GW - 1

MONITORING REPORTS

DATE:
1979

AMERICAN
GROUND WATER
CONSULTANTS, INC.

2300 CANDELARIA ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
TELE: (505) 345-9505 CABLE: HYDROCONSULT
TELEX: 66-0422 TELECOPIER: (505) 247-0155

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Febraury 7, 1979

Mr. Joe D. Ramey, Director
Energy and Minerals Department
Oil Conservation Division
Post Office Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Ramey:

On January 30, 1979, American Ground Water Consultants presented to Plateau, Inc. its report entitled: Milestone Report on Monitoring Activities at the Bloomfield Refinery Operated by Plateau, Inc., San Juan County, New Mexico. This report made specific recommendations for modification of the presently required monitoring program based upon the review of monitoring activities which had been carried on during 1978. It is the purpose of this letter to request that the presently required monitoring program be modified as follows.

1. Neutron logging should be carried out semi-annually in December and June.

2. Temperature logging should be carried out in September and March of each year.

3. ZETA-SP methods should be abandoned because it is no longer possible to carry out effective surveys with the plant growth on the bottom of the ponds.

4. Water-level measurements should be carried out monthly in conjunction with other activities.

5. AQUATRACE studies should be carried out monthly.

Upon your review of our report, should you concur with our recommendations, we would appreciate receiving a letter from you to this effect.

Sincerely,

William M. Turner

Dr. William M. Turner
President

WMT:rt

cc: Mr. J. T. Hearne

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ATTACHMENTS

Attachment		Following
1	Lithologic logs for neutron-probe-access holes	Dark Pink Sheet
2	Drillers log for the AMOCO Davis Gas Unit F-1 well	Light Pink Sheet
3	Neutron-probe data	Yellow Sheet
4	Temperature data	Aqua Sheet
5	AQUATRACE data	Blue Sheet
6	Water-Level data	Second Yellow Sheet

SUMMARY

The results of monitoring activities to date indicate:

1. The Hammond ditch is the principle source of ground-water below the solar-evaporation ponds.

2. At least while the water in the ditch is flowing, the direction of ground-water flow is to the south.

3. There are several anomalously high water levels in the observation holes which would suggest that water is moving towards the ditch. (These ground-water elevations could be caused by errors in the bench-mark elevations.) ?

4. The saturated zone in the vicinity of the Hammond ditch may extend as far as 600 feet south of the ditch and the saturated cobble may be as much as ten feet thick.

5. The neutron-probe-soil-moisture data indicates a slight increase in soil moisture in the silt beneath the embankment which surrounds the solar-evaporation ponds. A 10 volume-percent moisture increase over a pond area with dimensions of 650 x 250 feet for a depth of 10 feet beneath the pond prepresents an increase of about 1,215,584 gallons of water in storage in the soils. The results of neutron-probe studies are only strictly valid for the embankments of the pond and may not be valid for the inundated foundation of the reservoir.

6. Temperature data suggest that about 10 gpm of seepage is taking place also. The estimates based on an analysis of the temperature data are only valid for the embankment and may not be valid for the inundated reservoir foundation.

7. AQUATRACE methods indicate about 20 gpm seepage into the Hammond ditch and the San Juan River.

8. As of October 26, the Hammond ditch was empty and water in bank storage was emptying into the ditch at about one-half gallon per minute from uptstream to downstream of the refinery. The flow from bank storage must represent a maximum flow into the Hammond ditch.

9. Based upon present information, seepage is presently taking place from the pond at a very low rate.

10. At the location where seepage rates have been estimated, wave action has eroded the bentonite liner away and it is possible that the percolation is greater in the vicinity of the embankments than through the pond bottoms.

11. In conjunction with further monitoring a single water budget study should be made of the pond.

RECOMMENDATIONS

The recommendations given below deal with information on the monitoring program for improving the estimate of seepage.

1. Neutron monitoring has about fulfilled its usefulness because soil-moisture does not appear to be changing rapidly. It is therefore recommended that neutron logging be carried out semi-annually, in December and June.

2. Thermal methods are providing useful information. Data collected in September and March seems to be the most useful, and it is recommended that temperature profiles be made of all observation holes for one more year, in September and March.

3. ZETA-SP methods, while useful initially, are of little use at present because of the existence of plant growth on the pond bottom which prevents the measurement electrodes from contacting the soils on the pond bottom.

4. Water-level data is of value for evaluating the direction of ground-water flow in the cobble beneath the solar-evaporation ponds. Because water-level measurements are rapidly carried out, it is recommended that water-level measurements be carried out monthly in conjunction with other monitoring activities.

5. AQUATRACE is likely to provide the most unambiguous results in the quantification of seepage and it is recommended that samples of pond and ditch water be collected monthly and analyzed for TRAC-5.

6. The results of all monitoring activities should be presented in milestone reports at least once a year. Any change in the frequency of monitoring or the possible abandonment of a monitoring method will be recommended at that time.

7. All bench marks on the PVC casing in the observation holes should be relevelled with reference to a bench mark of known altitude. Also, the water-level surface of water in the Hammond ditch should be accurately levelled when the ditch again has water in it. All levelling should be accurate to the nearest 0.01 foot and should be carried out at the same time to minimize error.

INTRODUCTION

Plateau, Inc. operates a petroleum refinery near Bloomfield, New Mexico. The location of the refinery is shown in figures 1 and 2. The refinery discharges waste water into solar evaporation ponds. This activity requires a permit under the regulations of the New Mexico Water Quality Control Commission.

In October 1977, Plateau, Inc. submitted to the New Mexico Oil Conservation Commission (NMOCC) its proposed discharge and monitoring plan for its refinery located at Bloomfield, New Mexico.

On December 13, 1977, the NMOCC notified Plateau that additional information was required before a permit could be issued. The additional information was provided to the NMOCC on April 6, 1978. On June 5, 1978 the NMOCC notified Plateau that its discharge plan had been approved.

In his letter to Plateau dated June 5, 1978 the Director of the NMOCC indicated that "after one year of monitoring with satisfactory results, the Director may grant an extension to the frequency of monitoring." Because the solar evaporation ponds had been filled with water for more than one year at the time the permit was issued, it seemed reasonable to assemble all monitoring information collected and to interpret this data in terms of possible seepage from the ponds. It also will be determined which of the monitoring methods are the most useful so that the frequency of monitoring using the less effective methods can be reduced or eliminated altogether.

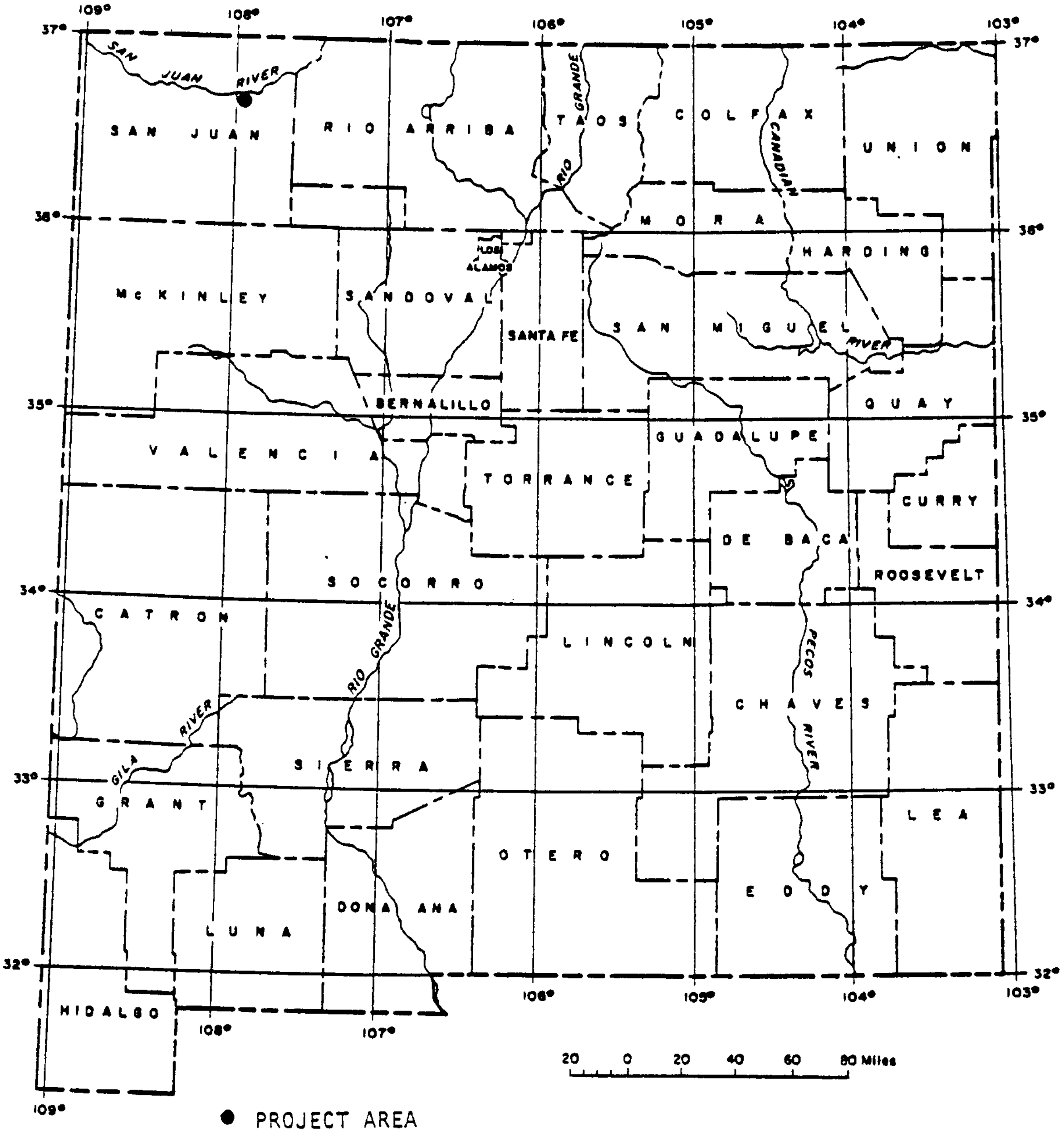

Figure 1. Map of New Mexico showing the location of the project area.

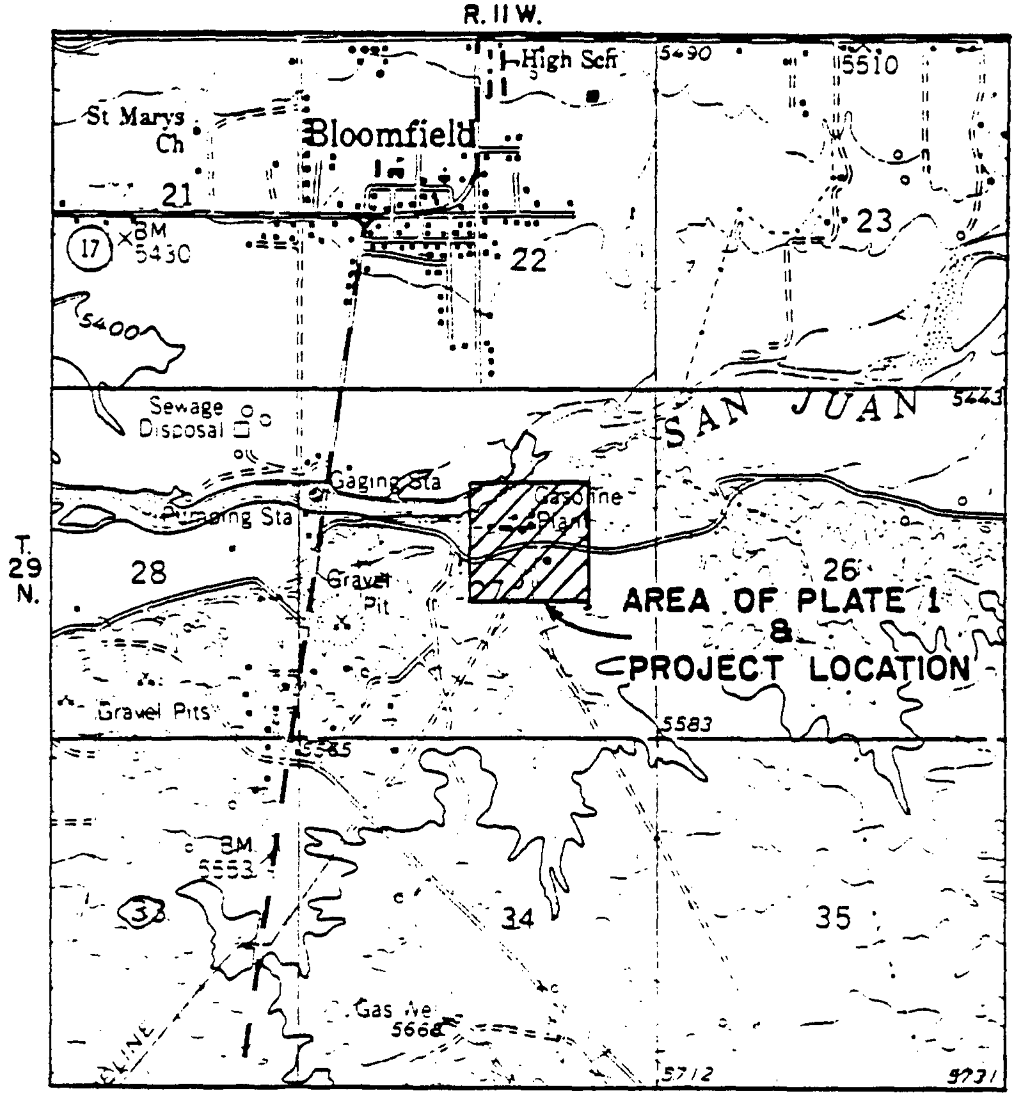

Figure 2. Diagram showing the location of the Plateau Refinery near Bloomfield, New Mexico.

This milestone report will bring together all monitoring data collected to date together with an analysis of the usefulness of the various monitoring methods and recommendations for future monitoring activities. This report will also discuss the results of monitoring activities.

HYDROGEOLOGIC SETTING

The Plateau refinery at Bloomfield, New Mexico is situated on the Jackson Lake Terrace (Pastuzak, 1968), a fluvial terrace of Pleistocene age. The terrace was formed by downcutting through an older valley floor which had been aggraded with cobble deposited during the last glacial advance. At that time the San Juan River was swollen with glacial meltwater and carried great quantities of glaciofluvial outwash. The Jackson Lake Terrace is about 100 feet above the valley floor of the San Juan River at present. At the time of its formation, it comprised a flood plain from three to five miles wide.

During the last glacial retreat, wind-blown sand and silt from the floodplains settled over the coarse clastics to form structureless loess deposits.

The glaciofluvial terrace deposits at the Plateau refinery consist primarily of a bed of cobble directly overlying the Nacimiento Formation of Tertiary age. The cobble bed is in turn overlain by and interfingers somewhat with fine-grained loess deposits. To the south, within one-half mile of the plant, the cobble bed wedges out leaving only the loess deposits.

The total thickness of Quaternary terrace alluvium is about 30 feet. At the edge of the scarp adjacent to the San Juan River, and in the bore holes drilled through the Quaternary alluvium at the location of the solar evaporation pond, the cobble bed is about 15 feet thick. One-half mile to the southwest a laterally continuous gravel bed is only several feet thick. At the gravel pit on the west side of section 27 the total thickness of gravel and silt is about 10 feet.

As far as can be determined, the Pleistocene cobble bed exists everywhere beneath the refinery, where it is overlain by about 20 feet of fine-grained, wind-blown silt and sand. Lithologic logs for neutron-probe-access holes (observation holes) drilled in the vicinity of solar evaporation pond 1 are given in attachment 1. Unfortunately samples were not preserved for all of the observation holes which were drilled.

Beneath the Pleistocene terrace deposits occurs the massively-bedded, olive-green, unctuous shale of the Nacimiento Formation. At least 100 feet of this unit is exposed in the cliff face north of the refinery and adjacent to the San Juan River. The clay at the outcrop is a tight unfractured rock unit. The best exposures of the Nacimiento Formation are in the badlands of nearby Kutz Canyon. The drillers log of the AMOCO Davis Gas Unit F-1 well, located near the refinery indicates the Nacimiento Formation is about 495 feet thick. This log is given in attachment 2.

The present-day channel of the San Juan River is incised into the Nacimiento Formation, and younger alluvial material occupies the present river channel.

At the cliff face, the contact between the cobble bed of Pleistocene age and the underlying Nacimiento Formation is easily visible. It is observed that the cobble bed contains no water except where water from the Hammond ditch percolates into the cobble bed and thence into small valleys which have been cut into the terrace. This seepage sustains lush vegetation in these valleys. Wherever these seeps are encountered, the seep is always at the contact between the cobble bed and the Nacimiento Formation. The Nacimiento Formation is for all intents and purposes impermeable.

To verify that the cobble bed is devoid of natural ground water, the contact between the cobble bed and the underlying Nacimiento Formation was staked at numerous points shown in figure 3. Elevations of the contact were then levelled. The elevations of the contacts are also shown in figure 3. Elevations shown in italics represent elevations of the contact at points where small seeps of water were observed.

It is evident from figure 3 that the slope of the subcrop beneath the cobble bed is to the north or northwest at about 1.2 degrees. It is also evident that the subcrop topography is slightly undulose and this is easily visible in the outcrop. The spatial occurrence of the cobble bed indicates that it is dry. Any natural recharge to the cobble bed would drain to the north and either discharge into one of the southward trending valleys or onto the northward facing cliff immediately north of the refinery. All seeps have been closely observed for nearly one year and for most of that time, solar evaporation pond 1 has been filled with fresh water. During that time and more significantly during the past winter when the Hammond ditch was dry, no

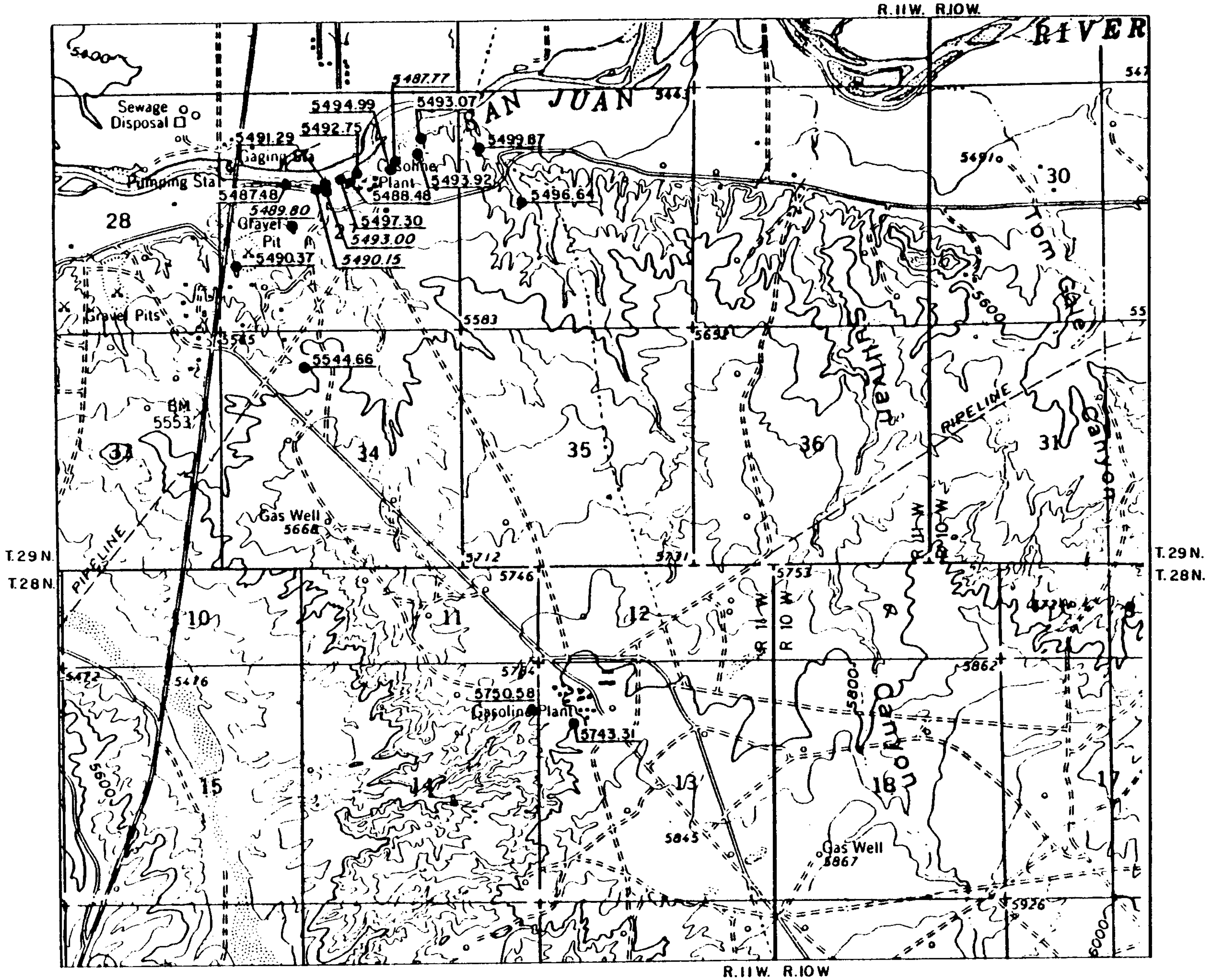

Figure 3. Map of Plateau refinery and vicinity showing elevation of the contact between the Nacimiento Formation and the cobble bed.

increase in seepage was observed at any seep, in fact, the amount of seepage has diminished suggesting that the Hammond ditch contributes the water which supports the vegetation in the area. In January 1978, the Hammond ditch was completely dry and it was walked from the eastern to the western boundary of the refinery. In the vicinity of the solar evaporation ponds no seepage into the ditch was observed. It is important to note that at the time of this visual inspection, solar evaporation pond 1, which is in the closest proximity to the was completely full.

It is concluded, therefore, that there is no naturally occurring ground water within the cobble bed capping the Jackson Lake Terrace. This conclusion is supported by the absence of private domestic water wells anywhere on the terrace. Any water in the cobble bed derives from the Hammond ditch and is perched above the Nacimiento Formation, and any contained water is most likely to be similar in quality to the water in the Hammond ditch and in the San Juan River, an analysis of which appears in table 4 in the discharge plan.

The Nacimiento Formation, as mentioned above, is an impermeable, unctuous green clay. It is about 495 feet deep and throughout its thickness is not known to contain any ground water. There are no known sandstone beds within the Nacimiento Formation. The upper 100 feet of the formation which is exposed in the cliff north of the refinery shows no seeps of water from within the Nacimiento Formation.

It is concluded that there is no ground water within the Nacimiento Formation which could be recovered for domestic purposes. Seeps at the contact of the cobble bed with the Nacimiento Formation support the impermeability of the Nacimiento Formation and support the conclusion that the Nacimiento Formation does not contribute ground water to the San Juan River.

SOLAR EVAPORATION POND CONSTRUCTION

The two solar evaporation ponds, which together occupy about five acres were constructed by building earthen embankments from silt and sand borrowed from the ponds bottoms. The bottoms of the ponds were treated with about two pounds of Wyoming bentonite per square foot to retard seepage of contaminated water. The western ends of the ponds were originally deeper than the eastern ends. However, because of the desirability of complete and immediate evaporation of effluent, the pond bottoms are level.

The location of the ponds is shown in plate 1.

MONITORING

To detect leakage from the solar evaporation ponds, several monitoring strategies have been employed. These include neutron logging, Thermonics, ZETA-SP, AQUATRACE, and water-level measurement.

MONITORING NETWORK

Plate 1 shows the location of the solar evaporation ponds at the Plateau refinery. Nine neutron-probe-access holes have been constructed on the western embankment of solar-evaporation pond 1. Neutron-probe-access tubes were installed in 6-inch diameter holes which were drilled to a depth of 50 feet by mud-rotary methods. To prevent drilling fluid from entering the unsaturated soils, a 100-second viscosity bentonite-based drilling mud was reportedly used. Drispack with WI-100 were used to control filtrate loss. Upon completion, the holes were flushed with water and blown with air. Two-inch schedule-40 PVC pipe was run to the bottom of each hole and the annular space was backfilled with a mixture of dry bentonite and soil. The backfill material will prevent leakage of water down the annulus. The PVC casing is open at the bottom and the casing is seated in the Nacimiento Formation. The bottoms of the tubes were left open so that ground-water levels may be measured and water samples collected if necessary.

Ideally, holes for this purpose should either be augered or drilled by air-rotary methods. Air-rotary methods were tried on the present project but the holes would not remain open due to caving of the boulders in the cobble bed underlying the Jackson Lake Terrace. However, the lithologic logs of holes from which samples were preserved indicates that they are similar. The elevations of the tops of the neutron-probe-access tubes are given in table 1.

The neutron-probe-access tubes are also used to provide access for temperature measuring equipment. Temperature profiles are measured periodically and this data is then analyzed to detect percolating water.

ZETA-SP data is collected by measuring the electrical potential at many points on the bottom of the pond by means of electrical sensors that are drawn along the bottom of the pond.

AQUATRACE monitoring is carried out by injecting one of several tracer compounds into the pond and then monitoring the ditch water near

Table 1. Elevations above mean sea level of the neutron-probe-access hole PVC-casing collars.

Hole No.	Elevation (ft)
1	5521.82
2	5520.67
3	5521.13
4	5521.17
5	5521.13
6	5520.94
7	5520.97
8	5521.29
9	5520.90

the ponds for the tracer. At the Plateau refinery, AGW is using TRAC-5 as the tracer. Initially TRAC-5 was injected into a large pipe which discharged into pond 1. Pond 1 is nearest the Hammond irrigation Ditch and is used for fresh water storage. It was subsequently learned that the pipe into which tracer was injected was also an outlet pipe through which the fresh water was led to the refiner. Consequently, the injection system was moved to the vicinity of neutron-probe access hole eight and the tracer is presently discharged through a 1/8-inch copper tube directly into the pond.

Although it was suspected that no ground water exists in the area, ground water was found in the observation holes. Consequently, water levels have been measured on a regular basis as well.

The neutron-probe data is included in attachment 3, the temperature data in attachment 4, and the AQUATRACE data in attachment 5, and water-level data in attachment 6.

MONITORING ACTIVITY

Monitoring activity at the Bloomfield Refinery began shortly after construction of pond 1 in April 1977. Not all monitoring activities began at the same time. Dates of data acquisition together with the type of data collected are given below in table 2.

Table 2. Dates of monitoring activity at the Plateau Refinery and types of data collected.

Date	Data Collected[1]
26 Apr. 1977	NW
6 May 1977	NW
21 May 1977	NWT
15 Jul. 1977	NWTZ
11 Sep. 1977	NWT
10 Jan. 1978	NWTA[2]
27 Mar. 1978	NWTA[2]
28 Jun. 1978	NWA[2]
12 Jul. 1978	WTZA
25 Aug. 1978	NWTZA
20 Sep. 1978	NWTZA

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[1] N = Neutron Logging, W = Water-Level Measurements, T = Thermonics, Z = ZETA-SP, A = AQUATRACE

[2] AQUATRACE results are indeterminate because of inconsistent tracer injection.

Monitoring had taken place quarterly until the issuance of the discharge permit. The discharge permit instructed that monitoring should take place bi-monthly. Consequently, bi-monthly monitoring began in September, 1978.

RESULTS

WATER LEVELS

Shortly after the observation holes were constructed, AGW personnel probed the holes to determine whether there was any water in the holes. Water was found in all of the holes and it was believed that this water was introduced during drilling of the holes. To remove the water, an air compressor was brought to the site and the holes were blown dry. Water levels have been measured in all of the observation holes since then and it is evident that water does exist within the cobble bed in the vicinity of the solar-evaporation pond. However, when the observation holes were first constructed, pond 1 had not been filled and pond 2 had not been completed. So, the water in the underlying cobble could not have been derived from the solar evaporation ponds.

At the time the observation holes were completed, it was noted that water was draining into a concrete culvert which passes beneath Hammond Ditch. This culvert is near the northwest corner of pond 1 and is shown on plate 1. The point of water entry into the culvert was well away from the ditch, which was flowing full at the time.

Figures 4-7 show the hydrographs for each observation hole since they were constructed. The large rise in water level shortly after construction occurred after the holes were blown. It is evident that the recovery of the water levels in these observation holes was not uniformly rapid. Holes NP - 3, 5, 7, 8, and 9 recovered rather quickly whereas water levels in holes NP - 1, 2, and 4 recovered very slowly.

The lag in recovery of the water levels is understandable considering the method of construction of the observation wells. The open end of the two-inch PVC tubes are set into the Nacimiento shale and the annular space extending through the cobble bed is filled with bentonite. Consequently, the path that water must take is passing from the cobble bed to the interior of the casing and is through materials of very low permeability.

To study the response of the water levels to changes in hydrostatic level, Hvorslev piezometer tests were carried out by introducing one gallon of water into each of the observation tubes very rapidly. The results of these tests were inconclusive except to indicate that the lag in response to an implied stress is significantly long.

Because of the inconsistent response behavior of the observation holes to changes in hydrostatic head, the water levels measured in these holes at any instant in time may not be comparable if the hydrostatic head in the cobble bed fluctuates rapidly. The water-level information is only useful in a quantitative way when the water table is relatively stable. This is likely to occur just prior to the irrigation season and immediately before the end of the irrigation season.

The water-level data indicates conclusively that ground water existed within the cobble above the Nacimiento Formation at the time the holes were constructed before any water had been introduced to pond 1 and before pond 2 had been completed. Small irregularities in the shape of the hydrographs before January 1978 were caused by removing or replacing temperature-measurement tubes before the water levels were measured. Because of the lag in response to changes in water level, the change in water level from ambient conditions caused by the removal or insertion of the temperature-measuring tube could not be dissipated rapidly enough and erroneously high or low measurements were observed. After January, water levels were always measured before any other activity took place in the observation holes.

The conclusion drawn from these observations is that water from the Hammond ditch which is excavated into the cobble bed near the ponds (see geologic map in plate 1) infiltrates into the cobble bed forming an elongate mound of ground water within the cobble bed and perched on the Nacimiento Formation. In fact, water-level elevation determinations in the observation holes are approximately equivalent to the level of the water in the Hammond ditch when the Hammond ditch is full. Where the saturated part of the cobble bed is penetrated by the concrete culvert pipe, water from the saturated cobble will drain into the culvert pipe. Furthermore, if a mound of water developes beneath the Hammond ditch and if the contact between the saturated cobble and the underlying impermeable Nacimiento Formation dips to the north towards the river, this water will drain away as springs where the contact has been breached by headward erosion of a stream. This is indeed the case as the numerous occurrences of seepage indicated in plate 1 and the photographic record in the discharge plan will attest.

The slope of the contact between the cobble bed and the Nacimiento Formation is about 1.2 degrees. If the saturated depth of cobble at observation hole 8, for example, is 10 feet, it is possible that the saturated zone extends about 600 feet south of the ditch.

Figure 8 is the ground-water-level-contour map of the water table in the vicinity of pond 1. It is based upon water-level elevations measured in Spetember 1978. Figure 8 indicates that the slope of the water table is away from the Hammond ditch and towards the solar-evaporation ponds. Water levels at observation holes NP-3, 5, and 9 have indicated water levels which are higher in elevation than the water level in the Hammond ditch. It is possible that this is indicative of a small amount of leakage from pond 1 which has caused a slight mound on the water table. Because most other data points indicate that water is moving from the Hammond ditch towards the solar-evaporation pond and, with the exception of the water level in observation hole 9, the difference in elevation between the water level in the observation holes and the water level in the Hammond ditch is very small, it is thought that error in the elevation of the measuring point may be the cause of the anomalous water-level measurements. The water level in observation hole 9 is about five feet above the water level in the Hammond ditch. This is either due to leakage from the pond or some other large error.

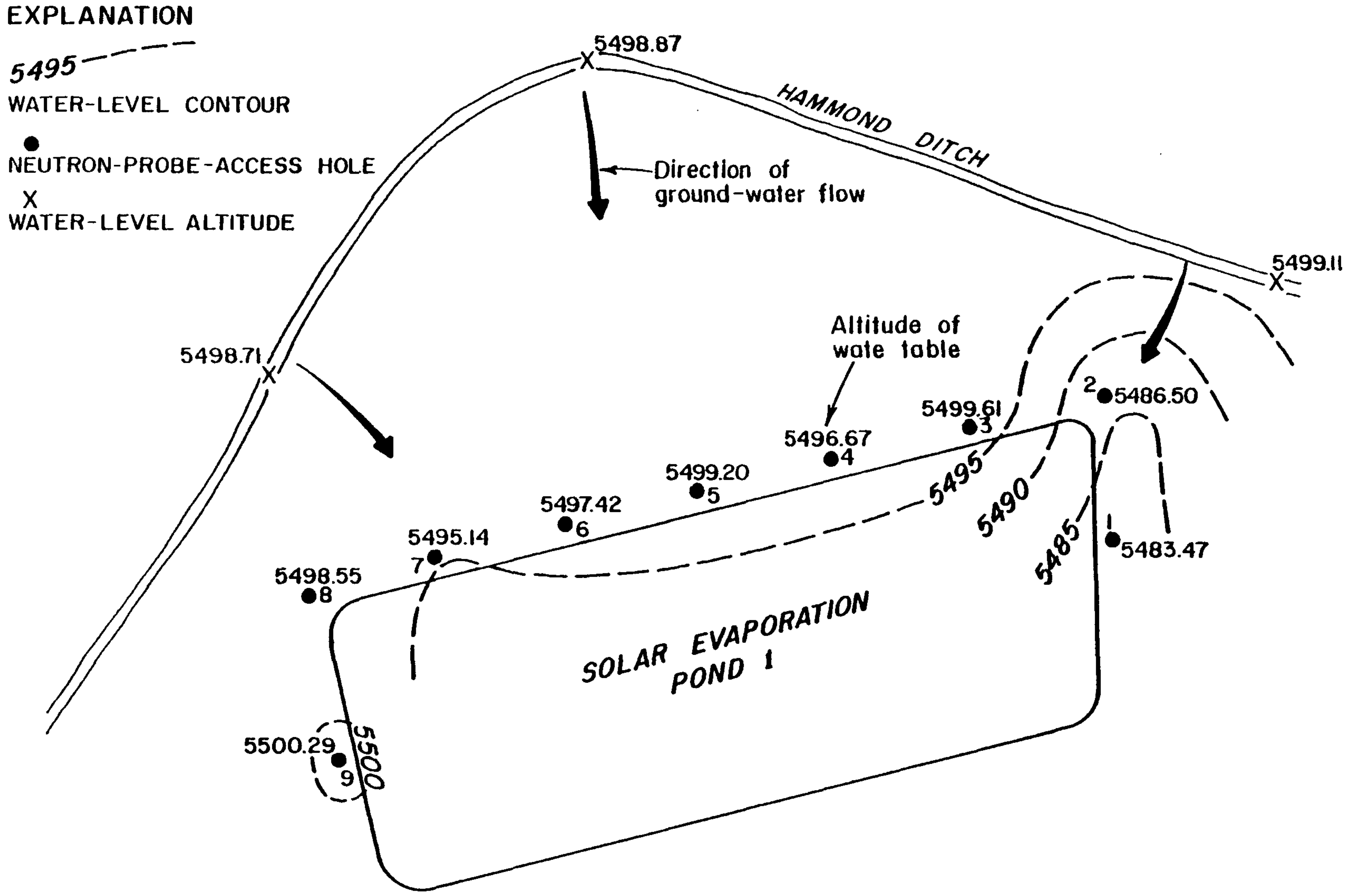


Figure 8. Ground-water-level-contour map in the vicinity of solar-evaporation pond 1.

Pond 2 has recently had waste water discharged into it. Pond 2 was constructed in a manner similar to pond 1. The depth of waste water in pond 2 is only several feet. As a result, the driving hydrostatic head in pond 2 is considerably less than in pond 1 and pond 2 probably does not leak significantly.

In summary, the water within the cobble bed beneath the solar-evaporation ponds is bank storage from the Hammond ditch. When the flow of water in the ditch ends at the end of the irrigation season, the water in bank storage will discharge as small seeps indicated in plate 1.

NEUTRON LOGGING

The neutron probe soil-moisture profiles are used to evaluate changes in the moisture content in the embankment and subsurface soils on the north, east, and west sides of solar-evaporation pond 1. This data has been collected to determine if leakage is taking place through these embankments into the subsurface which could lead to contamination of the ground water stored in the cobble bed beneath the ponds which is itself derived from infiltration from the Hammond ditch. These data are summarized in Figures 9 through 17.

Under ideal conditions, neutron logging is carried out in a dry hole so that no abnormally high readings are obtained due to the measurement of water in the hole as well as water within the soils surrounding the sample point. As it was initially assumed that there was no ground water in the area, the PVC tubes were not provided with caps to seal the lower ends of the tubes. And, as already discussed, the

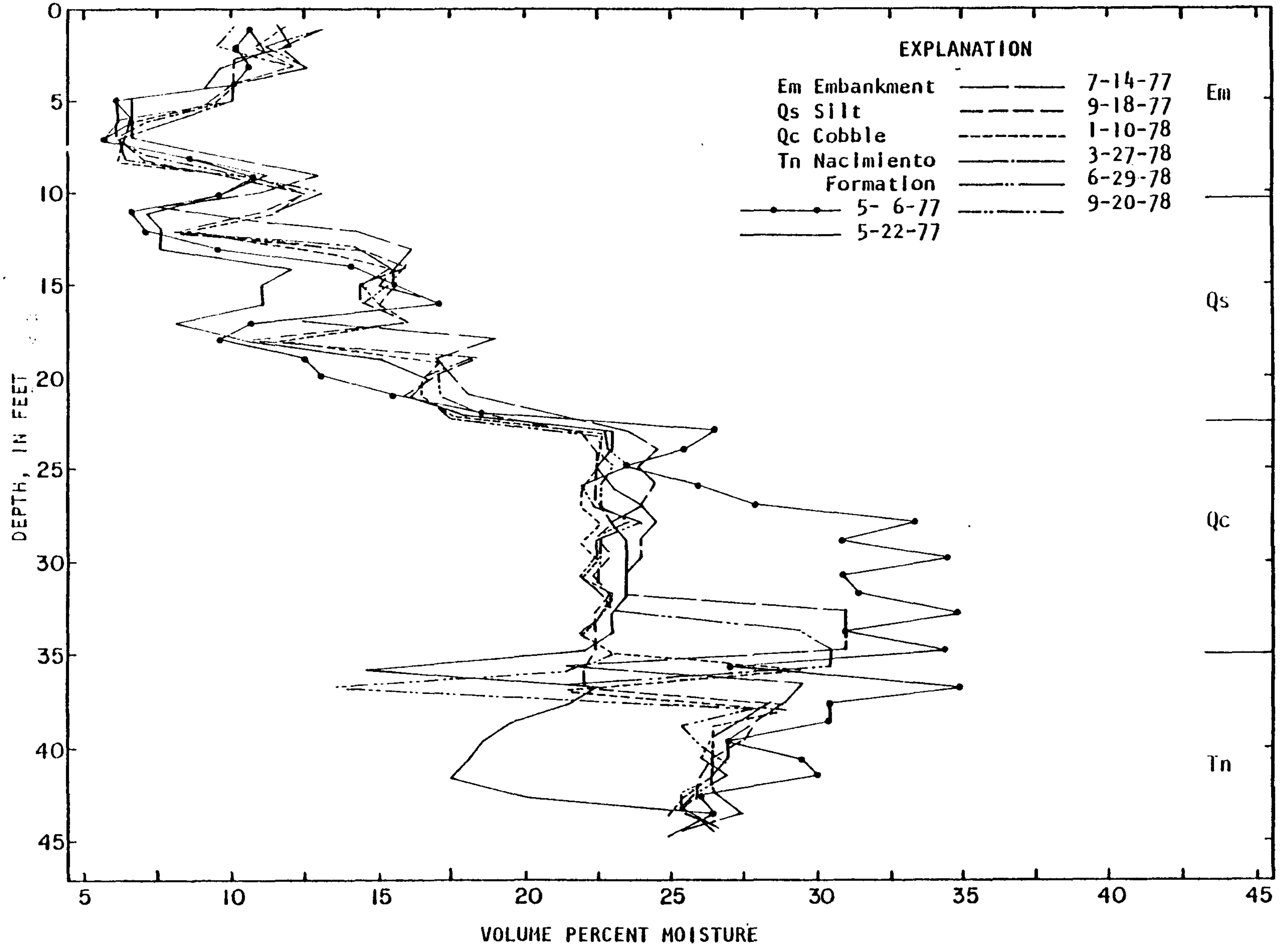


Figure 9. Soil-moisture profiles for observation hole NP-1.

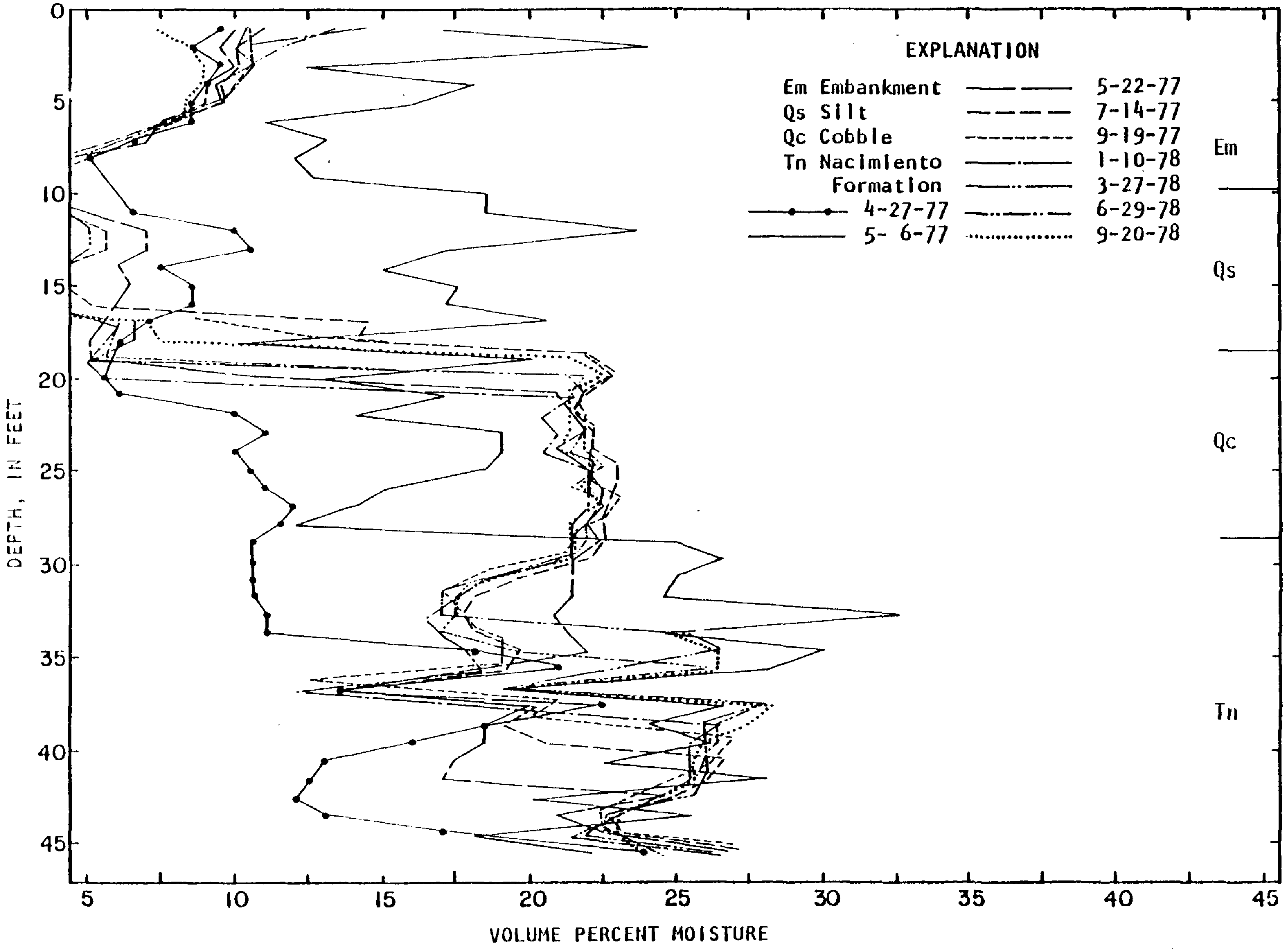


Figure 10. Soil-moisture profiles for observation hole NP-2.

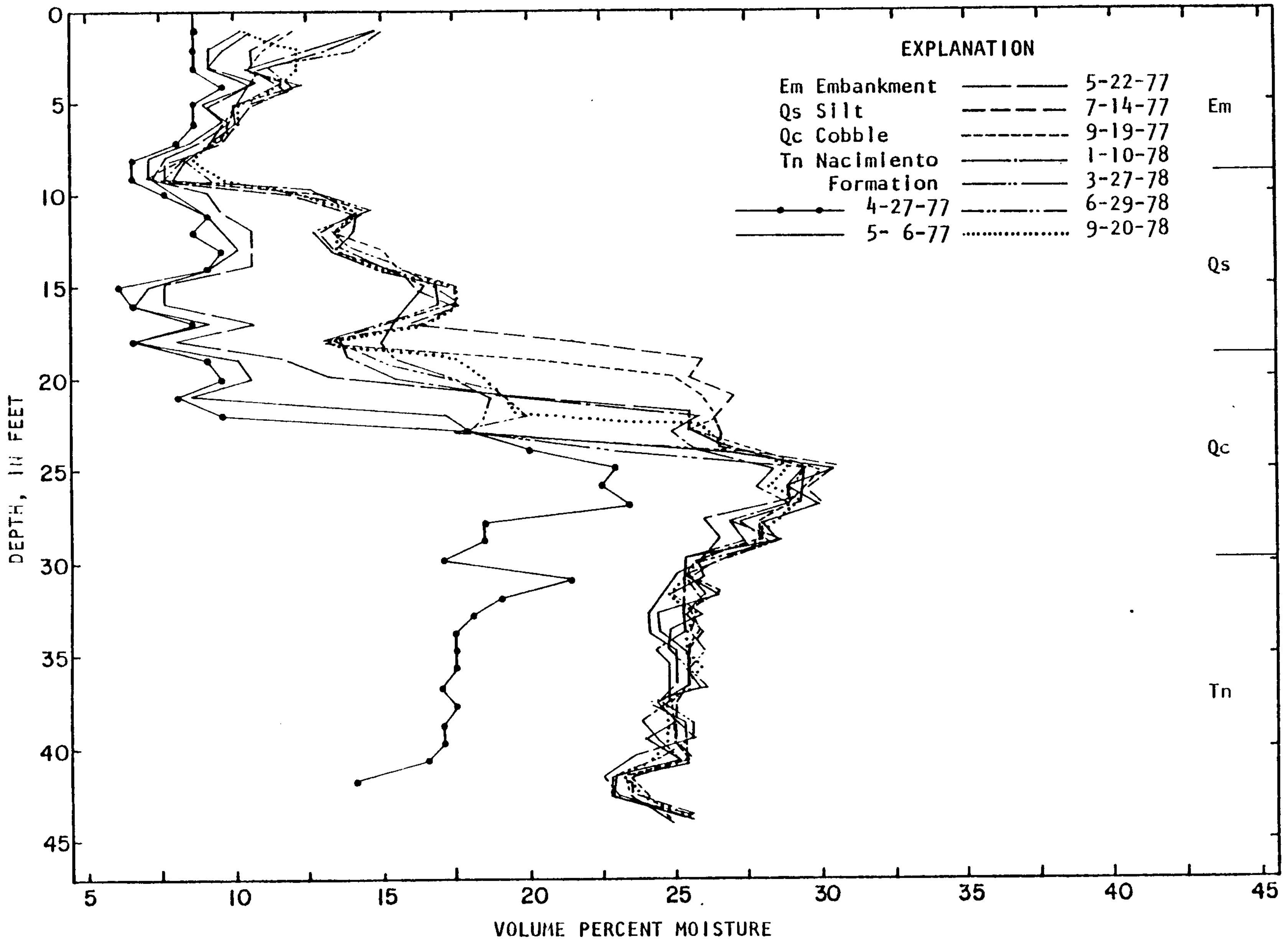


Figure 11. Soil-moisture profiles for observation hole NP-3.

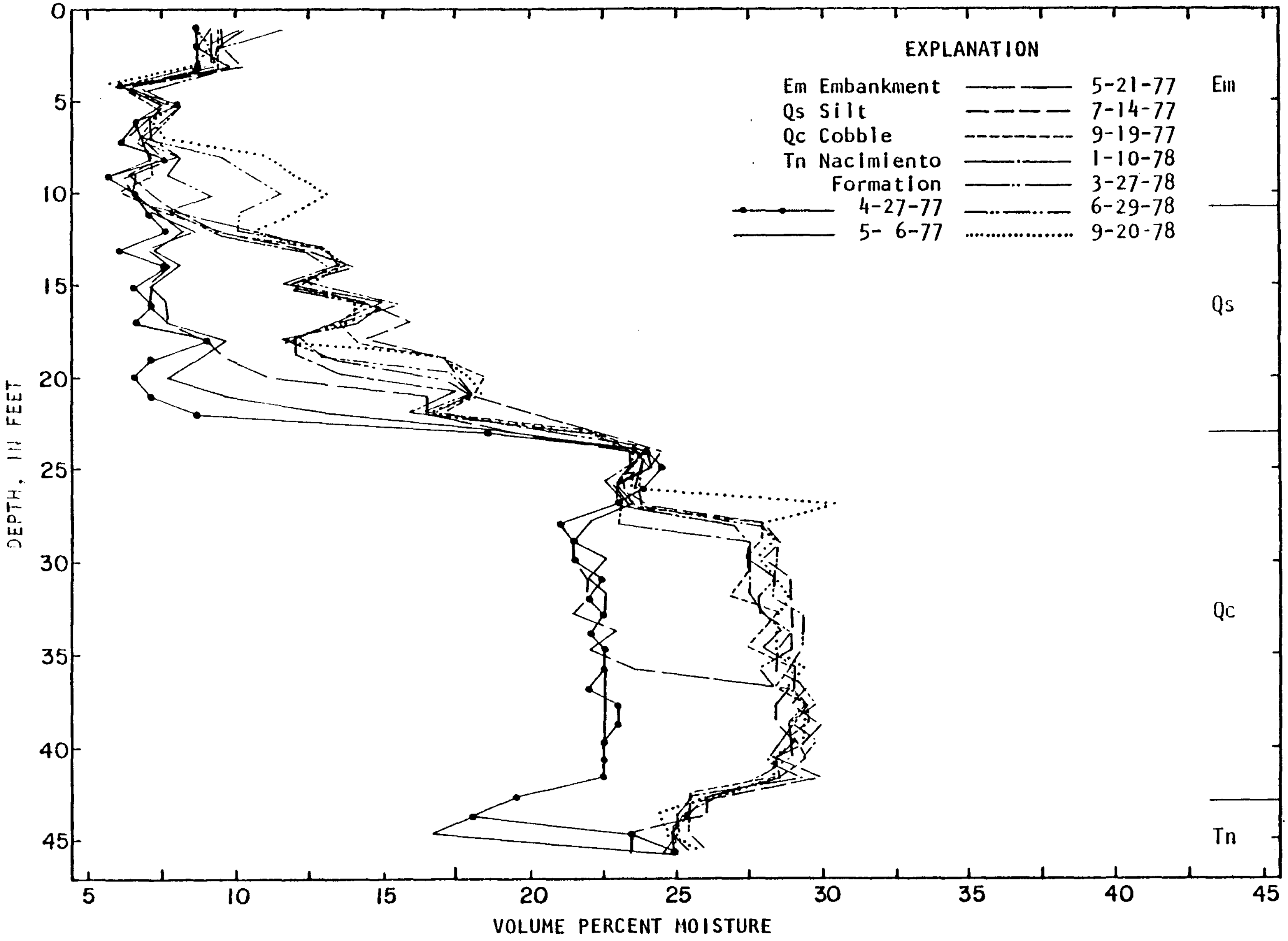


Figure 12, Soil-moisture profiles for observation hole NP-4.

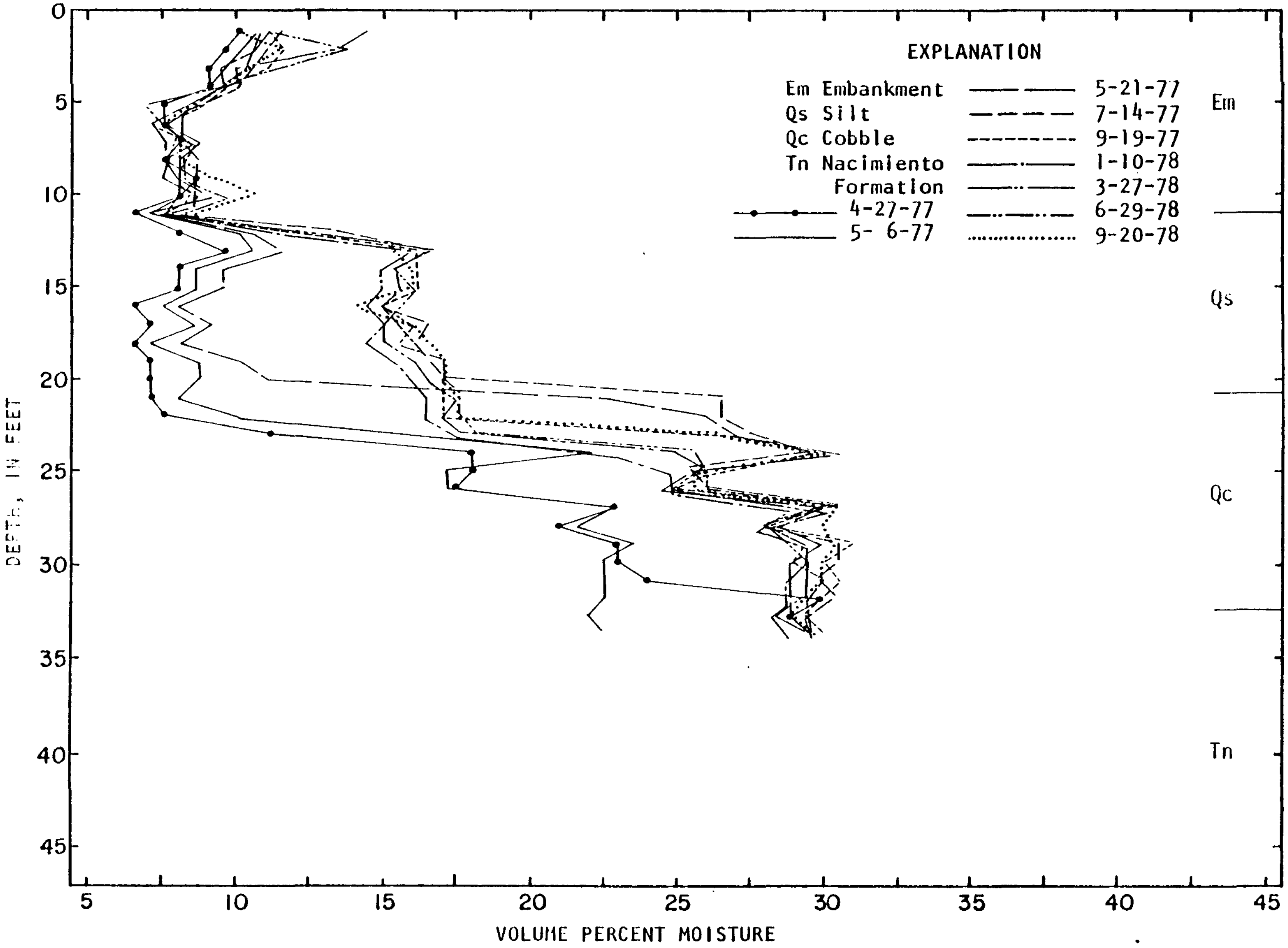


Figure 13. Soil-moisture profiles for observation hole NP-5.

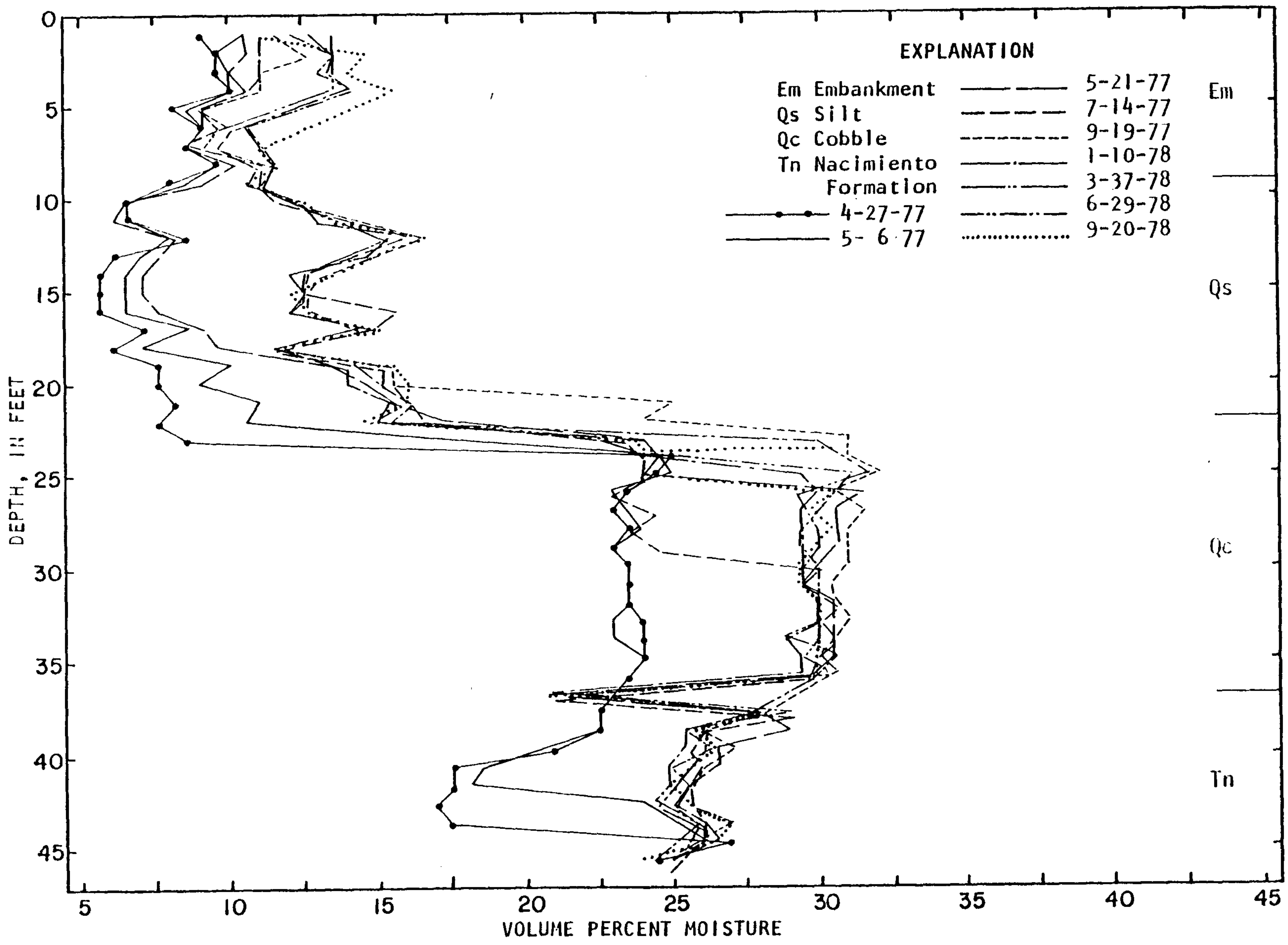


Figure 14. Soil-moisture profiles for observation holes NP-6.

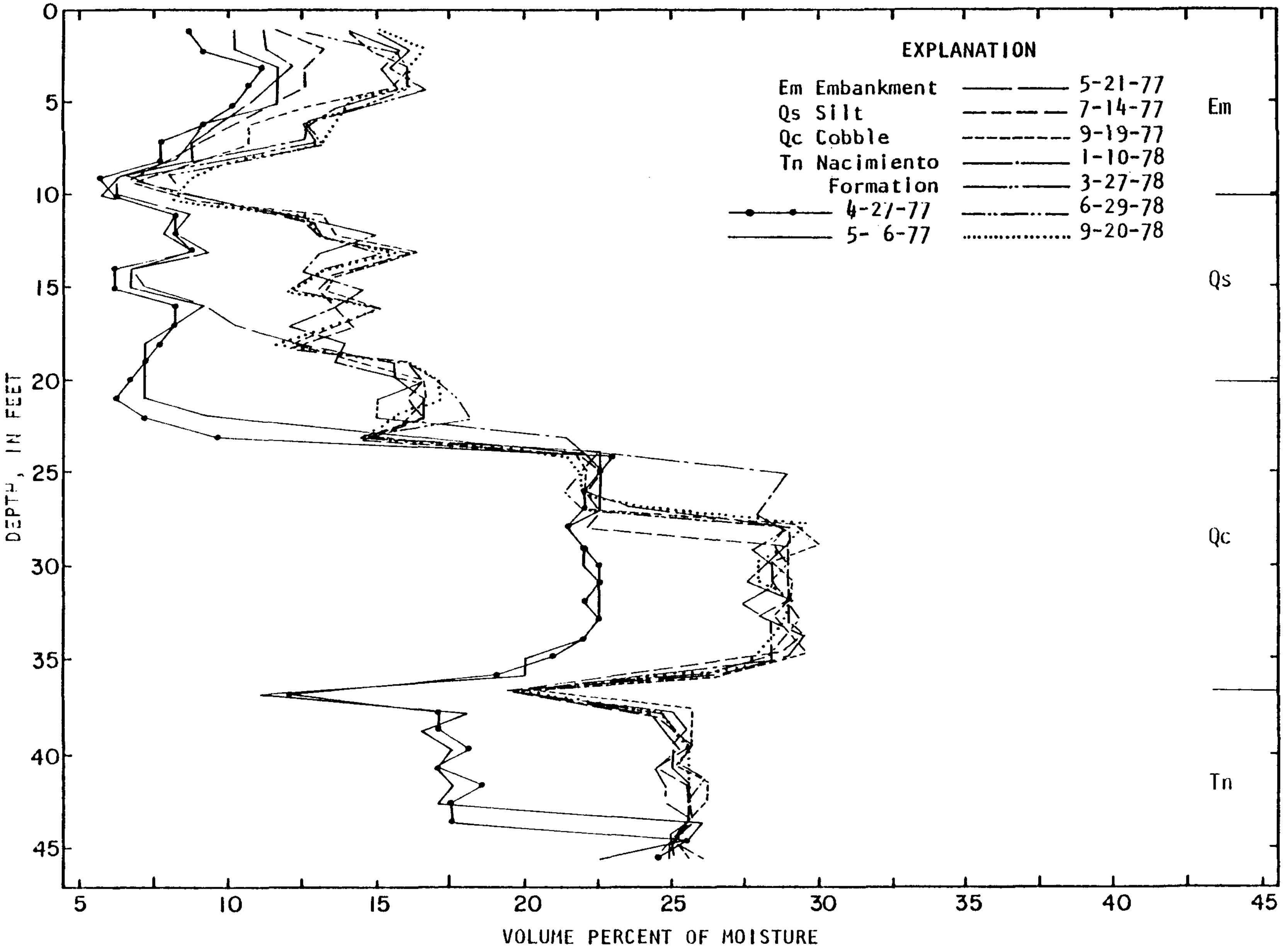


Figure 15. Soil-moisture profiles for observation hole NP-7.

