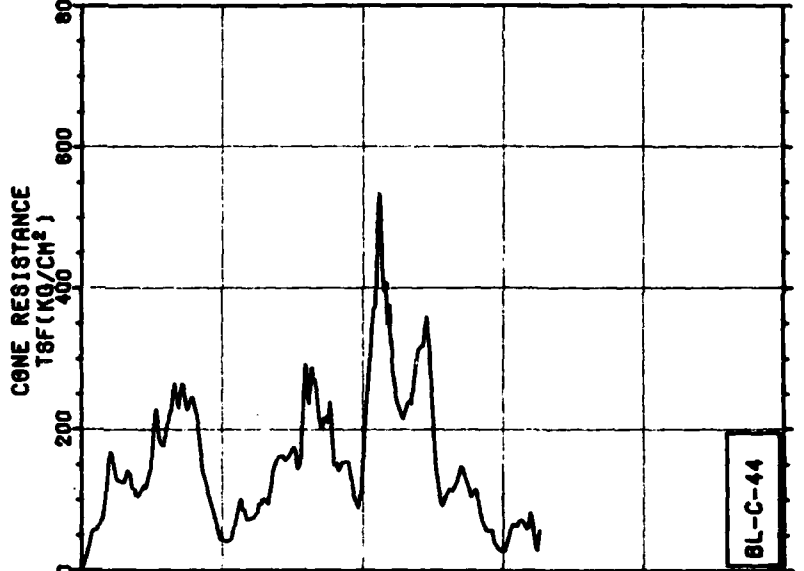
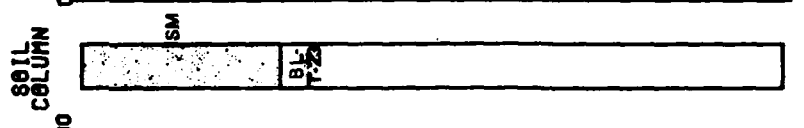
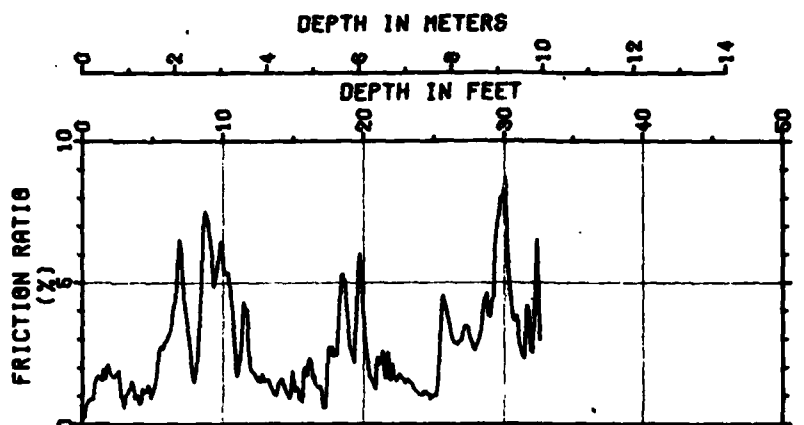
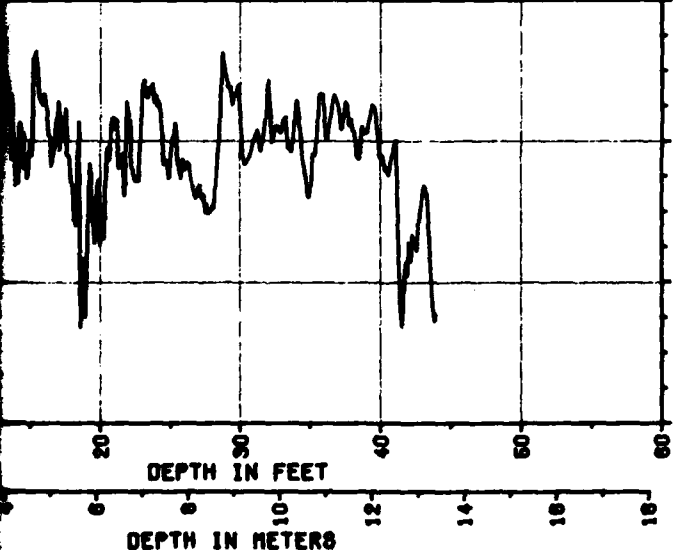
AD-

A112987

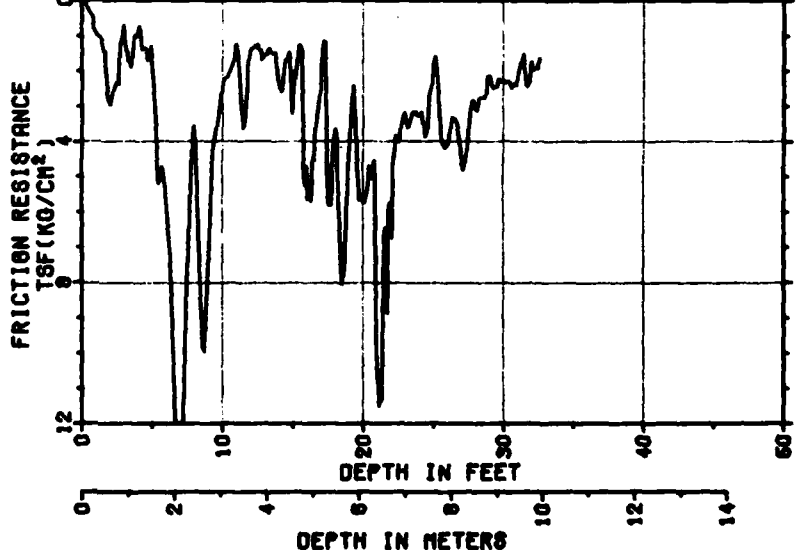




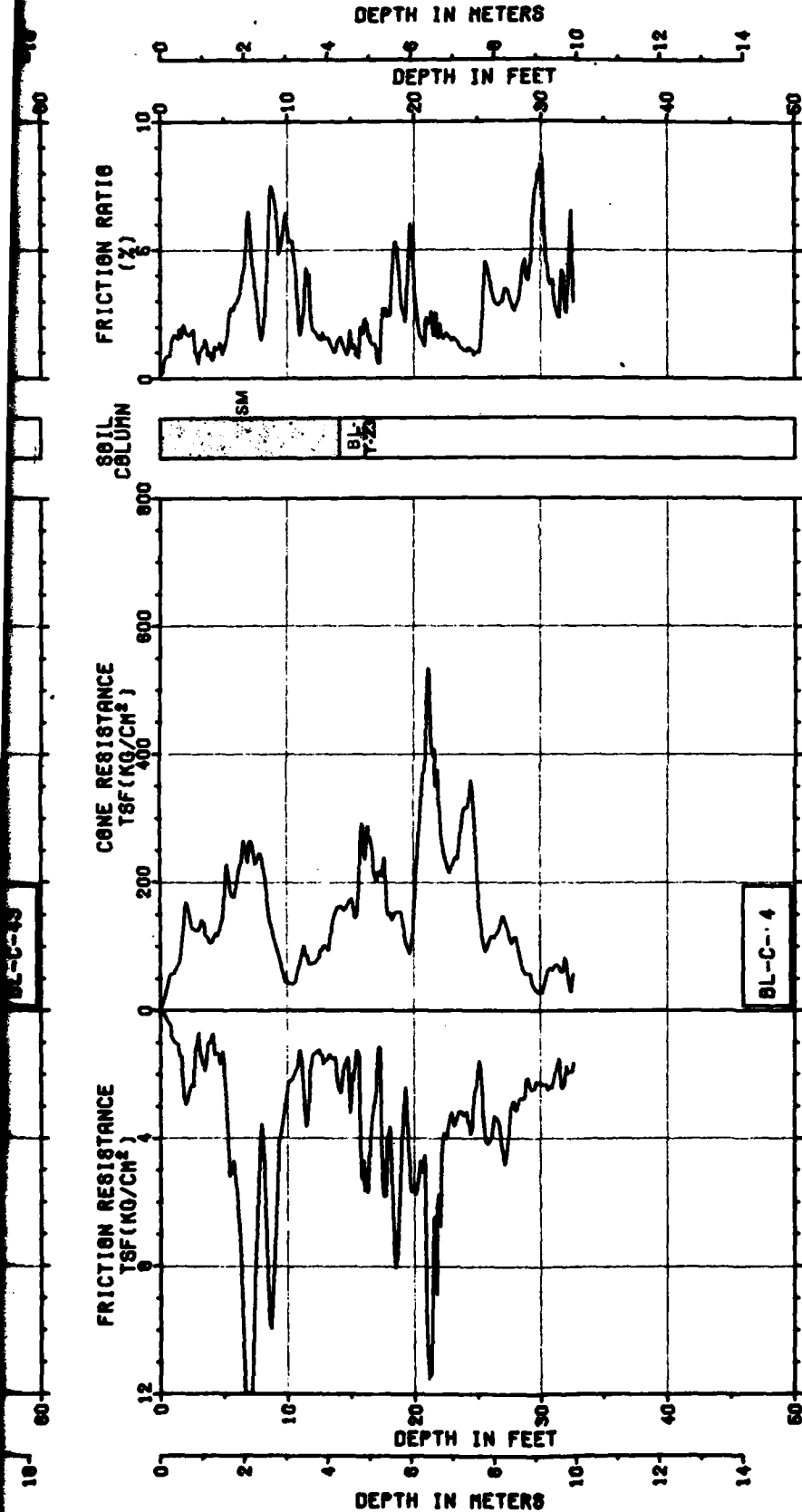
BL-C-43



BL-C-44



2



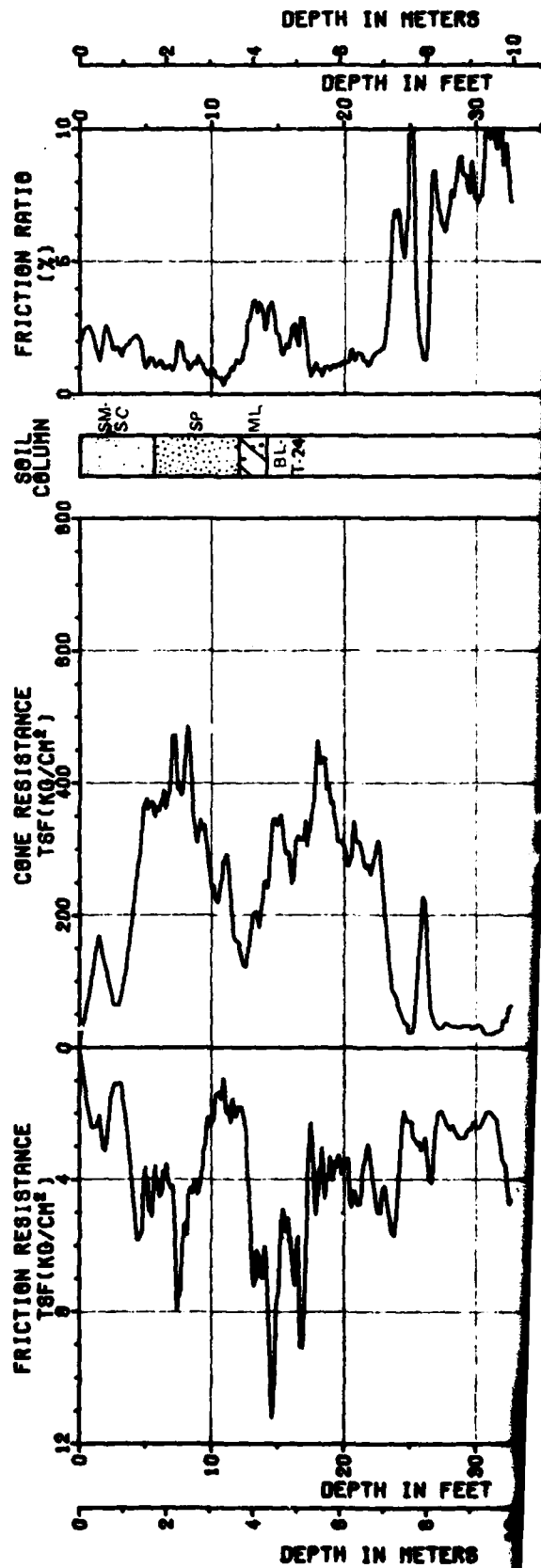
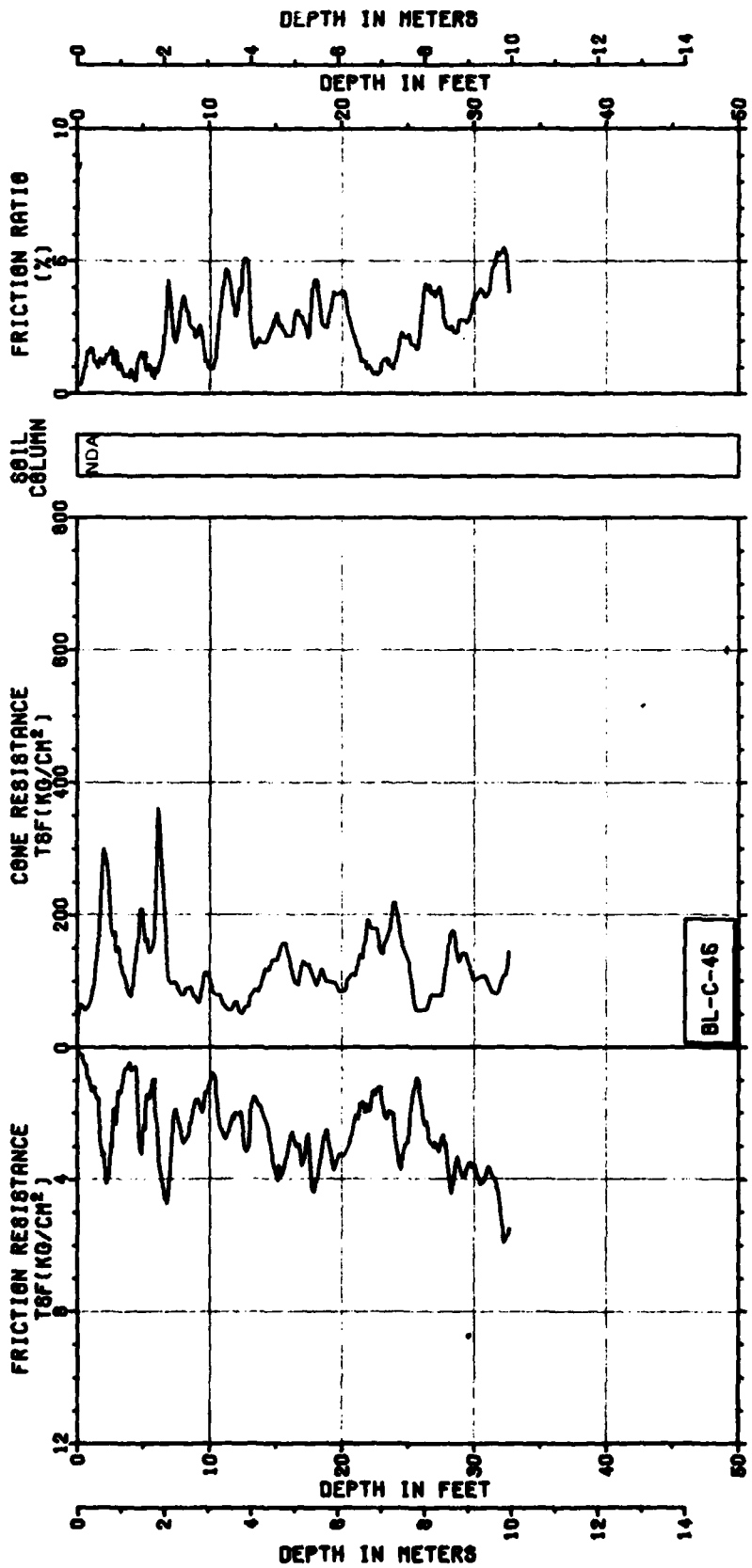
CONE PENETROMETER TESTS BY D&S, 43-8-65
 OPERATIONAL BASE SITE
 MORGAN, UTAH

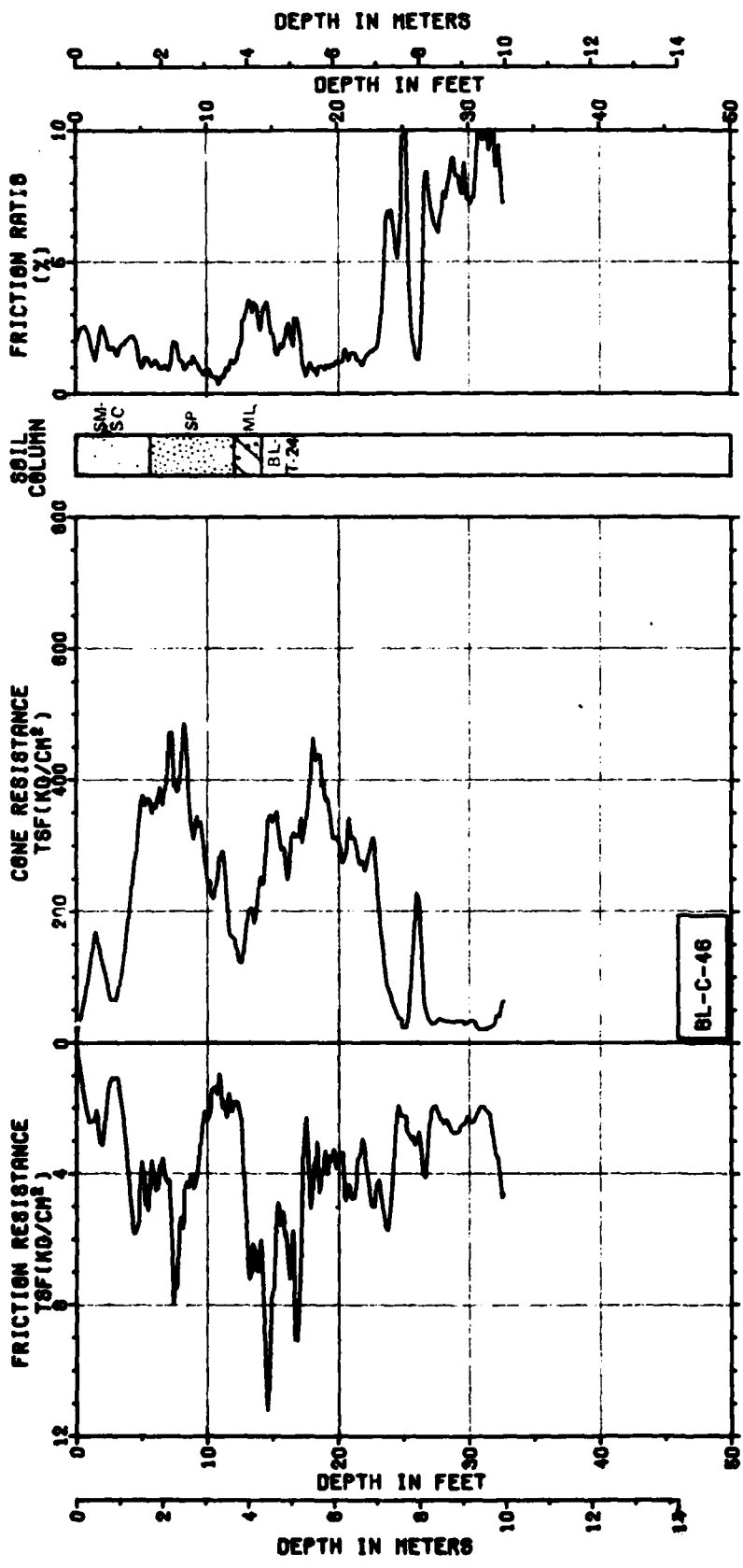
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 1-1
 M.C.E.

FUGRO NATIONAL, INC.

3





CONE PENETROMETER TEST BL-C-45 & 46
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-6-1
25 OF 25

FUGRO NATIONAL, INC.

2

FN-TR-44

SECTION 7.0
EXPLANATION OF
SEISMIC REFRACTION DATA

7.0 EXPLANATION OF SEISMIC-REFRACTION DATA

Each figure shows seismic wave travel times plotted versus surface distance between the energy source (shot) and the detector (geophone) for a single seismic line. Distances are measured along the line from geophone number 1 which is designated as zero distance. Distances to the right (on the paper) of geophone 1 are positive. The direction arrow gives the approximate direction along the geophone array from geophone 1 to geophone 24.

Travel Time Versus Distance Graph (Upper Half of Figure)

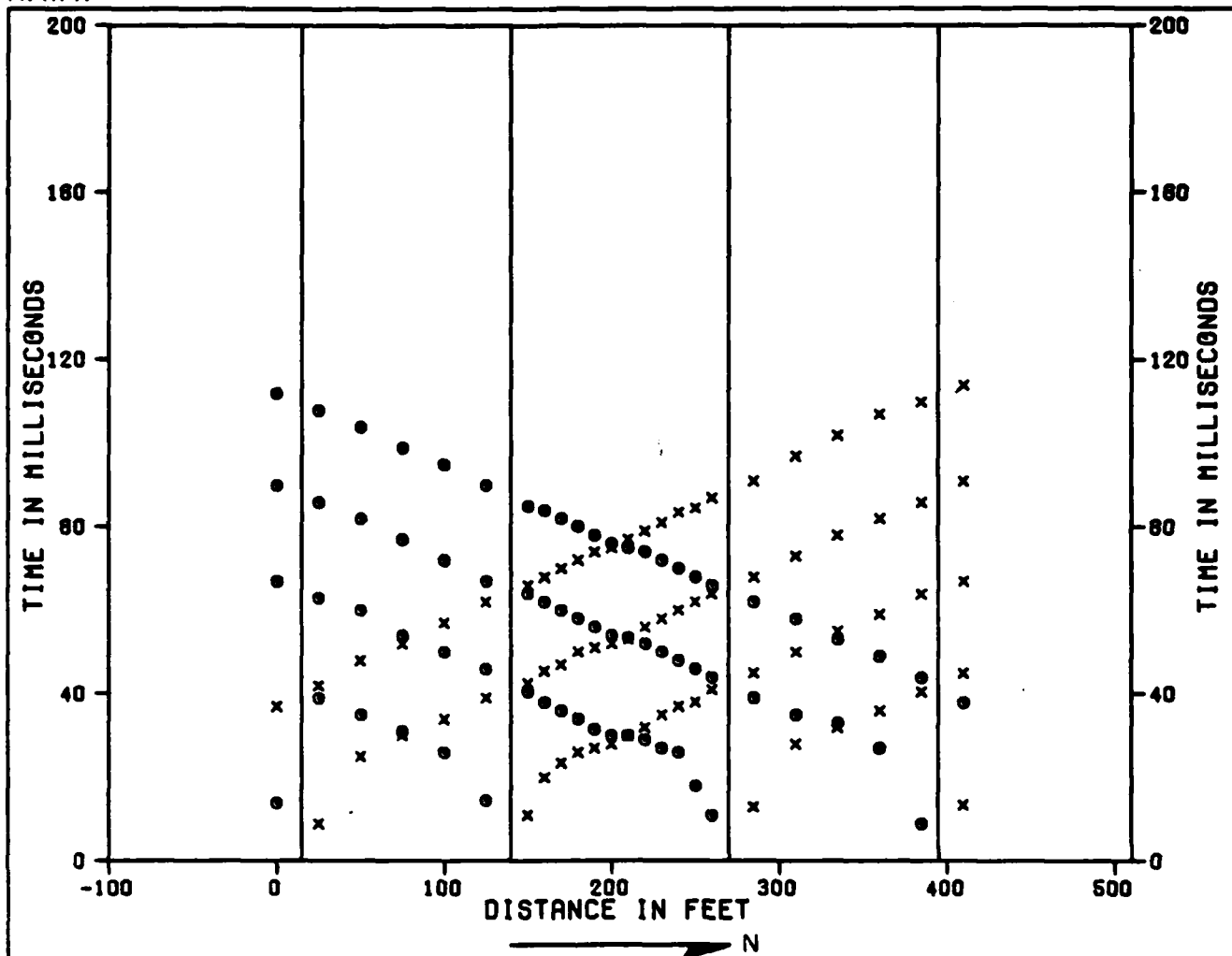
This is a travel time versus distance graph. The abscissa represents distance; the ordinate, time. The six vertical lines represent the locations of shots (designated as F, G, H, I, J, and K). The symbol, X, denotes travel times at geophones that were located to the right of a shot. The symbol, O, denotes travel times that were located to the left of shots.

Velocity Cross Section (Lower Half of Figure)

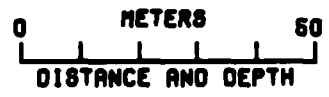
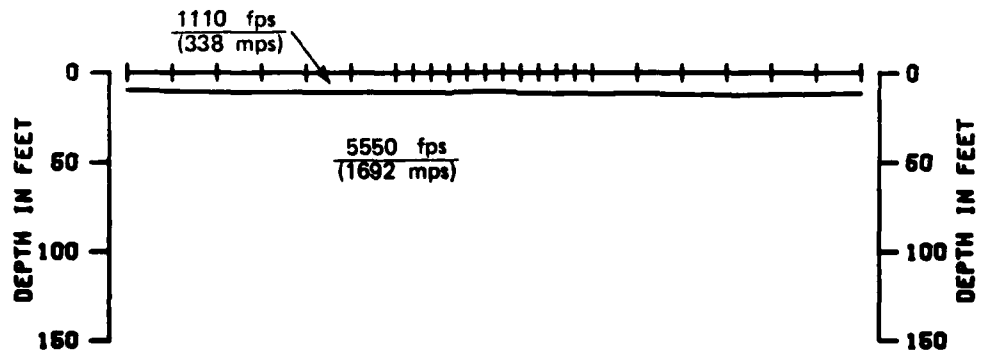
This is an interpreted velocity cross section beneath the seismic line. The top line represents the ground-surface profile. The short vertical lines crossing the top line mark the geophone positions. The depth scale is plotted relative to a point on the line which was arbitrarily chosen as "zero elevation" at the time the line was surveyed. The additional lines across the cross section represent the interpreted boundaries between layers of material with different compressional wave

velocities. These boundaries are commonly called "refractors." The velocity interpreted to be representative of each layer is shown.

NOTE: There were no seismic refraction lines at locations MD-SR-10 or MD-SR-11.



