ANNUAL REPORT ON RESULTS OF MAMMOTH COMMUNITY WATER DISTRICT GROUNDWATER MONITORING PROGRAM FOR OCTOBER 1996-SEPTEMBER 1997

Prepared for
Mammoth Community Water District
Mammoth Lakes, California

by
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December 8, 1997

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December 8, 1997

Mr. Dennis Erdman, General Manager
Mammoth Community Water District
P.O. Box 597
Mammoth Lakes, CA 93546

Re: Annual Report on Groundwater Monitoring

Dear Dennis:

Submitted herewith is our annual report on the results of the District groundwater monitoring program for the period October 1996-September 1997. I appreciate the cooperation of District personnel in conducting this monitoring and providing data tabulations.

Sincerely yours,

Kenneth D. Schmidt

KDS/bbs

cc: Steve Kronick

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ANNUAL REPORT ON RESULTS OF MAMMOTH COMMUNITY WATER DISTRICT GROUNDWATER MONITORING PROGRAM FOR OCTOBER 1996-SEPTEMBER 1997

INTRODUCTION

In Summer 1992, the Mammoth County Water District contracted for the drilling of five new test wells in Mammoth Lakes. One of these wells (No. 15) was converted to a supply well and pumping began on an emergency basis in Summer 1992. In December 1992, the California Department of Fish and Game filed an action against the District in Superior Court. Concerns were expressed by the Department about the potential impact of pumping of these wells on wildlife, vegetation, and fishery resources of Mammoth Creek and the Hot Creek headsprings, which is located downstream of the District wells. Kenneth D. Schmidt and Associates completed a hydrogeologic evaluation (July 6, 1993) on behalf of the District, to respond to these concerns. In August 1993, a settlement agreement was made between the Department and the District. As part of this agreement, the District was to:

1. Conduct routine monitoring in all District supply and monitor wells.
2. Install a new monitor well tapping consolidated rock at a location south of the District office.
3. Conduct monitoring in the new monitor well.
4. Prepare an annual interpretive report on the results of groundwater monitoring for the water year.

Data available to the District from Wells SC-1 and SC-2 (part of the Long Valley hydrologic monitoring program) were to be included in this evaluation. This report comprises the fifth annual report pursuant to the settlement agreement. The Mammoth County Water District is now the Mammoth Community Water District.

SUMMARY AND CONCLUSIONS

The District pumped 1,060 acre-feet of water from eight supply wells during the 1997 water year. This was 14 percent more than during the previous water year. A comprehensive water-level monitoring program was conducted for District supply wells and monitor wells. In addition, water-level measurements were available for two other monitor wells east of the District wells, and flow measurements were available for a spring at the University of California Valentine Reserve.

Water levels in most shallow wells tapping the uppermost glacial till strata rose during 1997, but not as high as in 1995. Groundwater is generally present in the uppermost strata only in the westerly part of the area, in the meadow and near Mammoth Creek. Water levels in most of the monitor wells tapping the consolidated rock rose during the 1997 water year, except for several pumped wells (i.e. No. 20). A water-level elevation contour map was prepared for September 1997. This map and other information indicates that the extent of the cone of depression due

to pumping of District wells was limited in size, and did not extend to the easterly District monitor well (No. 24).

The results of water quality monitoring indicate no significant changes during the water year, compared to previously.

The results of the 1996-97 monitoring indicate that District pumping did not influence Mammoth Creek streamflow or the spring at the Valentine Reserve. In addition, water-level declines due to pumping did not extend beyond the vicinity of the well field. Thus there was no influence on the Hot Creek headsprings, which are much more distant then the monitor wells utilized for the District monitoring program.

WELL CONSTRUCTION DATA

Figure 1 shows locations of District wells, a private supply well, a subsurface geologic cross section, two other monitor wells to the east (SC-1 and SC-2), and the spring area at the Valentine Reserve. Table 1 summarizes construction data for the District supply wells. All of these wells tap consolidated rock, primarily basalt and scoria layers, and some also tap interbedded glacial till and conglomerate. Well No. 1 has been in service since the 1970's. Wells No. 6 and 10 have been in service since 1988. These three wells are termed the "earlier" District supply wells in this report. Well No. 15 was first put in service in July 1992 on an emergency basis. Well No. 18 was put in service in September 1994. Wells No. 16 and 20 were put in service in March 1995, and Well No.

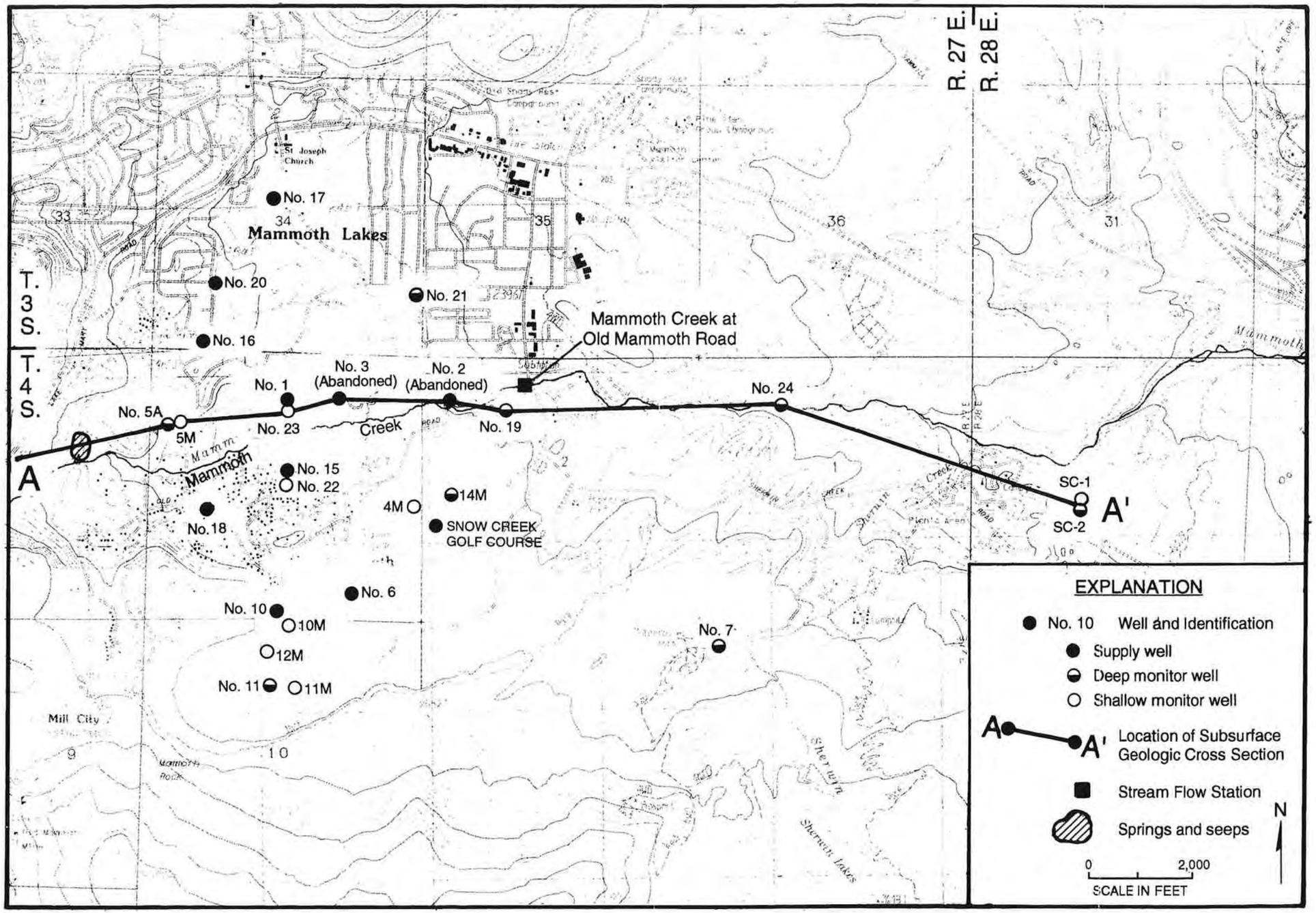


FIGURE 1 - LOCATION OF WELLS AND SUBSURFACE GEOLOGIC CROSS SECTION A-A'

TABLE 1 - CONSTRUCTION DATA FOR DISTRICT SUPPLY WELLS

Well No.	Date Drilled	Drilled Depth (feet)	Cased Depth (feet)	Perforated or Open Interval (feet)	Annular Seal (feet)
1	1976	382	370	200-370	0-90
6	11/87	670	670	146-670	0-52
10	10/87	700	700	136-700	0-52
15	8/92	720	407	407-720	0-135
16	8/92	710	715	420-470 500-680	0-60
17	7/92	710	513	400-710	0-60
18	8/92	710	480	90-150 240-470	0-60
20	9/92	710	420	420-710	0-60

Wells No. 16, 17, 18, and 20 were modified in June 1994 in preparation for being put into service. The test wells that were drilled in 1992 and subsequently converted to production wells are termed herein the "new District supply wells".

17 was put in service in June 1995. Wells put in service in 1992-95 are termed the "newer" District supply wells in this report. Wells No. 2, 3, 4, 5, and 7 (shown in Figure 1) were not put in service by the District because of low well yields. A small amount of water was pumped from Well No. 7 in Summer 1997 for use at the boys camp. Wells No. 2 and 3 were subsequently destroyed, whereas the other wells were converted to monitor wells.

Table 2 summarizes construction data for District monitor wells. Five of these wells (No. 5A, 14M, 19, 21, and 24) are deep and primarily tap water in fractured volcanic rock. Well No. 7 is a deep well located south of the basalt flow and taps water in a glacial morraine near Sherwin Creek. Well No. 11 is a deep well located south of the basalt flow and taps water in glacial till and granitic rocks. An annular seal was placed in Well No. 21 in July 1997, to preclude surface water and shallow groundwater from entering the well. Well No. 5M taps water in the shallow fractured volcanic rock, just beneath the glacial till. The remaining monitor wells are shallow and tap groundwater in the uppermost glacial till.

SUBSURFACE GEOLOGIC SECTION A-A'

Cross Section A-A' was developed during a previous evaluation, and was updated (Figure 2) by adding more recent water-level data. The locations of wells used for this section are shown in Figure 1. Cross Section A-A' shows that the uppermost till layer and volcanic

TABLE 2 - CONSTRUCTION DATA FOR DISTRICT MONITOR WELLS

Well No.	Date Drilled	Drilled Depth (feet)	Cased Depth (feet)	Perforated or Open Interval (feet)	Annular Seal (feet)
4M	1984	89	89	69-89	0-50
5A	7/82 (8/93)	357	357	112-357	0-112
5M	8/93	80	80	20-75	0-20
7	8/87	480	480	290-480	0-50
10M	6/88	27	27	7-27	0-5
11	7/88	600	600	170-360	0-50
11M	6/88	43	43	5-43	0-5
12M	9/88	27	27	7-27	0-5
14M	9/88	520	501	100-310	0-100
19	8/92	700	344	200-700	0-140
21	10/92(7/97)	640	145(157)	145-640(157-640)	(70-157)
22	9/92	85	85	55-85	0-25
23	9/92	65	65	30-65	0-25
24	8/93	450	430	300-450	0-20

Well No. 5 was modified in August 1993, so as to be sealed off opposite the glacial till and be perforated only opposite the volcanic rock, and re-designated Well No. 5A. An annular seal was placed in No. 19 in July 1997, and the values in parentheses are for after this work was completed.

Figure 2 -
Subsurface Geologic Cross Section A-A'
(In Pocket)

rocks are continuous along the section. Groundwater has been found in the uppermost glacial till layer only in the vicinity of District Wells No. 1, 4, 6, 10, 11, 12, and 15. Most of these wells are either in the meadow or near Mammoth Creek. Water production in the District supply wells is from highly fractured rock, often scoria layers, and sometimes from interbedded glacial till. The intervening less fractured rock probably acts as local confining layers. At Well No. 24, water was not found in the upper part of the basalt or in either of the till layers. Water in this well is in a fractured scoria layer. A lost circulation zone present in this well may influence the water level. In September 1997, there was a fairly uniform water-level slope (about 255 feet per mile) from Well No. 1 to No. 19 to No. 24. The part of the section east of Well No. 24 is oriented almost perpendicular to the direction of groundwater flow (shown later).

DISTRICT PUMPAGE

Pumpage records for District supply wells are provided in Appendix A. Table 3 shows monthly pumpage from District wells during the 1997 water year. The total pumpage was 1,060 acre-feet, or 14 percent more than that for the previous water year. Of this, 477 acre-feet were from Well No. 10, 163 acre-feet were from Well No. 15, 143 acre-feet were from Well No. 6, 131 acre-feet were from Well No. 20, and 98 acre-feet were from Well No. 17. The remaining District pumpage (48 acre-feet) was from Wells No. 1 and 16. An

TABLE 3 - PUMPAGE FROM DISTRICT WELLS (ACRE-FEET)

Month	No. 1	No. 6	No. 10	No. 15	No. 16	No. 17	No. 18	No. 20	Total (Rounded)
Oct-96	0.0	0.0	64.5	6.9	0.0	15.5	0.0	0.0	87
Nov	0.0	0.0	24.4	0.8	0.0	0.0	0.0	0.0	25
Dec	0.0	0.0	42.9	15.6	0.0	0.6	0.0	0.0	59
Jan-97	0.0	0.0	32.7	12.4	0.0	0.0	0.0	0.0	45
Feb	2.9	0.3	33.4	2.3	0.0	0.0	0.0	0.0	39
Mar	0.5	12.6	22.2	1.7	0.1	0.0	0.0	0.0	37
Apr	0.0	11.6	22.6	0.8	0.0	0.0	0.0	0.0	35
May	0.0	18.2	35.2	0.2	0.3	0.0	0.2	0.0	54
Jun	8.5	22.0	39.9	6.5	0.2	11.3	0.0	0.2	89
Jul	1.1	44.1	57.0	50.6	0.0	27.2	0.0	22.8	203
Aug	0.0	34.0	85.4	33.6	5.7	35.8	0.0	46.6	241
Sep	0.0	0.0	16.9	32.0	28.7	7.5	0.0	61.0	146
Total (Rounded)	13	143	477	163	35	98	0	131	1060

additional 108 acre-feet were pumped during the 1997 water year from the Snow Creek Golf Course Well (in the general vicinity of Well No. 14M). This well is owned by Dempsey Construction and used to supply the golf course. From June 5 to September 1, 1997, a total of about 87,000 gallons was pumped from Well No. 7 for use at the boys camp.

WATER LEVELS

District Supply Wells

Water-level measurements (static and pumping) for District supply wells are provided in Appendix A. Water-level hydrographs for the earlier wells (No. 1, 6, and 10) are provided in Appendix B.

New Wells

Figure 3 is a water-level and pumpage hydrograph for Well No. 15, extending back to when it was initially put in service in July 1992. The static water level fell about 80 feet after several months of pumping, and normally ranged from about 260 to 280 feet during periods when the well was being significantly used. Depth to water in Well No. 15 appears to be influenced primarily by the previous pumping history of the well and recharge. During periods when the well had not been used much for supply (i.e., May 1995-June 1997), the water level rose substantially. In late 1996 and

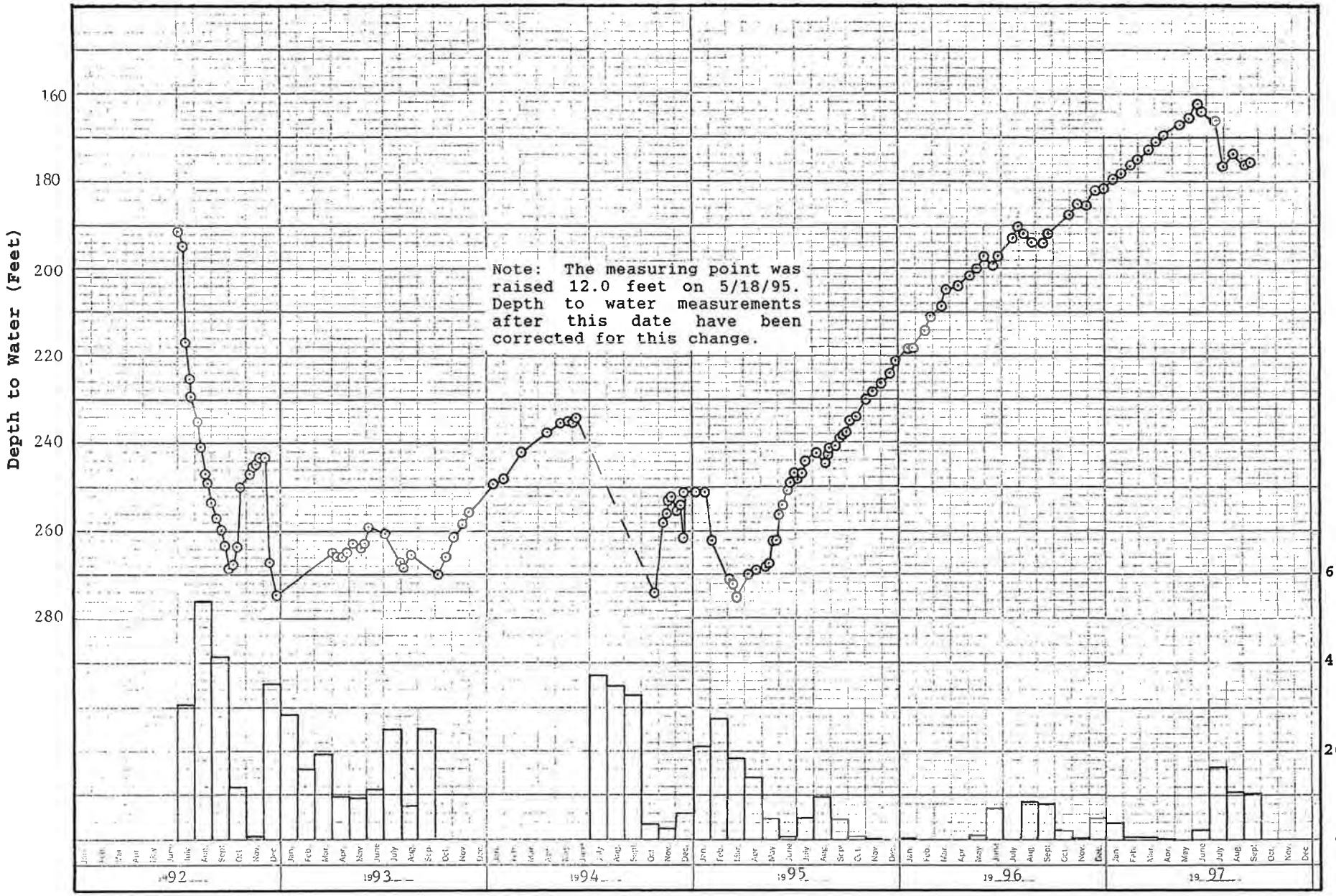


FIGURE 3 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 15

1997, the depth to water in Well No. 15 was the shallowest of record.

Figure 4 is a water-level and pumpage hydrograph for Well No. 16. The water level in this well changed substantially after the casing was installed (July 1994) and after the pump was installed (February 1995). After the casing was installed and prior to the pump installation, an access tube was not in the well, and the measurements during that period were apparently affected by cascading water. The measurements for July 1994-early February 1995 are thus not considered representative. During heavy pumping periods of Well No. 20, the static level in Well No. 16 has been about 12 feet lower than during periods of lower pumping of Well No. 20. Overall, static levels in Well No. 16 have been relatively stable since 1992.

Figure 5 is a water-level and pumpage hydrograph for Well No. 17. Measurements in early 1995 indicated that the water level apparently rose about eight feet, probably due to recharge. The water level in Well No. 17 appears to be influenced by pumpage of Well No. 20. During operational periods of both of these wells, the static level in Well No. 17 has been about four feet lower than during periods of little pumpage. During November 1995-September 1997, the water level in Well No. 17 gradually rose, except during some pumping periods in Summer 1996 and 1997. The shallowest depth to water yet measured in this well was in September 1997.

Figure 6 shows water levels and pumpage for Well No. 18. The

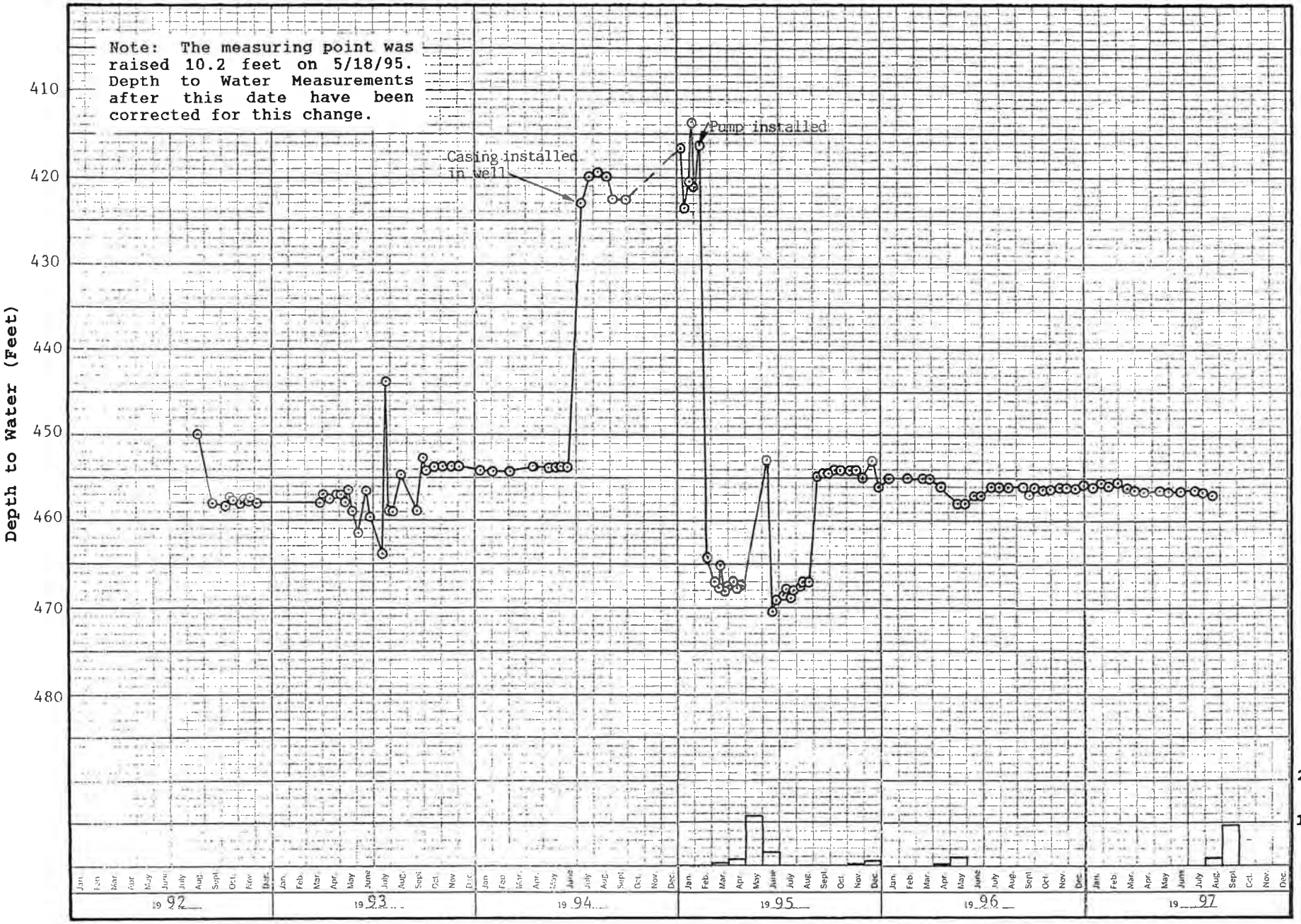


FIGURE 4 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 16

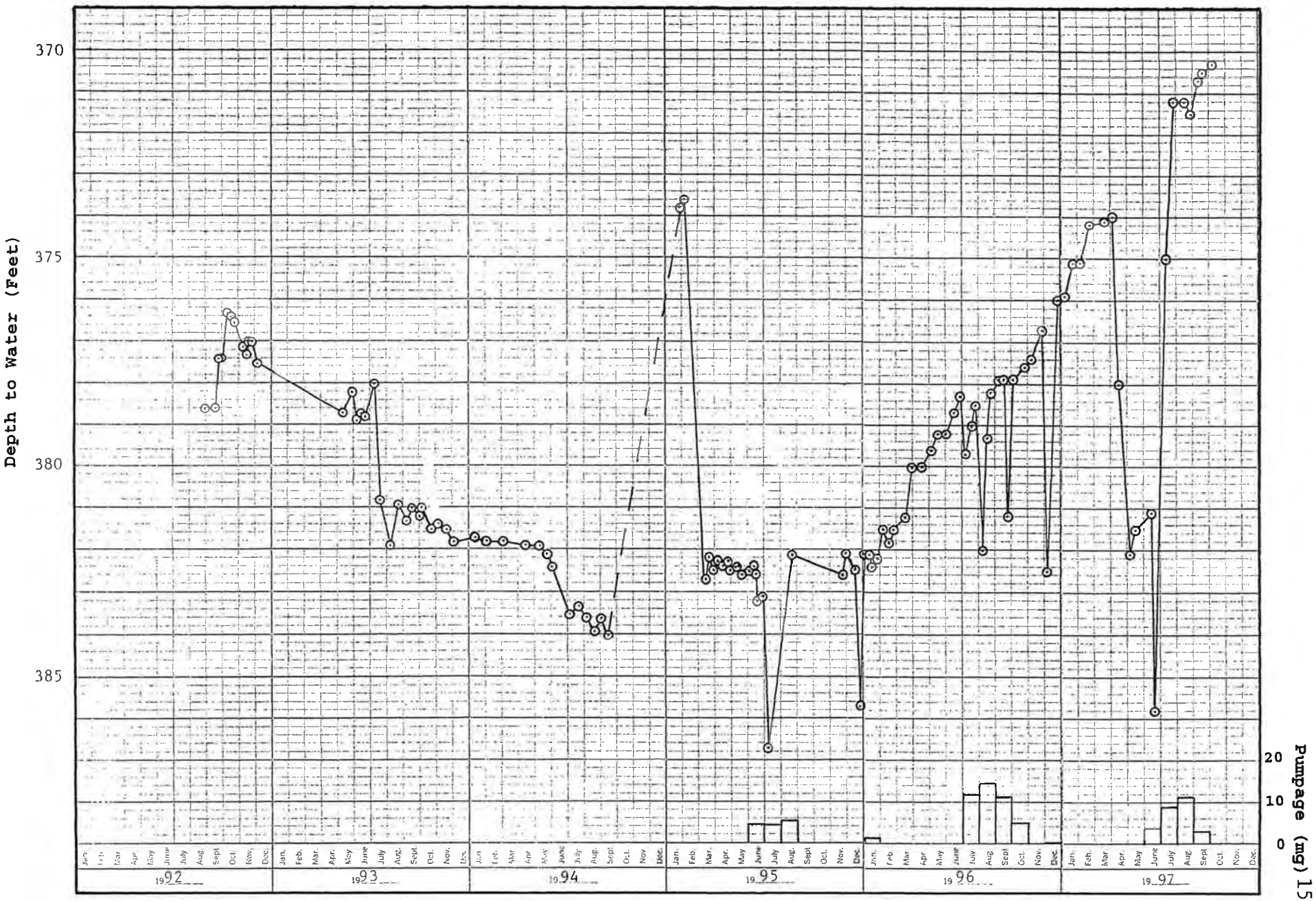


FIGURE 5 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 17

shallowest yet measured. The water level in Well No. 18 fell about seven feet during June-September, 1997, apparently due to pumping of Wells No. 6, 10, and 15.

Figure 7 is a water-level and pumpage hydrograph for Well No. 20. Since 1994, the overall trend has been a rising water level. The water level in this well may be somewhat affected by pumpage of Well No. 17. However, the main reason for the water-level variations in Well No. 20 is pumping of the well itself. The water level in this well fell about 16 feet during Summer 1997 pumping. The shallowest levels in Well No. 20 to date were in May 1997.

Earlier Wells

Water-level and pumpage hydrographs for Wells No. 1, 6, and 10 are provided in Appendix B. The static water level in Well No. 1 has ranged from about 165 to 200 feet during low pumping periods to an average of about 270 feet during heavy pumping periods (i.e., August 1994). Overall, the water level in this well has risen since 1992. In June 1997, depth to water in this well was 165 feet, or the shallowest measured since 1990. The static water level in Well No. 6 has ranged from less than 30 feet during low pumping periods (after September 1995) to more than 160 feet during heavy pumping periods (August-September, 1994). During May-September 1996, the static level in this well was at or above the land surface. During the 1997 water year, depth to water was usually less than 15 feet. The static water level in Well No. 10

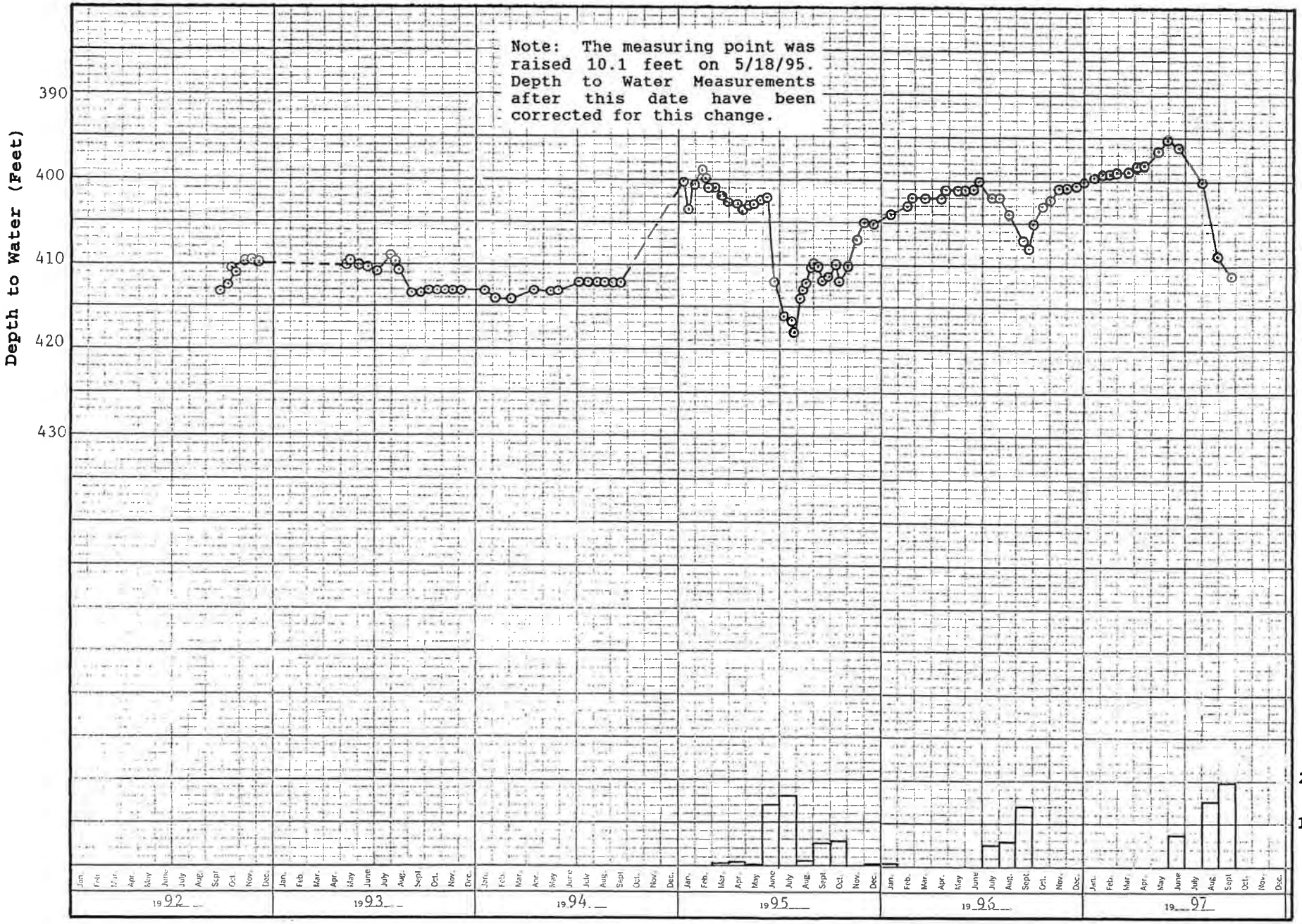


FIGURE 7 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 20

heavy pumping periods (August-September, 1994). During May-September 1996, the static level in this well was at or above the land surface. During the 1997 water year, depth to water was usually less than 15 feet. The static water level in Well No. 10 has ranged from less than 30 feet during low pumping periods (July 1995) to more than 160 feet during heavy pumping periods (Summer 1993). During the 1997 water year, depth to water was usually less than 30 feet. The combined pumpage of Wells No. 6 and 10 in the 1997 water year was about the same as for the previous year, and most of this was from Well No. 10. Depth to water in Well No. 10 was near 15 feet in early June 1996 and in early February 1997, the shallowest measured since 1991.

Deep Monitor Wells

Water-level measurements for monitor wells are provided in Appendix C, and supplementary water-level hydrographs are provided in Appendix D. Transducers were installed in four of the deep monitor wells (M-14, No. 19, No. 21, and No. 24), and continuous water-level measurements commenced in December 1995. Well No. 5A is located between Well No. 1 and the Valentine Reserve North Spring (Figure 1). Measurements for Well No. 5A indicate that depth to water has ranged from near the land surface to about 6 feet. During the past three years, the annual shallowest level has been near the land surface, and overall the water level has risen. Well No. 7 is located in the Sherwin Creek campground, about one

and a third miles east of Well No. 6. Measurements for Well No. 7 indicate that depth to water has ranged from 244 to 288 feet. The water level in this well appears to be primarily influenced by recharge from Sherwin Creek. The influence of recharge during 1995 is apparent. The shallowest water level of record in this well was measured in September 1997.

Well No. 11 is located in the meadow area, about one quarter mile south of Well No. 10. The water-level measurements for Well No. 11 indicate the deepest level (51 feet) in May 1993 and the shallowest levels (near the land surface), during most of the period after July 1995. The water level in this well is influenced by pumping of Wells No. 6 and 10, and surface flow, particularly in the Bodle Ditch, which passes through the meadow area. The water levels were deepest during drought conditions and heavy pumping of Wells No. 6 and 10. The shallowest water levels occurred during wet years and less pumping of Wells No. 6 and 10. Well No. 14M is located about two-thirds mile east of Well No. 15. The manual water-level measurements for Well No. 14M indicate that the depth to water normally ranged from about 350 to 360 prior to June 1995. Since May 1995, the water level in this well has generally risen. The rises have primarily been associated with recharge and the reduction in pumping of Well No. 6 and 10. In July-August, 1997, depth to water was 245 feet, or the shallowest of record. The water level in this well shows the influence of recharge and pumping patterns of Wells No. 6 and 10, and the Snow Creek Golf

Course well. Transducer measurements that are considered reliable are available for M-14 for November 1, 1996-September 30, 1997. These measurements (Appendix D) indicate no significant drawdown due to pumpage of District wells in 1997.

Well No. 19 is located about four-fifths of a mile east of Well No. 1. Based on manual measurements (Figure 8), the water level in Well No. 19 has ranged from 313 to 345 feet deep. Since early 1995, the water level has generally risen. During the 1997 water year, depth to water usually ranged from about 315 to 325 feet. In August 1997, depth to water was 313 feet, or the shallowest yet measured. Transducer readings that are considered fairly reliable are available for this well for November 1, 1996-September 10, 1997 (Appendix D). Well No. 21 is located about three fourths of a mile east of Well No. 20. Based on manual measurements, the water level in Well No. 21 (Figure 9) has ranged from about 231 to 370 feet in depth. The water level in this well rose significantly between early 1995 and late 1996. There was a water-level decline in this well from December 1996-February 1997, and the water level then rose. Most of the rise is attributed to recharge. In August 1997, the water level was the shallowest yet measured. As mentioned previously, an annular seal was placed in this well during July 1997. In August-September, 1997, water levels were relatively constant. Transducer measurements that are considered reliable are available for Well No. 21 from November 1, 1996-May 31, 1997 (Appendix D). A temporary water-level decline of

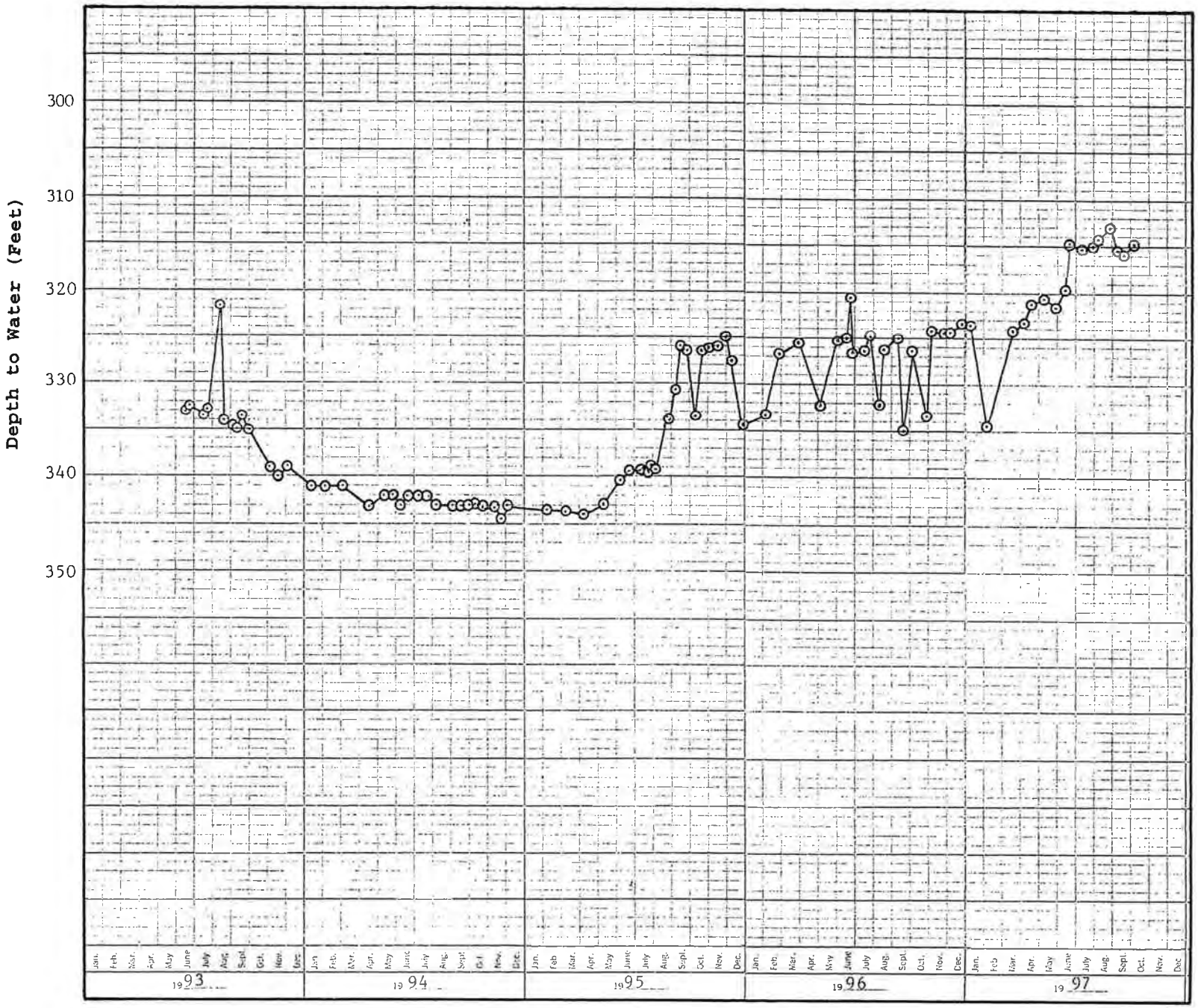


FIGURE 8 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 19

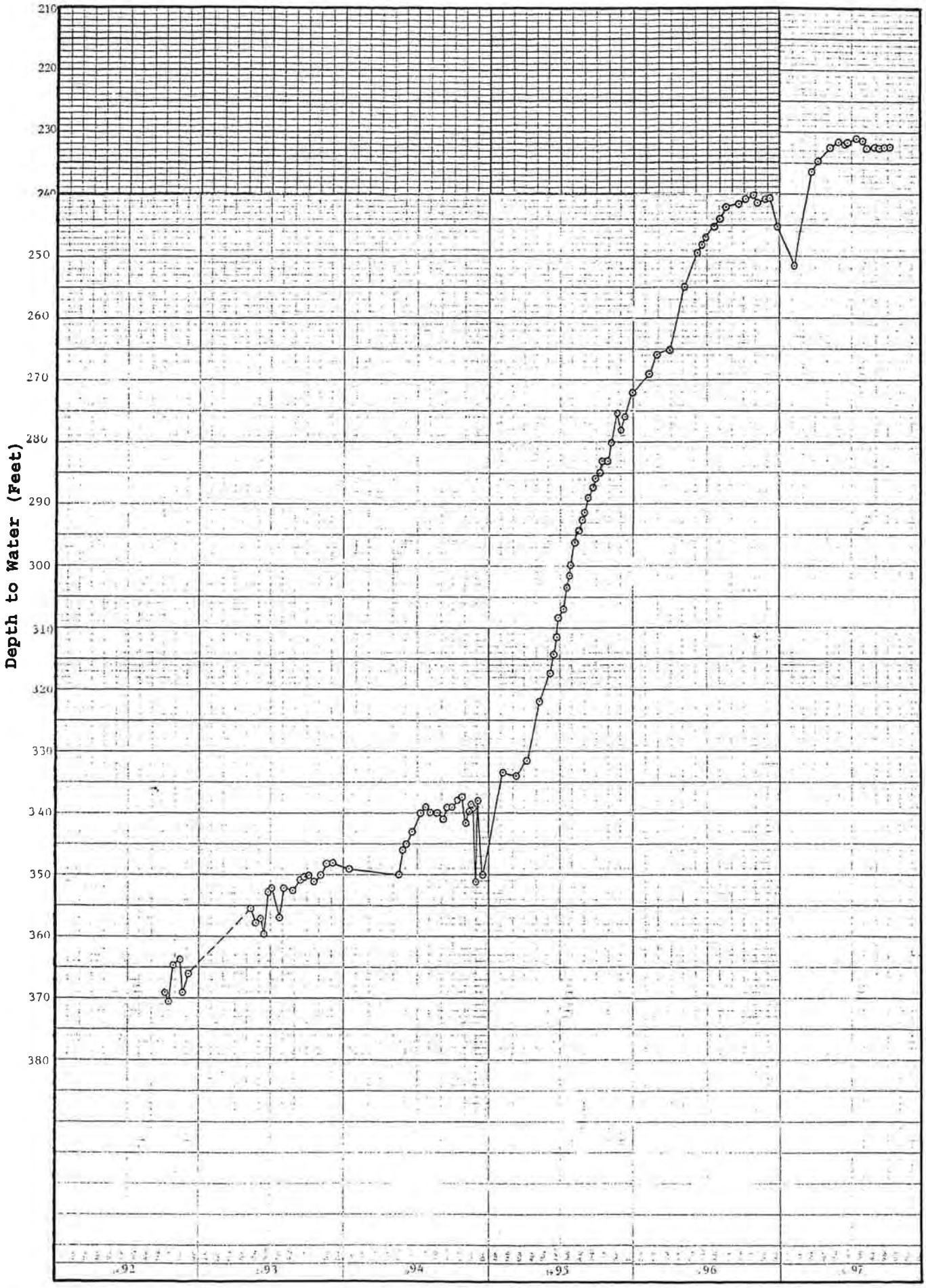


FIGURE 9 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 21

almost 60 feet was indicated during mid-January 1997 by the transducer measurements, but there was no pumping to cause this. The manual water-level measurements in this well have indicated no significant response due to pumping of District wells. Well No. 24 is located about one mile east of Well No. 19. Figure 10 is a water-level hydrograph for Well No. 24, based on manual measurements. Measurements for this well began in Summer 1993, and depth to water has ranged from 355 to 392 feet. The water level has risen since early 1995, to the shallowest depth yet measured in September 1997. Transducer measurements aren't available for this well after April 3, 1997, due to equipment failure. Transducer measurements for this well are not consistent with manual measurements and aren't considered reliable for this water year (Appendix D). The water level in this well obviously responds primarily to recharge, and no influence of District pumping is apparent.

Water levels in Wells No. 19, 21, and 24 rose significantly during water years 1995-1997. The best explanation for the historical water-level variations in these wells is due to the amount of recharge, which is primarily related to climatic patterns. Water levels in these wells rose during and following wet periods. In contrast, water levels in these wells temporarily fell during dry periods. Operational problems have continued to be encountered with many of the transducers.