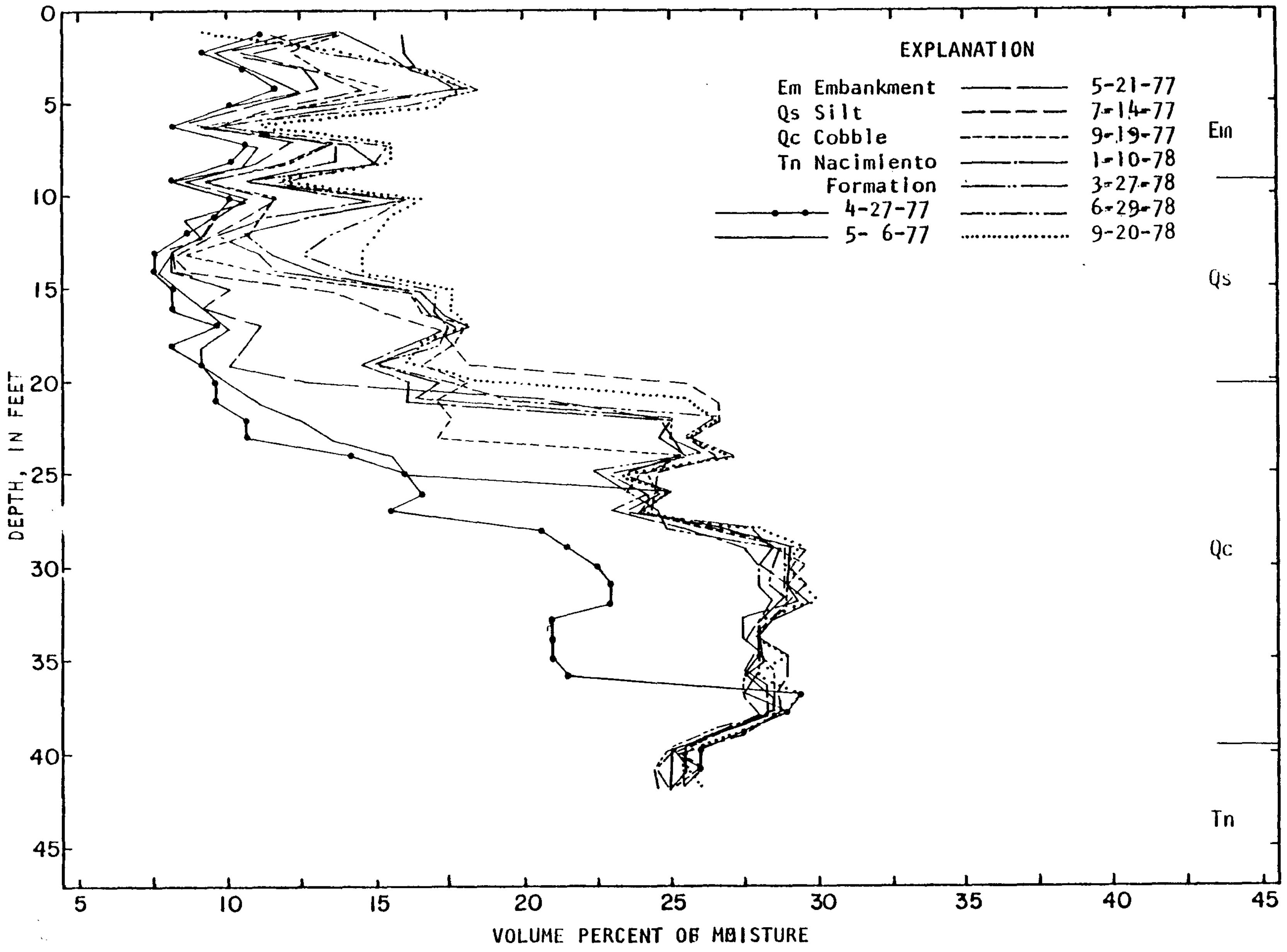


Figure 16. Soil-moisture profiles for observation hole NP-8.

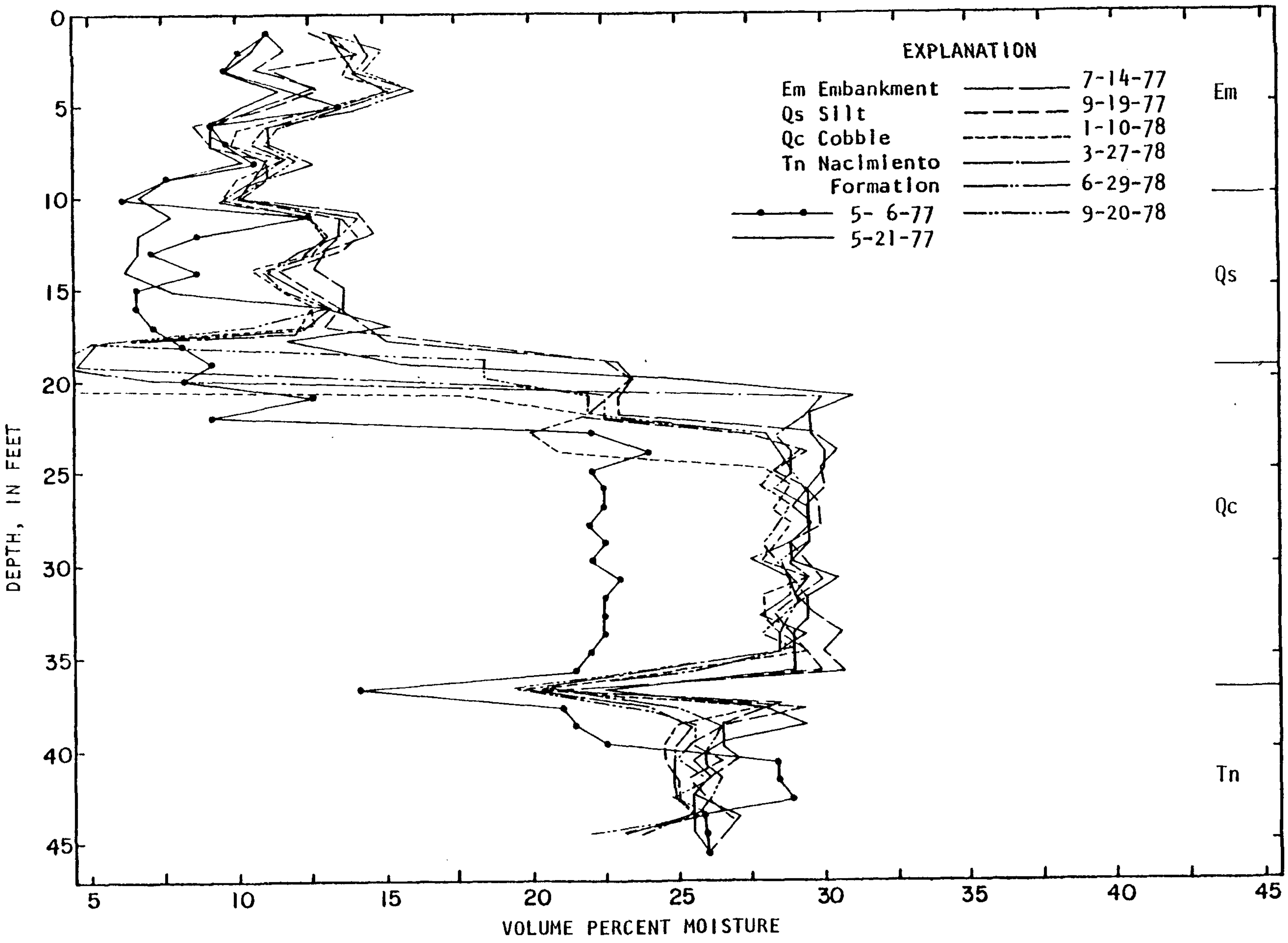


Figure 17. Soil-moisture profiles for observation hole NP-9.

observation holes are acting as piezometers although their response to changing water levels is rather slow. Consequently, there is water in the observation holes and logging is carried on with water in the casing.

In processing the data, no correction has been applied for the water in the neutron-probe-access tube. This is evident in most of the soil-moisture profiles, where original profiles were made after the hole had been blown with air. The soil moisture profile for hole NP-3, for example, shows an approximate increase in soil moisture of about eight volume percent from May 6, 1978 until the present. Where the water level rose slowly in the observation tubes, a somewhat confused set of soil moisture profiles was obtained. This is evident in the soil-moisture profile for observation hole NP-2. More recent measurements in this hole are fairly consistent, as the water level in the observation hole is no longer changing rapidly from month to month.

In the observation hole 2, it is noted that the soil-moisture profile for May 5, 1977 shows quite a bit more soil water than subsequent soil-moisture profiles. This was caused by the introduction of water into the silt and cobble deposits when the holes were drilled using mud as a circulating fluid in the holes. Because the other holes do not show this same situation, it is likely that hole NP-2 was probably drilled using water instead of the drilling mud designed to retard filtration. Within a short period of time, however, the water which invaded this dry section of material had dissipated.

The upper 10 feet of each soil-moisture profile represents the moisture contained in the soils of the embankment on the north, east, and west sides of solar-evaporation pond 1. The soil-moisture profiles of observation holes NP-1, 2, 3, 4, 5, and 8 show slight variations within the upper several feet of the embankment surface. These variations are likely caused by rainfall which has infiltrated the embankment soils. With the coming of the dry months, the soil moisture content diminished. In these profiles, there is no downward continuation into a region within the embankment with a higher soil moisture content. Consequently, no seepage within the embankment is identified at these locations.

In soil-moisture profiles taken in observation holes NP-6, 7, and 9, there is an increase of up to five volume percent of water in the embankment material for a total volume percentage of water of about 15 percent. This is insufficient water for saturation. Saturation of the fine-grained silt deposits which underlie the solar-evaporation ponds and from which the embankments were constructed should contain about 30 volume percent moisture before saturation occurs. The slight increase in the moisture content within the embankment is attributable to capillary rise of moisture into the soils of the embankment from the water in the solar-evaporation pond.

The soils surrounding all of the observation holes except observation hole NP-2 show an increase in soil moisture from the bottom of the embankment at a depth of about 10 feet to a depth of about 20 or 24 feet from the top of the embankment. This is generally an increase of from five to ten volume percent moisture and it always occurs within the undisturbed silt deposits into which the solar evaporation ponds were constructed. This rise is attributable either to capillary rise from the saturated zone or, what is probably more likely, slight percolation of water from the bottom of the pond through the silt deposits and into the underlying cobble bed. Because the cobble bed has a high permeability relative to the silt deposits, the cobble bed will act as an underdrain and probably prevent the silts from ever becoming saturated. The rate of seepage is not great as is indicated by the ZETA-SP data.

In conclusion, it appears that a small amount of seepage is taking place vertically from the bottom of the solar evaporation ponds to the cobble bed beneath the ponds. With regard to the soil-moisture profiles, it is evident that similar information is being obtained from each set of measurements. Consequently, it is recommended that the frequency of neutron-probe logging be reduced to semi-annually and that logging only be carried out above the water table.

ZETA-SP

Figures 18 through 20 show the results of ZETA-SP surveys of solar-evaporation pond 1. In general, negative ZETA-SP values are indicative of zones of leakage, and positive values are associated with the presence of clay minerals. For any given set of profiles, the background ZETA-SP values will be on the order of ± 5 to 10 millivolts. Therefore, any significant departure below the background ZETA-SP potential is indicative of leakage. The greater the amplitude of the anomaly, the greater will be the amount of seepage.

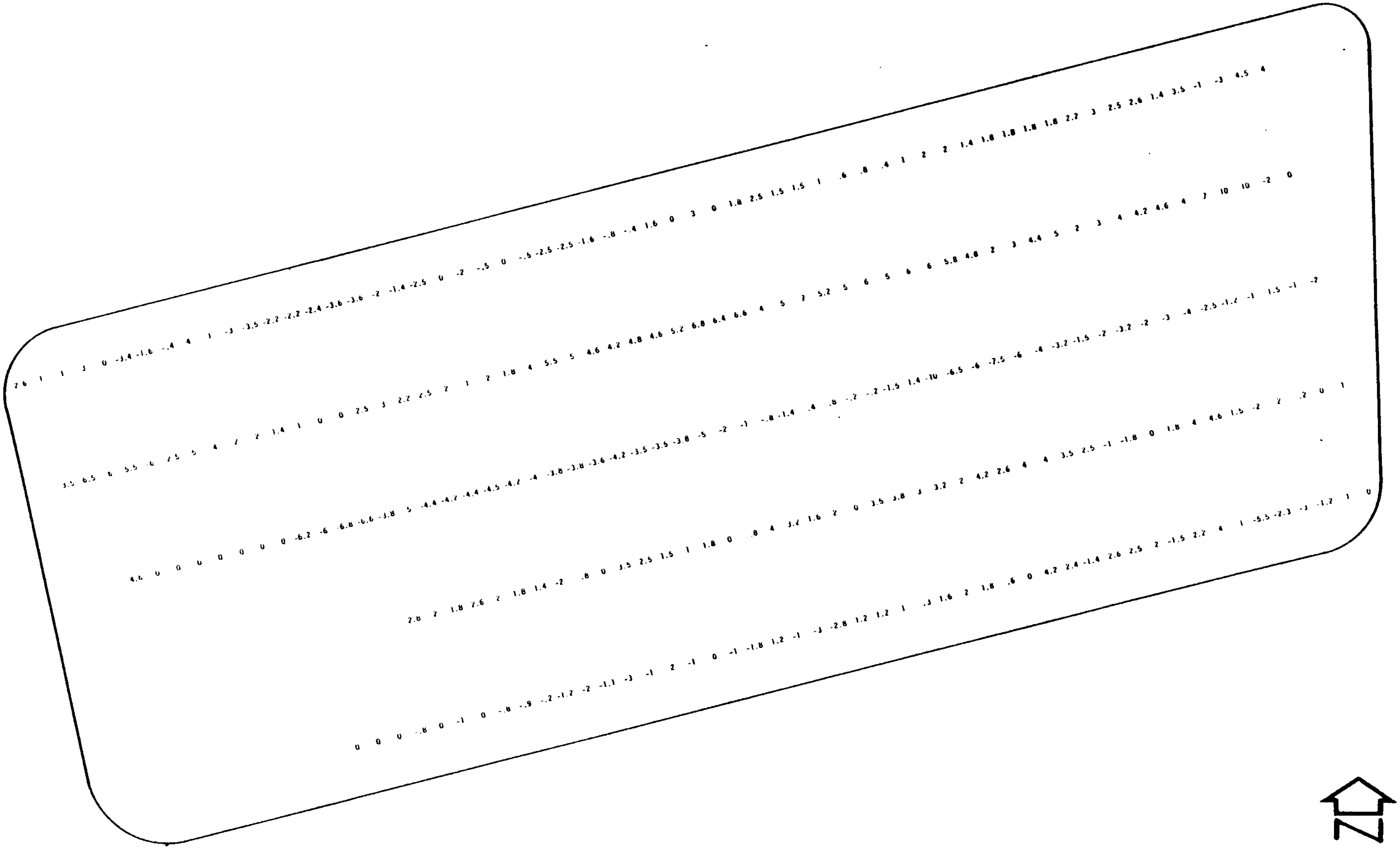


Figure 18, ZETA-SP data for July 15, 1977.

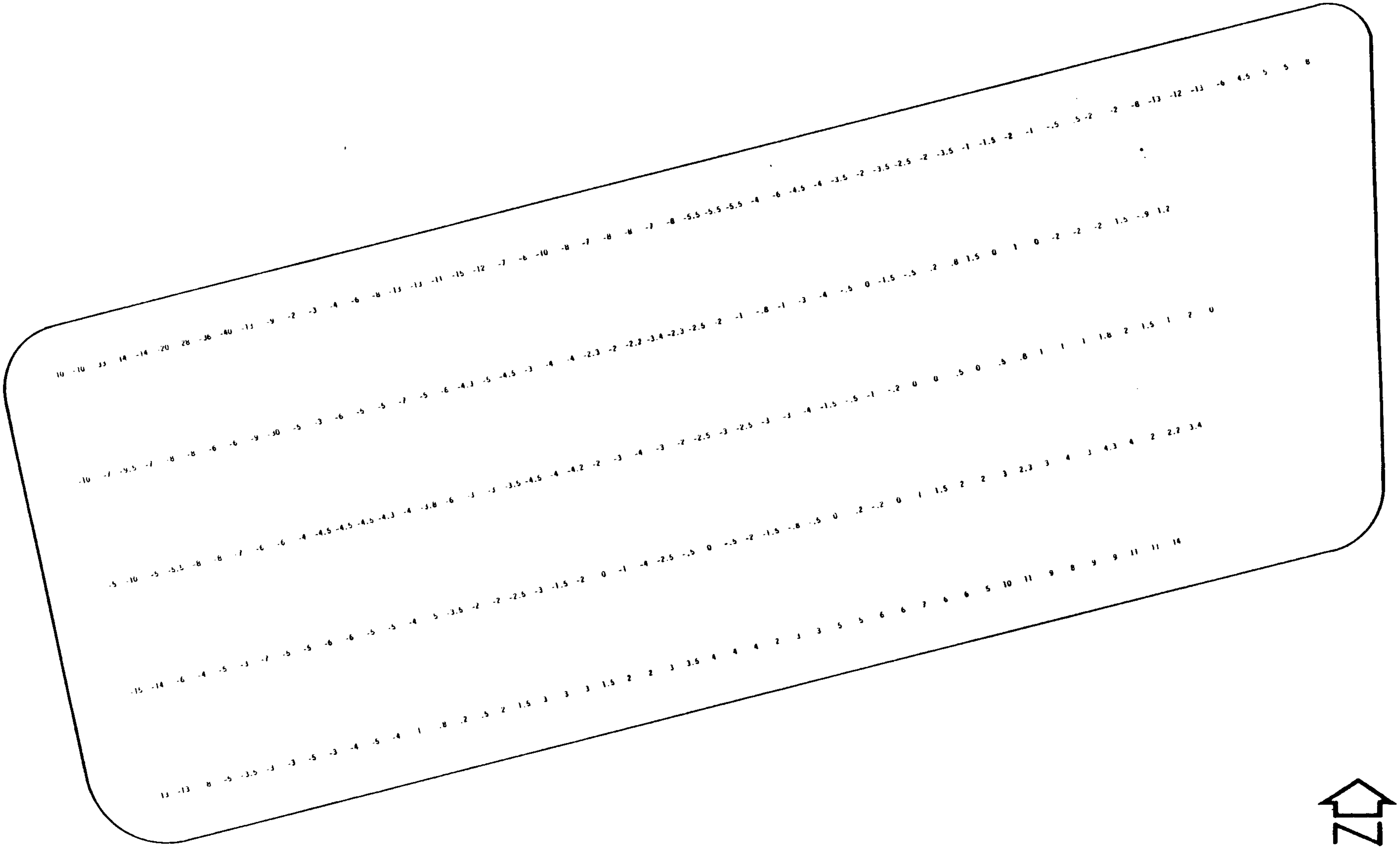


Figure 19. ZETA-SP data for July 12, 1978.

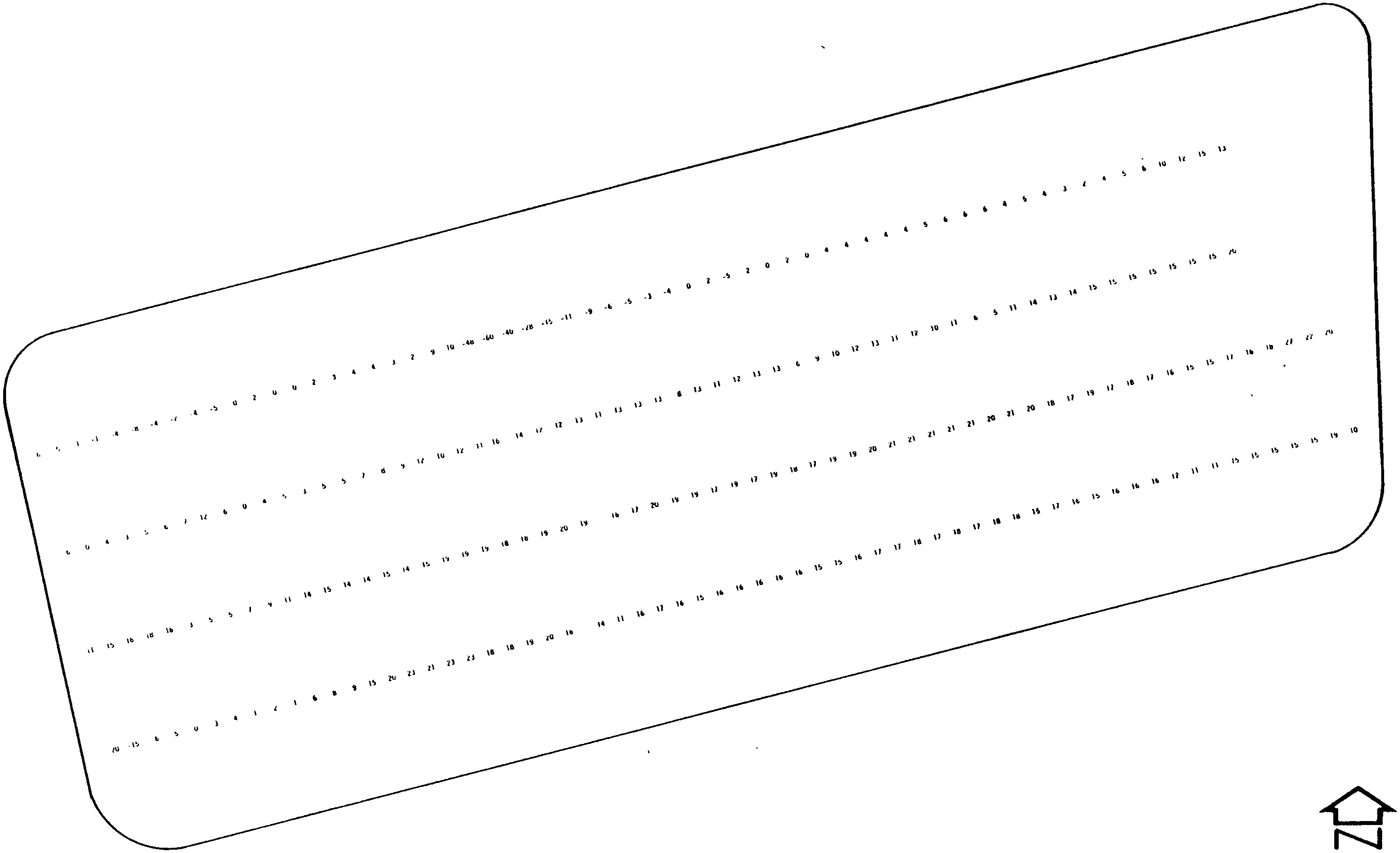


Figure 20. ZETA-SP data for September 20, 1978.

The first ZETA-SP survey carried out on solar-evaporation pond 1 was performed in July 1977. The results of this survey are shown in figure 18, and there are no electropotentials in excess of plus or minus 10 millivolts. From this survey, it is concluded that there is very little seepage from solar-evaporation pond 1.

In the second survey made in July 1978, the polarity of the measuring system was reversed so that the positive values are negative and vice versa. With the exception of some low electropotentials in the northwest corner of the pond, all other electropotentials are generally within the range of plus ten to minus ten millivolts. In general, the electropotentials measured in July of 1978 are higher than the electropotentials measured in July of 1977. Because the quality of the water has not changed, it is believed that poor readings were obtained because of plant life which by this time had covered much of the bottom of the pond. It is likely that the electrodes never came in contact with the pond bottom.

The ZETA-SP survey made in September 1978 seems to indicate the same problem only it is considered much worse. Visual observation of the plant life in the pond while the probe was being deployed suggests that the probe may never have touched the bottom, but may have been suspended above the bottom by a mat of plant life.

The conclusions drawn from the ZETA-SP surveys are that probably only the first one is valid and that very little leakage is taking place. Because of the problem with the plant growth in the pond, additional ZETA-SP surveys will probably not be of much value in monitoring for seepage, and it is recommended that they be discontinued as a monitoring methodology.

THERMONICS

It seems apparent from examination of the thermal profiles of the observation holes, shown in figures 21 through 25, that some seepage is taking place. This is evidenced, for example, in observation hole NP-1 where the thermal diffusivity of the soil in the embankment and the embankment foundation was about 9.24×10^{-4} cm^2/sec on May 25, 1977 whereas on September 20, 1978, the thermal diffusivity had increased to an apparent value of 12.9×10^{-3} cm^2/sec. The temperature profile made on May 5, 1977 was made before pond 1 was filled and the soils were essentially dry. The low moisture content of the soils at this time is also evident from the soil-moisture profile. The value of thermal diffusivity determined from the May 5, 1977 temperature profile is very reasonable for dry soil.

The value of soil diffusivity calculated from the September 20, 1978 temperature profile is beyond the limit for soils or earthen materials of any type and can only be accounted for by the convective transfer of heat by moving water. Indeed the soil-moisture profile indicates that the moisture content has increased.

In some cases, steady state, subsurface-temperature data may be used to estimate the velocity of vertical ground-water flow. This is accomplished by analyzing the amount of distortion of the exponential envelope which contains all subsurface temperature fluctuations caused by the sinusoidal input of heat at the land surface. The greater the velocity of vertically moving water, the greater will be the distortion

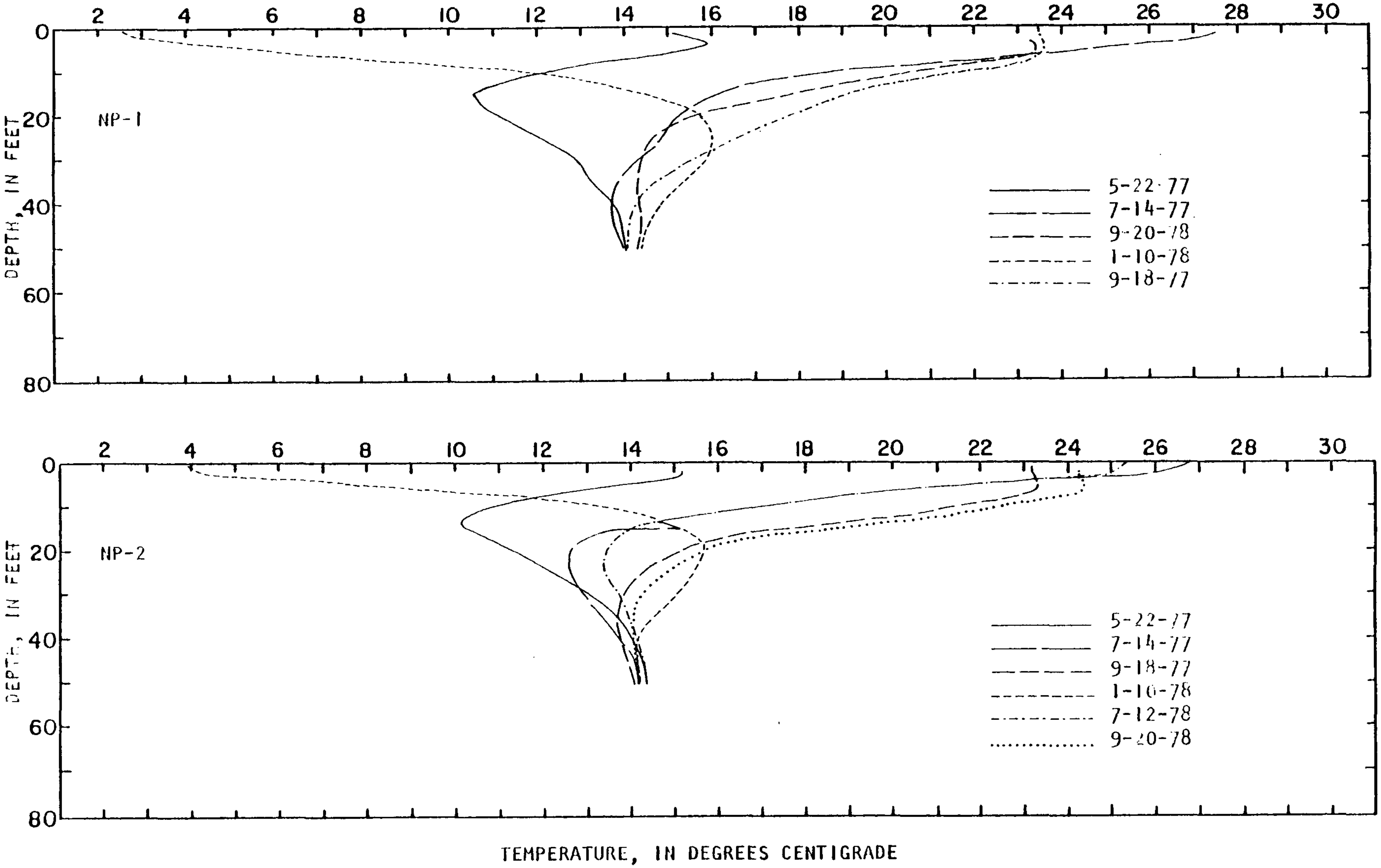


Figure [illegible]1. Temperature profiles in observation holes NP-1 and 2.

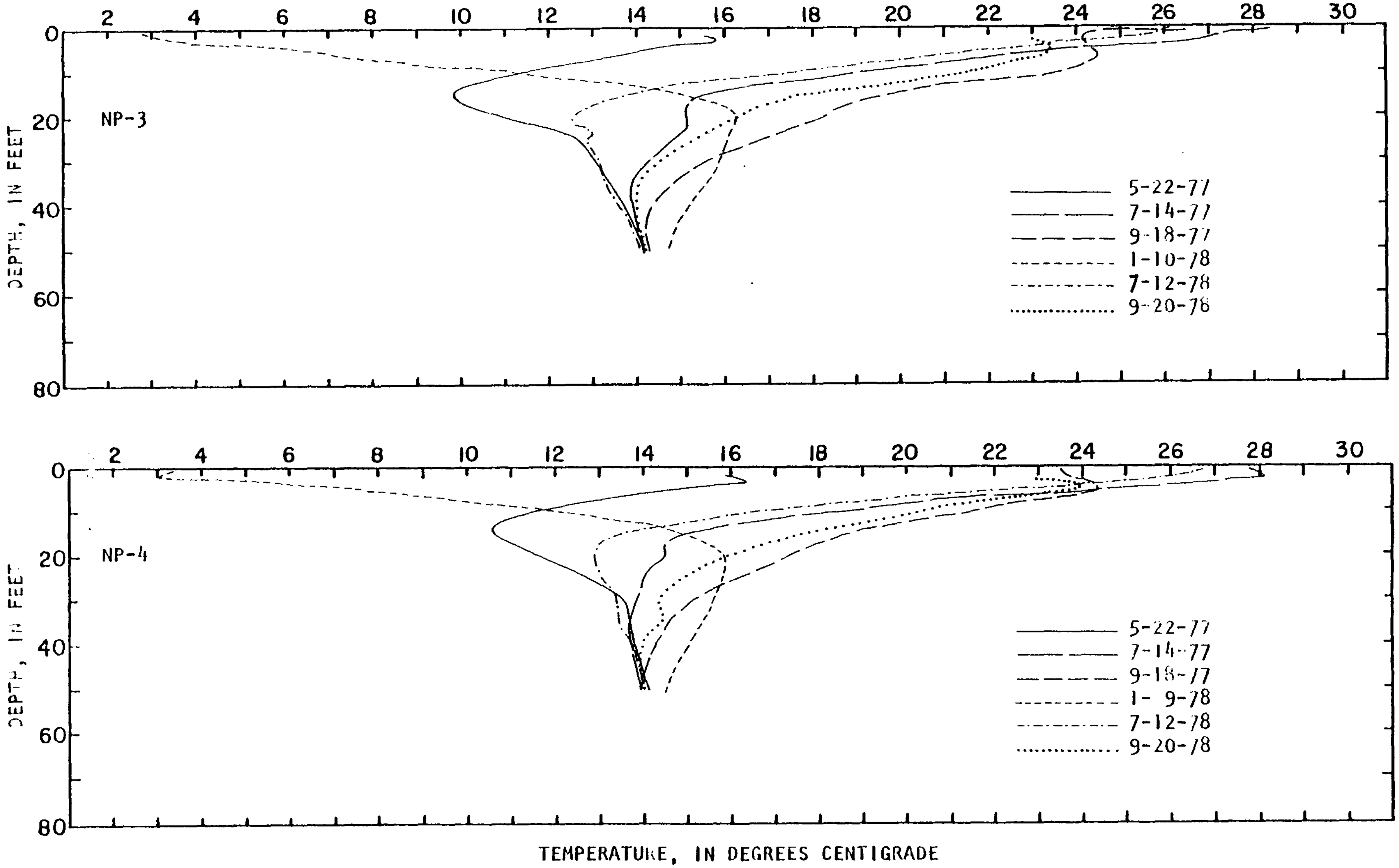


Figure 22. Temperature profiles in observation holes NP-3 and 4.

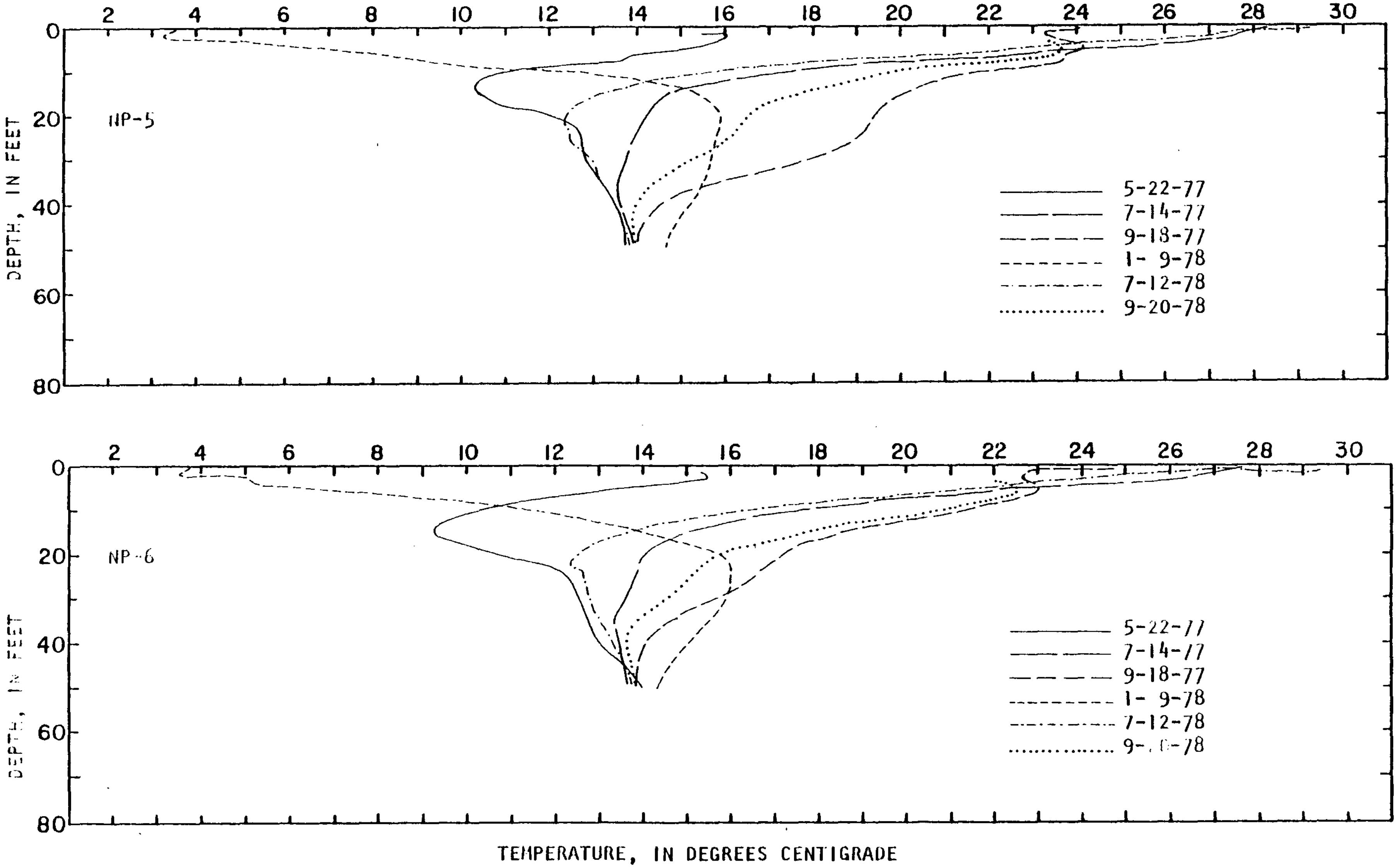


Figure 23. Temperature profiles in observation holes NP-5 and 6.

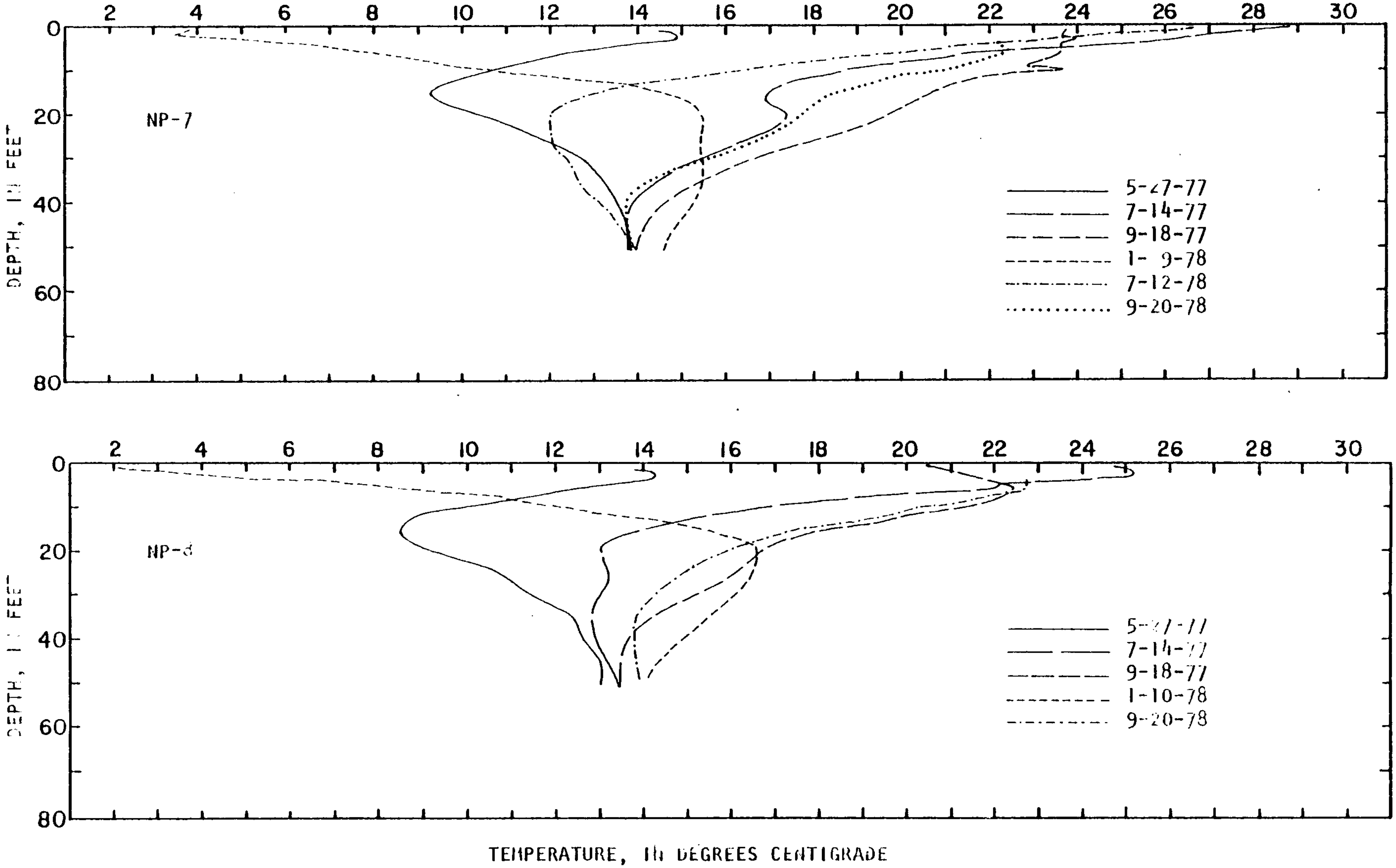


Figure 24. Temperature profiles in observation holes NP-7 and 8.

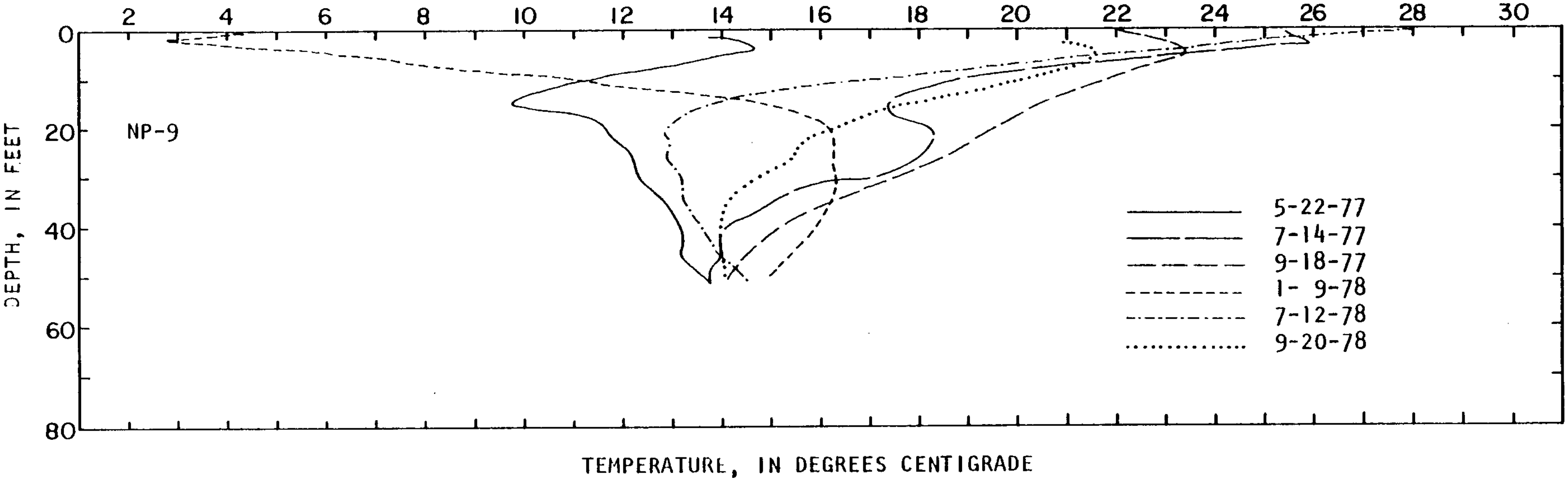


Figure 25. Temperature profile in observation hole 9.

of the exponential envelope. The approach velocity of ground-water flow, v_z, is given by:

$$v_z = (b^2 - a^2)\ K_{ws} / \ c_{pw} \rho_w \qquad (1)$$

where: $a = \ln ({}^{A}/T_z)/Z$ (2)

$b = 2\pi t_1/\tau z$ (3)

T_z = amplitude of the temperature wave at depth z

A = amplitude of the seasonal air temperature wave

z = depth of the point on the seasonal heat wave at which the amplitude is measured, crest at a depth of about five feet

t_1 = the time lag for the temperature cycle at depth z with respect to the temperature cycle at the land surface

τ = period of the seasonal heat wave

The solution of this relationship is only valid when the transfer of heat by conduction and convection is through a medium which is homogeneous for fluid flow and heat flow. In actual fact, the embankment surrounding the ponds is not homogeneous for fluid flow, it may approach homogeneity for heat flow, however. The lack of homogeneity for fluid flow is observed in figure 26 which depicts the temperature of the soils along the crest of the embankment at a depth of about 30 feet for two different times of the year. If the earthen material forming and underlying the embankment were homogeneous for fluid flow, then the temperature at any given depth along the embankment should be

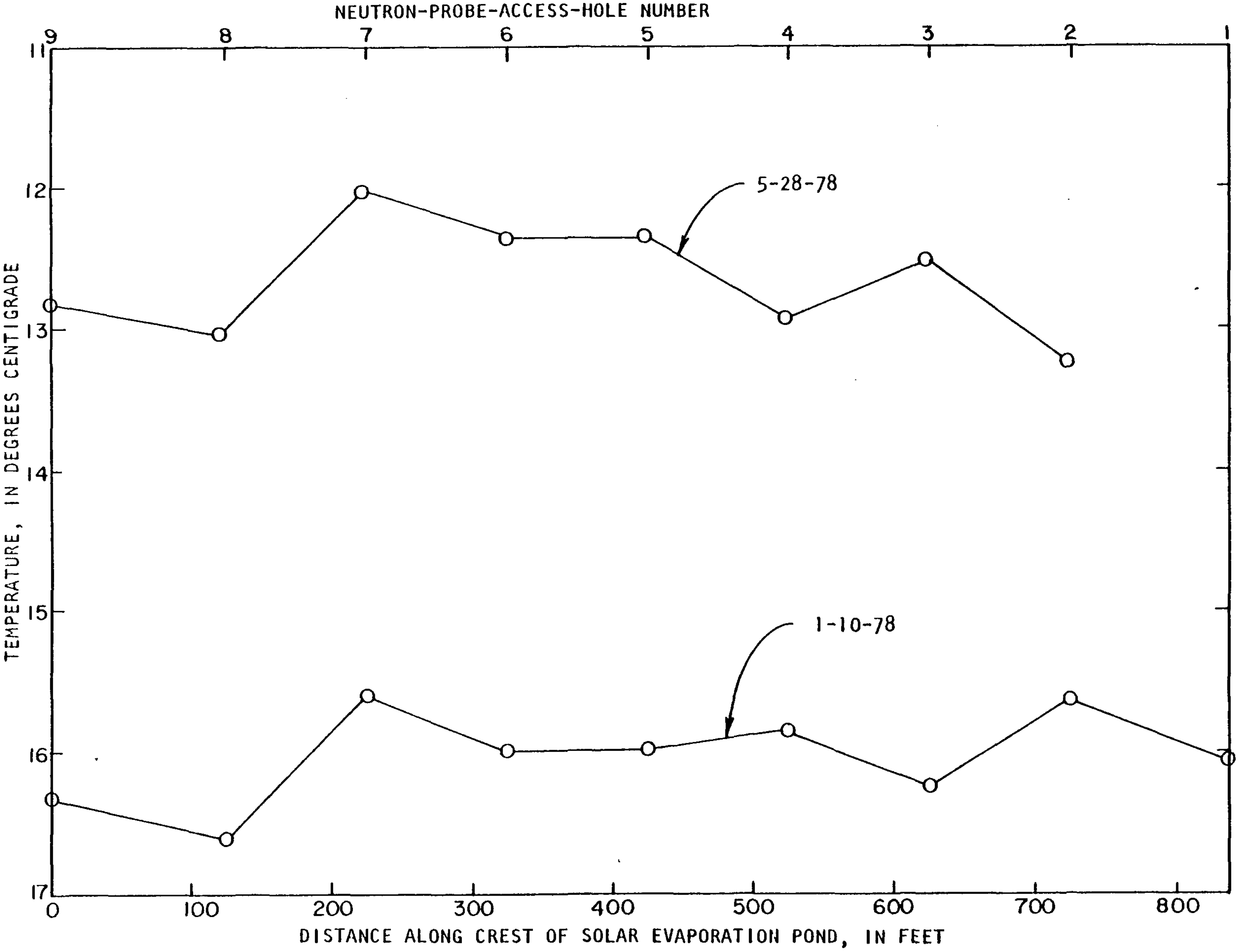


Figure 26. Subsurface temperatures at a depth of about 25 feet along the crest of solar-evaporation pond 1.

similar provided the observation holes in which the measurements were made are uniformly spaced with regard to the front face of the embankment, and the face of the embankment which faces the pond. If this condition is not met, then the thermal forcing functions from each face will not reach the observation tubes in the same phase and the temperature data will not be comparable from hole to hole. The observation holes have reasonably similar locations with regard to the front and back faces of the embankments and it is likely that the data are comparable.

The fact that slight variations in temperature exist at any given depth suggests that either the thermal diffusivity of the soil is different from place to place or that water is moving in the subsurface. Water-level information from the observation holes indicates that the position of the maximum and minimum temperatures on the temperature profiles are above the water table and the soil-moisture profile indicates that the soils at the depth of the temperature maxima and minima have an increase in soil moisture content but are not saturated. Consequently, the movement of moisture at each location sampled by the observation holes may be either due to vertical percolation of water through the silt material underlying the pond or to lateral movement of water in the cobble bed. Figure 27 shows the temperature along the crest at a depth of about five feet for September 20, 1978. From this diagram, it is evident that there is greater flow of water in the vicinity of observation holes NP-7, 8, and 9 than anywhere else along the crest of the dam and it is evident that most ground-water flow occurs in the vicinity of observation hole NP-9.

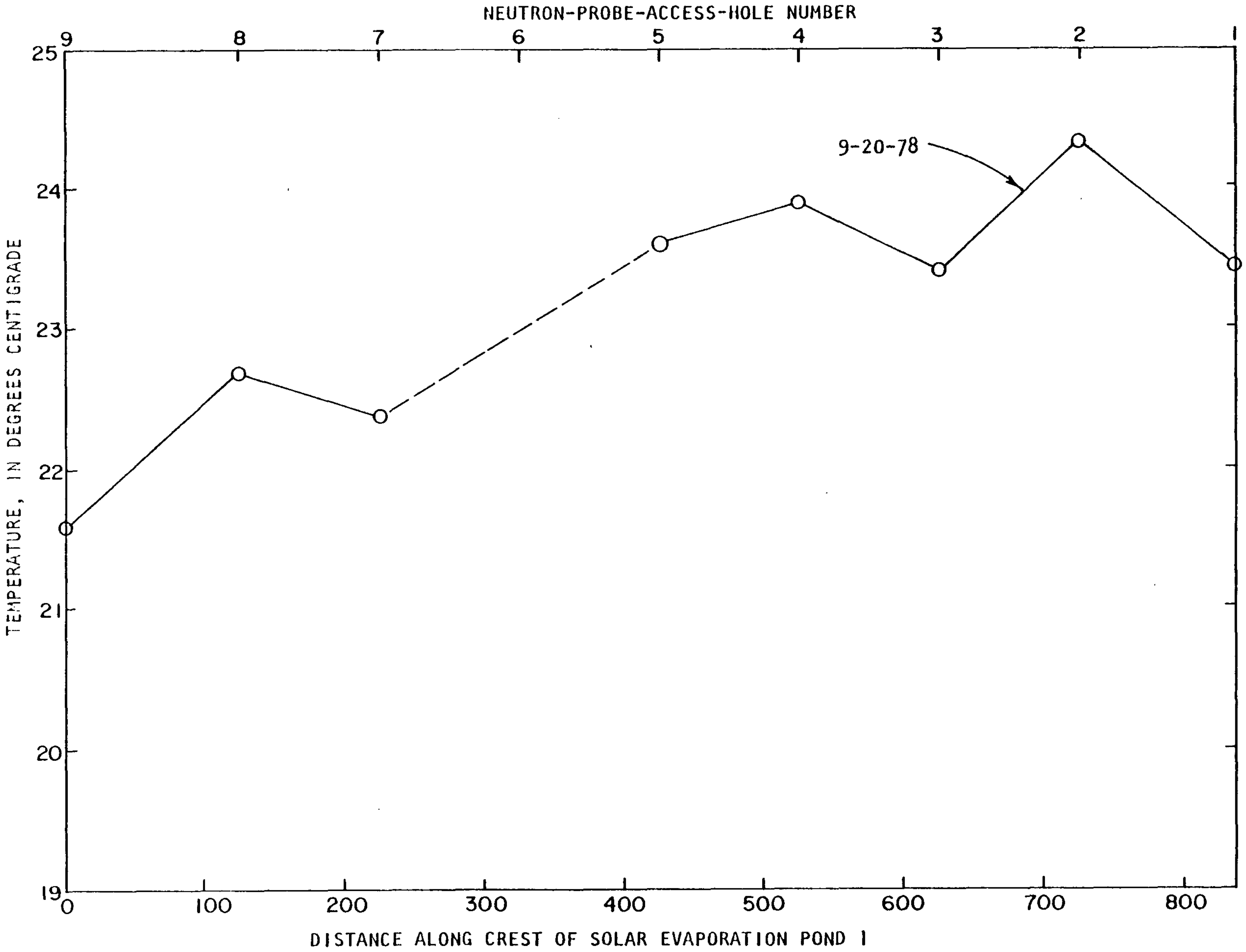


Figure 27. Subsurface temperatures at a depth of about five feet along the crest of solar-evaporation pond 1.

Bearing in mind that we are dealing with a non-ideal situation, equation 1 has been solved for each temperature profile. The solution is based upon an assumed thermal conductivity of the solid-fluid complex of 4×10^{-3} cal cm^{-1} sec^{-1}°C. If a lower value is used, lower approach velocities will result. The results of this analysis are presented in table 3. The average approach velocity of the groundwater in all observation holes is about 2.73×10^{-4} cm/sec. The Darcian velocity is obtained by multiplying the approach velocity by the porosity of the soils. Soil moisture data for these holes suggests that the soils in the embankment and immediately below the embankment have a moisture content of about 15 percent. Although the porosity is probably higher, the Darcian velocity may be calculated using 15 percent. The Darcian velocity of flow is therefore about 3.41 cm/day.

To determine whether 3.41 cm/day is a reasonable velocity, use may be made of Darcy's Law to evaluate the permeability of the foundation soils, values for which are reasonably well known for various earthen materials. Darcy's Law for the present case is

$$Q = K_v(Hs + Hc + Lw)/Lw \qquad (4)$$

where: K_v = vertical component of permeability

H_s = depth of water in the pond

H_c = height of the capillary fringe above the saturated zone

L_w = distance between the bottom of the pond and the wetting front

Because of the good information available from the soil-moisture profiles, the following values are used in this problem:

H_s = 10 ft

H_c = 1 ft

L_w = 10 ft

These values lead to a vertical component of permeability of 1.6 cm/day. In the English system of units, this converts to about 4.0 gallons per day per square foot which Todd (1959) indicates is typical of very fine sands; silts; mixtures of sand, silt and clay; glacial till; and stratified clays. This sounds very much like the material from which the embankments are constructed and upon which the ponds are located.

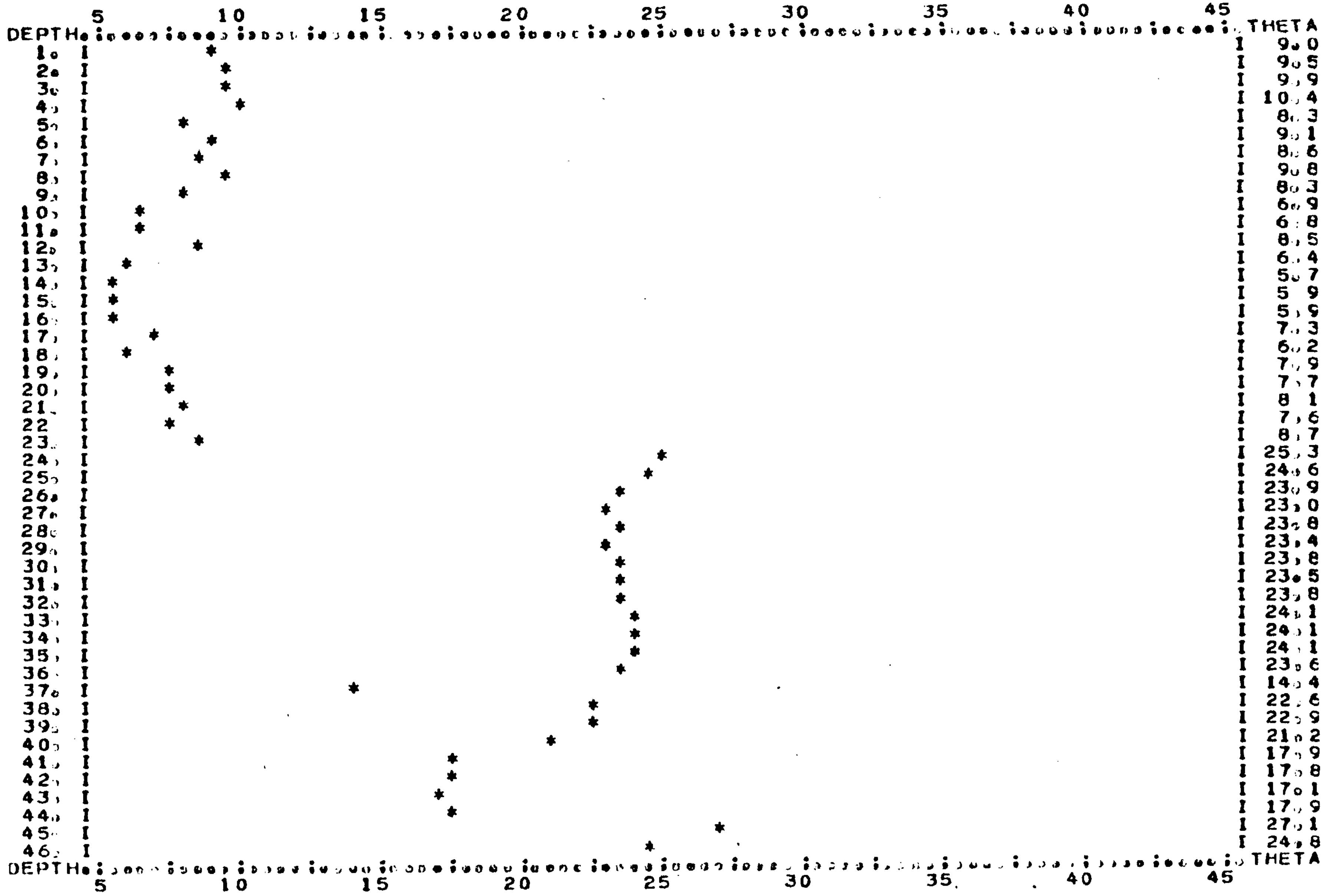
If the Darcian velocity of flow is 3.41 cm/day and if pond 1 has a surface area of 1.51×10^8 square centimetres, the amount of leakage would be about 94 gallons per minute if this average seepage rate obtains over the bottom of the entire pond.

If seepage occurs only around the periphery of the pond where the bentonite lining has been breached by wave action and if this zone of seepage is ten feet wide, then seepage would be taking place through an area of about 18,000 square feet. If 3.41 cm/day seeps through this area, the seepage rate is 10.46 gpm.

Observations of seeps of water in the Hammond ditch and in the nearby intermittent stream channels would support the lower seepage rate.

