Groundwater Report

Fall 2009

San Joaquin County
Flood Control and Water Conservation District

San Joaquin County
Flood Control and Water Conservation District

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Report Prepared by:

DISTRICT STAFF

Mel Lytle, Ph.D. ……..……Water Resources Coordinator
Brandon Nakagawa ……..……..... Water Resources Engineer
Gerardo Dominguez ……Engineer II

Copies of the Fall 2009 Groundwater Report may be purchased for $30 and 36″X48″ Contour Maps for $25 each from:

San Joaquin County Department of Public Works
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Make checks payable to: San Joaquin County Department of Public Works

Acknowledgements

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This Groundwater Report is a product of the commitment that the San Joaquin County Flood Control and Water Conservation District together with many other interested agencies made to sustain and enhance the groundwater resources of the Eastern San Joaquin Basin. The District extends thanks to…

California Water Service

City of Lathrop

City of Lodi

City of Manteca

City of Stockton Municipal Utilities Department

East Bay Municipal Utility District

Libby-Owens-Ford, Lathrop

Morada Area Association

Newark Sierra Paperboard Company

Pacific Gas and Electric Company

San Joaquin County Department of Public Works

State of California, Department of Water Resources, Central District

Stockton East Water District

United States Bureau of Reclamation

United States Geological Survey

Most of all, we would like to thank all of the individual well owners, who give us access to their wells and in some cases some of their time.

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Table of Contents

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San Joaquin County Flood Control and Water Conservation District
Fall 2009 Groundwater Report

Introduction

Since the fall of 1971, the San Joaquin County Flood Control and Water Conservation District has monitored groundwater levels and groundwater quality and has published the data in the Semi-annual Groundwater Report. This report utilizes data from federal, state and local government agencies as well as non-governmental sources.

Water level data is collected on a semi-annual basis, during the months of April and October, to observe groundwater levels before and after peak groundwater pumping conditions. Over 450 wells, of which 250 are measured by County staff, are included in the Monitoring Program. The exact number of wells varies from year to year, depending on circumstances such as destructions, new well construction, well accessibility, and well condition.

Purpose

The purpose of the Semi-annual Groundwater Report is to provide information on groundwater conditions in San Joaquin County and to publish the results of the groundwater monitoring program which consists of the following:

1. Monitor groundwater quality along a North-South line from the north of the City of Stockton to the City of Lathrop.
2. Measure groundwater levels on a County-wide basis.

In general, water quality data is more meaningful after peak production which usually occurs during the summer month. Therefore, groundwater quality data will be published only in the fall report. The groundwater depth and elevation data will be published in both the spring and fall.

Saline intrusion from the west is a continuing concern, affecting the quality of groundwater in the Basin. Groundwater quality analysis is completed on an annual basis, from approximately 18 municipal and domestic supply wells (exact number varies from year to year), located in proximity to the saline front.

Procedure

Groundwater quality sampling is conducted on an annual basis during the month of October, along with the Fall Measurements. Approximately 18 wells are currently sampled in the county (Figure 2-1). The exact number of wells may vary depending on well access and other conditions. Replicate groundwater samples (two) are analyzed for Chloride (Cl^-) using the Thomas Scientific 675 pH/ISE meter in conjunction with the ISE Cl^- Combination Electrode, and analyzed for Electrical Conductivity (EC) using DiST 3 by Hanna Instruments. Total Dissolved Solids (TDS) are calculated using the formula: TDS = 0.64 X EC(umhos). Data is then stored in a database for accessibility and reporting requirements.

Water Level Measurements are performed with the use of either a steel chain or sounder. Data is immediately recorded in field books and then stored in a database for accessibility and reporting requirements.

Section 1–Rainfall Distribution

Summary of Rainfall Distribution

The underlying groundwater basin levels in San Joaquin County respond to changes in annual precipitation. There are four total annual precipitation graphs and four monthly precipitation graphs included in this report (Figures 1-1 through 1-8). These graphs reflect three areas located across San Joaquin County and one area in Calaveras County. The station located at the Stockton Fire Station No. 4, as well as the station located in Tracy Carbona, has pertinent data beginning in 1940. Lodi station has data from 1949 to 2010. The Camp Pardee station has data available from 1949 to 2010.

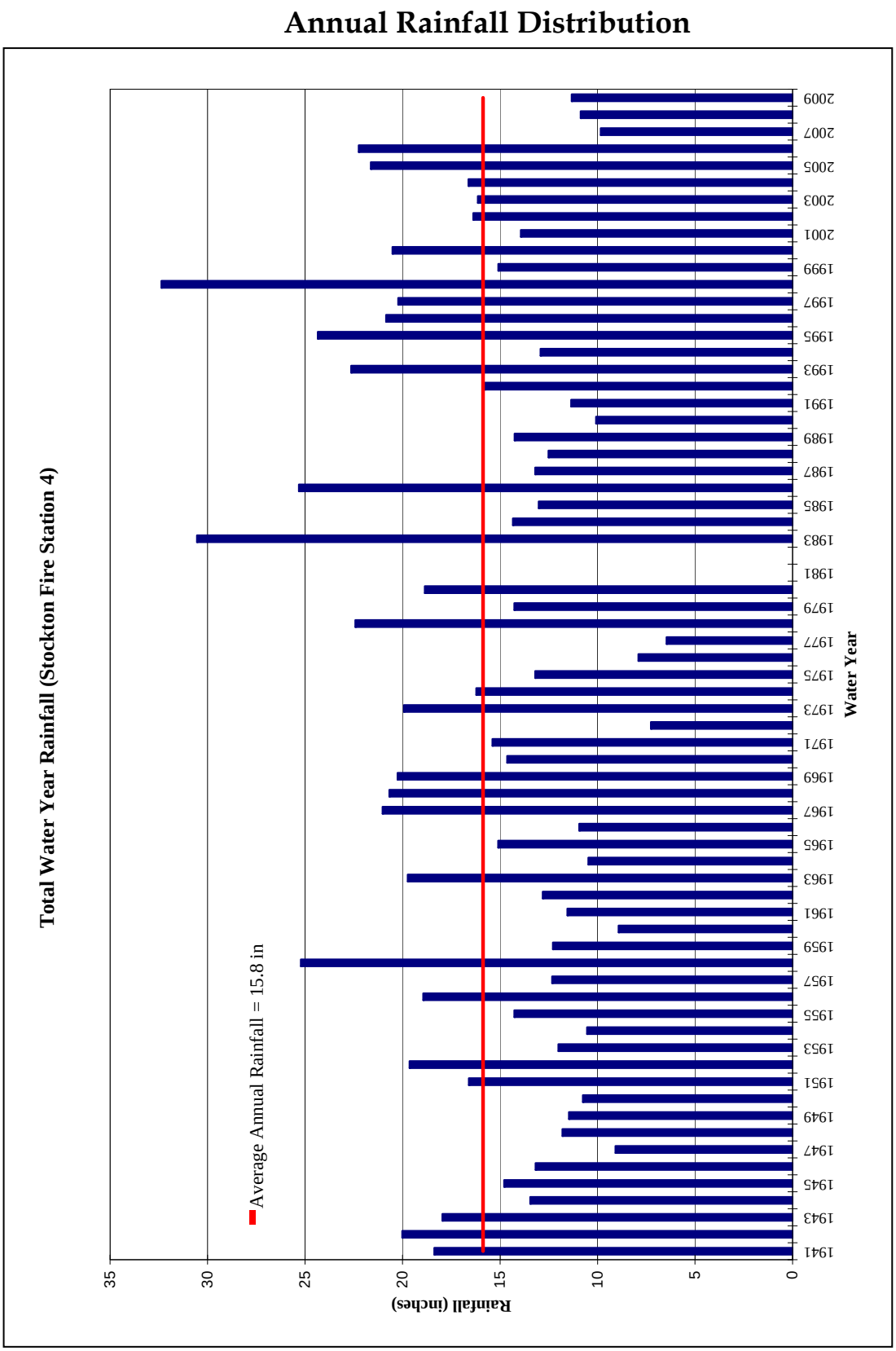

Figure 1-1: Total Annual Rainfall (Stockton Fire Station 4)

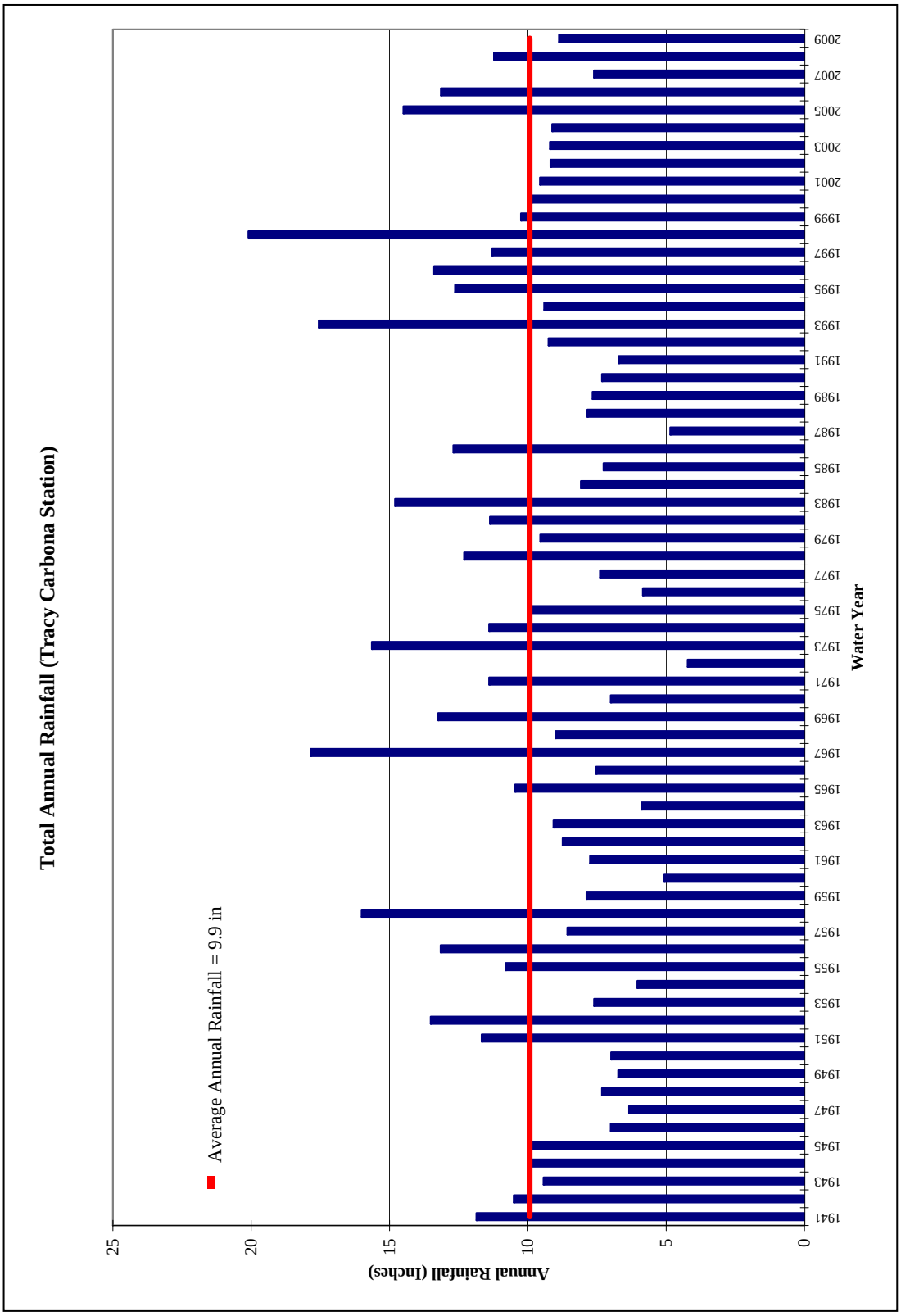

Figure 1-2: Total Annual Rainfall (Tracy Carbona Station)

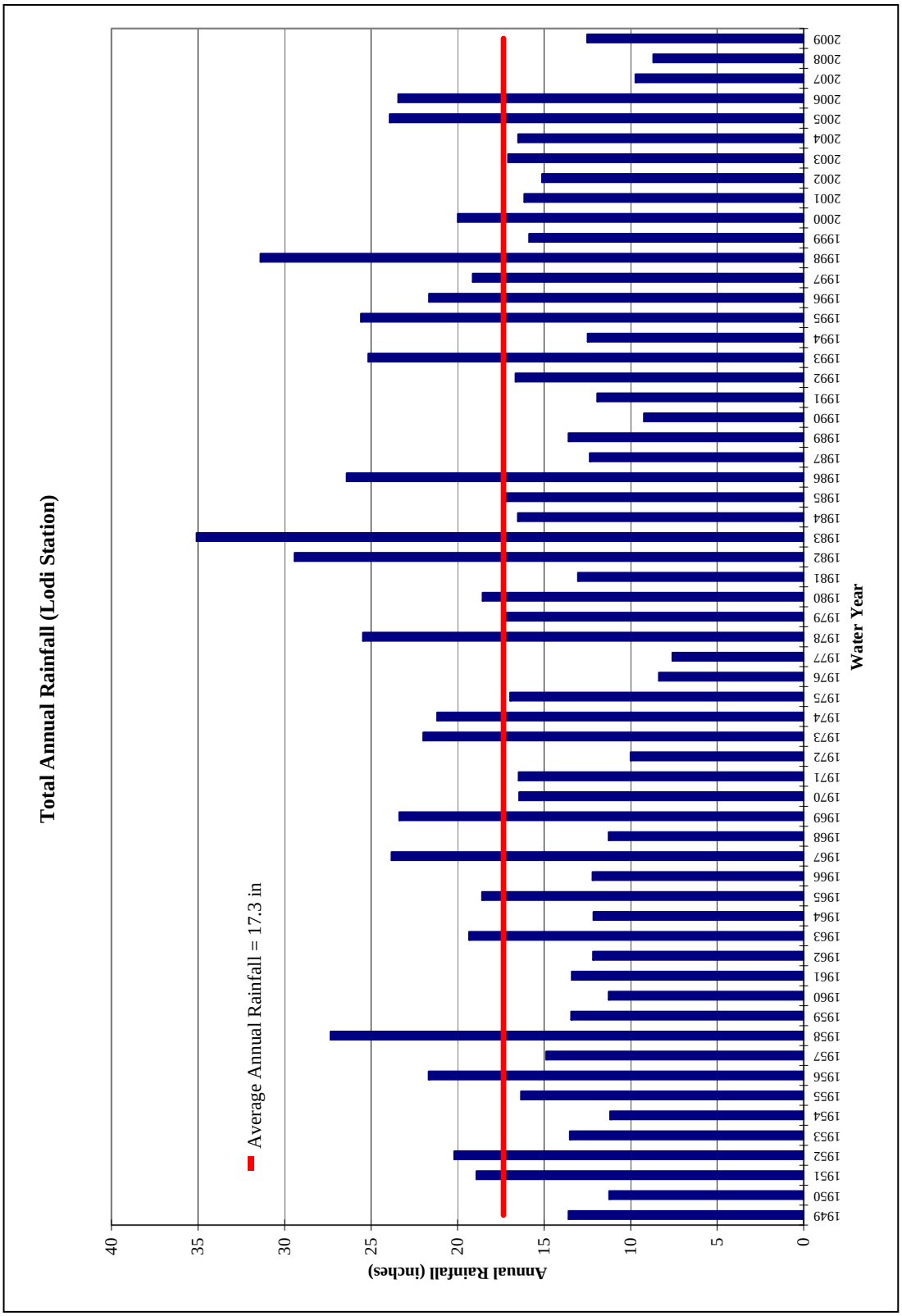

Figure 1-3: Total Annual Rainfall (Lodi Station)

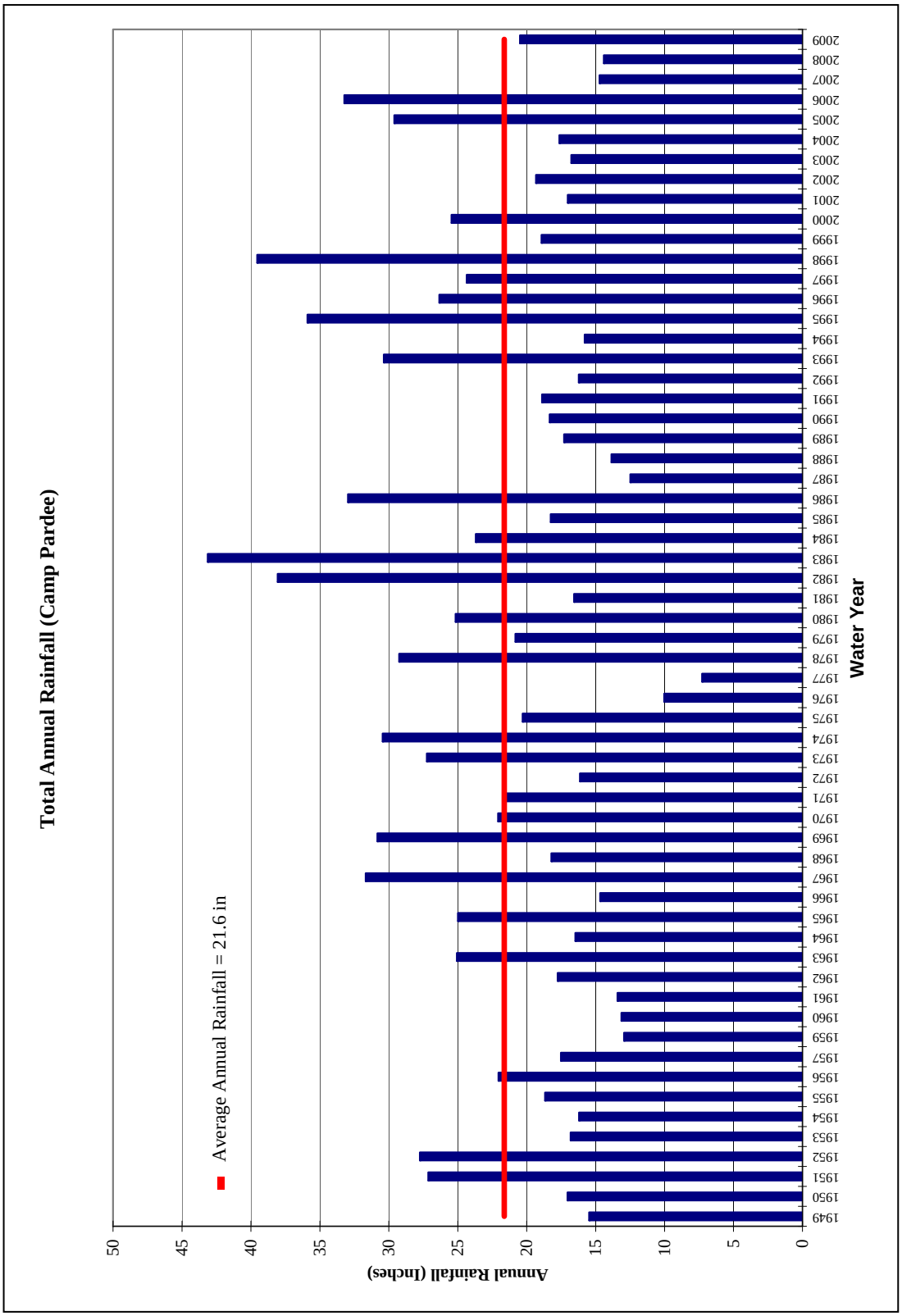

Figure 1-4: Total Annual Rainfall (Camp Pardee)

Monthly Rainfall Distribution

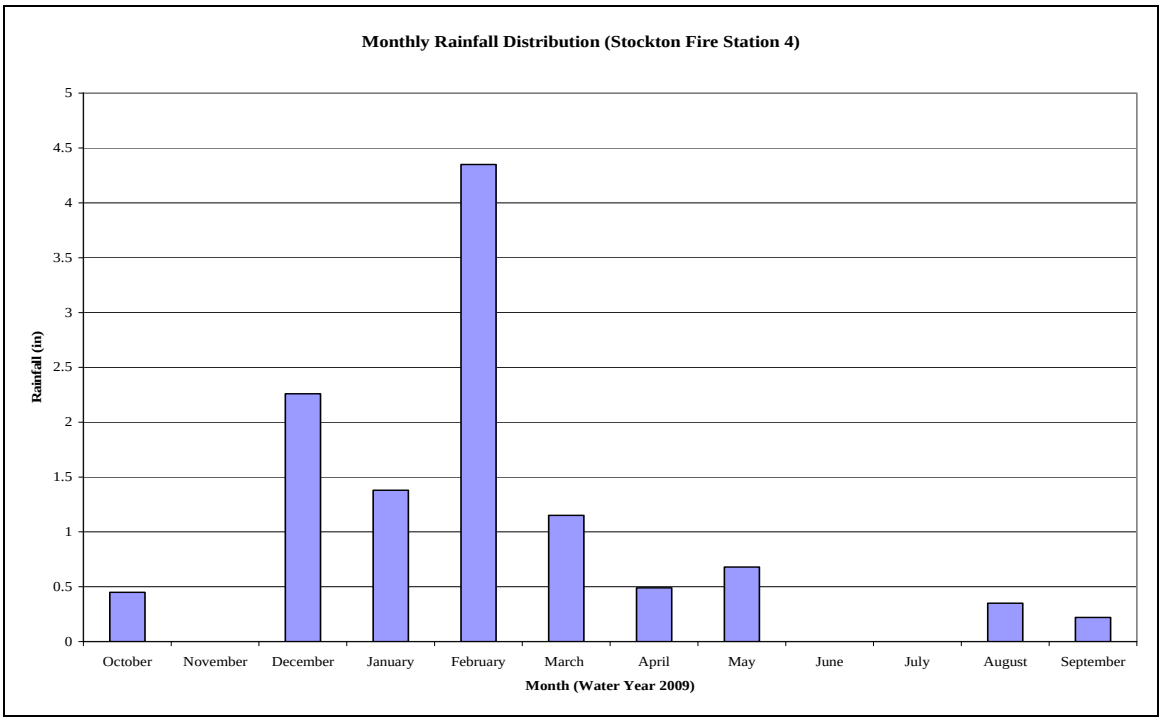

Figure 1-5: Monthly Rainfall Distribution (Stockton Fire Station 4)

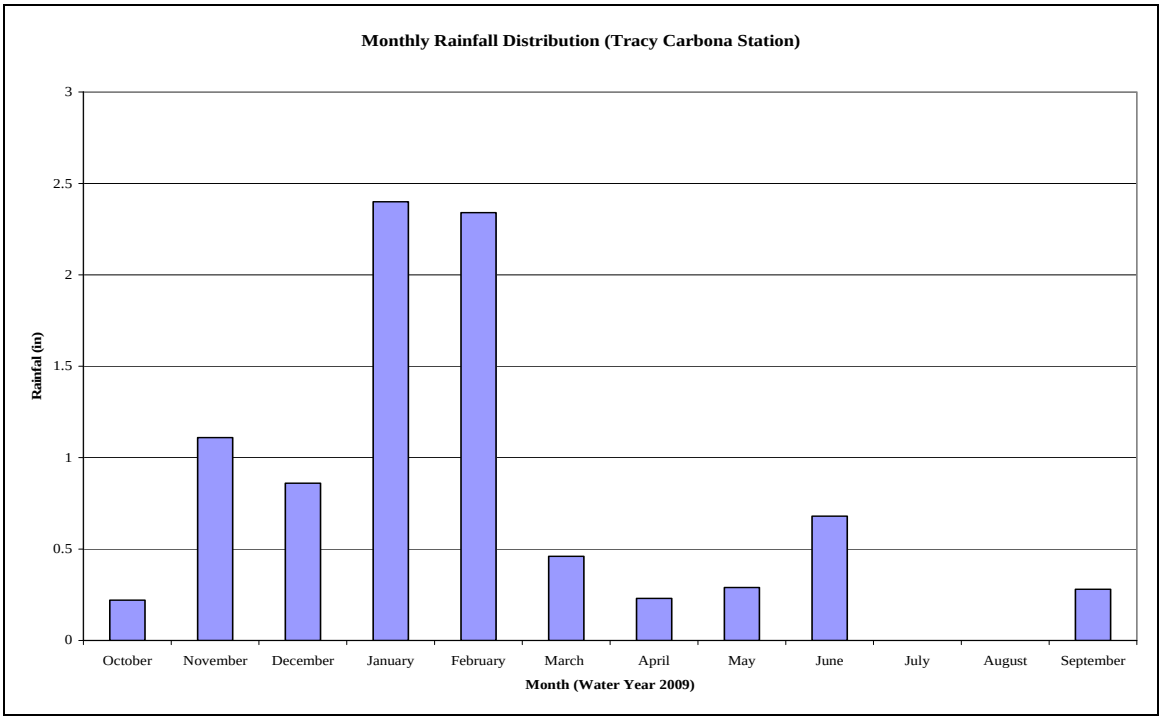

Figure 1-6: Monthly Rainfall Distribution (Tracy Carbona Station)

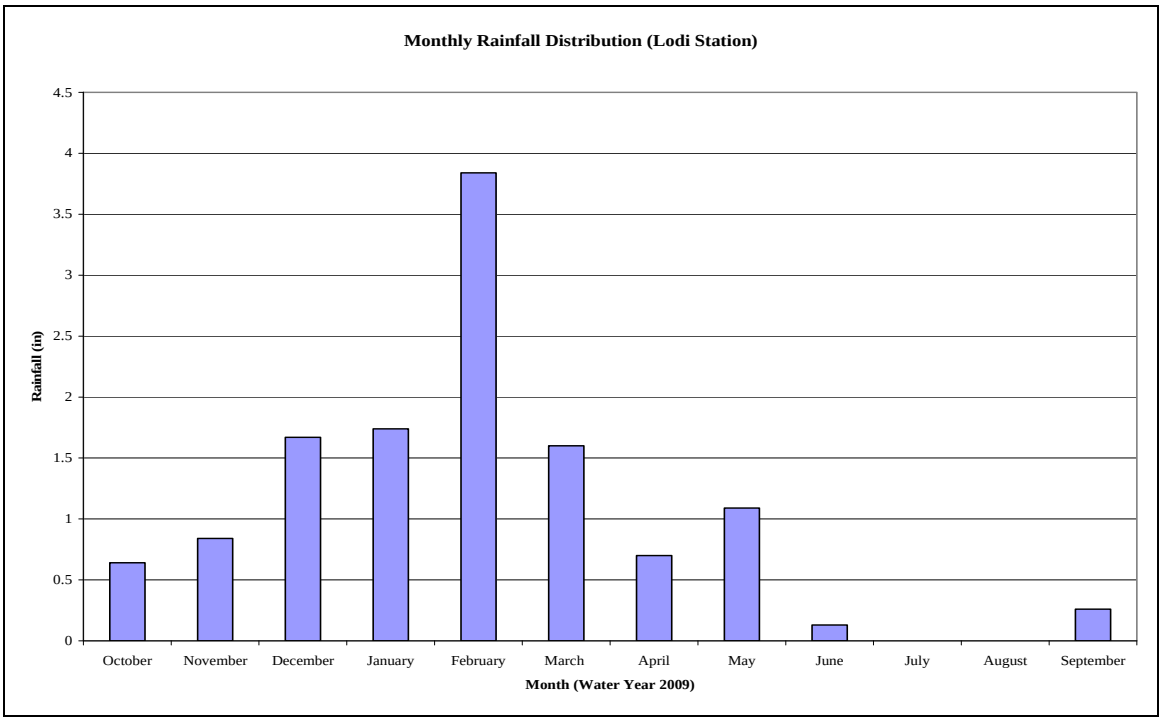

Figure 1-7: Monthly Rainfall Distribution (Lodi Station)

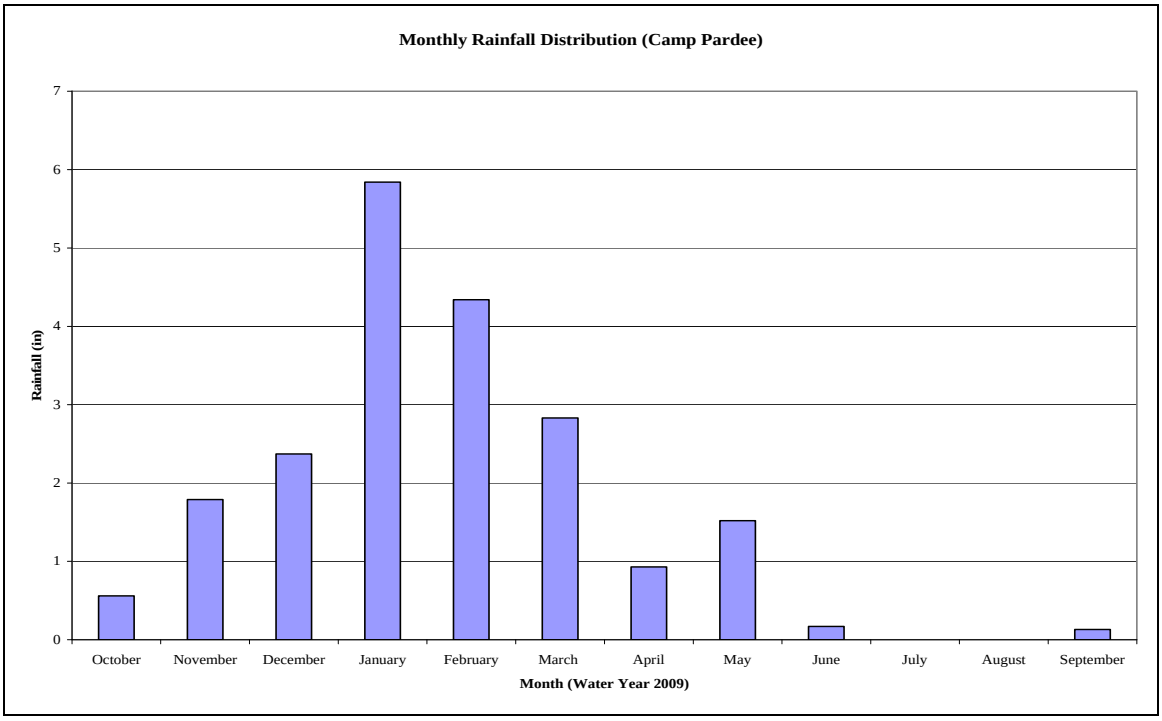

Figure 1-8: Monthly Rainfall Distribution (Camp Pardee)

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Section 2 – Groundwater Quality Monitoring

Summary of Groundwater Quality Results

The information contained in the Fall 2009 Groundwater Report is summarized as follows:

North San Joaquin County – One well was tested for chloride ions (Cl^-), electrical conductivity (EC) and total dissolved solids (TDS). There was a slight decrease in Cl^- and a slight increase in EC and TDS from the previous measurements in the fall of 2008.

