ANNUAL REPORT ON RESULTS OF MAMMOTH COMMUNITY WATER DISTRICT GROUNDWATER MONITORING PROGRAM FOR OCTOBER 1997-SEPTEMBER 1998

Prepared for
Mammoth Community Water District
Mammoth Lakes, California

by
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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 sixth 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 874 acre-feet of water from six supply wells during the 1998 water year. This was 18 percent less 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 were relatively constant and shallow during 1998. 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 1998 water year. A water-level elevation contour map was prepared for September 1998. 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 1997-98 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 from the District water supply wells 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 and 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. 17 was put in service in June 1995. Wells put in service in 1992-95 are termed the "newer" District supply wells in this

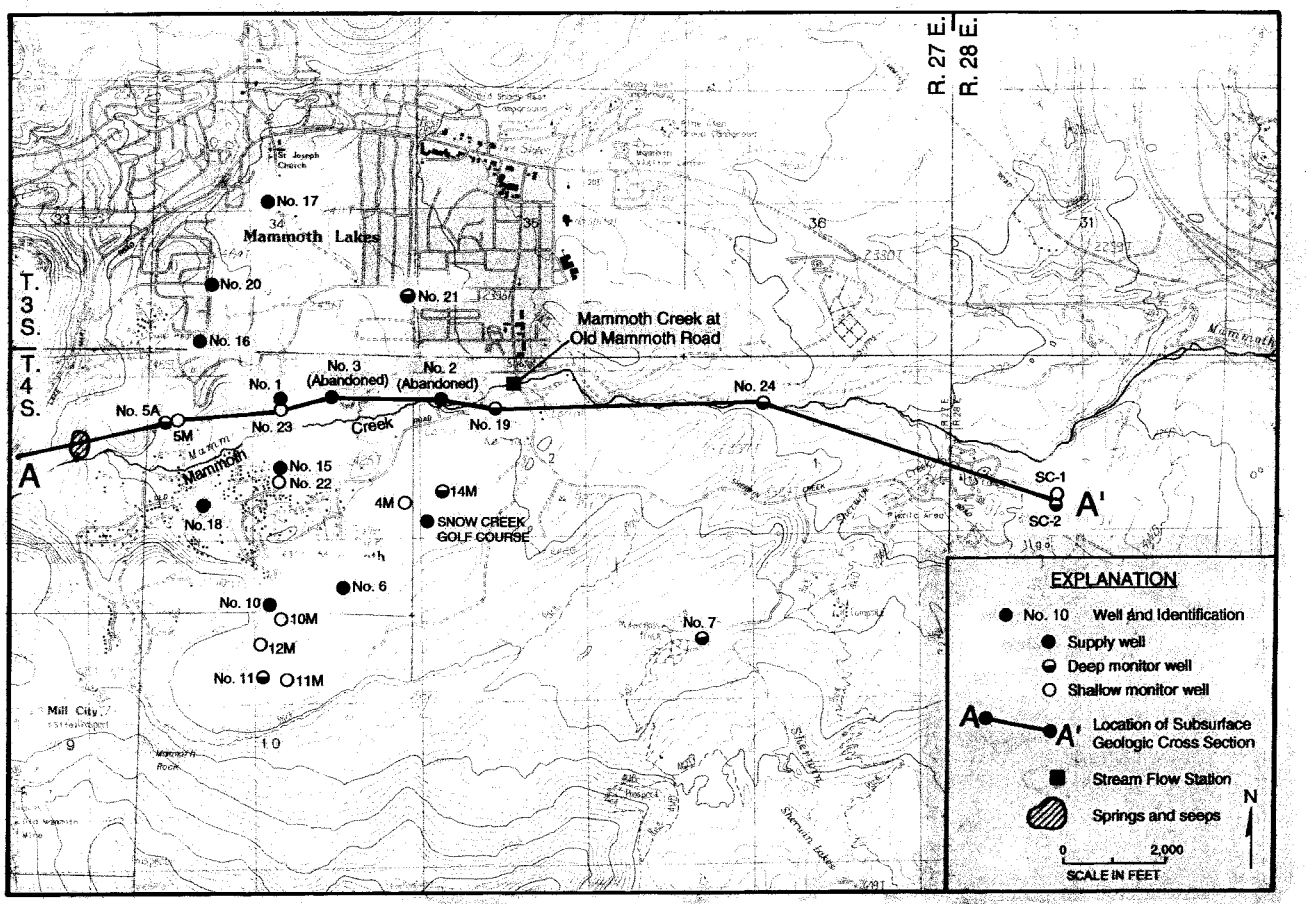


FIGURE 1 - LOCATION OF WELLS AND SUBSURFACE GEOLOGIC CROSS SECTION A-A'

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".

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 1998 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 rocks are continuous along the section. Groundwater has been found in the uppermost glacial till layer only in the vicinity of

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)

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 1998, 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 1998 water year. The total pumpage was 874 acre-feet, or 18 percent less than that for the previous water year. Of this, 234 acre-feet were from Well No. 15, 194 acre-feet were from Well No. 10, 183 acre-feet were from Well No.17, and 143 acre-feet were from Well No. 16. The remaining District pumpage (121 acre-feet) was from Wells No. 1 and 20. Wells No. 6 and 18 were not used during this water year. No water was pumped during the 1998 water year from the Snow Creek Golf Course Well (in the general vicinity

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
Oct-97	0.000	0.000	0.000	7.607	14.856	0.000	0.000	20.908	43.371
Nov-97	0.000	0.000	0.982	7.632	6.006	0.000	0.000	0.012	14.632
Dec-97	0.000	0.000	0.589	11.509	0.319	0.000	0.000	29.190	41.607
Jan-98	0.000	0.000	2.160	19.730	0.000	4.933	0.000	0.000	26.823
Feb-98	0.000	0.000	0.000	5.693	0.000	19.620	0.000	0.000	25.313
Mar-98	0.408	0.000	1.644	1.644	0.000	26.564	0.000	0.000	30.260
Apr-98	0.000	0.000	0.589	0.000	0.160	19.104	0.000	0.000	19.853
May-98	0.000	0.000	1.963	0.025	0.000	4.160	0.000	0.000	6.148
Jun-98	13.613	0.000	2.951	0.074	20.380	31.288	0.018	0.000	68.324
Jul-98	3.620	0.000	73.227	64.172	42.712	48.773	0.006	0.000	232.510
Aug-98	34.518	0.000	67.730	74.160	43.307	28.675	0.006	0.000	248.396
Sep-98	18.433	0.000	41.620	41.301	15.387	0.000	0.000	0.000	116.741
TOTAL	**70.592**	**0.000**	**193.455**	**233.547**	**143.127**	**183.117**	**0.030**	**50.110**	**873.978**

of Well No. 14M). This well is owned by Dempsey Construction and was used to supply the Snow Creek golf course in previous years. From June to August, 1998, an estimated total of about 92,000 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 through early 1995. During periods when the well had not been used much for supply (i.e., May 1995-June 1998), the water level rose substantially. In June 1998, the depth to water in Well No. 15 was 156 feet, or the shallowest of record. Depth to water in Well No. 15 appears to be influenced primarily by the previous pumping history of the well and recharge.

Figure 4 is a water-level and pumpage hydrograph for Well No. 16. The water level in this well changed substantially after the

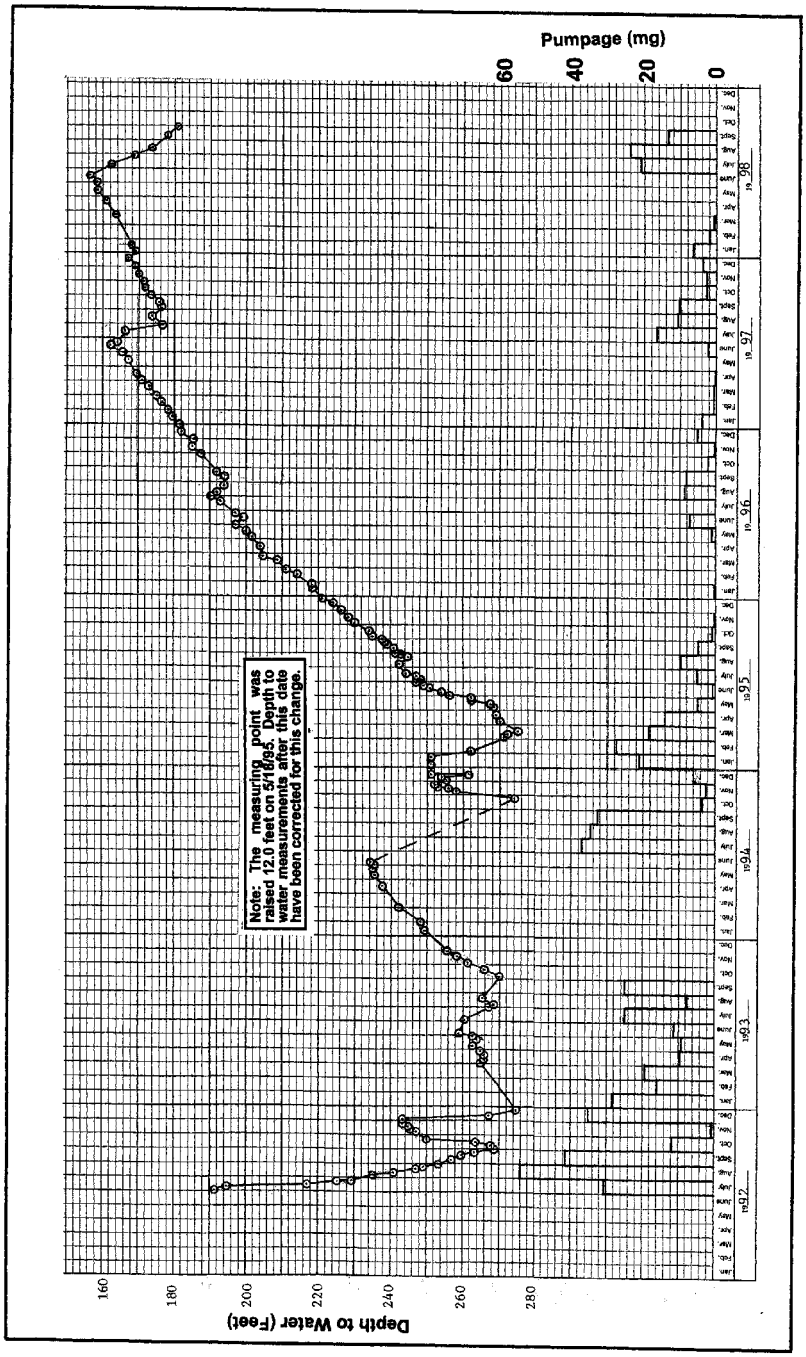


FIGURE 3 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 15

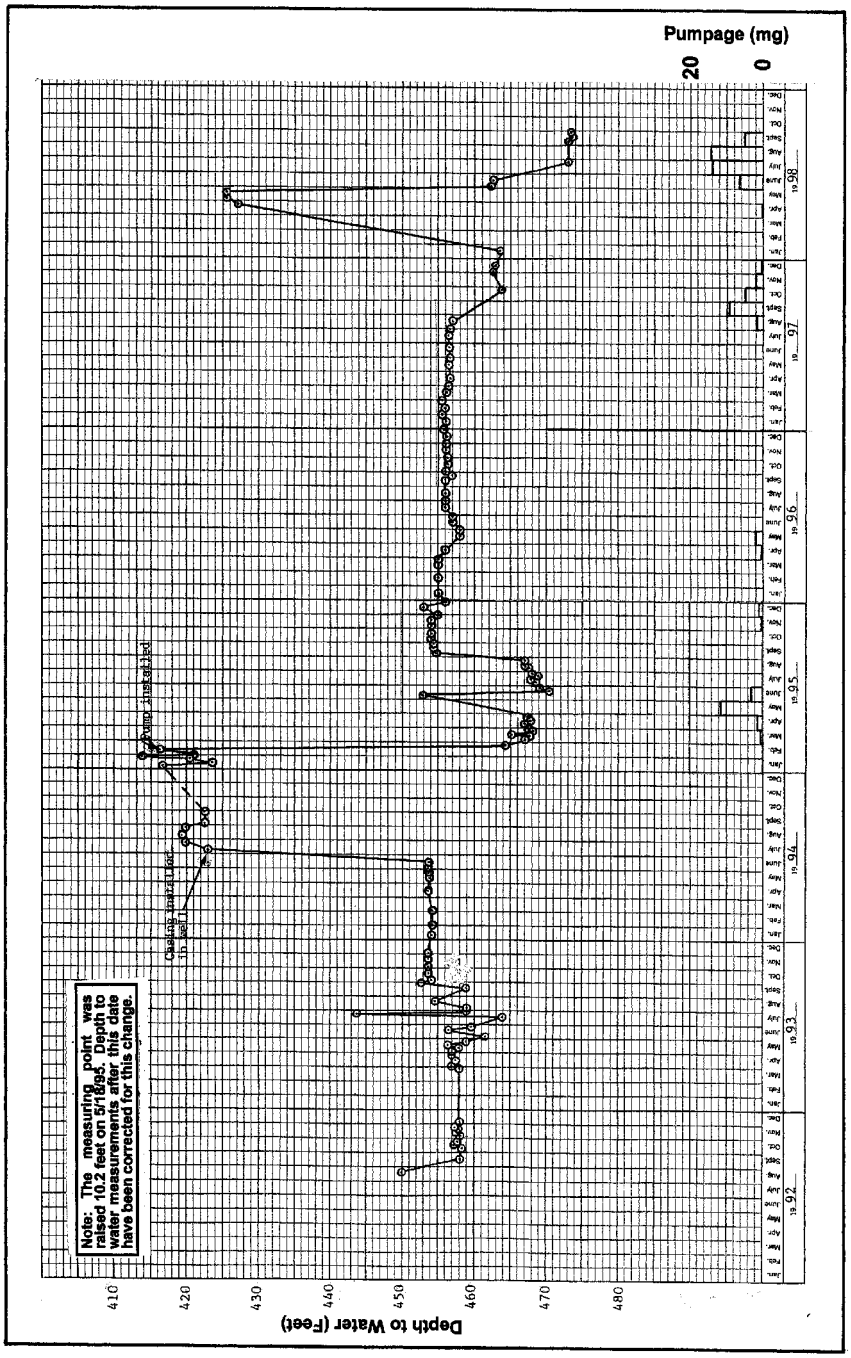


FIGURE 4 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 16

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. Measurements for April-May, 1998 also appear to not be 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-May 1998, the water level in Well No. 17 gradually rose, except during some pumping periods in 1996 and 1997. The shallowest depth to water yet measured in this well was in May 1998.

Figure 6 shows water levels and pumpage for Well No. 18. The overall trend for this well during non-operational periods has been a slight water-level rise. During pumping periods, the static level averaged about ten feet lower than during non-pumping

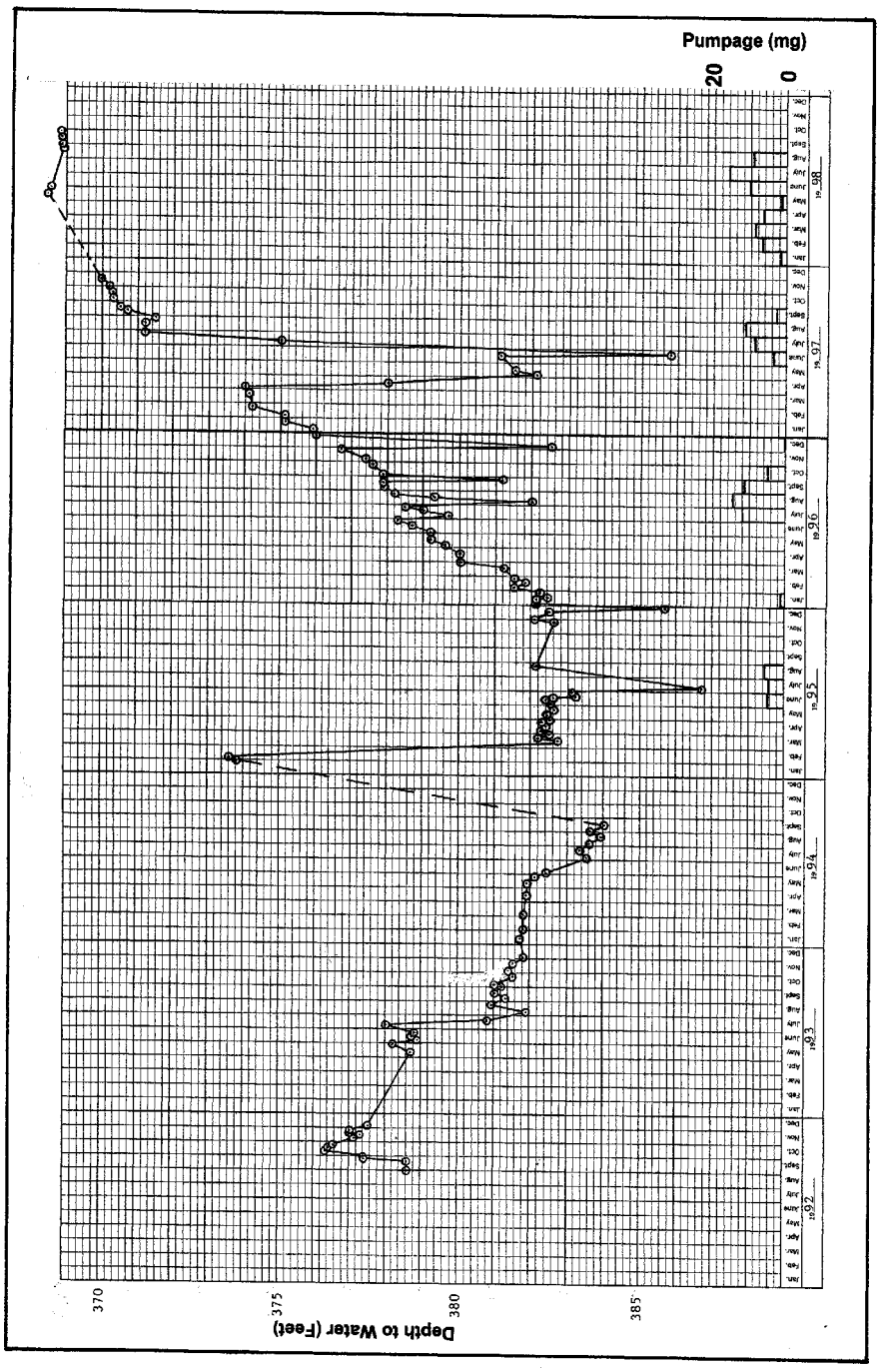


FIGURE 5 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 17

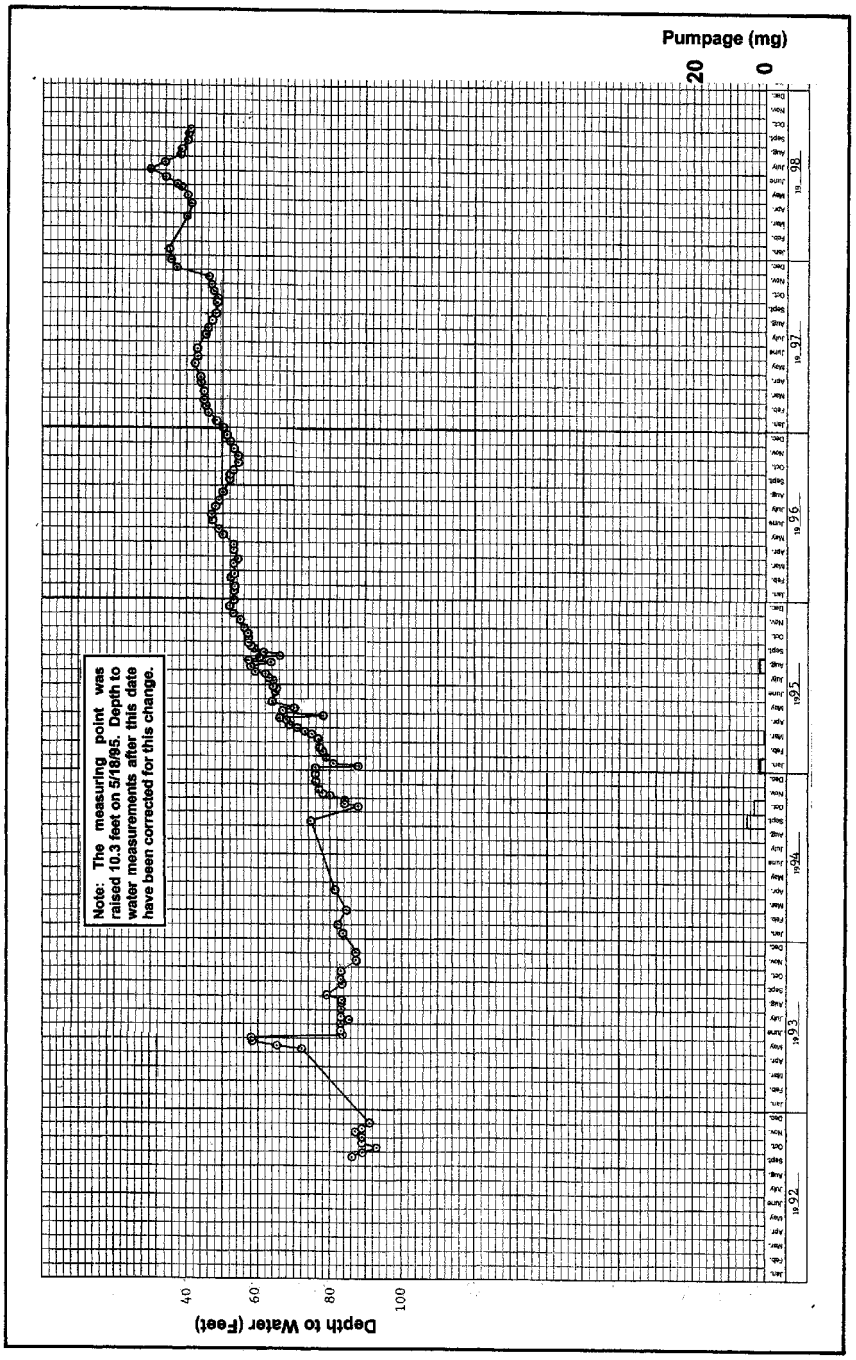


FIGURE 6 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 18

periods. In early June 1998, the water level in Well No. 18 was the shallowest yet measured. The water-level decline of about ten feet in this well during July 1998 appears to have been due to pumping of Wells No. 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 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 160 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 1998, depth to water in this well was 160 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 and 1998 water years, depth to water was less than 15 feet. The static water level in Well No. 10 has ranged from less than 30 feet during low pumping periods (July

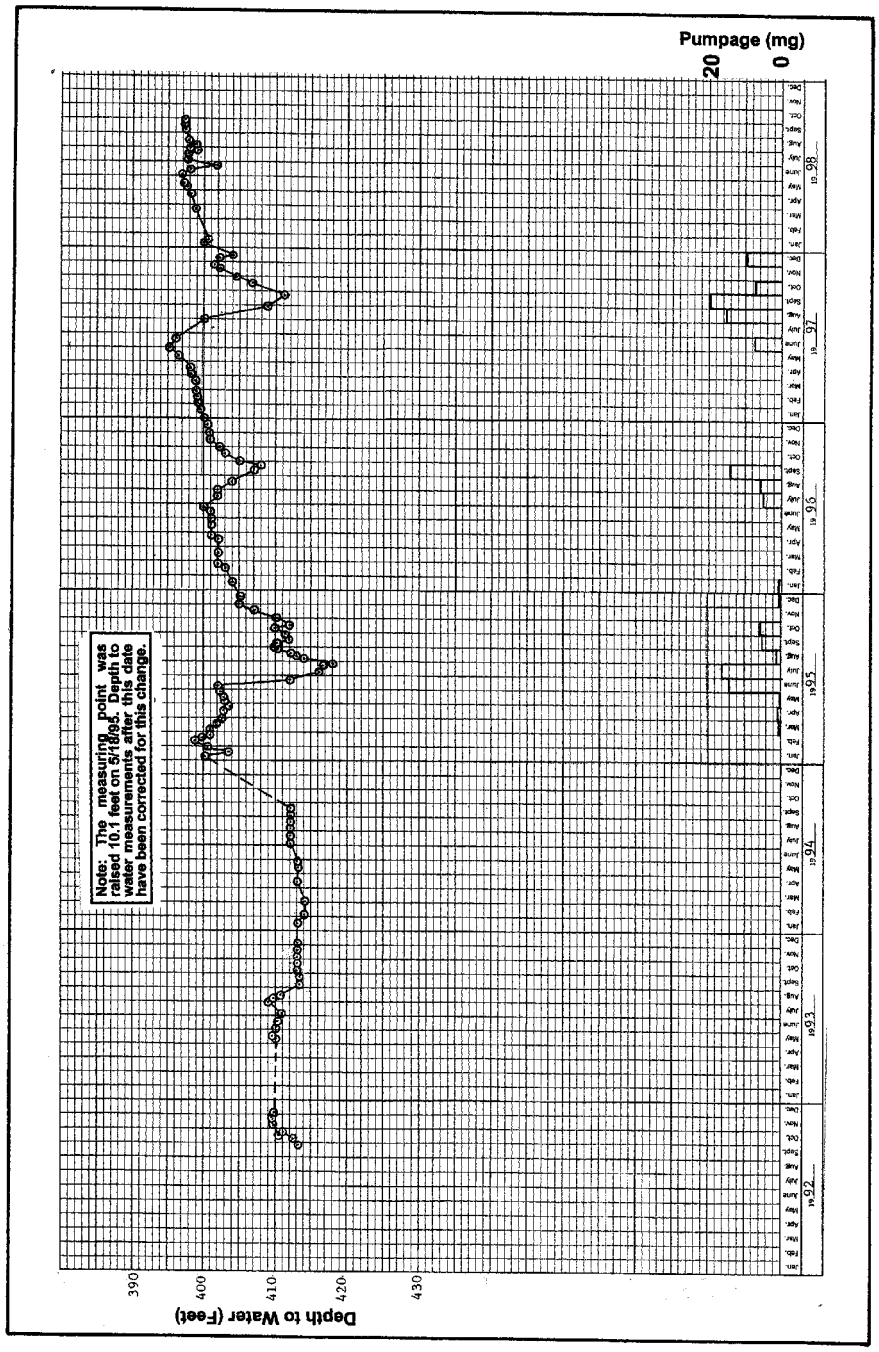


FIGURE 7 - WATER-LEVEL AND PUMPAGE HYDROGRAPH FOR WELL NO. 20

1995) to more than 160 feet during heavy pumping periods (Summer 1993). During the 1997 and 1998 water years, depth to water was usually less than 30 feet. 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 four 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 241 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 rise has primarily been associated with recharge and the reduction in pumping of Wells No. 6 and 10. In August 1998, depth to water was 236 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, 1998, except for October 1997 and June 1998. These measurements (Appendix D) indicate no significant drawdown due to pumpage of District wells in 1998.

Well No. 19 is located about four-fifths of a mile east of Well No. 1. Based on manual measurements (Figure 8), the water

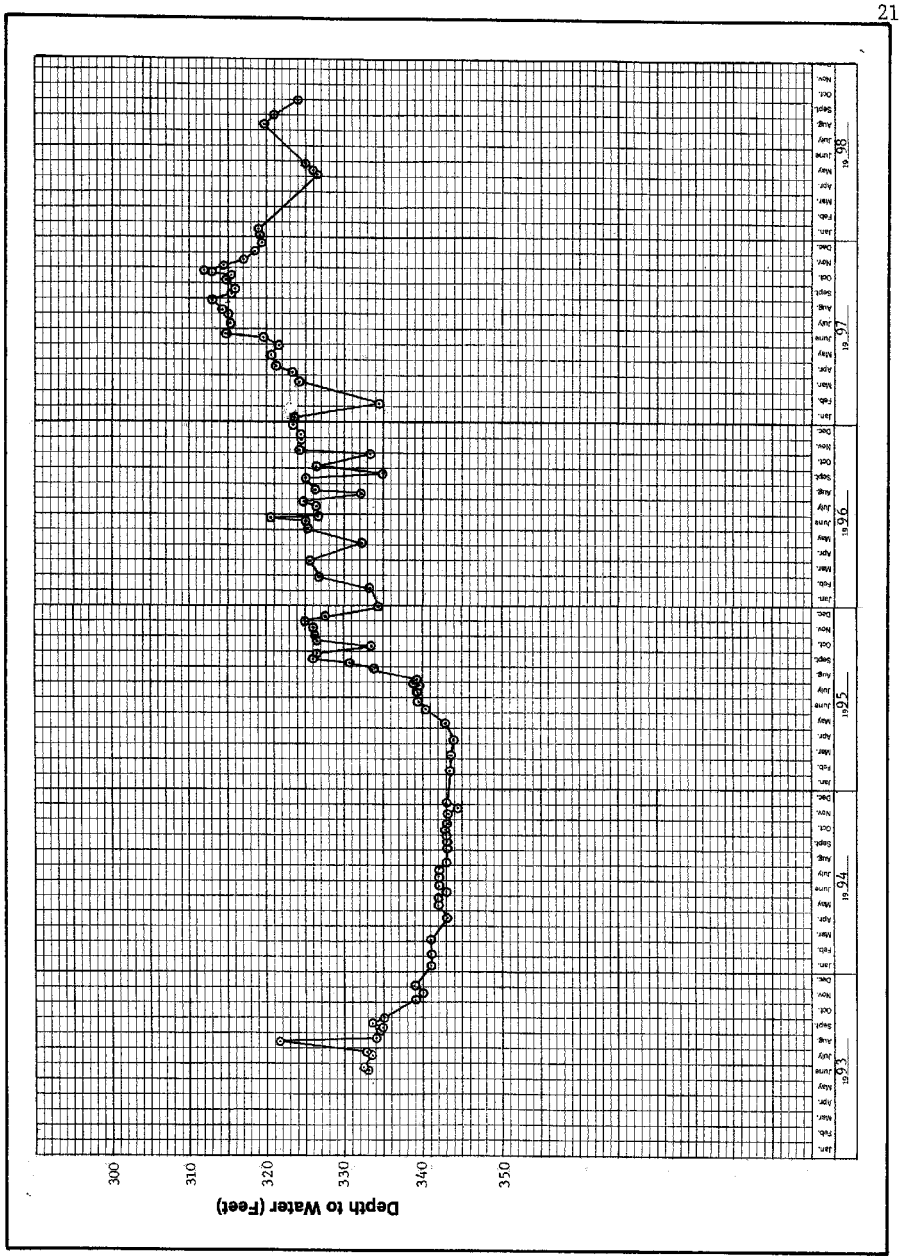


FIGURE 8 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 19

level in Well No. 19 has ranged from 312 to 345 feet deep. Since early 1995, the water level has generally risen. During the 1998 water year, depth to water usually ranged from about 313 to 325 feet. In October 1997, depth to water was 312 feet, or the shallowest yet measured. Transducer readings that are considered fairly reliable are available for this well from November 1, 1996-September 10, 1997 and from November 1, 1997-September 30, 1998, except for June 1998 (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. Since that time, water levels have been relatively constant. Transducer measurements that are considered reliable are available for Well No. 21 from November 1, 1996-May 31, 1997, and November 1, 1997-September 30, 1998, except for June 1998 (Appendix D). 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

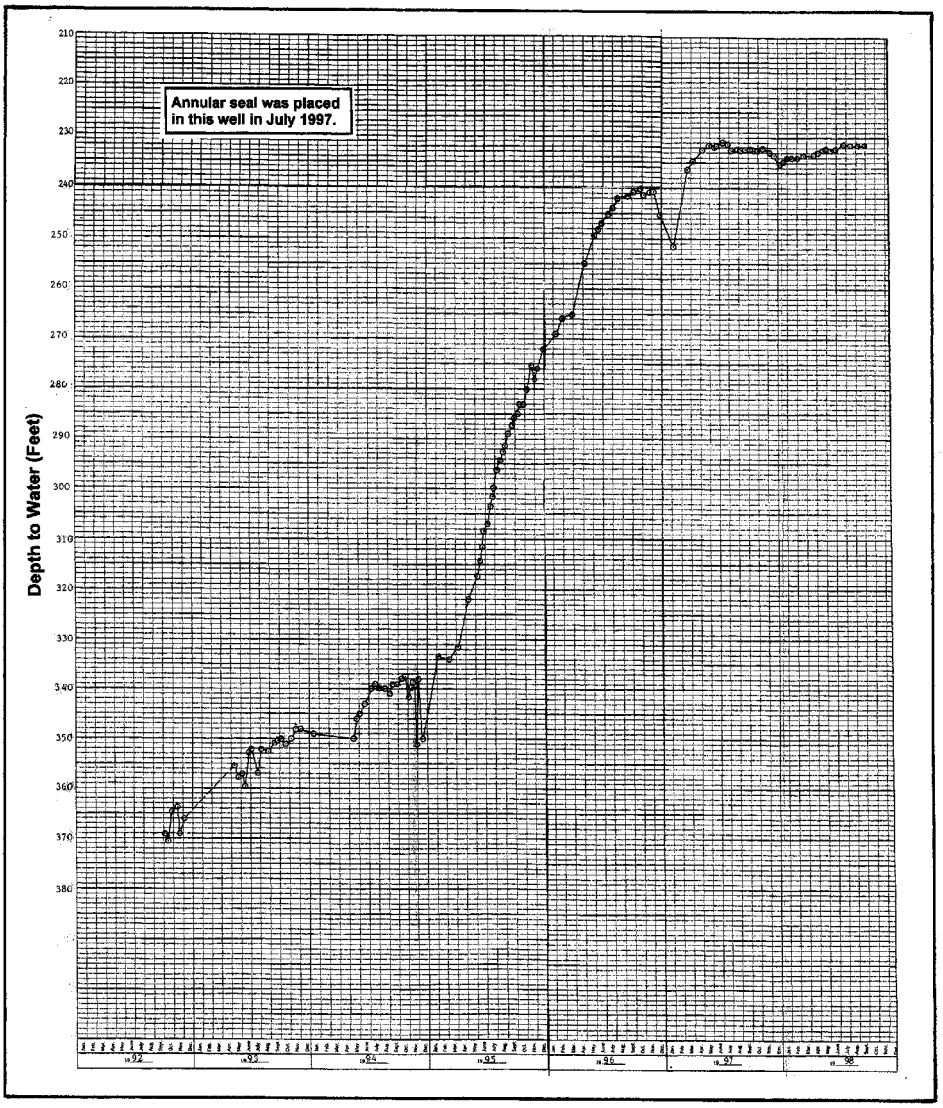


FIGURE 9 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 21

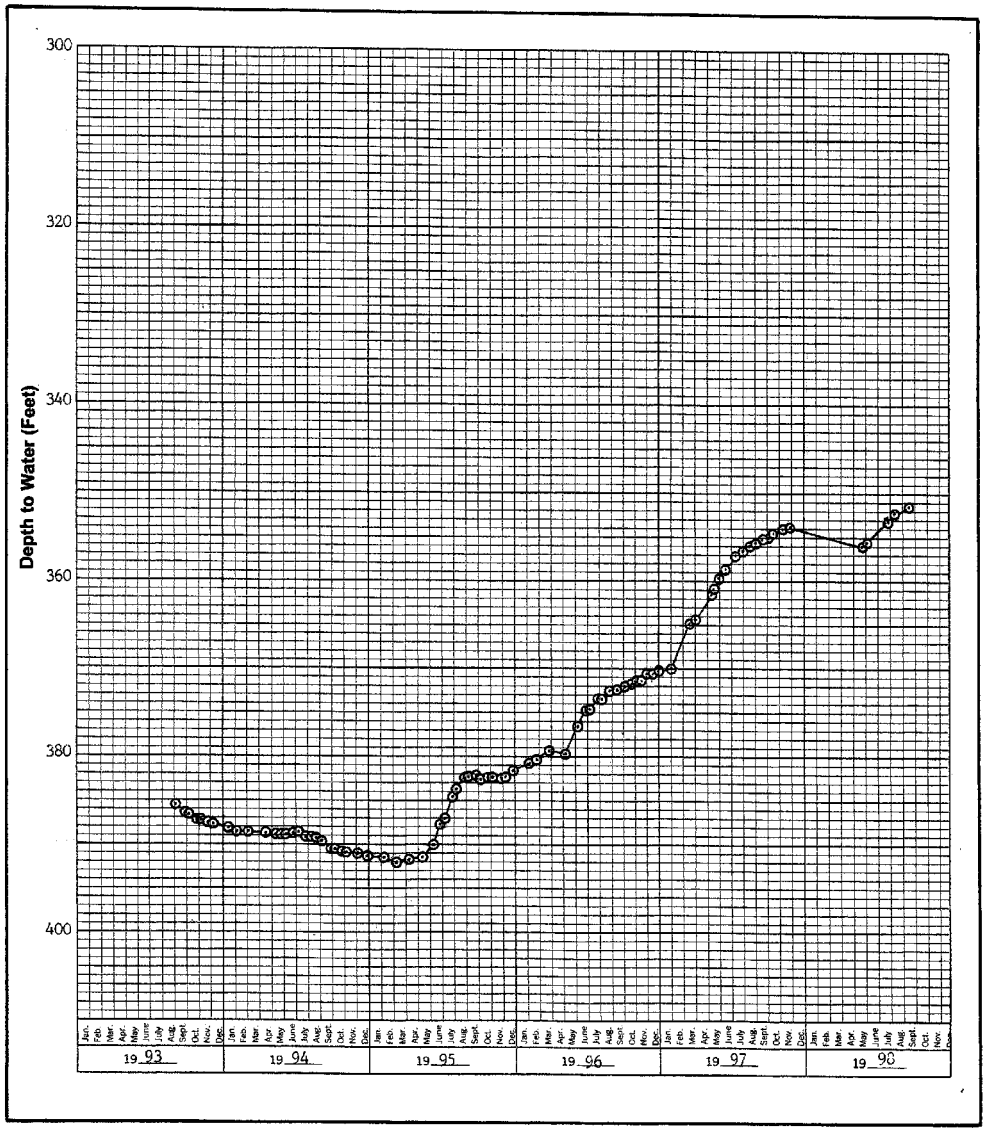


FIGURE 10 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 24

manual measurements. Measurements for this well began in Summer 1993, and depth to water has ranged from 352 to 392 feet. The water level has risen since early 1995, to the shallowest depth yet measured in September 1998. Transducer measurements aren't available for this well between April 3, 1997 and April 30, 1998, due to equipment failure. Transducer measurements for this well have not always been consistent with manual measurements (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 and were relatively constant during the 1998 water year. 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. The operational problems with some of the transducers that were encountered in the previous water year have been largely resolved.

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

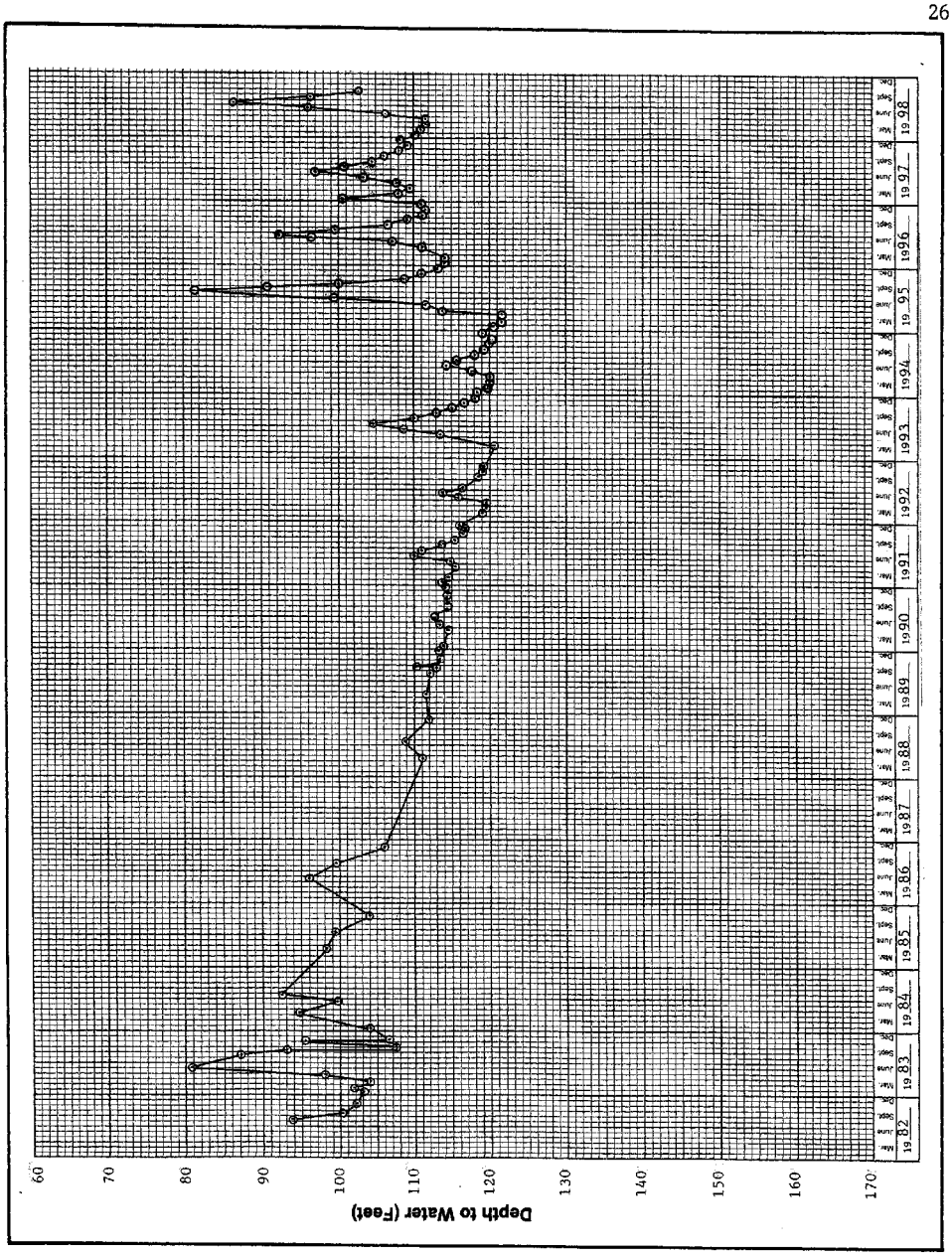


FIGURE 11 - WATER-LEVEL HYDROGRAPH FOR SC-1

June 1983 and late July 1995. In July 1998, depth to water in SC-1 was near that in August 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 was about 132 feet deep in August 1998, or about the same as in April 1989. 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. 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. The shallowest water level in Well No. 22 was in August 1995. Depth to water in this well rose about 12 feet during May-July, 1995, due to recharge

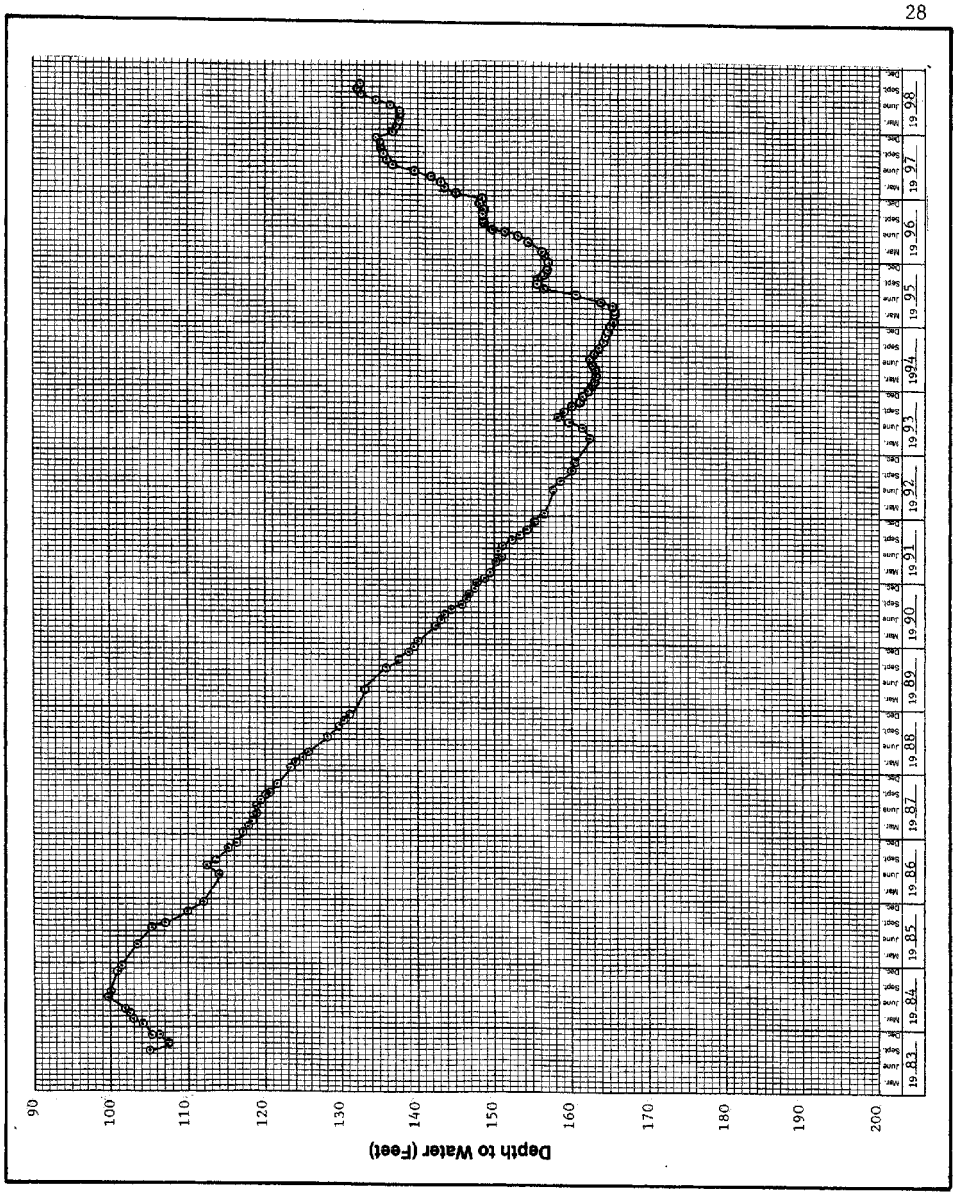


FIGURE 12 - WATER-LEVEL HYDROGRAPH FOR SC-2

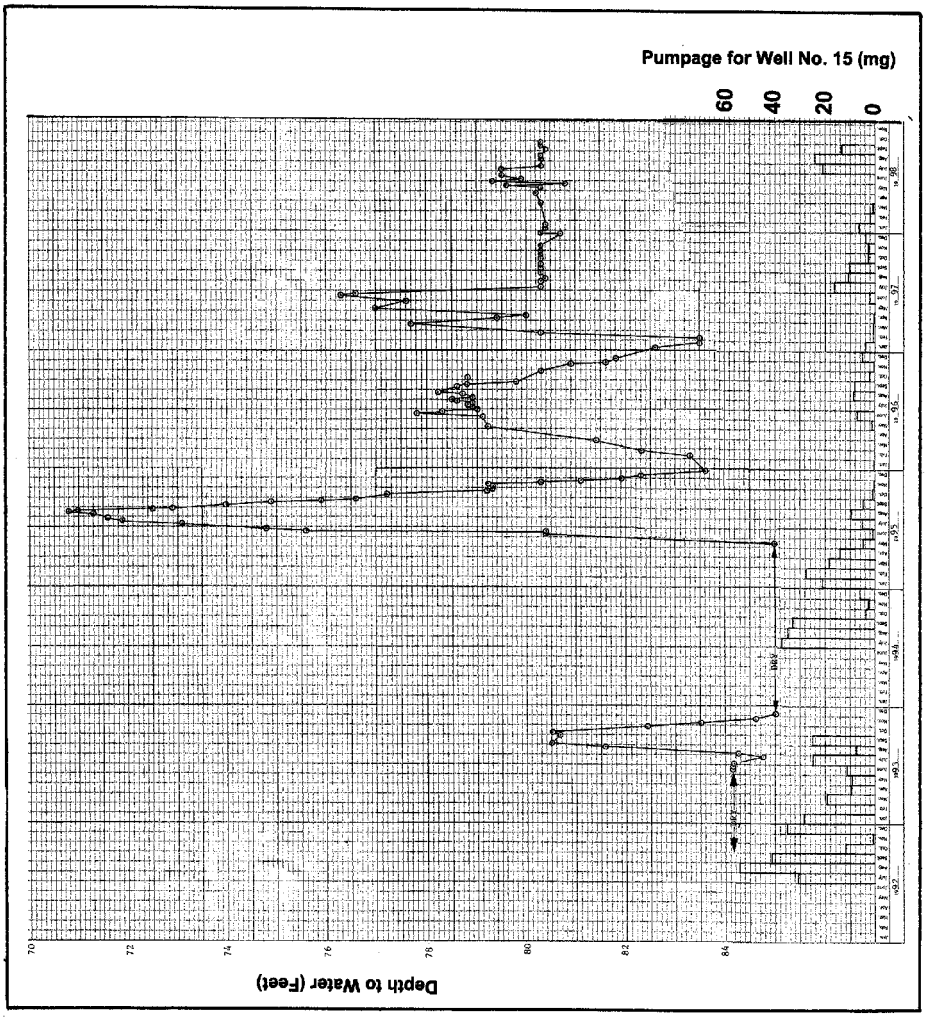


FIGURE 13 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 22 AND PUMPAGE FOR WELL NO.15

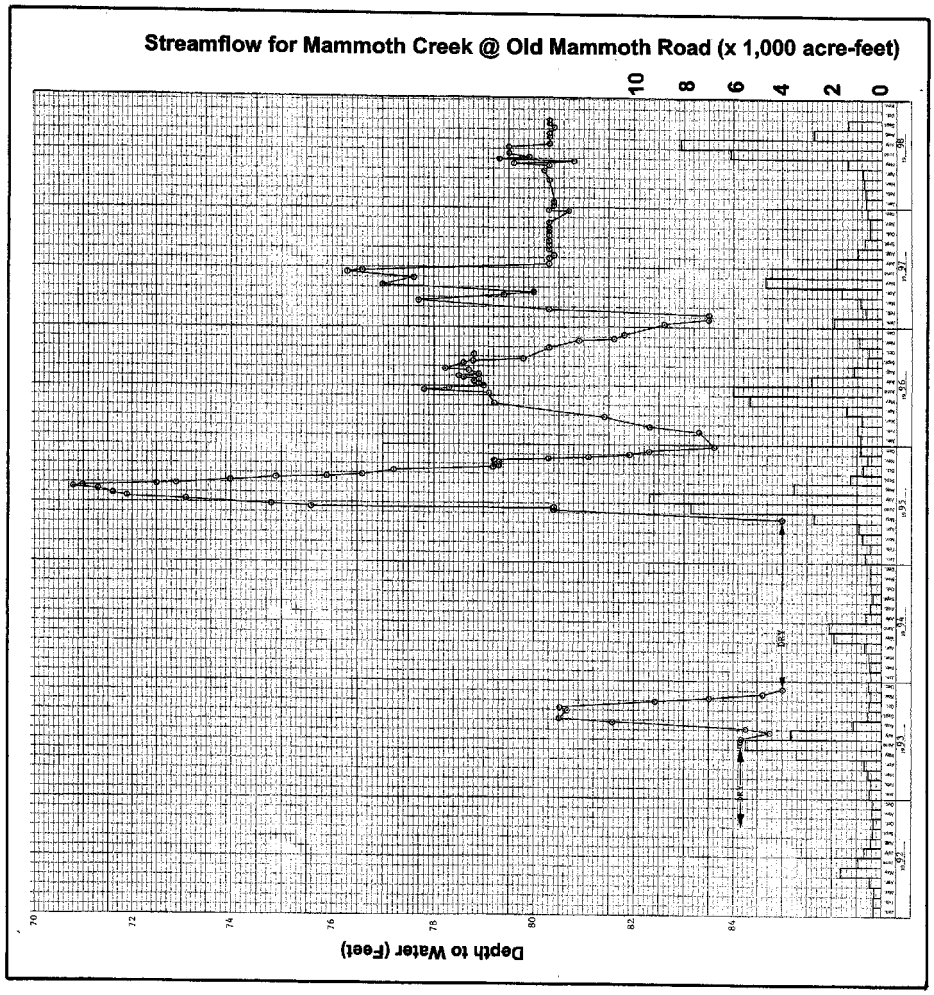


FIGURE 14 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 22 AND MAMMOTH CREEK STREAMFLOW

corresponding to high flows (exceeding 40 cfs) in Mammoth Creek. During 1996-98, the water-level trends in Well No. 22 also followed the pattern of streamflow in Mammoth Creek.

