Groundwater Report

Spring 2008

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 Spring 2008 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
Spring 2008 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 300 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– Annual Rainfall Distribution

Summary of Annual Rainfall Distribution

The groundwater basin in San Joaquin County responds 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 beginning in 1940. Lodi station has data from 1949 to 2008. The Camp Pardee station has data available from 1949 to 2008.

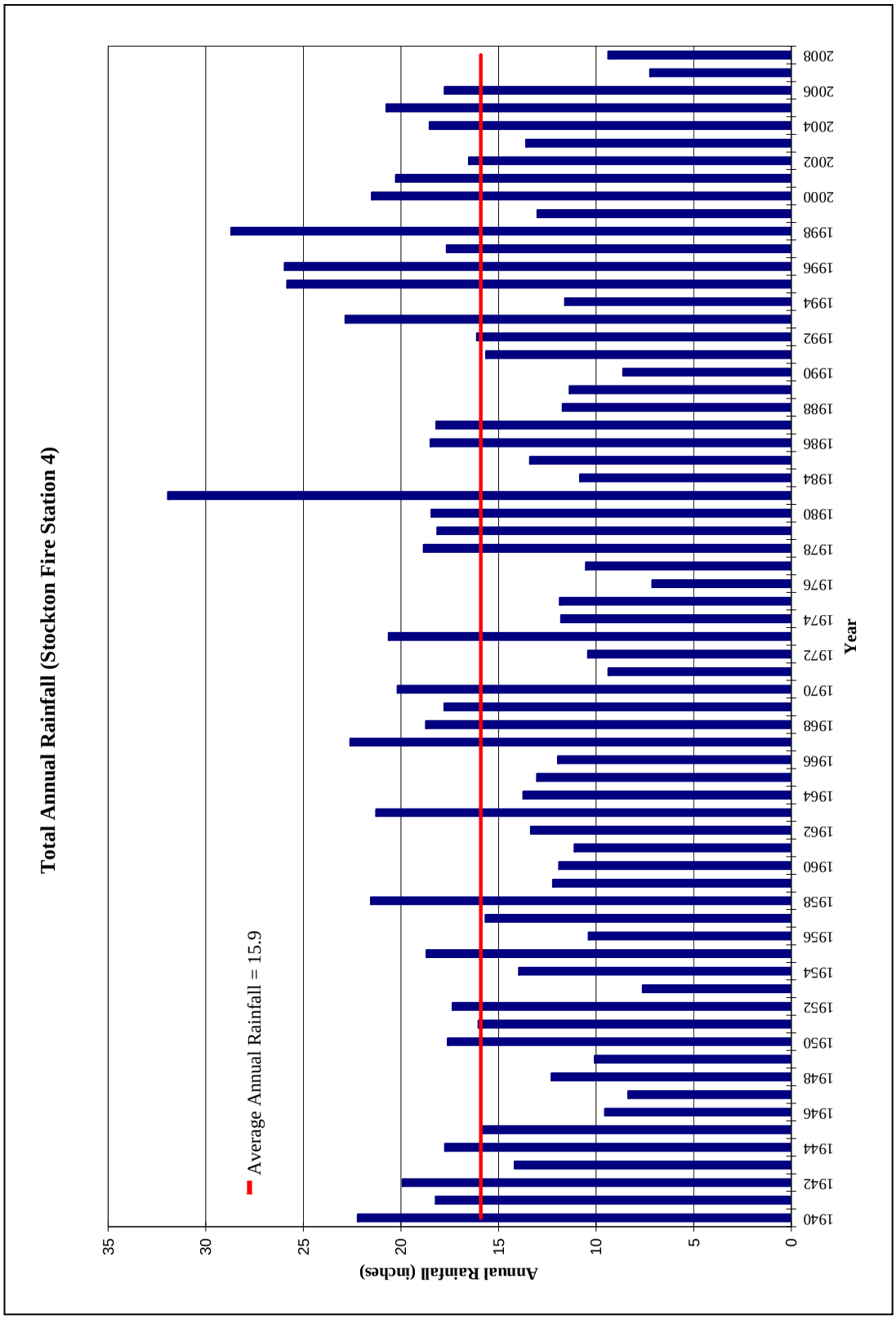

Figure 1-1: Total Annual Rainfall (Stockton Fire Station 4)

