Groundwater Report

Fall 2011

San Joaquin County
Flood Control and Water Conservation District

San Joaquin County
Flood Control and Water Conservation District

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Copies of the Fall 2011 Groundwater Report may be purchased for $30 and 36″X48″ Contour Maps for $25 each from:

San Joaquin County Department of Public Works
P.O. Box 1810
Stockton, California 95201
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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San Joaquin County Flood Control and Water Conservation District
Fall 2011 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 550 wells, of which 270 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 months. Therefore, groundwater quality data will be published only in the fall report. The groundwater depth and elevation data will be published both in 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. 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 then 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 2011. The Camp Pardee station has data available from 1949 to 2011.

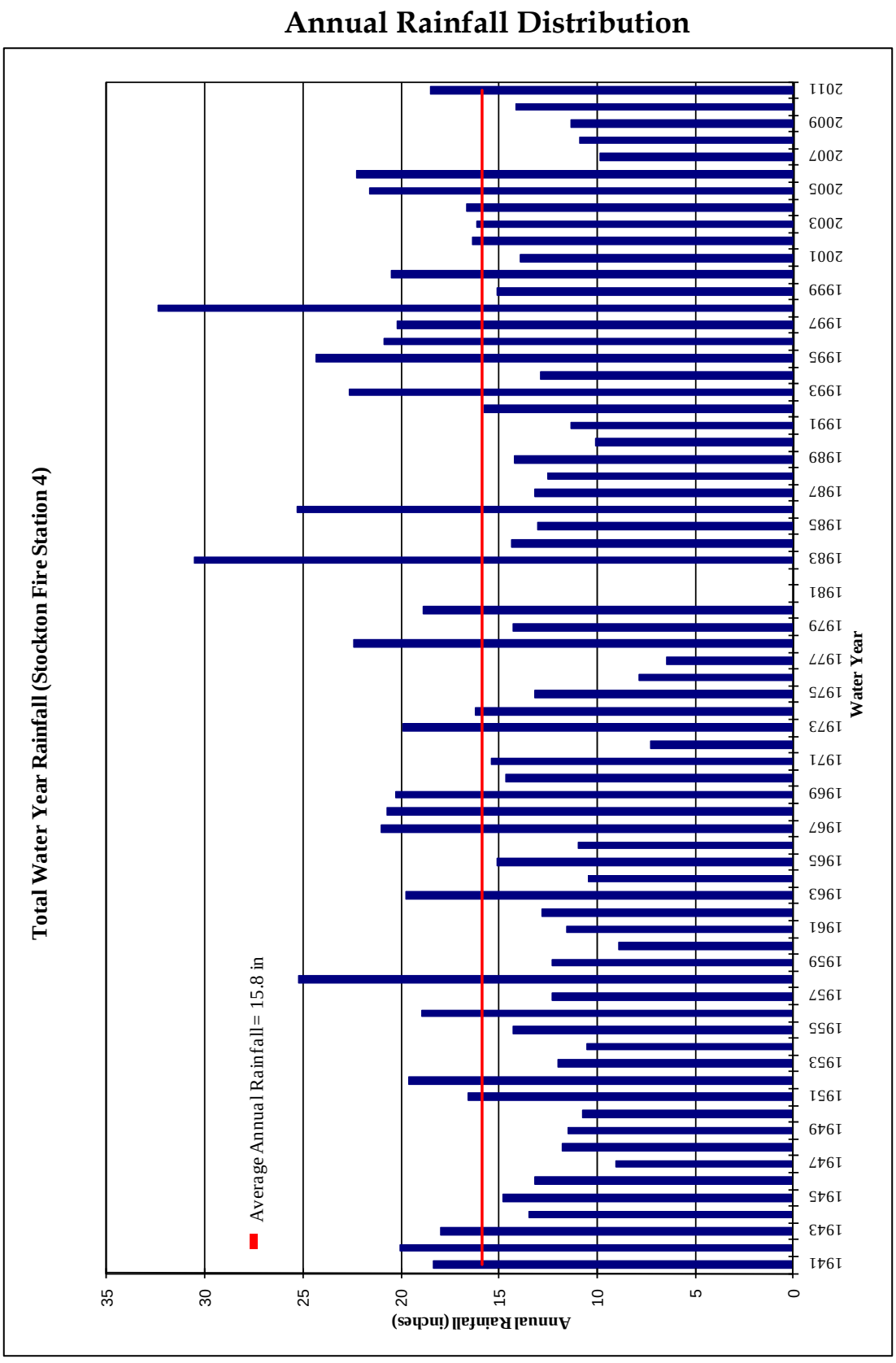

Figure 1-1: Total Annual Rainfall (Stockton Fire Station 4)

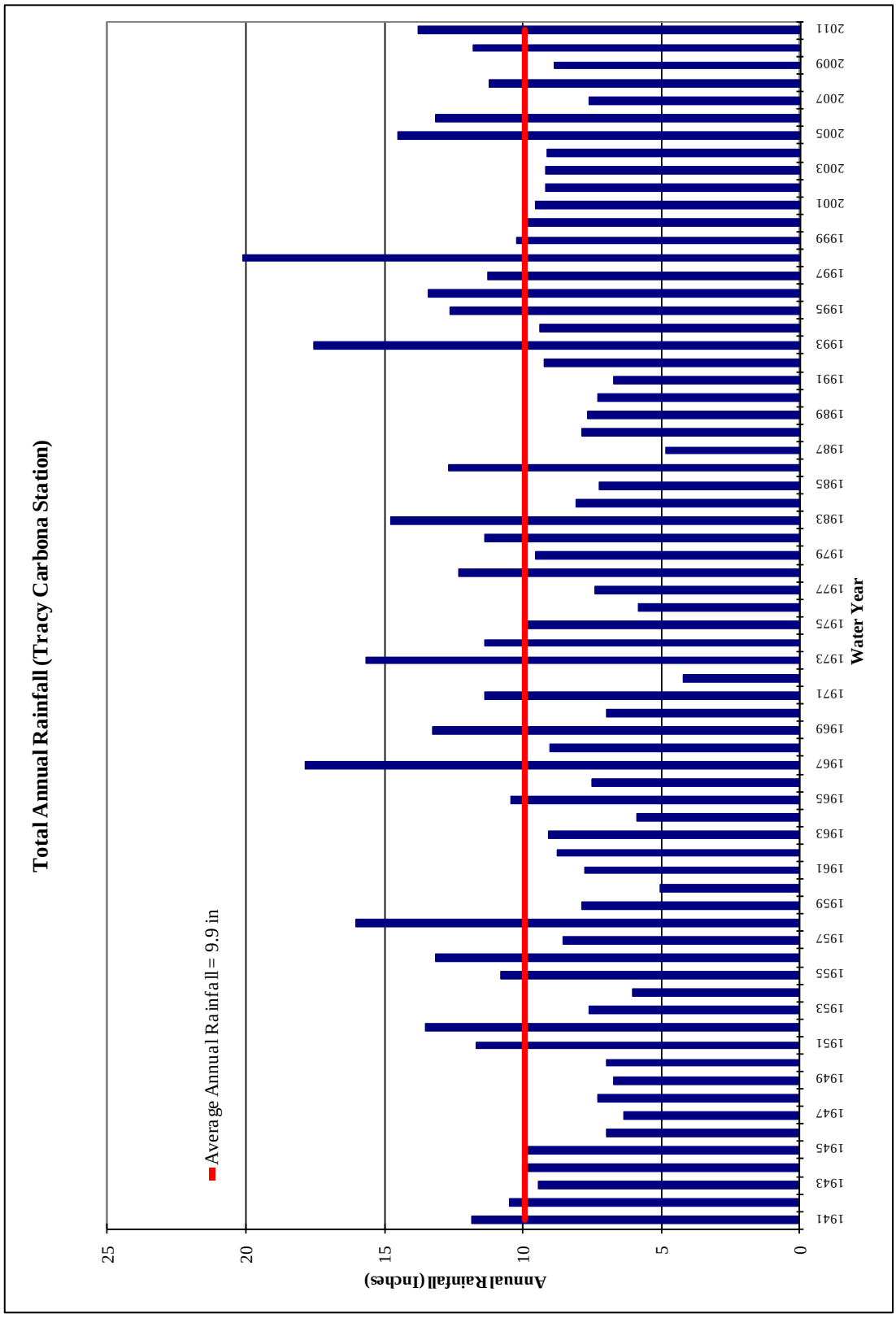

Figure 1-2: Total Annual Rainfall (Tracy Carbona Station)

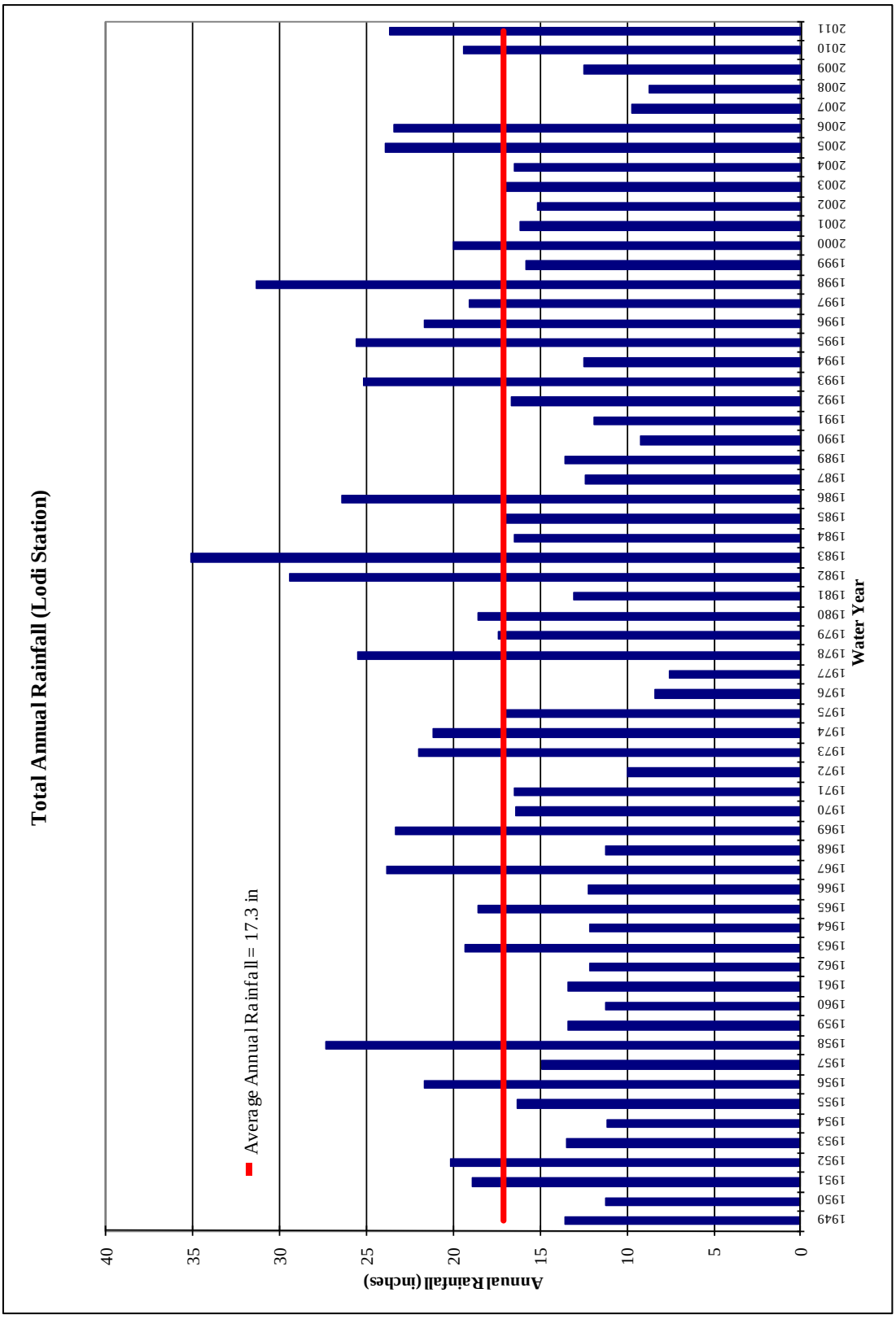

Figure 1-3: Total Annual Rainfall (Lodi Station)

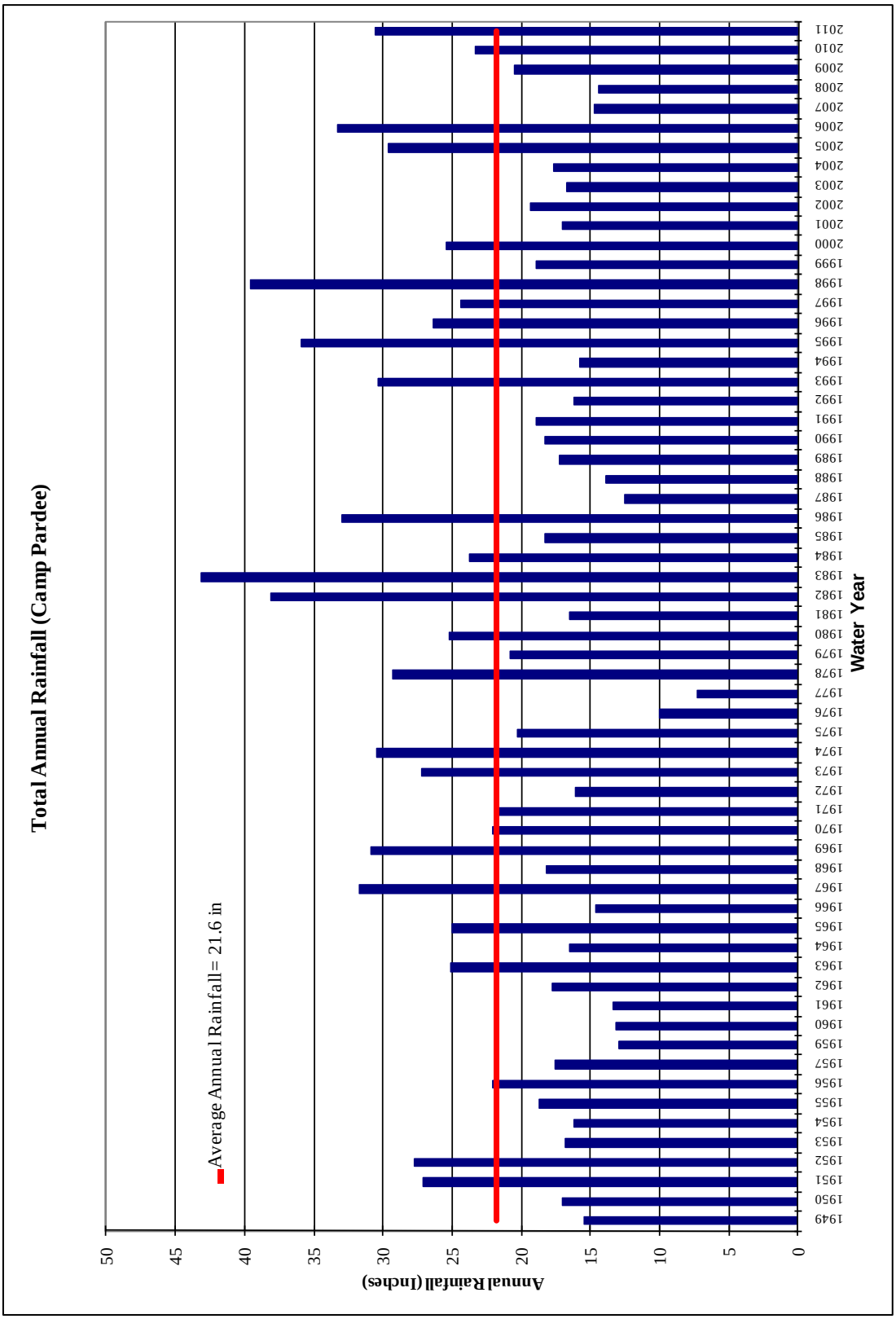

Figure 1-4: Total Annual Rainfall (Camp Pardee)

Monthly Rainfall Distribution

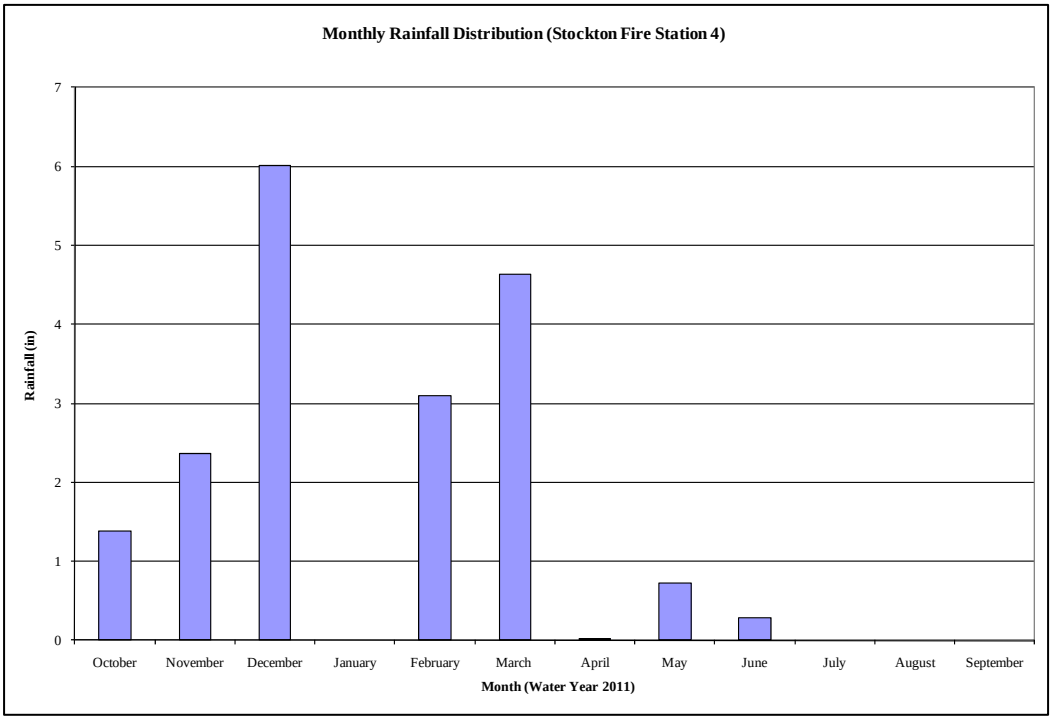

Figure 1-5: Monthly Rainfall Distribution (Stockton Fire Station 4)

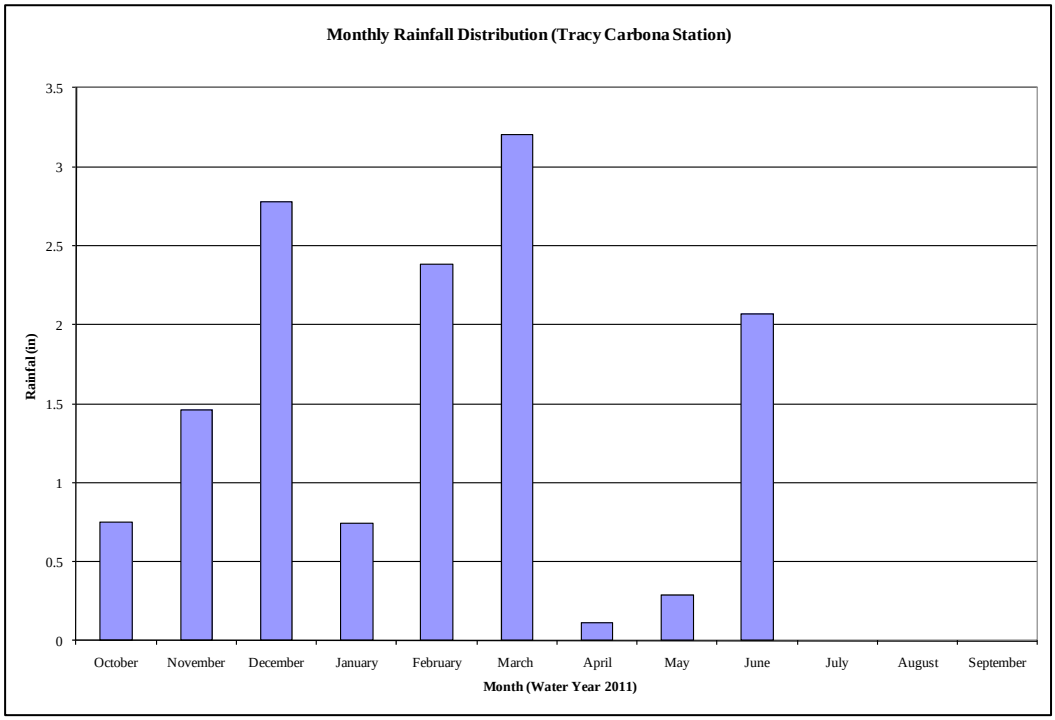

Figure 1-6: Monthly Rainfall Distribution (Tracy Carbona Station)

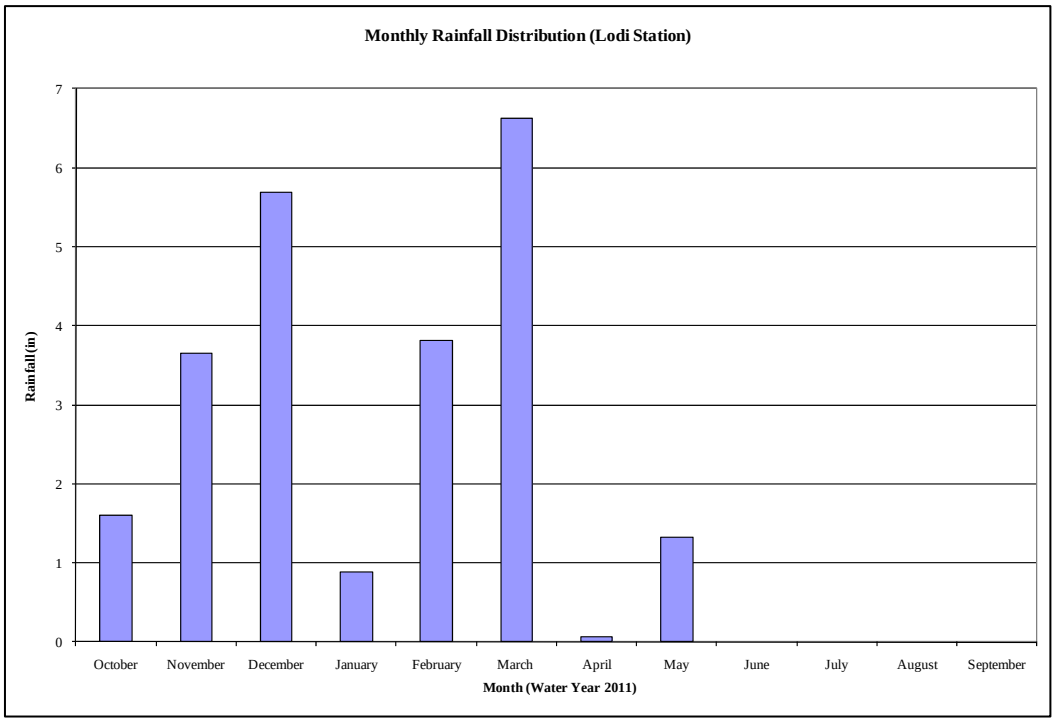

Figure 1-7: Monthly Rainfall Distribution (Lodi Station)

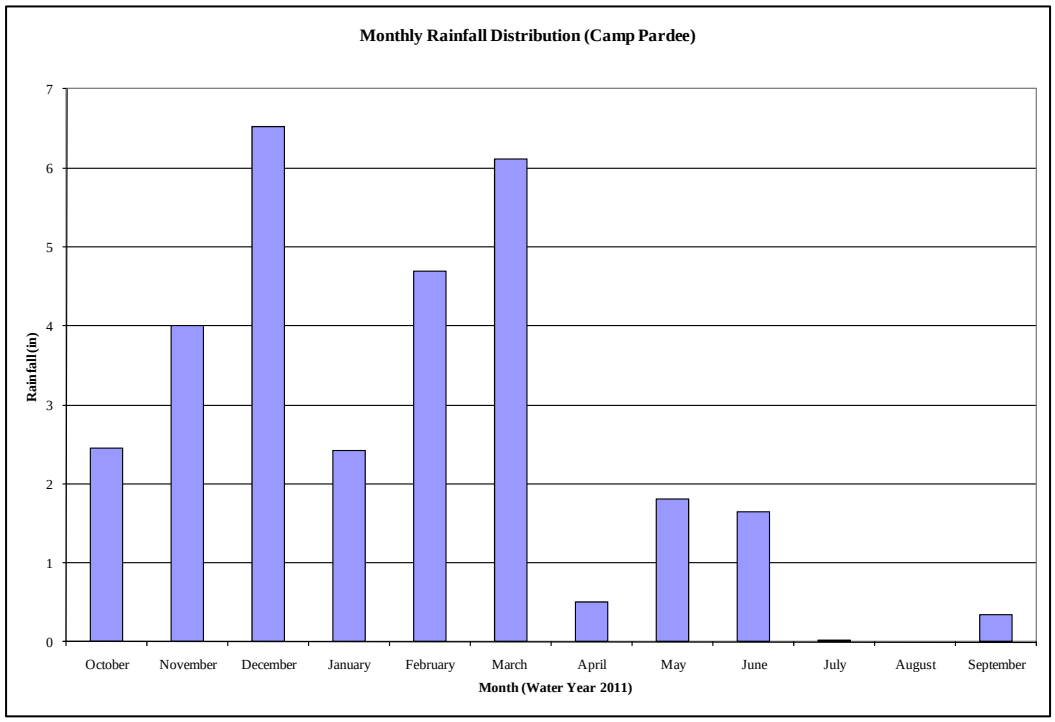

Figure 1-8: Monthly Rainfall Distribution (Camp Pardee)

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Section 2 – Groundwater Quality Monitoring

Summary of Groundwater Quality Results

The information contained in the Fall 2011 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 increase in Cl^- and a slight decrease in EC and TDS from the previous measurements in the fall of 2010.

North Stockton – Four wells were tested for Cl^-, EC and TDS in North Stockton. One well decreased in Cl^-, EC, and TDS concentrations while three increased in Cl^-, EC and TDS concentration from the analysis in the fall 2010.

County Hospital Area - One well was tested near the San Joaquin County Hospital. There was a slight increase in Cl^- and a slight decrease in EC and TDS from the previous measurements in the fall of 2010.

Lathrop – Two wells were sampled in Lathrop. All of the analysis show increases in concentrations .

