New Mexico Bureau of Mines and Mineral Resources

Open-file Report 132

DRILL HOLE AND TESTING DATA
COMPILED FOR
HYDROGEOLOGIC STUDY OF ANIMAS VALLEY,
HIDALGO COUNTY, NEW MEXICO

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CONTENTS

INTRODUCTION

The Animas Valley is a closed basin located in western Hidalgo County, southwest New Mexico (fig. 1). The valley is approximately 80 mi long, lying between the Mexican border and US highway 70. The width of the valley varies from 6 to 12 mi along its length.

Problem and purpose of study

The central part of the valley is an important area for irrigated agriculture (Lansford and others, 1980) and is the site of the Lightning Dock Known Geothermal Resource Area (fig. 1). Although an understanding of the hydrogeology of the valley is important to both the agricultural economy and the development of the area's geothermal resources, the water resources of the entire area had not been studied in detail since 1957 (Reeder, 1957). The Animas Valley is also an excellent example of a closed alluvial basin. For these reasons the present study was initiated as part of the U.S. Geological Survey Water-Resource Division's Southwest Alluvial Basin Regional Aquifer System Analysis. The work is being funded under contract with the U.S. Geological Survey (WRD), Albuquerque.

Purpose of this report

Basic data compiled for the Animas Valley study are being released in a series of Bureau Open-file reports so that the information compiled may be available for use prior to the completion of the final project report. This report (OF-132)

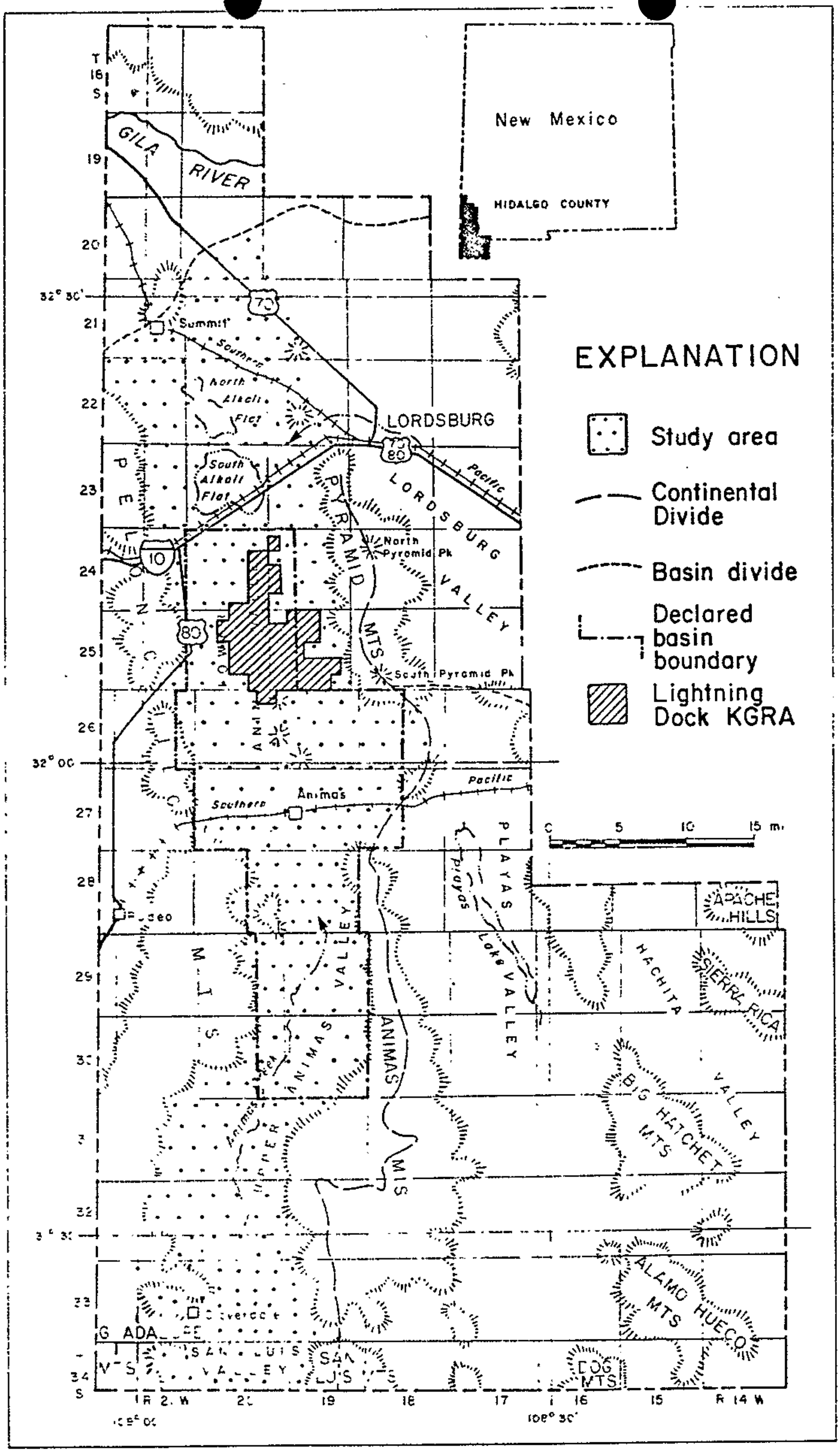

Figure 1 Location of Study Area

gives the drill hole and testing data. Bureau OF-130 gives the basic water-level data, OF-131 gives the basic water-quality data, OF-133 will give the hydrologic model, and OF-134 will be the final report on the project.

The Animas Valley

The Animas Valley lies in the Mexican Highlands section of the Basin and Range physiographic province. It is bounded on the west by the Peloncillo Mountains and on the east by the Animas Mountains and the Pyramid Mountains (fig. 1). The northern boundary is marked by an extensive eolian dune field just south of US 70. The southern boundary lies across the international boundary in Mexico.

The climate of the Animas Valley is arid to semiarid (Cox, 1973). Precipitation generally averages 10 inches in the valley and 22 inches in the higher mountains. Based on 30 years of data (1931-1960), precipitation at Lordsburg falls below 5.71 inches and exceeds 13.84 inches one year in ten. Rainfall is greatest in late summer and early fall; half of the average annual precipitation occurs in July through September. Animas Creek, which rises in the southern Peloncillo Mountains and flows northerly to a point just south of the town of Animas, is the only perennial stream in the study area. Alluvial fans along the west and east valley margins are sources of ephemeral flow.

The Peloncillo Mountains consist of various sedimentary and volcanic rocks. Approximately 5,000 ft of Paleozoic strata, approximately 2,500 ft of Cretaceous strata, and an undetermined thickness of Cretaceous and Tertiary volcanic rocks occur in the area north of the ghost town of Steins and south of Cowboy Pass (Gillerman, 1958).

The Animas Mountains consist mainly of sedimentary rocks. These include approximately 3,500 ft of Paleozoic limestone, dolostone, sandstone, and shale and 10,000-15,000 ft of Cretaceous sandstone and shale (Soule, 1972).

The Pyramid Mountains consist of a variety of volcanic and plutonic igneous rocks (Flege, 1959). The northern part consists of basalt intruded by granodiorite. The central part is characterized by pyroclastic volcanics and lesser amounts of rhyolite, rhyolitic welded tuff, and basalt. The southern part is dominated by andesite with lesser amounts of rhyolite and basalt.

The valley was the site of two Quaternary lakes: Lake Cloverdale in the south (Schwennesen, 1918) and Lake Animas in the north (Fleischhauer and Stone, 1981). The valley is filled with bolson and lacustrine deposits of undetermined thickness.

Geologic maps and geophysical surveys confirm the basin-and-range structure of the area. The valley is a graben and the bounding ranges are horsts. Complex folding and faulting is apparent within the mountain blocks and presumably occurs in the intervening basin as well.

Sources of data

Lithologic data used in this report were either generated as part of the project, or compiled from published sources, the files of the Deming office of the New Mexico State Engineer, or the petroleum library at the New Mexico Bureau of Mines and Mineral Resources.

Published sources include Schwennesen (1918), Reeder (1957), Kottlowski and others (1969), Thompson and others (1978), Deal and others (1978), Elston and others (1979), and Thompson (1981).

STRATIGRAPHIC DATA

Subsurface data either collected as part of the project or compiled from existing sources were utilized to define stratigraphic relationships in the Animas Valley. The New Mexico Bureau of Mines and Mineral Resources drilling crew completed two drill holes in T22S, R20W, section 6. The holes were sampled at 5 foot intervals and logged by the geophysical group of the U.S. Geophysical Survey, Albuquerque. Numerous well logs submitted by water well drillers to the State Engineers office in Deming, as well as petroleum well logs, cuttings and geophysical borehole logs from the petroleum library at the New Mexico Bureau of Mines and Mineral Resources were analyzed. A geologic cross-section based on these well logs was constructed (Plate 1).

Cuttings and Geophysical Logs

Description of cuttings from the holes drilled by the New Mexico Bureau of Mines and Mineral Resources is given in Appendix A. The description of cuttings includes type, grain composition, color, particle size, roundness, sorting, cementation and accessory minerals. The samples from the holes drilled by the rotary drill rig were compared with borehole geophysical logs (Appendix B) in order to determine tops of lithologic units.

Samples from test hole 1 (T-1) and test hole 2 (T-2) reflect the type of deposition which occurs in topographically closed basins of the Basin and Range province (figure 1). Test hole 1, located in T22S, R20W, section 6, SW¼, NE¼, NE¼ was drilled and sampled from 0 to 415 feet. The air rotary drilling method was used for the first 80 feet, after which drilling mud was added. The sampling interval was 5 feet. Description of the samples is given in Appendix A.

The initial 60 feet of drilling in T-1 encountered 5 to 10 foot intervals of sediments ranging from silt to coarse sand. Samples for the next 65 feet (60 to 125 ft) are predominantly clay. Water-bearing sediments present in the next 95 feet (125 to 220 ft) consist of a 35 foot interval of sand and gravel, a 40 foot interval of very fine sand and a 20 foot interval of sand and gravel. Pebbly clays are found from 220 to 240 feet. The 175 foot interval from 240 to 415 feet consists of silty clay.

Geophysical bore-hole logs for test hole 1 are difficult to interpret (Appendix B). The caliper log shows extreme bore-hole diameter fluctuations from the drill bit size of 5 1/8 inches. Attempts to fill the bore-hole with water were unsuccessful. Spontaneous potential and resistivity logs began recording at the raised groundwater level of 134 feet. The drill hole, which was initially 415 feet deep, collapsed to 191 feet. Bore-hole diameter fluctuations between 134 to 191 feet caused problems with the interpretation of these logs. The gamma, bulk density and neutron logs are also affected by large bore-hole diameter fluctuations, but not by bore-hole dewatering. Sand and clay layers are discernable on the neutron log between 0 to 53 feet, and silty clay is found from 53 to 130 feet. Sand and gravel with layers of fine sand are present on the neutron log between 144 to 191 feet. Detritas from volcanic source rocks cause sands to have higher radioactivity than clays. The gamma log shows the presence of sand and silt between 0 to 60 feet, silty clay with some sand between 60 to 125 feet, a washed out zone between 125 to 140 feet and predominantly sand and gravel with a few 2 to 4 foot intervals of silt between 140 to 191 feet.

Test hole 2 (T-2) is located 50 feet east of T-1 in T22S, R20W, section 6, SW¼, NE¼, NE¼. Samples were collected between 50 to 55 feet and at 5 foot intervals from 80 to 363 feet. The total depth of T-2 was 363 feet. Samples between 0 to 80 feet are assumed to be analogous to samples collected from T-1. Test hole 2 was drilled with drilling mud from the land surface to the total depth. Since drilling mud was not used in T-1 for the initial 80 feet, samples from T-1 in that interval are not intermixed with drilling mud. Description of the samples is given in Appendix A.

A sample of gravel, which was not present in the initial 80 feet of T-1, was taken at the 5 foot interval between 50 to 55 feet. From 80 to 135 feet, sediments ranging from fine gravel to silt are present. A 5 foot interval of very coarse to fine sand exists between 135 to 140 feet. Gravel to fine sand to silt are found in the 30 foot interval from 140 to 170 feet. Sand, ranging from very coarse to fine, is present between 170 to 215 feet. A 10 foot layer of very fine sand and silt exists from 215 to 225 feet. Medium sand along with fine to very fine sand is found from 225 to 255 feet. From 225 to 363 feet, clay is predominant in the samples.

Geophysical bore-hole logs for test hole 2 aid in determining tops of lithologic changes (Appendix B). The caliper log for T-2 is relatively consistent except for the initial 68 feet, which are washed out. Spontaneous potential and resistivity logs are available from the land surface since the bore-hole was successfully filled with water. Caving of the bore hole filled the drill hole to 273 feet.

Geophysical logs show alternating layers of sand and silt in the initial 46 feet. An 18 foot zone rich in gravel and sand exists between 46 to 64 feet. From 64 to 130 feet, there is a 66 foot interval of fine gravel to silt. Very coarse sand is indicated for 10 feet between 130 to 140 feet. Alternating layers of sand and silt are shown between 140 to 156 feet. A clean 15 foot zone of medium sand exists between 156 to 171 feet. From 171 to 201 feet, very fine sand to silt is encountered. Very fine sand to clay is present between 201 to 220 feet. Medium to fine sand is found between 220 to 250 feet. Clay and silt are indicated for the remainder of the log (between 250 to 273 feet).

Comparison of geophysical bore-hole logs with cuttings indicate a lag time for cuttings to reach the land surface. Coarse sand appears in cuttings for the 5 foot interval between 135 to 140 feet. Geophysical logs indicate coarse sand from 130 to 140 feet. In general, a 5 foot lag time exists for cuttings to reach the land surface.

Another observation in comparing the two subsurface methods is that cuttings from one horizon tend to be mixed with cuttings from another horizon. For example, cuttings show a mixture of gravel, sand and silt between the 30 foot interval from 140 to 170 feet, whereas geophysical logs indicate a medium sand within the 30 foot interval from 156 to 171 feet.

The temperature log for T-2 yields a temperature gradient of 1.4°C per 100 feet (2.6°F per 100 feet). The minimum temperature of 16.6°C (61.8°F) was encountered at a depth of 64 feet. The maximum temperature of 19.6°C (67.2°F) was indicated at 272 feet (Appendix B).

Spatial Correlation of Subsurface Deposits

An attempt was made to understand the spatial correlation of sediments in the subsurface. A northwest-southeast line of section A-A' was constructed down the center of the Animas Valley (figure 2). Well logs reported by water well drillers were compiled from the State Engineer's office in Deming, and well logs from petroleum exploration were collected from the New Mexico Bureau of Mines and Mineral Resources. Representative water well logs were chosen on the basis of distribution and depth. They are given in Appendix C. Location of water well logs used in cross section A-A' is shown on figure 2. Description of samples from petroleum wells is given in Appendix D. Location of petroleum wells is shown in figure 3. Wells closest to the line of section were orthogonally projected to the line of section and used in the construction of cross-section A-A' (plate 1).

The description of samples from wells is simplified into four categories. Descriptions of sand, sand and gravel, and gravel are grouped together as a single unit. Sand, silt, gravel and clay; gravelly clay; and conglomerate form another unit. The third unit is comprised of sandy clay and clay. Rhyolite, limestone and andesite are grouped to form the fourth unit. The distribution of these units in the subsurface is shown on plate 1 in cross-section A-A'.

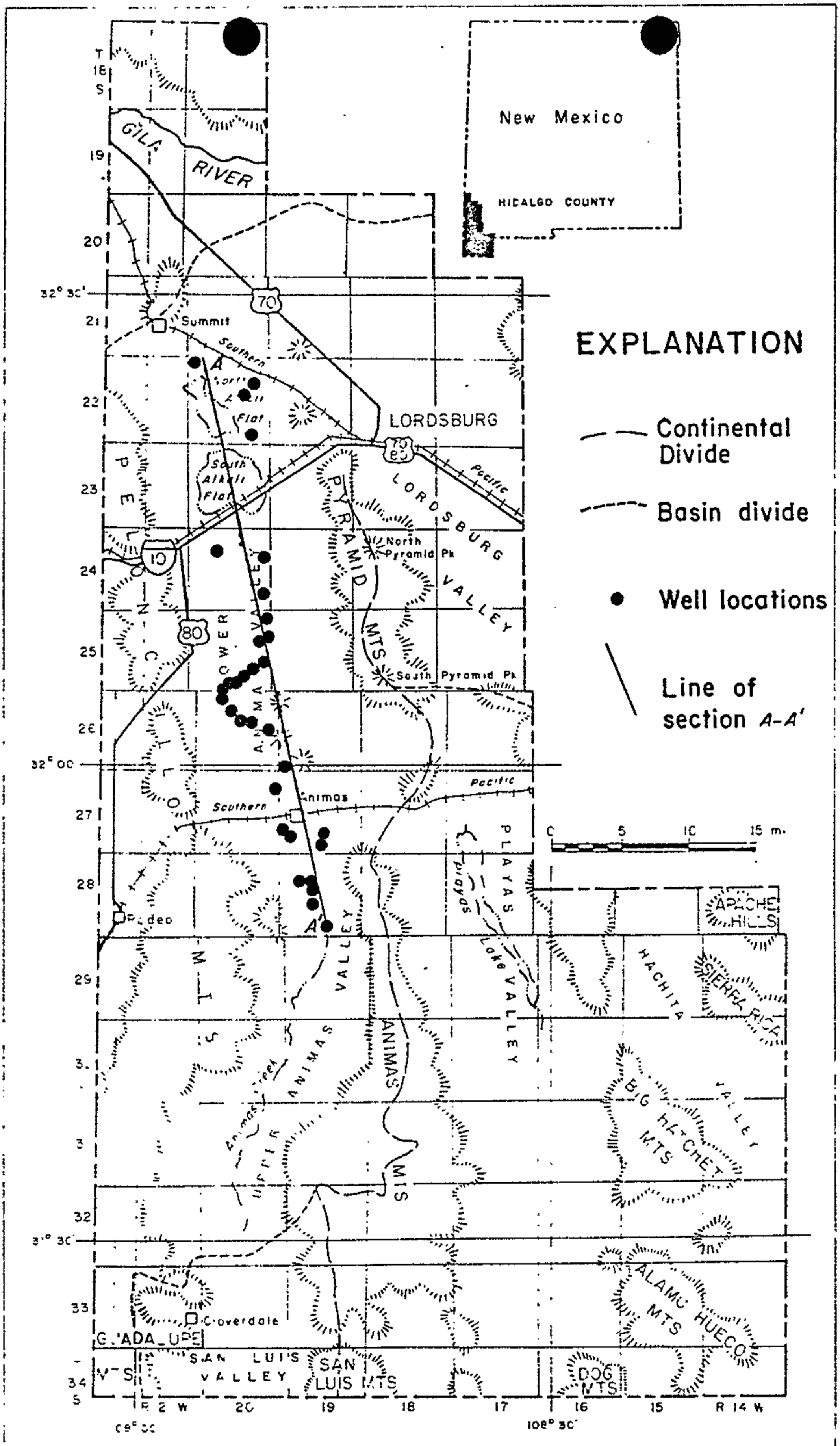

Figure 2 Location of wells used in geologic cross-section A-A'.