North Stockton – Five wells were tested for Cl^-, EC and TDS in North Stockton. Two wells decreased in Cl^- concentrations while three increased in Cl^- concentration from the analysis in the fall 2008. Four wells increased in EC levels and one of the wells stayed relatively at the same level of EC when compared to last year's measurements. Of the five wells four have higher concentrations of TDS and one has the same concentration when compared to the fall 2008 measurements.

Central Stockton – One well was tested for Cl^-, EC and TDS in Central Stockton. Concentrations in Cl^- decreased, EC and TDS increased.

County Hospital Area - Two wells were tested near the San Joaquin County Hospital. All of the analysis show increases in concentrations except for Cl^- in one of the wells.

Lathrop – Three wells were sampled in Lathrop. Well 25M3 was the only well to increase in Cl^- concentration. Well 36B1 was the only well with higher concentration of EC and TDS. All other analysis showed decreases in concentrations.

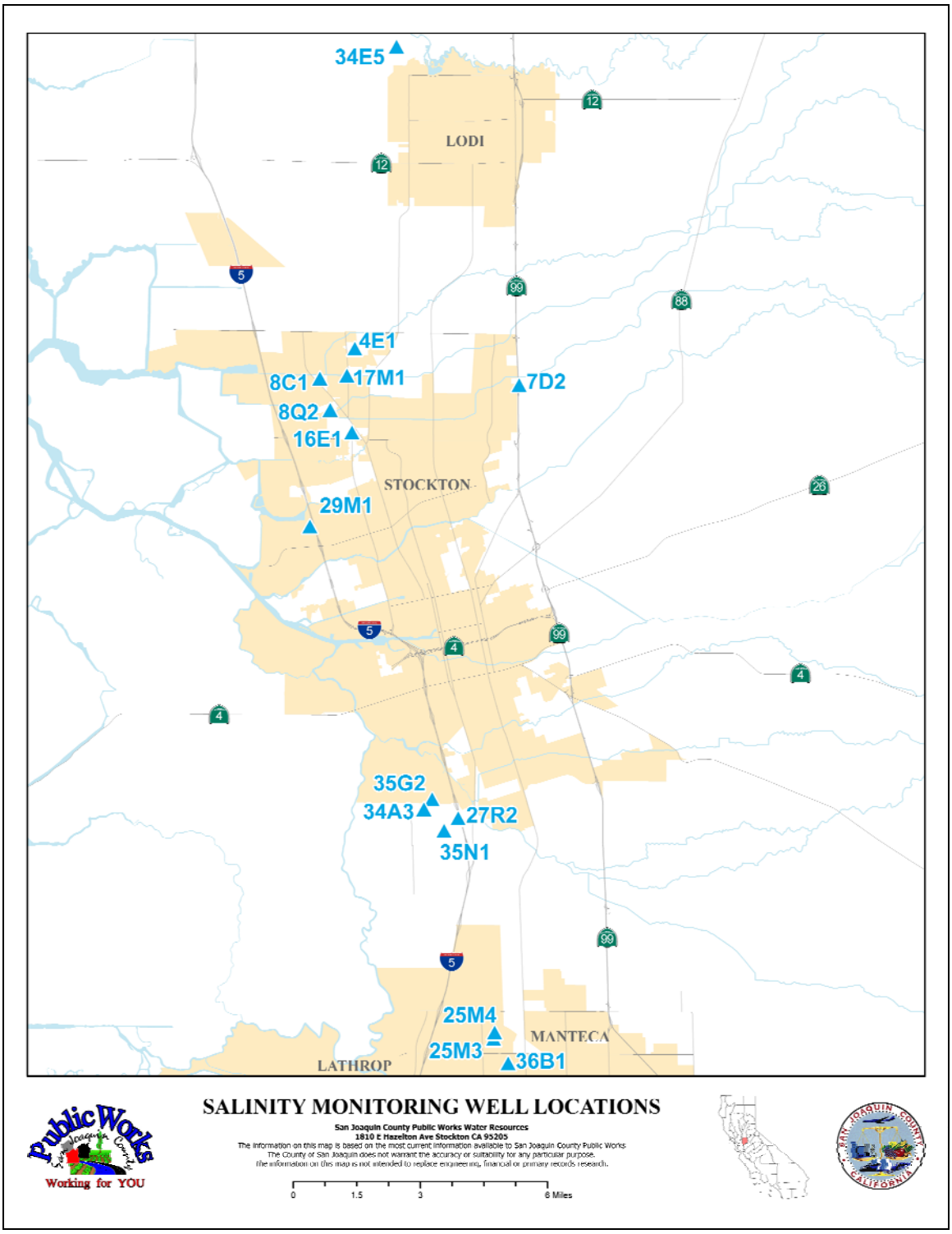

Figure 2-1: Salinity Monitoring Well Locations

Table 2-1: Groundwater Quality Mineral Analysis Fall 2009

Well	Chloride ppm	EC mmho	TDS* ppm
27R2	-		
34A3	1939	6.240	3993.6
35G2	818	3.170	2028.8
35N1	-		
25M3	69	0.619	396.16
25M4	30	0.440	281.6
36B1	16	0.540	345.6
4E1	29	0.524	335.36
8C1	23	0.572	366.08
8Q2	-		
16E1	50	0.956	611.84
17M1	23	0.284	181.76
29M1	77	0.551	352.64
7D2	13	0.404	258.56
34E5	22	0.736	471.04