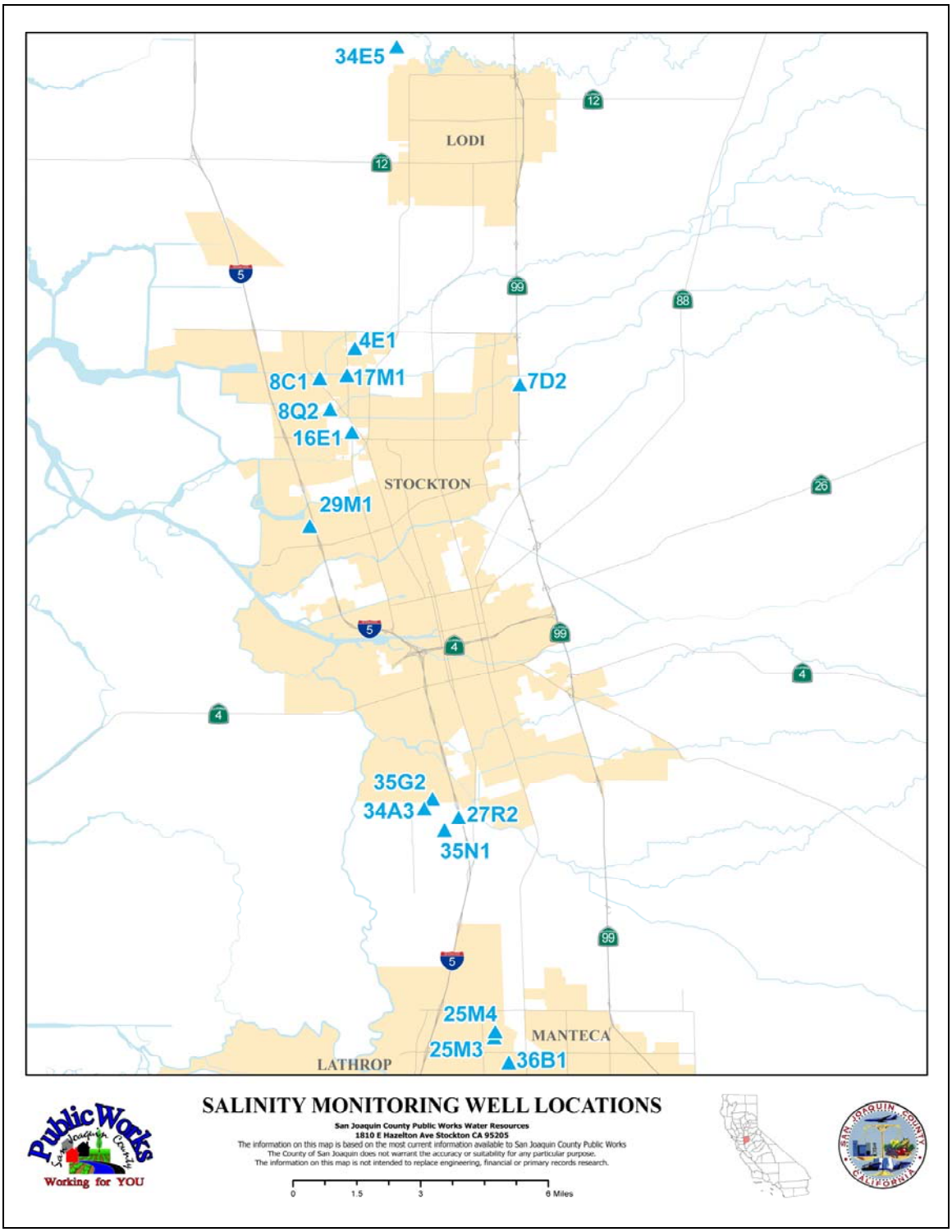

Figure 2-1: Salinity Monitoring Well Locations

Table 2-1: Groundwater Quality Mineral Analysis Fall 2011

Well	Chloride ppm	EC mmho	TDS* ppm
27R2	-	-	-
34A3	2164	5.70	3648
35G2	-	-	-
35N1	536	1.60	1024
25M3	-	-	-
25M4	36	0.45	288
36B1	24	0.51	326
4E1	37	0.56	358
8C1	32	0.63	403
8Q2	-	-	-
16E1	53	0.95	608
17M1	23	0.26	165
29M1	-	-	-
7D2	-	-	-
34E5	26	0.97	618