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 most of 1997-98. A detailed hydrograph for Well No. 23 is provided in Appendix D.

Water-level hydrographs for the remaining shallow monitor 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 May 1998, the water levels in this well were the shallowest since 1988.

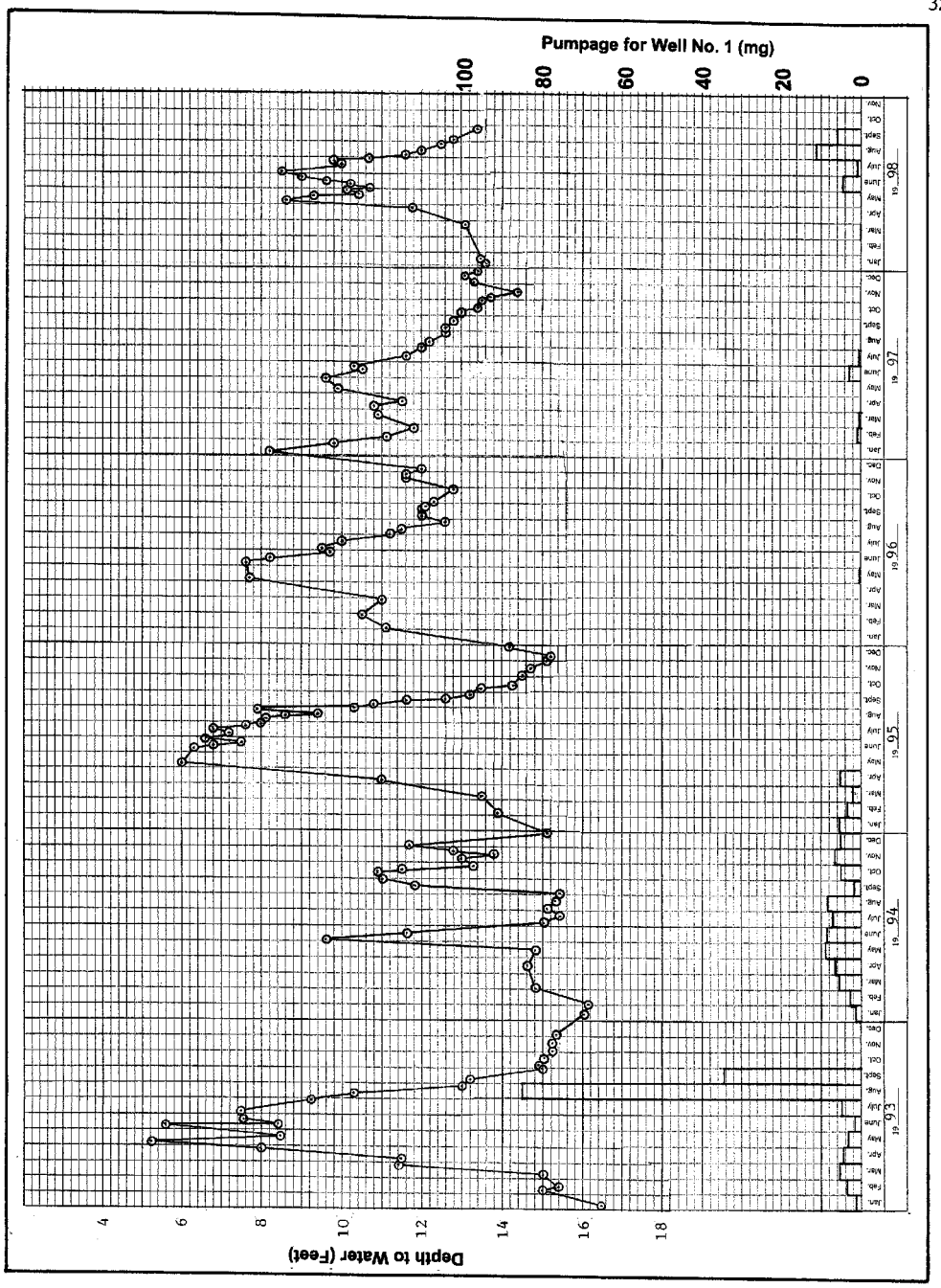


FIGURE 15 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 23 AND PUMPAGE FOR WELL NO. 1

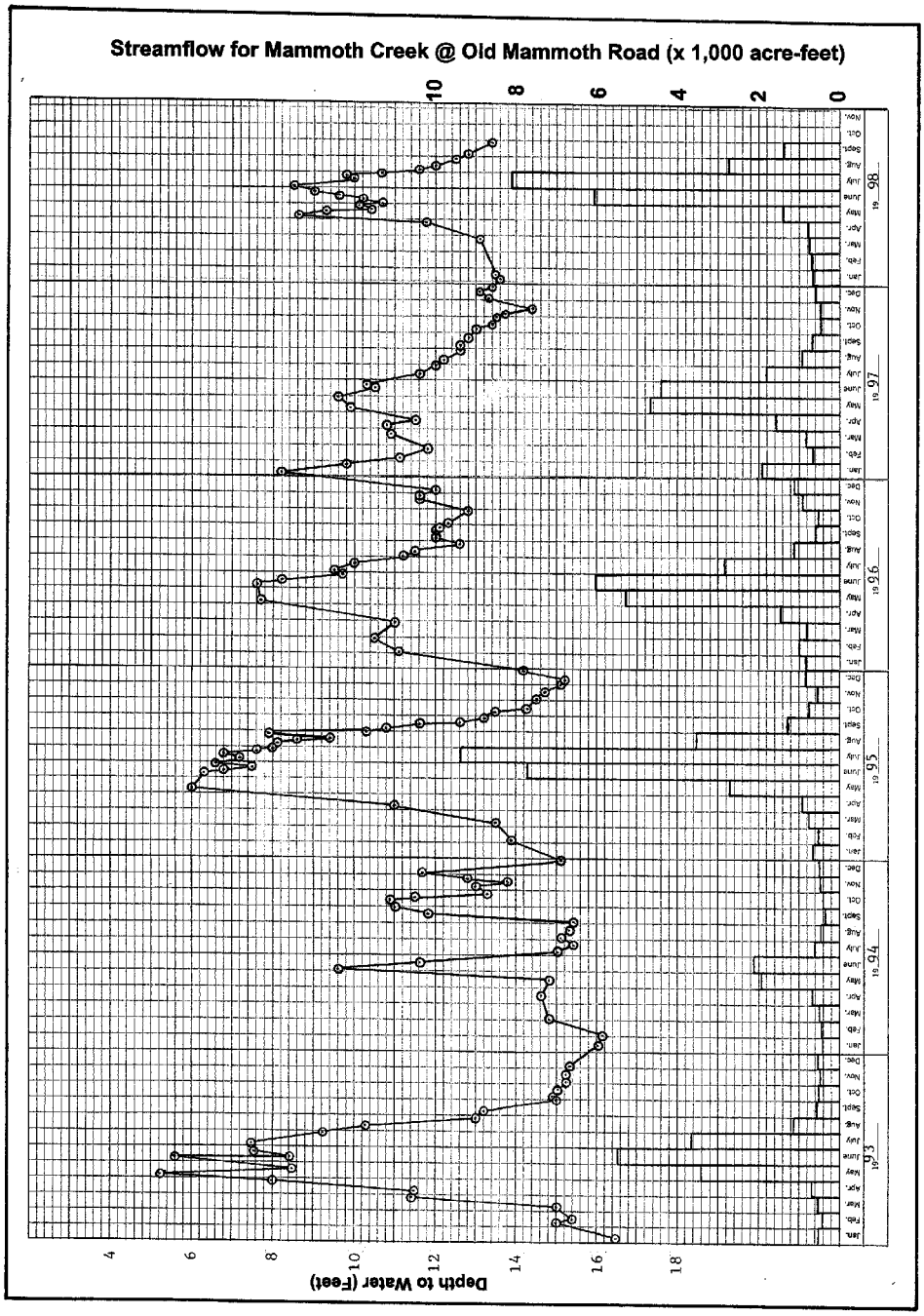


FIGURE 16 - WATER-LEVEL HYDROGRAPH FOR WELL NO. 23 AND MAMMOTH CREEK STREAMFLOW

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 June 1998, depth to water in this well was about the same as in June 1989.

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 1998, there was water in Well No. 10M during most of the water year. 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. The water level began to rise significantly in April 1996, and the shallowest level yet measured (about four feet deep) was in June 1996. The water level in this well remained shallow through 1998.

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. The water level in this well began to rise significantly in April 1996, and reached the shallowest level of record in June 1996. The water level in this well remained shallow through 1998. The water levels in all of the shallow monitor wells 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 1998. 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 1998 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 evidence (i.e., water levels in SC-1 and SC-2) indicates that there is also significant downward flow of groundwater in the area.

CHEMICAL QUALITY AND TEMPERATURE OF GROUNDWATER

The results of chemical analyses and temperatures of water for the supply wells and monitor wells during the 1998 water year are provided in Appendix F. Water samples were collected from the

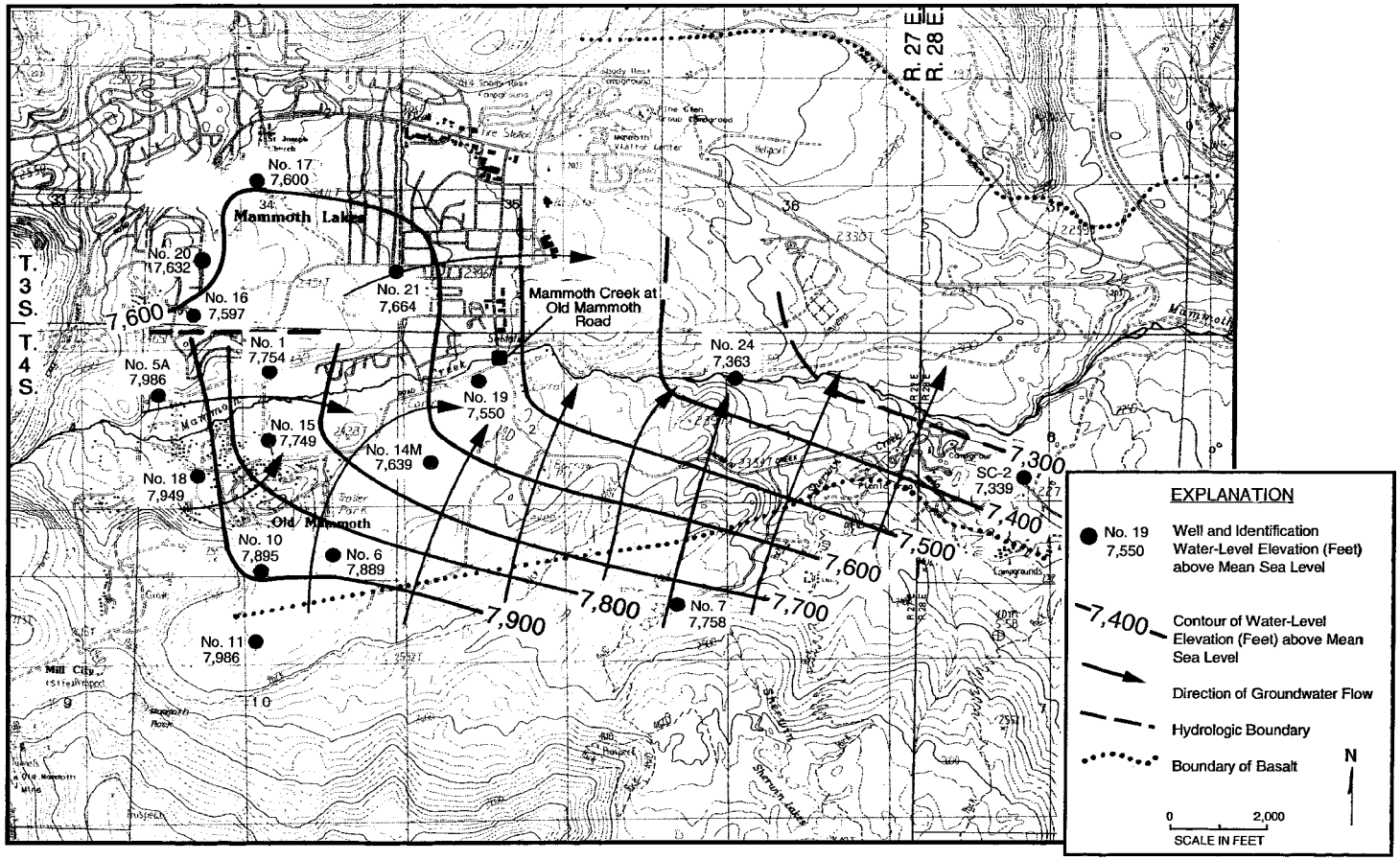


FIGURE 17 - WATER-LEVEL ELEVATIONS IN MID-SEPTEMBER 1998

supply wells in late June and early July and from the monitor wells in September 1998. Transducers are installed in most of the deep monitor wells to continuously measure water levels. Because of these transducers, it wasn't feasible to collect water samples from these wells during 1998. 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 1998, 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 1998 water year are provided in Appendix G. The mean monthly flow at the Old Mammoth Road crossing ranged from 7.2 cfs in October 1997 to 102 cfs in June

1998. In 1998, the flow at the Old Mammoth Road crossing began to rise significantly in June, and the highest flows were between June 17 and July 27.

Average daily flows are plotted in Appendix G for both stations for each month during the 1998 water year, except for June and July. 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 1998 water year.

VALENTINE RESERVE SPRINGFLOW

Rates of flow of the main spring at the University of California Eastern Sierra Valentine Reserve are provided in

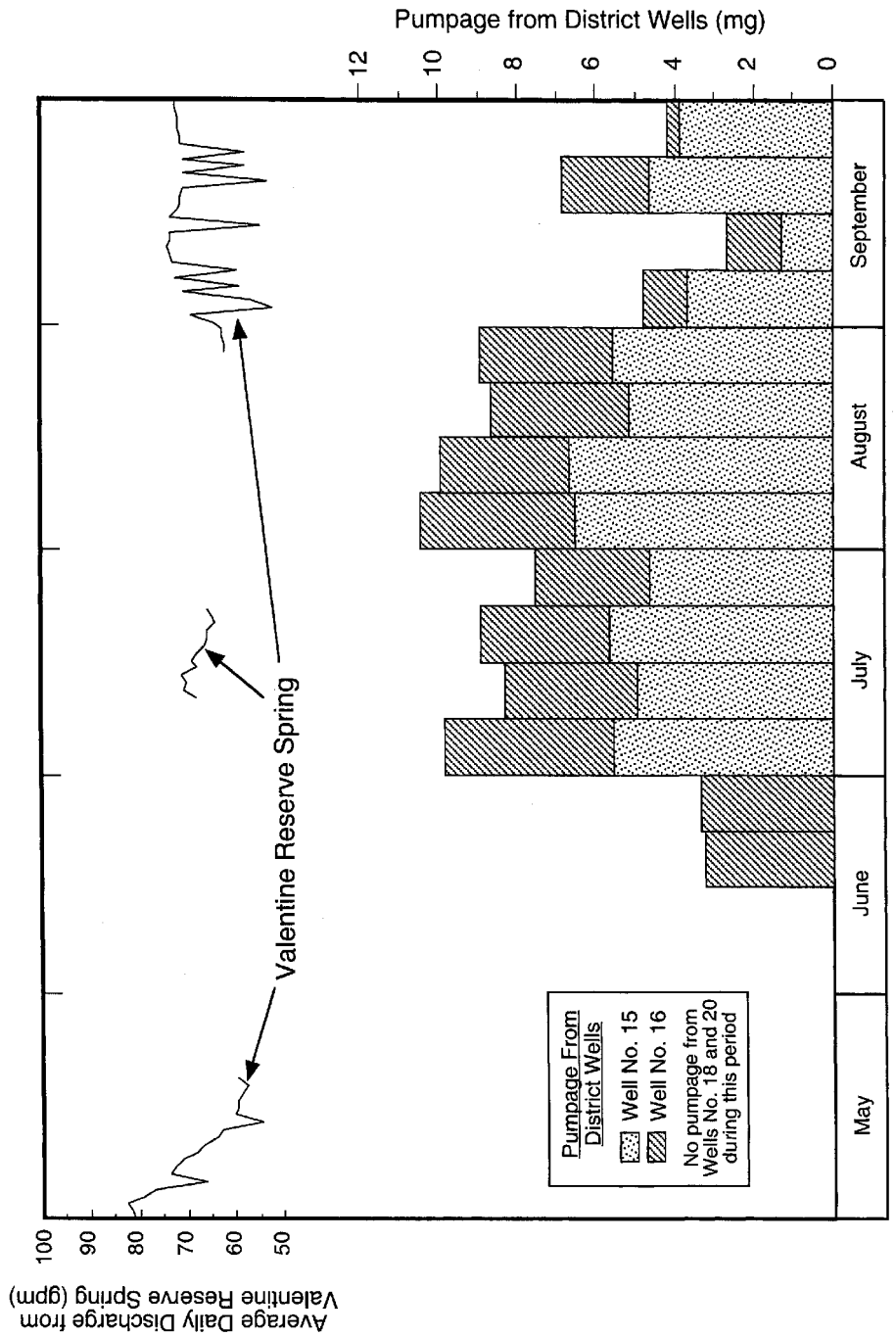


FIGURE 18 - FLOW FROM VALENTINE RESERVE SPRING AND DISTRICT WELL PUMPAGE (1998)

Appendix H. Figure 18 shows the variations in springflow during May-September, 1998. Records for late May and June, part of July, and much of August are not available, due to problems with monitoring. For most of the period of springflow measurements, the flow ranged from about 50 to 75 gpm. Pumpage from the closest District Wells (No. 15 and 16) that were pumped during this period is also shown in this figure. Well No. 15 was pumped primarily during July-September, and Well No. 16 was pumped primarily from June through early September. Well No. 18 was not pumped during the 1998 water year, and Well No. 20 wasn't pumped after December 1997. Careful examination of Figure 18 indicates that the variation in total pumpage from Wells No. 15 and 16 (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.

Springflow measurements for the six-year period of record (Figure 19) indicate that the pattern of springflow is related to runoff. For 1993-97, 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. There was no noticeable impact of District pumping during the 1998 water year on springflow at the Valentine Reserve.

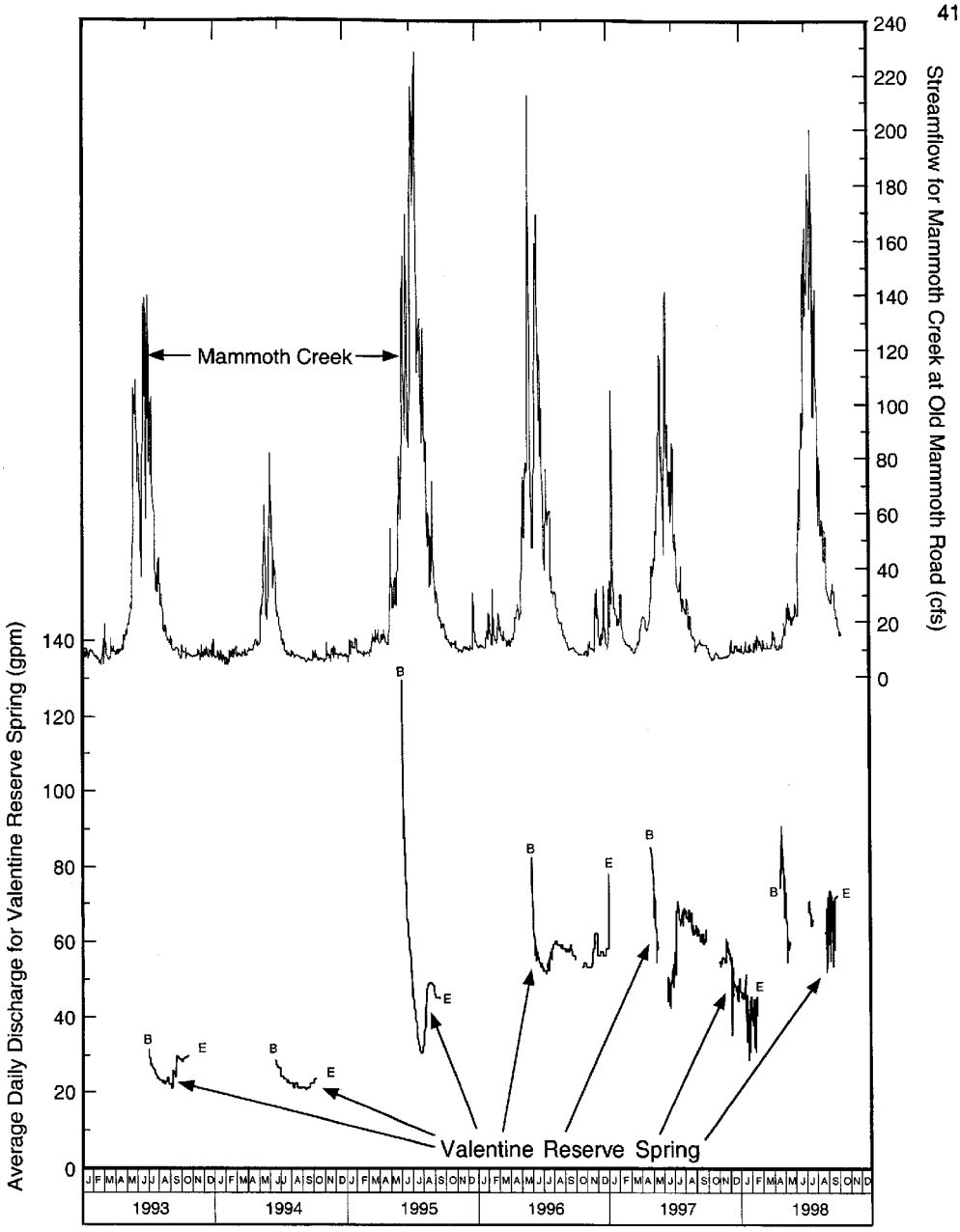


FIGURE 19 - FLOW FOR VALENTINE SPRING AND MAMMOTH CREEK STREAMFLOW (1993-1998)

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 water levels during the 1998 water year. Substantial recharge was indicated during the 1995-98 water years, coincident with substantial runoff in the Mammoth Creek watershed. Water-level hydrographs for Wells No. 7, 21, 24, and SC-1, east of the District well field, also indicate substantial rises during this period. 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 1998 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 1998 water year. 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, 43 p.

Kenneth D. Schmidt and Associates, "Annual Report on Results of Mammoth Community Water District Groundwater Monitoring Program for October 1996-September 1997, December 8, 1997, 45 p.

APPENDIX A

PUMPAGE AND WATER-LEVEL DATA FOR DISTRICT SUPPLY WELLS

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

	1997			1998											
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	0.489			
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.118			
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.431			
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.379			
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.524			
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.695		
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	1.151		
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	0.270		
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	0.179		
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.054		
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	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	0.103	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	0.041	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	0.420	0.000		
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.458	0.000		
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.092	0.434	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	0.517	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	0.594	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	0.448	0.000		
20	0.000	0.000	0.000	0.000	0.000	0.133	0.000	0.000	0.000	0.000	0.000	0.517	0.000		
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.435	0.468	0.000		
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.970	0.442	0.728	0.000		
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.103	0.000	1.128	0.030		
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.243	0.000	0.653	0.000		
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.683	0.000	0.730	0.045		
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.248	0.000	0.830	0.176		
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.147	0.000	0.648	0.145		
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044	0.000	0.669	0.002		
29	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.618	0.321		
30	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.636	0.000		
31	0.000		0.000	0.000		0.000		0.000		0.000	0.755				
TOTAL	0.000	0.000	0.000	0.000	0.000	0.133	0.000	0.000	4.438	1.180	11.253	6.009	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000	0.148	0.038	0.363	0.200	#DIV/0!	#DIV/0!	#DIV/0!
MAX	0.000	0.000	0.000	0.000	0.000	0.133	0.000	0.000	1.243	0.442	1.128	1.151	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	0.000	0.000	0.000	0.000	0.000	0.408	0.000	0.000	13.613	3.620	34.518	18.433	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			70.592	TOTAL AC-FT JAN THRU DEC:			70.592								

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

	1997			1998											
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	0.000	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	0.000	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	0.000	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	0.000	0.000	0.000	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	0.000	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	0.000	0.000	0.000	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0	0.0

TOTAL AC-FT OCT THRU SEP:	0.000	TOTAL AC-FT JAN THRU DEC:	0.000

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

	1997			1998											
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	0.896	0.832	0.320			
2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.768	0.704	0.448			
3	0.000	0.000	0.000	0.000	0.000	0.536	0.064	0.000	0.000	0.832	0.768	0.576			
4	0.000	0.000	0.064	0.064	0.000	0.000	0.000	0.000	0.000	0.896	0.768	0.576			
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.768	0.768	0.576			
6	0.000	0.000	0.000	0.128	0.000	0.000	0.128	0.320	0.000	0.832	0.704	0.640			
7	0.000	0.064	0.000	0.000	0.000	0.000	0.000	0.128	0.000	0.832	0.768	0.320			
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.832	0.704	0.384			
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.768	0.768	0.064			
10	0.000	0.000	0.000	0.064	0.000	0.000	0.000	0.000	0.000	0.832	0.704	0.192			
11	0.000	0.000	0.000	0.064	0.000	0.000	0.000	0.000	0.000	0.832	0.704	0.320			
12	0.000	0.000	0.000	0.320	0.000	0.000	0.000	0.000	0.000	0.768	0.768	0.320			
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.832	0.640	0.256			
14	0.000	0.000	0.000	0.064	0.000	0.000	0.000	0.000	0.000	0.832	0.704	0.256			
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.320	0.768	0.256			
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.704	0.704	0.256			
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.832	0.640	0.640			
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.832	0.768	0.640			
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.512	0.704	0.576			
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.192	0.000	1.024	0.704	0.704			
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.768	0.640	0.512			
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.832	0.768	0.640			
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.704	0.704	0.704			
24	0.000	0.128	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.768	0.704	0.640			
25	0.000	0.128	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.832	0.640	0.512			
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.512	0.704	0.384			
27	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.832	0.704	0.512			
28	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.768	0.640	0.576			
29	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.962	0.832	0.640	0.512			
30	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.512	0.704	0.256			
31	0.000		0.128	0.000		0.000		0.000		0.768	0.640				
TOTAL	0.000	0.320	0.192	0.704	0.000	0.536	0.192	0.640	0.962	23.872	22.080	13.568	0.000	0.000	0.000
MEAN	0.000	0.011	0.006	0.023	0.000	0.017	0.006	0.021	0.032	0.770	0.712	0.452	#DIV/0!	#DIV/0!	#DIV/0!
MAX	0.000	0.128	0.128	0.320	0.000	0.536	0.128	0.320	0.962	1.024	0.832	0.704	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	0.320	0.640	0.064	0.000	0.000	0.000
AC-FT	0.000	0.982	0.589	2.160	0.000	1.644	0.589	1.963	2.951	73.227	67.730	41.620	0.0	0.0	0.0

TOTAL AC-FT OCT THRU SEP:	193.454	TOTAL AC-FT JAN THRU DEC:	192.0

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

	1997			1998											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.152	0.064	0.000	1.152	0.000	0.000	0.000	0.000	0.000	0.712	0.776	0.704			
2	0.104	0.000	0.000	1.176	0.000	0.000	0.000	0.000	0.000	0.680	0.816	0.368			
3	0.000	0.576	0.000	1.088	0.000	0.536	0.000	0.000	0.000	0.696	0.800	0.264			
4	0.000	0.000	0.080	0.136	0.000	0.000	0.000	0.000	0.000	0.704	0.824	0.752			
5	0.000	0.000	0.000	0.152	0.000	0.000	0.000	0.000	0.000	0.696	0.840	0.648			
6	0.000	0.000	0.000	0.112	0.000	0.000	0.000	0.008	0.000	0.704	0.832	0.496			
7	0.000	0.032	0.000	0.000	0.796	0.000	0.000	0.000	0.000	0.656	0.848	0.144			
8	0.000	0.000	0.000	0.000	0.796	0.000	0.000	0.000	0.000	0.704	0.840	0.280			
9	0.000	0.000	0.000	0.488	0.000	0.000	0.000	0.000	0.000	0.696	0.848	0.072			
10	0.000	0.000	0.000	0.384	0.000	0.000	0.000	0.000	0.000	0.704	0.848	0.128			
11	0.000	0.000	0.000	0.216	0.000	0.000	0.000	0.000	0.000	0.712	0.840	0.192			
12	0.040	0.000	0.000	0.312	0.000	0.000	0.000	0.000	0.000	0.704	0.832	0.216			
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.680	0.840	0.080			
14	0.000	0.000	0.000	0.000	0.264	0.000	0.000	0.000	0.000	0.688	0.840	0.192			
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.240	0.832	0.168			
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.592	0.848	0.208			
17	0.000	0.000	0.000	0.400	0.000	0.000	0.000	0.000	0.000	0.752	0.848	0.640			
18	0.000	0.000	0.000	0.376	0.000	0.000	0.000	0.000	0.000	0.736	0.856	0.752			
19	0.000	0.000	0.000	0.392	0.000	0.000	0.000	0.000	0.000	0.744	0.808	0.608			
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.752	0.840	0.696			
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.720	0.832	0.672			
22	1.688	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.688	0.224	0.720			
23	0.432	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.728	0.000	0.576			
24	0.000	0.136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.584	0.832	0.576			
25	0.000	0.232	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.600	0.784	0.736			
26	0.000	0.216	0.000	0.048	0.000	0.000	0.000	0.000	0.000	0.552	0.800	0.752			
27	0.000	0.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.680	0.808	0.512			
28	0.000	0.496	0.160	0.000	0.000	0.000	0.000	0.000	0.000	0.720	0.864	0.464			
29	0.000	0.336	1.240	0.000		0.000	0.000	0.000	0.000	0.784	0.792	0.560			
30	0.000	0.000	1.152	0.000		0.000	0.000	0.000	0.000	0.520	0.816	0.288			
31	0.064		1.120	0.000		0.000		0.000		0.792	0.768				
TOTAL	2.480	2.488	3.752	6.432	1.856	0.536	0.000	0.008	0.024	20.920	24.176	13.464	0.000	0.000	0.000
MEAN	0.080	0.083	0.121	0.207	0.066	0.017	0.000	0.000	0.001	0.675	0.780	0.449	#DIV/0!	#DIV/0!	#DIV/0!
MAX	1.688	0.576	1.240	1.176	0.796	0.536	0.000	0.008	0.024	0.792	0.864	0.752	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	0.240	0.000	0.072	0.000	0.000	0.000
AC-FT	7.6	7.6	11.5	19.7	5.7	1.6	0.0	0.0	0.1	64.2	74.2	41.3	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			233.7	TOTAL AC-FT JAN THRU DEC:			206.9								

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

	1997			1998											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.366	0.692	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.560	0.442	0.480			
2	0.000	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.554	0.484	0.284			
3	0.265	0.000	0.104	0.000	0.000	0.000	0.000	0.000	0.000	0.568	0.478	0.088			
4	0.322	0.242	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.542	0.510	0.000			
5	0.408	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.550	0.488	0.000			
6	0.238	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.550	0.518	0.000			
7	0.000	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.516	0.220			
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.470	0.498	0.040			
9	0.000	0.208	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.400	0.520	0.000			
10	0.000	0.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.576	0.516	0.040			
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.400	0.504	0.000			
12	0.000	0.152	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.498	0.504	0.320			
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.550	0.412	0.148			
14	0.000	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.520	0.428	0.272			
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.498	0.052	0.364			
16	0.232	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.340	0.276			
17	0.050	0.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.548	0.332	0.276			
18	0.638	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.464	0.548	0.460	0.380			
19	0.022	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.502	0.546	0.372	0.340			
20	0.214	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.590	0.548	0.516	0.116			
21	0.000	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.570	0.550	0.448	0.280			
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.574	0.210	0.388	0.552			
23	0.000	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.562	0.266	0.524	0.232			
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.570	0.100	0.456	0.064			
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.338	0.158	0.500	0.160			
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.478	0.336	0.484	0.048			
27	0.534	0.000	0.000	0.000	0.000	0.000	0.052	0.000	0.466	0.378	0.496	0.036			
28	0.678	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.444	0.480	0.000			
29	0.246	0.000	0.000	0.000		0.000	0.000	0.000	0.456	0.472	0.464	0.000			
30	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.574	0.542	0.508	0.000			
31	0.630		0.000	0.000		0.000		0.000		0.542	0.480				
TOTAL	4.843	1.958	0.104	0.000	0.000	0.000	0.052	0.000	6.644	13.924	14.118	5.016	0.000	0.000	0.000
MEAN	0.156	0.065	0.003	0.000	0.000	0.000	0.002	0.000	0.221	0.449	0.455	0.167	#DIV/0!	#DIV/0!	#DIV/0!
MAX	0.678	0.692	0.104	0.000	0.000	0.000	0.052	0.000	0.590	0.576	0.524	0.552	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	0.052	0.000	0.000	0.000	0.000
AC-FT	14.9	6.0	0.3	0.0	0.0	0.0	0.2	0.0	20.4	42.7	43.3	15.4	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			143.2	TOTAL AC-FT JAN THRU DEC:			122.0								

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

	1997			1998											
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	0.292	0.668	0.148	0.000	0.000	0.408	0.744	0.000			
2	0.000	0.000	0.000	0.000	0.000	0.124	0.224	0.000	0.000	0.384	0.740	0.000			
3	0.000	0.000	0.000	0.000	0.000	0.200	0.144	0.000	0.000	0.492	0.768	0.000			
4	0.000	0.000	0.000	0.000	0.000	0.000	0.232	0.000	0.000	0.500	0.808	0.000			
5	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.000	0.000	0.472	0.820	0.000			
6	0.000	0.000	0.000	0.000	0.000	0.000	0.308	0.000	0.000	0.432	0.804	0.000			
7	0.000	0.000	0.000	0.000	0.000	0.900	0.236	0.000	0.000	0.452	0.796	0.000			
8	0.000	0.000	0.000	0.000	0.000	0.672	0.256	0.000	0.000	0.432	0.836	0.000			
9	0.000	0.000	0.000	0.020	0.000	0.052	0.236	0.000	0.000	0.356	0.336	0.000			
10	0.000	0.000	0.000	0.000	0.000	0.000	0.532	0.000	0.000	0.168	0.784	0.000			
11	0.000	0.000	0.000	0.000	0.000	0.000	0.656	0.000	0.000	0.248	0.800	0.000			
12	0.000	0.000	0.000	0.000	0.276	0.000	0.200	0.000	0.000	0.168	0.760	0.000			
13	0.000	0.000	0.000	0.000	0.544	0.692	0.220	0.000	0.000	0.484	0.352	0.000			
14	0.000	0.000	0.000	0.000	0.724	0.524	0.252	0.000	0.000	0.448	0.000	0.000			
15	0.000	0.000	0.000	0.000	0.628	0.460	0.212	0.000	0.000	1.104	0.000	0.000			
16	0.000	0.000	0.000	0.000	0.712	0.176	0.220	0.000	0.844	0.540	0.000	0.000			
17	0.000	0.000	0.000	0.000	0.136	0.000	0.468	0.000	0.356	0.500	0.000	0.000			
18	0.000	0.000	0.000	0.000	0.000	0.000	0.504	0.000	0.756	0.528	0.000	0.000			
19	0.000	0.000	0.000	0.244	0.000	0.000	0.220	0.000	1.128	0.456	0.000	0.000			
20	0.000	0.000	0.000	0.000	0.488	0.368	0.208	0.000	0.984	0.480	0.000	0.000			
21	0.000	0.000	0.000	0.000	0.788	1.284	0.192	0.000	0.836	0.716	0.000	0.000			
22	0.000	0.000	0.000	0.000	0.380	0.480	0.212	0.124	0.012	0.668	0.000	0.000			
23	0.000	0.000	0.000	0.000	0.000	0.000	0.084	0.336	0.000	0.552	0.000	0.000			
24	0.000	0.000	0.000	0.000	0.000	0.000	0.064	0.236	0.052	0.564	0.000	0.000			
25	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.272	0.760	0.528	0.000	0.000			
26	0.000	0.000	0.000	0.532	0.000	0.328	0.064	0.188	1.128	0.480	0.000	0.000			
27	0.000	0.000	0.000	0.000	0.632	0.672	0.000	0.132	1.140	0.676	0.000	0.000			
28	0.000	0.000	0.000	0.000	0.796	1.060	0.044	0.068	1.184	0.724	0.000	0.000			
29	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.652	0.688	0.000	0.000			
30	0.000	0.000	0.000	0.376		0.000	0.000	0.000	0.368	0.524	0.000	0.000			
31	0.000		0.000	0.436		0.000		0.000		0.728	0.000				
TOTAL	0.000	0.000	0.000	1.608	6.396	8.660	6.228	1.356	10.200	15.900	9.348	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.052	0.228	0.279	0.208	0.044	0.340	0.513	0.302	0.000	#DIV/0!	#DIV/0!	#DIV/0!
MAX	0.000	0.000	0.000	0.532	0.796	1.284	0.656	0.336	1.184	1.104	0.836	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	0.168	0.000	0.000	0.000	0.000	0.000
AC-FT	0.000	0.000	0.000	4.933	19.620	26.564	19.104	4.160	31.288	48.773	28.675	0.000	0.0	0.0	0.0
TOTAL AC-FT OCT THRU SEP:			183.117	TOTAL AC-FT JAN THRU DEC:			183.117								

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

	1997			1998											
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	0.002	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	0.002	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	0.006	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	0.000	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	0.000	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	0.000	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	0.000	0.000	0.000	0.006	0.002	0.002	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	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	0.000	0.000	0.000	0.006	0.002	0.002	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TOTAL AC-FT OCT THRU SEP:	0.0	TOTAL AC-FT JAN THRU DEC:	0.0

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

	1997			1998											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.420	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
2	0.524	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
3	0.480	0.000	0.096	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
4	0.532	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
5	0.608	0.000	0.120	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
6	0.788	0.000	0.088	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
7	0.548	0.000	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
8	0.468	0.000	0.096	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
9	0.468	0.000	0.096	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
10	0.344	0.000	0.116	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
11	0.404	0.000	0.256	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
12	0.400	0.000	0.276	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
13	0.392	0.000	0.316	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
14	0.440	0.000	0.292	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
15	0.000	0.000	0.204	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
16	0.000	0.000	0.192	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
17	0.000	0.000	0.148	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
18	0.000	0.000	0.152	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
19	0.000	0.000	0.220	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
20	0.000	0.000	0.412	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
21	0.000	0.000	0.464	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
22	0.000	0.000	0.440	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
23	0.000	0.000	0.828	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
24	0.000	0.000	0.856	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
25	0.000	0.000	0.836	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
26	0.000	0.000	1.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
27	0.000	0.000	0.980	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
28	0.000	0.000	0.972	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	6.816	0.004	9.516	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MEAN	0.220	0.000	0.307	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	#DIV/0!	#DIV/0!
MAX	0.788	0.004	1.012	0.000	0.000	0.000	0.000	0.000	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	20.9	0.0	29.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TOTAL AC-FT OCT THRU SEP: 50.1 TOTAL AC-FT JAN THRU DEC: 0.0

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL WATER LEVEL DATA
OCTOBER 1997 - SEPTEMBER 1998