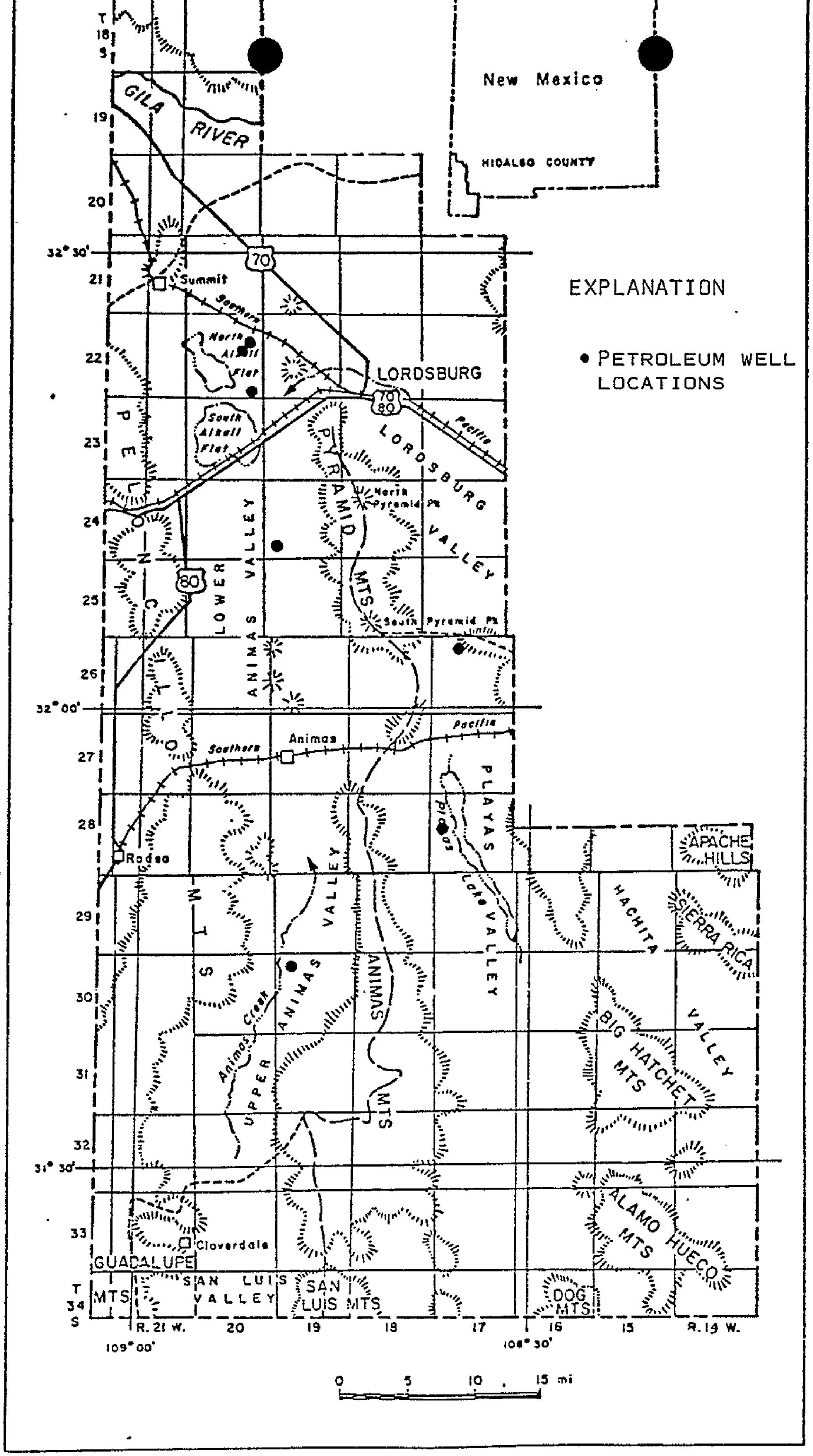

Figure 3 Location of petroleum wells for which subsurface data were available.

Inspection of cross section A-A' shows an absence of spatial correlation of sediments in the subsurface. Schwennesen (1918) noted the lack of sediment correlation between wells. Anastomosing deposition of sediments creates a wedge-shaped cross-sectional view of different types of deposits. Hence, units present in one well pinch out at short distances from the well and do not appear in other wells in the proximity.

Clay layers, which were hoped to be easily correlated, are present in practically all of the well logs. However, the tops of the clay horizons in one well can not be correlated with the tops of clay horizons in other wells. It was thought that lakes throughout the geologic past would create large stable sedimentation surfaces that could be correlated over large distances through the inspection of subsurface data. Subsurface data indicate the existence of several lakes during the geologic past, but determining the horizontal extent of these lakes by correlating tops of clay horizons is not possible. The discontinuous deposition of clay at different elevations in the subsurface creates a water-bearing system that exhibits both confined and unconfined conditions.

PETROGRAPHIC DATA

A total of seven samples from the well cuttings of T-1 and T-2 were chosen to investigate the textural and lithologic characteristics of sediments from the lower Animas Valley. The 5 foot intervals analyzed were from 210 to 215 feet and 215 to 220 feet in T-1, and from 135 to 140 feet, 150 to 155 feet, 170 to 175 feet, 180 to 185 feet and 205 to 210 feet in T-2.

Texture of Units

The seven samples were sieved in 8 inch diameter U.S. Standard sieves. If samples, which weighed between 209.4 g and 71.3 g, contained any gravel (>2.0 mm), they were initially sieved by hand through a -1ϕ (2 mm) screen. The remainder of each sample was sieved through 5 sieves. The mesh sizes of the 5 sieves were 0ϕ (1.0 mm), 1ϕ (0.5 mm), 2ϕ (0.25 mm), 3ϕ (0.125 mm), and 4ϕ (0.0625 mm). The sieve stack was placed in a Rotap for 15 minutes. The sample retained on each of the sieves was weighed, and the percentage of the total sample weight calculated as shown in Appendix D.

The results of the mechanical analysis are summarized in figure 4. This plot of grain size on the logarithmic scale versus cumulative weight percentage on the arithmetic scale illustrates the differences in sorting and grain size of the seven samples. Grain size of a sample is determined by its position on the graph. If the curve is found on the right side of the graph, it indicates the predominance of large grain sizes. Conversely, curves found on the left side indicate the predominance of small grain sizes.

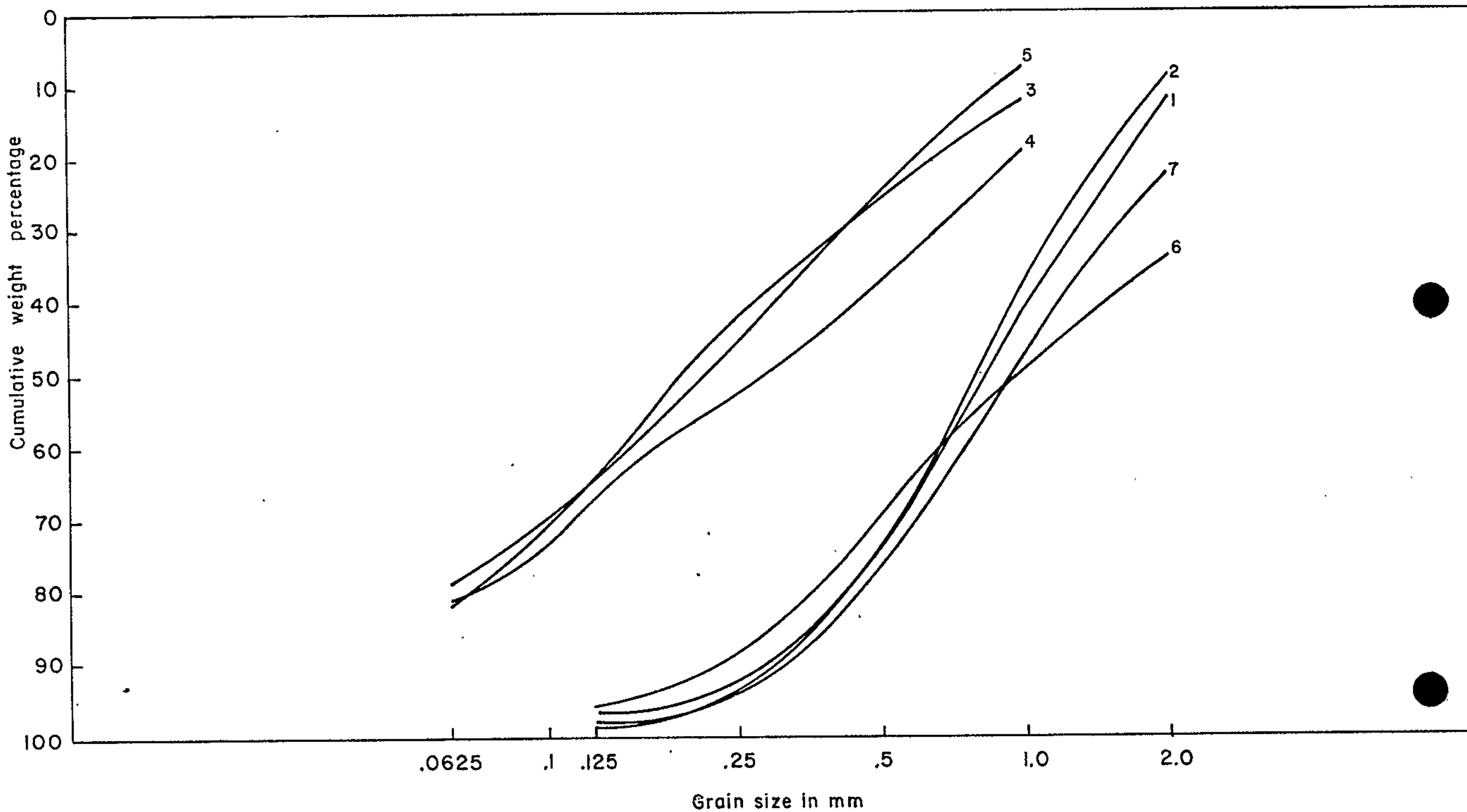

Figure 4 Summary of Mechanical Analyses

Sorting is shown by the steepness of the curve. Curves with steep slopes indicate good sorting, whereas curves with gentle slopes indicate poor sorting.

Figure 4 shows two separate groups of curves. Curves for samples 3, 4 and 5 have smaller grain sizes and slightly poorer sorting than the curves for samples 1, 2, 6 and 7. Curves 3, 4 and 5 have a median grain size in the range of fine sand (.19 mm). Curves 1, 2, 6 and 7 have a median grain size in the range of coarse sand (.88 mm). Curves 1, 2 and 7 have steeper slopes and therefore better sorting than 3, 4, 5 and 6. Inspection of the weight-percentage column in Appendix D points out that the grain size distribution is fairly equal for curves 3, 4 and 5 whereas curves 1, 2, 6 and 7 have a more restricted grain-size distribution. Furthermore, the cumulative percent column in Appendix D shows that for curves 3, 4 and 5, only 65% of the total weight of the samples are greater than the fine sand fraction, while for curves 1, 2, 6 and 7, 95% of the total weight of the samples are greater than the fine sand fraction.

The shape of the grains varies from angular to rounded with the majority of the grains being sub-angular to sub-rounded.

The texture of non-indurated sediments is an important factor in determining the water-bearing characteristics of a deposit. Ideally, a rounded, well-sorted, large-grained sediment would provide a desirable water-bearing deposit. However, such deposits are difficult to locate and are not present in many geologic environments. The samples chosen for mechanical analysis in this study are representative of the range of sediments that may serve as water-bearing deposits in the lower Animas Valley. The range of water-bearing sediments encountered in test holes 1 and 2 include sand and gravel, fine gravel to fine sand, very coarse to very fine sand, predominantly medium sand, and fine sand to silt. Figure 4 summarizes the results of the mechanical analyses and indicates which samples approach the ideal water-bearing deposit. None of the samples are well-sorted or well-rounded, but curves 1, 2 and 7 are better-sorted and possess larger grain sizes than the other curves in figure 4. Hence, in the development of a water supply, one should seek out these zones of predominantly sand and gravel.

Lithology of Units

The major rock type recognized in the cuttings from T-1 and T-2 is volcanic rock. The Northern Pyramid Mountains, as well as the Peloncillo Mountains consist primarily of Cretaceous and Tertiary volcanic flows and pyroclastics in the vicinity of the test holes. The volcanic rocks present in the samples from the test holes are most likely derived from these sources of volcanic rock.

AQUIFER TEST DATA

The drilling phase of the project was designed to complete three 1000 foot holes across the lower Animas Valley. Observation wells, which would have been placed near the 1000 foot holes, would have been used in aquifer tests to determine representative values for the transmissivity and storage coefficients of the lower Animas Valley aquifer system. However, drilling problems created by continuous caving of the side wall of the drill holes caused termination of the drilling phase.

Test hole 2 was reamed with a 6¼ inch drill bit, and 4 inch PVC casing perforated from 120 to 280 feet was set in the hole. The perforation scheme from 120 to 280 feet was to alternate 20 foot sections of perforated PVC with 20 foot sections of unperforated PVC. The perforations consisted of spiraling 1/8 inch (3.175 mm) hand drilled holes. The spirals were separated by a distance of 12 inches, and individual 1/8 inch drill holes were separated by a distance of 2 inches.

The feasibility of a pump test using T-2 as the pumping well and T-1 as the observation well was tested by pumping T-2 with a 2 inch diameter submersible pump. The pumping capacity of the submersible pump was 5 gallons per minute. After pumping for 105 minutes, there was no observable drawdown in the observation well. Since a larger capacity pump would not fit into a 4 inch casing, a suitable aquifer stress could not be economically applied, and the aquifer testing program was cancelled. Attempts to locate existing wells with large capacity pumps in the lower

Animas Valley (north of Interstate 10) for the purpose of aquifer testing were unsuccessful.

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Geological Survey Miscellaneous Investigations Map I-1151, 1:24,000

Appendix A

Description of Well Cuttings From T1, T2

(Township 22S, Range 20W, Section 6)

Explanation: qtz = quartz, vol. = volcanics, ls = limestone, Pred. = predominantly. Color is given in accordance with The Rock Color Chart Committee. Loam = equal proportions of clay, silt and sand particles.