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

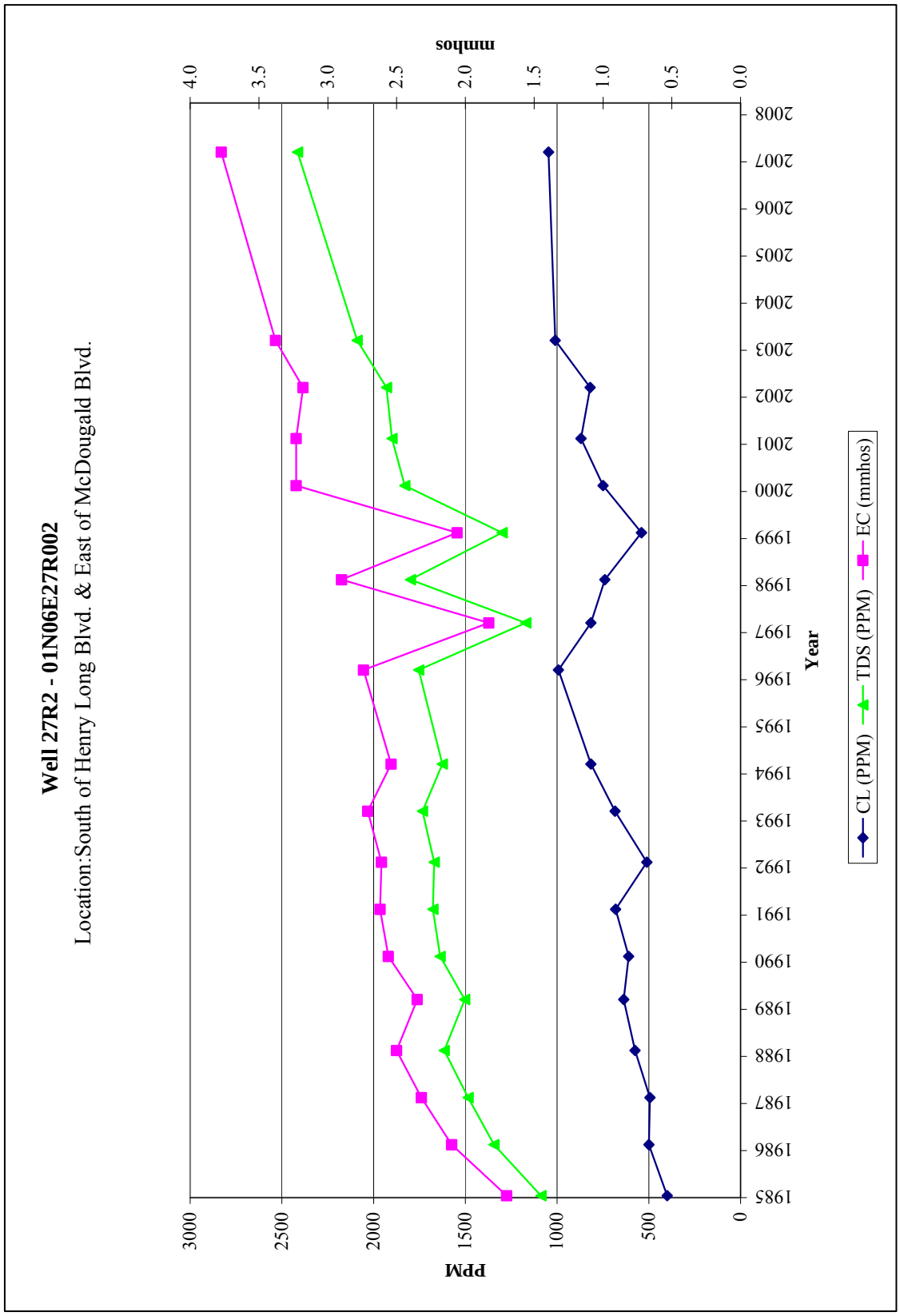

Figure 2-2: Quality Comparison Graph Well 27R2

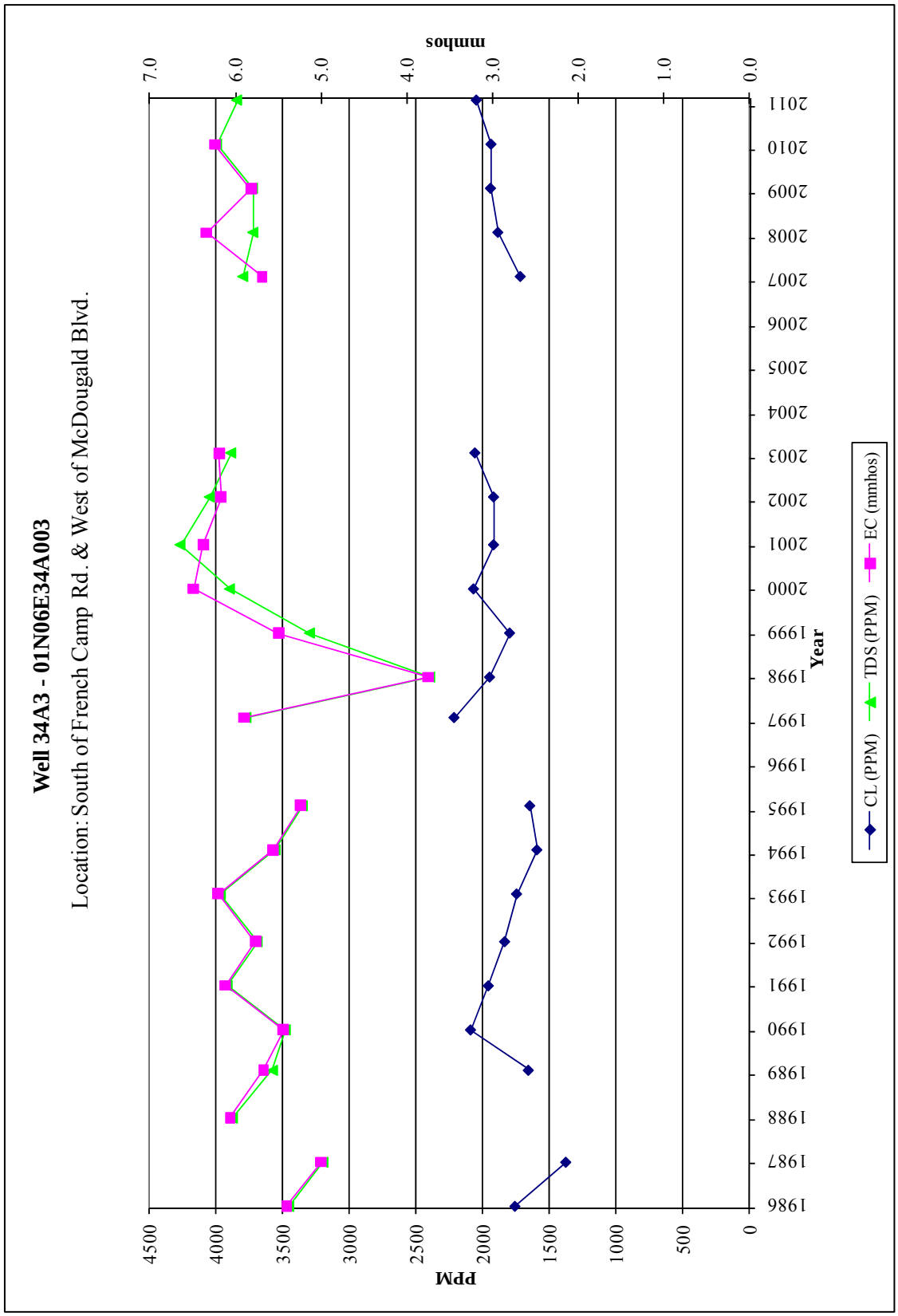

Figure 2-3: Quality Comparison Graph Well 34A3

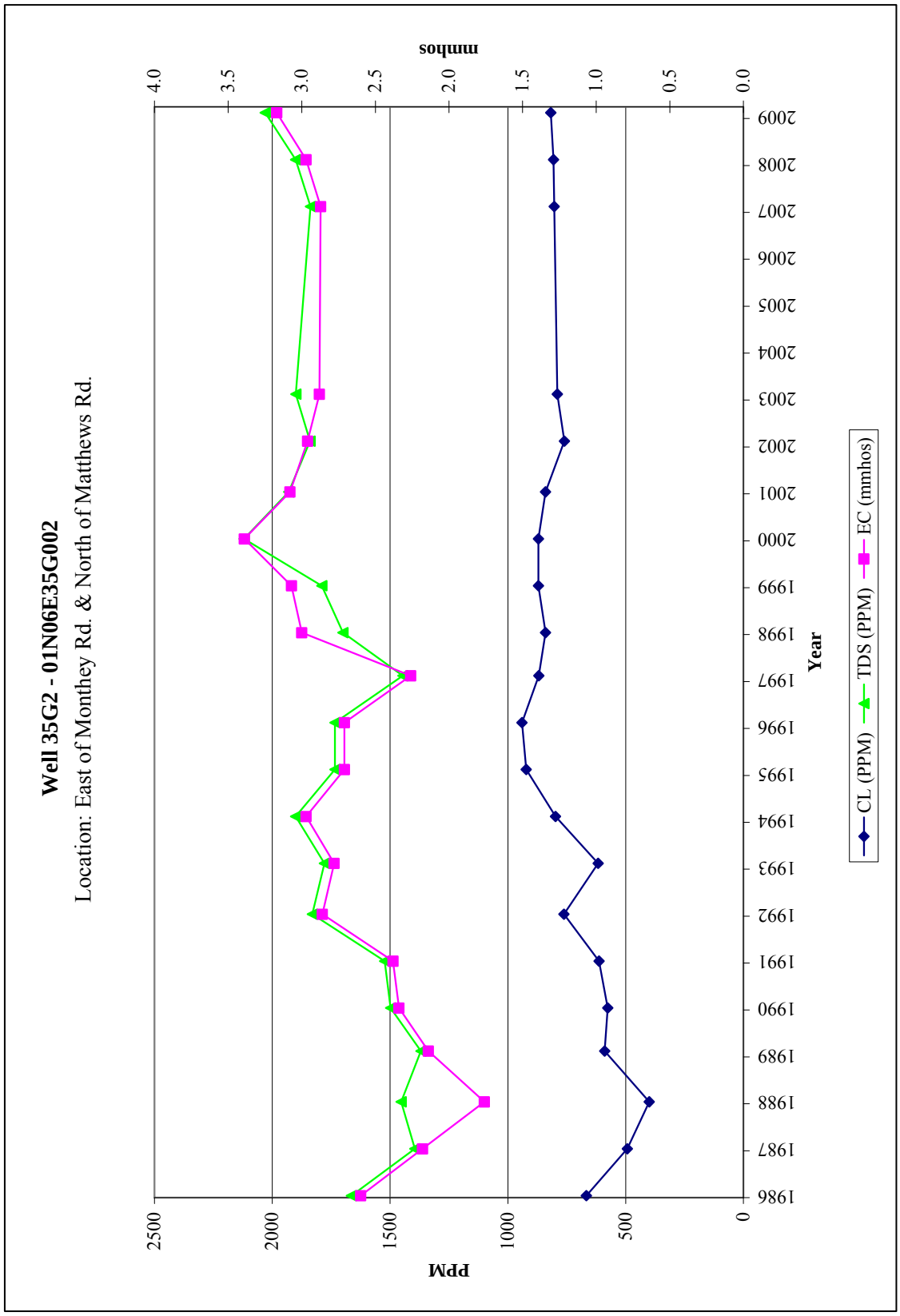

Figure 2-4: Quality Comparison Graph Well 35G2

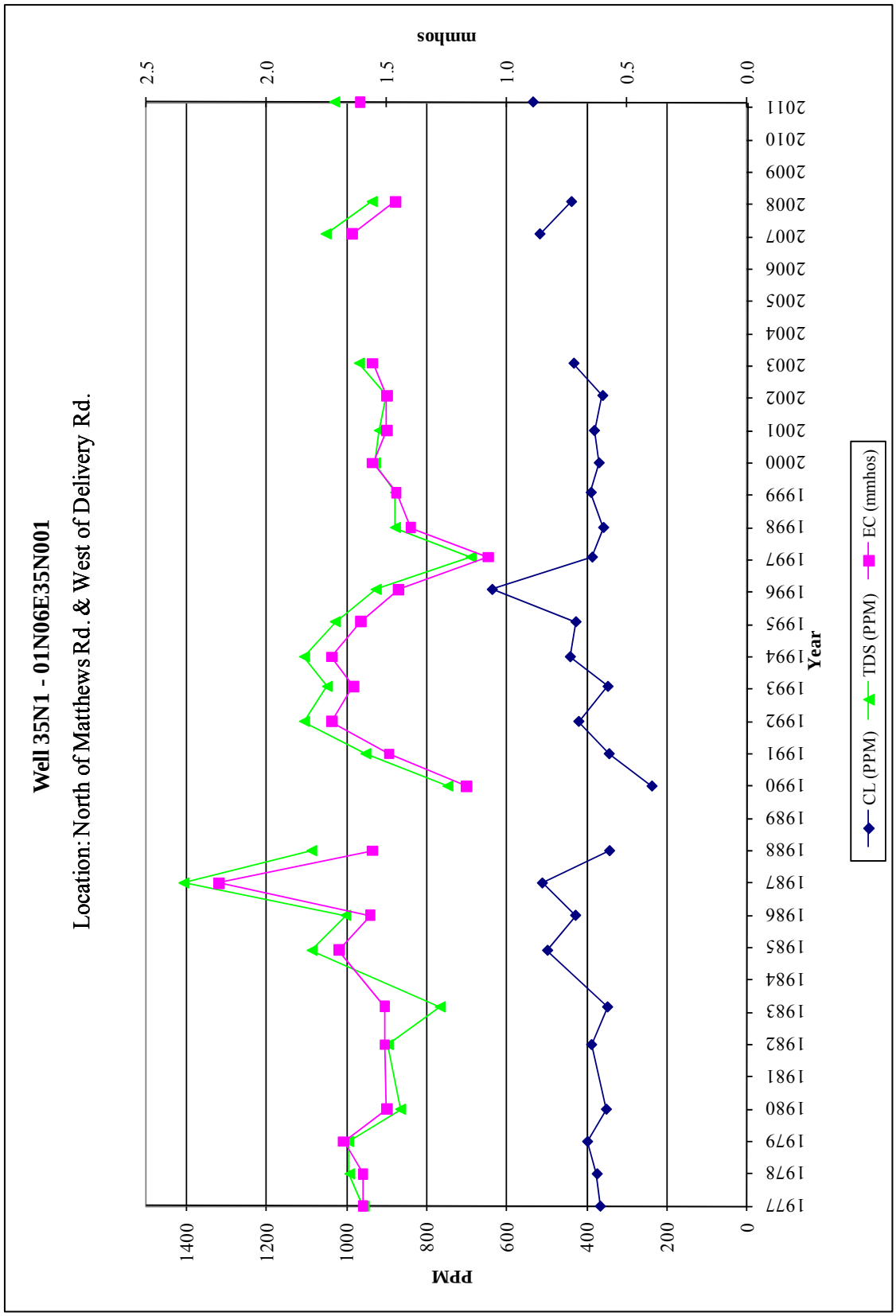

Figure 2-5: Quality Comparison Graph Well 35N1

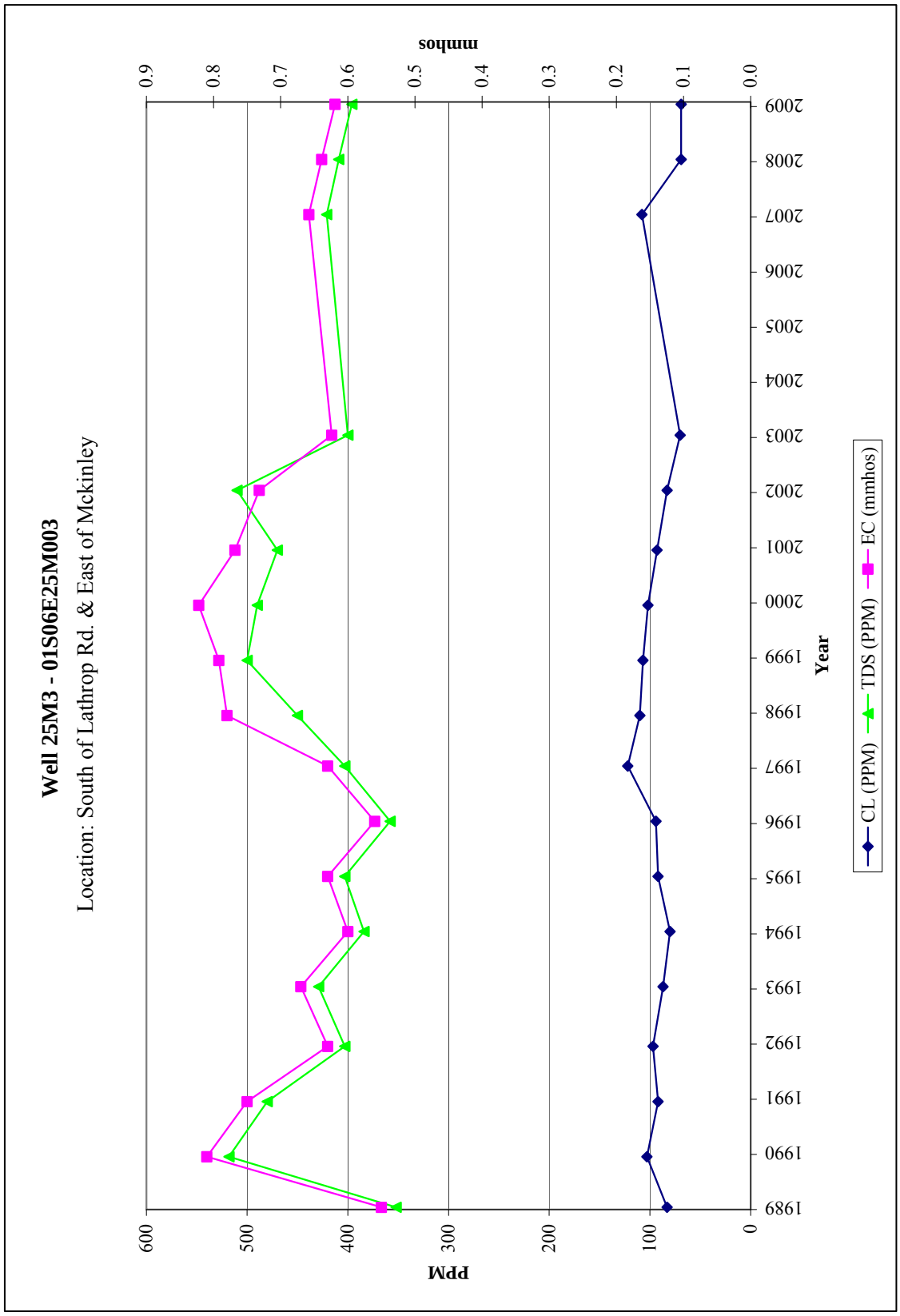

Figure 2-6: Quality Comparison Graph Well 25M3

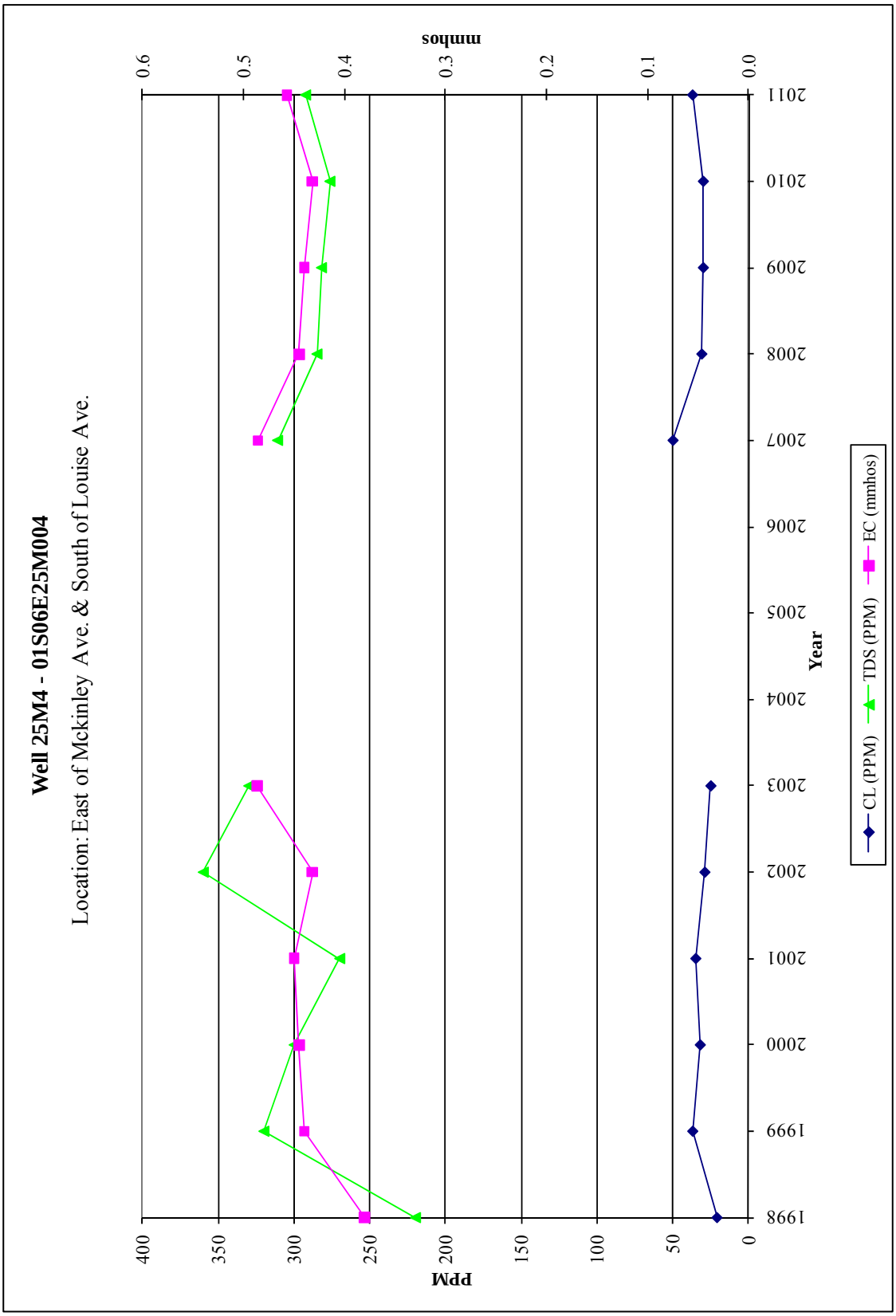

Figure 2-7: Quality Comparison Graph Well 25M4

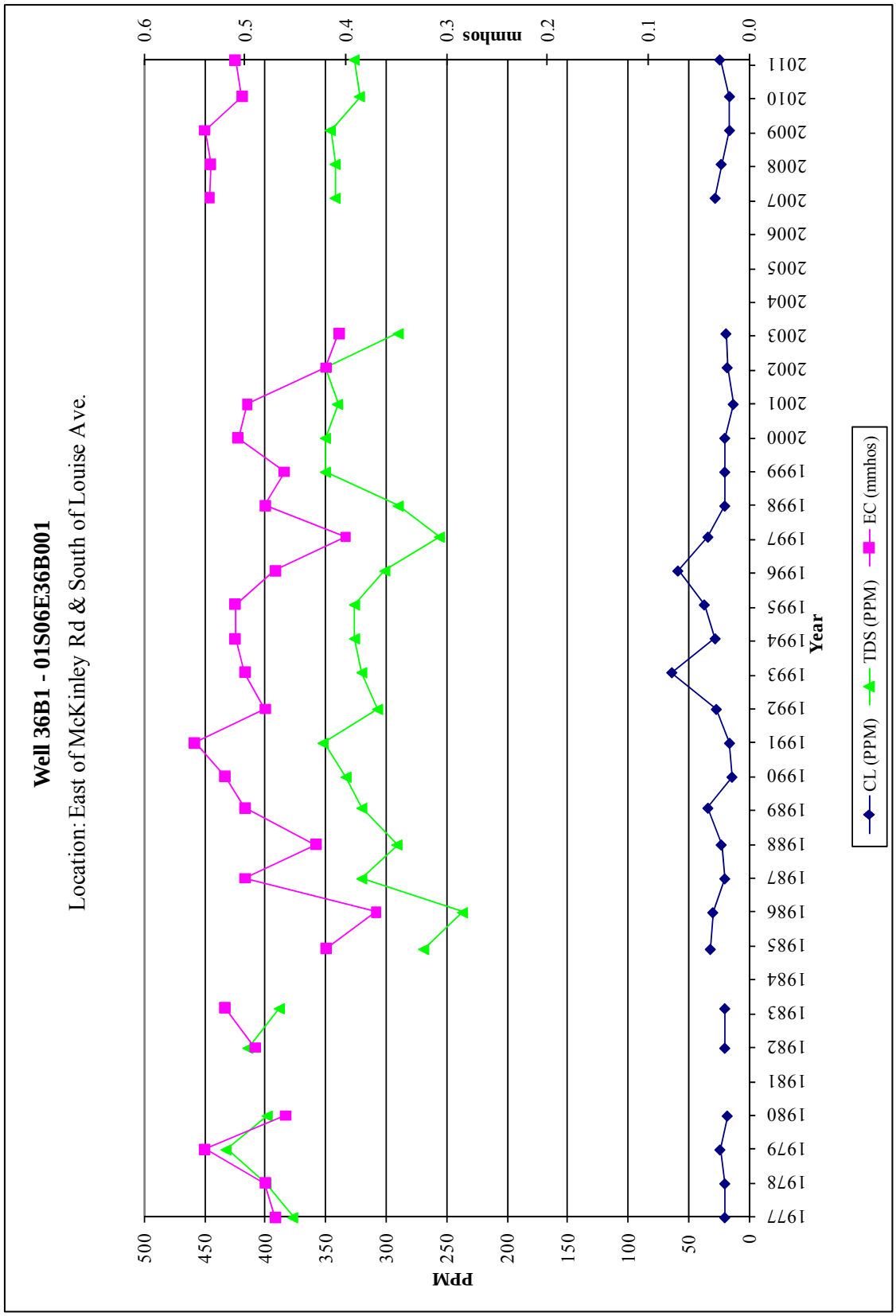

Figure 2-8: Quality Comparison Graph Well 36B1

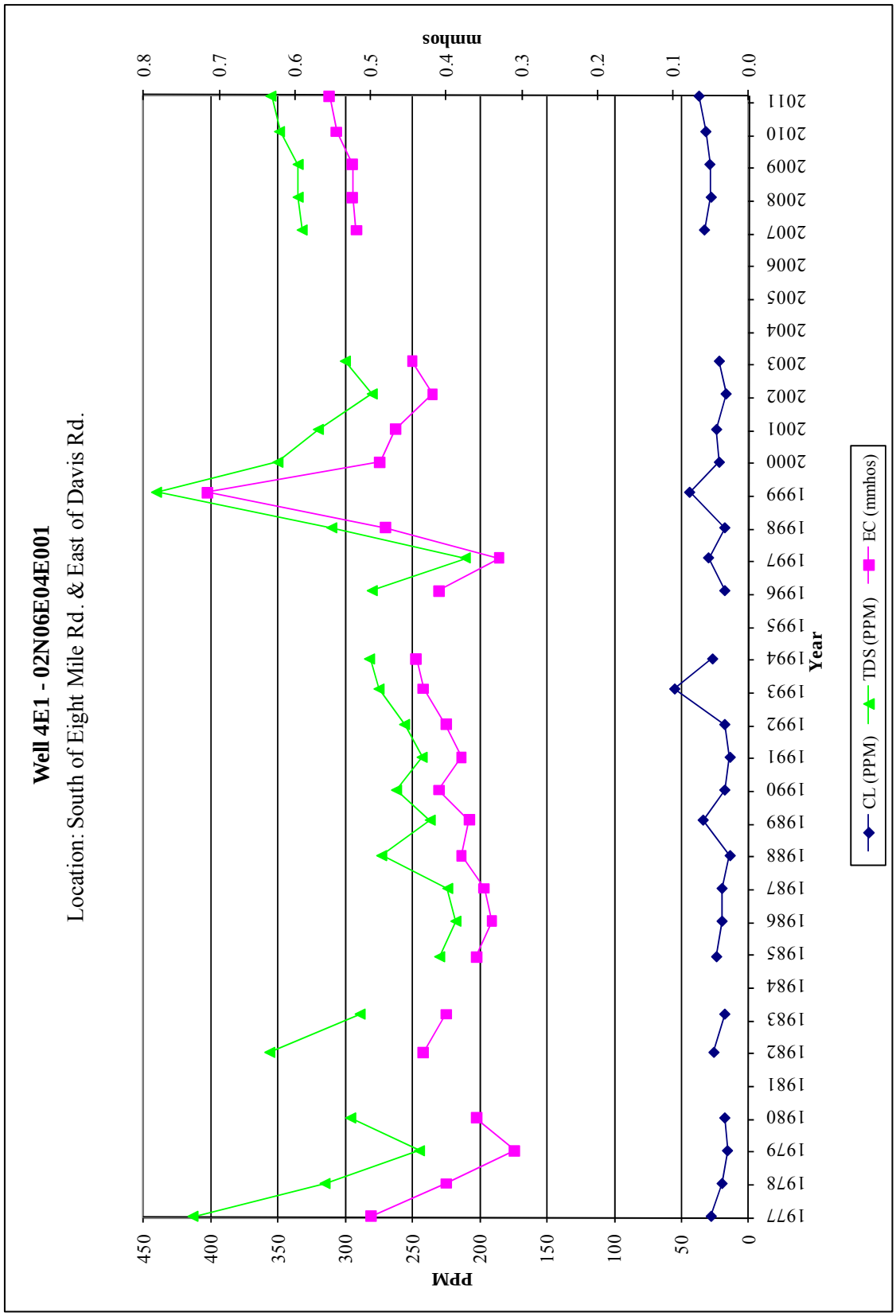

Figure 2-9: Quality Comparison Graph Well 4E1

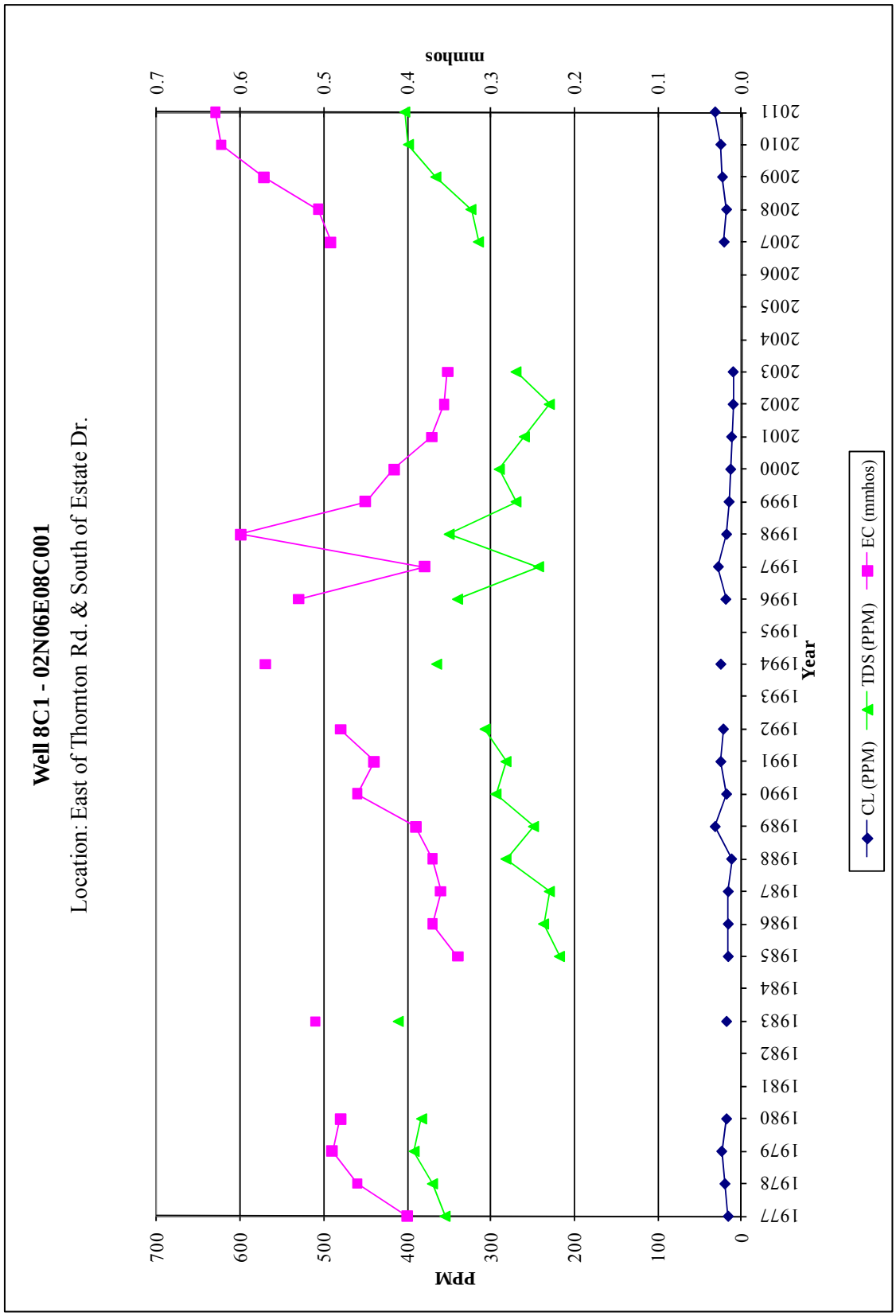

Figure 2-10: Quality Comparison Graph Well 8C1

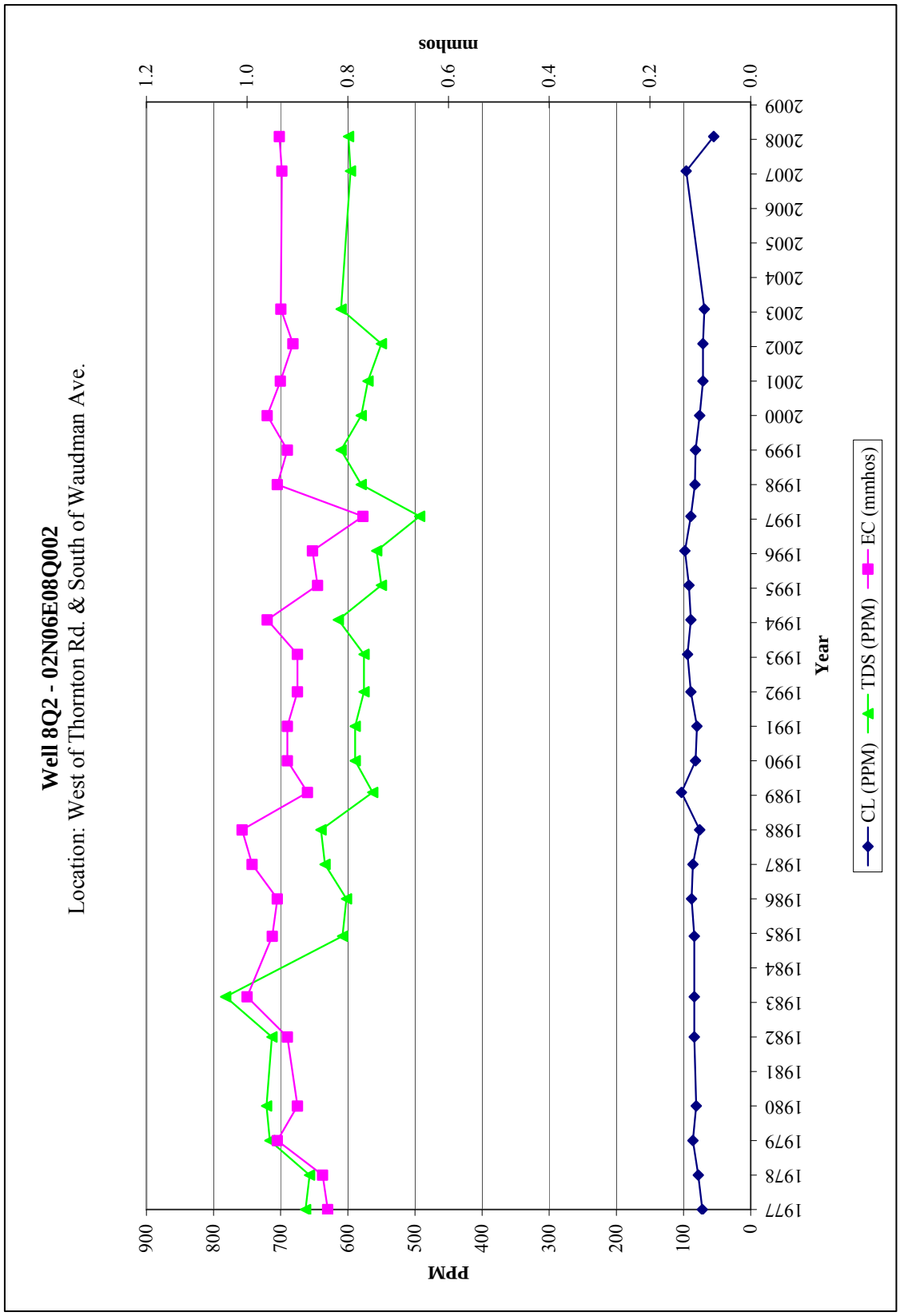

Figure 2-11: Quality Comparison Graph Well 8Q2

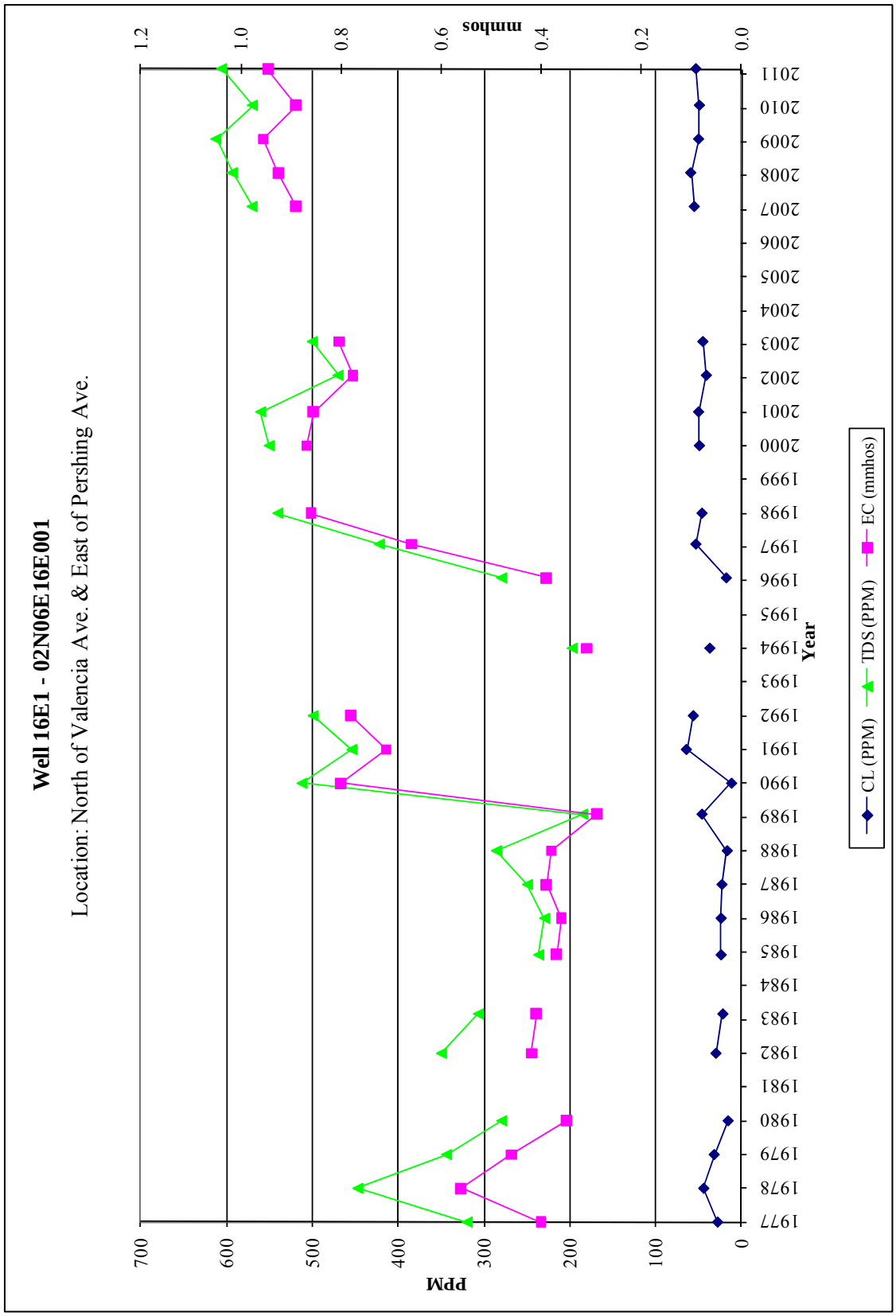

Figure 2-12: Quality Comparison Graph Well 16E1

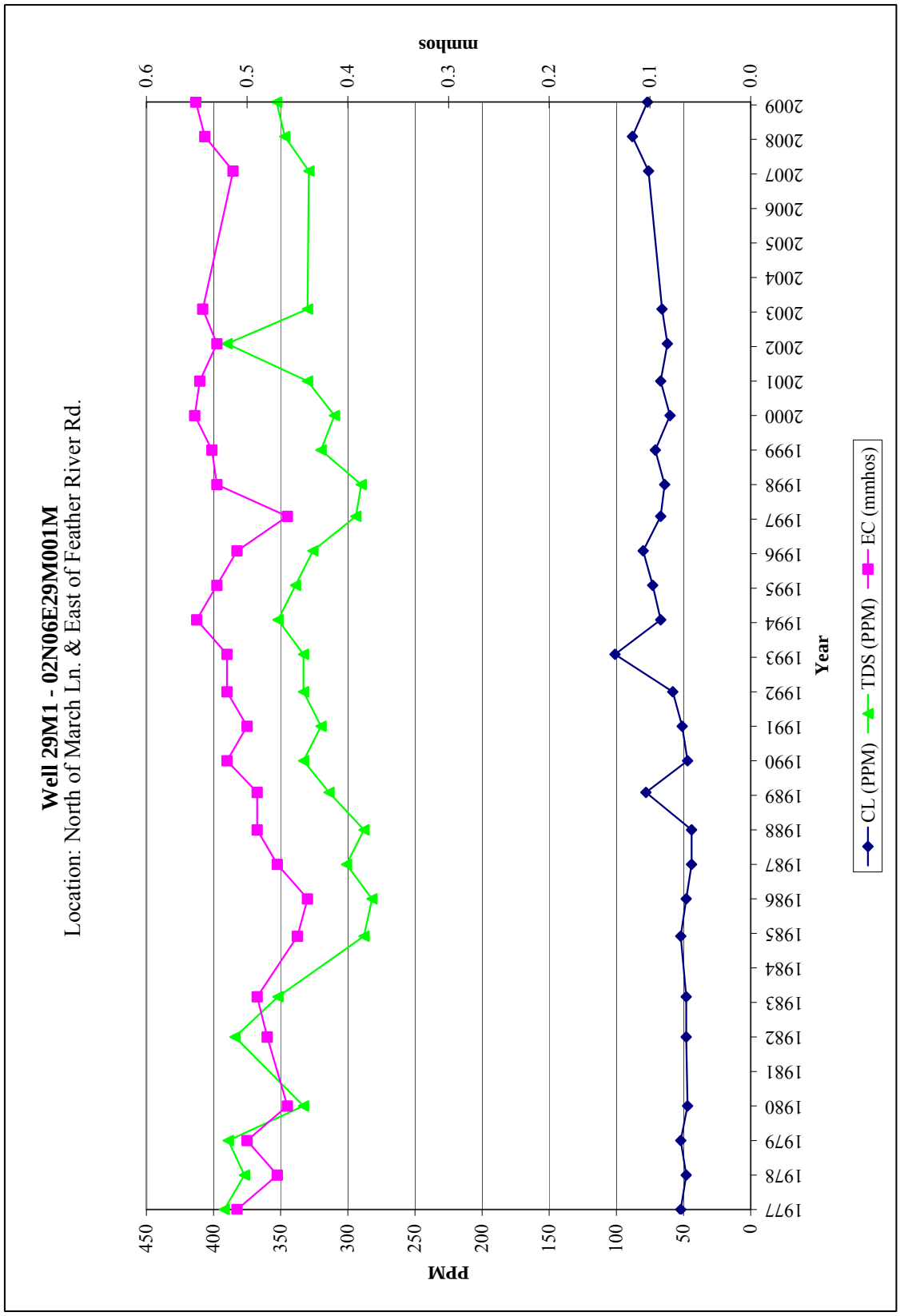

Figure 2-13: Quality Comparison Graph Well 29M1

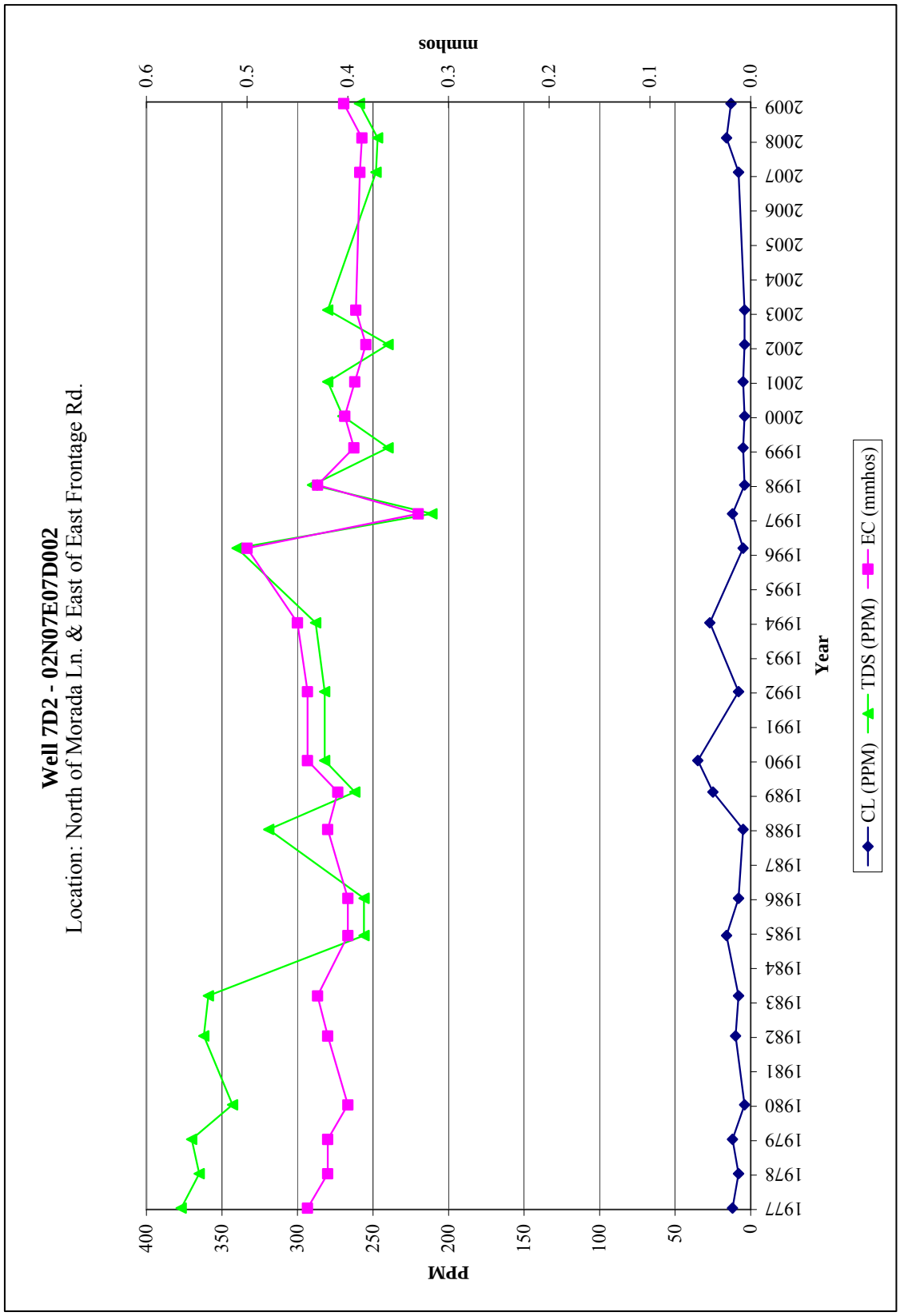

Figure 2-14: Quality Comparison Graph Well 7D2

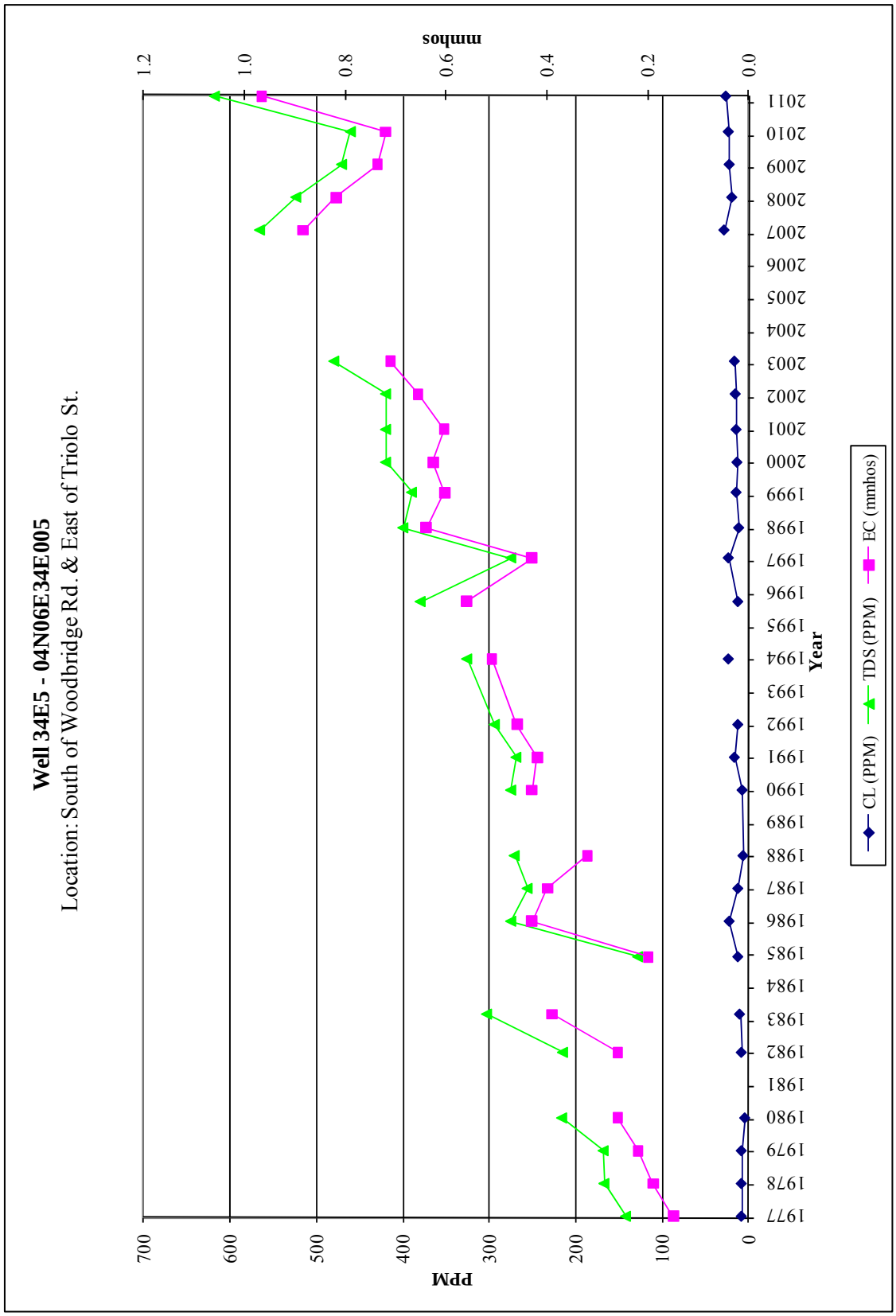

Figure 2-15: Quality Comparison Graph Well 34E5

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Section 3 – Groundwater Elevation Monitoring

Summary of Groundwater Elevations

The information contained in the Fall 2011 Groundwater Report is summarized as follows:

GROUNDWATER LEVELS

Banta-Carbona Irrigation District (BCID) – Two wells were compared in the BCID area. Both wells show increases in groundwater levels.

Central San Joaquin Water Conservation District (CSJWCD) – Fifty-one wells were able to be compared in CSJWCD. Fifteen show decreases in groundwater levels. Thirty-five wells show an increase in groundwater levels. One well had no change in groundwater levels.

North San Joaquin Water Conservation District (NSJWCD) – One-hundred forty-two wells were compared in NSJWCD. Thirty-three wells decreased in groundwater levels. One-hundred nine increased in groundwater levels.

Oakdale Irrigation District (OID) – Two wells were compared in the OID area. One well shows decrease in groundwater levels. One well increased in groundwater elevation.

Stockton East Water District (SEWD) – Ninety wells were compared in SEWD. Thirteen wells decreased in groundwater levels. Ninety wells show increases in groundwater levels. One well experienced no change in groundwater level.

South San Joaquin Irrigation District (SSJID) – Forty-five wells were compared in the SSJID area. Ten wells declined in groundwater elevation. Thirty-five show increases in groundwater levels.

Woodbridge Irrigation District (WID) – Twenty-eight wells were compared in the WID. One well decreased in groundwater levels. Twenty-seven wells show increases in groundwater levels.

Southwest County Areas – Twenty-one wells measured across the Southwest County. Two wells descended in groundwater levels. Seventeen wells increased in groundwater. One well remained constant.

Table 3-1 Comparison of BCID Water Levels

StateWellI	Fall 2011	Fall 2010	Change
02S06E31N001	54.00	53.50	0.50
03S06E27N001	74.30	72.80	1.50

Total Number of Wells	**2**
Total Number of Comparable Wells	**2**
Number of Wells with Decrease	**0**
Number of Wells with Increase	**2**
Number of Wells with No Change	**0**
Range of Change	**0.5 to 1.5**
Average Change	**1.0**

Table 3-2 Comparison of CSJWCD Water Levels

StateWellI	Fall 2011	Fall 2010	Change
01N07E11L001	-34.00	-40.50	6.50
01N07E11M001	-34.00	-39.90	5.90
01N07E13J002	-44.70	-48.00	3.30
01N07E14J002	-39.10	-43.10	4.00
01N07E14L001	-38.00	-43.00	5.00
01N07E15M002	-30.80	*	*
01N07E24A001	-39.60	*	*
01N07E24R001	-41.50	-46.50	5.00
01N07E26H003	-33.60	-35.90	2.30
01N07E32A001	-35.90	-31.60	-4.30
01N08E02B001	-40.50	-42.50	2.00
01N08E02J001	-38.20	-39.70	1.50
01N08E07M001	*	*	*
01N08E09L001	-55.30	-51.40	-3.90
01N08E11L001	-44.00	*	*
01N08E13J001	-29.20	-30.70	1.50
01N08E16G001	-39.50	-40.80	1.30
01N08E16H002	-38.10	-39.20	1.10
01N08E16P001	-38.70	-41.80	3.10
01N08E18A002	-40.50	-42.50	2.00
01N08E22J001	-36.80	-37.60	0.80
01N08E26A002	-24.90	-27.30	2.40
01N08E27R002	-30.70	-31.30	0.60
01N08E28K001	-33.60	-38.10	4.50
01N08E29M002	-36.30	*	*

StateWellI	Fall 2011	Fall 2010	Change
01N08E35F001	-26.90	-28.50	1.60
01N08E35R002	*	-22.00	*
01N08E36F001	-18.40	-18.80	0.40
01N09E01C001	15.50	15.90	-0.40
01N09E05J001	-10.70	-9.70	-1.00
01N09E06N001	-32.20	-32.00	-0.20
01N09E13D001	18.00	17.70	0.30
01N09E15B002	*	1.60	*
01N09E17D001	-22.80	-21.70	-1.10
01N09E17M001	-22.40	-21.80	-0.60
01N09E19C001	-27.00	-28.50	1.50
01N09E29R001	-6.00	-4.50	-1.50
01N09E30C005	-14.70	-14.70	0.00
01N09E31J001	-6.65	-6.15	-0.50
01S07E01J001	-23.70	-25.60	1.90
01S07E02J001	-26.90	-28.30	1.40
01S07E12H001	*	*	*
01S08E04R001	-25.80	-25.30	-0.50
01S08E05A001	-27.90	-27.40	-0.50
01S08E05R001	-26.90	-27.40	0.50
01S08E06D001	-24.90	-26.60	1.70
01S08E09Q001	-16.40	-20.40	4.00
01S08E11F001	-15.50	-15.40	-0.10
01S08E12B001	-9.10	*	*
01S08E14B001	-5.70	-7.70	2.00
01S08E15A001	-13.00	-15.00	2.00
01S08E15P001	-8.50	-10.80	2.30
01S08E20B001	-5.20	-5.70	0.50
01S08E23A001	*	-1.90	*
01S08E27A001	5.50	4.30	1.20
01S09E05H002	1.40	3.80	-2.40
01S09E07A001	-3.30	-1.60	-1.70
01S09E07N001	1.40	1.60	-0.20
01S09E09R001	15.60	13.30	2.30
01S09E18R003	11.10	9.90	1.20
01S09E19Q002	17.90	16.50	1.40

Total Number of Wells	**65**
Total Number of Comparable Wells	**55**
Number of Wells with Decrease	**17**
Number of Wells with Increase	**37**
Number of Wells with No Change	**1**
Range of Change	**-4.3 to 6.5**
Average Change	**1.1**

Table 3-3 Comparison of NSJWCD Water Levels

StateWellI	Fall 2011	Fall 2010	Change
03N06E04C001	-1.30	-4.60	3.30
03N06E24M003	-32.20	-33.40	1.20
03N06E25C001	-36.40	-37.40	1.00
03N06E25H015	-44.60	-41.80	-2.80
03N06E25R005	-37.80	-39.70	1.90
03N07E02G003	-24.10	-25.50	1.40
03N07E03R001	-22.80	-25.80	3.00
03N07E05D005	19.30	17.40	1.90
03N07E08B012	-19.30	-21.80	2.50
03N07E08E002	-22.00	-26.80	4.80
03N07E09C001	-21.10	-27.30	6.20
03N07E09P002	-31.50	-34.00	2.50
03N07E10L004	-31.60	-32.70	1.10
03N07E12P001	-39.80	-40.50	0.70
03N07E15C004	-30.00	-33.30	3.30
03N07E17A006	-32.10	-35.30	3.20
03N07E17D004	-25.70	-29.20	3.50
03N07E17K002	-34.70	-36.50	1.80
03N07E18D012	-27.60	-30.10	2.50
03N07E18M002	-32.00	-36.40	4.40
03N07E19J004	-43.50	-53.10	9.60
03N07E19Q012	-40.20	-42.70	2.50
03N07E20C012	-38.10	-39.60	1.50
03N07E21L003	-38.00	-41.50	3.50
03N07E22C011	-43.10	-43.70	0.60
03N07E23K011	-46.30	-45.40	-0.90
03N07E26G012	-48.00	-47.70	-0.30
03N07E32Q012	-46.30	-45.60	-0.70
03N07E33G002	*	-45.00	*
03N08E04Q001	-35.60	-35.10	-0.50
03N08E05K011	-39.60	-36.10	-3.50
03N08E07D002	-38.30	-38.60	0.30
03N08E07J001	*	-41.80	*
03N08E12P011	-33.50	-33.30	-0.20
03N08E17B001	-44.50	-43.30	-1.20
03N08E17Q011	-47.00	-47.10	0.10
03N08E19C001	-44.30	-43.60	-0.70
03N08E19M003	-49.00	-49.20	0.20
03N08E22A001	-44.90	-44.30	-0.60
04N06E02R011	-22.10	-28.80	6.70
04N06E03A012	-8.00	-21.30	13.30

