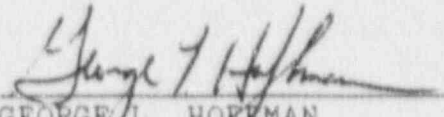


40-8903

GROUND-WATER MONITORING  
FOR HOMESTAKE'S MILL DISCHARGE PLAN  
DP-200 AND NRC LICENSE SUA-1471, 1990

FOR:  
HOMESTAKE MINING COMPANY

BY:  
HYDRO-ENGINEERING  
JANUARY, 1991

  
GEORGE L. HOFFMAN,  
P.E. 5831 N.M.  
HYDROLOGIST

9102260257 910131  
PDR ADOCK 04008903  
C PDR

W/ltt 1/31/91  
91-0225

TABLE OF CONTENTS

	<u>PAGE NO.</u>
1.0 INTRODUCTION, SUMMARY AND RECOMMENDATIONS . . . . .	1.1-1
1.1 INTRODUCTION. . . . .	1.1-1
1.2 SUMMARY . . . . .	1.2-1
1.3 RECOMMENDATIONS . . . . .	1.3-1
2.0 ALLUVIAL AQUIFER MONITORING . . . . .	2.0-1
2.1 PUMPING AND INJECTION RATES . . . . .	2.1-1
2.2 WATER LEVELS. . . . .	2.2-1
2.3 WATER QUALITY . . . . .	2.3-1
2.3.1 SULFATE CONCENTRATIONS . . . . .	2.3-1
2.3.2 URANIUM CONCENTRATIONS . . . . .	2.3-3
2.3.3 SELENIUM CONCENTRATIONS . . . . .	2.3-4
2.3.4 MOLYBDENUM CONCENTRATIONS . . . . .	2.3-5
2.3.5 RADIUM-226 PLUS RADIUM-228 CONCENTRATIONS . . . . .	2.3-5
2.3.6 OTHER CONSTITUENTS. . . . .	2.3-5a
3.0 CHINLE AQUIFER MONITORING . . . . .	3.0-1
3.1 INJECTION RATE. . . . .	3.1-1
3.2 WATER LEVELS. . . . .	3.2-1
3.3 WATER QUALITY . . . . .	3.3-1
3.3.1 SULFATE CONCENTRATIONS. . . . .	3.3-1
3.3.2 URANIUM CONCENTRATIONS . . . . .	3.3-1
3.3.3 SELENIUM CONCENTRATIONS . . . . .	3.3-2
3.3.4 MOLYBDENUM CONCENTRATIONS . . . . .	3.3-2
3.3.5 OTHER CONSTITUENTS. . . . .	3.3-3
4.0 SAN ANDRES AQUIFER MONITORING . . . . .	4.0-1
5.0 REFERENCES . . . . .	5.0-1

TABLE OF CONTENTS - DRAWINGS

(SEE POCKETS)

- 2.0-1 LOCATION OF HOMESTAKE'S ALLUVIAL WELLS
- 2.2-1 WATER-LEVEL ELEVATION FOR THE ALLUVIAL AQUIFER NEAR  
THE HOMESTAKE MILL, FALL 1990, IN FEET ABOVE MSL
- 2.3-1 SULFATE CONCENTRATIONS FOR THE ALLUVIAL AQUIFER,  
IN mg/l
- 2.3-2 URANIUM CONCENTRATIONS FOR THE ALLUVIAL AQUIFER,  
FALL 1990, IN mg/l
- 2.3-3 SELENIUM CONCENTRATIONS FOR THE ALLUVIAL AQUIFER,  
FALL 1990, IN mg/l
- 2.3-4 MOLYBDENUM CONCENTRATIONS FOR THE ALLUVIAL AQUIFER,  
FALL 1990, IN mg/l
- 3.1-1 WATER-LEVEL ELEVATION OF THE UPPER AND MIDDLE  
CHINLE AQUIFERS NEAR HOMESTAKE'S MILL, FALL 1990,  
IN FEET ABOVE MSL

TABLE OF CONTENTS - FIGURES

	<u>PAGE NO.</u>
2.1-1 INJECTION RATES FOR THE BROADVIEW AND MURRAY ACRES INJECTION SYSTEMS . . . . .	2.1-2
2.1-2 COLLECTION RATES FOR IMPOUNDMENT AND MURRAY ACRES COLLECTION WELLS. . . . .	2.1-3
2.2-1 WATER-LEVEL ELEVATION FOR WELLS I, J AND X. . . . .	2.2-3
2.2-2 WATER-LEVEL ELEVATION FOR WELLS DP AND DQ . . . . .	2.2-4
2.2-3 WATER-LEVEL ELEVATION FOR WELLS DN AND DO . . . . .	2.2-5
2.2-4 WATER-LEVEL ELEVATION FOR WELLS SO AND SP . . . . .	2.2-6
2.2-5 WATER-LEVEL ELEVATION FOR WELLS S1 AND S2 . . . . .	2.2-7
2.2-6 WATER-LEVEL ELEVATION FOR WELLS WR11, W AND S3. . . . .	2.2-8
2.2-7 WATER-LEVEL ELEVATION FOR WELLS B, D1 AND M5. . . . .	2.2-9
2.2-8 WATER-LEVEL ELEVATION FOR WELLS A1 AND DZ . . . . .	2.2-10
2.2-9 WATER-LEVEL ELEVATION FOR WELLS SUB3, 492 AND 490 . . . . .	2.2-11
2.2-10 WATER-LEVEL ELEVATION FOR WELLS 844, 846 AND FB . . . . .	2.2-12
2.3-1 SULFATE CONCENTRATIONS FOR WELLS WR11, S3 AND SC. . . . .	2.3-6
2.3-2 SULFATE CONCENTRATIONS FOR WELLS B, D1 AND M5 . . . . .	2.3-7
2.3-3 SULFATE CONCENTRATIONS FOR WELLS F, E AND BP . . . . .	2.3-8
2.3-4 SULFATE CONCENTRATIONS FOR WELLS Z, Y AND DQ. . . . .	2.3-9
2.3-5 SULFATE CONCENTRATIONS FOR WELLS I, J, X AND JC . . . . .	2.3-10
2.3-6 SULFATE CONCENTRATIONS FOR WELLS SUB3, 492 AND 490 . . . . .	2.3-10
2.3-7 SULFATE CONCENTRATIONS FOR WELLS 840, 846 AND 844 . . . . .	2.3-12
2.3-8 URANIUM CONCENTRATIONS FOR WELLS WR11, S3 AND SC. . . . .	2.3-13
2.3-9 URANIUM CONCENTRATIONS FOR WELLS B, D1 AND M5 . . . . .	2.3-14
2.3-10 URANIUM CONCENTRATIONS FOR WELLS F, E AND BP. . . . .	2.3-15
2.3-11 URANIUM CONCENTRATIONS FOR WELLS Z, Y AND DQ. . . . .	2.3-16

TABLE OF CONTENTS - FIGURES (CONTINUED)

	<u>PAGE NO.</u>
2.3-12 URANIUM CONCENTRATIONS FOR WELLS I, J, X AND JC . . . . .	2.3-17
2.3-13 URANIUM CONCENTRATIONS FOR WELLS SUB3, 453 AND SUB2. . . . .	2.3-18
2.3-14 URANIUM CONCENTRATIONS FOR WELLS SUB1, 490 AND 492 . . . . .	2.3-19
2.3-15 URANIUM CONCENTRATIONS FOR WELLS 840, 846 AND 844 . . . . .	2.3-20
2.3-16 SELENIUM CONCENTRATIONS FOR WELLS WR11, S3 AND SC . . . . .	2.3-21
2.3-17 SELENIUM CONCENTRATIONS FOR WELLS B, D1 AND M5. . . . .	2.3-22
2.3-18 SELENIUM CONCENTRATIONS FOR WELLS F, E AND BP . . . . .	2.3-23
2.3-19 SELENIUM CONCENTRATIONS FOR WELLS Z, Y AND DQ . . . . .	2.3-24
2.3-20 SELENIUM CONCENTRATIONS FOR WELLS I, J, X AND JC. . . . .	2.3-25
2.3-21 SELENIUM CONCENTRATIONS FOR WELLS SUB3, 453 AND SUB2. . . . .	2.3-26
2.3-22 SELENIUM CONCENTRATIONS FOR WELLS SUB1, 490, AND 492 . . . . .	2.3-27
2.3-23 SELENIUM CONCENTRATIONS FOR WELLS 840, 846, AND 844 . . . . .	2.3-28
2.3-24 MOLYBDENUM CONCENTRATIONS FOR WELLS WR11, S3 AND SC. . . . .	2.3-29
2.3-25 MOLYBDENUM CONCENTRATIONS FOR WELLS B, D1 AND M5. . . . .	2.3-30
2.3-26 MOLYBDENUM CONCENTRATIONS FOR WELLS F, E AND BP. . . . .	2.3-31
2.3-27 MOLYBDENUM CONCENTRATIONS FOR WELLS Z, Y AND DQ . . . . .	2.3-32
2.3-28 MOLYBDENUM CONCENTRATIONS FOR WELLS I, J, X AND JC. . . . .	2.3-33
2.3-29 MOLYBDENUM CONCENTRATIONS FOR WELLS SUB3, 453, AND SUB2. . . . .	2.3-34
2.3-30 MOLYBDENUM CONCENTRATIONS FOR WELLS SUB1, 490, AND 492 . . . . .	2.3-35

TABLE OF CONTENTS - FIGURES (CONTINUED)

	<u>PAGE NO.</u>
2.3-31 MOLYBDENUM CONCENTRATIONS FOR WELLS 840, 846, AND 844 . . . . .	2.3-36
2.3-32 RADIUM-226 AND RADIUM-228 CONCENTRATIONS FOR THE ALLUVIAL AQUIFER, FALL 1990, IN pCi/l . . . . .	2.3-37
2.3-33 CHROMIUM CONCENTRATIONS FOR THE ALLUVIAL AQUIFER, FALL 1990, IN mg/l . . . . .	2.3-38
2.3-34 VANADIUM CONCENTRATIONS FOR THE ALLUVIAL AQUIFER, FALL 1990, IN mg/l . . . . .	2.3-39
2.3-35 THORIUM-230 CONCENTRATIONS FOR THE ALLUVIAL AQUIFER, FALL 1990, IN pCi/l . . . . .	2.3-40
3.0-1 LOCATION OF CHINLE WELLS . . . . .	3.0-2
3.1-1 INJECTION RATES FOR THE UPPER CHINLE WELL CW1 . . . . .	3.1-2
3.2-1 WATER-LEVEL ELEVATION FOR WELLS CW2 AND 493 . . . . .	3.2-2
3.2-2 WATER-LEVEL ELEVATION FOR WELLS CW3, CW4 AND 494 . . . . .	3.2-3
3.3-1 SULFATE CONCENTRATIONS FOR THE MIDDLE AND UPPER CHINLE AQUIFER, FALL 1990, IN mg/l . . . . .	3.3-4
3.3-2 SULFATE CONCENTRATIONS FOR WELLS CW2 AND 493 . . . . .	3.3-5
3.3-3 SULFATE CONCENTRATIONS FOR WELLS 434 AND WCW . . . . .	3.3-6
3.3-4 SULFATE CONCENTRATIONS FOR WELLS CW3, CW4 AND 494 . . . . .	3.3-7
3.3-5 URANIUM CONCENTRATIONS FOR THE MIDDLE AND UPPER CHINLE AQUIFER, FALL 1990, IN mg/l . . . . .	3.3-8
3.3-6 URANIUM CONCENTRATIONS FOR WELLS CW2 AND 493 . . . . .	3.3-9
3.3-7 URANIUM CONCENTRATIONS FOR WELLS 434 AND WCW . . . . .	3.3-10
3.3-8 URANIUM CONCENTRATIONS FOR WELLS CW3, CW4 AND 494 . . . . .	3.3-11
3.3-9 SELENIUM CONCENTRATIONS FOR THE MIDDLE AND UPPER CHINLE AQUIFER, FALL 1990, IN mg/l . . . . .	3.3-12
3.3-10 SELENIUM CONCENTRATIONS FOR WELLS CW2 AND 493 . . . . .	3.3-13

TABLE OF CONTENTS - FIGURES (CONTINUED)

	<u>PAGE NO.</u>
3.3-11 SELENIUM CONCENTRATIONS FOR WELLS 434 AND WCW . . .	3.3-14
3.3-12 SELENIUM CONCENTRATIONS FOR WELLS CW3, CW4 AND 494 . . . . .	3.3-15
3.3-13 MOLYBDENUM CONCENTRATIONS FOR THE MIDDLE AND UPPER CHINLE AQUIFER, FALL 1990, IN mg/l . . . . .	3.3-16
3.3-14 MOLYBDENUM CONCENTRATIONS FOR WELLS CW2 AND 493 . . .	3.3-17
3.3-15 MOLYBDENUM CONCENTRATIONS FOR WELLS 434 AND WCW . . .	3.3-18
3.3-16 MOLYBDENUM CONCENTRATIONS FOR WELLS CW3, CW4 AND 494 . . . . .	3.3-19
4.0-1 LOCATION OF SAN ANDRES WELLS . . . . .	4.0-2
4.0-2 SULFATE CONCENTRATIONS FOR WELLS DEEP NO. 1 AND DEEP NO. 2 . . . . .	4.0-2

TABLE OF CONTENTS - TABLES

	<u>PAGE NO.</u>
2.2-1 ALLUVIAL AQUIFER WATER LEVELS . . . . .	2.2-13
2.2-2 WATER LEVELS FOR MURRAY ACRES WELLS . . . . .	2.2-51
2.2-3 WATER LEVELS FOR BROADVIEW ACRES WELLS. . . . .	2.2-52
2.2-4 WATER LEVELS FOR FELICE ACRES WELLS . . . . .	2.2-53
2.2-5 WATER LEVELS FOR PLEASANT VALLEY ESTATES AND NORTH OF PLEASANT VALLEY ESTATES WELLS. . . . .	2.2-54
2.3-1 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS CA THROUGH ION_BAL. . . . .	2.3-41
2.3-2 WATER QUALITY ANALYSES FOR HOMESTAKE'S ALLUVIAL WELLS PH THROUGH TH-230 . . . . .	2.3-53
2.3-3 WATER QUALITY ANALYSES FOR MURRAY ACRES ALLUVIAL WELLS CA THROUGH ION_BAL . . . . .	2.3-68
2.3-4 WATER QUALITY ANALYSES FOR MURRAY ACRES ALLUVIAL WELLS PH THROUGH TH-230 . . . . .	2.3-69
2.3-5 WATER QUALITY ANALYSES FOR BROADVIEW ACRES ALLUVIAL WELLS CA THROUGH ION_BAL . . . . .	2.3-70
2.3-6 WATER QUALITY ANALYSES FOR BROADVIEW ACRES ALLUVIAL WELLS PH THROUGH TH-230. . . . .	2.3-71
2.3-7 WATER QUALITY ANALYSES FOR FELICE ACRES ALLUVIAL WELLS CA THROUGH ION_BAL . . . . .	2.3-72
2.3-8 WATER QUALITY ANALYSES FOR FELICE ACRES ALLUVIAL WELLS PH THROUGH TH-230 . . . . .	2.3-73
2.3-9 WATER QUALITY ANALYSES FOR PLEASANT VALLEY ALLUVIAL WELLS CA THROUGH ION_BAL . . . . .	2.3-74
2.3-10 WATER QUALITY ANALYSES FOR PLEASANT VALLEY ALLUVIAL WELLS PH THROUGH TH-230. . . . .	2.3-75
2.3-11 WATER QUALITY ANALYSES FOR REGIONAL ALLUVIAL WELLS CA THROUGH ION_BAL . . . . .	2.3-76
2.3-12 WATER QUALITY ANALYSES FOR REGIONAL ALLUVIAL WELLS PH THROUGH TH-230 . . . . .	2.3-77
3.2-1 CHINLE AQUIFERS WATER LEVELS. . . . .	3.2-4



TABLE OF CONTENTS - TABLES (CONTINUED)

	<u>PAGE NO.</u>
3.3-1 CHINLE AQUIFERS WATER QUALITY DATA CA THROUGH ION_BAL. . . . .	3.3-20
3.3-2 CHINLE AQUIFERS WATER QUALITY DATA PH THROUGH TH-230 . . . . .	3.3-22
4.0-1 SAN ANDRES AQUIFER WATER QUALITY DATA CA THROUGH COND . . . . .	4.0-4
4.0-2 SAN ANDRES AQUIFER WATER QUALITY DATA PH THROUGH CD. . . . .	4.0-5
4.0-3 SAN ANDRES AQUIFER WATER QUALITY DATA PB THROUGH CR. . . . .	4.0-6

## 1.0 INTRODUCTION, SUMMARY AND RECOMMENDATIONS

### 1.1 INTRODUCTION

This report presents results of ground-water monitoring for Homestake's discharge plan DP-200 and the annual monitoring report for NRC License SUA-1471 for 1990. The report also presents the areal extent of the hazardous constituents for this site. The corrective action plan was submitted to the NRC in Hydro-Engineering (1989). Hydro-Engineering (1981, last update, June, 1983) presents DP-200. This is the second annual monitoring report to DP-200 and has been preceded by twelve quarterly and four semi-annual monitoring reports. Hydro-Engineering (1983a, 1983b, 1984a, 1984b, 1984c, 1985a, 1985b, 1985c, 1985d, 1986a, 1986b and 1986c) presents the results of the twelve quarterly monitoring reports while Hydro-Engineering (1987a, 1987b, 1988a and 1988b) presents the four semi-annual monitoring reports. Hydro-Engineering (1988c) presents the renewal report to DP-200 and Hydro-Engineering (1990) presents the first annual monitoring report.

The Broadview Acres injection system has been used to reduce concentrations in the alluvial aquifer in Broadview and Felice Acres since 1977. Collection wells near the large impoundment have been operated to intercept seepage in the alluvium since 1978.

The Murray Acres collection system has pumped alluvial water with elevated concentrations from the northeast corner of Murray Acres since 1980. The Murray Acres injection system started injection of water into the alluvium on the north side of this subdivision in August of 1983. Wells WR1R and WR2 were added to the Murray Acres injection system during the week of October 17, 1989. Injection into Broadview injection wells GW1, GW2 and GW3 started in January of 1990. Injection into the Upper Chinle aquifer in well CW5 started in May of 1984. Injection is pushing the elevated constituents north of Broadview Acres, north of Murray and northeast of Pleasant Valley in the alluvial aquifer back toward the pumpback collection system. Usage of the lined brine evaporation pond started in October of 1986 and the lined evaporation pond on the small impoundment in November of 1990.

## 1.2 SUMMARY

The Broadview Acres injection wells have been used to inject an average of 184 gpm into the alluvial aquifer during 1990. The hazardous constituents of all alluvial water in Broadview, Felice and Murray Acres has been reduced to concentrations below the State standards. The pumpback collection wells produced an average of 239 gpm this monitoring period. This rate is effectively intercepting the present-day seepage. Operation of the Murray Acres collection system has continued during 1990 at an average rate of 73.7 gpm. The Murray Acres injection system has operated at an average injection rate of 268 gpm for this period. Injection into the Upper Chinle aquifer has averaged 30.4 gpm for 1990.

Water levels in the alluvial aquifer were monitored in numerous wells. The flow patterns of this aquifer during 1990 have been similar to those observed since the Murray Acres injection system has been in operation. The reversed ground-water flow direction between the Murray Acres injection wells and the pumpback collection wells has been maintained this period. Water quality concentrations during 1990 were also very similar to those of 1989.

Several wells were monitored in the Upper and Middle Chinle aquifers. The water levels for the Fall of 1990 in the Upper and Middle Chinle aquifers are similar to those presented in the last report (see Hydro-Engineering, 1990). The changed flow directions in the Upper Chinle aquifer have been maintained by injection into well CW5. Water quality in these two aquifers was observed to be similar to those presented in 1989.

### 1.3 RECOMMENDATIONS

Collection from wells K2, KE and Y near the south edge of the small impoundment is recommended to be started in 1991. Collection wells E and Z are recommended to be switched to injection. Collection well JC will be switched after concentrations near this well are reduced. These changes should keep the elevated concentrations in this area moving at a reasonable rate to the north.

## 2.0 ALLUVIAL-AQUIFER MONITORING

The alluvial aquifer monitoring program is listed in Table 8.0-1 of Homestake's discharge plan, DP-200. Table 5-1 of Hydro-Engineering (1989) presents the monitoring program with some additional hazardous constituents added by the NRC. Alluvial wells are monitored quarterly up gradient and down gradient of Homestake's impoundment. Numerous alluvial wells are monitored in each of the four subdivisions, Murray Acres, Broadview Acres, Felice Acres, and Pleasant Valley Estates. Drawing 2.0-1 presents the location of all alluvial wells near the Homestake property. This drawing should be referenced when using the other drawings for the alluvial well names. Samples from residential alluvial wells 815 and 840 were not obtained during the sampling period due to the access problem.

## 2.1 PUMPING AND INJECTION RATES

The Broadview Acres injection system was operated at an average rate of 184 gpm for 1990. Figure 2.1-1 presents the monthly average injection rates for the Broadview and Murray Acres injection systems. The Murray Acres injection system averaged 268 gpm this period.

The monthly collection rates for the Murray Acres wells are presented in Figure 2.1-2. The Murray Acres collection rates have recently declined due to the restoration of the water quality at some sites. Murray Acres collection wells, WR3, WR5, E, Z and JC produced a total average collection rate of 73.7 gpm in 1990. Pumpback collection wells DB, DE, DF, DG, DH, EE, SA, SB, SC, SE, DR, DS, M1, SD4, DA2, DT, SQ and SR were used during this annual period. The collection wells have averaged a total pumping rate of 239 gpm in 1990. The pumpback collection system monthly collection rates are also presented in Figure 2.1-2.

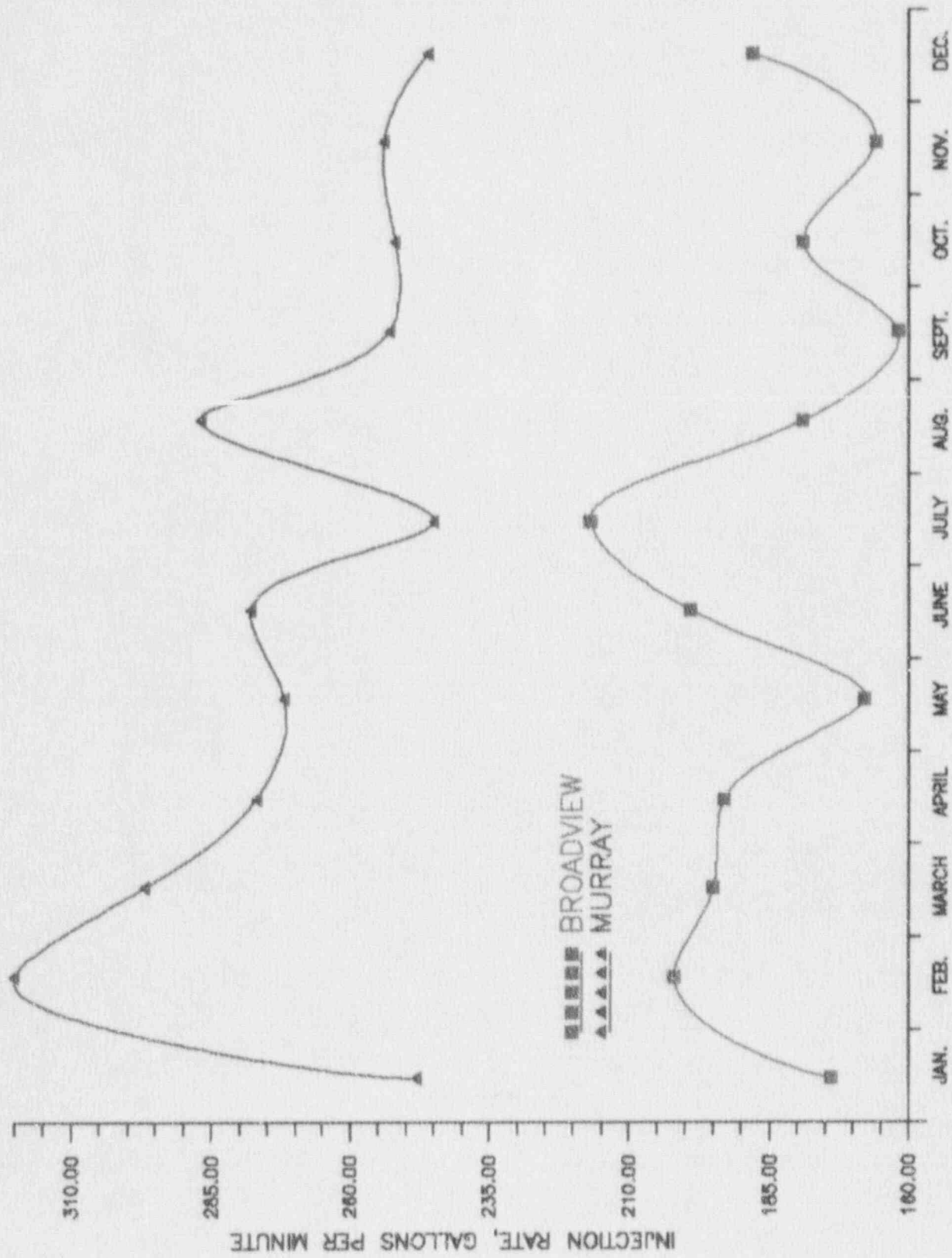


FIGURE 2.1-1. INJECTION RATES FOR BROADVIEW AND MURRAY ACRES INJECTION SYSTEM.

2.1--3

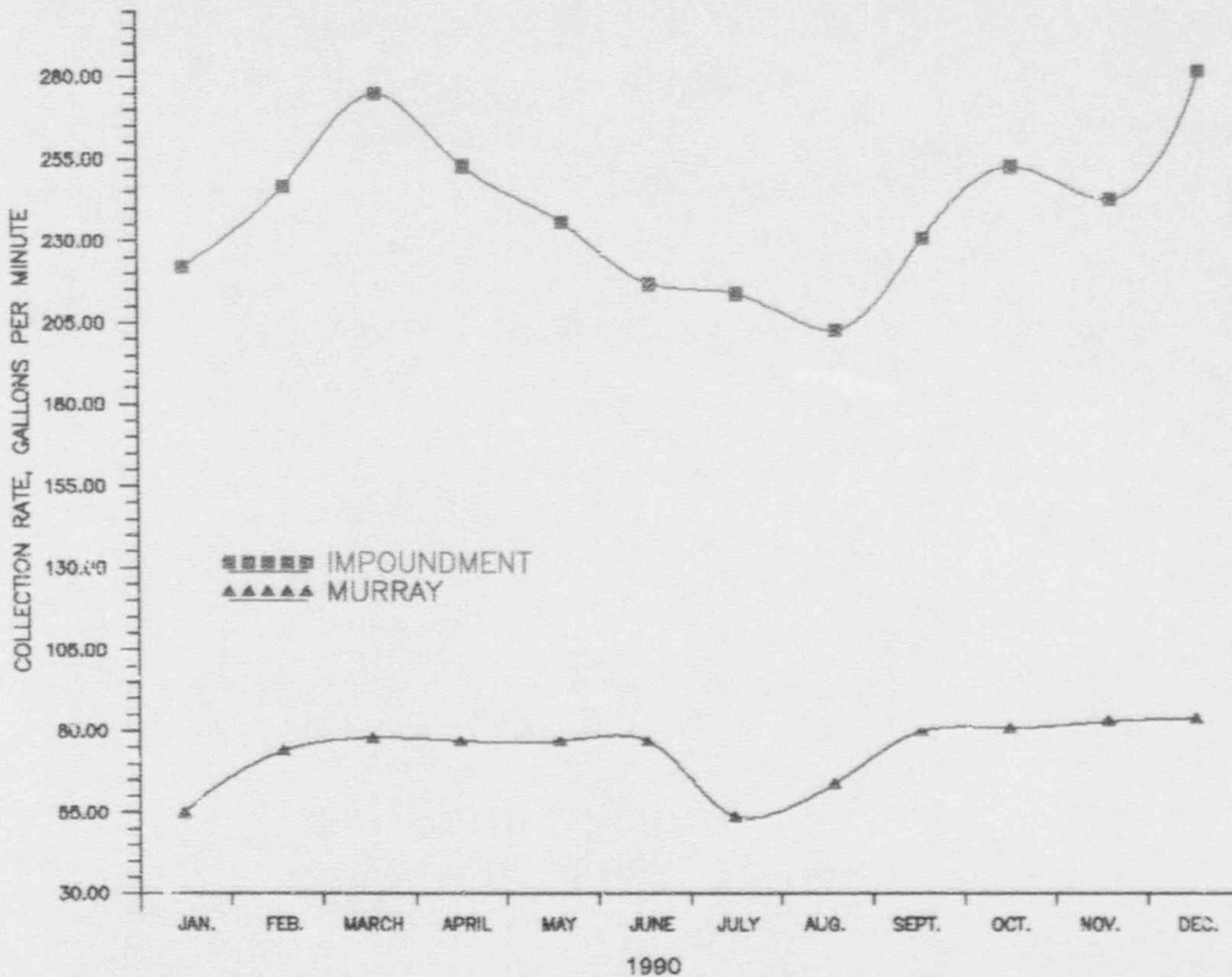


FIGURE 2.1-2. COLLECTION RATES FOR IMPOUNDMENT AND MURRAY ACRES COLLECTION WELLS



## 2.2 WATER LEVEL

Drawing 2.2-1 presents the Fall, 1990 water-level elevation map for the alluvial aquifer near Homestake's mill. This map shows the limit of the alluvial aquifer due to saturation. These aquifer limits are not shown on the alluvial concentration maps but limit the extent of some contours. The flow patterns in the alluvial aquifer are very similar to those observed in Fall, 1989 (see Drawing 2.3-1 of Hydro-Engineering 1990). One-foot contour intervals are presented in the area of the pumpback collection wells where space allows. All of the one-foot contours are not shown directly adjacent to individual collection wells due to closeness of well spacing and map scale. The collection wells are effectively intercepting seepage which is presently moving from the large impoundment.

The ground water upgradient of the impoundment is moving at an average rate of 0.5 ft/day into the impoundment area. This ground velocity is based on a gradient of 0.0033 ft/ft, a permeability of 30 ft/day and an effective porosity of 0.2. The ground-water velocity between well WR11 and the collection system is 0.15 ft/day (55 ft/yr). Ground water is moving at 0.7 ft/day southwest of the Murray Acres injection system. The estimate of the present rate of ground water moving between the GW injection wells and well J is 0.9 ft/day (0.009 ft/ft gradient, 20 ft/day permeability and 0.2 effective porosity). Injection needs to be moved farther to the north to continue this higher rate of ground-water movement in this direction.

Water levels in the HMC alluvial wells are presented on Table 2.2-1. Tables 2.2-2, 2.2-3, 2.2-4 and 2.2-5 present the alluvial water levels measured in the Murray Acres, Broadview Acres, Felice Acres, and Pleasant Valley subdivision, respectively. Water levels in the alluvial aquifer have been fairly stable during the last year.

The Murray Acres collection wells WR3 and WR5 are maintaining their cones of depressions. Murray Acres collection wells E, Z and JC have increased the gradient from Broadview Acres toward the small impoundment. The addition of wells GW1, GW2 and GW3 to the Broadview Acres injection system has increased the reversed piezometric gradient between wells I and J for 1990. The gradient toward well J was significant during 1990 resulting in movement of ground water with low concentration toward well J. A movement of the injection closer to the small impoundment is needed to extend the reversal beyond well J and upgradient of the impoundment. Injection into wells GW1, GW2 and GW3 was started in January of 1990. Figure 2.2-1 shows the water-level elevation plot for wells I, J and X.

Water-level elevations for the alluvial aquifer near the pumpback collection system at reversal wells DP and DQ are

presented on Figure 2.2-2. Well DQ is south of well DP, which prior to gradient reversal in this area of the alluvial aquifer was downgradient. Pumping of the impoundment collection wells has increased the reversed ground-water gradient in this area during the last half of 1990. The water-level elevations in reversal wells DO and DN show that the reverse gradient has been maintained in this area of the D line of the collection system (see Figure 2.2-3). Water levels gradually dropped during 1990 with an increased gradient resulting.

Water levels for two sets of reversal wells are presented for the S line of the collection system. Reversal wells SP and SO are just northeast of the majority of the S line of collection wells. Figure 2.2-4 presents the water levels for these two wells and shows that the gradient is reversed between wells SC and SP. The gradient reversal in this area has been maintained in 1990. Wells S1 and S2 are the two reversal wells down gradient of the S line collection wells (see Drawing 2.0-1 for location). The data from these two wells shows a strong reversal of the ground-water downgradient of the S collection wells (see Figure 2.2-5).

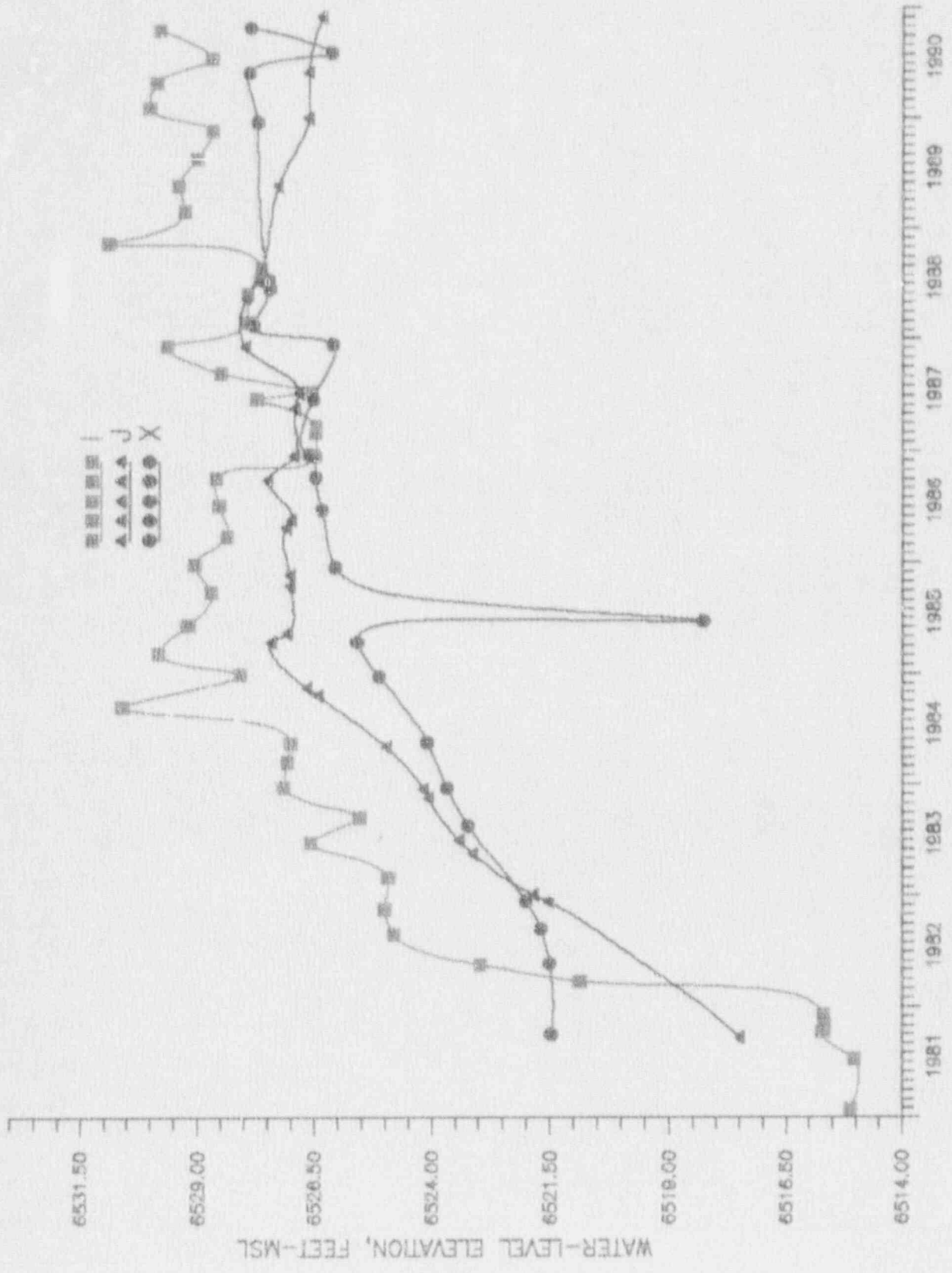
A gradient reversal northeast of the Murray Acres injection system between wells WR11 and S3 exist. This gradient reversal is gradually moving elevated concentrations toward the S collection wells. Some increased injection or movement of the injection closer to the collection wells may be needed to restore the aquifer in this area in an acceptable period of time.

Figure 2.2-7 presents the water-level plots for alluvial wells B, D1 and M5 which are located close to the lined evaporation pond. This plot shows that the gradient has nearly been reversed between wells B and D1. A gradient does exist between both of these wells and the compliance well M5 which is closer to the impoundment.

Figure 2.2-8 presents the water-level elevation plot for alluvial wells A1 and DZ. This data shows that a slight gradient exist from wells A1 and DZ. Ground water flow between these wells is controlled by the impoundment collection system.

The gradient south of the Broadview injection has also been fairly steady (see water levels for wells CUB3, 492 and 490 Figure 2.2-9). This figure shows that the water-level elevations in Felice alluvial wells 492 and 490 are very similar and therefore only a small southerly ground-water gradient exist in this area.

Water levels have been gradually declining in alluvial well 846 while the level in well 844 has been fairly steady (see Figure 2.2-16). The water-level decline in well 846 is probably caused by a decline in injection rate in Broadview Acres. Water levels have generally increased in well FE for the last several years due to the fresh water injection.



2.2-3

FIGURE 2.2-1. WATER-LEVEL ELEVATION FOR WELLS I, J AND X.

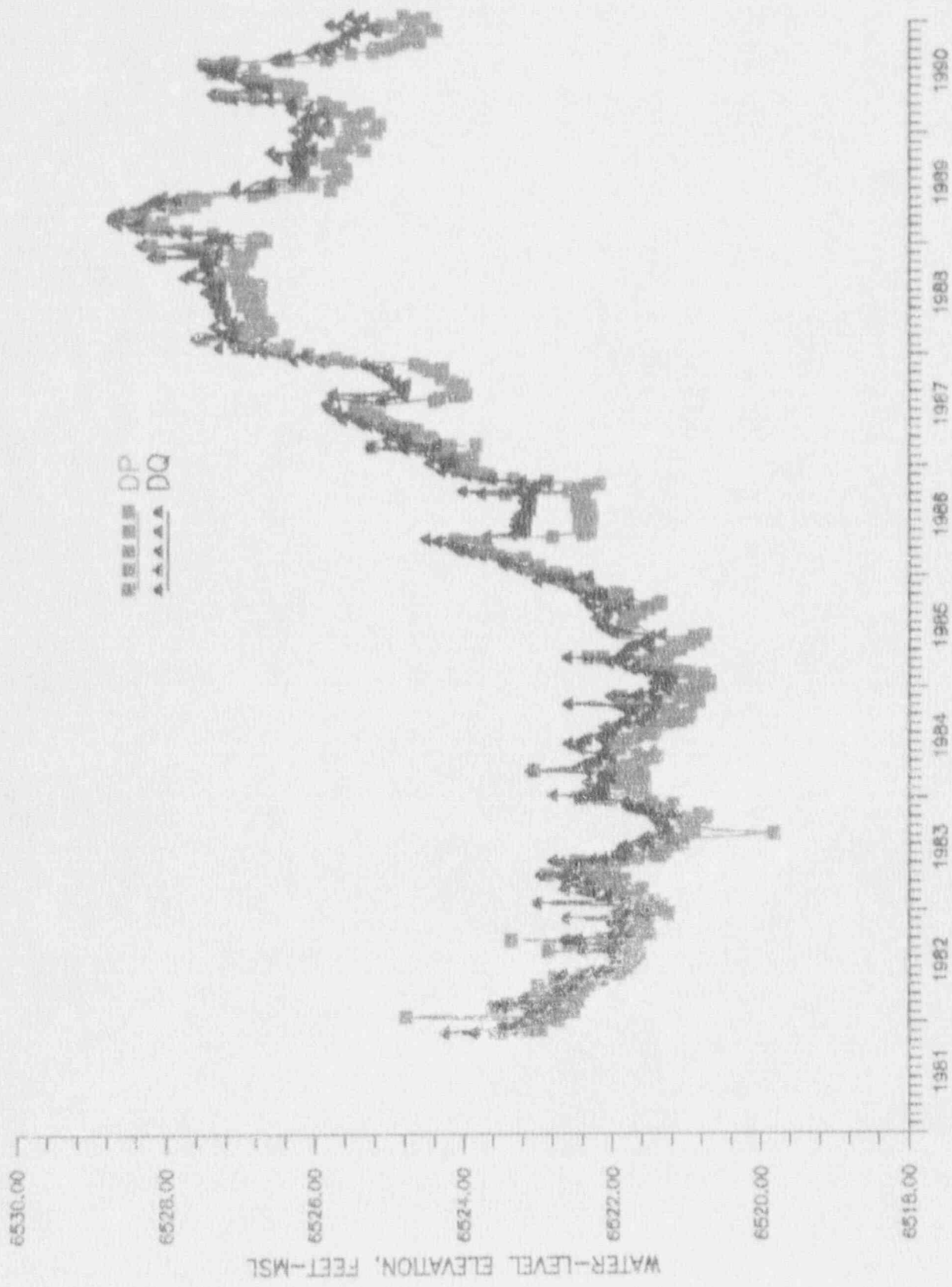


FIGURE 2.2-2. WATER-LEVEL ELEVATION FOR WELLS DP AND DQ.

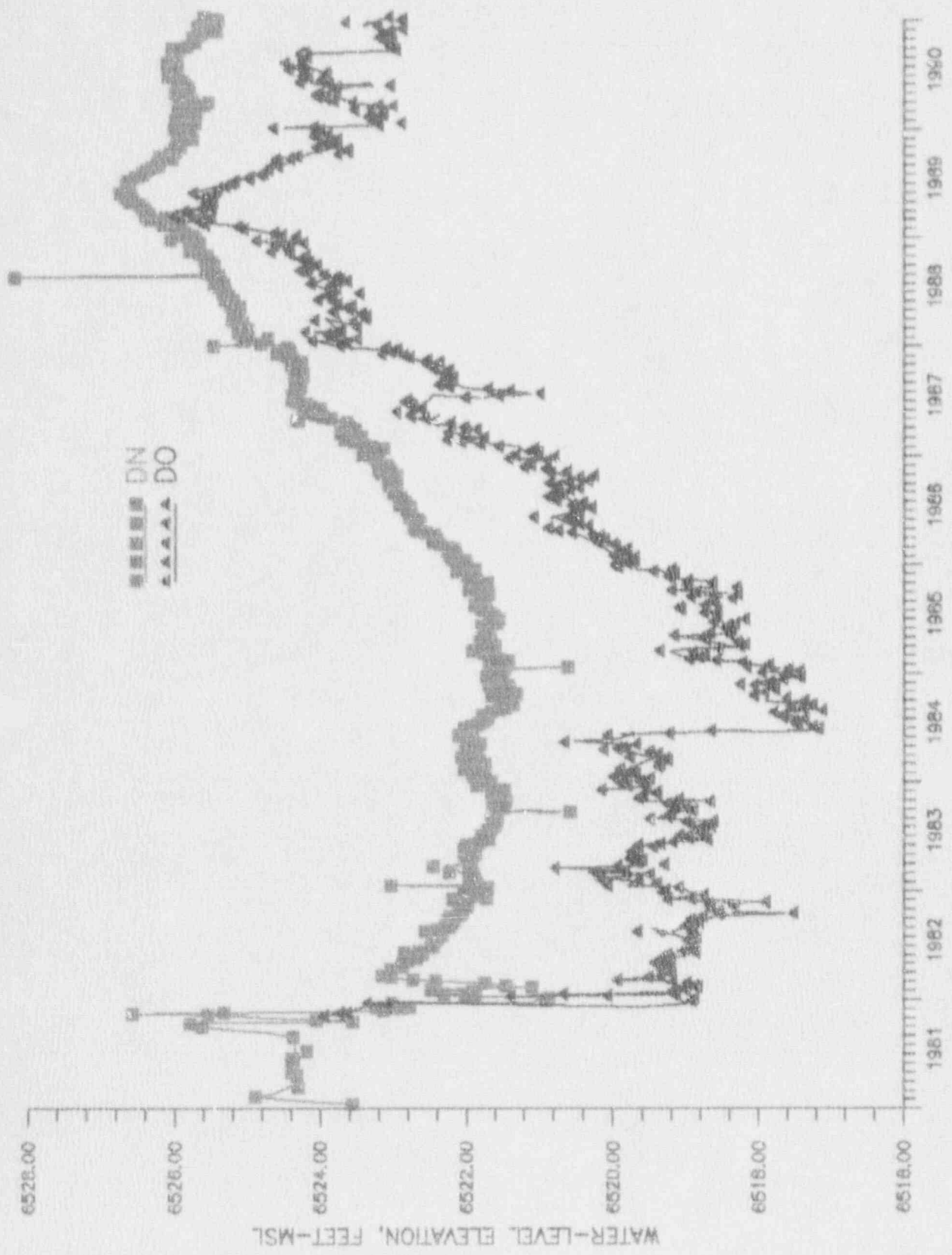


FIGURE 2.2-3. WATER-LEVEL ELEVATION FOR WELLS DN AND DO.

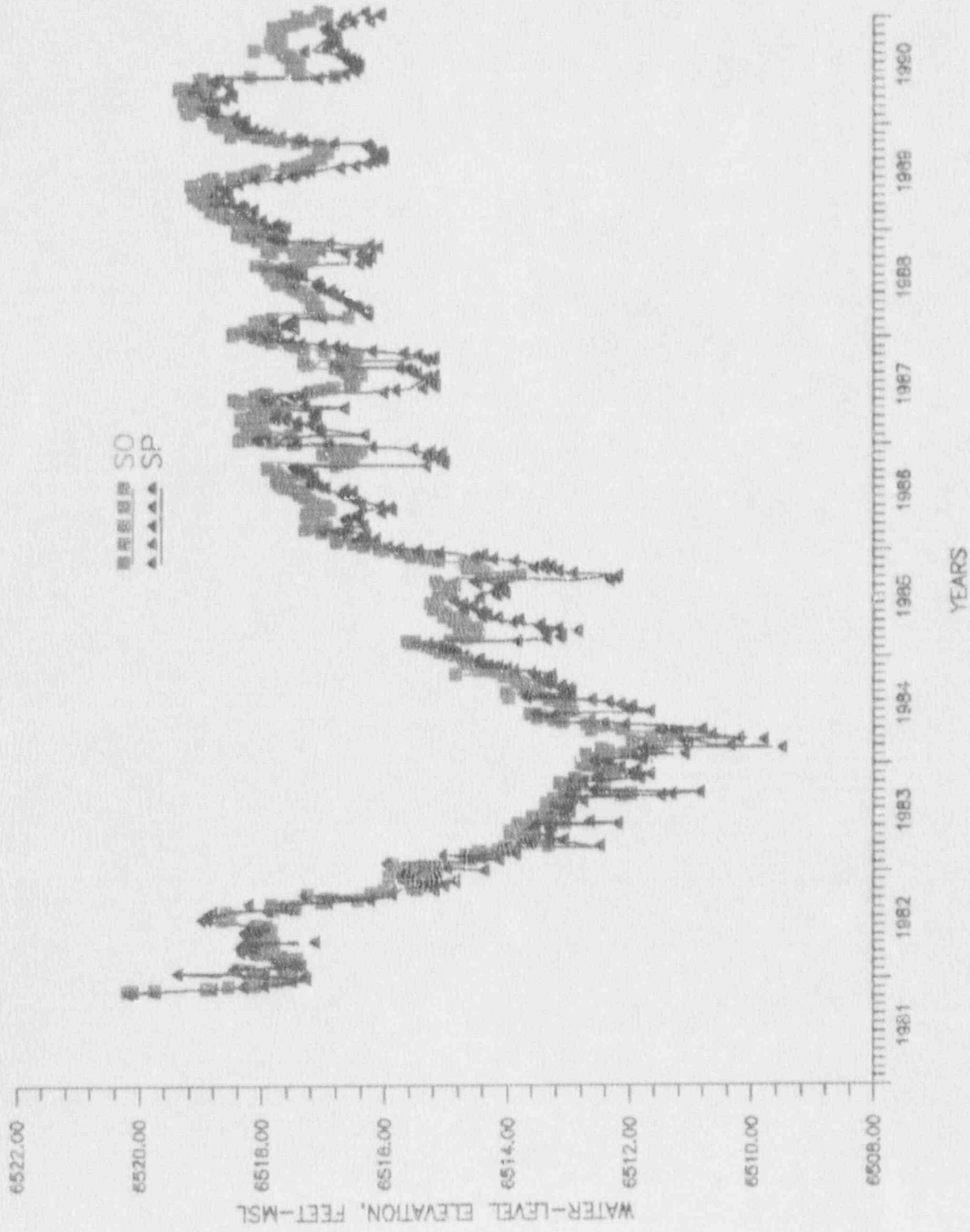


FIGURE 2.2-4. WATER-LEVEL ELEVATION FOR WELLS SO AND SP.

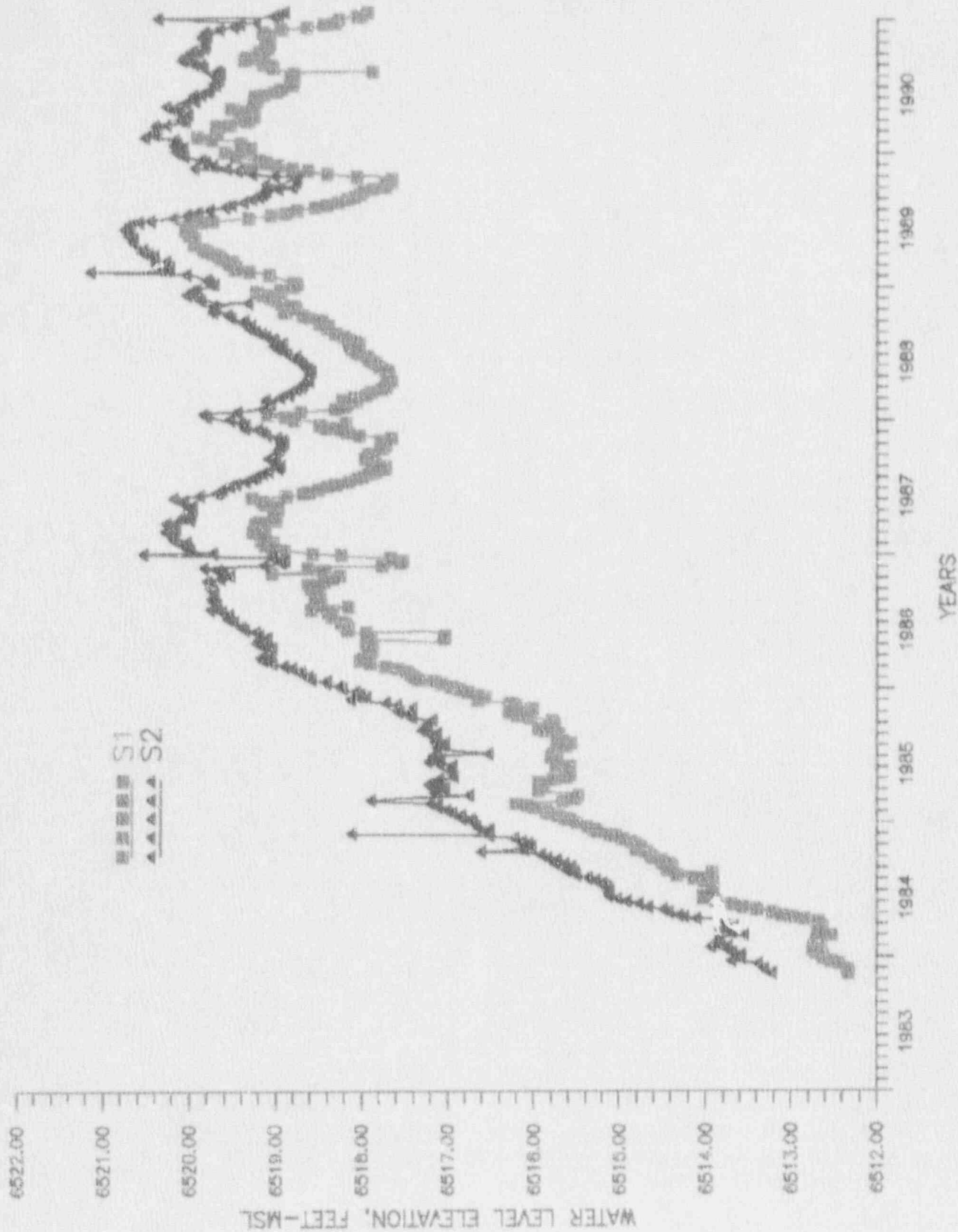


FIGURE 2.2-5. WATER LEVEL ELEVATION FOR WELLS S1 AND S2.

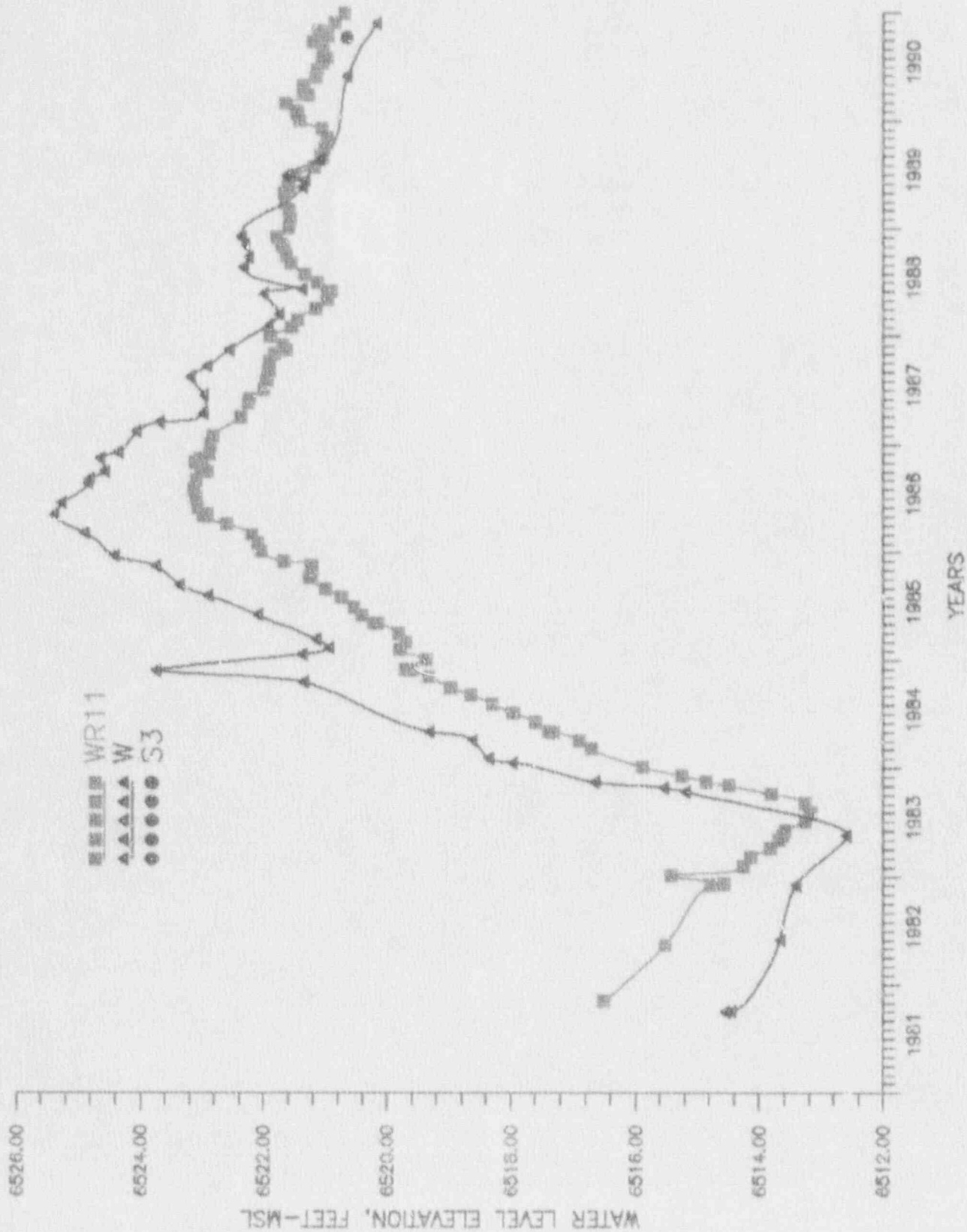


FIGURE 2.2-6. WATER LEVEL ELEVATION FOR WELLS WR11, W AND S3.



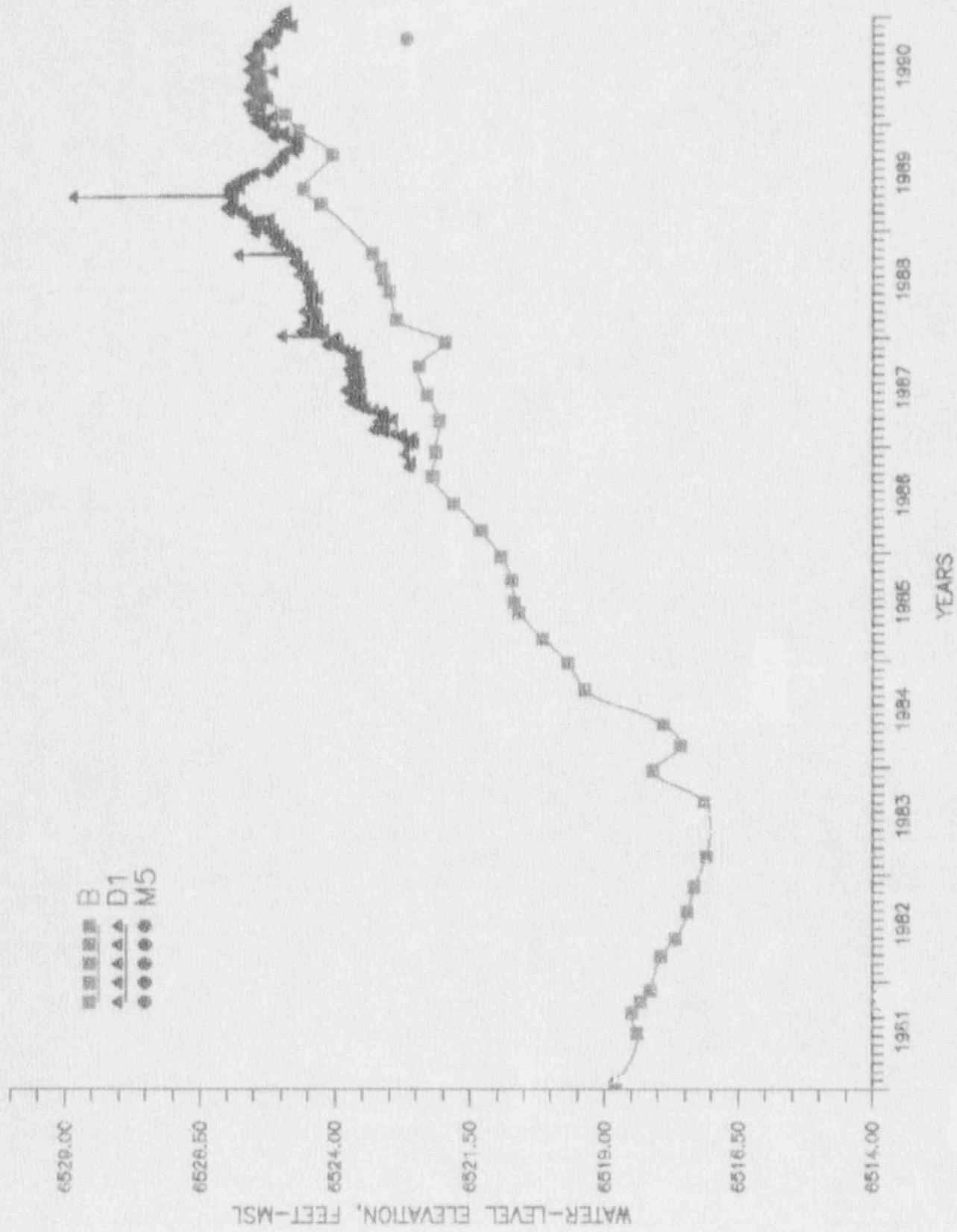


FIGURE 2.2-7. WATER-LEVEL ELEVATION FOR WELLS B, D1 AND M5.