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-6 BM= 5520.94
DATE= 27 APR 1977 TIME= PROBE NO= WL=49.10
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
1.	9.0
2.	9.5
3.	9.9
4.	10.4
5.	8.3
6.	9.1
7.	8.6
8.	9.8
9.	8.3
10.	6.9
11.	6.8
12.	8.5
13.	6.4
14.	5.7
15.	5.9
16.	5.9
17.	7.3
18.	6.2
19.	7.9
20.	7.7
21.	8.1
22	7.6
23.	8.7
24.	25.3
25.	24.6
26.	23.9
27.	23.0
28.	23.8
29.	23.4
30.	23.8
31.	23.5
32.	23.8
33.	24.1
34.	24.1
35.	24.1
36.	23.6
37.	14.4
38.	22.6
39.	22.9
40.	21.2
41.	17.9
42.	17.8
43.	17.1
44.	17.9
45.	27.1
46.	24.8

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-7 BM= 5520.97
DATE= 27 APR 1977 TIME= PROBE NO= WL=48.72
REMARKS=

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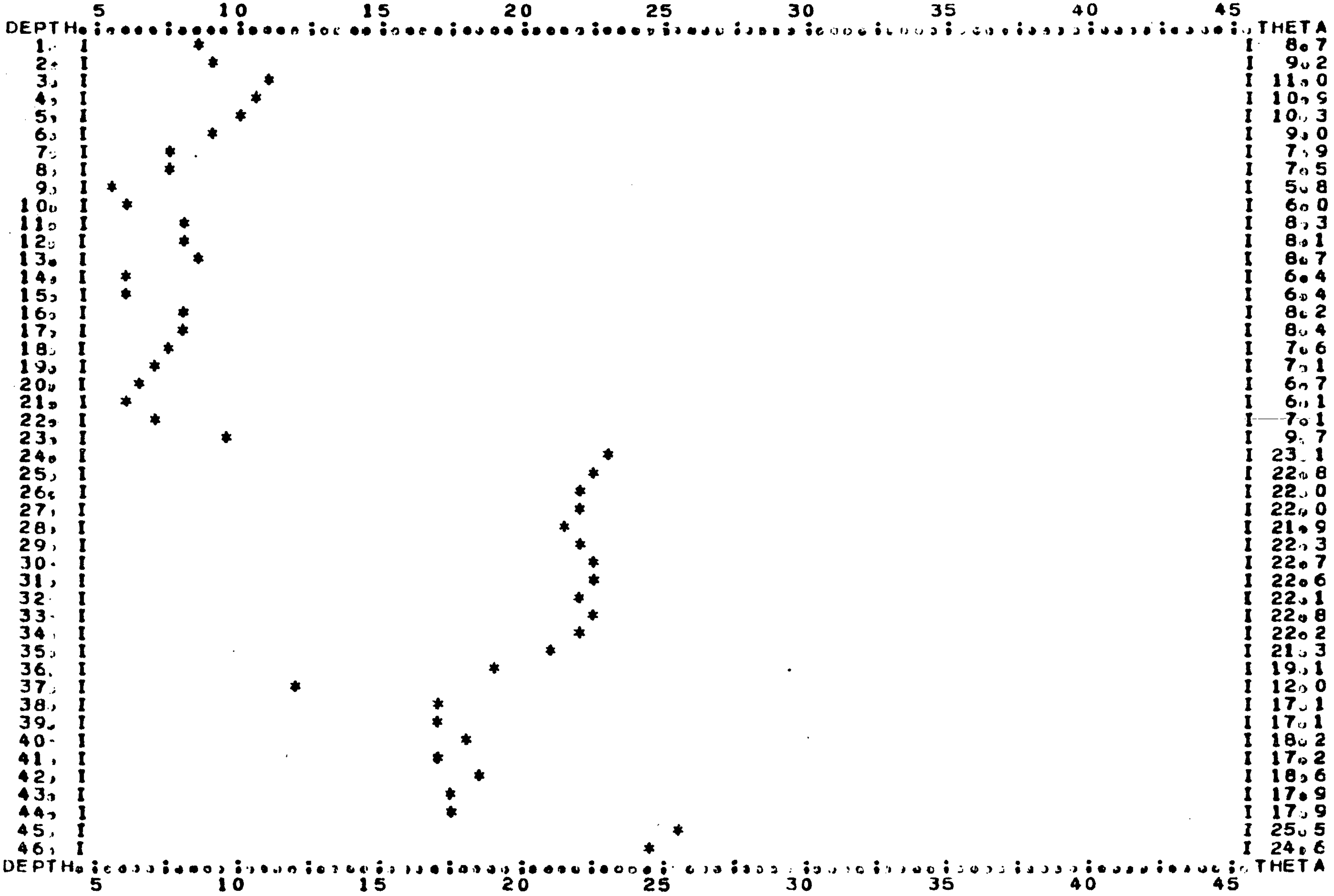
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
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6.	9.0
7.	7.9
8.	7.5
9.	5.8
10.	6.0
11.	8.3
12.	8.1
13.	8.7
14.	6.4
15.	6.4
16.	8.2
17.	8.4
18.	7.6
19.	7.1
20.	6.7
21.	6.1
22.	7.1
23.	9.7
24.	23.1
25.	22.8
26.	22.0
27.	22.0
28.	21.9
29.	22.3
30.	22.7
31.	22.6
32.	22.1
33.	22.8
34.	22.2
35.	21.3
36.	19.1
37.	12.0
38.	17.1
39.	17.1
40.	18.2
41.	17.2
42.	18.6
43.	17.9
44.	17.9
45.	25.5
46.	24.6

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DATE=  27 APR 1977   TIME=             PROBE NO=          WL=40.12
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
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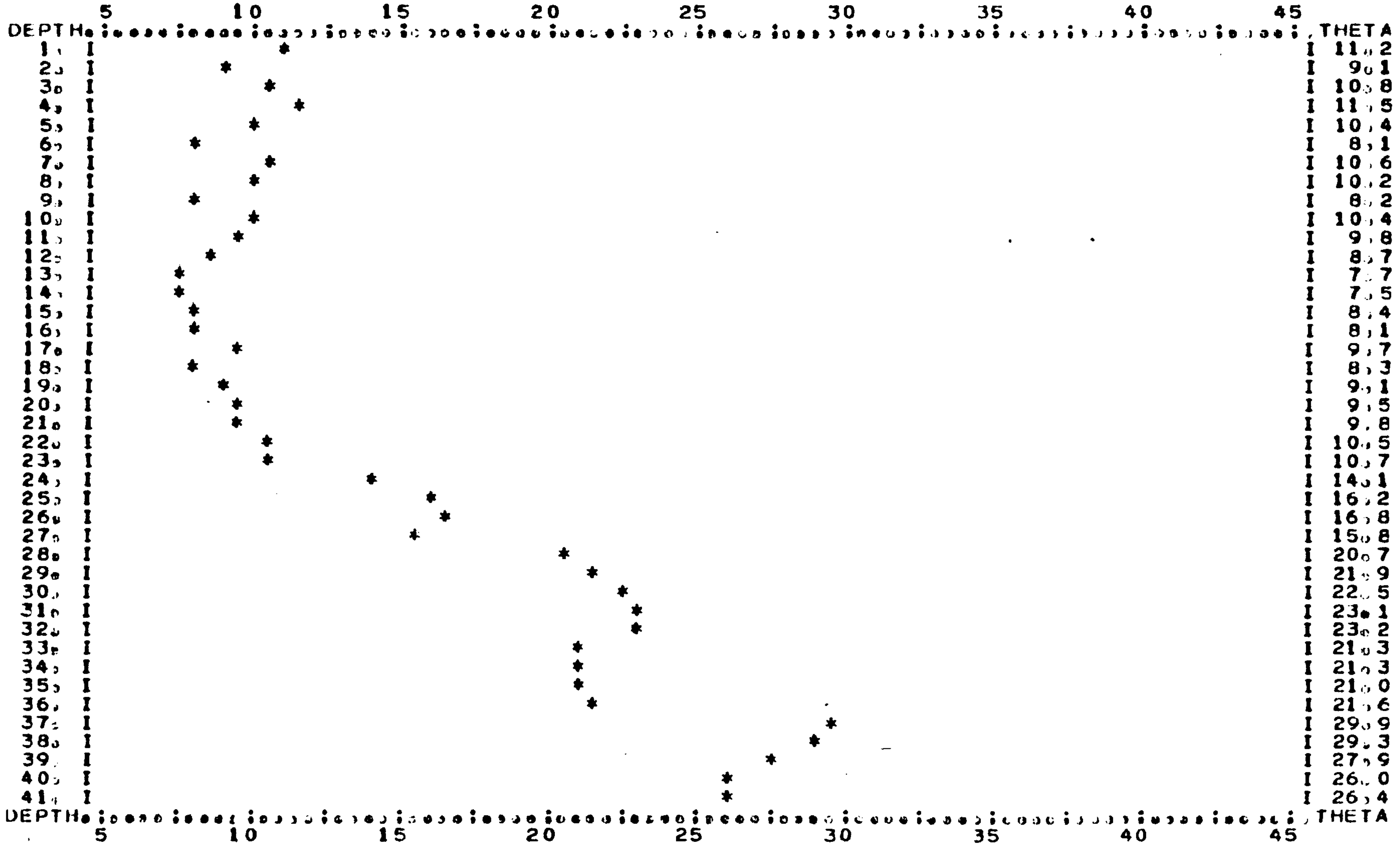

DEPTH	THETA
1.	11.2
2.	9.1
3.	10.8
4.	11.5
5.	10.4
6.	8.1
7.	10.6
8.	10.2
9.	8.2
10.	10.4
11.	9.8
12.	8.7
13.	7.7
14.	7.5
15.	8.4
16.	8.1
17.	9.7
18.	8.3
19.	9.1
20.	9.5
21.	9.8
22.	10.5
23.	10.7
24.	14.1
25.	16.2
26.	16.8
27.	15.8
28.	20.7
29.	21.9
30.	22.5
31.	23.1
32.	23.2
33.	21.3
34.	21.3
35.	21.0
36.	21.6
37.	29.9
38.	29.3
39.	27.9
40.	26.0
41.	26.4

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PROJECT=PLATEAU      HOLE ID=NP-1       BM= 5521.82
DATE= 6 MAY 1977      TIME=0930      PROBE NO=          WL=DRY
REMARKS=

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FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
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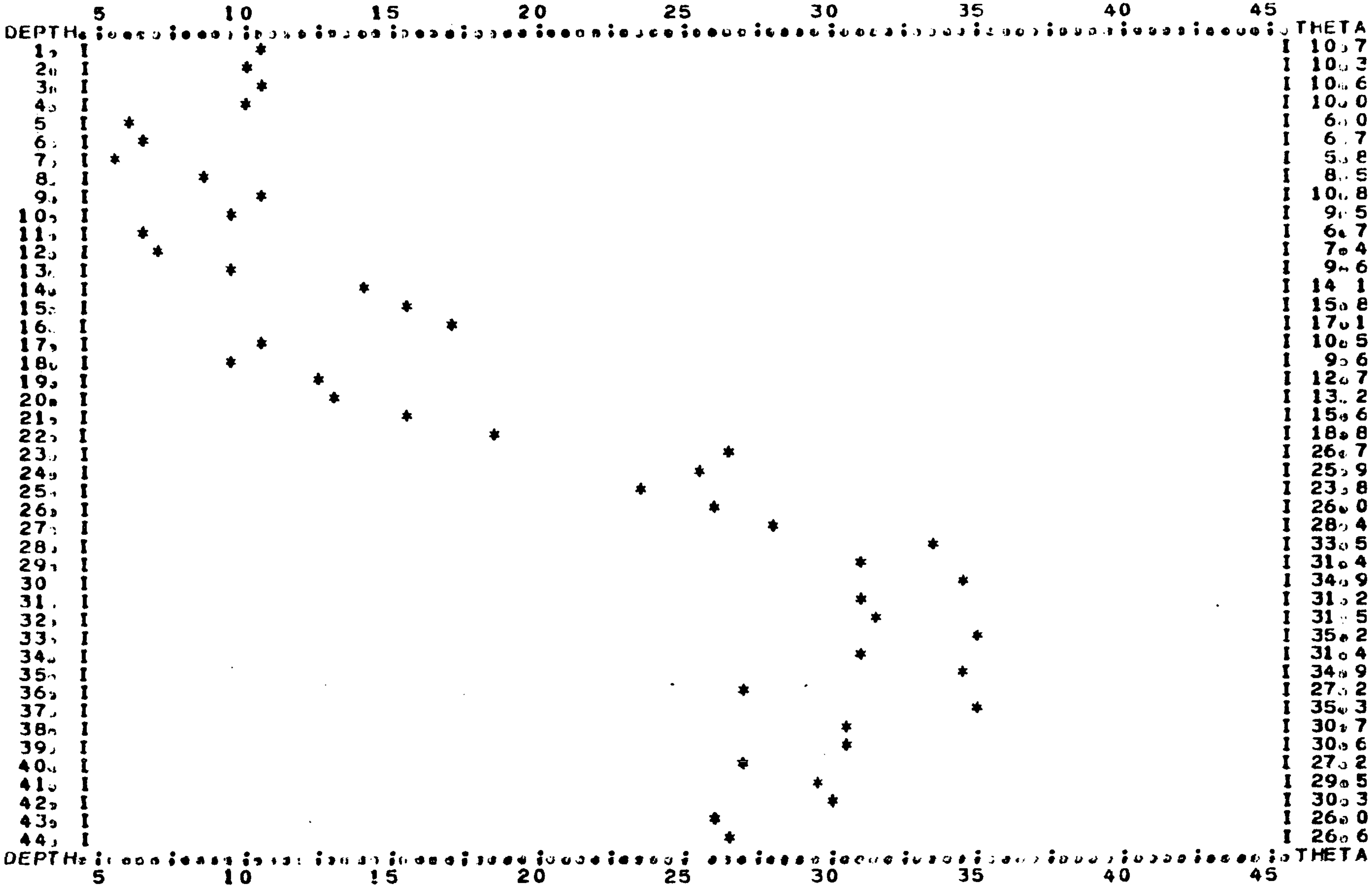

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DATE= 6 MAY 1977     TIME=1000       PROBE NO=          WL=DRY
REMARKS=

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FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
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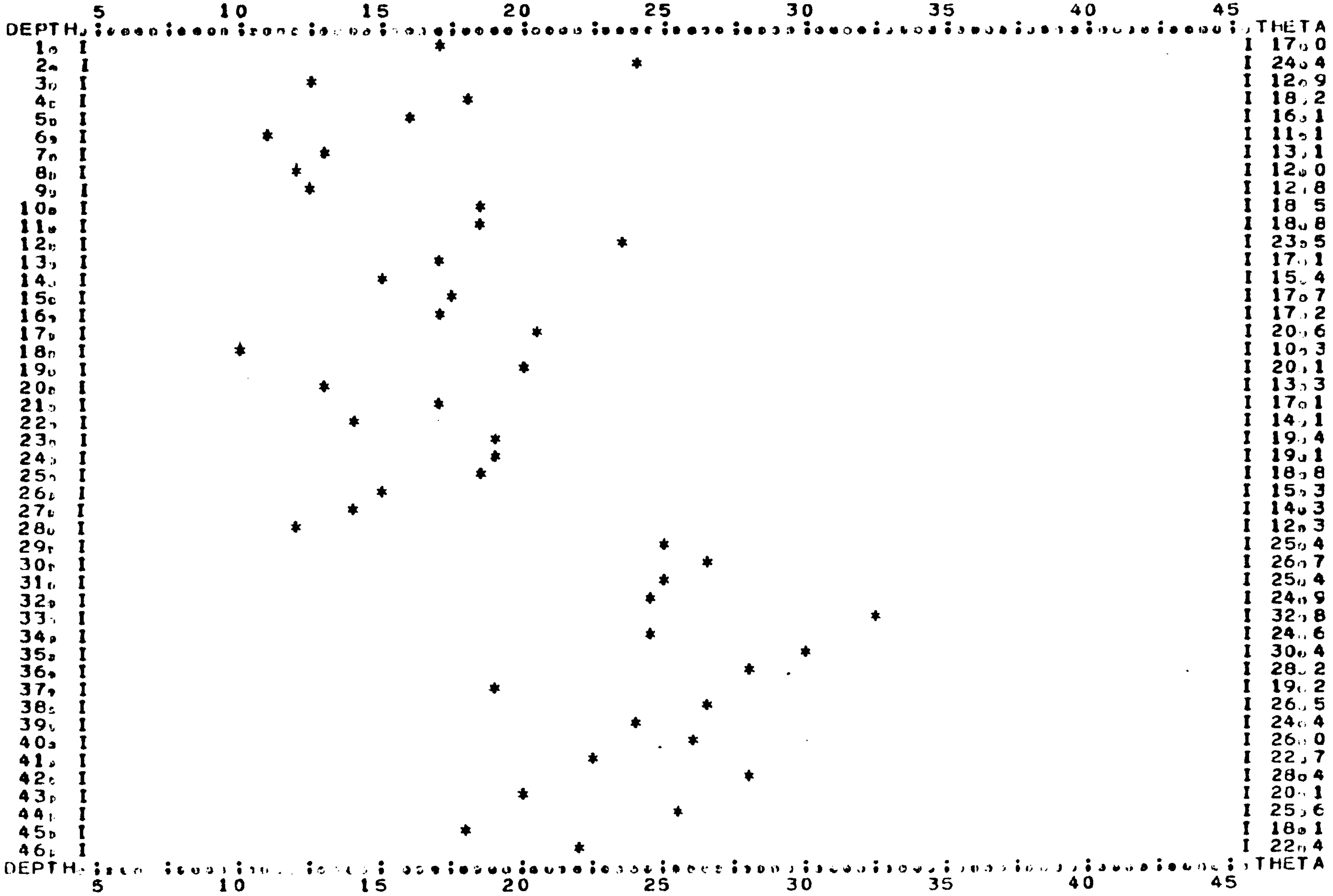

DEPTH	THETA
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2.	24.4
3.	12.9
4.	18.2
5.	16.1
6.	11.1
7.	13.1
8.	12.0
9.	12.8
10.	18.5
11.	18.8
12.	23.5
13.	17.1
14.	15.4
15.	17.7
16.	17.2
17.	20.6
18.	10.3
19.	20.1
20.	13.3
21.	17.1
22.	14.1
23.	19.4
24.	19.1
25.	18.8
26.	15.3
27.	14.3
28.	12.3
29.	25.4
30.	26.7
31.	25.4
32.	24.9
33.	32.8
34.	24.6
35.	30.4
36.	28.2
37.	19.2
38.	26.5
39.	24.4
40.	26.0
41.	22.7
42.	28.4
43.	20.1
44.	25.6
45.	18.1
46.	22.4

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
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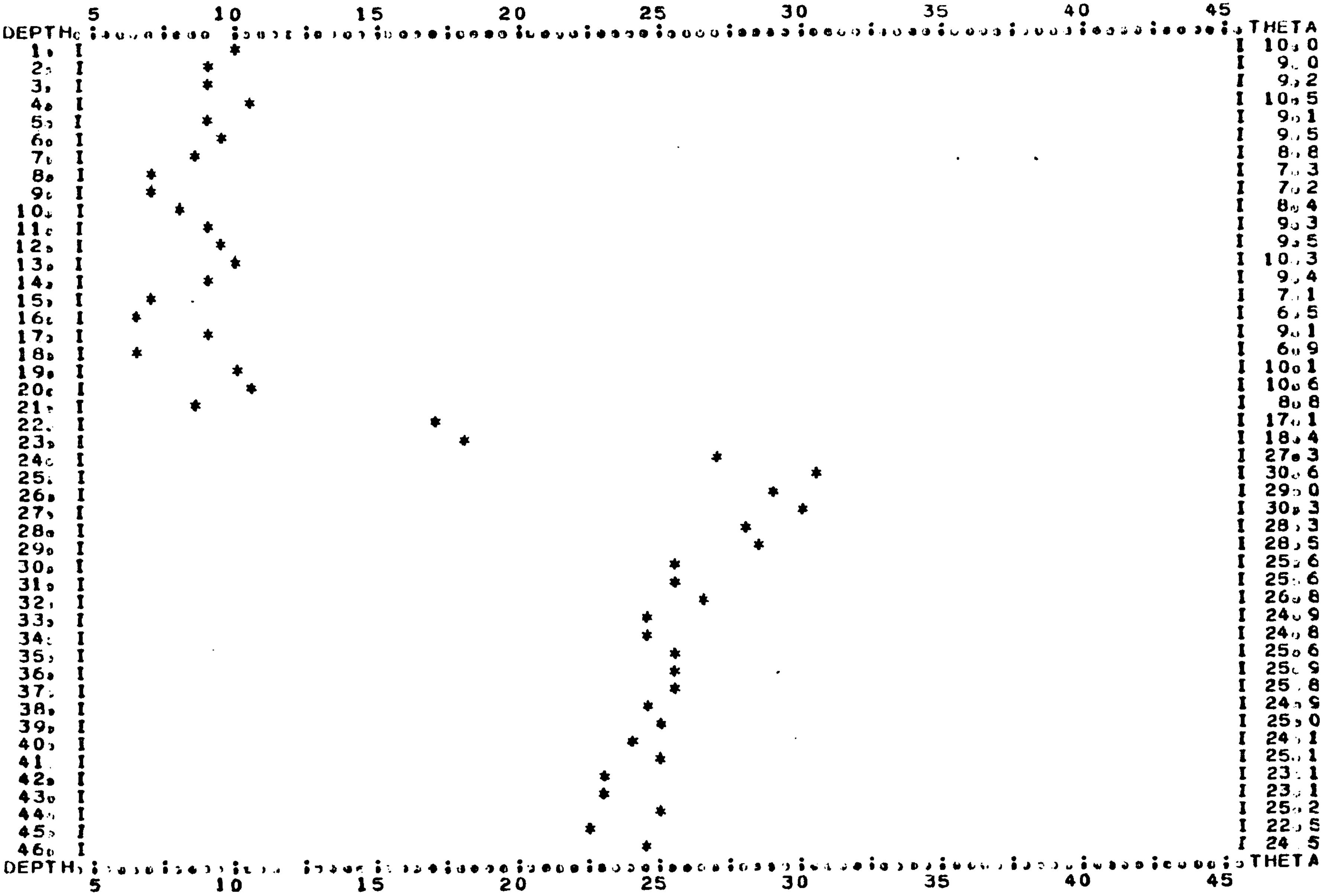
DATE= 6 MAY 1977 TIME=1500 PROBE NO= WL=26.98
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
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4.	10.5
5.	9.1
6.	9.5
7.	8.8
8.	7.3
9.	7.2
10.	8.4
11.	9.3
12.	9.5
13.	10.3
14.	9.4
15.	7.1
16.	6.5
17.	9.1
18.	6.9
19.	10.1
20.	10.6
21.	8.8
22.	17.1
23.	18.4
24.	27.3
25.	30.6
26.	29.0
27.	30.3
28.	28.3
29.	28.5
30.	25.6
31.	25.6
32.	26.8
33.	24.9
34.	24.8
35.	25.6
36.	25.9
37.	25.8
38.	24.9
39.	25.0
40.	24.1
41	25.1
42.	23.1
43.	23.1
44.	25.2
45.	22.5
46.	24.5

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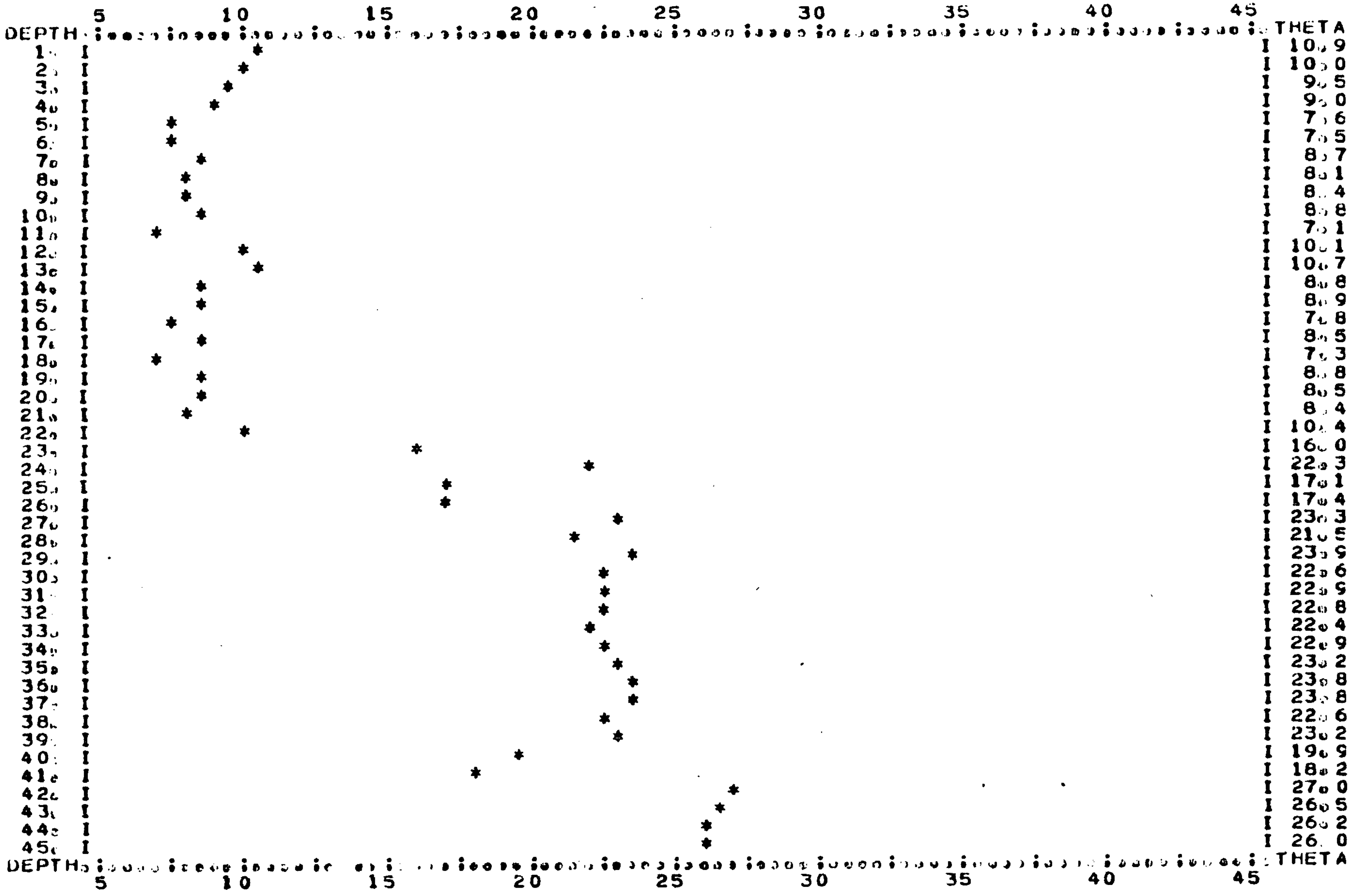
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-4       BM= 5521.17
DATE= 6 MAY 1977     TIME=1430      PROBE NO=          WL=45.54
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.

        5        10        15        20        25        30        35        40        45
DEPTH...:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:.THETA
   1.  I        *                                                                        I  9.4
   2.  I       *                                                                         I  8.6
   3.  I         *                                                                       I  9.6
   4.  I  *                                                                              I  6.0
   5.  I      *                                                                          I  8.2
   6.  I   *                                                                             I  6.7
   7.  I   *                                                                             I  6.6
   8.  I    *                                                                            I  7.4
   9.  I *                                                                               I  5.9
  10.  I   *                                                                             I  6.6
  11.  I    *                                                                            I  7.2
  12.  I      *                                                                          I  8.1
  13.  I    *                                                                            I  7.0
  14.  I      *                                                                          I  8.1
  15.  I    *                                                                            I  7.3
  16.  I    *                                                                            I  7.1
  17.  I     *                                                                           I  7.5
  18.  I         *                                                                       I  9.5
  19.  I       *                                                                         I  8.6
  20.  I     *                                                                           I  7.9
  21.  I         *                                                                       I  9.6
  22.  I                *                                                                I 13.3
  23.  I                            *                                                    I 19.4
  24.  I                                     *                                           I 23.9
  25.  I                                      *                                          I 24.4
  26.  I                                    *                                            I 23.3
  27.  I                                     *                                           I 23.8
  28.  I                                  *                                              I 22.1
  29.  I                                 *                                               I 21.8
  30.  I                                   *                                             I 22.5
  31.  I                                  *                                              I 22.4
  32.  I                                   *                                             I 22.5
  33.  I                                   *                                             I 22.5
  34.  I                                  *                                              I 22.3
  35.  I                                   *                                             I 22.5
  36.  I                                   *                                             I 22.6
  37.  I                                   *                                             I 22.8
  38.  I                                   *                                             I 22.6
  39.  I                                   *                                             I 22.9
  40   I                                   *                                             I 22.7
  41.  I                                   *                                             I 22.7
  42.  I                                   *                                             I 22.6
  43.  I                             *                                                   I 19.6
  44.  I                          *                                                      I 18.2
  45.  I                       *                                                         I 16.5
  46.  I                                       *                                         I 25.3
DEPTH...:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:.THETA
        5        10        15        20        25        30        35        40        45
```

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-5 BM= 5521.13
DATE= 6 MAY 1977 TIME=1350 PROBE NO= WL=45.28
REMARKS=

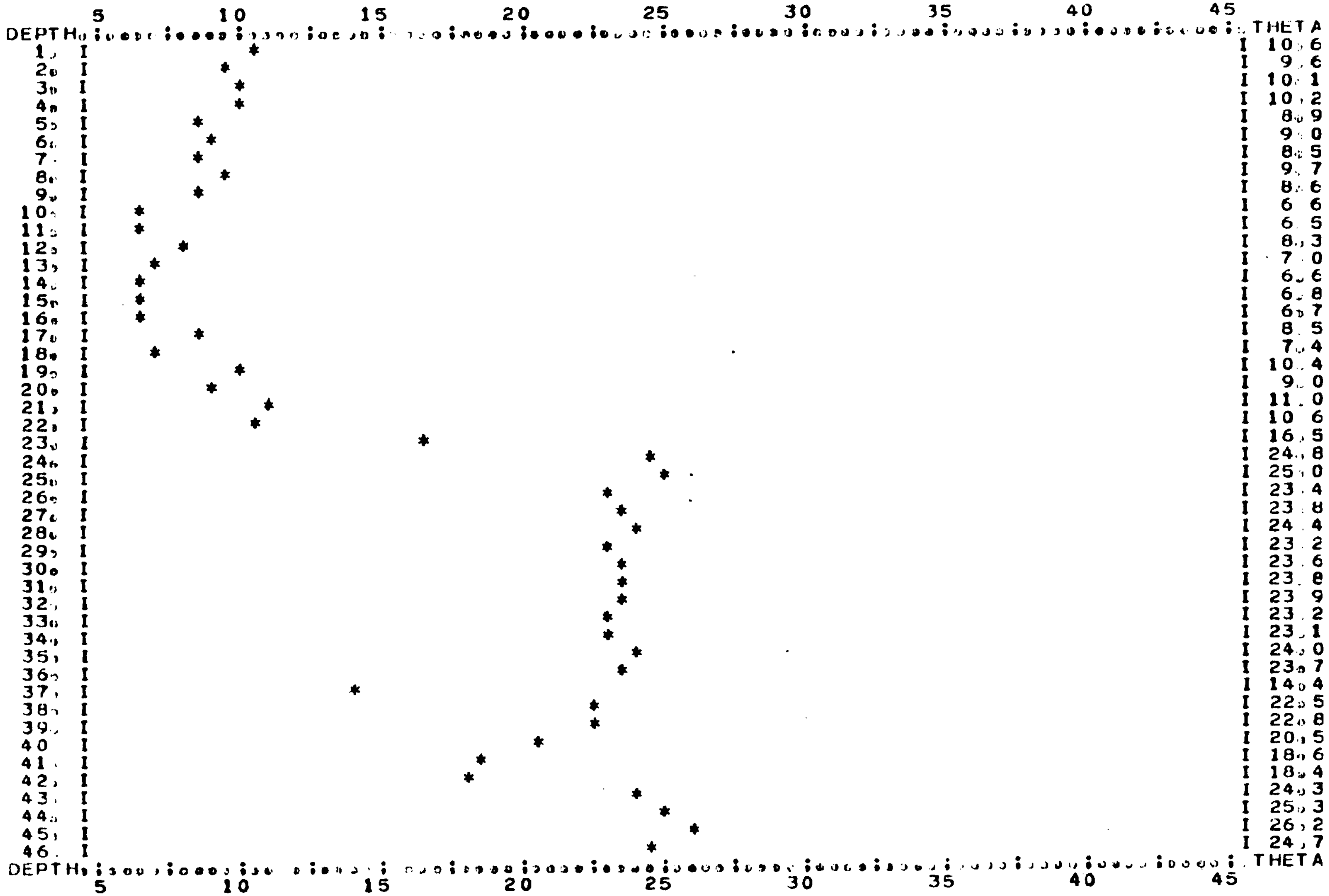
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
1.	10.9
2.	10.0
3.	9.5
4.	9.0
5.	7.6
6.	7.5
7.	8.7
8.	8.1
9.	8.4
10.	8.8
11.	7.1
12.	10.1
13.	10.7
14.	8.8
15.	8.9
16.	7.8
17.	8.5
18.	7.3
19.	8.8
20.	8.5
21.	8.4
22.	10.4
23.	16.0
24.	22.3
25.	17.1
26.	17.4
27.	23.3
28.	21.5
29.	23.9
30.	22.6
31.	22.9
32.	22.8
33.	22.4
34.	22.9
35.	23.2
36.	23.8
37.	23.8
38.	22.6
39.	23.2
40.	19.9
41.	18.2
42.	27.0
43.	26.5
44.	26.2
45.	26.0

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-6       BM= 5520.94
DATE=  6 MAY 1977     TIME=             PROBE NO=           WL=46.04
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN)
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND CCLUMN.
```



DEPTH	THETA
1.	10.6
2.	9.6
3.	10.1
4.	10.2
5.	8.9
6.	9.0
7.	8.5
8.	9.7
9.	8.6
10.	6.6
11.	6.5
12.	8.3
13.	7.0
14.	6.6
15.	6.8
16.	6.7
17.	8.5
18.	7.4
19.	10.4
20.	9.0
21.	11.0
22.	10.6
23.	16.5
24.	24.8
25.	25.0
26.	23.4
27.	23.8
28.	24.4
29.	23.2
30.	23.6
31.	23.8
32.	23.9
33.	23.2
34.	23.1
35.	24.0
36.	23.7
37.	14.4
38.	22.5
39.	22.8
40	20.5
41.	18.6
42.	18.4
43.	24.3
44.	25.3
45.	26.2
46.	24.7

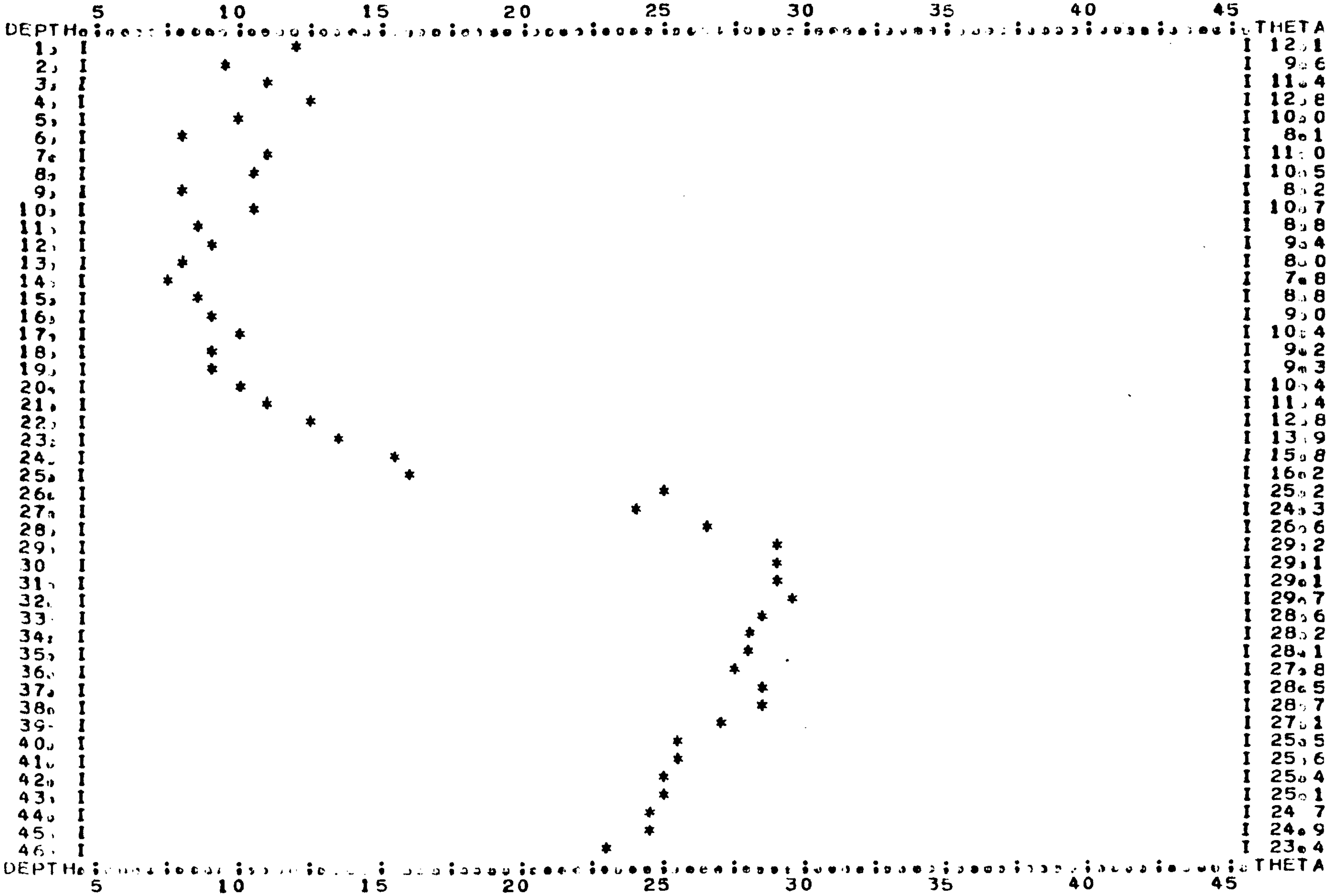
```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PFOJECT=PLATEAU     HOLE ID=NP-7      BM= 5520.97
DATE=  6 MAY 1977    TIME=1130     PROBE NO=          WL=47.64
REMARKS=

PERCENT MOISTURE BY VOLUME (ACRUSS) VS DEPTH IN FEET  (DOWN)
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.

      5        10        15        20        25        30        35        40        45
DEPTH.:.........:.........:.........:.........:.........:.........:.........:.........:.THETA
   1. I         *                                                                     I 10.0
   2. I          *                                                                    I 10.4
   3. I             *                                                                 I 11.8
   4. I            *                                                                  I 11.5
   5. I            *                                                                  I 11.5
   6. I        *                                                                      I  9.3
   7. I       *                                                                       I  8.9
   8. I     *                                                                         I  8.1
   9. I *                                                                             I  6.1
  10. I*                                                                              I  5.9
  11. I     *                                                                         I  8.4
  12. I    *                                                                          I  7.7
  13. I       *                                                                       I  8.9
  14. I  *                                                                            I  6.7
  15. I  *                                                                            I  6.8
  16. I        *                                                                      I  9.2
  17. I     *                                                                         I  8.3
  18. I   *                                                                           I  7.3
  19. I   *                                                                           I  7.3
  20. I   *                                                                           I  7.3
  21. I   *                                                                           I  7.0
  22. I        *                                                                      I  9.1
  23. I                  *                                                            I 15.0
  24. I                                  *                                            I 22.4
  25. I                                   *                                           I 22.5
  26. I                                   *                                           I 22.6
  27. I                                   *                                           I 22.8
  28. I                                  *                                            I 21.9
  29. I                                  *                                            I 22.4
  30. I                                  *                                            I 22.1
  31. I                                   *                                           I 22.5
  32  I                                   *                                           I 22.5
  33. I                                   *                                           I 22.9
  34. I                                  *                                            I 22.1
  35. I                             *                                                 I 20.3
  36. I                             *                                                 I 20.1
  37. I           *                                                                   I 11.3
  38. I                        *                                                      I 18.0
  39. I                       *                                                       I 16.8
  40. I                        *                                                      I 17.7
  41. I                       *                                                       I 17.4
  42. I                        *                                                      I 17.8
  43. I                       *                                                       I 17.0
6044. I                                         *                                     I 26.1
  45. I                                        *                                      I 25.6
  46. I                                   *                                           I 22.5
DEPTH.:.........:.........:.........:.........:.........:.........:.........:.........:.THETA
      5        10        15        20        25        30        35        40        45
```

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-8 BM= 5521.29
DATE= 6 MAY 1977 TIME=1100 PROBE NO= WL=28.25
REMARKS=

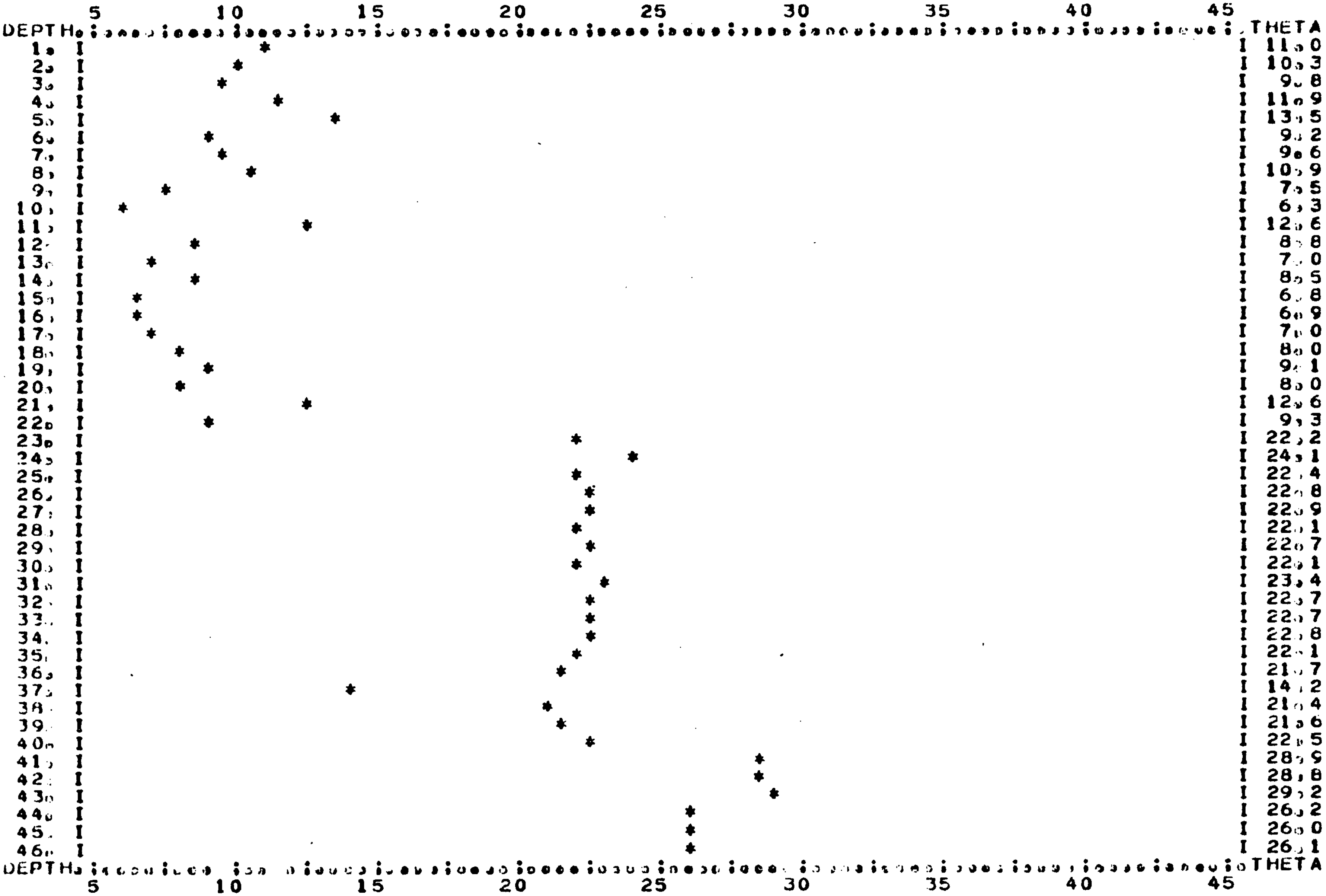
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
1.	12.1
2.	9.6
3.	11.4
4.	12.8
5.	10.0
6.	8.1
7.	11.0
8.	10.5
9.	8.2
10.	10.7
11.	8.8
12.	9.4
13.	8.0
14.	7.8
15.	8.8
16.	9.0
17.	10.4
18.	9.2
19.	9.3
20.	10.4
21.	11.4
22.	12.8
23.	13.9
24.	15.8
25.	16.2
26.	25.2
27.	24.3
28.	26.6
29.	29.2
30	29.1
31.	29.1
32.	29.7
33.	28.6
34.	28.2
35.	28.1
36.	27.8
37.	28.5
38.	28.7
39.	27.1
40.	25.5
41.	25.6
42.	25.4
43.	25.1
44.	24 7
45.	24.9
46.	23.4

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-9       BM= 5520.90
DATE=  6 MAY 1977     TIME=1030      PROBE NO=          WL=44.76
REMARKS=

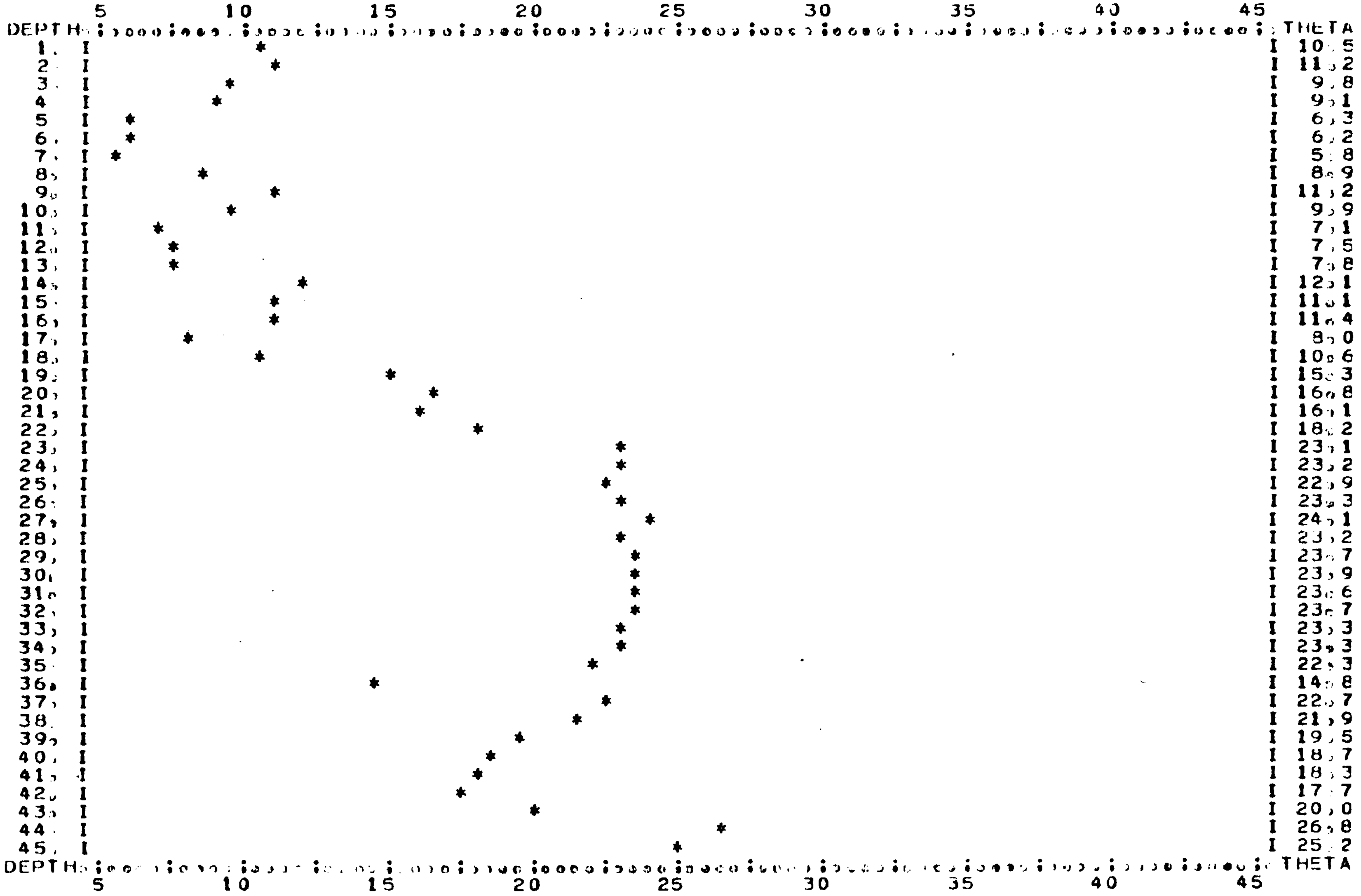
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN):
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1.	11.0
2.	10.3
3.	9.8
4.	11.9
5.	13.5
6.	9.2
7.	9.6
8.	10.9
9.	7.5
10.	6.3
11.	12.6
12.	8.8
13.	7.0
14.	8.5
15.	6.8
16.	6.9
17.	7.0
18.	8.0
19.	9.1
20.	8.0
21.	12.6
22.	9.3
23.	22.2
24.	24.1
25.	22.4
26.	22.8
27.	22.9
28.	22.1
29.	22.7
30.	22.1
31.	23.4
32.	22.7
33.	22.7
34.	22.8
35.	22.1
36.	21.7
37.	14.2
38.	21.4
39.	21.6
40.	22.5
41.	28.9
42.	28.8
43.	29.2
44.	26.2
45.	26.0
46.	26.1

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-1       BM= 5521.82
DATE=22 MAY 1977      TIME=1030      PROBE NO=          WL=48.16
REMARKS=

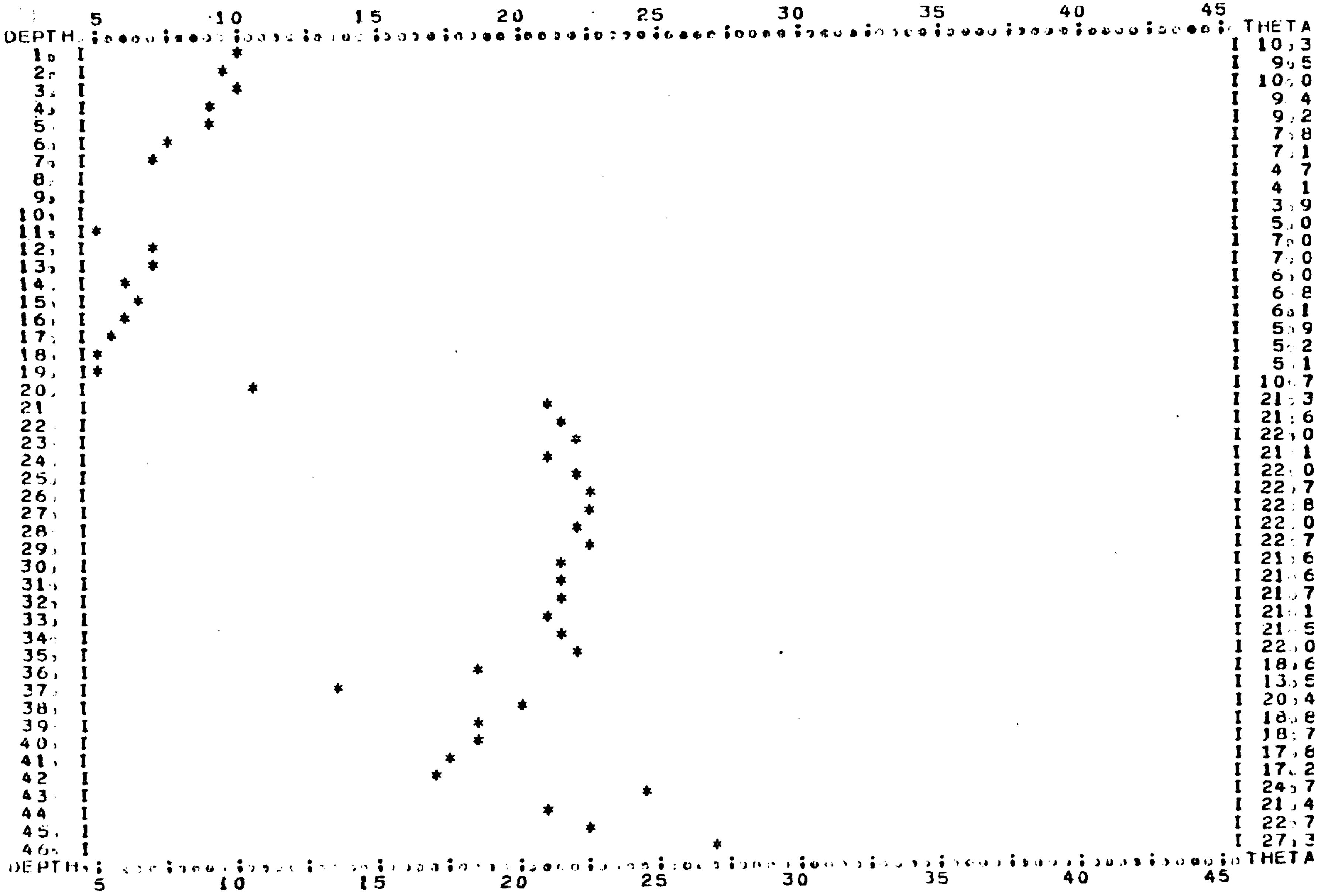
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1.	10.5
2.	11.2
3.	9.8
4	9.1
5	6.3
6.	6.2
7.	5.8
8.	8.9
9.	11.2
10.	9.9
11.	7.1
12.	7.5
13.	7.8
14.	12.1
15.	11.1
16.	11.4
17.	8.0
18.	10.6
19.	15.3
20.	16.8
21.	16.1
22.	18.2
23.	23.1
24.	23.2
25.	22.9
26.	23.3
27.	24.1
28.	23.2
29.	23.7
30.	23.9
31.	23.6
32.	23.7
33.	23.3
34.	23.3
35.	22.3
36.	14.8
37.	22.7
38.	21.9
39.	19.5
40.	18.7
41.	18.3
42.	17.7
43.	20.0
44.	26.8
45.	25.2

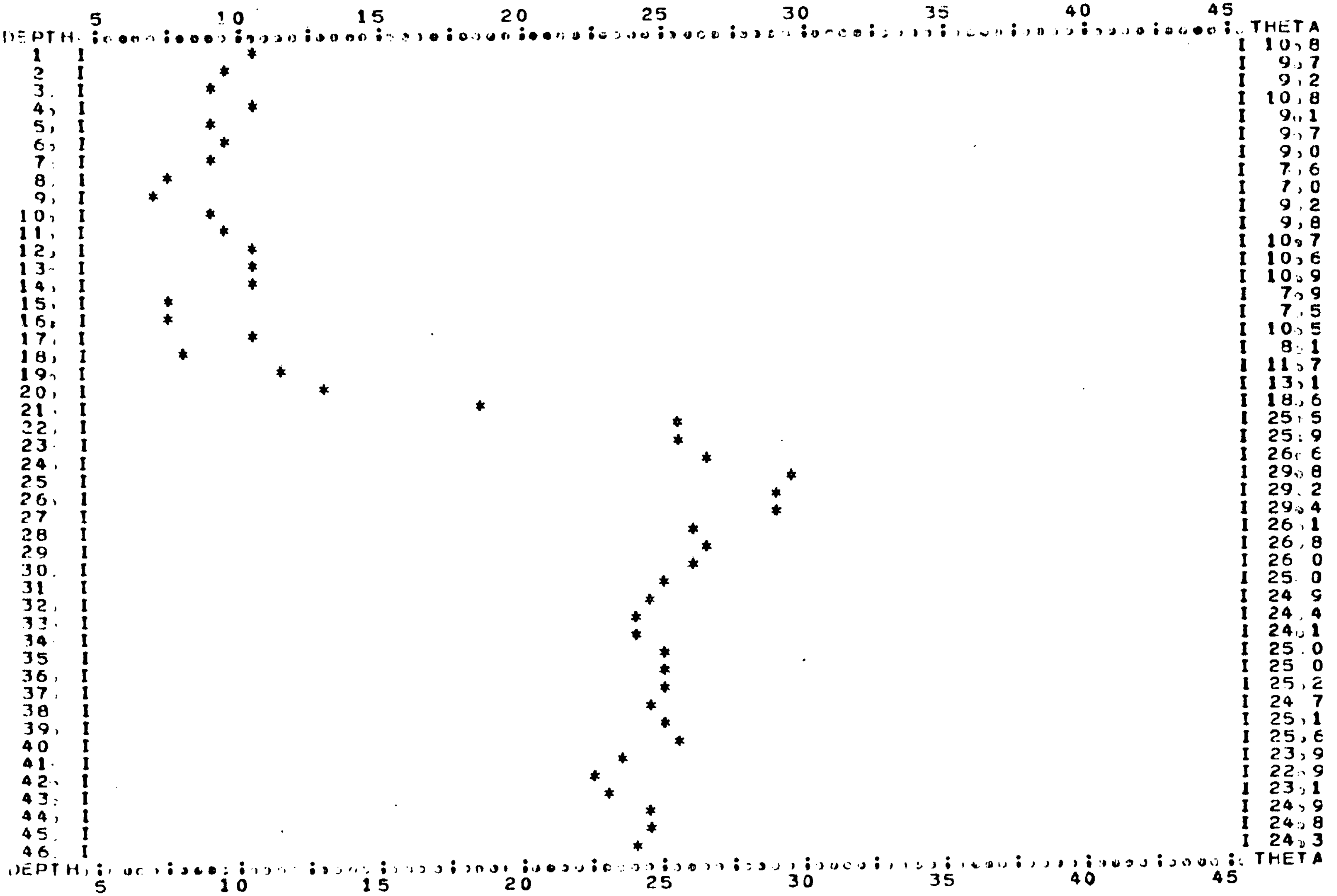
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-2 BM= 5520.67
DATE= 22 MAY 1977 TIME=1030 PROBE NO= WL=46.70
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MCISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-3       BM= 5521,13
DATE=  22 MAY 1977    TIME=1700       PROBE NO=            WL=23,95
REMARKS=

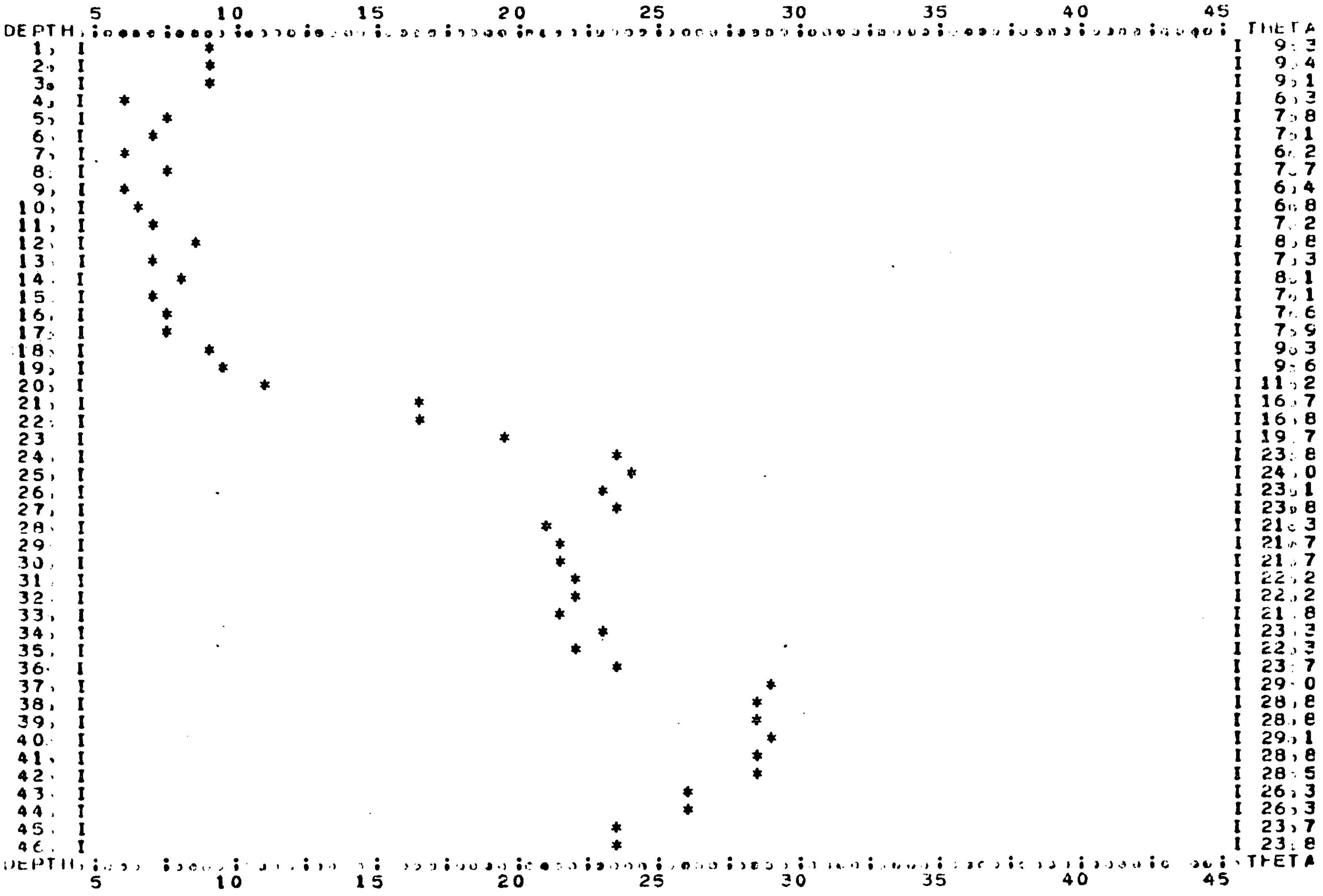
PERCENT MOISTURE BY VOLUME (ACRUSS) VS DEPTH IN FEET  (DOWN),
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1	10,8
2	9,7
3	9,2
4	10,8
5	9,1
6	9,7
7	9,0
8	7,6
9	7,0
10	9,2
11	9,8
12	10,7
13	10,6
14	10,9
15	7,9
16	7,5
17	10,5
18	8,1
19	11,7
20	13,1
21	18,6
22	25,5
23	25,9
24	26,6
25	29,8
26	29,2
27	29,4
28	26,1
29	26,8
30	26,0
31	25,0
32	24,9
33	24,4
34	24,1
35	25,0
36	25,0
37	25,2
38	24,7
39	25,1
40	25,6
41	23,9
42	22,9
43	23,1
44	24,9
45	24,8
46	24,3

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-4 BM= 5521.17
DATE= 21 MAY 1977 TIME= PROBE NO= WL=39.39
REMARKS=

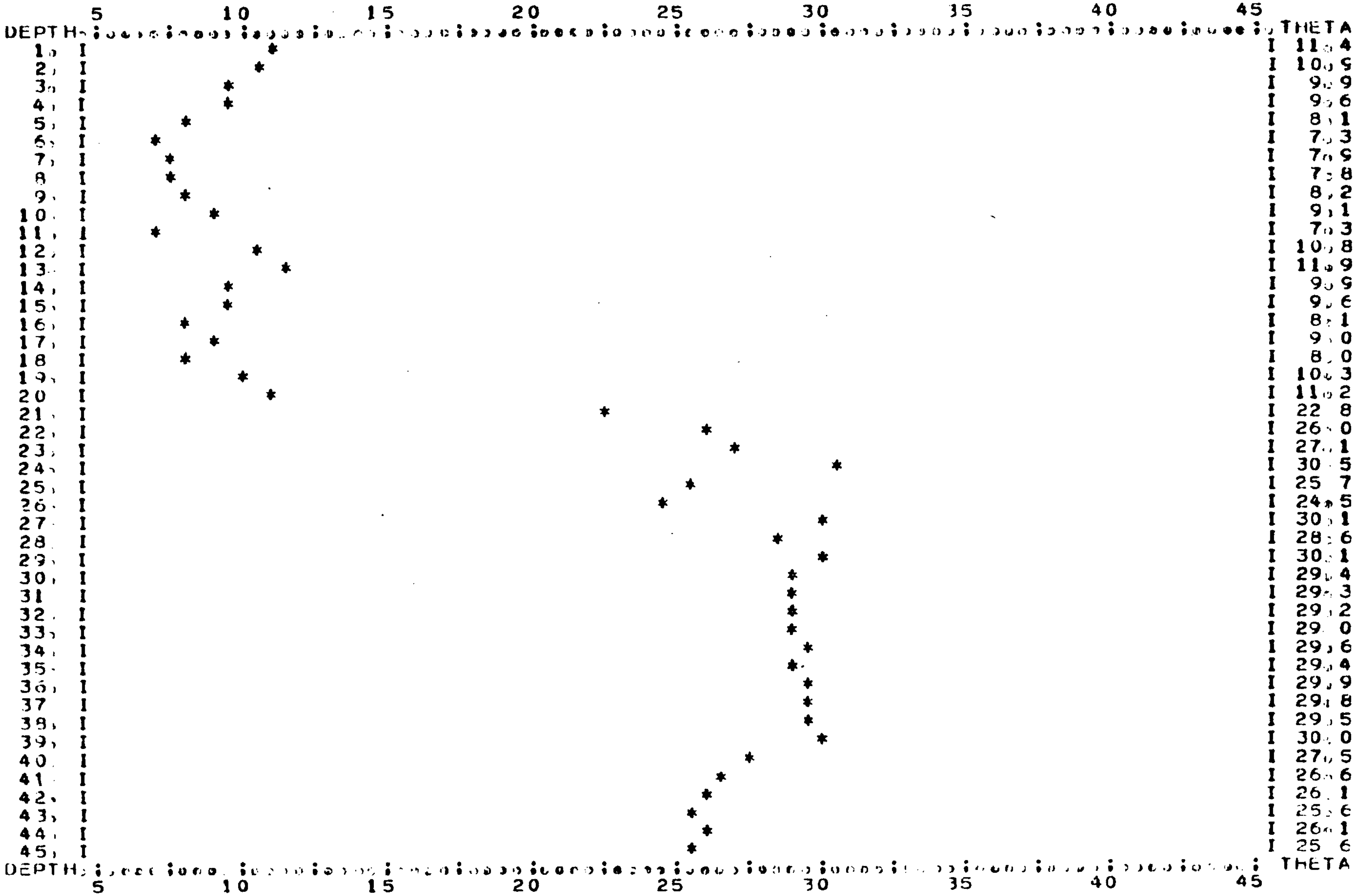
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
1.	9.3
2.	9.4
3.	9.1
4.	6.3
5.	7.8
6.	7.1
7.	6.2
8.	7.7
9.	6.4
10.	6.8
11.	7.2
12.	8.8
13.	7.3
14.	8.1
15.	7.1
16.	7.6
17.	7.9
18.	9.3
19.	9.6
20.	11.2
21.	16.7
22.	16.8
23	19.7
24.	23.8
25.	24.0
26.	23.1
27.	23.8
28.	21.3
29.	21.7
30.	21.7
31.	22.2
32.	22.2
33.	21.8
34.	23.3
35.	22.3
36.	23.7
37.	29.0
38.	28.8
39.	28.8
40.	29.1
41.	28.8
42.	28.5
43.	26.3
44.	26.3
45.	23.7
46.	23.8