GEOLOGIC WELL LOG

NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

Animas Valley Project | Samples described by: Douglas Heath

Location: 22.20.6.322a | Well Number: T-2

Well started: April 26, 1981 | Total depth of well: 363 feet

Well finished: May 9, 1981 | Depth to water level: 142 feet

Well elevation: 4,159 feet (msl)

Depth	Thickness	Description (type, grain composition, color, particle size, roundness, sorting, cementation, accessory minerals)
50		Gravel to medium sand/qtz + vol. grains/ 5 YR 6/4/ pebbles >25mm/ sub-angular to rounded/poor sorting/calcite cement
55		Not sampled
80		Very coarse sand-silt/qtz + vol. grains/10 YR 7/4 to 5 YR 6/4/> 4mm angular to sub-rounded/poor sorting/calcite cement
85		Fine gravel-silt/qtz, vol., ls grains/10 YR 7/4/pebbles > 15 mm/sub-angular to sub-rounded/poor sorting/calcite cement/limonite staining
90		Very coarse sand-silt/qtz + vol. grains/10 YR 7/4/pebbles > 3 mm/sub-angular to sub-rounded/poor sorting/calcite cement
95		Very coarse sand-silt/qtz + vol. grains/10 YR 7/4/ < 3mm/angular to sub-rounded/poor sorting/calcite cement
100		Gravel-silt/ls, qtz, vol. grains/10 YR 7/4/ < 11mm/sub-angular to sub-rounded. poor sorting/calcite cement
105		Very coarse sand-silt/ls, qtz, vol. grains/ 10 YR 7/4/ < 3mm/sub-angular to sub-rounded/fair sorting/calcite cement
110		Fine gravel-silt/qtz, vol., ls grains/ 10 YR 7/4/ < 5mm/sub-angular to rounded/fair sorting/calcite cement
115		Very coarse sand-silt/qtz, vol., ls grains/ 10 YR 7/4/ < 7mm/sub-angular to rounded/poor sorting/calcite cement
20		Coarse sand-silt/10 YR 7/4/pebbles < 5mm/angular to sub-rounded/ fair sorting/calcite cement
125		Coarse sand-silt/qtz, vol., ls grains/ 10 YR 7/4/ < 2mm/sub-angular to sub-rounded/fair sorting/calcite cement
130		Coarse sand-silt/qtz, vol., ls grains/ 10 YR 7/4/ < 2mm/sub-angular to sub-rounded/fair sorting/calcite cement
135		Very coarse-fine sand/qtz grains/ 5 YR 7/4/ < 4mm/sub-angular to rounded/poor sorting/calcite cement

GEOLOGIC WELL LOG

NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

Animas Valley Project | Samples described by: Douglas Heath

Location: 22.20.6.322a | Well Number: T-2

Well started: April 26, 1981 | Total depth of well: 363 feet

Well finished: May 9, 1981 | Depth to water level: 142 feet

Depth	Thickness	Description (type, grain composition, color, particle size, roundness, sorting, cementation, accessory minerals)
140		Fine gravel-silt/qtz, rhy. grains/10 YR $^{7}/4$/ < 6mm/angular to sub-rounded/
145		poor sorting/calcite cement
		Fine gravel-silt/qtz grains/10 YR $^{7}/4$/ < 5mm/angular to sub-rounded/
150		poor sorting/calcite cement
		Fine gravel-fine sand/qtz, vol. fragments/10 YR $^{7}/4$/ < 10mm/angular to
155		sub-rounded/poor sorting/calcite cement
		Fine gravel-silt/qtz, vol. grains/10 YR $^{7}/4$/ < 6mm/sub-angular to
160		sub-rounded/poor sorting/calcite cement
		Fine gravel-silt/qtz grains/10 YR $^{7}/4$/ < 5mm/angular to sub-rounded/
165		poor sorting/calcite cement
		Very coarse sand-silt/qtz, vol. fragments/10 YR $^{7}/4$/ < 2mm/angular to
170		sub-rounded/poor sorting/calcite cement
		Fine sand-silt/calcite nodules, qtz, vol. fragments/10 YR $^{7}/4$/angular to
175		sub-rounded/moderate sorting/calcite cement
		Very fine sand-silt/some qtz pebbles to 10mm, calcite, vol. fragments/
180		10 YR $^{7}/4$/angular to sub-rounded/moderate sorting/calcite cement
		Very coarse-very fine sand/qtz, calcite-nodules, vol. fragments/10 YR $^{7}/4$/
185		sub-angular to sub-rounded/poor sorting/calcite cement
		Very coarse-very fine sand/qtz, ls, vol. fragments/10 YR $^{7}/4$/angular to
190		rounded/poor sorting/calcite cement
		Coarse sand w/gravel-fine sand/ls, qtz, vol. fragments/10 YR $^{7}/4$/pebbles
		> 6mm/moderate sorting/sub-angular to sub-rounded/calcite cement/
195		MnO dendrites on pebbles
		Coarse sandy gravel-fine sand/calcite nodules, qtz, vol. fragments/10 YR $^{7}/4$/
		pebbles > 5 mm/sub-angular to sub-rounded/moderate sorting/
200		calcite cement
		Predominantly medium sand w/coarse to fine sand/calcite nodules, qtz, vol.
205		fragments/10 YR $^{7}/4$/coarse sand to 2 mm/poor sorting/sub-angular to
		rounded/calcite cement

GEOLOGIC WELL LOG

NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

Animas Valley Project — **Samples described by:** Douglas Heath

Location: 22.20.6.322a — **Well Number:** T-2

Well started: April 26, 1981 — **Total depth of well:** 363 feet

Well finished: May 9, 1981 — **Depth to water level:** 142 feet

Depth	Thickness	Description (type, grain composition, color, particle size, roundness, sorting, cementation, accessory minerals)
205		Pred. medium sand w/coarse to fine sand/ls, qtz, vol. fragments/10 YR 7/4/ sand to 2mm/poor sorting/sub-angular to rounded/calcite cement
210		Pred. fine sand w/coarse to very fine sand/calcite nodules, qtz, vol. fragments/10 YR 7/4/sand to 2 mm/poor sorting/sub-angular to sub-rounded/ calcite cement
215		Very fine sand to silt w/coarse-fine sand/calcite nodules, qtz, vol. frags/ 10 YR 7/4/pebbles > 5mm/poor sorting/sub-angular to sub-rounded/calcite cement
220		Very fine sand to silt w/coarse to fine sand/calcite nodules, qtz, vol. frags/ 10 YR 7/4/some pebbles > 10mm/poor sorting/sub-angular to sub-rounded/ calcite cement
225		Medium sand w/very coarse to very fine sand/qtz, vol. fragments/10 YR 7/4/ grains < 2mm/poor sorting/sub-angular to sub-rounded/calcite cement
230		Pred. medium-fine sand w/fine gravel and clay/ls, qtz, vol. fragments/5 YR 7/2 grains < 5mm/poor sorting/sub-angular to sub-rounded/calcite cement
235		Pred. medium-fine sand w/coarse sand and clay/ls, qtz, vol. fragments/5 YR 7/2 grains < 3mm/poor sorting/sub-angular to sub-rounded/calcite cement
240		Very fine sand-clay w/pebbles/ls, qtz, vol. fragments/5 YR 7/2/pebbles < 10mm/ poor sorting/angular to sub-rounded/calcite cement
245		Fine sand-clay w/very coarse sand/ls, qtz, vol. fragments/5 YR 7/2/grains < 2mm/poor sorting/angular to sub-rounded/calcite cement
250		Fine sand-clay w/very coarse sand/ls, qtz, vol. fragments/5 YR 7/2/grains < 2mm/poor sorting/angular to sub-rounded/calcite cement
255		Pred. clay w/fine sand/qtz, vol. fragments/5 YR 7/2/grains < .25mm/ moderate sorting/sub-angular to sub-rounded/calcite cement
260		Pred. clay w/fine sand/qtz, vol. fragments/5 YR 7/2/grains < .25mm/ moderate sorting/sub-angular to sub-rounded/calcite cement
265		Clay-silt-very fine sand/qtz, vol. fragments/5 YR 7/2/grains < .125mm/ moderate sorting/sub-angular to sub-rounded/calcite cement
270		Clay-silt-pebbles/qtz, vol. fragments/5 YR 7/2/pebbles < 5mm/poor sorting/ sub-angular to sub-rounded/calcite cement
275		

GEOLOGIC WELL LOG

NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

Animas Valley Project

Location: 22.20.6.322a

Well started: April 26, 1981

Well finished: May 9, 1981

Samples described by: Douglas Heath

Well Number: T-2

Total depth of well: 363 feet

Depth to water level: 142 feet

Depth	Thickness	Description (type, grain composition, color, particle size, roundness, sorting, cementation, accessory minerals)
275		Clay-silt-pebbles/qtz, vol. fragments/10 YR 7/2/pebbles < 4mm/poor sorting/ sub-angular to sub-rounded/calcite cement
280		Clay-silt-very fine sand/qtz, vol. fragments/10 YR 7/2/grains < .125mm/ moderate sorting/sub-angular to sub-rounded/calcite cement
285		Clay-silt-pebbles/qtz, vol.fragments/10 YR 7/2/grains < 4mm/poor sorting/ sub-angular to sub-rounded/calcite cement
290		Clay-silt-minor pebbles/qtz, vol. fragments/10 YR 7/2/ < 4mm/poor sorting/ sub-angular to sub-rounded/calcite cement
295		Clay-silt-medium sand/qtz, vol. fragments/10 YR 7/2/ < 1mm/moderate sorting/ sub-angular to sub-rounded/calcite cement
300		Clay-silt-fine sand/qtz, vol. fragments/10 YR 7/2/ < .125mm/moderate sorting/ sub-angular to sub-rounded/calcite cement
305		Clay-silt-medium sand/qtz, vol. fragments/10 YR 7/2/ < .5mm/sub-angular to sub-rounded/calcite cement
310		Clay-silt-very fine sand/qtz, vol. fragments/10 YR 7/2/ < .125mm/moderate sorting/sub-angular to sub-rounded/calcite cement
315		Clay-silt-coarse sand/qtz, vol. fragments/10 YR 7/2/ < 1mm/poor sorting/ sub-angular to sub-rounded/calcite cement
320		Clay-silt-pebbles/qtz, vol. fragments/10 YR 7/2/ < 5mm/poor sorting/ sub-angular to rounded/calcite cement
325		Clay-silt-medium sand/qtz,vol. fragments/10 YR 7/2/ < .5mm/moderate sorting/sub-angular to sub-rounded/calcite cement
330		Clay-silt-medium sand/qtz, ss, vol. fragments/10 YR 7/2/ < .5mm/moderate sorting/sub-angular to sub-rounded/calcite cement
335		Clay-silt-fine sand/qtz, vol. fragments/10 YR 7/2/ < ,25mm/moderate sorting/ sub-angular to sub-rounded/calcite cement
340		Clay-silt-fine sand/qtz, vol. fragments/10 YR 7/2/ < .25mm/moderate sorting/ sub-angular to sub-rounded/calcite cement
345		

GEOLOGIC WELL LOG

NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

Animas Valley Project

Samples described by: Douglas Heath

Location: 22.20.6.322a

Well Number: T-2

Well started: April 26, 1981

Total depth of well: 363 feet

Well finished: May 9, 1981

Depth to water level: 142 feet

Depth	Thickness	Description (type, grain composition, color, particle size, roundness, sorting, cementation, accessory minerals)
345		Clay-silt-very fine sand/ls, qtz, vol. fragments/10 YR 7/2/ < .125mm/
350		moderate sorting/sub-angular to sub-rounded/calcite cement
		Clay-silt-medium sand/qtz, ss, vol. fragments/10 YR 7/2/ < .5mm/poor
355		sorting/sub-angular to sub-rounded/calcite cement
		Clay-silt-medium sand/qtz, ss, vol. fragments/10 YR 7/2/ < .55mm/
360		poor sorting/sub-angular to sub-rounded/calcite cement
363		Clay-silt-medium sand/qtz, vol. fragments/10 YR 7/2/ < .5mm/poor
		sorting/sub-angular to sub-rounded/calcite cement

GEOLOGIC WELL LOG

NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

Animas Valley Project

Samples described by: Jim Boyle

Location: 22.20.6.322

Well Number: T-1

Well started: April 6, 1981

Total depth of well: 415 feet

Well finished: April 24, 1981

Depth to water level: 143 feet

Well elevation: 4,159 feet (msl)

Depth	Thickness	Description (type, grain composition, color, particle size, roundness, sorting, cementation, accessory minerals)
0		
		Silty loam/qtz, ls, vol. fragments/10 YR 5/3/grains < .05mm/sub-rounded/
5		poor sorting/calcite cement
		Sandy loam/qtz, vol. fragments/5 YR 5/3/grains < 1mm/sub-angular/poor
10		sorting/calcite cement/biotite accessory
		Silty loam/qtz grains/10 YR 5/3/grains < .05mm/sub-angular/moderate
15		sorting/calcite cement/biotite accessory
		Sandy loam/qtz, ls, vol. fragments/5 YR 4/3/grains < .5mm/sub-rounded/
20		poor sorting/calcite cement
		Silty loam/qtz, ls, vol. fragments/5 YR 4/4/grains < .05mm/sub-rounded/
25		moderate sorting/calcite cement
		Silty loam/qtz, ls, vol. fragments/5 YR 4/4/grains < .05mm/sub-rounded/
30		poor sorting/calcite cement
		Sandy loam/qtz, vol. fragments/5 YR 5/3/grains < .5mm/sub-angular/
35		poor sorting/minor calcite cement
		Sandy loam/qtz, vol. fragments/5 YR 3/3/grains < .5mm/sub-angular/
40		poor sorting/minor calcite cement
		Clay-silty loam/qtz, vol. fragments/5 YR 3/4/grains < .05mm/sub-rounded/
45		moderate sorting/minor calcite cement
		Sandy loam/qtz, vol. fragments/5 YR 3/3/grains < .1mm/sub-angular/
50		poor sorting/calcite cement/biotite accessroy
		Sandy loam/qtz, ls, vol. fragments/5 YR 3/3/grains < .1mm/sub-angular/
55		poor sorting/ calcite cement
		Clay-silty loam/qtz, ls, vol. fragments/5 YR 4/3/grains < .05mm/sub-rounded/
60		poor sorting/calcite cement
65		Clay loam/ls grains/5 YR 3/4/grains < .002mm/good sorting
		Clay loam/ls grains/5 YR 5/3/grains < .002 mm/good sorting/calcite
75		cement
		Clay loam/ls, qtz grains/5 YR 5/3/grains < .002mm/good sorting/
		calcite cement
85		

GEOLOGIC WELL LOG

NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

Animas Valley Project	**Samples described by:** Jim Boyle
Location: 22.20.6.322	**Well Number:** T-1
Well started: April 6, 1981	**Total depth of well:** 415 feet
Well finished: April 24, 1981	**Depth to water level:** 143 feet

Depth	Thickness	Description (type, grain composition, color, particle size, roundness, sorting, cementation, accessory minerals)
85		Clay loam/qtz, ls grains (24mm)/5 YR 5/3/grains < .002mm/poor sorting/ calcite cement
90		Clay loam/ls, qtz, vol. fragments (< 8mm)/5 YR 5/3/grains < .002mm/ poor sorting/calcite cement
95		Clay loam/ls, qtz, vol. fragments (< 8mm)/5 YR 5/3/grains < .002mm/ poor sorting/calcite cement/manganese on ls fragments
25		Loam/qtz, ls, vol.fragments/5 YR 4/3/grains < .5mm/sub-rounded/ fair sorting
30		Coarse sandy loam/qtz, ls granules/5 YR 4/3/sub-angular to sub-rounded/ grains < 2.0mm/poor sorting/calcite cement
35		Coarse loamy sand/qtz, ls granules/5 YR 4/3/sub-angular to sub-rounded/ grains < 2.0mm/poor sorting/calcite cement
40		Pebbly loamy sand/qtz, ls, vol. pebbles (< 8mm)/sand grains 1-2mm/ sub-angular to sub-rounded/poor sorting/calcite cement/manganese on ls
55		Coarse loamy sand/qtz, vol. pebbles (< 4mm)/5 YR 4/3/sand grains .5-1mm/ sub-angular to sub-rounded/poor sorting/calcite cement
60		Loamy sand/qtz, ls, vol. pebbles (< 4mm)/5 YR 3/4/sand grains < .1mm/ sub-angular to sub-rounded/moderate sorting/calcite cement
75		Loamy sand/qtz pebbles (< 4mm), ls, vol.fragments/5 YR 4/2/sand grains < .1mm/sub-angular/poor sorting/calcite cement
00		Pebbly loamy sand/qtz, vol. pebbles (< 8mm)/5 YR 4/2/sub-angular to sub-rounded/poor sorting/minor calcite cement
05		Pebbly loamy sand/qtz, vol.pebbles (< 16mm)/5 YR 4/2/sub-angular to sub-rounded/poor sorting/minor calcite cement
220		Pebbly clays/qtz, vol. pebbles (< 8mm)/5 YR 6/4; 5 Y 5/3/sub-angular to sub-rounded/good sorting/calcite cement
230		Pebbly clays/few qtz pebbles (< 4mm)/5 YR 6/4; 5 Y 5/3/sub-angular to sub-rounded/good sorting/calcite cement
240		

GEOLOGIC WELL LOG

NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

Animas Valley Project	Samples described by: Jim Boyle
Location: 22.20.6.322	Well Number: T-1
Well started: April 6, 1981	Total depth of well: 415 feet
Well finished: April 24, 1981	Depth to water level: 143 feet

Depth	Thickness	Description (type, grain composition, color, particle size, roundness, sorting, cementation, accessory minerals)
240		Silty-clay loam/qtz, ls pebbles (< 4mm)/5 YR 6/4; 5 Y 5/3/sub-angular to sub-rounded/moderate sorting/calcite cement
260		Silty-clay loam/fine sand (< .5mm)/5 YR 6/4; 5 Y 5/3/moderate sorting/ calcite cement
280		Silty-clay loam/minor qtz granules/very fine sand (< .1mm)/5 YR 6/4 and 5 Y 5/3/moderate sorting/calcite cement
285		Silty clay loam/qtz, vol. pebbles (< 4mm)/5 YR 6/4; 5 Y 5/3/sub-angular to sub-rounded/poor sorting/calcite cement
290		Silty-clay loam/qtz, ls, vol. pebbles (< 4mm)/5 YR 6/4; 5 Y 5/3/sub-angular to sub-rounded/poor sorting/calcite cement
300		Silty clay loam/qtz, vol. pebbles (< 4mm)/5 YR 6/4; 5 Y 5/3/ fine sand (< .5mm)/sub-angular to sub-rounded/poor sorting/calcite cement
320		Silty-clay loam/qtz,vol. fragments/5 YR 6/4; 5 Y 5/3/ fine sand (< .5mm)/sub-angular to sub-rounded/moderate sorting/calcite cement
345		Silty-clay leam/qtz,vol. pebbles (< 4mm)/5 YR 6/4; 5 Y 5/3/ fine sand < .5mm/sub-angular to sub-rounded/fair sorting/calcite cement
360		Silty-clay loam/qtz,vol. fragments/5 YR 6/4; 5 Y 5/3/ fine sand (< .5mm)/sub-angular to sub-rounded/fair sorting/calcite cement
375		Silty-clay loam/qtz, vol. fragments/5 YR 6/4; 5 Y 5/3/sub-angular to sub-rounded/moderate sorting/calcite cement
385		Silty-clay loam/qtz, vol. fragments/5 YR 6/4; 5 Y 5/3/ fine sand (< .5mm)/sub-angular to sub-rounded/moderate sorting/calcite cement
390		Silty-clay loam/qtz, vol. pebbles (< 4mm)/ 5 YR 6/4; 5 Y 5/3/ fine sand (< .5mm)/sub-angular to sub-rounded/calcite cement
395		Silty clay/5 YR 6/4; 5 Y 5/3/calcite cement
415		

APPENDIX B

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 24.20.1.410				
Well Elevation 4,155				
top soil	0	-	5	5
clay	5	-	50	45
sandy clay	50	-	90	40
sand and gravel	90	-	120	30
clay	120	-	130	10
sand and gravel	130	-	140	10
clay	140	-	150	10
Well Location 24.20.9.424				
Well Elevation 4,158				
soil	0	-	10	10
clay	10	-	30	20
sand	30	-	40	10
clay	40	-	50	10
sand and gravel	50	-	60	10
clay	60	-	62	2
Well Location 24.20.13.414				
Well Elevation 4,160				
soil	0	-	15	15
sand	15	-	25	10
clay	25	-	45	20
sand and gravel	45	-	58	13
clay	58	-	63	5

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Well Location 24.20.19.000
Well Elevation 4,190