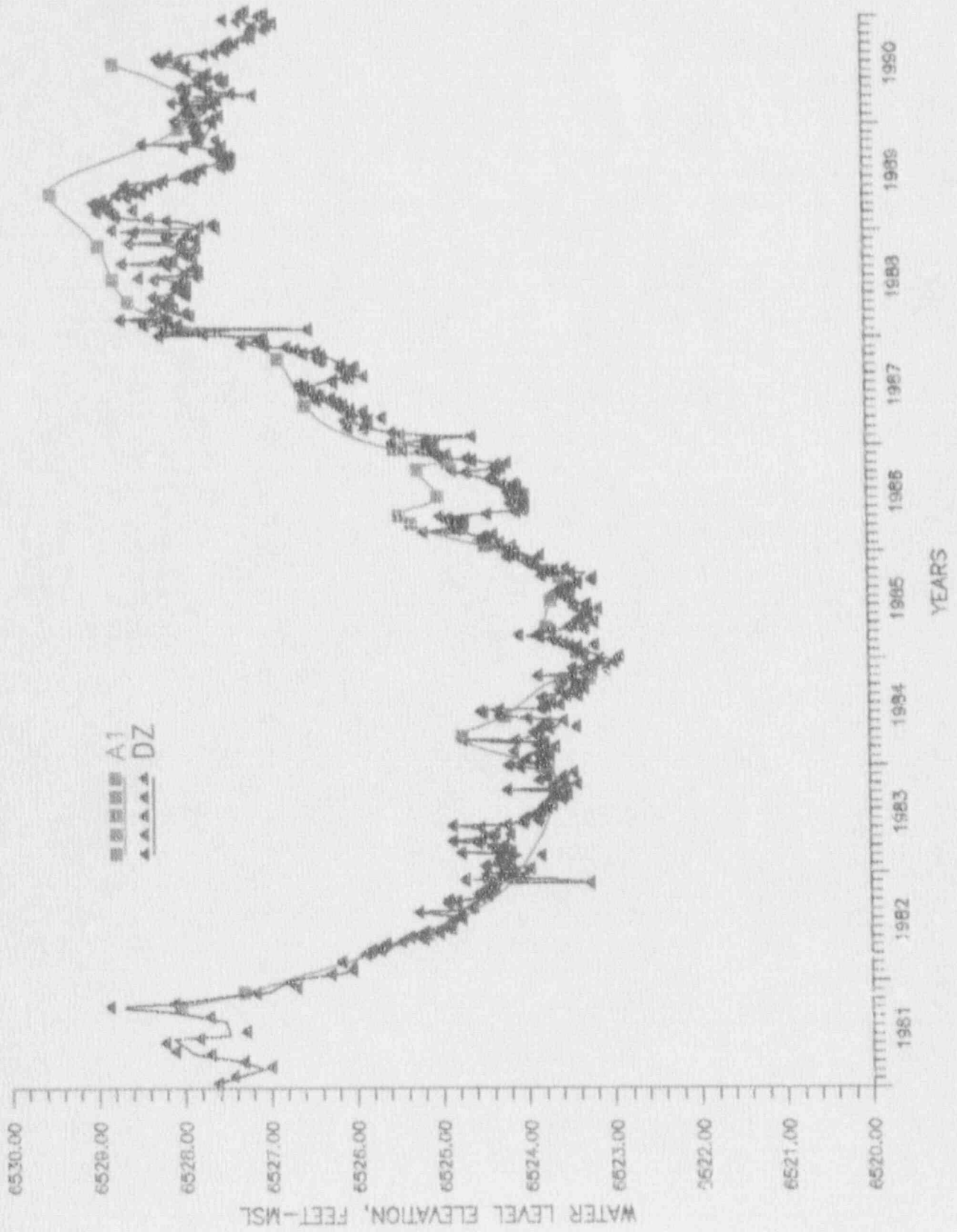


FIGURE 2.2-8. WATER LEVEL ELEVATION FOR WELLS A1 AND DZ.

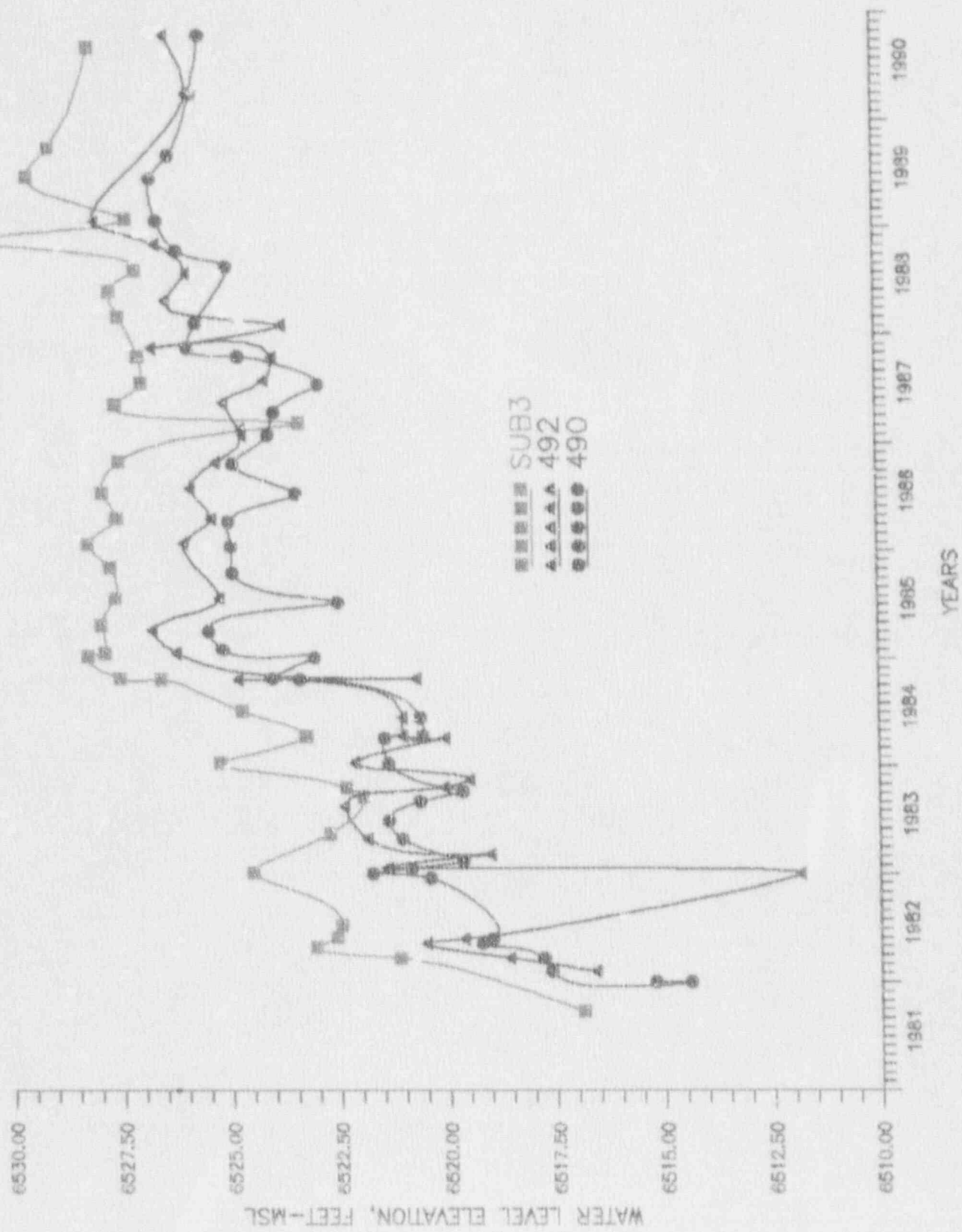


FIGURE 2.2-9. WATER LEVEL ELEVATION FOR WELLS SUB3, 492 AND 490.

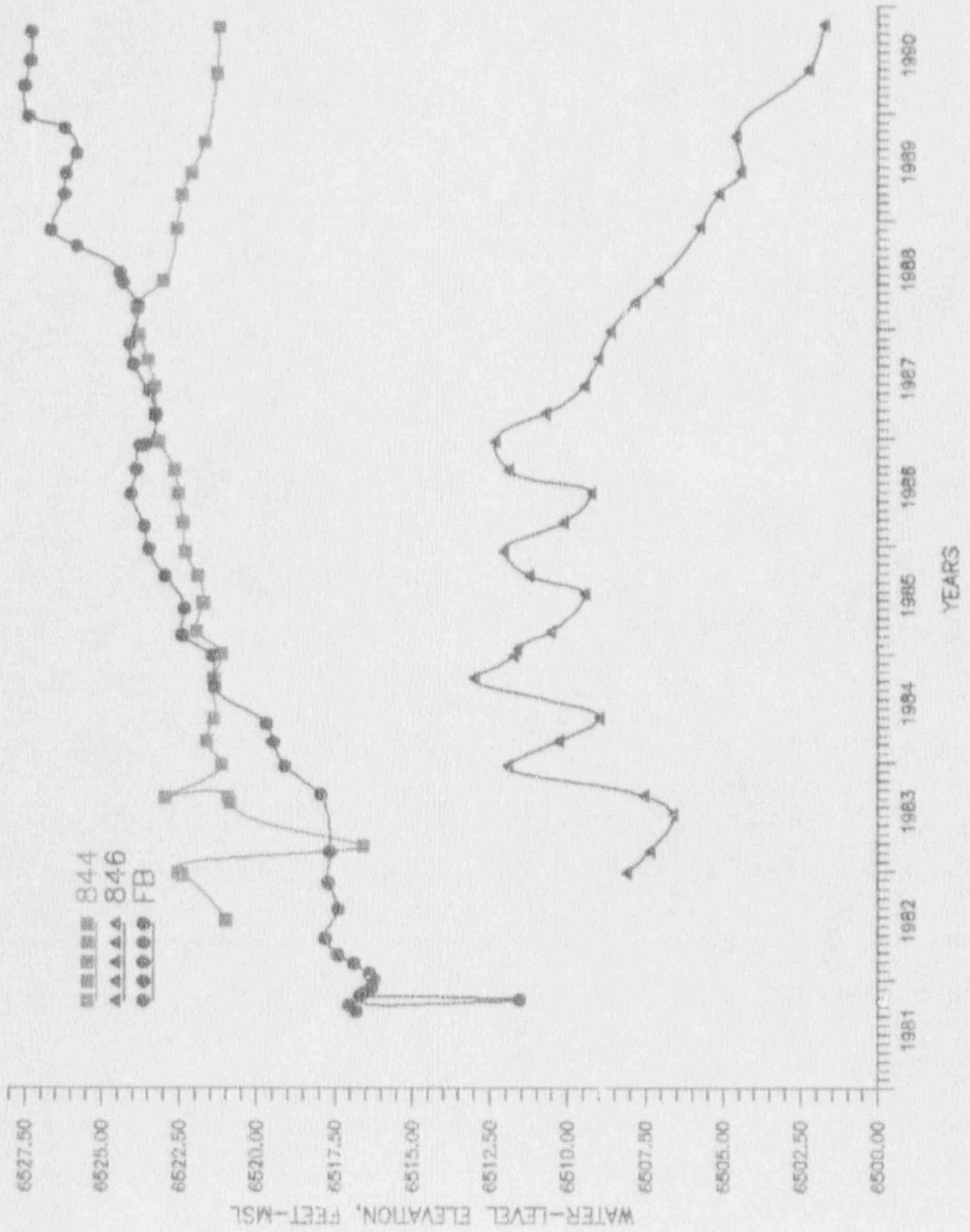


FIGURE 2.2-17. WATER-LEVEL ELEVATION FOR WELLS 844, 846 AND FB.

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
A1	01/25/90	6527.75
	07/16/90	6528.70
B	01/25/90	6524.91
	04/03/90	6525.27
	07/17/90	6525.46
	10/17/90	6525.22
B1	01/02/90	6524.55
	01/26/90	6524.43
	02/05/90	6524.48
	03/05/90	6524.69
	04/02/90	6524.40
	04/17/90	6523.89
	05/07/90	6524.54
	06/04/90	6524.43
	07/11/90	6524.71
	07/19/90	6524.67
	08/06/90	6524.57
	09/05/90	6524.49
	10/02/90	6524.49
	11/05/90	6524.31
12/04/90	6524.17	
01/02/91	6523.92	
BB2	01/25/90	6511.62
	06/04/90	6511.55
	07/17/90	6511.35
BC	01/02/90	6519.76
	01/08/90	6519.67
	01/15/90	6519.82
	01/22/90	6519.68
	01/25/90	6519.79
	01/29/90	6520.18
	02/05/90	6520.28
	02/12/90	6519.88
	02/19/90	6519.87
	02/26/90	6519.85
	03/05/90	6520.00
	03/12/90	6519.87
	03/20/90	6520.25
	03/26/90	6519.67
	04/02/90	6520.33
	04/03/90	6519.63
	04/09/90	6519.70
	04/17/90	6519.84
04/23/90	6519.86	
04/30/90	6519.85	
05/07/90	6519.65	
05/16/90	6519.60	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
BC	05/21/90	6519.57
	05/29/90	6519.70
	06/04/90	6519.38
	06/11/90	6519.33
	06/18/90	6519.21
	06/28/90	6519.23
	07/02/90	6519.21
	07/11/90	6519.18
	07/16/90	6519.20
	07/17/90	6519.19
	07/30/90	6519.17
	08/06/90	6519.22
	08/14/90	6519.43
	08/21/90	6519.43
	08/27/90	6519.43
	09/05/90	6519.58
	09/11/90	6519.58
	09/17/90	6519.55
	09/27/90	6519.47
	10/02/90	6519.55
	10/08/90	6519.45
	10/15/90	6519.40
	10/18/90	6519.29
	10/22/90	6519.34
	10/31/90	6519.37
	11/05/90	6519.39
	11/13/90	6519.32
	11/21/90	6519.47
	11/20/90	6519.30
	12/04/90	6519.13
	12/11/90	6519.18
	12/17/90	6519.16
	12/27/90	6519.03
01/03/91	6518.86	
01/07/91	6518.80	
01/14/91	6519.90	
01/21/91	6518.90	
BP	02/19/90	6526.96
	05/10/90	6527.02
	08/06/90	6526.64
	11/29/90	6526.26
C	01/02/90	6527.59
	01/15/90	6527.42
	01/22/90	6527.31
	01/26/90	6527.44
	02/05/90	6527.38
	02/19/90	6527.28
	03/05/90	6527.38
	03/20/90	6527.07
04/02/90	6527.13	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
C	04/17/90	6527.29
	04/23/90	6527.44
	05/07/90	6527.41
	05/21/90	6527.27
	06/04/90	6527.21
	06/18/90	6527.29
	07/02/90	6527.47
	07/16/90	6527.33
	07/17/90	6527.37
	07/24/90	6527.41
	08/06/90	6527.31
	08/21/90	6527.34
	09/05/90	6527.15
	09/17/90	6527.11
	10/02/90	6527.10
	10/15/90	6527.13
	10/31/90	6526.86
	11/05/90	6526.86
	11/21/90	6526.72
	12/04/90	6526.64
	12/17/90	6526.70
	12/27/90	6526.58
	01/02/91	6526.50
01/14/91	6526.59	
D1	01/02/90	6525.47
	01/08/90	6525.32
	01/15/90	6525.38
	01/22/90	6525.15
	01/29/90	6525.50
	02/05/90	6525.42
	02/12/90	6525.54
	02/19/90	6525.39
	02/19/90	6525.39
	02/26/90	6525.36
	03/05/90	6525.60
	03/12/90	6525.55
	03/20/90	6525.23
	03/26/90	6525.40
	04/02/90	6525.33
	04/09/90	6525.41
	04/17/90	6525.48
	04/23/90	6525.58
	04/30/90	6525.53
	05/07/90	6525.51
	05/10/90	6525.54
	05/16/90	6525.33
	05/21/90	6525.37
05/29/90	6525.47	
06/04/90	6525.38	
06/11/90	6525.46	
06/18/90	6525.43	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
D1	06/28/90	6525.13
	07/02/90	6525.60
	07/11/90	6525.46
	07/15/90	6525.44
	07/30/90	6525.44
	08/06/90	6525.35
	08/06/90	6525.40
	08/14/90	6525.58
	08/21/90	6525.42
	08/27/90	6525.46
	09/05/90	6525.40
	09/11/90	6525.43
	09/17/90	6525.42
	09/27/90	6525.22
	10/02/90	6525.40
	10/08/90	6525.18
	10/15/90	6525.13
	10/22/90	6525.08
	10/31/90	6525.13
	11/05/90	6525.18
	11/13/90	6525.07
	11/21/90	6525.04
	11/28/90	6524.80
	11/28/90	6524.77
	12/04/90	6524.95
	12/11/90	6525.06
	12/17/90	6525.04
	12/27/90	6524.91
	01/02/91	6524.90
	01/07/91	6524.98
01/14/91	6524.90	
01/21/91	6524.90	
DA2	01/02/90	6504.95
	02/05/90	6503.34
	03/05/90	6513.29
	05/09/90	6512.29
	06/05/90	6516.48
	06/07/90	6516.48
	07/05/90	6562.79
	08/14/90	6530.09
	09/05/90	6543.79
	10/02/90	6543.60
	11/05/90	6506.64
	12/04/90	6544.29
	01/02/91	6517.88
DB	01/02/90	6520.82
	02/05/90	6522.34
	03/05/90	6517.94
	04/03/90	6520.89
	05/09/90	6521.23



TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
DR	5/05/90	6521.66
	06/07/90	6521.66
	07/05/90	6557.73
	08/14/90	6556.23
	09/05/90	6554.23
	10/02/90	6555.82
	11/05/90	6541.89
	12/04/90	6553.73
	01/02/91	6523.83
	DC	01/02/90
02/05/90		6517.26
03/05/90		6517.44
03/12/90		6517.46
04/02/90		6515.27
04/17/90		6515.73
05/07/90		6516.24
06/04/90		6516.68
07/02/90		6517.04
08/06/90		6517.18
08/08/90		6517.18
09/05/90		6515.21
10/02/90		6515.89
11/05/90		6516.46
12/04/90		6516.94
01/03/91	6516.99	
DD	03/13/90	6534.80
	09/12/90	6534.71
DE	01/02/90	6519.91
	02/05/90	6519.07
	03/05/90	6519.03
	04/03/90	6519.38
	05/09/90	6520.54
	06/04/90	6522.05
	06/07/90	6522.05
	07/05/90	6529.91
	08/14/90	6555.91
	09/05/90	6552.61
	10/02/90	6521.11
	11/05/90	6524.13
	12/04/90	6517.81
01/02/91	6518.76	
DF	01/02/90	6523.06
	02/05/90	6523.42
	03/05/90	6524.32
	04/03/90	6525.26
	05/08/90	6525.29
	06/04/90	6525.82
	06/07/90	6525.82

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
DF	07/05/90	6551.36
	08/14/90	6555.66
	09/05/90	6556.66
	10/02/90	6522.85
	11/05/90	6522.31
	12/04/90	6522.16
	01/02/91	6521.68
DG	01/02/90	6513.01
	02/05/90	6513.91
	03/05/90	6513.34
	04/03/90	6514.81
	05/08/90	6520.66
	06/04/90	6511.27
	06/07/90	6511.27
	07/05/90	6565.01
	08/14/90	6565.01
	09/05/90	6557.81
	10/02/90	6517.64
	11/05/90	6517.90
	12/04/90	6558.69
	01/02/91	6518.89
DH	01/02/90	6525.33
	02/05/90	6526.24
	03/05/90	6526.48
	04/03/90	6519.91
	05/08/90	6526.94
	06/04/90	6527.14
	06/07/90	6527.14
	07/05/90	6549.21
	08/14/90	6530.21
	09/05/90	6527.21
	10/02/90	6526.82
	11/05/90	6526.63
	12/04/90	6526.71
	01/02/91	6527.07
DM	01/02/90	6525.45
	01/08/90	6525.21
	01/15/90	6525.11
	01/22/90	6524.85
	01/29/90	6525.19
	02/05/90	6525.14
	02/12/90	6525.23
	02/19/90	6525.05
	02/26/90	6524.99
	03/05/90	6525.35
	03/12/90	6525.19
	03/12/90	6525.19
	03/20/90	6524.93
	03/26/90	6525.07

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
DM	04/02/90	6525.01
	04/09/90	6525.31
	04/17/90	6525.16
	04/23/90	6525.59
	04/30/90	6525.58
	05/07/90	6525.51
	05/16/90	6525.28
	05/21/90	6525.26
	05/29/90	6525.48
	06/04/90	6525.35
	06/11/90	6525.49
	06/18/90	6525.39
	06/28/90	6525.48
	07/02/90	6525.57
	07/11/90	6525.49
	07/16/90	6525.50
	07/24/90	6525.63
	07/30/90	6525.50
	08/06/90	6525.49
	08/08/90	6525.49
	08/14/90	6525.79
	08/21/90	6525.43
	08/27/90	6525.43
	09/05/90	6525.35
	09/11/90	6525.44
	09/17/90	6525.34
	09/27/90	6524.90
	10/02/90	6524.98
	10/08/90	6524.89
	10/15/90	6524.80
	10/22/90	6524.75
	10/31/90	6524.83
	11/05/90	6524.86
	11/13/90	6524.76
11/21/90	6524.70	
11/28/90	6524.42	
12/04/90	6524.51	
12/11/90	6524.78	
12/17/90	6524.83	
12/27/90	6524.98	
01/02/91	6524.48	
01/07/91	6524.46	
01/14/91	6524.63	
01/21/91	6525.58	
DN	01/02/90	6526.00
	01/08/90	6525.83
	01/15/90	6525.88
	01/22/90	6525.72
	01/29/90	6525.98
	02/05/90	6525.87
02/12/90	6525.92	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
DN	02/19/90	6525.79
	02/26/90	6525.71
	03/05/90	6525.95
	03/12/90	6525.82
	03/20/90	6525.61
	03/26/90	6525.73
	04/02/90	6525.54
	04/09/90	6525.78
	04/17/90	6525.87
	04/23/90	6525.96
	04/30/90	6525.96
	05/07/90	6525.99
	05/16/90	6525.80
	05/21/90	6525.84
	05/29/90	6525.95
	06/04/90	6525.88
	06/11/90	6525.94
	06/18/90	6525.91
	06/28/90	6526.00
	07/02/90	6526.08
	07/11/90	6526.00
	07/16/90	6525.98
	07/24/90	6526.07
	07/30/90	6525.98
	08/06/90	6525.97
	08/14/90	6526.10
	08/21/90	6526.00
	08/27/90	6526.04
	09/05/90	6525.99
	09/11/90	6526.04
	09/17/90	6526.03
	09/27/90	6525.94
	10/02/90	6526.03
	10/08/90	6525.84
	10/15/90	6525.78
	10/22/90	6525.73
	10/31/90	6525.73
	11/05/90	6525.75
	11/13/90	6525.69
	11/21/90	6525.63
11/28/90	6525.43	
12/04/90	6525.48	
12/11/90	6525.68	
12/17/90	6525.66	
12/27/90	6525.53	
01/02/91	6525.41	
01/07/91	6525.44	
01/14/91	6525.60	
01/21/91	6525.60	
DNR	01/02/90	6527.58
	02/05/90	6527.06

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
DNR	03/05/90	6527.07
	04/02/90	6527.21
	04/17/90	6527.55
	05/07/90	6527.57
	05/16/90	6527.31
	06/04/90	6527.39
	07/02/90	6527.43
	08/06/90	6527.53
	09/05/90	6527.77
	10/02/90	6527.71
	11/05/90	6528.21
	12/04/90	6527.88
	01/02/91	6527.94
DO	01/02/90	6524.65
	01/08/90	6524.08
	01/15/90	6523.20
	01/22/90	6522.90
	01/29/90	6523.29
	02/05/90	6523.24
	02/12/90	6523.35
	02/19/90	6523.15
	02/26/90	6523.14
	03/05/90	6523.54
	03/12/90	6523.31
	03/20/90	6523.01
	03/26/90	6523.20
	04/02/90	6523.56
	04/09/90	6523.81
	04/17/90	6523.93
	04/23/90	6524.05
	04/30/90	6524.05
	05/07/90	6524.01
	05/16/90	6523.78
	05/21/90	6523.78
	05/29/90	6523.05
	06/04/90	6523.88
	06/11/90	6524.28
	06/18/90	6523.99
	06/28/90	6524.17
	07/02/90	6524.26
	07/11/90	6523.92
	07/16/90	6524.22
	07/24/90	6524.43
07/30/90	6524.28	
08/06/90	6524.27	
08/14/90	6524.48	
08/21/90	6524.26	
08/27/90	6524.26	
09/05/90	6524.18	
09/11/90	6524.29	
09/17/90	6524.22	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
DO	09/27/90	6522.97
	10/02/90	6523.19
	10/08/90	6523.06
	10/15/90	6523.02
	10/22/90	6523.02
	10/31/90	6523.14
	11/05/90	6523.20
	11/13/90	6523.16
	11/21/90	6523.03
	11/28/90	6523.06
	12/04/90	6522.89
	12/11/90	6523.21
	12/17/90	6523.22
	12/27/90	6523.66
	01/02/91	6522.90
	01/07/91	6522.89
	01/14/91	6523.06
	01/21/91	6522.96
	DP	01/02/90
01/08/90		6525.38
01/15/90		6525.39
01/22/90		6525.16
01/29/90		6525.56
02/05/90		6525.45
02/12/90		6525.52
02/19/90		6525.39
02/26/90		6525.30
03/05/90		6525.77
03/12/90		6525.68
03/19/90		6525.69
03/26/90		6525.87
04/02/90		6525.90
04/09/90		6526.29
04/17/90		6526.82
04/23/90		6527.15
04/30/90		6527.34
05/07/90		6526.39
05/16/90		6526.21
05/21/90		6526.25
06/01/90		6526.52
06/04/90		6526.40
06/11/90		6526.64
06/18/90		6526.72
06/28/90		6526.91
07/02/90		6526.89
07/11/90	6527.41	
07/16/90	6526.84	
07/24/90	6527.31	
07/30/90	6527.36	
08/06/90	6527.52	
08/14/90	6527.12	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
DP	08/21/90	6526.39
	08/27/90	6525.87
	09/05/90	6525.82
	09/11/90	6525.54
	09/17/90	6525.25
	09/27/90	6525.05
	10/02/90	6525.21
	10/08/90	6525.00
	10/15/90	6524.90
	10/22/90	6524.84
	10/24/90	6524.81
	10/31/90	6524.71
	11/05/90	6524.79
	11/13/90	6524.67
	11/21/90	6524.73
	11/28/90	6524.41
	12/04/90	6524.47
	12/11/90	6524.99
	12/17/90	6525.12
	12/27/90	6524.72
	01/02/91	6524.55
01/07/91	6524.57	
01/14/91	6524.84	
01/21/91	6524.74	
DQ	01/02/90	6526.32
	01/08/90	6526.12
	01/15/90	6526.05
	01/22/90	6525.86
	01/29/90	6526.21
	02/05/90	6526.09
	02/12/90	6526.16
	02/19/90	6526.01
	02/26/90	6525.92
	03/05/90	6526.33
	03/12/90	6526.35
	03/19/90	6526.11
	03/26/90	6526.36
	04/02/90	6526.37
	04/09/90	6526.66
	04/17/90	6527.13
	04/23/90	6527.29
	04/30/90	6527.42
	05/07/90	6526.88
	05/16/90	6526.67
	05/21/90	6526.68
06/01/90	6526.92	
06/04/90	6526.80	
06/11/90	6526.96	
06/18/90	6527.02	
06/28/90	6527.18	
07/02/90	6527.21	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
DQ	07/11/90	6527.31
	07/16/90	6527.16
	07/24/90	6527.43
	07/30/90	6527.44
	08/06/90	6527.56
	08/14/90	6527.31
	08/21/90	6526.59
	08/27/90	6526.54
	09/05/90	6526.41
	09/11/90	6526.37
	09/17/90	6526.10
	09/27/90	6525.87
	10/02/90	6526.02
	10/08/90	6525.81
	10/15/90	6525.71
	10/22/90	6525.63
	10/31/90	6525.61
	11/05/90	6525.64
	11/13/90	6525.48
	11/21/90	6525.53
	11/28/90	6525.23
	11/28/90	6525.20
	12/04/90	6525.28
	12/11/90	6525.70
	12/17/90	6525.83
	12/27/90	6525.46
	01/02/91	6525.36
01/07/91	6525.36	
01/14/91	6525.56	
01/21/91	6525.51	
DS	01/02/90	6519.11
	02/05/90	6510.08
	03/05/90	6509.94
	04/03/90	6513.61
	05/09/90	6513.76
	06/04/90	6518.25
	06/07/90	6518.25
	07/05/90	6516.16
	08/14/90	6563.46
	09/05/90	6514.46
	10/02/90	6517.37
	11/05/90	6510.27
	12/04/90	6510.46
01/02/91	6508.73	
DX	01/02/90	6523.70
	02/05/90	6523.63
	03/05/90	6523.92
	05/08/90	6525.17
	06/04/90	6525.50
	06/07/90	6525.50



TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
DX	07/05/90	6525.75
	08/14/90	6563.55
	09/05/90	6521.75
	10/02/90	6520.89
	11/05/90	6520.36
	12/04/90	6519.55
	01/02/91	6519.33
	DZ	01/02/90
01/08/90		6527.57
01/15/90		6527.80
01/22/90		6527.47
01/29/90		6527.86
02/05/90		6527.84
02/12/90		6527.84
02/19/90		6527.66
02/26/90		6527.55
03/05/90		6528.01
03/12/90		6527.87
03/19/90		6527.49
03/26/90		6527.86
04/02/90		6527.08
04/09/90		6527.33
04/17/90		6527.59
04/23/90		6527.83
04/30/90		6527.90
05/07/90		6527.66
05/16/90		6527.44
05/21/90		6527.41
05/29/90		6527.71
06/04/90		6527.47
06/11/90		6527.61
06/18/90		6527.60
06/28/90		6527.84
07/02/90		6527.86
07/11/90		6527.84
07/16/90		6527.93
07/24/90		6528.15
07/30/90		6528.11
08/06/90		6528.19
08/14/90		6528.04
08/21/90		6527.64
08/27/90	6527.51	
09/05/90	6527.39	
09/11/90	6527.44	
09/17/90	6527.35	
09/27/90	6527.28	
10/02/90	6527.36	
10/08/90	6527.26	
10/15/90	6527.16	
10/18/90	6527.08	
10/22/90	6527.10	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
DZ	10/31/90	6527.09
	11/05/90	6527.10
	11/13/90	6526.94
	11/21/90	6527.07
	11/28/90	6526.91
	12/04/90	6526.83
	12/11/90	6527.26
	12/17/90	6527.42
	12/27/90	6527.00
	01/02/91	6526.93
	01/07/91	6527.21
	01/14/91	6527.16
	01/21/91	6527.16
	E	01/02/90
02/05/90		6522.71
03/05/90		6523.79
04/03/90		6523.10
05/09/90		6523.06
06/05/90		6523.52
06/07/90		6523.52
07/05/90		6523.68
08/14/90		6524.48
09/05/90		6522.48
10/02/90		6515.90
11/05/90		6535.26
12/04/90		6516.48
01/03/91	6512.62	
F	01/29/90	6529.25
	04/19/90	6529.11
	07/17/90	6528.71
	10/24/90	6528.75
FB	01/26/90	6527.34
	04/19/90	6527.49
	07/17/90	6527.31
	10/24/90	6527.28
G	01/03/90	6561.51
	02/07/90	6561.81
	03/06/90	6560.83
	04/03/90	6560.89
	05/09/90	6562.02
	06/06/90	6562.05
	07/03/90	6560.88
	08/06/90	6561.93
	08/15/90	6559.33
	09/06/90	6560.03
	10/03/90	6561.90
	11/06/90	6559.99
12/05/90	6560.23	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
G	01/02/91	6561.79
GA	01/03/90	6559.25
	02/07/90	6552.23
	03/06/90	6561.26
	04/03/90	6561.36
	05/09/90	6560.80
	06/06/90	6561.81
	07/03/90	6561.16
	08/15/90	6559.26
	09/06/90	6559.26
	10/03/90	6560.00
	11/06/90	6560.11
	12/05/90	6559.46
	01/02/91	6561.42
GB	01/03/90	6561.94
	02/07/90	6557.20
	03/06/90	6560.74
	04/03/90	6562.67
	05/09/90	6562.64
	06/06/90	6562.72
	07/03/90	6561.49
	08/06/90	6562.14
	08/15/90	6559.04
	09/06/90	6560.74
	10/03/90	6561.29
	11/06/90	6561.60
	12/05/90	6560.84
01/02/91	6562.00	
GC	01/03/90	6562.48
	02/07/90	6564.03
	03/06/90	6562.53
	04/03/90	6558.05
	05/09/90	6563.01
	06/06/90	6564.21
	07/03/90	6563.38
	08/06/90	6563.23
	08/15/90	6563.23
	09/06/90	6563.03
	10/03/90	6564.05
	11/06/90	6563.09
	12/05/90	6562.53
01/02/91	6563.67	
GD	01/03/90	6562.30
	02/07/90	6564.16
	03/06/90	6564.28
	04/03/90	6560.28
	05/09/90	6564.05
	06/06/90	6564.24

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
GD	07/03/90	6561.68
	08/06/90	6564.48
	08/15/90	6563.88
	09/06/90	6563.28
	10/03/90	6563.96
	11/06/90	6564.88
	12/05/90	6562.98
	01/02/91	6563.82
GE	01/03/90	6560.54
	02/07/90	6563.27
	03/06/90	6562.27
	04/03/90	6561.57
	05/09/90	6562.97
	06/06/90	6562.99
	07/03/90	6562.47
	08/06/90	6562.97
	08/15/90	6562.67
	09/06/90	6562.77
	10/03/90	6563.80
	11/06/90	6563.31
	12/05/90	6562.97
01/02/91	6563.27	
GF	01/03/90	6563.18
	02/07/90	6564.45
	03/05/90	6563.20
	04/03/90	6563.32
	05/09/90	6564.35
	06/06/90	6565.05
	07/03/90	6563.22
	08/06/90	6564.00
	08/15/90	6564.20
	09/06/90	6562.60
	10/03/90	6563.12
	11/06/90	6563.99
	12/05/90	6561.60
01/02/91	6564.37	
GG	01/03/90	6560.53
	02/07/90	6561.61
	03/06/90	6562.41
	04/03/90	6554.44
	05/09/90	6562.11
	06/06/90	6561.70
	07/03/90	6561.66
	08/06/90	6561.56
	08/15/90	6560.16
	09/06/90	6560.16
	10/03/90	6560.80
	11/06/90	6561.23
	12/05/90	6560.86

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
GG	01/02/91	6561.50
GH	06/04/90	6528.97
	12/05/90	6528.29
GI	01/03/90	6560.21
	02/07/90	6561.55
	03/06/90	6564.11
	04/03/90	6563.41
	05/09/90	6563.76
	06/06/90	6564.39
	07/03/90	6560.11
	08/06/90	6564.16
	08/15/90	6560.81
	09/06/90	6562.61
	10/03/90	6563.77
	11/06/90	6564.58
	12/05/90	6563.61
	01/02/91	6564.24
GJ	01/03/90	6564.39
	02/07/90	6564.68
	03/06/90	6552.38
	04/03/90	6564.70
	05/09/90	6564.43
	06/06/90	6565.06
	07/03/90	6562.98
	08/06/90	6563.88
	08/15/90	6562.98
	09/06/90	6561.88
	10/03/90	6564.35
	11/06/90	6564.52
	12/05/90	6563.88
01/02/91	6561.74	
GK	01/03/90	6562.27
	02/07/90	6565.46
	03/06/90	6563.11
	04/03/90	6565.49
	05/09/90	6565.00
	06/06/90	6565.68
	07/03/90	6562.91
	08/06/90	6564.71
	08/15/90	6563.91
	09/06/90	6563.11
	10/03/90	6565.66
	11/06/90	6564.28
	12/05/90	6563.51
01/02/91	6565.59	
GL	01/03/90	6561.63
	02/07/90	6565.45

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
GL	03/06/90	6565.40
	04/03/90	6564.52
	05/09/90	6565.62
	06/06/90	6566.12
	07/03/90	6563.65
	08/06/90	6565.80
	08/15/90	6564.15
	09/06/90	6562.15
	10/03/90	6563.81
	11/06/90	6565.77
	12/05/90	6564.15
	01/02/91	6565.21
GM	01/03/90	6565.35
	02/07/90	6566.55
	03/06/90	6566.15
	04/03/90	6566.41
	05/09/90	6565.80
	06/06/90	6566.57
	07/03/90	6563.65
	08/06/90	6565.70
	08/15/90	6566.65
	09/06/90	6562.65
	10/03/90	6566.47
	11/06/90	6566.22
12/05/90	6564.15	
01/02/91	6565.94	
GN	01/03/90	6565.43
	02/07/90	6566.80
	03/06/90	6566.30
	04/03/90	6566.67
	05/09/90	6566.89
	06/06/90	6567.11
	07/03/90	6563.05
	08/06/90	6565.25
	08/15/90	6566.05
	09/06/90	6564.05
	10/03/90	6566.80
	11/06/90	6566.44
12/05/90	6563.55	
01/02/91	6566.66	
GO	01/03/90	6558.12
	01/09/90	6560.59
	03/06/90	6560.59
	04/03/90	6559.67
	05/09/90	6558.46
	06/06/90	6562.04
	07/03/90	6560.59
	08/06/90	6562.09
08/15/90	6561.29	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
GO	09/06/90	6560.5
	10/03/90	6561.73
	11/06/90	6562.63
	12/05/90	6561.79
	01/02/91	6562.65
GP	01/03/90	6558.14
	02/07/90	6564.02
	03/06/90	6562.67
	04/03/90	6557.21
	05/09/90	6563.92
	06/06/90	6563.75
	07/03/90	6561.96
	08/06/90	6562.27
	08/15/90	6560.47
	09/06/90	6562.07
	10/03/90	6563.94
	11/06/90	6562.51
	12/05/90	6563.17
01/02/91	6563.44	
GW1	02/07/90	6536.27
	03/06/90	6560.27
	04/03/90	6563.94
	05/09/90	6563.45
	06/06/90	6564.73
	07/03/90	6562.92
	08/06/90	6563.97
	08/15/90	6562.57
	09/06/90	6562.27
	10/03/90	6563.77
	11/06/90	6564.04
	12/05/90	6562.47
	01/02/91	6563.95
GW2	02/07/90	6531.88
	03/06/90	6565.08
	04/03/90	6546.43
	05/09/90	6560.99
	06/06/90	6565.33
	07/03/90	6561.58
	08/06/90	6564.98
	08/15/90	6558.08
	09/06/90	6562.08
	10/03/90	6565.25
	11/06/90	6565.83
	12/05/90	6562.08
	01/02/91	6562.87
GW3	02/07/90	6547.28
	03/06/90	6565.03
	04/03/90	6564.05

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
GW3	05/09/90	6561.76
	06/06/90	6565.72
	07/03/90	6564.78
	08/06/90	6565.08
	08/15/90	6563.28
	09/06/90	6560.28
	10/03/90	6564.98
	11/06/90	6565.82
	12/05/90	6563.78
	01/02/91	6564.85
	I	01/29/90
04/27/90		6529.88
07/17/90		6528.72
10/24/90		6529.82
J	06/04/90	6526.64
	12/05/90	6526.36
JC	01/02/90	6523.34
	02/05/90	6523.84
	03/05/90	6523.80
	04/03/90	6523.19
	05/09/90	6522.16
	06/05/90	6522.59
	06/07/90	6522.59
	07/05/90	6523.34
	08/14/90	6523.34
	09/05/90	6520.84
	10/02/90	6514.19
	11/05/90	6515.34
	12/04/90	6516.34
01/03/91	6515.24	
K2	04/28/90	6528.37
	10/26/90	6528.22
KM	04/28/90	6528.01
	10/26/90	6527.79
KZ	04/28/90	6528.06
	10/26/90	6527.83
M4	05/29/90	6521.90
	10/18/90	6521.78
M5	10/17/90	6522.67
MA	01/03/90	6569.44
	02/06/90	6570.95
	03/06/90	6569.72
	04/04/90	6570.74



TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
MA	04/19/90	6553.22
	05/09/90	6571.88
	06/05/90	6569.01
	07/06/90	6570.22
	08/15/90	6570.62
	09/06/90	6569.22
	10/03/90	6569.01
	11/05/90	6572.09
	12/07/90	6570.22
	01/02/91	6570.98
MB	01/03/90	6571.74
	02/06/90	6570.63
	03/06/90	6571.06
	04/04/90	6571.03
	04/19/90	6568.06
	05/09/90	6567.54
	06/05/90	6571.54
	07/06/90	6569.16
	08/15/90	6569.36
	09/06/90	6567.96
	10/03/90	6571.43
	11/05/90	6571.09
	12/05/90	6569.56
01/02/91	6568.92	
MC	01/03/90	6554.11
	02/06/90	6554.06
	03/06/90	6569.56
	04/04/90	6571.15
	04/19/90	6564.06
	05/09/90	6568.80
	06/05/90	6568.44
	07/06/90	6565.56
	08/15/90	6569.06
	09/06/90	6568.46
	10/03/90	6571.54
	11/05/90	6570.72
	12/05/90	6570.56
01/02/91	6571.64	
MD	01/03/90	6569.70
	02/06/90	6570.82
	03/06/90	6568.46
	04/04/90	6569.43
	04/19/90	6564.46
	05/09/90	6569.93
	06/05/90	6569.03
	07/06/90	6567.96
	08/15/90	6568.06
	09/06/90	6563.96
10/03/90	6570.48	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
MD	11/05/90	6569.36
	12/05/90	6569.46
	01/02/91	6570.62
ME	01/03/90	6555.79
	02/06/90	6570.15
	03/06/90	6568.42
	04/04/90	6568.86
	04/19/90	6561.92
	05/09/90	6569.71
	06/05/90	6566.72
	07/06/90	6569.92
	08/15/90	6569.92
	09/06/90	6564.92
	10/03/90	6570.68
	11/05/90	6568.77
	12/05/90	6568.92
01/02/91	6569.28	
MF	01/03/90	6569.13
	02/06/90	6570.41
	03/06/90	6569.28
	04/04/90	6571.55
	04/19/90	6565.78
	05/09/90	6567.73
	06/05/90	6566.93
	07/06/90	6567.28
	08/15/90	6566.48
	09/06/90	6566.58
	10/03/90	6571.65
	11/05/90	6570.18
	12/05/90	6569.78
01/02/91	6570.35	
MG	01/03/90	6571.63
	02/06/90	6572.40
	03/06/90	6572.08
	04/04/90	6571.52
	04/19/90	6565.08
	05/09/90	6569.84
	06/05/90	6568.58
	07/06/90	6569.08
	08/15/90	6571.58
	09/06/90	6569.08
	10/03/90	6571.74
	11/05/90	6571.58
	12/05/90	6571.08
01/02/91	6570.98	
MH	01/03/90	6571.92
	02/06/90	6573.32
	03/06/90	6572.67

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
MH	04/04/90	6572.84
	04/19/90	6563.92
	05/09/90	6571.82
	06/05/90	6573.40
	07/06/90	6569.42
	08/15/90	6571.12
	09/06/90	6572.02
	10/03/90	6572.28
	11/05/90	6572.10
	12/05/90	6570.42
	01/02/91	6572.49
	MI	01/03/90
02/06/90		6575.63
03/06/90		6575.27
04/04/90		6573.02
04/19/90		6568.27
05/09/90		6573.27
06/05/90		6575.99
07/06/90		6571.27
08/15/90		6573.67
09/06/90		6575.27
10/03/90		6575.75
11/05/90		6575.31
12/05/90	6572.87	
01/02/91	6574.14	
MJ	01/03/90	6574.98
	02/06/90	6574.97
	03/06/90	6575.11
	04/04/90	6571.78
	04/19/90	6563.10
	05/09/90	6574.11
	06/05/90	6573.66
	07/06/90	6574.01
	08/15/90	6574.61
	09/06/90	6574.81
	10/03/90	6574.53
	11/05/90	6574.89
12/05/90	6573.81	
01/02/91	6574.49	
N	05/23/90	6532.99
	12/04/90	6532.92
NC	01/30/90	6536.29
	04/27/90	6536.24
	07/16/90	6536.27
	10/26/90	6536.35
ND	10/17/90	6542.90

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
O	05/23/90	6538.98
	12/04/90	6539.03
P	01/02/90	6538.52
	02/05/90	6538.52
	03/05/90	6538.56
	03/13/90	6538.53
	04/02/90	6538.48
	05/07/90	6538.55
	06/04/90	6538.53
	06/04/90	6538.54
	07/02/90	6538.56
	08/06/90	6538.50
	09/05/90	6538.57
	09/12/90	6538.60
	10/02/90	6538.62
	11/05/90	6538.62
	12/03/90	6538.52
12/04/90	6538.48	
01/03/91	6538.57	
PM	01/02/90	6527.81
	01/15/90	6527.76
	01/22/90	6527.47
	02/05/90	6527.66
	02/19/90	6527.54
	03/05/90	6527.81
	03/06/90	6527.55
	03/20/90	6527.34
	04/02/90	6527.33
	04/17/90	6527.01
	04/23/90	6527.64
	05/07/90	6527.58
	05/21/90	6527.36
	06/01/90	6527.50
	06/04/90	6527.40
	06/18/90	6527.39
	07/02/90	6527.57
	07/16/90	6527.39
	07/24/90	6527.48
	08/06/90	6527.28
	08/06/90	6527.30
	08/21/90	6527.32
	09/05/90	6527.29
	09/17/90	6527.27
10/02/90	6527.34	
10/15/90	6527.07	
10/31/90	6527.09	
11/05/90	6527.12	
11/21/90	6526.94	
11/28/90	6526.70	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
PM	12/04/90	6526.96
	12/17/90	6526.95
	12/27/90	6526.86
	01/02/91	6526.75
	01/14/91	6526.44
Q	03/13/90	6546.54
	09/12/90	6546.67
R	03/13/90	6557.09
	09/12/90	6557.29
S	01/02/90	6524.58
	01/08/90	6524.44
	01/15/90	6524.52
	01/22/90	6524.47
	01/29/90	6524.67
	02/05/90	6524.65
	02/12/90	6524.70
	02/19/90	6524.71
	02/26/90	6524.72
	03/05/90	6524.95
	03/12/90	6524.82
	03/20/90	6524.62
	03/26/90	6524.74
	04/02/90	6524.61
	04/09/90	6524.71
	04/17/90	6524.75
	04/23/90	6524.85
	04/30/90	6524.87
	05/07/90	6524.81
	05/16/90	6524.67
	05/21/90	6524.67
	05/29/90	6524.77
	06/04/90	6524.66
	06/06/90	6524.64
	06/11/90	6524.52
	06/18/90	6524.43
	06/28/90	6524.37
	07/02/90	6524.38
	07/11/90	6524.27
	07/16/90	6524.26
07/24/90	6524.30	
07/30/90	6524.20	
08/06/90	6524.47	
08/14/90	6524.31	
08/21/90	6524.19	
08/27/90	6524.25	
09/05/90	6524.31	
09/11/90	6524.35	
09/17/90	6524.35	
09/27/90	6524.27	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
S	10/02/90	6524.34
	10/08/90	6524.19
	10/15/90	6524.16
	10/22/90	6524.13
	10/31/90	6524.15
	11/05/90	6524.18
	11/13/90	6524.15
	11/21/90	6524.17
	11/28/90	6524.09
	12/03/90	6524.10
	12/04/90	6524.10
	12/11/90	6524.15
	12/17/90	6524.02
	12/27/90	6523.87
	01/02/91	6523.79
	01/07/91	6523.77
	01/14/91	6523.82
	01/21/91	6523.72
	S1	01/02/90
01/08/90		6519.29
01/15/90		6519.40
01/22/90		6519.40
01/29/90		6519.74
02/05/90		6519.90
02/12/90		6519.69
02/19/90		6519.68
02/26/90		6519.67
03/05/90		6519.68
03/12/90		6519.53
03/20/90		6519.33
03/26/90		6519.36
04/02/90		6519.27
04/09/90		6519.26
04/17/90		6519.42
04/23/90		6519.51
04/30/90		6519.48
05/07/90		6519.26
05/16/90		6519.22
05/21/90		6519.25
05/29/90		6519.24
06/04/90		6519.14
06/11/90		6519.01
06/18/90		6518.94
06/28/90		6518.81
07/02/90		6518.81
07/16/90		6518.80
07/24/90		6518.83
07/30/90		6518.80
08/06/90	6517.87	
08/14/90	6519.03	
08/21/90	6519.06	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
S1	08/27/90	6519.16
	09/05/90	6519.37
	09/11/90	6519.34
	09/17/90	6519.25
	09/27/90	6519.14
	10/02/90	6519.20
	10/08/90	6519.10
	10/15/90	6519.08
	10/22/90	6519.07
	10/31/90	6519.08
	11/05/90	6519.15
	11/13/90	6519.08
	11/21/90	6519.
	11/28/90	6519.
	12/04/90	6519.
	12/11/90	6519.
	12/17/90	6519.
	12/27/90	6519.
	01/03/91	6519.
	01/07/91	6518.90
01/14/91	6517.93	
01/21/91	6517.98	
S2	01/02/90	6520.
	01/08/90	6520.0.
	01/15/90	6520.19
	01/22/90	6520.14
	01/29/90	6520.17
	02/05/90	6520.52
	02/12/90	6520.41
	02/19/90	6520.39
	02/26/90	6520.38
	03/05/90	6520.40
	03/12/90	6520.26
	03/20/90	6520.05
	03/26/90	6520.12
	04/02/90	6520.99
	04/09/90	6520.01
	04/17/90	6520.12
	04/23/90	6520.19
	04/30/90	6520.27
	05/07/90	6520.04
	05/16/90	6519.93
	05/21/90	6519.95
	05/29/90	6519.96
	06/04/90	6519.87
	06/11/90	6519.79
06/18/90	6519.76	
06/28/90	6519.69	
07/02/90	6519.72	
07/11/90	6519.68	
07/16/90	6519.65	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
S2	07/24/90	6519.71
	07/30/90	6519.64
	08/06/90	6519.68
	08/14/90	6519.8'
	08/21/90	6519.81
	08/27/90	6519.95
	09/05/90	6520.09
	09/11/90	6520.07
	09/17/90	6520.00
	09/27/90	6519.89
	10/02/90	6519.96
	10/08/90	6519.83
	10/15/90	6519.81
	10/18/90	6519.83
	10/22/90	6519.81
	10/31/90	6519.81
	11/05/90	6519.87
	11/13/90	6519.79
	11/21/90	6519.82
	11/28/90	6519.65
	12/04/90	6519.49
	12/11/90	6519.42
	12/17/90	6519.23
	12/27/90	6520.36
01/03/91	6519.03	
01/07/91	6518.97	
01/14/91	6518.91	
01/21/91	6518.96	
S3	10/16/90	6520.65
S4	10/16/90	6519.09
SA	01/02/90	6519.91
	02/05/90	6519.58
	03/05/90	6512.23
	04/03/90	6511.48
	05/09/90	6511.73
	06/05/90	6511.95
	06/07/90	6511.95
	07/05/90	6511.56
	08/14/90	6559.96
	09/05/90	6520.16
	10/02/90	6511.11
	11/05/90	6511.16
	12/04/90	6511.16
01/02/91	6510.13	
SB	01/02/90	6515.91
	02/05/90	6516.29
	03/05/90	6516.69
	04/03/90	6516.14



TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
SB	05/09/90	6516.34
	06/05/90	6516.34
	06/07/90	6516.34
	07/05/90	6554.79
	08/14/90	6561.29
	09/05/90	6544.79
	10/02/90	6511.37
	11/05/90	6511.55
	12/04/90	6539.29
	01/02/91	6510.60
	SC	01/02/90
02/05/90		6512.74
03/05/90		6514.91
04/03/90		6512.80
05/09/90		6514.37
06/05/90		6512.35
06/07/90		6512.35
07/05/90		6564.23
08/14/90		6528.53
09/05/90		6552.53
10/02/90		6514.07
11/05/90		6533.69
12/04/90		6546.03
01/02/91	6513.14	
SD4	01/02/90	6506.40
	02/0. '90	6506.84
	03/05/90	6507.90
	05/09/90	6505.02
	06/05/90	6515.08
	06/07/90	6515.08
	07/05/90	6537.60
	08/14/90	6559.60
	09/05/90	6527.90
	10/02/90	6533.05
	11/05/90	6504.35
	12/04/90	6555.90
	01/02/91	6506.50
SE	01/02/90	6504.60
	02/05/90	6520.85
	03/05/90	6515.32
	04/03/90	6515.24
	05/09/90	6514.86
	06/05/90	6515.07
	06/07/90	6515.07
	07/05/90	6518.27
	08/14/90	6535.07
	09/05/90	6518.07
	10/02/90	6518.65
11/05/90	6518.52	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
SE	12/04/90	6519.07
	01/02/91	6517.78
SM	01/02/90	6518.96
	02/05/90	6519.31
	03/05/90	6519.46
	04/02/90	6519.17
	04/17/90	6519.27
	05/07/90	6519.14
	06/04/90	6518.37
	07/02/90	6517.75
	07/24/90	6517.72
	08/06/90	6517.59
	09/05/90	6517.99
	10/02/90	6518.06
	11/05/90	6517.97
12/04/90	6516.94	
01/02/91	6517.30	
SN	01/02/90	6519.10
	02/05/90	6519.43
	03/05/90	6519.71
	04/02/90	6519.31
	04/17/90	6519.52
	05/07/90	6519.52
	06/04/90	6518.78
	07/02/90	6518.12
	07/24/90	6518.07
	08/06/90	6518.04
	09/05/90	6518.37
	10/02/90	6518.40
	11/05/90	6518.34
12/04/90	6518.32	
01/02/91	6517.84	
SO	01/02/90	6518.78
	01/08/90	6518.66
	01/15/90	6518.84
	01/22/90	6518.78
	01/29/90	6519.20
	02/05/90	6519.27
	02/12/90	6519.13
	02/19/90	6519.25
	02/26/90	6519.08
	03/05/90	6519.29
	03/12/90	6519.14
	03/20/90	6518.88
	03/26/90	6518.98
	04/02/90	6518.87
	04/09/90	6518.91
04/17/90	6519.25	
04/23/90	6519.37	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
SO	04/30/90	6519.33
	05/07/90	6518.92
	05/16/90	6518.99
	05/21/90	6519.05
	05/29/90	6518.99
	06/04/90	6518.21
	06/05/90	6518.21
	06/11/90	6516.83
	06/18/90	6517.42
	06/28/90	6517.49
	07/02/90	6517.47
	07/11/90	6517.54
	07/16/90	6517.44
	07/24/90	6517.52
	07/30/90	6517.42
	08/06/90	6517.45
	08/14/90	6517.61
	08/21/90	6517.57
	08/27/90	6517.68
	09/05/90	6518.15
	09/11/90	6517.83
	09/17/90	6517.82
	09/27/90	6517.73
	10/02/90	6517.88
	10/08/90	6517.71
	10/15/90	6517.70
	10/22/90	6517.71
	10/31/90	6517.74
	11/05/90	6517.85
	11/13/90	6517.78
	11/21/90	6517.84
	11/28/90	6517.67
	12/03/90	6517.54
12/11/90	6517.45	
12/17/90	6517.25	
12/27/90	6517.45	
01/02/91	6517.00	
01/07/91	6516.97	
01/14/91	6517.09	
01/21/91	6517.34	
SP	01/02/90	6518.36
	01/08/90	6518.29
	01/15/90	6518.47
	01/22/90	6518.47
	01/29/90	6518.82
	02/05/90	6518.88
	02/12/90	6518.83
	02/19/90	6519.01
	02/26/90	6518.92
	03/05/90	6519.00
03/12/90	6518.79	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
SP	03/20/90	6518.65
	03/26/90	6518.64
	04/02/90	6518.51
	04/09/90	6518.57
	04/17/90	6519.07
	04/23/90	6519.20
	04/30/90	6519.15
	05/07/90	6518.58
	05/16/90	6518.79
	05/21/90	6518.84
	05/29/90	6518.74
	06/04/90	6517.11
	06/11/90	6516.82
	06/18/90	6516.68
	06/28/90	6516.51
	07/02/90	6516.53
	07/11/90	6516.47
	07/16/90	6516.43
	07/24/90	6516.55
	07/30/90	6516.49
	08/06/90	6516.58
	08/14/90	6516.69
	08/21/90	6516.67
	08/27/90	6516.75
	09/05/90	6517.33
	09/11/90	6516.96
	09/17/90	6516.94
	09/27/90	6516.80
	10/02/90	6516.92
	10/08/90	6516.81
	10/15/90	6516.81
	10/22/90	6516.85
	10/31/90	6516.89
	11/05/90	6516.96
	11/13/90	6516.96
11/21/90	6517.01	
11/28/90	6516.95	
12/04/90	6516.75	
12/11/90	6516.55	
12/17/90	6516.27	
12/27/90	6516.66	
01/02/91	6516.09	
01/07/91	6516.09	
01/14/91	6516.35	
01/21/91	6516.45	
SQ	01/02/90	6516.07
	02/05/90	6513.85
	03/05/90	6516.67
	05/09/90	6514.62
	06/05/90	6515.60
	06/07/90	6514.80

TABLE 1.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
SQ	07/05/90	6556.40
	08/14/90	6537.90
	09/05/90	6548.10
	10/02/90	6519.55
	11/05/90	6547.79
	12/04/90	6548.30
	01/02/91	6526.62
SR	01/02/90	6516.64
	02/05/90	6517.64
	03/05/90	6518.21
	05/09/90	6517.90
	06/05/90	6532.14
	06/07/90	6532.14
	07/05/90	6549.74
	08/14/90	6535.04
	09/05/90	6546.04
	10/02/90	6513.63
	11/05/90	6514.07
	12/04/90	6540.74
	01/02/91	6510.95
SS	12/04/90	6513.19
	01/02/91	6511.67
ST	12/04/90	6514.47
	01/02/91	6513.67
SU	01/02/90	6516.54
	02/05/90	6517.01
	03/05/90	6510.41
	05/09/90	6510.31
	06/05/90	6512.00
	06/07/90	6512.00
	07/05/90	6533.60
	08/14/90	6564.10
	09/05/90	6526.10
	10/02/90	6519.29
	11/05/90	6517.57
	12/04/90	6530.10
	01/02/91	6518.80
SV	01/02/91	6516.03
S2	01/02/90	6539.49
	02/05/90	6539.06
	03/05/90	6539.24
	04/02/90	6539.66
	04/17/90	6539.88
	05/07/90	6539.96
	06/04/90	6539.74
	07/02/90	6539.41

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
SZ	08/06/90	6538.92
	09/05/90	6538.56
	10/02/90	6538.45
	11/05/90	6538.45
	12/04/90	6537.70
	01/02/91	6537.45
T	01/02/90	6536.32
	01/08/90	6536.17
	01/15/90	6536.21
	01/22/90	6536.14
	01/29/90	6536.35
	02/05/90	6536.21
	02/11/90	6536.27
	02/19/90	6536.14
	02/26/90	6536.05
	03/05/90	6536.32
	03/12/90	6536.29
	03/20/90	6536.05
	03/26/90	6536.09
	04/02/90	6535.94
	04/09/90	6535.99
	04/17/90	6536.07
	04/23/90	6536.11
	04/30/90	6536.08
	05/07/90	6536.20
	05/16/90	6535.92
	05/21/90	6535.96
	05/29/90	6536.00
	06/04/90	6535.93
	06/11/90	6535.97
	06/18/90	6535.94
	06/25/90	6535.99
	07/02/90	6536.14
	07/11/90	6536.02
	07/16/90	6535.95
	07/24/90	6536.05
	07/30/90	6535.92
	08/06/90	6535.91
	08/14/90	6536.07
	08/21/90	6535.97
	08/27/90	6536.03
	09/05/90	6535.99
09/11/90	6536.03	
09/17/90	6536.01	
09/27/90	6536.00	
10/02/90	6536.13	
10/08/90	6535.97	
10/15/90	6535.96	
10/22/90	6535.96	
10/31/90	6535.99	
11/05/90	6536.04	