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-5      BM= 5521.13
DATE=  21 MAY 1977    TIME=1500      PROBE NO=          WL=22.45
REMARKS=

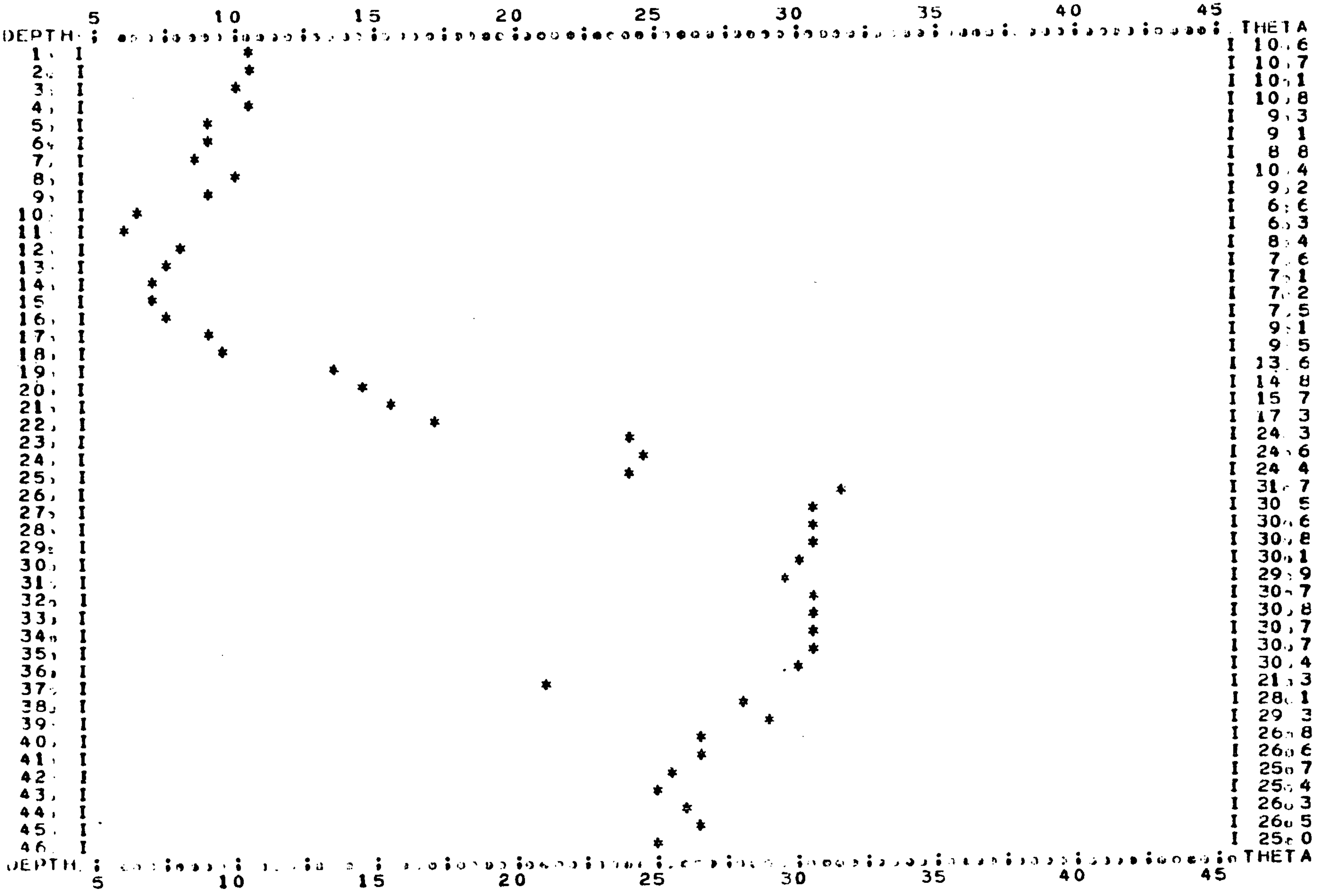
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1.	11.4
2.	10.9
3.	9.9
4.	9.6
5.	8.1
6.	7.3
7.	7.9
8	7.8
9.	8.2
10.	9.1
11.	7.3
12.	10.8
13.	11.9
14.	9.9
15.	9.6
16.	8.1
17.	9.0
18	8.0
19.	10.3
20	11.2
21.	22.8
22.	26.0
23.	27.1
24.	30.5
25.	25.7
26.	24.5
27	30.1
28	28.6
29.	30.1
30.	29.4
31	29.3
32.	29.2
33.	29.0
34.	29.6
35.	29.4
36.	29.9
37	29.8
38.	29.5
39.	30.0
40	27.5
41	26.6
42.	26.1
43.	25.6
44.	26.1
45.	25.6

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU        HOLE ID=NP-6        BM= 5520.94
DATE=    21 MAY 1977   TIME=1400       PROBE NO=           WL=28.23
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN,
```



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AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-7      BM= 5520.97
DATE= 21 MAY 1977     TIME=           PROBE NO=          WL=29.455
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.

      5        10        15        20        25        30        35        40        45
DEPTH.:.........:.........:.........:.........:.........:.........:.........:.........:.THETA
  1. I            *                                                                    I 11.1
  2. I            *                                                                    I 11.2
  3. I              *                                                                  I 12.1
  4. I             *                                                                   I 11.6
  5. I            *                                                                    I 10.9
  6. I          *                                                                      I  9.8
  7. I       *                                                                         I  8.7
  8. I       *                                                                         I  8.6
  9. I  *                                                                              I  6.1
 10. I  *                                                                              I  6.1
 11. I        *                                                                        I  8.8
 12. I      *                                                                          I  8.0
 13. I        *                                                                        I  9.1
 14  I    *                                                                            I  6.9
 15. I     *                                                                           I  7.3
 16. I         *                                                                       I  9.4
 17. I           *                                                                     I 10.3
 18. I              *                                                                  I 12.2
 19. I                      *                                                          I 15.8
 20. I                     *                                                           I 15.7
 21  I                       *                                                         I 16.5
 22. I                       *                                                         I 16.7
 23. I                     *                                                           I 15.6
 24. I                                   *                                             I 22.5
 25. I                                   *                                             I 22.6
 26. I                                  *                                              I 22.2
 27. I                                     *                                           I 23.6
 28. I                                                *                                I 29.1
 29. I                                                *                                I 29.0
 30. I                                               *                                 I 28.3
 31. I                                              *                                  I 27.9
 32  I                                                *                                I 29.0
 33. I                                              *                                  I 28.1
 34. I                                                  *                              I 29.9
 35  I                                                *                                I 29.2
 36. I                                            *                                    I 27.0
 37. I                             *                                                   I 19.6
 38. I                                         *                                       I 25.4
 39. I                                         *                                       I 25.7
 40. I                                         *                                       I 25.3
 41. I                                        *                                        I 25.2
 42  I                                          *                                      I 25.8
 43. I                                         *                                       I 25.7
 44. I                                         *                                       I 25.7
 45. I                                        *                                        I 25.1
 46. I                                         *                                       I 25.4
DEPTH.:.........:.........:.........:.........:.........:.........:.........:.........:.THETA
      5        10        15        20        25        30        35        40        45
```
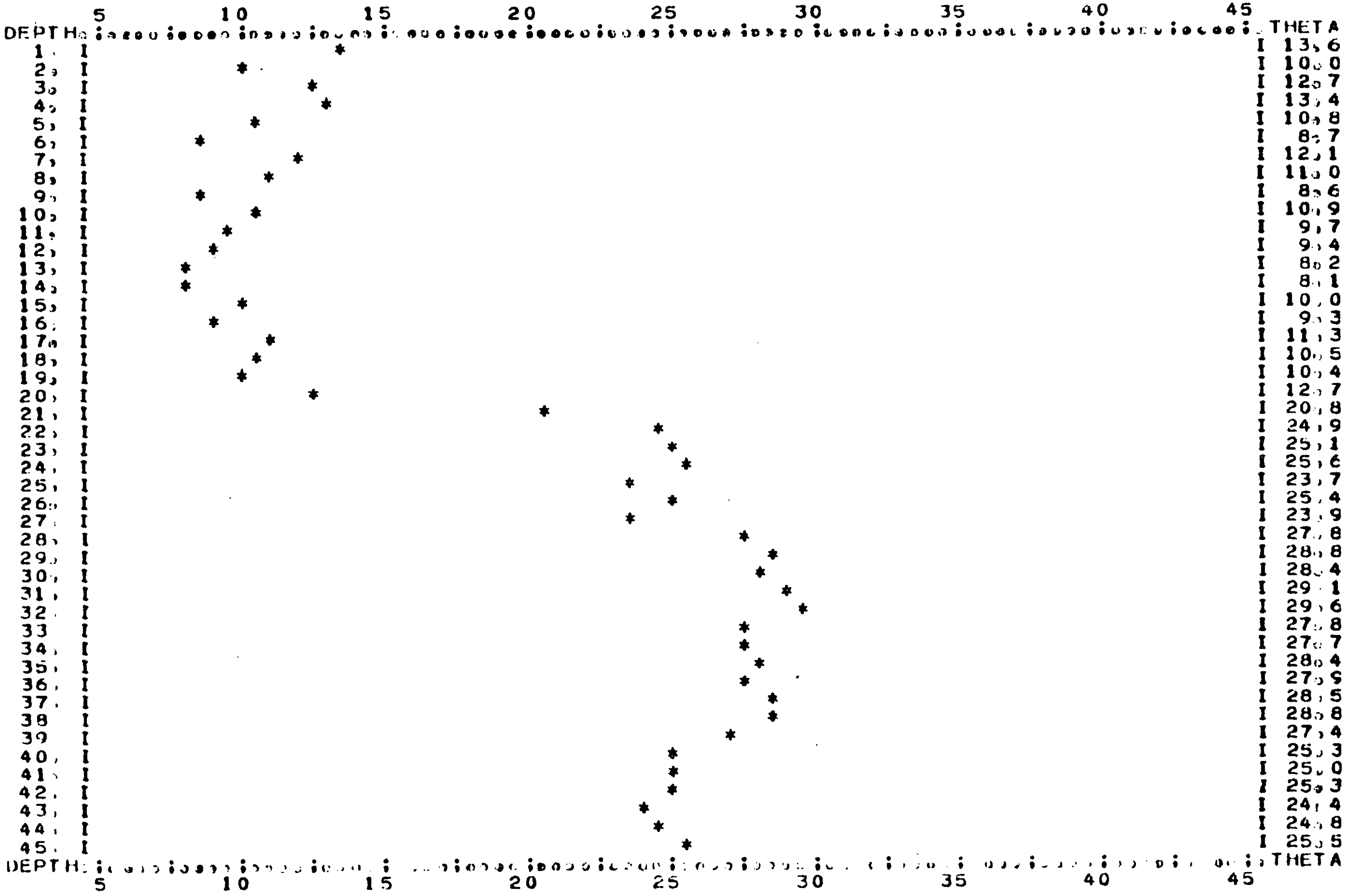
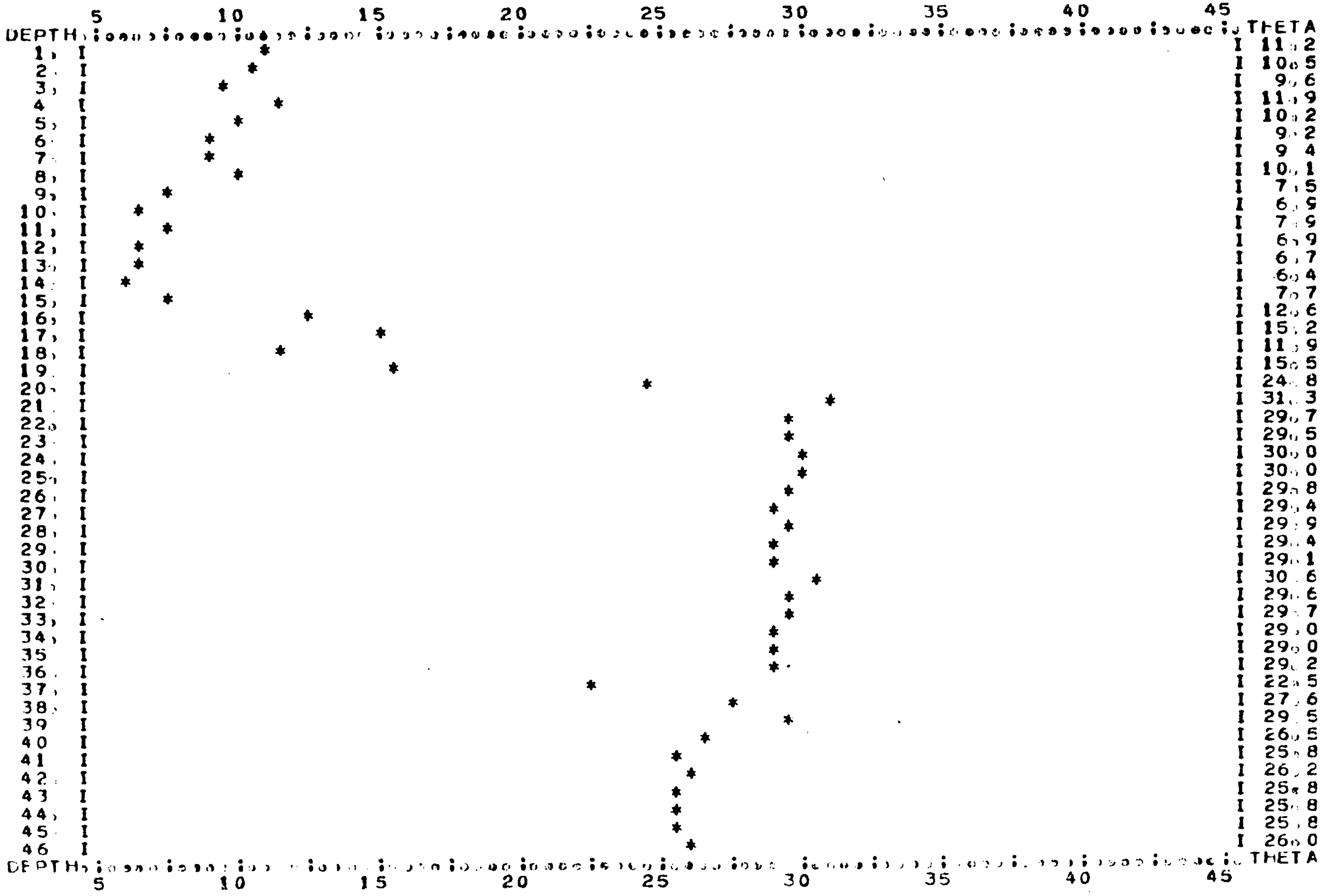

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-8 BM= 5521.29
DATE= 21 MAY 1977 TIME= PROBE NO= WL=23.105
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
1.	13.6
2.	10.0
3.	12.7
4.	13.4
5.	10.8
6.	8.7
7.	12.1
8.	11.0
9.	8.6
10.	10.9
11.	9.7
12.	9.4
13.	8.2
14.	8.1
15.	10.0
16.	9.3
17.	11.3
18.	10.5
19.	10.4
20.	12.7
21.	20.8
22.	24.9
23.	25.1
24.	25.6
25.	23.7
26.	25.4
27.	23.9
28.	27.8
29.	28.8
30.	28.4
31.	29.1
32.	29.6
33	27.8
34.	27.7
35.	28.4
36.	27.9
37.	28.5
38	28.8
39	27.4
40.	25.3
41.	25.0
42.	25.3
43.	24.4
44.	24.8
45.	25.5

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU       HOLE ID=NP-9       BM= 5520.90
DATE= 21 MAY 1977     TIME=1230       PROBE NO=            WL=21.405
FEMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



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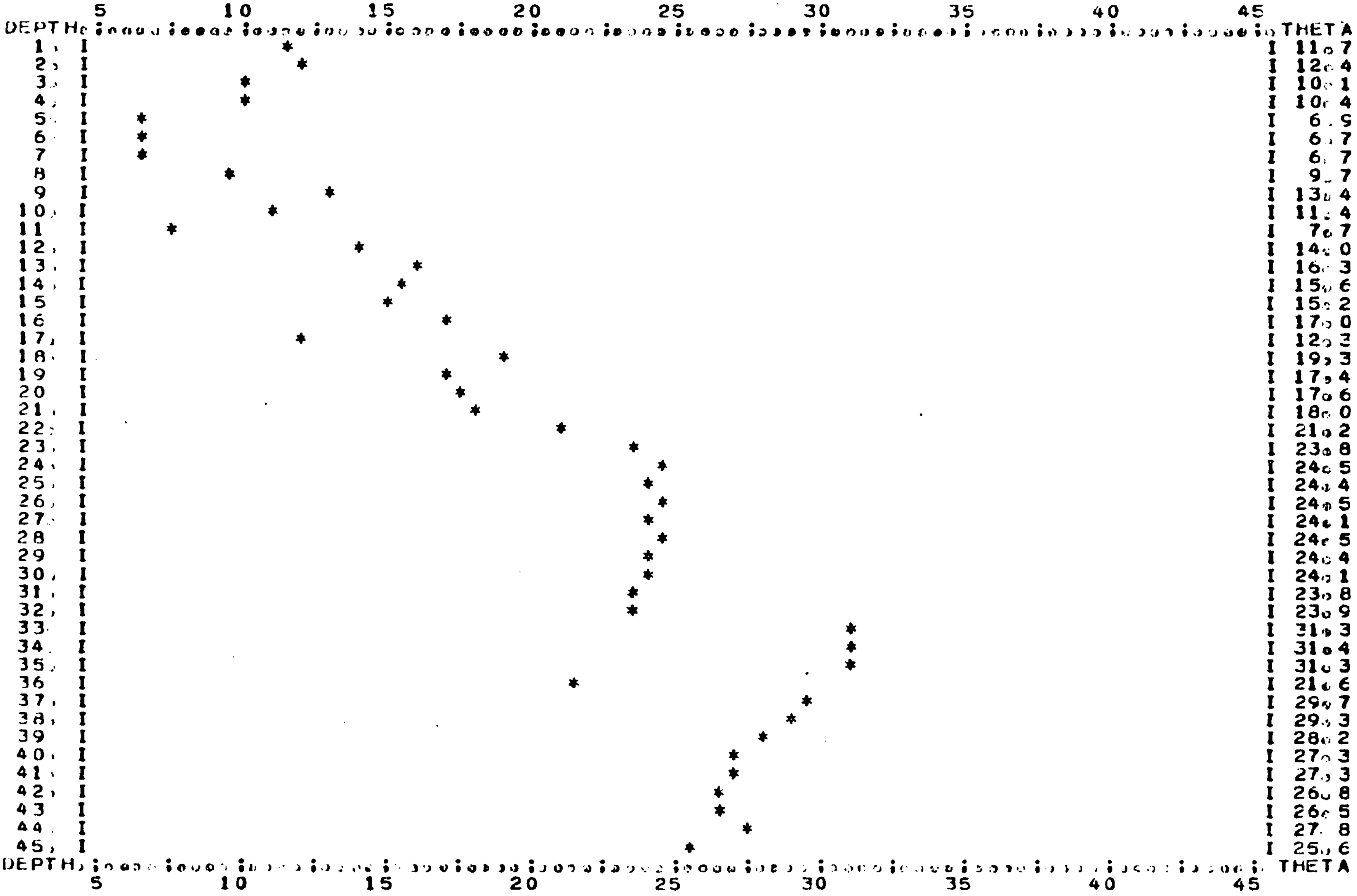
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-1       BM= 5521.82
DATE= 14 JULY 1977    TIME=1440      PROBE NO=          WL=
REMARKS=

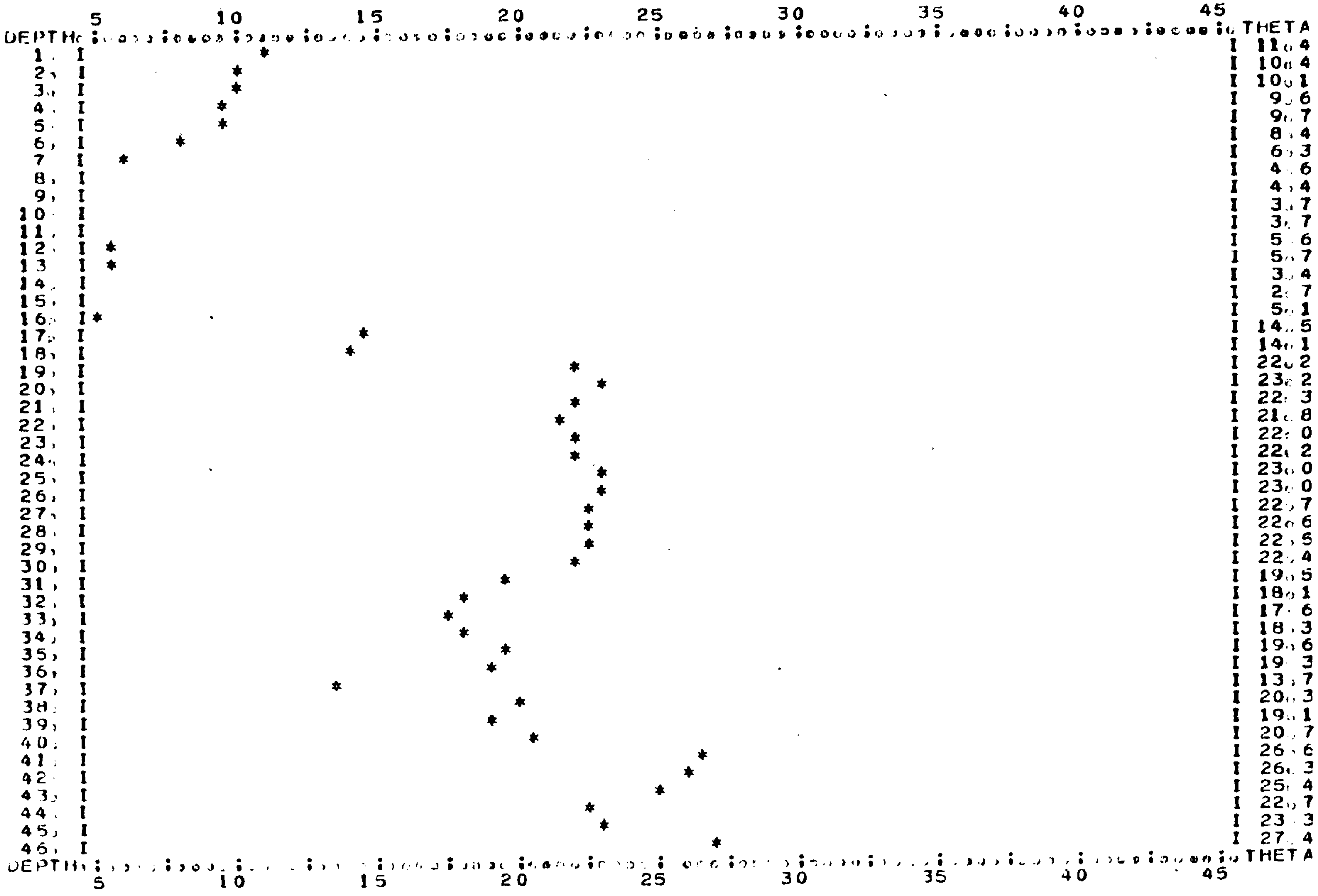
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1	11.7
2	12.4
3	10.1
4	10.4
5	6.9
6	6.7
7	6.7
8	9.7
9	13.4
10	11.4
11	7.7
12	14.0
13	16.3
14	15.6
15	15.2
16	17.0
17	12.3
18	19.3
19	17.4
20	17.6
21	18.0
22	21.2
23	23.8
24	24.5
25	24.4
26	24.5
27	24.1
28	24.5
29	24.4
30	24.1
31	23.8
32	23.9
33	31.3
34	31.4
35	31.3
36	21.6
37	29.7
38	29.3
39	28.2
40	27.3
41	27.3
42	26.8
43	26.5
44	27.8
45	25.6

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-2 BM= 5520.67
DATE= 14 JULY 1977 TIME=1600 PROBE NO= WL=
REMARKS=

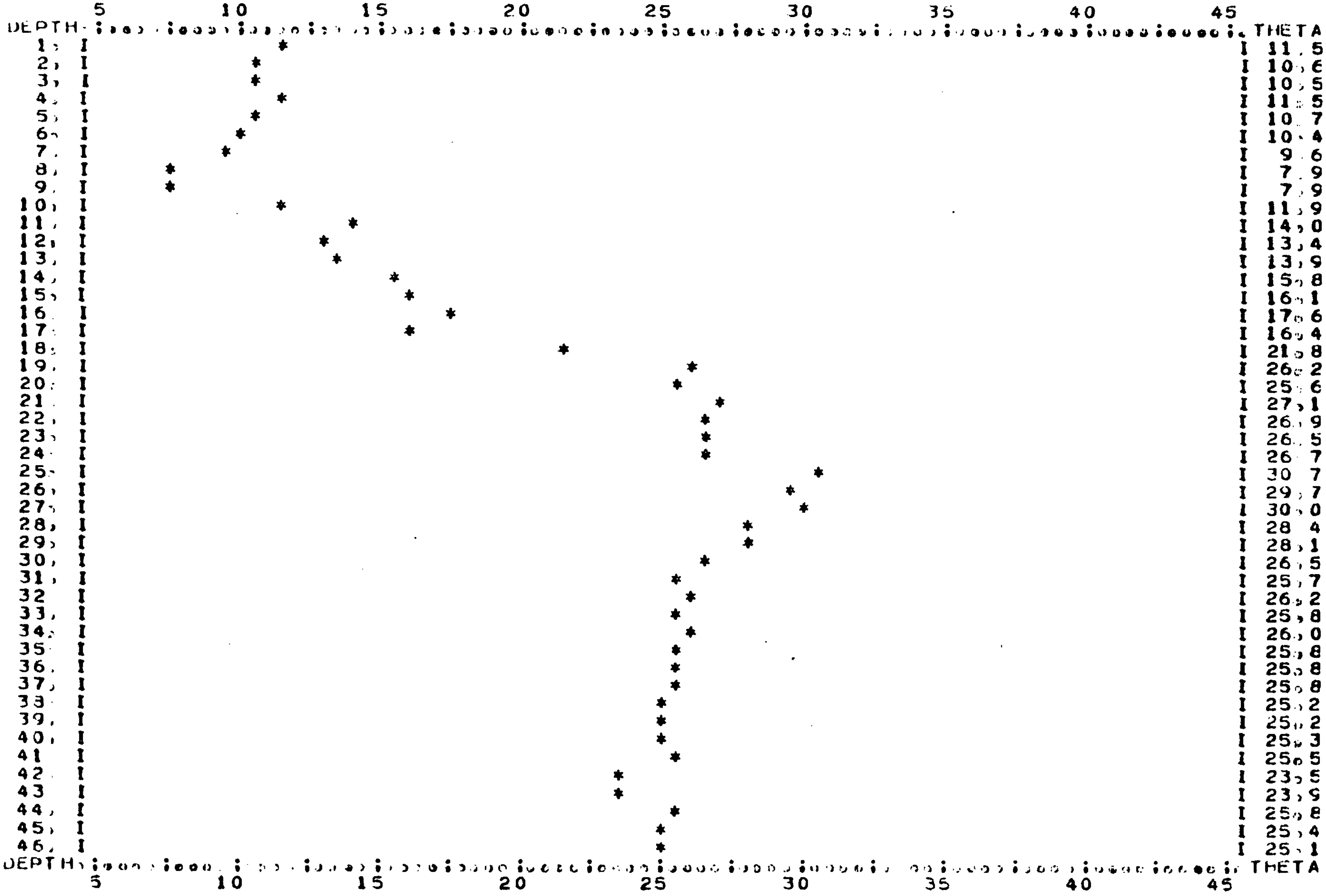
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
1.	11.4
2.	10.4
3.	10.1
4.	9.6
5.	9.7
6.	8.4
7	6.3
8.	4.6
9.	4.4
10.	3.7
11.	3.7
12.	5.6
13	5.7
14.	3.4
15.	2.7
16.	5.1
17.	14.5
18.	14.1
19.	22.2
20.	23.2
21.	22.3
22.	21.8
23.	22.0
24.	22.2
25.	23.0
26.	23.0
27.	22.7
28.	22.6
29.	22.5
30.	22.4
31.	19.5
32.	18.1
33.	17.6
34.	18.3
35.	19.6
36.	19.3
37.	13.7
38.	20.3
39.	19.1
40.	20.7
41.	26.6
42.	26.3
43.	25.4
44.	22.7
45.	23.3
46.	27.4

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-3      BM= 5521-13
DATE= 14 JULY 1977   TIME=1535      PROBE NO=         WL=
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1	11.5
2	10.6
3	10.5
4	11.5
5	10.7
6	10.4
7	9.6
8	7.9
9	7.9
10	11.9
11	14.0
12	13.4
13	13.9
14	15.8
15	16.1
16	17.6
17	16.4
18	21.8
19	26.2
20	25.6
21	27.1
22	26.9
23	26.5
24	26.7
25	30.7
26	29.7
27	30.0
28	28.4
29	28.1
30	26.5
31	25.7
32	26.2
33	25.8
34	26.0
35	25.8
36	25.8
37	25.8
38	25.2
39	25.2
40	25.3
41	25.5
42	23.5
43	23.9
44	25.8
45	25.4
46	25.1

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AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-4      BM= 5521.17
DATE=  14 JULY 1977  TIME=            PROBE NO=          WL=
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```
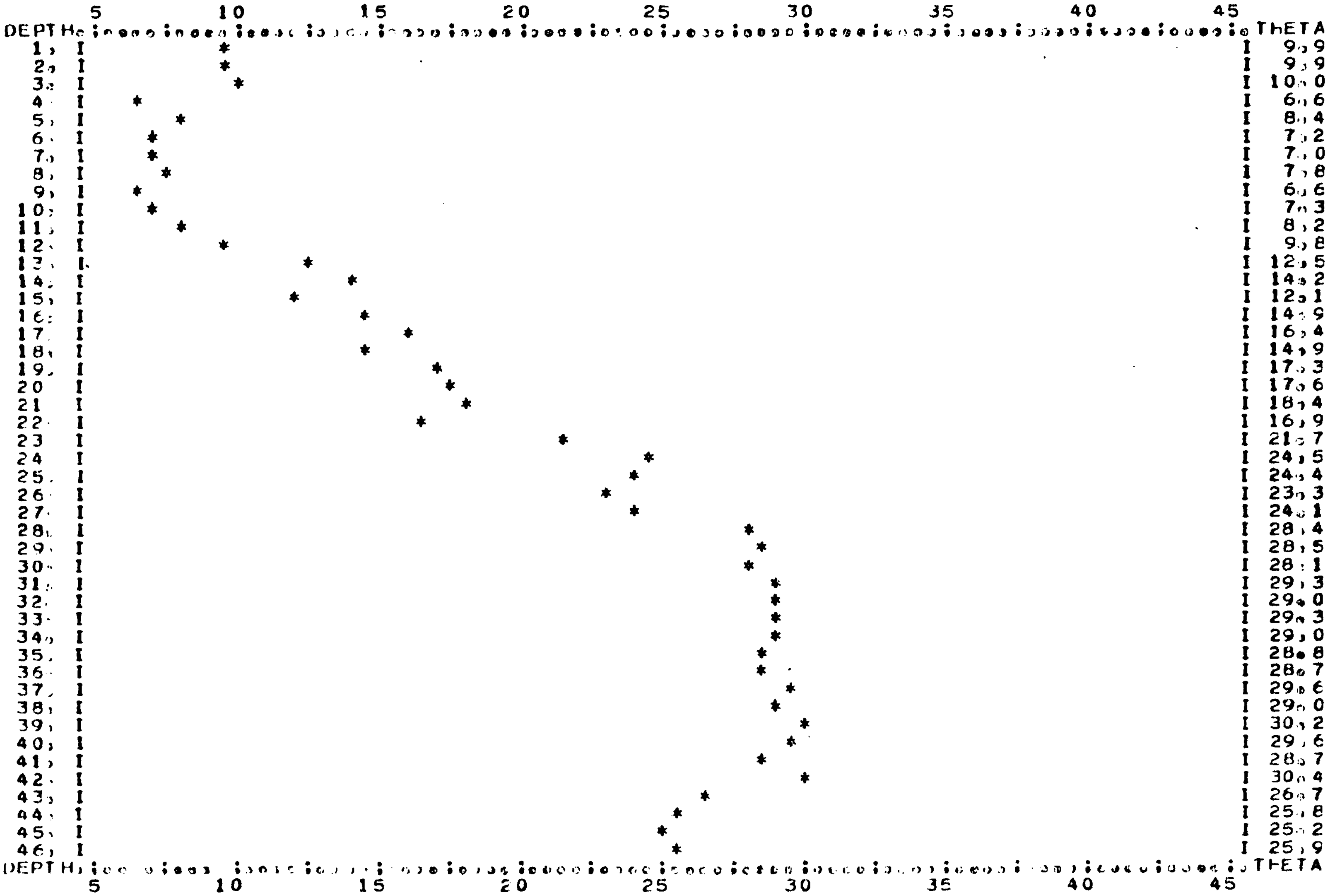
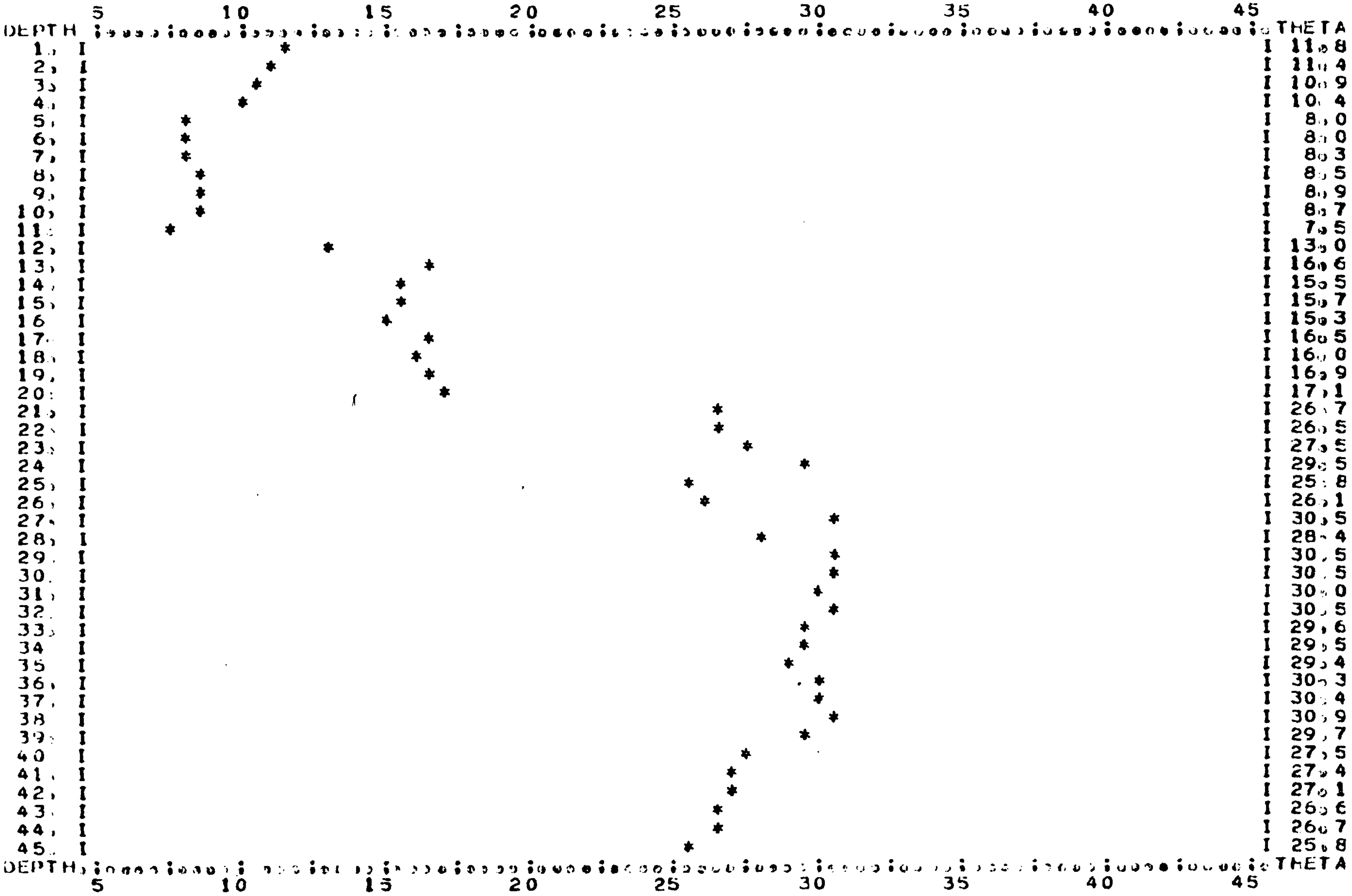



```
DEPTH  THETA
  1.   9.9
  2.   9.9
  3.  10.0
  4    6.6
  5.   8.4
  6.   7.2
  7.   7.0
  8.   7.8
  9.   6.6
 10.   7.3
 11.   8.2
 12.   9.8
 13.  12.5
 14.  14.2
 15.  12.1
 16.  14.9
 17.  16.4
 18.  14.9
 19.  17.3
 20   17.6
 21   18.4
 22   16.9
 23   21.7
 24   24.5
 25.  24.4
 26   23.3
 27   24.1
 28.  28.4
 29.  28.5
 30.  28.1
 31.  29.3
 32.  29.0
 33.  29.3
 34.  29.0
 35.  28.8
 36.  28.7
 37.  29.6
 38.  29.0
 39.  30.2
 40.  29.6
 41.  28.7
 42.  30.4
 43.  26.7
 44.  25.8
 45.  25.2
 46.  25.9
```

