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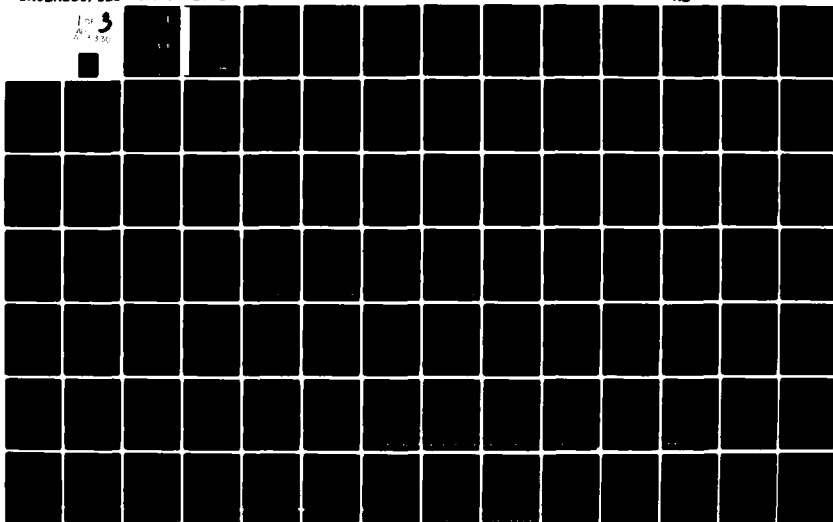
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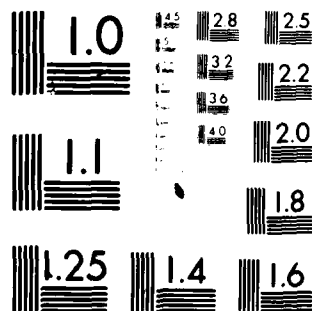
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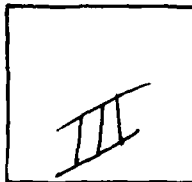


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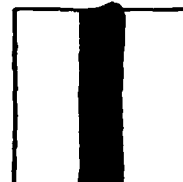
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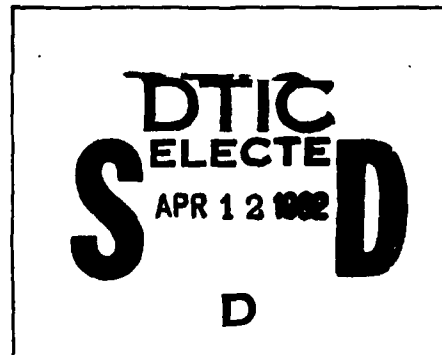
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**MX SITING INVESTIGATION  
GEOTECHNICAL EVALUATION**

**AD A113330**

**VOLUME VIII  
NEVADA-UTAH  
VERIFICATION STUDIES, FY 79  
GEOTECHNICAL DATA,  
BIG SMOKY CDP, NEVADA**

**PREPARED FOR  
SPACE AND MISSILE SYSTEMS ORGANIZATION (SAMSO)  
NORTON AIR FORCE BASE, CALIFORNIA**

**FUGRO**  
**NATIONAL, INC.**  
Consulting Engineers and Geologists

MX SITING INVESTIGATION  
GEOTECHNICAL EVALUATION  
VOLUME VIII, NEVADA-UTAH  
VERIFICATION STUDIES, FY 79  
GEOTECHNICAL DATA  
BIG SMOKY CDP, NEVADA

Prepared for:

U. S. Department of the Air Force  
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24 August 1979

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| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br>Ground-water, Gravity, borings logs, seismic<br>geology, compaction, cone penetrometer, electrical<br>resistivity, seismic analysis                                                                                                                                                    |                                     |                                                                           |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br>This report<br>evaluates geological, geophysical, + geotechnical<br>data + suitability of portions of Nevada +<br>Utah for siting the MX system. included are<br>bore data consisting of bench and boring logs, seismic analysis,<br>compression tests, and seismic refraction surveys. |                                     |                                                                           |

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VOLUME VIII  
GEOTECHNICAL DATA, BIG SMOKY CDP

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## FOREWORD

This report was prepared for the Department of the Air Force, Space and Missile Systems Organization (SAMSO), in compliance with Contract No. F04704-78-C-0027, CDRL Item 005A2. It presents geological, geophysical, and geotechnical data and evaluates the suitability of portions of Nevada and Utah for siting the MX Land Mobile Advanced ICBM System.

This report is the first of several Verification reports which will be prepared. The objectives are to verify sufficient suitable area for deployment of the MX System and to provide preliminary physical and engineering characteristics of the soils. The Verification Studies are the final phase of a site-selection process which was begun in 1977. Previous studies have been termed Screening, Characterization, and Ranking. In preparing this report, it has been assumed that the reader is familiar with these previous studies.

Results of the FY 79 Verification studies are contained in 11 volumes as follows:

### Geotechnical Results

Volume 1A - Sections 1.0, 2.0, and 3.0 contain Introduction, Results and Conclusions, and Recommendations for Future Studies. Sections 4.0 through 6.0 contain summary geotechnical data for Whirlwind, Snake East, and Hamlin CDP's.

Volume 1B - Sections 7.0 through 10.0 contain summary geotechnical data for White River North, Garden-Coal, Reveille-Railroad and Big Smoky CDP's.

### Geotechnical Data Volumes

|          |                             |
|----------|-----------------------------|
| Volume   | II - Whirlwind CDP          |
| Volume   | III - Snake East CDP        |
| Volume   | IV - Hamlin CDP             |
| Volume   | V - White River North CDP   |
| Volume   | VI - Garden-Coal CDP        |
| Volume   | VII - Reveille-Railroad CDP |
| * Volume | VIII - Big Smoky CDP        |
| Volume   | IX - Dry Lake CDP           |
| Volume   | X - Ralston CDP             |

\* This volume is presented herein.

SECTION 1.0  
GEOLOGIC STATION DATA

EXPLANATIONS OF GEOLOGIC STATION DATA

Geologic stations were established at selected locations throughout the CDP at which detailed descriptions of surficial basin-fill deposits or rock were recorded. Locations of all geologic stations are shown in Drawing 1, Activity Location Map. All data taken on surficial basin-fill units at these stations are listed in Table 1-1 and an explanation of the column headings in the table is given below. At stations where rock descriptions were made, only geologic unit designations are listed. A general explanation of all geologic unit symbols used in Verification Studies is included at the end of this section.

Column Heading  
Table 1-1

Explanation

|                                       |                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Station Number                        | Geologic stations are numbered sequentially. Where more than one geologic field team worked in a CDP, stations made by each team are differentiated with a letter (A, B, or C) following the station number.                                                                                                                |
| Geologic Unit                         | Generic geologic unit only, i.e. the grain-size designation (f, s, g, c) is omitted from surficial basin-fill units. The letter B in the unit designation indicates a buried deposit not exposed at the surface.                                                                                                            |
| MPS MM                                | Average maximum particle size in millimeters.                                                                                                                                                                                                                                                                               |
| Grain Size<br>(%B, %C, %G,<br>%S, %F) | Estimated particle size distribution using the Unified Soil Classification System. Percentages of boulders (%B) and cobbles (%C) are based on the entire deposit, whereas percentages of gravel (%G), sand (%S) and fines (%F) are taken only on the fraction composed of particles less than 3 inches (76 mm) in diameter. |
| USCS                                  | Soil class according to the Unified Soil Classification System.                                                                                                                                                                                                                                                             |

Munsell Color      Soil color based on Munsell Soil Color Chart.

Source Rock      Rock types of coarse clasts listed in order of  
Types(s)      abundance.

\* Physical      Data listed in columns 6 through 15 address  
Properties      specific soil properties. These are listed  
below in parentheses following the column  
heading number and are also listed at the  
bottom of Table 1-1. Data are coded with each  
numerical entry referring to a specific soil  
condition as listed below.

- 6 (Grain Shape) 1) Angular, 2) Subangular, 3) Subrounded,  
4) Rounded, 5) Well rounded
- 7 (Moisture      1) Dry, 2) Moist, 3) Wet  
Content)
- 8 (Plasticity      1) None, 2) Low, 3) Medium, 4) High  
of Fines)
- 9 (Consistency) Coarse grained: 1) Very Loose, 2) Loose,  
3) Medium Dense, 4) Dense, 5) Very Dense,  
  
Fine grained: 1) Soft, 2) Firm, 3) Stiff,  
4) Hard
- 10 (Structure) 1) Stratified Tabular, 2) Stratified Other  
(lensed, cross bedded, discontinuous beds),  
3) Nonstratified
- 11 (Cementation      1) None, 2) Weak, 3) Moderate, 4) Strong  
Induration)
- 12 (Depth to      Depth to layer (in centimeters) exhibiting  
Cemented      cementation induration described in Column 11  
Layers)      (above)
- 13 (Weathering      1) Fresh, 2) Slight, 3) Moderate, 4) Very  
of clasts)
- 14 (Soil      1) None (A-C profile), 2) Poor (incipient  
Profile      B-horizon), 3) Well (prominant B-horizon)  
Development)
- 15 (Caliche      1) Stage I, 2) Stage II, 3) Stage III,  
Development) 4) Stage IV, 5) None

## Drainage

DP (M)  
WD (M)Average depth of drainages (in meters)  
Average width of drainages (in meters)

Slope (%)

Average slope of ground surface (in percent  
grade)

Sample

Number of samples taken

GENERALIZED GEOLOGIC UNITSExplanation

## Surficial Basin-fill Units

- A1 Younger Fluvial Deposits - Major modern stream channel and flood-plain deposits.
- A2 Older Fluvial Deposits - Older incised stream channel and flood-plain deposits in elevated terraces bordering major modern drainages.
- A3 Eolian Deposits - Wind-blown deposits of sand occurring as either thin sheets (A3s) or dunes (A3d).
- A4 Playa and Lacustrine Deposits - Deposits occurring in modern, active playas (A4) or in either inactive playas or older lake beds and abandoned shorelines associated with extinct lakes (A4o).
- A5 Alluvial Fan Deposits - Alluvial deposits consisting of debris flow and water-laid alluvium near mountain fronts, grading into predominantly water-laid alluvium deposited in shifting distributary channels near the basin center. Younger (A5y), intermediate (A5i), and older (A5o) alluvial fans are differentiated by surface soil development, terrain conditions, and present depositional/erosional environment.

Grain sizes of these deposits (except A3 deposits, which are exclusively sandy) are indicated by a single letter (f, s, g, or c) following the geologic unit symbol. These letters indicate the predominant grain size and range of soil types according to the Unified Soil Classification System:

- f - fine-grained (ML, CL, MH, CH)
- s - sands (SP, SW, SM, SC)
- g - gravels (GP, GW, GM, GC)
- c - coarse grained with greater than 30 percent boulders and cobbles (generally GP, GW, GM, GC)

ROCK UNITS

- I Igneous (undifferentiated). Rocks formed by solidification of a molten or partially molten mass.
  - I1 Intrusive - Plutonic rocks formed by solidification of molten material beneath the surface (e.g., granite, granodiorite, diorite, gabbro).
  - I2 Extrusive (intermediate and acidic) - Volcanic rocks of intermediate and acidic composition formed by solidification of molten material at or near the surface, (e.g., rhyolite, latite, dacite, andesite).
  - I3 Extrusive (basic) - Volcanic rocks of basic composition, generally formed by solidification of molten materials at or near the surface (e.g., basalt).
  - I4 Extrusive (pyroclastic) - Rocks formed by accumulation of volcanic ejecta (e.g., ash, tuff, welded tuff, agglomerate).
- S Sedimentary (undifferentiated) - Rocks formed by accumulation of clastic solids, organic solids and/or chemically precipitated minerals.
  - S1 Arenaceous and/or Siliceous Rocks - Composed of sand size particles (e.g., sandstone, orthoquartzite) or of cryptocrystalline silica (e.g., opal, chert).
  - S2 Carbonate Rocks - Composed predominantly of calcium carbonate detritus or chemical precipitates (e.g., limestone, dolomite, chalk).
  - S3 Argillaceous Rocks - Composed of clay and silt-sized particles (e.g., siltstone, shale, claystone).
  - S4 Evaporite Rocks - Precipitated from solution as a result of evaporation (e.g., halite, gypsum, anhydrite, sylvite).
  - S5 Coarse Clastic Rocks - Composed of gravel sized or larger clasts (e.g., conglomerate, breccia).
- M Metamorphic (undifferentiated) - Rocks formed through recrystallization in the solid state of preexisting rocks by heat and pressure (e.g., gneiss, schist, hornfels, metaquartzite).



| SOIL DESCRIPTION  |                  |     |               |      |                  |                        |                     |       |              |    |    |    | TEST DATA |    |    |    |             |              |   |   |          |   |              |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------|------------------|-----|---------------|------|------------------|------------------------|---------------------|-------|--------------|----|----|----|-----------|----|----|----|-------------|--------------|---|---|----------|---|--------------|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STATION<br>NUMBER | GEOLOGIC<br>UNIT | MPS | SPAIN<br>SIZE | USCS | MUSSELL<br>COLOR | SOURCE<br>ROCK TYPE(S) | PHYSICAL PROPERTIES |       |              |    |    |    |           |    |    |    |             |              |   |   | DRAINAGE |   | SLOPE<br>(%) | SAMPLE |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                   |                  |     |               |      |                  |                        | 6                   | 7     | 8            | 9  | 10 | 11 | 12        | 13 | 14 | 15 | TRIP<br>(M) | DEPTH<br>(M) |   |   |          |   |              |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| VNSG77A           | 12               |     |               |      |                  |                        |                     |       |              |    |    |    |           |    |    |    |             |              |   |   |          |   |              |        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| VNSG78A           | 12               | 25  | 25            | 20   | 10               | 040                    | 110                 | SP-SM | 10-0-0-0-0-0 | 12 | 14 |    | 1         | 1  | 2  | 2  | 2           | 028          | 2 | 2 | 1        | 1 | 1            | 1      | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

PHYSICAL PROPERTIES:  
 6 - GRAIN SHAPE  
 7 - MOISTURE CONTENT  
 8 - PLASTICITY INDEX  
 9 - CONSISTENCY  
 10 - STRUCTURE  
 11 - COHESION/IMBIBITION  
 12 - DEPTH TO FRACTURED LAYER(S)  
 13 - WEATHERING OF CLUSTERS  
 14 - SOIL PROFILE DEVELOPMENT  
 15 - CALICHE DEVELOPMENT

GEOLOGIC STATION DATA  
 VERIFICATION SITE, BIG SMOKY, NEVADA

MX SITING INVESTIGATION  
 DEPARTMENT OF THE AIR FORCE - SAMS

TABLE  
 1-1  
 2 OF 2

FUGRO NATIONAL, INC.

SECTION 2.0  
GROUND-WATER DATA

EXPLANATIONS OF GROUND-WATER DATA

Existing ground-water data were collected from all available sources. These data were updated where possible from measurements taken during Fugro field operations, and all data are shown on Table 2-1. Locations of water wells and boreholes in which water-level measurements were available are shown in Drawing 1. Well numbers listed in Column 1 (Table 2-1) refer to well locations in Drawing 1. Actual well numbers giving location according to the Bureau of Land Management Land Survey System are shown in Column 2.

Water levels generally refer to the static ground-water table in the unconfined basin-fill aquifer. Perched conditions or levels in artesian aquifers are noted where known.

| WELL NO. | WELL LOCATION NUMBER* | ELEVATION OF GROUND SURFACE- FEET (METERS) ABOVE M.S.L. | DEPTH OF WELL- FEET (METERS) | WATER LEVEL                               |               |                                       | REFERENCES**/ REMARKS |
|----------|-----------------------|---------------------------------------------------------|------------------------------|-------------------------------------------|---------------|---------------------------------------|-----------------------|
|          |                       |                                                         |                              | DEPTH BELOW GROUND SURFACE- FEET (METERS) | DATE MEASURED | ELEVATION- FEET (METERS) ABOVE M.S.L. |                       |
| W1       | 9N/43E-9ad            | 5775<br>(1761)                                          | 513<br>(156)                 | 140<br>(43)                               | 1962          | 5635<br>(1718)                        | 3                     |
| W2       | 9N/43E-9bb            | 5800<br>(1768)                                          | 513<br>(156)                 | 140<br>(43)                               | 1968          | 5660<br>(1726)                        | 5                     |
| W3       | 9N/43E-9db            | 5880<br>(1793)                                          | 601<br>(183)                 | 215<br>(66)                               | 1968          | 5665<br>(1727)                        | 5                     |
| W4       | 9N/42E-3lad           | 6100<br>(1860)                                          | 93<br>(28)                   | 17                                        | 1948          | 6083<br>(1855)                        | 3,5                   |
| W5       | 8N/39E-13b1           | 5680<br>(1732)                                          | 42<br>(13)                   | 25<br>(8)                                 | 1950          | 5655<br>(1724)                        | 5                     |
| W6       | 8N/39E-13b2           | 5680<br>(1732)                                          | 36<br>(11)                   | 15<br>(5)                                 | 1950          | 5665<br>(1727)                        | 5                     |
| W7       | 8N/42E-16             | --                                                      | 100<br>(30)                  | 38<br>(12)                                | 1940          | --                                    | 6                     |
| W8       | 8N/42E-16             | --                                                      | 126<br>(38)                  | 44<br>(13)                                | 1940          | --                                    | 3,6                   |
| W9       | 8N/42E-18             | 6400<br>(1951)                                          | 55<br>(17)                   | 35<br>(11)                                | 1949          | 6365<br>(1941)                        | 3,6                   |
| W10      | 8N/43E-15d            | 6475<br>(1974)                                          | --                           | 40<br>(12)                                | pre<br>1917   | 6435<br>(1962)                        | 3,6                   |
| W11      | 8N/43E-21a            | 6220<br>(1896)                                          | 90<br>(27)                   | 85<br>(26)                                | 1913          | 6135<br>(1870)                        | 3                     |
| W12      | 8N/43E-23a            | 6580<br>(2006)                                          | --                           | 35<br>(11)                                | pre<br>1917   | 6545<br>(1995)                        | 3,6                   |
| W13      | 8N/44E-20c            | 7110<br>(2168)                                          | 60<br>(18)                   | 6<br>(2)                                  | 1913          | 7104<br>(2166)                        | 7                     |
| W14      | 7N/40E-27cb           | 5115<br>(1559)                                          | 300<br>(91)                  | 96<br>(29)                                | 1964          | 5030<br>(1530)                        | 5,7                   |
| W15      | 7N/40E-27dc           | 5115<br>(1559)                                          | 300<br>(91)                  | 86<br>(26)                                | 1968          | 5029<br>(1533)                        | 5,7                   |
| W16      | 7N/40E-28ad           | 5130<br>(1564)                                          | 560<br>(171)                 | 100<br>(30)                               | 1964          | 5030<br>(1534)                        | 5,7                   |

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- (7) U. S. Geological Survey (1979)

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GROUND-WATER DATA  
VERIFICATION SITE  
BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE  
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FUGRO NATIONAL, INC.

| WELL NO. | WELL LOCATION NUMBER* | ELEVATION OF GROUND SURFACE- FEET (METERS) ABOVE M.S.L. | DEPTH OF WELL- FEET (METERS) | WATER LEVEL                               |               |                                       | REFERENCES**/ REMARKS |
|----------|-----------------------|---------------------------------------------------------|------------------------------|-------------------------------------------|---------------|---------------------------------------|-----------------------|
|          |                       |                                                         |                              | DEPTH BELOW GROUND SURFACE- FEET (METERS) | DATE MEASURED | ELEVATION- FEET (METERS) ABOVE M.S.L. |                       |
| W17      | 7N/40E-28cb           | 5140<br>(1567)                                          | 300<br>(91)                  | 97<br>(30)                                | 1964          | 5043<br>(1538)                        | 5,7                   |
| W18      | 7N/40E-30a            | 5140<br>(1567)                                          | 133<br>(41)                  | 78<br>(24)                                | 1949          | 5062<br>(1543)                        | 5,7                   |
| W19      | 7N/40E-35b            | 5100<br>(1555)                                          | 420<br>(128)                 | 90<br>(27)                                | 1958          | 5010<br>(1527)                        | 5,6,7                 |
| W20      | 7N/40E-35ccc          | 5100<br>(1555)                                          | 1420<br>(433)                | 90<br>(27)                                | 1968          | 5010<br>(1527)                        | 5,7                   |
| W21      | 7N/42E-15             | --                                                      | 240<br>(73)                  | 180<br>(55)                               | 1949          | --                                    | 3,6                   |
| W22      | 7N/42E-17c7           | 5400<br>(1646)                                          | 84<br>(26)                   | 12<br>(4)                                 | 1949          | 5388<br>(1643)                        | 5                     |
| W23      | 7N/42EE-17c11         | 5430<br>(1655)                                          | 14<br>(4)                    | 4<br>(1)                                  | 1913          | 5426<br>(1654)                        | 3,5                   |
| W24      | 7N/42E-18dc           | 5380<br>(1640)                                          | 30<br>(9)                    | 17<br>(5)                                 | 1949          | 5363<br>(1635)                        | 5,7                   |
| W25      | 7N/42E-18-8           | --                                                      | 36<br>(11)                   | flowing                                   | 1949          | --                                    | 3                     |
| W26      | 7N/42E-18-10          | --                                                      | 100<br>(30)                  | flowing                                   | 1949          | --                                    | 3                     |
| W27      | 7N/42E-33aa           | 5617<br>(1713)                                          | 240<br>(73)                  | 180<br>(55)                               | 1949          | 5437<br>(1658)                        | 5,7                   |
| W28      | 6N/40E-12ca           | 5080<br>(1549)                                          | 415<br>(127)                 | 97<br>(30)                                | 1962          | 4983<br>(1519)                        | 6                     |
| W29      | 6N/40E-12da           | 5690<br>(1735)                                          | 282<br>(86)                  | 90<br>(27)                                | 1961          | 5600<br>(1707)                        | 6                     |
| W30      | 6N/40E-13aa1          | 5080<br>(1549)                                          | 480<br>(146)                 | 78<br>(24)                                | 1965          | 5002<br>(1525)                        | 5                     |
| W31      | 6N/40E-13aa2          | 5080<br>(1549)                                          | 387<br>(118)                 | 80<br>(24)                                | 1962          | 5000<br>(1524)                        | 5,6                   |
| W32      | 6N/40E-13da           | 5070<br>(1546)                                          | 350<br>(107)                 | 83<br>(25)                                | 1979          | 4987<br>(1520)                        | 5                     |

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GROUND-WATER DATA  
VERIFICATION SITE  
BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE  
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2 OF 8

FUGRO NATIONAL, INC.

| WELL NO. | WELL LOCATION NUMBER* | ELEVATION OF GROUND SURFACE- FEET (METERS) ABOVE M.S.L. | DEPTH OF WELL- FEET (METERS) | WATER LEVEL                               |               |                                       | REFERENCES**/ REMARKS |
|----------|-----------------------|---------------------------------------------------------|------------------------------|-------------------------------------------|---------------|---------------------------------------|-----------------------|
|          |                       |                                                         |                              | DEPTH BELOW GROUND SURFACE- FEET (METERS) | DATE MEASURED | ELEVATION- FEET (METERS) ABOVE M.S.L. |                       |
| W33      | 6N/40E-24aa           | 5060<br>(1543)                                          | 350<br>(107)                 | 87<br>(27)                                | 1963          | 4973<br>(1516)                        | 5                     |
| W34      | 6N/40E-34cbb          | 5000<br>(1524)                                          | --                           | 178<br>(54)                               | 1979          | 4822<br>(1470)                        | 1                     |
| W35      | 6N/40E-34cbd          | --                                                      | 40<br>(12)                   | dry                                       | 1979          | --                                    | 1                     |
| W36      | 6N/40E-34cd           | 4990<br>(1521)                                          | --                           | 171<br>(52)                               | 1979          | 4819<br>(1469)                        | 1                     |
| W37      | 6N/40E-34db           | 4990<br>(1521)                                          | --                           | 169<br>(52)                               | 1979          | 4821<br>(1470)                        | 1                     |
| W38      | 6N/40E-36c            | 4999<br>(1524)                                          | --                           | 96<br>(29)                                | 1979          | 4903<br>(1495)                        | 1                     |
| W39      | 6N/41E-7ba1           | 5110<br>(1558)                                          | 200<br>(61)                  | 76<br>(23)                                | 1963          | 5034<br>(1535)                        | 5,6                   |
| W40      | 6N/41E-7ba2           | 5110<br>(1558)                                          | 350<br>(107)                 | 92<br>(28)                                | 1970          | 5008<br>(1527)                        | 5,6                   |
| W41      | 6N/41E-7ca            | 5060<br>(1543)                                          | 244<br>(74)                  | 87<br>(27)                                | 1964          | 4973<br>(1516)                        | 3,5,6,7               |
| W42      | 6N/41E-16cc           | 5098<br>(1554)                                          | 230<br>(70)                  | 145<br>(44)                               | 1979          | 4963<br>(1513)                        | 5,6                   |
| W43      | 6N/41E-18ca1          | 5080<br>(1549)                                          | 400<br>(122)                 | 92<br>(28)                                | 1963          | 4988<br>(1521)                        | 3,5,6                 |
| W44      | 6n/41E-18cb1          | 5080<br>(1549)                                          | 191<br>(58)                  | 78<br>(24)                                | 1962          | 5002<br>(1525)                        | 3,5,6                 |
| W45      | 6N/41E-18cb2          | 5076<br>(1548)                                          | 200<br>(61)                  | 83<br>(25)                                | 1968          | 4993<br>(1522)                        | 5,7                   |
| W46      | 6N/43E-6cc            | 6006<br>(1831)                                          | --                           | 280<br>(85)                               | --            | 5726<br>(1746)                        | 5                     |
| W47      | 5N/40E-3ba            | 4980<br>(1518)                                          | --                           | 172<br>(52)                               | 1979          | 4808<br>(1466)                        | 1                     |
| W48      | 5N/40E-3bc            | 5003<br>(1525)                                          | --                           | 186<br>(57)                               | 1979          | 4817<br>(1469)                        | 1                     |

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GROUND-WATER DATA  
VERIFICATION SITE  
BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

TABLE  
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FUGRO NATIONAL, INC.

| WELL NO. | WELL LOCATION NUMBER* | ELEVATION OF GROUND SURFACE- FEET (METERS) ABOVE M.S.L. | DEPTH OF WELL- FEET (METERS) | WATER LEVEL                               |               |                                       | REFERENCES**/ REMARKS |
|----------|-----------------------|---------------------------------------------------------|------------------------------|-------------------------------------------|---------------|---------------------------------------|-----------------------|
|          |                       |                                                         |                              | DEPTH BELOW GROUND SURFACE- FEET (METERS) | DATE MEASURED | ELEVATION- FEET (METERS) ABOVE M.S.L. |                       |
| W49      | 5N/40E-3ca1           | 4975<br>(1517)                                          | --                           | 153<br>(47)                               | 1979          | 4822<br>(1470)                        | 1                     |
| W50      | 5N/40E-3ca2           | --                                                      | 155<br>(47)                  | dry                                       | 1979          | --                                    | 1                     |
| W51      | 5N/40E-3cb            | 4979<br>(1518)                                          | --                           | 170<br>(52)                               | 1979          | 4809<br>(1466)                        | 1                     |
| W52      | 5N/40E-3cc            | 4972<br>(1516)                                          | --                           | 156<br>(48)                               | 1979          | 4816<br>(1468)                        | 1                     |
| W53      | 5N/40E-4d             | 5000<br>(1524)                                          | --                           | 204<br>(62)                               | 1979          | 4796<br>(1462)                        | 1                     |
| W54      | 5N/40E-10b            | --                                                      | 52<br>(16)                   | dry                                       | 1979          | --                                    | 1                     |
| W55      | 5N/40E-33d            | 4882<br>(1488)                                          | 700<br>(213)                 | 90<br>(27)                                | 1913          | 4792<br>(1461)                        | 5                     |
| W56      | 5N/41E-5bd1           | 5002<br>(1525)                                          | 135<br>(41)                  | 130<br>(40)                               | 1979          | 4872<br>(1485)                        | 5                     |
| W57      | 5N/41E-5bd2           | 5002<br>(1525)                                          | 180<br>(55)                  | 125<br>(38)                               | 1965          | 4877<br>(1487)                        | 5,6                   |
| W58      | 5N/41E-6a             | 5020<br>(1530)                                          | 135<br>(41)                  | 124<br>(38)                               | 1913          | 4896<br>(1493)                        | 3,6                   |
| W59      | 4N/41E-16db           | 4858<br>(1481)                                          | 98<br>(30)                   | 55<br>(17)                                | 1968          | 4803<br>(1464)                        | 5,7                   |
| W60      | 4N/41E-30db           | 4830<br>(1473)                                          | 47<br>(14)                   | 43<br>(13)                                | 1913          | 4787<br>(1459)                        | 5,7                   |
| W61      | 3N/40E-2c1            | 4815<br>(1468)                                          | 61<br>(19)                   | 40<br>(12)                                | --            | 4775<br>(1456)                        | 6                     |
| W62      | 3N/40E-2cd            | 4817<br>(1469)                                          | 280<br>(85)                  | 50<br>(15)                                | 1968          | 4767<br>(1453)                        | 5,7                   |
| W63      | 3N/40E-11bb           | 4815<br>(1468)                                          | 61<br>(19)                   | 39<br>(12)                                | 1959          | 4776<br>(1456)                        | 5,7                   |
| W64      | 3N/41E-10cb           | 5000<br>(1524)                                          | 210<br>(64)                  | 202<br>(62)                               | 1913          | 4798<br>(1463)                        | 3,5,7                 |

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GROUND-WATER DATA  
VERIFICATION SITE  
BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE  
2-1  
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NOTE: All wells tap unconfined alluvial aquifers except where noted. Where published data are lacking or inaccurate, ground surface elevations are taken from topographic maps.

**FUGRO NATIONAL, INC.**

| WELL NO. | WELL LOCATION NUMBER* | ELEVATION OF GROUND SURFACE- FEET (METERS) ABOVE M.S.L. | DEPTH OF WELL - FEET (METERS) | WATER LEVEL                               |               |                                       | REFERENCES**/ REMARKS |
|----------|-----------------------|---------------------------------------------------------|-------------------------------|-------------------------------------------|---------------|---------------------------------------|-----------------------|
|          |                       |                                                         |                               | DEPTH BELOW GROUND SURFACE- FEET (METERS) | DATE MEASURED | ELEVATION- FEET (METERS) ABOVE M.S.L. |                       |
| W65      | 3N/41E-19ab           | 4773<br>(1455)                                          | --                            | 8<br>(2)                                  | 1969          | 4765<br>(1453)                        | 7                     |
| W66      | 3N/41E-2acd           | 5070<br>(1546)                                          | 310<br>(95)                   | 240<br>(73)                               | 1949          | 4830<br>(1473)                        | 5, 7                  |
| W67      | 3N/41E-26-1           | --                                                      | 179<br>(55)                   | 42<br>(13)                                | 1964          | --                                    | 2                     |
| W68      | 3N/41E-26-2           | 5233<br>(1595)                                          | 312<br>(95)                   | 42<br>(13)                                | 1964          | 5191<br>(1583)                        | 2                     |
| W69      | 3N/41E-28             | --                                                      | 310<br>(95)                   | 240<br>(73)                               | 1950          | --                                    | 1, 6                  |
| W70      | 3N/42E-4-1            | --                                                      | 330<br>(101)                  | 310<br>(95)                               | 1950          | --                                    | 2                     |
| W71      | 3N/42E-4-2            | --                                                      | 30<br>(9)                     | 20<br>(6)                                 | 1950          | --                                    | 2, 6                  |
| W72      | 3N/42E-9              | --                                                      | 179<br>(55)                   | 42<br>(13)                                | 1963          | --                                    | 2                     |
| W73      | 3N/42E-11             | 6130<br>(1869)                                          | 330<br>(101)                  | 132<br>(40)                               | 1949          | 5998<br>(1829)                        | 3, 6                  |
| W74      | 3N/42E-11             | --                                                      | 35<br>(11)                    | 20<br>(6)                                 | 1949          | --                                    | 2                     |
| W75      | 3N/42E-21             | 5639<br>(1719)                                          | 312<br>(95)                   | 9<br>(3)                                  | 1963          | 5630<br>(1716)                        | 2, 6                  |
| W76      | 3N/42E-32             | 5550<br>(1692)                                          | 179<br>(55)                   | 20<br>(6)                                 | 1963          | 5530<br>(1686)                        | 6                     |
| W77      | 1N/41E-26a            | 4875<br>(1486)                                          | --                            | 61<br>(19)                                | 1913          | 4814<br>(1468)                        | 4                     |
| W78      | 1N/41E-26d            | 4901<br>(1494)                                          | >400<br>(>122)                | 61<br>(19)                                | --            | 4840<br>(1476)                        | 6                     |
| W79      | 1N/42E-33d            | 4958<br>(1512)                                          | 160<br>(49)                   | 148<br>(45)                               | --            | 4810<br>(1466)                        | 6                     |
| W80      | 1N/42E-34c            | 4940<br>(1506)                                          | 160<br>(49)                   | 148<br>(45)                               | --            | 4792?<br>(1461)                       | 4                     |

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GROUND-WATER DATA  
VERIFICATION SITE  
BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE  
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FUGRO NATIONAL, INC.

| WELL NO. | WELL LOCATION NUMBER* | ELEVATION OF GROUND SURFACE- FEET (METERS) ABOVE M.S.L. | DEPTH OF WELL- FEET (METERS) | WATER LEVEL                               |               |                                       | REFERENCES**/ REMARKS |
|----------|-----------------------|---------------------------------------------------------|------------------------------|-------------------------------------------|---------------|---------------------------------------|-----------------------|
|          |                       |                                                         |                              | DEPTH BELOW GROUND SURFACE- FEET (METERS) | DATE MEASURED | ELEVATION- FEET (METERS) ABOVE M.S.L. |                       |
| W81      | 1S/41E-4c             | 4825<br>(1471)                                          | 72<br>(22)                   | 46<br>(14)                                | 1965          | 4779<br>(1457)                        | 4                     |
| W82      | 1S/41E-18a            | 4825<br>(1471)                                          | 72<br>(22)                   | 48<br>(15)                                | 1965          | 4777?<br>(1456)                       | 4                     |
| W83      | 1S/42E-3              | 4930<br>(1503)                                          | --                           | 197<br>(60)                               | --            | 4733<br>(1443)                        | 6                     |
| W84      | 1S/42E-10aa           | 4990<br>(1521)                                          | 310<br>(95)                  | 210<br>(64)                               | 1950          | 4780?<br>(1457)                       | 4,6                   |

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GROUND-WATER DATA  
VERIFICATION SITE.  
BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE  
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**FUGRO NATIONAL, INC.**

SECTION 3.0  
SEISMIC REFRACTION DATA

EXPLANATIONS OF SEISMIC REFRACTION DATA

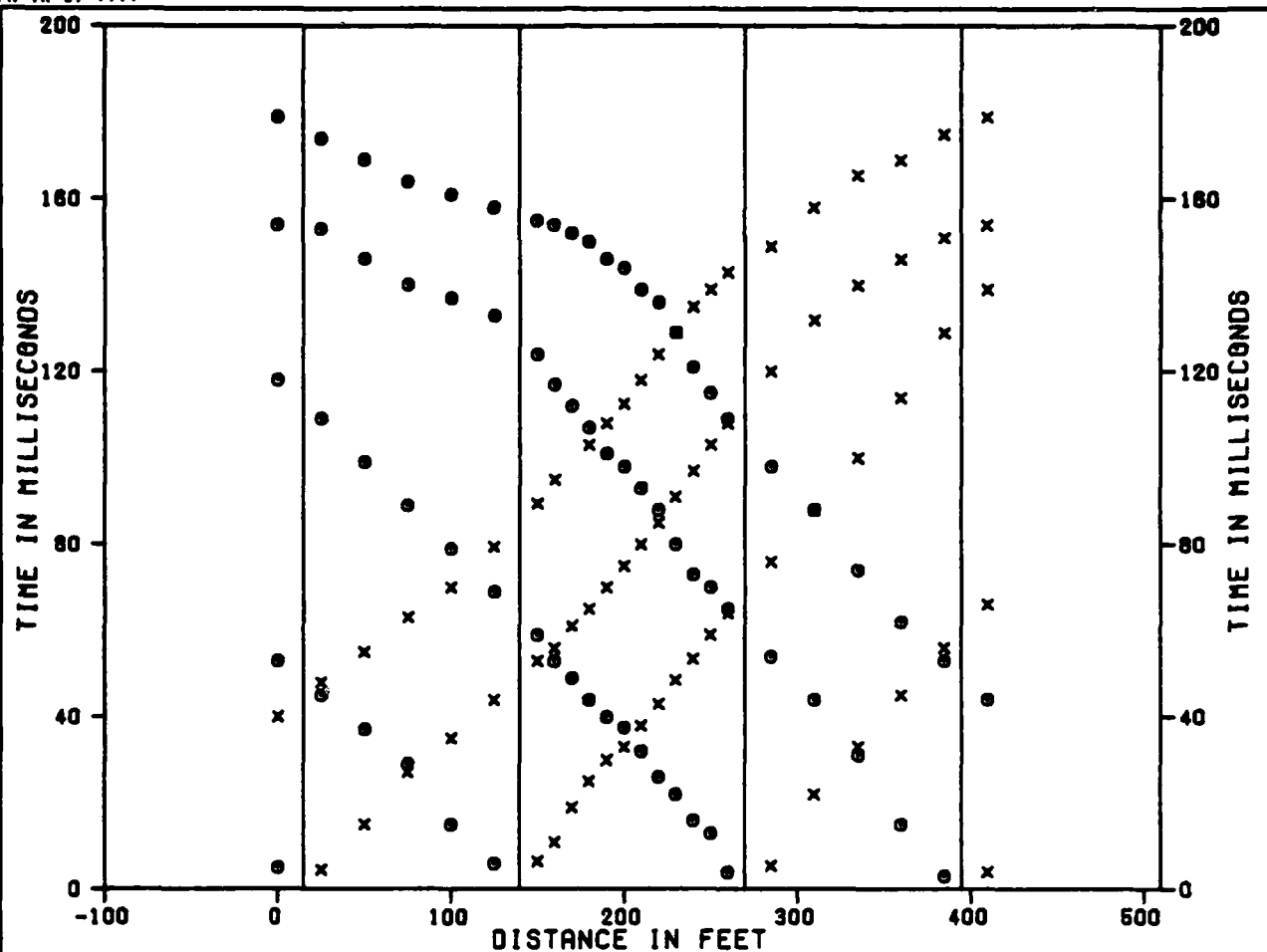
Each figure shows seismic wave travel times plotted versus surface distance between the energy source (shot) and the detector (geophone) for a single seismic line. Distances are measured along the line from geophone number 1 which is designated as zero distance. Distances to the right (on the paper)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

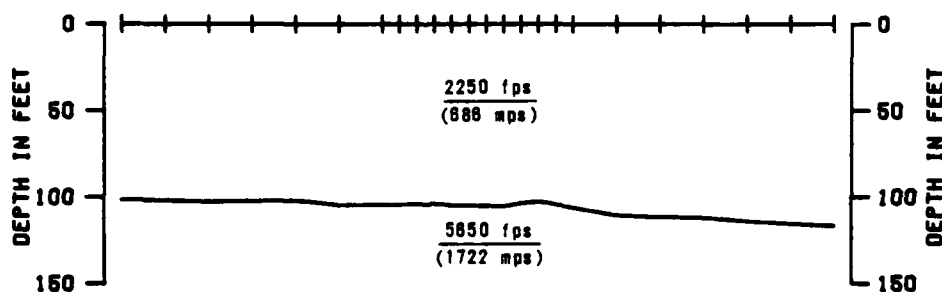
Velocity Cross Section (Lower Half of Figure)

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.



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

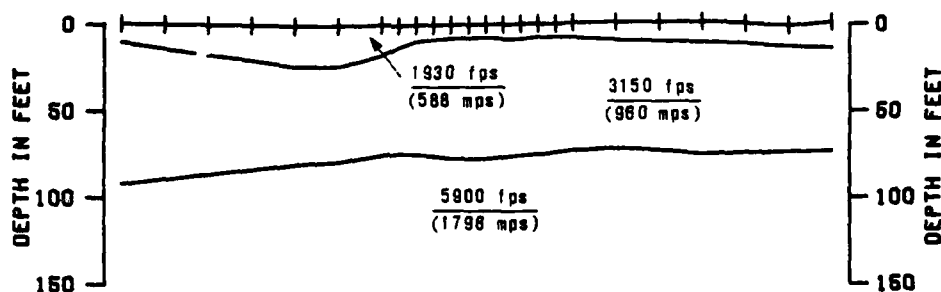
SEISMIC REFRACTION LINE BS-S-1  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

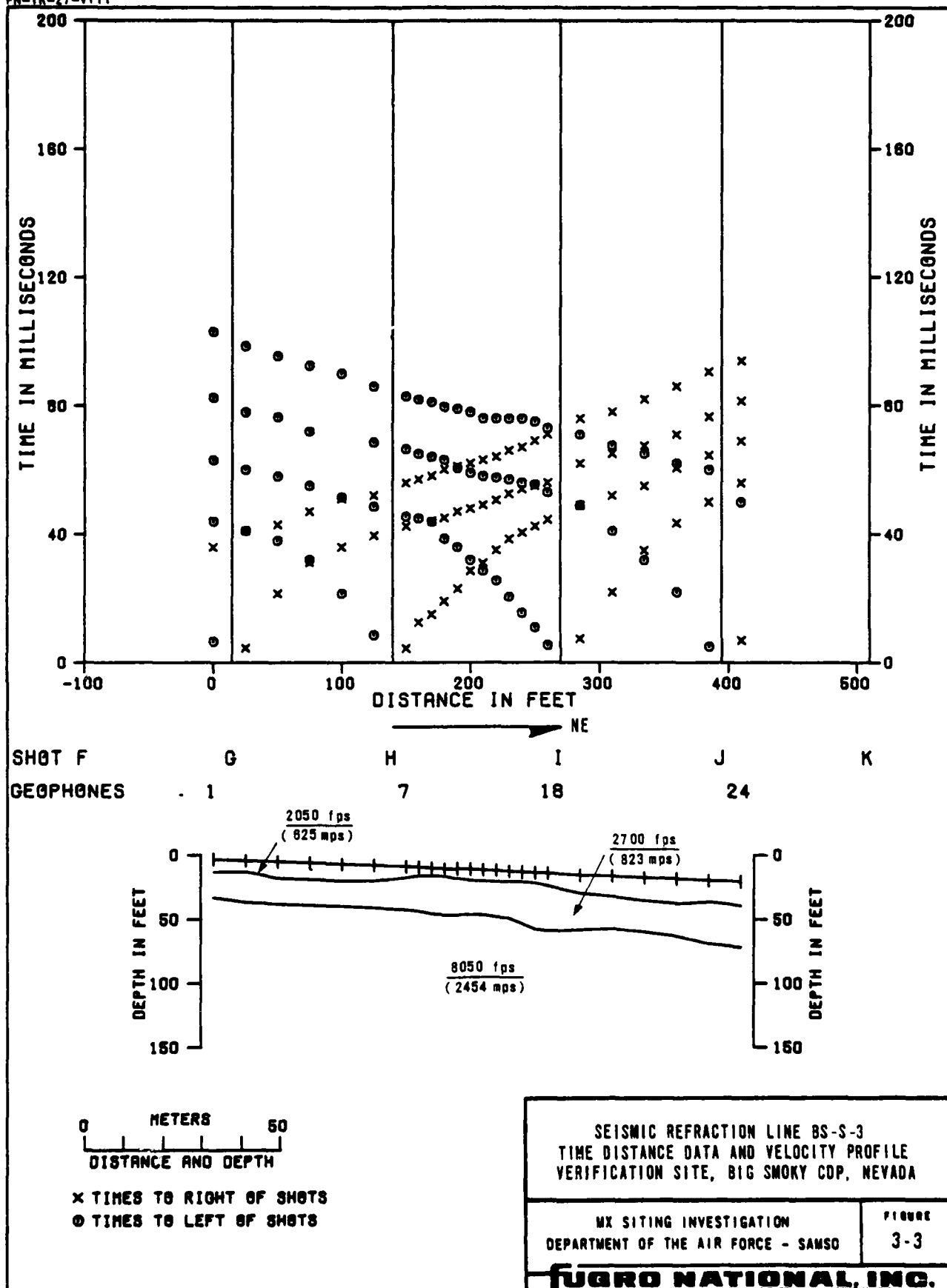
MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

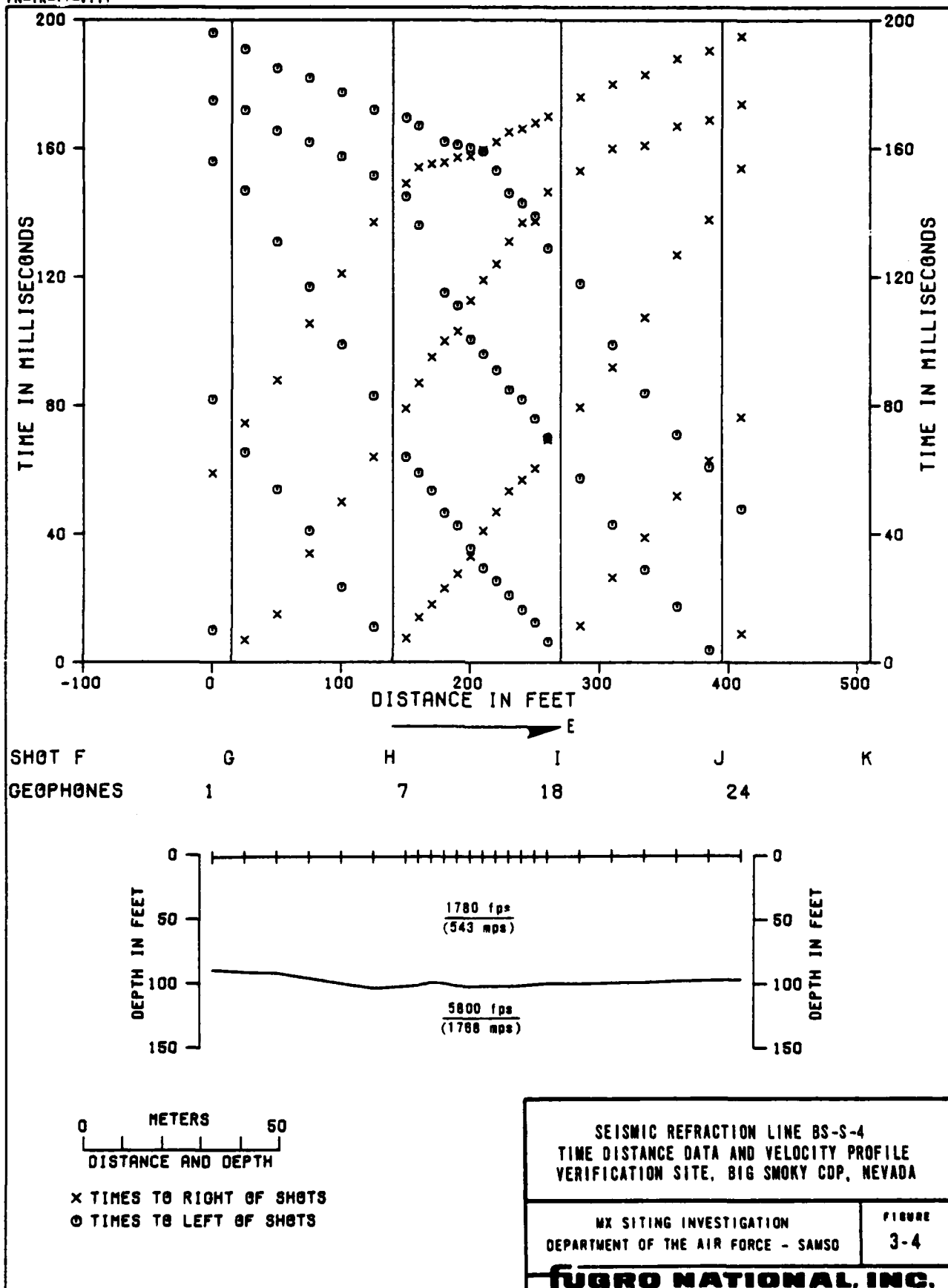
FIGURE  
3-1

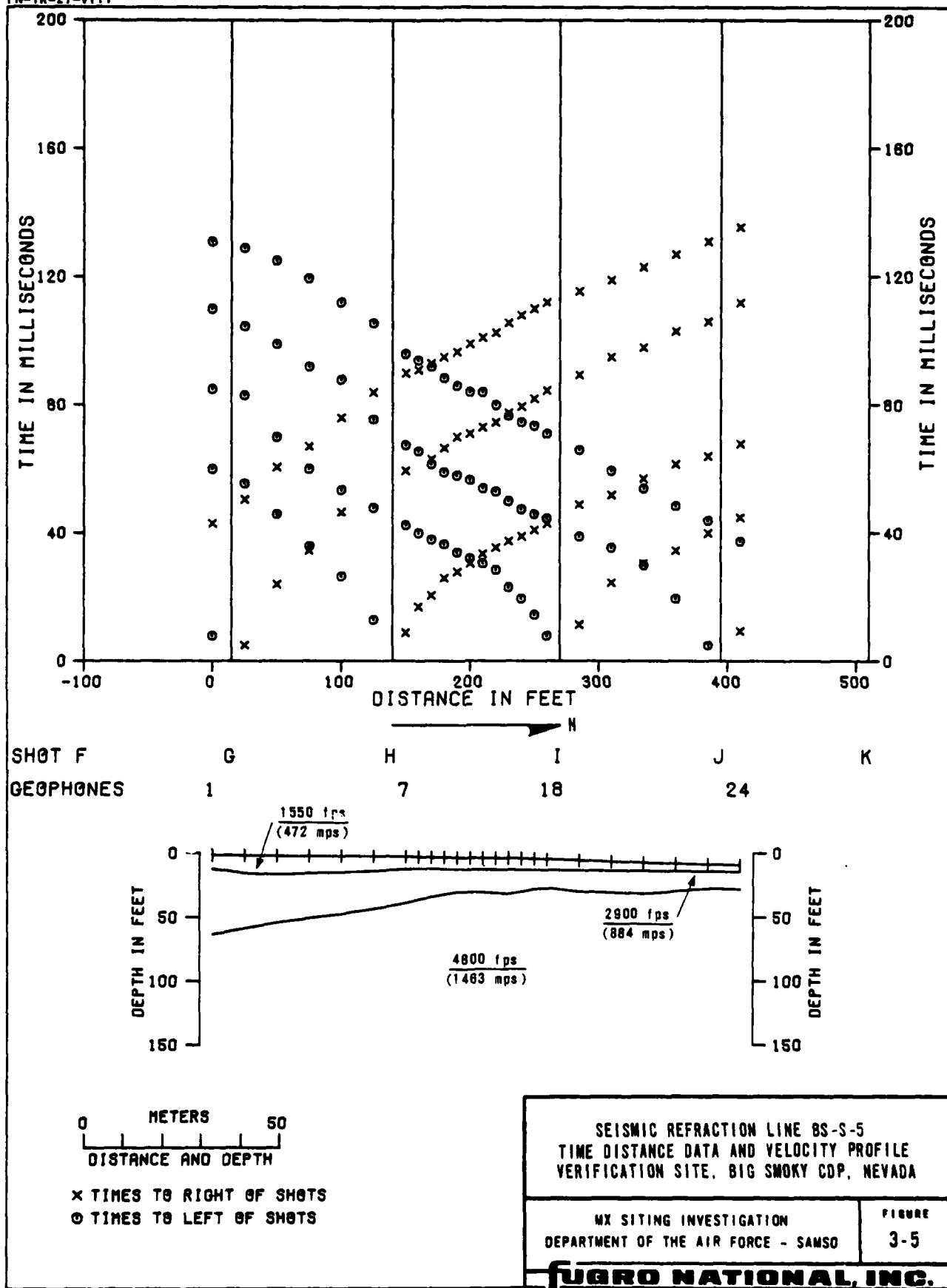
**FUGRO NATIONAL, INC.**

**K**

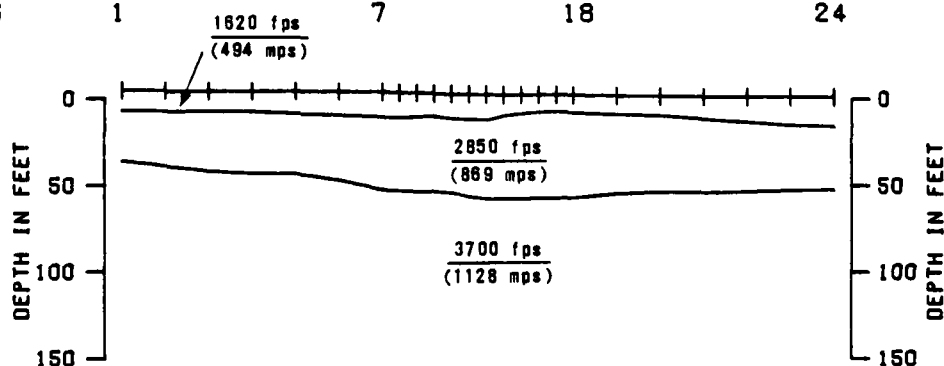
**FUGRO NATIONAL, INC.**







| G | H | I  | J  | K |
|---|---|----|----|---|
| 1 | 7 | 18 | 24 |   |



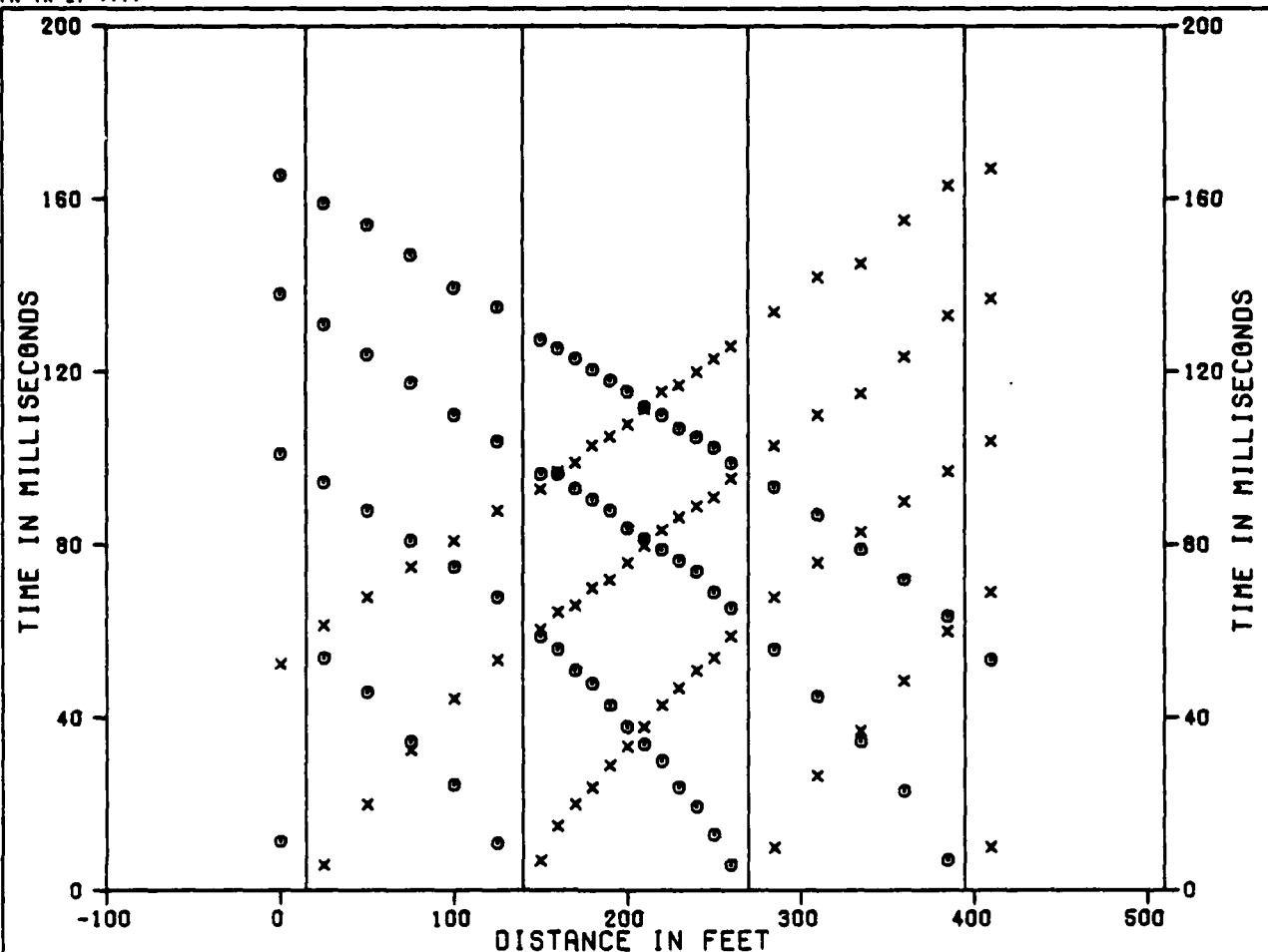
X TIMES TO RIGHT OF SHOTS  
O TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE BS-S-6  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

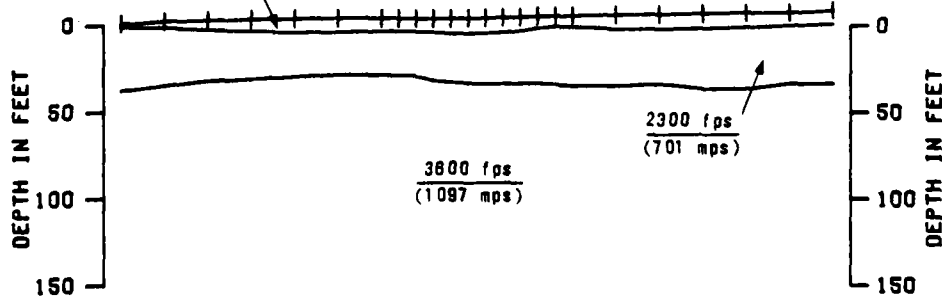
**FIGURE**  
**3-6**

**FUGRO NATIONAL, INC.**



SHOT F  
GEOPHONES

G H I J K  
1 7 18 24  
1520 fps  
(463 mps)



0 METERS 50  
DISTANCE AND DEPTH

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

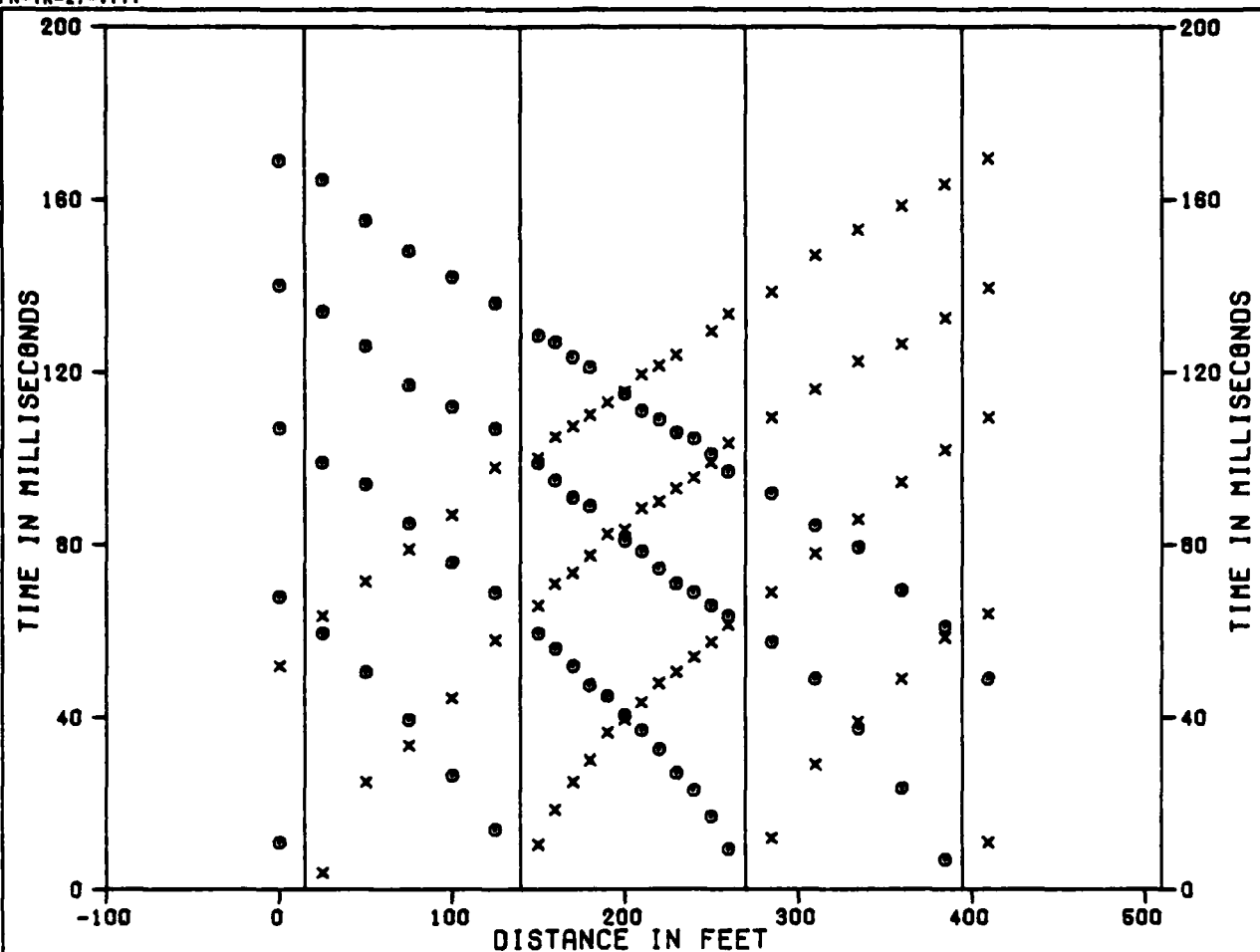
SEISMIC REFRACTION LINE BS-S-7  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
3-7

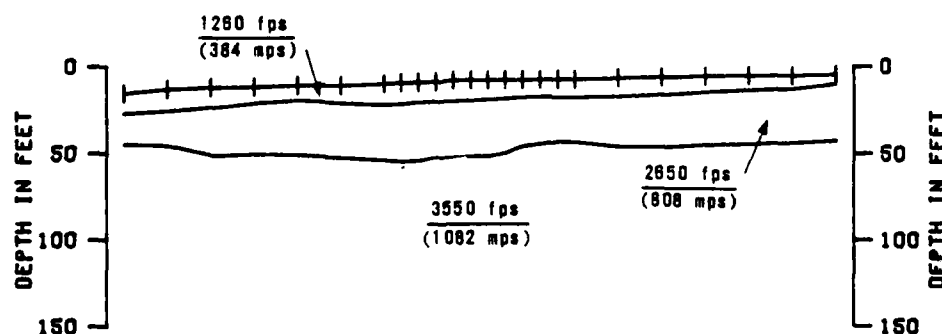
**FUGRO NATIONAL, INC.**





SHOT F  
GEOPHONES

G H I J K  
1 7 18 24



0 METERS 50  
DISTANCE AND DEPTH

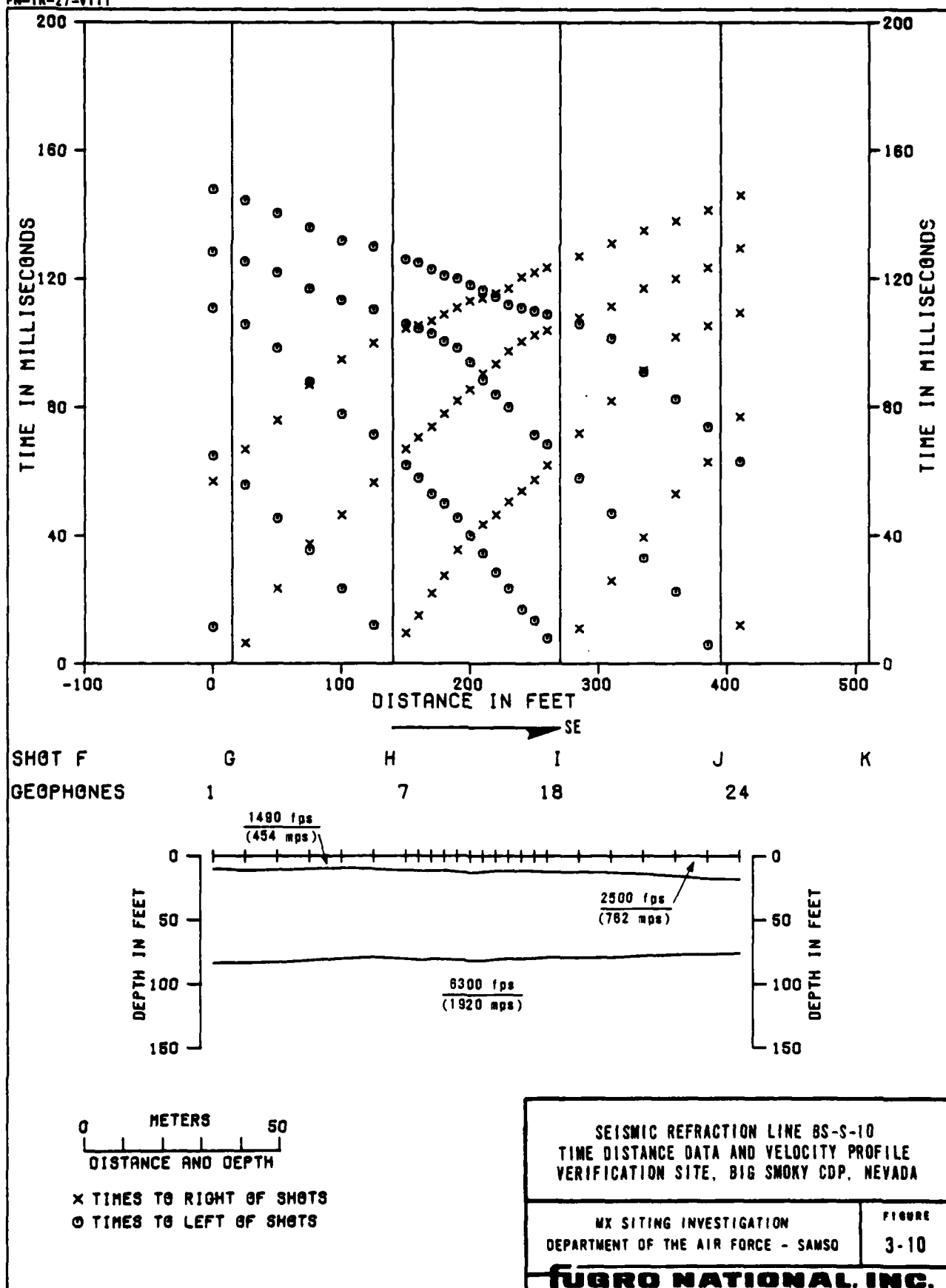
x TIMES TO RIGHT OF SHOTS  
o TIMES TO LEFT OF SHOTS

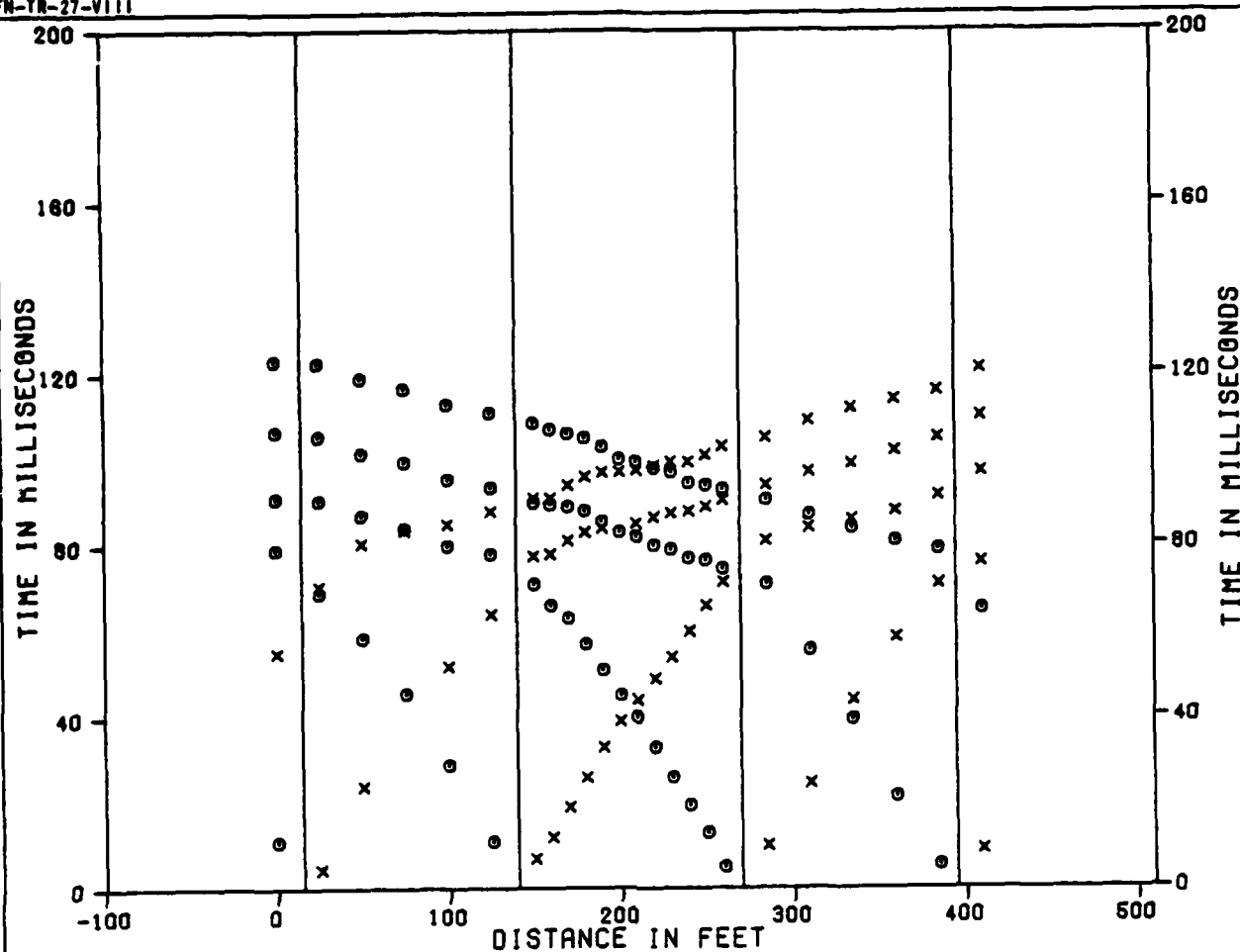
SEISMIC REFRACTION LINE BS-S-9  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
3-9

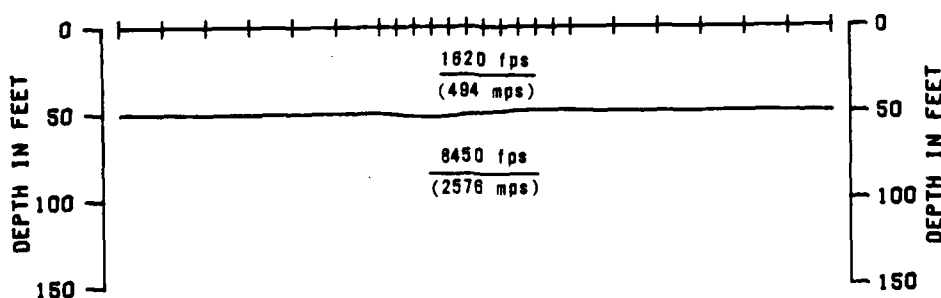
**FUGRO NATIONAL, INC.**





SHOT F  
GEOPHONES

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



0 METERS 50  
DISTANCE AND DEPTH

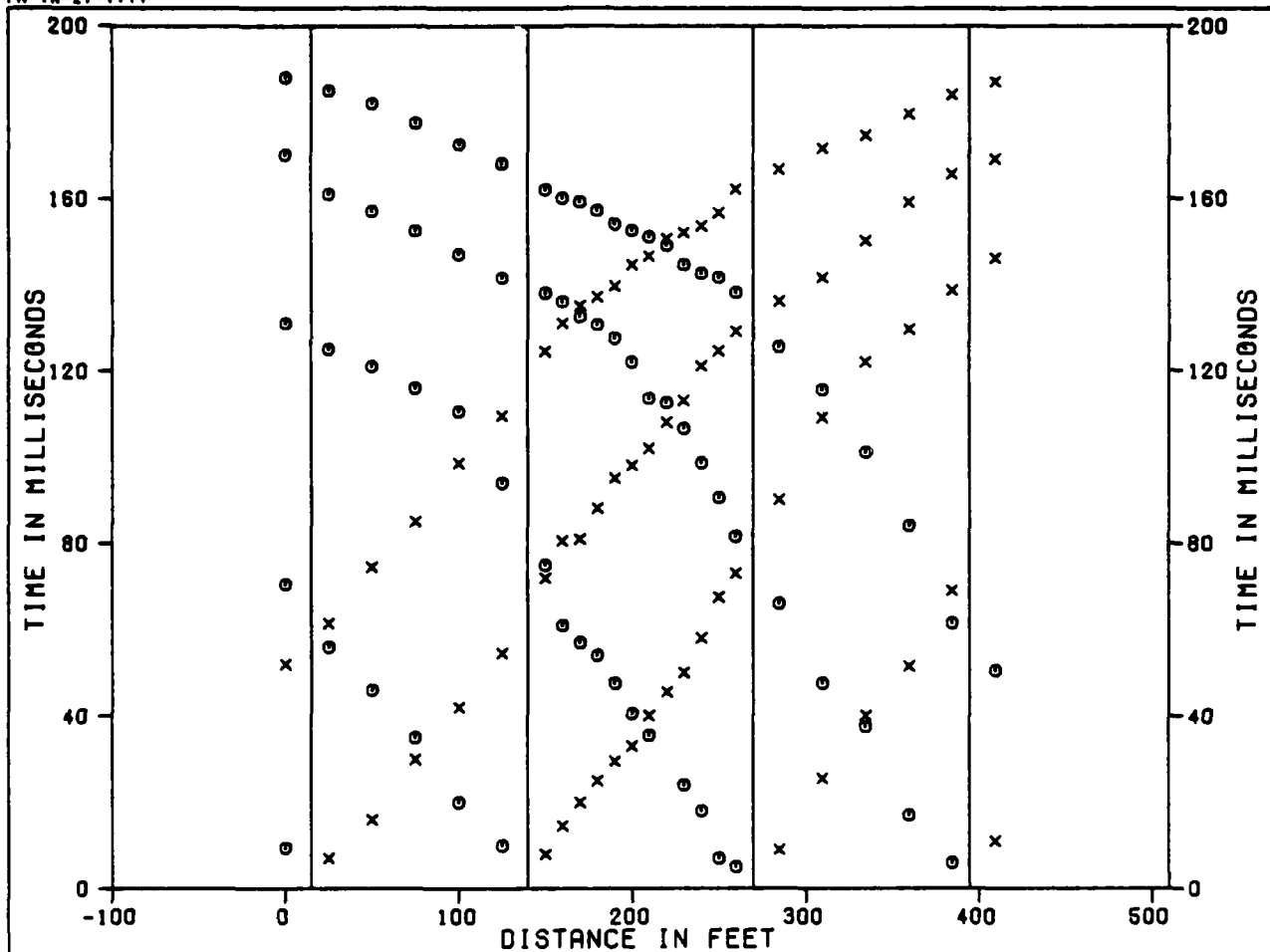
x TIMES TO RIGHT OF SHOTS  
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE BS-S-11  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

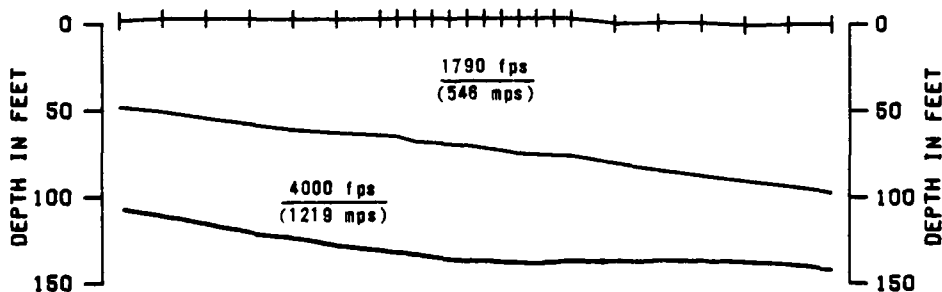
FIGURE  
3-11

**FUGRO NATIONAL, INC.**



SHOT F  
GEOPHONES

G H I J K  
1 7 18 24



0 METERS 50  
DISTANCE AND DEPTH

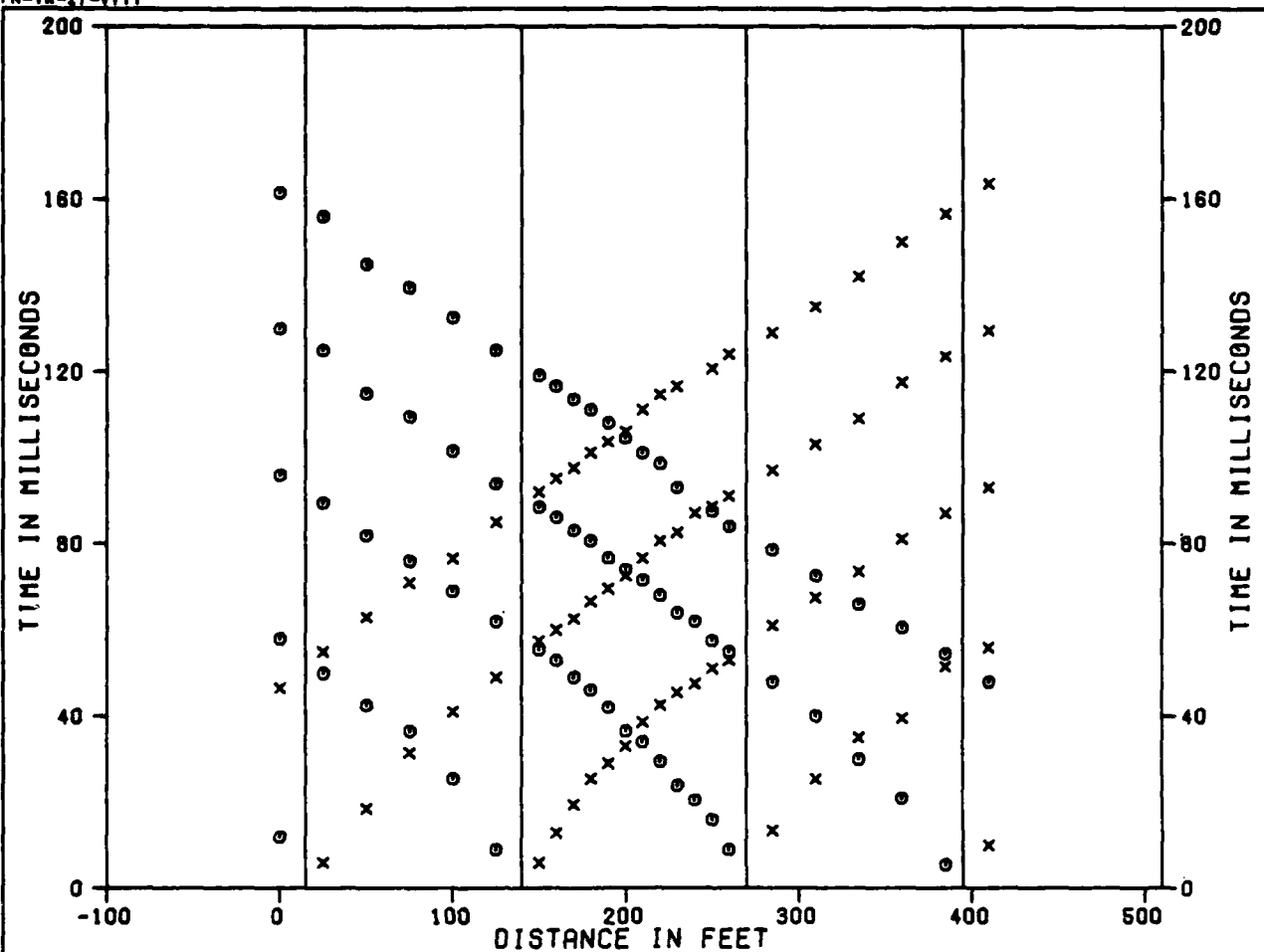
x TIMES TO RIGHT OF SHOTS  
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE BS-S-12  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