*TDS values are calculated by the following formula: TDS = .64*1000*EC

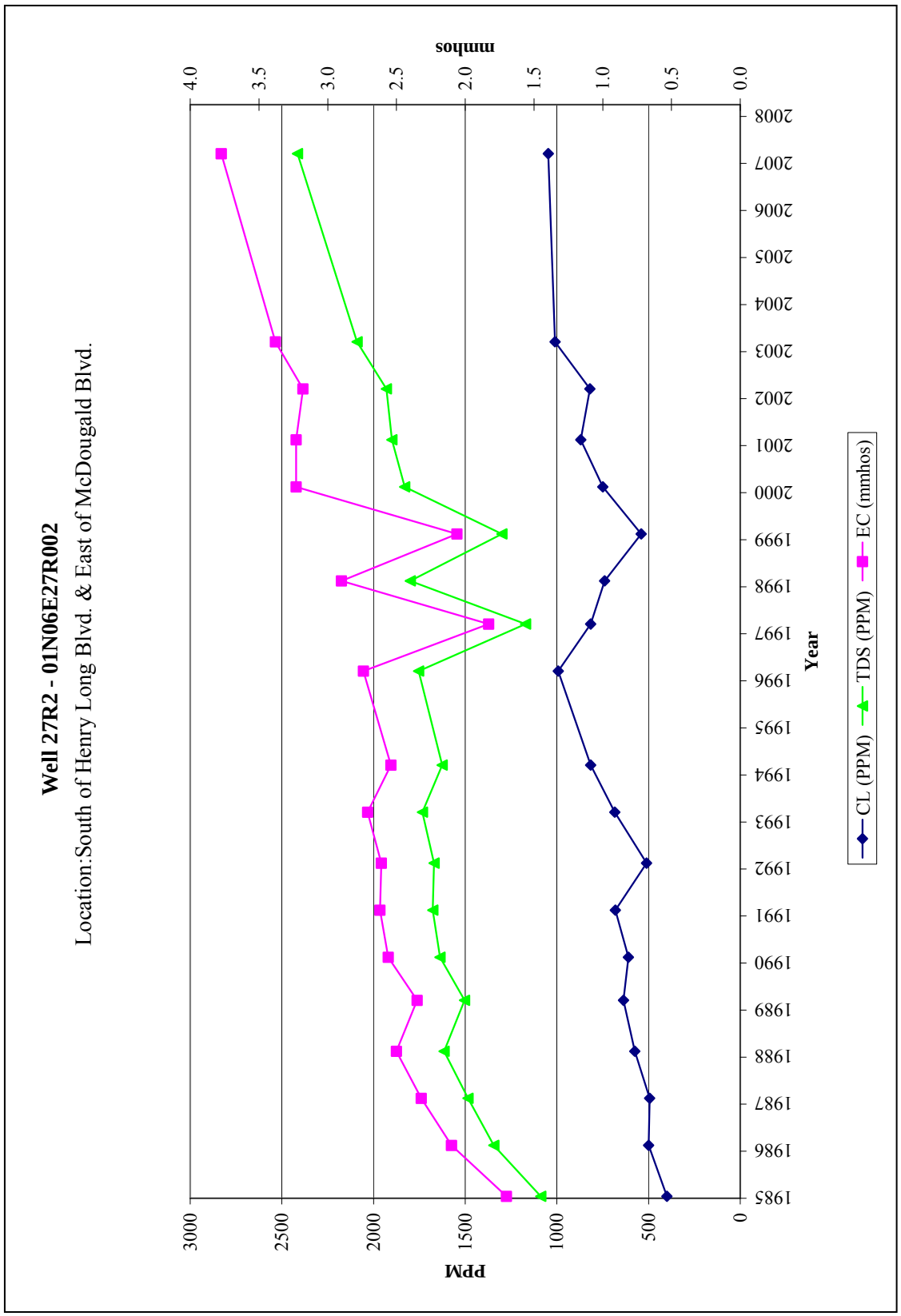

Figure 2-2: Quality Comparison Graph Well 27R2

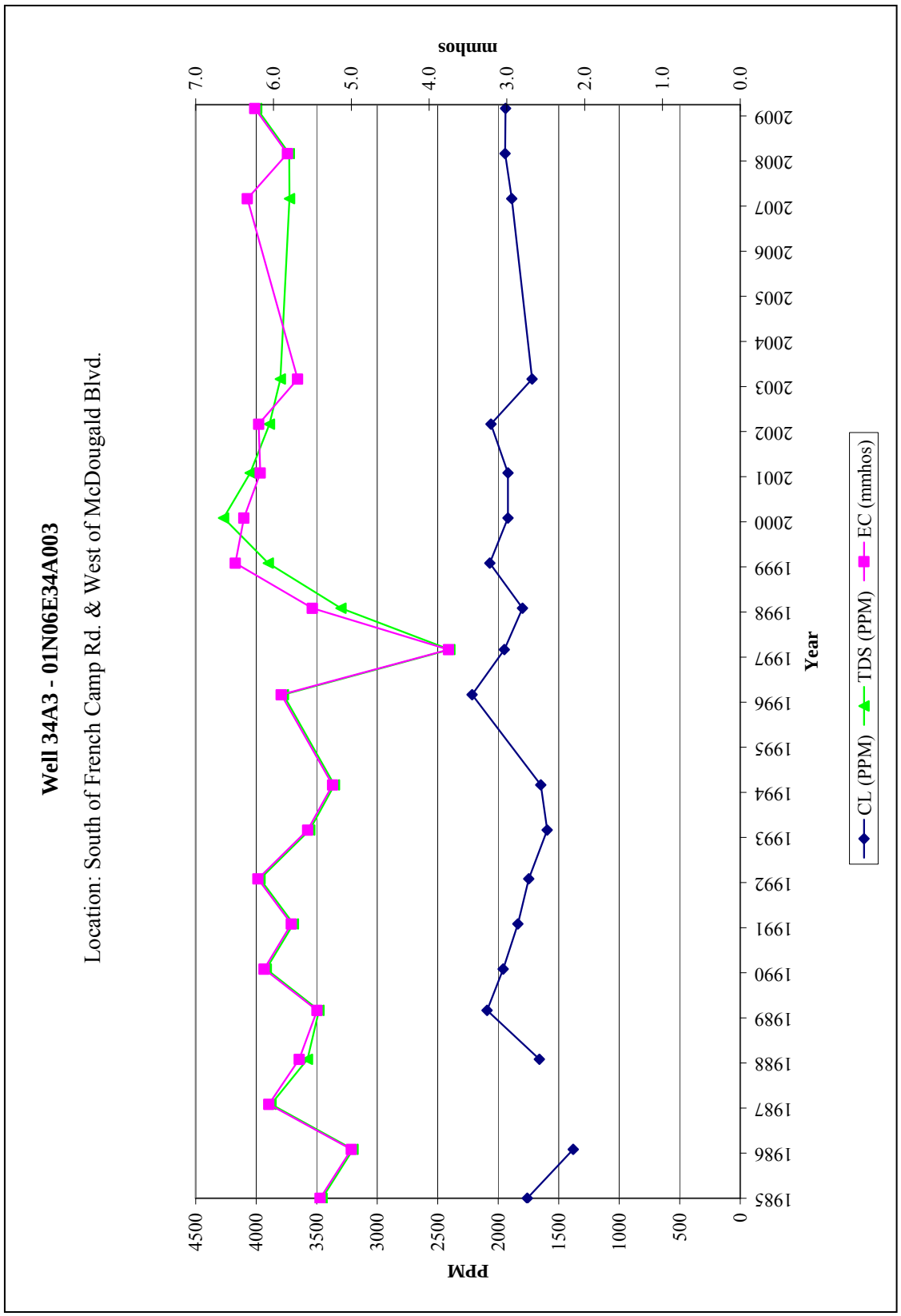

Figure 2-3: Quality Comparison Graph Well 34A3

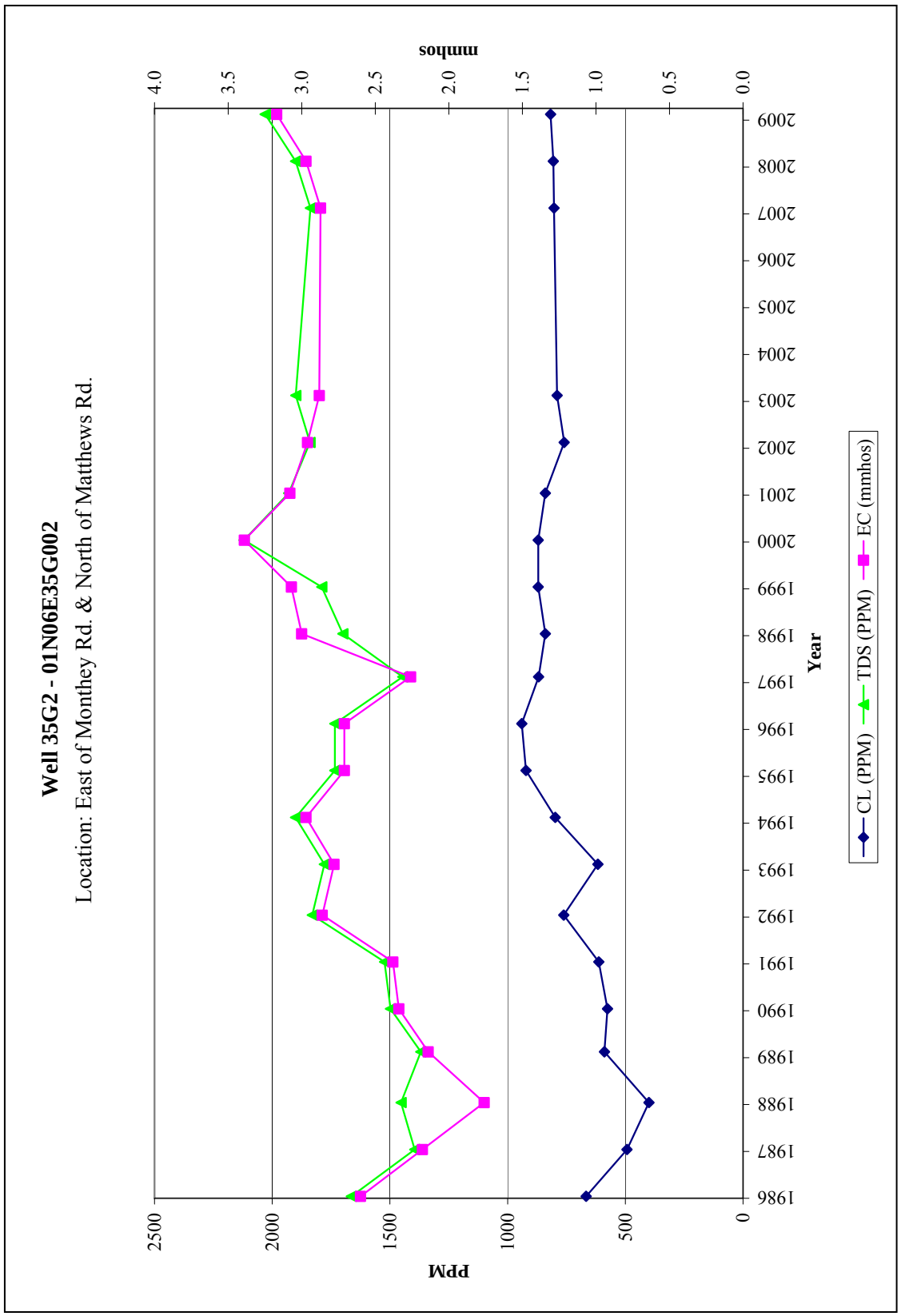

Figure 2-4: Quality Comparison Graph Well 35G2

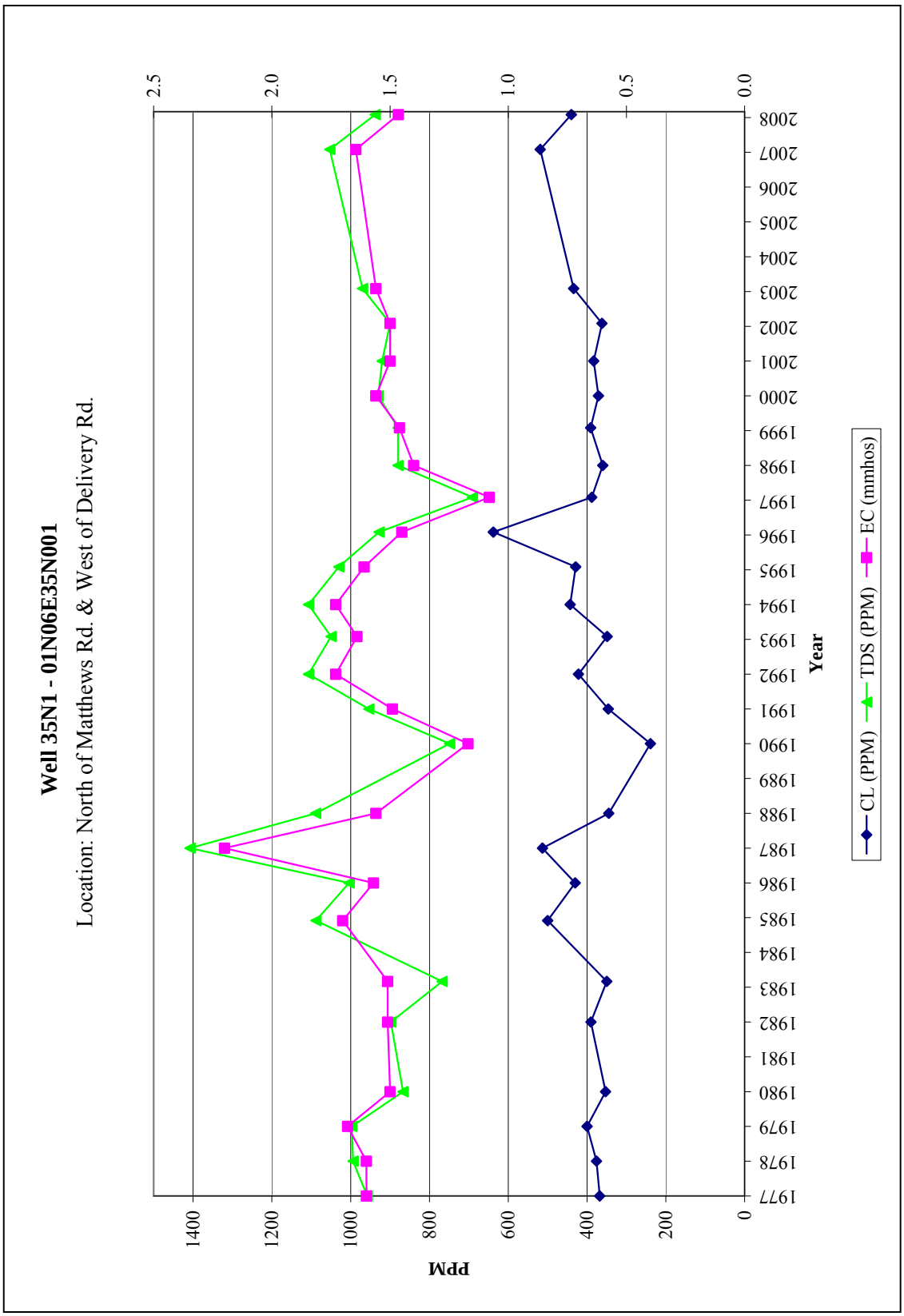

Figure 2-5: Quality Comparison Graph Well 35N1

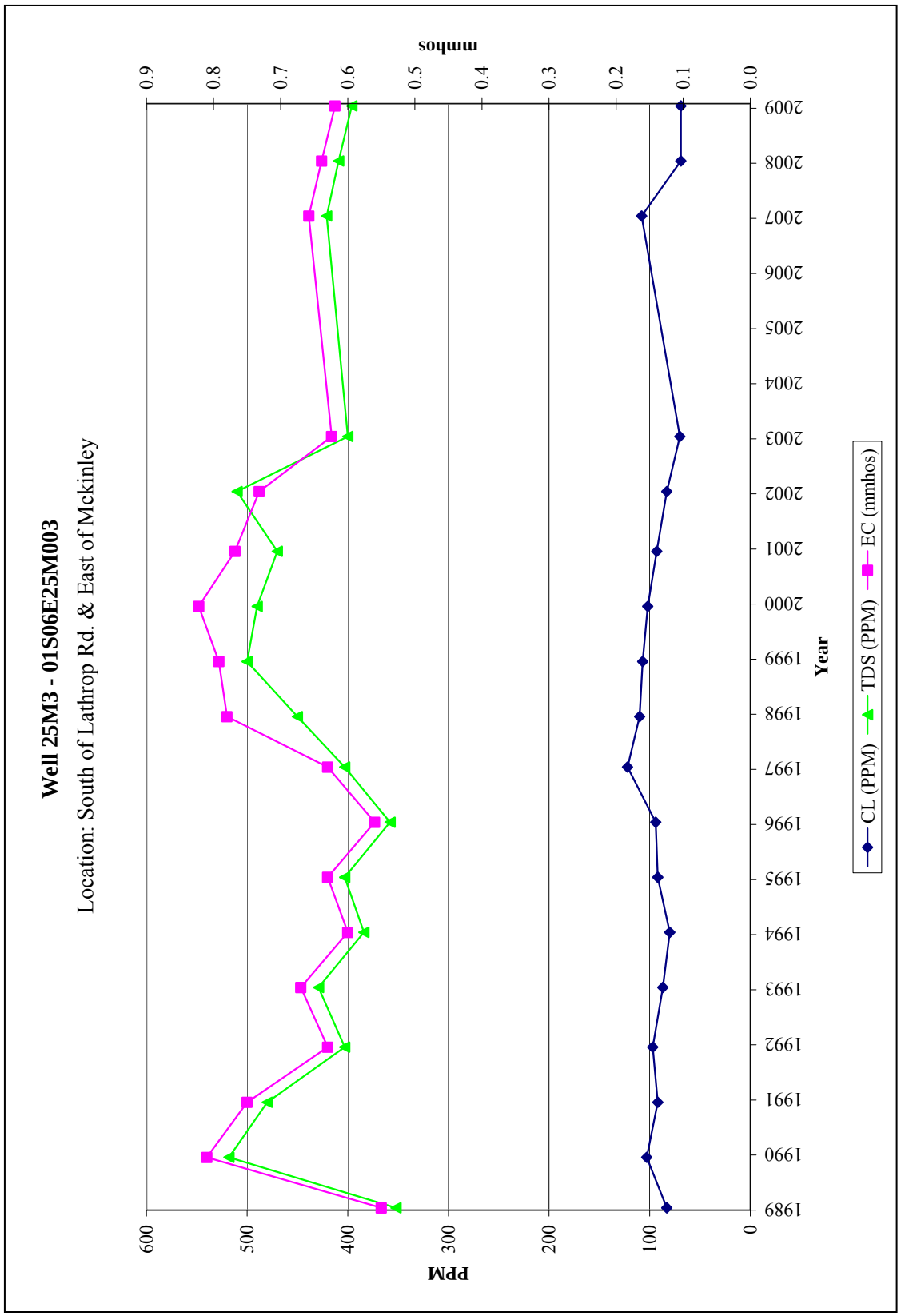

Figure 2-6: Quality Comparison Graph Well 25M3

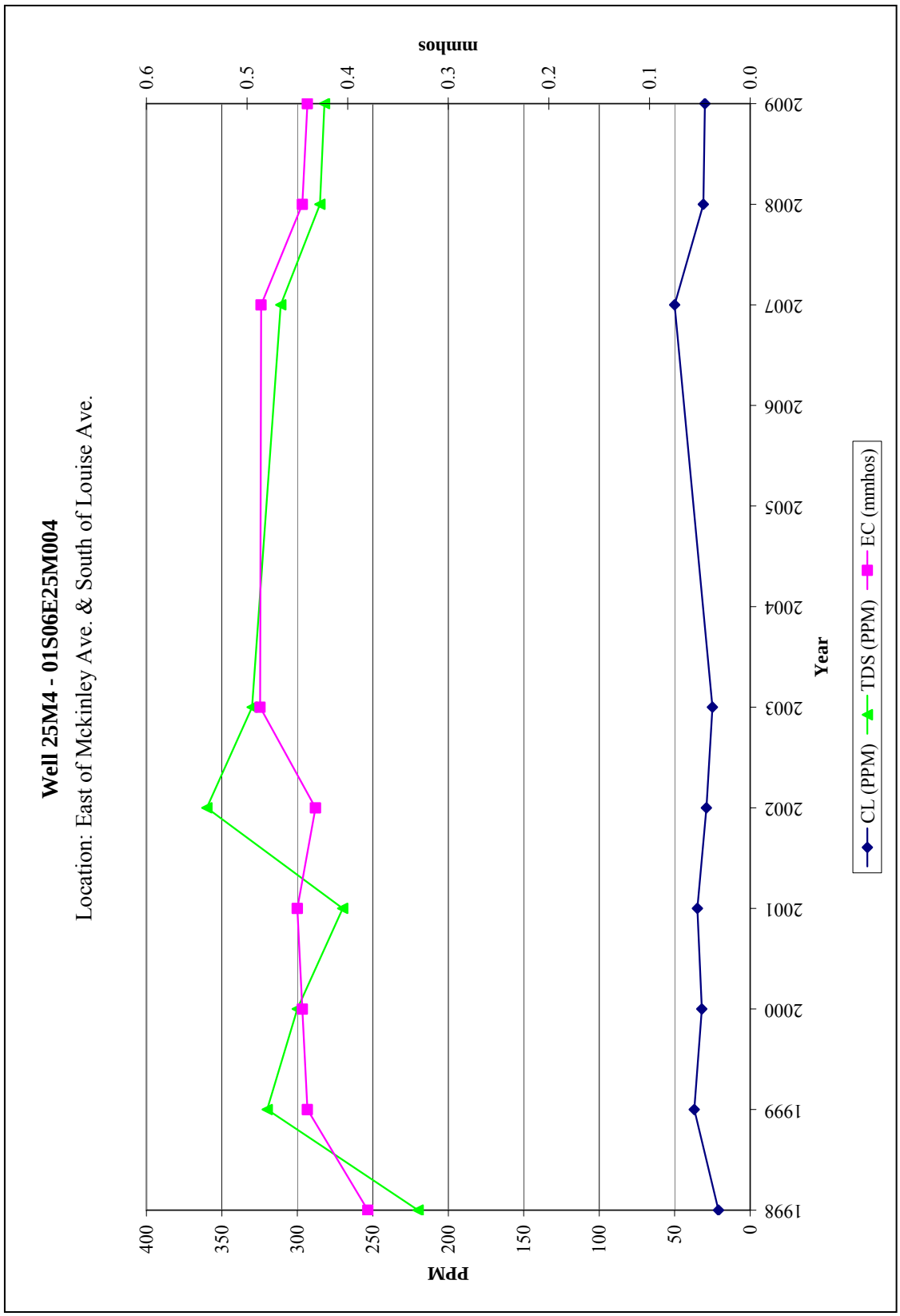

Figure 2-7: Quality Comparison Graph Well 25M4

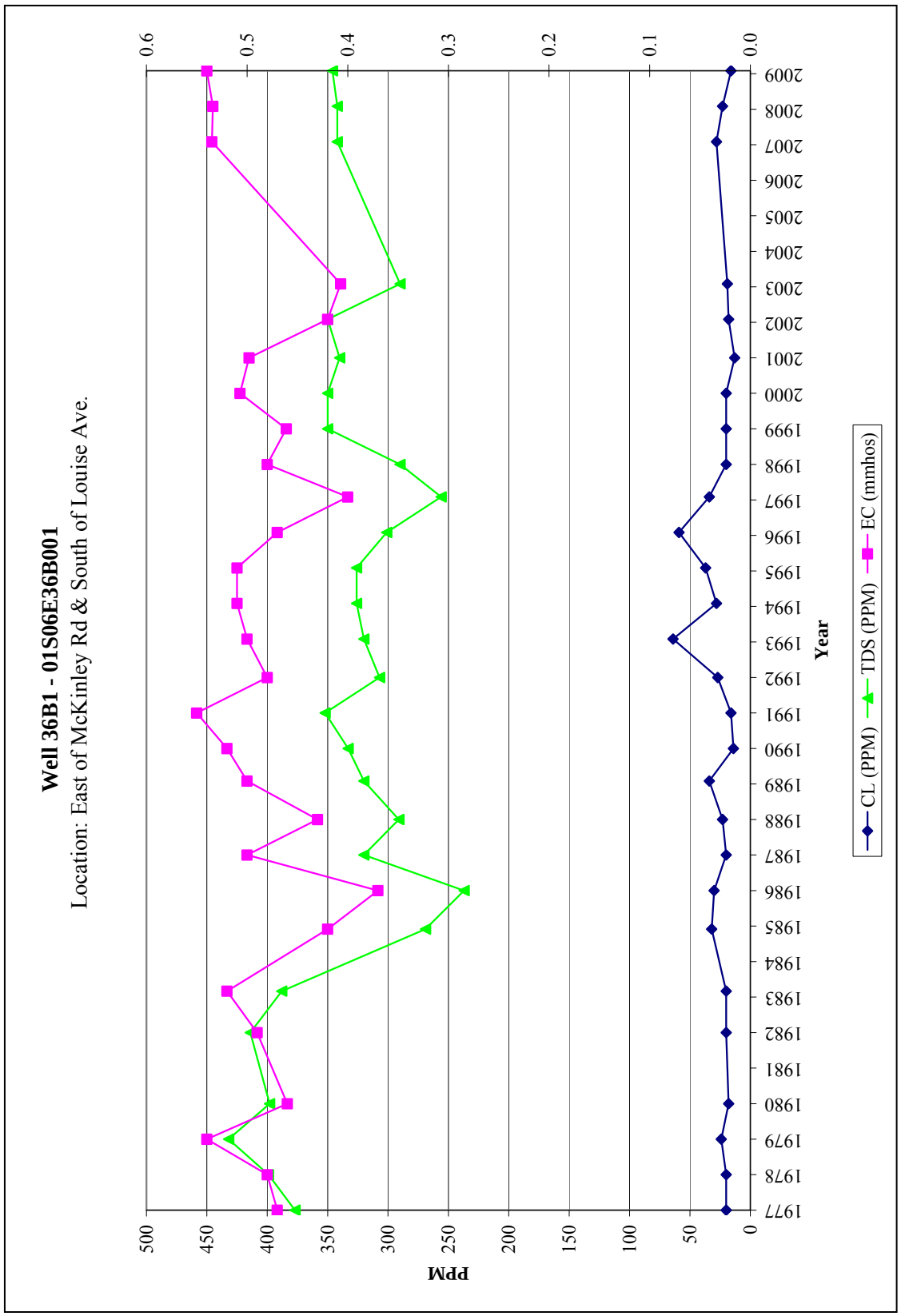

Figure 2-8: Quality Comparison Graph Well 36B1

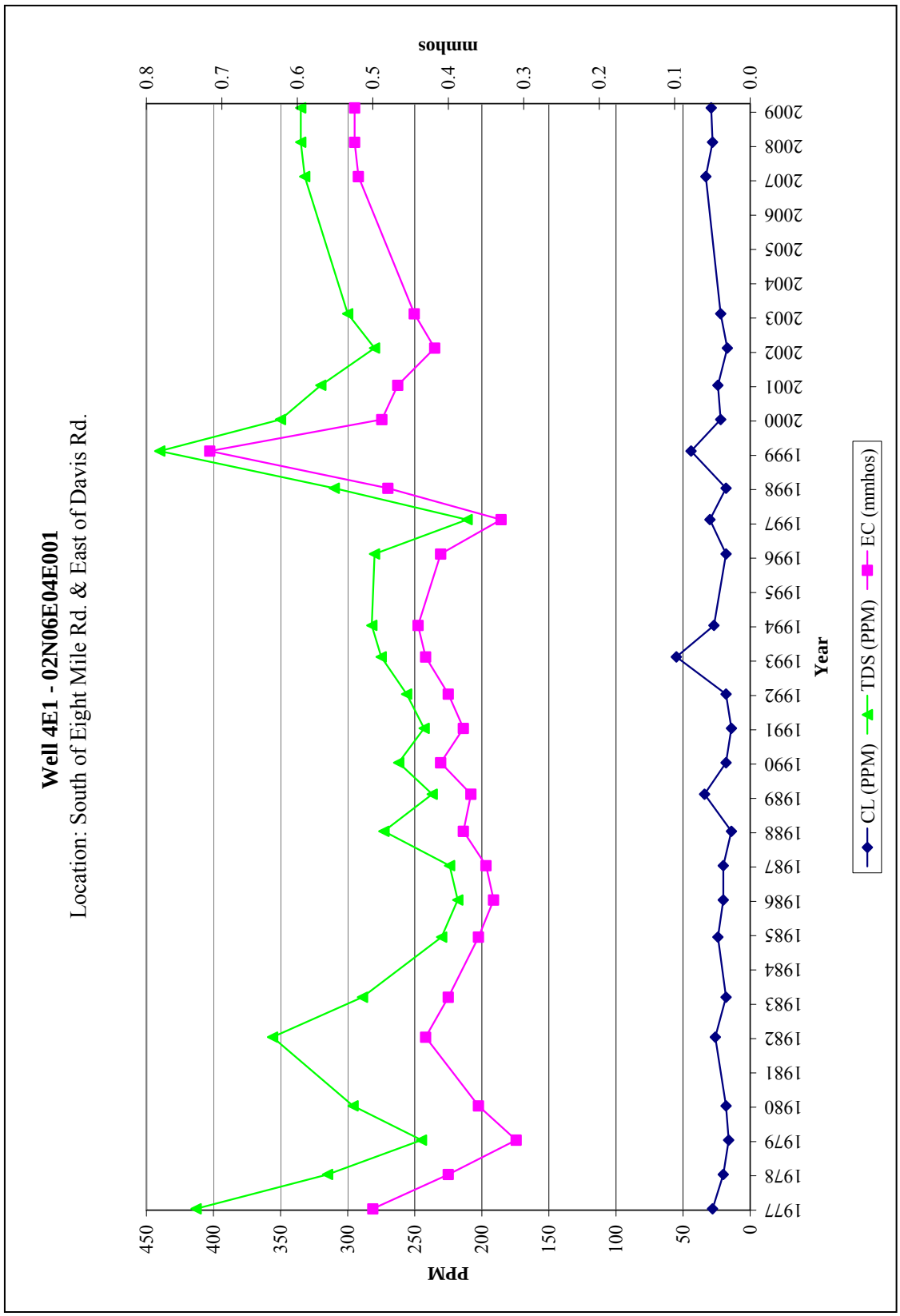

Figure 2-9: Quality Comparison Graph Well 4E1

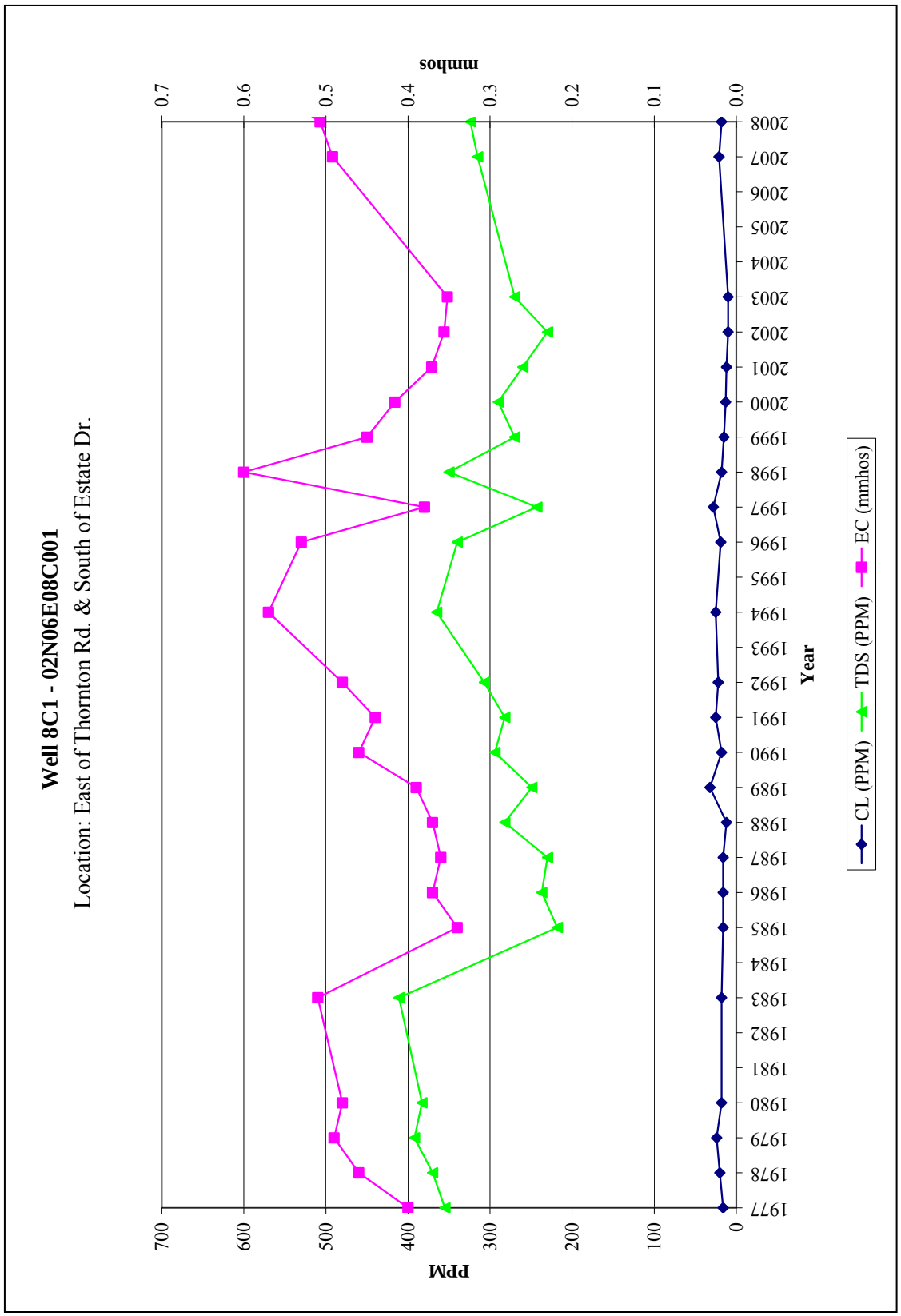

Figure 2-10: Quality Comparison Graph Well 8C1

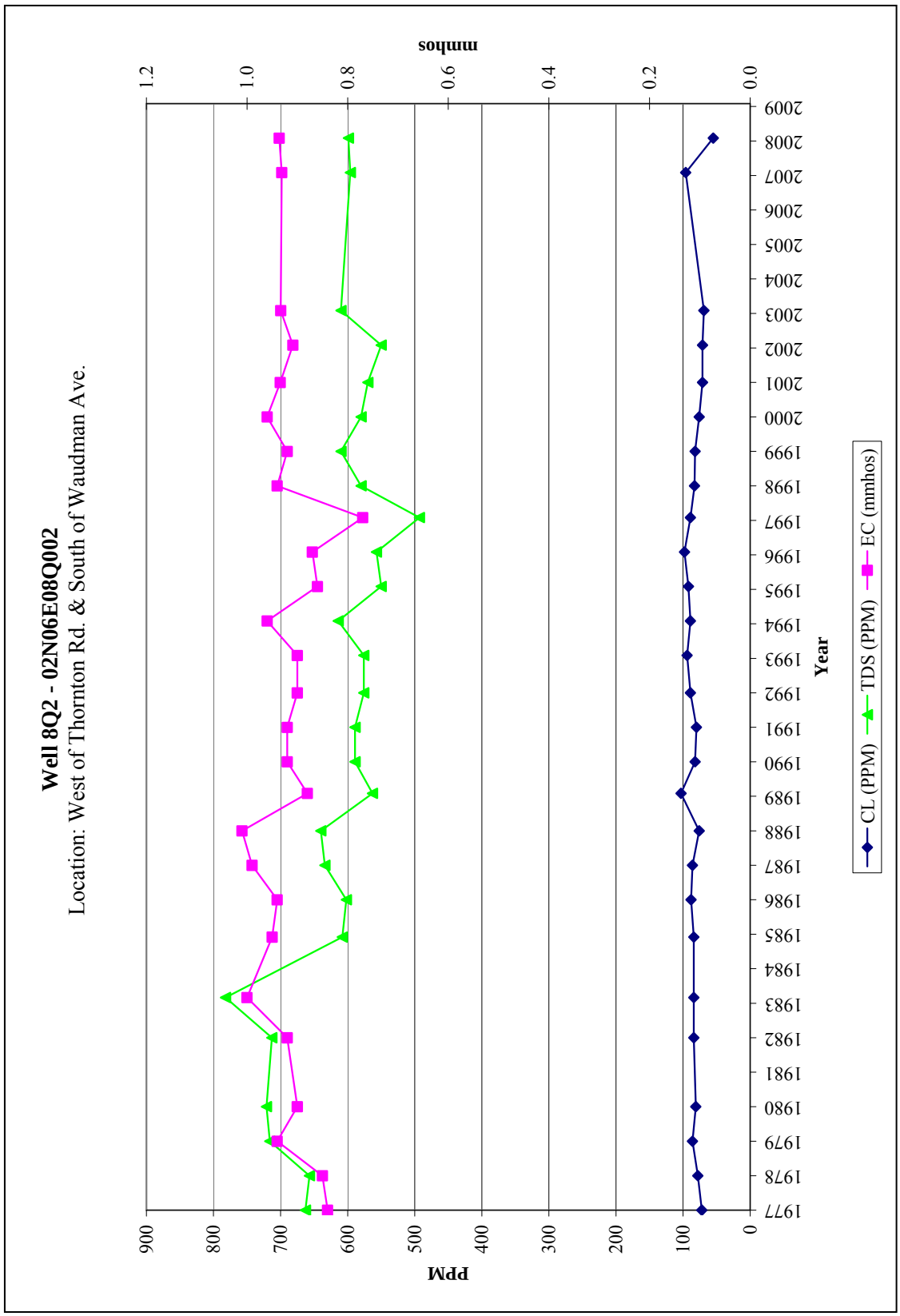

Figure 2-11: Quality Comparison Graph Well 8Q2

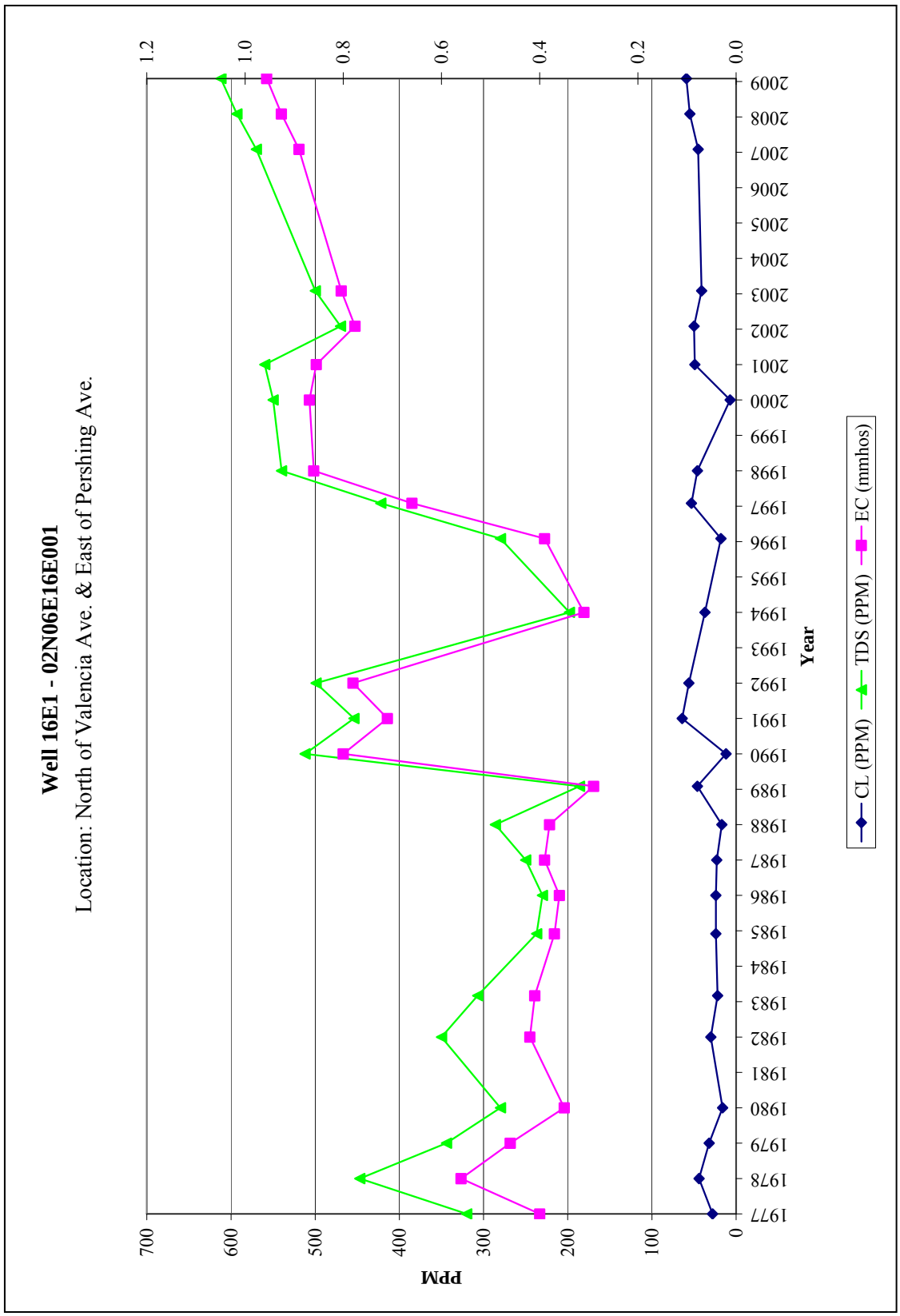

Figure 2-12: Quality Comparison Graph Well 16E1

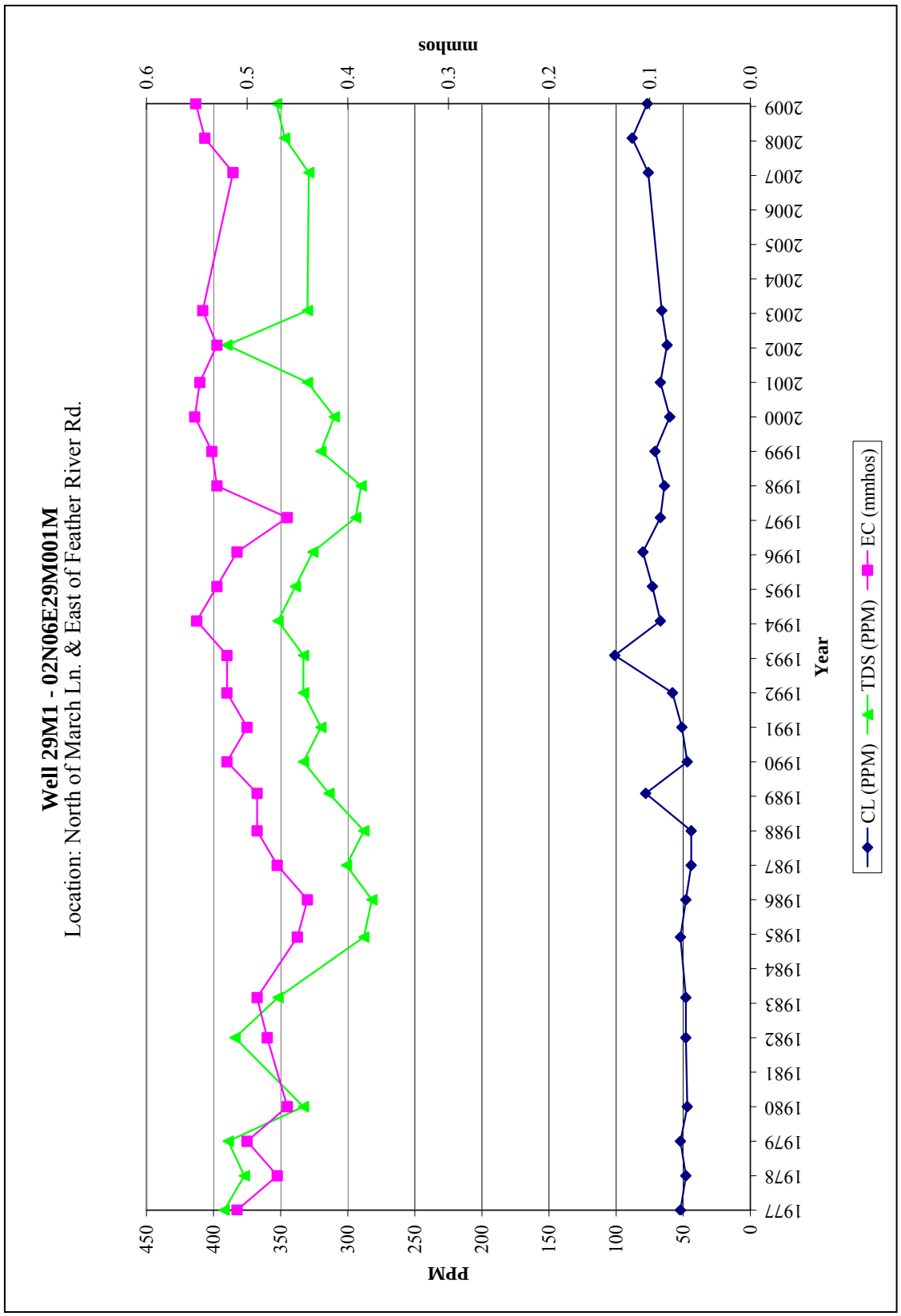

Figure 2-13: Quality Comparison Graph Well 29M1

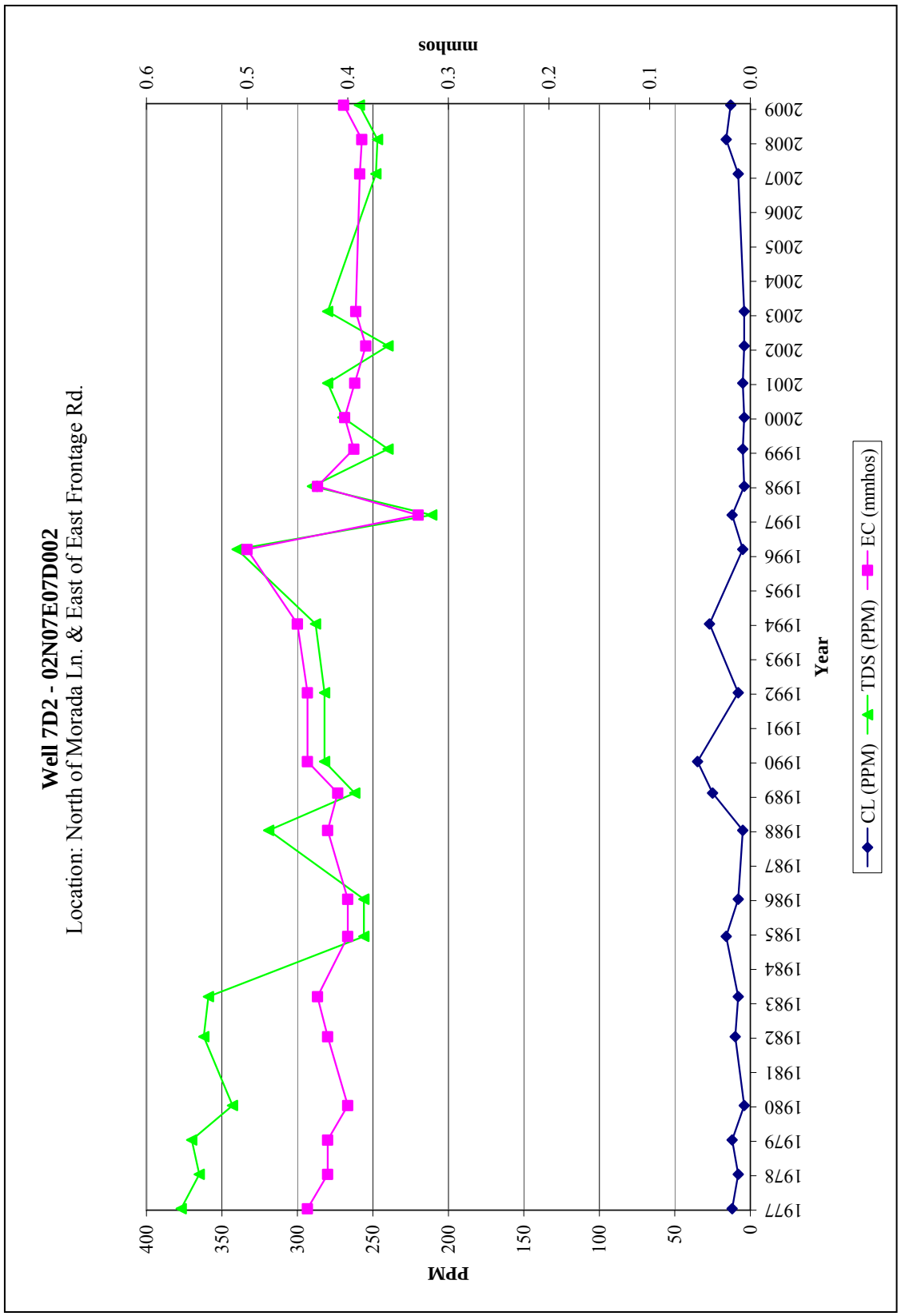

Figure 2-14: Quality Comparison Graph Well 7D2

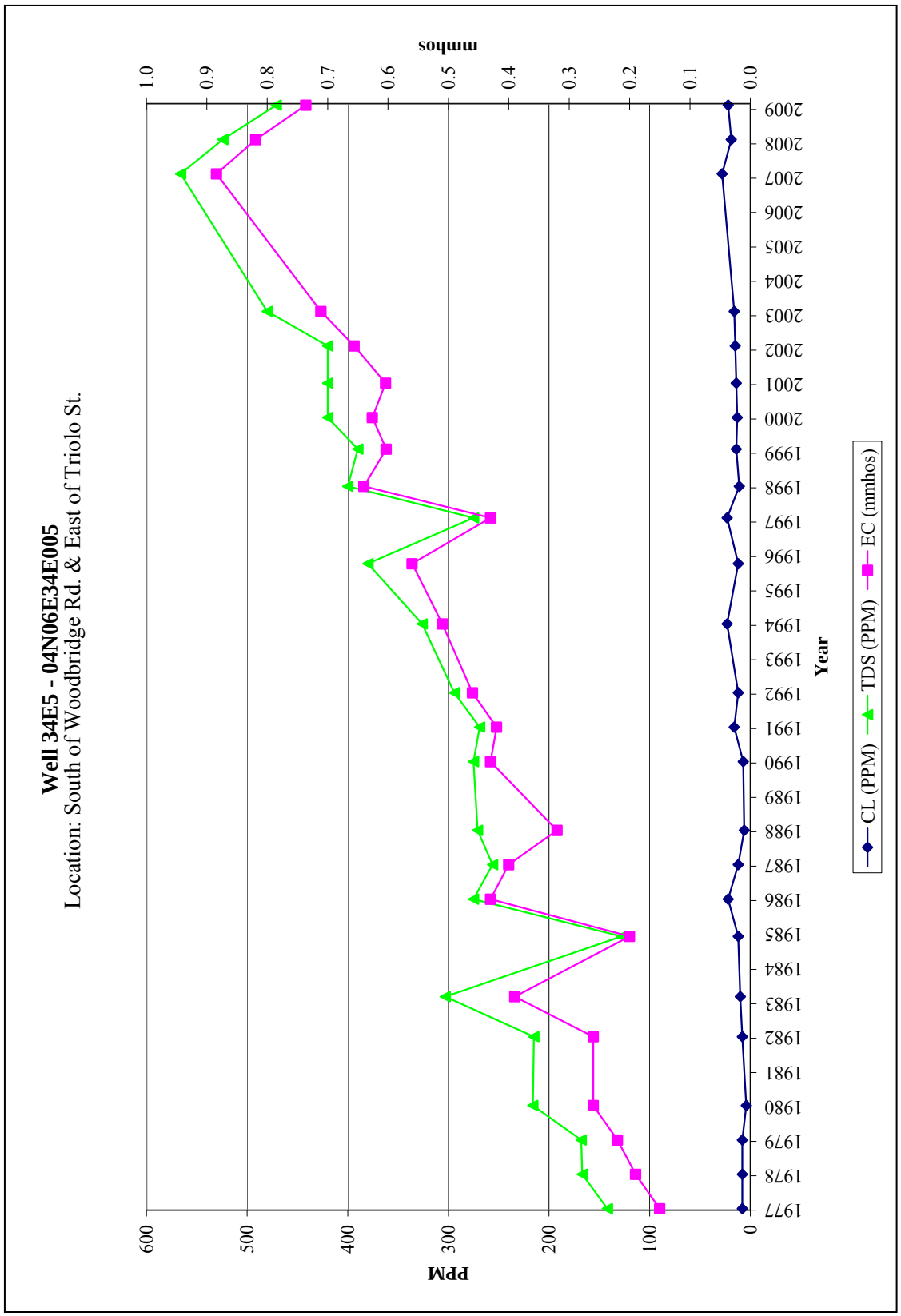

Figure 2-15: Quality Comparison Graph Well 34E5

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Section 3 – Groundwater Elevation Monitoring

Summary of Groundwater Elevations

The information contained in the Fall 2009 Groundwater Report is summarized as follows:

GROUNDWATER LEVELS

Banta-Carbona Irrigation District (BCID) – Two wells were compared in the BCID area. One well gained a half foot in groundwater level and the other well dropped three feet in groundwater level.

Central San Joaquin Water Conservation District (CSJWCD) – Forty-eight wells were measured in CSJWCD. Thirty-five show decreases in groundwater levels. Ten wells show an increase in groundwater levels. Three wells show no change in groundwater levels.

North San Joaquin Water Conservation District (NSJWCD) – One-hundred eighteen wells were measured in NSJWCD. Seventy-nine wells decreased in groundwater levels. Thirty-three increased in groundwater levels. Six wells had no change in groundwater elevations.