Figure 11 is a water-level hydrograph for SC-1, which taps

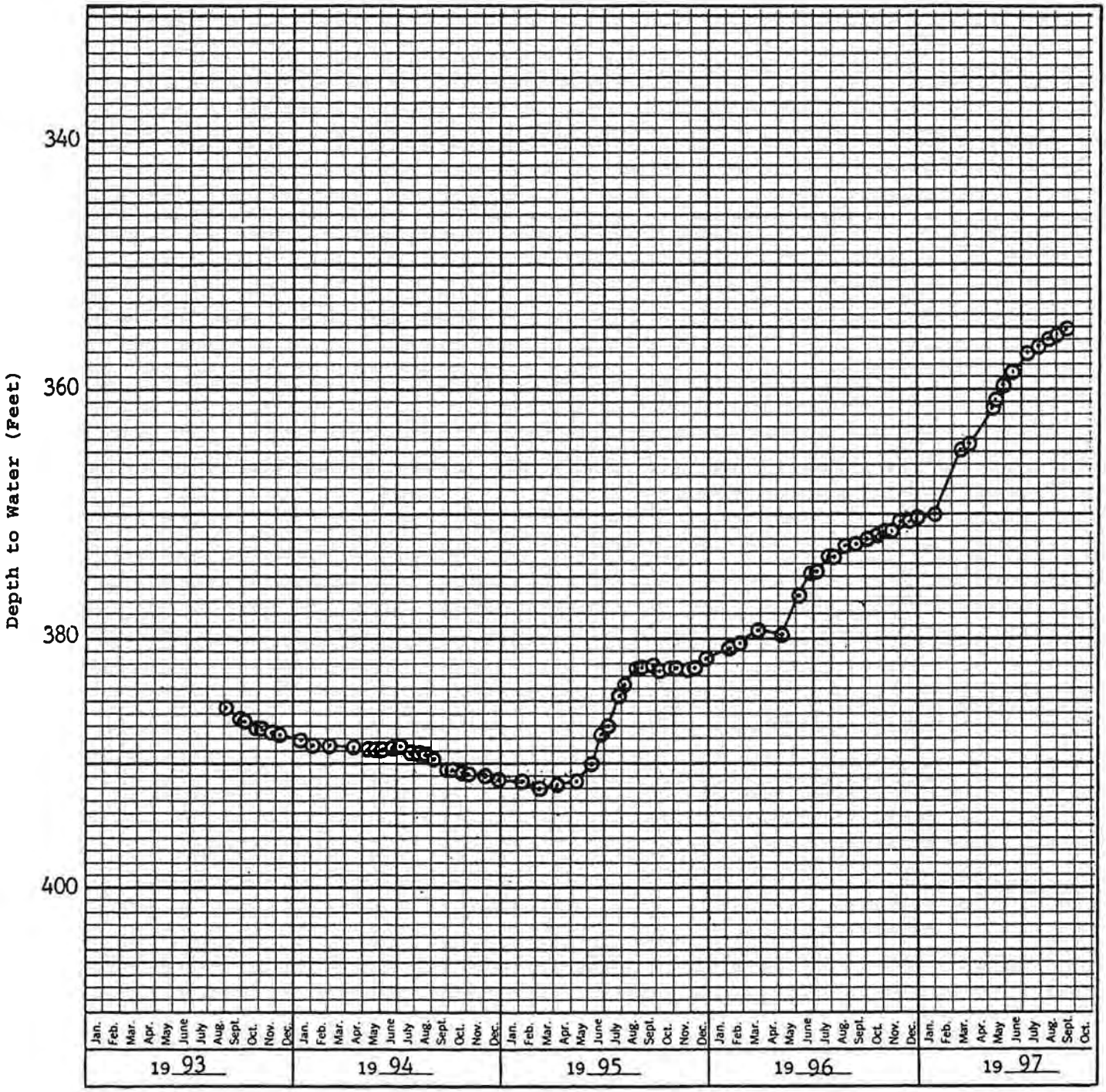


FIGURE 10 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 24

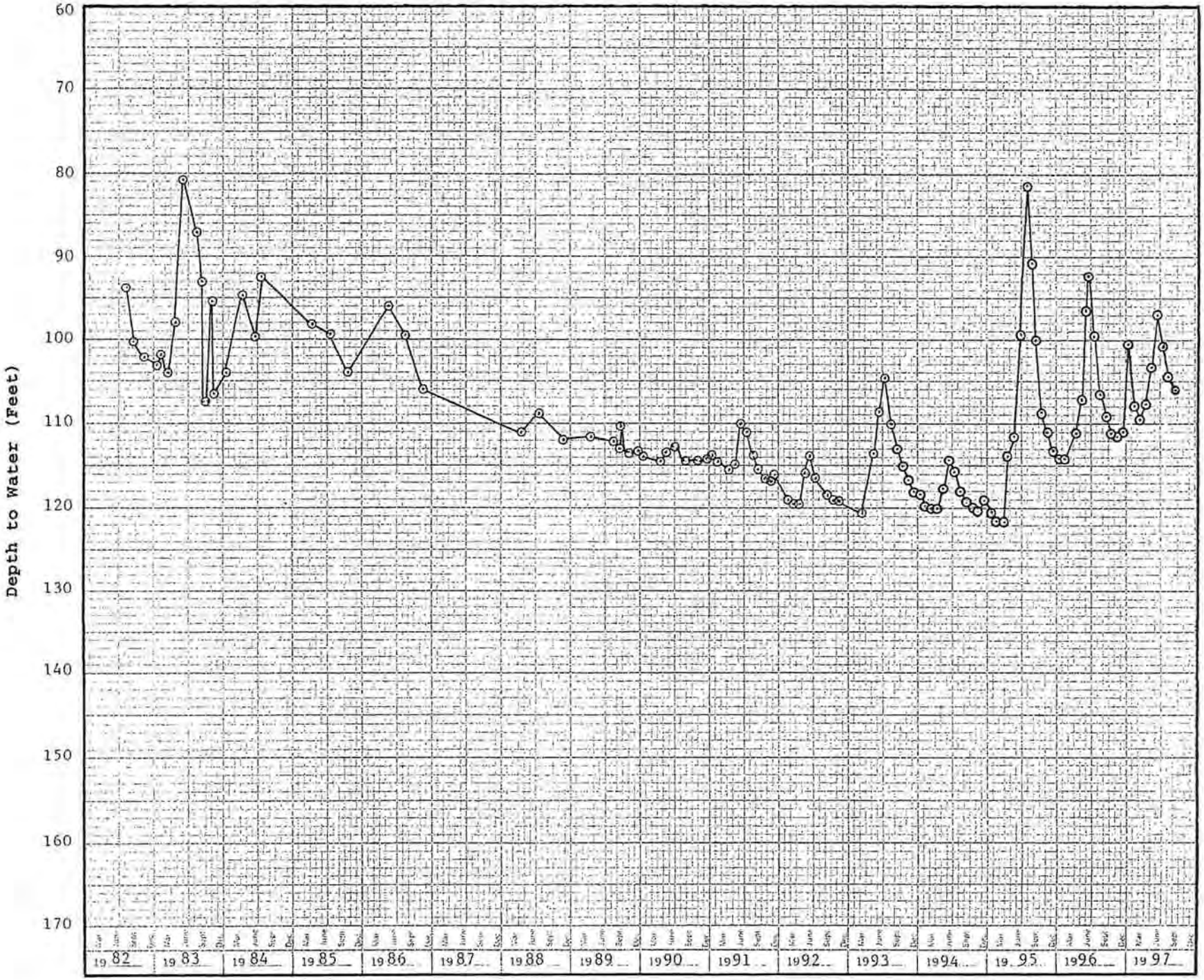


FIGURE 11 - WATER-LEVEL HYDROGRAPH FOR SC-1

groundwater in the upper part of the basalt east of the District wells. The water level in this well generally fell from June 1983 through early 1995. However, some water-level rise occurred during this period due to recharge. Significant recharge was evident during 1995. The shallowest water levels measured in SC-1 were in June 1983 and late July 1995. In September 1997, depth to water in SC-1 was near that in Fall 1983.

Figure 12 is a water-level hydrograph for SC-2, which taps groundwater in the deeper basalt near SC-1. Comparison of the hydrographs for SC-1 and SC-2 indicates that water levels in the two wells fluctuate similarly. However, the water-level rises are less in the deeper monitor well than in the shallower monitor well, as would be expected if the rises are mainly due to recharge, the source of which is from the land surface. The water level in SC-2 in September 1997 was about 135 feet deep, or about 35 feet lower than the shallowest level, which was measured in June 1984. Water-level variations in SC-1 and SC-2 are not indicated to be due to District well pumpage, based on the water-level hydrographs for Wells No. 19, 21, and 24 and other evidence.

Shallow Monitor Wells

A water-level hydrograph for Well No. 22 is provided in Figure 13. Pumpage of nearby Well No. 15 is also plotted on this figure. The water level in Well No. 22 is not related to pumpage of Well No. 15, which taps groundwater in the deeper consolidated rock.

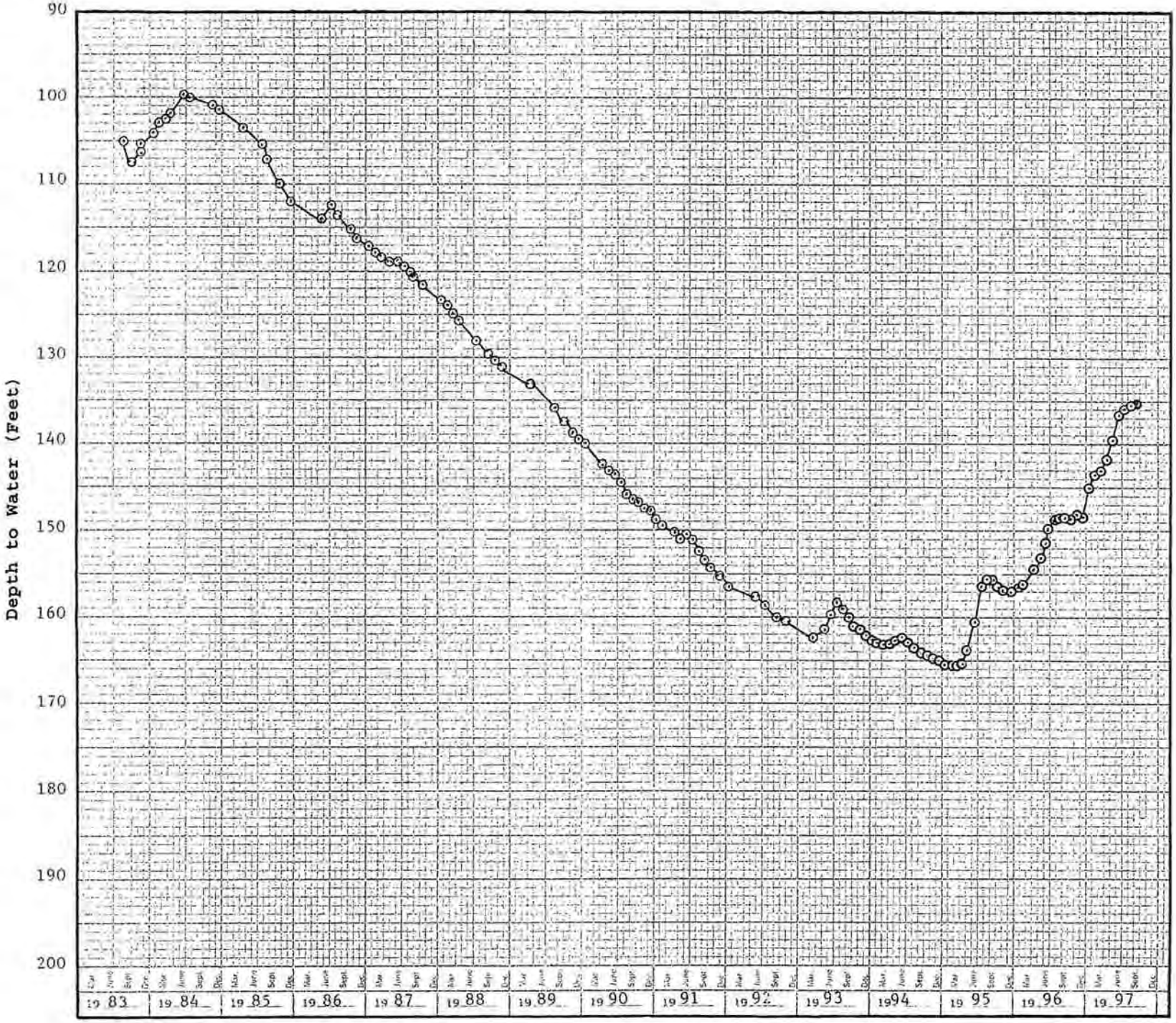


FIGURE 12 - WATER-LEVEL HYDROGRAPH FOR SC-2

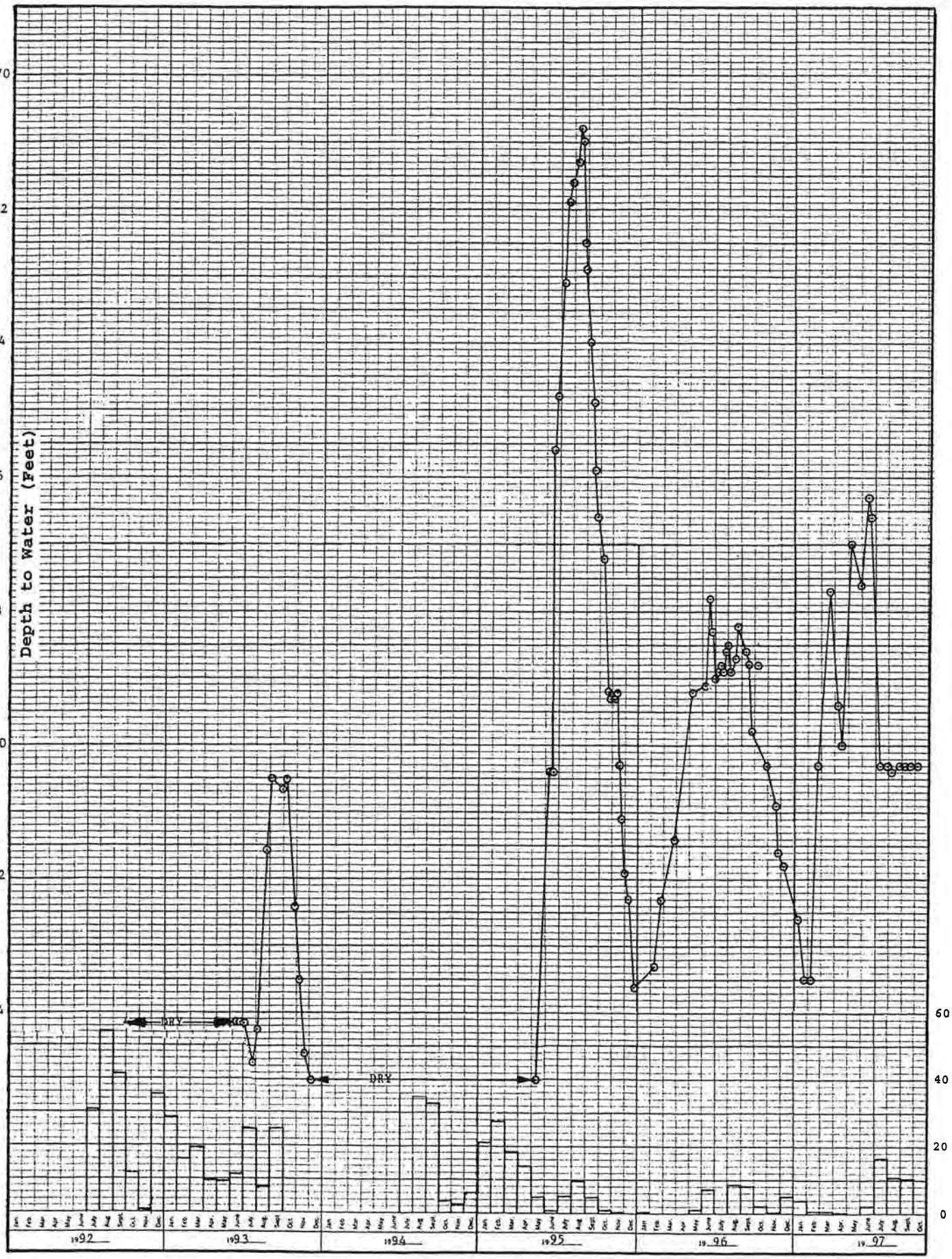


FIGURE 13 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 22
AND PUMPAGE FOR WELL NO. 15

The water level in this well responds primarily due to recharge from Mammoth Creek streamflow (Figure 14). Well No. 22 was dry until June 17, 1993 and during 1994-early 1995. There has been water in the well continuously since June 1995. Depth to water in this well rose about 12 feet during May-July, 1995, due to recharge corresponding to high flows (exceeding 40 cfs) in Mammoth Creek. In 1996 and 1997, the water level in Well No. 22 also followed the pattern of streamflow in Mammoth Creek. In June 1997, depth to water in this well was about 76 feet, the shallowest level to date, except during 1995.

A water-level hydrograph based on manual measurements for Well No. 23 and pumpage for nearby Well No. 1 are shown in Figure 15. Depth to water in Well No. 23 has ranged from about 5 to 16 feet during the period of record. The shallowest water levels were in the spring and early summer of 1993, 1995, and 1996. Depth to water in this well is not influenced by pumpage of Well No. 1, which taps groundwater in the deeper consolidated rock. Well No. 23 is located relatively close to Mammoth Creek and is clearly influenced by recharge from streamflow (Figure 16), and possibly from other local sources of recharge. On August 1, 1996, a float-type continuous water-level recorder was installed in Well No. 23. Some problems were experienced with this recorder, but reliable measurements were obtained during 1997. A detailed hydrograph for Well No. 23 is provided in Appendix D.

Water-level hydrographs for the remaining shallow monitor

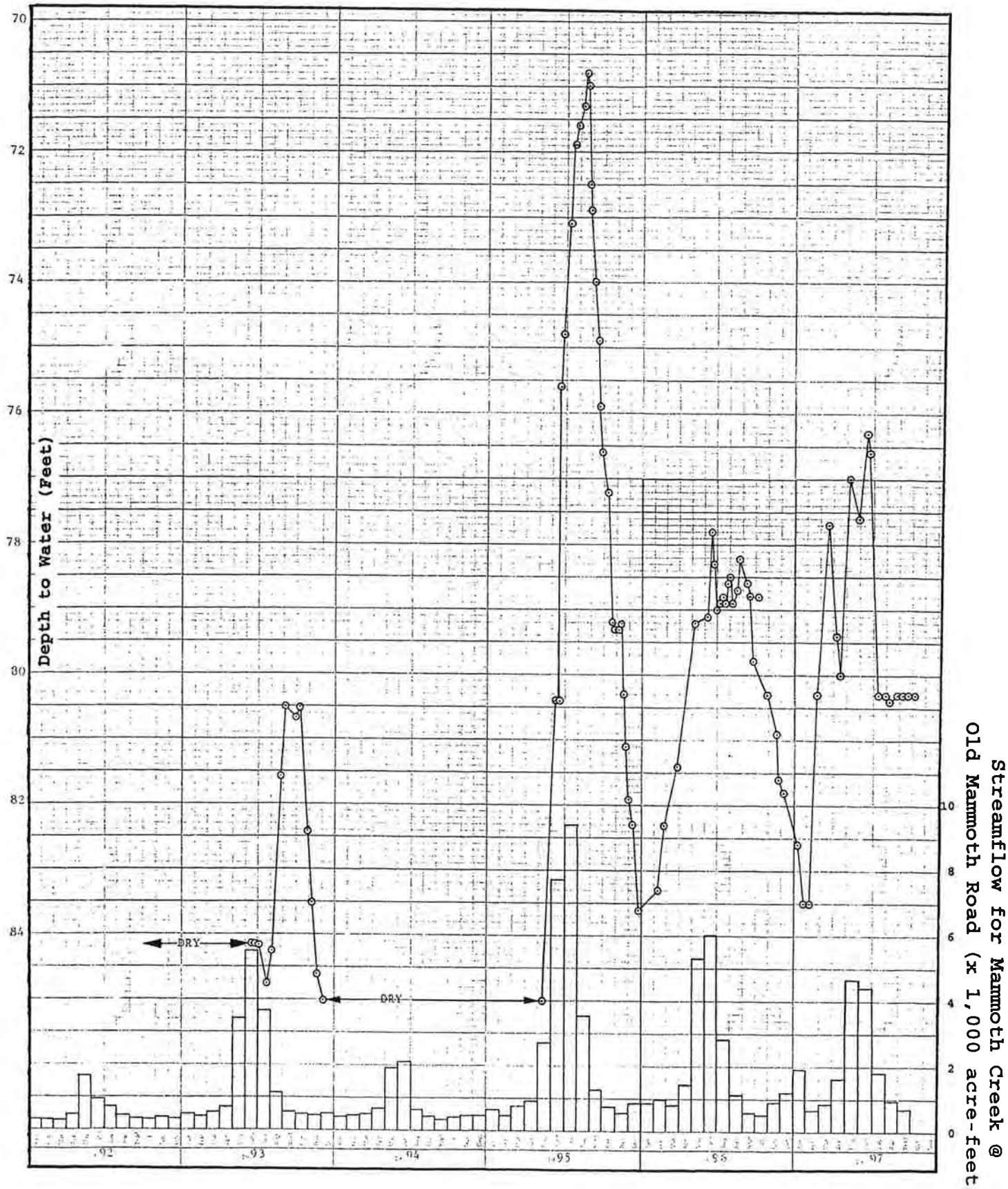


FIGURE 14 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 22 AND MAMMOTH CREEK STREAMFLOW

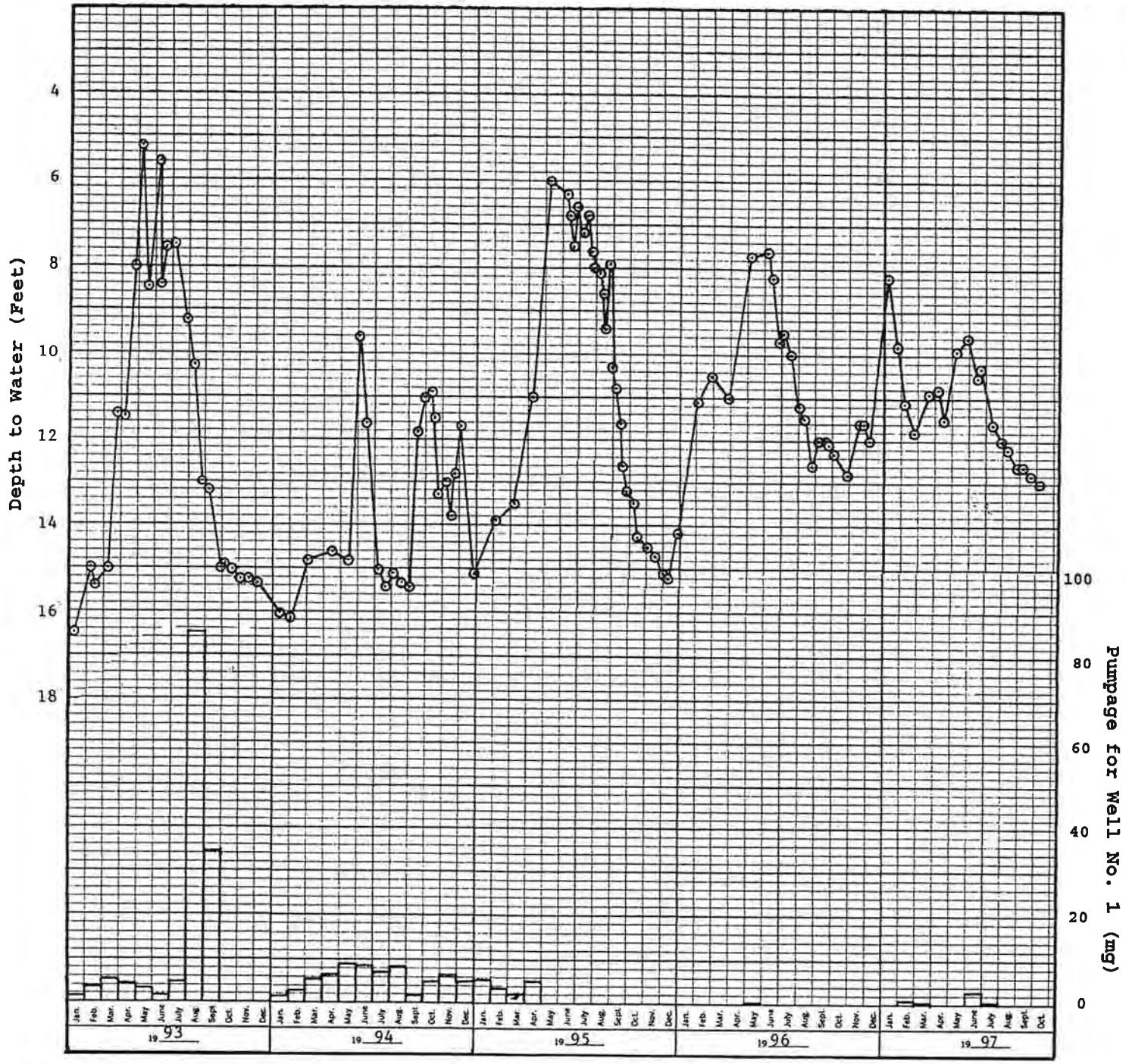


FIGURE 15 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 23 AND PUMPAGE FOR WELL NO. 1

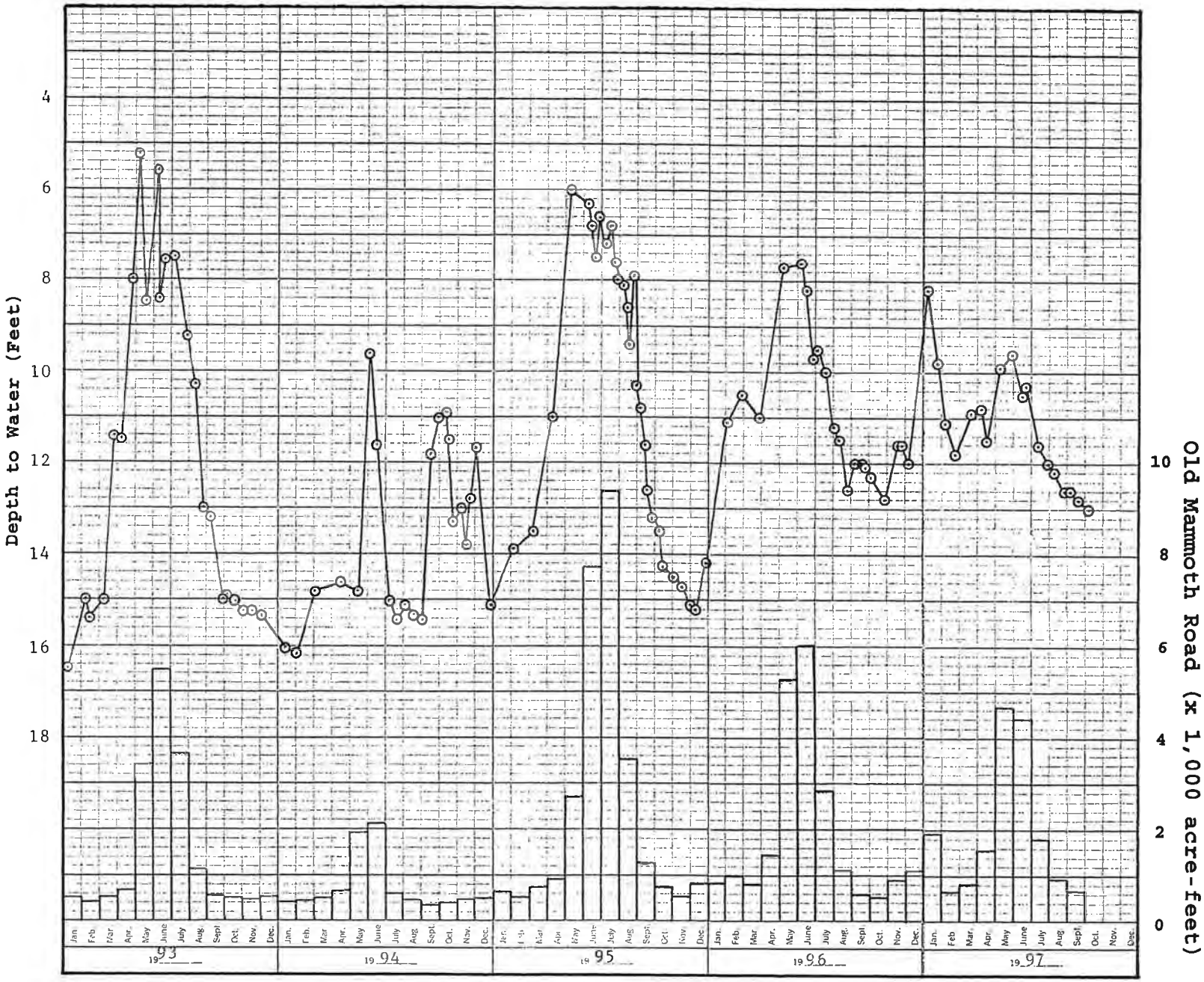


FIGURE 16 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 23 AND MAMMOTH CREEK STREAMFLOW

wells are provided in Appendix D. Well No. 4M is located in the meadow area east of District Wells No. 6 and 10. The water level in this well rose significantly after early 1995 due to significant surface water flow in the meadow. Depth to water fluctuations in this well have followed patterns of Bodle Ditch flows, rising during periods when flows are present in the ditch. In early 1997, the water levels in this well were the shallowest since 1988.

Well No. 5M taps the shallow volcanic rock, and no water was observed in the overlying glacial till at the time of drilling of this well. Depth to water in Well No. 5M has ranged from about 2.5 to 9 feet. The shallowest levels have been in the spring and early summer, and the deepest in the summer. In September 1997, depth to water in this well was about the same as in September 1994.

Well No. 10M was dry from October 1992 through June 10, 1993. Some water appeared in this well during June 17-August 19, 1993, and during June 6-June 20, 1996. The well was otherwise dry from late 1992 through December 4, 1996. In 1997, there was water in Well No. 10M from January 9-June 19, July 24-30, and September 11-30. This well is adjacent to District Well No. 10, and the water level in Well No. 10M is primarily influenced by pumping of this well and also by local recharge.

Well No. 11M is located in the southwest part of the meadow area near the Bodle Ditch. Water levels in this well have seasonal fluctuations, corresponding to flows in the ditch. The shallowest water levels have generally been in June-July. Water levels

gradually declined during 1989-92, but rose significantly after 1992. In 1996, the water level began to rise significantly in April, and the shallowest level yet measured (about four feet deep) was in June. In 1996-97, water levels were shallower than for any previous year.

Well No. 12M is located in the western part of the meadow area. The water level in this well has responded significantly to a number of recharge events. In 1996, the water level in this well began to rise significantly in April, and reached the shallowest level of record in June. In late 1996 and 1997, water levels were shallower than for any previous year. The water levels in all four of the shallow wells referenced thus respond significantly to recharge, often associated with flow of nearby surface water.

Water-Level Elevation Contours

Figure 17 shows water-level elevation contours for mid-September 1997. The hydrologic boundary is shown north of Wells No. 1 and 5A and south of Wells No. 16, 17, and 20. This boundary is believed to be present only west of a line connecting Wells No. 14M and 21. A cone of depression was evident due to pumping of District Wells No. 10 and 15. This cone of depression did not extend east of Well No. 19. The overall direction of groundwater flow in September 1997 was similar to that shown in the previous annual reports. This map shows only the horizontal component of groundwater flow in the basalt and interbedded glacial till. Other

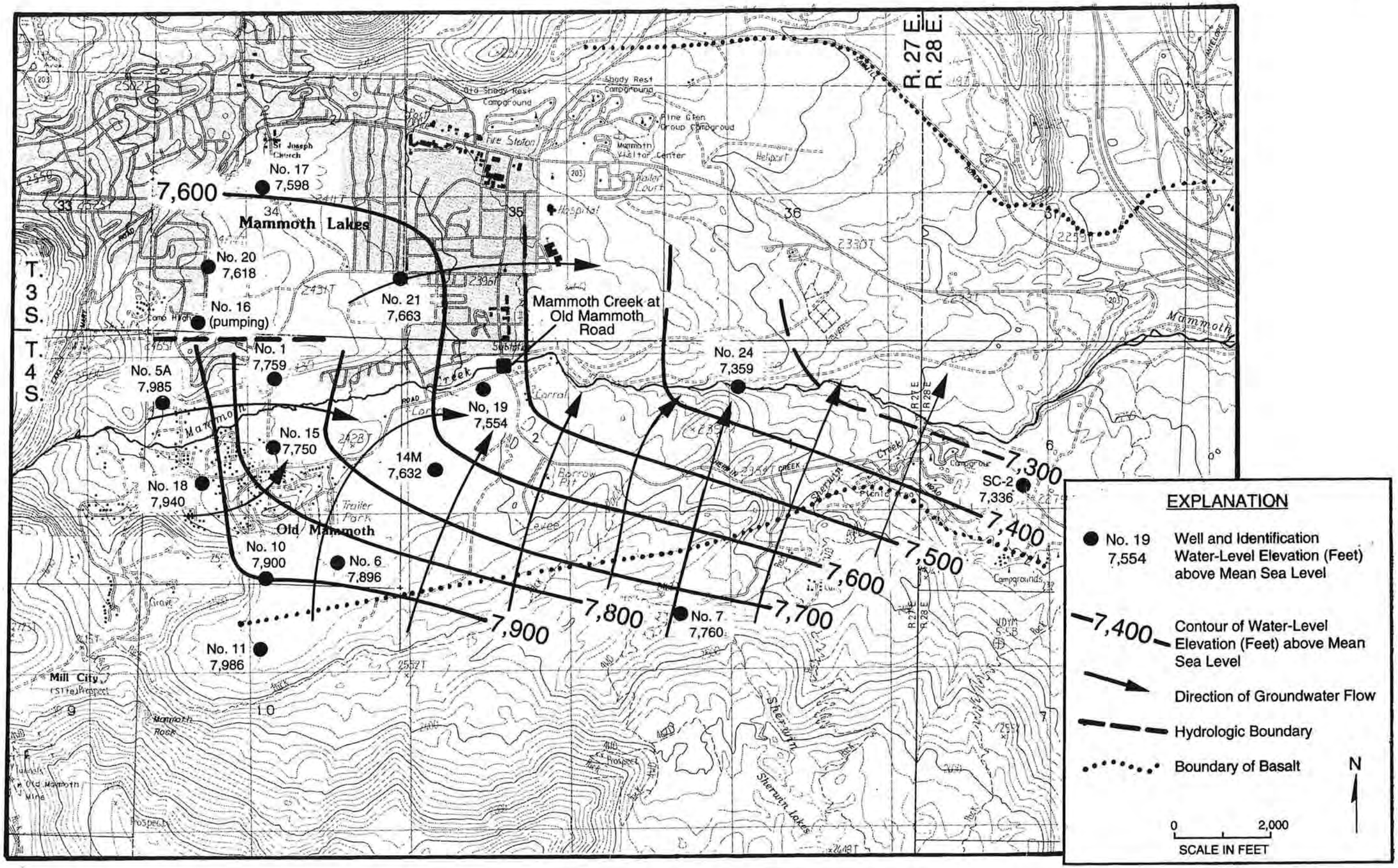


FIGURE 17 - WATER-LEVEL ELEVATIONS IN MID-SEPTEMBER 1997

evidence (i.e., water levels in SC-1 and SC-2) indicates that there is also significant downward flow of groundwater in the area.

WELL NO. 15 AQUIFER TEST

A 31-hour aquifer test was conducted on Well No. 15 by Mammoth CWD personnel on October 22-23, 1997. The methodology for this followed that proposed by Chris Farrar. Appendix E contains measurements for the test. Well No. 15 was kept idle from October 13-21, 1997. Daily water-level measurements prior to pumping were available from October 14 to 22 for all District wells except No. 6 and 11, which were flowing. Pumping of Well No. 15 began at 9:10 AM on October 22 and ended at 4:00 PM on October 23. The average pumping rate for Well No. 15 during the test was 1,090 gpm. The pump test could not be extended longer due to operational constraints. The static level in Well No. 15 was 183.1 feet below the measuring point prior to pumping. At the end of the pumping period, depth to water in Well No. 15 was 202.3 feet, and the drawdown was 19.2 feet. The specific capacity was thus 56.8 gpm per foot. Water levels in the other monitored wells were measured at least hourly after pumping of Well No. 15 began. The closest hardrock wells to Well No. 15 are No. 1, No. 18, No. 6, and 10. Shallow monitor well No. 22 is adjacent to Well No. 15.

For wells No. 6, 10, and 18, the average antecedent water-level trend was an average daily rise of about 0.04 to 0.06 foot. During the first six hours of pumping, the water levels in Wells

No. 1 and 18 rose about 0.1 foot, or at a rate greater than that for the antecedent rise. The water level in Well No. 10 did not change during pumping of Well No. 15. For Well No. 22, the antecedent water-level trend was a constant water level, and there was no water-level change in this well during pumping of Well No. 15.

Measurements of Valentine Reserve springflow indicated a background trend of rising springflow after October 14, 1997. The springflow increased about one cfs after pumping of Well No. 15 commenced. Mammoth Creek streamflow was slightly declining prior to pumping for the Well No. 15 test, and this trend continued during the test. There was no decrease in streamflow or springflow during pumping, and no drawdown in water levels in other wells due to pumping of Well No. 15. Thus the results of this short term test confirm the results of the Summer 1993 aquifer test on Well No. 15 (Kenneth D. Schmidt and Associates (1993).

CHEMICAL QUALITY AND TEMPERATURE OF GROUNDWATER

The results of chemical analyses and temperatures of water for the supply wells and monitor wells during the 1997 water year are provided in Appendix F. The analyses are for water samples collected from the wells in September 1997. Most of the deep monitor wells were not sampled, because transducers had been installed in the wells to continuously measure water levels. The coldest water (53°F or less) has normally been from shallow monitor

wells in the meadow area and in water from the supply wells tapping consolidated rock, south of the hydrologic boundary. In contrast, the warmest water (60°F or greater) normally has been from the wells tapping consolidated rock, north of the hydrologic boundary, closer to the known area of relatively shallow geothermal water in Mammoth Lakes. The lowest electrical conductivity values (less than 200 micromhos per centimeter at 25°C) have normally been for shallow monitor wells and Well No. 11. The highest values (greater than 430 micromhos) have been for wells tapping the consolidated rock in the western part of the area. There is no evidence of significant changes in chemical quality or temperature of well water during water year 1997, compared to previous information in the earlier annual reports.

MAMMOTH CREEK STREAMFLOW

Records of streamflow at the outlet from Twin Lakes and the Old Mammoth Road crossing during the 1997 water year are provided in Appendix G. The mean monthly flow at the Old Mammoth Road crossing ranged from 8.3 cfs in October 1996 to about 75 cfs in May 1997. In 1997, the flow at the Old Mammoth Road crossing began to rise significantly in late April, and the highest flows were during May 11-25 and May 29-June 7.

Average daily flows are plotted in Appendix G for both stations for each month during the 1997 water year, except for May and June. During these two months, flow at the Twin Lakes outlet

exceeded the accurate measuring capability of the gage. A comparison of these daily flows indicates that the streamflow at the Old Mammoth Road crossing normally equaled or exceeded that of the Twin Lakes outflow. During most periods, the flow was greater at the downstream station, by from about several cfs to up to 10 cfs. This downstream increase in flow is attributed to inflow from ungaged tributaries below the Twin Lakes outlet and possibly some groundwater flow. Such groundwater flow could enter Mammoth Creek locally from unconsolidated deposits. Historical records indicate that during the summers of drought years, there was little difference in streamflow between the two stations. There has never been a significant downstream decrease in streamflow between the two stations. This information indicates that pumpage of District wells did not influence Mammoth Creek streamflow during the 1997 water year.

VALENTINE RESERVE SPRINGFLOW

Rates of flow of the main spring at the University of California Eastern Sierra Valentine Reserve are provided in Appendix H. Figure 18 shows the variations in springflow during May 30-September 30, 1997, except for late May and early June, when no record was obtained. Pumpage from the closest District Wells (No. 15, 16, 18, and 20) that were pumped during this period is also shown in this figure. Wells No. 15 and 20 were pumped primarily during July-September, Well No. 16 was pumped primarily

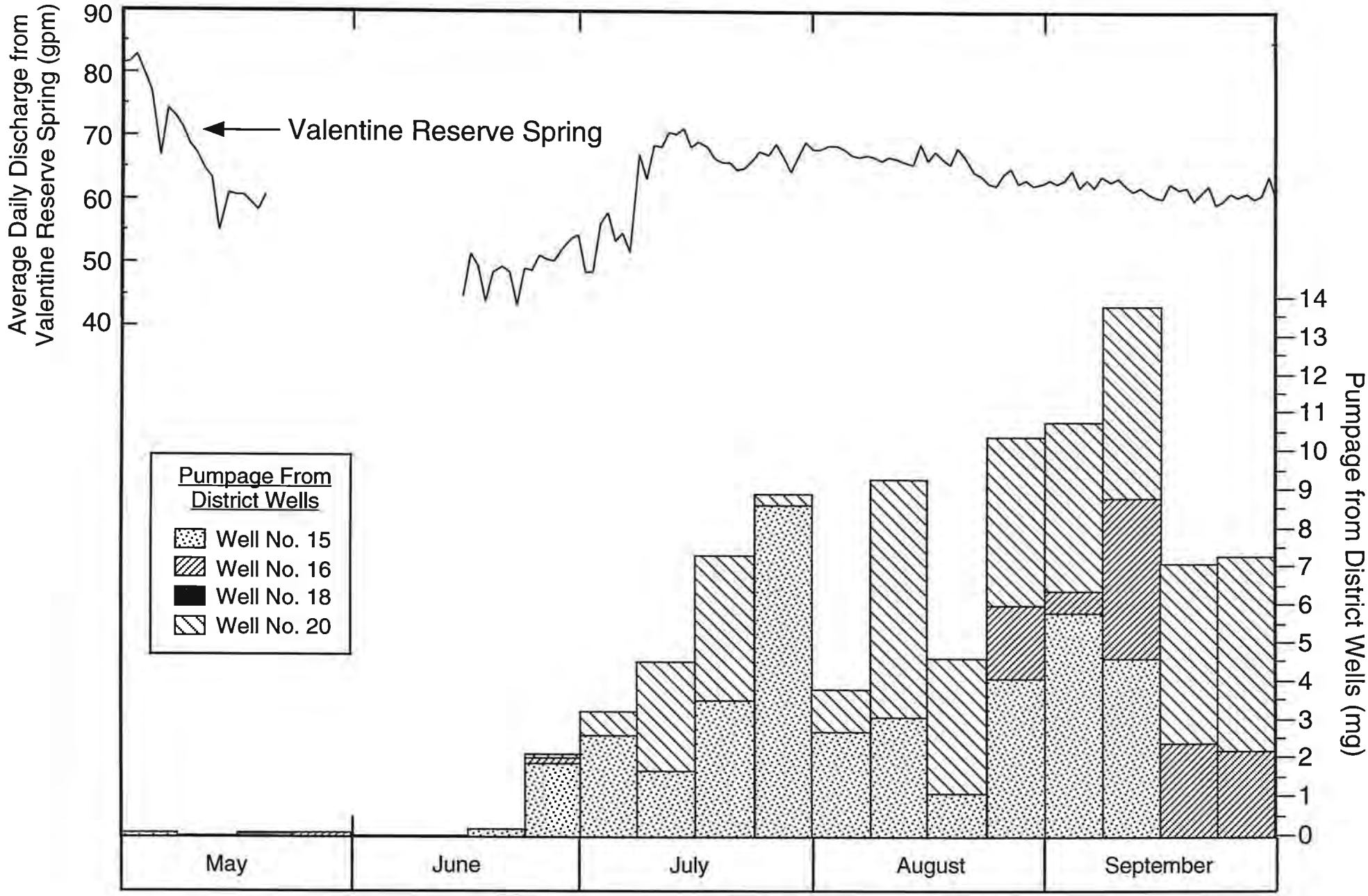


FIGURE 18 - FLOW FROM VALENTINE RESERVE SPRING AND DISTRICT WELL PUMPAGE (1997)

in September, and Well No. 18 was not pumped significantly during the 1997 water year. Careful examination of Figure 18 indicates that the variation in total pumpage from Wells No. 15, 16, and 20 (the closest new District supply wells that were pumping) does not correlate with the springflow. In addition, pumpage of the individual wells does not correlate with springflow. There was an increase in springflow in early July, and there was a slight reduction in springflow from mid-July through the end of September.

Springflow measurements for the four-year period of record (Figure 19) indicate that the pattern of springflow is related to runoff. For 1993-96, springflow was lowest in July or August, and then increased near the end of the water year. This could have been due to lower air temperatures, which would result in decreased evapotranspiration of water by plants in the area. Another possible factor is increased runoff from higher land on Mammoth Mountain. In 1997 the lowest springflows were apparently in June, and flow increased in early July. There was no noticeable impact of District pumping during the 1997 water year on springflow at the Valentine Reserve. This is consistent with monitoring results during the previous years.