Description	Depth From		Depth To	Thickness
soil	0	-	4	4
clay and gravel	4	-	43	39
gravel	43	-	45	2
blue clay	45	-	86	41
tight gravel with water	86	-	106	20
blue clay	106	-	122	16
gravel and water	122	-	126	4
blue clay	126	-	129	3
trap rock and water	129	-	136	7
clay and gravel	136	-	142	6
sand rock	142	-	150	8

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Well Location 24.20.19.230
Well Elevation 4,180

Description	Depth From		Depth To	Thickness
soil	0	-	4	4
sand with red clay	4	-	60	56
sand and gravel	60	-	70	10
gray clay	70	-	76	6
gravel	76	-	77	1
gray clay	77	-	92	15
gravel	92	-	93	1
gray clay	93	-	113	20
gravel	113	-	170	57
gray rock	170	-	172	2
gravel	172	-	190	18
gray clay	190	-	206	16
red clay	206	-	216	10
gray rock	216	-	233	17
gravel	233	-	234	1
gray rock and clay	234	-	252	18
gravel	252	-	253	1
gray clay	253	-	260	7
gravel	260	-	261	1
gray clay	261	-	268	7
red clay	268	-	276	8
red rhyolite	276	-	300	24

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 24.20.19.440				
Well Elevation 4,180				
gray clay and gravel	0	-	60	60
sand, gravel, and water	60	-	62	2
gray clay and gravel	62	-	119	57
gray volcanic tuff	119	-	130	11
gravel	130	-	137	7
red rhyolite	137	-	485	348
gravel	485	-	489	4
red rhyolite	489	-	500	11
red andesite	500	-	507	7
gray clay	507	-	564	57
gray clay	564	-	591	27
red clay	591	-	615	24
brown clay	615	-	620	5
gravel	620	-	621	1
brown clay	621	-	626	5
gravel	626	-	627	1
brown clay	627	-	630	3
gravel	630	-	631	1
gray clay	631	-	639	8
gravel	639	-	640	1
red clay	640	-	643	3
Well Location 24.20.22.112				
Well Elevation 4,165				
Soil	0	-	5	5
gray clay w/gravel	5	-	28	23
sand and gravel	28	-	65	37

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 24.20.22.421				
Well Elevation 4,165				
sand	0	-	15	15
clay	15	-	22	7
sand	22	-	30	8
clay	30	-	35	5
sand	35	-	100	65
Well Location 24.20.23.310				
Well Elevation 4,165				
fine sand and gravel mixed with clay	0	-	100	
Well Location 24.20.25.310				
Well Elevation 4,170				
soil	0	-	5	5
sandy clay	5	-	20	15
sandy clay and gravel	20	-	40	20
sand, gravel and clay	40	-	85	45
sandy clay	85	-	88	3
clay	88	-	90	2
Well Location 24.20.25.400				
Well Elevation 4,175				
soil	0	-	3	3
clay	3	-	42	39
sandy clay	42	-	105	63
sandy clay, gravel	105	-	150	45

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 24.20.29.323				
Well Elevation 4,177				
soil	0	-	5	5
sand and gravel	5	-	10	5
clay	10	-	11	1
sand and gravel	11	-	30	19
gray clay	30	-	40	10
red clay	40	-	48	8
sand and gravel	48	-	65	17
clay	65	-	66	1
gravel	66	-	75	9
sand and gravel	75	-	125	50
Well Location 24.20.29.341				
Well Elevation 4,180				
soil	0	-	3	3
gravel and sand	3	-	12	9
clay and gravel	12	-	40	28
brown clay and sand	40	-	60	20
sand and gravel	60	-	75	15
clay, sand and gravel	75	-	105	30
brown clay and sand	105	-	120	15
brown clay	120	-	125	5
sand and gravel	125	-	132	7
yellow clay	132	-	171	39
blue clay	171	-	191	20
sand and clay	191	-	210	19
gravel and clay	210	-	228	18
gravel and clay	228	-	250	22
red clay	250	-	490	240

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 25.19.7.210				
Well Elevation 4,205				
soil	0	-	3	3
brown clay	3	-	50	47
brown clay, gravel	50	-	93	43
Well Location 25.19.7.234				
Well Elevation 4,205				
soil	0	-	7	7
clay	7	-	25	18
sand and gravel	25	-	48	13
clay	48	-	120	72
sand and gravel	120	-	150	30
Well Location 25.19.7.234b				
Well Elevation 4,205				
bedrock @ 85'				
Well Location 25.19.7.234c				
Well Elevation 4,205				
bedrock @ 87'				
Well Location 25.20.1.242				
Well Elevation 4,183				
soil	0	-	5	5
sandy shale	5	-	55	50
sand, gravel and clay	55	-	75	20
sandy shale	75	-	125	50
sand, gravel, and clay	125	-	205	80

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 25.20.10.222				
Well Elevation 4,190				
not available	0	-	36	36
gravel	36	-	42	6
clay	42	-	61	19
gravel	61	-	73	12
clay	73	-	90	17
gravel	90	-	96	6
clay	96	-	100	4
sand and gravel with clay streaks	100	-	180	80
Well Location 25.20.10.334				
Well Elevation 4,200				
soil	0	-	5	5
clay	5	-	15	10
gravel and sand	15	-	25	10
clay	25	-	40	15
gravel and sand	40	-	68	28
clay	68	-	85	17
gravel and sand	85	-	105	20
clay gravel	105	-	145	40
red clay	145	-	152	7
clay and gravel	152	-	163	11
blue clay	163	-	170	7

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 25.20.13.124				
Well Elevation 4,195				
gravel	0	-	25	25
gravel and sand	25	-	50	25
gravel, sand, clay	50	-	80	30
sand and gravel	80	-	120	40
clay	120	-	140	20
sand and gravel	140	-	145	5
clay and gravel	145	-	190	45
sand and gravel	190	-	200	10
clay	200	-	250	50
blue clay	250	-	400	150
Well Location 25.20.13.213				
Well Elevation 4,195				
soil	0	-	4	4
clay, sand, gravel	4	-	84	80
sand and gravel	84	-	89	5
clay	89	-	110	21
sand and gravel	110	-	128	18
clay, sand and gravel	128	-	170	42
sand and gravel	170	-	190	20
blue clay	190	-	281	91

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 25.20.13.221				
Well Elevation 4,195				
top soil	0	-	8	8
gravel	8	-	15	7
sandy clay	15	-	75	60
sand and gravel	75	-	105	30
sand, clay, gravel	105	-	120	15
sand and gravel	120	-	130	10
sand, clay and gravel	130	-	165	35
clay and gravel	165	-	200	35
sandy shale	200	-	250	50
blue clay	250	-	400	150
Well Location 25.20.13.233				
Well Elevation 4,199				
soil	0	-	5	5
clay	5	-	15	10
sand and gravel	15	-	24	9
sandy clay	24	-	79	54
sand	79	-	85	6
sandy clay	85	-	110	35
sand and gravel	110	-	125	15
sandy clay	125	-	145	20
sandy clay	145	-	255	110
sand	255	-	265	10
sandy clay	265	-	475	210
conglomerate	475	-	510	35
sandy clay	510	-	600	90

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 25.20.16.333				
Well Elevation 4,215				
soil	0	-	2	2
sand and gravel	2	-	12	10
clay	12	-	32	20
gravel	32	-	40	8
gravel and sand	40	-	90	50
red clay	90	-	95	5
gray clay	95	-	165	70
green clay	165	-	228	63
buff clay	228	-	238	10
gravel and clay	238	-	255	17
buff clay	255	-	275	20
gravel	275	-	280	5
gray gravel	280	-	340	60
gray conglomerate	340	-	350	10
Well Location 25.20.20.444				
Well Elevation 4,226				
unavailable	0	-	104	104
gravel	104	-	124	20
clay	124	-	230	106
gravel	230	-	290	60
clay	290	-	292	2

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 25.20.22.313				
Well Elevation 4,220				
soil	0	-	6	6
gravel	6	-	38	32
clay	38	-	50	12
gravel	50	-	56	6
clay	56	-	72	16
gravel	72	-	76	4
gravel	76	-	85	9
clay	85	-	90	5
gravel	90	-	98	8
gravel	98	-	115	17
clay	115	-	125	10
gravel	125	-	140	15
clay	140	-	150	10
coarse gravel	150	-	157	7
blue clay	157	-	208	51
Well Location 25.20.23.443				
Well Elevation 4,223				
soil	0	-	6	6
gravel	6	-	18	12
red clay	18	-	63	45
gray clay and gravel	63	-	124	61
gravel	124	-	190	66
red clay	190	-	215	25
gravel	215	-	225	10
red clay	225	-	265	40
gray clay	265	-	300	35

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 25.20.24.132				
Well Elevation 4,215				
soil	0	-	8	8
sandy clay	8	-	26	18
gray clay	26	-	40	14
sandy clay	40	-	59	19
sand and gravel	59	-	76	17
brown clay	76	-	91	15
sand and gravel	91	-	139	48
sandy clay	139	-	182	43
sand and gravel	182	-	230	48
sandy clay and gravel	230	-	260	30
blue clay	260	-	395	135
Well Location 25.20.25.113				
Well Elevation 4,225				
soil	0	-	3	3
sand	3	-	5	2
clay	5	-	35	30
sand and gravel	35	-	50	15
clay	50	-	75	25
sand	75	-	100	25
clay	100	-	115	15
sand	115	-	122	7
clay	122	-	128	6
gravel	128	-	136	8
clay	136	-	145	9
gravel	145	-	152	7
sandy clay	152	-	185	33
sandy clay, some gravel streaks	185	-	220	35
brown and blue clay	220	-	325	105

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Well Location 25.20.25.314
Well Elevation 4,230

Description	Depth From		Depth To	Thickness
sandy clay and gravel	0	-	8	8
sand and gravel	8	-	14	6
sandy clay and gravel	14	-	22	8
sand and gravel	22	-	28	6
sandy clay and gravel	28	-	70	42
clay	70	-	100	30
sand	100	-	108	8
clay	108	-	112	4
sand and gravel	112	-	118	6
clay	118	-	126	8
sand and gravel	126	-	135	9
clay	135	-	140	5
sand and gravel	140	-	160	20
clay	160	-	212	52
blue bentonite	212	-	259	47
conglomerate	259	-	510	251
clay	510	-	514	4

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 25.20.26.144				
Well Elevation 4,225				
surface soil	0	-	12	12
clay	12	-	14	2
sand and gravel	14	-	40	26
clay	40	-	44	4
sand and gravel	44	-	55	11
sand and gravel	55	-	82	27
clay	82	-	86	4
sand and gravel	86	-	105	19
sand and gravel	105	-	116	11
sand	116	-	120	4
unavailable	120	-	206	86
red clay and sand	206	-	252	46
tan clay	252	-	280	28
gray clay	280	-	436	156
sandy gravel	436	-	495	59
conglomerate	495	-	636	141
gravelly clay and gravel	636	-	751	115
Well Location 25.20.27.340				
Well Elevation 4,230				
soil	0	-	6	6
clay	6	-	50	44
clay with gravel streaks	50	-	160	110
gravel	160	-	250	90
brown clay	250	-	500	250
conglomerate	500	-	750	250

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 25.20.27.412				
Well Elevation 4,225				
gravel and sand	0	-	65	65
clay	65	-	80	15
gravel	80	-	95	15
clay	95	-	102	7
gravel	102	-	121	19
clay	121	-	127	6
gravel	127	-	135	8
clay	135	-	142	7
sand and gravel	142	-	150	8
clay	150	-	168	18
sand and gravel	168	-	177	9
clay	177	-	200	23
gravel, sand	200	-	205	5
clay	205	-	230	25
blue clay	230	-	280	50
tan sandy clay	280	-	425	145
sand and gravel	425	-	636	211
clay	636	-	713	77

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Well Location 25.20.33.430
Well Elevation 4,230

Description	Depth From		Depth To	Thickness
soil	0	-	6	6
sand and gravel	6	-	30	24
clay and gravel	30	-	50	20
brown clay	50	-	70	20
gravel	70	-	90	20
brown clay	90	-	101	11
gravel	101	-	130	29
brown clay	130	-	180	50
gravel	180	-	200	20
brown clay	200	-	270	70
sand and clay	270	-	320	50
green clay	320	-	407	87
brown clay	407	-	425	18
clay	425	-	442	17
gravel and clay	442	-	480	38
streaks of gravel and clay	480	-	550	70
gravel	550	-	570	20
streaks of gravel and clay	570	-	685	115

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Well Location 25.20.34.140
Well Elevation 4,230

Description	Depth From		Depth To	Thickness
soil	0	-	2	2
clay and gravel	2	-	77	75
gravel	77	-	105	28
gravel	105	-	107	2
red clay	107	-	131	24
gravel	131	-	134	3
red clay	134	-	168	34
brown sand	168	-	170	2
red clay	170	-	281	111
gray clay	281	-	284	3
red clay	284	-	340	44
blue clay	340	-	376	36
red clay	376	-	407	31
gray clay	407	-	428	21
red clay	428	-	480	52
blue clay	480	-	482	2
red clay and gravel	482	-	610	128
sand and clay	610	-	628	18
andesite	628	-	630	2
clay and gravel	630	-	634	4
red clay	634	-	714	80
red conglomerate	714	-	774	60
gravel	774	-	779	5
gray clay	779	-	733	4
gravel	783	-	787	4
gray clay	787	-	799	12
gravel	799	-	813	14
gravel and clay	813	-	886	73
gray sand	886	-	900	14

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 25.20.34.240				
Well Elevation 4,235				
soil	0	-	3	3
gravel and sand	3	-	50	47
clay	50	-	70	20
gravel	70	-	150	80
streaks of gravel and clay	150	-	380	230
blue clay	380	-	480	100
conglomerate	480	-	710	230
Well Location 26.19.31.333				
Well Elevation 4,340				
soil	0	-	8	8
red clay	8	-	11	3
gravel	11	-	16	5
brown clay	16	-	31	15
red conglomerate	31	-	120	89
brown clay	120	-	126	6
red conglomerate loose	126	-	206	80
red clay	206	-	378	172
brown clay	378	-	393	15
clay and gravel	393	-	610	220
fine sand	610	-	615	5
clay, sand and gravel	615	-	625	10
clay	625	-	680	55
sand and gravel	680	-	695	15
clay	695	-	780	65
sand and gravel	780	-	970	210
clay	970	-	980	10

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 26.20.3.410a				
Well Elevation 4,250				
soil	0	-	4	4
gravel	4	-	17	13
clay and gravel	17	-	70	53
sand and gravel	70	-	96	26
sand and gravel	96	-	100	4
sandy clay and gravel	100	-	120	20
red and blue clay, some gravel	120	-	195	75
red sand and gravel	195	-	270	75
red clay	270	-	325	55
yellow clay	325	-	335	10
red clay and gravel	335	-	363	28
sand and gravel	363	-	370	7
clay and gravel	370	-	409	39
gravel	409	-	440	31
red clay and gravel	440	-	485	45
sand and gravel	485	-	521	36
brown clay	521	-	528	7
sand and gravel	528	-	603	75

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Well Location 26.20.4.324
Well Elevation 4,245

Description	Depth From		Depth To	Thickness
soil	0	-	5	5
sandy clay	5	-	12	7
gravel	12	-	30	18
sand and gravel	30	-	55	25
clay	55	-	60	5
sand and gravel	60	-	68	8
clay	68	-	92	23
sand and gravel	92	-	110	18
clay, sandy	110	-	123	13
sand and gravel	123	-	130	7
sandy clay	130	-	170	40
conglomerate	170	-	205	35
sandy clay	205	-	248	43
clay	248	-	279	31
sand and gravel	279	-	281	2
brown clay	281	-	320	39
blue clay	320	-	380	60
brown sandy clay	380	-	410	30
sand and gravel	410	-	415	5
fine sand	415	-	430	15
gravel	430	-	443	13
clay	443	-	450	7
large gravel	450	-	460	10
clay	460	-	580	120
conglomerate	580	-	595	15
clay	595	-	600	5
sand and gravel	600	-	605	5
conglomerate	605	-	612	7
clay	612	-	631	19

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Well Location 26.20.5.444
Well Elevation 4,240

Description	Depth From		Depth To	Thickness
soil	0	-	5	5
gravel	5	-	10	5
clay	10	-	17	7
gravel	17	-	27	10
clay	27	-	47	20
gravel	47	-	51	4
clay	51	-	72	21
gravel	72	-	76	4
clay	76	-	82	6
gravel	82	-	90	8
clay	90	-	93	3
gravel	93	-	118	25
clay	118	-	121	3
gravel	121	-	126	5
clay	126	-	142	16
gravel	142	-	150	8
tan clay	150	-	160	10
sand and gravel	160	-	165	5
tan clay	165	-	220	55
sand and gravel	220	-	235	15
conglomerate	235	-	500	265

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 26.20.8.443				
Well Elevation 4,250				
unavailable	0	-	150	150
tan clay	150	-	170	20
sand and gravel	170	-	175	5
tan clay	175	-	310	135
sandstone	310	-	320	10
tan clay	320	-	350	30
fine sand	350	-	355	5
tan clay	355	-	455	100
gravel	455	-	465	10
conglomerate	465	-	500	35
Well Location 26.20.9.243				
Well Elevation 4,255				
Soil	0	-	4	4
gravel	4	-	18	14
tan, red clay	18	-	43	25
sand, silt, gravel	43	-	49	6
gravel	49	-	56	7
sand, silt, gravel	56	-	142	86
gravel	142	-	154	12
sand	154	-	212	58
sandy clay	212	-	280	68
blue clay	280	-	308	28
brown, red clay	308	-	454	146
sand, silt, gravel	454	-	481	27
sand	481	-	494	13
sand, silt, gravel	494	-	513	19
gravel	513	-	520	7
sand, silt, gravel	520	-	610	90