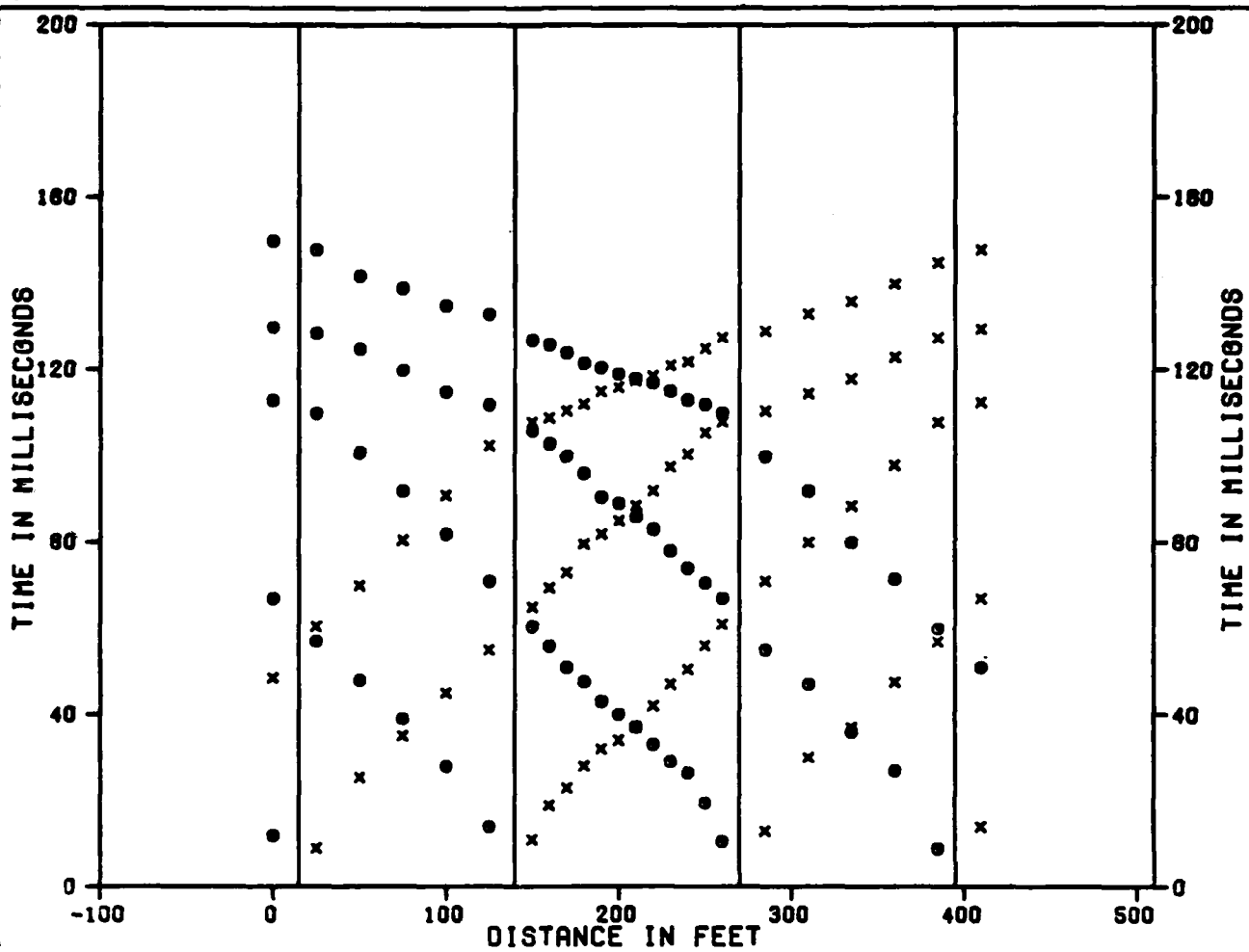
SHOT F G H I J K
 GEOPHONES 1 7 18 24



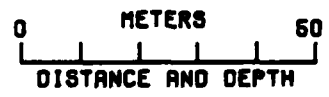
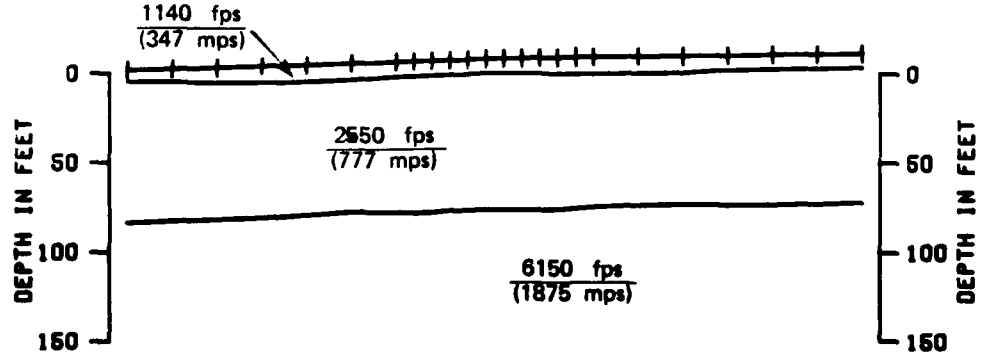
x TIMES TO RIGHT OF SHOTS
 o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE MD-S1 TIME DISTANCE DATA AND VELOCITY PROFILE OPERATIONAL BASE SITE, MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - SMO	FIGURE II-7-1

JUGRO NATIONAL, INC.



SHOT F G H I J K
 GEOPHONES 1 7 18 24

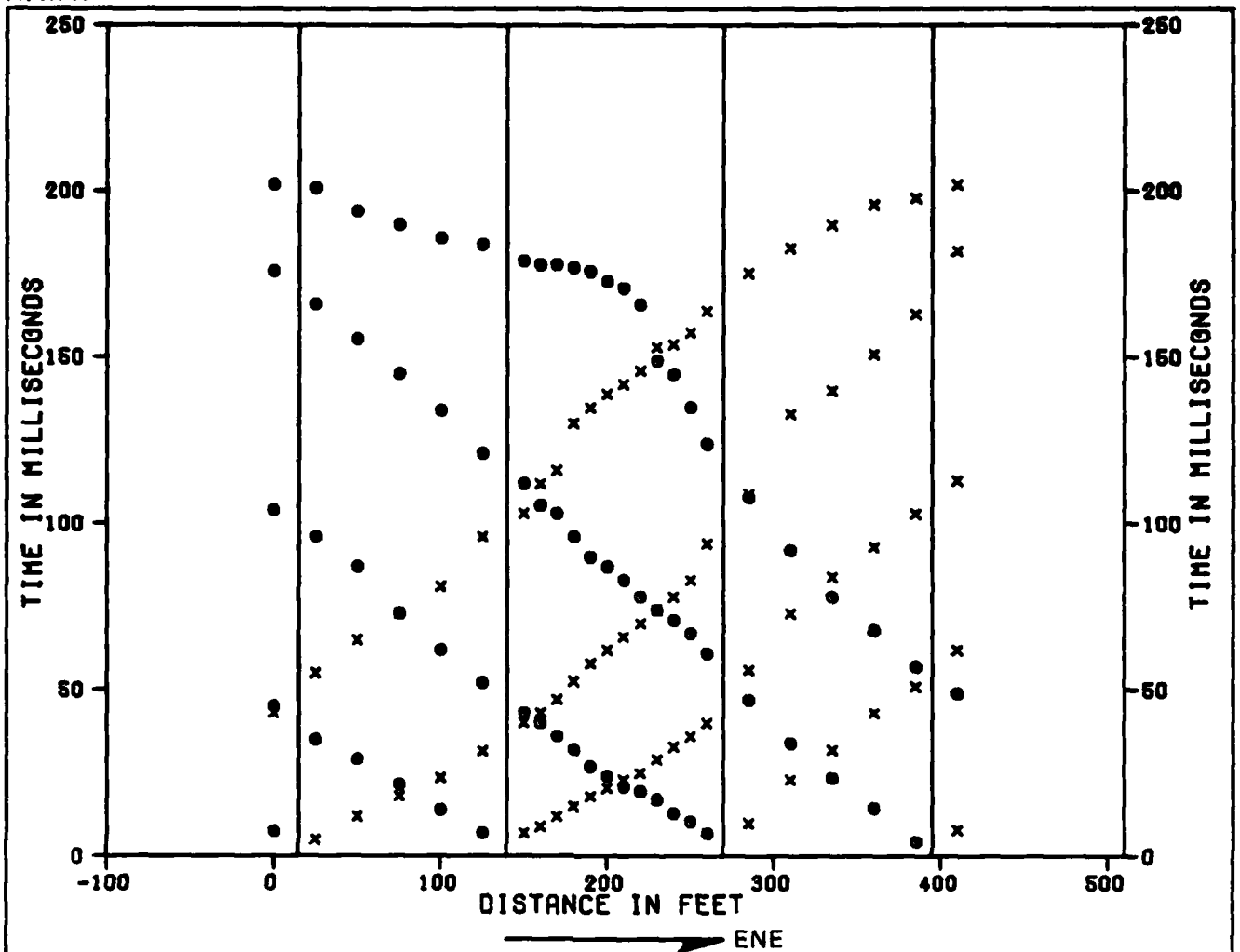


x TIMES TO RIGHT OF SHOTS
 o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE MD-S-2
 TIME DISTANCE DATA AND VELOCITY PROFILE
 OPERATIONAL BASE SITE, MILFORD, UTAH

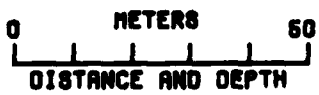
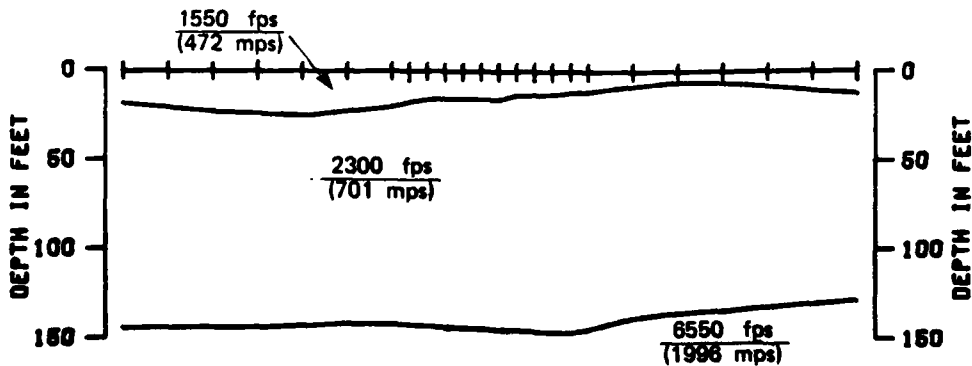
MX SITING INVESTIGATION FIGURE
 DEPARTMENT OF THE AIR FORCE - BMO II-7-2

FLUORO NATIONAL, INC.



SHOT F
GEOPHONES

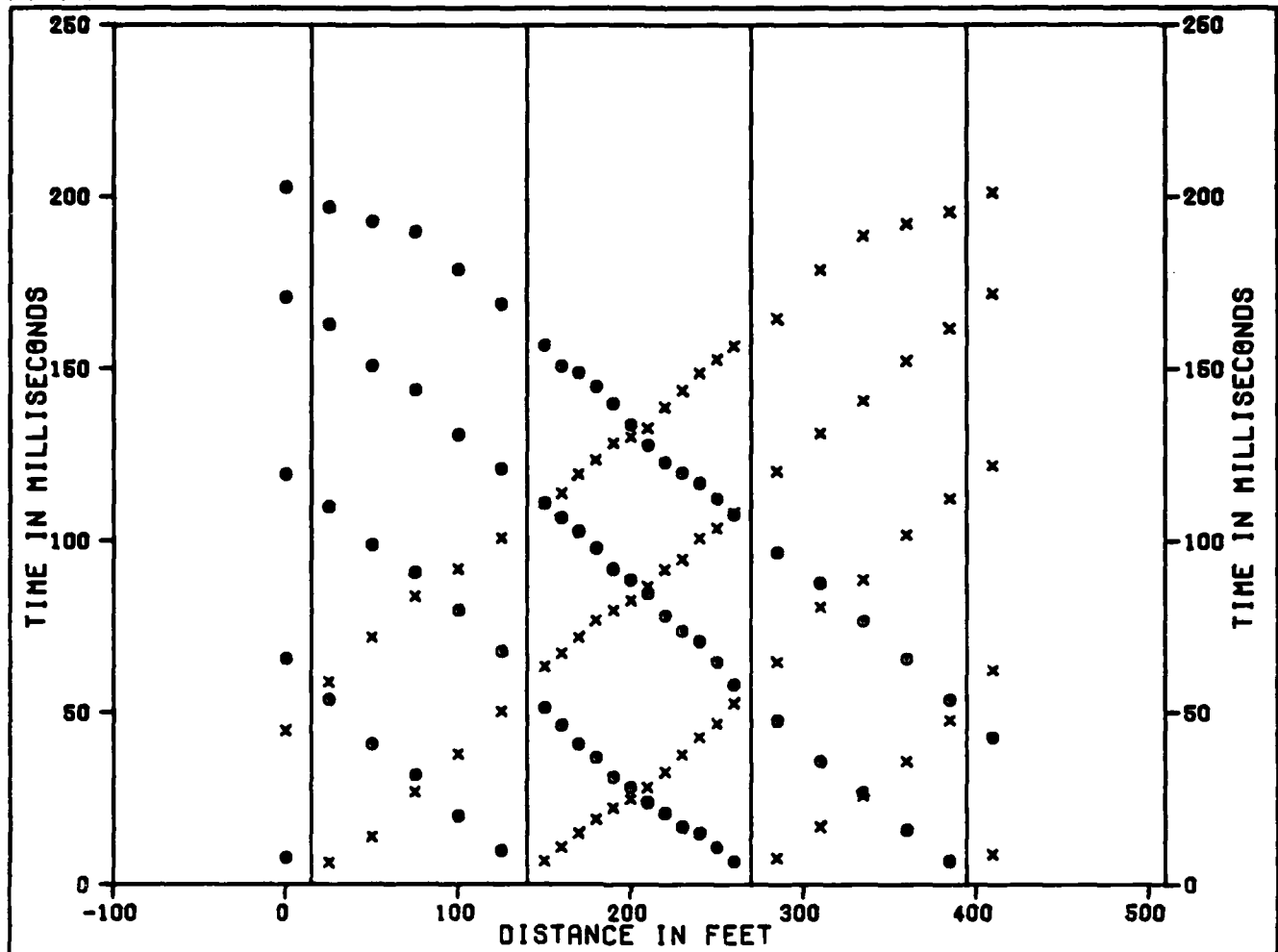
	G	H	I	J	K
	1	7	18	24	



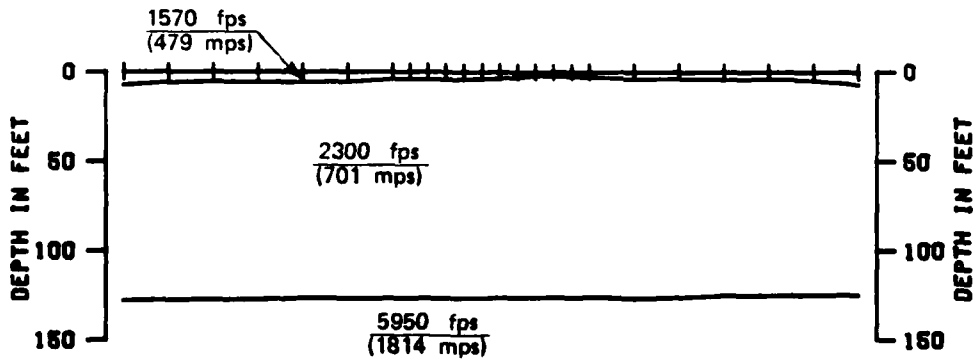
x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE MD-S-3 TIME DISTANCE DATA AND VELOCITY PROFILE OPERATIONAL BASE SITE, MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - SMO	FIGURE II-7-3

FUGRO NATIONAL, INC.



SHOT F G H I J K
 GEOPHONES 1 7 18 24



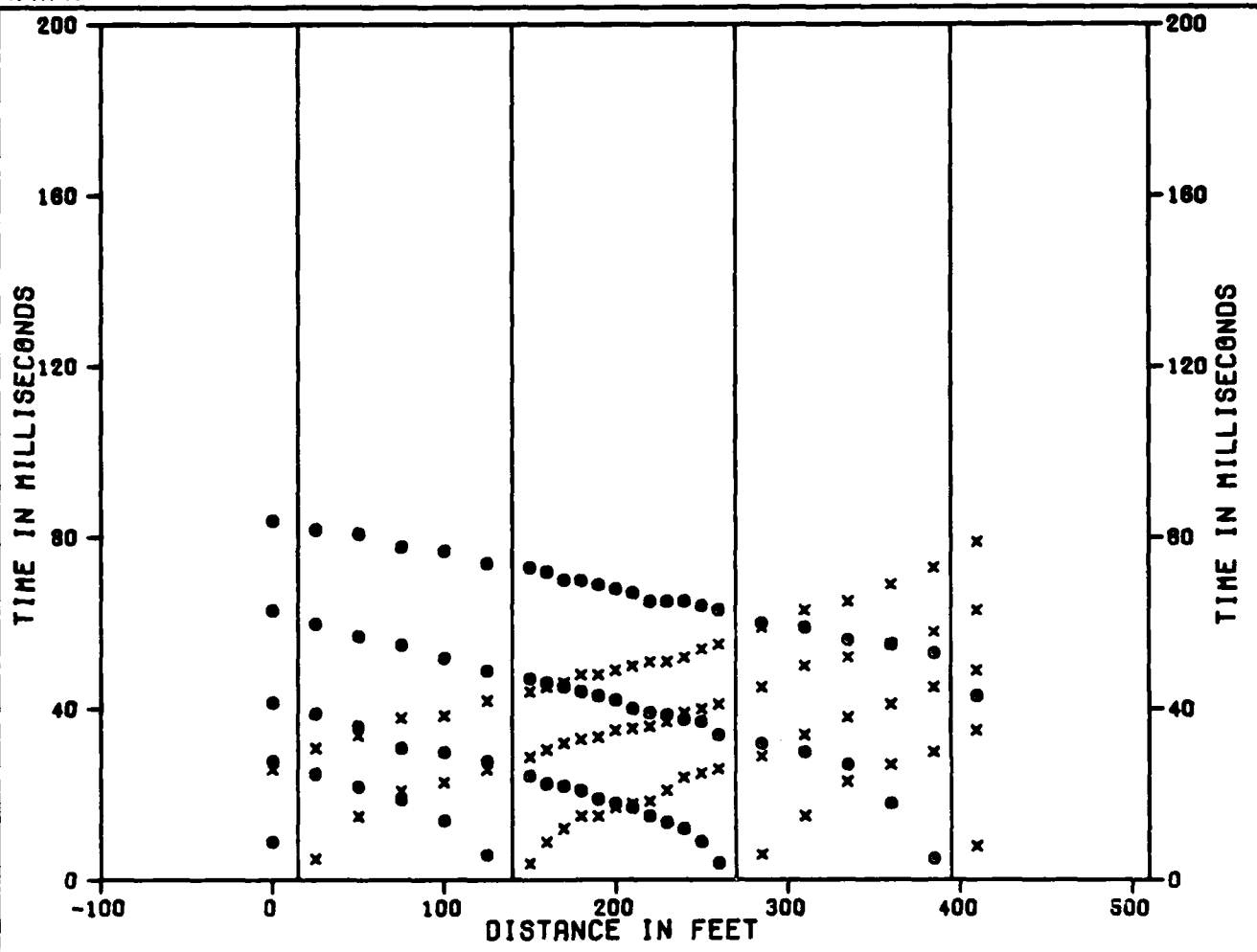
0 50
 METERS
 DISTANCE AND DEPTH

x TIMES TO RIGHT OF SHOTS
 o TIMES TO LEFT OF SHOTS

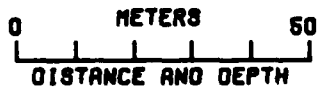
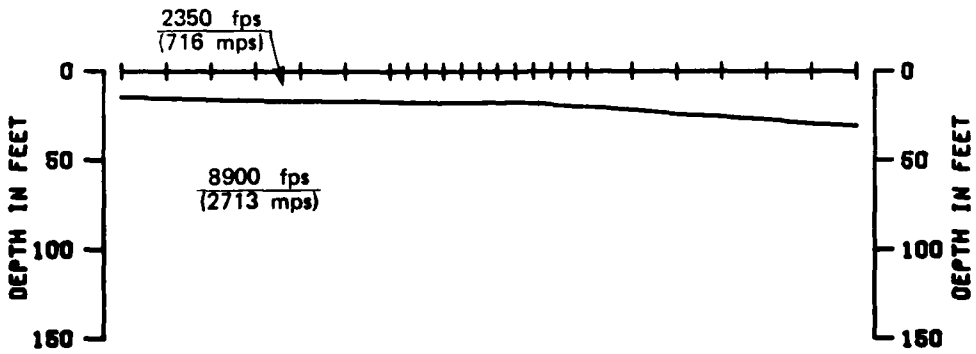
SEISMIC REFRACTION LINE MD-S-4
 TIME DISTANCE DATA AND VELOCITY PROFILE
 OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION FIGURE
 DEPARTMENT OF THE AIR FORCE - SMO II-7-4

FUGRO NATIONAL, INC.



SHOT F G H I J K
 GEOPHONES 1 7 18 24

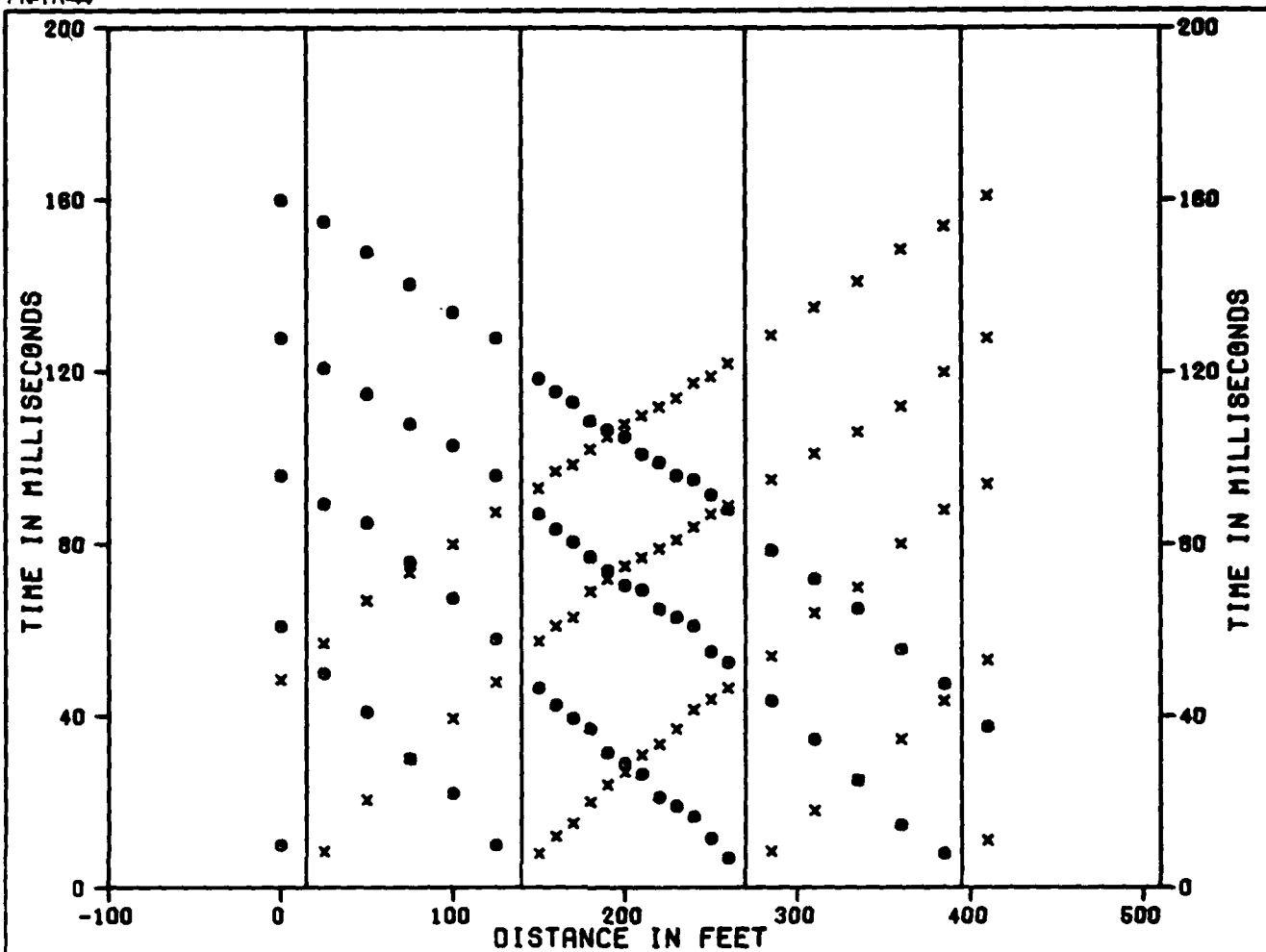


x TIMES TO RIGHT OF SHOTS
 o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE MD-S-5
 TIME DISTANCE DATA AND VELOCITY PROFILE
 OPERATIONAL BASE SITE, MILFORD, UTAH

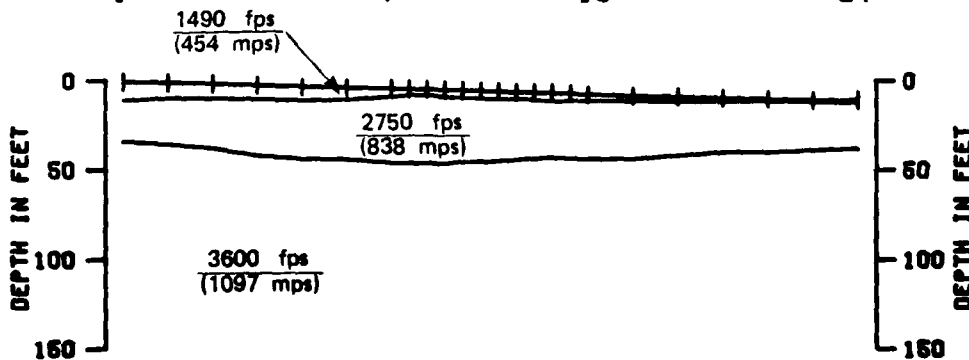
MX SITING INVESTIGATION FIGURE
 DEPARTMENT OF THE AIR FORCE - SMO II-7-5

FUGRO NATIONAL, INC.



SHOT F G H I J K

GEOPHONES 1 7 18 24



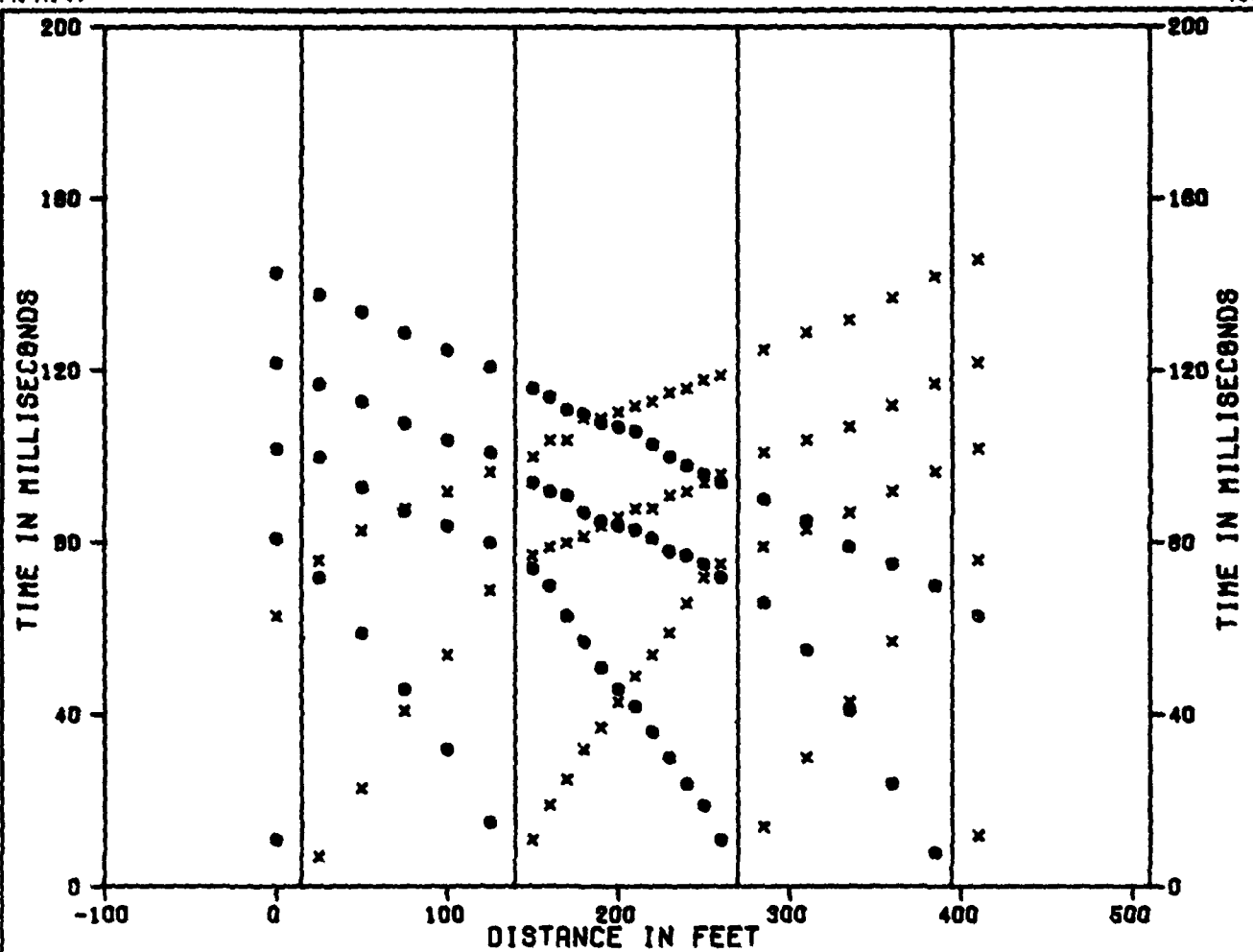
0 METERS 50

DISTANCE AND DEPTH

x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

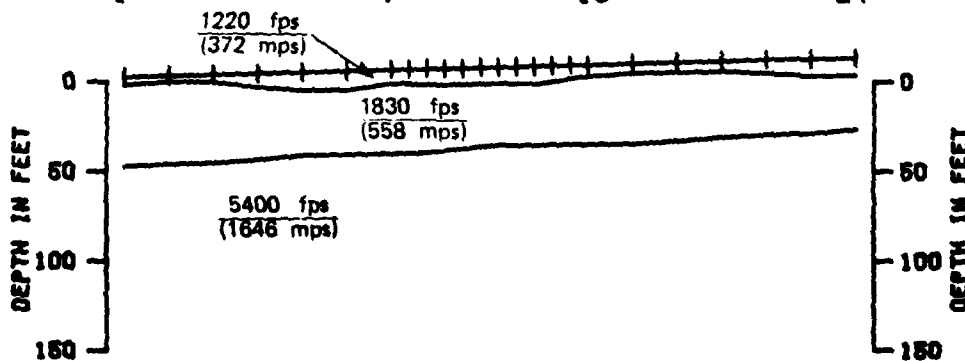
SEISMIC REFRACTION LINE MD-S-6 TIME DISTANCE DATA AND VELOCITY PROFILE OPERATIONAL BASE SITE, MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - SMO	FIGURE II-7-6

JUGRO NATIONAL, INC.