Oakdale Irrigation District (OID) – Five wells were measured in the OID area. All wells show decreases in groundwater levels.

Stockton East Water District (SEWD) – Ninety wells were measured in SEWD. Sixty-seven wells decreased in groundwater levels. Twenty-onw wells show increases in groundwater levels. Two wells experienced no change in groundwater level.

South San Joaquin Irrigation District (SSJID) – Seventeen wells were measured in the SSJID area. All wells show decreases in groundwater levels.

Woodbridge Irrigation District (WID) – Twenty-nine wells were measured in the WID. Fifteen wells decreased in groundwater levels. Six wells show increases in groundwater levels. Eight wells experienced no change in groundwater level.

Miscellaneous County Areas – Thirty-five wells measured across the County in areas that are not a part of any major irrigation district. Twenty-two wells descended in groundwater levels. Nine wells increased in groundwater. Four wells remained constant.

Table 3-1 Comparison of BCID Water Levels

State Well	Fall 2009	Fall 2008	Change
03S06E27N001	72.80	75.80	-3.00
02S06E31N001	53.00	52.50	0.50

Total Number of Wells	**2**
Number of Wells with Decrease	**2**
Number of Wells with Increase	**0**
Number of Wells with No Change	**0**
Range of Change	**-3.0 to 0.5**
Average Change	**-1.3**

Table 3-2Comparison of CSJWCD Area Water Levels

State Well	Fall 2009	Fall 2008	Change
01N07E11L001	-40.00	-37.00	-3.00
01N07E11M001	-40.20	-38.20	-2.00
01N07E13J002	-48.50	-52.50	4.00
01N07E14J002	-44.60	No Measurement	-----
01N07E14L001	-44.30	-42.40	-1.90
01N07E15M002	-34.50	-36.00	1.50
01N07E24A001	-44.10	-42.60	-1.50
01N07E24R001	-44.50	-52.50	8.00
01N07E26H003	-36.50	-36.00	-0.50
01N07E32A001	-36.00	-26.10	-9.90
01N08E07M001	-57.60	-59.10	1.50
01N08E09L001	-61.40	-59.60	-1.80
01N08E11L001	-47.00	-43.50	-3.50
01N08E13J001	-31.20	-28.20	-3.00
01N08E15J001	-42.20	-37.80	-4.40
01N08E16G001	-42.70	-40.20	-2.50
01N08E16H002	-41.50	-39.50	-2.00
01N08E16P001	-42.20	-39.30	-2.90
01N08E18A002	-44.50	-41.00	-3.50
01N08E22J001	-40.00	-37.50	-2.50
01N08E26A002	-28.30	-25.30	-3.00
01N08E27R002	-34.00	-31.50	-2.50
01N08E29M002	-59.00	No Measurement	-----
01N08E35F001	-27.90	-29.40	1.50
01N08E35R002	No Measurement	No Measurement	-----
01N08E36F001	-19.00	-18.50	-0.50
01N09E01C001	16.30	15.80	0.50
01N09E05J001	-11.50	-10.50	-1.00
01N09E06N001	-34.00	-32.50	-1.50
01N09E13D001	18.00	18.00	0.00
01N09E15B002	1.00	No Measurement	-----
01N09E17D001	-24.50	-21.50	-3.00
01N09E17M001	-25.50	-20.50	-5.00
01N09E19C001	-26.50	-22.50	-4.00

State Well	Fall 2009	Fall 2008	Change
01N09E30C005	-16.70	-23.70	7.00
01N09E31J001	-8.45	-4.95	-3.50
01S07E01J001	-26.60	-25.10	-1.50
01S07E02J001	-29.00	-32.00	3.00
01S07E12H001	No Measurement	-20.00	-----
01S08E04R001	-27.00	-27.00	0.00
01S08E05A001	-31.40	No Measurement	-----
01S08E05R001	-28.80	No Measurement	-----
01S08E06D001	-28.10	-25.60	-2.50
01S08E09Q001	-18.90	-20.90	2.00
01S08E11F001	-17.90	-15.90	-2.00
01S08E12B001	-10.70	-5.70	-5.00
01S08E14B001	-8.70	-8.70	0.00
01S08E15P001	-9.80	-8.30	-1.50
01S08E20B001	-7.70	-7.20	-0.50
01S08E23A001	-1.50	No Measurement	-----
01S09E05H002	0.50	5.00	-4.50
01S09E07A001	-2.80	2.20	-5.00
01S09E07N001	-0.30	3.70	-4.00
01S09E09R001	11.30	9.30	2.00
01S09E18R003	8.50	11.50	-3.00
01S09E19Q002	15.00	17.50	-2.50

Total Number of Wells	**48**
Number of Wells with Decrease	**35**
Number of Wells with Increase	**10**
Number of Wells with No Change	**3**
Range of Change	**-9.9 to 8**
Average Change	**-1.5**

Table 3-3 Comparison of NSJWCD Area Water Levels

State Well	Fall 2009	Fall 2008	Change
04N08E15J011	No Measurement	-9.80	-----
04N08E17A001	-31.30	-30.30	-1.00
04N08E17J001	-25.50	-24.50	-1.00
04N08E18Q011	-29.90	-29.10	-0.80
04N08E19B002	-24.60	-24.30	-0.30
04N08E21M001	-30.10	-27.60	-2.50
04N08E22C015	-15.70	-15.40	-0.30
04N08E26A012	-6.30	-6.20	-0.10
04N08E27J011	-16.10	-15.60	-0.50
04N08E32N001	-31.60	-31.10	-0.50
04N09E06L011	108.90	109.40	-0.50
04N09E07D012	83.30	81.60	1.70
04N09E07E011	90.50	91.40	-0.90
04N09E16Q002	162.60	161.20	1.40
04N09E17E001	134.10	134.40	-0.30

State Well	Fall 2009	Fall 2008	Change
04N09E18A011	152.20	154.00	-1.80
04N09E18D002	52.10	52.90	-0.80
04N09E18N011	25.20	27.30	-2.10
04N09E20M001	114.30	119.50	-5.20
04N09E21A001	169.10	170.00	-0.90
04N09E28C002	185.80	186.40	-0.60
05N06E36R001	-34.80	-32.80	-2.00
05N07E31J001	No Measurement	No Measurement	-----
05N07E31Q001	No Measurement	No Measurement	-----
05N07E34G001	-47.10	-50.10	3.00
05N07E34Q001	-45.90	-47.40	1.50
05N08E24Q011	54.50	54.60	-0.10
05N08E25P011	51.70	52.00	-0.30
05N08E32R011	-32.60	-31.10	-1.50
05N08E35K012	5.10	No Measurement	-----
03N08E04Q001	-33.60	-33.20	-0.40
03N08E05K011	-35.40	-36.00	0.60
03N08E12P011	-32.20	-31.30	-0.90
03N08E17B001	-42.90	-42.80	-0.10
03N08E17Q011	-46.40	-45.50	-0.90
03N08E19C001	-45.10	-42.30	-2.80
03N08E19M003	-47.00	-46.60	-0.40
03N08E22A001	-46.60	-43.50	-3.10
04N06E02R011	-25.30	-24.30	-1.00
04N06E03A012	-17.30	-18.20	0.90
04N06E06N012	-5.60	-2.60	-3.00
04N06E12C004	-31.50	-26.00	-5.50
04N06E12N002	-26.80	No Measurement	-----
04N06E15B002	-14.70	-13.20	-1.50
04N06E16A011	-12.70	-11.00	-1.70
04N06E16C001	-4.80	-4.80	0.00
04N06E16K011	-1.40	-1.70	0.30
04N06E23D004	-22.60	-26.80	4.20
04N06E23K00	-8.00	-13.00	5.00
04N06E24D012	-19.00	-17.60	-1.40
04N06E24F001	-23.00	-19.50	-3.50
04N06E25B001	-13.70	-14.10	0.40
04N06E25R001	-4.50	-4.00	-0.50
04N06E27B012	0.90	2.10	-1.20
04N06E27D002	14.70	13.20	1.50
04N06E27Q012	14.90	13.20	1.70
04N06E35D011	15.90	15.60	0.30
04N06E36J012	3.90	4.50	-0.60
04N07E01B011	No Measurement	-37.00	-----
04N07E02R001	-37.50	-37.40	-0.10
04N07E04B012	-42.10	-40.90	-1.20
04N07E04Q012	-42.00	-41.40	-0.60
04N07E07A001	-40.50	-38.50	-2.00
04N07E11D012	-39.60	-38.90	-0.70
04N07E12E001	-42.50	-41.00	-1.50

State Well	Fall 2009	Fall 2008	Change
04N07E12G012	-34.00	-33.80	-0.20
04N07E14P011	-31.00	-30.30	-0.70
04N07E15B012	-35.80	-33.50	-2.30
04N07E16D001	-35.20	-34.30	-0.90
04N07E17J013	-29.60	-27.90	-1.70
04N07E17N001	-39.80	-39.80	0.00
04N07E19K001	-20.10	No Measurement	-----
04N07E19R011	-20.70	-20.70	0.00
04N07E21F001	-26.80	-26.30	-0.50
04N07E23J012	-26.80	-26.60	-0.20
04N07E24N002	-26.10	-26.90	0.80
04N07E25G015	No Measurement	-23.10	-----
04N07E26B011	-22.40	-22.20	-0.20
04N07E27C002	-30.50	-30.50	0.00
04N07E28J002	-18.70	-18.70	0.00
04N07E28P011	8.10	5.40	2.70
04N07E29H001	-17.50	No Measurement	-----
04N07E29N012	-8.10	-8.70	0.60
04N07E31Q031	14.80	15.00	-0.20
04N07E32F011	0.00	-0.50	0.50
04N07E33H001	25.50	22.00	3.50
04N07E34K011	-10.60	-12.10	1.50
04N07E35C002	-13.80	-14.60	0.80
04N07E35E013	-14.00	-15.80	1.80
04N07E36L001	-24.00	-23.50	-0.50
04N08E01K001	50.40	51.30	-0.90
04N08E02E011	-8.60	-4.50	-4.10
04N08E04P014	-23.80	-22.70	-1.10
04N08E06C002	-37.20	-33.90	-3.30
04N08E06N002	-37.20	-36.20	-1.00
04N08E11M012	-4.30	-3.30	-1.00
04N08E12A011	75.60	76.40	-0.80
04N08E12B011	51.10	52.00	-0.90
04N08E12N001	25.00	27.80	-2.80
04N08E14B011	0.20	-1.80	2.00
04N08E14K001	-4.10	-3.10	-1.00
04N08E15D011	-14.60	-13.60	-1.00
03N06E23A003	No Measurement	No Measurement	-----
03N06E25C001	-35.40	-35.70	0.30
03N06E25H015	-39.10	-39.70	0.60
03N07E05D005	17.40	17.10	0.30
03N07E08B012	-20.10	-23.30	3.20
03N07E08E002	-25.00	-24.50	-0.50
03N07E09C001	-24.70	-25.20	0.50
03N07E09C003	No Measurement	-22.60	-----
03N07E10L004	-30.20	-30.10	-0.10
03N07E15C004	-34.50	-34.50	0.00
03N07E17A006	-30.80	-31.80	1.00
03N07E17D003	No Measurement	-27.00	-----
03N07E17D004	-28.90	-27.40	-1.50

State Well	Fall 2009	Fall 2008	Change
03N07E17K002	-36.00	-36.50	0.50
03N07E18D012	-29.50	-28.50	-1.00
03N07E18M002	-31.90	-33.20	1.30
03N07E19J004	-52.00	-56.00	4.00
03N07E19Q012	-39.90	-41.10	1.20
03N07E20C012	-39.00	-38.70	-0.30
03N07E21L003	-39.00	-47.00	----
03N07E22C011	-40.40	-42.10	1.70
03N07E23C002	-39.00	No Measurement	-----
03N07E23K011	-44.40	-43.10	-1.30
03N07E25G001	-49.90	-48.30	-1.60
03N07E26G012	-45.90	-44.60	-1.30
03N07E32Q012	-44.60	-44.50	-0.10
03N07E33G002	-48.20	No Measurement	-----
05N09E30C011	160.20	160.90	-0.70
05N09E30M011	144.20	144.70	-0.50
05N09E31L011	124.20	125.90	-1.70
03N06E36N001	-36.31	-35.81	-0.50

Total Number of Wells	**118**
Number of Wells with Decrease	**79**
Number of Wells with Increase	**33**
Number of Wells with No Change	**6**
Range of Change	**-5.5 to 5**
Average Change	**-0.4**

Table 3-4 Comparison of OID Area Water Levels

State Well	Fall 2009	Fall 2008	Change
01S09E14K001	41.30	46.00	-4.70
01S09E21J002	38.50	40.50	-2.00
01S09E23N001	48.50	51.00	-2.50
01S09E24R001	65.60	67.60	-2.00
01S09E28M002	37.70	39.70	-2.00

Total Number of Wells	**5**
Number of Wells with Decrease	**5**
Number of Wells with Increase	**0**
Number of Wells with No Change	**0**
Range of Change	**-4.7 to -2**
Average Change	**-2.6**

Table 3-5 Comparison of SEWD Area Water Levels

State Well	Fall 2009	Fall 2008	Change
03N07E35L001	-54.00	-50.00	-4.00
03N07E36J001	-51.80	-48.30	-3.50
03N08E27R001	-45.40	-44.00	-1.40
03N09E25R001	83.50	82.50	1.00
02N07E28P001	-57.00	-53.00	-4.00
01N06E03K001	-12.10	-11.50	-0.60
01N06E04J002	-15.90	-7.90	-8.00
01N06E05H001	-11.00	-9.70	-1.30
01N06E05M004	No Measurement	-7.50	-----
01N06E12G001	-31.80	-24.80	-7.00
01N06E23J001	-10.40	-15.60	5.20
01N06E27R002	-9.20	-8.20	-1.00
01N07E01A002	-53.30	-50.00	-3.30
01N07E01M002	-53.00	-50.00	-3.00
01N07E03L001	No Measurement	No Measurement	-----
01N07E03M001	-27.50	-24.00	-3.50
01N07E04R001	-30.50	-29.00	-1.50
01N07E08B001	-35.00	No Measurement	-----
01N07E09E004	-34.40	-32.00	-2.40
01N07E09Q003	-36.00	-37.00	1.00
01N07E10D001	-34.00	-33.00	-1.00
01N07E10G001	No Measurement	-37.50	-----
01N07E19G001	-24.50	-27.00	2.50
01N07E20G001	-28.00	-29.50	1.50
01N08E03P001	-54.00	-55.00	1.00
01N08E04E001	-54.50	-56.00	1.50
01S06E01C002	-10.00	-9.50	-0.50
01S06E02D004	-10.50	-8.10	-2.40
01S06E02G002	-11.30	-10.10	-1.20
01S06E10G001	-10.30	-7.30	-3.00
01S06E11E001	-8.50	-5.80	-2.70
01S07E06M002	-10.50	-9.00	-1.50
01S07E08J002	-9.00	-8.50	-0.50
02N06E08A002	-31.30	-31.40	0.10
02N06E11L001	-32.80	-32.80	0.00
02N06E15F001	-35.00	-28.80	-6.20
02N06E17J001	-24.30	-26.10	1.80
02N06E20F001	-2.60	-2.70	0.10
02N06E22D001	-34.40	-29.80	-4.60
02N06E24F001	-38.50	-36.50	-2.00
02N06E32G001	-14.20	-12.60	-1.60
02N07E03D001	-51.50	-51.00	-0.50
02N07E08D001	-54.70	-61.20	6.50
02N07E08K003	-62.20	-59.00	-3.20
02N07E10F002	No Measurement	-54.80	-----
02N07E11F001	-58.50	-59.50	1.00
02N07E12A003	-60.70	-54.60	-6.10
02N07E15C001	-63.40	-60.80	-2.60

State Well	Fall 2009	Fall 2008	Change
02N07E16F002	-63.64	-59.44	-4.20
02N07E16L001	-63.30	-58.30	-5.00
02N07E20N002	-48.00	-44.00	-4.00
02N07E21A002	-66.81	-62.81	-4.00
02N07E21K002	-56.00	-55.00	-1.00
02N07E21N001	-51.00	No Measurement	-----
02N07E23B001	-63.00	-62.00	-1.00
02N07E24B001	-62.00	-55.10	-6.90
02N07E24Q001	-61.00	-59.00	-2.00
02N07E26H003	-62.00	-59.00	-3.00
02N07E26N001	-60.50	-55.70	-4.80
02N07E28K002	-54.00	No Measurement	-----
02N07E28N004	No Measurement	-43.00	-----
02N07E29B001	-50.50	-48.50	-2.00
02N07E29M002	-46.00	-42.00	-4.00
02N07E30E001	-43.10	-40.00	-3.10
02N07E30H001	-46.50	-43.00	-3.50
02N07E31M001	-33.80	-31.80	-2.00
02N07E32J002	-42.50	-36.00	-6.50
02N07E32M002	-39.00	-33.50	-5.50
02N07E32R001	-42.10	No Measurement	-----
02N07E33L001	-45.50	-45.00	-0.50
02N07E34R001	-42.10	-38.50	-3.60
02N07E36H001	-60.80	-64.50	3.70
02N07E36P002	-56.30	-52.10	-4.20
02N08E03G002	-38.70	-40.70	2.00
02N08E04C001	-54.70	-50.50	-4.20
02N08E05C001	-56.50	-55.50	-1.00
02N08E08N001	-60.50	-56.50	-4.00
02N08E09G002	-58.30	-54.00	-4.30
02N08E10H002	-49.20	-46.10	-3.10
02N08E12C002	-33.00	-30.20	-2.80
02N08E13K001	-39.40	-38.10	-1.30
02N08E14C001	-48.00	-52.50	4.50
02N08E15M002	No Measurement	-51.20	-----
02N08E16D001	-58.80	-50.10	-8.70
02N08E18C001	-68.70	-68.20	-0.50
02N08E20F001	-64.30	-56.80	-7.50
02N08E24J001	No Measurement	-104.10	-----
02N08E24P001	No Measurement	No Measurement	-----
02N08E28H002	-45.60	-47.60	2.00
02N08E32L002	-56.20	-56.20	0.00
02N08E33E001	-56.60	-54.60	-2.00
02N09E03A001	61.80	63.10	-1.30
02N09E04H001	53.10	54.60	-1.50
02N09E05H001	0.30	-2.30	2.60
02N09E08N001	-24.90	-30.40	5.50
02N09E09D001	-15.30	-15.80	0.50
02N09E18Q001	-39.00	-37.60	-1.40
03N07E28K012	-47.30	No Measurement	-----

State Well	Fall 2009	Fall 2008	Change
03N07E35C002	-51.80	-47.80	-4.00
02N06E03A003	-30.80	-31.80	1.00
02N06E06C002	-14.00	-16.00	2.00
02N06E13R002	-40.00	-39.00	-1.00
02N06E24J002	-39.40	-33.30	-6.10

Total Number of Wells	**90**
Number of Wells with Decrease	**67**
Number of Wells with Increase	**21**
Number of Wells with No Change	**2**
Range of Change	**-8.7 to 6.5**
Average Change	**-1.8**

Table 3-6 Comparison of SSJID Area Water Levels

State Well	Fall 2009	Fall 2008	Change
01S07E25E001	11.50	15.00	-3.50
01S07E26G001	11.00	14.00	-3.00
01S07E27K001	11.00	12.00	-1.00
01S08E25Q001	No Measurement	23.90	-----
01S09E29M002	31.50	34.00	-2.50
01S09E34A001	56.50	57.50	-1.00
02S07E07D002	9.00	9.50	-0.50
02S07E11N002	36.50	37.00	-0.50
02S07E12R001	20.30	21.00	-0.70
02S07E12R002	27.50	29.40	-1.90
02S07E19H001	19.50	20.00	-0.50
02S07E26B001	27.00	28.00	-1.00
02S08E04M001	21.50	24.50	-3.00
02S08E06J001	20.50	22.50	-2.00
02S08E07R001	33.00	34.50	-1.50
02S08E08A001	25.00	27.50	-2.50
02S08E08E001	22.70	25.70	-3.00
02S09E03K001	60.50	61.00	-0.50

Total Number of Wells	**17**
Number of Wells with Decrease	**17**
Number of Wells with Increase	**0**
Number of Wells with No Change	**0**
Range of Change	**-3.5 to -0.5**
Average Change	**-1.7**

Table 3-7 Comparison of WID Area Water Levels

State Well	Fall 2009	Fall 2008	Change
05N05E32M001	-7.2	-6.7	-0.5
04N05E05H001	No Measurement	-4.0	-----
04N05E09D001	-6.8	-6.8	0.0
04N05E10K001	-5.5	No Measurement	-----
04N05E13C012	-5.5	-6.4	0.9
04N05E13H001	-9.0	-6.0	-3.0
04N05E13R004	-6.5	-6.0	-0.5
04N05E14B002	-5.9	-4.9	-1.0
04N05E14P001	-2.0	-2.0	0.0
04N05E22H001	-6.0	-5.5	-0.5
04N05E24J004	-0.6	-0.6	0.0
04N05E26F001	1.7	-1.8	3.5
04N05E36H003	1.0	1.0	0.0
04N06E19R012	1.0	1.5	-0.5
04N06E29A001	No Measurement	No Measurement	-----
04N06E29N002	-2.0	-3.0	1.0
04N06E30E001	1.7	1.7	0.0
03N05E13L001	-11.5	-12.0	0.5
03N05E14C001	-3.8	-6.3	2.5
03N06E04P012	-13.0	-12.0	-1.0
03N06E05C002	-4.4	-3.8	-0.6
03N06E05N003	-13.0	-12.5	-0.5
03N06E07D013	-9.0	-8.4	-0.6
03N06E07H003	-16.5	-16.0	-0.5
03N06E10D001	-10.4	-10.4	0.0
03N06E17A004	-24.7	No Measurement	-----
03N06E18M003	-17.1	-17.1	0.0
03N06E20D002	-24.5	-21.5	-3.0
03N06E26P002	-29.7	-28.7	-1.0
03N06E27E001	-33.2	-31.2	-2.0
03N06E28B012	-29.2	-29.0	-0.2
03N06E30R001	-26.0	No Measurement	-----
03N06E32R001	-30.0	-32.0	2.0
02S04E15R001	54.5	54.5	0.0

Total Number of Wells	**29**
Number of Wells with Decrease	**15**
Number of Wells with Increase	**6**
Number of Wells with No Change	**8**
Range of Change	**-3 to 2.5**
Average Change	**-0.2**

Table 3-8 Comparison of Miscellaneous Area Water Levels

State Well	Fall 2009	Fall 2008	Change
05N05E28L003	-5.0	-4.5	-0.5
03S05E04H001	57.0	57.5	-0.5
03S06E03F002	15.5	15.5	0.0
04N05E03D003	-5.7	-5.7	0.0
04N05E16N001	No Measurement	-9.5	-----
04N05E36C004	-0.8	-1.3	0.5
04N06E18R012	-5.5	-4.7	-0.8
04N06E34J002	21.9	18.9	3.0
01N09E26A001	4.9	0.0	4.9
01N09E36P001	No Measurement	0.0	-----
01S05E31R002	1.1	0.6	0.5
01S06E04J001	-2.0	-1.5	-0.5
01S06E12P001	-9.5	-5.4	-4.1
01S06E14F001	-3.6	-3.6	0.0
01S06E15F001	-1.0	0.3	-1.3
01S06E23C003	0.8	0.9	-0.1
01S06E26K001	-0.5	0.7	-1.2
01S07E10A001	-22.2	-18.4	-3.8
01S07E13J001	-7.0	-3.5	-3.5
01S07E14M001	-2.1	2.9	-5.0
01S07E14P003	-2.8	-1.3	-1.5
01S07E15F002	-5.6	-10.6	5.0
01S08E19R001	3.8	5.8	-2.0
01S08E29K001	6.5	9.0	-2.5
01S08E30C002	5.5	13.0	-7.5
01S09E02R001	30.8	31.3	-0.5
01S09E11J002	36.7	39.2	-2.5
02S05E08B001	-2.7	-4.7	2.0
02S05E13N001	14.7	13.2	1.5
02S06E10K001	2.0	1.0	1.0
02S06E25J001	14.5	15.0	-0.5
02S06E26B001	5.5	6.5	-1.0
02S06E27E001	9.0	9.0	0.0
02S07E31N001	11.5	12.5	-1.0
02S09E19B002	55.6	57.2	-1.6
03N06E09N011	No Measurement	No Measurement	-----
03N06E15C004	-21.8	-20.8	-1.0
03N06E29C001	-29.8	-33.3	3.5

Total Number of Wells	**35**
Number of Wells with Decrease	**22**
Number of Wells with Increase	**9**
Number of Wells with No Change	**4**
Range of Change	**-7.5 to 5**
Average Change	**-0.6**

