VOGTLE ELECTRIC GENERATING PLANT

GROUND-WATER MONITORING
July 1985 – June 1986

Bechtel Civil, Inc.

September 1986

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Seven Year Hydrographs - Water Table and Tertiary Aquifers

GROUND-WATER MONITORING

JUNE 1985 - JUNE 1986

A program of frequent measurement of water-table wells and piezometers in the Blue Bluff marl was implemented in July 1985. The purpose is to provide more detailed information to support the basis for the hydrostatic loading design. This is in response to the NRC staff concerns that the previous water-level records were short as a basis to "...confidently project a probable maximum design-basis ground water level..." (Section 2.3.12.6, SER, 7/85), and that wells should be installed in the Blue Bluff marl to determine the pressure distribution throughout the full depth of the marl (Section 2.4.12.2.2, SER, 7/85). Less frequent monitoring of wells in the Tertiary and Cretaceous aquifers is included in the program. The staff requested that upon completion of 6 months of monitoring and, again, upon completion of one year of monitoring, reports should be submitted for review of the data collected. The first 6 months of monitoring was completed December 31, 1985, and the results submitted by report in February 1986. The second six months of monitoring was completed June 30, 1986, and the results are submitted in this report. The data are presented in hydrograph form, providing a full year of data during the period of frequent measurements, July 1, 1985 through June 30, 1986. Additional data are also provided, including precipitation and barometric records to demonstrate relationships with the water-level fluctuations.

1.0 Review of First 6-months Assessment

In the report of February 1986, it was observed that the first 6-months of frequent monitoring indicated that there is no immediate response of ground-water levels in the plant area to individual rain storms, although a detectable rise in levels can result from a persistently wet period that continues for more than a month.

The data indicated that a general rise of 1 foot, or more, requires a seasonal period of markedly wet weather (at least 3 months). It was concluded from these observations that monitoring the wells monthly would readily identify such a water-level trend. Regardless, there was no reduction in monitoring frequency during the first year of the program.

2.0 Monitoring System

Locations of all monitor wells are shown on Figure 1. Well and piezometer construction details are summarized in Tables 1 and 2. There are 17 wells monitoring the water-table aquifer. Four of these wells (LT-1B, LT-7A, LT-12, and LT-13) are within the foundation area of the power-block structures in which all materials above the Blue Bluff marl (the Barnwell sands and Utley limestone) were removed and replaced with densely compacted, selected backfill. This excavated and backfill area is shown on Figure 1. The water-table in this area is within the backfill material. Elsewhere, considerable excavation and backfilling has been done for site grading, but none of those excavations extend below the water table. Thirteen water-table observation wells outside the principal excavation monitor the aquifer within undisturbed Barnwell sands and Utley limestone.

A series of 6 Casagrande-type piezometers have been set in the Blue Bluff marl. They are in two clusters (A and B on Figure 1) of 3 piezometers each. The piezometers in each cluster monitor pore pressure in the upper, middle and lower portions of the marl. In addition, 10 wells are open to the Tertiary aquifer immediately below the Blue Bluff marl. Two observation wells in the Cretaceous aquifer are also being maintained.

3.0 Monitoring Frequency

Two of the wells in the water-table aquifer, 808 and LT-13, are being monitored on a continuous basis. Stevens Type-F recorders have been installed at each well. The recorders are geared for a direct scale (1:1 ratio) reading. Eight-day charts are used. The objective has been to determine the rate and degree of fluctuation in response to rainfall, which is the source of recharge to the aquifer.

The balance of the water-table aquifer wells (15) are measured on a weekly interval. With each water-level measurement, depth to the base of each well is also measured to determine if silting is occurring. Early detection of silting will prevent plugging and questionable data. The wells in the confined aquifers (Tertiary and Cretaceous) are monitored on a monthly basis concurrently with measurements in the water-table aquifer.

The six piezometers open to the Blue Bluff marl are also being monitored weekly. These piezometers are measured the same day each week as the wells in the water-table aquifer.

Precipitation is being recorded at the meteorological tower (the "MT" gauge) using a climatronics Model 10097-1 (continuously recording, tip-bucket type) rain gauge. Precipitation is also being collected on a daily basis with a Taylor Clear-Vu, 4-inch diameter gauge at the sewage waste discharge facility; (the "WF" gauge). Locations of these gauges are shown on Figure 1.

4.0 Water-level Measurements

The actual monitoring of water levels is conducted by on-site personnel of the Vogtle EGP Environmental Group under the supervision of N.D. Dennis. Technical direction and review has been the responsibility of C.R. Farrell and L.R. West, hydrogeologists with Bechtel. A monitoring procedure has been established, and data are reported on a weekly basis.

When a water level is measured, the well depth is also sounded for indication of silting. Immediately following completion of the weekly round of monitoring, the measurements are compared to the prior data of each well by the on-site personnel. Any water level that appears anomalous is checked by remeasurement within 24 hours. The checked weekly water levels are then submitted to the Bechtel hydrogeologists for technical review.

The results of the monitoring have been used to prepare hydrographs for each well or piezometer. Hydrographs of weekly measurements of the 17 water-table wells for the year commencing July 1985 are in Figures 2 through 18.

Hydrographs of observation wells open to the Tertiary (confined) aquifer are shown on Figures 19 through 28. These wells are monitored once each month. Hydrographs of the two monitored wells open to the Cretaceous (confined) aquifer are shown on Figures 29 and 30. Monitoring of these wells commenced in August 1985. Finally, hydrographs of the 6 piezometers monitoring pore pressure in the Blue Bluff marl are shown on Figures 31 through 36.

Some of the observation wells have been monitored since 1971 and others for shorter periods, ranging from 1 to 10 years. All of the data available through January 1985 was submitted in the Ground Water Supplement, March 1985. Hydrographs for the period 1980-1986 of the water-table wells, and of the two Tertiary wells, 27 and 29, that have been present for that period, are included as an Appendix in this report.

5.0 Water-table Fluctuations

The intention of the frequent monitoring of wells in the water-table aquifer was to establish the kinds of fluctuations that may occur, including the period and magnitude of these fluctuations. Of primary concern was the correlation with precipitation events; the response to recharge from direct precipitation. Figure 37 correlates daily water levels measured at observation wells 808 and LT-13 with rainfall recorded at the WF gauge. Measurement at the WF gauge began six months prior to the commencement of frequent water-level monitoring providing a continuous record with antecedent rainfall.

A second meteorological factor causing fluctuations in water levels in wells is variation in barometric pressure. Figure 38 correlates the continuously recorded water levels in wells LT-13 and 808 with the two-week microbarograph recording made at the Vogtle Plant beginning June 23, 1986. Finally, water use in construction of the Vogtle Plant has had a significant impact on water levels during the year of monitoring.

5.1 Response to Precipitation. The results of the first 6 months of continuous records at wells LT-13 and 808 were sufficient to demonstrate there is no detectable response of the water table to individual rain storms. Several storms occurred during the first 6 months, including an intense 2-day storm greater than 3.5 inches in November. These data are described in more detail in the six-month report of February 1986. It was concluded that a discernable, general rise in the water-table in response to rainfall requires a period of persistent and significantly wet weather. The second 6 months of monitoring, January through June of 1986, further confirm that the water-table does not respond to individual storms. This is illustrated by Figure 37. Although the last six months includes an extreme drought, the few storms that did occur are not reflected in the water-table.

A seasonal fluctuation of rising water levels in late fall and winter, and declining water levels in late spring and summer should be expected. It is a natural response to recharge from precipitation and variations in evapotranspiration. Nearly all of the well hydrographs follow this general pattern. However, they are affected to varying degrees by the construction activities, as has been discussed previously in the six-month report of February 1986. Those wells believed to be least affected by construction activities during the first year of the monitoring program include those to the south and southwest of the power block area, i.e., 803A and 805A. The seasonal fluctuations at these wells are estimated at 0.75 and 0.95 foot, respectively. The maximum water level at these wells in response to recharge variations appears to have occurred in late March to early April.

This is in contrast to seasonal fluctuations of over 2 feet and the maximum water levels occurring in January or late February at wells in the primary areas of construction/backfilling activities. Some impact of construction activities (recharge from applied construction water) is reflected in the water-table fluctuations throughout the site. For example, a net rise in water level during the year of monitoring occurred in all wells except 179, in spite of the extended drought of spring and early summer 1986. The largest rises occurred in those areas where concentration of surface waters occurred, either through backfilling operations, or by ponding. The impact of construction activities is discussed further in Section 5.3.

5.2 Response to Barometric Pressure. The small, but repetitious diurnal fluctuations observed on the continuous records of water levels in wells LT-13 and 808 prompted the temporary installation of a microbarograph at the plant site to determine the degree of correlation with barometric pressure. As indicated by Figure 38 there is a very close correlation to these diurnal fluctuations in both water-level records. These fluctuations are caused by the solar atmospheric tide with two maximum and two minimum pressures daily. The primary maximum pressure occurs at about 10 AM, and the secondary maximum at about 10 PM.

Somewhat unexpected is the close response to longer period-pressure transients (resulting from the migration of low and high pressure systems in the atmosphere) by the water level in LT-13, but with only a minor response in 808. The densely compacted backfill at LT-13, and the presence of large buildings covering much of the area surrounding the LT-13 site apparently provide a more effective barrier to the longer-period atmospheric pressure transients reaching the aquifer than do the natural, undisturbed materials that comprise most of the materials overlying the aquifer at the 808 site.

The impact to water-level measurements at those wells by their differing responses to pressure transients is illustrated, first, by the hydrographs of Figure 37, and secondly by the hydrographs of Figures 5 and 17. The hydrographs are prepared from the daily high levels taken from the continuous recordings; Figures 37 shows each daily reading, and

Figures 5 and 17 are based on weekly levels. They indicate larger short-term fluctuations (i.e., one week or less) at LT-13 than at 808. This is a reflection of the greater response at LT-13 to the longer-period pressure transients, since the response to diurnal fluctuations are of similar magnitude at both wells (Figure 37). The hydrograph of 808, Figure 17, shows little weekly fluctuation, whereas at LT-13, Figure 5, a fluctuation of as much as 0.4 foot is present; a response to the irregular pressure transients of low and high pressure systems.

Reviewing the hydrographs of observation wells, all three of the other wells in backfill (Figures 2, 3, and 4) have similar or slightly larger weekly fluctuations to those of LT-13. All of the wells outside the backfill, except 179, show short-term fluctuations greater than 808. Some (i.e., 806B) approach that of LT-13. Most indicate fluctuations somewhat less than LT-13, but a few are of the same magnitude (i.e., 804, 806B and 807A).

5.3 Response To Construction Activities. As discussed in detail in the February 1986 six-month report, the relatively large and rapid rises of water levels in the fall and winter are attributed in large part to be in response to localized recharge of water from backfilling operations and from the ponding of runoff in temporary depressions and excavations during construction. Backfilling of excavations was nearly complete by the end of March 1986, so that recharge from those operations was relatively minor during the last 3 months of this reporting period. Plant grade has been achieved in over 80% of the area around the power block. Although the water table began declining in February, March, the impact of this temporary source of recharge has been to maintain water levels higher than they would be under normal conditions of recharge. As pointed out above, there was a net rise in the water table during the year of monitoring, which was a year of markedly low rainfall. Backfill operations and ponding during construction activities provided sufficient recharge to offset the subnormal rainfall. With the cessation of construction activities that contribute recharge, and final grading of the plant site completed, the water-table can be expected to continue to drop in the power block area.

5.4 Anomalous Fluctuations. In the February, 1986, six-month report, three wells were reported to have single measurements that deviated significantly from the general trend and short-term fluctuations (801, 806B and 807A). It was stated that these measurements were believed to be in error, although they were not checked within 24 hours for verification. Although the procedure for checking has since been reviewed and established with field personnel, it was not until February 1986 that the checking was begun. One additional anomalously low and unverified measurement was made at 806 B in January.

It has been demonstrated that a short-term fluctuation, or envelope of measured levels of 0.4 foot, as a result of pressure transients, is normal at LT-13. The fluctuations are somewhat less at most other water-table wells. A single measurement deviating from the trend or average water-level within that envelope of more than 0.2 foot can, therefore, be considered unusual. The anomalous measurements at wells 801, 806B and 807A deviate more than 0.6 foot from the hydrograph trends and are single isolated measurements. They are considered erroneous measurements.

The elevations of water levels at two wells (801 and 807A) have been corrected as a result of resurveying the reference elevations. An inferred correction at 807A was discussed in the six-month report. The correction at 801, which was determined in May 1986, indicates the water-level elevations previously reported at that well are 1-foot lower. The hydrographs of these wells in this report reflect the elevation corrections.

6.0 Confined Aquifer Fluctuations

Water levels measured in the wells open to the Tertiary aquifer fluctuated from 2 to 4 feet during the first year of the monitoring program. In the two wells open to the Cretaceous aquifer the levels fluctuated 8 and 9 feet. Based on the monitoring of these wells, the trend of levels during the year was downward beneath the site in both aquifers. The level of the Tertiary aquifer dropped 1 foot, and the Cretaceous aquifer level dropped approximately 7 feet. A portion of the decline may be attributed to adjustment of the aquifers to pumping of the site water supply wells. However, because the supply wells have been operating intermittently for over 4 years, and at less than design capacity, the portion of the decline that can be attributed to on-site pumping is minor. It is probable that the decline is primarily in response to seasonal, and longer, variations in recharge, (the last two years have been below normal rainfall), and to increased pumping by wells outside the site area.

The relatively uniform decline of about 1 foot during the year of monitoring at all wells open to the Tertiary aquifer supports this hypothesis. Longer term records at two Tertiary wells, 27 and 29, indicate this downward trend began in 1985. Since 1980, the general trend appears to be near constant, with only a slight total decline; about 2.5 feet in 6 years. A seasonal fluctuation of 1.5 to 2 feet is indicated by these wells during the past two years.

The relatively uniform decline of levels during the first six months of monitoring at the Cretaceous wells appears to have ceased in the second six months (Figures 29 and 30). This is confirmed by measurements in July and August 1986; the water level in both wells appears to have stabilized, although fluctuating as much as 2 feet from month to month. A range of fluctuation of 6 to 8 feet is not unreasonable for the confined Cretaceous aquifer.

7.0 Blue Bluff Marl Pore Pressure

The two clusters of piezometers (A and B) within the marl are located at opposite corners of the power block as shown on Figure 1. The NRC staff requested that the clusters be installed to provide additional detail on the pore pressure distribution within the marl. Previous information was limited to the 42 series well cluster that was installed in 1971 and removed in 1974.

As discussed in the February 1986 six-month report, the data from these clusters are consistent with that collected in the 42 series cluster; decreasing head with depth within the marl. The second six months of data indicate the piezometers have essentially stabilized, and a seasonal fluctuation of similar magnitude to that of the underlying Tertiary aquifer is indicated by the hydrographs (Figures 31 through 36). Further, the fluctuation in the marl occurs essentially coincidentially (no time lag) with that of the Tertiary aquifer, indicating a pressure response rather than migration of water within the marl. The low permeability of the marl precludes such close correlation of fluctuation with that of the aquifer to be caused by movement of water into or out of the marl.

Monitoring at 904B continues to demonstrate that the piezometer is open to an unsaturated zone in the marl.

8.0 Future Monitoring of Wells

The report on the first six months of monitoring concluded that frequency of monitoring most wells could be reduced to monthly. It was recommended that the continuous recorder wells (808 and LT-13) be maintained and wells monitoring the water-table aquifer within the backfill adjacent to structures (LT-1B, LT-7A, LT-12) continue to be monitored weekly. This was suggested in consideration of the daily and other short-term fluctuations being caused by construction activities. It is apparent now that atmospheric pressure transients are causing the daily fluctuations, as well as other short-term (weekly) fluctuations observed. During the second six-months of monitoring there have been no large or unusual short-term fluctuations, and construction backfilling is nearly complete.

Regardless of the conclusions from the first six-months monitoring, the original frequency has been maintained at all wells, and has continued to date. This provides more than a year of continuous monitoring at wells

808 and LT-13, and weekly monitoring at all water-table wells and the piezometers in the Blue Bluff marl. This record provides a reference base demonstrating the range of normal, short-term fluctuations to be expected. The record also indicates that the response of the water table lags by more than a month a persistent increase in recharge, i.e., above normal rainfall. It is apparent from this that a significant rise of the water table (0.5 foot, or more) can be readily detected by monthly monitoring of the observation wells. This will provide adequate definition of water-table fluctuations significant to assessment of the design-basis ground-water level.

Reducing the monitoring frequency of all wells to monthly is planned. Unless the NRC staff disagrees, it is planned to remove the continuous recorder at well 808 in October 1986, and the recorder at well LT-13 in November 1986. Monitoring of all other wells, including the water table wells and marl piezometers, is planned to be reduced to monthly following October 1986. This program will be maintained with any modifications requested by the NRC staff until July 1987 when the third report will be submitted, describing the results of the second year of the monitoring program.

TABLE 1 - OBSERVATION WELLS

Well No.	Installed (Yr.)	Coordinates N	Coordinates E	Ground Surface Elev.(1) (ft.)	Depth Top of Marl(2) (ft.)	Depth of Monitored Interval(2) (ft.)
Water-table aquifer						
129	1971	8856	9576	215.9	77	35 - 100
142	1971	8283	8262	231.2	92	52 - 101
179	1971	9059	7779	274.8	130	90 - 131
800	1979	8850	11011	213.7	83	59 - 94
801	1979	7656	10733	212.8	82	49 - 87.5
802A	1985	7196	10194	216.9	87.5	72 - 90
803A	1979	7085	8898	218.3	82	42 - 87
804	1979	6597	8227	224.1	87	49 - 102
805A	1979	6672	10403	232.7	124	69.5-127
806B	1980	8821	9726	214.8	77	23 - 70
807A	1980	9047	9835	213.6	77	36 - 80
808	1985	9625	9300	207.0	66.3	45.5- 68
809	1985	8320	7860	222.8	89	69.4- 90
LT-1B	1985	8388	9304	213.2	83.3	65.2- 84.7
LT-7A	1985	8151	9317	215.9	87	65 - 87
LT-12	1985	7775	9600	209.0	79	58.2- 78.6
LT-13	1985	8135	10110	219.0	89	68.1- 89.1
Tertiary aquifer						
27	1971	8622	13931	210.0		146 - 190
29	1971	9975	12392	193.0		124 - 210
34	1971	12180	10846	86.0		47 - 115
850A	1984	11723	10494	225.9		147 - 200
851A	1984	8868	7066	262.7		235.7-300
852	1984	5993	13380	200.7		159.1-220
853	1984	11020	9204	227.6		176.3-217
854	1984	9899	7917	236.8		174 - 220
855	1984	7159	13951	218.0		192 - 240
856	1984	4927	12558	186.7		156 - 197
Cretaceous aquifer						
TW-1	1972	7738	9984	218.5		506 - 850
MU-2	1977	9500	9135	214.5		450 - 820

NOTES:

(1) Determined at time of drilling.
(2) Below ground surface at time of drilling.

TABLE 2 - PIEZOMETERS IN BLUE BLUFF MARL

Well No.	Installed (Yr.)	Coordinates N	Coordinates E	Ground Surface Elev.(1) (ft.)	Depth of Marl(2) (ft.)	Depth of Monitored Interval(2) (ft.)
900	1985	7538	10119.5	216.3	92.6-148	133.8-140.7
901	1985	7538	10104.5	215.58	91.6-148	122.0-128.0
902	1985	7543.5	10110.5	215.97	91.0-148	101.5-108.0
903	1985	8480	8900	215.75	78.0-148	127.0-133.0
904B	1985	8464	8885	215.75	78.8-148	90.0- 96.7
905	1985	8450	8900	215.75	77.3-148	109.8-116.0

NOTES:

(1) Determined at time of drilling.
(2) Below ground surface at time of drilling. Bottom depth of marl is interpolated from figure 2.5.1-31, FSAR.

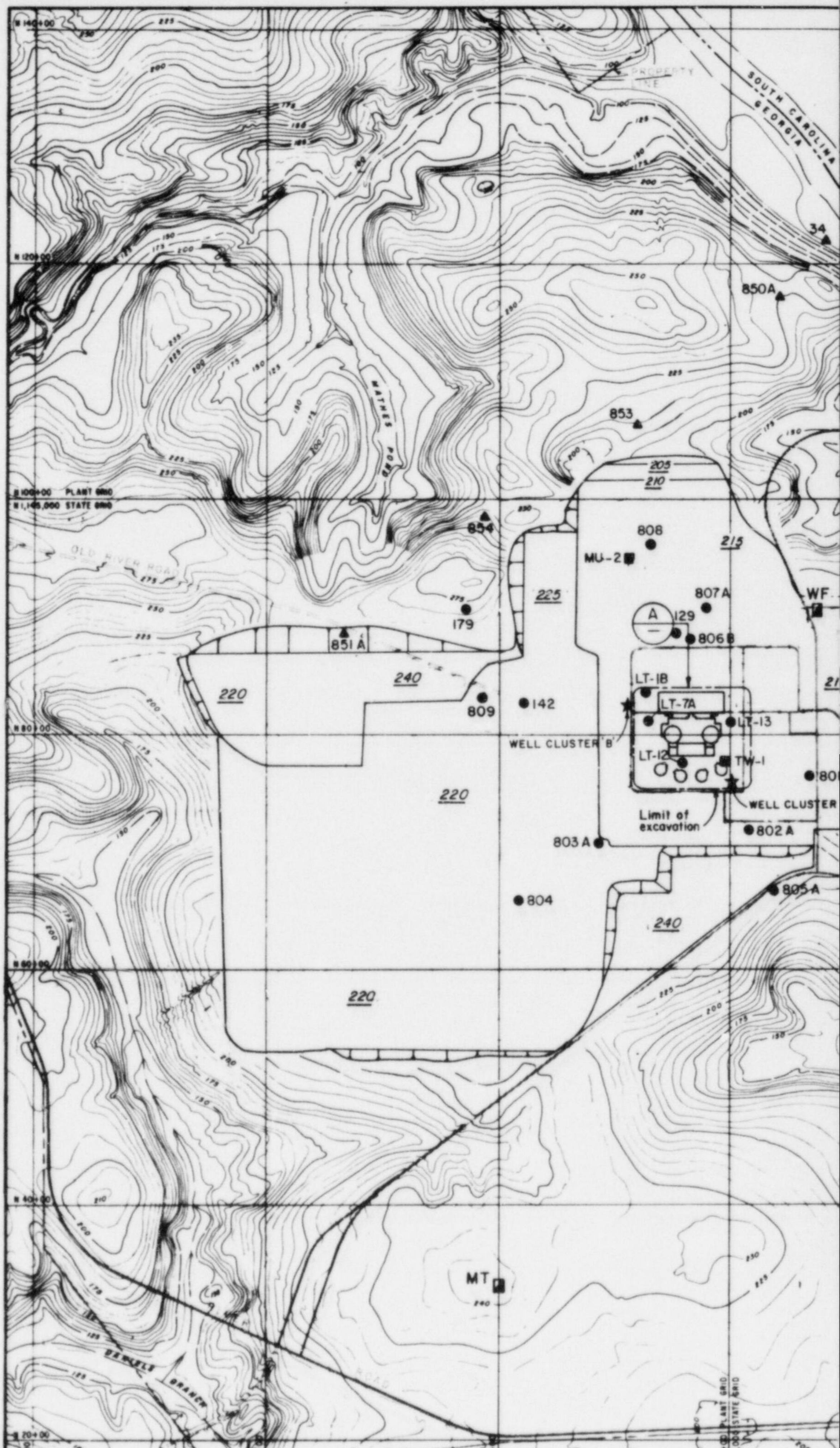
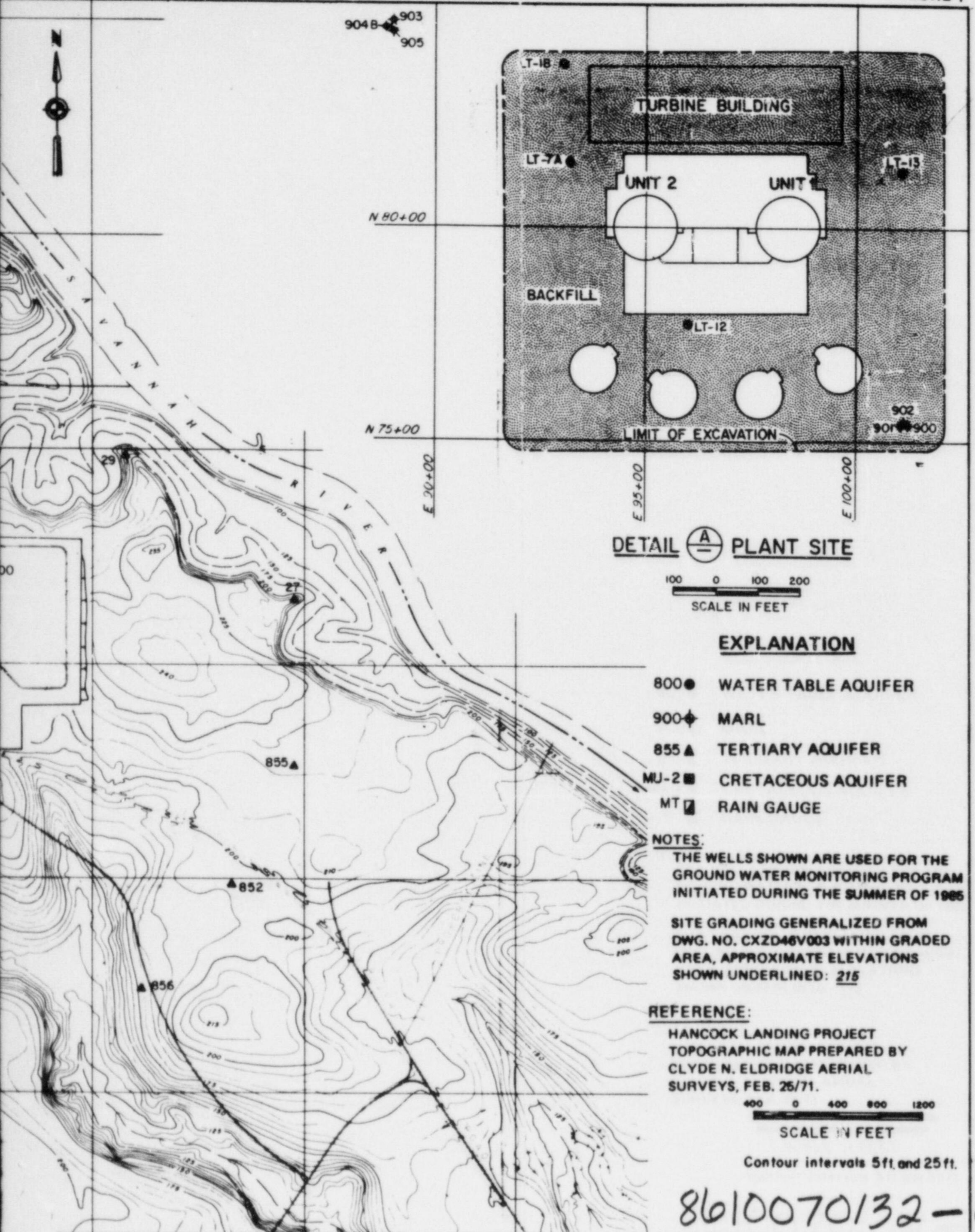

PROPERTY LINE
SOUTH CAROLINA
GEORGIA
N 140+00
N 120+00
N 100+00 PLANT GRID
N 1,145,000 STATE GRID
N 80+00
N 60+00
N 40+00
N 20+00
E 40+00
E 80+00
E 100+00 PLANT GRID
E 624,000 STATE GRID
MATHES POND
OLD RIVER ROAD
DEWIELS BRANCH
ROAD
PROPERTY LINE
34
850A
853
854
851 A
179
808
MU-2
807A
129
806B
WF
LT-18
LT-7A
LT-13
LT-12
TW-1
809
142
WELL CLUSTER 'B'
WELL CLUSTER
Limit of excavation
802 A
803 A
804
805-A
MT
205
210
215
225
220
240
220
220
240
220

FIGURE 1



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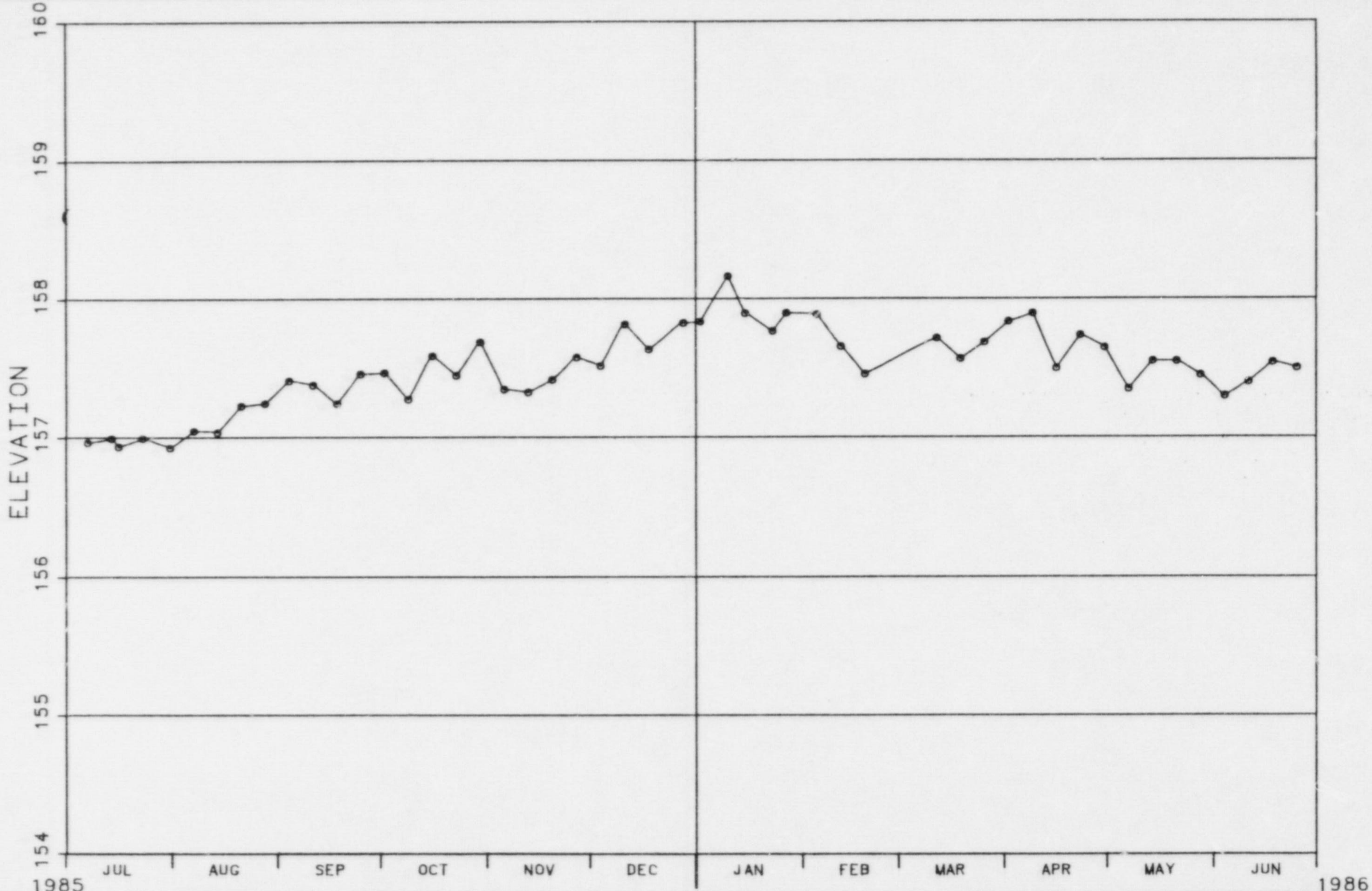
VOGTLE ELECTRIC GENERATING PLANT	OBSERVATION WELLS AND RAIN GAUGES