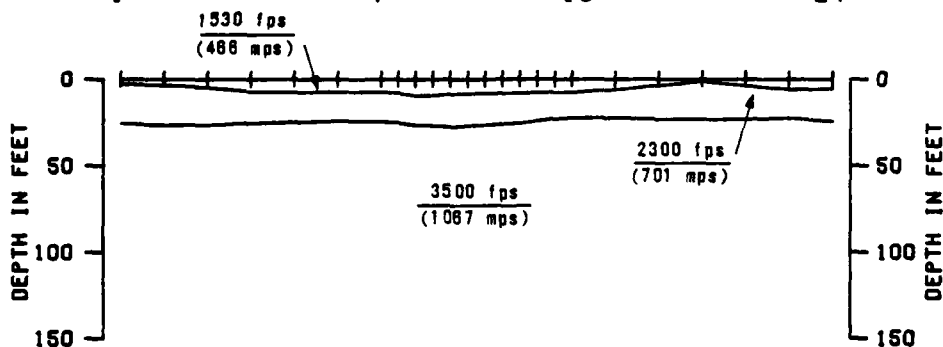
FIGURE  
3-12

**FUGRO NATIONAL, INC.**



SHOT F  
GEOPHONES

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



0 METERS 50  
DISTANCE AND DEPTH

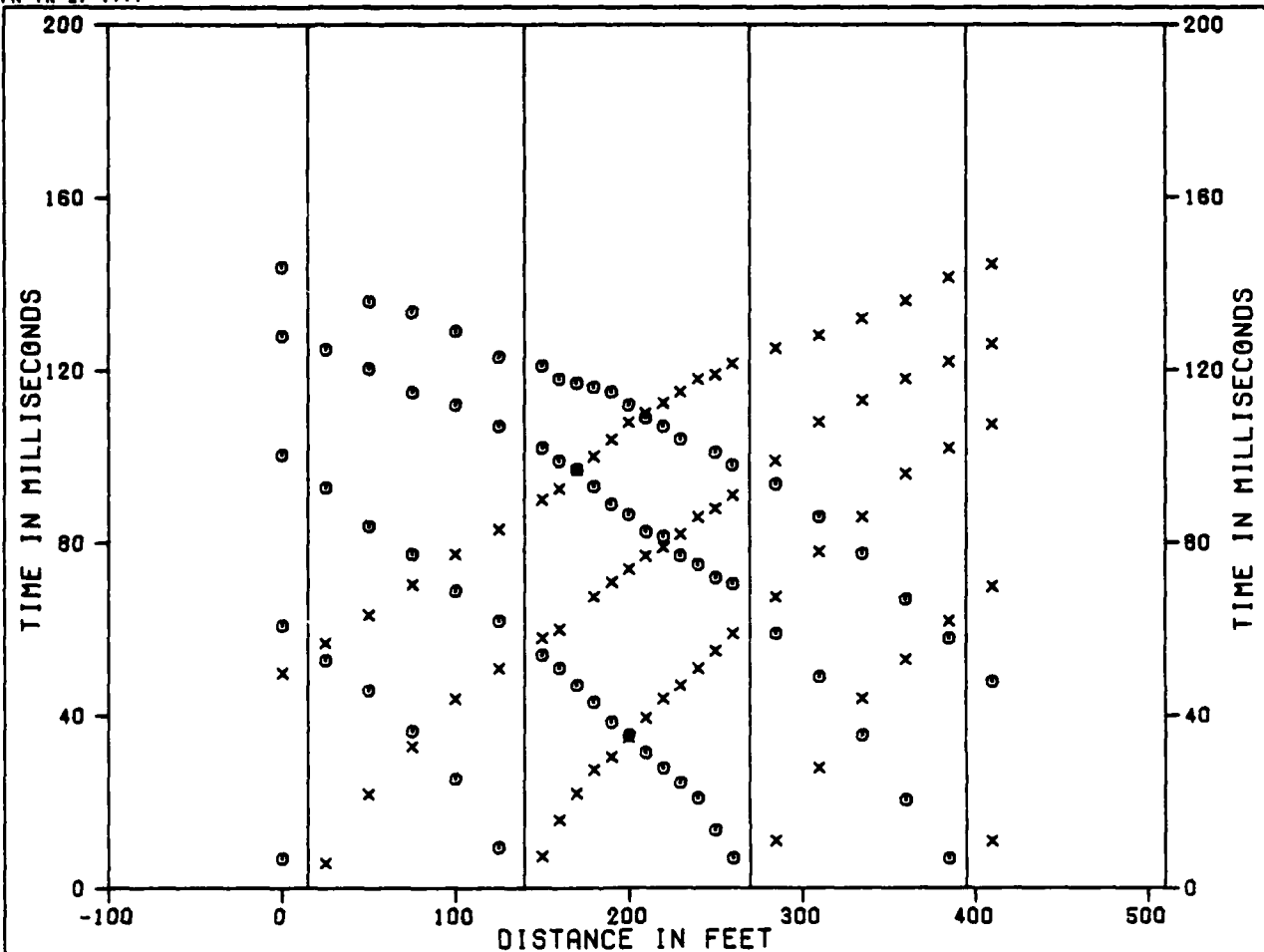
x TIMES TO RIGHT OF SHOTS  
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE BS-S-13  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

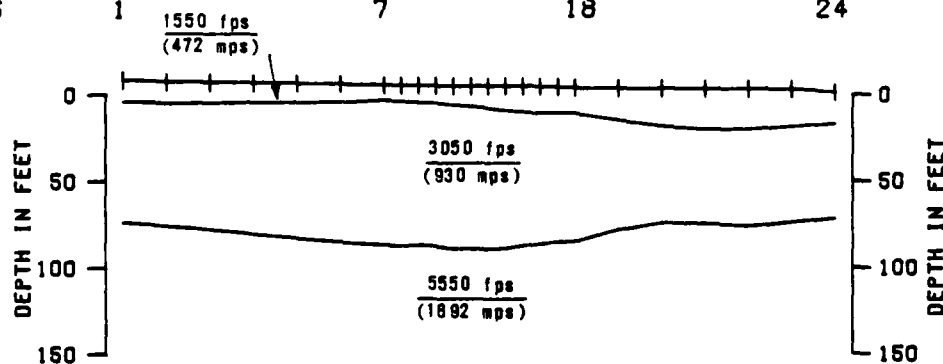
FIGURE  
3-13

**FUGRO NATIONAL, INC.**



SHOT F  
GEOPHONES

G H I J K  
1 7 18 24



0 METERS 50  
DISTANCE AND DEPTH

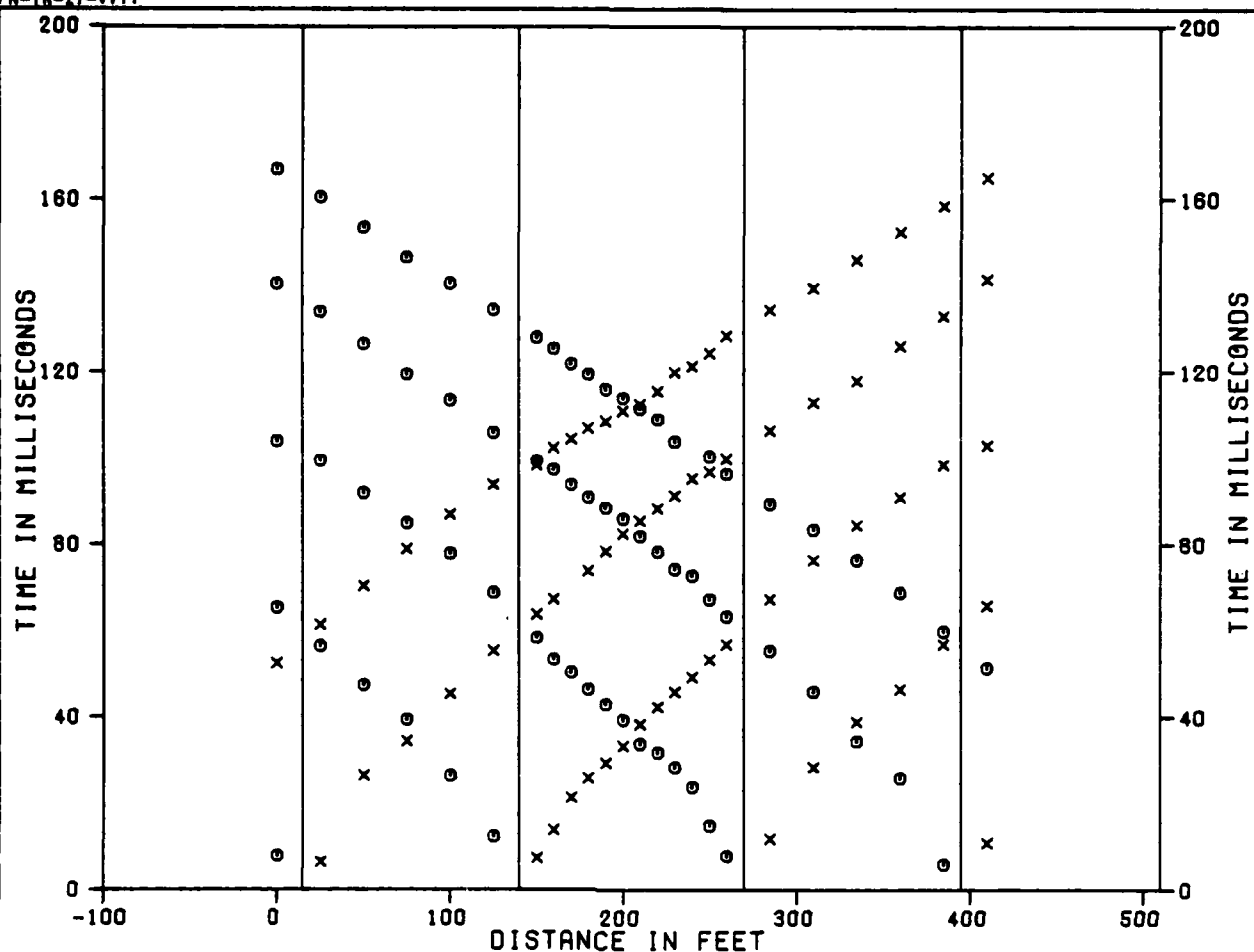
x TIMES TO RIGHT OF SHOTS  
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE 'S-S-14'  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMS0

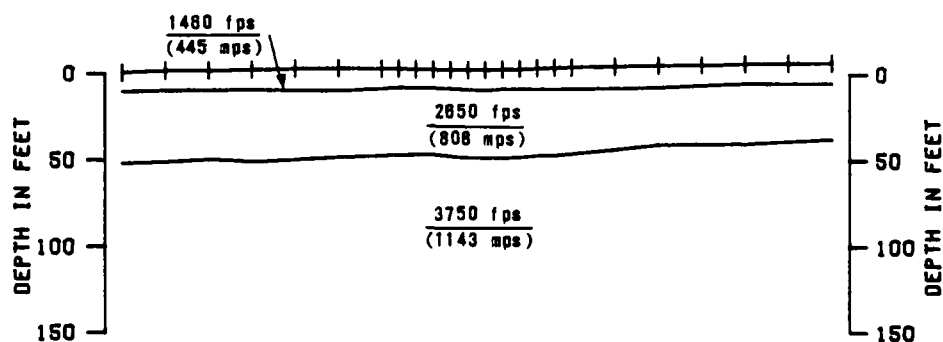
FIGURE  
3-14

**FUGRO NATIONAL, INC.**



SHOT F  
GEOPHONES

G H I J K  
1 7 18 24



0 METERS 50  
DISTANCE AND DEPTH

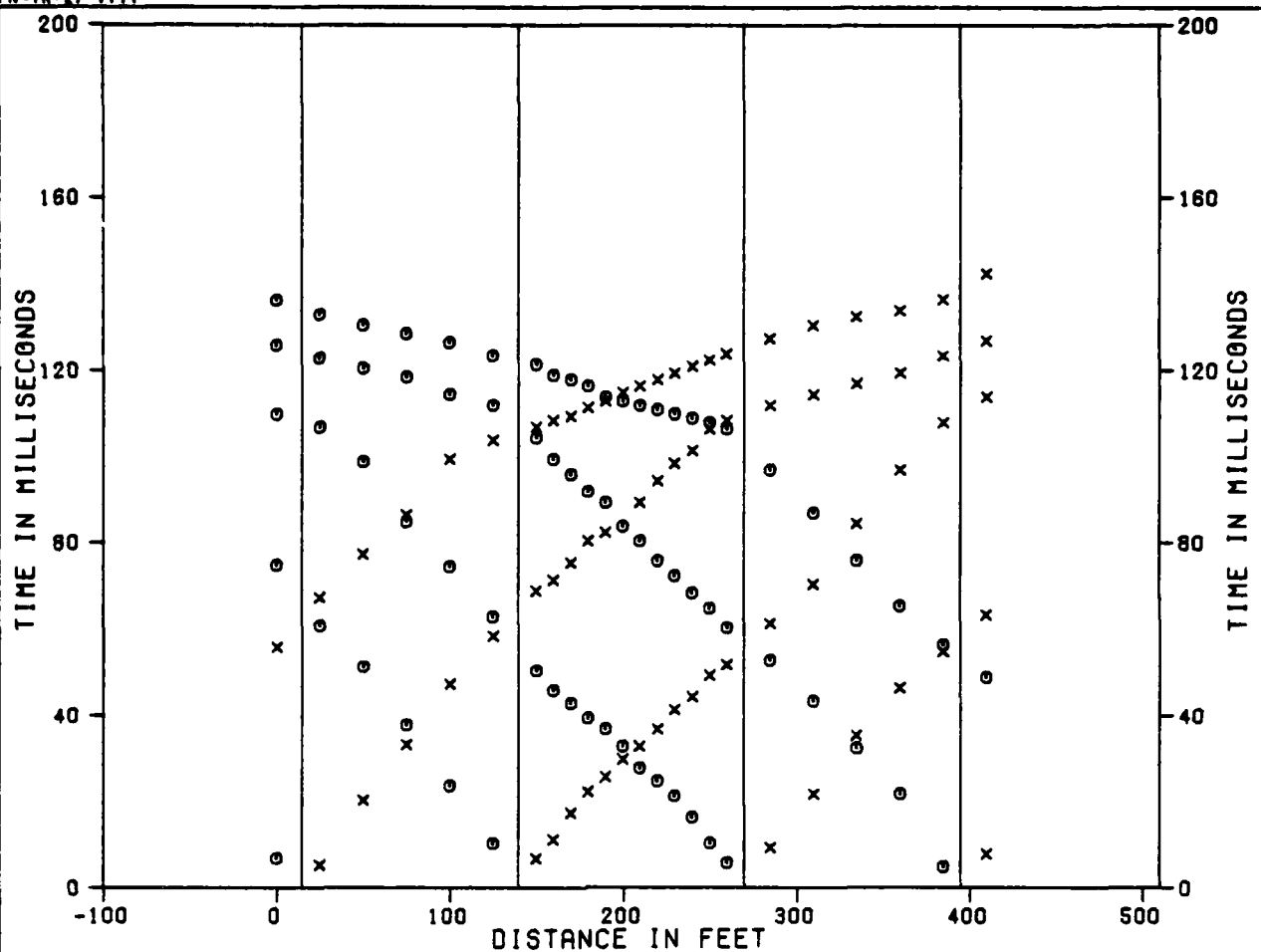
x TIMES TO RIGHT OF SHOTS  
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE BS-S-15  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMS

FIGURE  
3-15

**FUGRO NATIONAL, INC.**



SHOT F  
GEOPHONES

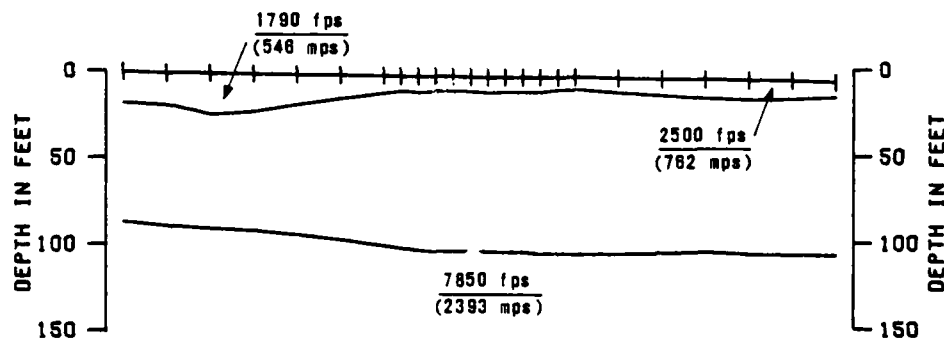
G  
1

H  
7

I  
18

J  
24

K



0 METERS 50  
DISTANCE AND DEPTH

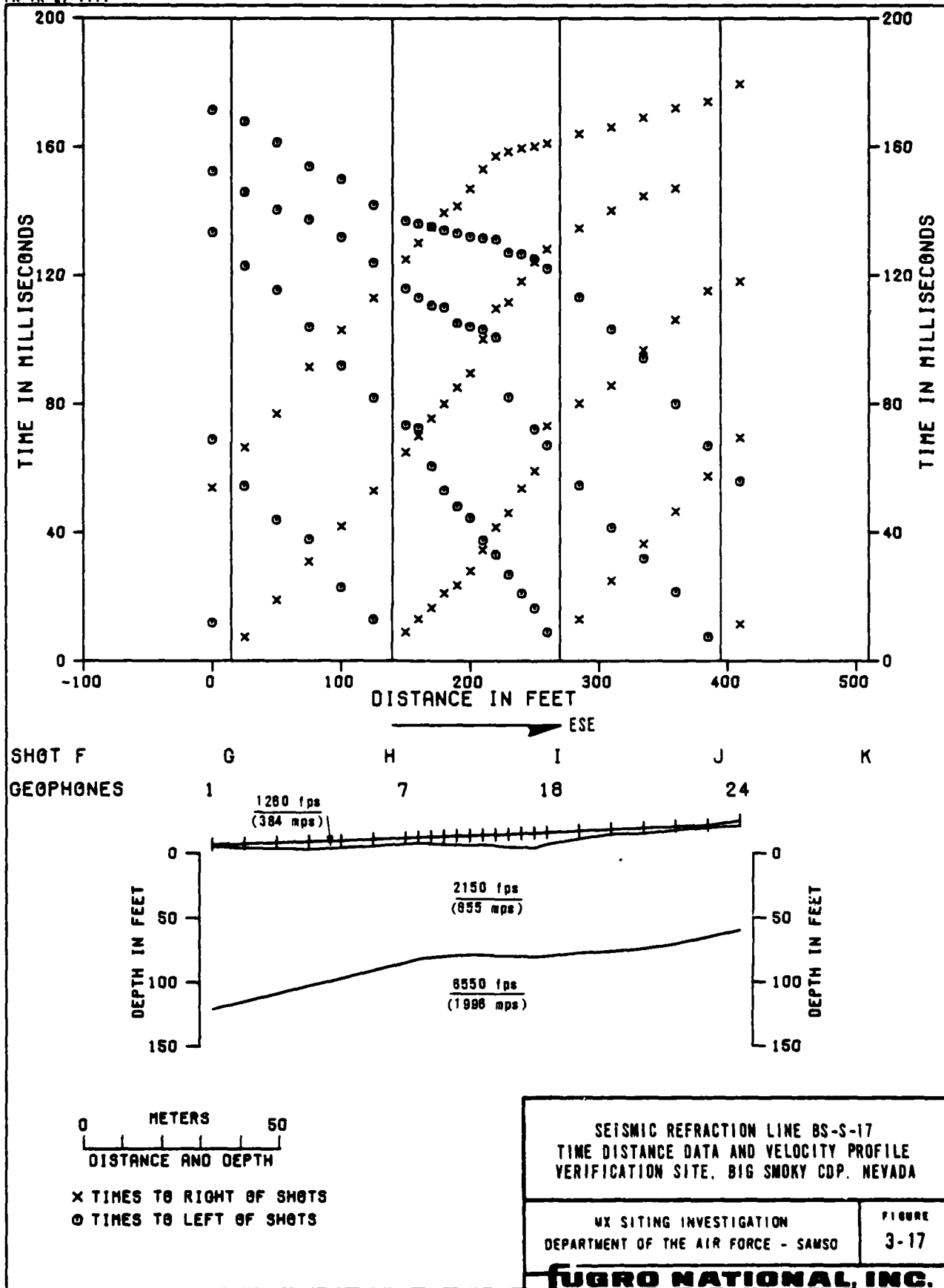
x TIMES TO RIGHT OF SHOTS  
o TIMES TO LEFT OF SHOTS

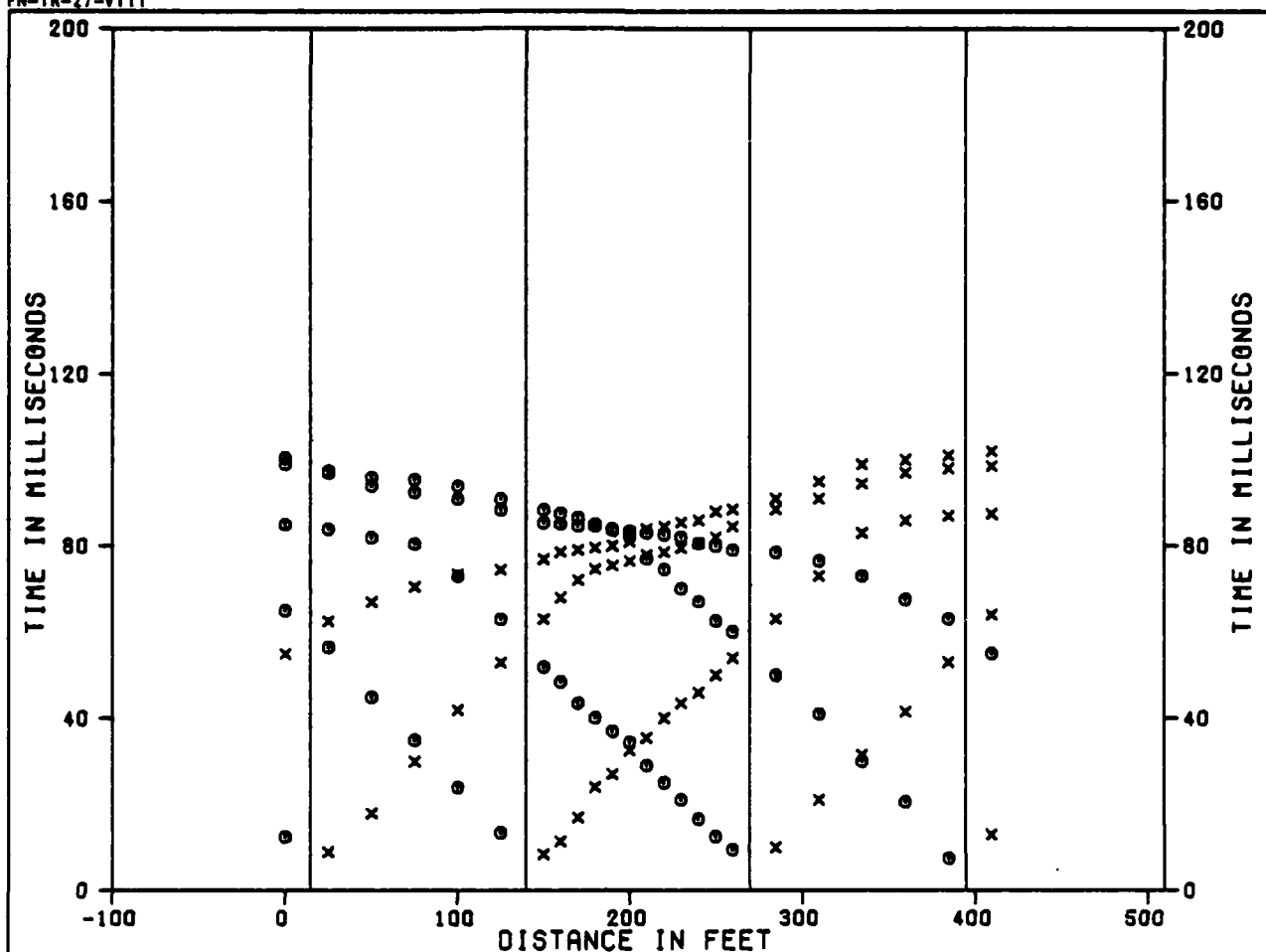
SEISMIC REFRACTION LINE BS-S-16  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
3-16

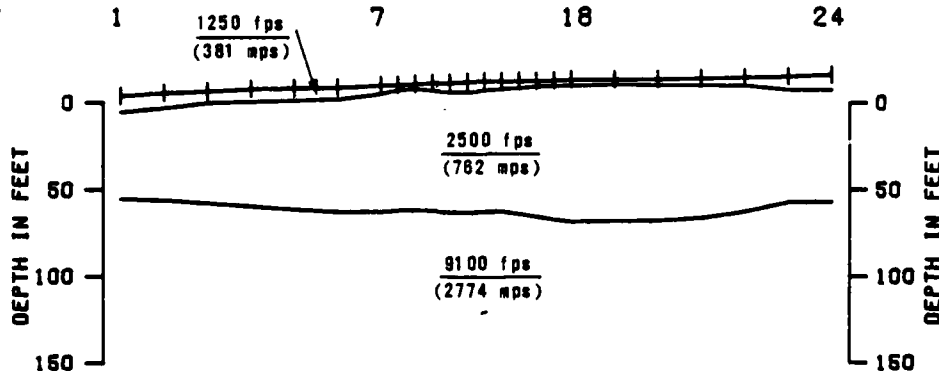
**UGRO NATIONAL, INC.**





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 BS-S-18  
TIME DISTANCE DATA AND VELOCITY PROFILE  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
3-18

**UGRO NATIONAL, INC.**

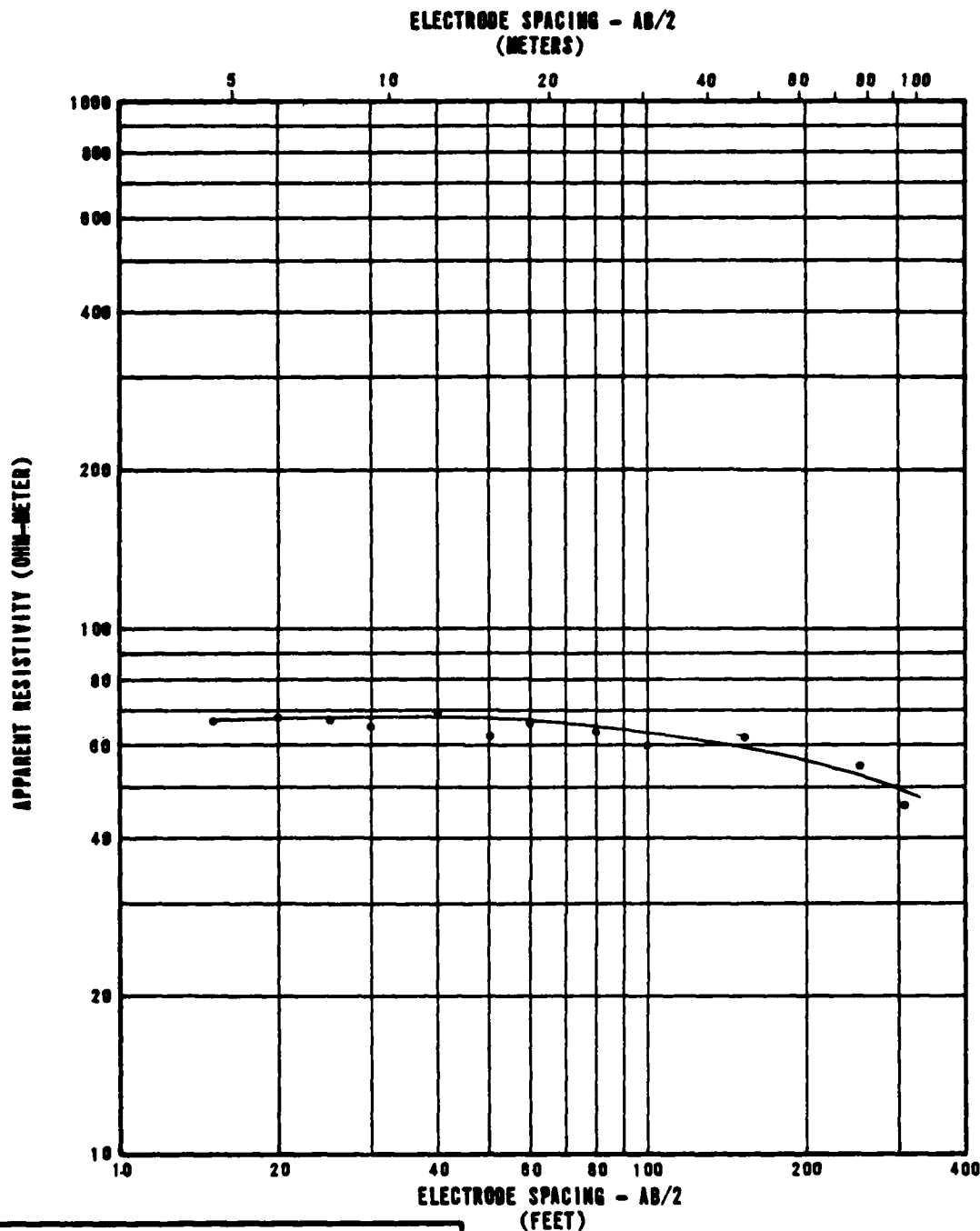
SECTION 4.0  
ELECTRICAL RESISTIVITY DATA

EXPLANATIONS 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 page shows a combination of true resistivity layers and thicknesses obtained by matching theoretical curves to the field curve.



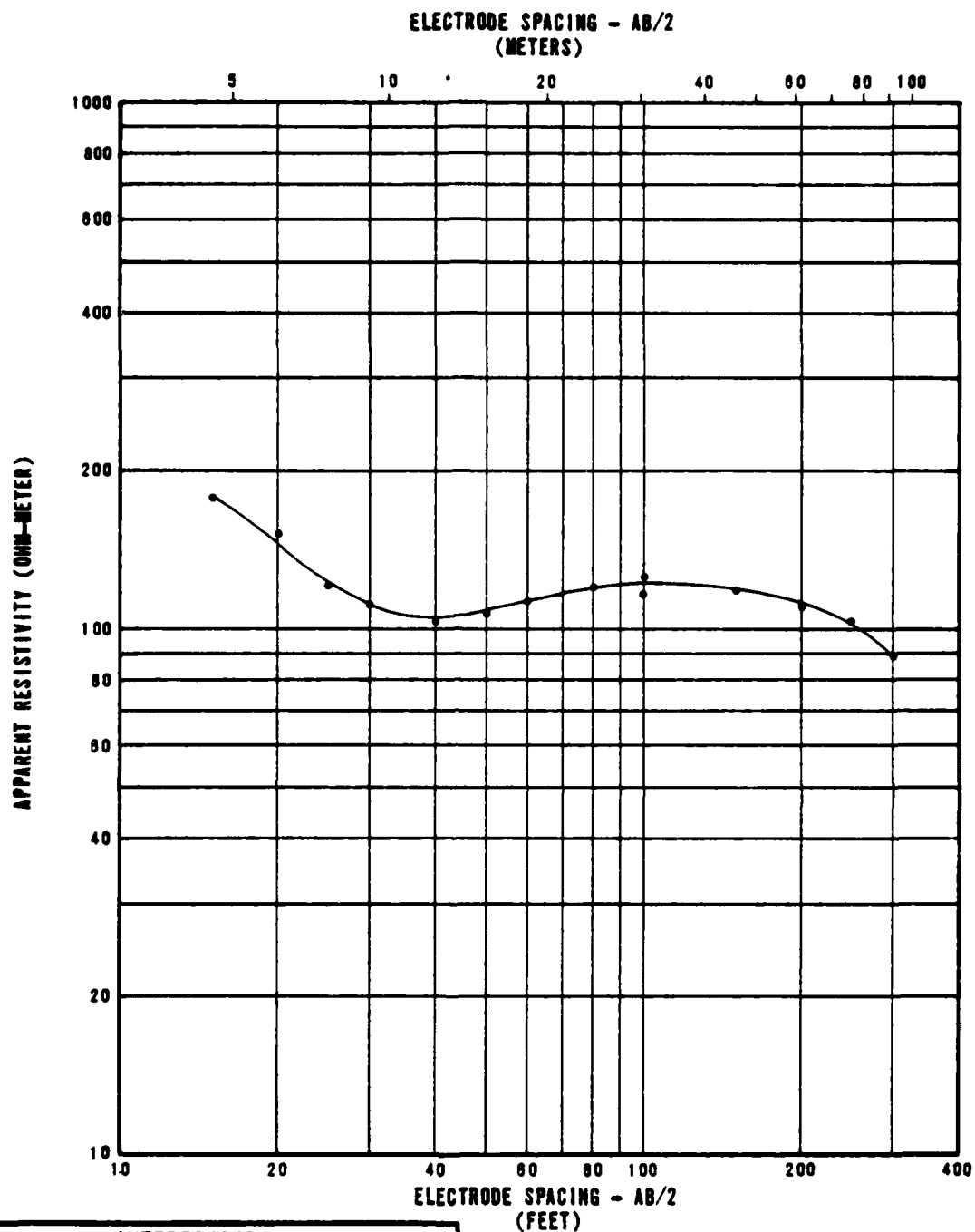
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 65                 |
| 250               | 78     | 10                 |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-1  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
4-1

**JUBRO NATIONAL INC.**



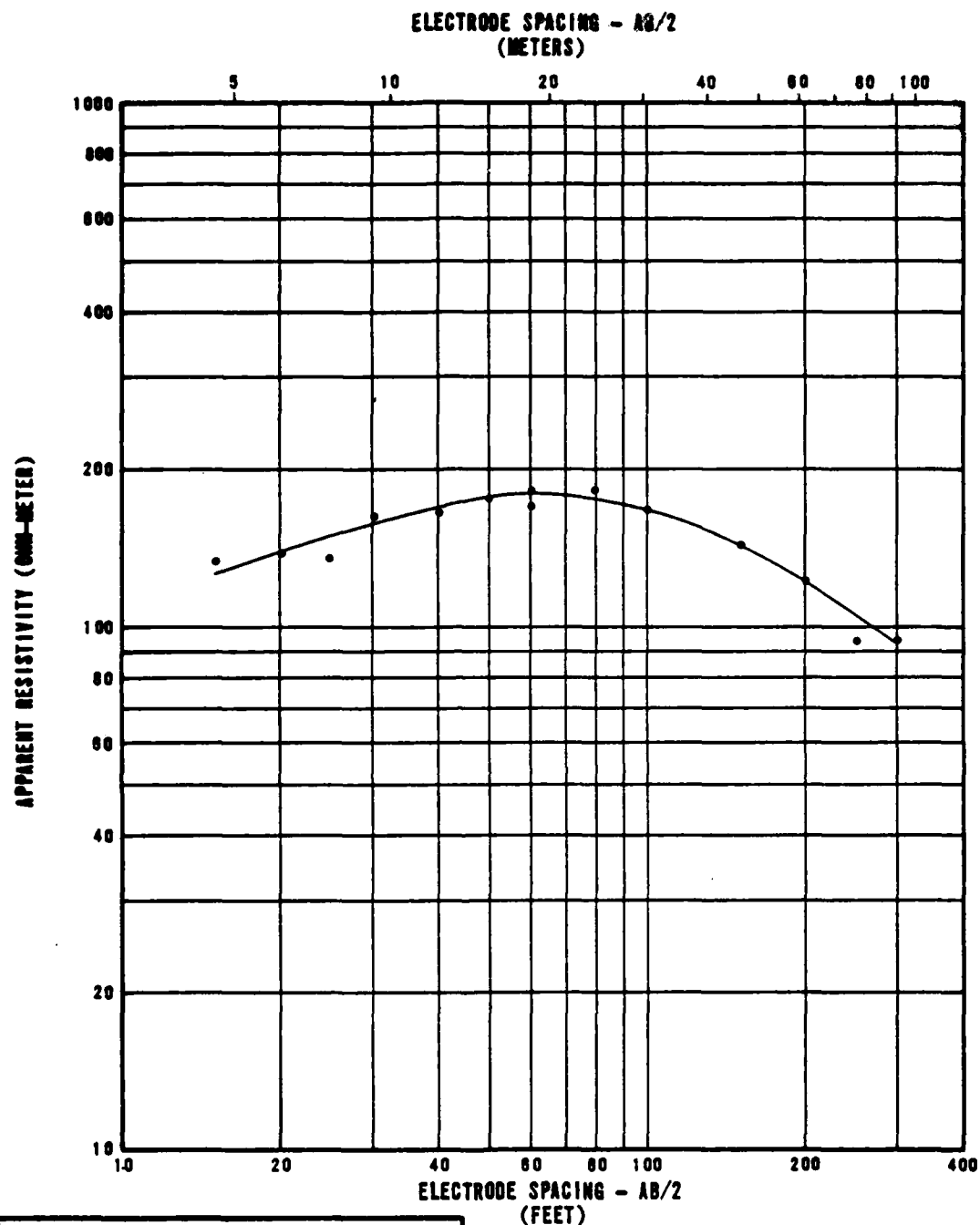
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 250                |
| 8                 | 2      | 85                 |
| 18                | 5      | 150                |
| 102               | 31     | 80                 |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-2  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
4-2

**FURRO NATIONAL, INC.**



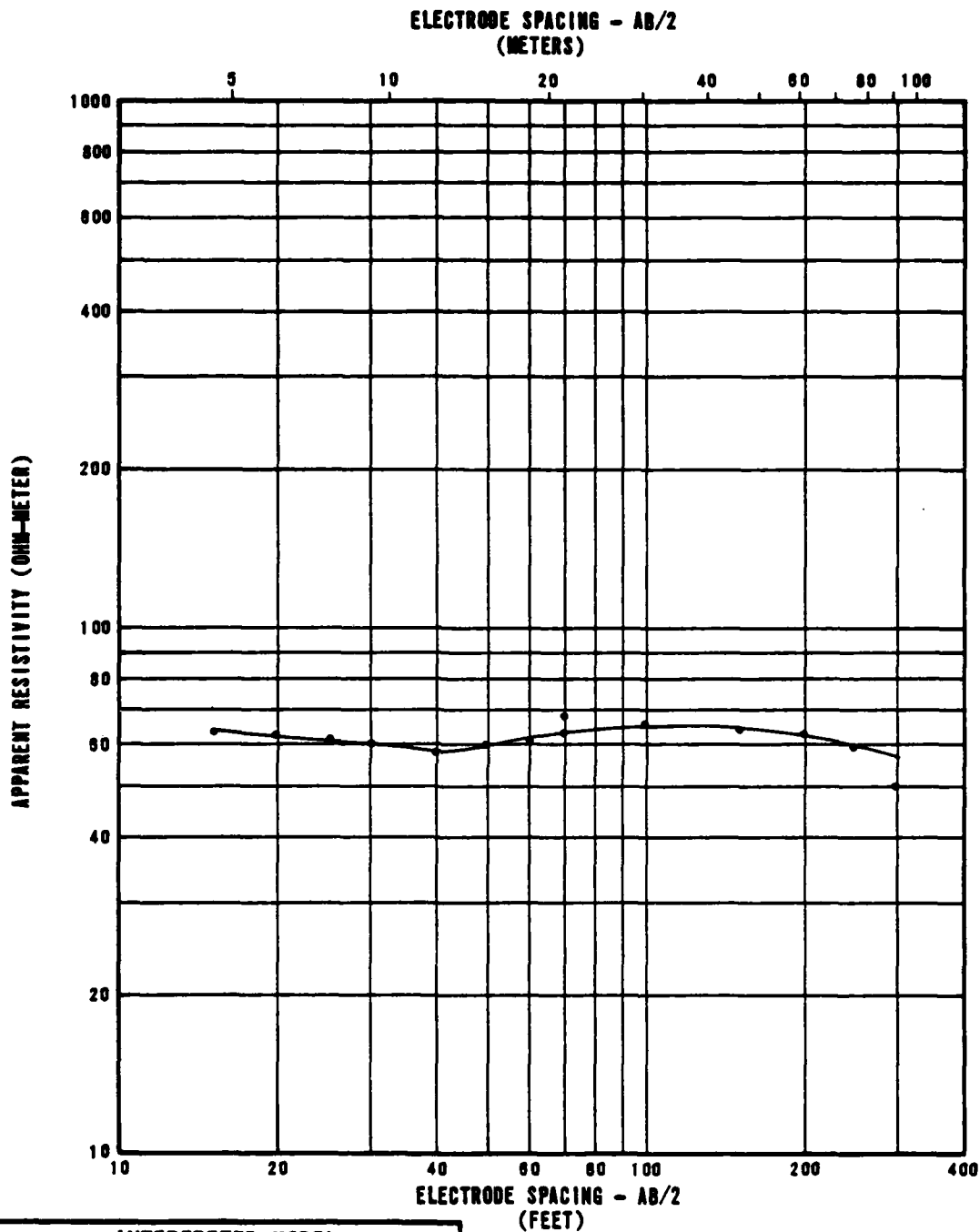
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 110                |
| 10                | 3'     | 220                |
| 81                | 19     | 80                 |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-3  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
4-3

**FUGRO NATIONAL, INC.**



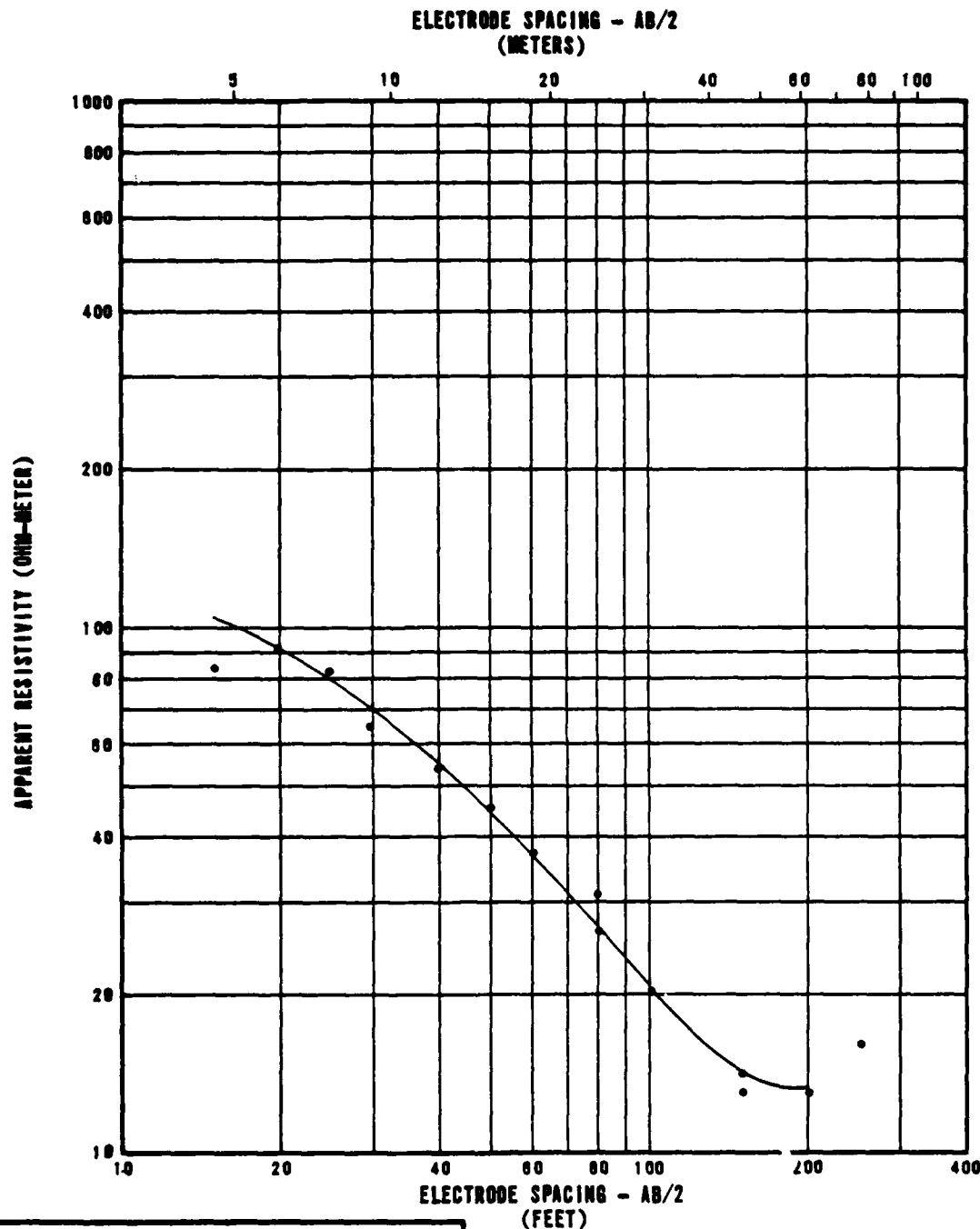
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 75                 |
| 120               | 37     | 40                 |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-4  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
4-4

**FUGRO NATIONAL, INC.**



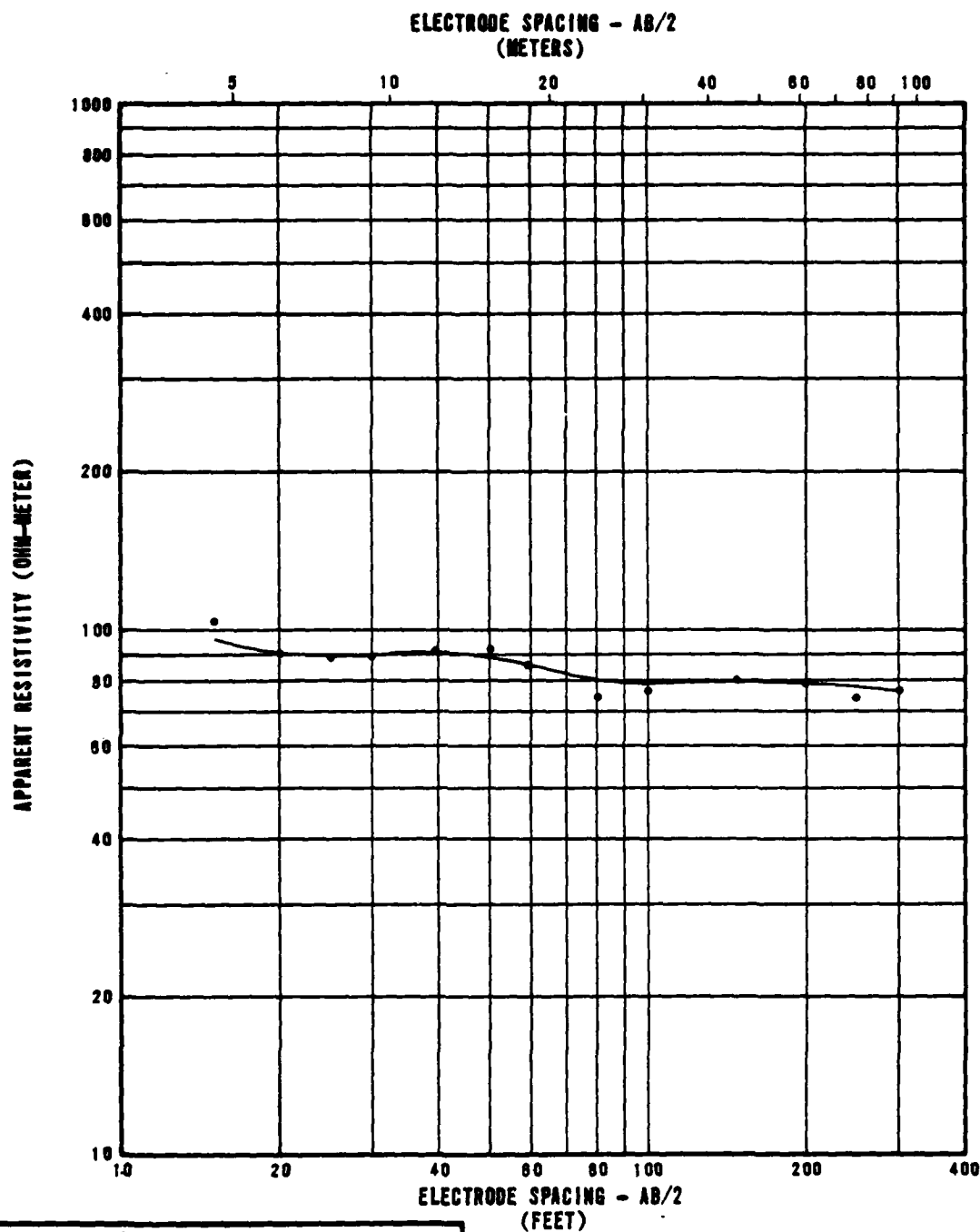
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 120                |
| 14                | 4      | 20                 |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-5  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
4-5

**FURRO NATIONAL INC.**



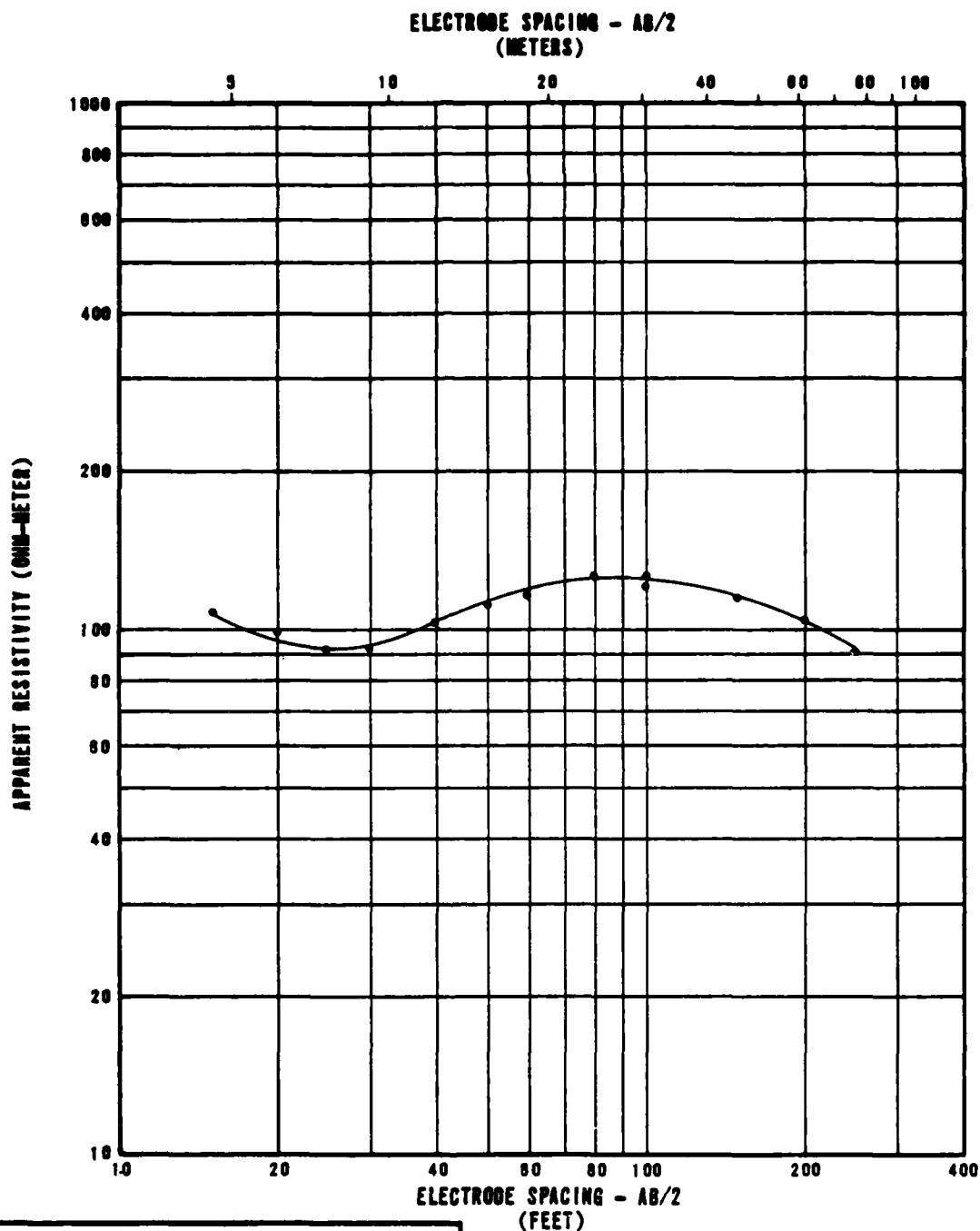
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 110                |
| 31                | 9      | 80                 |
| 82                | 25     | 130                |
| 137               | 42     | 85                 |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-6  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
4-6

**FUGRO NATIONAL, INC.**



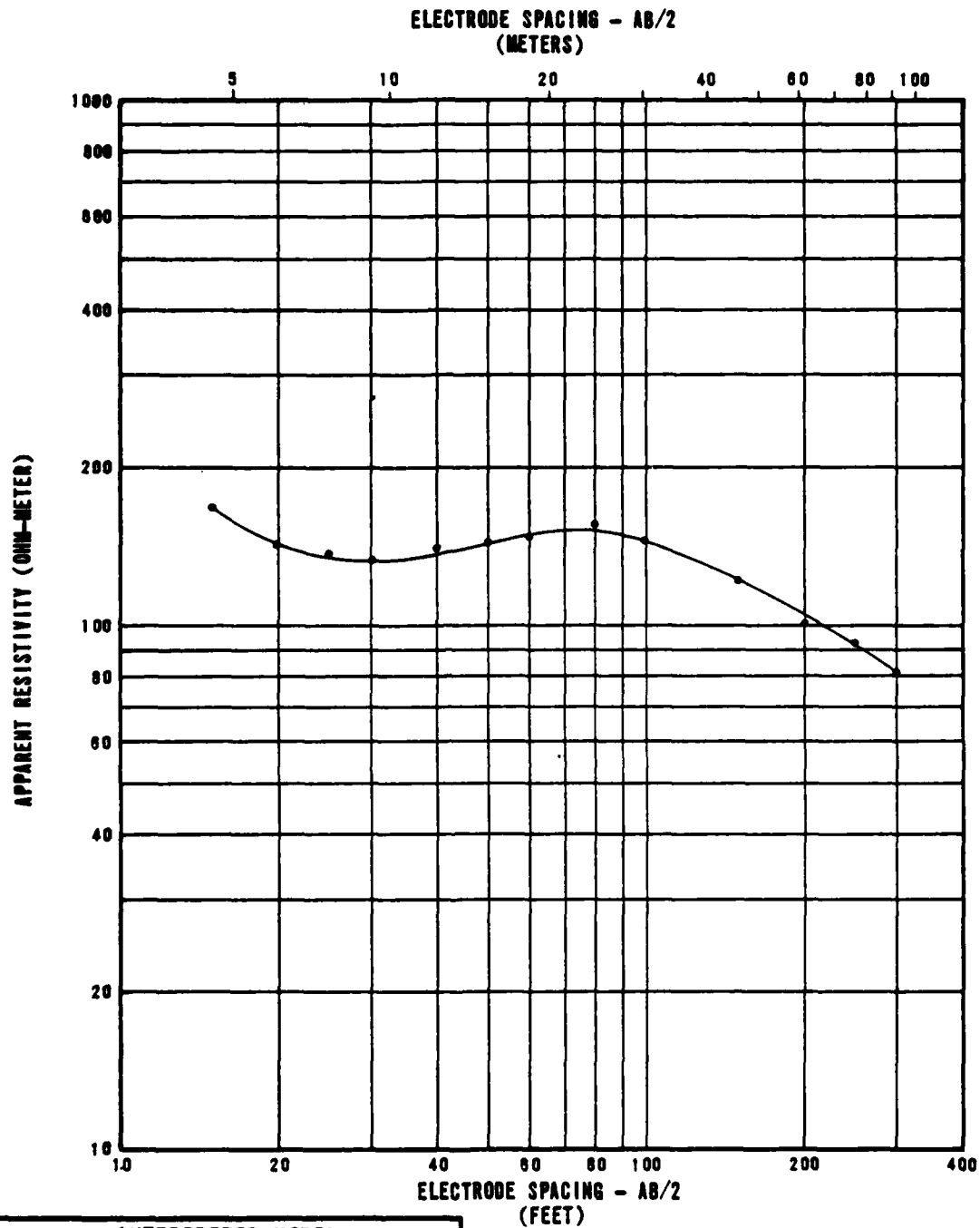
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 160                |
| 5                 | 2      | 80                 |
| 25                | 8      | 580                |
| 35                | 11     | 70                 |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-7  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
4-7

**FUGRO NATIONAL, INC.**



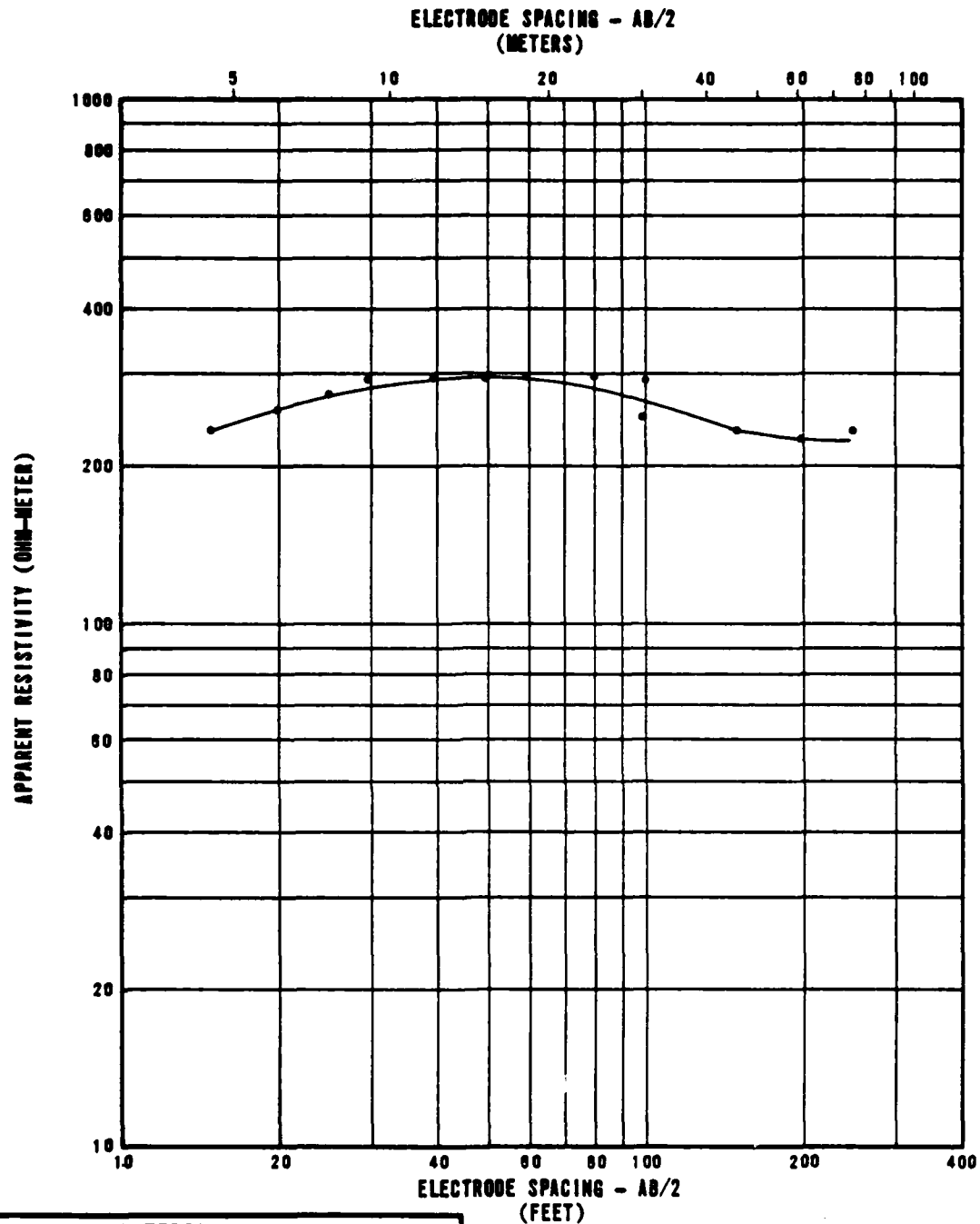
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 220                |
| 8                 | 2      | 95                 |
| 23                | 7      | 290                |
| 53                | 18     | 85                 |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-8  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
4-8

**FUGRO NATIONAL, INC.**



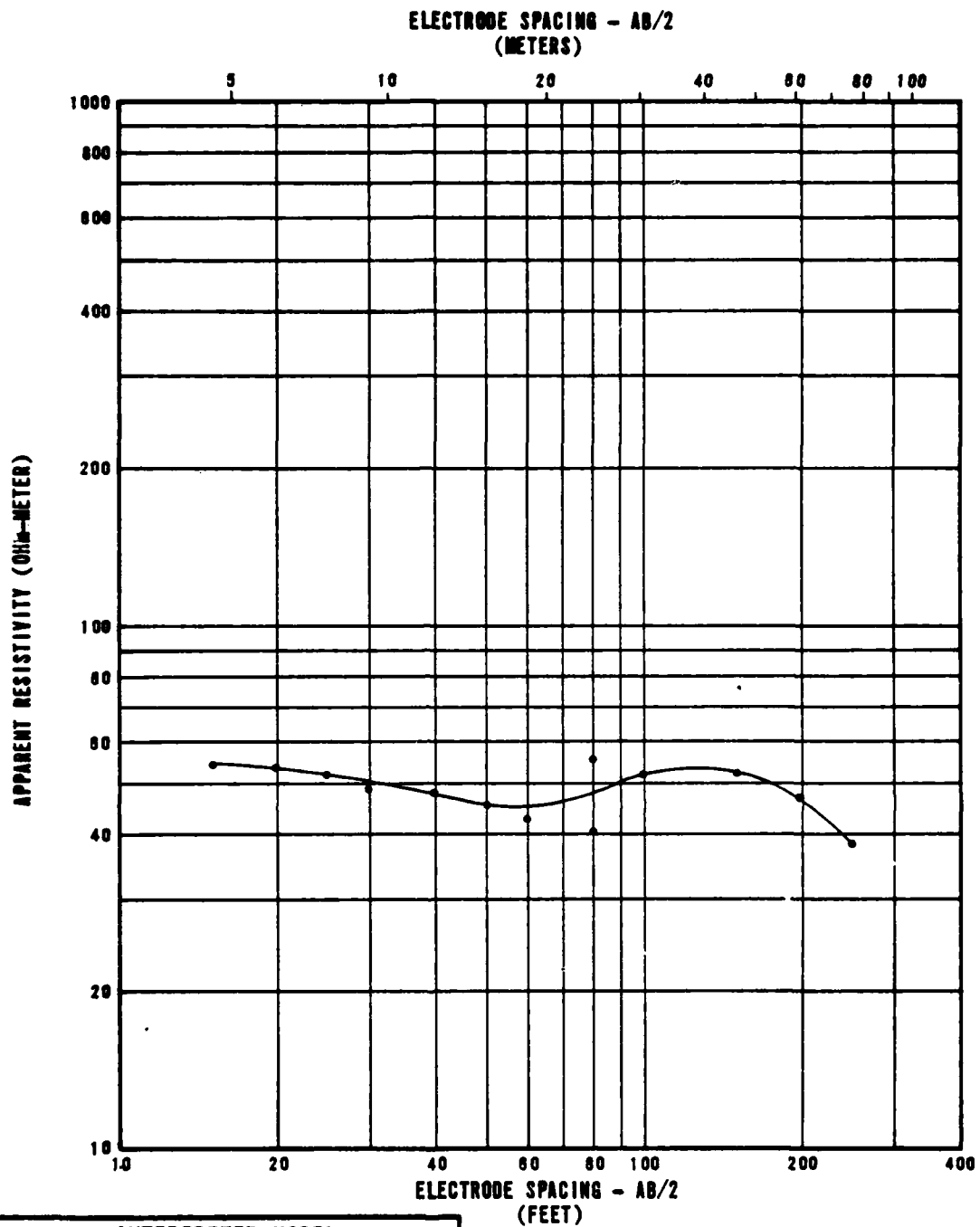
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 210                |
| 7                 | 2      | 340                |
| 48                | 14     | 140                |
| 99                | 30     | 280                |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-9  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
4-9

**FURRO NATIONAL, INC.**



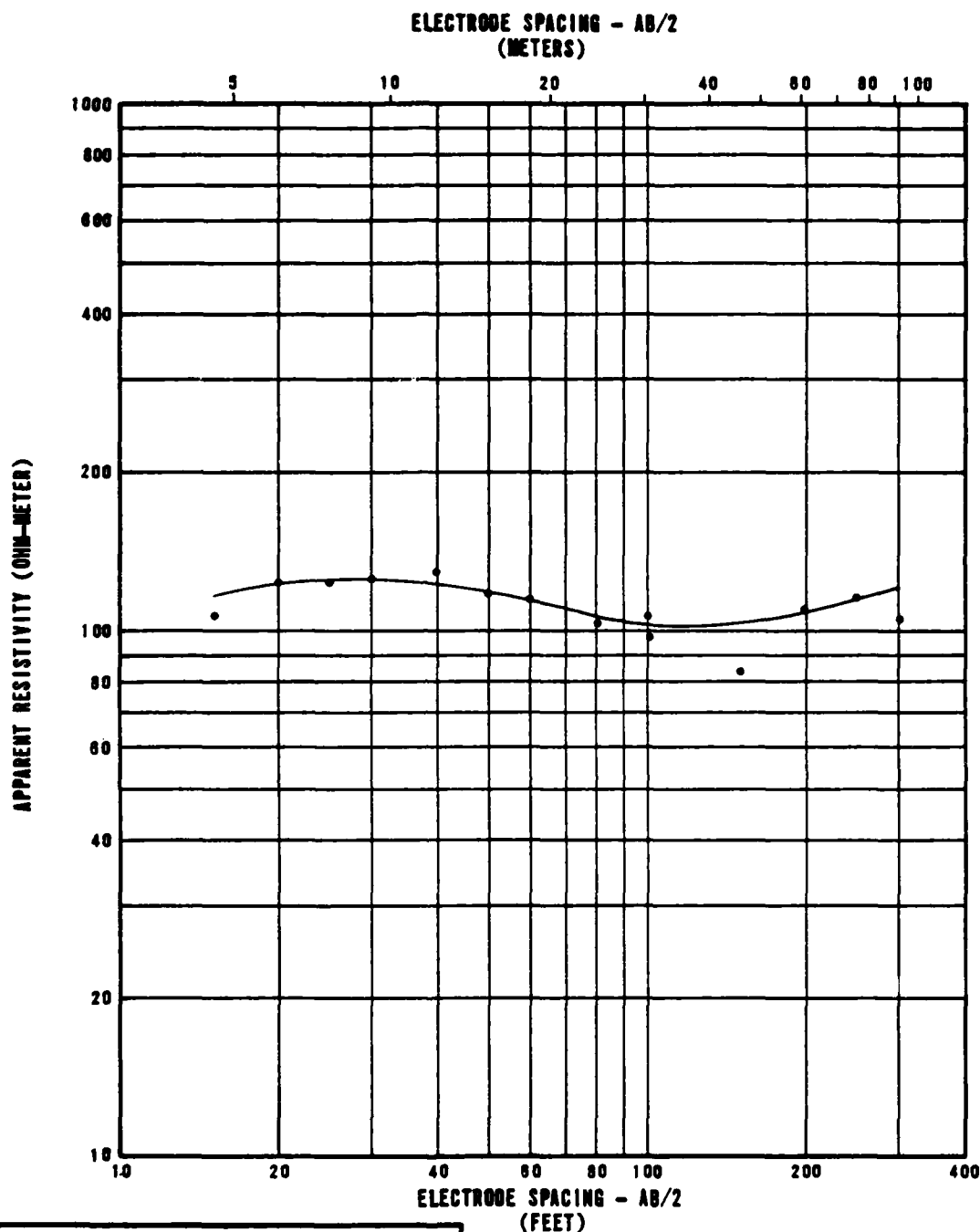
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 45                 |
| 40                | 12     | 85                 |
| 114               | 35     | 13                 |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-10  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
4-10

**FUGRO NATIONAL, INC.**



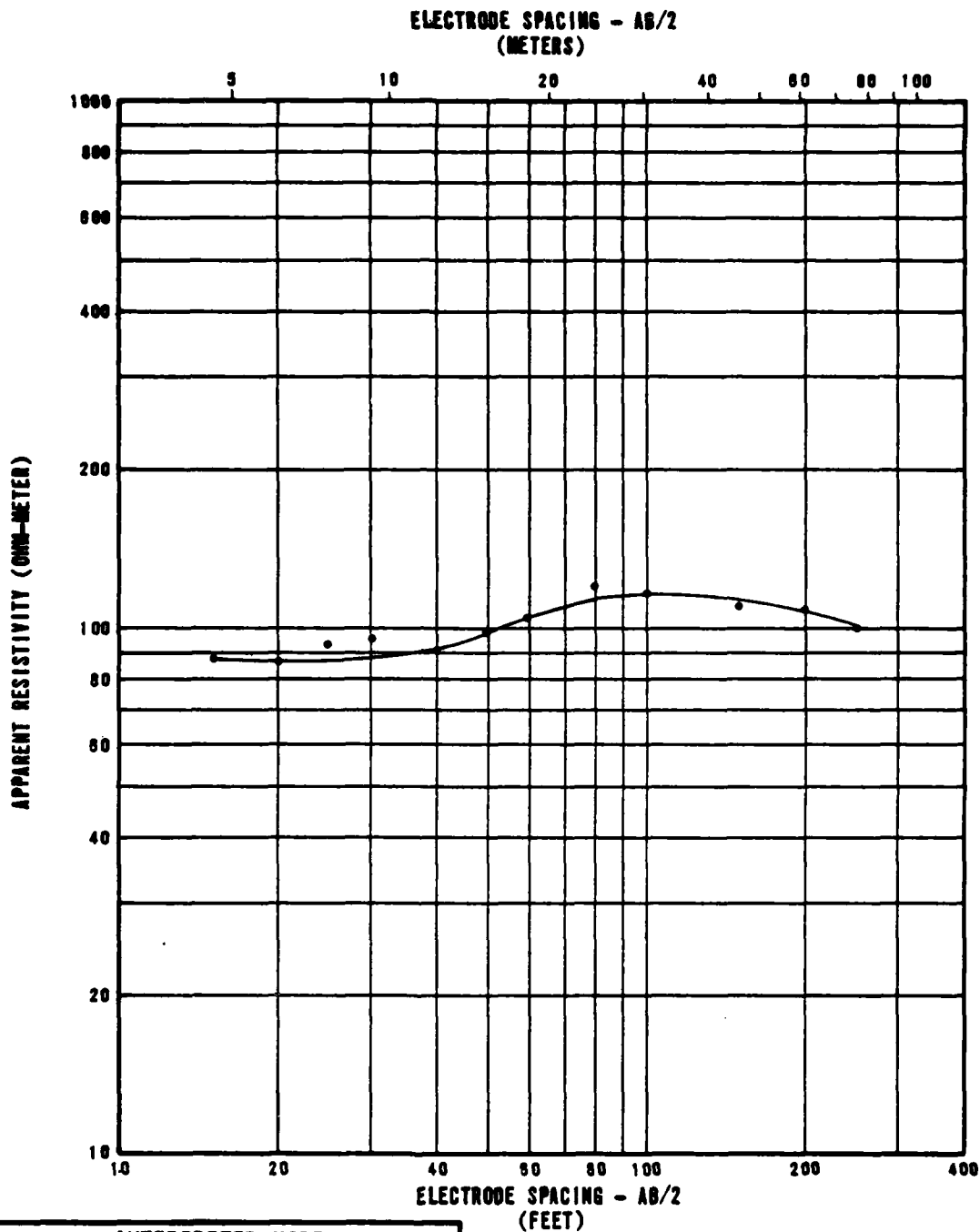
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 140                |
| 27                | 8      | 75                 |
| 102               | 31     | 210                |
| 182               | 55     | 140                |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-11  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
4-11

**FUGRO NATIONAL, INC.**



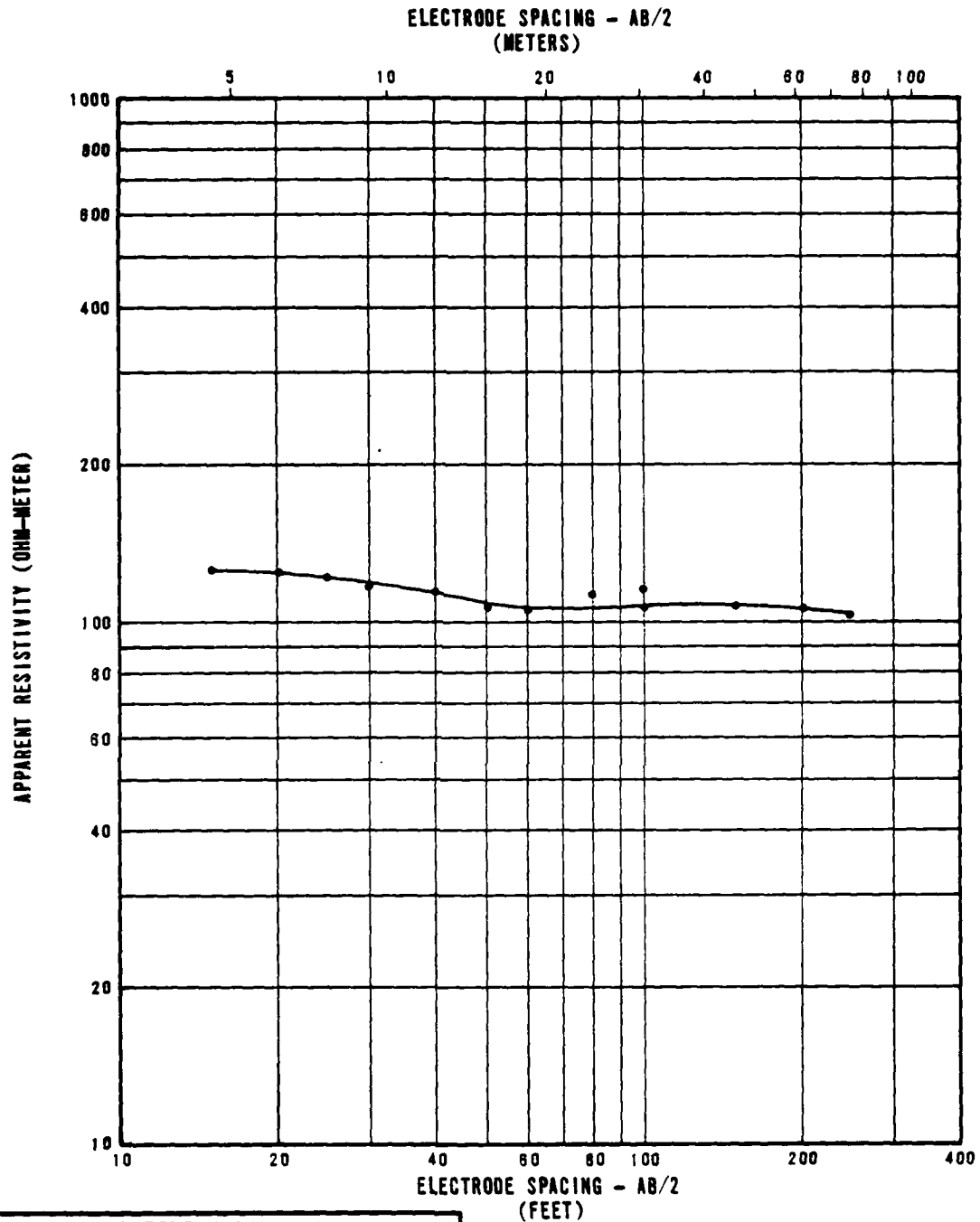
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 90                 |
| 30                | 9      | 180                |
| 98                | 30     | 80                 |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-12  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
4-12

**FUGRO NATIONAL, INC.**



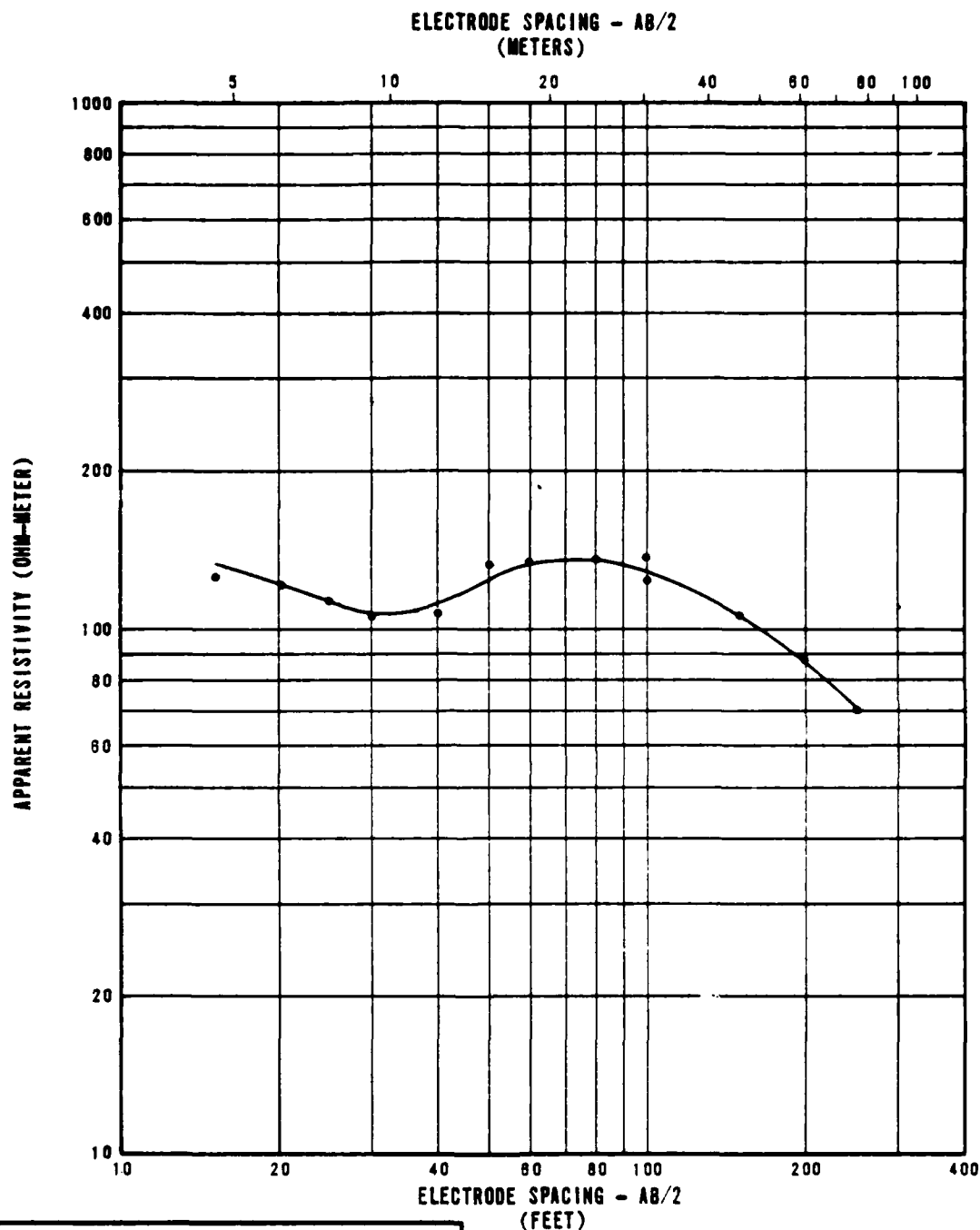
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 130                |
| 23                | 7      | 90                 |
| 89                | 21     | 130                |
| 194               | 59     | 80                 |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-13  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMS0