WELL NO. 1					WELL NO. 6			
Date	Static	Date	Pumping		Date	Static	Date	Pumping
10/02/97	-169.25	03/20/98	-196.16		10/02/97	-2.09		
10/10/97	-169.05	08/20/98	-197.59		10/10/97	-3.16		
10/16/97	-168.87	08/24/98	-203.36		10/16/97	-3.15		
10/23/97	-168.26	09/03/98	-211.02		10/23/97	-3.15		
10/31/97	-168.75				10/31/97	-4.20		
11/07/97	-168.14				11/07/97	-4.73		
11/14/97	-168.34				11/14/97	-5.25		
11/21/97	-168.24				11/21/97	-5.78		
12/05/97	-168.01				12/05/97	-9.64		
12/12/97	-168.61				12/12/97	-9.83		
12/19/97	-168.02				12/19/97	-10.34		
01/08/98	-168.98				01/08/98	-10.17		
01/13/98	-169.02				01/13/98	-8.00		
03/20/98	-167.92				03/20/98	-6.84		
04/22/98	-165.43				04/22/98	-7.19		
05/05/98	-163.88				05/05/98	-10.17		
05/12/98	-162.47				05/12/98	-11.23		
05/19/98	-161.87				05/19/98	-10.88		
05/26/98	-160.65				05/26/98	-11.41		
06/02/98	-160.12				06/02/98	-11.41		
06/09/98	-159.81				06/09/98	-12.63		
06/16/98	-159.09				06/16/98	-8.00		
07/21/98	-162.37				06/25/98	-8.00		
07/27/98	-163.17				07/02/98	-10.34		
08/05/98	-163.74				07/10/98	-9.13		
08/12/98	-164.58				07/17/98	-9.64		
09/10/98	-178.62				07/21/98	-9.47		
09/16/98	-174.27				07/27/98	-8.94		
09/21/98	-173.16				08/05/98	-8.06		
09/28/98	-173.68				08/12/98	-7.72		
10/07/98	-173.21				08/20/98	-7.36		
10/15/98	-172.79				08/24/98	-7.36		
					09/03/98	-7.19		
					09/10/98	-7.89		
					09/16/98	-7.19		
					09/21/98	-5.95		
					09/28/98	-5.61		
Mean	**-167.26**		**-202.03**			**-7.81**		**#DIV/0!**
Max	**-178.62**		**-211.02**			**-12.63**		**0.00**
Min	**-159.09**		**-196.16**			**-2.09**		**0.00**
Historical								
Mean	-200.25		-256.51			-51.24		-142.24
Max	-268.10		-295.00			-160.00		-200.00
Min	-149.75		-196.16			0.00		0.00

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL WATER LEVEL DATA
OCTOBER 1997 - SEPTEMBER 1998

WELL NO. 10					WELL NO. 15			
Date	Static	Date	Pumping		Date	Static	Date	Pumping
10/02/97	-25.83	07/02/98	-62.13		10/10/97	-183.58	10/02/97	-201.51
10/10/97	-25.31	07/10/98	-64.92		10/16/97	-183.92	10/23/97	-202.18
10/16/97	-25.31	07/17/98	-66.33		10/31/97	-183.71	07/02/98	-183.42
10/23/97	-24.78	07/21/98	-66.33		11/07/97	-183.52	07/17/98	-192.84
10/31/97	-25.31	07/27/98	-66.50		11/14/97	-182.01	08/05/98	-199.49
11/07/97	-24.95	08/05/98	-66.33		11/21/97	-180.26	09/03/98	-206.33
11/14/97	-25.14	08/12/98	-66.16		12/05/97	-180.75	09/21/98	-207.42
11/21/97	-25.14	08/20/98	-66.33		12/12/97	-179.42		
12/05/97	-24.44	08/24/98	-66.16		12/19/97	-178.88		
12/12/97	-24.61	09/03/98	-64.75		01/08/98	-180.86		
12/19/97	-24.61	09/21/98	-64.22		01/13/98	-179.94		
01/08/98	-25.48	09/28/98	-64.41		03/20/98	-175.51		
01/13/98	-25.48				04/22/98	-172.84		
03/20/98	-28.98				05/05/98	-171.67		
04/22/98	-29.52				05/12/98	-170.53		
05/05/98	-26.72				05/19/98	-170.82		
05/12/98	-24.95				05/26/98	-169.78		
05/19/98	-25.14				06/02/98	-170.32		
05/26/98	-23.91				06/09/98	-169.21		
06/02/98	-23.91				06/16/98	-168.15		
06/09/98	-23.73				06/25/98	-169.32		
06/16/98	-23.90				07/10/98	-174.56		
06/25/98	-23.90				07/21/98	-177.79		
09/10/98	-33.38				07/27/98	-180.74		
09/16/98	-33.20				08/12/98	-185.72		
					08/20/98	-188.11		
					08/24/98	-187.89		
					09/10/98	-190.04		
					09/16/98	-189.03		
					09/28/98	-193.03		
Mean	**-25.91**		**-65.38**			**-179.06**		**-199.03**
Max	**-33.38**		**-66.50**			**-193.03**		**-207.42**
Min	**-23.73**		**-62.13**			**-168.15**		**-183.42**
Historical								
Mean	-63.61		-125.08			-223.02		-260.72
Max	-164.00		-200.00			-275.07		-297.00
Min	-8.13		-40.92			-168.15		-183.42

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL WATER LEVEL DATA
OCTOBER 1997 - SEPTEMBER 1998

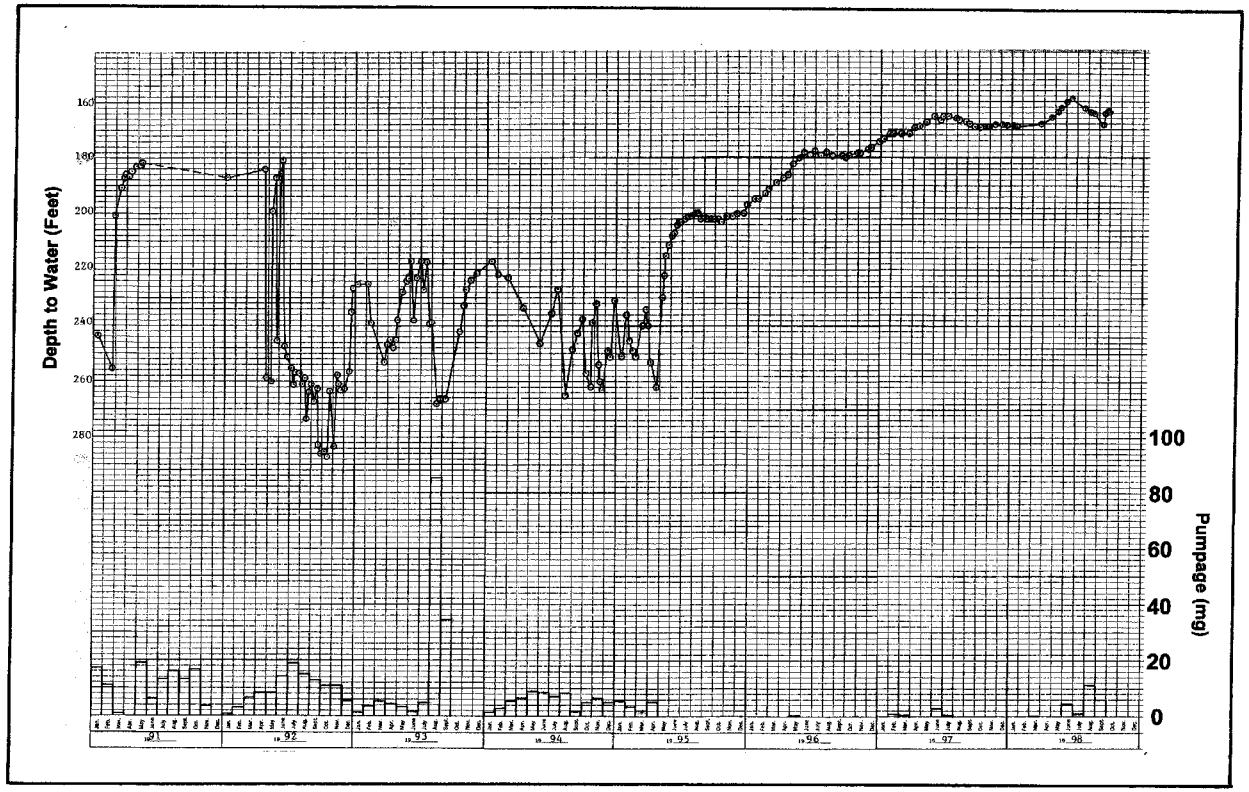
WELL NO. 16					WELL NO. 17			
Date	Static	Date	Pumping		Date	Static	Date	Pumping
10/23/97	-474.03	10/02/97	-479.81		10/02/97	-370.29	06/16/98	-372.78
12/05/97	-472.56	10/10/97	-476.72		10/10/97	-370.02	06/25/98	-373.11
12/12/97	-473.00	10/16/97	-477.53		10/16/97	-370.26	07/21/98	-373.34
12/19/97	-473.00	10/31/97	-480.41		10/23/97	-369.92	07/27/98	-369.98
01/08/98	-473.59	11/07/97	-479.38		10/31/97	-370.17	08/05/98	-373.88
01/13/98	-473.59	11/14/97	-478.34		11/07/97	-369.88	08/12/98	-370.55
04/22/98	-437.24	11/21/97	-477.13		11/14/97	-369.98		
05/05/98	-435.61	06/25/98	-480.84		11/21/97	-369.88		
05/12/98	-435.76	07/02/98	-486.00		05/12/98	-368.46		
05/19/98		07/10/98	-487.22		05/19/98	-368.78		
06/02/98	-472.38	07/17/98	-488.47		05/23/98	-368.86		
06/09/98	-472.38	07/21/98	-488.69		06/02/98	-368.57		
06/16/98	-472.78	08/05/98	-488.47		06/09/98	-368.53		
07/27/98	-483.09	08/12/98	-489.50		08/20/98	-368.94		
09/10/98	-483.09	08/20/98	-488.88		08/24/98	-368.72		
09/16/98	-483.94	08/24/98	-489.72		09/03/98	-368.48		
09/28/98	-483.53	09/03/98	-488.25		09/10/98	-368.33		
		09/21/98	-486.81		09/16/98	-368.24		
					09/21/98	-368.09		
					09/28/98	-368.06		
Mean	**-468.72**		**-484.01**			**-369.12**		**-372.27**
Max	**-483.94**		**-489.72**			**-370.29**		**-373.88**
Min	**-435.61**		**-476.72**			**-368.06**		**-369.98**
Historical								
Mean	-465.40		-483.36			-377.19		-375.65
Max	-483.94		-491.50			-386.71		-386.00
Min	-413.65		-473.05			-367.42		-369.98

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL WATER LEVEL DATA
OCTOBER 1997 - SEPTEMBER 1998

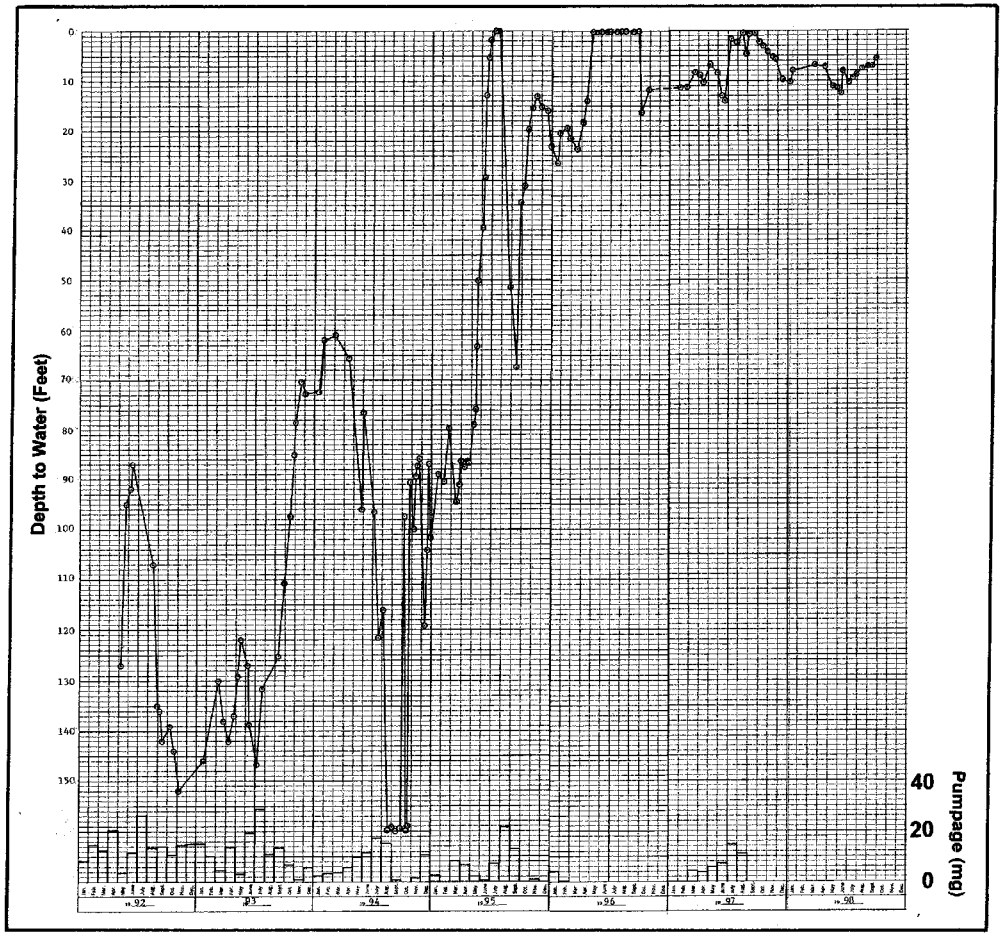
WELL NO. 18					WELL NO. 20			
Date	Static	Date	Pumping		Date	Static	Date	Pumping
10/02/97	-58.91				10/10/97	-416.97	10/02/97	-483.86
10/10/97	-58.25				10/16/97	-416.75		
10/16/97	-57.98				10/23/97	-414.72		
10/23/97	-57.33				10/31/97	-414.50		
10/31/97	-57.26				11/07/97	-412.84		
11/07/97	-56.75				11/14/97	-412.25		
11/14/97	-56.22				11/21/97	-411.63		
11/21/97	-56.01				12/05/97	-412.44		
12/05/97	-47.25				12/12/97	-414.09		
12/12/97	-46.78				12/19/97	-413.47		
12/19/97	-45.94				01/08/98	-410.19		
01/08/98	-45.72				01/13/98	-410.59		
01/13/98	-45.42				03/20/98	-408.94		
03/20/98	-50.26				04/22/98	-408.31		
04/22/98	-51.23				05/05/98	-407.72		
05/05/98	-50.27				05/12/98	-407.28		
05/12/98	-49.26				05/19/98	-407.51		
05/19/98	-48.76				05/26/98	-407.50		
05/26/98	-47.68				06/02/98	-407.09		
06/02/98	-47.19				06/09/98	-407.28		
06/09/98	-45.81				06/16/98	-408.31		
06/16/98	-44.22				06/25/98	-412.03		
06/25/98	-44.08				07/02/98	-407.91		
07/02/98	-40.00				07/10/98	-407.91		
07/10/98	-42.00				07/17/98	-407.91		
07/17/98	-44.00				07/21/98	-409.16		
07/21/98	-46.46				07/27/98	-408.13		
07/27/98	-47.46				08/05/98	-408.94		
08/05/98	-48.16				08/12/98	-407.91		
08/12/98	-48.59				08/20/98	-407.91		
08/20/98	-49.19				08/24/98	-407.91		
08/24/98	-49.46				09/03/98	-407.72		
09/03/98	-50.44				09/10/98	-407.50		
09/10/98	-50.63				09/16/98	-407.50		
09/16/98	-50.62				09/21/98	-407.50		
09/21/98	-50.54				09/28/98	-407.50		
09/28/98	-51.06							
Mean	**-49.65**		**#DIV/0!**			**-409.83**		**-483.86**
Max	**-58.91**		**0.00**			**-416.97**		**-483.86**
Min	**-40.00**		**0.00**			**-407.09**		**-483.86**
Historical								
Mean	-60.92		-83.2			-411.87		-452.24
Max	-87.9		-84.48			-436.52		-489.01
Min	-40		-81.91			-398.91		-428.53

APPENDIX B

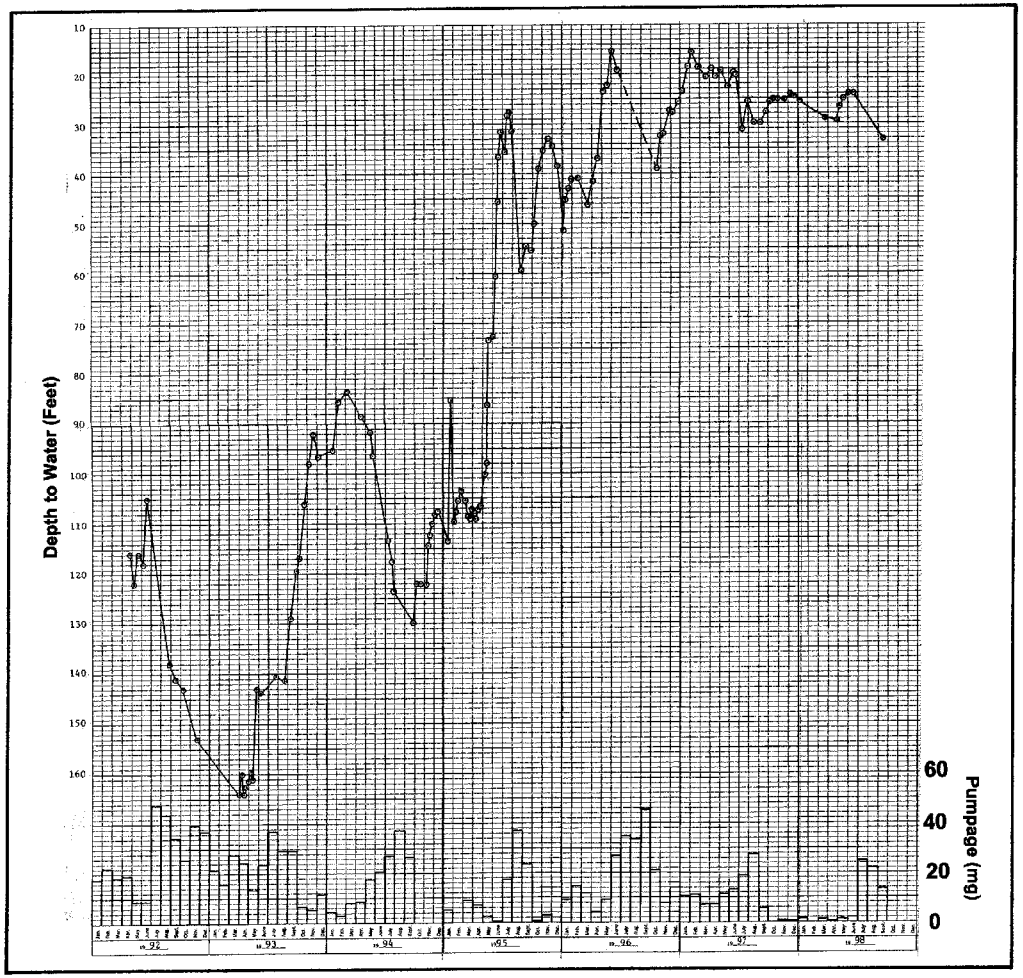
PUMPAGE AND WATER-LEVEL HYDROGRAPHS FOR EARLIER SUPPLY WELLS



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

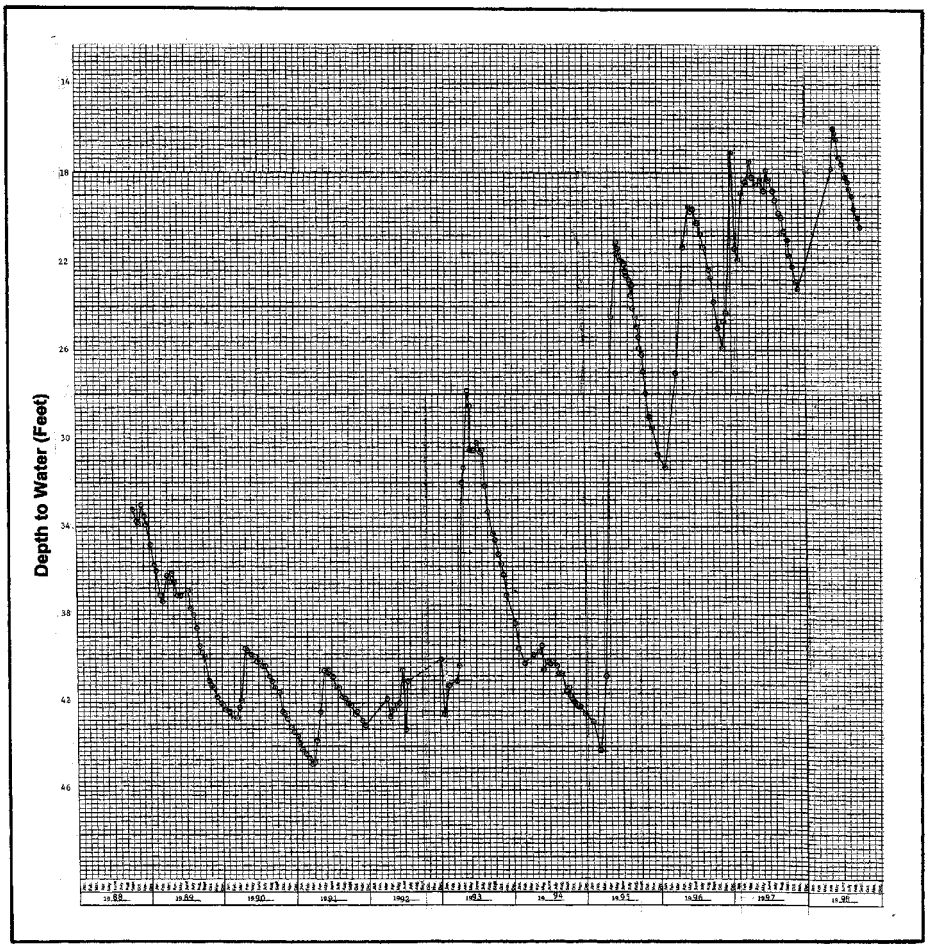
WATER-LEVEL MEASUREMENTS FOR MONITOR WELLS

MAMMOTH COMMUNITY WATER DISTRICT
MONITOR WELL LEVEL DATA (OCT/1997-SEP/1998)

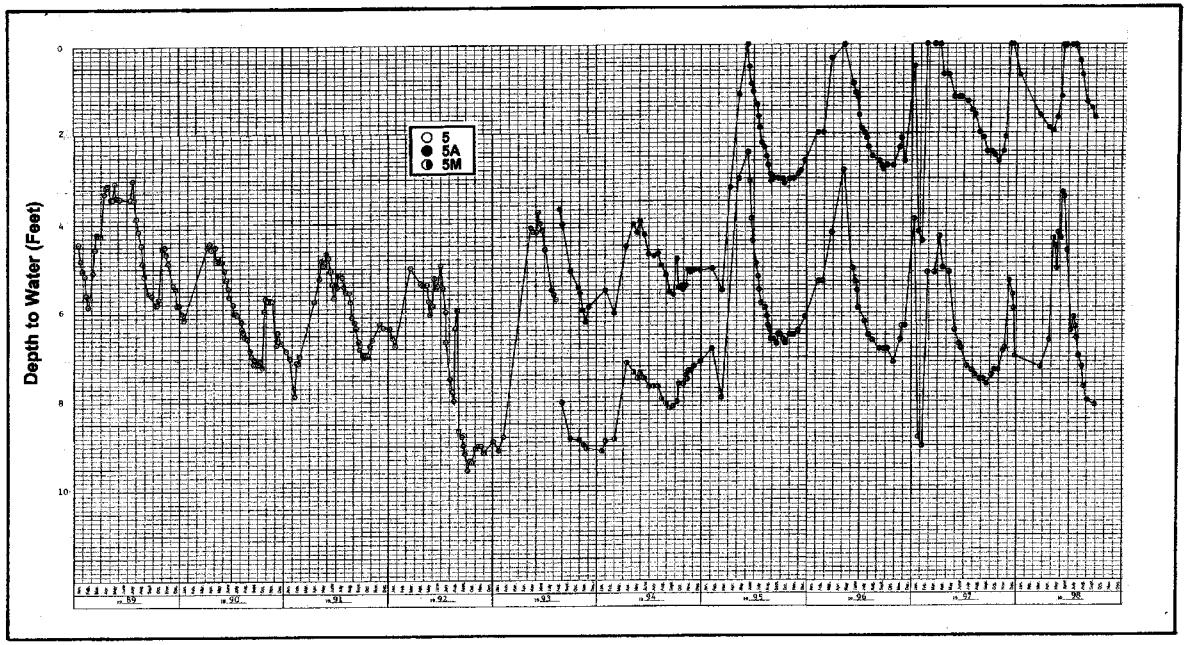
Date	Well 4	Well 5A	Well 5M	Well 7	Well 10M	Well 11	Well 11M	Well 12M	Well 14	Well 19	Well 21	Well 22	Well 23	Well 24
10/02/97	-21.03	-2.36	-7.41	-241.16	-19.21	0	-19.03	-12.56	-253.18	-314.94	-232.21	-80.33	-13.03	-354.95
10/10/97	-21.39	-2.41	-7.31		-18.56	0	-19.26	-12.87	-254.22	-315.64	-232.02	-80.34	-13.31	-354.78
10/16/97	-21.71	-2.48	-7.29		-18.39	0	-19.66	-13.19	-253.05	-313.03	-232.59	-80.31	-13.39	-354.64
10/23/97	-21.79	-2.5	-7.29		-18.01	0	-19.8	-13.4	-257.5	-312.33	-232.15	-80.31	-13.25	-354.64
10/31/97	-22.19	-2.62	-7.29		-17.92	0	-19.83	-13.55			-232.41	-80.31	-13.47	
11/07/97	-22.46	-2.49	-7.12		-17.78	0	-19.85	-13.59	-265.5	-314.6	-232.11	-80.31	-13.68	-354.05
11/14/97	-22.87	-2.39	-6.85		-17.54	0	-19.86	-13.59	-270.86	-317.03	-232.12	-80.31	-14.39	-354.02
11/21/97	-23.17	-2.09	-6.78		-17.41	0	-19.98	-13.77	-268.38	-317.35	-232.31	-80.32		-353.87
12/05/97		0	-5.28						-274.62	-318.48	-232.94	-86.22	-13.34	
12/12/97		0	-5.61		-16.48	0	-20.69	-14.37	-271.38	-319.03	-232.12	-80.72	-13.11	
12/19/97		0	-5.91						-273.91	-319.45	-233.49	-80.31	-13.39	
01/08/98		-0.72	-6.98		-16.08	0	-20.76	-15.41	-279.38	-319.11	-235.31	-80.41	-13.56	
01/13/98						0			-284.54	-318.89	-234.80	-80.43	-13.54	
03/20/98		-1.62	-7.21		-17.57	0					-233.52	-80.31	-13.11	
04/22/98		-1.88	-6.61		-17.22	0	-23.46	-18.37	-305.63		-233.26	-80.22	-11.76	
05/05/98	-17.77	-1.95	-4.36		-13.03	0	-21.04	-18.37	-303.86	-326.37	-232.86	-80.32	-8.64	
05/12/98	-15.98	-1.71	-4.52		-11.57	0	-19.44	-11.49	-293.21	-325.89	-232.56	-79.57	-9.31	
05/19/98	-16.03	-1.66	-5.01		-11.74	0	-10.39	-10.28		-325.76	-232.76	-80.76	-10.41	-355.89
05/26/98	-16.22	-1.42	-4.22	-250.29	-10.37	0	-15.39	-10.28		-324.86	-232.23	-79.32	-10.14	
06/02/98	-16.53	-1.19	-4.32	-250.14	-10.23	0	-10.88	-5.97			-232.17	-79.85	-10.69	-355.44
06/09/98	-17.32	0	-3.31	-250.04	-10.04	0	-8.37	-5.32				-79.87	-10.22	
06/16/98	-17.13	0	-3.43	-249.02	-9.69	0	-7.09	-4.84				-79.47	-9.57	
06/25/98	-17.49	0	-4.61		-10.39	0	-6.17	-4.86				-79.43	-9.01	
07/02/98	-17.64				-13.98	0	-6.31	-4.99				-79.51	-8.50	
07/10/98	-17.89	0	6.4		-16.48	0	-7.16	-5.18				-80.21	-8.47	
07/17/98	-18.17	0	-6.12		-17.13	0	-7.81	-5.47				-80.29	-10.04	
07/21/98	-18.32	0	-6.32	-247.54	-17.84	0	-8.29	-5.71				-80.33	-9.84	
07/27/98	-18.38	0	6.58	-246.98	-18.02	0	-9.14	-8.03				-80.33	-10.73	
08/05/98	-18.72	-0.38	-6.98	-246.17	-19.21	0	-10.37	-7.04				-80.32	-11.63	
08/12/98	-18.94	-0.71	-7.22	-245.69	-19.85	0	-11.37	-7.81	-235.72	-319.7	-231.61	-80.33	-11.98	-352.33
08/20/98	-19.04	-1.08	-7.61	-249.98	-20.31	0	-11.83	-8.54				-80.33	-12.56	
08/24/98	-19.23	-1.24	-7.67	-251.63	-20.59	0	-12.47	-8.91				-80.33	-12.54	
09/03/98	-19.62	-1.32	-7.98	-243.61	-19.43	0	-16.41	-9.96				-80.35	-12.76	
09/10/98	-19.77	-1.36	-7.84	-243.17	-17.66	0	-16.62	-10.33				-80.36	-12.71	
09/16/98	-19.98	-1.44	-7.95	-242.87	-17.55	0	-17.08	-10.56				-80.31	-12.91	-351.54
09/21/98	-20.11	-1.51	-8.08	-242.56	-20.21	0	-17.36	-11.03				-80.31	-13.17	
09/28/98	-20.44	-1.67	-8.08	-242.41	-20.63	0	-17.68	-11.45				-80.33	-13.42	
10/07/98	-20.67	-1.87	-7.71	-242.22	-16.26	0	-13.06	-10.47	-239.17		-230.98	-80.33	-13.81	-351.31
10/15/98	-20.88	-1.93	-7.86	-242.02	-15.92	0	-12.94	-9.92				-80.31	-14.17	
Mean	**-19.34**	**-1.24**	**-5.76**	**-245.97**	**-16.40**	**0.00**	**-14.77**	**-10.33**	**-269.65**	**-318.97**	**-232.66**	**-80.36**	**-11.94**	**-353.96**
Max	**-23.17**	**-2.62**	**-8.08**	**-251.63**	**-20.63**	**0**	**-23.46**	**-18.37**	**-305.63**	**-326.37**	**-235.31**	**-86.22**	**-14.39**	**-355.89**
Min	**-15.98**	**0**	**6.58**	**-241.16**	**-9.69**	**0**	**-6.17**	**-4.84**	**-235.72**	**-312.33**	**-230.98**	**-79.32**	**-8.47**	**-351.31**

APPENDIX D

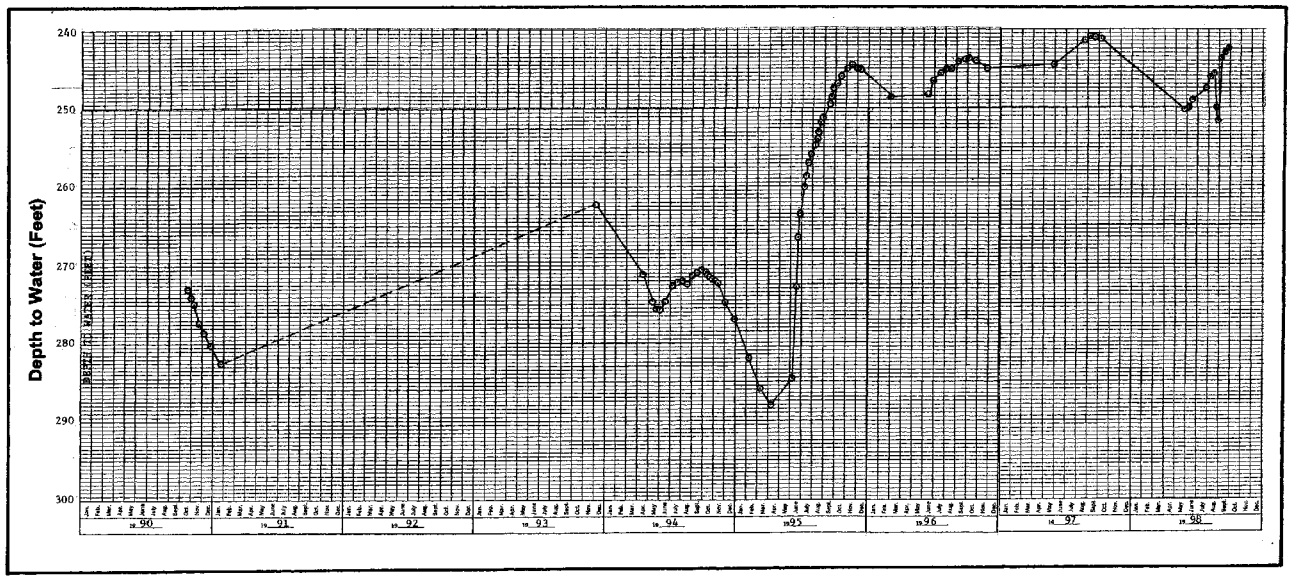
SUPPLEMENTARY WATER-LEVEL HYDROGRAPHS FOR MONITOR WELLS



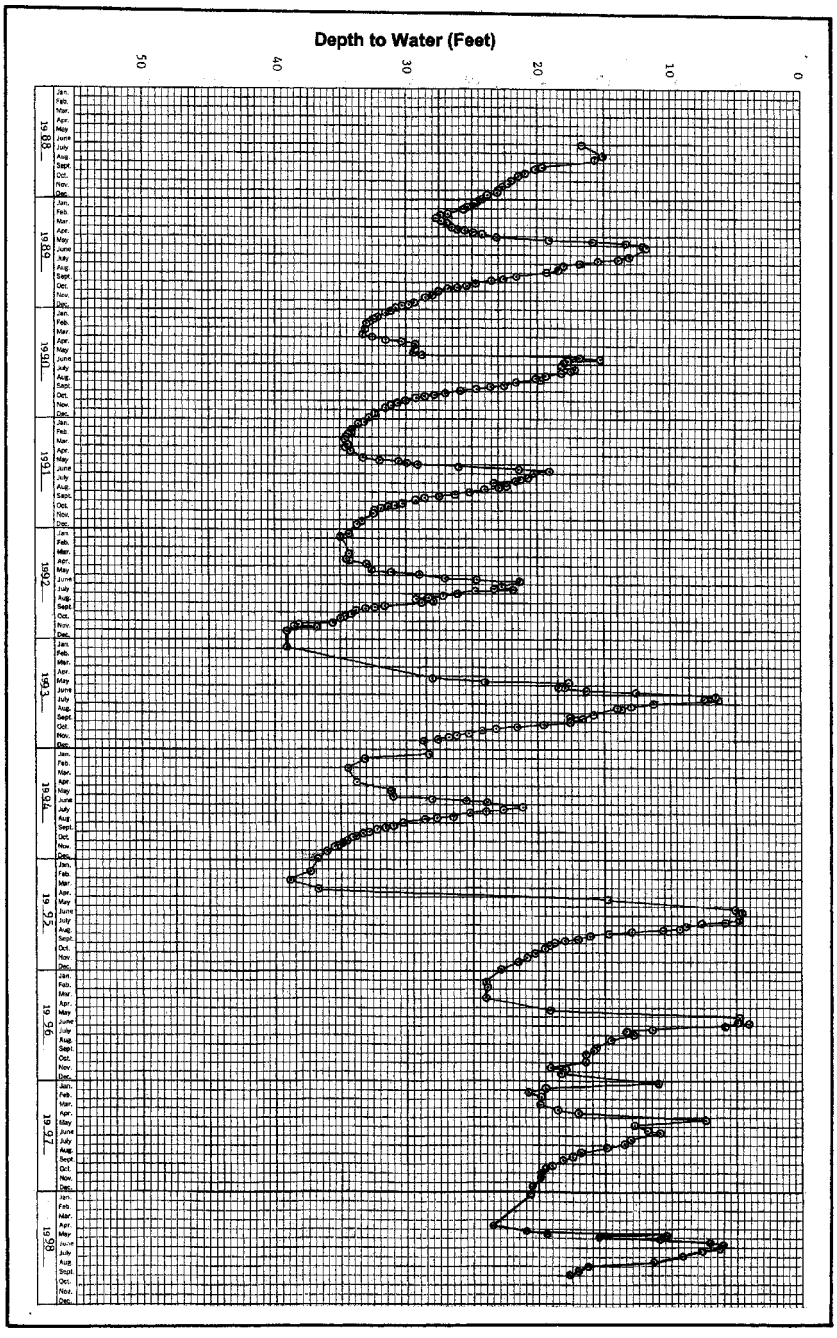
WATER-LEVEL HYDROGRAPH FOR WELL NO. 4M



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

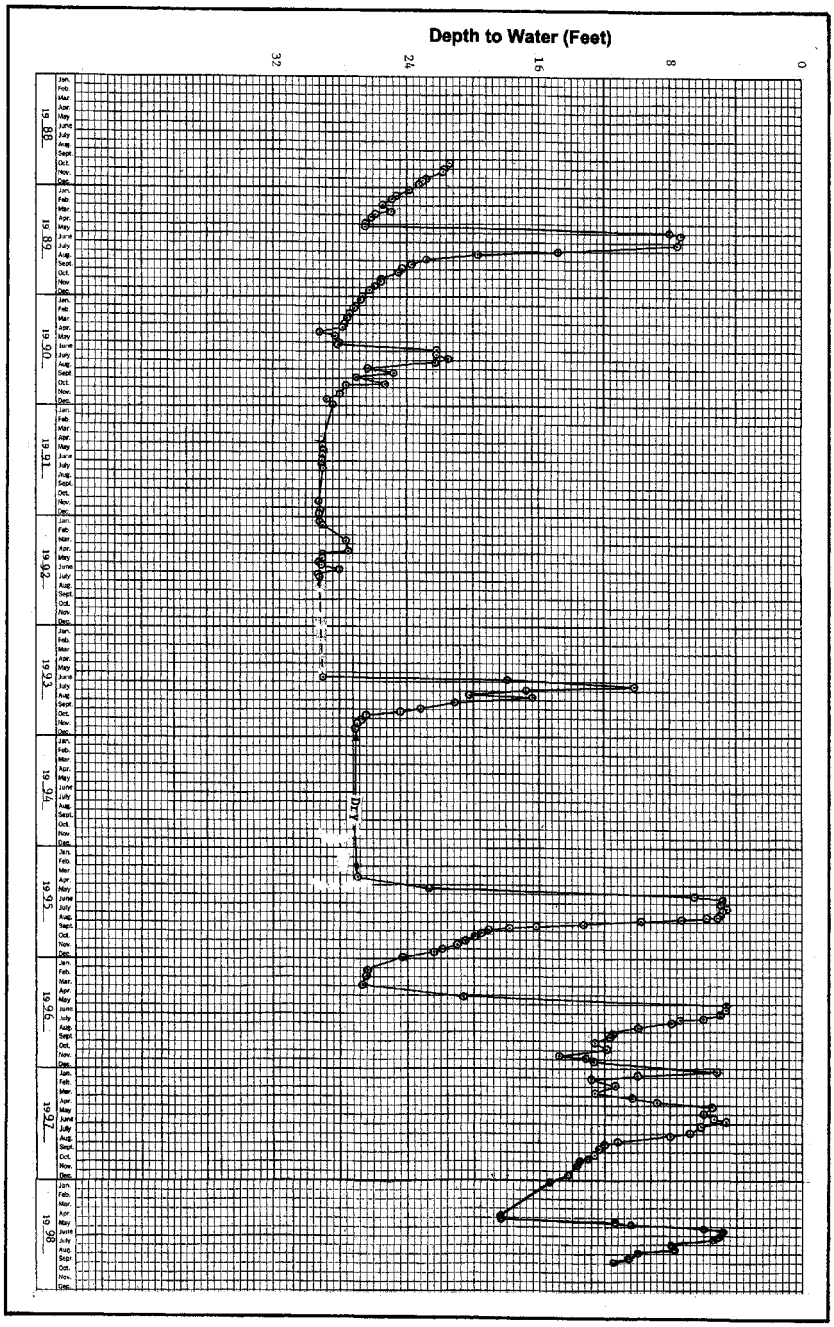


WATER-LEVEL HYDROGRAPH FOR WELL NO. 7

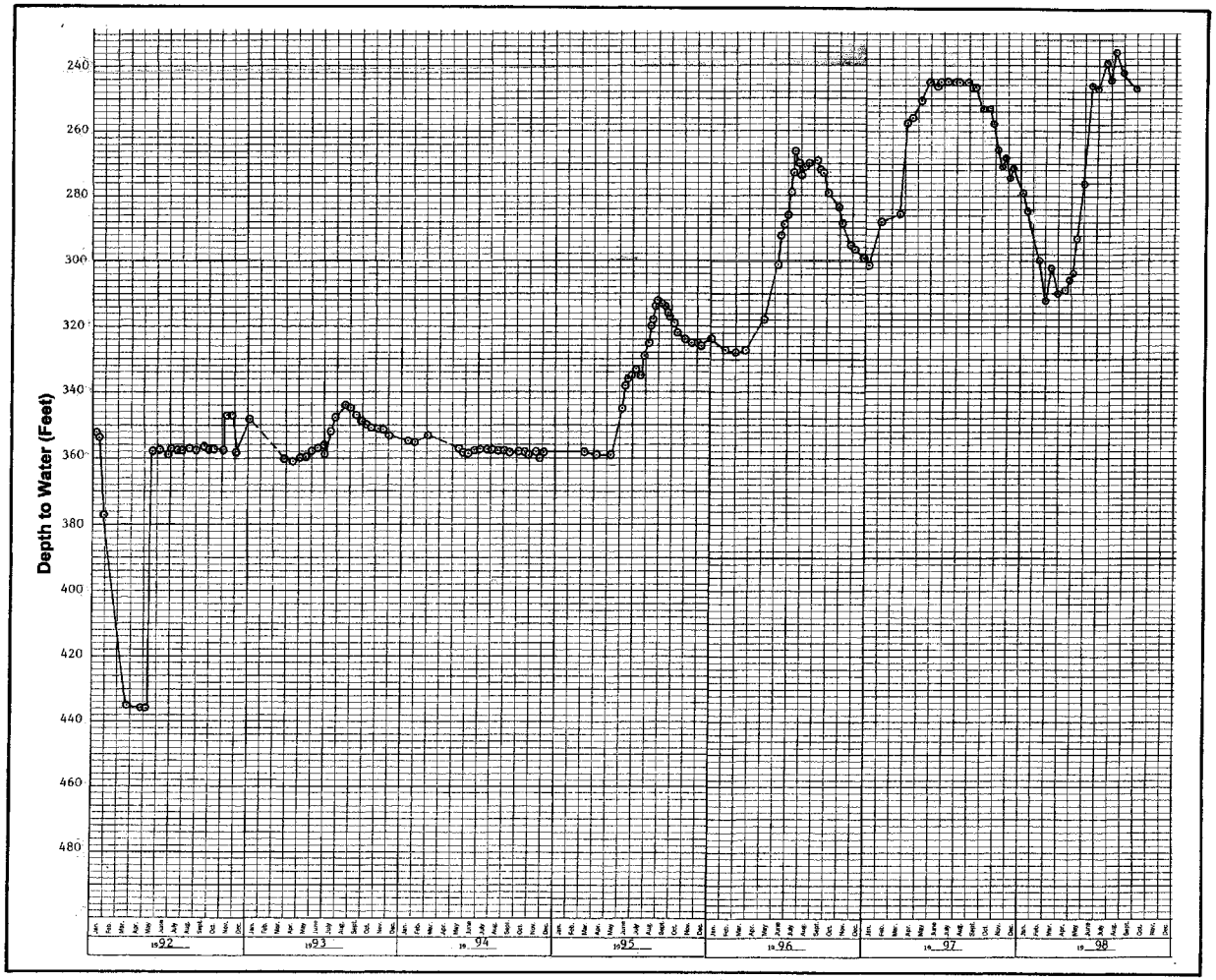


WATER-LEVEL HYDROGRAPH FOR WELL NO. 11M

WATER-LEVEL HYDROGRAPH FOR WELL NO. 11



WATER-LEVEL HYDROGRAPH FOR WELL NO. 12M

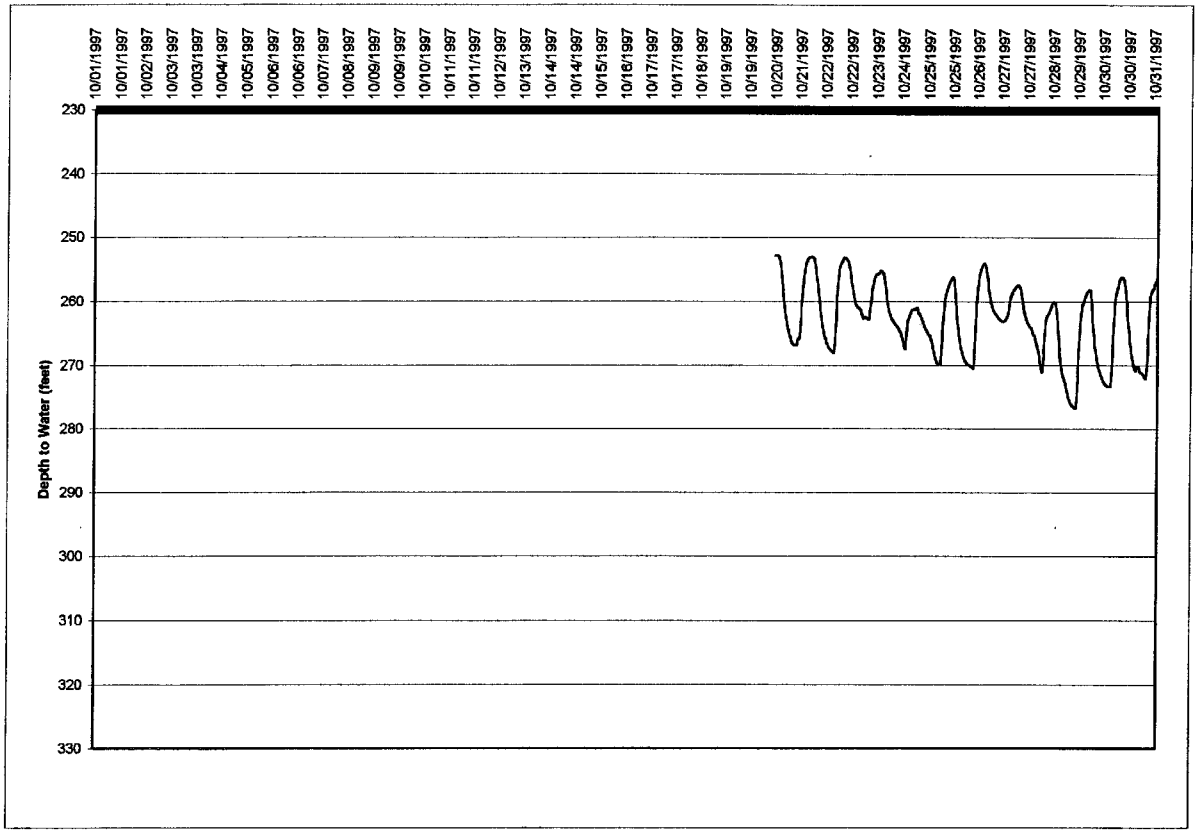


WATER-LEVEL HYDROGRAPH FOR WELL NO. 14M

Water-Level Hydrographs from Transducer Measurements for Well No. 14

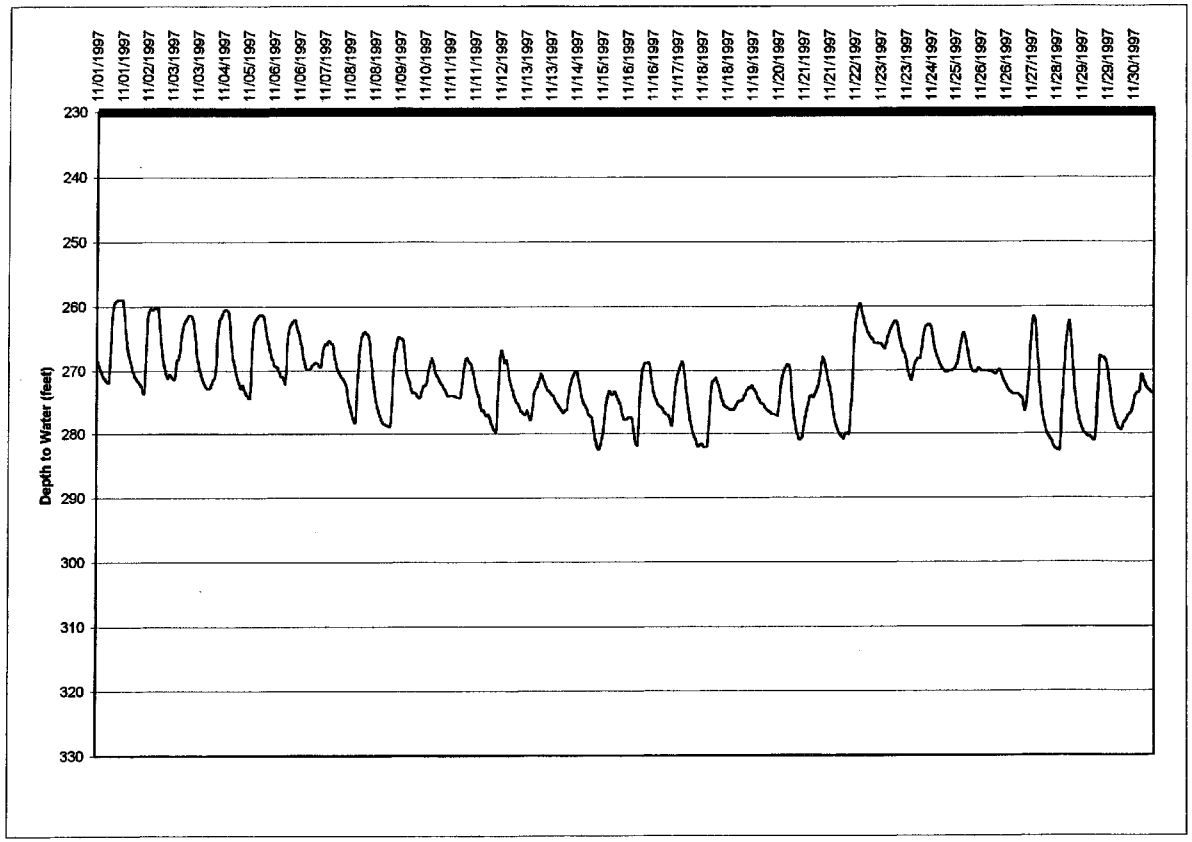
Note: Solid diamond shape symbol and adjoining water-level measurement on graph is an actual measurement from a water level sounder.