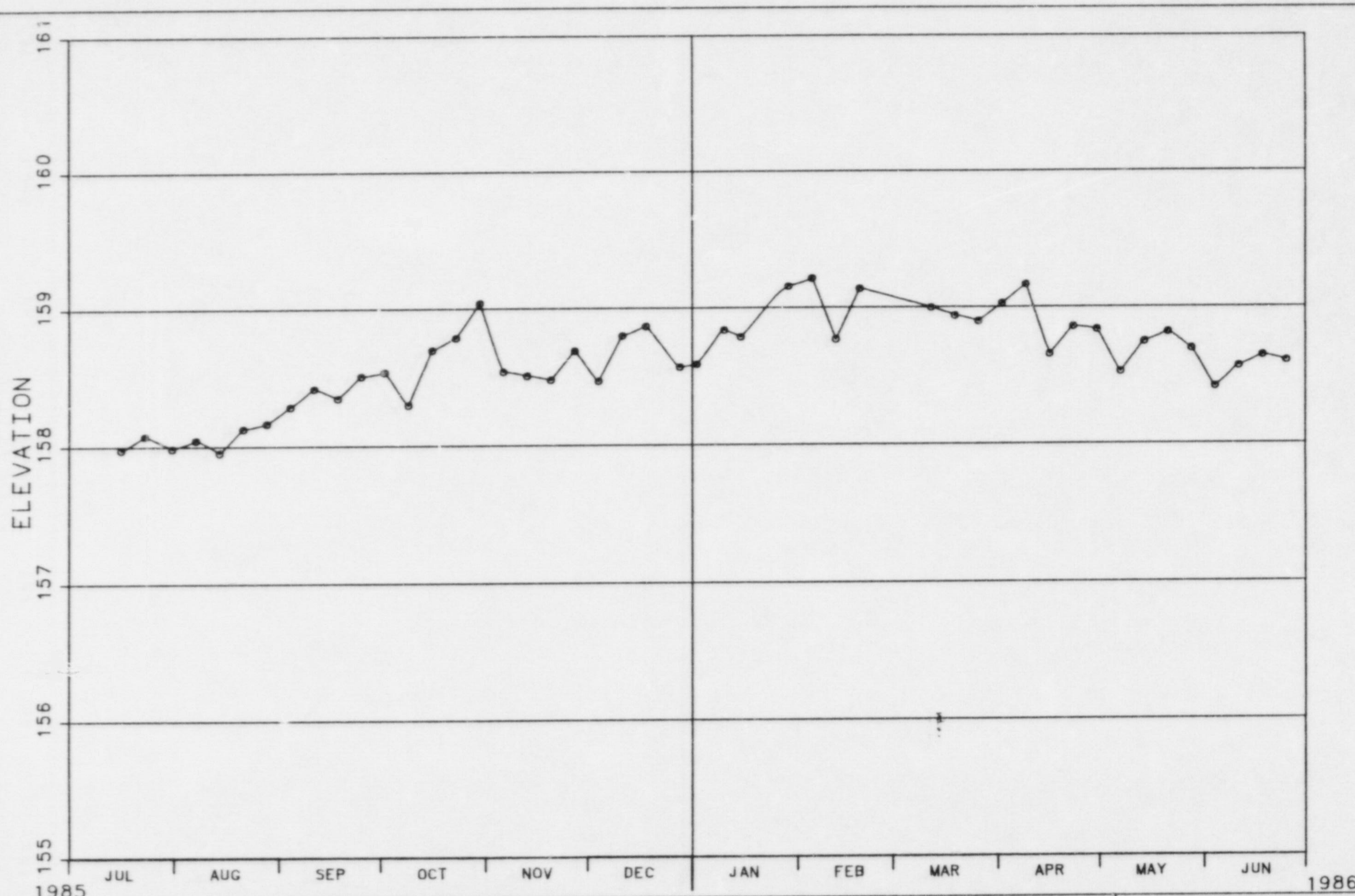
FIGURE 2



VOGTLE
ELECTRIC GENERATING PLANT

WELL LT1B
WATER TABLE

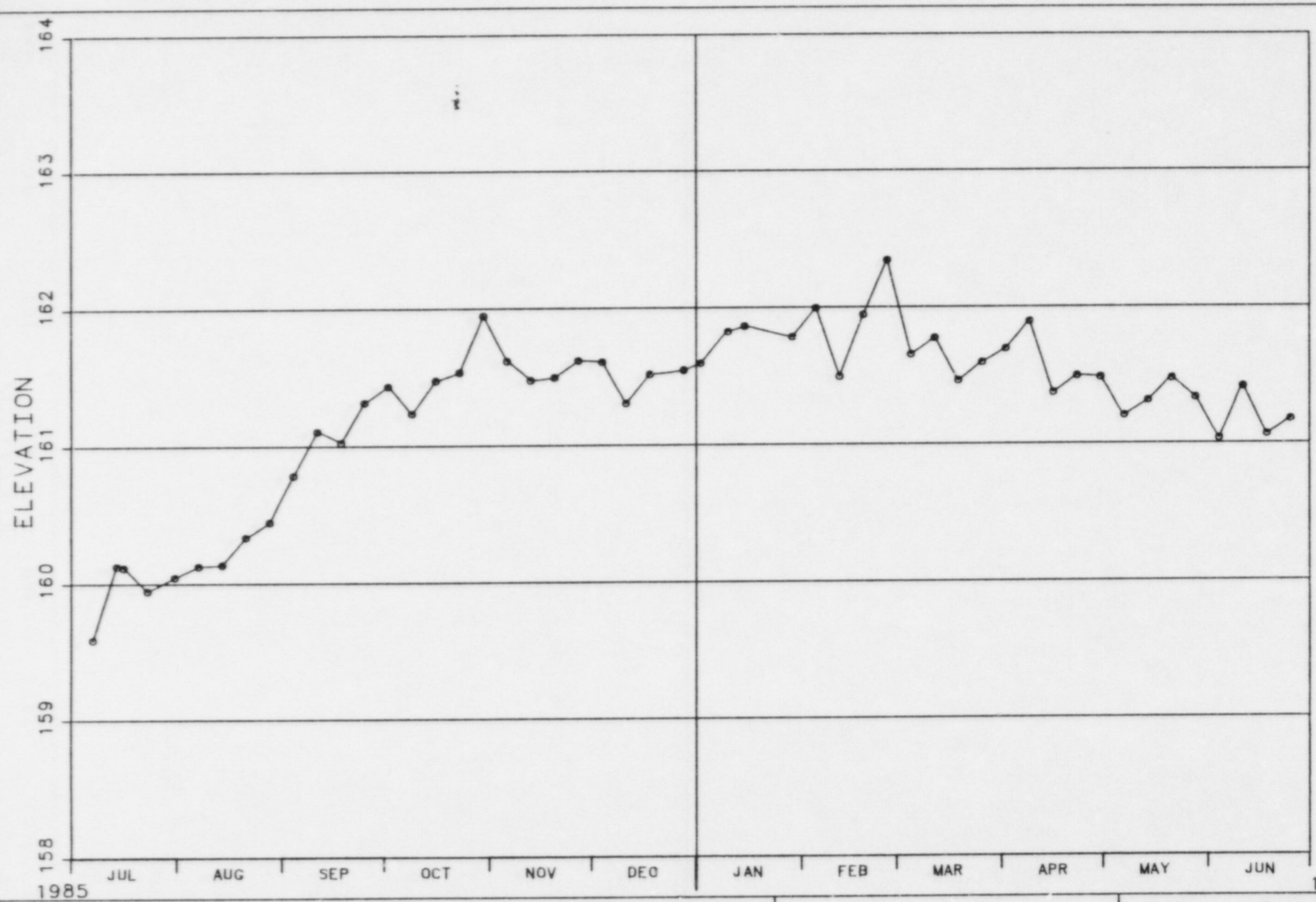
FIGURE 3



VOGTLE
ELECTRIC GENERATING PLANT

WELL LT7A
WATER TABLE

FIGURE 4



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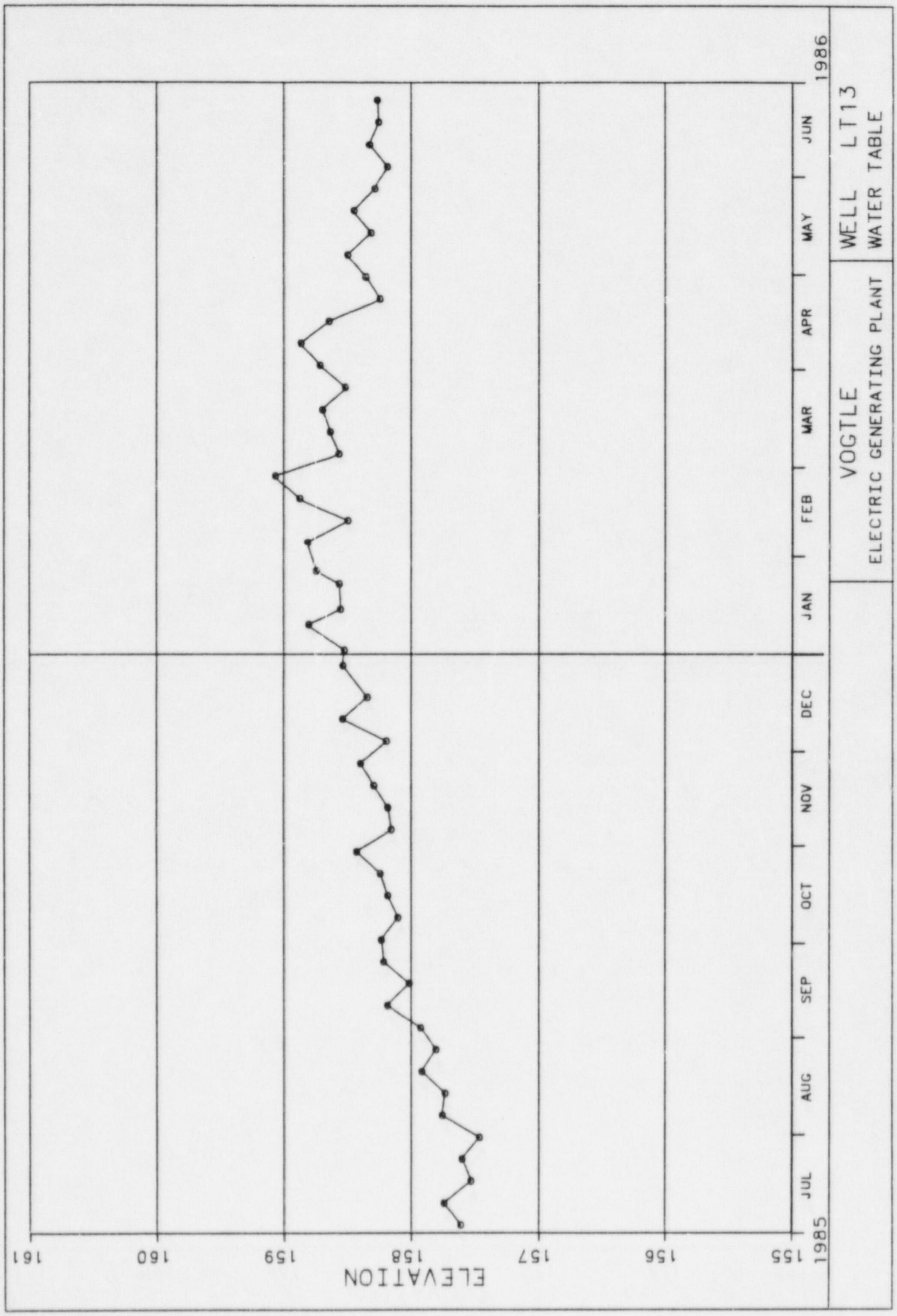
ELECTRIC GENERATING PLANT

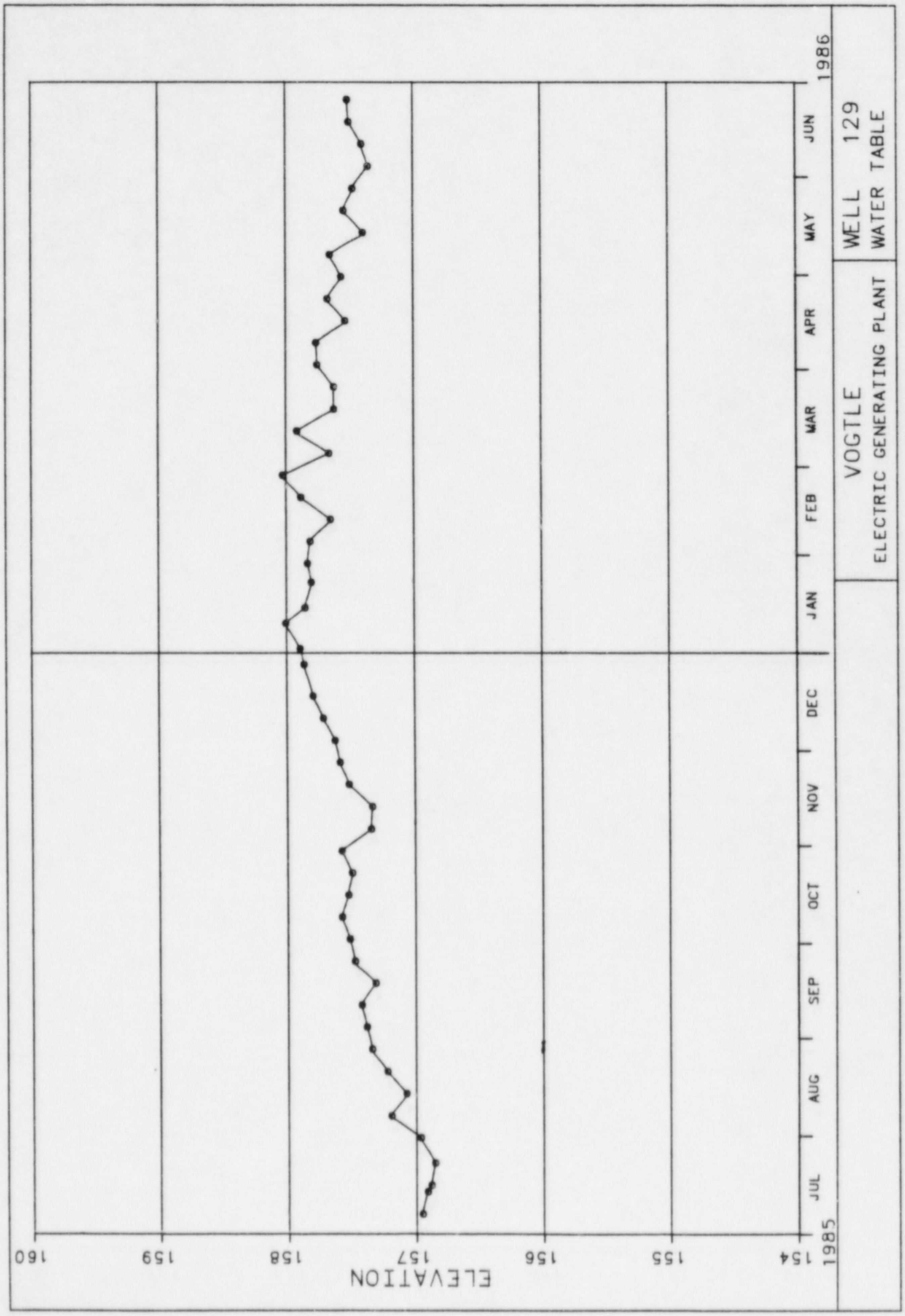
WELL LT12
WATER TABLE

FIGURE 5



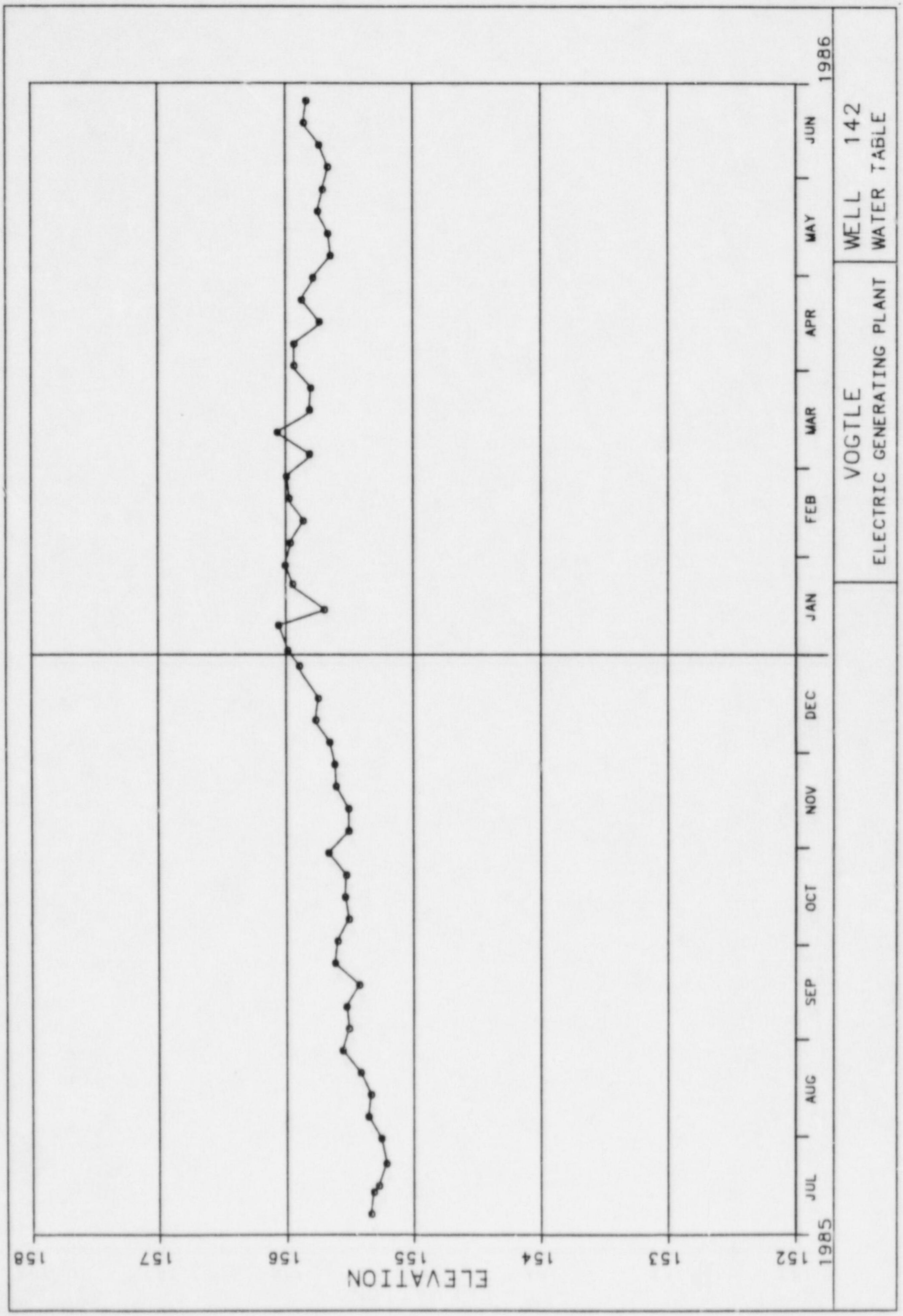
VOGTLE
ELECTRIC GENERATING PLANT
WELL LT13
WATER TABLE
ELEVATION
155
156
157
158
159
160
161
1985
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
1986

FIGURE 6



WELL 129
WATER TABLE
VOGTLE
ELECTRIC GENERATING PLANT
ELEVATION
160
159
158
157
156
155
154
1985
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
1986

FIGURE 7



VOGTLE
ELECTRIC GENERATING PLANT
WELL 142
WATER TABLE
ELEVATION
158
157
156
155
154
153
152
1985
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
1986

FIGURE 8

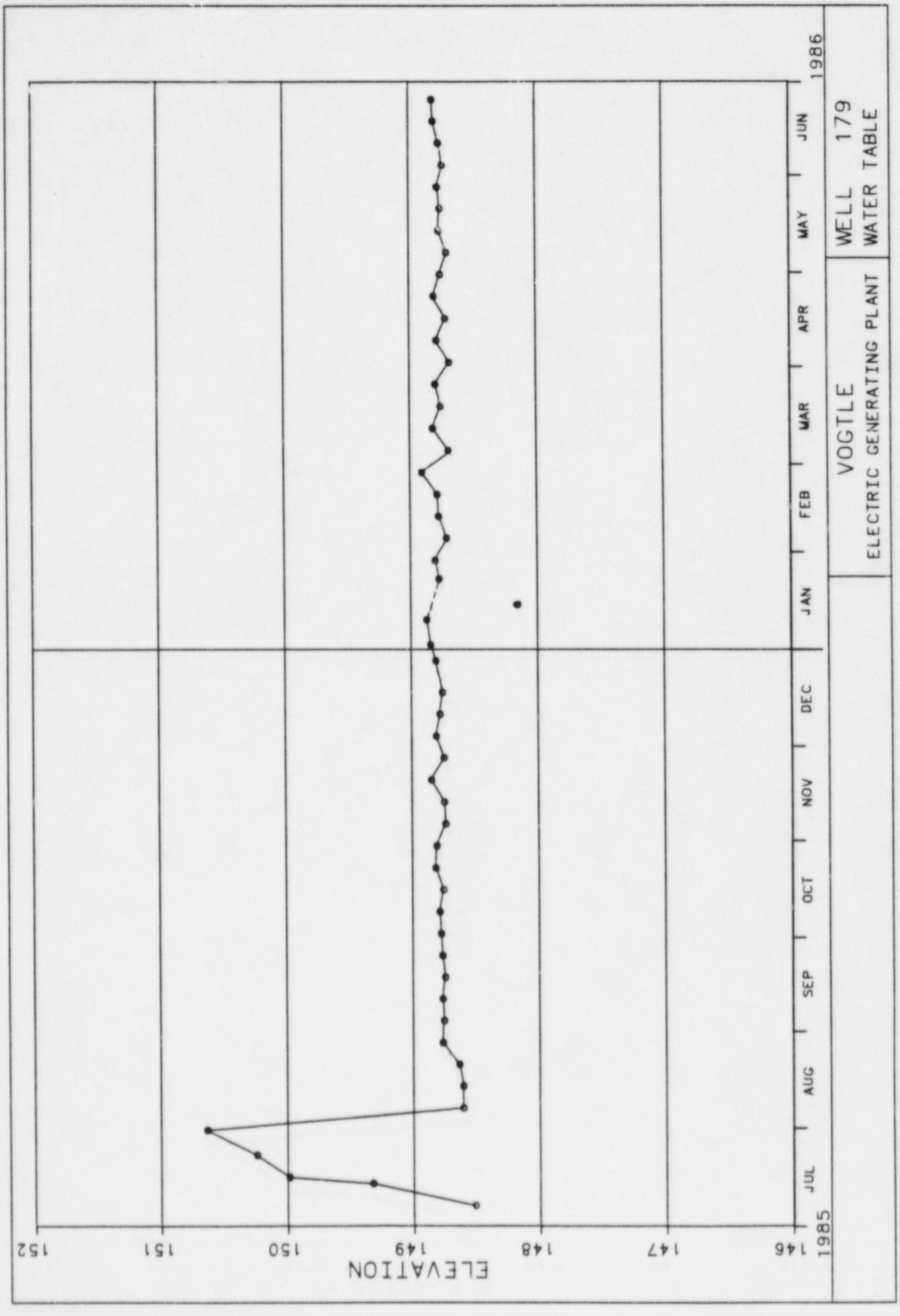

VOGTLE
ELECTRIC GENERATING PLANT
WELL 179
WATER TABLE
ELEVATION
146
147
148
149
150
151
152
1985
1986
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN

FIGURE 9

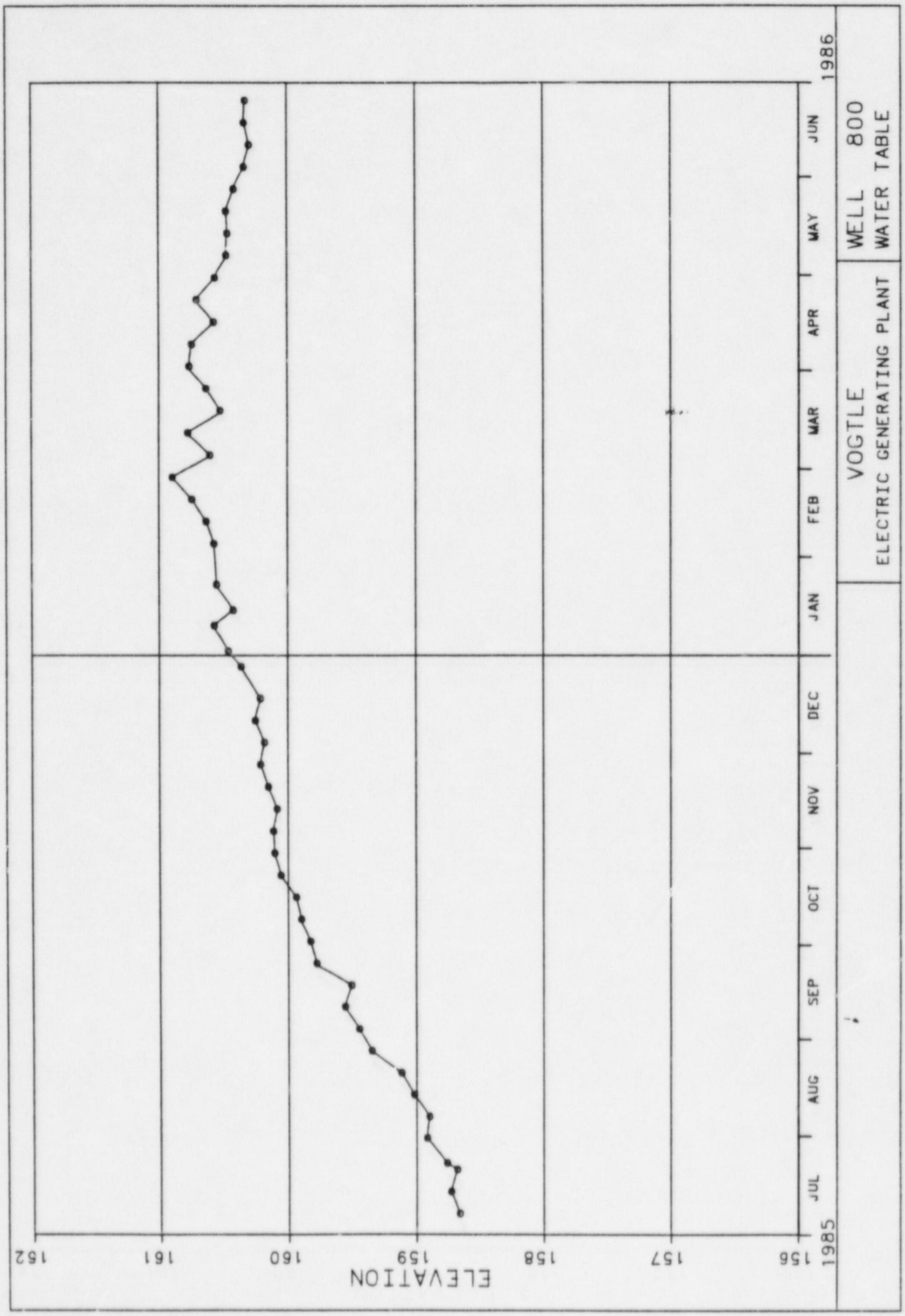
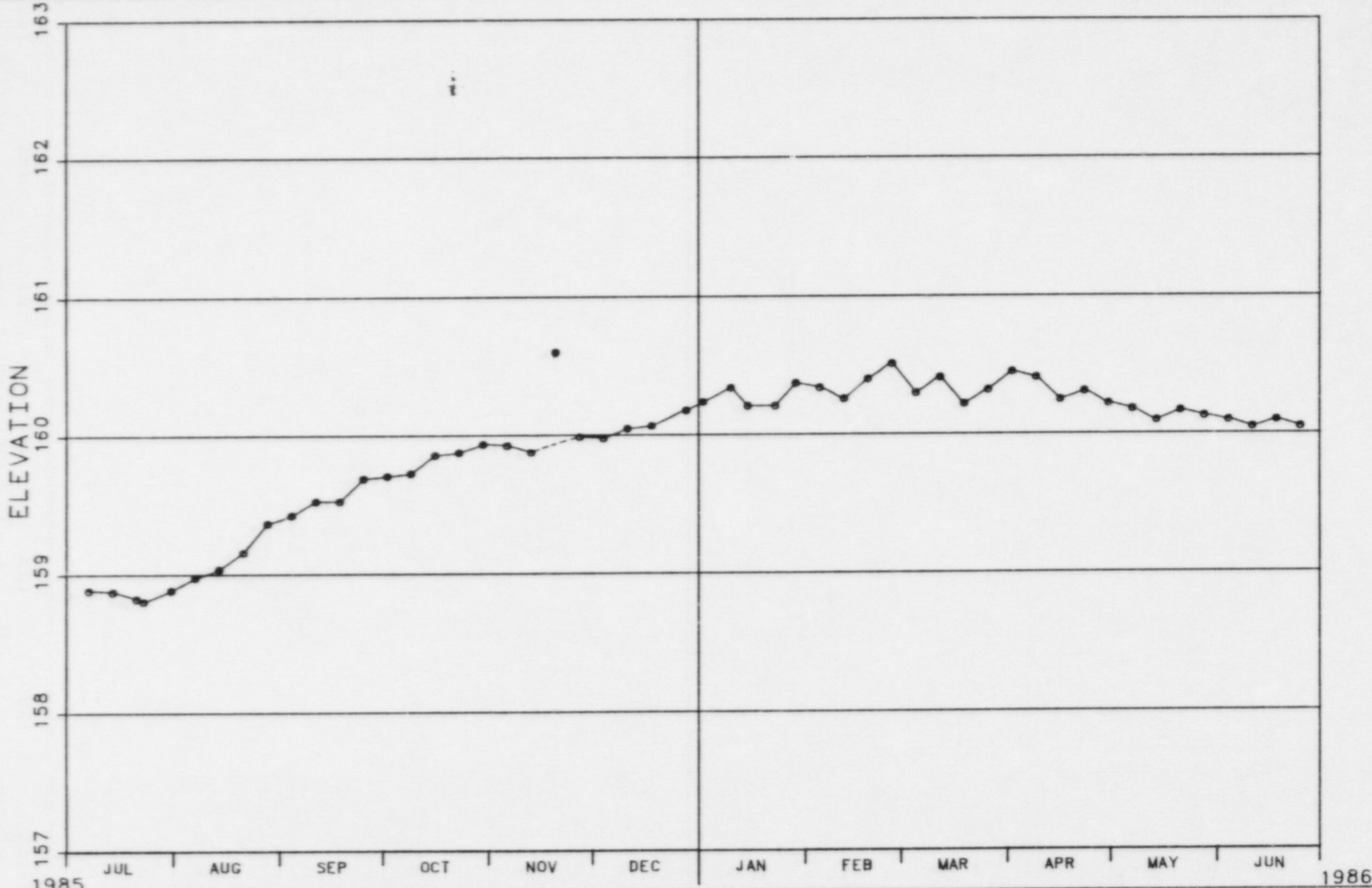