FIGURE  
4-13

**FUGRO NATIONAL, INC.**



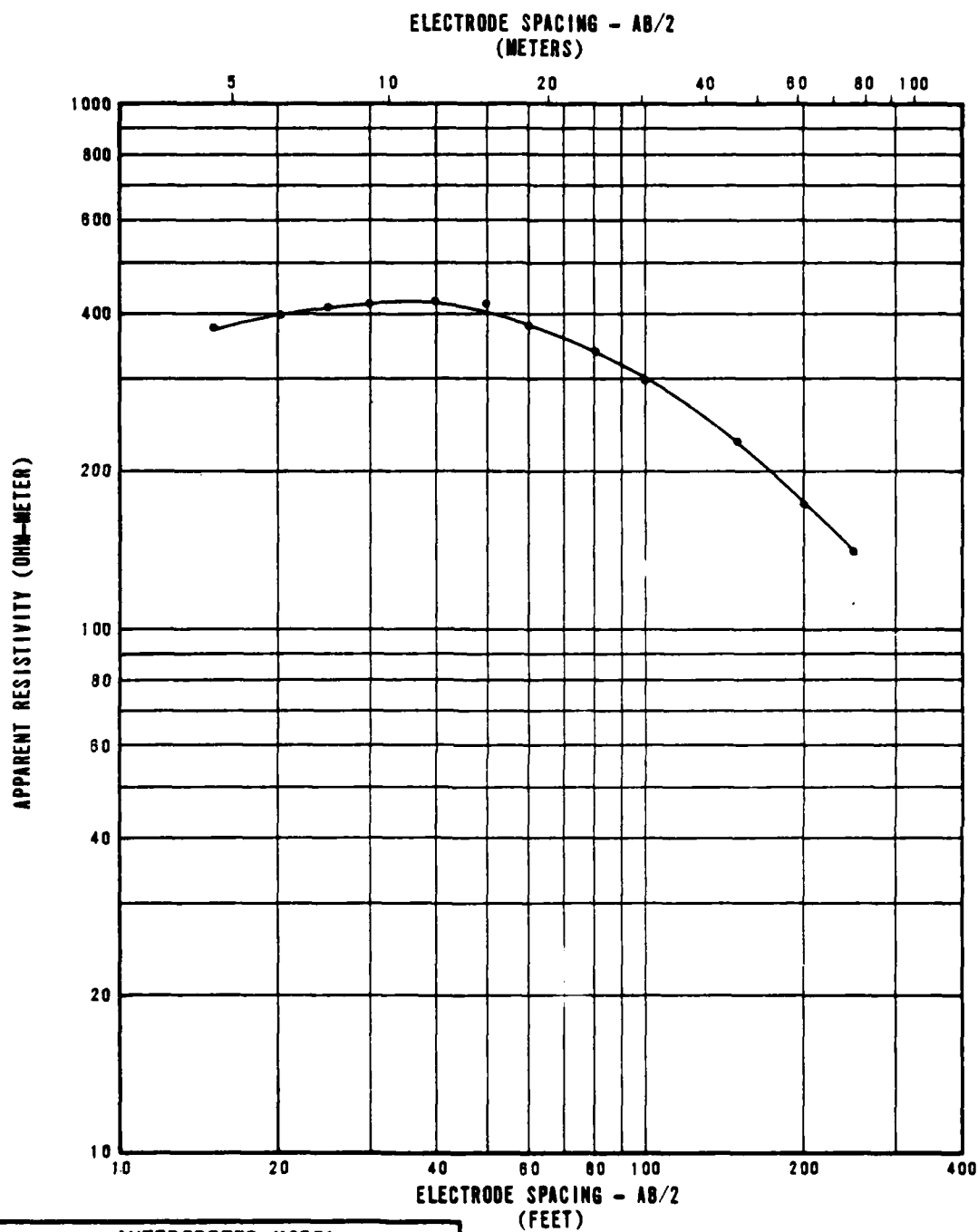
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 180                |
| 8                 | 2      | 90                 |
| 27                | 8      | 610                |
| 34                | 10     | 130                |
| 78                | 24     | 35                 |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-14  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
4-14

**FUGRO NATIONAL, INC.**



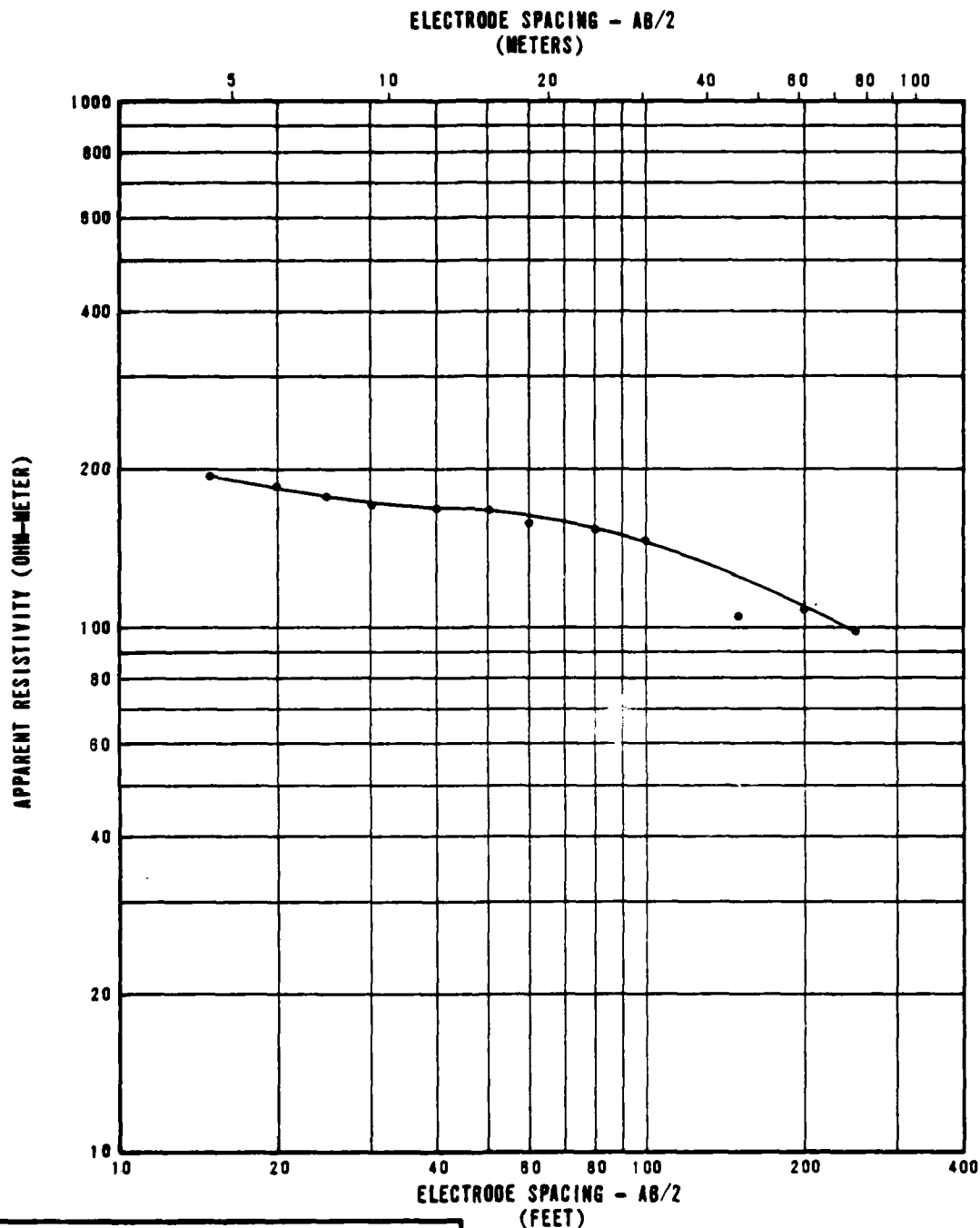
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 380                |
| 12                | 4      | 580                |
| 35                | 11     | 170                |
| 188               | 57     | 35                 |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-15  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
4-15

**FUGRO NATIONAL, INC.**



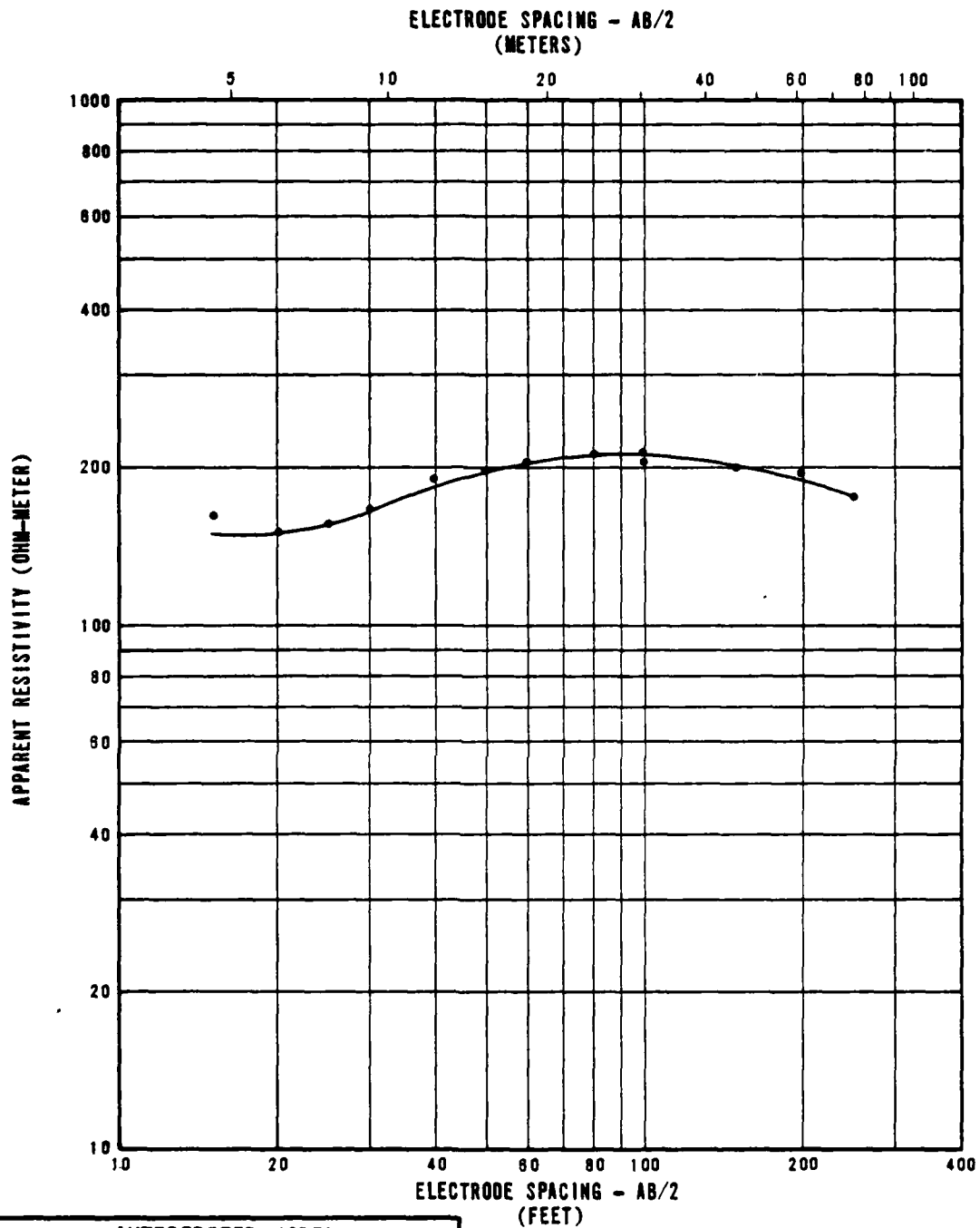
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 200                |
| 13                | 4      | 150                |
| 38                | 11     | 190                |
| 78                | 23     | 70                 |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-16  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
4-16

**FUGRO NATIONAL, INC.**



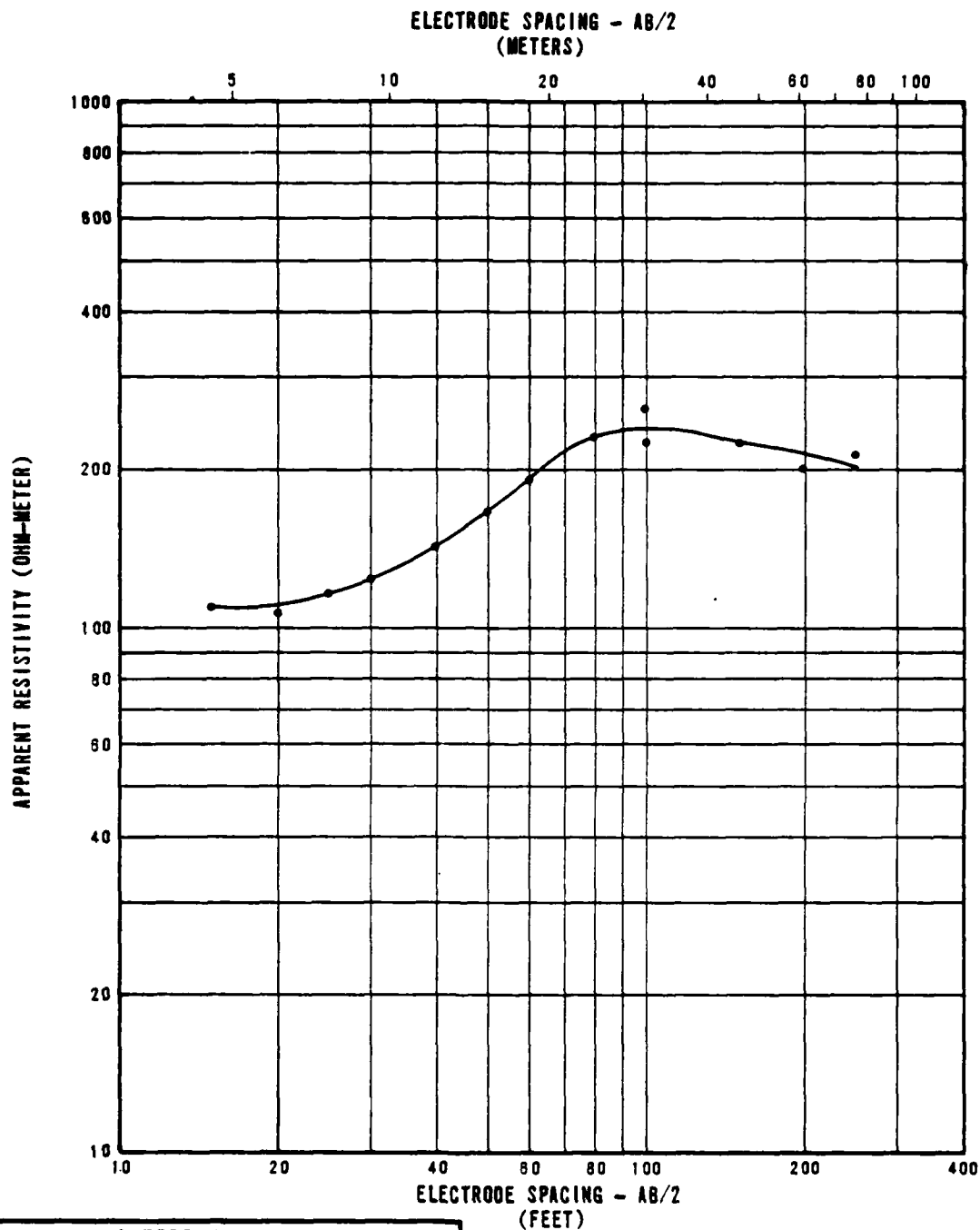
| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 140                |
| 17                | 5      | 360                |
| 42                | 13     | 180                |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-17  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
4-17

**FUGRO NATIONAL, INC.**



| INTERPRETED MODEL |        |                    |
|-------------------|--------|--------------------|
| LAYER DEPTH       |        | RESISTIVITY VALUES |
| FEET              | METERS | OHM-METER          |
| 0                 | 0      | 100                |
| 22                | 7      | 580                |
| 88                | 20     | 110                |
|                   |        |                    |
|                   |        |                    |
|                   |        |                    |

RESISTIVITY SOUNDING BS-R-18  
SOUNDING CURVE AND INTERPRETATION  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
4-18

**FUGRO NATIONAL, INC.**

SECTION 5.0

GRAVITY DATA

EXPLANATIONS OF GRAVITY DATA

Gravity data were not available in time (prior to June 1979) for incorporation into this report. A supplemental report containing gravity data and results will be issued at a later date.

SECTION 6.0

BORING LOGS

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 6.0 and 7.0. The following explanations are provided as a key to the logs.

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

WW-B-1

WW - abbreviation for the site (e.g., WW-Whirlwind)

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

1 - number of activity

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 A5.0 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 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 (see Table 6-1 for complete details) symbols.
- 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 (if known) |

SECTION 6.0

BORING LOGS

|                                                                |              |
|----------------------------------------------------------------|--------------|
| UNIFIED SOIL CLASSIFICATION SYSTEM                             |              |
| MX SITING INVESTIGATION<br>DEPARTMENT OF THE AIR FORCE - SAMSO | TABLE<br>6-1 |
| <b>FUGRO NATIONAL, INC.</b>                                    |              |

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

| <u>Consistency</u> | <u>N Value</u><br><u>(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><br><u>(ksf) (kn/m<sup>2</sup>)</u> |             | <u>Field Guide</u>                                                    |
|--------------------|----------------------------------------------------------|-------------|-----------------------------------------------------------------------|
| Very Soft          | 0.25                                                     | 12          | Sample with height equal to twice the diameter, sags under own weight |
| Soft               | 0.25-<br>0.50                                            | 12 -<br>24  | Can be squeezed between thumb and forefinger                          |
| Firm               | 0.50-<br>1.00                                            | 24-<br>48   | Can be molded easily with fingers                                     |
| Stiff              | 1.00-<br>2.00                                            | 48-<br>96   | Can be imprinted with slight pressure from fingers                    |
| Very Stiff         | 2.00-<br>4.00                                            | 96-<br>192  | Can be imprinted with considerable pressure from fingers              |
| Hard               | over<br>4.00                                             | over<br>192 | Cannot be imprinted by fingers                                        |

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

Subangular - particles are similar to angular but have somewhat rounded edges.

Subrounded - particles exhibit nearly plane sides but have well-rounded corners and edges.

Rounded - particles have smoothly curved sides and no edges.

Calcareous : Containing calcium carbonate; presence of calcium carbonate is commonly identified on the basis of reaction with dilute hydrochloric acid.

Caliche : Soils cemented by porous calcium carbonate and/or other soluble minerals by upward-moving solutions.

Degree of Cementation: (Stages of development of caliche profile)

| Stage | <u>Gravelly Soils</u>                                 | <u>Nongravelly Soils</u>                   |
|-------|-------------------------------------------------------|--------------------------------------------|
| I     | Thin, discontinuous pebble coatings                   | Few filaments or faint coatings            |
| II    | Continuous pebble coatings, some interpebble fillings | Few to abundant nodules, flakes, filaments |
| III   | Many interpebble fillings                             | Many nodules and internodular fillings     |
| IV    | Laminar horizon overlying plugged horizon             | Increasing carbonate impregnation          |

Secondary Material : Example - Sand with trace to some silt

Trace - 5-12% (by dry weight)  
 Little - 13-20% (by dry weight)  
 Some - >21% (by dry weight)

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, >31)     |

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, trench wall stability, loss of drilling fluid in the boring, 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.

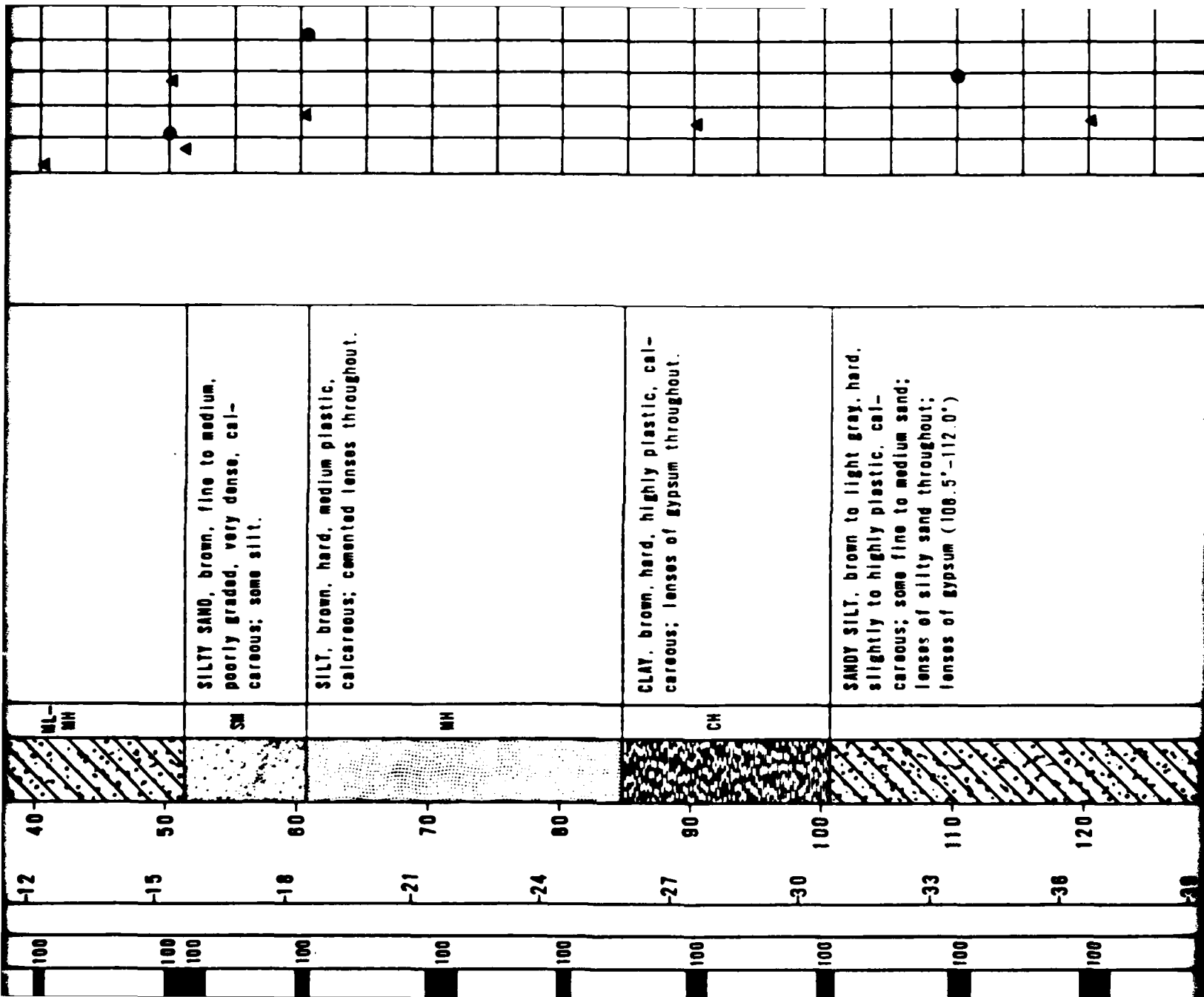
Water Level - indicates depth from ground surface to water table where encountered.

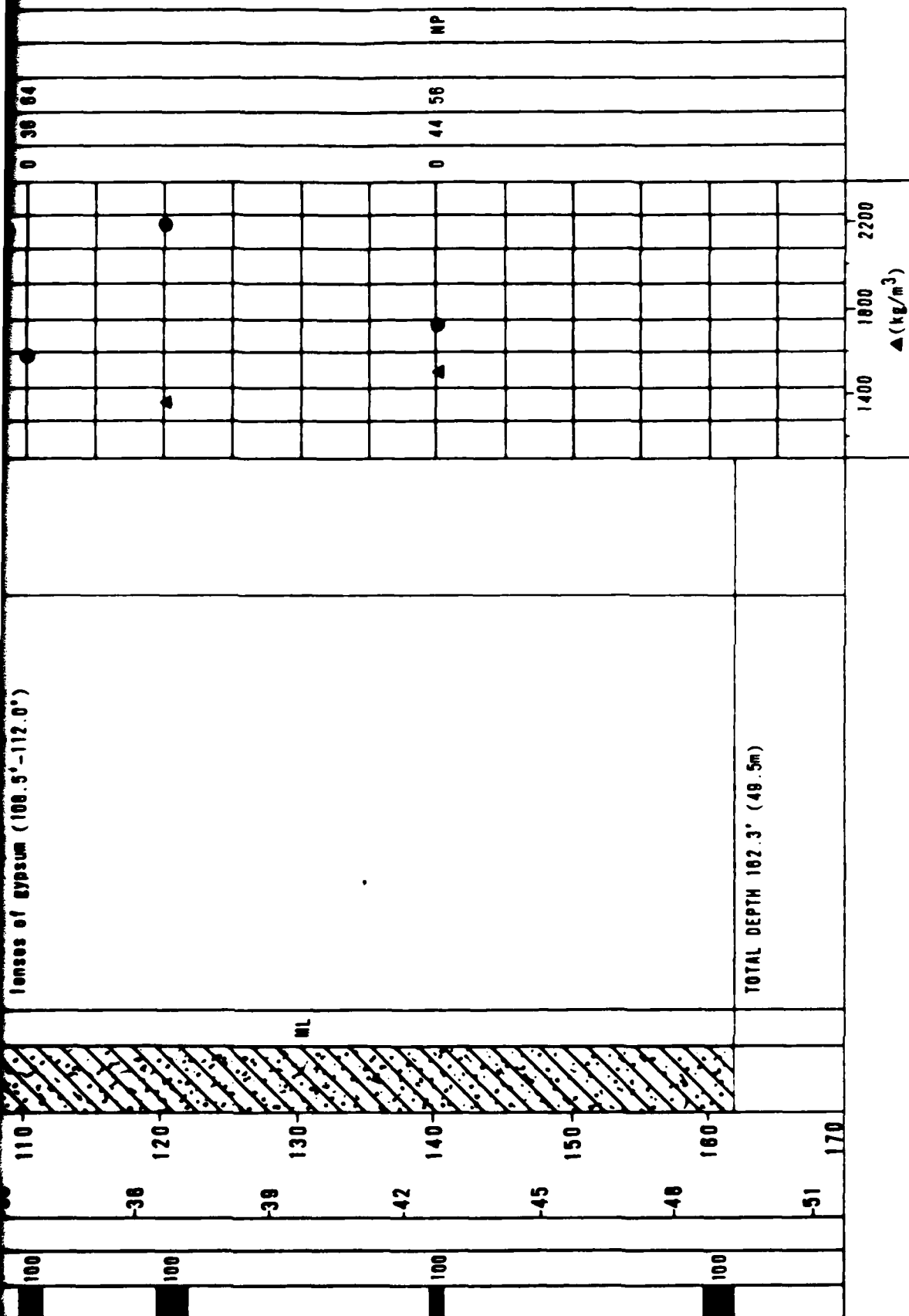
Trench Length - length at ground surface of final trench excavation.

Trench  
Orientation - bearing of longitudinal trench centerline.

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| SAMPLE TYPE | % RECOVERY | N VALUE | DEPTH  |      | LITHOLOGY | USCS  | SOIL DESCRIPTION                                                                      | REMARKS       | ▲(pcf) |    |     |     |     |     |     |    |    |    |    |    |  | SIEVE ANALYSIS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
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|             |            |         | METERS | FEET |           |       |                                                                                       |               | 80     | 90 | 100 | 110 | 120 | 130 | 140 | GR | SA | FI | LL | PI |  |                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|             | 90         | 58      | 0      | 0    | SP-SM     | SP-SM | SAND, brown to yellow brown, poorly graded, loose, angular to subangular, calcareous. | drill chatter | ●      | ▲  |     |     |     |     |     |    |    |    |    |    |  |                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |





# EXPLANATION

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

# BORING DETAILS

ELEVATION : 5145' (1568m)  
SURFICIAL GEOLOGIC UNIT : A5y  
DATE DRILLED : 4-5 April 1979  
DRILLING METHOD : Rotary Wash  
HOLE DIAMETER : 4 7/8" (124mm)  
WATER LEVEL : Not Encountered

LOG OF  
VERIFICATION SITE,

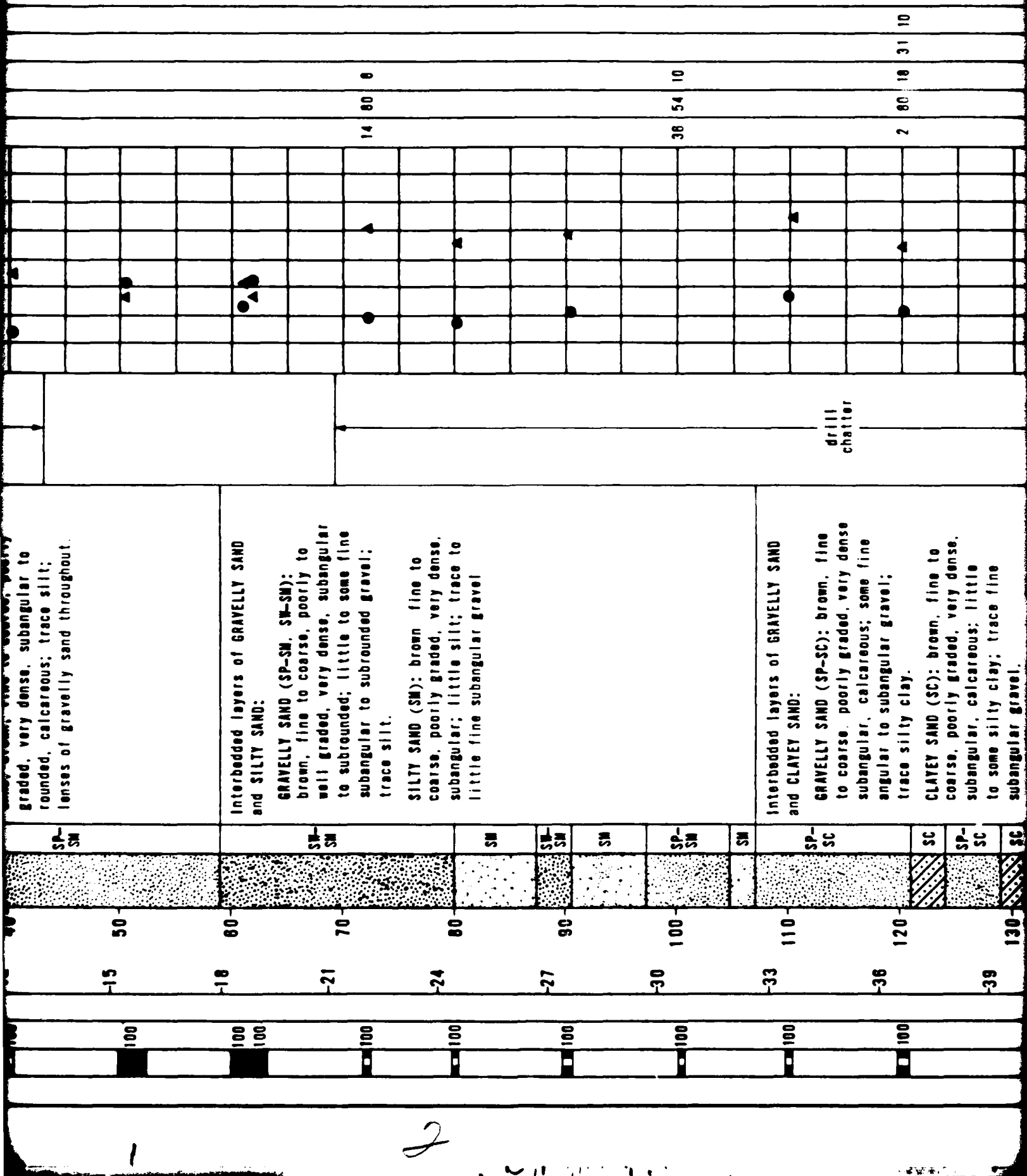
MX SITING INVEST  
DEPARTMENT OF THE AIR

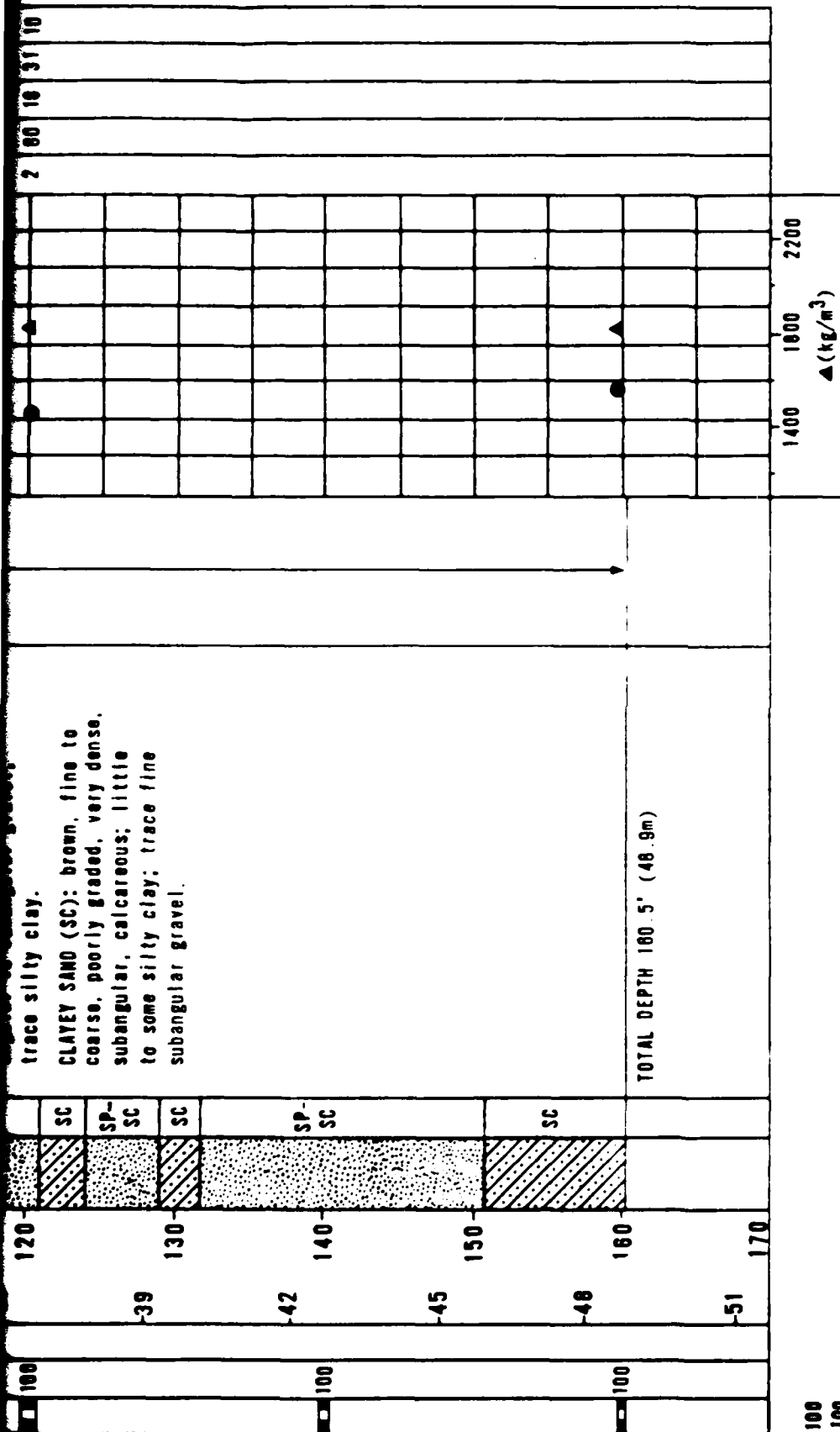
FUGRO NA

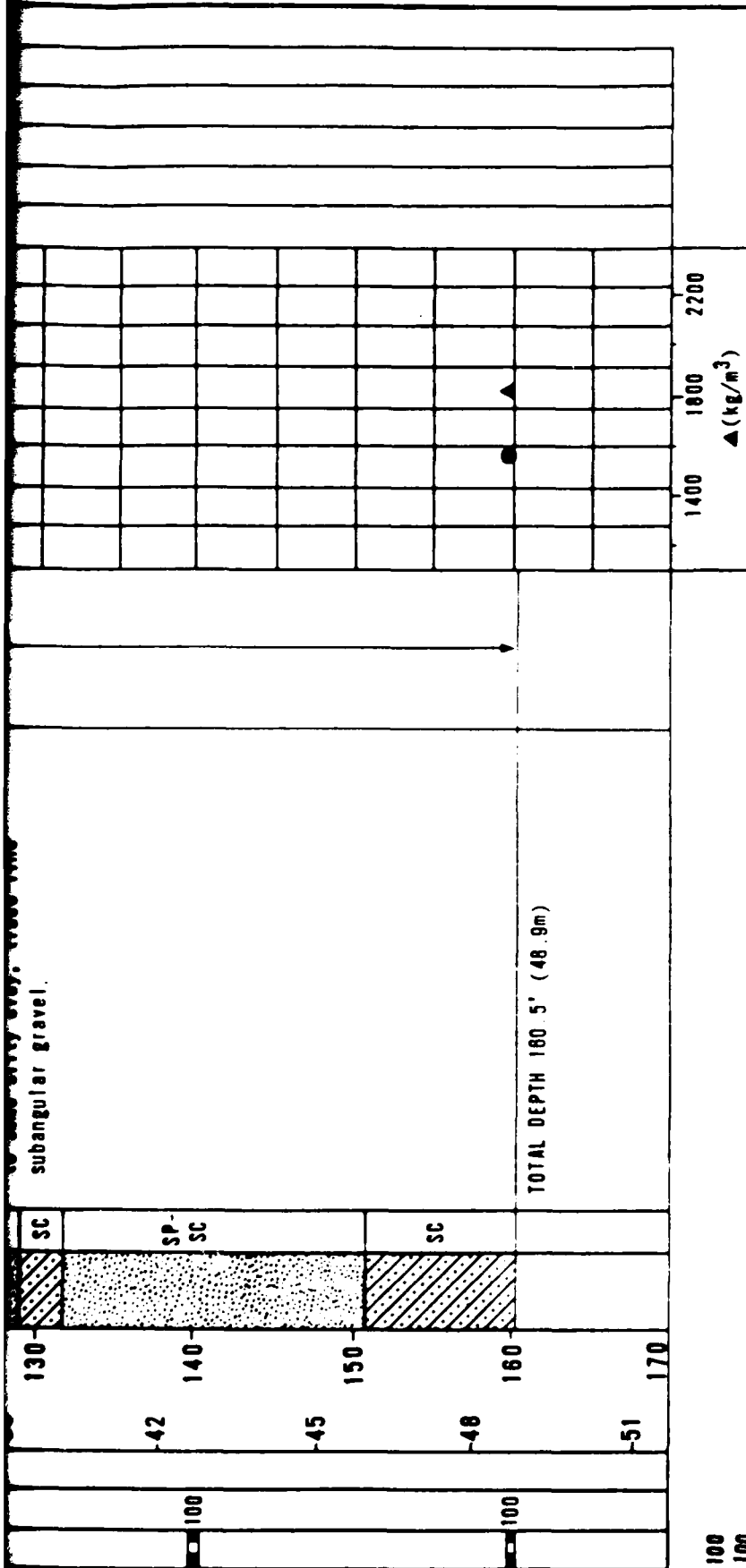


12227

[illegible]



**FUGRO NATIONAL**



# 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

SURFICIAL GEOLOGIC UNIT: A5y/A3

DATE DRILLED: 6-7 April 1979

DRILLING METHOD: Rotary Wash

HOLE DIAMETER: 4 7/8" (124mm)

WATER LEVEL: Not Encountered

LOG OF BORING BS-B-2  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
6-2

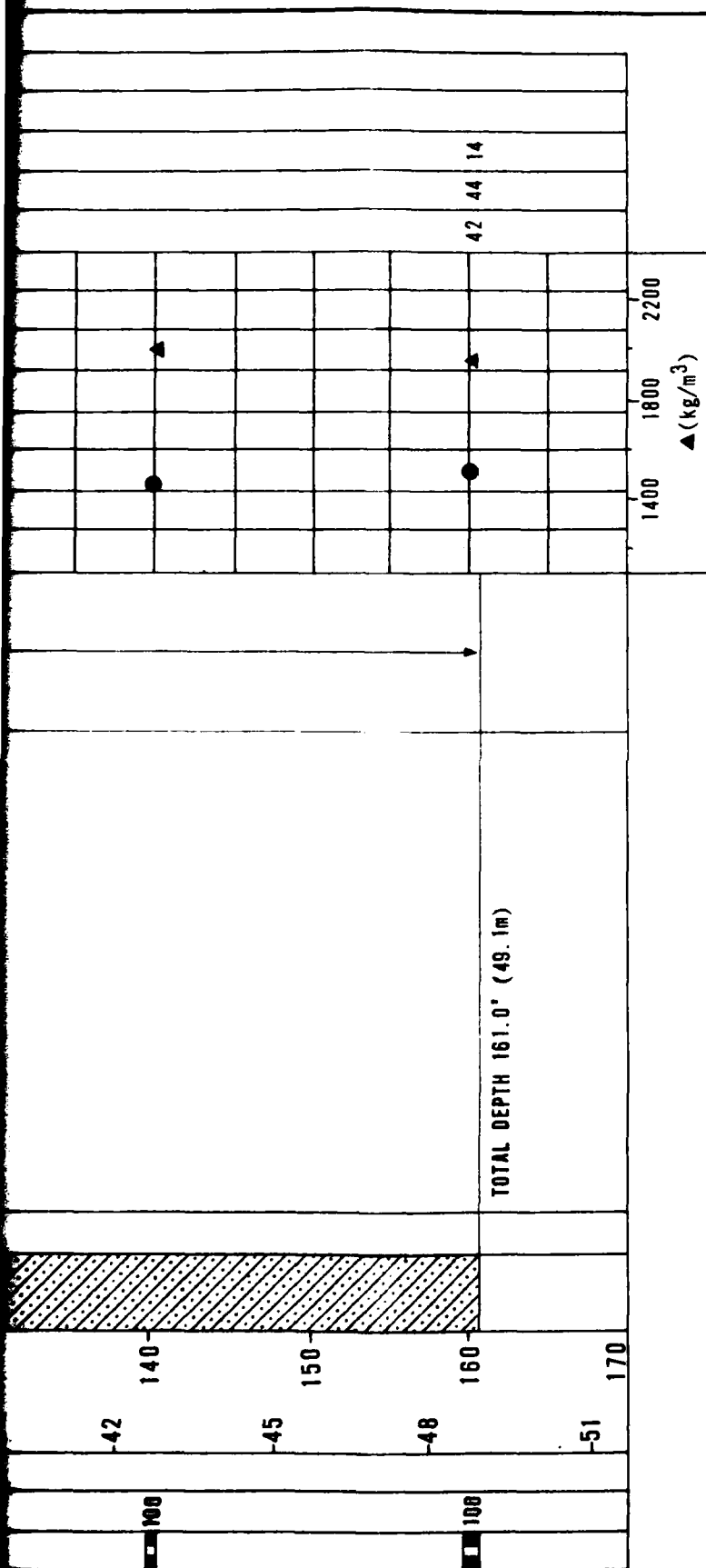
FUGRO NATIONAL INC.

CHECKED BY APPROVED BY

2 JUL 78

| SAMPLE TYPE | % RECOVERY | N VALUE | DEPTH<br>METERS | DEPTH<br>FEET | LITHOLOGY | USCS  | SOIL DESCRIPTION                                                                                                                                                          | REMARKS       | ▲(pcf) |    |     |     |     |     |     |    |    |    |    |    |    | SIEVE ANALYSIS |  |  |  |  |
|-------------|------------|---------|-----------------|---------------|-----------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----------------|--|--|--|--|
|             |            |         |                 |               |           |       |                                                                                                                                                                           |               | 80     | 90 | 100 | 110 | 120 | 130 | 140 | GR | SA | FI | LL | PI |    |                |  |  |  |  |
| ■           | 95         | 12      | 0               | 0             | SP-SM     | SP-SM | GRAVELLY SAND, brown, fine to coarse, poorly graded, loose to dense, angular to subangular; little to some fine to coarse subangular gravel; trace to some silt.          | drill chatter | ●      | ▲  |     |     |     |     |     |    | 19 | 74 | 7  |    |    |                |  |  |  |  |
| ■           | 67         |         |                 |               |           | SM    |                                                                                                                                                                           |               |        | ●  | ▲   |     |     |     |     |    |    |    |    |    |    |                |  |  |  |  |
| ■           | 100        |         |                 |               |           | SM    |                                                                                                                                                                           |               |        | ●  | ▲   |     |     |     |     |    |    | 36 | 40 | 24 |    |                |  |  |  |  |
| ■           | 88         |         |                 |               |           |       |                                                                                                                                                                           |               |        | ●  | ▲   |     |     |     |     |    |    |    |    |    |    |                |  |  |  |  |
| ■           | 100        |         | 3               | 10            | GW        | GW    | SANDY GRAVEL, brown, fine to coarse, well graded, dense to very dense, angular to subangular; some fine to coarse angular to subangular sand.                             |               |        | ●  | ▲   |     |     |     |     |    |    | 59 | 38 | 3  |    |                |  |  |  |  |
| ■           | 100        |         |                 |               |           |       |                                                                                                                                                                           |               | ●      | ▲  |     |     |     |     |     |    |    |    |    |    |    |                |  |  |  |  |
| ■           | 100        |         | 6               | 20            | SM-SM     | SM-SM | GRAVELLY SAND, brown, fine to coarse, well graded, very dense, angular to subangular; little fine subangular gravel; trace silt.                                          |               | ●      | ▲  |     |     |     |     |     |    | 18 | 73 | 9  |    |    |                |  |  |  |  |
| ■           | 100        |         |                 |               |           |       |                                                                                                                                                                           |               | ●      | ▲  |     |     |     |     |     |    |    |    |    |    |    |                |  |  |  |  |
| ■           | 100        |         | 9               | 30            | SM        | SM    | SILTY SAND, brown, fine to coarse, poorly graded, very dense, subangular; some silt.                                                                                      |               | ●      | ▲  |     |     |     |     |     |    |    |    |    |    |    |                |  |  |  |  |
| ■           | 100        |         |                 |               |           |       |                                                                                                                                                                           |               | ●      | ▲  |     |     |     |     |     |    |    |    |    |    |    |                |  |  |  |  |
| ■           | 100        |         | 12              | 40            | SP-SM     | SP-SM | GRAVELLY SAND, brown, fine to coarse, poorly graded, very dense, angular to subangular; some fine to coarse subangular gravel; trace to little silty clay (46.0°-161.0°). |               | ●      | ▲  |     |     |     |     |     |    | 44 | 49 | 7  |    |    |                |  |  |  |  |
| ■           | 100        |         |                 |               |           |       |                                                                                                                                                                           |               | ●      | ▲  |     |     |     |     |     |    |    |    |    |    |    |                |  |  |  |  |
| ■           | 100        |         | 15              | 50            |           |       |                                                                                                                                                                           |               |        |    |     |     |     |     |     |    |    |    |    |    |    |                |  |  |  |  |
| ■           | 100        |         |                 |               |           | SP-SC |                                                                                                                                                                           |               |        |    |     |     |     |     |     |    |    |    |    |    |    |                |  |  |  |  |
| ■           | 100        |         | 18              | 60            |           |       |                                                                                                                                                                           |               | ●      | ▲  |     |     |     |     |     |    | 39 | 49 | 12 | 36 | 17 |                |  |  |  |  |





APPROVED BY:

| SAMPLE TYPE | % RECOVERY | N VALUE | METERS | DEPTH<br>FEET | LITHOLOGY | USCS      | SOIL DESCRIPTION                                                                                                                                                                     | REMARKS |
|-------------|------------|---------|--------|---------------|-----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 100         | 87         | 11      | 0      | 0             |           | SM        | SANDY GRAVEL, brown, fine to coarse, well graded, loose to very dense, subangular; some fine to coarse sub-angular sand; layer of silty sand (0.0'-2.0').                            |         |
| 89          | 100        | -3      | 10     |               |           | GW        |                                                                                                                                                                                      |         |
| 100         | 100        | -6      | 20     |               |           | SW-<br>SM |                                                                                                                                                                                      |         |
| 100         | 100        | -9      | 30     |               |           | SM        | SANDY GRAVEL, brown, fine to coarse, poorly graded, very dense, subangular, calcareous; some fine to coarse sub-angular sand; little silty clay; lenses of gravelly sand throughout. |         |
| 100         | 100        | -12     | 40     |               |           |           |                                                                                                                                                                                      |         |
| 100         | 100        | -15     | 50     |               |           |           |                                                                                                                                                                                      |         |

48 38 15 48 29

51 38 13

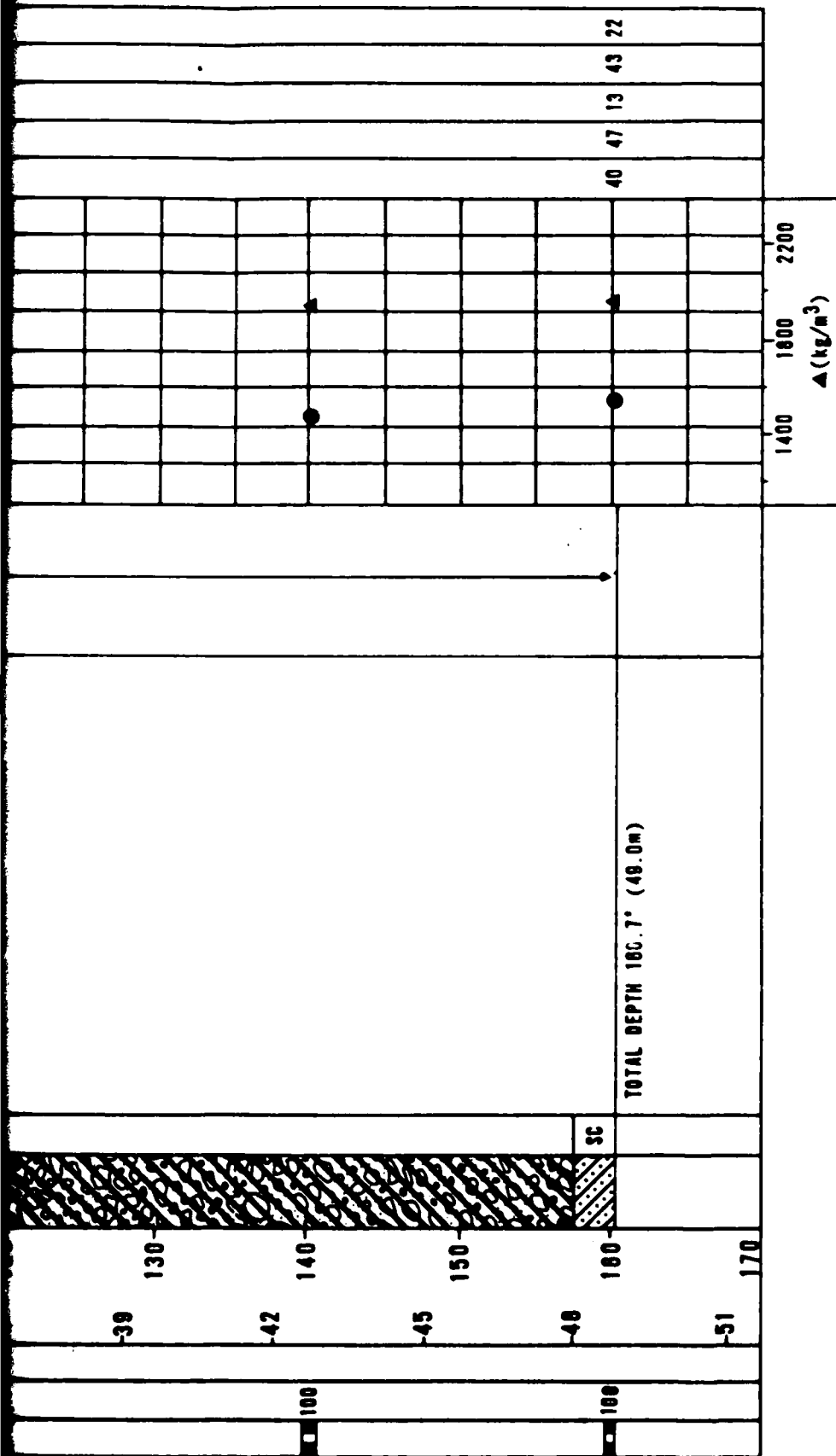
drill  
chatter

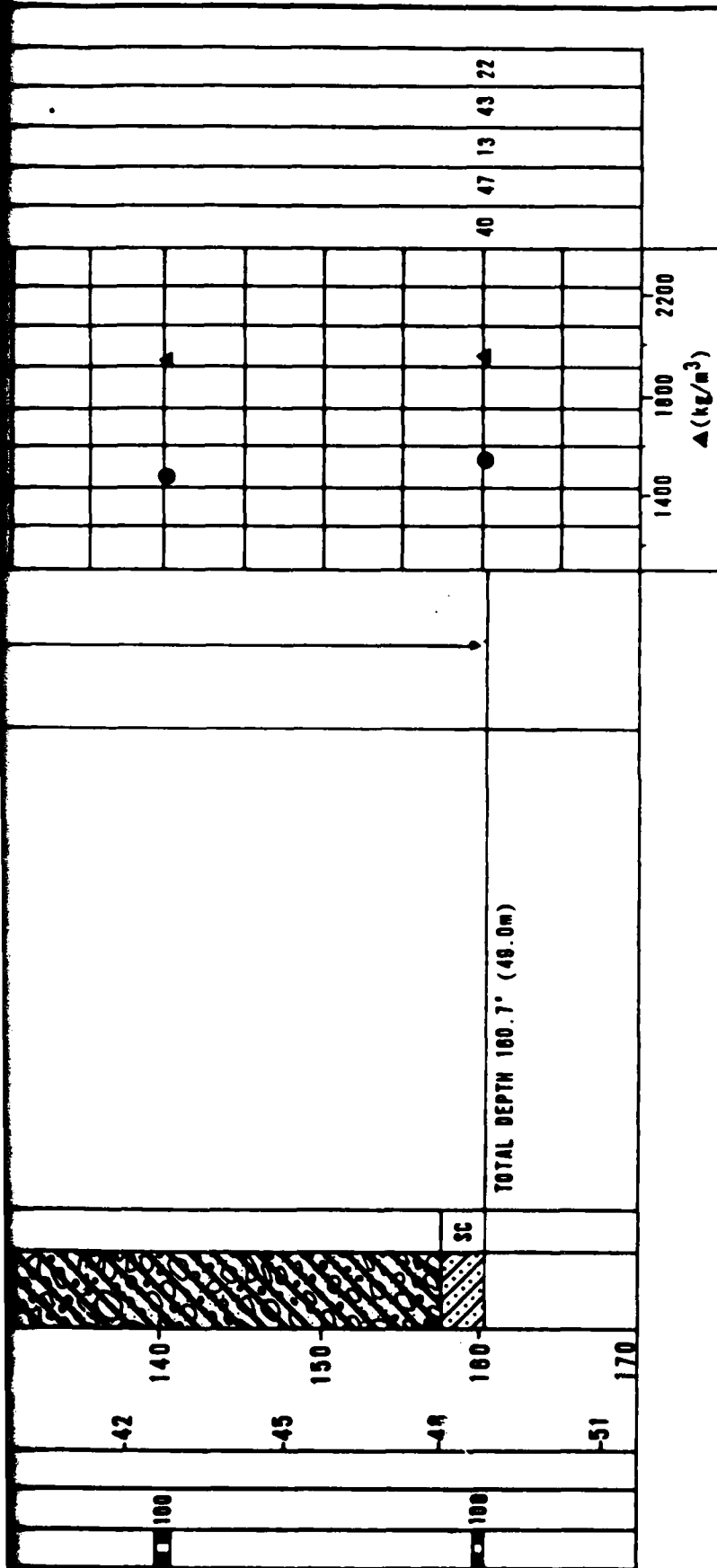
60

50 60 70 80 90 100 110 120 130

-15 -18 -21 -24 -27 -30 -33 -36 -39

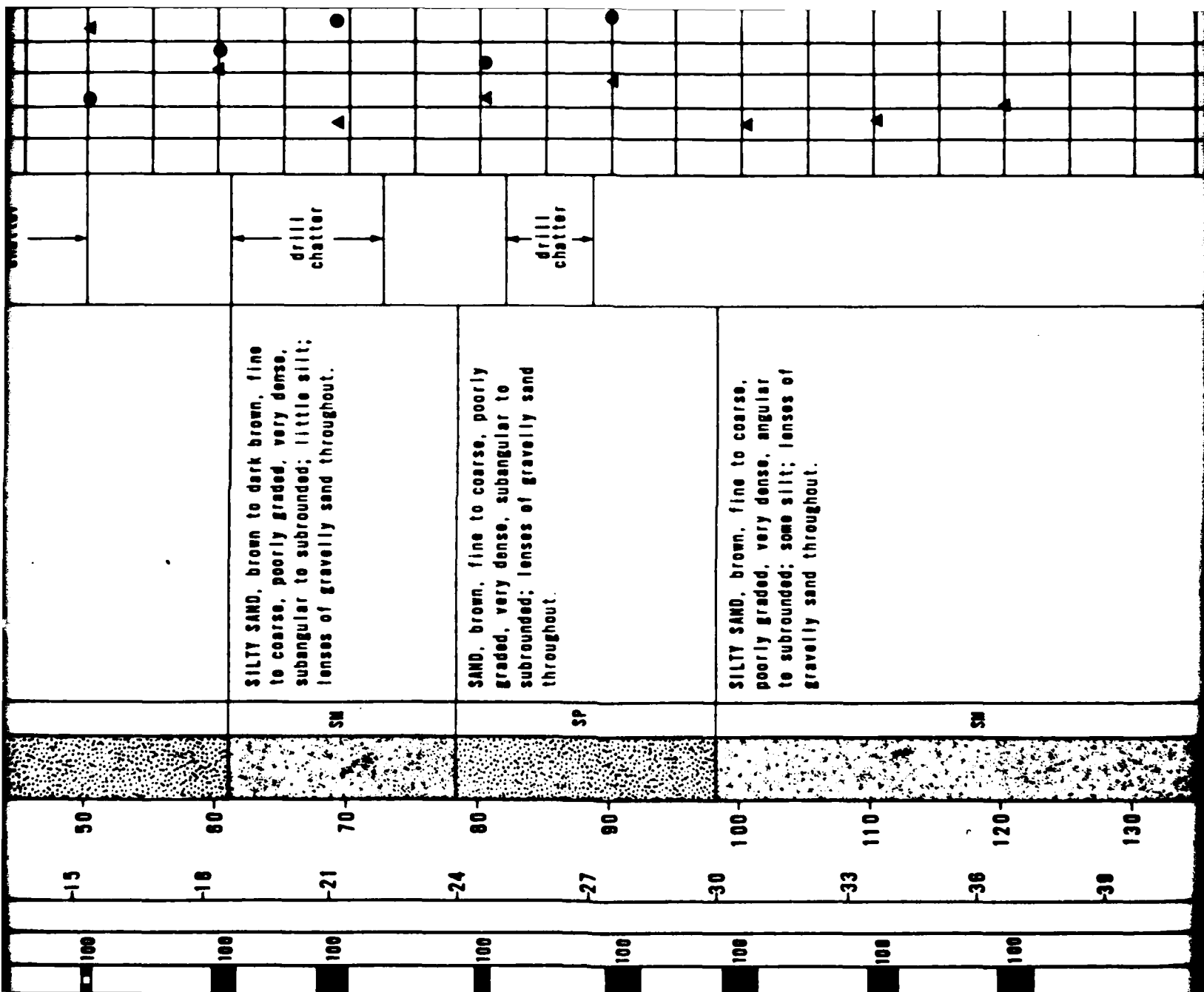
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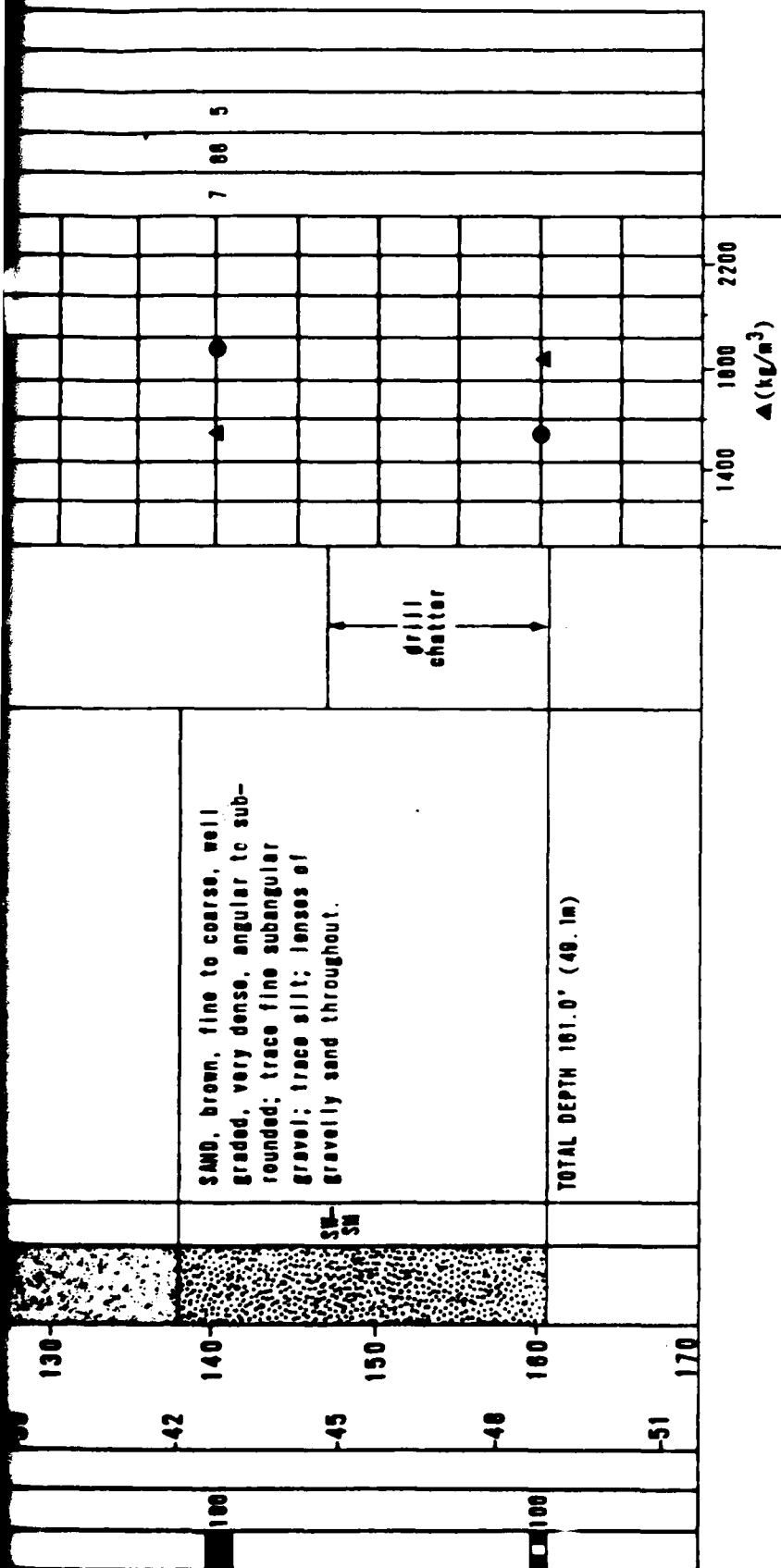




CONFIDENTIAL

| SAMPLE TYPE | % RECOVERY | N VALUE | METERS | FEET  | LITHOLOGY | USCS | SOIL DESCRIPTION                                                                                                                                                                                                                                          | REMARKS       | ▲(pcf) |    |     |     |     |     |     |    |    |    |    | SIEVE ANALYSIS |  |  |
|-------------|------------|---------|--------|-------|-----------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|----|-----|-----|-----|-----|-----|----|----|----|----|----------------|--|--|
|             |            |         |        |       |           |      |                                                                                                                                                                                                                                                           |               | 80     | 90 | 100 | 110 | 120 | 130 | 140 | GR | SA | FI | LL | PI             |  |  |
| 93          | 53         | 12      | 0      | 0     | SP-SM     |      | GRAVELLY SAND, light brown to brown, fine to coarse, poorly graded, loose to very dense, angular to subangular, calcareous; little to some fine to coarse angular to subangular gravel; trace silt; layer of sand (3.0'-6.0'); lenses of sand throughout. | drill chatter | 5      | 10 | 15  | 20  | 25  | 30  | 35  | 3  | 84 | 3  |    |                |  |  |
| 100         | 100        | 3       | 10     | SP    |           | 5    |                                                                                                                                                                                                                                                           |               | 10     | 15 | 20  | 25  | 30  | 35  | 14  | 81 | 5  |    |    |                |  |  |
| 100         | 100        | 6       | 20     | SP-SM |           | 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     |       |           | 5    |                                                                                                                                                                                                                                                           |               | 10     | 15 | 20  | 25  | 30  | 35  |     |    |    |    |    |                |  |  |





### 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 : 5480' (1664m)
- SURFICIAL GEOLOGIC UNIT : A5y
- DATE DRILLED : 9-10 April 1978
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4 7/8" (124mm)
- WATER LEVEL : Not Encountered

LOG OF BORING DS-B-5  
VERIFICATION SITE, BIG SMOKEY COP, NEVADA

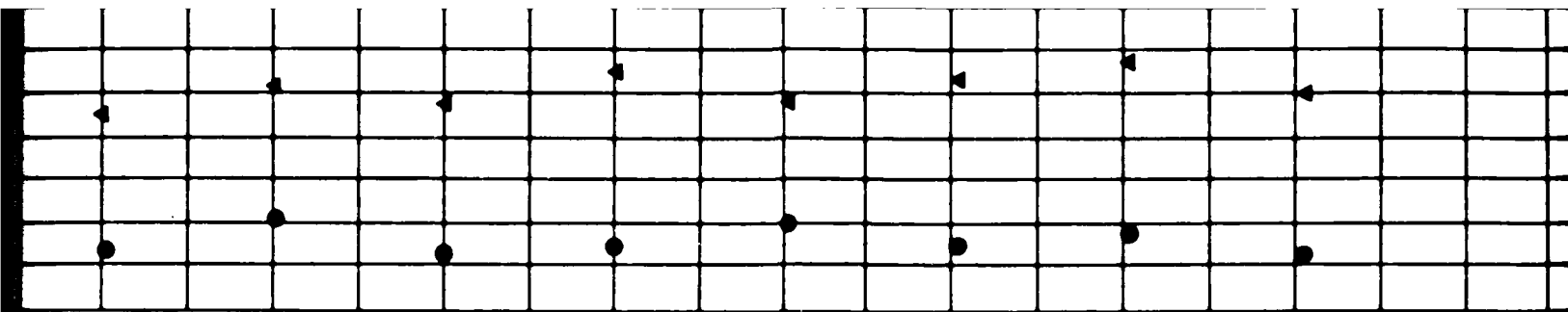
MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
6-5

FUGRO NATIONAL INC.

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

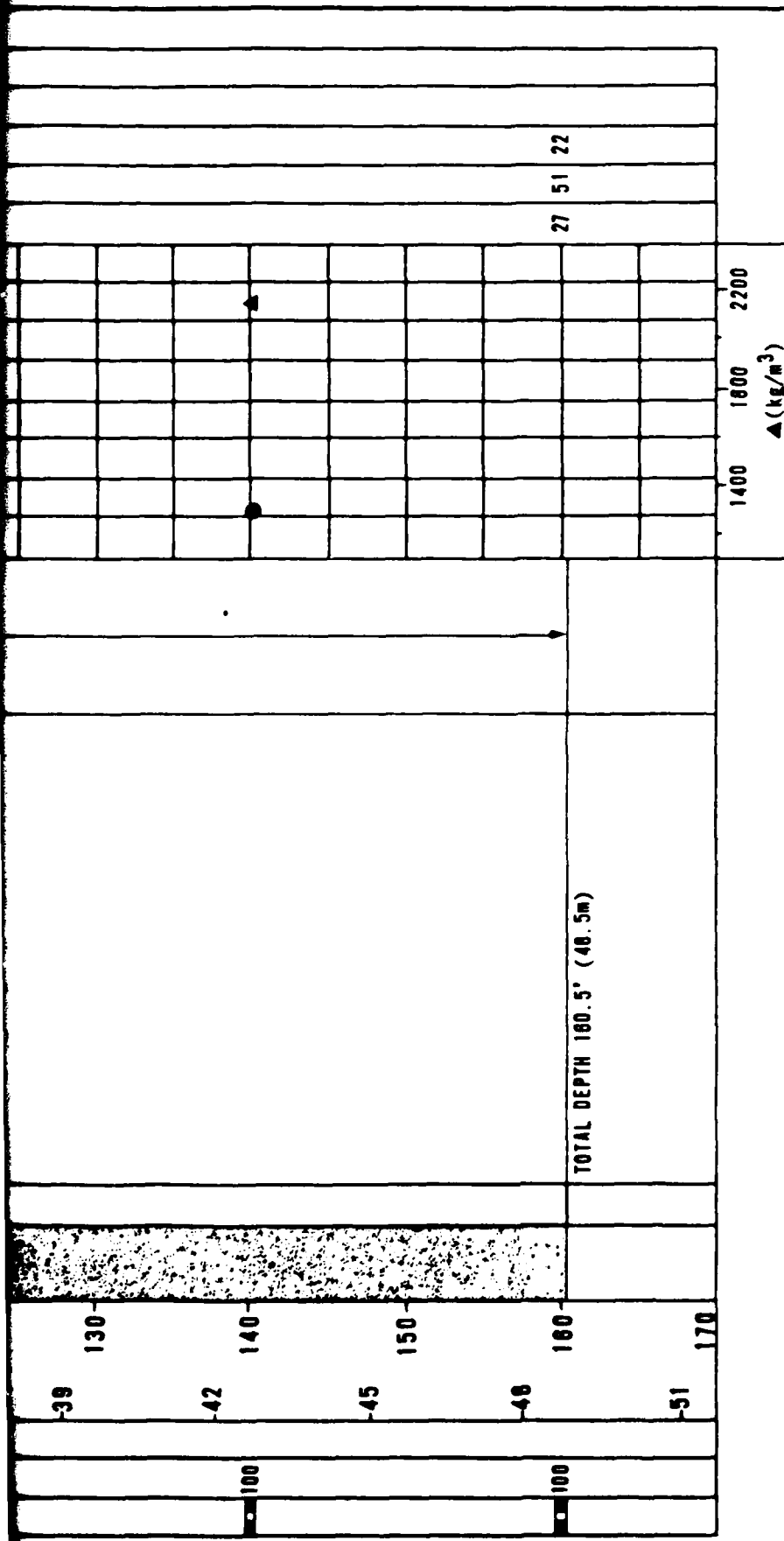
| SAMPLE TYPE | % RECOVERY | N VALUE | DEPTH  |      | LITHOLOGY | USCS  | SOIL DESCRIPTION                                                                                                                                                                                                | REMARKS | ▲ (pcf) |    |    |    |    |    |    |    |    |    |    | SIEVE ANALYSIS |    |     |     |     |    |    |    |    |    |
|-------------|------------|---------|--------|------|-----------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|----|----|----|----|----|----|----|----|----|----|----------------|----|-----|-----|-----|----|----|----|----|----|
|             |            |         | METERS | FEET |           |       |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 1           | 100        | 12      | 0      | 0    | SAND      | SP-SM | GRAVELLY SAND, light brown to dark brown, fine to coarse, poorly to well graded, very dense, angular to subangular, calcareous; trace to some fine to coarse angular to sub-angular gravel; trace to some silt. |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 2           | 100        | 12      | 0      | 0    |           |       |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 3           | 100        | 12      | 3      | 10   | SAND      | SM    |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 4           | 100        | 12      | 3      | 10   |           |       |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 5           | 100        | 12      | 6      | 20   | SAND      | SM    |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 6           | 100        | 12      | 6      | 20   |           |       |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 7           | 100        | 12      | 9      | 30   | SAND      | SM    |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 8           | 100        | 12      | 9      | 30   |           |       |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 9           | 100        | 12      | 12     | 40   | SAND      | SM    |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 10          | 100        | 12      | 12     | 40   |           |       |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 11          | 100        | 12      | 15     | 50   | SAND      | SM    |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |
| 12          | 100        | 12      | 15     | 50   |           |       |                                                                                                                                                                                                                 |         | 5       | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70             | 80 | 100 | 200 | 425 | GR | SA | FI | LL | PI |



drill  
chatter

SP-  
SM

MS



### 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-2218-71)
- NR - NO RECOVERY

### BORING DETAILS

ELEVATION : 5832' (1778m)  
 SURFICIAL GEOLOGIC UNIT : A5y  
 DATE DRILLED : 11 April 1978  
 DRILLING METHOD : Rotary Wash  
 HOLE DIAMETER : 4 7/8" (124mm)  
 WATER LEVEL : Not Encountered

LOG OF BORING BS-B-6  
 VERIFICATION SITE, BIG SMOKEY COP, NEVADA

MX SITING INVESTIGATION  
 DEPARTMENT OF THE AIR FORCE - SAUSO

FIGURE  
 8-6

FUGRO NATIONAL INC.

APV

SECTION 7.0  
TRENCH AND TEST PIT LOGS

AD-A113 330

FUGRO NATIONAL INC. LONG BEACH CA

F/6 8/13

MX SITING INVESTIGATION. GEOTECHNICAL EVALUATION. VOLUME VIII. --ETC(U)

AUG 79

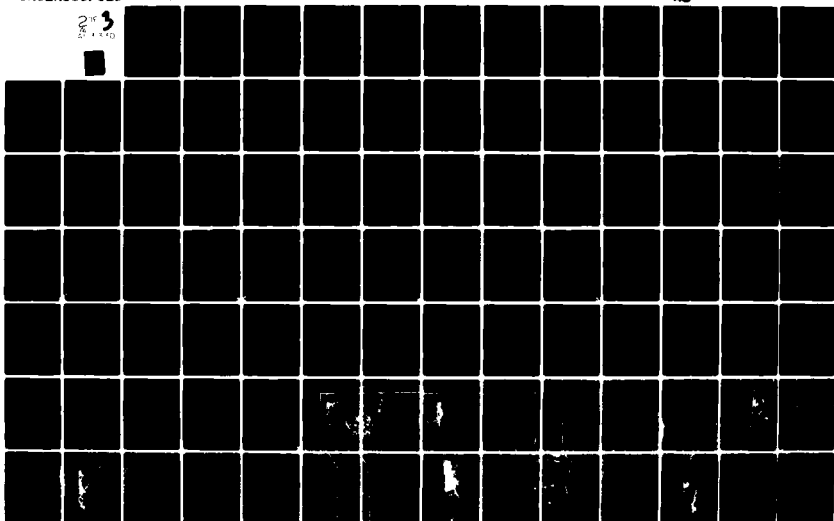
F04704-80-C-0000

UNCLASSIFIED

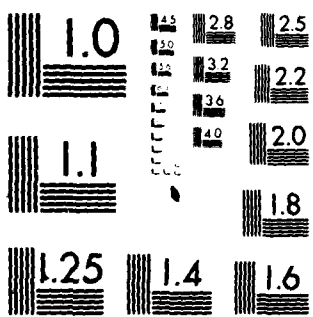
FM-TR-27-8

NL

2 3  
20 x 10



133



MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963-A

FN-TR-27-VIII

EXPLANATIONS OF TRENCH AND TEST PIT LOGS

See Section 6.0, "Boring Logs", for explanations.

FUGRO NATIONAL, INC.

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS  | CONSISTENCY  | SOIL DESCRIPTION                                                                                                                                                                                                                                      | REMARKS                                 | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|-------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------|----|----|----|----|
|             |                         |           |       |              |                                                                                                                                                                                                                                                       |                                         | GR             | SA | FI | LL | PI |
|             | 0                       |           |       |              | GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, sub-angular to angular, calcareous; some fine to coarse angular to subangular gravel; trace silt.                                                                                     |                                         |                |    |    |    |    |
|             | 2                       |           | SP-SM | medium dense |                                                                                                                                                                                                                                                       |                                         | 37             | 56 | 7  |    |    |
|             | 4                       |           |       |              | SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, angular to subangular, calcareous; some fine to coarse subangular to angular sand; trace silt; lenses of stage III caliche (2.0'-12.0'); occasional cobbles to 6" size. (0.25'-12.0'). | vertical walls stable                   |                |    |    |    |    |
|             | 6                       |           | GP-GM | medium dense |                                                                                                                                                                                                                                                       |                                         |                |    |    |    |    |
|             | 8                       |           |       |              |                                                                                                                                                                                                                                                       |                                         |                |    |    |    |    |
|             | 10                      |           |       |              |                                                                                                                                                                                                                                                       |                                         |                |    |    |    |    |
|             | 12                      |           |       |              | TOTAL DEPTH 12.0' (3.7m)                                                                                                                                                                                                                              | excavation stopped due to large boulder |                |    |    |    |    |
|             | 14                      |           |       |              |                                                                                                                                                                                                                                                       |                                         |                |    |    |    |    |
|             | 16                      |           |       |              |                                                                                                                                                                                                                                                       |                                         |                |    |    |    |    |
|             | 18                      |           |       |              |                                                                                                                                                                                                                                                       |                                         |                |    |    |    |    |
|             | 20                      |           |       |              |                                                                                                                                                                                                                                                       |                                         |                |    |    |    |    |

#### TRENCH DETAILS

SURFACE ELEVATION : 5755' (1754m)  
 DATE EXCAVATED : 6 APRIL 1979  
 SURFICIAL GEOLOGIC UNIT: ASI  
 TRENCH LENGTH : 18.0' (5m)  
 TRENCH ORIENTATION : E - W

LOG OF TRENCH BS-T-1  
 VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
 DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
 7-1

**FUGRO NATIONAL, INC.**

2 JUL 79

AFV-04

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS  | CONSISTENCY  | SOIL DESCRIPTION                                                                                                                                                                     | REMARKS                  | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|-------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------|----|----|----|----|
|             |                         |           |       |              |                                                                                                                                                                                      |                          | GR             | SA | FI | LL | PI |
|             | 0                       |           |       |              | SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; trace fine to coarse subangular to subrounded gravel; trace silt; occasional cobbles to 5" size. | vertical walls sloughing | 8              | 87 | 5  |    |    |
|             | 2                       |           | SP-SM | loose        |                                                                                                                                                                                      |                          |                |    |    |    |    |
|             | 4                       |           |       |              |                                                                                                                                                                                      |                          |                |    |    |    |    |
|             | 6                       |           | SM    | dense        | SILTY SAND, white, fine to coarse, poorly graded, dry, subrounded, calcareous; some silt; trace fine subrounded gravel; stage III caliche (5.0"-7.0").                               | vertical walls stable    |                |    |    |    |    |
|             | 8                       |           |       | medium dense |                                                                                                                                                                                      |                          |                |    |    |    |    |
|             | 10                      |           | SP-SM | medium dense | SAND, light brown, fine to coarse, poorly graded, dry, subrounded, calcareous; trace fine to coarse subangular to subrounded gravel; trace silt.                                     |                          |                |    |    |    |    |
|             | 12                      |           | GP    | medium dense | SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subangular, calcareous; some fine to coarse subangular sand.                                                          |                          |                |    |    |    |    |
|             | 14                      |           |       |              | TOTAL DEPTH 14.0' (4.3m)                                                                                                                                                             |                          |                |    |    |    |    |
|             | 16                      |           |       |              |                                                                                                                                                                                      |                          |                |    |    |    |    |
|             | 18                      |           |       |              |                                                                                                                                                                                      |                          |                |    |    |    |    |
|             | 20                      |           |       |              |                                                                                                                                                                                      |                          |                |    |    |    |    |

# TRENCH DETAILS

SURFACE ELEVATION : 5000' (1524m)  
 DATE EXCAVATED : 7 APRIL 1979  
 SURFICIAL GEOLOGIC UNIT: A5y/A3  
 TRENCH LENGTH : 16.0' (5m)  
 TRENCH ORIENTATION : NW - SE

LOG OF TRENCH BS-T-2  
 VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
 DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
 7-2

FUSRO NATIONAL INC.