DATA EVALUATION AND INTERPRETATION

Water-level hydrographs for most of the monitor wells tapping the uppermost glacial till strata and consolidated rock in and near the District well field indicate relatively constant or rising

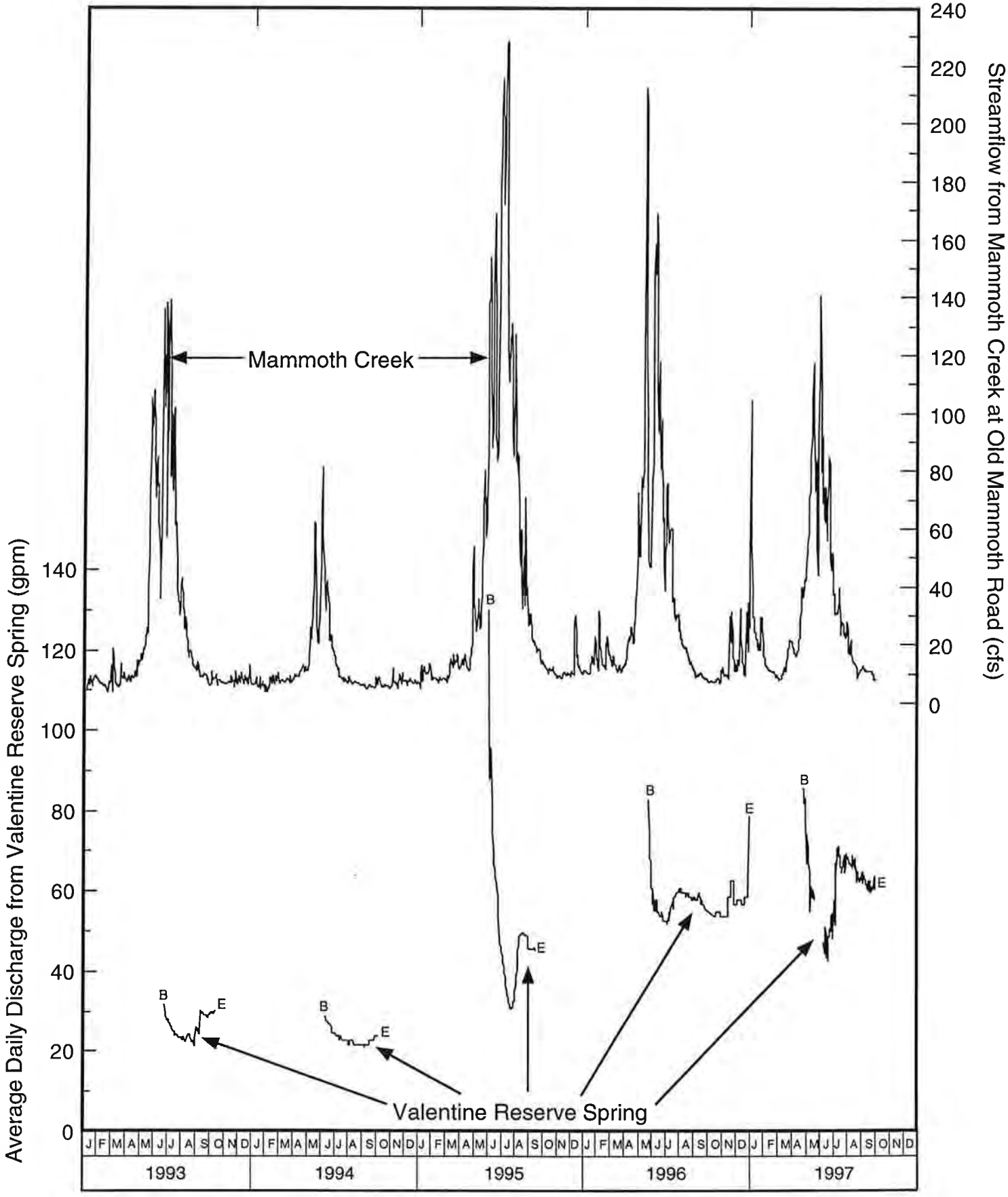


FIGURE 19 - FLOW FOR VALENTINE SPRING AND MAMMOTH CREEK STREAMFLOW (1993-1997)

water levels during the 1997 water year. Substantial recharge was indicated during the 1995-97 water years, coincident with substantial runoff in the Mammoth Creek watershed. This recharge is indicated to have been more than in the 1993 or 1994 water years, by the larger water-level responses in the monitor wells during 1995-1997 compared to previously. Water-level hydrographs for Wells No. 7, 21, 24, and SC-1, east of the District well field, also indicate substantial rises. Recharge was indicated to be the primary factor influencing water-level trends, except for some active District supply wells. Significant water-level declines due to pumping have only been observed in or near the pumped wells themselves.

The water-level elevation contour map for September 1997 confirms that the cone of depression due to pumping of District wells is localized, and does not extend east to Well No. 24. Because the water levels in the consolidated rock in the well field are well below the channel of Mammoth Creek, there is no apparent impact of District pumping on streamflow. This was confirmed by the Mammoth Creek streamflow measurements upstream and downstream of the well field. Water levels in the most westerly deep wells (No. 5A, 16, 18, and 20) that are closest to the Valentine Reserve were relatively stable or rose during the 1997 water year. Springflow measurements at the Valentine Reserve indicate much larger flow during 1996-97 than in 1993-94, due to higher runoff during the later period. There has been no impact on flow of the

springs at the Valentine Reserve or on the flow of the Hot Creek headsprings due to pumping of the District supply wells.

REFERENCES

Kenneth D. Schmidt and Associates, "Results of Summer 1993 Aquifer Test, Mammoth County Water District Well No. 15", November 9, 1993, 22 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth County Water District Groundwater Monitoring Program for October 1992-September 1993", December 13, 1993, 30 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth Community Water District Groundwater Monitoring Program for October 1993-September 1994, December 14, 1994, 34 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth Community Water District Groundwater Monitoring Program for October 1994-September 1995, December 11, 1995, 41 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth Community Water District Groundwater Monitoring Program for October 1995-September 1996, December 12, 1996, 43p.

APPENDIX A

PUMPAGE AND WATER-LEVEL DATA FOR DISTRICT SUPPLY WELLS

MAMMOTH COMMUNITY WATER DISTRICT PRODUCTION WELL LEVEL DATA (OCT/1996-SEP/1997)

	WELL 1		WELL 6		WELL 10		WELL 15	
	Static	Pumping	Static	Pumping	Static	Pumping	Static	Pumping
Date	Level	Level	Level	Level	Level	Level	Level	Level
10/1/96	-179.45		-16.17			-122.23	-200.92	
10/7/96	-179.27		-17.67			-124.52	-201.52	
10/15/96	-178.22		-13.25		-38.98			-216.72
10/23/96	-178.44		-14.16		-40.91		-199.42	
10/28/96	-178.49		-11.75		-32.33		-199.62	
11/7/96	-178.21				-31.97		-197.88	
11/14/96	-177.64				-31.44		-196.92	
11/20/96	-177.34				-28.81		-195.56	
11/27/96	-176.98				-27.23		-197.47	
12/4/96	-176.26				-27.77		-194.03	
12/13/96	-175.98				-26.72		-193.97	
12/20/96	-174.56				-25.48		-193.32	
12/27/96	-174.21					-96.30	-193.55	
1/9/97	-173.15				-23.38		-193.04	
1/17/97	-171.86				-18.30		-191.55	
1/23/97	-171.52				-18.47		-191.03	
2/3/97	-171.76				-15.84		-190.42	
2/12/97	-170.91		-11.23		-19.53		-188.67	
2/26/97	-171.84		-11.05		-18.92		-187.01	
3/19/97	-171.46		-8.23		-20.75		-185.03	
4/3/97	-169.17		-8.94		-19.00		-183.25	
4/16/97	-168.84		-10.17		-20.58		-181.76	
5/9/97	-167.67		-6.84		-19.17		-179.94	
5/16/97	-166.52		-7.89		-20.05		-178.89	
5/30/97	-165.44		-8.42		-22.69		-177.67	
6/13/97	-166.26		-12.98		-19.88		-174.03	
6/19/97	-165.31		-14.03		-20.23		-176.02	
7/10/97	-165.42		-1.77		-31.09		-177.34	
7/18/97	-165.25		-6.69		-32.33		-178.16	
7/24/97	-165.56		-0.52		-28.31		-180.94	
7/30/97	-165.97		-2.27		-25.48		-188.55	
8/8/97	-166.56			-92.20		-89.11	-185.47	
8/15/97	-167.26		-0.36		-29.88		-185.48	
8/21/97	-167.51			-37.59		-87.53	-183.67	
8/28/97	-167.34		-4.75			-83.50		-199.03
9/4/97	-168.04		-0.72		-29.88		-188.56	
9/11/97	-168.52		-0.52			-71.58		-201.22
9/19/97	-168.86		-0.52		-27.77		-187.71	
10/2/97	-169.25		-2.09		-25.83			-201.51
Total								
Mean	**-171.34**	**#DIV/0!**	**-7.72**	**-64.90**	**-25.59**	**-96.40**	**-188.52**	**-204.62**
Max	**-179.45**	**0**	**-17.67**	**-92.2**	**-40.91**	**-124.52**	**-201.52**	**-216.72**
Min	**-165.25**	**0**	**-0.36**	**-37.59**	**-15.84**	**-71.58**	**-174.03**	**-199.03**

MAMMOTH COMMUNITY WATER DISTRICT PRODUCTION WELL LEVEL DATA (OCT/1996-SEP/1997)

	WELL 16		WELL 17		WELL 18		WELL 20	
	Static	Pumping	Static	Pumping	Static	Pumping	Static	Pumping
Date	Level	Level	Level	Level	Level	Level	Level	Level
10/1/96	-466.19		-377.86		-63.46		-415.31	
10/7/96	-466.59		-377.89		-64.24		-415.31	
10/15/96	-466.38		-378.16		-64.97		-413.06	
10/23/96	-466.19		-377.16		-64.76		-412.84	
10/28/96	-466.38		-377.56		-64.96		-412.44	
11/7/96	-466.19		-377.44		-64.18		-411.41	
11/14/96	-466.19		-377.23		-63.55		-411.03	
11/20/96	-466.19		-377.09		-62.93		-411.22	
11/27/96	-466.19		-376.67		-62.17		-411.00	
12/4/96	-465.97		-382.54		-61.88		-410.59	
12/13/96	-466.38		-379.13		-61.23		-410.59	
12/20/96	-465.97		-377.98		-60.61		-410.78	
12/27/96	-465.97		-376.01		-60.14		-410.19	
1/9/97	-465.75		-375.87		-60.01		-409.97	
1/17/97	-466.19		-376.02		-58.67		-409.68	
1/23/97	-465.97		-375.07		-57.34		-409.56	
2/3/97	-465.75		-375.05		-56.26		-409.34	
2/12/97	-465.97		-375.16		-55.69		-409.16	
2/26/97	-465.56		-374.16		-55.33		-408.94	
3/19/97	-466.38		-374.08		-55.25		-408.94	
4/3/97	-466.59		-374.01		-54.45		-408.31	
4/16/97	-466.81		-378.01		-54.26		-408.31	
5/9/97	-466.59		-382.12		-53.65		-407.91	
5/16/97	-466.59		-381.46		-52.84		-406.47	
5/30/97	-466.81				-53.16		-405.25	
6/13/97	-466.19		-381.08		-53.01		-405.84	
6/19/97	-466.81		-385.75		-53.45		-406.28	
7/10/97	-466.38		-375.03		-54.86			-428.91
7/18/97	-466.59		-371.31		-55.85			-428.91
7/24/97	-466.81		-370.93		-56.52		-411.62	
7/30/97	-466.81		-371.22		-56.51		-410.38	
8/8/97	-466.81			-374.26	-56.56		-411.22	
8/15/97	-467.22		-371.16		-57.23			-428.91
8/21/97	-467.41			-374.36	-58.01		-415.31	
8/28/97		-471.75	-371.46		-58.36		-419.03	
9/4/97		-471.75		-374.46	-59.08		-417.59	
9/11/97		-479.19	-370.73		-58.69			-456.21
9/19/97		-479.19	-370.52		-58.87		-421.25	
10/2/97		-479.81	-370.29		-58.91			-483.86
Total								
Mean	-466.38	-476.34	-376.09	-374.36	-58.51		-411.06	-445.36
Max	-467.41	-479.81	-385.75	-374.46	-64.97		-421.25	-483.86
Min	-465.56	-471.75	-370.29	-374.26	-52.84		-405.25	-428.91

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 1
(FLOW IN MILLION GALLONS)

	1996			1997											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.150	0.000	0.000			
2	0.000	0.000	0.000	0.000	0.000	0.074	0.000	0.000	0.000	0.169	0.000	0.000			
3	0.000	0.000	0.000	0.000	0.224	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.000	0.000			
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
9	0.000	0.000	0.000	0.000	0.000	0.050	0.000	0.000	0.000	0.000	0.000	0.000			
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.129	0.000	0.000			
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.518	0.000	0.000			
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.422	0.000	0.000			
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.092	0.000	0.000			
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
16	0.000	0.000	0.000	0.007	0.107	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
17	0.000	0.000	0.000	0.000	0.156	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
21	0.000	0.000	0.000	0.000	0.163	0.000	0.000	0.000	0.510	0.000	0.000	0.000			
22	0.000	0.000	0.000	0.000	0.209	0.000	0.000	0.000	0.524	0.000	0.000	0.000			
23	0.000	0.000	0.000	0.000	0.078	0.024	0.000	0.000	0.068	0.000	0.000	0.000			
24	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000			
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.318	0.000	0.000	0.000			
29	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.072	0.000	0.000	0.000			
30	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.114	0.000	0.000	0.000			
31	0.000		0.000	0.000		0.002		0.000		0.000	0.000				
TOTAL	0.000	0.000	0.000	0.007	0.937	0.153	0.000	0.000	2.767	0.346	0.000	0.003	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.033	0.005	0.000	0.000	0.092	0.011	0.000	0.000	#DIV/0!	#DIV/0!	#DIV/0!
MAX	0.000	0.000	0.000	0.007	0.224	0.074	0.000	0.000	0.524	0.169	0.000	0.003	0.000	0.000	0.000
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AC-FT	0	0.0	0.0	0.0	2.9	0.5	0.0	0.0	8.5	1.1	0.0	0.0	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			12.9		TOTAL AC-FT JAN THRU DEC:										

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 6
(FLOW IN MILLION GALLONS)

	1996			1997											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.000	0.000	0.000	0.000	0.000	0.000	0.280	0.260	0.296	0.420	0.616	0.000			
2	0.000	0.000	0.000	0.000	0.000	0.000	0.296	0.152	0.332	0.392	0.588	0.000			
3	0.000	0.000	0.000	0.000	0.000	0.000	0.276	0.164	0.316	0.696	0.600	0.000			
4	0.000	0.000	0.000	0.000	0.012	0.000	0.312	0.132	0.284	0.844	0.600	0.000			
5	0.000	0.000	0.000	0.000	0.052	0.000	0.340	0.144	0.020	0.796	0.652	0.000			
6	0.000	0.000	0.000	0.000	0.000	0.000	0.320	0.224	0.088	0.796	0.644	0.000			
7	0.000	0.000	0.000	0.000	0.000	0.000	0.052	0.228	0.156	0.708	0.500	0.000			
8	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.212	0.240	0.688	0.600	0.000			
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.200	0.236	0.688	0.288	0.000			
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.240	0.236	0.576	0.000	0.000			
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.180	0.200	0.404	0.000	0.000			
12	0.000	0.000	0.000	0.000	0.040	0.000	0.000	0.160	0.032	0.536	0.000	0.000			
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.164	0.048	0.524	0.000	0.000			
14	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.160	0.000	0.516	0.360	0.000			
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.244	0.000	0.424	0.468	0.000			
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.208	0.000	0.592	0.452	0.000			
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.244	0.156	0.624	0.508	0.000			
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.132	0.132	0.416	0.420	0.000			
19	0.000	0.000	0.000	0.000	0.000	0.296	0.000	0.156	0.236	0.620	0.444	0.000			
20	0.000	0.000	0.000	0.000	0.000	0.280	0.000	0.160	0.196	0.628	0.412	0.000			
21	0.000	0.000	0.000	0.000	0.000	0.296	0.000	0.160	0.308	0.516	0.416	0.000			
22	0.000	0.000	0.000	0.000	0.000	0.264	0.328	0.172	0.324	0.596	0.420	0.000			
23	0.000	0.000	0.000	0.000	0.000	0.256	0.296	0.136	0.272	0.032	0.420	0.000			
24	0.000	0.000	0.000	0.000	0.000	0.260	0.300	0.132	0.384	0.000	0.456	0.000			
25	0.000	0.000	0.000	0.000	0.000	0.368	0.176	0.136	0.428	0.412	0.416	0.000			
26	0.000	0.000	0.000	0.000	0.000	0.264	0.176	0.240	0.444	0.396	0.440	0.000			
27	0.000	0.000	0.000	0.000	0.000	0.260	0.132	0.256	0.516	0.412	0.352	0.000			
28	0.000	0.000	0.000	0.000	0.000	0.408	0.148	0.216	0.444	0.052	0.000	0.000			
29	0.000	0.000	0.000	0.000		0.388	0.152	0.192	0.404	0.000	0.000	0.000			
30	0.000	0.000	0.000	0.000		0.404	0.184	0.236	0.432	0.000	0.000	0.000			
31	0.000		0.000	0.000		0.356		0.300		0.080	0.000				
TOTAL	0.000	0.000	0.000	0.000	0.108	4.100	3.792	5.940	7.160	14.384	11.072	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.004	0.132	0.126	0.192	0.239	0.464	0.357	0.000	#DIV/0!	#DIV/0!	#DIV/0!
MAX	0.000	0.000	0.000	0.000	0.052	0.408	0.340	0.300	0.516	0.844	0.652	0.000	0.000	0.000	0.000
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.132	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AC-FT	0.0	0.0	0.0	0.0	0.3	12.6	11.6	18.2	22.0	44.1	34.0	0.0	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			142.9		TOTAL AC-FT JAN THRU DEC:										

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 10
(FLOW IN MILLION GALLONS)

	1996			1997											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1.080	0.000	0.640	0.864	0.448	0.320	0.128	0.064	0.704	0.896	1.024	0.640			
2	1.152	0.000	0.384	0.832	0.448	0.000	0.064	0.256	0.704	0.832	1.088	0.000			
3	1.000	0.000	0.192	1.088	0.448	0.384	0.128	0.192	0.704	1.024	1.088	0.000			
4	1.024	0.000	0.256	0.384	0.448	0.320	0.128	0.256	0.384	1.152	1.088	0.000			
5	1.152	0.832	0.192	0.320	0.384	0.384	0.128	0.320	0.000	1.024	1.024	0.000			
6	1.088	0.320	0.256	0.192	0.384	0.384	0.064	0.320	0.128	1.152	1.088	0.000			
7	1.024	0.512	0.256	0.256	0.384	0.384	0.384	0.320	0.128	1.024	0.768	0.000			
8	1.152	0.000	0.256	0.256	0.384	0.384	0.448	0.384	0.576	1.152	0.960	0.768			
9	1.024	0.000	0.256	0.320	0.320	0.384	0.384	0.384	0.448	1.088	1.024	0.064			
10	1.152	0.000	0.256	0.320	0.320	0.448	0.384	0.512	0.256	0.768	0.832	0.064			
11	1.088	0.000	0.192	0.384	0.384	0.448	0.384	0.320	0.192	0.576	0.832	0.704			
12	1.088	0.000	0.320	0.384	0.384	0.384	0.448	0.320	0.000	0.768	0.704	0.768			
13	1.152	0.896	0.256	0.384	0.384	0.320	0.384	0.320	0.000	0.768	0.704	0.768			
14	0.000	0.320	0.256	0.320	0.640	0.448	0.384	0.320	0.000	0.704	0.640	0.768			
15	0.000	0.320	0.256	0.320	0.640	0.384	0.320	0.576	0.000	0.576	1.088	0.768			
16	0.000	0.320	0.192	0.512	0.704	0.320	0.256	0.448	0.000	0.768	0.960	0.192			
17	1.024	0.256	0.256	0.384	0.768	0.384	0.384	0.576	0.256	0.768	1.024	0.000			
18	1.152	0.320	0.320	0.000	0.256	0.320	0.320	0.320	0.320	0.448	0.960	0.000			
19	0.896	0.192	0.000	0.512	0.256	0.000	0.384	0.320	0.512	0.768	0.960	0.000			
20	1.024	0.320	0.320	0.448	0.256	0.000	0.384	0.320	0.384	0.832	1.024	0.000			
21	0.960	0.192	0.480	0.320	0.256	0.000	0.320	0.384	0.576	0.576	0.960	0.000			
22	0.896	0.192	0.480	0.256	0.256	0.000	0.000	0.256	0.512	0.640	0.832	0.000			
23	0.896	0.192	0.512	0.064	0.256	0.000	0.000	0.320	0.448	0.128	0.896	0.000			
24	0.000	0.192	0.960	0.000	0.256	0.000	0.000	0.320	0.896	0.000	0.960	0.000			
25	0.000	0.320	0.896	0.000	0.256	0.128	0.192	0.320	0.832	0.000	0.896	0.000			
26	0.000	0.256	0.960	0.000	0.256	0.128	0.192	0.384	0.704	0.000	0.832	0.000			
27	0.000	0.256	0.896	0.064	0.320	0.064	0.256	0.576	0.960	0.000	0.832	0.000			
28	0.000	0.512	0.896	0.128	0.384	0.192	0.128	0.512	0.896	0.000	0.704	0.000			
29	0.000	0.576	0.896	0.448		0.192	0.256	0.384	0.768	0.000	0.640	0.000			
30	0.000	0.640	0.832	0.448		0.064	0.128	0.576	0.704	0.000	0.704	0.000			
31	0.000		0.864	0.448		0.064		0.576		0.128	0.704				
TOTAL	21.024	7.936	13.984	10.656	10.880	7.232	7.360	11.456	12.992	18.560	27.840	5.504	0.000	0.000	0.000
MEAN	0.678	0.265	0.451	0.344	0.389	0.233	0.245	0.370	0.433	0.599	0.898	0.183	#DIV/0!	#DIV/0!	#DIV/0!
MAX	1.152	0.896	0.960	1.088	0.768	0.448	0.448	0.576	0.960	1.152	1.088	0.768	0.000	0.000	0.000
MIN	0.000	0.000	0.000	0.000	0.256	0.000	0.000	0.064	0.000	0.000	0.640	0.000	0.000	0.000	0.000
AC-FT	64.5	24.4	42.9	32.7	33.4	22.2	22.6	35.2	39.9	57.0	85.4	16.9	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			477.0		TOTAL AC-FT JAN THRU DEC:										

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 15
(FLOW IN MILLION GALLONS)

	1996			1997											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.000	0.000	0.080	0.432	0.000	0.000	0.000	0.000	0.000	0.528	0.360	0.736			
2	0.000	0.000	0.040	0.352	0.000	0.024	0.048	0.000	0.000	0.248	0.352	0.000			
3	0.000	0.000	0.000	0.280	0.000	0.000	0.000	0.000	0.000	0.256	0.472	0.000			
4	0.000	0.000	0.000	0.096	0.000	0.000	0.048	0.000	0.000	0.424	0.440	1.096			
5	0.000	0.000	0.000	0.000	0.016	0.000	0.072	0.000	0.008	0.344	0.360	1.232			
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.344	0.512	1.024			
7	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.072	0.000	0.312	0.128	1.168			
8	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000	0.176	0.048	0.536			
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.360	0.264	0.976			
10	0.000	0.000	0.000	0.064	0.000	0.000	0.000	0.000	0.000	0.080	0.712	1.040			
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.168	0.728	0.568			
12	0.000	0.000	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.160	0.564	0.472			
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.120	0.564	0.448			
14	0.952	0.000	0.000	0.000	0.144	0.000	0.000	0.000	0.000	0.304	0.040	0.496			
15	1.160	0.000	0.000	0.000	0.160	0.000	0.000	0.000	0.000	0.216	0.088	0.424			
16	0.120	0.000	0.000	0.224	0.240	0.000	0.000	0.000	0.000	0.330	0.128	0.200			
17	0.000	0.000	0.000	0.000	0.136	0.000	0.000	0.000	0.000	0.190	0.088	0.000			
18	0.000	0.000	0.000	0.488	0.000	0.040	0.000	0.000	0.000	0.232	0.128	0.000			
19	0.000	0.000	0.000	0.096	0.000	0.080	0.000	0.000	0.000	0.056	0.104	0.000			
20	0.000	0.000	0.248	0.064	0.000	0.040	0.000	0.000	0.000	0.224	0.040	0.000			
21	0.000	0.000	0.380	0.000	0.000	0.080	0.000	0.000	0.000	0.312	0.136	0.000			
22	0.000	0.000	0.380	0.000	0.000	0.096	0.000	0.000	0.000	0.296	0.224	0.000			
23	0.000	0.000	0.352	0.104	0.000	0.072	0.000	0.000	0.176	0.888	0.208	0.000			
24	0.000	0.000	0.496	0.688	0.000	0.080	0.000	0.000	0.296	1.312	0.128	0.000			
25	0.000	0.000	0.344	0.704	0.000	0.008	0.000	0.000	0.336	1.520	0.160	0.000			
26	0.000	0.000	0.392	0.368	0.000	0.000	0.000	0.000	0.248	1.456	0.208	0.000			
27	0.000	0.032	0.488	0.016	0.000	0.000	0.000	0.000	0.184	1.528	0.392	0.000			
28	0.000	0.011	0.448	0.032	0.000	0.000	0.000	0.000	0.216	1.376	0.784	0.000			
29	0.000	0.120	0.520	0.016		0.000	0.000	0.000	0.360	1.384	0.880	0.000			
30	0.000	0.112	0.472	0.000		0.040	0.000	0.000	0.280	1.304	0.832	0.000			
31	0.000		0.432	0.000		0.000		0.000		0.048	0.864				
TOTAL	2.232	0.275	5.072	4.024	0.736	0.560	0.256	0.072	2.104	16.496	10.936	10.416	0.000	0.000	0.000
MEAN	0.072	0.009	0.164	0.130	0.026	0.018	0.009	0.002	0.070	0.532	0.353	0.347	#DIV/0!	#DIV/0!	#DIV/0!
MAX	1.160	0.120	0.520	0.704	0.240	0.096	0.080	0.072	0.360	1.528	0.880	1.232	0.000	0.000	0.000
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.048	0.040	0.000	0.000	0.000	0.000
AC-FT	6.9	0.8	15.6	12.4	2.3	1.7	0.8	0.2	6.5	50.6	33.6	32.0	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			163.2		TOTAL AC-FT JAN THRU DEC:										

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 16
(FLOW IN MILLION GALLONS)

	1996			1997											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013			
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.624			
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.630			
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.598			
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.615			
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.612			
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.587			
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.601			
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.119			
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.437			
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.217			
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.553			
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.237			
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.523			
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.466			
24	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.367			
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.099	0.000	0.000	0.000	0.377			
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.062	0.000	0.016	0.280			
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.571	0.392			
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.051	0.390			
29	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.630	0.360			
30	0.000	0.000	0.000	0.000		0.020	0.000	0.000	0.000	0.000	0.590	0.353			
31	0.000		0.000	0.000		0.000		0.000		0.000	0.000				
TOTAL	0.000	0.000	0.000	0.000	0.000	0.021	0.000	0.099	0.062	0.000	1.858	9.351	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.003	0.002	0.000	0.060	0.334	#DIV/0!	#DIV/0!	#DIV/0!
MAX	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.099	0.062	0.000	0.630	0.630	0.000	0.000	0.000
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AC-FT	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.2	0.0	5.7	28.7	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			35.0		TOTAL AC-FT JAN THRU DEC:										

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 17
(FLOW IN MILLION GALLONS)

	1996			1997											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.916	0.000	0.656			
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.254	0.000	0.000			
3	0.346	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.104	0.044			
4	0.476	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.520			
5	0.476	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.476			
6	0.560	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.492			
7	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.946	2.334	0.260			
8	0.436	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.486	0.406	0.000			
9	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.322	0.000			
10	0.510	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.368	0.312	0.000			
11	0.408	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.382	0.358	0.000			
12	0.450	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.282	0.382	0.000			
13	0.768	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.280	0.396	0.000			
14	0.054	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.274	0.348	0.000			
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.286	0.412	0.000			
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.292	0.416	0.000			
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.252	0.552	0.000			
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.476	0.448	0.000			
19	0.000	0.000	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.856	0.468	0.000			
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.392	0.400	0.000			
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.680	0.000			
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.592	0.000			
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.226	0.564	0.000			
24	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.002	0.500	0.000			
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.774	0.612	0.000			
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.714	0.296	0.568	0.000			
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.086	0.488	0.000			
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.724	0.000	0.000			
29	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000			
30	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.960	0.000	0.000	0.000			
31	0.000		0.000	0.000		0.000		0.000		0.000	0.008				
TOTAL	5.044	0.000	0.200	0.000	0.000	0.002	0.000	0.000	3.674	8.852	11.670	2.448	0.000	0.000	0.000
MEAN	0.163	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.122	0.286	0.376	0.082	#DIV/0!	#DIV/0!	#DIV/0!
MAX	0.768	0.000	0.200	0.000	0.000	0.002	0.000	0.000	2.714	0.946	2.334	0.656	0.000	0.000	0.000
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AC-FT	15.5	0.0	0.6	0.0	0.0	0.0	0.0	0.0	11.3	27.2	35.8	7.5	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP :			97.9		TOTAL AC-FT JAN THRU DEC:										

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 18
(FLOW IN MILLION GALLONS)

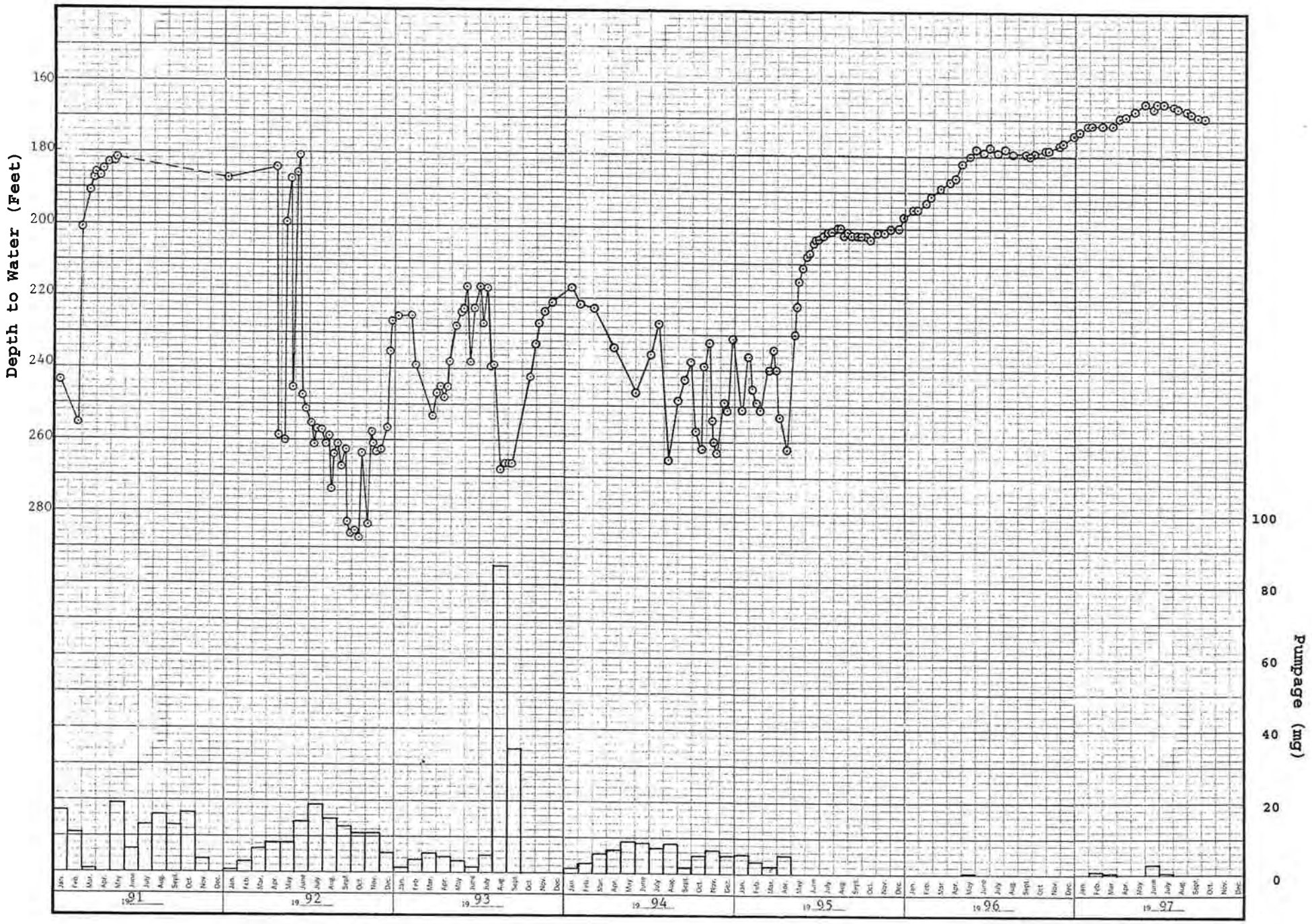
	1996			1997											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.066	0.000	0.000	0.000	0.000			
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
25	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000			
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
29	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000			
30	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000			
31	0.000		0.000	0.000		0.000		0.000		0.000	0.000				
TOTAL	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.066	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	#DIV/0!	#DIV/0!	#DIV/0!
MAX	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.066	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AC-FT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			0.2		TOTAL AC-FT JAN THRU DEC:										

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL NO. 20
(FLOW IN MILLION GALLONS)

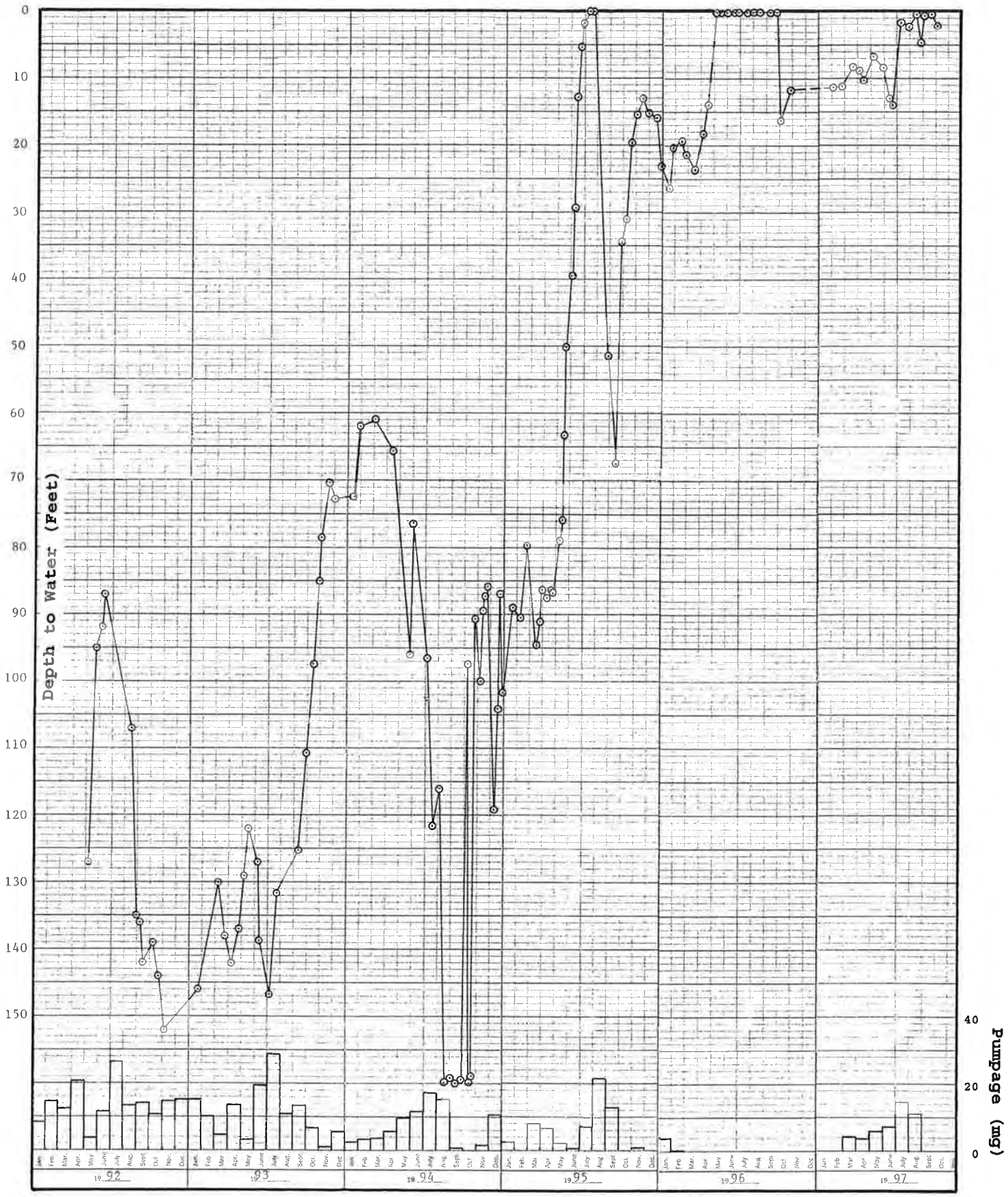
	1996			1997											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.248			
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.092			
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.228			
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.124			
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.284	0.656	0.000			
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.340	0.464	0.672			
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.236	0.432	0.872			
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.396	1.276	0.708			
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.392	1.192	0.672			
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.336	0.604	0.664			
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.380	0.952	0.672			
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.332	0.836	0.632			
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.360	0.400	0.788			
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.324	0.540	0.680			
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.376	0.536	0.716			
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.332	0.540	0.328			
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.404	0.424	0.676			
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.420	0.392	0.792			
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.988	0.288	0.632			
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.440	0.364	0.760			
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.376	0.524	0.828			
25	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.428	0.400	0.764			
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.388	0.564			
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.696			
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.000	0.000	0.720			
29	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.012	0.676	0.696			
30	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	1.060	0.740			
31	0.000		0.000	0.000		0.000		0.000		0.084	1.072	0.904			
										0.200	1.180				
TOTAL	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.016	0.060	7.440	15.196	19.868	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.240	0.490	0.662	#DIV/0!	#DIV/0!	#DIV/0!
MAX	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.016	0.060	0.988	1.276	1.248	0.000	0.000	0.000
MIN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AC-FT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	22.8	46.6	61.0	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			130.7		TOTAL AC-FT JAN THRU DEC:										

APPENDIX B

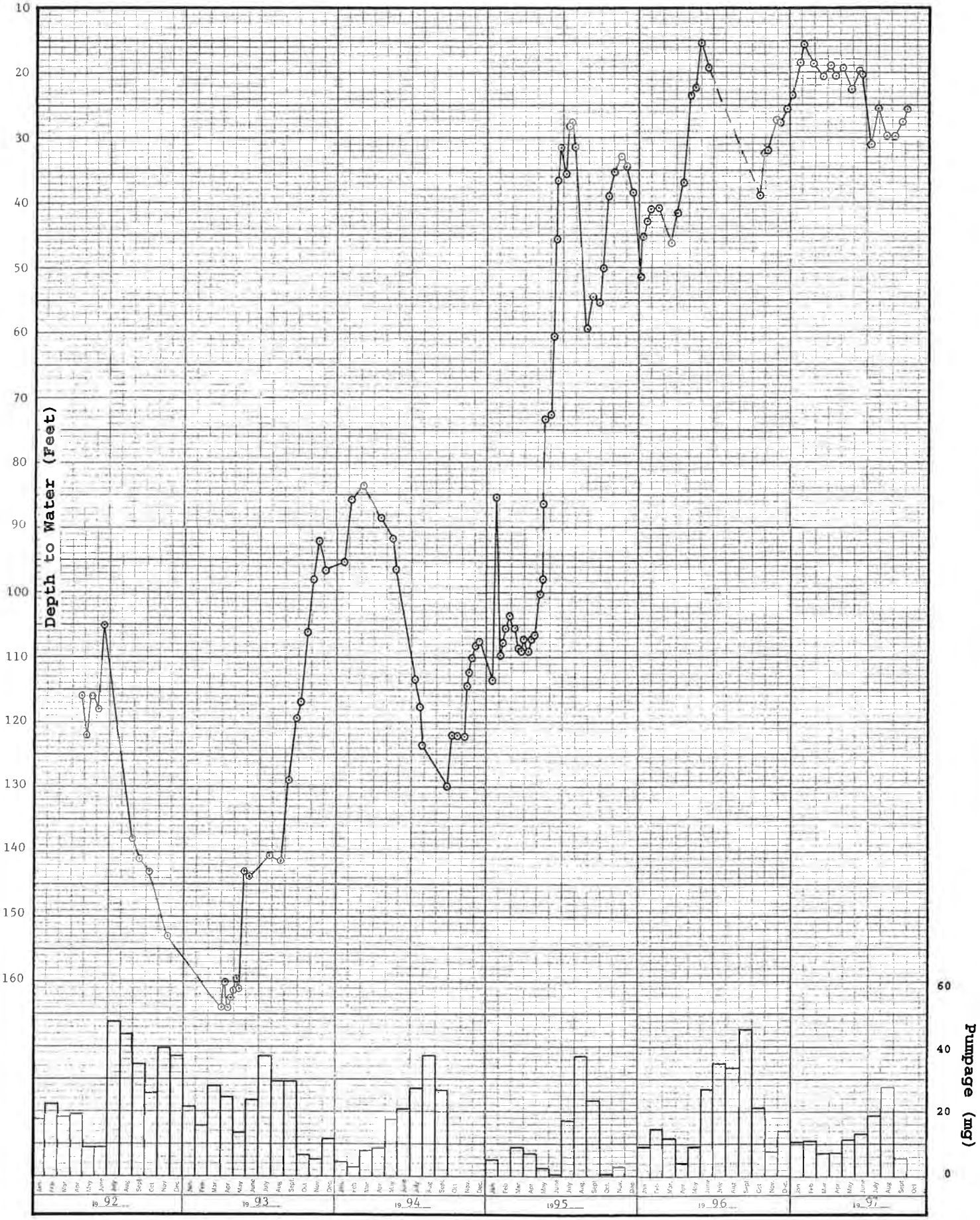
PUMPAGE AND WATER-LEVEL HYDROGRAPHS FOR EARLIER SUPPLY WELLS



WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 1



WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 6



WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 10

APPENDIX C

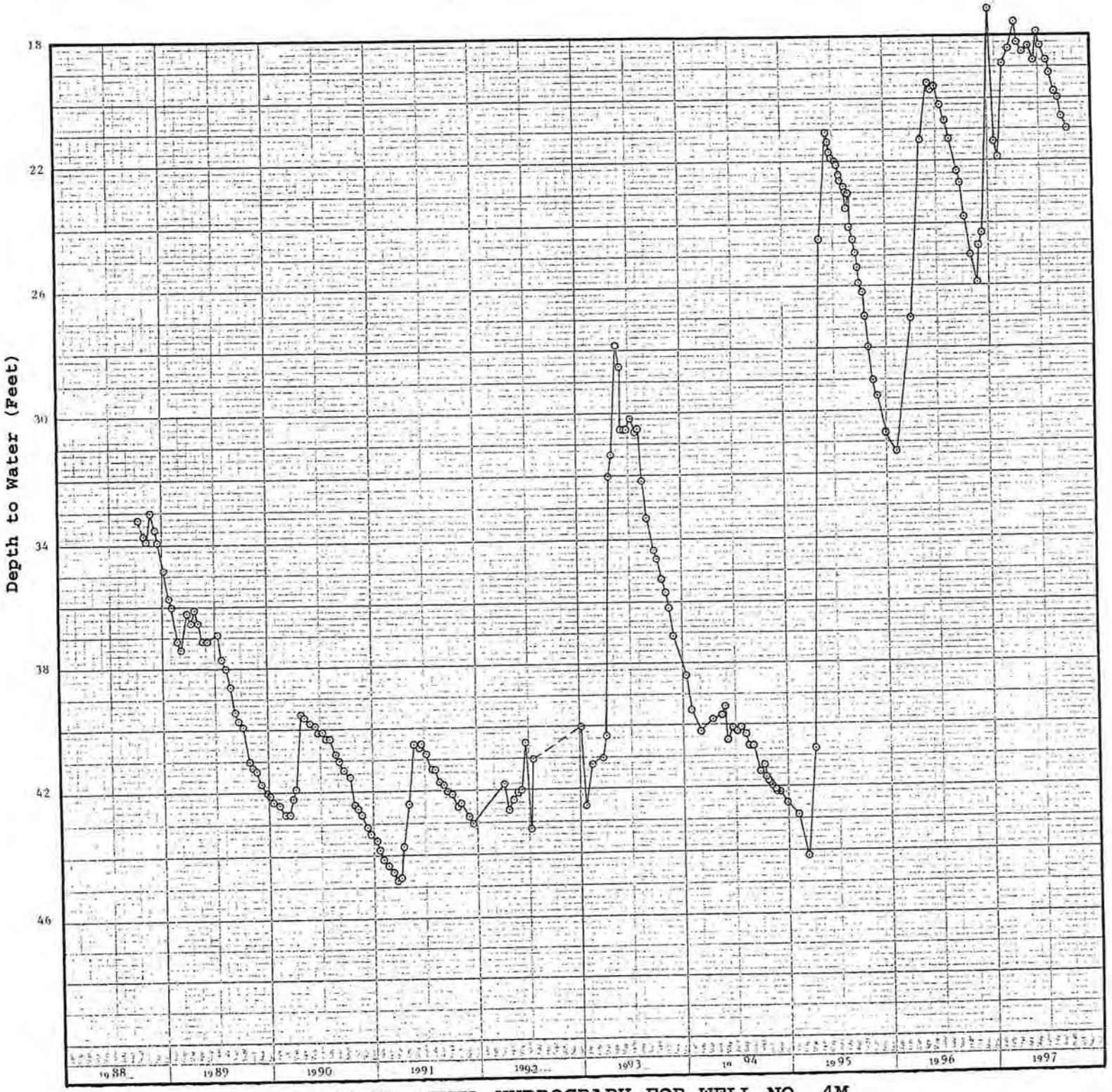
WATER-LEVEL MEASUREMENTS FOR MONITOR WELLS

MAMMOTH COMMUNITY WATER DISTRICT MONITOR WELL LEVEL DATA (OCT/1996-SEP/1997)