HYDROGRAPHS

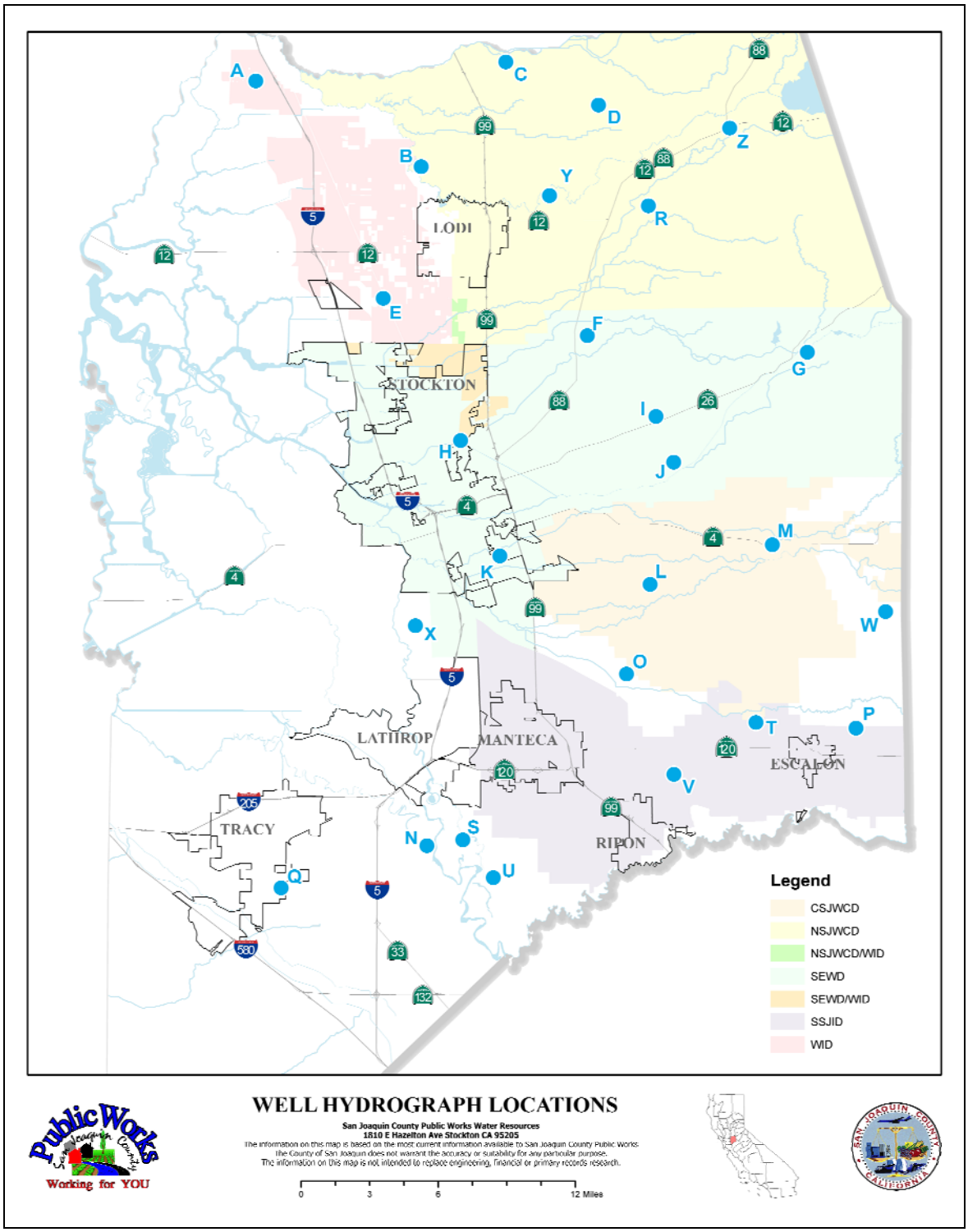

Figure 3-1: Well Hydrograph Locations

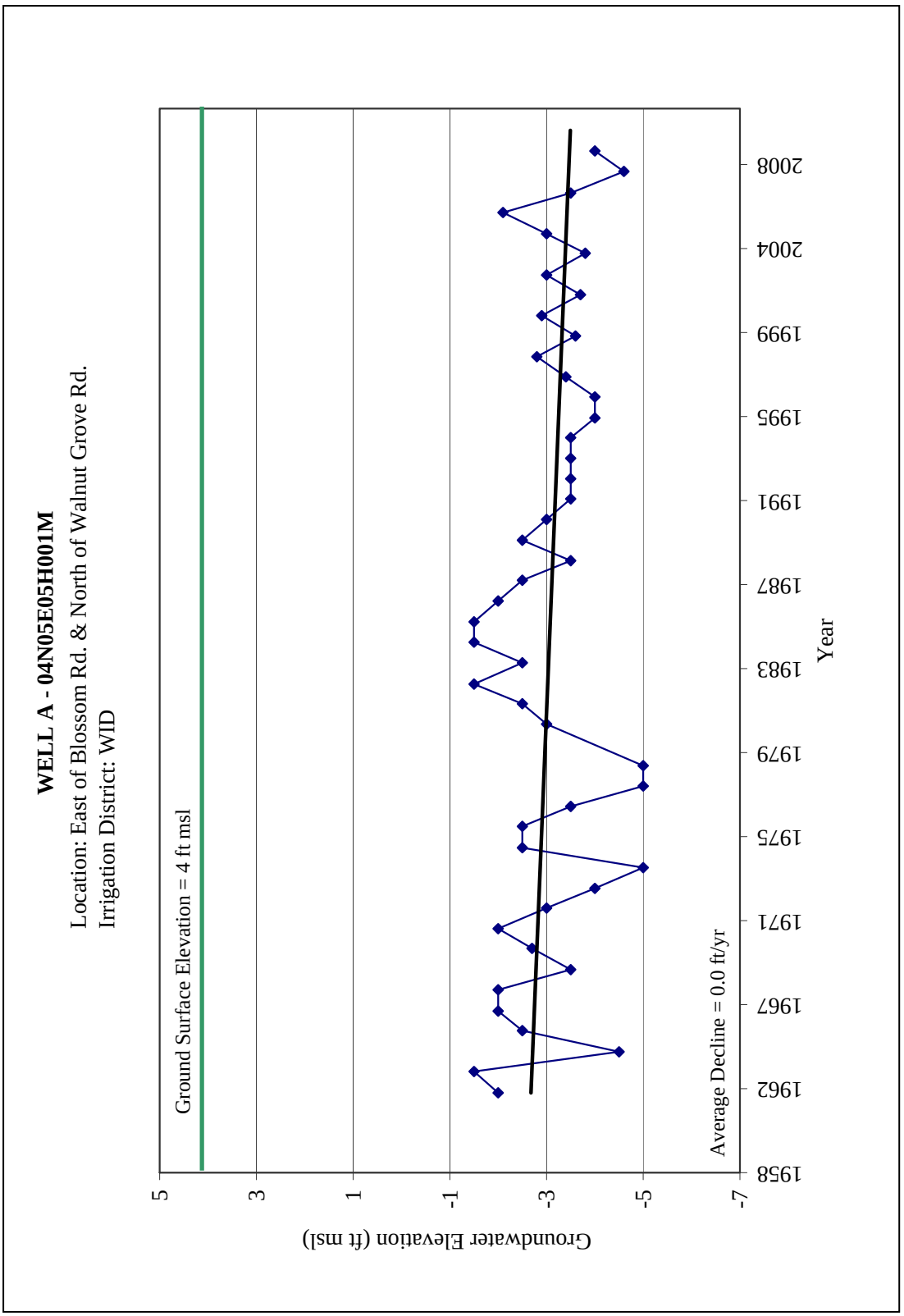

Figure 3-2: Fall Hydrograph Well A

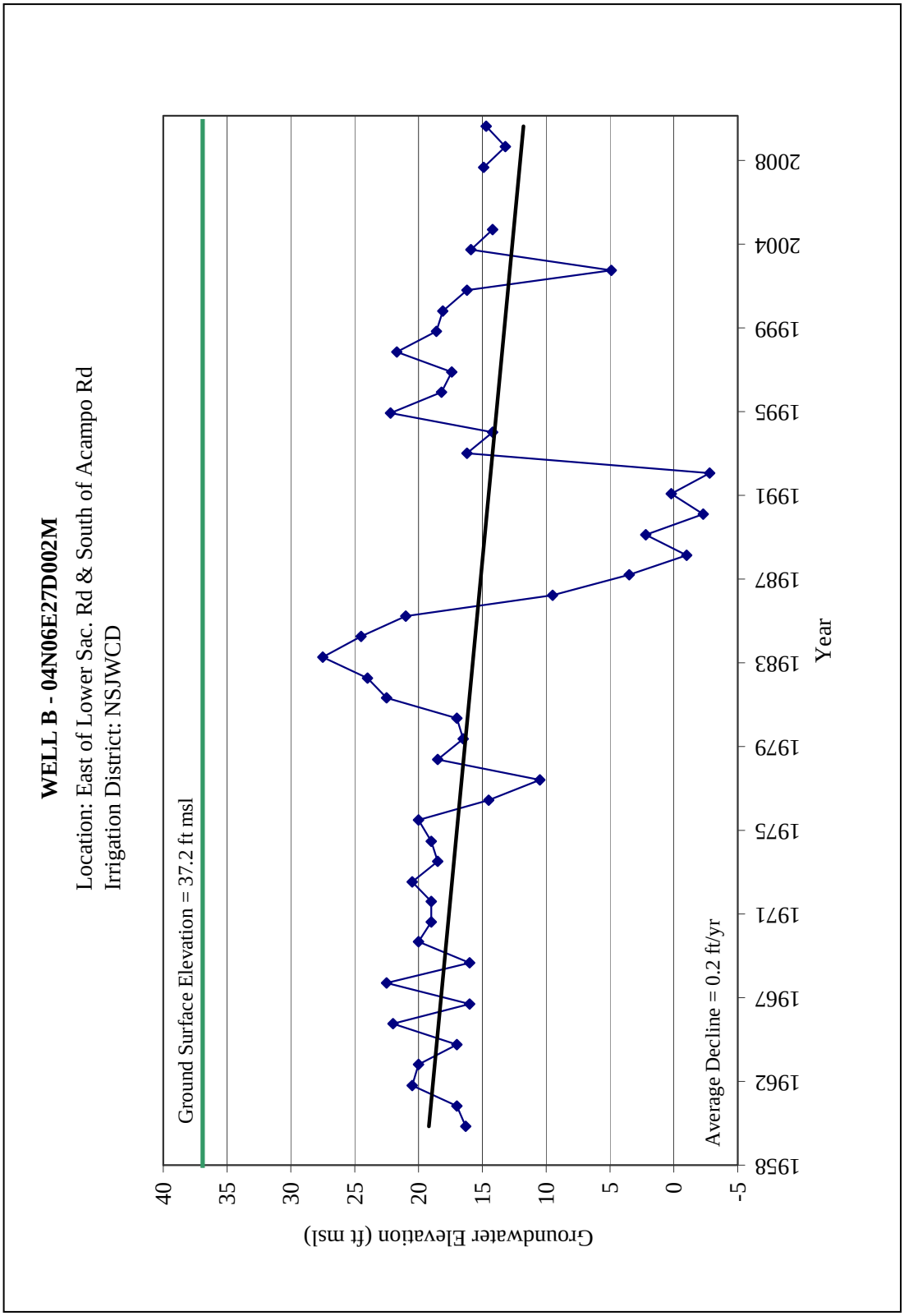

Figure 3-3: Fall Hydrograph Well B

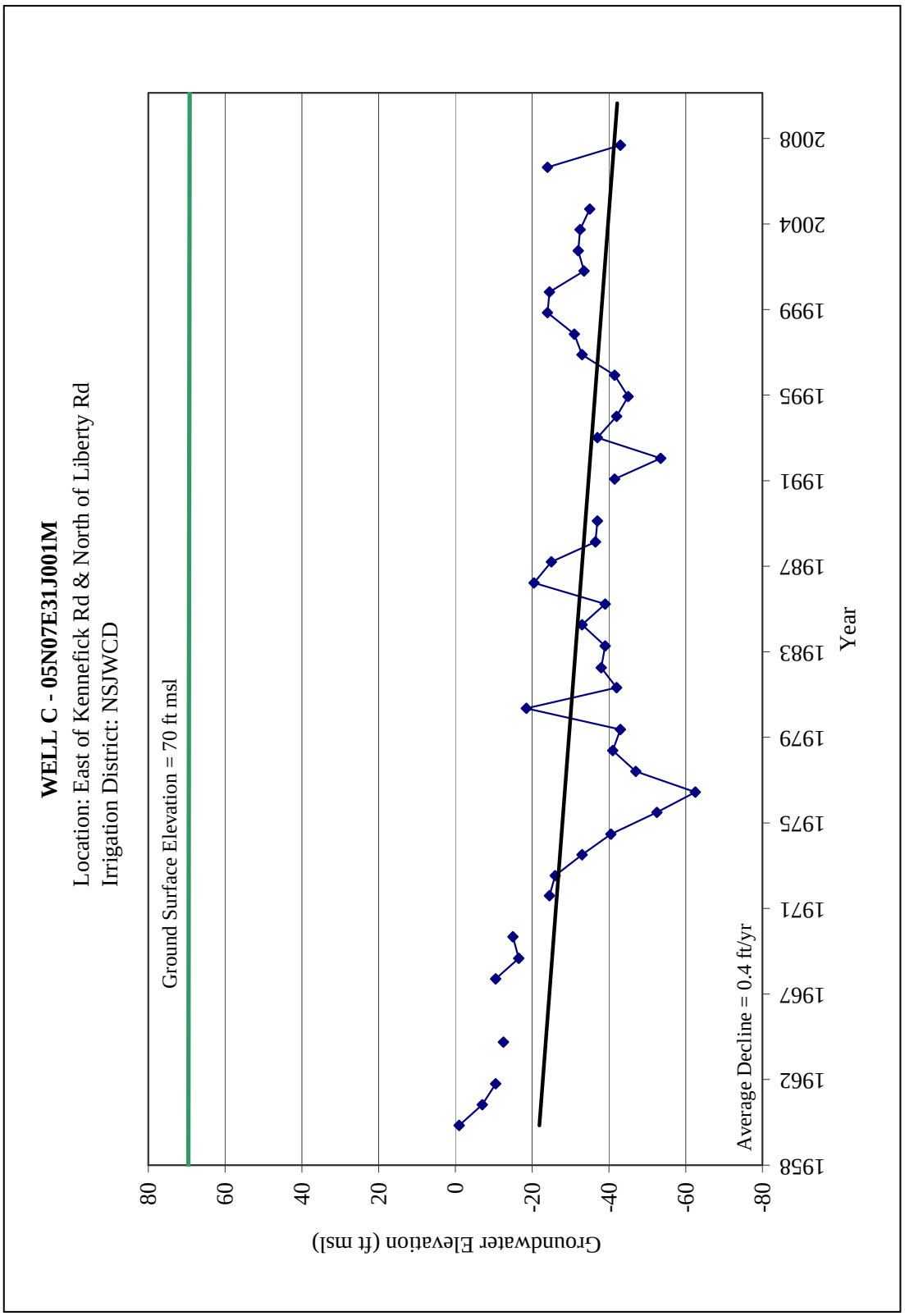

Figure 3-4: Fall Hydrograph Well C

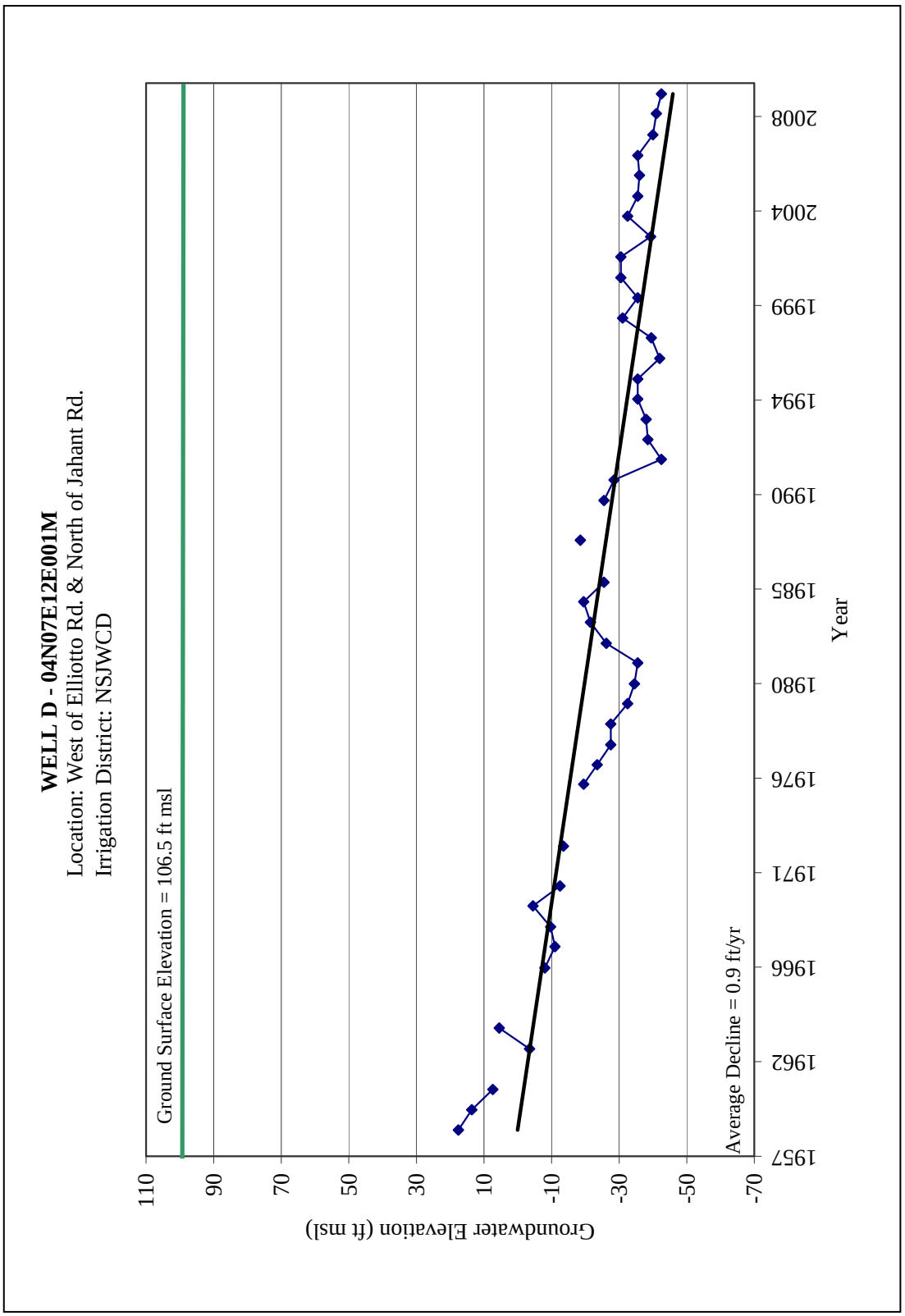

Figure 3-5: Fall Hydrograph Well D

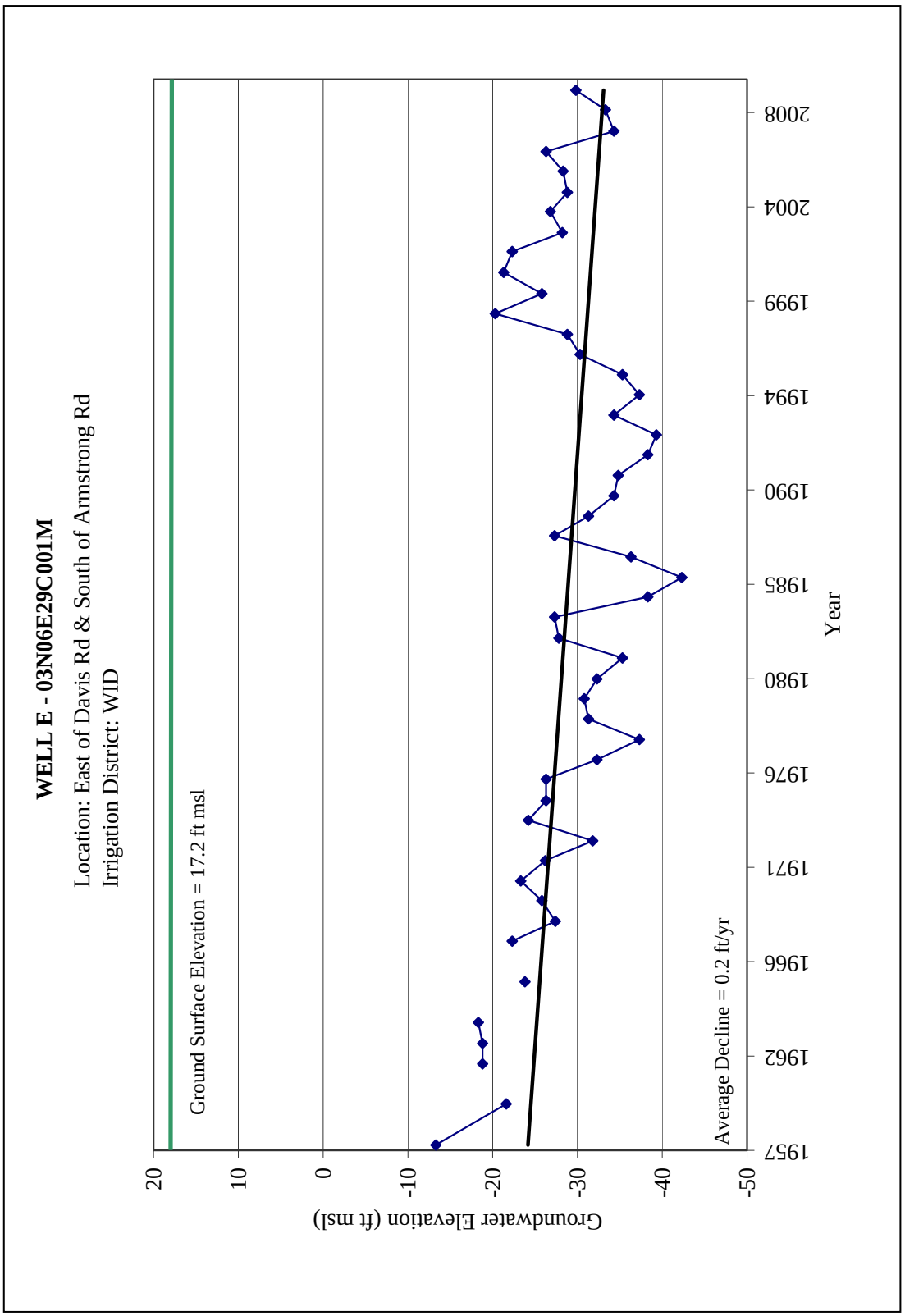

Figure 3-6: Fall Hydrograph Well E

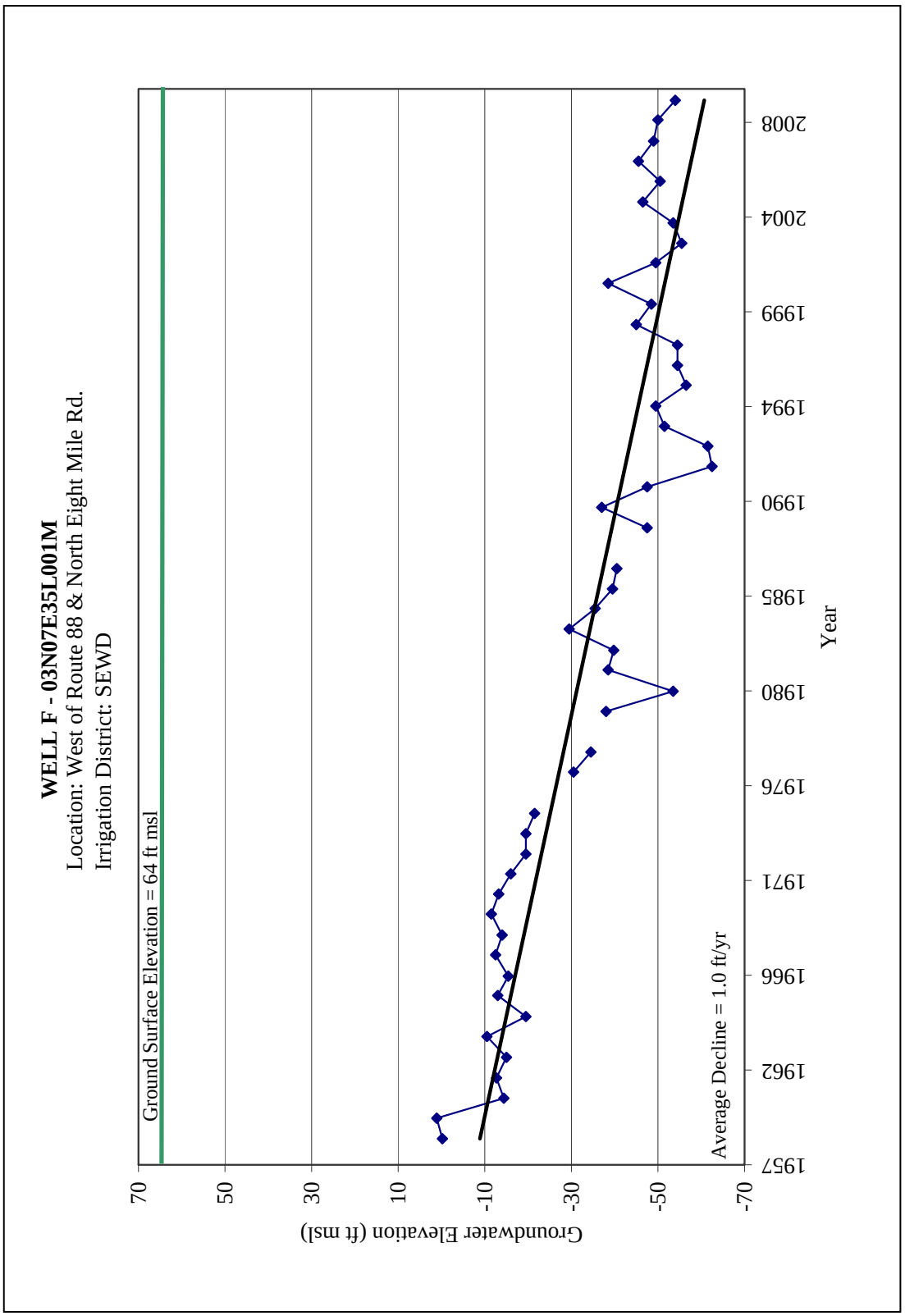

Figure 3-7: Fall Hydrograph Well F

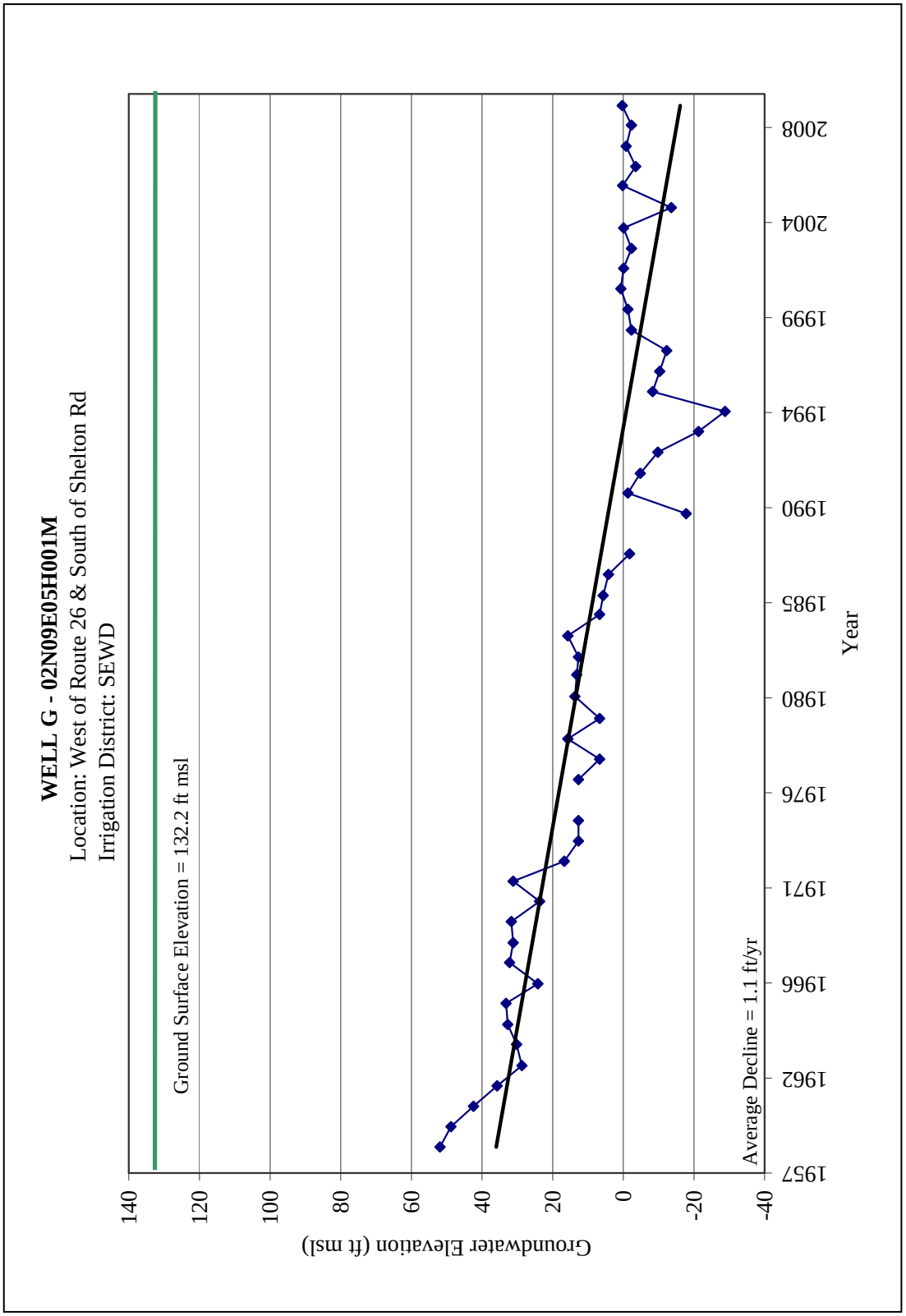

Figure 3-8: Fall Hydrograph Well G

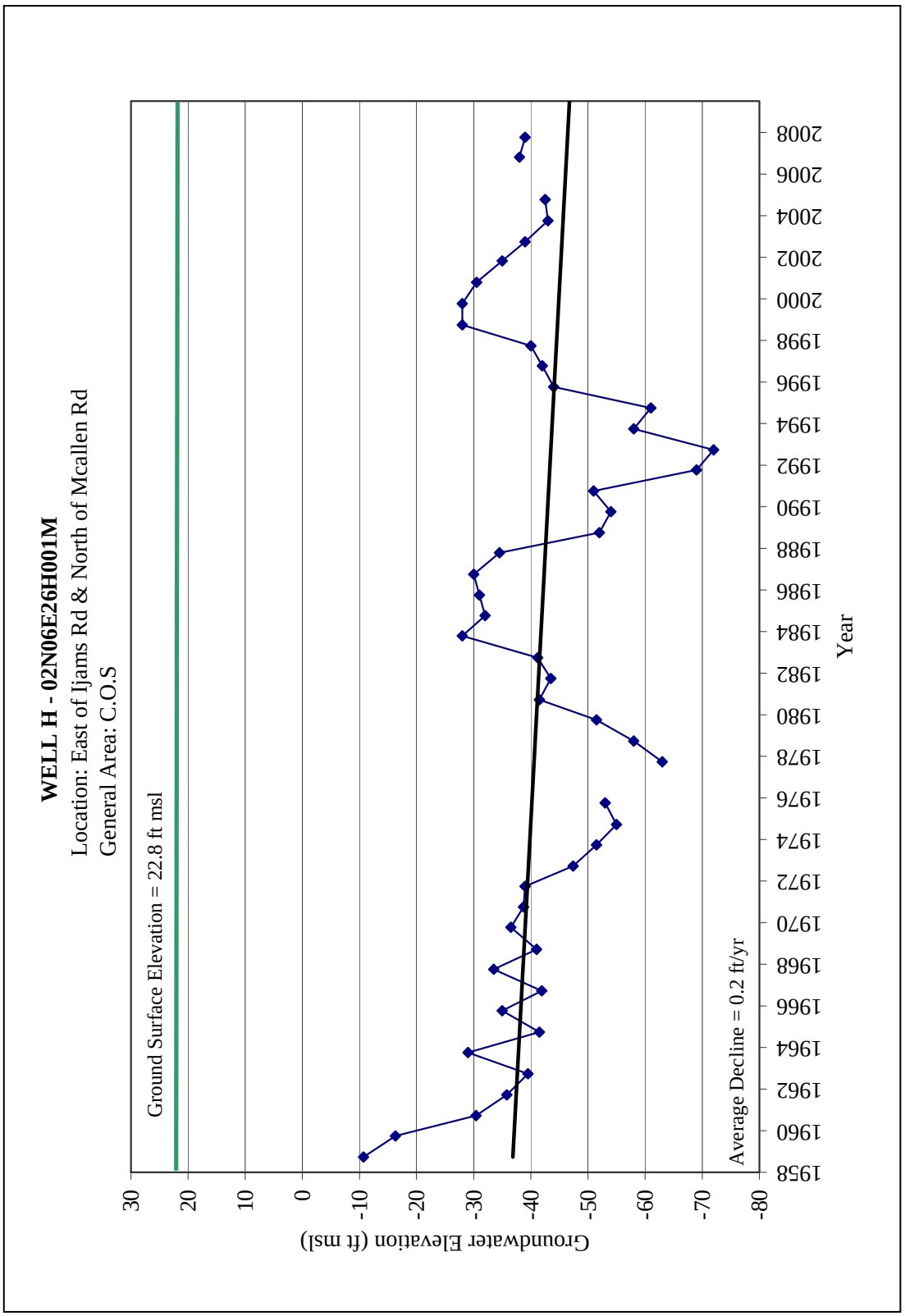