Well#14 97.xls



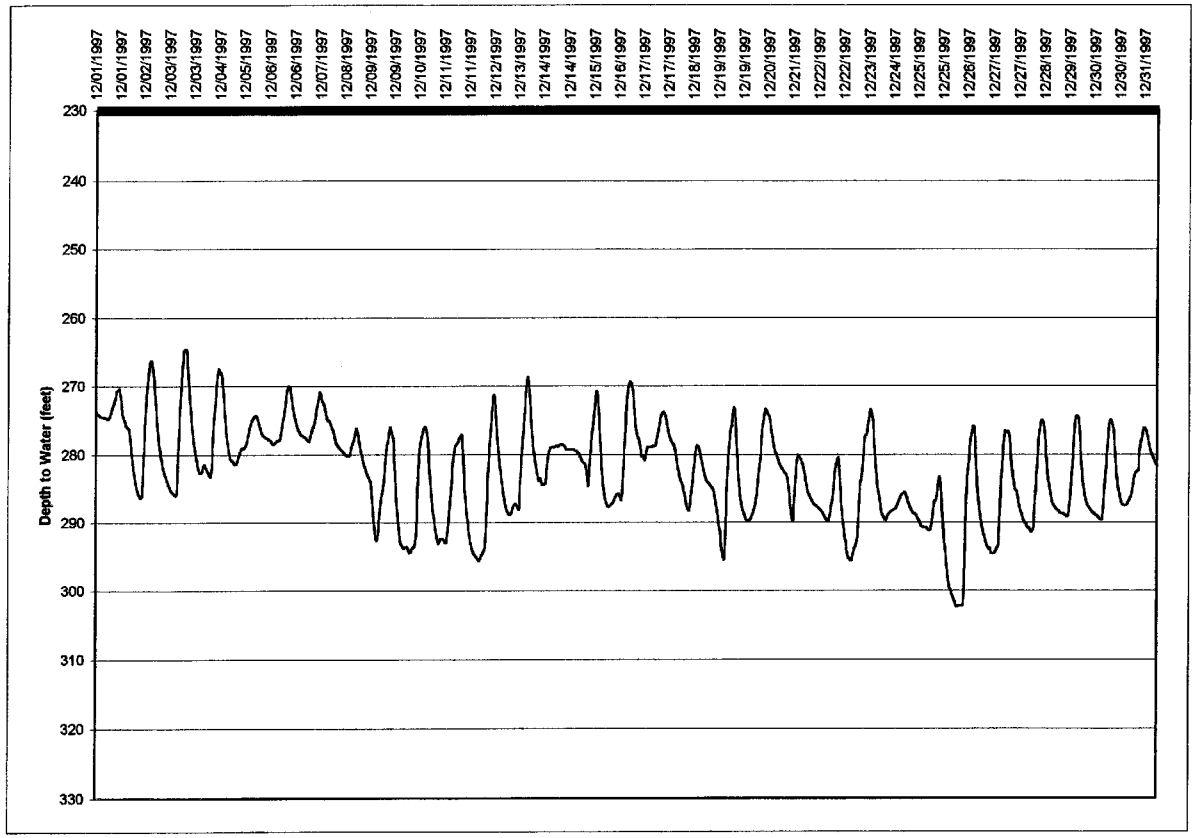
Oct 97 Chart

Well#14 97.xls



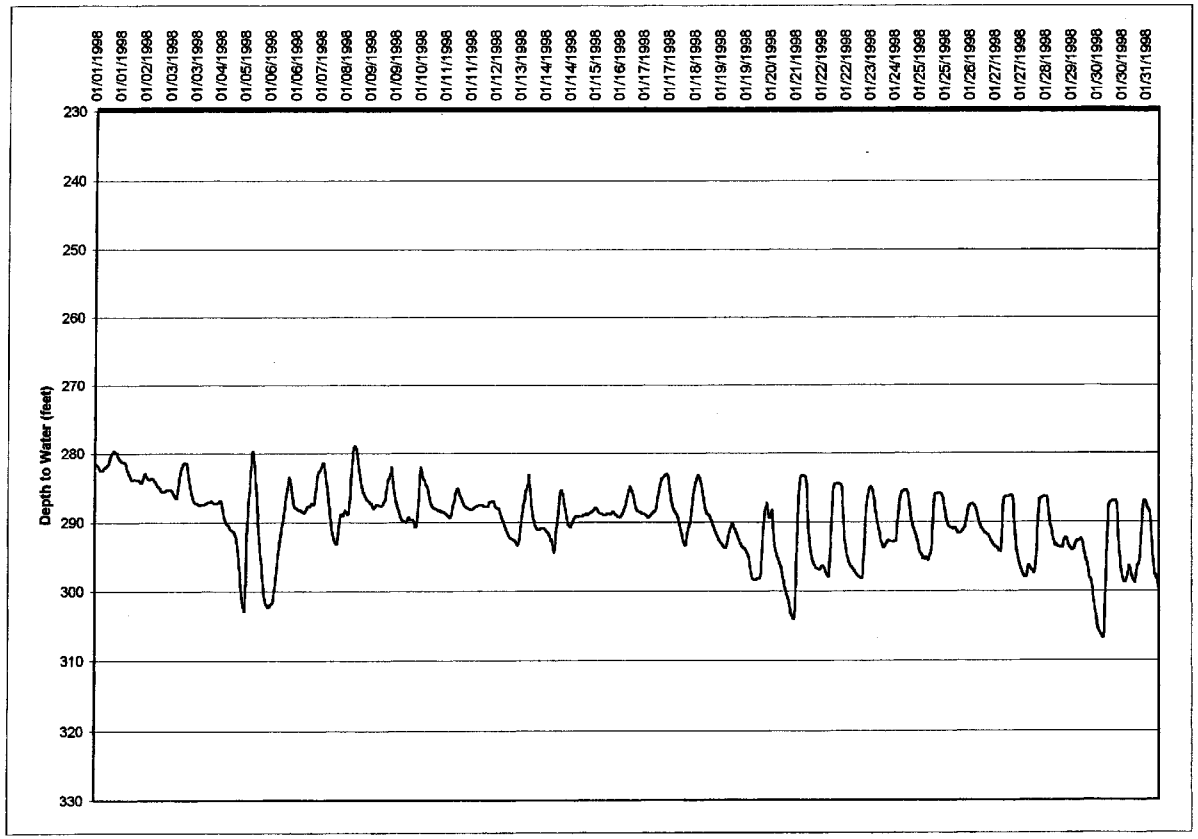
Nov 97 Chart

Well#14 97.xls



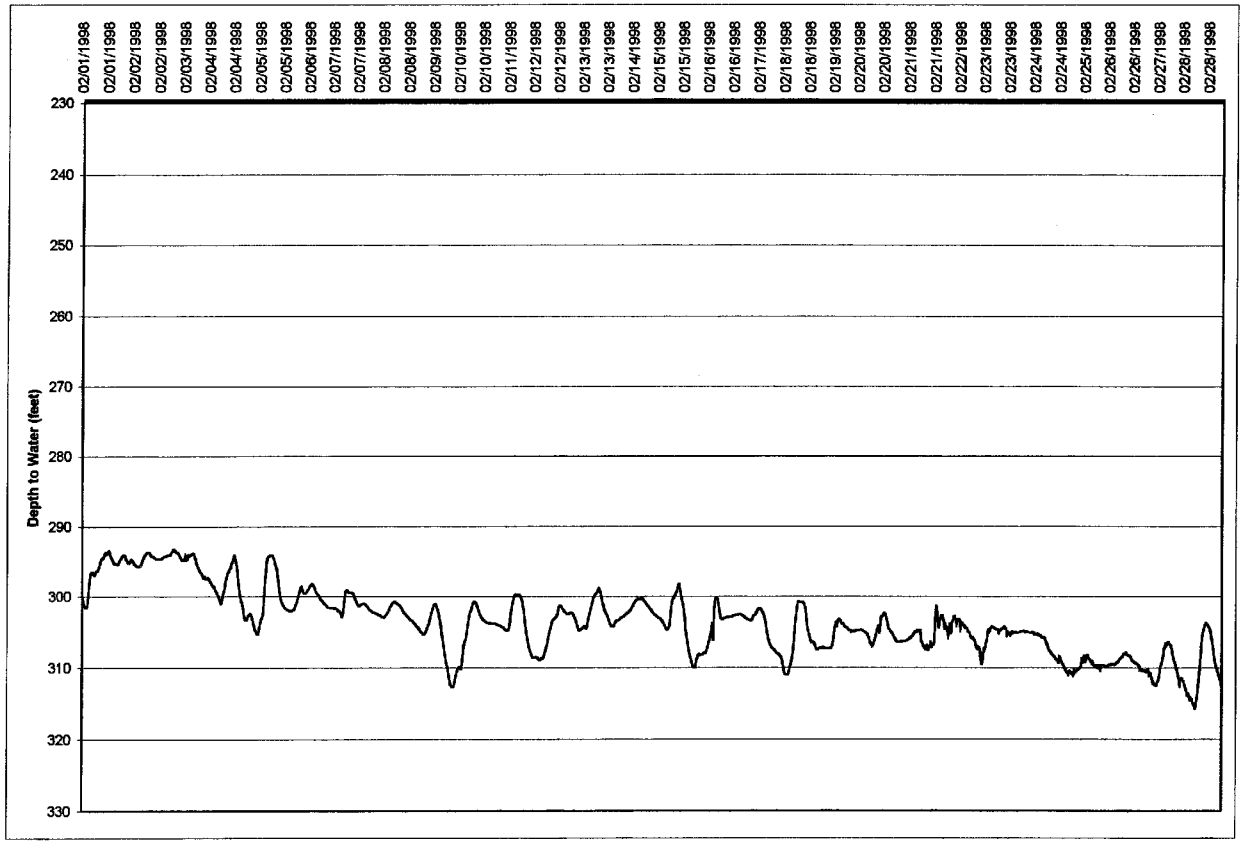
Dec 97 Chart

Well#14 98.xls



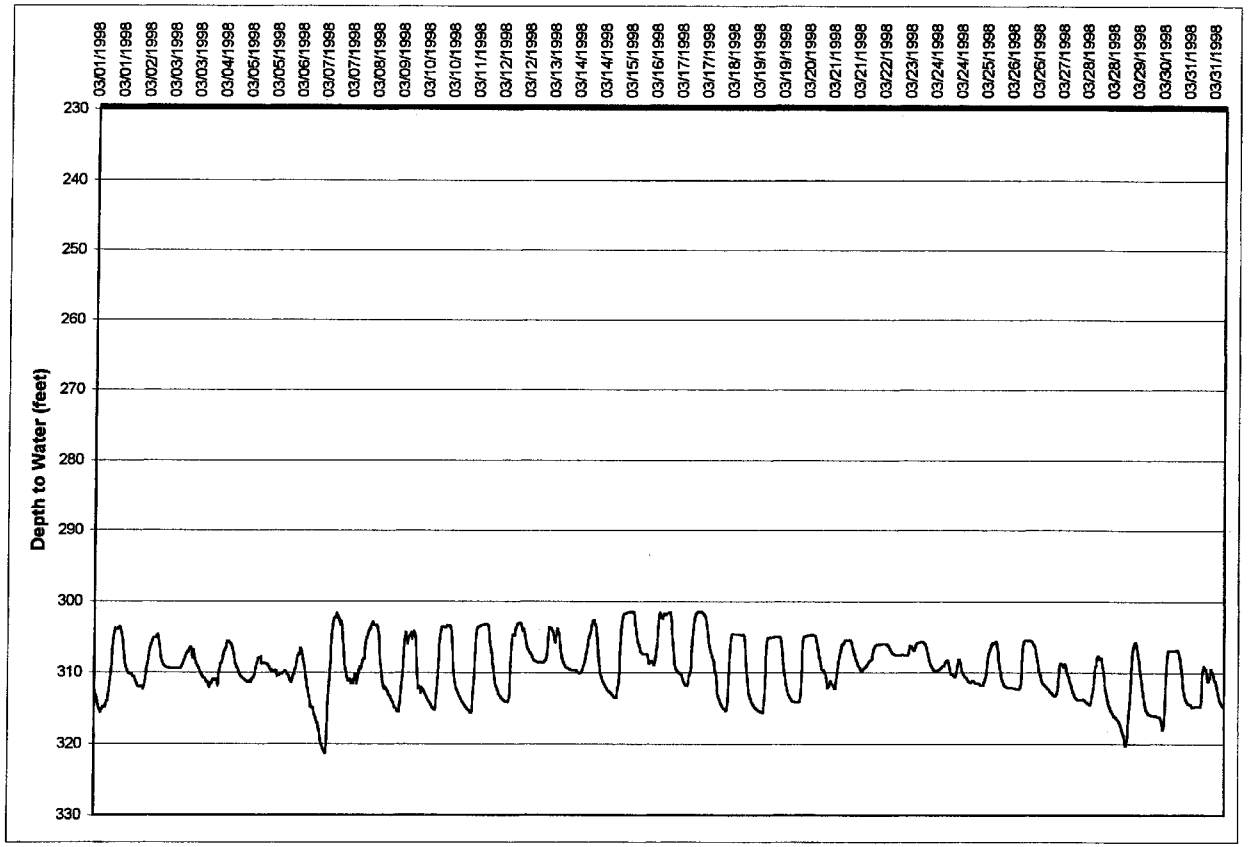
Jan 98 Chart

Well #14



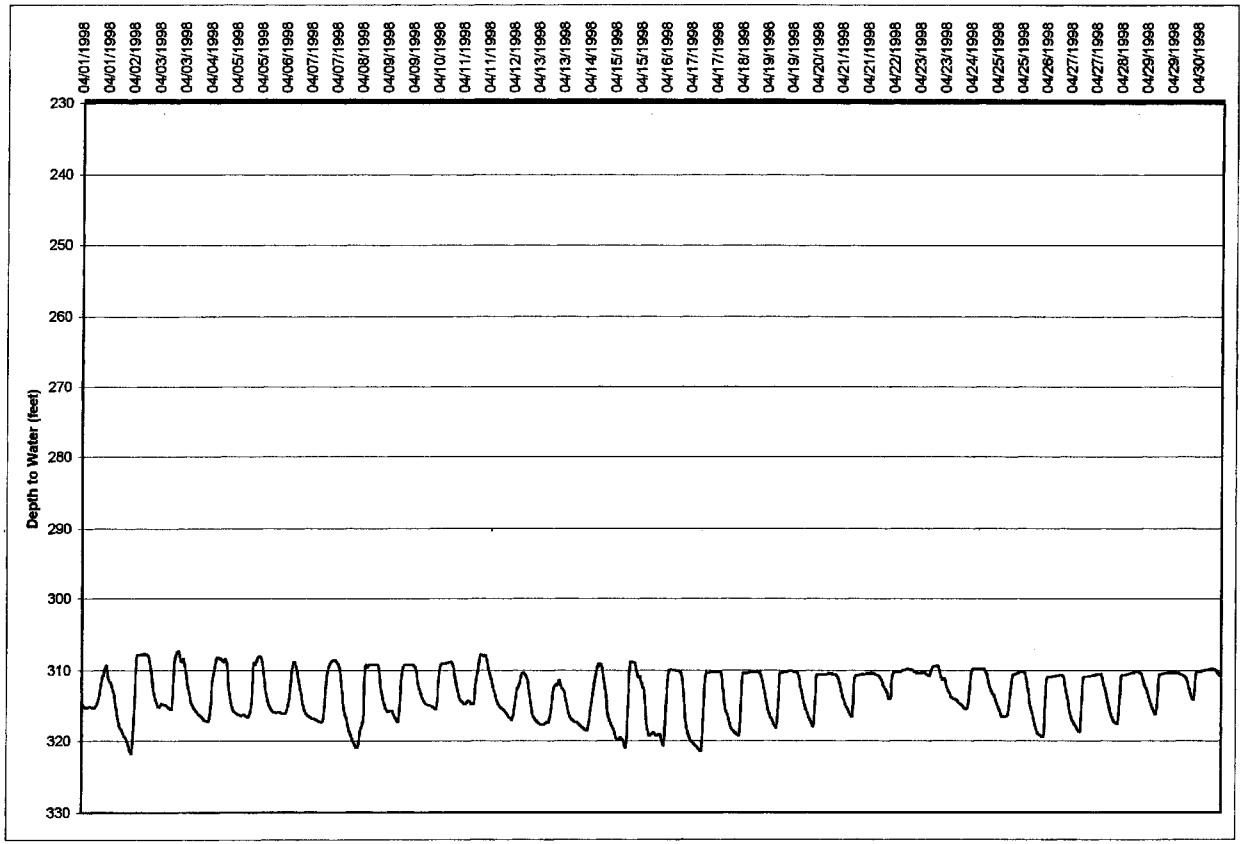
Feb 98 Chart

Well #14



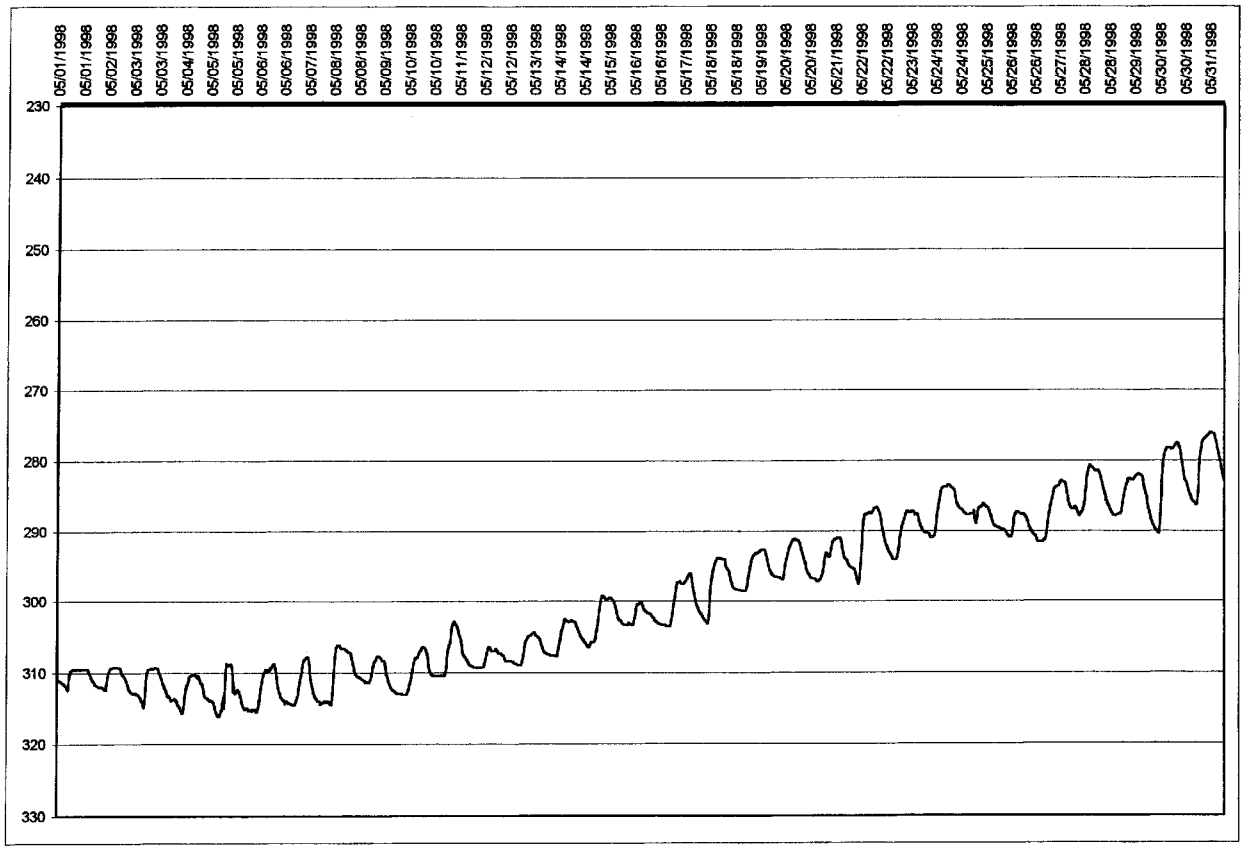
Mar 98 Chart

Well #14



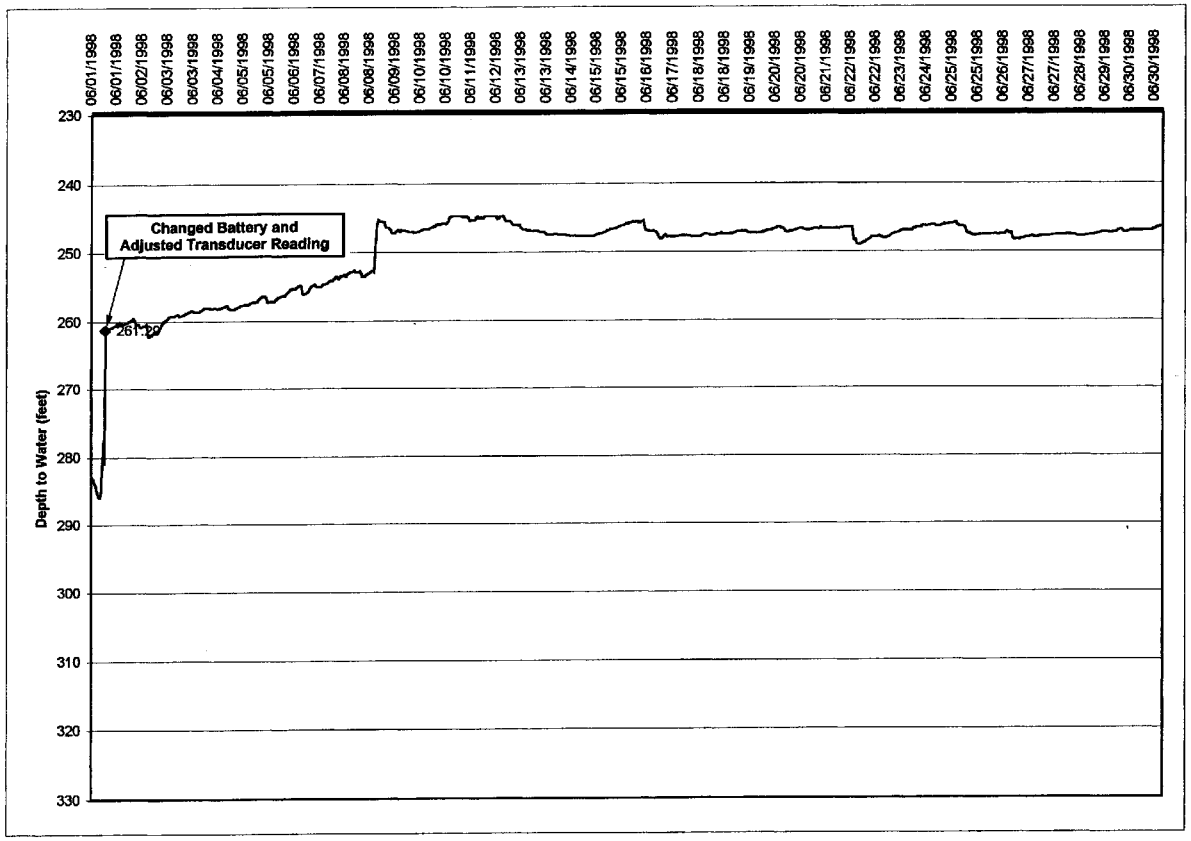
Apr 98 Chart

Well #14



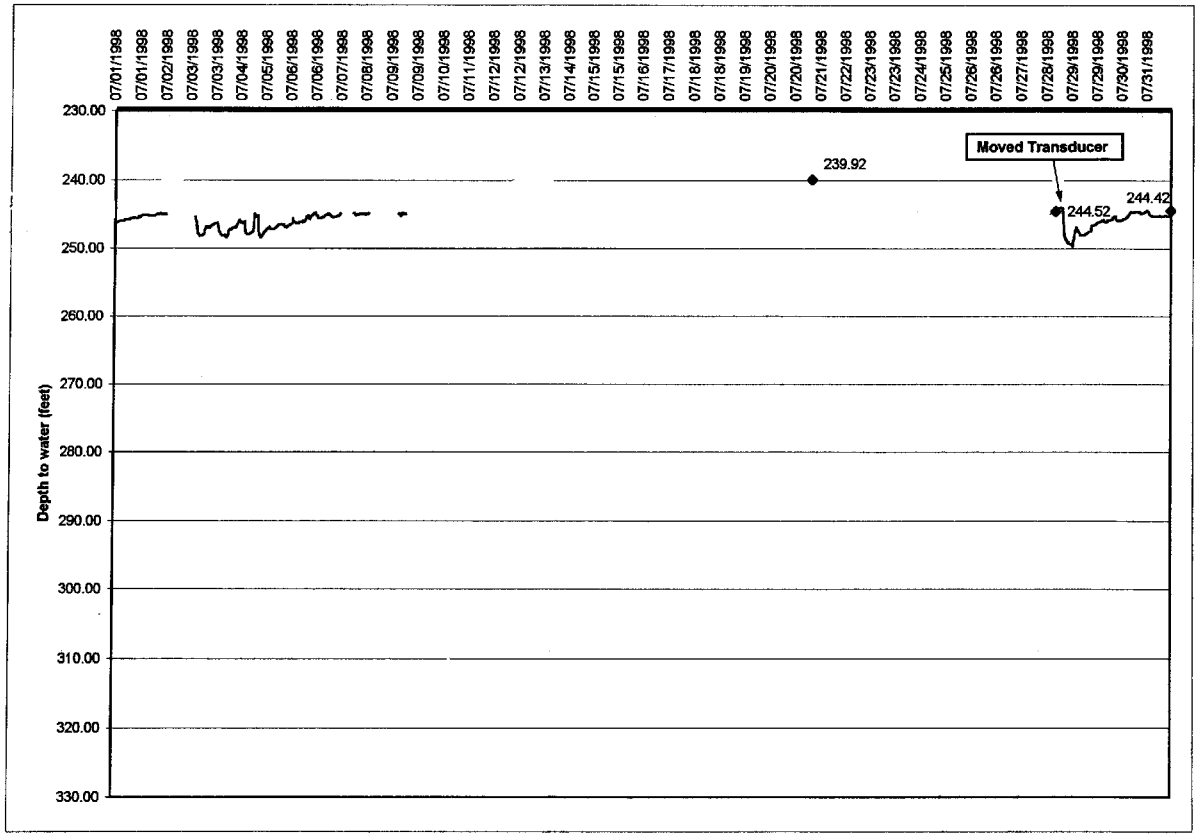
May 98 Chart

Well#14 98.xls



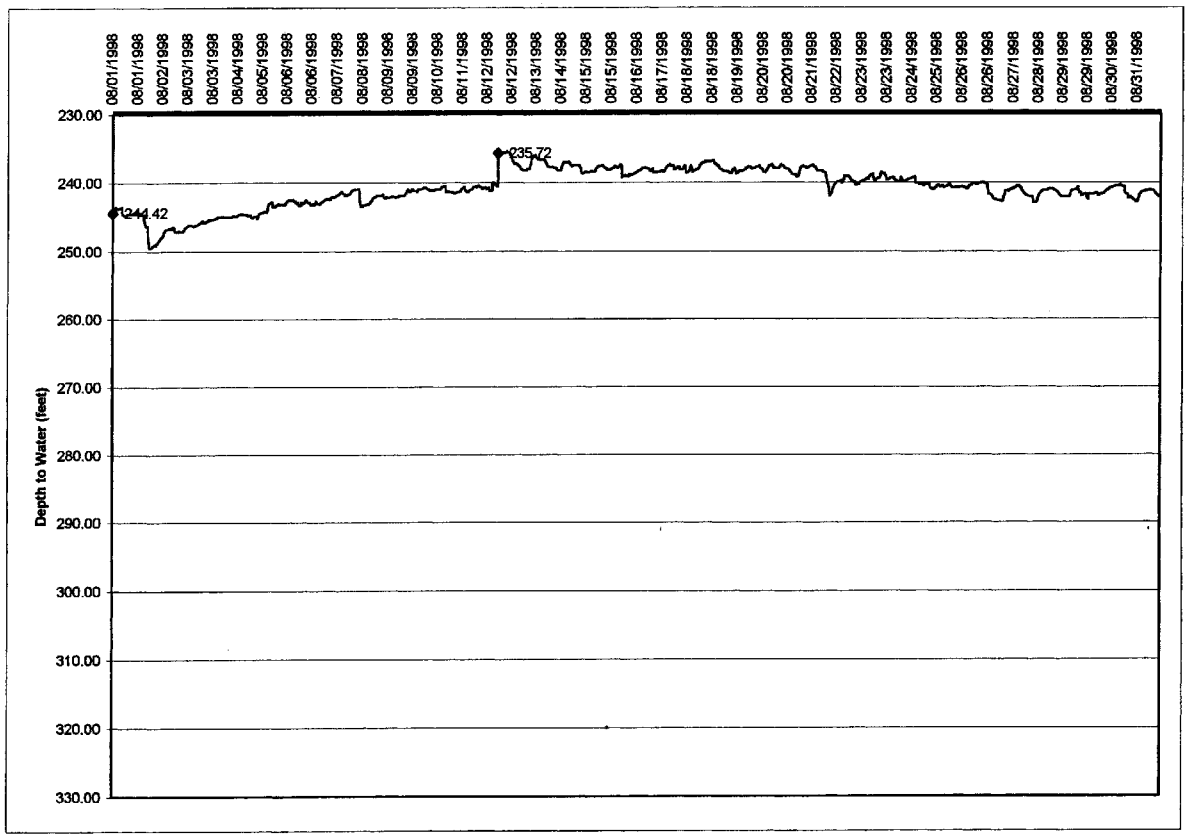
Jun 98 Chart

Well#14 98.xls



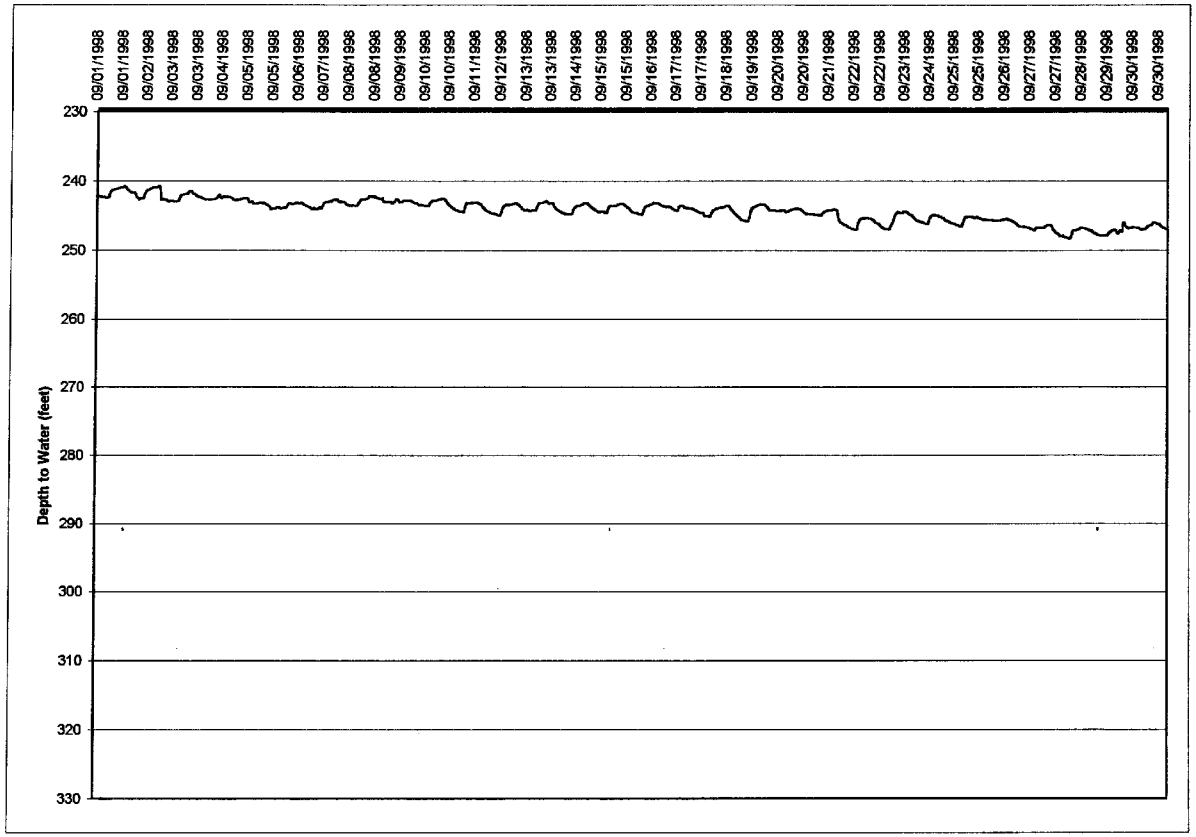
Jul 98 Chart

Well#14 98.xls



Aug 98 Chart

Well#14 98.xls

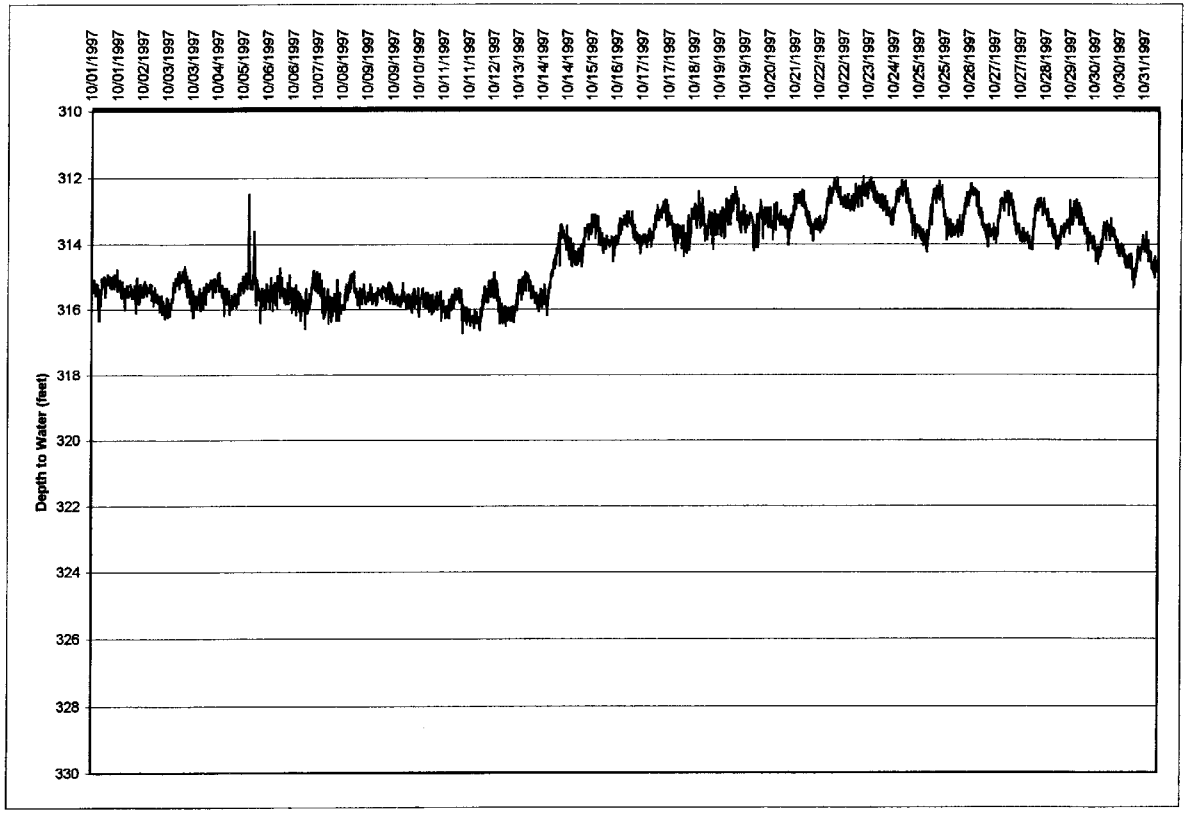


Sep 98 Chart

Water-Level Hydrographs from Transducer Measurements for Well No. 19

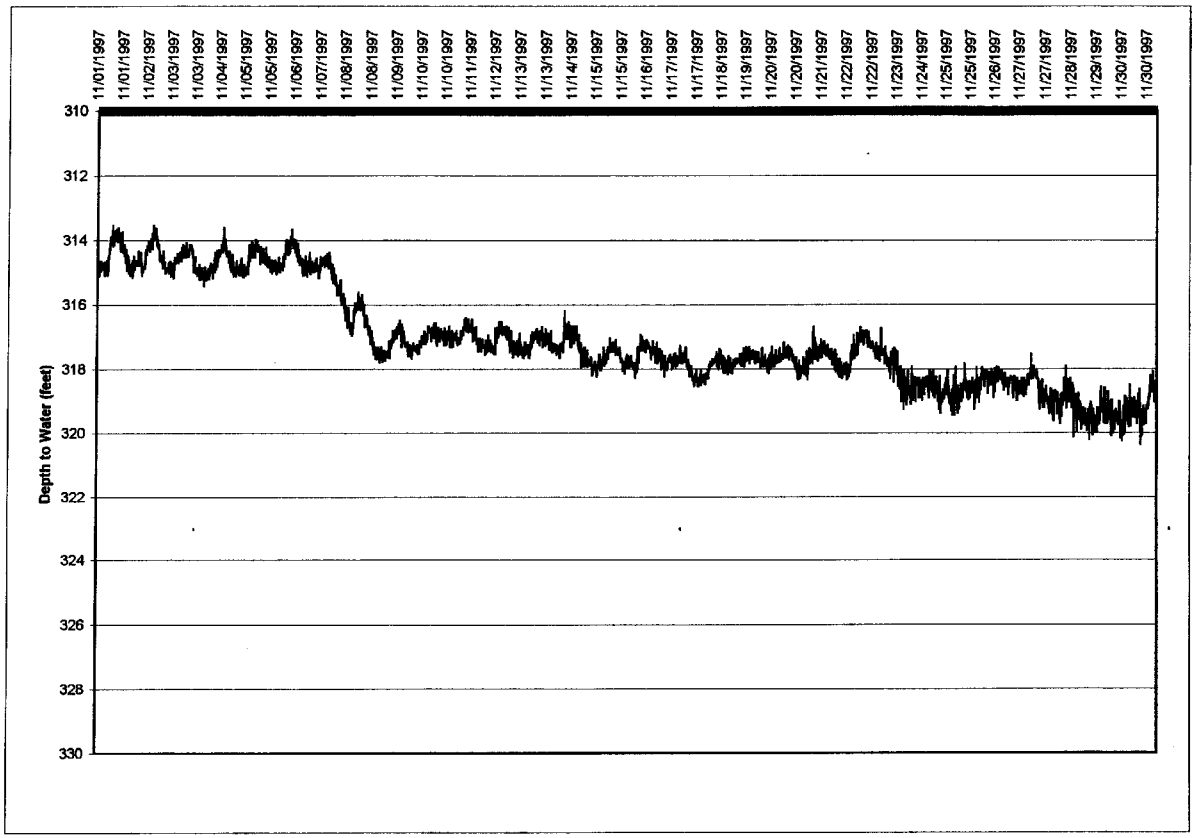
Note: Solid diamond shape symbol and adjoining water-level measurement on graph is an actual measurement from a water level sounder.