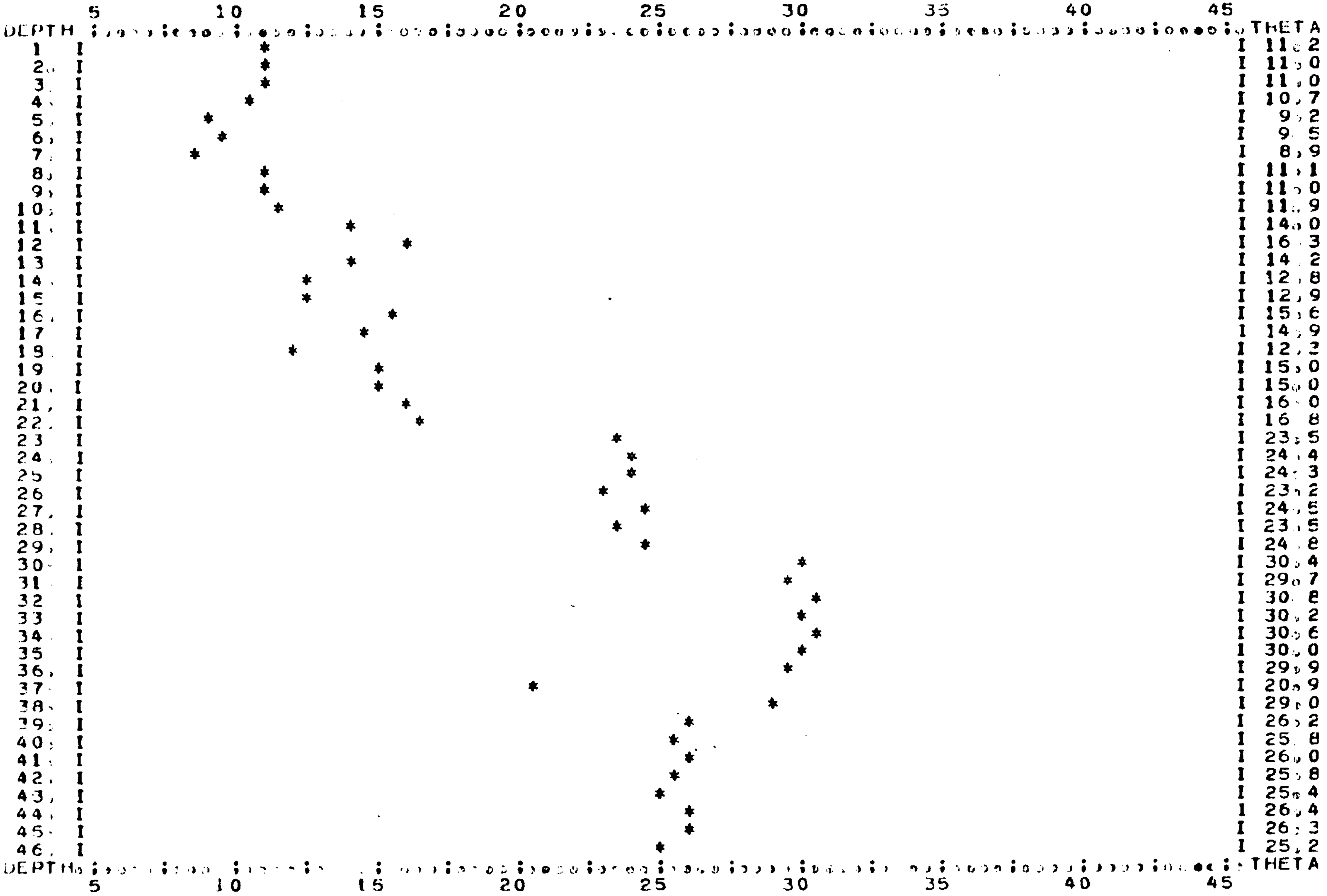
```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-5      BM= 5521.13
DATE=   14 JULY 1977 TIME=1435     PROBE NO=          WL=
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1.	11.8
2.	11.4
3.	10.9
4.	10.4
5.	8.0
6.	8.0
7.	8.3
8.	8.5
9.	8.9
10.	8.7
11.	7.5
12.	13.0
13.	16.6
14.	15.5
15.	15.7
16	15.3
17.	16.5
18.	16.0
19.	16.9
20.	17.1
21.	26.7
22.	26.5
23.	27.5
24	29.5
25.	25.8
26.	26.1
27.	30.5
28.	28.4
29.	30.5
30.	30.5
31.	30.0
32.	30.5
33.	29.6
34	29.5
35	29.4
36.	30.3
37.	30.4
38	30.9
39.	29.7
40	27.5
41.	27.4
42.	27.1
43.	26.6
44.	26.7
45.	25.8

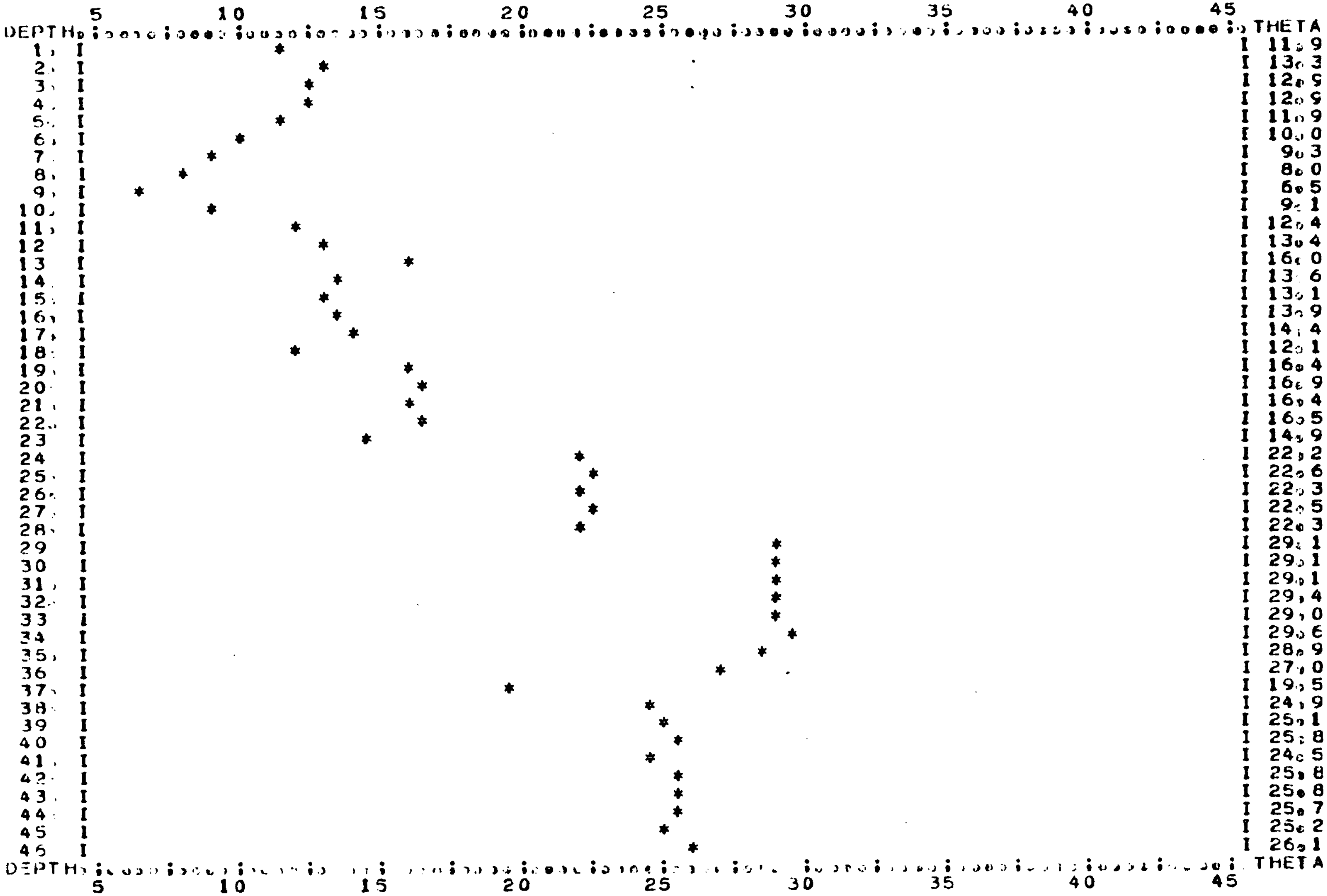
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-6 BM= 5520.94
DATE= 14 JULY 1977 TIME=1810 PROBE NO= WL=
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



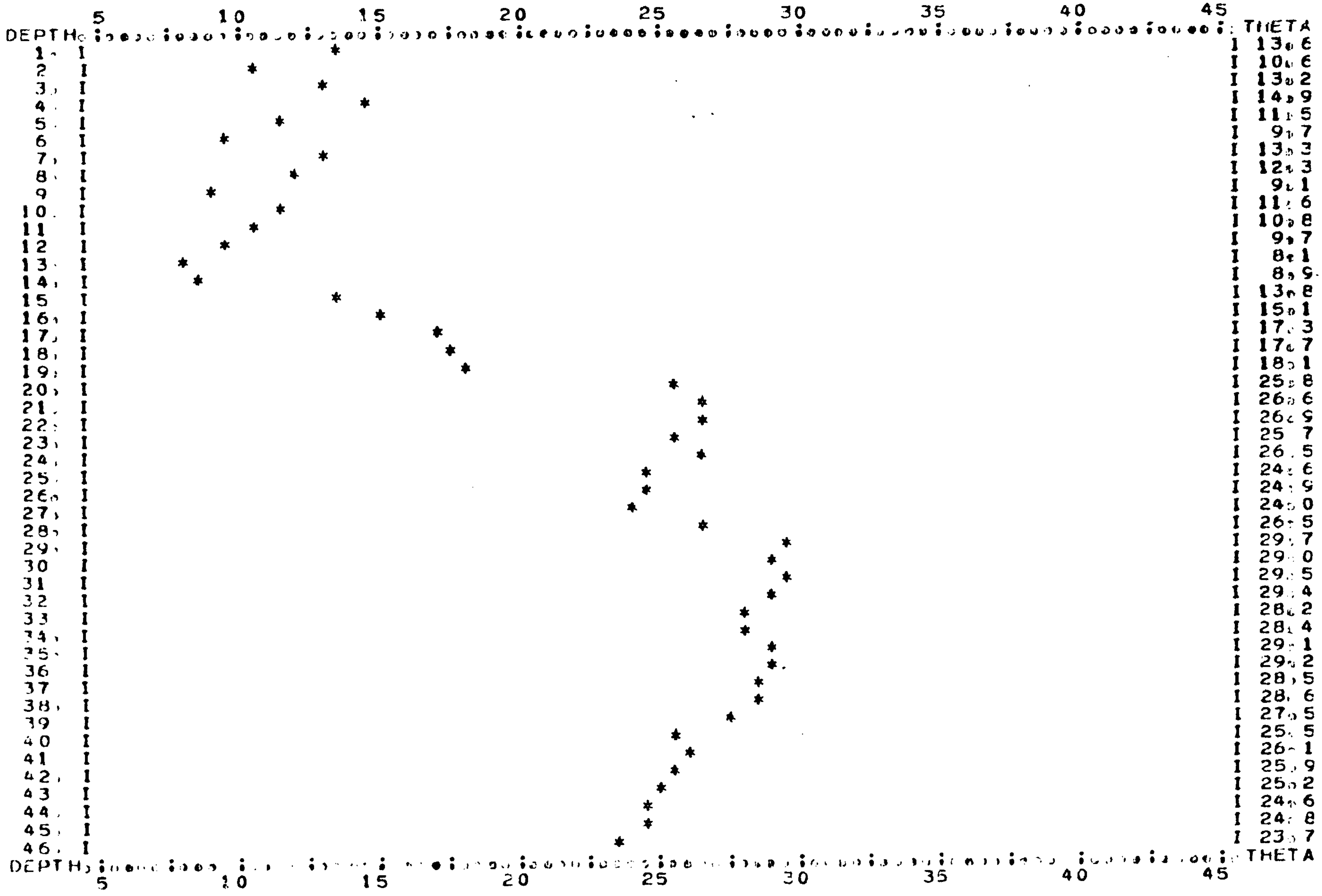
DEPTH	THETA
1	11.2
2	11.0
3	11.0
4	10.7
5	9.2
6	9.5
7	8.9
8	11.1
9	11.0
10	11.9
11	14.0
12	16.3
13	14.2
14	12.8
15	12.9
16	15.6
17	14.9
18	12.3
19	15.0
20	15.0
21	16.0
22	16.8
23	23.5
24	24.4
25	24.3
26	23.2
27	24.5
28	23.5
29	24.8
30	30.4
31	29.7
32	30.8
33	30.2
34	30.6
35	30.0
36	29.9
37	20.9
38	29.0
39	26.2
40	25.8
41	26.0
42	25.8
43	25.4
44	26.4
45	26.3
46	25.2

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-7       BM= 5520.97
DATE= 14 JULY 1977   TIME=1840       PROBE NO=          WL=
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



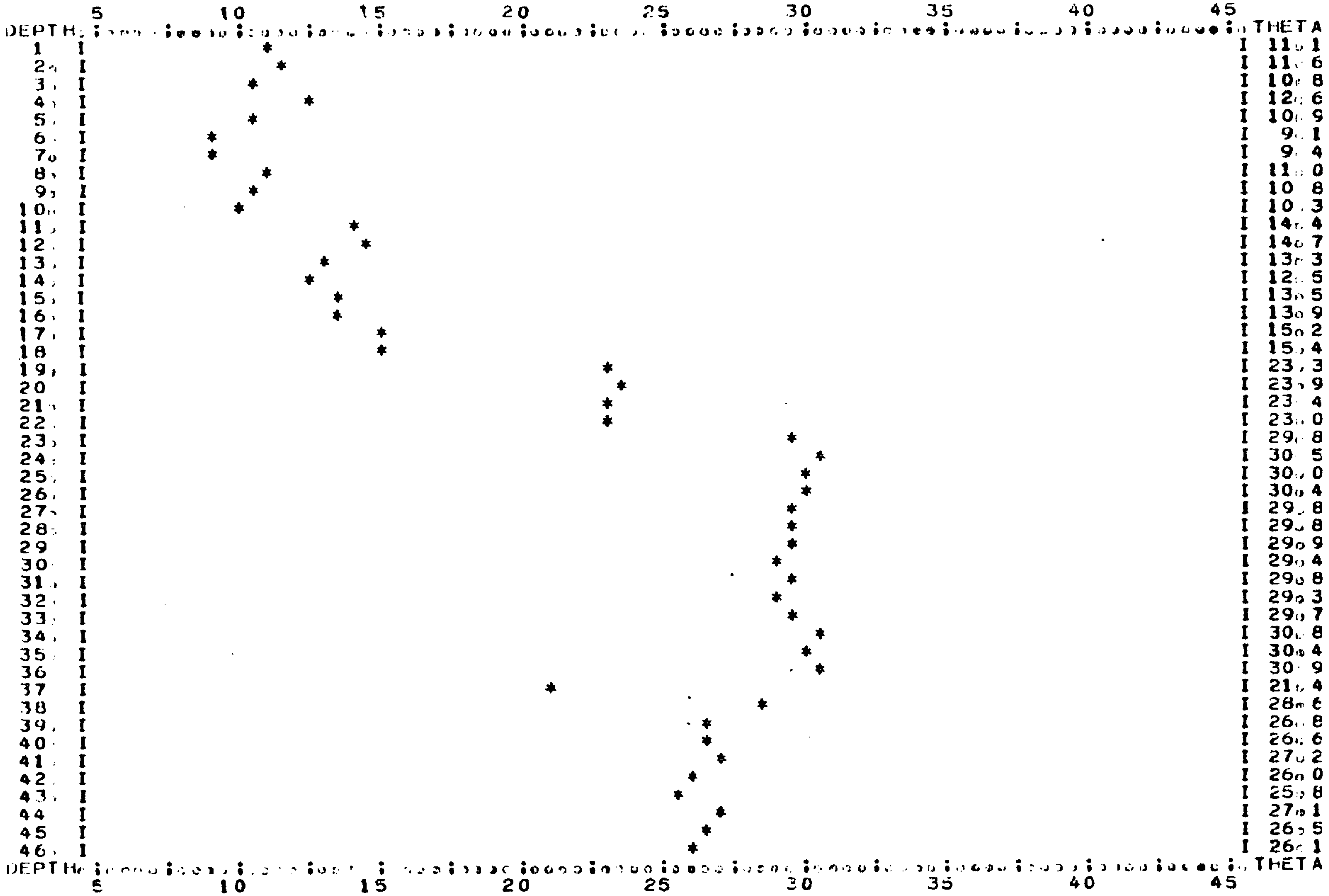
DEPTH	THETA
1	11.9
2	13.3
3	12.9
4	12.9
5	11.9
6	10.0
7	9.3
8	8.0
9	6.5
10	9.1
11	12.4
12	13.4
13	16.0
14	13.6
15	13.1
16	13.9
17	14.4
18	12.1
19	16.4
20	16.9
21	16.4
22	16.5
23	14.9
24	22.2
25	22.6
26	22.3
27	22.5
28	22.3
29	29.1
30	29.1
31	29.1
32	29.4
33	29.0
34	29.6
35	28.9
36	27.0
37	19.5
38	24.9
39	25.1
40	25.8
41	24.5
42	25.8
43	25.8
44	25.7
45	25.2
46	26.1

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-8      BM= 5521.29
DATE=  14 JULY 1977  TIME=1400       PROBE NO=           WL=
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



1	13.6
2	10.6
3	13.2
4	14.9
5	11.5
6	9.7
7	13.3
8	12.3
9	9.1
10	11.6
11	10.8
12	9.7
13	8.1
14	8.9
15	13.8
16	15.1
17	17.3
18	17.7
19	18.1
20	25.8
21	26.6
22	26.9
23	25.7
24	26.5
25	24.6
26	24.9
27	24.0
28	26.5
29	29.7
30	29.0
31	29.5
32	29.4
33	28.2
34	28.4
35	29.1
36	29.2
37	28.5
38	28.6
39	27.5
40	25.5
41	26.1
42	25.9
43	25.2
44	24.6
45	24.8
46	23.7

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-9       BM= 5520.90
DATE=  14 JULY 1977   TIME=1330       PROBE NO=           WL=
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN)
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



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AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTUPE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-1       BM= 5521.82
DATE= 18 SEPT 1977    TIME=1600      PROBE NO=          WL=39.88
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.

      5         10        15        20        25        30        35        40        45
DEPTH I.........I.........I.........I.........I.........I.........I.........I.........I THETA
  1.  I               *                                                               I  13.2
  2.  I            *                                                                  I  11.5
  3.  I              *                                                                I  12.6
  4.  I          *                                                                    I  10.3
  5.  I       *                                                                       I   9.1
  6.  I  *                                                                            I   6.4
  7.  I  *                                                                            I   6.3
  8.  I    *                                                                          I   7.4
  9.  I          *                                                                    I  10.4
 10.  I               *                                                               I  12.9
 11.  I            *                                                                  I  11.4
 12.  I     *                                                                         I   8.1
 13.  I                  *                                                            I  14.5
 14.  I                     *                                                         I  16.0
 15.  I                   *                                                           I  14.9
 16.  I                   *                                                           I  14.8
 17.  I                     *                                                         I  16.0
 18.  I          *                                                                    I  10.7
 19.  I                          *                                                    I  18.7
 20.  I                        *                                                      I  17.3
 21.  I                      *                                                        I  16.4
 22.  I                          *                                                    I  18.7
 23.  I                                 *                                             I  22.2
 24.  I                                   *                                           I  22.8
 25.  I                                   *                                           I  22.7
 26.  I                                   *                                           I  22.9
 27.  I                                   *                                           I  22.6
 28.  I                                    *                                          I  23.2
 29.  I                                   *                                           I  22.9
 30   I                                    *                                          I  23.2
 31.  I                                   *                                           I  22.9
 32.  I                                    *                                          I  23.0
 33.  I                                   *                                           I  22.9
 34   I                                   *                                           I  22 8
 35.  I                                   *                                           I  22.6
 36.  I                                 *                                             I  22.0
 37.  I                                 *                                             I  22.2
 38.  I                                               *                               I  29.2
 39   I                                             *                                 I  28.3
 40.  I                                           *                                   I  27.6
 41   I                                          *                                    I  26.9
 42   I                                         *                                     I  26.2
 43   I                                         *                                     I  26.4
 44   I                                        *                                      I  25.6
 45.  I                                           *                                   I  27.0
 26   I                                    *                                          I  23.2
DEPTH I.........I.........I.........I.........I.........I.........I.........I.........I THETA
      5         10        15        20        25        30        35        40        45
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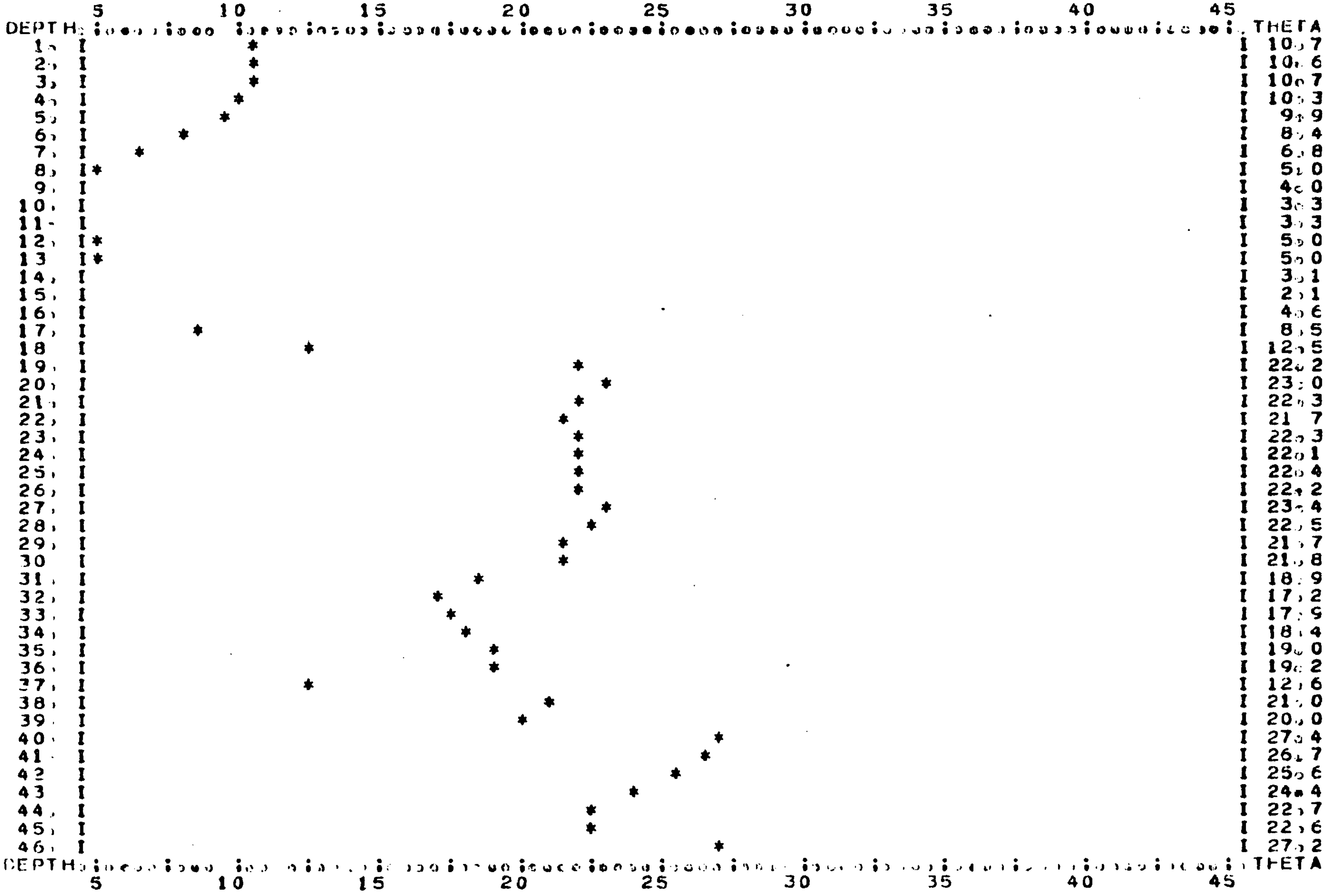
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-2      BM= 5520.67
DATE= 19 SEPT 1977    TIME=1500      PROBE NO=         WL=42.40
REMARKS=

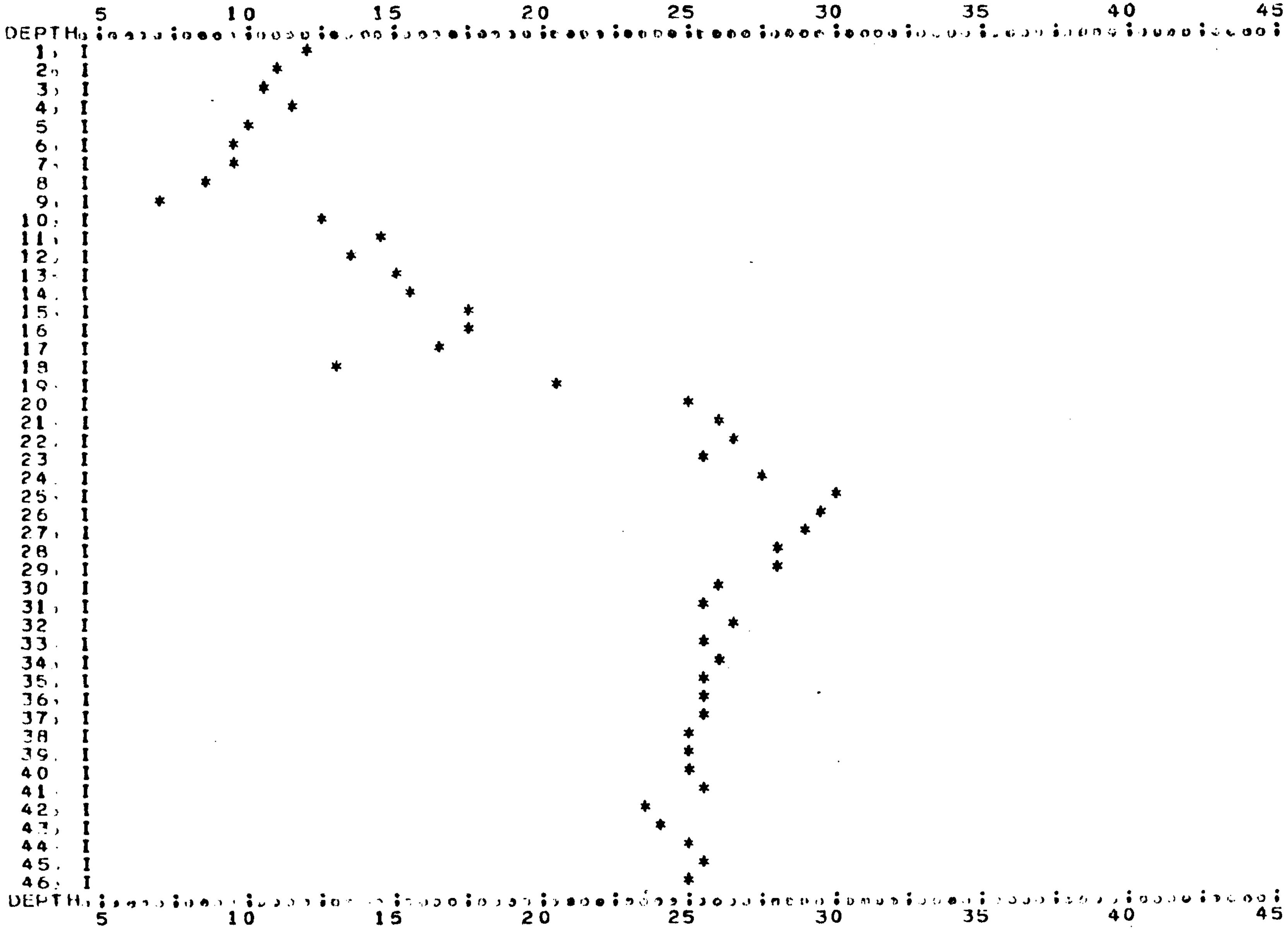
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1.	10.7
2.	10.6
3.	10.7
4.	10.3
5.	9.9
6.	8.4
7.	6.8
8.	5.0
9.	4.0
10.	3.3
11.	3.3
12.	5.0
13	5.0
14.	3.1
15.	2.1
16.	4.6
17.	8.5
18	12.5
19.	22.2
20.	23.0
21.	22.3
22.	21.7
23.	22.3
24.	22.1
25.	22.4
26.	22.2
27.	23.4
28.	22.5
29.	21.7
30	21.8
31.	18.9
32.	17.2
33.	17.9
34.	18.4
35.	19.0
36.	19.2
37.	12.6
38.	21.0
39.	20.0
40.	27.4
41.	26.7
42	25.6
43	24.4
44.	22.7
45.	22.6
46.	27.2

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-3       BM= 5521.13
DATE= 19 SEPT 1977    TIME=1700       PROBE NO=          WL=21.30
REMARKS=

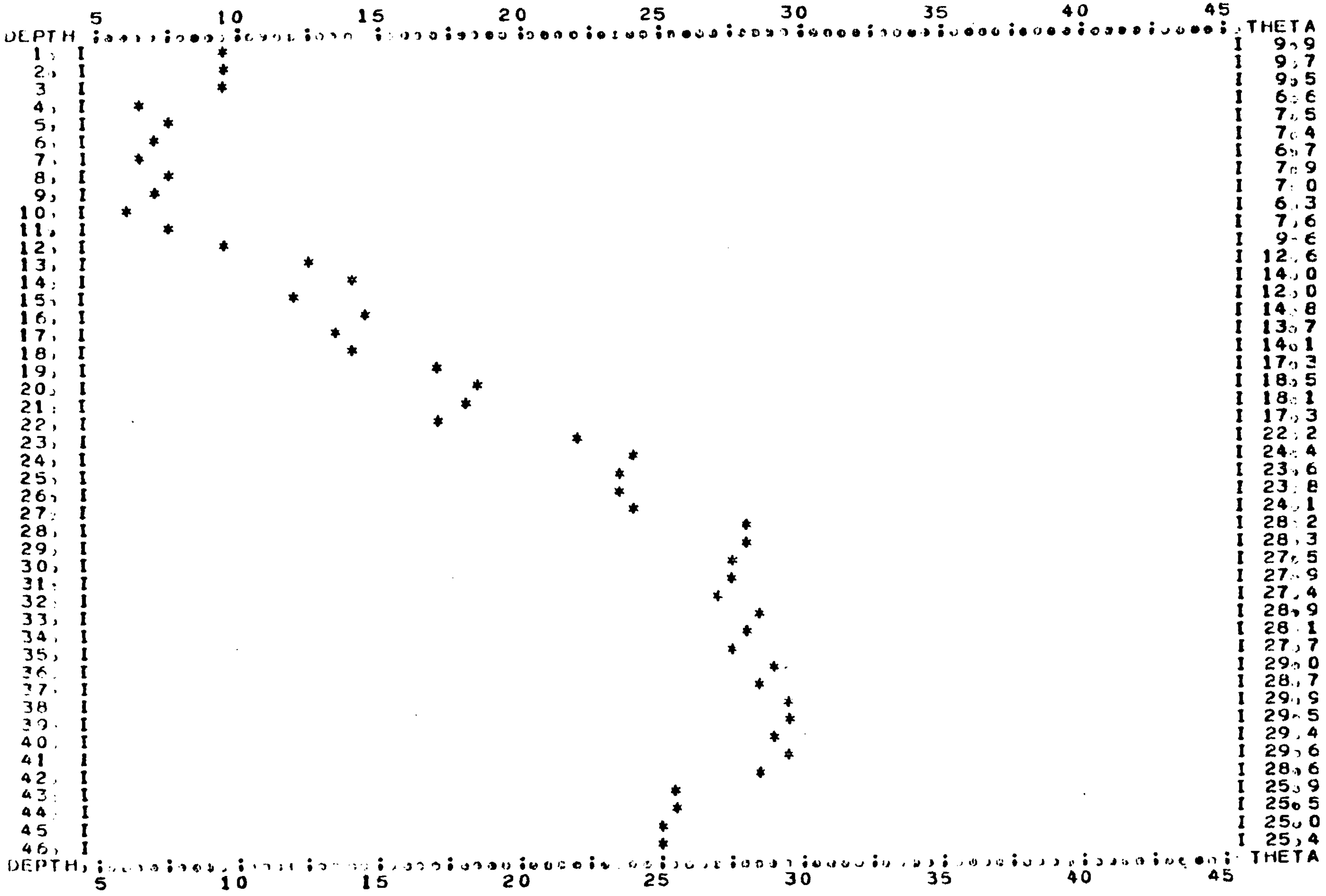
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1	12.1
2	11.4
3	10.9
4	11.6
5	10.3
6	9.9
7	9.8
8	8.7
9	7.4
10	12.8
11	14.8
12	13.9
13	15.2
14	15.6
15	17.8
16	17.5
17	16.5
18	13.3
19	20.7
20	25.0
21	26.4
22	26.8
23	25.8
24	27.5
25	30.1
26	29.6
27	29.4
28	28.2
29	28.2
30	26.1
31	25.8
32	26.7
33	25.8
34	26.3
35	25.8
36	25.9
37	25.7
38	25.3
39	25.1
40	25.4
41	25.7
42	23.7
43	24.4
44	25.2
45	25.6
46	25.0

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU   HOLE ID=NP-4   BM= 5521.17
DATE= 19 SEPT 1977   TIME=1420   PROBE NO=   WL=30.49
REMARKS=

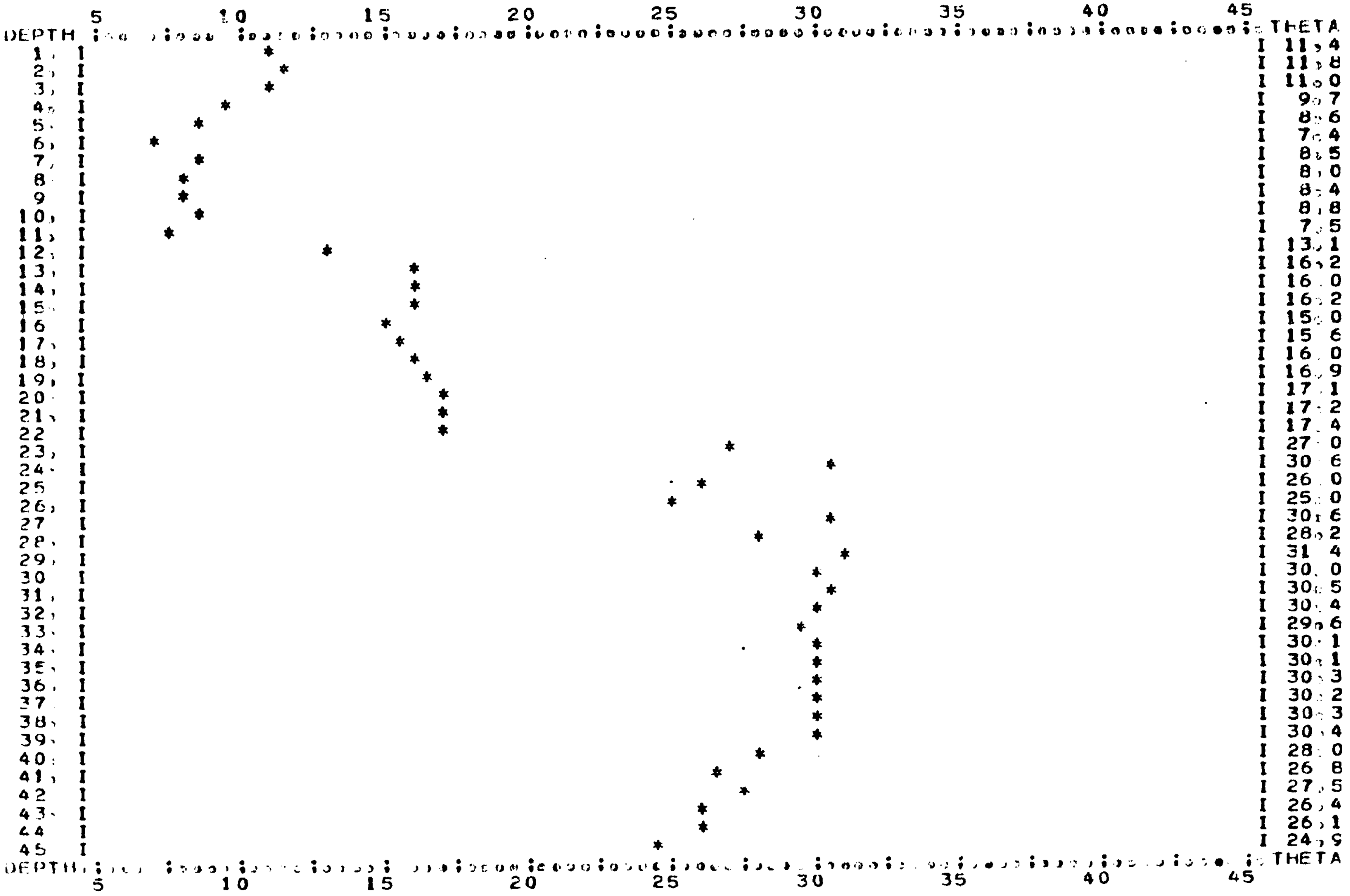
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
1.	9.9
2.	9.7
3	9.5
4.	6.6
5.	7.5
6.	7.4
7.	6.7
8.	7.9
9.	7.0
10.	6.3
11.	7.6
12.	9.6
13.	12.6
14.	14.0
15.	12.0
16.	14.8
17.	13.7
18.	14.1
19.	17.3
20.	18.5
21.	18.1
22.	17.3
23.	22.2
24.	24.4
25.	23.6
26.	23.8
27.	24.1
28.	28.2
29.	28.3
30.	27.5
31.	27.9
32.	27.4
33.	28.9
34.	28.1
35.	27.7
36.	29.0
37.	28.7
38	29.9
39.	29.5
40.	29.4
41	29.6
42.	28.6
43.	25.9
44.	25.5
45	25.0
46.	25.4

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-5 BM= 5521.13
DATE= 19 SEPT 1977 TIME=1740 PROBE NO= WL=24.95
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



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AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU       HOLE ID=NP-6       BM= 5520.94
DATE=  19 SEPT 1977  TIME=1310       PROBE NO=           WL=22.34
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```
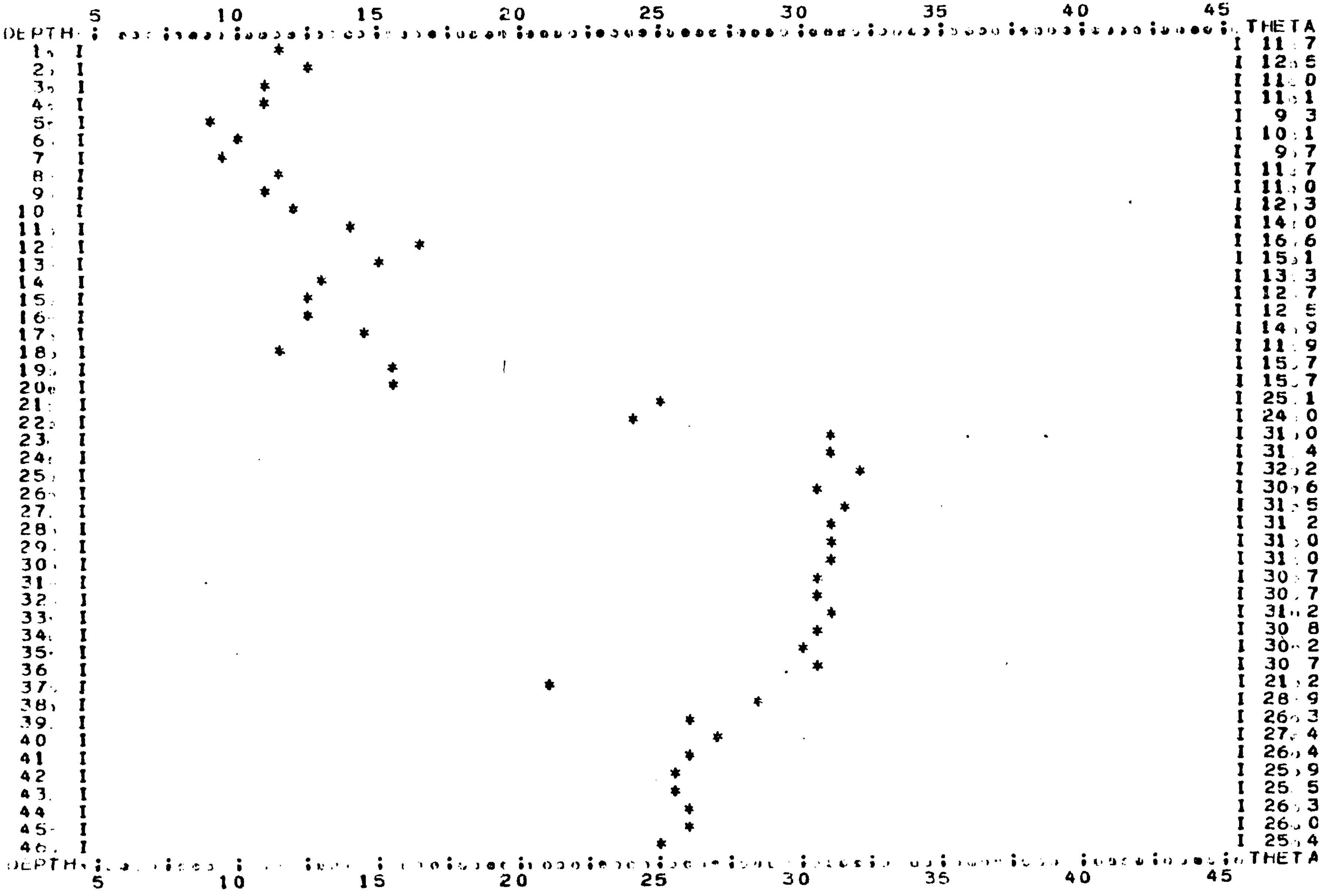
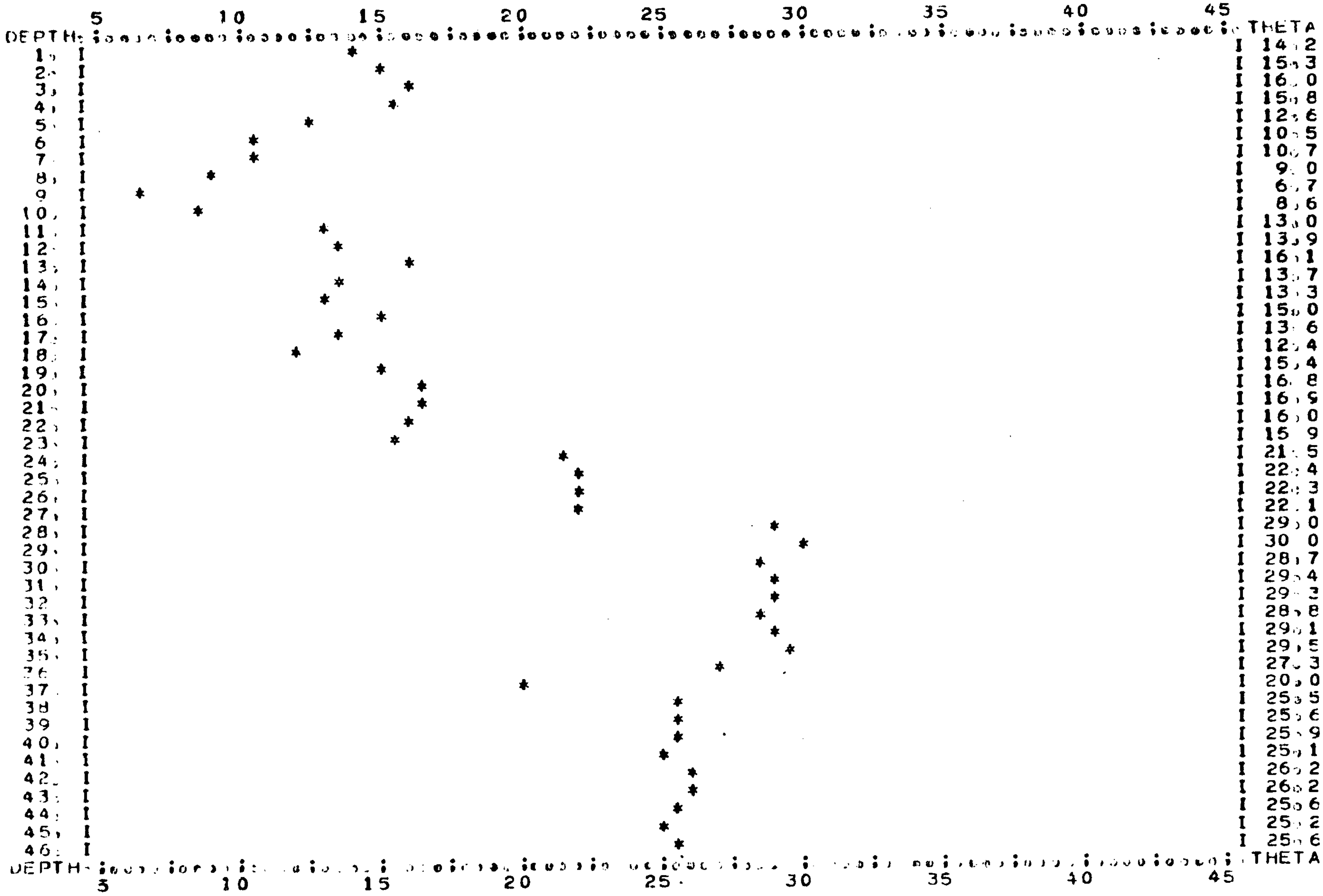



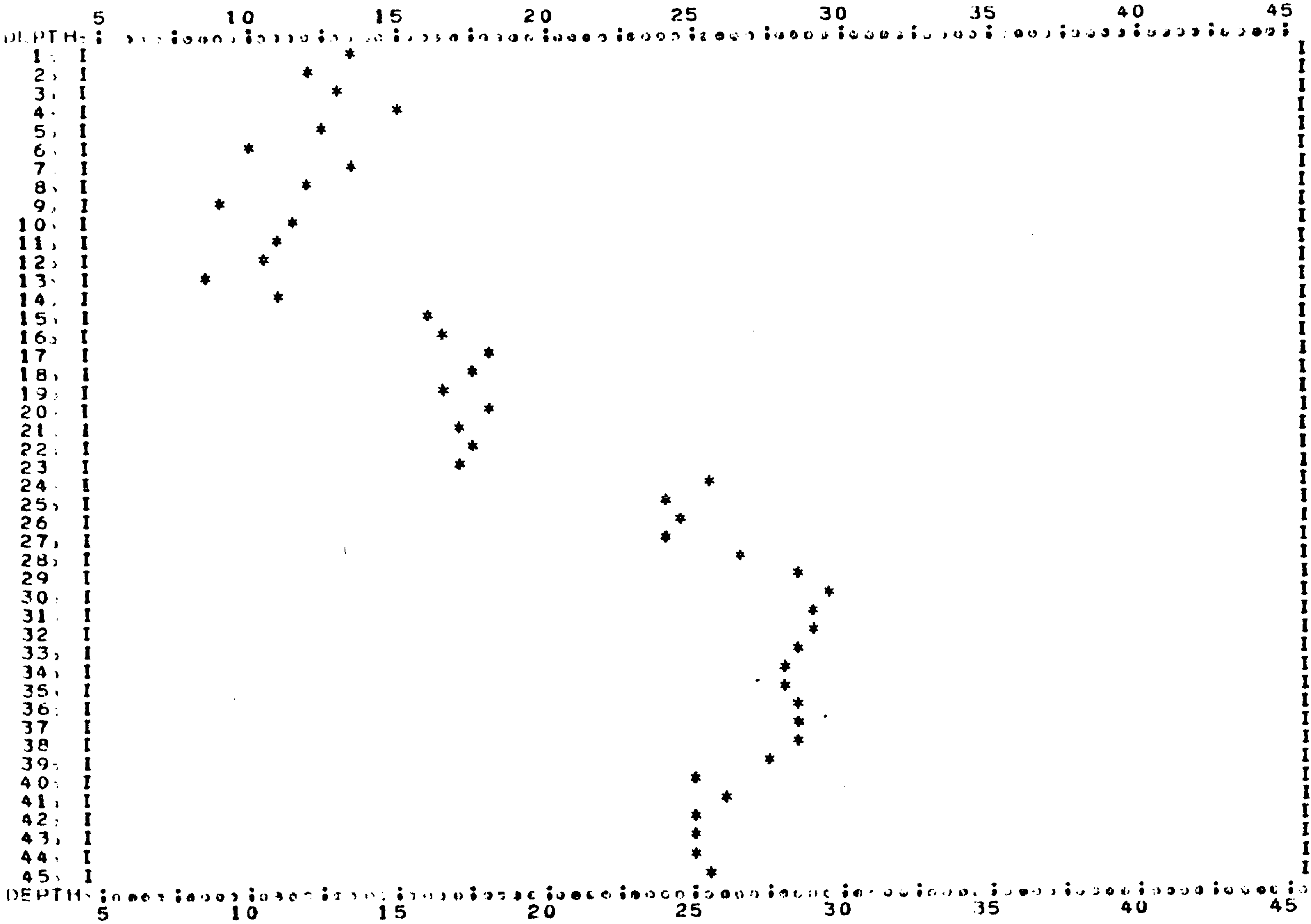
DEPTH	THETA
1	11.7
2	12.5
3	11.0
4	11.1
5	9.3
6	10.1
7	9.7
8	11.7
9	11.0
10	12.3
11	14.0
12	16.6
13	15.1
14	13.3
15	12.7
16	12.5
17	14.9
18	11.9
19	15.7
20	15.7
21	25.1
22	24.0
23	31.0
24	31.4
25	32.2
26	30.6
27	31.5
28	31.2
29	31.0
30	31.0
31	30.7
32	30.7
33	31.2
34	30.8
35	30.2
36	30.7
37	21.2
38	28.9
39	26.3
40	27.4
41	26.4
42	25.9
43	25.5
44	26.3
45	26.0
46	25.4

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-7       BM= 5520.97
DATE=  19 SEPT 1977  TIME=1235      PROBE NO=          WL=30.53
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



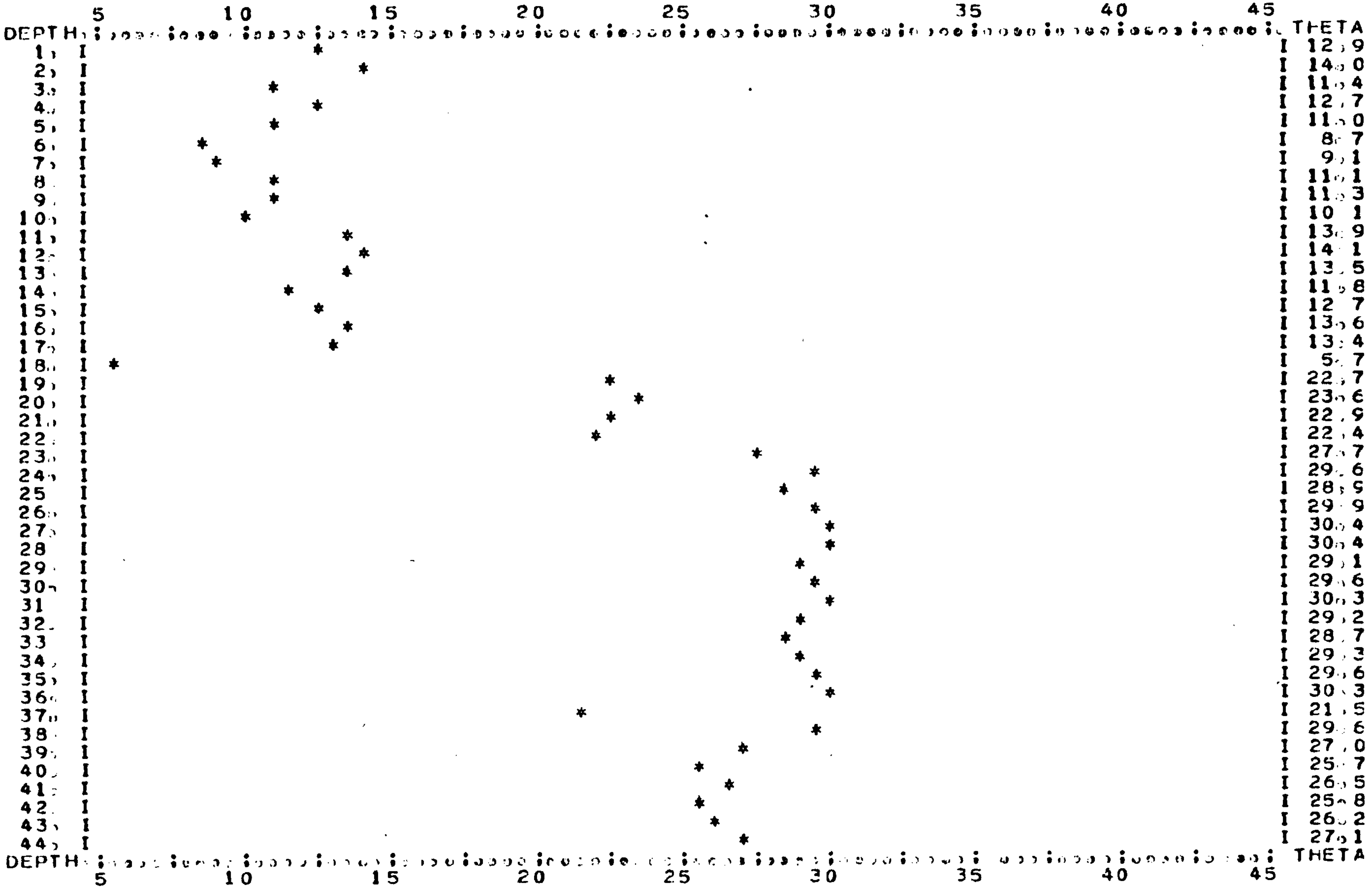
DEPTH	THETA
1.	14.2
2.	15.3
3.	16.0
4.	15.8
5.	12.6
6.	10.5
7.	10.7
8.	9.0
9.	6.7
10.	8.6
11.	13.0
12.	13.9
13.	16.1
14.	13.7
15.	13.3
16.	15.0
17.	13.6
18.	12.4
19.	15.4
20.	16.8
21.	16.9
22.	16.0
23.	15.9
24.	21.5
25.	22.4
26.	22.3
27.	22.1
28.	29.0
29.	30.0
30.	28.7
31.	29.4
32.	29.3
33.	28.8
34.	29.1
35.	29.5
36.	27.3
37.	20.0
38.	25.5
39.	25.6
40.	25.9
41.	25.1
42.	26.2
43.	26.2
44.	25.6
45.	25.2
46.	25.6

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU        HOLE ID=NP-8       BM= 5521.29
DATE= 19 SEPT 1977    TIME=1200       PROBE NO=          WL=26.12
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET. (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



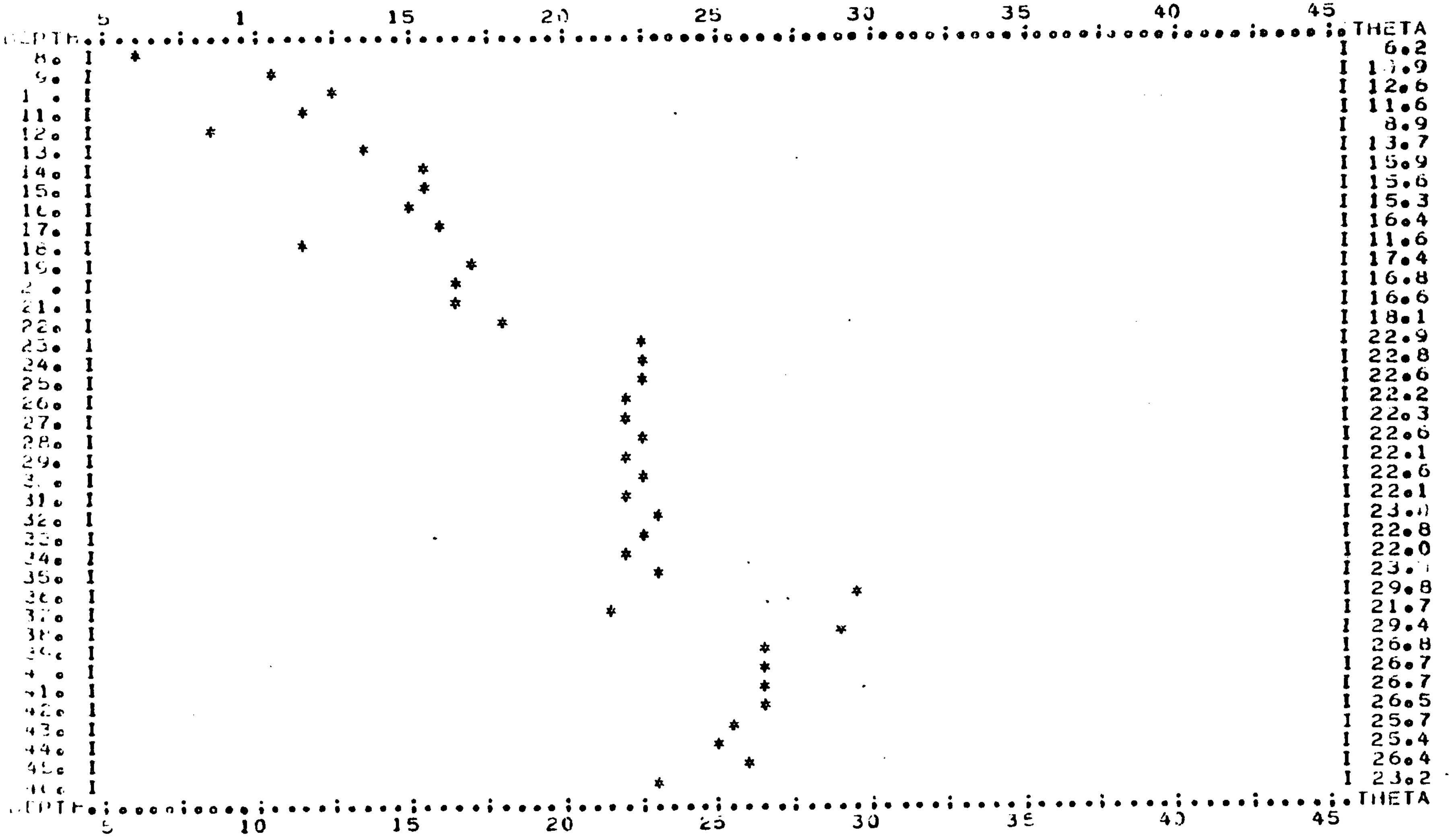
```
DEPTH  THETA
 1.    13.9
 2.    12.3
 3.    13.2
 4.    15.3
 5.    12.8
 6.    10.0
 7.    13.8
 8.    12.3
 9.     9.0
10.    11.8
11.    11.0
12.    10.6
13.     8.7
14.    11.1
15.    16.4
16.    16.9
17     18.4
18.    17.5
19.    16.6
20.    18.3
21.    17.0
22.    17.8
23     17.4
24     25.8
25.    24.1
26     24.9
27.    24.2
28.    26.6
29     28.6
30.    29.7
31.    29.0
32     29.2
33.    28.8
34.    28.1
35.    28.4
36.    28.6
37     28.7
38     28.9
39.    27.6
40.    25.3
41.    26.1
42.    25.4
43.    25.0
44.    25.4
45.    25.6
       THETA
```

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-9      BM= 5520.90
DATE=  19 SEPT 1977  TIME=1100      PROBE NO=          WL=25.48
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```

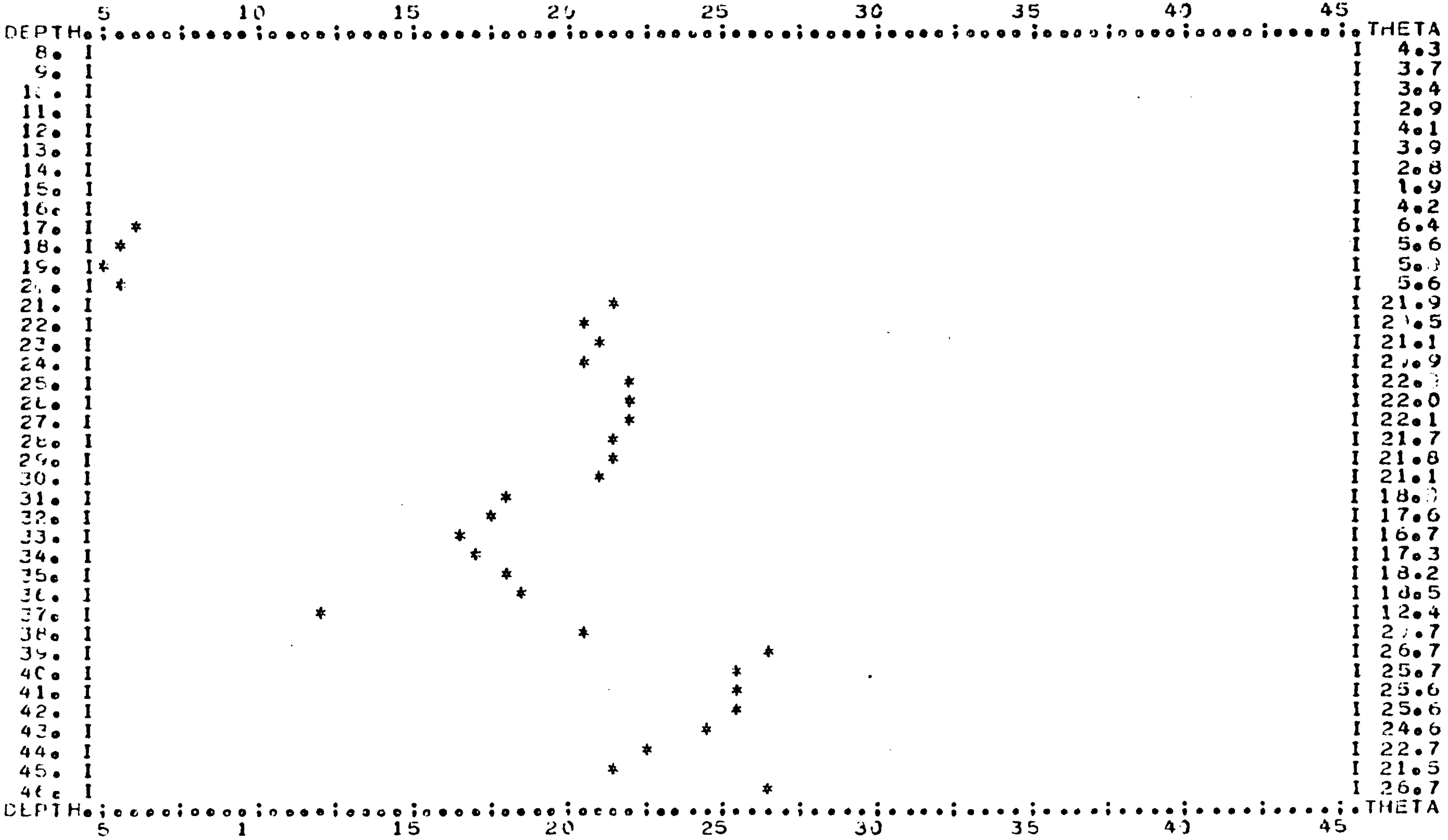


DEPTH	THETA
1.	12.9
2.	14.0
3.	11.4
4.	12.7
5.	11.0
6.	8.7
7.	9.1
8.	11.1
9.	11.3
10.	10.1
11.	13.9
12.	14.1
13.	13.5
14.	11.8
15.	12.7
16.	13.6
17.	13.4
18.	5.7
19.	22.7
20.	23.6
21.	22.9
22.	22.4
23.	27.7
24.	29.6
25	28.9
26.	29.9
27.	30.4
28	30.4
29.	29.1
30.	29.6
31	30.3
32.	29.2
33	28.7
34.	29.3
35.	29.6
36.	30.3
37.	21.5
38.	29.6
39.	27.0
40.	25.7
41.	26.5
42.	25.8
43.	26.2
44.	27.1

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU        HOLE ID=NP-1        BM= 5521.82
DATE= 10  JAN 1978     TIME=1030        PROBE NO=           WL=36.73
REMARKS=               1.  11.7  2.  10.9  3.  12.1  4.  10.1  5.   9.6  6.   6.6  7.   6.3

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```

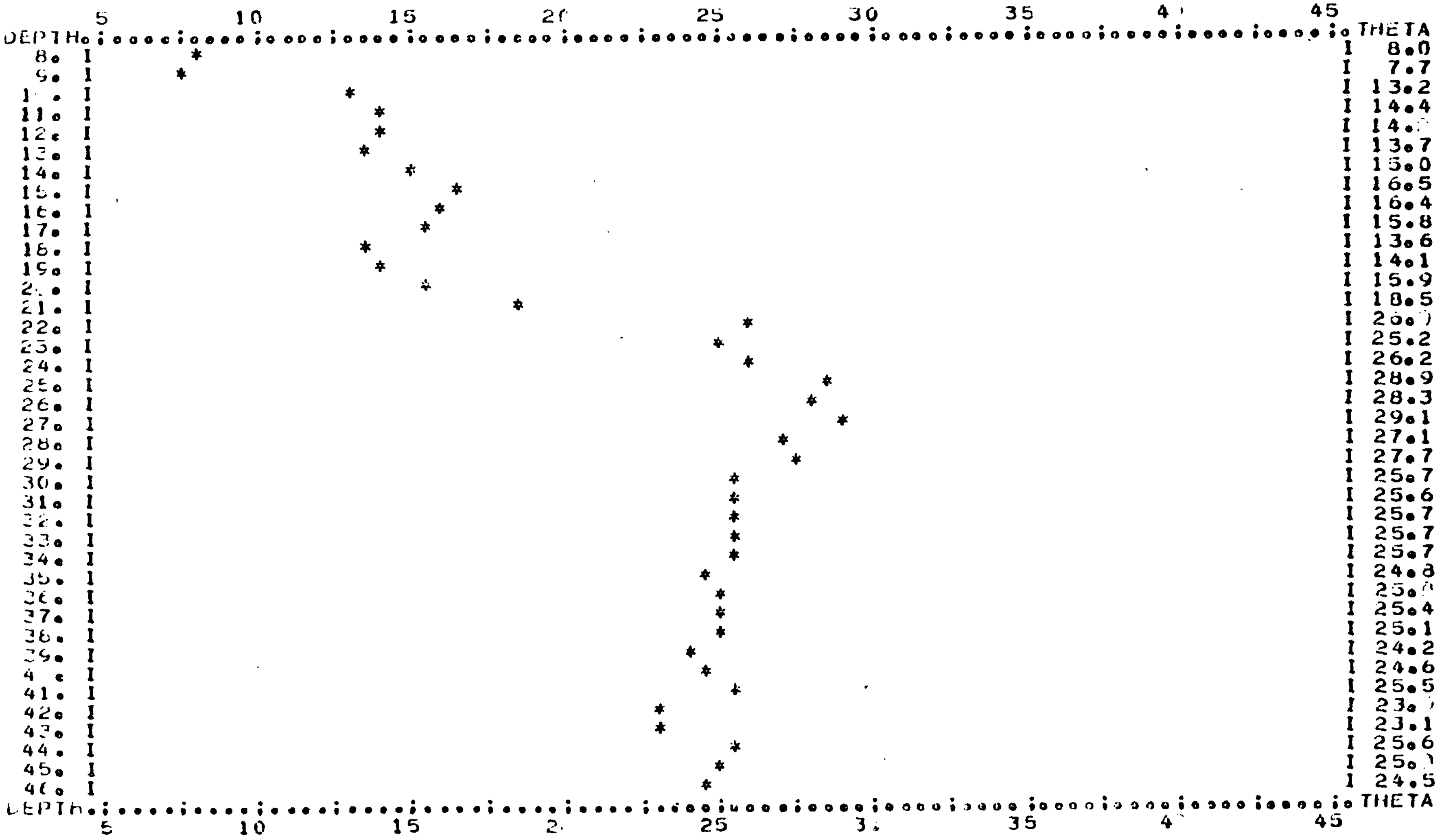


```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-2       GM= 5520.67
DATE= 1  JAN 1978    TIME=12[illegible]        PROBE NO=          WL=4[illegible].8
REMARKS=             1.  10.5  2.  10.0  3.  14.9  4.  10.[illegible]  5.   9.6  6.   7.4  7.   6.1

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



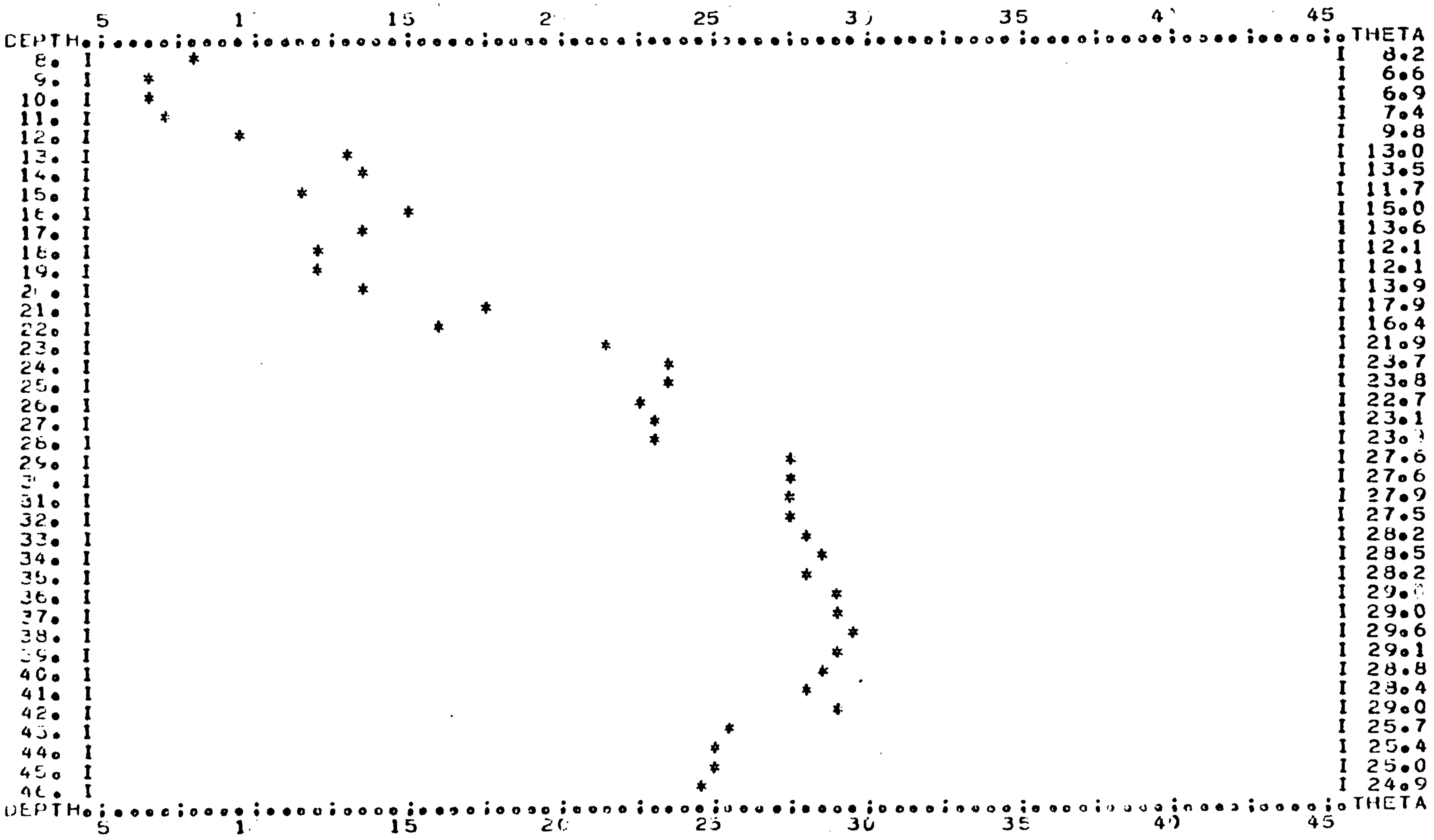
DEPTH	THETA
8.	4.3
9.	3.7
10.	3.4
11.	2.9
12.	4.1
13.	3.9
14.	2.8
15.	1.9
16.	4.2
17.	6.4
18.	5.6
19.	5.[illegible]
20.	5.6
21.	21.9
22.	20.5
23.	21.1
24.	20.9
25.	22.[illegible]
26.	22.0
27.	22.1
28.	21.7
29.	21.8
30.	21.1
31.	18.[illegible]
32.	17.6
33.	16.7
34.	17.3
35.	18.2
36.	18.5
37.	12.4
38.	20.7
39.	26.7
40.	25.7
41.	25.6
42.	25.6
43.	24.6
44.	22.7
45.	21.5
46.	26.7

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU       HOLE ID=NP-3        BM= 5521.13
DATE= 10 JAN 1978      TIME=123[illegible]      PROBE NO=              WL=23.62
REMARKS=               1. 14.8  2.  13.1  3.  10.7  4.  12.[illegible]  5.   9.9  6.   9.9  7.   9.2

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



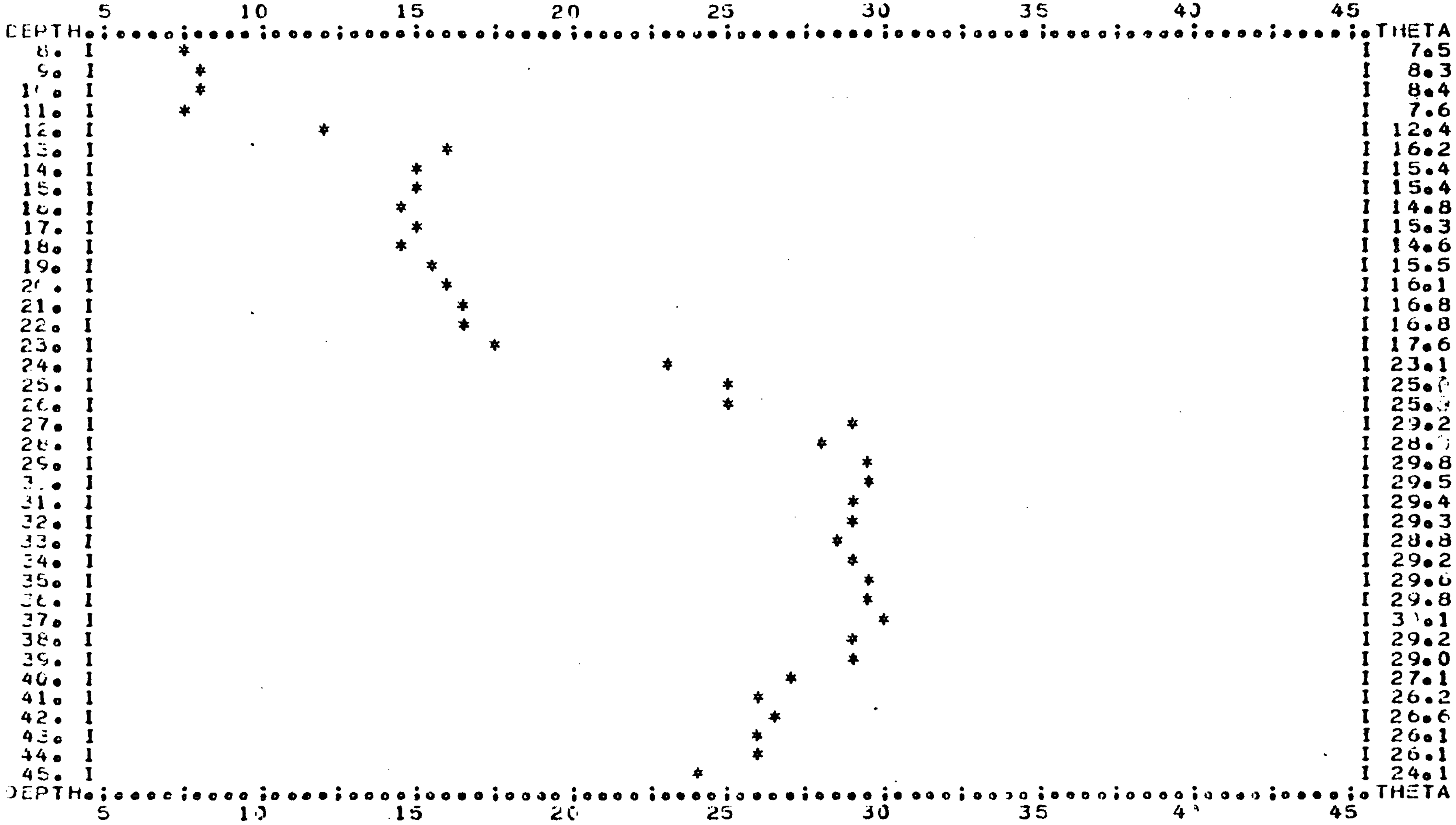
8.	8.0
9.	7.7
10.	13.2
11.	14.4
12.	14.[illegible]
13.	13.7
14.	15.0
15.	16.5
16.	16.4
17.	15.8
18.	13.6
19.	14.1
20.	15.9
21.	18.5
22.	26.[illegible]
23.	25.2
24.	26.2
25.	28.9
26.	28.3
27.	29.1
28.	27.1
29.	27.7
30.	25.7
31.	25.6
32.	25.7
33.	25.7
34.	25.7
35.	24.8
36.	25.[illegible]
37.	25.4
38.	25.1
39.	24.2
40.	24.6
41.	25.5
42.	23.[illegible]
43.	23.1
44.	25.6
45.	25.[illegible]
46.	24.5

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU        HOLE ID=NP-4        BM= 5521.17
DATE= 10  JAN 1978     TIME=1300        PROBE NO=              WL=27.35
REMARKS=               1.  10.1  2.   9.4  3.   9.3  4.   6.6  5.   7.6  6.   7.0  7.   7.0

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



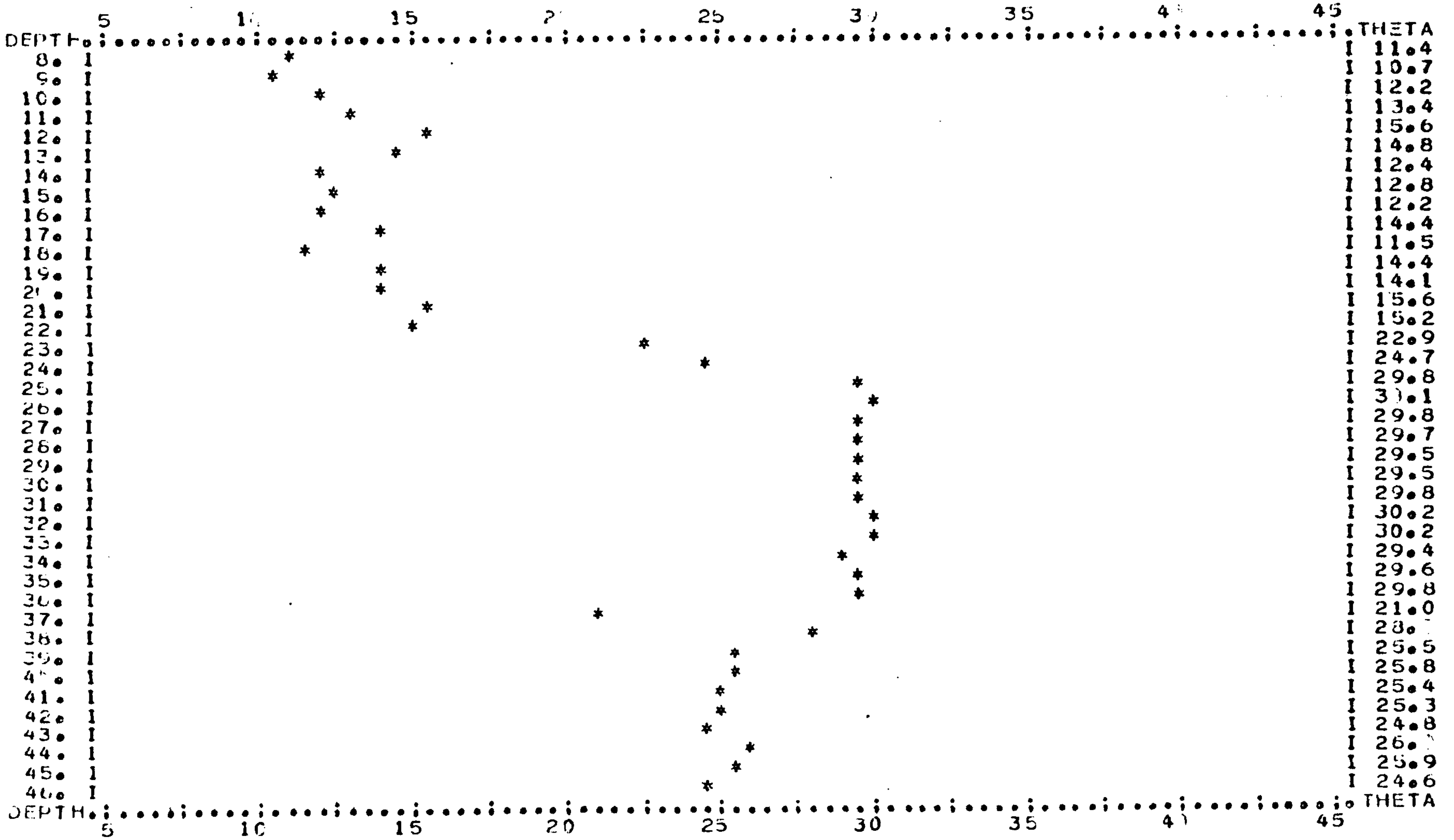
DEPTH	THETA
8.	8.2
9.	6.6
10.	6.9
11.	7.4
12.	9.8
13.	13.0
14.	13.5
15.	11.7
16.	15.0
17.	13.6
18.	12.1
19.	12.1
20.	13.9
21.	17.9
22.	16.4
23.	21.9
24.	23.7
25.	23.8
26.	22.7
27.	23.1
28.	23.3
29.	27.6
30.	27.6
31.	27.9
32.	27.5
33.	28.2
34.	28.5
35.	28.2
36.	29.0
37.	29.0
38.	29.6
39.	29.1
40.	28.8
41.	28.4
42.	29.0
43.	25.7
44.	25.4
45.	25.0
46.	24.9

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-5       BM= 5521.13
DATE= 10 JAN 1978     TIME=133         PROBE NO=            WL=23.36
REMARKS=              1.  10.9  2.  10.7  3.  10.3  4.   9.6  5.   7.7  6.   7.3  7.   8.7

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



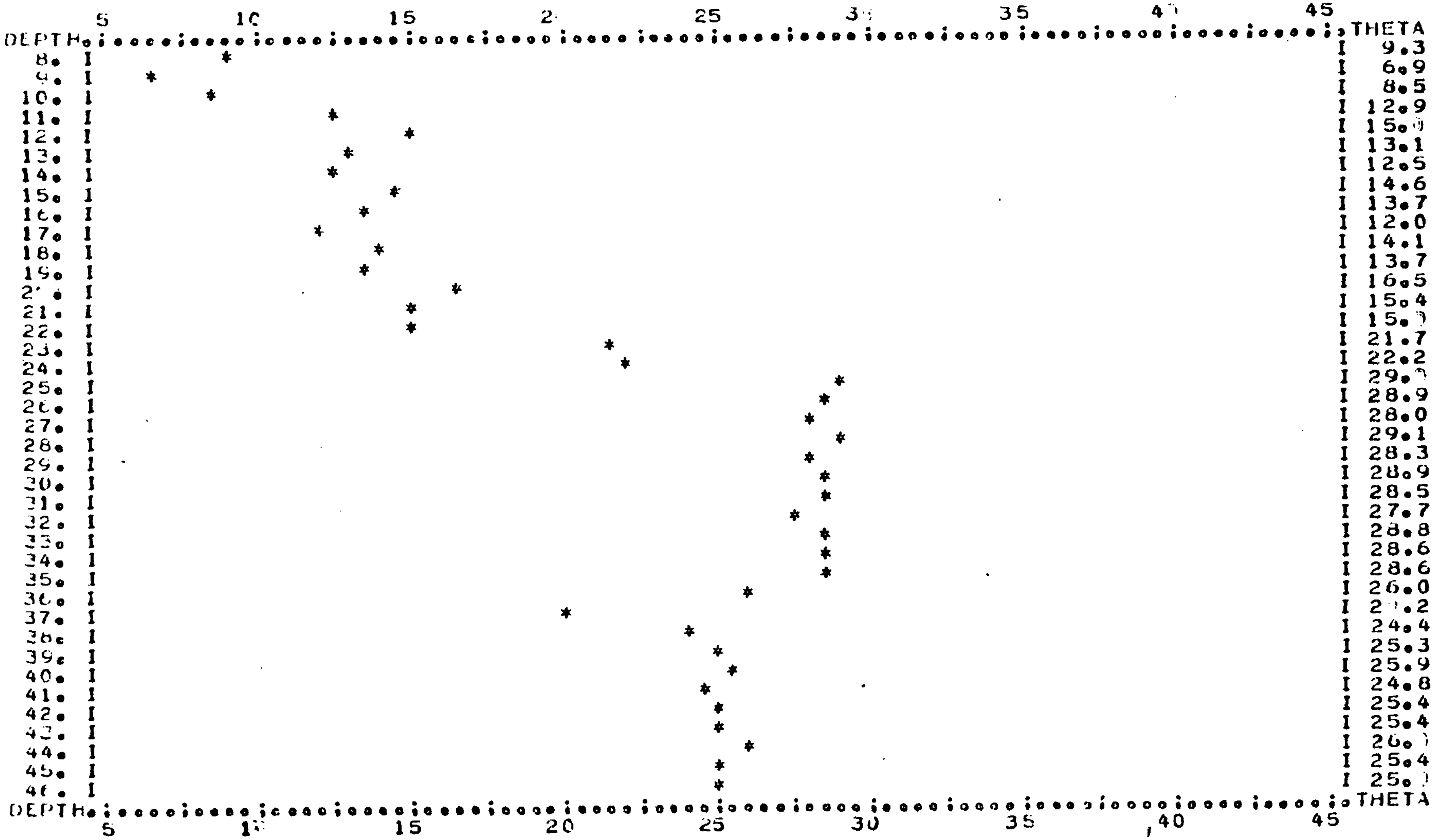
DEPTH	THETA
8.	7.5
9.	8.3
10.	8.4
11.	7.6
12.	12.4
13.	16.2
14.	15.4
15.	15.4
16.	14.8
17.	15.3
18.	14.6
19.	15.5
20.	16.1
21.	16.8
22.	16.8
23.	17.6
24.	23.1
25.	25.0
26.	25.3
27.	29.2
28.	28.[illegible]
29.	29.8
30.	29.5
31.	29.4
32.	29.3
33.	28.8
34.	29.2
35.	29.6
36.	29.8
37.	30.1
38.	29.2
39.	29.0
40.	27.1
41.	26.2
42.	26.6
43.	26.1
44.	26.1
45.	24.1