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS | CONSISTENCY  | SOIL DESCRIPTION                                                                                                 | REMARKS                  | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|------|--------------|------------------------------------------------------------------------------------------------------------------|--------------------------|----------------|----|----|----|----|
|             |                         |           |      |              |                                                                                                                  |                          | GR             | SA | FI | LL | PI |
|             | 0                       |           | SM   | medium dense | SILTY SAND, brown, fine to medium, poorly graded, slightly moist, sub-rounded, calcareous; some silt.            | vertical walls stable    | 3              | 72 | 25 |    |    |
|             | 2                       |           | GP   |              | Interbedded layers of SAND and GRAVEL:                                                                           |                          |                |    |    |    |    |
|             |                         |           | SP   | loose        | SAND:                                                                                                            | vertical walls sloughing |                |    |    |    |    |
|             | 4                       |           | GP   | medium dense | GRAVELLY SAND (SP): gray brown, fine to coarse, poorly graded, dry, subrounded; some fine sub-rounded gravel.    |                          |                |    |    |    |    |
|             |                         |           |      |              | GRAVEL:                                                                                                          |                          |                |    |    |    |    |
|             | 6                       |           |      |              | SANDY GRAVEL (GP): brown, fine, poorly graded, dry, subrounded, calcareous; some fine to coarse subrounded sand. |                          |                |    |    |    |    |
|             | 8                       |           | SP   | dense        | Stage I caliche (1.5'-2.5')                                                                                      | vertical walls stable    |                |    |    |    |    |
|             |                         |           |      |              | Stage III caliche (5.0'-7.0')                                                                                    |                          |                |    |    |    |    |
|             | 10                      |           | GP   | medium dense |                                                                                                                  |                          |                |    |    |    |    |
|             | 12                      |           | SP   | medium dense |                                                                                                                  |                          |                |    |    |    |    |
|             | 14                      |           |      |              | TOTAL DEPTH 14.0' (4.3m)                                                                                         |                          |                |    |    |    |    |
|             | 16                      |           |      |              |                                                                                                                  |                          |                |    |    |    |    |
|             | 18                      |           |      |              |                                                                                                                  |                          |                |    |    |    |    |
|             | 20                      |           |      |              |                                                                                                                  |                          |                |    |    |    |    |

# TRENCH DETAILS

SURFACE ELEVATION : 4892' (1491m)  
 DATE EXCAVATED : 7 APRIL 1979  
 SURFICIAL GEOLOGIC UNIT: A5y/A3  
 TRENCH LENGTH : 18.0' (3m)  
 TRENCH ORIENTATION : NW - SE

LOG OF TRENCH BS-T-3  
 VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
 DEPARTMENT OF THE AIR FORCE - SAMS0

FIGURE  
 7-3

FUSRO NATIONAL, INC.

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS  | CONSISTENCY  | SOIL DESCRIPTION                                                                                                                                                              | REMARKS               | SIEVE ANALYSIS |    |    |    |    |  |  |
|-------------|-------------------------|-----------|-------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------|----|----|----|----|--|--|
|             |                         |           |       |              |                                                                                                                                                                               |                       | GR             | SA | FI | LL | PI |  |  |
|             | 0                       |           | GP-SM | medium dense | GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, sub-rounded, calcareous; some fine to coarse subrounded gravel; trace silt; stage I caliche (1.0'-2.0'). | vertical walls stable | 33             | 61 | 6  |    |    |  |  |
|             | 2                       |           | GP    | medium dense | SANDY GRAVEL, gray brown, fine to coarse, poorly graded, dry, sub-rounded, calcareous; some fine to coarse subrounded sand.                                                   |                       |                |    |    |    |    |  |  |
|             | 4                       |           |       |              |                                                                                                                                                                               |                       |                |    |    |    |    |  |  |
|             | 6                       |           |       |              |                                                                                                                                                                               |                       |                |    |    |    |    |  |  |
|             | 8                       |           |       |              |                                                                                                                                                                               |                       |                |    |    |    |    |  |  |
|             | 10                      |           | SM    | dense        | SILTY SAND, brown, fine to coarse, poorly graded, dry, subrounded; little silt; trace fine subrounded gravel.                                                                 |                       |                |    |    |    |    |  |  |
|             | 12                      |           | GP    | dense        | SANDY GRAVEL, brown, fine to coarse, poorly graded, dry, subrounded, calcareous; some fine to coarse sub-rounded sand.                                                        |                       |                |    |    |    |    |  |  |
|             | 14                      |           |       |              | TOTAL DEPTH 14.0' (4.3m)                                                                                                                                                      |                       |                |    |    |    |    |  |  |
|             | 16                      |           |       |              |                                                                                                                                                                               |                       |                |    |    |    |    |  |  |
|             | 18                      |           |       |              |                                                                                                                                                                               |                       |                |    |    |    |    |  |  |
|             | 20                      |           |       |              |                                                                                                                                                                               |                       |                |    |    |    |    |  |  |

**TRENCH DETAILS**

SURFACE ELEVATION : 5108' (1557m)  
 DATE EXCAVATED : 8 APRIL 1979  
 SURFICIAL GEOLOGIC UNIT: A1  
 TRENCH LENGTH : 16.0' (5m)  
 TRENCH ORIENTATION : N - S

LOG OF TRENCH BS-T-4  
 VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
 DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
 7-4

**FUGRO NATIONAL, INC.**

2 JUL 79

AFV-04

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| 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, light brown, fine to coarse, poorly graded, slightly moist, subangular, calcareous; some fine to coarse subangular gravel; little nonplastic silt.                                                  | vertical walls stable                                         | 28             | 55 | 17 |    | NT |
|             | 2      |      |           |       |              |                                                                                                                                                                                                                    |                                                               |                |    |    |    |    |
|             | 4      |      |           | GP-GM | dense        | SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subangular, calcareous; some fine to coarse subangular sand; trace silt; stage III caliche (2.0'-7.0'); occasional cobbles to 5" size (2.0'-10.0'). |                                                               |                |    |    |    |    |
|             | 6      |      |           |       |              |                                                                                                                                                                                                                    |                                                               |                |    |    |    |    |
|             | 8      |      |           |       |              |                                                                                                                                                                                                                    |                                                               |                |    |    |    |    |
|             | 10     |      |           |       |              | TOTAL DEPTH 10.0' (3.0m)                                                                                                                                                                                           | soil strength exceeded capacity of Case 580C backhoe at 10.0' |                |    |    |    |    |
|             | 12     |      |           |       |              |                                                                                                                                                                                                                    |                                                               |                |    |    |    |    |
|             | 14     |      |           |       |              |                                                                                                                                                                                                                    |                                                               |                |    |    |    |    |
|             | 16     |      |           |       |              |                                                                                                                                                                                                                    |                                                               |                |    |    |    |    |
|             | 18     |      |           |       |              |                                                                                                                                                                                                                    |                                                               |                |    |    |    |    |
|             | 20     |      |           |       |              |                                                                                                                                                                                                                    |                                                               |                |    |    |    |    |

**TRENCH DETAILS**

SURFACE ELEVATION : 5375' (1638m)  
 DATE EXCAVATED : 9 APRIL 1979  
 SURFICIAL GEOLOGIC UNIT: A51  
 TRENCH LENGTH : 18.0' (5m)  
 TRENCH ORIENTATION : NE - SW

**LOG OF TRENCH BS-T-5  
 VERIFICATION SITE, BIG SMOKY CDP, NEVADA**

MX SITING INVESTIGATION  
 DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
 7-5

**FUSRO NATIONAL, INC.**

2 JUL 79

AFV-04

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS | CONSISTENCY | SOIL DESCRIPTION                                                                                                                                                                             | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             |                         |           |      |             |                                                                                                                                                                                              |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |      |             | GRAVELLY SAND, light brown, fine to coarse, well graded, slightly moist, subrounded, calcareous; some fine to coarse subrounded gravel; trace non-plastic silt; stage I caliche (1.0"-3.0"). |         |                |    |    |    |    |
|             | 2                       |           |      |             |                                                                                                                                                                                              |         |                |    |    |    |    |
|             | 4                       |           |      |             |                                                                                                                                                                                              |         |                |    |    |    |    |
|             | 6                       |           |      |             |                                                                                                                                                                                              |         |                |    |    |    |    |
|             | 8                       |           |      |             |                                                                                                                                                                                              |         |                |    |    |    |    |
|             | 10                      |           |      |             |                                                                                                                                                                                              |         |                |    |    |    |    |
|             | 12                      |           |      |             |                                                                                                                                                                                              |         |                |    |    |    |    |
|             | 14                      |           |      |             |                                                                                                                                                                                              |         |                |    |    |    |    |
|             | 16                      |           |      |             |                                                                                                                                                                                              |         |                |    |    |    |    |
|             | 18                      |           |      |             |                                                                                                                                                                                              |         |                |    |    |    |    |
|             | 20                      |           |      |             |                                                                                                                                                                                              |         |                |    |    |    |    |
|             |                         |           |      |             | TOTAL DEPTH 14.0' (4.3m)                                                                                                                                                                     |         |                |    |    |    |    |

**TRENCH DETAILS**

SURFACE ELEVATION : 8055' (1848m)  
 DATE EXCAVATED : 10 APRIL 1979  
 SURFICIAL GEOLOGIC UNIT : ASy  
 TRENCH LENGTH : 18.0' (5m)  
 TRENCH ORIENTATION : NW-SE

LOG OF TRENCH BS-T-6  
 VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
 DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
 7-6

**FURRO NATIONAL, INC.**

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS  | CONSISTENCY  | SOIL DESCRIPTION                                                                                                                          | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|-------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             |                         |           |       |              |                                                                                                                                           |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |       |              |                                                                                                                                           |         |                |    |    |    |    |
|             | 1                       |           | SM    | loose        | SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; little nonplastic silt; trace fine subrounded gravel. |         | 11             | 70 | 19 |    | NP |
|             | 2                       |           |       |              |                                                                                                                                           |         |                |    |    |    |    |
|             | 3                       |           | SP-SM | medium dense | GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular, calcareous; trace fine subangular gravel; trace silt.         |         |                |    |    |    |    |
|             | 4                       |           |       |              |                                                                                                                                           |         |                |    |    |    |    |
|             | 5                       |           |       |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                   |         |                |    |    |    |    |

SURFACE ELEVATION: 5355' (1632m)  
SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT BS-P-1

|  |   |  |       |              |                                                                                                                                                                                |  |  |  |  |  |  |
|--|---|--|-------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  | 0 |  |       | medium dense | SAND, light brown, fine to coarse, poorly graded, slightly moist to dry, subangular, calcareous; trace to little subangular gravel; trace silt; stage III caliche (1.5'-2.5'). |  |  |  |  |  |  |
|  | 1 |  |       |              |                                                                                                                                                                                |  |  |  |  |  |  |
|  | 2 |  | SP-SM |              |                                                                                                                                                                                |  |  |  |  |  |  |
|  | 3 |  |       | dense        |                                                                                                                                                                                |  |  |  |  |  |  |
|  | 4 |  |       |              |                                                                                                                                                                                |  |  |  |  |  |  |
|  | 5 |  |       |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                                        |  |  |  |  |  |  |

SURFACE ELEVATION: 5281' (1610m)  
SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT BS-P-2

LOGS OF TEST PITS BS-P-1 AND BS-P-2  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMS0

FIGURE  
7-7

FUSRO NATIONAL, INC.

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS  | CONSISTENCY  | SOIL DESCRIPTION        | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|-------|--------------|-------------------------|---------|----------------|----|----|----|----|
|             |                         |           |       |              |                         |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |       |              |                         |         |                |    |    |    |    |
|             | 1                       |           |       | medium dense |                         |         |                |    |    |    |    |
|             | 2                       |           |       |              |                         |         |                |    |    |    |    |
|             | 3                       |           | SP-SM | dense        |                         |         |                |    |    |    |    |
|             | 4                       |           |       | medium dense |                         |         |                |    |    |    |    |
|             | 5                       |           |       |              |                         |         |                |    |    |    |    |
|             |                         |           |       |              | TOTAL DEPTH 5.0' (1.5m) |         |                |    |    |    |    |

SURFACE ELEVATION: 5270' (1606m)  
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT BS-P-3

|  |   |  |       |              |                         |  |  |  |  |  |  |
|--|---|--|-------|--------------|-------------------------|--|--|--|--|--|--|
|  | 0 |  |       |              |                         |  |  |  |  |  |  |
|  | 1 |  |       | medium dense |                         |  |  |  |  |  |  |
|  | 2 |  |       |              |                         |  |  |  |  |  |  |
|  | 3 |  | SP-SM | dense        |                         |  |  |  |  |  |  |
|  | 4 |  |       | medium dense |                         |  |  |  |  |  |  |
|  | 5 |  |       |              |                         |  |  |  |  |  |  |
|  |   |  |       |              | TOTAL DEPTH 5.0' (1.5m) |  |  |  |  |  |  |

SURFACE ELEVATION: 5480' (1673m)  
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT BS-P-4

LOGS OF TEST PITS BS-P-3 AND BS-P-4  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
7-8

FUGRO NATIONAL, INC.

2 JUL 79

AFV-03

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS | CONSISTENCY | SOIL DESCRIPTION                                                                                                                                                    | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             |                         |           |      |             |                                                                                                                                                                     |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |      |             | GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, sub-angular to angular, calcareous; little fine to coarse subangular to angular gravel; trace silt. |         |                |    |    |    |    |
|             | 1                       |           |      |             |                                                                                                                                                                     |         |                |    |    |    |    |
|             | 2                       |           |      |             |                                                                                                                                                                     |         |                |    |    |    |    |
|             | 3                       |           |      |             |                                                                                                                                                                     |         |                |    |    |    |    |
|             | 4                       |           |      |             |                                                                                                                                                                     |         |                |    |    |    |    |
|             | 5                       |           |      |             |                                                                                                                                                                     |         |                |    |    |    |    |
|             |                         |           |      |             | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                             |         |                |    |    |    |    |

SURFACE ELEVATION: 5840' (1719m)  
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT BS-P-5

|  |   |  |  |  |                                                                                                                                                                               |  |  |  |  |  |  |
|--|---|--|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  | 0 |  |  |  | GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, sub-rounded, calcareous; some fine sub-rounded to subangular gravel; trace silt; stage II caliche (1.2"-4.5') |  |  |  |  |  |  |
|  | 1 |  |  |  |                                                                                                                                                                               |  |  |  |  |  |  |
|  | 2 |  |  |  |                                                                                                                                                                               |  |  |  |  |  |  |
|  | 3 |  |  |  |                                                                                                                                                                               |  |  |  |  |  |  |
|  | 4 |  |  |  |                                                                                                                                                                               |  |  |  |  |  |  |
|  | 5 |  |  |  |                                                                                                                                                                               |  |  |  |  |  |  |
|  |   |  |  |  | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                                       |  |  |  |  |  |  |

SURFACE ELEVATION: 5380' (1640m)  
SURFICIAL GEOLOGIC UNIT: ASi

LOG OF TEST PIT BS-P-8

LOGS OF TEST PITS BS-P-5 AND BS-P-8  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
7-9

FUGRO NATIONAL, INC.

2 JUL 79

AFV-03

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS  | CONSISTENCY  | SOIL DESCRIPTION                                                                                                                                         | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|-------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             |                         |           |       |              |                                                                                                                                                          |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |       |              |                                                                                                                                                          |         |                |    |    |    |    |
|             | 1                       |           | SP-SM | loose        | SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; trace silt; trace fine subrounded gravel.                            |         |                |    |    |    |    |
|             | 2                       |           |       |              |                                                                                                                                                          |         |                |    |    |    |    |
|             | 3                       |           | GP    | medium dense | SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subrounded, calcareous; some fine to coarse subrounded sand; stage I caliche (2.5'-5.0'). |         |                |    |    |    |    |
|             | 4                       |           |       |              |                                                                                                                                                          |         |                |    |    |    |    |
|             | 5                       |           |       |              |                                                                                                                                                          |         |                |    |    |    |    |
|             |                         |           |       |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                  |         |                |    |    |    |    |

SURFACE ELEVATION: 5015' (1529m)  
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT BS-P-7

|  |   |  |       |              |                                                                                                                                                                      |  |  |  |  |  |  |
|--|---|--|-------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  | 0 |  |       |              |                                                                                                                                                                      |  |  |  |  |  |  |
|  | 1 |  | SM    | medium dense | SILTY SAND, red brown, fine to coarse, poorly graded, slightly moist, subangular, calcareous; some silt; trace fine subangular gravel; stage II caliche (0.5'-5.0'). |  |  |  |  |  |  |
|  | 2 |  |       |              |                                                                                                                                                                      |  |  |  |  |  |  |
|  | 3 |  | SP-SM | medium dense | SAND, light brown, fine to coarse, poorly graded, dry, subangular, calcareous; little fine subangular gravel; trace silt.                                            |  |  |  |  |  |  |
|  | 4 |  |       |              |                                                                                                                                                                      |  |  |  |  |  |  |
|  | 5 |  |       |              |                                                                                                                                                                      |  |  |  |  |  |  |
|  |   |  |       |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                              |  |  |  |  |  |  |

SURFACE ELEVATION: 4942' (1506m)  
SURFICIAL GEOLOGIC UNIT: ASy

LOG OF TEST PIT BS-P-8

LOGS OF TEST PITS BS-P-7 AND BS-P-8  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE SAMSQ

FIGURE  
7-10

**FUGRO NATIONAL, INC.**

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS  | CONSISTENCY | SOIL DESCRIPTION                                                                                                                  | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|-------|-------------|-----------------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             |                         |           |       |             |                                                                                                                                   |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |       |             | SAND, gray brown, fine to coarse, poorly graded, dry, subangular, calcareous; trace fine to coarse subangular gravel; trace silt. |         |                |    |    |    |    |
|             | 1                       |           |       |             |                                                                                                                                   |         |                |    |    |    |    |
|             | 2                       |           |       |             |                                                                                                                                   |         |                |    |    |    |    |
|             | 3                       |           | SP-SM | loose       |                                                                                                                                   |         |                |    |    |    |    |
|             | 4                       |           |       |             |                                                                                                                                   |         |                |    |    |    |    |
|             | 5                       |           |       |             |                                                                                                                                   |         |                |    |    |    |    |
|             |                         |           |       |             | TOTAL DEPTH 5.0' (1.5m)                                                                                                           |         |                |    |    |    |    |

SURFACE ELEVATION: 4882' (1488m)  
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT BS-P-9

|  |   |  |    |              |                                                                                                                                                                    |  |  |  |  |  |  |
|--|---|--|----|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  | 0 |  |    |              | SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular, calcareous; little silt; trace fine subangular gravel; stage II caliche (1.0'-5.0'). |  |  |  |  |  |  |
|  | 1 |  |    | medium dense |                                                                                                                                                                    |  |  |  |  |  |  |
|  | 2 |  | SM |              |                                                                                                                                                                    |  |  |  |  |  |  |
|  | 3 |  |    | dense        |                                                                                                                                                                    |  |  |  |  |  |  |
|  | 4 |  |    |              |                                                                                                                                                                    |  |  |  |  |  |  |
|  | 5 |  |    |              |                                                                                                                                                                    |  |  |  |  |  |  |
|  |   |  |    |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                            |  |  |  |  |  |  |

SURFACE ELEVATION: 5080' (1548m)  
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT BS-P-10

LOGS OF TEST PITS BS-P-9 AND BS-P-10  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

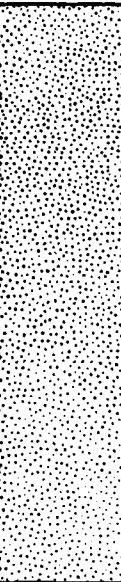
MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMS

FIGURE  
7-11

FUGRO NATIONAL, INC.

2 JUL 78

AFV-03

| BULK SAMPLE | DEPTH  |      | LITHOLOGY                                                                         | USCS  | CONSISTENCY | SOIL DESCRIPTION                                                                                | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|--------|------|-----------------------------------------------------------------------------------|-------|-------------|-------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             | METERS | FEET |                                                                                   |       |             |                                                                                                 |         | GR             | SA | FI | LL | PI |
|             | 0      | 0    |  | SP-SM | loose       | SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; trace silt. |         |                |    |    |    |    |
|             | 1      |      |                                                                                   |       |             |                                                                                                 |         |                |    |    |    |    |
|             | 2      |      |                                                                                   |       |             |                                                                                                 |         |                |    |    |    |    |
|             | 3      |      |                                                                                   |       |             |                                                                                                 |         |                |    |    |    |    |
|             | 4      |      |                                                                                   |       |             |                                                                                                 |         |                |    |    |    |    |
|             | 5      |      |                                                                                   |       |             | TOTAL DEPTH 5.0' (1.5m)                                                                         |         |                |    |    |    |    |

SURFACE ELEVATION: 4850' (1509m)  
SURFICIAL GEOLOGIC UNIT: A5y/A3

LOG OF TEST PIT BS-P-11

|  |   |  |       |       |                                                                                                                                                              |  |  |  |  |  |  |
|--|---|--|-------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  | 0 |  |       |       | SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; trace silt; trace fine subrounded gravel; stage III caliche (1.5'-5.0'). |  |  |  |  |  |  |
|  | 1 |  |       | loose |                                                                                                                                                              |  |  |  |  |  |  |
|  | 2 |  |       |       |                                                                                                                                                              |  |  |  |  |  |  |
|  | 3 |  | SP-SM | dense |                                                                                                                                                              |  |  |  |  |  |  |
|  | 4 |  |       |       |                                                                                                                                                              |  |  |  |  |  |  |
|  | 5 |  |       |       | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                      |  |  |  |  |  |  |

SURFACE ELEVATION: 4872' (1485m)  
SURFICIAL GEOLOGIC UNIT: A5y/A3

LOG OF TEST PIT BS-P-12

LOGS OF TEST PITS BS-P-11 AND BS-P-12  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
7-12

**FUGRO NATIONAL, INC.**

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS | CONSISTENCY | SOIL DESCRIPTION                                                                    | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|------|-------------|-------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             |                         |           |      |             |                                                                                     |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |      |             | SAND, brown, fine to medium, poorly graded, slightly moist, subrounded, calcareous. |         |                |    |    |    |    |
|             | 1                       |           |      |             |                                                                                     |         | 0              | 97 | 3  |    |    |
|             | 2                       |           |      |             |                                                                                     |         |                |    |    |    |    |
|             | 3                       |           | SP   | loose       |                                                                                     |         |                |    |    |    |    |
|             | 4                       |           |      |             |                                                                                     |         |                |    |    |    |    |
|             | 5                       |           |      |             |                                                                                     |         |                |    |    |    |    |
|             |                         |           |      |             | TOTAL DEPTH 5.0' (1.5m)                                                             |         |                |    |    |    |    |

SURFACE ELEVATION: 4995' (1522m)  
SURFICIAL GEOLOGIC UNIT: A3

LOG OF TEST PIT BS-P-13

|  |   |  |       |              |                                                                                                                                                           |  |  |  |  |  |  |
|--|---|--|-------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  | 0 |  |       |              | SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; trace fine subangular to subrounded gravel; trace silt. |  |  |  |  |  |  |
|  | 1 |  |       |              |                                                                                                                                                           |  |  |  |  |  |  |
|  | 2 |  |       |              |                                                                                                                                                           |  |  |  |  |  |  |
|  | 3 |  | SP-SM | loose        |                                                                                                                                                           |  |  |  |  |  |  |
|  | 4 |  |       |              |                                                                                                                                                           |  |  |  |  |  |  |
|  | 5 |  | SP    | medium dense | GRAVELLY SAND, brown, fine to coarse, poorly graded, dry, subangular, calcareous; some fine to coarse subangular gravel.                                  |  |  |  |  |  |  |
|  |   |  |       |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                   |  |  |  |  |  |  |

SURFACE ELEVATION: 5018' (1529m)  
SURFICIAL GEOLOGIC UNIT: A5y/A3

LOG OF TEST PIT BS-P-14

LOGS OF TEST PITS BS-P-13 AND BS-P-14  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
7-13

FUGRO NATIONAL, INC.

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| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS | CONSISTENCY  | SOIL DESCRIPTION                                                                                                               | REMARKS | SIEVE ANALYSIS |    |    |    |    |  |
|-------------|-------------------------|-----------|------|--------------|--------------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|--|
|             |                         |           |      |              |                                                                                                                                |         | GR             | SA | FI | LL | PI |  |
|             | 0                       |           | SM   | loose        | SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subrounded; little silt; trace fine subrounded gravel. |         | 8              | 74 | 18 |    |    |  |
|             | 1                       |           |      |              |                                                                                                                                |         |                |    |    |    |    |  |
|             | 2                       |           | GP   | medium dense | SANDY GRAVEL, gray brown, fine, poorly graded, slightly moist, subrounded; some fine to coarse subrounded sand.                |         |                |    |    |    |    |  |
|             | 3                       |           |      |              |                                                                                                                                |         |                |    |    |    |    |  |
|             | 4                       |           |      |              |                                                                                                                                |         |                |    |    |    |    |  |
|             | 5                       |           |      |              |                                                                                                                                |         |                |    |    |    |    |  |
|             |                         |           |      |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                        |         |                |    |    |    |    |  |

SURFACE ELEVATION: 4910' (1497m)  
SURFICIAL GEOLOGIC UNIT: A1/A4

LOG OF TEST PIT BS-P-15

|  |   |  |       |              |                                                                                                      |  |  |  |  |  |  |  |
|--|---|--|-------|--------------|------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
|  | 0 |  | SP-SM | medium dense | SAND, light brown, fine, poorly graded, slightly moist, subrounded; trace silt.                      |  |  |  |  |  |  |  |
|  | 1 |  |       |              |                                                                                                      |  |  |  |  |  |  |  |
|  | 2 |  |       |              |                                                                                                      |  |  |  |  |  |  |  |
|  | 3 |  | GP    | medium dense | SANDY GRAVEL, gray brown, fine, poorly graded, dry, subrounded; some fine to coarse subrounded sand. |  |  |  |  |  |  |  |
|  | 4 |  |       |              |                                                                                                      |  |  |  |  |  |  |  |
|  | 5 |  |       |              |                                                                                                      |  |  |  |  |  |  |  |
|  |   |  |       |              | TOTAL DEPTH 5.0' (1.5m)                                                                              |  |  |  |  |  |  |  |

SURFACE ELEVATION: 4903' (1484m)  
SURFICIAL GEOLOGIC UNIT: A5y/A4

LOG OF TEST PIT BS-P-16

LOGS OF TEST PITS BS-P-15 AND BS-P-16  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMS0

FIGURE  
7-14

**FUBRO NATIONAL, INC.**

2 JUL 79

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CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS | CONSISTENCY  | SOIL DESCRIPTION                                                                                                                                             | REMARKS               | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------|----|----|----|----|
|             |                         |           |      |              |                                                                                                                                                              |                       | GR             | SA | FI | LL | PI |
|             | 0                       |           |      |              |                                                                                                                                                              |                       |                |    |    |    |    |
|             | 1                       |           | SM   | medium dense | SILTY SAND, light brown, fine to coarse, poorly graded, dry, sub-rounded, calcareous; some silt; trace fine subrounded gravel; stage I caliche (0.25"-2.0"). |                       |                |    |    |    |    |
|             | 2                       |           |      |              |                                                                                                                                                              |                       |                |    |    |    |    |
|             | 3                       |           | GP   | loose        | SANDY GRAVEL, brown gray, fine to coarse, poorly graded, dry, sub-rounded; some fine to coarse sub-rounded sand.                                             | vertical walls caving |                |    |    |    |    |
|             | 4                       |           |      |              |                                                                                                                                                              |                       |                |    |    |    |    |
|             | 5                       |           |      |              |                                                                                                                                                              |                       |                |    |    |    |    |
|             |                         |           |      |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                      |                       |                |    |    |    |    |

SURFACE ELEVATION: 4896' (1492m)  
SURFICIAL GEOLOGIC UNIT: A5y/A4

LOG OF TEST PIT BS-P-17

|  |   |  |    |       |                                                                                                                        |                       |  |  |  |  |  |
|--|---|--|----|-------|------------------------------------------------------------------------------------------------------------------------|-----------------------|--|--|--|--|--|
|  | 0 |  |    |       | SANDY GRAVEL, gray, fine to coarse, poorly graded, dry, subrounded, calcareous; little fine to coarse subrounded sand. |                       |  |  |  |  |  |
|  | 1 |  |    |       |                                                                                                                        |                       |  |  |  |  |  |
|  | 2 |  | GP | loose |                                                                                                                        | vertical walls caving |  |  |  |  |  |
|  | 3 |  |    |       |                                                                                                                        |                       |  |  |  |  |  |
|  | 4 |  |    |       |                                                                                                                        |                       |  |  |  |  |  |
|  | 5 |  |    |       |                                                                                                                        |                       |  |  |  |  |  |
|  |   |  |    |       | TOTAL DEPTH 5.0' (1.5m)                                                                                                |                       |  |  |  |  |  |

SURFACE ELEVATION: 4878' (1487m)  
SURFICIAL GEOLOGIC UNIT: A5y/A4

LOG OF TEST PIT BS-P-18

LOGS OF TEST PITS BS-P-17 AND BS-P-18  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
7-15

**FUGRO NATIONAL, INC.**

2 JUL 78

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CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS | CONSISTENCY  | SOIL DESCRIPTION                                                                                                       | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|------|--------------|------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             |                         |           |      |              |                                                                                                                        |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |      |              |                                                                                                                        |         |                |    |    |    |    |
|             | 1                       |           | SC   | medium dense | CLAYEY SAND, brown, fine to medium, poorly graded, slightly moist, subrounded, calcareous; some slightly plastic clay. |         |                |    |    |    |    |
|             | 2                       |           |      |              | SANDY SILT, light brown, nonplastic; some fine to coarse subrounded sand; trace subrounded gravel.                     |         |                |    |    |    |    |
|             | 3                       |           | ML   | firm         |                                                                                                                        |         |                |    |    |    |    |
|             | 4                       |           |      |              |                                                                                                                        |         |                |    |    |    |    |
|             | 5                       |           |      |              |                                                                                                                        |         |                |    |    |    |    |
|             |                         |           |      |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                |         |                |    |    |    |    |

SURFACE ELEVATION: 5014' (1528m)  
SURFICIAL GEOLOGIC UNIT: A1

#### LOG OF TEST PIT BS-P-19

|  |   |  |       |              |                                                                                                                                                                  |  |  |  |  |  |  |
|--|---|--|-------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  | 0 |  |       |              |                                                                                                                                                                  |  |  |  |  |  |  |
|  | 1 |  | SM    | medium dense | SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; some silt; trace fine subrounded gravel; stage II caliche (1.0'-2.0'). |  |  |  |  |  |  |
|  | 2 |  | SP-SM | medium dense | SAND, brown, fine to coarse, poorly graded, dry, subrounded, calcareous; little fine subrounded gravel; trace silt.                                              |  |  |  |  |  |  |
|  | 3 |  |       |              |                                                                                                                                                                  |  |  |  |  |  |  |
|  | 4 |  | SM    | dense        | SILTY SAND, light brown, fine to coarse, poorly graded, dry, subrounded, calcareous; some silt; trace fine subrounded gravel; stage II caliche (3.0'-5.0').      |  |  |  |  |  |  |
|  | 5 |  |       |              |                                                                                                                                                                  |  |  |  |  |  |  |
|  |   |  |       |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                          |  |  |  |  |  |  |

SURFACE ELEVATION: 5158' (1572m)  
SURFICIAL GEOLOGIC UNIT: A5y

#### LOG OF TEST PIT BS-P-20

LOGS OF TEST PITS BS-P-19 AND BS-P-20  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMS0

FIGURE  
7-16

**FUGRO NATIONAL, INC.**

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CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS  | CONSISTENCY  | SOIL DESCRIPTION                                                                                                                                                                | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|-------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             |                         |           |       |              |                                                                                                                                                                                 |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |       |              |                                                                                                                                                                                 |         |                |    |    |    |    |
|             | 1                       |           | SP-SM | loose        | SAND, brown, fine to coarse, poorly graded, slightly moist, angular to subangular, calcareous; trace fine angular gravel; trace silt.                                           |         |                |    |    |    |    |
|             | 2                       |           |       |              |                                                                                                                                                                                 |         |                |    |    |    |    |
|             | 3                       |           | GP    | medium dense | SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, sub-angular to angular, calcareous; some fine to coarse subangular to angular sand; stage I caliche (2.0'-5.0'). |         |                |    |    |    |    |
|             | 4                       |           |       |              |                                                                                                                                                                                 |         |                |    |    |    |    |
|             | 5                       |           |       |              |                                                                                                                                                                                 |         |                |    |    |    |    |
|             |                         |           |       |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                                         |         |                |    |    |    |    |

SURFACE ELEVATION: 5210' (1588m)  
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT BS-P-21

|  |   |  |    |              |                                                                                                                                                                           |  |  |  |  |  |  |
|--|---|--|----|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  | 0 |  |    | medium dense | SANDY GRAVEL, brown, fine, poorly graded, slightly moist to dry, sub-angular, calcareous; some fine to coarse subangular sand; little silt; stage II caliche (1.0'-5.0'). |  |  |  |  |  |  |
|  | 1 |  |    |              |                                                                                                                                                                           |  |  |  |  |  |  |
|  | 2 |  | GM | dense        |                                                                                                                                                                           |  |  |  |  |  |  |
|  | 3 |  |    |              |                                                                                                                                                                           |  |  |  |  |  |  |
|  | 4 |  |    |              |                                                                                                                                                                           |  |  |  |  |  |  |
|  | 5 |  |    |              |                                                                                                                                                                           |  |  |  |  |  |  |
|  |   |  |    |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                                   |  |  |  |  |  |  |

SURFACE ELEVATION: 5510' (1879m)  
SURFICIAL GEOLOGIC UNIT: A5I

LOG OF TEST PIT BS-P-22

LOGS OF TEST PITS BS-P-21 AND BS-P-22  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
7-17

**FUGRO NATIONAL, INC.**

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS | CONSISTENCY  | SOIL DESCRIPTION                                                                                                                                                                     | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             |                         |           |      |              |                                                                                                                                                                                      |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |      |              |                                                                                                                                                                                      |         |                |    |    |    |    |
|             | 1                       |           | SM   | medium dense | GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, sub-angular, calcareous; some fine sub-rounded gravel; little silt.                                             |         |                |    |    |    |    |
|             | 2                       |           |      | medium dense |                                                                                                                                                                                      |         |                |    |    |    |    |
|             | 3                       |           | GP   | dense        | SANDY GRAVEL, brown to light brown, fine to coarse, poorly graded, slightly moist to dry, subangular, calcareous; some fine to coarse subangular sand; stage II caliche (2.5'-5.0'). |         |                |    |    |    |    |
|             | 4                       |           |      |              |                                                                                                                                                                                      |         |                |    |    |    |    |
|             | 5                       |           |      |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                                              |         |                |    |    |    |    |

SURFACE ELEVATION: 5512' (1680m)  
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT BS-P-23

|  |   |  |    |              |                                                                                                                                                                                                  |  |    |    |    |    |    |
|--|---|--|----|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|----|----|----|----|
|  | 0 |  |    |              |                                                                                                                                                                                                  |  |    |    |    |    |    |
|  | 1 |  |    | medium dense | CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist to dry, subangular, calcareous; some medium plastic clay; some fine to coarse subangular gravel; stage II caliche (2.0'-5.0'). |  | 22 | 45 | 33 | 40 | 16 |
|  | 2 |  | SC |              |                                                                                                                                                                                                  |  |    |    |    |    |    |
|  | 3 |  |    | very dense   |                                                                                                                                                                                                  |  |    |    |    |    |    |
|  | 4 |  |    |              |                                                                                                                                                                                                  |  |    |    |    |    |    |
|  | 5 |  |    |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                                                          |  |    |    |    |    |    |

SURFACE ELEVATION: 5400' (1646m)  
SURFICIAL GEOLOGIC UNIT: A5i

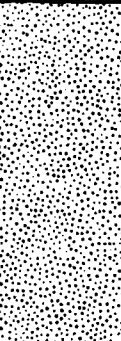
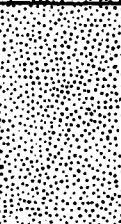
LOG OF TEST PIT BS-P-24

LOGS OF TEST PITS BS-P-23 AND BS-P-24  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

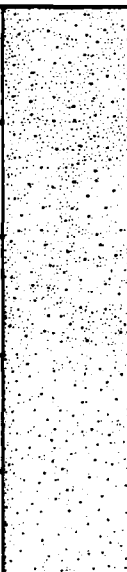
FIGURE  
7-18

FUGRO NATIONAL, INC.

| BULK SAMPLE | DEPTH                   |      | LITHOLOGY                                                                         | USCS  | CONSISTENCY  | SOIL DESCRIPTION                                                                                                              | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|------|-----------------------------------------------------------------------------------|-------|--------------|-------------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             | METERS                  | FEET |                                                                                   |       |              |                                                                                                                               |         | GR             | SA | FI | LL | PI |
|             | 0                       | 0    |  | SP-SM | medium dense | SAND, brown, fine to coarse, poorly graded, slightly moist, subangular, calcareous; trace fine subangular gravel; trace silt. |         |                |    |    |    |    |
|             | 1                       |      |                                                                                   |       |              |                                                                                                                               |         |                |    |    |    |    |
|             | 2                       |      |                                                                                   |       |              |                                                                                                                               |         |                |    |    |    |    |
|             | 3                       |      |  | SP    | medium dense | SAND, gray, fine to coarse, poorly graded, dry, subrounded, calcareous; trace fine subrounded gravel.                         |         |                |    |    |    |    |
|             | 4                       |      |                                                                                   |       |              |                                                                                                                               |         |                |    |    |    |    |
|             | 5                       |      |                                                                                   |       |              |                                                                                                                               |         |                |    |    |    |    |
|             | TOTAL DEPTH 5.0' (1.5m) |      |                                                                                   |       |              |                                                                                                                               |         |                |    |    |    |    |

SURFACE ELEVATION: 5370' (1637m)  
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT BS-P-25

|                         |   |   |                                                                                     |    |       |                                                                                                                                      |  |  |  |  |  |  |
|-------------------------|---|---|-------------------------------------------------------------------------------------|----|-------|--------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|                         | 0 | 0 |  | SM | loose | SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; little silt; trace fine subrounded gravel. |  |  |  |  |  |  |
|                         | 1 |   |                                                                                     |    |       |                                                                                                                                      |  |  |  |  |  |  |
|                         | 2 |   |                                                                                     |    |       |                                                                                                                                      |  |  |  |  |  |  |
|                         | 3 |   |                                                                                     |    |       |                                                                                                                                      |  |  |  |  |  |  |
|                         | 4 |   |                                                                                     |    |       |                                                                                                                                      |  |  |  |  |  |  |
|                         | 5 |   |                                                                                     |    |       |                                                                                                                                      |  |  |  |  |  |  |
| TOTAL DEPTH 5.0' (1.5m) |   |   |                                                                                     |    |       |                                                                                                                                      |  |  |  |  |  |  |

SURFACE ELEVATION: 5338' (1627m)  
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT BS-P-26

LOGS OF TEST PITS BS-P-25 AND BS-P-26  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
7-19

**FUGRO NATIONAL, INC.**

2 JUL 79

AFV-03

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS  | CONSISTENCY | SOIL DESCRIPTION                                                                    | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|-------------------------|-----------|-------|-------------|-------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             |                         |           |       |             |                                                                                     |         | GR             | SA | FI | LL | PI |
|             | 0                       |           |       |             | SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded; trace silt. |         |                |    |    |    |    |
|             | 1                       |           |       |             |                                                                                     |         |                |    |    |    |    |
|             | 2                       |           |       |             |                                                                                     |         |                |    |    |    |    |
|             | 3                       |           | SP-SM | loose       |                                                                                     |         |                |    |    |    |    |
|             | 4                       |           |       |             |                                                                                     |         |                |    |    |    |    |
|             | 5                       |           |       |             |                                                                                     |         |                |    |    |    |    |
|             |                         |           |       |             | TOTAL DEPTH 5.0' (1.5m)                                                             |         |                |    |    |    |    |

SURFACE ELEVATION: 5550' (1692m)  
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT BS-P-27

|  |   |  |    |              |                                                                                                                                                               |  |  |  |  |  |  |
|--|---|--|----|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
|  | 0 |  |    |              | SILTY SAND, light brown, fine to coarse, poorly graded, dry, subrounded, calcareous; little silt; trace fine subrounded gravel; stage II caliche (1.0'-3.0'). |  |  |  |  |  |  |
|  | 1 |  |    |              |                                                                                                                                                               |  |  |  |  |  |  |
|  | 2 |  | SM | medium dense |                                                                                                                                                               |  |  |  |  |  |  |
|  | 3 |  |    |              |                                                                                                                                                               |  |  |  |  |  |  |
|  | 4 |  |    |              |                                                                                                                                                               |  |  |  |  |  |  |
|  | 5 |  | GP | medium dense | SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subrounded, calcareous; some fine to coarse subrounded sand.                                   |  |  |  |  |  |  |
|  |   |  |    |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                       |  |  |  |  |  |  |

SURFACE ELEVATION: 5755' (1754m)  
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT BS-P-28

LOGS OF TEST PITS BS-P-27 AND BS-P-28  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

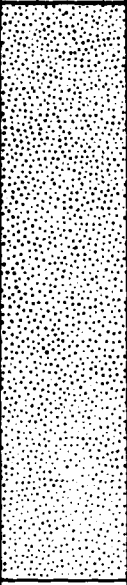
FIGURE  
7-20

FUGRO NATIONAL, INC.

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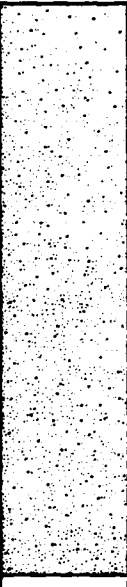
AFV-03

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| BULK SAMPLE | DEPTH  |      | LITHOLOGY                                                                         | USCS  | CONSISTENCY | SOIL DESCRIPTION                                                                                                                                    | REMARKS | SIEVE ANALYSIS |    |    |    |    |
|-------------|--------|------|-----------------------------------------------------------------------------------|-------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|----|----|----|----|
|             | METERS | FEET |                                                                                   |       |             |                                                                                                                                                     |         | GR             | SA | FI | LL | PI |
|             | 0      | 0    |  | SP-SM | loose       | GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, sub-rounded, calcareous; little fine subangular to angular gravel; trace silt. |         |                |    |    |    |    |
|             |        | 1    |                                                                                   |       |             |                                                                                                                                                     |         |                |    |    |    |    |
|             |        | 2    |                                                                                   |       |             |                                                                                                                                                     |         |                |    |    |    |    |
|             |        | 3    |                                                                                   |       |             |                                                                                                                                                     |         |                |    |    |    |    |
|             | 1      | 4    |                                                                                   |       |             |                                                                                                                                                     |         |                |    |    |    |    |
|             |        | 5    |                                                                                   |       |             | TOTAL DEPTH 5.0' (1.5m)                                                                                                                             |         |                |    |    |    |    |

SURFACE ELEVATION: 5980' (1817m)  
SURFICIAL GEOLOGIC UNIT: I4

LOG OF TEST PIT BS-P-29

|  |   |   |                                                                                     |    |              |                                                                                                                                                                                |  |    |    |    |  |  |
|--|---|---|-------------------------------------------------------------------------------------|----|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----|----|----|--|--|
|  | 0 | 0 |  | SM | medium dense | SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, sub-rounded, calcareous; little silt; little fine to coarse subrounded gravel; stage II caliche (3.0"-5.0'). |  | 15 | 88 | 18 |  |  |
|  |   | 1 |                                                                                     |    |              |                                                                                                                                                                                |  |    |    |    |  |  |
|  |   | 2 |                                                                                     |    |              |                                                                                                                                                                                |  |    |    |    |  |  |
|  |   | 3 |                                                                                     |    |              |                                                                                                                                                                                |  |    |    |    |  |  |
|  | 1 | 4 |                                                                                     |    |              |                                                                                                                                                                                |  |    |    |    |  |  |
|  |   | 5 |                                                                                     |    |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                                        |  |    |    |    |  |  |

SURFACE ELEVATION: 5853' (1784m)  
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT BS-P-30

LOGS OF TEST PITS BS-P-29 AND BS-P-30  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
7-21

**FUGRO NATIONAL, INC.**

| BULK SAMPLE | DEPTH<br>METERS<br>FEET | LITHOLOGY | USCS  | CONSISTENCY | SOIL DESCRIPTION                                                                                                                                                         | REMARKS               | SIEVE ANALYSIS |    |    |    |    |  |
|-------------|-------------------------|-----------|-------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------|----|----|----|----|--|
|             |                         |           |       |             |                                                                                                                                                                          |                       | GR             | SA | FI | LL | PI |  |
|             | 0                       |           |       |             | SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; trace silt; trace fine subrounded gravel; occasional cobbles to 6" size (3.0'-4.0'). |                       |                |    |    |    |    |  |
|             | 1                       |           |       |             |                                                                                                                                                                          |                       |                |    |    |    |    |  |
|             | 2                       |           | SP-SM | loose       |                                                                                                                                                                          |                       |                |    |    |    |    |  |
|             | 3                       |           |       |             |                                                                                                                                                                          |                       |                |    |    |    |    |  |
|             | 4                       |           |       |             |                                                                                                                                                                          |                       |                |    |    |    |    |  |
|             | 5                       |           | GP    | loose       | SANDY GRAVEL, gray, fine to coarse, poorly graded, dry, subangular, calcareous; some fine to coarse subangular to subrounded sand; occasional cobbles to 6" size.        | vertical walls caving |                |    |    |    |    |  |
|             |                         |           |       |             | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                                  |                       |                |    |    |    |    |  |

SURFACE ELEVATION: 5780' (1756m)  
SURFICIAL GEOLOGIC UNIT: A5y

#### LOG OF TEST PIT BS-P-31

|  |   |  |    |              |                                                                                                                                                                     |  |  |  |  |  |  |  |
|--|---|--|----|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|
|  | 0 |  | SC | medium dense | CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; some slightly plastic clay; trace fine subrounded gravel.                |  |  |  |  |  |  |  |
|  | 1 |  |    |              |                                                                                                                                                                     |  |  |  |  |  |  |  |
|  | 2 |  | GP | medium dense | SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subrounded, calcareous; some fine to coarse subrounded sand; stage I caliche (1.0'-2.0'). |  |  |  |  |  |  |  |
|  | 3 |  |    |              |                                                                                                                                                                     |  |  |  |  |  |  |  |
|  | 4 |  |    |              |                                                                                                                                                                     |  |  |  |  |  |  |  |
|  | 5 |  |    |              |                                                                                                                                                                     |  |  |  |  |  |  |  |
|  |   |  |    |              | TOTAL DEPTH 5.0' (1.5m)                                                                                                                                             |  |  |  |  |  |  |  |

SURFACE ELEVATION: 6170' (1881m)  
SURFICIAL GEOLOGIC UNIT: A5I

#### LOG OF TEST PIT BS-P-32

LOGS OF TEST PITS BS-P-31 AND BS-P-32  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
7-22

**FUBRO NATIONAL, INC.**

SECTION 8.0  
SURFICIAL SAMPLE LOGS

| ACTIVITY<br>NUMBER | GROUND<br>SURFACE<br>ELEVATION,<br>FEET<br>(METERS) | SURFICIAL<br>GEOLOGIC<br>UNIT | DEPTH,<br>FEET<br>(METERS) | USCS  | SOIL DESCRIPTION                                                                                                                                                                         | SIEVE<br>ANALYSIS |    |    |    |    |
|--------------------|-----------------------------------------------------|-------------------------------|----------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----|----|----|
|                    |                                                     |                               |                            |       |                                                                                                                                                                                          | GR                | SA | FI | LL | PI |
| BS-CS-4            | 5242<br>(1598)                                      | A5i                           | 0.0-2.0<br>(0.0-0.8)       | SM    | SILTY SAND, light brown, fine to coarse, poorly graded, subangular, calcareous; some nonplastic silt; trace fine gravel; stage II caliche (1.0'-2.0').                                   | 5                 | 72 | 23 |    | NP |
| BS-CS-5            | 5230<br>(1594)                                      | A5y                           | 0.0-2.0<br>(0.0-0.8)       | SP    | SAND, light brown, fine to coarse, poorly graded, subangular, calcareous; trace fine gravel.                                                                                             |                   |    |    |    |    |
| BS-CS-7            | 5380<br>(1634)                                      | A5y                           | 0.0-2.0<br>(0.0-0.8)       | SM    | SILTY SAND, light brown, fine to coarse, poorly graded, subangular, calcareous; little silt; trace fine gravel; stage II caliche (1.0'-2.0').                                            | 5                 | 77 | 18 |    |    |
| BS-CS-11           | 5300<br>(1615)                                      | A5i                           | 0.0-2.0<br>(0.0-0.8)       | GP-GM | SANDY GRAVEL, brown, fine to coarse, poorly graded, subrounded, calcareous; some fine to coarse sand; trace silt.                                                                        | 63                | 32 | 5  |    |    |
| BS-CS-13           | 5105<br>(1558)                                      | A5y                           | 0.0-1.0<br>(0.0-0.3)       | SM    | SILTY SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; little silt; little fine gravel.                                                                               |                   |    |    |    |    |
|                    |                                                     |                               | 1.0-2.0<br>(0.3-0.6)       | GP    | SANDY GRAVEL, light brown, fine, poorly graded, subrounded, calcareous; some fine to coarse sand; stage II caliche (1.0'-2.0').                                                          |                   |    |    |    |    |
| BS-CS-15           | 4880<br>(1521)                                      | A1                            | 0.0-2.0<br>(0.0-0.8)       | SP    | SAND, light brown, fine to coarse, poorly graded, subrounded, calcareous.                                                                                                                |                   |    |    |    |    |
| BS-CS-16           | 4874<br>(1516)                                      | A5y                           | 0.0-2.0<br>(0.0-0.8)       | SP-SM | SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; trace silt.                                                                                                          |                   |    |    |    |    |
| BS-CS-18           | 4820<br>(1500)                                      | A5y                           | 0.0-2.0<br>(0.0-0.8)       | SP-SM | SAND, light brown, fine to coarse, poorly graded, subrounded, calcareous; trace silt; occasional cobbles to 5" size (1.0'-2.0').                                                         |                   |    |    |    |    |
| BS-CS-20           | 4855<br>(1480)                                      | A5y                           | 0.0-2.0<br>(0.0-0.8)       | SM    | SILTY SAND, light brown, fine to coarse, poorly graded, subangular to angular, calcareous; little silt; trace fine gravel; stage II caliche (0.75'-1.5'); stage III caliche (1.5'-2.0'). |                   |    |    |    |    |

LOGS OF SURFICIAL SOIL SAMPLES  
VERIFICATION SITE,  
BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
8-1  
1 OF 4

**FUGRO NATIONAL, INC.**

| ACTIVITY<br>NUMBER | GROUND<br>SURFACE<br>ELEVATION,<br>FEET<br>(METERS) | SURFICIAL<br>GEOLOGIC<br>UNIT | DEPTH,<br>FEET<br>(METERS) | USCS  | SOIL DESCRIPTION                                                                                                                                            | SIEVE<br>ANALYSIS |    |    |    |    |
|--------------------|-----------------------------------------------------|-------------------------------|----------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----|----|----|
|                    |                                                     |                               |                            |       |                                                                                                                                                             | GR                | SA | FI | LL | PI |
| BS-CS-24           | 4880<br>(1487)                                      | A5y/A3                        | 0.0-0.5<br>(0.0-0.2)       | SC    | CLAYEY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; some slightly plastic clay; trace fine gravel.                                   |                   |    |    |    |    |
|                    |                                                     |                               | 0.5-2.0<br>(0.2-0.8)       | SM    | SILTY SAND, brown, fine to coarse, poorly graded, subangular, calcareous; some silt; trace fine gravel; stage III caliche (0.9'-1.2').                      |                   |    |    |    |    |
| BS-CS-27           | 5080<br>(1548)                                      | A3                            | 0.0-2.0<br>(0.0-0.6)       | SP    | SAND, brown, fine to coarse, poorly graded, subrounded.                                                                                                     |                   |    |    |    |    |
| BS-CS-28           | 4925<br>(1501)                                      | A5y/A3                        | 0.0-2.0<br>(0.0-0.6)       | SM    | SILTY SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; little silt.                                                                      |                   |    |    |    |    |
| BS-CS-29           | 4870<br>(1484)                                      | A5y/A4                        | 0.0-2.0<br>(0.0-0.6)       | SP-SM | SAND, brown, fine to medium, poorly graded, subrounded, calcareous; trace silt.                                                                             |                   |    |    |    |    |
| BS-CS-30           | 4878<br>(1487)                                      | A5y/A3                        | 0.0-2.0<br>(0.0-0.6)       | SP-SM | SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; trace silt.                                                                             |                   |    |    |    |    |
| BS-CS-31           | 4886<br>(1489)                                      | A5y/A3                        | 0.0-2.0<br>(0.0-0.8)       | SP    | SAND, light brown, fine to coarse, poorly graded, subrounded, calcareous; trace fine gravel.                                                                |                   |    |    |    |    |
| BS-CS-34           | 4938<br>(1505)                                      | A5y/A3                        | 0.0-2.0<br>(0.0-0.8)       | SM    | SILTY SAND, light brown, fine to coarse, poorly graded, subangular, calcareous; some silt; trace fine gravel; stage I caliche (1.0'-2.0').                  |                   |    |    |    |    |
| BS-CS-38           | 4917<br>(1489)                                      | A1/A4                         | 0.0-2.0<br>(0.0-0.8)       | SM    | SILTY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; little silt; trace fine gravel; stage I caliche (0.75'-2.0'). |                   |    |    |    |    |
| BS-CS-42           | 4887<br>(1490)                                      | A1/A4                         | 0.0-2.0<br>(0.0-0.8)       | GP-GM | SANDY GRAVEL, light brown, fine, poorly graded, calcareous; some fine to coarse sand; trace silt.                                                           |                   |    |    |    |    |

LOGS OF SURFICIAL SOIL SAMPLES  
VERIFICATION SITE,  
BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
8-1  
2 OF 4

**FUGRO NATIONAL, INC.**

| ACTIVITY<br>NUMBER | GROUND<br>SURFACE<br>ELEVATION,<br>FEET<br>(METERS) | SURFICIAL<br>GEOLOGIC<br>UNIT | DEPTH,<br>FEET<br>(METERS) | USCS  | SOIL DESCRIPTION                                                                                                                            | SIEVE<br>ANALYSIS |    |    |    |    |
|--------------------|-----------------------------------------------------|-------------------------------|----------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----|----|----|
|                    |                                                     |                               |                            |       |                                                                                                                                             | GR                | SA | FI | LL | PI |
| BS-CS-44           | 4958<br>(1511)                                      | A5y                           | 0.0-2.0<br>(0.0-0.6)       | SM    | SILTY SAND, brown, fine to coarse, poorly graded, subangular; some silt; trace fine gravel; stage I caliche (1.0'-2.0').                    |                   |    |    |    |    |
| BS-CS-47           | 5030<br>(1533)                                      | A1                            | 0.0-1.0<br>(0.0-0.3)       | SC    | CLAYEY SAND, brown, fine to coarse, poorly graded, subrounded cal-<br>careous; some slightly plastic<br>clay; trace fine gravel.            |                   |    |    |    |    |
|                    |                                                     |                               | 1.0-2.0<br>(0.3-0.6)       | ML    | SANDY SILT, light brown, slightly<br>plastic, calcareous; little fine<br>sand; stage II-III caliche (1.0'-<br>2.0').                        |                   |    |    |    |    |
| BS-CS-48           | 5125<br>(1582)                                      | A1                            | 0.0-2.0<br>(0.0-0.6)       | SM    | SILTY SAND, brown, fine to coarse, poorly graded, subrounded; some<br>silt, trace fine gravel.                                              |                   |    |    |    |    |
| BS-CS-54           | 5438<br>(1658)                                      | A5i                           | 0.0-2.0<br>(0.0-0.6)       | SP    | GRAVELLY SAND, brown, fine to<br>coarse, poorly graded, subangular,<br>calcareous; some fine gravel.                                        | 13                | 83 | 4  |    |    |
| BS-CS-61           | 5382<br>(1634)                                      | A5y                           | 0.0-1.5<br>(0.0-0.5)       | SM    | SILTY SAND, brown, fine to coarse,<br>poorly graded, subangular, cal-<br>careous; some silt; trace fine gravel                              |                   |    |    |    |    |
|                    |                                                     |                               | 1.5-2.0<br>(0.5-0.6)       | SP    | GRAVELLY SAND, gray brown, fine to<br>coarse, poorly graded, subrounded,<br>calcareous; little fine gravel;<br>stage I caliche (0.5'-2.0'). |                   |    |    |    |    |
| BS-CS-63           | 5355<br>(1632)                                      | A5y                           | 0.0-2.0<br>(0.0-0.6)       | SP    | GRAVELLY SAND, brown, fine to<br>coarse, poorly graded, subangular,<br>calcareous; little fine gravel.                                      |                   |    |    |    |    |
| BS-CS-64           | 5330<br>(1625)                                      | A5y                           | 0.0-1.5<br>(0.0-0.5)       | SC    | CLAYEY SAND, brown, fine to<br>coarse, poorly graded, subrounded,<br>calcareous; some slightly plastic<br>clay; trace fine gravel.          |                   |    |    |    |    |
|                    |                                                     |                               | 1.5-2.0<br>(0.5-0.6)       | SM    | SILTY SAND, white, fine to coarse,<br>poorly graded, subrounded, cal-<br>careous; some silt; trace fine<br>gravel.                          |                   |    |    |    |    |
| BS-CS-68           | 5615<br>(1711)                                      | A5y                           | 0.0-2.0<br>(0.0-0.6)       | SP-SM | SAND, brown, fine to coarse, poorly<br>graded, subrounded; trace silt;<br>trace fine gravel.                                                |                   |    |    |    |    |

LOGS OF SURFICIAL SOIL SAMPLES  
VERIFICATION SITE,  
BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
8-1  
3 OF 4

**FUGRO NATIONAL, INC.**

| ACTIVITY<br>NUMBER | GROUND<br>SURFACE<br>ELEVATION,<br>FEET<br>(METERS) | SURFICIAL<br>GEOLOGIC<br>UNIT | DEPTH,<br>FEET<br>(METERS) | USCS  | SOIL DESCRIPTION                                                                                              | SIEVE<br>ANALYSIS |    |    |    |    |
|--------------------|-----------------------------------------------------|-------------------------------|----------------------------|-------|---------------------------------------------------------------------------------------------------------------|-------------------|----|----|----|----|
|                    |                                                     |                               |                            |       |                                                                                                               | GR                | SA | FI | LL | PI |
| BS-CS-70           | 5840<br>(1780)                                      | A1                            | 0.0-2.0<br>(0.0-0.6)       | SP    | SAND, brown, fine to coarse, poorly graded, subrounded; trace fine gravel.                                    |                   |    |    |    |    |
| BS-CS-72           | 5832<br>(1778)                                      | A5y                           | 0.0-2.0<br>(0.0-0.6)       | SP    | SAND, brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; little fine gravel.         |                   |    |    |    |    |
| BS-CS-73           | 5855<br>(1815)                                      | A5y                           | 0.0-2.0<br>(0.0-0.6)       | SP-SM | SAND, brown, fine to coarse, poorly graded, subrounded, calcareous; trace silt; trace fine gravel.            |                   |    |    |    |    |
| BS-CS-79           | 5720<br>(1743)                                      | A5y                           | 0.0-1.0<br>(0.0-0.3)       | SC    | CLAYEY SAND, brown, fine to coarse, poorly graded, subrounded; some slightly plastic clay; trace fine gravel. |                   |    |    |    |    |
|                    |                                                     |                               | 1.0-2.0<br>(0.3-0.6)       | GP    | SANDY GRAVEL, brown, fine to coarse, poorly graded, subrounded; some fine to coarse sand.                     |                   |    |    |    |    |
| BS-CS-80           | 5760<br>(1758)                                      | A5y                           | 0.0-2.0<br>(0.0-0.6)       | GP    | SANDY GRAVEL, brown, fine to coarse poorly graded, subrounded, calcareous; little fine to coarse sand.        |                   |    |    |    |    |

LOGS OF SURFICIAL SOIL SAMPLES  
VERIFICATION SITE,  
BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
8-1  
4 OF 4

**FUGRO NATIONAL, INC.**

SECTION 9.0  
LABORATORY TEST RESULTS

EXPLANATIONS OF LABORATORY TEST RESULTS

Laboratory test results are presented in this section. Table 9-1 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 9-2 through 9-6 and Figures 9-1 through 9-3 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 table 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, test pit, or surficial 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 6.1 in Section 6.0, "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 are 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 ( $\sigma_3$ ) - 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,  $\epsilon$ , at a given stress level is defined as the ratio of the change in length ( $\Delta L$ ) 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 table at the beginning of the "Explanation of Laboratory Test Results".
- O. CBR - California Bearing Ratio (CBR) is the ratio (in percent) of the resistance to penetration developed by a subgrade 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<br>NUMBER | SAMPLE<br>NUMBER (a) | SAMPLE INTERVAL |             | PERCENT FINER BY WEIGHT |         |    |        |        |      |      |     |       |    |
|--------------------|----------------------|-----------------|-------------|-------------------------|---------|----|--------|--------|------|------|-----|-------|----|
|                    |                      |                 |             | STANDARD SIEVE OPENING  |         |    |        |        |      |      |     | U S S |    |
|                    |                      | FEET            | METERS      | BLDRS.                  | COBBLES |    | GRAVEL |        |      |      |     |       |    |
|                    |                      |                 |             | 24"                     | 12"     | 8" | 3"     | 1 1/2" | 3/4" | 3/8" | 4   | 10    |    |
| BS-B-1             | P-1                  | 0.0-1.8         | 0.00-0.55   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-3                  | 3.9-4.6         | 1.19-1.40   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-4                  | 7.1-7.8         | 2.16-2.38   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-5                  | 10.2-10.9       | 3.11-3.32   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-6                  | 15.0-15.6       | 4.57-4.75   |                         |         |    |        |        | 100  | 95   | 84  | 6     |    |
|                    | P-7                  | 20.7-21.4       | 6.31-6.52   |                         |         |    |        |        | 100  | 97   | 87  | 7     |    |
|                    | P-8                  | 25.0-25.9       | 7.62-7.89   |                         |         |    |        |        |      |      |     |       |    |
|                    | P-9                  | 30.0-30.9       | 9.14-9.42   |                         |         |    |        |        |      |      |     |       |    |
|                    | P-10                 | 35.0-36.4       | 10.67-11.09 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-11                 | 40.0-40.7       | 12.19-12.41 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-12                 | 50.0-50.4       | 15.24-15.36 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-13                 | 50.4-51.3       | 15.36-15.64 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-14                 | 60.0-61.0       | 18.29-18.59 |                         |         |    |        |        |      |      |     |       | 10 |
|                    | P-15                 | 70.0-72.3       | 21.34-22.04 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-16                 | 80.0-81.1       | 24.38-24.72 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-17                 | 90.0-91.5       | 27.43-27.89 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-18                 | 100.0-101.2     | 30.48-30.85 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-19                 | 110.0-111.8     | 33.53-34.08 |                         |         |    |        |        |      |      | 100 | 9     |    |
|                    | P-20                 | 120.8-122.2     | 36.82-37.34 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-21                 | 140.0-141.1     | 42.67-43.01 |                         |         |    |        |        |      |      | 100 | 9     |    |
|                    | P-22                 | 160.0-162.1     | 48.77-49.41 |                         |         |    |        |        |      |      |     |       |    |
| BS-B-2             | P-1                  | 0.0-0.4         | 0.00-0.12   |                         |         |    |        |        |      |      |     |       |    |
|                    | b-3                  | 2.5-3.0         | 0.76-0.91   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-4                  | 3.7-4.4         | 1.13-1.34   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-6                  | 7.0-7.5         | 2.13-2.29   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-7                  | 10.0-10.7       | 3.05-3.26   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-8                  | 15.7-16.4       | 4.79-5.00   |                         |         |    |        |        |      |      | 100 | 98    | 9  |
|                    | D-9                  | 20.2-20.9       | 6.16-6.37   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-10                 | 25.2-25.9       | 7.68-7.89   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-11                 | 30.0-30.5       | 9.14-9.30   |                         |         |    |        |        |      |      |     |       |    |
|                    | D-12                 | 35.2-35.9       | 10.73-10.94 |                         |         |    | 100    | 81     | 66   | 61   | 57  |       |    |
|                    | D-13                 | 40.0-40.5       | 12.19-12.34 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-14                 | 50.0-52.7       | 15.24-16.06 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-15                 | 60.0-61.4       | 18.29-18.71 |                         |         |    |        |        |      |      |     |       |    |
|                    | P-16                 | 61.4-62.2       | 18.71-18.96 |                         |         |    |        |        |      |      | 100 | 99    |    |
|                    | D-17                 | 72.0-72.6       | 21.95-22.13 |                         |         |    |        |        |      |      | 100 | 96    | 86 |
|                    | D-18                 | 80.0-80.3       | 24.38-24.48 |                         |         |    |        |        |      |      |     |       |    |
|                    | D-19                 | 90.2-90.9       | 27.49-27.71 |                         |         |    |        |        |      |      |     |       |    |
|                    | D-20                 | 101.5-101.9     | 30.94-31.06 |                         |         |    |        |        |      |      | 100 | 97    | 82 |
|                    | D-21                 | 110.0-110.4     | 33.53-33.65 |                         |         |    |        |        |      |      |     |       |    |
|                    | D-22                 | 120.2-120.9     | 36.64-36.65 |                         |         |    |        |        |      |      | 100 | 99    | 98 |
|                    | D-23                 | 140.0-140.5     | 42.67-42.82 |                         |         |    |        |        |      |      |     |       |    |

## 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

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| PERCENT FINER BY WEIGHT |       |      |     |    |     |              |      |                       | ATTERBERG<br>LIMITS (b) |    |       | USCS<br>(c) | IN-SITU              |       |                            |                   |               | COMPACTED              |  |                     |
|-------------------------|-------|------|-----|----|-----|--------------|------|-----------------------|-------------------------|----|-------|-------------|----------------------|-------|----------------------------|-------------------|---------------|------------------------|--|---------------------|
| U S STANDARD SIEVE NO   |       |      |     |    |     |              |      | PARTICLE<br>SIZE (mm) |                         |    |       |             | DRY UNIT<br>WEIGHT   |       | MOISTURE<br>CONTENT<br>(%) | SATURATION<br>(%) | VOID<br>RATIO | MAXIMUM<br>DRY DENSITY |  | OPTIMUM<br>MOISTURE |
| L                       |       | SAND |     |    |     | SILT OR CLAY |      | LL                    | PL                      | PI | (pcf) |             | (kg m <sup>3</sup> ) | (pcf) |                            |                   |               | (kg m <sup>3</sup> )   |  |                     |
| 7.5"                    | 3.75" | 4    | 10  | 40 | 100 | 200          | .005 | .001                  |                         |    |       | SP-SM       | 92.4                 | 1480  | 9.5                        | 31.1              | 0.82          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SM          | 108.7                | 1741  | 4.6                        | 22.6              | 0.55          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SM          | 105.9                | 1696  | 8.1                        | 37.2              | 0.59          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SM          | 103.4                | 1656  | 6.3                        | 27.0              | 0.63          |                        |  |                     |
| 100                     | 95    | 84   | 62  | 33 | 21  | 15           |      |                       |                         |    |       | SM          | 113.5                | 1818  | 10.8                       | 60.1              | 0.48          |                        |  |                     |
| 100                     | 97    | 87   | 76  | 39 | 19  | 12           |      |                       |                         |    |       | SP-SM       | 102.3                | 1639  | 9.0                        | 37.5              | 0.65          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SM       | 109.1                | 1748  | 9.9                        | 49.5              | 0.54          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       | 110                     | 62 | 48    | MH          | 49.4                 | 791   | 78.4                       | 89.4              | 2.28          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | ML-MH       | 70.5                 | 1129  | 46.7                       | 93.4              | 1.30          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       | 50                      | 37 | 13    | ML-MH       | 79.6                 | 1275  | 32.8                       | 79.3              | 1.04          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | ML-MH       | 97.3                 | 1559  | 6.0                        | 22.2              | 0.73          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | ML-MH       | 77.7                 | 1245  | 32.4                       | 74.8              | 1.17          |                        |  |                     |
|                         |       |      | 100 | 92 | 81  | 46           |      |                       |                         |    |       | SM          | 87.5                 | 1402  | 21.8                       | 63.4              | 0.93          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       | 72                      | 48 | 24    | MH          | 65.4                 | 1048  | 57.1                       | 97.9              | 1.58          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | MH          | 74.4                 | 1192  | 49.7                       | 106.1             | 1.27          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       | 98                      | 35 | 63    | CH          | 85.6                 | 1371  | 34.4                       | 94.7              | 0.97          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | CH          | 70.9                 | 1136  | 42.0                       | 82.4              | 1.38          |                        |  |                     |
|                         |       | 100  | 97  | 90 | 84  | 64           |      |                       |                         |    |       | ML          | 59.1                 | 947   | 16.5                       | 24.0              | 1.85          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | ML          | 86.6                 | 1387  | 33.4                       | 95.5              | 0.95          |                        |  |                     |
|                         |       | 100  | 98  | 88 | 83  | 56           |      |                       |                         |    | NP    | ML          | 94.4                 | 1512  | 19.1                       | 65.7              | 0.79          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | ML          | 57.9                 | 927   | 78.2                       | 100.0             | 1.91          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SM       |                      |       |                            |                   |               |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SM       |                      |       |                            |                   |               |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SM       | 115.7                | 1853  | 2.8                        | 16.9              | 0.46          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SM       | 117.9                | 1889  | 10.9                       | 68.6              | 0.43          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SM          | 113.4                | 1817  | 5.9                        | 32.8              | 0.49          |                        |  |                     |
|                         | 100   | 98   | 93  | 75 | 23  | 7            |      |                       |                         |    |       | SP-SM       | 106.3                | 1703  | 4.9                        | 22.8              | 0.59          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SM       | 112.1                | 1796  | 4.9                        | 26.6              | 0.50          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SM       | 111.6                | 1788  | 6.4                        | 34.2              | 0.51          |                        |  |                     |
| 66                      | 61    | 57   | 53  | 43 | 20  | 13           |      |                       |                         |    |       | SM          | 124.5                | 1494  | 7.5                        | 57.7              | 0.35          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SM       | 119.3                | 1911  | 5.3                        | 34.7              | 0.41          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SM       | 104.0                | 1666  | 6.9                        | 29.9              | 0.62          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SM       | 96.1                 | 1539  | 15.8                       | 56.5              | 0.75          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SW-SM       | 96.4                 | 1544  | 16.9                       | 61.0              | 0.75          |                        |  |                     |
|                         | 100   | 99   | 97  | 81 | 42  | 30           |      |                       |                         |    |       | SM          | 101.6                | 1627  | 11.2                       | 45.8              | 0.66          |                        |  |                     |
| 100                     | 96    | 86   | 74  | 21 | 8   | 6            |      |                       |                         |    |       | SW-SM       | 120.1                | 1924  | 9.9                        | 66.5              | 0.40          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SM          | 116.2                | 1861  | 9.7                        | 58.5              | 0.45          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SM          | 119.4                | 1913  | 10.8                       | 71.1              | 0.41          |                        |  |                     |
| 97                      | 82    | 64   | 48  | 24 | 13  | 10           |      |                       |                         |    |       | SP-SM       |                      |       |                            |                   |               |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SC       | 124.1                | 1988  | 12.7                       | 96.2              | 0.36          |                        |  |                     |
| 100                     | 99    | 98   | 93  | 70 | 34  | 18           |      |                       | 31                      | 21 | 10    | SC          | 115.4                | 1849  | 11.9                       | 69.9              | 0.46          |                        |  |                     |
|                         |       |      |     |    |     |              |      |                       |                         |    |       | SP-SC       |                      |       |                            |                   |               |                        |  |                     |

System

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| TERBERG<br>BITS (b) |    | USCS<br>(c) | IN-SITU            |                      |                            |                   |               | COMPACTED              |                      |                            | SPECIFIC<br>GRAVITY<br>OF SOLIDS | TRIAxIAL (d) | UNCONFINED<br>COMPRESSION | DIRECT<br>SHEAR | CONSOLIDATION | CHEMICAL | CBR |
|---------------------|----|-------------|--------------------|----------------------|----------------------------|-------------------|---------------|------------------------|----------------------|----------------------------|----------------------------------|--------------|---------------------------|-----------------|---------------|----------|-----|
|                     |    |             | DRY UNIT<br>WEIGHT |                      | MOISTURE<br>CONTENT<br>(%) | SATURATION<br>(%) | VOL.<br>RATIO | MAXIMUM<br>DRY DENSITY |                      | OPTIMUM<br>MOISTURE<br>(%) |                                  |              |                           |                 |               |          |     |
|                     |    |             | (pcf)              | (kg m <sup>3</sup> ) |                            |                   |               | (pcf)                  | (kg m <sup>3</sup> ) |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       | 92.4               | 1480                 | 9.5                        | 31.1              | 0.82          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SM          | 108.7              | 1741                 | 4.6                        | 22.6              | 0.55          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SM          | 105.9              | 1696                 | 8.1                        | 37.2              | 0.59          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SM          | 103.4              | 1656                 | 6.3                        | 27.0              | 0.63          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SM          | 113.5              | 1818                 | 10.8                       | 60.1              | 0.48          |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
|                     |    | SP-SM       | 102.3              | 1639                 | 9.0                        | 37.5              | 0.65          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       | 109.1              | 1748                 | 9.9                        | 49.5              | 0.54          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
| 62                  | 48 | MH          | 49.4               | 791                  | 78.4                       | 89.4              | 2.28          |                        |                      |                            | 2.60                             | *            |                           |                 |               |          |     |
|                     |    | ML-MH       | 70.5               | 1129                 | 46.7                       | 93.4              | 1.30          |                        |                      |                            |                                  | *            |                           |                 |               |          |     |
| 37                  | 13 | ML-MH       | 79.6               | 1275                 | 32.8                       | 79.3              | 1.04          |                        |                      |                            |                                  |              | *                         |                 |               | *        |     |
|                     |    | ML-MH       | 97.3               | 1559                 | 6.0                        | 22.2              | 0.73          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | ML-MH       | 77.7               | 1245                 | 32.4                       | 74.8              | 1.17          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SM          | 87.5               | 1402                 | 21.8                       | 63.4              | 0.93          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
| 48                  | 24 | MH          | 65.4               | 1048                 | 57.1                       | 97.9              | 1.58          |                        |                      |                            |                                  |              |                           | *               |               |          |     |
|                     |    | MH          | 74.4               | 1192                 | 49.7                       | 106.1             | 1.27          |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
| 35                  | 63 | CH          | 95.6               | 1371                 | 34.4                       | 94.7              | 0.97          |                        |                      |                            |                                  |              | *                         |                 |               |          |     |
|                     |    | CH          | 70.9               | 1136                 | 42.0                       | 82.4              | 1.38          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | ML          | 59.1               | 947                  | 16.5                       | 24.0              | 1.85          |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
|                     |    | ML          | 86.6               | 1387                 | 33.4                       | 95.5              | 0.95          |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
|                     | NP | ML          | 94.4               | 1512                 | 19.1                       | 65.7              | 0.79          |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
|                     |    | ML          | 57.9               | 927                  | 78.2                       | 100.0             | 1.91          |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
|                     |    | SP-SM       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       | 115.7              | 1853                 | 2.8                        | 16.9              | 0.46          |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
|                     |    | SP-SM       | 117.9              | 1889                 | 10.9                       | 68.6              | 0.43          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SM          | 113.4              | 1817                 | 5.9                        | 32.8              | 0.49          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       | 106.3              | 1703                 | 4.9                        | 22.8              | 0.59          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       | 112.1              | 1796                 | 4.9                        | 26.6              | 0.50          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       | 111.6              | 1788                 | 6.4                        | 34.2              | 0.51          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SM          | 124.5              | 1494                 | 7.5                        | 57.7              | 0.35          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       | 119.3              | 1911                 | 5.3                        | 34.7              | 0.41          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       | 104.0              | 1666                 | 6.9                        | 29.9              | 0.62          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       | 96.1               | 1539                 | 15.8                       | 56.5              | 0.75          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SW-SM       | 96.4               | 1544                 | 16.9                       | 61.0              | 0.75          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SM          | 101.6              | 1627                 | 11.2                       | 45.8              | 0.66          |                        |                      |                            |                                  | *            |                           |                 |               |          |     |
|                     |    | SW-SM       | 120.1              | 1924                 | 9.9                        | 66.5              | 0.40          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SM          | 116.2              | 1861                 | 9.7                        | 58.5              | 0.45          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SM          | 119.4              | 1913                 | 10.8                       | 71.1              | 0.41          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SM       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SC       | 124.1              | 1988                 | 12.7                       | 96.2              | 0.36          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
| 1                   | 21 | 10 SC       | 115.4              | 1849                 | 11.9                       | 69.9              | 0.46          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                     |    | SP-SC       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |

SUMMARY OF LABORATORY TEST RESULTS  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE SANSO

TABLE  
9-1  
1 OF 3

**UGRO NATIONAL, INC.**

AFV-01

| ACTIVITY<br>NUMBER | SAMPLE<br>NUMBER (a) | SAMPLE INTERVAL |             | PERCENT FINER BY WEIGHT |         |    |        |     |    |      |              |    |    |
|--------------------|----------------------|-----------------|-------------|-------------------------|---------|----|--------|-----|----|------|--------------|----|----|
|                    |                      |                 |             | STANDARD SIEVE OPENING  |         |    |        |     |    |      | U S STANDARD |    |    |
|                    |                      |                 |             | BLDRS.                  | COBBLES |    | GRAVEL |     |    |      | SAND         |    |    |
|                    |                      | FEET            | METERS      | 24"                     | 12"     | 6" | 3"     | 1½" | ¾" | 3/8" | 4            | 10 | 40 |
|                    | D-24                 | 160.0-160.4     | 48.77-48.89 |                         |         |    |        |     |    |      |              |    |    |
| BS-B-3             | P-1                  | 0.0-1.9         | 0.00-0.58   |                         |         |    |        | 100 | 96 | 88   | 81           | 72 | 49 |
|                    | D-3                  | 4.2-4.9         | 1.28-1.49   |                         |         |    |        |     |    |      |              |    |    |
|                    | D-4                  | 7.0-7.5         | 2.13-2.29   |                         |         |    |        | 100 | 89 | 77   | 64           | 51 | 31 |
|                    | D-5                  | 10.2-10.9       | 3.11-3.32   |                         |         |    |        | 100 | 84 | 61   | 41           | 27 | 9  |
|                    | D-6                  | 15.2-15.7       | 4.63-4.79   |                         |         |    |        |     |    |      |              |    |    |
|                    | D-7                  | 20.0-20.7       | 6.10-6.31   |                         |         |    |        | 100 | 97 | 92   | 82           | 71 | 34 |
|                    | D-8                  | 25.0-25.5       | 7.62-7.77   |                         |         |    |        |     |    |      |              |    |    |
|                    | P-9                  | 30.0-31.2       | 9.14-9.51   |                         |         |    |        |     |    |      |              |    |    |
|                    | D-10                 | 35.0-35.6       | 10.67-10.85 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-11                 | 40.0-40.4       | 12.19-12.31 |                         |         |    |        | 100 | 95 | 69   | 56           | 45 | 21 |
|                    | D-13                 | 60.0-60.4       | 18.29-18.41 |                         |         |    |        | 100 | 85 | 74   | 61           | 50 | 26 |
|                    | D-14                 | 70.2-70.9       | 21.40-21.61 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-15                 | 80.2-80.9       | 24.44-24.66 |                         |         |    |        | 100 | 77 | 69   | 57           | 44 | 21 |
|                    | D-16                 | 90.0-90.7       | 27.43-27.65 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-17                 | 100.0-100.5     | 30.48-30.63 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-18                 | 110.0-110.3     | 33.53-33.62 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-19                 | 120.0-120.4     | 36.58-36.70 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-20                 | 140.0-140.7     | 42.67-42.89 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-21                 | 160.2-160.9     | 48.83-49.04 |                         |         |    |        | 100 | 88 | 77   | 58           | 41 | 21 |
| BS-B-4             | P-1                  | 0.0-0.8         | 0.00-0.24   |                         |         |    |        |     |    | 100  | 97           | 91 | 71 |
|                    | D-3                  | 3.6-4.2         | 1.10-1.28   |                         |         |    |        | 100 | 89 | 69   | 50           | 35 | 11 |
|                    | D-4                  | 7.0-7.6         | 2.13-2.32   |                         |         |    |        |     |    |      |              |    |    |
|                    | D-5                  | 10.0-10.4       | 3.05-3.17   |                         |         |    |        |     |    |      |              |    |    |
|                    | D-6                  | 15.0-15.6       | 4.57-4.75   |                         |         |    |        | 100 | 93 | 81   | 61           | 44 | 21 |
|                    | D-7                  | 20.0-20.4       | 6.10-6.22   |                         |         |    |        |     |    |      |              |    |    |
|                    | D-9                  | 30.0-30.3       | 9.14-9.24   |                         |         |    |        |     |    |      |              |    |    |
|                    | D-10                 | 35.0-35.4       | 10.67-10.79 |                         |         |    |        | 100 | 90 | 63   | 53           | 43 | 21 |
|                    | D-11                 | 40.0-40.5       | 12.19-12.34 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-12                 | 50.0-50.4       | 15.25-15.36 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-13                 | 60.0-60.4       | 18.29-18.41 |                         |         |    |        | 100 | 82 | 66   | 49           | 39 | 21 |
|                    | D-14                 | 70.0-70.4       | 21.34-21.46 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-15                 | 80.0-80.4       | 24.38-24.51 |                         |         |    |        | 100 | 83 | 67   | 54           | 41 | 21 |
|                    | D-16                 | 90.0-90.4       | 27.43-27.55 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-17                 | 100.0-100.4     | 30.48-30.60 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-18                 | 110.0-110.7     | 33.53-33.74 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-19                 | 119.0-119.7     | 36.27-36.48 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-20                 | 140.1-140.7     | 42.70-42.89 |                         |         |    |        |     |    |      |              |    |    |
|                    | D-21                 | 160.1-160.6     | 48.80-48.95 |                         |         |    |        | 100 | 93 | 80   | 60           | 43 | 21 |
| BS-B-5             | P-1                  | 0.0-1.3         | 0.00-0.40   |                         |         |    |        |     |    |      |              |    |    |

## 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

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| GRAIN SIZE DISTRIBUTION BY WEIGHT |    |    |     |                       |      |                    | ATTERBERG<br>LIMITS (b) |    |    | USCS<br>(c) | IN-SITU                    |                   |               |                        | COMPACTED |                            |                      | SPECIFIC<br>GRAVITY<br>OF SOLIDS |
|-----------------------------------|----|----|-----|-----------------------|------|--------------------|-------------------------|----|----|-------------|----------------------------|-------------------|---------------|------------------------|-----------|----------------------------|----------------------|----------------------------------|
| U S STANDARD SIEVE NO             |    |    |     | PARTICLE<br>SIZE (mm) |      | DRY UNIT<br>WEIGHT |                         |    |    |             | MOISTURE<br>CONTENT<br>(%) | SATURATION<br>(%) | VOID<br>RATIO | MAXIMUM<br>DRY DENSITY |           | OPTIMUM<br>MOISTURE<br>(%) |                      |                                  |
| SAND                              |    |    |     | SILT OR CLAY          |      | (pcf)              |                         |    |    |             |                            |                   |               | (kg/m <sup>3</sup> )   | (pcf)     |                            | (kg/m <sup>3</sup> ) |                                  |
| 4                                 | 10 | 40 | 100 | 200                   | .005 | .001               | LL                      | PL | PI |             |                            |                   |               |                        |           |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SC          | 115.4                      | 1849              | 13.7          | 80.1                   | 0.46      |                            |                      |                                  |
| 81                                | 72 | 49 | 16  | 7                     |      |                    |                         |    |    | SP-SM       | 102.0                      | 1634              | 4.6           | 19.2                   | 0.65      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SM          | 119.3                      | 1911              | 8.0           | 52.3                   | 0.41      |                            |                      |                                  |
| 64                                | 51 | 39 | 28  | 24                    |      |                    |                         |    |    | SM          | 116.1                      | 1860              | 8.0           | 47.7                   | 0.45      |                            |                      |                                  |
| 41                                | 27 | 9  | 4   | 3                     |      |                    |                         |    |    | GW          | 124.1                      | 1988              | 8.7           | 65.3                   | 0.36      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GW          | 118.3                      | 1895              | 10.7          | 68.4                   | 0.42      |                            |                      |                                  |
| 82                                | 71 | 34 | 12  | 9                     |      |                    |                         |    |    | SW-SM       | 112.3                      | 1799              | 9.9           | 53.4                   | 0.50      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SW-SM       |                            |                   |               |                        |           |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SM          | 107.7                      | 1725              | 10.6          | 50.8                   | 0.56      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SP-SM       | 116.8                      | 1871              | 13.9          | 84.8                   | 0.44      |                            |                      |                                  |
| 56                                | 45 | 25 | 9   | 7                     |      |                    |                         |    |    | SP-SM       | 122.1                      | 1956              | 8.6           | 61.1                   | 0.38      |                            |                      |                                  |
| 61                                | 50 | 26 | 15  | 12                    |      |                    | 36                      | 19 | 17 | SP-SC       | 126.2                      | 2022              | 11.4          | 91.8                   | 0.34      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SC          | 123.8                      | 1983              | 10.8          | 81.3                   | 0.36      |                            |                      |                                  |
| 57                                | 44 | 21 | 14  | 13                    |      |                    | 29                      | 22 | 7  | SC          | 124.6                      | 1996              | 9.2           | 70.7                   | 0.35      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SC          | 119.7                      | 1917              | 10.3          | 68.4                   | 0.41      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SC          | 118.9                      | 1905              | 12.4          | 80.0                   | 0.42      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SC          | 132.3                      | 2119              | 8.2           | 80.8                   | 0.27      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SC          | 126.4                      | 2025              | 9.8           | 79.7                   | 0.33      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SC          | 125.8                      | 2015              | 10.6          | 84.3                   | 0.34      |                            |                      |                                  |
| 58                                | 41 | 20 | 15  | 14                    |      |                    |                         |    |    | SC          | 122.7                      | 1965              | 12.7          | 91.9                   | 0.37      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    |             |                            |                   |               |                        |           |                            |                      |                                  |
| 97                                | 91 | 74 | 42  | 30                    |      |                    |                         |    |    | SM          | 90.6                       | 1451              | 16.3          | 51.3                   | 0.86      |                            |                      |                                  |
| 50                                | 35 | 16 | 4   | 2                     |      |                    |                         |    |    | GW          | 122.7                      | 1965              | 3.9           | 28.2                   | 0.37      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GW          | 120.6                      | 1932              | 7.6           | 51.4                   | 0.40      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GW          | 122.8                      | 1967              | 8.7           | 62.8                   | 0.37      |                            |                      |                                  |
| 61                                | 44 | 20 | 12  | 10                    |      |                    |                         |    |    | SW-SM       | 119.3                      | 1911              | 10.4          | 67.8                   | 0.41      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SW-SM       | 120.3                      | 1927              | 10.8          | 72.9                   | 0.40      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GC          |                            |                   |               |                        |           |                            |                      |                                  |
| 53                                | 43 | 33 | 18  | 14                    |      |                    |                         |    |    | GC          | 121.8                      | 1951              | 11.3          | 79.3                   | 0.38      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GC          | 110.6                      | 1772              | 16.9          | 87.1                   | 0.52      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GC          | 115.1                      | 1844              | 14.8          | 86.0                   | 0.46      |                            |                      |                                  |
| 49                                | 39 | 25 | 15  | 13                    |      |                    |                         |    |    | GC          | 125.2                      | 2006              | 11.6          | 90.5                   | 0.35      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GC          | 115.4                      | 1849              | 13.2          | 77.6                   | 0.46      |                            |                      |                                  |
| 54                                | 41 | 23 | 17  | 15                    | 11   | 8                  | 49                      | 20 | 29 | GC          | 123.3                      | 1975              | 11.6          | 85.9                   | 0.37      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GC          |                            |                   |               |                        |           |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GC          | 119.4                      | 1913              | 10.5          | 69.0                   | 0.41      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GC          | 121.4                      | 1945              | 13.9          | 96.7                   | 0.39      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GC          | 114.0                      | 1826              | 14.9          | 84.2                   | 0.48      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | GC          | 121.2                      | 1941              | 11.8          | 81.4                   | 0.39      |                            |                      |                                  |
| 60                                | 43 | 23 | 15  | 13                    |      |                    | 43                      | 21 | 22 | SC          | 122.5                      | 1962              | 13.3          | 95.6                   | 0.38      |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    |             |                            |                   |               |                        |           |                            |                      |                                  |
|                                   |    |    |     |                       |      |                    |                         |    |    | SP-SM       | 100.0                      | 1602              | 8.1           | 32.2                   | 0.69      |                            |                      |                                  |

| TERBERG<br>TS (b) |    | USCS<br>(c) | IN-SITU            |                      |                            |                   |               | COMPACTED              |                      |                            | SPECIFIC<br>GRAVITY<br>OF SOLIDS | TRIAxIAL (d) | UNCONFINED<br>COMPRESSION | DIRECT<br>SHEAR | CONSOLIDATION | CHEMICAL | CBR |
|-------------------|----|-------------|--------------------|----------------------|----------------------------|-------------------|---------------|------------------------|----------------------|----------------------------|----------------------------------|--------------|---------------------------|-----------------|---------------|----------|-----|
|                   |    |             | DRY UNIT<br>WEIGHT |                      | MOISTURE<br>CONTENT<br>(%) | SATURATION<br>(%) | VOID<br>RATIO | MAXIMUM<br>DRY DENSITY |                      | OPTIMUM<br>MOISTURE<br>(%) |                                  |              |                           |                 |               |          |     |
|                   |    |             | (pcf)              | (kg/m <sup>3</sup> ) |                            |                   |               | (pcf)                  | (kg/m <sup>3</sup> ) |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SC          | 115.4              | 1849                 | 13.7                       | 80.1              | 0.46          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SP-SM       | 102.0              | 1634                 | 4.6                        | 19.2              | 0.65          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SM          | 119.3              | 1911                 | 8.0                        | 52.3              | 0.41          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SM          | 116.1              | 1860                 | 8.0                        | 47.7              | 0.45          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GW          | 124.1              | 1988                 | 8.7                        | 65.3              | 0.36          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GW          | 118.3              | 1895                 | 10.7                       | 68.4              | 0.42          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SW-SM       | 112.3              | 1799                 | 9.9                        | 53.4              | 0.50          |                        |                      |                            |                                  |              |                           | *               |               | *        |     |
|                   |    | SW-SM       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SM          | 107.7              | 1725                 | 10.6                       | 50.8              | 0.56          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SP-SM       | 116.8              | 1871                 | 13.9                       | 84.8              | 0.44          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SP-SM       | 122.1              | 1956                 | 8.6                        | 61.1              | 0.38          |                        |                      |                            |                                  |              |                           | *               |               |          |     |
| 19                | 17 | SP-SC       | 126.2              | 2022                 | 11.4                       | 91.8              | 0.34          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SC          | 123.8              | 1983                 | 10.8                       | 81.3              | 0.36          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
| 22                | 7  | SC          | 124.6              | 1996                 | 9.2                        | 70.7              | 0.35          |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
|                   |    | SC          | 119.7              | 1917                 | 10.3                       | 68.4              | 0.41          |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
|                   |    | SC          | 118.9              | 1905                 | 12.4                       | 80.0              | 0.42          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SC          | 132.3              | 2119                 | 8.2                        | 80.8              | 0.27          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SC          | 126.4              | 2025                 | 9.8                        | 79.7              | 0.33          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SC          | 125.8              | 2015                 | 10.6                       | 84.3              | 0.34          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SC          | 122.7              | 1965                 | 12.7                       | 91.9              | 0.37          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SM          | 90.6               | 1451                 | 16.3                       | 51.3              | 0.86          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GW          | 122.7              | 1965                 | 3.9                        | 28.2              | 0.37          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GW          | 120.6              | 1932                 | 7.6                        | 51.4              | 0.40          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GW          | 122.8              | 1967                 | 8.7                        | 62.8              | 0.37          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SW-SM       | 119.3              | 1911                 | 10.4                       | 67.8              | 0.41          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SW-SM       | 120.3              | 1927                 | 10.8                       | 72.9              | 0.40          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GC          |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GC          | 121.8              | 1951                 | 11.3                       | 79.3              | 0.38          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GC          | 110.6              | 1772                 | 16.9                       | 87.1              | 0.52          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GC          | 115.1              | 1844                 | 14.8                       | 86.0              | 0.46          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GC          | 125.2              | 2006                 | 11.6                       | 90.5              | 0.35          |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
|                   |    | GC          | 115.4              | 1849                 | 13.2                       | 77.6              | 0.46          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
| 20                | 29 | GC          | 123.3              | 1975                 | 11.6                       | 85.9              | 0.37          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GC          |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GC          | 119.4              | 1913                 | 10.5                       | 69.0              | 0.41          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GC          | 121.4              | 1945                 | 13.9                       | 96.7              | 0.39          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GC          | 114.0              | 1826                 | 14.9                       | 84.2              | 0.48          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | GC          | 121.2              | 1941                 | 11.8                       | 81.4              | 0.39          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
| 21                | 22 | SC          | 122.5              | 1962                 | 13.3                       | 35.6              | 0.38          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                   |    | SP-SM       | 100.0              | 1602                 | 8.1                        | 32.2              | 0.69          |                        |                      |                            |                                  |              |                           |                 |               |          |     |

SUMMARY OF LABORATORY TEST RESULTS  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE SAMS0

TABLE  
9-1  
2 OF 2

**FUGRO NATIONAL, INC.**

AFV-01

| ACTIVITY<br>NUMBER | SAMPLE<br>NUMBER (a) | SAMPLE INTERVAL |             | PERCENT FINER BY WEIGHT |         |    |        |        |      |      |    |       |  |
|--------------------|----------------------|-----------------|-------------|-------------------------|---------|----|--------|--------|------|------|----|-------|--|
|                    |                      |                 |             | STANDARD SIEVE OPENING  |         |    |        |        |      |      |    | U S S |  |
|                    |                      | FEET            | METERS      | BLDRS.                  | COBBLES |    | GRAVEL |        |      |      |    |       |  |
|                    |                      |                 |             | 24"                     | 12"     | 8" | 3"     | 1 1/2" | 3/4" | 3/8" | 4" | 1"    |  |
| BS-B-5             | SS-2                 | 1.5-2.3         | 0.46-0.70   |                         |         |    |        |        |      |      |    |       |  |
|                    | D-3                  | 3.7-4.4         | 1.13-1.34   |                         |         |    |        |        | 100  | 99   | 97 | 8     |  |
|                    | D-4                  | 6.7-7.4         | 2.04-2.26   |                         |         |    |        |        |      |      |    |       |  |
|                    | D-6                  | 15.2-15.9       | 4.63-4.85   |                         |         |    |        |        |      |      |    |       |  |
|                    | D-7                  | 20.2-20.9       | 6.16-6.37   |                         |         |    |        |        | 100  | 96   | 86 | 6     |  |
|                    | D-8                  | 25.2-25.9       | 7.68-7.89   |                         |         |    |        |        |      |      |    |       |  |
|                    | D-9                  | 30.2-30.9       | 9.20-9.42   |                         |         |    |        |        |      |      |    |       |  |
|                    | D-10                 | 35.0-35.6       | 10.67-10.85 |                         |         |    |        |        |      |      |    |       |  |
|                    | D-11                 | 40.0-40.4       | 12.19-12.31 |                         |         |    |        |        |      |      |    |       |  |
|                    | D-12                 | 50.0-50.7       | 15.24-15.45 |                         |         |    |        |        |      |      |    |       |  |
|                    | P-13                 | 60.0-61.6       | 18.29-18.78 |                         |         |    |        |        |      | 100  | 99 | 9     |  |
|                    | P-14                 | 68.0-68.7       | 20.73-20.94 |                         |         |    |        |        |      |      |    |       |  |
|                    | P-15                 | 80.0-81.1       | 24.38-24.72 |                         |         |    |        |        |      |      |    |       |  |
|                    | P-16                 | 90.0-92.7       | 27.43-28.25 |                         |         |    |        |        |      | 100  | 97 | 8     |  |
|                    | P-17                 | 99.0-101.8      | 30.18-31.03 |                         |         |    |        |        |      |      |    |       |  |
|                    | P-18                 | 110.0-110.8     | 33.53-33.77 |                         |         |    |        |        |      | 100  | 99 | 9     |  |
|                    | P-19                 | 120.0-122.7     | 36.58-37.40 |                         |         |    |        |        |      |      |    |       |  |
|                    | P-20                 | 140.0-141.6     | 42.67-43.16 |                         |         |    |        |        | 100  | 95   | 93 | 4     |  |
|                    | D-21                 | 160.2-160.9     | 48.83-49.04 |                         |         |    |        |        |      |      |    |       |  |
| BS-B-6             | P-1                  | 0.0-1.3         | 0.00-0.40   |                         |         |    |        |        |      |      |    |       |  |
|                    | D-3                  | 3.3-4.0         | 1.01-1.22   |                         |         |    |        |        | 100  | 89   | 78 | 4     |  |
|                    | P-4                  | 6.5-8.1         | 1.98-2.47   |                         |         |    |        |        | 100  | 87   | 79 | 4     |  |
|                    | D-5                  | 10.7-11.4       | 3.26-3.47   |                         |         |    |        |        |      |      |    |       |  |
|                    | D-6                  | 15.2-15.9       | 4.63-4.85   |                         |         |    |        |        |      |      |    |       |  |
|                    | D-7                  | 20.0-20.5       | 6.10-6.25   |                         |         |    |        |        | 100  | 82   | 67 | 4     |  |
|                    | D-8                  | 25.7-26.4       | 7.83-8.05   |                         |         |    |        |        |      |      |    |       |  |
|                    | D-9                  | 30.2-30.9       | 9.20-9.42   |                         |         |    |        |        |      |      |    |       |  |
|                    | D-10                 | 35.0-35.6       | 10.67-10.85 |                         |         |    |        |        |      |      |    |       |  |
|                    | D-11                 | 40.0-40.6       | 12.19-12.37 |                         |         |    |        |        | 100  | 80   | 60 | 4     |  |
|                    | D-12                 | 50.2-50.9       | 15.30-15.51 |                         |         |    |        |        |      |      |    |       |  |
|                    | D-13                 | 60.0-60.7       | 18.29-18.50 |                         |         |    |        |        |      |      |    |       |  |
|                    | D-14                 | 70.2-70.7       | 21.40-21.55 |                         |         |    |        |        | 100  | 99   | 89 | 4     |  |
|                    | D-15                 | 80.4-80.9       | 24.51-24.66 |                         |         |    |        |        |      |      |    |       |  |
|                    | D-16                 | 90.4-90.9       | 27.55-27.71 |                         |         |    |        |        |      |      |    |       |  |
|                    | D-17                 | 100.1-100.6     | 30.51-30.66 |                         |         |    |        |        |      |      |    |       |  |
|                    | D-18                 | 110.0-110.4     | 33.53-33.65 |                         |         |    |        | 100    | 95   | 81   | 71 | 4     |  |
|                    | D-19                 | 120.4-120.9     | 36.70-36.85 |                         |         |    |        |        |      |      |    |       |  |
|                    | D-20                 | 140.2-140.7     | 42.73-42.89 |                         |         |    |        |        |      |      |    |       |  |
|                    | D-21                 | 160.0-160.5     | 48.77-48.92 |                         |         |    |        |        | 100  | 86   | 73 | 4     |  |
| BS-T-1             | B-1                  | 0.5-2.0         | 0.15-0.61   |                         |         |    |        | 100    | 87   | 76   | 63 | 4     |  |

## 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

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| PERCENT FINER BY WEIGHT |     |                       |    |    |     |     |                       |      | ATTERBERG<br>LIMITS (b) |    |    | USCS<br>(c) | IN-SITU            |                      |                         |                   |               | COMPACTED              |                      | OPTIONAL |
|-------------------------|-----|-----------------------|----|----|-----|-----|-----------------------|------|-------------------------|----|----|-------------|--------------------|----------------------|-------------------------|-------------------|---------------|------------------------|----------------------|----------|
| SIGNAL                  |     | U S STANDARD SIEVE NO |    |    |     |     | PARTICLE<br>SIZE (mm) |      |                         |    |    |             | DRY UNIT<br>WEIGHT |                      | MOISTURE<br>CONTENT (%) | SATURATION<br>(%) | VOID<br>RATIO | MAXIMUM<br>DRY DENSITY |                      |          |
|                         |     | SAND                  |    |    |     |     | SILT OR CLAY          |      |                         |    |    |             |                    |                      |                         |                   |               | (pcf)                  | (kg m <sup>3</sup> ) |          |
| LEVEL                   |     | 4                     | 10 | 40 | 100 | 200 | .005                  | .001 | LL                      | PL | PI |             | (pcf)              | (kg m <sup>3</sup> ) |                         |                   |               |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       |                    |                      |                         |                   |               |                        |                      |          |
| 100                     | 99  | 97                    | 86 | 50 | 7   | 3   |                       |      |                         |    |    | SP          | 109.0              | 1746                 | 3.0                     | 15.1              | 0.55          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 111.5              | 1786                 | 4.8                     | 25.5              | 0.51          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       |                    |                      |                         |                   |               |                        |                      |          |
| 100                     | 96  | 86                    | 69 | 39 | 11  | 5   |                       |      |                         |    |    | SP-SM       | 115.0              | 1842                 | 7.1                     | 41.3              | 0.47          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 107.9              | 1728                 | 5.3                     | 25.6              | 0.56          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 115.9              | 1857                 | 10.3                    | 61.5              | 0.45          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 105.3              | 1687                 | 15.7                    | 70.6              | 0.60          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 113.1              | 1812                 | 10.6                    | 58.4              | 0.49          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 114.7              | 1837                 | 11.0                    | 63.6              | 0.47          |                        |                      |          |
|                         | 100 | 99                    | 98 | 91 | 39  | 18  |                       |      |                         |    |    | SM          | 100.5              | 1610                 | 23.6                    | 94.3              | 0.68          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SM          | 85.1               | 1363                 | 22.9                    | 63.0              | 0.98          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP          | 93.9               | 1504                 | 18.2                    | 62.0              | 0.79          |                        |                      |          |
|                         | 100 | 97                    | 86 | 55 | 13  | 1   |                       |      |                         |    |    | SP          | 98.8               | 1583                 | 23.3                    | 89.2              | 0.71          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SM          | 84.9               | 1360                 | 32.6                    | 89.4              | 0.99          |                        |                      |          |
|                         | 100 | 99                    | 92 | 74 | 55  | 39  |                       |      |                         |    |    | SM          | 81.8               | 1310                 | 34.5                    | 87.9              | 1.06          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SM          | 90.7               | 1453                 | 28.5                    | 89.7              | 0.86          |                        |                      |          |
| 100                     | 95  | 93                    | 89 | 32 | 12  | 5   |                       |      |                         |    |    | SW-SM       | 97.2               | 1557                 | 23.9                    | 88.0              | 0.73          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SW-SM       | 115.6              | 1852                 | 13.6                    | 80.3              | 0.46          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 97.5               | 1562                 | 5.7                     | 21.1              | 0.73          |                        |                      |          |
| 100                     | 89  | 78                    | 63 | 44 | 23  | 12  |                       |      |                         |    |    | SP-SM       | 109.0              | 1746                 | 3.2                     | 16.1              | 0.55          |                        |                      |          |
| 100                     | 87  | 79                    | 72 | 58 | 36  | 21  |                       |      |                         |    |    | SM          | 104.6              | 1676                 | 4.7                     | 20.6              | 0.61          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 109.3              | 1751                 | 9.4                     | 47.1              | 0.54          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 117.8              | 1887                 | 8.3                     | 52.0              | 0.43          |                        |                      |          |
| 100                     | 82  | 67                    | 50 | 23 | 13  | 9   |                       |      |                         |    |    | SW-SM       | 123.8              | 1983                 | 9.8                     | 73.5              | 0.36          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SM          | 115.0              | 1842                 | 6.8                     | 39.1              | 0.47          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SM          | 123.8              | 1983                 | 8.3                     | 62.0              | 0.36          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SM          | 128.2              | 2054                 | 8.6                     | 73.6              | 0.31          |                        |                      |          |
| 100                     | 80  | 60                    | 43 | 30 | 23  | 18  |                       |      |                         |    |    | SM          | 126.3              | 2023                 | 8.7                     | 70.1              | 0.33          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 115.5              | 1850                 | 6.9                     | 40.8              | 0.46          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 121.0              | 1938                 | 10.3                    | 71.1              | 0.39          |                        |                      |          |
| 100                     | 99  | 89                    | 72 | 41 | 16  | 7   |                       |      |                         |    |    | SP-SM       | 117.4              | 1881                 | 6.3                     | 39.4              | 0.44          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SP-SM       | 124.7              | 1998                 | 7.5                     | 57.5              | 0.35          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SM          | 119.4              | 1913                 | 10.0                    | 65.5              | 0.41          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SM          | 123.1              | 1972                 | 7.2                     | 53.0              | 0.37          |                        |                      |          |
| 95                      | 81  | 71                    | 59 | 30 | 19  | 14  |                       |      |                         |    |    | SM          | 127.1              | 2036                 | 9.3                     | 77.3              | 0.33          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SM          | 120.7              | 1934                 | 6.4                     | 43.6              | 0.40          |                        |                      |          |
|                         |     |                       |    |    |     |     |                       |      |                         |    |    | SM          | 134.0              | 2146                 | 5.3                     | 55.5              | 0.26          |                        |                      |          |
| 100                     | 86  | 73                    | 61 | 41 | 29  | 22  |                       |      |                         |    |    | SM          |                    |                      |                         |                   |               |                        |                      |          |
| 87                      | 76  | 63                    | 49 | 21 | 12  | 7   |                       |      |                         |    |    | SP-SM       |                    |                      |                         |                   |               |                        |                      |          |

System

formed  
report

| NO<br>(b)<br>PI | USCS<br>(c) | IN-SITU            |                      |                            |                   |               | COMPACTED              |                      |                            | SPECIFIC<br>GRAVITY<br>OF SOLIDS | TRIAxIAL (d) | UNCONFINED<br>COMPRESSION | DIRECT<br>SHEAR | CONSOLIDATION | CHEMICAL | CBR |
|-----------------|-------------|--------------------|----------------------|----------------------------|-------------------|---------------|------------------------|----------------------|----------------------------|----------------------------------|--------------|---------------------------|-----------------|---------------|----------|-----|
|                 |             | DRY UNIT<br>WEIGHT |                      | MOISTURE<br>CONTENT<br>(%) | SATURATION<br>(%) | VOID<br>RATIO | MAXIMUM<br>DRY DENSITY |                      | OPTIMUM<br>MOISTURE<br>(%) |                                  |              |                           |                 |               |          |     |
|                 |             | (pcf)              | (kg m <sup>3</sup> ) |                            |                   |               | (pcf)                  | (kg m <sup>3</sup> ) |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               | *        |     |
|                 | SP          | 109.0              | 1746                 | 3.0                        | 15.1              | 0.55          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 111.5              | 1786                 | 4.8                        | 25.5              | 0.51          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 115.0              | 1842                 | 7.1                        | 41.3              | 0.47          |                        |                      |                            |                                  |              |                           | *               |               |          |     |
|                 | SP-SM       | 107.9              | 1728                 | 5.3                        | 25.6              | 0.56          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 115.9              | 1857                 | 10.3                       | 61.5              | 0.45          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 105.3              | 1687                 | 15.7                       | 70.6              | 0.60          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 113.1              | 1812                 | 10.6                       | 58.4              | 0.49          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 114.7              | 1837                 | 11.0                       | 63.6              | 0.47          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 100.5              | 1610                 | 23.6                       | 94.3              | 0.68          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 85.1               | 1363                 | 22.9                       | 63.0              | 0.98          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP          | 93.9               | 1504                 | 18.2                       | 62.0              | 0.79          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP          | 98.8               | 1583                 | 23.3                       | 89.2              | 0.71          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 84.9               | 1360                 | 32.6                       | 89.4              | 0.99          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 81.8               | 1310                 | 34.5                       | 87.9              | 1.06          |                        |                      |                            |                                  |              | *                         |                 |               |          |     |
|                 | SM          | 90.7               | 1453                 | 28.5                       | 89.7              | 0.86          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SW-SM       | 97.2               | 1557                 | 23.9                       | 88.0              | 0.73          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SW-SM       | 115.6              | 1852                 | 13.6                       | 80.3              | 0.46          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 |             |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 97.5               | 1562                 | 5.7                        | 21.1              | 0.73          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 109.0              | 1746                 | 3.2                        | 16.1              | 0.55          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 104.6              | 1676                 | 4.7                        | 20.6              | 0.61          |                        |                      |                            |                                  |              |                           | *               |               |          |     |
|                 | SP-SM       | 109.3              | 1751                 | 9.4                        | 47.1              | 0.54          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 117.8              | 1887                 | 8.3                        | 52.0              | 0.43          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SW-SM       | 123.8              | 1983                 | 9.8                        | 73.5              | 0.36          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 115.0              | 1842                 | 6.8                        | 39.1              | 0.47          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 123.8              | 1983                 | 0.3                        | 62.0              | 0.36          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 128.2              | 2054                 | 8.6                        | 73.6              | 0.31          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 126.3              | 2023                 | 8.7                        | 70.1              | 0.33          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 115.5              | 1850                 | 6.9                        | 40.8              | 0.46          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 121.0              | 1938                 | 10.3                       | 71.1              | 0.39          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 117.4              | 1881                 | 6.3                        | 39.4              | 0.44          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       | 124.7              | 1998                 | 7.5                        | 57.5              | 0.35          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 119.4              | 1913                 | 10.0                       | 65.5              | 0.41          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 123.1              | 1972                 | 7.2                        | 53.0              | 0.37          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 127.1              | 2036                 | 9.3                        | 77.3              | 0.33          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 120.7              | 1934                 | 6.4                        | 43.6              | 0.40          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          | 134.0              | 2146                 | 5.3                        | 55.5              | 0.26          |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SM          |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 | SP-SM       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 |             |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |
|                 |             |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |     |

SUMMARY OF LABORATORY TEST RESULTS  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE  
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3 OF 3

FUGRO NATIONAL, INC.

[illegible]

| PERCENT FINER BY WEIGHT |      |                       |     |    |    |              |     |                       |      | ATTERBERG<br>LIMITS (b) |    |    | USCS<br>(c) | IN-SITU            |                      |                            |                   |               | COMPACTED              |                      | REMARKS |
|-------------------------|------|-----------------------|-----|----|----|--------------|-----|-----------------------|------|-------------------------|----|----|-------------|--------------------|----------------------|----------------------------|-------------------|---------------|------------------------|----------------------|---------|
| SAMPLING                |      | U S STANDARD SIEVE NO |     |    |    |              |     | PARTICLE<br>SIZE (mm) |      |                         |    |    |             | DRY UNIT<br>WEIGHT |                      | MOISTURE<br>CONTENT<br>(%) | SATURATION<br>(%) | VOID<br>RATIO | MAXIMUM<br>DRY DENSITY |                      |         |
| GRAVEL                  |      | SAND                  |     |    |    | SILT OR CLAY |     |                       |      | LL                      | PL | PI |             | (pcf)              | (kg m <sup>3</sup> ) |                            |                   |               | (pcf)                  | (kg m <sup>3</sup> ) |         |
|                         | 3/4" | 3/8"                  | 4   | 10 | 40 | 100          | 200 | .005                  | .001 |                         |    |    |             |                    |                      |                            |                   |               |                        |                      |         |
| 0                       | 95   | 94                    | 92  | 87 | 75 | 19           | 5   |                       |      |                         |    |    | SP-SM       |                    |                      |                            |                   |               |                        |                      |         |
|                         |      | 100                   | 97  | 94 | 74 | 39           | 25  |                       |      |                         |    |    | SM          |                    |                      |                            |                   |               |                        |                      |         |
|                         |      |                       |     |    |    |              |     |                       |      |                         |    |    | SP          |                    |                      |                            |                   |               |                        |                      |         |
| 0                       | 86   | 76                    | 67  | 59 | 41 | 10           | 6   |                       |      |                         |    |    | SP-SM       |                    |                      |                            |                   |               |                        |                      |         |
|                         | 88   | 82                    | 72  | 63 | 48 | 28           | 17  | 5                     | 3    |                         |    | NP | SM          |                    |                      |                            |                   |               | 119.2                  | 1909                 | 1       |
|                         | 91   | 78                    | 67  | 53 | 29 | 16           | 11  |                       |      |                         |    | NP | SW-SM       |                    |                      |                            |                   |               | 130.5                  | 2090                 |         |
|                         | 100  | 96                    | 89  | 82 | 65 | 37           | 19  |                       |      |                         |    | NP | SM          |                    |                      |                            |                   |               |                        |                      |         |
| 0                       | 99   | 94                    | 89  | 82 | 68 | 19           | 6   |                       |      |                         |    |    | SP-SM       |                    |                      |                            |                   |               |                        |                      |         |
|                         |      |                       | 100 | 98 | 80 | 16           | 3   |                       |      |                         |    |    | SP          |                    |                      |                            |                   |               |                        |                      |         |
| 0                       | 99   | 96                    | 92  | 85 | 62 | 36           | 18  |                       |      |                         |    |    | SM          |                    |                      |                            |                   |               |                        |                      |         |
| 0                       | 98   | 88                    | 78  | 65 | 52 | 40           | 33  | 23                    | 13   | 40                      | 24 | 16 | SC          |                    |                      |                            |                   |               |                        |                      |         |
| 0                       | 95   | 89                    | 85  | 79 | 65 | 26           | 16  |                       |      |                         |    |    | SM          |                    |                      |                            |                   |               |                        |                      |         |
|                         |      | 100                   | 95  | 84 | 59 | 33           | 23  | 6                     | 3    |                         |    | NP | SM          |                    |                      |                            |                   |               |                        |                      |         |
|                         |      | 100                   | 95  | 86 | 52 | 31           | 18  |                       |      |                         |    |    | SM          |                    |                      |                            |                   |               |                        |                      |         |
| 0                       | 89   | 65                    | 37  | 25 | 17 | 8            | 5   |                       |      |                         |    |    | GP-GM       |                    |                      |                            |                   |               |                        |                      |         |
|                         | 100  | 97                    | 87  | 64 | 21 | 8            | 4   |                       |      |                         |    |    | SP          |                    |                      |                            |                   |               |                        |                      |         |
| 0                       | 98   | 93                    | 82  | 64 | 38 | 19           | 12  |                       |      |                         |    | NP | SM          |                    |                      |                            |                   |               |                        |                      |         |
|                         | 100  | 94                    | 79  | 63 | 37 | 16           | 8   |                       |      |                         |    |    | SP-SM       |                    |                      |                            |                   |               |                        |                      |         |
| 0                       | 99   | 97                    | 83  | 83 | 52 | 30           | 19  |                       |      |                         |    |    | SM          |                    |                      |                            |                   |               | 123.3                  | 1975                 |         |
|                         |      | 100                   | 96  | 84 | 36 | 12           | 7   |                       |      |                         |    |    | SW-SM       |                    |                      |                            |                   |               | 120.0                  | 1922                 |         |
|                         | 100  | 95                    | 79  | 60 | 34 | 20           | 14  |                       |      | 23                      | 21 | 2  | SM          |                    |                      |                            |                   |               |                        |                      |         |
|                         | 100  | 98                    | 90  | 72 | 35 | 16           | 11  |                       |      |                         |    |    | SW-SM       |                    |                      |                            |                   |               |                        |                      |         |
| 0                       | 97   | 92                    | 84  | 73 | 43 | 23           | 15  |                       |      |                         |    |    | SM          |                    |                      |                            |                   |               | 130.2                  | 2086                 |         |
|                         | 100  | 95                    | 86  | 76 | 52 | 26           | 15  |                       |      |                         |    | NP | SM          |                    |                      |                            |                   |               |                        |                      |         |

on System

performed  
as report

| BERG<br>(b) |    | USCS<br>(c) | IN-SITU            |                      |                            |                   | COMPACTED     |                        |                      | SPECIFIC<br>GRAVITY<br>OF SOLIDS | TRIAxIAL (d) | UNCONFINED<br>COMPRESSION | DIRECT<br>SHEAR | CONSOLIDATION | CHEMICAL | CBR |                            |
|-------------|----|-------------|--------------------|----------------------|----------------------------|-------------------|---------------|------------------------|----------------------|----------------------------------|--------------|---------------------------|-----------------|---------------|----------|-----|----------------------------|
|             |    |             | DRY UNIT<br>WEIGHT |                      | MOISTURE<br>CONTENT<br>(%) | SATURATION<br>(%) | VOID<br>RATIO | MAXIMUM<br>DRY DENSITY |                      |                                  |              |                           |                 |               |          |     | OPTIMUM<br>MOISTURE<br>(%) |
|             |    |             | (pcf)              | (kg/m <sup>3</sup> ) |                            |                   |               | (pcf)                  | (kg m <sup>3</sup> ) |                                  |              |                           |                 |               |          |     |                            |
|             | PI | SP-SM       |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SM          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SP          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               | *        |     |                            |
|             |    | SP-SM       |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             | NP | SM          |                    |                      |                            |                   |               | 119.2                  | 1909                 | 13.2                             | 2.68         |                           |                 |               |          | *   |                            |
|             | NP | SW-SM       |                    |                      |                            |                   |               | 130.5                  | 2090                 | 8.8                              | 2.69         |                           |                 |               |          | *   |                            |
|             | NP | SM          |                    |                      |                            |                   |               |                        |                      |                                  | 2.56         |                           |                 |               |          |     |                            |
|             |    | SP-SM       |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SP          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SM          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
| 24          | 16 | SC          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SM          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             | NP | SM          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SM          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | GP-GM       |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SP          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             | NP | SM          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SP-SM       |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SM          |                    |                      |                            |                   |               | 123.3                  | 1975                 | 10.5                             |              |                           |                 |               |          | *   |                            |
|             |    | SW-SM       |                    |                      |                            |                   |               | 120.0                  | 1922                 | 11.5                             |              |                           |                 |               |          | *   |                            |
| 21          | 2  | SM          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SW-SM       |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |
|             |    | SM          |                    |                      |                            |                   |               | 130.2                  | 2086                 | 8.5                              |              |                           |                 |               |          | *   |                            |
|             | NP | SM          |                    |                      |                            |                   |               |                        |                      |                                  |              |                           |                 |               |          |     |                            |

SUMMARY OF LABORATORY TEST RESULTS  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE  
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FUGRO NATIONAL, INC.

AFV-01

| ACTIVITY<br>NUMBER | SAMPLE<br>NUMBER (a) | SAMPLE INTERVAL |           | PERCENT FINER BY WEIGHT |         |    |        |     |     |      |     |
|--------------------|----------------------|-----------------|-----------|-------------------------|---------|----|--------|-----|-----|------|-----|
|                    |                      |                 |           | STANDARD SIEVE OPENING  |         |    |        |     |     |      | U S |
|                    |                      | FEET            | METERS    | BLDRS.                  | COBBLES |    | GRAVEL |     |     |      |     |
|                    |                      |                 |           | 24"                     | 12"     | 8" | 3"     | 1½" | ¾"  | 3/8" | 4"  |
| BS-F-5             | B-1                  | 1.0-1.3         | 0.30-0.40 |                         |         |    |        | 100 | 96  | 94   | 91  |
|                    | B-2                  | 1.7-2.0         | 0.52-0.61 |                         |         |    |        |     |     | 100  | 97  |
| BS-F-6             | B-1                  | 1.0-1.3         | 0.30-0.40 |                         |         |    |        |     | 100 | 99   | 94  |
|                    | B-2                  | 2.0-2.8         | 0.61-0.85 |                         |         |    |        | 100 | 99  | 96   | 85  |
| BS-F-7             | B-1                  | 1.2-1.5         | 0.35-0.46 |                         |         |    |        |     | 100 | 96   | 91  |
|                    | B-2                  | 2.2-2.5         | 0.67-0.76 |                         |         |    |        |     | 100 | 96   | 88  |
| BS-F-8             | B-1                  | 0.5-1.0         | 0.15-0.30 |                         |         |    |        | 100 | 99  | 96   | 93  |
|                    | B-2                  | 1.5-1.8         | 0.46-0.55 |                         |         |    |        |     | 100 | 93   | 78  |
| BS-F-9             | B-1                  | 0.7-1.3         | 0.21-0.40 |                         |         |    |        | 100 | 78  | 62   | 48  |
|                    | B-2                  | 1.7-2.0         | 0.52-0.61 |                         |         |    |        | 100 | 80  | 62   | 50  |
| BS-F-10            | B-1                  | 1.0-1.3         | 0.30-0.40 |                         |         |    |        |     | 100 | 94   | 84  |
|                    | B-2                  | 1.8-2.2         | 0.55-0.67 |                         |         |    |        | 100 | 95  | 77   | 62  |
| BS-F-11            | B-1                  | 0.5-1.0         | 0.15-0.30 |                         |         |    |        |     | 100 | 99   | 97  |
|                    | B-2                  | 1.5-1.8         | 0.46-0.55 |                         |         |    |        | 100 | 99  | 98   | 98  |
| BS-F-12            | B-1                  | 1.0-1.5         | 0.30-0.46 |                         |         |    |        |     |     | 100  | 93  |
|                    | B-2                  | 1.8-2.2         | 0.55-0.67 |                         |         |    |        | 100 | 96  | 91   | 85  |
| BS-F-13            | B-1                  | 0.5-1.0         | 0.15-0.30 |                         |         |    |        |     | 100 | 99   | 96  |
|                    | B-2                  | 2.0-2.3         | 0.61-0.70 |                         |         |    |        |     | 100 | 92   | 90  |
| BS-F-14            | B-1                  | 1.0-1.3         | 0.30-0.40 |                         |         |    |        |     |     | 100  | 98  |
|                    | B-2                  | 2.0-2.3         | 0.61-0.70 |                         |         |    |        | 100 | 97  | 90   | 87  |
| BS-F-15            | B-1                  | 1.0-1.3         | 0.30-0.40 |                         |         |    |        | 100 | 96  | 89   | 76  |
|                    | B-2                  | 1.7-2.0         | 0.52-0.61 |                         |         |    |        | 100 | 97  | 89   | 78  |
| BS-F-16            | B-1                  | 1.0-1.2         | 0.30-0.37 |                         |         |    |        |     |     | 100  | 99  |
|                    |                      |                 |           |                         |         |    |        |     |     |      |     |
| BS-F-17            | B-1                  | 0.5-0.8         | 0.15-0.24 |                         |         |    |        |     | 100 | 87   | 77  |
|                    | B-2                  | 1.5-1.8         | 0.46-0.55 |                         |         |    |        |     | 100 | 90   | 80  |
| BS-F-18            | B-1                  | 1.0-1.3         | 0.30-0.40 |                         |         |    |        |     |     | 100  | 98  |
|                    | B-2                  | 1.7-2.0         | 0.52-0.61 |                         |         |    |        |     | 100 | 99   | 98  |
| BS-F-19            | B-1                  | 1.3-2.0         | 0.40-0.61 |                         |         |    |        |     |     | 100  | 97  |
|                    |                      |                 |           |                         |         |    |        |     |     |      |     |

## 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

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| FINER BY WEIGHT       |      |    |    |     |              |                       |                    | ATTERBERG<br>LIMITS (b) |    |       | USCS -<br>(c) | IN-SITU                    |                   |               |                        | COMPACTED |                            |      | SPECIFIC<br>GRAVITY |
|-----------------------|------|----|----|-----|--------------|-----------------------|--------------------|-------------------------|----|-------|---------------|----------------------------|-------------------|---------------|------------------------|-----------|----------------------------|------|---------------------|
| U S STANDARD SIEVE NO |      |    |    |     |              | PARTICLE<br>SIZE (mm) | DRY UNIT<br>WEIGHT |                         |    |       |               | MOISTURE<br>CONTENT<br>(%) | SATURATION<br>(%) | VOID<br>RATIO | MAXIMUM<br>DRY DENSITY |           | OPTIMUM<br>MOISTURE<br>(%) |      |                     |
|                       | SAND |    |    |     | SILT OR CLAY |                       |                    |                         |    | (pcf) |               |                            |                   |               | (kg. m <sup>3</sup> )  |           |                            |      |                     |
| 1/8"                  | 4    | 10 | 40 | 100 | 200          | .005                  | .001               | LL                      | PL | PI    |               |                            |                   |               |                        |           |                            |      |                     |
| 94                    | 91   | 88 | 70 | 26  | 12           |                       |                    |                         |    |       | SP-SM         |                            |                   |               |                        |           |                            |      |                     |
| 100                   | 97   | 94 | 76 | 35  | 15           |                       |                    |                         |    |       | SM            |                            |                   |               |                        | 114.0     | 1826                       | 10.6 |                     |
| 99                    | 94   | 89 | 70 | 31  | 17           |                       |                    |                         |    |       | SM            |                            |                   |               |                        |           |                            |      |                     |
| 96                    | 85   | 76 | 54 | 15  | 7            |                       |                    |                         |    |       | SW-SM         |                            |                   |               |                        |           |                            |      |                     |
| 96                    | 91   | 84 | 63 | 25  | 14           |                       |                    |                         |    |       | SM            |                            |                   |               |                        |           |                            |      |                     |
| 96                    | 88   | 80 | 60 | 23  | 11           |                       |                    |                         |    |       | SW-SM         |                            |                   |               |                        |           |                            |      |                     |
| 96                    | 93   | 86 | 71 | 44  | 34           |                       |                    | 22                      | 19 | 3     | SM            |                            |                   |               |                        | 128.0     | 2050                       | 9.5  |                     |
| 93                    | 78   | 62 | 32 | 12  | 9            |                       |                    |                         |    | NP    | SP-SM         |                            |                   |               |                        |           |                            |      |                     |
| 62                    | 48   | 35 | 13 | 5   | 4            |                       |                    |                         |    | NP    | GP            |                            |                   |               |                        |           |                            |      |                     |
| 62                    | 50   | 39 | 17 | 3   | 2            |                       |                    |                         |    |       | GP            |                            |                   |               |                        |           |                            |      |                     |
| 94                    | 84   | 75 | 54 | 26  | 17           |                       |                    |                         |    |       | SM            |                            |                   |               |                        |           |                            |      |                     |
| 77                    | 62   | 50 | 27 | 4   | 3            |                       |                    |                         |    |       | SP            |                            |                   |               |                        |           |                            |      |                     |
| 99                    | 97   | 91 | 83 | 55  | 38           |                       |                    | 25                      | 19 | 6     | SM-SC         |                            |                   |               |                        | 118.5     | 1898                       | 14.1 |                     |
| 98                    | 98   | 96 | 94 | 84  | 73           |                       |                    | 22                      | 21 | 1     | ML            |                            |                   |               |                        | 114.5     | 1834                       | 14.7 |                     |
| 100                   | 93   | 81 | 62 | 38  | 28           |                       |                    | 21                      | 18 | 3     | SM            |                            |                   |               |                        |           |                            |      |                     |
| 91                    | 85   | 77 | 54 | 16  | 11           |                       |                    |                         |    |       | SW-SM         |                            |                   |               |                        |           |                            |      |                     |
| 99                    | 96   | 85 | 54 | 25  | 12           |                       |                    |                         |    |       | SP-SM         |                            |                   |               |                        |           |                            |      |                     |
| 92                    | 90   | 87 | 81 | 56  | 33           |                       |                    |                         |    |       | CM            |                            |                   |               |                        |           |                            |      |                     |
| 100                   | 98   | 95 | 81 | 38  | 16           |                       |                    |                         |    |       | SM            |                            |                   |               |                        |           |                            |      |                     |
| 90                    | 87   | 81 | 63 | 31  | 19           |                       |                    |                         |    | NP    | SM            |                            |                   |               |                        |           |                            |      |                     |
| 89                    | 76   | 60 | 36 | 20  | 11           |                       |                    |                         |    |       | SP-SM         |                            |                   |               |                        |           |                            |      |                     |
| 89                    | 78   | 57 | 32 | 14  | 6            |                       |                    |                         |    |       | SP-SM         |                            |                   |               |                        |           |                            |      |                     |
| 100                   | 99   | 91 | 56 | 33  | 23           |                       |                    |                         |    |       | SM            |                            |                   |               |                        |           |                            |      |                     |
| 87                    | 77   | 69 | 56 | 42  | 32           |                       |                    | 33                      | 22 | 11    | SC            |                            |                   |               |                        | 128.3     | 2055                       | 10.6 |                     |
| 90                    | 80   | 65 | 31 | 16  | 9            |                       |                    |                         |    |       | SW-SM         |                            |                   |               |                        | 133.4     | 2137                       | 8.3  |                     |
| 100                   | 98   | 94 | 84 | 51  | 27           |                       |                    |                         |    |       | SM            |                            |                   |               |                        | 120.5     | 1930                       | 10.5 |                     |
| 99                    | 98   | 92 | 69 | 43  | 30           |                       |                    |                         |    |       | S'            |                            |                   |               |                        |           |                            |      |                     |
| 100                   | 97   | 92 | 67 | 35  | 16           |                       |                    |                         |    |       | SM            |                            |                   |               |                        |           |                            |      |                     |

| PI      | USCS<br>(C)    | IN-SITU            |                      |                            |                   |               | COMPACTED              |                      |                            | SPECIFIC<br>GRAVITY<br>OF SOLIDS | TRIAxIAL (d) | UNCONFINED<br>COMPRESSION | DIRECT<br>SHEAR | CONSOLIDATION | CHEMICAL | CBR    |
|---------|----------------|--------------------|----------------------|----------------------------|-------------------|---------------|------------------------|----------------------|----------------------------|----------------------------------|--------------|---------------------------|-----------------|---------------|----------|--------|
|         |                | DRY UNIT<br>WEIGHT |                      | MOISTURE<br>CONTENT<br>(%) | SATURATION<br>(%) | VOID<br>RATIO | MAXIMUM<br>DRY DENSITY |                      | OPTIMUM<br>MOISTURE<br>(%) |                                  |              |                           |                 |               |          |        |
|         |                | (pcf)              | (kg m <sup>3</sup> ) |                            |                   |               | (pcf)                  | (kg m <sup>3</sup> ) |                            |                                  |              |                           |                 |               |          |        |
|         | SP-SM<br>SM    |                    |                      |                            |                   |               | 114.0                  | 1826                 | 10.6                       |                                  |              |                           |                 |               |          | •      |
|         | SM<br>SW-SM    |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |        |
|         | SM<br>SW-SM    |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |        |
| 3<br>NP | SM<br>SP-SM    |                    |                      |                            |                   |               | 128.0                  | 2050                 | 9.5                        |                                  |              |                           |                 |               |          | •      |
| NP      | GP<br>GP       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          | •<br>• |
|         | SM<br>SP       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |        |
| 6<br>1  | SM-SC<br>ML    |                    |                      |                            |                   |               | 118.5<br>114.5         | 1838<br>1834         | 14.1<br>14.7               |                                  |              |                           |                 |               |          | •<br>• |
| 3       | SM<br>SW-SM    |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |        |
|         | SP-SM<br>SM    |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |        |
| NP      | SM<br>SM       |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |        |
|         | SP-SM<br>SP-SM |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |        |
|         | SM             |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |        |
| 11      | SC<br>SW-SM    |                    |                      |                            |                   |               | 128.3<br>133.4         | 2055<br>2137         | 10.6<br>8.3                |                                  |              |                           |                 |               |          | •<br>• |
|         | SM<br>SM       |                    |                      |                            |                   |               | 120.5                  | 1930                 | 10.5                       |                                  |              |                           |                 |               |          | •      |
|         | SM             |                    |                      |                            |                   |               |                        |                      |                            |                                  |              |                           |                 |               |          |        |

SUMMARY OF LABORATORY TEST RESULTS  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE SAMS0

TABLE  
9-1  
8 OF 8

FUGRO NATIONAL, INC.

AFV-01

## SUMMARY OF TRIAXIAL COMPRESSION TEST RESULTS

### VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

**TABLE  
9-2**

**FUGRO NATIONAL, INC.**

**SUMMARY OF UNCONFINED COMPRESSION  
TEST RESULTS  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA**

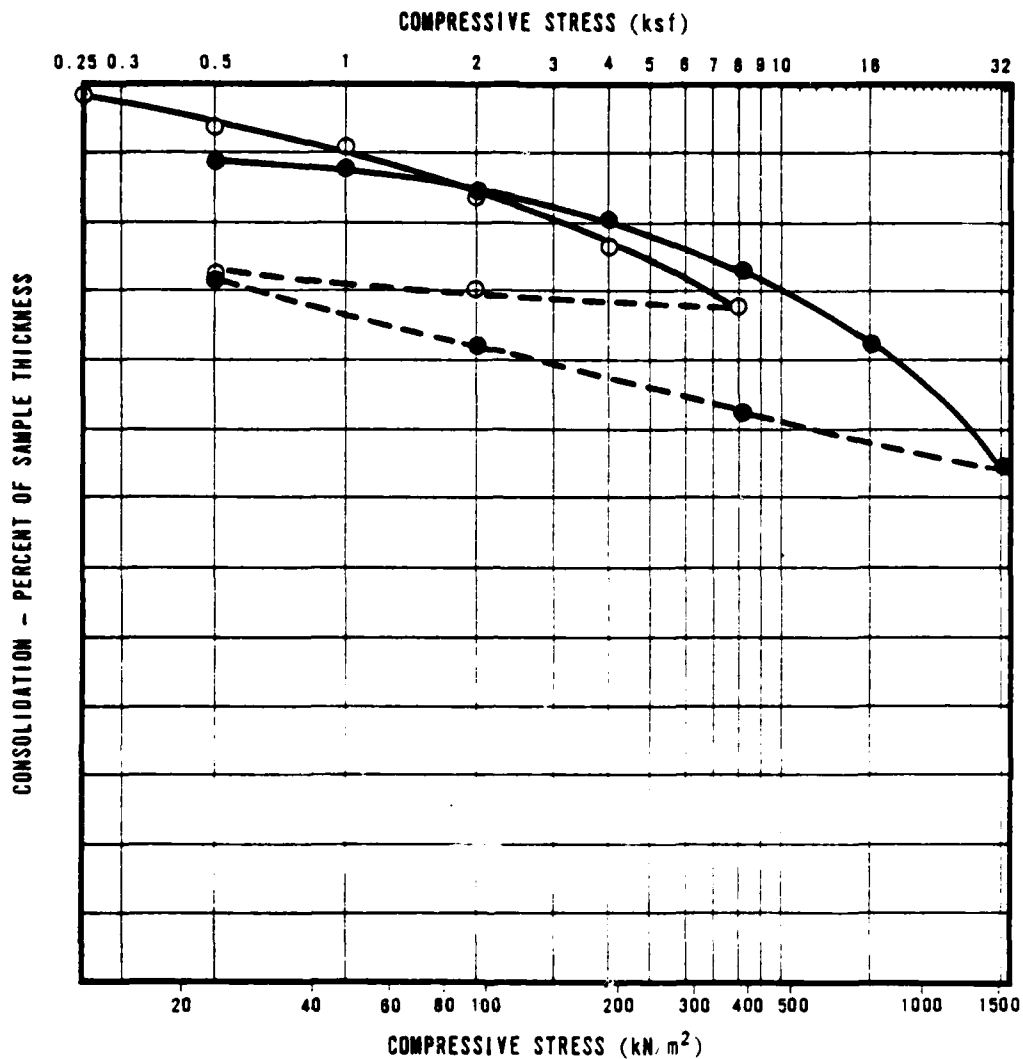
**TABLE  
9-3.**

AFV-08

SUMMARY OF DIRECT SHEAR TEST RESULTS  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

**TABLE  
9-4**

**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 <sup>3</sup> |                              |                    |                                  |
| ○      | BS-8-1     | P-9        | 30.0-31.8       | 9.14-9.69 | MH        | 52.4                | 839               | 75.4                         | 2.10               | 93.4                             |
|        |            |            |                 |           |           |                     |                   |                              |                    |                                  |
|        |            |            |                 |           |           |                     |                   |                              |                    |                                  |

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

CONSOLIDATION TEST RESULTS  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMS0

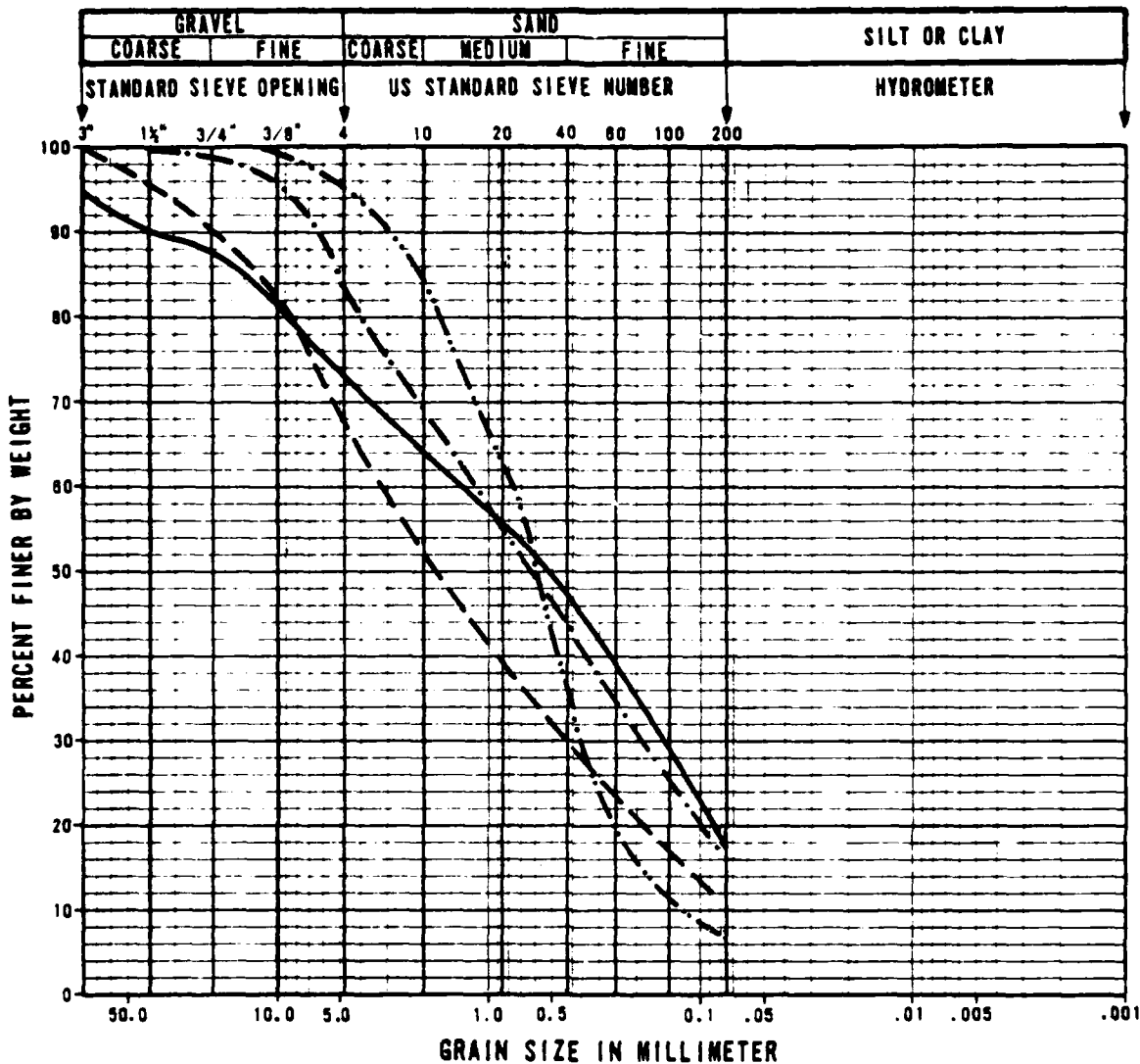
FIGURE  
9-1

**FUGRO NATIONAL, INC.**

**SUMMARY OF CHEMICAL TEST RESULTS**  
**VERIFICATION SITE, BIG SMOKY CDP, NEVADA**

**TABLE**  
**9-5**

AFV-07



| SYMBOL | COMPOSITE SAMPLE NUMBER | ACTIVITY NUMBER | SAMPLE INTERVAL |           | SOIL TYPE |
|--------|-------------------------|-----------------|-----------------|-----------|-----------|
|        |                         |                 | FEET            | METERS    |           |
| ---    | A                       | BS-T-5          | 0.5-2.0         | 0.15-0.61 | SM        |
| ---    | B                       | BS-T-6          | 0.5-2.0         | 0.15-0.61 | SW-SM     |
| ---    | C                       | BS-F-2          | 1.0-1.3         | 0.30-0.40 | SM        |
| ---    | D                       | BS-F-2          | 2.0-2.3         | 0.61-0.70 | SW-SM     |

GRAIN SIZE CURVES, CBR TESTS  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

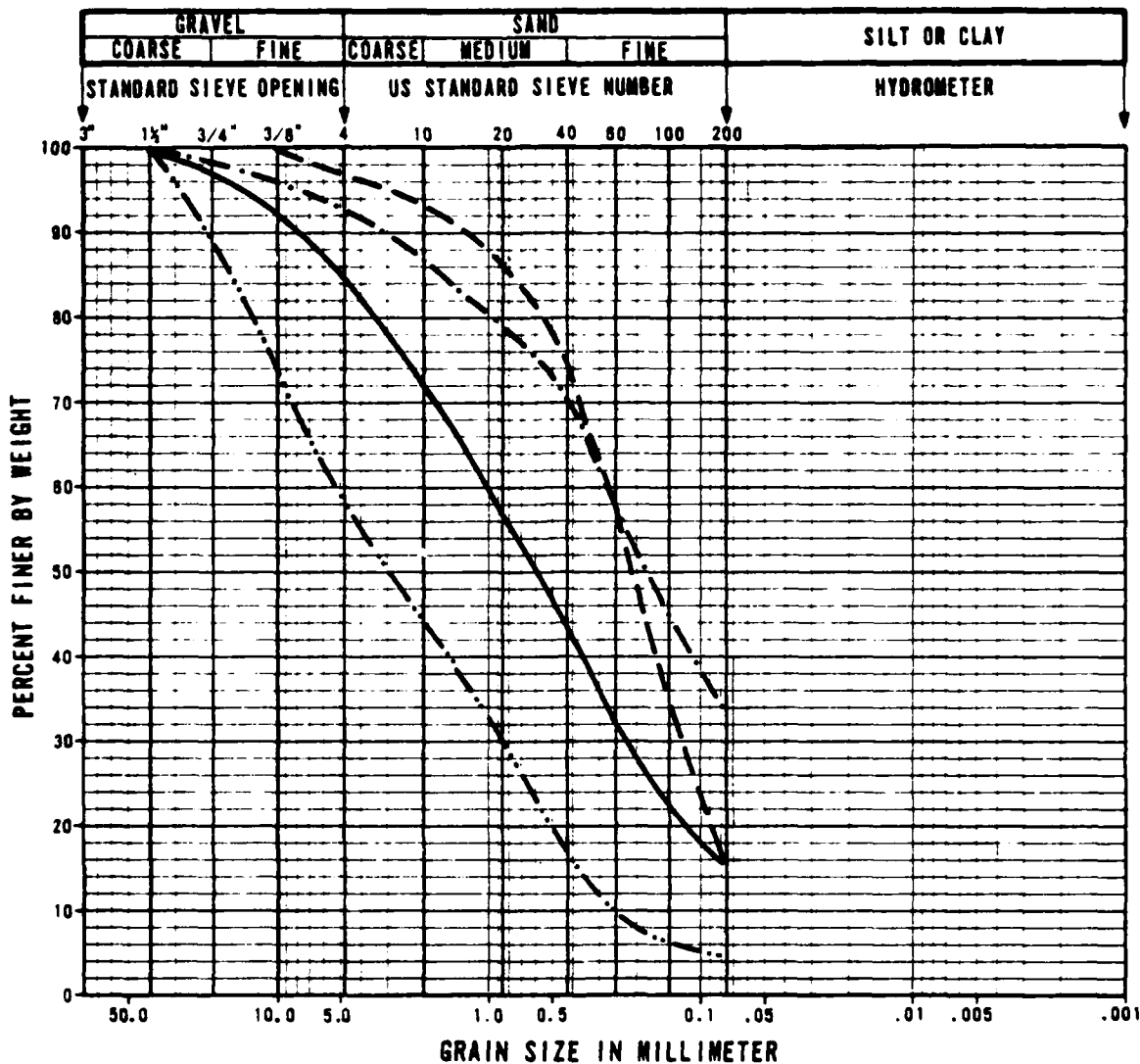
FIGURE  
9-2  
1 OF 4

**TRERO NATIONAL INC.**

2 JUL 79

AFV-12

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_



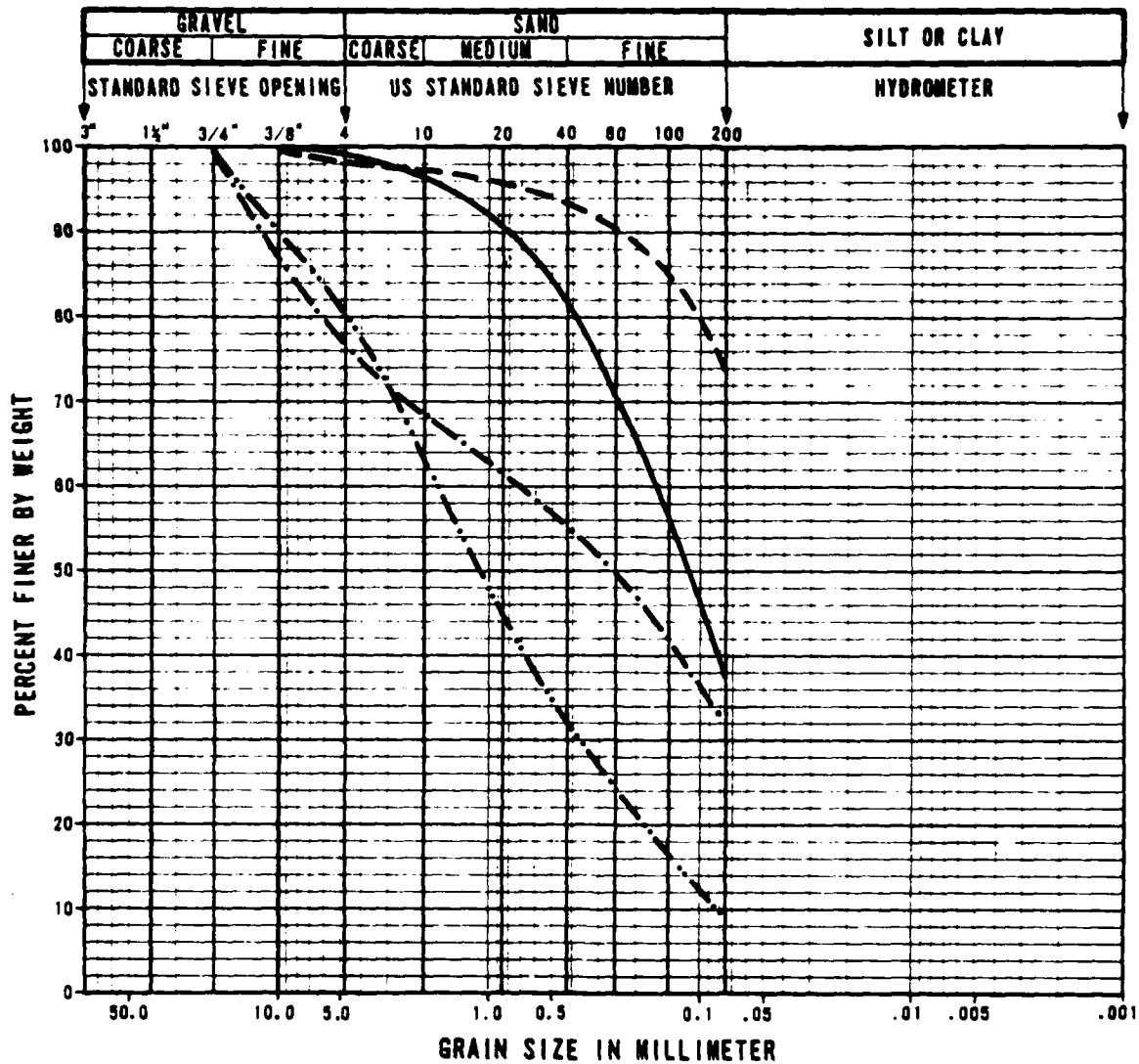
| SYMBOL  | COMPOSITE<br>SAMPLE<br>NUMBER | ACTIVITY<br>NUMBER | SAMPLE INTERVAL    |                        | SOIL<br>TYPE |
|---------|-------------------------------|--------------------|--------------------|------------------------|--------------|
|         |                               |                    | FEET               | METERS                 |              |
| —       | E                             | BS-F-4             | 1.0-1.3            | 0.30-0.40              | SM           |
| - - -   | F                             | BS-F-5             | 1.7-2.0            | 0.52-0.61              | SM           |
| - . - . | G                             | BS-F-8             | 0.5-1.0            | 0.15-0.30              | SM           |
| - . . . | H                             | BS-F-9             | 0.7-1.3<br>1.7-2.0 | 0.21-0.40<br>0.52-0.61 | SP-SM        |

GRAIN SIZE CURVES, CBR TESTS  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
9-2  
2 OF 4

**FUGRO NATIONAL INC.**



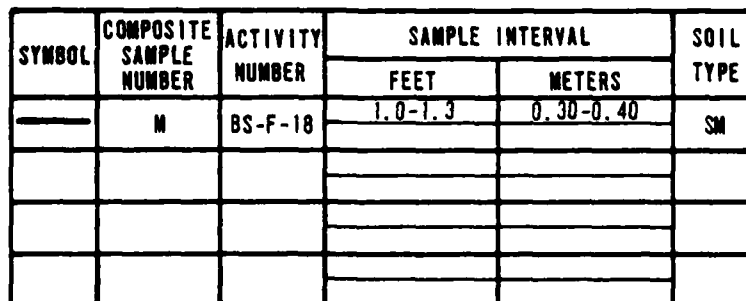


FIGURE  
9-2  
4 OF 4

AFV-12

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| COMPOSITE<br>SAMPLE<br>NUMBER | SOIL<br>TYPE | PERCENT<br>PASSING<br>#200 | ATTERBERG<br>LIMITS |    | SPECIFIC<br>GRAVITY | MAXIMUM<br>DRY DENSITY |                   | OPTIMUM<br>MOISTURE<br>(%) | COMPACTED<br>DRY DENSITY |                   | COMPACTED<br>MOISTURE<br>(%) | PERCENT OF<br>MAXIMUM<br>DRY DENSITY | CBR<br>(%) |
|-------------------------------|--------------|----------------------------|---------------------|----|---------------------|------------------------|-------------------|----------------------------|--------------------------|-------------------|------------------------------|--------------------------------------|------------|
|                               |              |                            | LL                  | PI |                     | pcf                    | kg/m <sup>3</sup> |                            | pcf                      | kg/m <sup>3</sup> |                              |                                      |            |
| A                             | SM           | 17                         |                     | NP | 2.68                | 119.2                  | 1908              | 13.2                       | 107.3                    | 1719              | 13.7                         | 90.0                                 | 33         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 103.1                    | 1652              | 12.4                         | 86.5                                 | 10         |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
| B                             | SW-SM        | 11                         |                     | NP | 2.69                | 130.5                  | 2080              | 8.8                        | 124.1                    | 1888              | 8.7                          | 95.1                                 | 58         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 118.8                    | 1805              | 8.9                          | 91.1                                 | 23         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 115.9                    | 1857              | 9.0                          | 88.8                                 | 14         |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
| C                             | SM           | 16                         |                     |    |                     | 123.3                  | 1975              | 10.5                       | 119.2                    | 1908              | 10.0                         | 96.7                                 | 77         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 115.1                    | 1844              | 10.0                         | 93.4                                 | 30         |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
| D                             | SW-SM        | 7                          |                     |    |                     | 120.0                  | 1922              | 11.5                       | 114.7                    | 1837              | 11.3                         | 95.6                                 | 42         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 111.9                    | 1792              | 11.2                         | 93.2                                 | 31         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 107.5                    | 1722              | 11.3                         | 89.6                                 | 19         |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |

CALIFORNIA BEARING RATIO (CBR) TEST RESULTS  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

TABLE  
9-6  
1 OF 4

**TUBRO NATIONAL, INC.**

CHECKED BY \_\_\_\_\_ / APPROVED BY \_\_\_\_\_ /

| COMPOSITE<br>SAMPLE<br>NUMBER | SOIL<br>TYPE | PERCENT<br>PASSING<br>#200 | ATTERBERG<br>LIMITS |    | SPECIFIC<br>GRAVITY | MAXIMUM<br>DRY DENSITY |                   | OPTIMUM<br>MOISTURE<br>(%) | COMPACTED<br>DRY DENSITY |                   | COMPACTED<br>MOISTURE<br>(%) | PERCENT OF<br>MAXIMUM<br>DRY DENSITY | CBR<br>(%) |
|-------------------------------|--------------|----------------------------|---------------------|----|---------------------|------------------------|-------------------|----------------------------|--------------------------|-------------------|------------------------------|--------------------------------------|------------|
|                               |              |                            | LL                  | PI |                     | pcf                    | kg/m <sup>3</sup> |                            | pcf                      | kg/m <sup>3</sup> |                              |                                      |            |
| E                             | SM           | 15                         |                     |    |                     | 130.2                  | 2086              | 8.5                        | 120.1                    | 1924              | 8.4                          | 92.2                                 | 35         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 113.8                    | 1823              | 8.4                          | 67.4                                 | 8          |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
| F                             | SM           | 15                         |                     |    |                     | 114.0                  | 1826              | 10.6                       | 110.4                    | 1788              | 10.3                         | 96.8                                 | 84         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 105.5                    | 1690              | 10.3                         | 92.5                                 | 32         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 100.6                    | 1615              | 10.4                         | 88.4                                 | 12         |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
| G                             | SM           | 34                         | 22                  | 3  |                     | 128.0                  | 2050              | 9.5                        | 125.9                    | 2017              | 9.5                          | 98.4                                 | 55         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 118.5                    | 1898              | 9.6                          | 92.6                                 | 17         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 111.2                    | 1781              | 9.4                          | 86.9                                 | 5          |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
| H                             | SP-SM        | 5                          |                     | NP |                     | 129.5                  | 2074              | 8.0                        | 124.6                    | 1986              | 7.1                          | 96.2                                 | 59         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 119.9                    | 1921              | 7.4                          | 92.6                                 | 33         |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |

CALIFORNIA BEARING RATIO (CBR) TEST RESULTS  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

TABLE  
9-6  
2 OF 4

**FUBRO NATIONAL, INC.**

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_

| COMPOSITE<br>SAMPLE<br>NUMBER | SOIL<br>TYPE | PERCENT<br>PASSING<br>#200 | ATTERBERG<br>LIMITS |    | SPECIFIC<br>GRAVITY | MAXIMUM<br>DRY DENSITY |                   | OPTIMUM<br>MOISTURE<br>(%) | COMPACTED<br>DRY DENSITY |                   | COMPACTED<br>MOISTURE<br>(%) | PERCENT OF<br>MAXIMUM<br>DRY DENSITY | CBR<br>(%) |
|-------------------------------|--------------|----------------------------|---------------------|----|---------------------|------------------------|-------------------|----------------------------|--------------------------|-------------------|------------------------------|--------------------------------------|------------|
|                               |              |                            | LL                  | PI |                     | pcf                    | kg/m <sup>3</sup> |                            | pcf                      | kg/m <sup>3</sup> |                              |                                      |            |
| I                             | SM-SC        | 38                         | 25                  | 6  |                     | 118.5                  | 1898              | 14.1                       | 115.3                    | 1847              | 13.8                         | 97.3                                 | 7          |
|                               |              |                            |                     |    |                     |                        |                   |                            | 107.6                    | 1724              | 14.2                         | 90.8                                 | 5          |
|                               |              |                            |                     |    |                     |                        |                   |                            | 98.8                     | 1584              | 14.0                         | 83.5                                 | 2          |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
| J                             | ML           | 73                         | 22                  | 1  |                     | 114.5                  | 1834              | 14.7                       | 107.8                    | 1728              | 14.7                         | 94.2                                 | 10         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 103.7                    | 1661              | 14.6                         | 90.6                                 | 3          |
|                               |              |                            |                     |    |                     |                        |                   |                            | 99.4                     | 1592              | 14.7                         | 86.8                                 | 2          |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
| K                             | SC           | 32                         | 33                  | 11 |                     | 128.3                  | 2055              | 10.6                       | 120.7                    | 1933              | 12.0                         | 94.1                                 | 28         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 115.5                    | 1850              | 12.8                         | 90.1                                 | 20         |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |
| L                             | SW-SM        | 9                          |                     |    |                     | 133.4                  | 2137              | 8.3                        | 128.7                    | 2062              | 8.0                          | 96.5                                 | 89         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 124.2                    | 1989              | 8.1                          | 93.1                                 | 39         |
|                               |              |                            |                     |    |                     |                        |                   |                            | 121.1                    | 1940              | 7.9                          | 90.6                                 | 23         |
|                               |              |                            |                     |    |                     |                        |                   |                            |                          |                   |                              |                                      |            |