Well#19 97.xls



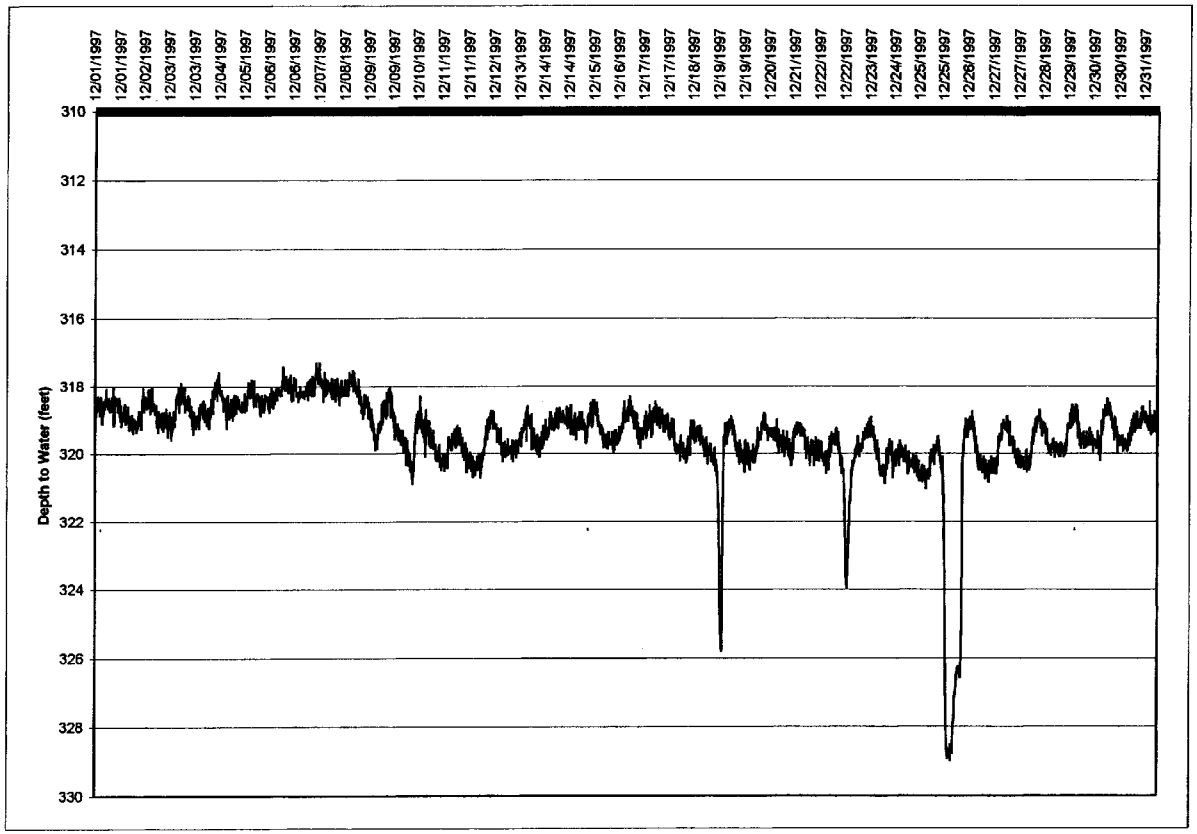
Oct 97 Chart

Well#19 97.xls



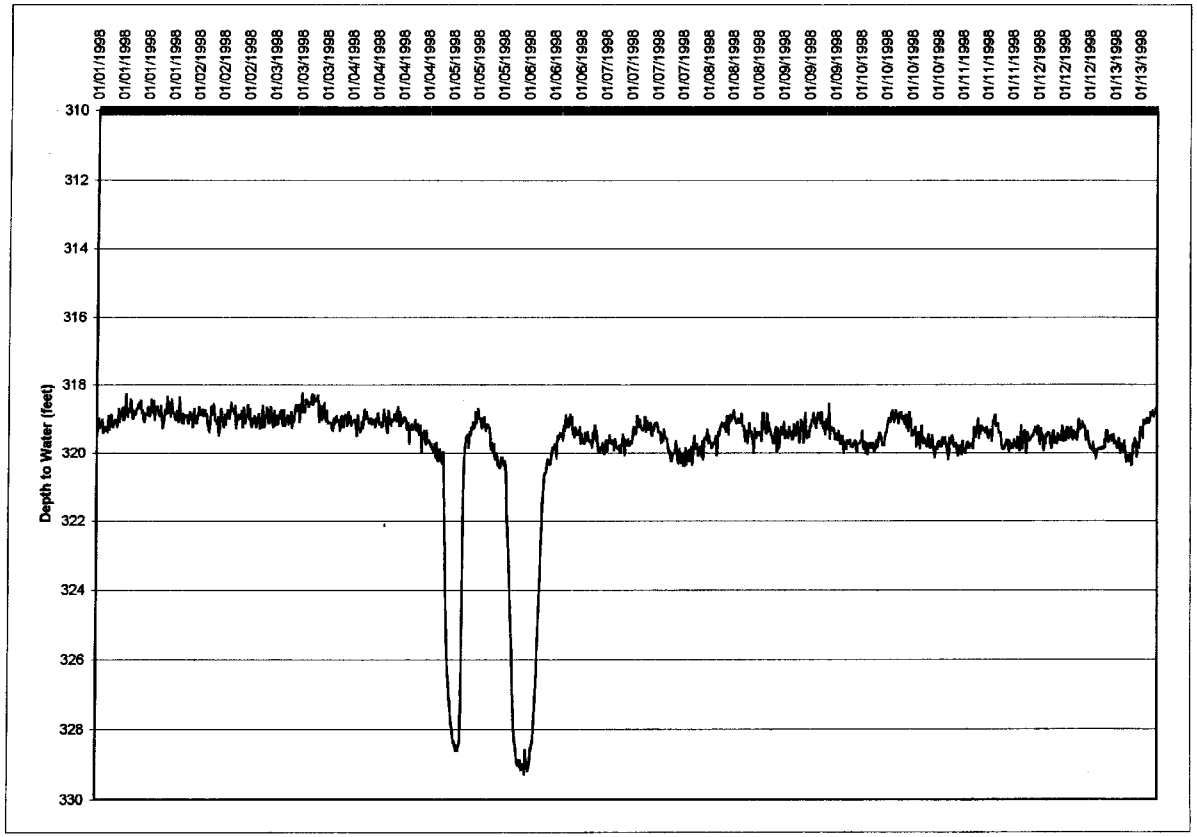
Nov 97 Chart

Well#19 97.xls



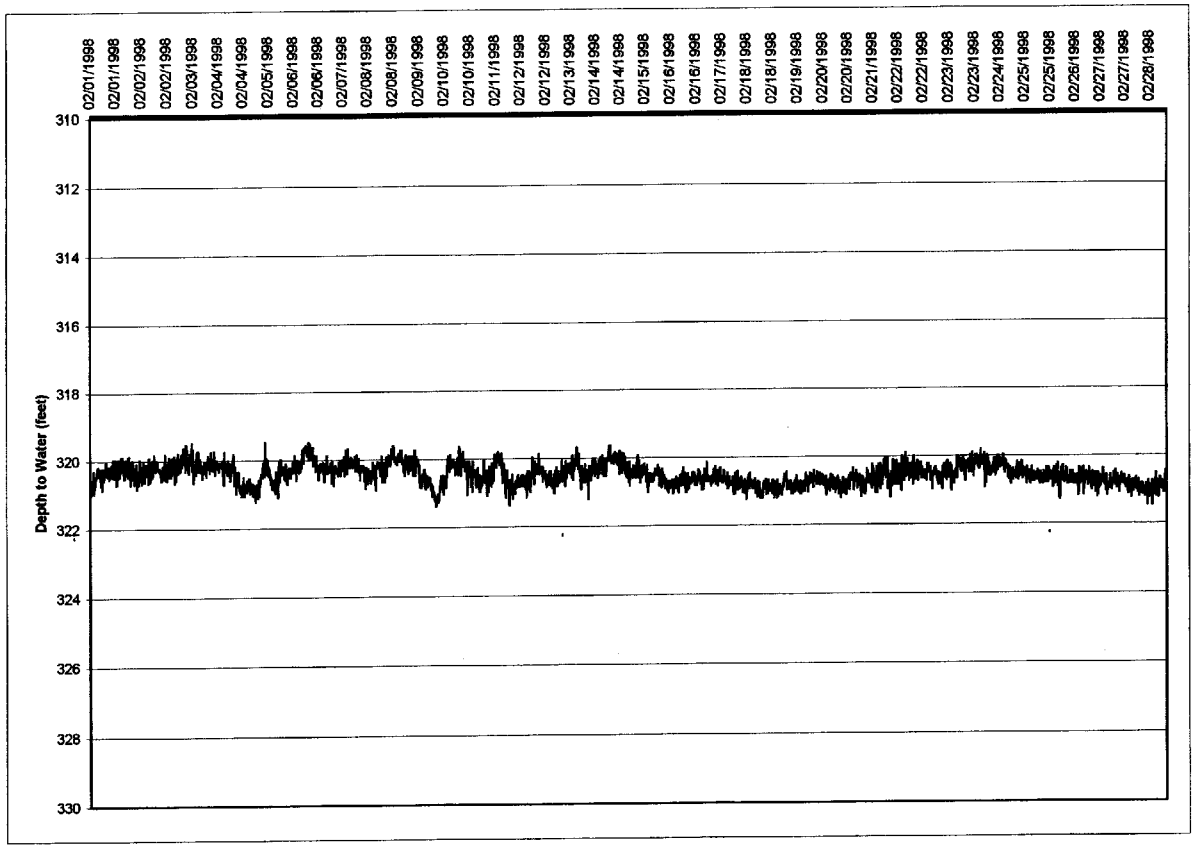
Dec 97 Chart

Well#19 98.xls



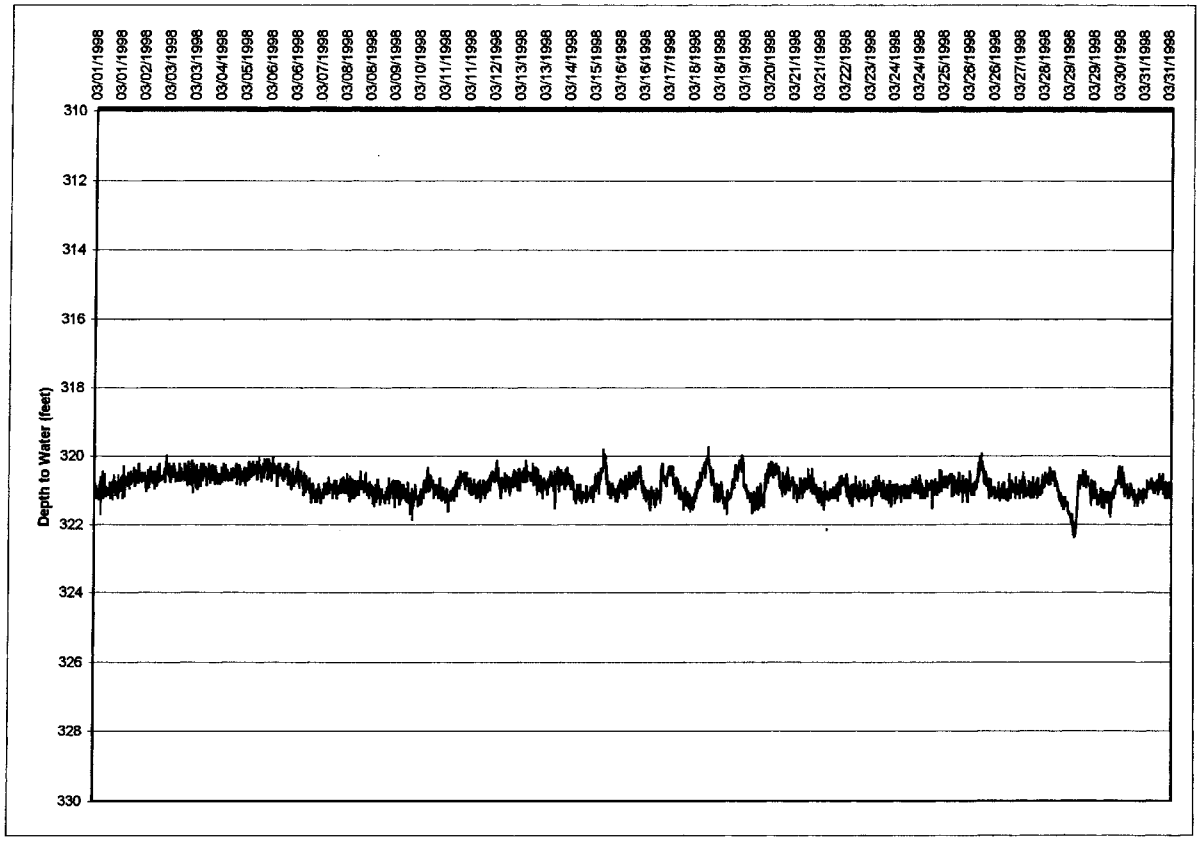
Jan 98 Chart

Well#19 98.xls



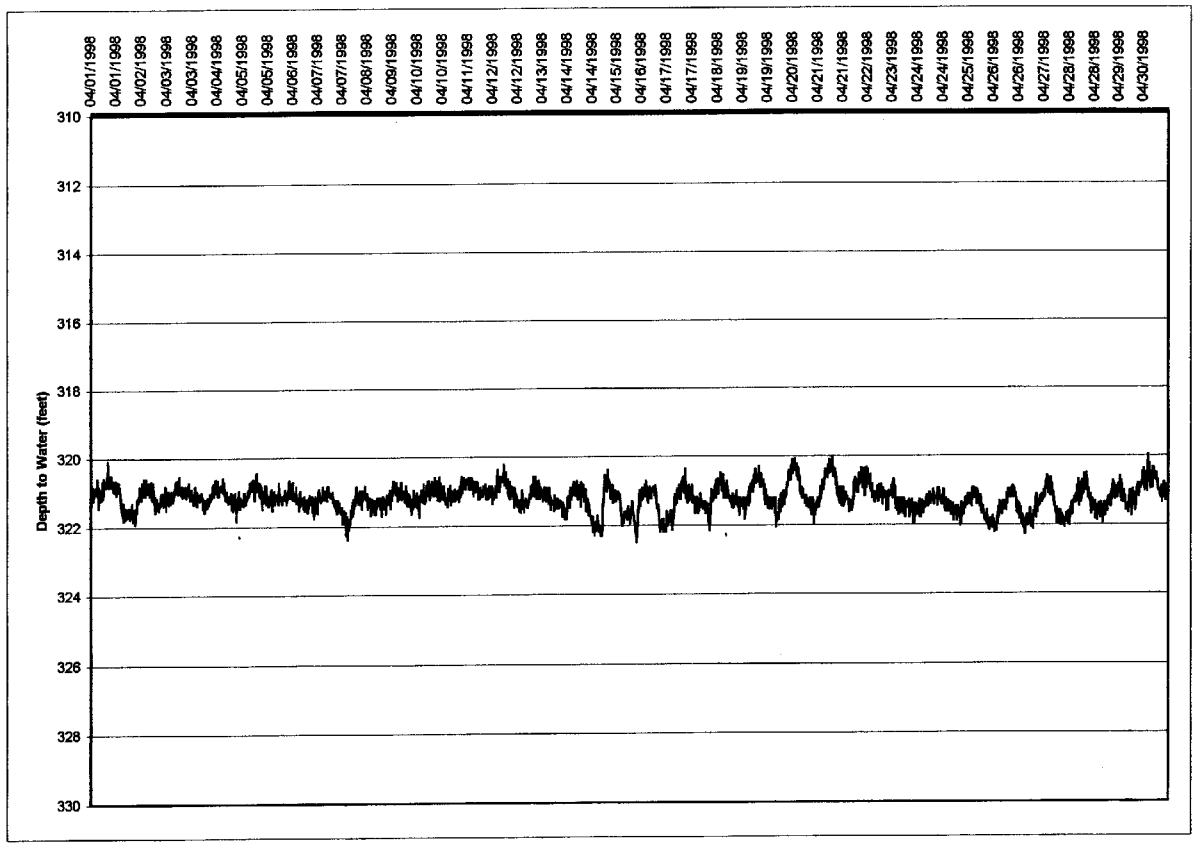
Feb 98 Chart

Well#19 98.xls



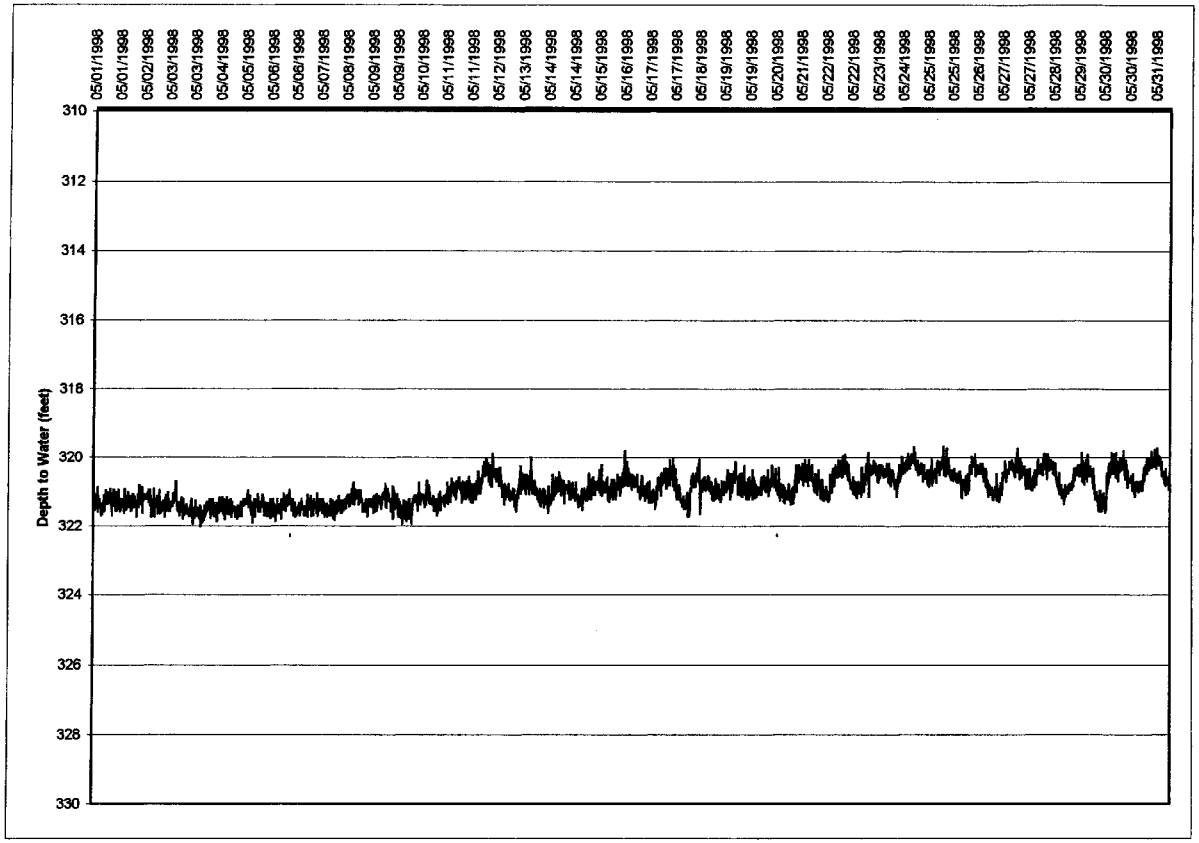
Mar 98 Chart

Well#19 98.xls



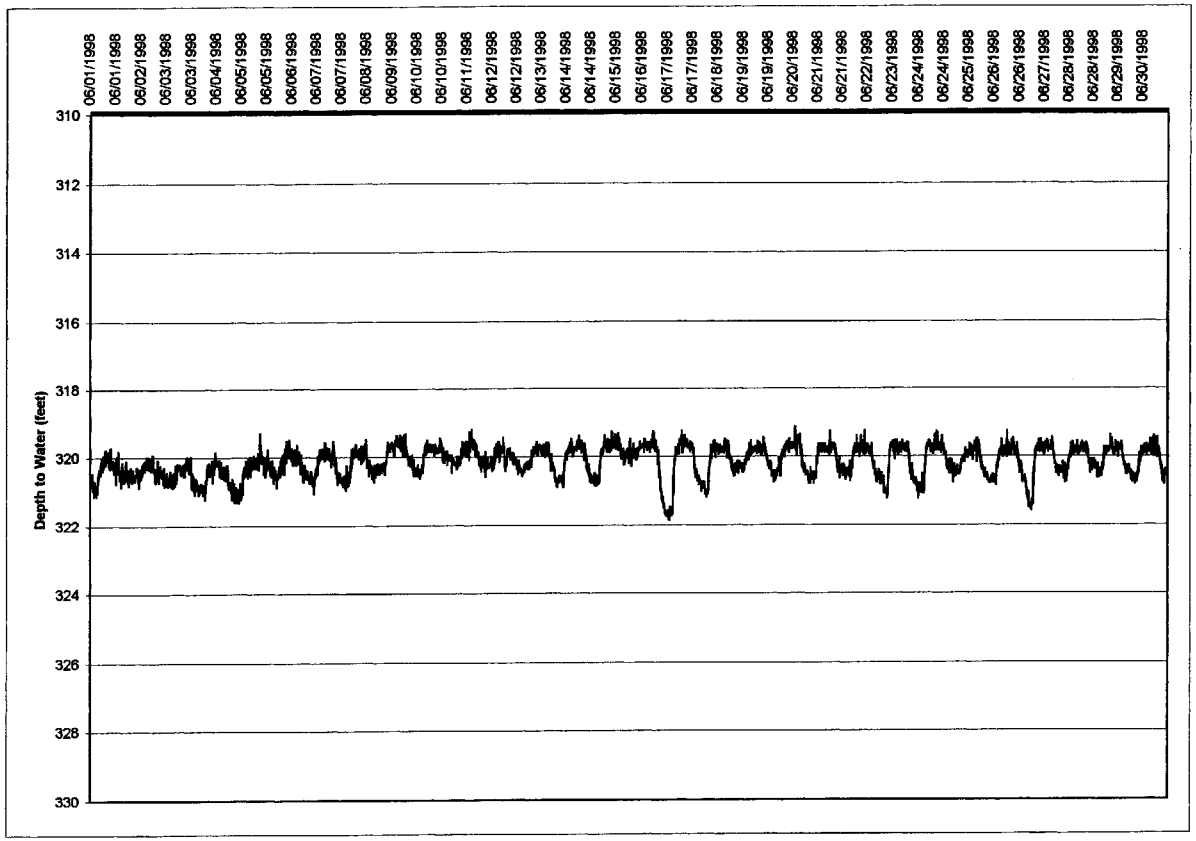
Apr 98 Chart

Well#19 98.xls



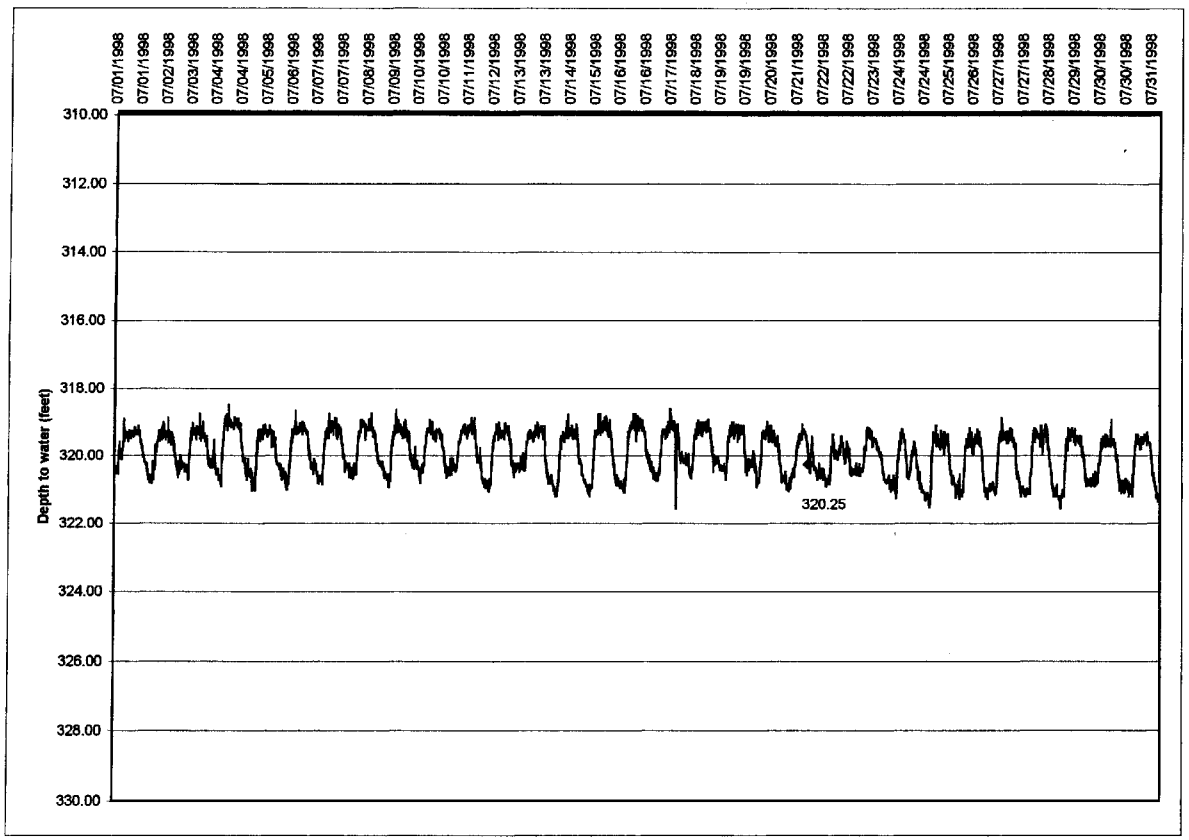
May 98 Chart

Well#19 98.xls



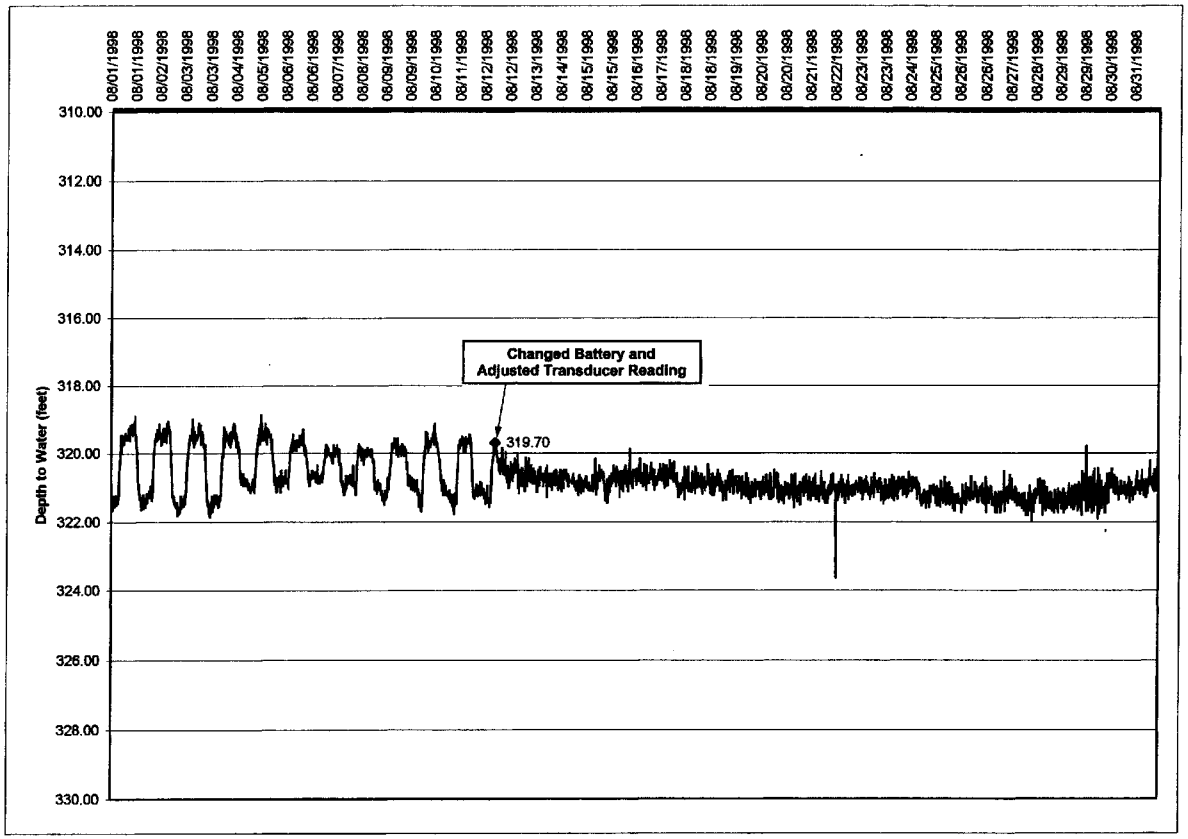
Jun 98 Chart

Well#19 98.xls



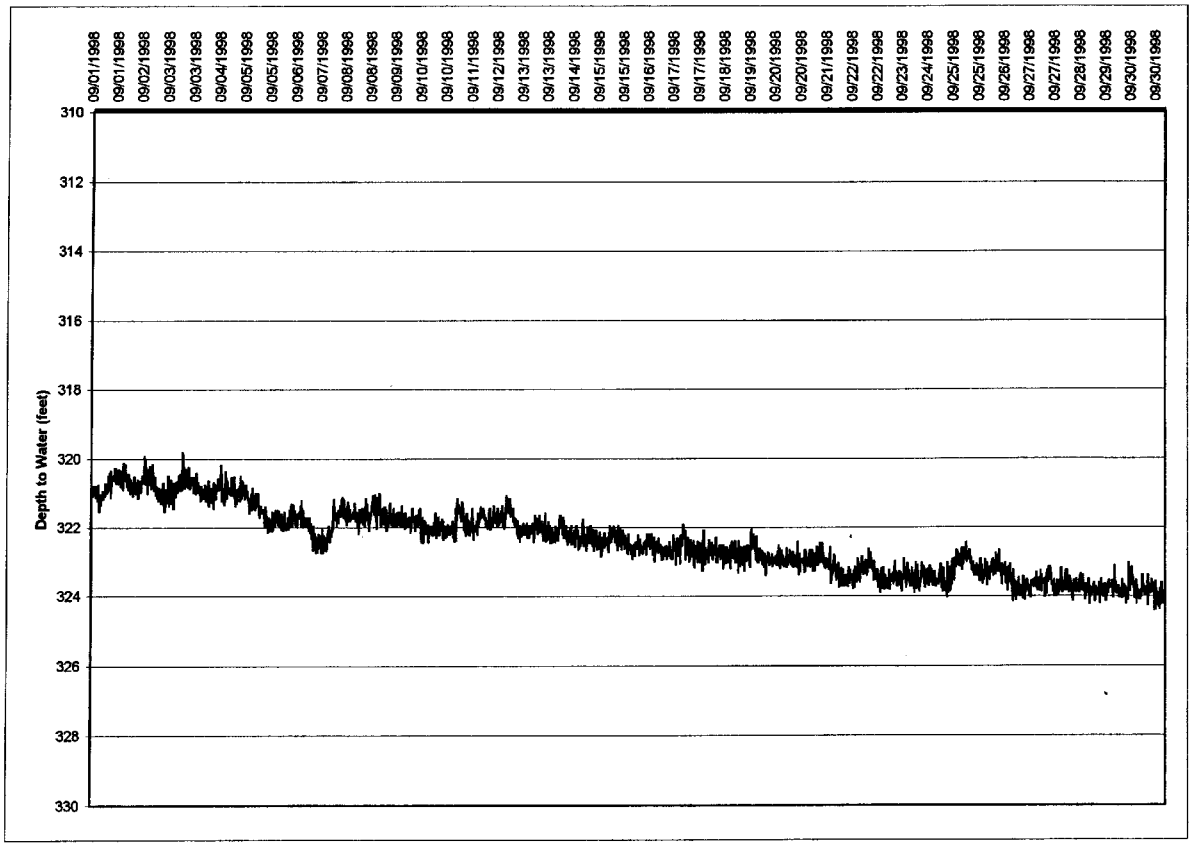
Jul 98 Chart

Well#19 98.xls



Aug 98 Chart

Well#19 98.xls

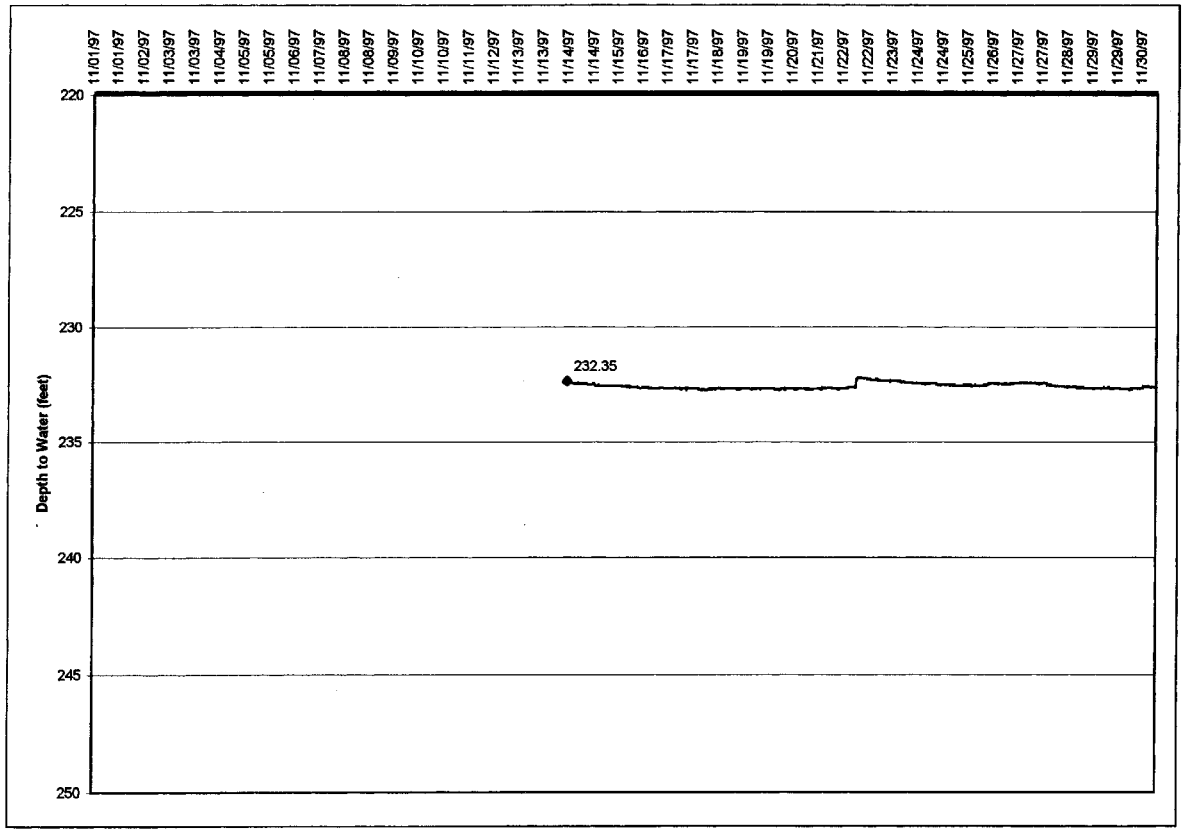


Sep 98 Chart

Water-Level Hydrographs from Transducer Measurements for Well No. 21

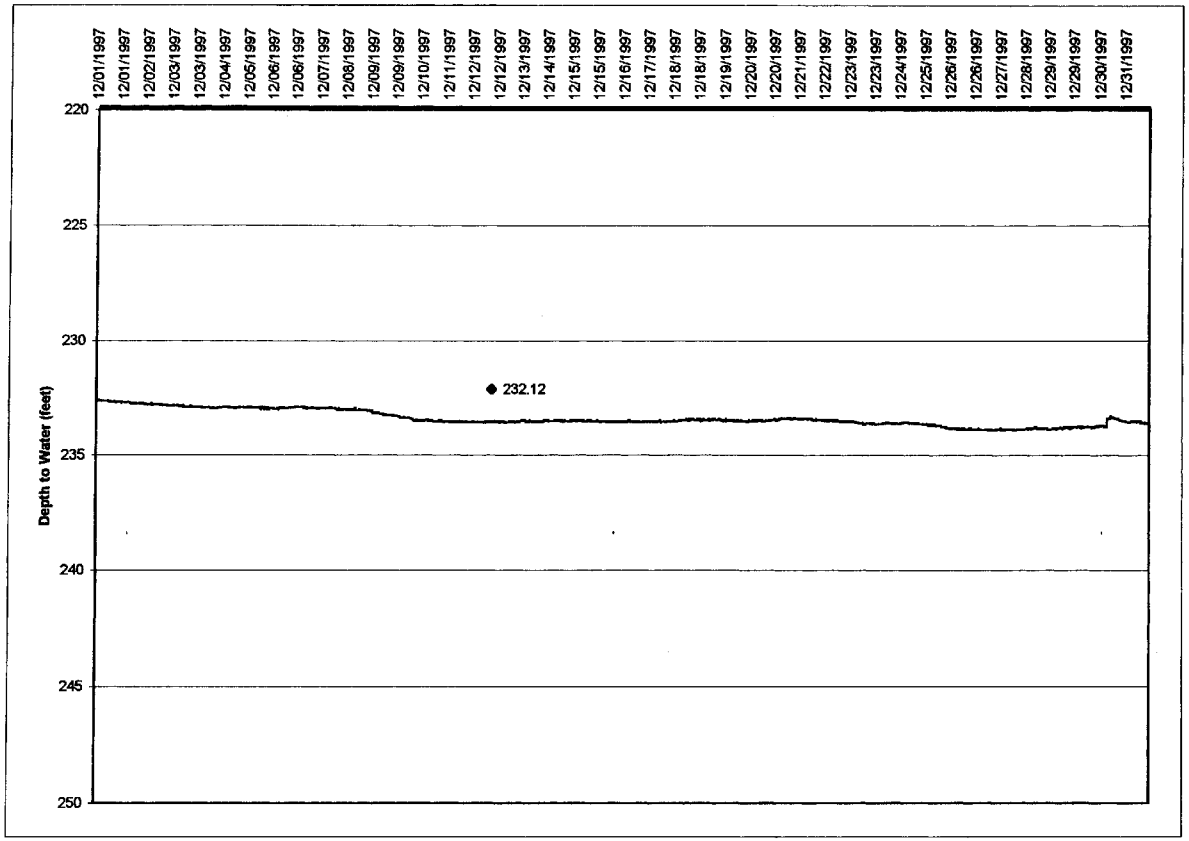
Note: Solid diamond shape symbol and adjoining water-level measurement on graph is an actual measurement from a water level sounder.