SHOT F
 GEOPHONES

	G	H	I	J	K
	1	7	18	24	

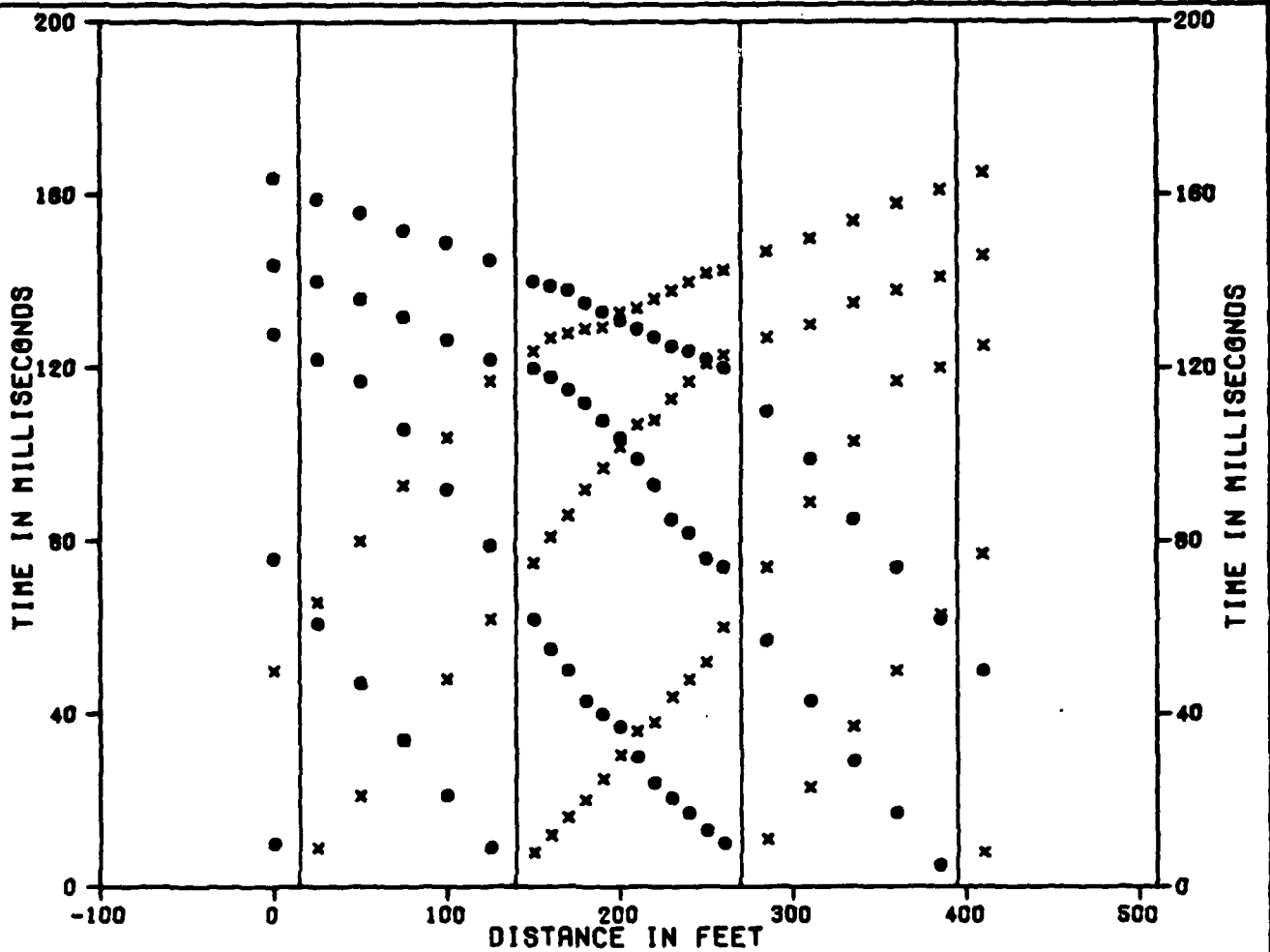


x TIMES TO RIGHT OF SHOTS
 o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE MD-S-7
 TIME DISTANCE DATA AND VELOCITY PROFILE
 OPERATIONAL BASE SITE, MILFORD, UTAH

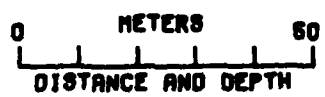
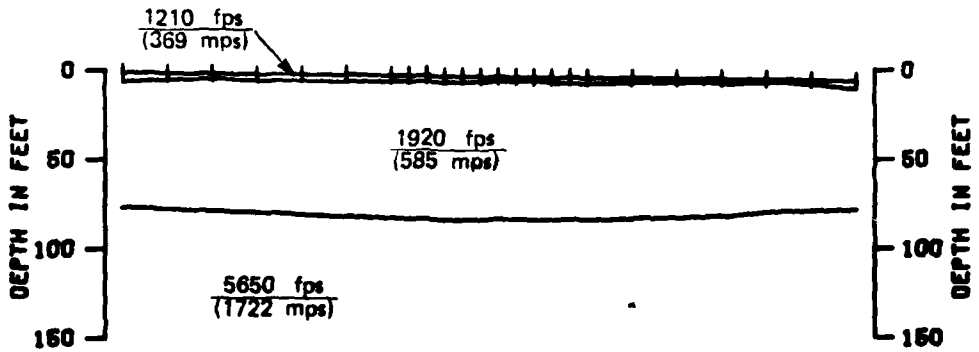
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - SMO	FIGURE II-7-7
--	------------------

FUGRO NATIONAL, INC.



SHOT F
GEOPHONES

	G	H	I	J	K
	1	7	18	24	



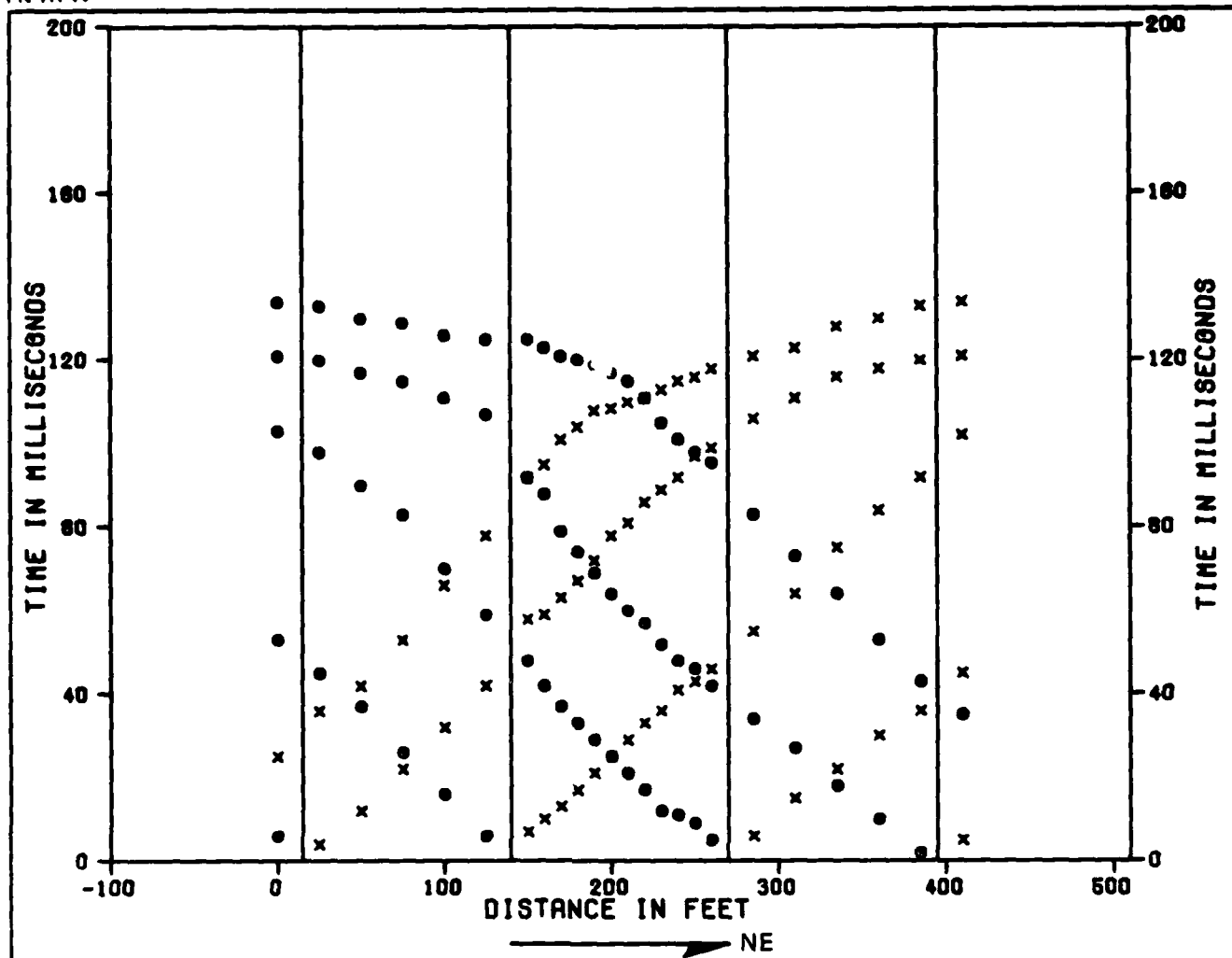
x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE MD-S-8
TIME DISTANCE DATA AND VELOCITY PROFILE
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

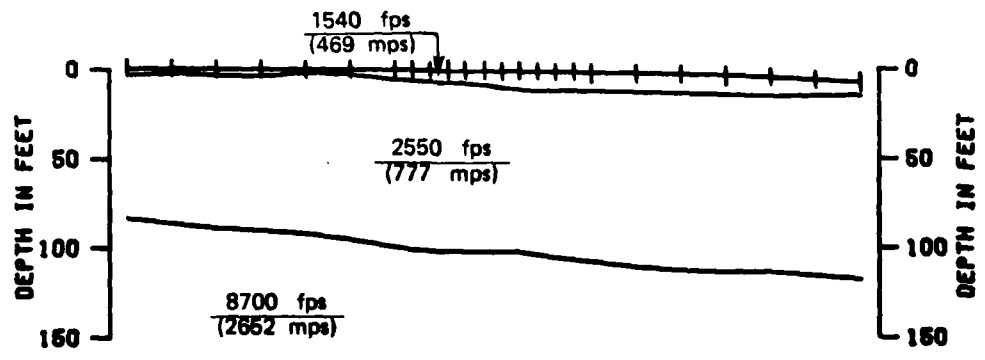
FIGURE
II-7-8

FUGRO NATIONAL, INC.



SHOT F
GEOPHONES

	G	H	I	J	K
	1	7	18	24	

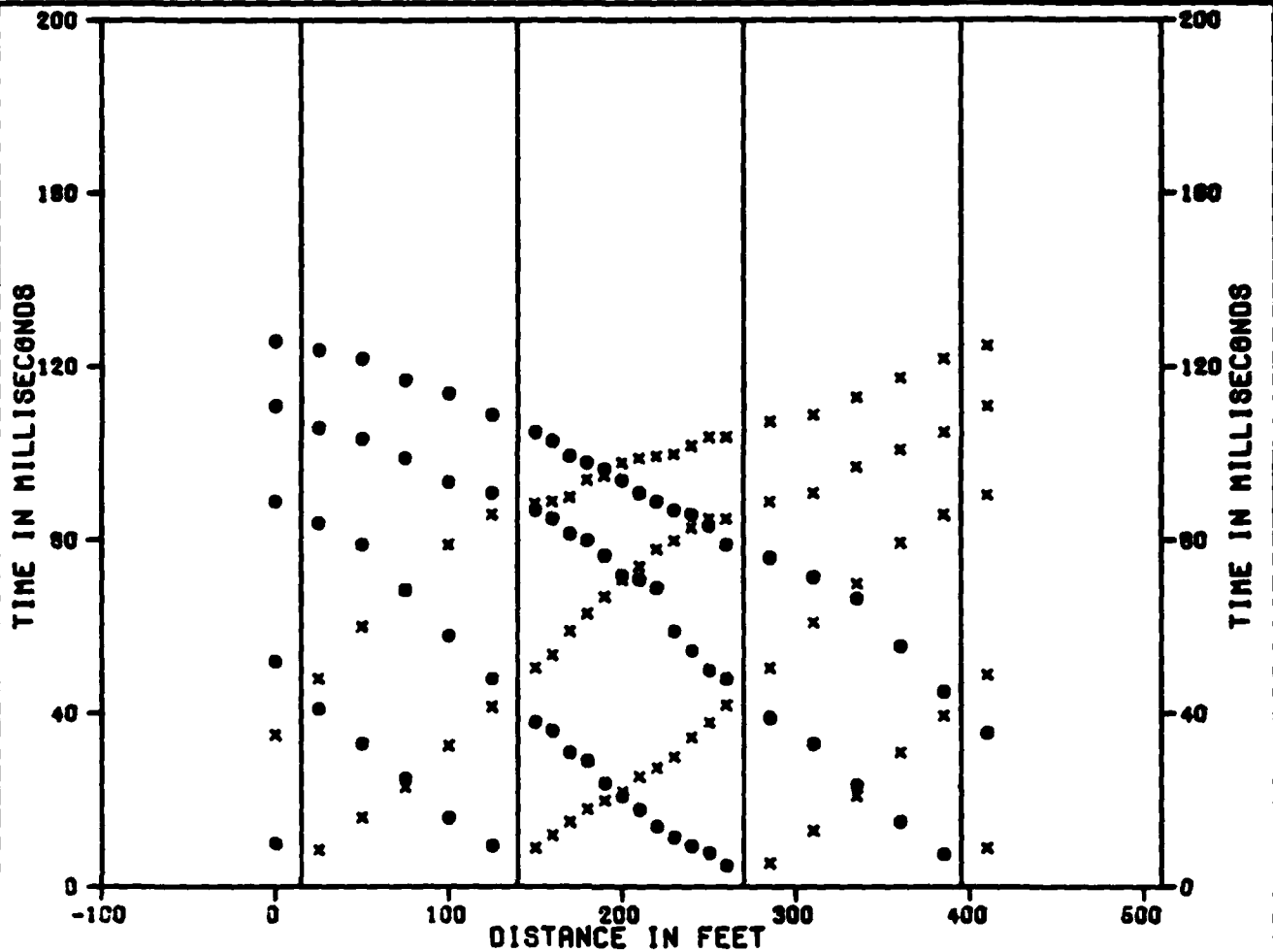


0 METERS 50
DISTANCE AND DEPTH

x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

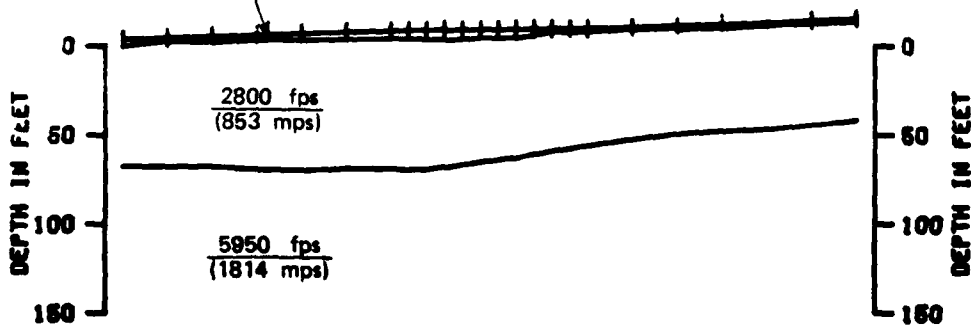
SEISMIC REFRACTION LINE MD-S-9 TIME DISTANCE DATA AND VELOCITY PROFILE OPERATIONAL BASE SITE, MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - BMO	FIGURE II-7-9

JUBRO NATIONAL, INC.



SHOT F
GEOPHONES

	G	H	I	J	K
	1	7	18	24	
		1470 fps (448 mps)			



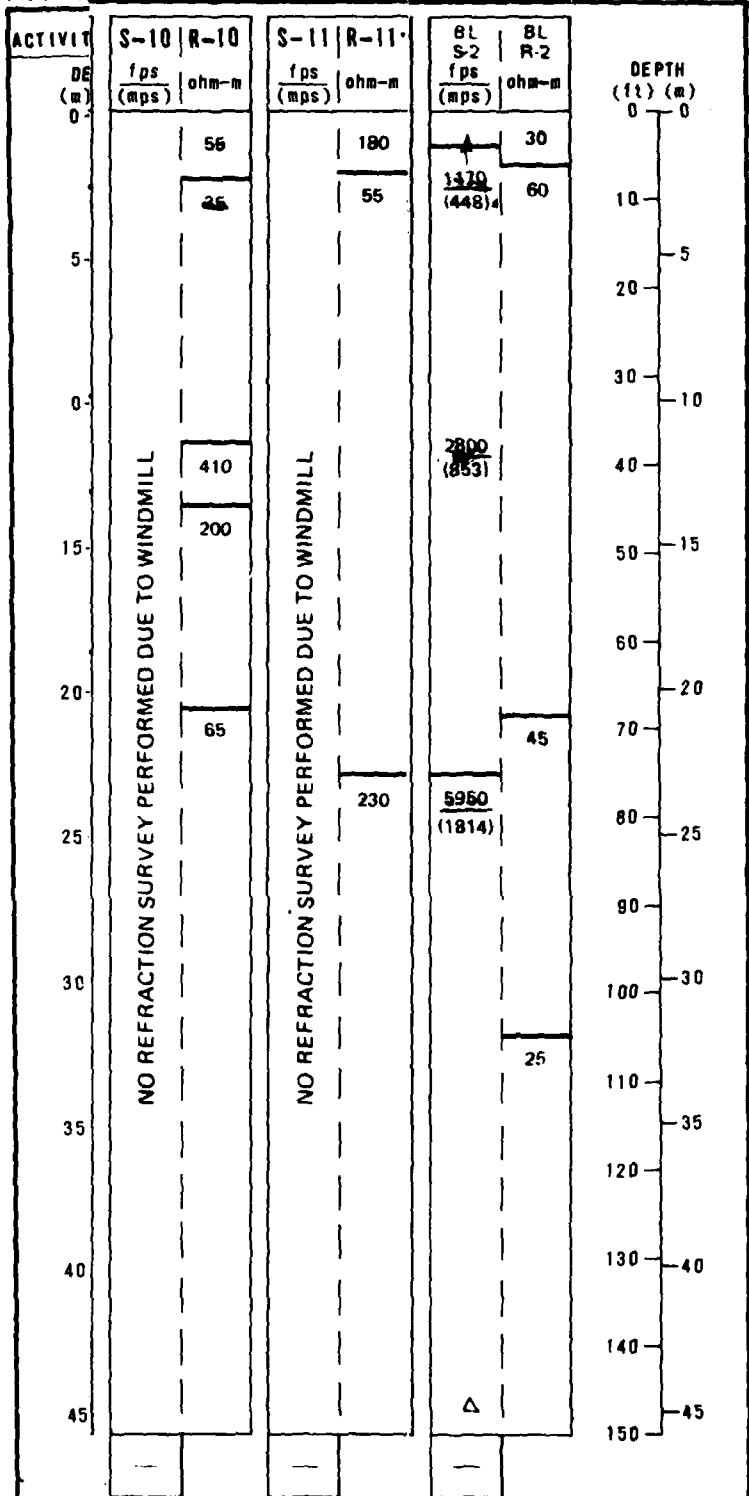
x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE BL-S-2
TIME DISTANCE DATA AND VELOCITY PROFILE
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

FIGURE
II-7-10

JUGRO NATIONAL, INC.



SHALLOW SEISMIC REFRACTION
VELOCITY PROFILE
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE DMO

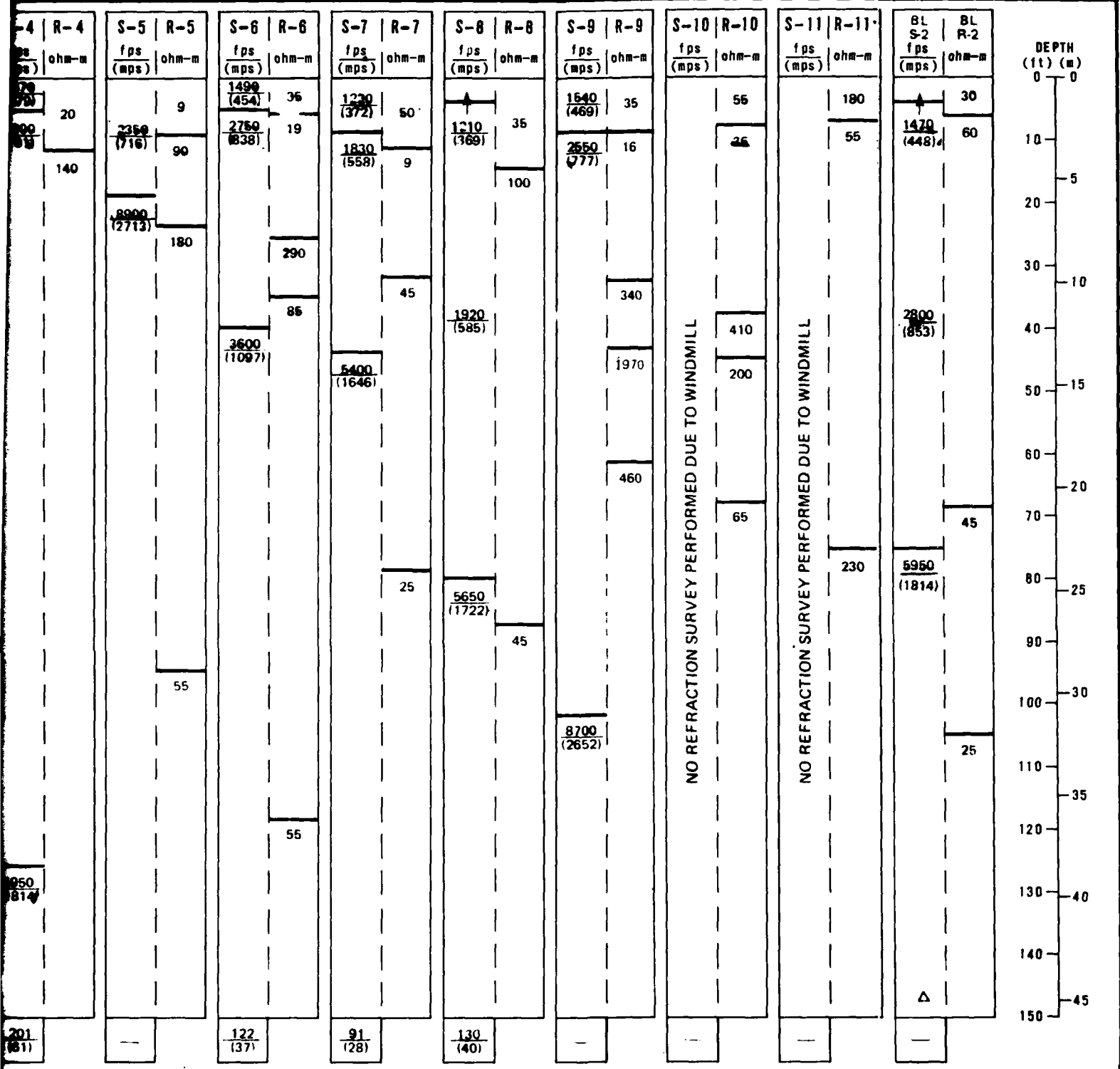
TABLE
II-7-1

FUGRO NATIONAL, INC.

ACTIVITY NO.	S-1		R-1		S-2		R-2		S-3		R-3		S-4		R-4		S-5		R-5		S-6		R-6		S-7		R-7		S-8		R-8	
	DEPTH (m) (ft)	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m			
	0																															
	10	1110 (338)	2		1140 (347)		110		1550 (473)		90		1670 (479)		20		2350 (716)		9		1490 (454)		36		1230 (372)		50		1210 (369)		35	
	5	5550 (1692)	4		2550 (777)		14		2300 (701)		45		2200 (701)		140				90		2750 (838)		19		1830 (558)		9			100		
	20																															
	30																															
	40						90																									
	15																															
	50																															
	60																															
	20																															
	70																															
	25																															
	80																															
	90					6150 (1875)																										
	30																															
	110																															
	35																															
	120																															
	40																															
	130																															
	140																															
	45																															
	150																															
	* ft (m)	100 (30)			120 (37)				215 (66)				201 (61)								122 (37)				91 (28)			130 (40)				

* Approximate depth above which there is no indication of material with a velocity as great as 7000 fps (2134 mps). See Appendix A for an explanation of how this exclusion depth is calculated when the observed velocities are all less than 7000 fps (2134 mps).

▲ 11450 (3490) @ 177 ft (54 m)
 △ 11500 (3505) @ 177 ft (54 m)



Indication of material
 (34 mps) See Appendix A
 depth is calculated
 then 7000 fps (2134 mps).

▲ 11450 (3490) 177 ft (54 m)
 △ 11500 (3505) 177 ft (54 m)

**SHALLOW SEISMIC REFRACTION
 VELOCITY PROFILE
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE **DND**

TABLE
II-7-1

JUGRO NATIONAL, INC.

AFV-18

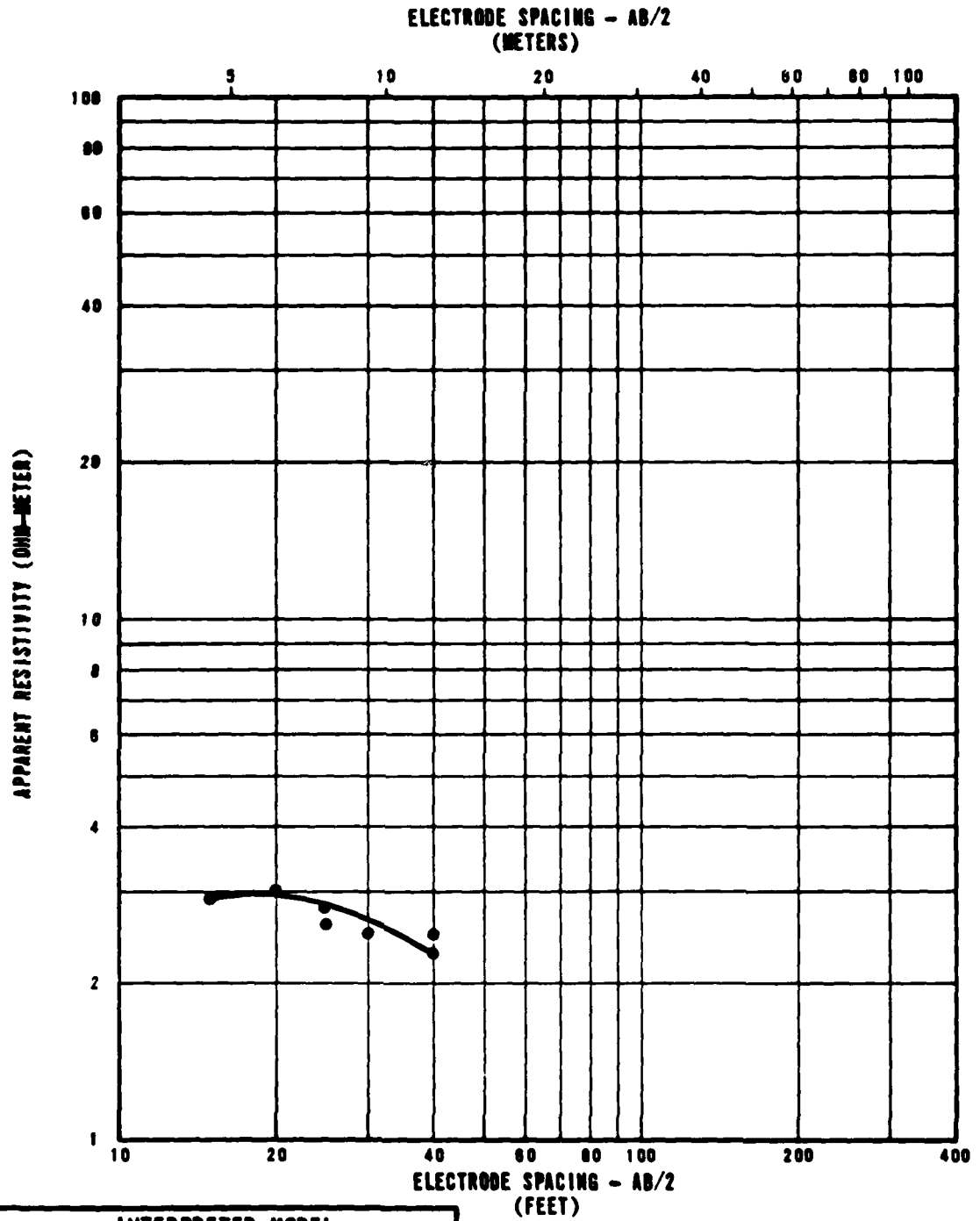
FN-TR-44

SECTION 8.0
EXPLANATION OF
ELECTRICAL RESISTIVITY DATA

8.0 EXPLANATION OF ELECTRICAL RESISTIVITY DATA

Each figure in this section presents the data obtained from a resistivity sounding and a tabulated model of resistivity layers that would produce a curve similar to the observed curve. The upper portion of the figures is a graph in which measured apparent resistivity values in ohm-meters are plotted versus one-half the distance between the current electrodes.