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU       HOLE ID=NP-6        BM= 5520.94
DATE= 1[illegible] JAN 1978      TIME=1430       PROBE NO=            WL=23.34
REMARKS=              1. 12.8  2.  13.5  3.  13.3  4.  14.1  5.  12.[illegible]   6.  10.0  7.    9.6

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
8.	11.4
9.	10.7
10.	12.2
11.	13.4
12.	15.6
13.	14.8
14.	12.4
15.	12.8
16.	12.2
17.	14.4
18.	11.5
19.	14.4
20.	14.1
21.	15.6
22.	15.2
23.	22.9
24.	24.7
25.	29.8
26.	30.1
27.	29.8
28.	29.7
29.	29.5
30.	29.5
31.	29.8
32.	30.2
33.	30.2
34.	29.4
35.	29.6
36.	29.8
37.	21.0
38.	28.[illegible]
39.	25.5
40.	25.8
41.	25.4
42.	25.3
43.	24.8
44.	26.[illegible]
45.	25.9
46.	24.6

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU        HOLE ID=NP-7        BM= 5520.97
DATE=  1[illegible] JAN 1978    TIME=143[illegible]       PROBE NO=               WL=26.00
REMARKS=                 1.  14.[illegible]   2.  15.8  3.   15.3  4.  15.6  5.  13.8  6.  12.5  7.  12.4

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



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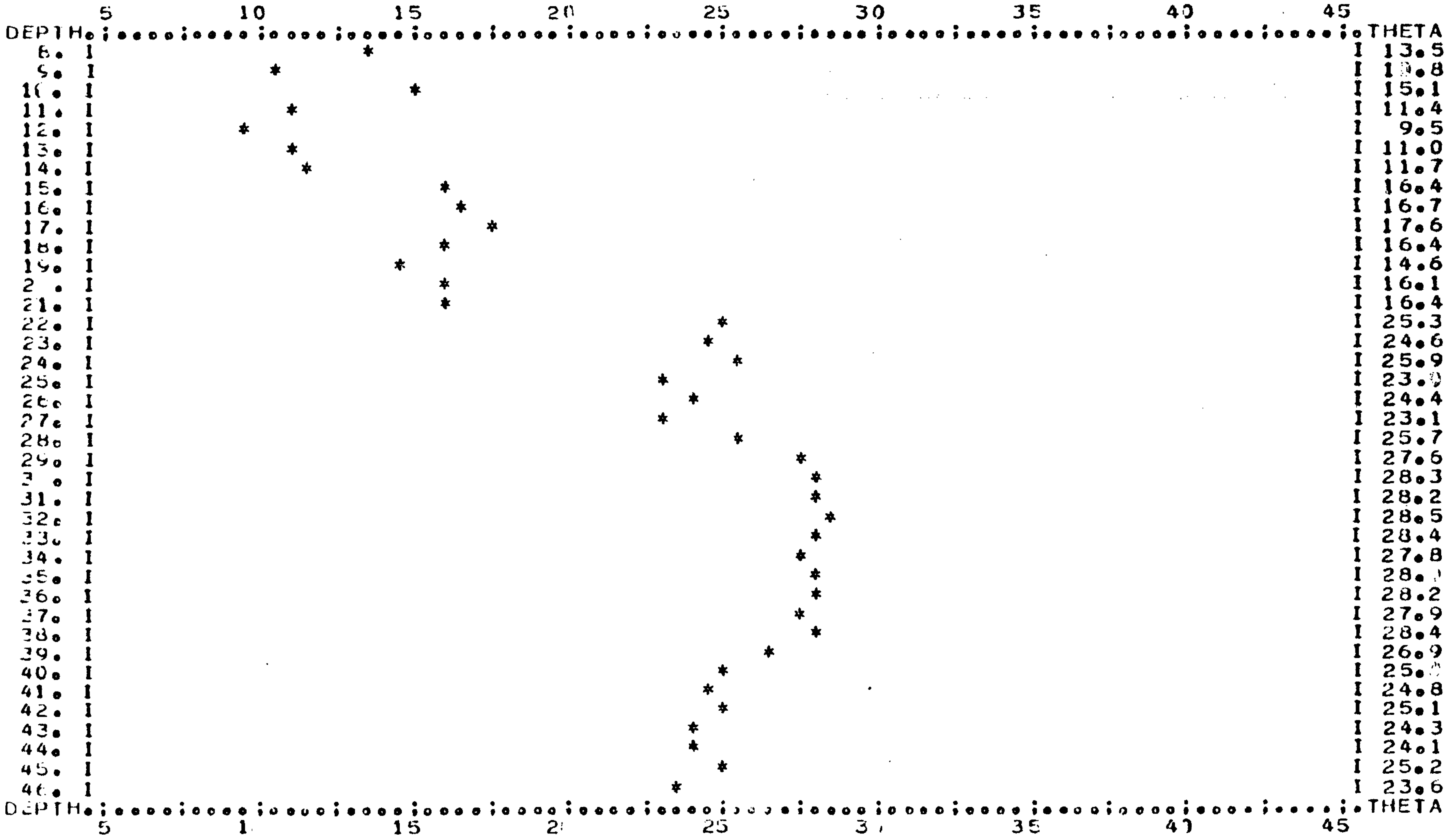
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU       HOLE ID=NP-8       BM= 5521.29
DATE=  10 JAN 1978    TIME=1:3        PROBE NO=              WL=24.29
REMARKS=                1.  13.6  2.  15.5  3.  16.3  4.  17.9  5.  13.8  6.   9.7  7.  13.7

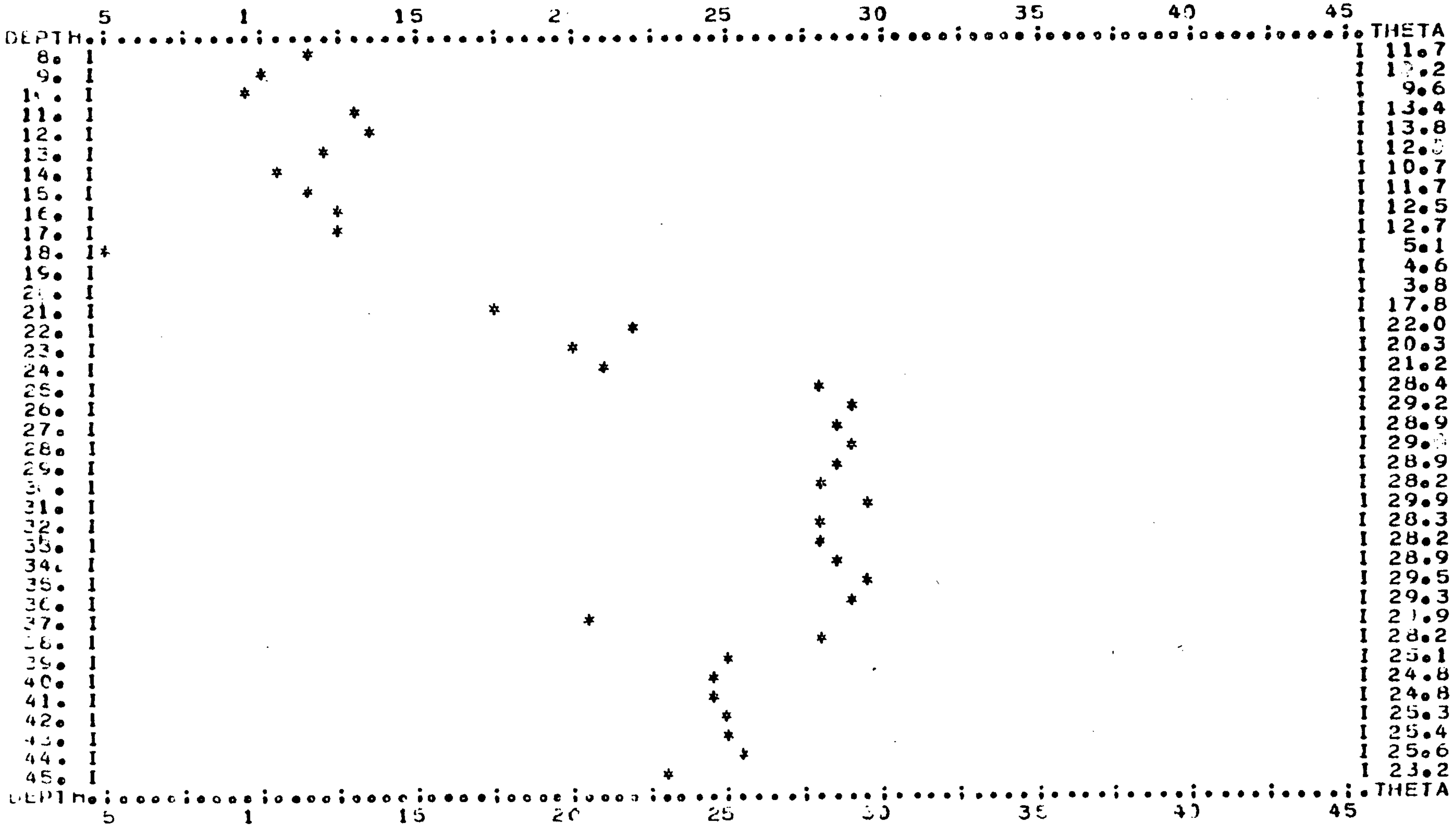
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
8.	13.5
9.	10.8
10.	15.1
11.	11.4
12.	9.5
13.	11.0
14.	11.7
15.	16.4
16.	16.7
17.	17.6
18.	16.4
19.	14.6
20.	16.1
21.	16.4
22.	25.3
23.	24.6
24.	25.9
25.	23.0
26.	24.4
27.	23.1
28.	25.7
29.	27.6
30.	28.3
31.	28.2
32.	28.5
33.	28.4
34.	27.8
35.	28.0
36.	28.2
37.	27.9
38.	28.4
39.	26.9
40.	25.0
41.	24.8
42.	25.1
43.	24.3
44.	24.1
45.	25.2
46.	23.6

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU     HOLE ID=NP-9     BM= 552[illegible].9[illegible]
DATE=  10 JAN 1978   TIME=1600     PROBE NO=           WL=22.97
REMARKS=             1.  13.3  2.  14.0  3.  13.7  4.  15.3  5.  13.1  6.  10.0  7.   9.8

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



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AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-1       BM= 5521.82         .
DATE= 27 MAR 1978     TIME=1300      PROBE NO=            WL=36.28
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.

      5        10        15        20        25        30        35        40        45
DEPTH.;....;....;....;....;....;....;....;....;....;....;....;....;....;....;....;....;.THETA
   1. I               *                                                               I 13.2
   2. I           *                                                                   I 11.2
   3. I              *                                                                I 12.5
   4. I         *                                                                     I 10.4
   5. I         *                                                                     I 10.0
   6. I  *                                                                            I  6.8
   7. I *                                                                             I  6.3
   8. I  *                                                                            I  6.6
   9. I          *                                                                    I 10.7
  10. I               *                                                               I 13.3
  11. I            *                                                                  I 11.6
  12. I     *                                                                         I  8.4
  13. I                 *                                                             I 14.0
  14. I                    *                                                          I 15.6
  15. I                  *                                                            I 14.8
  16. I                   *                                                           I 15.1
  17. I                     *                                                         I 16.3
  18. I            *                                                                  I 11.9
  19. I                          *                                                    I 18.6
  20. I                       *                                                       I 17.0
  21. I                       *                                                       I 17.3
  22. I                         *                                                     I 18.3
  23. I                                   *                                           I 23.3
  24. I                                   *                                           I 23.3
  25. I                                    *                                          I 23.5
  26. I                                 *                                             I 22.4
  27. I                                  *                                            I 22.7
  28. I                                     *                                         I 24.1
  29. I                                  *                                            I 22.8
  30. I                                  *                                            I 22.6
  31. I                                 *                                             I 22.1
  32. I                                  *                                            I 22.6
  33. I                                   *                                           I 23.1
  34. I                                                *                              I 29.9
  35. I                                                  *                            I 30.7
  36. I                                                  *                            I 30.5
  37. I                                *                                              I 21.6
  38. I                                              *                                I 28.8
  39. I                                            *                                  I 27.6
  40. I                                          *                                    I 26.5
  41. I                                         *                                     I 26.4
  42. I                                           *                                   I 27.0
  43. I                                         *                                     I 26.3
  44. I                                        *                                      I 25.9
  45. I                                          *                                    I 26.9
  46. I                                       *                                       I 25.0
DEPTH.;....;....;....;....;....;....;....;....;....;....;....;....;....;....;....;....;.THETA
      5        10        15        20        25        30        35        40        45
```
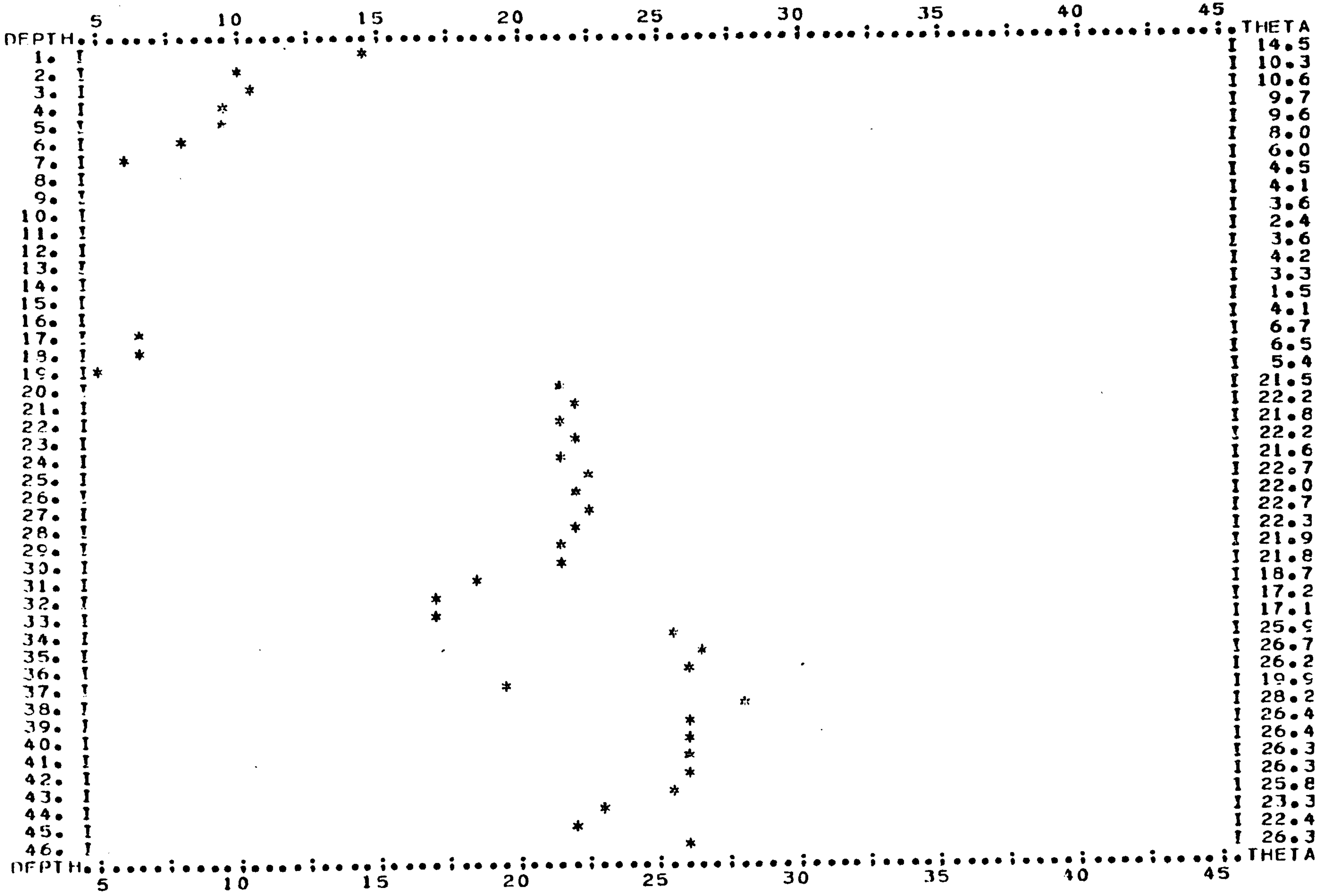
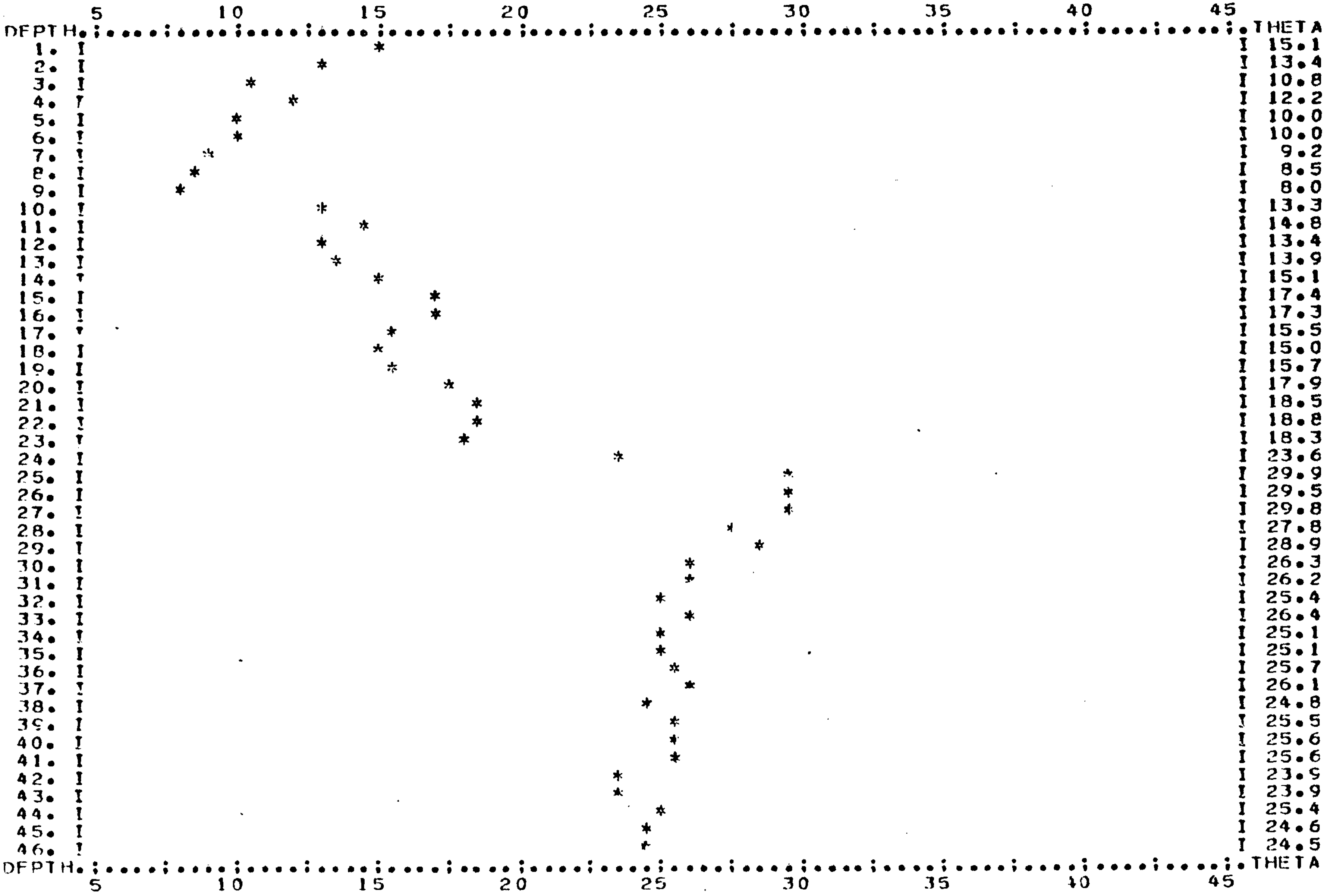

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-2      BM= 5520.67
DATE= 27 MAR 1978    TIME=1140      PROBE NO=           WL=34.17
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



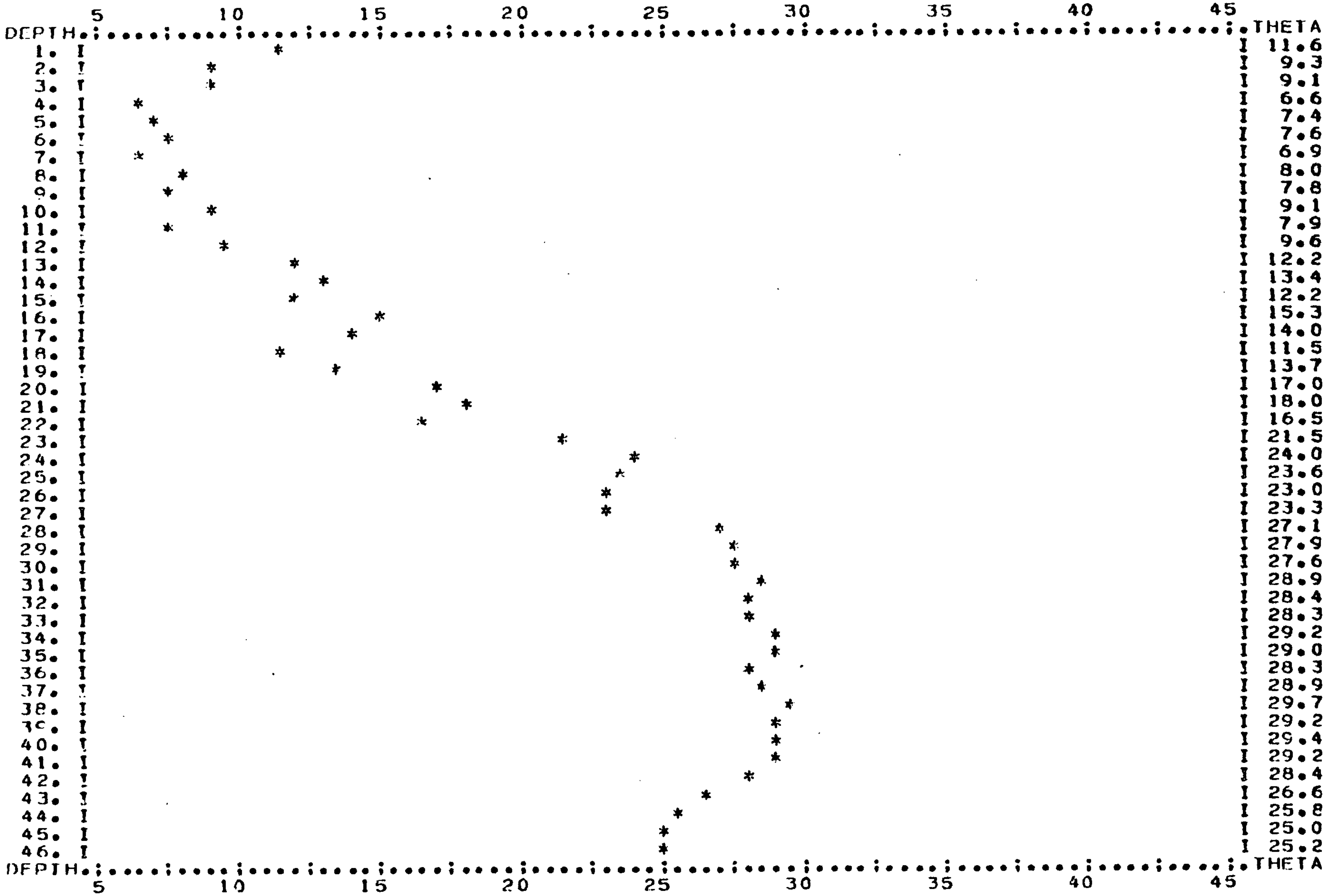
DEPTH	THETA
	14.5
1.	10.3
2.	10.6
3.	9.7
4.	9.6
5.	8.0
6.	6.0
7.	4.5
8.	4.1
9.	3.6
10.	2.4
11.	3.6
12.	4.2
13.	3.3
14.	1.5
15.	4.1
16.	6.7
17.	6.5
18.	5.4
19.	21.5
20.	22.2
21.	21.8
22.	22.2
23.	21.6
24.	22.7
25.	22.0
26.	22.7
27.	22.3
28.	21.9
29.	21.8
30.	18.7
31.	17.2
32.	17.1
33.	25.9
34.	26.7
35.	26.2
36.	19.9
37.	28.2
38.	26.4
39.	26.4
40.	26.3
41.	26.3
42.	25.8
43.	23.3
44.	22.4
45.	26.3
46.	

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-3       BM= 5521.13
DATE= 27 MAR 1978    TIME=1115      PROBE NO=          WL=22.71
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1.	15.1
2.	13.4
3.	10.8
4.	12.2
5.	10.0
6.	10.0
7.	9.2
8.	8.5
9.	8.0
10.	13.3
11.	14.8
12.	13.4
13.	13.9
14.	15.1
15.	17.4
16.	17.3
17.	15.5
18.	15.0
19.	15.7
20.	17.9
21.	18.5
22.	18.8
23.	18.3
24.	23.6
25.	29.9
26.	29.5
27.	29.8
28.	27.8
29.	28.9
30.	26.3
31.	26.2
32.	25.4
33.	26.4
34.	25.1
35.	25.1
36.	25.7
37.	26.1
38.	24.8
39.	25.5
40.	25.6
41.	25.6
42.	23.9
43.	23.9
44.	25.4
45.	24.6
46.	24.5

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-4       BM= 5521.17
DATE= 27 MAR 1978    TIME=1100      PROBE NO=          WL=26.16
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



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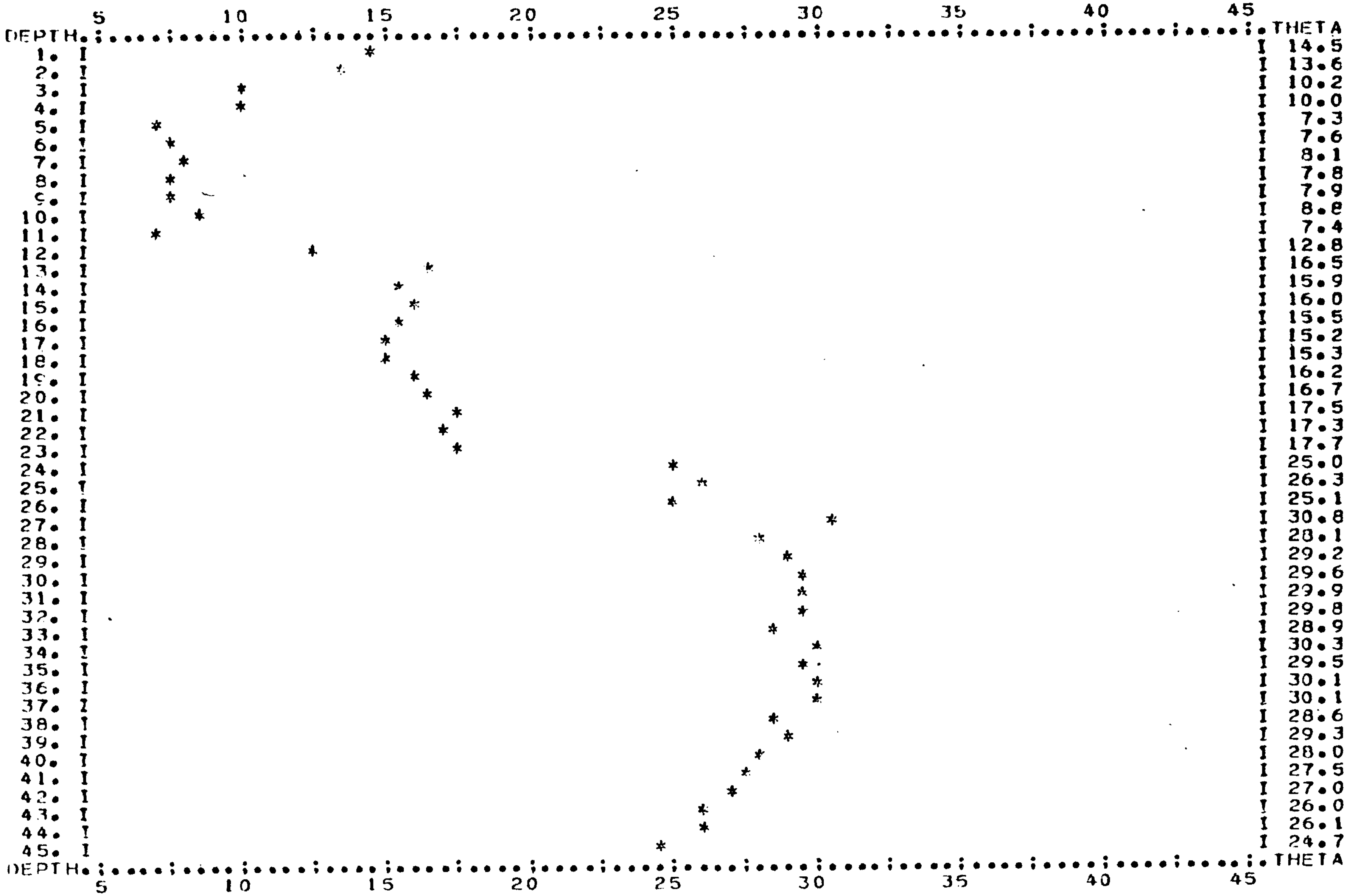
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU     HOLE ID=NP-5       BM= 5521.13
DATE= 27 MAR 1978    TIME=1030      PROBE NO=          WL=22.30
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



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AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU     HOLE ID=NP-6      BM= 5520.94
DATE= 27 MAR 1978    TIME=1000      PROBE NO=         WL=19.91
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```
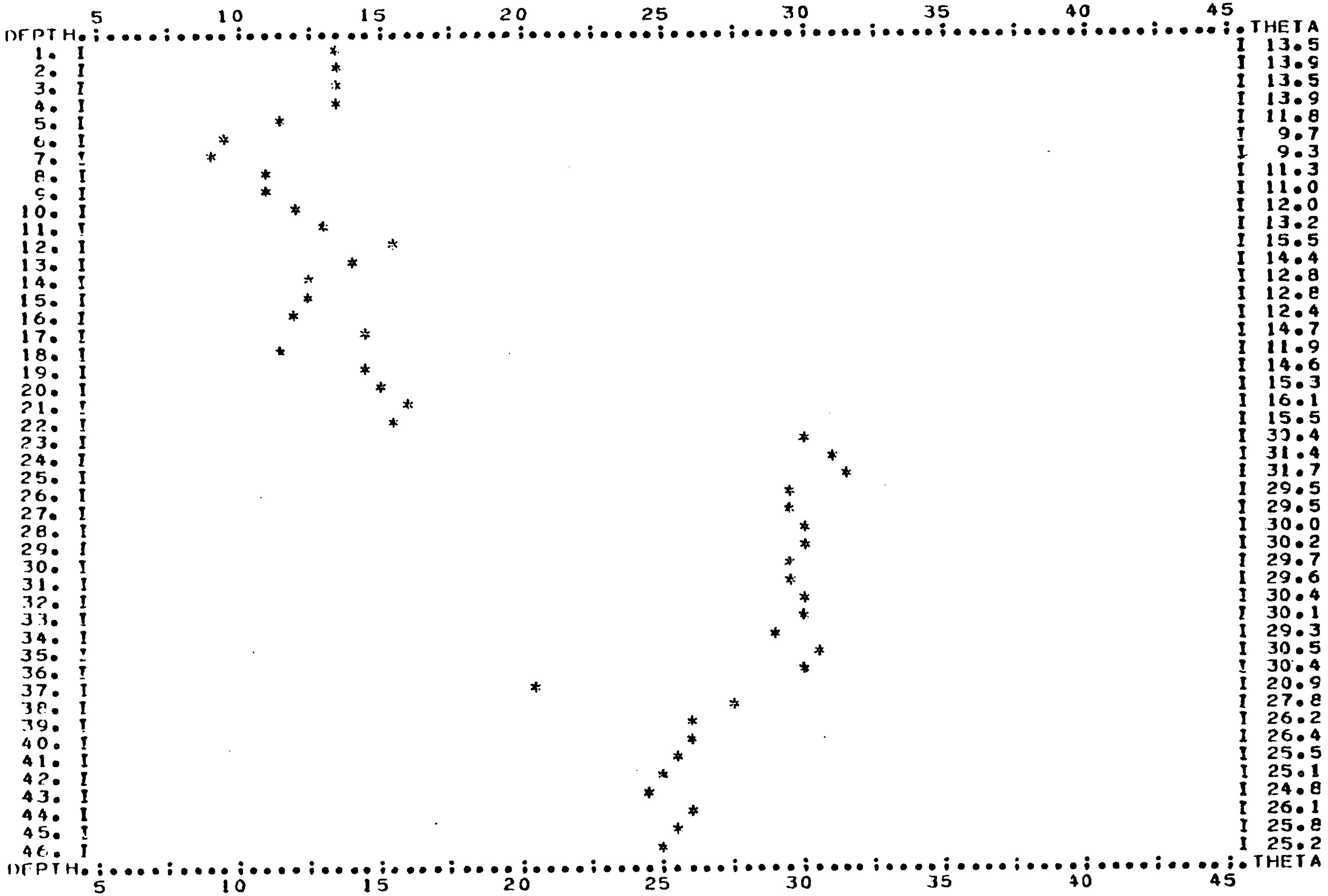
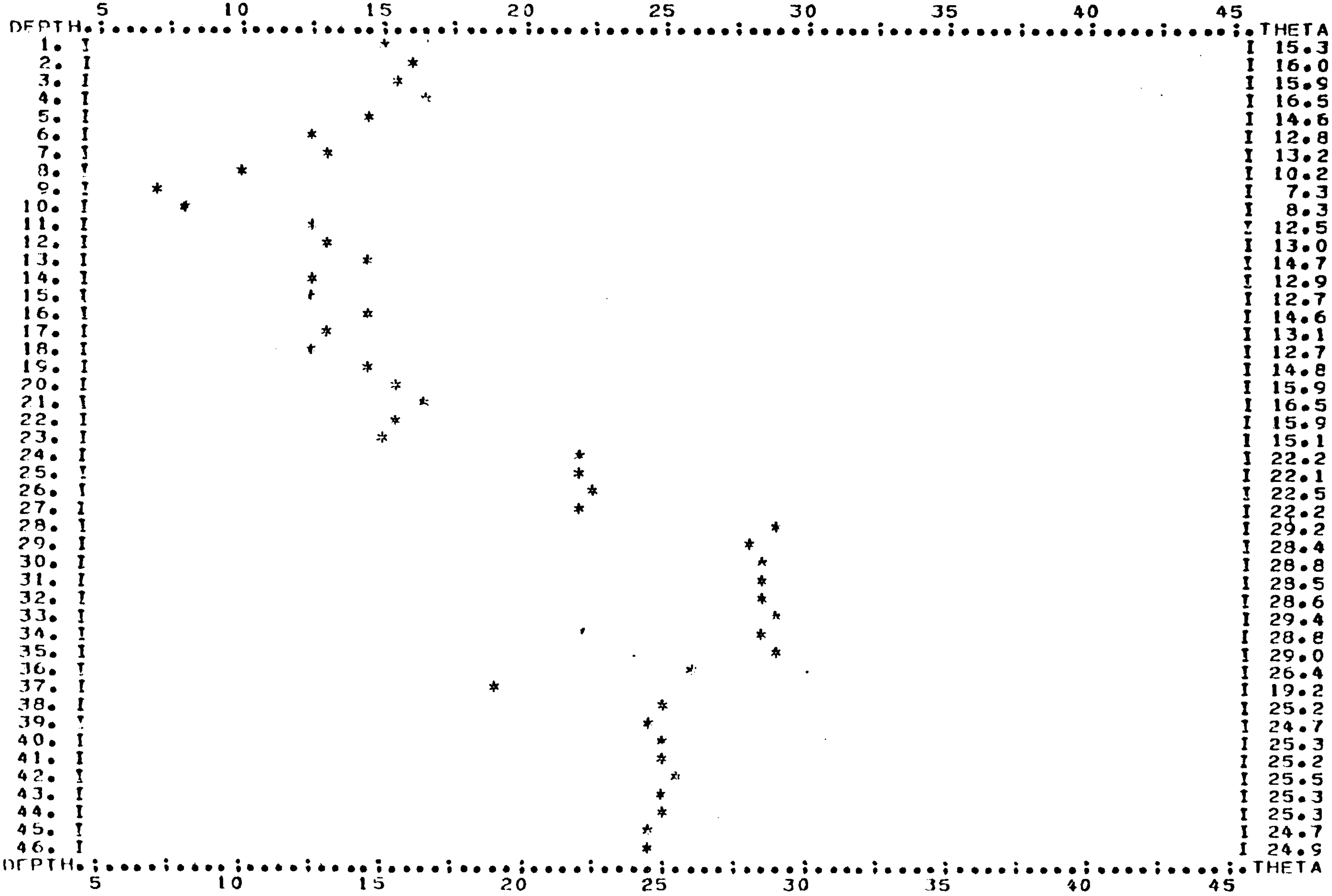



DEPTH	THETA
1.	13.5
2.	13.9
3.	13.5
4.	13.9
5.	11.8
6.	9.7
7.	9.3
8.	11.3
9.	11.0
10.	12.0
11.	13.2
12.	15.5
13.	14.4
14.	12.8
15.	12.8
16.	12.4
17.	14.7
18.	11.9
19.	14.6
20.	15.3
21.	16.1
22.	15.5
23.	30.4
24.	31.4
25.	31.7
26.	29.5
27.	29.5
28.	30.0
29.	30.2
30.	29.7
31.	29.6
32.	30.4
33.	30.1
34.	29.3
35.	30.5
36.	30.4
37.	20.9
38.	27.8
39.	26.2
40.	26.4
41.	25.5
42.	25.1
43.	24.8
44.	26.1
45.	25.8
46.	25.2

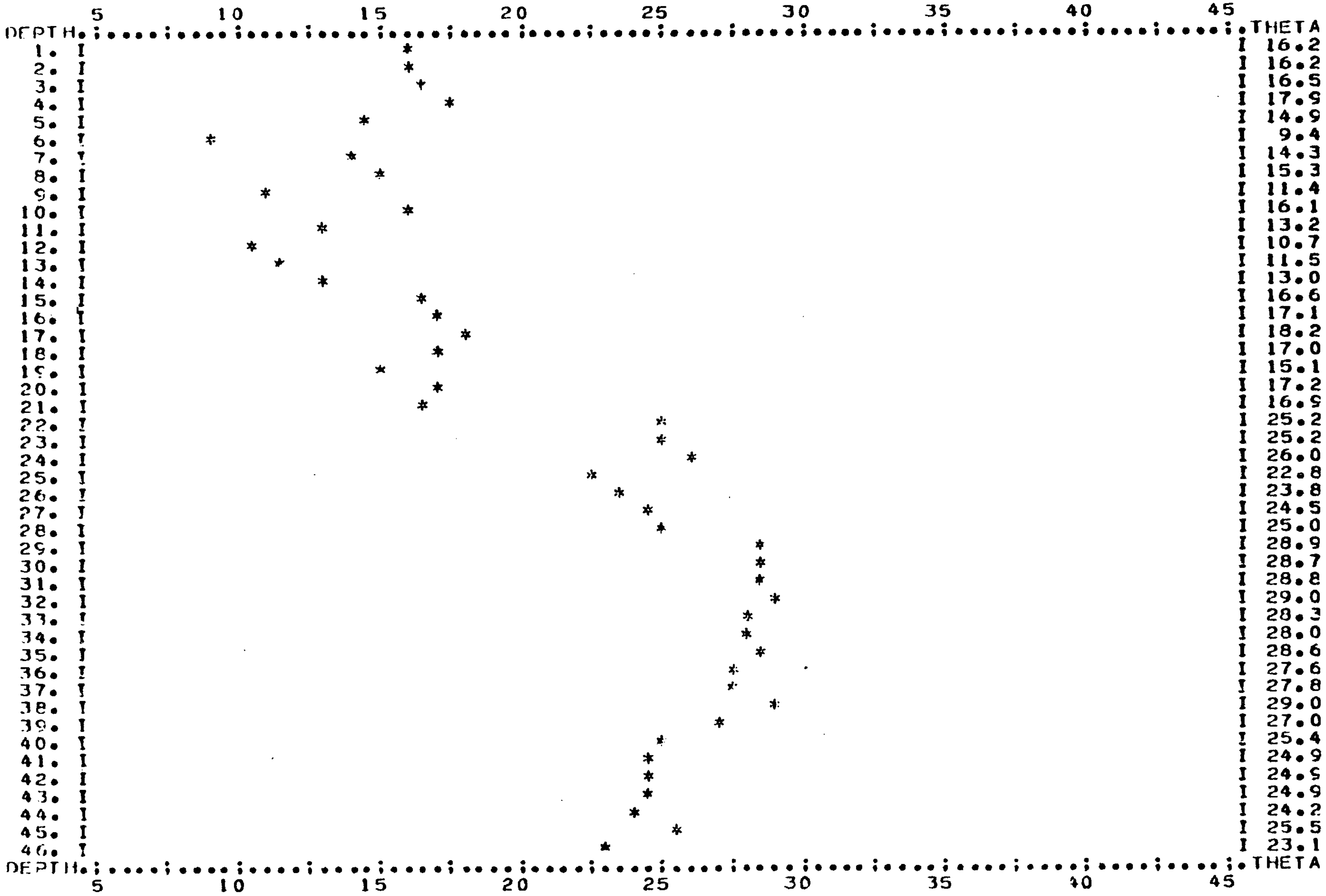
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-7 BM= 5520.97
DATE= 27 MAR 1978 TIME=0930 PROBE NO= WL=26.14
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



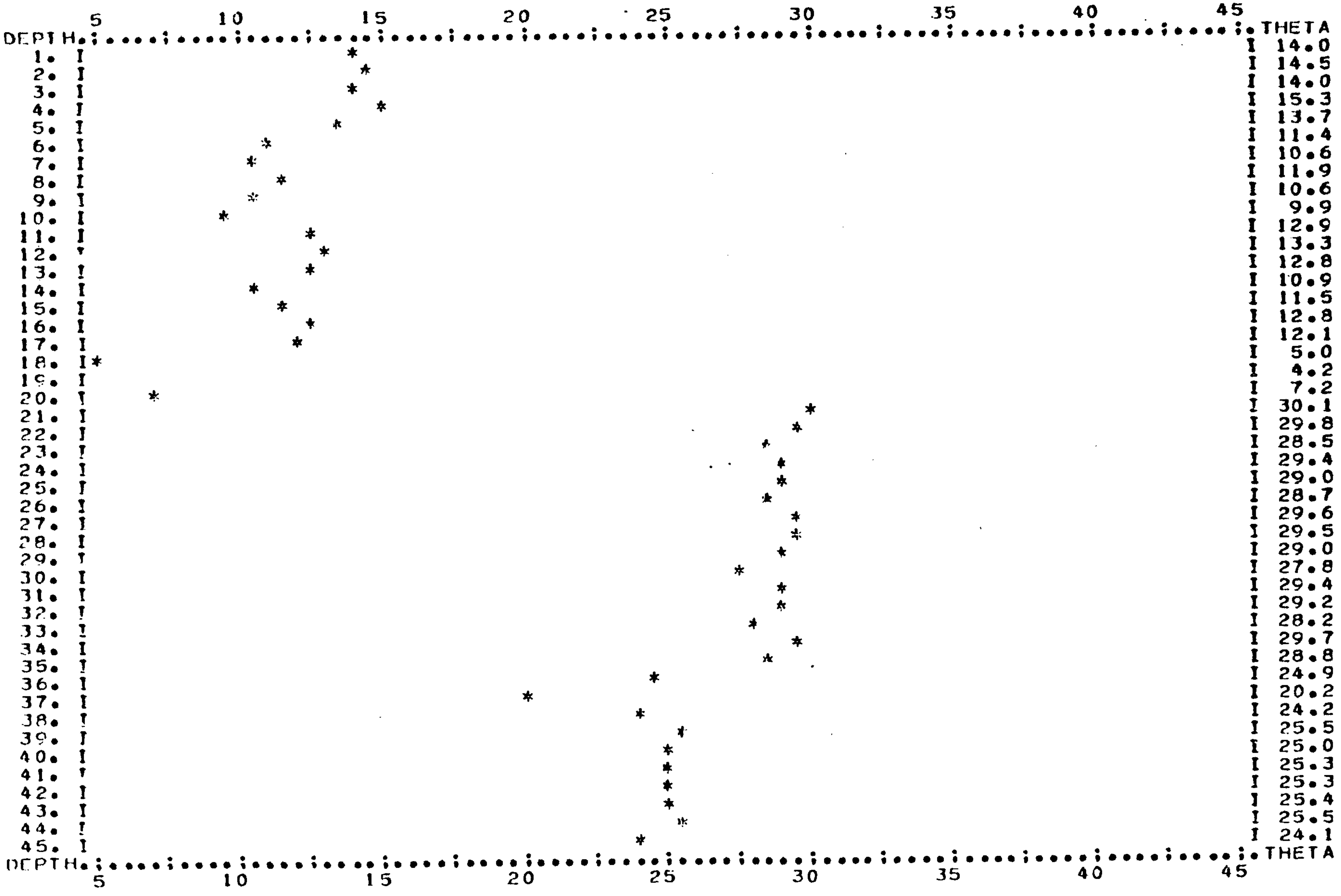
DEPTH	THETA
1.	15.3
2.	16.0
3.	15.9
4.	16.5
5.	14.6
6.	12.8
7.	13.2
8.	10.2
9.	7.3
10.	8.3
11.	12.5
12.	13.0
13.	14.7
14.	12.9
15.	12.7
16.	14.6
17.	13.1
18.	12.7
19.	14.8
20.	15.9
21.	16.5
22.	15.9
23.	15.1
24.	22.2
25.	22.1
26.	22.5
27.	22.2
28.	29.2
29.	28.4
30.	28.8
31.	28.5
32.	28.6
33.	29.4
34.	28.8
35.	29.0
36.	26.4
37.	19.2
38.	25.2
39.	24.7
40.	25.3
41.	25.2
42.	25.5
43.	25.3
44.	25.3
45.	24.7
46.	24.9

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-8      BM= 5521.29
DATE= 27 MAR 1978    TIME=0900      PROBE NO=           WL=23.68
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



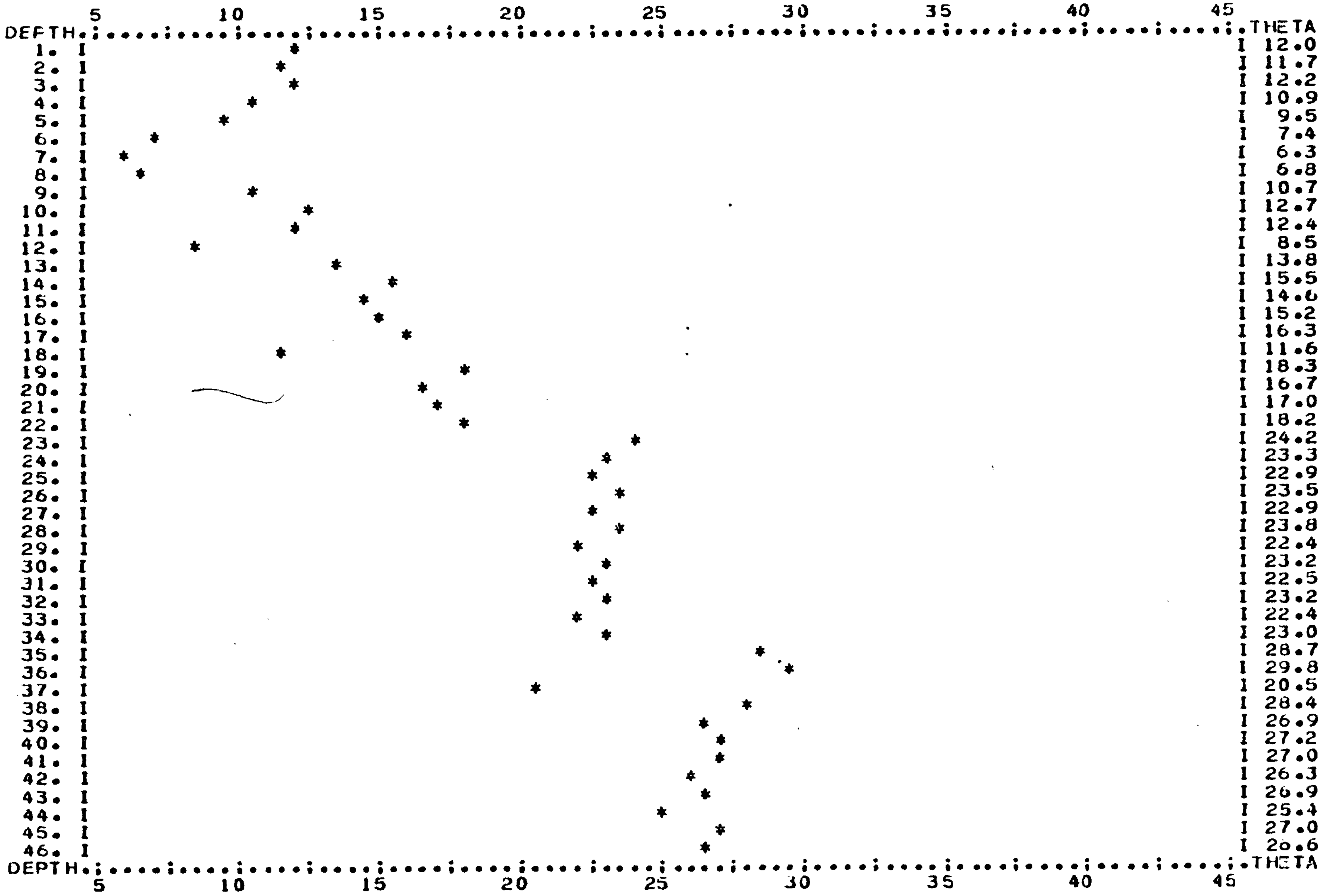
DEPTH	THETA
1.	16.2
2.	16.2
3.	16.5
4.	17.9
5.	14.9
6.	9.4
7.	14.3
8.	15.3
9.	11.4
10.	16.1
11.	13.2
12.	10.7
13.	11.5
14.	13.0
15.	16.6
16.	17.1
17.	18.2
18.	17.0
19.	15.1
20.	17.2
21.	16.9
22.	25.2
23.	25.2
24.	26.0
25.	22.8
26.	23.8
27.	24.5
28.	25.0
29.	28.9
30.	28.7
31.	28.8
32.	29.0
33.	28.3
34.	28.0
35.	28.6
36.	27.6
37.	27.8
38.	29.0
39.	27.0
40.	25.4
41.	24.9
42.	24.9
43.	24.9
44.	24.2
45.	25.5
46.	23.1

```
AMERICAN GFCUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PFOJFCT=PLATEAU       HOLE ID=NP-9        BM= 5520.90
DATE= 27 MAP 1978     TIME=0830       PROBE NO=          WL=17.60
FEMARKS=