Well#21 97.xls



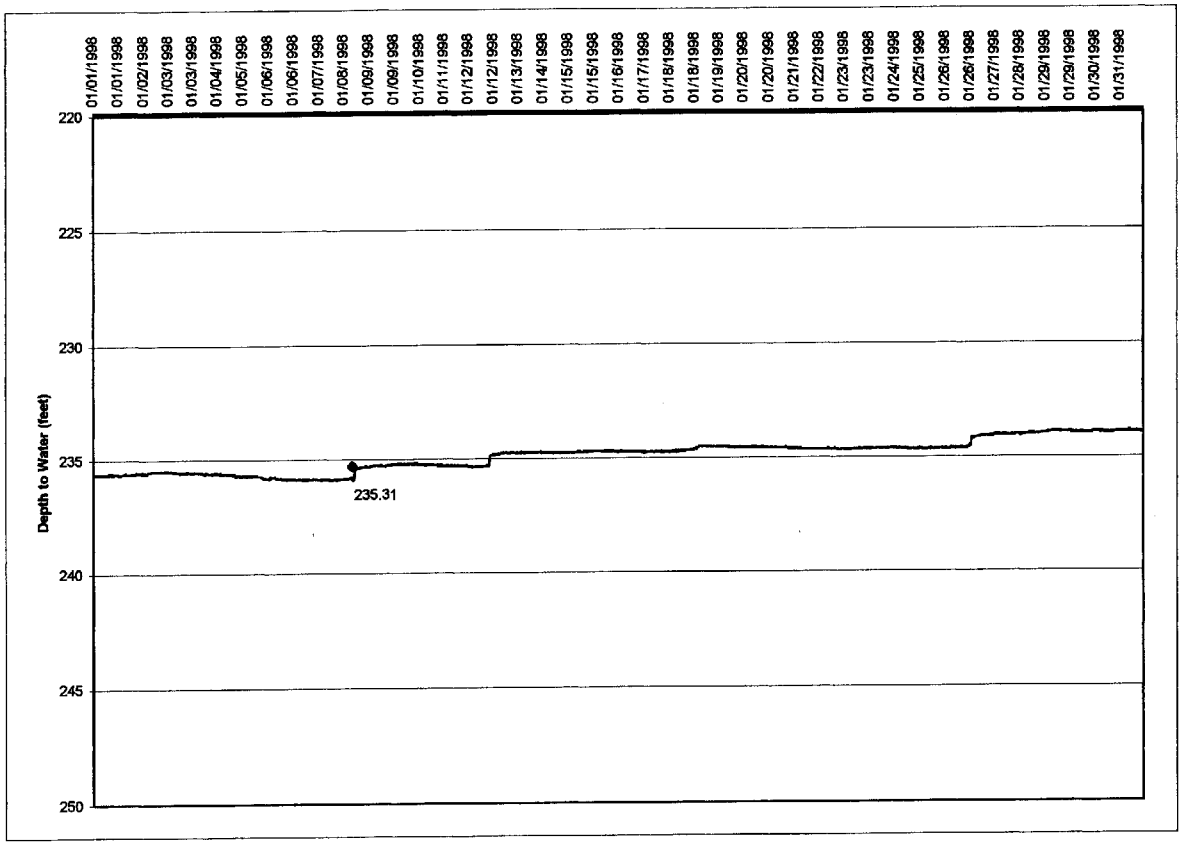
Nov 97 Chart

Well#21 97.xls



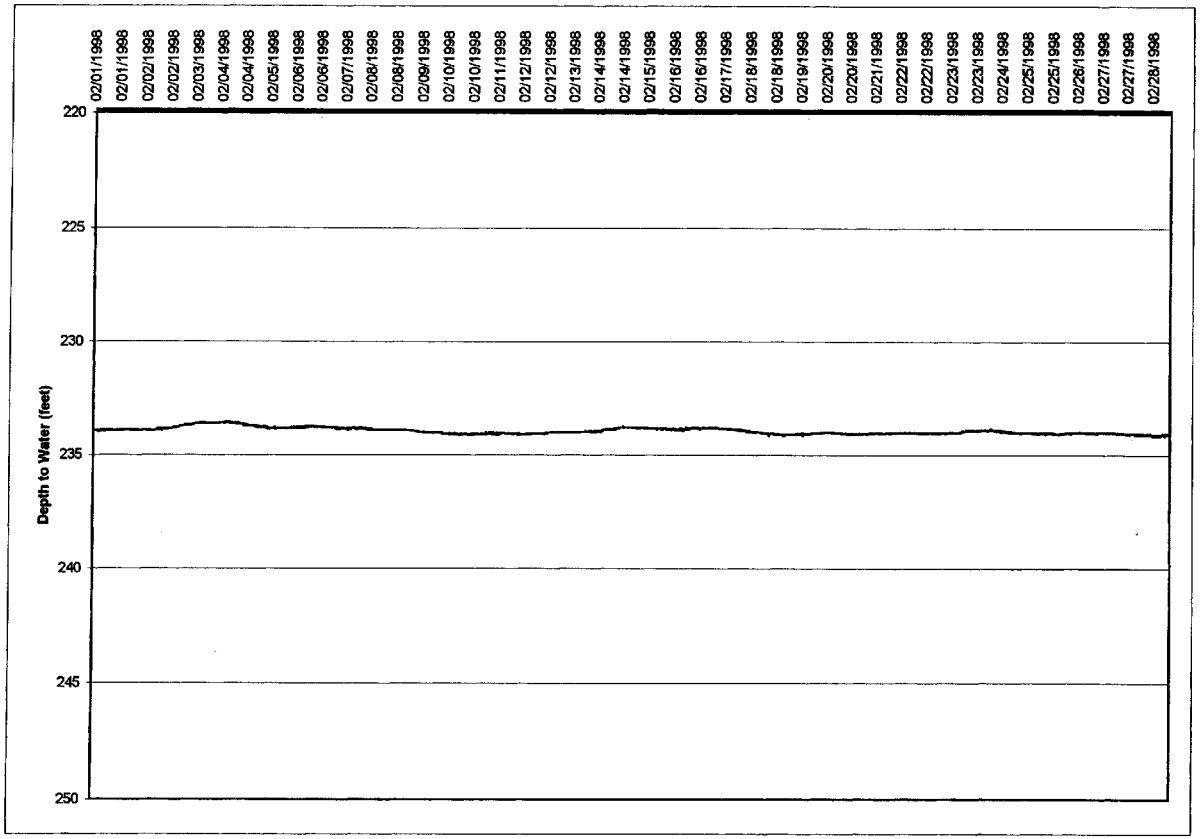
Dec 97 Chart

Well#21 98.xls



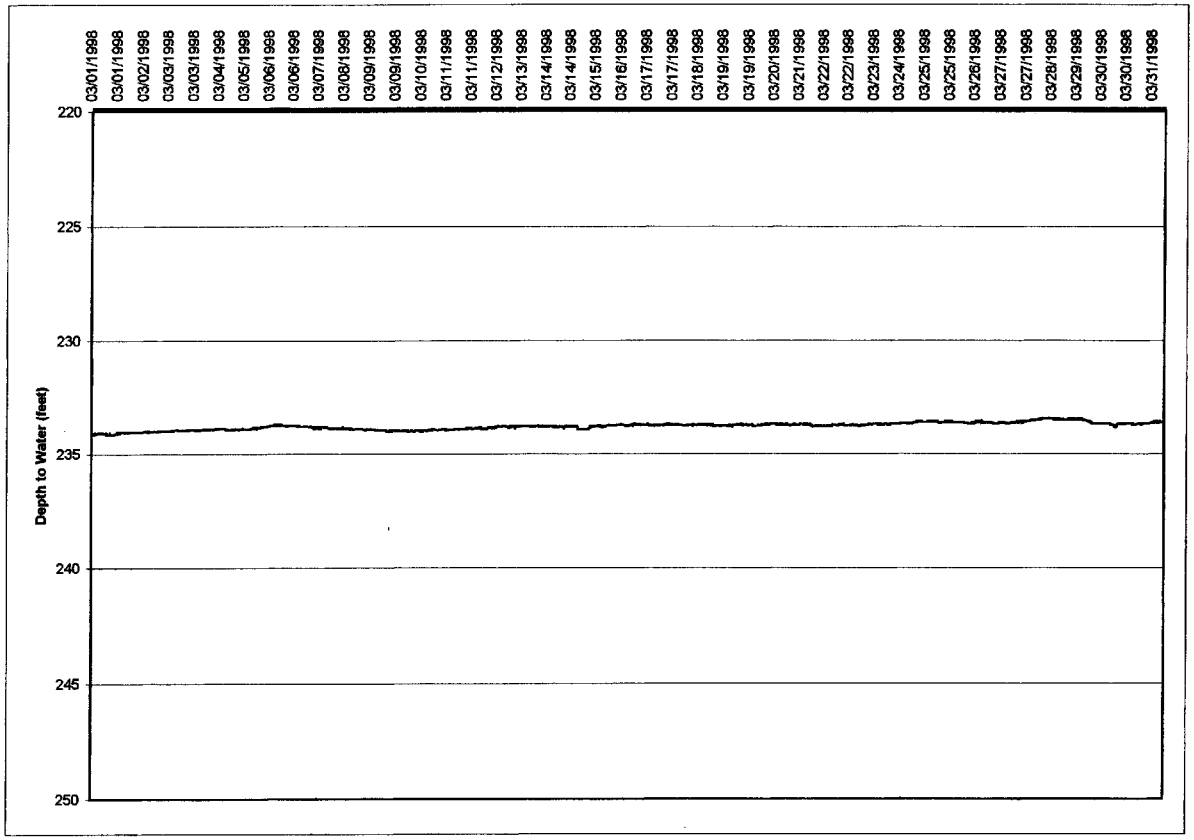
Jan 98 Chart

Well#21 98.xls



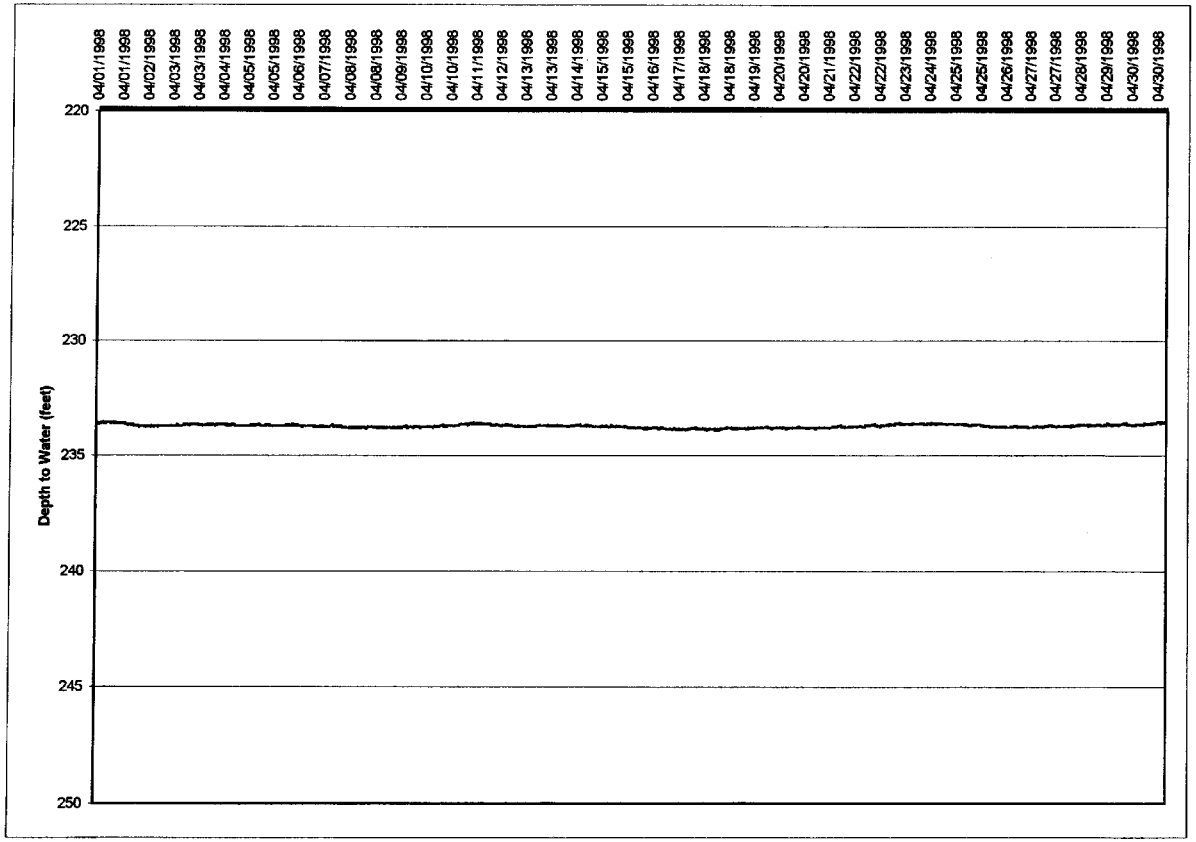
Feb 98 Chart

Well#21 98.xls



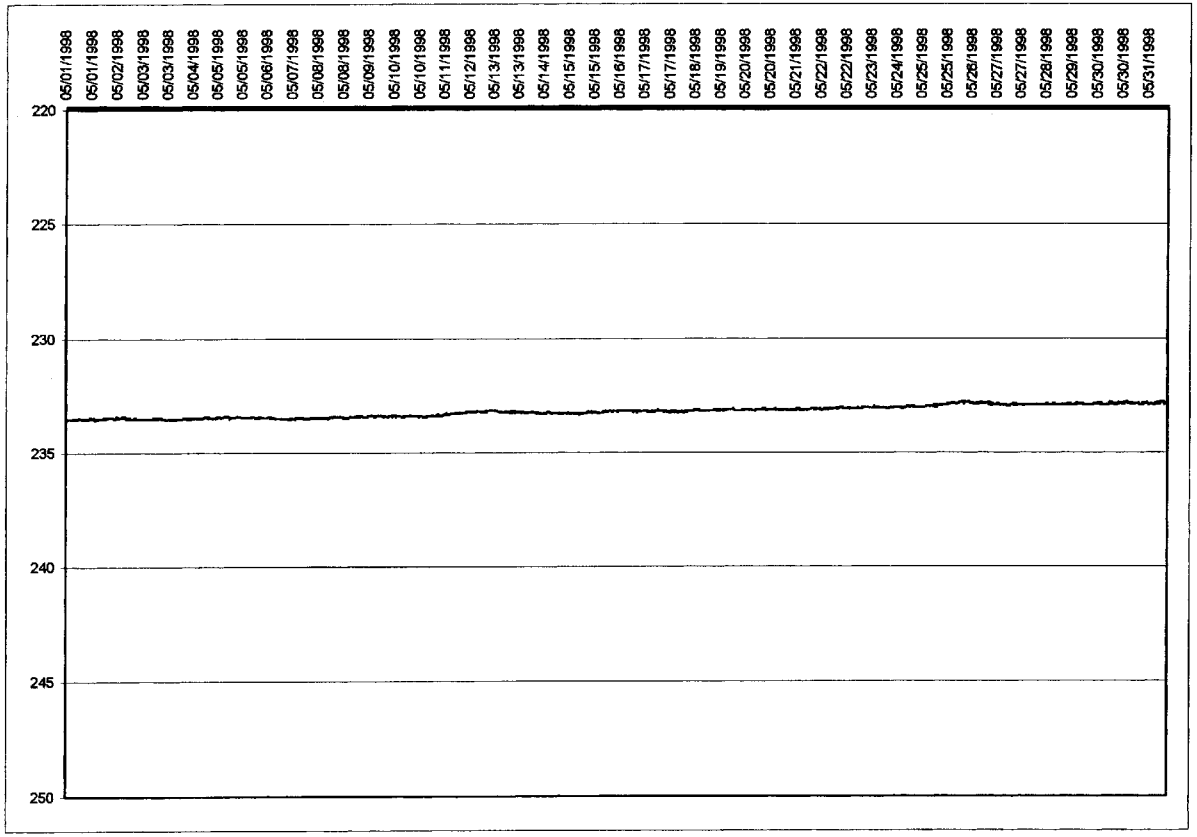
Mar 98 Chart

Well#21 98.xls



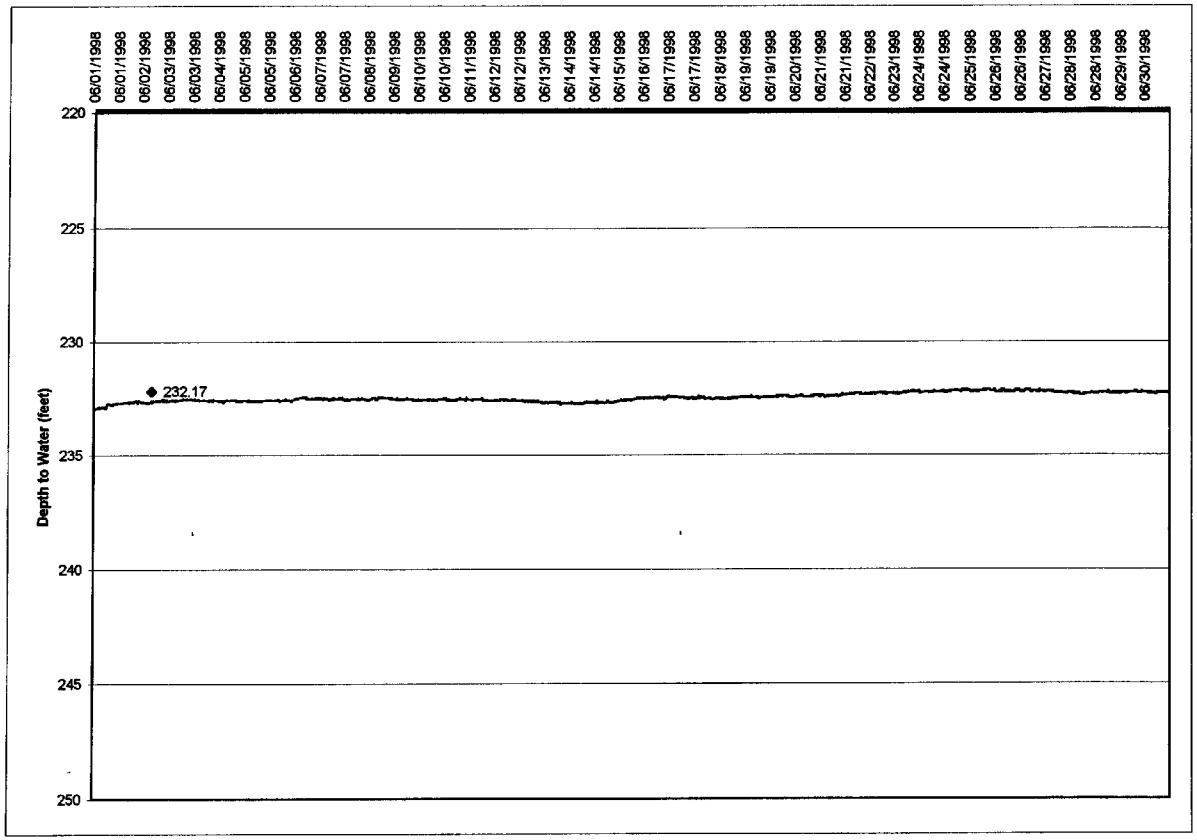
Apr 98 Chart

Well#21 98.xls



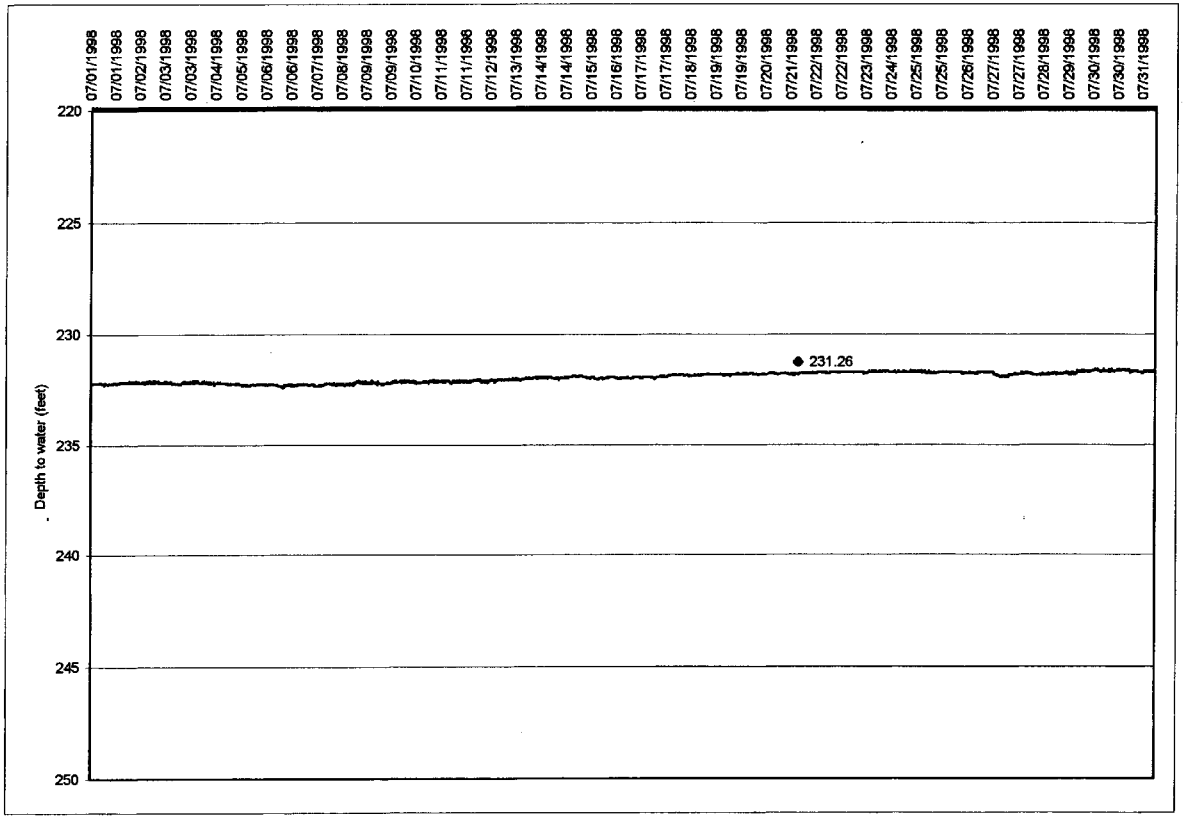
May 98 Chart

Well#21 98.xls



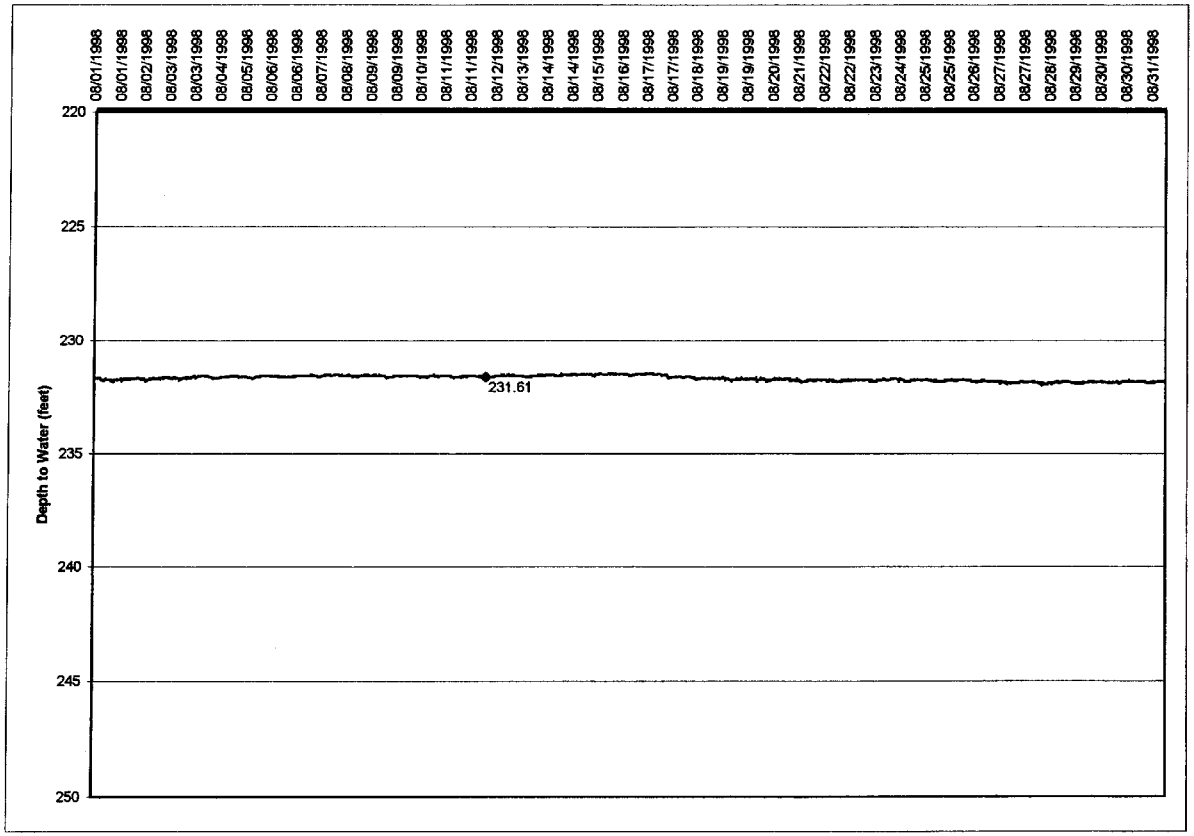
Jun 98 Chart

Well#21 98.xls



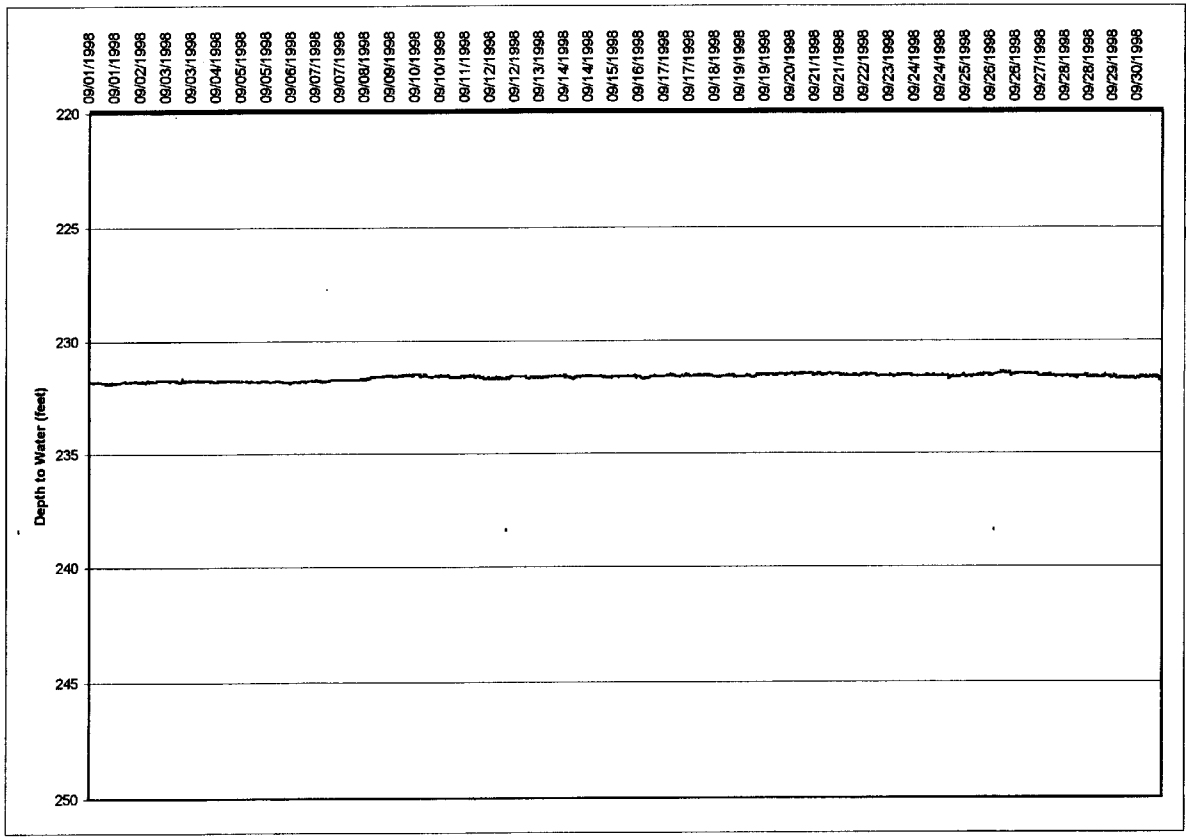
Jul 98 Chart

Well#21 98.xls



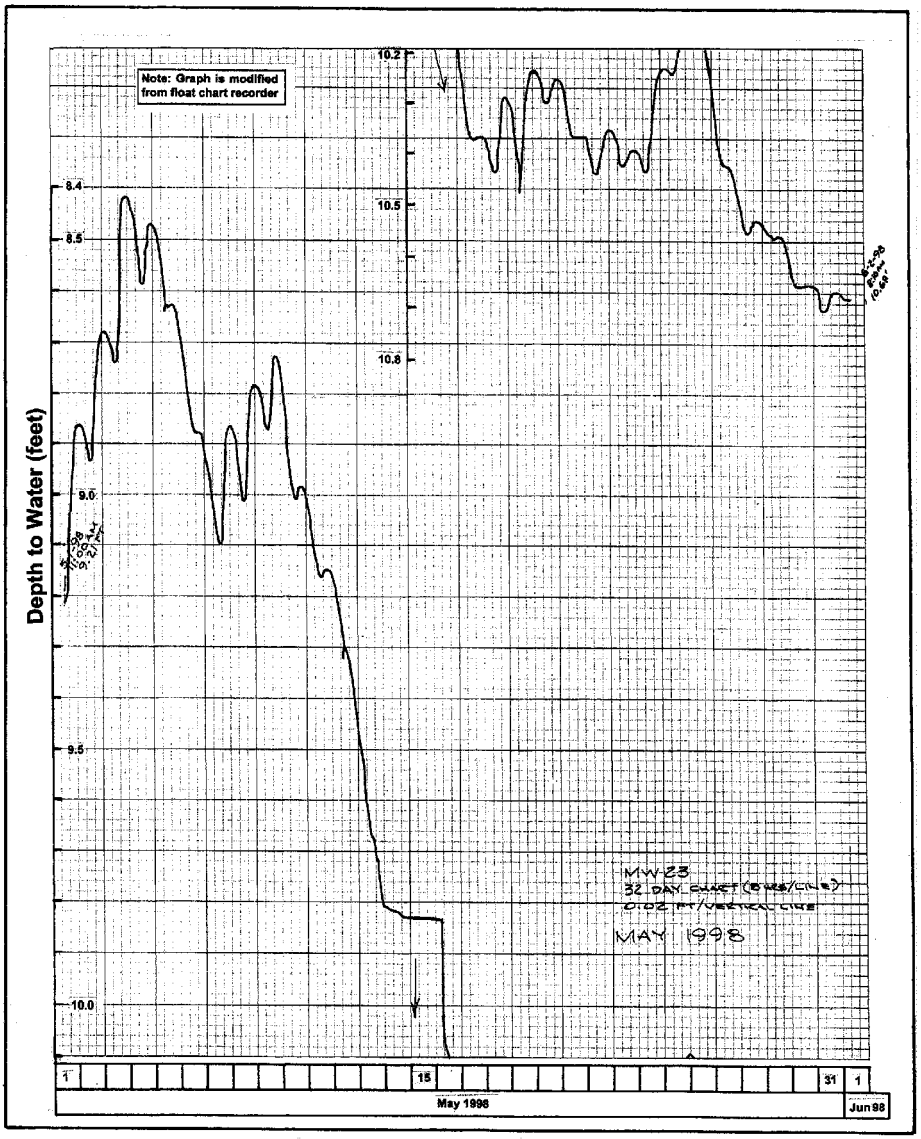
Aug 98 Chart

Well#21 98.xls

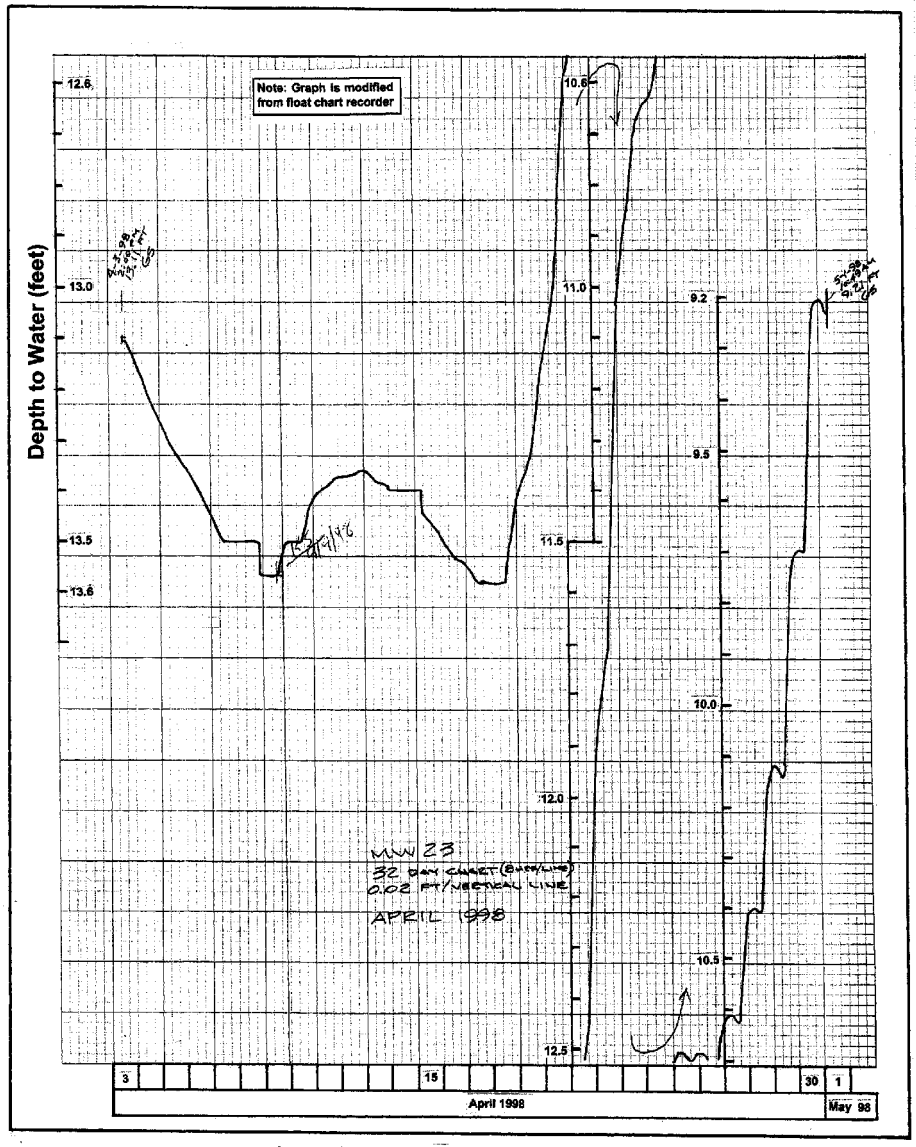


Sep 98 Chart

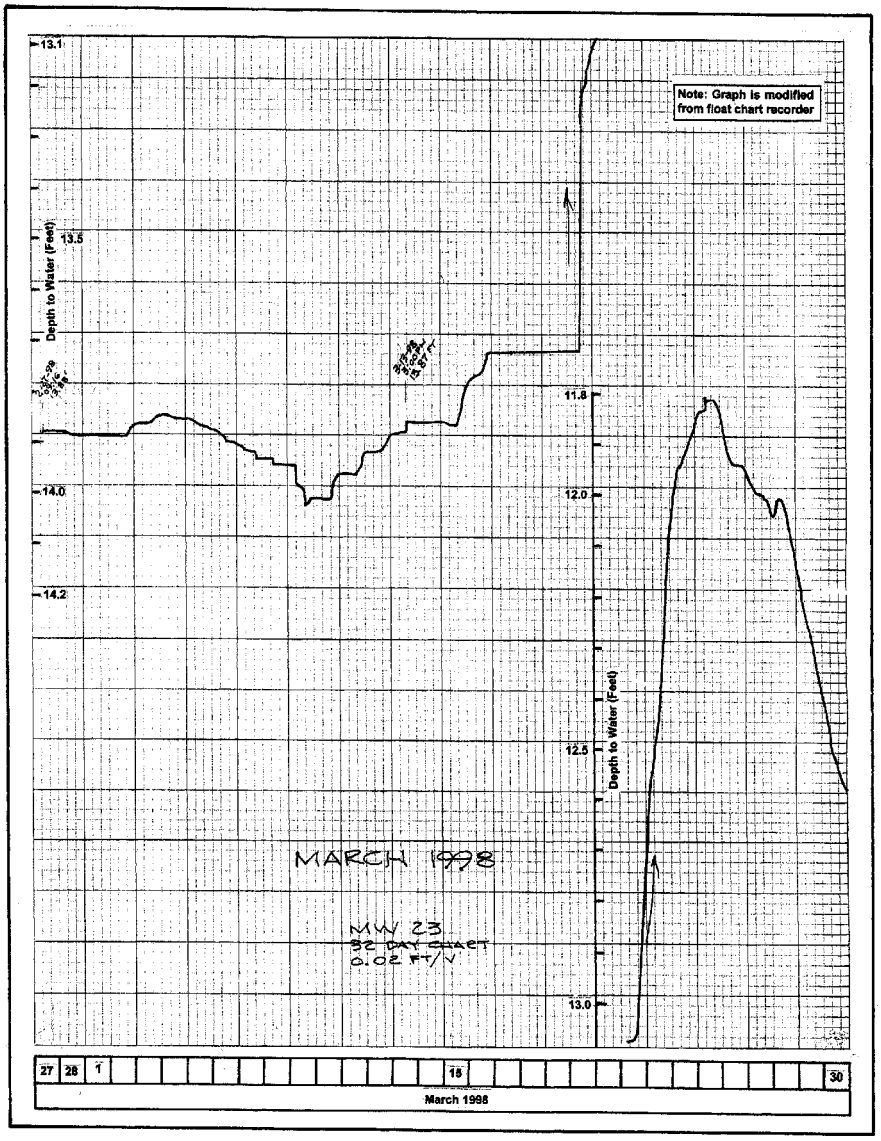
Water-Level Hydrographs from a Float Chart Recorder for MW-23