VOGTLE
ELECTRIC GENERATING PLANT
WELL 800
WATER TABLE
ELEVATION
156
157
158
159
160
161
162
1985
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
1986

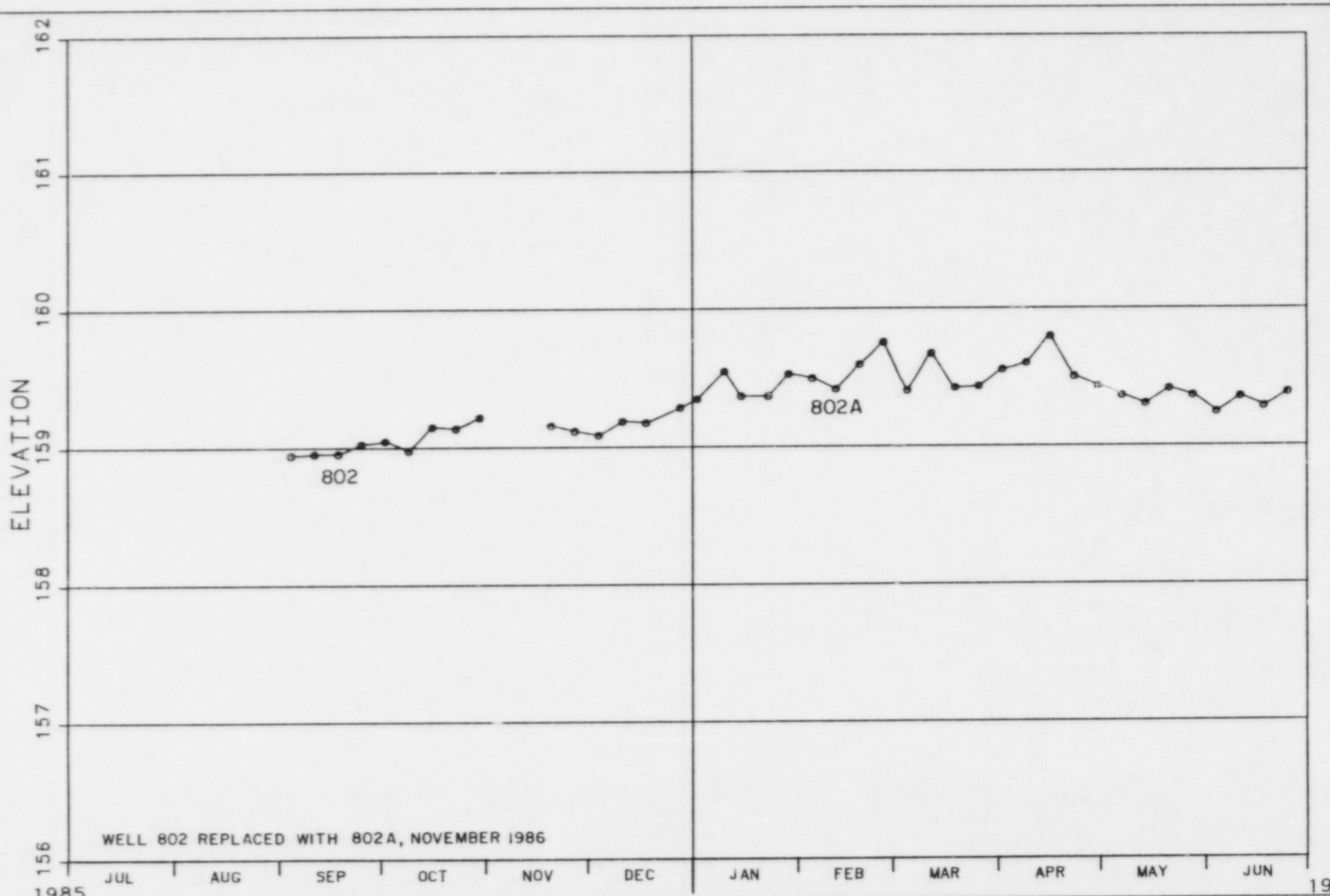
FIGURE 10



VOGTLE
ELECTRIC GENERATING PLANT

WELL 801
WATER TABLE

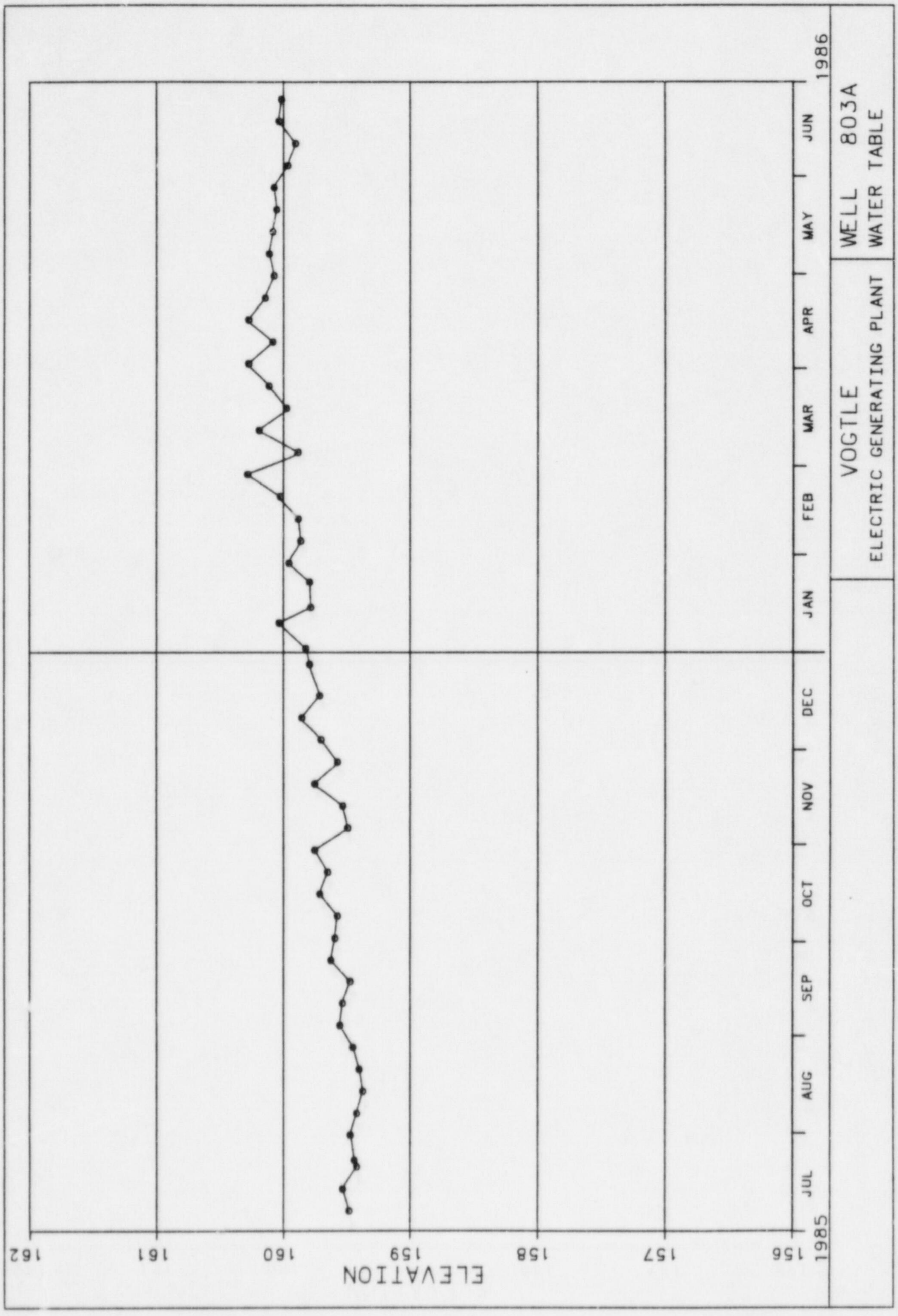
FIGURE 11



VOGTLE
ELECTRIC GENERATING PLANT

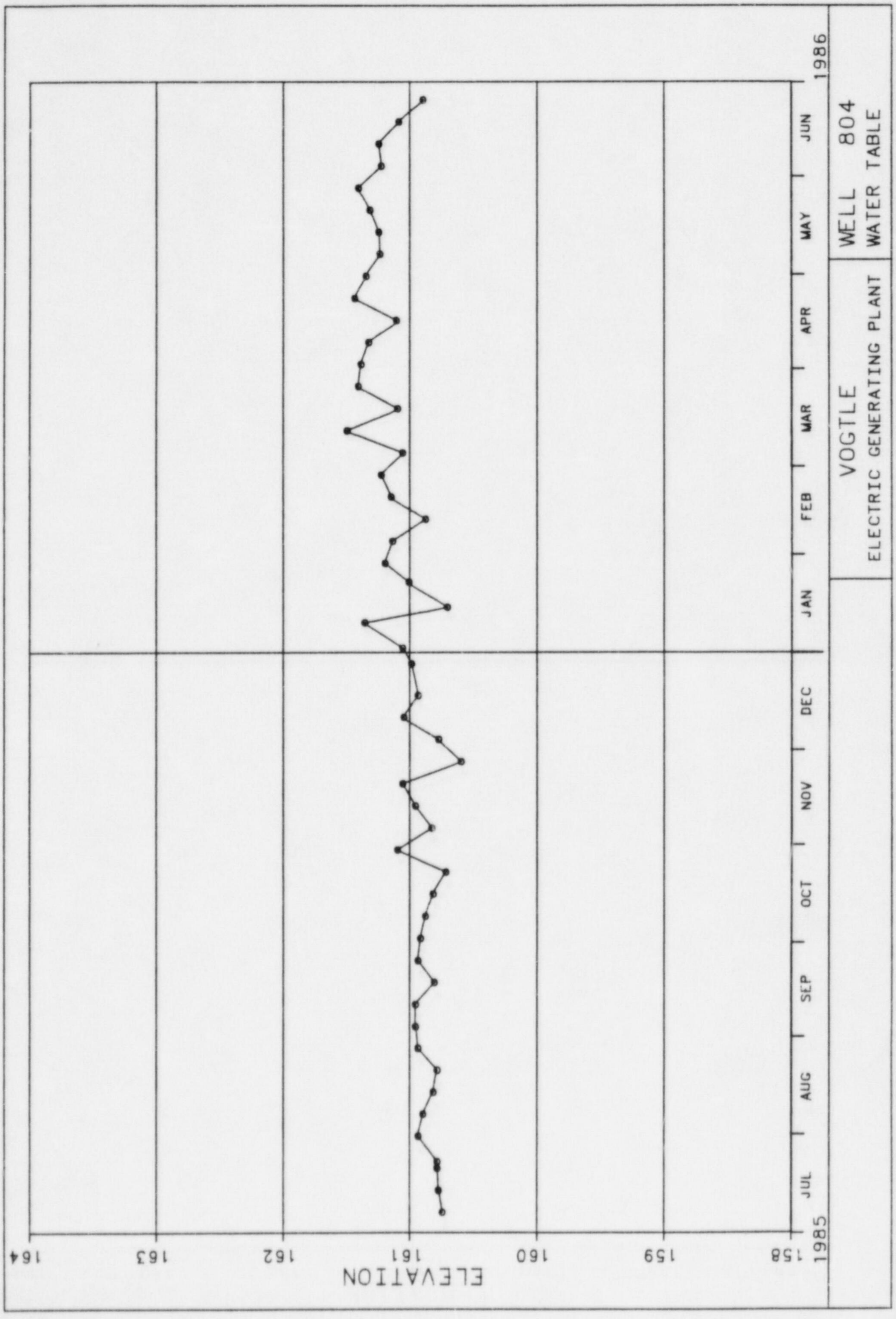
WELL 802A
WATER TABLE

FIGURE 12

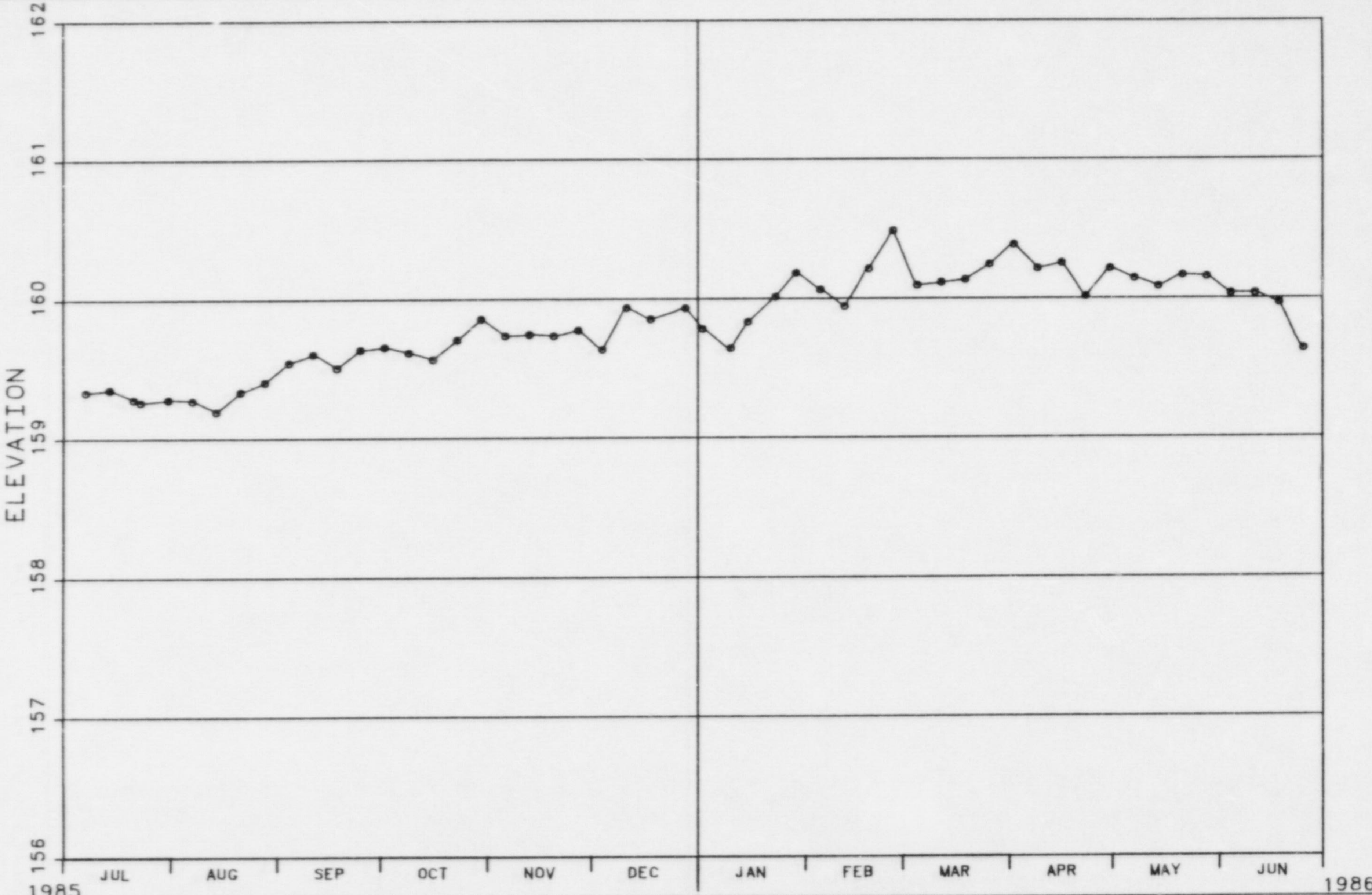


WELL 803A
WATER TABLE
VOGTLE
ELECTRIC GENERATING PLANT
ELEVATION
162
161
160
159
158
157
156
1985
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
1986

FIGURE 13



VOGTLE
ELECTRIC GENERATING PLANT
WELL 804
WATER TABLE
ELEVATION
158
159
160
161
162
163
164
1985
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
1986

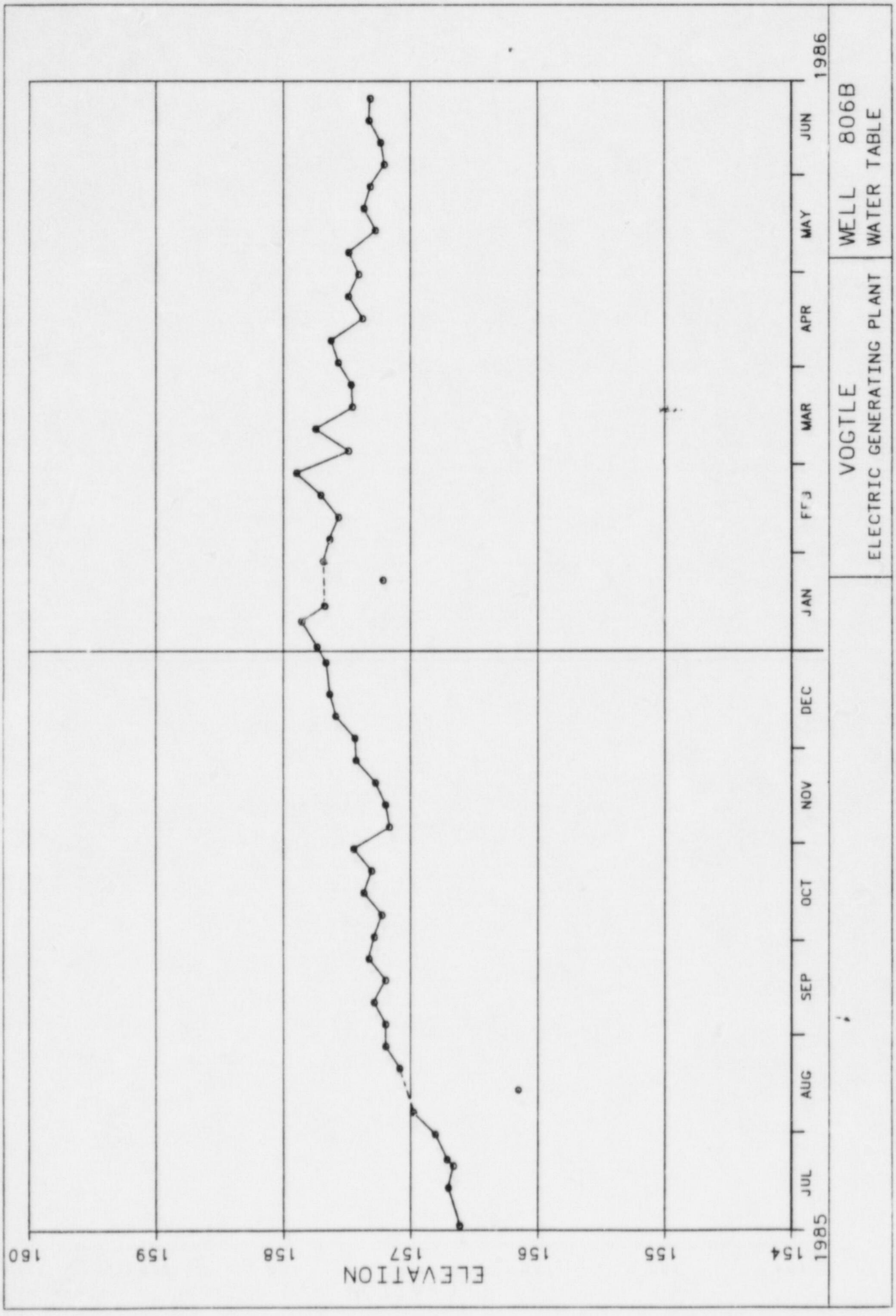


VOGTLE
ELECTRIC GENERATING PLANT

WELL 805A
WATER TABLE

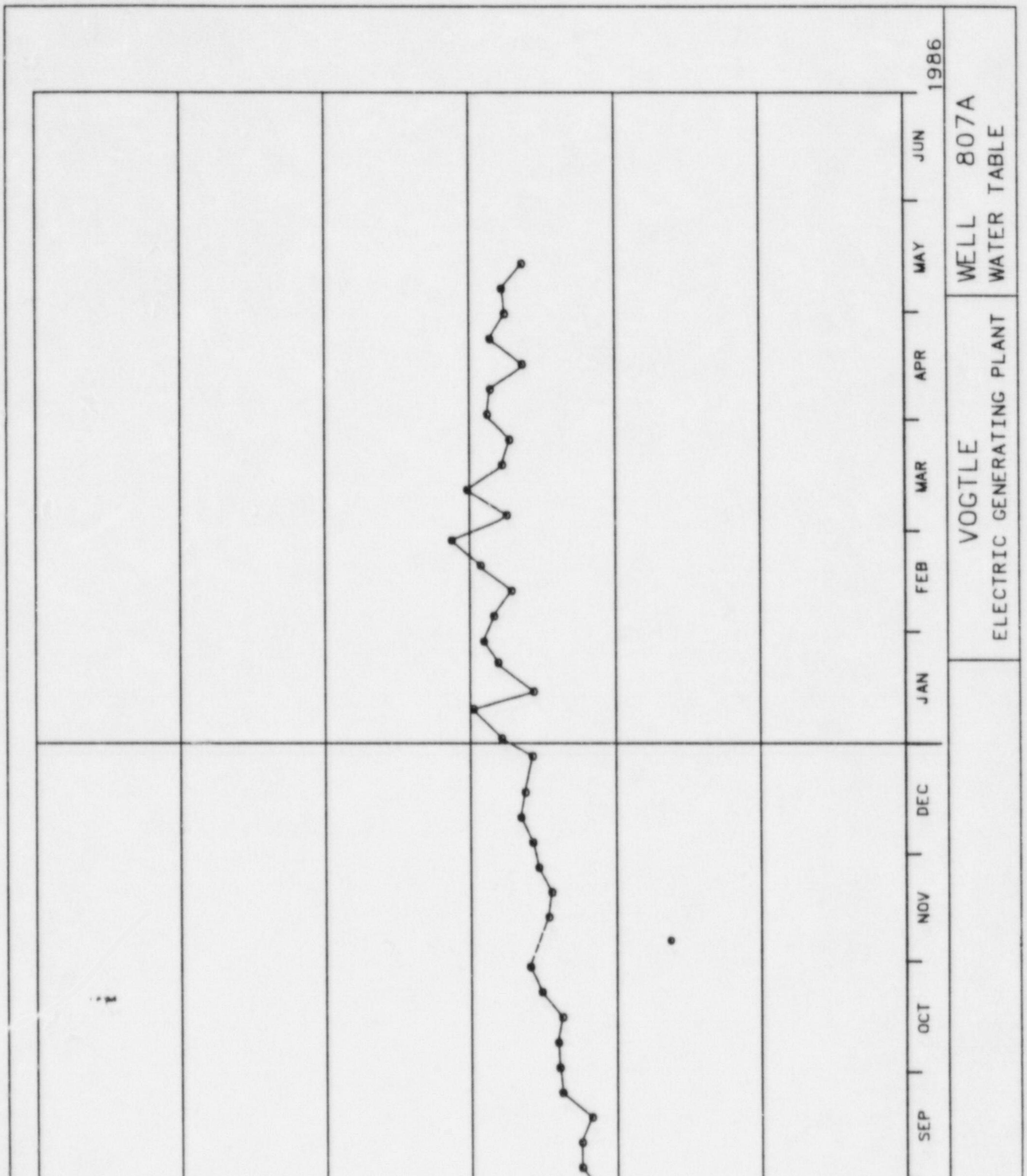
FIGURE 14

FIGURE 15



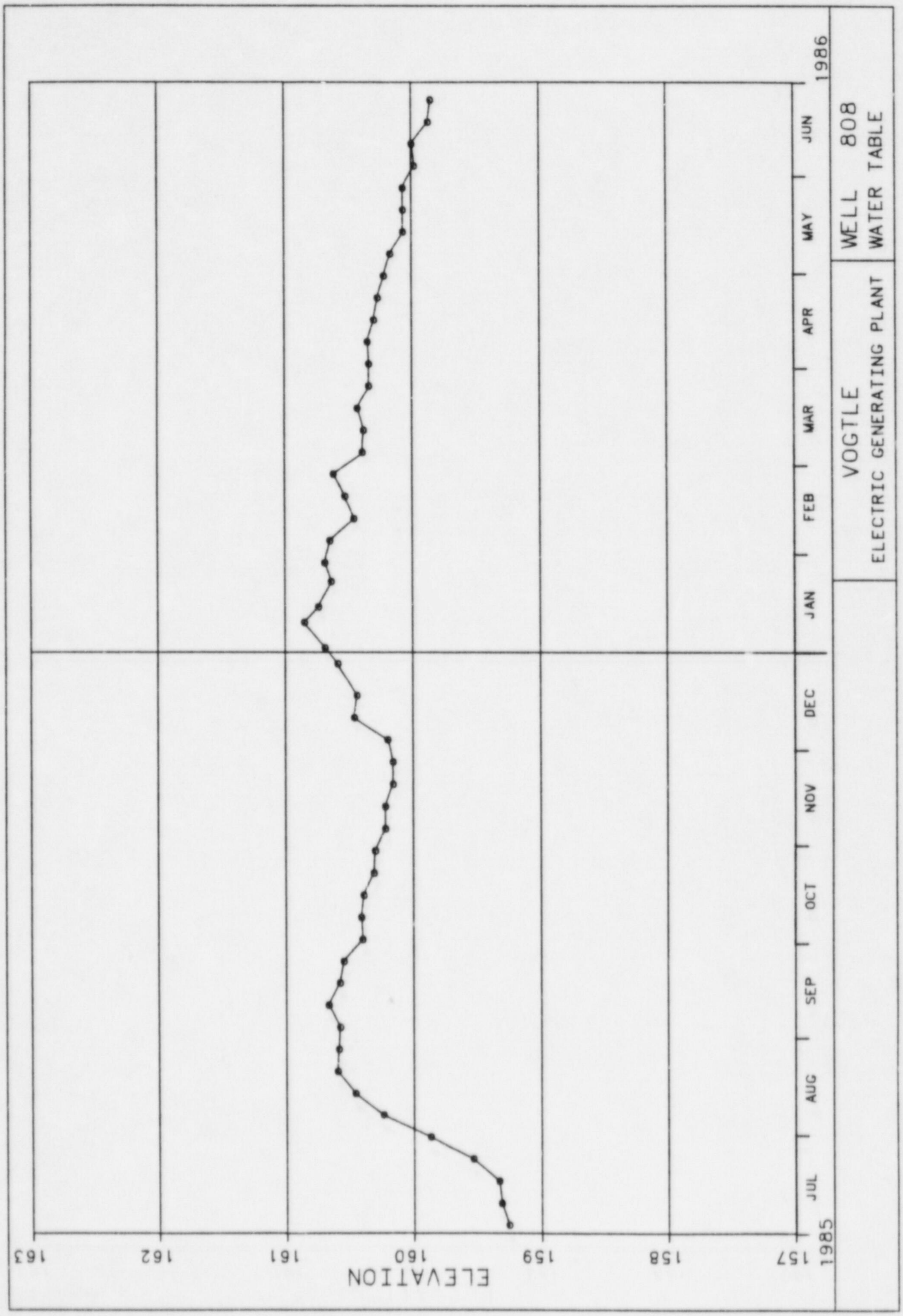
ELEVATION
154
155
156
157
158
159
160
1985
JUL
AUG
SEP
OCT
NOV
DEC
JAN
MAR
APR
MAY
JUN
1986
VOGTLE
ELECTRIC GENERATING PLANT
WELL 806B
WATER TABLE