The interpreted model tabulated at the bottom of the figures shows a combination of true resistivity layers and thicknesses obtained by matching theoretical curves to the field curve.



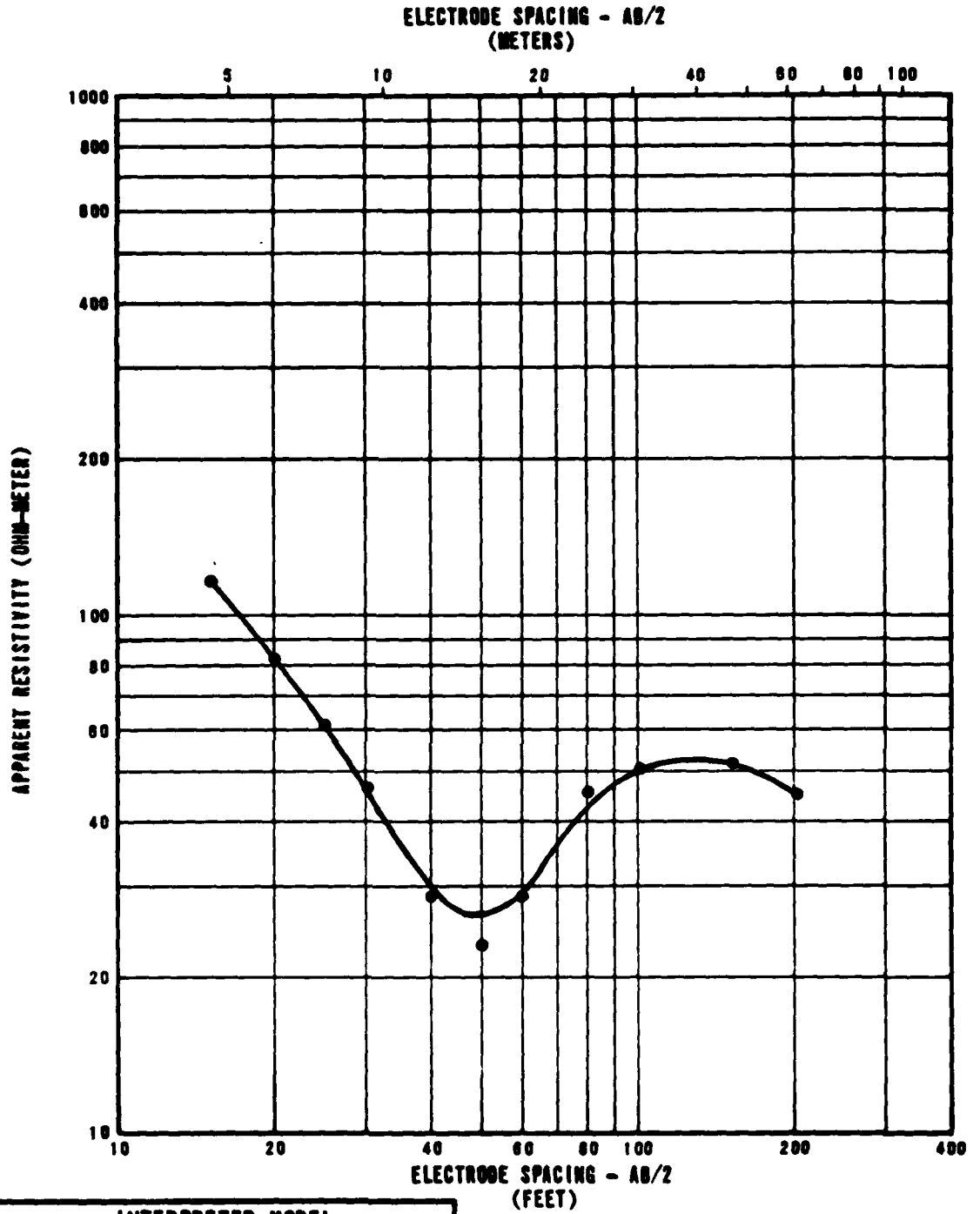
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	2
6	2	4

RESISTIVITY SOUNDING MD-R-1
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-8-1

FUGRO NATIONAL, INC.



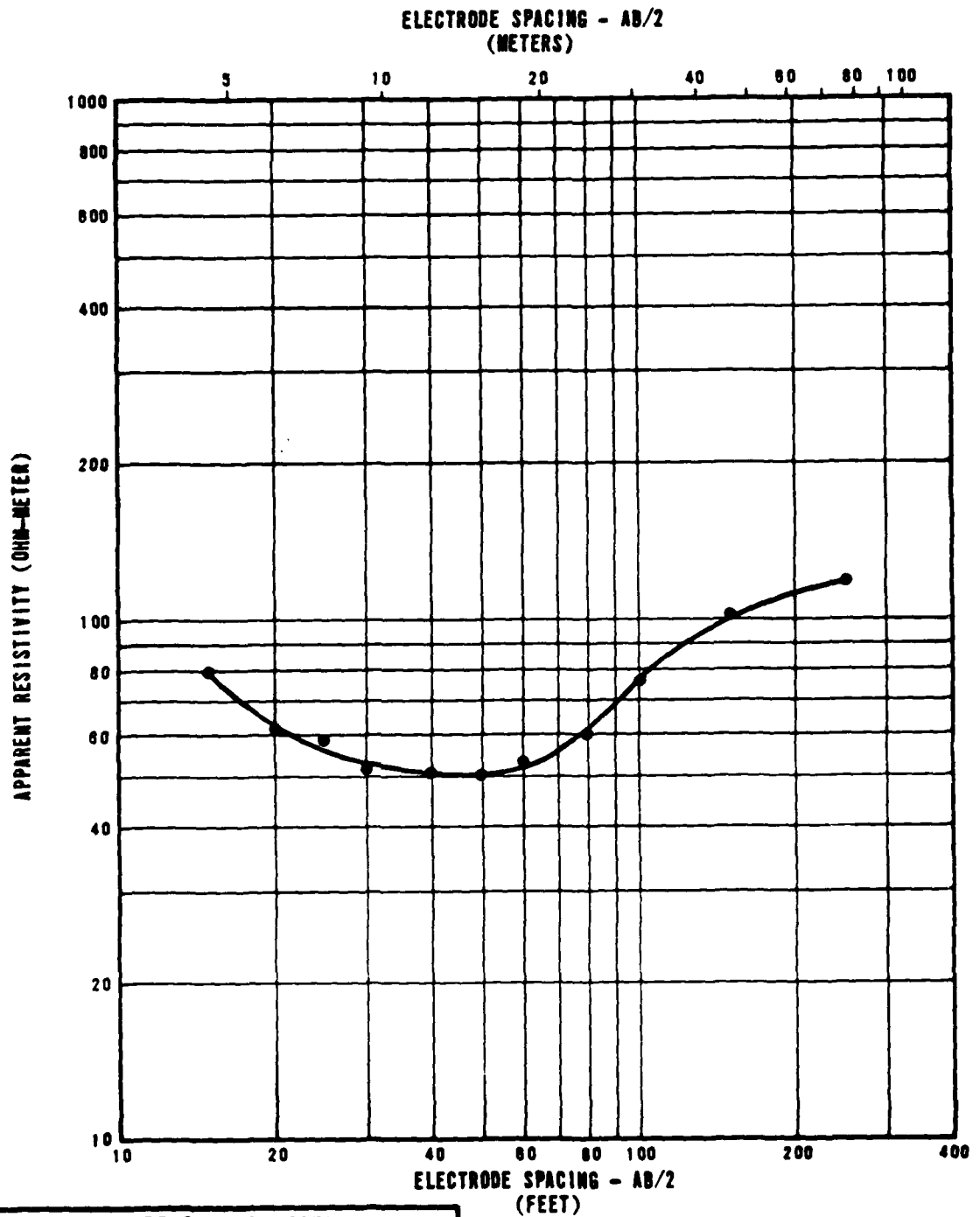
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	110
15	5	14
37	11	90
103	31	35

RESISTIVITY SOUNDING MD-R-2
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

FIGURE
II-8-2

JUBRO NATIONAL, INC.



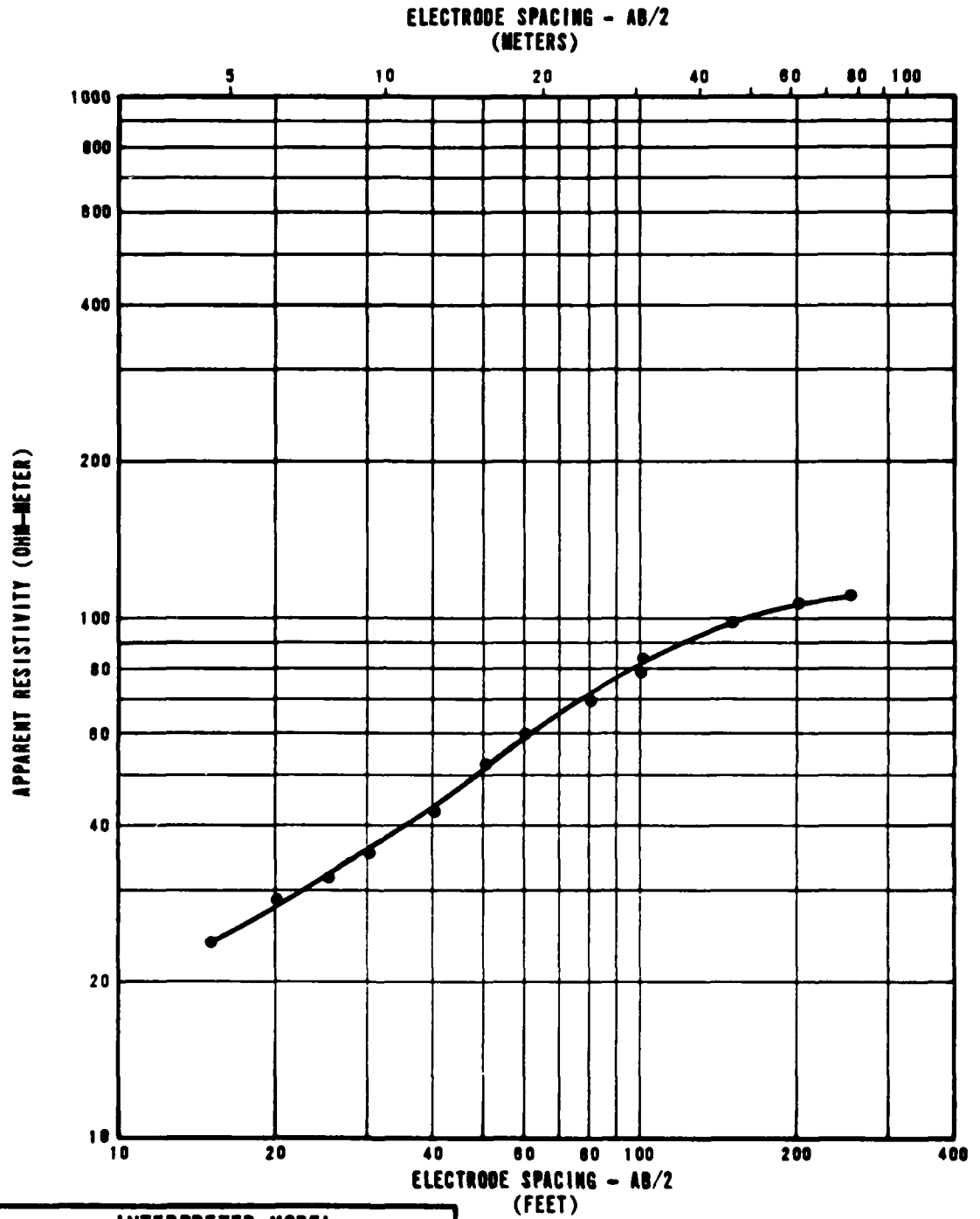
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	90
8	2	45
54	16	240
149	45	140

RESISTIVITY SOUNDING MD-R-3
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-8-3

FUGRO NATIONAL INC.



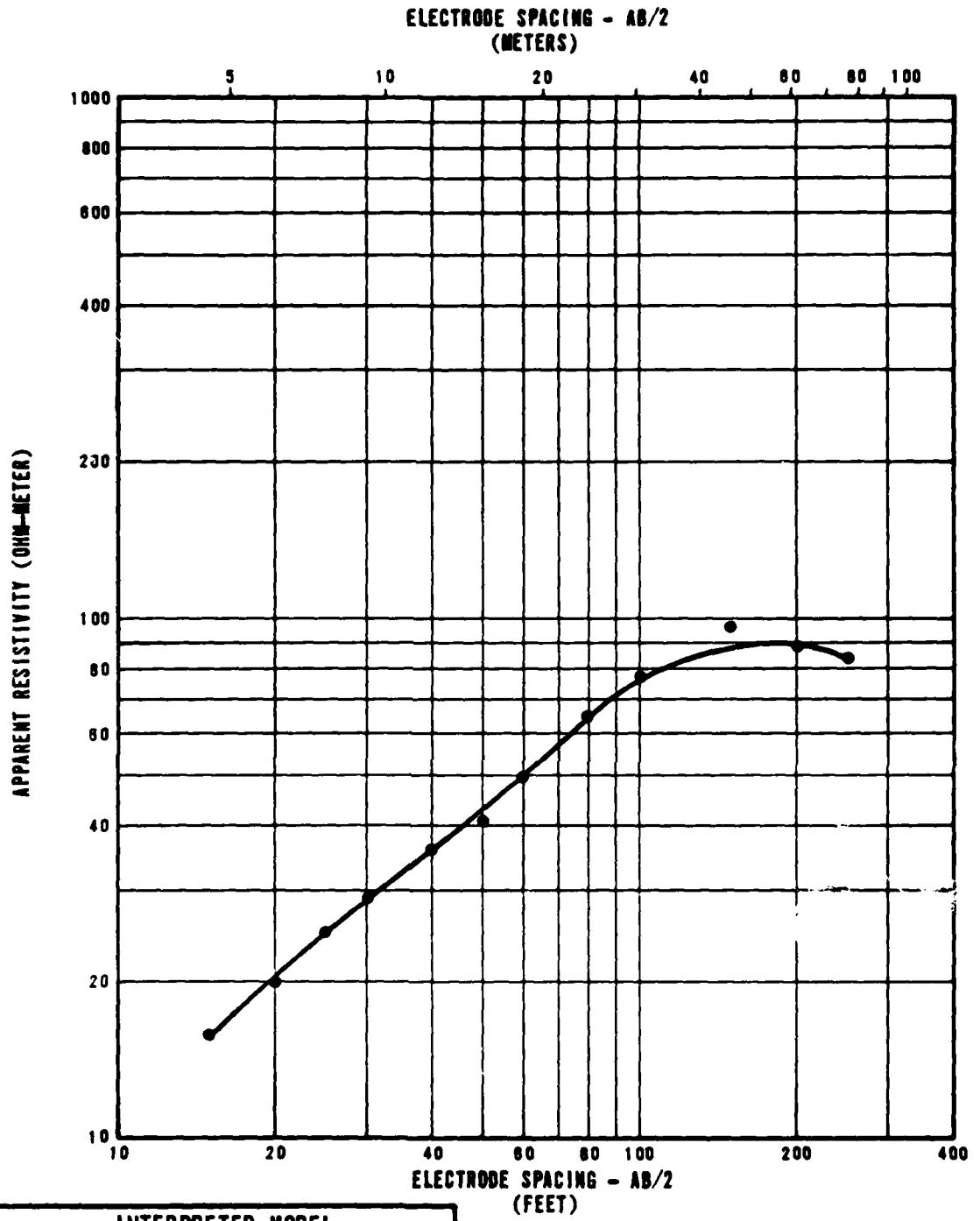
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	20
12	4	140

RESISTIVITY SOUNDING MD-R-4
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

FIGURE
II-8-4

FUGRO NATIONAL, INC.

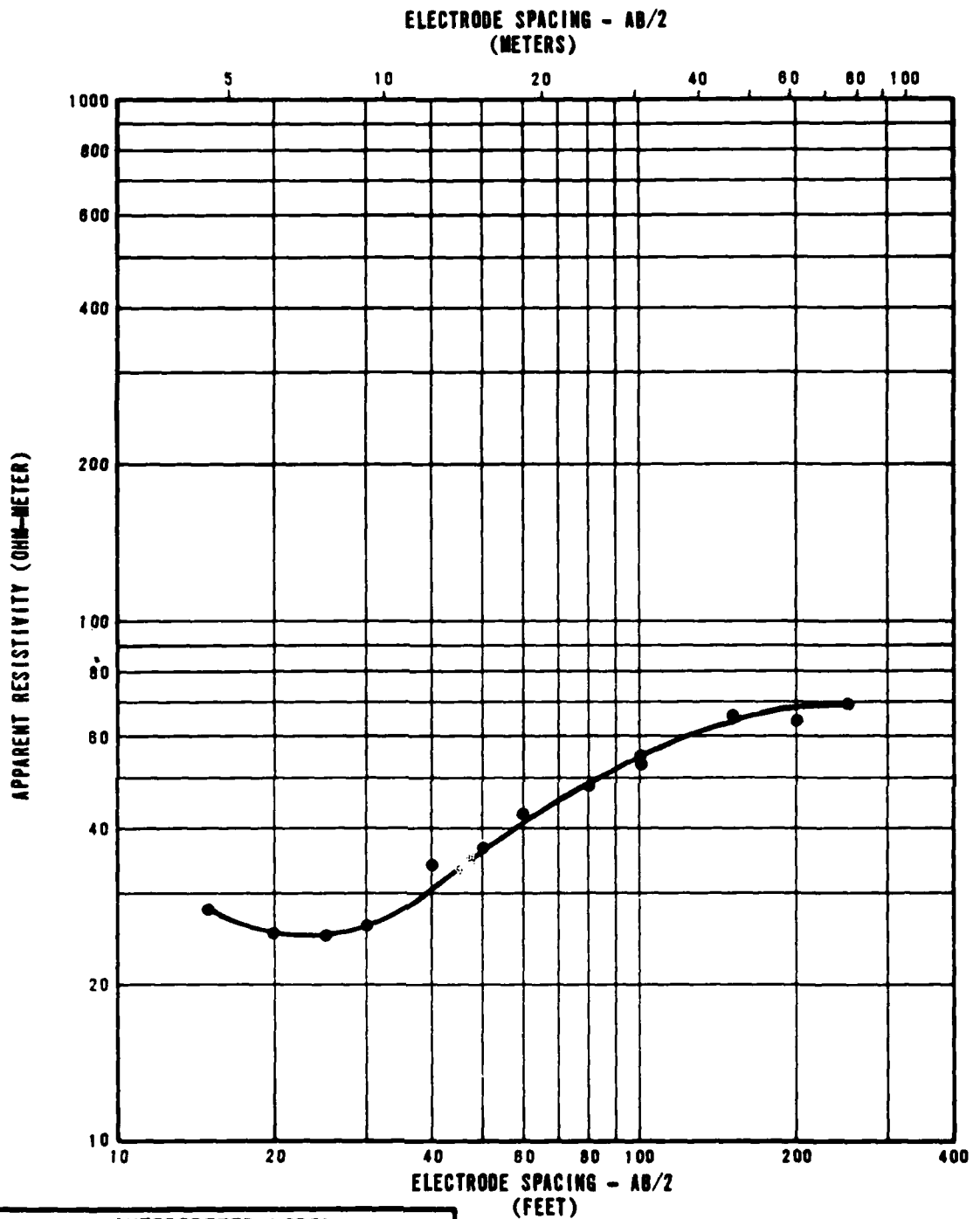


INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	9
8	2	90
24	7	180
98	29	55

RESISTIVITY SOUNDING MD-R-5
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-8-5
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UGRO NATIONAL, INC.



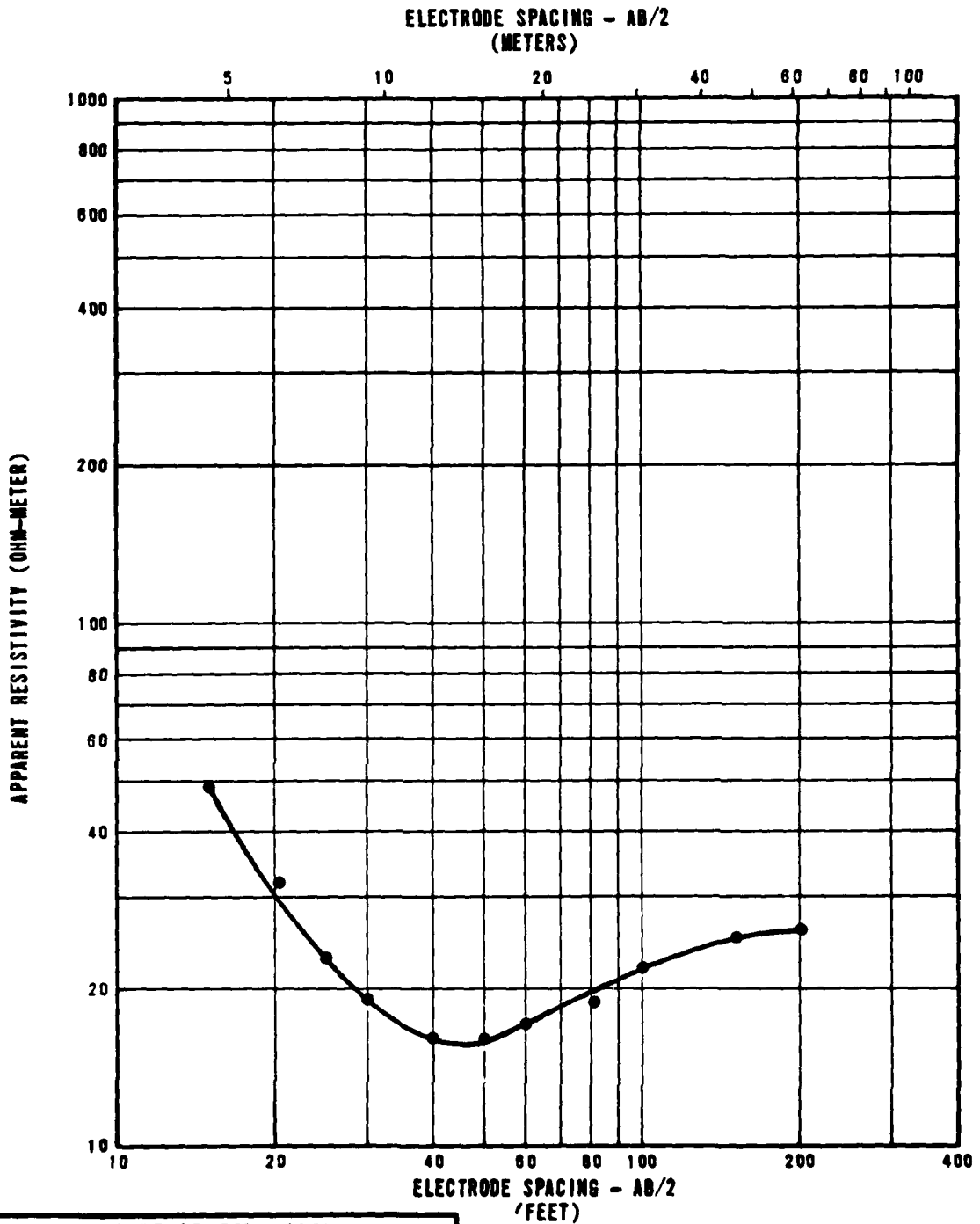
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	35
5	2	19
25	8	290
35	11	85
119	36	55

RESISTIVITY SOUNDING MD-R-6
 SOUNDING CURVE AND INTERPRETATION
 OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-8-6

FUGRO NATIONAL, INC.