StateWellI	Fall 2011	Fall 2010	Change
04N06E05Q001	-5.90	-14.90	9.00
04N06E06N012	8.40	2.90	5.50
04N06E12C004	-30.80	-35.00	4.20
04N06E12N002	-29.30	-33.90	4.60
04N06E15B002	-9.00	-15.10	6.10
04N06E16A011	-5.50	-12.60	7.10
04N06E16C001	-6.80	-4.10	-2.70
04N06E16K011	5.10	-1.20	6.30
04N06E23D004	-27.20	-25.80	-1.40
04N06E23K00	-3.00	-11.50	8.50
04N06E24D012	-17.20	-19.50	2.30
04N06E24F001	-16.00	-23.00	7.00
04N06E25B001	-11.10	-13.80	2.70
04N06E25R001	-2.00	-5.50	3.50
04N06E27B012	5.10	*	*
04N06E27D002	18.40	*	*
04N06E27Q012	16.60	14.60	2.00
04N06E35D011	17.60	16.00	1.60
04N06E36J012	6.70	4.10	2.60
04N07E01B011	-37.40	-37.20	-0.20
04N07E04B012	-44.40	*	*
04N07E04Q012	-42.70	-43.50	0.80
04N07E07H011	-39.80	-40.40	0.60
04N07E11D012	-42.00	-41.90	-0.10
04N07E12E001	-36.00	-42.50	6.50
04N07E12G012	-36.30	*	*
04N07E14P011	-32.30	-32.90	0.60
04N07E15B012	*	-37.70	*
04N07E16D001	-39.40	*	*
04N07E17J013	-33.00	*	*
04N07E17N001	-29.40	-35.30	5.90
04N07E19K001	-19.10	-23.60	4.50
04N07E19R011	-20.00	-21.40	1.40
04N07E20H003	-24.90	-27.80	2.90
04N07E21F001	-25.20	-26.30	1.10
04N07E23J012	-27.10	-29.10	2.00
04N07E24N002	-25.60	-26.60	1.00
04N07E25G015	-23.10	-22.10	-1.00
04N07E26B011	*	-24.30	*
04N07E27C002	-21.50	-27.00	5.50
04N07E28J002	-15.70	-19.20	3.50
04N07E28P011	8.80	8.00	0.80
04N07E29H001	-14.30	-18.40	4.10

StateWellI	Fall 2011	Fall 2010	Change
04N07E29N012	-6.50	-9.80	3.30
04N07E31Q031	16.80	15.00	1.80
04N07E32F011	5.20	*	*
04N07E33H001	28.30	26.70	1.60
04N07E34K011	-10.30	-13.20	2.90
04N07E35C002	-11.60	-14.10	2.50
04N07E35E013	*	-15.50	*
04N07E36L001	*	-24.60	*
04N08E01K001	48.90	49.50	-0.60
04N08E02E011	-6.90	-6.60	-0.30
04N08E04P014	-25.60	-26.20	0.60
04N08E06C002	-36.10	-36.50	0.40
04N08E06N002	-37.20	-36.00	-1.20
04N08E11M012	-5.60	-6.10	0.50
04N08E12A011	74.10	*	*
04N08E12B011	51.10	50.60	0.50
04N08E12N001	24.80	20.80	4.00
04N08E14B011	-0.60	-1.60	1.00
04N08E14K001	-3.50	-5.40	1.90
04N08E15D011	-16.80	-16.40	-0.40
04N08E15J011	-11.50	-12.20	0.70
04N08E17A001	*	-27.80	*
04N08E17J001	-23.00	-27.60	4.60
04N08E21M001	-30.20	-30.80	0.60
04N08E22C015	-17.10	-17.80	0.70
04N08E26A012	-9.00	-7.30	-1.70
04N08E27J011	-18.60	-17.20	-1.40
04N08E28E001	-30.40	-30.50	0.10
04N08E32N001	-33.60	-34.80	1.20
04N08E34Q011	-31.50	-30.40	-1.10
04N09E05E099	162.00	161.40	0.60
04N09E06H097	161.40	160.60	0.80
04N09E06H098	182.90	182.10	0.80
04N09E06H099	209.50	207.70	1.80
04N09E06J098	208.60	207.30	1.30
04N09E06J099	168.40	168.00	0.40
04N09E06K097	108.80	108.70	0.10
04N09E06K099	122.00	121.80	0.20
04N09E06L011	112.90	108.30	4.60
04N09E06Q098	133.50	132.90	0.60

StateWellI	Fall 2011	Fall 2010	Change
04N09E07B098	157.90	156.00	1.90
04N09E07B099	154.50	154.80	-0.30
04N09E07D012	81.30	80.80	0.50
04N09E07E011	89.90	89.40	0.50
04N09E08N096	175.80	174.40	1.40
04N09E08N097	171.50	170.00	1.50
04N09E08N098	169.80	168.10	1.70
04N09E08N099	173.60	172.00	1.60
04N09E08P099	178.70	178.00	0.70
04N09E08R099	180.90	180.70	0.20
04N09E16D099	186.00	185.70	0.30
04N09E16Q002	165.90	162.50	3.40
04N09E17A099	175.30	174.80	0.50
04N09E17E001	139.80	137.20	2.60
04N09E17E099	157.10	155.70	1.40
04N09E17F099	161.90	160.90	1.00
04N09E17G099	164.00	163.60	0.40
04N09E18A011	156.00	151.50	4.50
04N09E18D002	50.00	51.50	-1.50
04N09E18N011	20.20	22.90	-2.70
04N09E20M001	111.30	113.30	-2.00
04N09E21A001	170.80	169.30	1.50
04N09E28C002	184.80	185.50	-0.70
04N09E31M001	-16.40	*	*
05N06E36C003	-36.40	-44.50	8.10
05N06E36R001	-27.80	-36.00	8.20
05N07E34G001	-46.60	-49.30	2.70
05N07E34Q001	-44.60	-47.20	2.60
05N08E25P011	51.10	51.60	-0.50
05N08E32R011	-34.90	-34.40	-0.50
05N08E35K012	2.20	3.90	-1.70
05N09E30C011	159.50	160.00	-0.50
05N09E30M011	143.50	144.00	-0.50
05N09E31L011	123.70	124.30	-0.60
03N06E36N001	*	-36.41	*

Total Number of Wells	**158**
Total Number of Comparable Wells	**142**
Number of Wells with Decrease	**33**
Number of Wells with Increase	**109**
Number of Wells with No Change	**0**
Range of Change	**-2.7 to 8.2**
Average Change	**1.0**

Table 3-4 Comparison of OID Water Levels

StateWellI	Fall 2011	Fall 2010	Change
01S09E14K001	41.90	43.00	-1.10
01S09E21J002	39.80	39.20	0.60
01S09E23N001	*	50.70	*
01S09E24R001	68.90	*	*

Total Number of Wells	**4**
Total Number of Comparable Wells	**2**
Number of Wells with Decrease	**1**
Number of Wells with Increase	**1**
Number of Wells with No Change	**0**
Range of Change	**-1.1 to 0.6**
Average Change	**-0.25**

Table 3-5 Comparison of SEWD Water Levels

StateWellI	Fall 2011	Fall 2010	Change
01N06E02C001	-17.80	-21.70	3.90
01N06E03K001	-11.70	-10.50	-1.20
01N06E05H001	-8.20	-9.60	1.40
01N06E23J001	-10.50	-12.90	2.40
01N06E27R002	-5.70	-7.70	2.00
01N07E01M002	-47.00	-53.50	6.50
01N07E02G001	*	-48.40	*
01N07E03L001	*	-9.10	*
01N07E03M001	8.50	7.50	1.00
01N07E04R001	*	-40.60	*
01N07E08B001	-27.00	-33.00	6.00
01N07E09E004	-24.70	-32.00	7.30
01N07E09H001	*	-34.70	*
01N07E09Q003	-29.50	-36.00	6.50
01N07E10D001	-19.00	-28.00	9.00
01N07E10G001	*	-38.20	*
01N07E19G001	*	-23.10	*
01N07E20G001	-21.50	*	*
01N07E21R001	-26.60	*	*
01N07E29A002	-33.10	*	*
01N08E03P001	-43.00	-44.50	1.50
01N08E04E001	-49.50	-52.00	2.50
01N09E05B001	-17.20	-18.00	0.80

StateWellI	Fall 2011	Fall 2010	Change
01S06E01C002	-3.10	-7.30	4.20
01S06E02D004	-5.50	-8.20	2.70
01S06E02G002	-5.40	-9.40	4.00
01S06E10G001	-4.30	-4.80	0.50
01S06E11E001	-3.00	8.00	-11.00
01S07E05A001	28.50	*	*
01S07E06M002	-1.30	-6.10	4.80
01S07E08J002	-0.50	-5.80	5.30
02N06E12H001	-40.00	-42.40	2.40
02N06E24F001	-32.00	-37.50	5.50
02N06E24J003	-30.60	-36.60	6.00
02N06E32G001	-12.30	-12.50	0.20
02N07E03D001	*	-47.80	*
02N07E08D001	-49.50	-52.20	2.70
02N07E08K003	-54.50	-59.40	4.90
02N07E08R002	-51.60	-56.70	5.10
02N07E11F001	-52.00	-62.00	10.00
02N07E11R002	-54.20	-57.00	2.80
02N07E12A003	-51.60	-51.90	0.30
02N07E15C001	-56.30	-61.80	5.50
02N07E16F002	-54.34	-60.64	6.30
02N07E16L001	-54.60	-59.80	5.20
02N07E20N002	-39.00	-44.50	5.50
02N07E21A002	-58.31	-63.91	5.60
02N07E21K002	-49.60	-58.70	9.10
02N07E21N001	*	-55.50	*
02N07E23B001	-58.10	-65.10	7.00
02N07E24B001	-56.10	-55.80	-0.30
02N07E24Q001	-57.60	-62.40	4.80
02N07E26H003	-57.10	-63.10	6.00
02N07E26N001	-52.90	-57.20	4.30
02N07E28K002	*	-65.50	*
02N07E28N004	*	-48.00	*
02N07E28P001	-51.00	-60.50	9.50
02N07E29B001	-42.80	-50.50	7.70
02N07E29M002	-34.30	-42.10	7.80
02N07E30E001	-30.10	-37.20	7.10
02N07E30H001	-34.10	-42.20	8.10
02N07E31M001	-23.80	-29.30	5.50
02N07E32J002	*	-33.60	*
02N07E32M002	-25.50	-31.50	6.00
02N07E32R001	-24.10	-31.10	7.00
02N07E33L001	*	-48.00	*

StateWellI	Fall 2011	Fall 2010	Change
02N07E34R001	*	-41.80	*
02N07E35L001	-49.00	*	*
02N07E36H001	-58.50	-61.50	3.00
02N08E03G002	-35.60	-36.40	0.80
02N08E04C001	-50.40	-51.80	1.40
02N08E05C001	-51.00	-55.00	4.00
02N08E08N001	*	-61.00	*
02N08E09G002	*	-56.00	*
02N08E10H002	-47.00	-48.30	1.30
02N08E12C002	-32.70	-33.20	0.50
02N08E13K001	-34.60	-37.60	3.00
02N08E14C001	-47.50	-50.00	2.50
02N08E15M002	-51.00	-50.20	-0.80
02N08E16D001	-53.70	-54.10	0.40
02N08E18C001	-60.70	-69.70	9.00
02N08E20F001	-57.10	-62.30	5.20
02N08E24J001	-49.60	-50.10	0.50
02N08E24P001	-38.50	-38.80	0.30
02N08E28H002	-48.10	-48.60	0.50
02N08E32L002	-51.40	-54.70	3.30
02N08E33E001	-51.10	-55.10	4.00
02N09E03A001	60.80	61.10	-0.30
02N09E05H001	-4.70	-4.30	-0.40
02N09E05N001	-19.50	-19.30	-0.20
02N09E09D001	-11.80	*	*
02N09E18Q001	-38.00	-38.00	0.00
02N09E22D001	*	3.10	*
02N09E28N001	-9.90	-9.70	-0.20
03N07E28K012	*	-48.70	*
03N07E35C002	-48.80	-48.30	-0.50
03N07E35L001	-48.50	-51.50	3.00
03N07E36J001	-47.30	-51.30	4.00
03N08E27R001	-43.70	-44.40	0.70
03N08E32P001	-52.30	-53.30	1.00
03N09E25R001	84.90	83.00	1.90
03N09E36G001	*	76.70	*
02N06E03A003	-29.80	-30.80	1.00
02N06E06C002	-13.70	-13.90	0.20
02N06E13R002	*	-39.00	*
02N06E24J002	-29.30	-36.00	6.70
03N06E35P002	-30.00	-31.50	1.50

Total Number of Wells	**112**
Total Number of Comparable Wells	**82**
Number of Wells with Decrease	**9**
Number of Wells with Increase	**72**
Number of Wells with No Change	**1**
Range of Change	**-11.0 to 10.0**
Average Change	**3.4**

Table 3-6 Comparison of SSJID Water Levels

StateWellI	Fall 2011	Fall 2010	Change
01S07E09Q001	2.20	-2.30	4.50
01S07E18L001	6.30	2.90	3.40
01S07E21G001	14.30	11.80	2.50
01S07E25E001	13.40	12.00	1.40
01S07E25R001	15.20	13.20	2.00
01S07E26G001	13.40	12.00	1.40
01S07E27K001	13.30	13.70	-0.40
01S07E30R001	10.70	8.70	2.00
01S07E33H001	17.20	16.10	1.10
01S07E36D001	21.20	19.10	2.10
01S08E34Q001	19.20	18.40	0.80
01S08E35R002	28.60	27.00	1.60
01S09E29M002	31.90	*	*
01S09E33J002	53.50	52.80	0.70
01S09E33P001	50.00	50.60	-0.60
01S09E34A001	56.60	58.30	-1.70
02S07E07D002	10.30	10.80	-0.50
02S07E07Q001	23.20	23.40	-0.20
02S07E08R001	26.50	26.00	0.50
02S07E10B002	26.40	25.70	0.70
02S07E11N002	37.20	35.80	1.40
02S07E12G001	30.50	29.70	0.80
02S07E12R001	22.50	24.40	-1.90
02S07E12R001	25.70	24.40	1.30
02S07E12R002	28.90	29.40	-0.50
02S07E12R002	29.50	29.40	0.10
02S07E19H001	21.00	20.00	1.00
02S07E20R002	22.30	22.00	0.30
02S07E22N002	26.00	25.40	0.60

StateWellI	Fall 2011	Fall 2010	Change
02S07E24R002	36.50	34.50	2.00
02S07E26B001	30.00	29.00	1.00
02S08E04M001	22.50	21.90	0.60
02S08E06J001	22.00	21.50	0.50
02S08E07R001	35.40	33.50	1.90
02S08E08A001	26.80	25.30	1.50
02S08E08E001	25.70	24.20	1.50
02S08E09J001	35.70	34.80	0.90
02S08E12D001	40.60	39.80	0.80
02S08E14E001	47.40	45.80	1.60
02S09E03K001	*	61.90	*
02S09E07D001	44.70	42.80	1.90
02S09E11K001	74.00	73.10	0.90
02S09E12R001	71.50	70.00	1.50

Total Number of Wells	**43**
Total Number of Comparable Wells	**41**
Number of Wells with Decrease	**7**
Number of Wells with Increase	**34**
Number of Wells with No Change	**0**
Range of Change	**-1.9 to 4.5**
Average Change	**1.0**

Table 3-7 Comparison of WID Water Levels

StateWellI	Fall 2011	Fall 2010	Change
03N05E13L001	-8.50	-11.00	2.50
03N05E14C001	-3.00	-4.30	1.30
03N06E04P012	-11.30	-13.30	2.00
03N06E05C002	1.70	-4.70	6.40
03N06E07D013	-5.90	-8.50	2.60
03N06E07H003	-13.10	-15.60	2.50
03N06E10D001	-8.90	-9.90	1.00
03N06E17A004	-22.20	-26.20	4.00
03N06E18M003	-12.40	-15.30	2.90
03N06E20D002	-17.50	-20.00	2.50
03N06E26P002	-29.40	-31.40	2.00
03N06E27E001	-29.20	-33.70	4.50
03N06E30R001	-23.00	-27.50	4.50
03N06E32R001	-23.40	-29.50	6.10

StateWellI	Fall 2011	Fall 2010	Change
04N05E09D001	*	-5.80	*
04N05E10K001	-4.90	-4.60	-0.30
04N05E13C012	1.30	-5.00	6.30
04N05E13H001	1.00	-6.50	7.50
04N05E13R004	0.20	-6.40	6.60
04N05E14B002	-0.40	-5.40	5.00
04N05E14P001	1.50	-1.00	2.50
04N05E22H001	-7.40	*	*
04N05E24J004	6.00	-1.10	7.10
04N05E26F001	2.40	-0.60	3.00
04N05E36H003	3.40	-0.10	3.50
04N06E19F001	7.00	-0.90	7.90
04N06E19R012	6.50	1.10	5.40
04N06E21D001	10.90	5.20	5.70
04N06E29N002	2.90	-1.70	4.60
04N06E30E001	6.70	0.20	6.50

Total Number of Wells	**30**
Total Number of Comparable Wells	**28**
Number of Wells with Decrease	**1**
Number of Wells with Increase	**27**
Number of Wells with No Change	**0**
Range of Change	**-0.3 to 7.9**
Average Change	**4.1**

Table 3-8 Comparison of Southwest County Water Levels

StateWellI	Fall 2011	Fall 2010	Change
01S05E31R002	0.90	0.60	0.30
01S06E04J001	-1.40	-1.00	-0.40
01S06E14F001	-0.10	-2.10	2.00
01S06E15F001	-0.10	-0.60	0.50
01S06E26K001	2.00	1.50	0.50
02S05E08B001	-1.20	-2.00	0.80
02S05E13N001	14.20	14.00	0.20
02S06E10K001	5.00	3.00	2.00
02S06E11J001	9.40	9.80	-0.40
02S06E25J001	16.90	15.70	1.20

StateWellI	Fall 2011	Fall 2010	Change
02S06E26B001	9.30	7.00	2.30
02S06E27E001	10.90	9.00	1.90
02S07E31N001	16.00	14.00	2.00
02S09E19B002	59.10	56.80	2.30
03S05E04H001	58.00	56.50	1.50
03S06E03F002	18.50	15.00	3.50
03S06E23C001	*	-4.20	*
03S07E05J001	22.90	21.90	1.00
03S07E06Q001	17.30	16.00	1.30

Total Number of Wells	**21**
Total Number of Comparable Wells	**20**
Number of Wells with Decrease	**2**
Number of Wells with Increase	**17**
Number of Wells with No Change	**1**
Range of Change	**-0.4 to 3.5**
Average Change	**1.3**