FIGURE 16



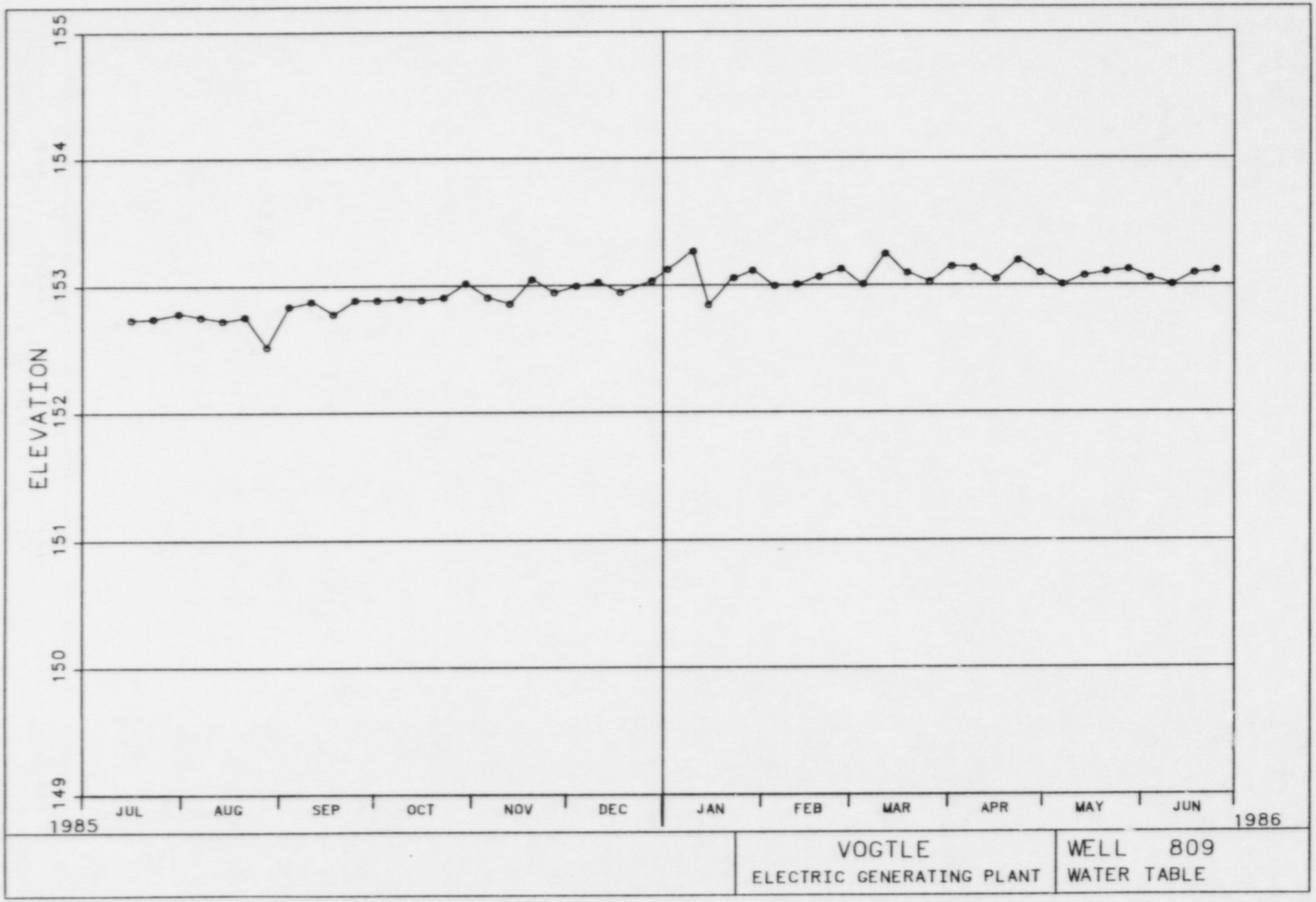
VOGTLE
ELECTRIC GENERATING PLANT
WELL 807A
WATER TABLE
ELEVATION
163
162
161
160
159
158
157
1985
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
1986

FIGURE 17

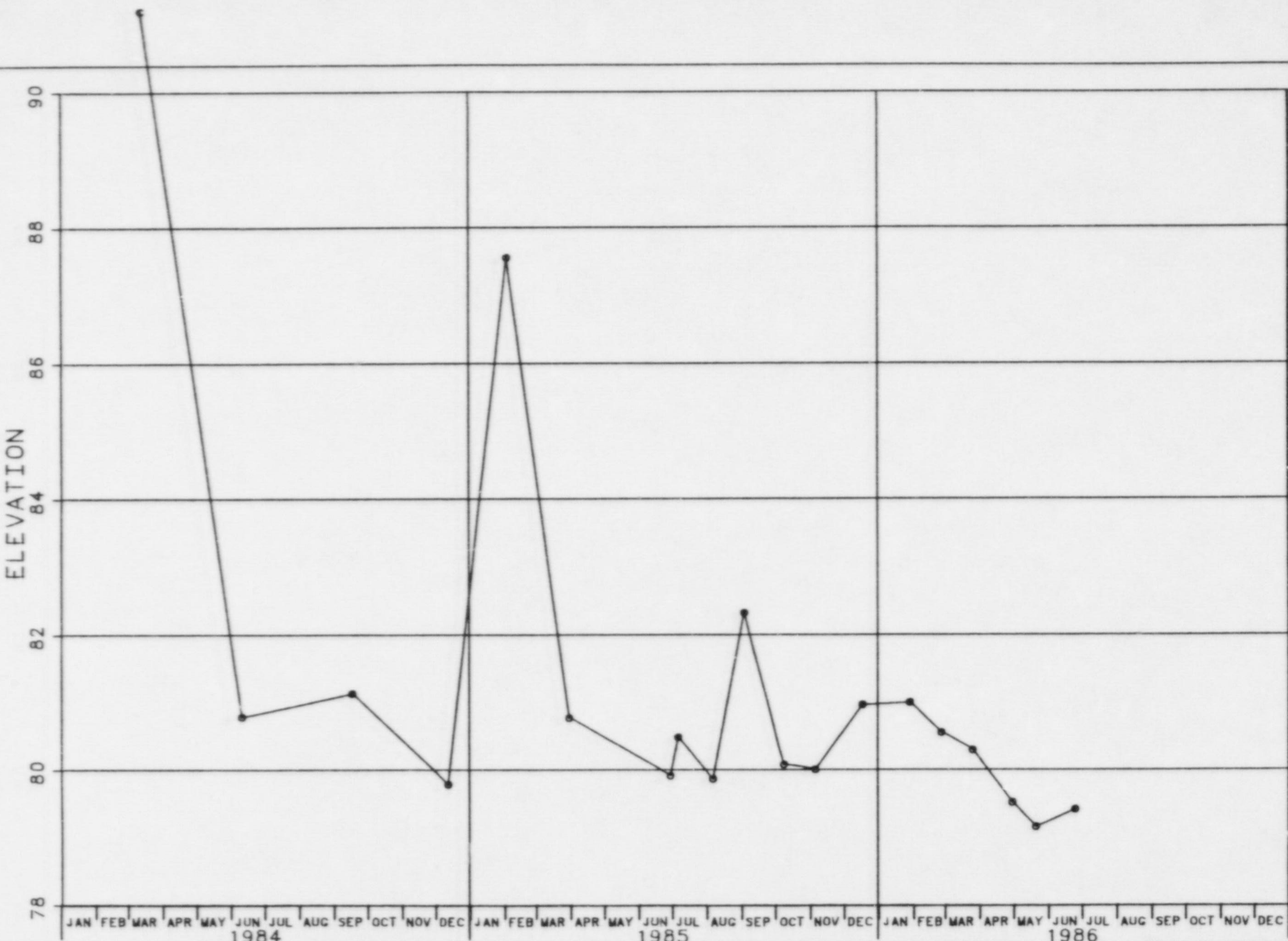


VOGTLE
ELECTRIC GENERATING PLANT
WELL 808
WATER TABLE
ELEVATION
163
162
161
160
159
158
157
1985
1986
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN

FIGURE 18



ELEVATION
155
154
153
152
151
150
149
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
1985
1986
VOGTLE
ELECTRIC GENERATING PLANT
WELL 809
WATER TABLE



	VOGTLE ELECTRIC GENERATING PLANT	WELL 27 TERTIARY

FIGURE 19

FIGURE 20

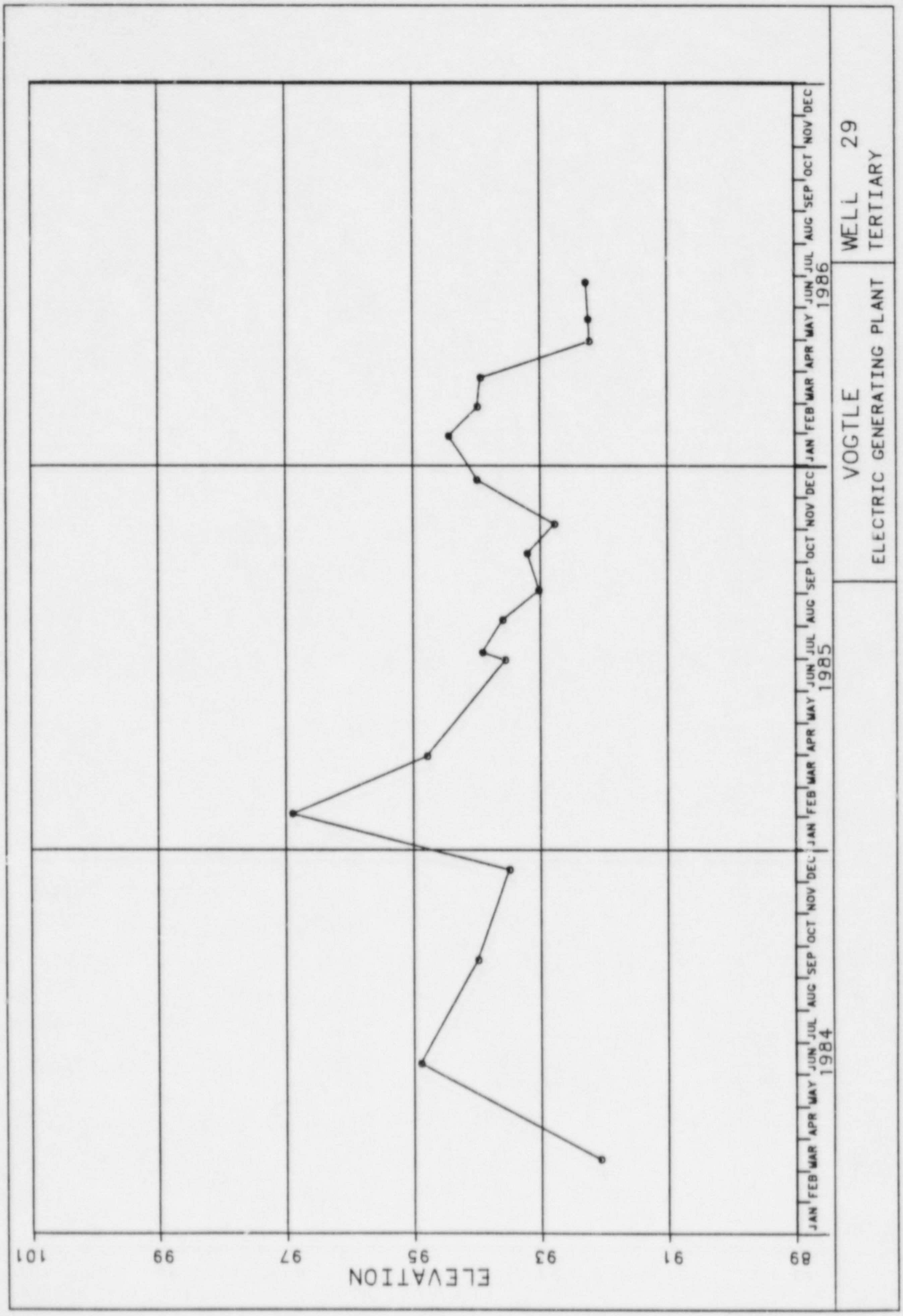
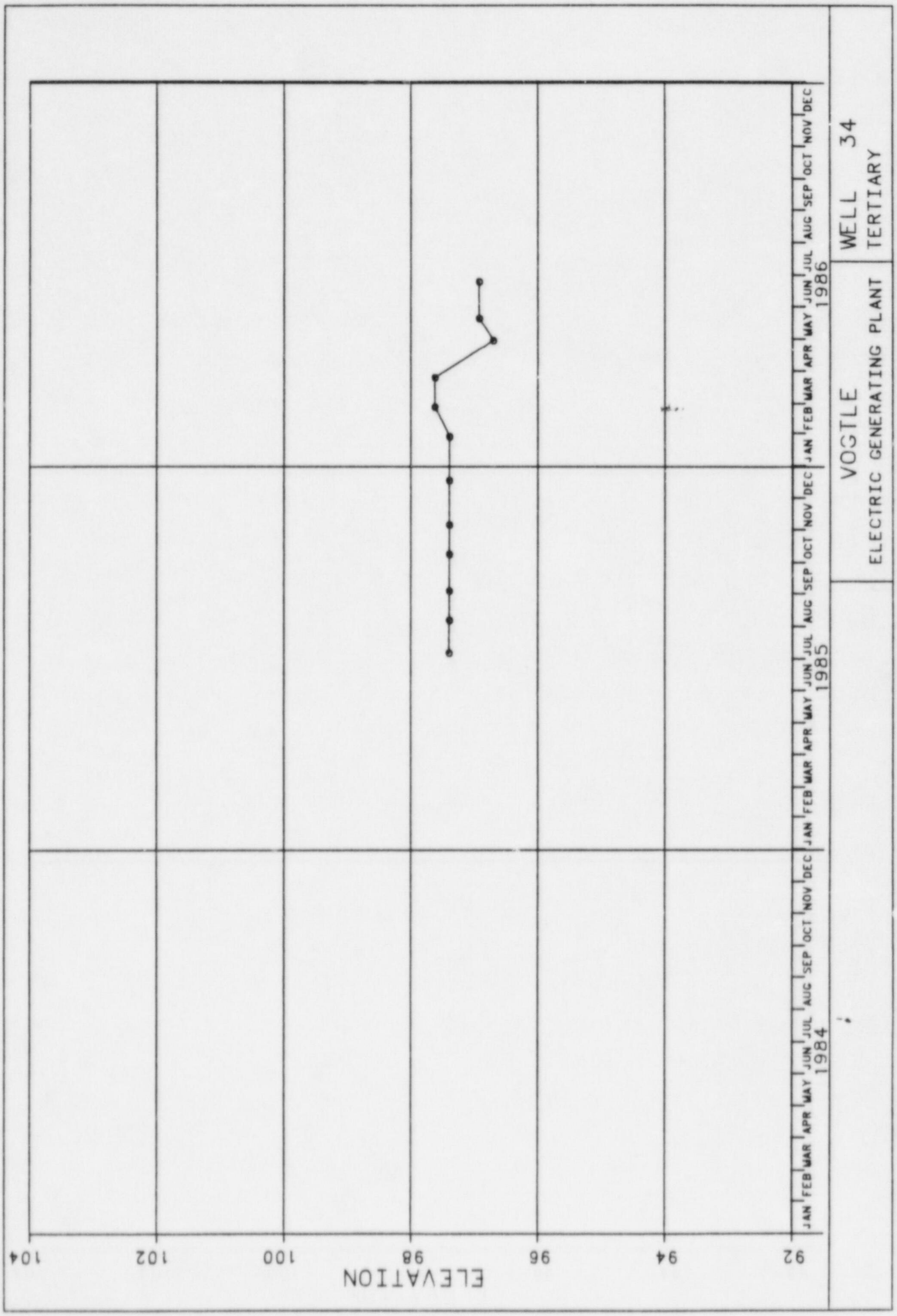
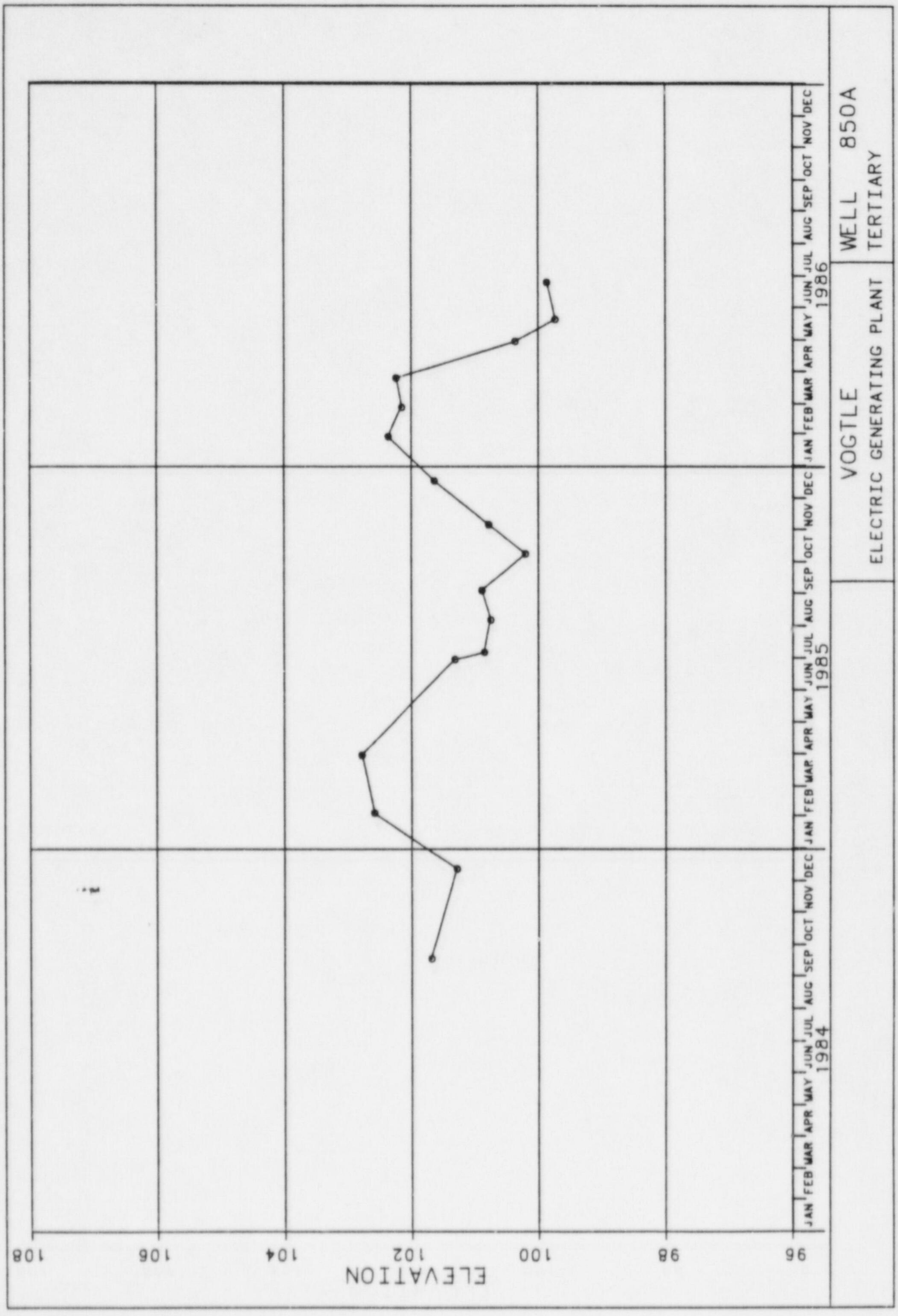

VOGTLE
ELECTRIC GENERATING PLANT
WELL 29
TERTIARY
ELEVATION
89
91
93
95
97
99
101
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1984
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1985
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1986

FIGURE 21



VOGTLE
ELECTRIC GENERATING PLANT
WELL 34
TERTIARY
ELEVATION
92
94
96
98
100
102
104
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1984
1985
1986

FIGURE 22



WELL 850A
TERTIARY
VOGTLE
ELECTRIC GENERATING PLANT
ELEVATION
108
106
104
102
100
98
96
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1984
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1985
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1986

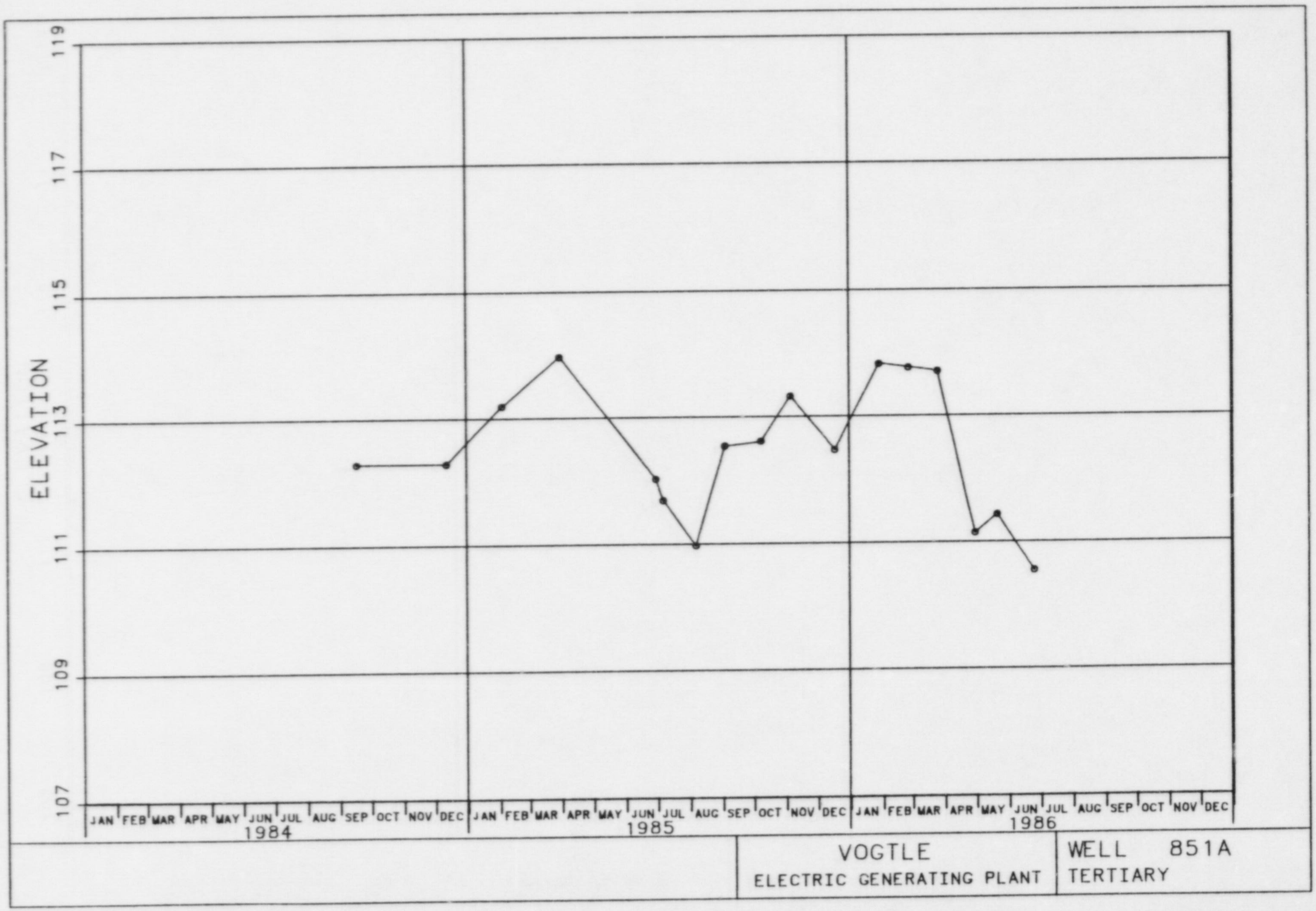

ELEVATION
119
117
115
113
111
109
107
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1984
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1985
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1986
VOGTLE
ELECTRIC GENERATING PLANT
WELL 851A
TERTIARY

FIGURE 23

FIGURE 24

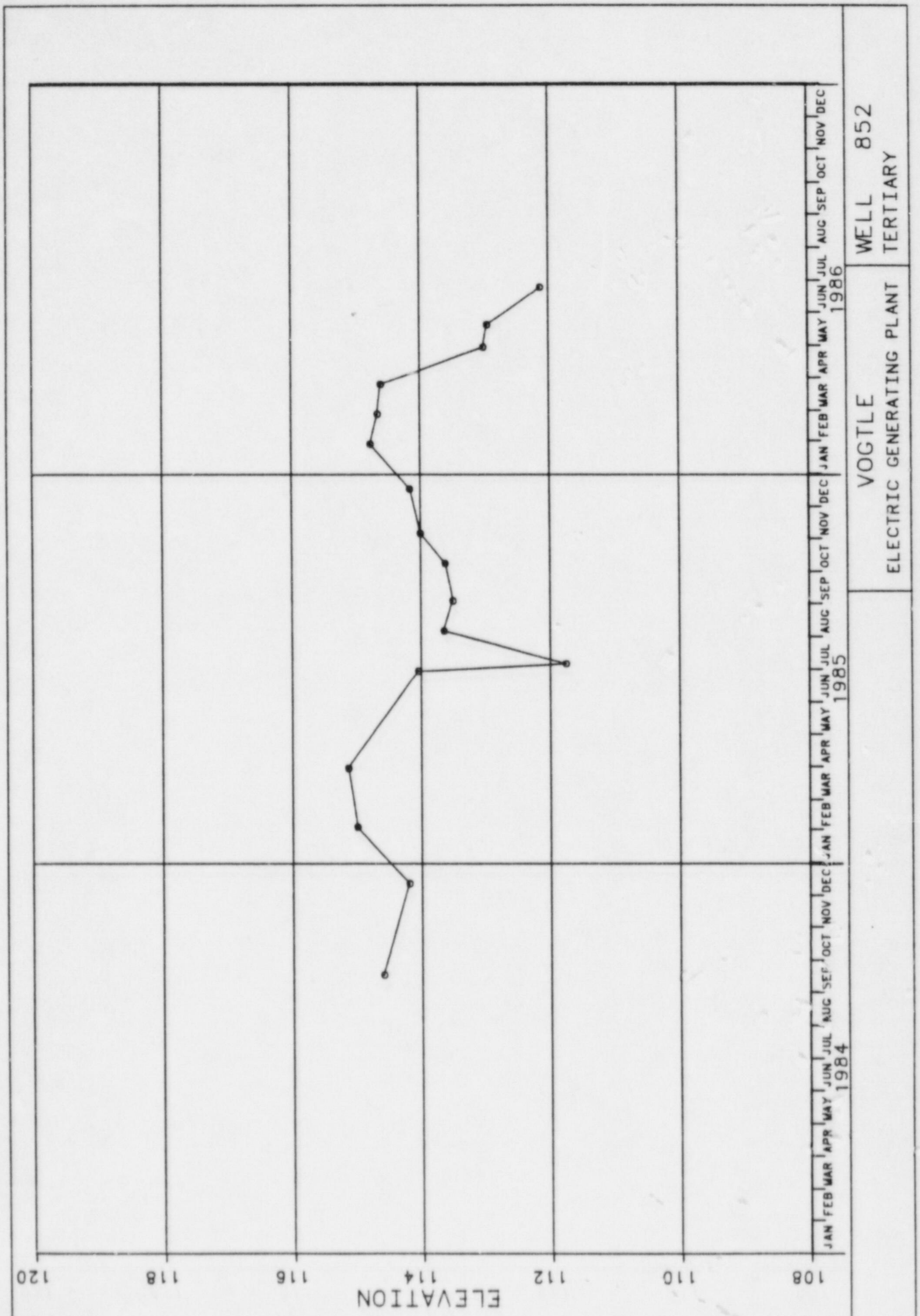
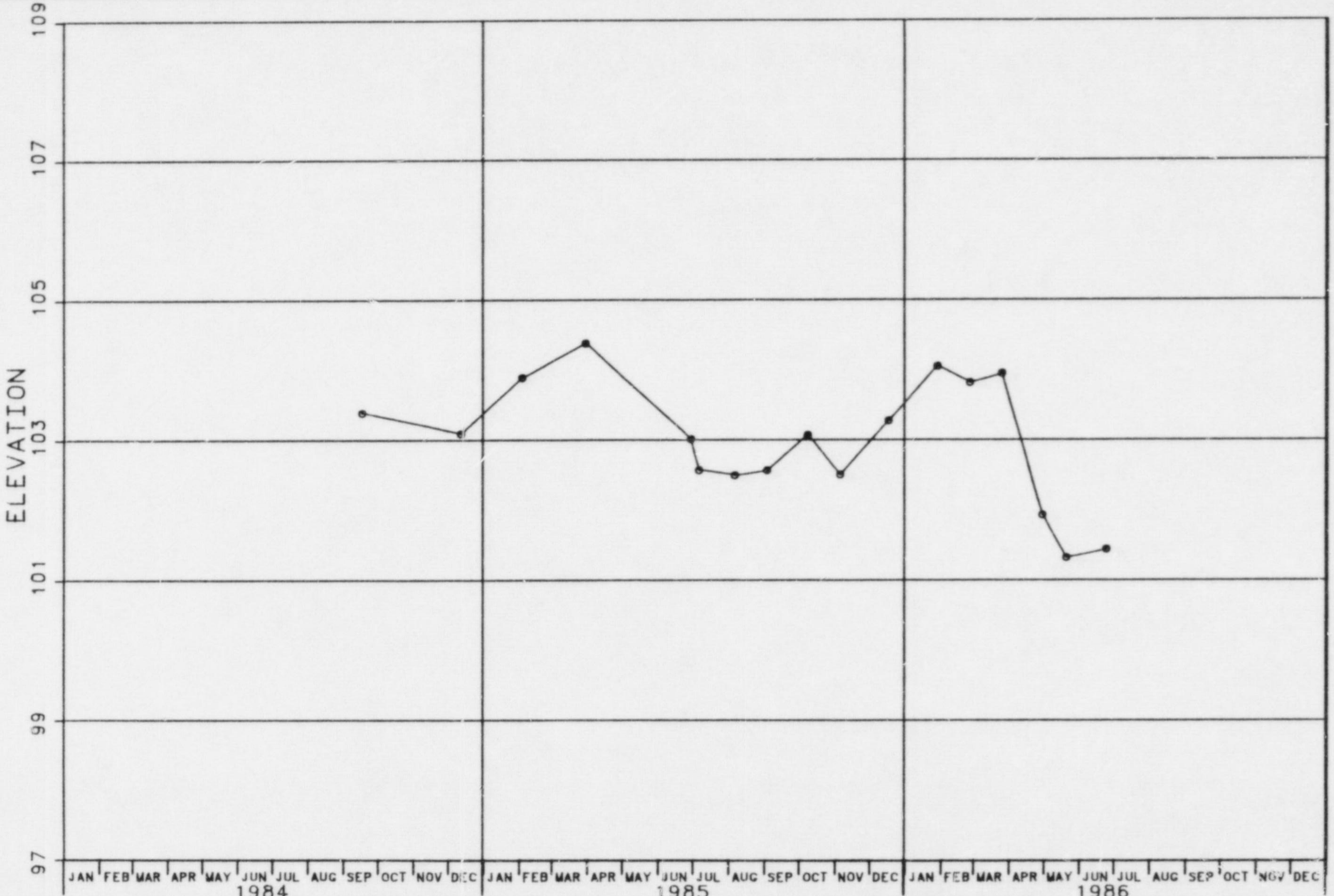