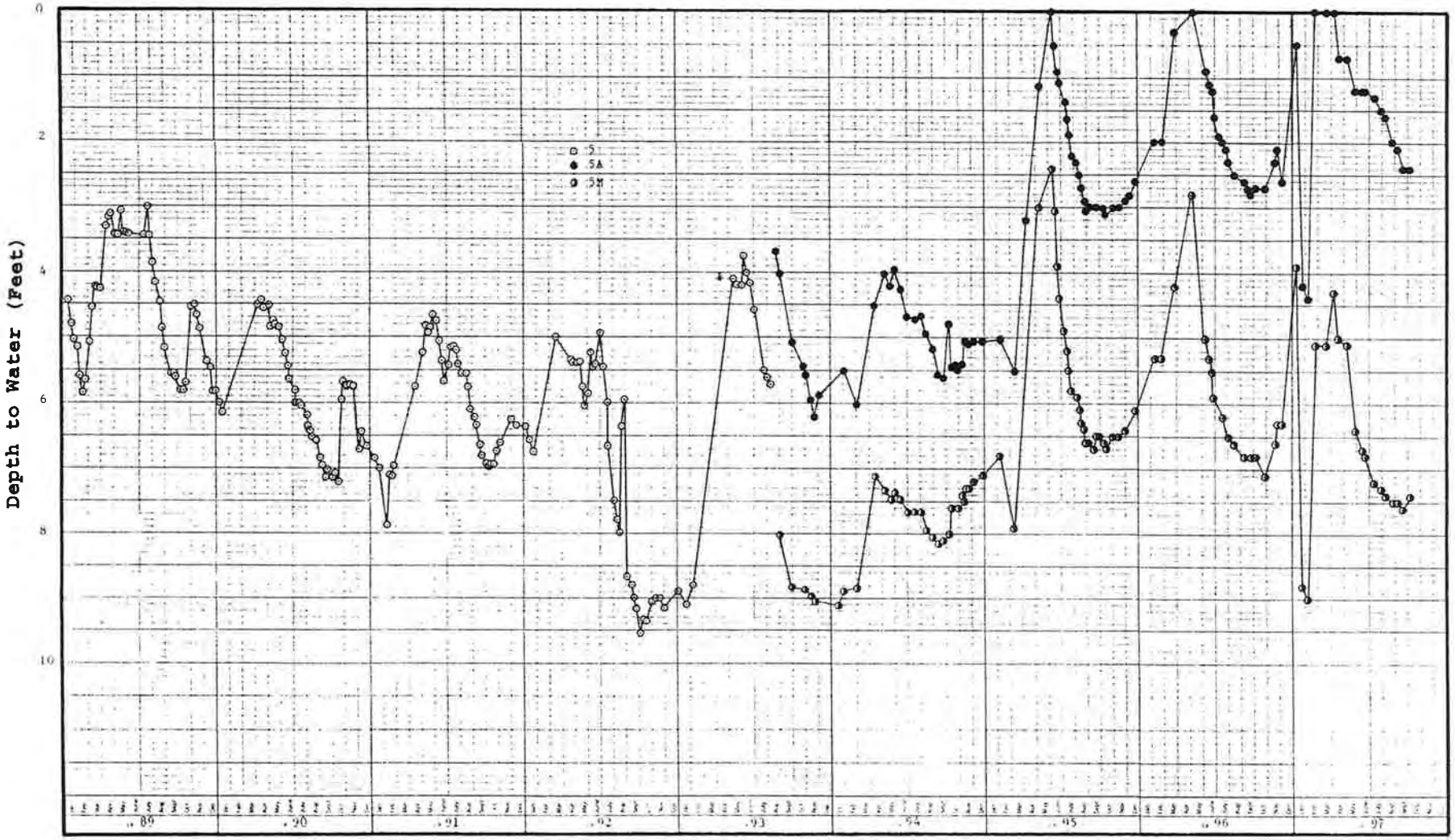
Date	Well 4	Well 5A	Well 5M	Well 7	Well 10M	Well 11	Well 11M	Well 12M	Well 14M	Well 19	Well 21	Well 22	Well 23	Well 24
10/1/96	-23.79	-2.68	-6.80	-243.63	-27.00	0.00	-16.47	-12.59	-278.51	-326.26	-240.83	-78.81	-12.32	-371.98
10/7/96	-23.78	-2.78	-7.37	-243.89	-27.00	0.00	-16.84	-13.35	-280.56	-325.56	-240.98	-80.76	-12.76	-370.98
10/15/96	-24.24	-2.88	-7.40	-243.85	-27.00	0.00	-16.38	-12.96	-282.41	-326.56	-240.51	-80.27	-12.62	-371.81
10/23/96	-24.43	-2.74	-7.29	-243.86	-27.00	0.00	-15.39	-11.47	-281.81	-324.68	-240.14	-80.24	-12.50	-371.71
10/28/96	-25.03	-2.65	-7.13		-27.00	0.00	-16.48	-11.91	-283.39	-333.26	-239.99	-80.27	-12.79	-371.36
11/7/96						0.00			-288.84	-324.08	-241.30			-371.16
11/14/96									-289.72	-323.48	-240.64			-371.39
11/20/96	-25.92	-2.29	-6.59		-27.00	0.00	-19.14	-14.75	-292.42	-323.50	-240.76	-80.91	-11.57	-370.94
11/27/96	-24.68	-2.14	-6.26	-245.03	-27.00	0.00	-18.03	-13.11	-295.06	-324.26	-240.81	-81.61	-11.55	-370.93
12/4/96	-24.31	-2.55	-6.26		-27.00	0.00	-17.81	-12.62	-296.31	-324.18	-240.74	-81.82	-12.04	-370.72
12/13/96									-297.32	-323.96	-240.69			-370.69
12/20/96									-299.99	-323.87	-240.81			-370.57
12/27/96									-299.39	-323.33	-245.14			-370.24
1/9/97	-17.03	-0.47	-3.91		-15.56	0.00	-10.97	-5.19	-301.16	-323.50		-82.56	-8.24	-369.49
1/17/97	-17.08	-0.88	-5.13		-17.62	0.00	-13.96	-6.11				-80.37	-10.13	
1/23/97	-21.41	-4.16	-8.78		-19.83	0.00	-19.46	-9.96				-83.45	-9.84	
2/3/97	-21.85	-4.41	-8.98		-22.02	0.00	-20.75	-12.83	-287.93	-334.26	-251.46	-83.49	-11.06	-369.93
2/12/97	-18.41	0	-4.71		-18.69	0.00	-18.41	-9.01				-80.37	-11.47	
2/26/97	-18.85	0	-5.12		-18.92	0.00	-19.77	-11.27				-80.31	-11.76	
3/19/97	-18.41	0	-5.06		-18.53	0.00	-19.89	-12.62	-285.58	-324.14	-236.43	-77.71	-10.89	-364.94
4/3/97	-17.53	0	-4.31		-16.93	0.00	-18.58	-10.32	-257.63	-323.18	-234.81	-79.38	-10.83	-364.28
4/16/97	-18.18	-0.67	-4.95		-18.36	0.00	-17.07	-8.84	-255.86	-321.09		-80.04	-11.51	
5/9/97	-18.47	-0.72	-5.07		-18.32	0.00	-7.34	-5.54	-250.06	-320.60	-232.39	-76.99	-9.91	-361.47
5/16/97	-18.33	-0.86	-5.66		-16.65	0.00	-6.39	-4.49	-246.46	-320.10	-232.27	-76.94	-9.14	-360.83
5/30/97	-18.32	-1.22	-6.43	-244.48	-18.71	0.00	-12.84	-5.98	-244.75	-321.50	-231.51	-77.63	-9.61	-359.73
6/13/97	-18.75	-1.23	-6.72		-16.16	0.00	-11.81	-5.27	-246.10	-319.62	-231.86	-76.31	-10.48	-358.71
6/19/97	-17.86	-1.23	-6.78		-16.03	0.00	-10.87	-4.58	-244.75	-314.78	-231.78	-76.59	-10.31	-358.32
7/10/97	-18.27	-1.29	-7.23		-27.00	0.00	-13.11	-6.12	-244.75	-315.15	-230.97	-80.29	-11.57	-357.01
7/18/97	-18.65	-1.36	-7.18		-27.00	0.00	-13.94	-6.89	-244.75	-315.96	-233.08	-80.32	-11.79	
7/24/97	-18.92	-1.42	-7.21		-25.91	0.00	-13.88	-7.09	-244.75	-314.88	-233.23	-80.38	-11.89	-356.53
7/30/97	-18.78	-1.53	-7.29		-20.31	0.00	-13.62	-6.75	-244.75	-314.98	-231.18	-80.32	-11.97	-356.42
8/8/97	-19.21	-1.62	-7.36		-27.00	0.00	-14.93	-7.97	-244.75	-314.26	-232.71	-80.38	-12.18	
8/15/97	-19.49	-1.81	-7.38		-27.00	0.00	-15.78	-9.18	-244.75	-313.75	-232.58	-80.31	-12.13	-355.93
8/21/97	-19.71	-1.89	-7.47		-27.00	0.00	-16.11	-9.98	-244.75	-312.85	-232.72	-80.34	-12.32	-357.78
8/28/97	-19.79	-2.03	-7.51	-241.39	-27.00	0.00	-16.79	-11.17	-244.75	-313.01	-232.39	-80.34	-12.56	-355.65
9/4/97	-20.03	-2.14	-7.51	-240.94	-27.00	0.00	-17.46	-11.97	-246.40	-315.43	-232.45	-80.32	-12.59	-355.48
9/11/97	-20.45	-2.19	-7.55	-241.18	-23.32	0.00	-17.81	-11.82	-246.34	-316.37	-232.13	-80.31	-12.64	-355.35
9/19/97	-20.62	-2.37	-7.62	-240.97	-21.83	0.00	-18.16	-12.32		-315.94	-232.28	-80.32	-12.84	-355.15
10/2/97	-21.03	-2.36	-7.41	-241.16	-19.21	0.00	-19.03	-12.56		-314.94	-232.21	-80.33	-13.03	-354.95
Mean	-20.34	-1.72	-6.63	-242.76	-22.59	0.00	-15.74	-9.66	-267.78	-320.78	-236.48	-80.02	-11.50	-364.14
Max	-25.92	-4.41	-8.98	-245.03	-27.00	0.00	-20.75	-14.75	-301.16	-334.26	-251.46	-83.49	-13.03	-371.98
Min	-17.03	0.00	-3.91	-240.94	-15.56	0.00	-6.39	-4.49	-244.75	-312.85	-230.97	-76.31	-8.24	-354.95

APPENDIX D

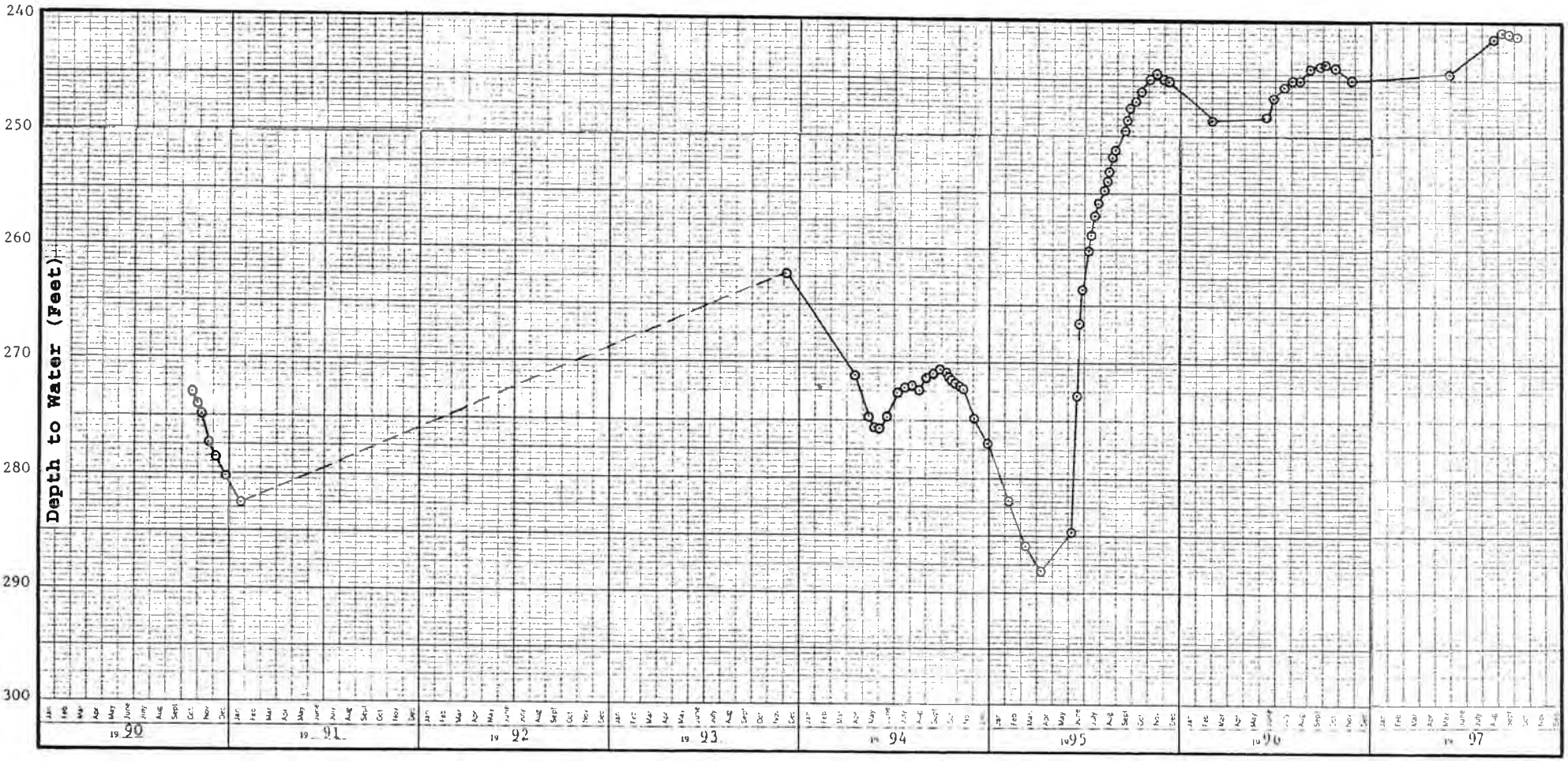
SUPPLEMENTARY WATER-LEVEL HYDROGRAPHS FOR MONITOR WELLS



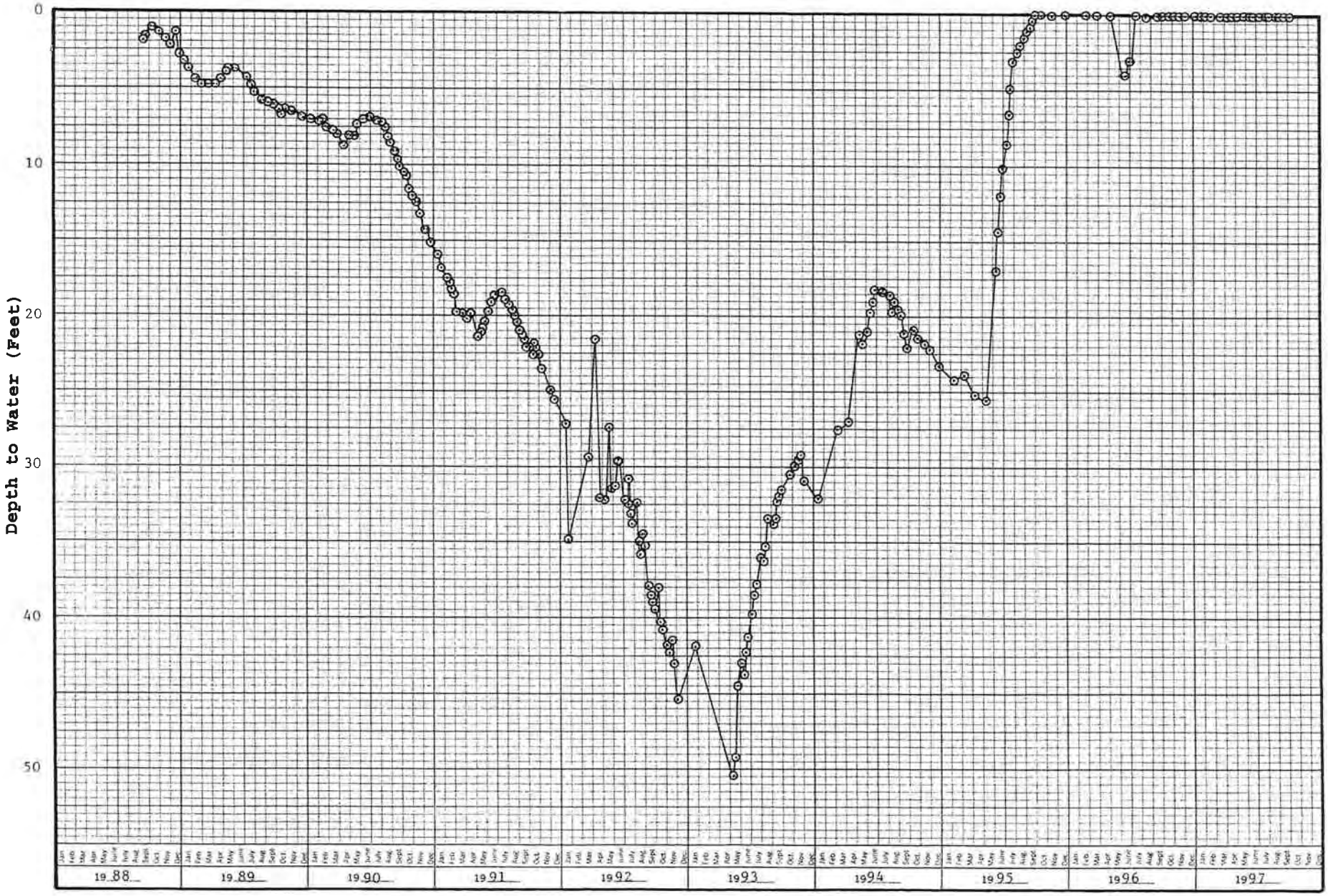
WATER-LEVEL HYDROGRAPH FOR WELL NO. 4M



WATER-LEVEL HYDROGRAPH FOR WELL NO. 5, No. 5A, AND NO. 5M



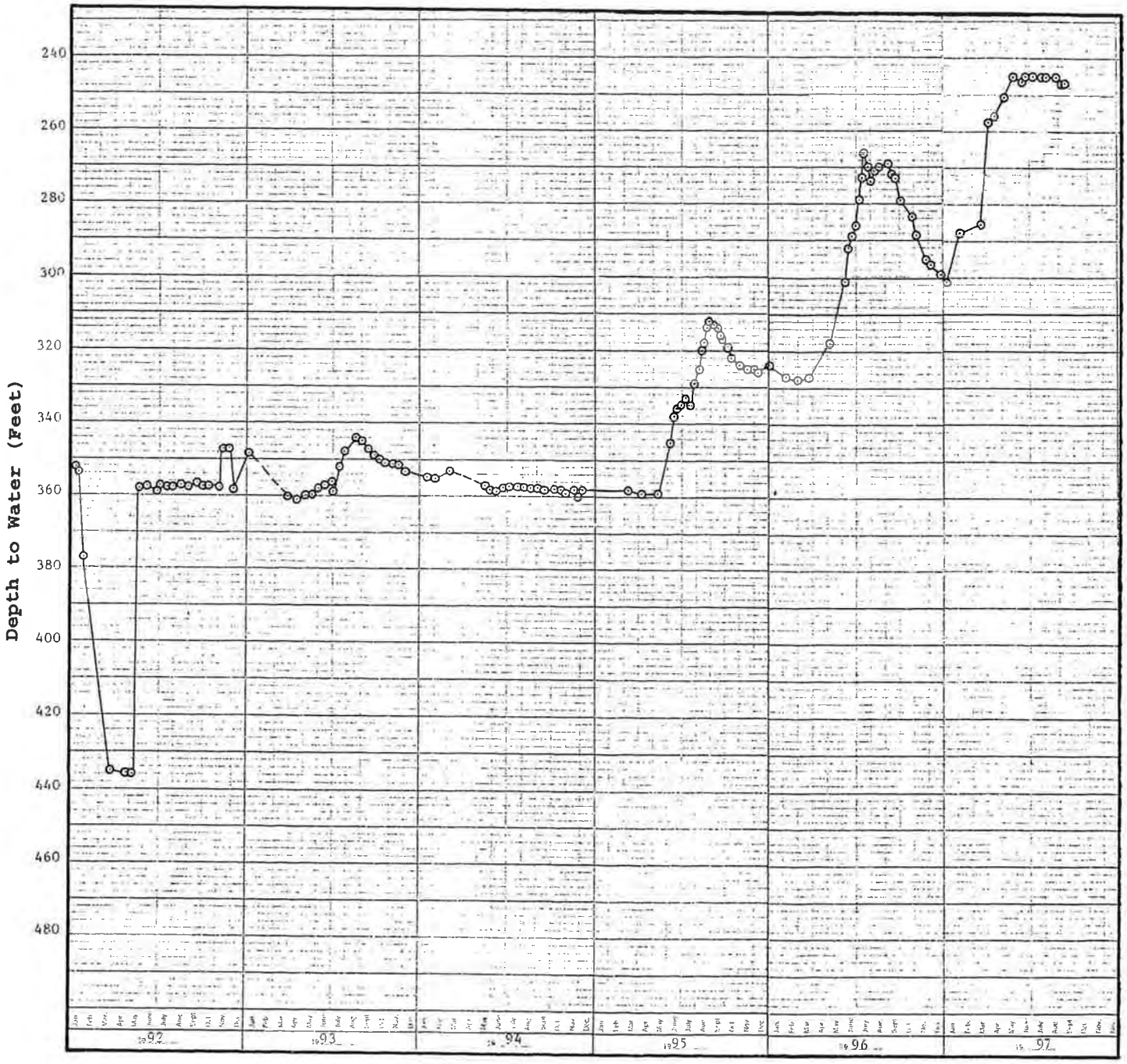
WATER-LEVEL HYDROGRAPH FOR WELL NO. 7



WATER-LEVEL HYDROGRAPH FOR WELL NO. 11

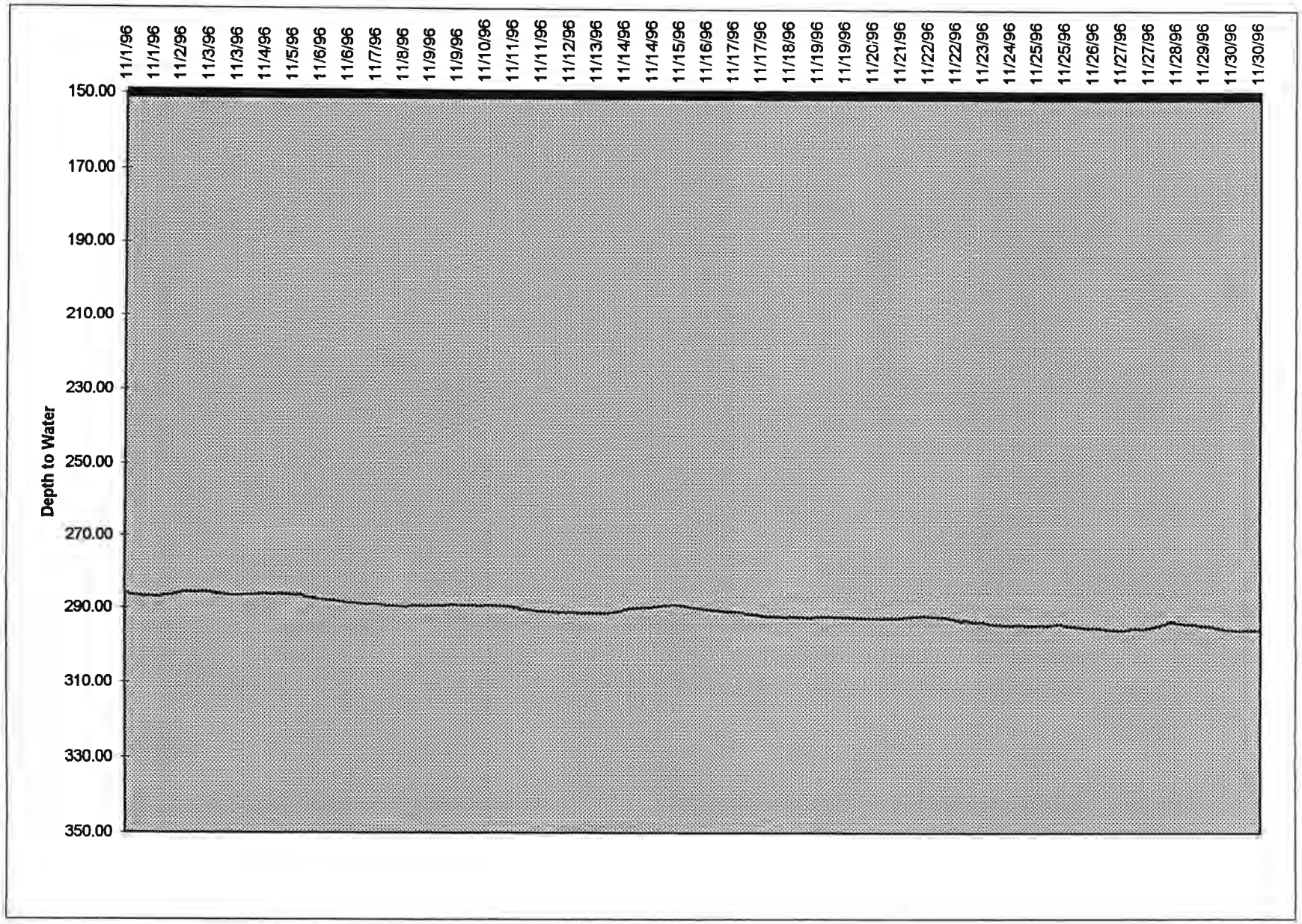
WATER-LEVEL HYDROGRAPH FOR WELL NO. 11M

WATER-LEVEL HYDROGRAPH FOR WELL NO. 12M



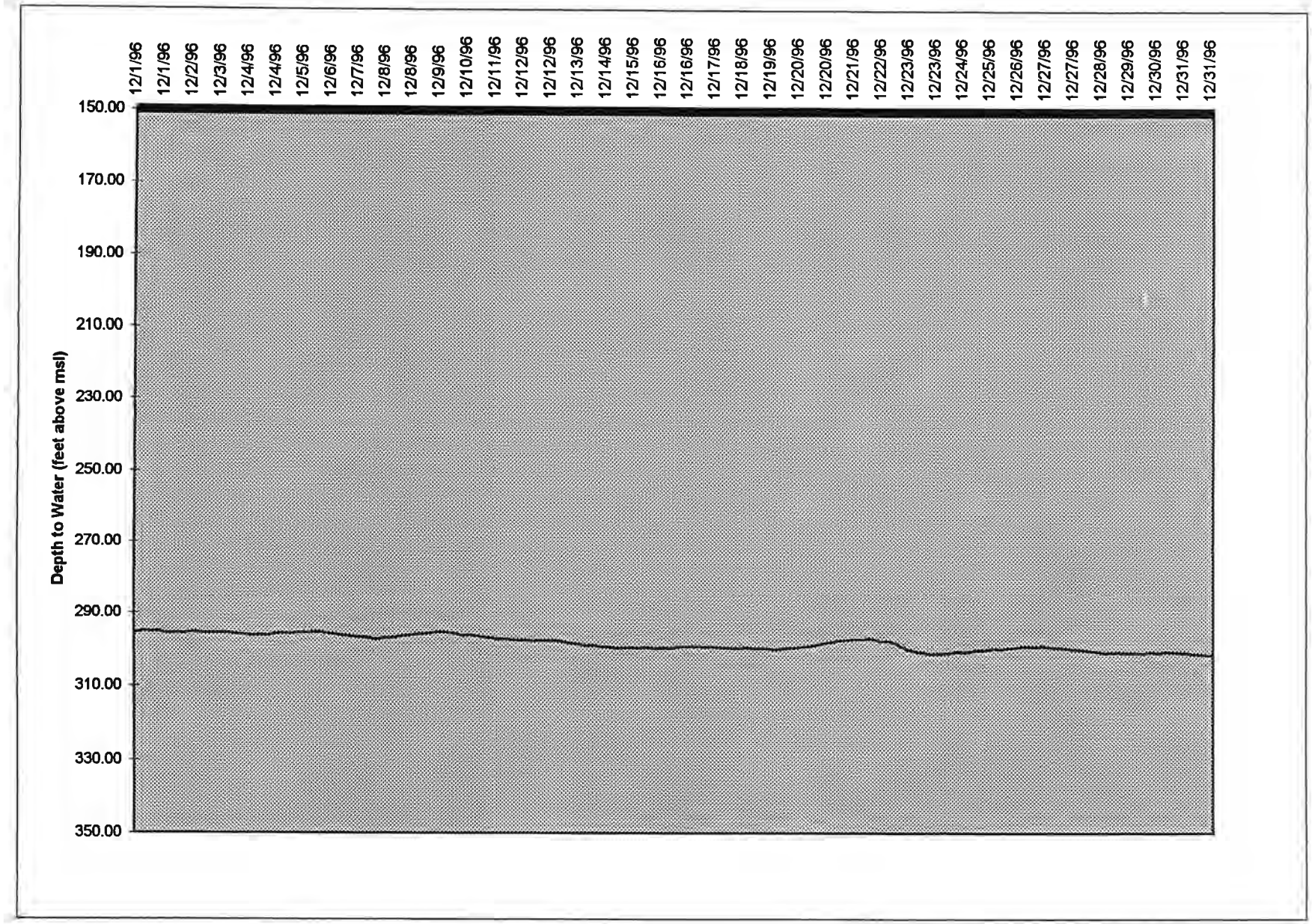
WATER-LEVEL HYDROGRAPH FOR WELL NO. 14M

Well #14 Data Logger 96.xls



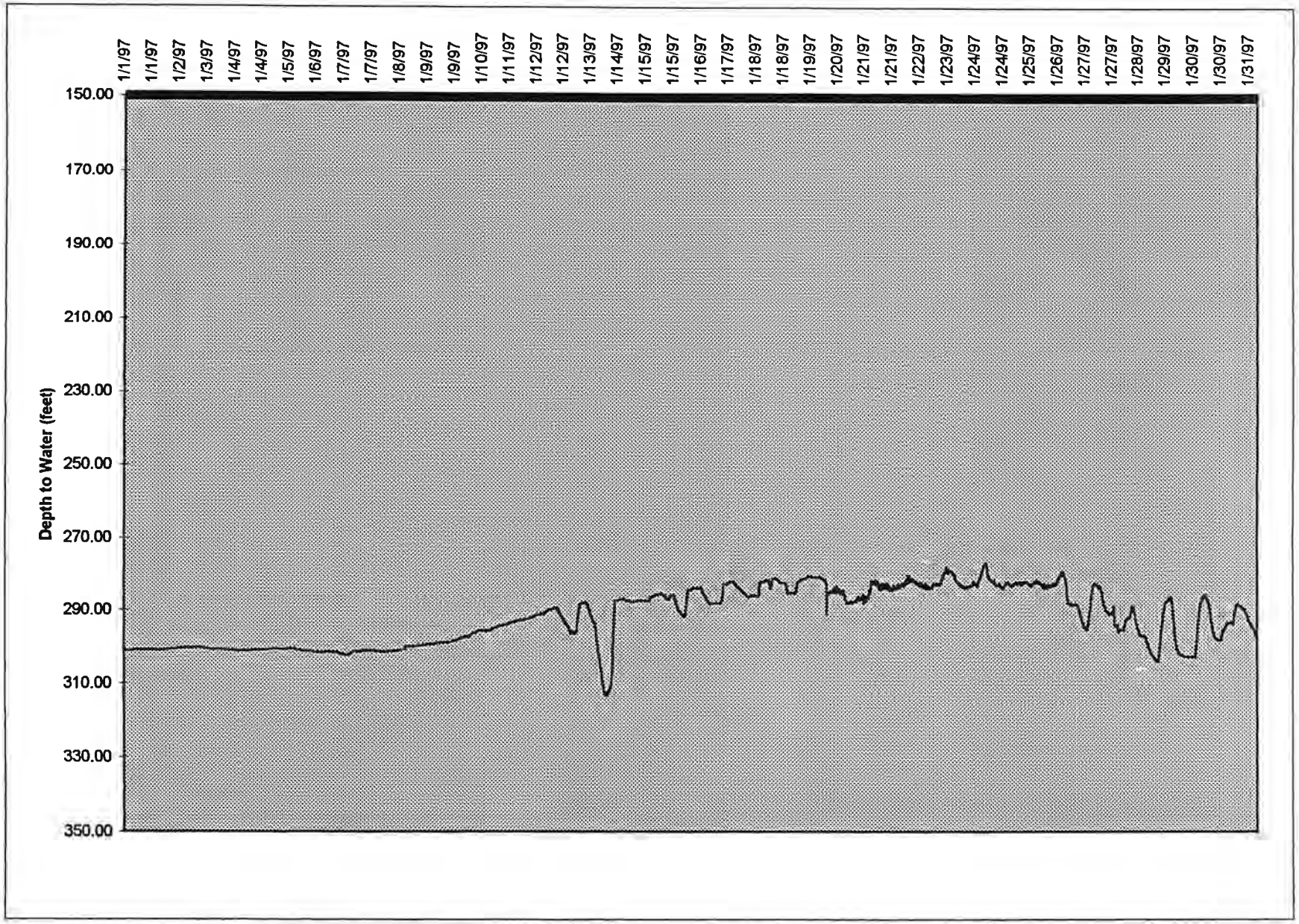
Nov 96 Chart

Well #14 Data Logger 96.xls



Dec 96 Chart

Well #14 Data Logger 97.xls



Jan 97 Chart

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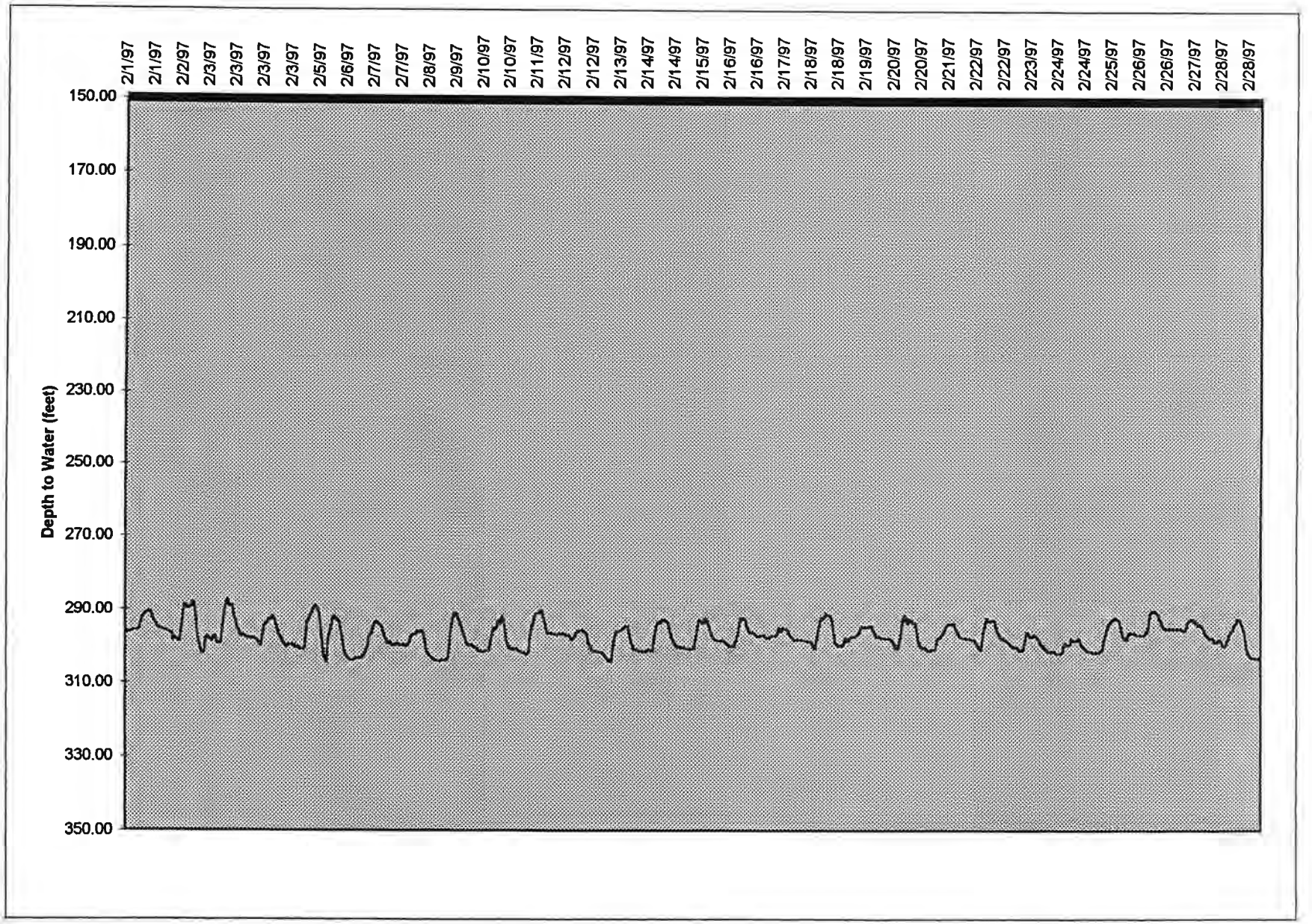

Feb 97 Chart

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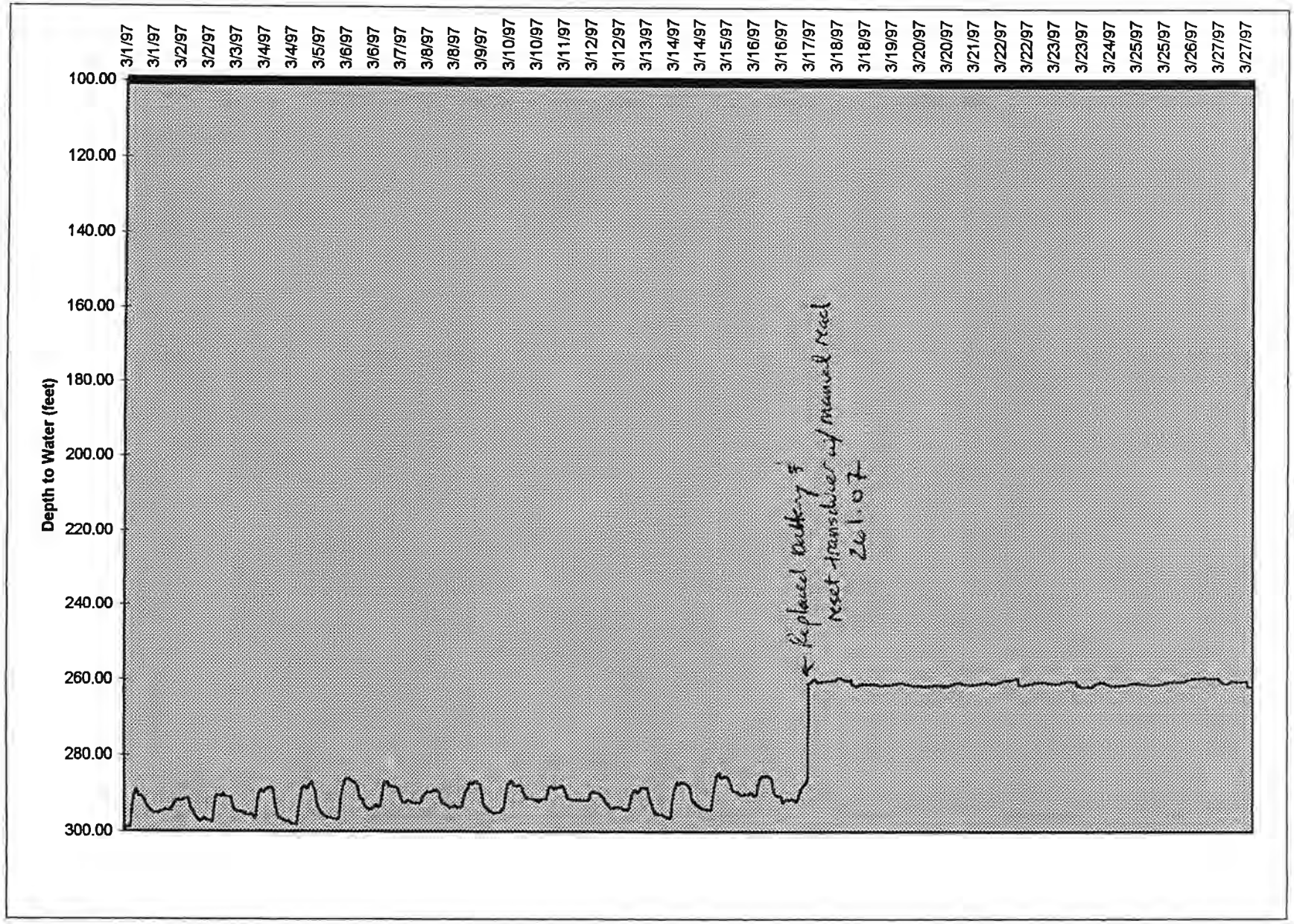
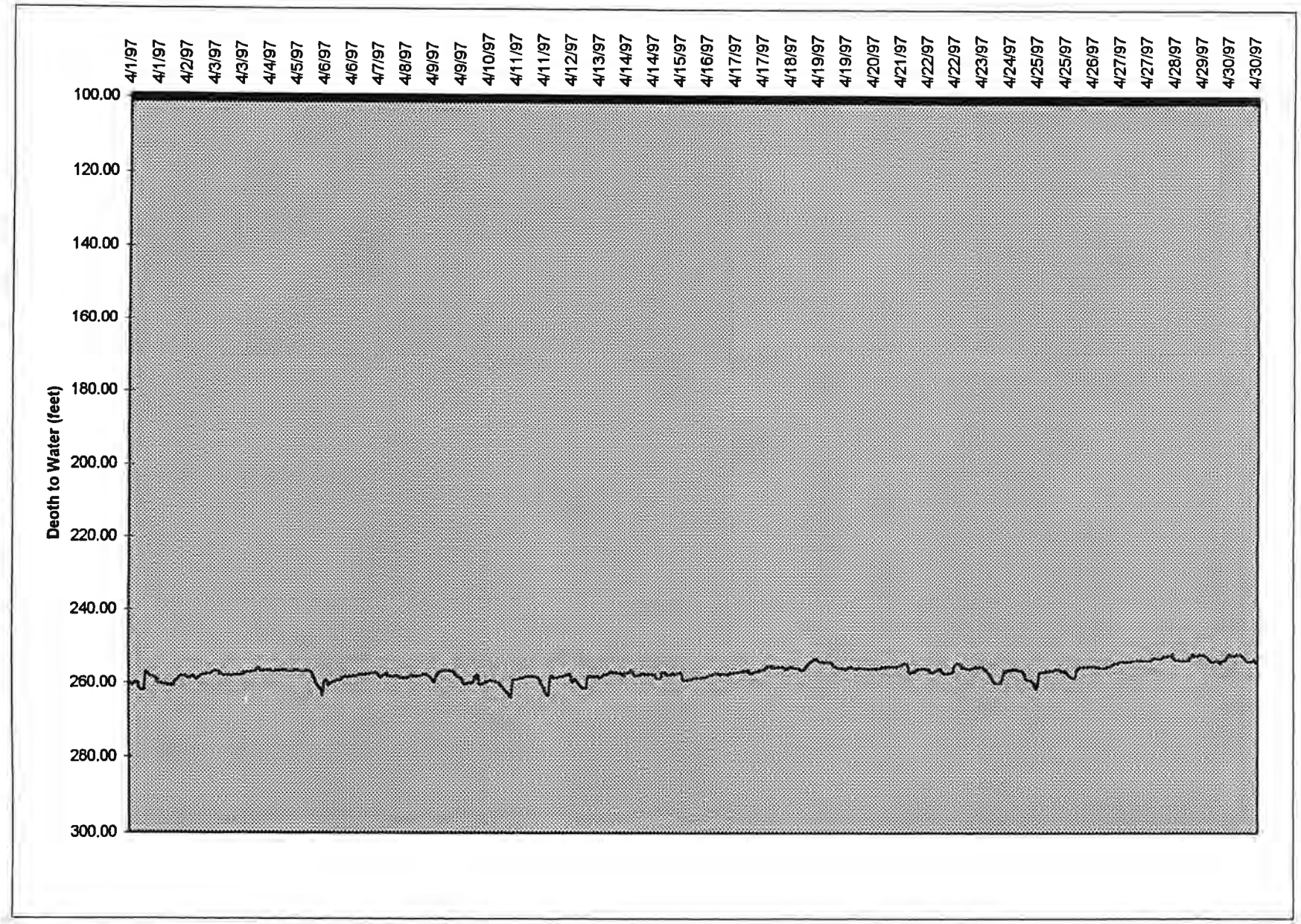