HYDROGRAPHS

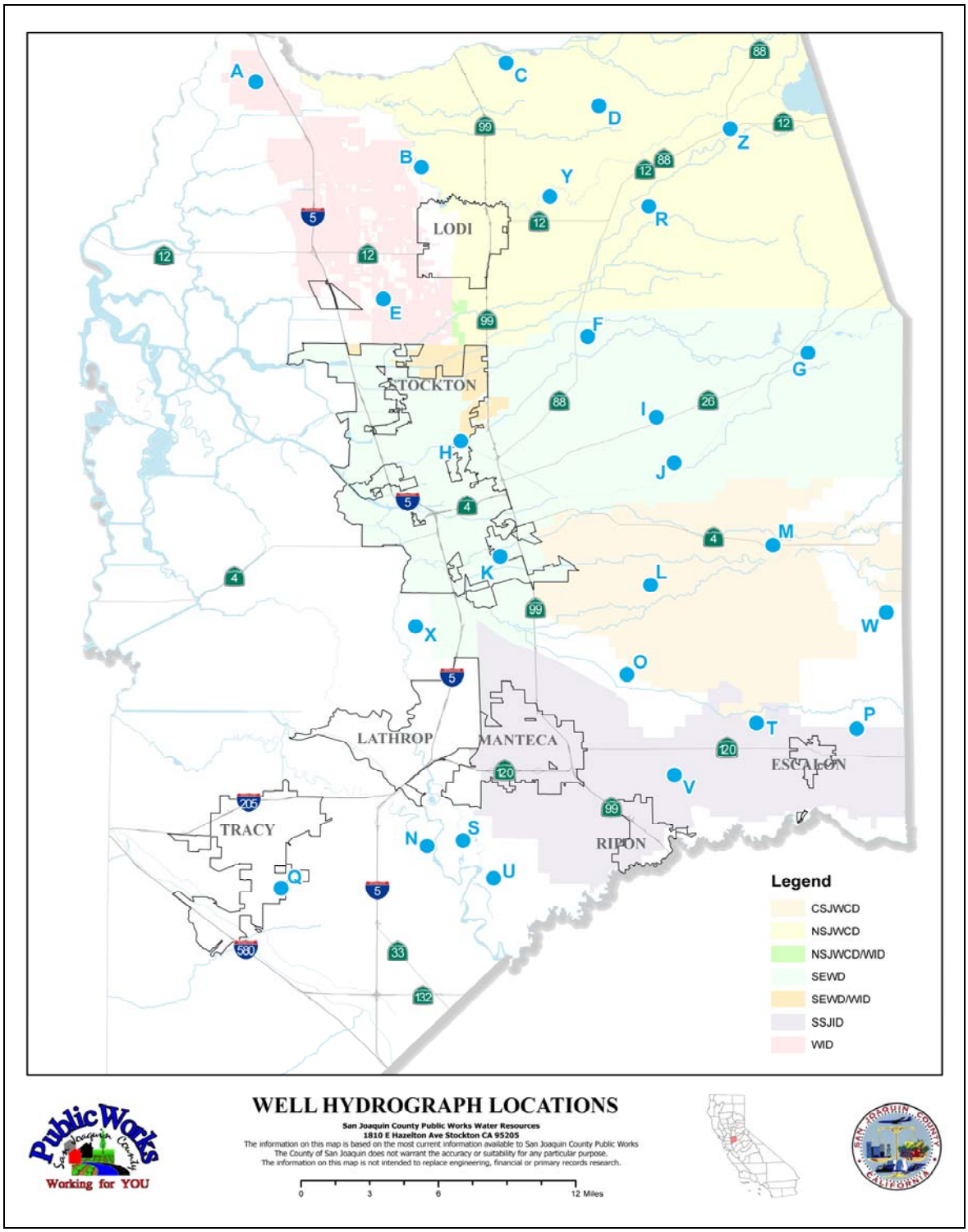


Figure 3-1: Well Hydrograph Locations

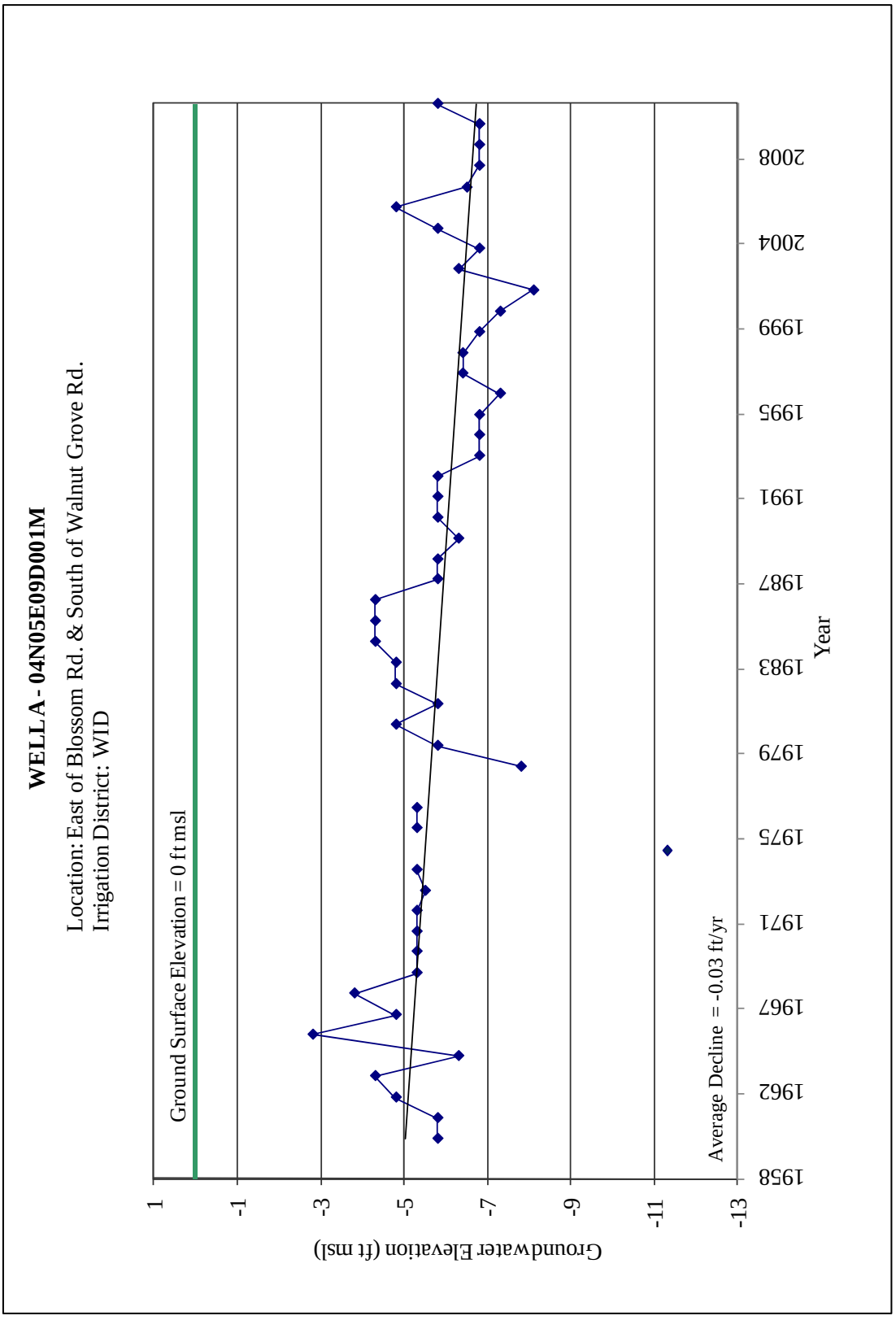


Figure 3-2: Fall Hydrograph Well A

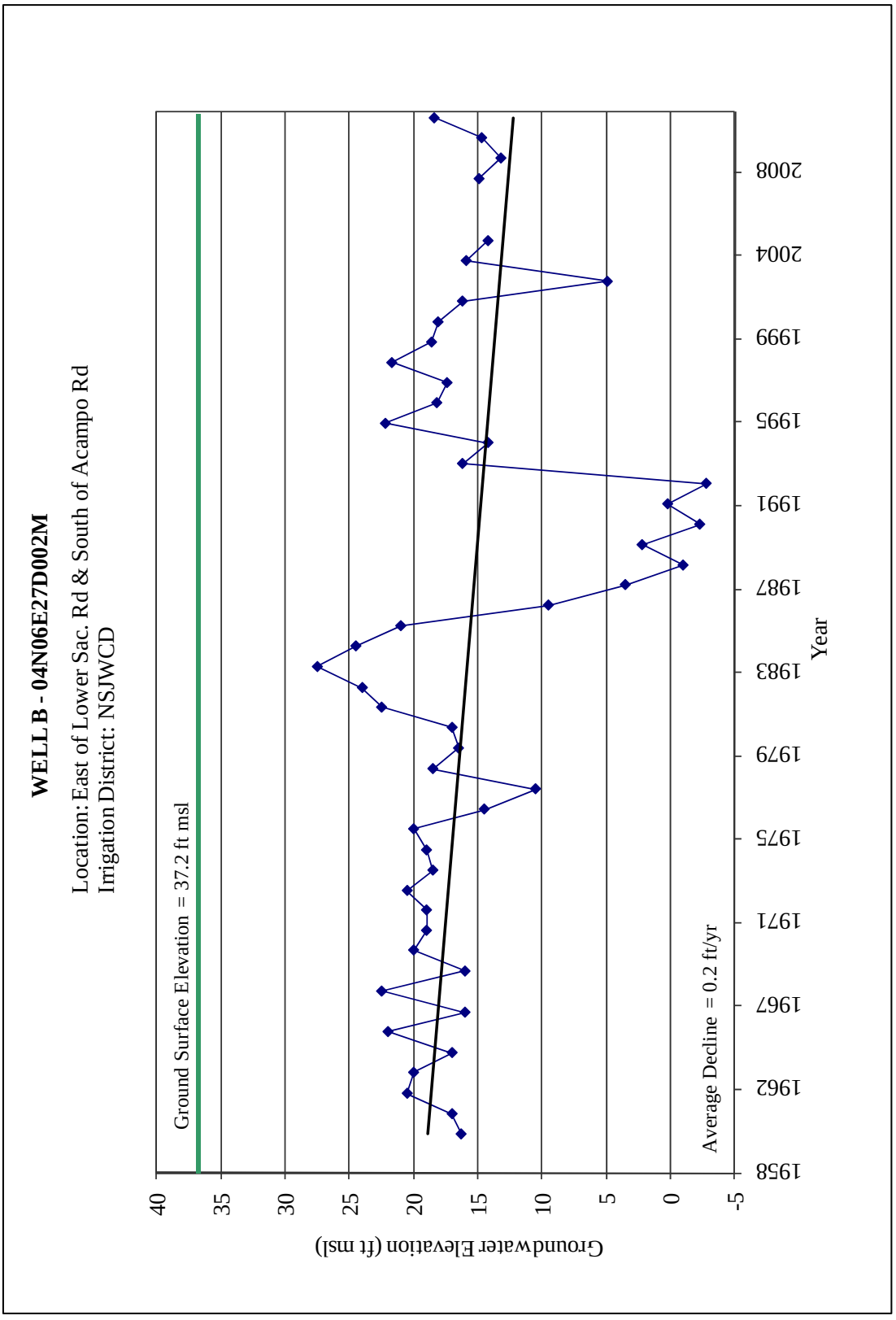


Figure 3-3: Fall Hydrograph Well B

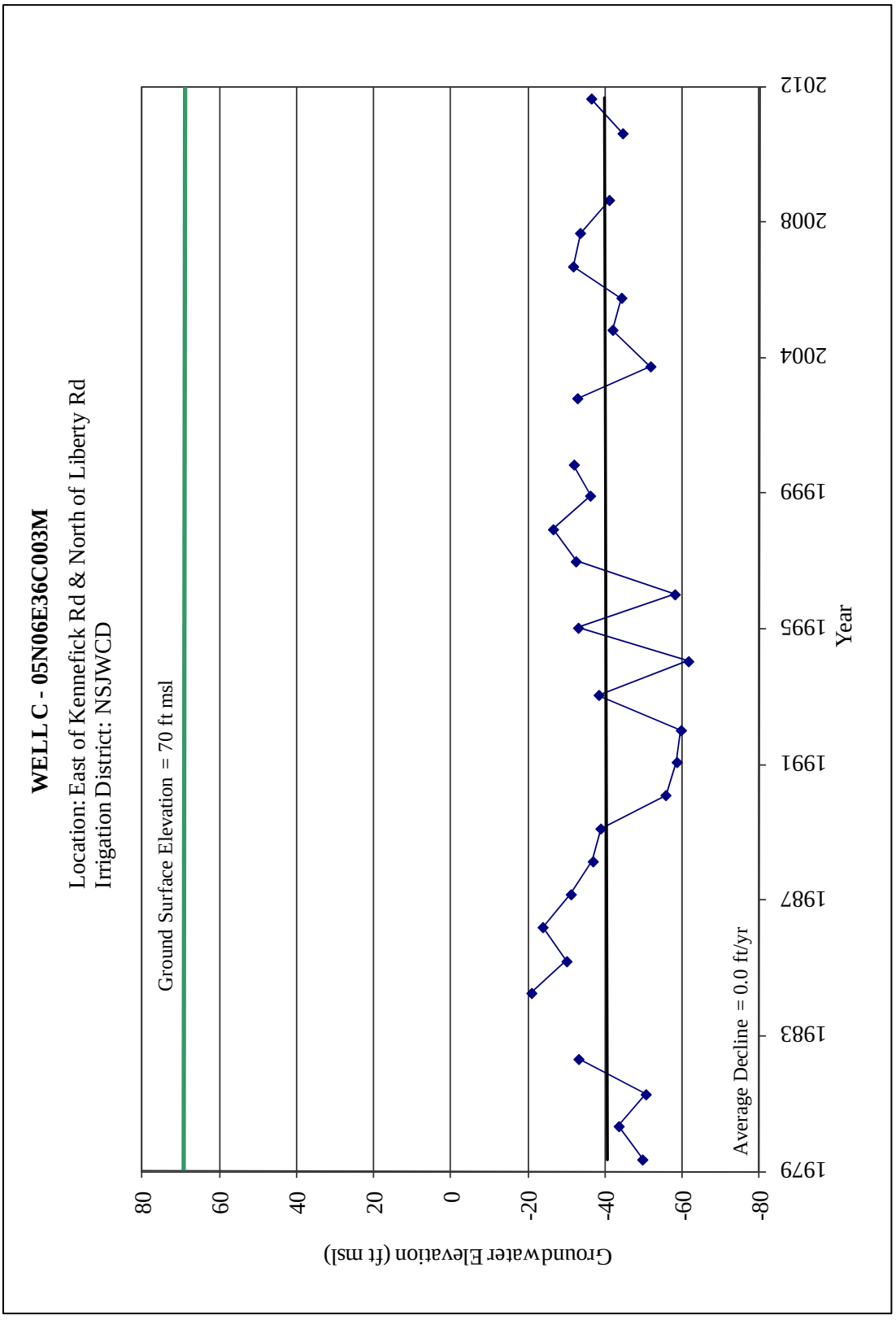


Figure 3-4: Fall Hydrograph Well C

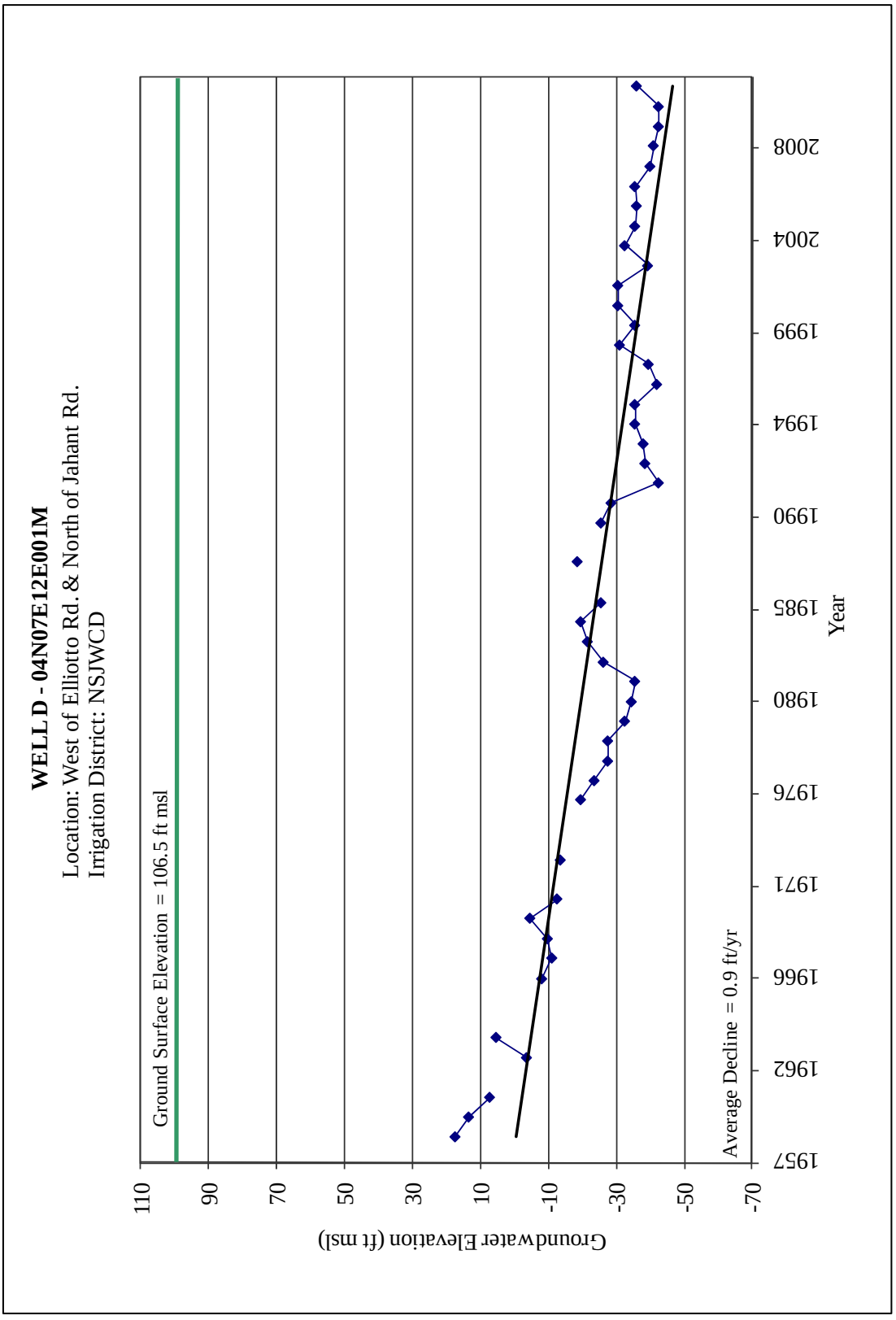


Figure 3-5: Fall Hydrograph Well D

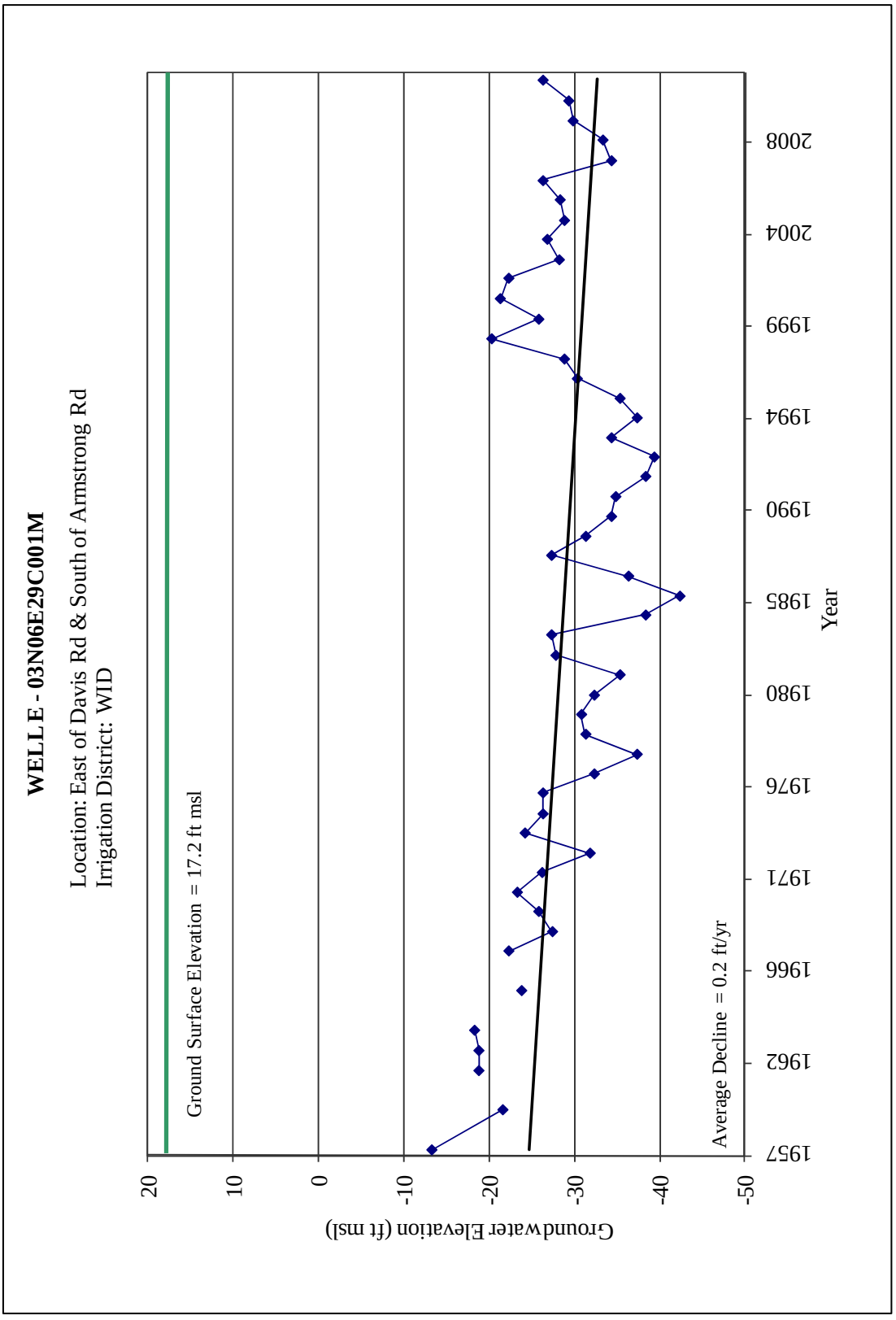


Figure 3-6: Fall Hydrograph Well E

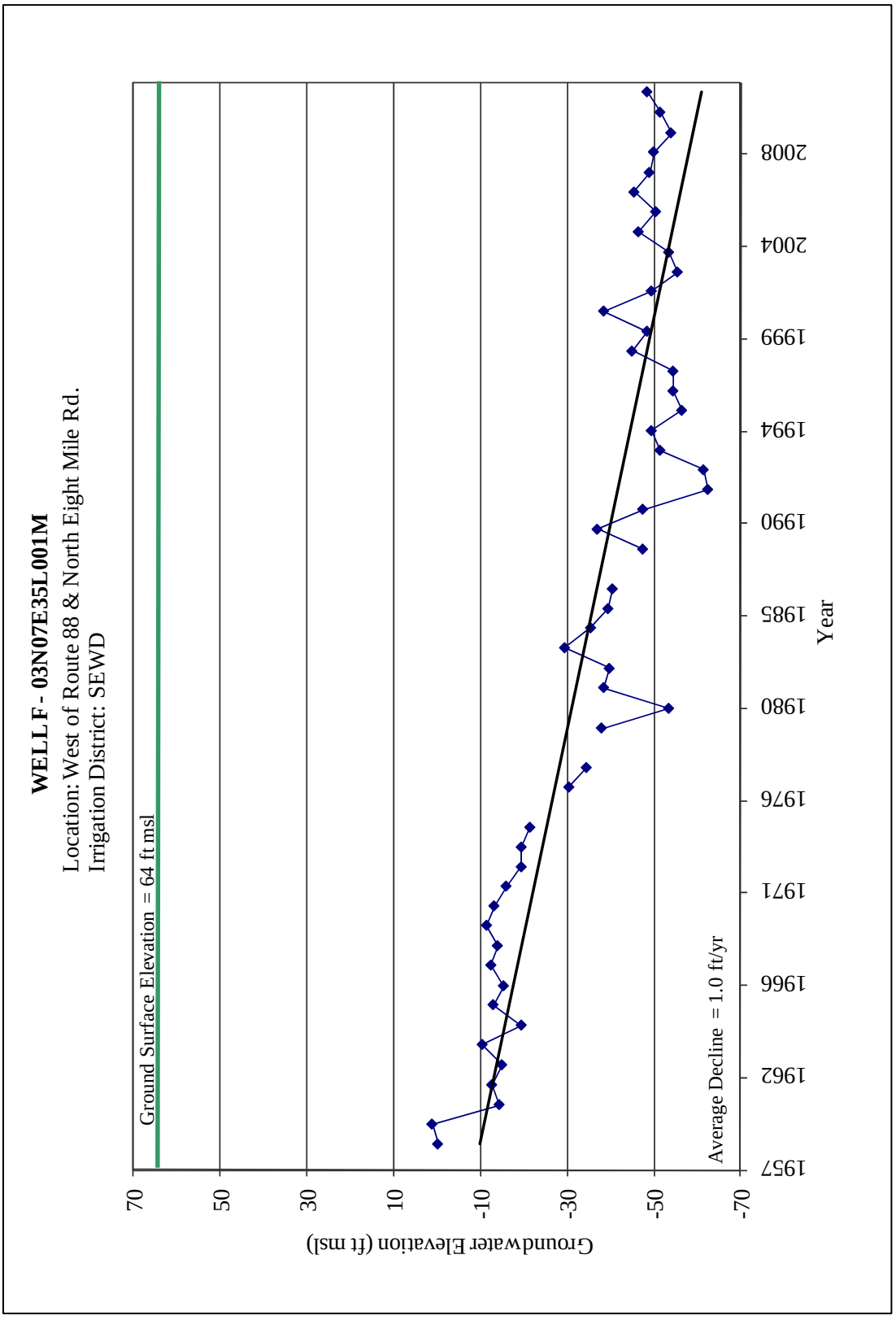


Figure 3-7: Fall Hydrograph Well F

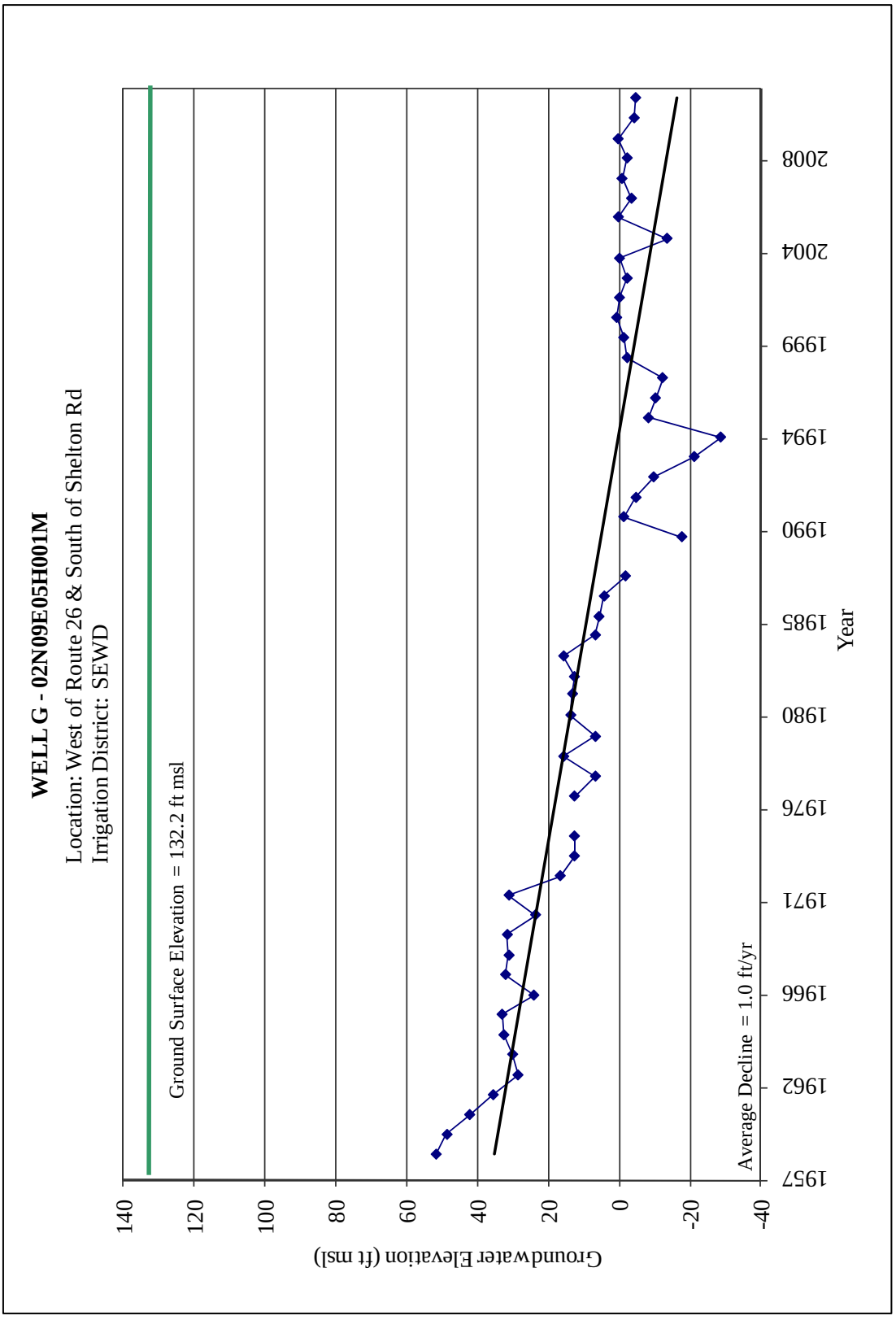


Figure 3-8: Fall Hydrograph Well G

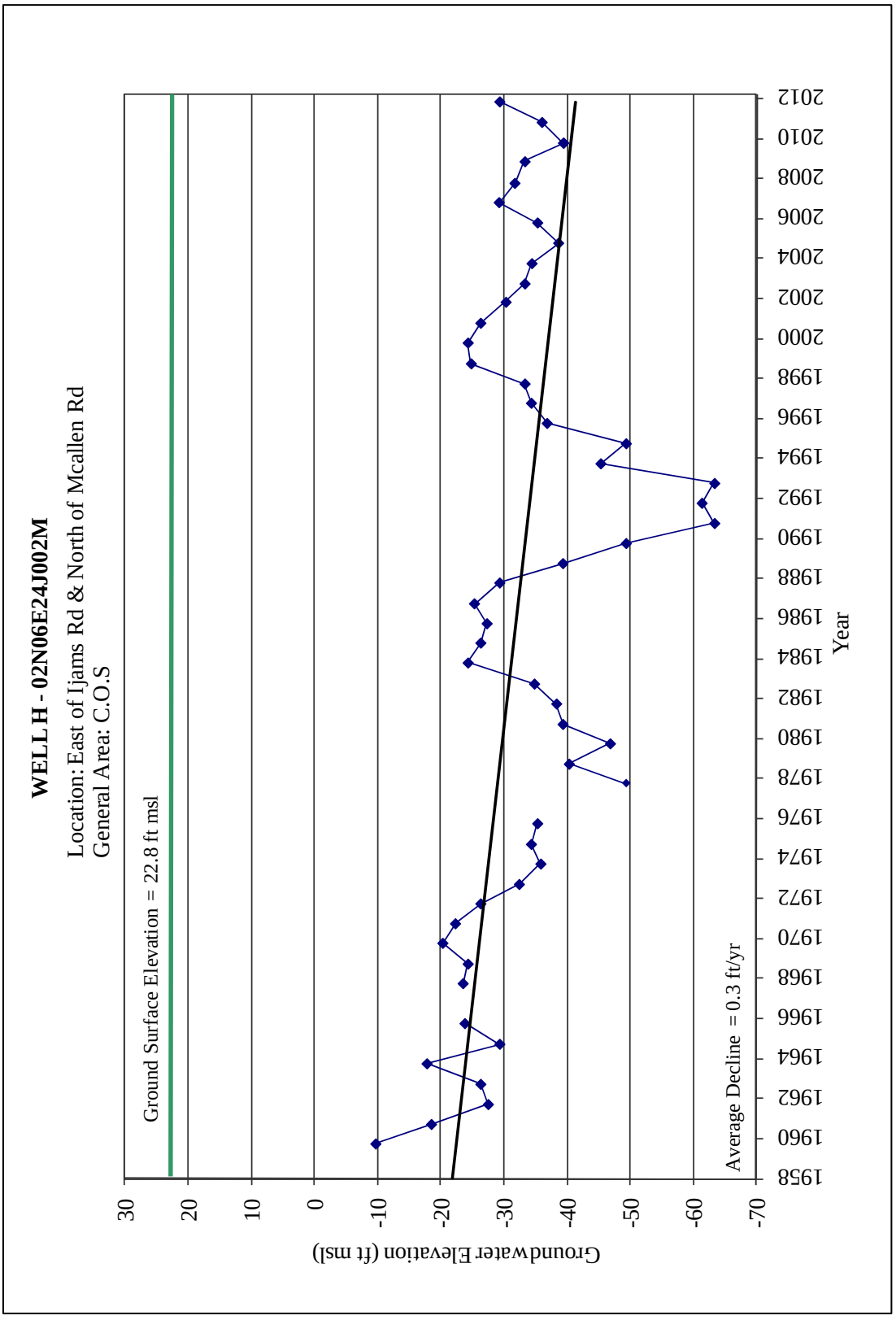


Figure 3-9: Fall Hydrograph Well H

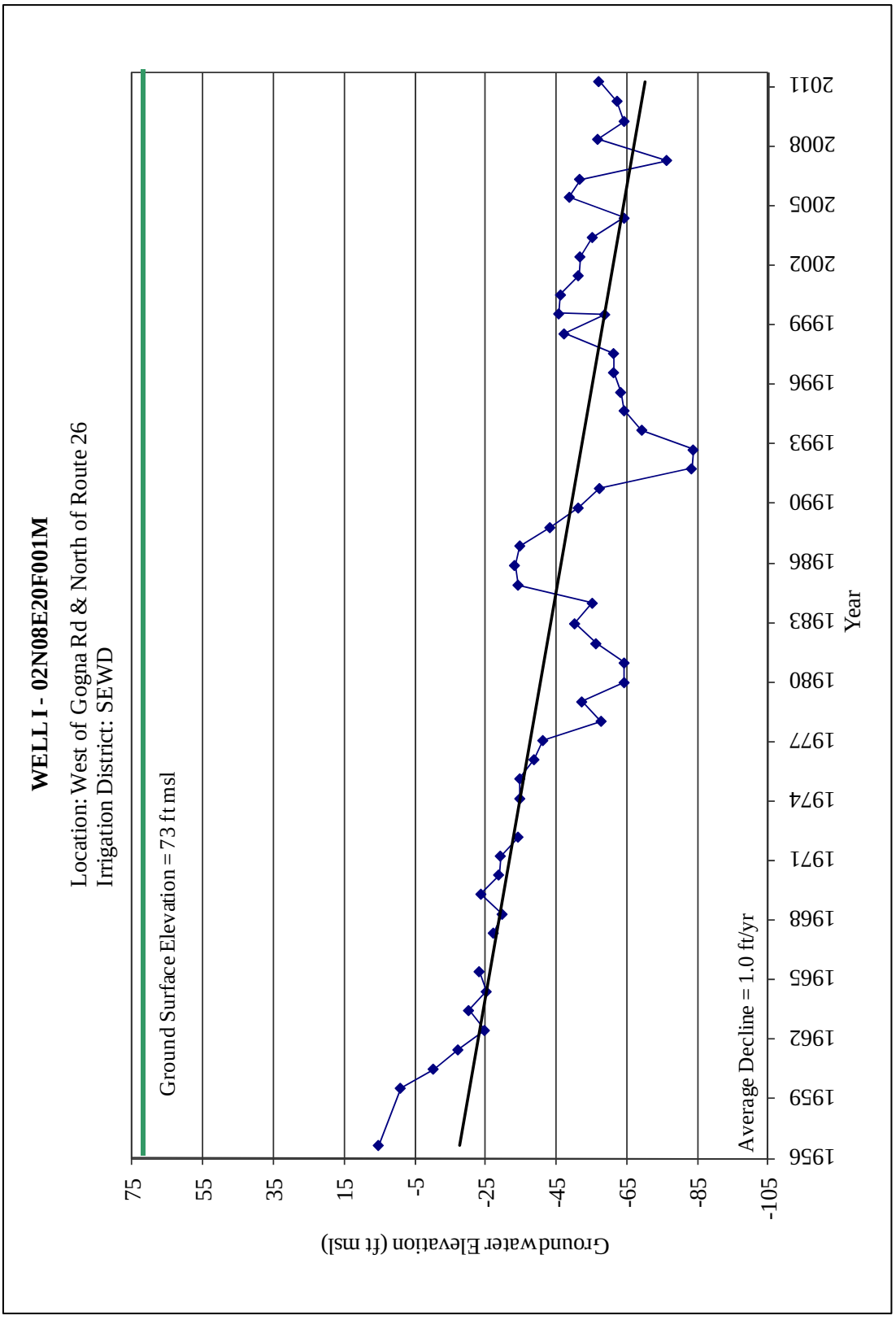