WELL 852
TERTIARY
VOGTLE
ELECTRIC GENERATING PLANT
ELEVATION
108
110
112
114
116
118
120
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1984
1985
1986

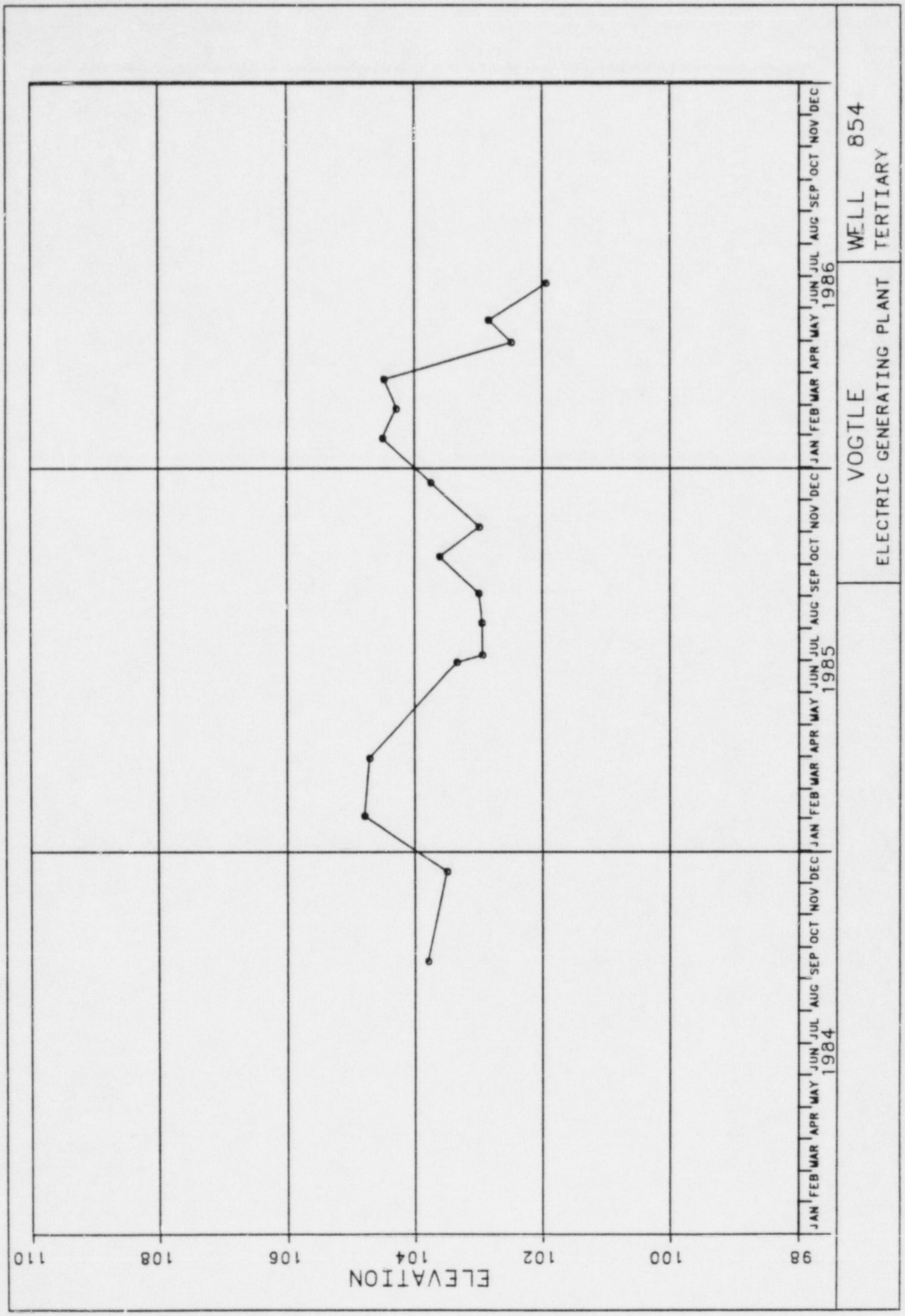
FIGURE 25



VOGTLE
ELECTRIC GENERATING PLANT

WELL 853
TERTIARY

FIGURE 26



VOGTLE
ELECTRIC GENERATING PLANT
WELL 854
TERTIARY
ELEVATION
110
108
106
104
102
100
98
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1984
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1985
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1986

FIGURE 27

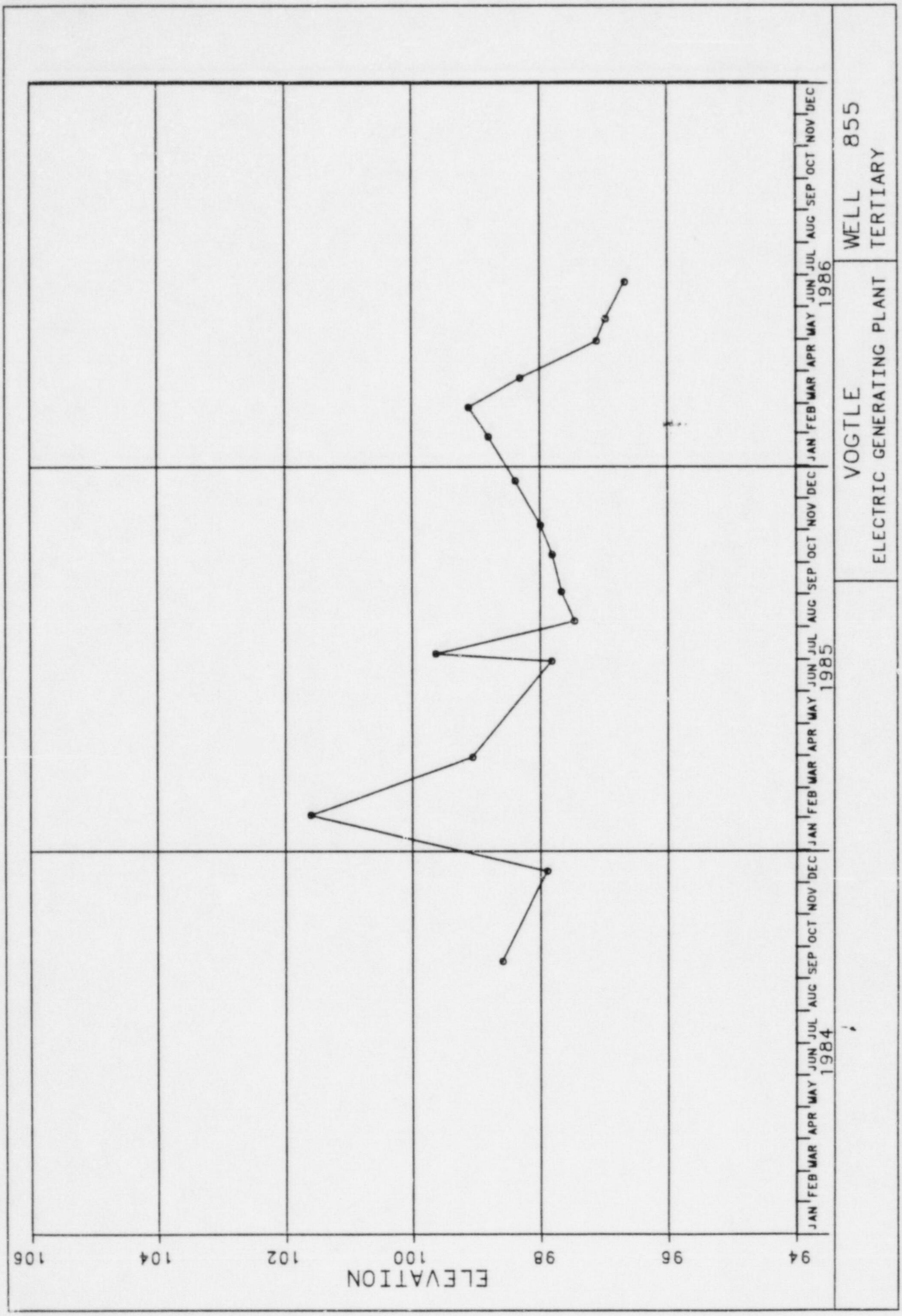

WELL 855
TERTIARY
VOGTLE
ELECTRIC GENERATING PLANT
ELEVATION
94
96
98
100
102
104
106
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1984
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1985
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1986

FIGURE 28

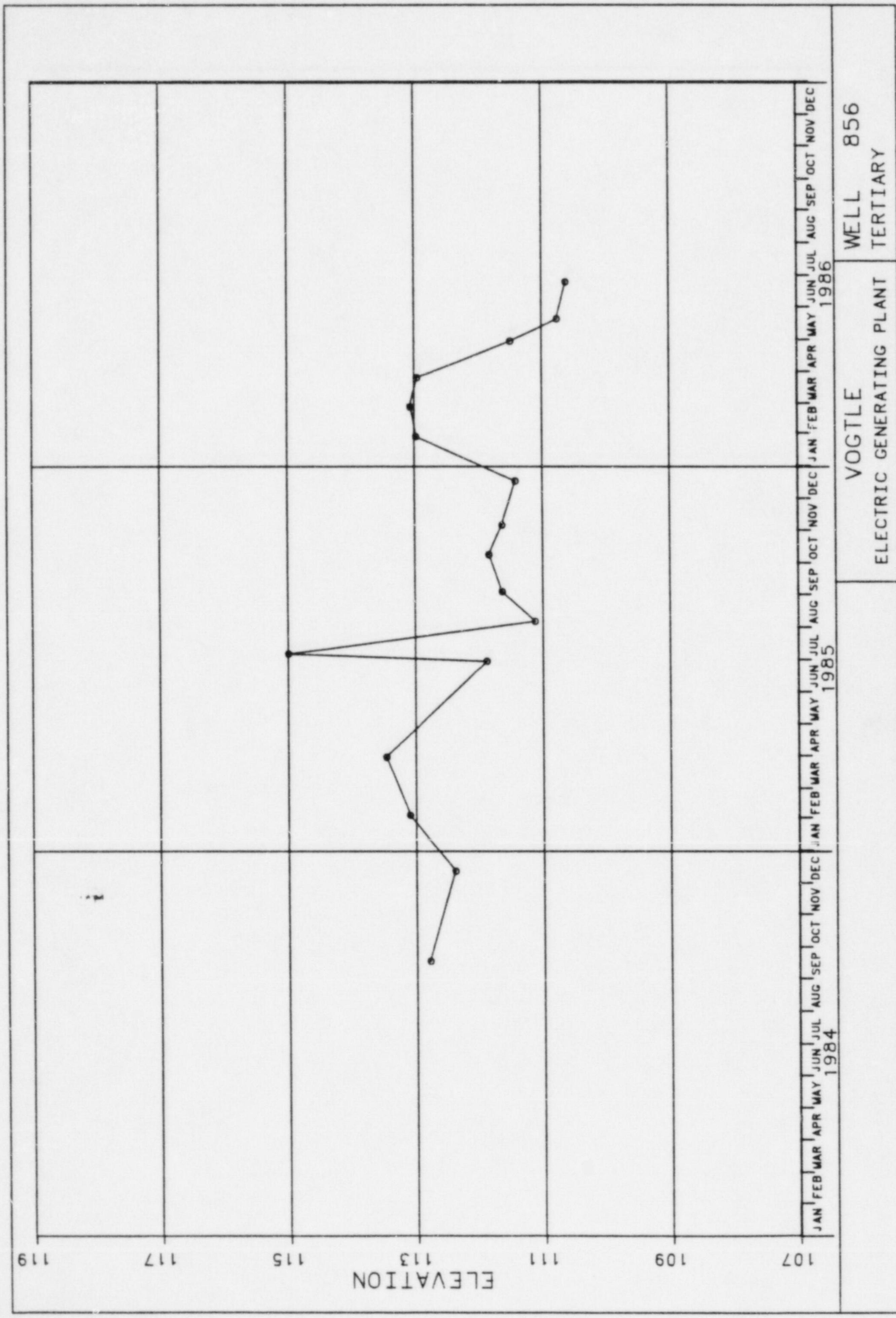
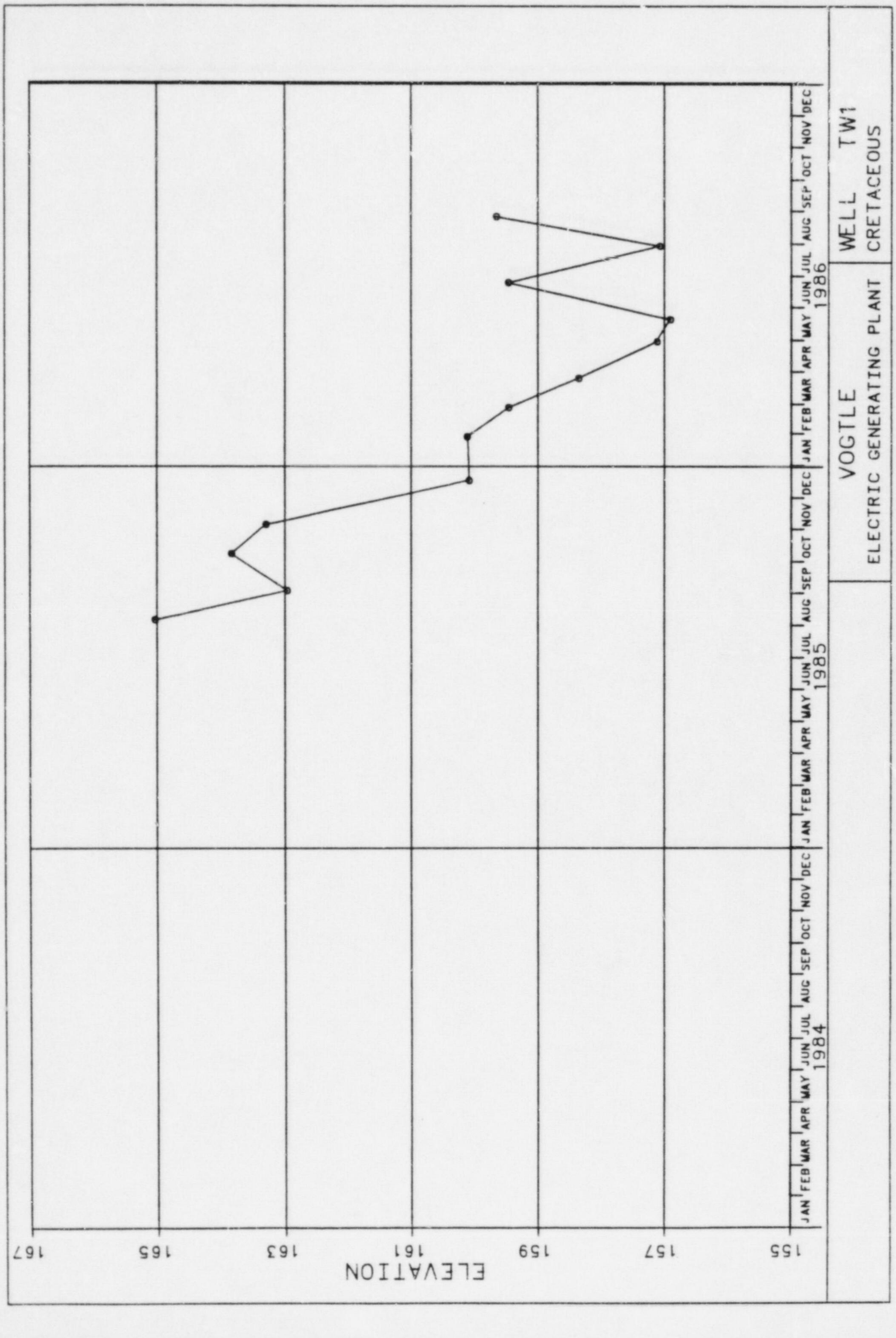
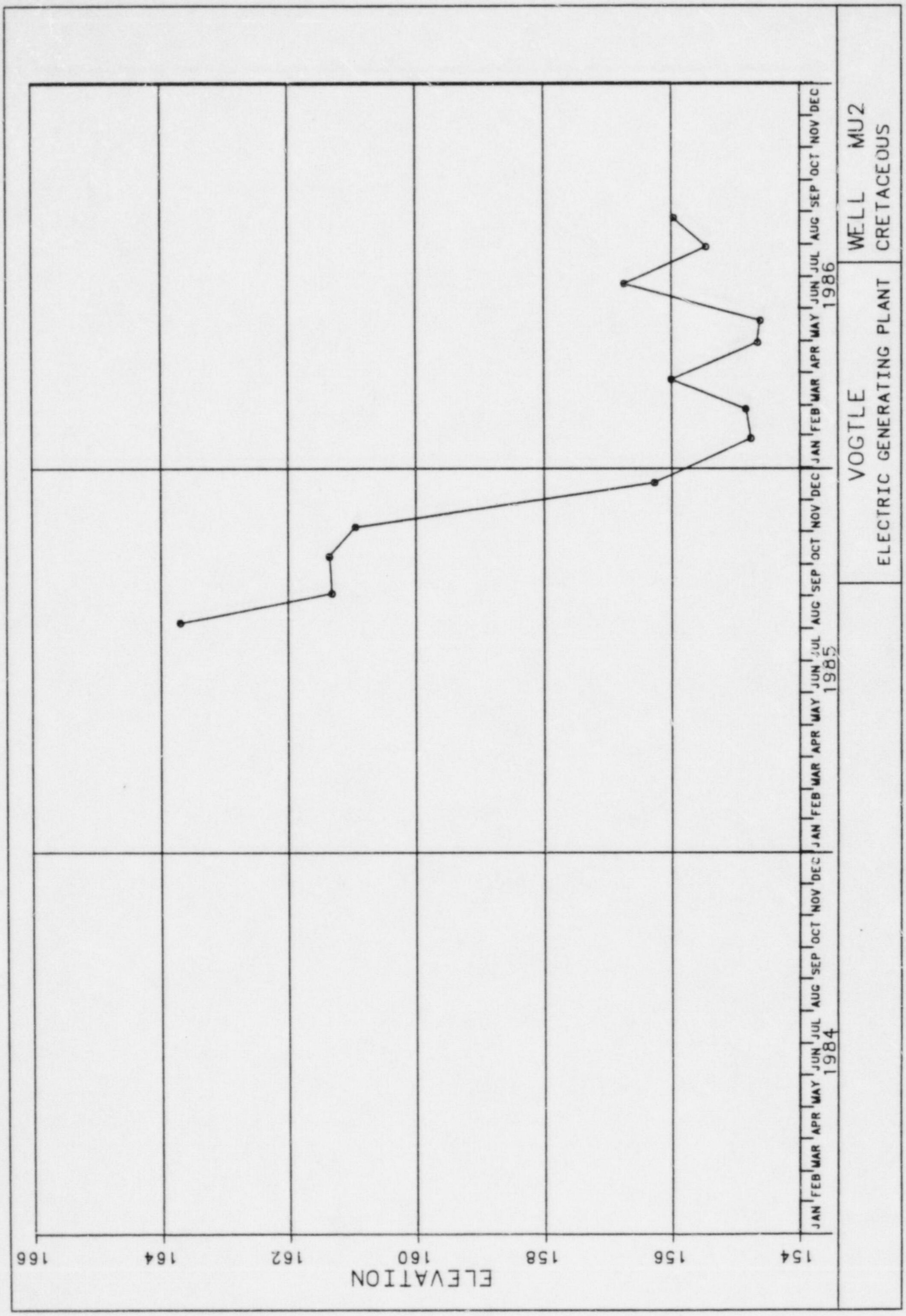

VOGTLE
ELECTRIC GENERATING PLANT
WELL 856
TERTIARY
ELEVATION
107
109
111
113
115
117
119
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1984
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1985
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1986

FIGURE 29

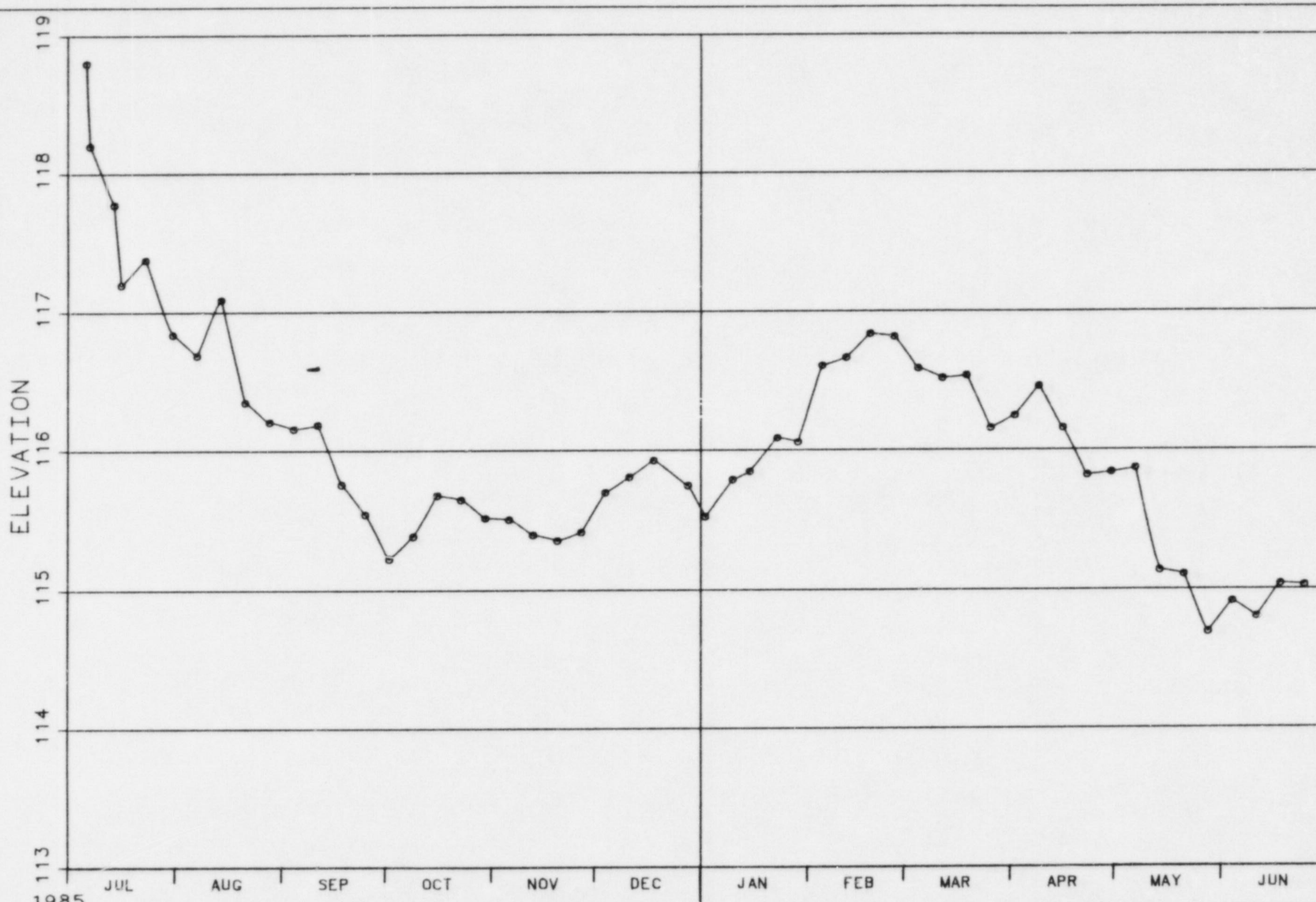


WELL TW1
CRETACEOUS
VOGTLE
ELECTRIC GENERATING PLANT
ELEVATION
155
157
159
161
163
165
167
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1984
1985
1986

FIGURE 30



WELL MU2
CRETACEOUS
VOGTLE
ELECTRIC GENERATING PLANT
ELEVATION
154
156
158
160
162
164
166
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1984
1985
1986



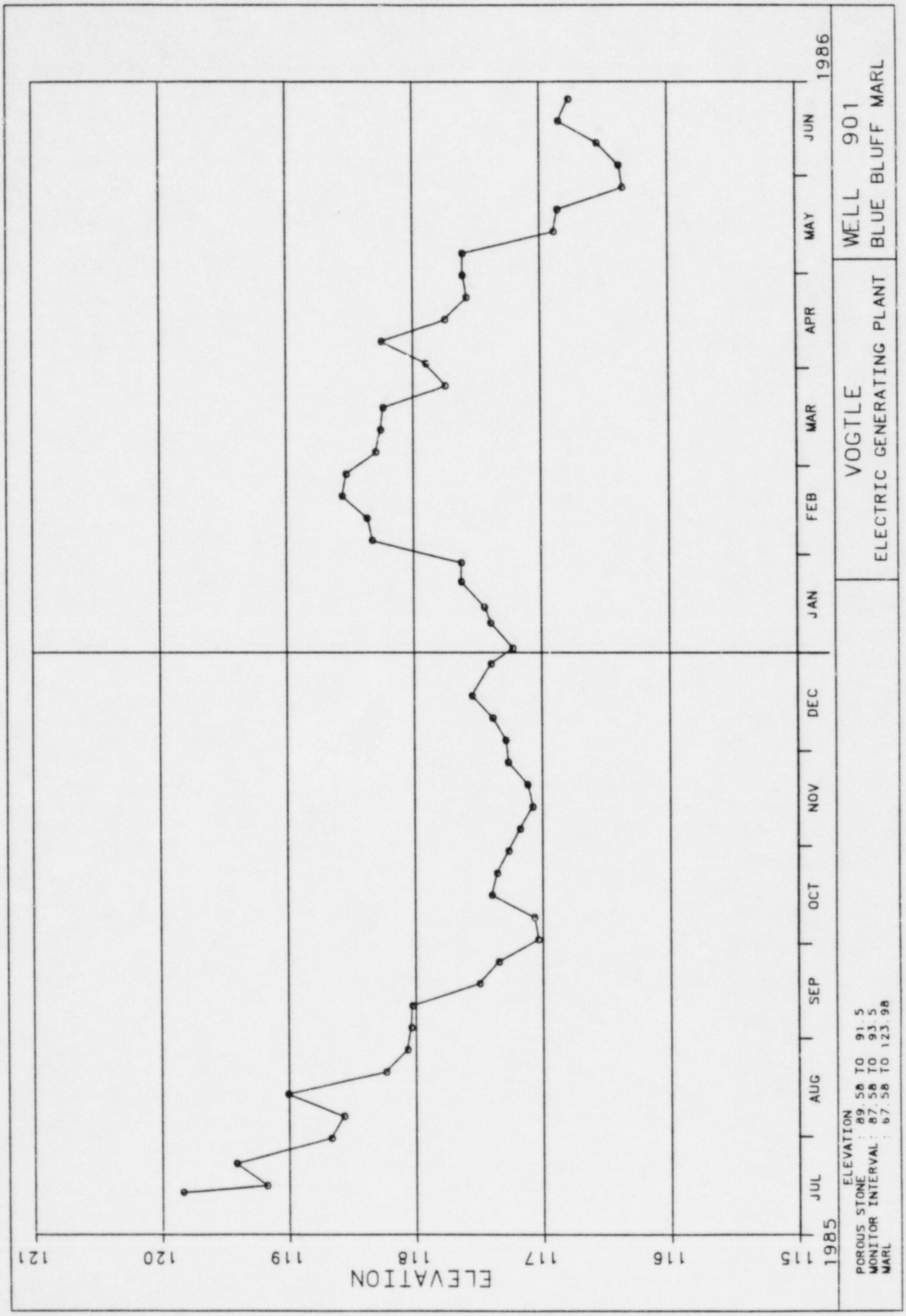
ELEVATION
POROUS STONE : 78.5 TO 80.5
MONITOR INTERVAL : 75.6 TO 102.5
MARL : 68.3 TO 123.7