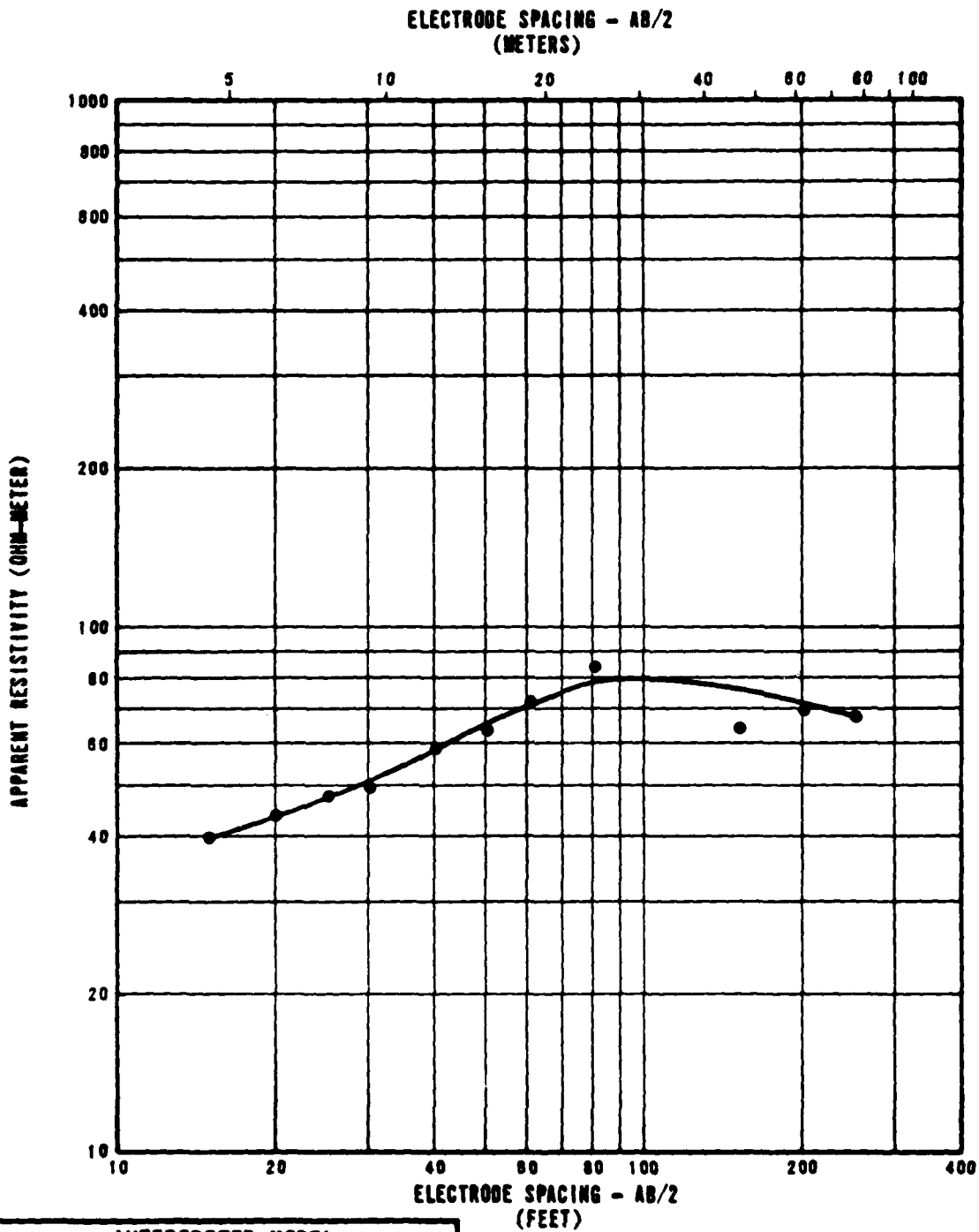


INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	50
11	3	9
32	10	45
79	24	25

RESISTIVITY SOUNDING MD-R-7
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-8-7
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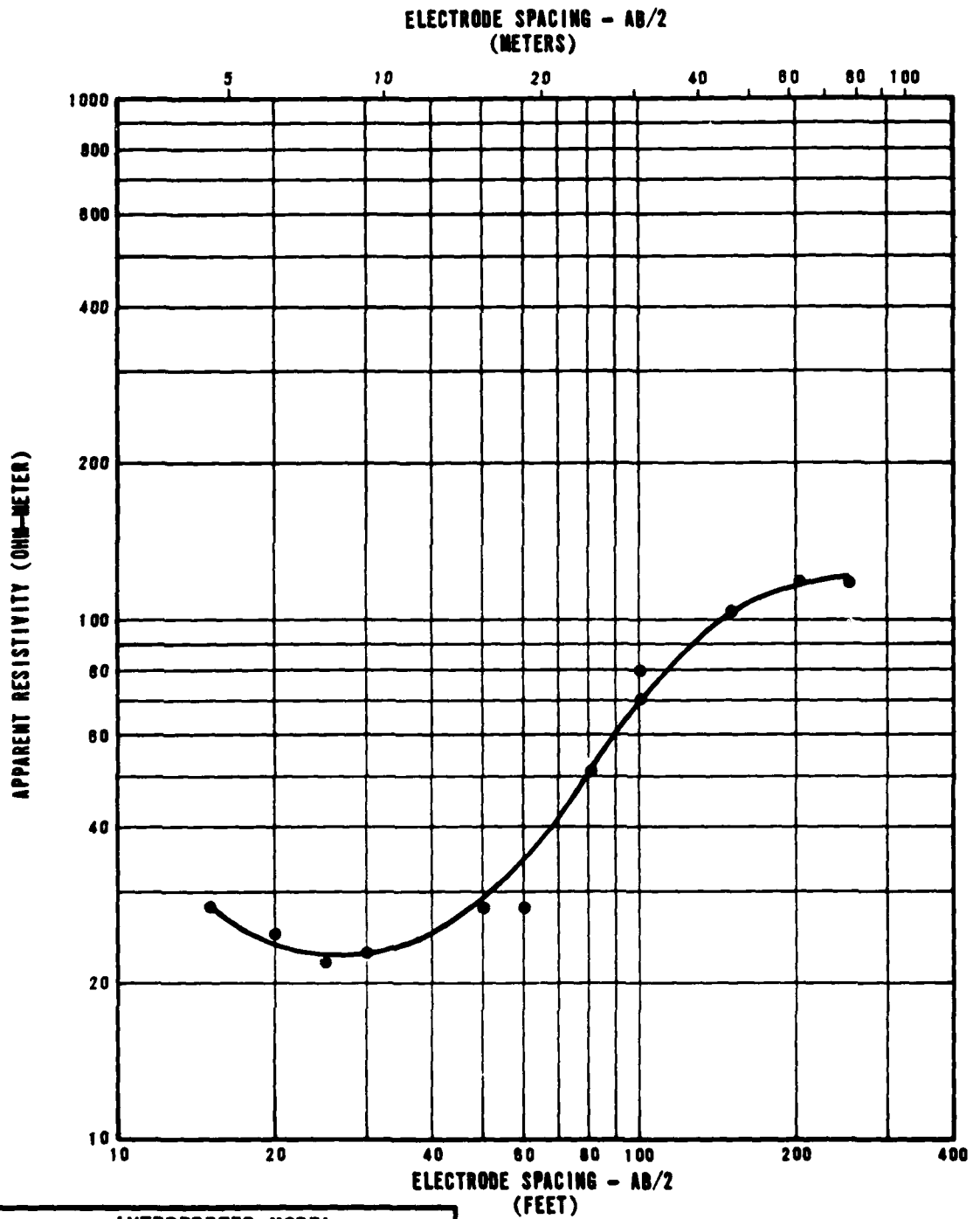
FUGRO NATIONAL INC.



INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	35
13	4	100.
88	27	45

RESISTIVITY SOUNDING MD -R- 8 SOUNDING CURVE AND INTERPRETATION OPERATIONAL BASE SITE, MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - ONO	FIGURE II-8-8

JUBRO NATIONAL, INC.



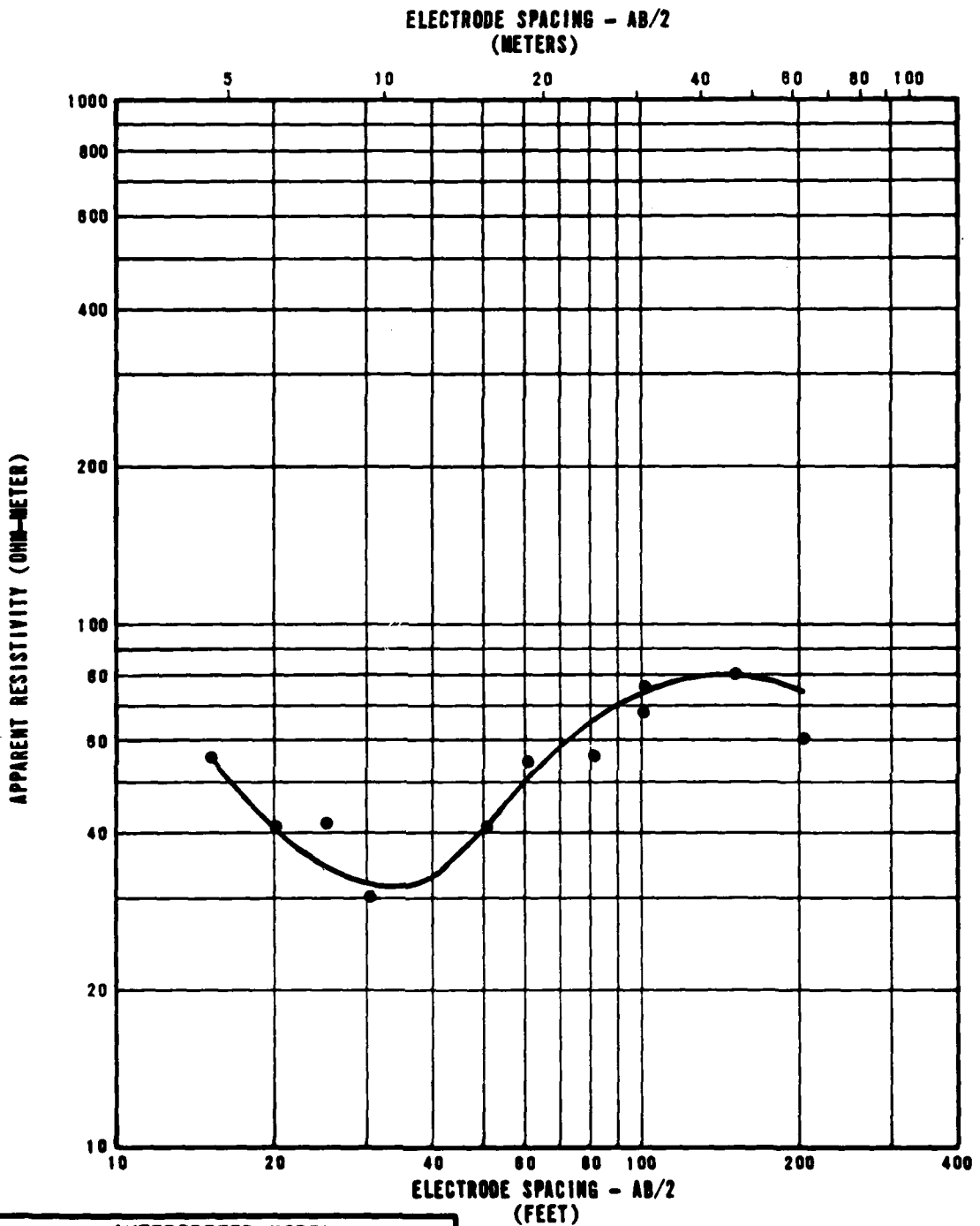
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	35
9	3	18
32	10	340
43	13	1970
61	19	480

RESISTIVITY SOUNDING MD-R-9
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-8-9

FUGRO NATIONAL, INC.



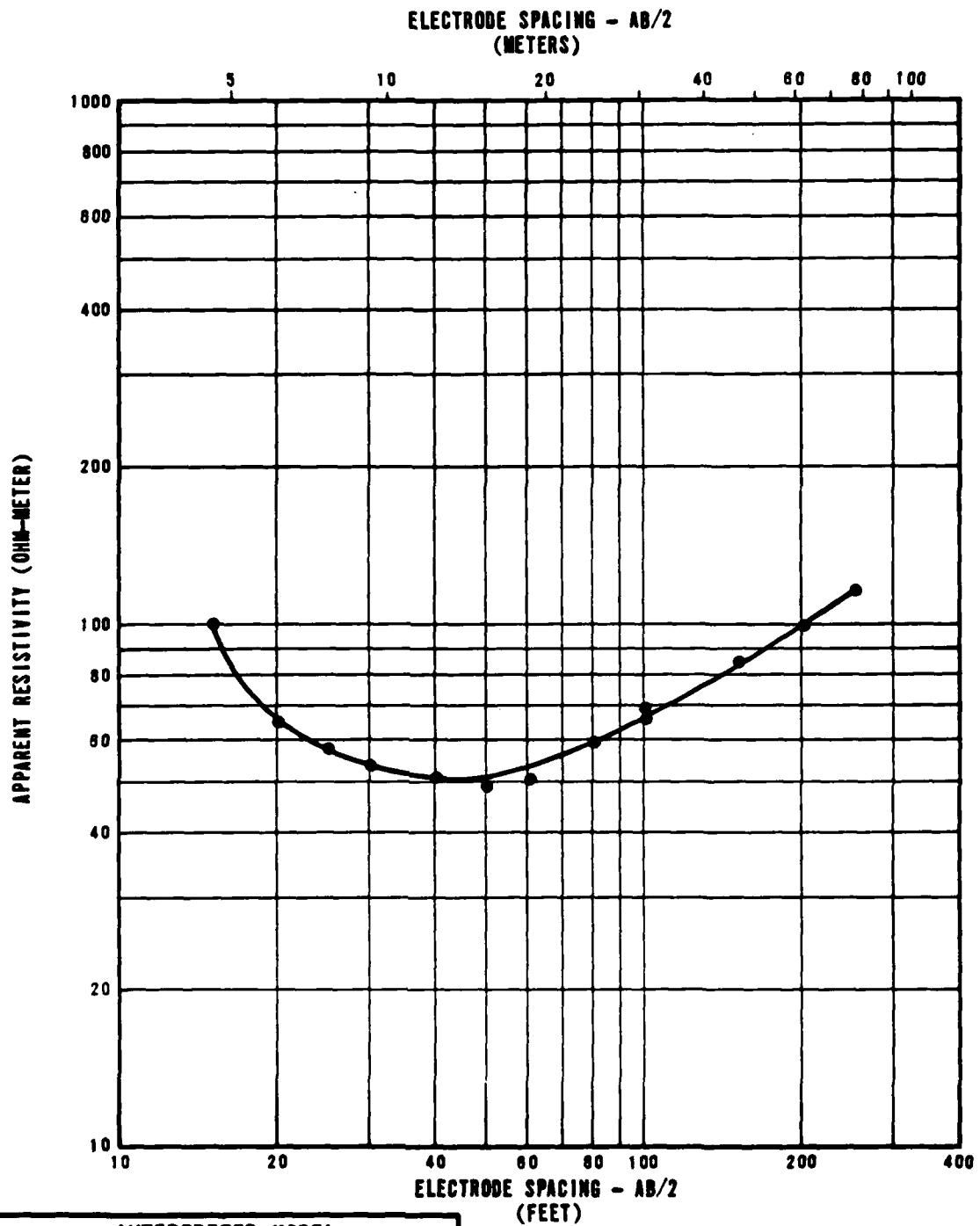
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	55
8	2	35
38	12	410
44	13	200
68	21	65

RESISTIVITY SOUNDING MD -R-10
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-8-10

FURRO NATIONAL, INC.



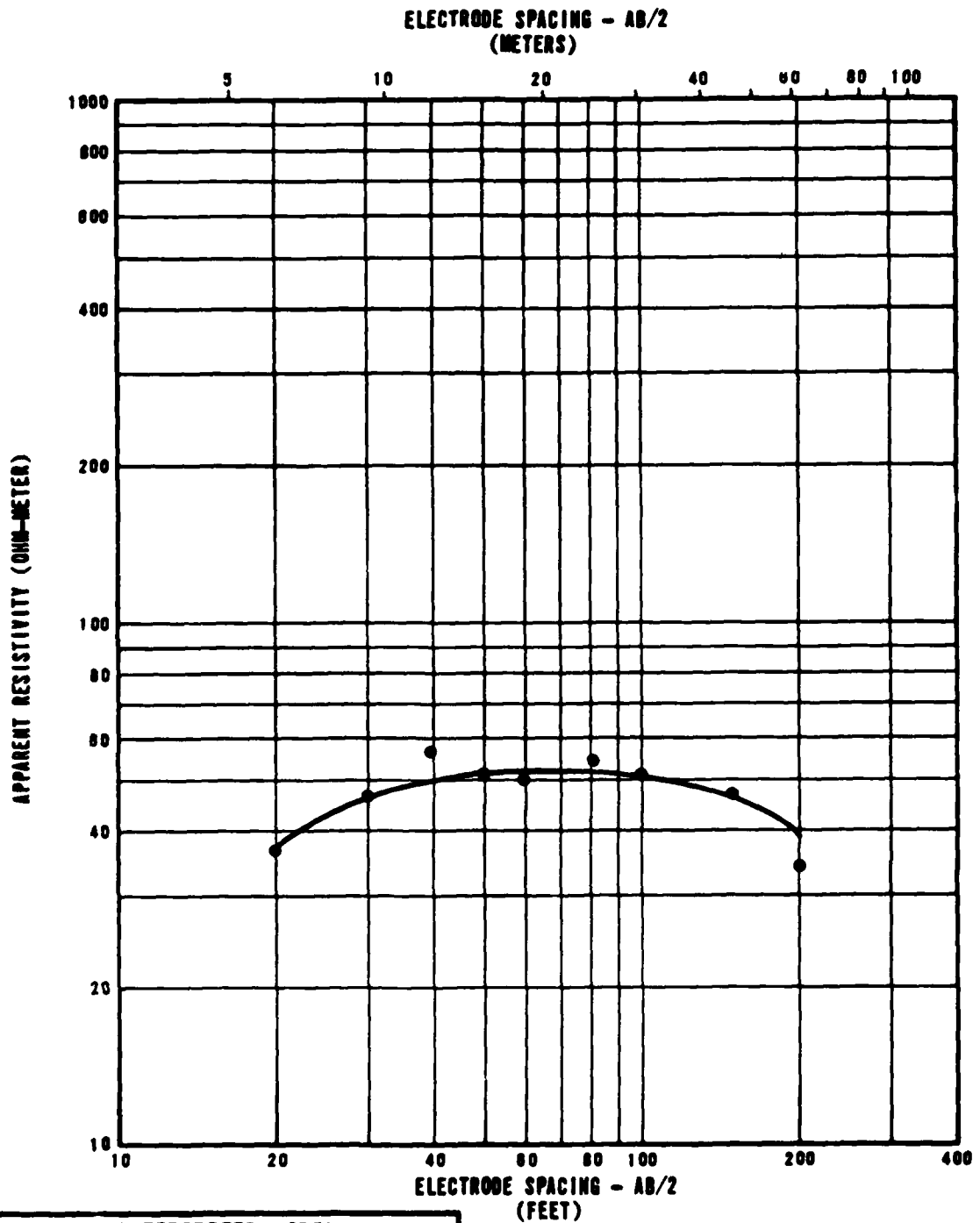
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	180
7	2	55
77	23	230

RESISTIVITY SOUNDING MD-R-11
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - ONO

FIGURE
II-8-11

TEUBRO NATIONAL, INC.



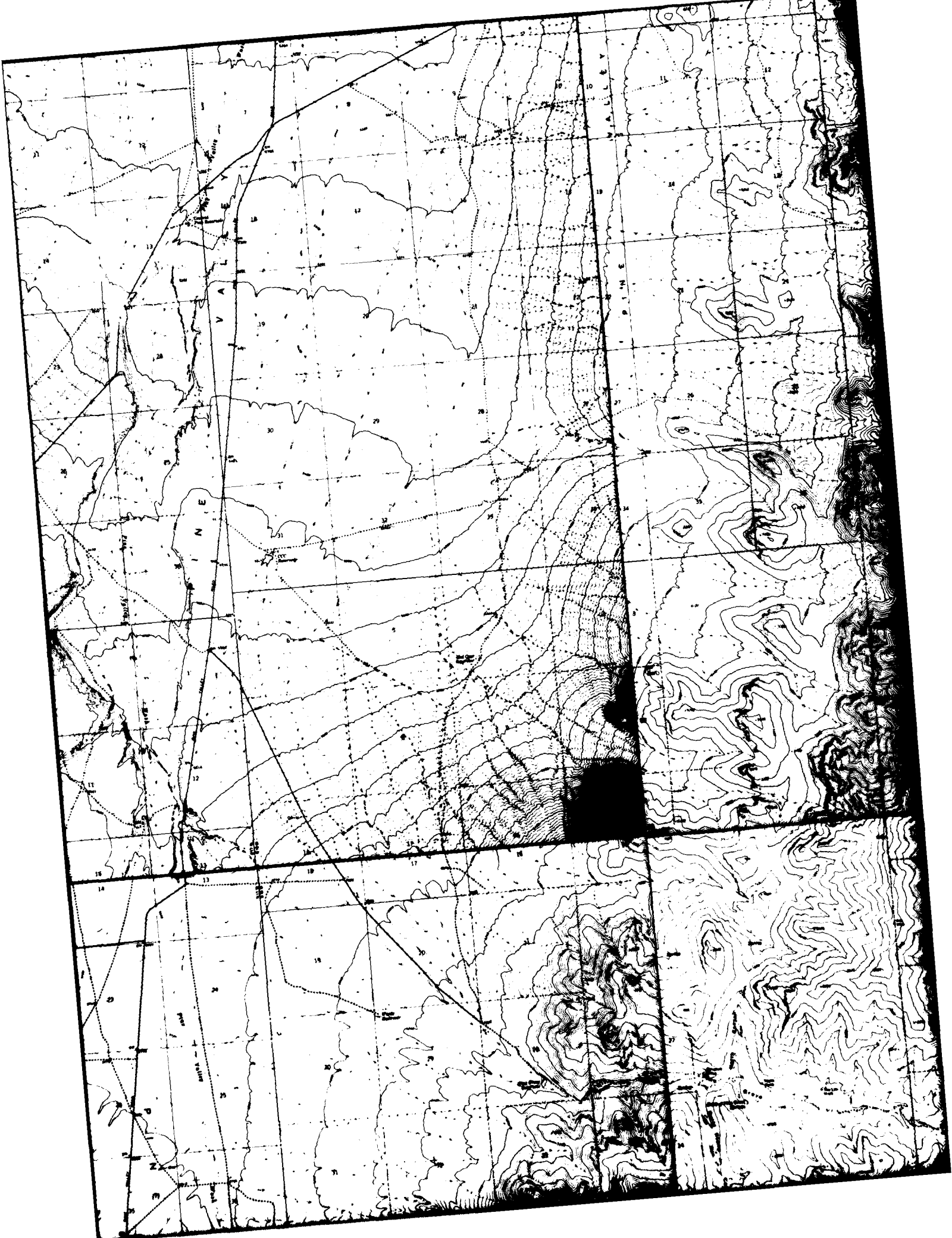
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	30
6	2	60
68	21	45
104	32	25

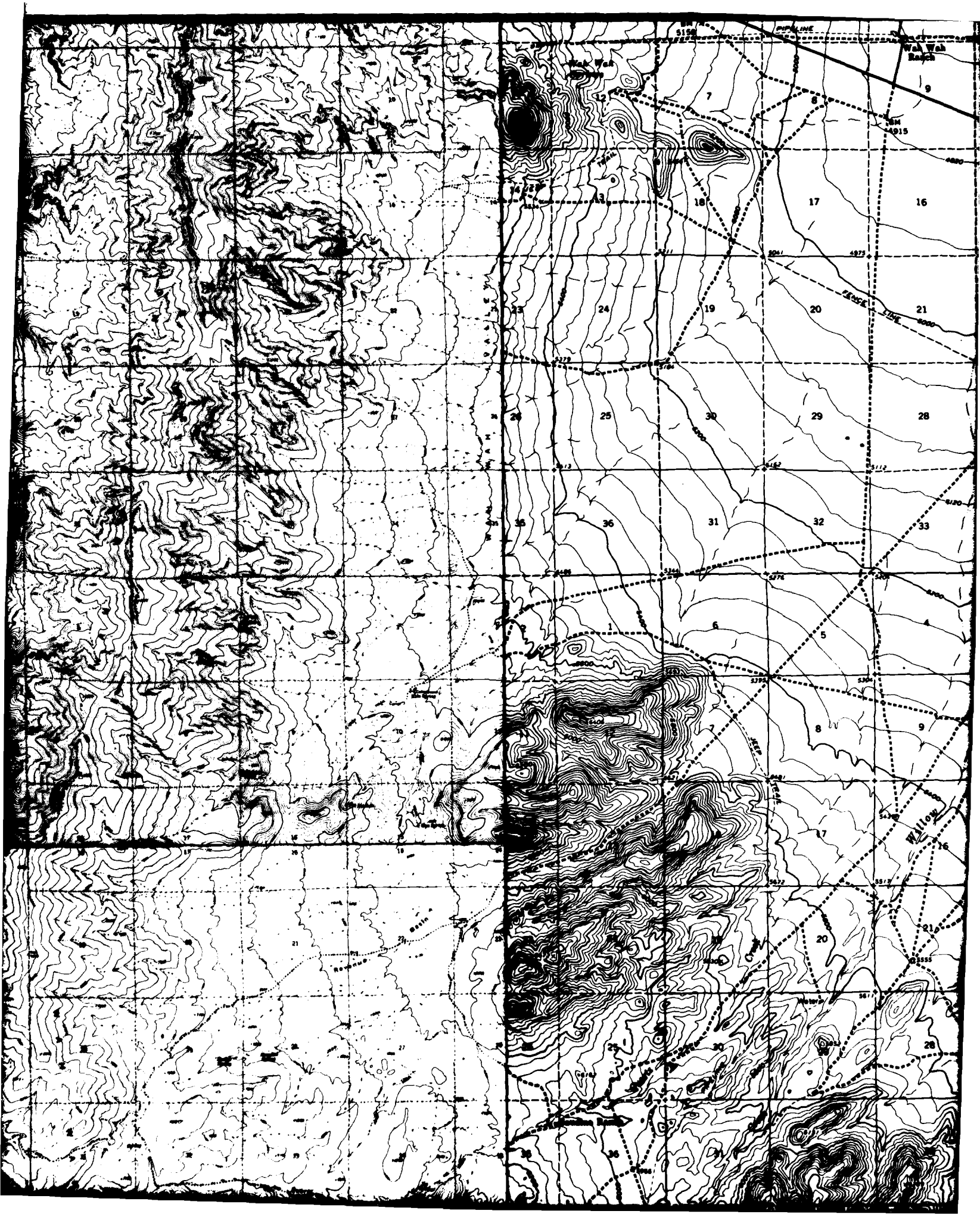
RESISTIVITY SOUNDING BL-R-2
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

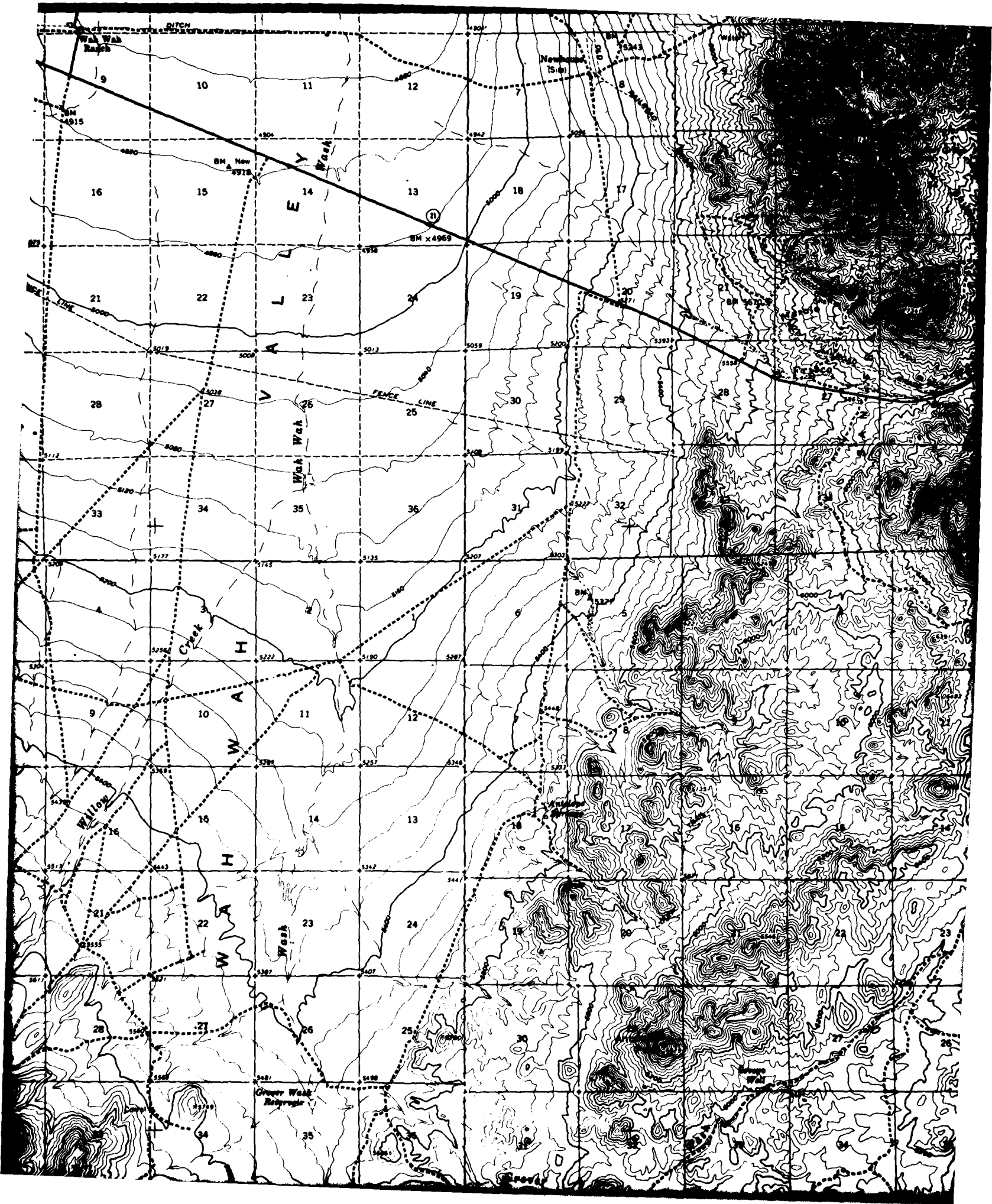
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 080