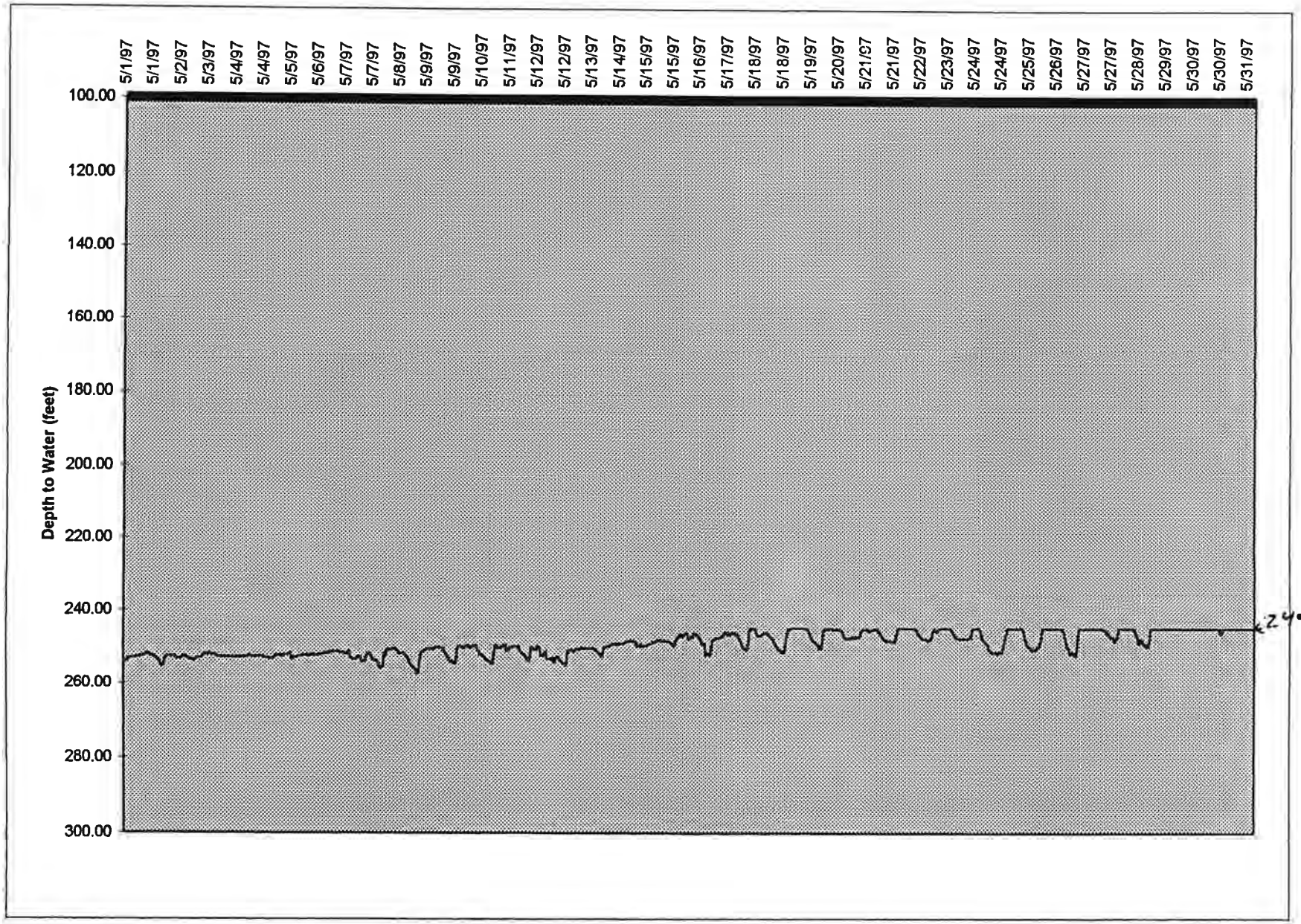
Mar 97 Chart

Well #14 Data Logger 97.xls



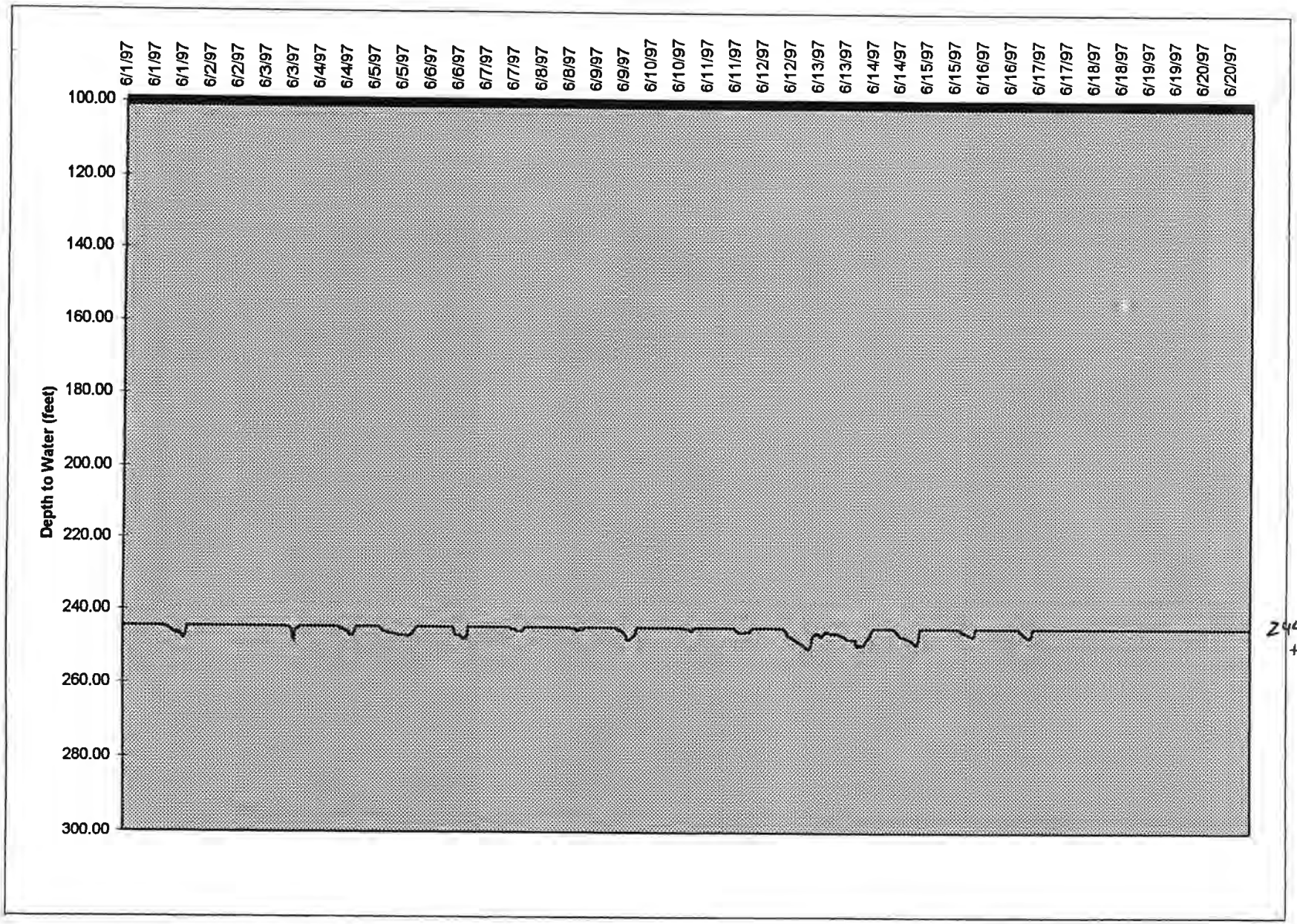
Apr 97 Chart

Well #14 Data Logger 97.xls



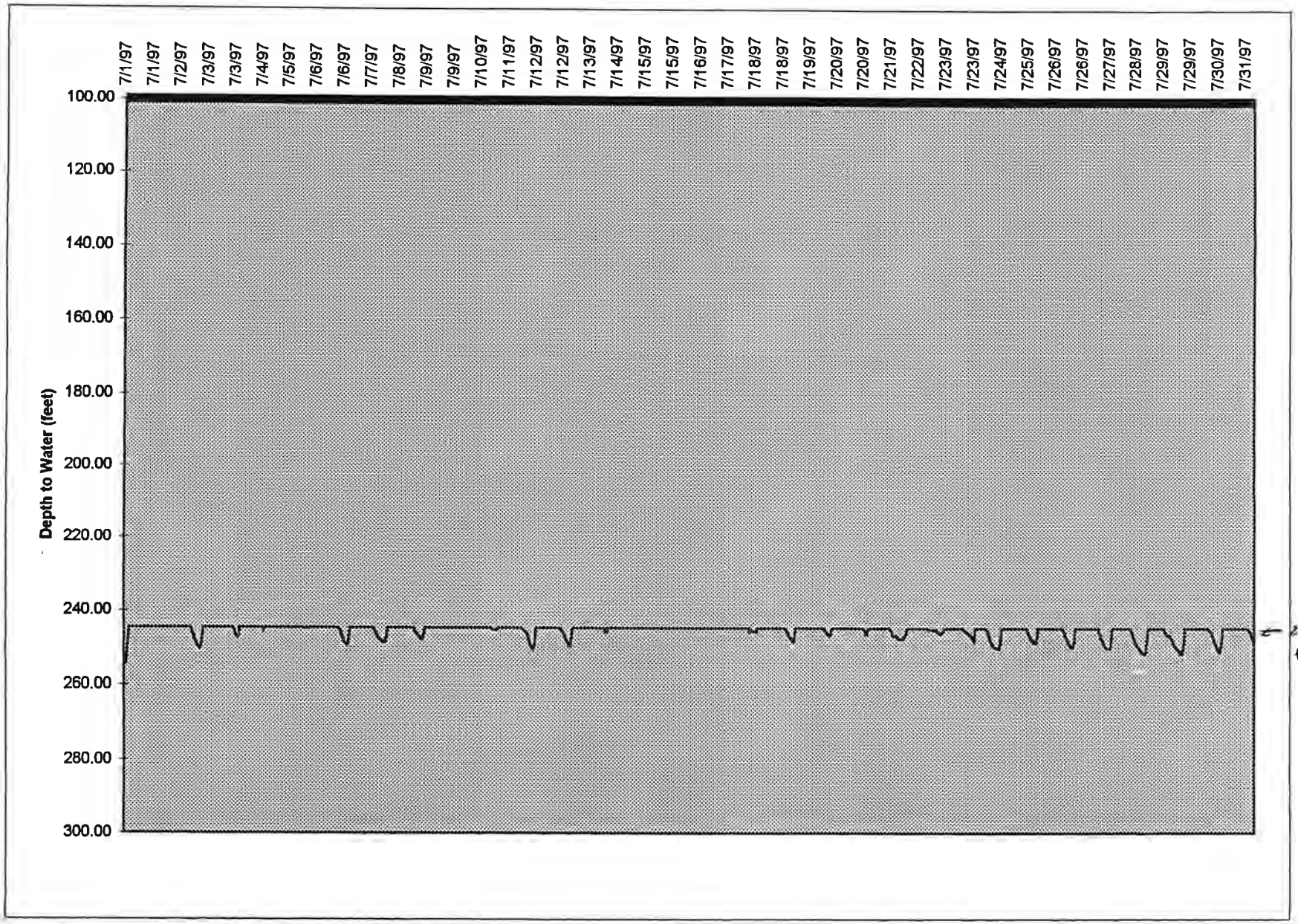
May 97 Chart

Well #14 Data Logger 97.xls



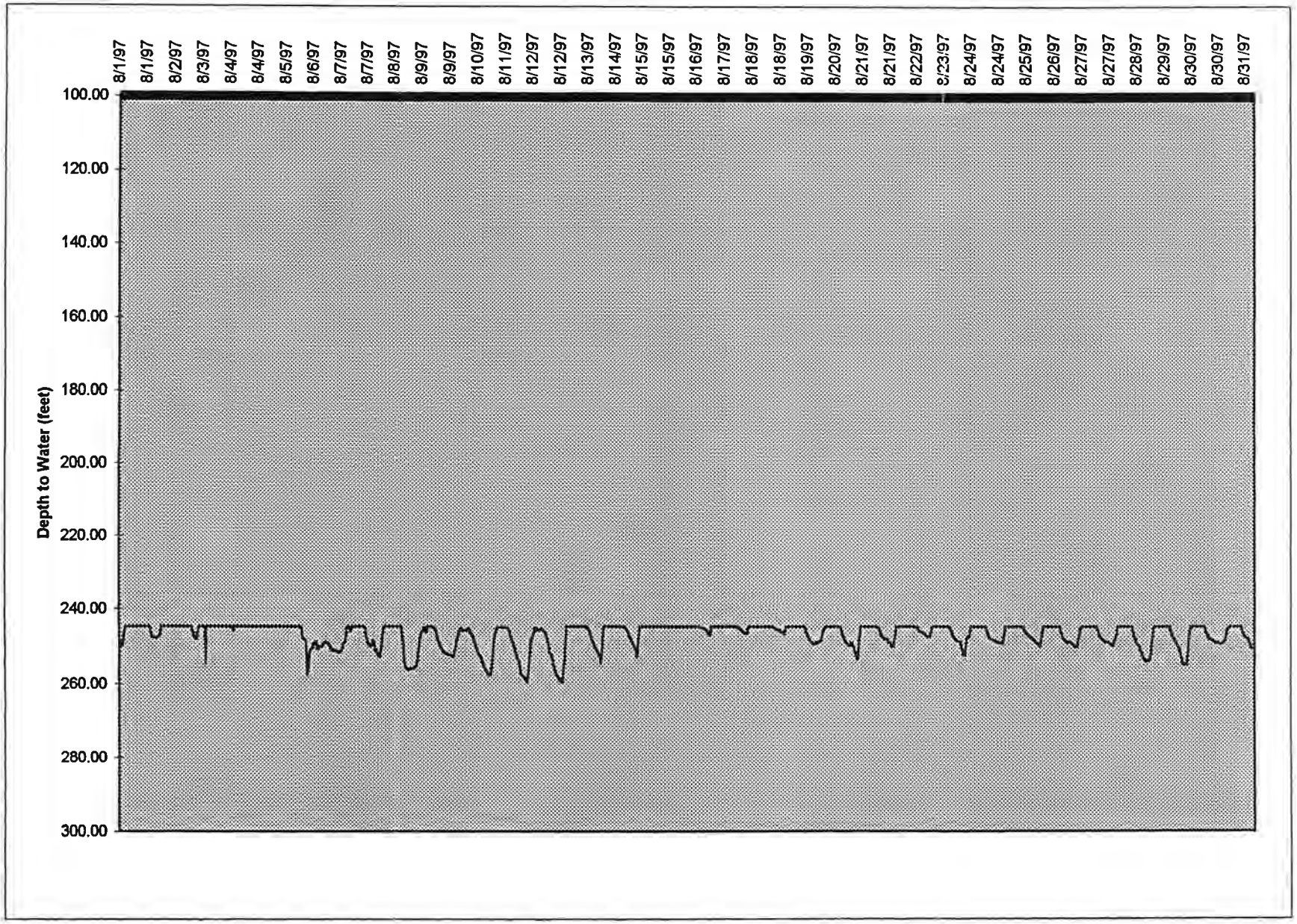
June 97 Chart

Well #14 Data Logger 97.xls



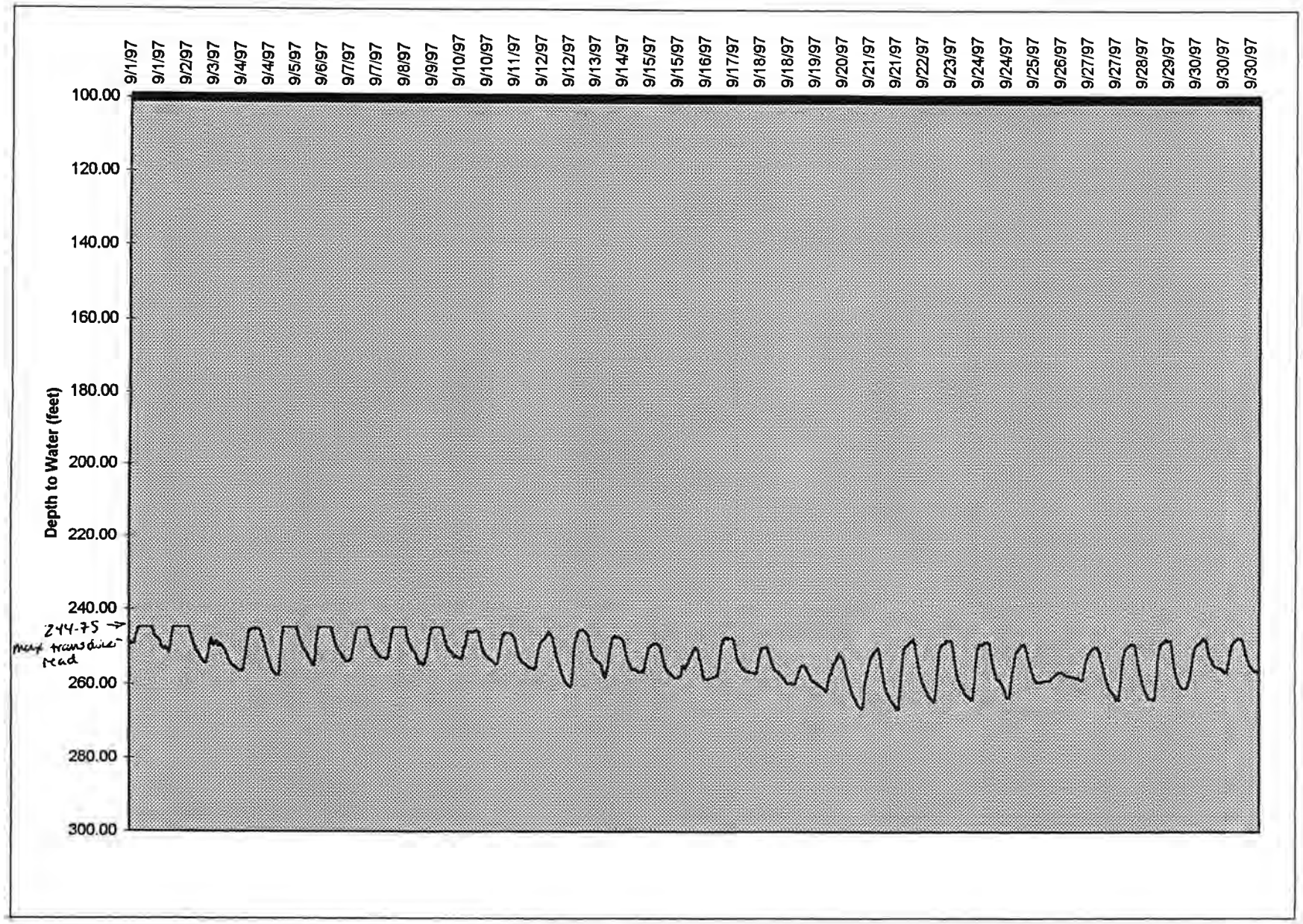
July 97 Chart

Well #14 Data Logger 97.xls



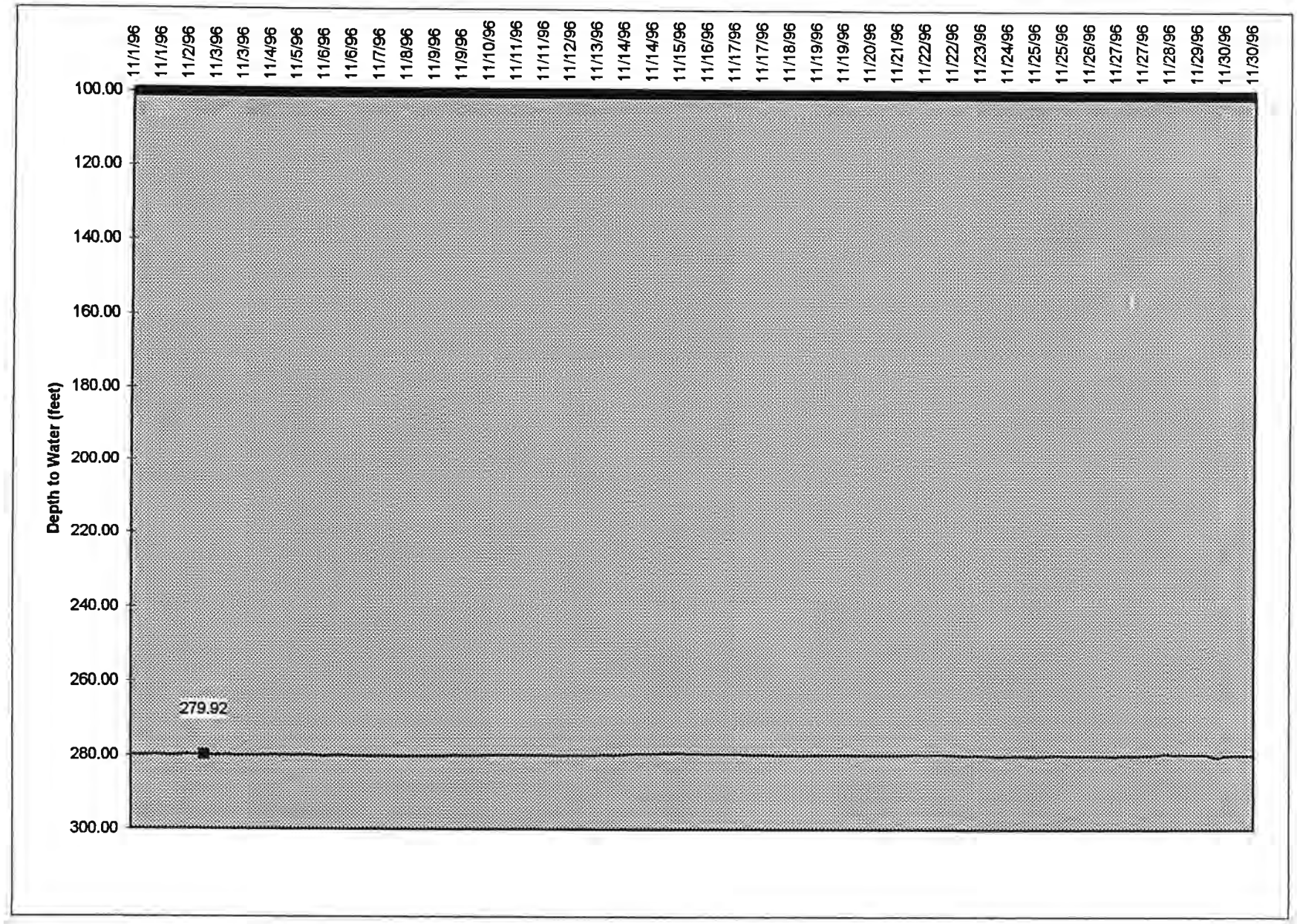
Aug 97 Chart

Well #14 Data Logger 97.xls



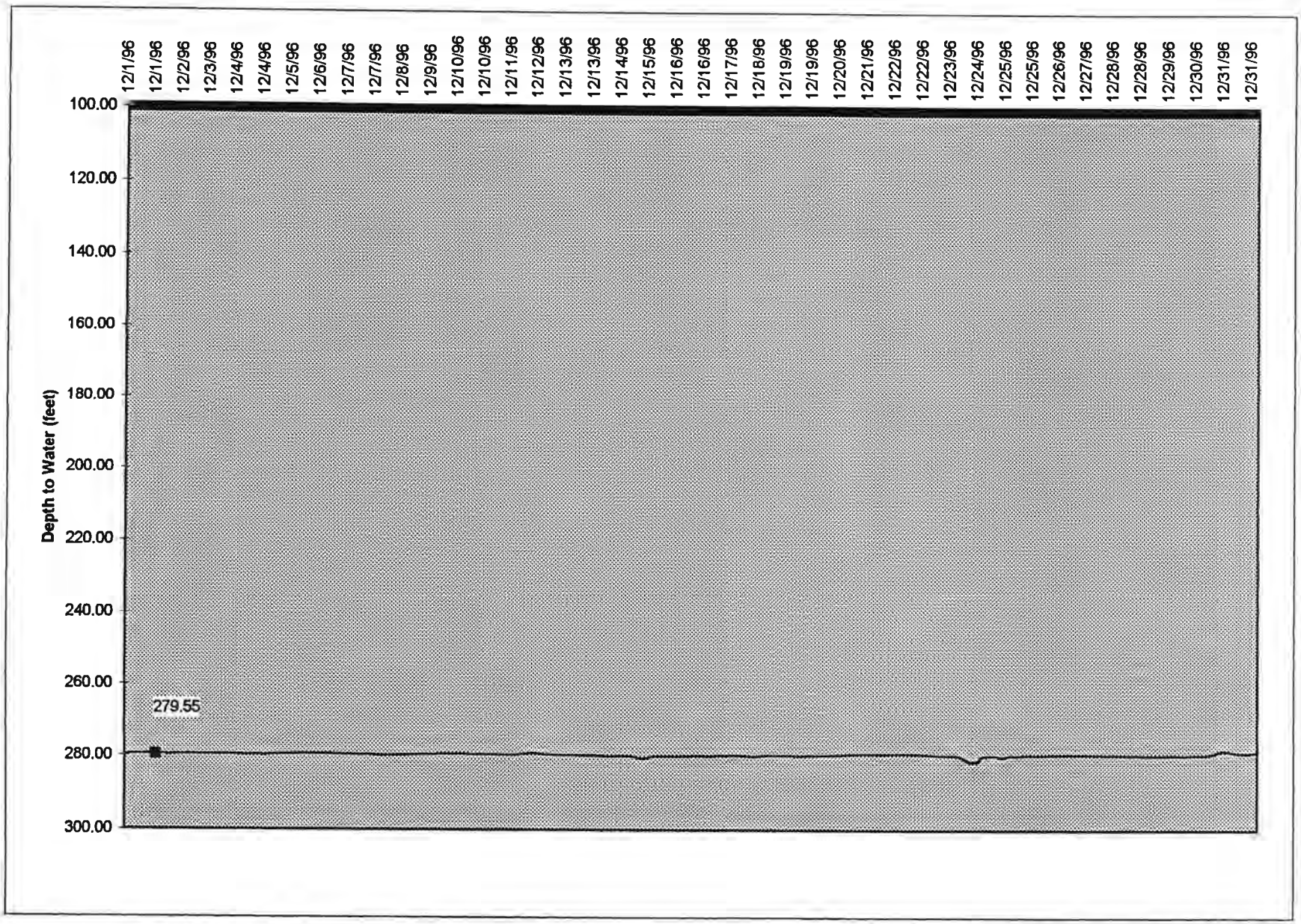
Sept 97 Chart

Well #21 Data Logger 96.xls



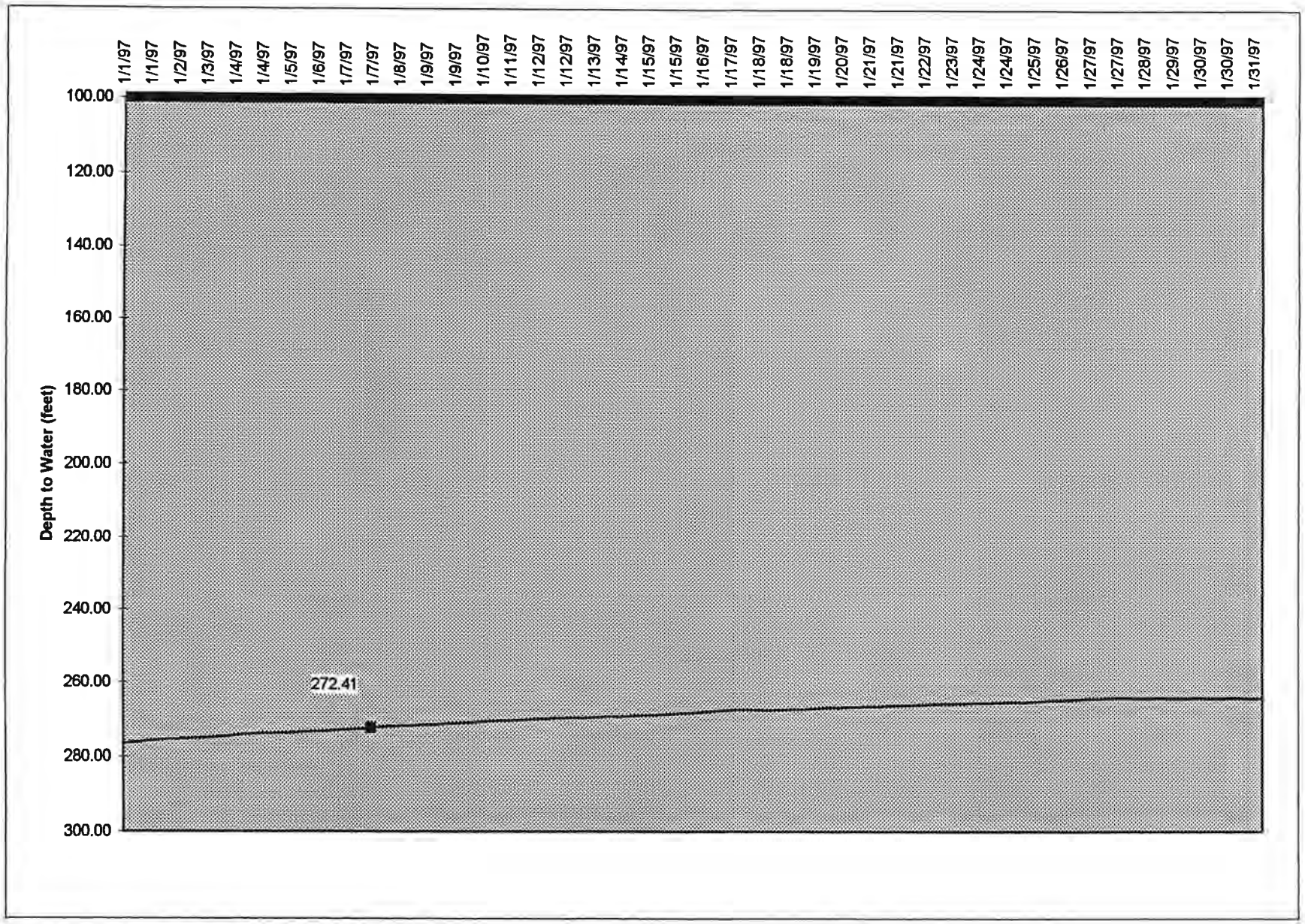
Nov 96 Chart

Well #21 Data Logger 96.xls



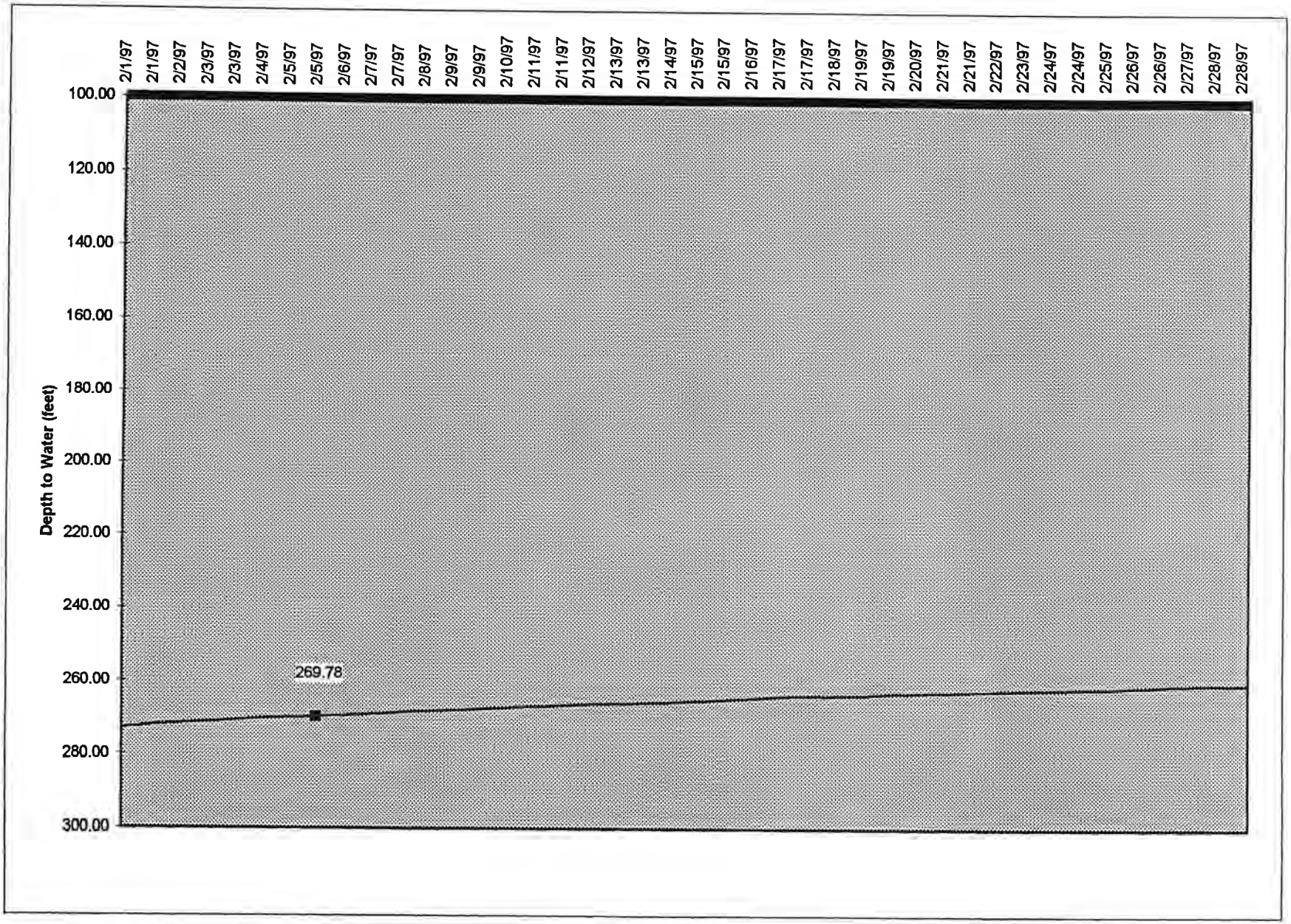
Dec 96 Chart

Well #21 Data Logger 97.xls



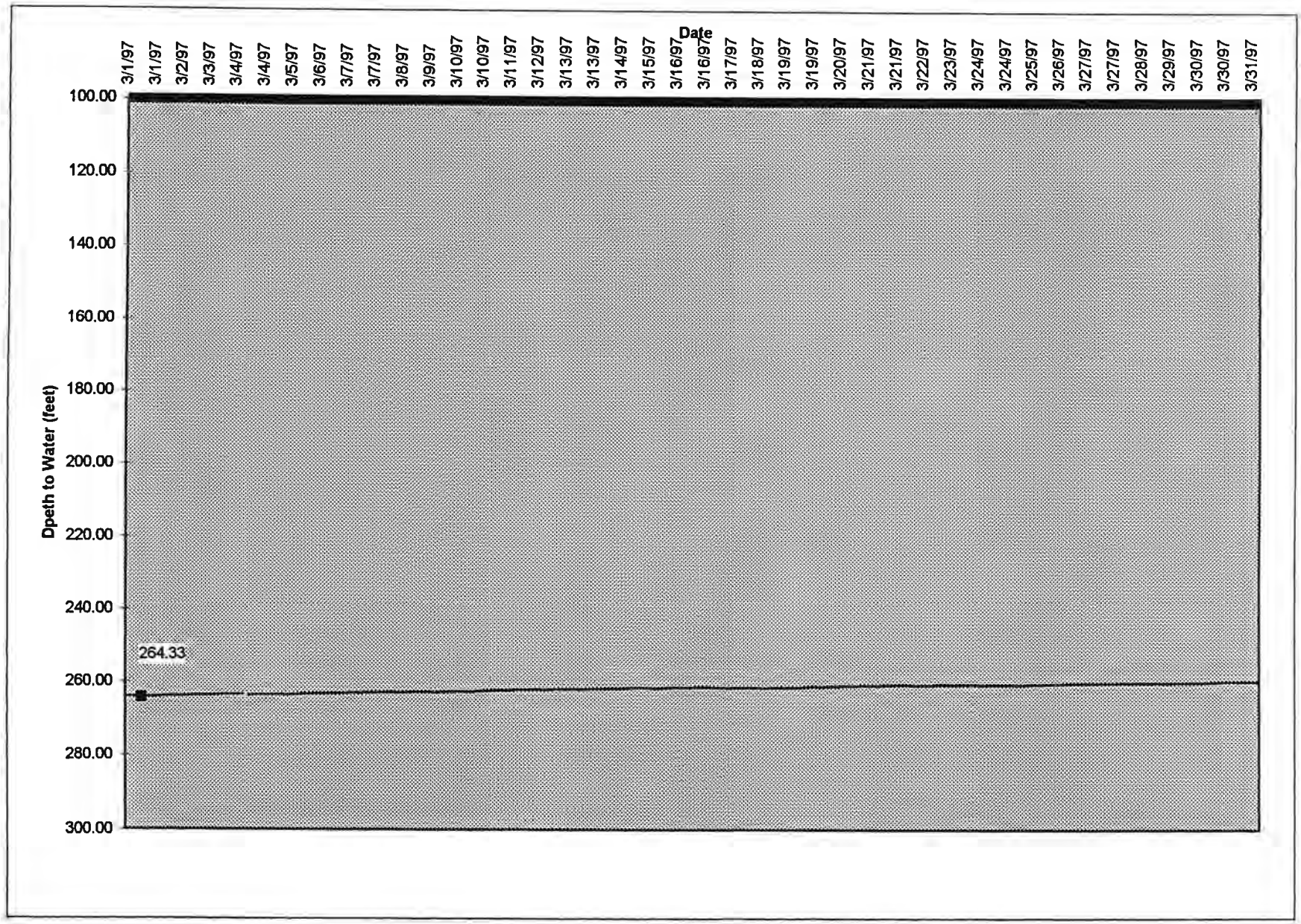
Jan 97 Chart

Well #21 Data Logger 97.xls



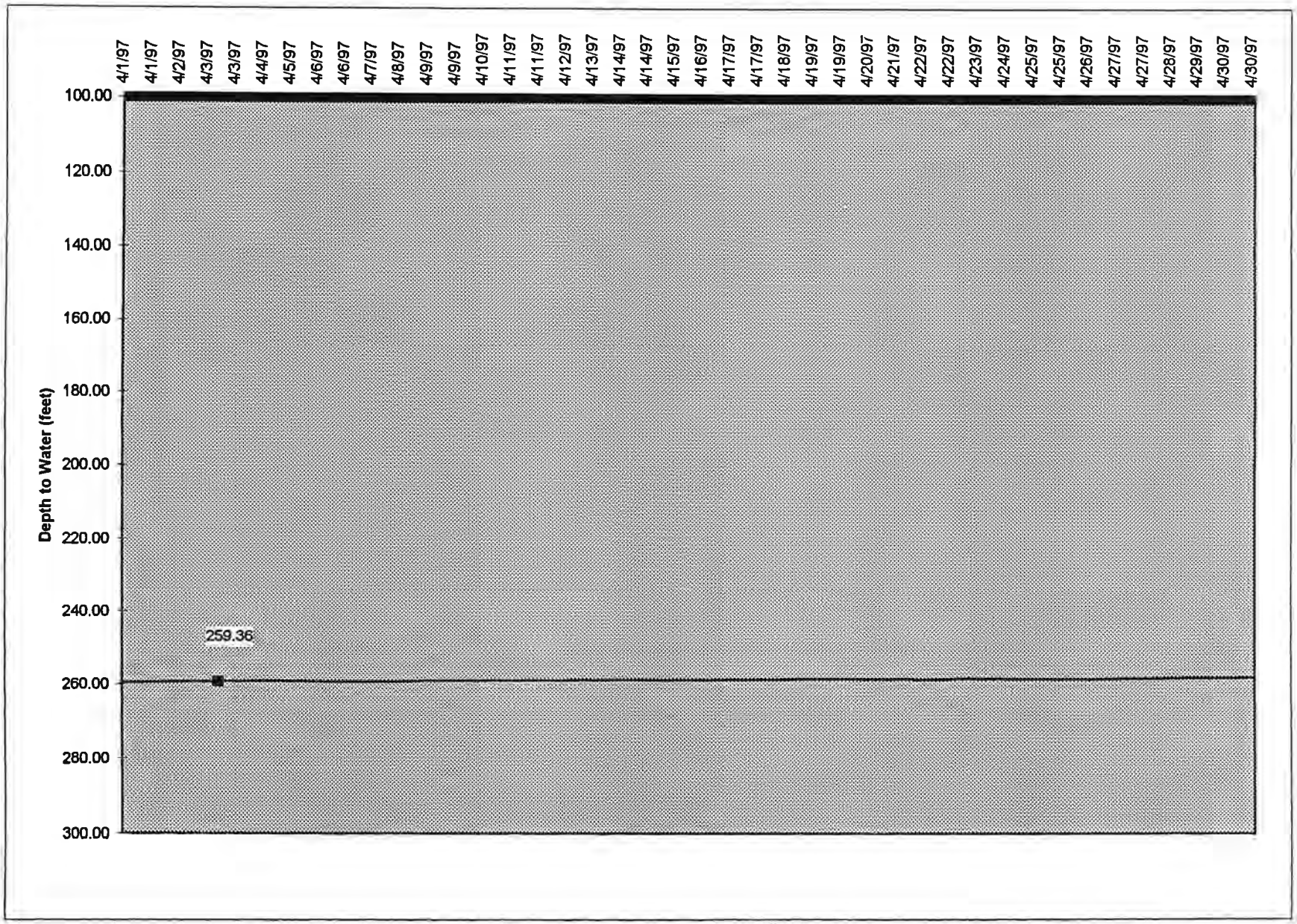
Feb 97 Chart

Well #21 Data Logger 97.xls



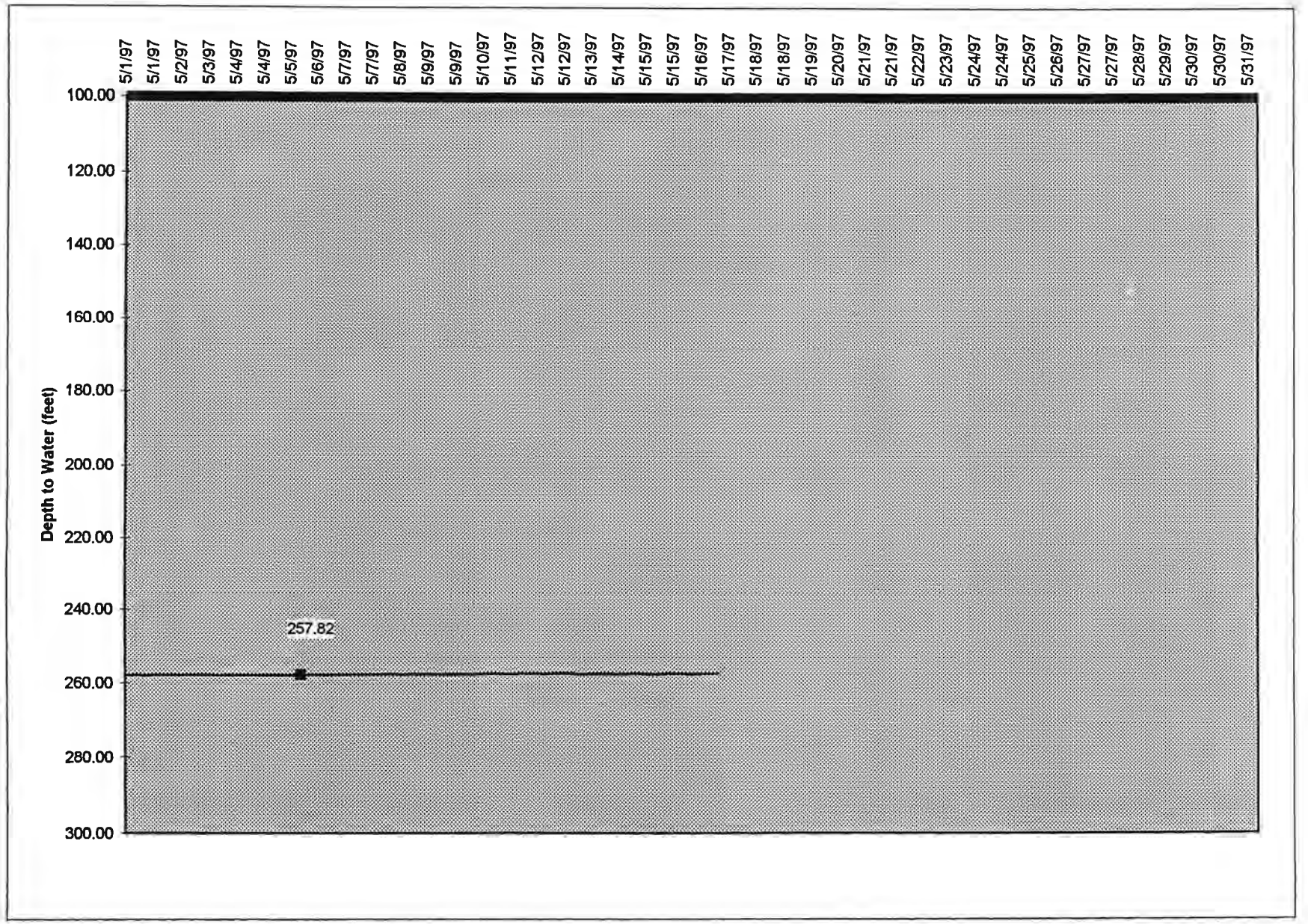
Mar 97 Chart

Well #21 Data Logger 97.xls

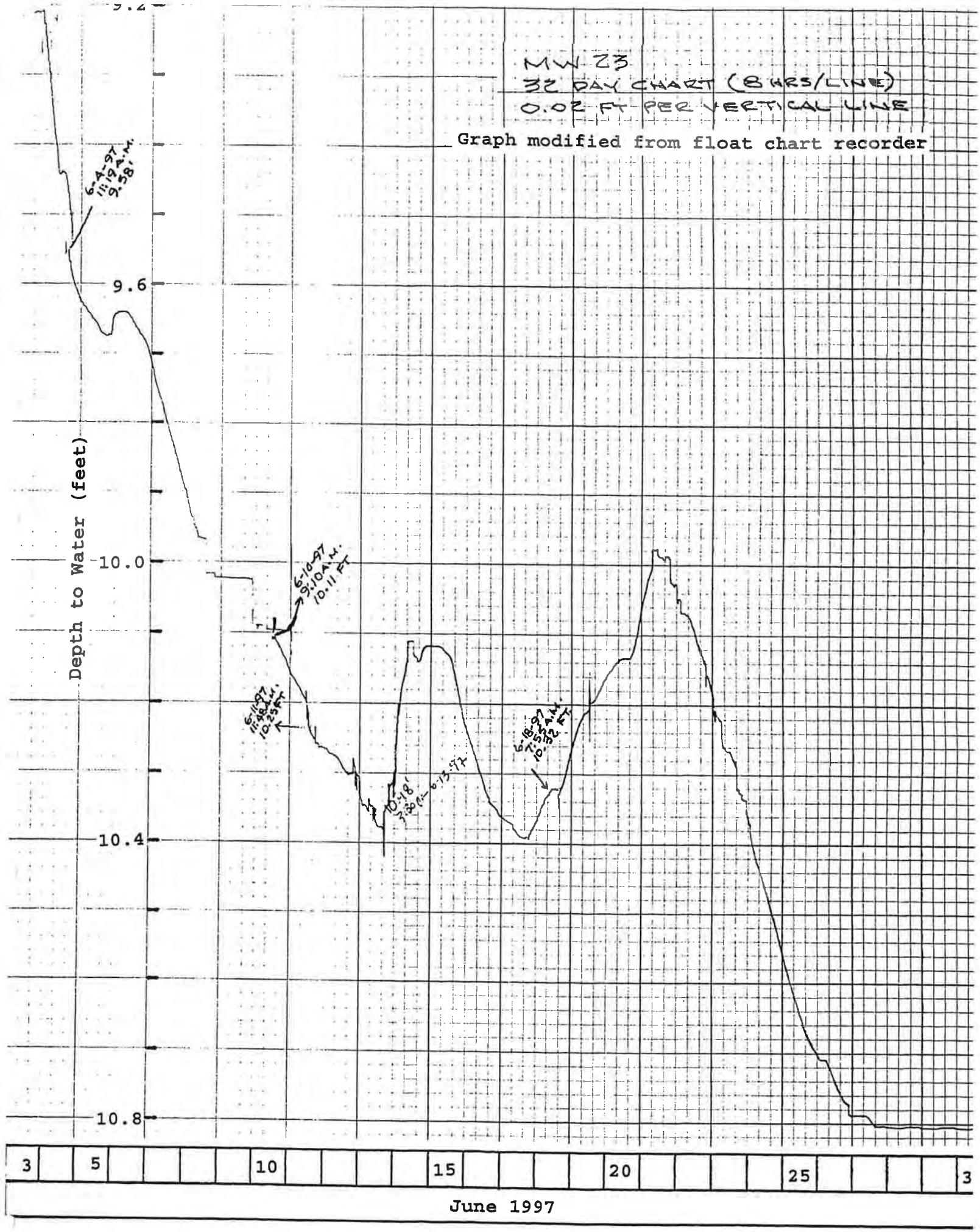


Apr 97 Chart

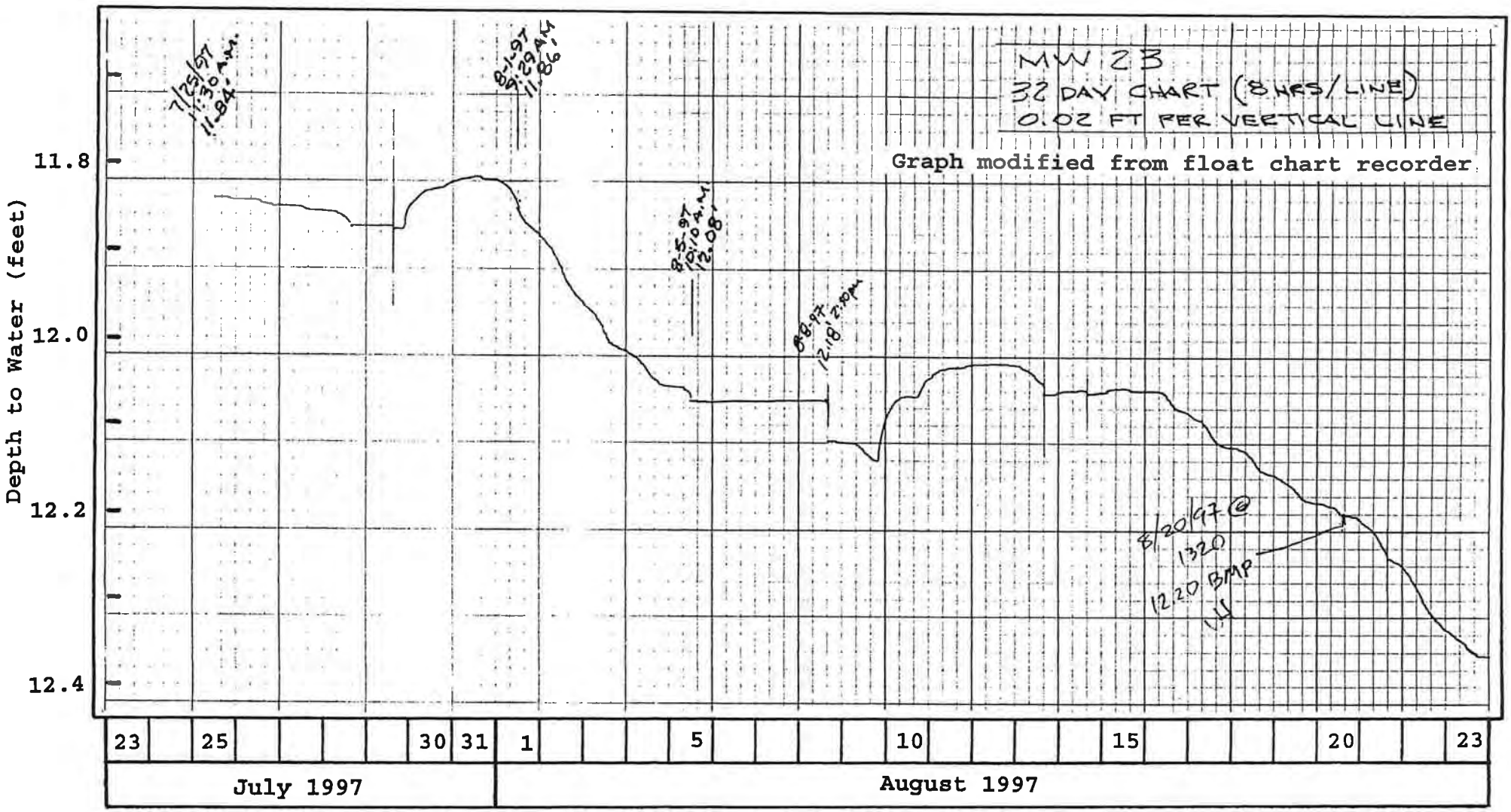
Well #21 Data Logger 97.xls



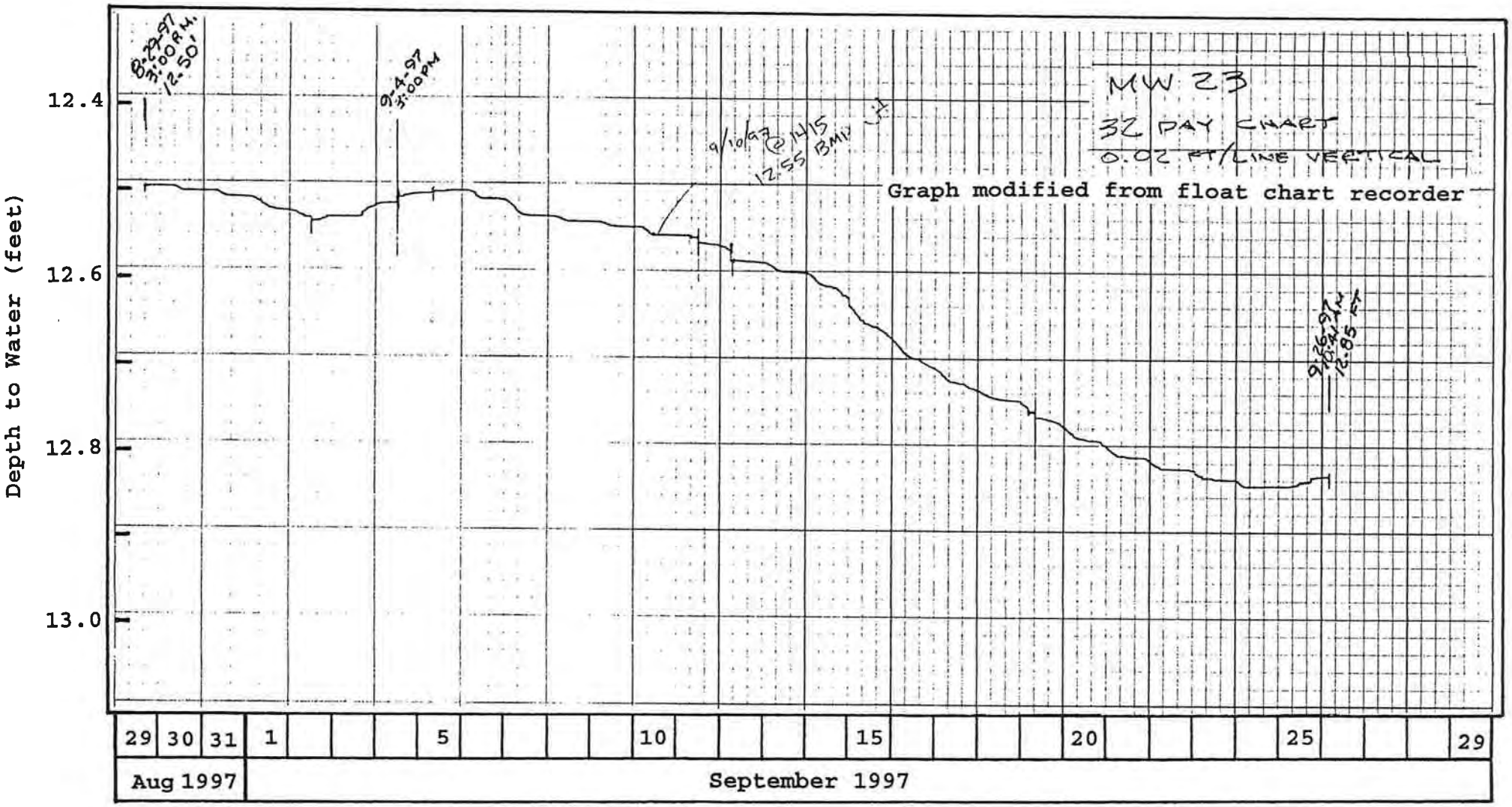
May 97 Chart



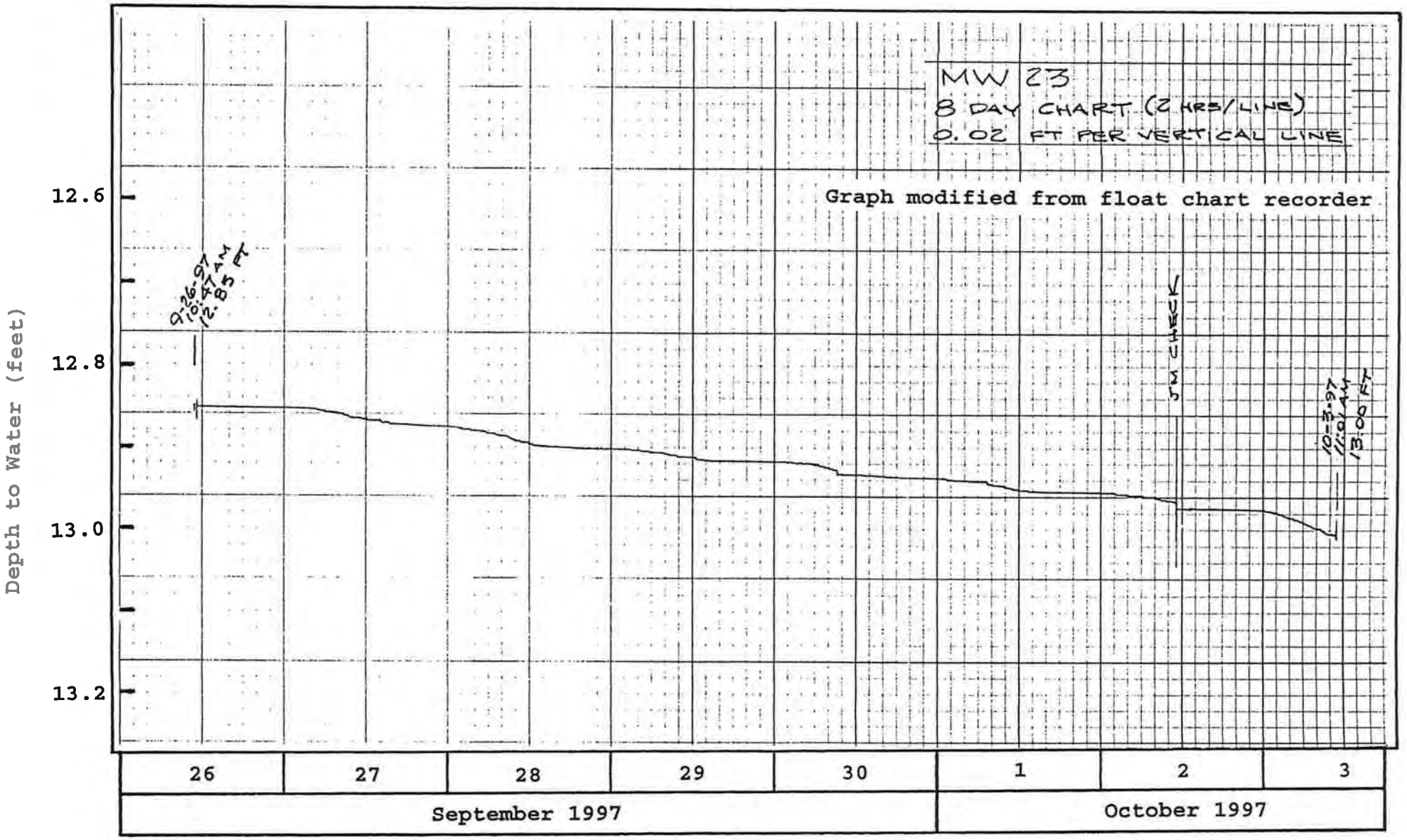
WATER-LEVEL HYDROGRAPH FOR MW-23



WATER-LEVEL HYDROGRAPH FOR MW-23

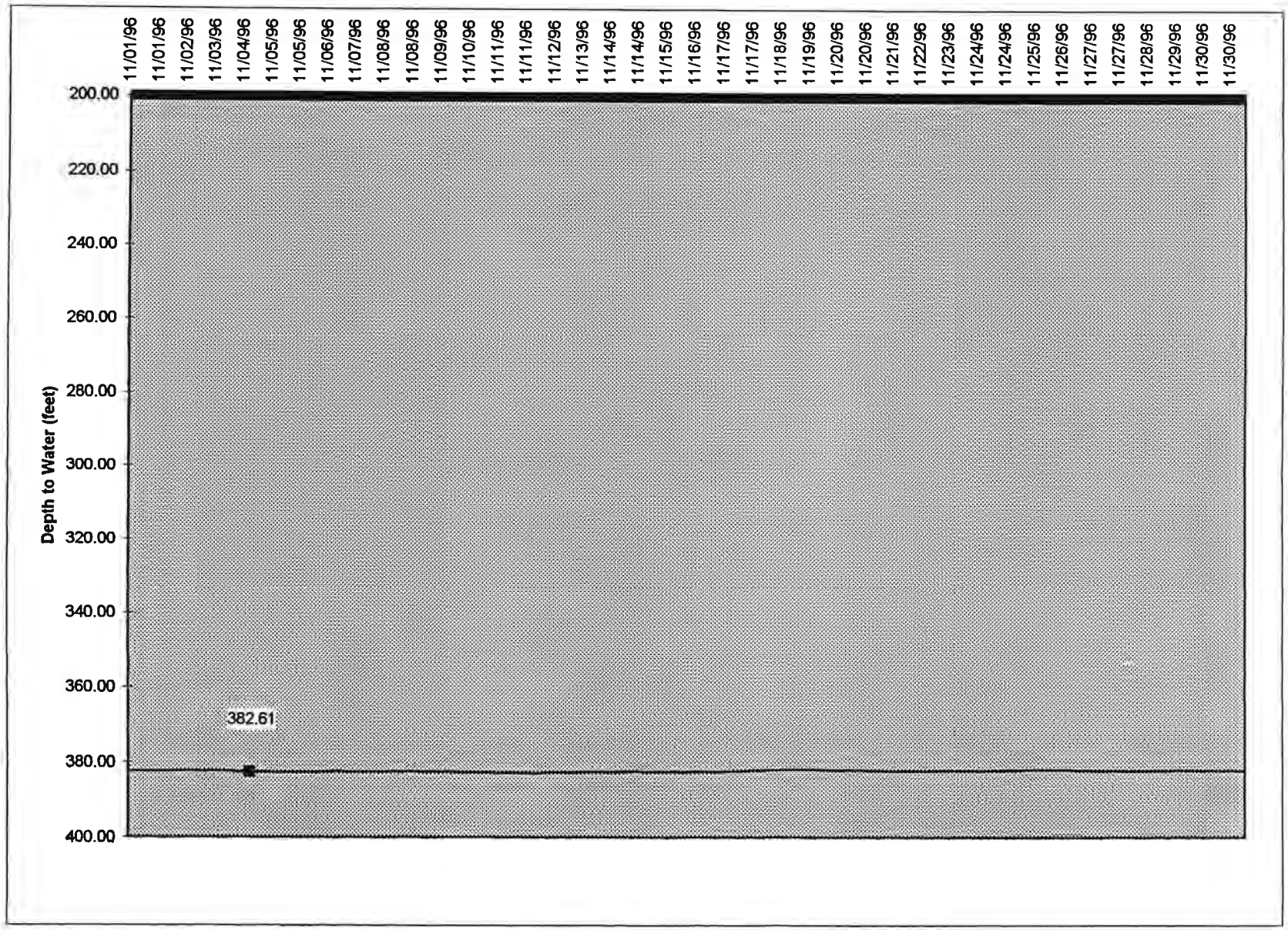


WATER-LEVEL HYDROGRAPH FOR MW-23



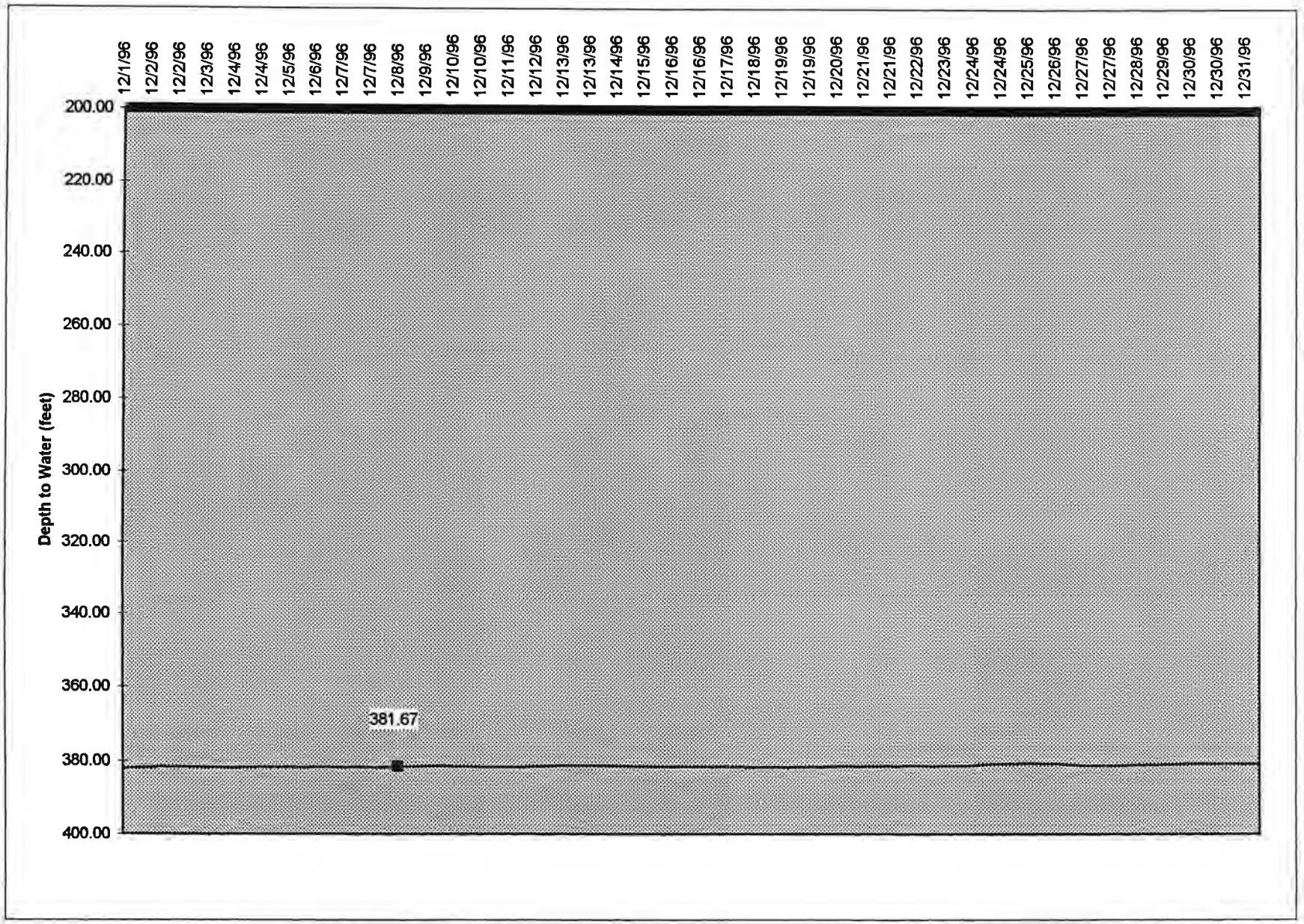
WATER-LEVEL HYDROGRAPH FOR MW-23

Well #24 Data Logger 96.xls



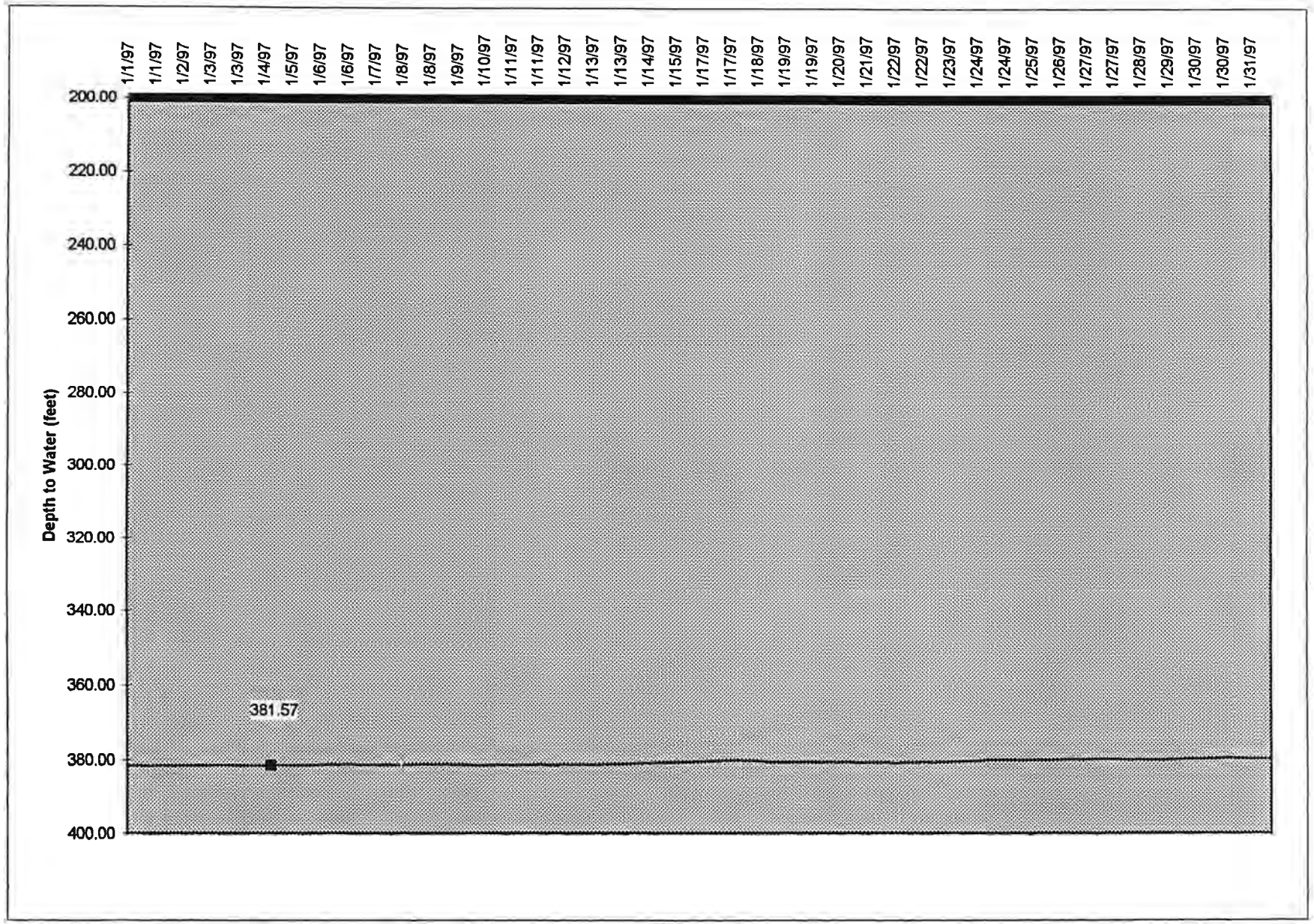
Nov 96 Chart

Well #24 Data Logger 96.xls



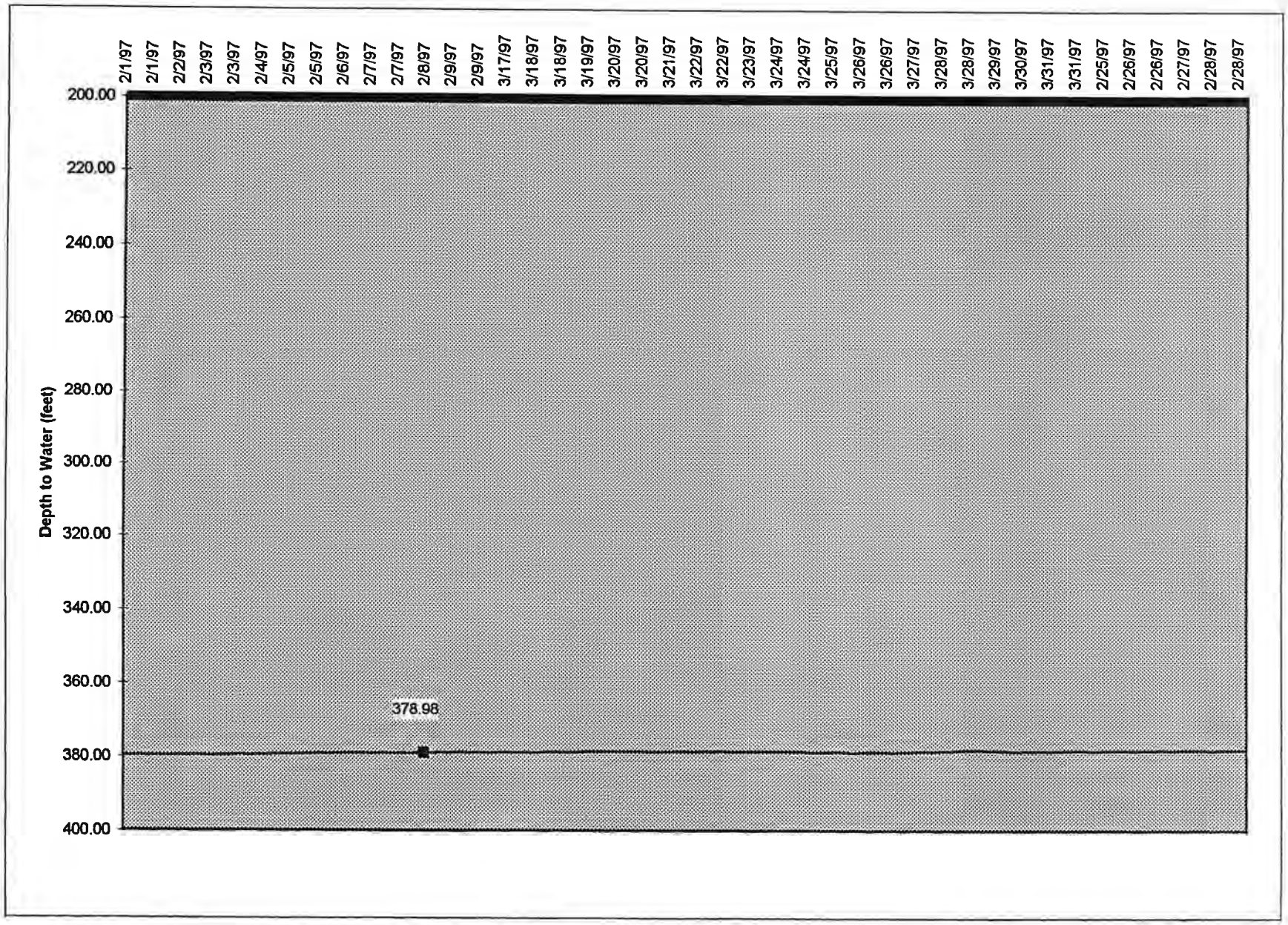
Dec 96 Chart

Well #24 Data Logger 97.xls



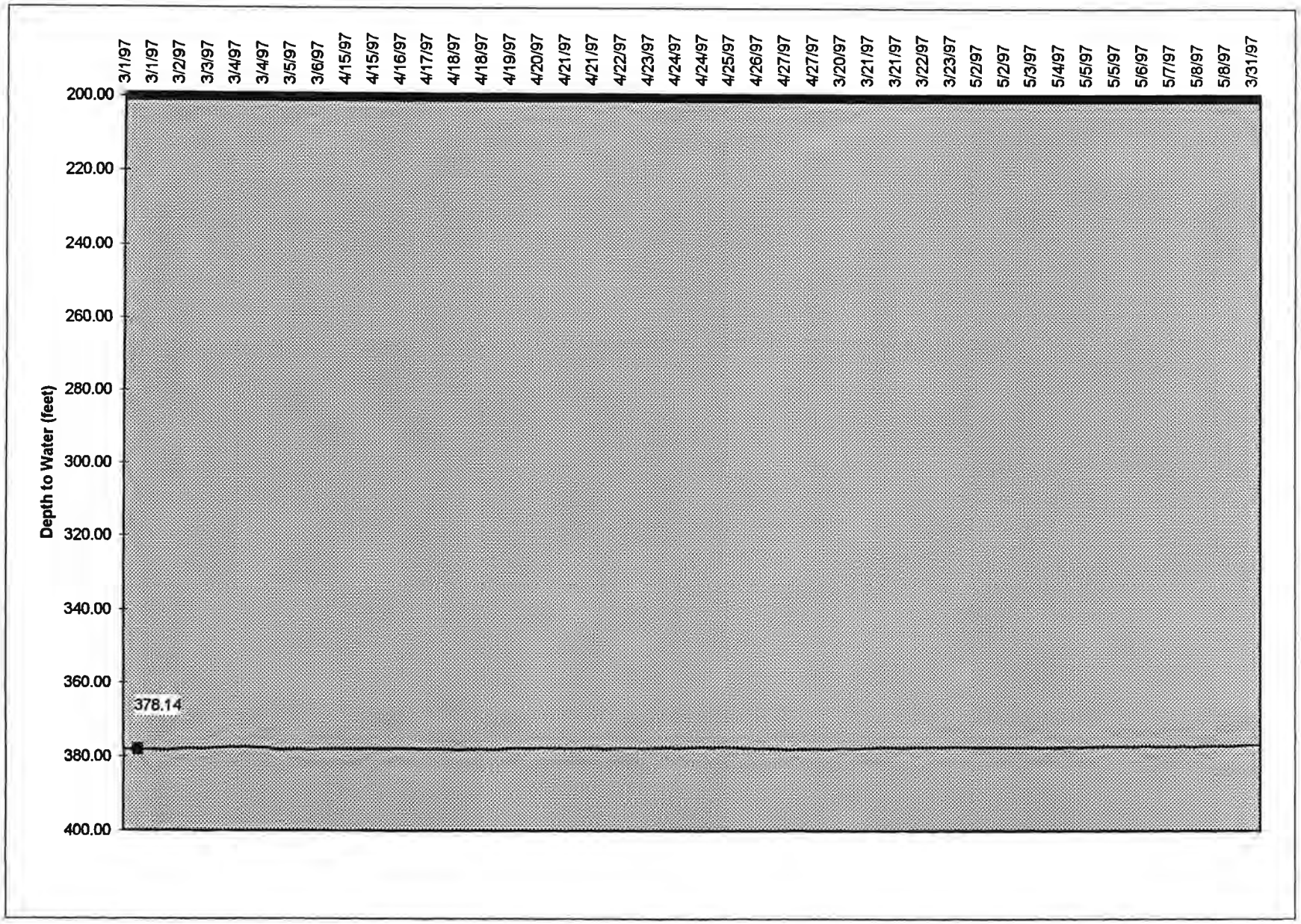
Jan 97 Chart

Well #24 Data Logger 97.xls



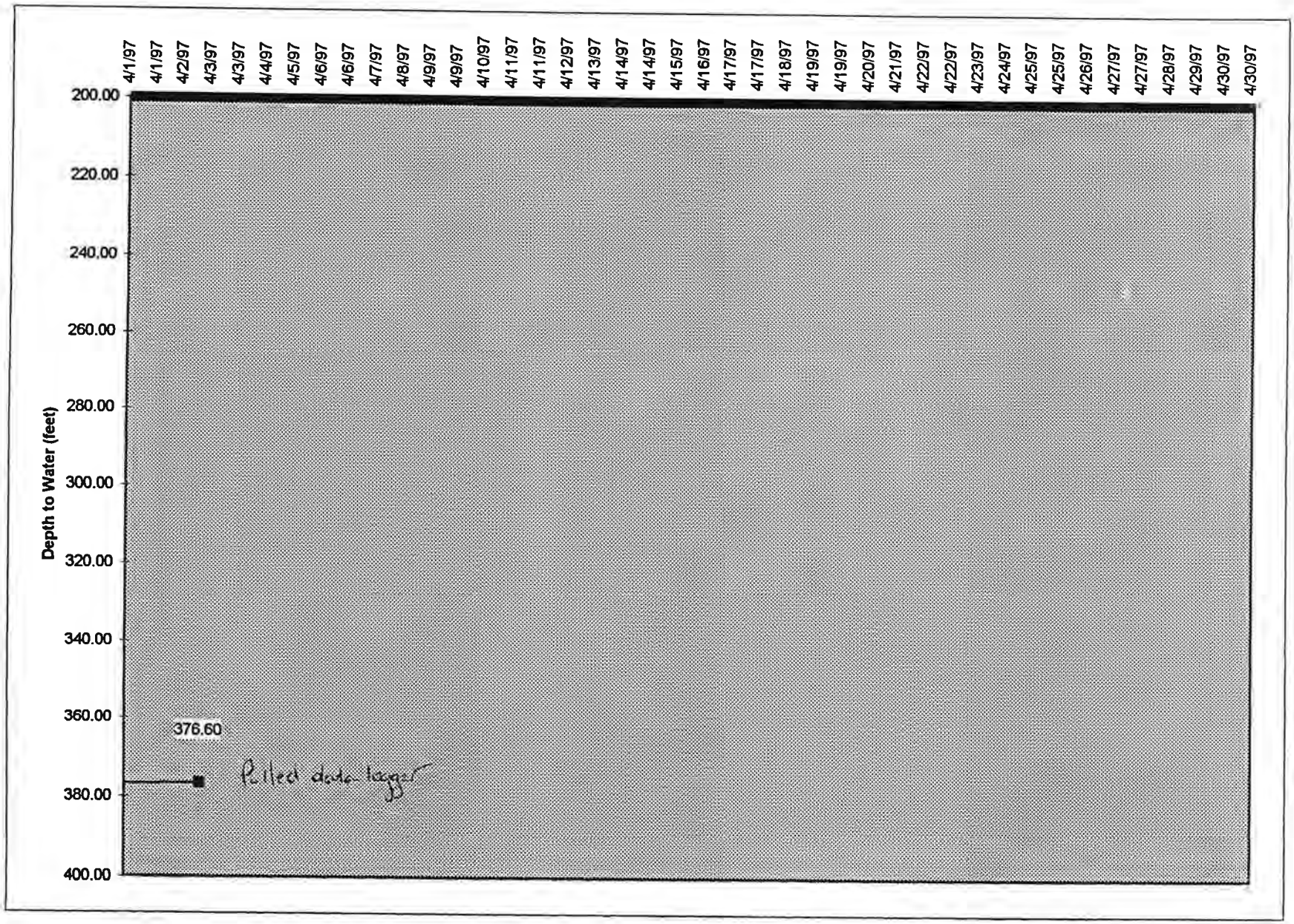
Feb 97 Chart

Well #24 Data Logger 97.xls



Mar 97 Chart

Well #24 Data Logger 97.xls



Apr 97 Chart

APPENDIX E

WELL NO. 15 AQUIFER TEST

WELL 15 AQUIFER TEST

Date	Time	Level (ft)	Pump Rate (gpm)	Temp (C)	Sp Cnd (umho/cm)
10/22/97	905	183.09	off		
Start Pmp	910				
(2 min)	912	196.15			
	914	197.44			
	916	197.88			
	918	198.20			
	920	198.25			
	922	198.38	1090		
	924	198.45			
	926	198.71			
	928	198.58		11.2	290
	930	198.76			
	932	198.68			
	934	198.77			
	936	198.96			
	938	198.80	1090		
	940	198.98			
	942	198.80			
	944	198.80			
	946	198.79			
	948	198.88			
	950	198.92			
	952	198.91			
	954	198.97			
	956	198.92			
	958	198.92			
	1000	198.98			
	1002	199.02			
	1004	199.02			
	1006	198.96			
	1008	198.98			
	1010	199.02			
	1012	199.00			
(5 min)	1017	199.00			
	1023	199.06	1090	10.7	310
	1028	199.10			
	1033	199.10			
	1038	199.17			
	1043	199.20			
	1048	199.25			
	1053	199.22			
	1058	199.20			
	1103	199.21			
	1108	199.24			
	1113	199.27			
	1118	199.22			
	1123	199.32	1090	11.4	310
	1128	199.32			
	1133	199.26			

WELL 15 AQUIFER TEST

	1138	199.29			
	1143	199.28			
	1148	199.28			
	1203	199.44			
	1208	199.48			
	1213	199.41			