PERCENT MOISTUPE BY VOLUMF (ACROSS) VS DEPTH IN FEET  (DOWN).
F?ELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND CCLUMN.
```



AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-1 BM= 5521.82
DATE= 29 JUNE 1978 TIME=1300 PROBE NO= WL=38.13
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
1.	12.0
2.	11.7
3.	12.2
4.	10.9
5.	9.5
6.	7.4
7.	6.3
8.	6.8
9.	10.7
10.	12.7
11.	12.4
12.	8.5
13.	13.8
14.	15.5
15.	14.6
16.	15.2
17.	16.3
18.	11.6
19.	18.3
20.	16.7
21.	17.0
22.	18.2
23.	24.2
24.	23.3
25.	22.9
26.	23.5
27.	22.9
28.	23.8
29.	22.4
30.	23.2
31.	22.5
32.	23.2
33.	22.4
34.	23.0
35.	28.7
36.	29.8
37.	20.5
38.	28.4
39.	26.9
40.	27.2
41.	27.0
42.	26.3
43.	26.9
44.	25.4
45.	27.0
46.	26.6

Table 3. Summary of pertinent data used to calculate the approach velocity in the vicinity of solar-evaporation pond 1.

Hole No.	ΔT_2 (^oC)	A^1 (^oC)	z (ft)	t_1 (days	T (days)	a (ft^{-1})	b (rad ft^{-1})	v_z (cm/day)
1	9.60	11.73	5	55	365	0.040	0.289	23.18
2	8.65	11.73	5	55	365	.061	.289	14.86
3	10.30	11.73	7	55	365	.019	.207	25.95
4	10.30	11.73	5	55	365	.026	.289	36.13
5	10.15	11.73	5	55	365	.029	.289	32.40
6	9.25	11.73	6	55	365	.040	.241	16.19
7	9.55	11.73	5	55	365	.041	.289	22.56
8	9.10	11.73	6	55	365	.042	.241	15.08
9	9.20	11.73	5	55	365	.049	.289	18.94

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[1] Calculated by Fourier analysis of daily temperature maxima and minima at Bloomfield. May differ for the actual plant site.

[2] $K_{ws} = 4 \times 10^{-3}$ cal cm^{-1} sec^{-1} ^oC

AQUATRACE

In January, 1978, American Ground Water Consultants installed a tracer injection system for introducing TRAC-5 into pond 1. The injection system was comprised of a stainless steel tank into which TRAC-5 had been placed. The tank was pressurized with bottled nitrogen and TRAC-5 was led from the stainless-steel tank directly into a 10-inch pipeline which supplied fresh water to the pond. Subsequently, analysis for TRAC-5 in the pond water were negative and in July, it was learned that the pipeline into which the TRAC-5 was injected served primarily to withdraw water from the pond. At that time, the injection system was removed from its installation and reinstalled in a small barrel near observation hole 8 on the embankment. At present, TRAC-5 is injected through a 1/8-inch copper tube directly into the pond. The injection rate is presently controlled by a metering valve to about 0.4 millilitres per minute.

Samples of pond water, ditch water, and San Juan River water are collected monthly and analyzed by AGW's own facilities in Tucson, Arizona. The ditch water and San Juan River water samples are always collected downstream from the refinery. In some instances, samples have been collected from the Hammond ditch upstream of the refinery. The results of the quantitative analyses of these water samples are given in attachment 5.

In July, 1978, there was 0.16 picogram per millilitre (pgm/ml) of TRAC-5 detected in the pond and no TRAC-5 was detected in either the

Hammond ditch or the San Juan River. On September 20, 1978 an average concentration of about 421.5 pgm/ml of TRAC-5 was found in pond 1 and about 0.45 pgm/ml was found in a ditch water sample taken downstream from the refinery. On November 22, 1978 47.1 pgm/ml were found in the ditch and 0.042 pgm/ml in the river downstream of the refinery.

Although the results are unambiguous, the significance of the results must be examined. The water level information suggests that the Hammond ditch contributes water to the cobble bed beneath the pond and as a result, the direction of ground-water flow is towards the pond, and it is not likely that water which may be seeping from the pond at the present time is flowing into the ditch. On the other hand, the soil-moisture data and the thermal information suggest a small amount of seepage into the subsurface. The detection of TRAC-5 downstream of the refinery in September is considered to be caused by sample contamination. In September the pond samples were collected first. Next the Hammond ditch sample was collected and lastly, the sample from the San Juan River was collected. It is possible that TRAC-5 adhered to the hands of the individual who collected the sample and that it was later transferred to the bottles used for the subsequent samples. In fact, the water in the ditch may have been contaminated by TRAC-5 also.

To eliminate possible contamination problems, the sequence and method of sample collection and analysis was changed. First upstream samples are collected and the sample bottles sealed. Second, downstream samples are collected then sealed, and last, samples from the pond are collected and sealed. In the analysis, samples will be analyzed in the same order they were collected to further minimize possible contamination. This procedure was followed with samples collected October 25, 1978.

The results of AQUATRACE monitoring for October 25, 1978 are quite concrete in their significance. At the time of sampling, the water in the Hammond ditch had been turned off. The ditch was inspected upstream of the refinery and no water was observed in the ditch. Downstream of the refinery, a flow of about one gallon per minute was observed. This is water which was being released from bank storage in the cobble bed. The sample of water taken upstream of the refinery contained no TRAC-5. The sample collected downstream of the refinery contained 58.4 pgm/ml of TRAC-5, unambiguous verification of indications from other methods. At the same time, the pond contained about 85 pgm/ml of TRAC-5. The concentration of TRAC-5 in the pond had dropped because the injection system became plugged with dirt between visits to the pond in September and October.

Seepage has been estimated by means of mass balances using the September TRAC-5 concentration in the pond of 421.5 pgm/ml, and the November TRAC-5 concentrations in the ditch water and the San Juan River. The TRAC-5 concentration in the ditch water has been assumed similar to the TRAC-5 concentration in all of the ground water flowing into the San Juan River. Furthermore, the flow of the San Juan River is assumed to be 500 cfs upstream of the refinery. The results of the mass balance calculations indicate that about 22 gpm is seeping from the pond and entering the San Juan River. This is in reasonably good agreement with about 10 gpm estimated by thermal methods, bearing in mind the uncertainty in the flow rate of the San Juan River.

AQUATRACE is the most valuable method for verifying seepage and it should replace the other methods in the near future as good agreement between seepage estimates using different methods are obtained. It is recommended that AQUATRACE monitoring continue on a monthly basis to more accurately evaluate the rate of seepage.

CONCLUSIONS

Water-level, neutron-probe, Thermonic, ZETA-SP and AQUATRACE monitoring methods all verify that a small amount of leakage is taking place from pond 1. The water-level, ZETA-SP. and Thermonic data suggest that the greatest amount of seepage is taking place in the western or northwestern part of the reservoir, and that the seepage rate is about 10 to 20 gpm of fresh water.

ATTACHMENT 1

LITHOLOGIC LOGS FOR NEUTRON-PROBE-ACCESS HOLES

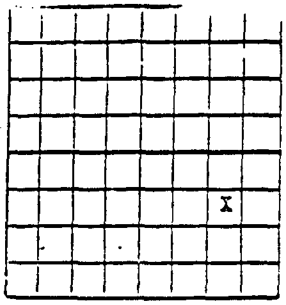
LITHOLOGY	INTERVAL (ft)
Neutron Access Hole 1	
Samples missing	0-5
Samples missing	5-10
Samples missing	10-15
Samples missing	15-20
Cobble and large pebbles	20-25
Pebbles and cobble	25-30
Brownish silt and pebbles	30-35
Brownish green silty clay	35-40
Bluish gray silty clay	40-45
Grayish silty clay	45-50
Neutron Access Hole 2	
Samples missing	0-5
Samples missing	5-10
Samples missing	10-15
Samples missing	15-20
Brownish silt and pebbles	20-25
Greenish clay	25-30
Greenish gray silty clay	30-35
Grayish silty clay	35-40
Grayish silty caly	40-45
Grayish silty clay	45-50
Neutron Access Hole 3	
Samples missing	0-5
Samples missing	5-10
Samples missing	10-15
Brown silt, and pebbles and cobble	15-20
Pebbles and cobble	20-25
Green shale	25-30
Greenish gray clay	30-35
Greenish gray silty clay	35-40
Bluish gray silty clay	40-45
Bluish gray sandy clay	45-50

LITHOLOGY	INTERVAL (ft)
Neutron Access Hole 5	
Samples missing	0-5
Samples missing	5-10
Samples missing	10-15
Samples missing	15-20
Gravel and pebbles	20-25
Pebbles	25-30
Greenish gray silty clay	30-35
Grayish silty clay	35-40
Grayish silty clay	40-45
Grayish silty clay	45-50
Neutron Access Hole 6	
Gray sand	0-5
Gray sand	5-10
Gray sand	10-15
Gray sand	15-20
Pebbles and cobble	20-25
Pebbles	25-30
Buff silt	30-35
Buff silty clay	35-40
Buff sand	40-45
Buff sand	45-50
Neutron Access Hole 7	
Samples missing	0-5
Brownish sand	5-10
Silt and pebbles	10-15
Pebbles	15-20
Pebbles and cobble	20-25
Pebbles and cobble	25-30
Pebbles and cobble	30-35
Grayish clayey sand	35-40
Grayish clayey sand	40-45
Grayish clayey sand	45-50

LITHOLOGY	INTERVAL (ft)
Neutron Access Hole 9	
Samples missing	0-5
Samples missing	5-10
Samples missing	10-15
Samples missing	15-20
Samples missing	20-25
Samples missing	25-30
Samples missing	30-35
Buff silt	35-40
Gray sand	40-45
Gray sand	45-50

ATTACHMENT 2

DRILLERS LOG FOR THE AMOCO DAVIS GAS UNIT F-1 WELL



AREA 640 ACRES
LOCATE WELL CORRECTLY

NEW MEXICO OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

WELL RECORD

Mail to District Office, Oil Conservation Commission, to which Form C-101 was sent not later than twenty days after completion of well. Follow instructions in Rules and Regulations of the Commission. Submit in QUINTUPLICATE. If State Land submit 6 Copies

Pan American Petroleum Corporation (Company or Operator) Davis Gas Unit "F" (Lease)

Well No. 1, in NE ¼ of SE ¼, of Sec. 27, T. 29N, R. 11W, NMPM.

Undesignated Dakota Pool, San Juan County.

Well is 1850 feet from South line and 1190 feet from East line

of Section 27 If State Land the Oil and Gas Lease No. is —

Drilling Commenced October 4, 1960 Drilling was Completed October 24, 1960

Name of Drilling Contractor Brinkerhoff Drilling Company

Address 870 Denver Club Building, Denver 2, Colorado

Elevation above sea level at Top of Tubing Head 5565 (RDB) The information given is to be kept confidential until not confidential, 19

OIL SANDS OR ZONES

No. 1, from 6213 to 6250 No. 4, from to

No. 2, from to No. 5, from to

No. 3, from to No. 6, from to

IMPORTANT WATER SANDS

Include data on rate of water inflow and elevation to which water rose in hole.

No. 1, from to feet.

No. 2, from to feet.

No. 3, from to feet.

No. 4, from to feet.

CASING RECORD

SIZE	WEIGHT PER FOOT	NEW OR USED	AMOUNT	KIND OF SHOE	CUT AND PULLED FROM	PERFORATIONS	PURPOSE
8-5/8"	22.7	New	323	Guide			Surface
4-1/2"	9.5	New	6390	Guide			Oil String

MUDDING AND CEMENTING RECORD

SIZE OF HOLE	SIZE OF CASING	WHERE SET	NO. SACKS OF CEMENT	METHOD USED	MUD GRAVITY	AMOUNT OF MUD USED
12-1/4"	8-5/8"	332	225	Halliburton 2 plug		
7-7/8"	4-1/2"	6365	575	2-stage		

DIST.

RECORD OF PRODUCTION AND STIMULATION

(Record the Process used, No. of Qts. or Gals. used, interval treated or shot.)

Spotted 500 gallons 15% BDA. Perforated 6215-19, 6227-29, 6236-40, with 6 shots per foot. Sand water fracked with 40,000 gallons water and 40,000 pounds sand. Breakdown pressure 1500 psi, average treating pressure 2500 psi, average injection rate 39 barrels per minute.

Result of Production Stimulation Completed as Undesignated Dakota field development well November 7, 1960. Preliminary test flowed 4653 MCFPD.

Depth Cleaned Out 6332

RECORD OF DRILL-STEM AND SPECIAL TESTS

If drill-stem or other special tests or deviation surveys were made, submit report on separate sheet and attach hereto

TOOLS USED

Rotary tools were used from 0 feet to 6365 feet, and from ______ feet to ______ feet.

Cable tools were used from ______ feet to ______ feet, and from ______ feet to ______ feet.

PRODUCTION

Put to Producing November 7, 19 60 (Shut in for pipeline connection.)

OIL WELL: The production during the first 24 hours was ______ barrels of liquid of which ______ % was was oil; ______ % was emulsion; ______ % water; and ______ % was sediment. A.P.I. Gravity ______

GAS WELL: The production during the first 24 hours was Preliminary test 4653 M.C.F. plus ______ barrels of liquid Hydrocarbon. Shut in Pressure ______ lbs.

Length of Time Shut in Potential test will be submitted on Sundry Notice when available.

PLEASE INDICATE BELOW FORMATION TOPS (IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE):

Southeastern New Mexico		Northwestern New Mexico
T. Anhy	T. Devonian	T. Ojo Alamo 495
T. Salt	T. Silurian	T. Kirtland-Fruitland 650
B. Salt	T. Montoya	T. Farmington
T. Yates	T. Simpson	T. Pictured Cliffs 1716
T. 7 Rivers	T. McKee	T. Menefee
T. Queen	T. Ellenburger	T. Point Lookout 4143
T. Grayburg	T. Gr. Wash	T. Mancos 4410
T. San Andres	T. Granite	T. Dakota 6156
T. Glorieta	T.	T. Morrison
T. Drinkard	T.	T. Penn
T. Tubbs	T.	T.
T. Abo	T.	T.
T. Penn	T.	T.
T. Miss	T.	T.

FORMATION RECORD

From	To	Thickness in Feet	Formation	From	To	Thickness in Feet	Formation
0	495	495	Surface sands & shales.				
495	650	155	Ojo Alamo sand.				
650	1523	873	Kirtland shales & sands, including Farmington.				
1523	1716	193	Fruitland sands, shales & coals.				
1716	1840	124	Pictured Cliffs sands & shales.				
1840	3300	1460	Lewis shales & sands.				
3300	4410	1110	Mesaverde sands & shales.				
4410	5304	894	Mancos shale.				
5304	6060	756	Gallup sands & shales.				
6060	6100	40	Greenhorn shaly sand.				
6100	6156	56	Graneros sands & shales.				
6156	6213	57	Dakota sands & shales.				
6213	6365	152	Dakota pay sands & shales.				
			(Tops from E log)				

ATTACH SEPARATE SHEET IF ADDITIONAL SPACE IS NEEDED

I hereby swear or affirm that the information given herewith is a complete and correct record of the well and all work done on it so far as can be determined from available records.

November 9, 1960
(Date)

Company or Operator Pan American Petroleum Corporation Address Box 480, Farmington, New Mexico

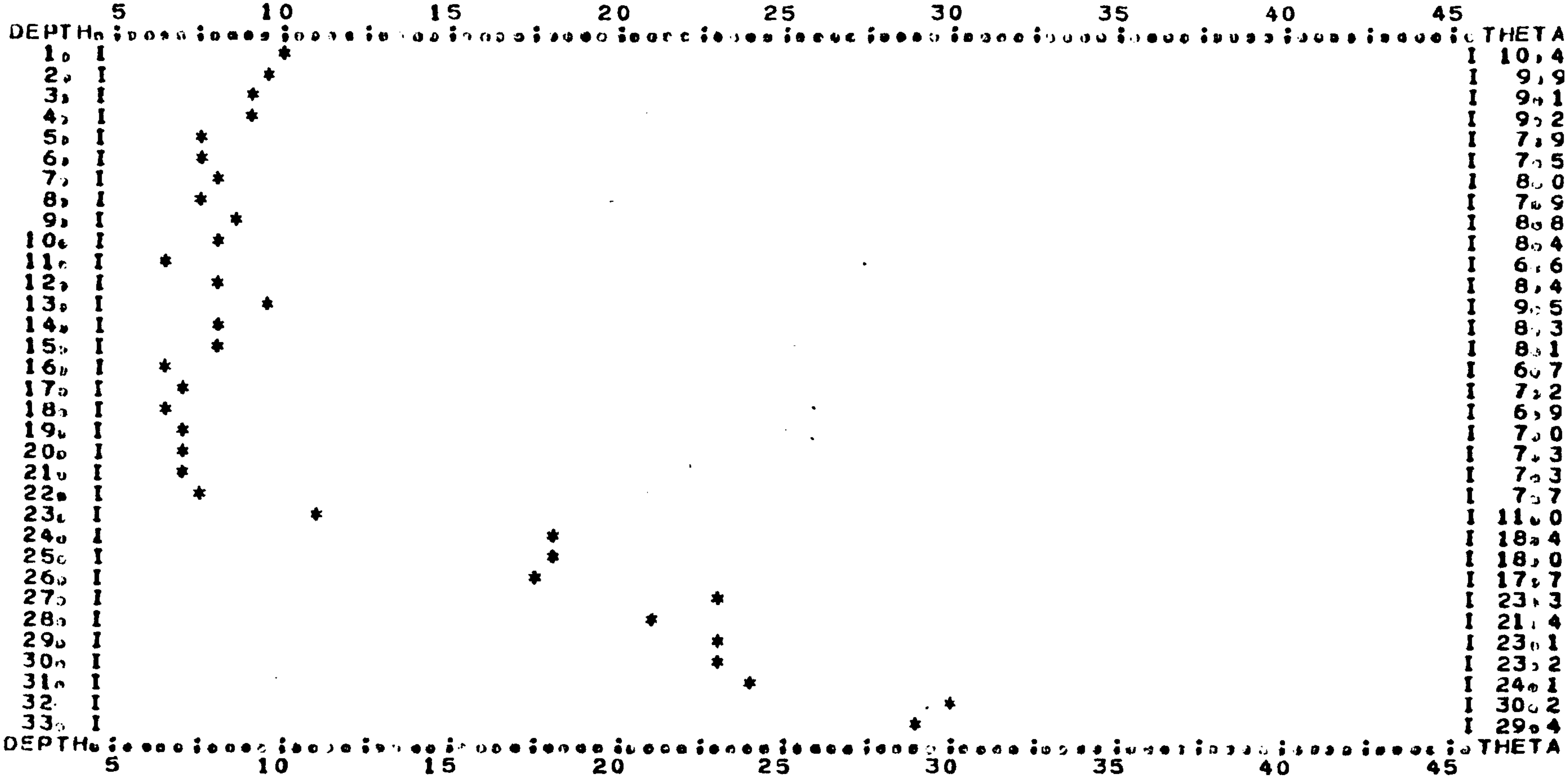
Name ORIGINAL SIGNED BY R. M. [illegible], Jr. Position Title Area Engineer

ATTACHMENT 3

NEUTRON-PROBE DATA

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-5       BM= 5521.13
DATE=  27 APR 1977    TIME=             PROBE NO=          WL=38.15
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



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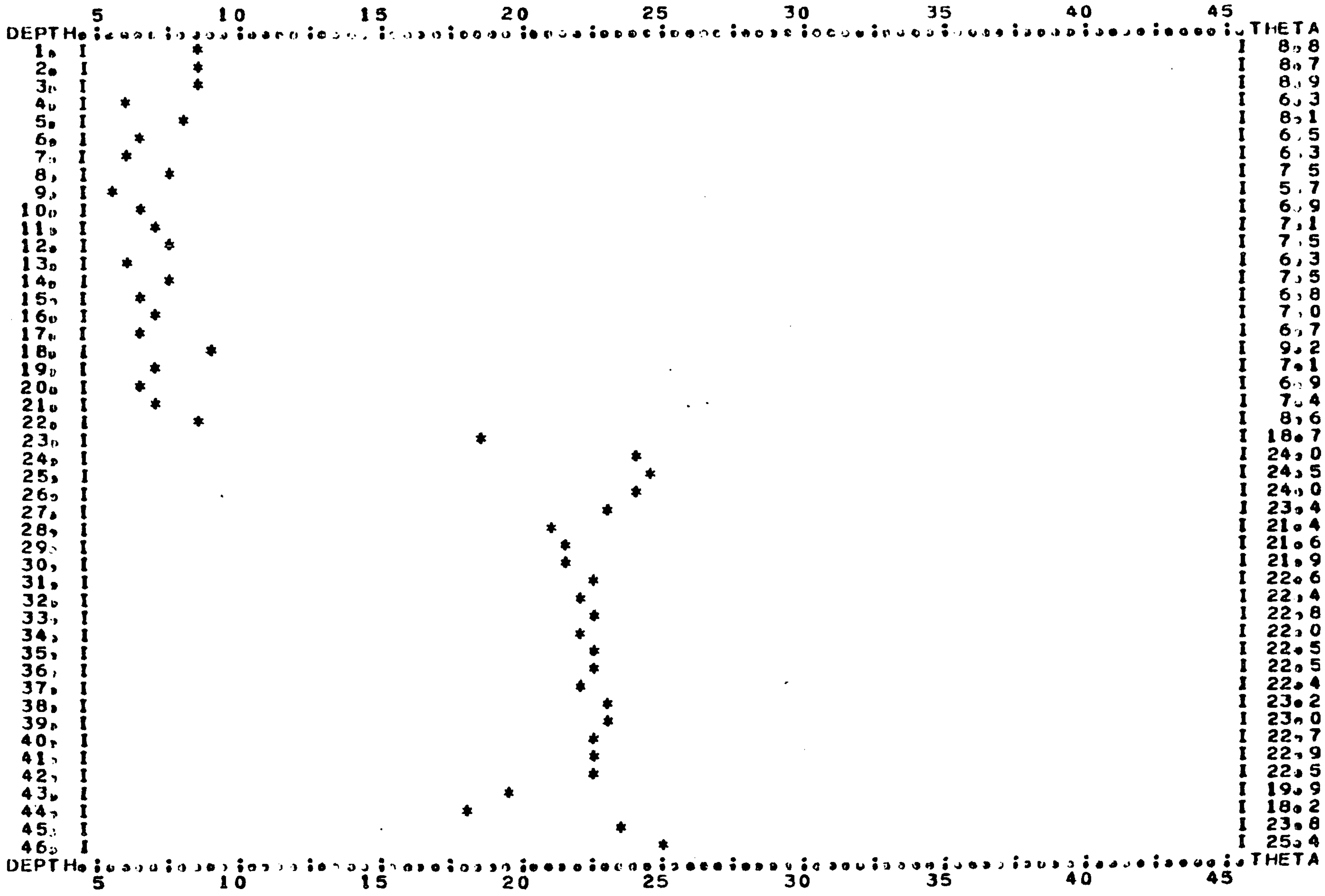
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-4      BM= 5521.17
DATE=  27 APR 1977   TIME=          PROBE NO=           WL=48.44
REMARKS=

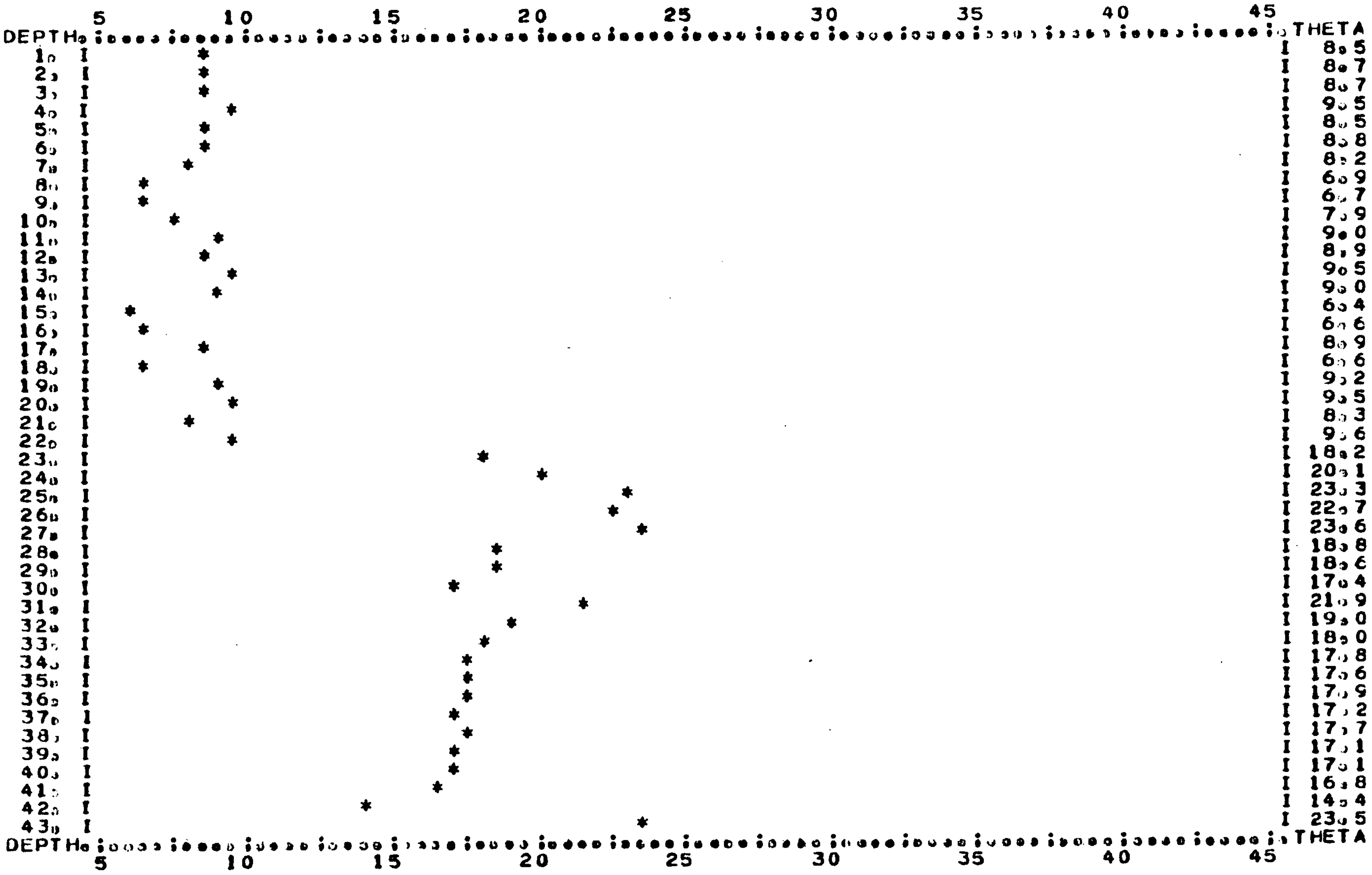
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1.	8.8
2.	8.7
3.	8.9
4.	6.3
5.	8.1
6.	6.5
7.	6.3
8.	7.5
9.	5.7
10.	6.9
11.	7.1
12.	7.5
13.	6.3
14.	7.5
15.	6.8
16.	7.0
17.	6.7
18.	9.2
19.	7.1
20.	6.9
21.	7.4
22.	8.6
23.	18.7
24.	24.0
25.	24.5
26.	24.0
27.	23.4
28.	21.4
29.	21.6
30.	21.9
31.	22.6
32.	22.4
33.	22.8
34.	22.0
35.	22.5
36.	22.5
37.	22.4
38.	23.2
39.	23.0
40.	22.7
41.	22.9
42.	22.5
43.	19.9
44.	18.2
45.	23.8
46.	25.4

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-3 BM= 5521.13
DATE= 27 APR 1977 TIME= PROBE NO= WL=41.09
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



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AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-2        BM= 5520.67
DATE=  27 APR 1977    TIME=              PROBE NO=           WL=49.17
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
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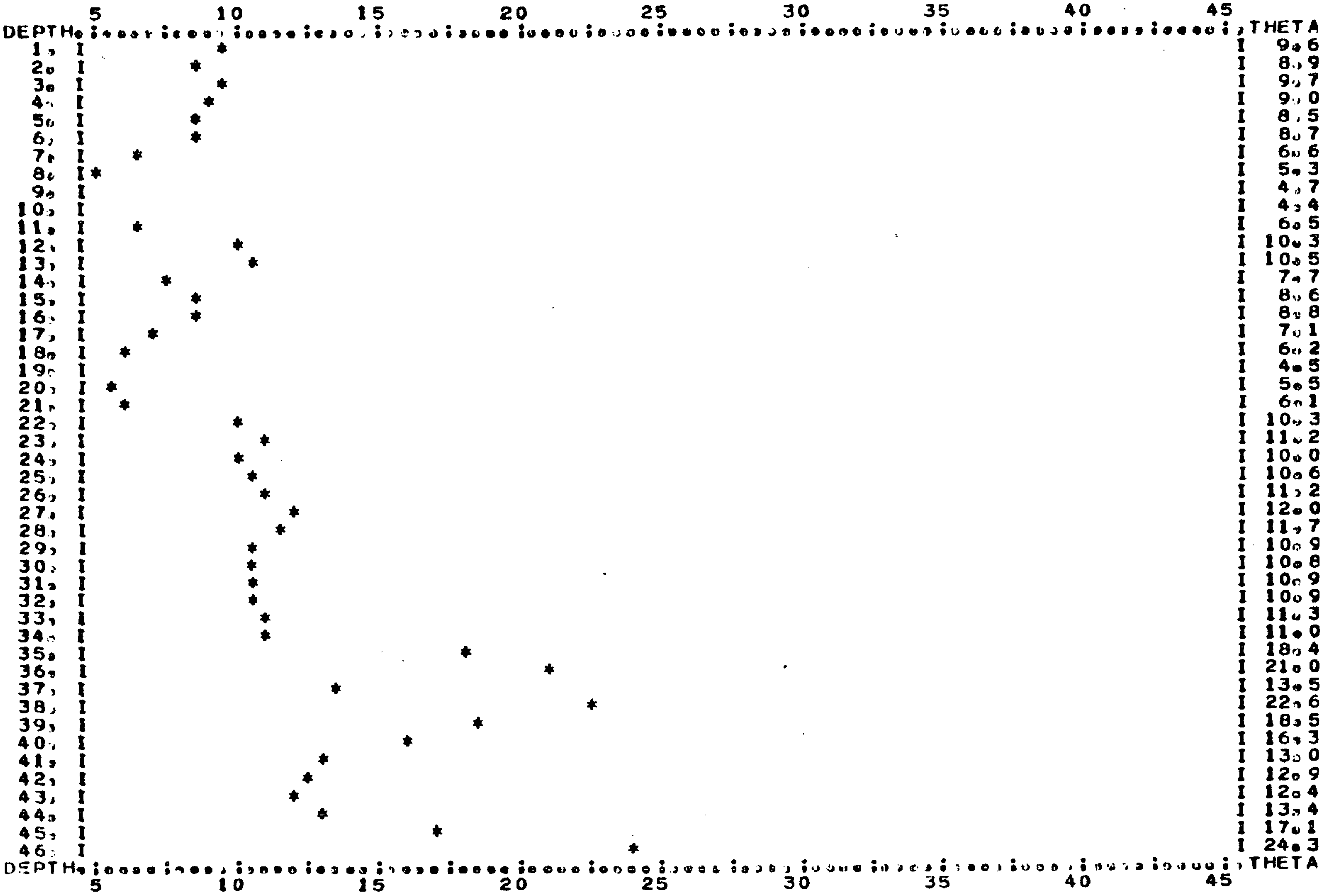

RESULTS OF TRACER ANALYSES

PROJECT: Plateau

DATE COLLECTED: 9-20-78

DATE OF ANALYSIS: October 4, 1978

TRACER: TRAC 5

LOCATION	AMOUNT	
San Juan R. at Bridge	0.025	picograms/millilitre
Ditch downstream of pond	0.45	"
NW corner of pond	406.	"
NE corner of pond	455.	"
SW corner of pond	416.	"
SE corner of pond	409.	"
Center of pond	162.	"

RESULTS OF TRACER ANALYSES

PROJECT: Plateau

DATE COLLECTED: October 25, 1978

DATE OF ANALYSIS: November 1, 1978

TRACER: TRAC-5

LOCATION	AMOUNT
Blank	0
Ditch upstream	0 both samples
Ditch downstream	58.4 pgm/ml
River downstream	+ but less than analytical limits
NE corner pond	81.6 pgm/ml
SE corner pond	92.9 pgm/ml

RESULTS OF TRACER ANALYSES

PROJECT: Plateau

DATE COLLECTED: December 14, 1978

DATE OF ANALYSIS: December 29, 1978

TRACER: TRAC-5

LOCATION	CONCENTRATION
San Juan upstream	0 picograms/millilitre
(two of the three samples were leaking and not analysed)	
San Juan downstream	0 pg/ml
(one sample was broken)	
Hammond ditch upstream	24.0 pg/ml
(chromatogram suggests this sample was contaminated)	
Hammond ditch downstream	65.2 pg/ml

ATTACHMENT 6

WATER-LEVEL DATA

WATER LEVEL MEASUREMENTS IN NEUTRON-PROBE ACCESS HOLE NP-1

DATE	DEPTH TO WATER (ft)	W.L. ELEVATION (ft above M.S.L.)
26 April 1977	36.80	5485.02[1]
27 April 1977	48.60[2]	5473.22
6 May 1977	DRY[2]	
22 May 1977	48.16	5473.66
18 Sept. 1977	39.88	5481.94
11 Jan. 1978	36.73[3]	5485.09
14 Feb. 1978	35.04[3]	5486.78
27 March 1978	36.28[3]	5485.54
26 April 1978	37.00[3]	5484.82
2 June 1978	37.50[3]	5484.32
29 June 1978	38.13[3]	5483.69
12 July 1978	38.43[3]	5483.39
20 Sept. 1978	38.35[3]	5483.47

---

[1] -- B.M. 5521.82

[2] -- Water level taken after blowing the hole.

[3] -- Water level taken in undisturbed hole.

10'sat

5484 EL

WATER LEVEL MEASUREMENTS IN NEUTRON-PROBE ACCESS HOLE NP-2

DATE	DEPTH TO WATER (ft)	W.L. ELEVATION (ft above M.S.L.)
26 April 1977	48.17	5472.50[1]
27 April 1977	49.17[2]	5471.50
6 May 1977	DRY[2]	
22 May 1977	46.70	5473.97
19 Sept. 1977	42.40	5478.27
10 Jan. 1978	40.08[3]	5480.59
14 Feb. 1978	34.07[3]	5486.60
27 March 1978	34.17[3]	5486.50
26 April 1978	36.10[3]	5484.57
2 June 1978	36.10[3]	5484.57
29 June 1978	36.50[3]	5484.17
12 July 1978	35.85[3]	5484.82
20 Sept. 1978	34.17[3]	5486.50

---

[1] -- B.M. 5520.67

[2] -- Water level taken after blowing the hole.

[3] -- Water level taken in undisturbed hole.

5484

49
34
15

WATER LEVEL MEASUREMENTS IN NEUTRON-PROBE ACCESS HOLE NP-3

DATE	DEPTH TO WATER (ft)	W.L. ELEVATION (ft above M.S.L.)
26 April 1977	26.72	5494.41[1]
27 April 1977	41.09[2]	5480.04
6 May 1977	26.98	5494.15
21 May 1977	23.95	5497.18
19 Sept. 1977	21.30	5499.83
10 Jan. 1978	23.62[3]	5497.51
14 Feb. 1978	21.52[3]	5499.61
27 March 1978	22.71[3]	5498.42
26 April 1978	22.69[3]	5498.44
2 June 1978	22.40[3]	5498.73
29 June 1978	22.43[3]	5498.70
12 July 1978	21.93[3]	5499.20
20 Sept. 1978	21.52[3]	5499.61

---

[1] -- B.M. 5521.13

[2] -- Water level taken after blowing the hole.

[3] -- Water level taken in undisturbed hole.

20' saturated

WATER LEVEL MEASUREMENTS IN NEUTRON-PROBE ACCESS HOLE NP-4

DATE	DEPTH TO WATER (ft)	W.L. ELEVATION (ft above M.S.L.)
26 April 1977	35.92	5485.25[1]
27 April 1977	48.44[2]	5472.73
6 May 1977	45.54	5475.63
21 May 1977	39.39	5481.78
19 Sept. 1977	30.49	5490.68
10 Jan. 1978	27.35[3]	5493.82
14 Feb. 1978	25.76[3]	5495.41
27 March 1978	26.16[3]	5495.01
26 April 1978	26.49[3]	5494.68
2 June 1978	26.30[3]	5494.87
29 June 1978	26.40[3]	5494.77
12 July 1978	26.21[3]	5494.96
20 Sept. 1978	24.50[3]	5496.67

---

[1] -- B.M. 5521.17

[2] -- Water level taken after blowing the hole.

[3] -- Water level taken in undisturbed hole.

5494

20 saturated

WATER LEVEL MEASUREMENTS IN NEUTRON-PROBE ACCESS HOLE NP-5

DATE	DEPTH TO WATER (ft)	W.L. ELEVATION (ft above M.S.L.)
26 April 1977	28.70	5467.97[1]
27 April 1977	38.15[2]	5482.98
6 May 1977	45.28[2]	5475.85
21 May 1977	22.45	5498.68
19 Sept. 1977	24.95	5496.18
10 Jan. 1978	23.36[3]	5497.77
14 Feb. 1978	21.09[3]	5500.04
27 March 1978	22.30[3]	5498.83
26 April 1978	22.35[3]	5498.78
2 June 1978	22.05[3]	5499.08
29 June 1978	22.26[3]	5498.87
12 July 1978	21.59[3]	5499.54
20 Sept. 1978	21.93[3]	5499.20

---

1 -- B.M. 5521.13

2 -- Water level taken after blowing the hole.

3 -- Water level taken in undisturbed hole.

22' sot

5499

WATER LEVEL MEASUREMENTS IN NEUTRON-PROBE ACCESS HOLE NP-6

DATE	DEPTH TO WATER (ft)	W.L. ELEVATION (ft above M.S.L.)
26 April 1977	27.57	5493.37[1]
27 April 1977	49.10[2]	5471.84
6 May 1977	46.04	5474.90
21 May 1977	28.23	5492.71
19 Sept. 1977	22.34	5498.60
10 Jan. 1978	23.34[3]	5497.60
14 Feb. 1978	18.10[3]	5502.84
27 March 1978	19.91[3]	5501.03
26 April 1978	20.10[3]	5500.84
2 June 1978	26.05[3]	5494.89
29 June 1978	22.63[3]	5498.31
12 July 1978	23.00[3]	5497.94
20 Sept. 1978	23.52[3]	5497.42

---

[1] -- B.M. 5520.94

[2] --Water level taken after blowing the hole.

[3] -- Water level taken in undisturbed hole.

5498

23' sat

WATER LEVEL MEASUREMENTS IN NEUTRON-PROBE ACCESS HOLE NP-7

DATE	DEPTH TO WATER (ft)	W.L. ELEVATION (ft above M.S.L.)
26 April 1977	28.03	5492.94[1]
27 April 1977	48.72[2]	5472.25
6 May 1977	47.64	5473.33
21 May 1977	24.46	5496.51
19 Sept. 1977	30.53	5490.44
10 Jan. 1978	26.00[3]	5494.97
14 Feb. 1978	25.74[3]	5495.23
27 March 1978	26.14[3]	5494.83
26 April 1978	26.11[3]	5494.86
2 June 1978	26.05[3]	5494.92
29 June 1978	26.47[3]	5494.50
12 July 1978	26.44[3]	5494.53
20 Sept. 1978	25.83[3]	5495.14

---

[1] -- B.M. 5520.97

[2] -- Water level taken after blowing the hole.

[3] -- Water level taken in undisturbed hole.

5495

20' sat

WATER LEVEL MEASUREMENTS IN NEUTRON-PROBE ACCESS HOLE NP-8

DATE	DEPTH TO WATER (ft)	W.L. ELEVATION (ft above M.S.L.)
26 April 1977	26.82	5494.47[1]
27 April 1977	40.12[2]	5481.17
6 May 1977	28.25	5493.04
21 May 1977	23.11	5498.18
19 Sept. 1977	26.12	5495.17
10 Jan. 1978	24.29[3]	5497.00
14 Feb. 1978	23.02[3]	5498.27
27 March 1978	23.68[3]	5497.61
26 April 1978	23.54[3]	5497.75
2 June 1978	23.35[3]	5497.94
29 June 1978	23.44[3]	5497.85
12 July 1978	22.97[3]	5498.32
20 Sept. 1978	22.74[3]	5498.55

---

[1] -- B.M. 5521.29

[2] -- Water level taken after blowing the hole.

[3] -- Water level taken in undisturbed hole.

46
23
17' sat

5497

WATER LEVEL MEASUREMENTS IN NEUTRON-PROBE ACCESS HOLE NP-9

DATE	DEPTH TO WATER (ft)	W.L. ELEVATION (ft above M.S.L.)
26 April 1977	25.23	5495.67[1]
26 April 1977	45.46[2]	5475.44
6 May 1977	44.76[2]	5476.14
21 May 1977	21.41	5499.49
19 Sept. 1977	25.48	5495.42
10 Jan. 1978	22.97[3]	5497.93
14 Feb. 1978	15.86[3]	5505.04
27 March 1978	17.60[3]	5503.30
26 April 1978	19.00[3]	5501.90
2 June 1978	19.80[3]	5501.10
29 June 1978	20.19[3]	5500.17
12 July 1978	20.62[3]	5500.28
20 Sept. 1978	20.61[3]	5500.29

---

[1] -- B.M. 5520.90

[2] -- Water level taken after blowing the hole.

[3] -- Water level taken in undisturbed hole.

25' sat

5500

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AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-2       BM= 5520.67
DATE= 29 JUNE 1978    TIME=1140      PROBE NO=         WL=36.50
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
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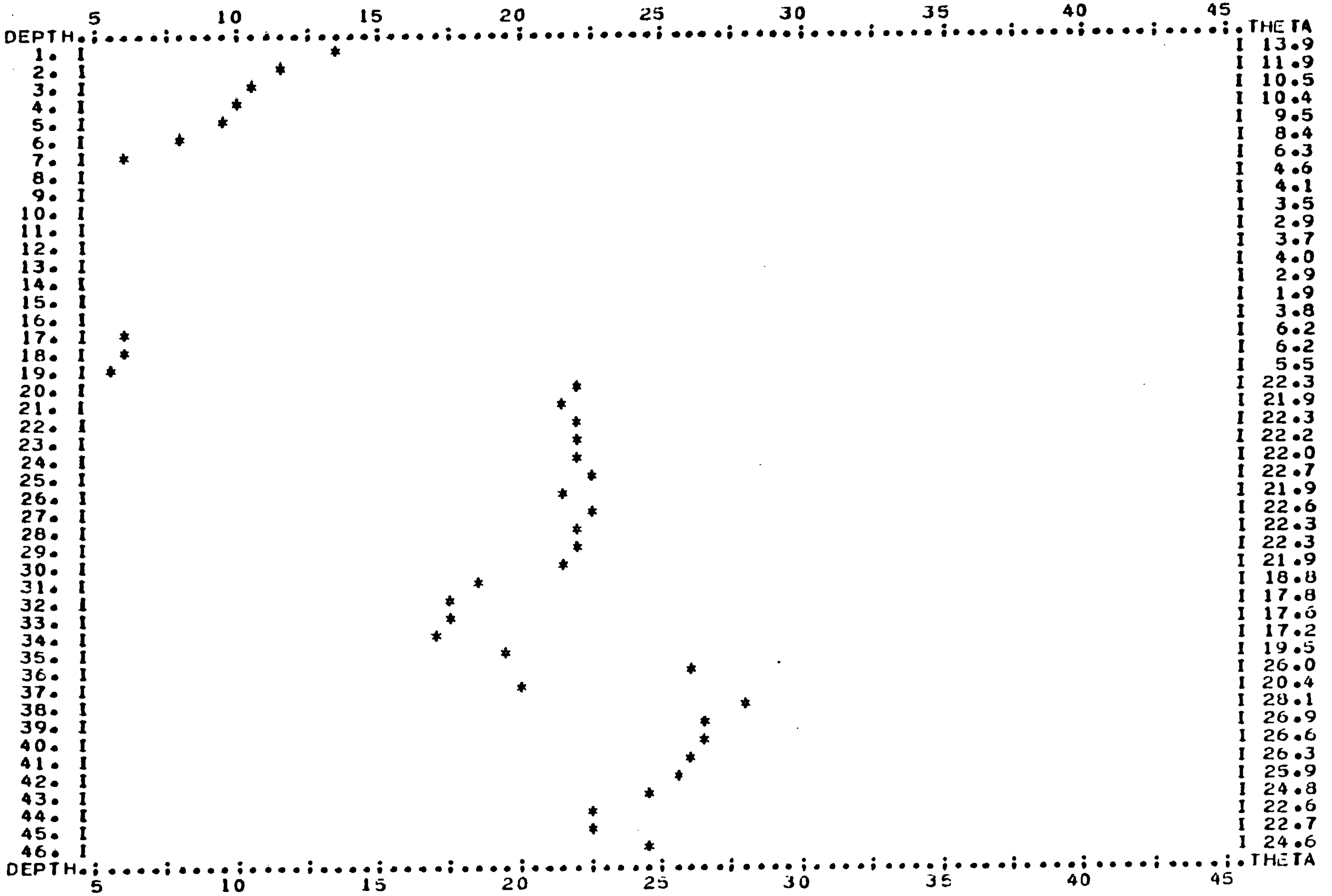

DEPTH	THETA
1.	13.9
2.	11.9
3.	10.5
4.	10.4
5.	9.5
6.	8.4
7.	6.3
8.	4.6
9.	4.1
10.	3.5
11.	2.9
12.	3.7
13.	4.0
14.	2.9
15.	1.9
16.	3.8
17.	6.2
18.	6.2
19.	5.5
20.	22.3
21.	21.9
22.	22.3
23.	22.2
24.	22.0
25.	22.7
26.	21.9
27.	22.6
28.	22.3
29.	22.3
30.	21.9
31.	18.8
32.	17.8
33.	17.6
34.	17.2
35.	19.5
36.	26.0
37.	20.4
38.	28.1
39.	26.9
40.	26.6
41.	26.3
42.	25.9
43.	24.8
44.	22.6
45.	22.7
46.	24.6

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-3      BM= 5521.13
DATE= 29 JUNE 1978   TIME=1115     PROBE NO=          WL =22.45
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
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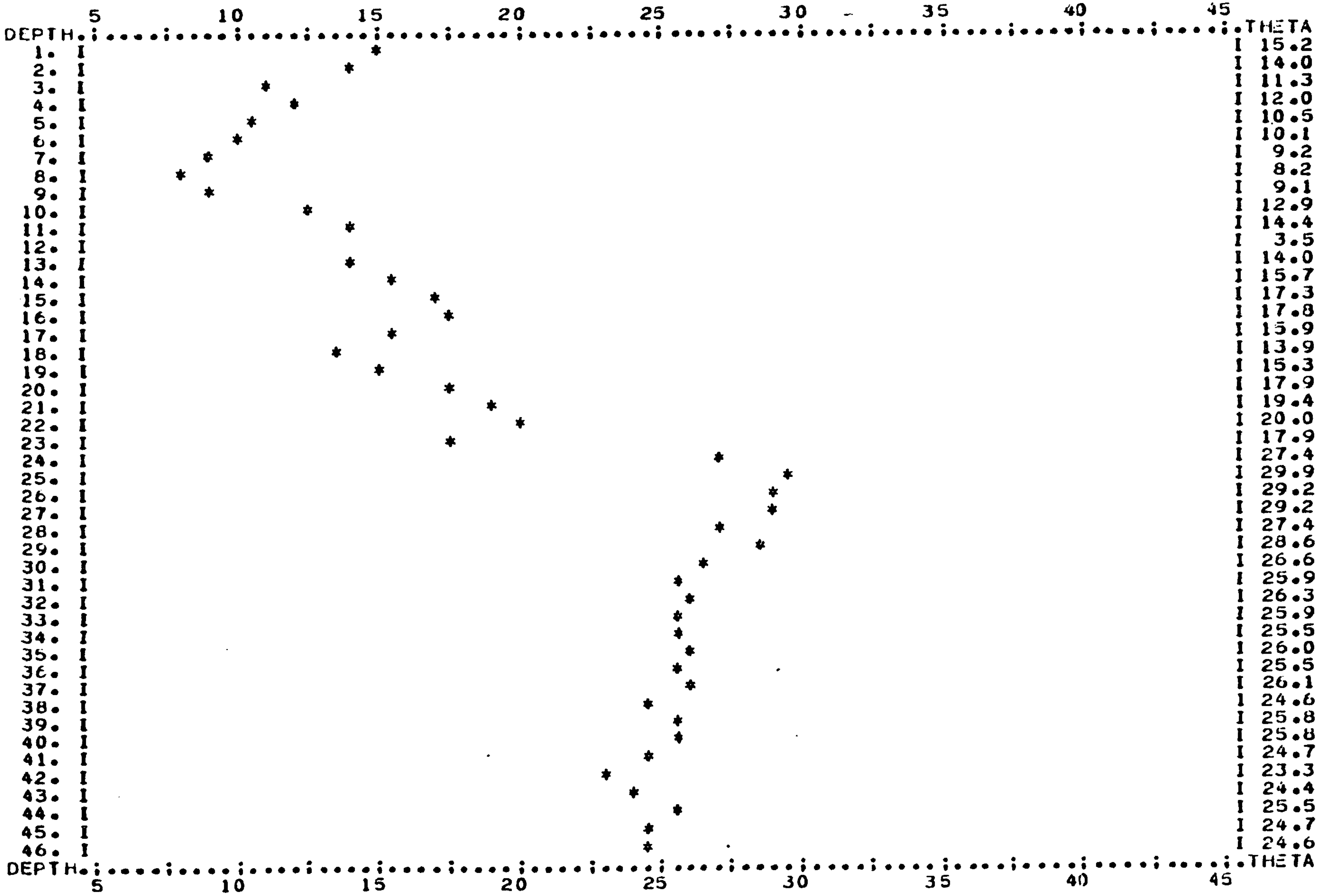

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AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-4       BM= 5521.17
DATE= 29 JUNE 1978   TIME=1100      PROBE NO=         WL=26.40
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
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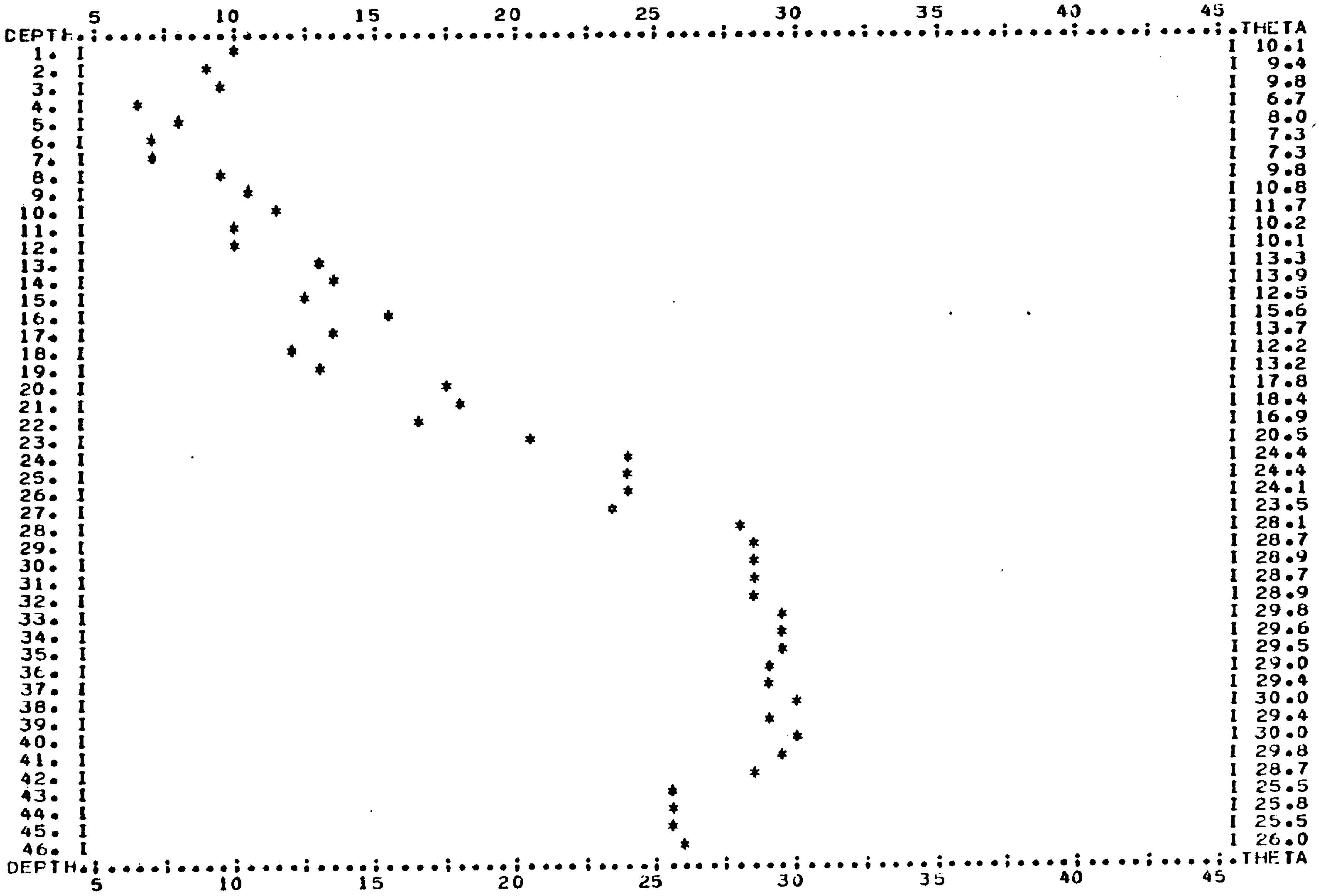
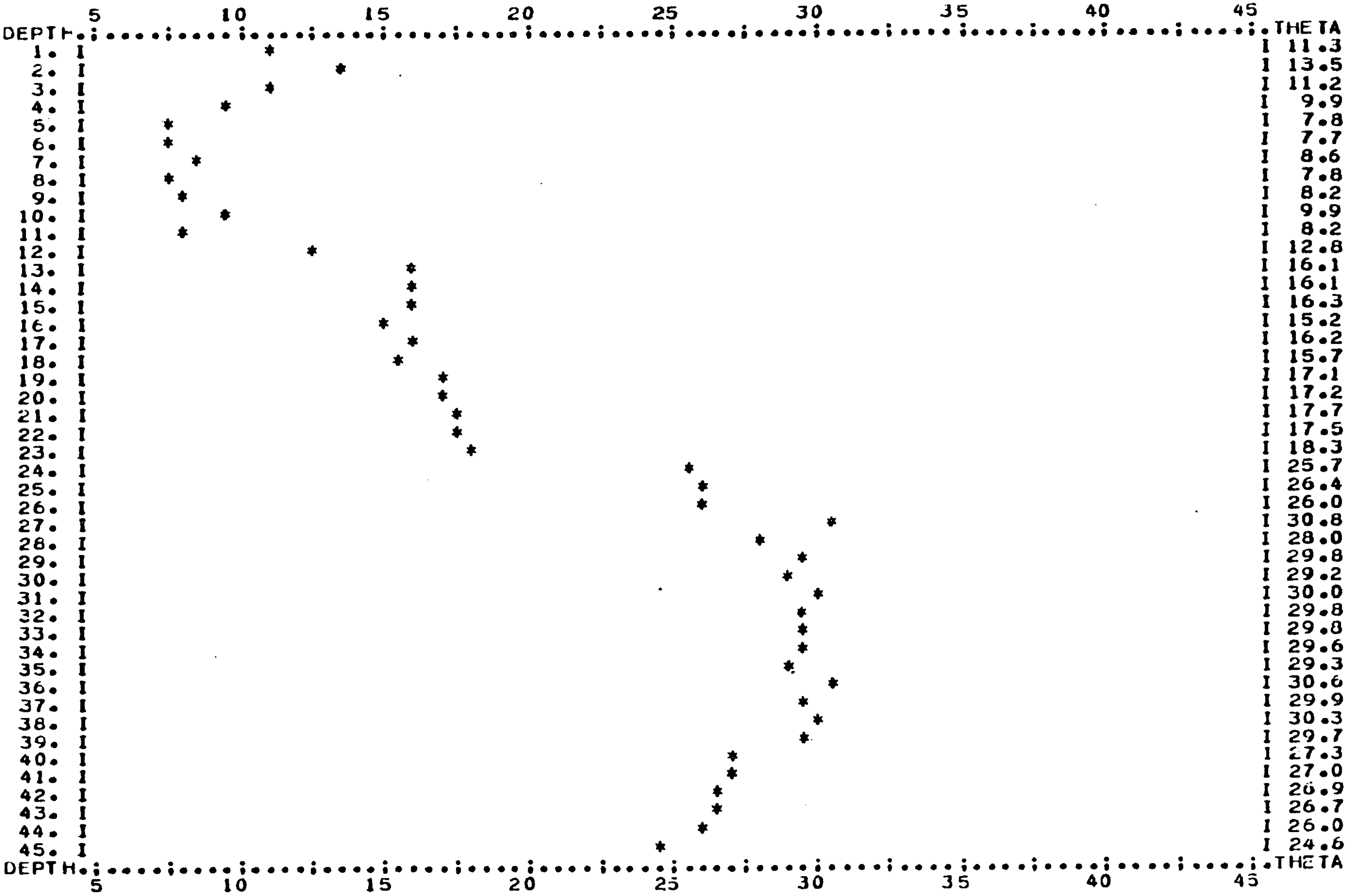


DEPTH	THETA
1.	10.1
2.	9.4
3.	9.8
4.	6.7
5.	8.0
6.	7.3
7.	7.3
8.	9.8
9.	10.8
10.	11.7
11.	10.2
12.	10.1
13.	13.3
14.	13.9
15.	12.5
16.	15.6
17.	13.7
18.	12.2
19.	13.2
20.	17.8
21.	18.4
22.	16.9
23.	20.5
24.	24.4
25.	24.4
26.	24.1
27.	23.5
28.	28.1
29.	28.7
30.	28.9
31.	28.7
32.	28.9
33.	29.8
34.	29.6
35.	29.5
36.	29.0
37.	29.4
38.	30.0
39.	29.4
40.	30.0
41.	29.8
42.	28.7
43.	25.5
44.	25.8
45.	25.5
46.	26.0

AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-5 BM= 5521.13
DATE= 29 JUNE 1978 TIME=1030 PROBE NO= WL=22.26
REMARKS=

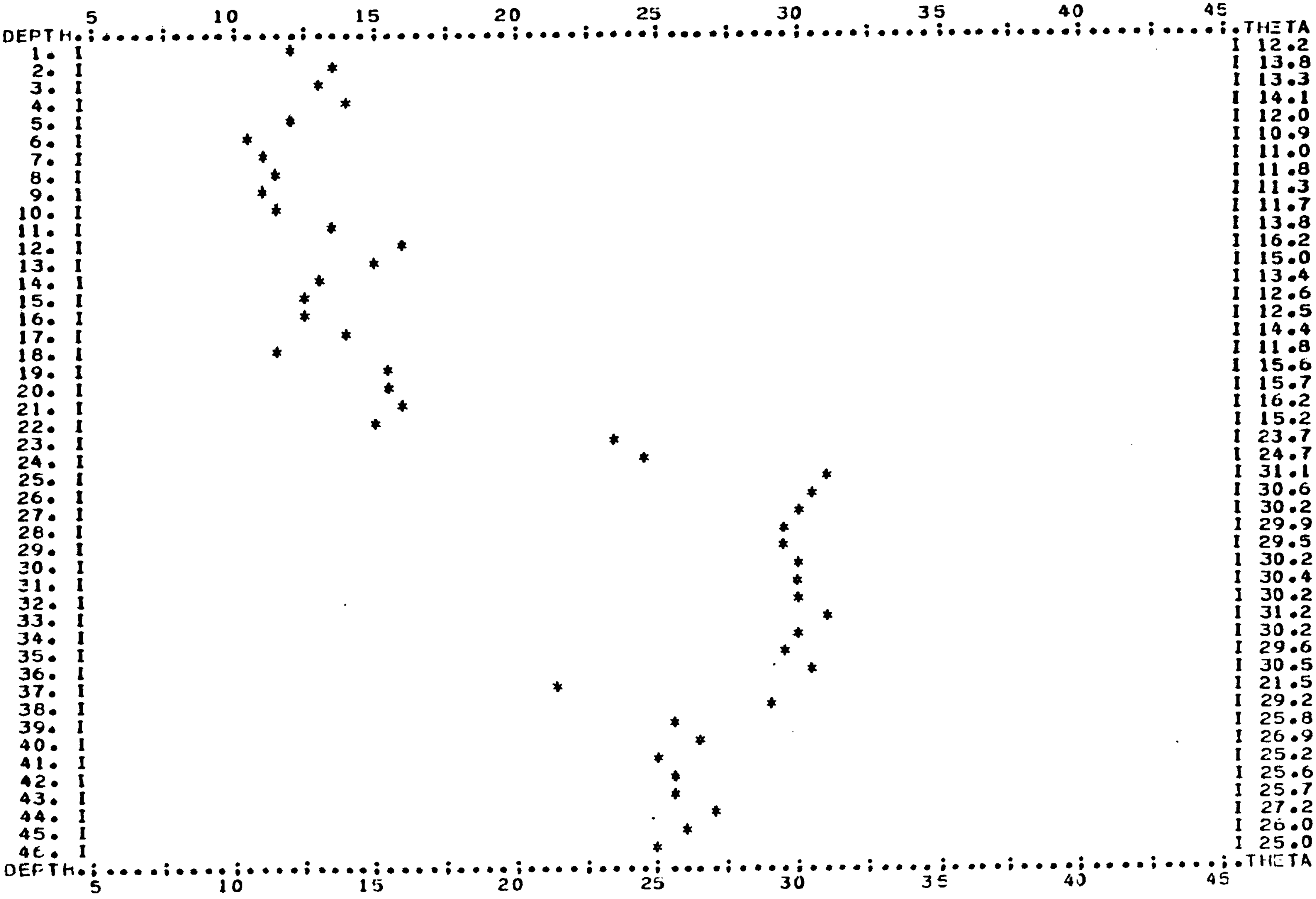
PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



DEPTH	THETA
1.	11.3
2.	13.5
3.	11.2
4.	9.9
5.	7.8
6.	7.7
7.	8.6
8.	7.8
9.	8.2
10.	9.9
11.	8.2
12.	12.8
13.	16.1
14.	16.1
15.	16.3
16.	15.2
17.	16.2
18.	15.7
19.	17.1
20.	17.2
21.	17.7
22.	17.5
23.	18.3
24.	25.7
25.	26.4
26.	26.0
27.	30.8
28.	28.0
29.	29.8
30.	29.2
31.	30.0
32.	29.8
33.	29.8
34.	29.6
35.	29.3
36.	30.6
37.	29.9
38.	30.3
39.	29.7
40.	27.3
41.	27.0
42.	26.9
43.	26.7
44.	26.0
45.	24.6

```
AMERICAN GRCUNDWATER CCNSULTANTS NEUTRCN PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HCLE ID=NP-6      BM= 5520.94
DATE= 29 JUNE 1978    TIME=1000      PROBE NO=          WL=22.63
REMARKS=

PERCENT MCISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE CF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



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AMERICAN GRCUNDWATER CCNSULTANTS NEUTRCN PRCBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      FCLE ID=NP-7      BM= 5520.97
DATE= 29 JUNE 1978   TIME=0930      PROBE NO=          WL=26.47
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE CF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
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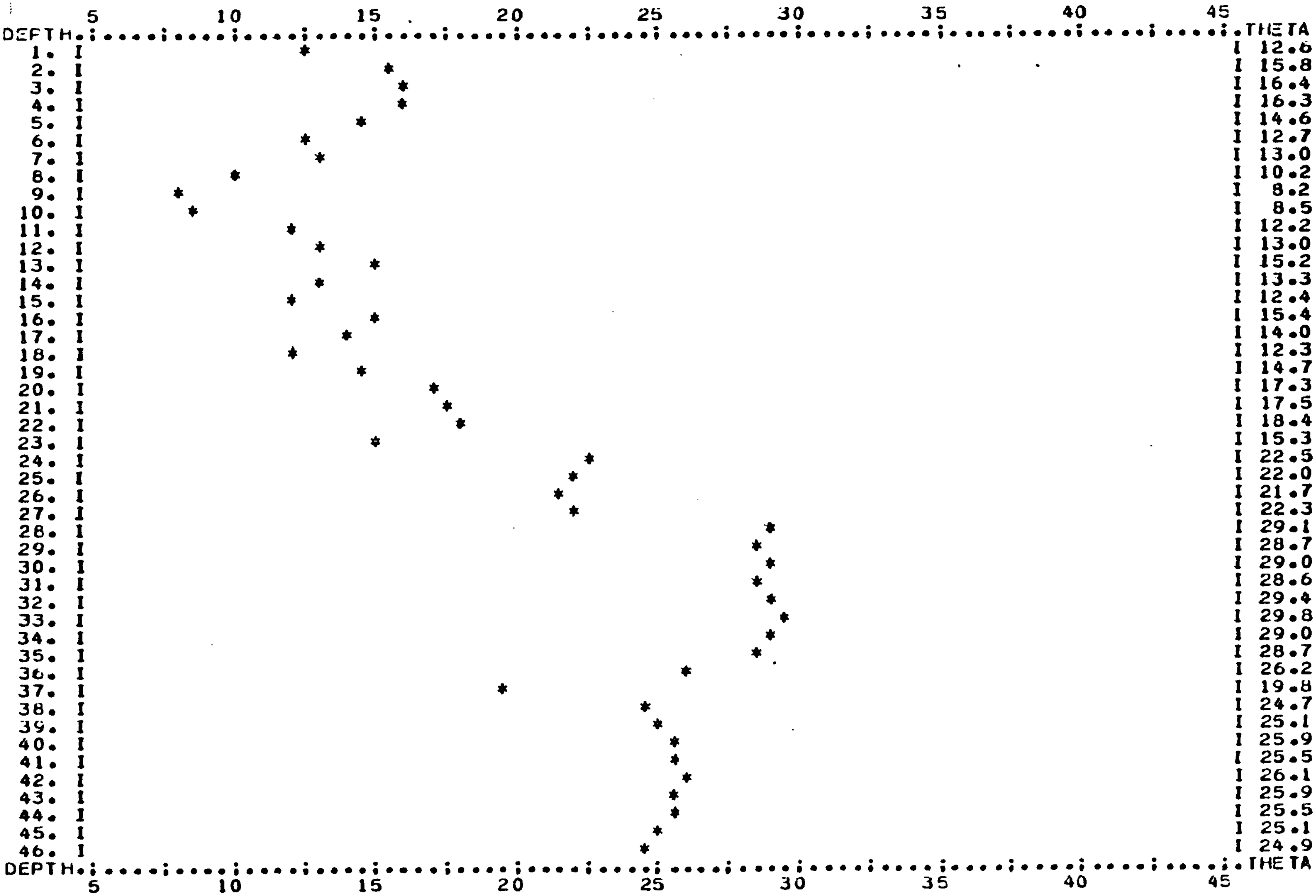
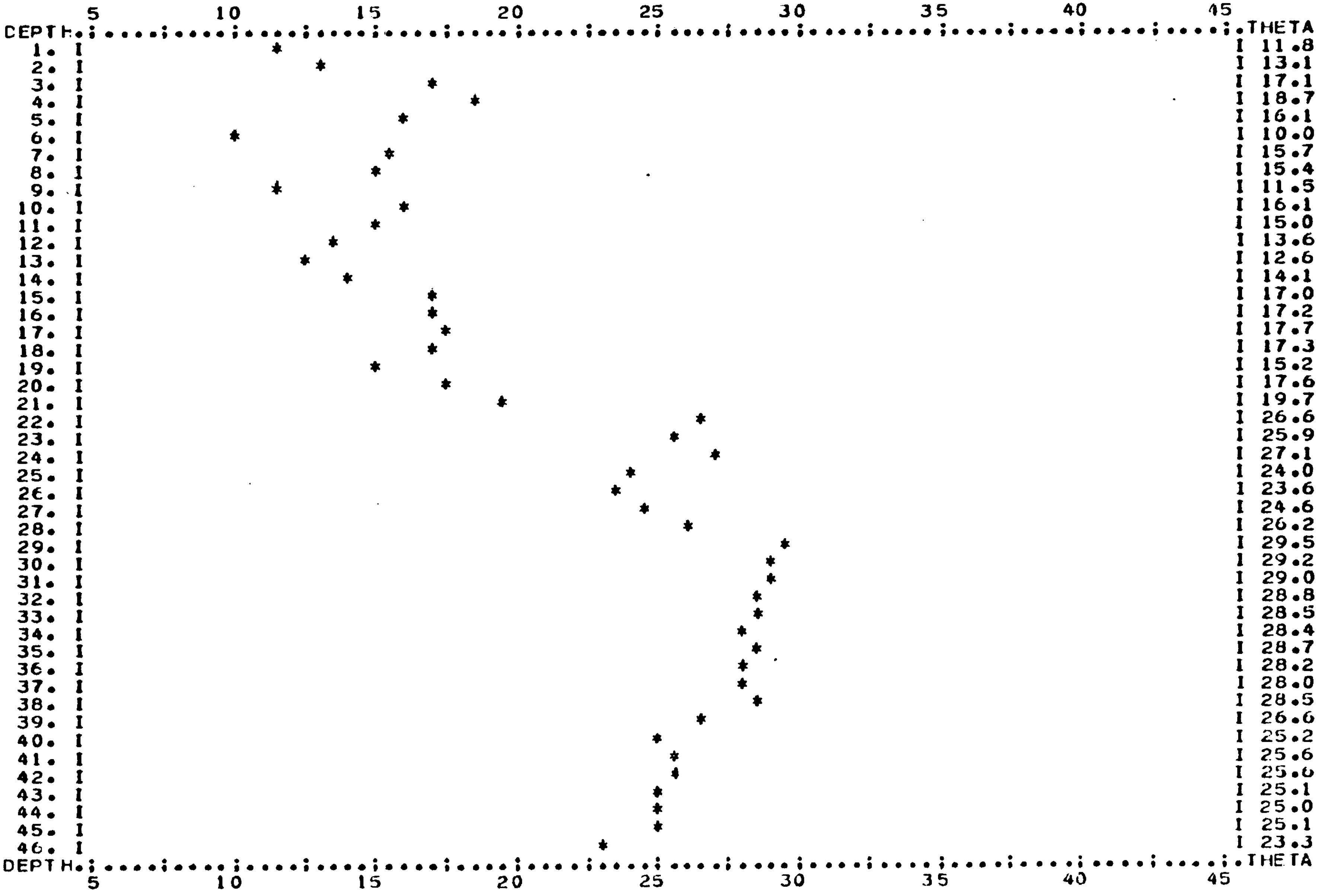


DEPTH	THETA
1.	12.6
2.	15.8
3.	16.4
4.	16.3
5.	14.6
6.	12.7
7.	13.0
8.	10.2
9.	8.2
10.	8.5
11.	12.2
12.	13.0
13.	15.2
14.	13.3
15.	12.4
16.	15.4
17.	14.0
18.	12.3
19.	14.7
20.	17.3
21.	17.5
22.	18.4
23.	15.3
24.	22.5
25.	22.0
26.	21.7
27.	22.3
28.	29.1
29.	28.7
30.	29.0
31.	28.6
32.	29.4
33.	29.8
34.	29.0
35.	28.7
36.	26.2
37.	19.8
38.	24.7
39.	25.1
40.	25.9
41.	25.5
42.	26.1
43.	25.9
44.	25.5
45.	25.1
46.	24.9