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 26.20.14.343				
Well Elevation 4,290				
soil	0	-	5	5
sand and gravel	5	-	41	36
clay	41	-	48	7
sand and gravel	48	-	70	22
clay	70	-	95	25
sand and gravel	95	-	205	110
clay	205	-	225	20
sand and gravel	225	-	260	35
clay and gravel	260	-	275	15
sand and gravel	275	-	300	25
conglomerate	300	-	325	25
clay-rich conglomerate	325	-	285	60
gravel	385	-	390	5
conglomerate	390	-	560	170
gravel	560	-	580	20
conglomerate	580	-	610	30
hard conglomerate	610	-	700	90

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 26.20.15.443 Well Elevation 4,280				
soil	0	-	5	5
clay	5	-	35	30
sand	35	-	55	20
brown clay	55	-	105	50
sand	105	-	119	14
streaks of clay and gravel	119	-	205	86
gravel	205	-	215	10
streaks of clay and gravel	215	-	390	175
gravel	390	-	400	10
streaks of clay and gravel	400	-	475	75
gravel	475	-	490	15
streaks of clay and gravel	490	-	501	11
Well Location 26.20.24.333 Well Elevation 4,308				
soil	0	-	5	5
light red gravel	5	-	40	35
conglomerate	40	-	351	311
conglomerate	351	-	607	256
Well Location 26.20.29.141 Well Elevation 4,260				
brown fill	0	-	30	30
conglomerate	30	-	150	120
clay, sand and gravel	150	-	450	300
conglomerate	450	-	500	50

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 26.21.13.430				
Well Elevation 4,420				
gravels, granite boulders	0	-	360	360
badly fractured siltstones, shales	360	-	460	100
siltstones, shale limestones highly fractured	460	-	701	241
Well Location 27.18.18.240				
Well Elevation 4,475				
Silt, sand and gravel	0	-	90	90
sand and conglomerate	90	-	120	30
silt, sand and gravel	120	-	280	160
rhyolite tuff	280	-	400	120
Well Location 27.19.11.231				
Well Elevation 4,425				
reddish rhyolite	350	-	700	350
Well Location 27.19.19.100				
Well Elevation 4,401				
sandy clay	0	-	20	20
shale, hard clay	20	-	178	158
large gravel and sand	178	-	300	122
Well Location 27.19.19.100a				
Well Elevation 4,401				
sandy clay	0	-	8	8
loose gravel	8	-	18	10
clay and some gravel	18	-	35	17
sticky clay	35	-	100	65
sandy clay	100	-	130	30
pea gravel with streaks of sandy clay and sand	130	-	300	170

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 27.19.19.344				
Well Elevation 4,416				
sandy soil	0	-	23	23
stony clay	23	-	40	17
red clay	40	-	110	70
sandy gray clay	110	-	128	18
sandy gray clay w/gravel	128	-	150	22
gravel	150	-	154	4
sandy clay	154	-	166	12
heavy gravel	166	-	168	2
clay w/sand and gravel	168	-	245	77
hard clay	245	-	256	11
gravel w/clay stratas	256	-	300	44
clay, conglomerates	300	-	620	320
clean hard conglomerates	620	-	750	130
Well Location 27.19.20.444				
Well Elevation 4,422				
soil	0	-	3	3
gravel, sand	3	-	6	3
gray clay	6	-	31	25
gravel	31	-	43	12
red clay	43	-	87	44
rocks and gravel	87	-	128	41
gravel, rocks, clay	128	-	142	14
clay and gravel	142	-	152	10
sand and gravel	152	-	157	5
large gravel	157	-	166	9
gravel and sand	166	-	201	35
gravel w/clay	201	-	215	14
clay and gravel, sand	215	-	303	88
clay, conglomerate	303	-	620	317
clean hard conglomerate	620	-	750	130

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 27.19.22.430				
Well Elevation 4,475				
soil	0	-	2	2
brown clay, gravel	2	-	8	6
caliche and conglomerate	8	-	55	47
brown clay and gravel	55	-	65	10
gravel	65	-	90	25
brown clay and gravel	90	-	158	68
red rhyolite	158	-	215	57
red sandy clay	215	-	218	3
brown clay and gravel	218	-	248	30
red rhyolite	248	-	320	72
brown clay and gravel	320	-	323	3
red clay and gravel	323	-	342	19
brown sandy clay	342	-	350	8
brown clay and gravel	350	-	357	7
brown clay and boulders	357	-	359	2
brown rhyolite	359	-	400	41
Well Location 27.20.2.420				
Well Elevation 4,338				
soil	0	-	3	3
conglomerate	3	-	96	93
conglomerate w/rhyolite	96	-	350	254
shelly conglomerate	350	-	370	20
rhyolite, granite	370	-	512	142
malpais, hard	512	-	520	8

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 27.20.2.424				
Well Elevation 4,344				
soil	0	-	8	8
sand	8	-	29	21
malpais	29	-	53	24
clay	53	-	78	25
sandy clay	78	-	80	2
clay	80	-	128	48
sand and gravel	128	-	130	2
clay	130	-	200	70
Well Location 27.20.12.444				
Well Elevation 4,377				
malpais	0	-	33	33
clay	33	-	44	11
clay and malpais boulders	44	-	70	26
clay	70	-	87	17
soft streak of clay	87	-	90	3
clay	90	-	110	20
sandy clay	110	-	122	12
sand and gravel	122	-	140	18
gravel	140	-	255	115
conglomerate	255	-	600	345

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 27.20.21.110				
Well Elevation 4,400				
soil	0	-	2	2
limey clay	2	-	100	98
quartzite boulder	100	-	105	5
limestone chert	105	-	180	75
red andesite	180	-	218	38
red andesite	218	-	305	87
gray shale	205	-	307	2
red rhyolite	307	-	405	98
Well Location 28.19.16.244				
Well Elevation 4,510				
surface	0	-	15	15
gravel	15	-	50	35
clay	50	-	70	20
clay and boulders	70	-	240	170
gravel	240	-	250	10
clay and gravel	250	-	290	40
conglomerate and clay	290	-	625	335
sand and gravel	625	-	645	20
hard conglomerate	645	-	700	55
conglomerate	700	-	800	100

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 28.19.17.221				
Well Elevation 4,500				
gray gravel	0	-	138	138
clay w/gravel	138	-	215	77
gravel and sand	215	-	227	12
red clay and gravel	227	-	387	160
gravel and sand	387	-	394	7
conglomerate	394	-	517	123
red clay	517	-	536	19
conglomerate	536	-	709	173
gravel and sand	709	-	719	10
red clay and small gravel	719	-	735	16
Well Location 28.19.21.240				
Well Elevation 4,525				
surface	0	-	12	12
gravel	12	-	30	18
sand and gravel	30	-	55	25
clay	55	-	180	125
sandy clay	180	-	240	60
sand and pea gravel	240	-	435	195
large gravel	435	-	485	50
clay	485	-	495	10
gravel	495	-	505	10
conglomerates	505	-	700	195

Drillers' logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From		Depth To	Thickness
Well Location 28.19.27.314				
Well Elevation 4,575				
brown sand	0	-	9	9
sand, gravel and boulders	9	-	142	133
red clay and gravel	142	-	272	130
red conglomerate	272	-	277	5
clay and gravel	277	-	573	296
conglomerate	573	-	600	27
clay and gravel	600	-	672	72
gravel	672	-	676	4
red clay	676	-	720	44
red clay and gravel	720	-	833	113
gray clay and gravel	833	-	892	59
red clay and gravel	892	-	931	39
gravel	931	-	944	13
red clay and gravel	944	-	1000	56
Well Location 29.20.2.410				
Well Elevation 4,800				
conglomerate and fill	0	-	400	400
white rock	400	-	520	120
Well Location 30.20.24.330				
Well Elevation 4,875				
black clay w/gravel	0	-	8	8
conglomerate w/clay	8	-	600	592

Petroleum logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Well Location 22.20.14.234
Well Name Long and Gossum State #1
Well Elevation 4,180 feet

Description	Depth From	Depth To	Thickness
Sand and brown mud	0	20	20
Brown mud	20	60	40
Sand, brown shale	60	90	30
Sand and gravel	90	95	5
Gravel, sand and shale	95	100	5
Sand, brown shale	100	140	40
Sandy brown shale	140	180	40
Water and gravel	180	206	26
Gray shale	206	243	37
Gravel and blue shale	243	252	9
Blue shale	252	289	37
Brown shale	289	311	22
Blue shale	311	368	57
Brown shale	368	430	62
Sand and water	430	472	42
Hard sand	472	490	18
Hard sand	490	512	22
Sand and gravel	512	618	106
Gray shale	618	765	147
Red shale	765	793	28
Sand and gravel	793	900	107
Shale and gravel	900	925	25
Sand and shale	925	957	32
Sand and gravel	957	1,030	73
Red shale	1,030	1,050	20
Shale and gravel	1,050	1,080	30
Lime and gravel	1,080	1,115	35
Lime, hard	1,115	1,120	5
Red rock	1,120	1,125	5
Lime, hard	1,125	1,150	25
Red rock	1,150	1,155	5
Dark shale	1,155	1,170	15
Sandy shale	1,170	1,180	10
Sand and water	1,180	1,190	10
Shale, dark	1,190	1,195	5
Sand and water	1,195	1,250	55
Red shale	1,250	1,261	11
Pencil shale	1,261	1,280	17
Sand and water	1,280	1,287	7
Red shale	1,287	1,297	10
Red sand	1,297	1,310	13
Red shale	1,310	1,325	15
Red shale	1,325	1,350	25

Petroleum logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From	Depth To	Thickness
Well Location 22.20.14.234			
Well Name Long and Gossum State #1			
Well Elevation 4,180 feet			
Brown shale	1,350	1,370	20
Sandy shale	1,370	1,410	40
Red shale	1,410	1,440	30
Sand and shale	1,440	1,460	20
Sand and shale, red	1,460	1,495	35

Petroleum logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From	To	Thickness
Well Location 22.20.14.440			
Well Name Phillips Owens State #1			
Well Elevation 4,180 feet			
Lime and sand	0	15	15
Brown shale	15	68	53
Sand	68	69	1
Brown shale	69	73	4
Gravel, coarse	73	78	5
Brown shale	78	85	7
Gravel, round	85	93	8
Brown sandy shale	93	130	37
Gravel	130	136	6
Gray shale	136	165	29
Sand and gravel, water	165	180	15
Gray sandy shale	180	215	35
Sand and gravel	215	233	18
Light gray shale	233	238	5
Blue shale	238	253	15
Gray sandy shale	253	265	12
Blue shale	265	274	9
Brown shale	274	318	44
Blue lime and shale	318	380	62
Brown shale and sand	380	405	25
Sand and gravel, water	405	428	23
Brown shale	428	433	5
Sand	433	453	20
Sand and gravel	453	525	72
Brown shale and layers of sand and gravel	525	628	103
Gray sandy shale	628	685	57
Brown sandy shale and gravel	685	710	25
Light brown shale	710	790	80
Light gray sand	790	848	58
Red gumbo	848	852	4
Hard red shale	852	864	12
Brown sand	864	906	42
Brown shale and black sand	906	935	29
Black sand and fine	935	937	2
Brown shale and some lime	937	950	13
Reddish brown shale	950	982	32
Reddish brown rock	982	998	16
Hard gray sand	998	1003	5
Pink clay	1003	1004	1
Gray lime	1004	1006	2
Gray, brown lime	1006	1026	20
Reddish brown lime	1026	1046	20
Red rock	1046	1060	14
Red sand	1060	1092	32
Sand	1092	1124	32

Petroleum logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Well Location 22,20.14.440
Well Name Phillips Owens State #1
Well Elevation 4,180 feet

Description	Depth From	Depth To	Thickness
Gray sand	1124	1330	206
Red sand	1330	1350	20
Red shale	1350	1364	14
Dark shale	1364	1366	2
Reddish brown shale	1366	1367	1
Gray shale	1367	1369	2
Gray to pink lime	1369	1371	2
Gray, white lime	1371	1390	18
Blue to gray shale	1390	1400	10
Lime	1400	1405	5
Brown sand	1405	1406	1
Black shale	1406	1407	1
White to pink waxy shale	1407	1410	3
Red brownish shale	1410	1413	3
Red rock, streaks of lime	1413	1428	15
Hard fine sand, red, streaks of lime	1428	1431	3
Coarse red sand, streaks of lime	1431	1436	5
Red sandy shale	1436	1438	2

Petroleum logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Well Location 22.20.35.000
Well Name Buffalo #1
Well Elevation 4,160 feet

Description	Depth From	Depth To	Thickness
Clay and gravel	1	340	340
Coal black muck	340	344	4
Blue clay, gravel and cement	344	700	356

Well Location 24.19.31.244
Well Name Cockrell #1 Pyramid Federal
Well Elevation 4,244 feet KB

Description	Depth From	Depth To	Thickness
Surface-Quaternary	1	385	385
Gila Conglomerate?	385	1890	1505
Tertiary volcanic rocks	1890	5795	3905
Escabrosa limestone	5795	6680	885
Percha shale	6680	6860	180
Montoya dolostone	6860	6980	120
El Paso limestone	6980	7130	150
Bliss sandstone	7130	7340	210
Precambrian	7340	7404	64

Well Location 26.17.4.434
Well Name Powers No. 1 State
Well Elevation 4,377 feet KB

Description	Depth From	Depth To	Thickness
Surface-Quaternary	1	920	920
Volcanic rock	920	1190	270
Mojado mudstone	1190	3930	2740
Tertiary intrusive rock	3930	4007	77

Well Location 28.17.18.232
Well Name KCM No. 1 Cochise State A
Well Elevation 4,416 feet KB

Description	Depth From	Depth To	Thickness
Surface-Quaternary	1	70	70
Gila conglomerate	70	2352	2282
Ringbone-shale, sand, felsite	2352	3788	1436
Mojado-quartzite,felsite	3788	5907	2119

Petroleum logs of wells in Animas Valley, Hidalgo County, New Mexico
(Thickness and depth values in feet)

Description	Depth From	Depth To	Thickness
Well Location: 30.19.8113			
Well Elevation: 4825'			
Well Name: Cockrell #1 State 1209			
Agglomeration	0 -	480	480
Tertiary Volcanics; rhyolite, welded tuff, ashflow tuff	480 -	2950	2470

APPENDIX D

Particle Size Analyses

COMPOSITE DATA SHEET FOR PARTICLE-SIZE ANALYSIS

Sample No. T-2 Analyzed By K. O'Brien Date 2/18/82

Description of Sample Very coarse to fine sand

Remarks Interval from 135 to 140 ft

Classification (Folk) ____________ Initial Sample Weight 130.5 g

Plotted on Figure 3 as curve # 1

Class (Ø)	Wentworth Class	Weight (g)	Percent	Cumulative Percent
> - 1	gravel	15.7	11.9	11.9
-1 to 0	very coarse sand	37.8	29.0	40.9
0 to 1	coarse sand	42.9	32.9	73.8
1 to 2	medium sand	26.3	20.2	94.0
2 to 3	fine sand	5.3	4.1	98.1
3 to 4	very fine sand	1.6	1.2	99.3
Pan	silt and clay	0.9	0.7	100.00
Median		.82		
	Totals	130.5 g	100.0%	

COMPOSITE DATA SHEET FOR PARTICLE-SIZE ANALYSIS

Sample No. T-2 **Analyzed By** K. O'Brien **Date** 2/18/82

Description of Sample Fine gravel to fine sand

Remarks Interval from 150 to 155 ft.

Classification (Folk) ______ **Initial Sample Weight** 115.6 g

Plotted on Figure 3 as curve # 2

Class (Ø)	Wentworth Class	Weight (g)	Percent	Cumulative Percent
> - 1	gravel	9.6	8.3	8.3
-1 to 0	very coarse sand	32.5	28.1	36.4
0 to 1	coarse sand	43.9	38.0	74.4
1 to 2	medium sand	19.9	17.2	91.6
2 to 3	fine sand	5.9	5.1	96.7
3 to 4	very fine sand	2.0	1.7	98.4
Pan	silt and clay	1.8	1.6	100.00
Median		.78		
	Totals	115.6 g	100.0%	

COMPOSITE DATA SHEET FOR PARTICLE-SIZE ANALYSIS

Sample No. T-2 Analyzed By K. O'Brien Date 2/18/82

Description of Sample Fine sand to silt

Remarks Interval from 170 to 175 ft.

Classification (Folk) ________ Initial Sample Weight 71.3 g

Plotted on Figure 3 as curve # 3

Class (Ø)	Wentworth Class	Weight (g)	Percent	Cumulative Percent
> - 1	gravel	--		--
-1 to 0	very coarse sand	8.5	11.9	11.9
0 to 1	coarse sand	9.7	13.6	25.5
1 to 2	medium sand	11.7	16.4	41.9
2 to 3	fine sand	14.9	20.9	62.8
3 to 4	very fine sand	13.6	19.1	81.9
Pan	silt and clay	12.9	18.1	100.00
Median		.19		
	Totals	71.3 g	100.0%	

COMPOSITE DATA SHEET FOR PARTICLE-SIZE ANALYSIS

Sample No. T-2 Analyzed By K. O'Brien Date 2/18/82

Description of Sample Very coarse to very fine sand

Remarks Interval from 180 to 185 ft.

Classification (Folk) ____________ Initial Sample Weight 92.4 g

Plotted on Figure 3 as curve # 4

Class (Ø)	Wentworth Class	Weight (g)	Percent	Cumulative Percent
> - 1	gravel	--		
-1 to 0	very coarse sand	17.4	18.8	18.8
0 to 1	coarse sand	17.8	19.3	38.1
1 to 2	medium sand	13.2	14.3	52.4
2 to 3	fine sand	13.3	14.4	66.8
3 to 4	very fine sand	13.3	14.4	81.2
Pan	silt and clay	17.4	18.8	100.00
Median		.29		
	Totals	92.4 g	100.0%	

COMPOSITE DATA SHEET FOR PARTICLE-SIZE ANALYSIS

Sample No. T-2 Analyzed By K. O'Brien Date 2/18/82

Description of Sample Predominantly medium sand with coarse to fine sand

Remarks Interval from 205 to 210 ft.