	1218	199.45			
	1223	199.48			
	1228	199.50			
	1233	199.55			
	1238	199.47			
	1243	199.53			
	1248	199.57			
	1253	199.52			
	1258	199.56			
	1303	199.56			
	1308	199.56		11.4	310
(hour)	1400	199.72	1090	11.6	320
	1500	199.85	1090	11.2	320
	1600	199.95	1090	11.3	320
	1700	200.16			
	1800	200.25			
	1900	200.33			
	2000	200.42			
	2100	200.51			
	2200	200.58			
	2300	200.65			
10/23/97	700	201.22			
	800	201.25	1090	11.5	310
	900	201.35			
	1000	201.52	1090	11.7	283
	1100	201.68			
	1200	201.71			
	1300	201.79			
	1400	201.86	1090	12.0	284
	1500	201.90			
Pmp Off	1600	202.31	off		
(2 min)	1602	189.61			
	1604	187.95			
	1606	187.10			
	1608	186.72			
	1610	186.54			
	1612	186.42			
	1614	186.22			
	1616	186.20			
	1618	186.11			
	1620	185.98			
(5 min)	1625	185.90			
	1630	185.88			
	Max	**202.31**	**1090**	**12.0**	**320**
	Min	**183.09**	**1090**	**10.7**	**283**

WELL 15 TEST
OCTOBER 22, 1997
HOURLY LEVEL RECORD

Time	Well 1	Time	Well 4	Time	Well 5A	Time	Well 5M
10:10	168.67	10:55	21.88	10:30	2.49	10:30	7.29
11:10	168.63	11:55	21.88	11:30	2.49	11:30	7.29
12:10	168.62	12:55	21.88	12:30	2.49	12:30	7.29
13:10	168.61	13:55	21.88	13:30	2.49	13:30	7.29
14:10	168.59	14:55	21.88	14:30	2.49	14:30	7.29
15:10	168.58	15:55	21.88	15:30	2.49	15:30	7.29
16:10	168.56	16:55	21.88	16:30	2.49	16:30	7.29

Time	Well 6	Time	Well 10	Time	Well 10M	Time	Well 11
10:00	3.15	10:00	24.95	10:50	18.11	10:40	Flowing
11:00	3.15	11:00	24.95	11:50	18.11	11:40	Flowing
12:00	3.15	12:00	24.95	12:50	18.11	12:40	Flowing
13:00	3.15	13:00	24.95	13:50	18.11	13:40	Flowing
14:00	3.15	14:00	24.95	14:50	18.11	14:40	Flowing
15:00	3.15	15:00	24.95	15:50	18.11	15:40	Flowing
16:00	3.15	16:00	24.95	16:50	18.11	16:40	Flowing

Time	Well 11M	Time	Well 12M	Time	Well 14	Time	Well 15
10:40	19.80	10:45	13.40	10:00	260.72	10:20	199.02
11:40	19.80	11:45	13.40	11:00	257.69	11:20	199.24
12:40	19.80	12:45	13.41	12:00	255.86	12:20	199.44
13:40	19.81	13:45	13.41	13:00	255.12	13:20	199.56
14:40	19.81	14:45	13.41	14:00	254.54	14:20	199.72
15:40	19.81	15:45	13.42	15:00	254.18	15:20	199.85
16:40	19.82	16:45	13.42	16:00	254.27	16:20	199.95

Time	Well 16	Time	Well 17	Time	Well 18	Time	Well 19
10:00	475.06	10:05	370.16	10:35	57.66	10:00	312.28
11:00	475.06	11:05	370.17	11:35	57.67	11:00	312.33
12:00	475.06	12:05	370.17	12:35	57.65	12:00	312.41
13:00	475.06	13:05	370.18	13:35	57.62	13:00	312.27
14:00	475.06	14:05	370.17	14:35	57.59	14:00	312.11
15:00	475.06	15:05	370.15	15:35	57.57	15:00	312.30
16:00	475.06	16:05	370.11	16:35	57.56	16:00	312.33

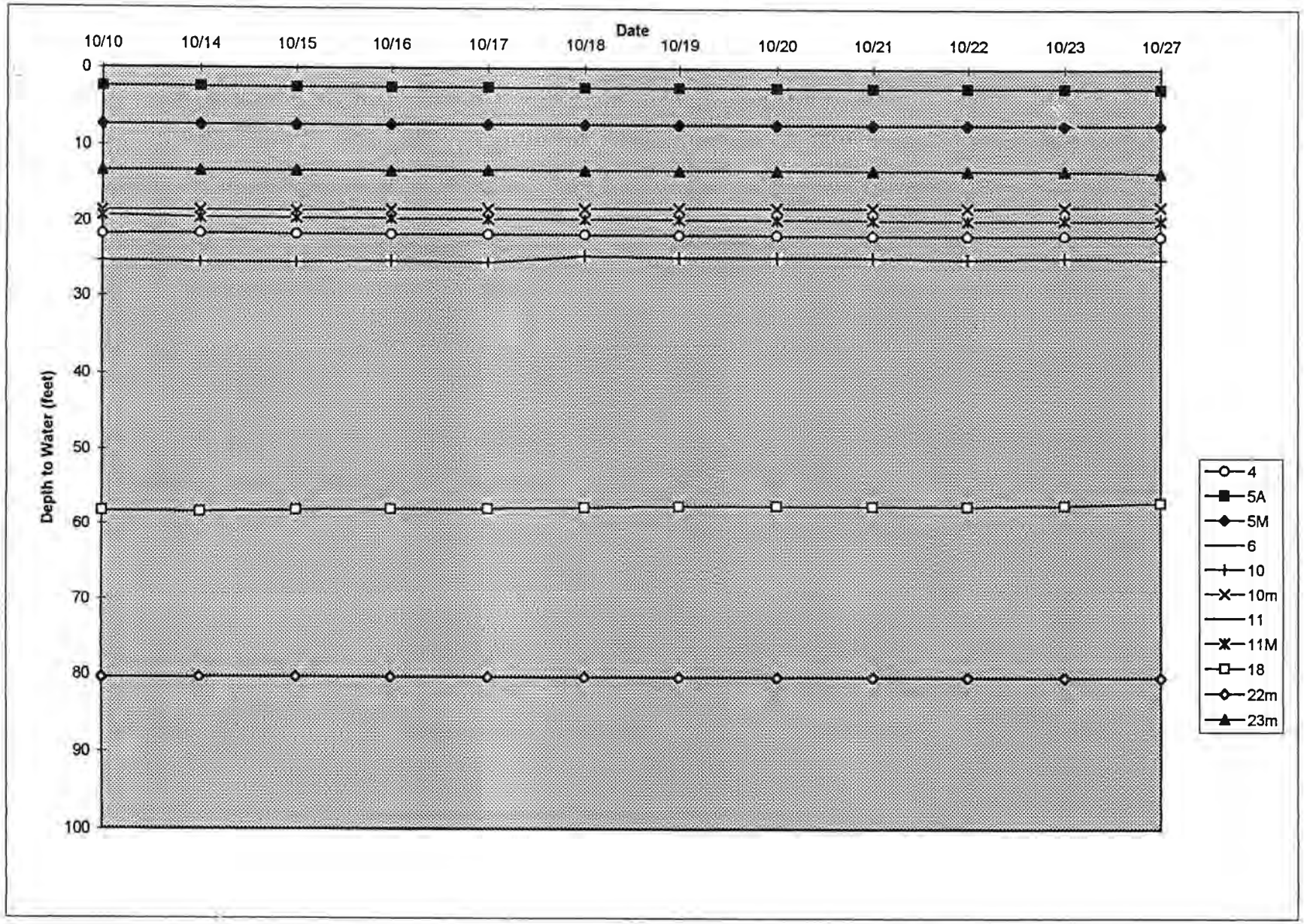
Time	Well 20	Time	Well 21	Time	Well 22M	Time	Well 23M
10:00	414.72	10:00	232.37	10:00	80.31	11:10	13.24
11:00	414.72	11:00	232.34	11:00	80.31	12:10	13.25
12:00	414.72	12:00	232.32	12:00	80.31	13:10	13.25
13:00	414.72	13:00	232.32	13:00	80.31	14:10	13.25
14:00	414.72	14:00	232.32	14:00	80.31	15:10	13.25
15:00	414.72	15:00	232.31	15:00	80.31	16:10	13.25
16:00	414.72	16:00	232.31	16:00	80.31	17:10	13.25