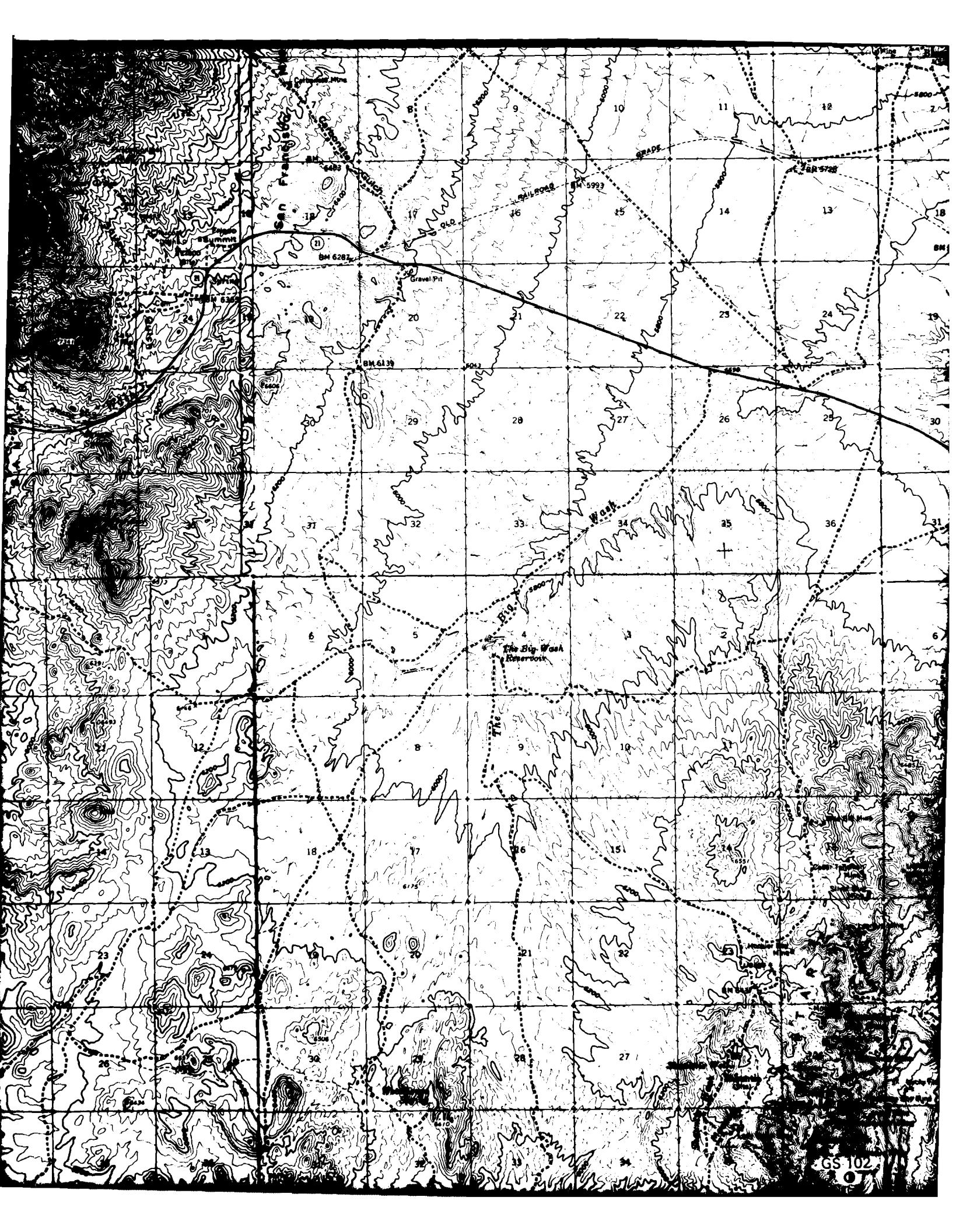
FIGURE
II-8-12

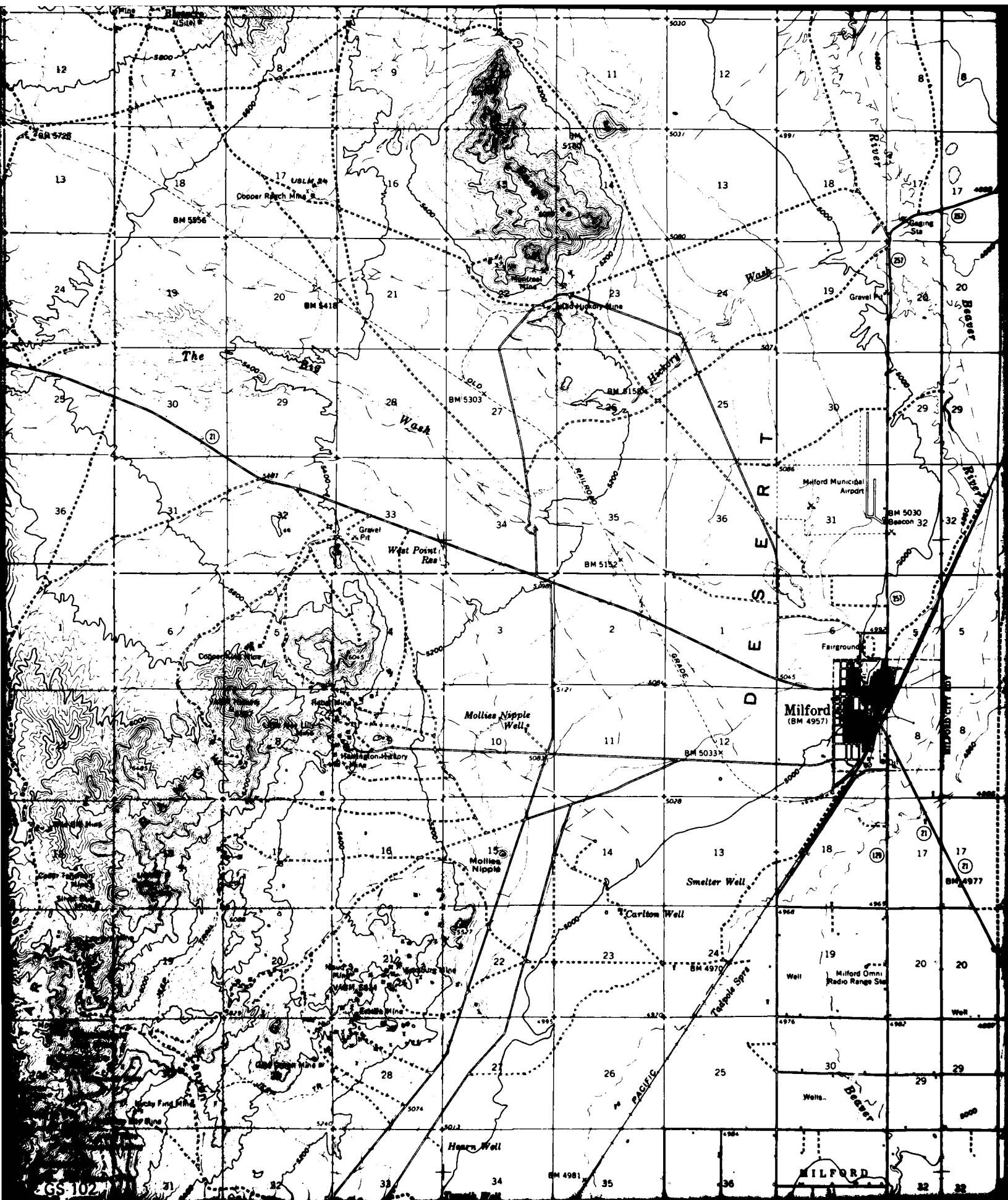
FUGRO NATIONAL, INC.

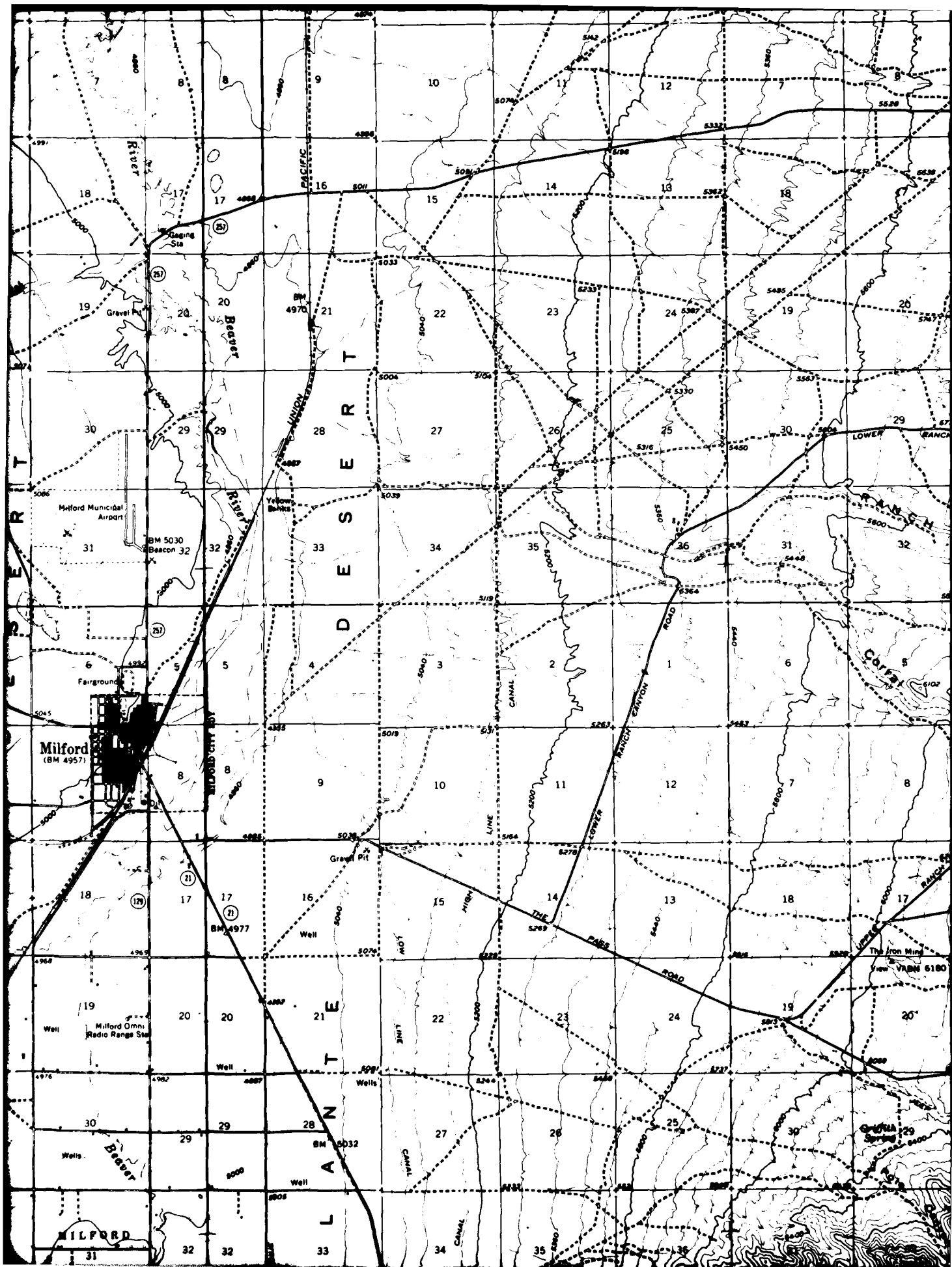


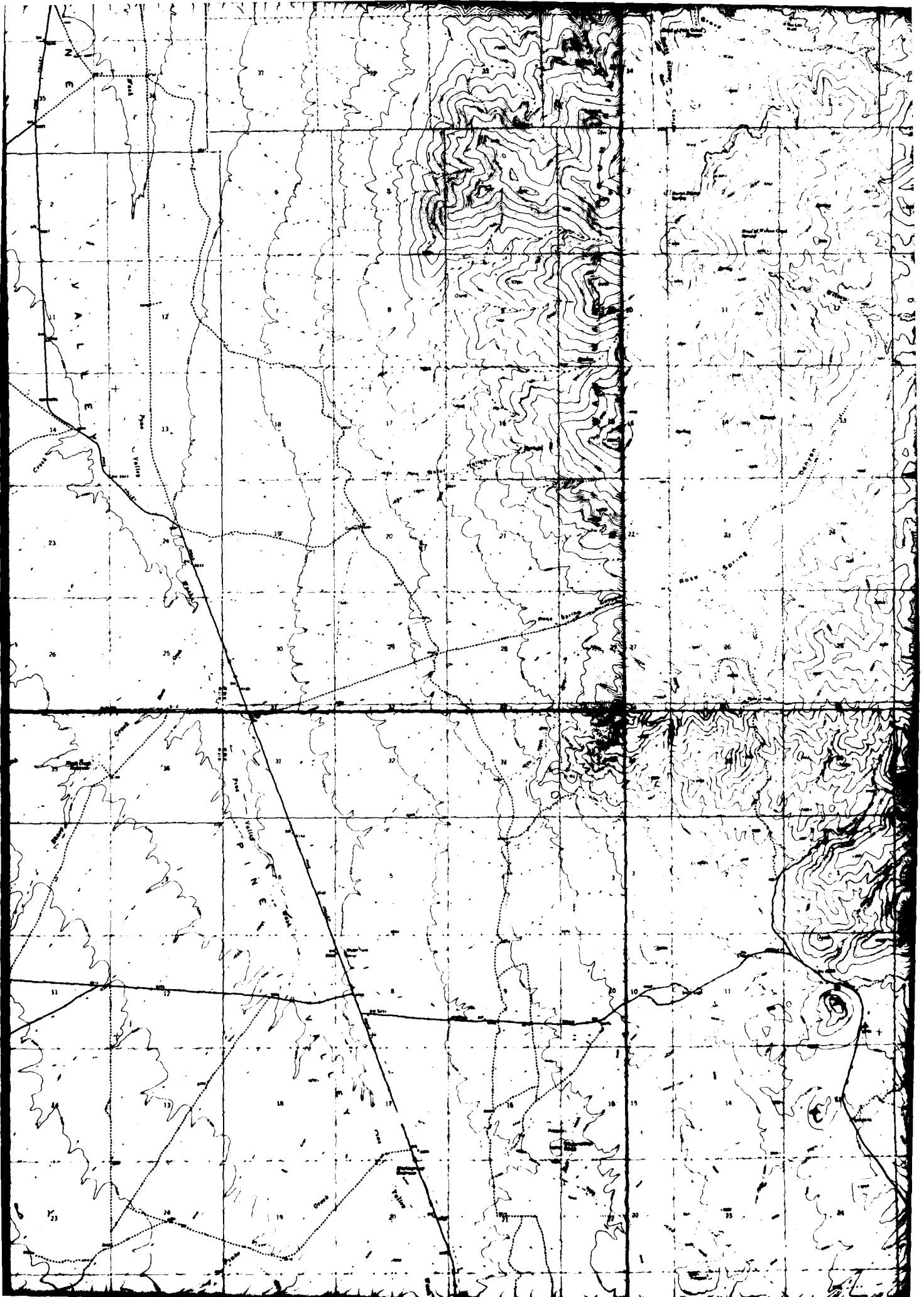


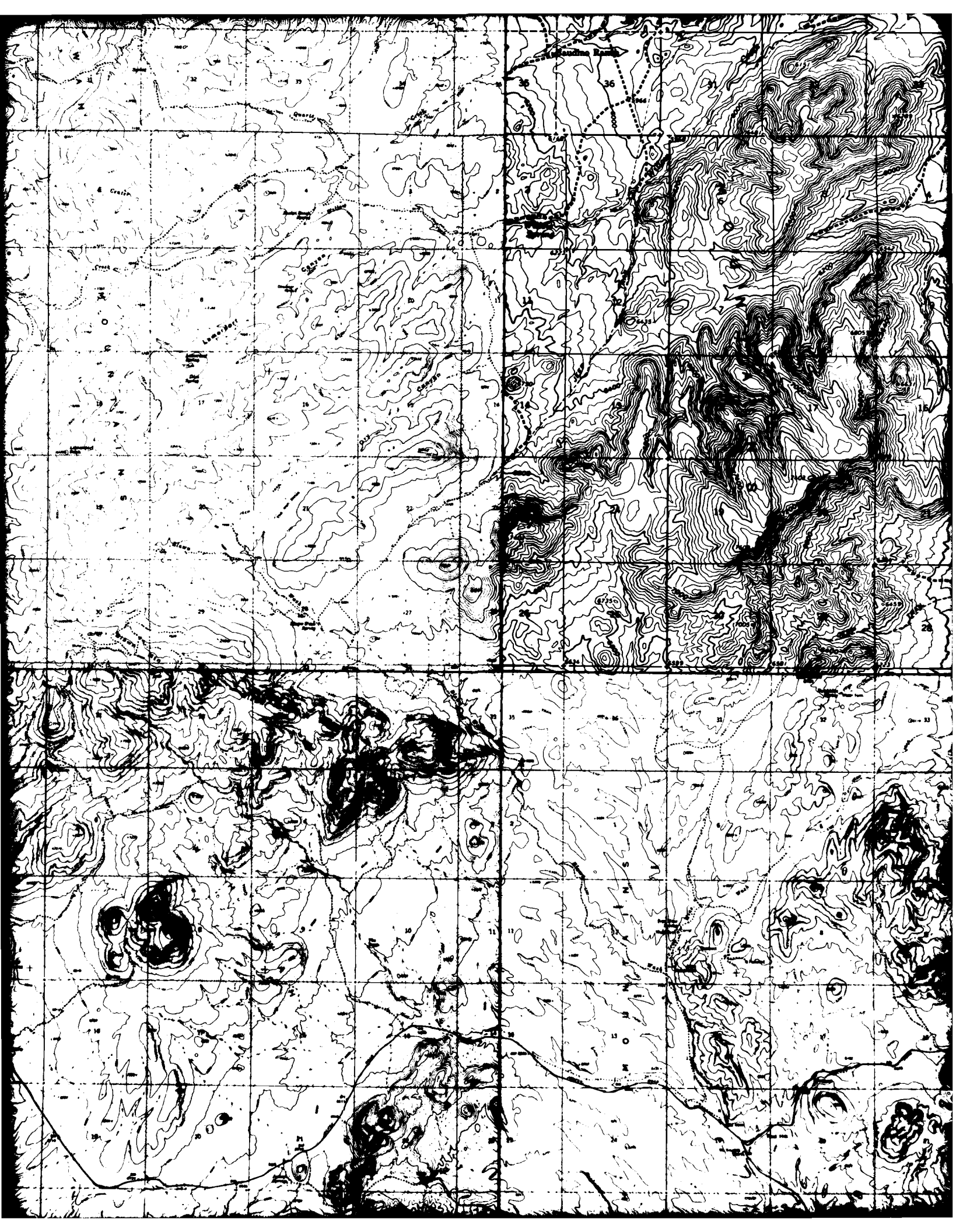


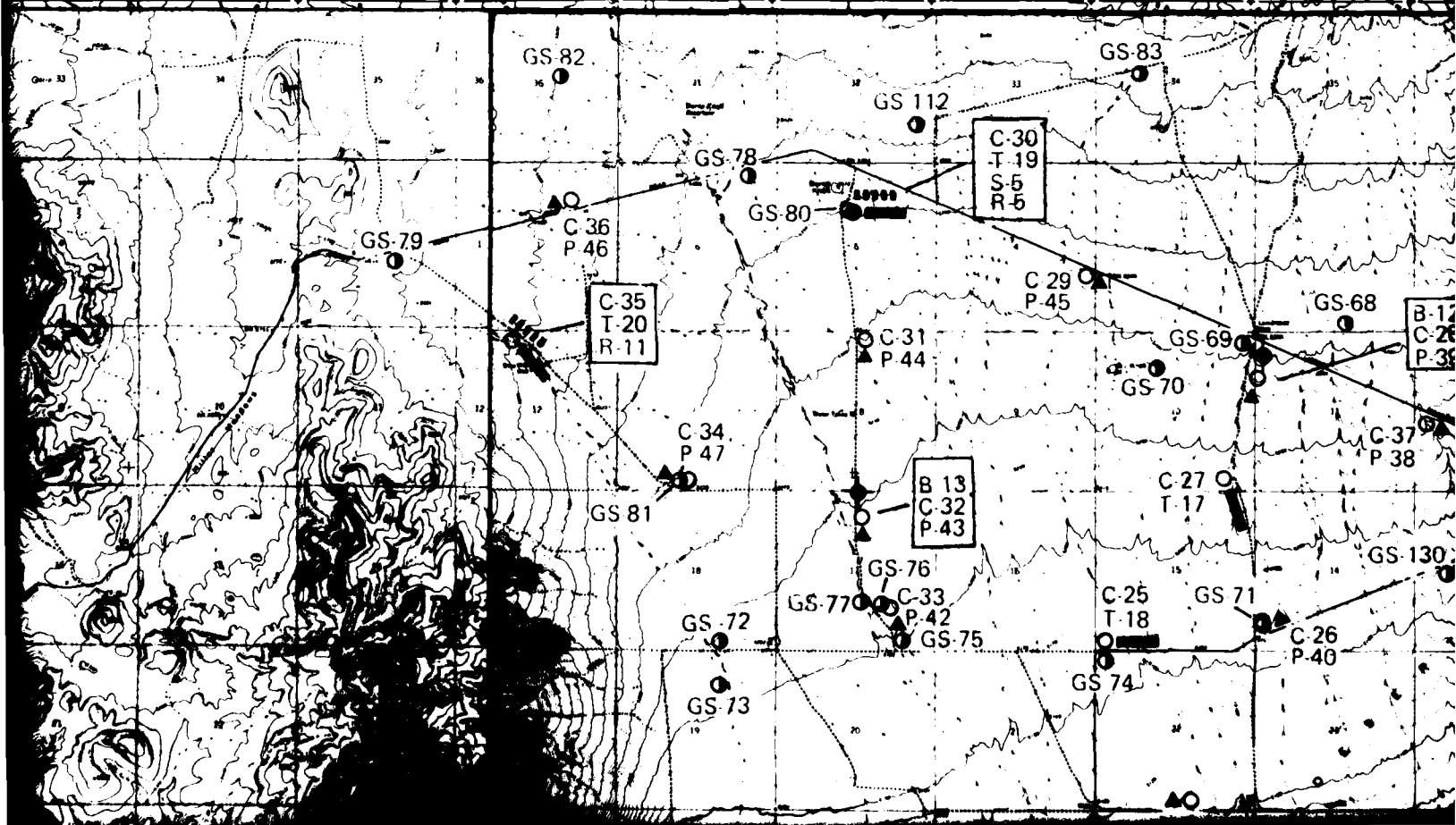
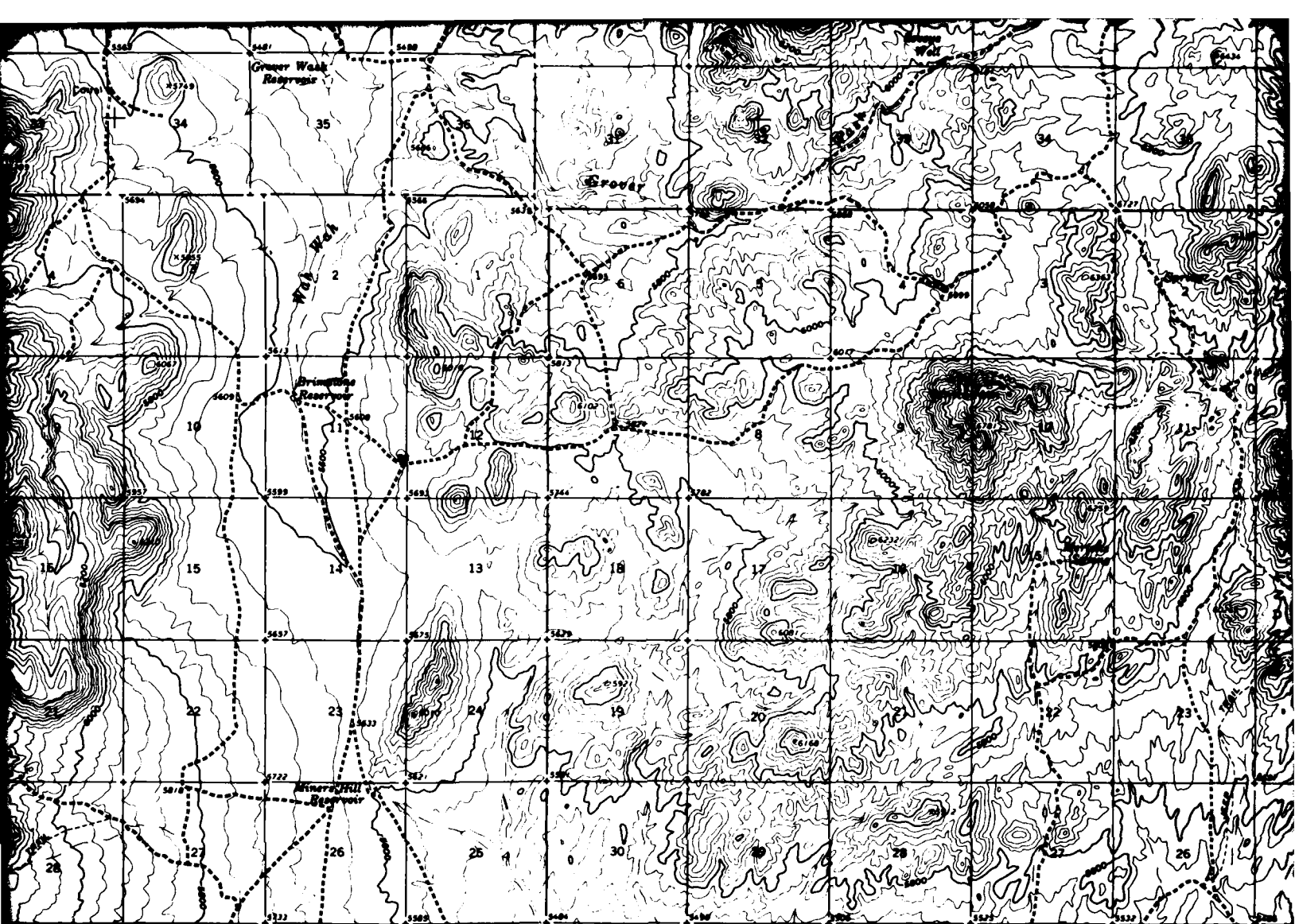