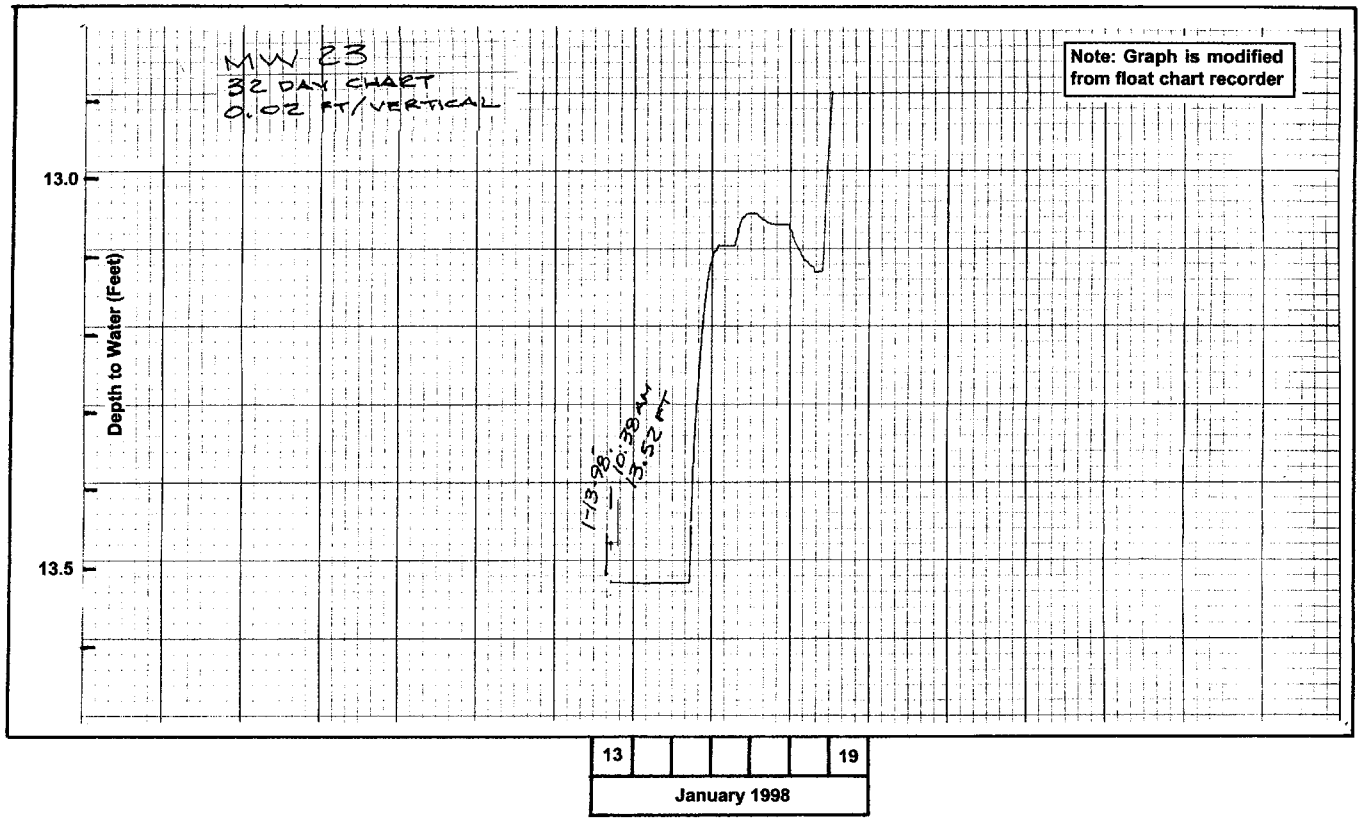
WATER-LEVEL HYDROGRAPH FOR MW-23



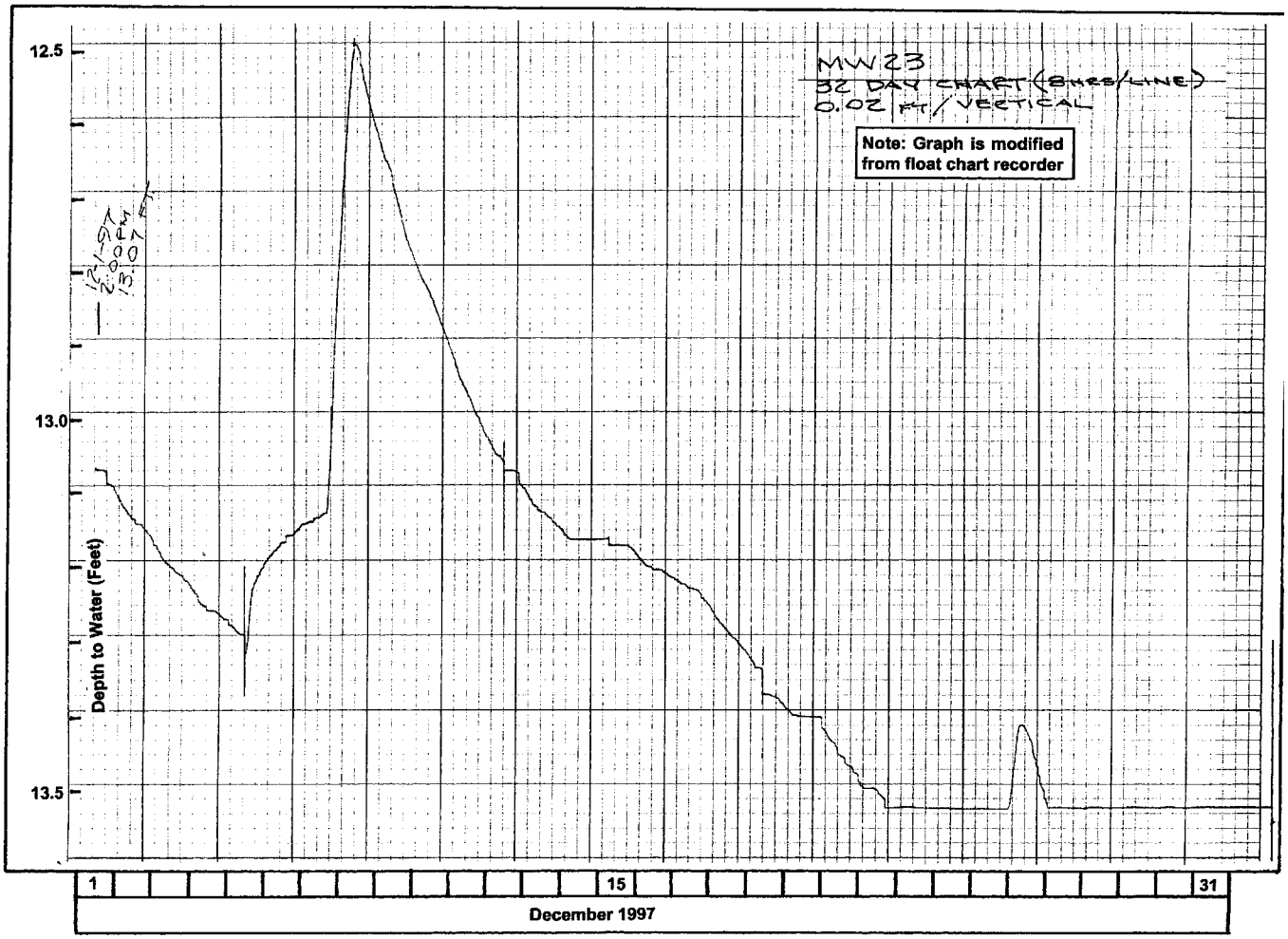
WATER-LEVEL HYDROGRAPH FOR MW-23



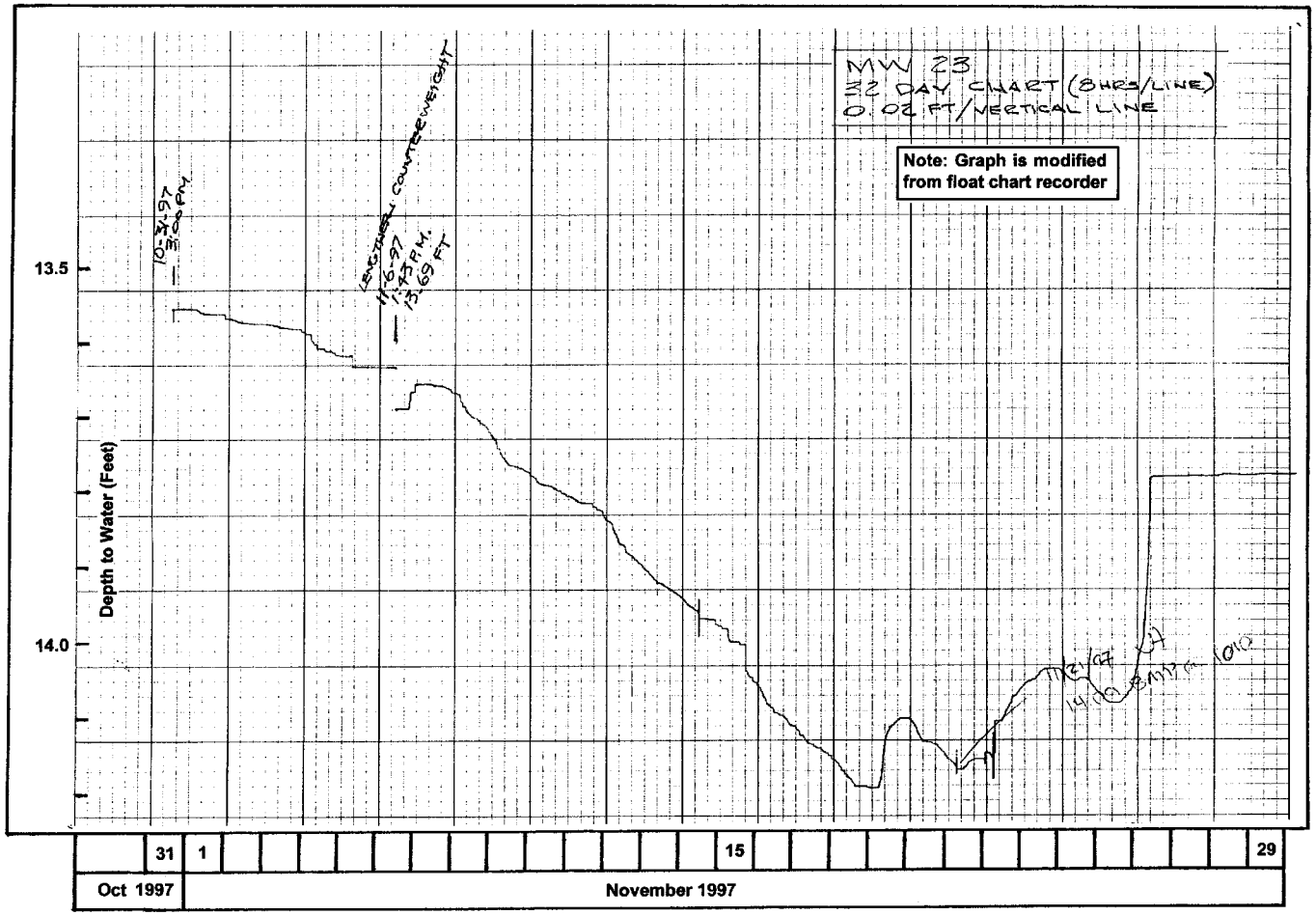
WATER-LEVEL HYDROGRAPH FOR MW-23



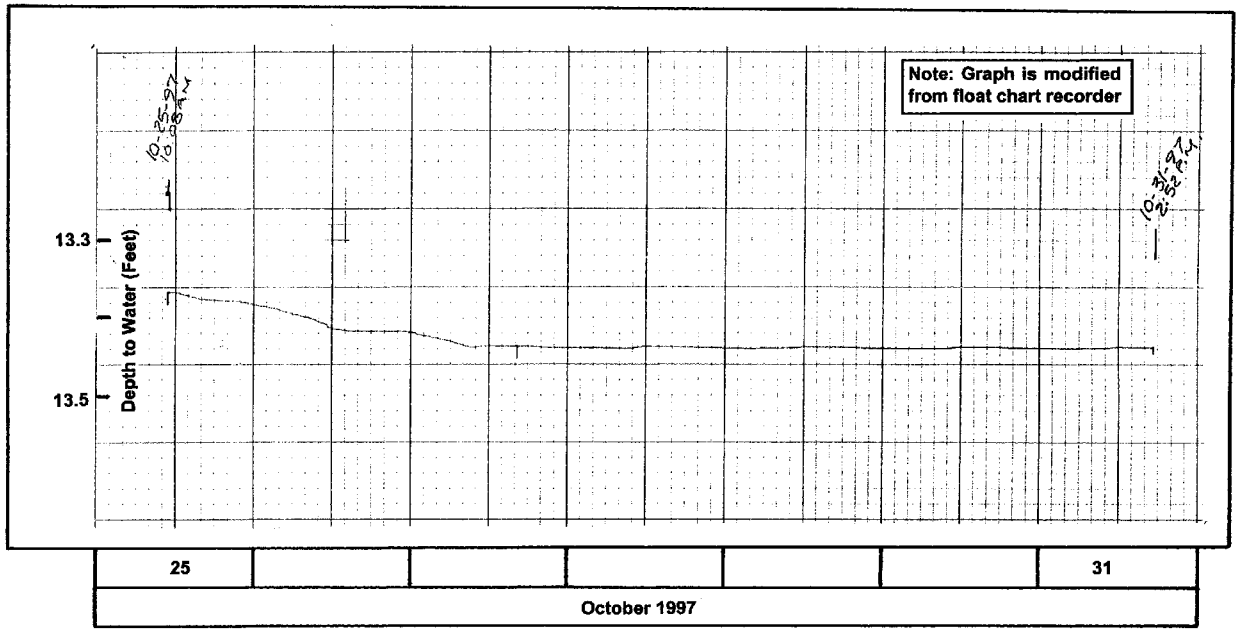
WATER-LEVEL HYDROGRAPH FOR MW-23



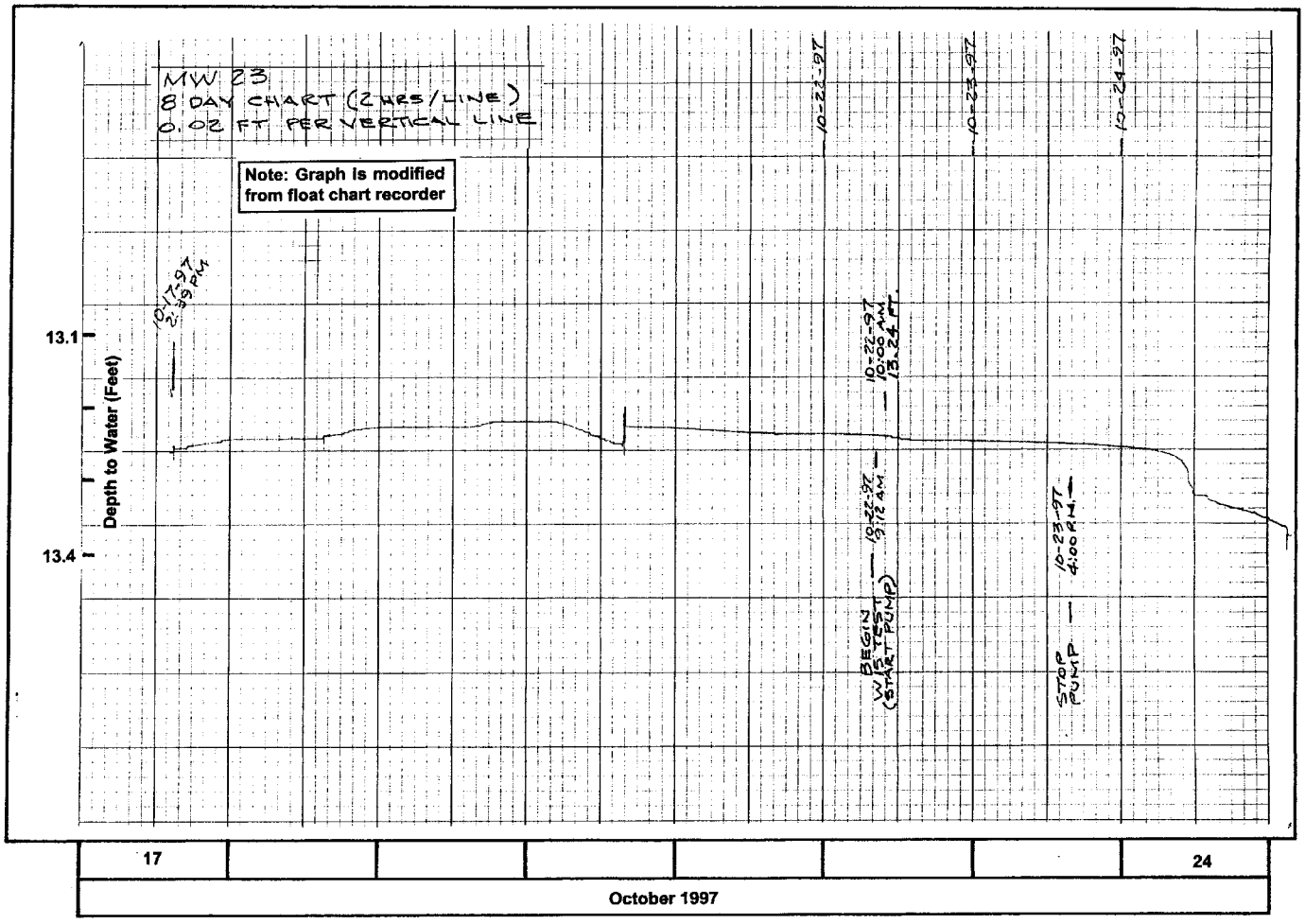
WATER-LEVEL HYDROGRAPH FOR MW-23



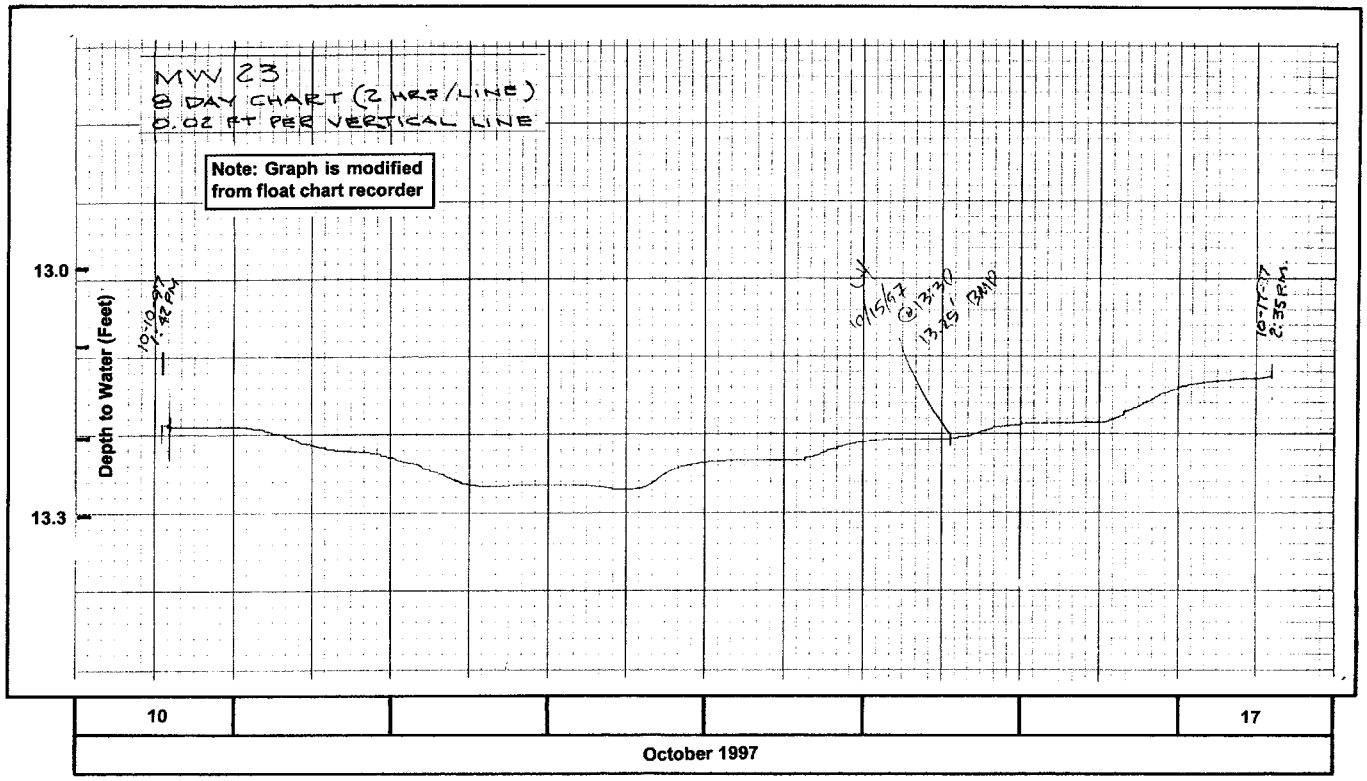
WATER-LEVEL HYDROGRAPH FOR MW-23



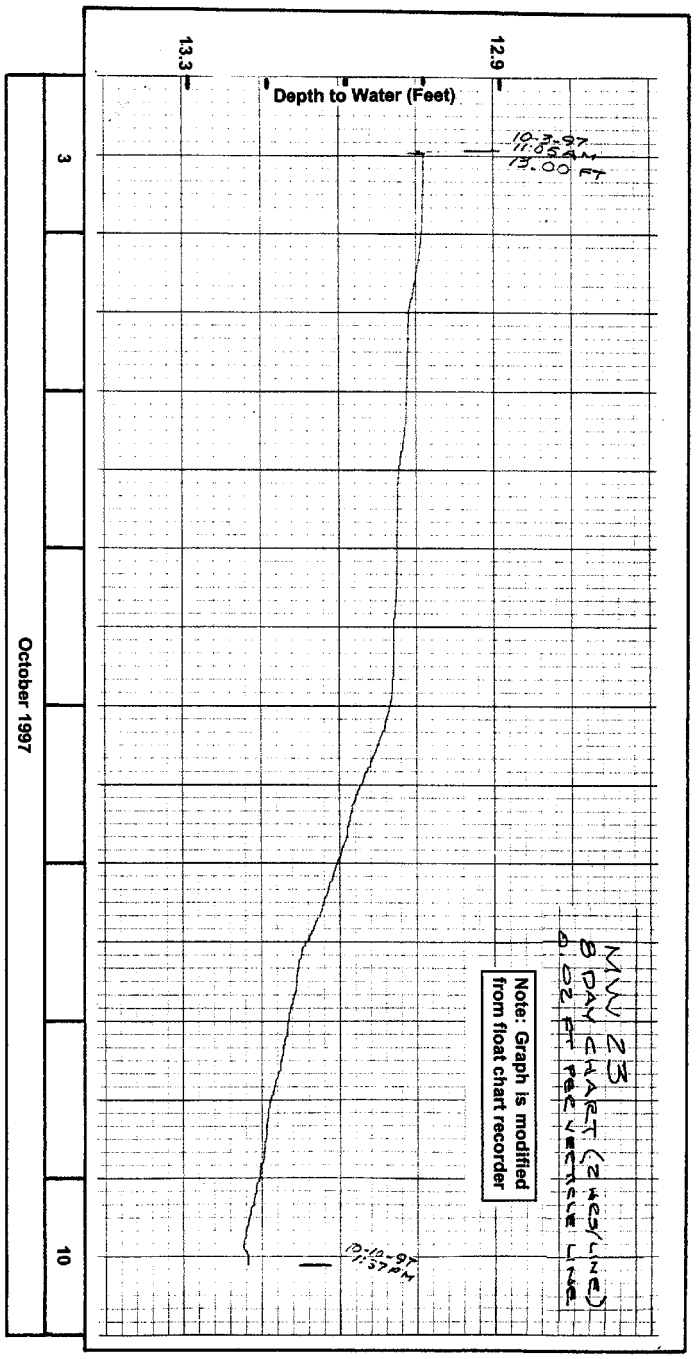
WATER-LEVEL HYDROGRAPH FOR MW-23



WATER-LEVEL HYDROGRAPH FOR MW-23



WATER-LEVEL HYDROGRAPH FOR MW-23

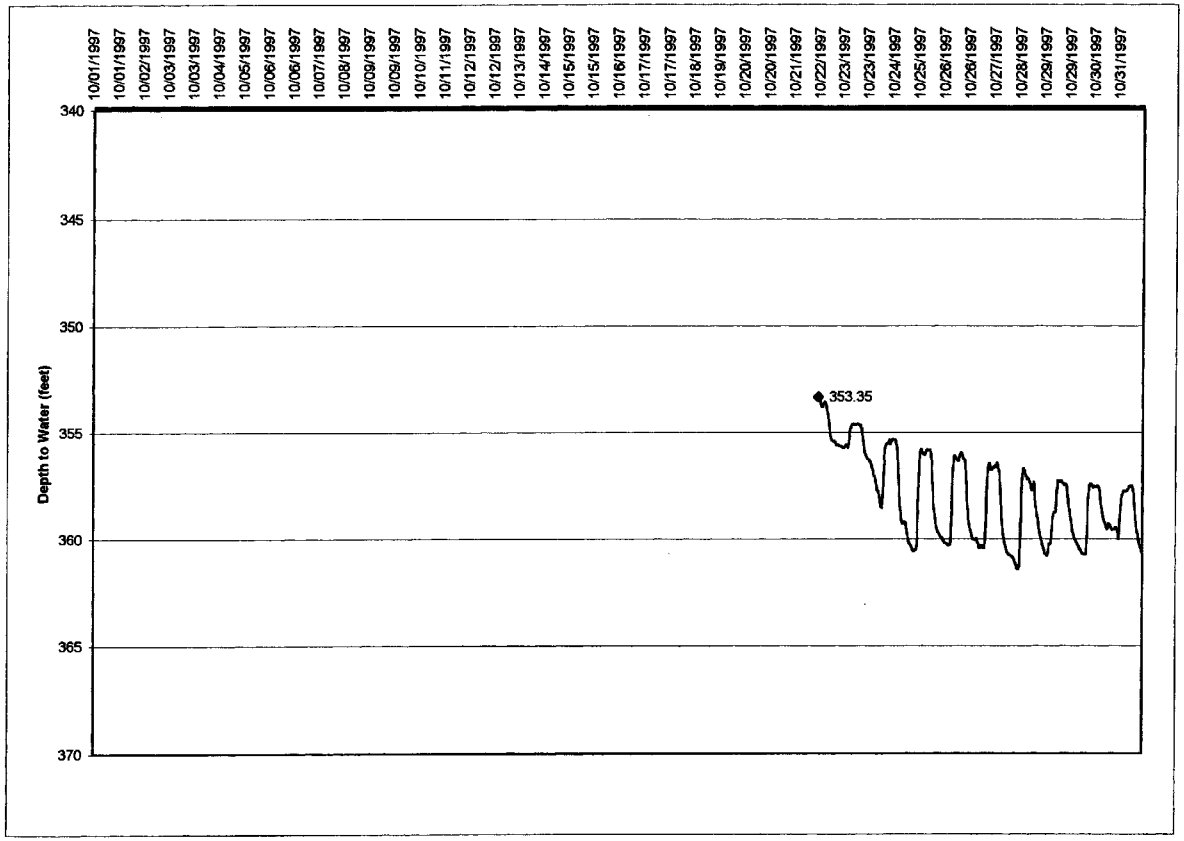


WATER-LEVEL HYDROGRAPH FOR MW-23

Water-Level Hydrographs from Transducer Measurements for Well No. 24

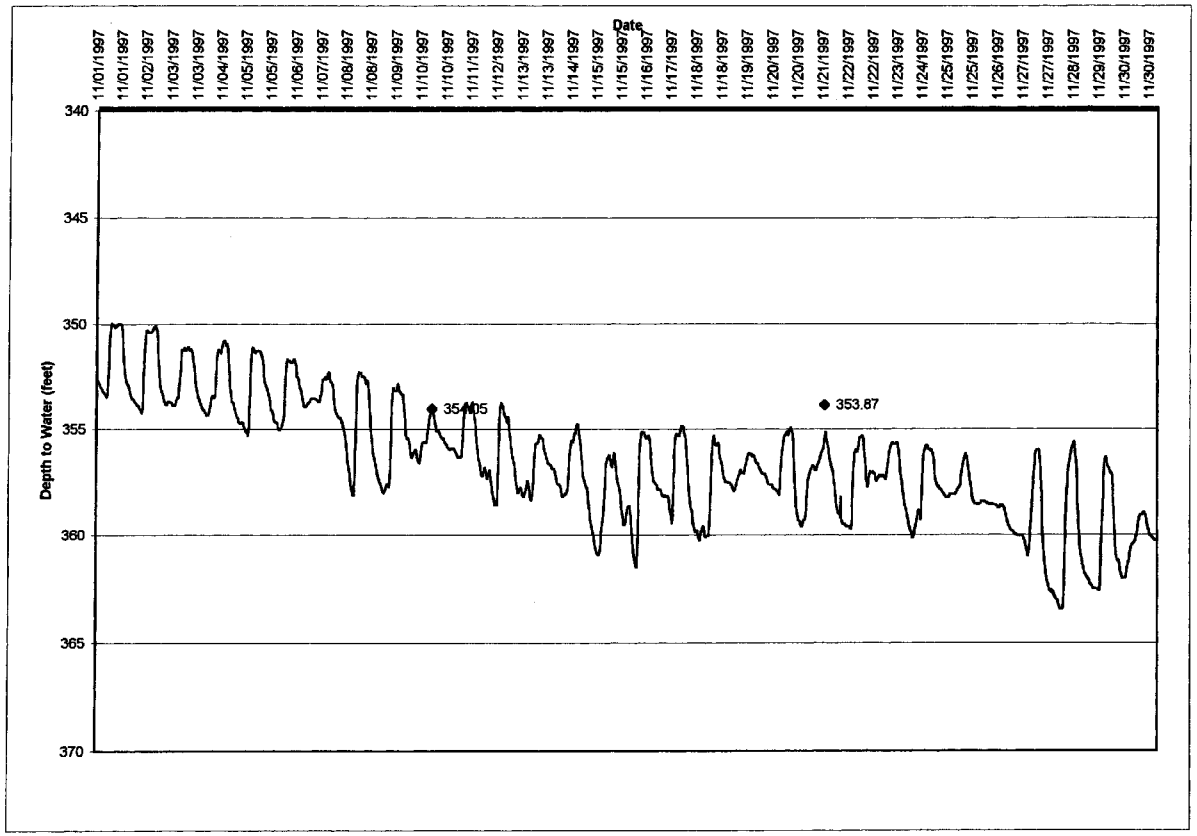
Note: Solid diamond shape symbol and adjoining water-level measurement on graph is an actual measurement from a water level sounder.

Well#24 97.xls



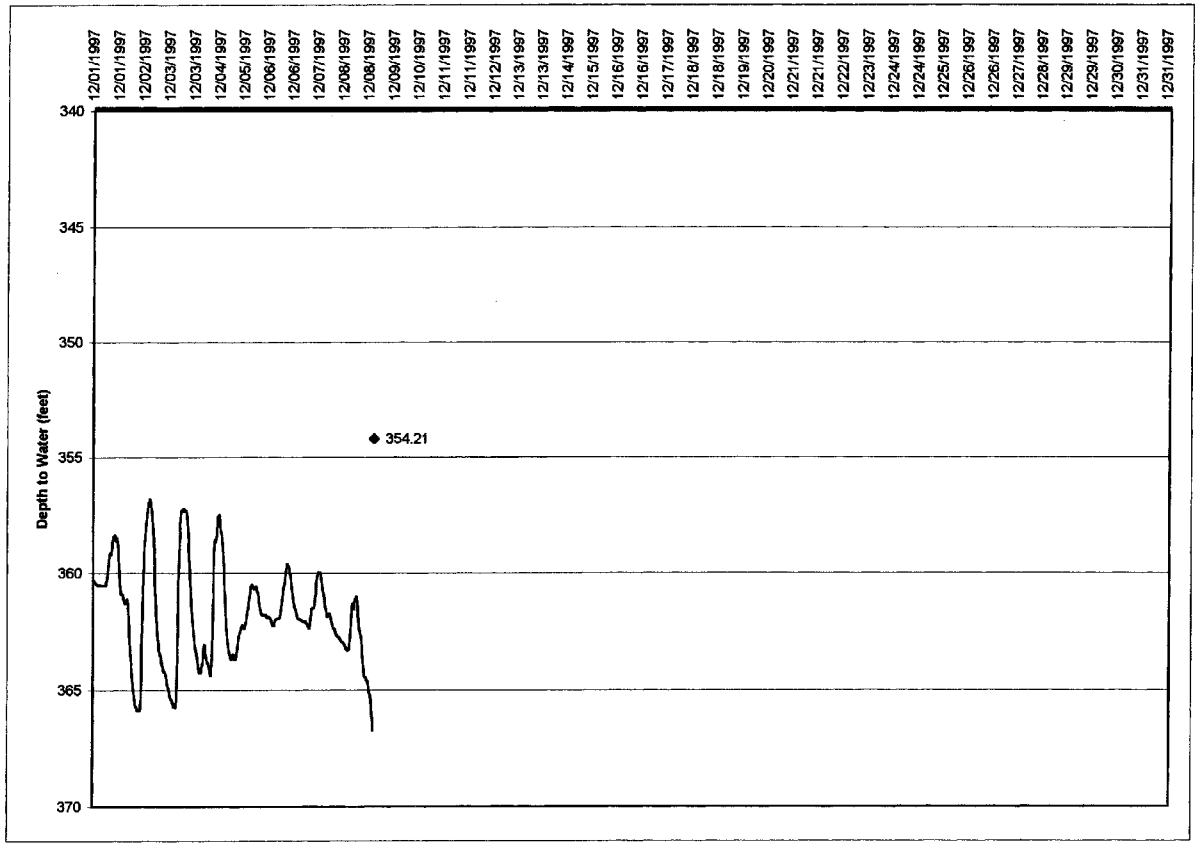
Oct 97 Chart

Well#24 97.xls



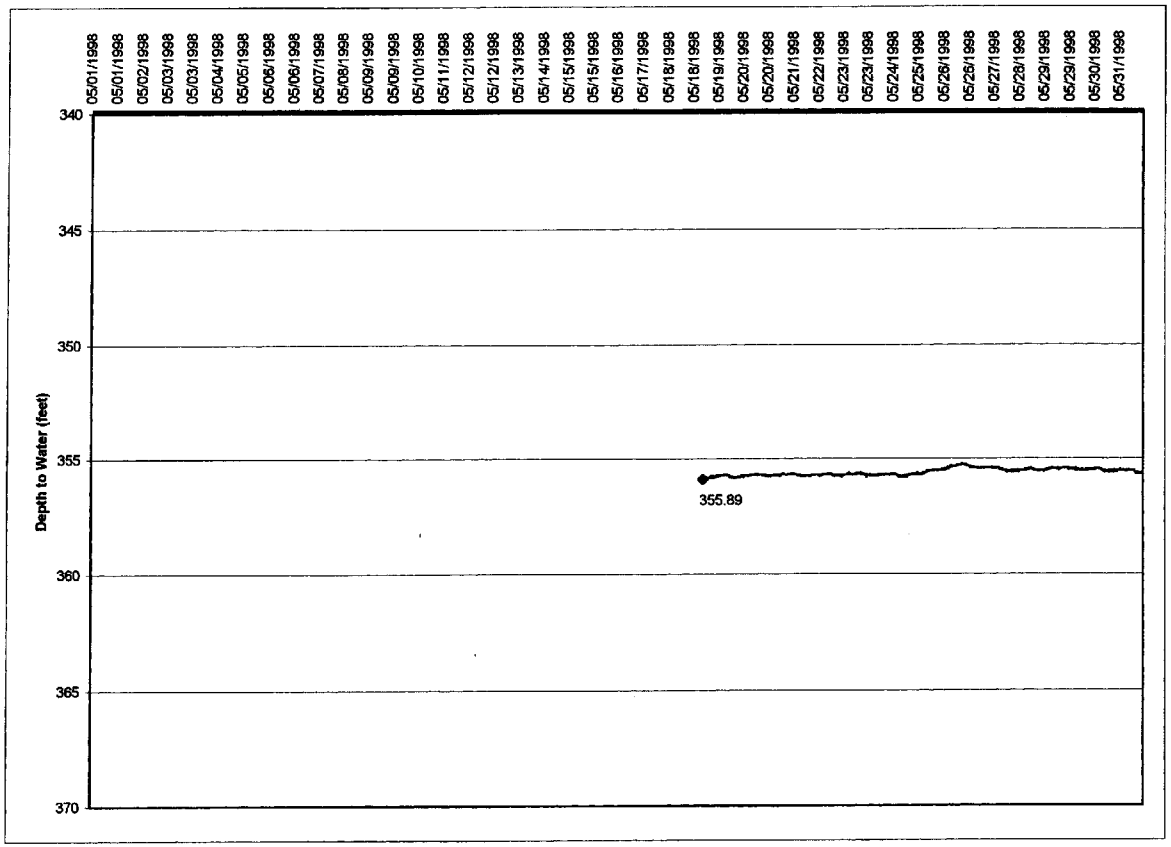
Nov 97 Chart

Well#24 97.xls



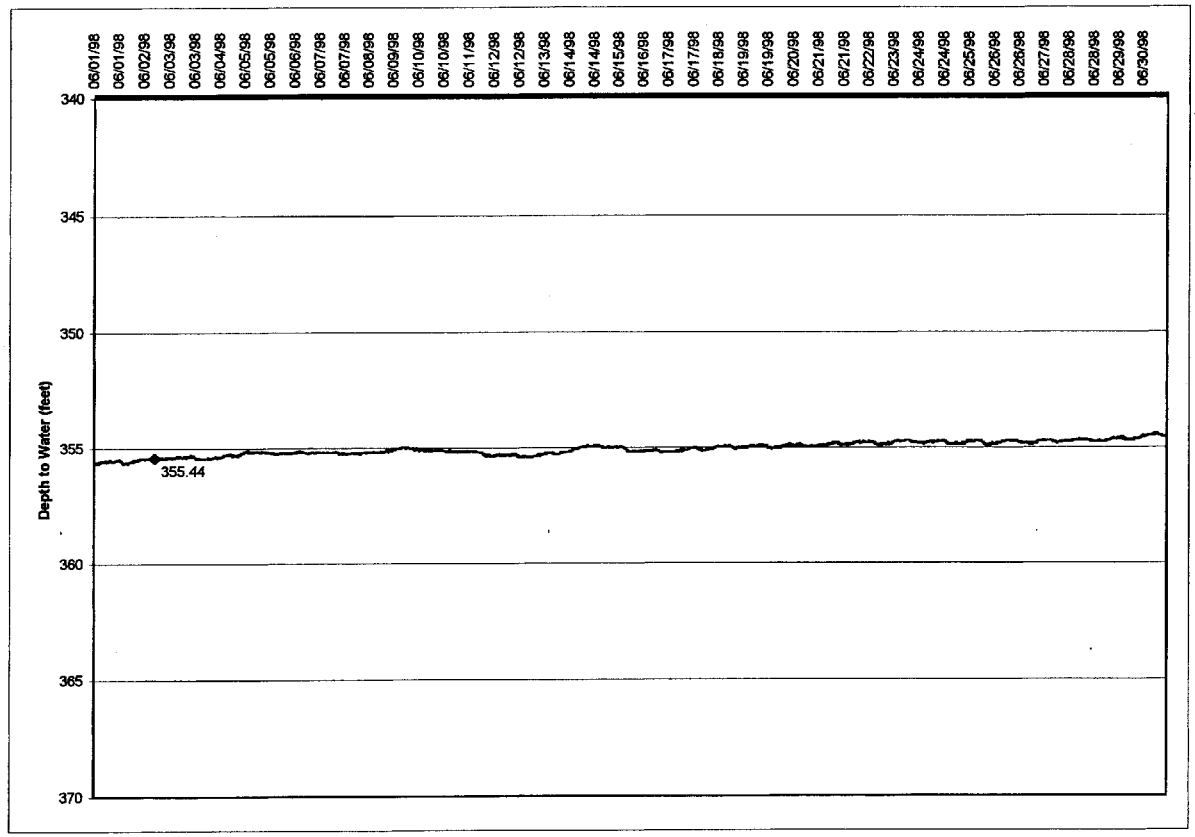
Dec 97 Chart

Well#24 98.xls



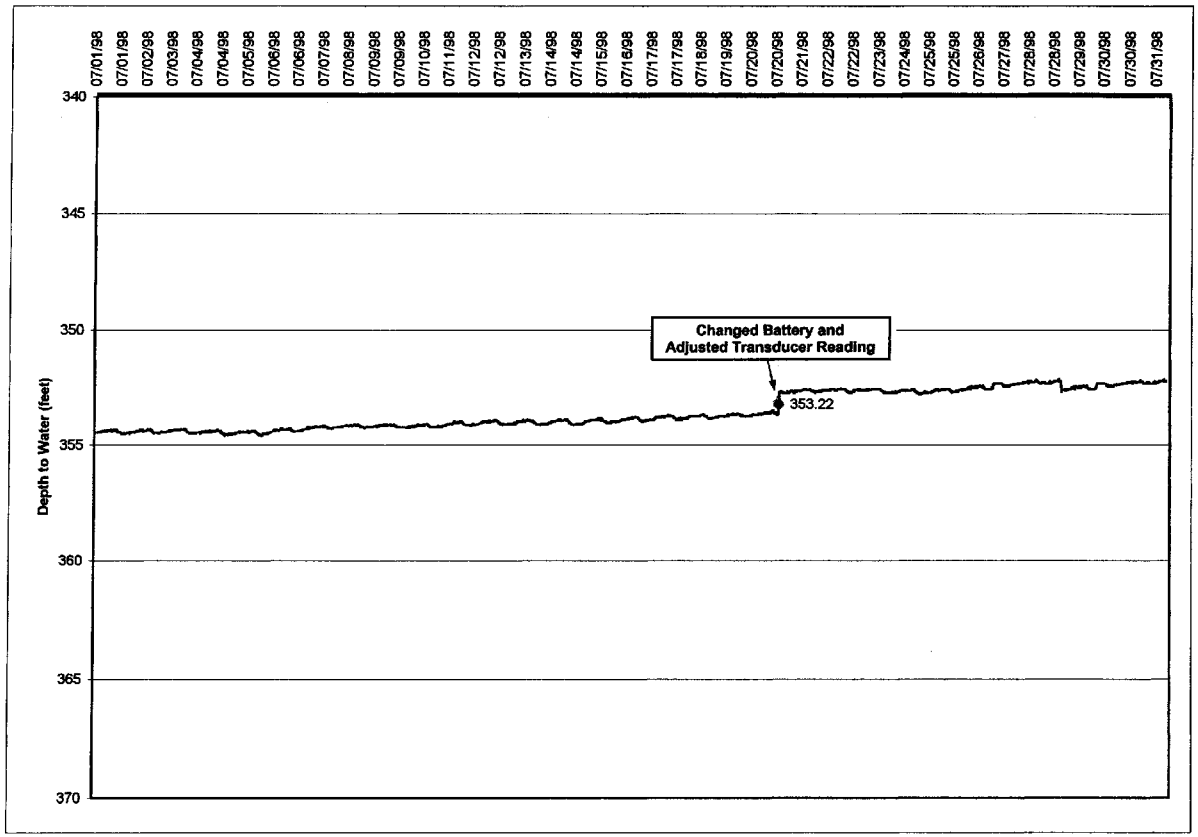
May 98 Chart

Well#24 98.xls



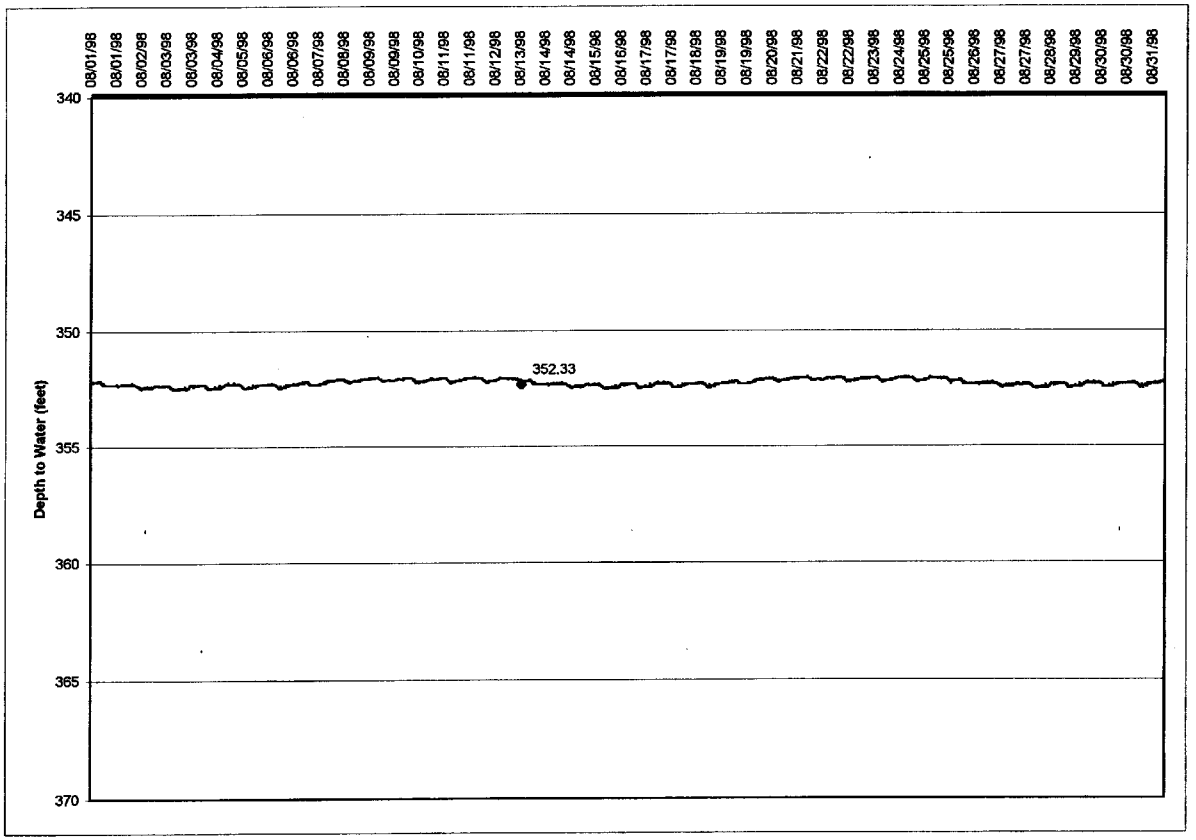
Jun 98 Chart

Well#24 98.xls



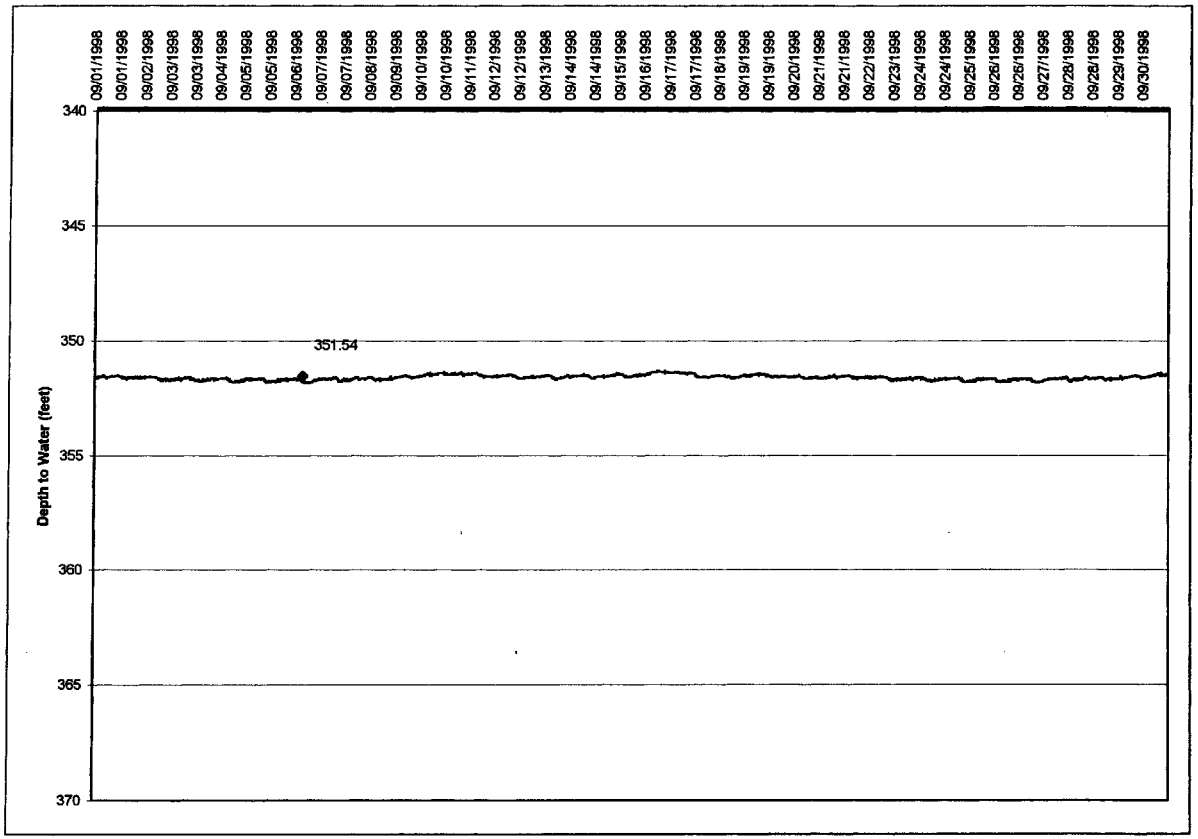
Jul 98 Chart

Well#24 98.xls



Aug 98 Chart

Well#24 98.xls



Sep 98 Chart

APPENDIX E

CHEMICAL ANALYSES OF WATER FROM DISTRICT WELLS

MAMMOTH COMMUNITY WATER DISTRICT
PRODUCTION WELL WATER QUALITY

Production Well Site	Sample Date	Sample Time	Conductivity umho/cm	TDS mg/L	Temp F	pH
1	06/06/1996	8:20	240	168	47	7.4
	09/12/1997	10:15	190	96	49	7.2
	07/06/1998	14:30	210	120	47	7.4
6	06/06/1996	9:05	470	283	49	7.5
	09/12/1997	9:25	397	198	53	7.1
	07/07/1998	8:20	300	160	51	8.2
10	06/06/1996	9:20	465	315	50	7.3
	09/12/1997	9:14	359	179	55	7.2
	06/30/1998	13:25	350	240	49	7.6
15	06/06/1996	9:45	240	152	55	7.4
	09/12/1997	9:19	288	144	55	7.2
	06/30/1998	13:45	360	210	53	7.5
16	07/11/1996	9:00	660	432	70	7.5
	09/11/1997	10:11	632	317	73	7.1
	07/06/1998	14:35	710	500	70	7.1
17	07/11/1996	8:45	360	265	65	7.3
	No sample due to motor/pump failure					
	07/06/1998	9:15	350	280	60	7.1
18	07/11/1996	8:15	540	332	47	7.1
	09/12/1997	13:40	500	251	68	7.1
	07/06/1998	14:15	490	350	70	6.9
20	07/11/1996	9:20	217	164	59	7.1
	09/11/1997	9:57	336	168	61	6.9
	No sample due to motor/pump failure					

MAMMOTH COMMUNITY WATER DISTRICT
MONITOR WELL WATER QUALITY

Monitor Well Site	Sample Date	Sample Time	Conductivity umho/cm	TDS mg/L	Temp F	pH
4M	09/09/96	8:05	162	84	47	7.4
	09/24/97	8:03	93	47	45	7.2
	09/04/98	7:45	99	53	45	7.2
5A	09/09/96	8:30	674	339	60	6.7
	09/24/97	8:35	662	331	58	6.8
	09/04/98	8:20	660	332	58	6.8
5M	09/09/96	8:40	430	217	56	6.4
	No sample due to USGS chart recorder					
	09/04/98	8:30	450	226	56	6.5
7	No sample					
	09/02/97	10:15	101	50	49	7.4
	09/10/98	9:45	110	51	49	7.2
10M	No water in well to sample					
	09/16/97	14:05	358	180	50	7.3
	09/04/98	8:45	349	175	50	7.2
11	09/09/96	9:30	96	50	51	7.4
	09/16/97	14:20	106	53	53	7.3
	09/04/98	9:20	104	50	50	7.3
11M	09/09/96	9:40	283	144	52	7.5
	09/16/97	14:30	350	175	51	7.5
	09/04/98	9:25	350	175	50	7.3
12M	09/09/96	10:05	267	137	52	7.5
	09/16/97	14:02	364	182	50	7.5
	09/04/98	9:05	359	180	50	7.4
14	09/09/96	No sample due to transducer in well.				
	09/16/97	No sample due to transducer in well.				
	09/04/98	No sample due to transducer in well.				
19	09/09/96	No sample due to transducer in well.				
	09/16/97	No sample due to transducer in well.				
	09/04/98	No sample due to transducer in well.				
21	09/09/96	No sample due to transducer in well.				
	09/16/97	No sample due to transducer in well.				
	09/04/98	No sample due to transducer in well.				
22	09/09/96	No sample				
	09/16/97	No sample				
	09/10/98	8:00	115	57	48	7.1
23	09/09/96	10:50	93	47	52	7.3
	09/16/97	10:05	95	48	50	7.3
	09/04/98	10:00	98	50	50	7.3
24	09/09/96	No sample due to transducer in well.				
	09/16/97	No sample due to transducer in well.				
	09/04/98	No sample due to transducer in well.				

APPENDIX F

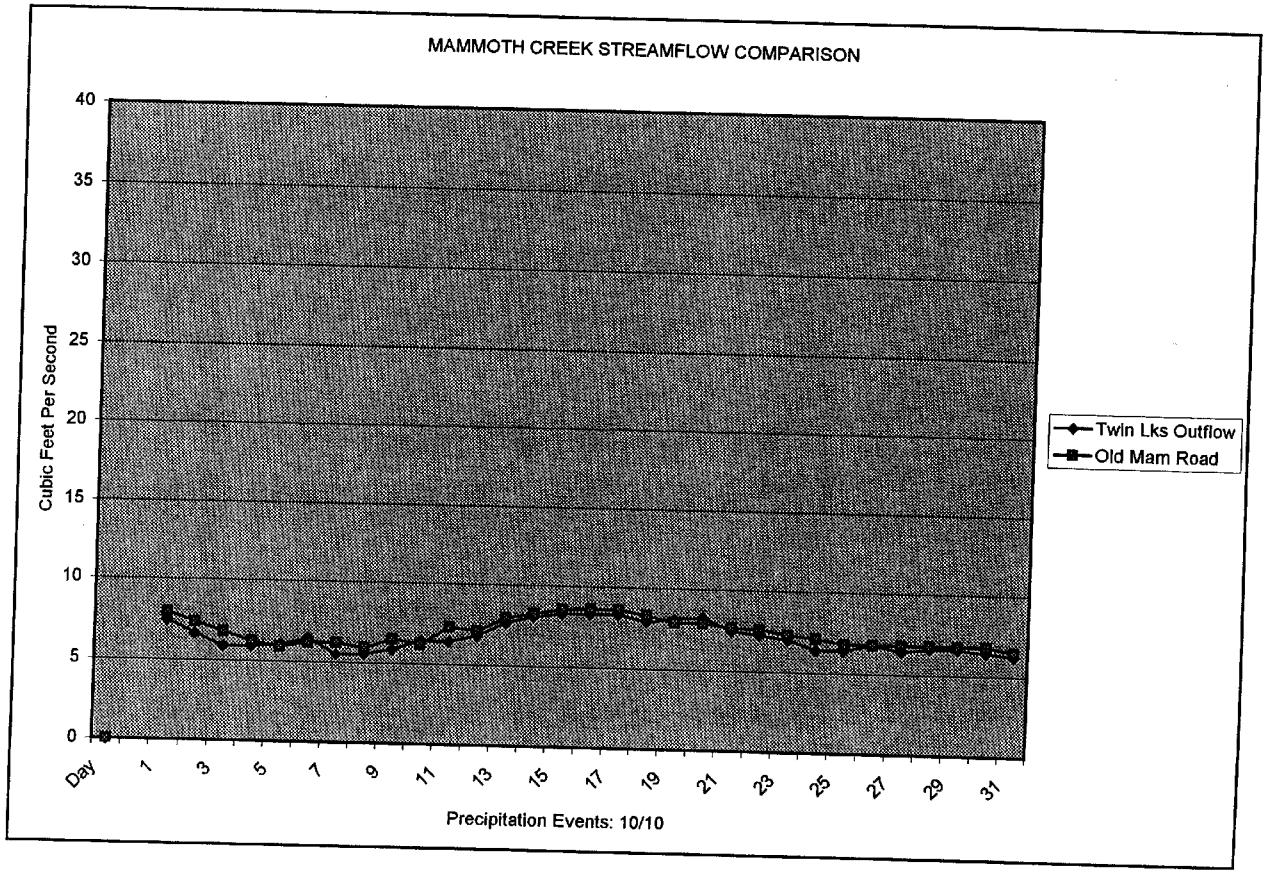
MAMMOTH CREEK STREAMFLOW

TWIN LAKES OUTFLOW

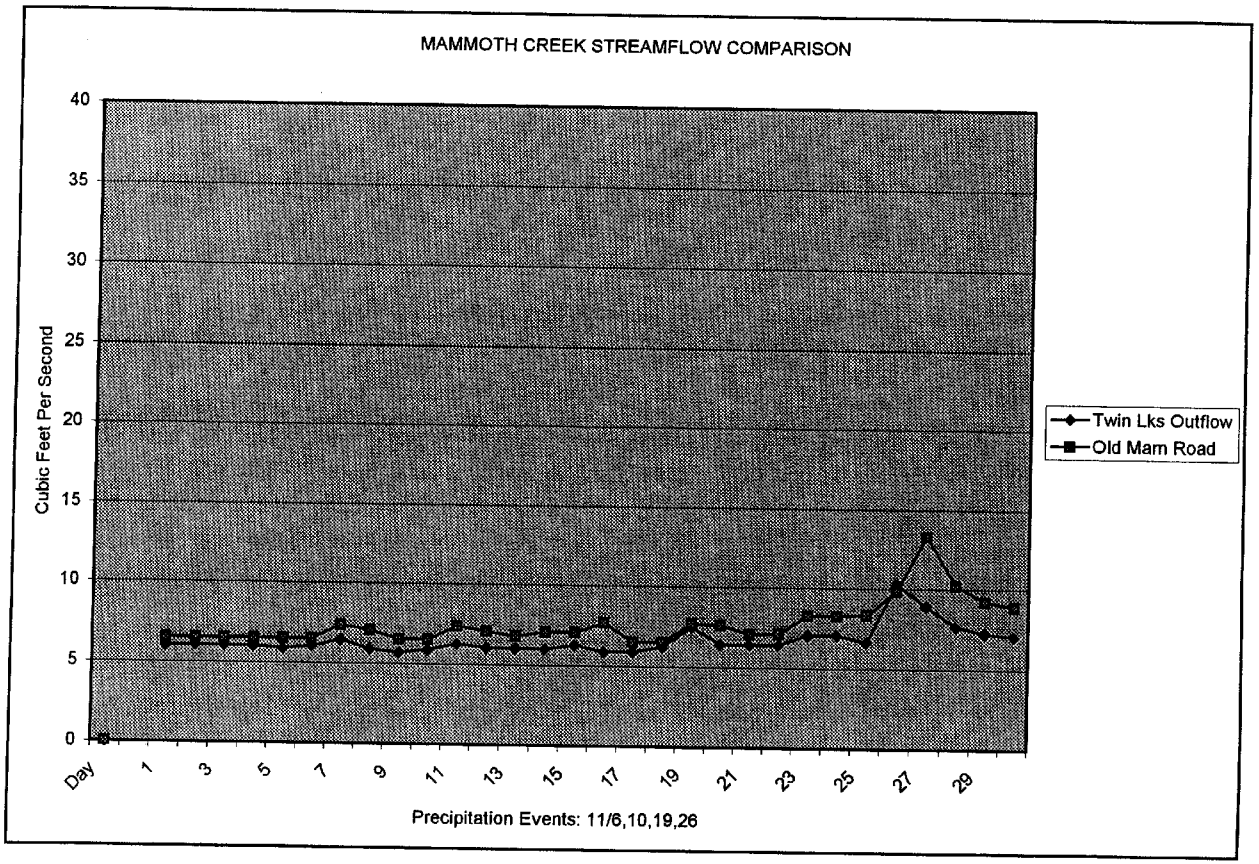
Daily discharge in cubic feet per second												
	1997			1998								
Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.4	6.0	7.0	7.4	7.2		9.1	12.3	17.1	>32.42	>32.42	19.5
2	6.6	6.0	6.8	7.2	7.9		8.9	12.8	18.7	>32.42	>32.42	18.9
3	5.9	6.0	6.8	7.2	10.5		8.7	12.8	>32.42	>32.42	>32.42	19.5
4	5.9	6.0	6.8	7.9	10.2		8.7	13.3	>32.42	>32.42	>32.42	20.3
5	6.0	5.9	6.8	7.6	8.5		8.5	12.6	>32.42	>32.42	>32.42	23.0
6	6.4	6.0	8.1	7.2	7.9		8.7	12.1	>32.42	>32.42	>32.42	26.5
7	5.5	6.4	8.1	7.2	9.6		8.5	12.3	>32.42	>32.42	>32.42	25.6
8	5.5	5.9	8.9	7.0	9.4		8.5	13.1	>32.42	>32.42	>32.42	23.6
9	5.9	5.7	7.6	7.2	8.9		8.3	14.3	>32.42	>32.42	>32.42	23.0
10	6.4	5.9	7.4		7.9		8.3	13.3	>32.42	>32.42	>32.42	23.6
11	6.4	6.2	7.2	7.4	8.1		8.9	14.3	>32.42	>32.42	31.82	18.9
12	6.8	6.0	7.2	7.4	8.1		8.9	14.3	>32.42	>32.42	>32.42	16.6
13	7.6	6.0	7.2	8.3	8.1		9.4	13.8	>32.42	>32.42	>32.42	15.8
14	8.1	6.0	7.4	7.4	7.4		9.1	13.3	>32.42	>32.42	>32.42	15.3
15	8.3	6.2	8.1	8.3			9.4	13.1	>32.42	>32.42	>32.42	14.8
16	8.3	5.9	7.6	8.9			9.4	13.5	>32.42	>32.42	>32.42	14.0
17	8.3	5.9	7.4	8.1		8.3	9.1	13.1	>32.42	>32.42	>32.42	15.3
18	7.9	6.2	7.0	7.4		8.1	9.1	13.3	>32.42	>32.42	>32.42	14.8
19	8.1	7.4	7.2	7.4		8.5	9.1	13.8	>32.42	>32.42	25.3	13.8
20	8.2	6.4	7.2	8.5	6.8	8.7	9.4	14.0	>32.42	>32.42	30.0	13.1
21	7.4	6.4	7.0	7.9		8.9	9.6	14.0	>32.42	>32.42	25.0	12.3
22	7.2	6.4	7.0	7.4		9.6	10.2	14.0	>32.42	>32.42	24.2	12.3
23	7.0	7.0	7.0	7.4		9.8	10.7	14.8	>32.42	>32.42	23.2	11.9
24	6.4	7.0	7.0	7.0		11.6	10.0	15.0	>32.42	>32.42	23.0	11.9
25	6.4	6.6	7.2	7.0		10.9	9.8	17.1	>32.42	>32.42	21.9	12.1
26	6.8	10.2	7.0	6.8		9.8	9.6	16.8	>32.42	>32.42	19.2	12.6
27	6.4	8.9	7.0	6.6		9.6	9.6	15.8	>32.42	>32.42	19.2	13.1
28	6.6	7.6	7.0	6.8		9.6	10.7	15.5	>32.42	>32.42	19.2	12.8
29	6.6	7.2	7.2	8.7		9.1	11.2	16.6	>32.42	>32.42	19.5	14.8
30	6.4	7.0	7.0	7.9		8.9	11.6	15.8	>32.42	>32.42	20.3	15.3
31	6.2		7.2	7.4		9.1		16.0		>32.42	19.2	
Mean	6.9	6.5	7.3	7.5	8.4	9.4	9.4	14.1	>32.4	>32.42	22.9	16.8
Maximum	8.3	10.2	8.9	8.9	10.5	11.6	11.6	17.1	>32.4	>32.42	>32.4	26.5
Minimum	5.5	5.7	6.8	6.6	6.8	8.1	8.3	12.1	>32.4	>32.42	19.2	11.9