Figure 3-9: Fall Hydrograph Well H

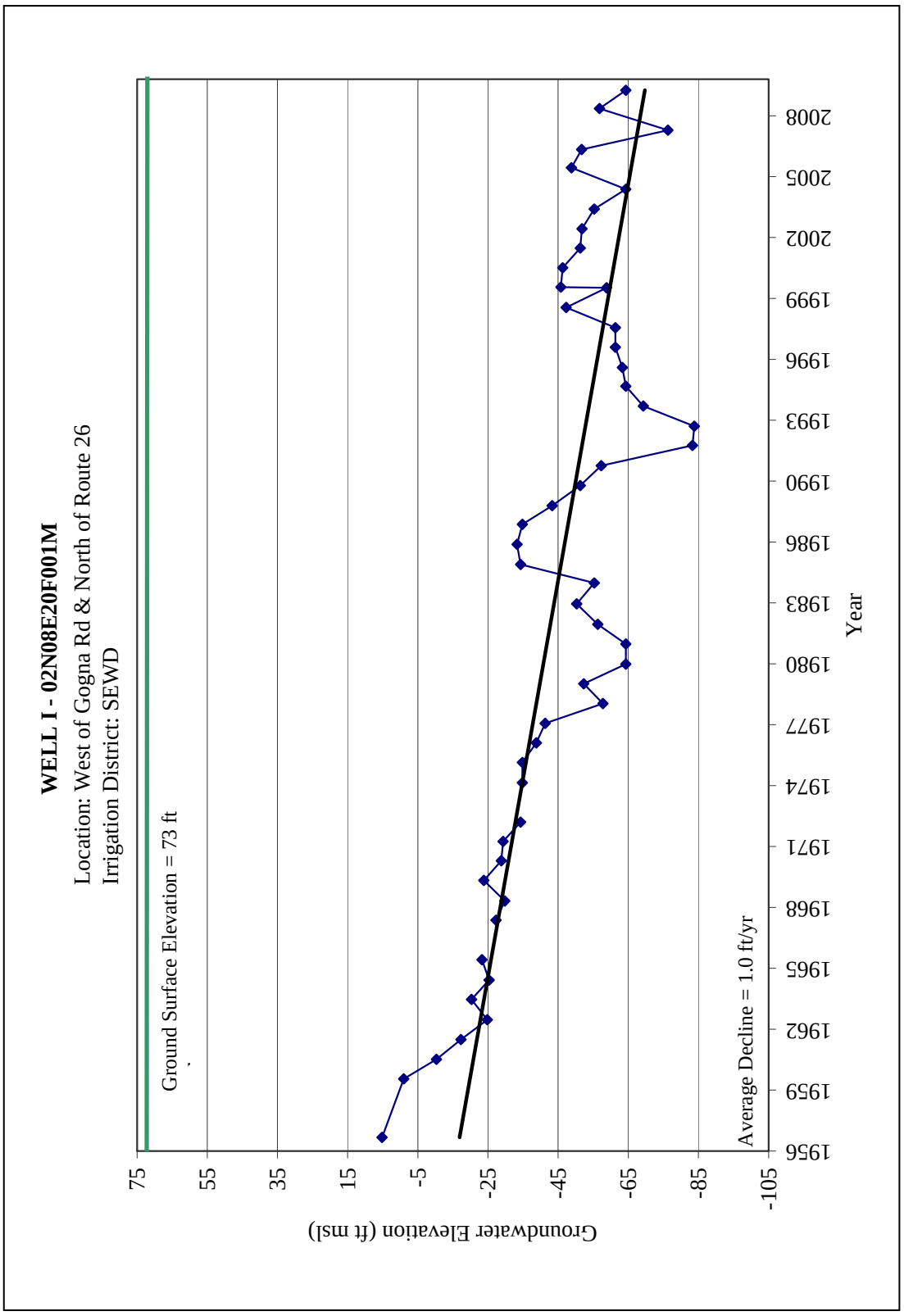

Figure 3-10: Fall Hydrograph Well I

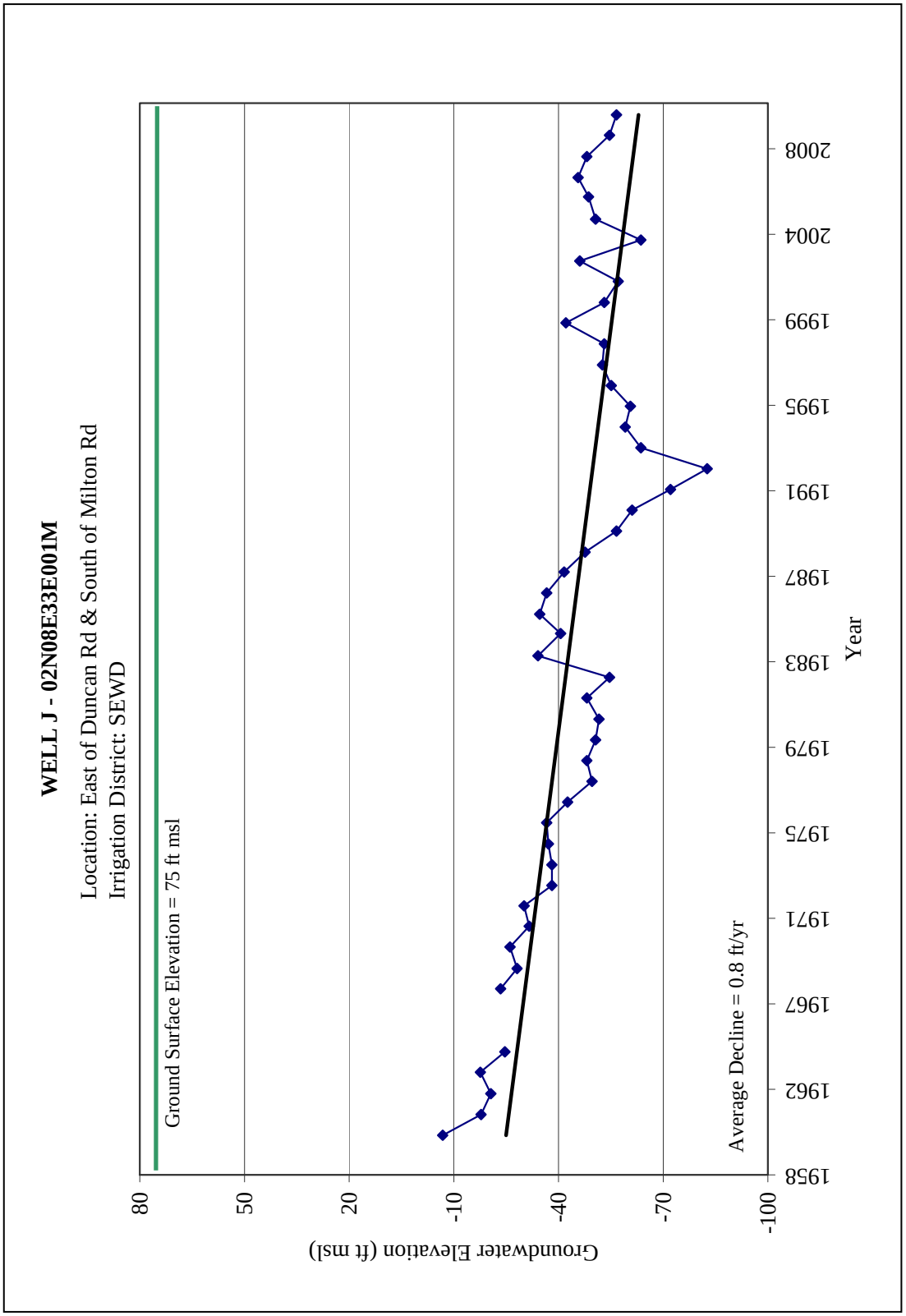

Figure 3-11: Fall Hydrograph Well J

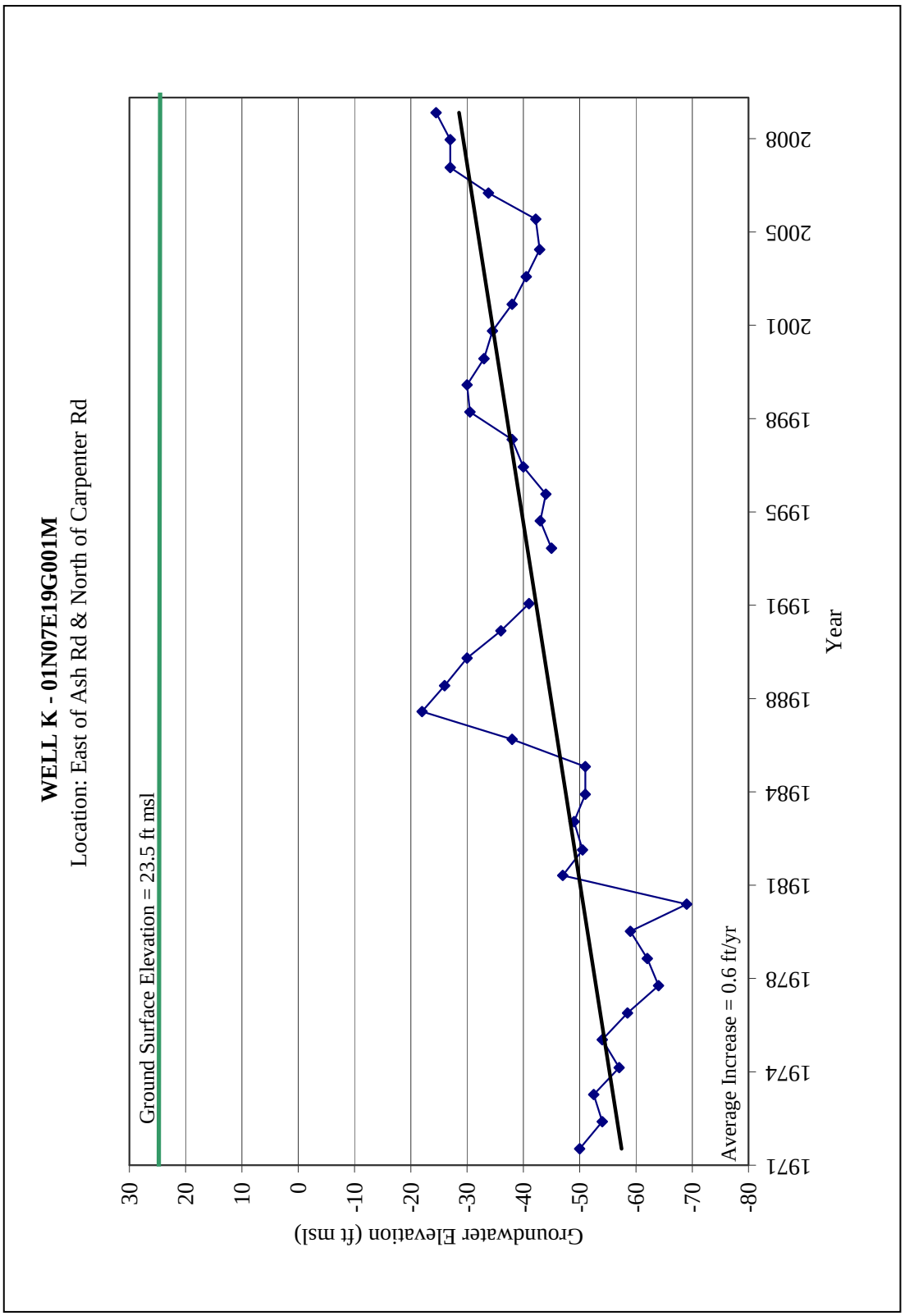

Figure 3-12: Fall Hydrograph Well K

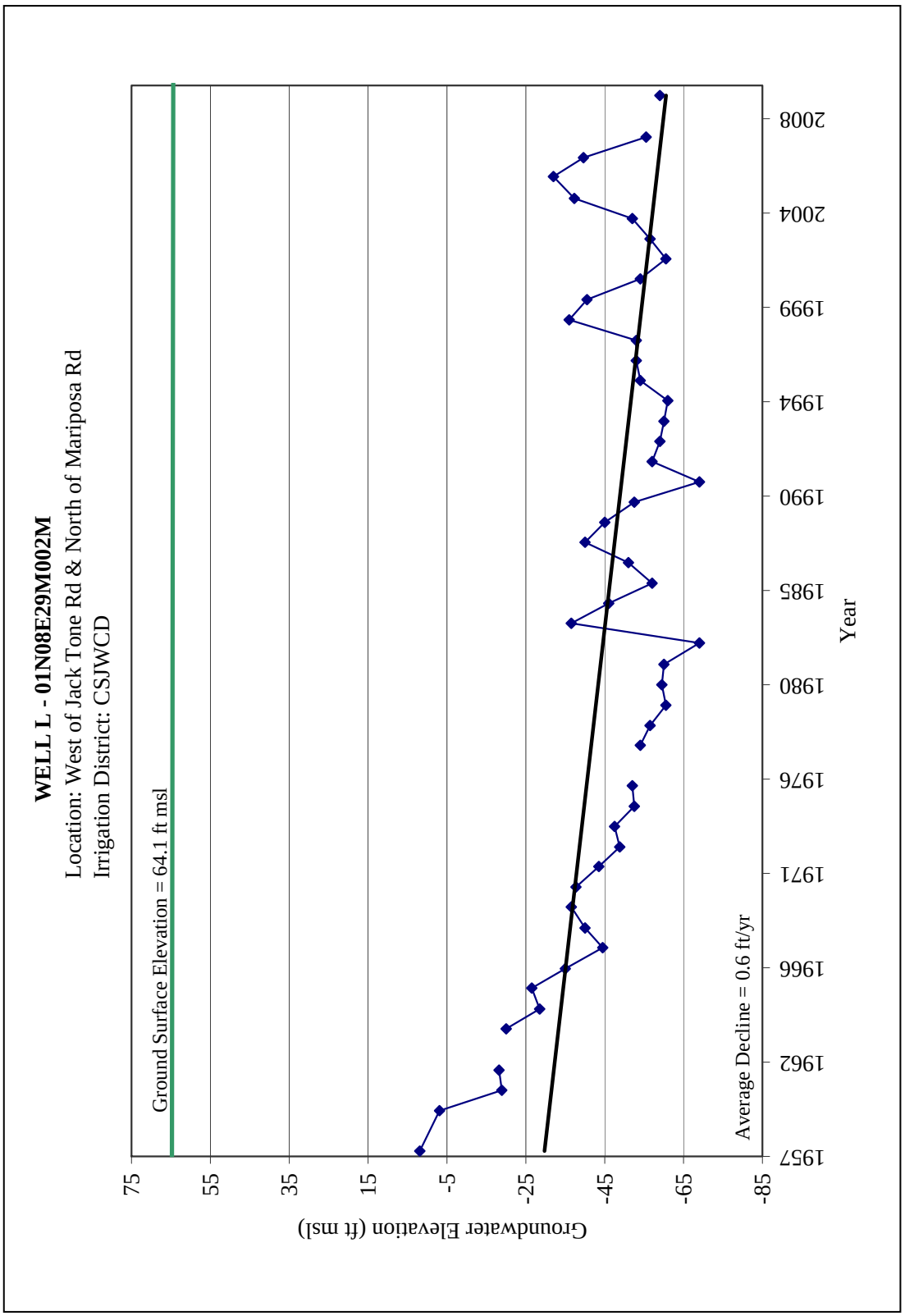

Figure 3-13: Fall Hydrograph Well L

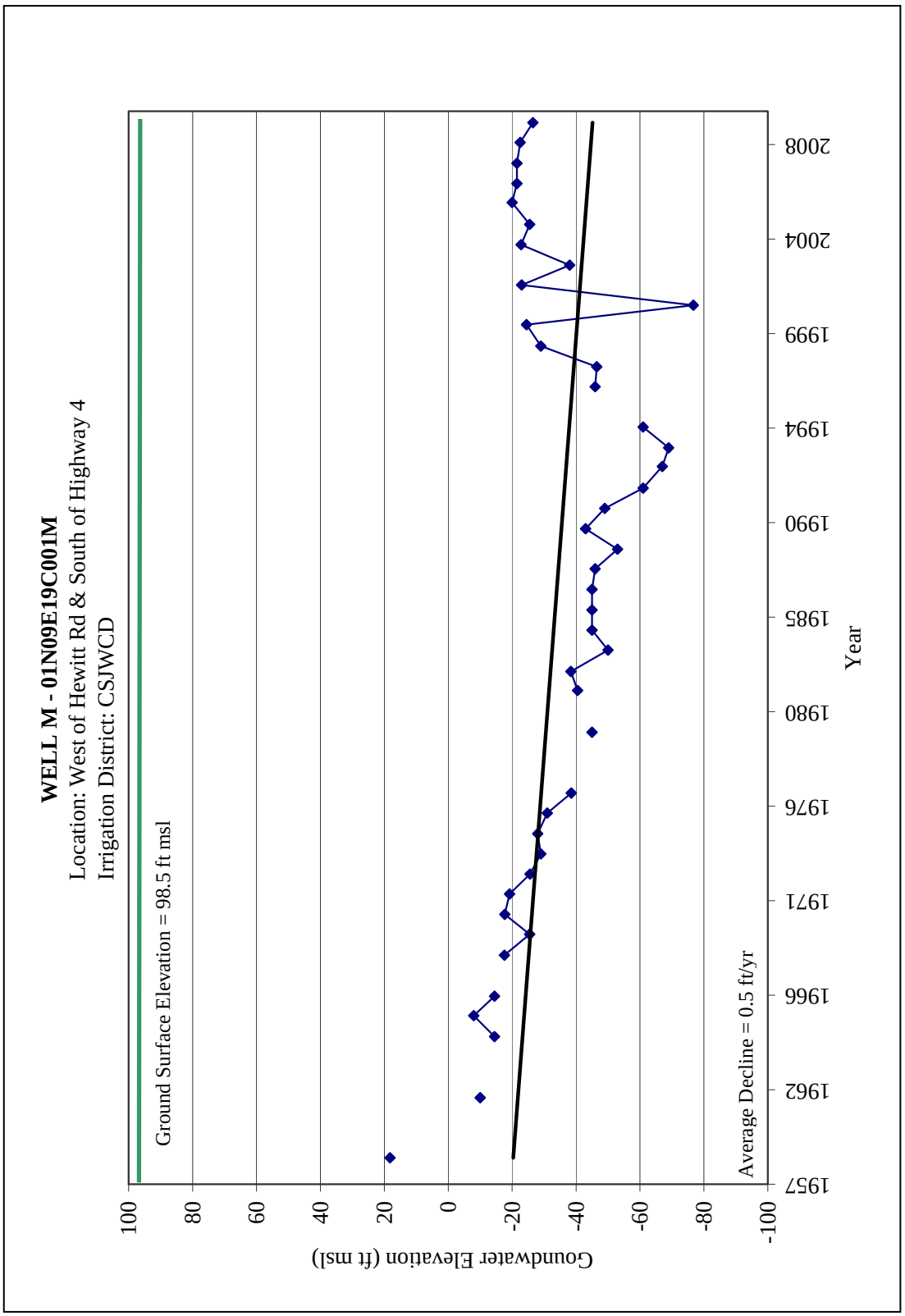

Figure 3-14: Fall Hydrograph Well M

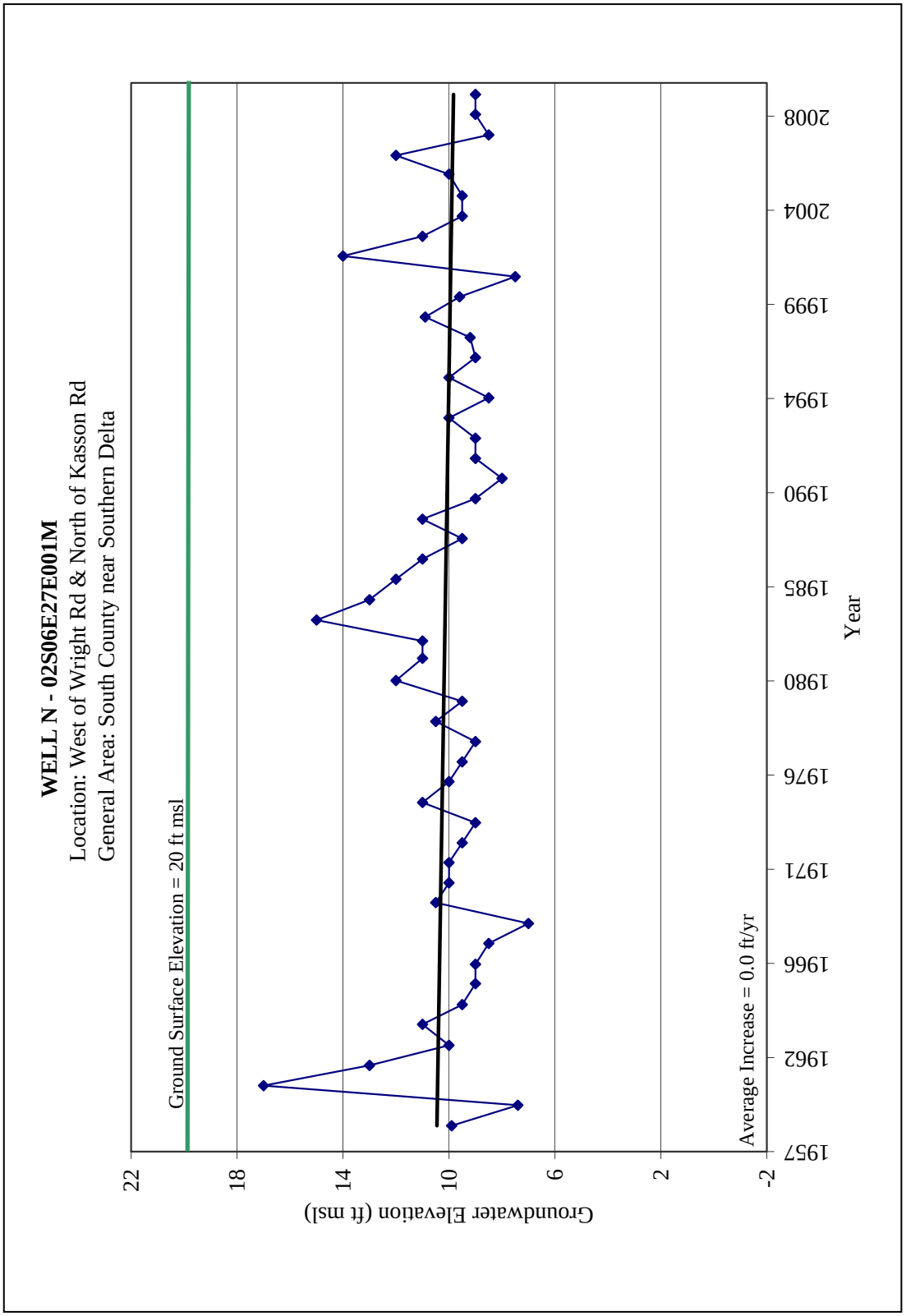

Figure 3-15: Fall Hydrograph Well N

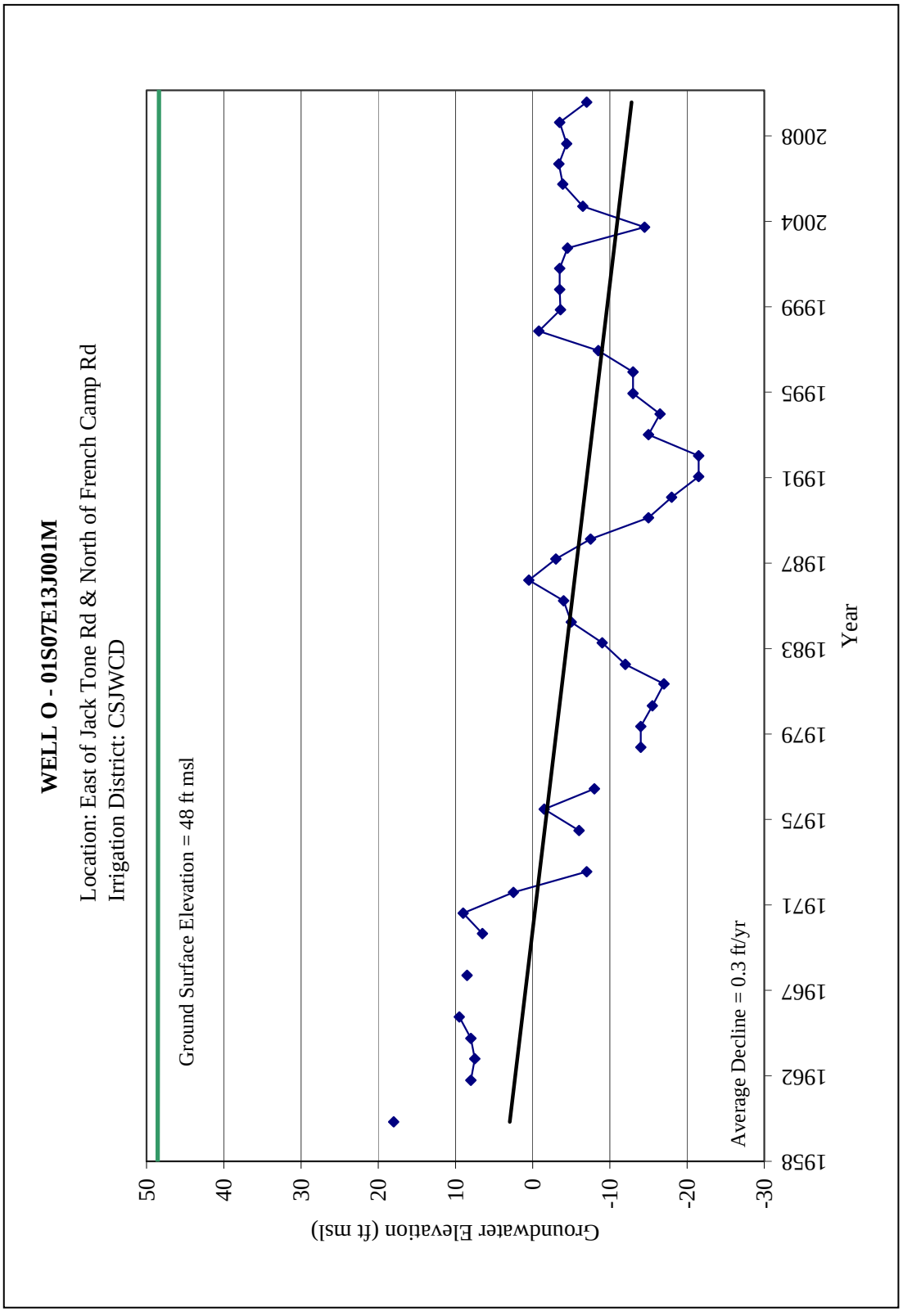

Figure 3-16: Fall Hydrograph Well O

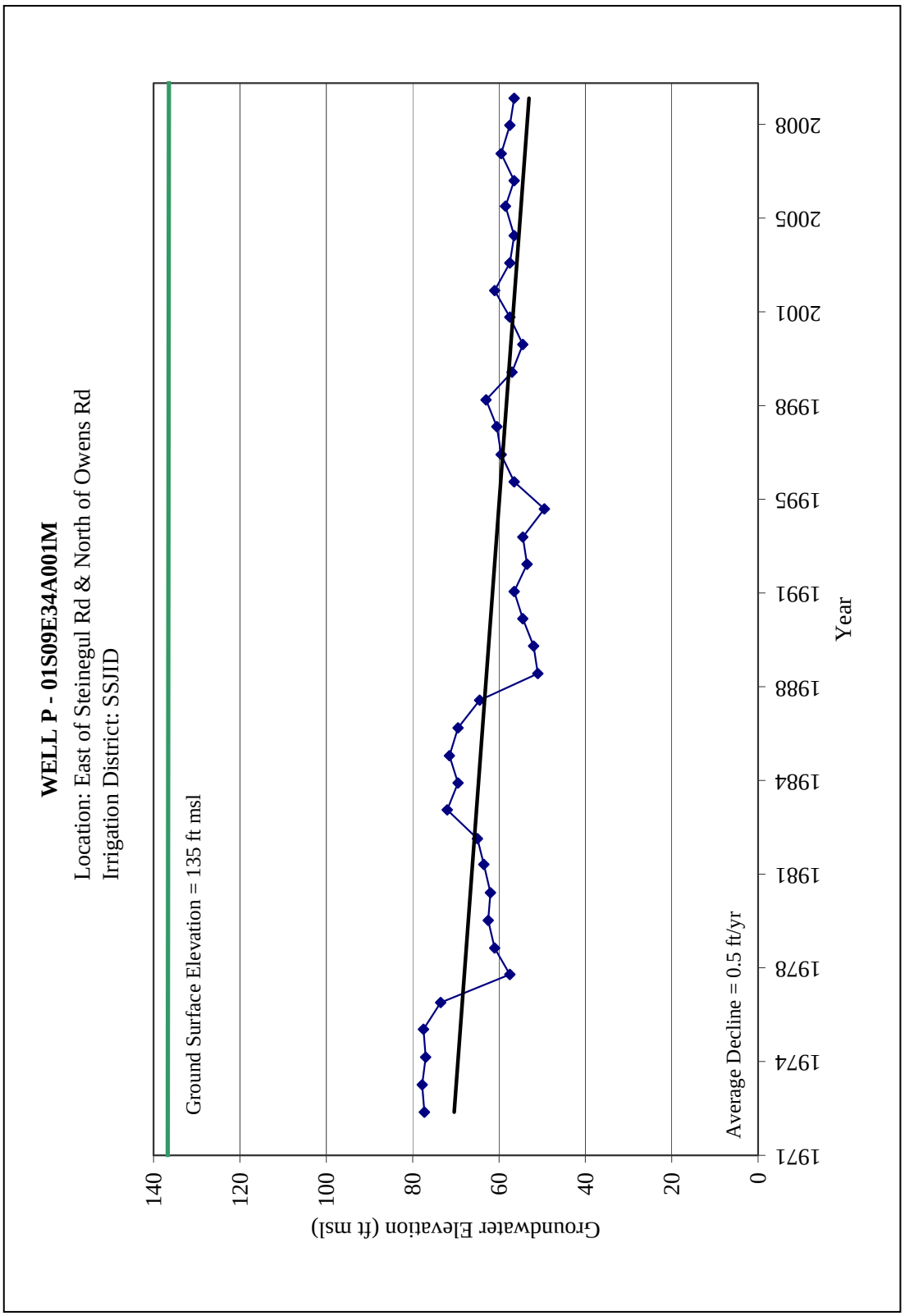

Figure 3-17: Fall Hydrograph Well P