Time	Well 24
10:00	354.64
11:00	354.64
12:00	354.64
13:00	354.64
14:00	354.64
15:00	354.64
16:00	354.64

1997 WELL 15 TEST

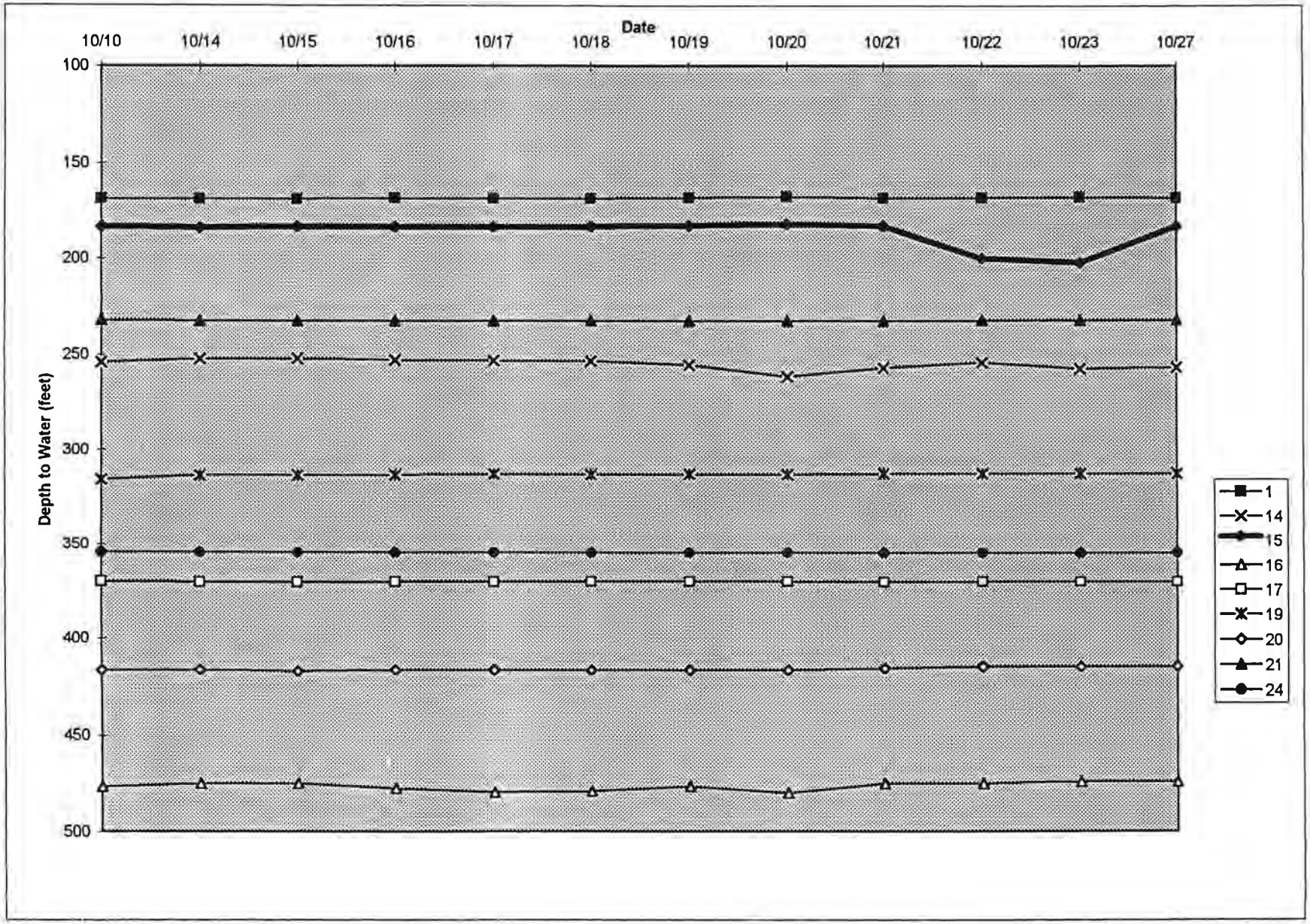
Time (ea day	Well No.	10-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct	20-Oct	21-Oct	22-Oct	23-Oct	27-Oct
13:30	1	169.05	169.26	169.24	168.87	168.94	168.93	168.48	168.12	168.84	168.56	168.26	168.71
14:45	4	21.63	21.63	21.73	21.71	21.72	21.75	21.79	21.83	21.85	21.88	21.79	21.94
14:00	5A	2.43	2.43	2.47	2.48	2.45	2.51	2.47	2.44	2.51	2.49	2.5	2.52
14:05	5M	7.35	7.35	7.34	7.29	7.29	7.29	7.29	7.29	7.29	7.29	7.29	7.29
15:00	6	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
15:00	10	25.48	25.48	25.48	25.31	25.48	24.6	24.78	24.78	24.78	24.95	24.78	24.95
14:30	10M	18.51	18.51	18.59	18.39	18.31	18.22	18.19	18.17	18.12	18.1	18.01	17.93
14:20	11	Flowing	Flowing	Flowing	Flowing	Flowing	Flowing	Flowing	Flowing	Flowing	Flowing	Flowing	Flowing
14:25	11M	19.26	19.59	19.61	19.66	19.69	19.71	19.74	19.77	19.79	19.82	19.8	19.81
14:20	12M	12.87	13.15	13.18	13.19	13.22	13.28	13.32	13.34	13.38	13.42	13.4	13.44
15:00	14	254.22	252.49	252.12	252.87	253.18	253.29	255.31	261.4	256.98	254.18	257.5	256.76
13:50	15	183.58	184.32	183.61	183.92	183.93	183.59	183.06	182.42	183.47	199.95	202.18	183.52
13:15	16	476.72	475.06	475.06	477.53	479.59	479.19	476.5	480.22	475.06	475.06	474.03	474.03
13:10	17	370.02	370.51	370.46	370.26	370.17	370.12	370.13	370.11	370.16	370.11	369.92	370.01
14:10	18	58.25	58.34	58.11	57.98	57.94	57.73	57.56	57.49	57.56	57.56	57.33	56.98
15:00	19	315.64	313.42	313.36	313.06	312.67	312.77	312.65	312.91	312.41	312.3	312.33	312.43
13:15	20	416.97	416.56	417.37	416.75	416.75	416.56	416.56	416.75	415.53	414.72	414.72	414.28
13:00	21	232.02	232.56	232.52	232.59	232.41	232.35	232.39	232.42	232.39	232.31	232.15	232.11
13:45	22M	80.34	80.31	80.31	80.31	80.31	80.31	80.31	80.31	80.31	80.31	80.31	80.31
13:25	23M	13.31	13.35	13.32	13.39	13.24	13.23	13.22	13.24	13.24	13.25	13.25	13.47
15:00	24	354.78	354.64	354.64	354.64	354.64	354.64	354.64	354.64	354.64	354.64	354.64	354.39

1997 Well 15 Test



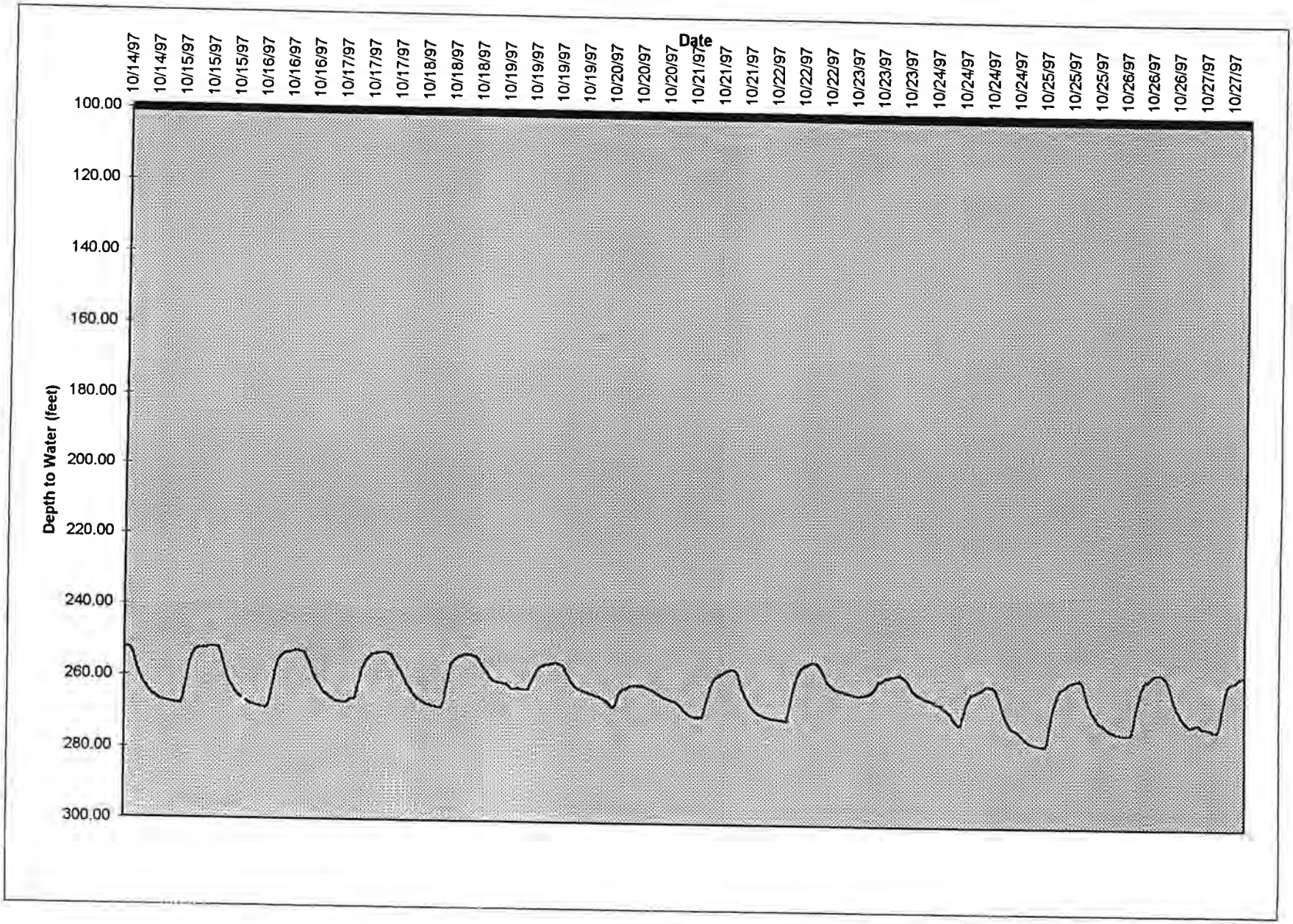
Shallow Wells Chart

1997 Well 15 Test

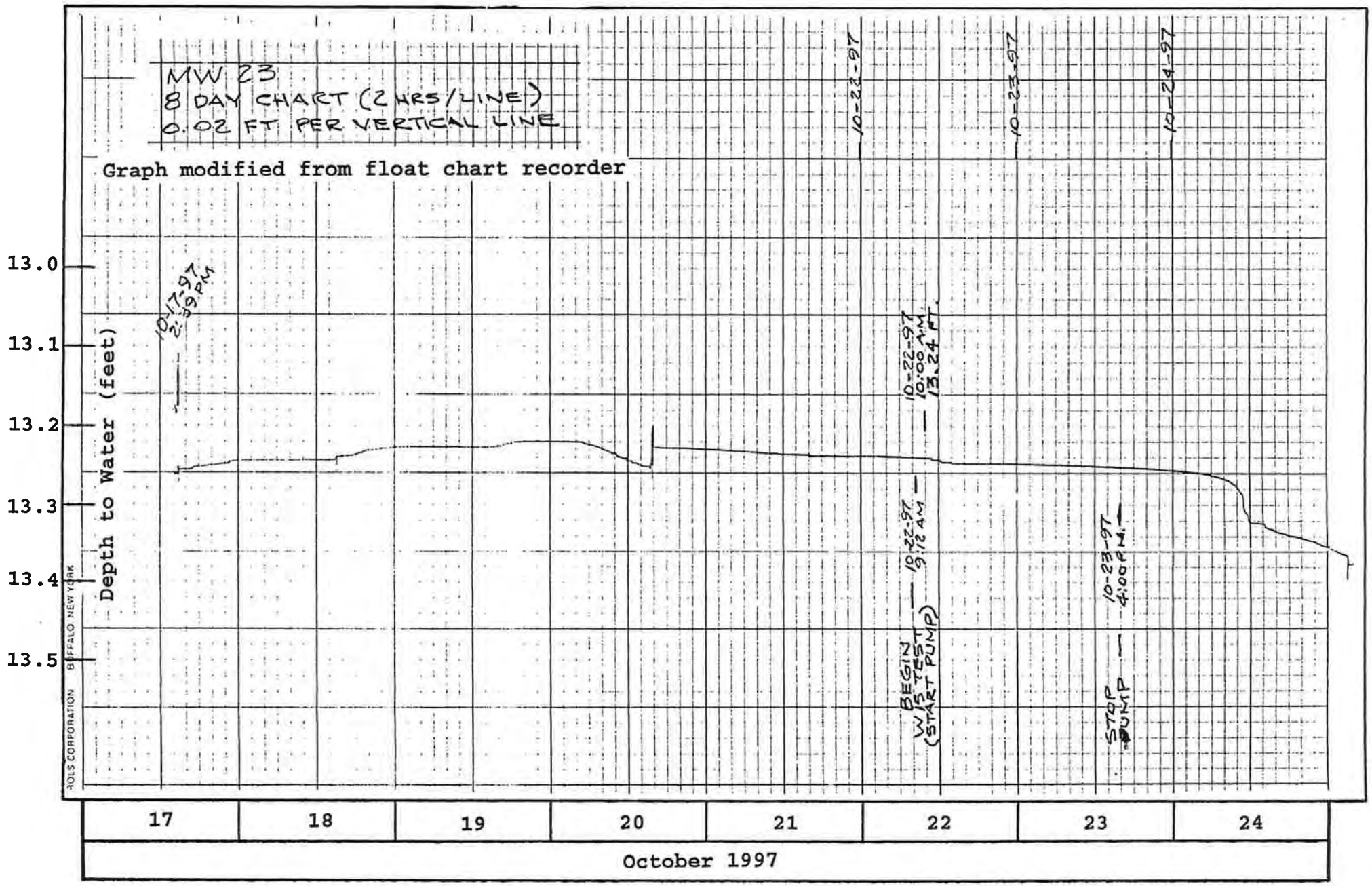


Deep Wells Chart

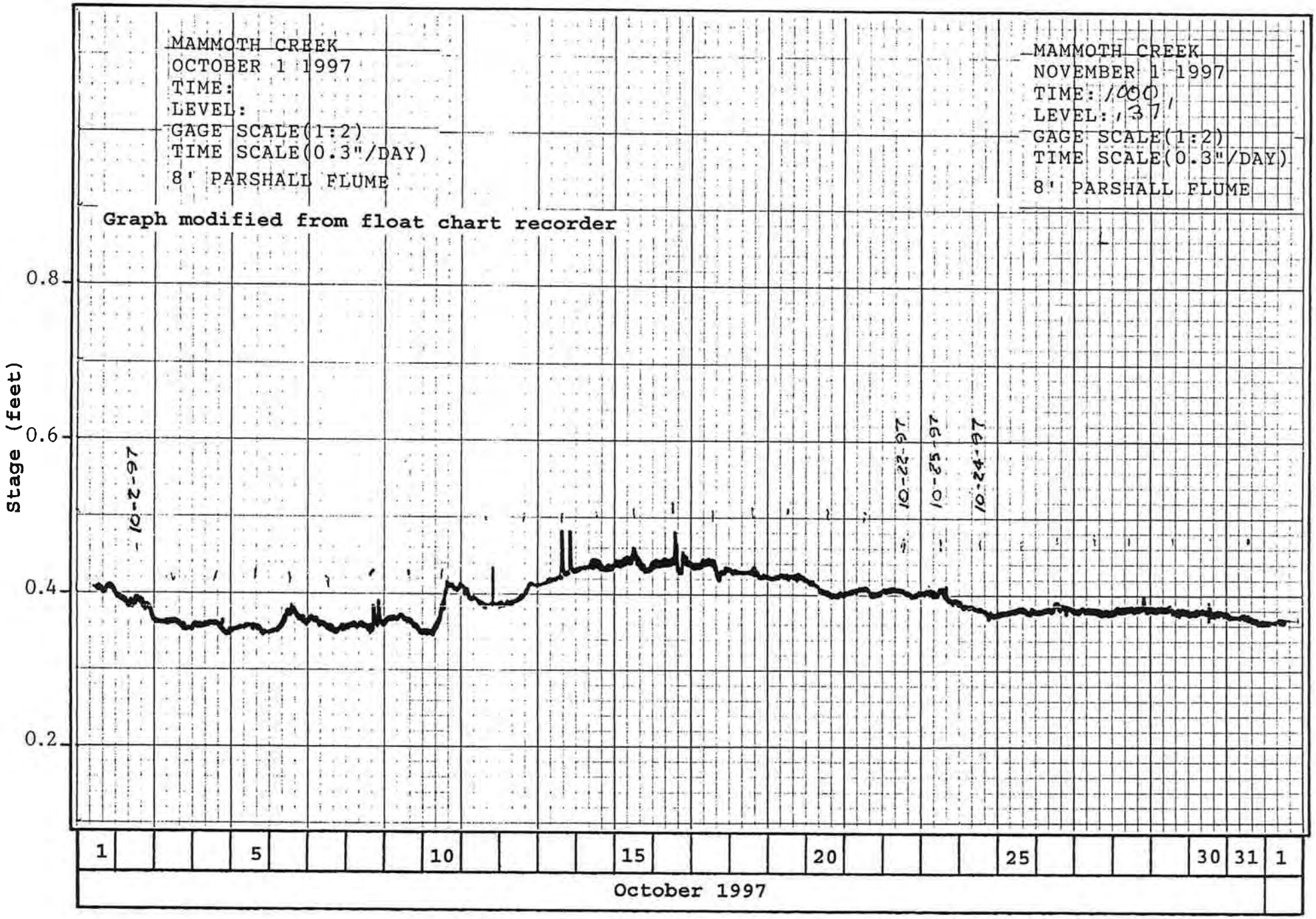
Well #14 Data Logger 97.xls



Oct 97 Chart



WATER-LEVEL HYDROGRAPH FOR MW-23



STREAMFLOW HYDROGRAPH FOR MAMMOTH CREEK @ OLD MAMMOTH ROAD

APPENDIX F

CHEMICAL ANALYSES OF WATER FROM DISTRICT WELLS

PRODUCTION WELL WATER QUALITY

Well Site	Sample Date	Sample Time	Conductivity umho/cm	TDS mg/L	Temp F	pH
1	6/6/96	8:20	240	168	47	7.4
6	6/6/96	9:05	470	283	49	7.5
10	6/6/96	9:20	465	315	50	7.3
15	6/6/96	9:45	240	152	55	7.4
16	7/11/96	9:00	660	432	70	7.5
17	7/11/96	8:45	360	265	65	7.3
18	7/11/96	8:15	540	332	47	7.1
20	7/11/96	9:20	217	164	59	7.1
1	9/12/97	10:15	190	96	49	7.2
6	9/12/97	9:25	397	198	53	7.1
10	9/12/97	9:14	359	179	55	7.2
15	9/12/97	9:19	288	144	55	7.2
16	9/11/97	10:11	632	317	73	7.1
17	no sample due to motor/pump failure					
18	9/12/97	13:40	500	251	68	7.1
20	9/11/97	9:57	336	168	61	6.9
x						

MONITOR WELL WATER QUALITY

Well Site	Sample Date	Sample Time	Conductivity umho/cm	TDS mg/L	Temp F	pH
4M	9/9/96	8:05	162	84	47	7.4
5A	9/9/96	8:30	674	339	60	6.7
5M	9/9/96	8:40	430	217	56	6.4
7	No sample					
10M			No water in well			
11	9/9/96	9:30	96	50	51	7.4
11M	9/9/96	9:40	283	144	52	7.5
12M	9/9/96	10:05	267	137	52	7.5
14M	No sample					
19	No sample					
21	No sample					
22	No sample					
23	9/9/96	10:50	93	47	52	7.3
24	No sample					

Note: not able to collect samples from 14M, 19, 21 & 24 due to transducer and data logger installation.

Well Site	Sample Date	Sample Time	Conductivity umho/cm	TDS mg/L	Temp F	pH
4M	9/24/97	8:03	93	47	45	7.2
5A	9/24/97	8:35	662	331	58	6.8
5M	no sample due to float chart recorder in well					
7	9/2/97	10:15	101	50	49	7.4
10M	9/16/97	14:05	358	180	50	7.3
11	9/16/97	14:20	106	53	53	7.3
11M	9/16/97	14:30	350	175	51	7.5
12M	9/16/97	14:02	364	182	50	7.5
14M	no sample due to transducer in well					
19	no sample due to transducer in well					
21	no sample due to transducer in well					
22						
23	9/16/97	10:05	95	48	50	7.3
24	no sample due to transducer in well					

APPENDIX G

MAMMOTH CREEK STREAMFLOW

TWIN LAKES OUTFLOW

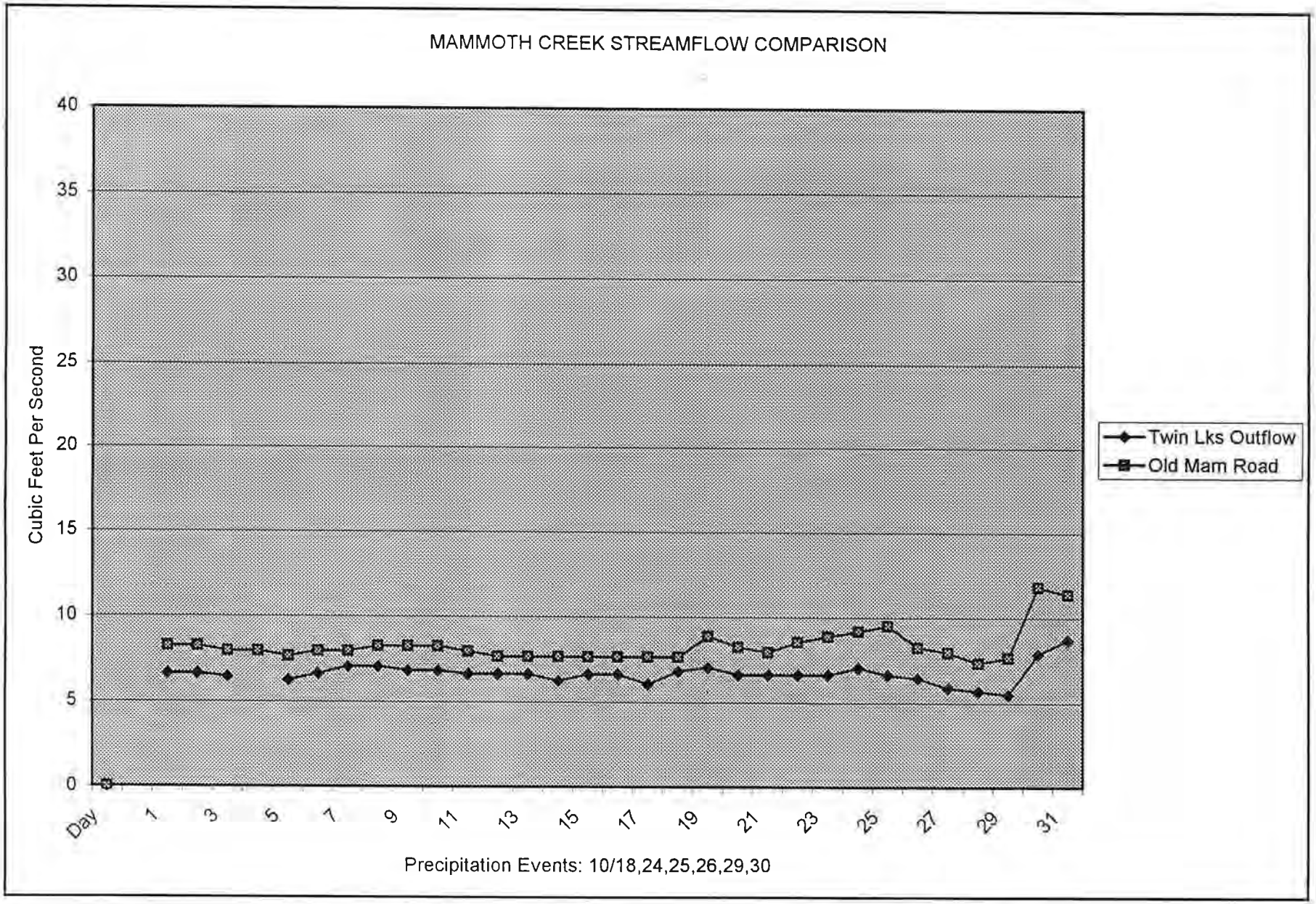
Daily discharge in cubic feet per second

Day	1996 OCT	NOV	DEC	1997 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	8.7	9.6	16.3		8.1	13.5	32.1	>32.42	>32.42	21.6	11.6
2	6.6	8.7	8.5	50.1		8.1	14.5	31.5	>32.42	>32.42	16.6	11.9
3	6.4	8.9	8.5	97.7		7.4	13.5	>32.42	>32.42	31.2	14.8	12.3
4		8.7	8.3	63.6		7.2	12.6	>32.42	>32.42	27.9	15.3	11.9
5	6.2	8.3	10.2	48.5		7.2	12.1	>32.42	>32.42	28.8	16.9	12.1
6	6.6	8.3	11.9	35.6		7.2	11.6	>32.42	>32.42	27.9	18.1	11.9
7	7.0	8.1	11.4	30.9	10.2	7.0	11.4	>32.42	>32.42	29.1	19.7	11.4
8	7.0	8.1	10.7	25.6	9.8	7.0	11.2	>32.42	>32.42	28.5	17.3	11.4
9	6.8	8.1	9.8	22.8	9.6	7.0	11.2	>32.42	>32.42	29.1	15.3	11.4
10	6.8	7.9		20.3	9.6	6.8	11.2	>32.42	>32.42	28.5	14.7	11.4
11	6.6	7.4	19.5	18.7	9.6	7.0	11.2	>32.42	>32.42	29.7	14.7	11.2
12	6.6	7.6	19.7	17.1	9.4	7.0	10.9	>32.42	>32.42	>32.42	14.7	11.6
13	6.6	7.4	16.0	18.1	9.1	7.0	11.2	>32.42	>32.42	>32.42	14.7	11.4
14	6.2	7.9	13.3	17.1	9.1	7.0	11.4	>32.42	>32.42	31.5	14.0	11.4
15	6.6	7.6	11.6	16.6	9.1	7.0	11.6	>32.42	>32.42	22.2	13.8	11.6
16	6.6	7.4	10.5	15.8	8.9	7.0	12.6	>32.42	>32.42	20.0	13.3	11.4
17	6.0	12.6	9.8	15.0	8.7	7.2	13.8	>32.42	>32.42	23.9	13.3	10.9
18	6.8	21.9	9.1	14.0	8.9	7.2	14.5	>32.42	>32.42	25.6	13.3	11.4
19	7.0	20.3	8.9	12.8	8.9	7.0	17.3	>32.42	>32.42	26.8	12.6	10.9
20	6.6	18.7	8.3	14.0	8.7	7.6	20.0	>32.42	>32.42	26.2	12.6	10.9
21	6.6	16.0	10.0	15.8	8.5	8.1	22.5	>32.42	>32.42	24.8	12.1	10.9
22	6.6	25.9	14.8	15.8	8.5	8.5	24.7	>32.42	>32.42	24.7	8.1	10.7
23	6.6	23.0	12.1	18.4	8.3	8.7	28.5	>32.42	>32.42	21.6	9.4	10.7
24	7.0	18.7	12.1	18.1	8.3	9.1	30.9	>32.42	>32.42	21.4	10.2	10.5
25	6.6	15.5	12.1	21.4	8.1	9.6	31.5	>32.42	>32.42	22.8	10.7	10.0
26	6.4	13.5	9.8	21.6	8.1	10.2	31.8	>32.42	>32.42	22.5	11.2	10.2
27	5.9	12.1	9.1	18.7	8.1	10.7	31.2	>32.42	>32.42	21.1	11.4	9.1
28	5.7	11.2	10.9	18.1	8.1	11.4	30.6	>32.42	>32.42	20.5	11.6	8.7
29	5.5	10.7	8.9	17.1		12.1	31.8	>32.42	>32.42	22.8	11.6	8.5
30	7.9	10.0	10.7			12.6	32.7	>32.42	>32.42	26.2	11.9	7.6
31	8.7		10.2			12.8		>32.42		25.6	11.4	
Mean	6.6	12.0	11.2	25.4	8.9	8.3	18.5	>32.4	>32.4	25.6	13.8	10.9
Maximum	8.7	25.9	19.7	97.7	10.2	12.8	32.7	>32.4	>32.4	31.5	21.6	12.3
Minimum	5.5	7.4	8.3	12.8	8.1	6.8	10.9	31.5	>32.4	20.0	8.1	7.6

MAMMOTH CREEK FLOW AT OLD MAMMOTH ROAD

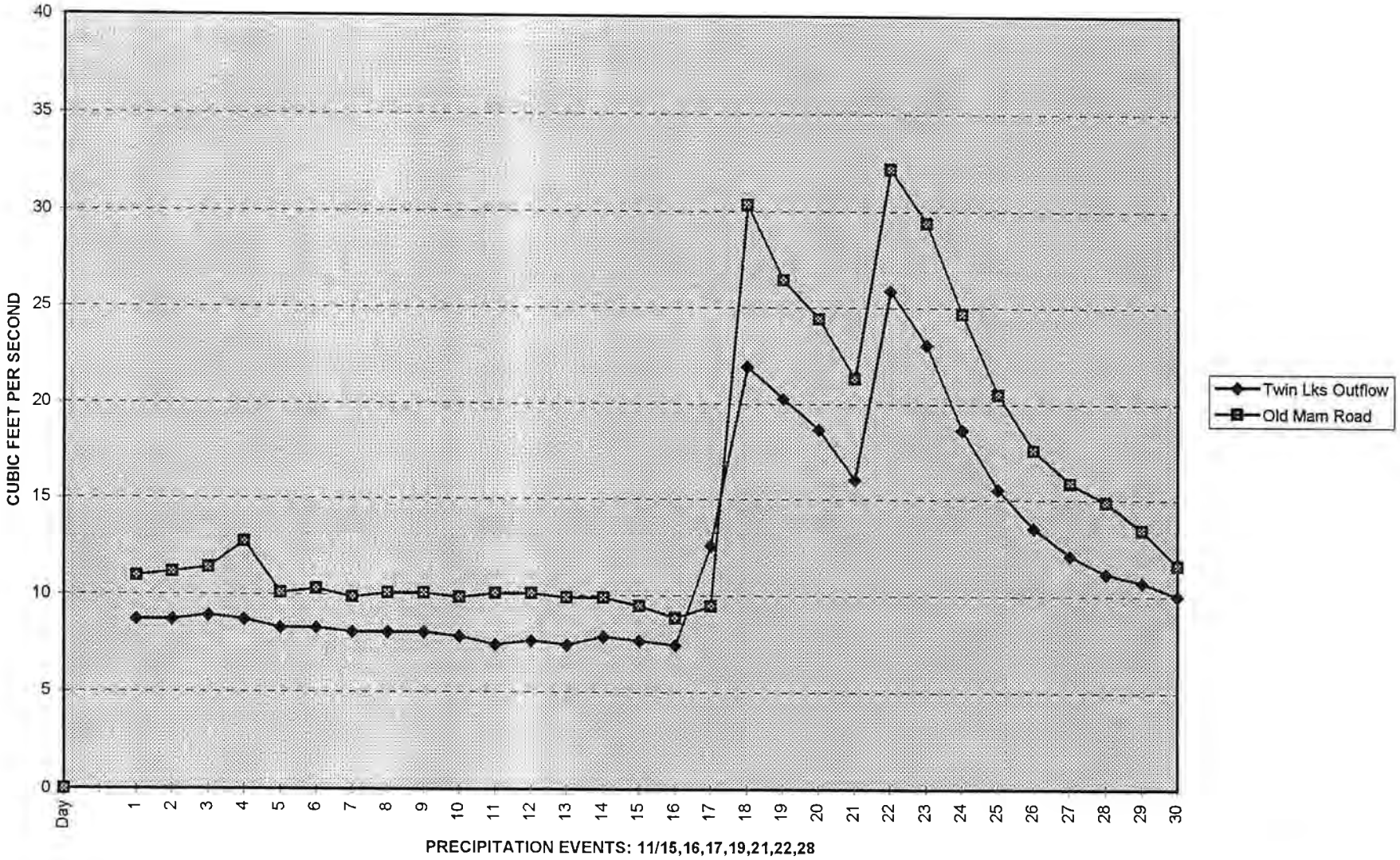
Daily discharge in cubic feet per second

	1996			1997								
Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.3	10.9	14.1	40.0	15.8	10.1	21.0	43.5	136.8	37.8	26.1	11.9
2	8.3	11.2	11.4	55.0	15.1	9.4	21.5	42.3	141.3	38.4	21.5	11.9
3	7.9	11.4	11.4	105.0	14.4	9.2	21.5	45.8	111.1	33.6	18.0	13.3
4	7.9	12.7	12.1	70.0	13.7	8.4	20.2	53.1	82.3	32.0	17.2	12.6
5	7.6	10.1	12.1	55.0	13.2	8.8	19.3	51.8	80.1	31.0	17.6	12.6
6	7.9	10.3	15.3	40.0	13.2	8.8	18.0	52.4	92.8	31.0	19.7	12.3
7	7.9	9.9	15.3	35.0	13.0	8.8	17.6	55.6	80.8	31.0	22.4	12.3
8	8.3	10.1	13.9	30.0	12.5	8.6	17.6	58.8	69.5	31.5	21.9	11.5
9	8.3	10.1	13.7	30.0	12.7	9.0	17.6	61.4	72.2	31.0	20.6	11.5
10	8.3	9.9	13.7	25.0	11.8	9.6	16.8	71.6	75.1	31.5	17.6	11.9
11	7.9	10.1	33	25.0	11.8	10.1	17.2	73.6	67.4	32.0	15.2	11.5
12	7.6	10.1	30	25.0	11.6	10.3	17.2	77.2	64.0	35.7	15.2	11.2
13	7.6	9.9	22.7	25.0	11.8	10.5	17.2	86.0	62.7	40.1	15.2	11.5
14	7.6	9.9	18.6	23.3	11.4	10.7	18.0	92.0	72.2	36.8	14.1	11.5
15	7.6	9.4	15.3	22.7	11.4	11.4	18.5	98.2	75.1	29.0	14.5	11.2
16	7.6	8.8	14.4	22.4	11.4	12.7	20.6	105.4	58.1	23.7	14.5	11.2
17	7.6	9.4	13.2	20.8	11.2	11.8	22.4	117.8	56.2	24.2	13.7	11.2
18	7.6	30.3	12.1	20.0	11.2	11.6	22.8	116.1	67.4	26.5	13.7	11.2
19	8.9	26.4	11.6	18.6	11.1	11.4	25.1	108.6	77.2	28.5	13.7	11.5
20	8.3	24.4	10.9	18.9	11.4	13.4	29.5	96.7	78.7	28.0	13.3	11.2
21	7.9	21.3	9.6	21.0	11.2	13.7	32.0	80.8	85.2	28.0	12.6	11.2
22	8.6	32.2	10.1	18.6	10.7	14.5	36.2	73.6	83.0	27.5	10.5	11.2
23	8.9	29.4	13	21.9	10.7	16.8	40.1	80.8	71.6	25.1	8.9	10.9
24	9.2	24.7	32.2	30.0	10.5	18.5	40.1	84.5	62.0	23.7	10.2	10.5
25	9.5	20.5	30	30.0	9.4	18.9	37.8	72.9	49.4	24.2	10.5	10.5
26	8.3	17.6	23.5	30.0	10.5	19.7	36.8	54.9	45.8	24.6	10.9	10.5
27	7.9	15.8	20.2	30.0	9.6	21.9	37.3	44.6	51.8	23.3	10.9	9.8
28	7.3	14.9	20	26.4	9.6	22.4	40.1	53.1	52.4	22.8	11.5	8.3
29	7.6	13.4	18.1	21.0		21.5	41.7	70.8	51.2	23.7	11.9	8.6
30	11.8	11.6	35	18.6		21.9	42.9	93.6	42.9	26.5	11.9	8.3
31	11.4		26.4	16.8		21.9		119.4		28.5	11.9	
Mean	8.3	15.2	17.8	31.3	11.9	13.4	26.2	75.4	73.9	29.4	15.1	11.2
Maximum	11.8	32.2	35.0	105.0	15.8	22.4	42.9	119.4	141.3	40.1	26.1	13.3
Minimum	7.3	8.8	9.6	16.8	9.4	8.4	16.8	42.3	42.9	22.8	8.9	8.3