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
T	11/13/90	6535.98
	11/21/90	6535.75
	11/28/90	6535.28
	12/04/90	6535.31
	12/05/90	6535.37
	12/11/90	6535.62
	12/17/90	6535.77
	12/27/90	6536.39
	01/02/91	6535.54
	01/07/91	6535.59
	01/14/91	6535.74
	01/21/91	6535.84
	TA	12/03/90
TB	12/04/90	6536.58
W	06/05/90	6520.65
	12/03/90	6520.16
W2	06/04/90	6518.96
	12/03/90	6518.30
WR11	01/02/90	6521.41
	01/26/90	6521.45
	02/05/90	6521.48
	03/05/90	6521.65
	04/02/90	6521.27
	04/17/90	6521.35
	05/07/90	6521.36
	06/04/90	6521.16
	07/02/90	6521.15
	07/19/90	6521.07
	08/06/90	6520.98
	09/05/90	6521.04
	10/02/90	6521.20
	10/23/90	6520.96
	11/05/90	6521.12
	12/04/90	6520.84
	01/03/91	6520.69
WK12	01/03/90	6559.04
	02/06/90	6567.12
	03/06/90	6565.69
	04/04/90	6562.64
	04/19/90	6559.69
	05/09/90	6563.60
	06/05/90	6565.37
	07/06/90	6562.19
	08/15/90	6562.79
	09/06/90	6567.19
	10/03/90	6564.81

TABLE 2.2-1 ALLUVIAL WATER LEVEL MEASUREMENT LEVELS (ON T-MSL)

WELL NAME	DATE	WATER ELEVATION
WR12	11/05/90	6567.88
	12/05/90	6566.19
	01/02/91	6565.09
WR13	01/03/90	6565.64
	02/06/90	6565.62
	03/06/90	6566.04
	04/04/90	6566.30
	05/09/90	6562.04
	06/05/90	6563.54
	07/06/90	6565.04
	08/15/90	6565.04
	09/05/90	6559.14
	10/03/90	6564.58
	11/05/90	6563.84
	12/05/90	6563.54
	01/02/91	6565.43
WR14	01/03/90	6558.76
	02/06/90	6564.66
	03/06/90	6564.14
	04/04/90	6564.48
	04/19/90	6541.14
	05/09/90	6561.94
	06/05/90	6564.66
	07/06/90	6563.84
	08/15/90	6562.94
	09/06/90	6557.14
	10/03/90	6561.93
	11/05/90	6563.73
	12/05/90	6561.14
01/02/91	6563.71	
WR15	01/03/90	6568.19
	02/06/90	6570.05
	03/06/90	6569.19
	04/04/90	6566.87
	04/19/90	6565.69
	05/09/90	6568.75
	06/05/90	6569.59
	07/06/90	6565.69
	08/15/90	6569.89
	09/06/90	6570.19
	10/03/90	6570.91
	11/05/90	6569.57
	12/05/90	6568.99
01/02/91	6569.39	
WR1R	01/03/90	6558.55
	02/06/90	6567.99
	03/06/90	6563.47
	04/04/90	6566.78



TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
WR1R	05/09/90	6563.47
	06/05/90	6565.03
	07/06/90	6561.82
	08/15/90	6551.87
	09/06/90	6560.07
	10/03/90	6563.91
	11/05/90	6565.26
	12/05/90	6565.67
	01/02/91	6566.13
	WR2	02/06/90
03/06/90		6541.09
04/04/90		6543.37
05/09/90		6562.59
06/05/90		6563.09
07/06/90		6548.09
08/15/90		6546.59
09/06/90		6549.29
10/03/90		6564.23
11/05/90		6565.19
12/05/90		6554.59
01/02/91		6565.33
WR3		01/02/90
	02/05/90	6510.54
	03/05/90	6511.37
	04/03/90	6511.21
	05/09/90	6511.25
	06/05/90	6511.51
	06/07/90	6511.51
	07/05/90	6520.54
	08/14/90	6531.21
	09/05/90	6511.54
	10/02/90	6511.94
	11/05/90	6512.08
	12/04/90	6530.51
	01/03/91	6511.31
WR5	01/02/90	6522.66
	02/05/90	6514.88
	03/05/90	6515.01
	04/03/90	6514.65
	05/09/90	6514.49
	06/05/90	6514.32
	06/07/90	6514.32
	07/05/90	6526.83
	08/14/90	6514.23
	09/05/90	6514.23
	10/02/90	6513.99
	11/05/90	6513.55
	12/04/90	6513.63
	01/03/91	6512.78

TABLE 2.2-1 ALLUVIAL AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
WR7	01/25/90	6522.58
	07/19/90	6522.90
	10/23/90	6522.36
WR9	01/02/90	6521.60
	02/05/90	6522.38
	03/05/90	6522.53
	04/02/90	6522.52
	04/17/90	6522.38
	05/07/90	6522.35
	06/04/90	6522.20
	07/02/90	6522.28
	08/06/90	6522.24
	09/05/90	6522.18
	10/02/90	6522.26
	10/23/90	6522.06
	11/05/90	6522.24
	12/04/90	6521.92
01/03/91	6521.73	
X	05/29/90	6527.92
	08/07/90	6526.15
	10/31/90	6527.88
Y	03/06/90	6528.28
	05/29/90	6528.15
	10/17/90	6528.07
	11/27/90	6527.07
Z	02/05/90	6505.49
	03/05/90	6507.21
	04/03/90	6507.69
	05/09/90	6497.01
	06/05/90	6507.21
	06/07/90	6507.21
	07/05/90	6546.41
	08/14/90	6514.51
	09/05/90	6513.21
	10/02/90	6510.82
	11/05/90	6510.29
	12/04/90	6508.01
	01/03/91	6507.52

TABLE 2.2-2 WATER LEVELS FOR MURRAY ACRES WELLS  
 WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
0802	05/31/90	6526.45
	10/30/90	6526.34
0804	11/01/90	6516.91
0815	05/31/90	6524.40
AW	02/06/90	6528.63
	04/04/90	6529.18
	07/06/90	6538.33
	08/15/90	6535.43
	09/06/90	6533.43
	10/03/90	6507.63
	11/05/90	6514.81
	12/05/90	6537.43
	01/02/91	6519.62

TABLE 2.2-3 WATER LEVELS FOR BROADVIEW ACRES WELLS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
0453	04/30/90	6532.43
	10/23/90	6532.50
SUB1	09/14/90	6527.35
SUB2	04/30/90	6526.44
	09/27/90	6525.42
SUB3	09/14/90	6528.07

TABLE 2.2-4 WATER LEVELS FOR FELICE ACRES WELLS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
0490	04/04/90	6525.74
	10/23/90	6525.52
0492	04/04/90	6525.84
	10/23/90	6526.33

TABLE 2.2-5 WATER LEVELS FOR PLEASANT VALLEY ESTATES AND  
 NORTH OF PLEASANT VALLEY ESTATES WELLS  
 WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
0835	06/07/90	6511.30
	10/31/90	6511.46
0844	05/31/90	6521.28
	11/02/90	6521.20
0846	06/04/90	6502.23
	10/31/90	6501.73

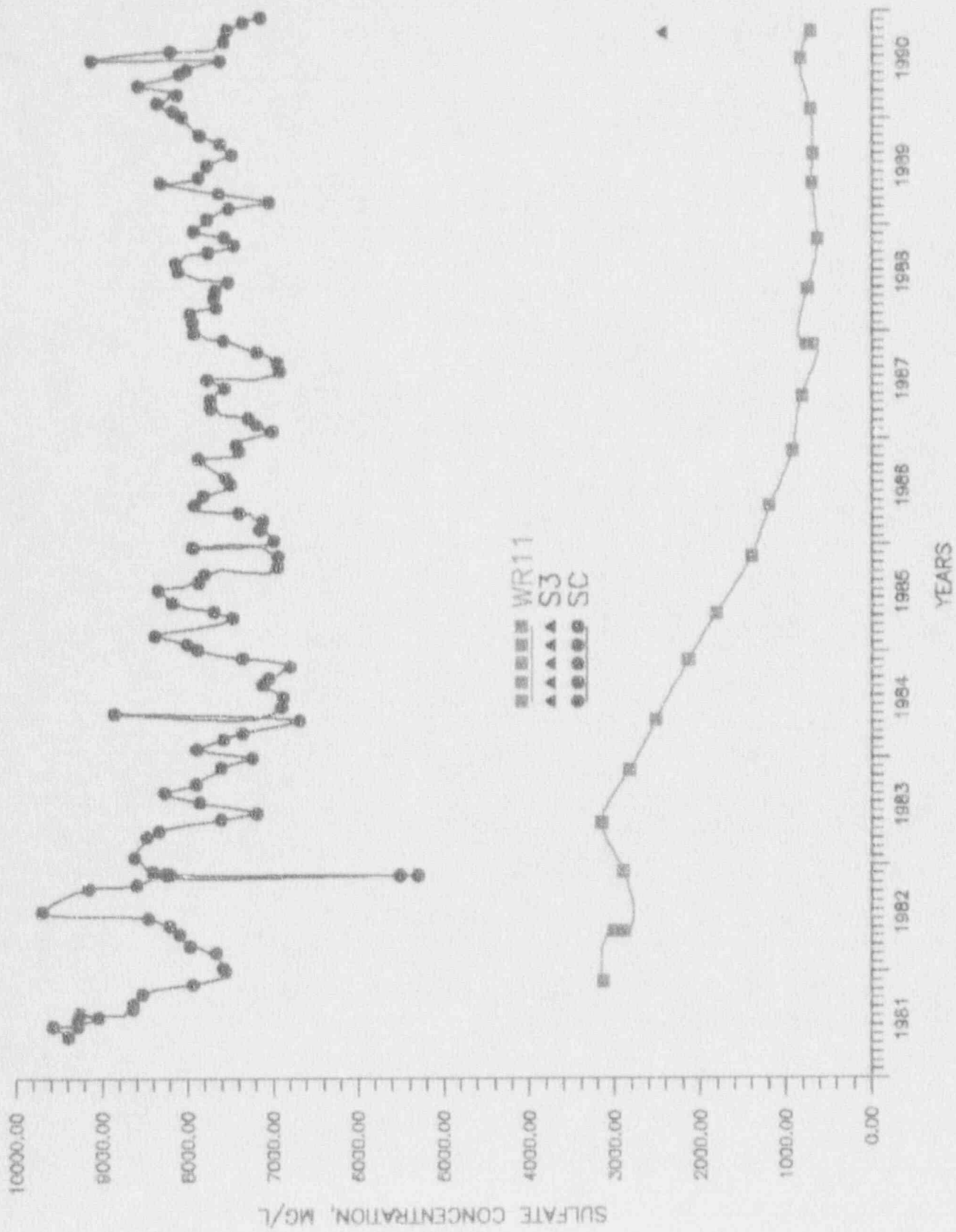


FIGURE 2.3-1. SULFATE CONCENTRATION FOR WELLS WR11, S3 AND SC.

## 2.3 WATER QUALITY

The water quality parameters monitored and the frequency of monitoring a particular constituent are presented in Table 8.0-1 of DP-200 and Table 5-1 of Hydro-Engineering (1989). Additional parameters which are required to be monitored by the NRC are chromium, radium-228, thorium-230 and vanadium. Tables 2.3-1 and 2.3-2 present the water quality data from the Homestake alluvial wells. Constituents of calcium through ion balance for the alluvial water quality data for the Murray Acres, Broadview Acres, Felice Acres, and Pleasant Valley subdivisions are presented in Tables 2.3-3, 2.3-5, 2.3-7 and 2.3-9 respectively. Tables 2.3-4, 2.3-6, 2.3-8 and 2.3-10 present the pH through thorium-230 concentrations. Tables 2.3-11 and 2.3-12 present the alluvial water quality for the regional wells monitored. Sulfate, uranium, selenium and molybdenum are the main parameters used to evaluate this site. Drawing 2.0-1 presents the locations of the alluvial wells near the Homestake mill. Concentration maps for sulfate, uranium, selenium and molybdenum and concentration figures for radium-226, radium-228, chromium, vanadium and thorium-230 are presented in this monitoring report to portray water-quality conditions of the alluvial aquifer. Hydro-Engineering (1981) should be consulted for concentration maps prior to those presented in the monitoring reports.

### 2.3.1 SULFATE CONCENTRATIONS

Drawing 2.3-1 presents the Fall, 1990 sulfate concentrations in alluvial aquifer water near the Homestake mill. Drawing 2.3-1 of the prior monitoring reports (see Hydro-Engineering 1983a, 1983b, 1984a, 1984b, 1984c, 1985a, 1985b, 1985c, 1985d, 1986a, 1986b, 1986c, 1987a, 1987b, 1988a, 1988b and 1990) should be consulted for sulfate concentrations maps prior to this one. A Fall of 1988 sulfate concentration map is presented in DP-200 renewal (Hydro-Engineering 1988c). The main changes between the Fall of 1989 and 1990 concentration maps are the northerly movement of the 1000 contour south of the small impoundment and the southerly movement of the 1000 contour to the southwest of the Murray Acres injection. Sulfate concentrations at collection well Z have been restored while the levels in wells E and JC were significantly reduced this last year. Collection wells E and Z are recommended to be switched to injection wells to increase the movement rate of the elevated concentrations to the north.

All of the Broadview and Felice Acres wells that were sampled this annual period contain water with sulfate concentrations that are significantly less than the average background concentration of 976 mg/l. This data shows that the Broadview Acres injection system is maintaining low sulfate concentrations in Broadview and Felice Acres.



Figure 2.3-1 shows the sulfate concentrations have been fairly steady the last few years in collection well SC and the monitoring well WR11 to the southwest of the large impoundment. The steady concentrations in well WR11 is due to the Murray Acres injection system. This figure shows that the good water quality has been maintained to the southwest of the impoundment in 1990 by the collection system and Murray Acres injection. The initial sulfate concentration in the new compliance monitoring well S3 is also shown on the figure.

Monitoring wells B and D1 and new compliance well M5 are located to the northeast of Murray Acres. The sulfate concentrations in wells D1 and B seem to be gradually declining due to the fresh water injection (see Figure 2.3-2). The sulfate concentration in well M5 which is closer to the impoundment is higher, as expected. Concentrations in all three of these wells should gradually decline in the future. Figure 2.3-3 shows that the sulfate concentrations in compliance monitoring well BP have been gradually declining while concentrations in well E have generally been declining since collection started from this well. Well E has been pumped as a collection well in 1989 and 1990 which probably has caused the decrease in concentration.

Concentrations in collection well Z have steadily declined to the injection concentration since the start of pumping of this well in 1989. The steady level the last few months is due to the sulfate concentration reaching the injection value. Sulfate values for compliance wells Y and DQ are also shown on this figure. Figure 2.3-5 shows that the Broadview Acres injection has maintained the sulfate concentration in well I and has caused a decline in the area of well J and JC which are adjacent to each other. The movement of some of the Broadview Acres injection to the north should cause the concentrations in well JC to continue to decline to the injection level. The sulfate concentrations in compliance well X have been gradually increasing. Well X is located on the edge of the alluvial aquifer and therefore effects from seepage are lagged in this lower permeability area. The Broadview Acres injection prevents movement of these concentrations to the south of well J.

The sulfate concentrations in the line of monitoring well SUB3, 492 and 490 have been near the injection concentration since 1985 (see Figure 2.3-6). The latest data indicates that higher values in the Fall of 1989 were probably erroneous.

Figure 2.3-7 shows that the sulfate concentrations in Murray and Pleasant Valley Acres wells, 840, 846 and 844. Sulfate concentrations have declined in Pleasant Valley well 840 due to the Murray injection during the last two years. The sulfate concentrations in wells 844 and 846 have not been affected by the Murray Acres injection due to their distances from the line of injection wells.

### 2.3.2 URANIUM CONCENTRATIONS

Drawing 2.3-2 presents uranium concentrations for alluvial aquifer water for Fall 1990. The uranium concentrations in the alluvial aquifer have changed gradually during the last year in a few locations. Uranium concentrations in all of the upgradient sites and most of the low levels downgradient have shown an increase during the last year. This change is not thought to be correct but due to a variation in the lab. The lab splits with low concentrations of uranium compare favorable.

All of the uranium concentrations in water sampled from wells in the four subdivisions are less than one mg/l. The largest uranium concentration in wells in all four of the subdivisions during the Fall of 1990 was 0.59 mg/l in well SUB1. This well is located in southwest Broadview Acres. Uranium concentrations should gradually decline in the alluvial aquifer in each of the subdivisions. Restoration of uranium concentrations lag other constituents at this site due to the leaching of the constituent out of the alluvium. This lag may require an ACL for uranium at this site.

Figure 2.3-8 shows that uranium concentration in collection well SC have been fairly steady the two last years but are gradually declining over the long term. The Murray Acres injection system maintained the low uranium concentrations in well WR11. The uranium concentration in compliance well S3 is between the collection value and the fresh water downgradient. Uranium concentrations in wells B, D1 and M5 are presented in Figure 2.3-9. The Murray Acres injection should cause the uranium concentrations in each of these wells to gradually decline. Figure 2.3-10 shows that the uranium concentrations in wells E and F are small while the levels in well BP need some restoration. Figure 2.3-11 shows that the uranium concentrations in collection well Z are small and that significant levels exist in compliance wells Y and DQ. The uranium concentration in collection well JC is still slightly elevated and additional collection in this area is needed. The low concentration in well I has been maintained the last year (see Figure 2.3-12). The elevated uranium concentration in compliance well X has been fairly steady for several years.

Figure 2.3-13 shows that the uranium concentration in well SUB2 has shown a gradual increase in the last year. Concentrations in well SUB2 are well below the State standard but will be several years before they decline below the NRC site standard of 0.04 mg/l. Sulfate concentrations in well SUB3 have been near the injection concentration since 1985. The uranium concentration in Broadview monitoring well 453 seems to have slightly increased during the last year. The uranium concentrations in well SUB1, 492 and 490 were also gradually declining toward the NRC site standard (see Figure 2.3-14) but the latest value indicates a small increase in concentration. These small increases are likely due to variation

in the lab analysis and an actual change in uranium concentration.

Figure 2.3-15 shows that the uranium concentrations in western Murray Acres, Pleasant Valley and south of Pleasant Valley are low. These concentrations for wells 840 and 846 on the average are below the NRC site standard while they are slightly above this value in well 844.

### 2.3.3 SELENIUM CONCENTRATIONS

Selenium concentrations are presented on Drawing 2.3-3 for alluvial aquifer water for Fall, 1990. Selenium concentration contours are very similar to those that were presented for Fall 1989 (see Drawing 2.3-3 of Hydro-Engineering, 1990). All of the alluvial wells that were sampled in Broadview, Felice, Murray and Pleasant Valley this quarter contain water with a selenium concentration which is less than the State standard of 0.12 mg/l and the NRC site standards of 0.10 mg/l. Water from well 802, in the northeast corner of Murray Acres, has the highest selenium concentration in the subdivision wells.

Figure 2.3-16 shows the selenium concentrations for well SC, WR11 and S3. Selenium concentrations in well WR11 has declined to near the standards due to the Murray Acres injection. The selenium concentration in collection well SC is gradually declining with time. The selenium concentration in compliance well S3 is below that observed in the collection water but still elevated. The selenium concentrations in well B is gradually declining while the values in well D1 is fairly steady (see Figures 2.3-17). The concentration in compliance well M5 is slightly greater than the other two wells. The Murray injection should cause the concentrations in each of these wells to gradually decline in the future. The selenium concentrations in wells E and BF have been declining the last couple of years while the level in well F has stayed small (see Figure 2.3-18).

Figure 2.3-19 shows that the selenium concentration in collection well Z is small while a higher value exists in compliance well Y. The selenium concentration in well DQ has been increasing the last two years. Well DQ is within the zone of control of the D collection wells. The Broadview Acres injection system has maintained the reduced selenium concentrations in well I but has not significantly affected the levels in well JC (see Figure 2.3-20). The movement of some of the Broadview Acres injection farther to the north should cause concentrations in well JC to decline. Significant selenium concentration exist in compliance well X which will eventually be decreased by the Broadview injection also.

Figures 2.3-21 and 2.3-22 show that selenium concentrations in Broadview and Felice alluvial wells SUB2, SUB3, 453, SUB1, 490 and

492 have been maintained low with the Broadview Acres injection. Selenium concentrations in Murray and Pleasant Valley are presented in Figure 2.3-23 for wells 840, 846 and 844. A small increase in selenium in well 840 may have existed in 1988 and early 1989. These levels are small enough that the difference could be lab variation.

#### 2.3.4 MOLYBDENUM CONCENTRATIONS

Molybdenum concentrations for the alluvial aquifer for the Fall of 1990 are presented in Drawing 2.3-4. Molybdenum contours are similar to those presented for the Fall of 1989. The molybdenum concentrations seem to be lagging in restoration also but not as slow as uranium.

The molybdenum concentration in collection well SC have stayed high in 1990 while the levels in well WR11 have been maintained low (see Figure 2.3-24). The concentration in compliance monitoring wells S3 is much less than that observed close to the impoundment. The molybdenum concentration in well D1 has been steadily declining the last few years. The molybdenum concentration is small in well B but large in compliance well M5. Figure 2.3-25 shows the concentration plot for these three wells. Figure 2.3-26 shows that the molybdenum concentrations are elevated at well BP while the levels for wells E and F are small. Figure 2.3-27 presents the molybdenum concentrations for collection well Z and points of compliance wells Y and DQ. The elevated concentrations in well Y should start to gradually decline after the gradient is reversed in this area. The molybdenum concentrations in well JC are still elevated but should have started to gradually decline due to the injection that started approximately one year ago south of wells J and JC (see Figure 2.3-28). The latest value from well JC is probably in error. The molybdenum concentrations in Broadview wells SUB2, SUB3 and 453 are low and have been maintained at their low levels with the Broadview injection (see Figure 2.3-29). Figure 2.3-30 presents the molybdenum concentrations in wells SUB1, 492 and 490. The molybdenum concentration in well 490 are still elevated while the sulfate and selenium concentrations in this well are close to the injection level. The molybdenum concentrations in alluvial wells 840, 846 and 844 have stayed low in 1990 (see Figure 2.3-31).

#### 2.3.5 RADIUM-226 PLUS RADIUM-228 CONCENTRATIONS

Figure 2.3-29 presents the radium-226 and radium-228 concentrations for the alluvial aquifer. The radium-228 concentrations are listed horizontally to the right of the well symbol while the radium-226 values are listed at a 65 degree angle above horizontal. The radium-226 plus radium-228 concentrations are small showing no significant movement of these two

constituents. Contours can not be drawn on this data due to the low levels. Radium-226 would be adequate to be continued to show that these two constituents are not migrating. Radium-226 is proposed to be monitored not based on the concentrations but because a good history of this constituent exists.

#### 2.3.6 OTHER CONSTITUENTS

The other hazardous constituents at this site are chromium, vanadium and thorium-230. Figure 2.3-30 presents the chromium concentrations in the alluvial aquifer for the Fall of 1990. All concentrations are less than the site standard of 0.06 mg/l. A few of the alluvial wells very near the impoundment contain values slightly below the site standard.

Figure 2.3-31 presents the vanadium concentrations in the alluvial aquifer for the Fall of 1990. A few of the vanadium concentrations in the alluvial aquifer near the impoundment exceed the site standard of 0.02 mg/l. These contours show that vanadium has migrated only a short distance from the impoundment.

Figure 2.3-32 presents the thorium-230 concentrations in the alluvial aquifer for the Fall of 1990. Concentrations of thorium-230 are low near the impoundment but are slightly above background near the impoundment as shown by the contours. The migration of thorium-230 has been greatly retarded at this site.

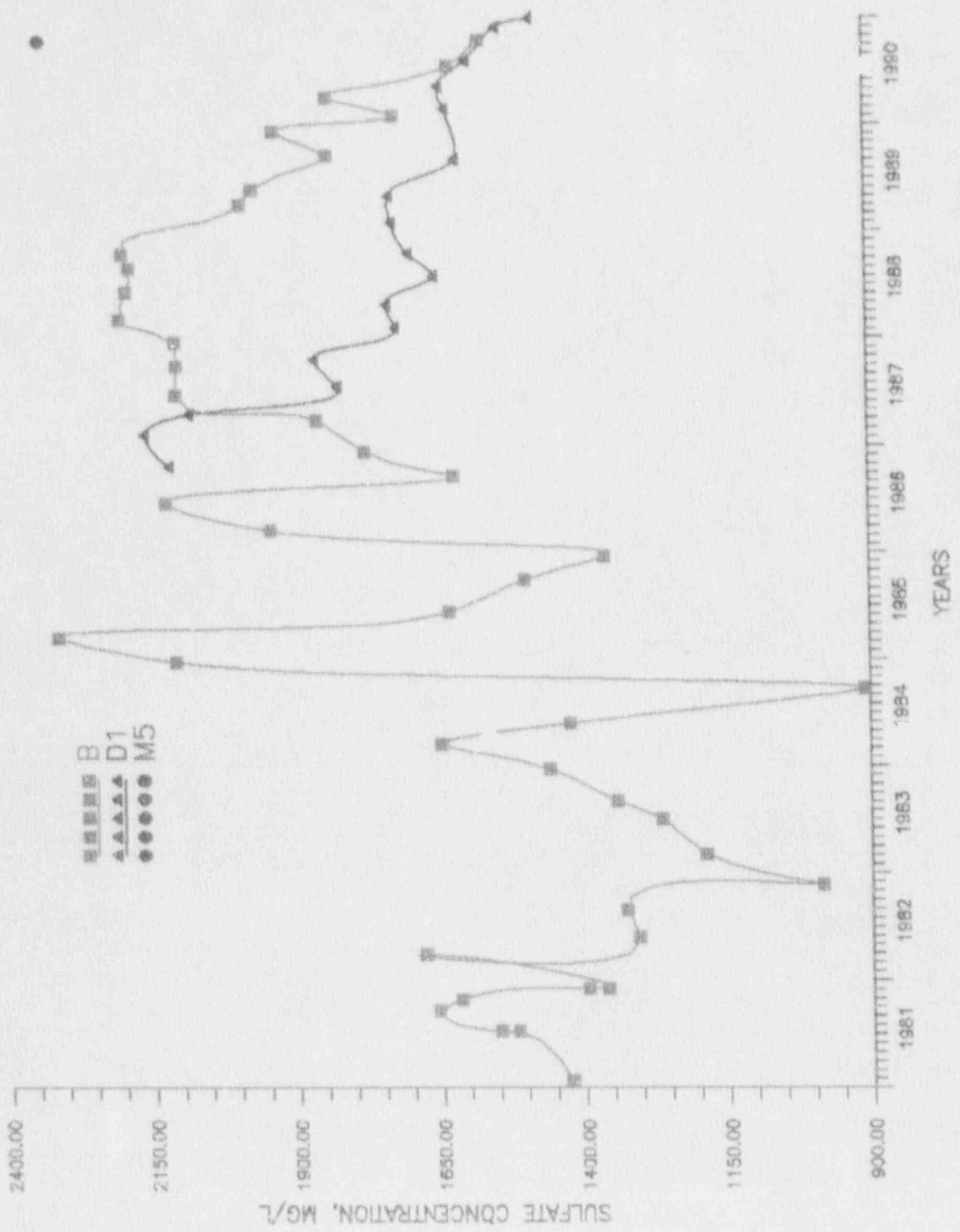


FIGURE 2.3-2. SULFATE CONCENTRATIONS FOR WELLS B, D1 AND M5.

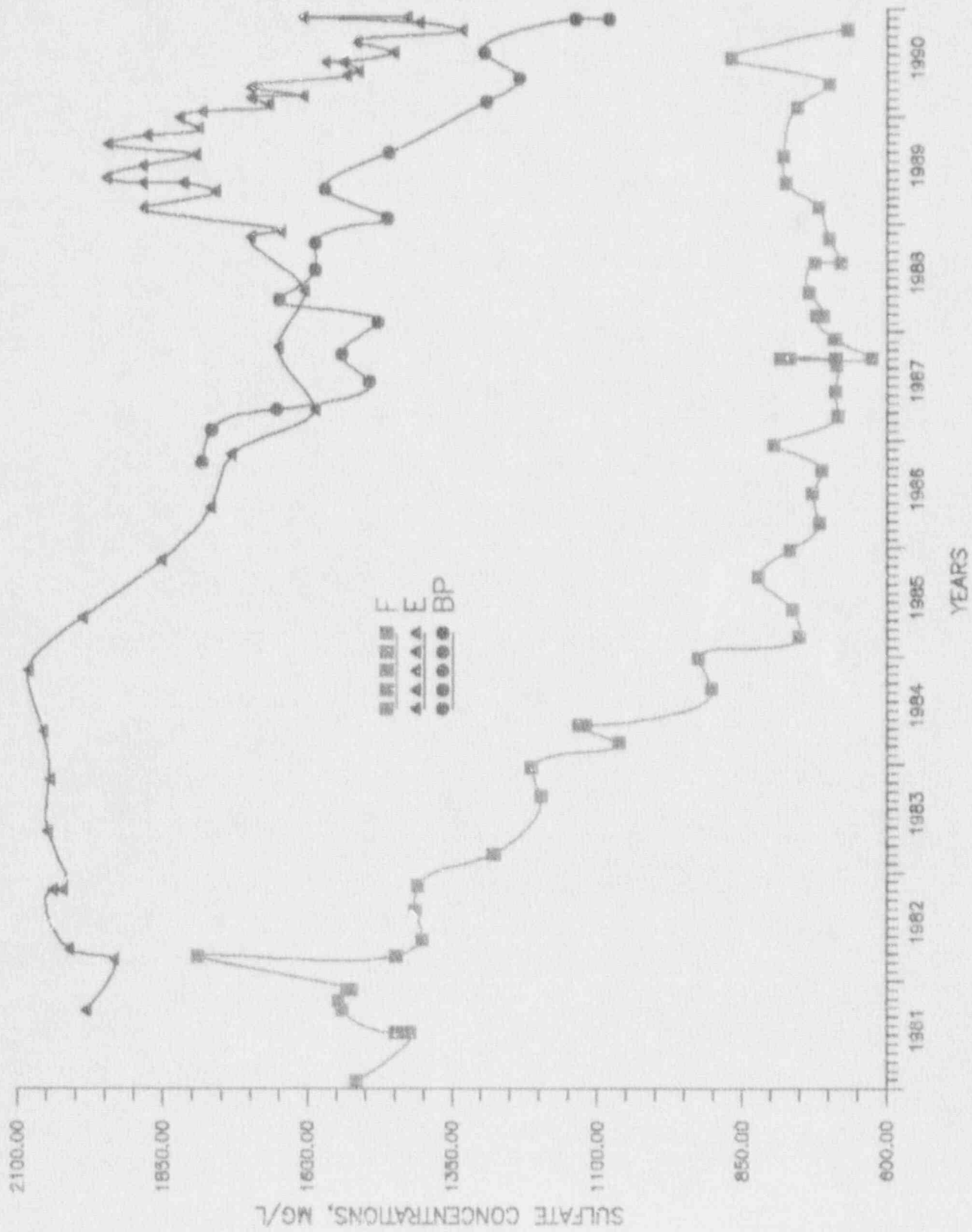


FIGURE 2.3-3. SULFATE CONCENTRATIONS FOR WELLS F, E AND BP.

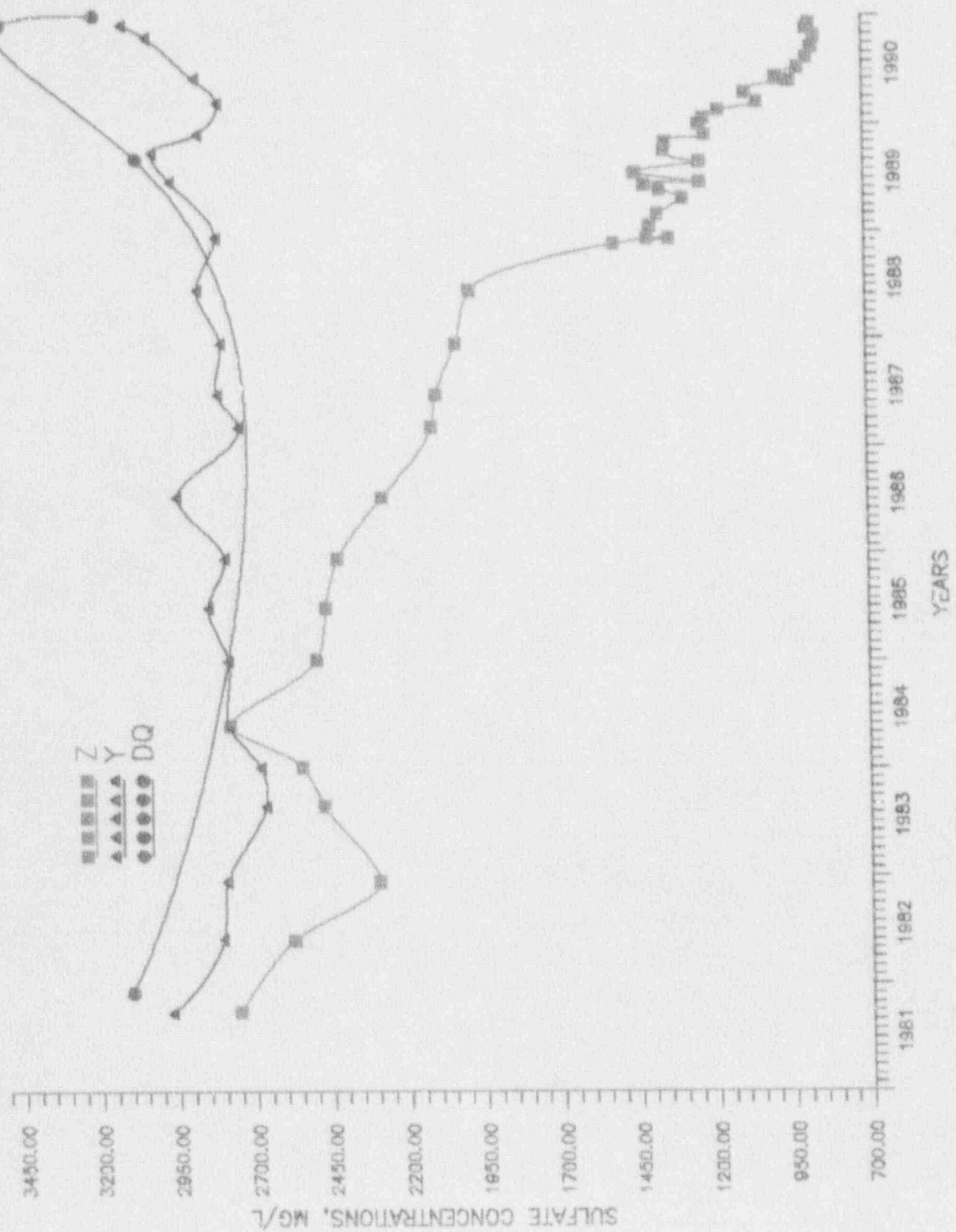


FIGURE 2.3-4. SULFATE CONCENTRATIONS FOR WELLS Z, Y AND DQ.



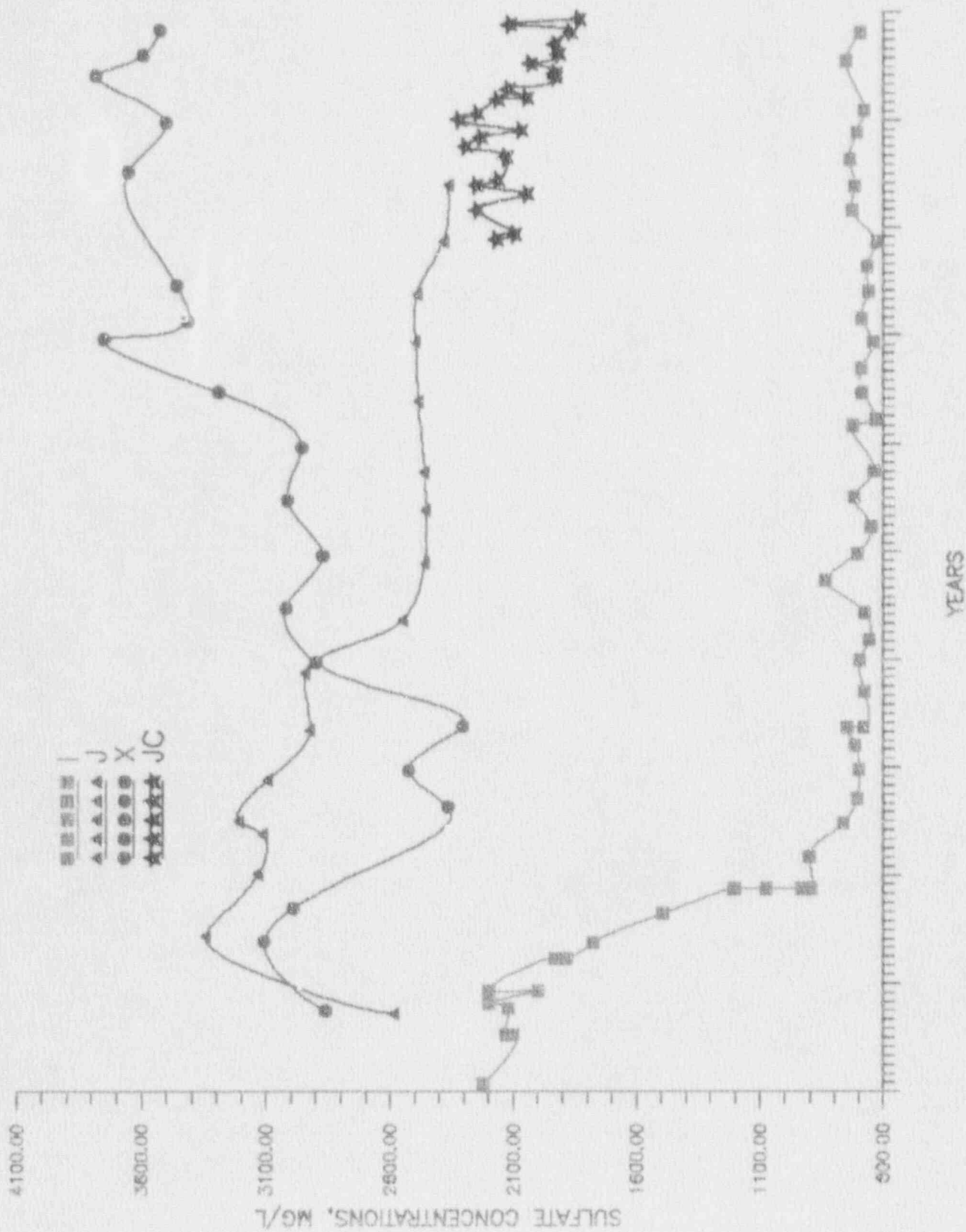


FIGURE 2.3-5. SULFATE CONCENTRATIONS FOR WELLS I, J, X AND JC.

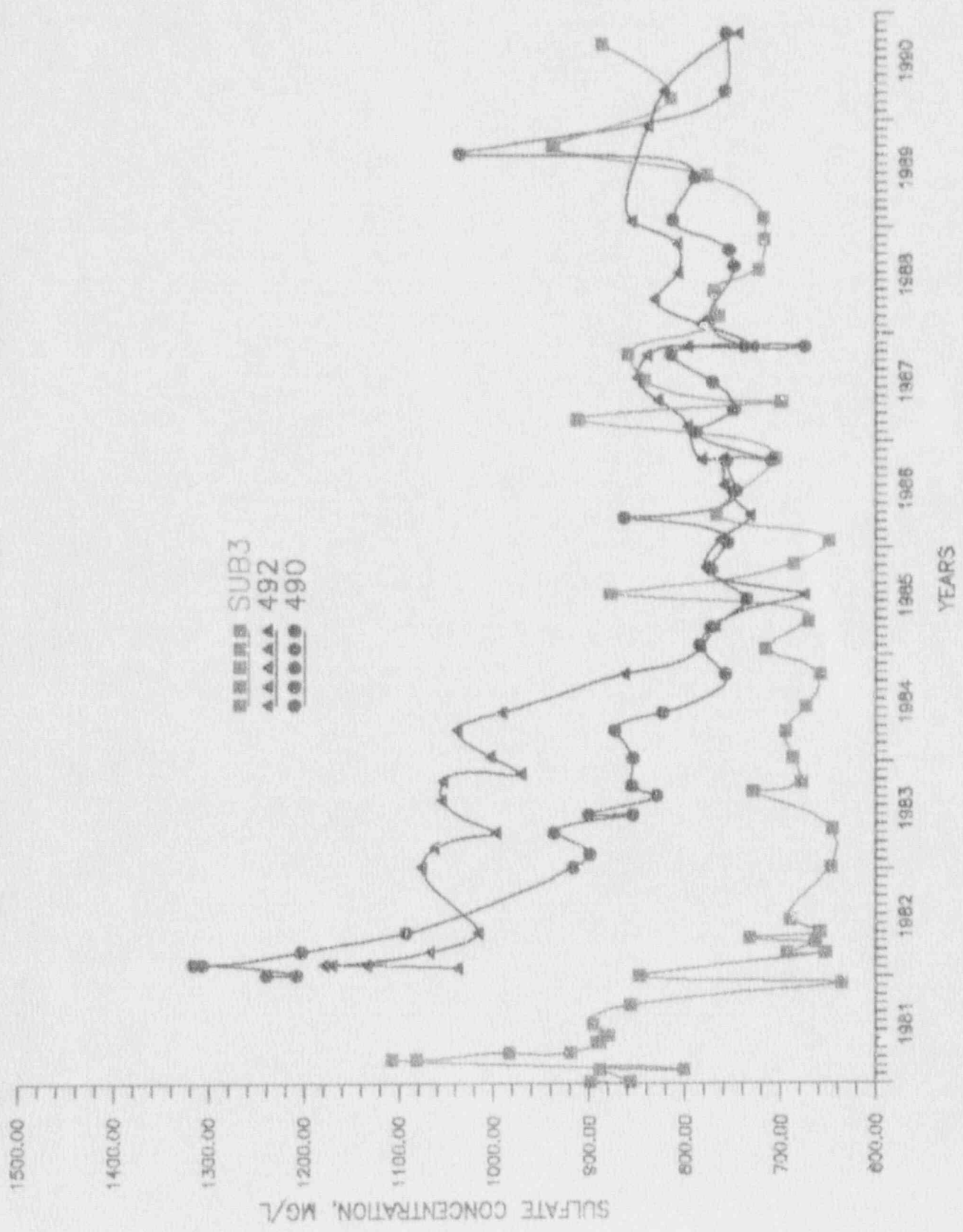


FIGURE 2.3-6. SULFATE CONCENTRATION FOR WELLS SUB3, 492 AND 49C.

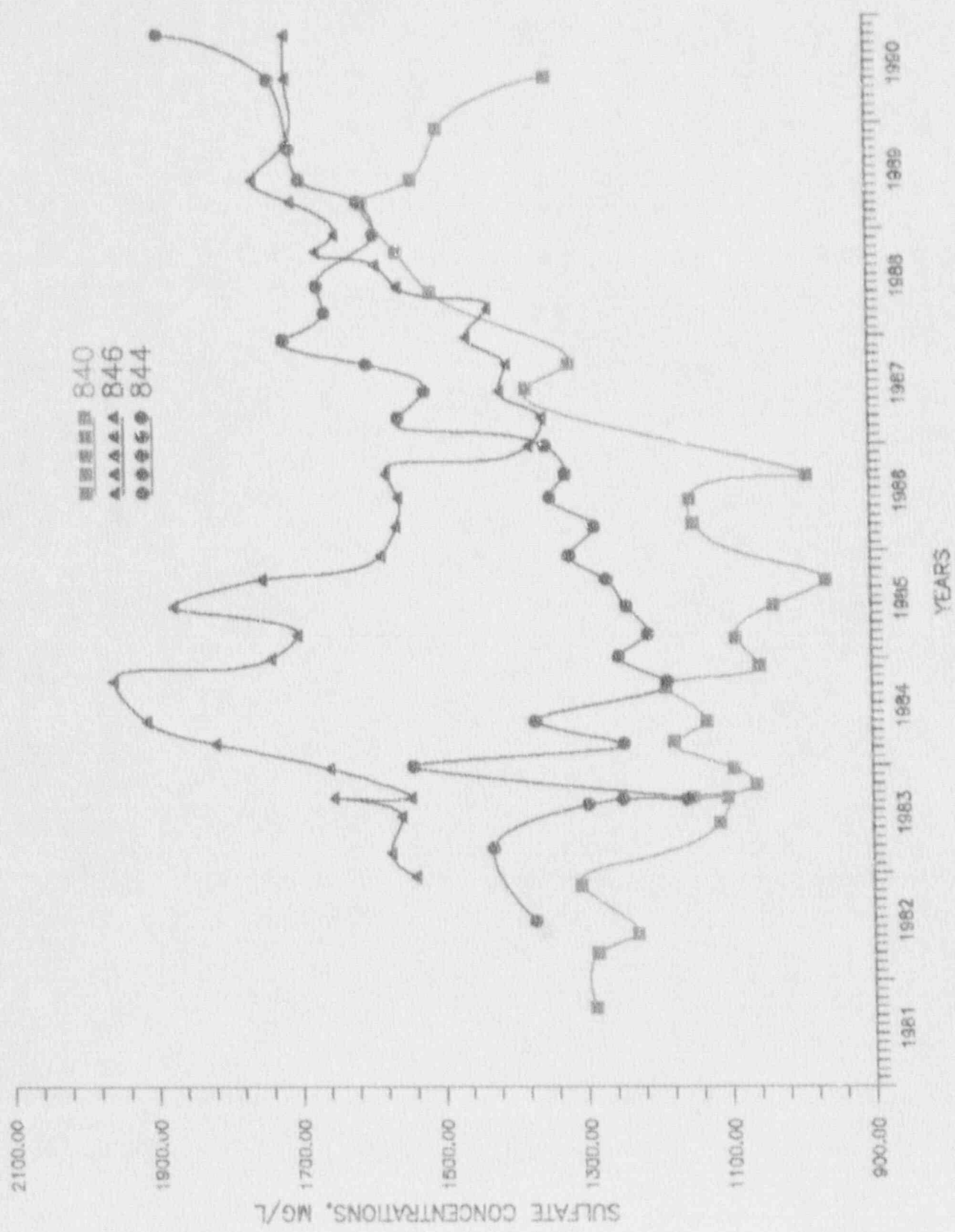


FIGURE 2.3-7. SULFATE CONCENTRATIONS FOR WELLS 840, 846 AND 844.

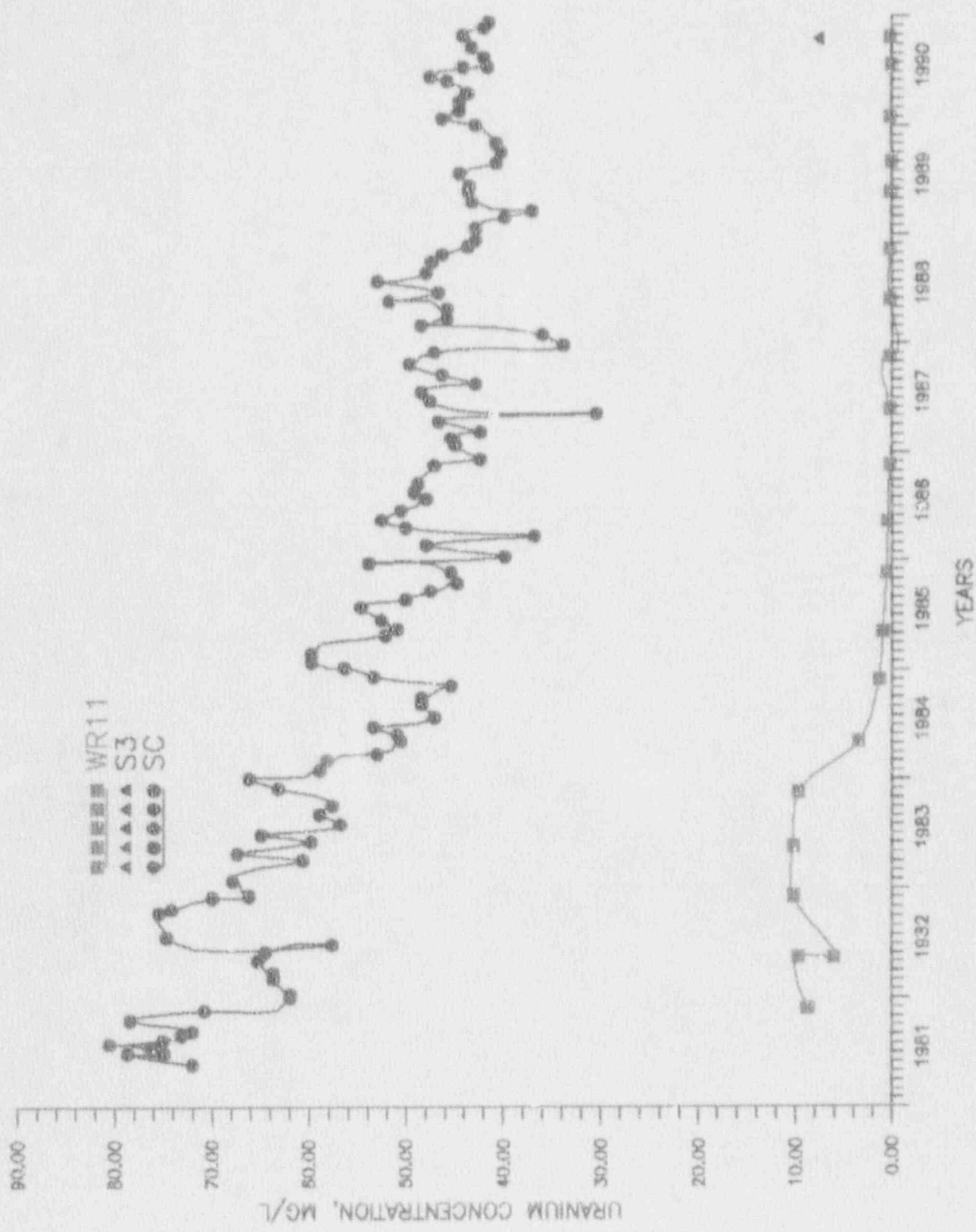


FIGURE 2.3-8. URANIUM CONCENTRATION FOR WELLS WR11, S3 AND SC.

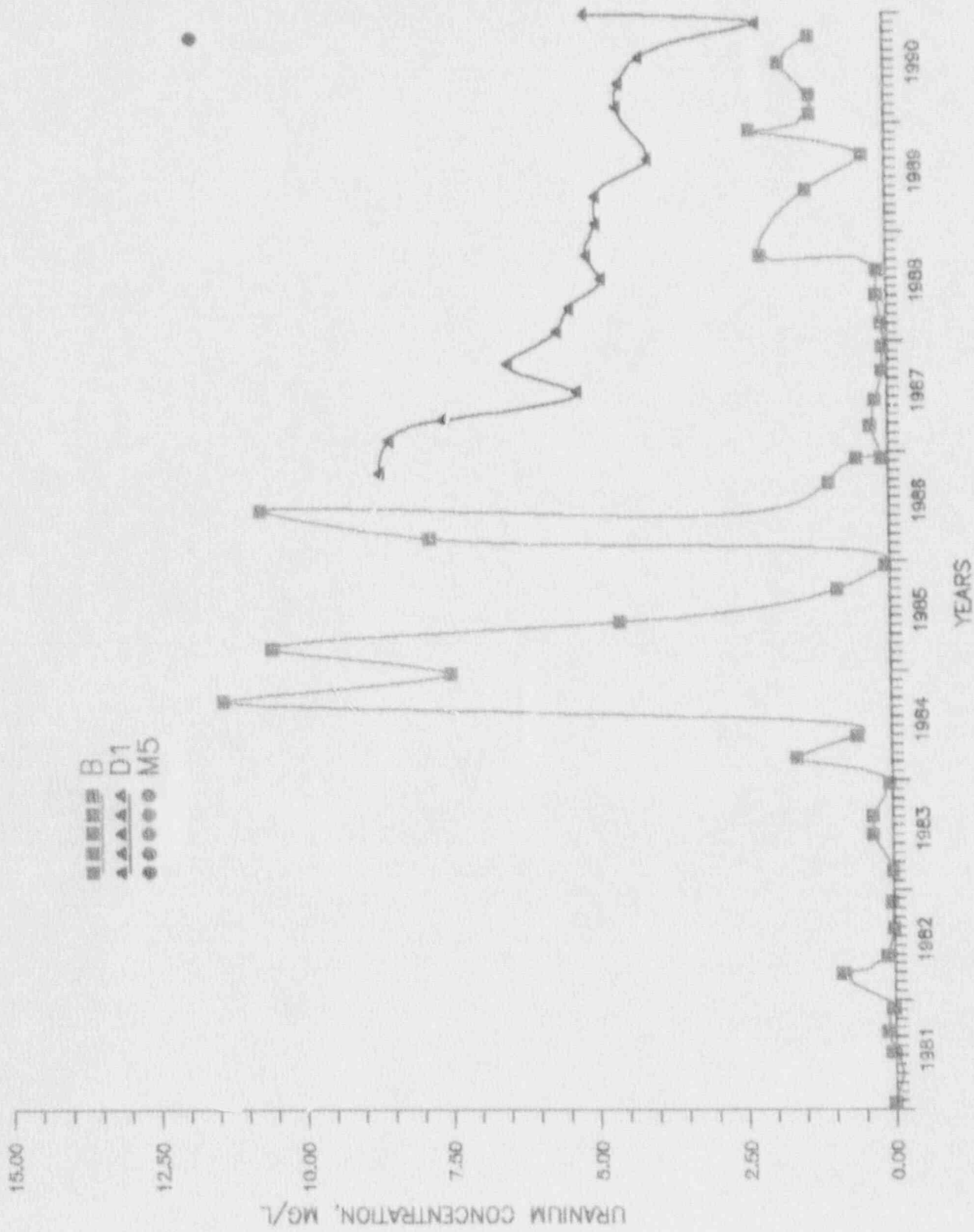


FIGURE 2.3-9. URANIUM CONCENTRATION FOR WELLS B, D1 AND M5.

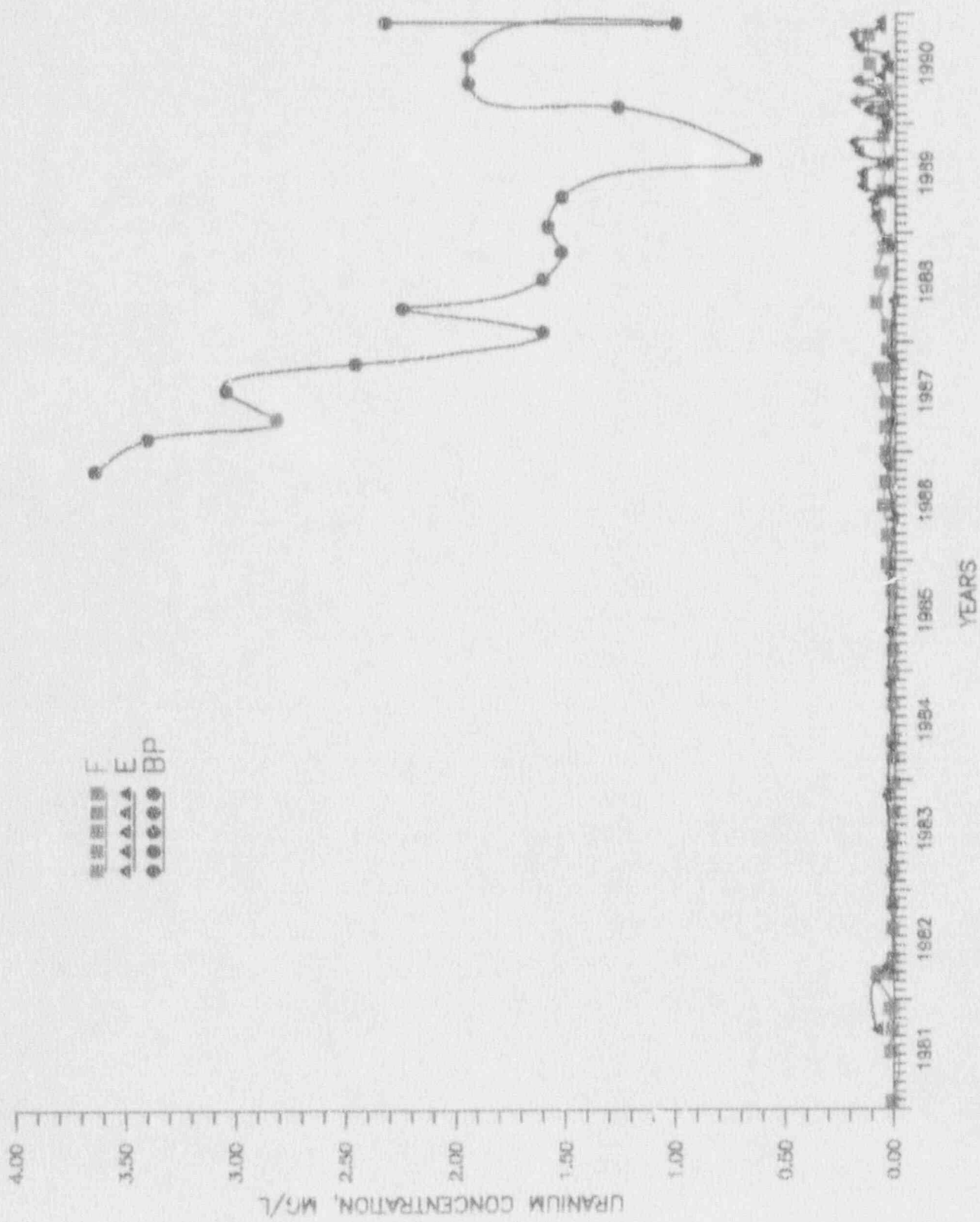


FIGURE 2.3-10. URANIUM CONCENTRATION FOR WELLS F, E AND BP.

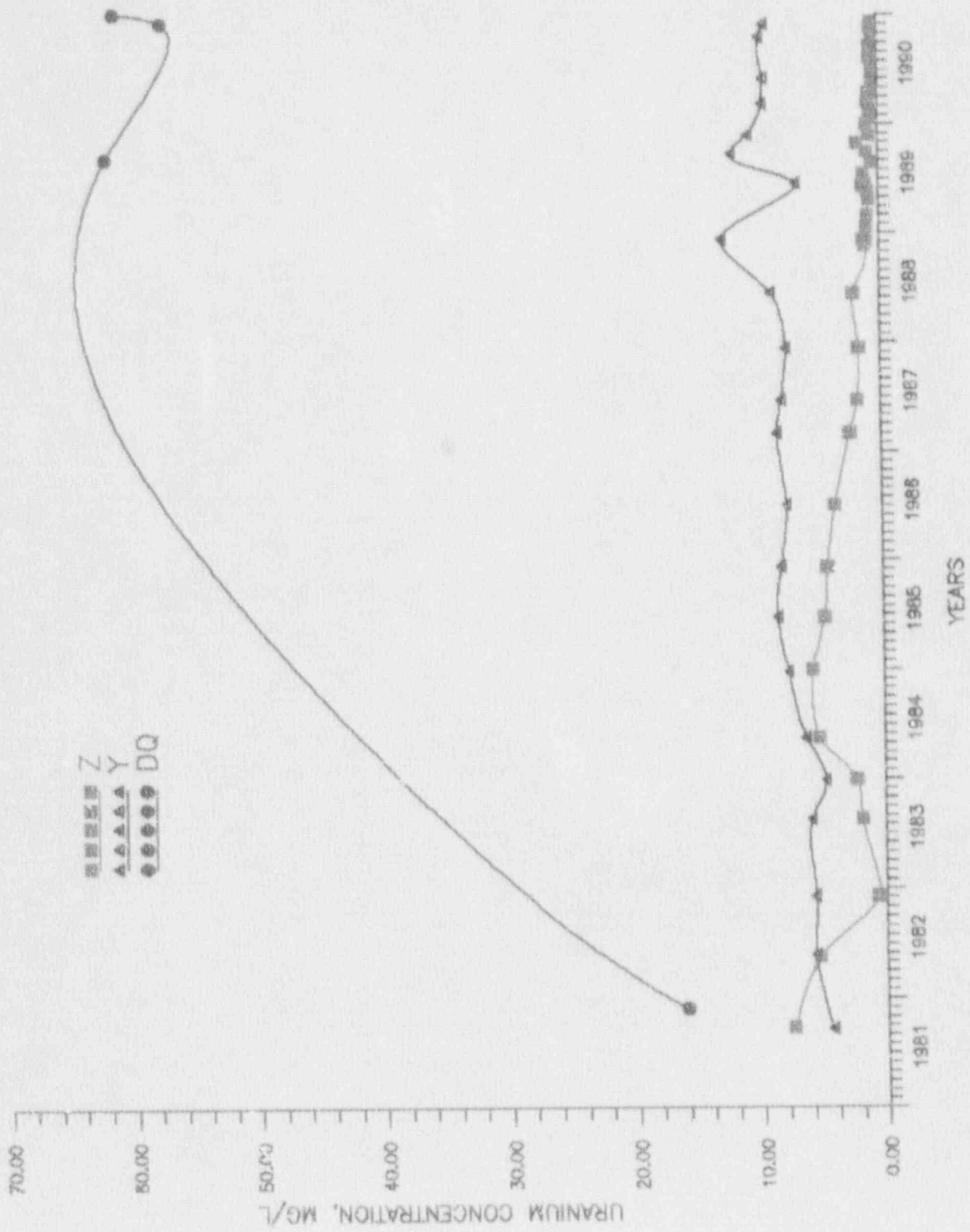


FIGURE 2.3-11. URANIUM CONCENTRATION FOR WELLS Z, Y AND DQ.