Figure 3-10: Fall Hydrograph Well I

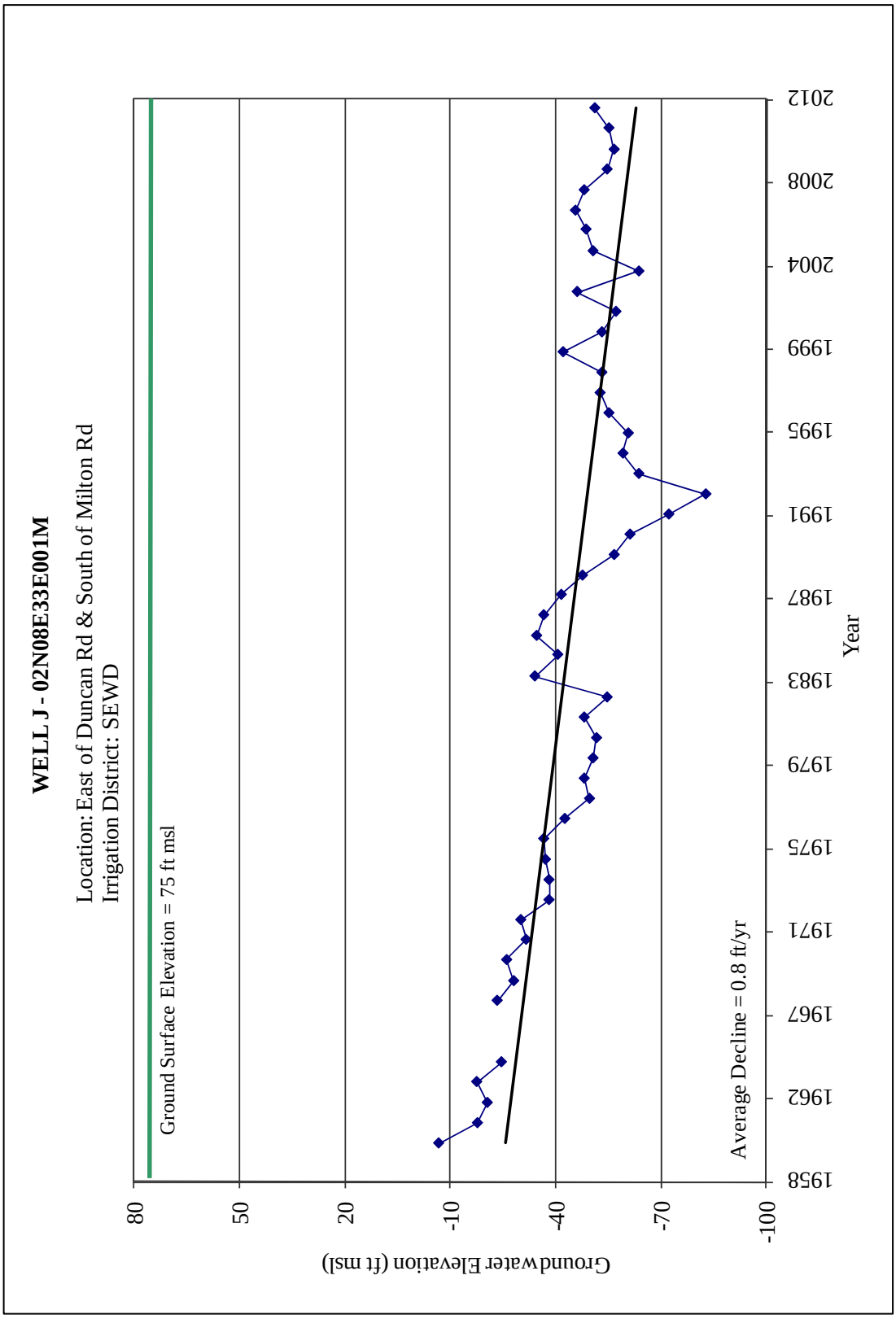


Figure 3-11: Fall Hydrograph Well J

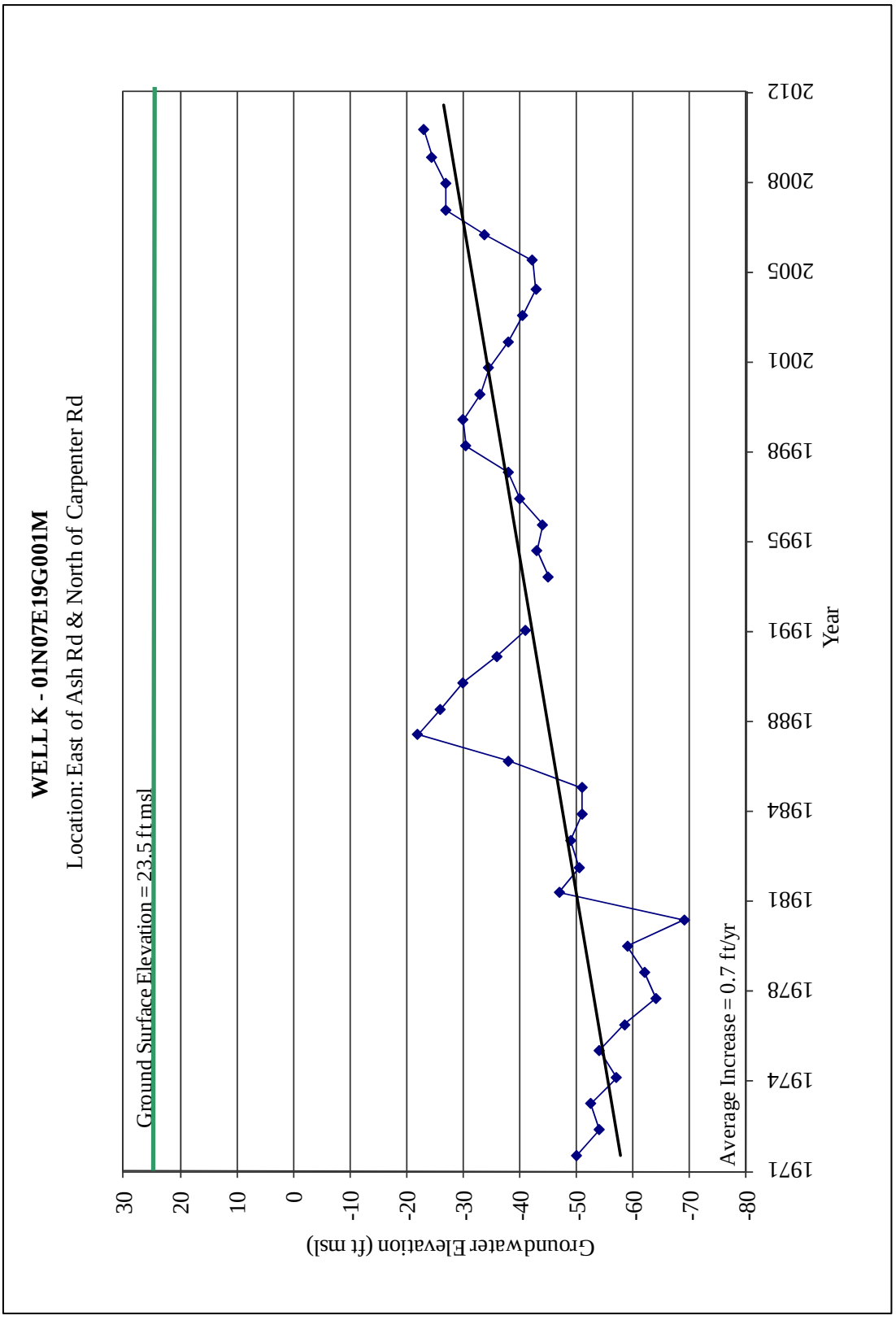


Figure 3-12: Fall Hydrograph Well K

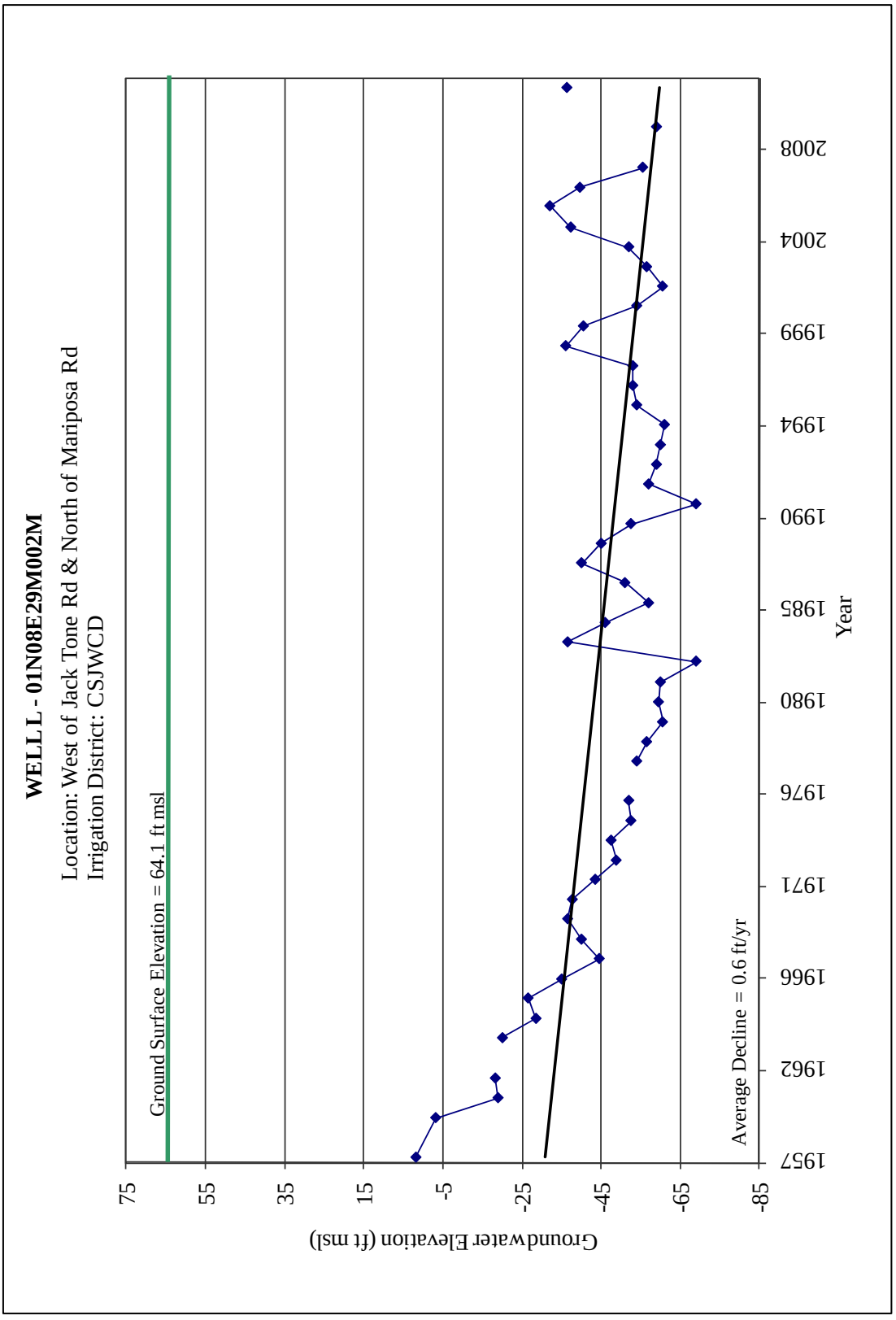


Figure 3-13: Fall Hydrograph Well L

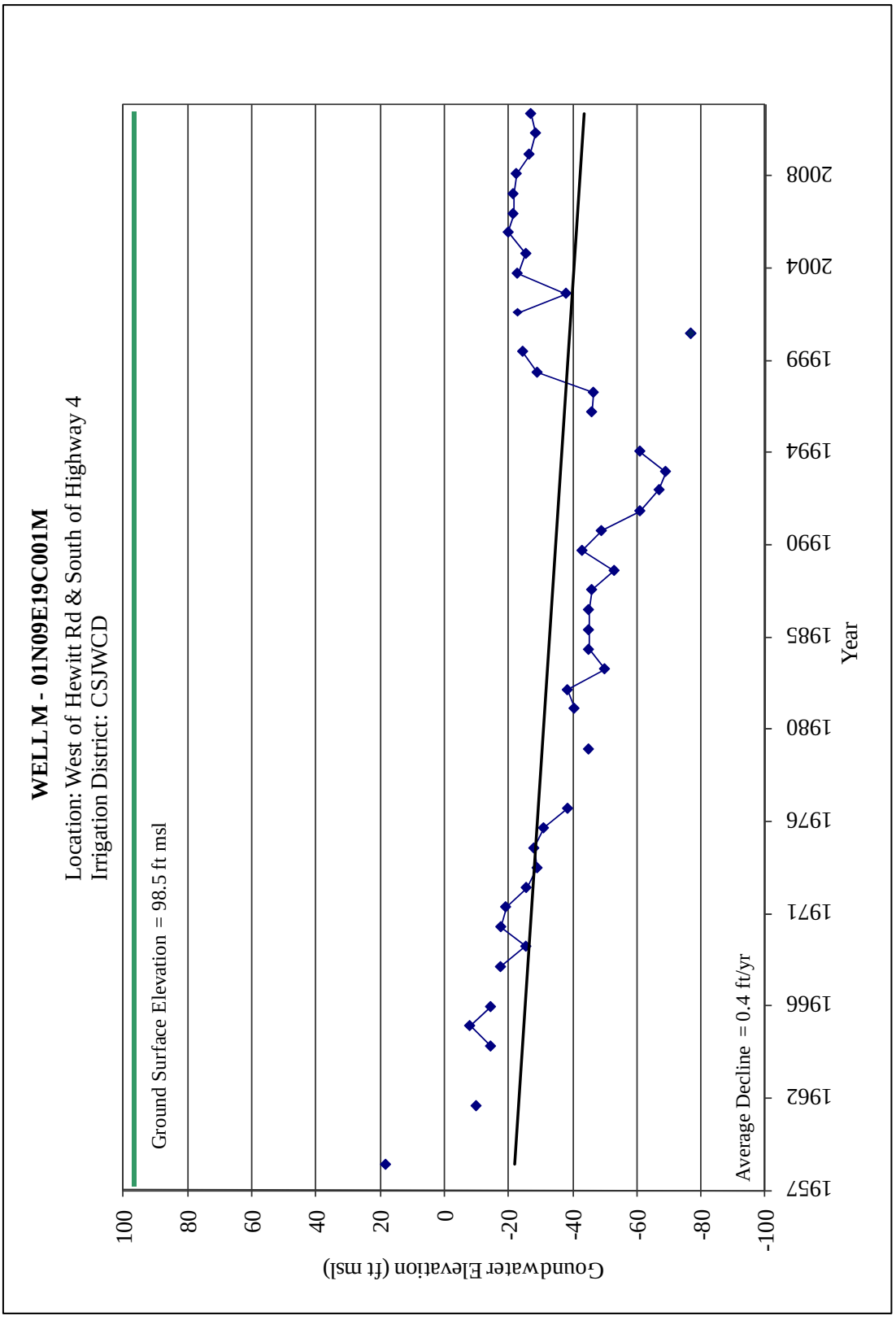


Figure 3-14: Fall Hydrograph Well M

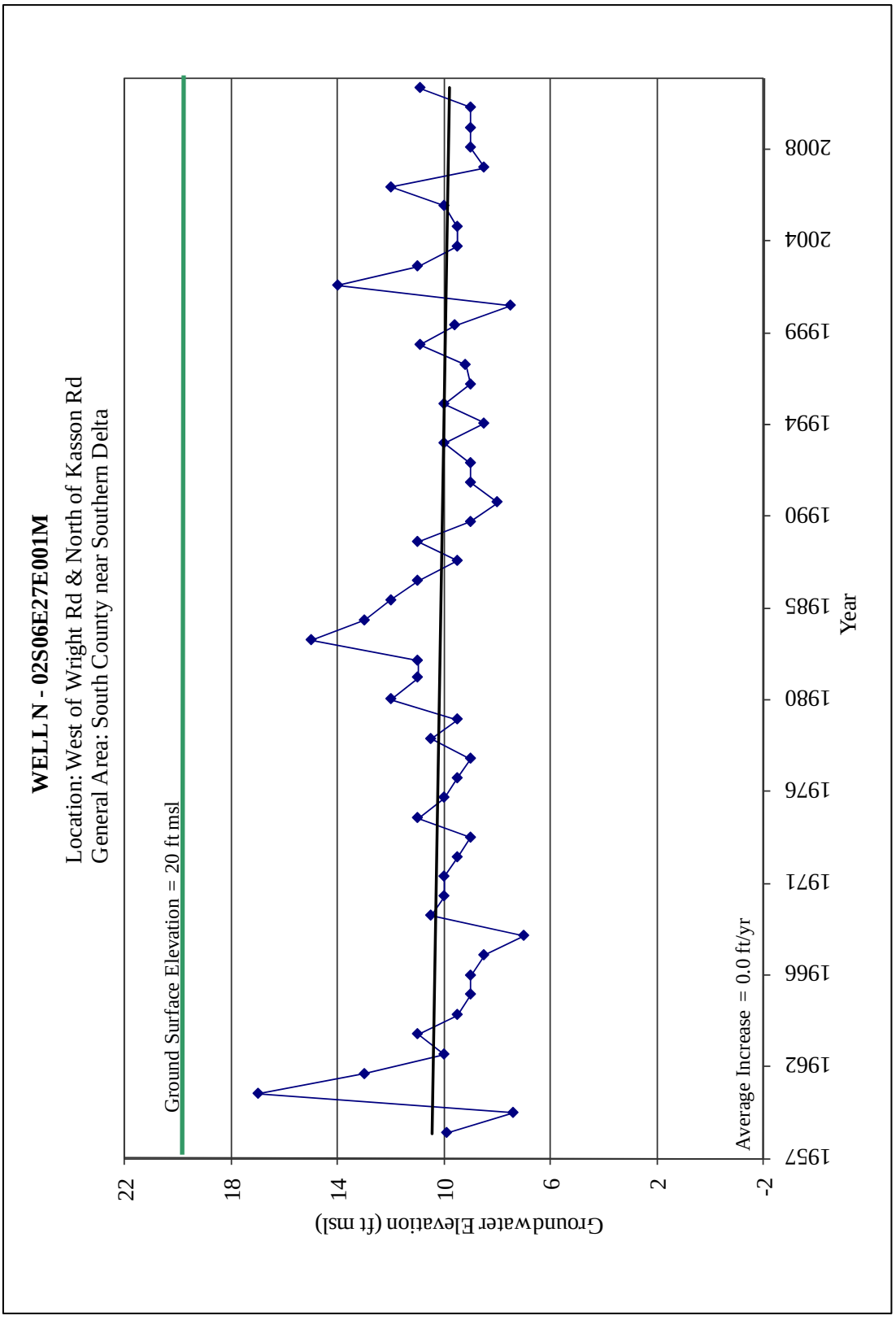


Figure 3-15: Fall Hydrograph Well N

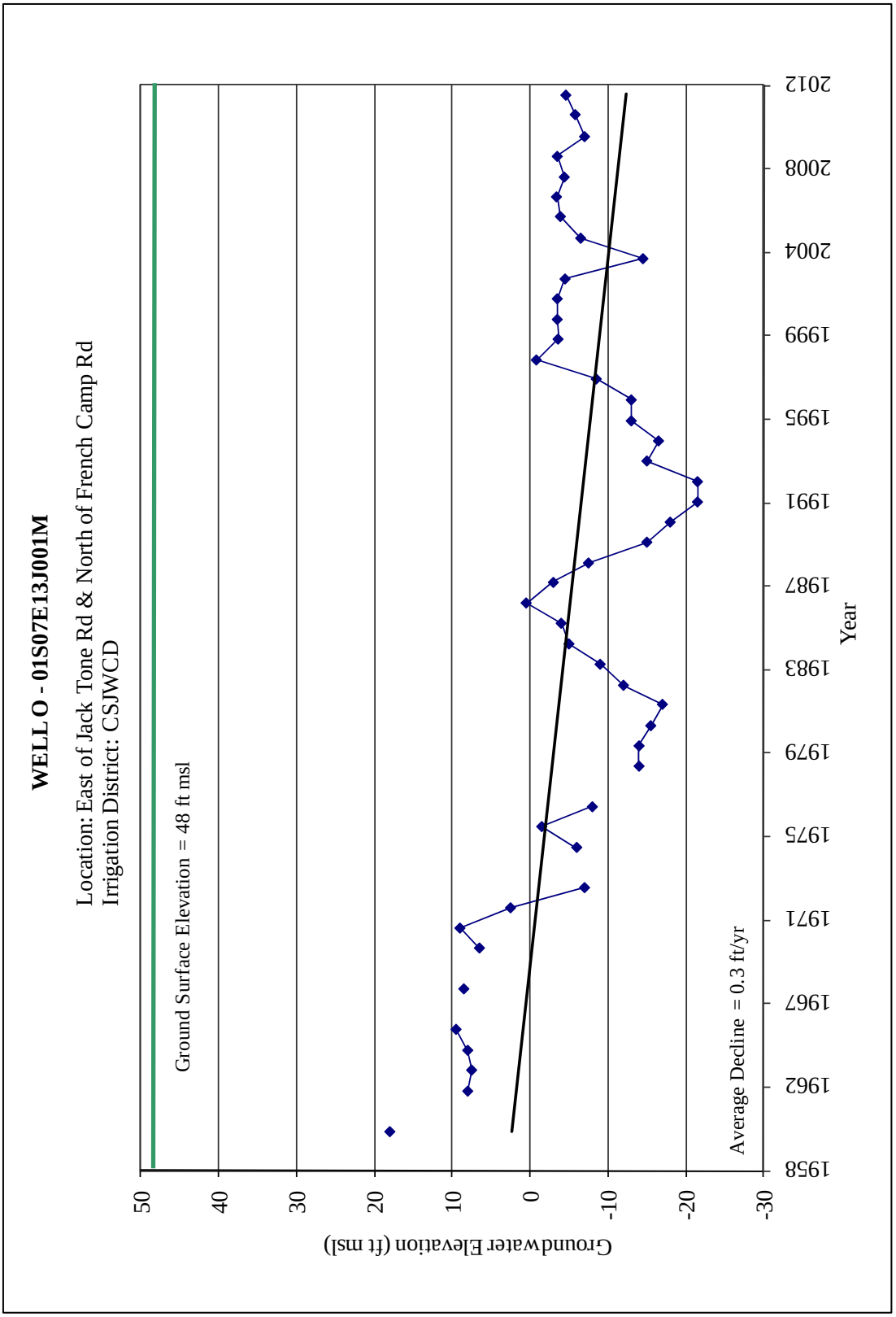


Figure 3-16: Fall Hydrograph Well O

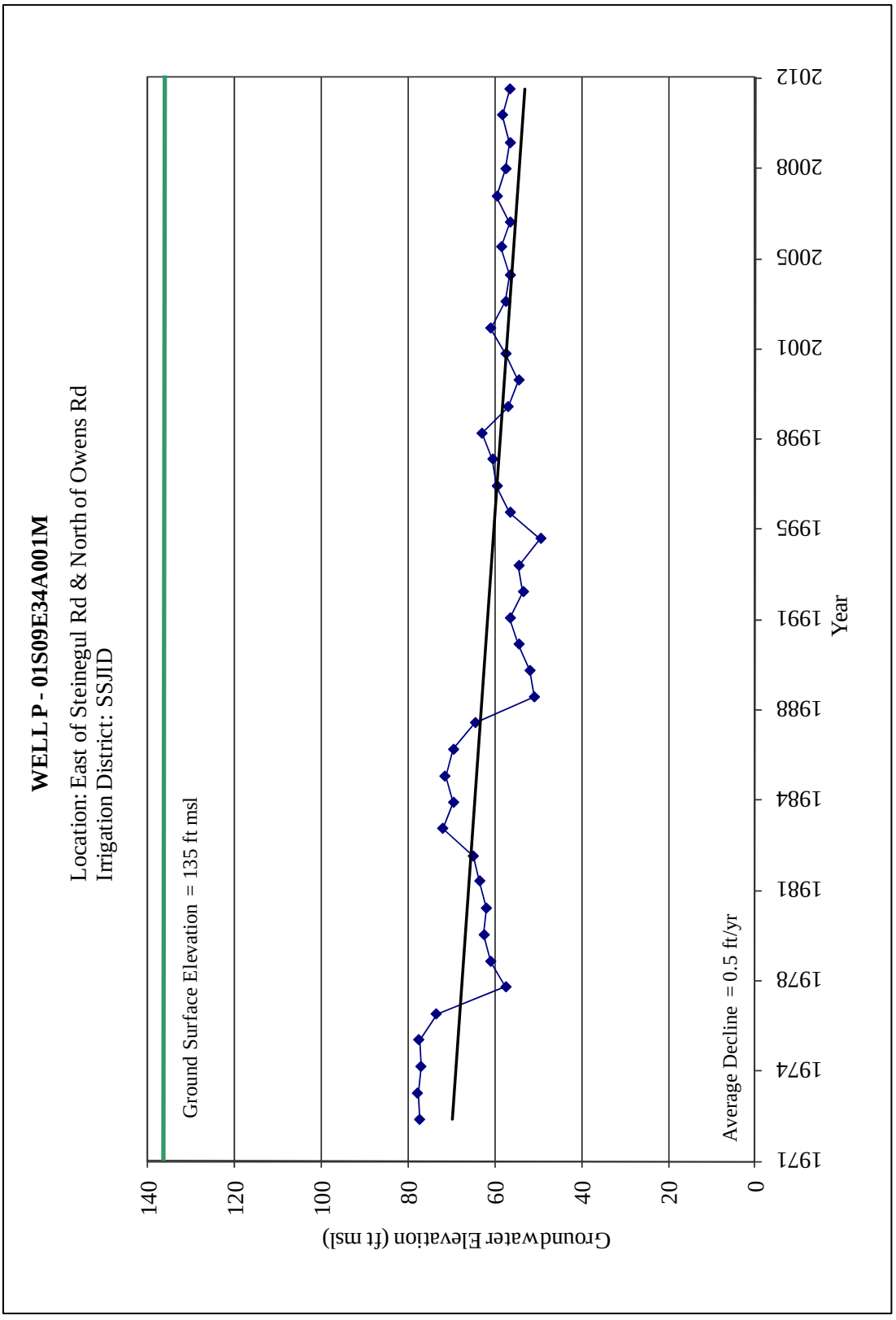


Figure 3-17: Fall Hydrograph Well P

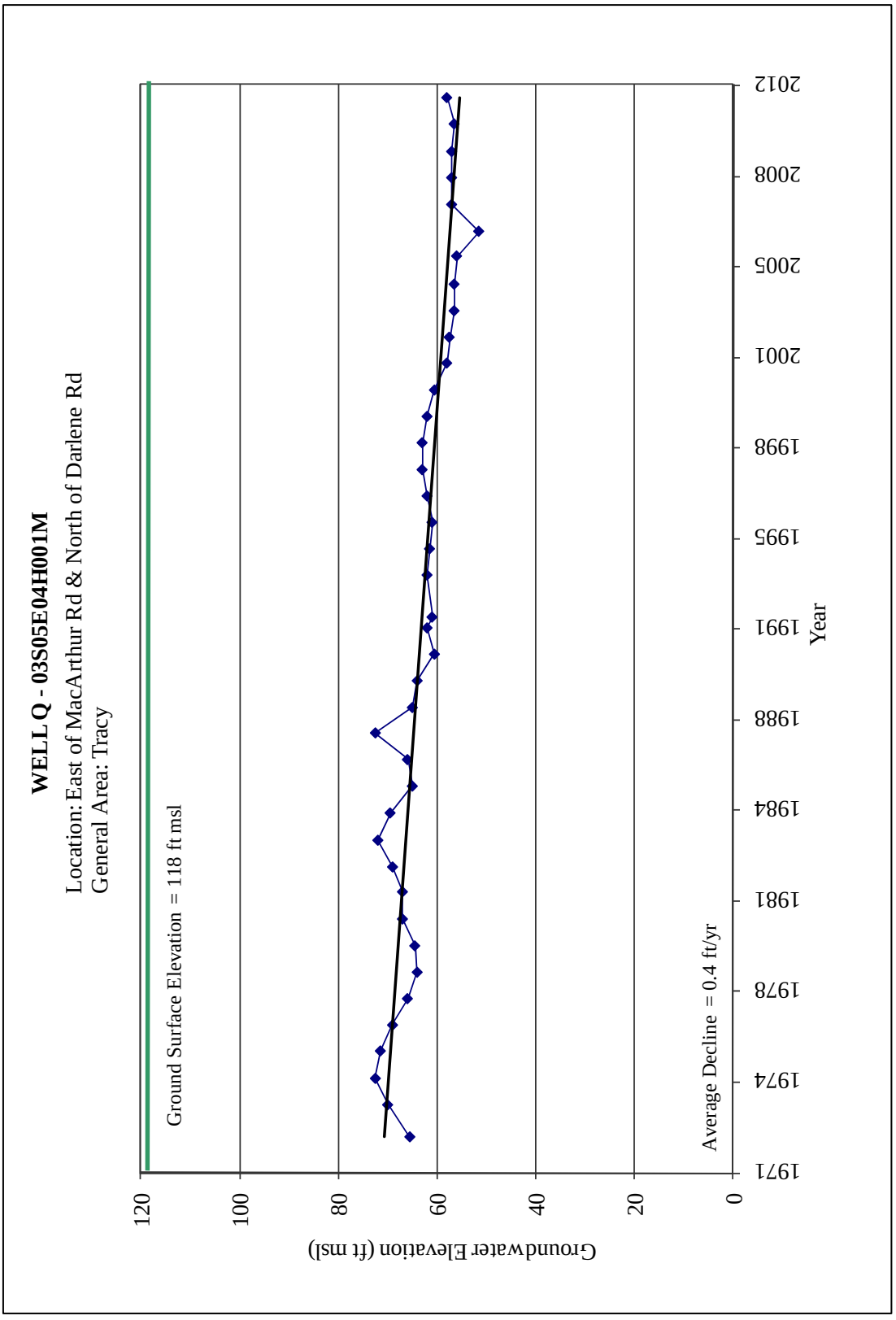


Figure 3-18: Fall Hydrograph Well Q

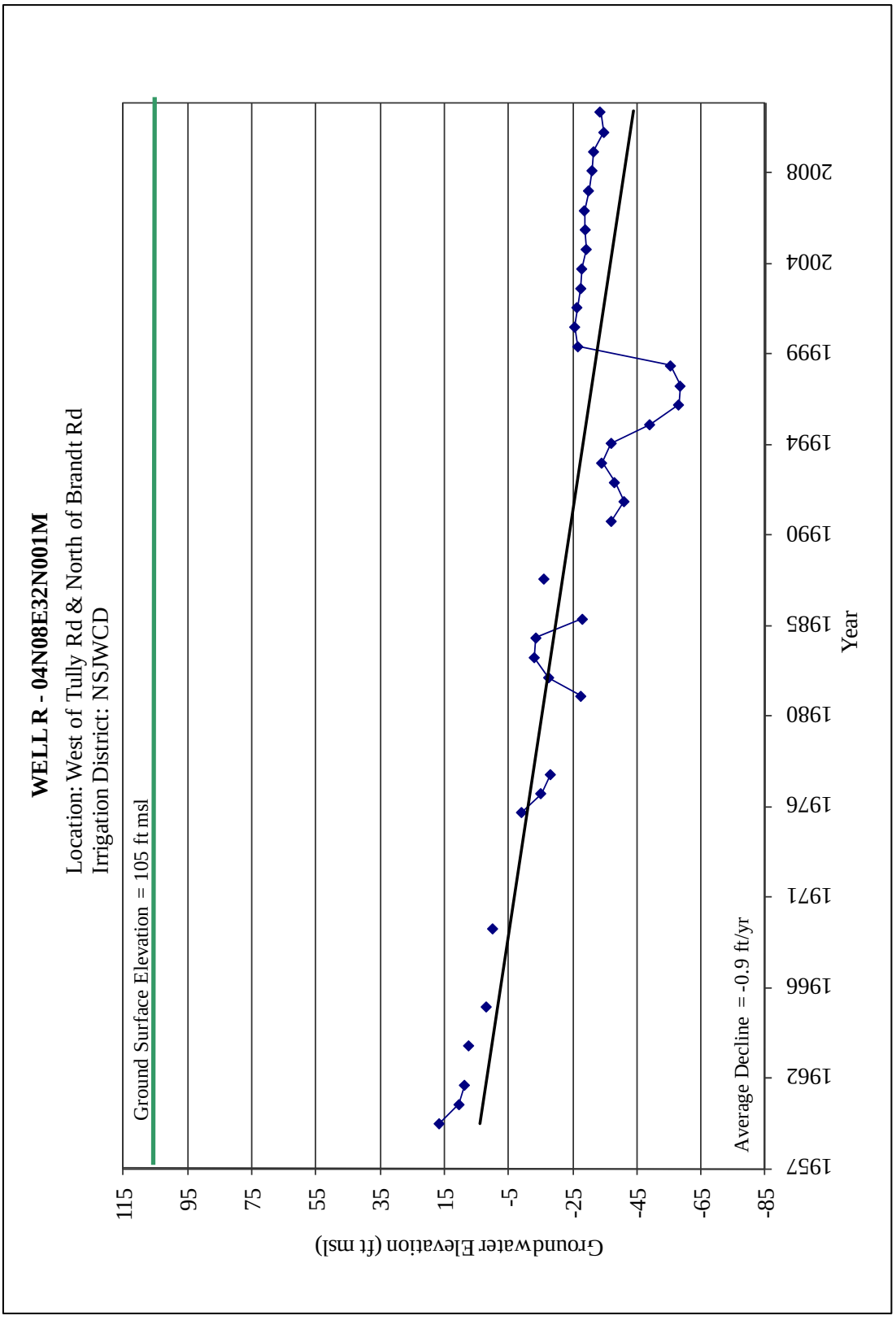


Figure 3-19: Fall Hydrograph Well R