Classification (Folk) ____ Initial Sample Weight 81.1 g

Plotted on Figure 3 as curve # 5

Class (Ø)	Wentworth Class	Weight (g)	Percent	Cumulative Percent
> - 1	gravel	--		
-1 to 0	very corase sand	6.3	7.7	7.7
0 to 1	coarse sand	13.6	16.8	24.5
1 to 2	medium sand	17.2	21.2	45.7
2 to 3	fine sand	14.5	17.9	63.6
3 to 4	very fine sand	12.3	15.2	78.8
Pan	silt and clay	17.2	21.2	100.0
Median		.22		
	Totals	81.1 g	100.0%	

COMPOSITE DATA SHEET FOR PARTICLE-SIZE ANALYSIS

Sample No. T-1 Analyzed By K. O'Brien Date 2/18/82

Description of Sample Sand and gravel

Remarks Interval from 210 to 215 ft.

Classification (Folk) ______ Initial Sample Weight 209.4 g

Plotted on Figure 3 as curve # 6

Class (Ø)	Wentworth Class	Weight (g)	Percent	Cumulative Percent
> - 1	gravel	71.1	34.0	34.0
-1 to 0	very coarse sand	33.1	15.8	49.8
0 to 1	coarse sand	40.9	19.5	69.3
1 to 2	medium sand	38.2	18.2	87.5
2 to 3	fine sand	17.7	8.5	96.0
3 to 4	very fine sand	4.7	2.2	98.2
Pan	silt and clay	3.7	1.8	100.00
Median		1.0		
Totals		209.4 g	100.0%	

COMPOSITE DATA SHEET FOR PARTICLE-SIZE ANALYSIS

Sample No. T-1 **Analyzed By** K. O'Brien **Date** 2/18/82

Description of Sample Sand and gravel

Remarks Interval from 215 to 220 ft.

Classification (Folk) ____________ **Initial Sample Weight** 167.1 g

Plotted on Figure 3 as curve # 7

Class (Ø)	Wentworth Class	Weight (g)	Percent	Cumulative Percent
> - 1	gravel	36.3	21.8	21.8
-1 to 0	very coarse sand	42.2	25.2	47.0
0 to 1	coarse sand	48.5	29.0	76.0
1 to 2	medium sand	30.1	18.0	94.0
2 to 3	fine sand	7.4	4.4	98.4
3 to 4	very fine sand	1.5	0.9	99.3
Pan	silt and clay	1.1	0.7	100.0
Median		.94		
	Totals	167.1 g	100.0%	

U.S. GEOLOGICAL SURVEY

WATER RESOURCES DIVISION

ALBUQUERQUE, NEW MEXICO

LOG HEADING

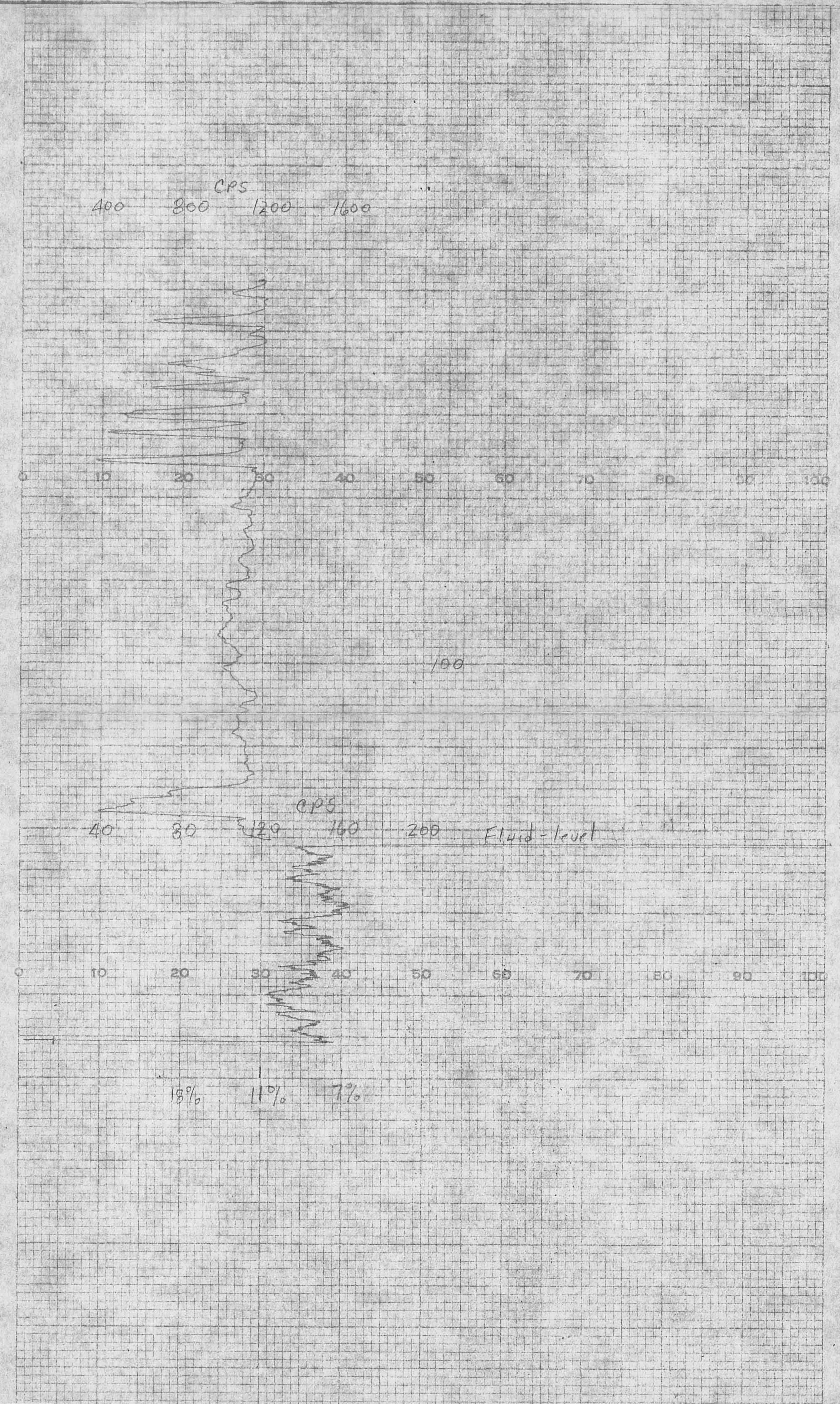
LOCATION NO. 22s.20w.6.320

OWNER	SEC. NE SW 6	TWP. 22s	RNG. 20w	OPERATOR(S) Hudson-Cruz
PROJECT	HOLE NO. T-1	COUNTY Hidalgo	STATE N. Mex.	DATE May 12, 1981

		CASING	THICKNESS	BORE SIZE
DEPTH-DRILLER		Diam. ___ In. ___ Ft. to ___ Ft.	___	Diam. 5 1/4 In. ___ Ft. to ___ Ft.
DEPTH-LOGGER	192	Diam. ___ In. ___ Ft. to ___ Ft.	___	Diam. ___ In. ___ Ft. to ___ Ft.
INTERVAL LOGGED	8-192	Diam. ___ In. ___ Ft. to ___ Ft.	___	Diam. ___ In. ___ Ft. to ___ Ft.

						PERFORATIONS
LOG MEAS. FROM G.L.	ELEVATIONS KB.	DF.	GL.	TC.		___ Ft. to ___ Ft.
DRILLERS MEAS. FROM G.L.	TYPE FLUID	LEVEL	DENSITY	Lb/Gal		___ Ft. to ___ Ft.

NUCLEAR RADIATION						ELECTRIC LOG	
CHANNEL NO.	1	2	3	4	REMARKS	DEPTH	Ft.
DEPTH					Porosity increases left	RESISTIVITY	Ohms
RANGE CPS 5 In.	1K / 100					S.P. PEN NO.	MV
SPAN	.5					VERTICAL SCALE	Ft/In
POSITION	10.0					**CALIPER**	
TIME CONSTANT Sec.	2					VERTICAL SCALE	Ft/In
LOGGING SPEED Ft/Min	20					HORIZONTAL SCALE	In/In
VERTICAL SCALE Ft/In	20					**OTHER**	
WATER LEVEL Ft.	144					DEPTH	Ft.
DIGITAL RECORD						RANGE	
TYPE LOG	Neutron						



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WATER RESOURCES DIVISION
ALBUQUERQUE, NEW MEXICO

LOG HEADING

LOCATION NO. 22s.20w.6.320

OWNER	SEC. NE SW 6 TWP. 22s RNG. 20w	OPERATOR(S) Hudson-Cruz	
PROJECT	HOLE NO. T-2	COUNTY Hidalgo STATE N. Mex.	DATE May 12, 1981

	CASING	THICKNESS	BORE SIZE
DEPTH-DRILLER	Diam. ___ In. ___ Ft. to ___ Ft.	___	Diam. 5 1/4 In. ___ Ft. to ___ Ft.
DEPTH-LOGGER 272	Diam. ___ In. ___ Ft. to ___ Ft.	___	Diam. ___ In. ___ Ft. to ___ Ft.
INTERVAL LOGGED 10-272	Diam. ___ In. ___ Ft. to ___ Ft.	___	Diam. ___ In. ___ Ft. to ___ Ft.

		PERFORATIONS
LOG MEAS. FROM G.L.	ELEVATIONS KB. DF. GL. TC.	___ Ft. to ___ Ft.
DRILLERS MEAS. FROM G.L.	TYPE FLUID LEVEL DENSITY Lb/Gal	___ Ft. to ___ Ft.

NUCLEAR RADIATION

CHANNEL NO.	1	2	3	4	REMARKS
DEPTH					Porosity increases left
RANGE CPS 5 In.	100				
SPAN	.5				
POSITION	10.0				
TIME CONSTANT Sec.	2				
LOGGING SPEED Ft/Min	20				
VERTICAL SCALE Ft/In	20				
WATER LEVEL Ft.	10				
DIGITAL RECORD					
TYPE LOG	Neutron				

ELECTRIC LOG

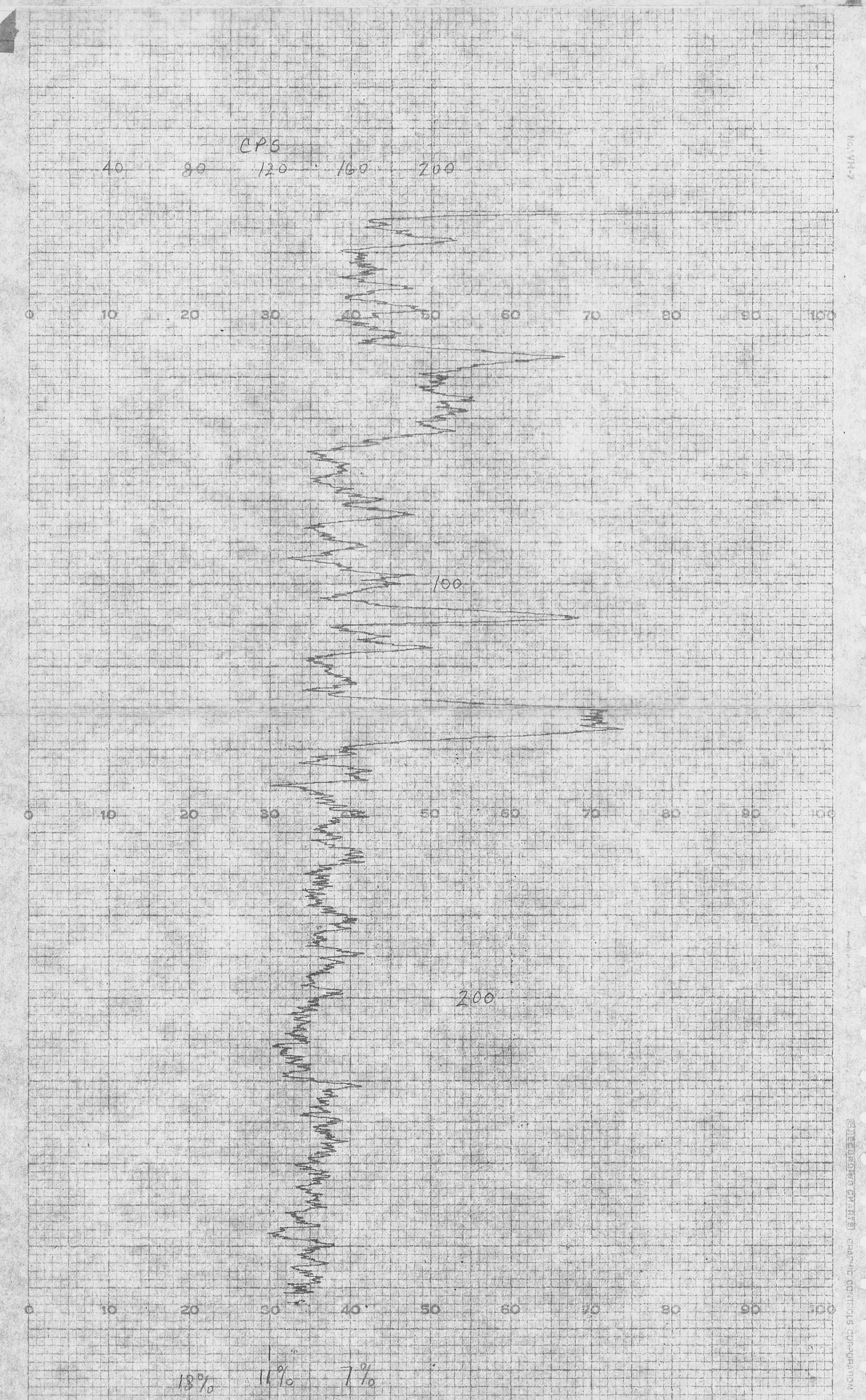
DEPTH		Ft.
RESISTIVITY		Ohms
S.P. PEN NO.		MV
VERTICAL SCALE		Ft/In

CALIPER

VERTICAL SCALE		Ft/In
HORIZONTAL SCALE		In/In

OTHER

DEPTH		Ft.
RANGE		



U.S. GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
ALBUQUERQUE, NEW MEXICO

LOG HEADING

LOCATION NO. 22s.20w.6.320

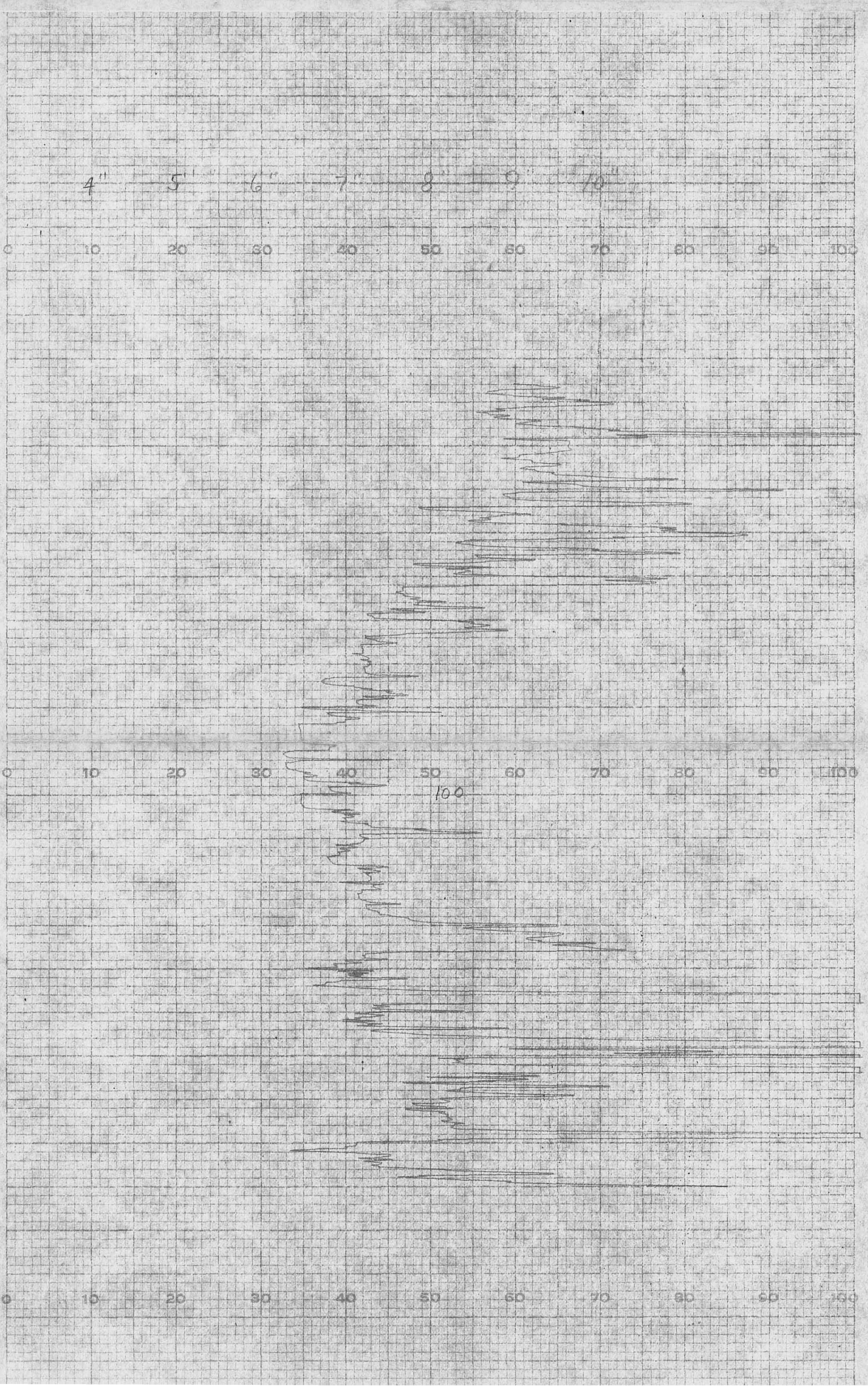
OWNER		SEC. NE SW 6 TWP. 22s RNG. 20w		OPERATOR(S) Hudson-Cruz
PROJECT	HOLE NO. T-1	COUNTY Hidalgo	STATE N. Mex.	DATE May 12, 1981

		CASING / THICKNESS	BORE SIZE
DEPTH-DRILLER		Diam. ___ In. ___ Ft. to ___ Ft. ___	Diam. 5 1/4 In. ___ Ft. to ___ Ft.
DEPTH-LOGGER	192	Diam. ___ In. ___ Ft. to ___ Ft. ___	Diam. ___ In. ___ Ft. to ___ Ft.
INTERVAL LOGGED	6-192	Diam. ___ In. ___ Ft. to ___ Ft. ___	Diam. ___ In. ___ Ft. to ___ Ft.