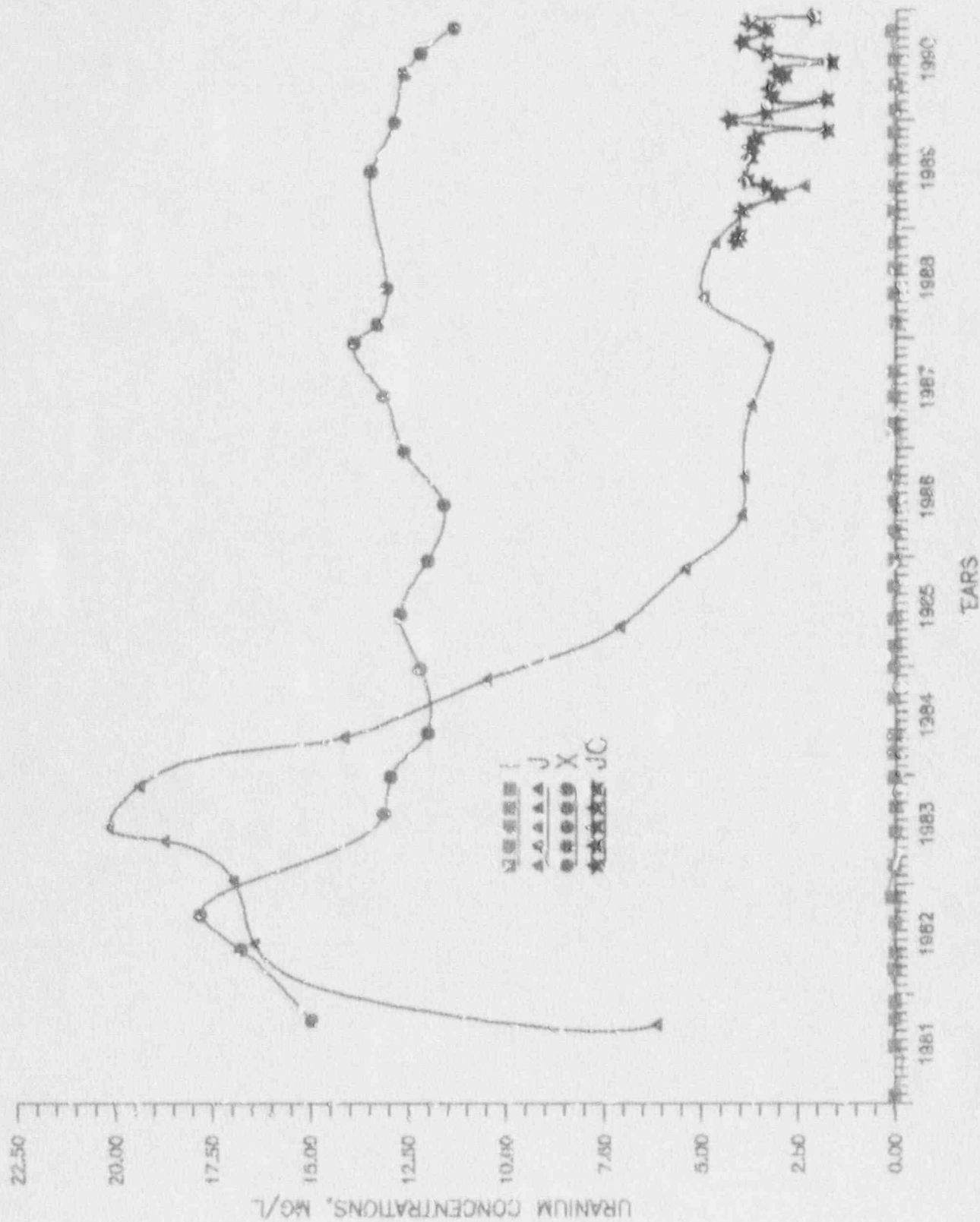


FIGURE 2.3-12. URANIUM CONCENTRATIONS FOR WELLS I, J, X AND JC.



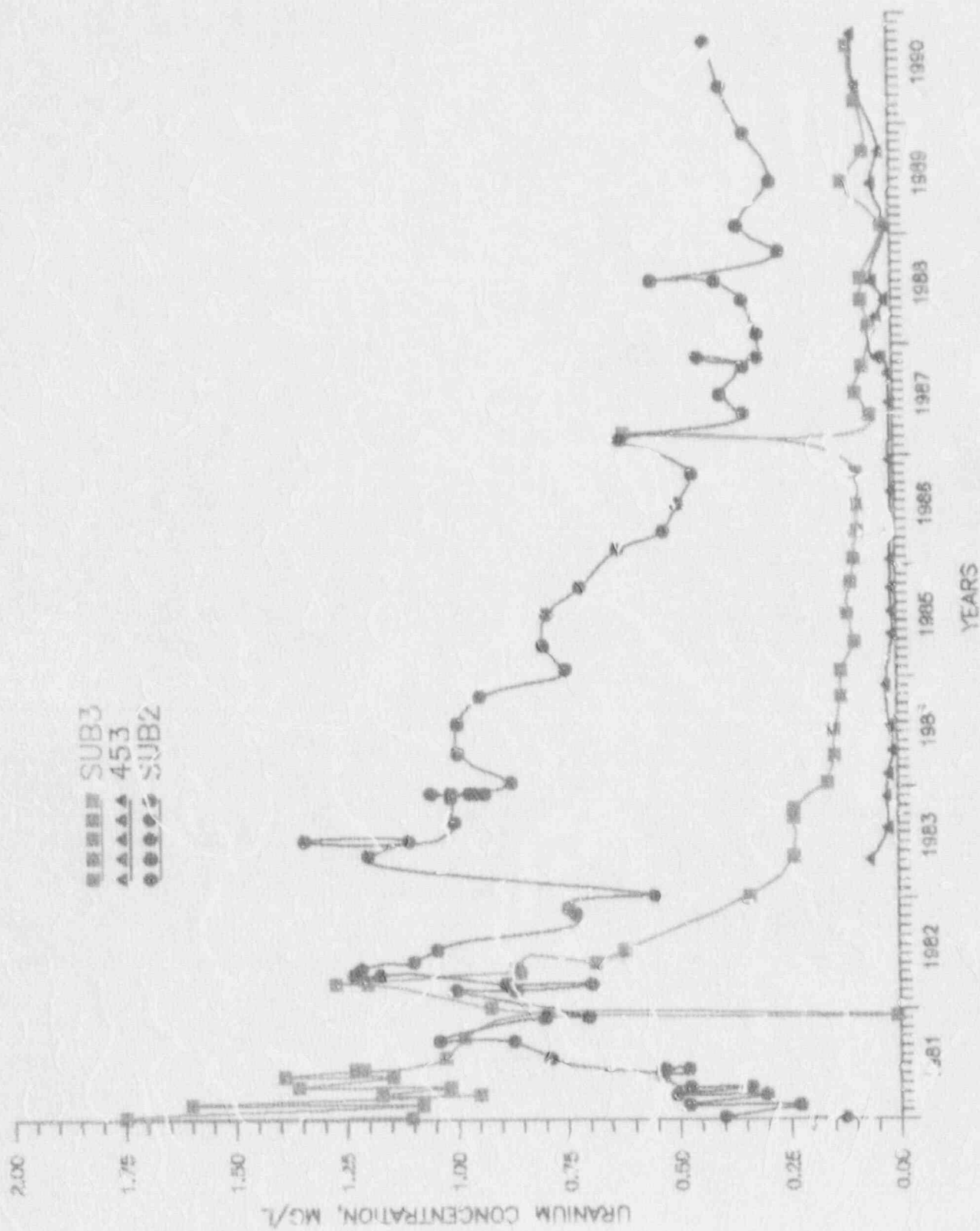


FIGURE 2.3-13. URANIUM CONCENTRATION FOR WELLS SUB3, 453 AND SUB2

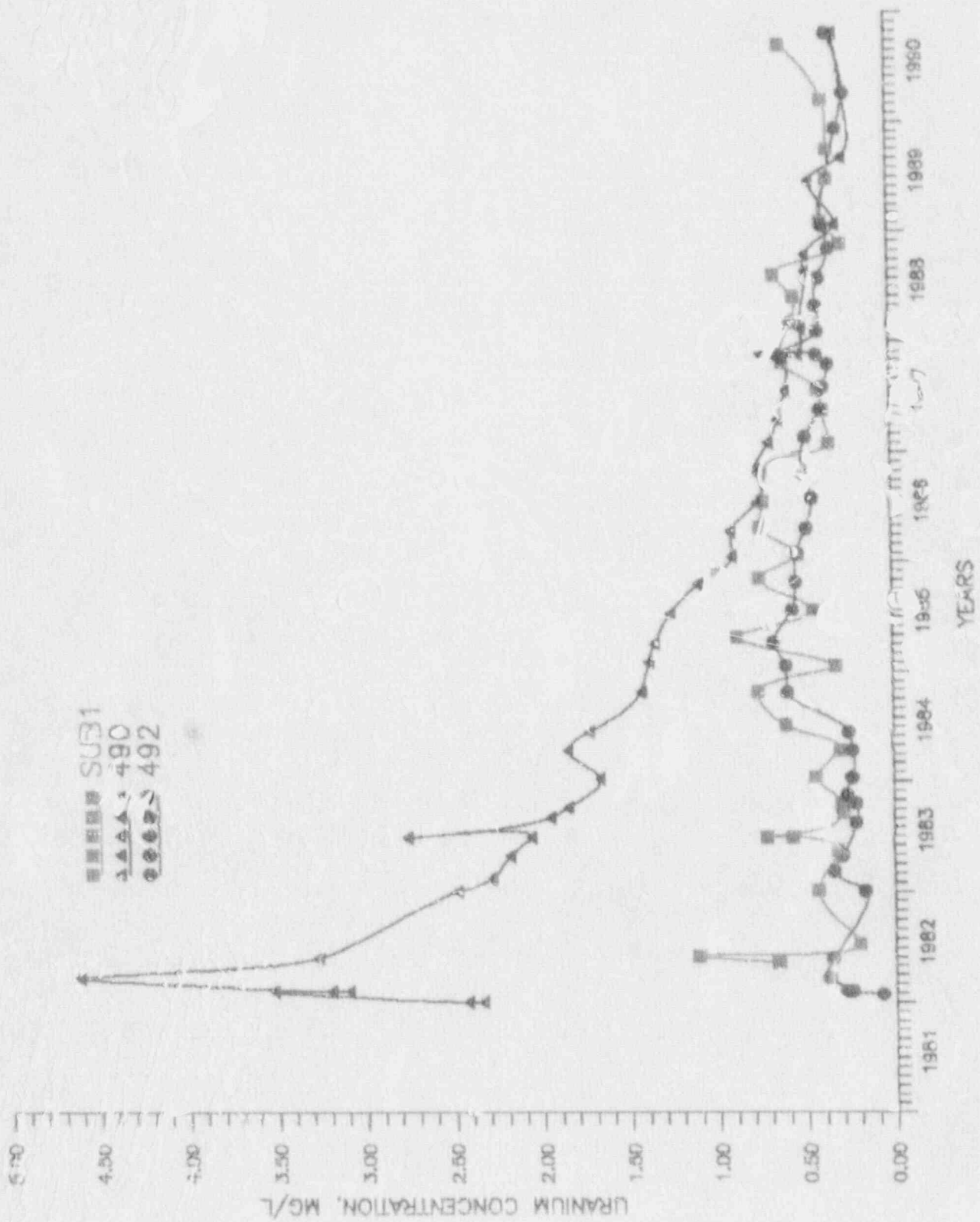


FIGURE 2.3-14. URANIUM CONCENTRATION FOR WELLS SU31, 490 AND 492.

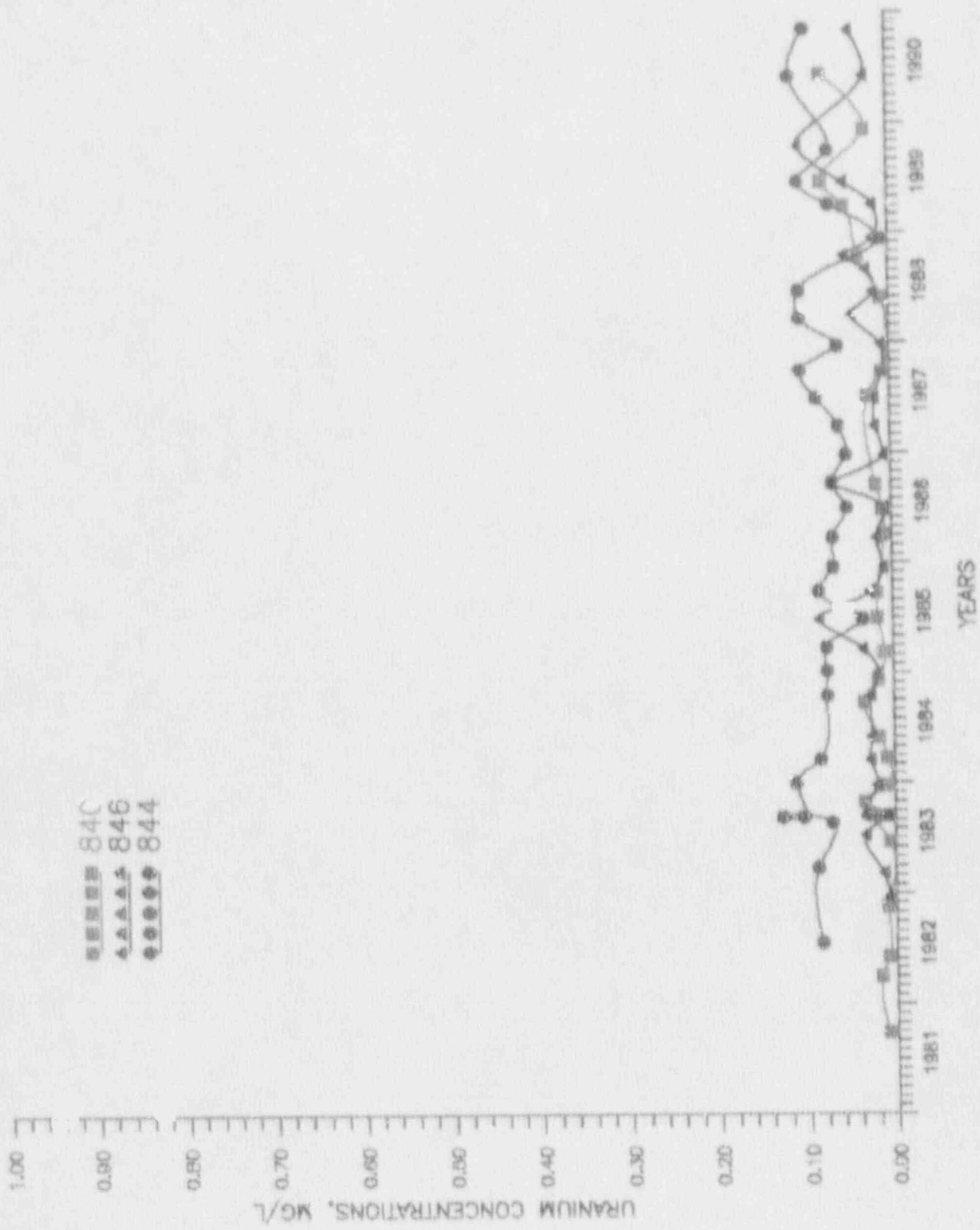


FIGURE 2.3-15. URANIUM CONCENTRATIONS FOR WELLS 840, 846 AND 844.

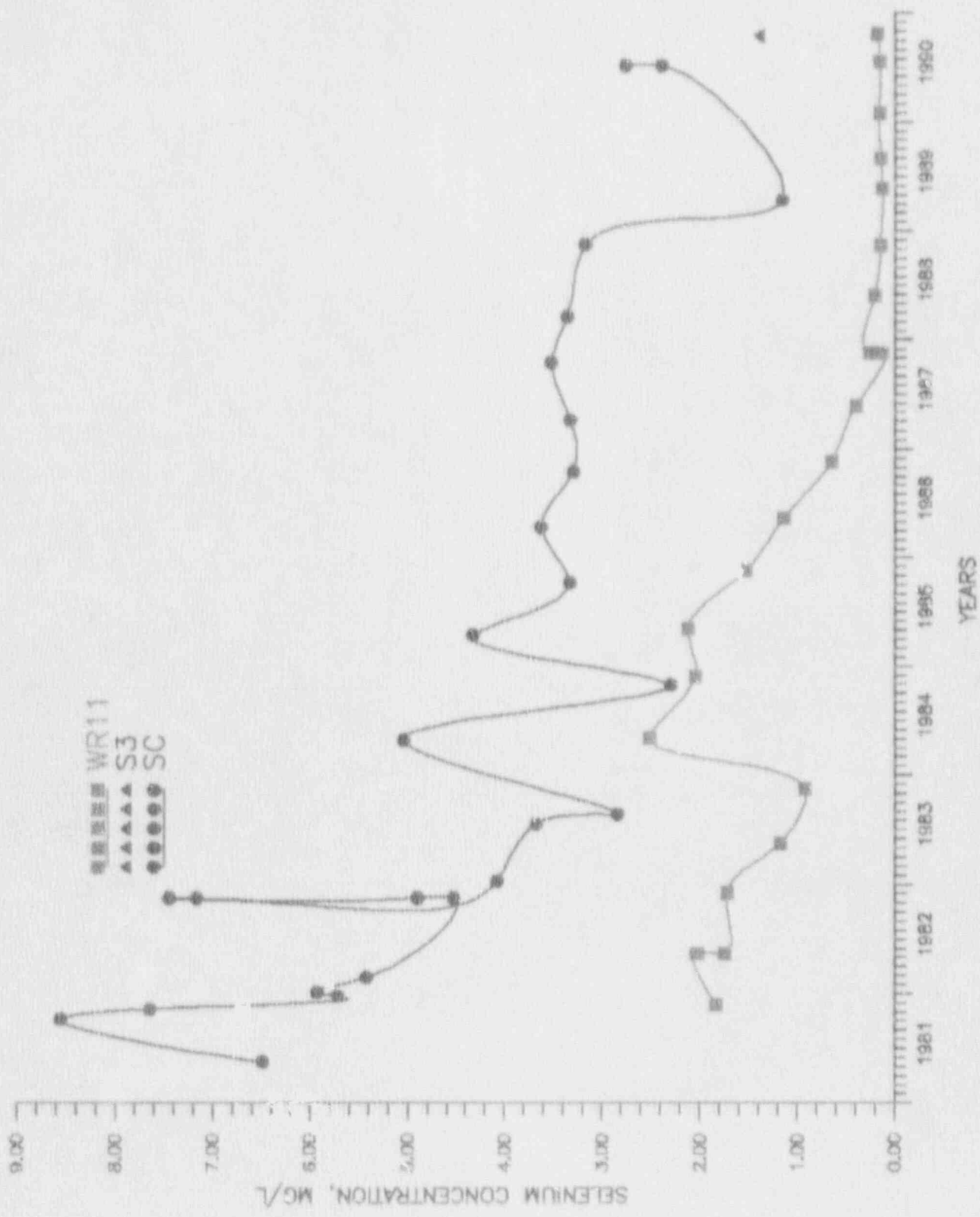


FIGURE 2.3-16. SELENIUM CONCENTRATION FOR WELLS WR11, S3 AND SC.

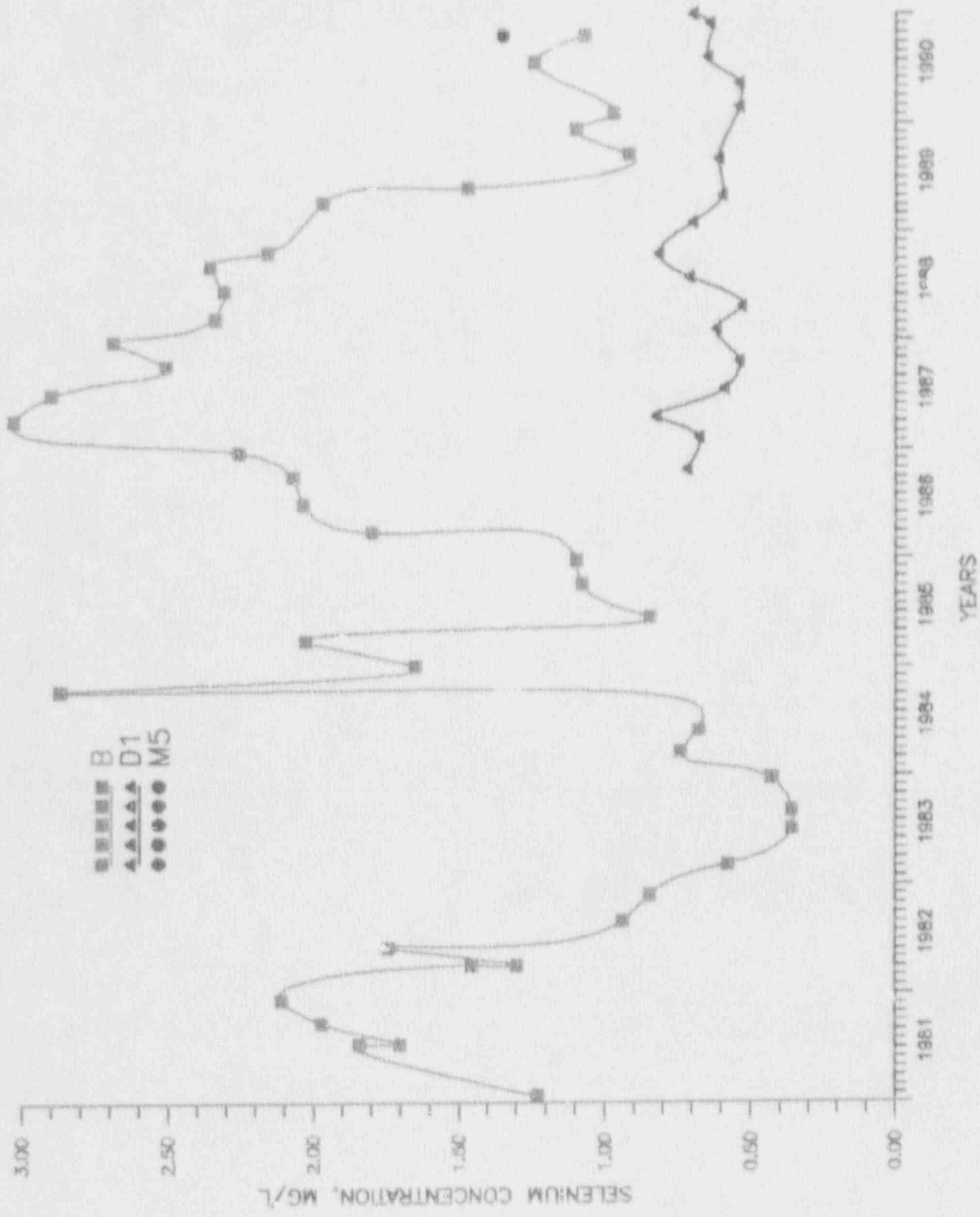


FIGURE 2.3-17. SELENIUM CONCENTRATION FOR WELLS B, D1 AND M5.

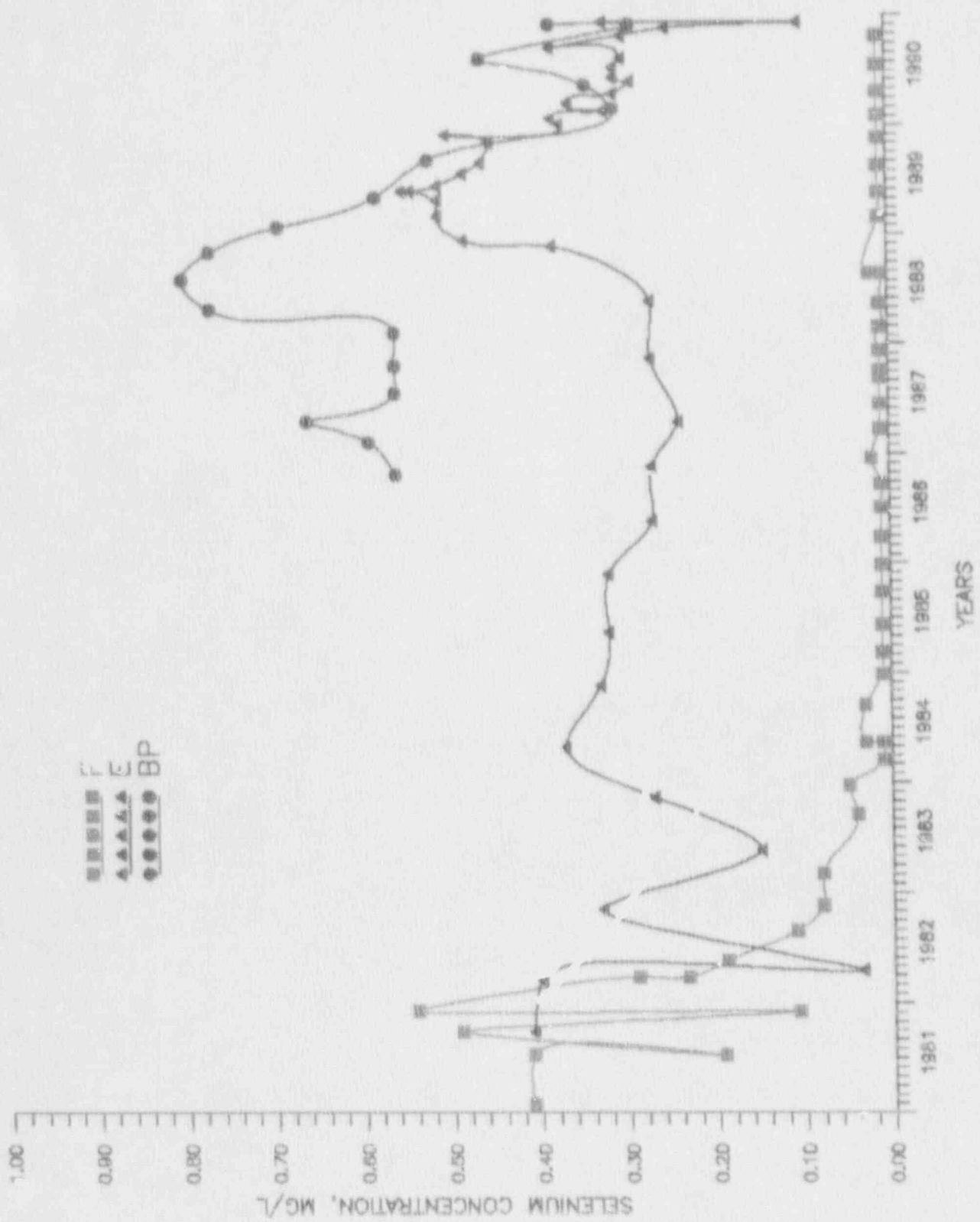


FIGURE 2.3-18. SELENIUM CONCENTRATION FOR WELLS F, E AND BP.

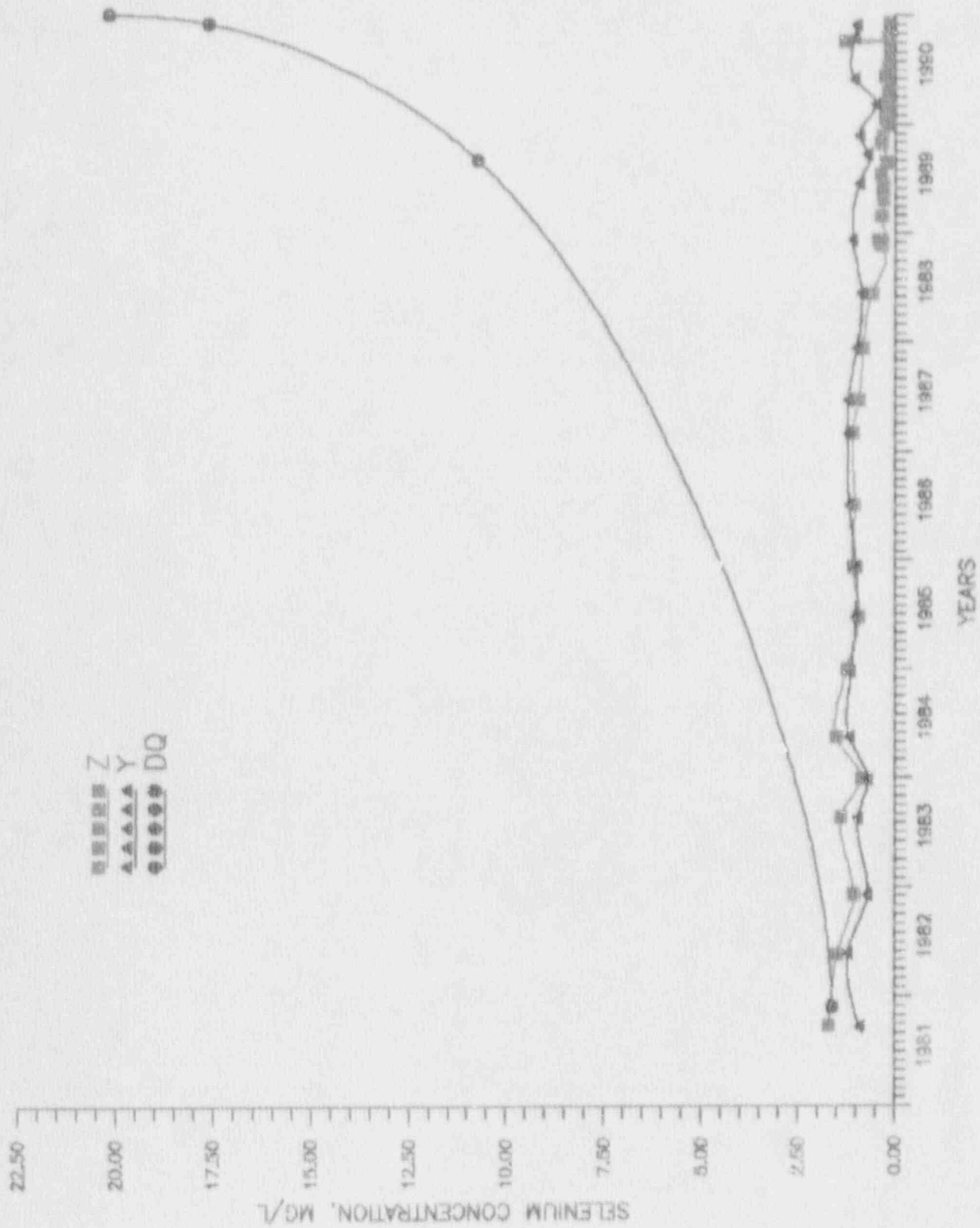


FIGURE 2.3-19. SELENIUM CONCENTRATION FOR WELLS Z, Y AND DQ.

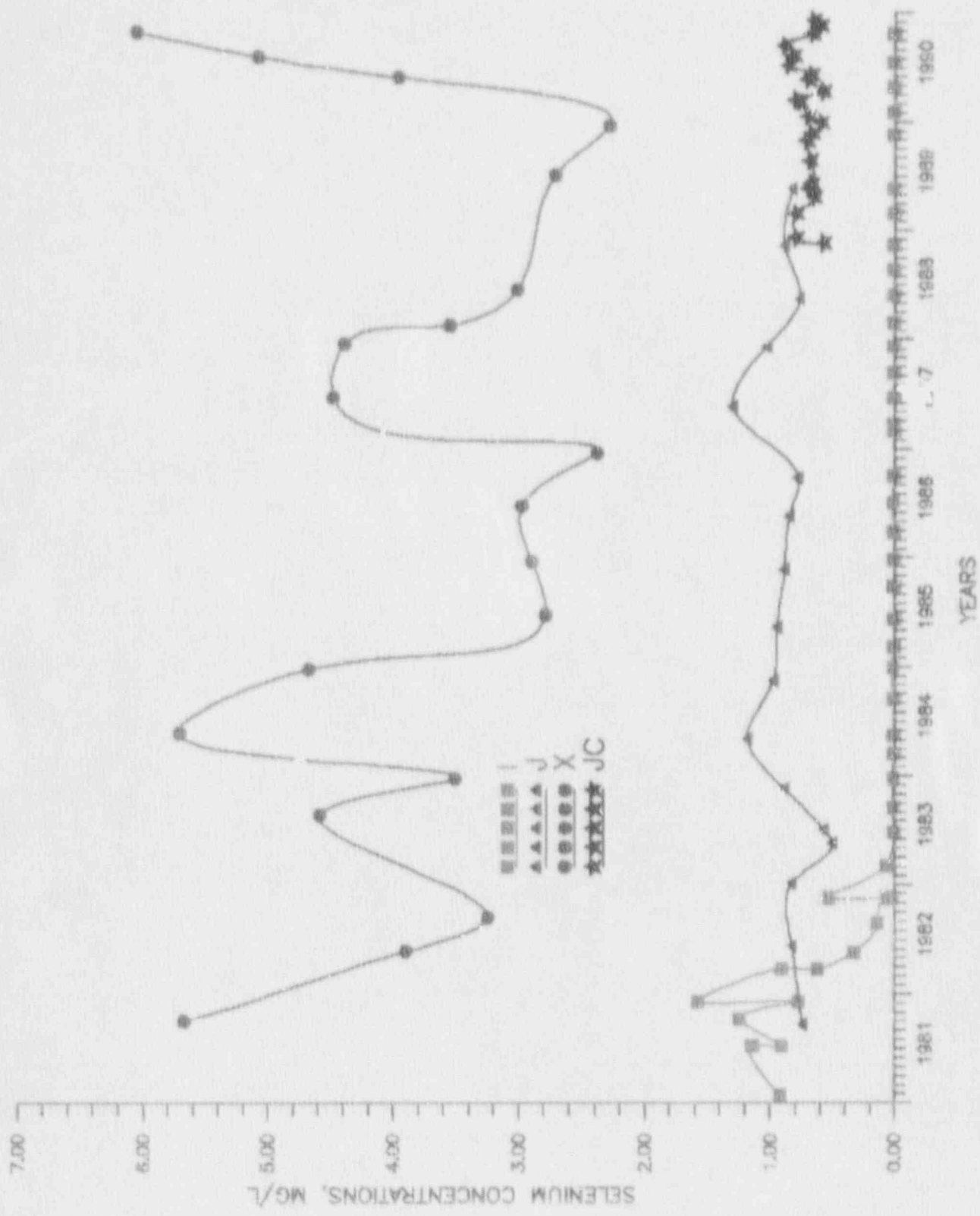


FIGURE 2.3-20. SELENIUM CONCENTRATIONS FOR WELLS I, J, X AND JC.



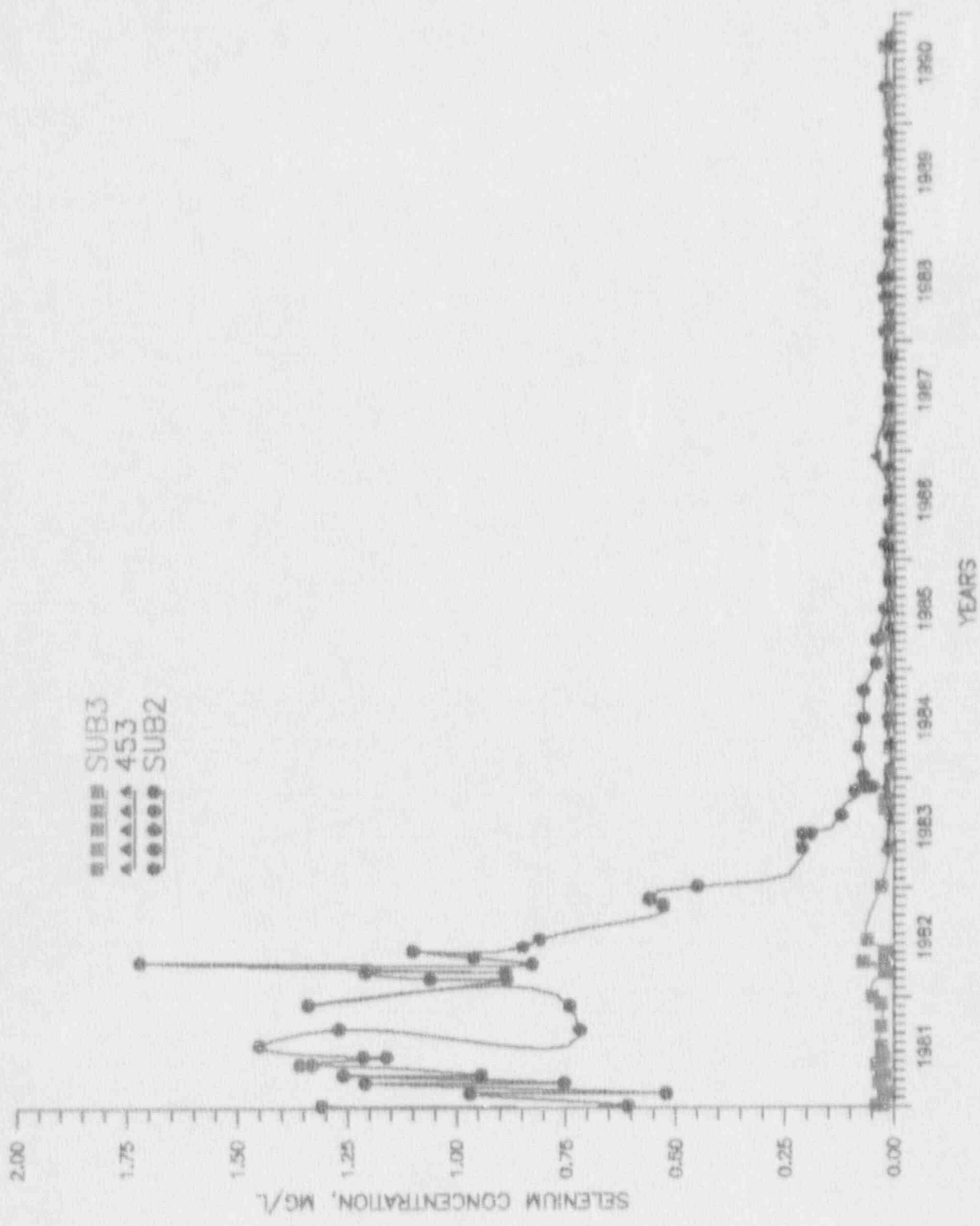


FIGURE 2.3-21. SELENIUM CONCENTRATION FOR WELLS SUB3, 453 AND SUB2.

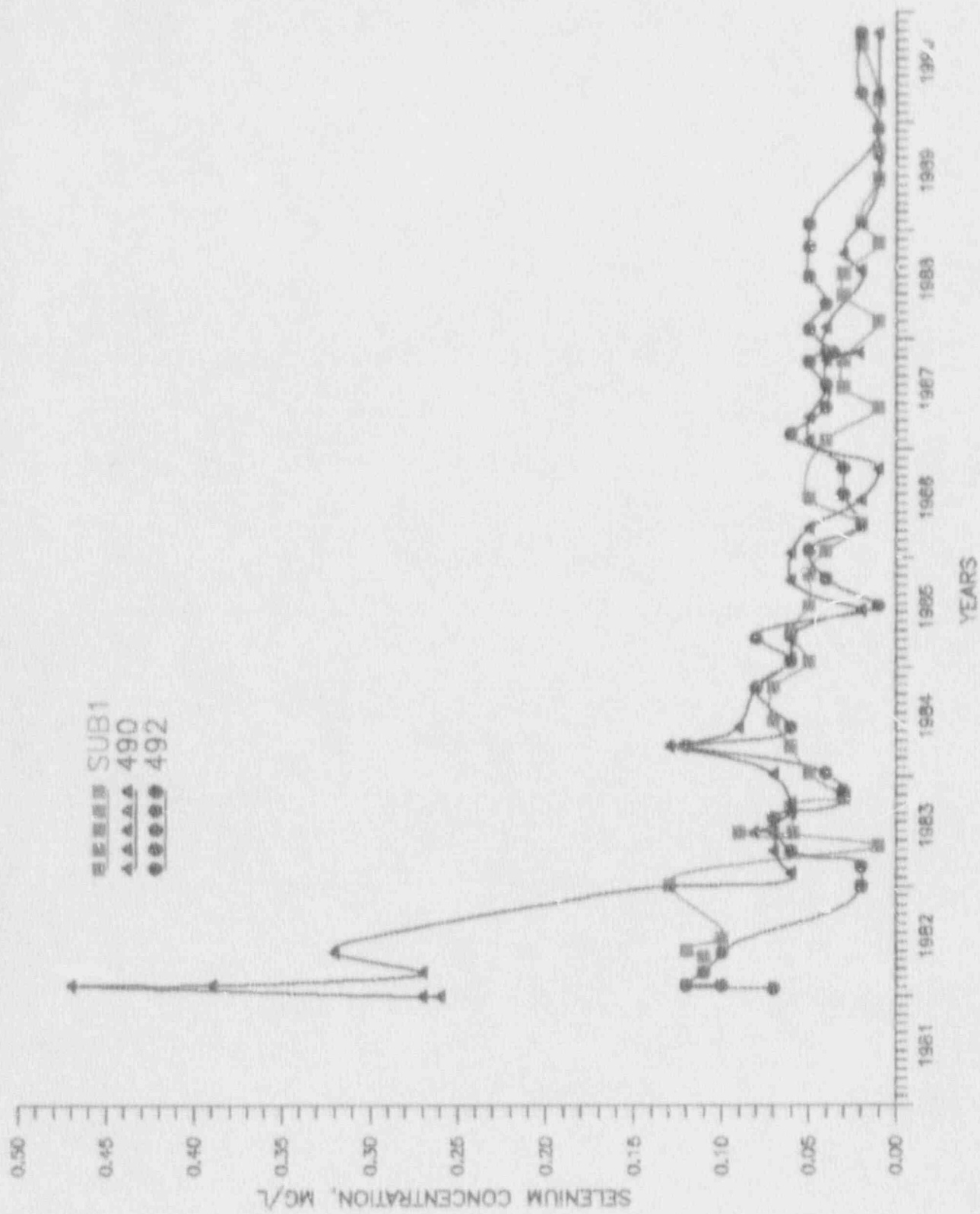


FIGURE 2.3-22. SELENIUM CONCENTRATION FOR WELLS SUB1, 490 AND 492.

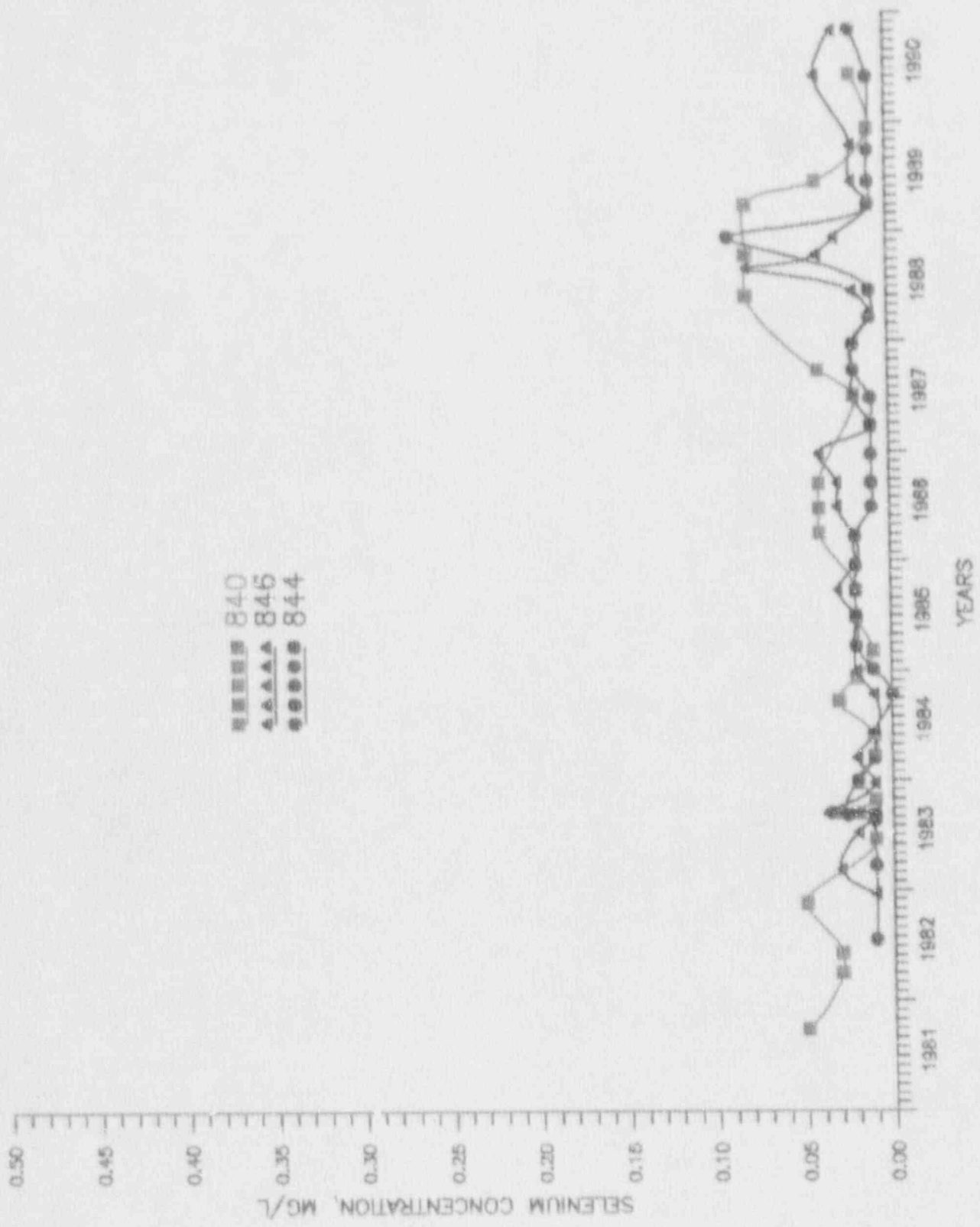


FIGURE 2.3-23. SELENIUM CONCENTRATION FOR WELLS 840, 846 AND 844.

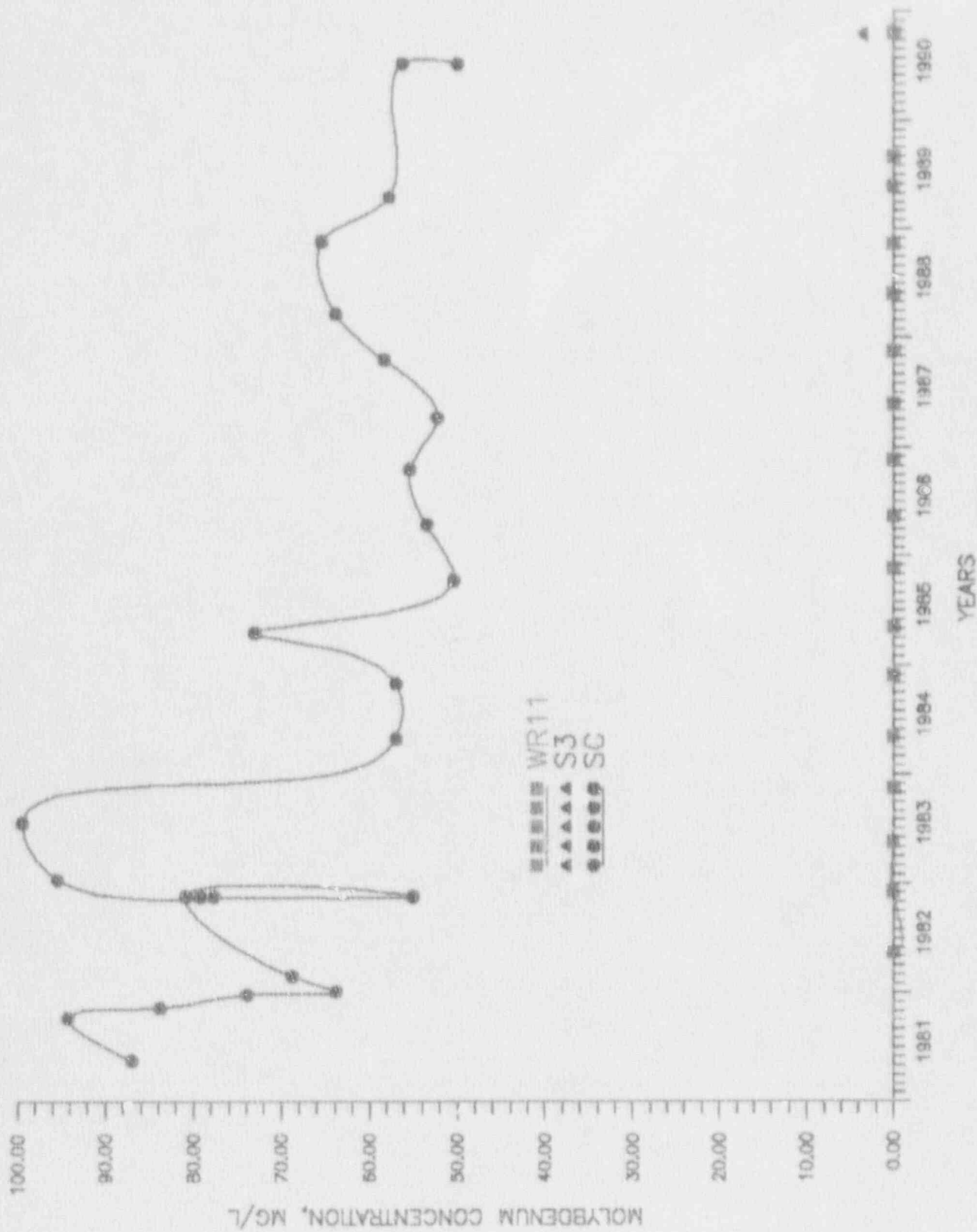


FIGURE 2.3-24. MOLYBDENUM CONCENTRATION FOR WELLS WR11, S3 AND SC.

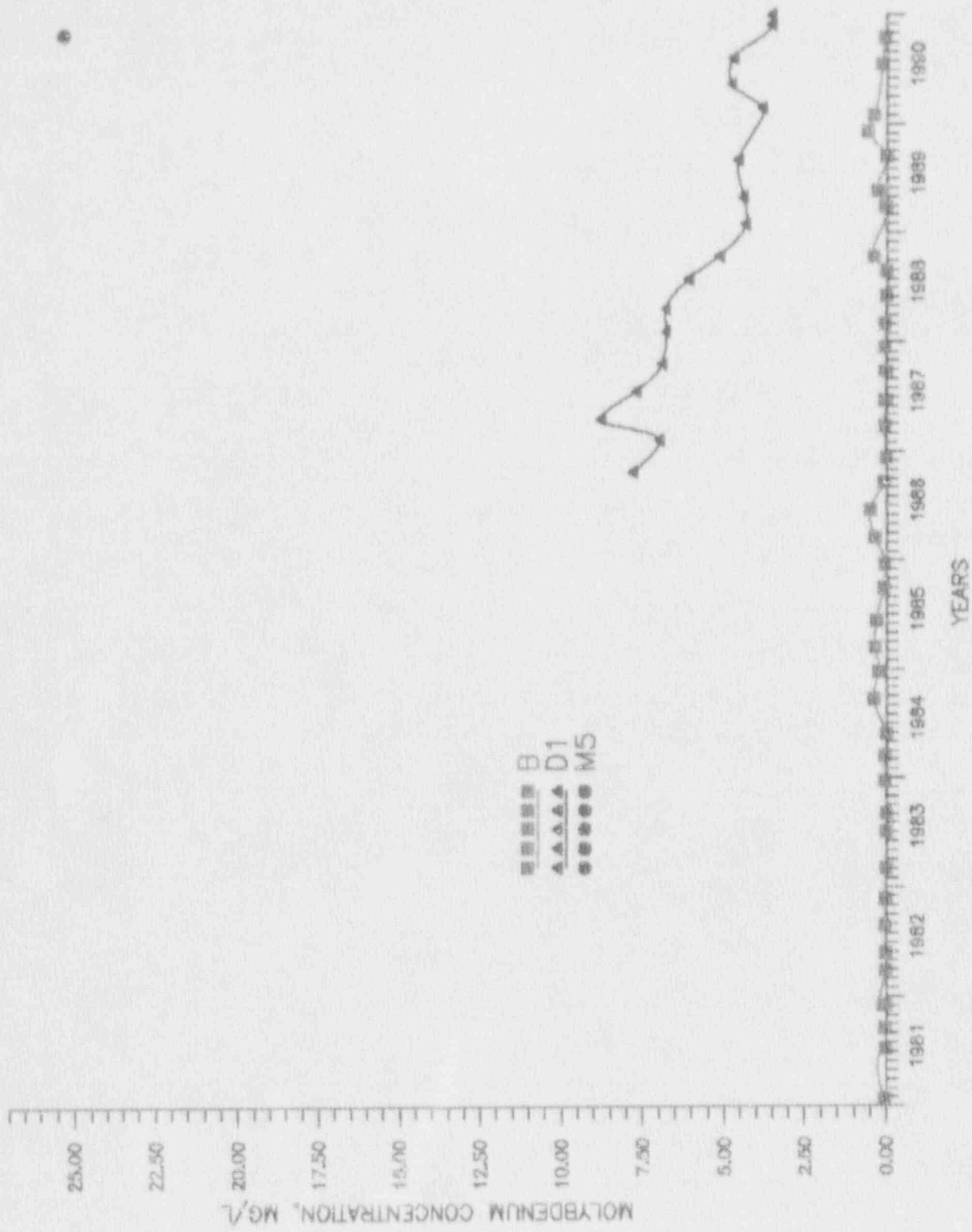


FIGURE 2.3-25. MOLYBDENUM CONCENTRATION FOR WELLS B, D1 AND M5.

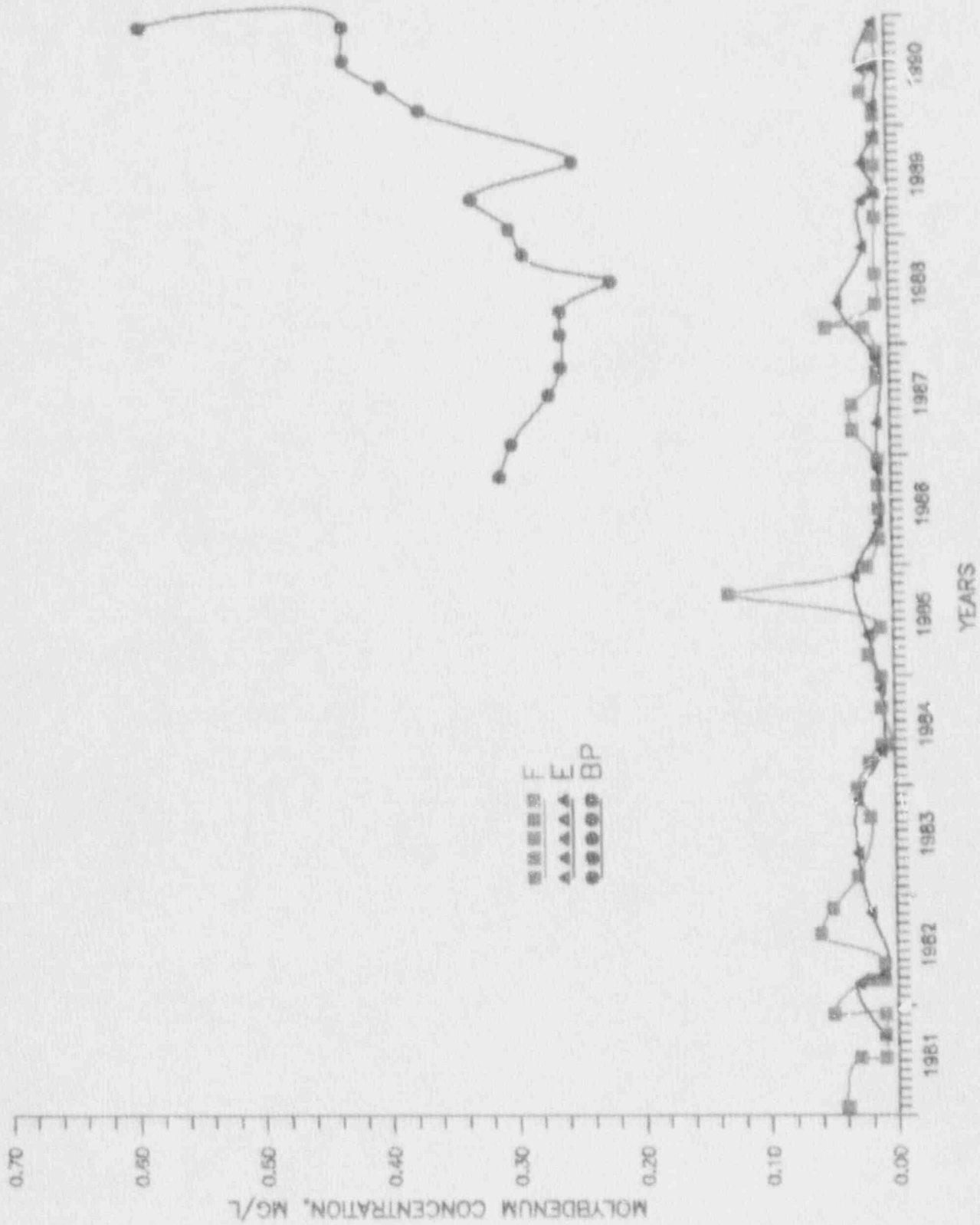


FIGURE 2.3-26. MOLYBDENUM CONCENTRATION FOR WELLS F, E AND BP.

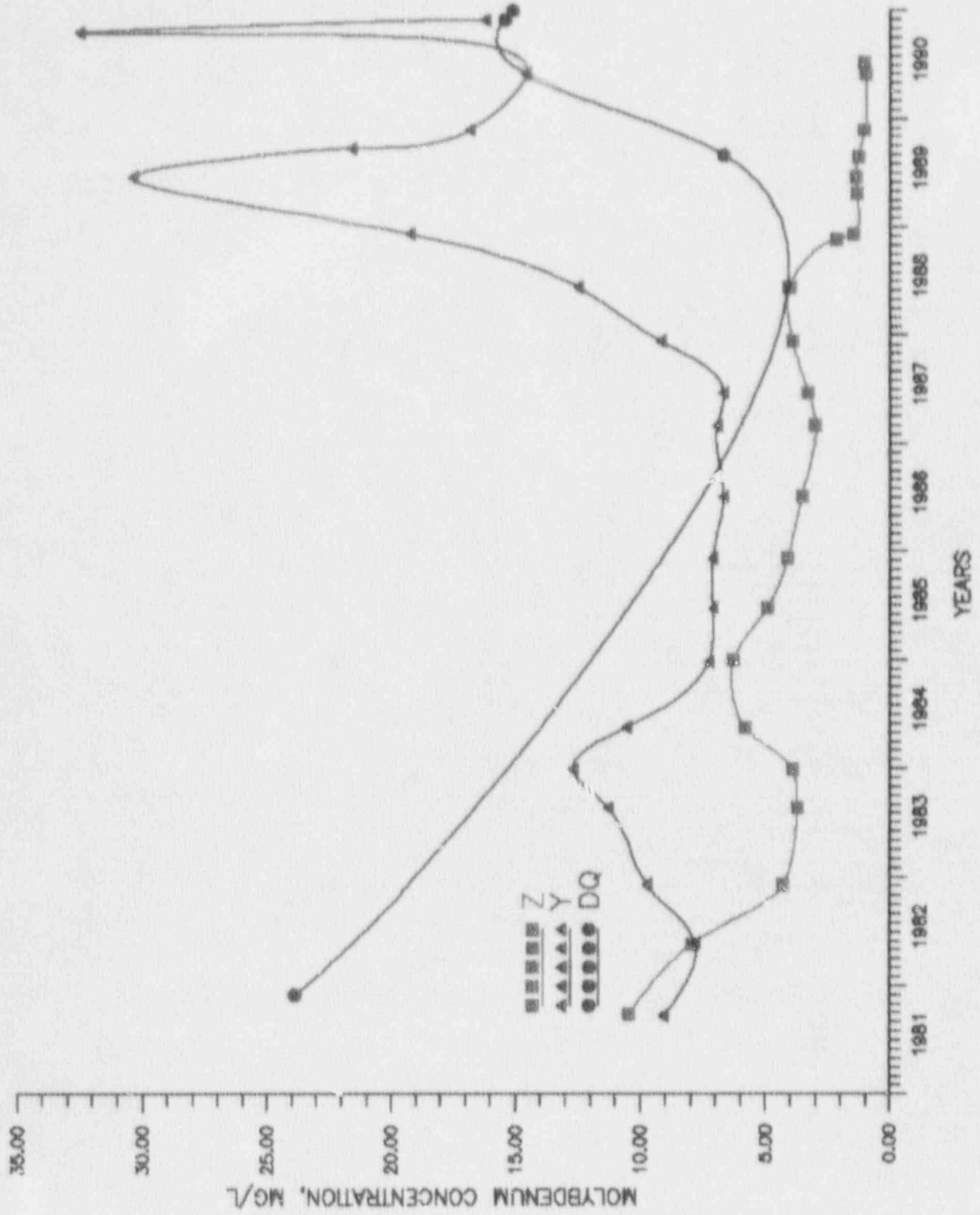


FIGURE 2.3-27. MOLYBDENUM CONCENTRATION FOR WELLS Z, Y AND DQ.