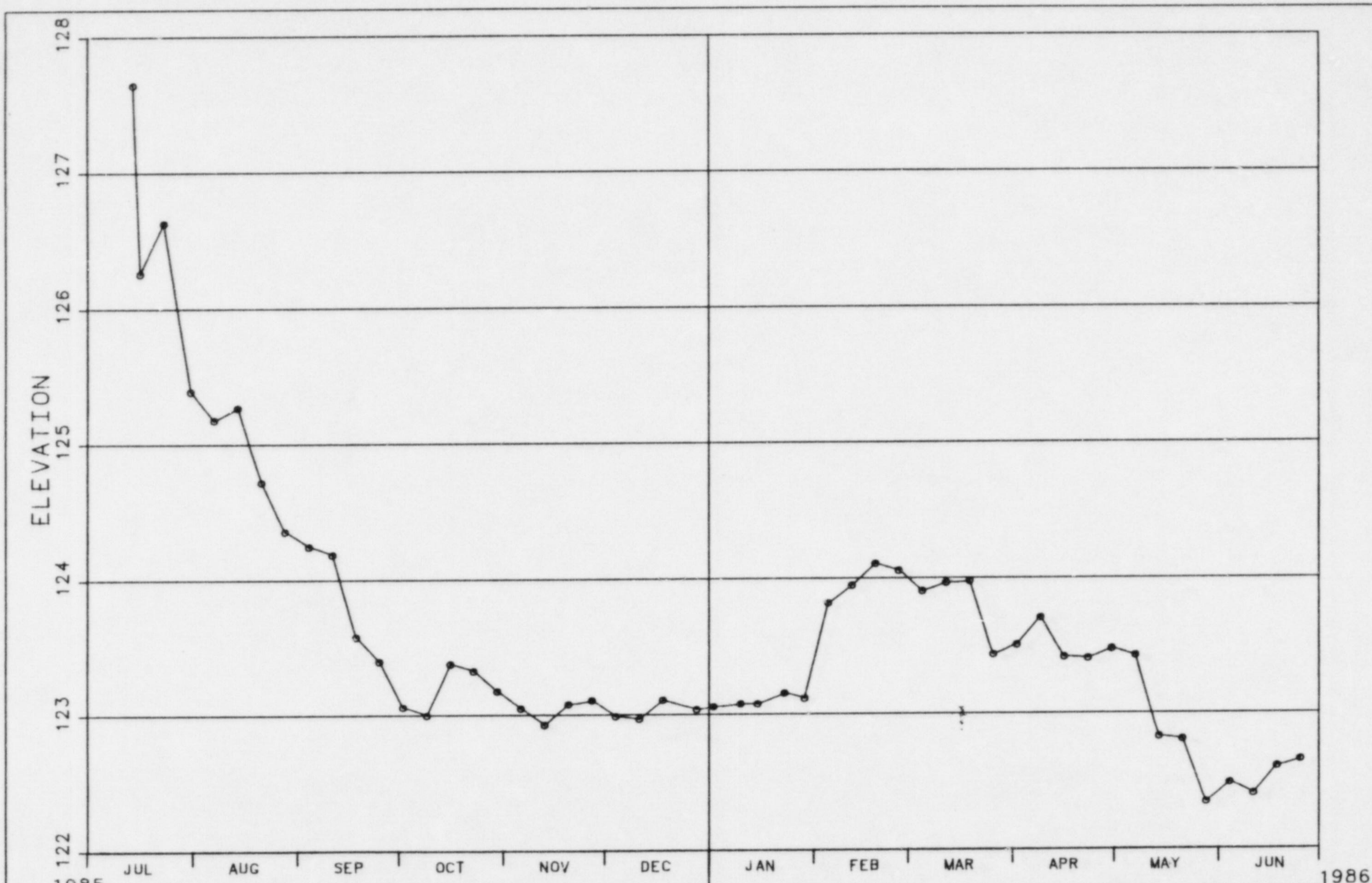
VOGTLE
ELECTRIC GENERATING PLANT

WELL 900
BLUE BLUFF MARL

FIGURE 31

FIGURE 32


VOGTLE
ELECTRIC GENERATING PLANT
WELL 901
BLUE BLUFF MARL
ELEVATION
121
120
119
118
117
116
115
1985
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
1986
ELEVATION
POROUS STONE : 89.58 TO 91.5
MONITOR INTERVAL : 87.58 TO 93.5
MARL : 67.58 TO 123.98

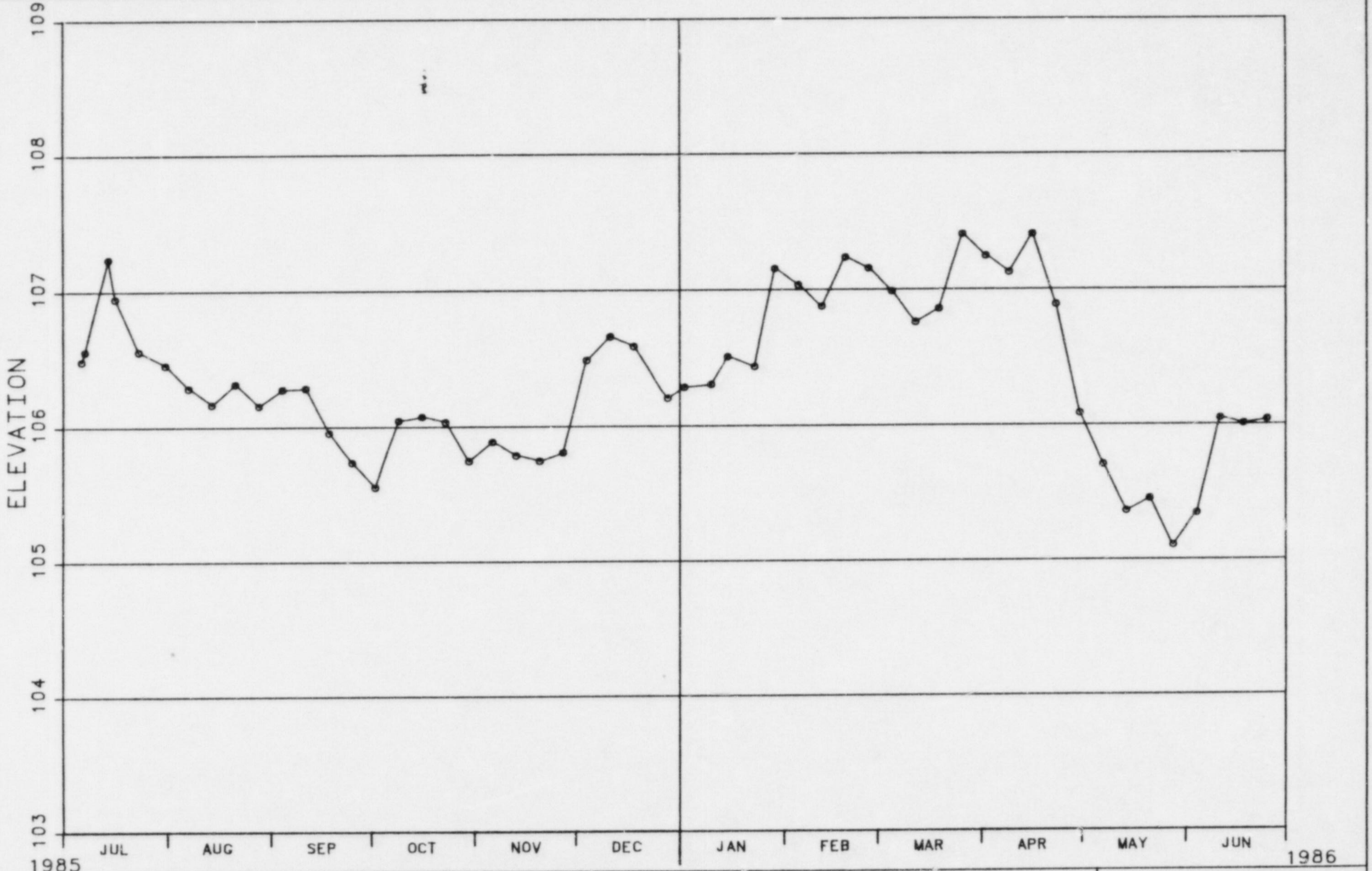


ELEVATION
POROUS STONE : 110.47 TO 112.
MONITOR INTERVAL : 107.97 TO 114.
MARL : 67.97 TO 124.97

VOGTLE
ELECTRIC GENERATING PLANT

WELL 902
BLUE BLUFF MARL

FIGURE 33



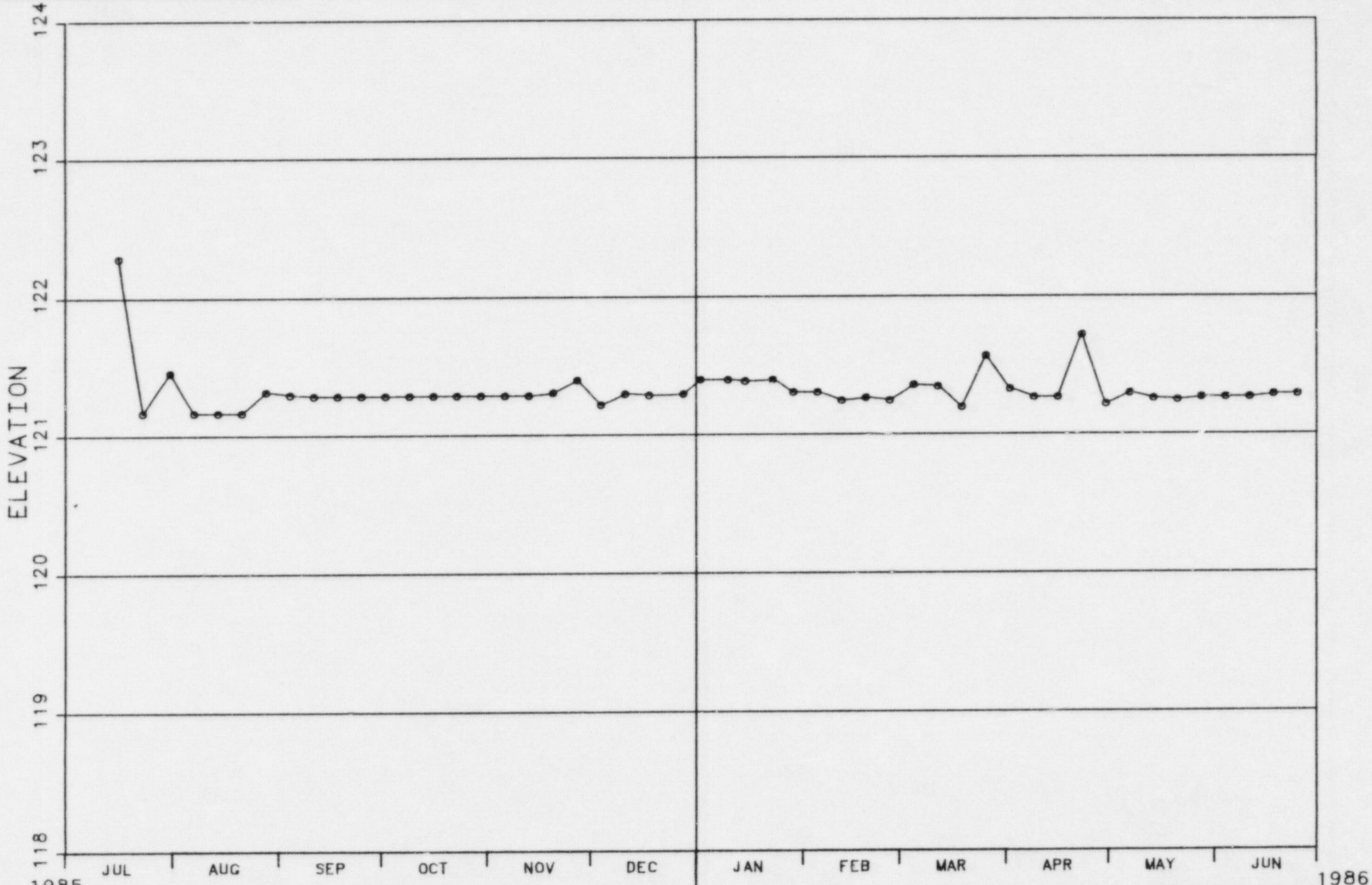
ELEVATION
POROUS STONE : 84.9 TO 86.9
MONITOR INTERVAL : 82.75 TO 88.7
MARL : 67.75 TO 137.75

VOGTLE
ELECTRIC GENERATING PLANT

WELL 903
BLUE BLUFF MARL

FIGURE 34

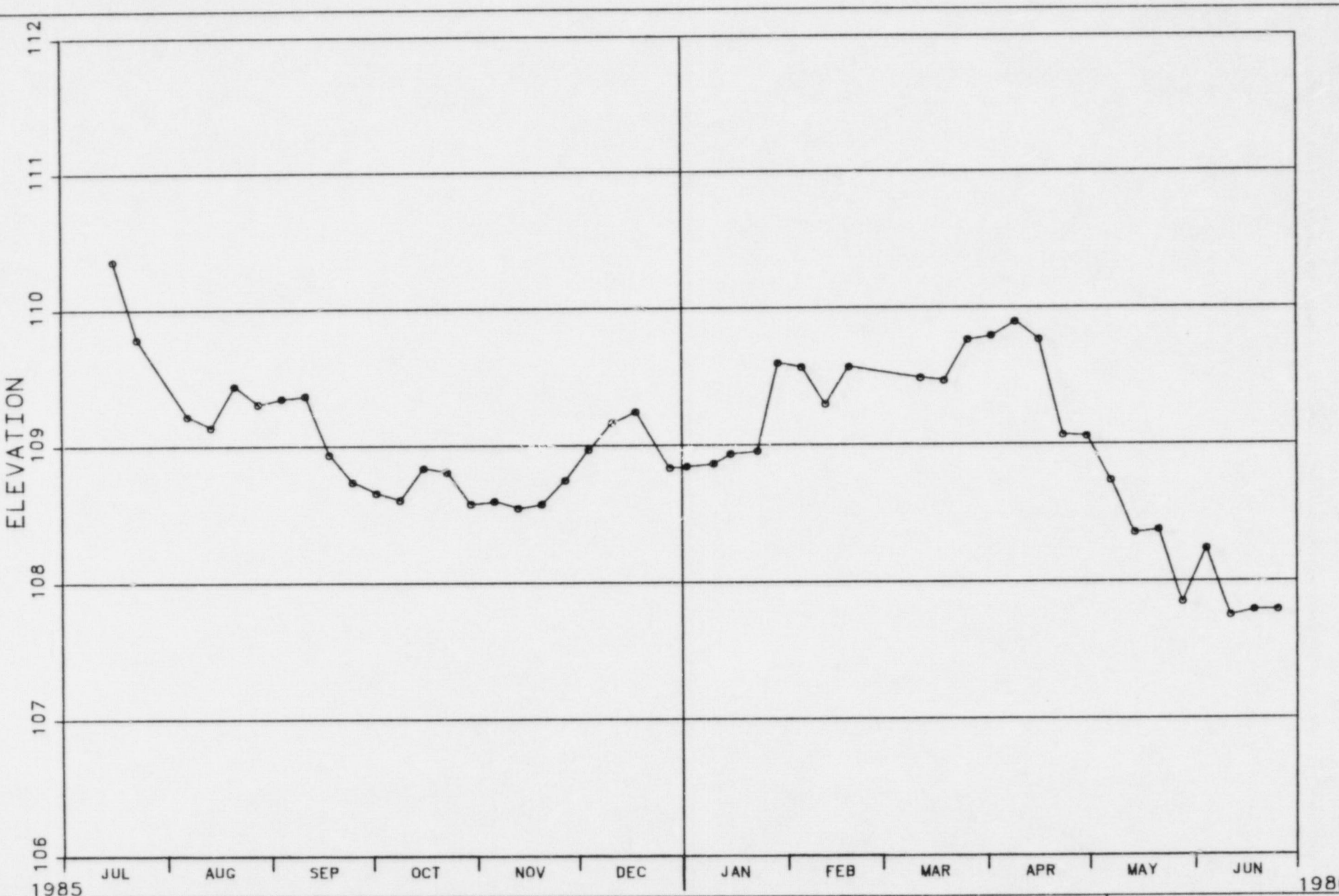
FIGURE 35



ELEVATION
POROUS STONE : 121.29 TO 123.29
MONITOR INTERVAL : 119.75 TO 125.75
MARL : 67.75 TO 136.95

VOGTLE
ELECTRIC GENERATING PLANT

WELL 904B
BLUE BLUFF MARL



ELEVATION
POROUS STONE : 101.9 TO 103.9
MONITOR INTERVAL: 99.75 TO 105.95
MARL : 67.75 TO 138.45

VOGTLE
ELECTRIC GENERATING PLANT

WELL 905
BLUE BLUFF MARL

FIGURE 36

OVERSIZE DOCUMENT PAGE PULLED

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NUMBER OF PAGES: 1

ACCESSION NUMBER(S):

8610070132-02

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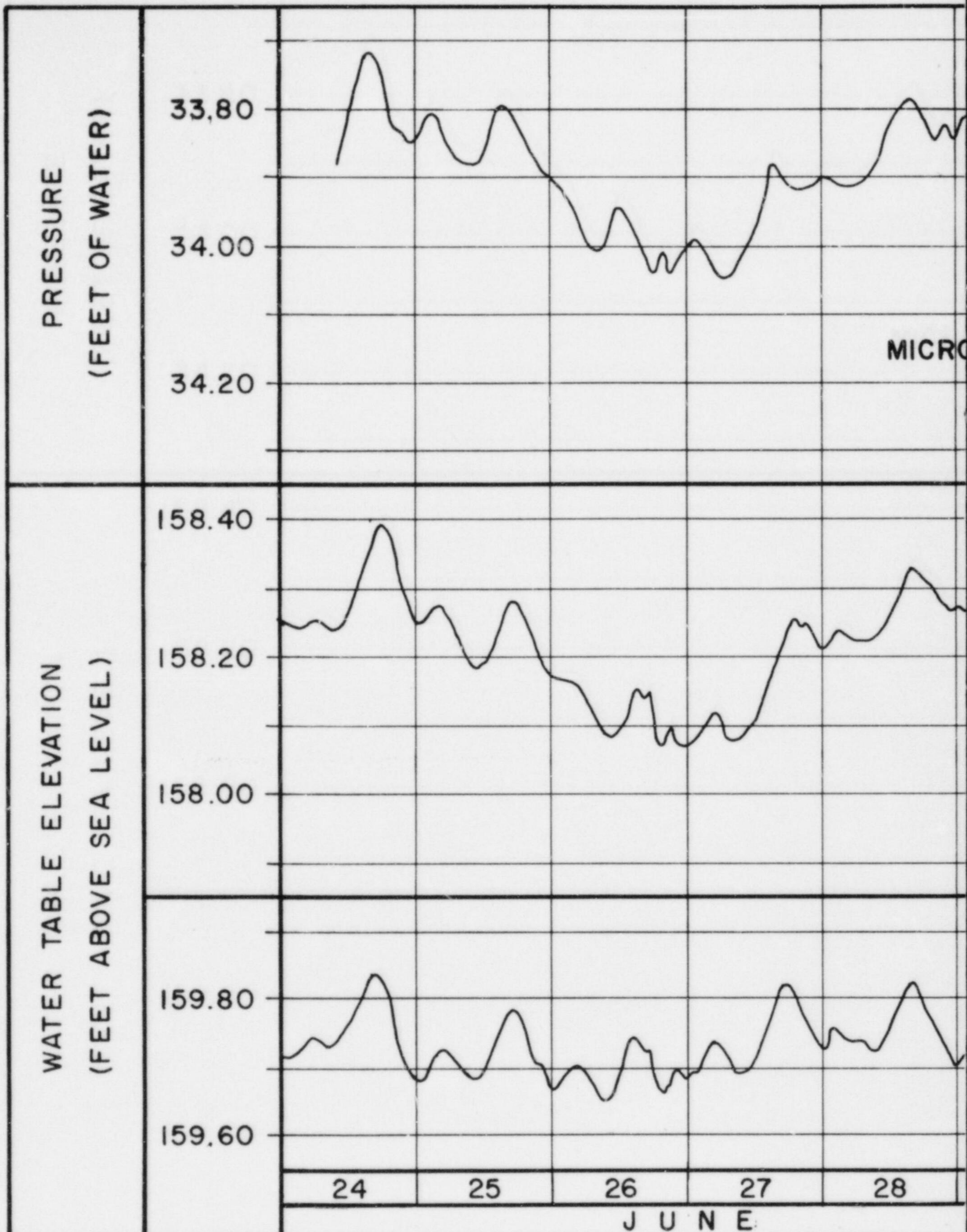
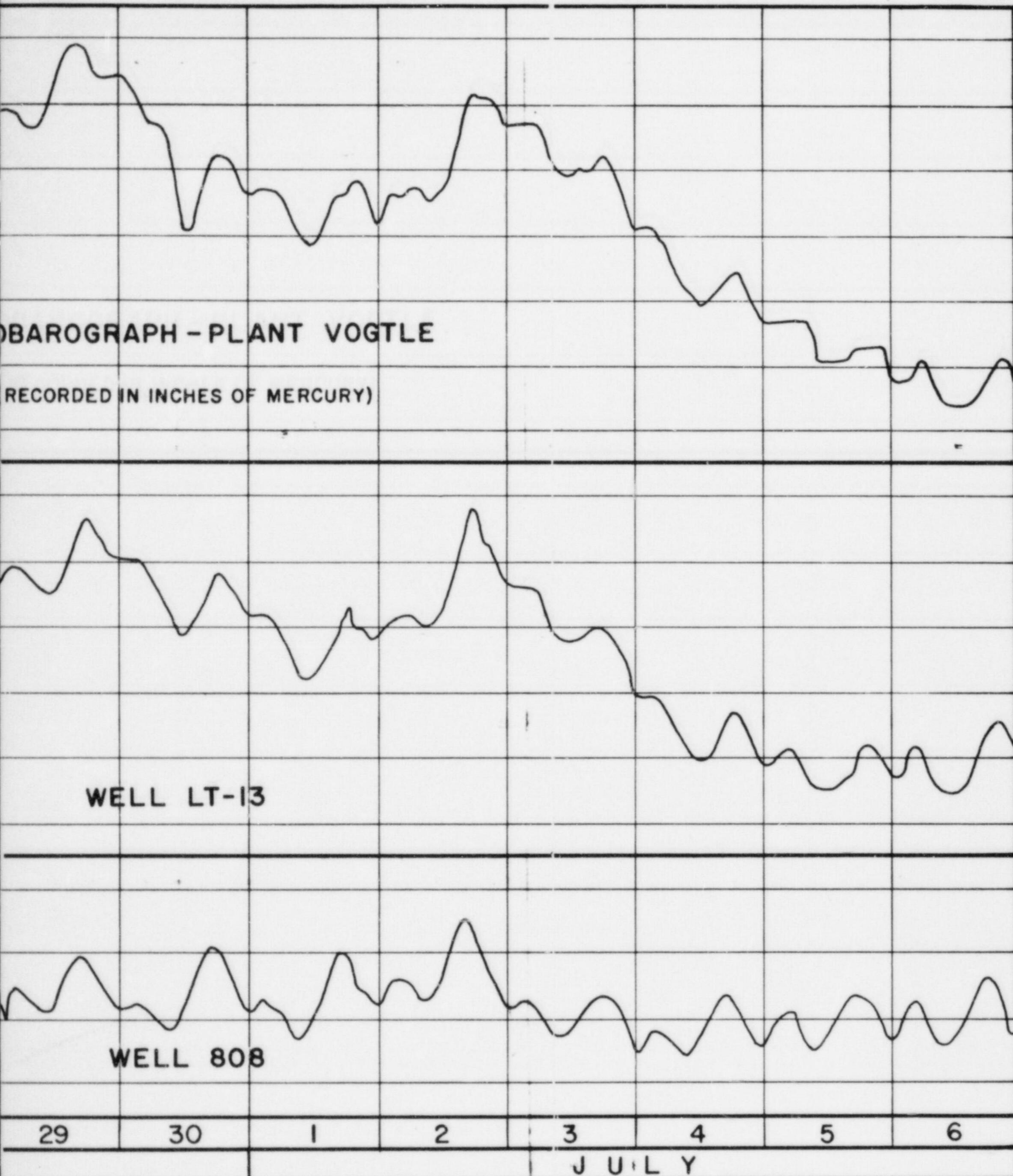
FTS 492-8989



TI APERTURE CARD	VOGT ELECTRIC GENE

Also Available On Aperture Card



LE

RATING PLANT

WATER LEVELS - BAROMETRIC PRESSURE

JUNE 24 - JULY 6, 1986

8610070132-03

VOGTLE ELECTRIC GENERATING PLANT

GROUND-WATER MONITORING

July 1985 - June 1986

APPENDIX

HYDROGRAPHS FOR PERIOD 1980-1986

Bechtel Civil, Inc.

September 1986

Hydrographs - 1980-1986

Water Table Aquifer

LT-1B

LT-7A

142

179

800

801

802A

803A

804

805A

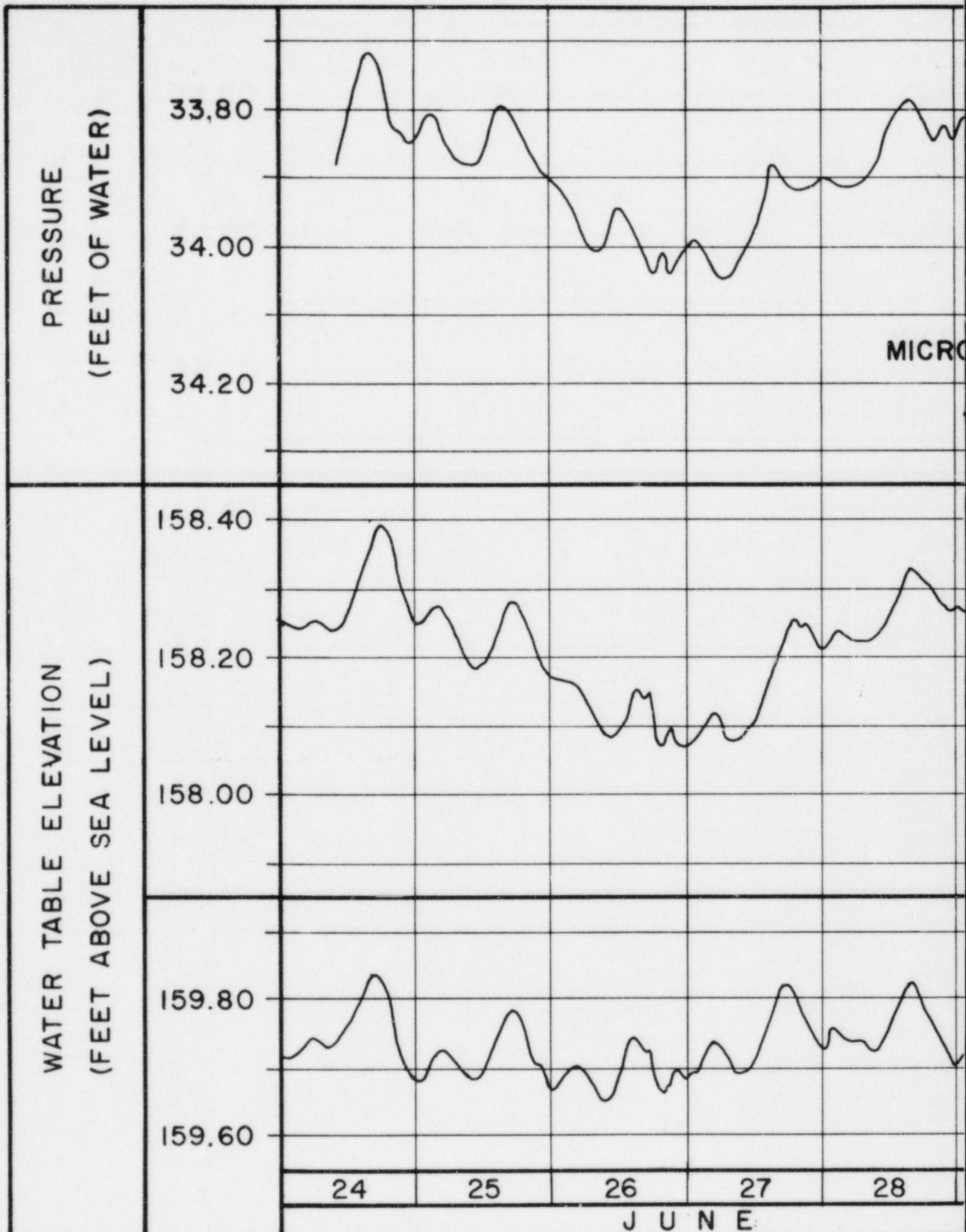
806B

807A

Tertiary Aquifer

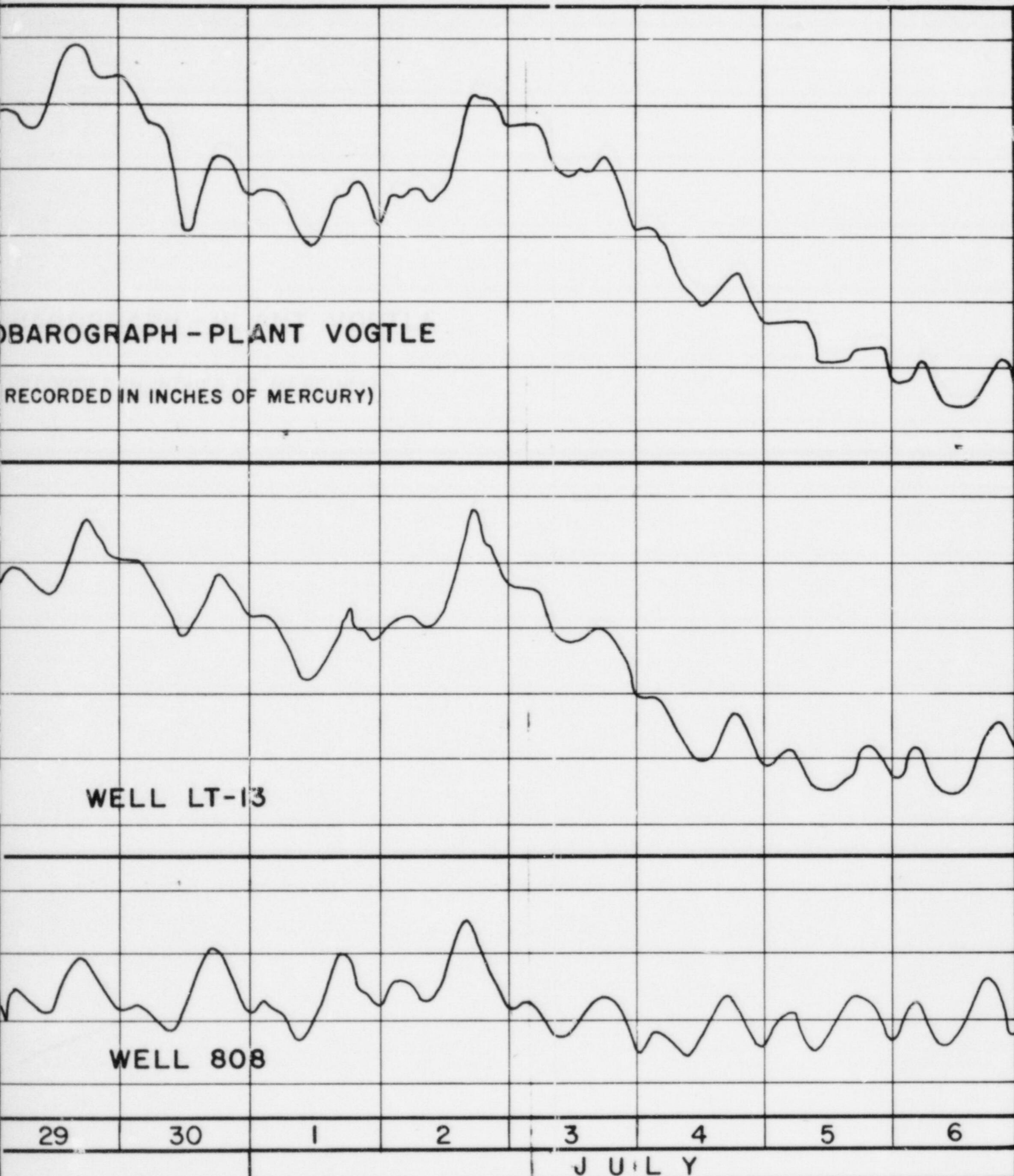
27

29



TI APERTURE CARD	VOGT ELECTRIC GENE

FIGURE 38



LE RATING PLANT	WATER LEVELS - BAROMETRIC PRESSURE JUNE 24 - JULY 6, 1986

8610070132-03

VOGTLE ELECTRIC GENERATING PLANT

GROUND-WATER MONITORING

July 1985 - June 1986

APPENDIX

HYDROGRAPHS FOR PERIOD 1980-1986

Bechtel Civil, Inc.