			PERFORATIONS
LOG MEAS. FROM	G.L.	ELEVATIONS KB. DF. GL. TC.	___ Ft. to ___ Ft.
DRILLERS MEAS. FROM	G.L.	TYPE FLUID LEVEL DENSITY Lb/Gal	___ Ft. to ___ Ft.

NUCLEAR RADIATION					
CHANNEL NO.	1	2	3	4	REMARKS
DEPTH					
RANGE CPS 5 In.					
SPAN					
POSITION					
TIME CONSTANT Sec.					
LOGGING SPEED Ft/Min					
VERTICAL SCALE Ft/In					
WATER LEVEL Ft.					
DIGITAL RECORD					
TYPE LOG					

ELECTRIC LOG		
DEPTH		Ft.
RESISTIVITY		Ohms
S.P. PEN NO.		MV
VERTICAL SCALE		Ft/In
CALIPER		
VERTICAL SCALE	20	Ft/In
HORIZONTAL SCALE	one	In/In
OTHER		
DEPTH		Ft.
RANGE		



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WATER RESOURCES DIVISION
ALBUQUERQUE, NEW MEXICO

LOG HEADING

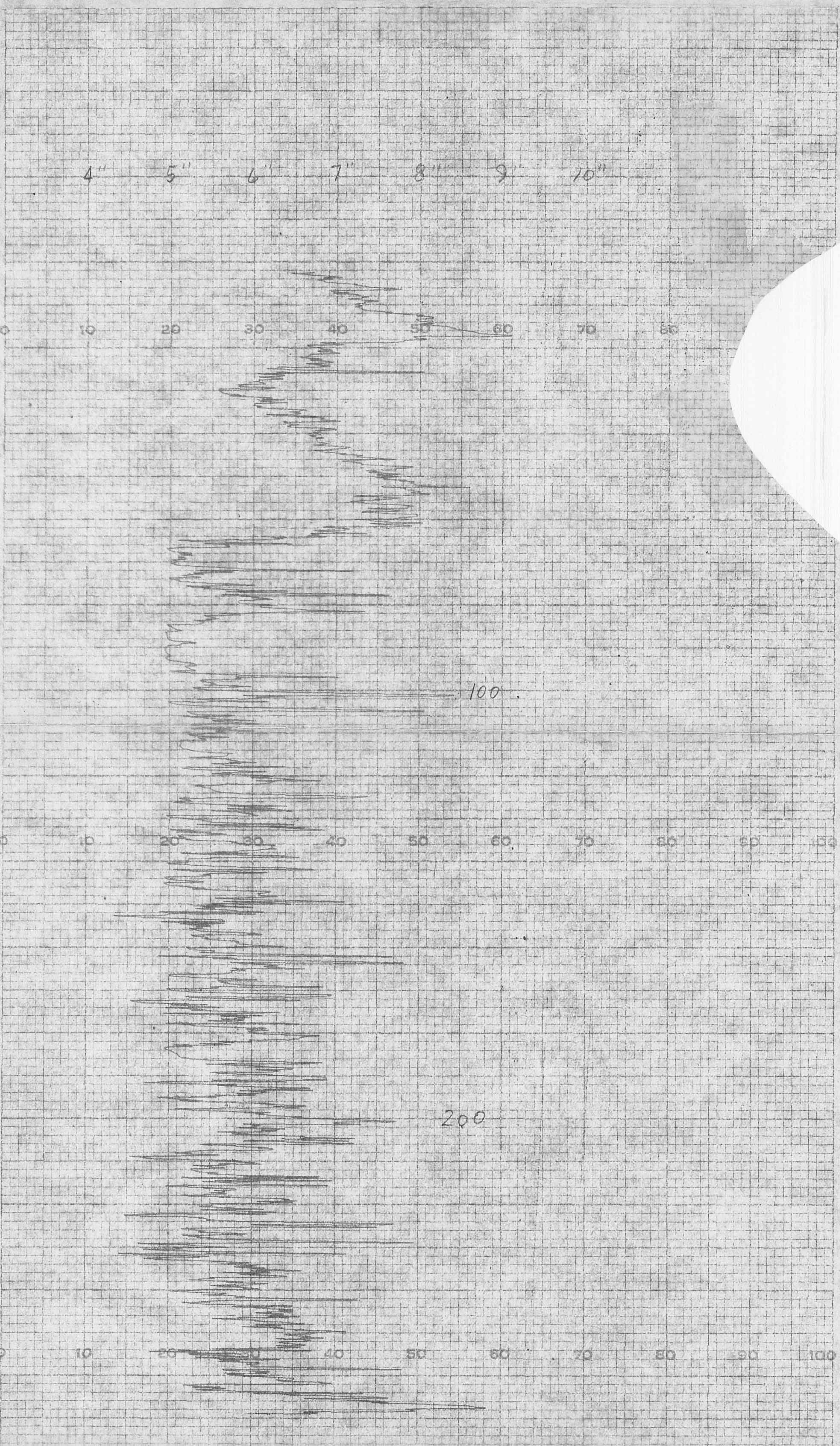
LOCATION NO. 22s.20w.6.320

OWNER	SEC. NE SW 6	TWP. 22s	RNG. 20w	OPERATOR(S) Hudson-Cruz
PROJECT	HOLE NO. T-2	COUNTY Hidalgo	STATE N. Mex.	DATE May 12, 1981

	CASING	THICKNESS	BORE SIZE
DEPTH-DRILLER	Diam. ___ In. ___ Ft. to ___ Ft.		Diam. 5 1/4 In. 0 Ft. to T.D.
DEPTH-LOGGER 272	Diam. ___ In. ___ Ft. to ___ Ft.		Diam. ___ In. ___ Ft. to ___ Ft.
INTERVAL LOGGED 2-269	Diam. ___ In. ___ Ft. to ___ Ft.		Diam. ___ In. ___ Ft. to ___ Ft.

		PERFORATIONS
LOG MEAS. FROM G.L.	ELEVATIONS KB. DF. GL. TC.	___ Ft. to ___ Ft.
DRILLERS MEAS. FROM G.L.	TYPE FLUID LEVEL DENSITY Lb/Gal	___ Ft. to ___ Ft.

NUCLEAR RADIATION						ELECTRIC LOG	
CHANNEL NO.	1	2	3	4	REMARKS	DEPTH	Ft.
DEPTH						RESISTIVITY	Ohms
RANGE CPS 5 In.						S.P. PEN NO.	MV
SPAN						VERTICAL SCALE	Ft/In
POSITION						**CALIPER**	
TIME CONSTANT Sec.						VERTICAL SCALE	20 Ft/In
LOGGING SPEED Ft/Min						HORIZONTAL SCALE	One In/In
VERTICAL SCALE Ft/In						**OTHER**	
WATER LEVEL Ft.						DEPTH	Ft.
DIGITAL RECORD						RANGE	
TYPE LOG							



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WATER RESOURCES DIVISION
ALBUQUERQUE, NEW MEXICO

LOG HEADING

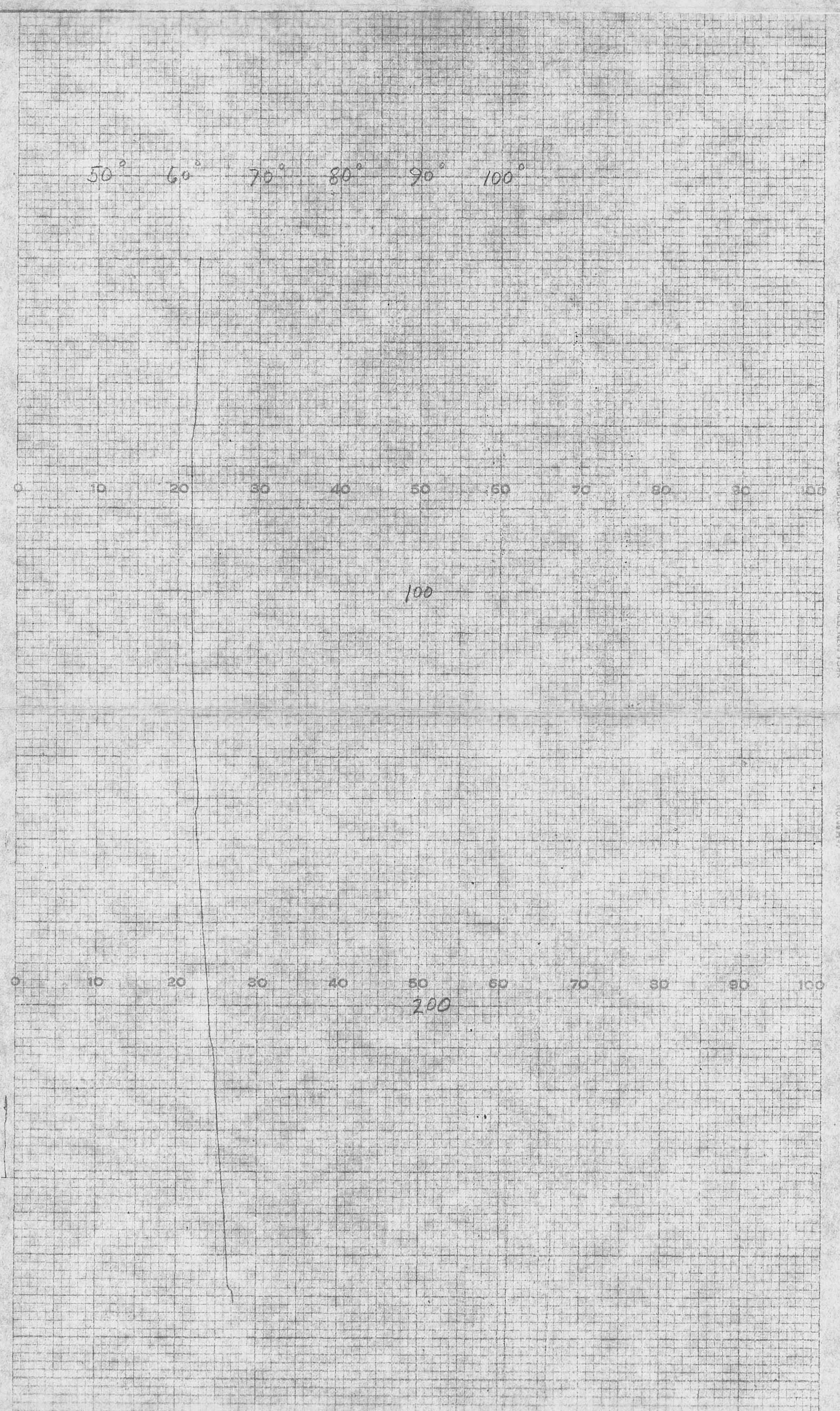
LOCATION NO. 22s. 20w. 6.340

OWNER	SEC. NE SW 6 TWP. 22s RNG. 20w		OPERATOR(S) Hudson-Cruz
PROJECT	HOLE NO. T-2	COUNTY Hidalgo STATE N. Mex.	DATE May 12, 1981

	CASING	THICKNESS	BORE SIZE
DEPTH-DRILLER	Diam. ___ In. ___ Ft. to ___ Ft.		Diam. ___ In. ___ Ft. to ___ Ft.
DEPTH-LOGGER 272	Diam. ___ In. ___ Ft. to ___ Ft.		Diam. ___ In. ___ Ft. to ___ Ft.
INTERVAL LOGGED 20 - 272	Diam. ___ In. ___ Ft. to ___ Ft.		Diam. ___ In. ___ Ft. to ___ Ft.

		PERFORATIONS
LOG MEAS. FROM G.L.	ELEVATIONS KB. DF. GL. TC.	___ Ft. to ___ Ft.
DRILLERS MEAS. FROM G.L.	TYPE FLUID LEVEL DENSITY Lb/Gal	___ Ft. to ___ Ft.

NUCLEAR RADIATION						ELECTRIC LOG	
CHANNEL NO.	1	2	3	4	REMARKS	DEPTH	Ft.
DEPTH					Hole was refilled	RESISTIVITY	Ohms
RANGE CPS 5 In.					with water 3 hrs.	S.P. PEN NO.	MV
SPAN					before temp. Log.	VERTICAL SCALE	Ft/In
POSITION						**CALIPER**	
TIME CONSTANT Sec.						VERTICAL SCALE	Ft/In
LOGGING SPEED Ft/Min						HORIZONTAL SCALE	In/In
VERTICAL SCALE Ft/In						**OTHER**	
WATER LEVEL Ft.	20					DEPTH	272 Ft.
DIGITAL RECORD						RANGE	10°/inch
TYPE LOG	TEMP.						



U.S. GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
ALBUQUERQUE, NEW MEXICO

LOG HEADING

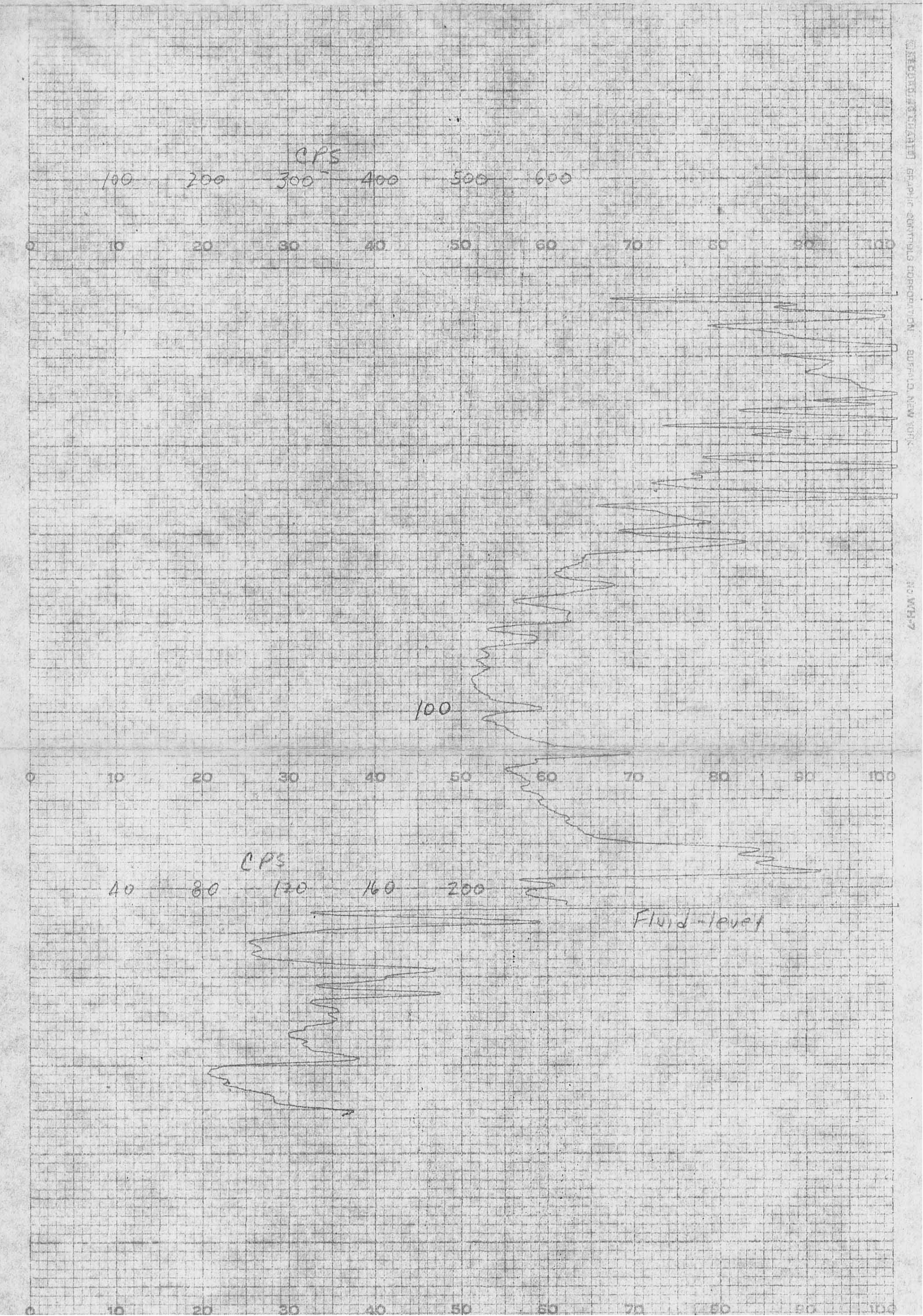
LOCATION NO. 22s.20w.6.320

OWNER	SEC. NESW 6 TWP. 22s RNG. 20w		OPERATOR(S) Hudson-Cruz
PROJECT HOLE NO. T-7	COUNTY Hidalgo	STATE N. Mex.	DATE May 12, 1981

	CASING	THICKNESS	BORE SIZE
DEPTH-DRILLER	Diam. ___ In. ___ Ft. to ___ Ft.	___	Diam. 5 1/4 In. ___ Ft. to ___ Ft.
DEPTH-LOGGER 192	Diam. ___ In. ___ Ft. to ___ Ft.	___	Diam. ___ In. ___ Ft. to ___ Ft.
INTERVAL LOGGED 6-192	Diam. ___ In. ___ Ft. to ___ Ft.	___	Diam. ___ In. ___ Ft. to ___ Ft.

		PERFORATIONS
LOG MEAS. FROM G.L.	ELEVATIONS KB. DF. GL. TC.	___ Ft. to ___ Ft.
DRILLERS MEAS. FROM G.L.	TYPE FLUID LEVEL DENSITY Lb/Gal	___ Ft. to ___ Ft.