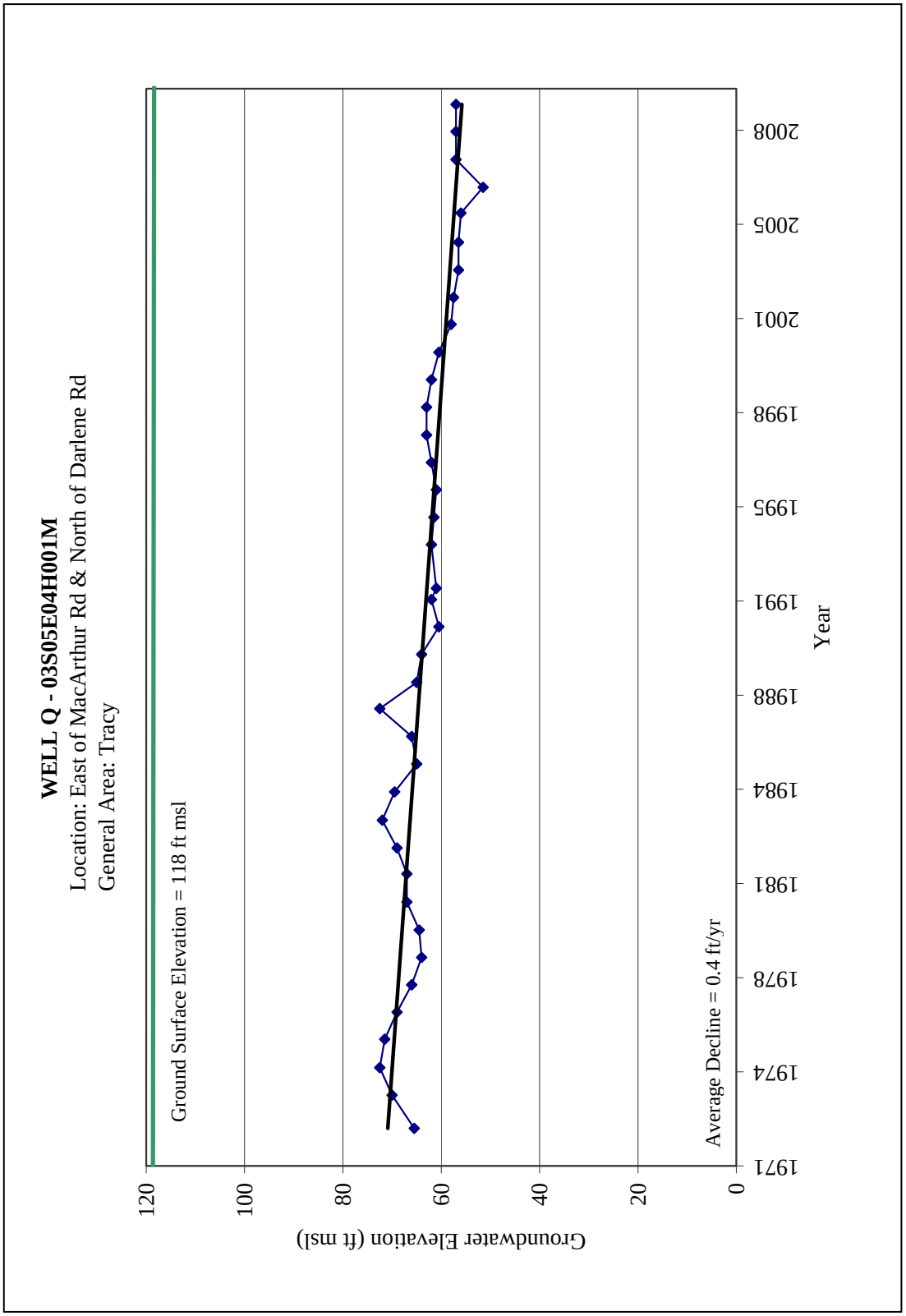

Figure 3-18: Fall Hydrograph Well Q

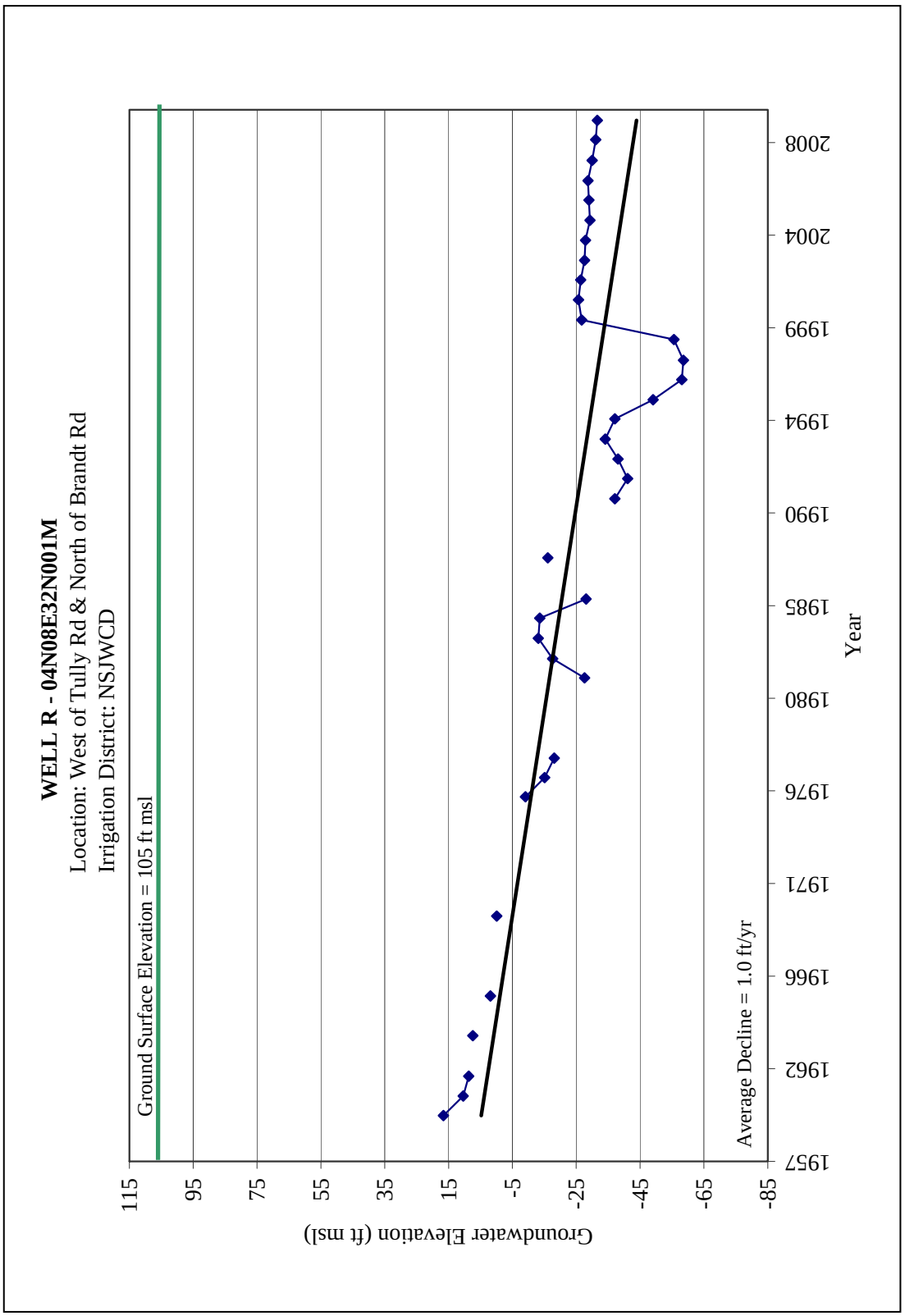

Figure 3-19: Fall Hydrograph Well R

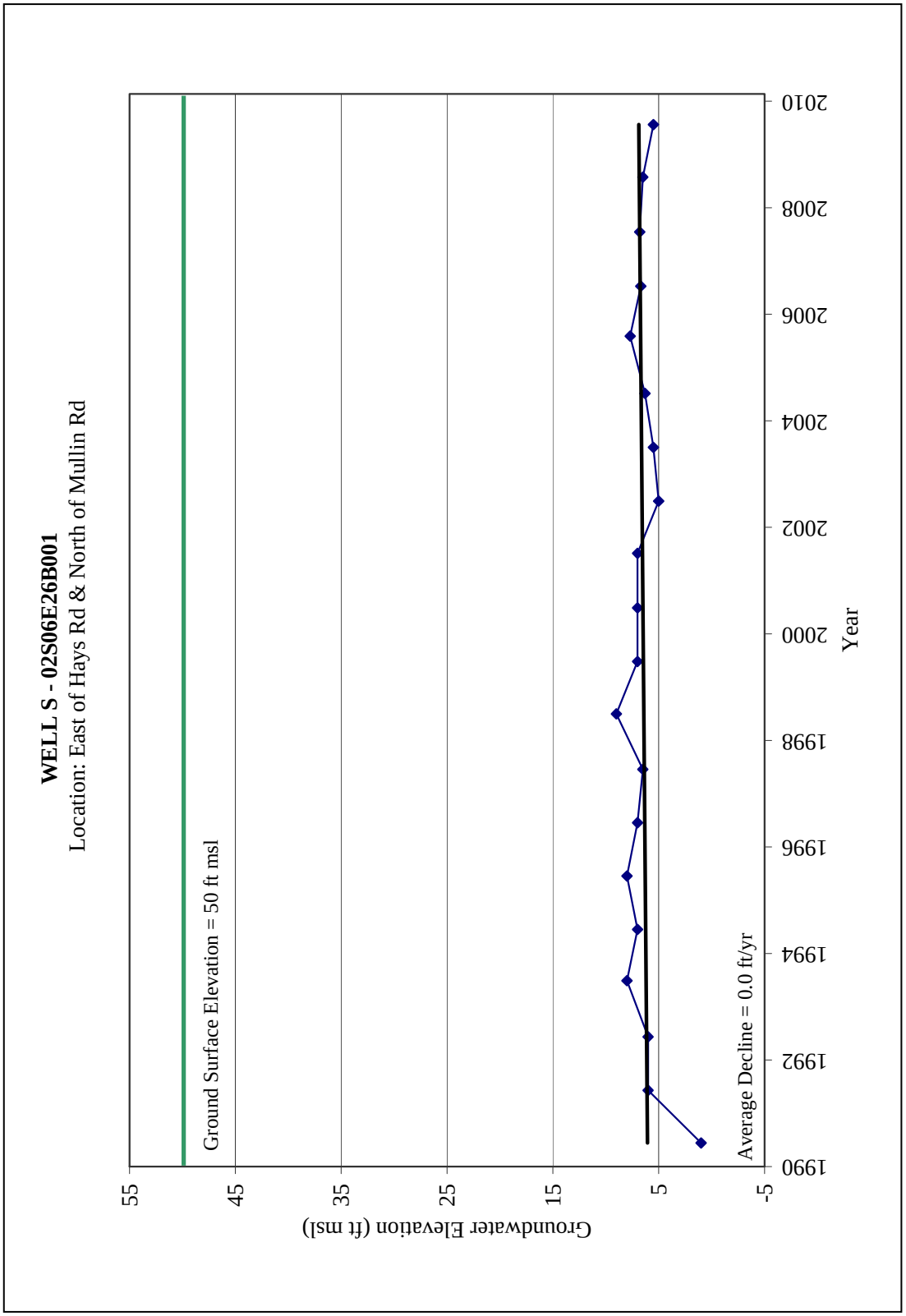

Figure 3-20: Fall Hydrograph Well S

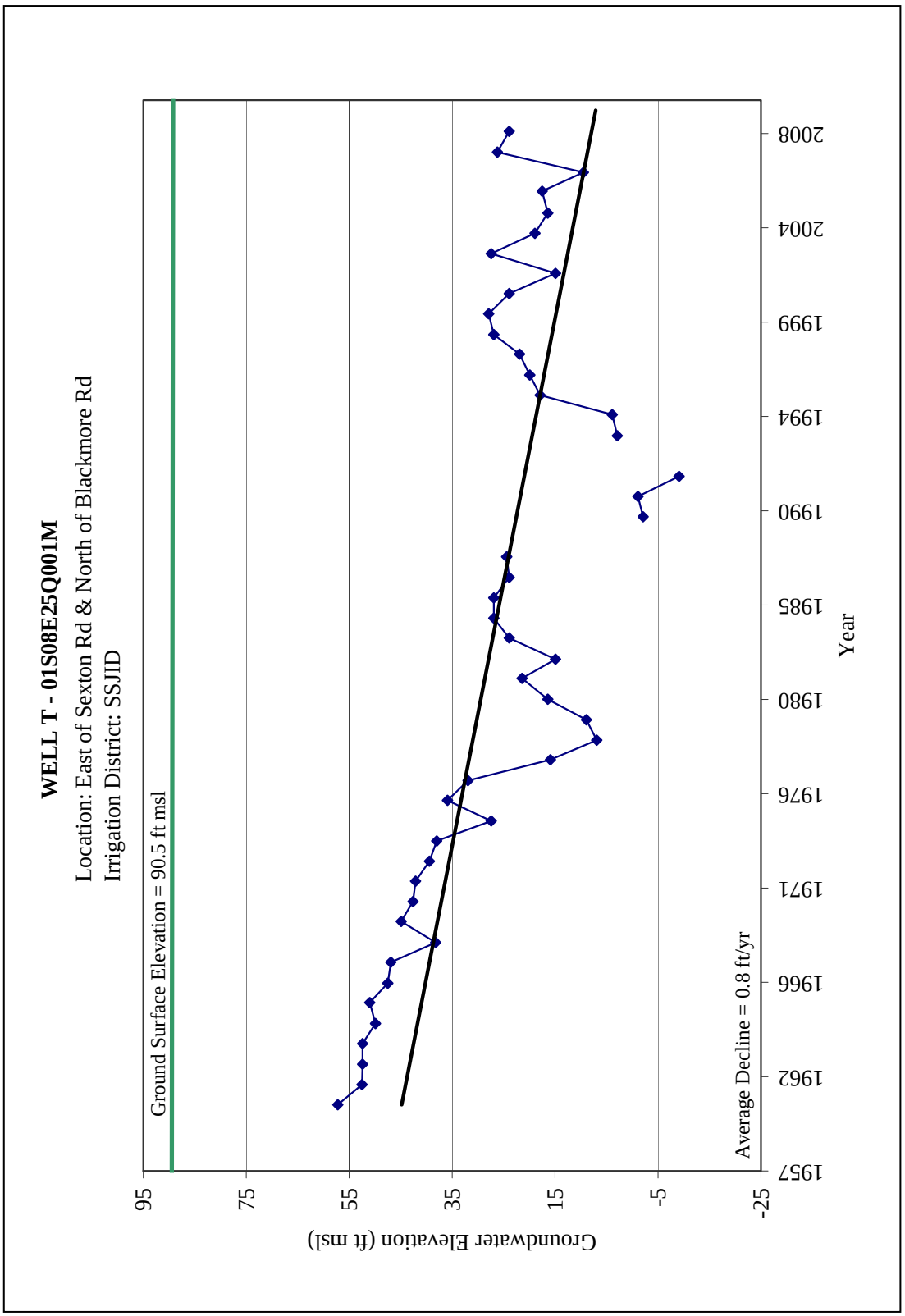

Figure 3-21: Fall Hydrograph Well T

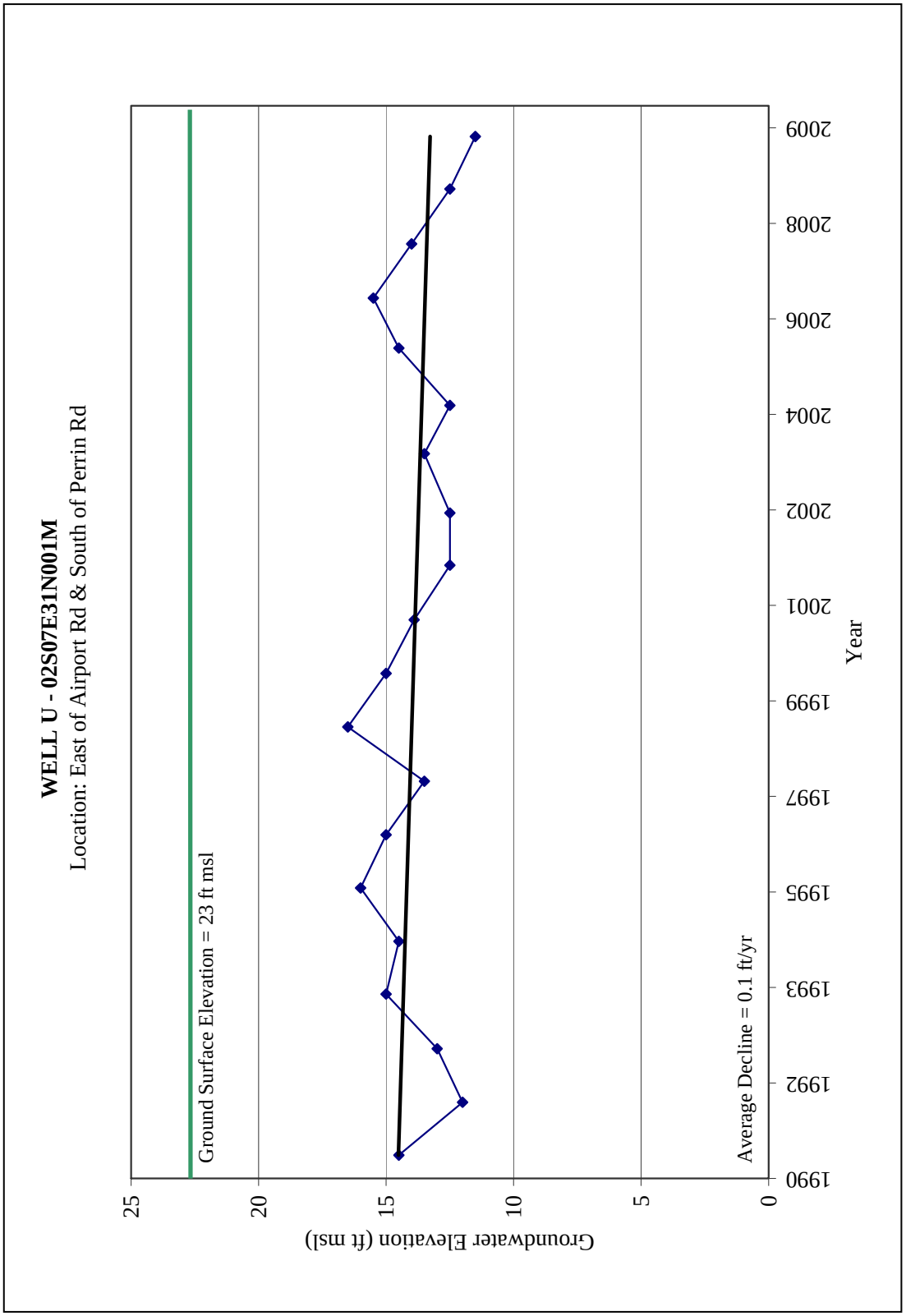

Figure 3-22: Fall Hydrograph Well U

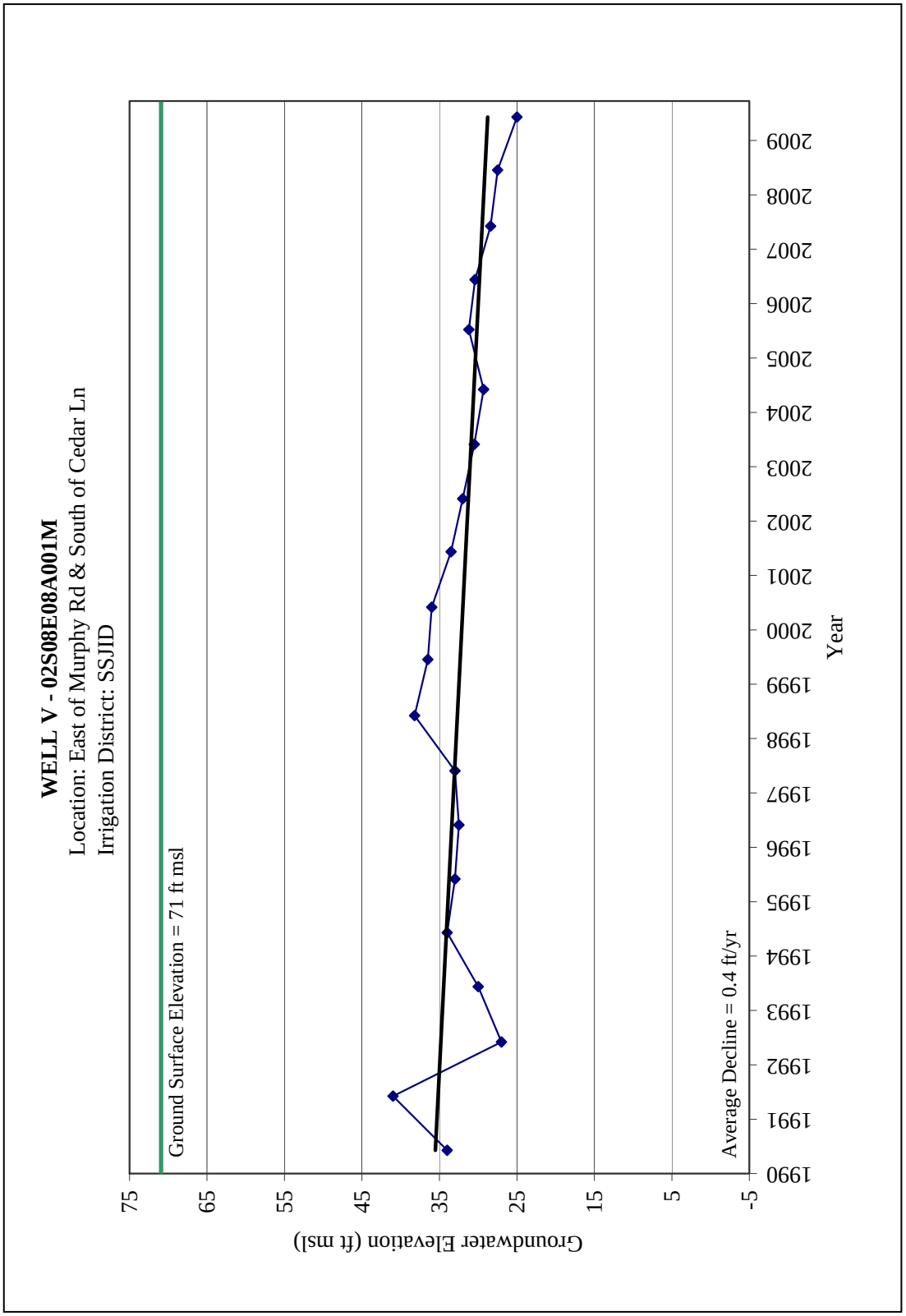

Figure 3-23: Fall Hydrograph Well V

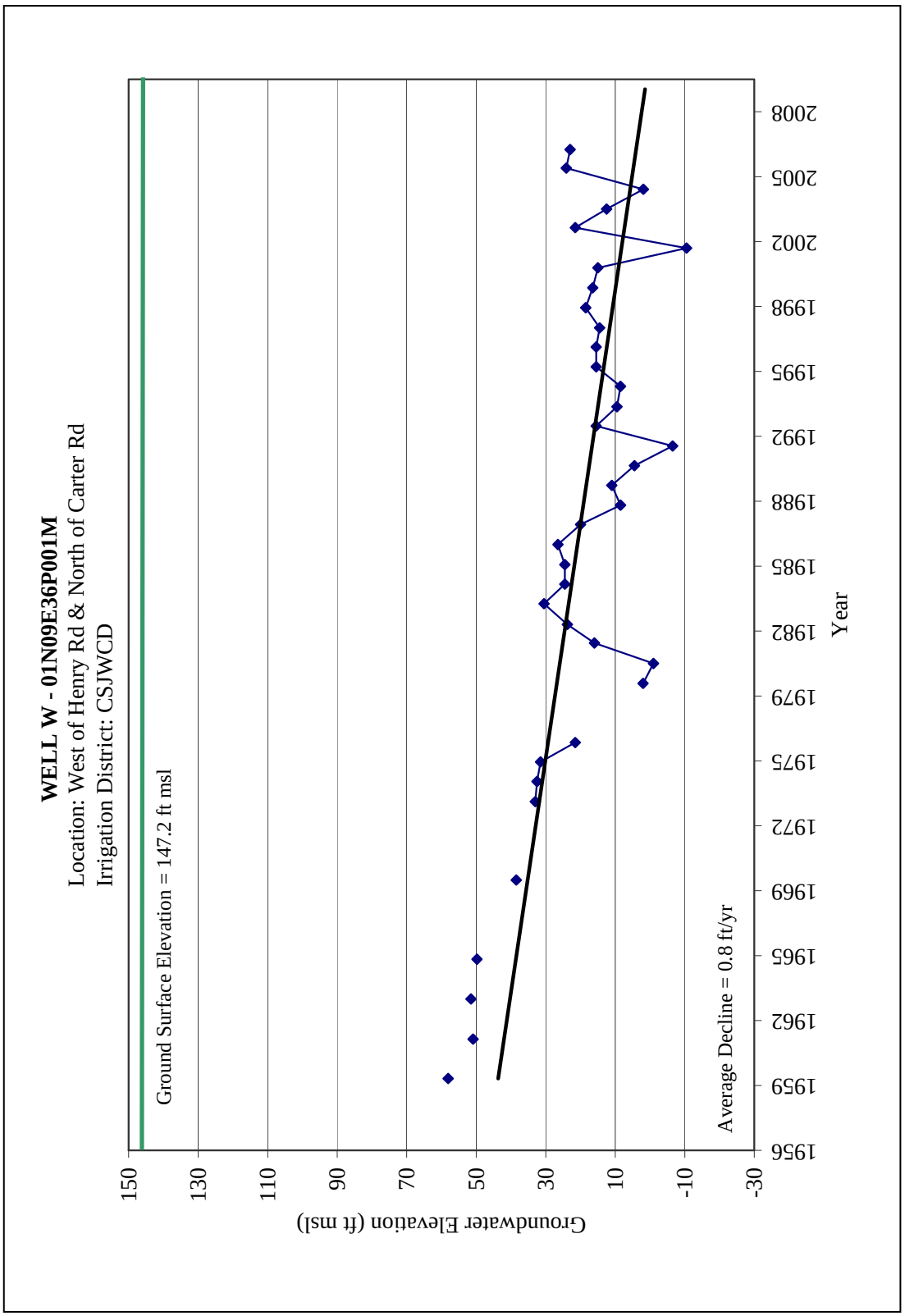

Figure 3-24: Fall Hydrograph Well W

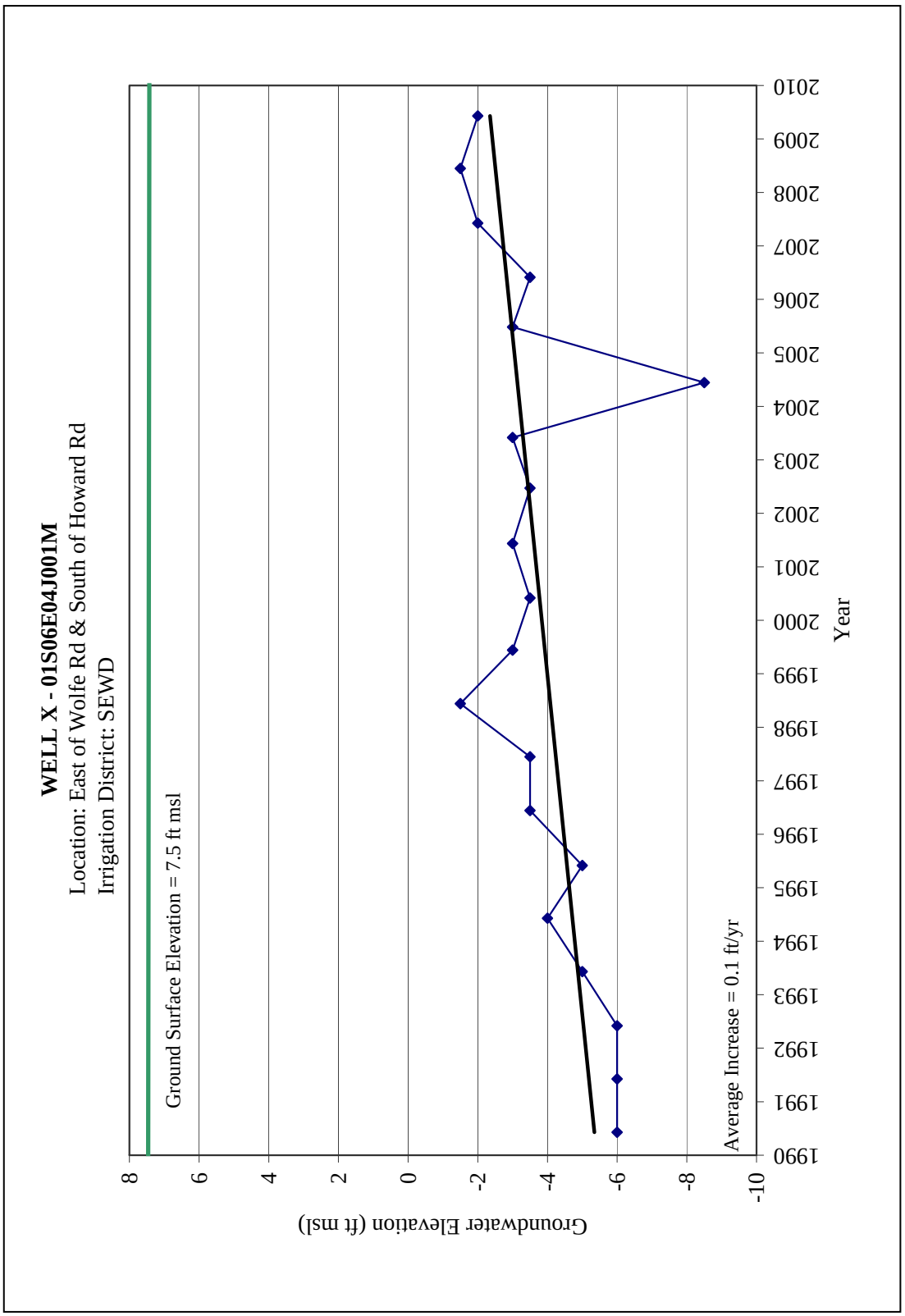

Figure 3-25: Fall Hydrograph Well X

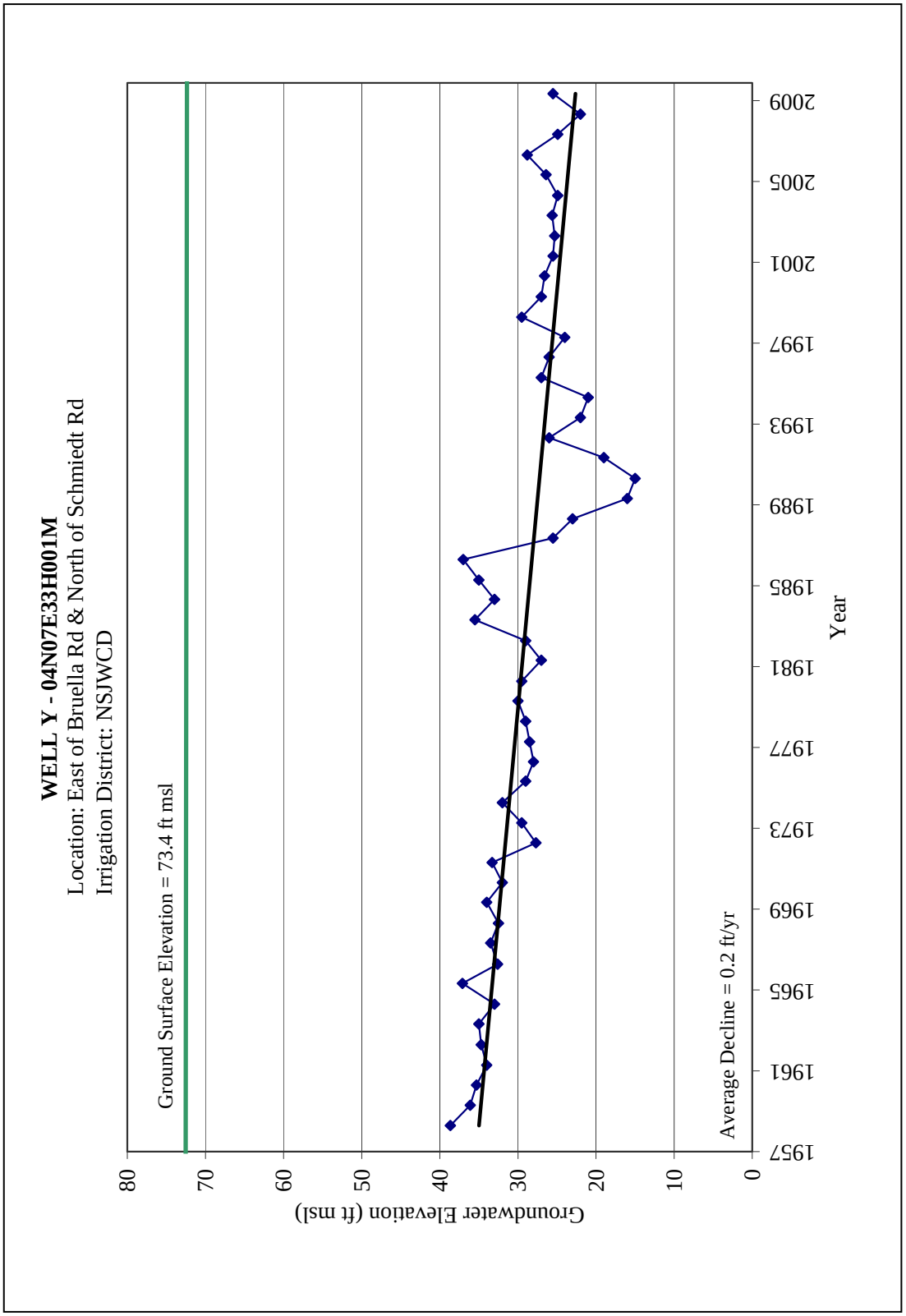