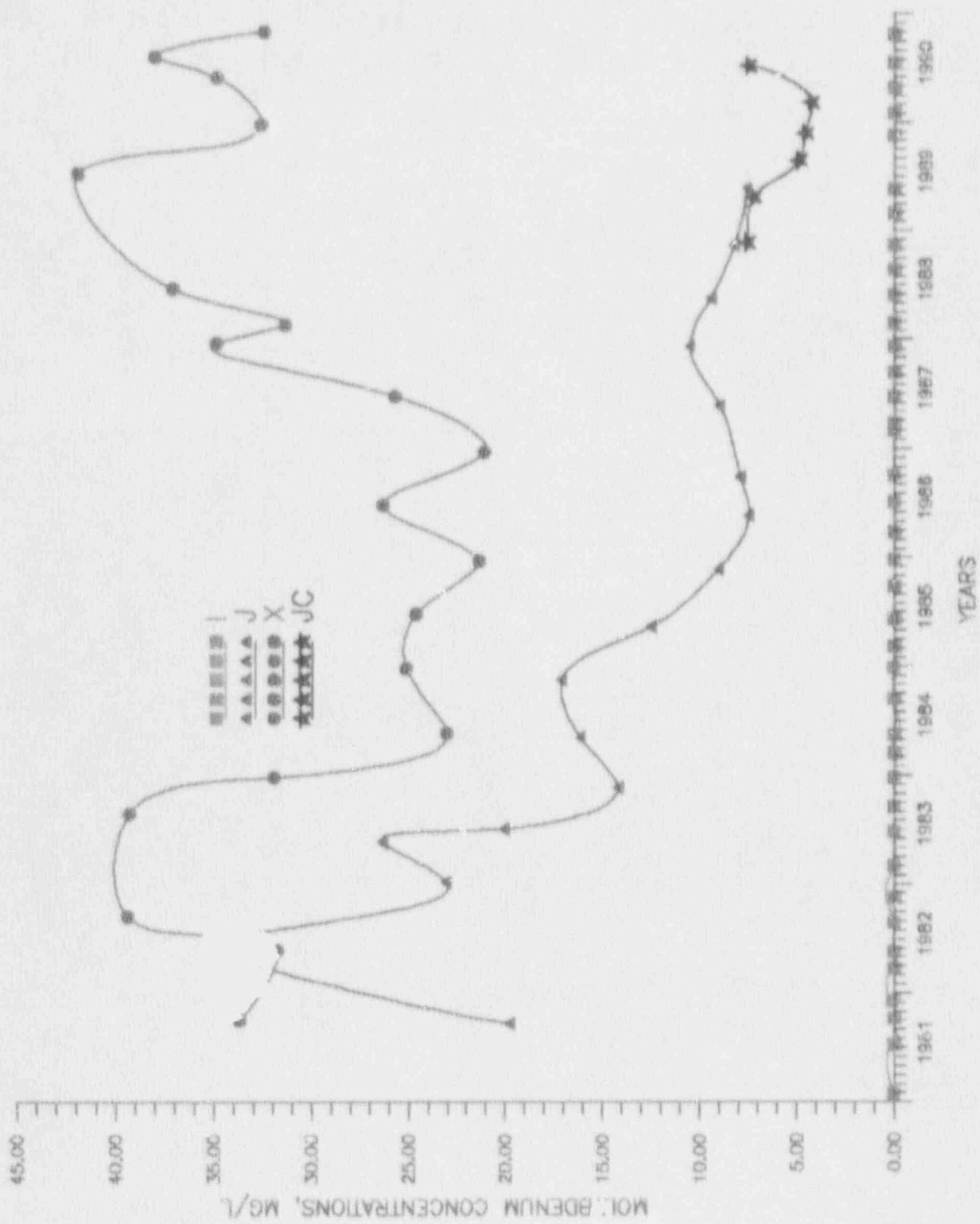


FIGURE 2.3-28. MOLYBDENUM CONCENTRATIONS FOR WELLS I, J, X AND JC.



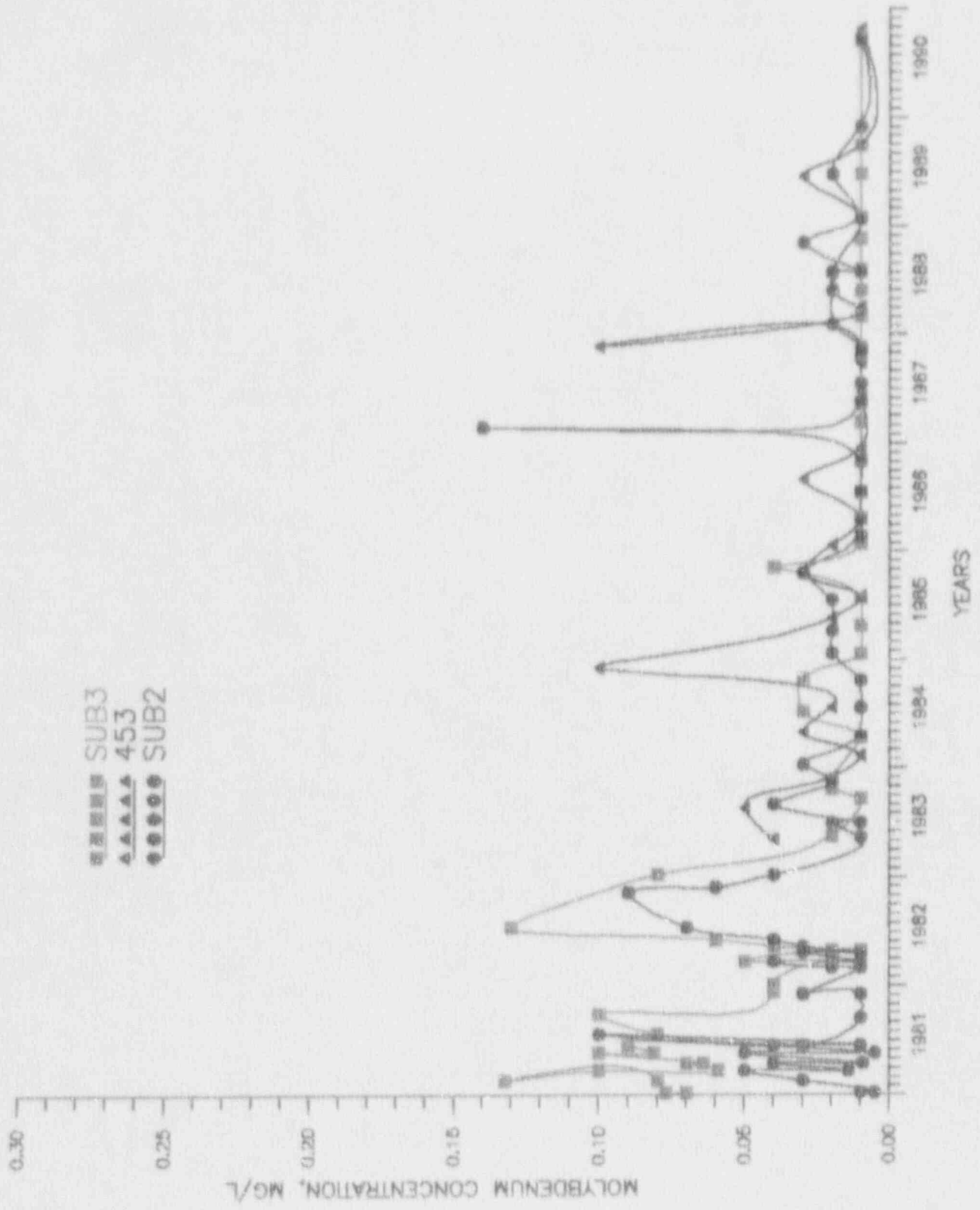


FIGURE 2.3 -29. MOLYBDENUM CONCENTRATION FOR WELLS SUB3, 453 AND SUB2.

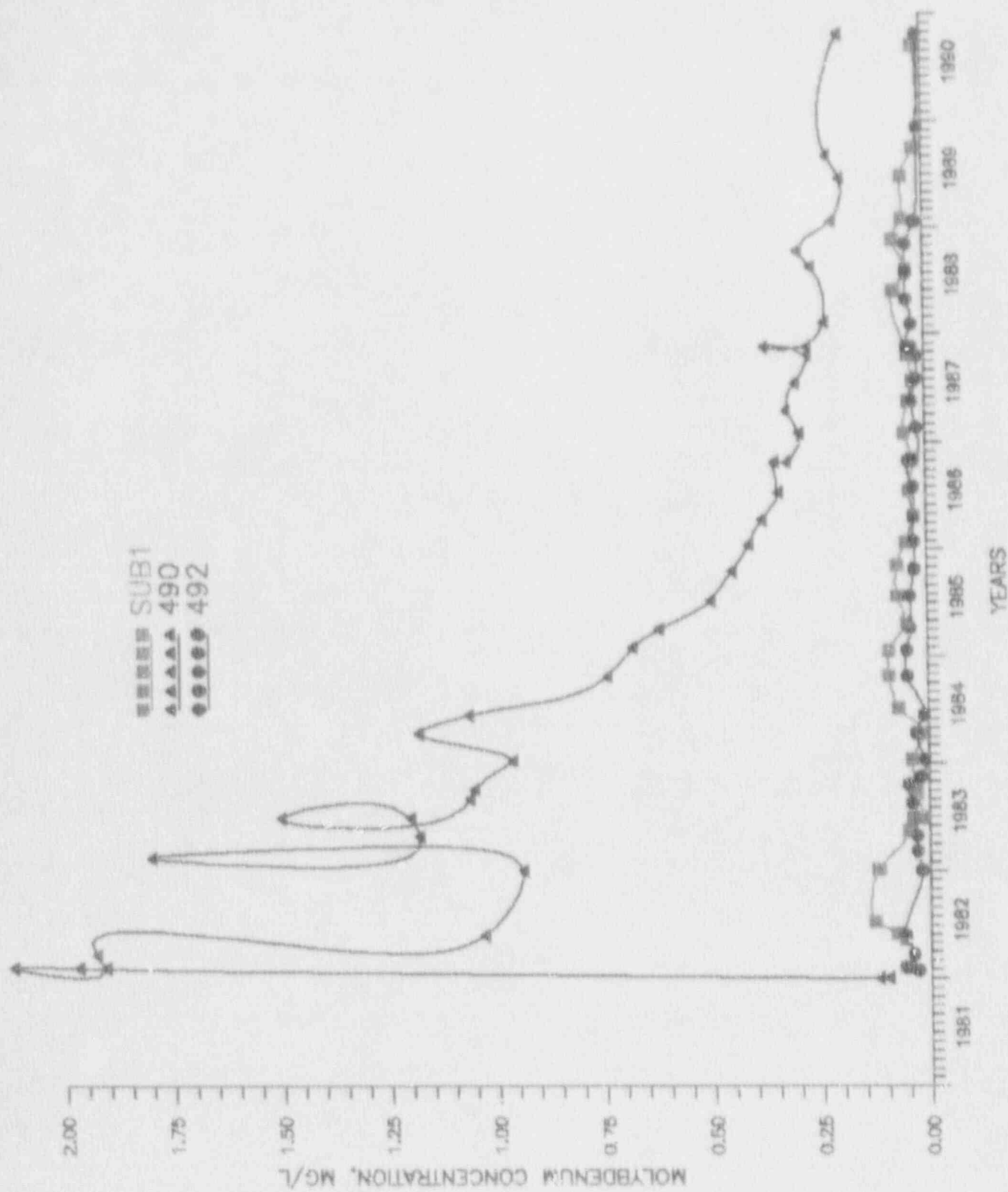


FIGURE 2.3-30. MOLYBDENUM CONCENTRATION FOR WELLS SUB1, 490 AND 492.

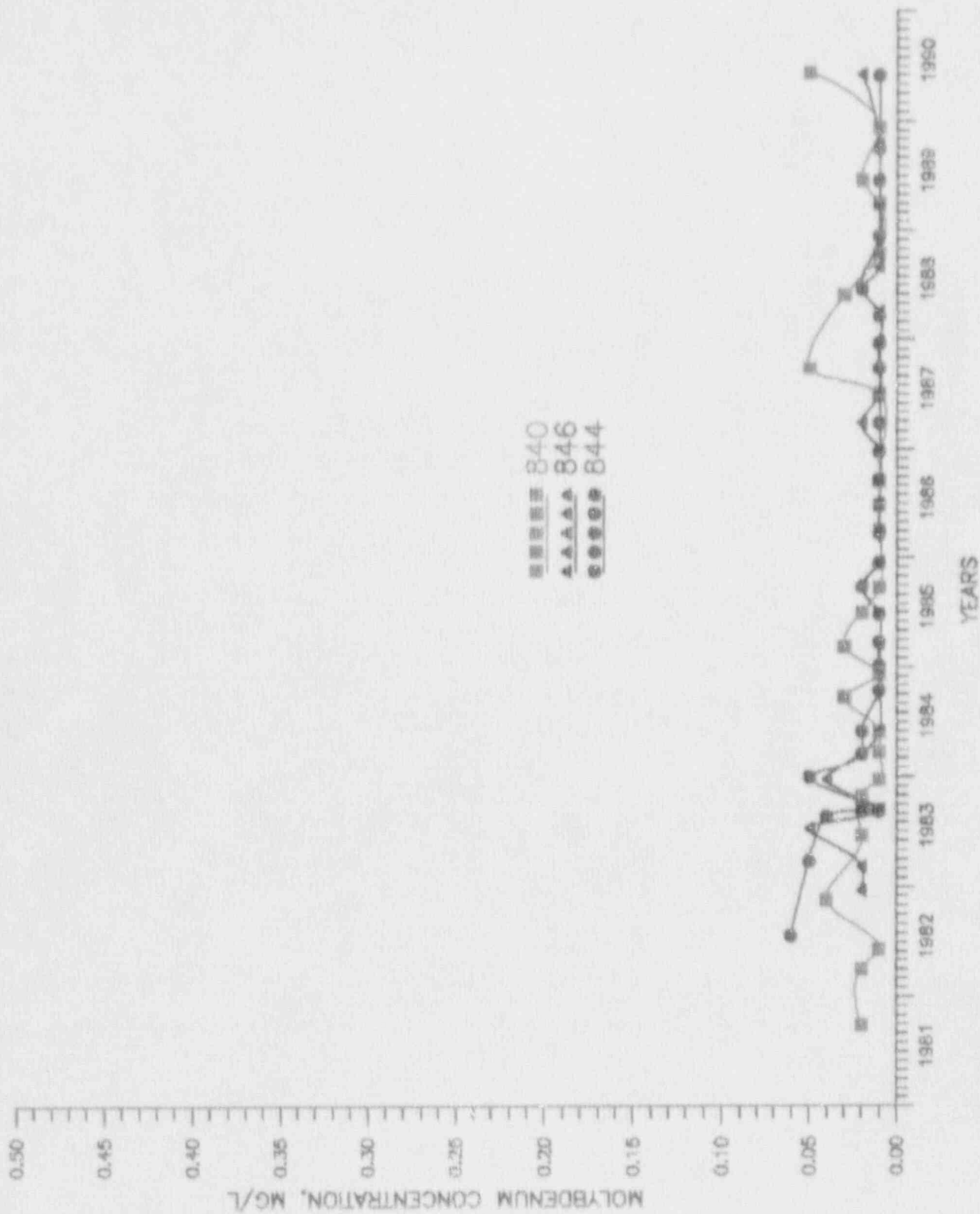


FIGURE 2.3-31. MOLYBDENUM CONCENTRATIONS FOR WELLS 840, 846 AND 844.

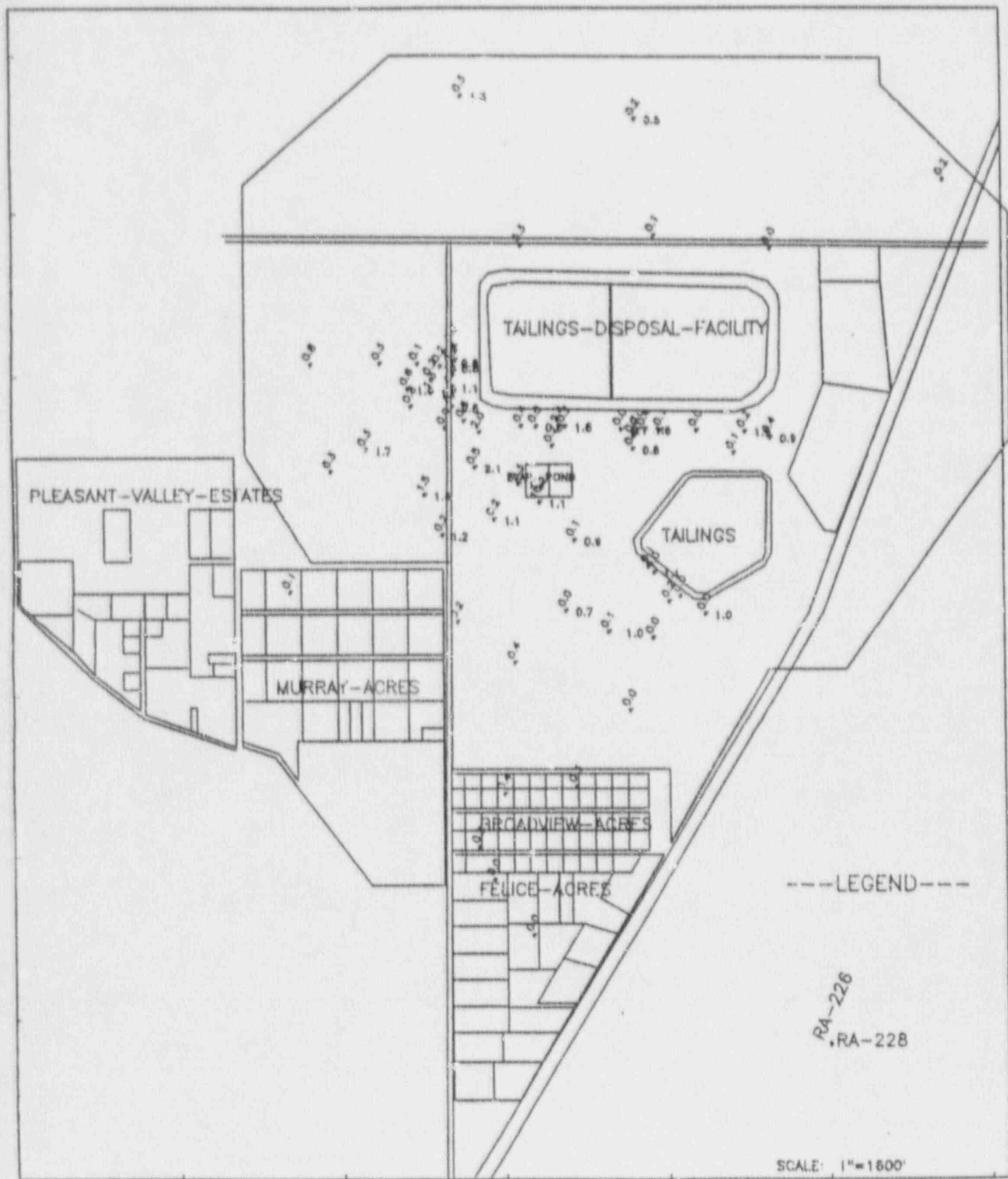


FIGURE 2.3-32. RADIUM-226 AND RADIUM-228 CONCENTRATIONS FOR THE ALLUVIAL AQUIFER, FALL 1990, IN pCi/L

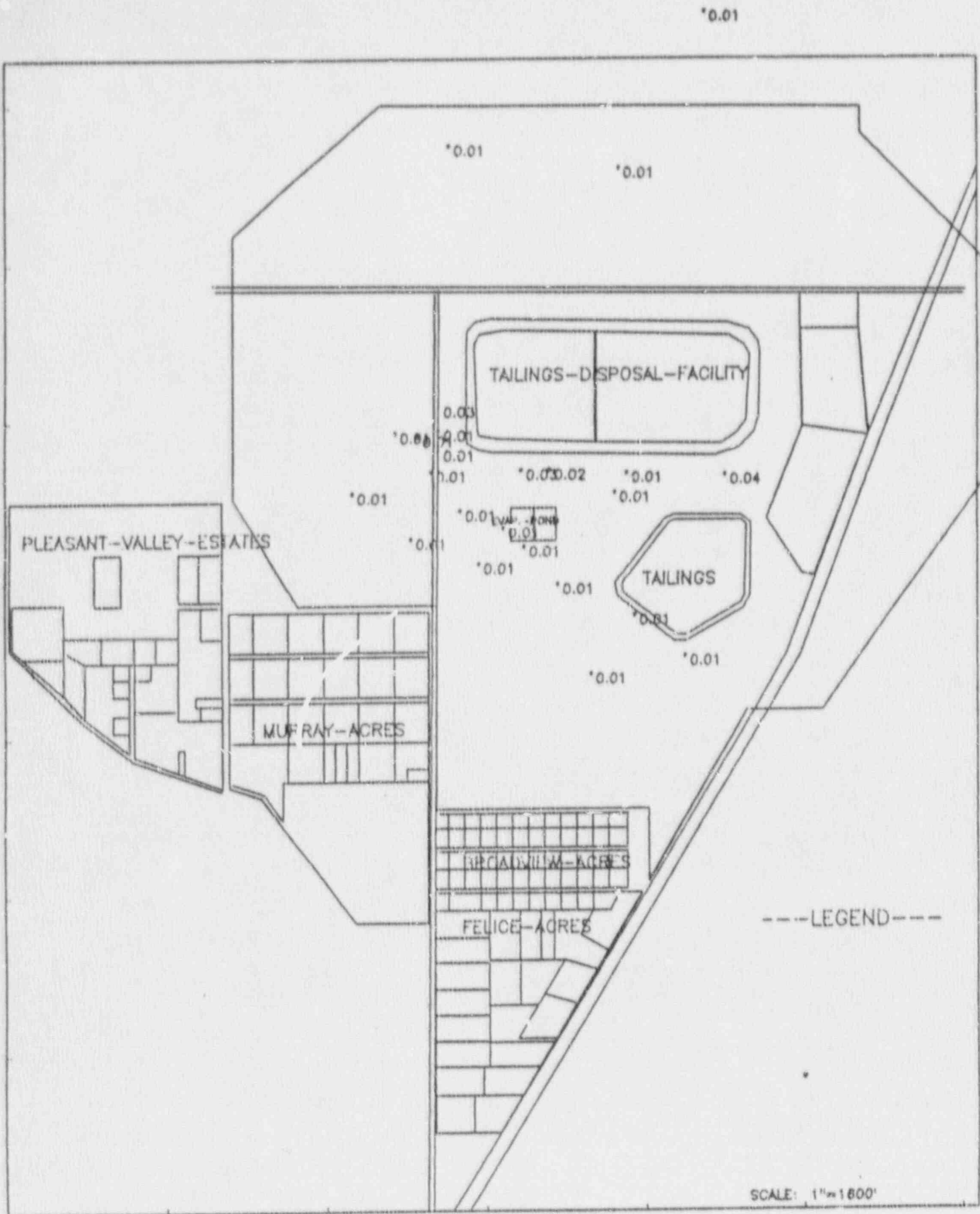


FIGURE 2.3-33. CHROMIUM CONCENTRATIONS FOR THE ALLUVIAL AQUIFER, FALL 1990, IN mg/l

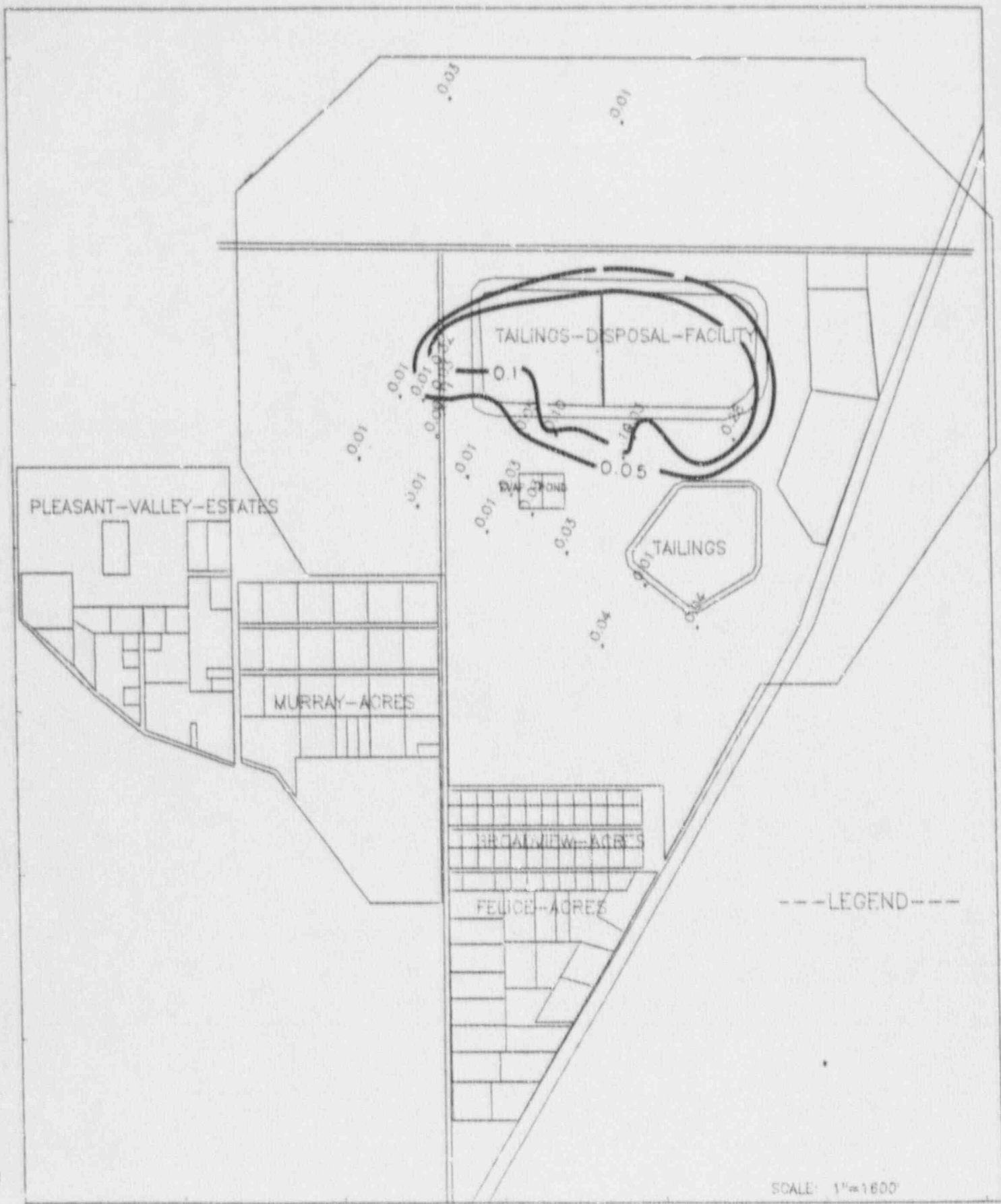


FIGURE 2.3-34. VANADIUM CONCENTRATIONS FOR THE ALLUVIAL AQUIFER, FALL 1990, IN mg/l

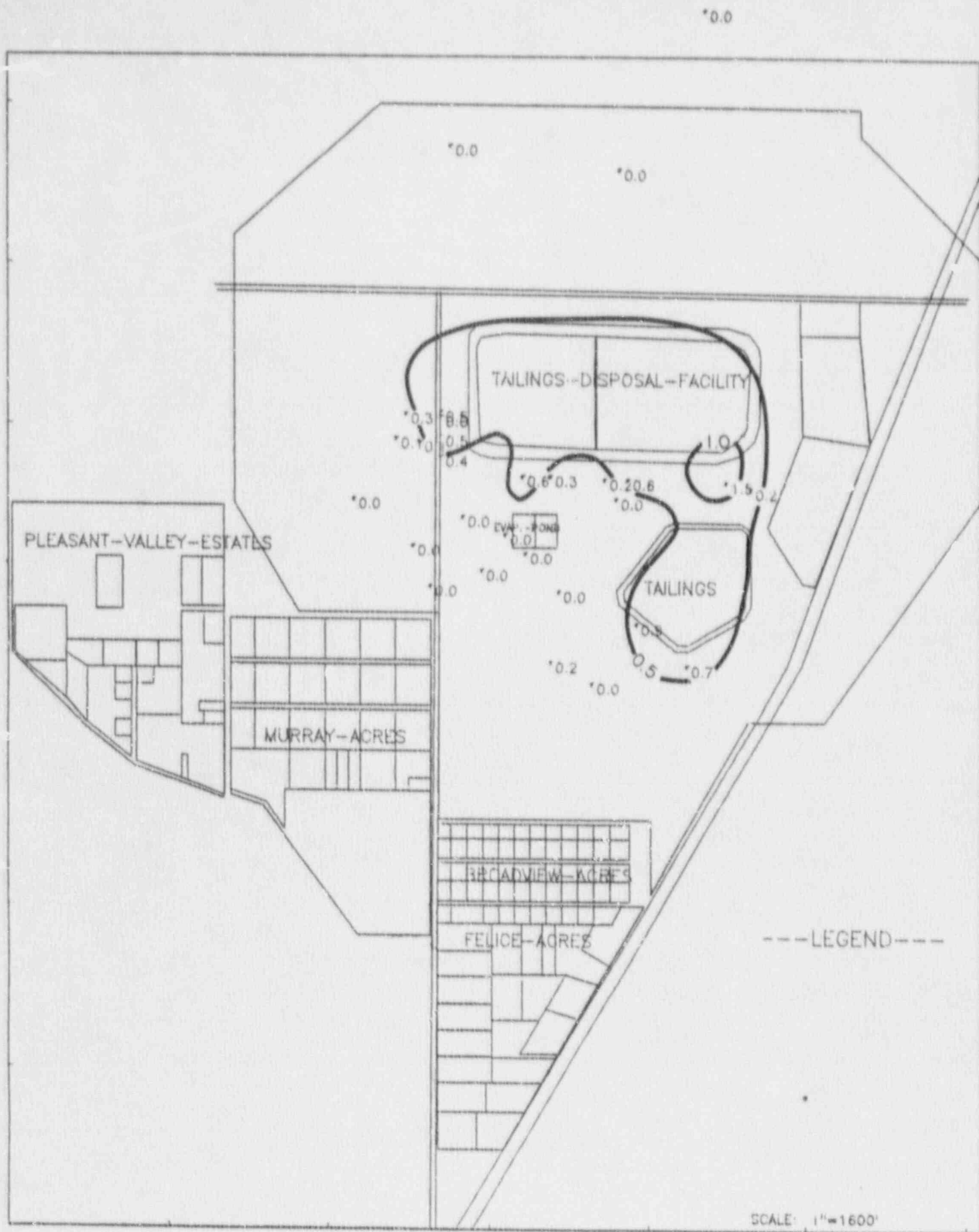


FIGURE 2.3-35. THORIUM-230 CONCENTRATIONS FOR THE ALLUVIAL AQUIFER, FALL 1990, IN pCi/L

TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
A1	01/25/90	HMC	-----	-----	-----	-----	-----	-----	-----	2451.00	4960.00	2972.63	-----
	07/16/90	HMC	709.00	98.00	8.00	917.00	489.00	< 0.10	553.00	2691.00	4790.00	5720.55	1.05
B	01/25/90	HMC	529.00	16.00	7.00	494.00	399.00	< 0.10	170.00	1718.00	3120.00	3840.34	1.05
	04/03/90	HMC	549.00	19.00	7.00	533.00	405.00	< 0.10	177.00	1835.00	3440.00	3101.87	1.05
	07/17/90	HMC	526.00	27.00	6.00	496.00	382.00	< 0.01	213.00	1622.00	3070.00	3506.05	1.09
	10/17/90	HMC	519.00	20.00	6.00	413.00	350.00	-----	191.00	1569.00	2990.00	3511.52	1.04
B1	01/26/90	HMC	-----	-----	-----	-----	-----	-----	-----	2216.00	4040.00	4895.87	-----
	07/19/90	HMC	504.00	23.00	8.00	853.00	494.00	< 0.01	206.00	2324.00	4080.00	4873.26	1.03
BC	01/25/90	HMC	442.00	8.00	6.00	393.00	431.00	< 0.10	92.00	1416.00	2440.00	6462.24	1.02
	04/03/90	HMC	446.00	19.00	5.00	383.00	411.00	< 0.10	89.00	1467.00	2710.00	-----	1.02
	07/17/90	HMC	471.00	51.00	6.00	387.00	443.00	< 0.01	121.00	1534.00	2760.00	3158.08	1.05
	10/18/90	HMC	461.00	27.00	6.00	400.00	423.00	-----	99.00	1467.00	2680.00	3600.91	1.06
BP	02/19/90	HMC	348.00	4.00	5.00	517.00	534.00	< 0.10	184.00	1291.00	2210.00	3268.55	0.99
	05/10/90	HMC	308.00	3.00	6.00	516.00	509.00	-----	199.00	1236.00	2430.00	3244.40	0.96
	08/06/90	HMC	343.00	36.00	5.00	533.00	516.00	< 0.10	206.00	1296.00	2330.00	3284.31	1.05
	11/29/90	HMC	315.00	18.00	5.00	550.00	589.00	-----	213.00	1139.00	2380.00	3190.47	1.05
C	01/26/90	HMC	-----	-----	-----	-----	-----	-----	-----	1644.00	2710.00	3840.34	-----
	07/17/90	HMC	349.00	29.00	4.00	687.00	409.00	< 0.01	206.00	1728.00	3090.00	3941.96	1.03
D1	02/19/90	HMC	359.00	3.00	6.00	667.00	461.00	< 0.10	184.00	1630.00	2660.00	3897.44	1.02
	05/10/90	HMC	341.00	2.00	6.00	683.00	455.00	< 10.00	191.00	1639.00	2950.00	3940.34	0.99
	08/06/90	HMC	337.00	26.00	6.00	667.00	471.00	< 0.10	206.00	1591.00	2860.00	4867.63	1.03
	11/28/90	HMC	337.00	19.00	6.00	667.00	503.00	-----	206.00	1539.00	2830.00	3592.63	1.03
DA2	12/28/90	BARR	235.00	60.30	4.90	601.00	392.00	< 1.00	207.00	1480.00	2790.00	-----	1.04
	01/17/90	HMC	-----	-----	-----	-----	-----	-----	-----	5968.00	11020.00	13082.27	-----
	02/12/90	HMC	-----	-----	-----	-----	-----	-----	-----	6062.00	12160.00	14607.56	-----
	03/13/90	HMC	-----	-----	-----	-----	-----	-----	-----	6742.00	12700.00	14781.93	-----
	04/11/90	HMC	-----	-----	-----	-----	-----	-----	-----	6500.00	14560.00	-----	-----
	05/21/90	HMC	-----	-----	-----	-----	-----	-----	-----	6987.00	11940.00	13874.96	-----
06/07/90	HMC	-----	-----	-----	-----	-----	-----	-----	5967.00	11670.00	12866.46	-----	



TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOME/STAKE'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
DAZ	07/09/90	HMC	567.00	66.90	13.00	3083.00	1667.00	< 0.10	61.20	5482.00	10860.00	11993.49	1.05
	08/09/90	HMC	-----	-----	-----	-----	-----	-----	-----	4951.00	10610.00	1136.98	-----
	09/13/90	HMC	-----	-----	-----	-----	-----	-----	-----	5066.00	10040.00	10401.00	-----
	10/22/90	HMC	-----	-----	-----	-----	-----	-----	-----	6144.00	10640.00	-----	-----
	11/16/90	HMC	-----	-----	-----	-----	-----	-----	-----	6177.00	13260.00	12909.65	-----
	12/06/90	HMC	-----	-----	-----	-----	-----	-----	-----	6880.00	14050.00	15767.00	-----
DB	01/18/90	HMC	619.00	49.00	12.00	2833.00	1471.00	< 0.10	603.00	5522.00	9850.00	11492.26	1.02
	02/12/90	HMC	-----	-----	-----	-----	-----	-----	-----	5452.00	9180.00	11067.75	-----
	05/13/90	HMC	-----	-----	-----	-----	-----	-----	-----	4798.00	8970.00	11086.45	-----
	04/07/90	HMC	637.00	16.00	9.00	2916.00	1580.00	< 0.10	532.00	5354.00	9920.00	11164.44	1.05
	05/21/90	HMC	-----	-----	-----	-----	-----	-----	-----	5810.00	9800.00	11772.69	-----
	06/07/90	HMC	-----	-----	-----	-----	-----	-----	-----	5535.00	10560.00	11322.48	-----
	07/09/90	HMC	625.00	73.00	11.00	3250.00	1751.00	-----	638.00	5650.00	10840.00	10084.99	1.09
	08/09/90	HMC	-----	-----	-----	-----	-----	-----	-----	5810.00	11270.00	12358.52	-----
	09/13/90	HMC	-----	-----	-----	-----	-----	-----	-----	5938.00	10730.00	11036.90	-----
	10/04/90	HMC	605.00	25.00	23.00	2915.00	1525.00	-----	496.00	5407.00	9510.00	10739.49	1.05
	10/22/90	HMC	-----	-----	-----	-----	-----	-----	-----	4615.00	9030.00	-----	-----
	11/16/90	HMC	-----	-----	-----	-----	-----	-----	-----	4753.00	12090.00	9022.62	-----
12/06/90	HMC	-----	-----	-----	-----	-----	-----	-----	4612.00	8990.00	10511.33	-----	
DC	03/12/90	HMC	496.00	33.00	5.00	362.00	161.00	< 0.10	156.00	1650.00	2850.00	3308.29	1.05
	08/08/90	HMC	-----	-----	-----	-----	-----	-----	-----	1412.00	2810.00	3253.36	-----
DD	03/13/90	HMC	570.00	31.00	8.00	427.00	368.00	< 0.10	64.00	1955.00	3230.00	3528.37	1.03
	09/12/90	HMC	580.00	2.00	8.00	443.00	346.00	-----	64.00	1964.00	2696.00	3554.23	1.00
DE	01/18/90	HMC	136.00	7.00	12.00	4791.00	2696.00	252.00	709.00	7057.00	14690.00	17245.58	0.98
	02/12/90	HMC	-----	-----	-----	-----	-----	-----	-----	7486.00	13940.00	16798.70	-----
	03/13/90	HMC	-----	-----	-----	-----	-----	-----	-----	7185.00	14710.00	17245.58	-----
	04/07/90	HMC	123.00	6.00	9.00	4899.00	2751.00	300.00	656.00	7082.00	14630.00	16452.86	1.00
	05/21/90	HMC	-----	-----	-----	-----	-----	-----	-----	7798.00	15060.00	17659.04	-----
	06/07/90	HMC	-----	-----	-----	-----	-----	-----	-----	7086.00	15540.00	15241.43	-----
	07/09/90	HMC	104.00	5.00	10.00	5166.00	3221.00	348.00	709.00	7332.00	15040.00	16381.15	0.97
	08/09/90	HMC	-----	-----	-----	-----	-----	-----	-----	6605.00	16100.00	13139.17	-----
	09/13/90	HMC	-----	-----	-----	-----	-----	-----	-----	7728.00	16730.00	15127.49	-----
	10/04/90	HMC	93.00	3.00	10.00	5874.00	3007.00	438.00	780.00	8152.00	15970.00	17529.87	1.02
10/22/90	HMC	-----	-----	-----	-----	-----	-----	-----	7316.00	15390.00	-----	-----	

TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOMEBAKE'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NH (mg/l)	CA THROUGH ION_BAL			504 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (%)
							HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)				
DE	11/16/90	HMC	----	----	----	----	----	----	7522.00	17850.00	17961.25	----	
	12/06/90	HMC	----	----	----	----	----	----	7329.00	14980.00	17720.16	----	
DF	01/17/90	HMC	----	----	----	----	----	----	3453.00	6280.00	7108.46	----	
	02/12/90	HMC	----	----	----	----	----	----	3636.00	6390.00	7819.61	----	
	03/13/90	HMC	----	----	----	----	----	----	3824.00	6810.00	8421.11	----	
	04/11/90	HMC	----	----	----	----	----	----	5365.00	14170.00	----	----	
	05/21/90	HMC	----	----	----	----	----	----	3829.00	6950.00	8112.78	----	
	06/07/90	HMC	----	----	----	----	----	----	4057.00	7060.00	7205.22	----	
	07/09/90	HMC	627.00	62.00	8.00	1583.00	765.00	0.10	397.00	3730.00	7000.00	7563.75	1.04
	07/09/90	BARR	461.00	129.00	6.60	1500.00	616.00	1.00	415.00	4220.00	6760.00	----	0.90
	09/13/90	HMC	----	----	----	----	----	----	----	3790.00	7030.00	7039.23	----
	10/22/90	HMC	----	----	----	----	----	----	----	3745.00	6980.00	----	----
	11/16/90	HMC	----	----	----	----	----	----	----	3958.00	9570.00	7886.11	----
	12/06/90	HMC	----	----	----	----	----	----	----	3952.00	7340.00	898.06	----
DG	01/18/90	HMC	769.00	159.00	10.00	3083.00	1556.00	0.10	638.00	6584.00	11849.00	13242.56	1.03
	02/12/90	HMC	----	----	----	----	----	----	7118.00	11770.00	12927.25	----	----
	03/13/90	HMC	----	----	----	----	----	----	6665.00	12250.00	13550.10	----	----
	04/07/90	HMC	843.00	153.00	7.00	3166.00	1818.00	0.10	638.00	6646.00	12710.00	14032.23	1.03
	05/21/90	HMC	----	----	----	----	----	----	7444.00	13100.00	14085.19	----	----
	06/07/90	HMC	----	----	----	----	----	----	7028.00	13060.00	13381.12	----	----
	07/09/90	HMC	773.00	191.00	11.00	3500.00	1906.00	----	726.00	6954.00	12980.00	12358.52	1.05
	08/09/90	HMC	----	----	----	----	----	----	----	6599.00	12430.00	1400.66	----
	09/13/90	HMC	----	----	----	----	----	----	----	7477.00	12570.00	12866.46	----
	10/04/90	HMC	774.00	172.00	10.00	4080.00	2324.00	----	674.00	7876.00	13960.00	14661.34	1.04
	10/22/90	HMC	----	----	----	----	----	----	----	8127.00	13950.00	----	----
	11/16/90	HMC	----	----	----	----	----	----	----	8012.00	16670.00	14593.52	----
12/06/90	HMC	----	----	----	----	----	----	----	7488.00	14390.00	15894.45	----	
DH	01/17/90	HMC	----	----	----	----	----	----	12209.00	22920.00	24594.66	----	----
	02/12/90	HMC	----	----	----	----	----	----	12752.00	23410.00	25868.37	----	----
	03/13/90	HMC	----	----	----	----	----	----	12785.00	23860.00	25864.85	----	----
	04/11/90	HMC	----	----	----	----	----	----	12637.00	26770.00	----	----	----
	05/21/90	HMC	----	----	----	----	----	----	13032.00	24100.00	26278.33	----	----
	06/07/90	HMC	----	----	----	----	----	----	12671.00	23940.00	24188.94	----	----
	07/09/90	HMC	296.00	169.00	15.00	7666.00	4355.00	66.00	1383.00	12555.00	24470.00	22739.67	0.97
	08/09/90	HMC	----	----	----	----	----	----	----	12152.00	23540.00	22541.93	----

TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HORSESHOE'S ALLUVIAL WELLS  
CA THROUGH ION\_BAL

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
DH	09/13/90	HMC	----	----	----	----	----	----	----	12505.00	23580.00	20802.00	----
	10/22/90	HMC	----	----	----	----	----	----	----	13291.00	24570.00	----	----
	11/16/90	HMC	----	----	----	----	----	----	----	13020.00	27800.00	24696.72	----
DL	01/18/90	HMC	87.00	119.00	11.00	14746.00	6783.00	654.00	2199.00	21365.00	40600.00	41019.99	1.03
	04/10/90	HMC	95.00	71.00	40.00	14834.00	685.70	696.00	2057.00	20995.00	41050.00	41342.10	1.04
	07/12/90	HMC	44.00	62.00	20.00	14580.00	6564.00	1212.00	2340.00	21069.00	42650.00	33845.88	0.98
	10/04/90	HMC	22.00	7.00	15.00	15830.00	6167.00	1758.00	2095.00	21855.00	44980.00	39179.14	1.00
DM	03/12/90	HMC	26.00	54.00	5.00	7250.00	4020.00	1524.00	851.00	9246.00	21200.00	23819.72	0.96
	08/08/90	HMC	----	----	----	----	----	----	----	5259.00	21210.00	17628.06	----
DP	03/12/90	HMC	758.00	62.00	7.00	1199.00	845.00	< 0.10	426.00	3013.00	6180.00	7023.05	1.05
	10/24/90	HMC	----	----	----	----	----	----	----	2838.00	5850.00	6621.28	----
DQ	11/28/90	HMC	778.00	105.00	9.00	1350.00	883.00	----	532.00	3498.00	6040.00	6753.70	1.04
	12/28/90	SARR	517.00	159.00	4.30	1180.00	703.00	< 1.00	544.00	3190.00	5960.00	----	0.97
DS	01/17/90	HMC	----	----	----	----	----	----	----	5963.00	11010.00	12924.47	----
	02/12/90	HMC	----	----	----	----	----	----	----	5957.00	10800.00	13233.18	----
	03/13/90	HMC	----	----	----	----	----	----	----	5863.00	11110.00	13233.18	----
	04/11/90	HMC	----	----	----	----	----	----	----	6255.00	14810.00	----	----
	05/21/90	HMC	----	----	----	----	----	----	----	6675.00	11310.00	13664.73	----
	06/07/90	HMC	----	----	----	----	----	----	----	6197.00	11040.00	12351.80	----
	07/09/90	HMC	285.00	60.00	11.00	3699.00	1796.00	----	709.00	5889.00	11256.00	11597.74	1.05
	08/09/90	HMC	----	----	----	----	----	----	----	5300.00	10540.00	11981.58	----
	09/13/90	HMC	----	----	----	----	----	----	----	6288.00	11640.00	12028.23	----
	10/22/90	HMC	----	----	----	----	----	----	----	6568.00	11610.00	----	----
	11/16/90	HMC	----	----	----	----	----	----	----	6263.00	13880.00	13173.17	----
	12/06/90	HMC	----	----	----	----	----	----	----	5843.00	11560.00	13664.73	----
DX	01/17/90	HMC	----	----	----	----	----	----	----	4149.00	6560.00	9047.13	----
	02/12/90	HMC	----	----	----	----	----	----	----	4156.00	7120.00	8917.39	----
	03/13/90	HMC	----	----	----	----	----	----	----	3981.00	7790.00	7218.10	----
	04/11/90	HMC	----	----	----	----	----	----	----	4151.00	11340.00	----	----
	05/21/90	HMC	----	----	----	----	----	----	----	4026.00	7320.00	----	----
	06/07/90	HMC	----	----	----	----	----	----	----	4361.00	7400.00	4835.21	----
07/09/90	HMC	709.00	96.00	7.00	1.83.00	864.00	< 0.10	468.00	3806.00	7630.00	7563.75	1.05	

TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLUVIAL WELLS  
CA THROUGH ION\_BAL

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
DX	08/09/90	HMC	----	----	----	----	----	----	----	4449.00	8920.00	8430.09	----
	09/13/90	HMC	----	----	----	----	----	----	----	4484.00	8460.00	8413.33	----
	10/22/90	HMC	----	----	----	----	----	----	----	5205.00	9100.00	----	----
	11/16/90	HMC	----	----	----	----	----	----	----	4982.00	12320.00	10428.76	----
	12/06/90	HMC	----	----	----	----	----	----	----	5001.00	9830.00	10739.49	----
DZ	03/12/90	HMC	69.00	119.00	25.00	10000.00	4447.00	33.00	1631.00	15201.00	29850.00	----	1.03
	10/18/90	HMC	----	----	----	----	----	----	----	13440.00	29520.00	15770.47	----
E	01/17/90	HMC	----	----	----	----	----	----	----	1784.00	3060.00	3639.21	----
	02/12/90	HMC	----	----	----	----	----	----	----	1670.00	2800.00	3626.41	----
	03/06/90	HMC	400.00	20.00	5.00	583.00	248.00	< 10.00	206.00	1700.00	2980.00	3609.05	1.03
	03/13/90	HMC	----	----	----	----	----	----	----	1608.00	2990.00	3428.75	----
	04/11/90	HMC	----	----	----	----	----	----	----	1700.00	3080.00	----	----
	05/21/90	HMC	----	----	----	----	----	----	----	1534.00	2820.00	3499.68	----
	06/07/90	HMC	----	----	----	----	----	----	----	1512.00	2740.00	3363.63	----
	07/09/90	BARR	252.00	65.20	4.00	455.00	175.00	< 1.00	235.00	1570.00	2660.00	----	0.90
	07/09/90	HMC	376.00	24.00	5.00	527.00	254.00	< 1.00	213.00	1539.00	3690.00	3396.75	1.04
	08/09/90	HMC	----	----	----	----	----	----	----	1453.00	2510.00	3347.57	----
	09/13/90	HMC	----	----	----	----	----	----	----	1516.00	2640.00	3179.01	----
	10/22/90	HMC	----	----	----	----	----	----	----	1333.00	2430.00	----	----
11/16/90	HMC	----	----	----	----	----	----	----	1606.00	3250.00	3244.21	----	
12/06/90	HMC	----	----	----	----	----	----	----	1430.00	2580.00	3347.73	----	
F	01/29/90	HMC	276.00	17.00	4.00	283.00	434.00	< 0.10	149.00	756.00	1590.00	2225.39	1.02
	04/19/90	HMC	280.00	8.00	4.00	283.00	431.00	< 0.10	170.00	700.00	1640.00	1090.97	1.02
	07/17/90	HMC	271.00	12.00	5.00	387.00	454.00	< 0.10	170.00	871.00	1640.00	2211.88	1.04
	10/24/90	HMC	279.00	15.00	5.00	253.00	432.00	----	163.00	669.00	5590.00	2239.16	1.03
	01/26/90	HMC	----	----	----	----	----	----	----	999.00	1780.00	2336.66	----
FB	04/19/90	HMC	345.00	3.00	5.00	260.00	140.00	< 0.10	142.00	1039.00	1880.00	1122.58	1.03
	07/17/90	HMC	----	----	----	----	----	----	----	1004.00	1640.00	2319.13	----
	10/24/90	HMC	351.00	22.00	5.00	230.00	150.00	----	142.00	1041.00	1810.00	2305.72	1.05
	01/29/90	HMC	327.00	1.00	4.00	300.00	582.00	< 0.10	184.00	680.00	1820.00	2459.18	1.02
I	04/27/90	HMC	325.00	6.00	5.00	308.00	589.00	< 0.10	177.00	729.00	1710.00	2391.03	1.01
	07/17/90	HMC	310.00	26.00	4.00	320.00	602.00	< 0.10	199.00	756.00	1677.00	2479.99	1.01
	10/24/90	HMC	329.00	10.00	5.00	268.00	536.00	----	191.00	694.00	1800.00	2489.60	1.01

TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	CA THROUGH ION BAL			CL (mg/l)	SO4 (mg/l)	TDS (mg/l)	SPECIFIC CONDUCTIVITY (µMHO/cm)	TSS (mg/l)
							HCO3-	CO3	CL					
JC	01/17/90	HMC	---	---	---	---	---	---	---	---	3900.00	4724.59	---	
	03/06/90	HMC	480.00	23.00	8.00	743.00	243.00	<	0.10	269.00	3870.00	4564.86	1.03	
	03/06/90	HMC	480.00	23.00	8.00	743.00	243.00	---	---	269.00	3870.00	4564.86	1.03	
	03/13/90	HMC	---	---	---	---	---	---	---	---	3770.00	4511.31	---	
	04/11/90	HMC	---	---	---	---	---	---	---	---	3110.00	---	---	
	05/21/90	HMC	---	---	---	---	---	---	---	---	3020.00	---	---	
	06/07/90	HMC	---	---	---	---	---	---	---	---	3020.00	4220.21	---	
	07/09/90	HMC	475.00	28.00	7.00	741.00	239.00	<	0.10	312.00	2770.00	4034.00	1.06	
	08/09/90	HMC	---	---	---	---	---	---	---	---	1919.00	4295.30	---	
	09/13/90	HMC	---	---	---	---	---	---	---	---	1934.00	3962.41	---	
	10/22/90	HMC	---	---	---	---	---	---	---	---	1869.00	---	---	
	11/16/90	HMC	---	---	---	---	---	---	---	---	2118.00	4249.05	---	
12/06/90	HMC	---	---	---	---	---	---	---	---	1837.00	3360.00	4285.80	---	
K2	04/28/90	HMC	---	---	---	---	---	---	---	---	6423.00	9770.86	---	
	10/26/90	HMC	827.00	112.00	23.00	1808.00	970.00	---	780.00	4147.00	8430.00	11653.45	1.01	
KM	04/28/90	HMC	---	---	---	---	---	---	---	---	7290.00	8142.38	---	
	10/26/90	HMC	1019.00	92.00	23.00	1350.00	620.00	---	887.00	3915.00	7470.00	10594.05	1.01	
KZ	04/28/90	HMC	---	---	---	---	---	---	---	---	7240.00	7372.94	---	
	10/26/90	HMC	783.00	44.00	19.00	1050.00	598.00	---	443.00	3146.00	5790.00	6639.97	0.99	
M4	05/29/90	HMC	---	---	---	---	---	---	---	---	17260.00	18920.40	---	
	10/18/90	HMC	163.00	50.00	10.00	5750.00	3148.00	78.00	780.00	8539.00	17100.00	17319.31	1.03	
M5	10/17/90	HMC	340.00	3.00	7.00	1183.00	669.00	---	220.00	2335.00	4500.00	5270.54	1.05	
	05/23/90	HMC	---	---	---	---	---	---	---	---	2470.00	3061.17	---	
N	12/04/90	BARH	324.00	88.30	5.30	305.00	268.00	<	1.00	67.00	2640.00	---	1.00	
	12/04/90	HMC	453.00	35.00	5.00	360.00	365.00	---	71.00	1609.00	2330.00	2701.86	0.99	
	01/30/90	HMC	---	---	---	---	---	---	---	---	1320.00	1769.51	---	
NC	04/27/90	HMC	226.00	3.00	4.00	243.00	220.00	<	0.10	50.00	1350.00	1831.52	0.06	
	07/16/90	HMC	---	---	---	---	---	---	---	---	1115.00	1787.68	---	
	10/26/90	HMC	225.00	1.00	4.00	245.00	220.00	---	50.00	818.00	1370.00	1783.58	0.06	

TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLIUM WELLS  
CA THROUGH ION\_BAL

WELL_ID	DATE	LAB	CA	MG	K	NA	HCO3	CO3	CL	SO4	TDS	SPECIFIC COND	ION_BAL (RATIO)
ND	10/17/90	HMC	41.00	3.00	1.00	390.00	484.00	12.00	71.00	422.00	1150.00	1786.15	1.01
O	05/23/90	HMC	-----	-----	-----	-----	-----	-----	-----	1297.00	2210.00	2743.12	-----
	12/04/90	BARR	160.00	35.20	< 0.80	240.00	149.00	-----	140.00	1310.00	2140.00	-----	0.63
	12/04/90	HMC	335.00	17.00	2.00	430.00	209.00	-----	177.00	1270.00	2140.00	2739.99	1.06
	12/07/90	HMC	160.00	35.20	0.80	240.00	149.00	< 1.00	140.00	1310.00	2140.00	-----	0.63
P	03/13/90	HMC	269.00	2.00	5.00	283.00	310.00	< 0.10	43.00	896.00	1580.00	2077.61	1.04
	06/04/90	HMC	276.00	6.00	5.00	297.00	305.00	-----	57.00	968.00	1680.00	2406.91	1.02
	09/12/90	HMC	282.00	8.00	6.00	296.00	299.00	-----	-----	984.00	1420.00	2095.76	1.03
	12/03/90	HMC	276.00	4.00	6.00	300.00	310.00	-----	71.00	954.00	1320.00	-----	1.01
	12/03/90	BARR	195.00	40.60	5.00	255.00	239.00	< 0.10	54.00	872.00	1580.00	-----	-----
	03/16/90	HMC	364.00	32.00	5.00	567.00	426.00	< 10.00	177.00	1527.00	2870.00	3503.30	1.03
Q	06/01/90	HMC	-----	-----	-----	-----	-----	-----	-----	1518.00	2880.00	3525.76	-----
	08/06/90	HMC	-----	-----	-----	-----	-----	-----	-----	1494.00	2590.00	3562.25	-----
	11/22/90	HMC	348.00	32.00	6.00	617.00	421.00	-----	191.00	1566.00	2750.00	3555.51	1.05
	12/28/90	BARR	234.00	69.20	4.10	530.00	341.00	< 1.00	200.00	1490.00	2720.00	-----	2.96
S	03/13/90	HMC	360.00	8.00	6.00	306.00	268.00	< 0.10	50.00	1216.00	1570.00	2712.20	1.03
	09/12/90	HMC	374.00	8.00	8.00	310.00	267.00	-----	50.00	1245.00	1570.00	2520.27	1.04
R	03/13/90	HMC	274.00	2.00	3.00	260.00	206.00	< 0.10	35.00	930.00	1560.00	2033.29	1.06
	09/12/90	HMC	277.00	5.00	4.00	270.00	188.00	-----	50.00	957.00	1490.00	2032.20	1.06
	06/06/90	HMC	-----	-----	-----	-----	-----	-----	-----	13040.00	26640.00	28391.10	-----
S2	12/03/90	BARR	9.60	58.20	20.10	9360.00	3515.00	1150.00	1650.00	13700.00	25700.00	-----	0.97
	12/03/90	HMC	33.00	17.00	20.00	9041.00	4423.00	678.00	1631.00	12938.00	26490.00	27653.41	0.97
	10/18/90	HMC	461.00	39.00	8.00	773.00	719.00	-----	191.00	1926.00	3670.00	3681.02	1.05
S3	10/16/90	HMC	720.00	39.00	11.00	650.00	497.00	-----	262.00	2450.00	4350.00	-----	1.02
S4	10/16/90	HMC	293.00	12.00	8.00	1625.00	983.00	-----	213.00	2991.00	5720.00	7237.70	1.04
SA	01/18/90	HMC	322.00	12.00	9.00	1056.00	688.00	< 0.10	185.00	2263.00	4090.00	4852.29	1.00
	02/12/90	HMC	-----	-----	-----	-----	-----	-----	-----	2127.30	3840.00	4869.19	-----

TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLU. 1AL WELLS  
CA THROUGH 1.0N BAL