NUCLEAR RADIATION						ELECTRIC LOG	
CHANNEL NO.	1	2	3	4	REMARKS	DEPTH	Ft.
DEPTH					Density increases left.	RESISTIVITY	Ohms
RANGE CPS 5 In.	500 / 100					S.P. PEN NO.	MV
SPAN	1.0 / .5					VERTICAL SCALE	Ft/In
POSITION	10.0					CALIPER	
TIME CONSTANT Sec.	2					VERTICAL SCALE	Ft/In
LOGGING SPEED Ft/Min	20					HORIZONTAL SCALE	In/In
VERTICAL SCALE Ft/In	20					OTHER	
WATER LEVEL Ft.	146					DEPTH	Ft.
DIGITAL RECORD						RANGE	
TYPE LOG	Bulk Density						



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WATER RESOURCES DIVISION
ALBUQUERQUE, NEW MEXICO

LOG HEADING

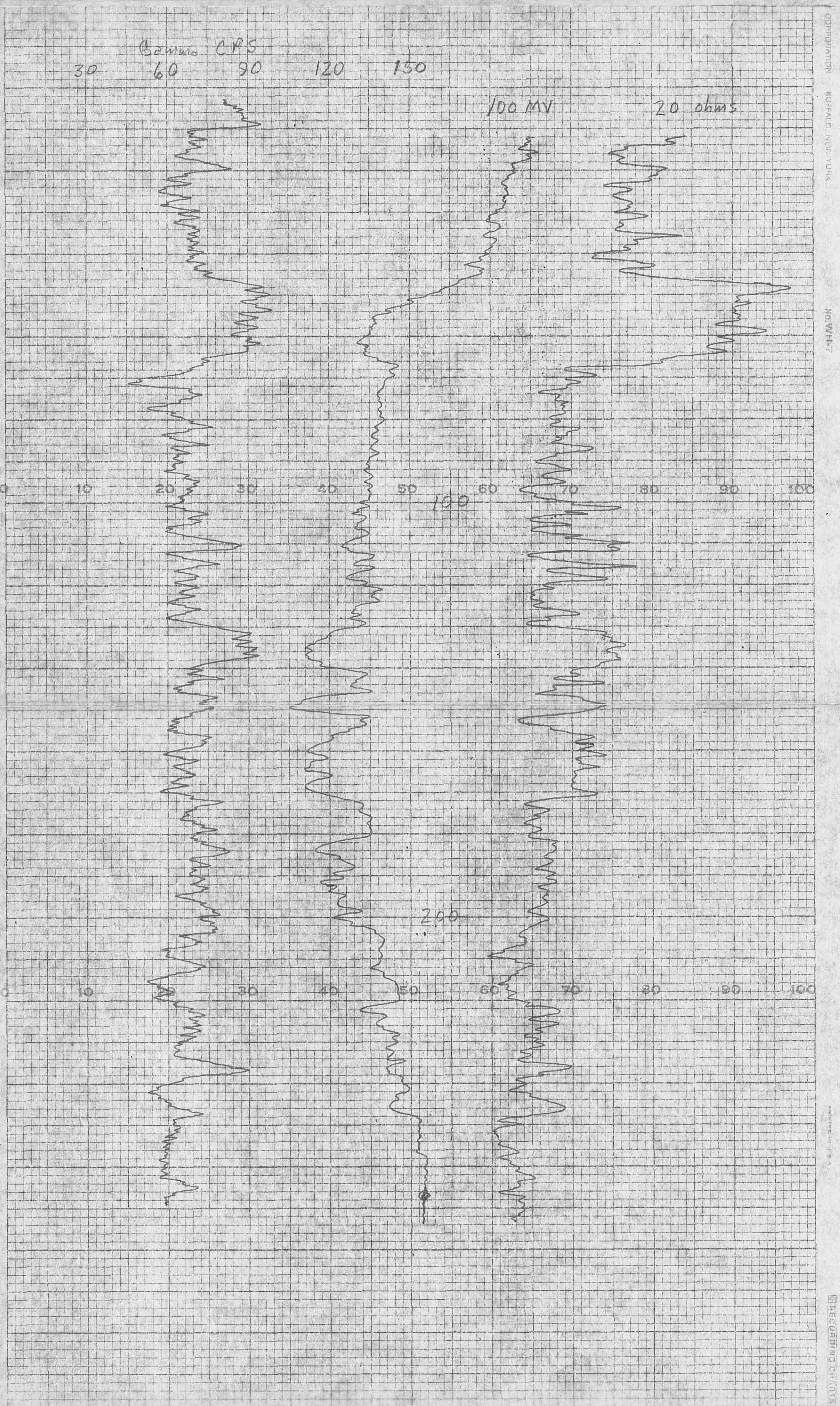
LOCATION NO. NESW 6.22S.20W.

OWNER	SEC. 6 TWP. 22s RNG. 20w	OPERATOR(S) Hudson-Cruz	
PROJECT HOLE NO. T-2	COUNTY Hidalgo	STATE N. Mex.	DATE May 12, 1981

	CASING	THICKNESS	BORE SIZE
DEPTH-DRILLER	Diam. ___ In. ___ Ft. to ___ Ft.		Diam. 5 1/4 In. 0 Ft. to TD Ft.
DEPTH-LOGGER 273	Diam. ___ In. ___ Ft. to ___ Ft.		Diam. ___ In. ___ Ft. to ___ Ft.
INTERVAL LOGGED 12-273	Diam. ___ In. ___ Ft. to ___ Ft.		Diam. ___ In. ___ Ft. to ___ Ft.

						PERFORATIONS
LOG MEAS. FROM G.L.	ELEVATIONS KB.	DF.	GL.	TC.		___ Ft. to ___ Ft.
DRILLERS MEAS. FROM G.L.	TYPE FLUID		LEVEL	DENSITY	Lb/Gal	___ Ft. to ___ Ft.

NUCLEAR RADIATION						ELECTRIC LOG	
CHANNEL NO.	1	2	3	4	REMARKS	DEPTH	Ft.
DEPTH					Fluid-level was	RESISTIVITY	20 Ohms
RANGE CPS 5 In.	100				brought to surface	S.P. PEN NO.	100 MV
SPAN	.75				with clear water	VERTICAL SCALE	20 Ft/In
POSITION	10.0					CALIPER	
TIME CONSTANT Sec.	2					VERTICAL SCALE	Ft/In
LOGGING SPEED Ft/Min	20					HORIZONTAL SCALE	In/In
VERTICAL SCALE Ft/In	20					OTHER	
WATER LEVEL Ft.						DEPTH	Ft.
DIGITAL RECORD						RANGE	
TYPE LOG	Gamma						



U.S. GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
ALBUQUERQUE, NEW MEXICO

LOG HEADING

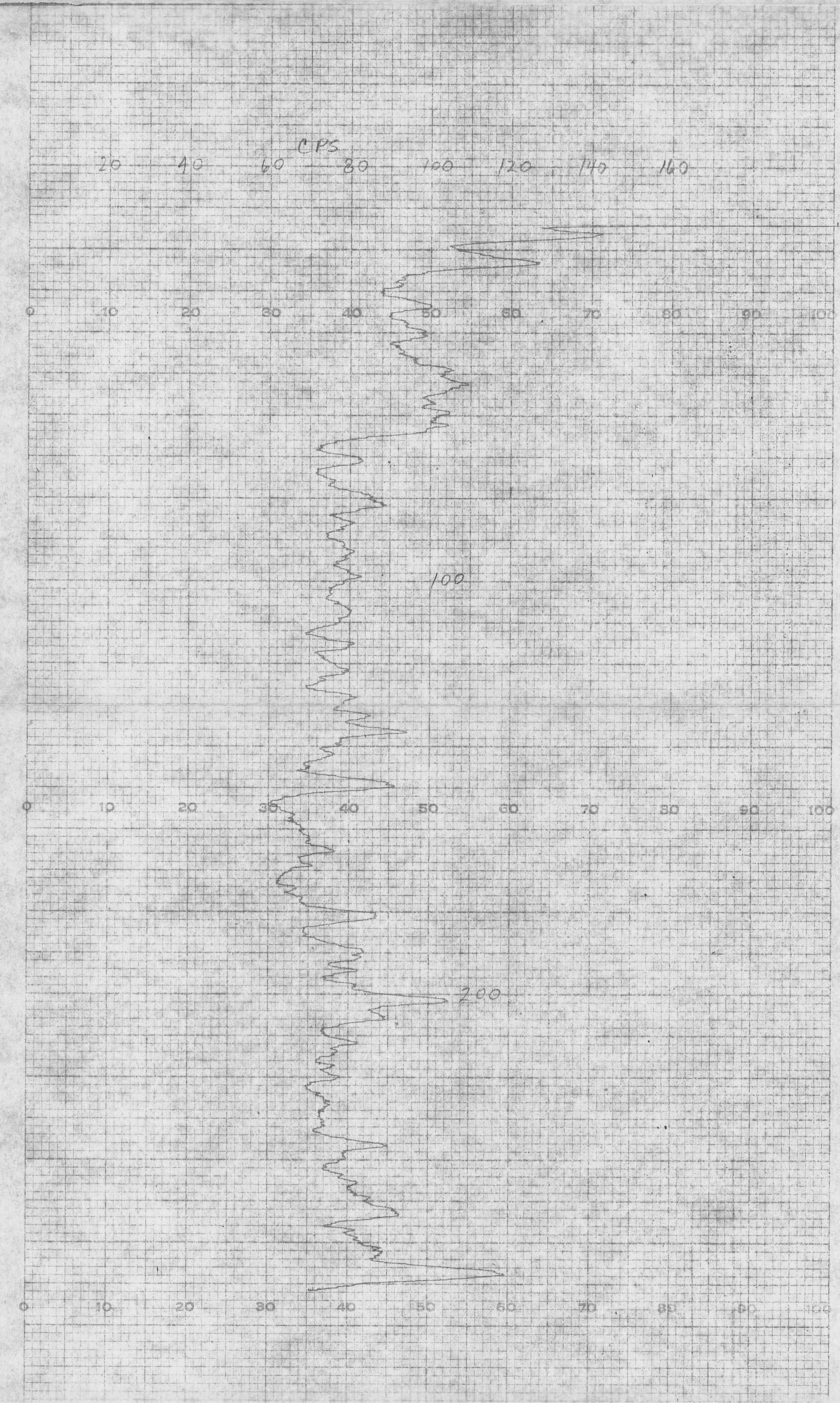
LOCATION NO. 22s.20w.6.320

OWNER	SEC. NESW 6	TWP. 22s	RNG. 20w	OPERATOR(S) Hudson-Cruz	
PROJECT	HOLE NO. T-2	COUNTY Hidalgo	STATE N. Mex.	DATE May 12, 1981	

DEPTH-DRILLER	CASING / THICKNESS		BORE SIZE
DEPTH-LOGGER 272	Diam. ___ In. ___ Ft. to ___ Ft. ___		Diam. 5 1/4 In. 0 Ft. to T.D. Ft.
	Diam. ___ In. ___ Ft. to ___ Ft. ___		Diam. ___ In. ___ Ft. to ___ Ft.
INTERVAL LOGGED 14-272	Diam. ___ In. ___ Ft. to ___ Ft. ___		Diam. ___ In. ___ Ft. to ___ Ft.

LOG MEAS. FROM	ELEVATIONS KB. DF. GL. TC.	PERFORATIONS ___ Ft. to ___ Ft.
DRILLERS MEAS. FROM	TYPE FLUID LEVEL DENSITY Lb/Gal	___ Ft. to ___ Ft.

NUCLEAR RADIATION						ELECTRIC LOG	
CHANNEL NO.	1	2	3	4	REMARKS	DEPTH	Ft.
DEPTH	272				Density increases left	RESISTIVITY	Ohms
RANGE CPS 5 In.	100					S.P. PEN NO.	MV
SPAN	1.0					VERTICAL SCALE	Ft/In
POSITION	10.0					**CALIPER**	
TIME CONSTANT Sec.	2					VERTICAL SCALE	Ft/In
LOGGING SPEED Ft/Min	20					HORIZONTAL SCALE	In/In
VERTICAL SCALE Ft/In	20					**OTHER**	
WATER LEVEL Ft.	14					DEPTH	Ft.
DIGITAL RECORD						RANGE	
TYPE LOG	Bulk Density						



U.S. GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
ALBUQUERQUE, NEW MEXICO

LOG HEADING

LOCATION NO. 22s.20w.6.320

OWNER	SEC. NESW 6 TWP. 22s RNG. 20w		OPERATOR(S) Hudson-Cruz
PROJECT HOLE NO. T-1	COUNTY Hidalgo	STATE N. Mex.	DATE May 12, 1981

	CASING	THICKNESS	BORE SIZE
DEPTH-DRILLER	Diam. ____ In. ____ Ft. to ____ Ft.	____	Diam. 5 1/4 In. ____ Ft. to ____ Ft.
DEPTH-LOGGER 192	Diam. ____ In. ____ Ft. to ____ Ft.	____	Diam. ____ In. ____ Ft. to ____ Ft.
INTERVAL LOGGED 5-192	Diam. ____ In. ____ Ft. to ____ Ft.	____	Diam. ____ In. ____ Ft. to ____ Ft.

		PERFORATIONS
LOG MEAS. FROM G.L.	ELEVATIONS KB. DF. GL. TC.	____ Ft. to ____ Ft.
DRILLERS MEAS. FROM G.L.	TYPE FLUID LEVEL DENSITY Lb/Gal	____ Ft. to ____ Ft.

NUCLEAR RADIATION

CHANNEL NO.	1	2	3	4	REMARKS
DEPTH					Tried to fill hole
RANGE CPS 5 In.	100				with clear water
SPAN	.75				Fluid-level dropping
POSITION	10.0				
TIME CONSTANT Sec.	2				
LOGGING SPEED Ft/Min	20				
VERTICAL SCALE Ft/In	20				
WATER LEVEL Ft.	134				
DIGITAL RECORD					
TYPE LOG	Gamma				

ELECTRIC LOG

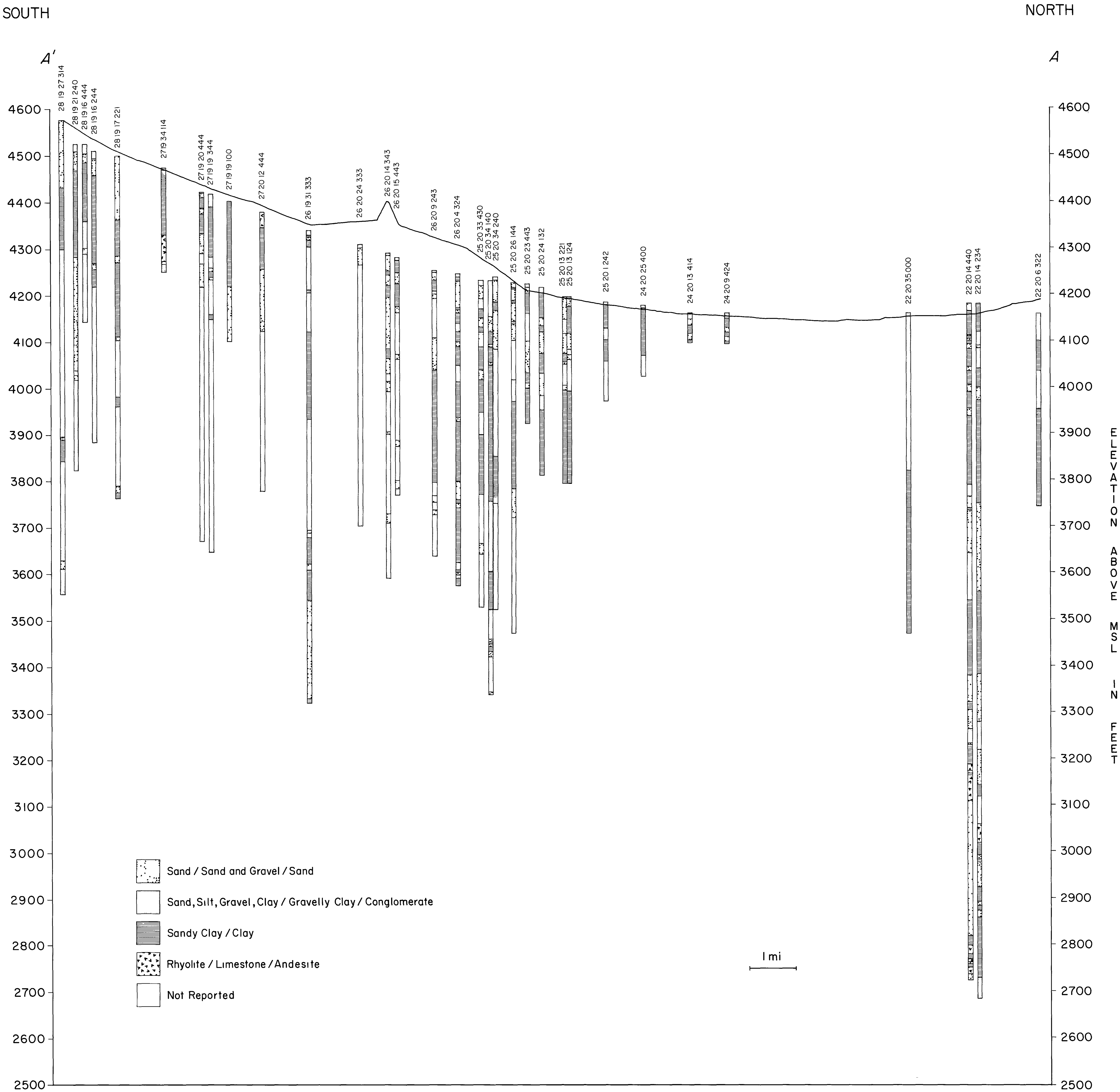
DEPTH		Ft.
RESISTIVITY	20	Ohms
S.P. PEN NO.	200	MV
VERTICAL SCALE	20	Ft/In

CALIPER

VERTICAL SCALE		Ft/In
HORIZONTAL SCALE		In/In

OTHER

DEPTH		Ft.
RANGE		



OF 132 CROSS-SECTION A-A'