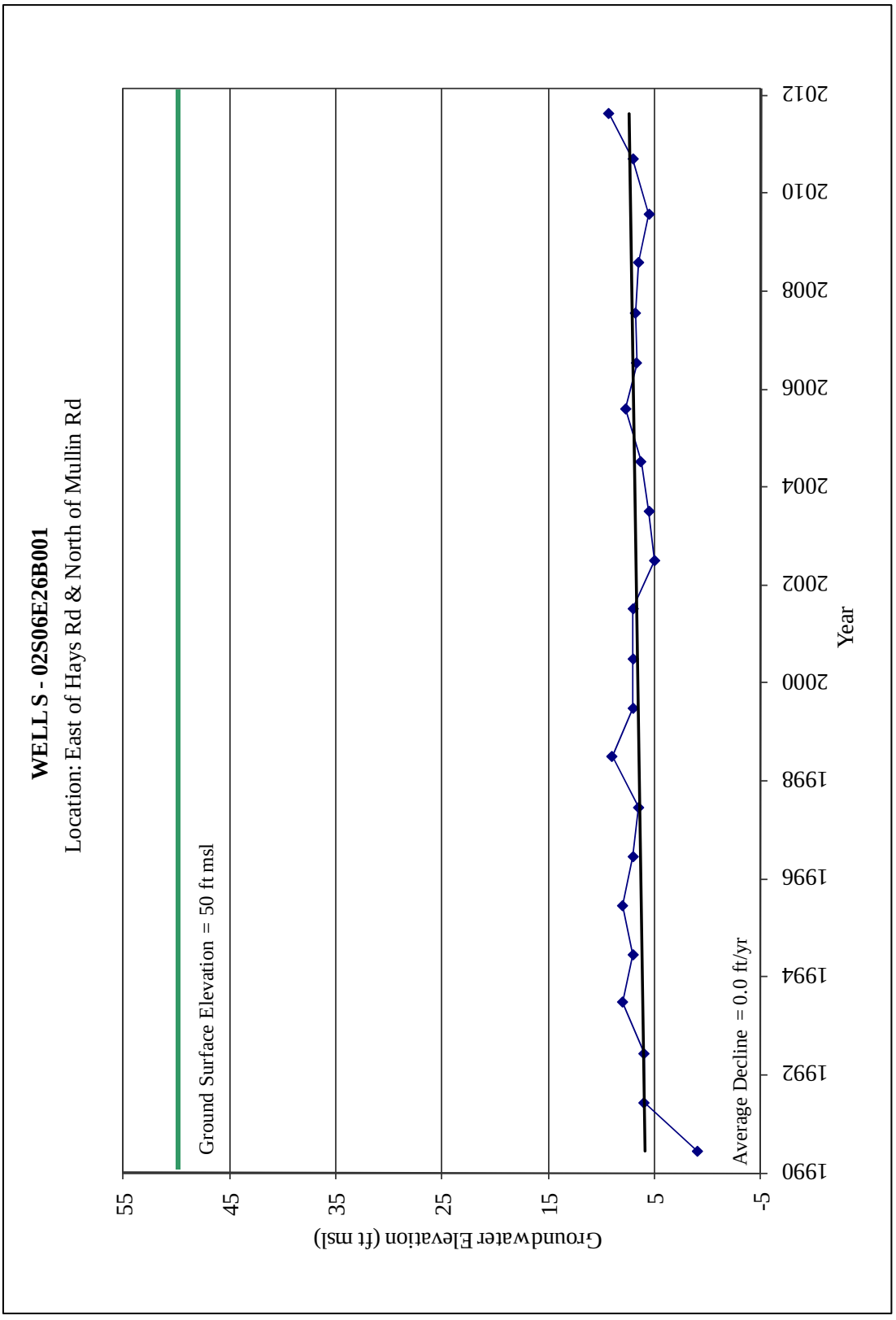


Figure 3-20: Fall Hydrograph Well S

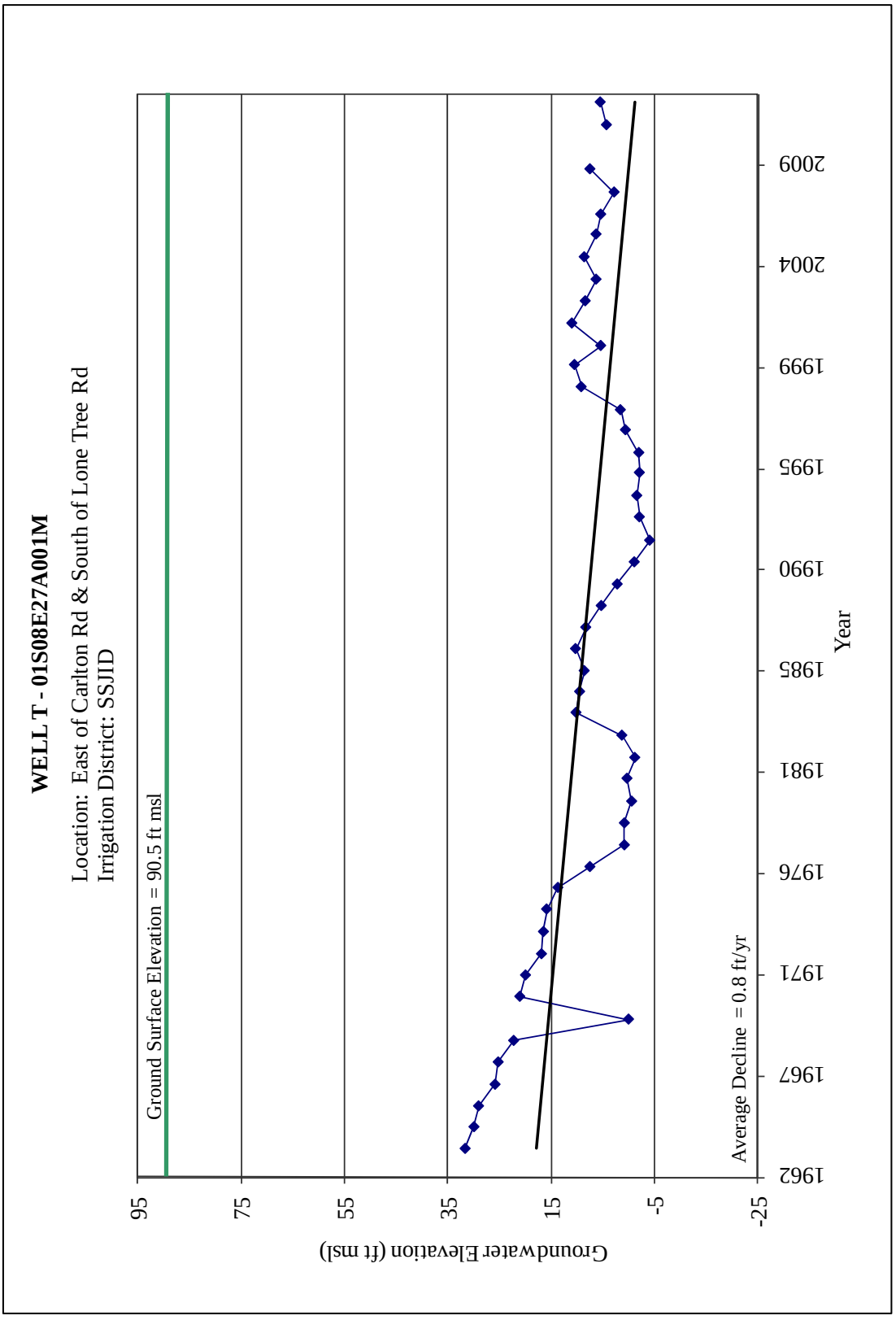


Figure 3-21: Fall Hydrograph Well T

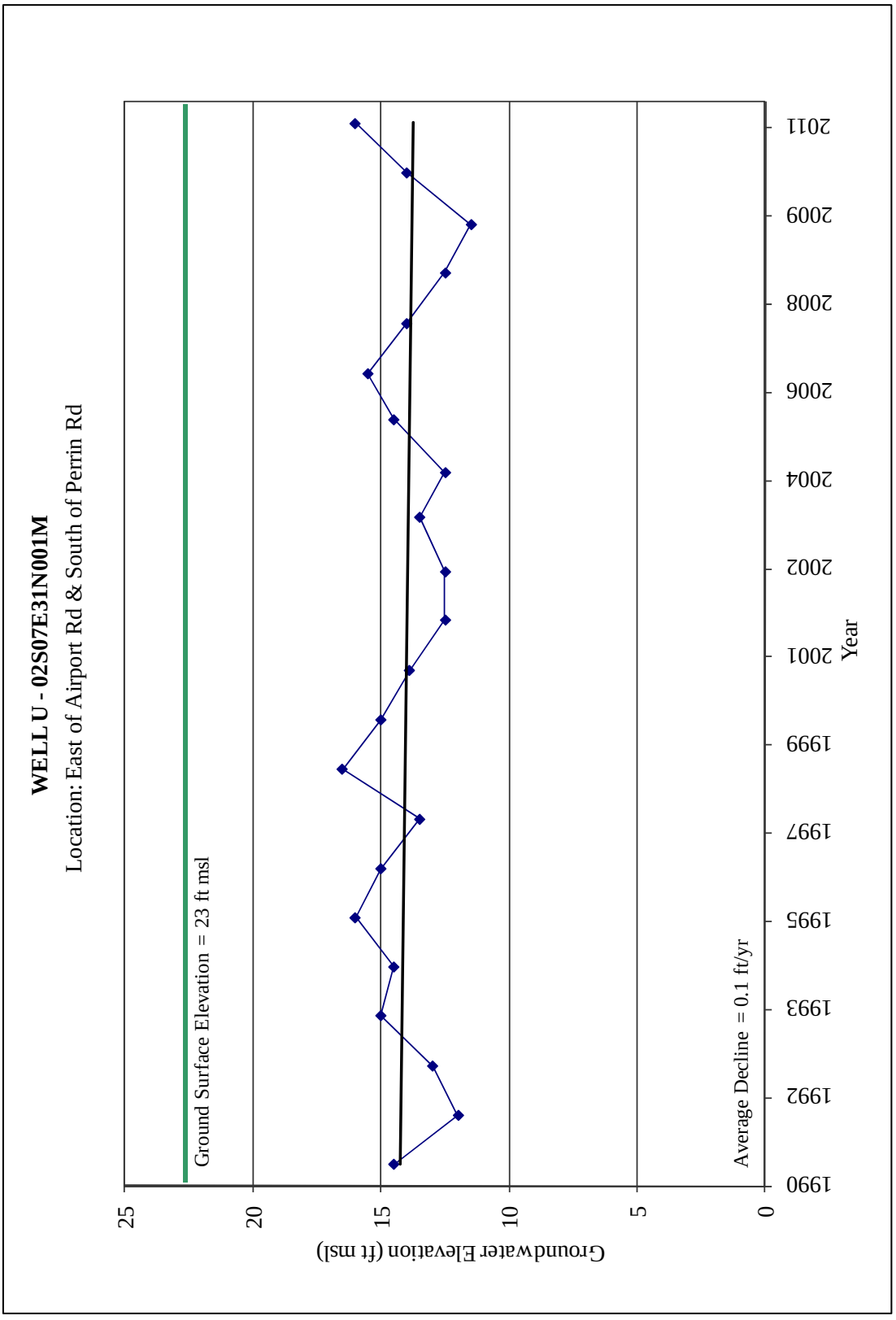


Figure 3-22: Fall Hydrograph Well U

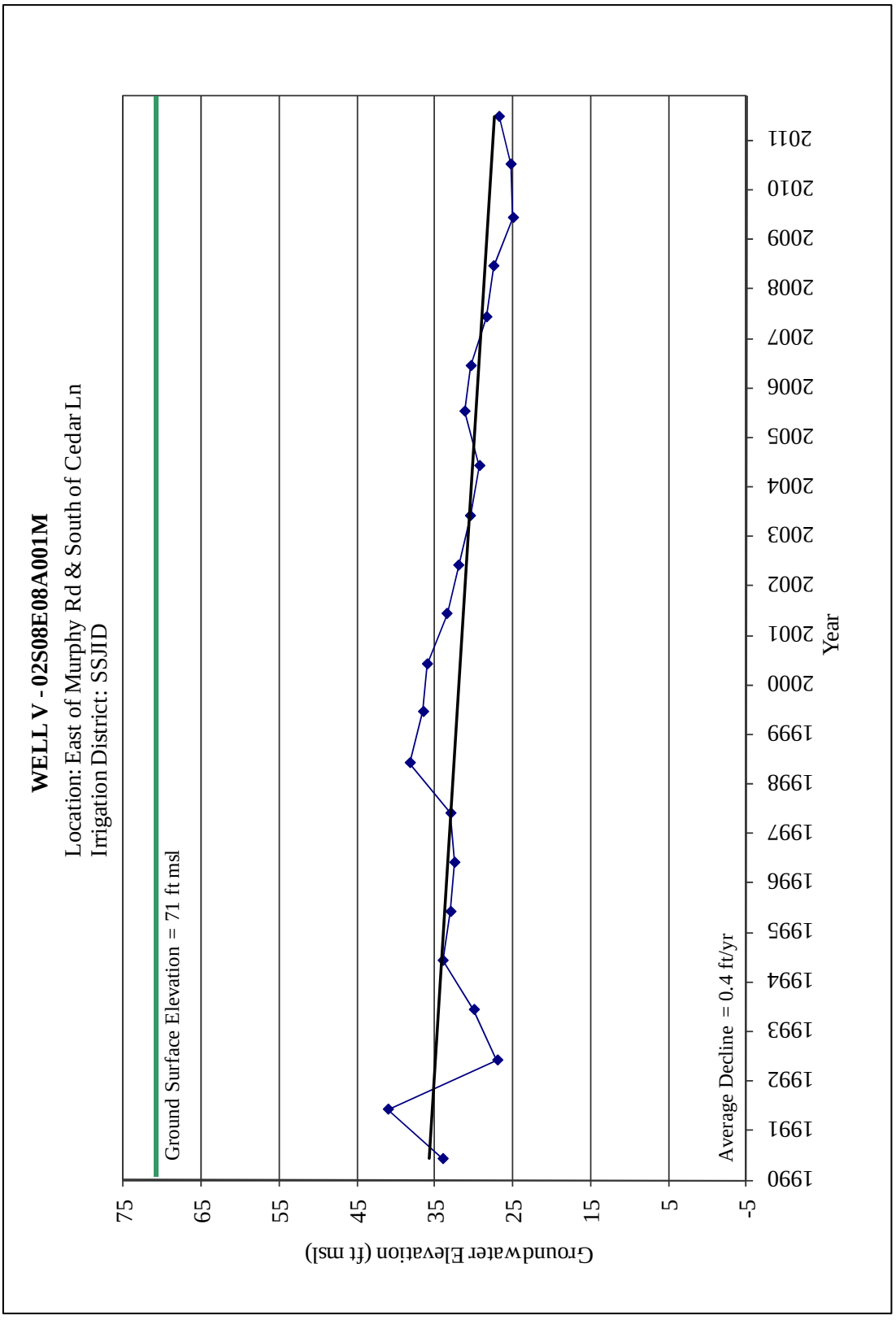


Figure 3-23: Fall Hydrograph Well V

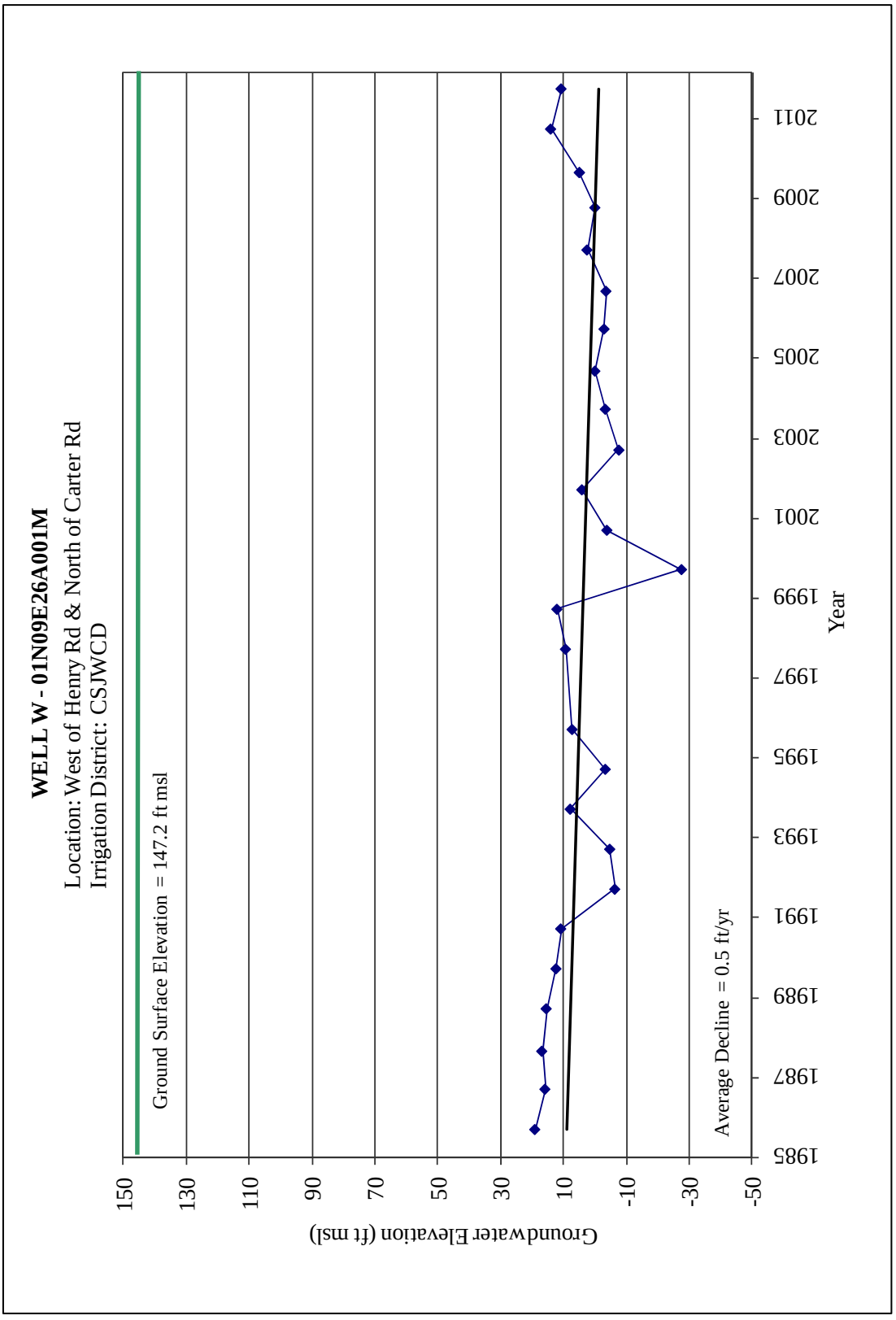


Figure 3-24: Fall Hydrograph Well W

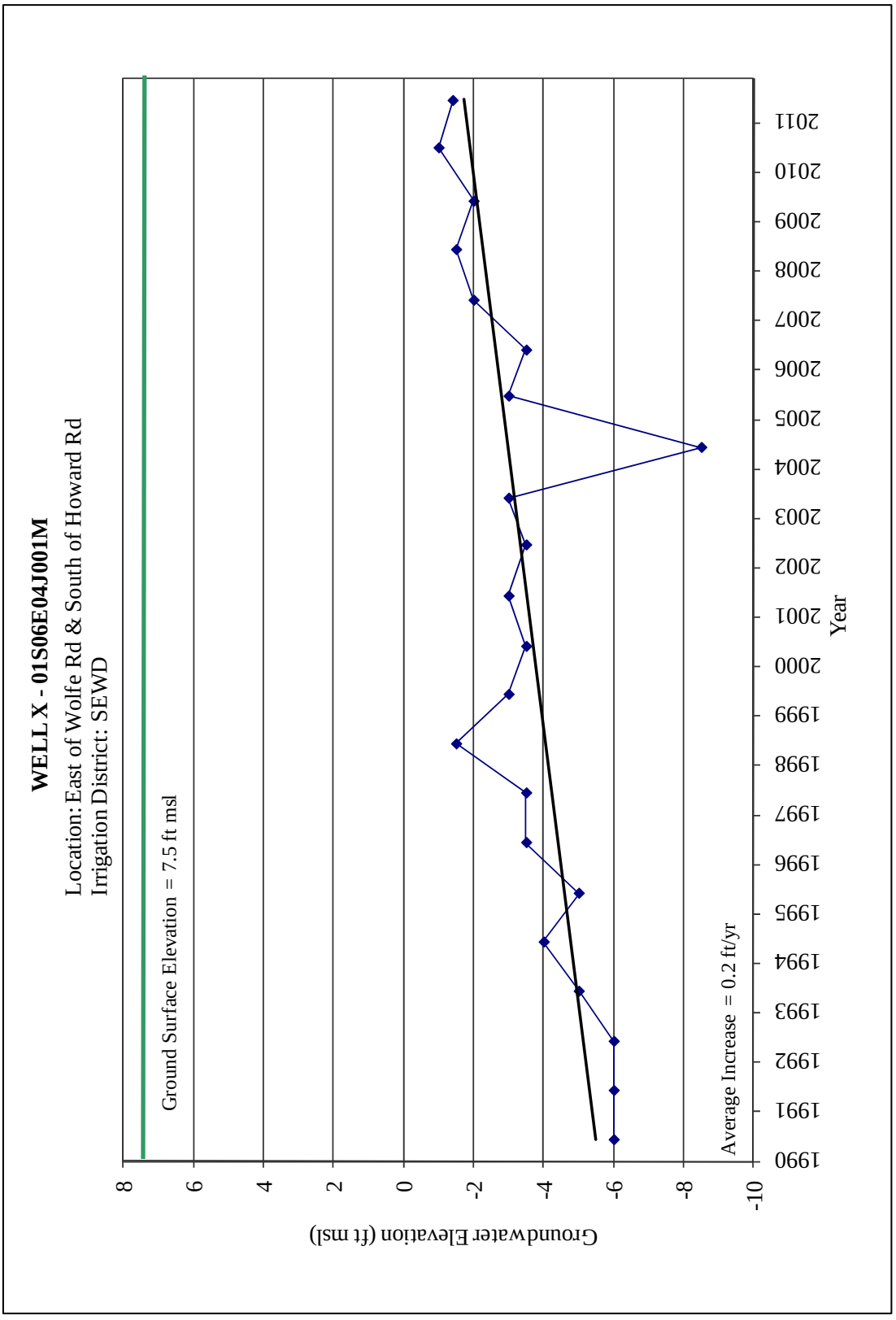


Figure 3-25: Fall Hydrograph Well X

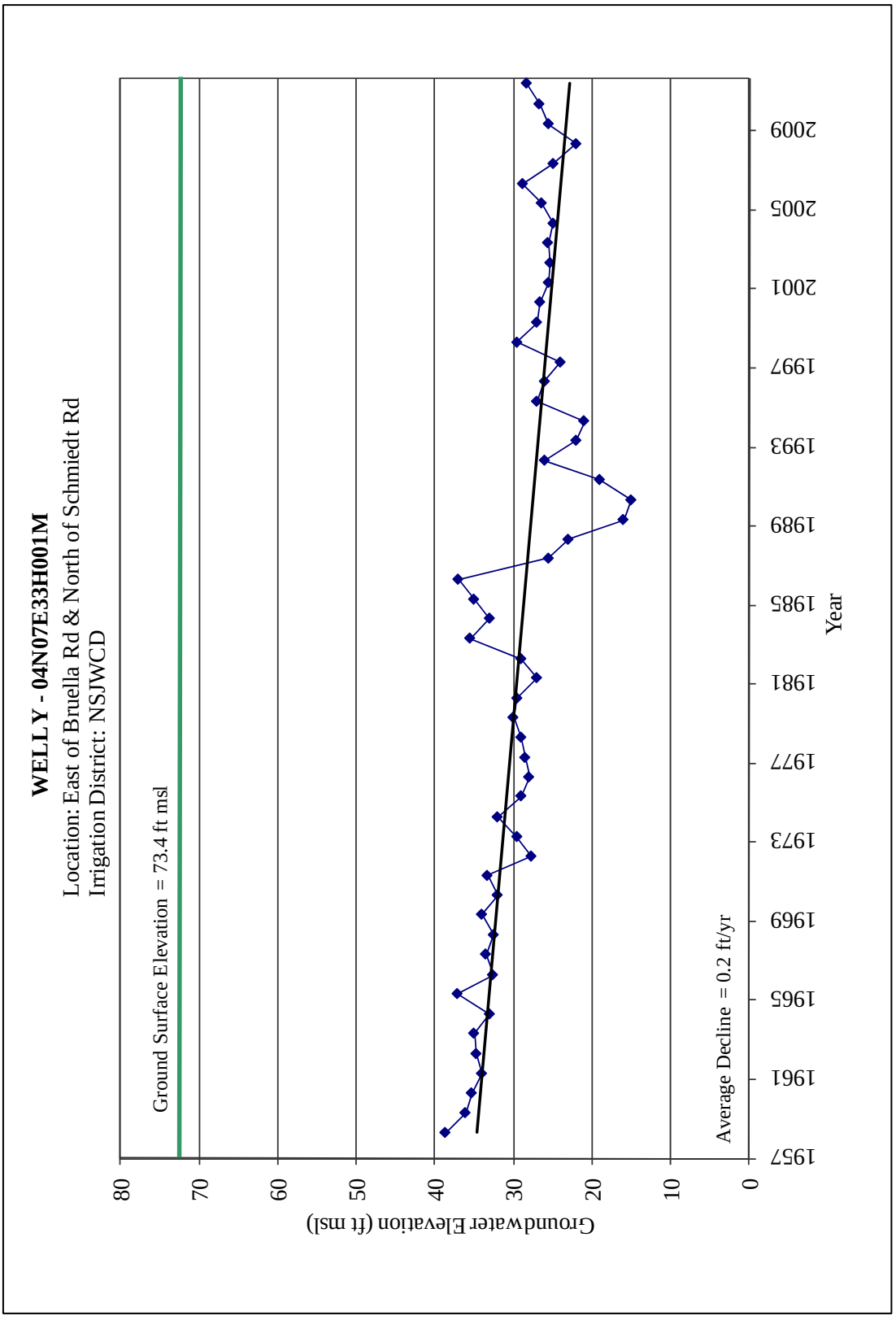


Figure 3-26: Fall Hydrograph Well Y

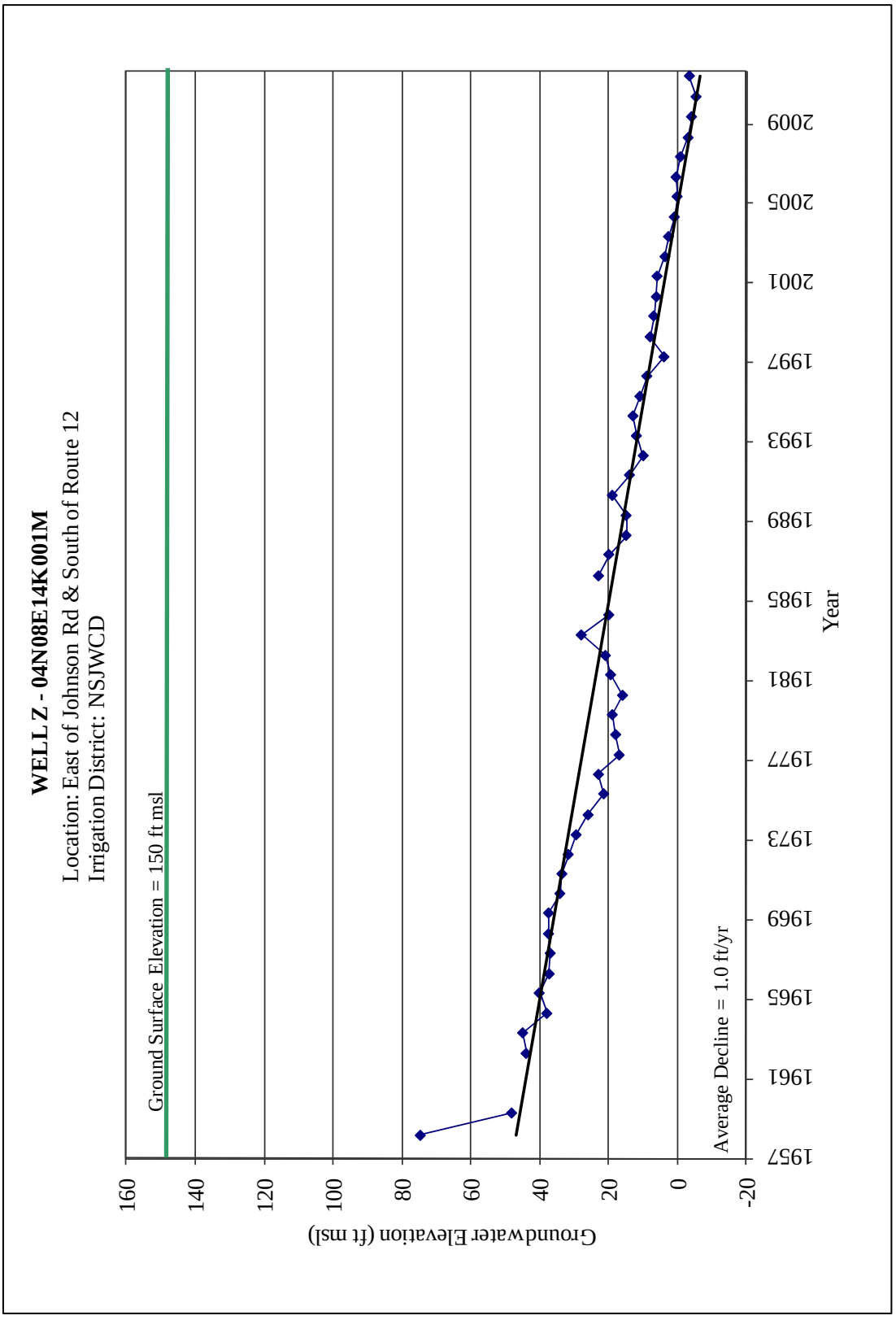


Figure 3-27: Fall Hydrograph Well Z

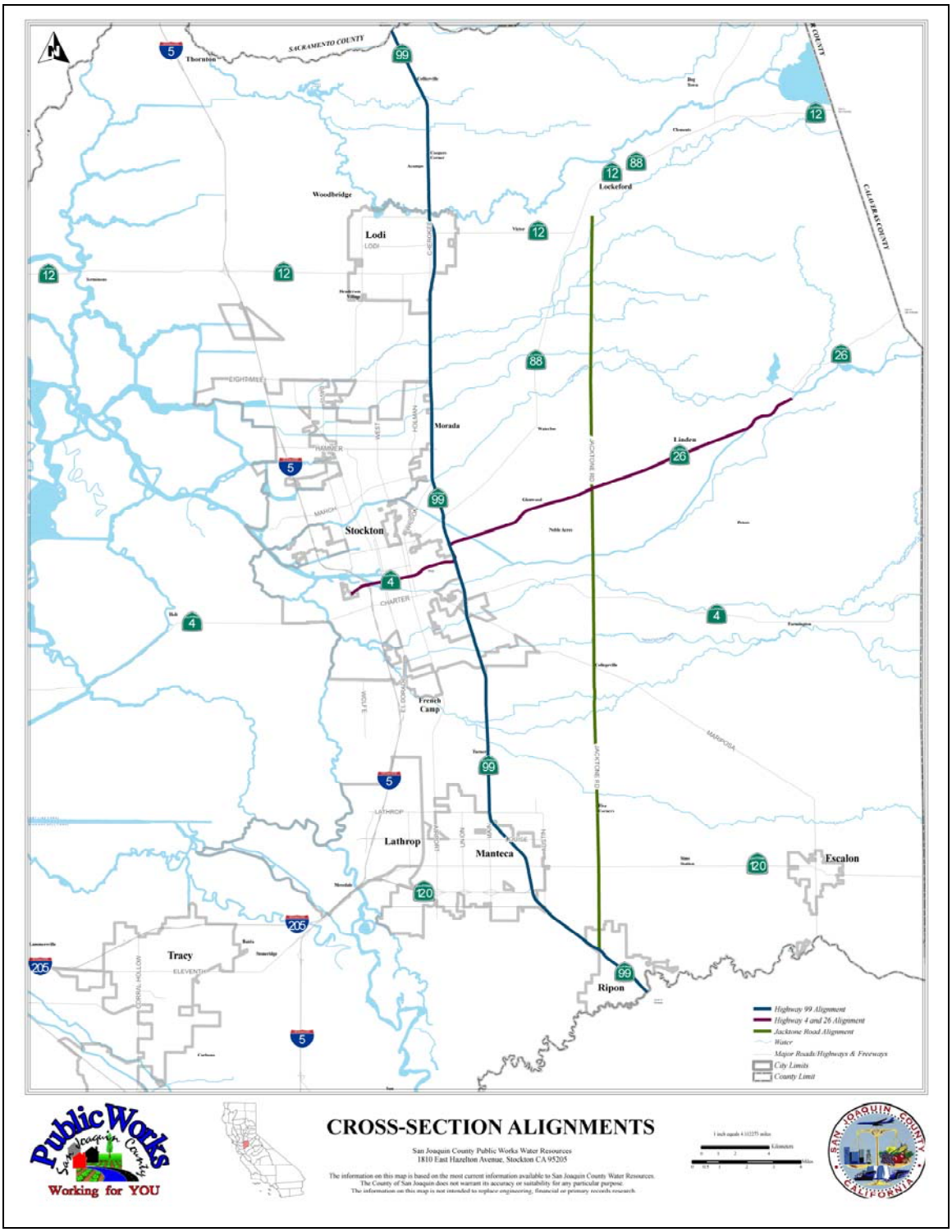


Figure 3-28: Cross Section Alignments

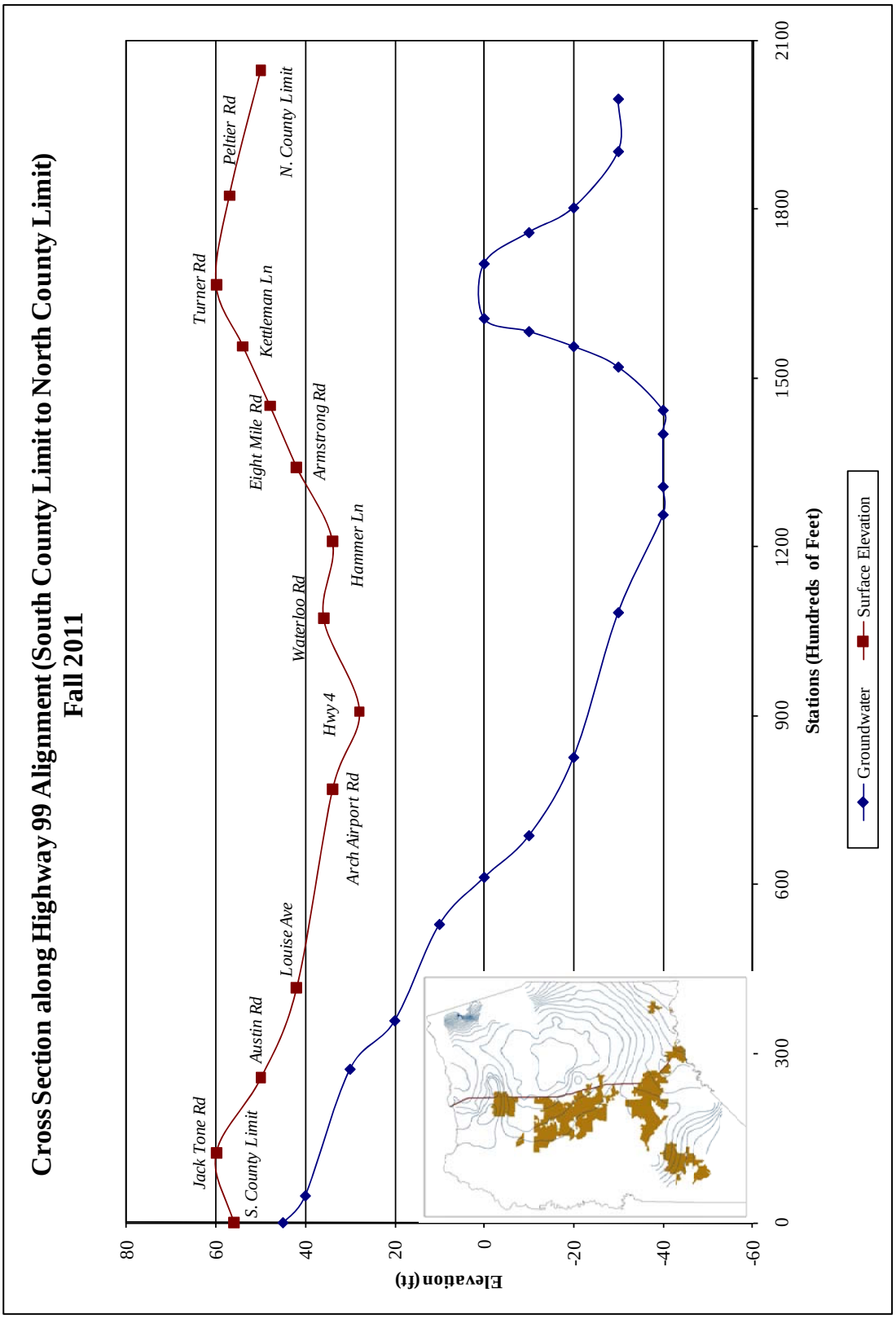


Figure 3-29: Highway 99 Cross Section Fall 2011