MAMMOTH CREEK FLOW AT OLD MAMMOTH ROAD

Daily discharge in cubic feet per second												
	1997			1998								
Day	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.9	6.5	8.6	8.6	9.5	10.5	11.2	24.2	25.1	179.1	80.8	27.0
2	7.3	6.5	9.2	9.2		10.5	10.5	25.1	27.5	184.0	73.6	27.0
3	6.8	6.5	9.5	9.2	11.5	10.5	10.5	23.7	44.0	178.1	63.4	27.0
4	6.2	6.5	8.3	8.6	13.7	10.5	11.2	27.0	68.8	175.1	54.3	27.5
5	5.9	6.5	8.6	11.5	12.3	10.2	9.8	24.6	67.4	172.2	51.8	30.5
6	6.2	6.5	10.5	13.0	9.8	11.2	9.8	21.9	57.5	162.6	52.4	34.1
7	6.2	7.3	10.5	12.6	13.3	12.3	10.5	20.6	53.7	155.1	54.9	32.5
8	5.9	7.1	11.2	9.8	9.8	11.5	9.8	23.7	54.3	135.1	57.5	30.0
9	6.5	6.5	10.9	8.6	14.9	10.2	9.8	25.1	56.9	149.5	57.5	31.0
10	6.2	6.5	10.2	9.2	13.0	10.2	10.2	23.7	70.8	196.1	54.9	31.5
11	7.3	7.3	10.9	9.5	10.9	10.2	10.5	21.9	83.0	200.2	44.6	28.5
12	7.1	7.1	11.2	9.5	13.0	10.2	11.2	21.9	84.5	184.9	42.3	26.1
13	7.9	6.8	9.2	8.6	13.0	10.2	11.2	20.6	96.7	165.5	53.7	24.6
14	8.3	7.1	9.2	10.5	11.5	10.2	11.9	18.9	92.8	129.8	53.1	24.2
15	8.6	7.1	10.2	11.2	12.3	10.2	11.5	18.9	88.2	109.5	45.2	22.4
16	8.6	7.6	9.8	11.2	12.3	10.5	11.2	21.5	92.0	95.1	41.7	21.0
17	8.6	6.5	9.5	8.9	11.5	10.5	10.5	20.6	145.8	95.1	48.2	21.0
18	8.3	6.5	9.2	11.9	11.2	11.2	10.9	19.7	147.7	102.2	51.2	21.9
19	7.9	7.6	9.2	10.5	10.2	11.2	11.9	21.5	125.4	119.4	38.4	20.6
20	7.9	7.6	9.8	9.8	10.9	11.2	13.3	22.4	132.4	132.4	34.1	19.7
21	7.6	7.1	9.2	10.5	9.5	11.9	15.2	21.5	139.5	138.6	33.0	18.5
22	7.6	7.1	8.9	9.8	10.2	11.5	18.0	21.5	155.3	142.2	30.5	17.6
23	7.3	8.3	10.5	9.5	10.5	15.2	19.7	22.4	164.5	132.4	31.0	15.2
24	7.1	8.3	8.6	9.5	13.3	16.8	16.8	22.8	141.3	110.3	30.5	14.9
25	6.8	8.3	8.9	9.2	11.5	16.0	16.4	26.1	132.4	97.4	29.0	14.9
26	6.8	9.8	11.5	9.2	10.9	14.1	15.2	27.0	141.3	95.9	28.5	15.2
27	6.8	13.3	9.8	9.2	10.9	13.7	16.4	23.3	144.9	89.7	28.5	16.4
28	6.8	10.2	8.6	9.2	10.5	13.3	17.6	22.4	140.4	70.2	28.5	15.6
29	6.8	9.2	8.6	8.6		14.5	19.7	23.3	142.2	55.6	28.0	14.9
30	6.8	8.9	8.3	12.3		10.9	21.0	22.4	142.2	56.9	27.5	15.6
31	6.5		8.3	10.2		10.9		22.4		75.8	27.5	
Mean	7.2	7.6	9.6	10.0	11.6	11.7	13.1	22.7	102.0	131.8	44.4	22.9
Maximum	8.6	13.3	11.5	13.0	14.9	16.8	21.0	27.0	164.5	200.2	80.8	34.1
Minimum	5.9	6.5	8.3	8.6	9.5	10.2	9.8	18.9	25.1	55.6	27.5	14.9



OCTOBER, 1997



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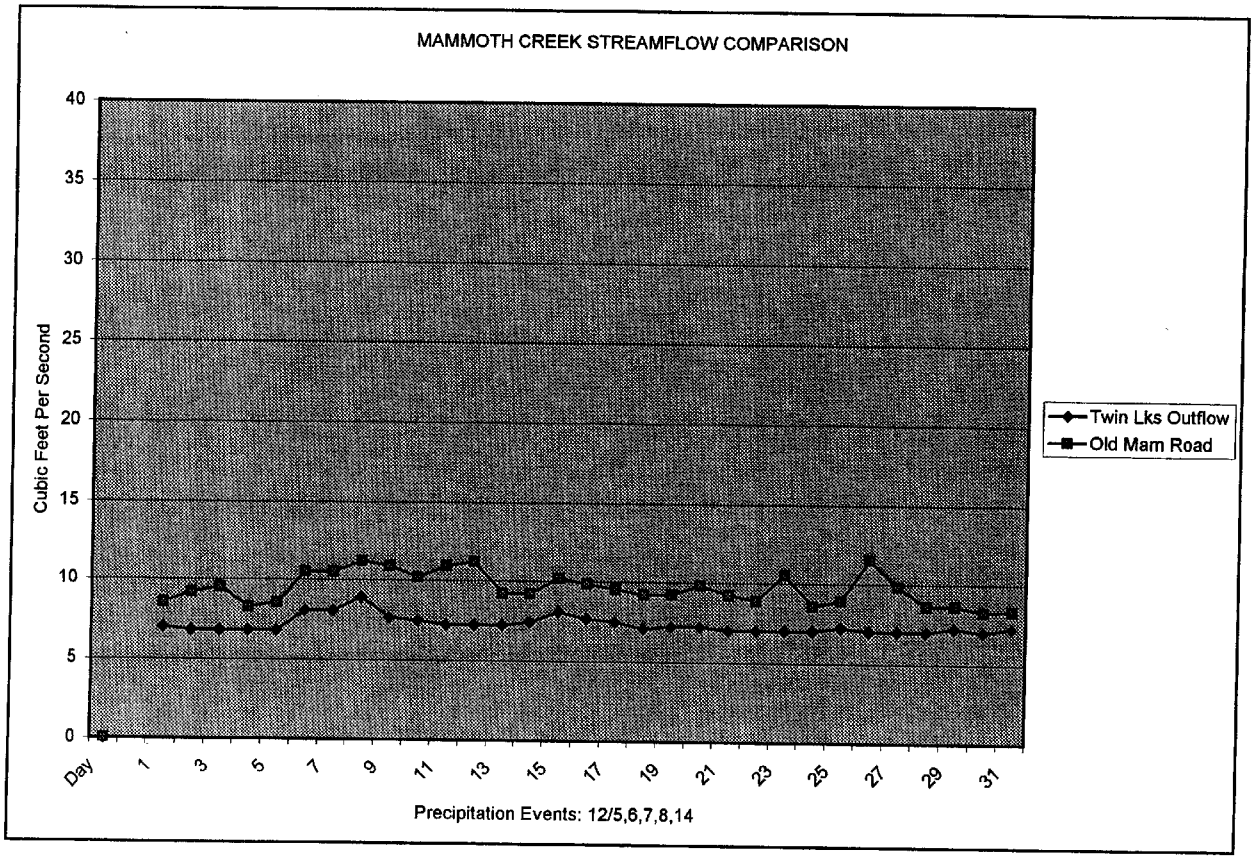

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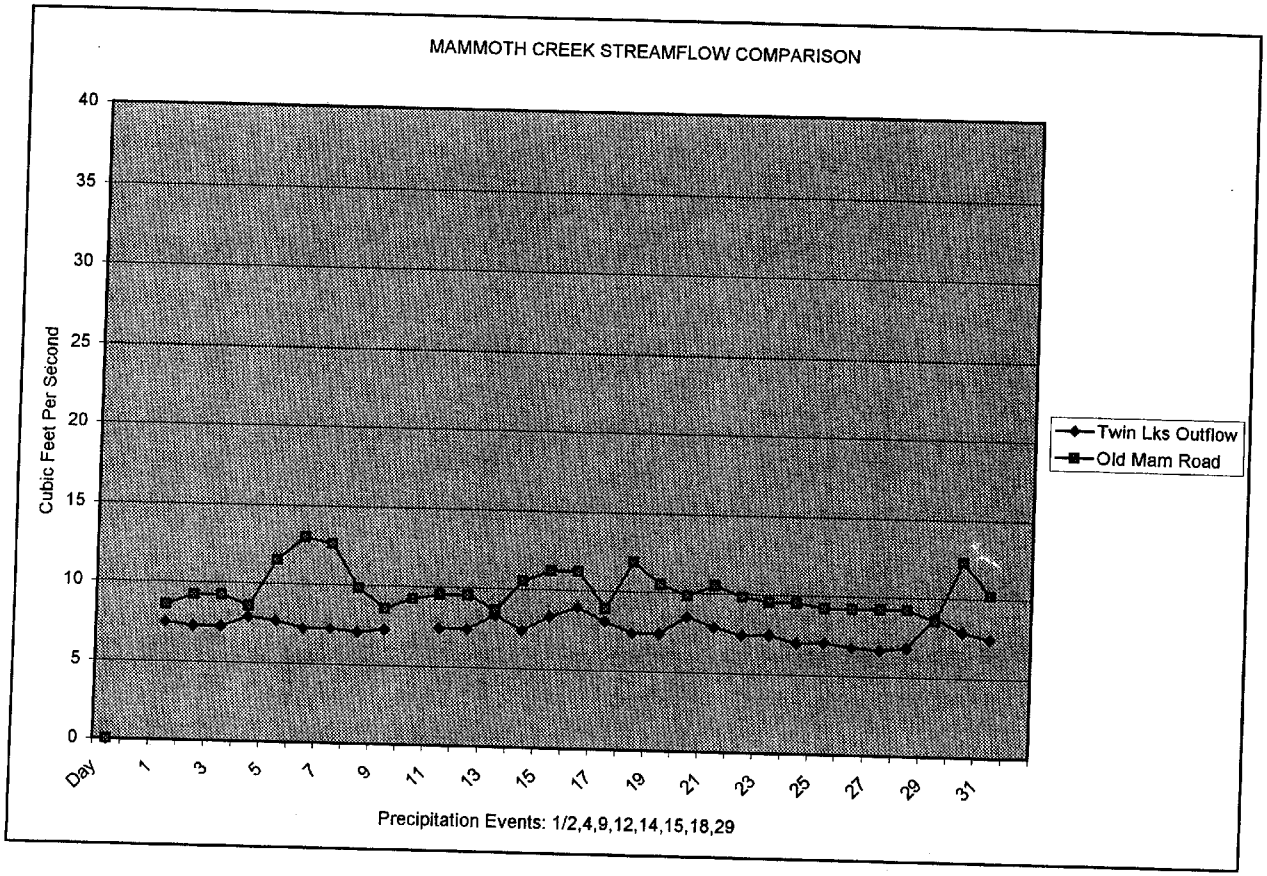

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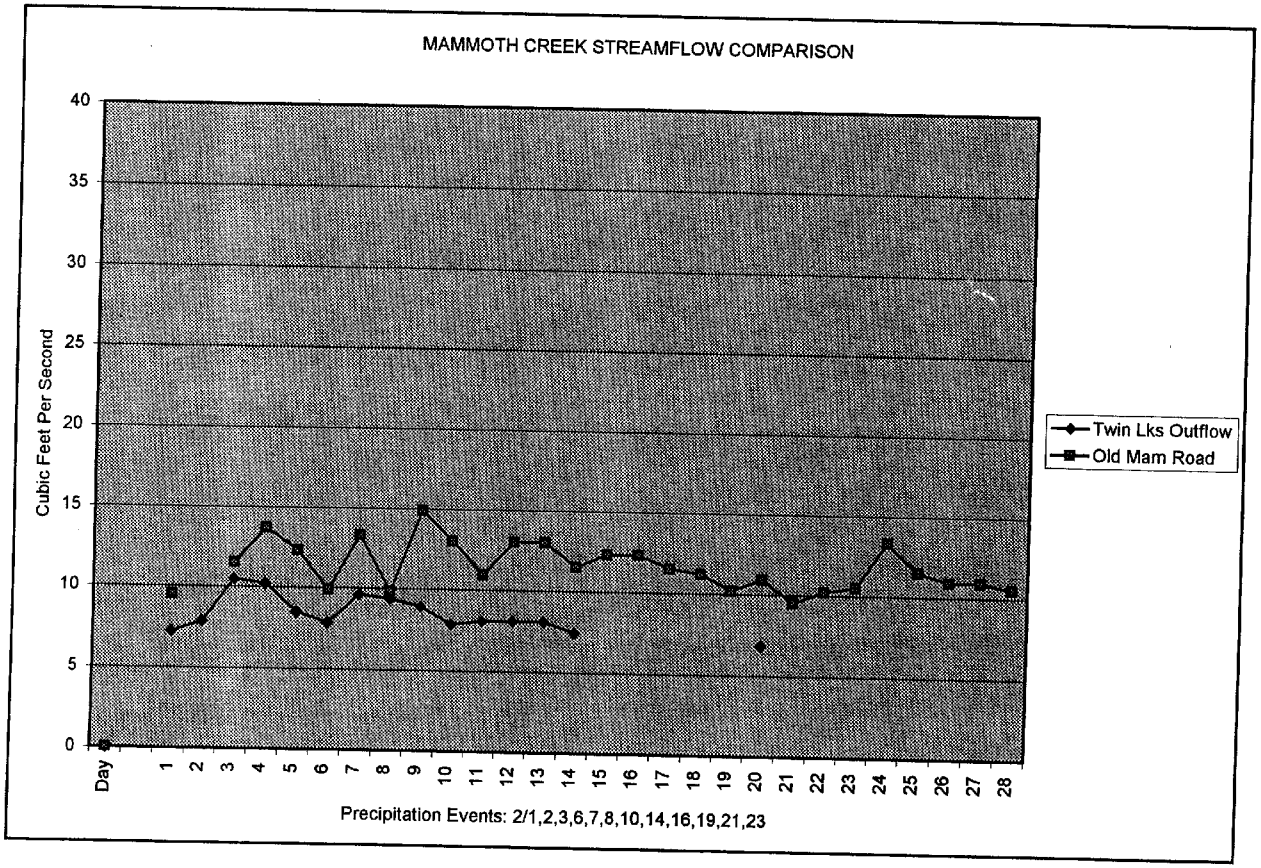

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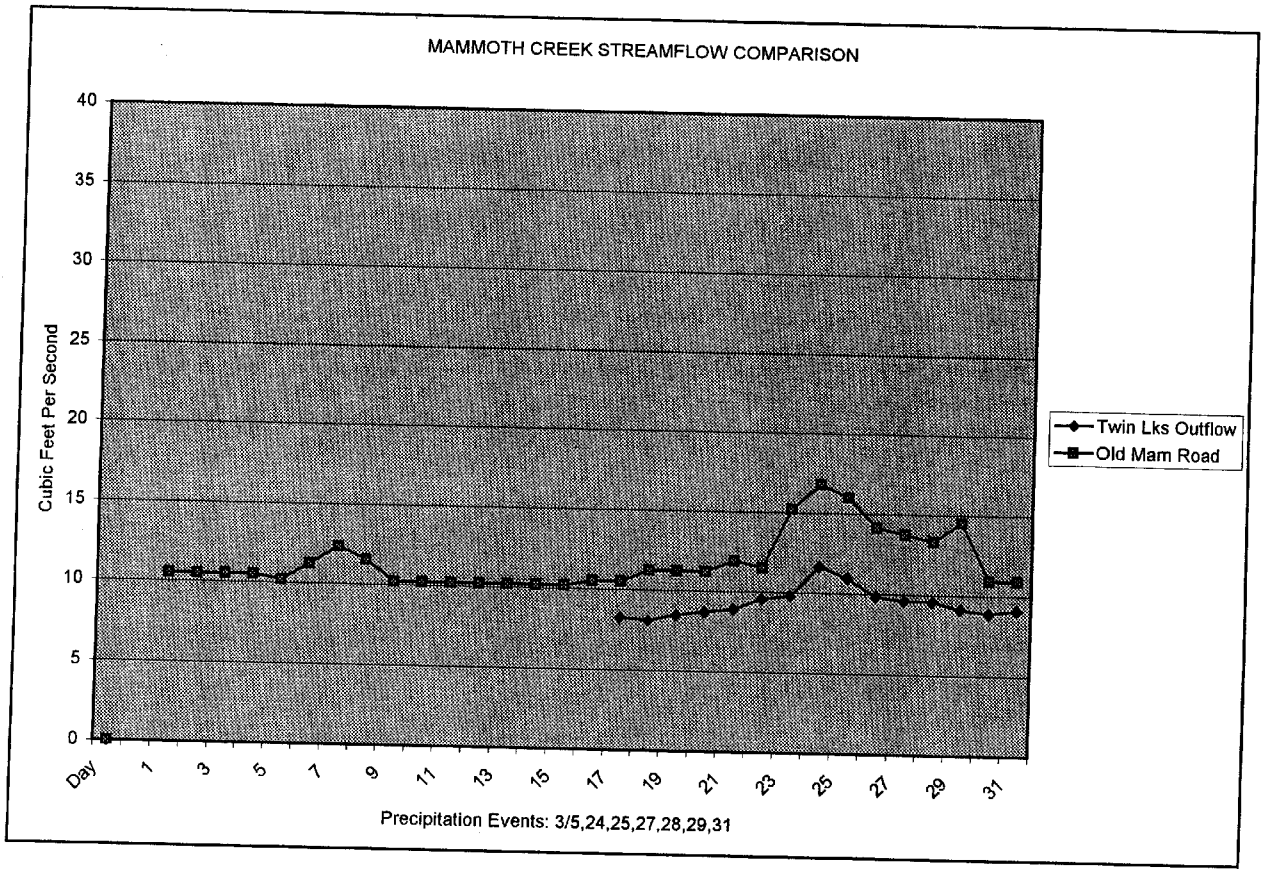
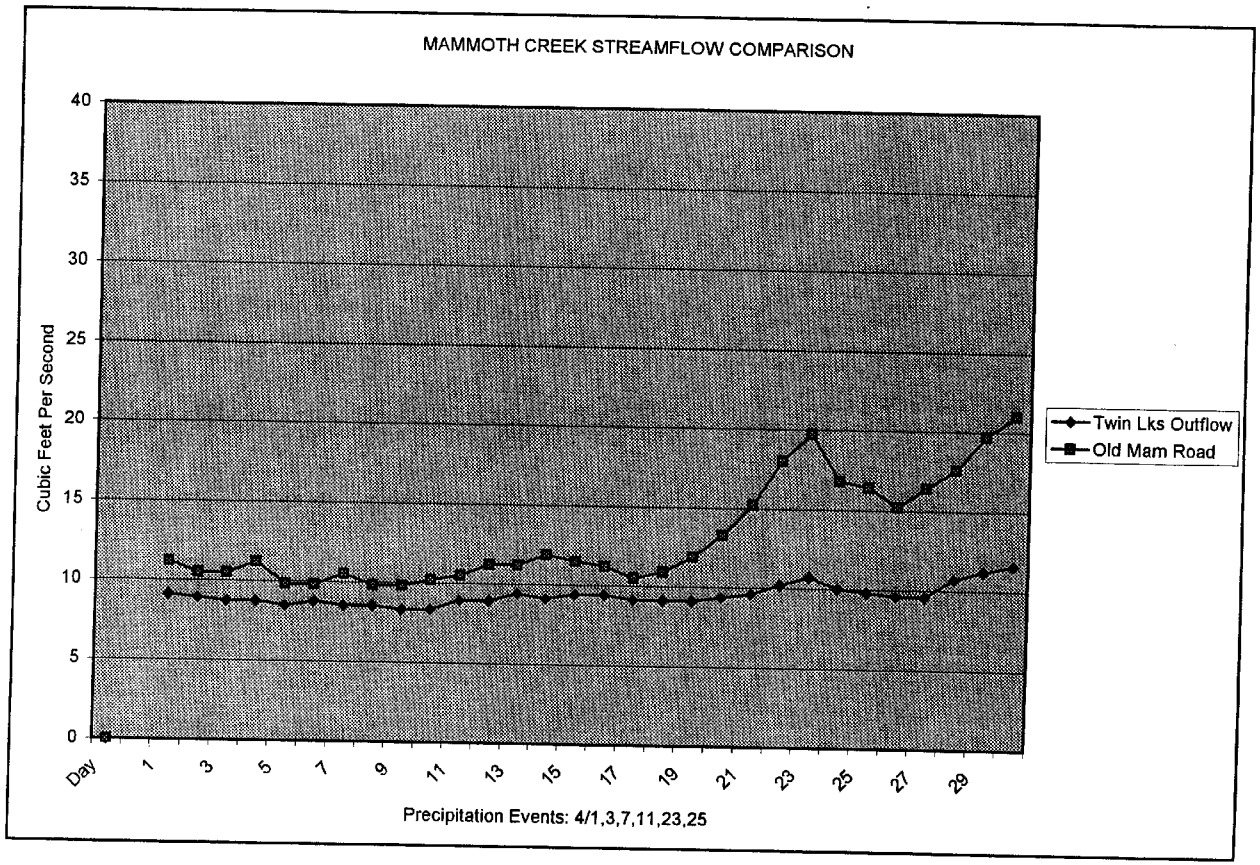
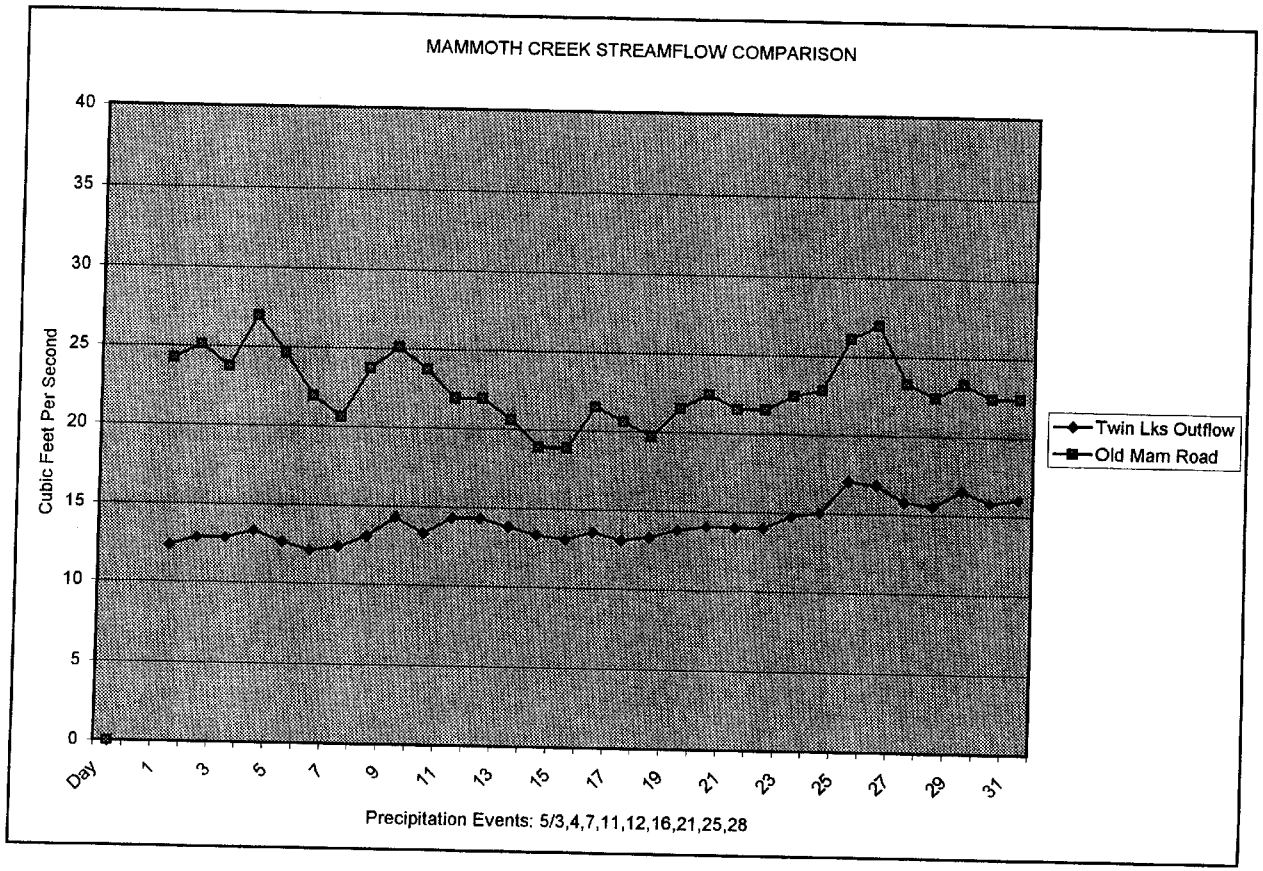

MAMMOTH CREEK STREAMFLOW COMPARISON
Cubic Feet Per Second
40
35
30
25
20
15
10
5
0
Day
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
Precipitation Events: 3/5,24,25,27,28,29,31
Twin Lks Outflow
Old Mam Road

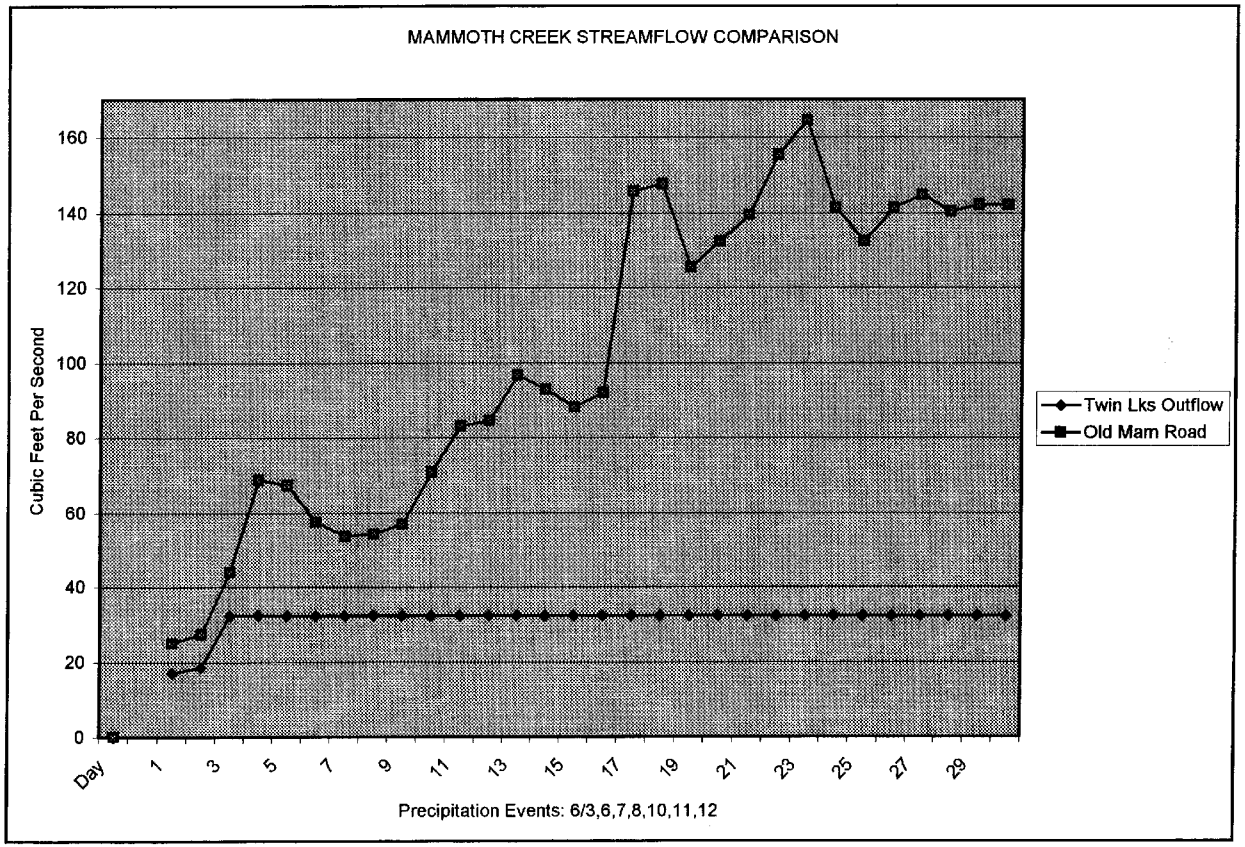
March 1998


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
Precipitation Events: 4/1,3,7,11,23,25
Twin Lks Outflow
Old Mam Road

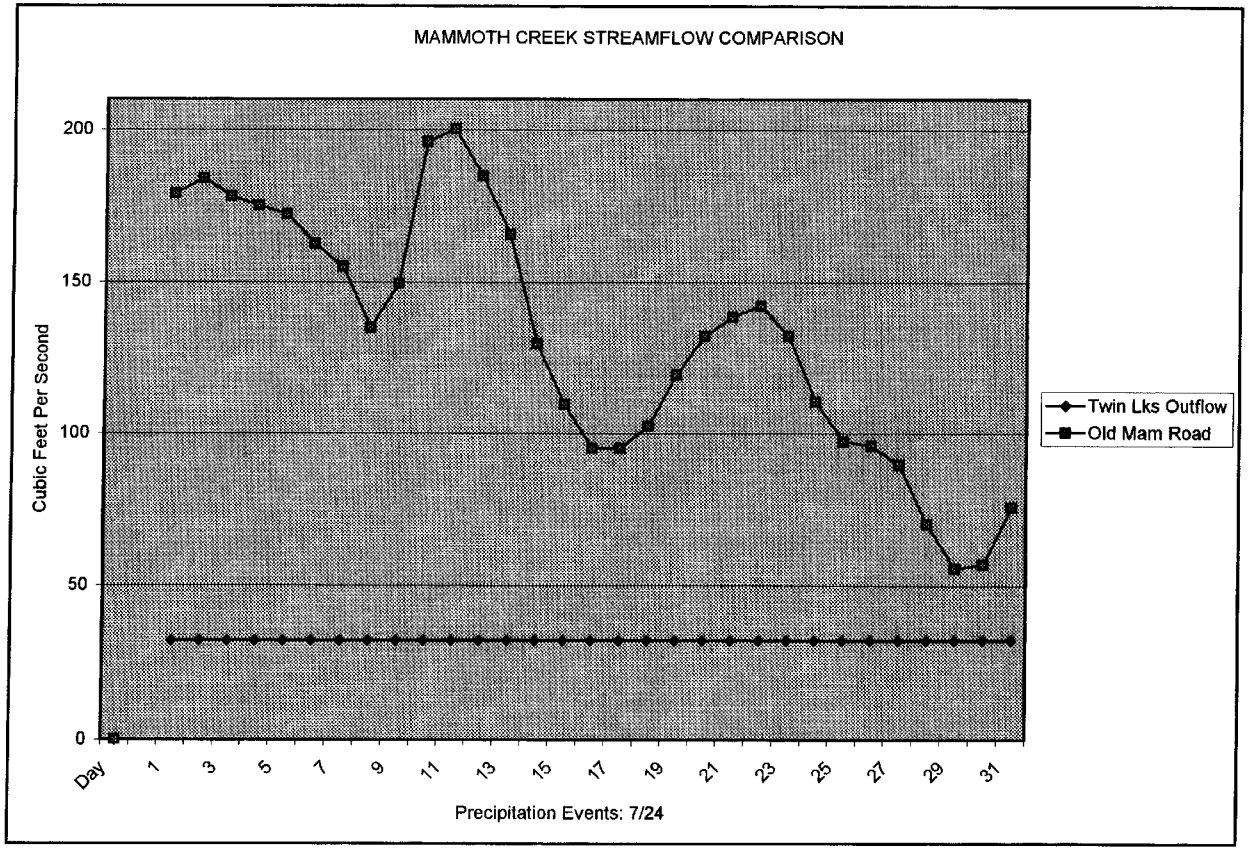
April 1998


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
Precipitation Events: 5/3,4,7,11,12,16,21,25,28
Twin Lks Outflow
Old Mam Road

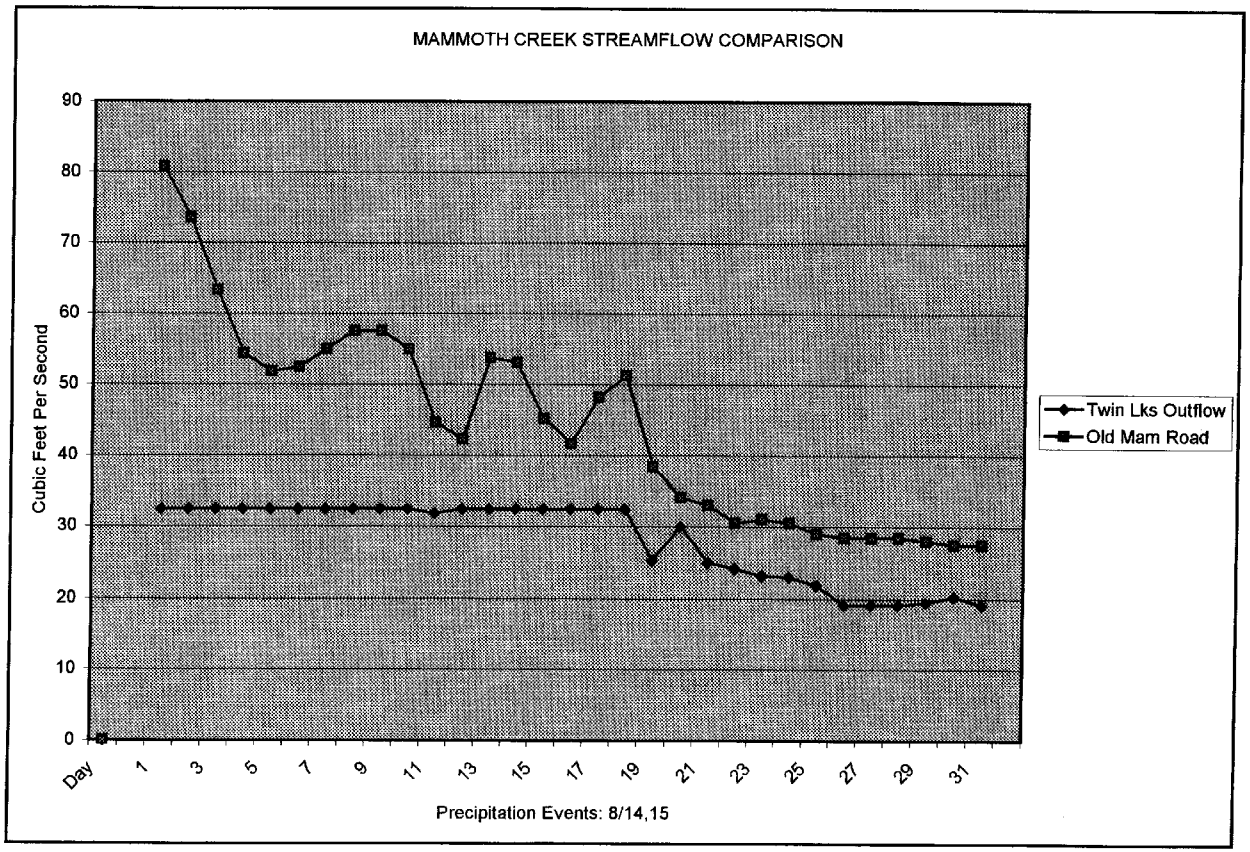
May 1998



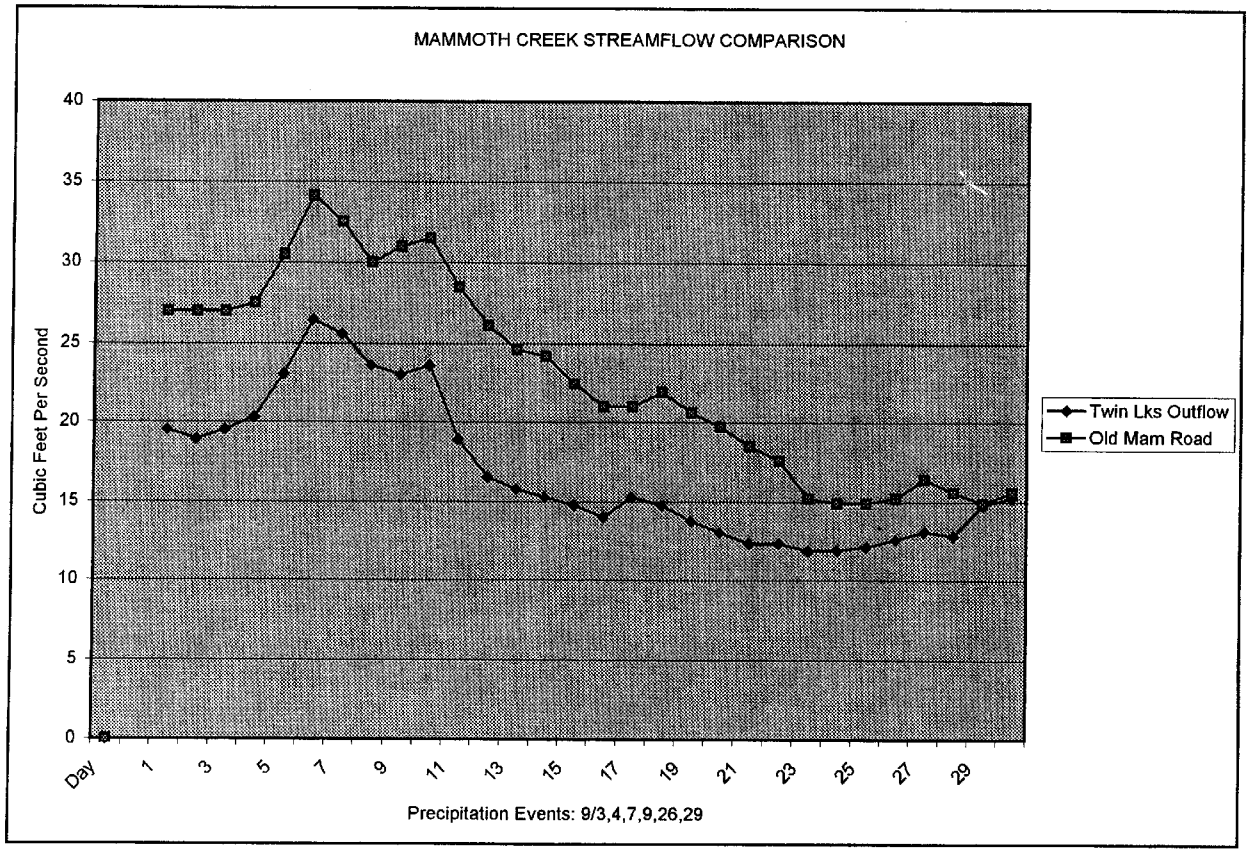
June 1998
(Twin Lakes maximum flow measurement is 32.4 cfs)



July 1998
(Twin Lakes maximum flow measurement is 32.4 cfs)



August 1998
(Twin Lakes maximum flow measurement is 32.4 cfs)



September 1998

APPENDIX G

VALENTINE RESERVE SPRINGFLOW

Valentine Reserve Spring Discharge
Daily Average in Gallons Per Minute
1997-98

Date	Time	24 hr av. Discharge.
04-Nov 97	23:59	54.1
05-Nov	23:59	54.5
06-Nov	23:59	53.2
07-Nov	23:59	54.6
08-Nov	23:59	54.4
09-Nov	23:59	53.9
10-Nov	23:59	55.1
11-Nov	23:59	54.7
12-Nov	23:59	55.1
13-Nov	23:59	55.7
14-Nov	23:59	55.7
15-Nov	23:59	55.8
16-Nov	23:59	55.1
17-Nov	23:59	55.3
18-Nov	23:59	54.5
19-Nov	23:59	54.5
20-Nov	23:59	54.6
21-Nov	23:59	54.2
22-Nov	23:59	58.4
23-Nov	23:59	60.3
24-Nov	23:59	59.6
25-Nov	23:59	59.6
26-Nov	23:59	57.2
27-Nov	23:59	58.9
28-Nov	23:59	58.4
29-Nov	23:59	57.4
30-Nov	23:59	56.8
01-Dec	23:59	56.5
02-Dec	23:59	56.2
03-Dec	23:59	56.6
04-Dec	23:59	56.3
05-Dec	23:59	55.1
06-Dec	23:59	54.7
07-Dec	23:59	53.8
08-Dec	23:59	55.7
09-Dec	23:59	48.3
10-Dec	23:59	34.9
11-Dec	23:59	53.0
12-Dec	23:59	45.1
13-Dec	23:59	49.4
14-Dec	23:59	49.4
15-Dec	23:59	48.3
16-Dec	23:59	48.4
17-Dec	23:59	48.1
18-Dec	23:59	47.8
19-Dec	23:59	47.3
20-Dec	23:59	47.6
21-Dec	23:59	46.6
22-Dec	23:59	46.4
23-Dec	23:59	48.3
24-Dec	23:59	45.5
25-Dec	23:59	44.3
26-Dec	23:59	43.7
27-Dec	23:59	47.8
28-Dec	23:59	47.4
29-Dec	23:59	49.1
30-Dec	23:59	50.2
31-Dec	23:59	48.8
01-Jan-98	23:59	46.2
02-Jan	23:59	46.7
03-Jan	23:59	46.1
04-Jan	23:59	45.6
05-Jan	23:59	45.3
06-Jan	23:59	44.8
07-Jan	23:59	45.3
08-Jan	23:59	46.2
09-Jan	23:59	44.4
10-Jan	23:59	45.5
11-Jan	23:59	45.1
12-Jan	23:59	47.4
13-Jan	23:59	45.4
14-Jan	23:59	44.3
15-Jan	23:59	51.0
16-Jan	23:59	45.4
17-Jan	23:59	45.1
18-Jan	23:59	43.1
19-Jan	23:59	32.7
20-Jan	23:59	44.9
21-Jan	23:59	45.4
22-Jan	23:59	42.4
23-Jan	23:59	36.6
24-Jan	23:59	27.9
25-Jan	23:59	40.4
26-Jan	23:59	39.9
27-Jan	23:59	30.3
28-Jan	23:59	43.0
29-Jan	23:59	37.8
30-Jan	23:59	43.7
31-Jan	23:59	45.0
01-Feb	23:59	43.5
02-Feb	23:59	38.8
03-Feb	23:59	40.4
04-Feb	23:59	38.6
05-Feb	23:59	39.4
06-Feb	23:59	37.4
07-Feb	23:59	44.4
08-Feb	23:59	31.3
09-Feb	23:59	33.2
10-Feb	23:59	43.4
11-Feb	23:59	42.5

Valentine Reserve Spring Discharge
Daily Average in Gallons Per Minute
1997-98

Date	Time	24 hr av. Discharge.
12-Feb98	23:59	40.8
13-Feb	23:59	30.2
14-Feb	23:59	43.4
15-Feb	23:59	45.0
16-Feb	23:59	40.1
17-Feb	23:59	43.5
26-Apr	23:59	73.8
27-Apr	23:59	88.6
28-Apr	23:59	90.4
29-Apr	23:59	85.4
30-Apr	23:59	86.1
01-May	23:59	80.9
02-May	23:59	81.4
03-May	23:59	82.4
04-May	23:59	79.4
05-May	23:59	76.5
06-May	23:59	66.1
07-May	23:59	73.7
08-May	23:59	72.4
09-May	23:59	70.7
10-May	23:59	67.9
11-May	23:59	66.5
12-May	23:59	64.1
13-May	23:59	62.7
14-May	23:59	54.2
15-May	23:59	60.3
16-May	23:59	59.9
17-May	23:59	59.8
18-May	23:59	58.7
19-May	23:59	57.6
20-May	23:59	59.8
11-Jul	23:59	67.7
12-Jul	23:59	70.2
13-Jul	23:59	69.8
14-Jul	23:59	70.7
15-Jul	23:59	67.8
16-Jul	23:59	68.5
17-Jul	23:59	67.8
18-Jul	23:59	65.9
19-Jul	23:59	65.4
20-Jul	23:59	65.3
21-Jul	23:59	64.0
22-Jul	23:59	64.3
23-Jul	23:59	65.7
27-Aug	17:00	61.8
28-Aug	17:00	62.0
29-Aug	17:00	62.3
30-Aug	17:00	62.5
31-Aug	17:00	64.1
01-Sep	17:00	68.8
02-Sep	17:00	51.7
03-Sep	17:00	56.6
04-Sep	17:00	70.3
05-Sep	17:00	58.5
06-Sep	17:00	71.7
07-Sep	17:00	59.1
08-Sep	17:00	72.3
09-Sep	17:00	72.8
10-Sep	17:00	73.3
11-Sep	17:00	73.0
12-Sep	17:00	73.1
13-Sep	17:00	54.5
14-Sep	17:00	72.8
15-Sep	17:00	71.4
16-Sep	17:00	71.0
17-Sep	17:00	70.8
18-Sep	17:00	70.5
19-Sep	17:00	52.9
20-Sep	17:00	70.5
21-Sep	17:00	57.4
22-Sep	17:00	70.2
23-Sep	17:00	57.4
24-Sep	17:00	70.6
25-Sep	17:00	70.9
26-Sep	17:00	71.2
27-Sep	17:00	71.5
28-Sep	17:00	71.3
29-Sep	17:00	71.6
30-Sep	17:00	72.1

Valentine Reserve Spring Discharge
1997-98 Daily Average