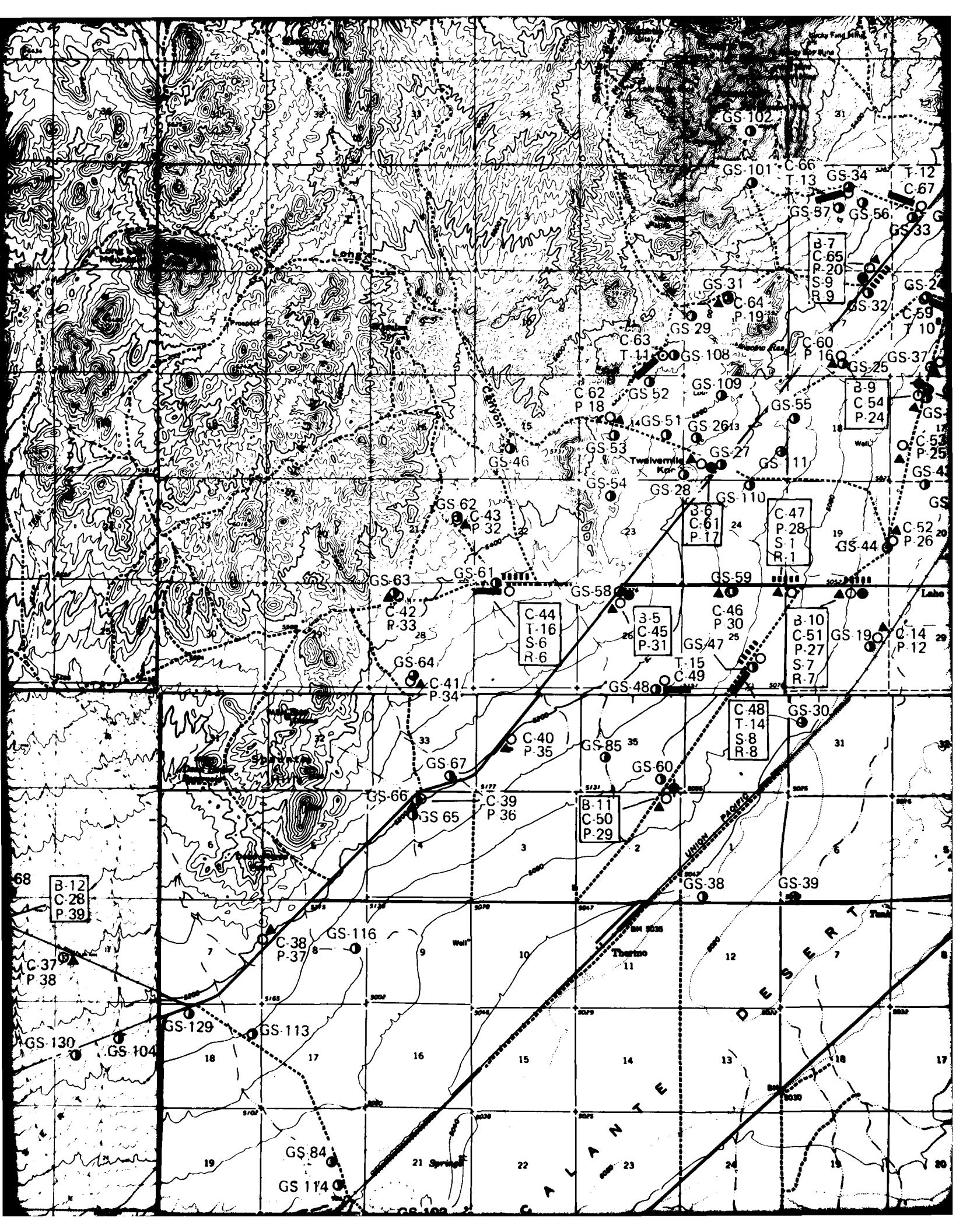


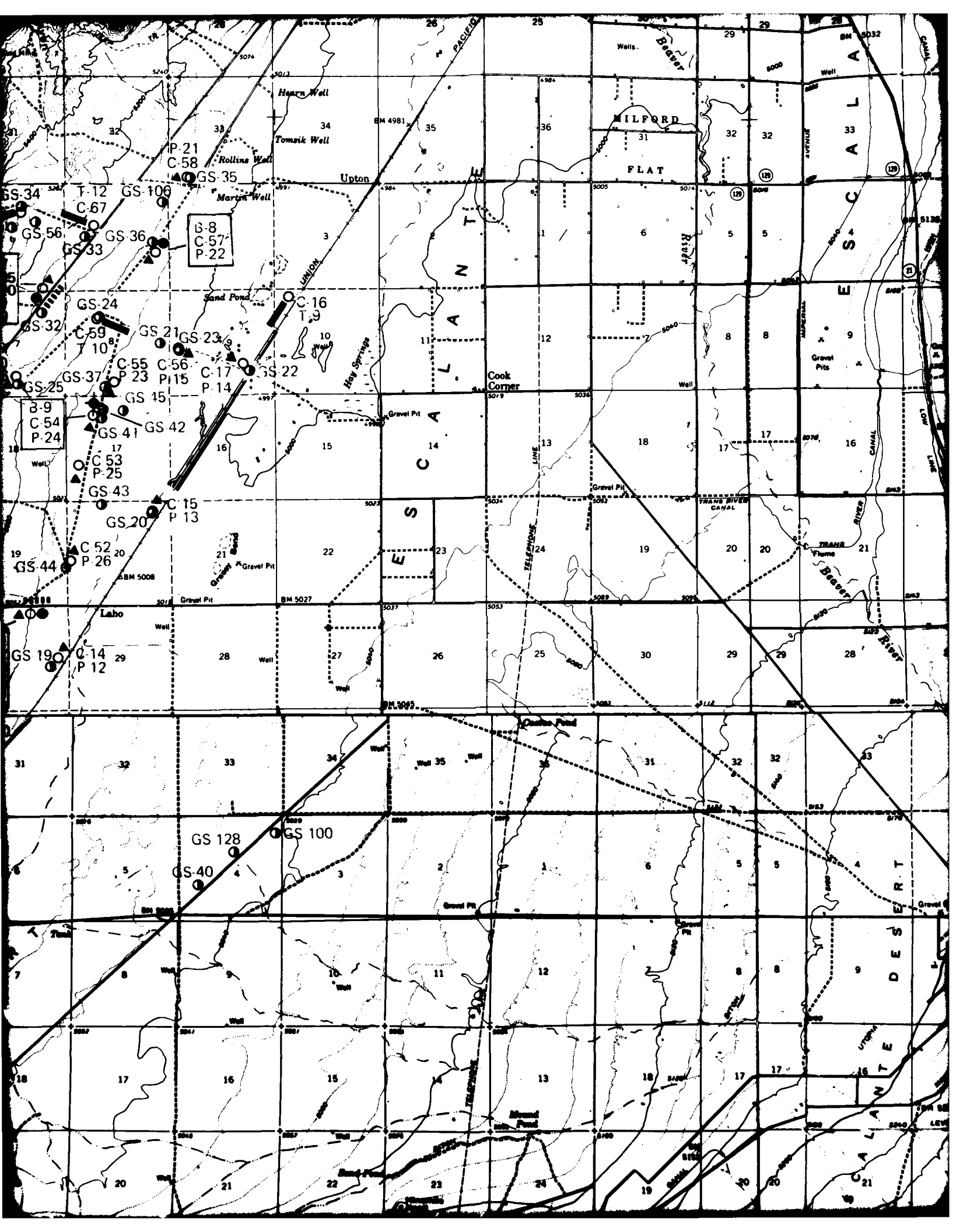


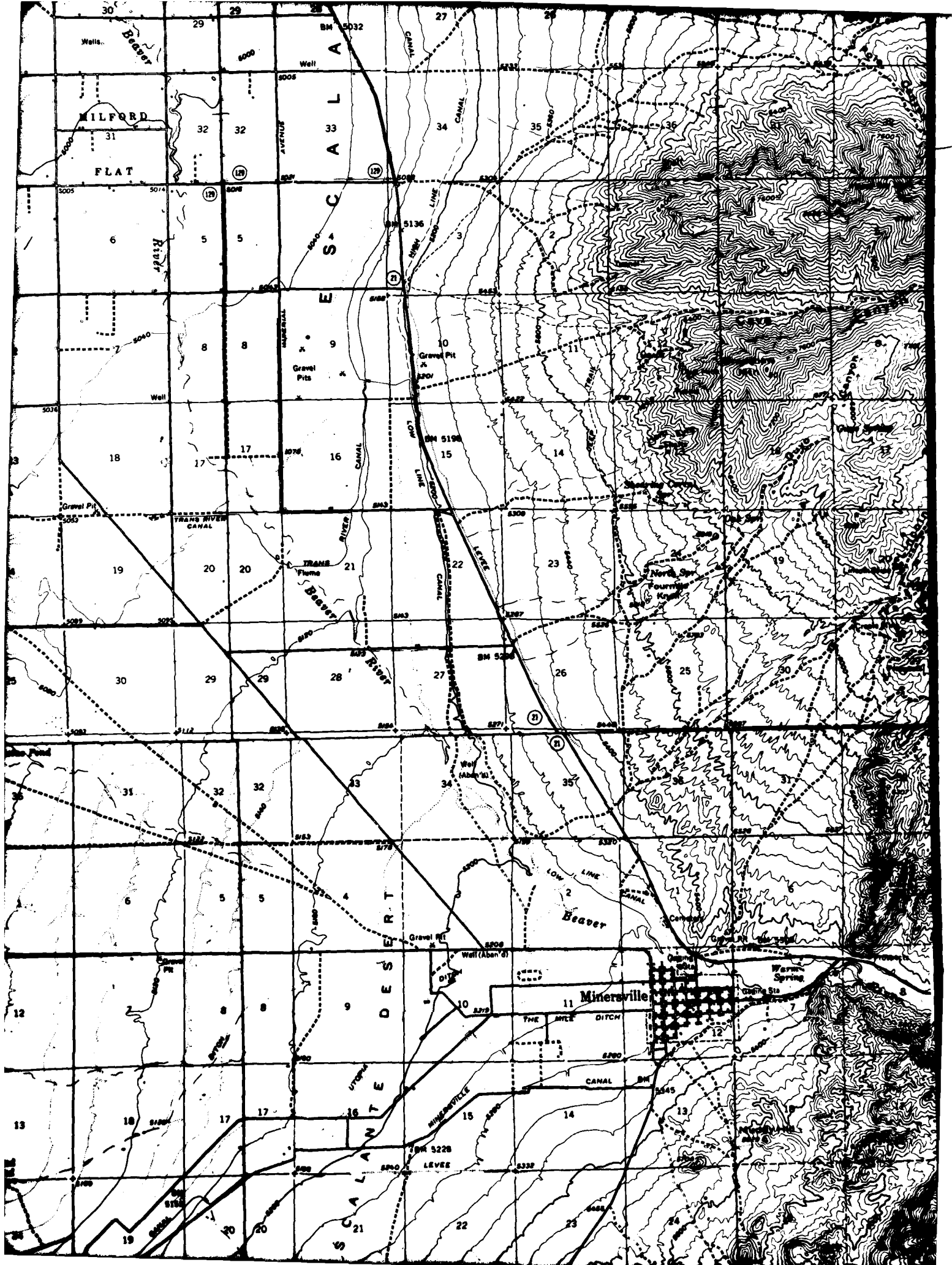


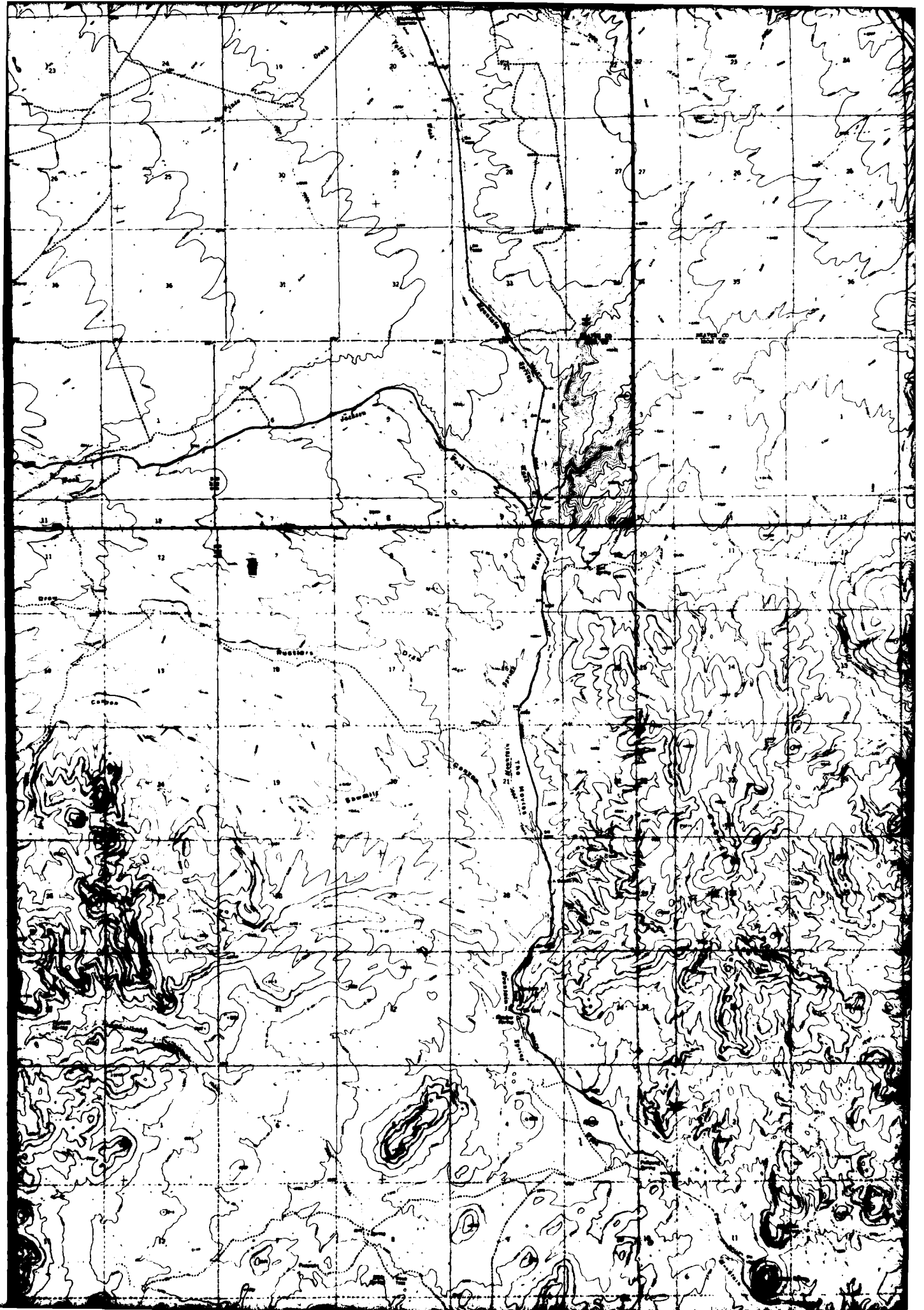


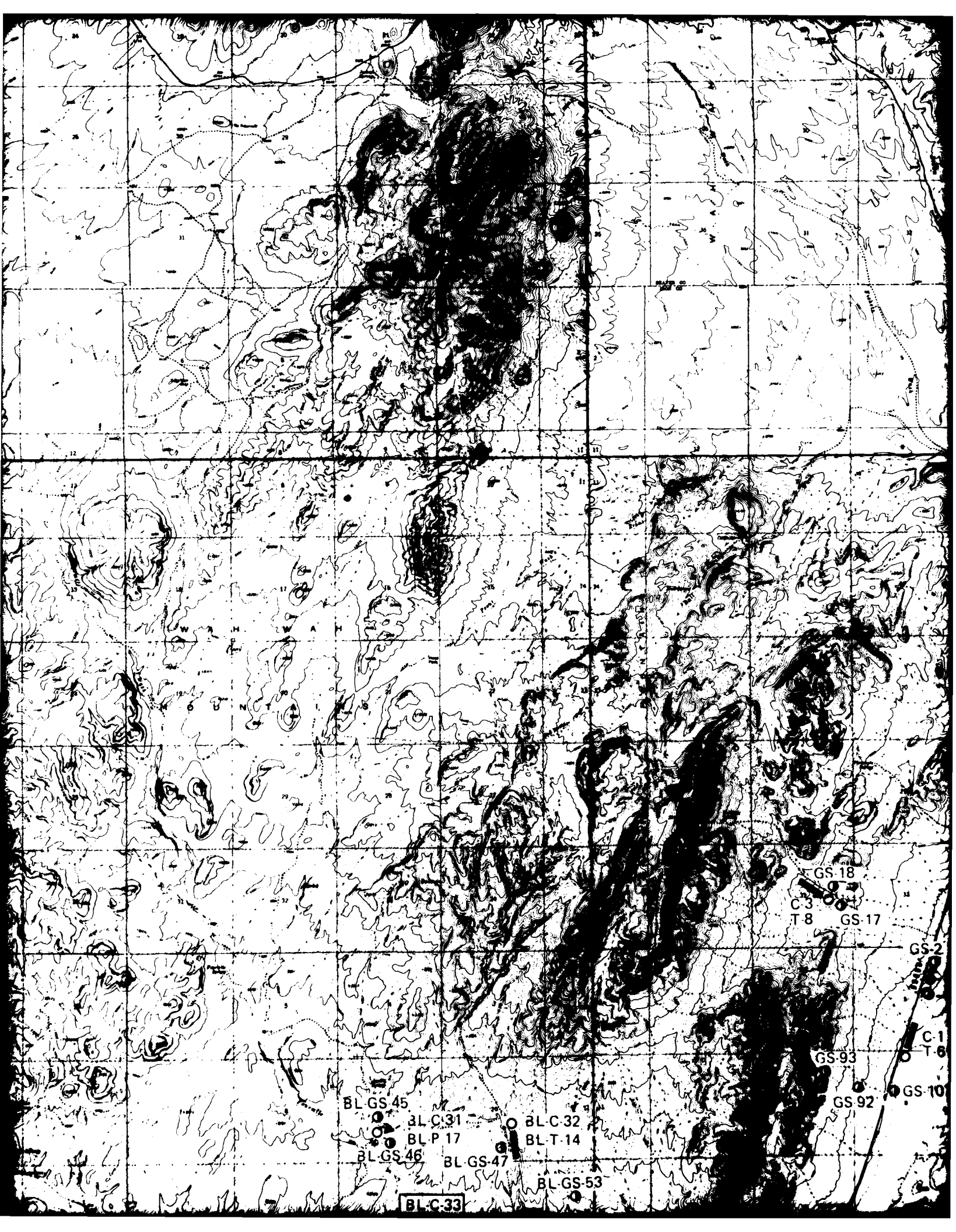






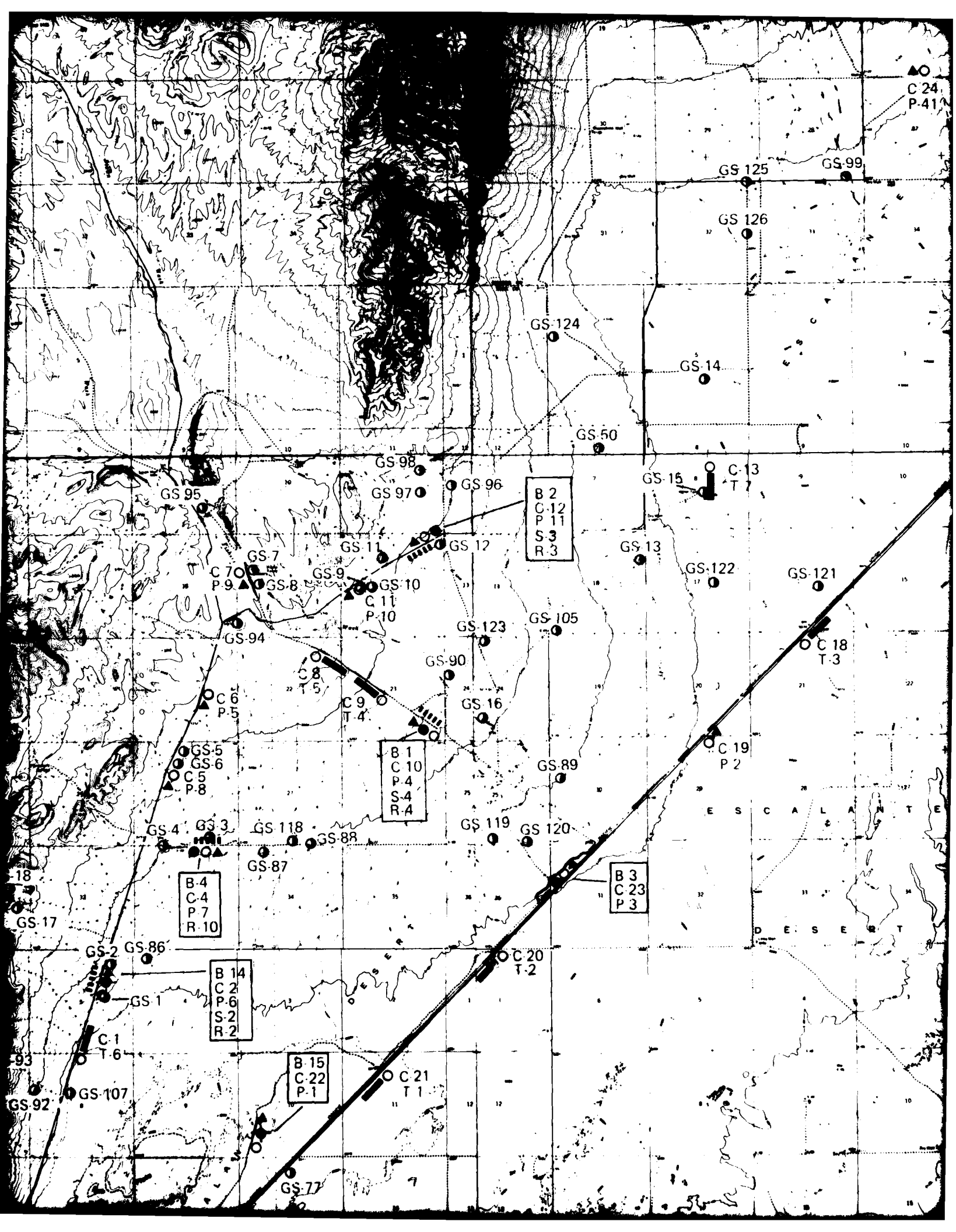






BL-GS-45
BLC-31
BLP-17
BL-GS-46
BL-GS-47
BLC-33
BLC-32
BLT-14
BL-GS-53

GS-18
C-3
T-8
GS-17
GS-2
GS-93
GS-92
GS-10
C-1
T-6



○ C 24
▲ P 41

GS 125 GS 99

GS 126

GS 124

GS 14

GS 50

GS 15 C 13
T 7

GS 95

GS 98

GS 97

GS 96

B 2
C 12
P 11
S 3
R 3

GS 13

GS 7

GS 11

GS 12

C 7
P 9

GS 8

GS 9

GS 10

GS 17

GS 122

GS 121

GS 94

C 8
T 5

C 9
T 4

GS 90

GS 16

GS 105

C 18
T 3

GS 5

GS 6

C 5
P 8

B 1
C 10
P 4
S 4
R 4

GS 89

E S C A L A N T E

GS 4

GS 3

GS 118

GS 88

GS 119

GS 120

D E S E S T

B 4
C 4
P 7
R 10

B 3
C 23
P 3

GS 17

GS 2

GS 86

B 14
C 2
P 6
S 2
R 2

GS 1

C 20
T 2

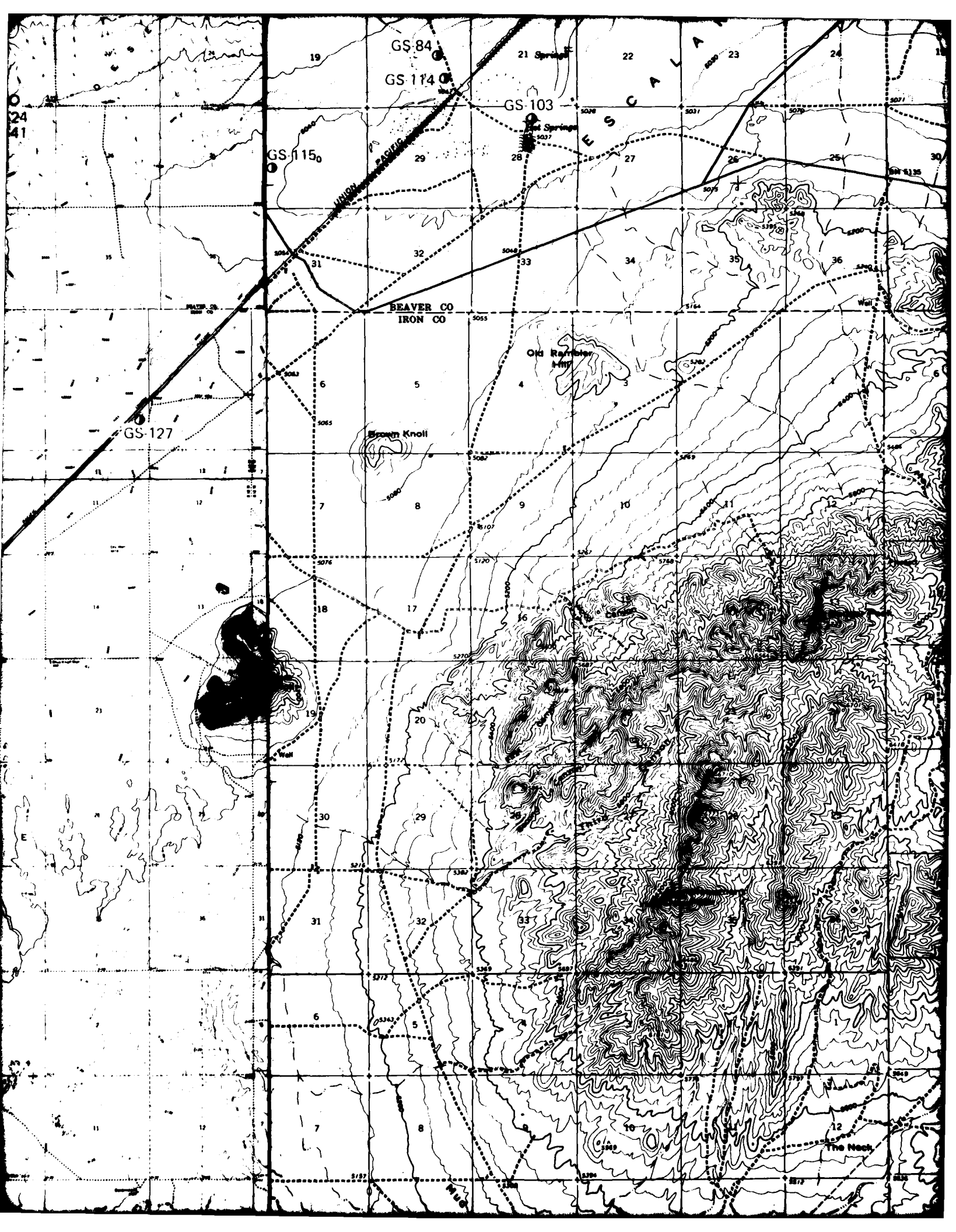
GS 92

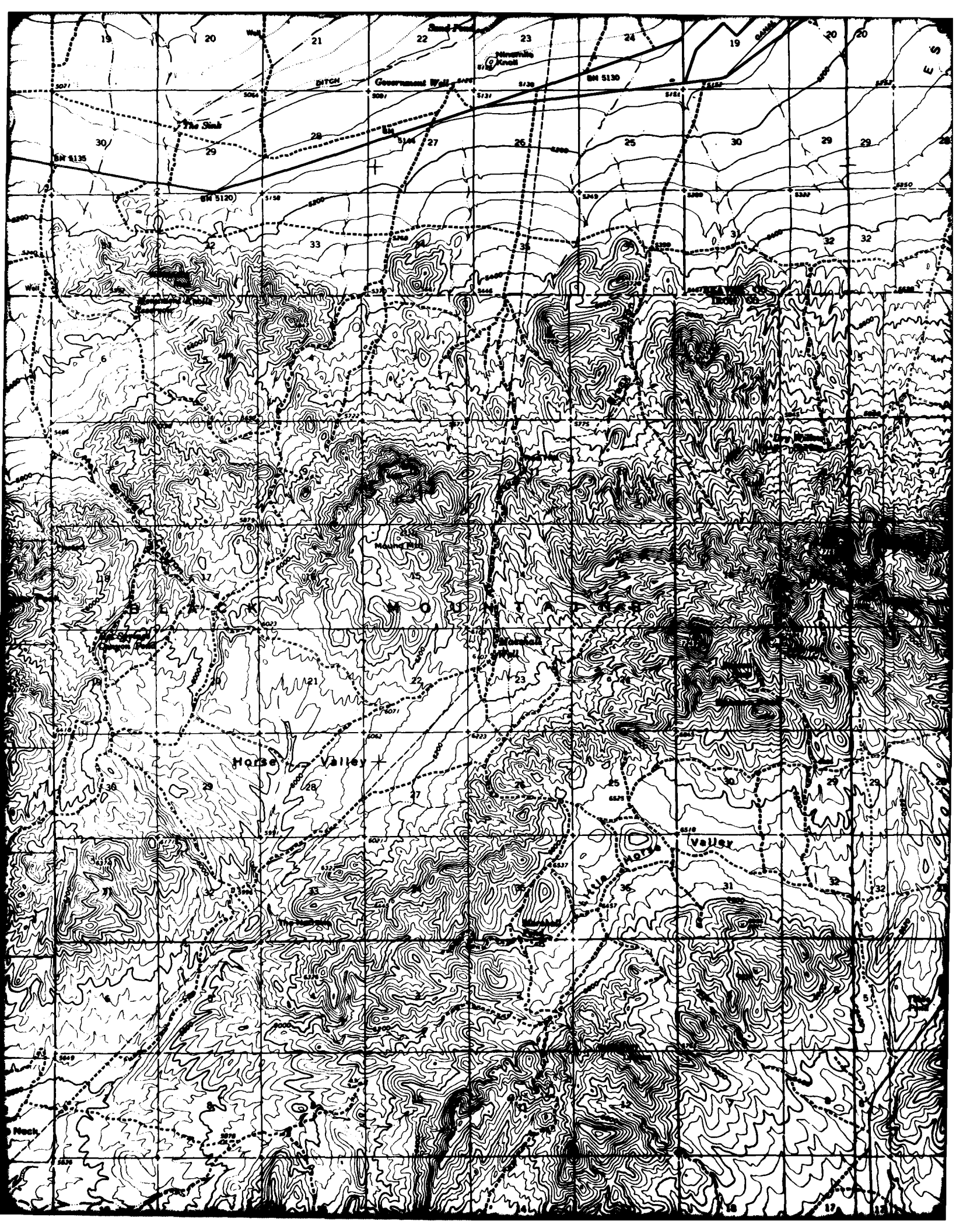
GS 107

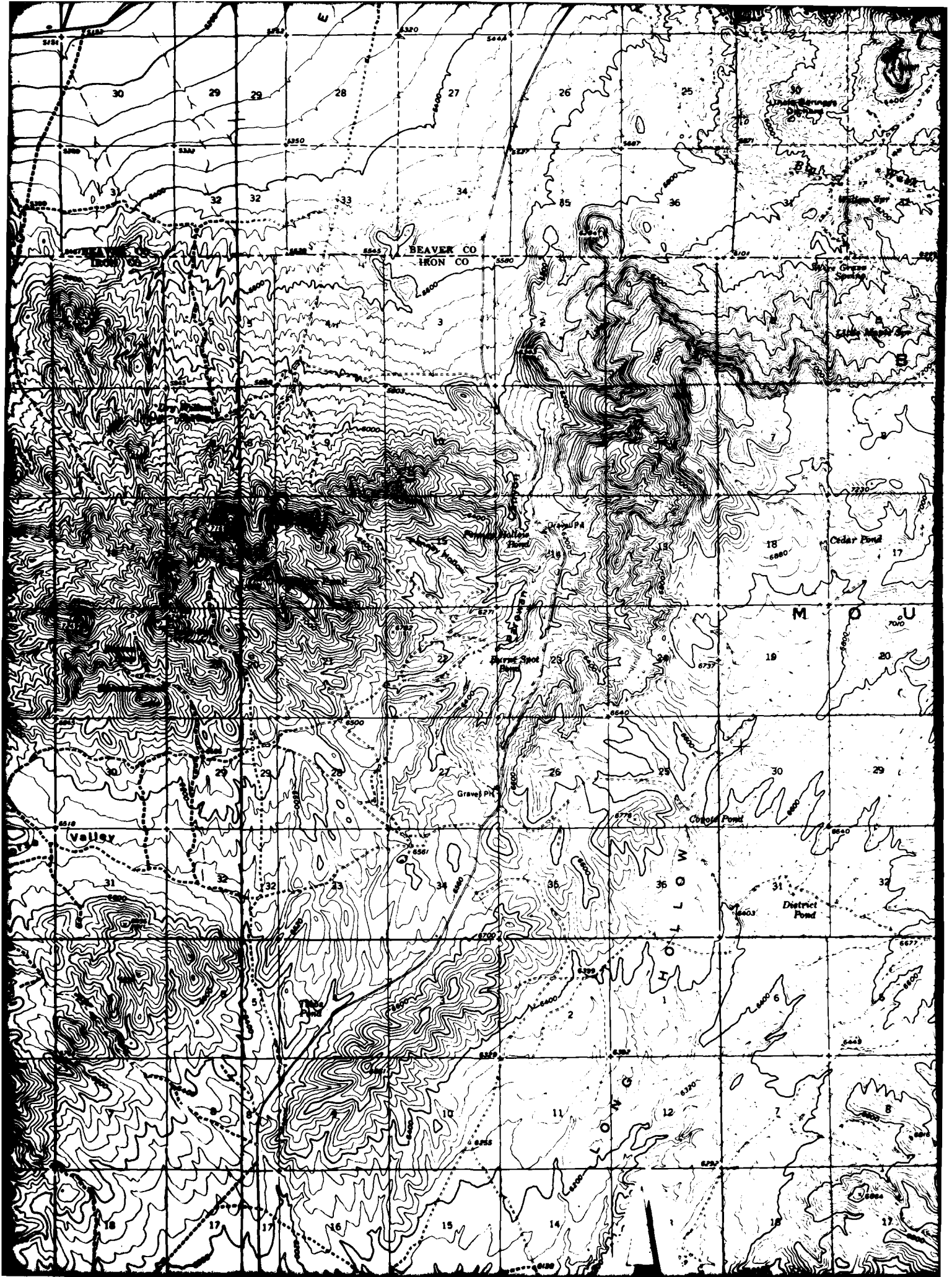
B 15
C 22
P 1