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
SA	03/13/90	HMC	---	---	---	---	---	---	---	2517.00	4700.00	8036.83	---
	04/07/90	HMC	429.00	14.00	8.00	1142.00	705.00	< 0.10	220.00	2468.00	4720.00	5298.88	1.05
	05/21/90	HMC	---	---	---	---	---	---	---	554.00	4290.00	5225.30	---
	06/07/90	HMC	---	---	---	---	---	---	---	2337.00	4340.00	5146.58	---
	07/09/90	HMC	420.00	30.00	9.00	1033.00	598.00	< 0.10	227.00	2346.00	4340.00	5042.50	1.05
	08/09/90	HMC	---	---	---	---	---	---	---	2214.00	4190.00	4992.88	---
	09/13/90	HMC	---	---	---	---	---	---	---	2276.00	4250.00	4993.86	---
	10/04/90	HMC	430.00	24.00	8.00	1050.00	697.00	---	213.00	2667.00	4350.00	5152.72	0.95
	10/22/90	HMC	---	---	---	---	---	---	---	2704.00	4240.00	---	---
	11/16/90	HMC	---	---	---	---	---	---	---	2342.00	5910.00	5163.86	---
	12/06/90	HMC	---	---	---	---	---	---	---	2351.00	4380.00	5255.67	---
	SB	01/18/90	HMC	355.00	17.00	12.00	1783.00	1194.00	< 0.10	241.00	3617.00	6110.00	7912.43
02/12/90		HMC	---	---	---	---	---	---	---	3971.00	6000.00	7819.61	---
04/07/90		HMC	375.00	12.00	10.00	2133.00	1318.00	< 0.10	284.00	3755.00	6980.00	8006.88	1.04
05/21/90		HMC	---	---	---	---	---	---	---	4551.00	7040.00	9249.97	---
06/07/90		HMC	---	---	---	---	---	---	---	3823.00	7430.00	8749.19	---
07/09/90		HMC	378.00	34.00	12.00	2333.00	1458.00	< 0.01	312.00	4078.00	7280.00	7909.45	1.05
08/09/90		HMC	---	---	---	---	---	---	---	3843.00	7240.00	7719.88	---
09/13/90		HMC	---	---	---	---	---	---	---	3559.00	6530.00	7377.93	---
10/04/90		HMC	376.00	30.00	11.00	1933.00	1360.00	748.00	---	11234.00	6690.00	7968.12	0.40
10/22/90		HMC	---	---	---	---	---	---	---	3592.00	6858.00	---	---
11/16/90		HMC	---	---	---	---	---	---	---	3481.00	9090.00	6735.47	---
12/06/90		HMC	---	---	---	---	---	---	---	3905.00	7100.00	8591.59	---
SC	01/17/90	HMC	---	---	---	---	---	---	---	8177.00	15560.00	18315.17	---
	02/12/90	HMC	---	---	---	---	---	---	---	8367.00	15680.00	18477.41	---
	03/13/90	HMC	---	---	---	---	---	---	---	8127.00	15820.00	18477.41	---
	04/11/90	HMC	---	---	---	---	---	---	---	8588.00	18830.00	---	---
	05/21/90	HMC	---	---	---	---	---	---	---	8098.00	15770.00	18920.40	---
	06/07/90	HMC	---	---	---	---	---	---	---	8020.00	15760.00	17498.38	---
	07/09/90	HMC	132.00	36.00	16.00	5500.00	3099.00	234.00	745.00	7629.00	15280.00	14715.87	1.05
	07/09/90	BARR	75.70	80.60	13.30	5430.00	2130.00	283.00	749.00	9130.00	14960.00	---	0.97
	08/09/90	HMC	---	---	---	---	---	---	---	8205.00	14780.00	15975.45	---
	09/13/90	HMC	---	---	---	---	---	---	---	7588.00	14700.00	14262.96	---
	10/22/90	HMC	---	---	---	---	---	---	---	7543.00	14540.00	---	---
	11/16/90	HMC	---	---	---	---	---	---	---	7366.00	16780.00	13308.77	---
12/06/90	HMC	---	---	---	---	---	---	---	7152.00	14030.00	16968.39	---	

TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	CA THROUGH ION_BAL										TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
			CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)					
SD4	01/17/90	HMC	----	----	----	----	----	----	----	----	----	4000.00	7140.00	5929.98	----
	02/12/90	HMC	----	----	----	----	----	----	----	----	----	4469.00	6910.00	8764.54	----
	03/13/90	HMC	----	----	----	----	----	----	----	----	----	3843.00	7260.00	8622.79	----
	04/11/90	HMC	----	----	----	----	----	----	----	----	----	4281.00	10530.00	-----	----
	05/21/90	HMC	----	----	----	----	----	----	----	----	----	737.00	8440.00	10511.33	----
	06/07/90	HMC	----	----	----	----	----	----	----	----	----	4029.00	7430.00	8749.19	----
	07/09/90	HMC	333.00	27.00	7.00	2100.00	1102.00	29.00	284.00	3680.00	6.770.50	7059.50	1.06	----	
	08/09/90	HMC	----	----	----	----	----	----	----	3391.00	6520.00	7131.48	----		
	09/13/90	HMC	----	----	----	----	----	----	----	3180.00	6010.00	6586.98	----		
	10/22/90	HMC	----	----	----	----	----	----	----	2898.00	5690.00	-----	----		
	11/16/90	HMC	----	----	----	----	----	----	----	2855.00	6500.00	6735.47	----		
	12/06/90	HMC	----	----	----	----	----	----	----	2986.00	5760.00	729.68	----		
SE	01/16/90	HMC	355.00	20.00	7.00	600.00	420.00	< 0.10	170.00	1593.00	2990.00	3554.23	1.02		
	02/12/90	HMC	----	----	----	----	----	----	----	1672.00	2800.00	3651.89	----		
	03/13/90	HMC	----	----	----	----	----	----	----	1519.00	2860.00	3486.75	----		
	04/07/90	HMC	393.00	2.00	6.00	616.00	415.00	< 0.10	163.00	1695.00	3040.00	3532.59	1.00		
	06/07/90	HMC	----	----	----	----	----	----	----	1897.00	3150.00	3705.54	----		
	07/09/90	HMC	366.00	28.00	6.00	600.00	455.00	< 0.10	163.00	1602.00	3000.00	3468.74	1.03		
	07/09/90	BARR	246.00	74.80	6.80	558.00	329.00	< 1.00	188.00	1730.00	2830.00	-----	0.92		
	08/09/90	HMC	----	----	----	----	----	----	----	1436.00	2740.00	3311.07	----		
	09/13/90	HMC	----	----	----	----	----	----	----	1402.00	2580.00	3028.54	----		
	10/04/90	HMC	316.00	13.00	7.00	500.00	434.00	14.2.00	14.2.00	1358.00	2400.00	3027.89	0.98		
	10/22/90	HMC	----	----	----	----	----	----	----	1295.00	2450.00	-----	----		
	11/16/90	HMC	----	----	----	----	----	----	----	1337.00	3090.00	371.28	----		
12/06/90	HMC	----	----	----	----	----	----	----	1434.00	2510.00	3367.73	----			
SO	06/05/90	HMC	----	----	----	----	----	----	----	8395.00	14240.00	16000.04	----		
	12/03/90	BARR	353.00	192.00	11.90	3470.00	1161.00	< 0.10	6.00	7930.00	12900.00	-----	1.00		
	12/03/90	HMC	541.00	139.00	13.00	3438.00	1491.00	4.79.00	4.79.00	7465.00	12890.00	11860.33	0.97		
SQ	01/17/90	HMC	----	----	----	----	----	----	----	6317.00	11820.00	14216.92	----		
	02/12/90	HMC	----	----	----	----	----	----	6388.00	11770.00	14781.93	----			
	03/13/90	HMC	----	----	----	----	----	----	6275.00	11820.00	14781.93	----			
	04/11/90	HMC	----	----	----	----	----	----	6642.00	15600.00	-----	----			
	05/21/90	HMC	----	----	----	----	----	----	6481.00	12460.00	14926.09	----			
	06/07/90	HMC	----	----	----	----	----	----	6889.00	12080.00	13664.73	----			



TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	CA THROUGH IOW_BAL										SPECIFIC COND	IOW_BAL (RATIO)
			CA	MG	K	NA	HCO3	CO3	CL	SO4	TDS			
SQ	07/09/90	HMC	279.00	38.00	13.00	4299.00	2684.00	60.00	525.00	6456.00	12490.00	17144.49	1.05	
	08/09/90	HMC	---	---	---	---	---	---	6296.00	12640.00	13347.20	---		
	09/13/90	HMC	---	---	---	---	---	---	6605.00	12590.00	12481.20	---		
	10/22/90	HMC	---	---	---	---	---	---	6600.00	12520.00	---	---		
	11/16/90	HMC	---	---	---	---	---	---	6444.00	15650.00	13780.70	---		
	12/06/90	HMC	---	---	---	---	---	---	6415.00	12760.00	14715.87	---		
	01/17/90	HMC	---	---	---	---	---	---	10003.00	19330.00	21713.02	---		
	02/12/90	HMC	---	---	---	---	---	---	10000.00	18500.00	21502.69	---		
	03/13/90	HMC	---	---	---	---	---	---	10386.00	20880.00	23404.72	---		
	04/11/90	HMC	---	---	---	---	---	---	10757.00	23500.00	---	---		
SR	05/21/90	HMC	---	---	---	---	---	---	10897.00	21660.00	24176.06	---		
	06/07/90	HMC	---	---	---	---	---	---	10349.00	21160.00	21615.65	---		
	07/09/90	HMC	126.00	31.00	15.00	6082.00	396.00	887.00	8620.00	17350.00	17144.49	1.03		
	08/09/90	HMC	---	---	---	---	---	---	8107.00	16100.00	17173.60	---		
	09/13/90	HMC	---	---	---	---	---	---	7921.00	15580.00	15081.45	---		
	10/22/90	HMC	---	---	---	---	---	---	7386.00	15040.00	---	---		
	11/16/90	HMC	---	---	---	---	---	---	7790.00	17950.00	16838.67	---		
	12/06/90	HMC	---	---	---	---	---	---	8304.00	16450.00	18257.13	---		
	12/06/90	HMC	---	---	---	---	---	---	2095.00	3900.00	4821.09	---		
	12/06/90	HMC	---	---	---	---	---	---	1630.00	2840.00	3704.51	---		
SU	01/17/90	HMC	---	---	---	---	---	---	4991.00	9230.00	10339.58	---		
	02/12/90	HMC	---	---	---	---	---	---	5144.00	9440.00	11199.13	---		
	03/13/90	HMC	---	---	---	---	---	---	5185.00	9480.00	10827.15	---		
	04/11/90	HMC	---	---	---	---	---	---	5514.00	14250.00	---	---		
	05/21/90	HMC	---	---	---	---	---	---	6378.00	10500.00	11961.15	---		
	06/07/90	HMC	---	---	---	---	---	---	5646.00	10840.00	11322.48	---		
	07/09/90	HMC	729.00	64.00	16.00	3250.00	1750.00	638.00	6156.00	11480.00	11093.49	1.05		
	08/09/90	HMC	---	---	---	---	---	---	6079.00	11580.00	12358.52	---		
	09/13/90	HMC	---	---	---	---	---	---	6456.00	11910.00	11562.47	---		
	10/22/90	HMC	---	---	---	---	---	---	6732.00	12470.00	---	---		
SV	11/16/90	HP	---	---	---	---	---	---	7057.00	15000.00	13173.17	---		
	12/06/90	HMC	---	---	---	---	---	---	6887.00	13240.00	14715.87	---		
	03/30/90	HMC	145.00	28.00	18.00	6458.00	3056.00	993.00	9304.00	18390.00	20863.07	1.02		

TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS  
CA THROUGH ION\_BAL

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	HCO3 (mg/l)	CO3 (ug/l)	CL (mg/l)	SO4 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
SV	04/07/90	HMC	86.00	44.00	18.00	6458.00	3068.00	294.00	855.00	9328.00	18250.00	3055.53	1.04
	07/12/90	HMC	22.00	47.00	10.00	6292.00	3221.00	360.00	887.00	8930.00	17900.00	18568.23	1.01
	10/04/90	HMC	49.00	24.00	13.00	6082.00	3093.00	354.00	922.00	8839.00	17010.00	18471.92	0.99
T	06/04/90	HMC	-----	-----	-----	-----	-----	-----	-----	7795.00	13390.00	17877.45	-----
	12/04/90	BARR	456.00	412.00	39.40	2940.00	839.00	-----	1180.00	8600.00	-----	-----	0.82
	12/05/90	HMC	651.00	291.00	42.00	1111.00	1017.00	-----	993.00	7002.00	13560.00	18095.66	0.96
V	12/07/90	HMC	456.00	412.00	39.40	2940.00	839.00	< 1.00	1180.00	-----	13900.00	-----	-----
	06/05/90	HMC	-----	-----	-----	-----	-----	-----	-----	797.00	1680.00	2289.40	-----
	12/03/90	HMC	274.00	9.00	7.00	300.00	473.00	-----	163.00	680.00	1400.00	2224.75	1.04
WR11	12/03/90	BARR	192.00	44.30	5.50	258.00	371.00	< 0.10	168.00	531.00	1570.00	-----	1.12
	01/26/90	HMC	-----	-----	-----	-----	-----	-----	-----	718.00	1480.00	2103.45	-----
	07/19/90	HMC	-----	-----	-----	-----	-----	-----	-----	844.00	1560.00	2145.29	-----
WR3	10/23/90	HMC	271.00	10.00	6.00	233.00	317.00	-----	142.00	718.00	1540.00	2082.15	1.02
	01/17/90	HMC	-----	-----	-----	-----	-----	-----	-----	917.00	1940.00	2714.72	-----
	02/12/90	HMC	-----	-----	-----	-----	-----	-----	-----	873.00	1980.00	2913.36	-----
	03/13/90	HMC	-----	-----	-----	-----	-----	-----	-----	900.00	2030.00	2646.64	-----
	04/11/90	HMC	-----	-----	-----	-----	-----	-----	-----	956.00	2090.00	-----	-----
	05/21/90	HMC	-----	-----	-----	-----	-----	-----	-----	807.00	1850.00	2589.85	-----
	06/07/90	HMC	-----	-----	-----	-----	-----	-----	-----	843.00	2030.00	2573.29	-----
	07/09/90	HMC	295.00	14.00	6.00	346.00	465.00	< 0.10	206.00	799.00	1950.00	2571.67	1.03
	07/09/90	BARR	224.00	52.40	5.00	303.00	349.00	< 1.00	228.00	850.00	1760.00	-----	0.96
	08/09/90	HMC	-----	-----	-----	-----	-----	-----	-----	783.00	1850.00	2648.43	-----
	09/13/90	HMC	-----	-----	-----	-----	-----	-----	-----	746.00	1950.00	2469.67	-----
	10/22/90	HMC	-----	-----	-----	-----	-----	-----	-----	743.00	1860.00	-----	-----
WRS	11/16/90	HMC	-----	-----	-----	-----	-----	-----	-----	792.00	2730.00	2641.30	-----
	12/06/90	HMC	-----	-----	-----	-----	-----	-----	-----	788.00	1860.00	2604.38	-----
	01/17/90	HMC	-----	-----	-----	-----	-----	-----	-----	1797.00	3230.00	3972.77	-----
	02/12/90	HMC	-----	-----	-----	-----	-----	-----	-----	1881.00	2950.00	4370.04	-----
WRS	03/13/90	HMC	-----	-----	-----	-----	-----	-----	-----	1839.00	3420.00	4249.80	-----
	04/11/90	HMC	-----	-----	-----	-----	-----	-----	-----	1668.00	3110.00	-----	-----
	05/21/90	HMC	-----	-----	-----	-----	-----	-----	-----	1639.00	2920.00	3723.56	-----
	06/07/90	HMC	-----	-----	-----	-----	-----	-----	-----	1513.00	3030.00	3602.61	-----
08/10/90	HMC	-----	-----	-----	-----	-----	-----	-----	1470.00	2870.00	3590.23	-----	

TABLE 2.3-1 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	CA THROUGH ION_BAL				SO4 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
							HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)				
WR5	09/13/90	HMC	----	----	----	----	----	----	----	1462.00	2990.00	3445.17	----	
	10/22/90	HMC	----	----	----	----	----	----	1458.00	2800.00	----	----		
	11/16/90	HMC	----	----	----	----	----	----	1408.00	4111.00	3560.01	----		
	12/06/90	HMC	----	----	----	----	----	----	1396.00	2770.00	3536.12	----		
WR7	01/25/90	HMC	----	----	----	----	----	----	659.00	1550.00	2326.40	----		
	07/19/90	HMC	----	----	----	----	----	----	741.00	1540.00	2185.07	----		
	10/23/90	HMC	312.00	5.00	6.00	230.00	397.00	156.00	683.00	1510.00	2118.81	1.04		
WR9	10/23/90	HMC	----	----	----	----	----	----	672.00	1560.00	2145.29	----		
X	05/29/90	HMC	596.00	73.00	13.00	1806.00	737.00	744.00	3786.00	7080.00	8591.59	1.03		
	08/07/90	HMC	547.00	56.00	12.00	1858.00	749.00	0.10	3594.00	7320.00	7770.32	1.02		
	10/31/90	HMC	488.00	33.00	19.00	2000.00	671.00	887.00	3528.00	7560.00	9193.81	1.05		
	03/06/90	HMC	----	----	----	----	----	----	2793.00	5310.00	6258.92	----		
Y	05/29/90	HMC	764.00	18.00	10.00	1033.00	592.00	460.00	2868.00	5450.00	6336.80	1.03		
	10/17/90	HMC	782.00	73.00	10.00	1050.00	625.00	479.00	3022.00	5930.00	6488.85	1.05		
	11/27/90	BARR	554.00	152.00	8.80	983.00	520.00	1.00	3160.00	5630.00	----	0.93		
	11/27/90	HMC	812.00	90.00	14.00	1116.00	609.00	674.00	3100.00	5770.00	6509.04	1.04		
	01/17/90	HMC	----	----	----	----	----	----	1216.00	2190.00	2972.63	----		
	02/12/90	HMC	----	----	----	----	----	----	1170.00	2216.00	2734.67	----		
Z	03/13/90	HMC	----	----	----	----	----	----	1045.00	2000.00	2646.64	----		
	04/11/90	HMC	----	----	----	----	----	----	1085.00	2100.00	----	----		
	05/21/90	HMC	----	----	----	----	----	----	958.00	1910.00	2617.32	----		
	05/29/90	HMC	264.00	7.00	6.00	400.00	298.00	191.00	981.00	1750.00	2522.72	1.02		
	06/07/90	HMC	----	----	----	----	----	----	981.00	1750.00	2575.28	----		
	07/09/90	HMC	229.00	10.00	4.00	400.00	282.00	0.10	908.00	1970.00	2017.00	1.04		
	08/09/90	HMC	----	----	----	----	----	----	880.00	1880.00	2577.48	----		
	09/13/90	HMC	----	----	----	----	----	----	864.00	1800.00	2357.41	----		
	10/22/90	HMC	----	----	----	----	----	----	853.00	1760.00	----	----		
	11/16/90	HMC	----	----	----	----	----	----	879.00	2370.00	2526.46	----		
12/06/90	HMC	----	----	----	----	----	----	869.00	1800.00	2526.46	----			

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS  
PH THROUGH TH-230

WELL_ID	DATE	LAB	PH (units)	UMAT (mg/l)	MO (mg/l)	SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/l)	CR (mg/l)	V (mg/l)	TH230 (pCi/l)
A1	01/25/90	HMC	7.40	6.05	---	5.03	---	---	---	---	---	---
	07/16/90	HMC	7.40	5.89	41.08	4.95	14.50	---	---	---	---	---
B	01/25/90	HMC	7.20	1.26	0.41	0.97	14.40	1.60	---	---	---	---
	04/03/90	HMC	7.90	1.26	0.27	1.21	9.00	1.20	---	---	---	---
	04/03/90	BARR	---	---	---	---	---	0.50	< 0.90	---	---	< 0.30
	07/17/90	HMC	7.60	1.78	0.14	1.24	32.00	---	---	< 0.01	< 0.01	---
	10/17/90	HMC	7.90	1.27	0.05	1.07	30.00	---	---	---	---	---
10/17/90	BARR	---	---	---	---	---	< 0.20	1.10	---	---	< 0.00	
B1	01/26/90	HMC	7.50	6.44	---	0.90	---	---	---	---	---	---
	07/19/90	HMC	7.50	5.72	8.63	0.60	8.00	---	---	---	---	---
B2	01/25/90	HMC	7.50	0.31	0.08	0.01	0.30	0.40	---	---	---	---
	04/03/90	HMC	7.90	0.44	0.09	0.11	12.20	0.10	---	---	---	---
	07/17/90	HMC	7.70	0.53	0.12	0.07	27.00	---	---	---	---	---
	10/18/90	HMC	8.00	0.65	0.20	0.02	14.40	---	---	---	---	---
	10/18/90	BARR	---	---	---	---	---	0.30	---	---	---	---
BP	02/19/90	HMC	7.00	1.27	0.37	0.31	2.30	0.10	---	---	---	---
	05/10/90	BARR	---	---	---	---	---	< 0.20	0.90	---	---	1.50
	05/10/90	HMC	7.40	1.95	0.40	0.34	4.80	---	---	< 0.01	0.01	---
	08/06/90	HMC	7.50	1.95	0.43	0.46	7.20	---	---	---	---	---
	08/08/90	BARR	---	---	---	---	---	< 0.00	---	---	---	---
11/29/90	BARR	7.61	2.33	0.59	0.38	1.30	< 0.20	1.10	< 0.01	0.03	< 0.00	
11/29/90	HMC	7.90	1.01	0.43	0.29	10.50	---	---	< 0.01	0.01	---	
C	01/26/90	HMC	7.70	0.95	---	0.59	---	---	---	---	---	---
	07/17/90	HMC	7.70	1.78	6.53	0.79	6.20	---	---	---	---	---
D1	02/19/90	HMC	7.10	4.54	3.85	0.54	4.10	0.10	---	---	---	---
	05/10/90	HMC	7.40	4.49	4.81	0.54	6.40	---	---	< 0.01	0.04	0.20
	05/10/90	BARR	---	---	---	---	---	< 0.20	< 0.90	---	---	---
	08/06/90	HMC	7.40	4.16	4.74	0.65	8.60	---	---	---	---	---
	11/28/90	HMC	8.00	2.19	3.55	0.64	12.00	---	---	< 0.01	< 0.01	< 0.00
12/28/90	BARR	7.69	5.07	5.54	0.70	2.10	0.30	1.40	< 0.01	0.03	< 0.00	

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH (units)	UNRT (mg/l)	MO (mg/l)	PH THROUGH TH-230					V (mg/l)	TH230 (pCi/l)
						SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/l)	CR (mg/l)		
DA2	01/17/90	HMC	----	27.98	----	----	----	----	----	----	----	----
	02/12/90	HMC	----	29.26	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	30.10	----	----	----	----	----	----	----	----
	04/11/90	HMC	----	28.20	----	----	----	----	----	----	----	----
	05/21/90	HMC	----	28.41	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	29.09	----	----	----	----	----	----	----	----
	07/09/90	HMC	8.00	26.29	50.70	1.28	4.20	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	0.40	----	----	----	----
	08/09/90	HMC	----	24.25	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	21.37	----	----	----	----	----	----	----	----
	10/22/90	HMC	----	28.66	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	11.45	----	----	----	----	----	----	----	----
12/06/90	HMC	----	34.34	----	----	----	----	----	----	----	----	
DAA	04/07/90	BARR	----	----	----	----	----	0.40	----	----	----	----
DB	01/18/90	HMC	7.50	29.93	38.68	1.49	12.40	1.20	----	----	----	----
	02/12/90	HMC	----	25.69	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	24.17	----	----	----	----	----	----	----	----
	04/07/90	BARR	----	----	----	----	----	< 0.20	1.20	----	----	< 0.20
	04/07/90	HMC	7.60	28.62	34.65	1.53	16.80	0.30	----	0.03	0.05	----
	05/21/90	HMC	----	28.41	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	32.65	----	----	----	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	< 0.10	----	----	----	----
	07/09/90	HMC	7.80	33.75	49.40	1.76	23.00	----	----	----	----	----
	08/09/90	HMC	----	34.34	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	37.31	----	----	----	----	----	----	----	----
	10/04/90	BARR	----	----	----	----	----	< 0.00	< 0.80	----	----	0.60
10/04/90	HMC	7.60	20.61	37.60	1.71	13.00	----	----	----	----	----	
10/22/90	HMC	----	26.29	----	----	----	----	----	----	----	----	
11/16/90	HMC	----	19.33	----	----	----	----	----	----	----	----	
12/06/90	HMC	----	28.41	----	----	----	----	----	----	----	----	
DC	03/12/90	HMC	7.70	0.12	0.08	0.17	351.00	0.80	----	----	----	----
	08/08/90	HMC	----	0.14	----	0.19	----	----	----	----	----	----
DD	03/13/90	BARR	----	----	0.03	----	----	< 0.20	< 0.90	< 0.01	----	< 0.20

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE<sup>®</sup> ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH (units)	PH THROUGH TH-230								
				UNA1 (mg/L)	MO (mg/L)	SE (mg/L)	NO3 (mg/L)	RA226 (pCi/L)	RA228 (pCi/L)	CR (mg/L)	V (mg/L)	TH230 (pCi/L)
DD	03/13/90	HMC	7.50	0.14	< 0.01	< 0.01	9.80	0.10	----	< 0.01	< 0.01	----
	09/12/90	HMC	7.30	0.18	< 0.01	0.01	13.50	----	----	< 0.01	0.03	----
	09/12/90	BARR	----	----	----	----	----	0.30	1.30	----	----	< 0.00
DE	01/18/90	HMC	8.90	44.35	61.23	2.78	16.60	1.30	----	----	----	----
	02/12/90	HMC	----	41.98	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	41.55	----	----	----	----	----	----	----	----
	04/07/90	HMC	9.00	41.98	53.27	2.48	4.20	0.20	----	0.02	0.10	----
	04/07/90	BARR	----	----	----	----	----	1.90	0.90	----	----	< 0.20
	05/21/90	HMC	----	41.55	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	43.67	----	----	----	----	----	----	----	----
	07/09/90	HMC	9.50	42.40	76.60	2.11	23.00	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	< 0.20	----	----	----	----
	08/09/90	HMC	----	42.40	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	48.34	----	----	----	----	----	----	----	----
	10/04/90	BARR	----	----	----	----	----	< 0.20	1.60	----	----	0.30
	10/04/90	HMC	9.30	46.64	80.40	2.95	28.50	----	----	----	----	----
10/22/90	HMC	----	44.94	----	----	----	----	----	----	----	----	
11/16/90	HMC	----	42.40	----	----	----	----	----	----	----	----	
12/06/90	HMC	----	44.52	----	----	----	----	----	----	----	----	
DF	01/17/90	HMC	----	15.94	----	----	----	----	----	----	----	----
	02/12/90	HMC	----	17.38	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	16.71	----	----	----	----	----	----	----	----
	04/11/90	HMC	----	31.63	----	----	----	----	----	----	----	----
	05/21/90	HMC	----	18.15	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	15.16	----	----	----	----	----	----	----	----
	07/09/90	HMC	7.80	18.32	16.55	1.56	9.60	----	----	----	----	----
	07/09/90	BARR	7.56	18.90	11.70	1.72	2.20	< 0.10	< 0.70	----	----	< 0.20
	09/13/90	HMC	----	17.98	----	----	----	----	----	----	----	----
	10/22/90	HMC	----	21.45	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	21.88	----	----	----	----	----	----	----	----
12/06/90	HMC	----	22.05	----	----	----	----	----	----	----	----	
DG	01/18/90	HMC	7.50	45.79	28.00	1.30	54.40	0.10	----	----	----	----
	02/12/90	HMC	----	47.79	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	46.22	----	----	----	----	----	----	----	----
	04/07/90	HMC	7.40	49.61	39.35	1.40	43.40	0.10	----	< 0.01	0.03	----

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH (units)	PH THROUGH TH-230								
				UNAT (mg/l)	MO (mg/l)	SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/L)	CR (mg/l)	V (mg/l)	TH230 (pCi/l)
DG	04/07/90	BARR	----	----	----	----	----	< 0.20	1.20	----	----	0.50
	05/21/90	HMC	----	50.71	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	54.10	----	----	----	----	----	----	----	----
	07/09/90	HMC	7.60	53.00	56.30	1.91	76.00	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	< 0.10	----	----	----	----
	08/09/90	HMC	----	48.34	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	59.36	----	----	----	----	----	----	----	----
	10/04/90	HMC	7.30	61.90	64.50	1.42	27.00	----	----	----	----	----
	10/04/90	BARR	----	----	----	----	----	0.40	1.60	----	----	0.60
	10/22/90	HMC	----	62.58	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	47.49	----	----	----	----	----	----	----	----
	12/06/90	HMC	----	61.40	----	----	----	----	----	----	----	----
DH	01/17/90	HMC	----	93.28	----	----	----	----	----	----	----	----
	02/12/90	HMC	----	89.46	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	84.80	----	----	----	----	----	----	----	----
	04/11/90	HMC	----	87.77	----	----	----	----	----	----	----	----
	05/21/90	HMC	----	90.31	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	105.58	----	----	----	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	< 0.10	----	----	----	----
	07/09/90	HMC	8.30	97.52	133.30	2.53	24.00	----	----	----	----	----
	08/09/90	HMC	----	89.89	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	93.28	----	----	----	----	----	----	----	----
	10/22/90	HMC	----	93.28	----	----	----	----	----	----	----	----
11/16/90	HMC	----	82.26	----	----	----	----	----	----	----	----	
D1	08/08/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----
DL	01/18/90	HMC	8.80	159.85	177.33	3.63	25.60	0.10	----	----	----	----
	04/10/90	HMC	8.90	141.19	170.25	3.31	28.80	0.10	----	0.04	0.28	----
	04/10/90	BARR	----	----	----	----	----	0.60	1.40	----	----	1.40
	07/09/90	BARR	----	----	----	----	----	0.50	----	----	----	----
	07/12/90	HMC	9.30	122.11	226.60	3.41	44.00	----	----	----	----	----
	10/04/90	HMC	9.60	113.63	181.25	3.93	44.00	----	----	----	----	----
10/04/90	BARR	----	----	----	----	----	< 0.20	1.90	----	----	1.50	
DM	03/12/90	HMC	9.50	58.94	87.25	1.52	36.60	0.20	----	----	----	----
	08/08/90	HMC	----	54.27	----	1.20	----	----	----	----	----	----

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH (units)	UNAT (mg/l)	MO (mg/l)	PH THROUGH TH-250						V (mg/l)	TH230 (pCi/l)
						SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/l)	CR (mg/l)			
DP	03/12/90	HMC	7.30	35.96	5.35	14.23	17.40	0.20	----	----	----	----	
	10/24/90	HMC	----	40.55	----	16.13	----	----	----	----	----	----	
DQ	11/28/90	HMC	7.80	57.24	15.42	17.64	40.00	----	----	< 0.01	0.01	----	
	12/28/90	BARR	7.47	61.00	15.10	20.20	2.40	< 0.20	0.80	< 0.01	0.14	< 0.00	
DS	01/17/90	HMC	----	35.19	----	----	----	----	----	----	----	----	
	02/12/90	HMC	----	33.50	----	----	----	----	----	----	----	----	
	03/13/90	HMC	----	32.22	----	----	----	----	----	----	----	----	
	04/11/90	HMC	----	35.50	----	----	----	----	----	----	----	----	
	05/21/90	HMC	----	33.75	----	----	----	----	----	----	----	----	
	06/07/90	HMC	----	35.02	----	----	----	----	----	----	----	----	
	07/09/90	HMC	8.00	34.34	58.33	2.97	21.00	----	----	----	----	----	
	07/09/90	BARR	----	----	----	----	----	2.40	----	----	----	----	
	08/09/90	HMC	----	31.38	----	----	----	----	----	----	----	----	
	09/13/90	HMC	----	39.43	----	----	----	----	----	----	----	----	
	10/22/90	HMC	----	37.57	----	----	----	----	----	----	----	----	
	11/16/90	HMC	----	32.05	----	----	----	----	----	----	----	----	
12/06/90	HMC	----	36.04	----	----	----	----	----	----	----	----		
DX	01/17/90	HMC	----	22.22	----	----	----	----	----	----	----	----	
	02/12/90	HMC	----	22.39	----	----	----	----	----	----	----	----	
	03/13/90	HMC	----	22.90	----	----	----	----	----	----	----	----	
	04/11/90	HMC	----	23.07	----	----	----	----	----	----	----	----	
	05/21/90	HMC	----	22.30	----	----	----	----	----	----	----	----	
	06/07/90	HMC	----	22.81	----	----	----	----	----	----	----	----	
	07/09/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----	
	07/09/90	HMC	7.70	22.90	12.95	5.17	12.00	----	----	----	----	----	
	08/09/90	HMC	----	29.34	----	----	----	----	----	----	----	----	
	09/13/90	HMC	----	26.97	----	----	----	----	----	----	----	----	
	10/22/90	HMC	----	35.45	----	----	----	----	----	----	----	----	
	11/16/90	HMC	----	33.50	----	----	----	----	----	----	----	----	
12/06/90	HMC	----	39.01	----	----	----	----	----	----	----	----		
DZ	03/12/90	HMC	8.40	----	105.13	2.16	10.40	0.20	----	----	----	----	
	10/18/90	HMC	----	91.58	----	2.56	----	----	----	----	----	----	



TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLUVIAL WELLS  
PH THROUGH TH-230

WELL_ID	DATE	LAB	PH	UNAT	MO	SE	NO3	RA226	RA228	CR	V	TH230
			(units)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(pCi/l)	(pCi/l)	(mg/l)	(mg/l)	(pCi/l)
E	01/17/90	HMC	---	0.05	---	0.38	---	---	---	---	---	---
	02/12/90	HMC	---	0.13	---	0.32	---	---	---	---	---	---
	03/06/90	HMC	7.60	0.03	0.01	0.36	6.60	0.10	---	---	---	---
	03/13/90	HMC	---	0.19	---	0.36	---	---	---	---	---	---
	04/11/90	HMC	---	0.07	---	0.31	---	---	---	---	---	---
	05/21/90	HMC	---	0.18	---	0.29	---	---	---	---	---	---
	06/07/90	HMC	---	0.07	---	0.31	---	---	---	---	---	---
	07/09/90	HMC	8.00	0.04	0.01	0.31	5.60	---	---	---	---	---
	07/09/90	BARR	7.65	0.04	0.02	0.31	6.70	< 0.00	< 0.70	---	---	< 0.20
	08/09/90	HMC	---	0.05	---	0.30	---	---	---	---	---	---
	09/13/90	HMC	---	0.17	---	0.38	---	---	---	---	---	---
	10/22/90	HMC	---	0.20	---	0.30	---	---	---	---	---	---
11/16/90	HMC	---	0.07	---	0.25	---	---	---	---	---	---	
12/06/90	HMC	---	0.07	---	0.32	---	---	---	---	---	---	
F	01/29/90	HMC	7.30	0.06	0.01	0.01	2.30	0.30	---	---	---	---
	04/19/90	HMC	7.40	0.05	0.02	< 0.01	1.80	0.30	---	---	---	---
	04/19/90	BARR	---	---	---	---	---	< 0.20	---	---	---	---
	07/17/90	HMC	7.60	0.12	0.01	0.01	6.40	---	---	---	---	---
	10/24/90	HMC	7.70	0.13	0.01	0.01	4.10	---	---	---	---	---
	10/24/90	BARR	---	---	---	---	---	0.40	---	---	---	---
FS	01/26/90	HMC	---	0.19	---	0.10	---	---	---	---	---	---
	04/19/90	HMC	7.50	0.15	0.02	0.09	4.10	0.20	---	---	---	---
	04/19/90	BARR	---	---	---	---	---	0.30	---	---	---	---
	07/17/90	HMC	---	0.19	---	0.11	---	---	---	---	---	---
	10/24/90	BARR	---	---	---	---	---	< 0.20	---	---	---	---
	10/24/90	HMC	7.90	0.22	0.02	0.14	9.00	---	---	---	---	---
I	01/29/90	HMC	7.30	0.04	< 0.01	< 0.01	1.00	0.10	---	---	---	---
	04/27/90	HMC	7.50	0.07	0.01	< 0.01	1.60	0.20	---	---	---	---
	04/27/90	BARR	---	---	---	---	---	< 0.20	---	---	---	---
	07/17/90	HMC	7.40	0.08	0.01	0.01	4.30	---	---	---	---	---
	10/24/90	HMC	7.70	0.14	0.01	0.01	3.00	---	---	---	---	---
	10/24/90	BARR	---	---	---	---	---	< 0.00	---	---	---	---
JC	01/17/90	HMC	---	3.39	---	0.70	---	---	---	---	---	---

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH (units)	UNAT (mg/l)	MG (mg/l)	PH THROUGH TH-230		RA226 (pCi/l)	RA228 (pCi/L)	CR (mg/l)	V (mg/l)	TH230 (pCi/l)
						SE (mg/l)	NO3 (mg/l)					
JC	03/06/90	HMC	7.0	1.82	4.26	0.77	9.60	0.20	----	----	----	----
	03/06/90	HMC	7.00	1.82	4.26	0.77	9.60	0.20	----	----	----	----
	03/13/90	HMC	----	3.22	----	0.80	----	----	----	----	----	----
	04/11/90	HMC	----	3.29	----	0.57	----	----	----	----	----	----
	05/21/90	HMC	----	2.91	----	0.70	----	----	----	----	----	----
	06/07/90	HMC	----	3.12	----	0.67	----	----	----	----	----	----
	07/09/90	HMC	8.10	1.69	7.50	0.85	8.40	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----
	08/09/90	HMC	----	3.39	----	0.82	----	----	----	----	----	----
	09/13/90	HMC	----	3.99	----	0.88	----	----	----	----	----	----
	10/22/90	HMC	----	3.38	----	0.66	----	----	----	----	----	----
	11/16/90	HMC	----	3.82	----	0.59	----	----	----	----	----	----
12/06/90	HMC	----	2.15	----	0.65	----	----	----	----	----	----	
K2	04/28/90	HMC	----	24.38	----	1.34	----	----	----	----	----	----
	10/26/90	HMC	7.90	21.88	54.40	3.00	50.00	----	----	----	----	----
	10/26/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----
KH	04/28/90	HMC	----	23.74	----	0.73	----	----	----	----	----	----
	10/26/90	BARR	----	----	----	----	----	< 0.20	----	----	----	----
	10/26/90	HMC	7.40	24.76	39.85	0.87	72.00	----	----	----	----	----
K2	04/28/90	HMC	----	21.84	----	0.94	----	----	----	----	----	----
	10/26/90	HMC	7.50	17.47	31.43	1.09	88.00	----	----	----	----	----
	10/26/90	BARR	----	----	----	----	----	< 0.10	----	----	----	----
M4	05/29/90	HMC	----	60.63	----	1.12	----	----	----	----	----	----
	10/18/90	HMC	8.40	56.82	118.95	1.32	26.00	----	----	----	----	----
	10/18/90	BARR	----	----	----	----	----	2.00	----	----	----	----
M5	10/17/90	BARR	----	----	----	----	----	0.50	2.10	----	----	< 0.00
	10/17/90	HMC	7.80	11.79	25.35	1.35	8.40	----	----	< 0.01	0.01	----
N	05/23/90	HMC	----	0.08	----	0.07	----	----	----	----	----	----
	12/04/90	HMC	8.00	0.07	0.01	0.10	19.00	----	----	----	----	----
	12/04/90	BARR	8.08	0.08	0.04	0.05	12.70	0.30	----	----	----	----
NC	01/30/90	HMC	----	0.04	----	0.03	----	----	----	----	----	----

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS  
PH THROUGH TH-230

WELL_ID	DATE	SAB	PH	URAT	MO	BC	NO3	RA226	RA228	CR	V	TH230
		(mg/l)	(unitless)	(mg/l)	(mg/l)	(pc/l)	(mg/l)	(pc/l)	(pc/l)	(mg/l)	(mg/l)	(pc/l)
NC	04/19/90	BARR	---	---	---	---	---	5.20	---	---	---	---
	04/27/90	HMC	8.10	0.02	0.01	2.60	0.20	---	---	---	---	---
	07/16/90	HMC	---	0.08	0.06	---	---	---	---	---	---	---
	10/26/90	BARR	---	---	---	---	---	0.10	---	---	---	---
	10/26/90	HMC	8.00	0.03	0.07	3.00	---	---	---	---	---	---
ND	10/17/90	BARR	---	---	---	---	0.20	---	---	---	---	---
	10/17/90	HMC	8.40	0.12	0.01	4.40	---	---	---	---	---	---
O	05/23/90	HMC	---	0.03	---	---	---	---	---	---	---	---
	12/04/90	---	---	---	---	---	---	0.00	---	---	---	---
	12/04/90	BARR	7.81	0.03	0.19	---	---	---	---	---	---	---
	12/04/90	HMC	8.20	0.05	0.24	4.40	---	---	---	---	---	---
	12/07/90	HMC	7.81	0.03	0.18	1.70	---	0.00	---	---	---	---
P	05/13/90	BARR	---	---	0.10	---	---	9.20	1.20	---	0.10	0.20
	03/13/90	HMC	7.80	0.05	0.01	4.20	0.20	---	---	0.01	0.01	---
	06/04/90	HMC	7.40	0.03	0.01	10.10	---	---	---	---	---	0.30
	09/12/90	BARR	---	---	---	---	0.30	---	0.50	---	---	---
	09/12/90	HMC	7.50	0.08	0.01	6.60	---	---	---	0.01	0.01	---
PM	12/03/90	HMC	8.10	0.03	0.01	8.20	---	---	---	---	---	---
	12/03/90	BARR	7.56	0.04	0.02	2.80	0.20	---	---	---	---	0.00
	03/06/90	BARR	---	---	1.00	---	---	0.20	0.90	0.10	---	0.20
	03/06/90	HMC	7.70	1.70	0.88	6.00	0.10	---	---	---	---	---
	06/01/90	HMC	---	1.36	---	---	---	---	---	---	---	---
R	08/06/90	HMC	---	0.70	---	---	---	---	---	---	---	---
	11/29/90	HMC	8.00	0.57	0.71	16.00	---	---	---	0.01	0.01	---
	12/29/90	BARR	7.72	1.47	0.67	2.90	0.10	0.90	0.01	0.03	0.00	0.00
	03/11/90	HMC	7.70	0.07	0.01	10.10	0.20	---	---	0.01	0.01	---
	03/13/90	BARR	---	---	0.04	---	0.20	0.90	0.01	0.01	0.01	0.20
R	09/12/90	BARR	---	---	---	---	0.50	0.70	---	---	---	0.00
	09/12/90	HMC	7.50	0.06	0.01	14.00	---	---	0.01	0.01	0.01	---
	03/13/90	BARR	---	---	0.05	---	---	0.20	0.90	0.01	0.01	0.20
R	03/13/90	HMC	7.90	0.02	0.01	5.60	0.20	---	0.01	0.01	0.01	---
	09/12/90	HMC	7.50	0.11	0.01	8.10	---	---	0.01	0.01	0.01	---

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH (units)	PH THROUGH TH-230								
				UNAT (mg/l)	MO (mg/l)	SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/L)	CR (mg/l)	V (mg/l)	TH230 (pCi/l)
R	09/12/90	BARR	----	----	----	----	----	0.50	< 0.20	----	----	0.30
S	06/06/90	HMC	----	70.81	----	1.69	----	----	----	----	----	----
	12/03/90	HMC	9.20	63.60	85.20	2.00	30.00	----	----	----	----	----
	12/03/90	BARR	9.03	62.00	73.10	4.00	2.80	< 0.00	----	----	----	----
S2	10/18/90	HMC	7.90	11.70	16.90	1.07	14.00	----	----	----	----	----
	10/18/90	BARR	----	----	----	----	----	0.80	----	----	----	----
S3	10/16/90	BARR	----	----	----	----	----	< 0.00	1.90	----	----	0.30
	10/16/90	HMC	7.60	7.55	3.55	1.40	9.20	----	----	< 0.01	0.02	----
S4	10/16/90	HMC	7.80	15.43	31.68	3.79	11.00	----	----	< 0.01	0.01	----
	10/16/90	BARR	----	----	----	----	----	0.60	1.60	----	----	< 0.10
SA	01/18/90	HMC	7.70	8.99	11.75	0.40	11.20	0.40	----	----	----	----
	02/12/90	HMC	----	8.48	----	----	----	----	----	----	----	----
	03/15/90	HMC	----	11.02	----	----	----	----	----	----	----	----
	04/07/90	HMC	7.60	11.36	9.99	0.37	11.50	0.70	----	0.01	< 0.01	----
	04/07/90	BARR	----	----	----	----	----	1.40	1.00	----	----	< 0.30
	05/21/90	HMC	----	10.01	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	10.85	----	----	----	----	----	----	----	----
	07/09/90	HMC	8.00	10.35	9.73	1.15	8.00	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	< 0.10	----	----	----	----
	08/09/90	HMC	----	10.35	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	10.77	----	----	----	----	----	----	----	----
	10/04/90	HMC	7.60	10.18	14.13	1.07	12.00	----	----	----	----	----
	10/04/90	BARR	----	----	----	----	----	0.40	< 0.80	----	----	0.40
10/22/90	HMC	----	11.28	----	----	----	----	----	----	----	----	
11/16/90	HMC	----	9.24	----	----	----	----	----	----	----	----	
12/06/90	HMC	----	10.18	----	----	----	----	----	----	----	----	
SB	01/18/90	HMC	7.60	22.05	31.15	0.51	19.20	0.10	----	----	----	----
	02/12/90	HMC	----	19.33	----	----	----	----	----	----	----	----
	04/07/90	HMC	7.70	20.56	21.65	0.65	17.60	0.19	----	0.01	0.03	----
	04/07/90	BARR	----	----	----	----	----	0.20	< 0.90	----	----	< 0.20
	05/21/90	HMC	----	21.52	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	25.44	----	----	----	----	----	----	----	----

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH (units)	UNAT (mg/l)	MO (mg/l)	PH THROUGH TH-230						TH23J (pCi/L)
						SE (mg/l)	NO3 (mg/l)	RA226 (pCi/L)	RA228 (pCi/L)	CR (mg/l)	V (mg/l)	
SB	07/09/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----
	07/09/90	HMC	7.80	22.47	34.13	0.73	12.00	----	----	----	----	----
	08/09/90	HMC	----	22.90	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	22.90	----	----	----	----	----	----	----	----
	10/04/90	HMC	7.70	22.05	37.70	1.20	23.00	----	----	----	----	----
	10/04/90	BARR	----	----	----	----	----	0.40	1.10	----	----	0.50
	10/22/90	HMC	----	22.05	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	21.20	----	----	----	----	----	----	----	----
	12/06/90	HMC	----	23.74	----	----	----	----	----	----	----	----
SC	01/17/90	HMC	----	46.22	----	----	----	----	----	----	----	----
	02/12/90	HMC	----	44.52	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	44.52	----	----	----	----	----	----	----	----
	04/11/90	HMC	----	43.67	----	----	----	----	----	----	----	----
	05/21/90	HMC	----	45.79	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	47.19	----	----	----	----	----	----	----	----
	07/09/90	BARR	8.72	47.60	50.00	2.76	9.20	1.20	< 0.80	----	----	< 0.00
	07/09/90	HMC	8.90	44.10	56.27	2.39	15.00	----	----	----	----	----
	08/09/90	HMC	----	41.98	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	43.25	----	----	----	----	----	----	----	----
	10/22/90	HMC	----	44.10	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	41.98	----	----	----	----	----	----	----	----
	12/06/90	HMC	----	41.55	----	----	----	----	----	----	----	----
SD4	01/17/90	HMC	----	22.47	----	1.86	----	----	----	----	----	----
	02/12/90	HMC	----	22.05	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	21.96	----	----	----	----	----	----	----	----
	04/11/90	HMC	----	26.08	----	----	----	----	----	----	----	----
	05/21/90	HMC	----	29.26	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	25.67	----	----	----	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	< 0.20	----	----	----	----
	07/09/90	HMC	8.10	21.88	31.50	1.61	9.40	----	----	----	----	----
	08/09/90	HMC	----	19.25	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	15.94	----	----	----	----	----	----	----	----
	10/22/90	HMC	----	17.64	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	13.82	----	----	----	----	----	----	----	----
12/06/90	HMC	----	16.28	----	----	----	----	----	----	----	----	

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS  
PH THROUGH TH-230

WELL_ID	DATE	LAB	PH (units)	UNAT (mg/l)	MO (mg/l)	SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/L)	CR (mg/l)	V (mg/l)	TH230 (pCi/l)
SE	01/18/90	HMC	7.40	3.90	4.79	1.09	9.10	0.10	----	----	----	----
	02/12/90	HMC	----	3.90	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	3.39	----	----	----	----	----	----	----	----
	04/07/90	BARR	----	----	----	----	----	< 0.20	< 0.90	----	----	< 0.30
	04/07/90	HMC	7.50	4.49	5.10	1.05	7.60	0.10	----	0.01	< 0.01	----
	06/07/90	HMC	----	5.51	----	----	----	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----
	07/09/90	HMC	8.00	4.41	5.94	1.38	8.60	----	----	----	----	----
	07/09/90	BARR	7.66	3.93	4.33	1.51	7.70	0.50	0.60	----	----	< 0.00
	08/09/90	HMC	----	4.24	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	3.48	----	----	----	----	----	----	----	----
	10/04/90	HMC	7.60	2.63	5.95	1.38	11.00	----	----	----	----	----
	10/04/90	BARR	----	----	----	----	----	< 1.30	1.10	----	----	< 0.10
	10/22/90	HMC	----	3.39	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	2.97	----	----	----	----	----	----	----	----
	12/06/90	HMC	----	3.14	----	----	----	----	----	----	----	----
SO	06/05/90	HMC	----	70.21	----	2.31	----	----	----	----	----	----
	12/03/90	BARR	7.62	64.00	67.60	4.00	20.30	< 0.10	----	----	----	0.30
	12/03/90	HMC	7.90	62.33	70.30	2.50	29.00	----	----	----	----	----
SQ	01/17/90	HMC	----	35.62	----	----	----	----	----	----	----	----
	02/12/90	HMC	----	33.92	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	33.92	----	----	----	----	----	----	----	----
	04/11/90	HMC	----	33.92	----	----	----	----	----	----	----	----
	05/21/90	HMC	----	34.77	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	36.04	----	----	----	----	----	----	----	----
	07/09/90	HMC	8.30	34.60	65.70	1.95	12.50	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	< 0.20	----	----	----	----
	08/09/90	HMC	----	33.92	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	39.86	----	----	----	----	----	----	----	----
	10/22/90	HMC	----	36.89	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	36.04	----	----	----	----	----	----	----	----
12/06/90	HMC	----	35.19	----	----	----	----	----	----	----	----	
SR	01/17/90	HMC	----	55.80	----	2.26	----	----	----	----	----	----
	02/12/90	HMC	----	53.00	----	----	----	----	----	----	----	----

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH	PH THROUGH TH-230								
				UNAT (mg/l)	MO (mg/l)	SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/L)	CR (mg/l)	V (mg/l)	TH230 (pCi/l)
SR	03/13/90	HMC	----	53.85	----	----	----	----	----	----	----	----
	04/11/90	HMC	----	55.97	----	----	----	----	----	----	----	----
	05/21/90	HMC	----	55.97	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	59.78	----	----	----	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	0.20	----	----	----	----
	07/09/90	HMC	9.20	48.17	80.10	2.19	18.50	----	----	----	----	----
	08/09/90	HMC	----	48.76	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	50.46	----	----	----	----	----	----	----	----
	10/22/90	HMC	----	49.18	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	45.37	----	----	----	----	----	----	----	----
	12/06/90	HMC	----	48.76	----	----	----	----	----	----	----	----
	SS	12/06/90	HMC	----	9.84	----	----	----	----	----	----	----
ST	12/06/90	HMC	----	5.77	----	----	----	----	----	----	----	----
SU	01/17/90	HMC	----	25.27	----	----	----	----	----	----	----	----
	02/12/90	HMC	----	27.14	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	27.98	----	----	----	----	----	----	----	----
	04/11/90	HMC	----	30.53	----	----	----	----	----	----	----	----
	05/21/90	HMC	----	31.63	----	----	----	----	----	----	----	----
	06/07/90	HMC	----	35.02	----	----	----	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	0.50	----	----	----	----
	07/09/90	HMC	7.70	33.75	42.00	1.47	23.00	----	----	----	----	----
	08/09/90	HMC	----	34.77	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	40.28	----	----	----	----	----	----	----	----
	10/22/90	HMC	----	41.55	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	40.70	----	----	----	----	----	----	----	----
12/06/90	HMC	----	41.13	----	----	----	----	----	----	----	----	
SV	03/30/90	HMC	8.90	49.61	76.60	3.28	13.00	0.20	----	0.03	0.27	----
	04/07/90	BARR	----	----	----	----	----	----	0.90	----	----	< 0.20
	04/07/90	HMC	8.90	48.76	70.67	2.88	39.20	0.10	----	0.03	0.32	----
	07/12/90	HMC	9.10	48.34	92.56	2.14	18.00	----	----	----	----	----
	07/12/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----
	10/04/90	HMC	9.20	49.18	84.88	3.50	29.00	----	----	----	----	----
	10/04/90	BARR	----	----	----	----	----	< 0.20	< 0.60	----	----	0.50

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLUVIAL WELLS  
PH THROUGH TR-230

WELL_ID	DATE	LAB	PH (units)	UNAT (mg/l)	MO (mg/l)	SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/l)	CR (mg/l)	V (mg/l)	TH230 (pCi/l)
T	06/04/90	HMC	---	24.85	---	4.57	---	---	---	---	---	---
	12/04/90	BARR	7.71	25.50	6.06	4.90	239.00	0.10	---	---	---	---
	12/05/90	HMC	7.70	27.96	7.10	5.33	240.00	---	---	---	---	---
	12/07/90	HMC	7.71	25.50	6.06	4.90	239.00	< 0.10	---	---	---	---
U	06/05/90	HMC	---	0.03	---	0.05	---	---	---	---	---	---
	12/03/90	BARR	7.50	0.04	0.03	0.07	1.20	0.30	---	---	---	---
	12/03/90	HMC	8.00	0.03	0.01	0.05	4.40	---	---	---	---	---
	01/26/90	HMC	---	0.20	---	0.16	---	---	---	---	---	---
UR11	07/19/90	HMC	---	0.11	---	0.16	---	---	---	---	---	---
	10/21/90	BARR	---	---	---	---	---	0.70	---	---	---	n.m.
	10/23/90	HMC	7.90	0.17	0.01	0.18	4.60	---	---	< 0.01	0.01	---
	01/17/90	HMC	---	1.31	---	0.05	---	---	---	---	---	---
UR3	02/12/90	HMC	---	1.06	---	0.07	---	---	---	---	---	---
	03/13/90	HMC	---	1.14	---	0.08	---	---	---	---	---	---
	04/11/90	HMC	---	1.53	---	0.08	---	---	---	---	---	---
	05/21/90	HMC	---	0.93	---	0.04	---	---	---	---	---	---
	06/07/90	HMC	---	0.92	---	0.06	---	---	---	---	---	---
	07/09/90	HMC	8.10	0.48	0.32	0.04	3.70	---	---	---	---	---
	07/09/90	BARR	7.59	0.77	0.30	0.04	1.10	< 0.20	1.20	---	---	< 0.00
	08/09/90	HMC	---	0.85	---	0.04	---	---	---	---	---	---
	09/13/90	HMC	---	0.85	---	0.03	---	---	---	---	---	---
	10/22/90	HMC	---	0.53	---	0.04	---	---	---	---	---	---
	11/16/90	HMC	---	0.76	---	0.02	---	---	---	---	---	---
	12/06/90	HMC	---	0.59	---	0.03	---	---	---	---	---	---
UR5	01/17/90	HMC	---	5.20	---	0.98	---	---	---	---	---	---
	02/12/90	HMC	---	5.60	---	0.68	---	---	---	---	---	---
	03/13/90	HMC	---	6.72	---	0.72	---	---	---	---	---	---
	04/11/90	HMC	---	5.20	---	0.60	---	---	---	---	---	---
	05/21/90	HMC	---	4.49	---	0.73	---	---	---	---	---	---
	06/07/90	HMC	---	4.45	---	0.72	---	---	---	---	---	---
	08/10/90	HMC	---	4.75	---	0.90	---	---	---	---	---	---
	09/13/90	HMC	---	4.16	---	0.82	---	---	---	---	---	---
	10/22/90	HMC	---	3.99	---	0.68	---	---	---	---	---	---



TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTAKE'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH (units)	PH THROUGH TH-230										
				UNAT (mg/l)	MO (mg/l)	SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/L)	CR (mg/l)	V (mg/l)	TR230 (pCi/l)		
WRS	11/16/90	HMC	----	3.69	----	0.68	----	----	----	----	----	----	----	
	12/06/90	HMC	----	4.49	----	0.50	----	----	----	----	----	----	----	
WR7	01/25/90	HMC	----	0.13	----	0.07	----	----	----	----	----	----	----	
	07/19/90	HMC	----	0.07	----	0.05	----	----	----	----	----	----	----	
	10/23/90	HMC	7.80	0.10	0.01	0.06	4.50	----	----	<	0.01	0.01	----	
	10/23/90	BARR	----	----	----	----	----	1.50	1.60	----	----	----	< 0.00	
WR9	10/23/90	HMC	----	0.08	----	0.05	----	----	----	----	----	----	----	
X	05/29/90	BARR	----	----	----	----	----	<	0.00	<	0.00	----	----	0.90
	05/29/90	HMC	7.70	12.64	34.86	3.96	32.00	----	----	<	0.01	0.23	----	----
	08/07/90	HMC	7.40	12.21	38.00	5.08	43.00	----	----	----	----	----	----	----
	08/08/90	BARR	----	----	----	----	----	<	0.10	----	----	----	----	----
	10/03/90	BARR	----	----	----	----	----	<	0.00	1.00	----	----	----	0.70
	10/31/90	HMC	7.80	11.36	32.44	6.05	40.00	----	----	<	0.01	0.04	----	----
Y	03/06/90	HMC	----	9.33	----	0.50	----	----	----	----	----	----	----	----
	05/29/90	HMC	7.60	9.24	14.59	1.05	94.00	----	----	----	----	----	----	----
	05/29/90	BARR	----	----	----	----	----	0.40	1.10	----	----	----	----	0.90
	10/17/90	HMC	7.70	9.50	32.53	1.06	94.00	----	----	----	----	----	----	----
	10/17/90	BARR	----	----	----	----	----	<	0.00	----	----	----	----	----
	11/27/90	HMC	7.60	9.07	16.20	0.99	100.00	----	----	>	0.01	0.01	----	----
	11/27/90	BARR	7.68	----	17.30	1.31	2.40	<	0.10	11.00	<	0.01	0.04	<
Z	01/17/90	HMC	----	0.54	----	0.26	----	----	----	----	----	----	----	----
	02/12/90	HMC	----	0.64	----	0.20	----	----	----	----	----	----	----	----
	03/13/90	HMC	----	0.79	----	0.20	----	----	----	----	----	----	----	----
	04/11/90	HMC	----	0.70	----	0.17	----	----	----	----	----	----	----	----
	05/21/90	HMC	----	0.42	----	0.15	----	----	----	----	----	----	----	----
	05/29/90	HMC	7.70	0.38	1.01	0.15	7.40	----	----	----	----	----	----	----
	06/07/90	HMC	----	0.38	----	0.27	----	----	----	----	----	----	----	----
	07/09/90	HMC	7.90	0.41	1.05	0.16	5.60	----	----	----	----	----	----	----
	07/09/90	BARR	----	----	----	----	----	<	0.20	----	----	----	----	----
	08/09/90	HMC	----	0.68	----	0.14	----	----	----	----	----	----	----	----
	09/13/90	HMC	----	0.68	----	0.13	----	----	----	----	----	----	----	----
	10/22/90	HMC	----	0.43	----	0.16	----	----	----	----	----	----	----	----
	11/16/90	HMC	----	0.49	----	0.11	----	----	----	----	----	----	----	----

TABLE 2.3-2 WATER QUALITY ANALYSIS FOR HOMESTEAK'S ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH	PH (units)	URAT (mg/l)	MO (mg/l)	SE (mg/l)	PH THROUGH TH-230							
								NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/L)	CR (mg/l)	V (mg/l)	TH230 (pCi/l)		
Z	12/06/90	HMC	-----	-----	0.42	-----	0.13	-----	-----	-----	-----	-----	-----	-----	-----

TABLE 2.3-3 WATER QUALITY ANALYSIS FOR MURRAY ACRES ALLUVIAL WELLS

WELL_ID	DATE	LAB	CA THROUGH ION_BAL										
			CA (mg/L)	MG (mg/L)	K (mg/L)	NA (mg/L)	HCO3 (mg/L)	CO3 (mg/L)	CL (mg/L)	SO4 (mg/L)	TDS (mg/L)	SPECIFIC COND	ION_BAL (RATIO)
0802	05/31/90	HMC	242.00	4.00	5.00	307.00	210.00	----	156.00	823.00	1580.00	2185.02	1.04
	10/30/90	HMC	----	----	----	----	----	----	----	891.00	1130.00	2118.81	----
0806	11/01/90	HMC	252.00	2.00	2.00	203.00	417.00	----	126.00	763.00	1700.00	2143.29	0.93
0815	05/31/90	HMC	41.00	2.00	2.00	517.00	265.00	----	71.00	863.00	1550.00	2223.99	1.02