September 1986

Hydrographs - 1980-1986

<u>Water Table Aquifer</u>

LT-1B

LT-7A

142

179

800

801

802A

803A

804

805A

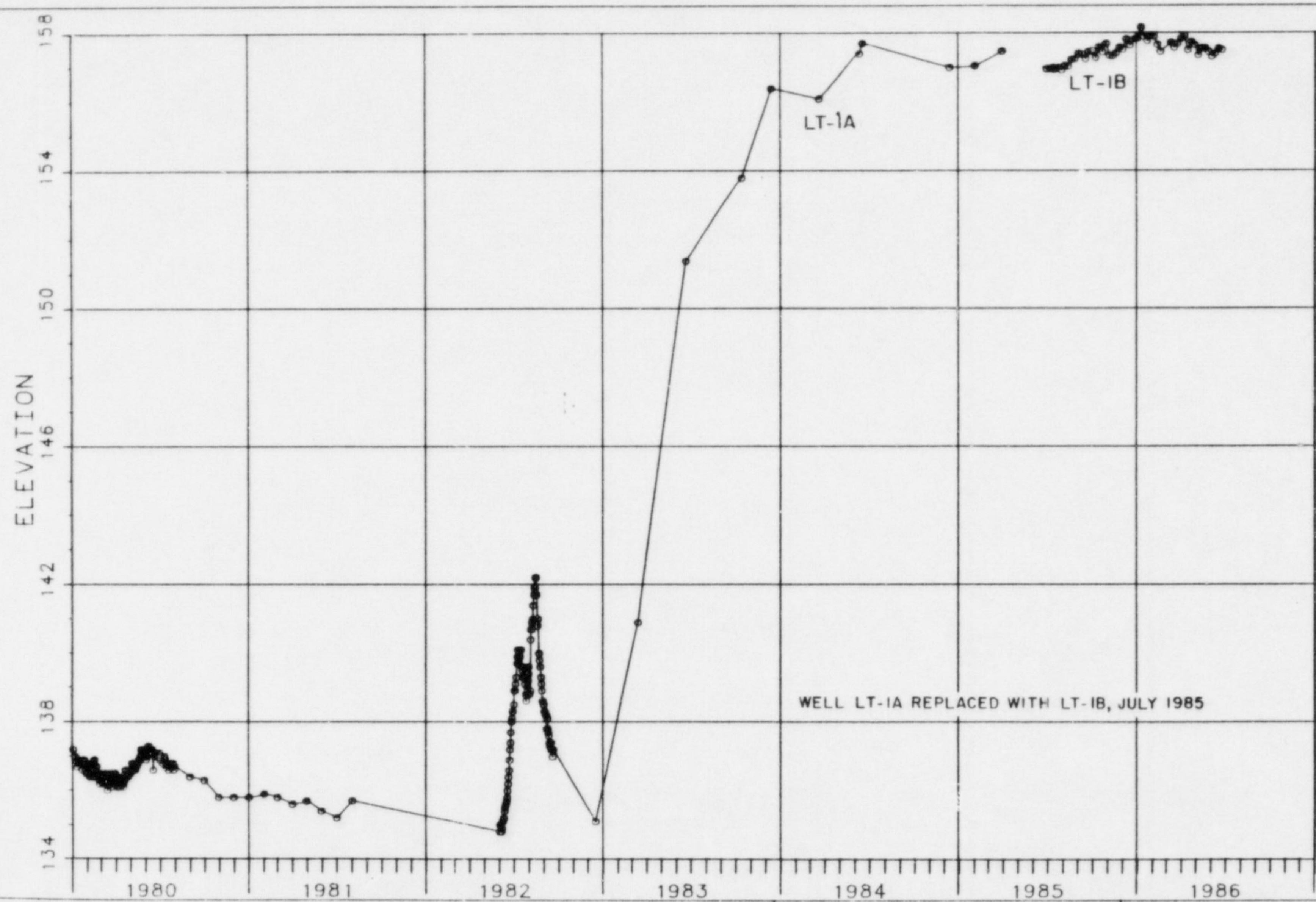
806B

807A

<u>Tertiary Aquifer</u>

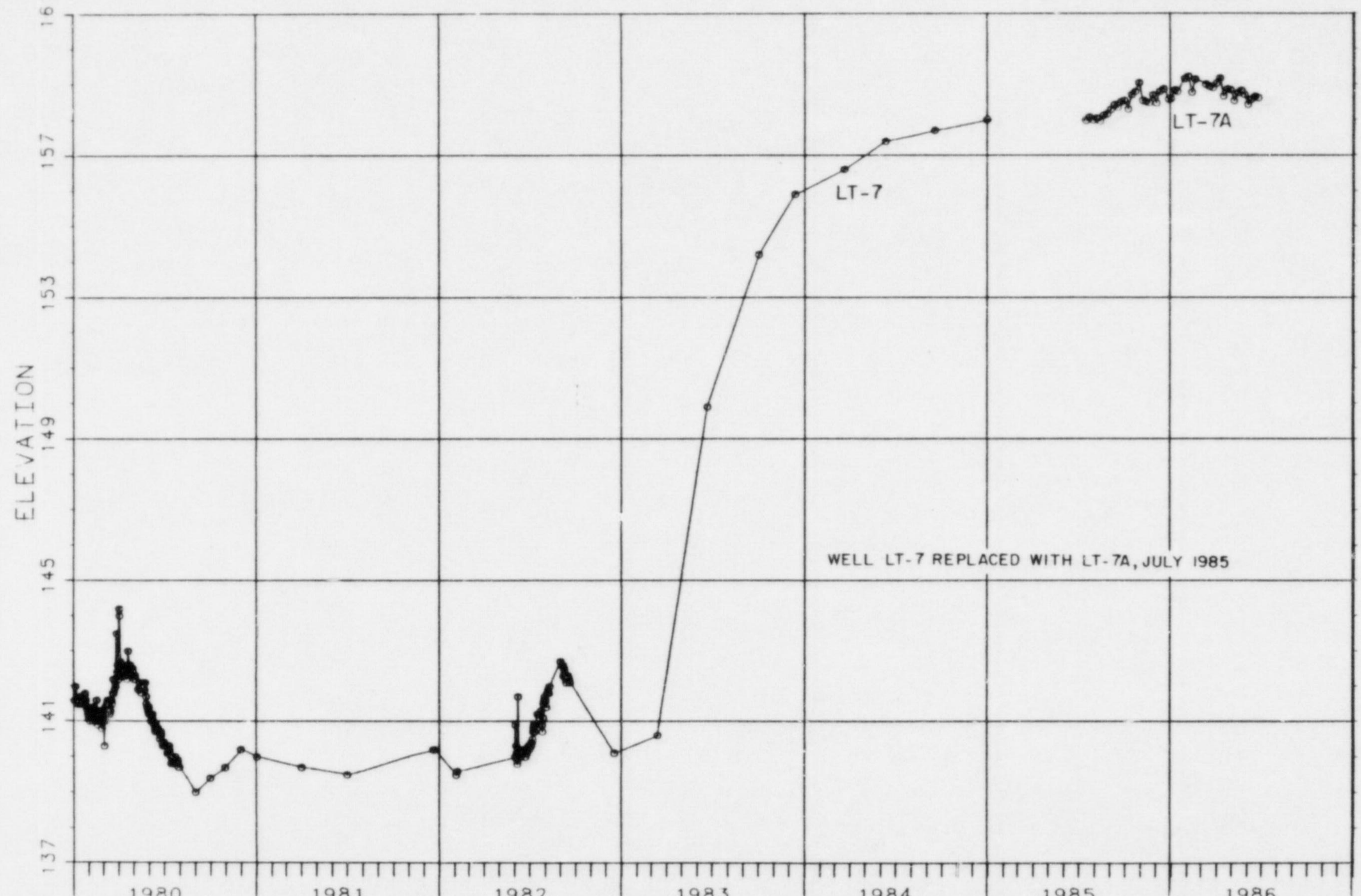
27

29



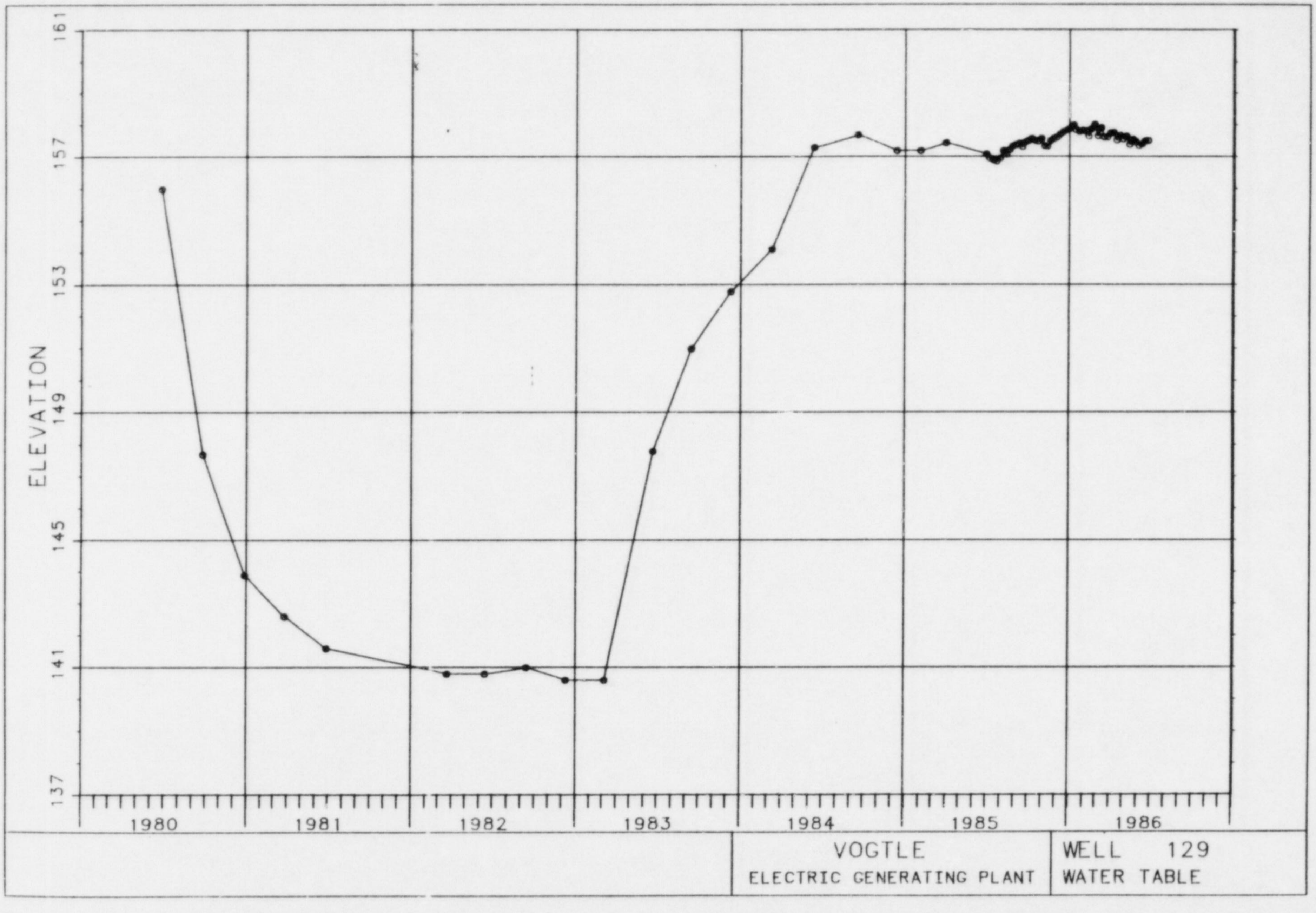
VOGTLE
ELECTRIC GENERATING PLANT

WELL LT1B
WATER TABLE

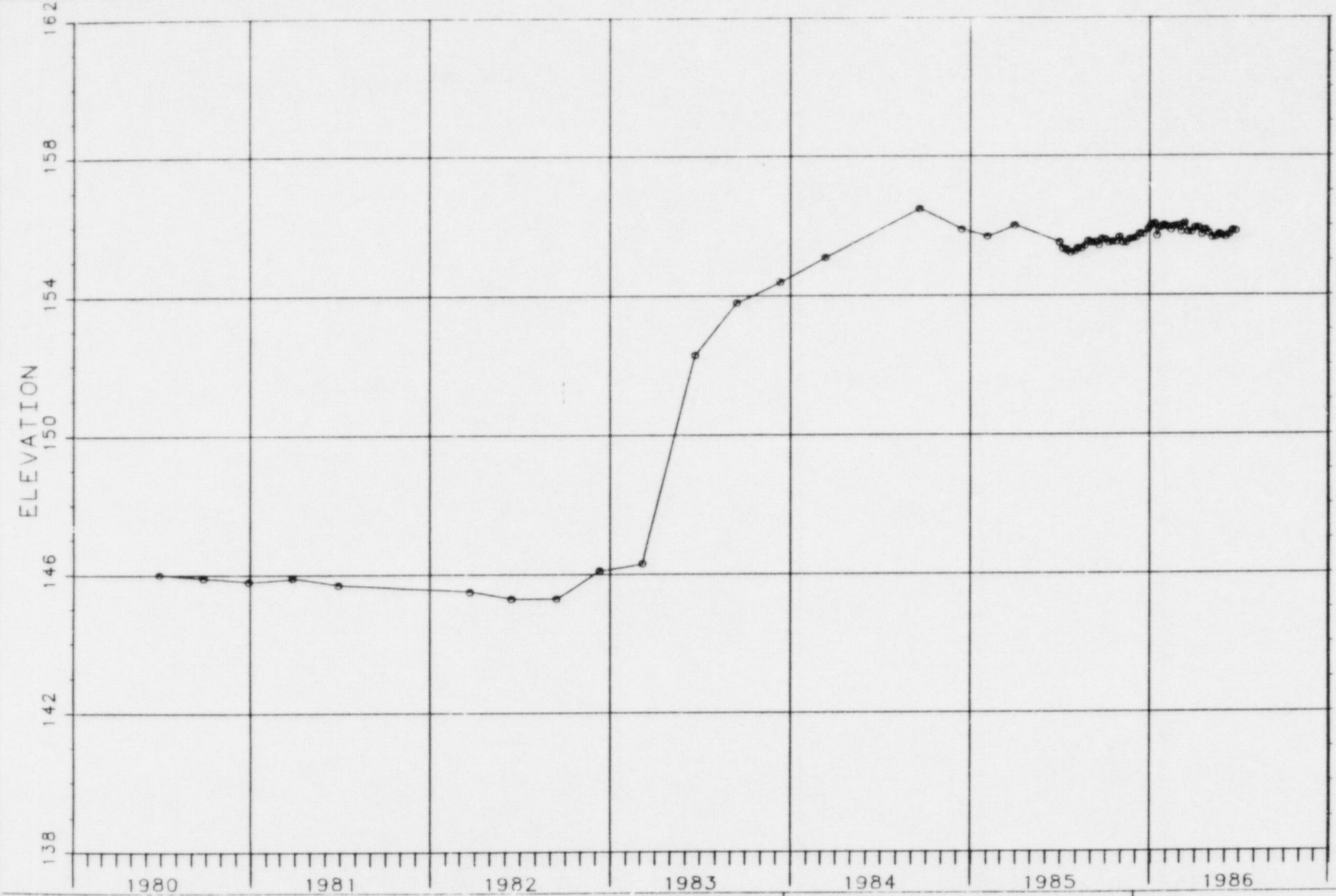


VOGTLE
ELECTRIC GENERATING PLANT

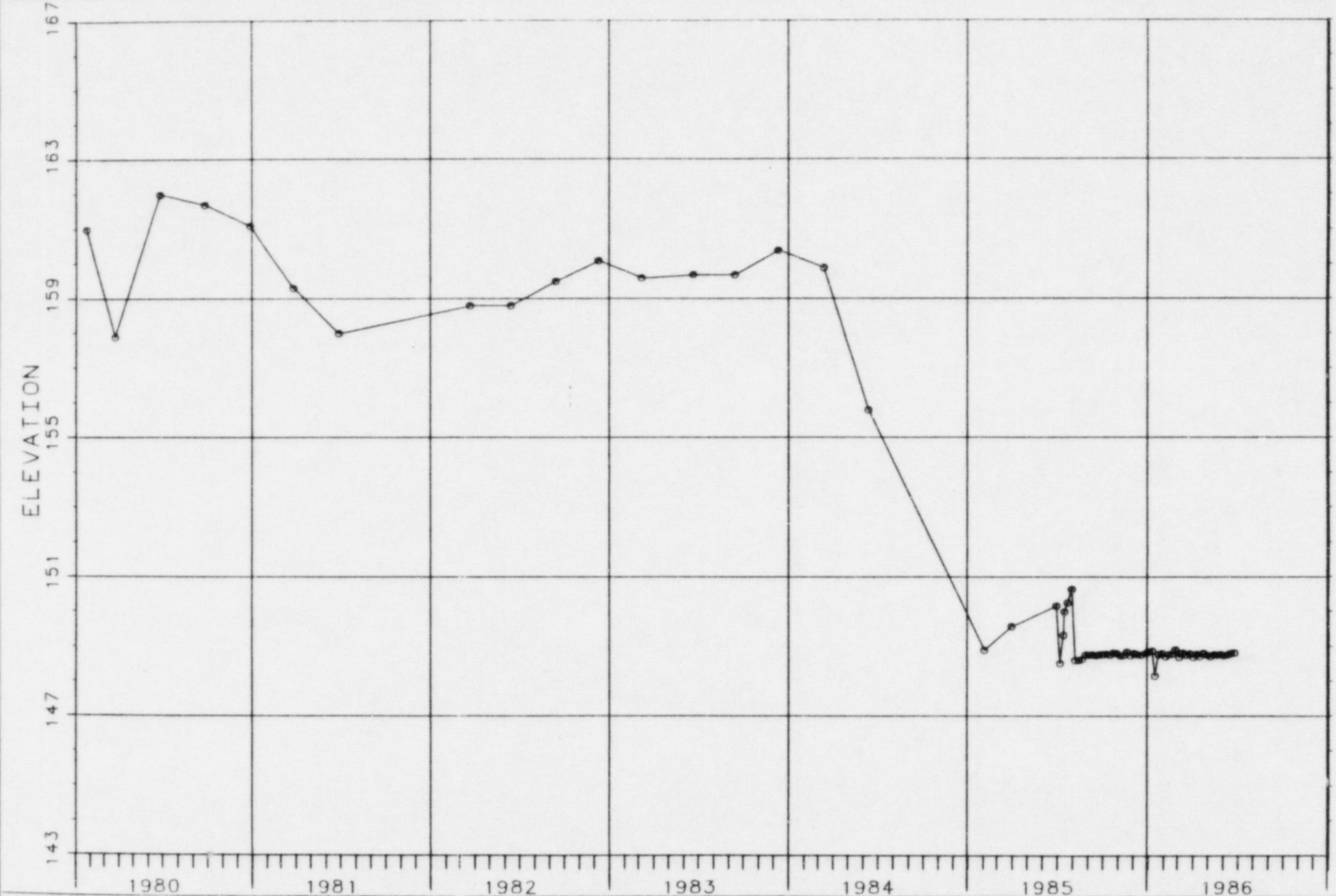
WELL LT7A
WATER TABLE



ELEVATION
161
157
153
149
145
141
137
1980
1981
1982
1983
1984
1985
1986
VOGTLE
ELECTRIC GENERATING PLANT
WELL 129
WATER TABLE