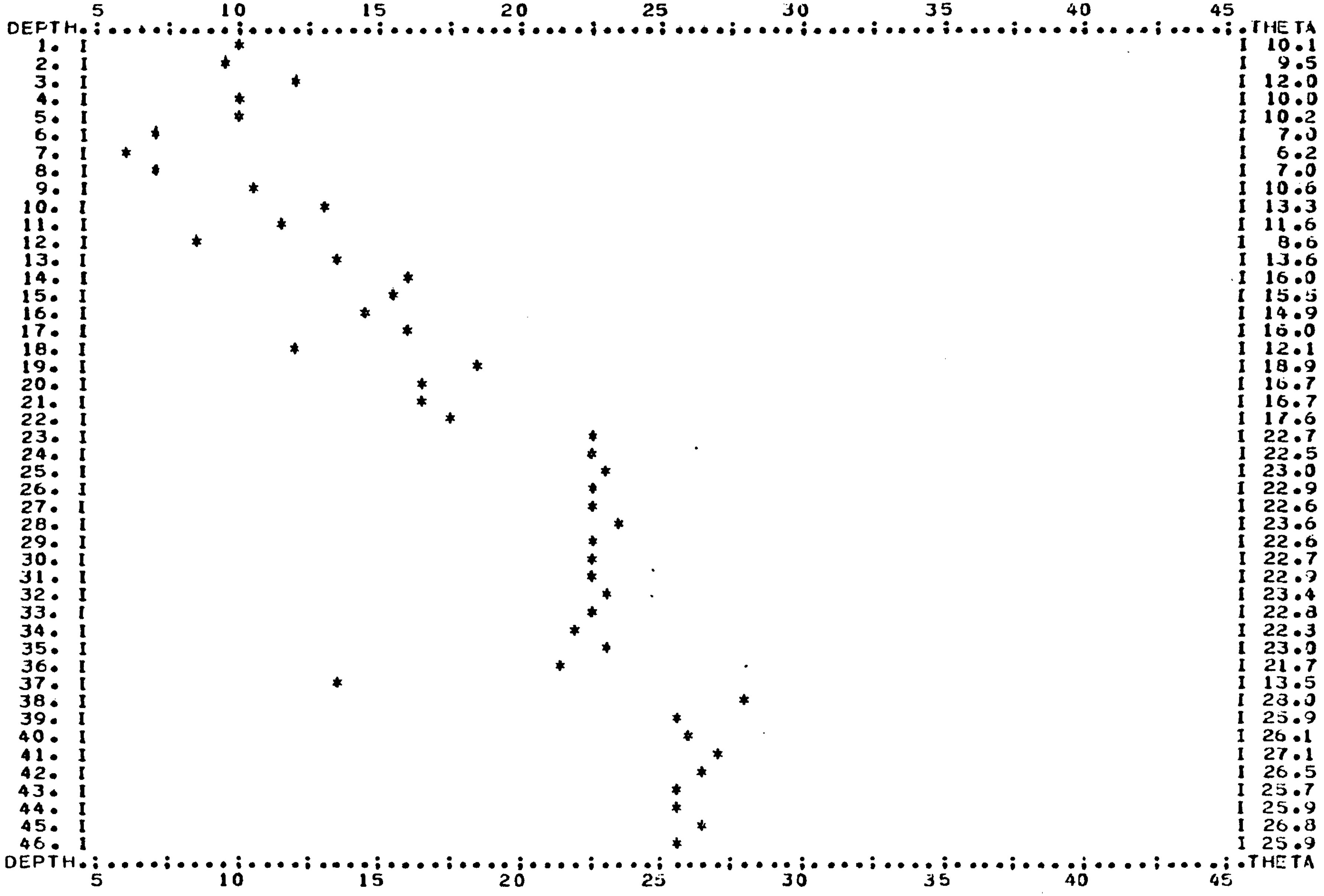
```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU       HOLE ID=NP-8       BM= 5521.29
DATE= 29 JUNE 1978    TIME=0900        PROBE NO=          WL=23.44
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1.	11.8
2.	13.1
3.	17.1
4.	18.7
5.	16.1
6.	10.0
7.	15.7
8.	15.4
9.	11.5
10.	16.1
11.	15.0
12.	13.6
13.	12.6
14.	14.1
15.	17.0
16.	17.2
17.	17.7
18.	17.3
19.	15.2
20.	17.6
21.	19.7
22.	26.6
23.	25.9
24.	27.1
25.	24.0
26.	23.6
27.	24.6
28.	26.2
29.	29.5
30.	29.2
31.	29.0
32.	28.8
33.	28.5
34.	28.4
35.	28.7
36.	28.2
37.	28.0
38.	28.5
39.	26.6
40.	25.2
41.	25.6
42.	25.6
43.	25.1
44.	25.0
45.	25.1
46.	23.3

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-9       BM= 5520.90
DATE= 29 JUNE 1978   TIME=0830     PROBE NO=           WL=20.19
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.

      5        10        15        20        25        30        35        40        45
DEPTH.:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:.THETA
  1. I                *                                                                I 13.4
  2. I                 *                                                               I 13.6
  3. I                  *                                                              I 14.4
  4. I                      *                                                          I 16.1
  5. I                  *                                                              I 14.1
  6. I            *                                                                    I 11.1
  7. I            *                                                                    I 11.2
  8. I               *                                                                 I 12.5
  9. I           *                                                                     I 10.6
 10. I          *                                                                      I 10.0
 11. I                  *                                                              I 14.0
 12. I                 *                                                               I 13.9
 13. I              *                                                                  I 12.4
 14. I            *                                                                    I 11.2
 15. I              *                                                                  I 12.0
 16. I                *                                                                I 13.1
 17. I              *                                                                  I 12.1
 18. I*                                                                                I  5.4
 19. I                                                                                 I  4.8
 20. I                      *                                                          I 16.3
 21. I                                   *                                             I 22.5
 22. I                                   *                                             I 22.5
 23. I                                              *                                  I 28.0
 24. I                                               *                                 I 28.6
 25. I                                                *                                I 29.1
 26. I                                                 *                               I 29.9
 27. I                                                 *                               I 29.9
 28. I                                                 *                               I 29.7
 29. I                                                 *                               I 29.5
 30. I                                               *                                 I 28.9
 31. I                                                  *                              I 30.1
 32. I                                                 *                               I 29.8
 33. I                                                *                                I 29.4
 34. I                                               *                                 I 28.9
 35. I                                               *                                 I 28.5
 36. I                                         *                                       I 25.5
 37. I                                *                                                I 21.1
 38. I                                        *                                        I 25.2
 39. I                                           *                                     I 26.6
 40. I                                          *                                      I 26.2
 41. I                                          *                                      I 26.3
 42. I                                           *                                     I 26.5
 43. I                                          *                                      I 26.0
 44. I                                         *                                       I 25.8
 45. I                                  *                                              I 22.3
DEPTH.:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:.THETA
      5        10        15        20        25        30        35        40        45
```

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-1        BM= 5521.82
DATE= 20 SEPT 1978    TIME=1300      PROBE NO=           WL=38.35
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```

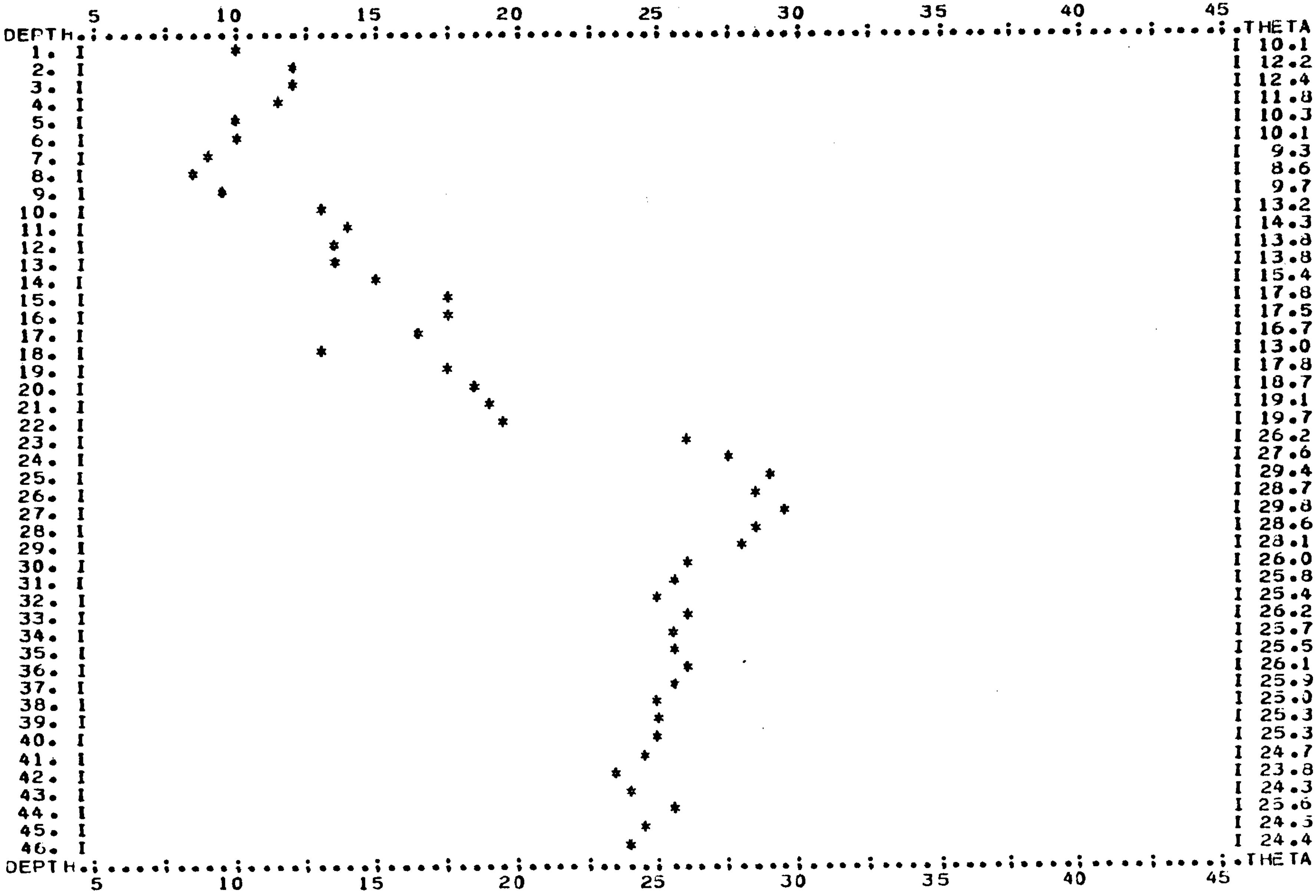


DEPTH	THETA
1.	10.1
2.	9.5
3.	12.0
4.	10.0
5.	10.2
6.	7.0
7.	6.2
8.	7.0
9.	10.6
10.	13.3
11.	11.6
12.	8.6
13.	13.6
14.	16.0
15.	15.5
16.	14.9
17.	16.0
18.	12.1
19.	18.9
20.	16.7
21.	16.7
22.	17.6
23.	22.7
24.	22.5
25.	23.0
26.	22.9
27.	22.6
28.	23.6
29.	22.6
30.	22.7
31.	22.9
32.	23.4
33.	22.8
34.	22.3
35.	23.0
36.	21.7
37.	13.5
38.	28.0
39.	25.9
40.	26.1
41.	27.1
42.	26.5
43.	25.7
44.	25.9
45.	26.8
46.	25.9

```
AMERICAN GRCUNDWATEF CCNSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU     HOLE ID=NP-2       BM= 5520.67
DATE= 20 SEPT 1978    TIME=1140      PROBE NO=          WL=34.17
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE CF MOISTUPE (THETA) GIVEN IN RIGHT HAND COLUMN.

      5        10        15        20        25        30        35        40        45
DEPTH.:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:.THETA
  1. I     *                                                                           I  7.8
  2. I       *                                                                         I  8.5
  3. I        *                                                                        I  9.3
  4. I        *                                                                        I  9.2
  5. I       *                                                                         I  8.6
  6. I      *                                                                          I  8.0
  7. I  *                                                                              I  6.0
  8. I                                                                                 I  4.2
  9. I                                                                                 I  4.1
 10. I                                                                                 I  3.3
 11. I                                                                                 I  2.7
 12. I                                                                                 I  3.2
 13. I                                                                                 I  3.7
 14. I                                                                                 I  2.3
 15. I                                                                                 I  1.7
 16. I                                                                                 I  4.2
 17. I    *                                                                            I  7.1
 18. I     *                                                                           I  7.9
 19. I                                 *                                               I 21.6
 20. I                                   *                                             I 22.9
 21. I                                 *                                               I 21.7
 22. I                                 *                                               I 21.5
 23. I                                 *                                               I 21.8
 24. I                                *                                                I 21.3
 25. I                                   *                                             I 22.6
 26. I                                  *                                              I 22.2
 27. I                                   *                                             I 22.7
 28. I                                 *                                               I 21.9
 29. I                                 *                                               I 21.7
 30. I                                 *                                               I 21.6
 31. I                           *                                                     I 18.9
 32. I                         *                                                       I 17.5
 33. I                         *                                                       I 17.9
 34. I                                        *                                        I 25.1
 35. I                                           *                                     I 26.7
 36. I                                           *                                     I 26.6
 37. I                              *                                                  I 20.4
 38. I                                               *                                 I 28.7
 39. I                                             *                                   I 27.5
 40. I                                          *                                      I 26.3
 41. I                                         *                                       I 25.6
 42. I                                         *                                       I 25.5
 43. I                                       *                                         I 24.9
 44. I                                    *                                            I 23.1
 45. I                                    *                                            I 23.3
 46. I                                      *                                          I 24.2
DEPTH.:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:....:.THETA
      5        10        15        20        25        30        35        40        45
```

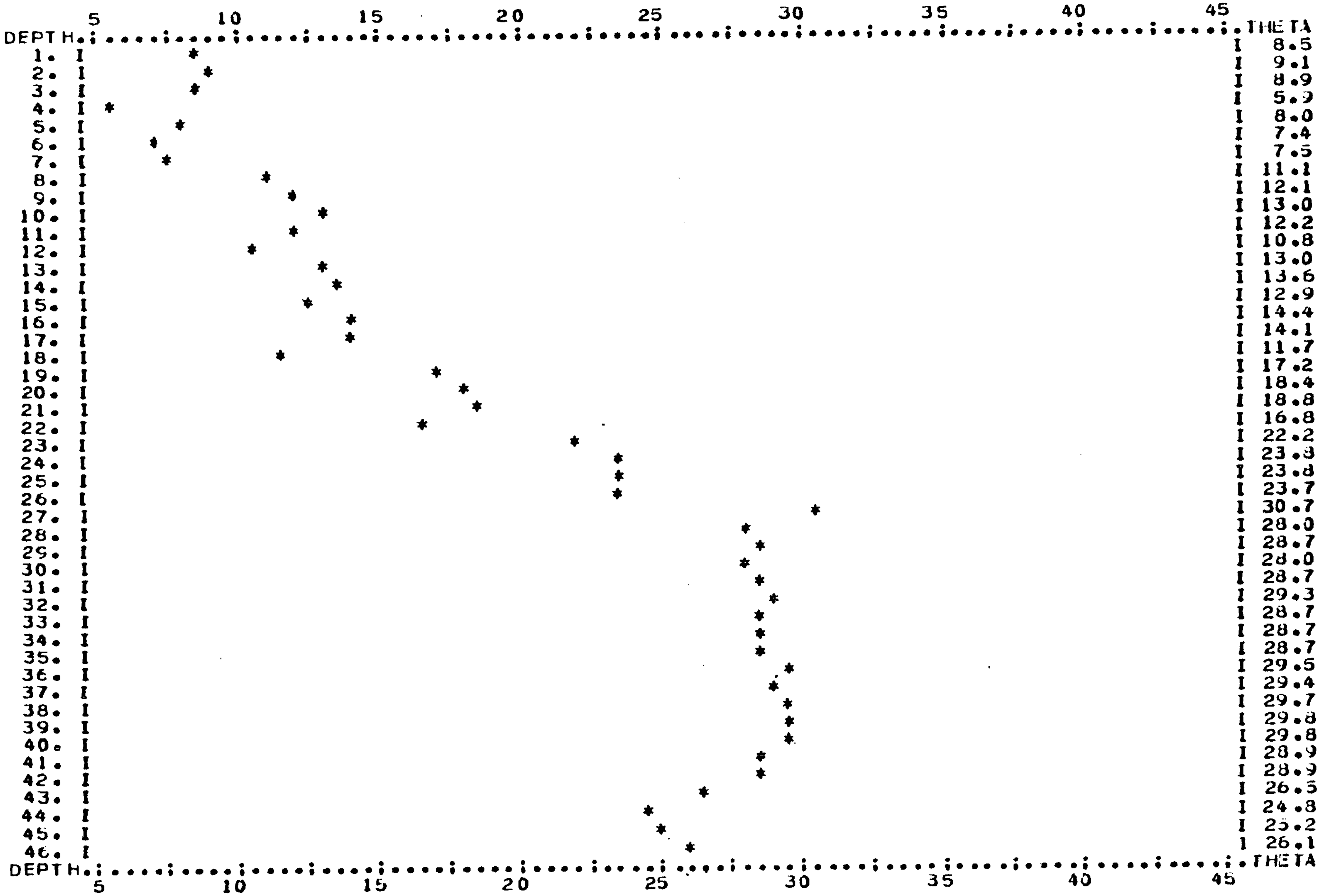
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU HOLE ID=NP-3 BM= 5521.13
DATE= 20 SEPT 1978 TIME=1550 PROBE NO= WL=21.52
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.



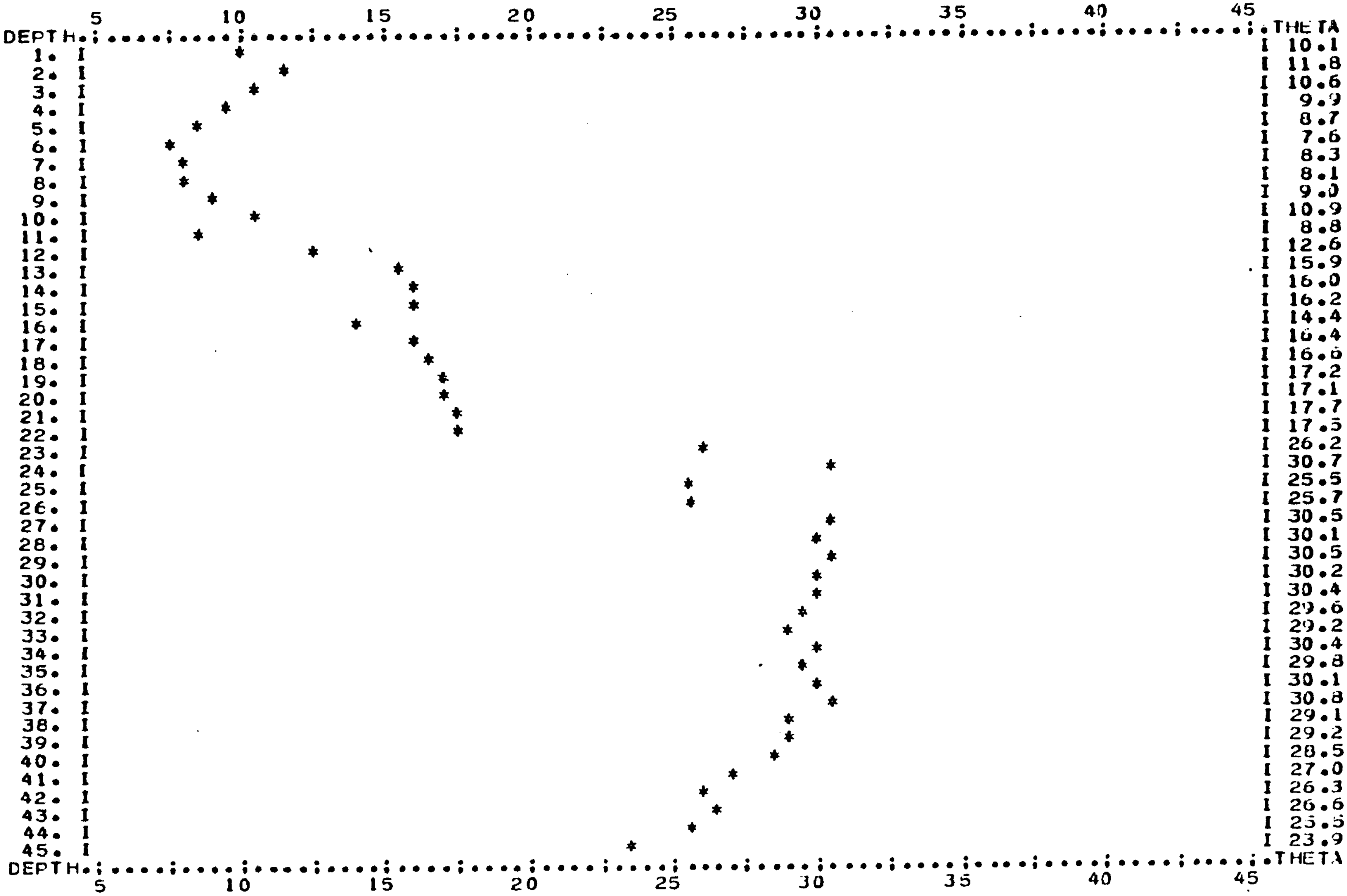
DEPTH	THETA
1.	10.1
2.	12.2
3.	12.4
4.	11.8
5.	10.3
6.	10.1
7.	9.3
8.	8.6
9.	9.7
10.	13.2
11.	14.3
12.	13.8
13.	13.8
14.	15.4
15.	17.8
16.	17.5
17.	16.7
18.	13.0
19.	17.8
20.	18.7
21.	19.1
22.	19.7
23.	26.2
24.	27.6
25.	29.4
26.	28.7
27.	29.8
28.	28.6
29.	28.1
30.	26.0
31.	25.8
32.	25.4
33.	26.2
34.	25.7
35.	25.5
36.	26.1
37.	25.9
38.	25.0
39.	25.3
40.	25.3
41.	24.7
42.	23.8
43.	24.3
44.	25.6
45.	24.5
46.	24.4

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-4        BM= 5521.17
DATE= 20 SEPT 1978    TIME=1100      PROBE NO=           WL=24.50
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



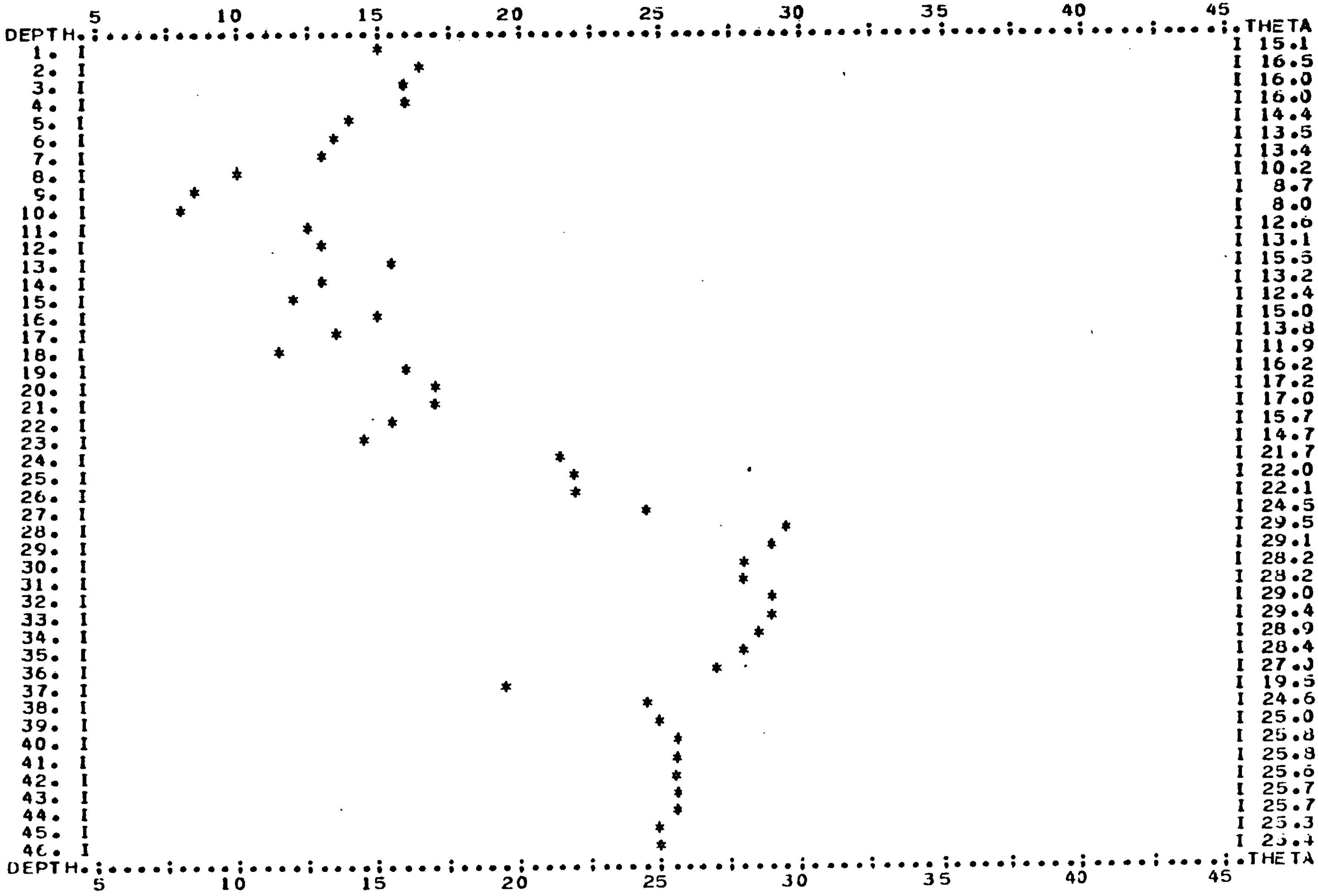
DEPTH	THETA
1.	8.5
2.	9.1
3.	8.9
4.	5.9
5.	8.0
6.	7.4
7.	7.5
8.	11.1
9.	12.1
10.	13.0
11.	12.2
12.	10.8
13.	13.0
14.	13.6
15.	12.9
16.	14.4
17.	14.1
18.	11.7
19.	17.2
20.	18.4
21.	18.8
22.	16.8
23.	22.2
24.	23.8
25.	23.8
26.	23.7
27.	30.7
28.	28.0
29.	28.7
30.	28.0
31.	28.7
32.	29.3
33.	28.7
34.	28.7
35.	28.7
36.	29.5
37.	29.4
38.	29.7
39.	29.8
40.	29.8
41.	28.9
42.	28.9
43.	26.5
44.	24.8
45.	25.2
46.	26.1

```
AMERICAN GRCUNDWATER CCNSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-5      BM= 5521.13
DATE= 20 SEPT 1978    TIME=1655      PROBE NO=         WL=21.93
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE CF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



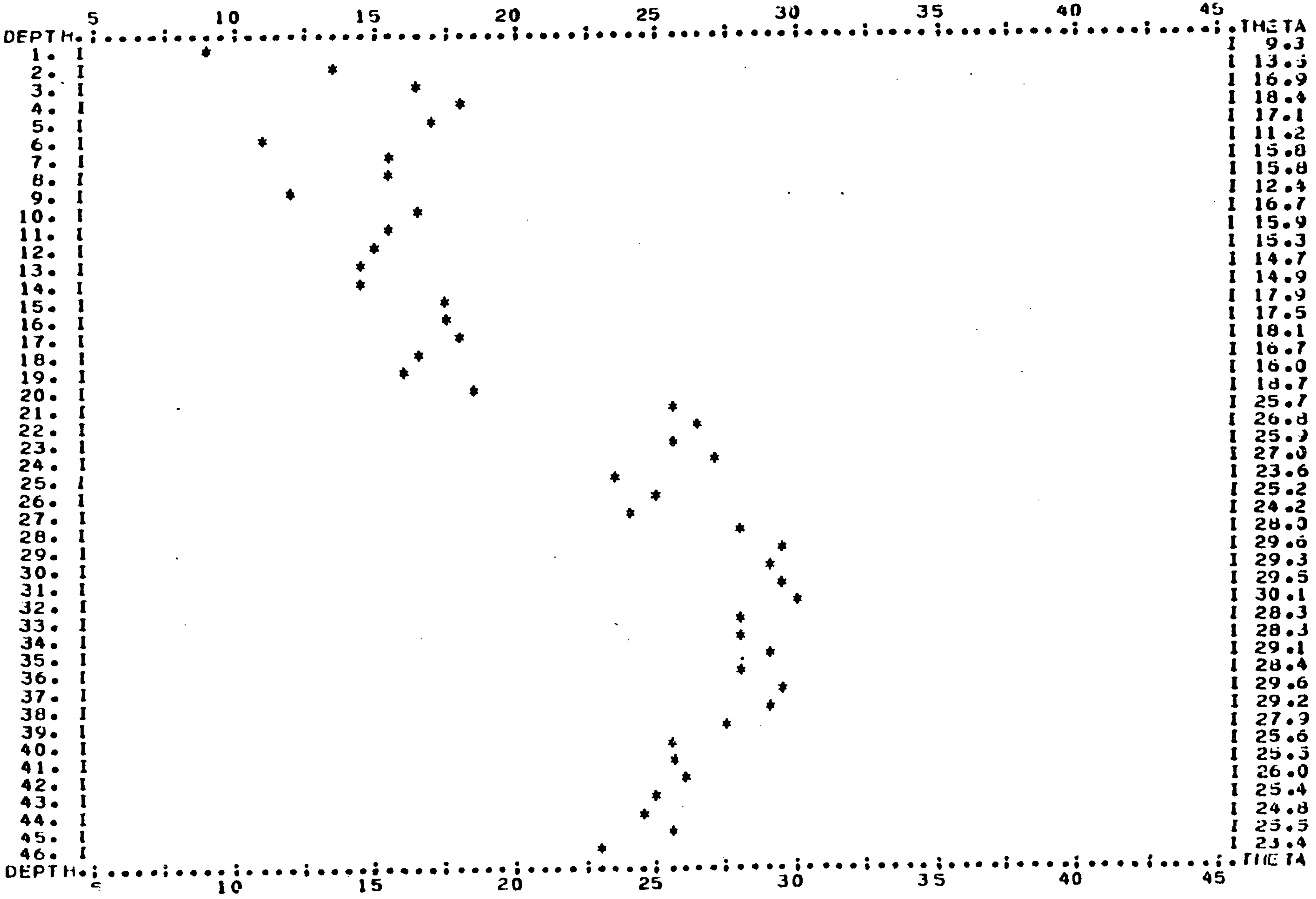
```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-6       BM= 5520.94
DATE= 20 SEPT 1978    TIME=1000       PROBE NO=          WL=23.52
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.

      5        10        15        20        25        30        35        40        45
DEPTH.;....;....;....;....;....;....;....;....;....;....;....;....;....;....;....;....;.THETA
   1. I            *                                                                  I 11.3
   2. I                   *                                                           I 14.9
   3. I                  *                                                            I 14.2
   4. I                     *                                                         I 15.6
   5. I                  *                                                            I 14.1
   6. I               *                                                               I 12.7
   7. I            *                                                                  I 11.2
   8. I             *                                                                 I 11.8
   9. I           *                                                                   I 10.9
  10. I               *                                                               I 12.9
  11. I                 *                                                             I 13.9
  12. I                       *                                                       I 16.5
  13. I                    *                                                          I 15.0
  14. I                 *                                                             I 13.6
  15. I              *                                                                I 12.2
  16. I               *                                                               I 12.8
  17. I                    *                                                          I 15.3
  18. I             *                                                                 I 11.5
  19. I                     *                                                         I 15.8
  20. I                      *                                                        I 16.0
  21. I                      *                                                        I 16.4
  22. I                   *                                                           I 14.8
  23. I                                    *                                          I 23.4
  24. I                                      *                                        I 24.3
  25. I                                      *                                        I 24.4
  26. I                                                   *                           I 30.9
  27. I                                                  *                            I 30.4
  28. I                                                   *                           I 30.6
  29. I                                                  *                            I 30.2
  30. I                                                 *                             I 29.5
  31. I                                                 *                             I 29.8
  32. I                                                  *                            I 30.0
  33. I                                                  *                            I 30.2
  34. I                                                  *                            I 30.4
  35. I                                                  *                            I 30.0
  36. I                                                  *                            I 30.4
  37. I                                *                                              I 21.1
  38. I                                              *                                I 28.4
  39. I                                         *                                     I 25.7
  40. I                                           *                                   I 26.5
  41. I                                         *                                     I 25.5
  42. I                                        *                                      I 25.4
  43. I                                         *                                     I 25.5
  44. I                                            *                                  I 27.1
  45. I                                           *                                   I 26.5
  46. I                                      *                                        I 24.1
DEPTH.;....;....;....;....;....;....;....;....;....;....;....;....;....;....;....;....;.THETA
      5        10        15        20        25        30        35        40        45
```

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU      HOLE ID=NP-7       BM= 5520.97
DATE= 20 SEPT 1978   TIME=1800      PROBE NO=          WL=25.83
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



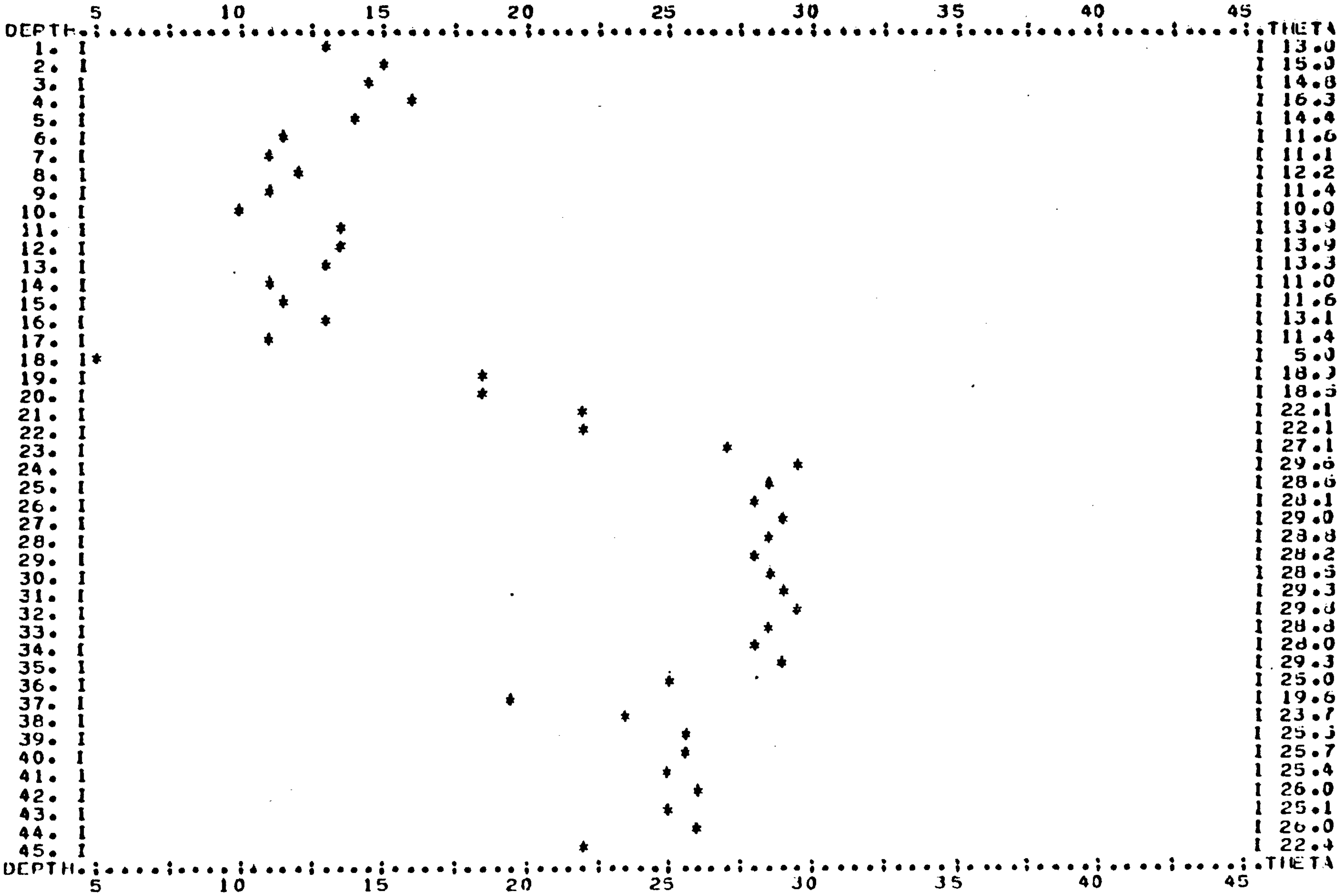
```
DEPTH.  THETA
 1. I  I 15.1
 2. I  I 16.5
 3. I  I 16.0
 4. I  I 16.0
 5. I  I 14.4
 6. I  I 13.5
 7. I  I 13.4
 8. I  I 10.2
 9. I  I  8.7
10. I  I  8.0
11. I  I 12.6
12. I  I 13.1
13. I  I 15.5
14. I  I 13.2
15. I  I 12.4
16. I  I 15.0
17. I  I 13.8
18. I  I 11.9
19. I  I 16.2
20. I  I 17.2
21. I  I 17.0
22. I  I 15.7
23. I  I 14.7
24. I  I 21.7
25. I  I 22.0
26. I  I 22.1
27. I  I 24.5
28. I  I 29.5
29. I  I 29.1
30. I  I 28.2
31. I  I 28.2
32. I  I 29.0
33. I  I 29.4
34. I  I 28.9
35. I  I 28.4
36. I  I 27.0
37. I  I 19.5
38. I  I 24.6
39. I  I 25.0
40. I  I 25.8
41. I  I 25.8
42. I  I 25.6
43. I  I 25.7
44. I  I 25.7
45. I  I 25.3
46. I  I 25.4
DEPTH.  THETA
```

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU       HOLE ID=NP-8       BM= 5521.29
DATE= 20 SEPT 1978    TIME=1300         PROBE NO=            WL=22.74
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1.	9.3
2.	13.5
3.	16.9
4.	18.4
5.	17.1
6.	11.2
7.	15.8
8.	15.8
9.	12.4
10.	16.7
11.	15.9
12.	15.3
13.	14.7
14.	14.9
15.	17.9
16.	17.5
17.	18.1
18.	16.7
19.	16.0
20.	18.7
21.	25.7
22.	26.8
23.	25.9
24.	27.0
25.	23.6
26.	25.2
27.	24.2
28.	28.0
29.	29.6
30.	29.3
31.	29.5
32.	30.1
33.	28.3
34.	28.3
35.	29.1
36.	28.4
37.	29.6
38.	29.2
39.	27.9
40.	25.6
41.	25.5
42.	26.0
43.	25.4
44.	24.8
45.	25.5
46.	23.4

```
AMERICAN GROUNDWATER CONSULTANTS NEUTRON PROBE SOIL MOISTURE PROFILE
PROJECT=PLATEAU        HOLE ID=NP-9        BM= 5520.90
DATE= 20 SEPT 1978     TIME=0830        PROBE NO=          WL=20.61
REMARKS=

PERCENT MOISTURE BY VOLUME (ACROSS) VS DEPTH IN FEET  (DOWN).
FIELD VALUE OF MOISTURE (THETA) GIVEN IN RIGHT HAND COLUMN.
```



DEPTH	THETA
1.	13.0
2.	15.0
3.	14.8
4.	16.3
5.	14.4
6.	11.6
7.	11.1
8.	12.2
9.	11.4
10.	10.0
11.	13.9
12.	13.9
13.	13.3
14.	11.0
15.	11.6
16.	13.1
17.	11.4
18.	5.0
19.	18.3
20.	18.5
21.	22.1
22.	22.1
23.	27.1
24.	29.6
25.	28.6
26.	28.1
27.	29.0
28.	28.8
29.	28.2
30.	28.5
31.	29.3
32.	29.8
33.	28.8
34.	28.0
35.	29.3
36.	25.0
37.	19.6
38.	23.7
39.	25.5
40.	25.7
41.	25.4
42.	26.0
43.	25.1
44.	26.0
45.	22.4

ATTACHMENT 4

TEMPERATURE DATA

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-1 FOR MAY 22, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
2	15.16	15	10.63
3	15.63	16	10.64
4	16.01	17	10.72
5	15.62	18	10.84
6	15.21	19	11.04
7	14.52	20	11.23
8	13.67	25	12.14
9	12.86	30	12.93
10	12.17	35	13.22
11	11.65	40	13.82
12	11.26	45	13.97
13	10.95	50	14.06
14	10.51		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-2 FOR MAY 22, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
2	15.18	30	13.11
3	15.17	35	13.68
4	14.65	40	14.00
5	13.92	45	14.25
6	13.21	49.8	14.35
7	12.43		
8	11.87		
9	11.25		
10	10.82		
11	10.46		
12	10.19		
13	10.10		
14	10.07		
15	10.18		
16	10.36		
17	10.56		
18	10.80		
19	11.03		
20	11.29		
25	12.14		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-3 FOR MAY 22, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
2	15.51	30	13.08
3	15.81	35	13.36
4	15.19	40	13.69
5	14.57	45	13.99
6	13.92	49.8	14.09
7	13.22		
8	12.80		
9	12.16		
10	11.49		
11	10.86		
12	10.32		
13	9.95		
14	9.79		
15	9.76		
16	9.90		
17	10.07		
18	10.25		
19	10.43		
20	10.77		
25	12.67		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-4 FOR MAY 22, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
2	15.85	30	13.59
3	16.33	35	13.69
4	15.94	40	13.83
5	15.36	45	13.91
6	14.52	49.9	14.07
7	13.49		
8	12.68		
9	12.12		
10	11.61		
11	11.21		
12	10.83		
13	10.61		
14	10.54		
15	10.58		
16	10.72		
17	10.87		
18	11.11		
19	11.32		
20	11.58		
25	12.89		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-5 FOR MAY 22, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
2	15.43	30	12.80
3	15.98	35	13.13
4	15.79	40	13.43
5	15.20	45	13.64
6	14.63	49	13.80
7	13.80		
8	13.64		
9	11.70		
10	11.05		
11	10.63		
12	10.34		
13	10.33		
14	10.27		
15	10.37		
16	10.51		
17	10.70		
18	10.86		
19	11.60		
20	12.14		
25	12.75		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-6 FOR MAY 22, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
2	15.32	30	12.55
3	15.49	35	12.75
4	14.76	40	12.97
5	13.95	45	13.54
6	13.31	50	13.67
7	12.51		
8	11.73		
9	11.08		
10	10.58		
11	10.20		
12	9.84		
13	9.54		
14	9.27		
15	9.22		
16	9.26		
17	9.50		
18	9.85		
19	10.26		
20	10.48		
25	12.24		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-7
FOR MAY 22, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
2	14.56	30	12.71
3	14.96	35	13.22
4	14.45	40	13.54
5	13.73	45	13.71
6	13.03	50	13.80
7	12.48		
8	11.90		
9	11.31		
10	10.89		
11	10.33		
12	9.94		
13	9.63		
14	9.38		
15	9.29		
16	9.33		
17	9.46		
18	9.85		
19	10.26		
20	10.58		
25	11.61		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-8 FOR MAY 22, 1977

DEPTH (ft)	TEMPERATURE (^{o}C)
2	13.88
3	14.30
4	14.15
5	13.45
6	13.50
7	12.14
8	11.39
9	10.59
10	10.16
11	9.61
12	9.21
13	8.94
14	8.69
15	8.57
16	8.54
17	8.60
18	8.70
19	8.94
20	9.11
25	10.70
30	11.46
35	12.41
40	12.61
45	13.08
49.8	13.06

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-9
FOR MAY 22, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
2	13.73	30	12.25
3	14.27	35	12.91
4	14.66	40	13.15
5	14.42	42.5	13.21
6	13.85	45	13.17
7	13.24	50	13.79
7	12.60		
9	12.07		
10	11.70		
11	11.14		
12	10.53		
13	10.12		
14	9.97		
15	9.74		
16	10.21		
17	11.18		
18	11.49		
19	11.67		
20	11.69		
25	12.14		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-1 FOR JULY 14, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
2	27.46	30	14.34
3	27.38	35	13.85
4	26.50	40	13.78
5	25.37	41	13.79
6	24.32	45	13.85
7	23.57	50	13.96
8	22.20		
9	20.62		
10	19.53		
11	18.70		
12	17.92		
13	17.17		
14	16.64		
15	16.27		
16	16.09		
17	15.86		
18	15.62		
19	15.50		
20	15.41		
25	14.99		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-2 FOR JULY 14, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	26.66	25	12.60
2	26.25	30	12.98
3	25.02	35	13.37
4	23.63	40	13.74
5	22.32	45	14.03
6	21.03	50	14.16
7	20.16		
8	19.09		
9	18.16		
10	17.27		
11	16.55		
12	15.95		
13	15.39		
14	14.75		
15	15.01		
16	13.46		
17	13.08		
18	12.81		
19	12.66		
20	12.61		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-3 FOR JULY 14, 1977

DEPTH (ft)	TEMPERATURE (^{o}C)	DEPTH (ft)	TEMPERATURE (^{o}C)
1	28.40	23	15.18
2	27.28	25	14.93
3	26.97	30	14.27
4	25.57	35	13.89
5	24.30	37.5	13.85
6	23.19	40	13.85
7	22.27	45	13.95
8	21.36	50	14.06
9	20.52		
10	19.44		
11	18.55		
12	17.56		
13	16.83		
14	16.33		
15	15.73		
16	15.35		
17	15.16		
18	15.09		
19	15.10		
20	15.14		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-4 FOR JULY 14, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	27.80	25	14.04
2	28.10	30	13.83
3	27.78	35	13.79
4	26.48	40	13.86
5	25.22	45	13.89
6	23.40	50	13.99
7	21.64		
8	20.43		
9	19.47		
10	18.51		
11	17.72		
12	16.89		
13	16.06		
14	15.36		
15	14.97		
16	14.73		
17	14.60		
18	14.53		
19	14.50		
20	14.52		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-5 FOR JULY 14, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	28.30	25	13.91
2	27.70	30	13.80
3	27.37	35	13.54
4	26.16	40	13.59
5	24.85	45	13.73
6	23.68	48.5	13.83
7	22.42		
8	20.33		
9	18.78		
10	17.75		
11	16.87		
12	16.15		
13	15.52		
14	15.01		
15	14.75		
16	14.56		
17	14.44		
18	14.33		
19	14.34		
20	14.26		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-6 FOR JULY 14, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	27.54	22	13.91
2	26.94	25	13.86
3	26.12	30	13.63
4	24.62	35	13.38
5	23.30	40	13.42
6	22.18	45	13.58
7	20.94	50	13.75
8	19.87		
9	18.79		
10	17.89		
11	17.10		
12	16.43		
13	15.85		
14	15.45		
15	15.20		
16	14.90		
17	14.57		
18	14.29		
19	14.13		
20	14.01		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-7 FOR JULY 14, 1977

DEPTH (ft)	TEMPERATURE (^{o}C)	DEPTH (ft)	TEMPERATURE (^{o}C)
1	28.89	21	17.48
2	27.08	25	16.84
3	26.04	30	15.58
4	24.73	35	14.45
5	23.53	40	13.87
6	22.43	50	13.81
7	21.60		
8	20.67		
9	19.94		
10	19.17		
11	18.44		
12	17.87		
13	17.44		
14	17.19		
15	17.02		
16	16.94		
17	16.97		
18	17.10		
19	17.25		
20	17.46		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-6 FOR JULY 12, 1978

DEPTH (ft)	TEMPERATURE (°C)
1	27.56
2	25.35
3	24.21
4	22.95
5	21.89
6	20.79
7	19.70
8	18.66
9	17.56
10	16.80
11	16.02
12	15.27
13	14.61
14	14.23
15	13.71
16	13.42
17	13.15
18	12.88
19	12.74
20	12.52
21	12.40
22	12.35
23	12.35
24	12.66
25	12.67
30	12.76
35	12.95
40	13.27
45	13.65
50	13.92

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-7 FOR JULY 12, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	26.64	23	12.05
2	24.56	24	12.08
3	23.57	25	12.08
4	22.46	30	12.45
5	21.32	35	12.63
6	20.24	40	13.14
7	19.29	45	13.60
8	18.26	50	13.97
9	17.34		
10	16.49		
11	15.51		
12	14.78		
13	14.09		
14	13.50		
15	13.09		
16	12.70		
17	12.45		
18	12.21		
19	12.10		
20	12.02		
21	12.00		
22	12.01		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-8 FOR JULY 14, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	24.79	25	13.23
2	25.15	28	13.25
3	25.14	30	13.01
4	23.57	34	12.84
5	22.18	35	12.86
6	22.12	40	12.96
7	21.21	42.5	13.01
8	19.77	45	13.14
9	18.54	49.8	13.44
10	17.65		
11	16.74		
12	16.12		
13	15.27		
14	14.73		
15	14.16		
16	13.88		
17	13.43		
18	13.22		
19	13.04		
20	13.02		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-9 FOR JULY 14, 1977

DEPTH (ft)	TEMPERATURE (^oC)	DEPTH (ft)	TEMPERATURE (^oC)
1	25.33	22.5	18.30
2	25.50	25	18.17
3	25.84	30	16.60
4	24.97	35	14.90
5	23.74	40	14.00
6	22.63	45	13.97
7	21.65	48	13.75
8	20.71	50	13.75
9	19.84		
10	19.24		
11	18.56		
12	18.03		
13	17.67		
14	17.43		
15	17.34		
16	17.36		
17	17.48		
18	17.65		
19	17.88		
20	18.21		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-1
FOR SEPTEMBER 18, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	23.42	25	16.88
2	23.49	30	15.69
3	23.55	35	14.80
4	23.63	40	14.29
5	23.68	45	14.13
6	23.62	50	14.04
7	23.60		
8	23.24		
9	22.88		
10	21.94		
11	21.31		
12	20.92		
13	20.29		
14	19.62		
15	19.38		
16	19.06		
17	18.68		
18	18.45		
19	18.00		
20	17.75		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-2 FOR SEPTEMBER 18, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	23.17	25	14.39
2	23.12	30	13.81
3	23.25	35	13.70
4	23.32	40	13.75
5	23.36	45	13.91
6	23.32	50	14.02
7	23.10		
8	22.68		
9	22.09		
10	21.58		
11	21.07		
12	20.47		
13	19.66		
14	18.72		
15	17.68		
16	16.94		
17	16.49		
18	15.91		
19	15.39		
20	15.18		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-3 FOR SEPTEMBER 18, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	26.47	25	17.05
2	24.28	26	15.69
3	24.10	35	14.77
4	24.27	40	14.37
5	24.35	45	14.19
6	24.47	56	14.24
7	24.49	47.5	14.23
8	24.30		
9	23.98		
10	23.35		
11	22.75		
12	21.81		
13	21.20		
14	20.47		
15	19.83		
16	19.24		
17	18.83		
18	18.56		
19	18.38		
20	18.21		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-4 FOR SEPTEMBER 18, 1977

DEPTH (ft)	TEMPERATURE (^oC)	DEPTH (ft)	TEMPERATURE (^oC)
1	23.50	25	16.22
2	23.58	30	15.35
3	24.02	35	14.65
4	24.27	40	14.34
5	24.36	45	14.11
6	24.13	50	14.03
7	23.56		
8	23.05		
9	22.52		
10	21.90		
11	21.49		
12	20.78		
13	19.88		
14	19.27		
15	18.88		
16	18.46		
17	18.14		
18	17.94		
19	17.69		
20	17.53		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-5 FOR SEPTEMBER 19, 1977

DEPTH (ft)	TEMPERATURE (^{o}C)	DEPTH (ft)	TEMPERATURE (^{o}C)
1	24.04	25	19.15
2	23.24	30	17.87
3	23.61	35	15.91
4	23.84	40	14.65
5	24.12	45	14.02
6	24.07	49	13.94
7	23.72		
8	23.61		
9	23.07		
10	22.29		
11	21.87		
12	21.32		
13	20.88		
14	20.52		
15	20.13		
16	19.82		
17	19.67		
18	19.55		
19	19.49		
20	19.45		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-6
FOR SEPTEMBER 18, 1977

DEPTH (ft)	TEMPERATURE (^oC)	DEPTH (ft)	TEMPERATURE (^oC)
1	24.74	25	16.62
2	22.76	30	15.88
3	22.63	35	14.68
4	22.83	40	14.03
5	23.00	45	13.83
6	23.03	50	13.79
7	22.68		
8	22.25		
9	21.70		
10	21.22		
11	20.77		
12	20.25		
13	19.86		
14	19.25		
15	18.86		
16	18.60		
17	18.21		
18	17.84		
19	17.37		
20	17.26		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-7
FOR SEPTEMBER 18, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	23.72	25	18.35
2	23.70	30	16.79
3	23.94	35	15.54
4	23.61	40	14.77
5	23.67	45	14.19
6	23.63	50	14.05
7	23.44		
8	23.18		
9	22.85		
10	23.63		
11	22.06		
12	21.70		
13	21.34		
14	21.01		
15	20.75		
16	20.52		
17	20.32		
18	20.12		
19	19.94		
20	19.82		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-8 FOR SEPTEMBER 18, 1977

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	20.47	25	16.31
2	20.97	30	15.34
3	21.55	35	14.28
4	21.81	40	13.70
5	22.04	45	13.52
6	22.60	50	13.54
7	22.40		
8	21.95		
9	21.51		
10	21.01		
11	20.50		
12	19.99		
13	19.55		
14	19.06		
15	18.46		
16	17.91		
17	17.54		
18	17.25		
19	17.06		
20	16.90		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-9 FOR SEPTEMBER 18, 1977

DEPTH (ft)	TEMPERATURE (^{o}C)	DEPTH (ft)	TEMPERATURE (^{o}C)
1	21.95	30	17.38
2	22.58	35	16.05
3	22.92	40	15.09
4	23.23	45	14.50
5	23.20	49	14.17
6	23.05		
7	22.78		
8	22.49		
9	22.19		
10	21.85		
11	21.50		
12	21.14		
13	20.85		
14	20.57		
15	20.40		
16	20.14		
17	19.98		
18	19.84		
19	19.68		
25	18.52		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-1 FOR JANUARY 10, 1978

DEPTH (ft)	TEMPERATURE (^oC)	DEPTH (ft)	TEMPERATURE (^oC)
1	2.66	21	15.89
2	3.21	22	15.97
3	4.17	23	16.01
4	5.26	24	16.00
5	6.10	25	16.06
6	6.63	30	15.81
7	7.83	35	15.32
8	9.18	40	14.83
9	9.71	45	14.53
10	11.49	50	14.34
11	12.15		
12	12.94		
13	13.52		
14	13.95		
15	13.91		
16	14.44		
17	15.01		
18	15.38		
19	15.65		
20	15.79		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-3
FOR JANUARY 10, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	2.86	21	16.24
2	3.47	22	16.21
3	4.45	23	16.18
4	5.70	25	16.05
5	6.77	30	15.90
6	7.86	35	15.51
7	8.63	40	15.19
8	9.60	45	14.84
9	10.79	50	14.63
10	10.89		
11	11.92		
12	12.80		
13	13.63		
14	14.33		
15	14.78		
16	15.34		
17	15.76		
18	16.04		
19	16.17		
20	16.19		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-2 FOR JANUARY 10, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	3.93	21	15.61
2	4.07	25	15.47
3	4.87	30	15.03
4	6.80	35	14.46
5	8.16	40	14.13
6	8.91	45	14.17
7	9.87	50	14.12
8	11.10		
9	12.21		
10	12.96		
11	13.40		
12	14.02		
13	14.51		
14	14.81		
15	15.18		
16	15.29		
17	15.42		
18	15.63		
19	15.66		
20	15.65		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-4
FOR JANUARY 9, 1978

DEPTH (ft)	TEMPERATURE (^{o}C)	DEPTH (ft)	TEMPERATURE (^{o}C)
1	3.41	21	15.83
2	3.00	23	15.81
3	4.19	25	15.73
4	5.27	30	15.57
5	6.20	35	15.36
6	7.81	40	15.06
7	8.85	45	14.74
8	9.76	50	14.54
9	10.78		
10	11.51		
11	12.79		
12	13.02		
13	14.01		
14	14.13		
15	14.76		
16	15.13		
17	15.59		
18	15.59		
19	15.76		
20	15.76		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-5 FOR JANUARY 9, 1978

DEPTH (ft)	TEMPERATURE (^{o}C)	DEPTH (ft)	TEMPERATURE (^{o}C)
1	3.89	23.5	15.88
2	3.23	25	15.80
3	4.45	30	15.68
4	5.70	35	15.55
5	6.54	40	15.25
6	7.52	45	14.89
7	8.89	48.7	14.68
8	9.41		
9	10.93		
10	12.09		
11	13.34		
12	13.87		
13	14.23		
14	14.95		
15	15.21		
16	15.52		
17	15.69		
18	15.80		
19	15.88		
20	15.93		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-6 FOR JANUARY 9, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	3.66	21	15.80
2	3.42	22	15.93
3	5.07	23	15.93
4	5.13	24	15.98
5	6.38	25	15.98
6	7.34	28	15.96
7	8.56	30	15.94
8	9.65	35	15.53
9	10.44	40	15.04
10	11.11	45	14.60
11	11.54	50	14.35
12	12.26		
13	13.42		
14	13.62		
15	13.91		
16	14.40		
17	14.82		
18	15.08		
19	15.35		
20	15.61		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-7 FOR JANUARY 9, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	3.74	21	15.50
2	3.42	22	15.52
3	4.37	23	15.50
4	5.67	24	15.45
5	6.62	25	15.43
6	7.63	28.7	15.43
7	8.52	30	15.50
8	9.15	35	15.58
9	9.66	40	15.34
10	10.52	45	14.87
11	11.41	50	14.60
12	12.19		
13	13.11		
14	13.58		
15	14.32		
16	14.77		
17	15.03		
18	15.13		
19	15.31		
20	15.45		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-8 FOR JANUARY 10, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	2.07	25	16.50
2	3.07	30	16.12
3	4.15	35	15.57
4	6.16	40	14.98
5	7.32	45	14.48
6	8.48	50	14.18
7	9.60		
8	10.71		
9	11.34		
10	12.14		
11	12.62		
12	13.37		
13	14.05		
14	14.88		
15	15.39		
16	15.75		
17	16.15		
18	16.40		
19	16.53		
20	16.58		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-9
FOR JANUARY 9, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	4.43	21	16.19
2	2.82	22	16.25
3	3.74	23	16.26
4	5.24	24	16.25
5	6.19	25	16.24
6.	7.00	30	16.24
7	8.06	35	16.17
8	8.80	40	15.77
9	10.41	45	15.35
10	11.14	49	14.93
11	11.75		
12	12.40		
13	13.46		
14	14.35		
15	14.81		
16	15.26		
17	15.58		
18	15.87		
19	16.05		
20	16.12		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-2
FOR JULY 12, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	25.25	21	13.36
2	25.00	22	13.35
3	24.20	23	13.35
4	23.19	24	13.36
5	22.02	25	13.39
6	20.71	30	13.74
7	19.69	35	13.90
8	18.70	40	14.13
9	17.77	45	14.26
10	17.05	50	14.33
11	16.43		
12	15.92		
13	15.44		
14	14.81		
15	14.31		
16	13.92		
17	13.65		
18	13.54		
19	13.41		
20	13.37		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-3
FOR JULY 12, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	26.02	21	12.50
2	25.56	22	12.55
3	24.37	23	12.89
4	23.39	24	12.91
5	22.12	25	12.86
6	21.19	26	12.89
7	20.13	27	12.98
8	19.28	30	13.05
9	18.45	35	13.29
10	17.63	40	13.57
11	16.51	45	14.00
12	15.75	50	14.06
13	15.01		
14	14.38		
15	13.71		
16	13.24		
17	12.93		
18	12.78		
19	12.64		
20	12.52		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-4
FOR JULY 12, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	26.78	21	12.95
2	26.37	22	12.91
3	25.41	23	12.95
4	24.31	24	12.99
5	23.19	25	13.07
6	21.50	30	13.40
7	20.17	35	13.46
8	18.82	40	13.75
9	18.99	45	13.91
10	17.04	50	14.16
11	16.41		
12	15.57		
13	14.98		
14	14.07		
15	13.59		
16	13.30		
17	13.11		
18	12.99		
19	12.93		
20	12.89		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-5 FOR JULY 12, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
4	23.95	21	12.39
5	22.87	22	12.39
6	21.76	23	12.44
7	20.41	24	12.44
8	18.60	25	12.46
9	17.22	30	12.91
10	16.28	35	13.16
11	15.43	40	13.44
12	1476	45	13.69
13	14.25	48	13.92
14	13.68		
15	13.24		
16	13.00		
17	12.78		
18	12.65		
19	12.53		
20	12.43		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-9 FOR JULY 12,1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
1	27.86	23	12.92
2	25.04	24	12.92
3	24.43	25	12.90
4	23.60	30	13.12
5	22.41	35	13.26
6	21.21	40	13.54
7	20.13	45	13.90
8	19.16	49	14.36
9	18.28		
10	17.34		
11	16.42		
12	15.62		
13	14.89		
14	14.34		
15	13.87		
16	13.49		
17	13.24		
18	13.04		
19	12.91		
20	12.84		
21	12.83		
22	12.92		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-1 FOR SEPTEMBER 20, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
4	23.24	35	14.31
5	23.46	40	14.31
6	23.46	45	14.42
7	22.98	50	14.37
8	22.36		
9	21.62		
10	20.90		
11	20.25		
12	19.62		
13	18.99		
14	18.39		
15	17.88		
16	17.48		
17	17.05		
18	16.42		
19	15.92		
20	15.70		
25	14.80		
30	14.41		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-2 FOR SEPTEMBER 20, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
4	24.29	35	14.07
5	24.40	40	14.08
6	24.36	45	14.15
7	23.95	50	14.19
8	23.50		
9	22.94		
10	22.34		
11	21.71		
12	21.06		
13	20.31		
14	19.24		
15	18.31		
16	17.31		
17	16.71		
18	16.19		
19	15.82		
20	15.60		
25	14.90		
30	14.21		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-3 FOR SEPTEMBER 20, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
3	23.02	35	14.00
4	23.40	40	13.93
5	23.44	45	13.99
6	23.33	50	14.12
7	23.15		
8	22.76		
9	22.35		
10	21.73		
11	21.06		
12	20.25		
13	19.53		
14	18.78		
15	18.02		
16	17.41		
17	16.93		
18	16.66		
19	16.46		
20	16.23		
25	15.38		
30	14.50		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-4 FOR SEPTEMBER 20, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
3	22.92	35	14.46
4	23.93	40	13.96
5	23.92	45	14.02
6	23.41	50	14.10
7	22.49		
8	21.80		
9	21.28		
10	20.77		
11	20.12		
12	19.56		
13	19.02		
14	18.35		
15	17.74		
16	17.36		
17	16.94		
18	16.51		
19	16.28		
20	16.02		
25	14.98		
30	14.38		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-5 FOR SEPTEMBER 20, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
4	23.36	45	13.91
5	23.65	50	14.02
6	23.40		
7	22.90		
8	21.95		
9	21.14		
10	20.56		
11	19.87		
12	19.41		
13	18.90		
14	18.24		
15	17.72		
16	17.40		
17	17.13		
18	16.89		
19	16.68		
20	16.51		
25	16.24		
30	15.38		
35	14.43		
40	13.97		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-6 FOR SEPTEMBER 20, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
4	22.07	40	13.67
5	22.57	45	13.78
6	22.57	50	13.88
7	22.31		
8	21.91		
9	21.41		
10	20.87		
11	20.37		
12	19.87		
13	18.80		
14	18.25		
15	17.83		
16	17.50		
17	17.02		
18	16.56		
19	16.16		
20	15.87		
25	15.18		
30	14.57		
35	13.86		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-7 FOR SEPTEMBER 20, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
4	22.19	45	13.75
5	22.42	50	13.86
6	22.26		
7	21.97		
8	21.60		
9	21.26		
10	20.93		
11	20.32		
12	19.81		
13	19.42		
14	18.99		
15	18.62		
16	18.38		
17	18.18		
18	18.01		
19	17.86		
20	17.79		
25	16.91		
30	15.60		
35	14.26		
40	13.75		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-8 FOR SEPTEMBER 20, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
4	22.74	40	13.87
5	22.79	45	13.87
6	22.79	50	13.97
7	22.29		
8	21.78		
9	21.26		
10	20.75		
11	20.12		
12	19.58		
13	19.24		
14	18.61		
15	17.97		
16	17.39		
17	16.96		
18	16.55		
19	16.15		
20	15.92		
25	14.97		
30	14.35		
35	13.87		

TEMPERATURE PROFILE FOR NEUTRON-PROBE-ACCESS HOLE NP-9 FOR SEPTEMBER 20, 1978

DEPTH (ft)	TEMPERATURE (°C)	DEPTH (ft)	TEMPERATURE (°C)
3	20.85	25	15.47
4	21.41	26	15.42
5	21.60	27	15.26
6	21.49	28	15.08
7	21.28	29	14.83
8	20.96	30	14.60
9	20.57	35	14.07
10	20.19	40	13.97
11	19.70	45	13.99
12	19.25	49	14.11
13	18.69		
14	18.19		
15	17.72		
16	17.36		
17	17.02		
18	16.72		
19	16.46		
20	16.25		
21	15.97		
22	15.66		
23	15.52		
24	15.47		

ATTACHMENT 5

AQUATRACE DATA

RESULTS OF TRACER ANALYSES

PROJECT: Plateau

DATE COLLECTED: July 11, 1978

DATE OF ANALYSIS: October 27, 1978

TRACER: TRAC-5

LOCATION	CONCENTRATION
Pond	0.16 picograms/millilitre
San Juan downstream	No detectable concentration
Hammond ditch upstream	No detectable concentration
Hammond ditch downstream	No detectable concentration