# CALIFORNIA BEARING RATIO (CBR) TEST RESULTS VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

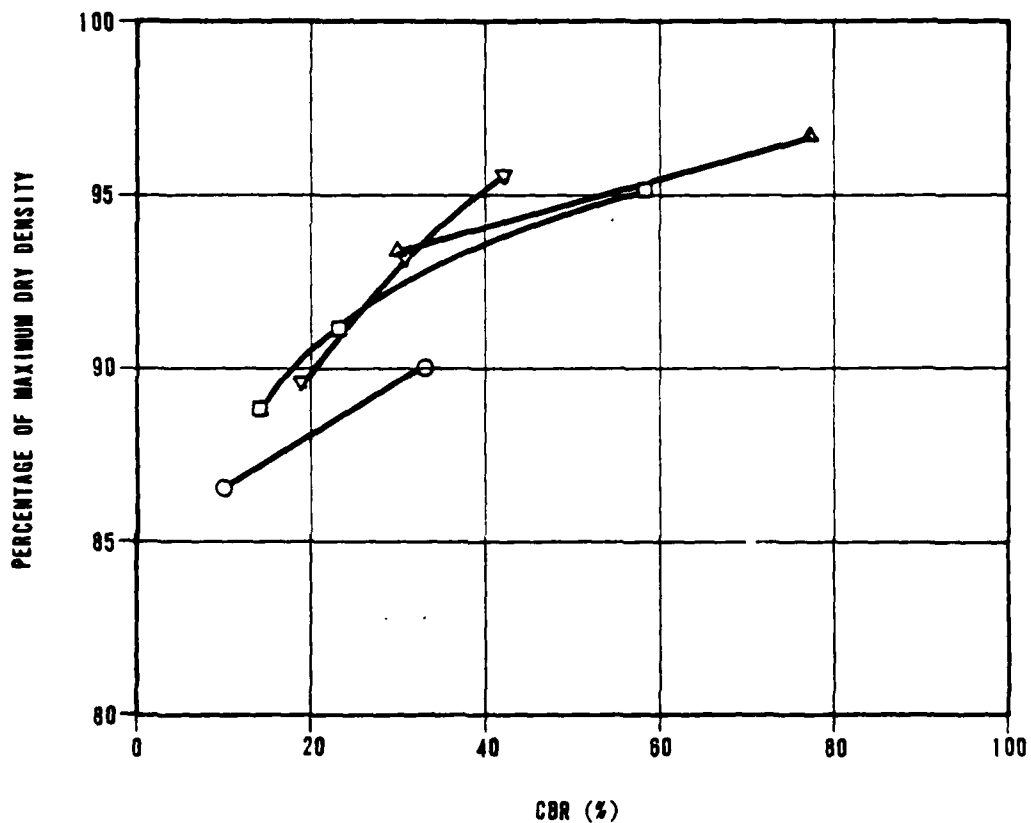
TABLE  
9-6  
3 OF 4

**FUGRO NATIONAL, INC.**

**CALIFORNIA BEARING RATIO (CBR) TEST RESULTS**  
**VERIFICATION SITE, BIG SMOKY COP, NEVADA**

TABLE  
9-6  
4 OF 4

**AFV-13**



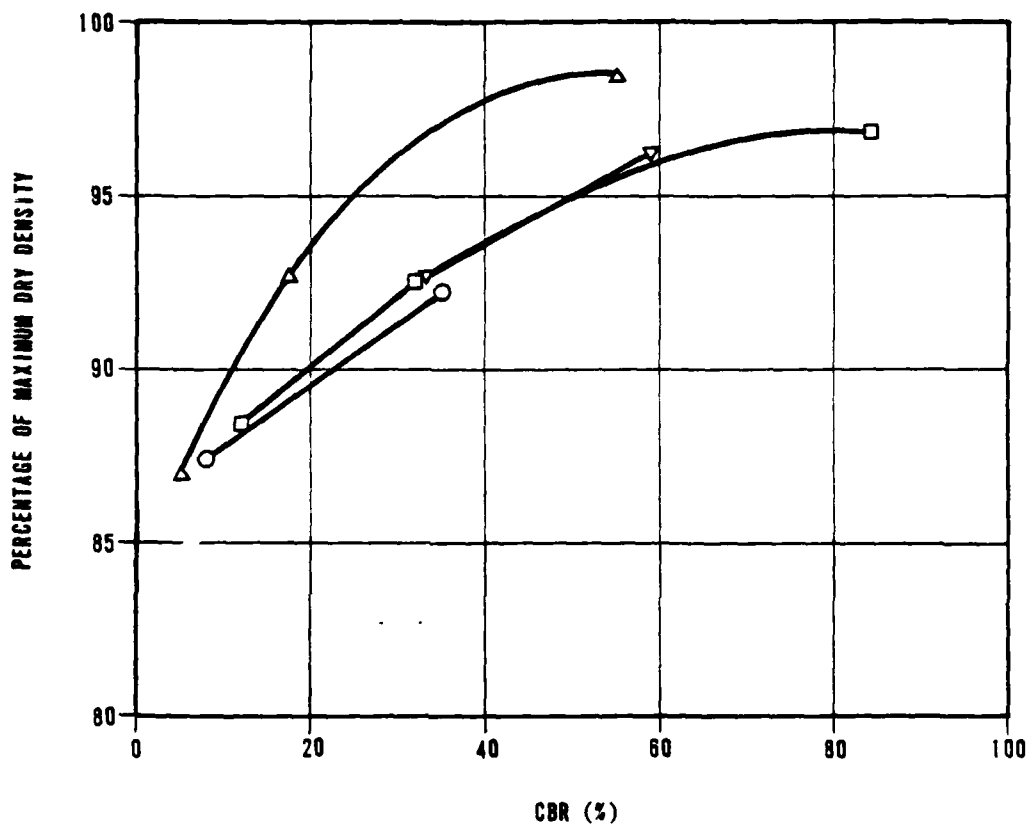
| SYMBOL | COMPOSITE SAMPLE NUMBER | SOIL TYPE |
|--------|-------------------------|-----------|
| ○      | A                       | SM        |
| □      | B                       | SW-SM     |
| △      | C                       | SM        |
| ▽      | D                       | SW-SM     |

CALIFORNIA BEARING RATIO (CBR) CURVES  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

WX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

FIGURE  
9-3  
1 OF 4

**FUGRO NATIONAL, INC.**



| SYMBOL | COMPOSITE<br>SAMPLE<br>NUMBER | SOIL<br>TYPE |
|--------|-------------------------------|--------------|
| ○      | E                             | SM           |
| □      | F                             | SM           |
| △      | G                             | SM           |
| ▽      | H                             | SP-SM        |

CALIFORNIA BEARING RATIO (CBR) CURVES  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

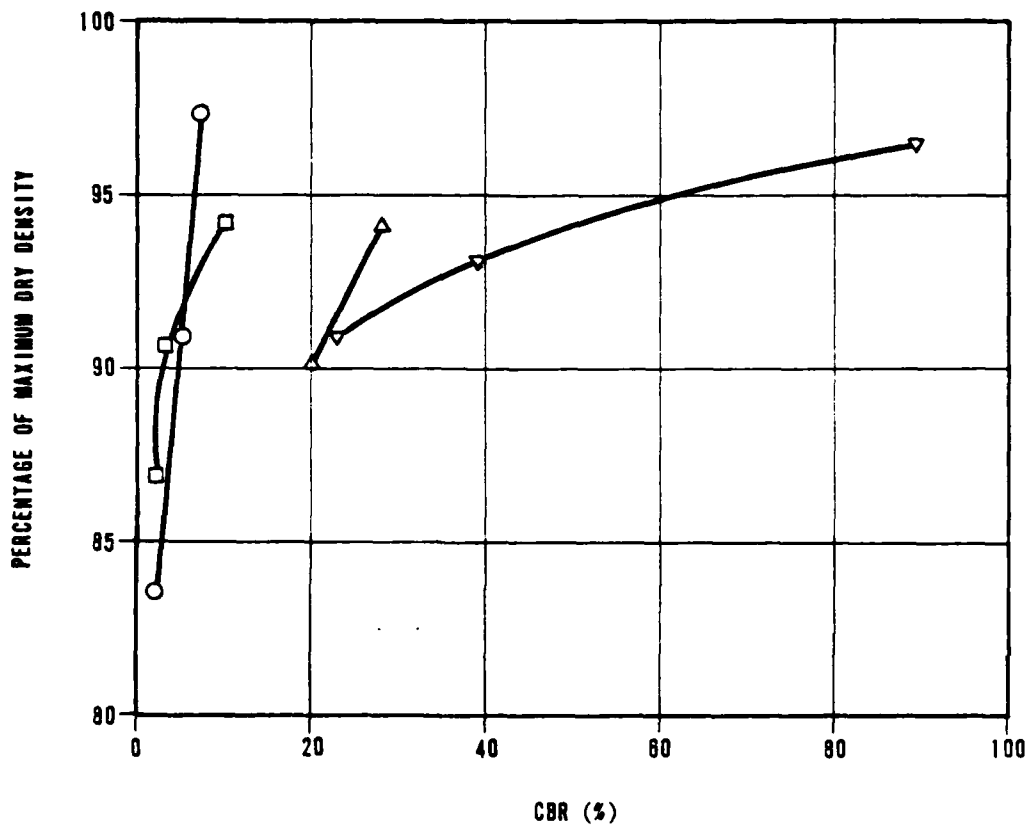
FIGURE  
9-3  
2 OF 4

**FUGRO NATIONAL, INC.**

2 JUL 79

AFV-14

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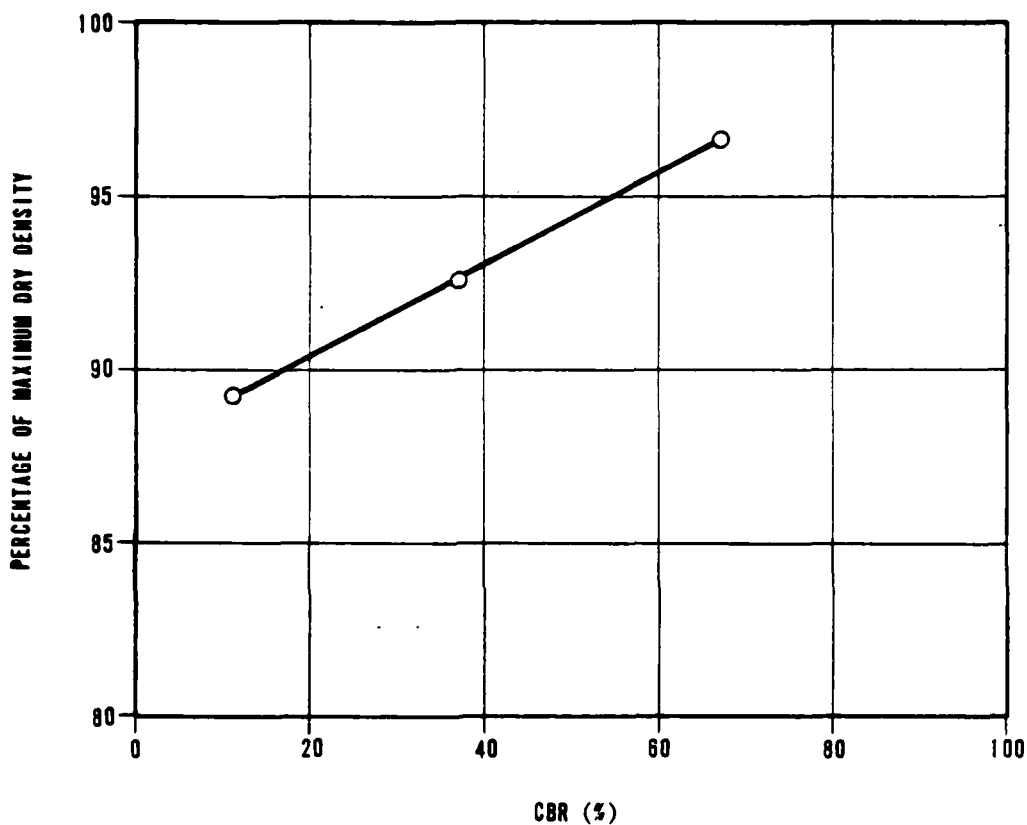
| SYMBOL | COMPOSITE<br>SAMPLE<br>NUMBER | SOIL<br>TYPE |
|--------|-------------------------------|--------------|
| ○      | I                             | SM-SC        |
| □      | J                             | ML           |
| △      | K                             | SC           |
| ▽      | L                             | SW-SM        |

CALIFORNIA BEARING RATIO (CBR) CURVES  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMS0

FIGURE  
9-3  
3 OF 4

**FUGRO NATIONAL, INC.**



| SYMBOL | COMPOSITE SAMPLE NUMBER | SOIL TYPE |
|--------|-------------------------|-----------|
| ○      | M                       | SM        |
|        |                         |           |
|        |                         |           |
|        |                         |           |

CALIFORNIA BEARING RATIO (CBR) CURVES  
VERIFICATION SITE, BIG SMOKY CDP, NEVADA

MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

FIGURE  
9-3  
4 OF 4

**FUGRO NATIONAL, INC.**

2 JUL 79

AFV-14

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SECTION 10.0  
FIELD CBR TEST RESULTS

EXPLANATIONS OF FIELD CBR TEST RESULTS

The results of field CBR tests and related field density, moisture content, and laboratory soil classification tests are presented on the summary table included in this section. The following explanations will aid in reviewing the data included in the table.

- A. Definition of California Bearing Ratio (CBR) - California Bearing Ratio (CBR) is the ratio (in percent) of the resistance to penetration developed by a soil to that developed by a specimen of standard crushed-rock base material and is the basis for many empirical road design methods used in this country.
- B. Activity Number - Field CBR tests are identified as follows:  
BS-F-1  
BS - abbreviation for the site (e.g., BS-Big Smoky)  
F - abbreviation for field CBR test  
1 - number of activity
- C. Ground Surface Elevation - Indicated elevations (in feet and meters) are estimated from topographic maps of the study area within an accuracy of half the contour interval.
- D. Surficial Geologic Units - Indicates the surficial geologic unit in which the activity is located.
- E. USCS - The symbols used are from the Unified Soil Classification System; see Table 6-1 of Section 6.0, "Boring Logs", for details of USCS.

- F. Grain-Size Distribution and Plasticity - These are from results of laboratory tests. See Section 6.0, "Boring Logs", for explanations.
- G. In-Situ Dry Unit Weight - Indicated dry unit weights are from field density tests conducted at each CBR test site in accordance with ASTM D 1556-64, "Test for Density of Soil in Place by the Sand-Cone Method".
- H. Moisture Content - Moisture contents as determined in the field by the "Speedy Moisture Tester".
- I. Estimated Percent of Maximum Dry Density - Indicates the ratio (as a percentage) of in-situ dry unit weight to the 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".
- J. Average Field CBR - Average of three field CBR tests performed at each level.
- K. Remarks - These include comments about the in-situ soil conditions which may have had significant influence on the CBR test (cementation, cobbles, gravel, and/or unusual moisture content). See Section 6.0, "Boring Logs", for explanation of terms used to describe cementation and cobbles. Indurated indicates soil or rock hardened by heat, pressure and/or cementation. Disseminated caliche indicates a scattered distribution of calcium carbonate in the soil profile.

SECTION 10.0  
FIELD CBR TEST RESULTS

| ACTIVITY<br>NUMBER | GROUND<br>SURFACE<br>ELEVATION |        | SURFICIAL<br>GEOLOGIC<br>UNIT | DEPTH |        | USCS  | GRAIN SIZE<br>DISTRIBUTION<br>AND PLASTICITY |    |    |    |    | IN SITU<br>DRY UNIT<br>WEIGHT |                      | MOISTURE<br>CONTENT<br>(%) | ESTIMATED<br>PERCENT OF<br>MAXIMUM<br>DRY<br>DENSITY | AVERAGE<br>FIELD CBR<br>(%) |
|--------------------|--------------------------------|--------|-------------------------------|-------|--------|-------|----------------------------------------------|----|----|----|----|-------------------------------|----------------------|----------------------------|------------------------------------------------------|-----------------------------|
|                    | FEET                           | METERS |                               | FEET  | METERS |       | GR                                           | SA | FI | LL | PI | (pcf)                         | (kg m <sup>3</sup> ) |                            |                                                      |                             |
| BS-F-1             | 5380                           | 1840   | A5i                           | 1.0   | 0.30   | SM    | 18                                           | 70 | 12 |    | NP | 98.2                          | 1573                 | 12.8                       | 88                                                   | 28                          |
|                    |                                |        |                               | 1.8   | 0.55   | SP-SM | 21                                           | 71 | 8  |    |    | 100.1                         | 1804                 | 8.0                        | 81                                                   | 24                          |
| BS-F-2             | 5145                           | 1588   | A5y                           | 1.0   | 0.30   | SM    | 14                                           | 72 | 14 |    |    | 103.7                         | 1881                 | 9.0                        | 84                                                   | 11                          |
|                    |                                |        |                               | 2.0   | 0.61   | SW-SM | 4                                            | 90 | 8  |    |    | 102.3                         | 1839                 | 4.4                        | 85                                                   | 14                          |
| BS-F-3             | 5080                           | 1548   | A5y                           | 1.0   | 0.30   | SM    | 23                                           | 83 | 14 | 23 | 2  | 101.9                         | 1832                 | 9.8                        | 83                                                   | 15                          |
|                    |                                |        |                               | 1.7   | 0.52   | SW-SM | 10                                           | 78 | 11 |    |    | 107.7                         | 1725                 | 8.2                        | 83                                                   | 41                          |
| BS-F-4             | 4942                           | 1508   | A5y                           | 1.0   | 0.30   | SM    | 18                                           | 88 | 15 |    |    | 103.0                         | 1850                 | 5.8                        | 78                                                   | 15                          |
|                    |                                |        |                               | 1.7   | 0.52   | SM    | 14                                           | 71 | 15 |    | NP | 111.0                         | 1778                 | 5.2                        | 85                                                   | 38                          |
| BS-F-5             | 4872                           | 1485   | A5y/A3                        | 1.0   | 0.30   | SP-SM | 9                                            | 79 | 12 |    |    | 98.8                          | 1454                 | 7.0                        | 88                                                   | 8                           |
|                    |                                |        |                               | 1.7   | 0.52   | SM    | 3                                            | 82 | 15 |    |    | 98.4                          | 1544                 | 4.8                        | 85                                                   | 28                          |
| BS-F-6             | 4822                           | 1500   | A5y/A3                        | 1.0   | 0.30   | SM    | 8                                            | 77 | 17 |    |    | 105.4                         | 1888                 | 8.0                        | 85                                                   | 10                          |
|                    |                                |        |                               | 2.0   | 0.61   | SW-SM | 15                                           | 78 | 7  |    |    | 102.7                         | 1845                 | 4.8                        | 82                                                   | 31                          |
| BS-F-7             | 4905                           | 1485   | A1/A5y                        | 1.2   | 0.38   | SM    | 9                                            | 77 | 14 |    |    | 97.1                          | 1555                 | 5.8                        | 85                                                   | 13                          |
|                    |                                |        |                               | 2.2   | 0.67   | SW-SM | 12                                           | 77 | 11 |    |    | 100.2                         | 1805                 | 3.8                        | 81                                                   | 17                          |
| BS-F-8             | 4897                           | 1493   | A5y/A4                        | 0.5   | 0.15   | SM    | 7                                            | 59 | 34 | 22 | 3  | 102.8                         | 1844                 | 8.4                        | 88                                                   | 17                          |
|                    |                                |        |                               | 1.5   | 0.48   | SP-SM | 23                                           | 88 | 8  |    | NP | 110.5                         | 1770                 | 3.2                        | 83                                                   | 38                          |
| BS-F-9             | 4878                           | 1487   | A5y/A4                        | 0.7   | 0.21   | GP    | 52                                           | 44 | 4  |    | NP | 118.2                         | 1881                 | 2.2                        | 88                                                   | 48                          |
|                    |                                |        |                               | 1.7   | 0.52   | GP    | 50                                           | 48 | 2  |    |    |                               |                      |                            |                                                      | 31                          |
| BS-F-10            | 5880                           | 1823   | A1/A5y                        | 1.0   | 0.30   | SM    | 18                                           | 87 | 17 |    |    | 98.3                          | 1581                 | 8.8                        | 88                                                   | 10                          |
|                    |                                |        |                               | 1.8   | 0.55   | SP    | 38                                           | 59 | 3  |    |    | 120.8                         | 1932                 | 2.2                        | 93                                                   | 22                          |
| BS-F-11            | 5014                           | 1528   | A1                            | 0.5   | 0.15   | SC-SM | 1                                            | 81 | 38 | 25 | 8  | 88.7                          | 1421                 | 12.3                       | 75                                                   | 11                          |
|                    |                                |        |                               | 1.5   | 0.48   | ML    | 2                                            | 25 | 73 | 22 | 1  | 75.4                          | 1208                 | 7.1                        | 88                                                   | 8                           |
| BS-F-12            | 5108                           | 1557   | A1                            | 1.0   | 0.30   | SM    | 8                                            | 84 | 28 | 21 | 3  | 94.5                          | 1514                 | 15.1                       | 77                                                   | 8                           |
|                    |                                |        |                               | 1.8   | 0.55   | SW-SM | 15                                           | 74 | 11 |    |    | 115.8                         | 1855                 | 5.2                        | 88                                                   | 38                          |
| BS-F-13            | 5130                           | 1584   | A5y                           | 0.5   | 0.15   | SM    | 4                                            | 84 | 12 |    |    | 95.8                          | 1531                 | 12.4                       | 88                                                   | 4                           |
|                    |                                |        |                               | 2.0   | 0.61   | SM    | 10                                           | 57 | 33 |    |    | 90.8                          | 1458                 | 12.8                       | 75                                                   | 4                           |
| BS-F-14            | 5175                           | 1577   | A5y                           | 1.0   | 0.30   | SM    | 2                                            | 82 | 18 |    |    | 104.1                         | 1888                 | 8.0                        | 81                                                   | 3                           |
|                    |                                |        |                               | 2.0   | 0.61   | SM    | 13                                           | 88 | 18 |    |    | 84.3                          | 1350                 | 8.3                        | 74                                                   | 9                           |
| BS-F-15            | 5510                           | 1878   | A5i                           | 1.0   | 0.30   | SP-SM | 24                                           | 85 | 11 |    |    | 108.4                         | 1752                 | 7.2                        | 84                                                   | 21                          |
|                    |                                |        |                               | 1.7   | 0.52   | SP-SM | 22                                           | 72 | 8  |    |    | 104.8                         | 1878                 | 4.5                        | 78                                                   | 12                          |
| BS-F-16            | 5570                           | 1898   | A5y                           | 1.0   | 0.30   | SM    | 1                                            | 78 | 23 |    |    | 105.7                         | 1893                 | 7.8                        | 83                                                   | 20                          |
| BS-F-17            | 5380                           | 1834   | A5i                           | 0.5   | 0.15   | SC    | 23                                           | 45 | 32 | 33 | 11 | 99.5                          | 1584                 | 8.8                        | 78                                                   | 3                           |
|                    |                                |        |                               | 1.5   | 0.48   | SW-SM | 20                                           | 72 | 8  |    |    | 108.8                         | 1708                 | 3.8                        | 88                                                   | 22                          |
| BS-F-18            | 5338                           | 1827   | A5y                           | 1.0   | 0.30   | SM    | 2                                            | 71 | 27 |    |    | 93.5                          | 1488                 | 8.8                        | 78                                                   | 4                           |
|                    |                                |        |                               | 1.7   | 0.52   | SM    | 3                                            | 67 | 30 |    |    | 92.5                          | 1482                 | 8.8                        | 77                                                   | 4                           |
| BS-F-19            | 5881                           | 1732   | A5y                           | 1.3   | 0.40   | SM    | 3                                            | 81 | 18 |    |    | 104.1                         | 1888                 | 8.2                        | 88                                                   | 8                           |
|                    |                                |        |                               | 2.0   | 0.61   | SM    | 3                                            | 81 | 18 |    |    | 98.7                          | 1548                 | 8.8                        | 88                                                   | 5                           |

| ESTIMATED<br>PERCENT OF<br>MAXIMUM<br>DRY<br>DENSITY | AVERAGE<br>FIELD CBR<br>(%) | REMARKS                                             |
|------------------------------------------------------|-----------------------------|-----------------------------------------------------|
| 80                                                   | 20                          | Stage I-□ caliche, slightly indurated               |
| 81                                                   | 24                          | Stage □ caliche, slightly indurated                 |
| 84                                                   | 11                          | Stage I caliche, variable cementation, weak         |
| 85                                                   | 14                          | Stage □ caliche, weak to slightly indurated         |
| 83                                                   | 15                          | Stage I caliche, weak                               |
| 83                                                   | 41                          | Stage □ caliche, moderately indurated               |
| 78                                                   | 15                          | Stage I caliche, slightly indurated                 |
| 85                                                   | 39                          | Stage □ caliche, moderately indurated               |
| 80                                                   | 8                           | Disseminated caliche, uncemented to weakly cemented |
| 85                                                   | 28                          | Stage □ caliche, slightly indurated                 |
| 85                                                   | 10                          | Disseminated caliche, weak                          |
| 82                                                   | 31                          | Stage □ caliche, moderately indurated               |
| 85                                                   | 13                          | Stage I caliche, weak                               |
| 81                                                   | 17                          | Stage I-□ caliche, slightly indurated               |
| 80                                                   | 17                          |                                                     |
| 83                                                   | 38                          | Disseminated caliche, weak                          |
| 80                                                   | 48                          |                                                     |
|                                                      | 31                          | Field density not obtained due to soil caving       |
| 80                                                   | 10                          | Disseminated caliche, weak                          |
| 83                                                   | 22                          |                                                     |
| 75                                                   | 11                          |                                                     |
| 88                                                   | 8                           | Collapsing silt                                     |
| 77                                                   | 8                           |                                                     |
| 88                                                   | 38                          | Disseminated caliche, weak                          |
| 80                                                   | 4                           |                                                     |
| 75                                                   | 4                           |                                                     |
| 81                                                   | 3                           |                                                     |
| 74                                                   | 9                           | Stage I caliche, weak                               |
| 84                                                   | 21                          | Stage □ caliche, slightly indurated                 |
| 78                                                   | 12                          | Stage I caliche, weak                               |
| 83                                                   | 20                          |                                                     |
| 78                                                   | 3                           |                                                     |
| 80                                                   | 22                          | Stage I caliche, slightly indurated                 |
| 78                                                   | 4                           |                                                     |
| 77                                                   | 4                           |                                                     |
| 88                                                   | 8                           |                                                     |
| 80                                                   | 5                           |                                                     |

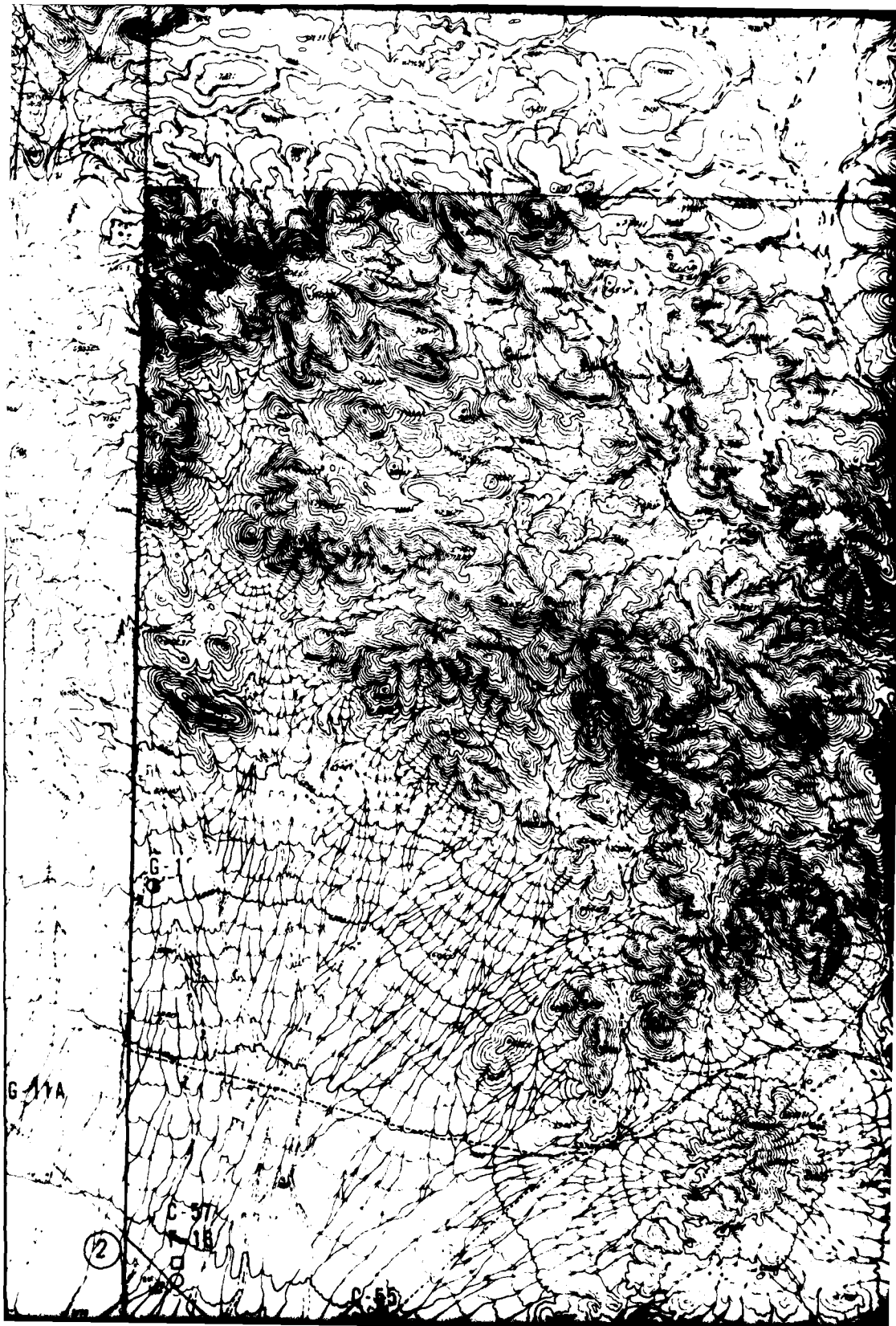
FIELD CBR TEST RESULTS  
VERIFICATION SITE, BIG SMOKY COP, NEVADA

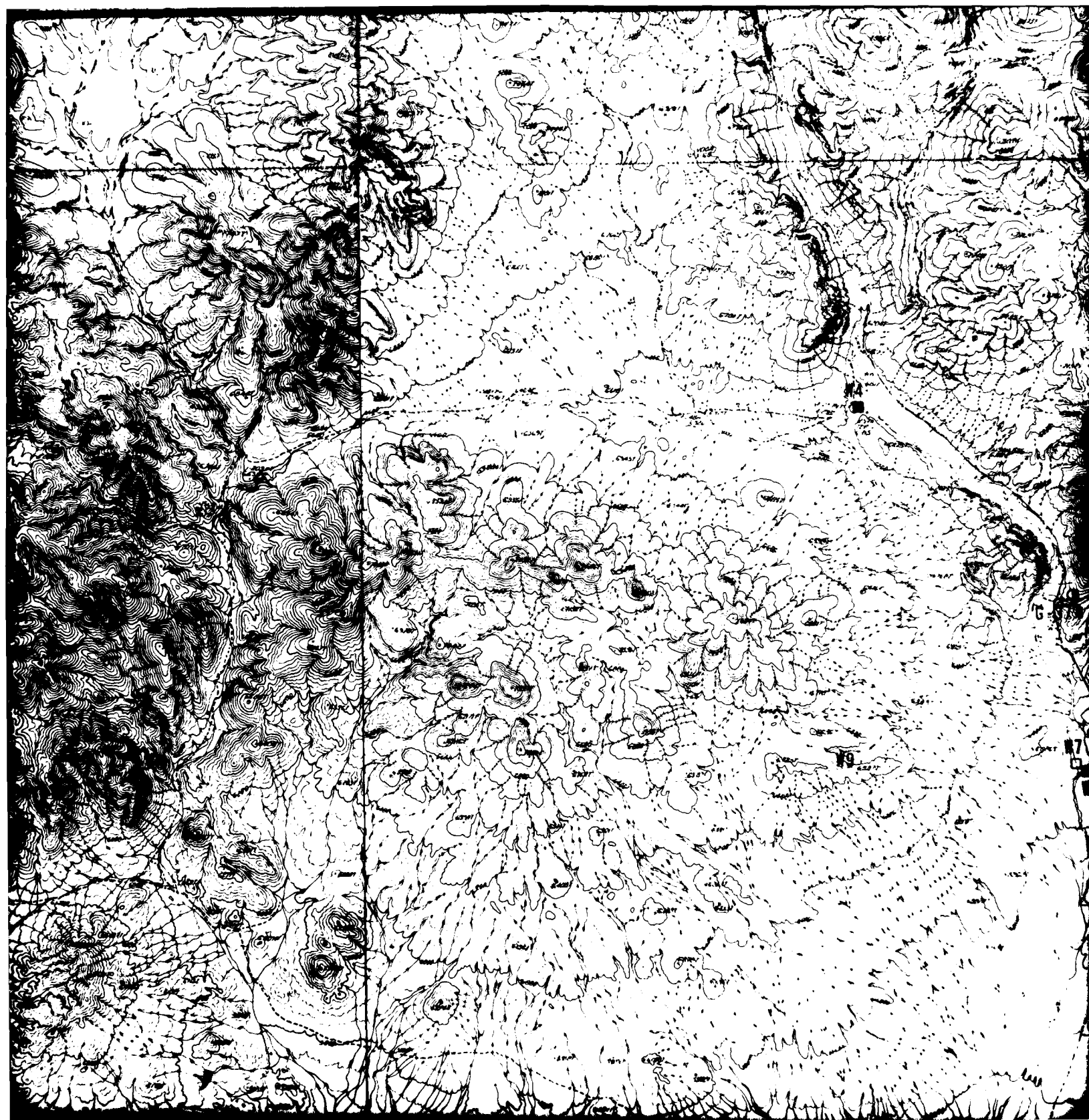
MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SANSO

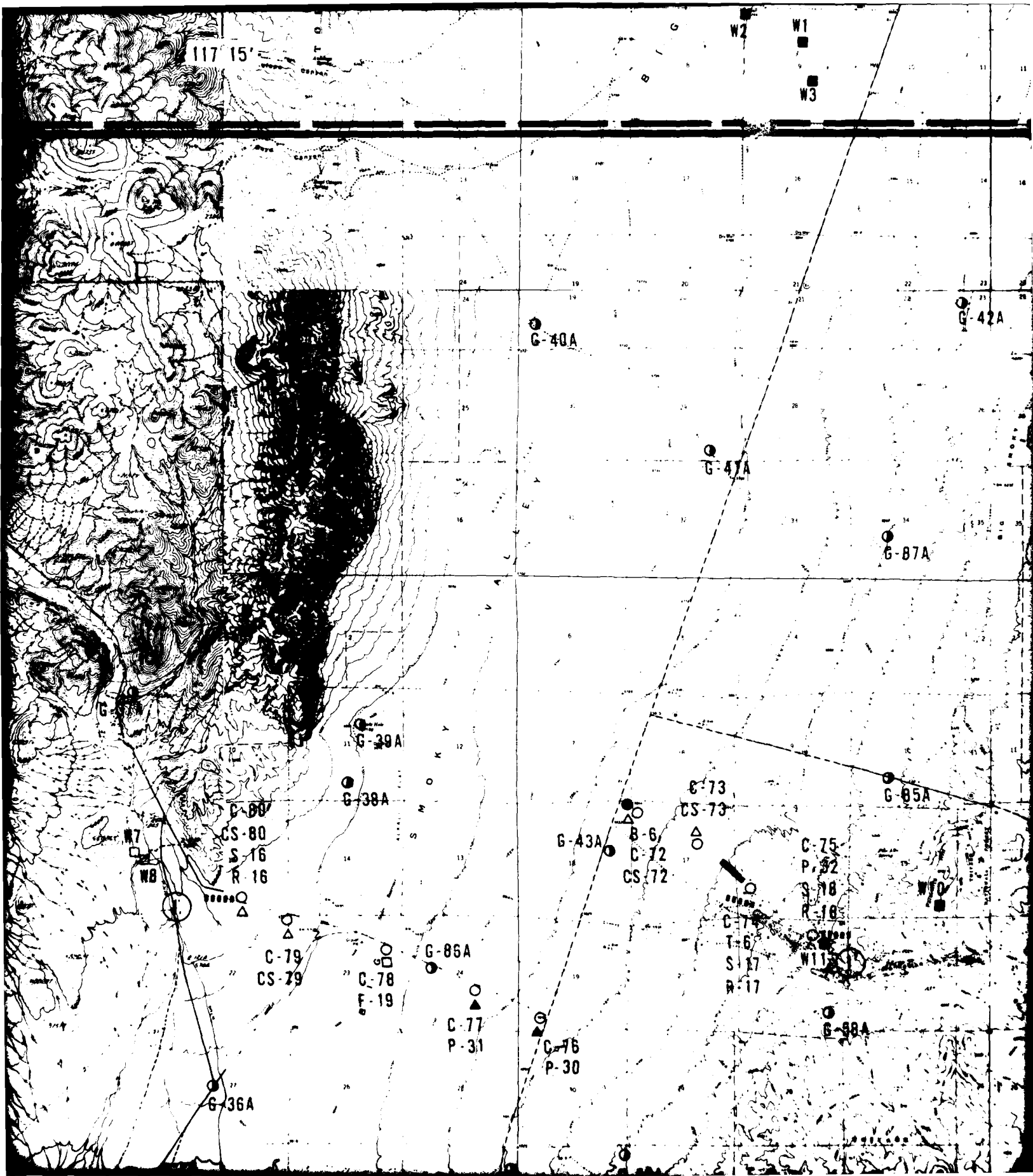
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10-1

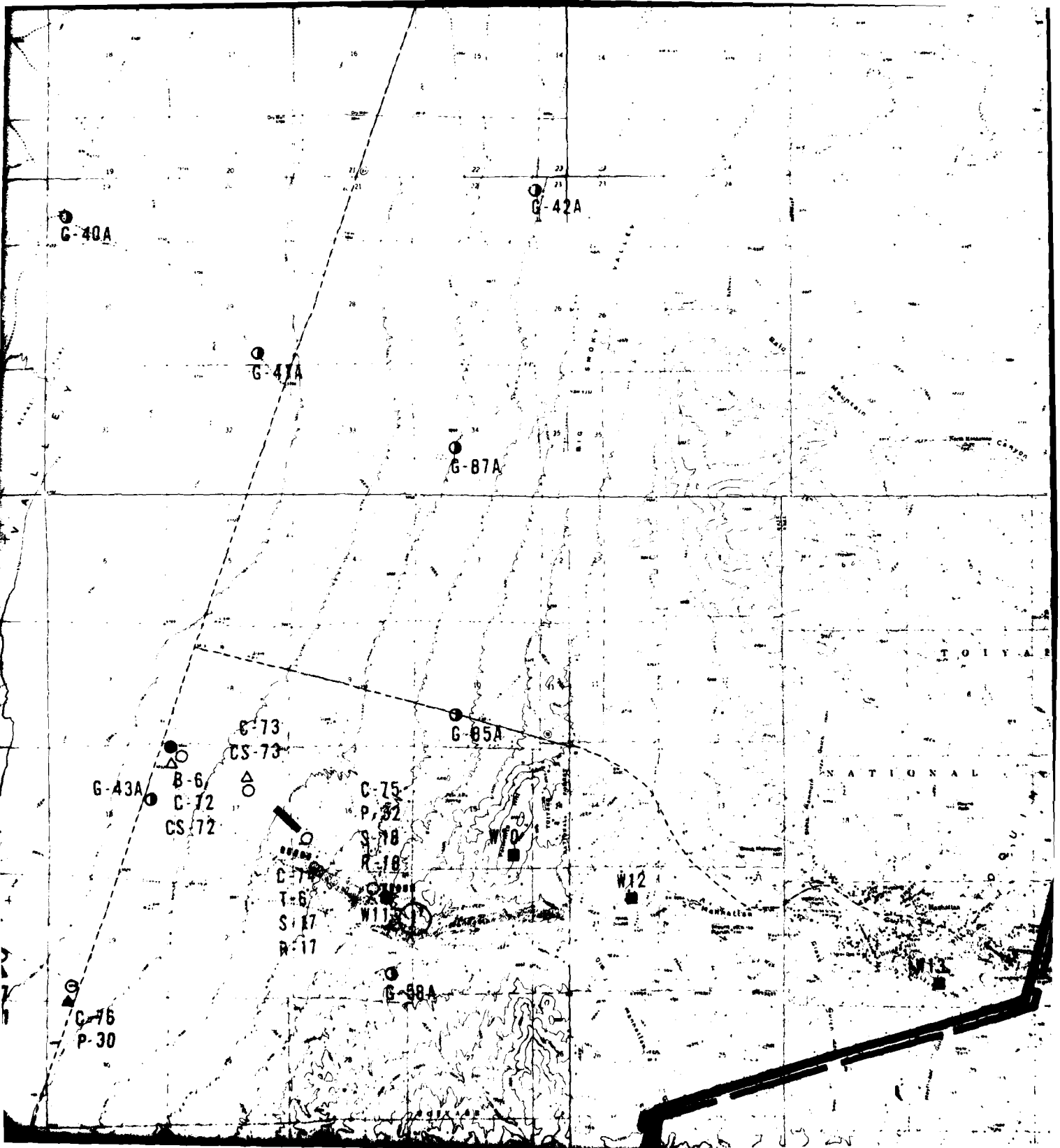
**FUGRO NATIONAL, INC.**

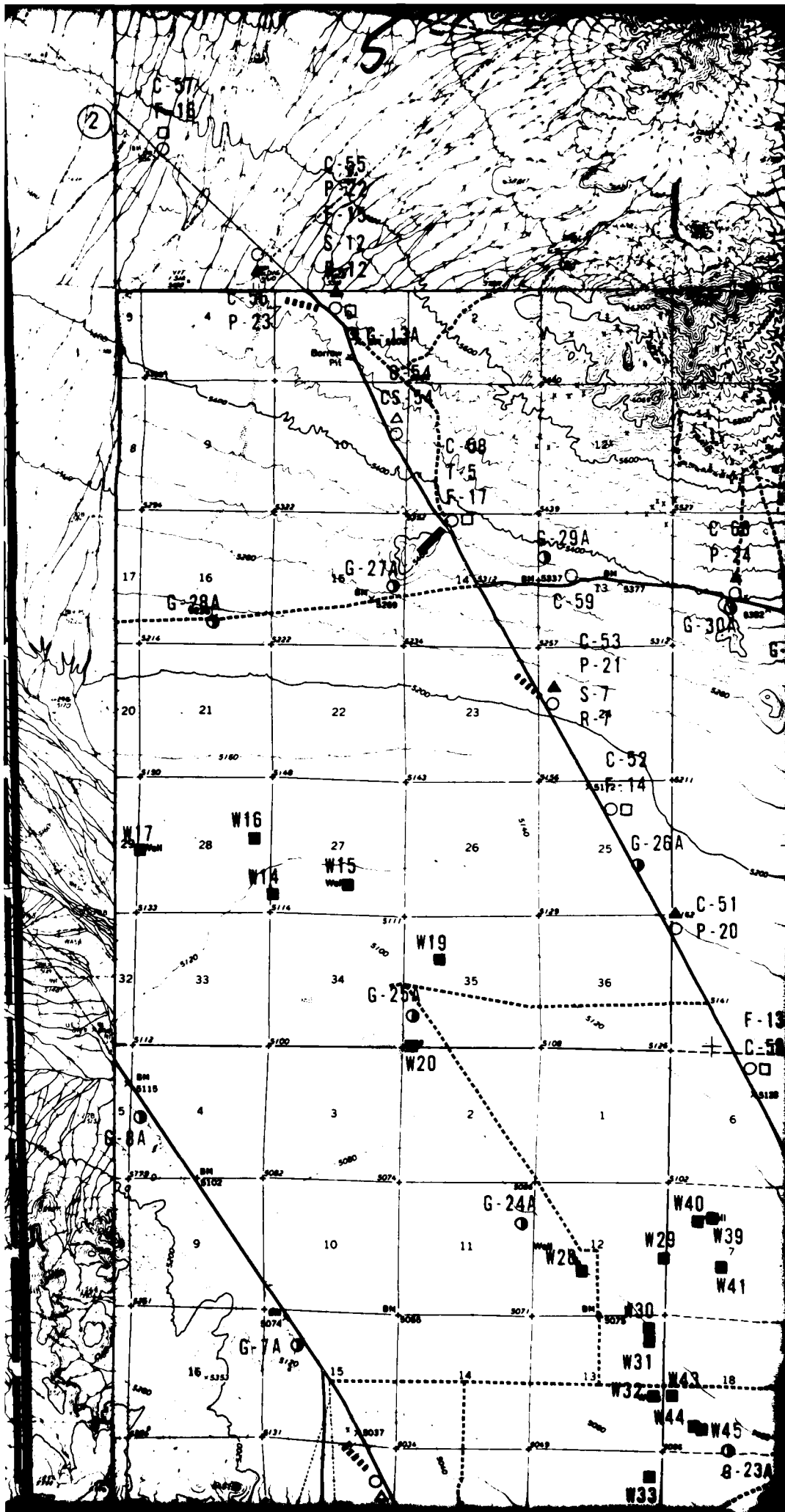
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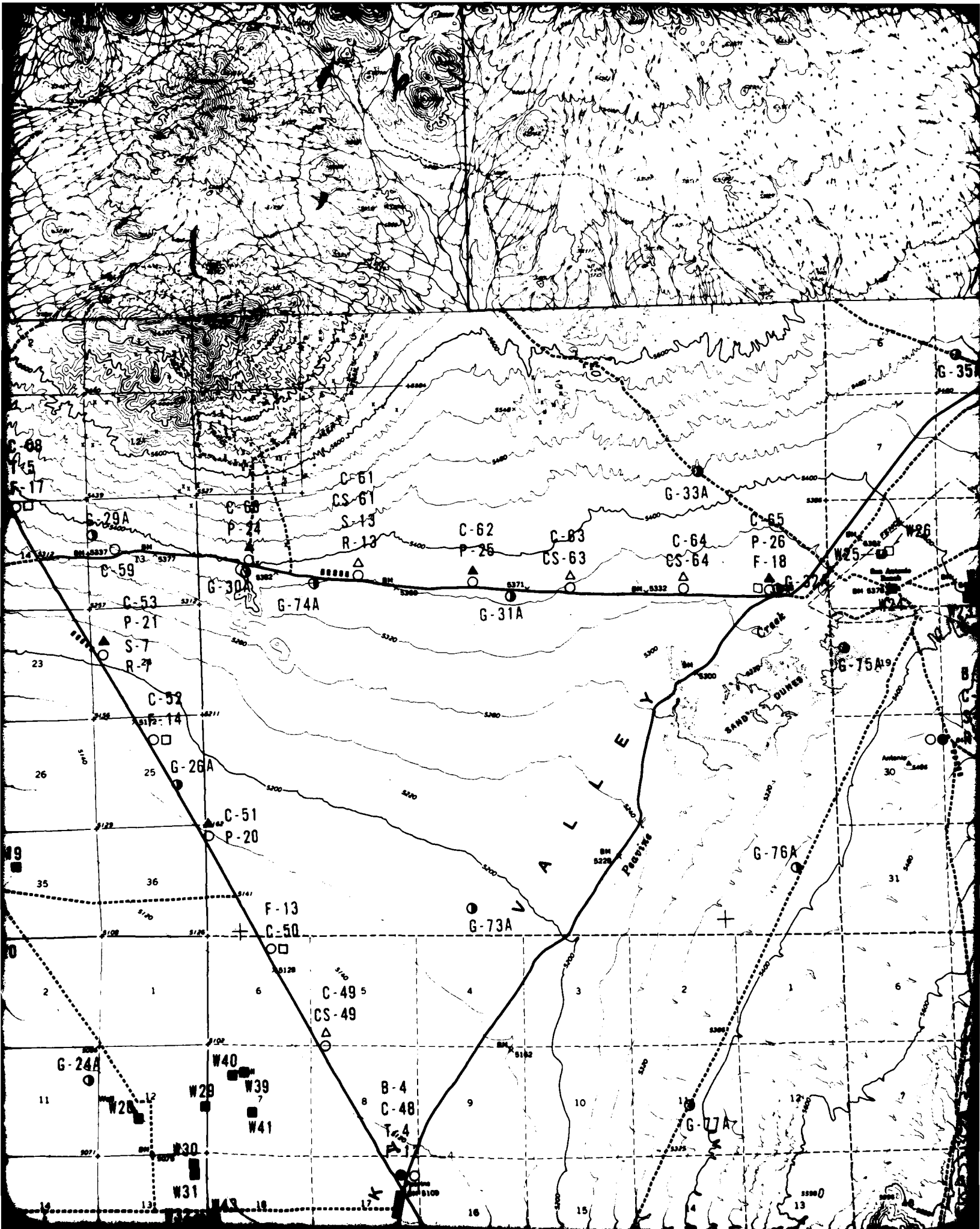