TABLE 2.3-4 WATER QUALITY ANALYSIS FOR MURRAY ACRES ALLUVIAL WELLS

WELL_ID	DATE	LAB	PH	PH (units)	NH4 (mg/l)	NO (mg/l)	SE (mg/l)	NO3 (mg/l)	PH THROUGH TH-230					
									RA226 (µg/l)	RA228 (µg/l)	CR (mg/l)	V (mg/l)	TH230 (µg/l)	
0802	05/31/90	HMC	7.70	---	0.01	0.01	0.02	4.00	---	---	---	---	---	---
	10/30/90	HMC	---	---	0.03	---	0.07	---	---	---	---	---	---	---
0804	10/03/90	BARR	---	---	---	---	---	---	< 0.10	---	---	---	---	---
	11/01/90	HMC	8.00	---	0.06	0.01	0.01	6.60	---	---	---	---	---	---
0815	05/31/90	HMC	7.90	---	0.01	0.01	0.06	8.00	---	---	---	---	---	---

TABLE 2.3-5 WATER QUALITY ANALYSIS FOR BROADVIEW ACRES ALLUVIAL WELLS

WELL_ID	LAB	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	CA THROUGH ION_BAL				SOD4 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
								HCO3 (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)				
0453	HMC	04/30/90	HMC	----	----	----	----	----	----	----	----	956.00	2140.00	2887.24	----
	HMC	10/23/90	HMC	337.00	31.00	13.00	317.00	536.00	----	220.00	----	825.00	2000.00	2766.94	1.04
SUB1	HMC	03/13/90	HMC	----	----	----	----	----	----	----	----	764.00	1910.00	2586.84	----
	HMC	09/14/90	HMC	309.00	14.00	5.00	346.00	608.00	184.00	----	184.00	754.00	1580.00	2551.04	1.03
SUB2	HMC	04/30/90	HMC	----	----	----	----	----	----	----	----	700.00	1830.00	2520.27	----
	HMC	09/27/90	HMC	282.00	18.00	5.00	308.00	603.00	184.00	184.00	727.00	727.00	1630.00	2357.41	0.96
SUB3	HMC	03/14/90	HMC	----	----	----	----	----	----	----	----	815.00	1940.00	2646.64	----
	HMC	09/14/90	HMC	325.00	16.00	9.00	367.00	540.00	184.00	184.00	887.00	887.00	1870.00	2555.55	1.04

TABLE 2.3-6 WATER QUALITY ANALYSIS FOR BROADVIEW ACRES ALLUVIAL WELLS  
PH THROUGH TH-230

WELL_ID	DATE	LAB	PH (units)	UNAT (mg/l)	MO (mg/l)	SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/L)	CR (mg/l)	V (mg/l)	TH230 (pCi/l)
0453	04/30/90	HMC	----	0.08	--	0.02	----	----	----	----	----	----
	10/23/90	BARR	----	----	----	----	----	0.30	----	----	----	----
	10/23/90	HMC	7.50	0.08	0.01	< 0.01	3.60	----	----	----	----	----
SUB1	03/13/90	HMC	----	0.36	----	0.01	----	----	----	----	----	----
	09/14/90	HMC	7.50	0.59	0.02	0.02	2.70	----	----	----	----	----
	09/14/90	BARR	----	----	----	----	----	0.30	----	----	----	----
SUB2	04/30/90	HMC	----	0.38	----	0.02	----	----	----	----	----	----
	09/27/90	HMC	7.60	0.42	< 0.01	0.01	2.30	----	----	----	----	----
	09/27/90	BARR	----	----	----	----	----	2.10	----	----	----	----
SUB3	03/14/90	HMC	----	0.08	----	0.01	----	----	----	----	----	----
	09/14/90	BARR	----	----	----	----	----	0.40	----	----	----	----
	09/14/90	HMC	7.50	0.09	0.01	0.02	3.20	----	----	----	----	----

TABLE 2.3-7 WATER QUALITY ANALYSIS FOR FELICE ACRES ALLUVIAL WELLS  
CA THROUGH ION\_BAL

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
0490	04/04/90	HMC	-----	-----	-----	-----	-----	-----	-----	758.00	1890.00	2586.84	-----
	10/23/90	HMC	334.00	17.00	8.00	307.00	573.00	-----	177.00	757.00	1900.00	2594.94	1.05
0491	04/03/90	HMC	-----	-----	-----	-----	-----	-----	-----	760.00	1680.00	2419.25	-----
0492	04/04/90	HMC	-----	-----	-----	-----	-----	-----	-----	822.00	1780.00	2523.28	-----
	10/23/90	HMC	307.00	23.00	8.00	297.00	512.00	-----	177.00	744.00	1840.00	2516.09	1.05

TABLE 2.3-8 WATER QUALITY ANALYSIS FOR FELICE ACRES ALLUVIAL WELLS  
PH THROUGH TH-230

WELL_ID	DATE	LAB	PH (units)	UMAT (mg/L)	MO (mg/L)	SE (mg/L)	NO3 (mg/L)	RA226 (pCi/L)	RA228 (pCi/L)	CR (mg/L)	V (mg/L)	TH230 (pCi/L)
0490	04/04/90	HMC	----	0.25	----	0.01	----	----	----	----	----	----
	10/23/90	HMC	7.60	0.30	0.19	0.01	3.00	----	----	----	----	----
	10/23/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----
0491	04/03/90	HMC	----	0.58	----	0.02	----	----	----	----	----	----
0492	04/04/90	HMC	----	0.24	----	0.02	----	----	----	----	----	----
	10/23/90	HML	7.70	0.33	0.01	4.40	----	----	----	----	----	----
	10/23/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----



TABLE 2.3-9 WATER QUALITY ANALYSIS FOR PLEASANT VALLEY ALLUVIAL WELLS

WELL_ID	DATE	LAB	CA THROUGH ION_BAL										SPECIFIC COND	ION_BAL (RATIO)
			CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)	TDS (mg/l)			
0835	06/07/90	HMC	209.00	5.00	4.00	223.00	401.00	----	64.00	542.00	1100.00	1699.87	1.05	
	10/31/90	HMC	----	----	----	----	----	----	649.00	1320.00	1831.52	----		
0840	06/05/90	HMC	429.00	1.00	6.00	470.00	372.00	----	184.00	1344.00	2020.00	3348.18	1.07	
0844	05/31/90	HMC	511.00	4.00	5.00	613.00	523.00	----	241.00	1732.00	3410.00	4038.98	1.02	
	11/02/90	HMC	----	----	----	----	----	----	----	188.00	3680.00	4424.03	----	
0846	06/04/90	HMC	379.00	1.00	5.00	650.00	428.00	----	99.00	1709.00	3180.00	3703.06	1.04	
	10/31/90	HMC	----	----	----	----	----	----	1709.00	2970.00	3649.95	----		

TABLE 2.3-10 WATER QUALITY ANALYSIS FOR PLEASANT VALLEY ALLUVIAL WELLS  
PH THROUGH TH-230

WELL_ID	DATE	LAB	PH (units)	UNAT (mg/l)	MO (mg/l)	SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	RA228 (pCi/l)	CR (mg/l)	V (mg/l)	TH230 (pCi/l)
0835	06/07/90	HMC	7.50	0.03	0.02	0.01	6.20	-----	-----	-----	-----	-----
	10/31/90	HMC		0.04		0.01						
0840	06/05/90	HMC	7.50	0.08	0.05	0.02	9.00	-----	-----	-----	-----	-----
0844	05/31/90	HMC	7.40	0.11	0.01	0.01	10.40	-----	-----	-----	-----	-----
	11/02/90	HMC	-----	0.09	-----	0.02	-----	-----	-----	-----	-----	-----
0846	06/04/90	HMC	7.50	0.03	0.02	0.04	10.30	-----	-----	-----	-----	-----
	10/31/90	HMC	-----	0.04	-----	0.03	-----	-----	-----	-----	-----	-----

TABLE 2.3-11 WATER QUALITY ANALYSIS FOR REGIONAL ALLUVIAL WELLS

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	CA THROUGH ION_BAL				TDS (mg/l)	SPECIFIC COND	ION_BAL (RAI,0)
							HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)			
0905	05/09/90	HMC	226.00	2.00	5.00	63.00	262.00	63.00	551.00	1010.00	1357.16	0.00	
0910	05/09/90	HMC	231.00	4.00	5.00	63.00	356.00	28.00	425.00	890.00	1347.09	0.95	
0920	05/09/90	HMC	550.00	3.00	10.00	300.00	226.00	57.00	1588.00	2610.00	2941.62	1.07	
0942	05/09/90	HMC	157.00	3.00	4.00	217.00	386.00	35.00	257.00	1060.00	832.53	1.05	

TABLE 2.3-12 WATER QUALITY ANALYSIS FOR REGIONAL ALLUVIAL WELLS  
PH THROUGH TH-230

WELL_ID	DATE	LAB	PH (units)	UNAT (mg/l)	NO (mg/l)	SE (mg/l)	NO3 (mg/l)	RAZ26 (pc1/l)	RAZ28 (pc1/l)	TR (mg/l)	V (mg/l)	TH230 (pc1/l)
0905	05/09/90	HMC	7.30	< 0.01	0.01	0.02	6.20	----	----	----	----	----
	05/09/90	BARR	----	----	----	----	----	0.40	----	----	----	----
0910	05/09/90	HMC	7.40	< 0.01	< 0.01	0.02	7.80	----	----	----	----	----
	05/09/90	BARR	----	----	----	----	----	0.20	----	----	----	----
0920	05/09/90	HMC	7.40	0.09	< 0.01	0.58	21.50	----	----	----	----	----
	05/09/90	BARR	----	----	----	----	----	0.50	----	----	----	----
0942	05/09/90	HMC	7.50	0.03	< 0.01	0.02	3.80	----	----	----	----	----
	05/09/90	BARR	----	----	----	----	----	< 0.20	----	----	----	----

### 3.0 CHINLE AQUIFER

Several Chinle aquifer wells on Homestake's property and in the adjacent subdivisions were monitored this annual monitoring period. Some of the Chinle aquifer wells are completed in both the Upper and Middle Chinle aquifers. Several of the Broadview Acres wells are completed in both the Upper Chinle and alluvial aquifers (see Hydro-Engineering 1988c for aquifer completions in the basic well data tables). Information for wells which are completed in both the Chinle and alluvium are presented in this chapter. Figure 3.0-1 shows the locations of the Chinle wells. Chinle well 446 in the Broadview Acres subdivision was not accessible during 1990 and therefore a 1990 analysis was not measured.

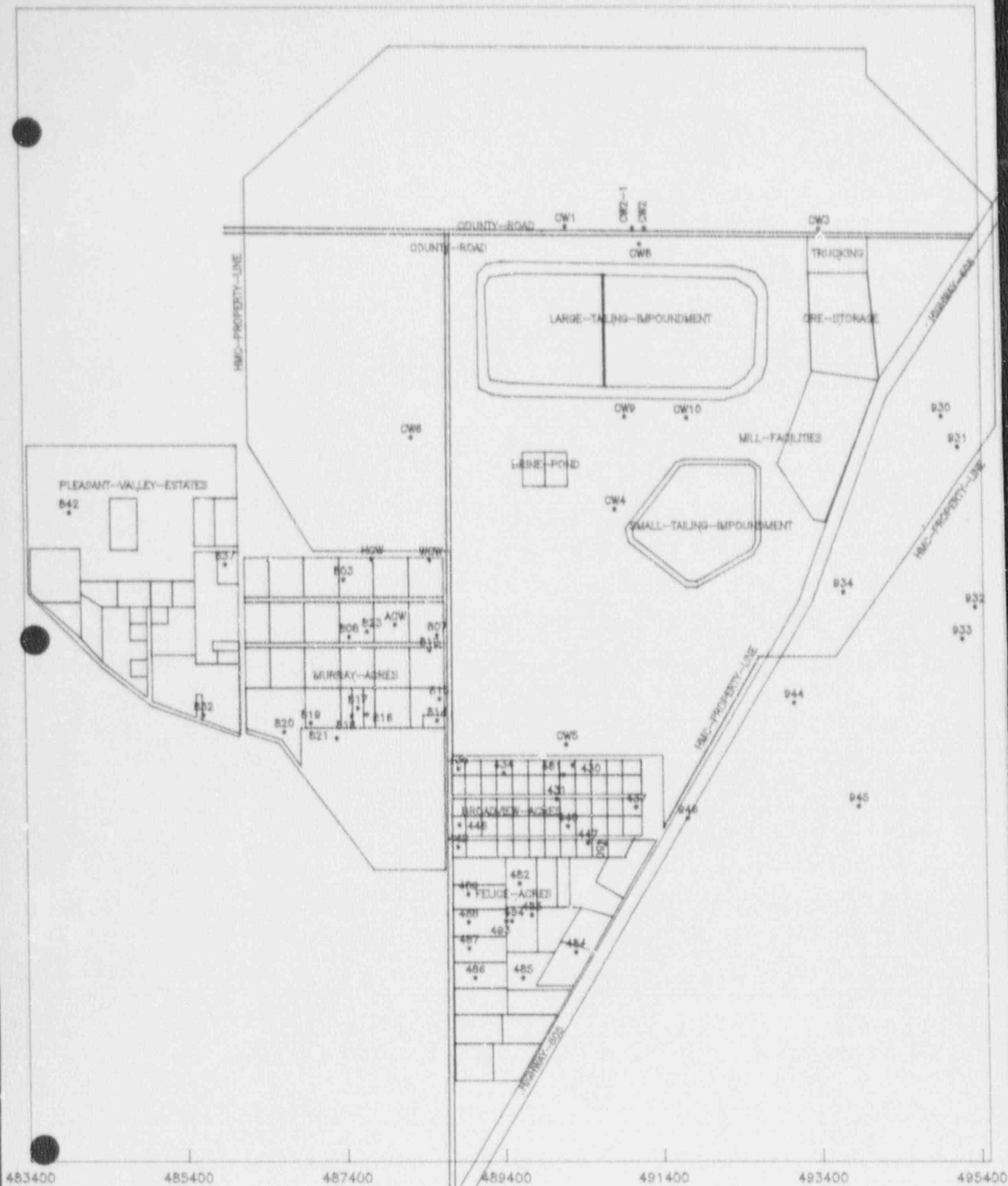


FIGURE 3.0-1. LOCATION OF CHICLE WELLS. PAGE 3.0-2

### 3.1 UPPER CHINLE INJECTION RATES

Injection into the Upper Chinle aquifer through well CW5, north of Broadview Acres, started on May 3, 1984. Figure 3.1-1 presents a plot of the CW5 injection rate. An average injection rate into the Upper Chinle aquifer of 30.4 gpm for 1990 was obtained.

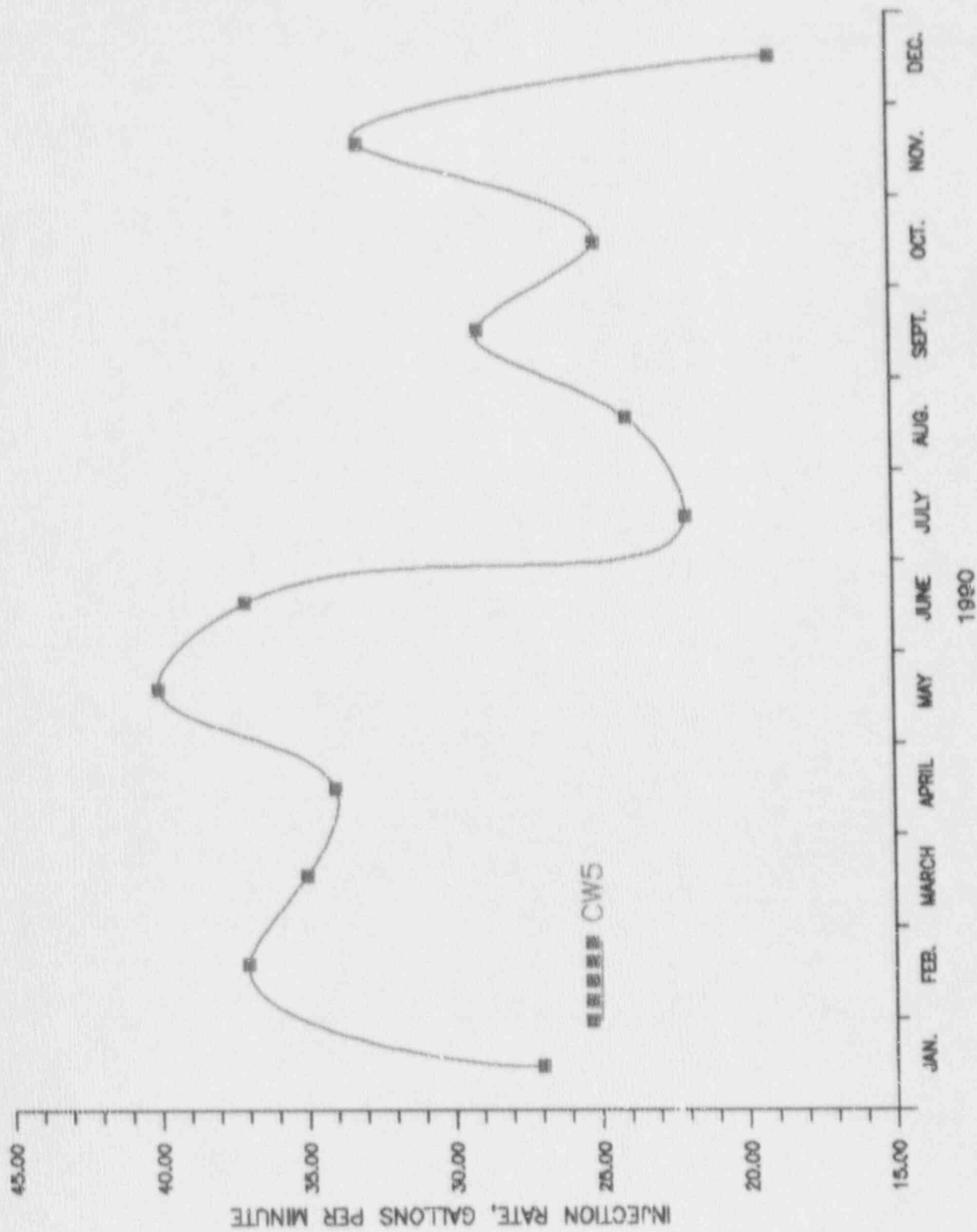


FIGURE 3.1-1. INJECTION RATES FOR THE UPPER CHINLE WELL CW5.



### 3.2 WATER LEVELS

Water levels in Homestake's Upper and Middle Chinle aquifer wells, are presented in Table 3.2-1. Water levels for Chinle wells in the subdivisions are reported in this table also. Water levels for Chinle wells in the subdivisions were reported in the alluvial aquifer subdivision tables prior to the fourth quarter of 1984.

The flow patterns in the Upper Chinle aquifer during the Fall of 1989 were very similar to those previously reported. Drawing 3.1-1 presents the water-level elevations for the Upper and Middle Chinle aquifer for the Fall of 1990. A mound of ground water presently exists around well CW5, which is causing Upper Chinle aquifer water to be moving toward the pumpback collection wells north of well CW5 and to the southwest of well CW5 in Broadview and Felice Acres. The present injection rate is maintaining the reversed gradient north of Broadview Acres in the Upper Chinle aquifer. The solid contours presented on Drawing 3.1-1 are for the Upper Chinle aquifer. The limits of the Upper Chinle are also shown on the map.

The lines with dots present the Middle Chinle water level contours and shows that ground water in the Middle Chinle is flowing from the west to the east in this area. Water-level elevations from wells 820, ACW and WCW were measured earlier in the year and were not used in drawing the contours. Water level rise in the Middle Chinle aquifer have demonstrated only a seasonal fluctuation for the last three years. The seasonal fluctuation is thought to be due to domestic use of water from this aquifer. Water-level elevations for Middle Chinle wells CW2 and 493 are shown on Figure 3.2-1.

Water-level elevation measurements for the Upper Chinle wells are presented in Table 3.2-1 also. This table includes water levels from wells in the subdivision which penetrate the Upper Chinle and alluvial aquifers.

Water levels near Upper Chinle well CW3 (see Figure 3.2-2) have been fairly steady during 1990. Water-level changes in Felice Acres Upper Chinle well 494 have been similar to those observed in well CW4.

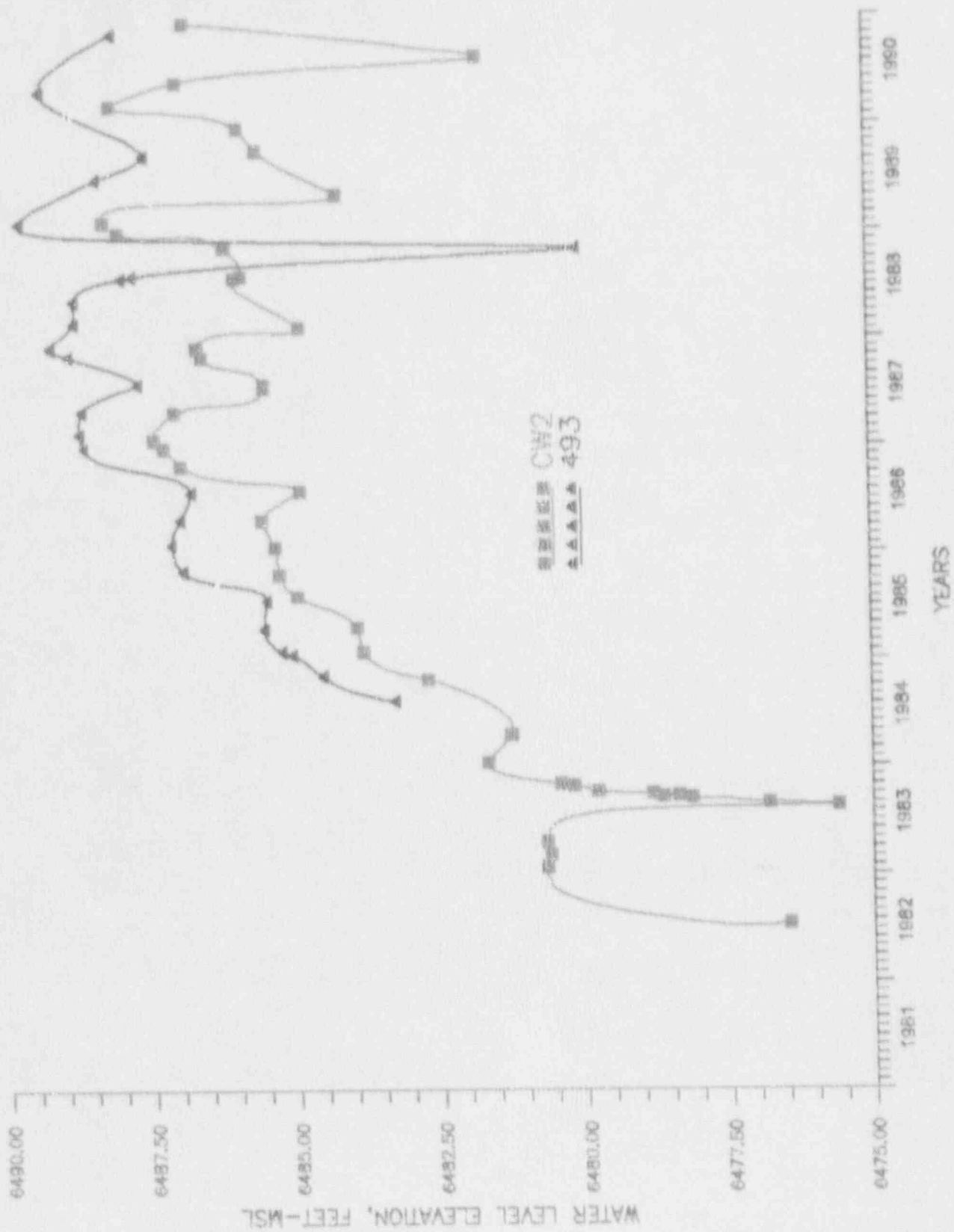


FIGURE 3.2-1. WATER LEVEL ELEVATION FOR WELLS CW2 AND 493.

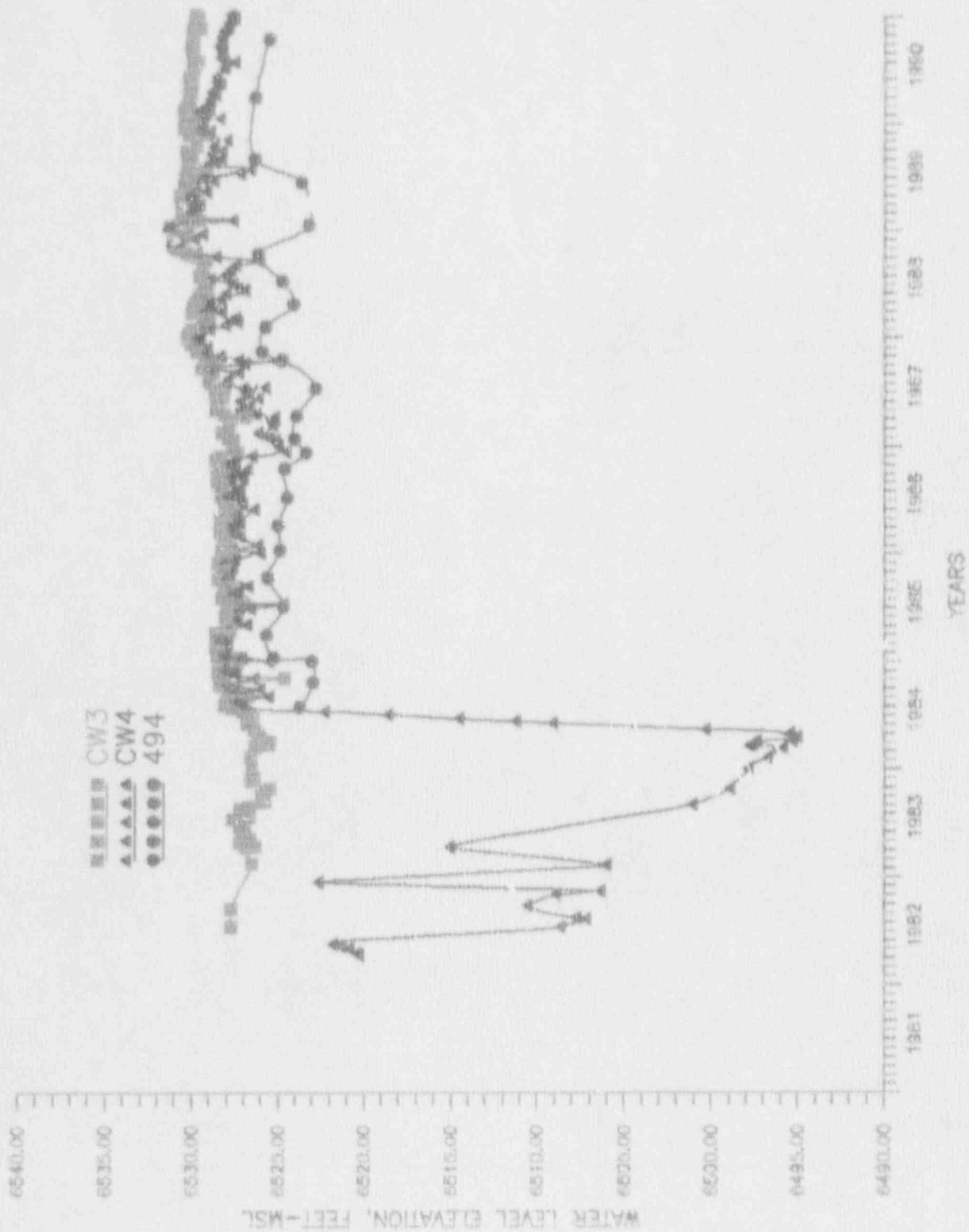


FIGURE 3.2-2. WATER LEVEL ELEVATION FOR WELLS CW3, CW4 AND 494.

TABLE 3.2-1 CHINLE AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
0493	04/04/90	6489.32
	10/22/90	6488.05
0494	04/04/90	6526.39
	10/22/90	6525.58
	01/25/91	6525.37
0820	06/26/90	6484.72
0929	02/14/90	6504.15
0930	01/25/91	6488.87
0931	07/03/90	6505.47
	01/25/91	6506.01
0932	01/22/90	6488.34
0933	01/22/90	6504.31
0934	07/03/90	6504.78
	01/25/91	6505.95
0944	01/22/90	6505.27
0946	01/22/90	6505.91
ACW	06/26/90	6482.85
CW1	01/22/90	6488.12
	01/25/91	6487.10
CW10	08/06/90	6529.31
	01/25/91	6529.32
CW2	02/15/90	6488.09
	05/08/90	6486.94
	08/07/90	6481.70
	11/27/90	6486.80
CW2-1	01/02/90	6533.58
	01/15/90	6533.59
	01/22/90	6533.34
	02/05/90	6533.56
	02/19/90	6533.47
	03/05/90	6533.66
	03/20/90	6533.38
	04/02/90	6533.43
	04/03/90	6533.43
	04/17/90	6533.44
	04/23/90	6533.58

TABLE 3.2-1 CHINLE AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
CW2-1	05/07/90	6533.54
	05/21/90	6533.42
	06/04/90	6533.42
	06/04/90	6533.40
	06/18/90	6533.50
	07/03/90	6533.46
	07/16/90	6533.47
	07/24/90	6533.45
	08/06/90	6533.33
	08/21/90	6533.46
	09/05/90	6534.16
	09/17/90	6533.51
	10/02/90	6533.54
	10/15/90	6533.46
	10/31/90	6533.44
	11/05/90	6533.49
	11/21/90	6533.46
	11/28/90	6533.19
	12/04/90	6533.29
	12/04/90	6533.29
	12/17/90	6533.46
	12/27/90	6533.31
	01/03/91	6533.29
	01/14/91	6533.36
	01/25/91	6533.29
CW3	01/02/90	6530.39
	01/15/90	6530.43
	01/22/90	6529.91
	02/05/90	6530.34
	02/15/90	6530.48
	02/19/90	6530.23
	03/05/90	6530.39
	03/20/90	6530.16
	04/02/90	6530.22
	04/17/90	6530.06
	04/23/90	6530.23
	05/07/90	6530.15
	05/08/90	6530.10
	05/21/90	6529.99
	06/04/90	6530.14
	06/18/90	6530.19
	07/03/90	6530.01
	07/11/90	6529.98
	07/16/90	6529.96
	07/24/90	6529.90
08/06/90	6529.67	
08/07/90	6529.71	
08/21/90	6530.01	
09/05/90	6529.96	
09/17/90	6530.07	
10/02/90	6530.06	

TABLE 3.2-1 CHINLE AQUIFER WATER LEVELS  
 WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION	
CW3	10/15/90	6529.92	
	10/31/90	6529.93	
	11/05/90	6529.96	
	11/21/90	6530.00	
	11/27/90	6529.93	
	11/28/90	6529.52	
	12/04/90	6529.70	
	12/17/90	6529.90	
	12/27/90	6529.73	
	01/03/91	6529.67	
	01/14/91	6529.78	
	01/25/91	6529.67	
	CW4	01/02/90	6529.36
		01/15/90	6529.45
01/22/90		6528.40	
02/05/90		6529.27	
02/15/90		6529.65	
02/19/90		6529.01	
03/05/90		6529.22	
03/20/90		6528.99	
04/02/90		6528.95	
04/17/90		6528.66	
04/23/90		6528.88	
05/07/90		6528.73	
05/08/90		6528.68	
05/21/90		6528.44	
06/04/90		6528.62	
06/18/90		6528.63	
07/02/90		6528.48	
07/16/90		6528.18	
07/24/90		6528.14	
08/06/90		6527.60	
08/21/90		6528.39	
09/05/90		6528.25	
09/17/90		6528.35	
10/02/90		6528.47	
10/15/90		6528.29	
10/31/90		6528.35	
11/05/90		6528.25	
11/21/90		6528.22	
11/27/90	6528.09		
12/04/90	6527.91		
12/17/90	6527.95		
12/27/90	6527.80		
01/02/91	6527.56		
01/14/91	6527.80		
01/25/91	6527.66		
CW5	01/03/90	6558.30	
	02/07/90	6563.87	
	03/06/90	6555.62	

TABLE 3.2-1 CHINLE AQUIFER WATER LEVELS  
WATER LEVEL ELEVATION (FT-MSL)

WELL NAME	DATE	WATER LEVEL ELEVATION
CW5	04/03/90	6556.37
	05/09/90	6564.32
	06/06/90	6563.80
	07/03/90	6562.02
	08/06/90	6558.62
	08/15/90	6559.12
	09/06/90	6562.62
	11/03/90	6564.11
	11/06/90	6563.20
	11/05/90	6561.12
	01/02/91	6564.12
CW6	01/22/90	6491.65
	01/25/91	6490.97
CW8	01/02/90	6512.62
	01/05/90	6510.49
	01/05/90	6514.00
	03/12/90	6514.36
	04/02/90	6514.84
	05/07/90	6515.60
	06/04/90	6516.13
	07/03/90	6516.69
	08/06/90	6517.27
	09/05/90	6517.82
	11/02/90	6518.26
	11/05/90	6518.88
	11/04/90	6519.54
	01/02/91	6520.22
CW9	08/06/90	6517.23
	01/25/91	6519.14
WCW	06/25/90	6483.07

### 3.3 WATER QUALITY

Tables 3.3-1 and 3.3-2 present water quality results for samples collected from the Chinle aquifer wells during the last year. Chinle aquifer water quality results for subdivision wells are also presented in this chapter.

#### 3.3.1 SULFATE CONCENTRATIONS

The water quality results for Middle Chinle wells are similar to concentrations previously measured from water in this aquifer. Figure 3.3-1 presents the sulfate concentrations for the Upper and Middle Chinle aquifers. The Upper Chinle data are listed horizontally while the Middle Chinle values are placed at a 65 degree angle above horizontal. Sulfate concentration from Middle Chinle well 820 is the only concentration that is above the expected concentrations. Concentrations in Middle Chinle wells CW2 and 493 for the last year have been declining. This trend is not expected to continue because a long term trend in this aquifer should not exist. Figure 3.3-2 shows the sulfate concentrations for Middle Chinle wells CW2 and 493 for 1990. Figure 3.3-3 presents the sulfate concentrations for the Middle Chinle wells 434 and WCW. Sulfate concentrations in these two wells have stayed fairly steady and within the expected range.

Sulfate concentrations in Upper Chinle wells CW3, CW4 and 494 have also been fairly steady (see Figure 3.3-4). These Upper Chinle sulfate concentrations are also similar to the previous annual values.

#### 3.3.2 URANIUM CONCENTRATIONS

Uranium concentrations contours for 1990 in the Upper Chinle aquifer are presented on Figure 3.3-5. This figure shows that uranium concentrations slightly greater than 0.1 mg/l exist near the small impoundment. An area with concentrations greater than 0.1 mg/l also exist in northern Felice Acres. The Upper Chinle injection should cause these concentrations to gradually decline. The uranium concentrations for the Middle Chinle aquifer are also presented on Figure 3.3-5 at a 65 degree angle. The largest uranium concentration in the Middle Chinle aquifer is 0.04 mg/l.

Figure 3.3-6 presents the uranium concentrations for Middle Chinle wells CW2 and 493. Uranium concentration have been low in 1990 in these two wells. The uranium concentrations are small in Middle Chinle wells 434 and WCW (see Figure 3.3-7). The uranium concentration in well 434 during 1990 has stayed slightly higher than it was prior to 1989 but these values are still small. The uranium concentrations in Upper Chinle well 494 and CW4 are still elevated but are gradually declining with time (see Figure 3.3-8). The uranium concentration in the Upper Chinle well north of this



facility has stayed low at well CW3.

### 3.3.3 SELENIUM CONCENTRATIONS

Selenium concentrations in the Upper and Middle Chinle aquifers are presented on Figure 3.3-9. The largest selenium concentration in the Upper Chinle on Homestake property is 0.10 mg/l from well CW4. This area of the Upper Chinle aquifer has nearly been restored by the CW5 injection. The area of selenium concentrations greater than 0.1 mg/l is small in the Upper Chinle aquifer. The CW5 injection should continue to gradually remove the concentrations greater than 0.1 mg/l.

Selenium concentrations for the water collected from wells CW2 and 493 (see Figure 3.3-10) have been steady and low for the several years of monitoring. The recent small increase in selenium in well 493 is not thought to be significant because it fits the variations previously observed. Selenium concentrations (see Table 3.3-2) for Middle Chinle well WCW, which is located in the northeast corner of Murray Acres, have also been low (see Figure 3.3-11). A rise in the selenium concentration is shown for well 434 during 1990 but this rise is within the expected fluctuation of this constituent.

Selenium concentrations for Upper Chinle wells CW3 and 494 have also been low. Figure 3.3-12 shows that the selenium concentrations for water from well 494 is presently similar to those observed for well CW3. Well CW3 is located just northeast of the impoundment, while well 494 is located in central Felice Acres. Selenium concentrations in Upper Chinle well CW4 has gradually declined to below the state standard prior to 1990. Selenium concentrations seem to have become steady in well CW4. The selenium and uranium concentrations is low in Upper Chinle well CW9.

### 3.3.4 MOLYBDENUM CONCENTRATIONS

Figure 3.3-13 presents the molybdenum concentrations for the Upper and Middle Chinle aquifers. The contours show that the molybdenum concentrations near the small impoundment are near 0.1 mg/l. The highest Middle Chinle concentration of 0.02 mg/l was observed at well 832 (see Figure 3.3-13).

Figures 3.3-14 and 3.3-15 show that the molybdenum concentrations with time have been very small in Middle Chinle wells CW2, 493, 434 and WCW. Figure 3.3-16 presents the molybdenum concentrations in Upper Chinle wells CW3, CW4 and 494. Slightly elevated concentrations exist in wells 494 and CW4 but are gradually declining with time due to the CW5 injection.

### 3.3.5 OTHER CONSTITUENTS

All chromium concentrations in the Upper and Middle Chinle aquifers are also very small. No significant concentrations of chromium would be expected in the Chinle with the limited migration of chromium in the alluvial aquifer. Vanadium and thorium-230 concentrations in the Chinle are all small also.

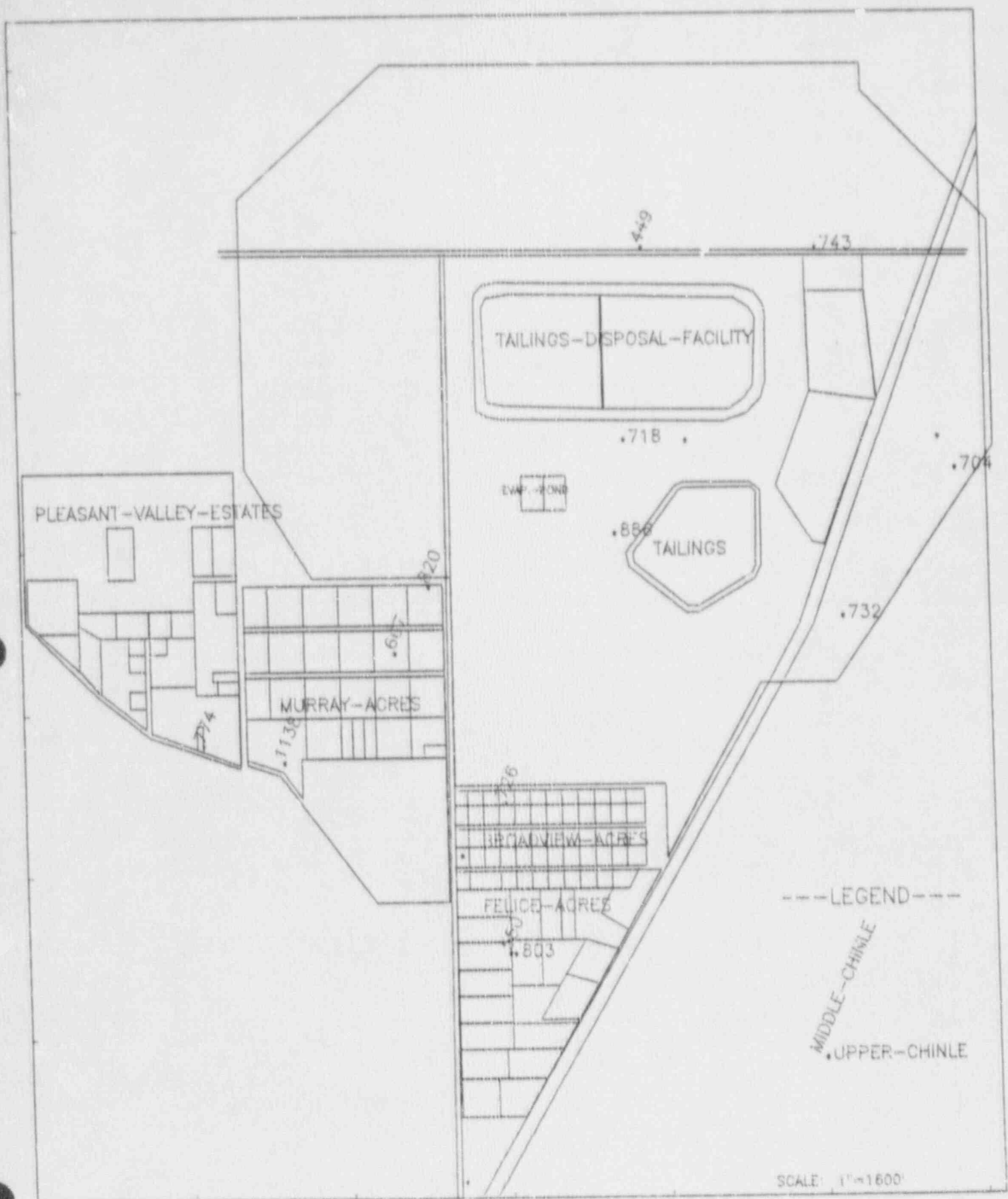


FIGURE 3.3-1. SULFATE CONCENTRATIONS FOR THE MIDDLE AND UPPER CHINLE, FALL 1990, mg/l.

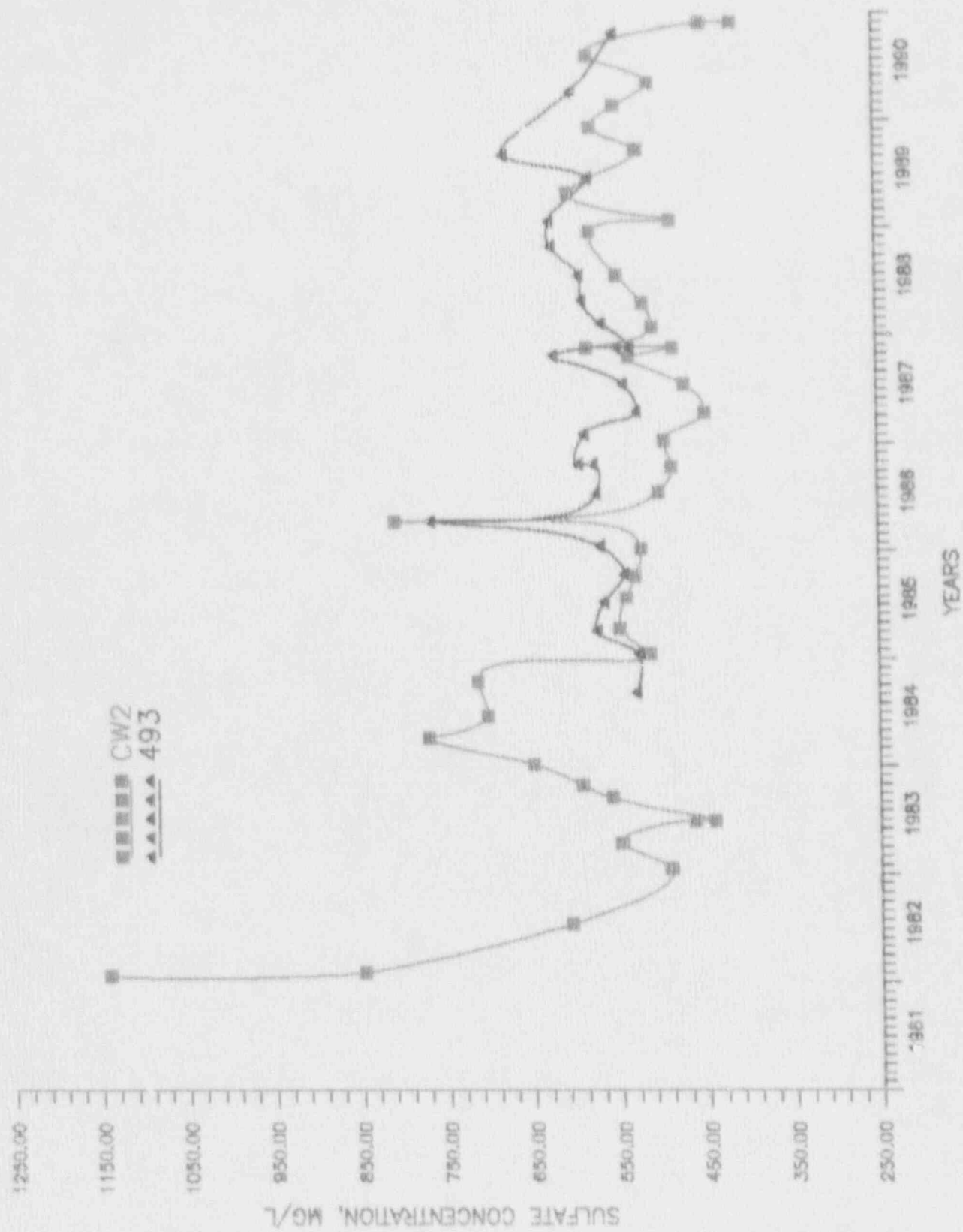


FIGURE 3.3-2. SULFATE CONCENTRATIONS FOR WELLS CW2 AND 493.

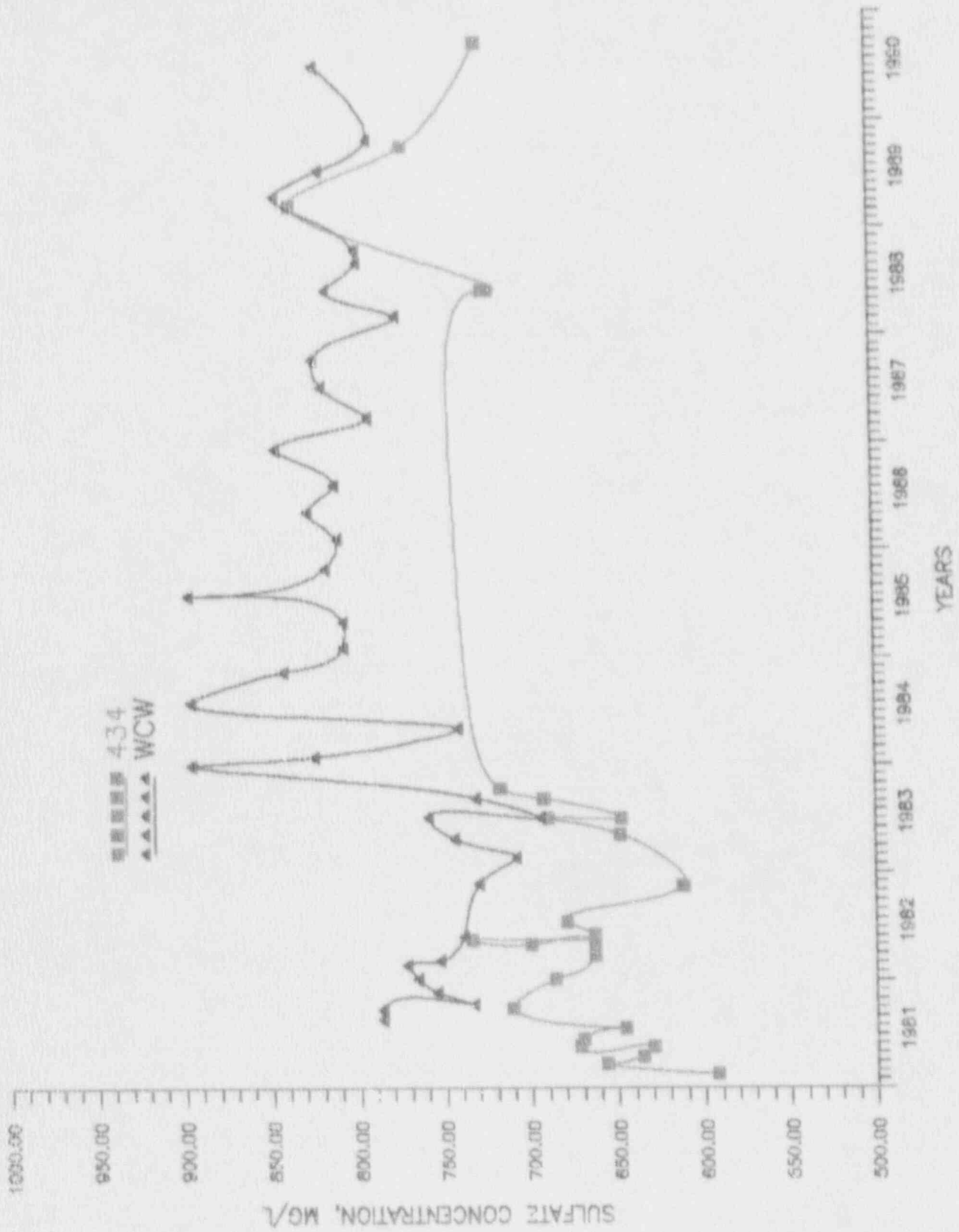


FIGURE 3.3-3. SULFATE CONCENTRATIONS FOR WELLS 434 AND WCW.

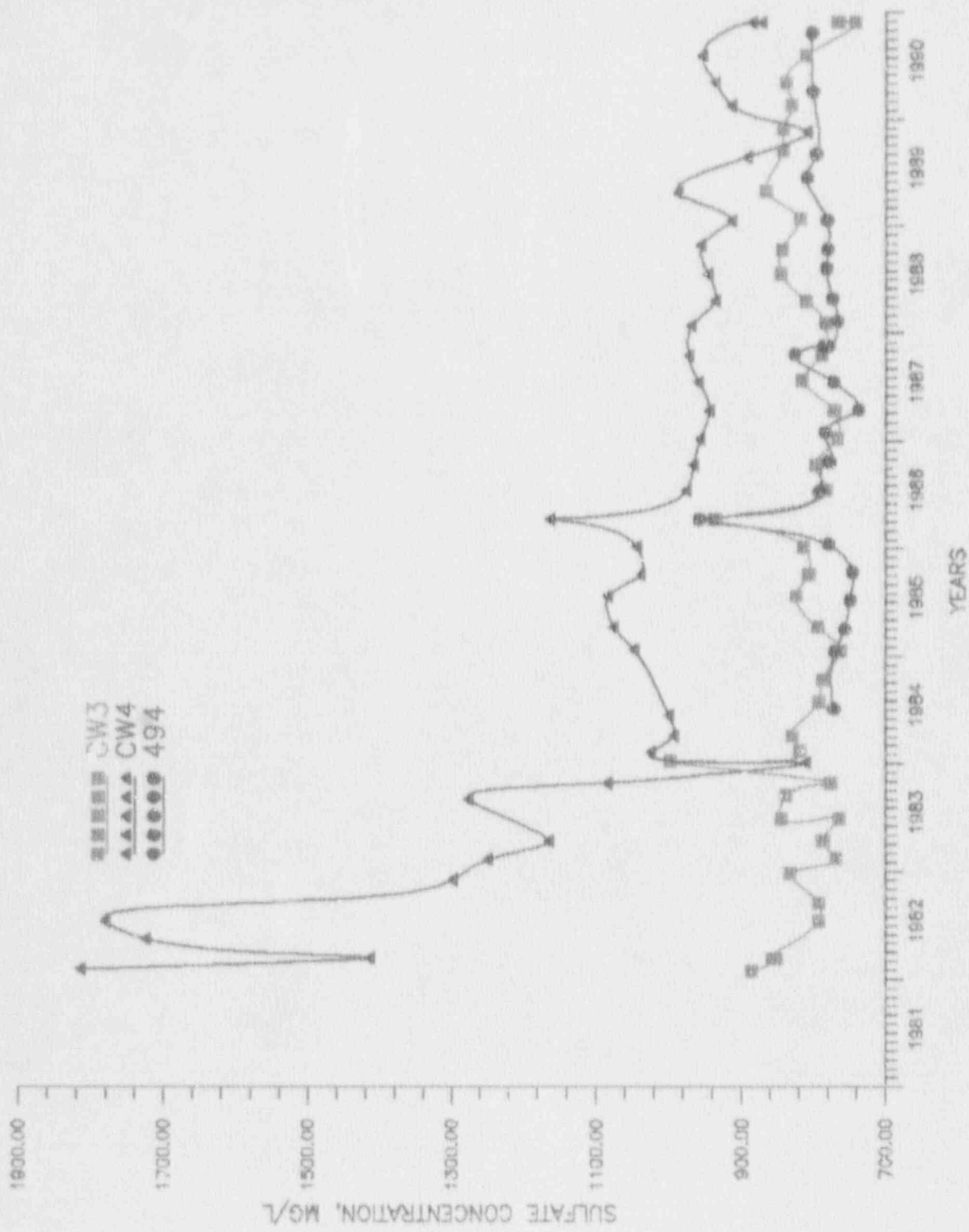


FIGURE 3.3-4. SULFATE CONCENTRATIONS FOR WELLS CW3, CW4 AND 494.

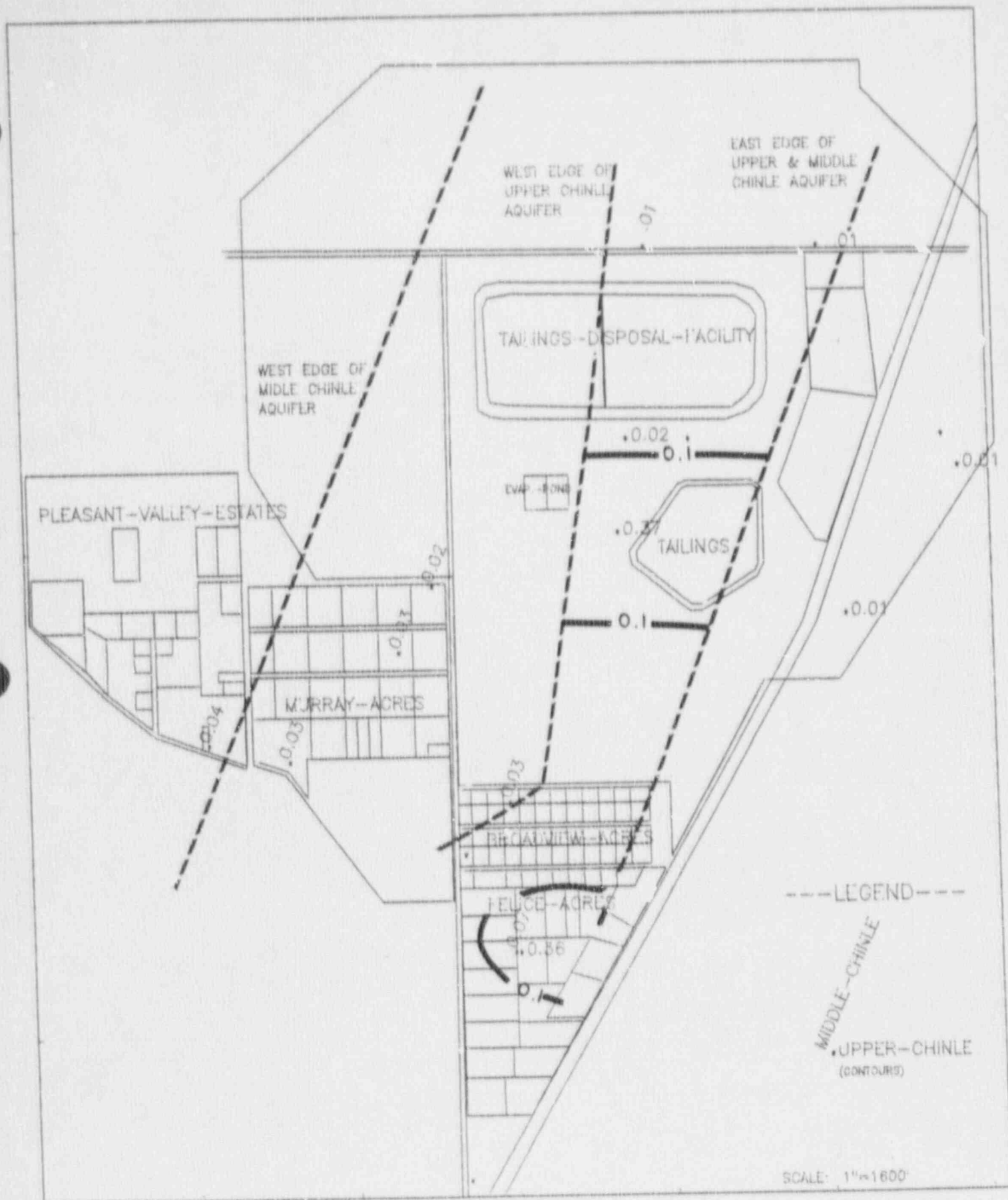


FIGURE 3.3-5. URANIUM CONCENTRATIONS FOR THE MIDDLE AND UPPER CHINLE, FALL 1990, mg/l.

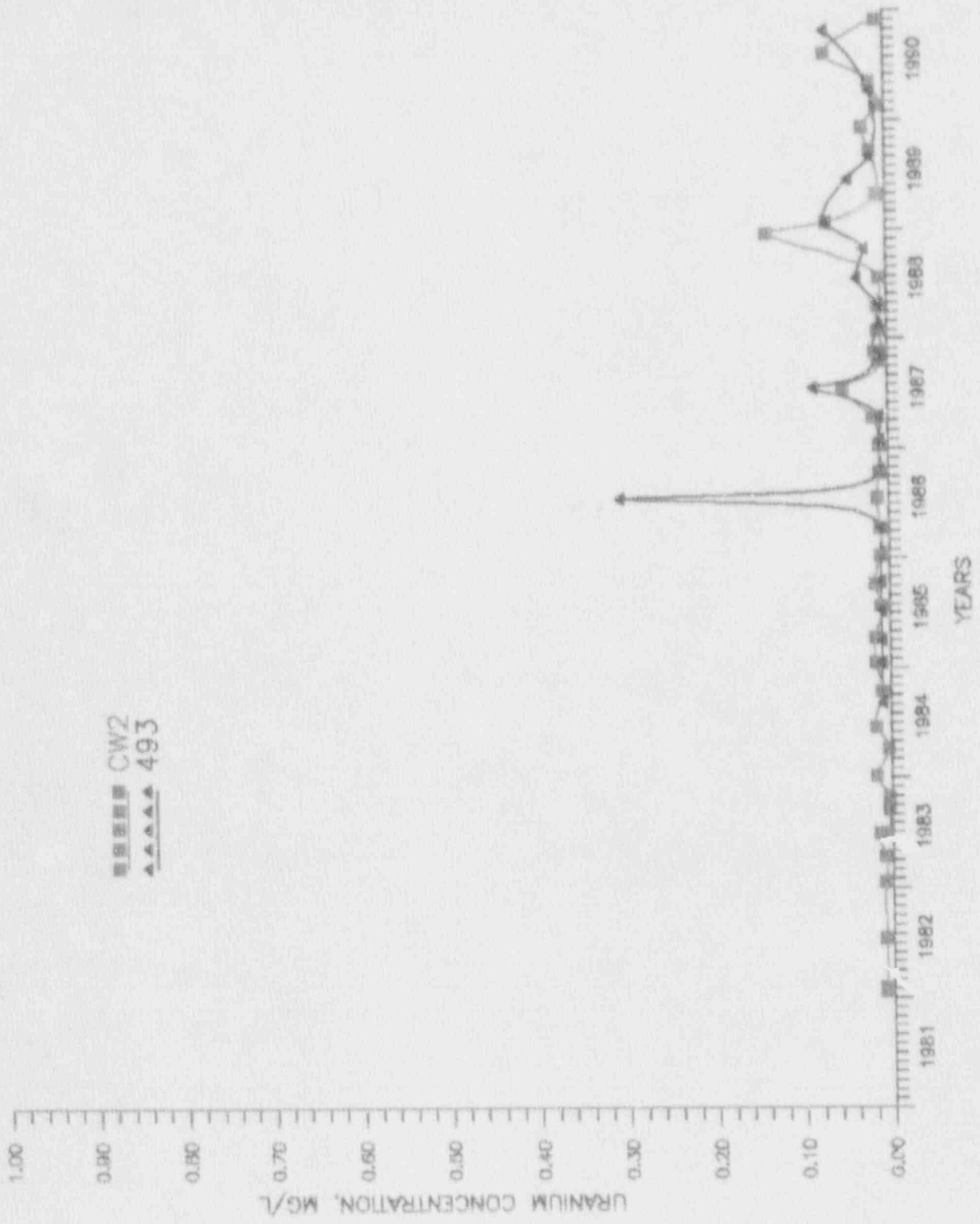


FIGURE 3.3-6. URANIUM CONCENTRATIONS FOR WELLS CW2 AND 493.