OCTOBER, 1996

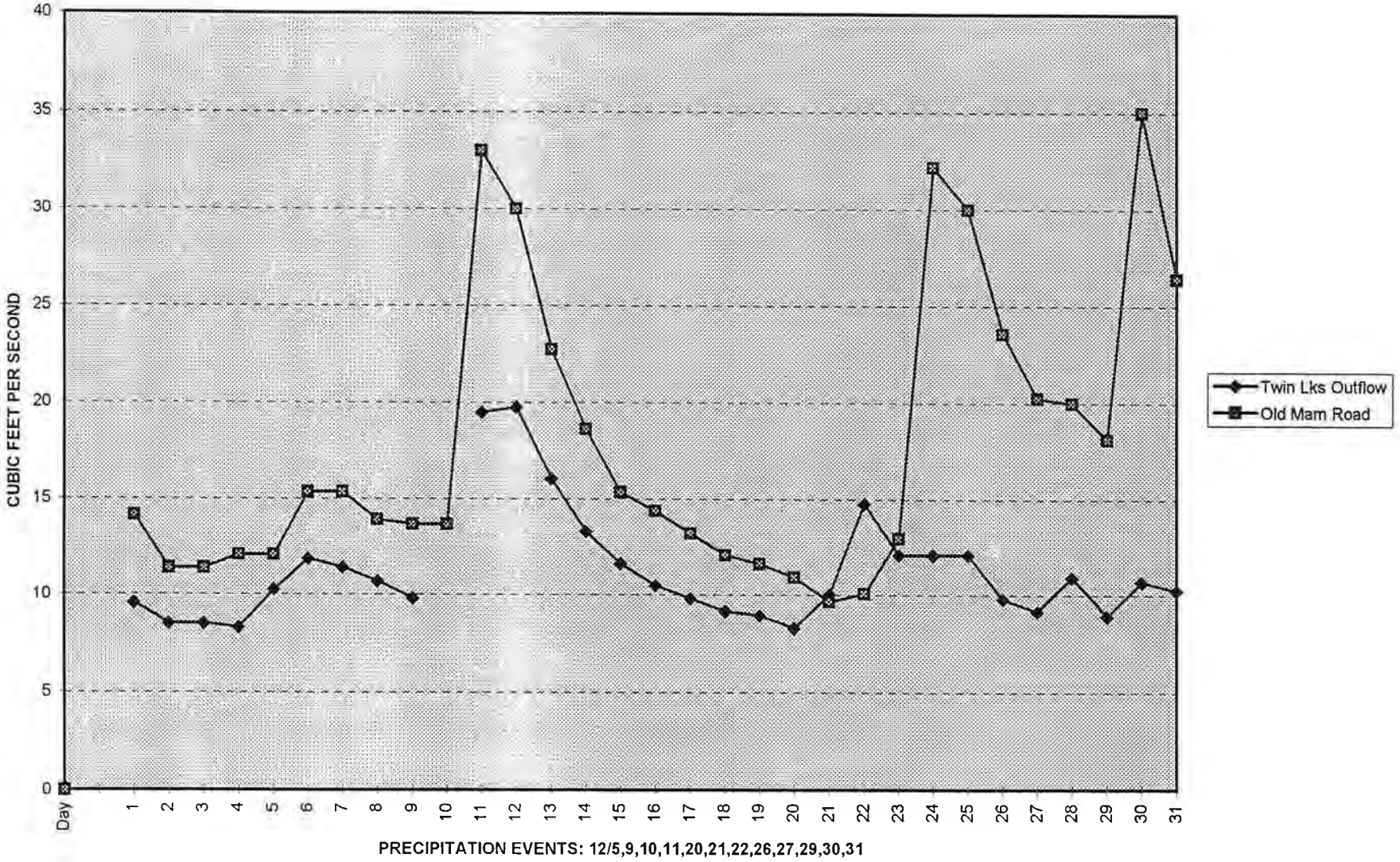
MAMMOTH CREEK STREAMFLOW COMPARISON



PRECIPITATION EVENTS: 11/15,16,17,19,21,22,28

NOVEMBER, 1996

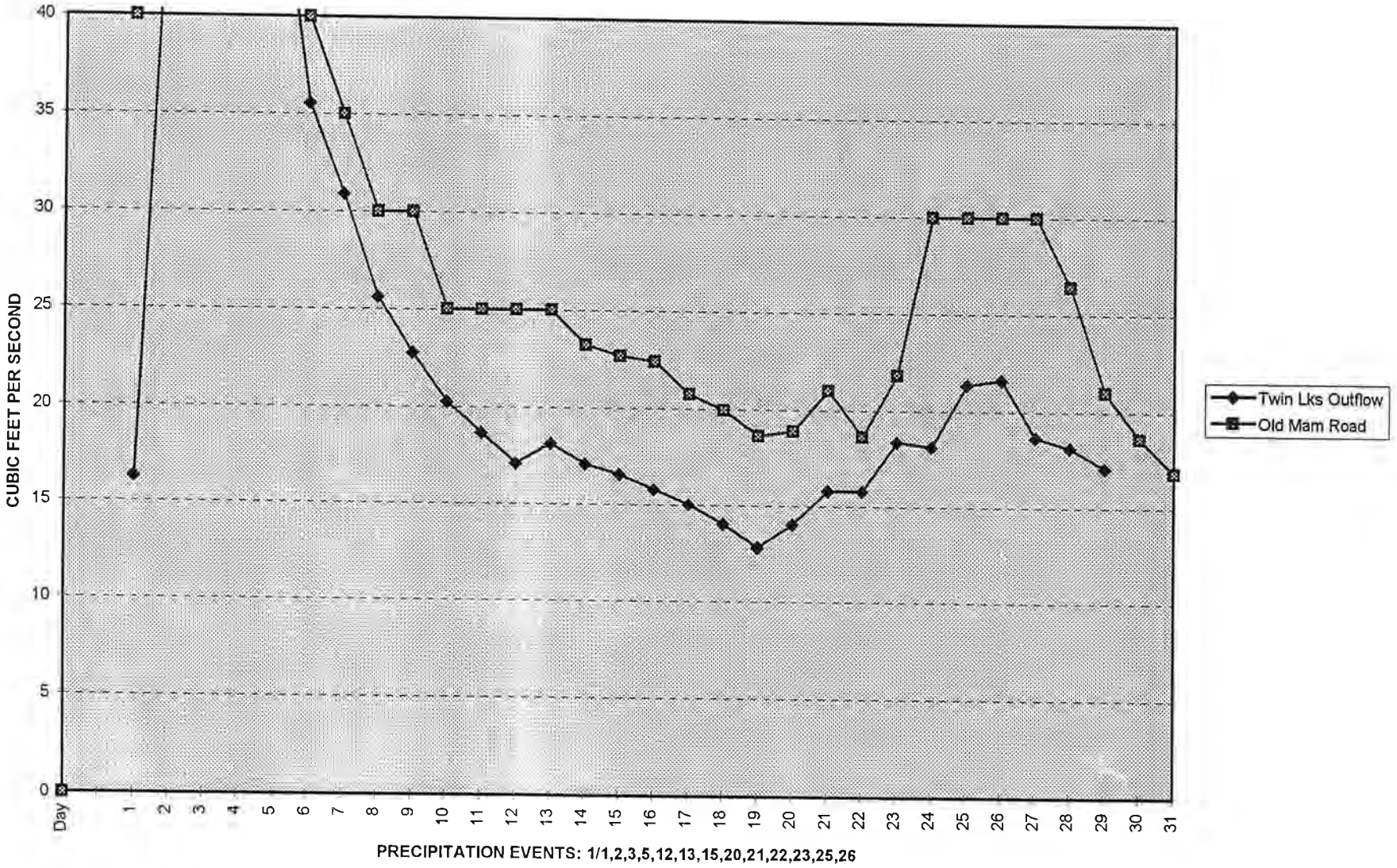
MAMMOTH CREEK STREAMFLOW COMPARISON



PRECIPITATION EVENTS: 12/5,9,10,11,20,21,22,26,27,29,30,31

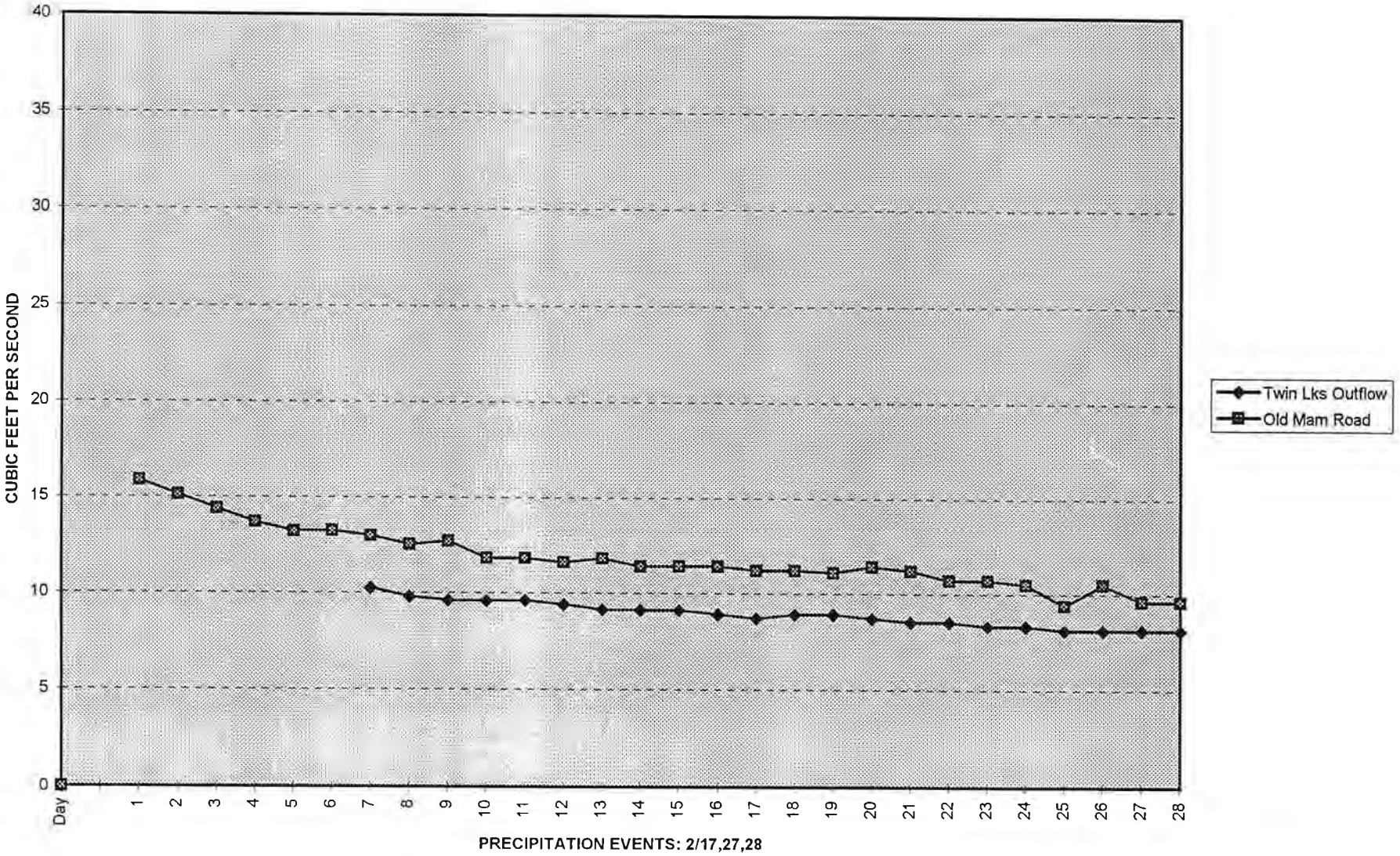
DECEMBER, 1996

MAMMOTH CREEK STREAMFLOW COMPARISON



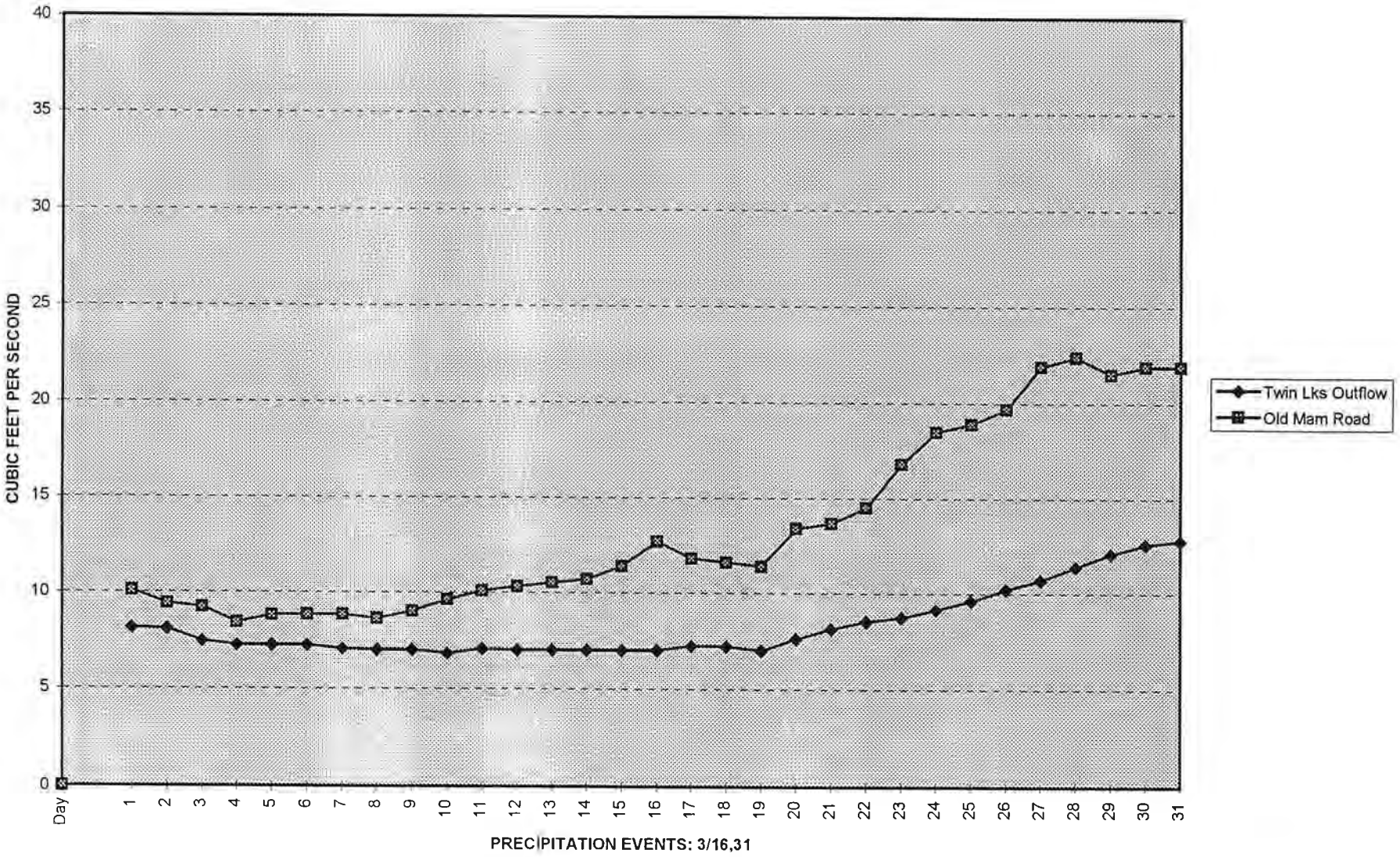
JANUARY, 1997

MAMMOTH CREEK STREAMFLOW COMPARISON

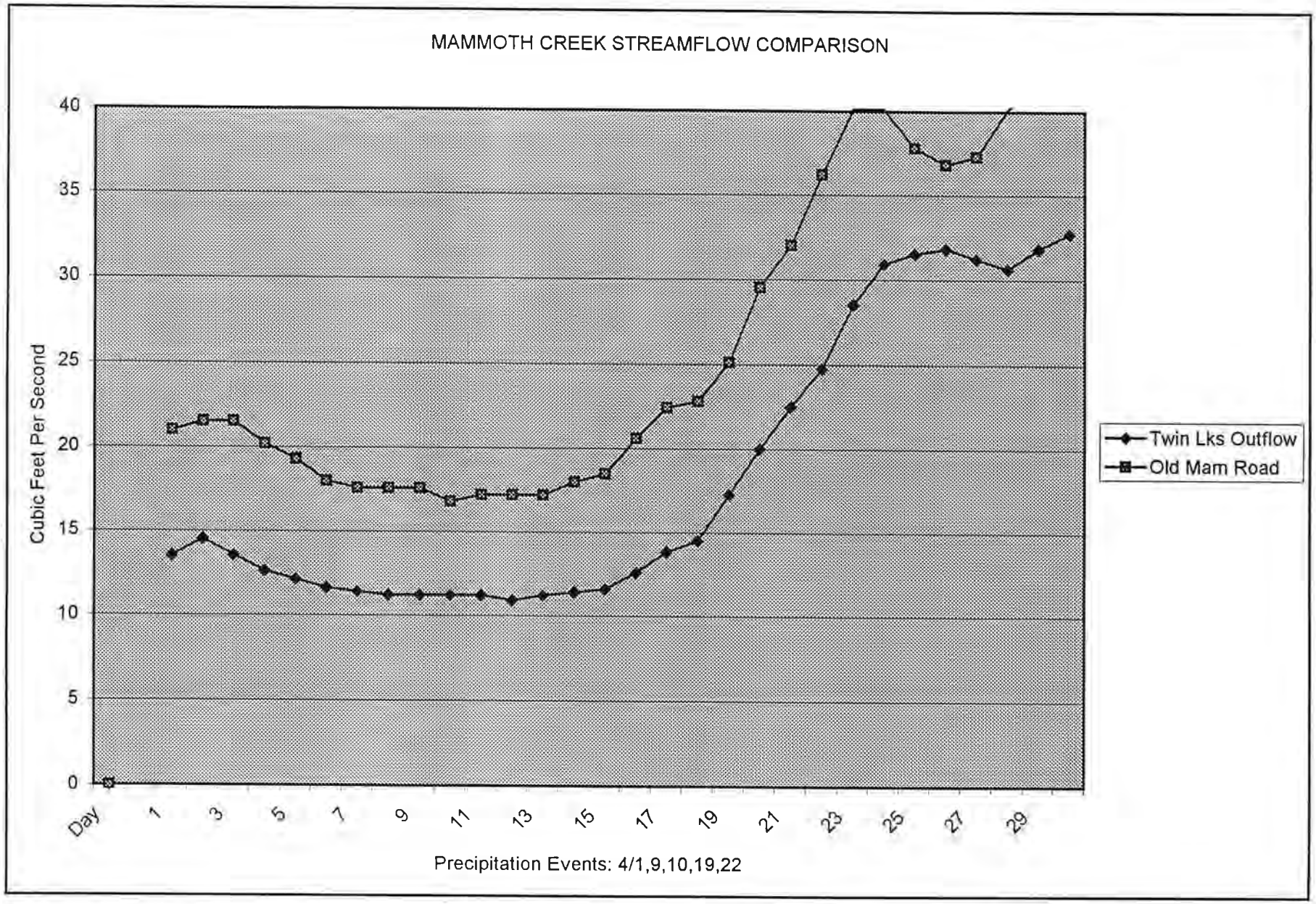


FEBRUARY, 1997

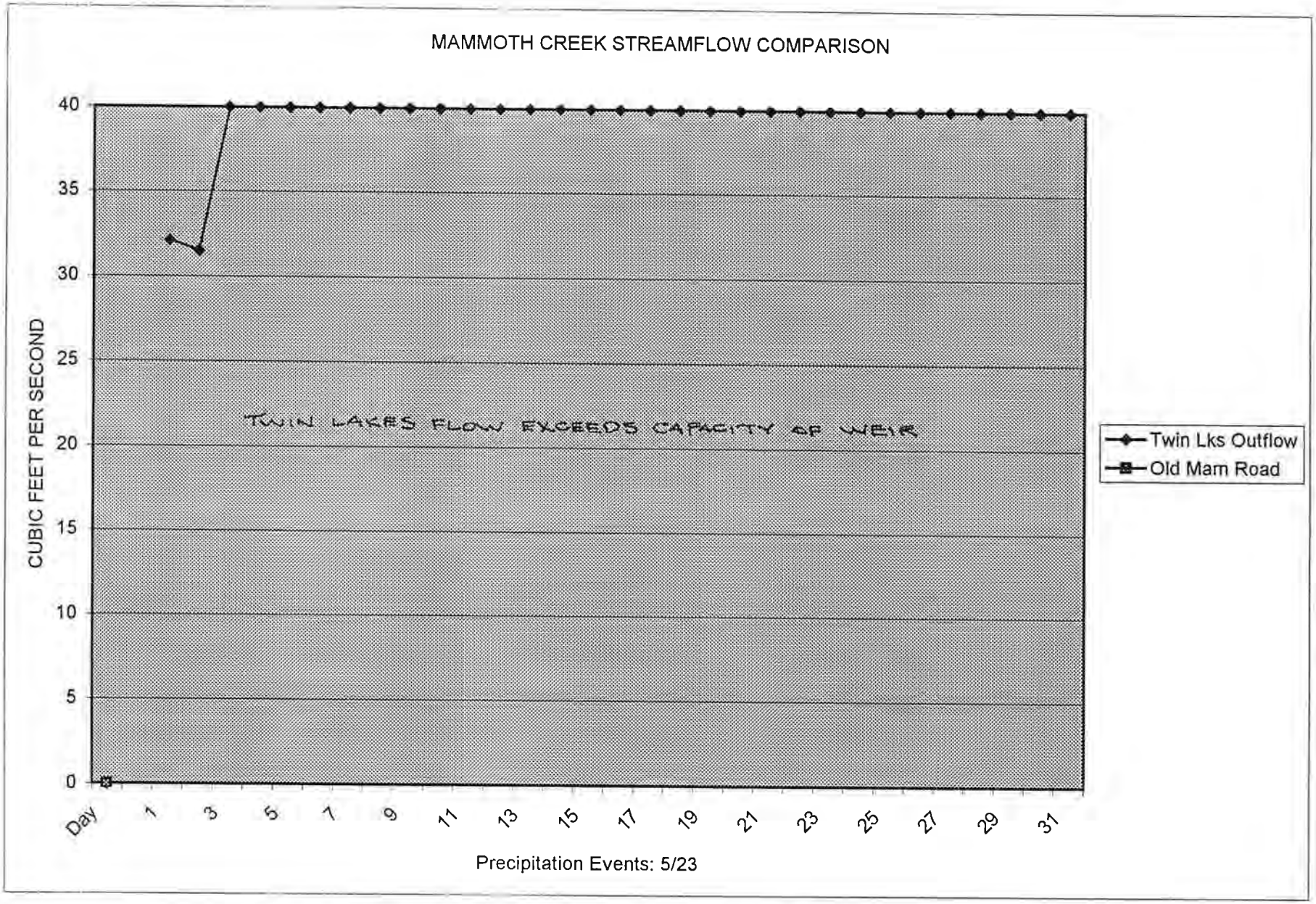
MAMMOTH CREEK STREAMFLOW COMPARISON



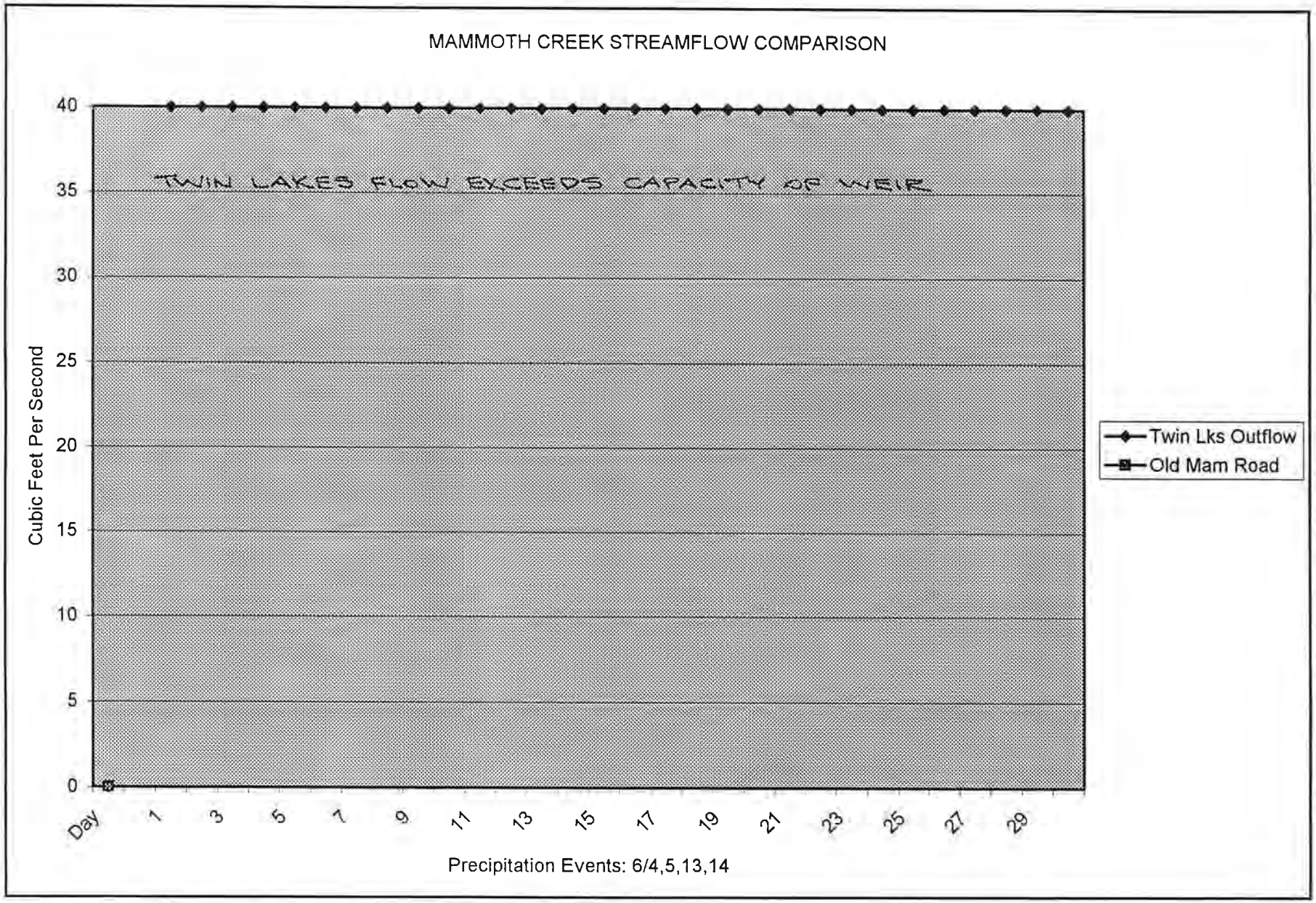
MARCH, 1997


MAMMOTH CREEK STREAMFLOW COMPARISON
Cubic Feet Per Second
40
35
30
25
20
15
10
5
0
Day
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
Twin Lks Outflow
Old Mam Road
Precipitation Events: 4/1,9,10,19,22

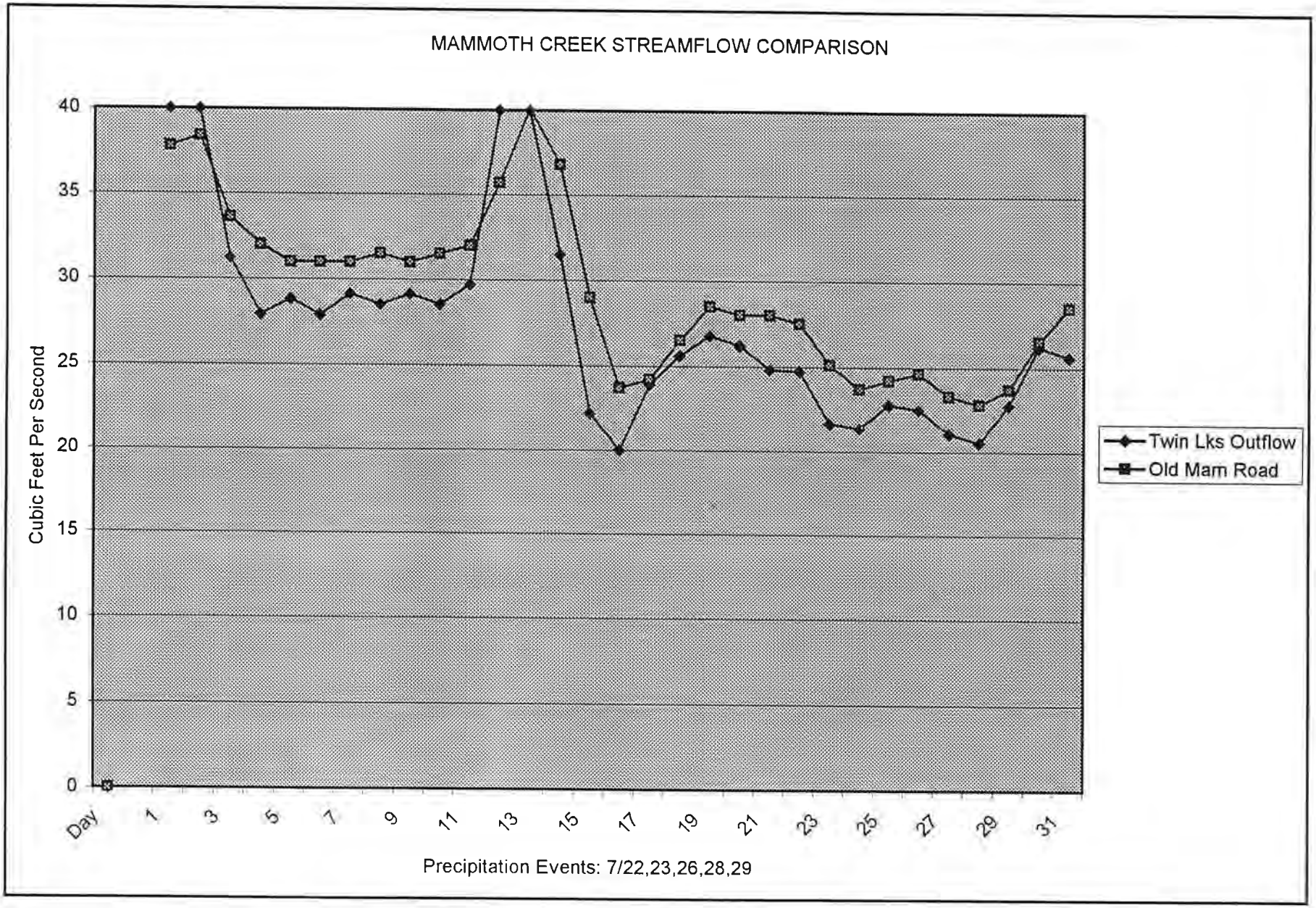
APRIL, 1997


MAMMOTH CREEK STREAMFLOW COMPARISON
CUBIC FEET PER SECOND
40
35
30
25
20
15
10
5
0
TWIN LAKES FLOW EXCEEDS CAPACITY OF WEIR
Twin Lks Outflow
Old Mam Road
Day
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
Precipitation Events: 5/23

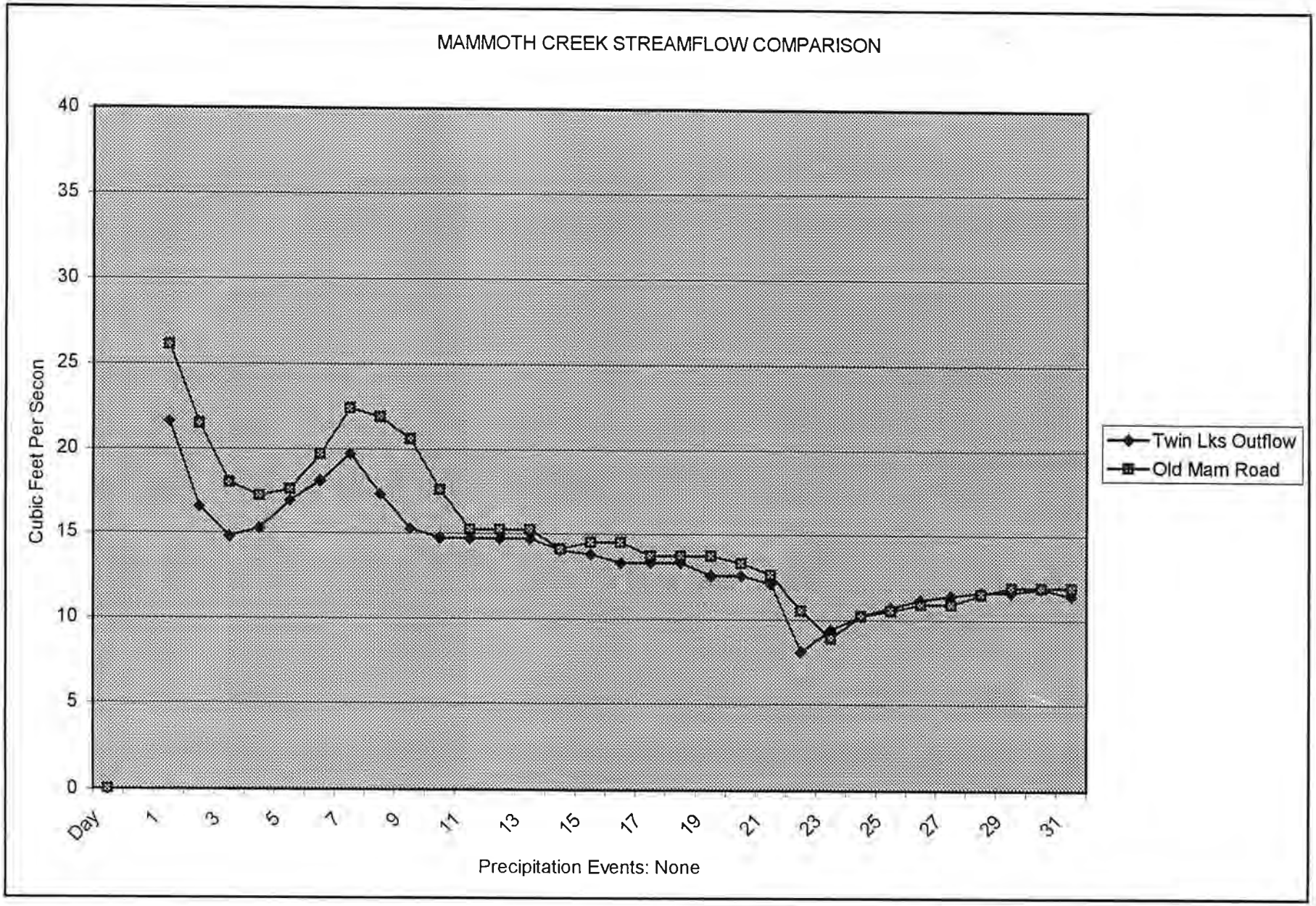
MAY, 1997


MAMMOTH CREEK STREAMFLOW COMPARISON
TWIN LAKES FLOW EXCEEDS CAPACITY OF WEIR
Cubic Feet Per Second
40
35
30
25
20
15
10
5
0
Day
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
Twin Lks Outflow
Old Mam Road
Precipitation Events: 6/4,5,13,14

JUNE, 1997


MAMMOTH CREEK STREAMFLOW COMPARISON
Cubic Feet Per Second
40
35
30
25
20
15
10
5
0
Day
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
Twin Lks Outflow
Old Mam Road
Precipitation Events: 7/22,23,26,28,29

JULY, 1997


MAMMOTH CREEK STREAMFLOW COMPARISON
Cubic Feet Per Secon
40
35
30
25
20
15
10
5
0
Day
1
3
5
7
9
11
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15
17
19
21
23
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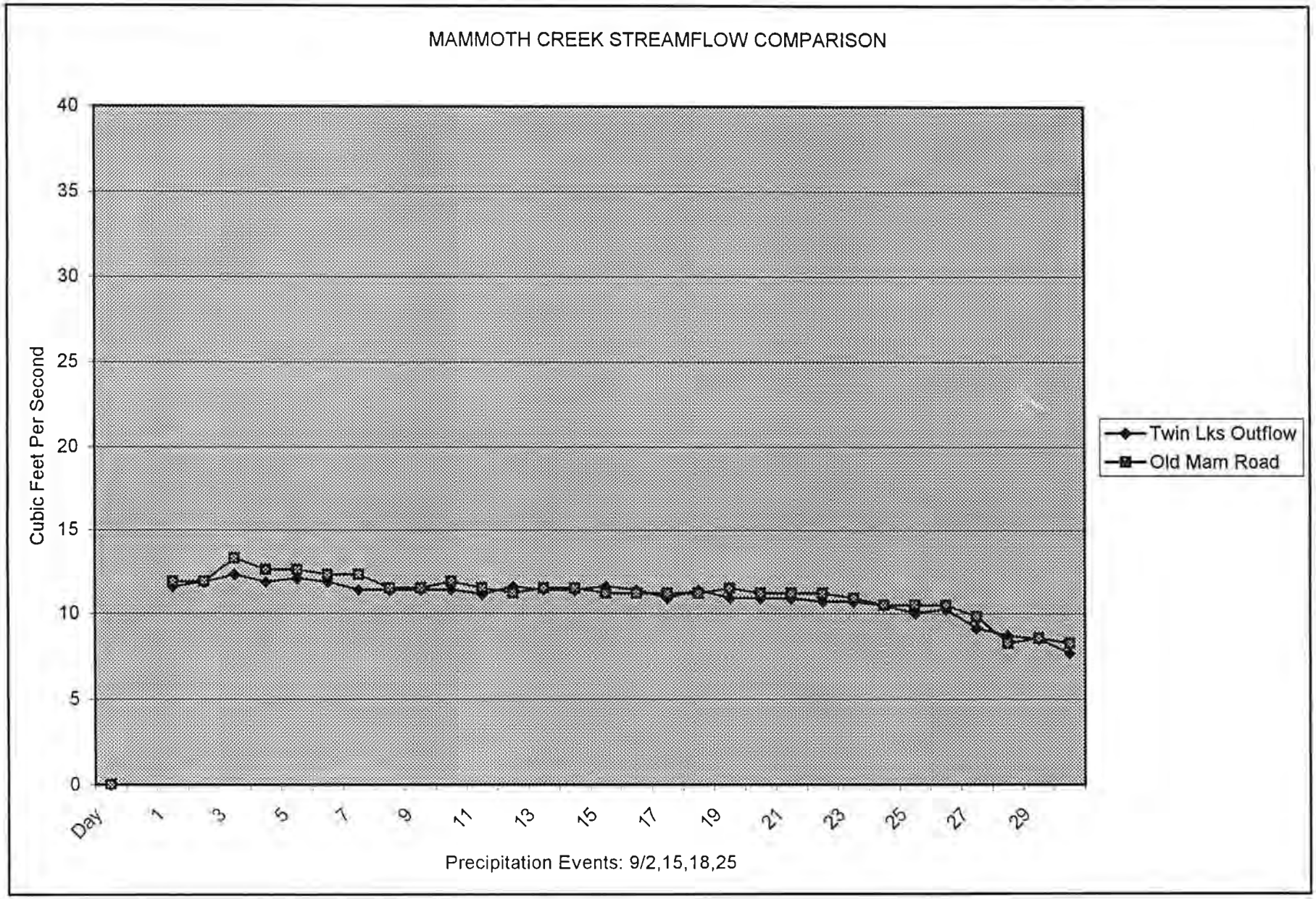
27
29
31
Twin Lks Outflow
Old Mam Road
Precipitation Events: None

AUGUST, 1997



SEPTEMBER, 1997

APPENDIX H

VALENTINE RESERVE SPRINGFLOW

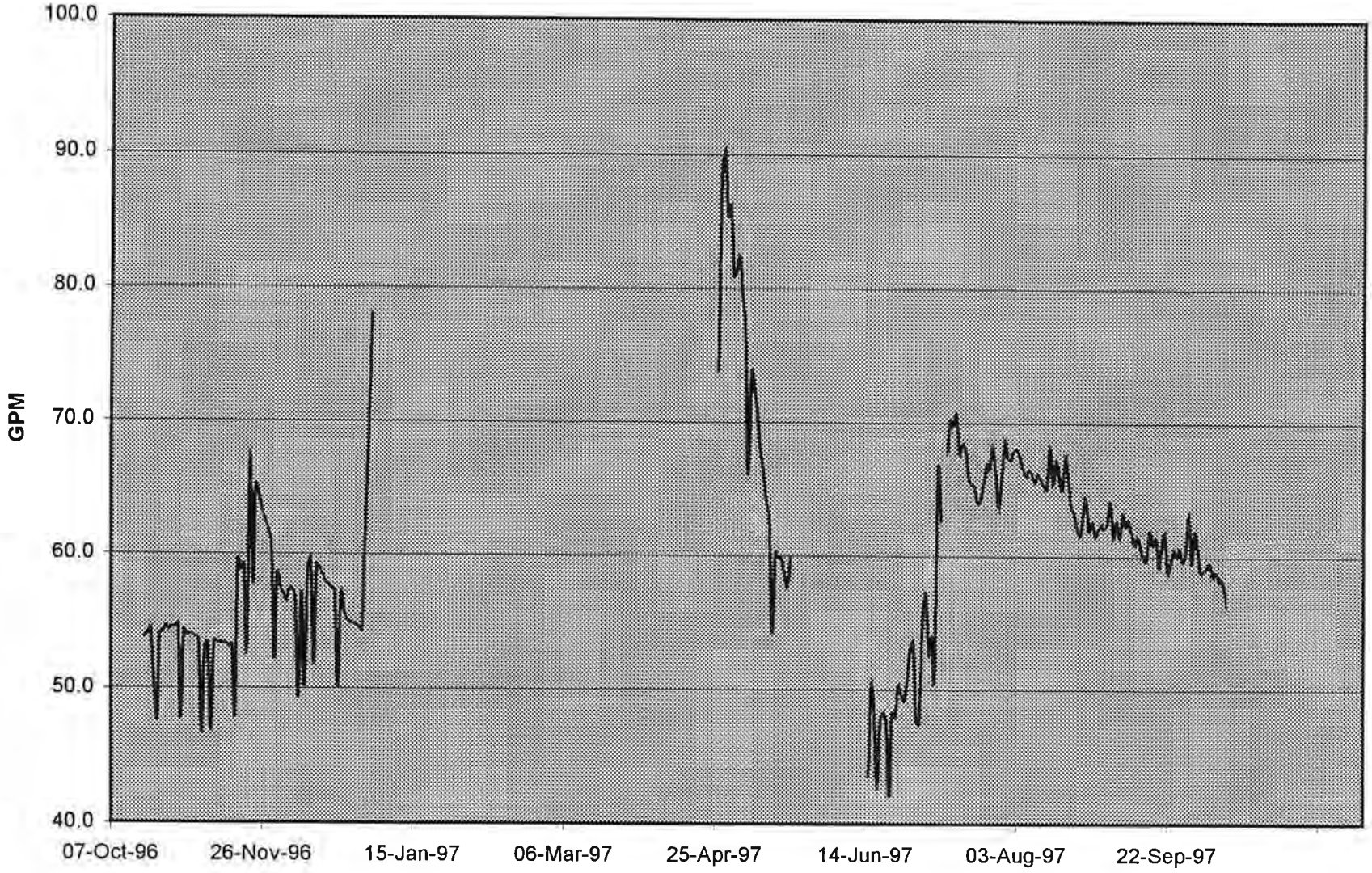
Valentine Reserve North Spring Flow
(Oct/96 thru Sep/97)

Date	Av. 24 hr discharge (gpm)	Date	Av. 24 hr discharge (gpm)	Date	Av. 24 hr discharge (gpm)
18-Oct-96	53.8	06-Dec-96	57.3	11-May-97	66.5
19-Oct-96	54.1	07-Dec-96	56.7	12-May-97	64.1
20-Oct-96	54.4	08-Dec-96	49.2	13-May-97	62.7
22-Oct-96	47.6	09-Dec-96	57.2	14-May-97	54.2
23-Oct-96	54.0	10-Dec-96	50.1	15-May-97	60.3
24-Oct-96	54.1	11-Dec-96	58.8	16-May-97	59.9
25-Oct-96	54.6	12-Dec-96	59.7	17-May-97	59.8
26-Oct-96	54.3	13-Dec-96	51.7	18-May-97	58.7
27-Oct-96	54.5	14-Dec-96	59.2	19-May-97	57.6
28-Oct-96	54.5	15-Dec-96	58.9	20-May-97	59.8
29-Oct-96	54.8	16-Dec-96	58.4		
30-Oct-96	47.7	17-Dec-96	57.9		
31-Oct-96	54.3	18-Dec-96	57.7	15-Jun-97	43.6
01-Nov-96	53.9	19-Dec-96	57.4	16-Jun-97	50.5
02-Nov-96	54.0	20-Dec-96	57.3	17-Jun-97	48.5
03-Nov-96	53.9	21-Dec-96	50.0	18-Jun-97	42.6
04-Nov-96	53.8	22-Dec-96	57.1	19-Jun-97	47.6
05-Nov-96	53.6	23-Dec-96	55.7	20-Jun-97	48.3
06-Nov-96	46.6	24-Dec-96	55.1	21-Jun-97	47.4
07-Nov-96	53.2	25-Dec-96	54.9	22-Jun-97	42.0
08-Nov-96	53.3	26-Dec-96	54.8	23-Jun-97	48.2
09-Nov-96	46.8	27-Dec-96	54.7	24-Jun-97	47.9
10-Nov-96	53.5	28-Dec-96	54.5	25-Jun-97	50.2
11-Nov-96	53.4	29-Dec-96	54.3	26-Jun-97	49.6
12-Nov-96	53.3	30-Dec-96	61.9	27-Jun-97	49.2
13-Nov-96	53.3	31-Dec-96	68.8	28-Jun-97	51.0
14-Nov-96	53.3	01-Jan-97	78.0	29-Jun-97	53.0
15-Nov-96	53.1			30-Jun-97	53.6
16-Nov-96	53.2			01-Jul-97	47.5
17-Nov-96	48.0			02-Jul-97	47.5
18-Nov-96	59.6			03-Jul-97	55.3
19-Nov-96	58.7			04-Jul-97	57.2
20-Nov-96	59.2			05-Jul-97	52.7
21-Nov-96	52.8	26-Apr-97	73.8	06-Jul-97	53.9
22-Nov-96	67.4	27-Apr-97	88.6	07-Jul-97	50.8
23-Nov-96	57.7	28-Apr-97	90.4	08-Jul-97	66.5
24-Nov-96	65.2	29-Apr-97	85.4	09-Jul-97	62.7
25-Nov-96	64.5	30-Apr-97	86.1	10-Jul-97	
26-Nov-96	63.3	01-May-97	80.9	11-Jul-97	67.7
27-Nov-96	62.6	02-May-97	81.4	12-Jul-97	70.2
28-Nov-96	61.9	03-May-97	82.4	13-Jul-97	69.8
29-Nov-96	60.6	04-May-97	79.4	14-Jul-97	70.7
30-Nov-96	52.1	05-May-97	76.5	15-Jul-97	67.8
01-Dec-96	58.5	06-May-97	66.1	16-Jul-97	68.5
02-Dec-96	57.6	07-May-97	73.7	17-Jul-97	67.8
03-Dec-96	57.0	08-May-97	72.4	18-Jul-97	65.9
04-Dec-96	56.5	09-May-97	70.7	19-Jul-97	65.4
05-Dec-96	57.4	10-May-97	67.9	20-Jul-97	65.3

Valentine Reserve North Spring Flow
(Oct/96 thru Sep/97)

21-Jul-97	64.0	10-Sep-97	61.8
22-Jul-97	64.3	11-Sep-97	60.9
23-Jul-97	65.7	12-Sep-97	61.5
24-Jul-97	67.0	13-Sep-97	60.5
25-Jul-97	66.6	14-Sep-97	59.9
26-Jul-97	68.3	15-Sep-97	59.7
27-Jul-97	66.1	16-Sep-97	61.9
28-Jul-97	63.7	17-Sep-97	61.0
29-Jul-97	66.2	18-Sep-97	61.4
30-Jul-97	68.7	19-Sep-97	59.2
31-Jul-97	67.4	20-Sep-97	60.6
01-Aug-97	67.3	21-Sep-97	61.8
02-Aug-97	68.0	22-Sep-97	58.8
03-Aug-97	68.0	23-Sep-97	59.4
04-Aug-97	67.5	24-Sep-97	60.5
05-Aug-97	66.5	25-Sep-97	60.0
06-Aug-97	66.1	26-Sep-97	60.6
07-Aug-97	66.5	27-Sep-97	59.6
08-Aug-97	66.2	28-Sep-97	60.2
09-Aug-97	65.6	29-Sep-97	63.2
10-Aug-97	66.2	30-Sep-97	59.6
11-Aug-97	65.8		
12-Aug-97	65.3		
13-Aug-97	65.1		
14-Aug-97	68.2		
15-Aug-97	65.6		
16-Aug-97	67.2		
17-Aug-97	66.0		
18-Aug-97	65.1		
19-Aug-97	67.6		
20-Aug-97	66.2		
21-Aug-97	63.9		
22-Aug-97	63.3		
23-Aug-97	62.1		
24-Aug-97	61.6		
25-Aug-97	63.4		
26-Aug-97	64.3		
27-Aug-97	62.0		
28-Aug-97	62.6		
29-Aug-97	61.6		
30-Aug-97	62.1		
31-Aug-97	62.5		
01-Sep-97	62.1		
02-Sep-97	62.6		
03-Sep-97	64.1		
04-Sep-97	61.5		
05-Sep-97	62.7		
06-Sep-97	61.4		
07-Sep-97	63.3		
08-Sep-97	62.3		
09-Sep-97	62.8		

N. Springs, Av. Daily Dischage



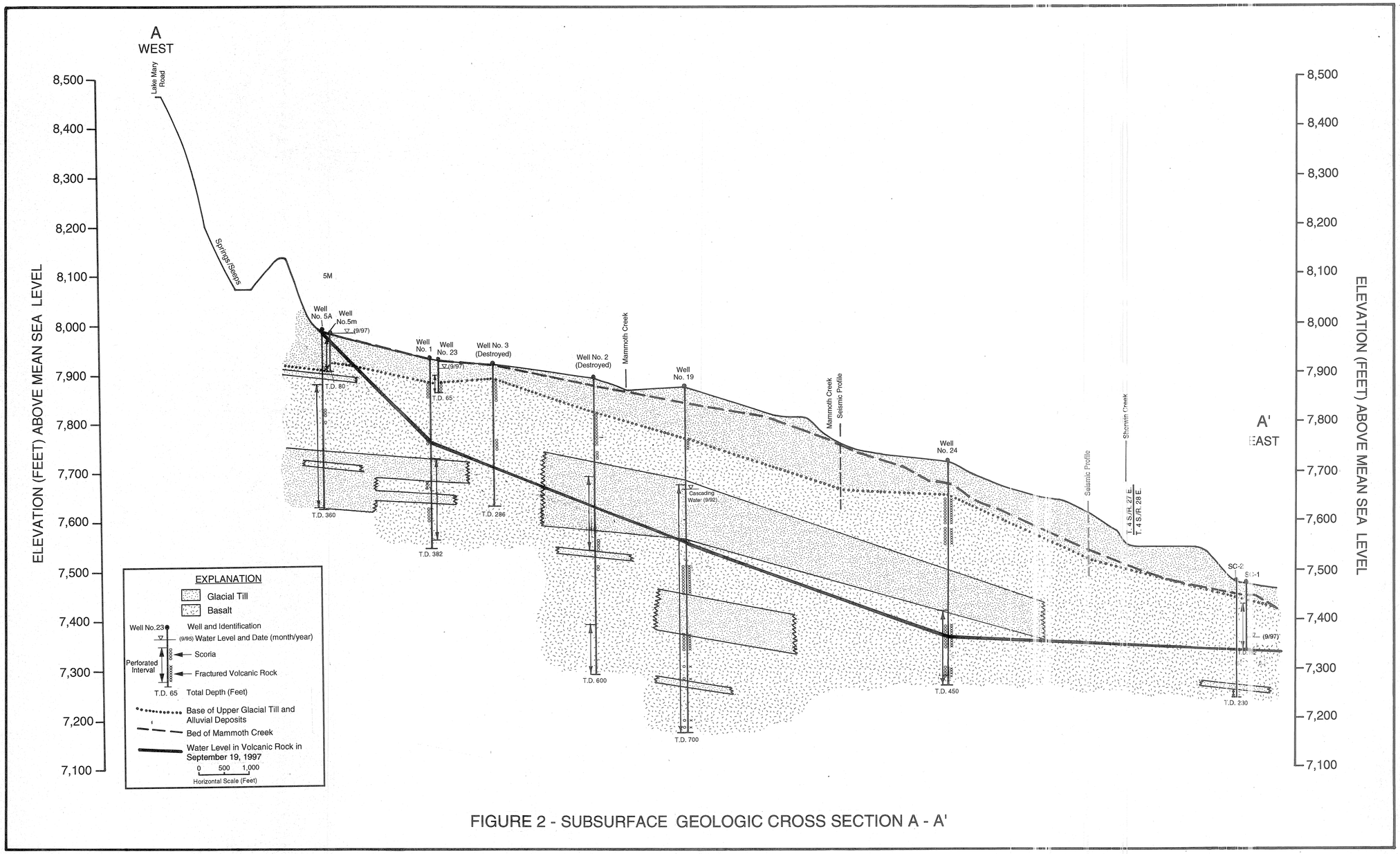


FIGURE 2 - SUBSURFACE GEOLOGIC CROSS SECTION A - A'