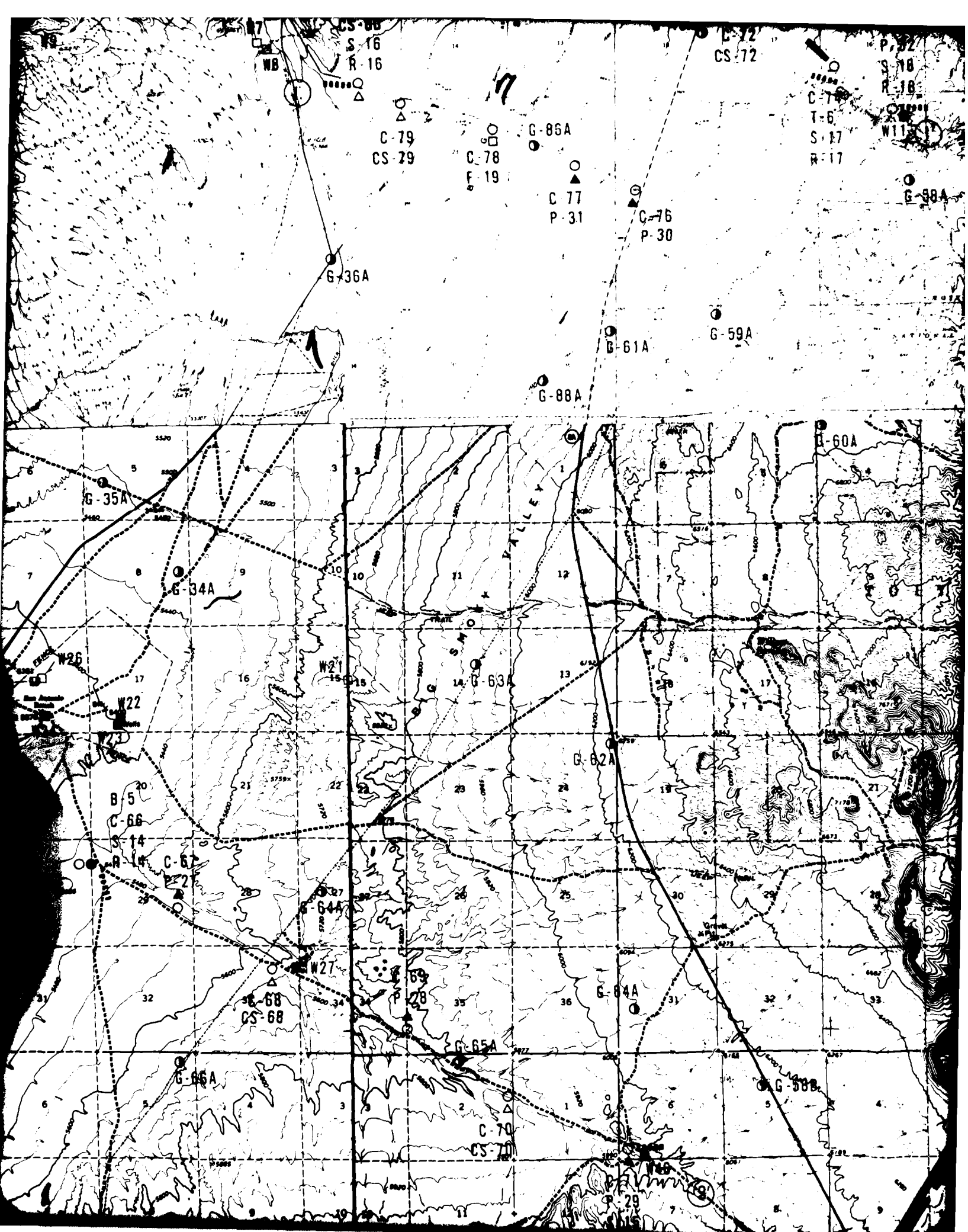


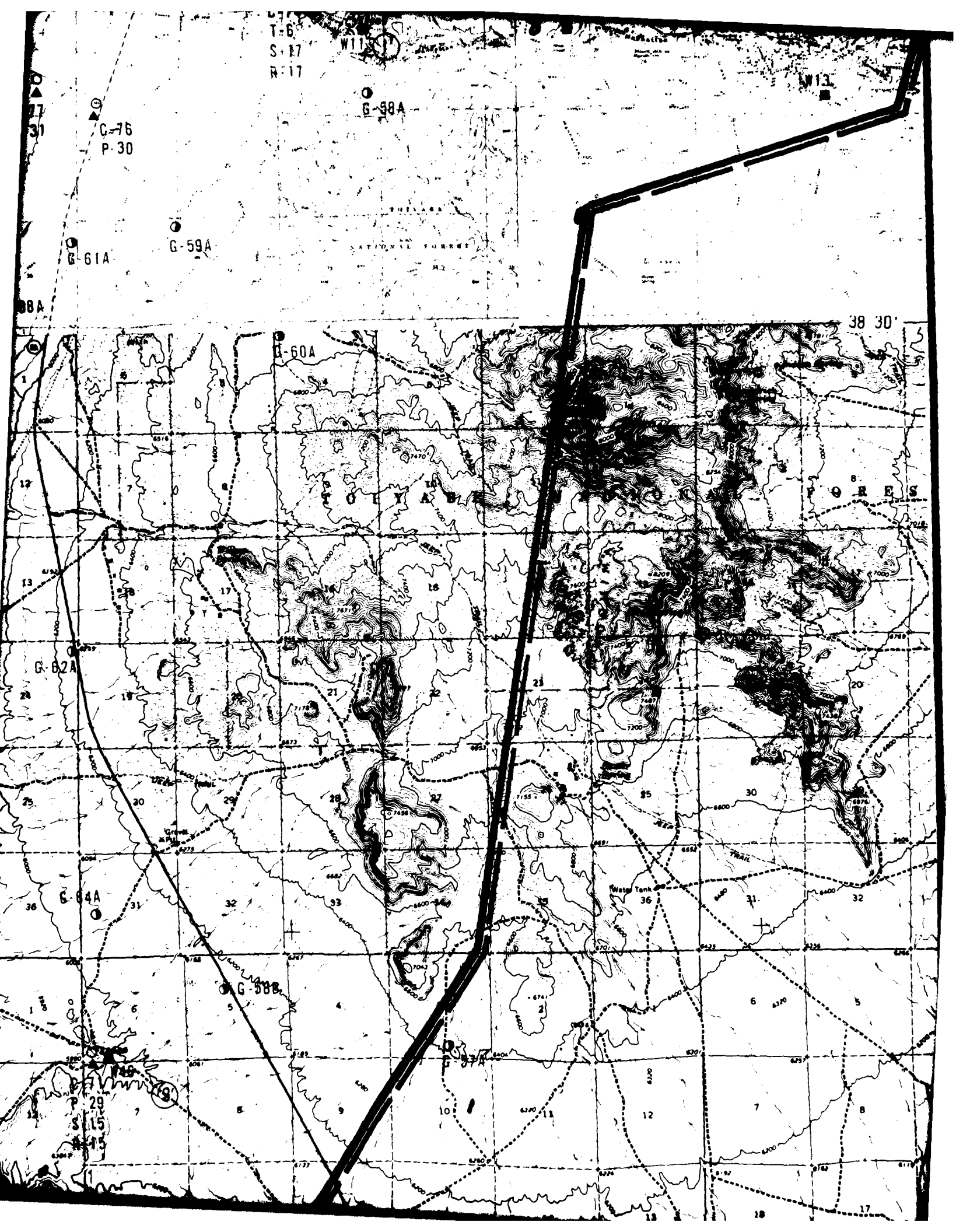


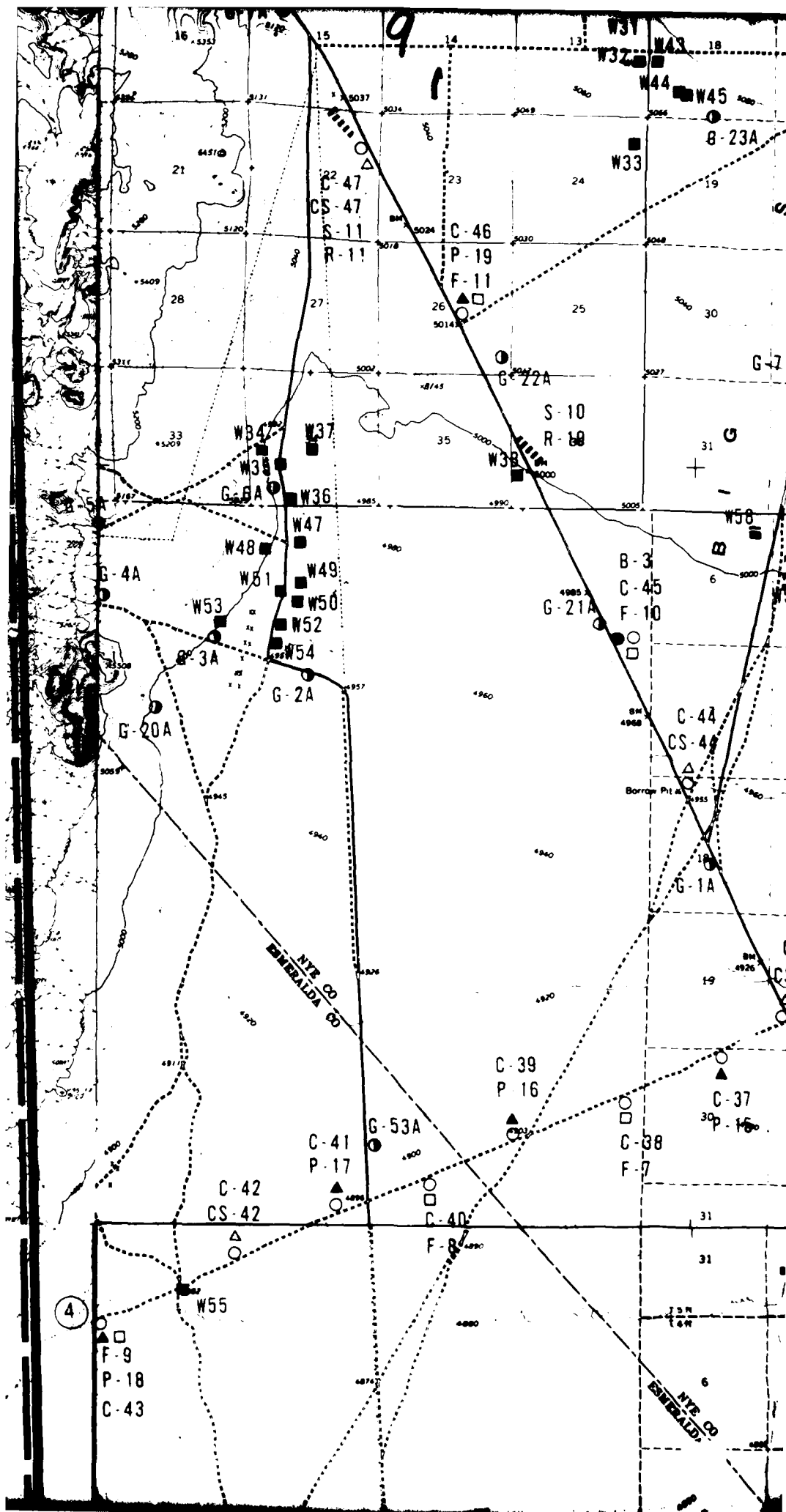


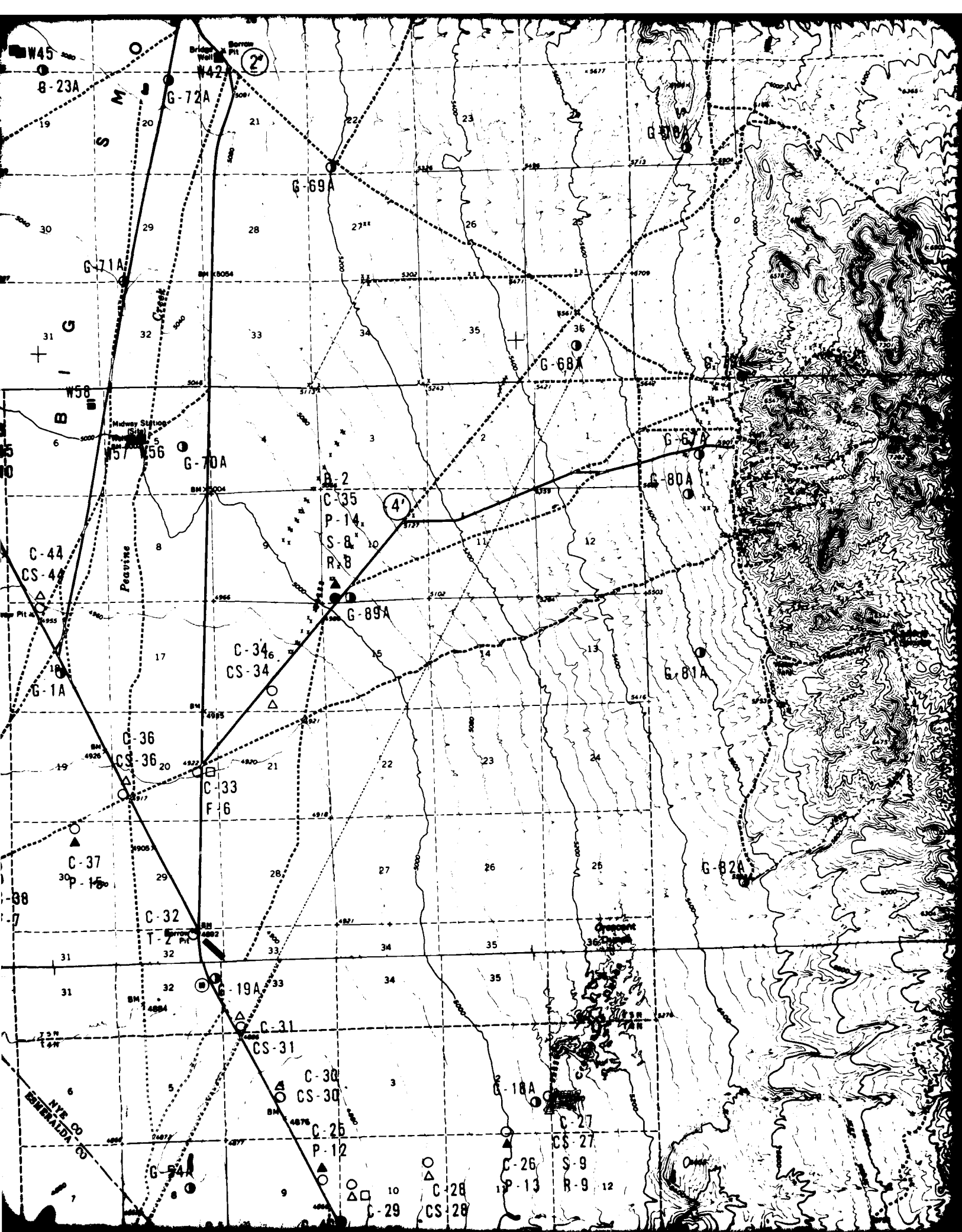


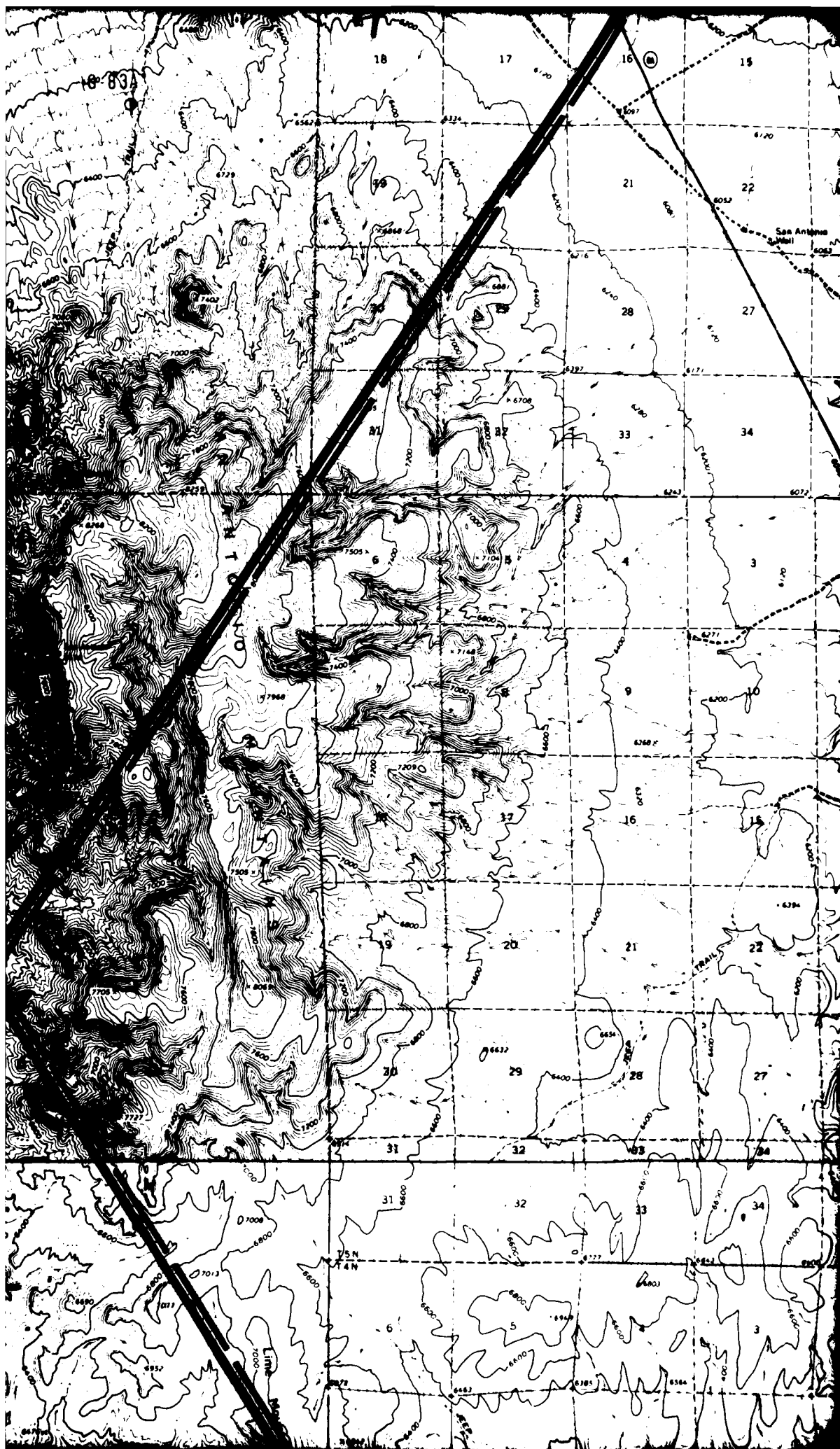


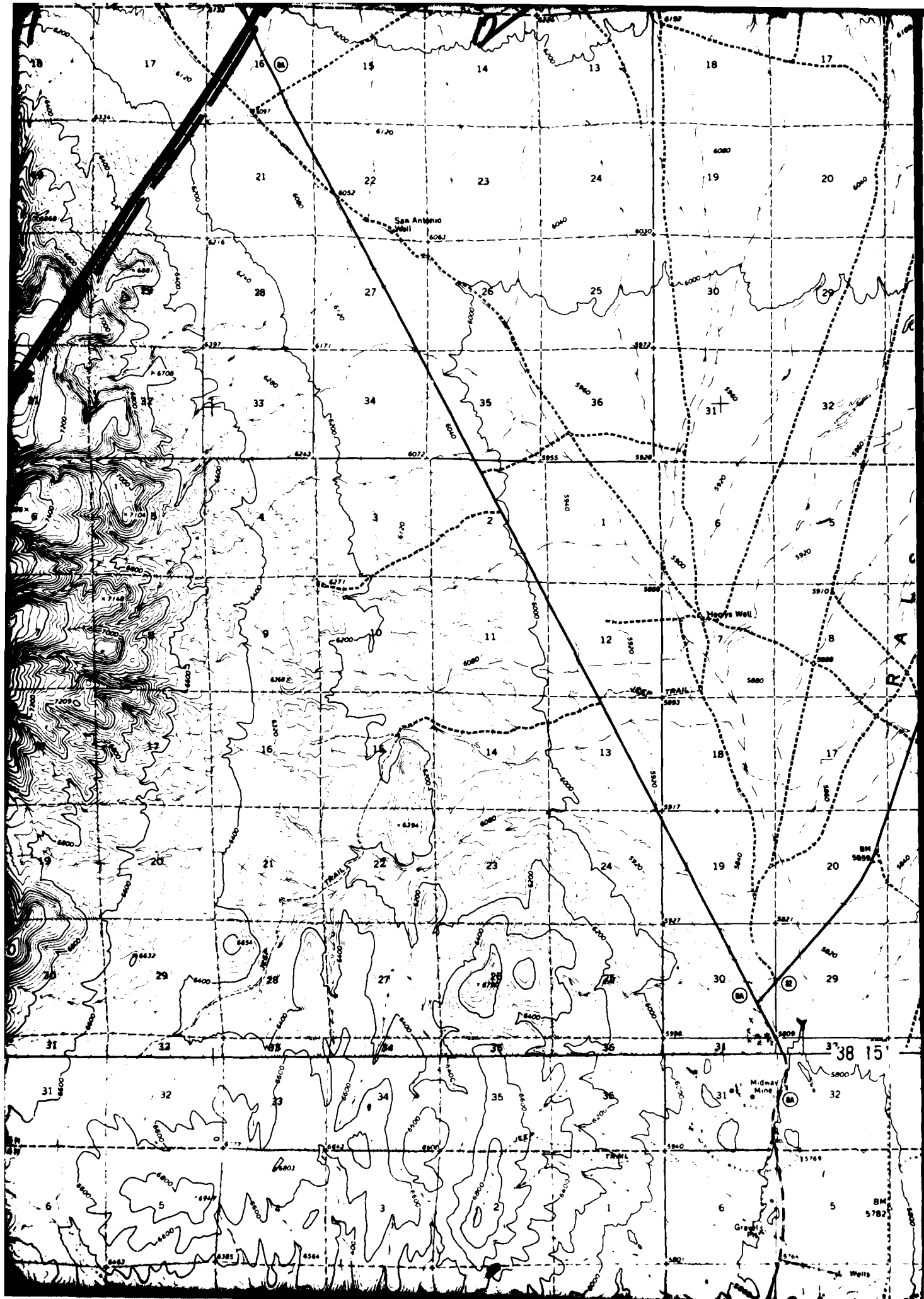


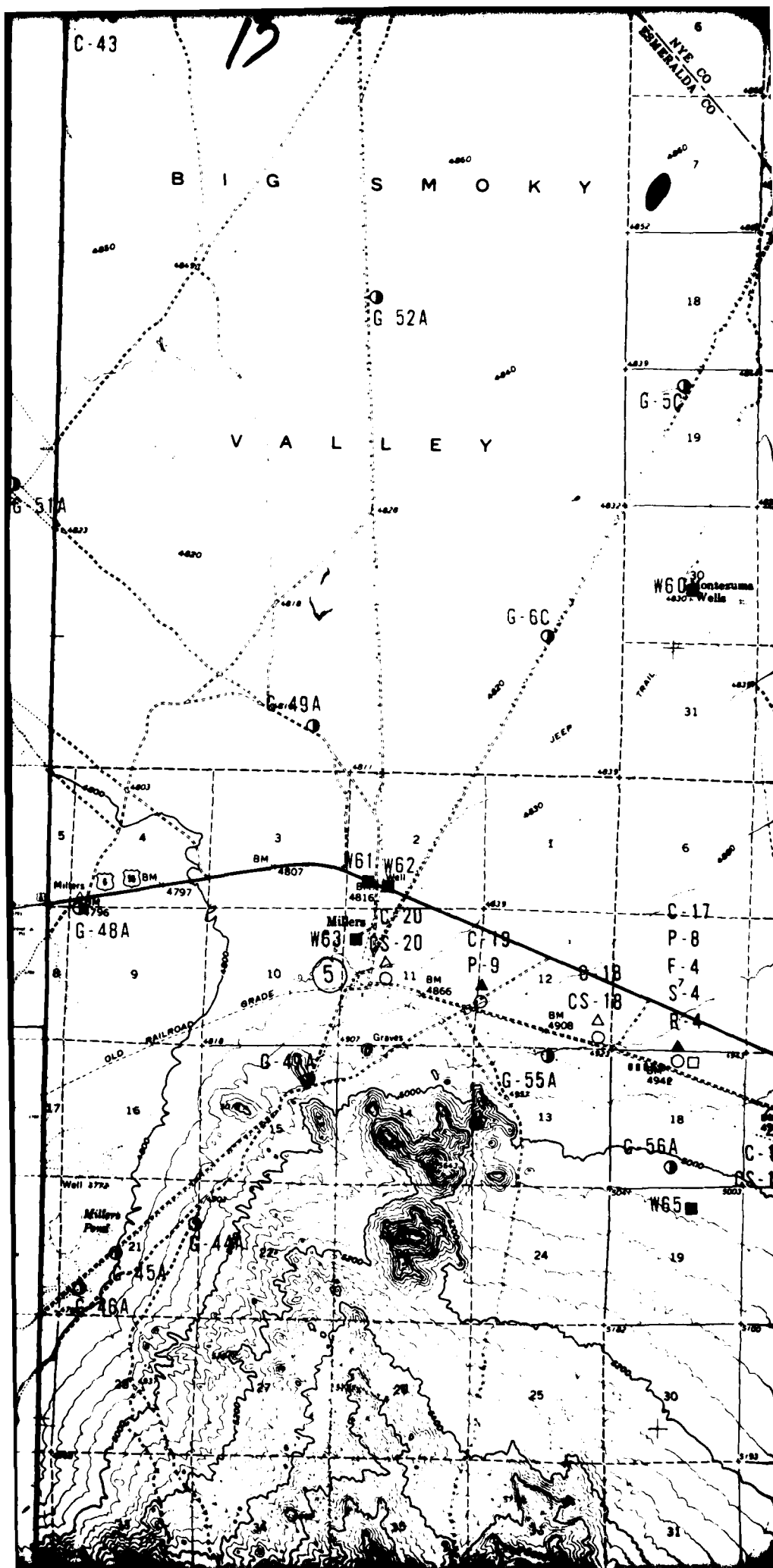


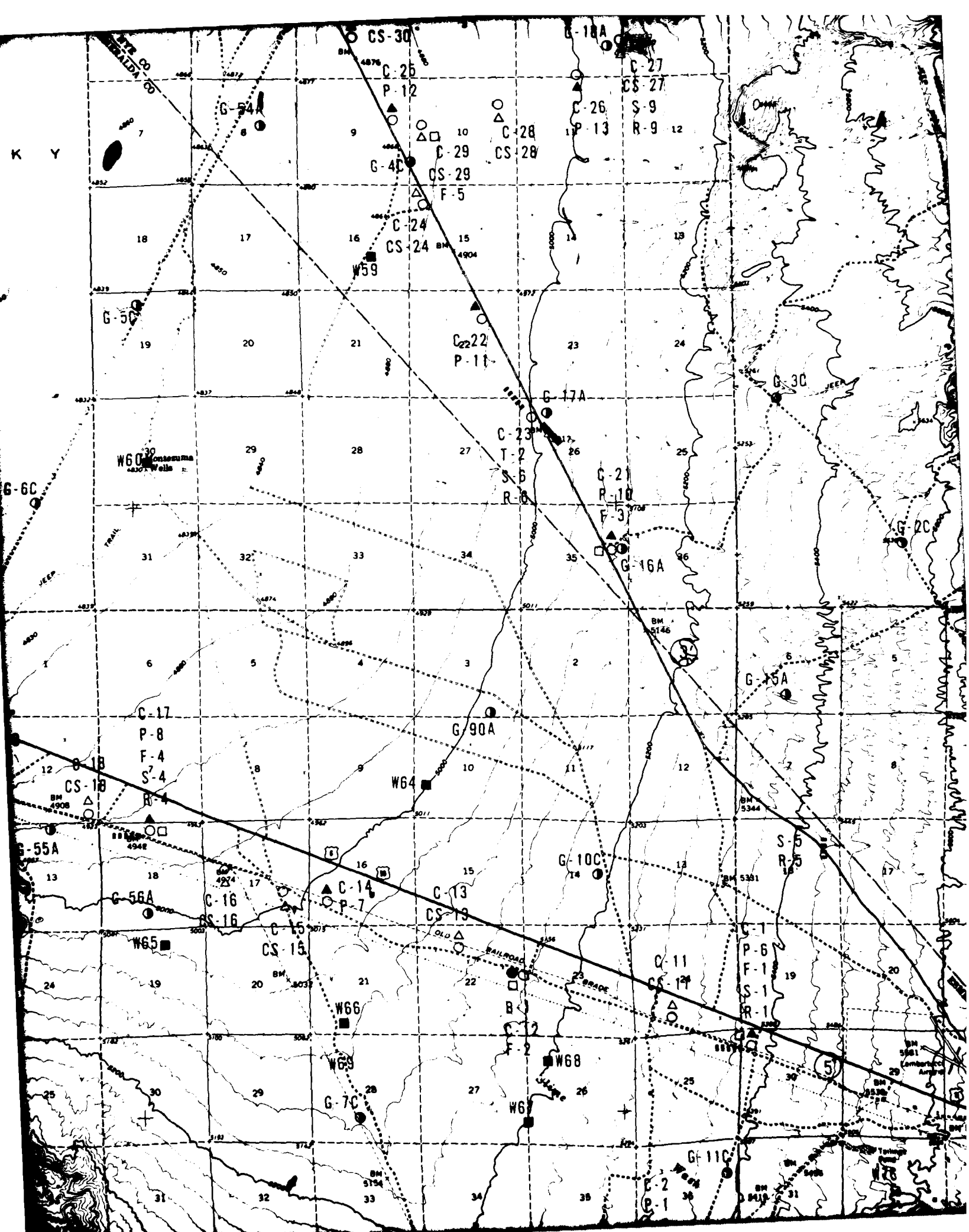


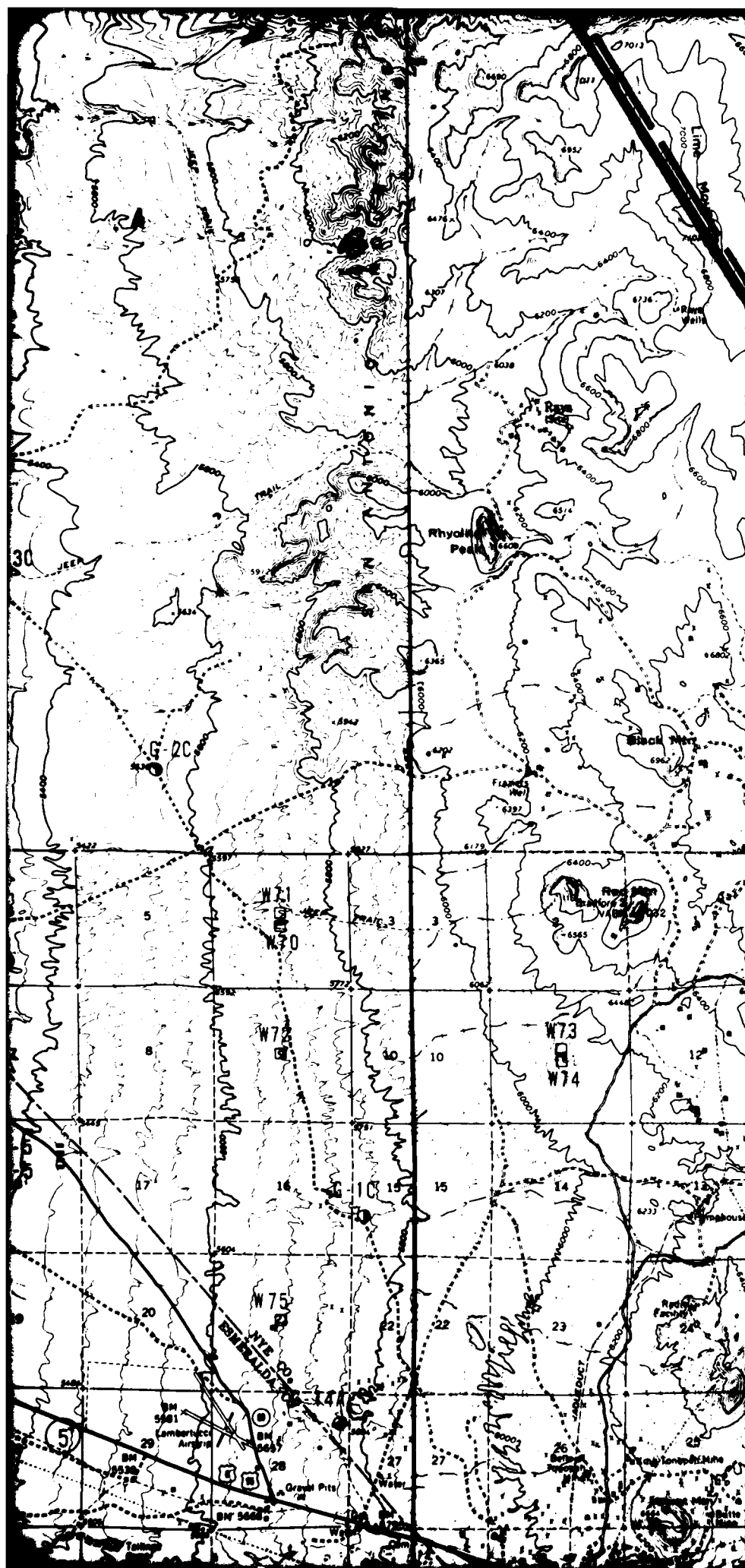


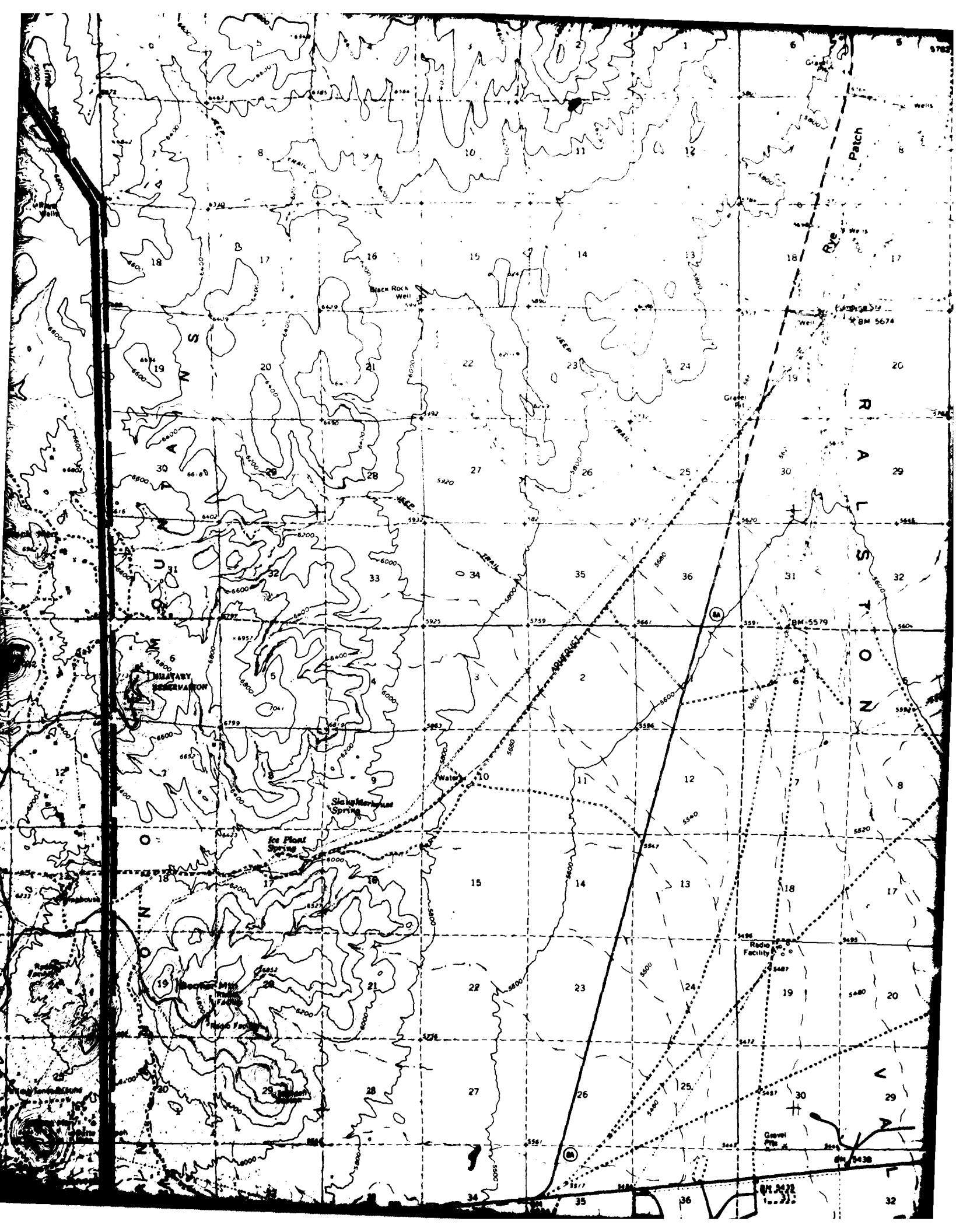


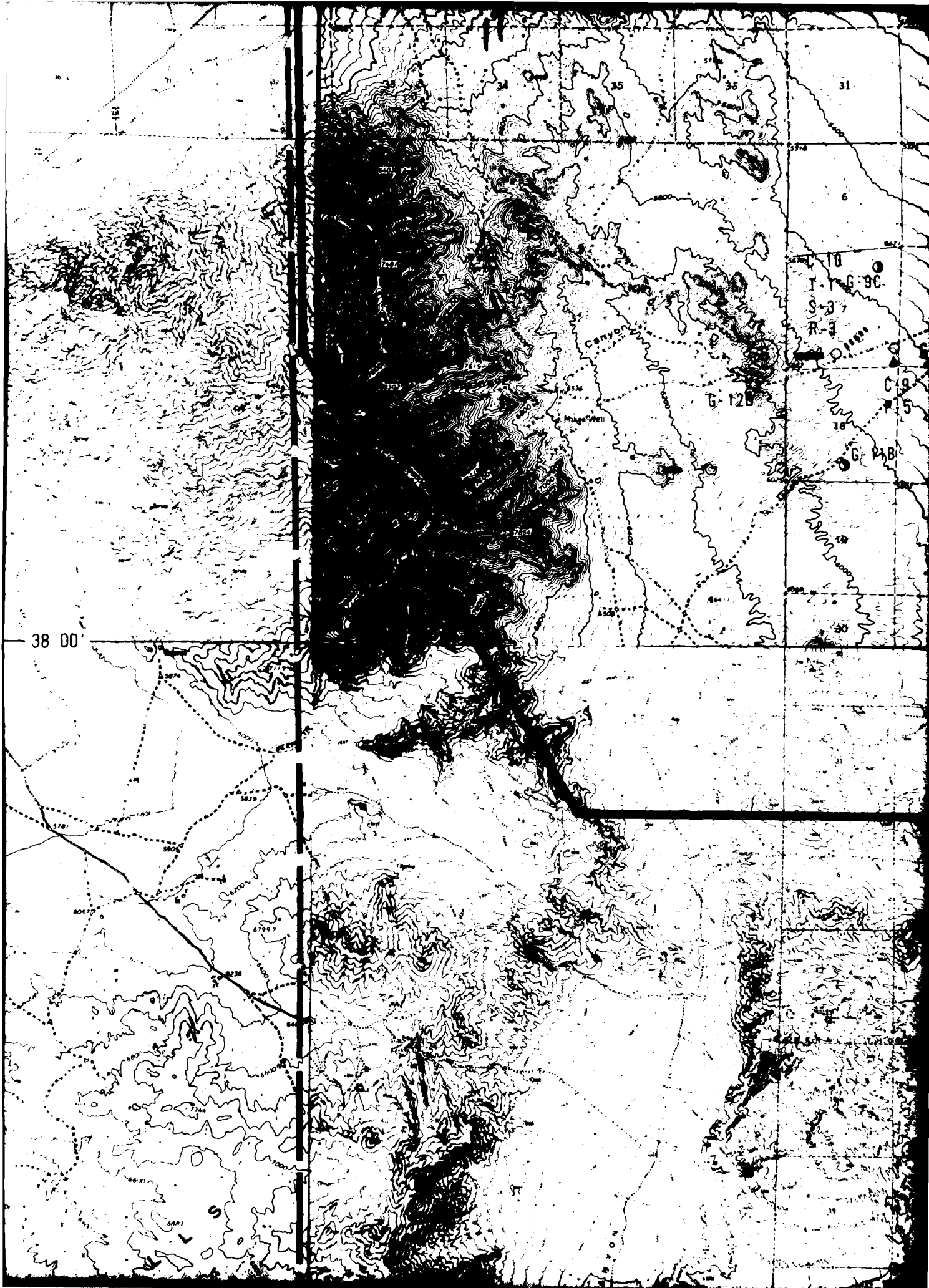


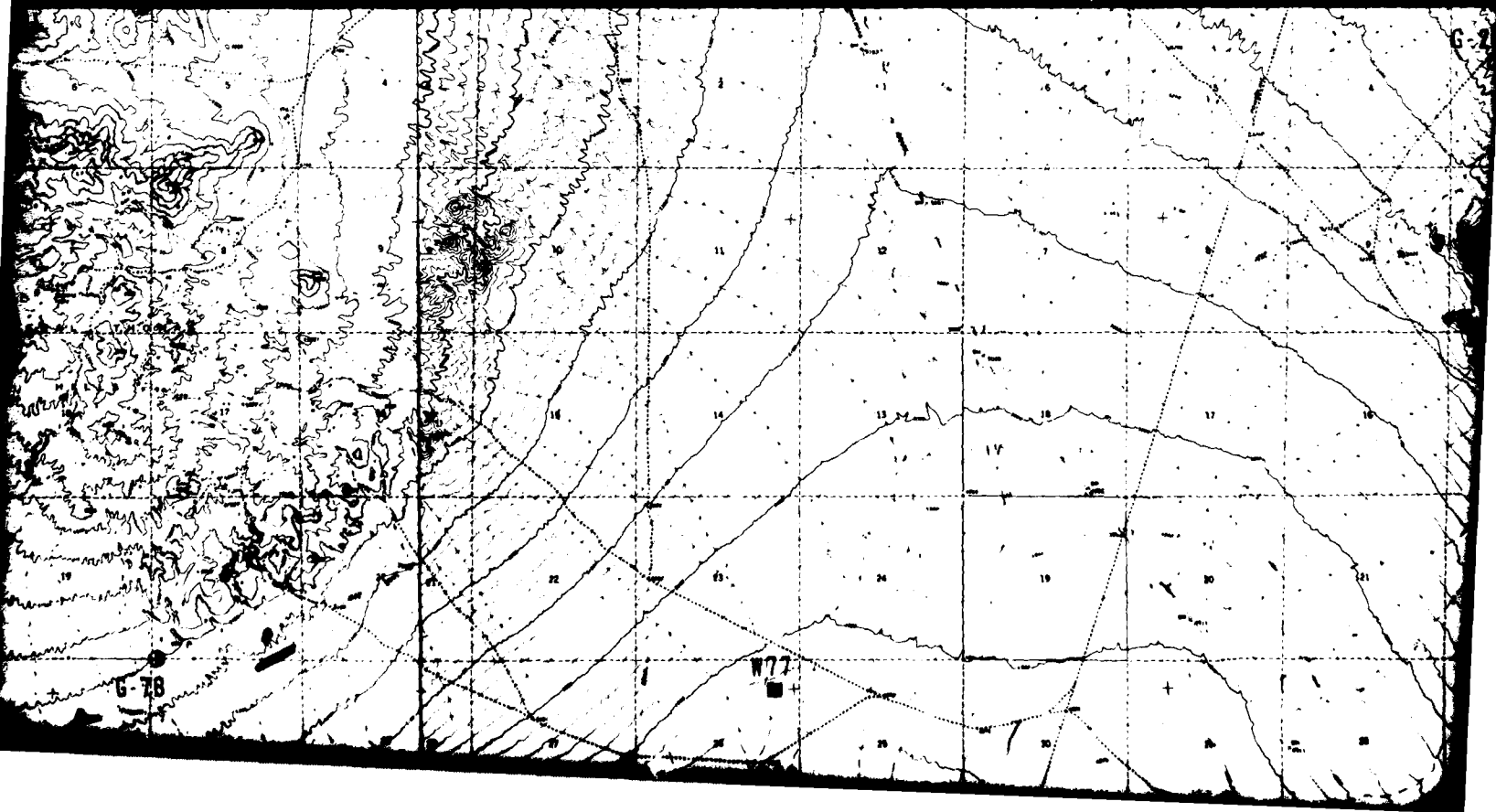
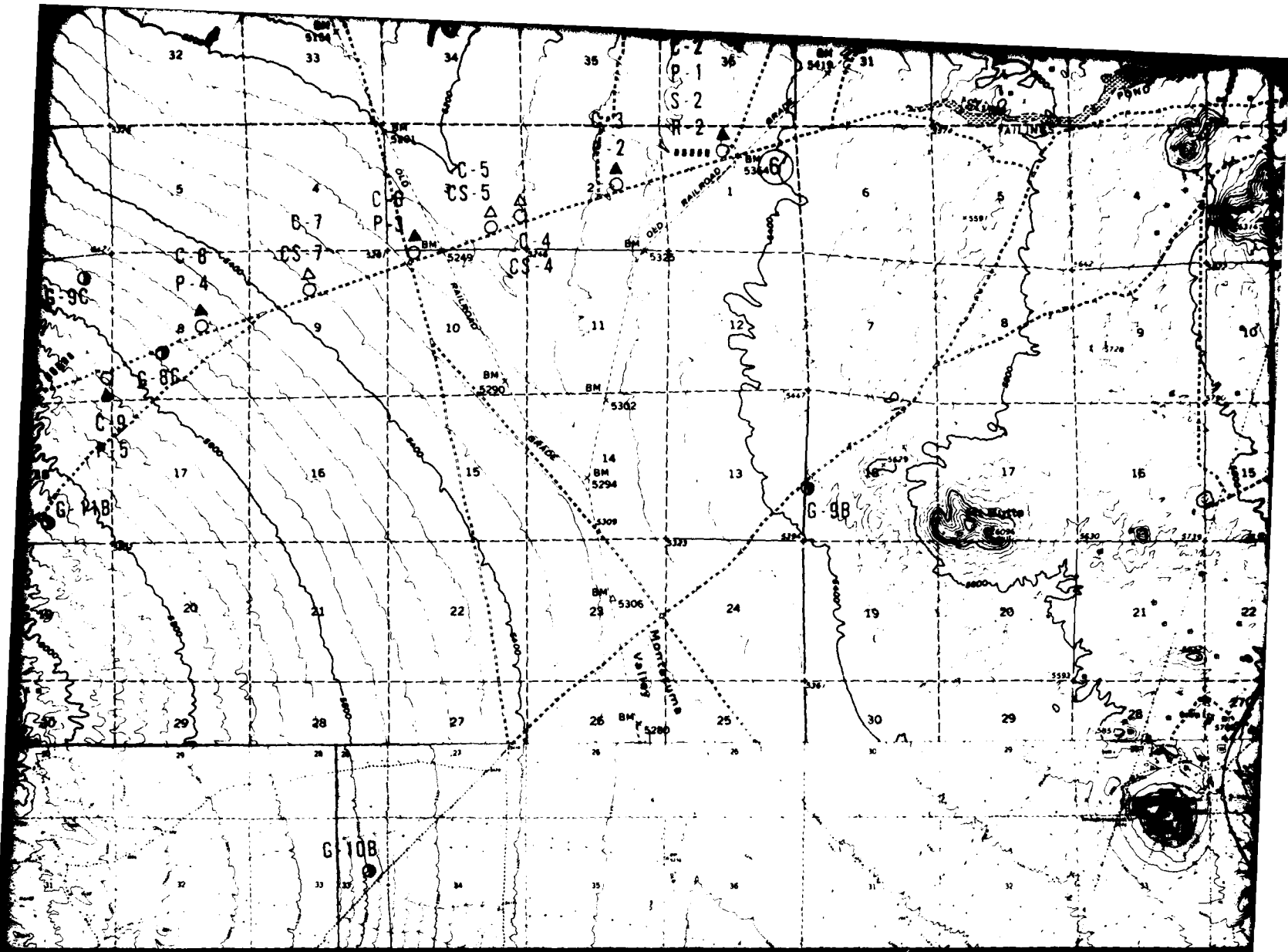


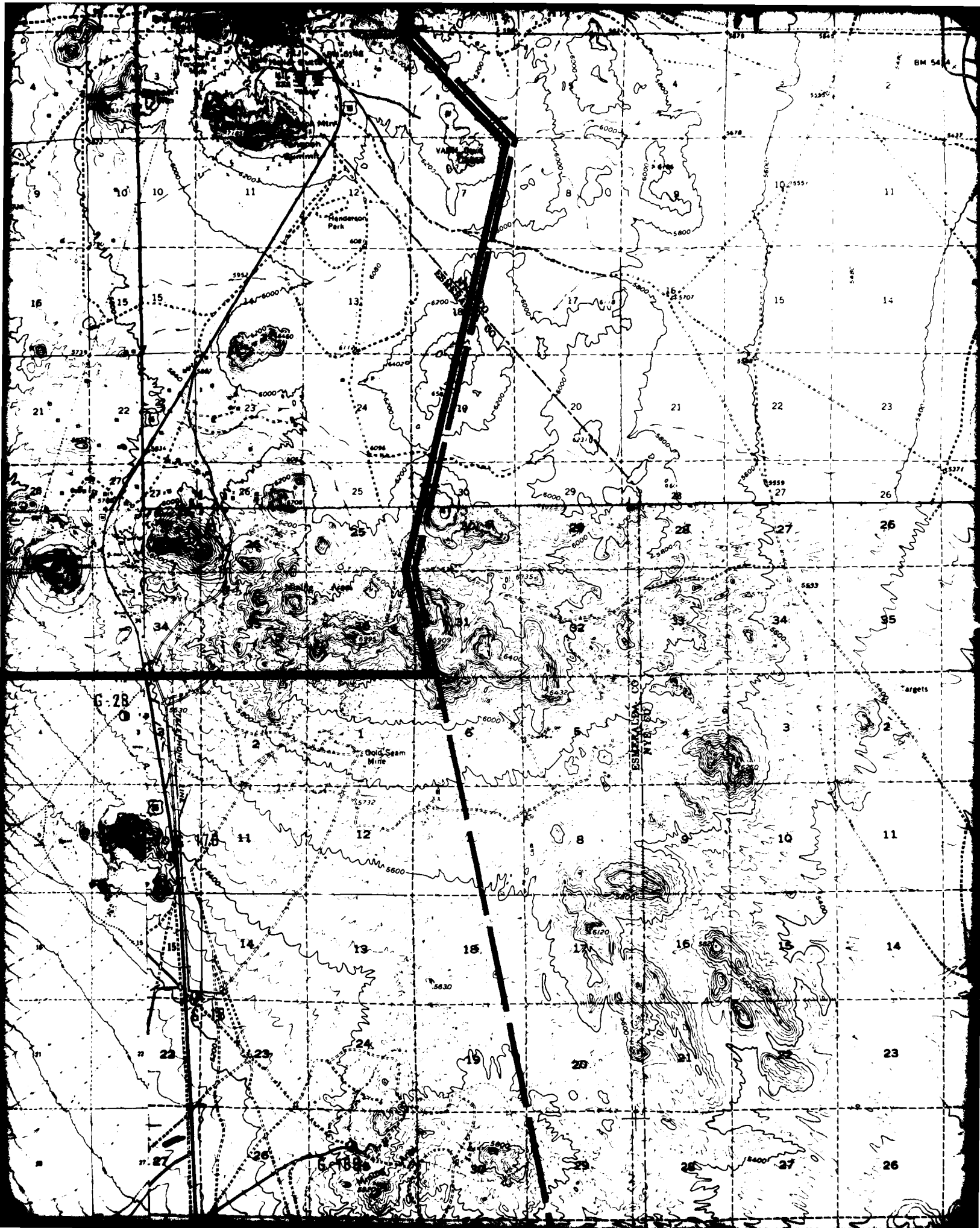


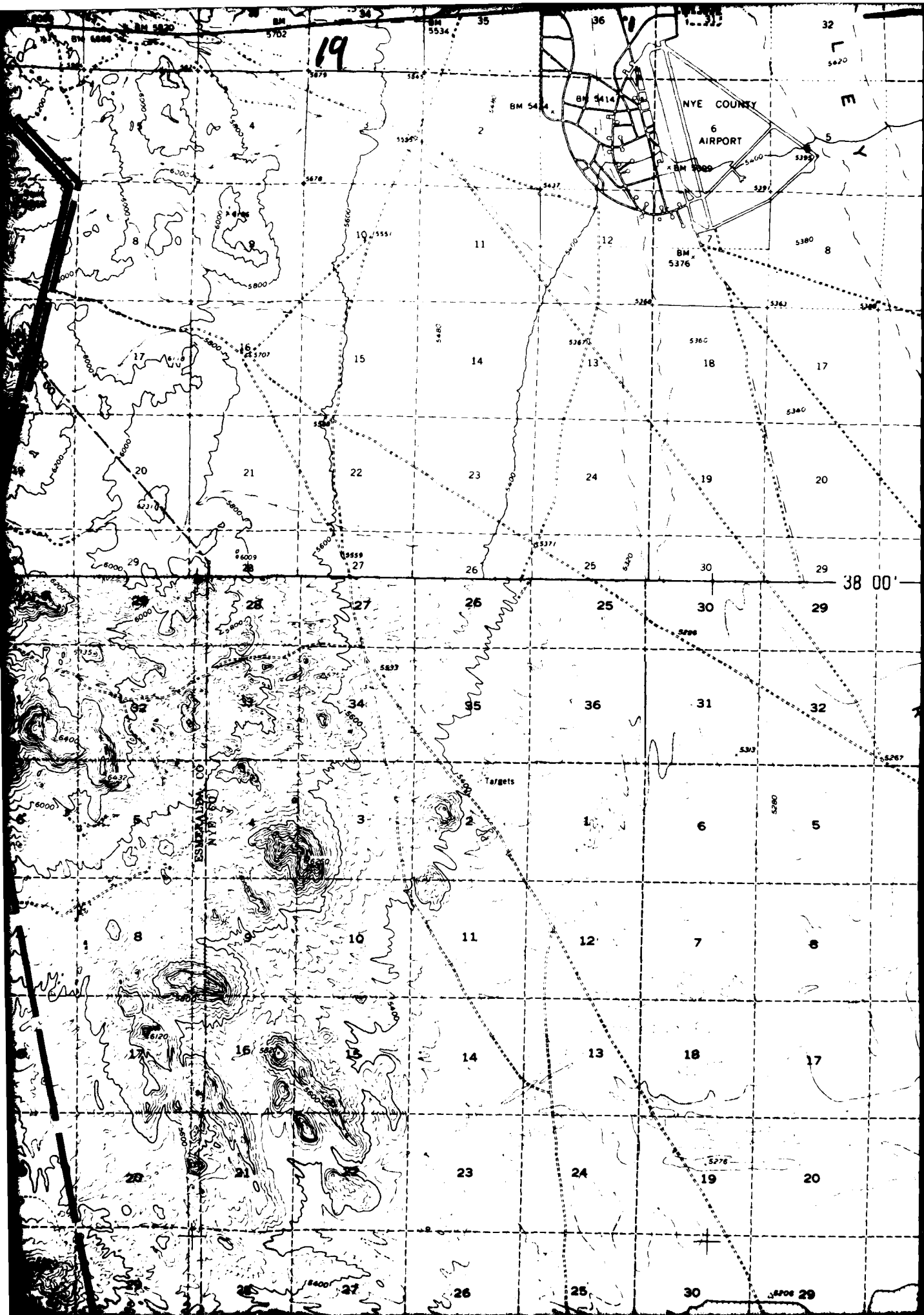


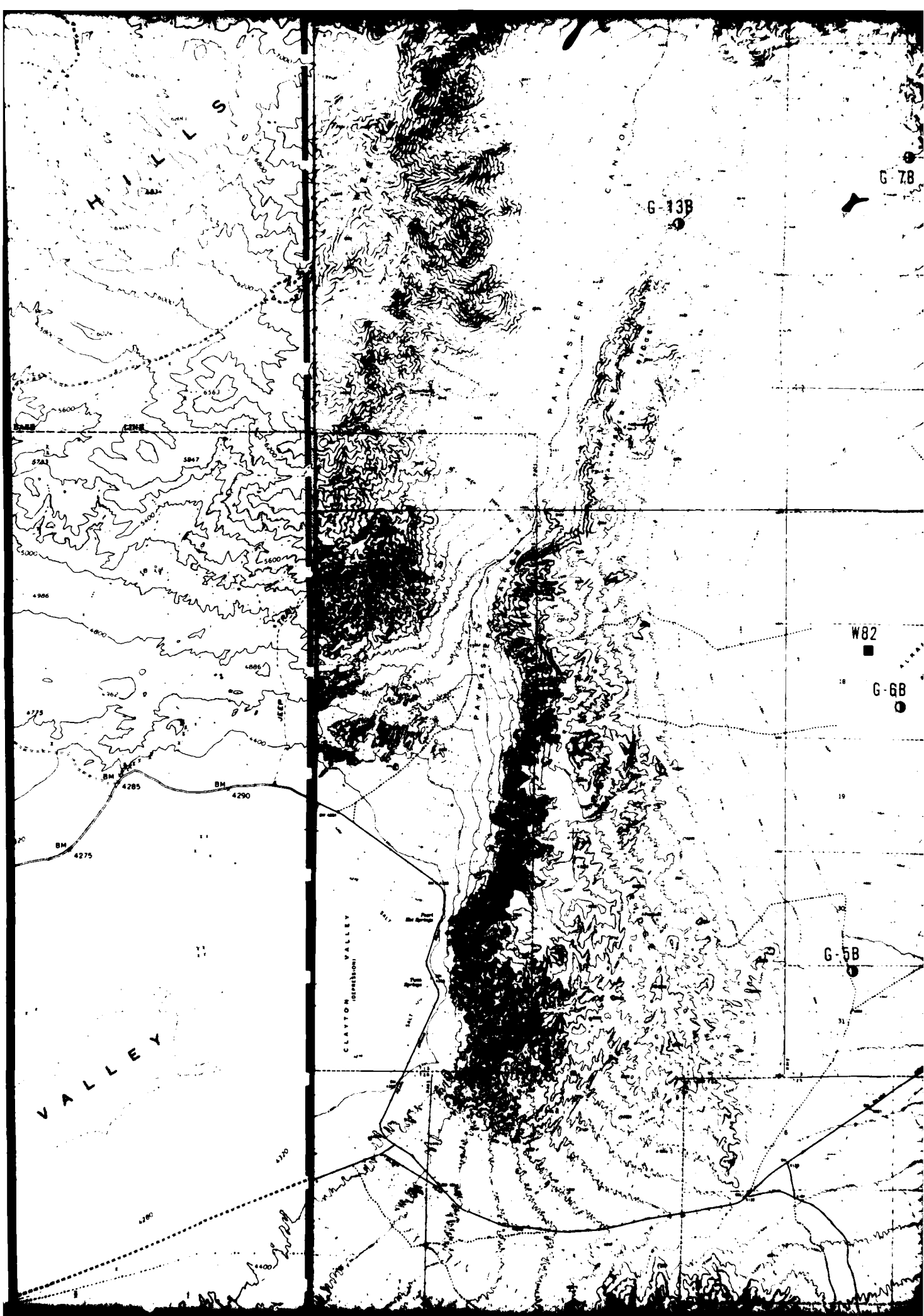


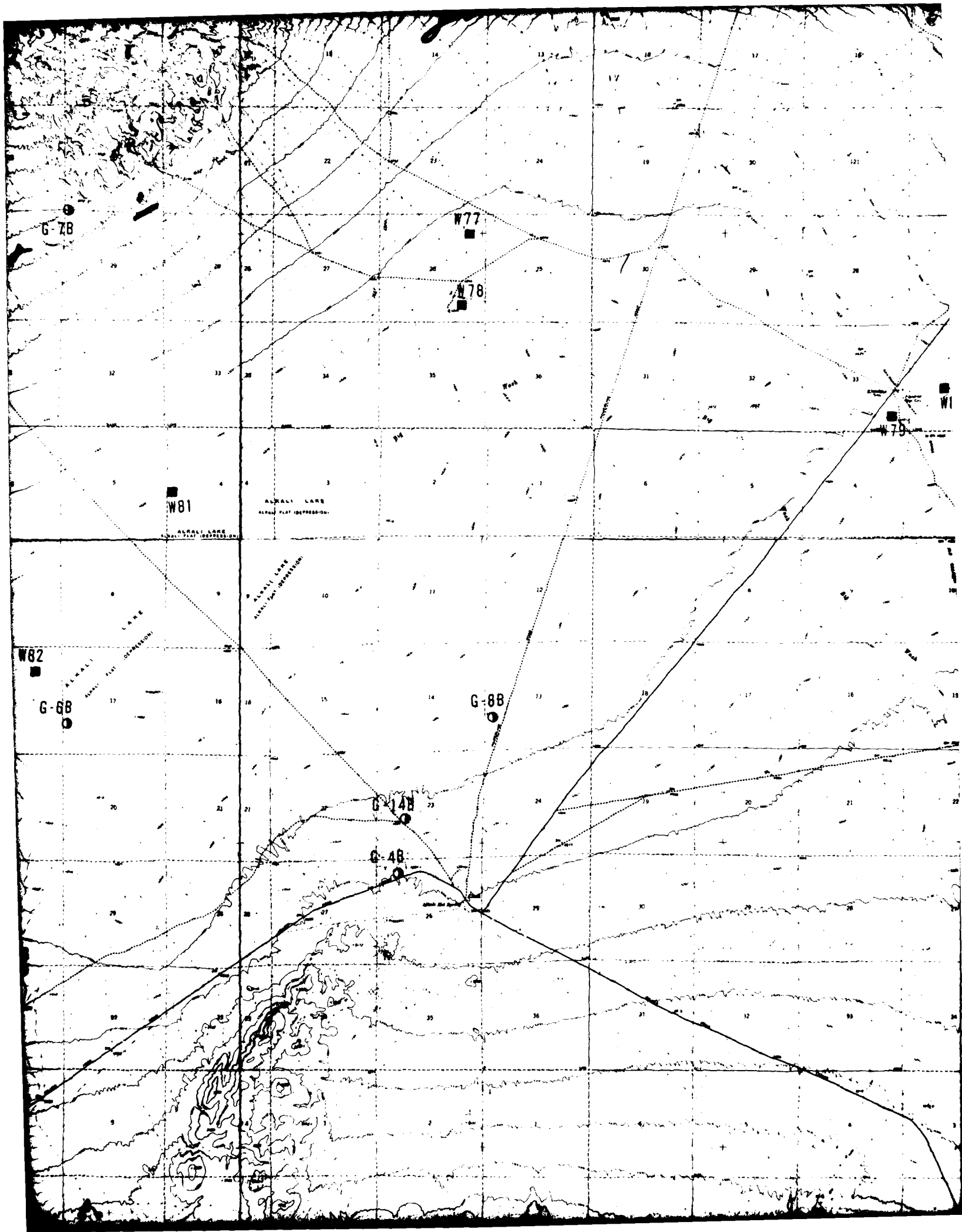


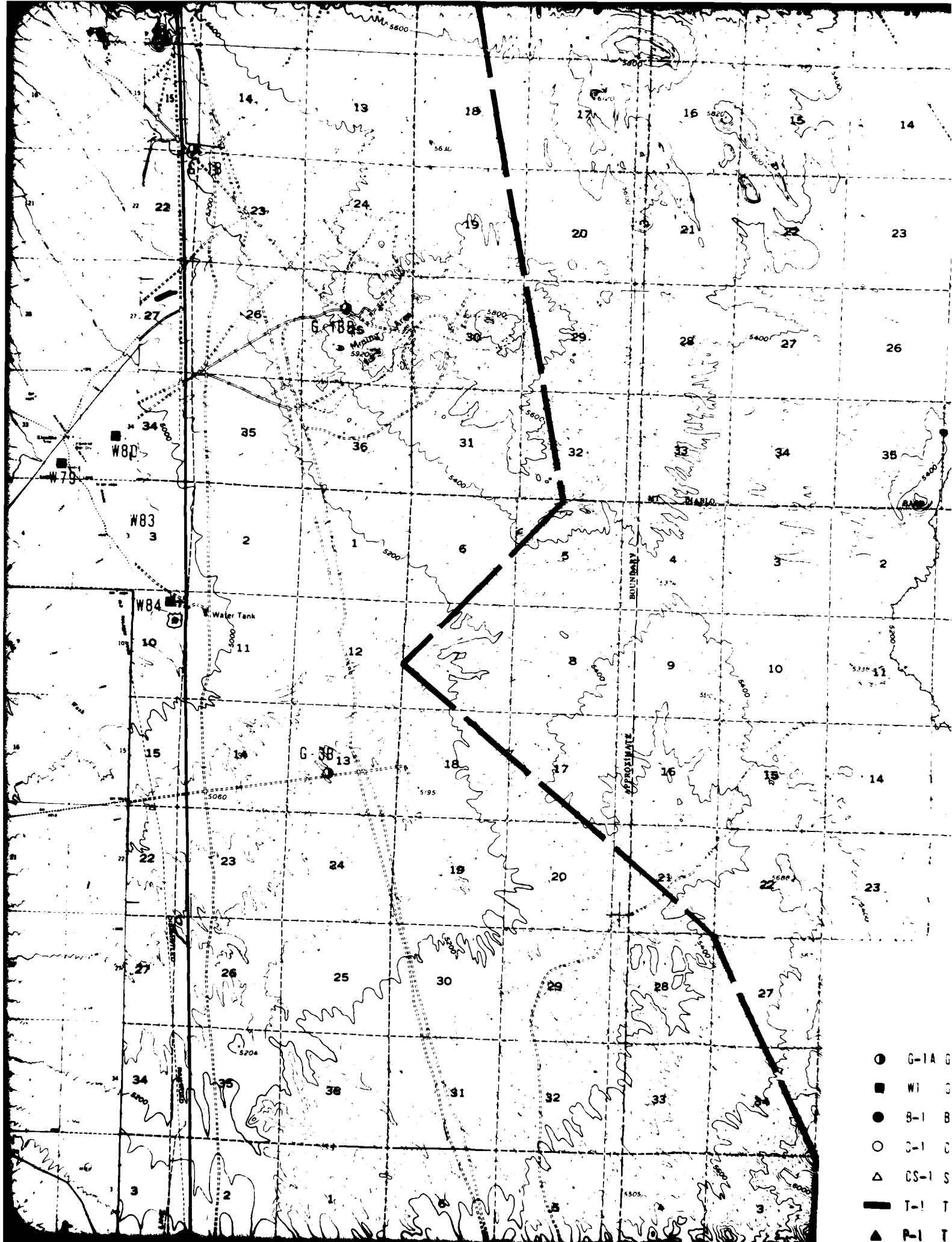












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FUGRO NATIONAL INC LONG BEACH CA  
MX SITING INVESTIGATION. GEOTECHNICAL EVALUATION. VOLUME VIII. --ETC(U)  
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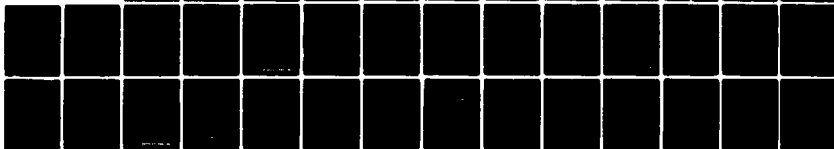
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3-3  
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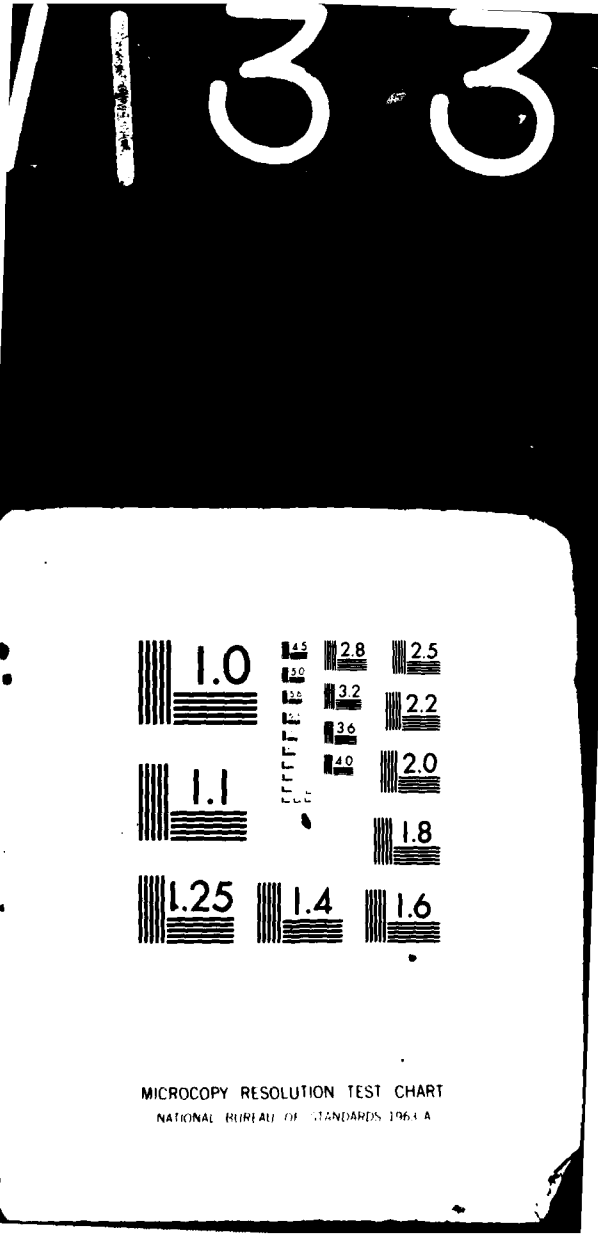
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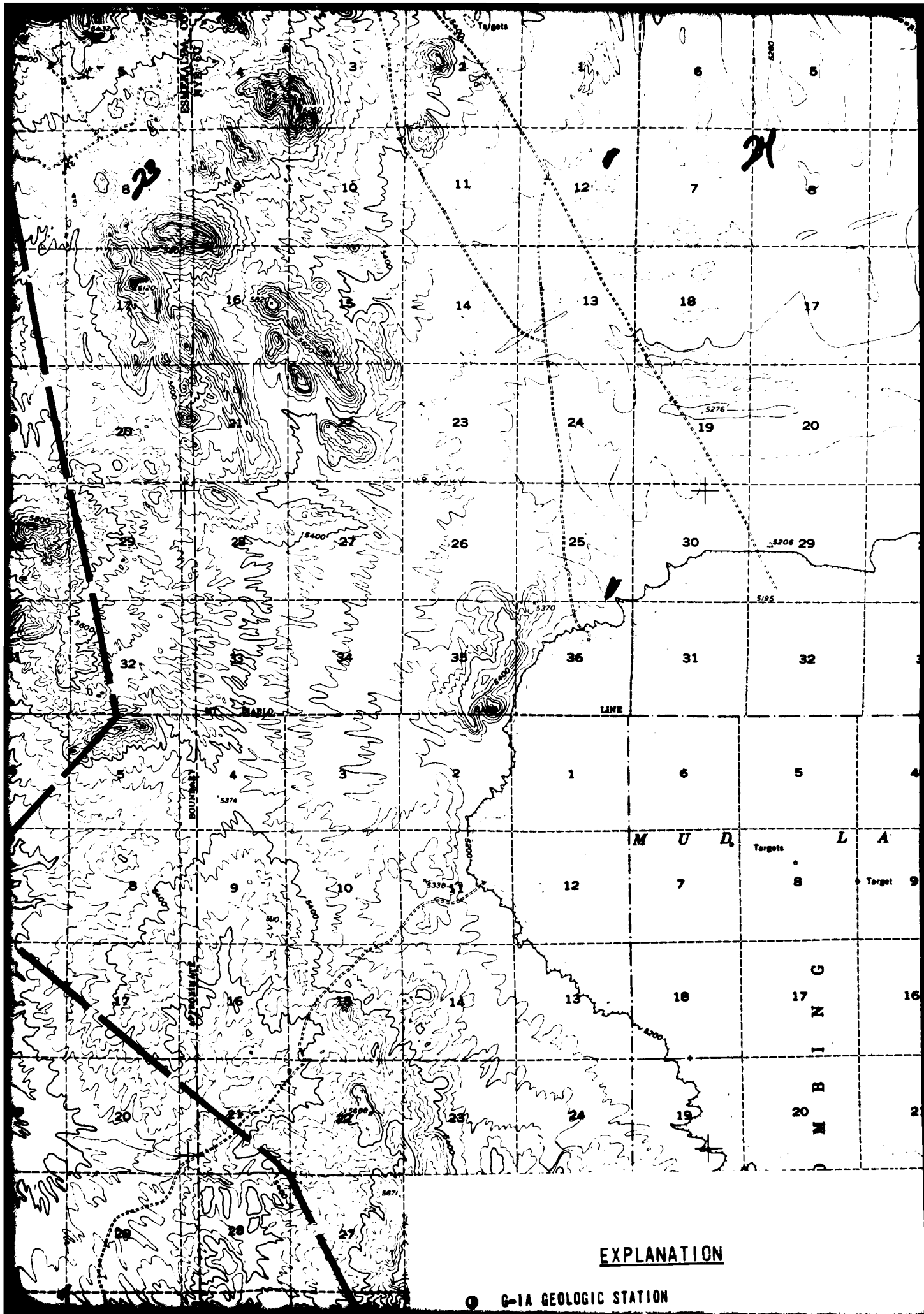
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4-82

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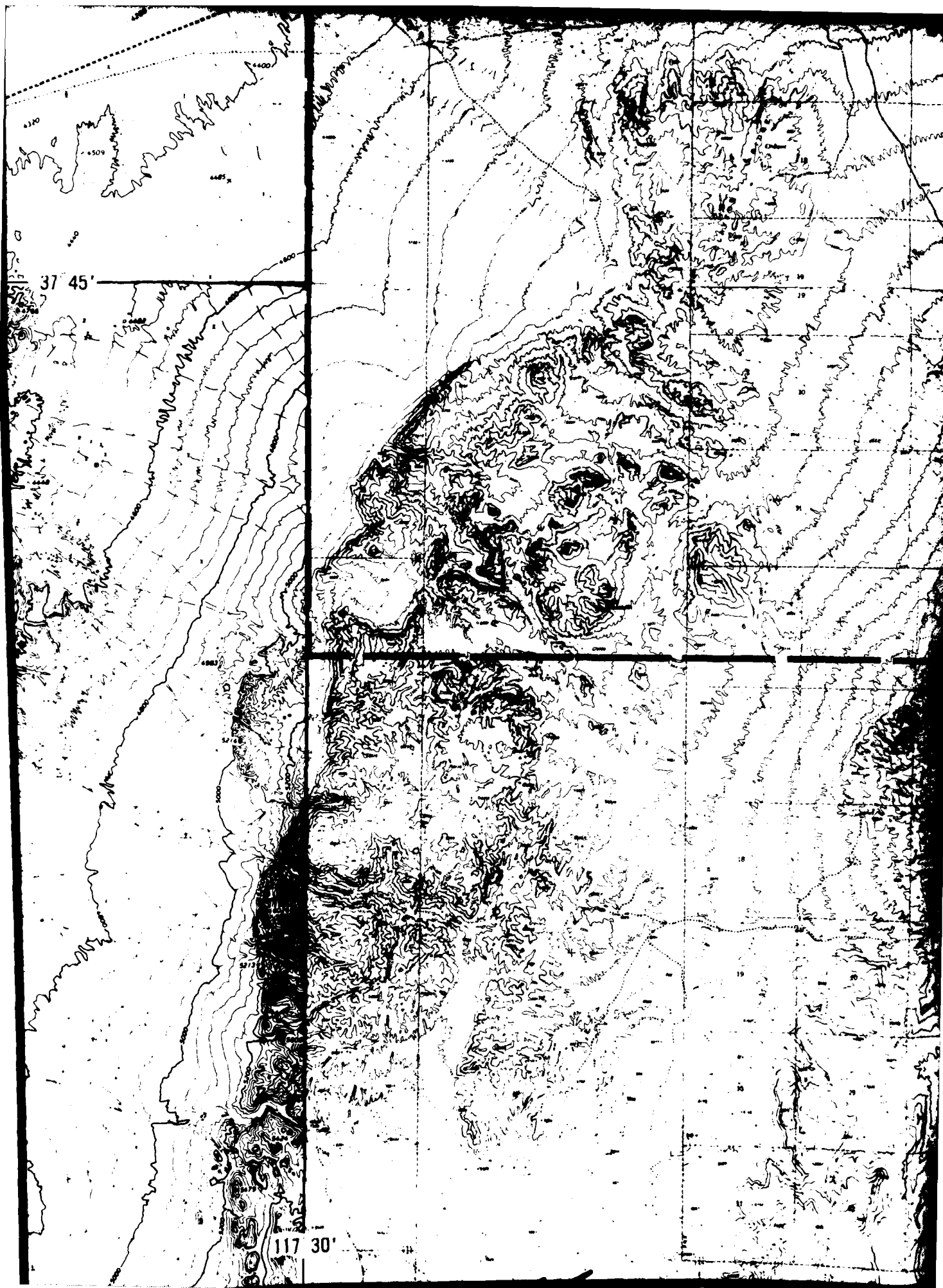


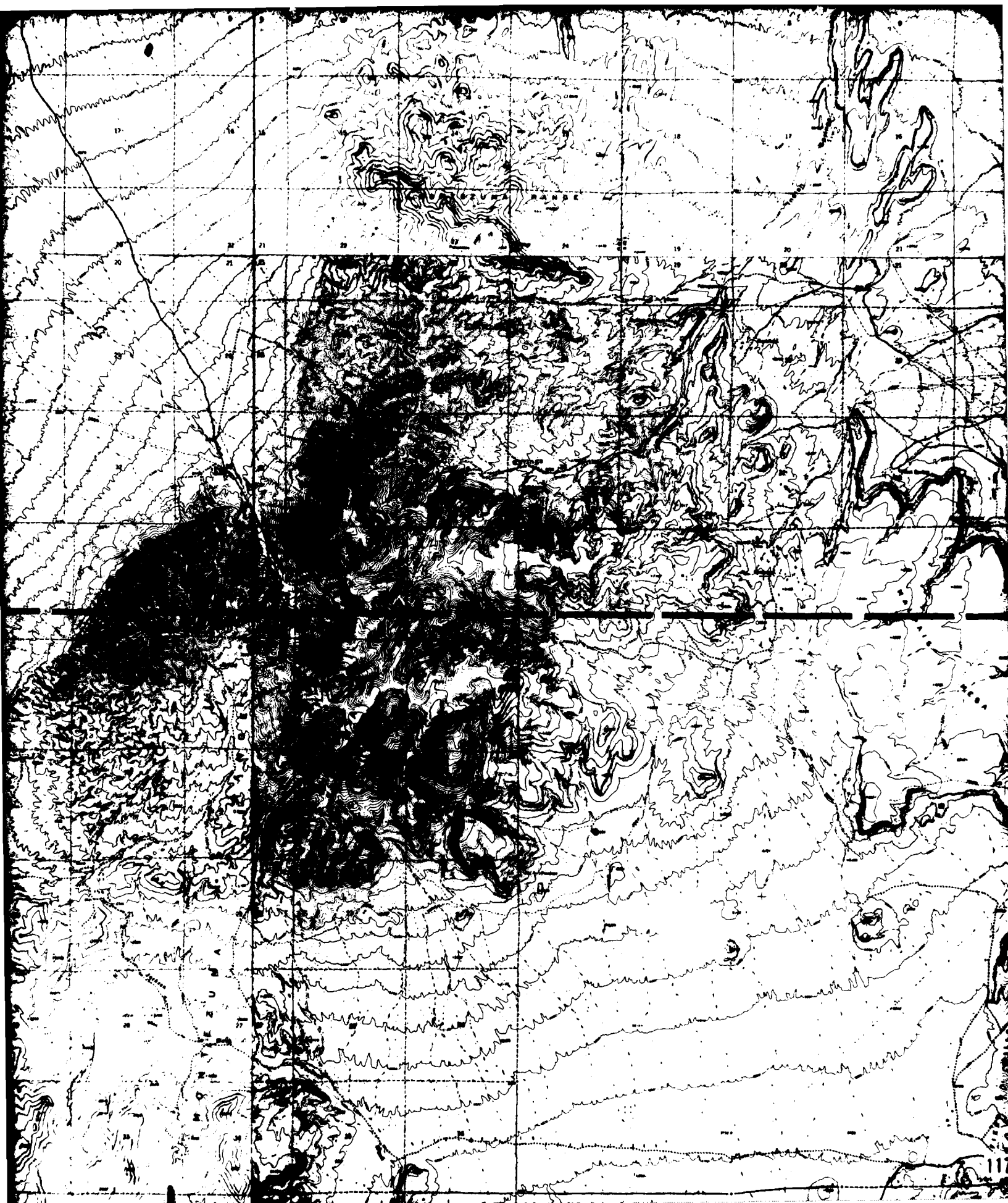
MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963 A



**EXPLANATION**

① G-1A GEOLOGIC STATION

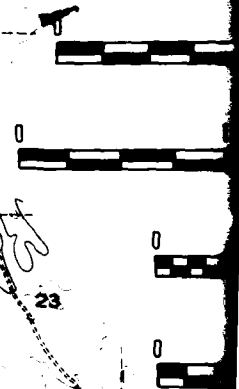




VERIF  
CAND

NOTE: Where multiple  
the correct lo  
symbol or (2)

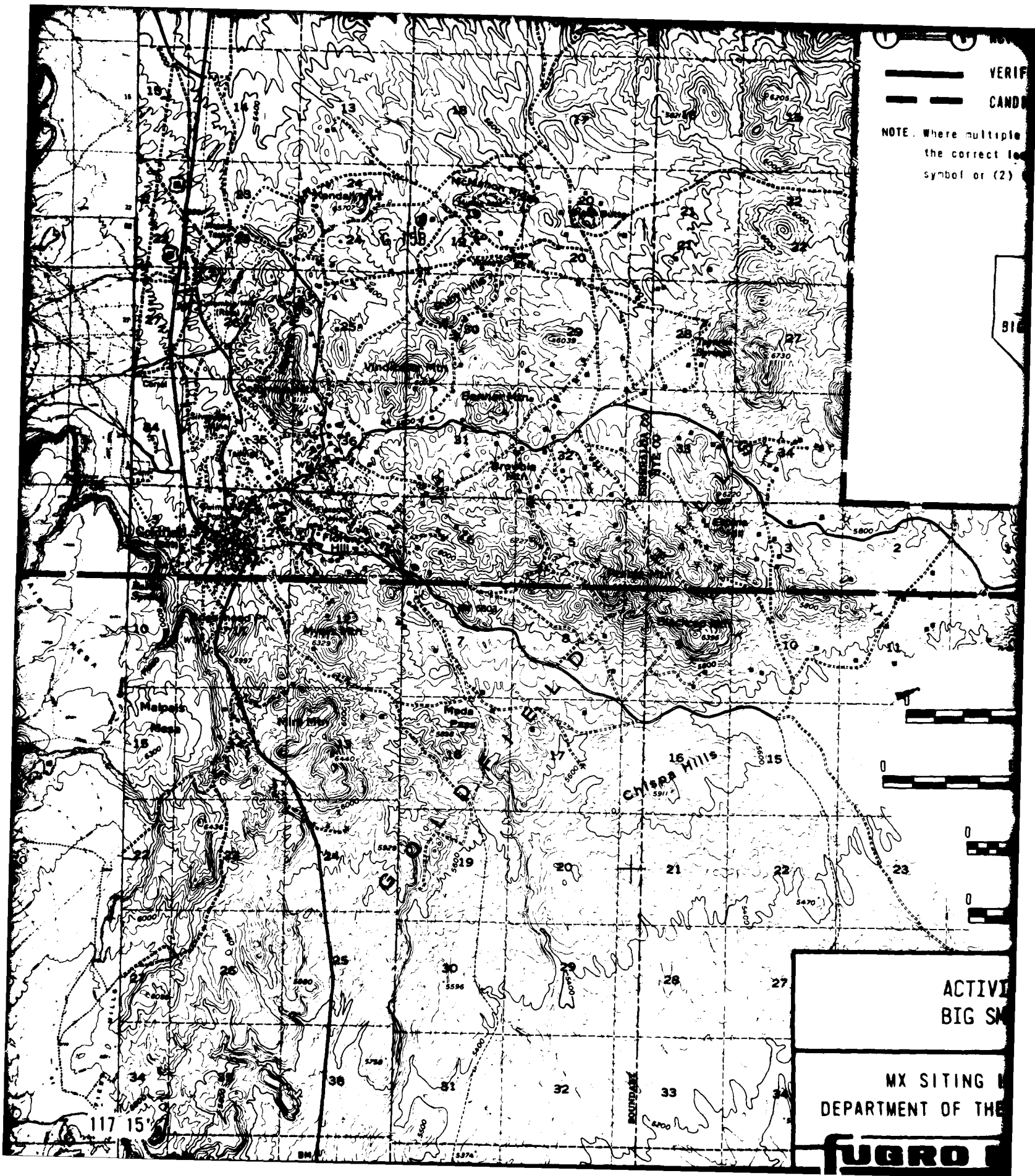
910



ACTIVE  
BIG SM

MX SITING  
DEPARTMENT OF THE

**FUGRO**



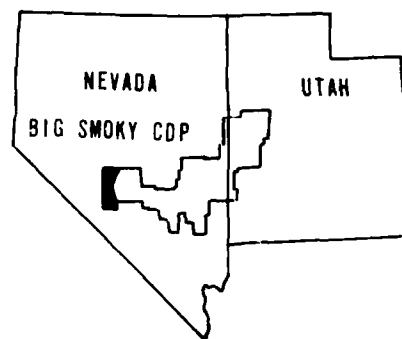
ACTIVITY LINE

VERIFICATION SITE BOUNDARY

CANDIDATE DEPLOYMENT PARCEL (CDP) BOUNDARY

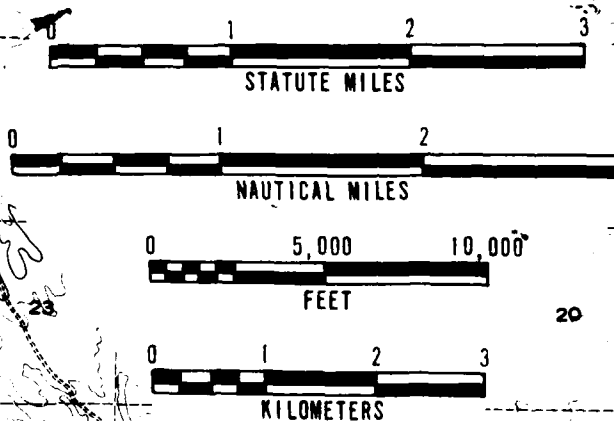
NOTE: Where multiple activities were performed at the same location, the correct location is designated by either (1) the boring symbol or (2) the CPT symbol, if no boring was drilled.

LOCATION MAP



37° 45'

SCALE 1:62,500



ACTIVITY LOCATION MAP  
BIG SMOKY CDP, NEVADA

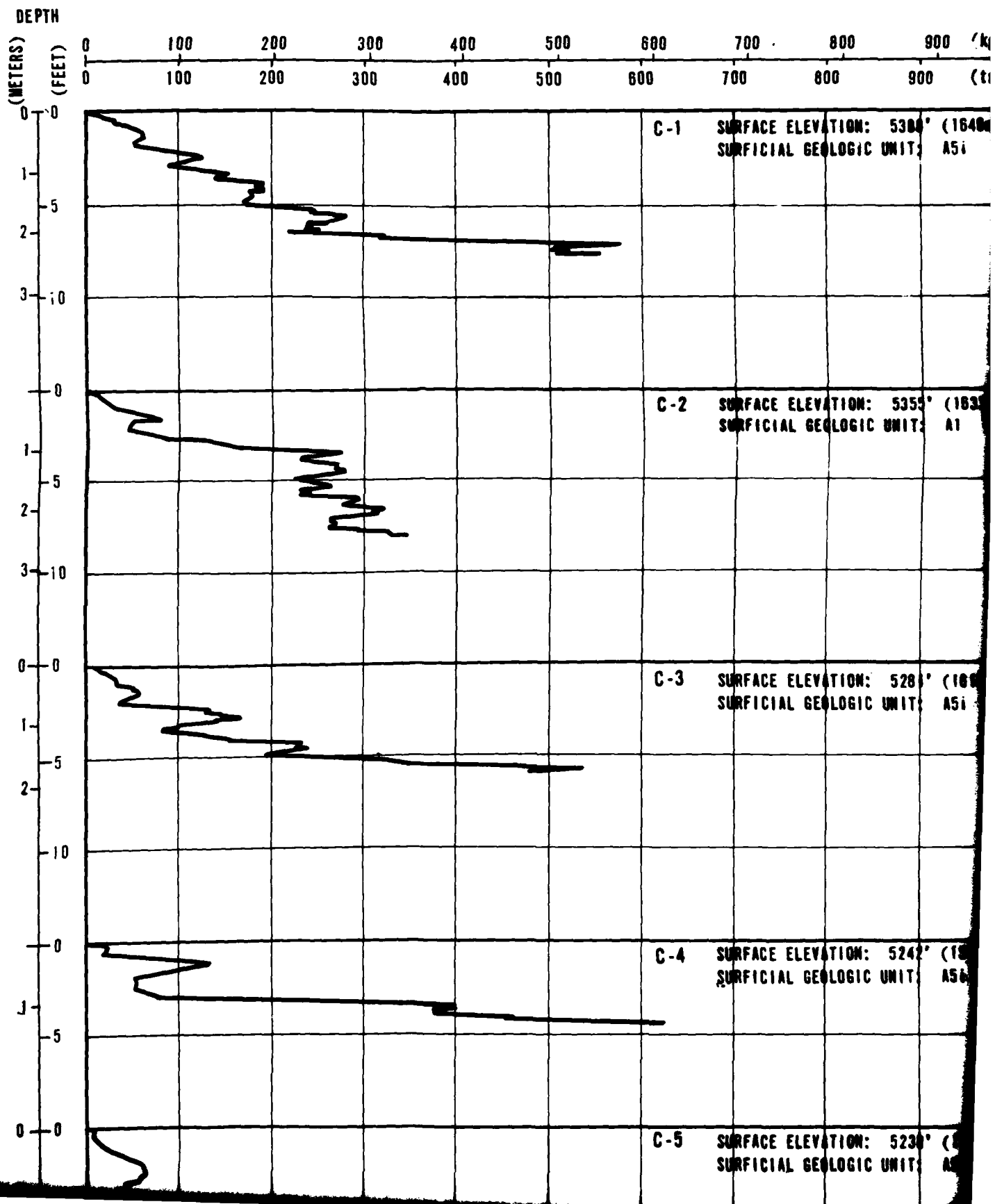
MX SITING INVESTIGATION  
DEPARTMENT OF THE AIR FORCE - SAMSO

DRAWING

1

**FUGRO NATIONAL, INC.**

CONE RESISTANCE



2

1

CONE RESISTANCE

DEPTH

(METERS)  
(FEET)

0 100 200 300 400 500 600 700  
0 100 200 300 400 500 600 700

100 (kg/cm<sup>2</sup>)

(tsf)

SOIL  
COLUMN

SP-SM

P-6

SW-SM

SP-SM

P-1

SP-SW

P-2

SM

CS-4

SP

CS-5

(1640m)  
A5i

(1632m)  
A1

(1610m)  
A5i

(1598m)  
A5i

(1594m)  
A5y

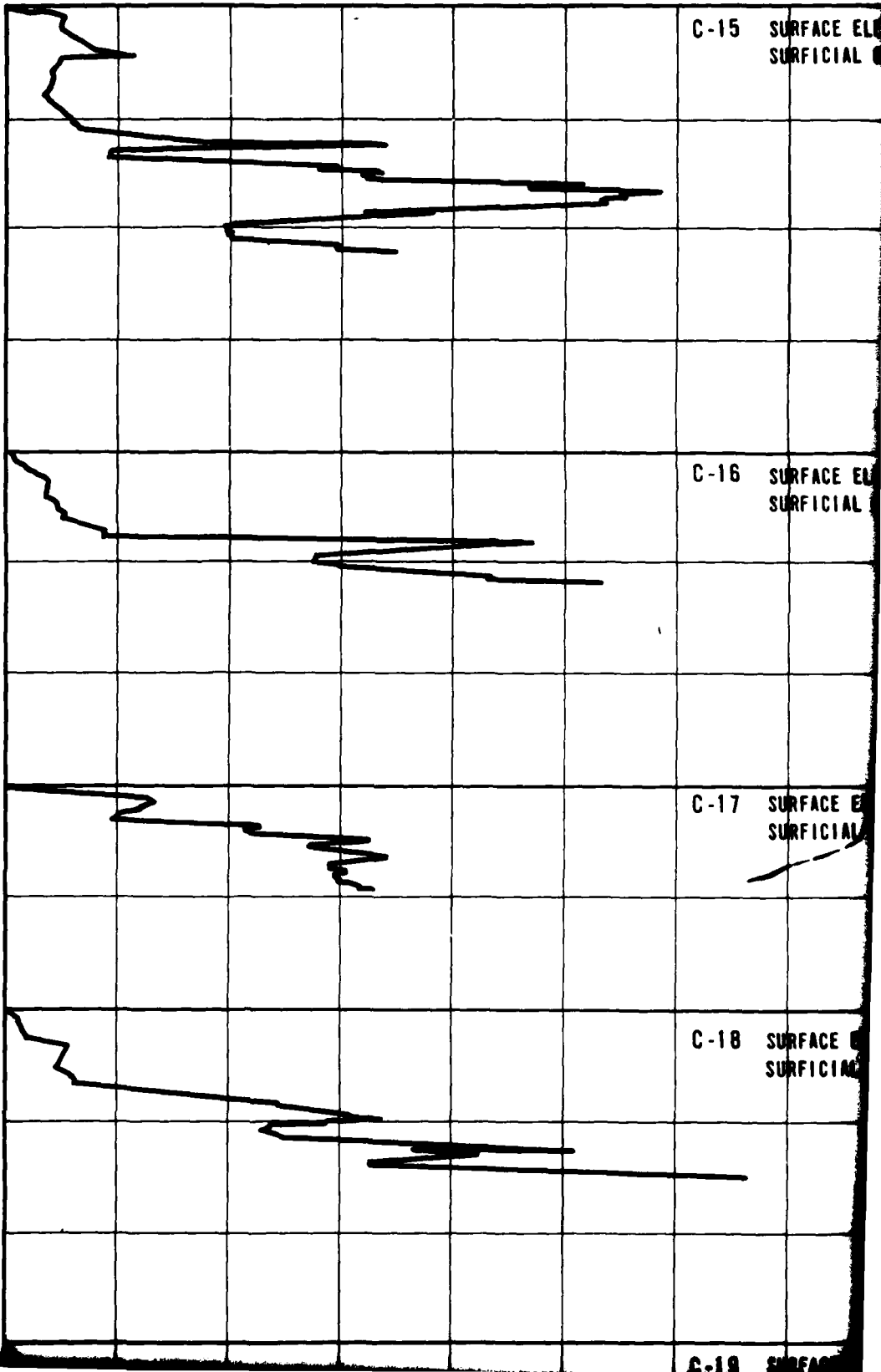
C-15 SURFACE EL  
SURFICIAL

C-16 SURFACE EL  
SURFICIAL

C-17 SURFACE E  
SURFICIAL

C-18 SURFACE  
SURFICIAL

C-19 SURFACE



# RESISTANCE

500 600 700 800 900 (kg/cm<sup>2</sup>)  
500 600 700 800 900 (tsf)

C-15 SURFACE ELEVATION: 4990' (1521m)  
SURFICIAL GEOLOGIC UNIT: A1

C-16 SURFACE ELEVATION: 4974' (1516m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-17 SURFACE ELEVATION: 4942' (1506m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-18 SURFACE ELEVATION: 4920' (1500m)  
SURFICIAL GEOLOGIC UNIT: A5y

## SOIL COLUMN

SP

CS-15

SP-SM

CS-16

SM

SP

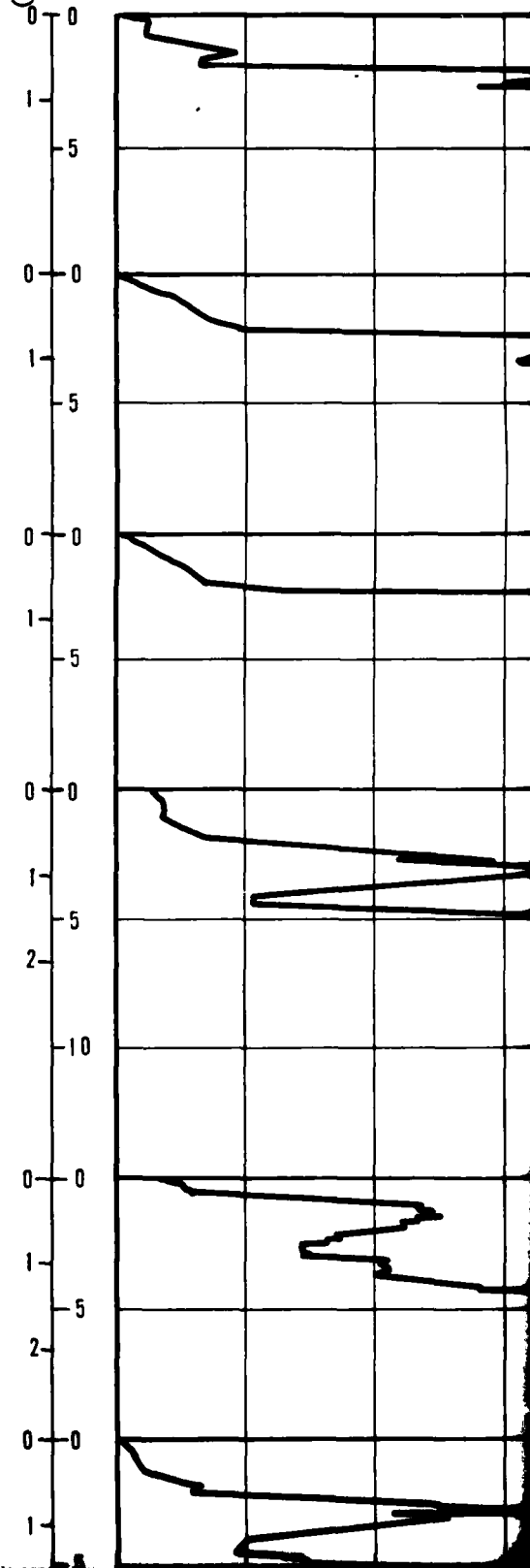
P-8

SP-SM

CS-18

## DEPTH

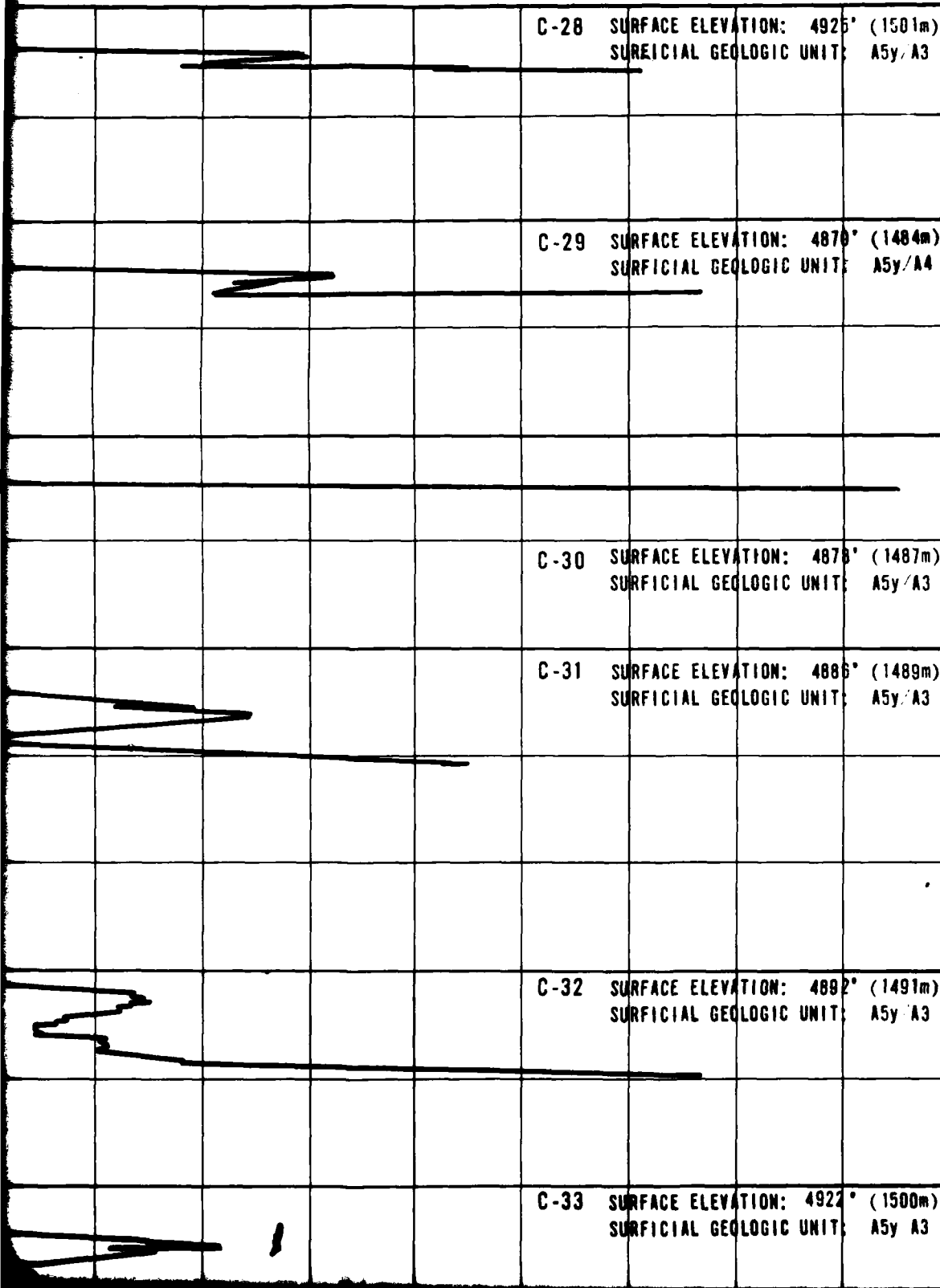
(METERS) (FEET) 0 100 200 300  
0 100 200 300



# CONE RESISTANCE

200 300 400 500 600 700 800 900 (kg/cm<sup>2</sup>)  
 200 300 400 500 600 700 800 900 (tsf)

SOIL  
COLUMN

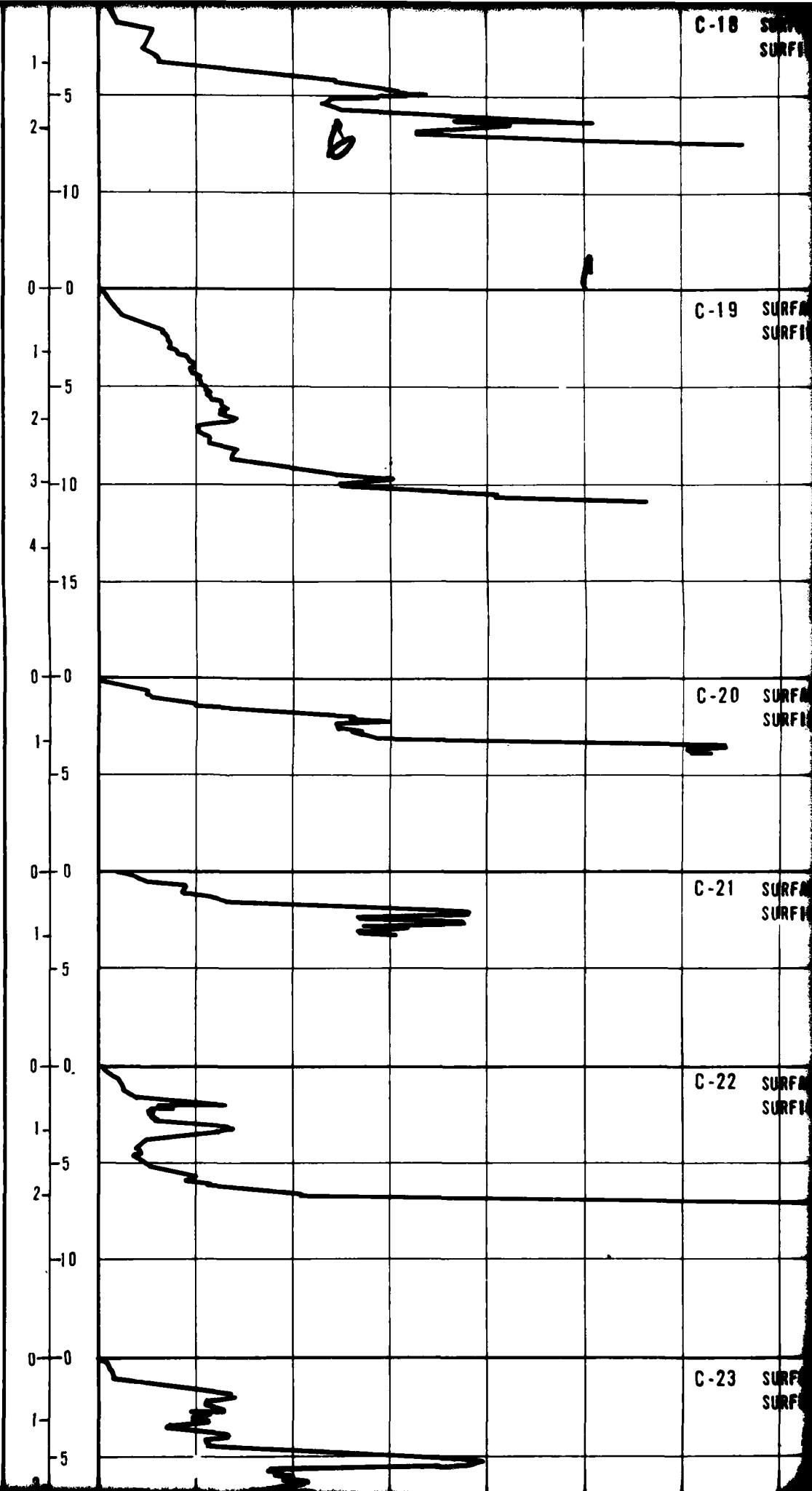


|       |
|-------|
| SM    |
| CS-28 |
| SP-SM |
| CS-29 |
| SP-SM |
| CS-30 |
| SP    |
| CS-31 |
| SP-SM |
| GP    |
| T-3   |
| SM    |
| SW-SM |
| F-6   |



|               |  |
|---------------|--|
| UNIT: A5i     |  |
| 5230' (1594m) |  |
| UNIT: A5y     |  |
| 5270' (1606m) |  |
| UNIT: A5y     |  |
| 5380' (1634m) |  |
| UNIT: A5y     |  |
| 5490' (1673m) |  |
| UNIT: A5y     |  |
| 5640' (1719m) |  |
| UNIT: A5y     |  |
| 5750' (1755m) |  |

|       |    |
|-------|----|
| CS-4  | SM |
| SP    |    |
| CS-5  |    |
| SP-SM |    |
| P-3   |    |
| SM    |    |
| CS-7  |    |
| SP-SM |    |
| P-4   |    |
| SP-SM |    |
| P-5   |    |



7

C-19 SURFACE ELEVATION: 4882' (1488m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-20 SURFACE ELEVATION: 4855' (1480m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-21 SURFACE ELEVATION: 5080' (1548m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-22 SURFACE ELEVATION: 4950' (1509m)  
SURFICIAL GEOLOGIC UNIT: A5y A3