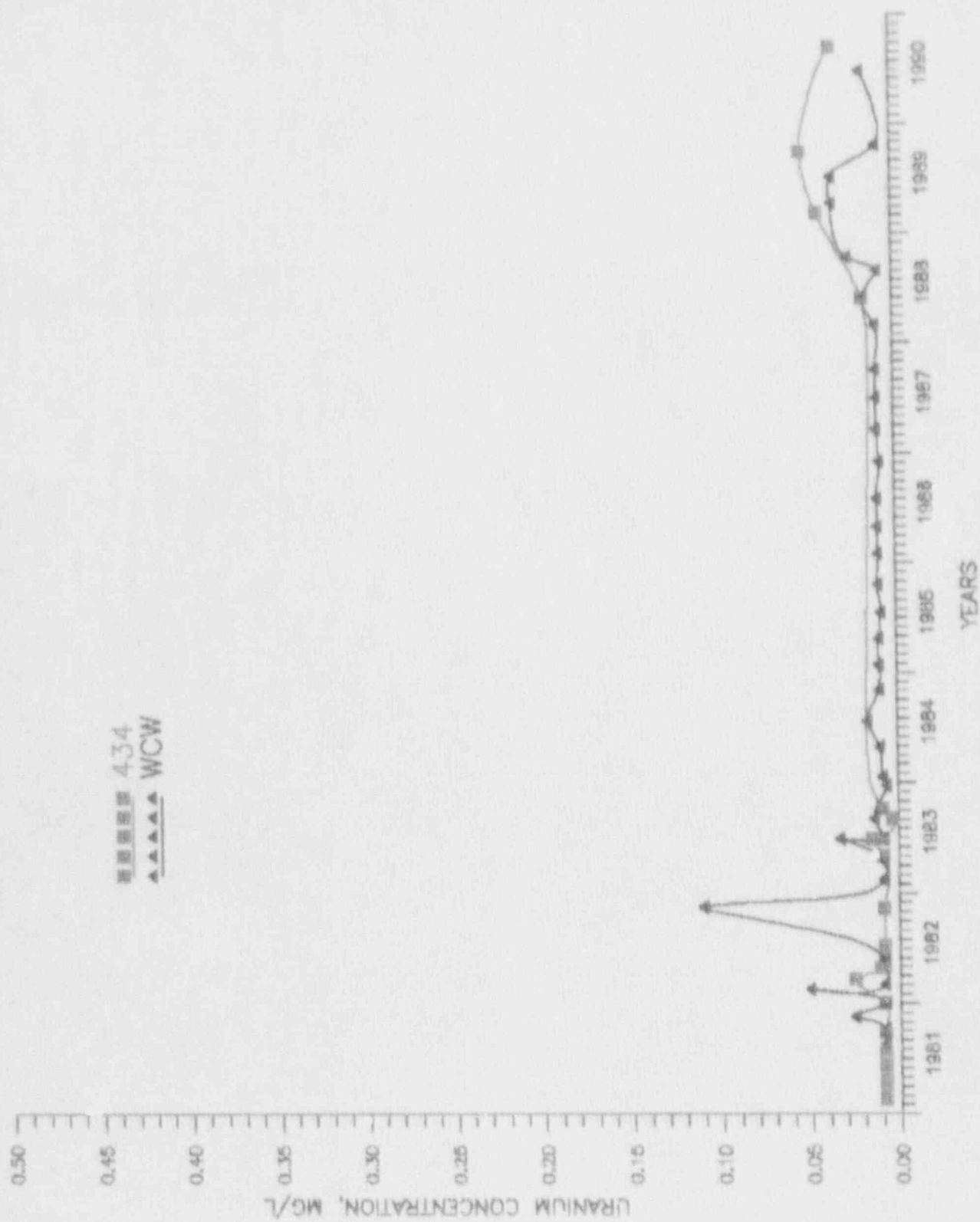


FIGURE 3.3-7. URANIUM CONCENTRATIONS FOR V.S. 434 AND WCW.

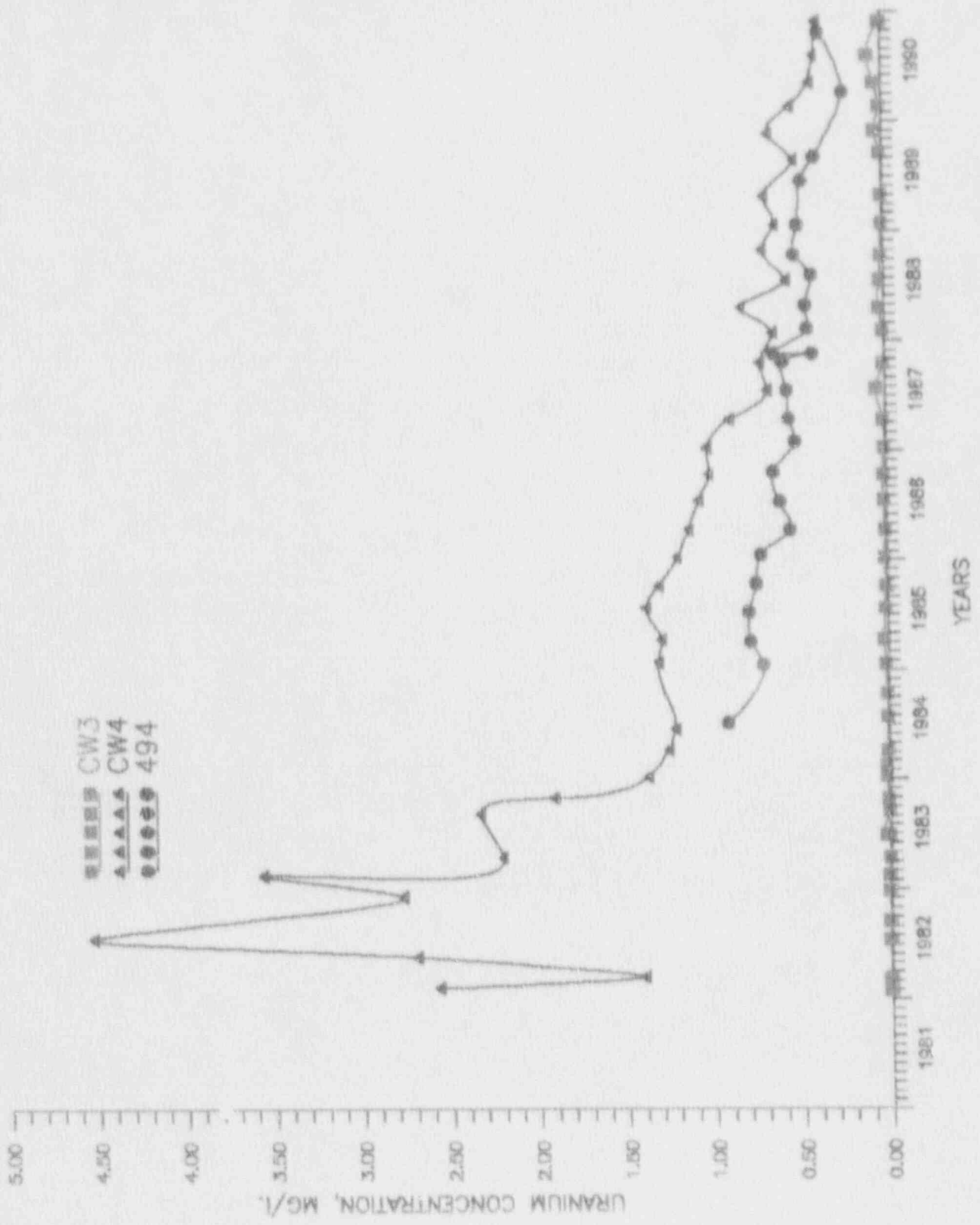


FIGURE 3.3-8. URANIUM CONCENTRATIONS FOR WELLS CW3, CW4 AND 494.

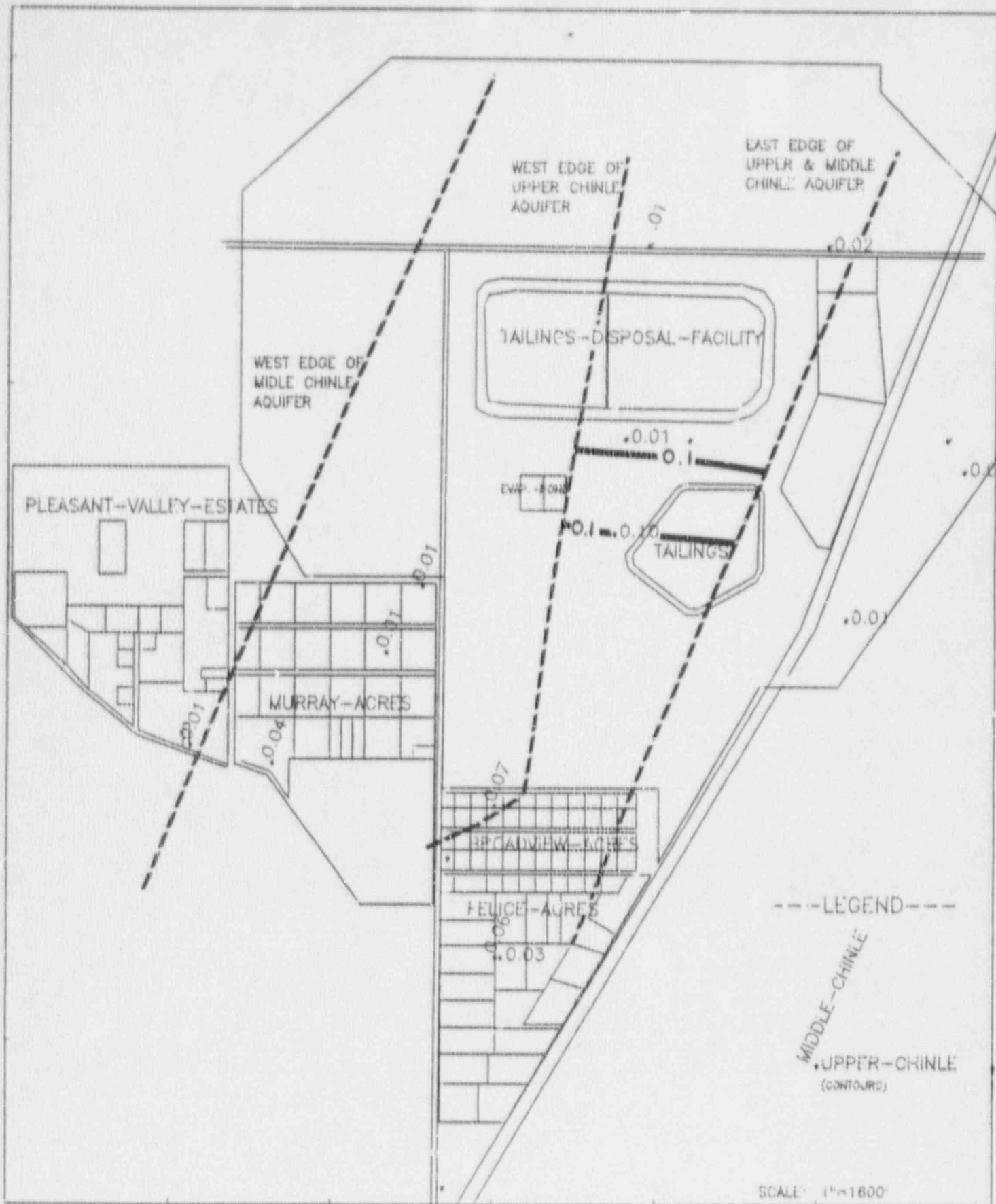


FIGURE 3.3-9. SELENIUM CONCENTRATIONS FOR THE MIDDLE AND UPPER CHINLE, FALL 1990, mg/l.

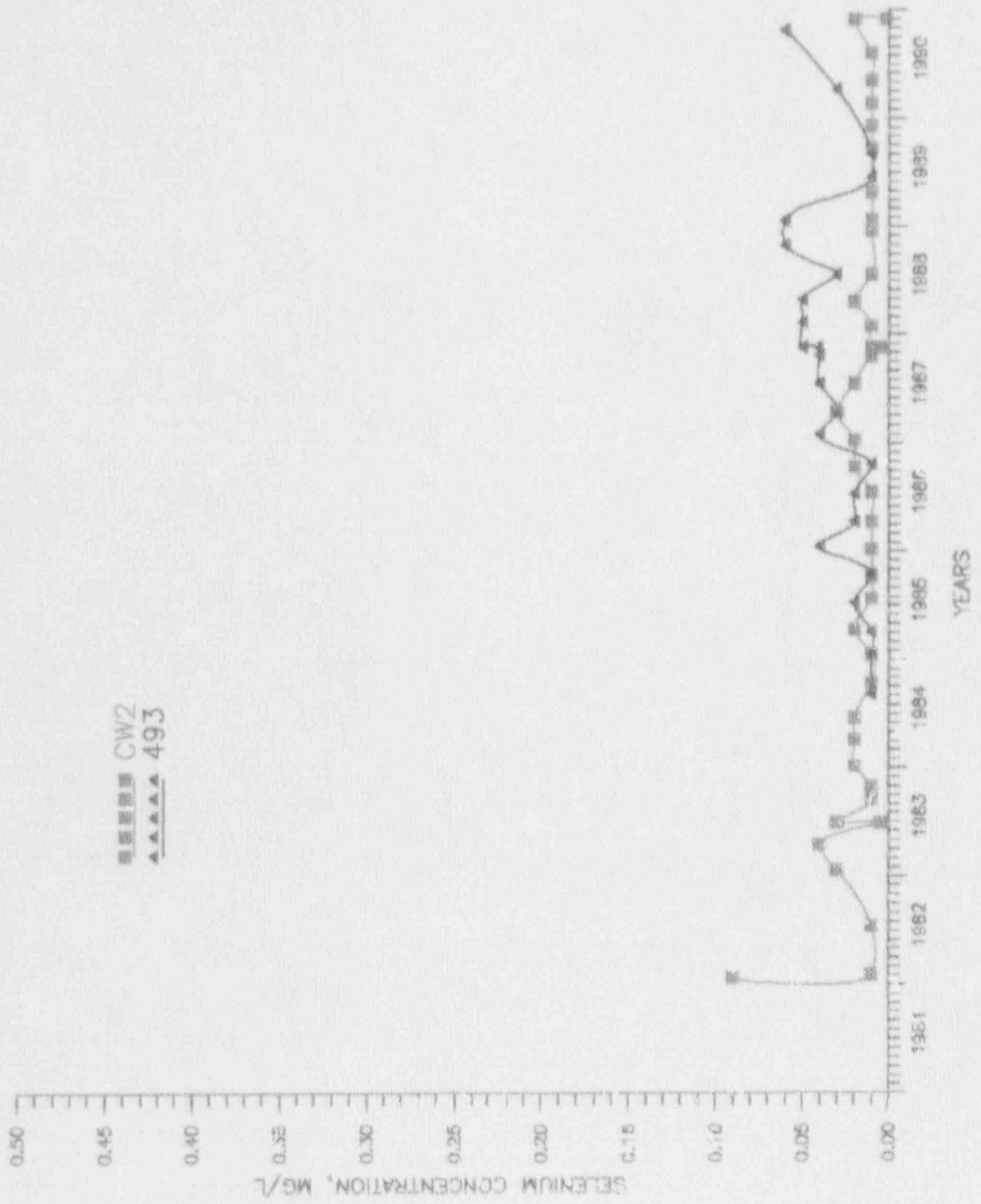


FIGURE 3.J-10. SELENIUM CONCENTRATIONS FOR WELLS CW2 AND 493.

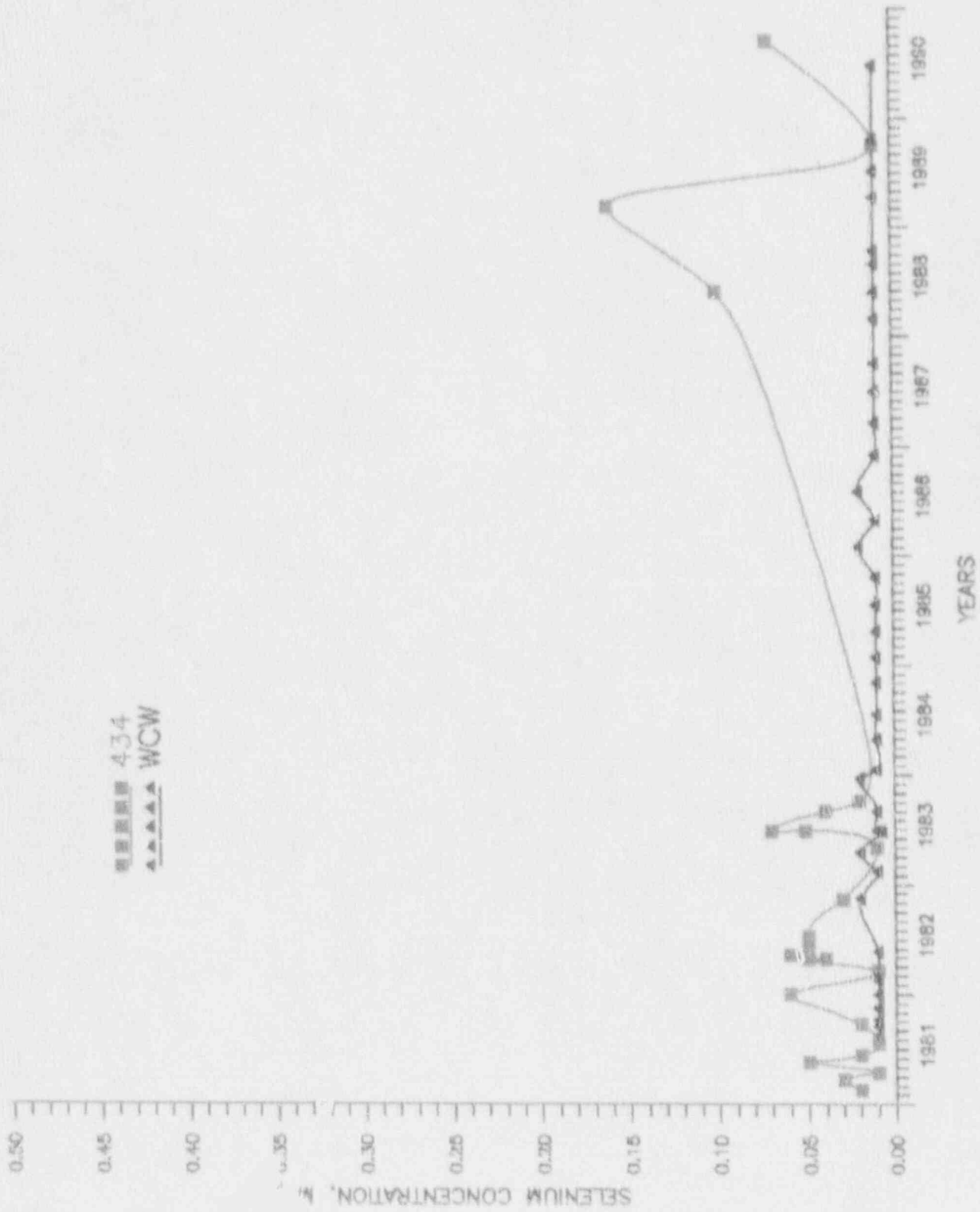


FIGURE 3.3-11. SELENIUM CONCENTRATIONS FOR WELLS 434 AND WCW.

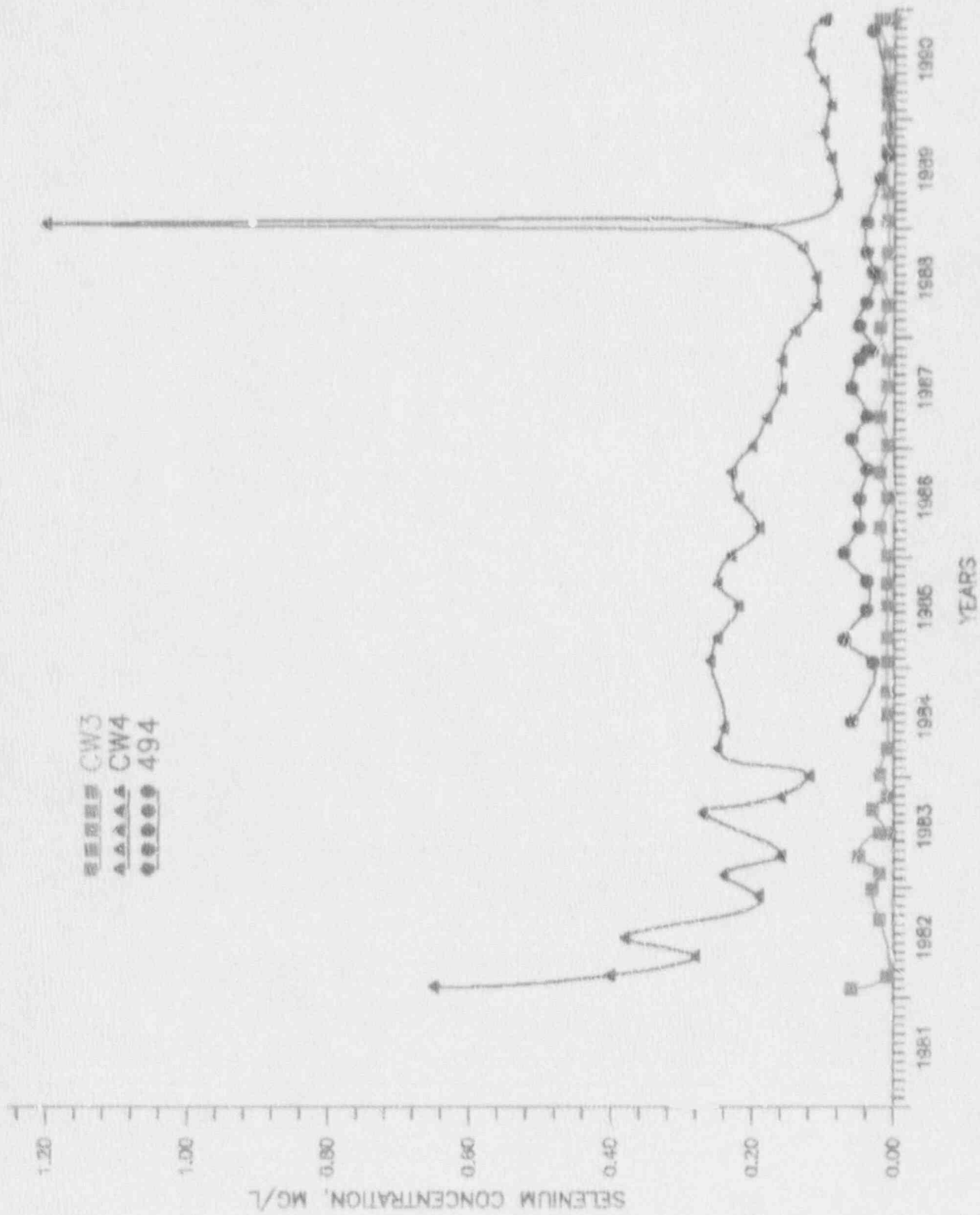


FIGURE 3.3-12. SELENIUM CONCENTRATIONS FOR WELLS CW3, CW4 AND 494.

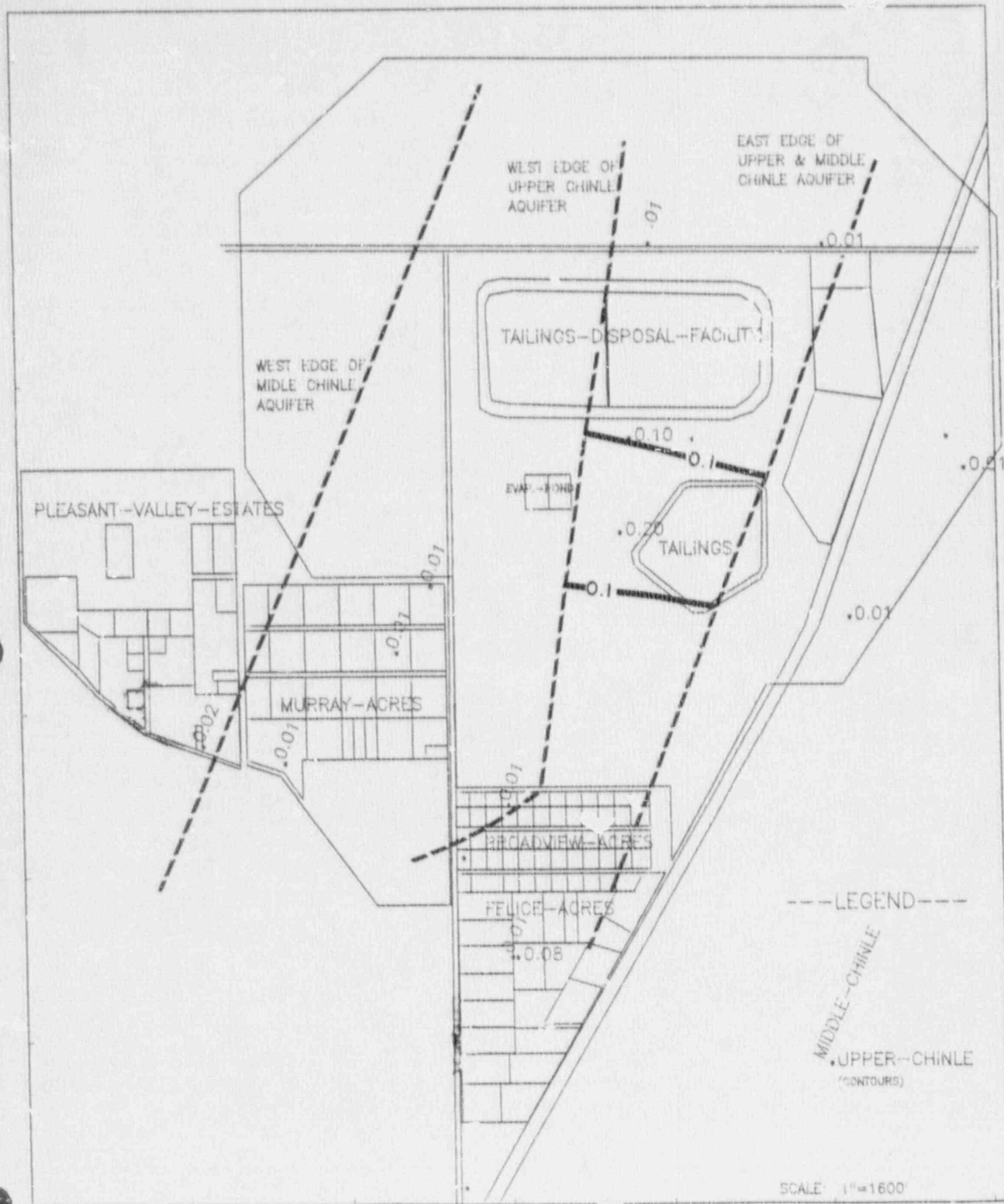


FIGURE 3.3-13. MOLYBDENUM CONCENTRATIONS FOR THE MIDDLE AND UPPER CHINLE, FALL 1990, mg/l.

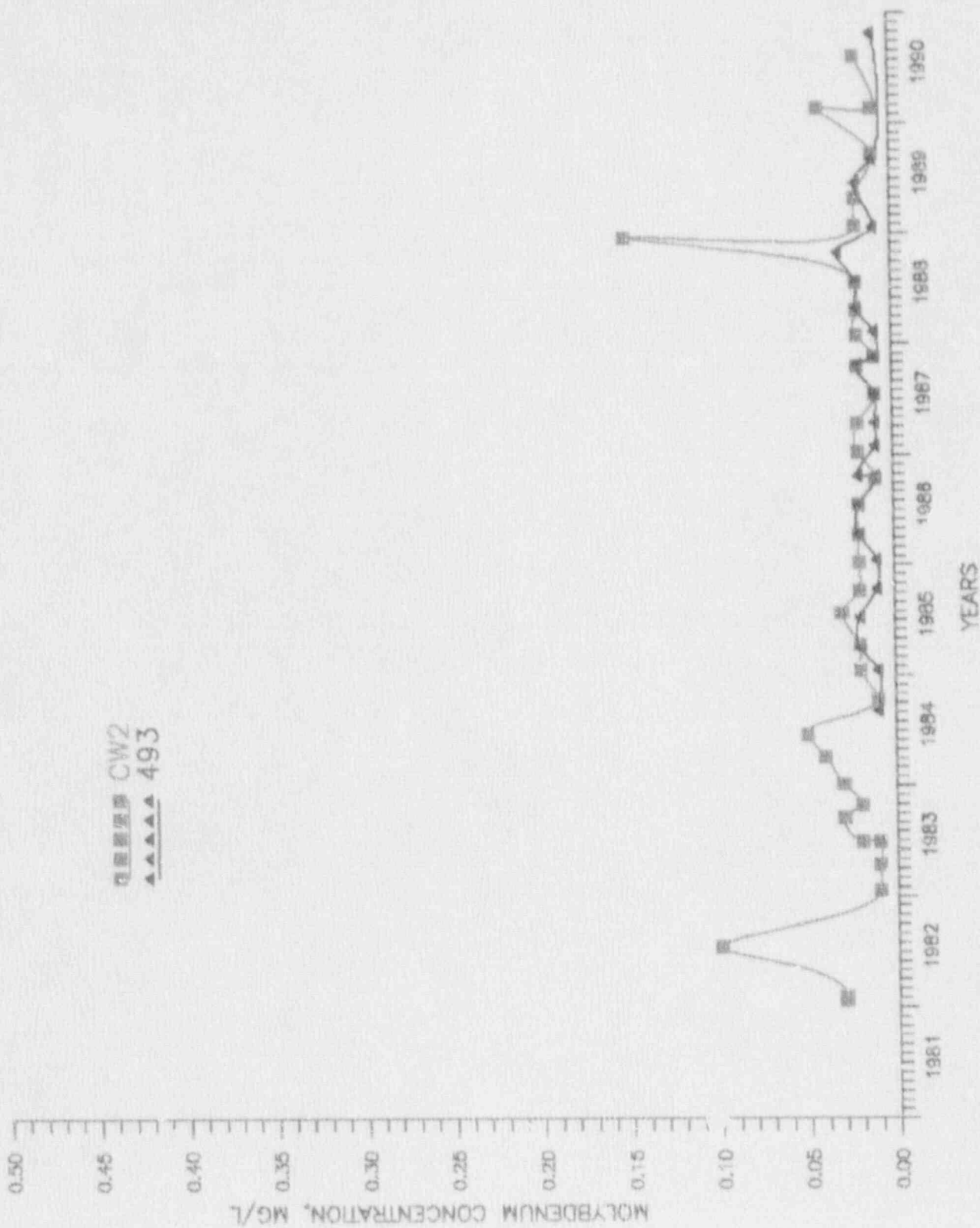


FIGURE 3.3-14. MOLYBDENUM CONCENTRATIONS FOR WELLS CW2 AND 493.



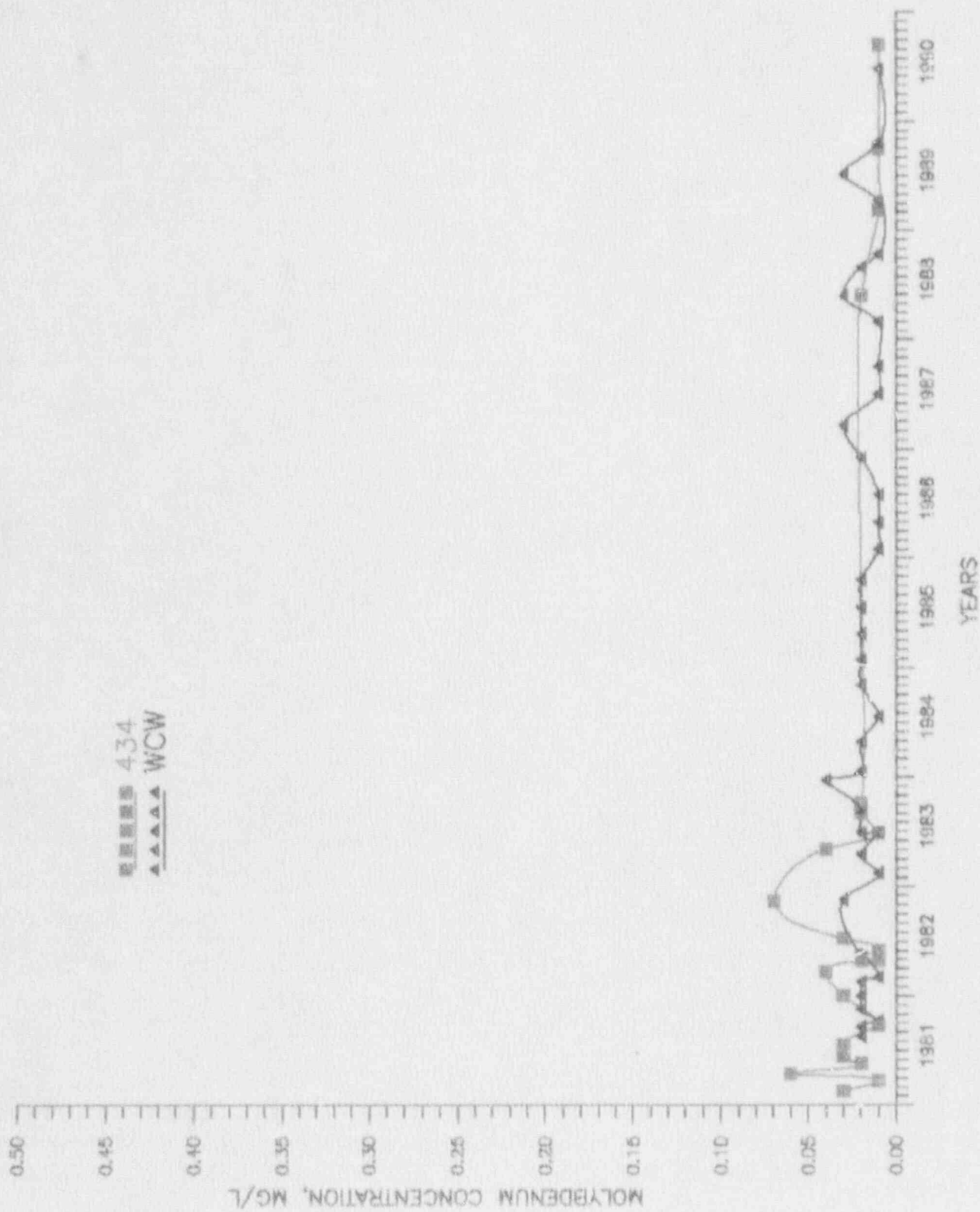


FIGURE 3.3-15. MOLYBDENUM CONCENTRATIONS FOR WELLS 434 AND WCW.

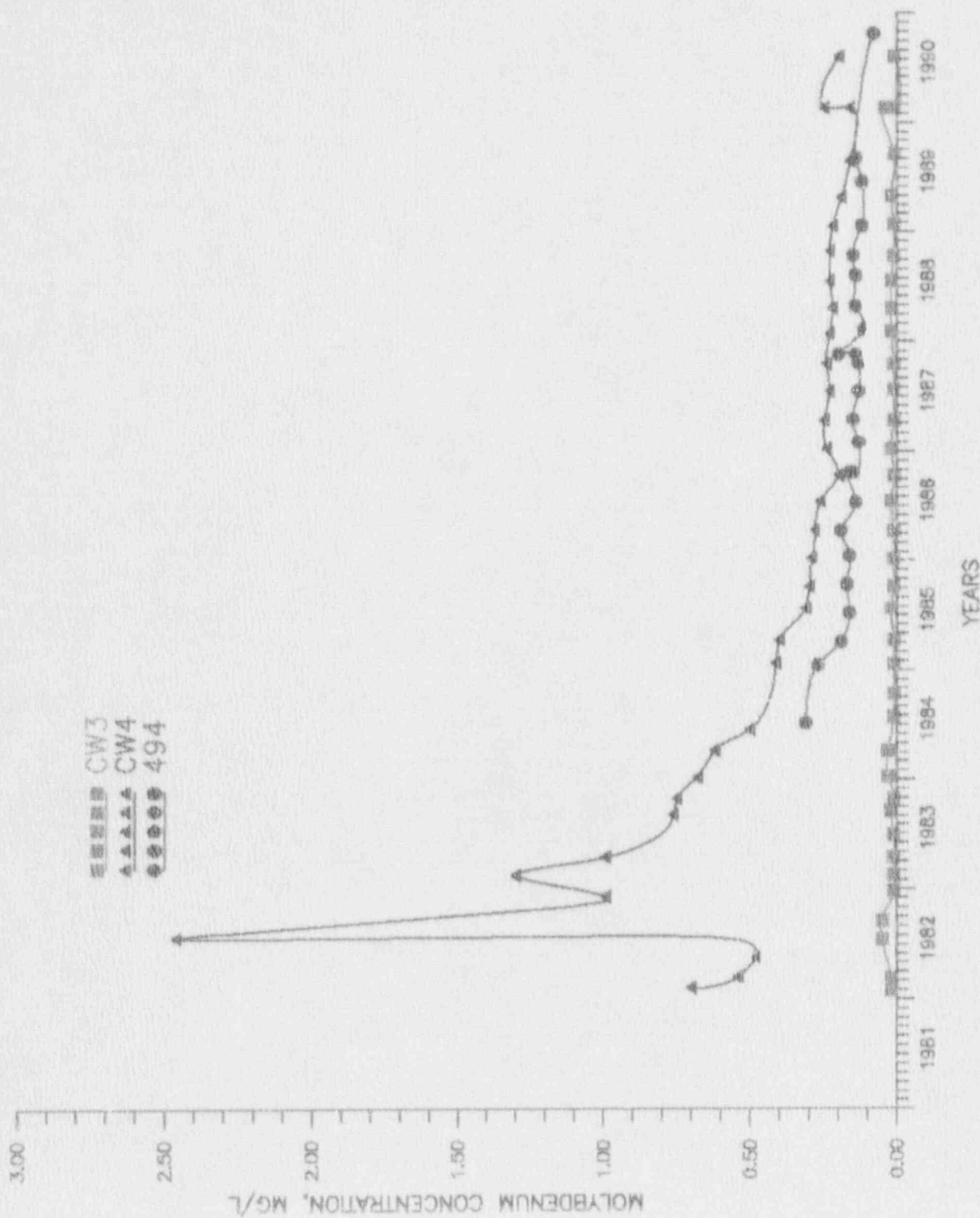


FIGURE 3.3-16. MOLYBDENUM CONCENTRATIONS FOR WELLS CW3, CW4 AND 494.

TABLE 3.3-1 CHINLE AQUIFERS WATER QUALITY DATA

WELL_ID	DATE	LAB	CA THROUGH ION BAL										TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
			CA	MG	K	NA	HCO3	CO3	CL	SO4					
0434	09/16/90	HMC	22.00	3.00	2.00	473.00	182.50	4.80	71.00	726.00	1390.00	2058.63	1.01		
0493	04/04/90	HMC	----	----	----	----	----	----	598.00	1180.00	1724.56	----			
	10/22/90	HMC	22.00	1.00	6.00	387.00	268.00	----	57.00	1110.00	1734.47	1.04			
0494	04/04/90	HMC	----	----	----	----	----	----	802.00	1810.00	2586.84	----			
	10/22/90	HMC	329.00	30.00	9.00	333.00	531.00	----	191.00	1710.00	2497.18	1.09			
0820	05/26/90	HMC	149.00	5.00	4.00	503.00	316.00	0.01	92.00	2030.00	2078.10	1.06			
0832	06/21/90	BARR	88.00	28.40	4.50	255.00	260.00	<	1.00	1114.00	----	1.04			
	06/21/90	HMC	132.00	3.00	4.00	283.00	294.00	8.00	64.00	1090.00	1563.92	1.01			
	11/01/90	HMC	----	----	----	----	----	----	774.00	1480.00	1970.92	----			
0902	01/04/90	HMC	441.00	18.00	10.00	405.00	224.00	<	10.00	1460.00	3045.79	1.04			
	01/04/90	BARR	279.00	77.00	8.20	365.00	178.00	<	1.00	2580.00	----	0.93			
0929	02/14/90	HMC	32.90	2.00	1.00	633.00	410.00	----	170.00	1600.00	2586.36	1.05			
0931	07/03/90	HMC	22.00	1.00	2.00	754.00	410.00	6.00	312.00	2140.00	3103.78	1.12			
	07/03/90	HMC	22.00	1.00	2.00	616.00	415.00	7.00	170.00	1840.00	2586.84	1.04			
0934	06/26/90	HMC	19.00	4.00	1.00	673.00	334.00	<	35.00	1400.00	1995.49	1.04			
	08/06/90	HMC	216.00	93.00	4.00	283.00	343.00	<	0.10	1470.00	1917.69	1.34			
CW2	02/15/90	HMC	27.00	2.00	1.00	387.00	338.00	<	0.10	1080.00	----	1.02			
	05/08/90	HMC	----	----	----	----	----	----	----	990.00	1614.90	----			
CW10	08/07/90	HMC	25.00	1.00	1.00	413.00	345.00	<	0.10	1140.00	1612.21	1.00			
	11/27/90	BARR	----	----	----	----	----	----	----	988.00	----	----			
CW3	11/27/90	HMC	----	----	----	----	----	----	449.00	900.00	1596.15	----			
	02/15/90	HMC	32.00	1.00	1.00	533.00	340.00	<	0.10	1340.00	2239.16	1.04			
CW3	05/08/90	HMC	----	----	----	----	----	----	840.00	1530.00	2234.61	----			
	08/07/90	HMC	28.00	1.00	1.00	533.00	370.00	<	0.10	1540.00	2340.47	1.02			
11/27/90	HMC	----	----	----	----	----	----	743.00	1450.00	2197.16	----				

TABLE 3.3-1. URBINE BRITERS WATER QUALITY DATA  
CA THROUGH ION BAL

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	HC03 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)	TCS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
CW3	11/27/90	BARR	----	----	----	----	----	----	----	767.00	1450.00	----	----
CW4	02/15/90	HMC	275.00	3.00	4.00	368.00	486.00	< 0.10	92.00	914.00	1770.00	2393.85	1.05
	05/08/90	HMC	----	----	----	----	----	----	----	937.00	1790.00	2354.91	----
	08/06/90	HMC	265.00	1.00	5.00	360.00	397.00	< 0.10	103.00	955.00	1770.00	2295.38	0.99
	11/27/90	BARR	----	----	----	----	----	----	----	872.00	1750.00	----	----
	11/27/90	HMC	----	----	----	----	----	----	----	886.00	1310.00	2334.15	----
CW9	08/06/90	HMC	55.00	16.00	2.00	426.00	231.00	< 0.10	57.00	718.00	1260.00	----	1.11
WCM	06/25/90	HMC	25.00	3.00	2.00	520.00	264.00	19.00	85.00	820.00	1440.00	2272.91	0.99

TABLE 3.3-2 CHINLE AQUIFERS WATER QUALITY DATA  
PH THROUGH TH-230

WELL_ID	DATE	LAB	PH	UNAT	MO	SE	NO3	RA226	RA228	CR	V	TH230
			(units)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(pCi/l)	(pCi/L)	(mg/l)	(mg/l)	(pCi/l)
0434	09/14/90	HMC	9.40	0.03	0.01	0.07	1.80	----	----	----	----	----
	09/14/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----
0493	04/04/90	HMC	----	0.02	----	0.03	----	----	----	----	----	----
	10/22/90	HMC	7.80	0.07	0.01	0.06	4.20	----	----	----	----	----
	10/22/90	BARR	----	----	----	----	----	0.10	----	----	----	----
0494	04/04/90	HMC	----	0.22	----	0.01	----	----	----	----	----	----
	10/22/90	HMC	7.30	0.36	0.08	0.03	3.20	----	----	----	----	----
	10/22/90	BARR	----	----	----	----	----	< 0.00	----	----	----	----
0820	06/26/90	HMC	7.70	0.03	0.01	0.04	3.40	----	----	----	----	----
	06/21/90	HMC	8.00	0.02	0.01	0.01	0.80	----	----	< 0.01	< 0.01	----
0832	06/21/90	BARR	7.79	0.01	0.02	< 0.01	46.00	----	0.80	----	----	----
	11/01/90	HMC	----	0.04	----	0.01	----	----	----	----	----	----
0902	01/04/90	HMC	7.70	0.08	0.02	0.35	3.80	0.10	----	< 0.01	0.01	----
	01/06/90	BARR	7.92	0.06	0.01	0.59	41.10	0.20	----	< 0.01	0.02	----
0929	02/14/90	HMC	7.70	0.02	0.03	0.02	0.20	0.10	----	< 0.01	< 0.01	----
	07/03/90	HMC	8.30	0.01	0.01	0.01	1.10	----	----	----	----	----
0934	07/03/90	HMC	8.40	0.01	0.01	0.01	1.1	----	----	----	----	----
	06/26/90	HMC	8.90	0.03	0.01	0.01	3.00	----	----	----	----	----
CW10	08/06/90	HMC	7.50	0.03	0.02	0.01	1.90	----	----	----	----	----
	08/08/90	BARR	----	----	----	----	----	< 0.10	----	----	----	----
CW2	02/15/90	HMC	7.90	0.01	0.01	< 0.01	0.30	0.10	----	< 0.01	< 0.01	----
	02/15/90	BARR	----	----	0.04	----	----	< 0.20	< 0.90	< 0.01	< 0.01	< 0.20
	05/08/90	HMC	----	0.02	----	0.01	----	0.20	< 0.20	----	----	< 0.00
	08/07/90	BARR	----	----	----	----	----	----	----	----	----	----
	08/07/90	HMC	8.30	0.07	0.02	0.01	1.70	----	----	----	----	----
11/27/90	BARR	----	----	----	< 0.00	----	----	----	----	----	----	

TABLE 3.3-2 CHINLE AQUIFERS WATER QUALITY DATA  
PH THROUGH TH 250

WELL_ID	DATE	LAB	PH (units)	URAI (mg/l)	MU (mg/l)	SE (mg/l)	NO3 (mg/l)	RAZ25 (pCi/l)	RAZ26 (pCi/l)	LR (mg/l)	V (mg/l)	TH230 (pCi/l)
CW2	11/27/90	HMC	----	< 0.01	----	0.02	----	----	----	----	----	----
	02/15/90	HMC	7.50	0.02	0.01	0.01	0.20	0.10	----	< 0.01	< 0.01	----
CW3	02/15/90	BARR	----	----	0.04	----	----	< 0.20	< 0.90	< 0.10	----	< 0.20
	05/08/90	HMC	----	0.04	----	0.01	----	----	----	----	----	----
	08/07/90	HMC	7.90	0.08	0.01	0.01	1.50	----	----	----	----	0.20
	08/07/90	BARR	----	----	----	----	----	< 0.00	< 0.40	----	----	----
	11/27/90	HMC	----	< 0.01	----	0.02	----	----	----	----	----	----
	11/27/90	BARR	----	----	----	< 0.00	----	----	----	----	----	----
CW4	02/15/90	HMC	7.30	0.53	0.16	0.09	0.20	0.10	----	< 0.01	< 0.01	----
	02/15/90	BARR	----	----	0.25	----	----	< 0.20	< 0.90	< 0.10	----	< 0.20
	05/08/90	HMC	----	0.42	----	0.10	----	----	----	----	----	----
	08/06/90	BARR	----	----	----	----	----	< 0.00	< 0.30	----	----	< 0.00
	08/06/90	HMC	7.40	0.39	0.20	0.12	1.90	----	----	----	----	----
	11/27/90	HMC	----	0.37	----	0.10	----	----	----	----	----	----
CW9	11/27/90	BARR	----	----	----	0.09	----	----	----	----	----	----
	08/06/90	HMC	7.70	0.02	0.10	0.01	1.70	----	----	----	----	----
MCW	08/08/90	BARR	----	----	----	----	----	10.00	----	----	----	----
	06/25/90	HMC	8.80	0.02	0.01	0.01	0.70	----	----	----	----	----

#### 4.0 SAN ANDRES AQUIFER

Homestake's San Andres well, Deep Well No. 2, is monitored on a semi-annual basis for numerous water quality parameters. Tables 4.0-1, 4.0-2 and 4.0-3 present the latest water quality analysis for this well and Deep Well No. 1. The sulfate concentrations in both wells are lower in the second half of 1990 than they were in the first half. On the average a gradual rising trend has occurred in the sulfate concentrations in both the San Andreas wells. A sample was not collected from Deep Well No. 1 during the last quarter of 1990 due to the pump in this well being down.

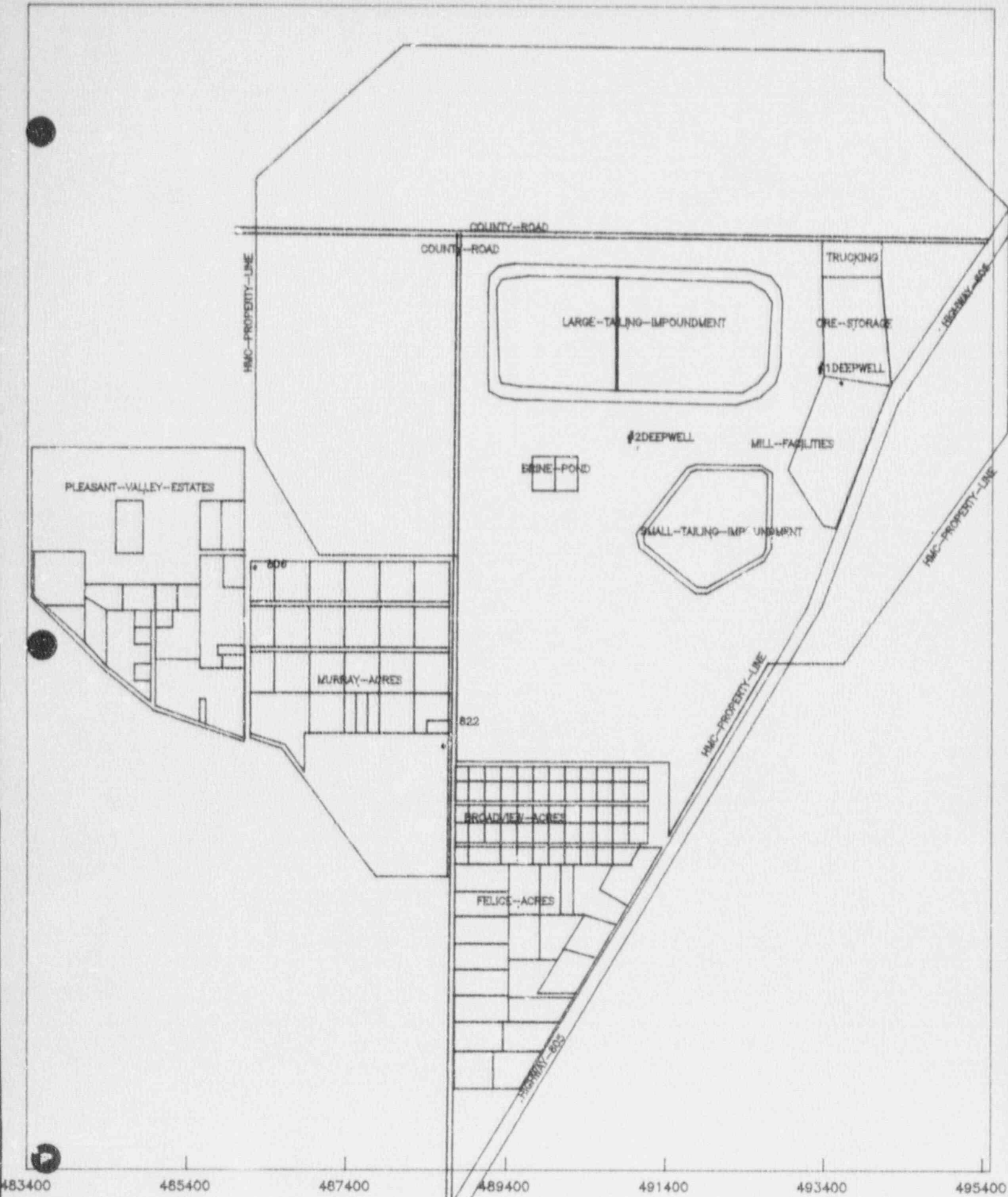
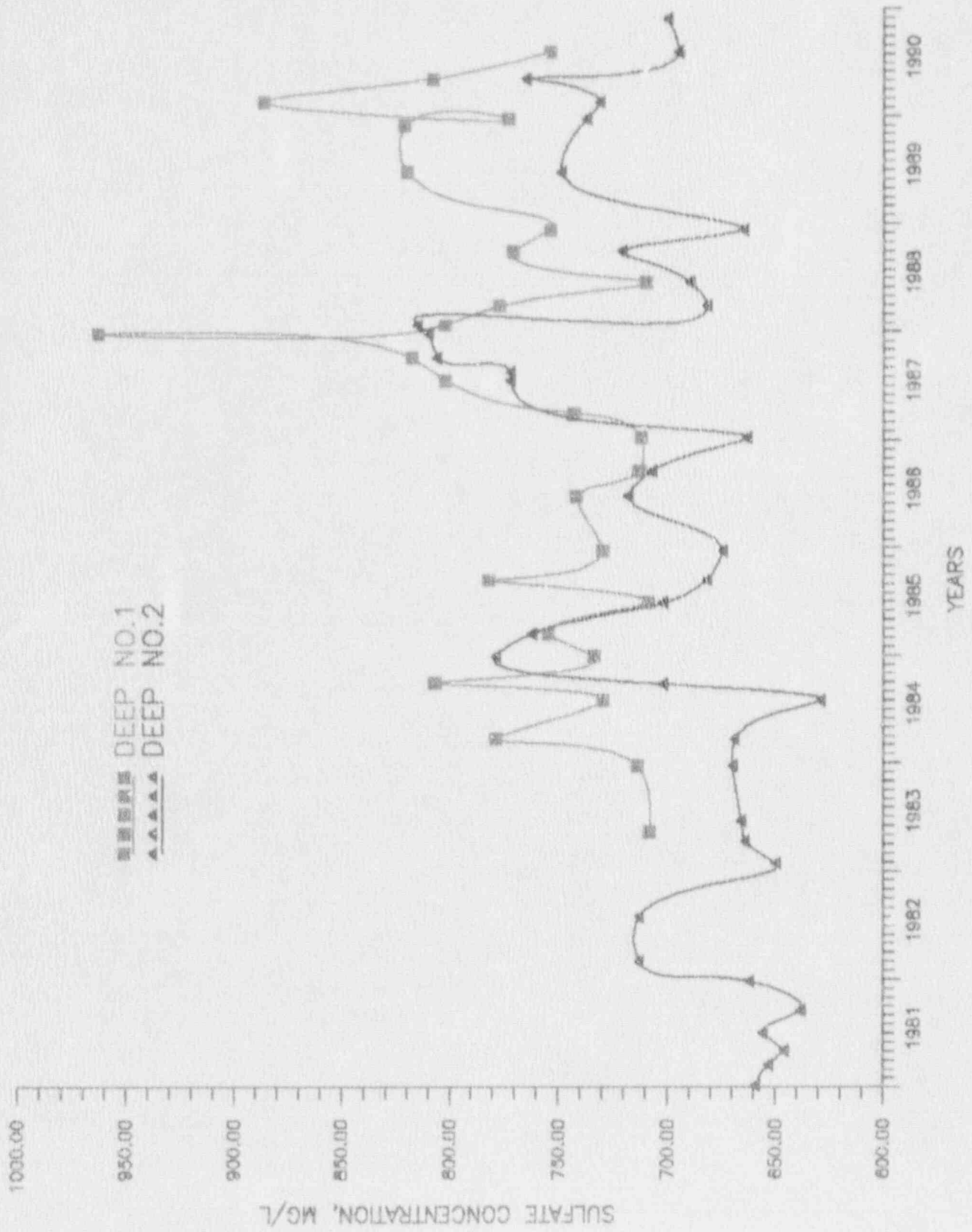


FIGURE 4.0-1. LOCATION OF SAN ANDRES WELLS.





4.0-3

FIGURE 4.0-2. SULFATE CONCENTRATION FOR WELLS DEEP NO. 1 AND DEEP NO. 2.

TABLE 4.0-1 SAN ANDRES AQUIFER WATER QUALITY DATA  
C.A. THROUGH LUMI

WELL_ID	DATE	LAB	CA (mg/l)	MG (mg/l)	K (mg/l)	NA (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	CL (mg/l)	SO4 (mg/l)	TDS (mg/l)	SPECIFIC COND	ION_BAL (RATIO)
#1DEEPMELL	02/15/90	HMC	---	---	---	---	---	---	---	886.00	2000.00	---	---
	05/09/90	HMC	314.00	9.00	7.00	352.00	603.00	---	199.00	808.00	1990.00	---	0.99
	08/07/90	HMC	---	---	---	---	---	---	---	754.00	1780.00	---	---
#2DEEPMELL	02/15/90	HMC	---	---	---	---	---	---	---	731.00	1720.00	---	---
	05/09/90	HMC	297.00	7.00	3.00	303.00	540.00	---	177.00	765.00	1770.00	---	0.96
	08/07/90	HMC	---	---	---	---	---	---	---	695.00	1700.00	---	---
	11/27/90	HMC	---	---	---	---	---	---	---	703.00	1750.00	---	---

TABLE 4.0-2 SAN ANDRES AQUIFER WATER QUALITY DATA

WELL_ID	DATE	LAB	PH	PH (UNITS)	PH THROUGH CD										
					UNAT (mg/l)	MO (mg/l)	SE (mg/l)	NO3 (mg/l)	RA226 (pCi/l)	CN (mg/l)	F (mg/l)	AS (mg/l)	BA (mg/l)	CB (mg/l)	
#1DEEPWELL	05/09/90	HMC	7.30		< 0.01	< 0.01	0.01	0.01	1.80		< 0.10	< 0.10	< 0.10	< 1.00	< 0.01
	05/09/90	BARR							0.40						
#2DEEPWELL	05/09/90	HMC	7.30		< 0.01	< 0.01	0.01	0.01	3.10		< 0.10	< 0.10	< 0.10	< 1.00	< 0.01
	05/09/90	BARR							0.30						

TABLE 4.0-3 SAN ANDRES AQUIFER WATER QUALITY DATA  
PB THROUGH CR

WELL_ID	DATE	LAB	PB (mg/L)	G (mg/L)	AG (mg/L)	CU (mg/L)	FE (mg/L)	MN (mg/L)	ZN (mg/L)	AL (mg/L)	CO (mg/L)	NI (mg/L)	CR (mg/L)
#1DEEPWELL	05/09/90	HMC	< 0.01	< 0.00	< 0.05	< 0.01	0.03	< 0.10	< 1.00	< 1.00	< 0.05	< 0.01	< 0.01
#2DEEPWELL	05/09/90	HMC	< 0.01	< 0.00	< 0.05	< 0.01	0.02	< 0.10	< 1.00	< 1.00	< 0.05	< 0.01	< 0.01

## 5.0 REFERENCES

Hydro-Engineering, 1981, Ground-Water Discharge Plan for Homestake's Mill near Milan, New Mexico, DP-200, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1983a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1983b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Fourth Quarter 1983, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1984a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, First Quarter 1984, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1984b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Second Quarter 1984, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1984c, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Third Quarter 1984, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1985a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Fourth Quarter 1984, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1985b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, First Quarter 1985, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1985c, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Second Quarter 1985, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1985d, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Third Quarter 1985, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1986a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Fourth Quarter 1985, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1986b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, First Quarter 1986, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1986c, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Second Quarter 1986, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1987a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Third and Fourth Quarters 1986, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1987b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, First and Second Quarters 1987, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1988a, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, Third and Fourth Quarters 1987, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1988b, Ground-Water Monitoring for Homestake's Mill Discharge Plan, DP-200, First and Second Quarters 1988, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1988c, Renewal Ground-Water Discharge Plan, DP-200 for Homestake's Mill Near Milan, New Mexico, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1989, Corrective Action Plan for Homestake's Tailings, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Hydro-Engineering, 1990, Ground-Water Monitoring for Homestake's Mill Discharge Plan DP-200 and NRC License SUA-1471, 1989, Consulting Report for Homestake Mining Company, Grants, New Mexico.

**OVERSIZE  
DOCUMENT  
PAGE PULLED**

---

**SEE APERTURE CARDS**

---

**NUMBER OF OVERSIZE PAGES FILMED ON APERTURE CARDS**

2

**APERTURE CARD/HARD COPY AVAILABLE FROM  
RECORDS AND REPORTS MANAGEMENT BRANCH**