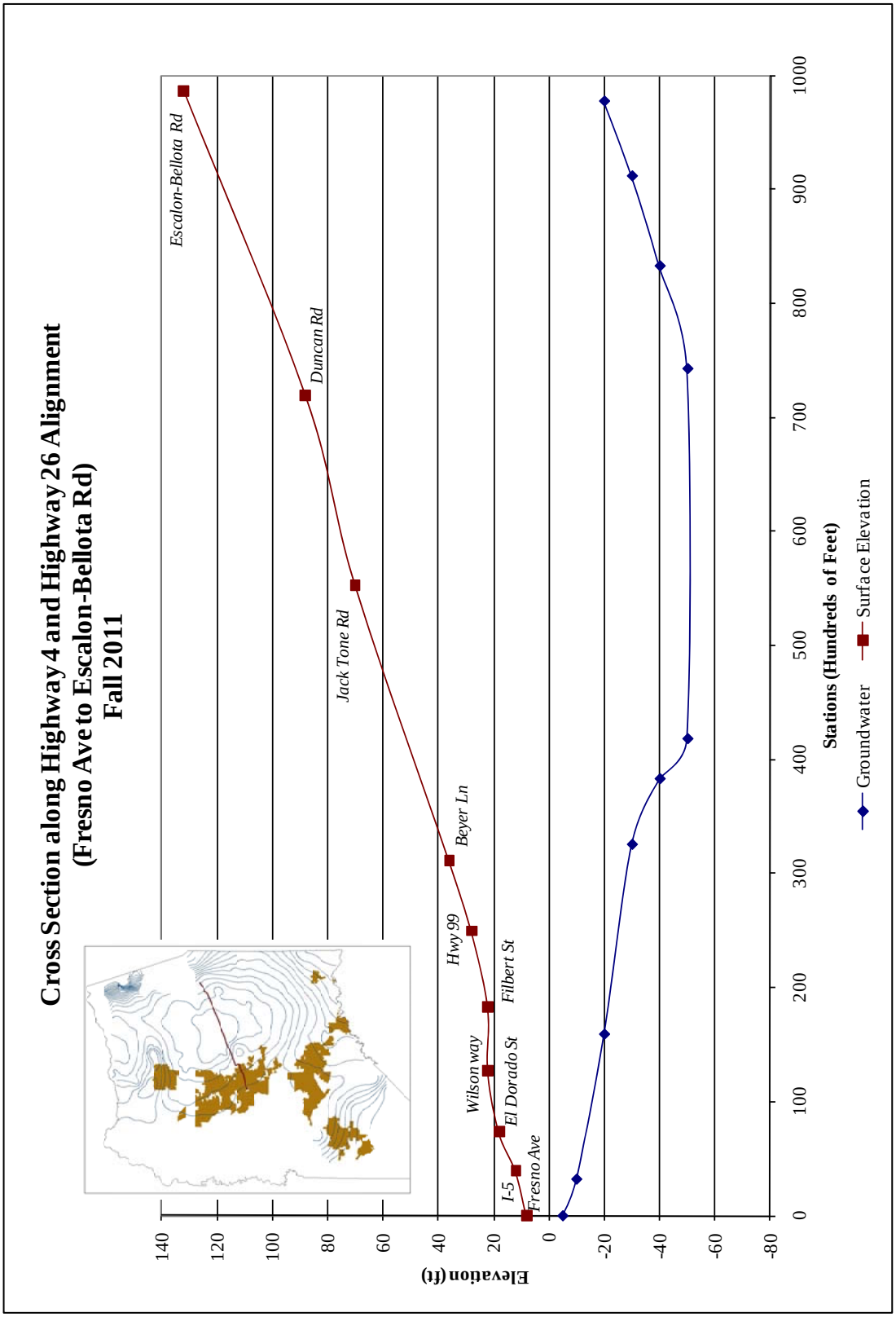


Figure 3-30: Highway 4 & Highway 26 Cross Section Fall 2011

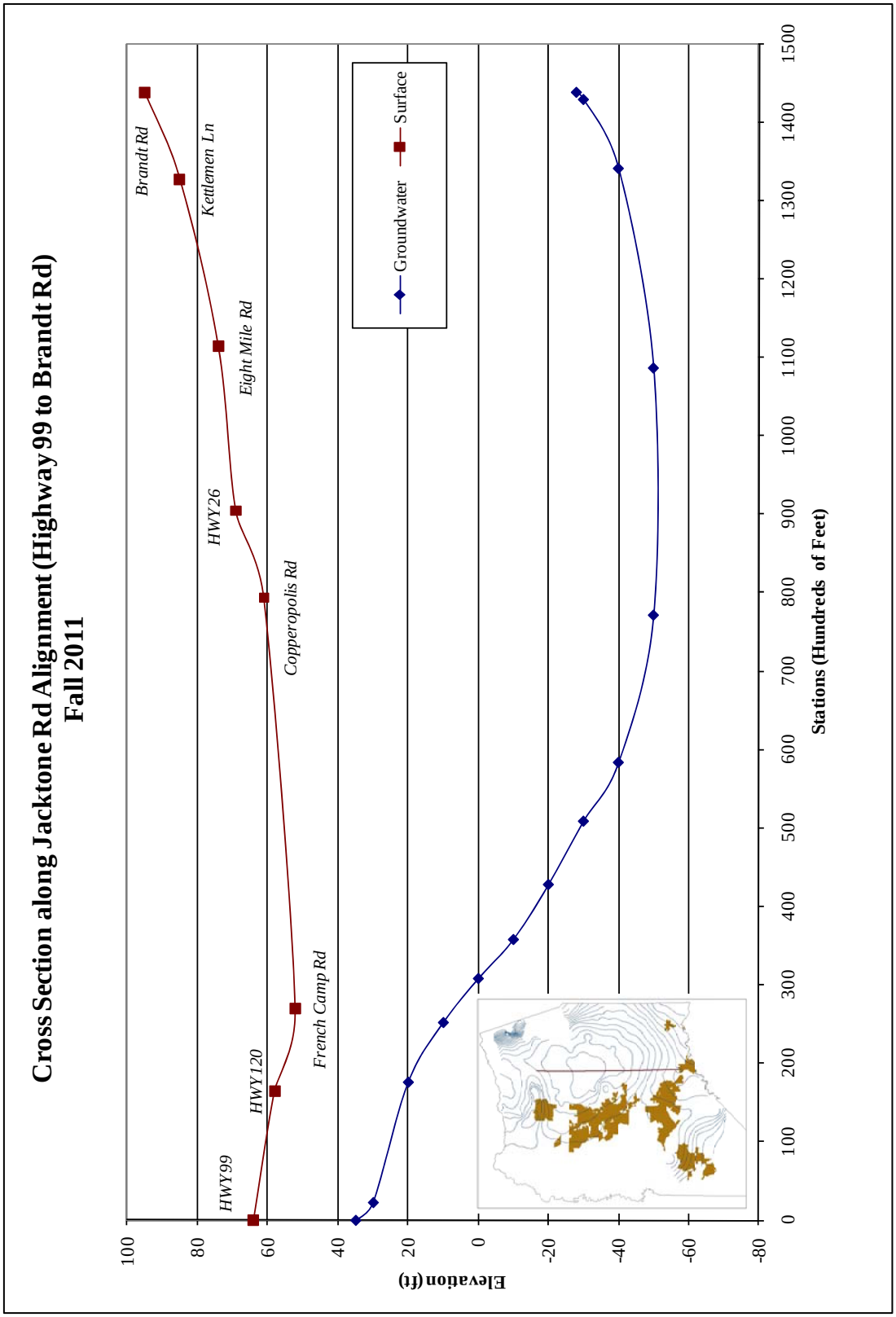


Figure 3-31: Jacktone Rd Cross Section Fall 2011

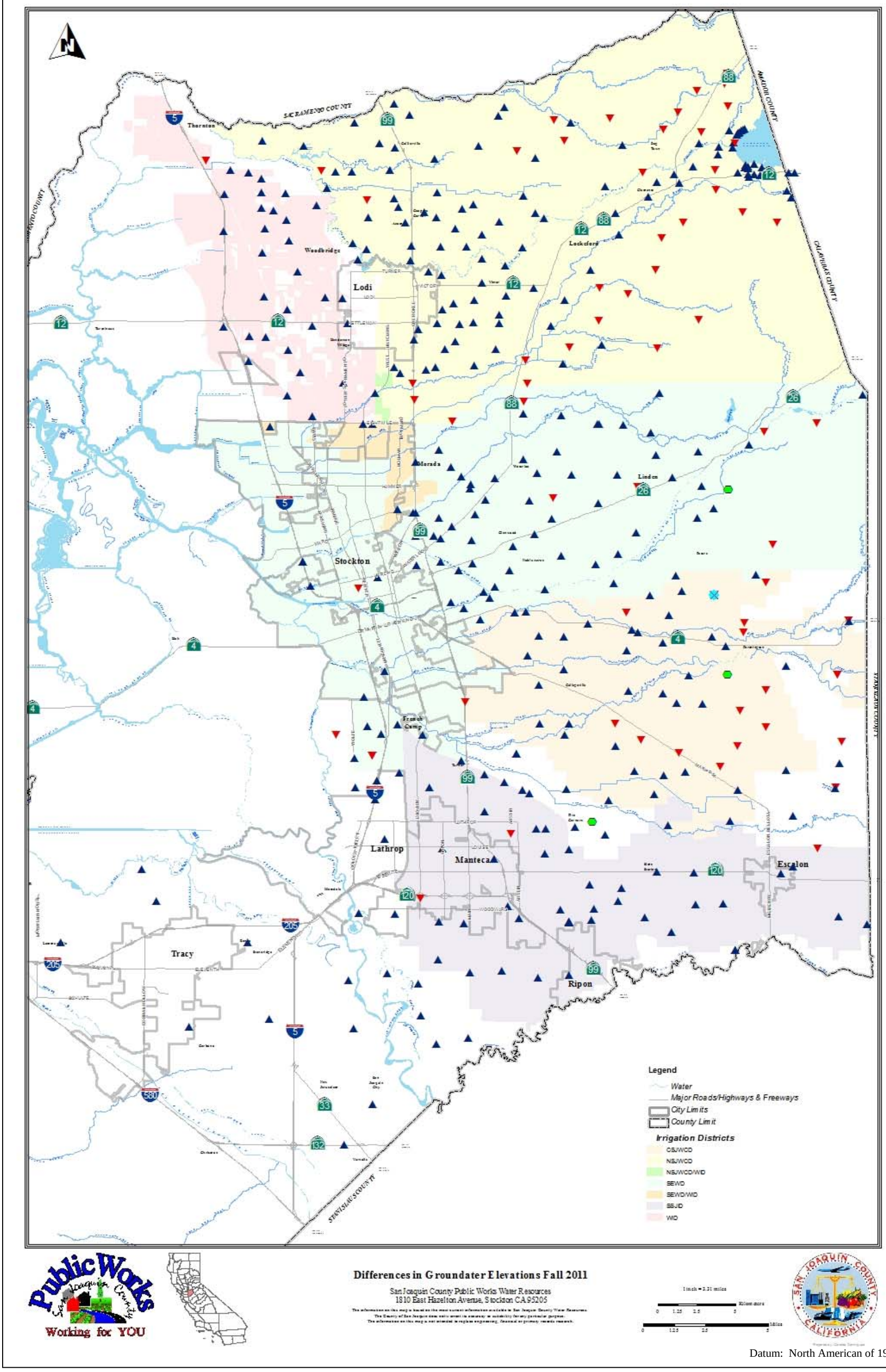
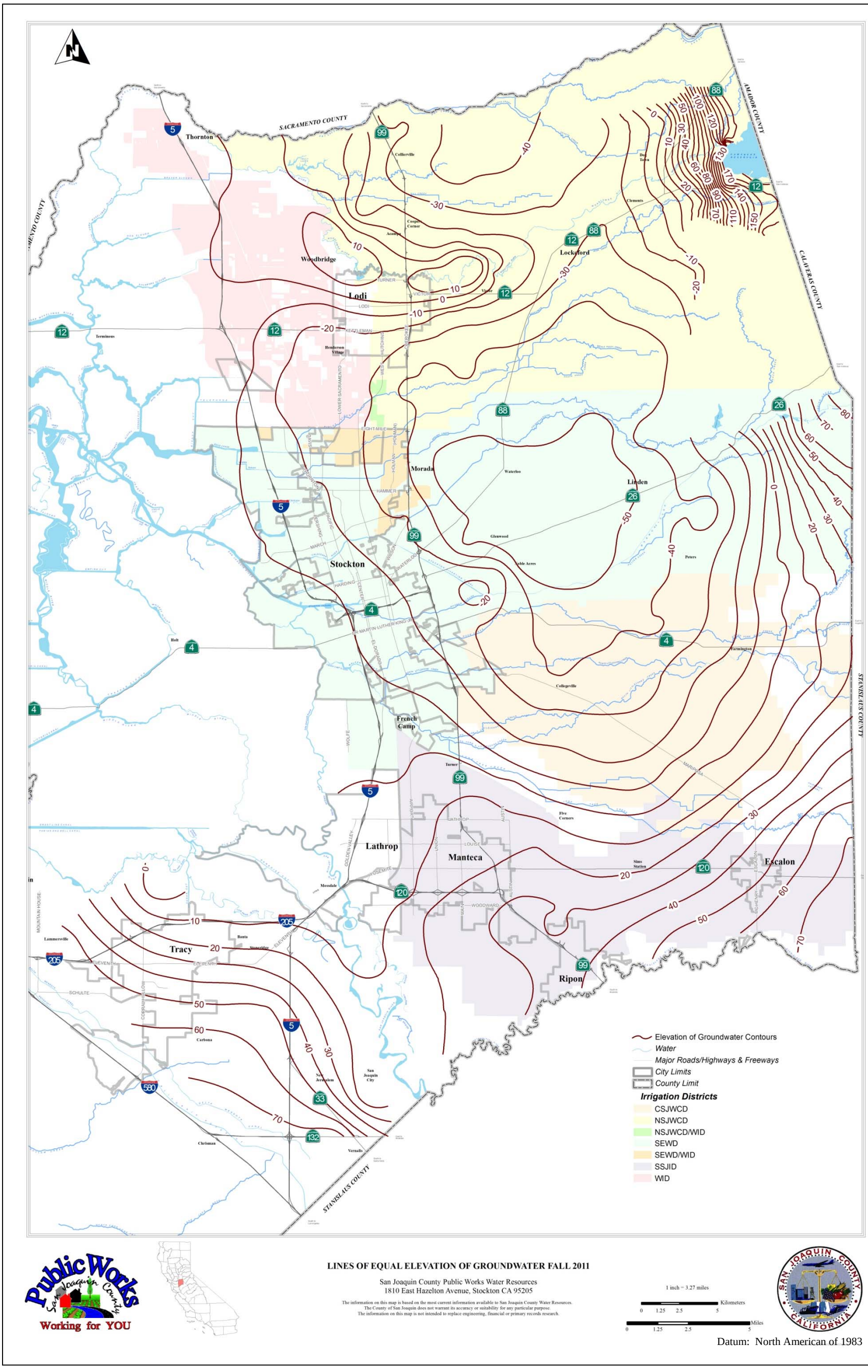


Figure 3-32: Differences in Groundwater Elevations Fall 2011



Datum: North American of 1983

Figure 3-33: Lines of Equal Elevation of Groundwater Fall 2011

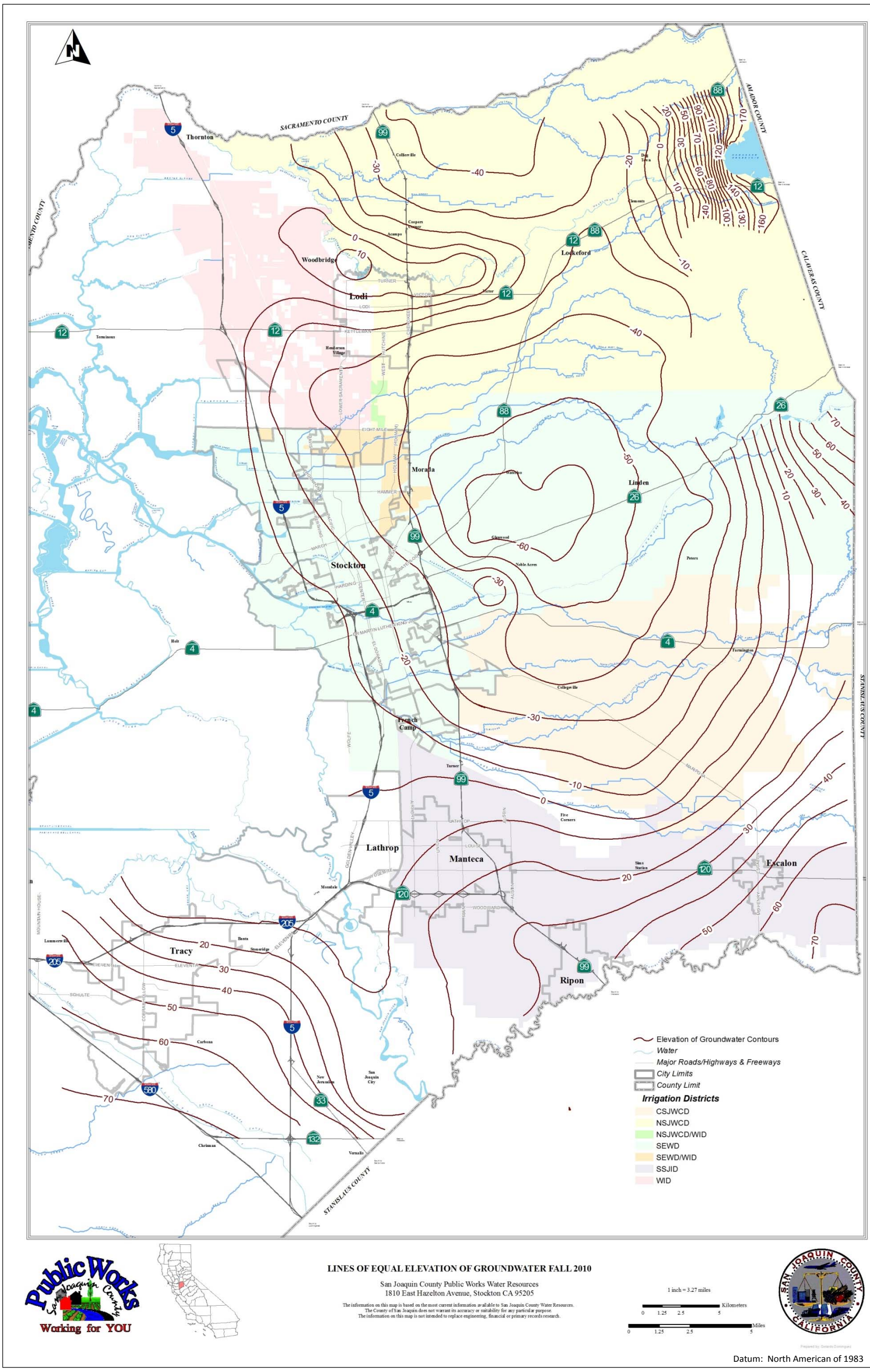


Figure 3-34: Lines of Equal Elevation of Groundwater Fall 2010

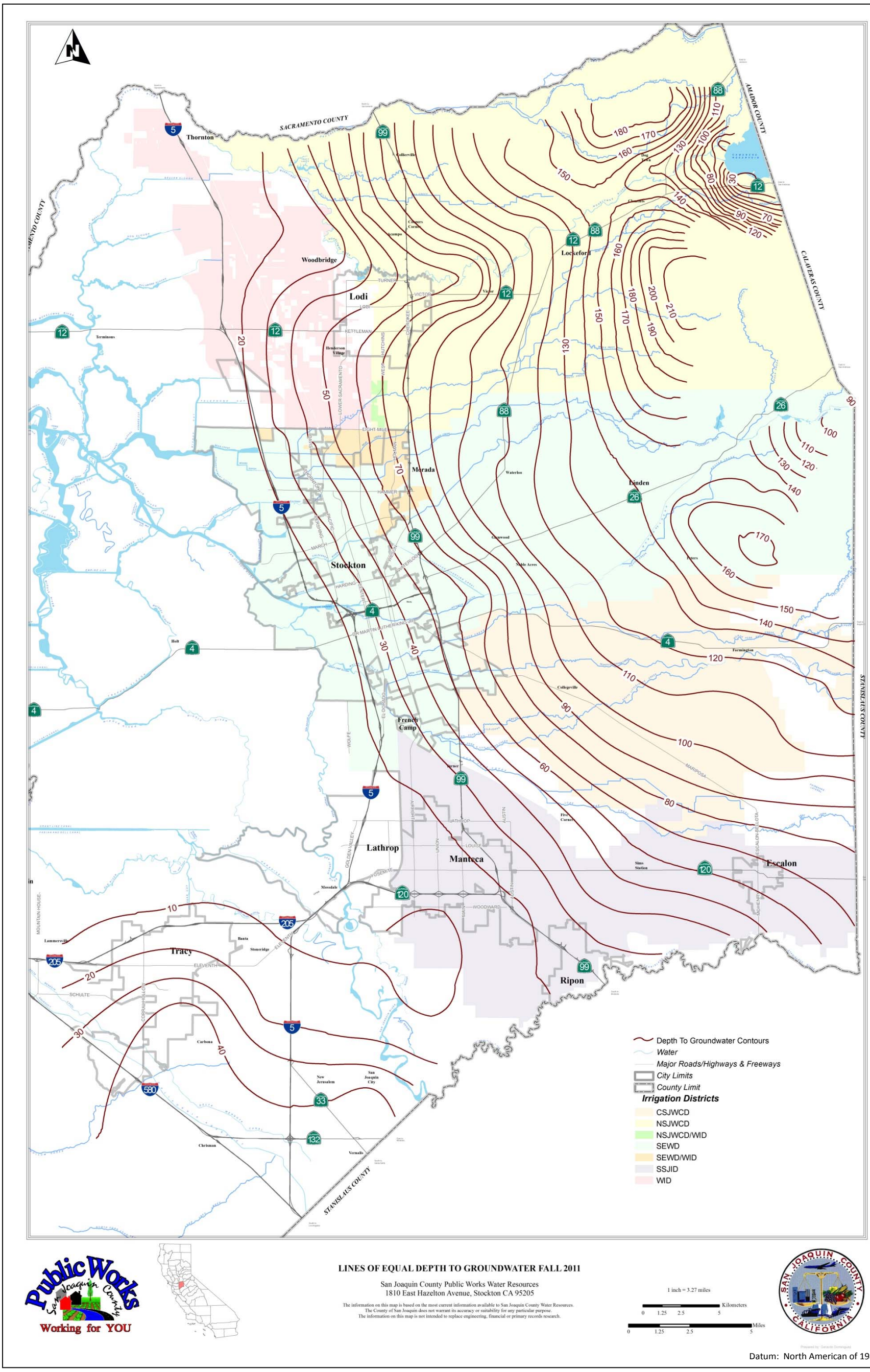


Figure 3-35: Lines of Equal Depth to Groundwater Fall 2011

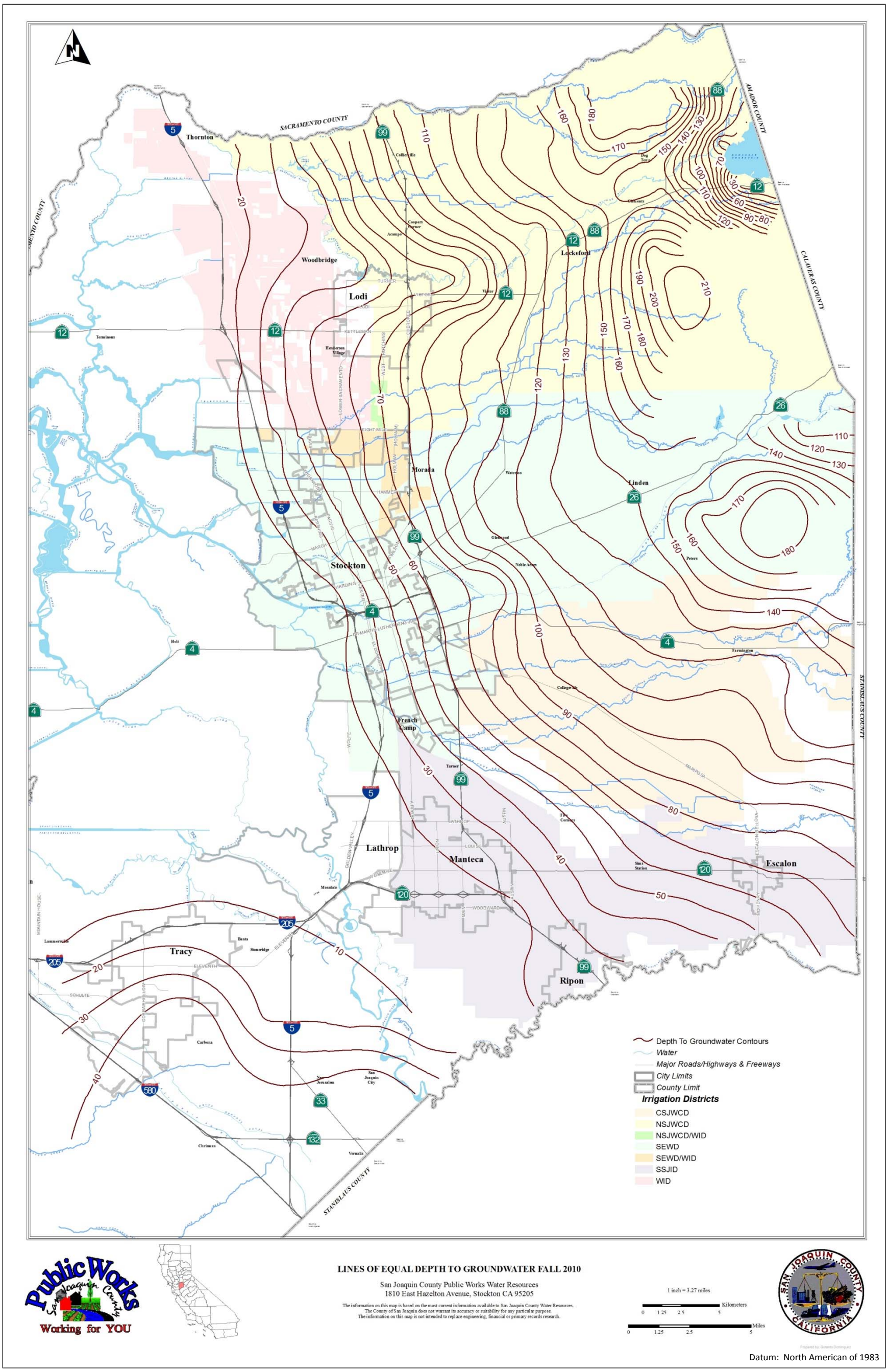


Figure 3-36: Lines of Equal Depth to Groundwater Fall 2010