C-23 SURFACE ELEVATION: 5000' (1524m)  
SURFICIAL GEOLOGIC UNIT: A5y A3

CS-18

SP-SM

P-19

SM

CS-20

SM

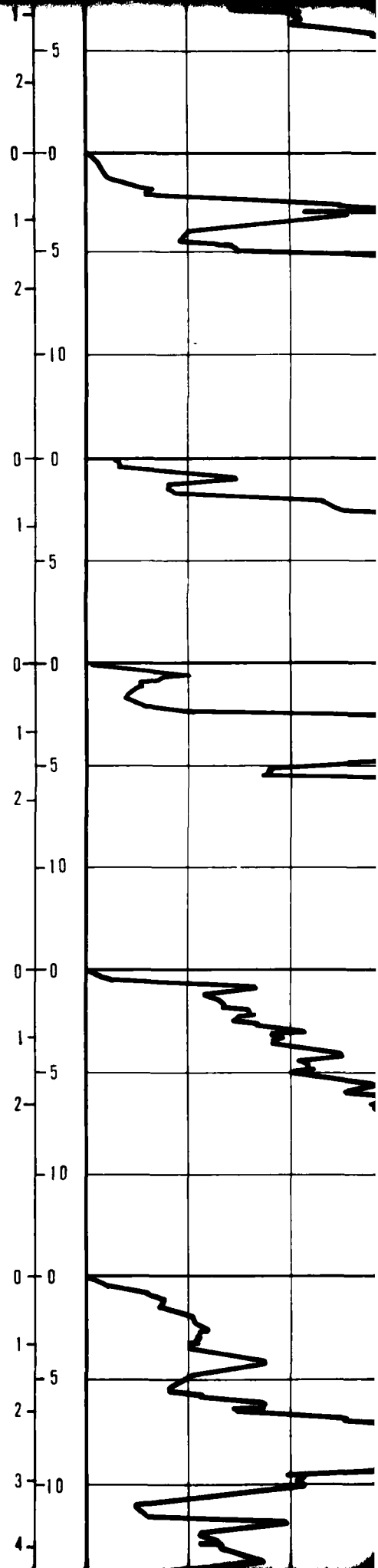
P-10

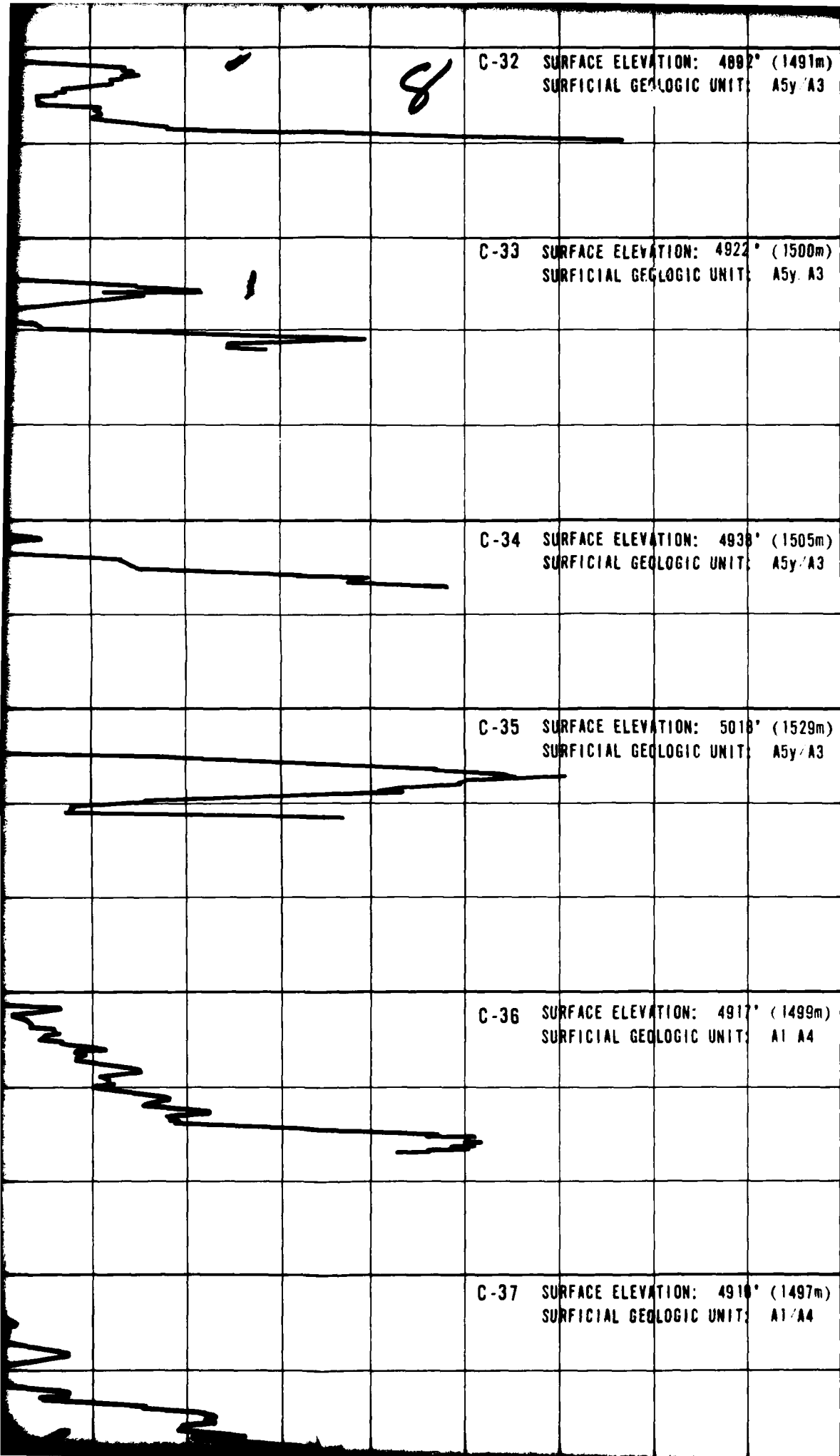
SP-SM

P-11

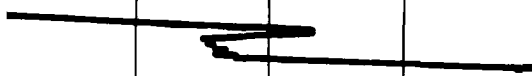
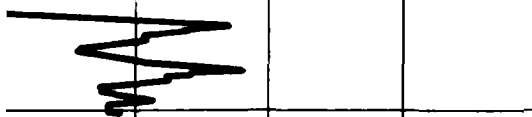
SP-SM

SM





|       |       |
|-------|-------|
|       | SP-SM |
|       | GP    |
|       | T-3   |
|       | SM    |
|       | SW-SM |
| F-6   |       |
|       | SM    |
| CS-34 |       |
|       | SP-SM |
|       | B-2   |
|       | SM    |
| CS-36 |       |
|       | SM    |
|       | GP    |
| P-15  |       |

|                                                                                     |                                                                      |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|
|                                                                                     | C-11 SURFACE ELEVATION: 5300' (1615)<br>SURFICIAL GEOLOGIC UNIT: A5i |
|                                                                                     |                                                                      |
|   | C-12 SURFACE ELEVATION: 5145' (1560)<br>SURFICIAL GEOLOGIC UNIT: A5y |
|                                                                                     |                                                                      |
|  | C-13 SURFACE ELEVATION: 5105' (1550)<br>SURFICIAL GEOLOGIC UNIT: A5y |

BM: 5755' (1754m)  
SIC UNIT: A5i

SP-SM

GP-GM

T-1

GP-GM

CS-11

BM: 5300' (1615m)  
SIC UNIT: A5i

BM: 5145' (1568m)  
SIC UNIT: A5y

SP-SM

SM

B-1

SM

GP

CS-13

BM: 5105' (1556m)  
SIC UNIT: A5y

BM: 5015' (1529m)  
SIC UNIT: A5y

SP-SM

GP

P-7

900 (tsf)

900 (kg/cm<sup>2</sup>)

2  
3  
4  
5

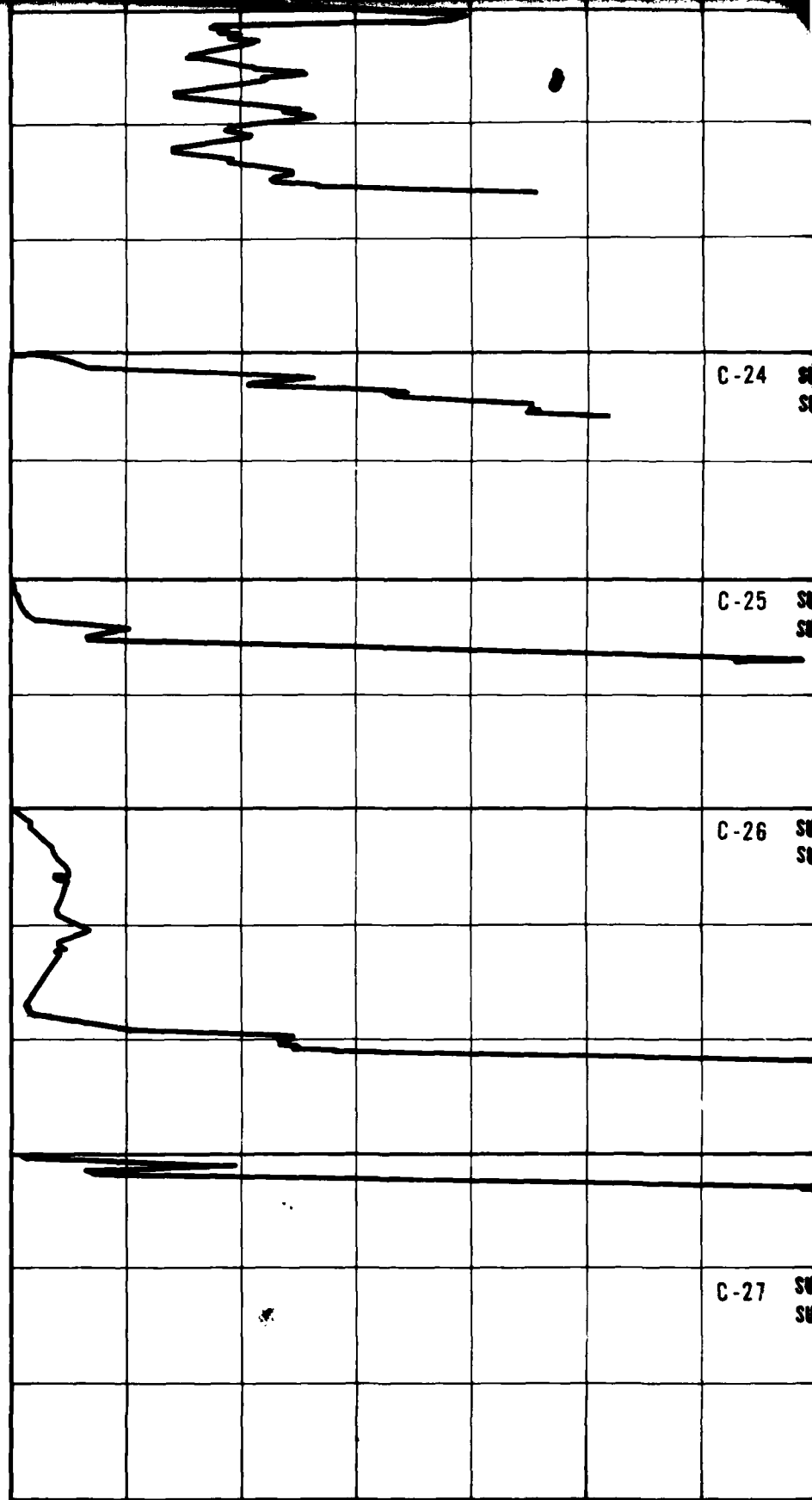
0  
1  
5

0  
1  
5

0  
1  
2  
3

0  
1  
5

0  
1  
5



0 100 200 300 400 500 600 700

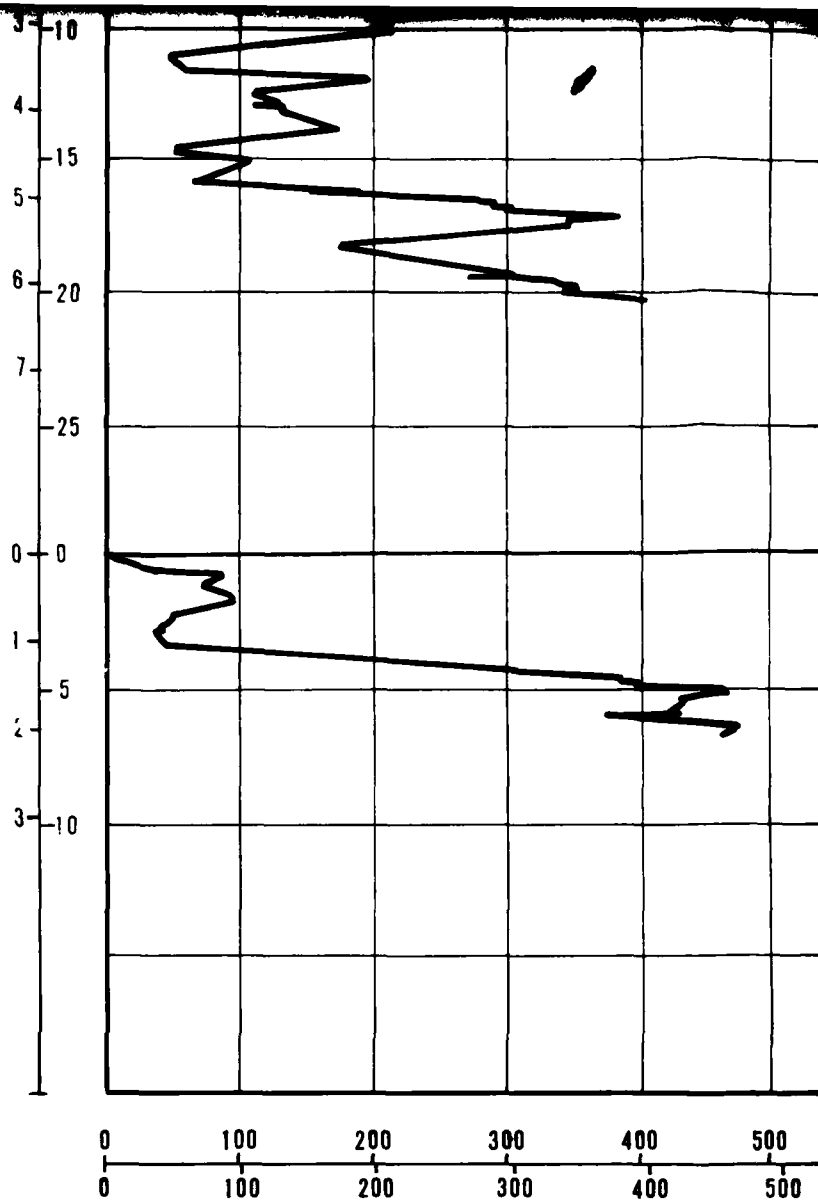
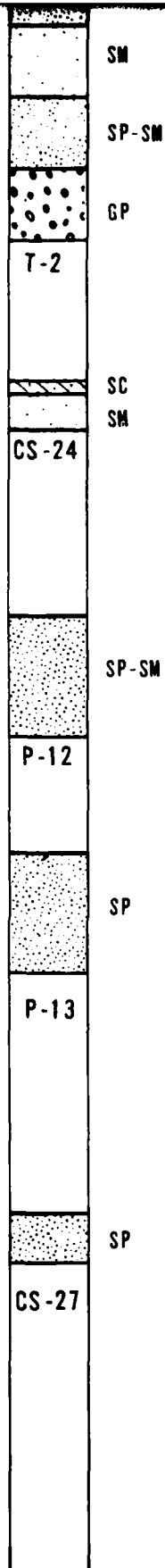
10

SURFACE ELEVATION: 4880' (1487m)  
SURFICIAL GEOLOGIC UNIT: A5y A3

SURFACE ELEVATION: 4872' (1485m)  
SURFICIAL GEOLOGIC UNIT: A5y A3

SURFACE ELEVATION: 4995' (1522m)  
SURFICIAL GEOLOGIC UNIT: A3

SURFACE ELEVATION: 5080' (1548m)  
SURFICIAL GEOLOGIC UNIT: A3

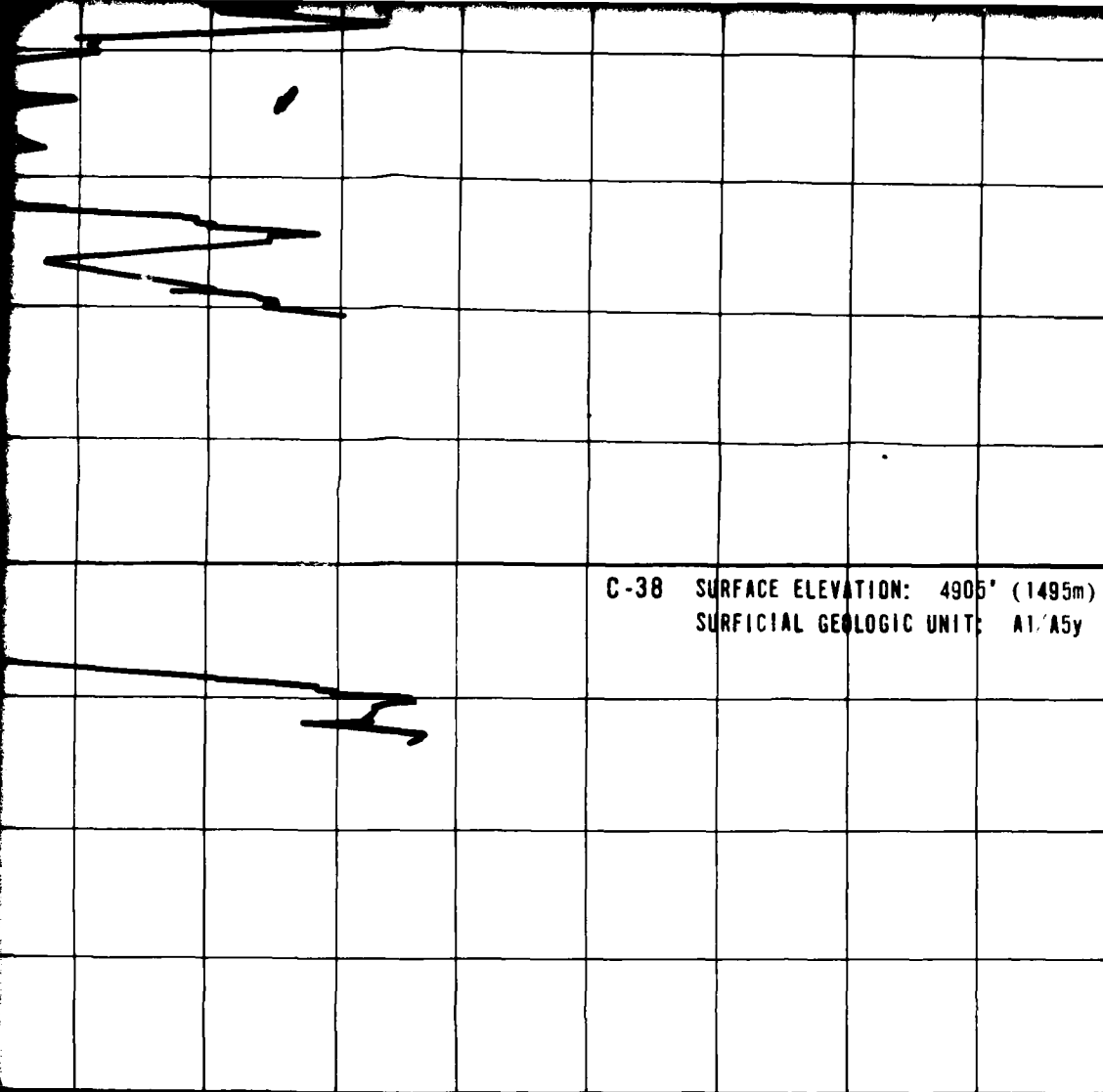


700 800 900 (tsf)

700 800 900 (kg/cm<sup>2</sup>)

1

11



C-38 SURFACE ELEVATION: 4905' (1495m)  
SURFICIAL GEOLOGIC UNIT: A1/A5y

SM

F-7

200 300 400 500 600 700 800 900 (tsf)  
200 300 400 500 600 700 800 900 (kg/cm<sup>2</sup>)

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FN-TR-27-VIII

# CONE RESISTANCE

DEPTH

(METERS)  
(FEET)

0 0

1 5

2 10

3 15

4 20

5 25

6 30

7 35

8 40

9 45

10 50

11 55

12 60

13 65

14 70

15 75

16 80

17 85

18 90

19 95

20 100

21 105

22 110

23 115

24 120

25 125

26 130

27 135

28 140

29 145

30 150

31 155

32 160

33 165

34 170

35 175

36 180

37 185

38 190

39 195

40 200

41 205

42 210

43 215

44 220

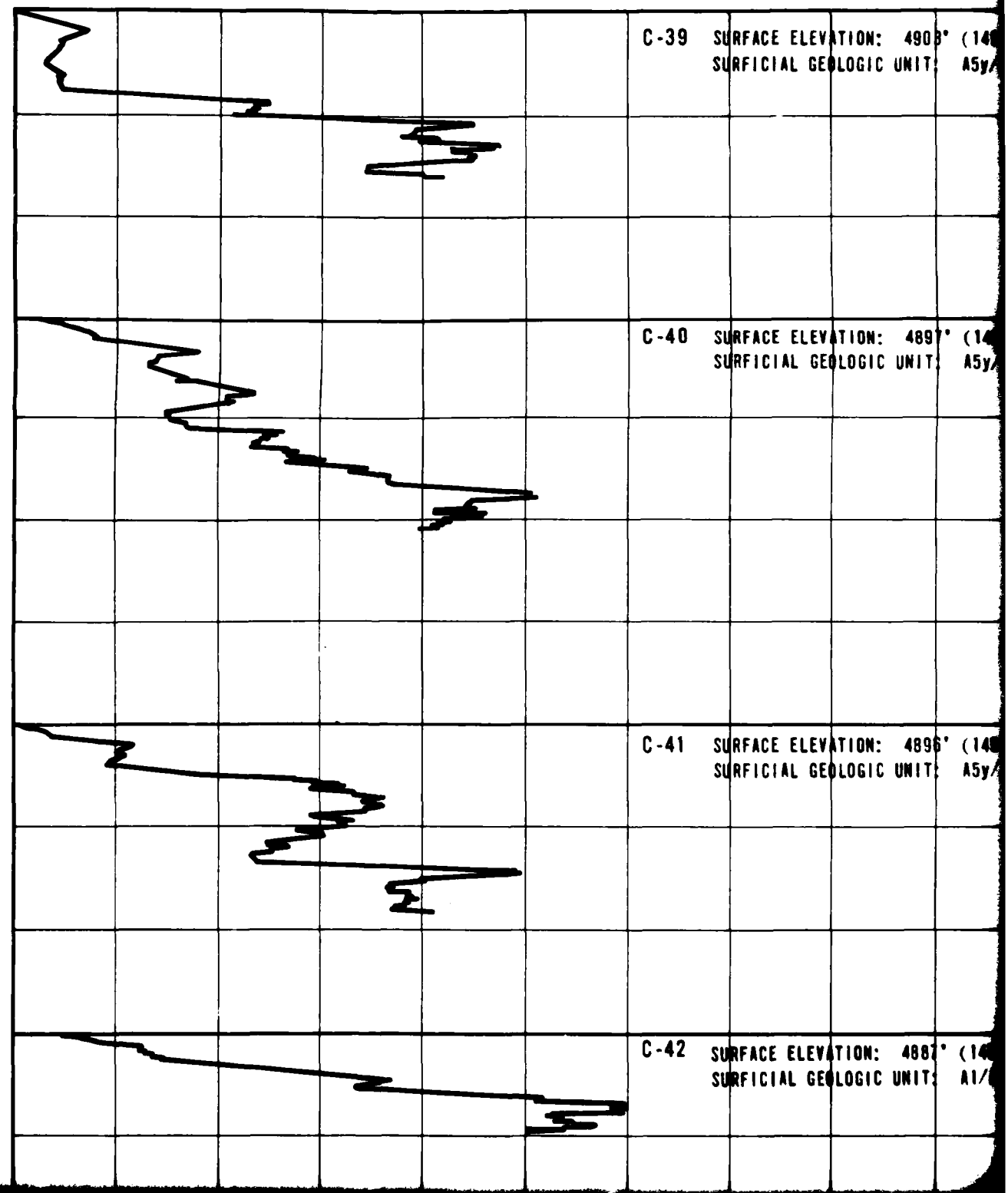
45 225

46 230

47 235

48 240

49 245



2

CONE RESISTANCE

DEPTH

(METERS)  
(FEET)

0 100 200 300 400 500 600 700  
0 100 200 300 400 500 600 700

900 (kg/cm<sup>2</sup>)

900 (tsf)

SOIL  
COLUMN

4905' (1494m)  
UNIT: A5y/A4

SP-SM

GP

P-16

4895' (1493m)  
UNIT: A5y/A4

SM

GP

F-8

4895' (1492m)  
UNIT: A5y/A4

SM

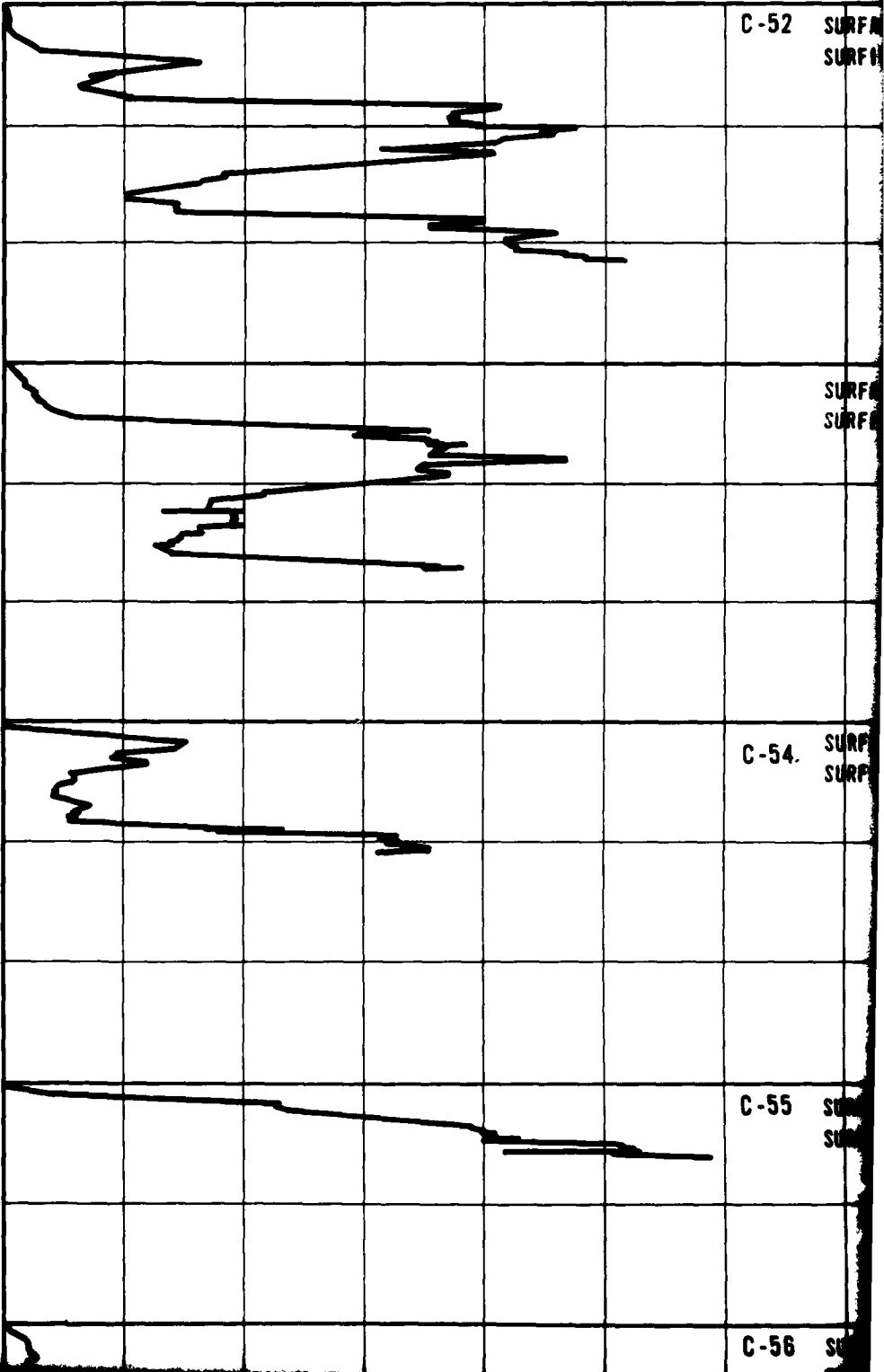
GP

P-17

4885' (1490m)  
UNIT: A1/A4

GP-GM

CS-42



3

DISTANCE

500 600 700 800 900 (kg/cm<sup>2</sup>)  
500 600 700 800 900 (tsf)

C-52 SURFACE ELEVATION: 5175' (1577m)  
SURFICIAL GEOLOGIC UNIT: A5y

SURFACE ELEVATION: 5210' (1588m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-54 SURFACE ELEVATION: 5430' (1658m)  
SURFICIAL GEOLOGIC UNIT: A5i

C-55 SURFACE ELEVATION: 5510' (1679m)  
SURFICIAL GEOLOGIC UNIT: A5i

C-56 SURFACE ELEVATION: 5512' (1680m)  
SURFICIAL GEOLOGIC UNIT: A5y

SOIL COLUMN

F-14 SM

F-14

SP-SM

GP

P-21

SP

CS-54

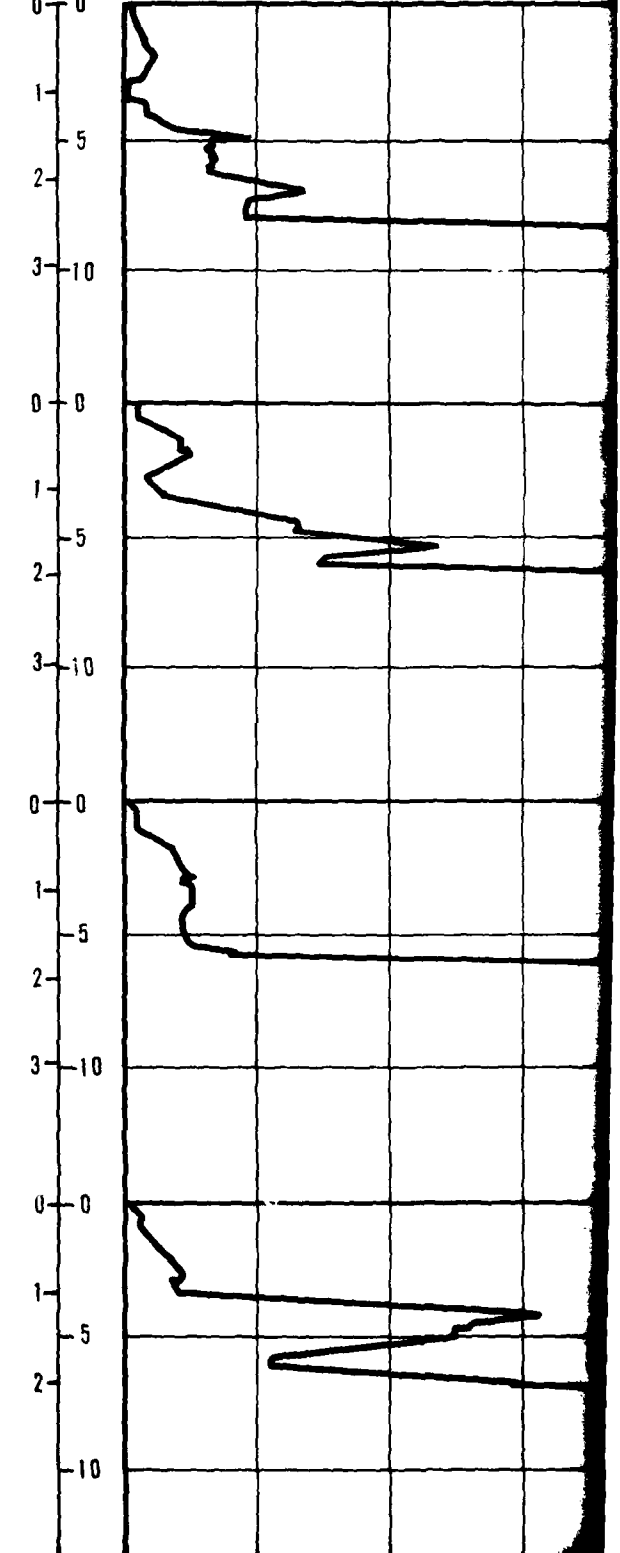
GM

F-15

SM

DEPTH

(METERS) 0 100 200 300  
(FEET) 0 100 200 300



1

4

CONE RESISTANCE

200 300 400 500 600 700 800 900 (kg/cm<sup>2</sup>)  
200 300 400 500 600 700 800 900 (tsf)

C-65 SURFACE ELEVATION: 5330' (1627m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-66 SURFACE ELEVATION: 5460' (1664m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-67 SURFACE ELEVATION: 5550' (1692m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-68 SURFACE ELEVATION: 5615' (1711m)  
SURFICIAL GEOLOGIC UNIT: A5y

SOIL COLUMN

SM

P-26

SP-SM

SP

SP-SM

B-5

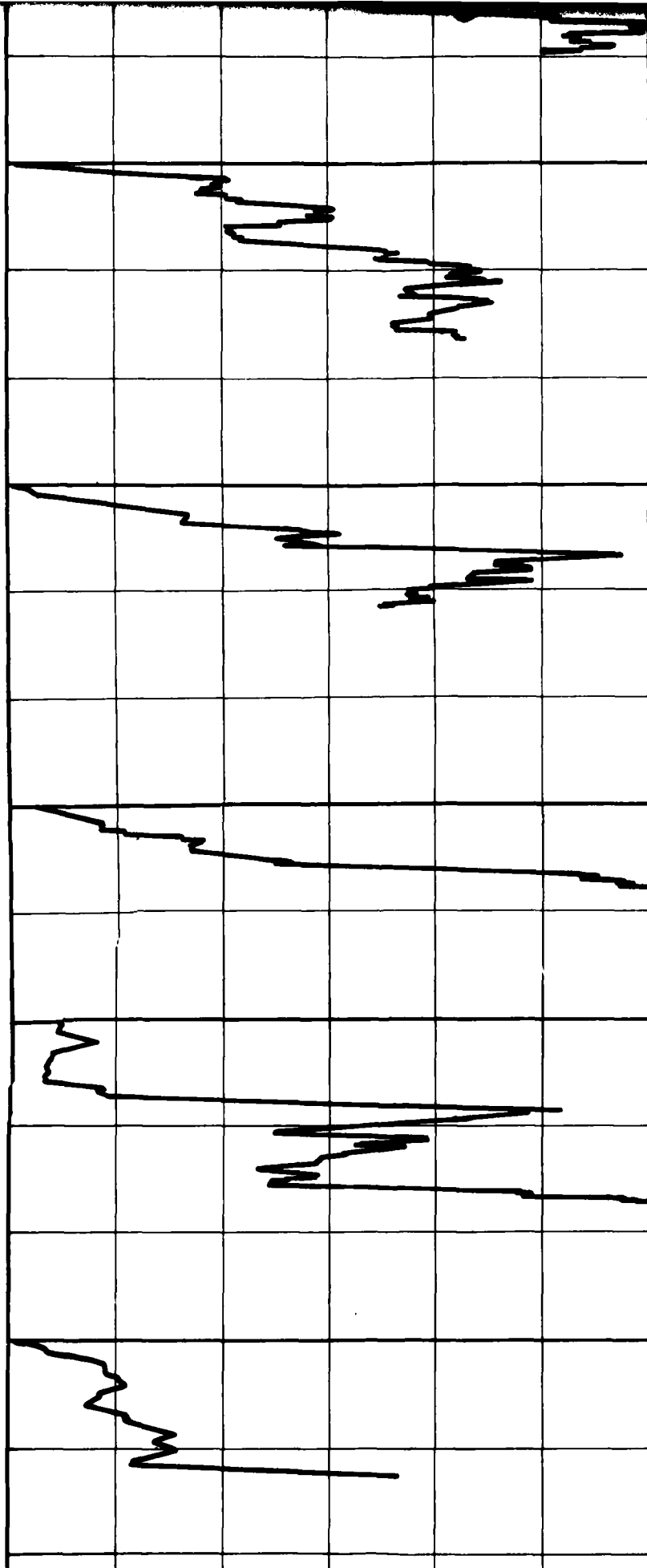
SP-SM

P-27

SP-SM

CS-68

5  
0 0  
1 5  
2  
10  
0 0  
1 5  
2  
10  
0 0  
1 5  
2  
10  
0 0  
1 5  
2  
10



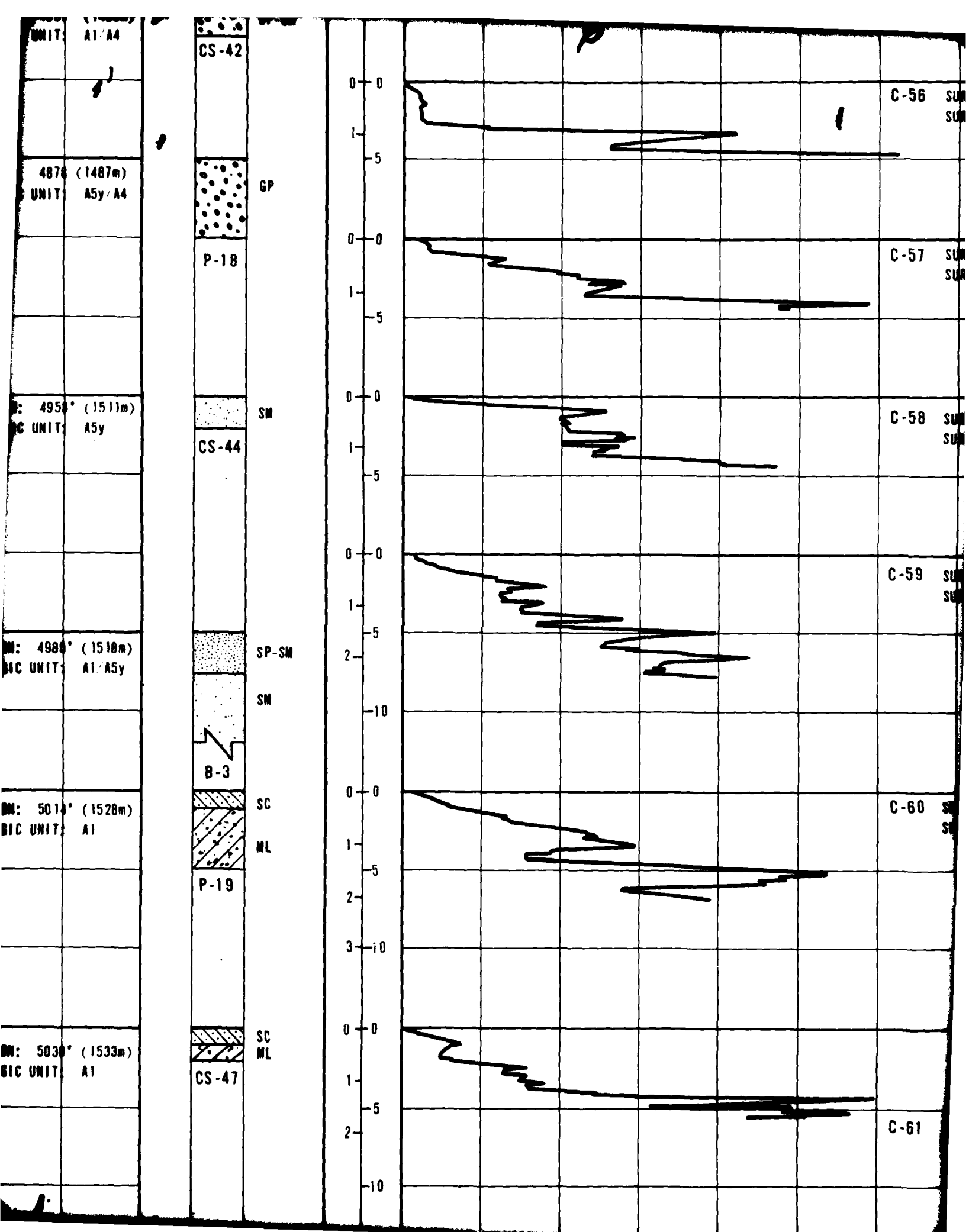
C-43 SURFACE ELEVATION: 4870' (148)  
SURFICIAL GEOLOGIC UNIT: A59

C-44 SURFACE ELEVATION: 4950' (15)  
SURFICIAL GEOLOGIC UNIT: A59

C-45 SURFACE ELEVATION: 4980' (15)  
SURFICIAL GEOLOGIC UNIT: A1A

C-46 SURFACE ELEVATION: 5010' (15)  
SURFICIAL GEOLOGIC UNIT: A1

C-47 SURFACE ELEVATION: 5030' (15)  
SURFICIAL GEOLOGIC UNIT: A1



C-56 SURFACE ELEVATION: 5512' (1680m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-57 SURFACE ELEVATION: 5570' (1698m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-58 SURFACE ELEVATION: 5375' (1638m)  
SURFICIAL GEOLOGIC UNIT: A5i

C-59 SURFACE ELEVATION: 5360' (1634m)  
SURFICIAL GEOLOGIC UNIT: A5i

C-60 SURFACE ELEVATION: 5400' (1646m)  
SURFICIAL GEOLOGIC UNIT: A5i

C-61 SURFACE ELEVATION: 5382' (1634m)  
SURFICIAL GEOLOGIC UNIT: A5y

SM  
GP  
P-23

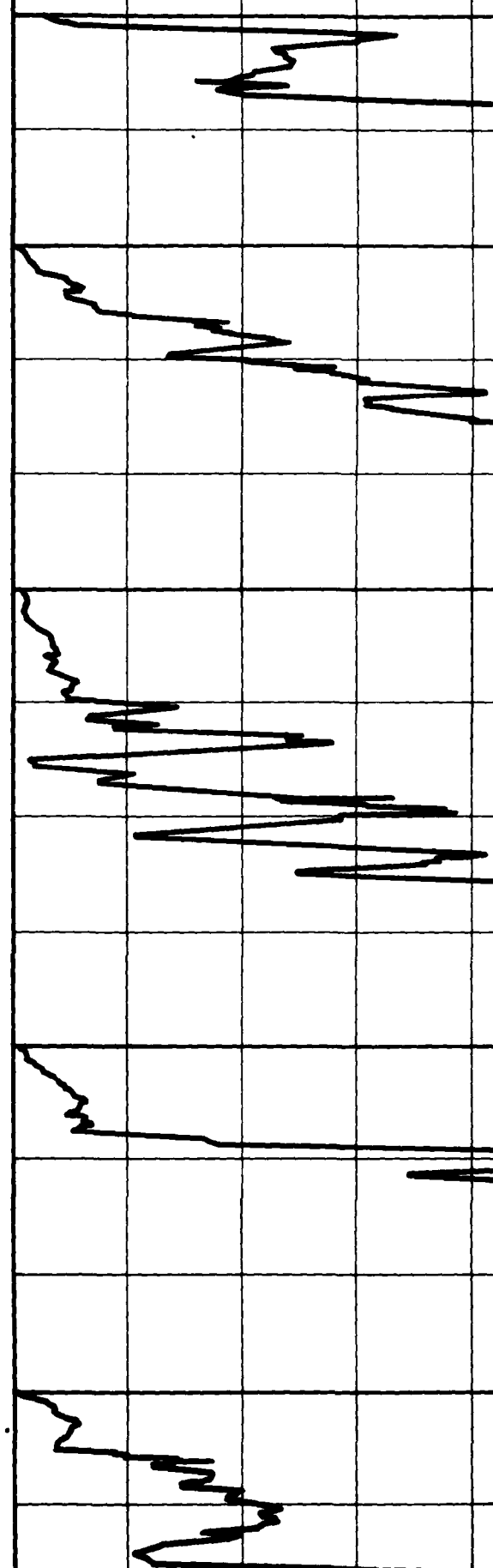
SM  
F-16

SM  
SP  
T-10

SC  
P-24

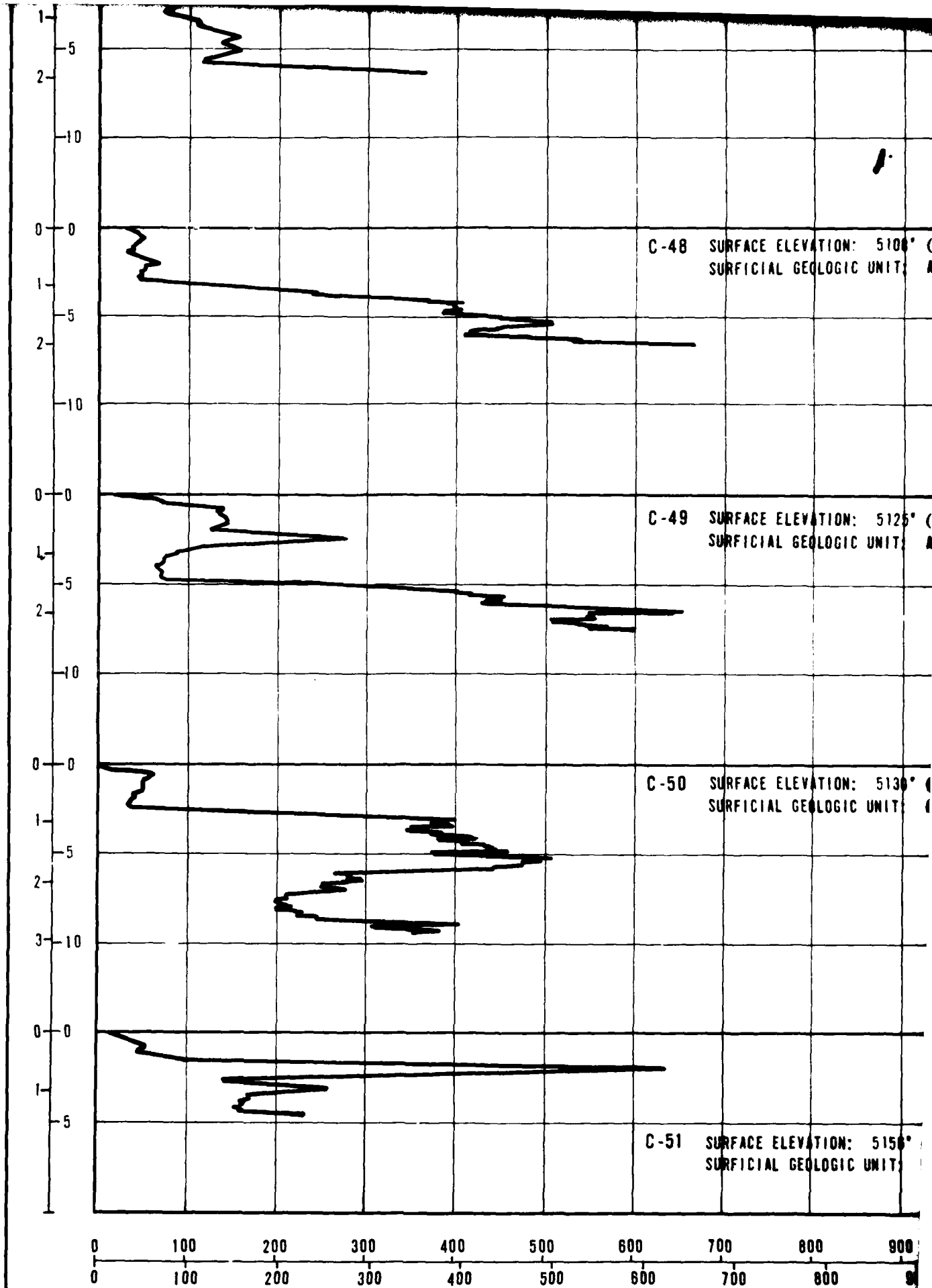
SM  
SP  
CS-61

10  
0 0  
1 5  
0 0  
1 5  
2 10  
0 0  
1 5  
2 10  
3 15  
0 0  
1 5  
2 10  
0 0  
1 5  
2



|  |                                                                               |              |
|--|-------------------------------------------------------------------------------|--------------|
|  | <p>C-69 SURFACE ELEVATION: 5755' (1754m)<br/>SURFICIAL GEOLOGIC UNIT: A5i</p> | <p>SM</p>    |
|  |                                                                               | <p>GP</p>    |
|  |                                                                               | <p>P-28</p>  |
|  | <p>C-70 SURFACE ELEVATION: 5840' (1780m)<br/>SURFICIAL GEOLOGIC UNIT: A1</p>  | <p>SP</p>    |
|  |                                                                               | <p>CS-70</p> |
|  | <p>C-71 SURFACE ELEVATION: 5960' (1817m)<br/>SURFICIAL GEOLOGIC UNIT: 14</p>  | <p>SP-SM</p> |
|  |                                                                               | <p>P-29</p>  |
|  | <p>C-72 SURFACE ELEVATION: 5832' (1778m)<br/>SURFICIAL GEOLOGIC UNIT: A5y</p> | <p>SP</p>    |
|  |                                                                               | <p>CS-72</p> |
|  | <p>C-73 SURFACE ELEVATION: 5955' (1815m)<br/>SURFICIAL GEOLOGIC UNIT: A5y</p> | <p>SP-SM</p> |
|  |                                                                               | <p>CS-73</p> |

CHECKED BY \_\_\_\_\_ APPROVED BY \_\_\_\_\_



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SON: 5100' (1557m)  
SIC UNIT: A1

SON: 5125' (1562m)  
SIC UNIT: A1

SON: 5130' (1564m)  
SIC UNIT: A5y

SON: 5150' (1572m)  
SIC UNIT: A5y

SM



GW

B-4

SM

CS-49

SM

F-13

SM

SP-SM

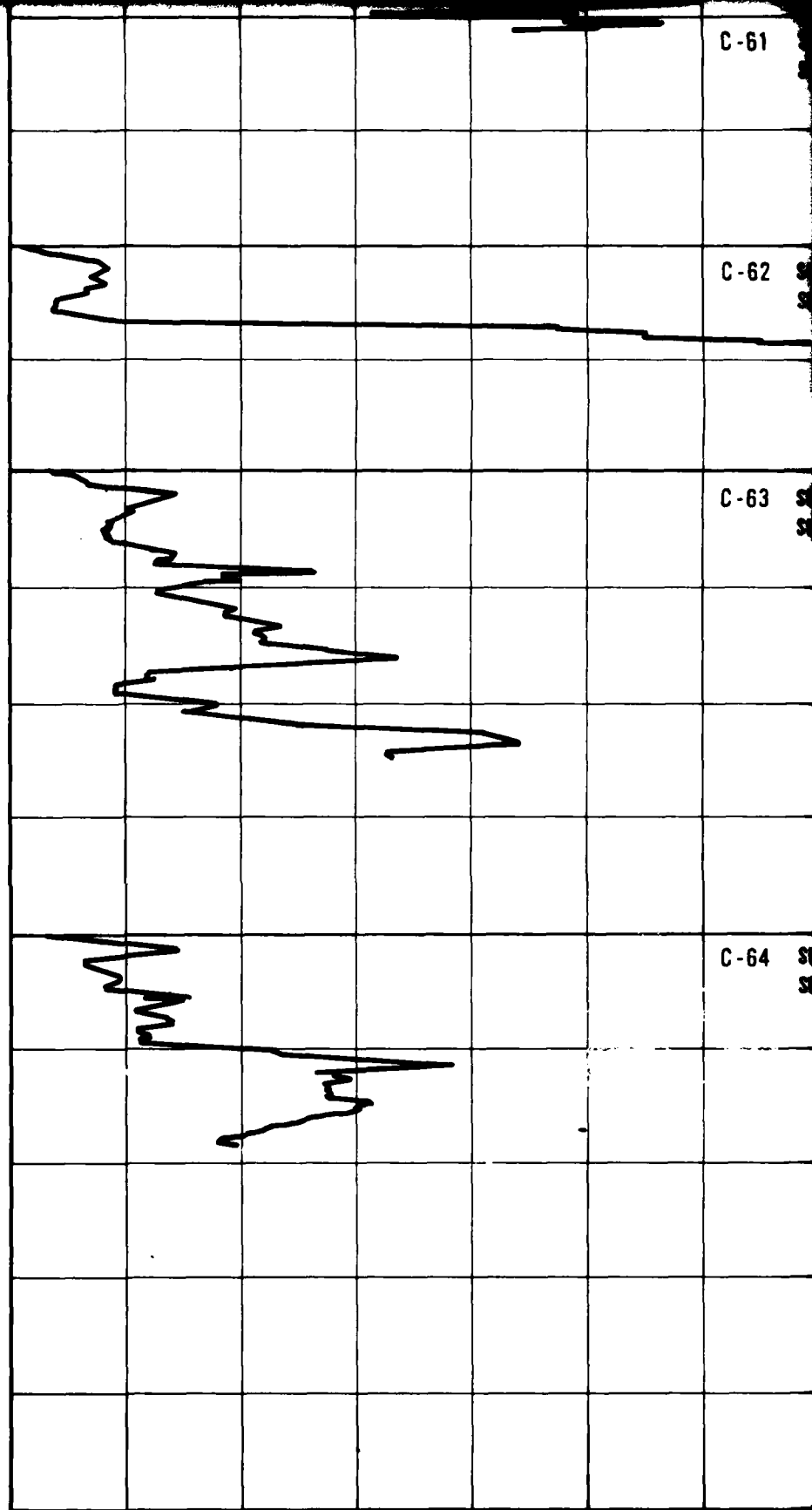
SM

P-20

900 (tsf)

900 (kg/cm<sup>2</sup>)

2  
-10  
0  
1  
-5  
0  
1  
-5  
2  
3  
-10  
4  
-15  
0  
1  
-5  
2  
3  
-10



C-61

C-62

C-63

C-64

0 100 200 300 400 500 600 700  
0 100 200 300 400 500 600

10

C-61 SURFACE ELEVATION: 5362' (1634m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-62 SURFACE ELEVATION: 5370' (1637m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-63 SURFACE ELEVATION: 5355' (1632m)  
SURFICIAL GEOLOGIC UNIT: A5y

C-64 SURFACE ELEVATION: 5330' (1625m)  
SURFICIAL GEOLOGIC UNIT: A5y

SP-SM

SP

P-25

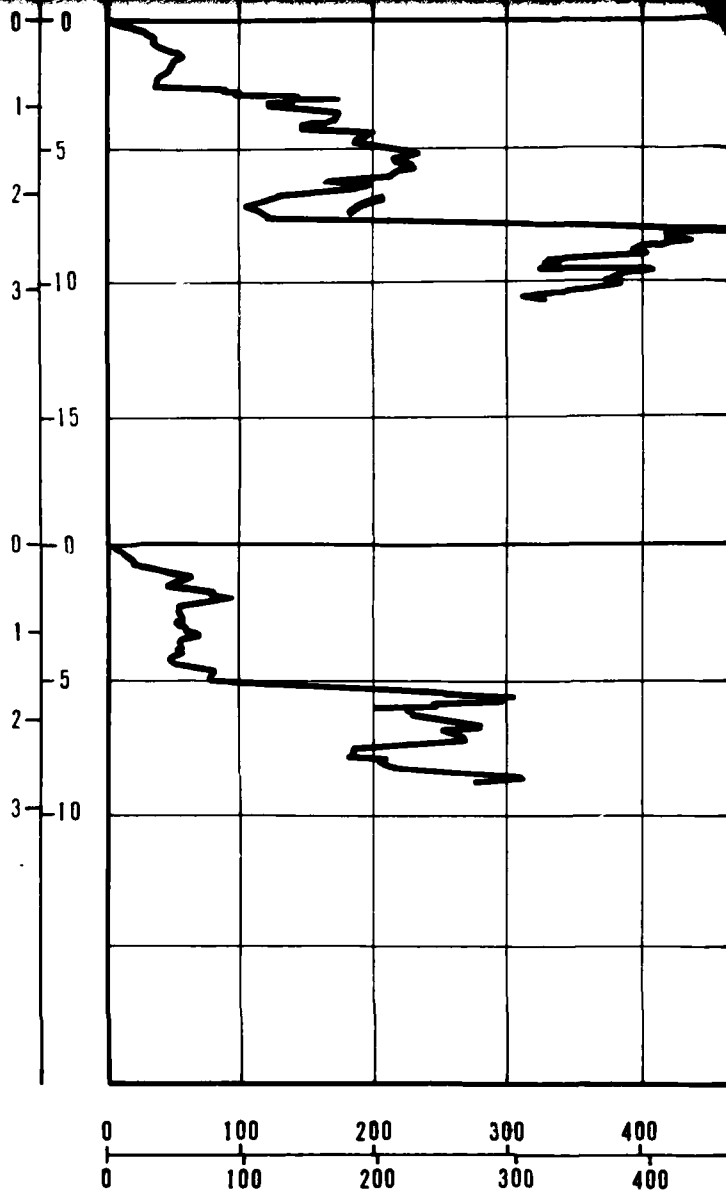
SP

CS-63

SC

SM

CS-64



800 700 800 800 (tsf)  
800 700 800 900 (kg/cm<sup>2</sup>)

//

C-73 SURFACE ELEVATION: 5955' (1815m)  
SURFICIAL GEOLOGIC UNIT: A5y

SP-SM

CS-73

C-74 SURFACE ELEVATION: 6055' (1846m)  
SURFICIAL GEOLOGIC UNIT: A5y

SW-SM

T-6

200 300 400 500 600 700 800 900 (tsf)  
200 300 400 500 600 700 800 900 (kg/cm<sup>2</sup>)

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CONE RESISTANCE

DEPTH

(METERS)  
(FEET)

0 100 200 300 400 500 600 700 800 900 (

0 0

1

5

2

3

10

0

0

1

5

2

3

10

4

15

0

0

1

5

2

3

10

4

15

0

0

C-75 SURFACE ELEVATION: 6170' (1880)  
SURFICIAL GEOLOGIC UNIT: A5i

C-76 SURFACE ELEVATION: 5850' (1780)  
SURFICIAL GEOLOGIC UNIT: A5y

C-77 SURFACE ELEVATION: 5760' (1750)  
SURFICIAL GEOLOGIC UNIT: A5y

C-78 SURFACE ELEVATION: 5680' (1720)  
SURFICIAL GEOLOGIC UNIT: A5y

2

900 (kg/cm<sup>2</sup>)

900 (tsf)

## SOIL COLUMN

SC

**GP**

**P-32**

SM

**P-30**

**SP-SM**

**P-31**

SM

**F-19**

### CONE RESISTANCE

**DEPTH**

(METERS)

(133f)

040

100

200

300

400

**500**

600

71

0

100

200

300

400

500

600

701

6170' (1881m)  
UNIT: A5i

585' (1784m)  
UNIT: A5y

M: 5760' (1756m)  
 IC UNIT: A5y

UNIT: A5y

1

3

# RESISTANCE

500 600 700 800 900 (kg/cm<sup>2</sup>)  
500 600 700 800 900 (tsf)

SOIL  
COLUMN

# DEPTH

(METERS) (FEET) 0 100 200 300  
0 100 200 300

2

1

4

### CONE RESISTANCE

**SOIL  
COLUMN**[illegible]

\_\_\_\_\_

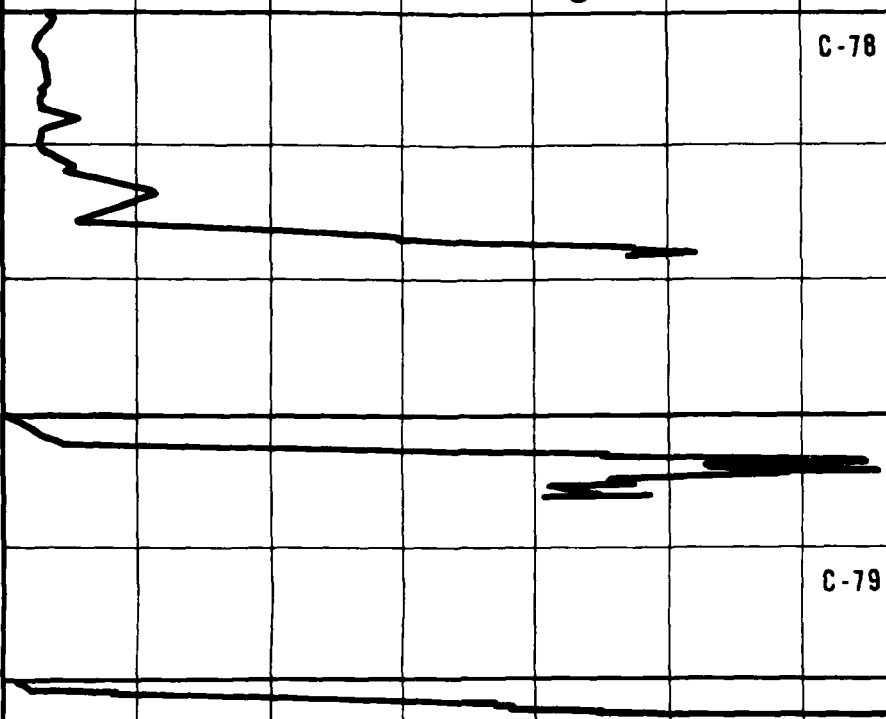
5

0-0  
1-5  
2-10  
3-10  
0-0  
1-5  
0-0  
1-5

C-78 SURFACE ELEVATION: 568' (1)  
SURFICIAL GEOLOGIC UNIT: A5

C-79 SURFACE ELEVATION: 5720' (1)  
SURFICIAL GEOLOGIC UNIT: A5

C-80 SURFACE ELEVATION: 5760' (1)  
SURFICIAL GEOLOGIC UNIT: A5

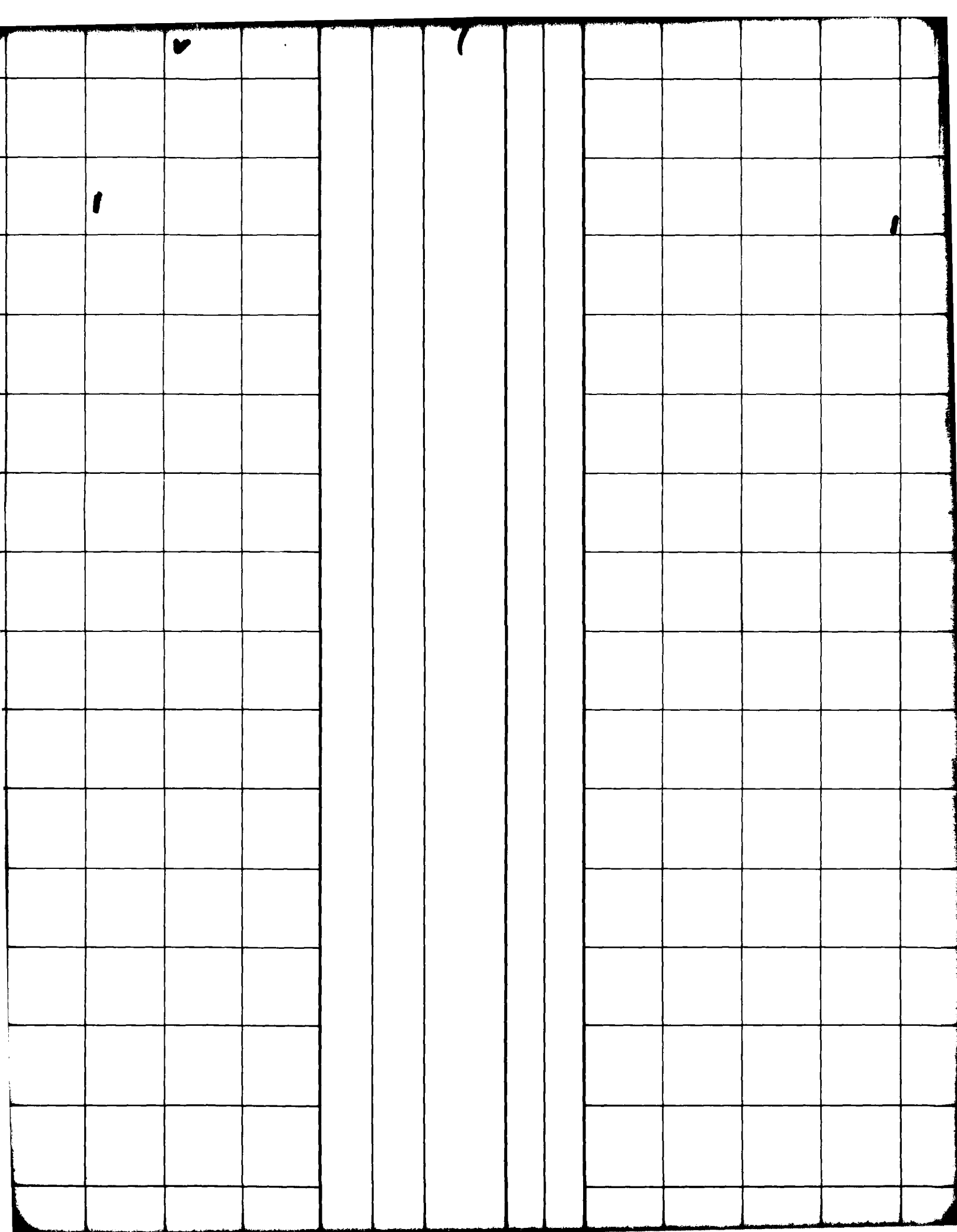


•

1

CS-79

**CS-80**



4

1

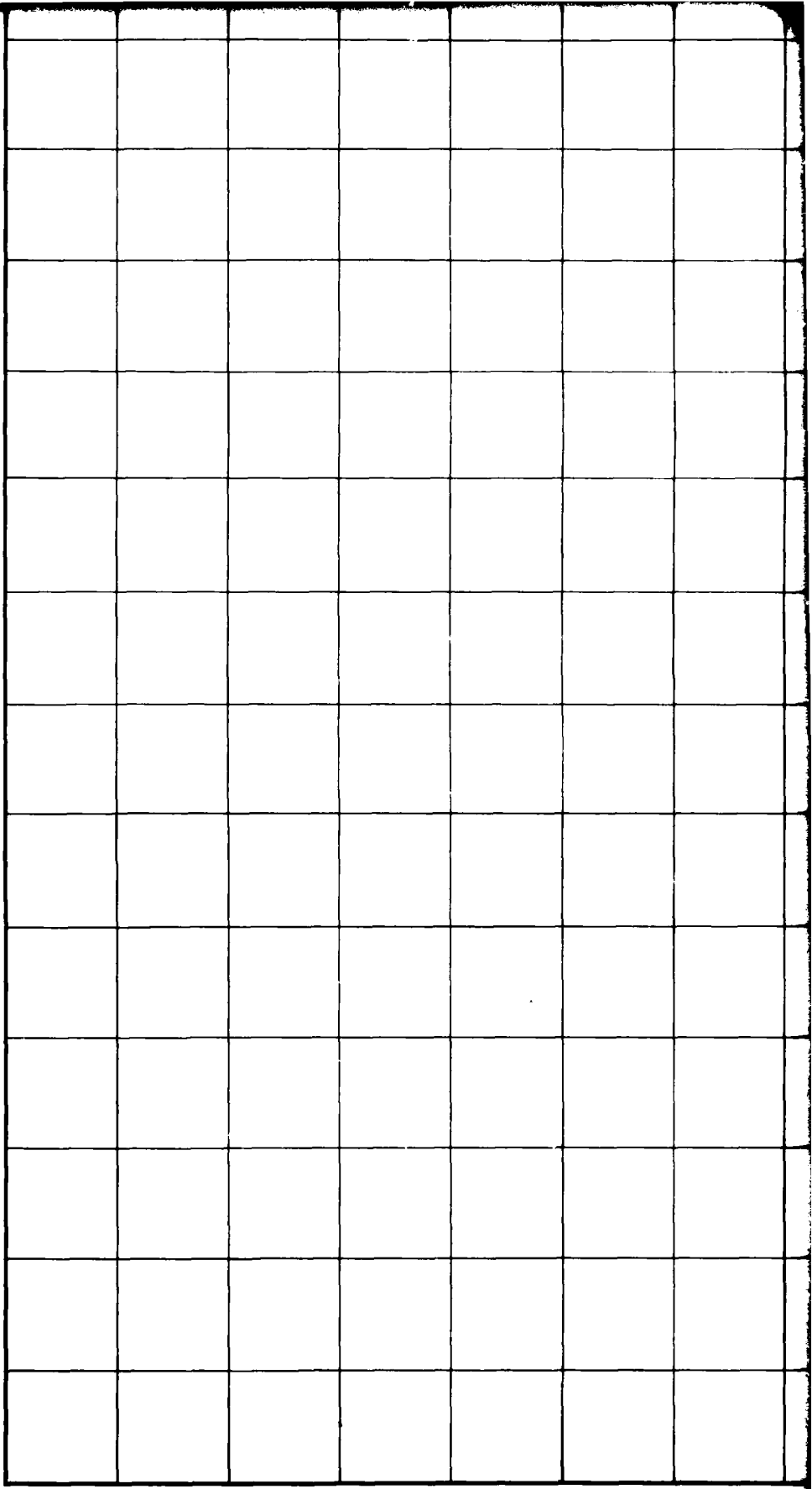
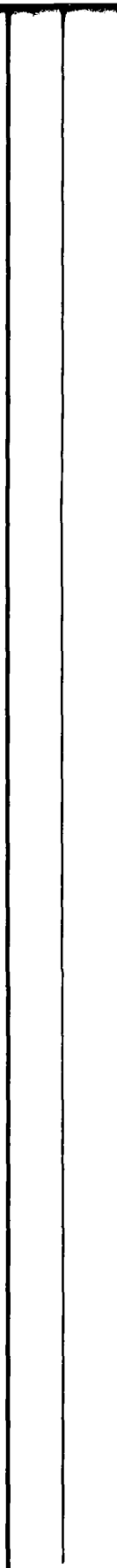
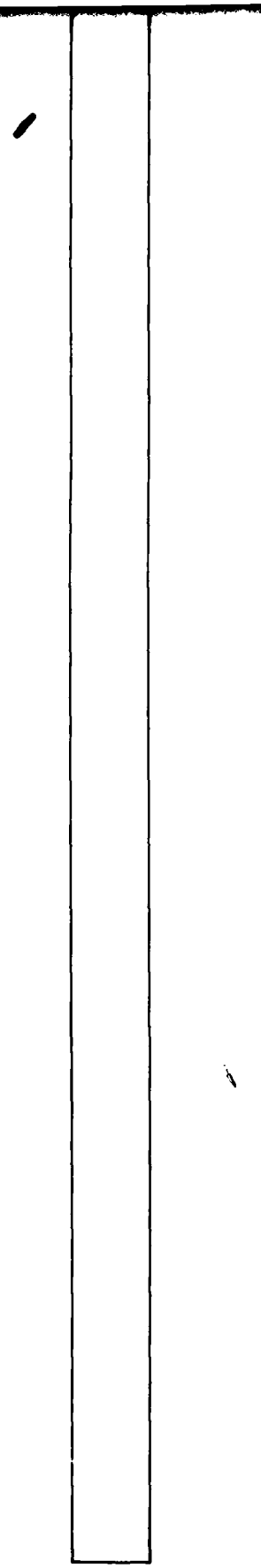
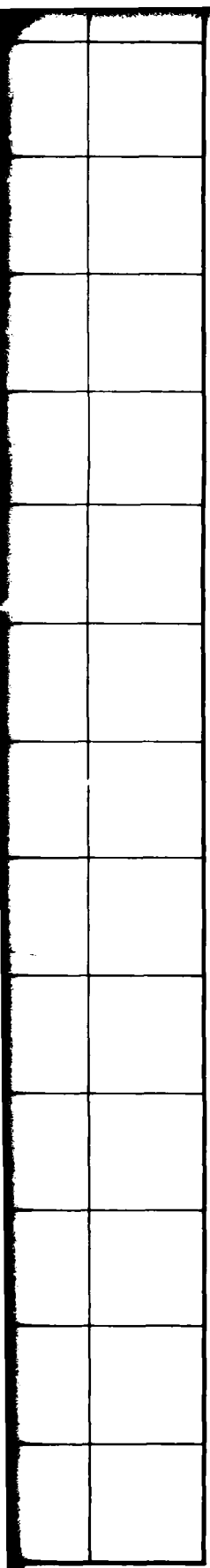
1

1

[illegible]

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9



900 (tsf)

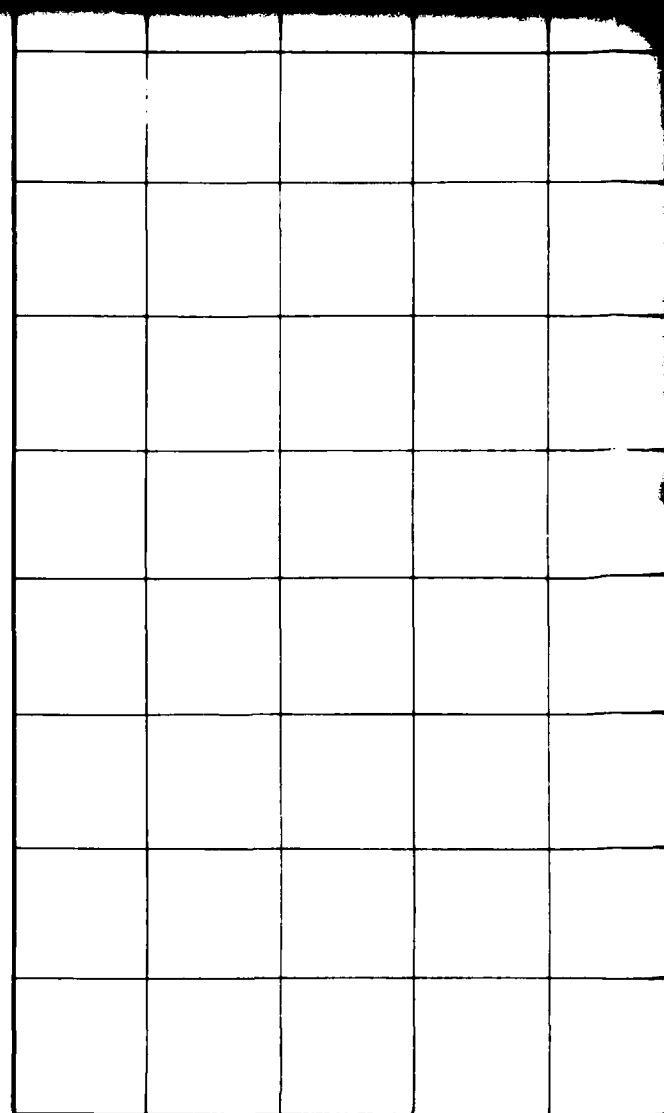
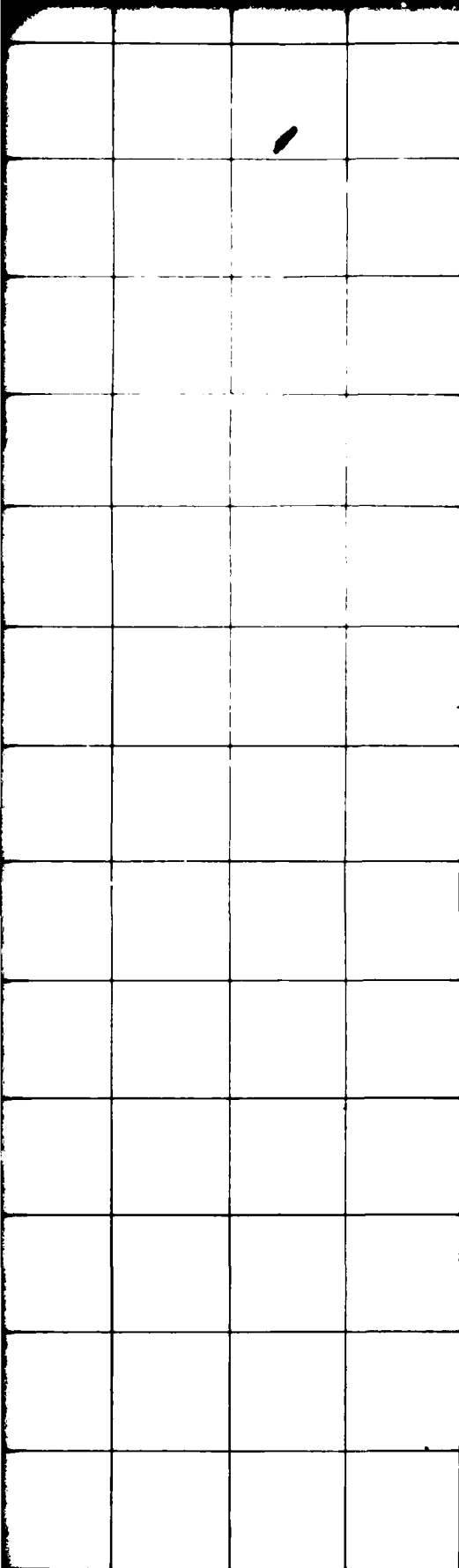
900 (kg/cm<sup>2</sup>)

0 100 200 300 400 500 600 700

0 100 200 300 400 500 600 700

1

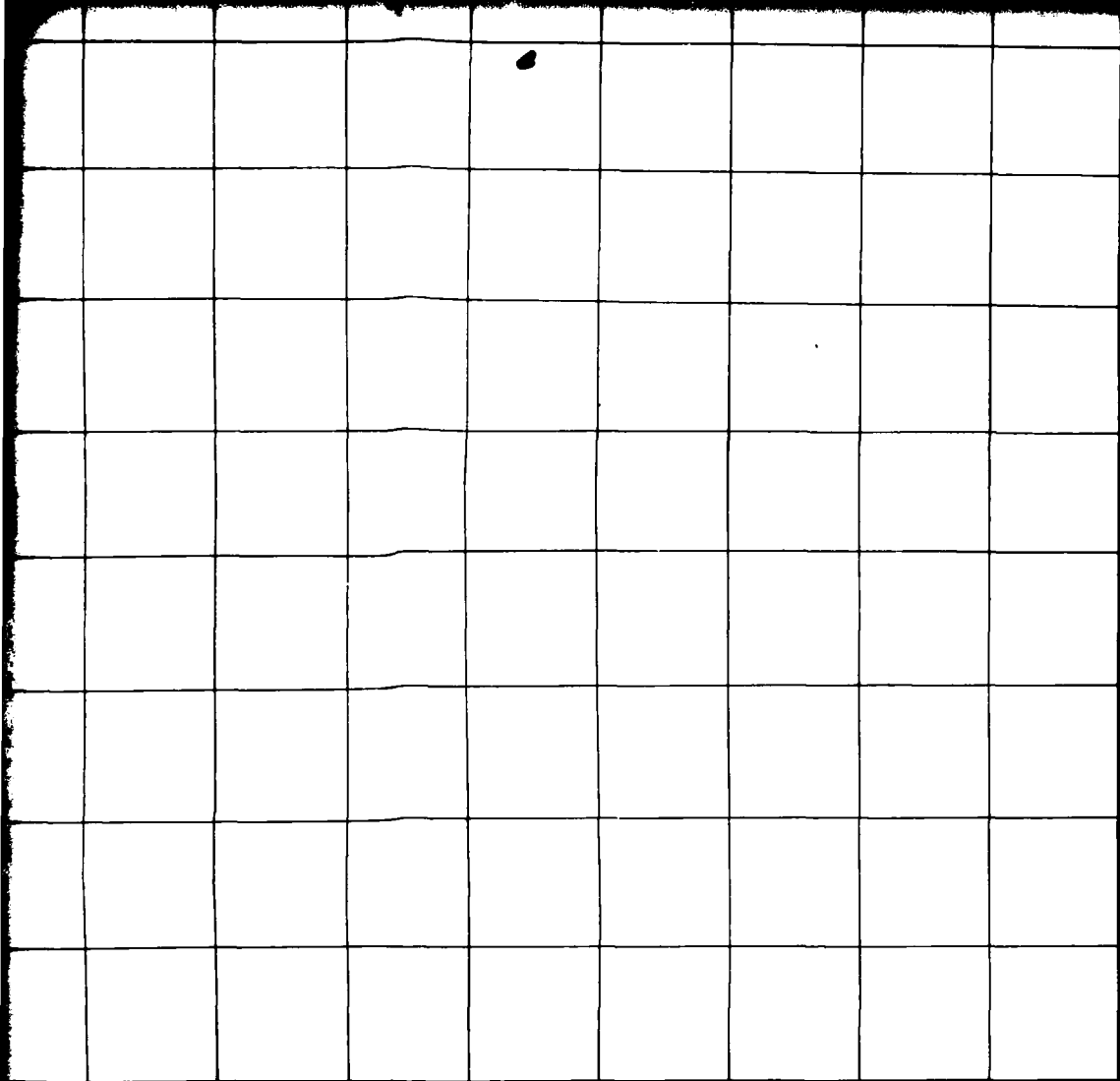
10



0 100 200 300 400 5  
0 100 200 300 400

700 800 900 (tsf)  
700 800 900 (kg/cm<sup>2</sup>)

11



|     |     |     |     |     |     |     |     |                       |
|-----|-----|-----|-----|-----|-----|-----|-----|-----------------------|
| 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | (tsf)                 |
| 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | (kg/cm <sup>2</sup> ) |

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