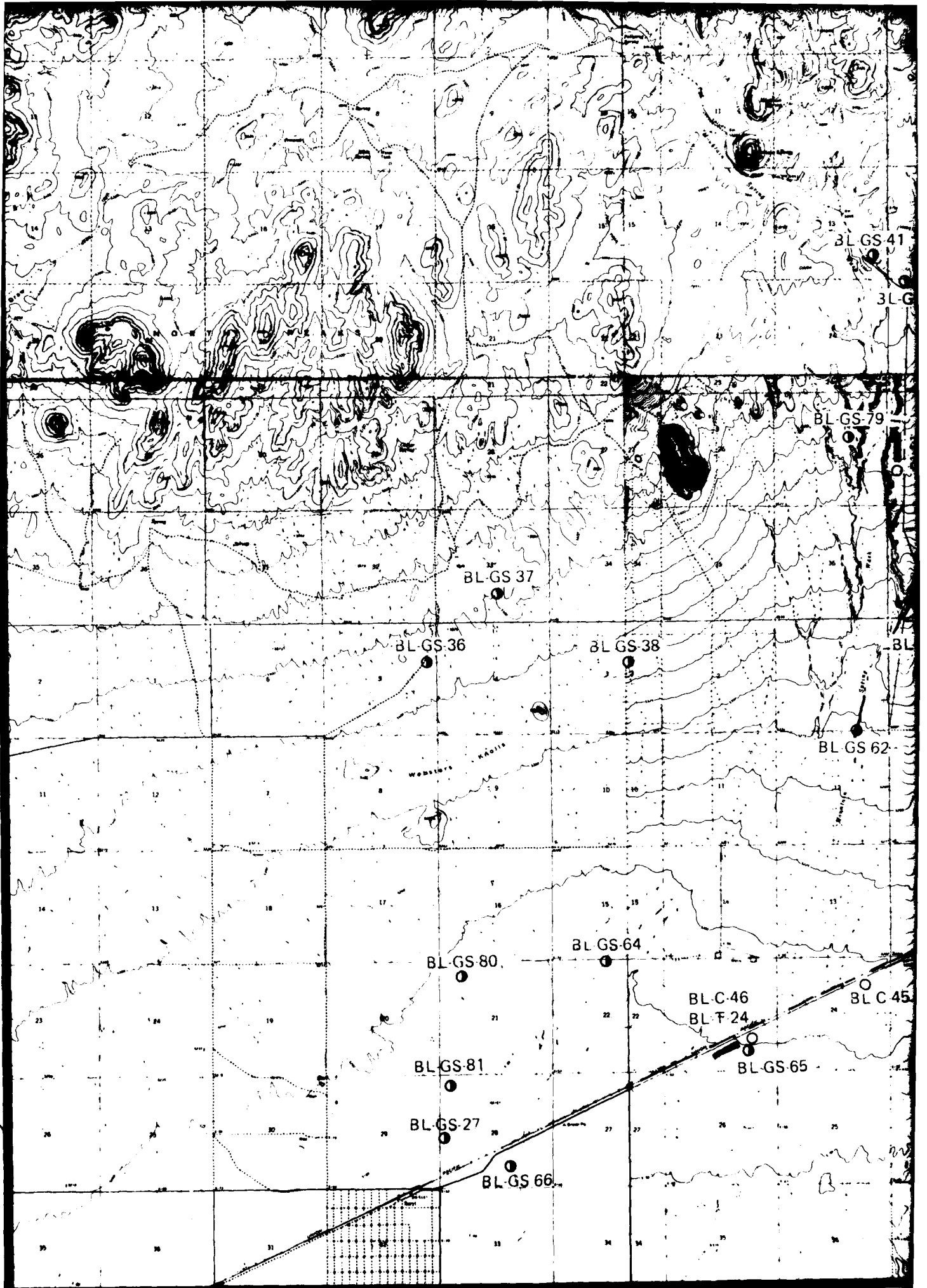
C 21
T 1

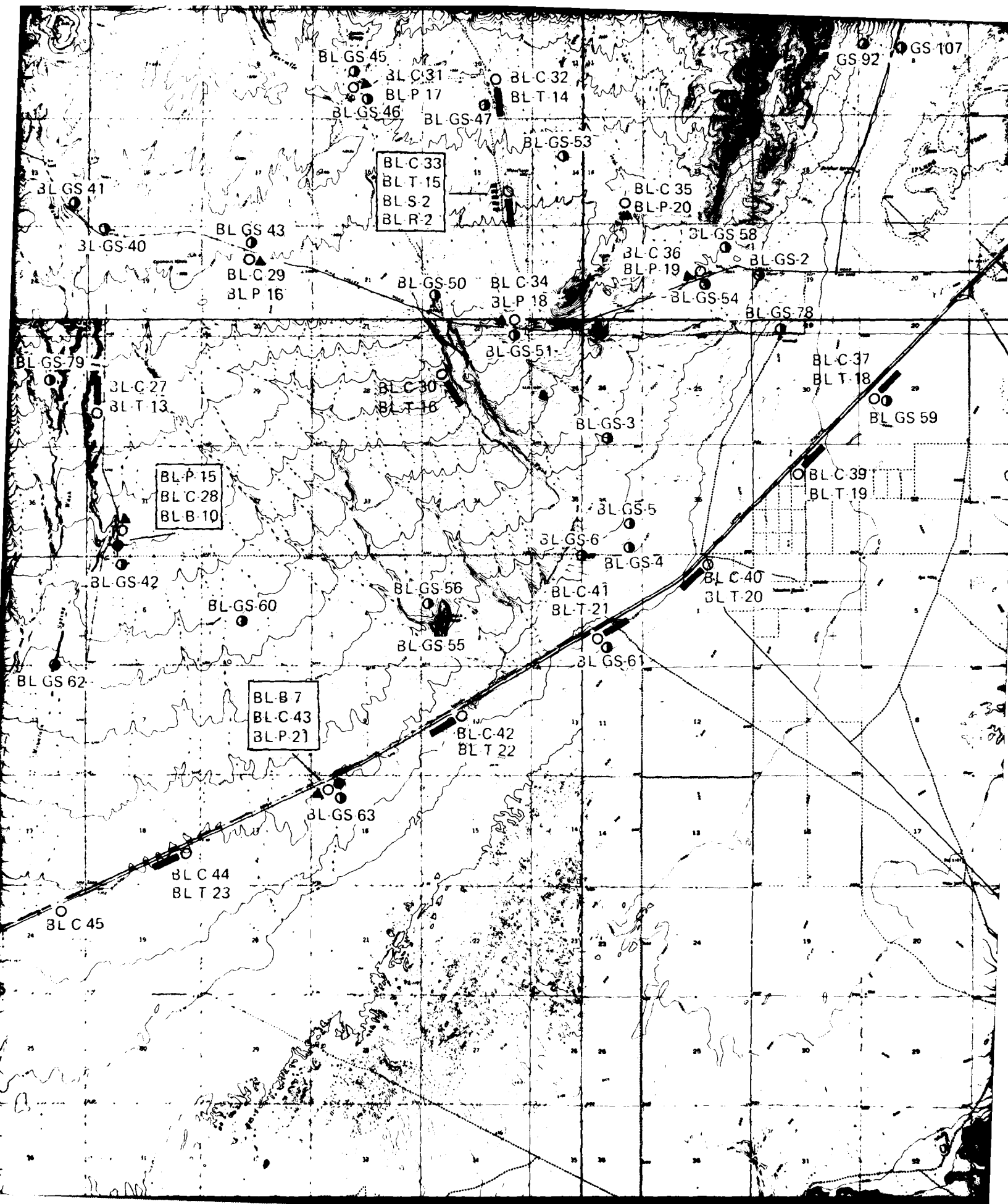
GS 77

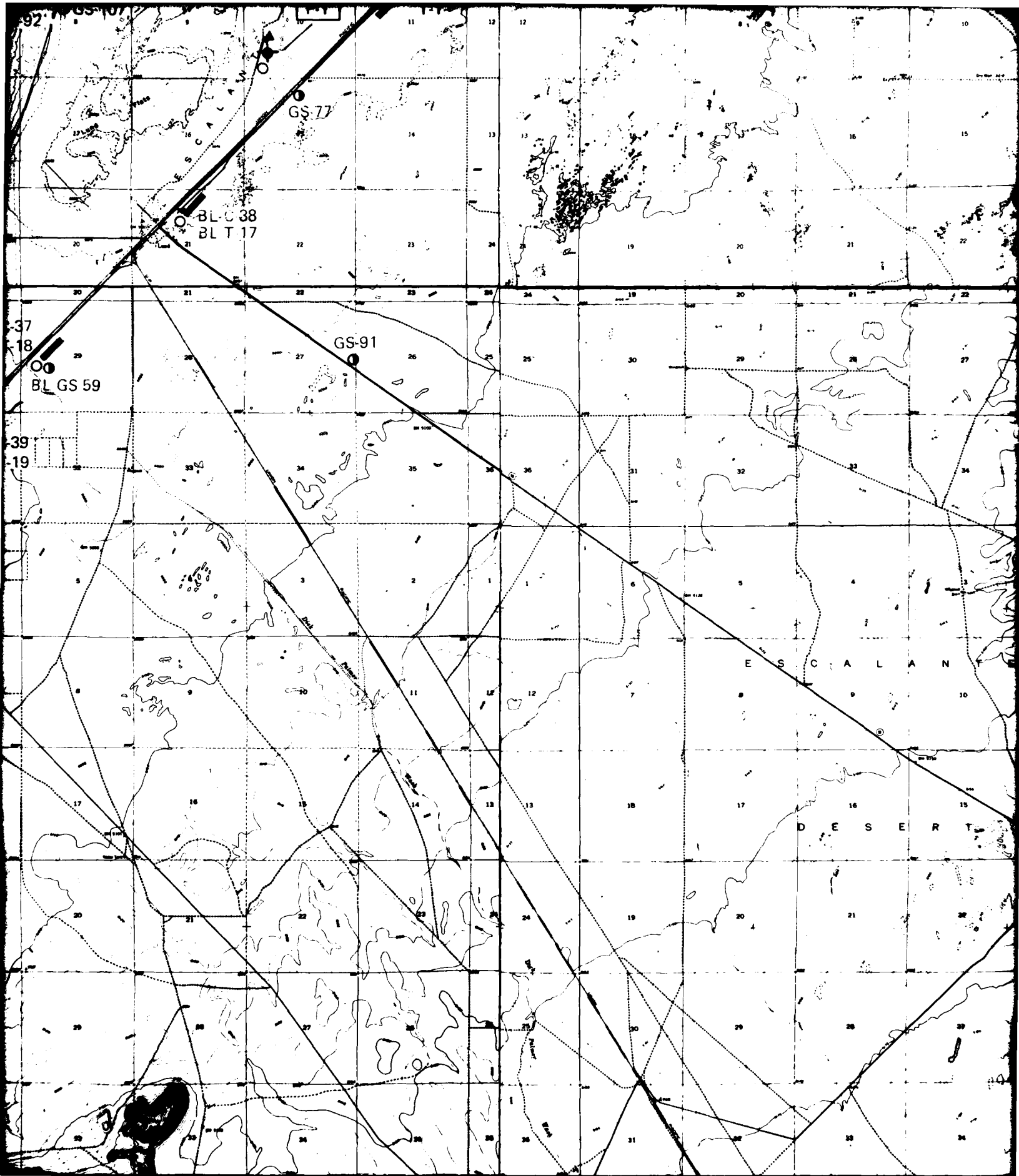


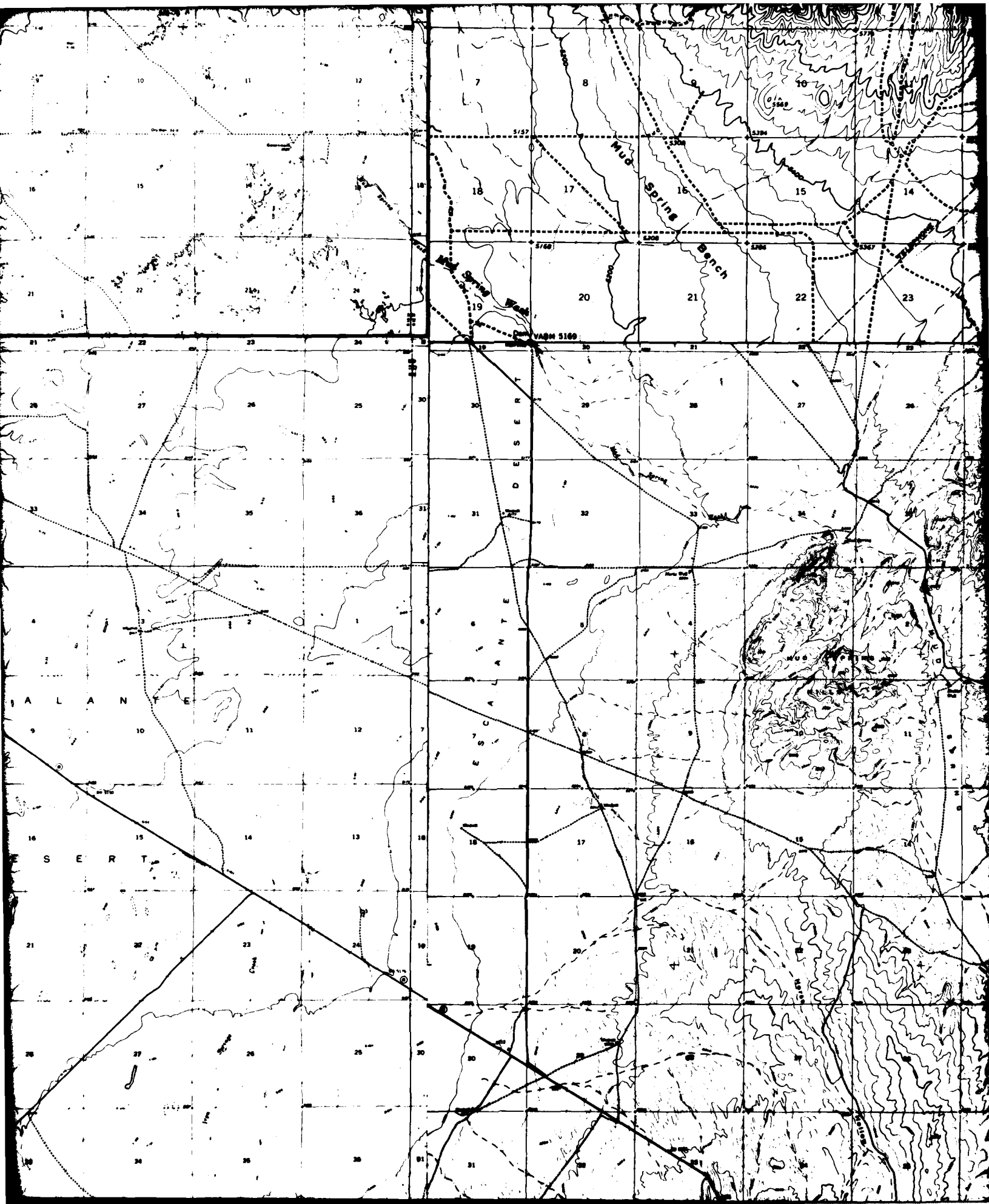


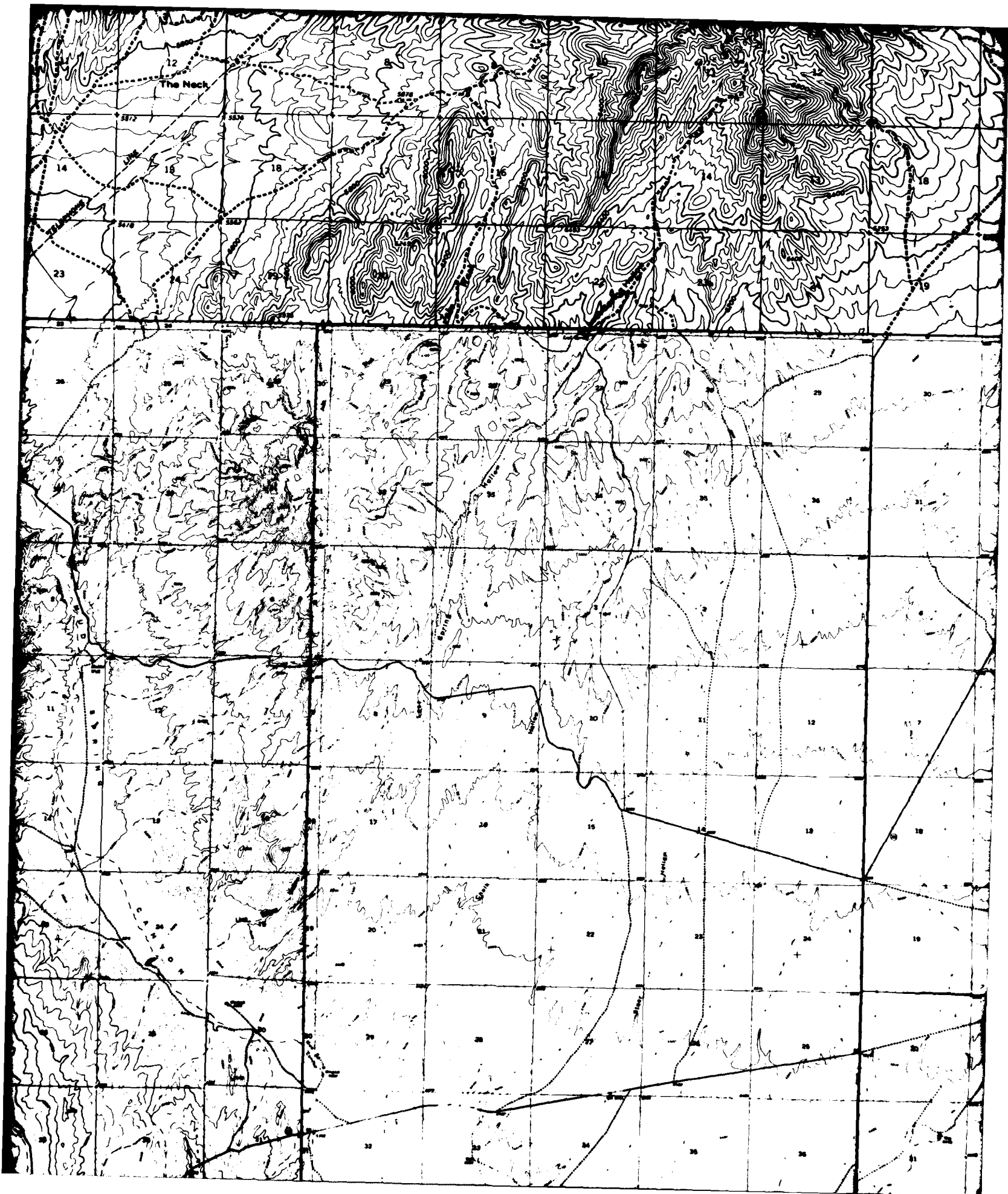


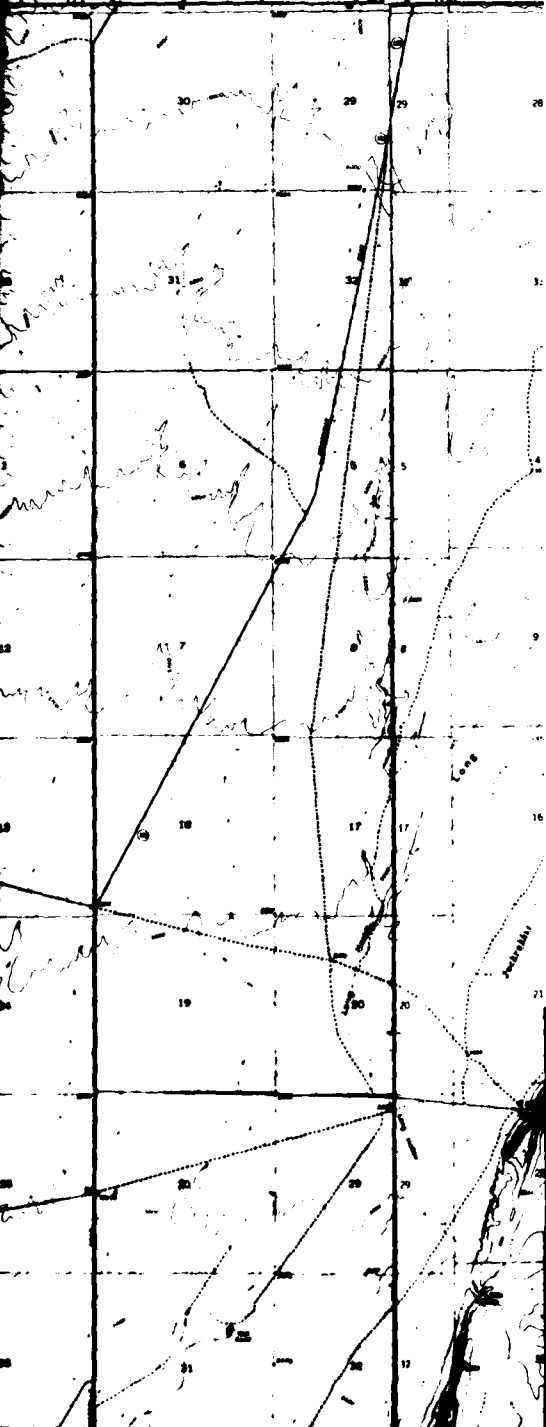
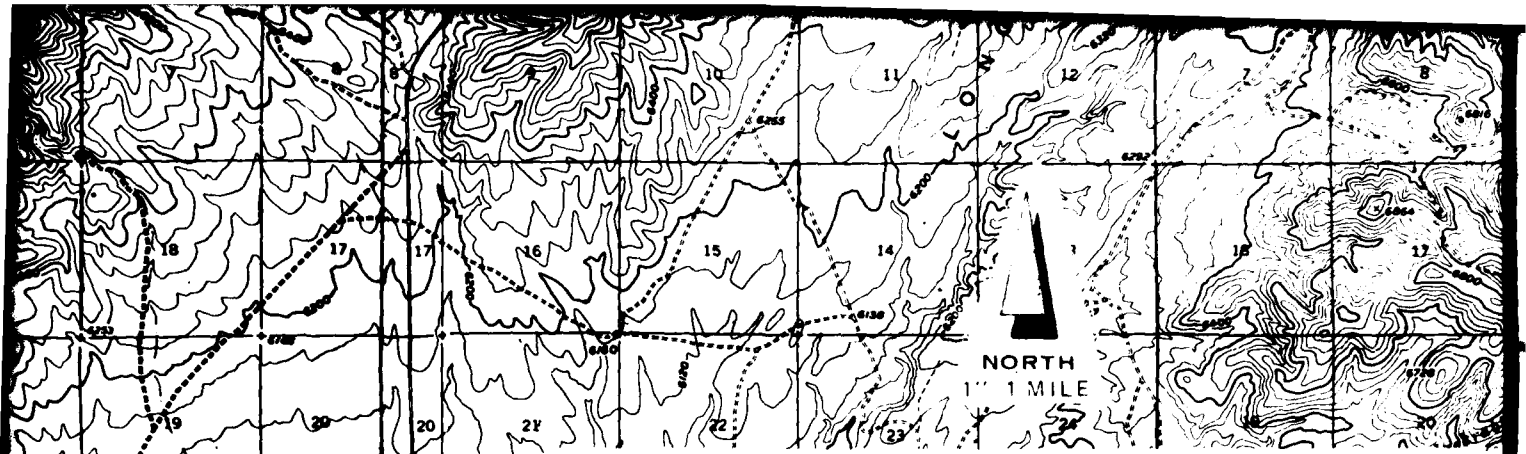












EXPLANATION

SYMBOLS

- ◆ BORINGS WITH OBSERVATION WELLS
- BORINGS (B)
- CONE PENETROMETER TESTS (C)
- ▬ TRENCHES (T)
- ▲ TEST PITS (P)
- △ SURFICIAL SOIL SAMPLES (CS)
- SEISMIC REFRACTION LINES (S)
- ||||| ELECTRICAL RESISTIVITY LINES (R)
- ⊙ GEOLOGIC STATION (GS)

NOTE: Due to the exaggeration of the map symbols, the exact location of any letter combination of activities is where either the boring (1st) or the CPT (2nd) is situated. Single activities must accurately located nearest the center of the symbol.

**ACTIVITY LOCATION MAP
OPERATIONAL BASE SITE
MILFORD, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE -- BMO

DRAWING

II-1-1

FUGRO NATIONAL, INC.

DA

FILE

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