Figure 3-26: Fall Hydrograph Well Y

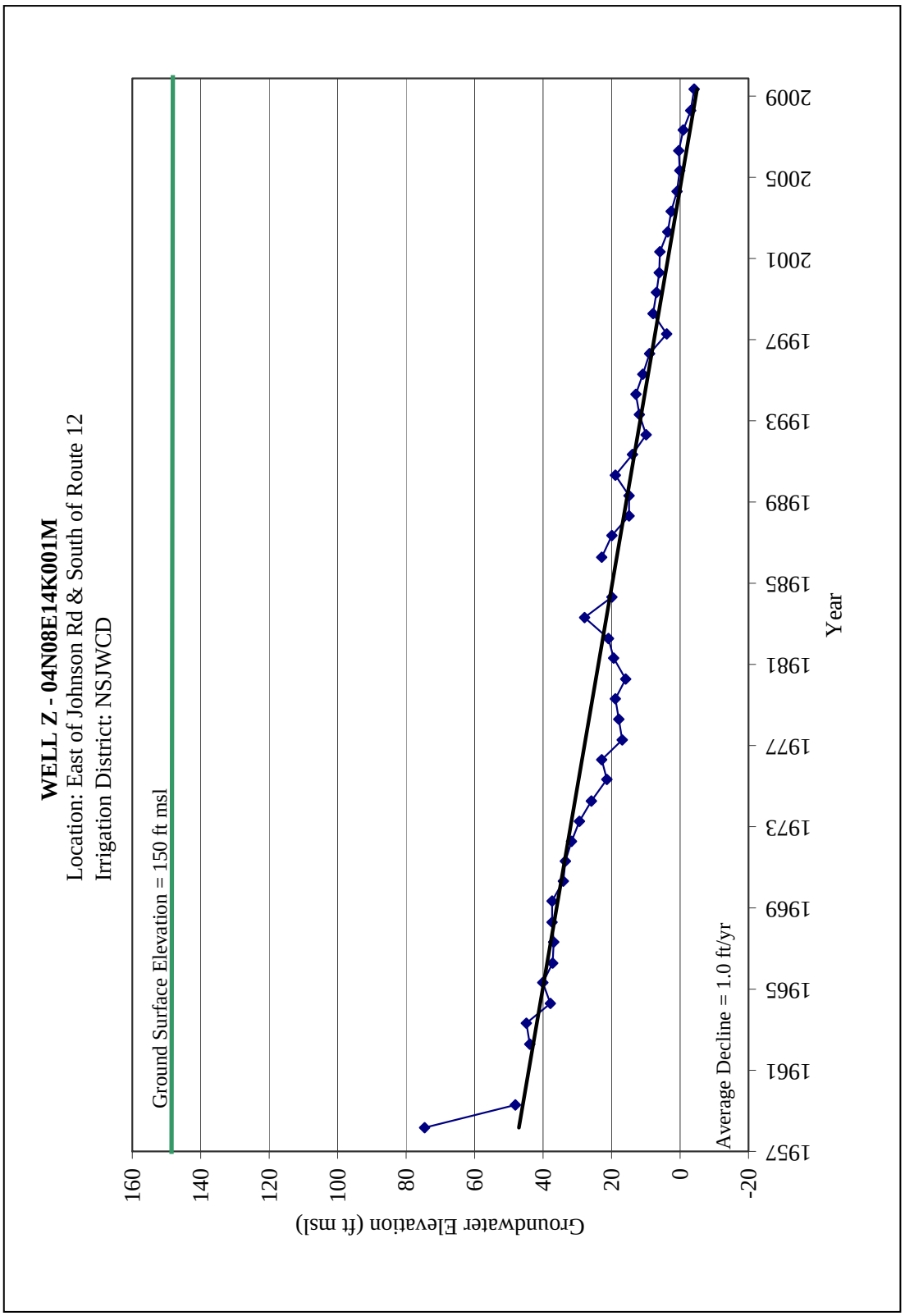

Figure 3-27: Fall Hydrograph Well Z

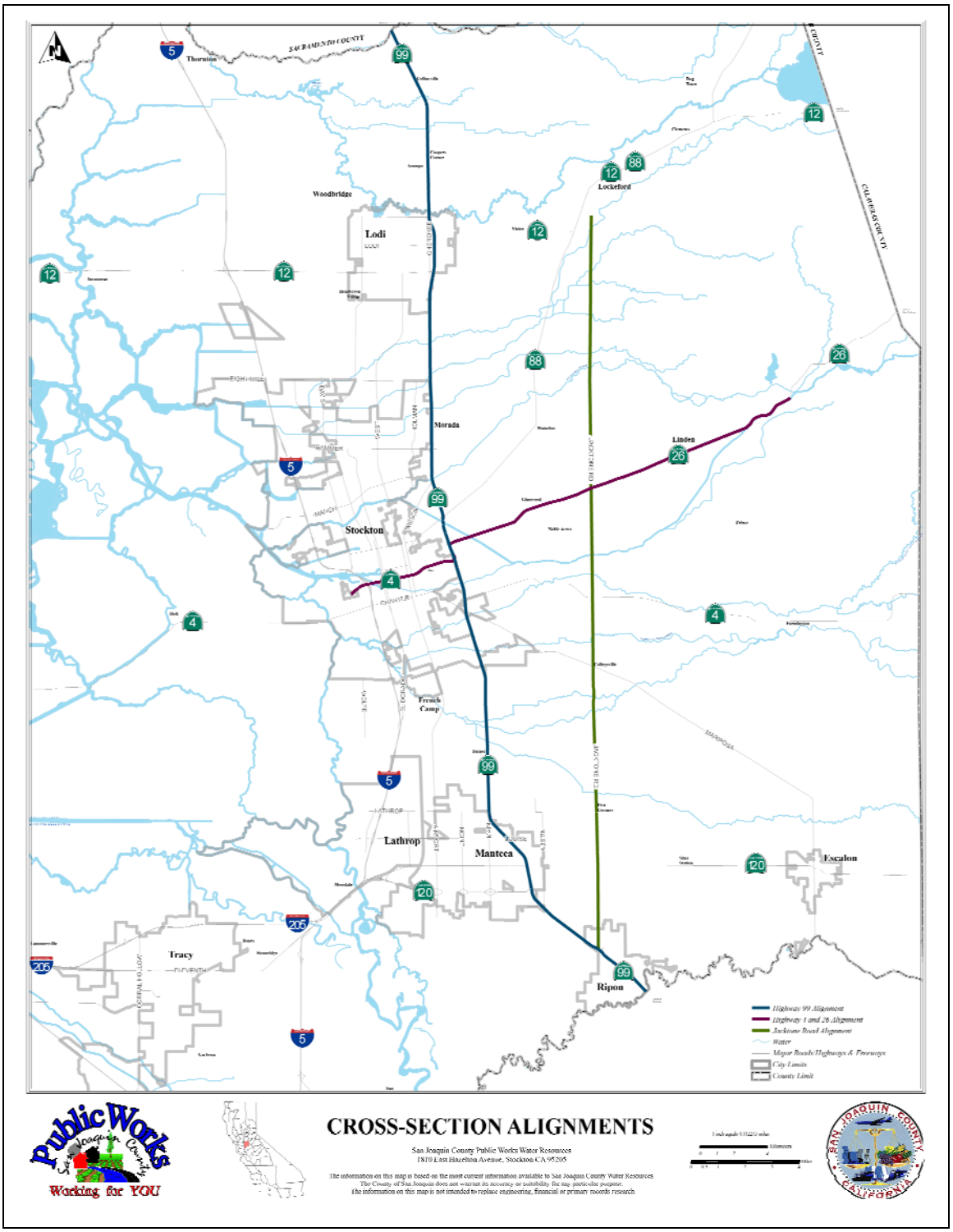

Figure 3-28: Cross Section Alignments

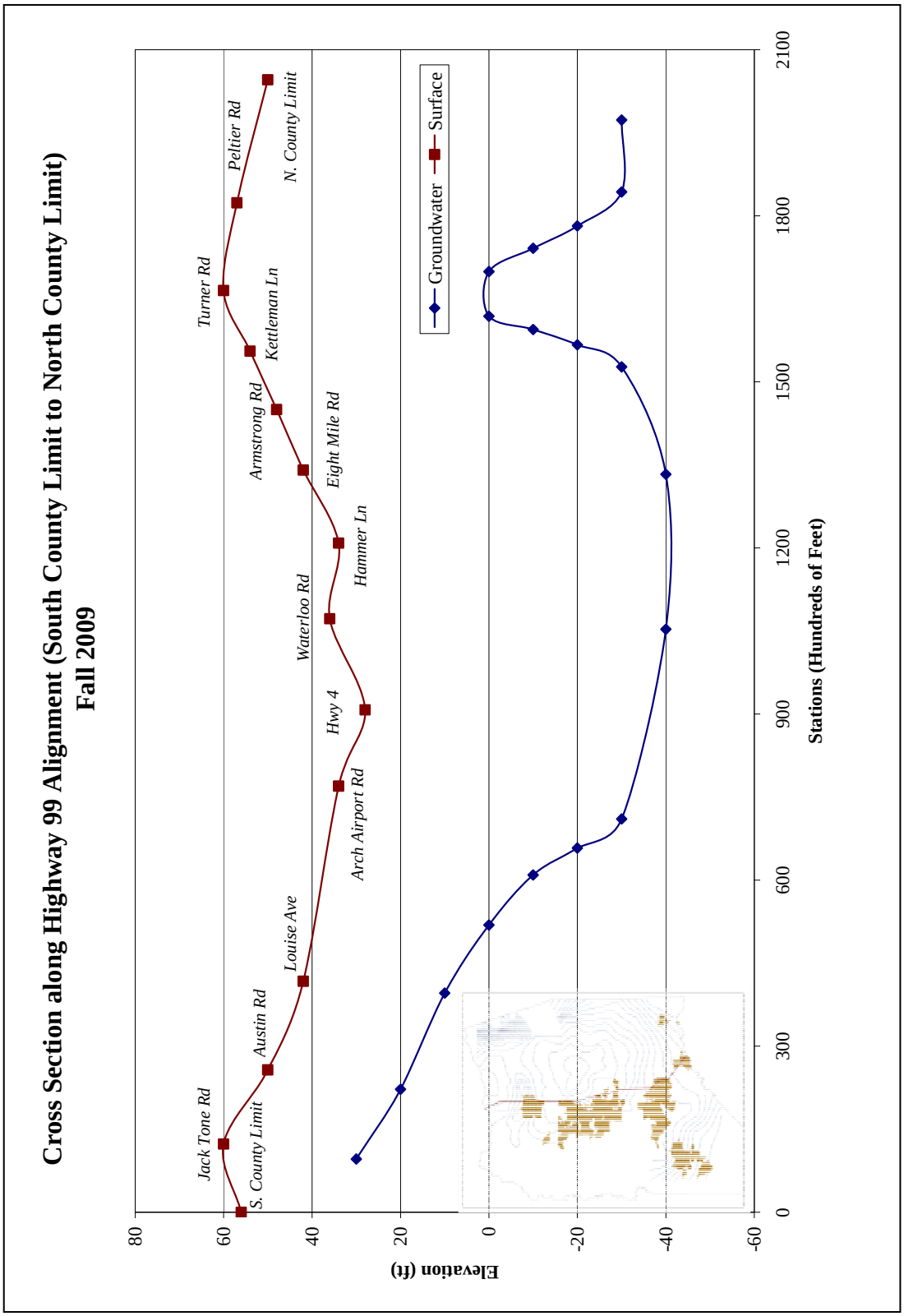

Figure 3-29: Highway 99 Cross Section Fall 2009

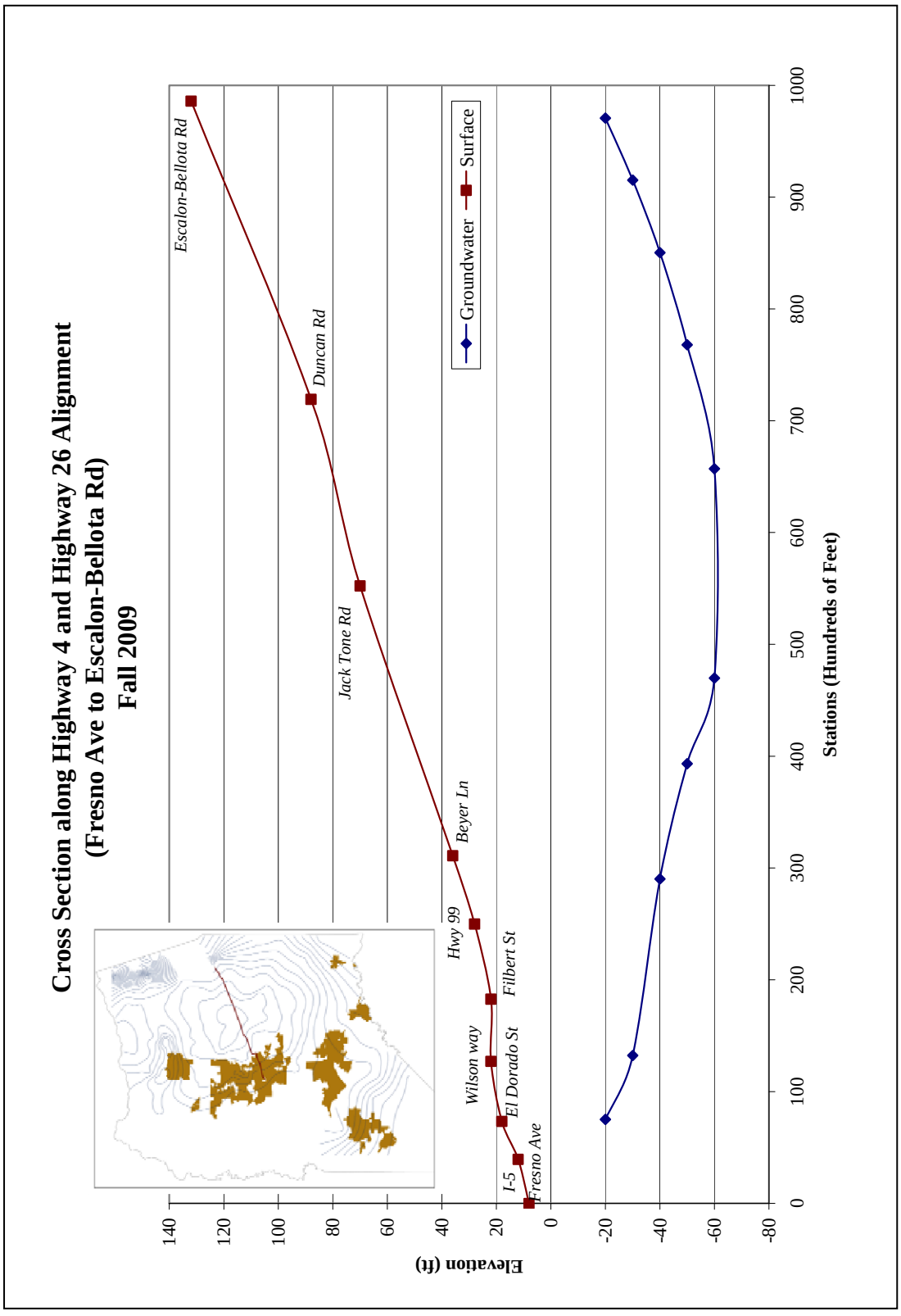

Figure 3-30: Highway 4 & Highway 26 Cross Section Fall 2009

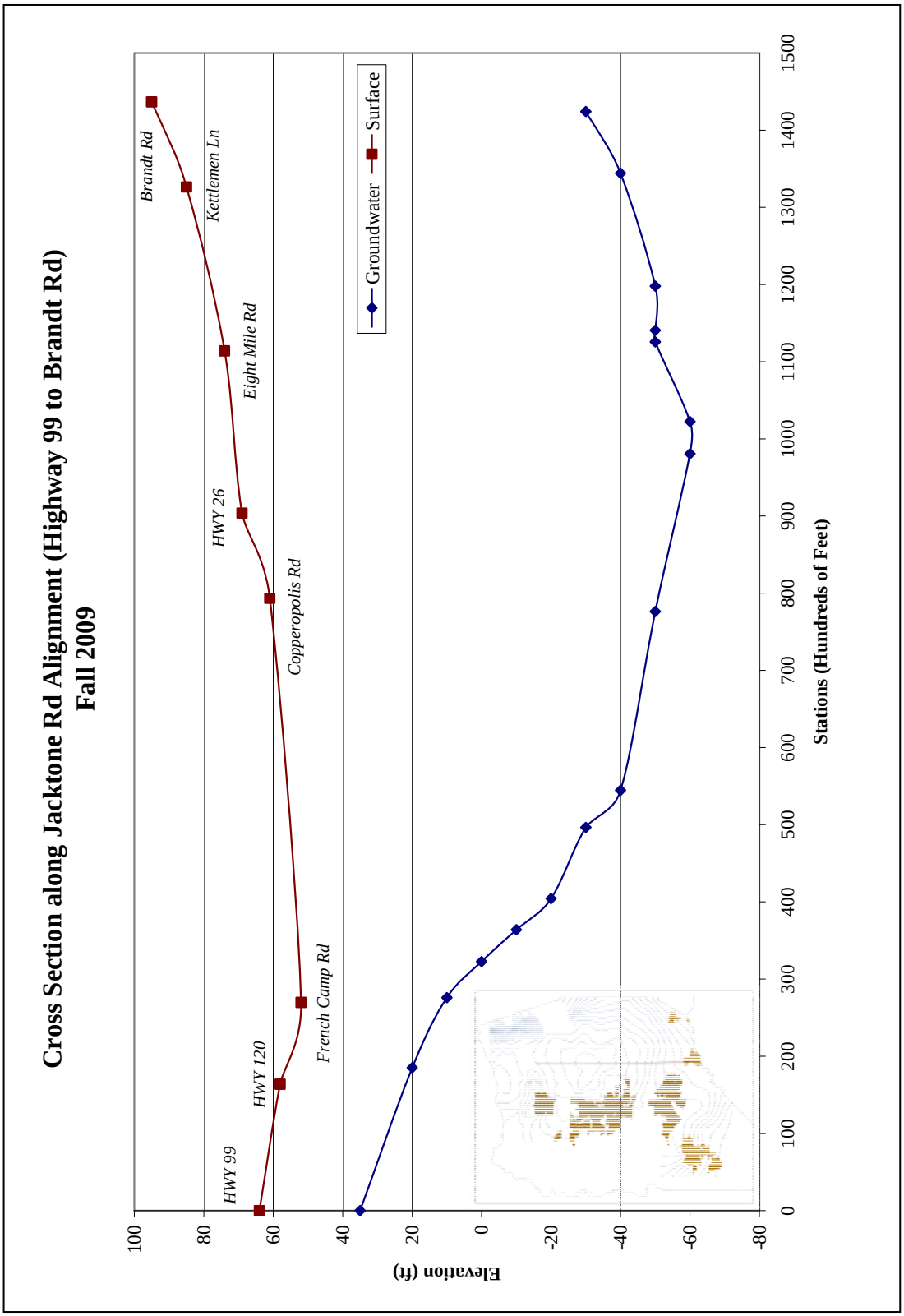

Figure 3-31: Jacktone Rd Cross Section Fall 2009

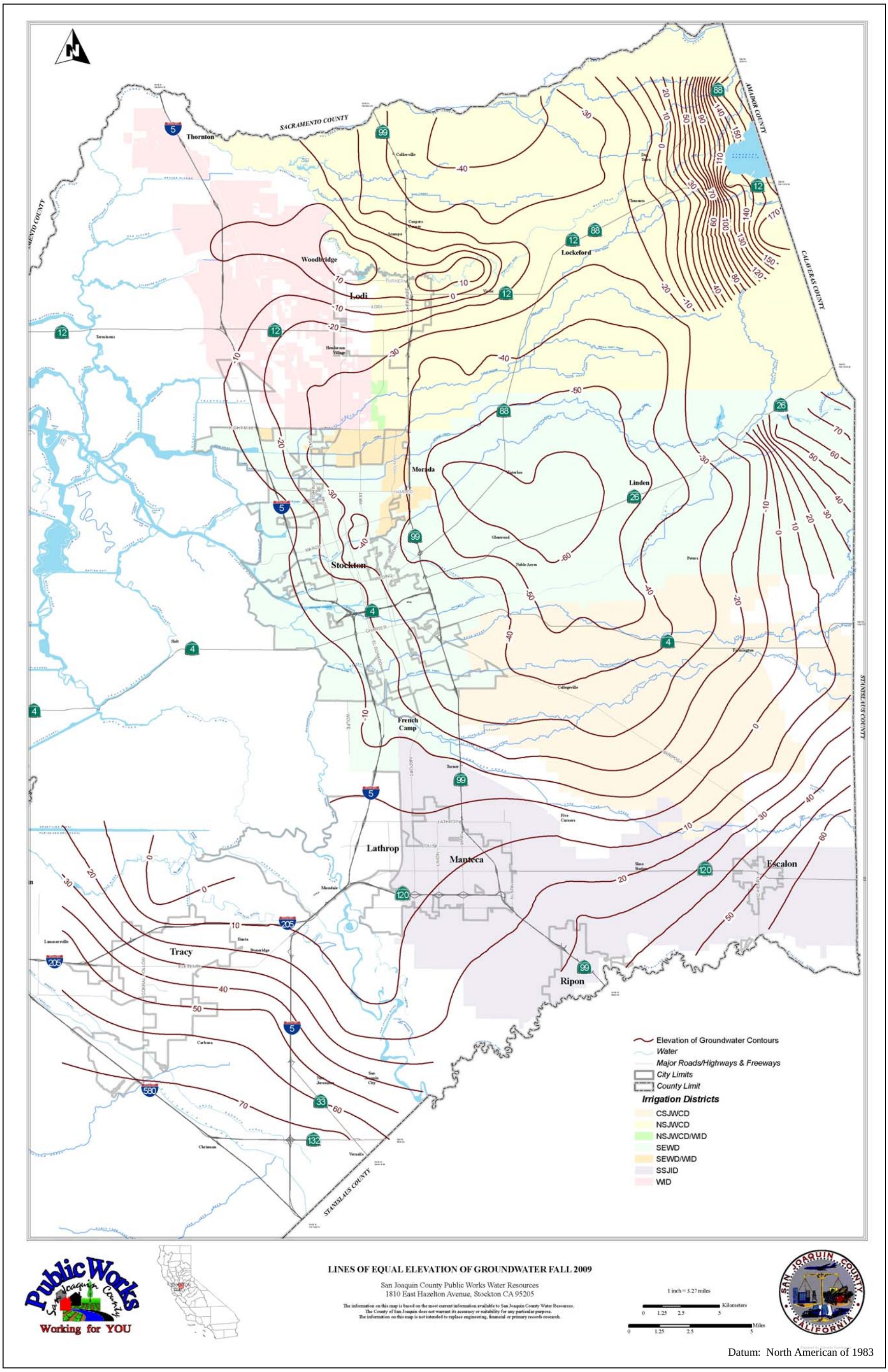

Figure 3-32: Lines of Equal Elevation of Groundwater Fall 2009

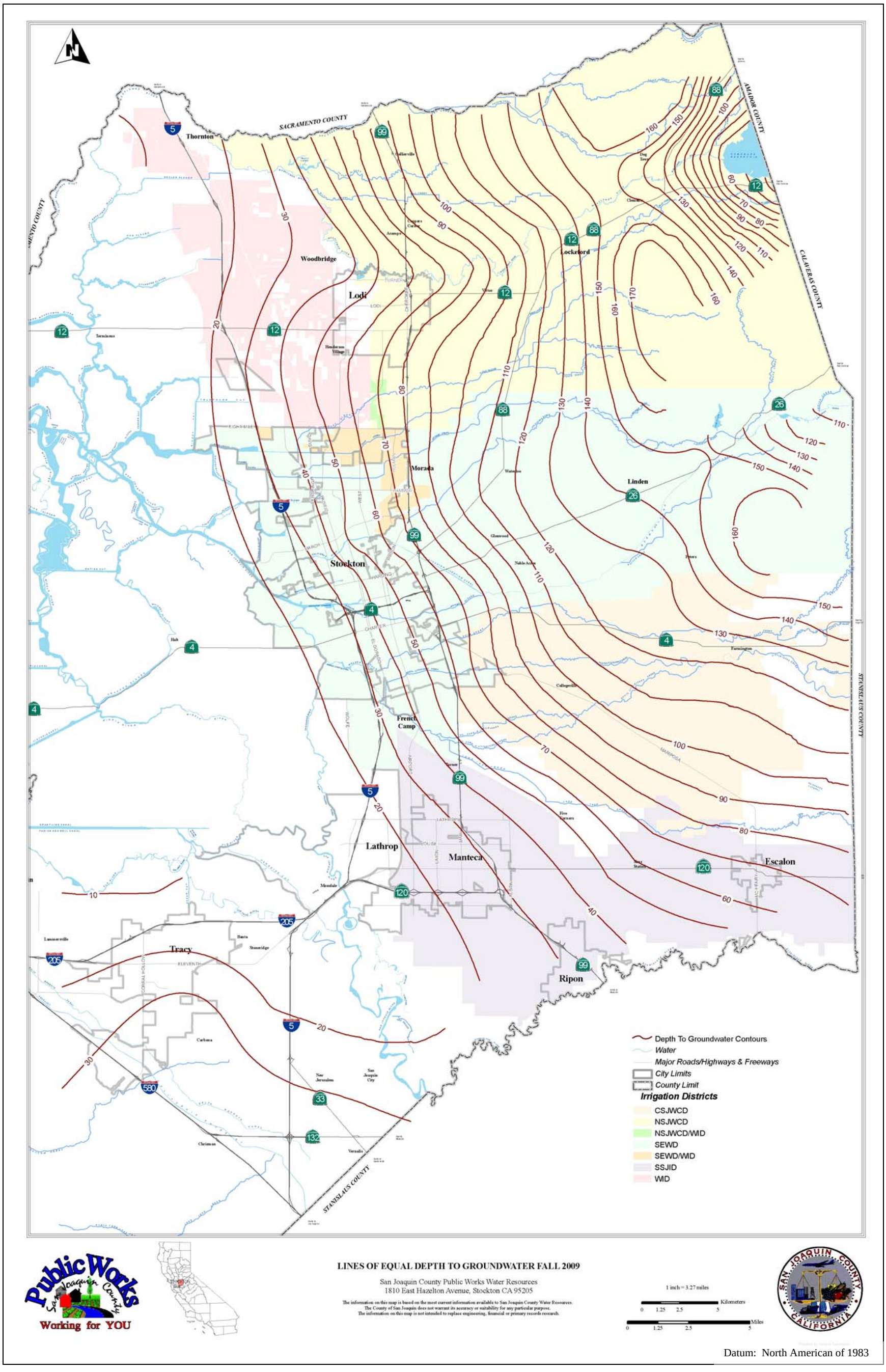

Figure 3-33: Lines of Equal Depth to Groundwater Fall 2009