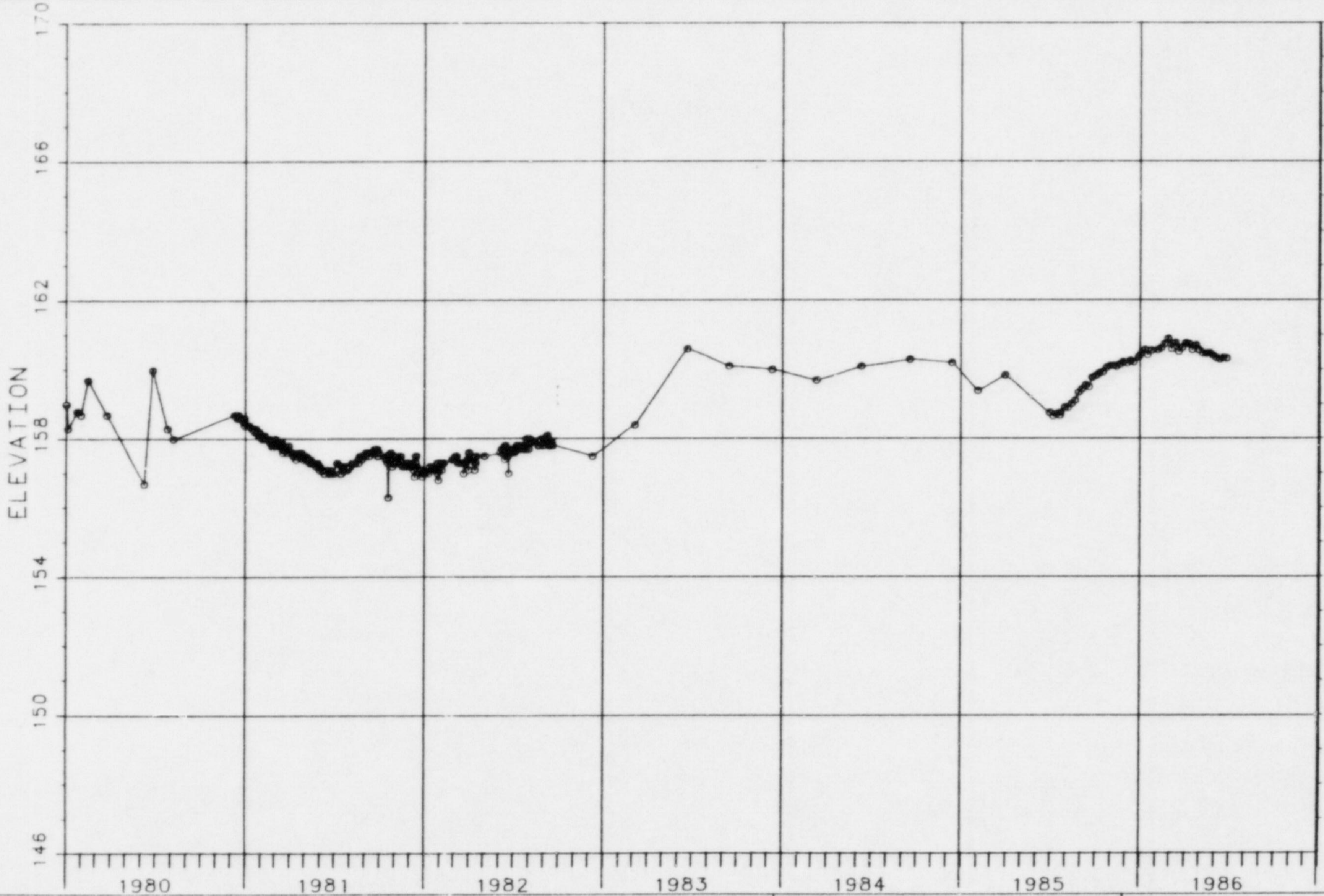


VOGTLE ELECTRIC GENERATING PLANT	WELL 142 WATER TABLE



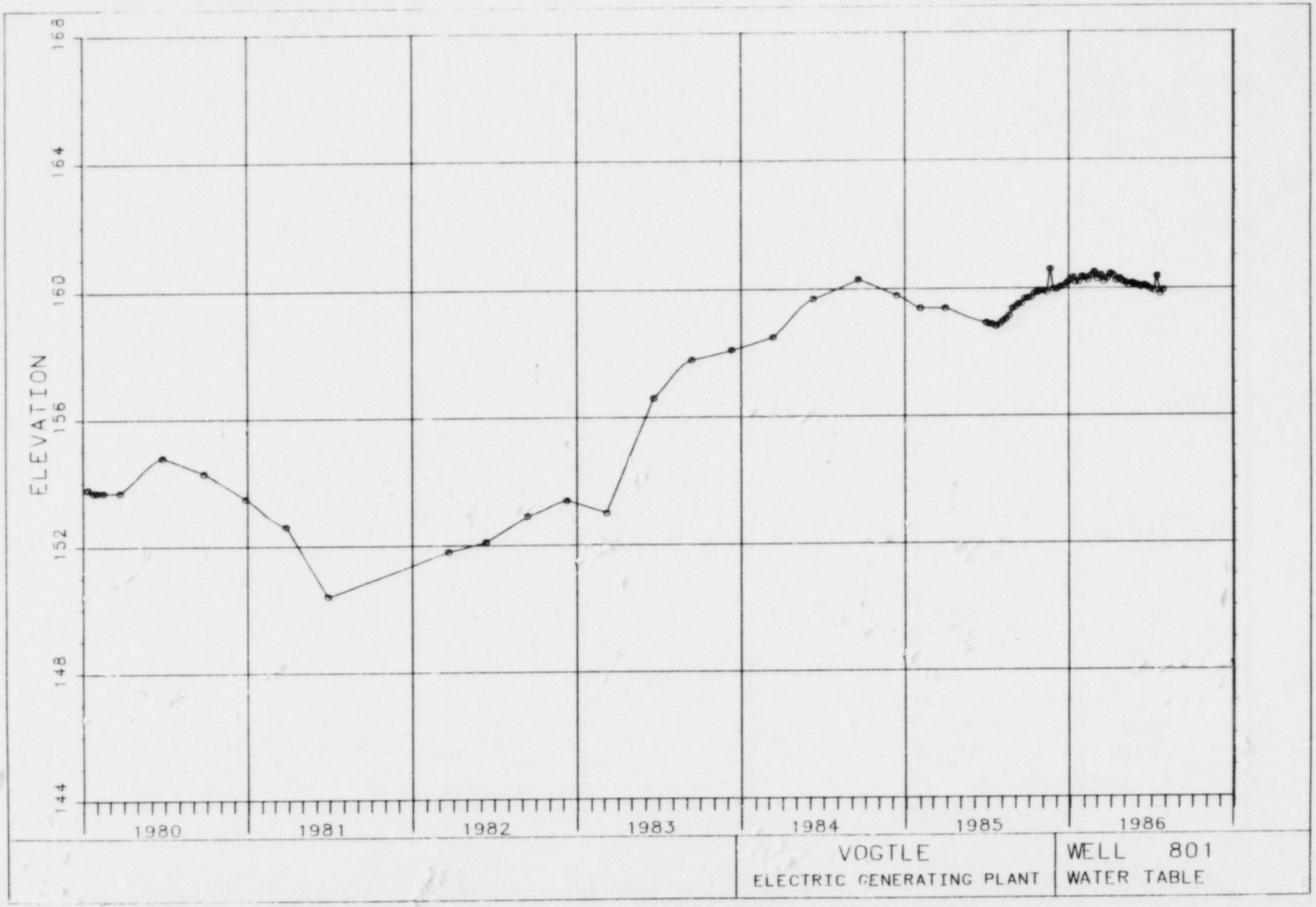
VOGTLE
ELECTRIC GENERATING PLANT

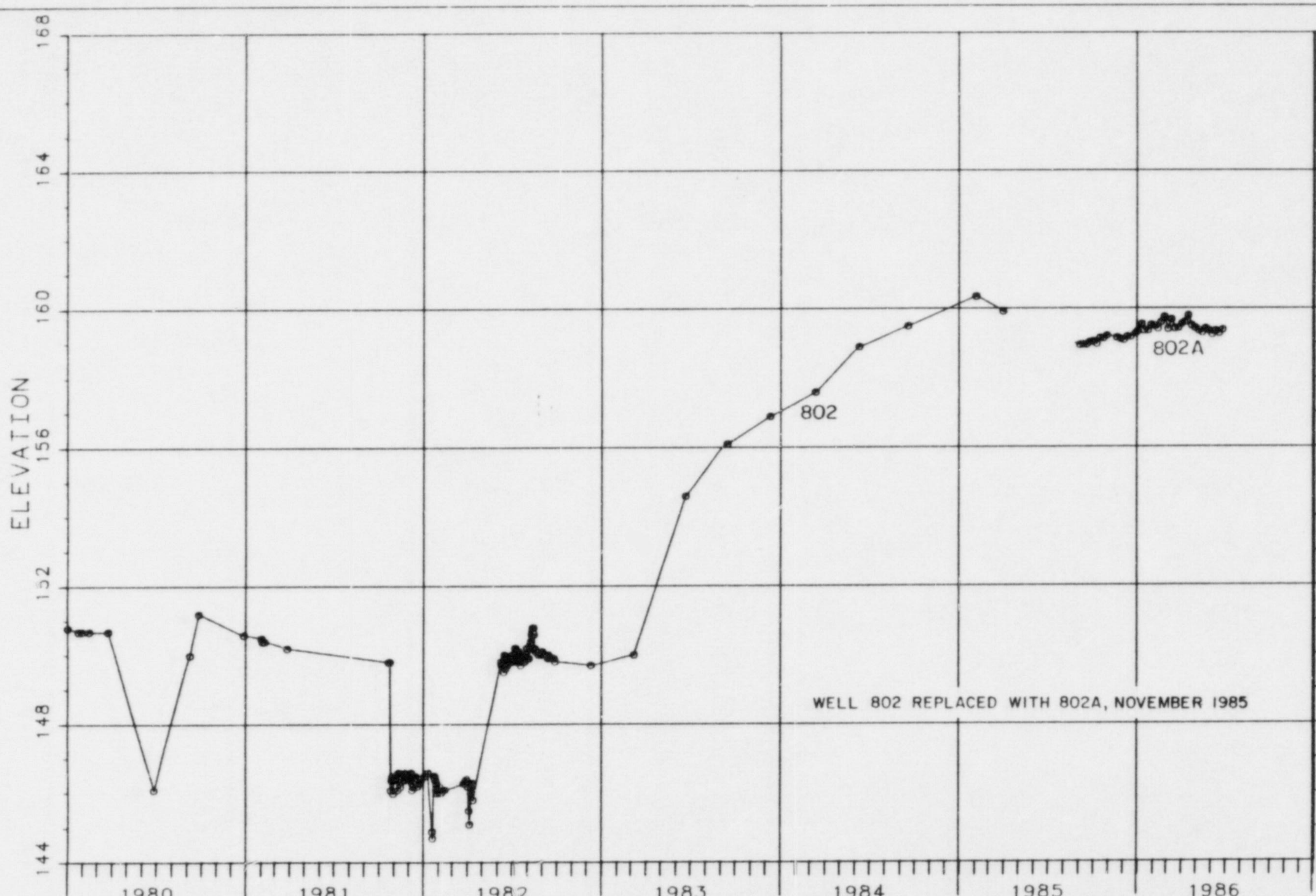
WELL 179
WATER TABLE



VOGTLE
ELECTRIC GENERATING PLANT

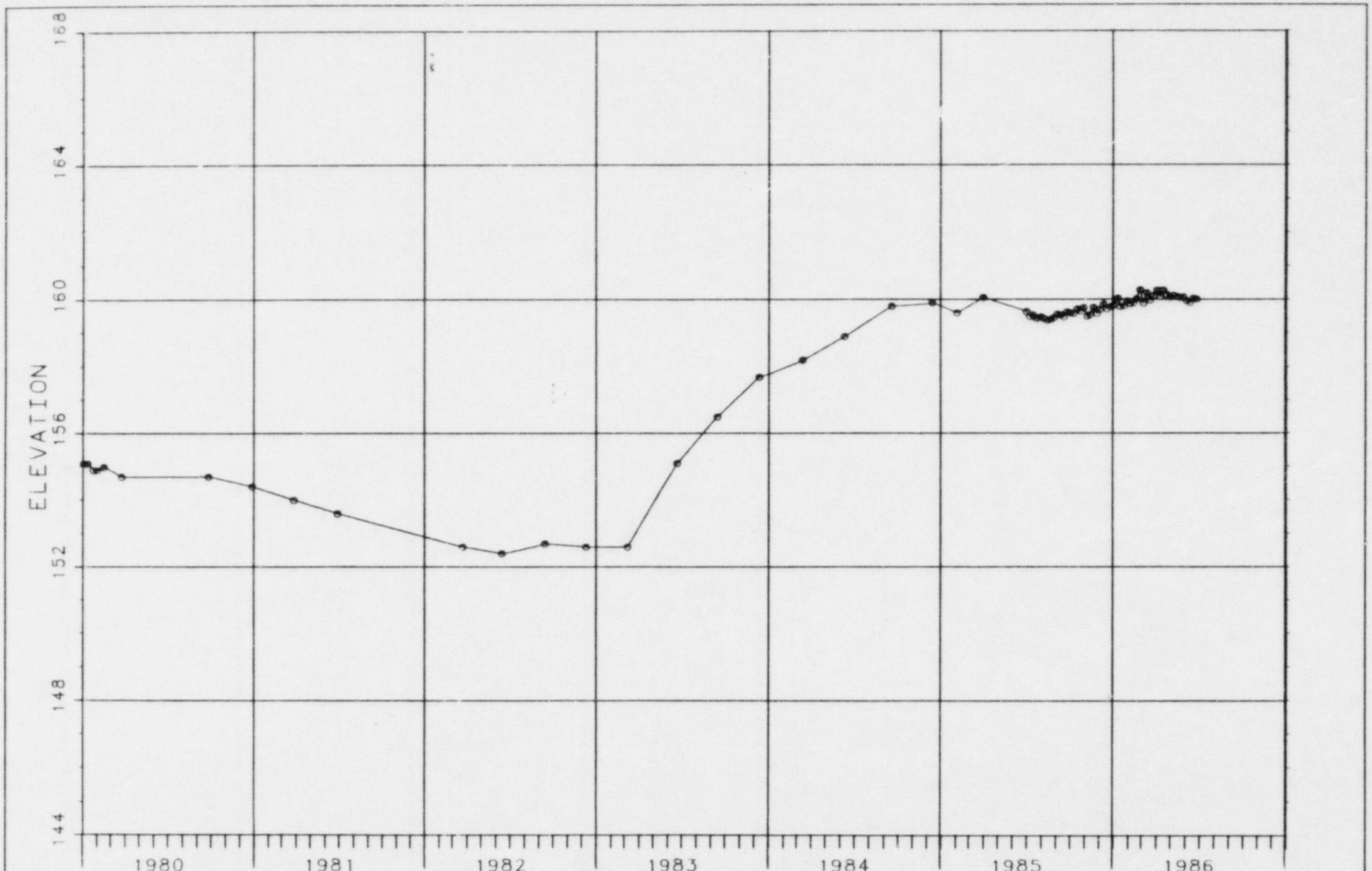
WELL 800
WATER TABLE


ELEVATION
168
164
160
156
152
148
144
1980
1981
1982
1983
1984
1985
1986
VOGTLE
ELECTRIC GENERATING PLANT
WELL 801
WATER TABLE

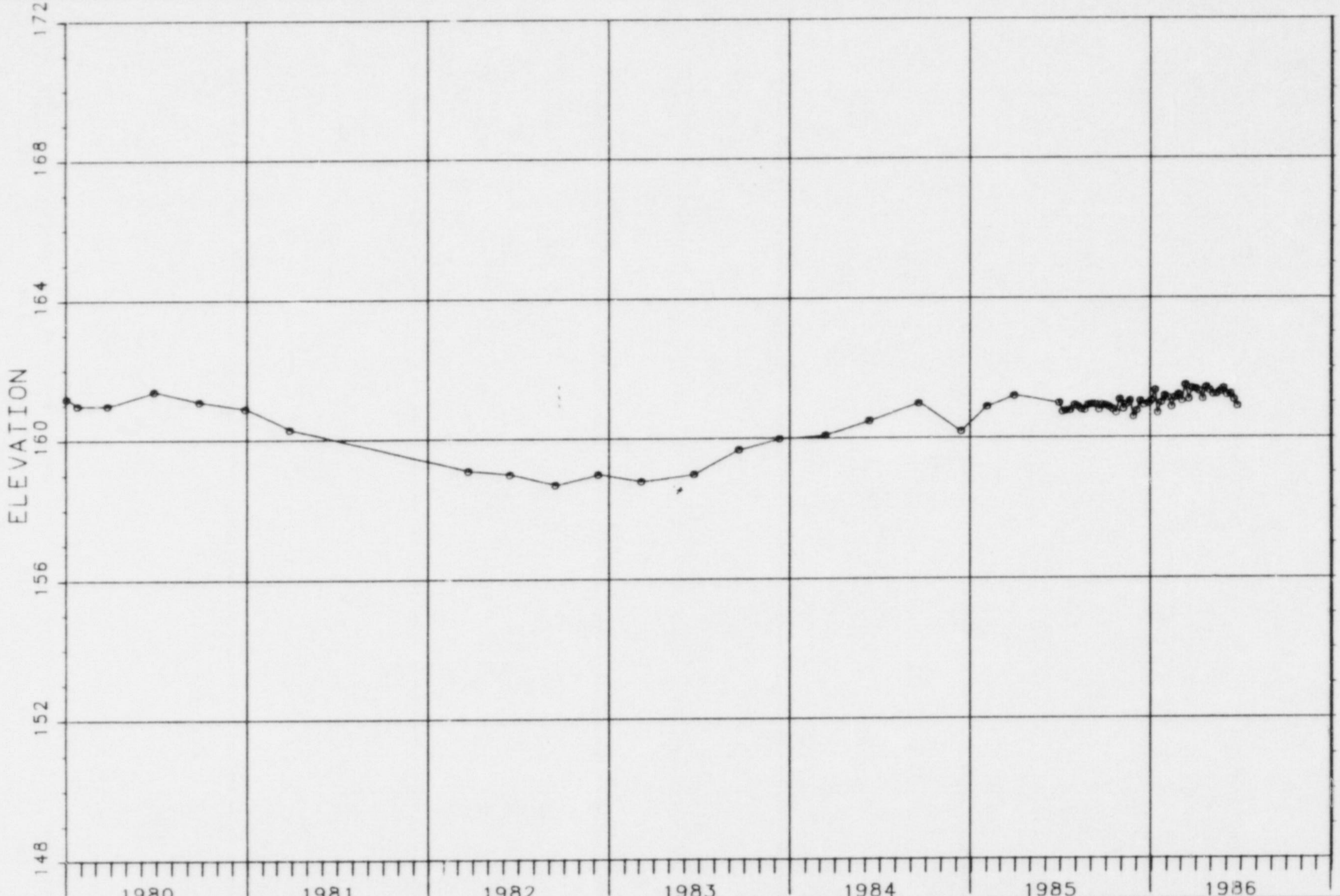


VOGTLE
ELECTRIC GENERATING PLANT

WELL 802A
WATER TABLE

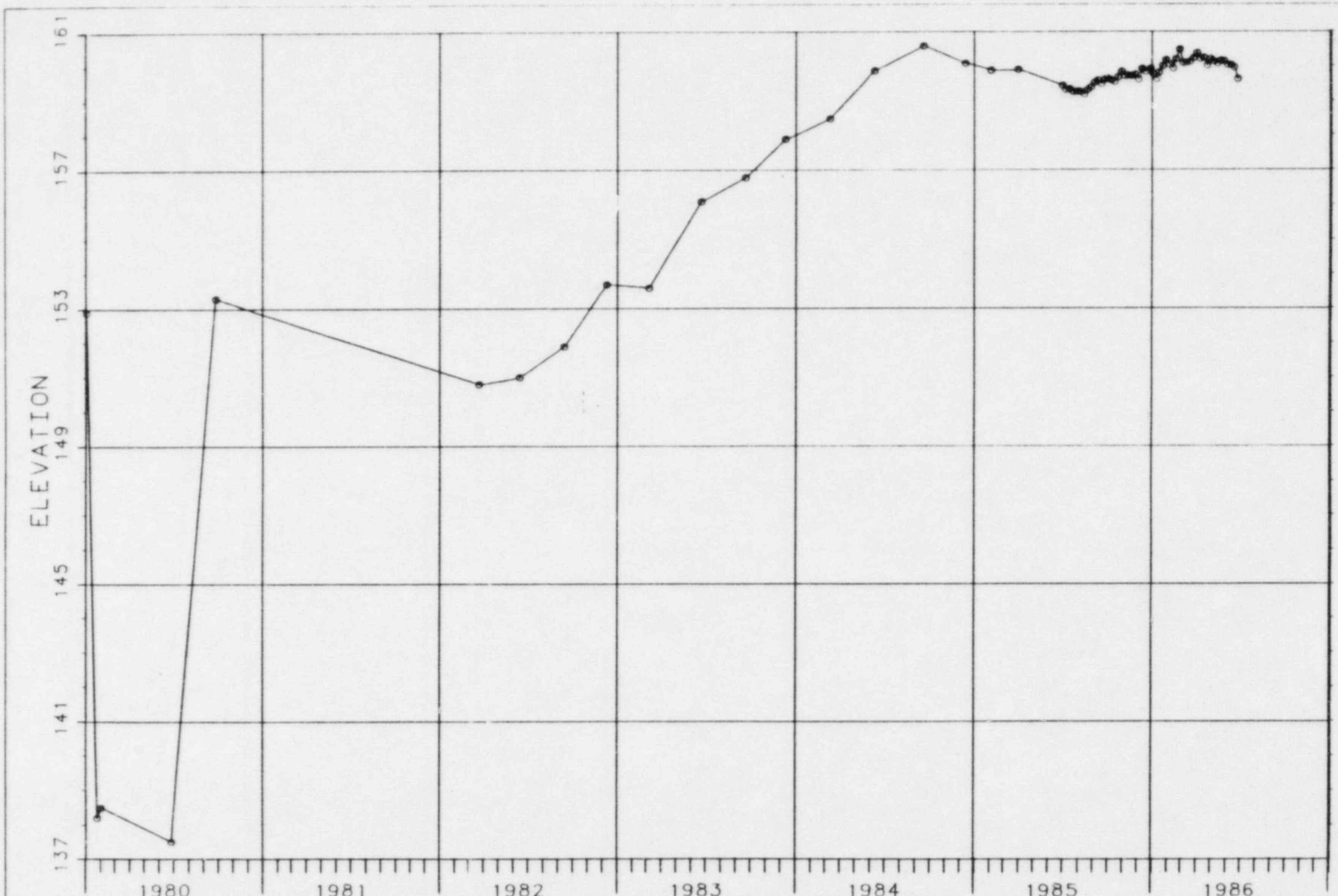


VOGTLE ELECTRIC GENERATING PLANT	WELL 803A WATER TABLE



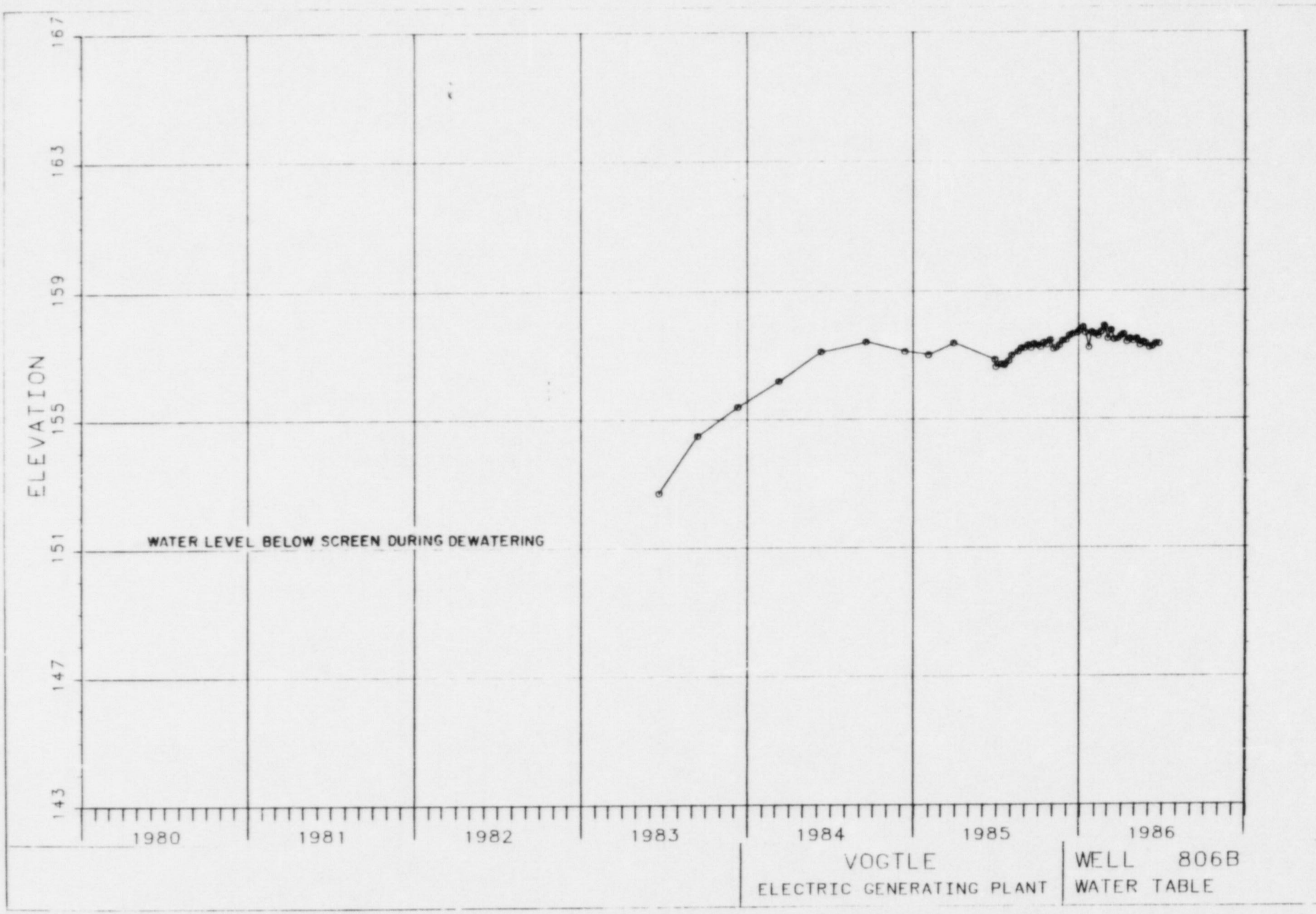
VOGTLE
ELECTRIC GENERATING PLANT

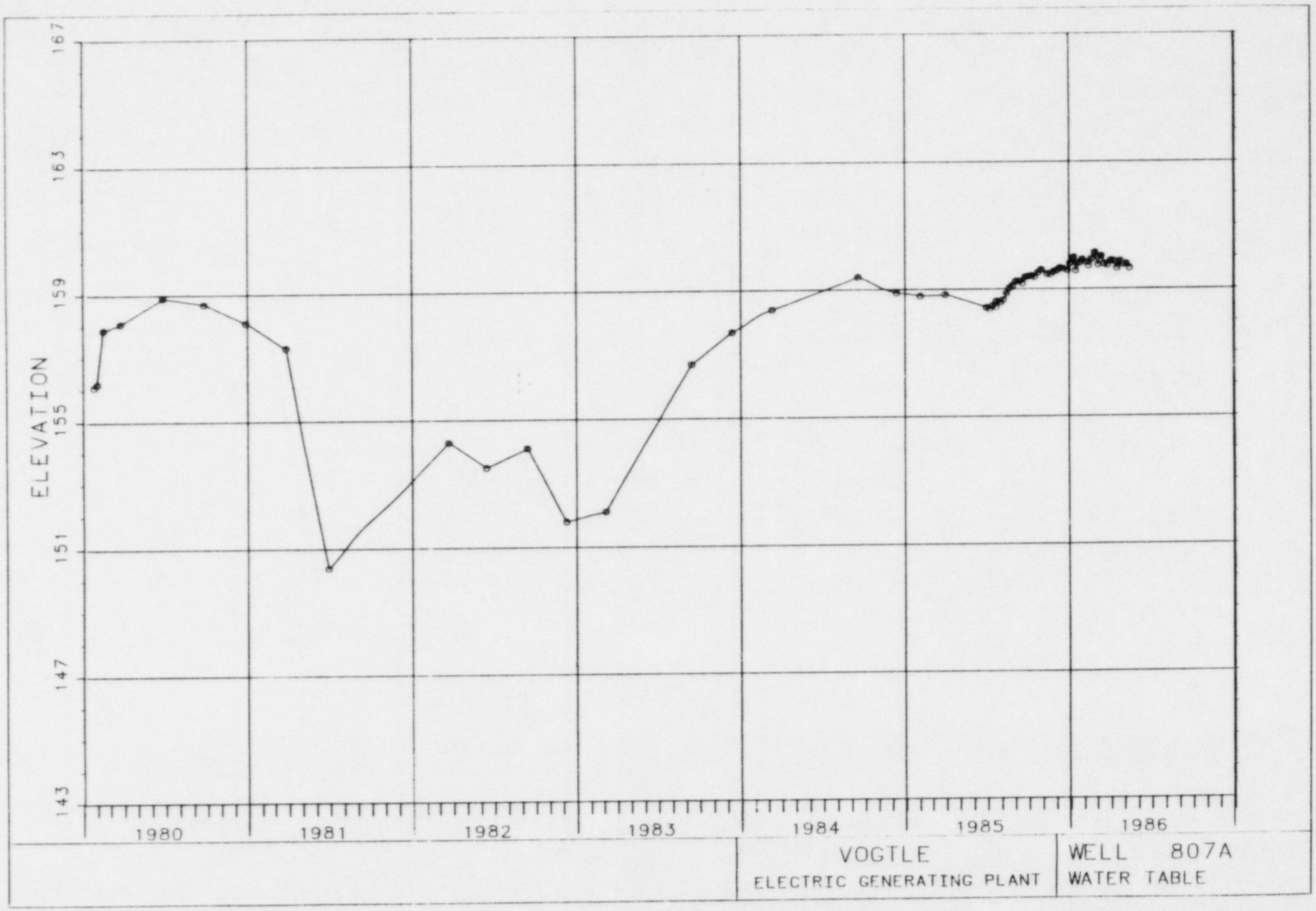
WELL 804
WATER TABLE



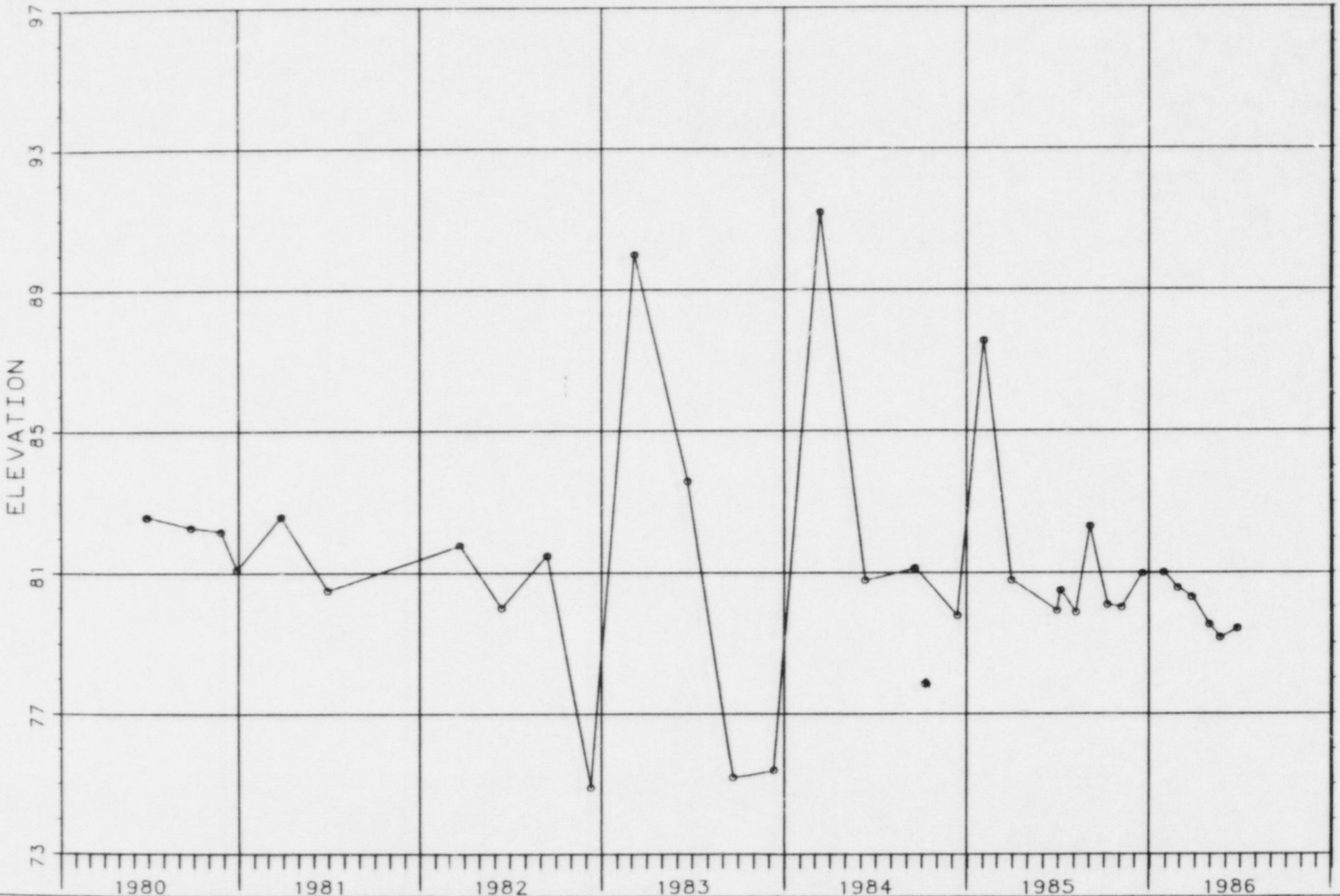
VOGTLE
ELECTRIC GENERATING PLANT

WELL 805A
WATER TABLE

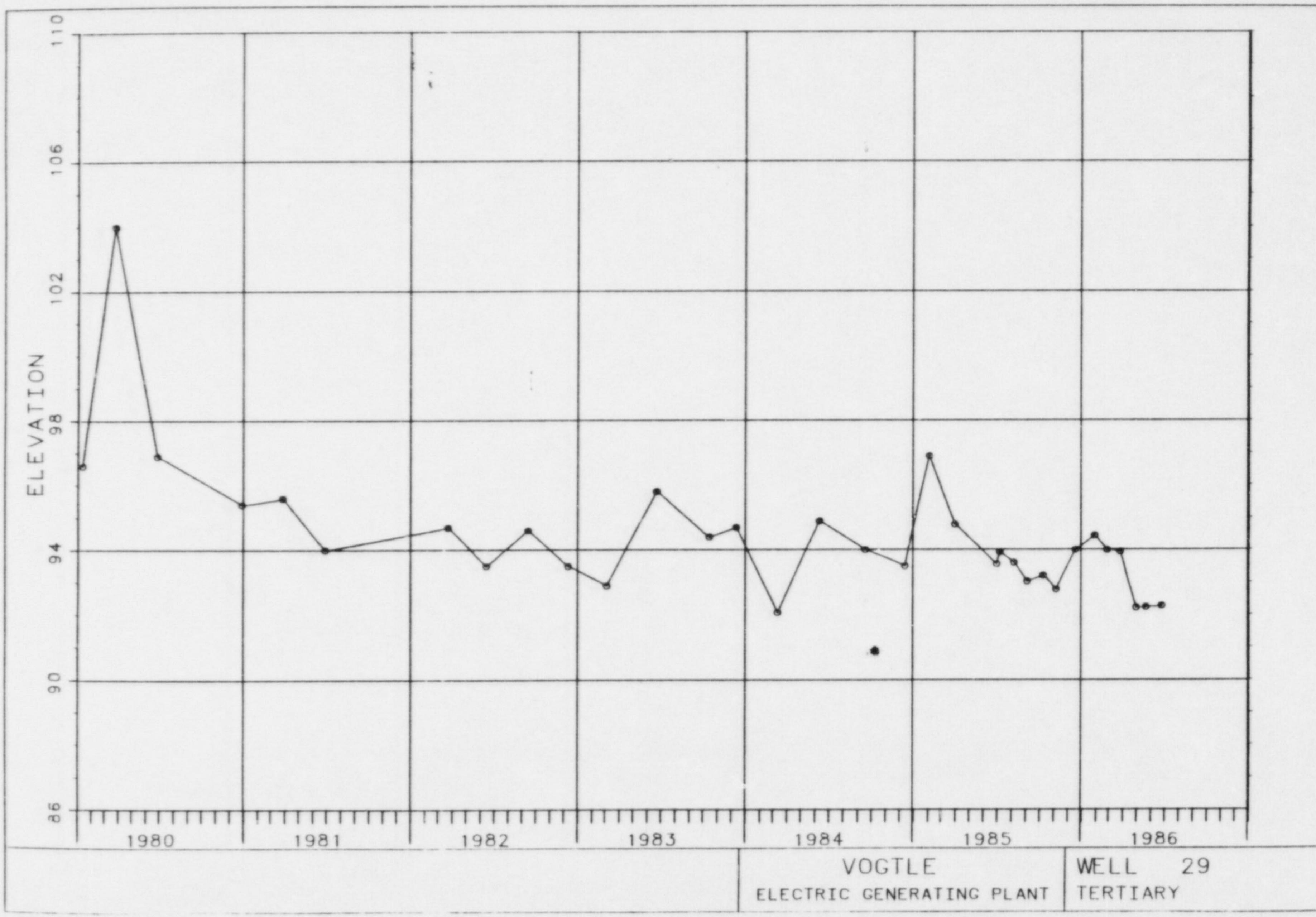

ELEVATION
167
163
159
155
151
147
143
WATER LEVEL BELOW SCREEN DURING DEWATERING
1980
1981
1982
1983
1984
1985
1986
VOGTLE
ELECTRIC GENERATING PLANT
WELL 806B
WATER TABLE



ELEVATION
167
163
159
155
151
147
143
1980
1981
1982
1983
1984
1985
1986
VOGTLE
ELECTRIC GENERATING PLANT
WELL 807A
WATER TABLE



VOGTLE ELECTRIC GENERATING PLANT	WELL 27 TERTIARY


ELEVATION
110
106
102
98
94
90
86
1980
1981
1982
1983
1984
1985
1986
VOGTLE
ELECTRIC GENERATING PLANT
WELL 29
TERTIARY