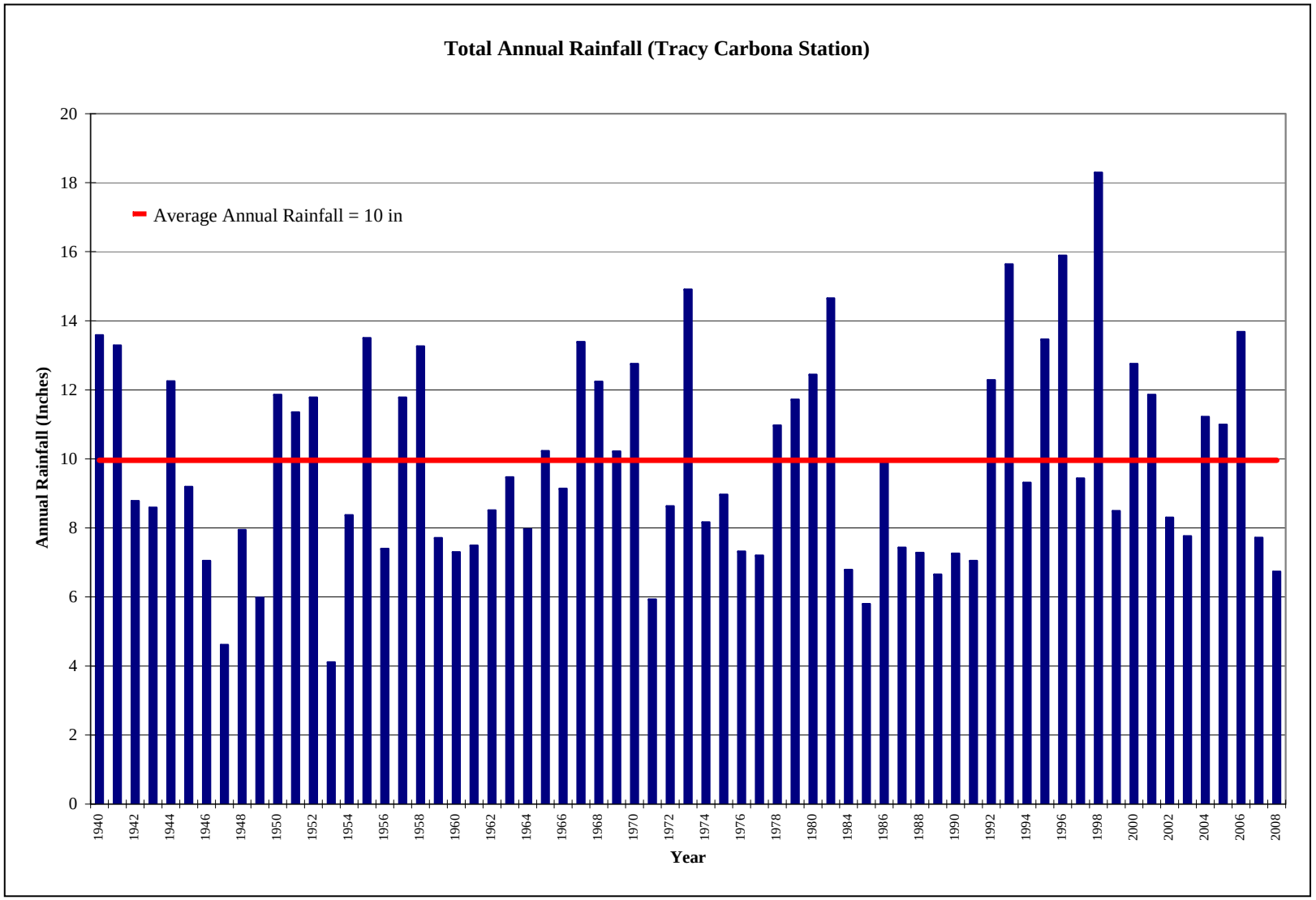

Figure 1-2: Total Annual Rainfall (Tracy Carbona Station)

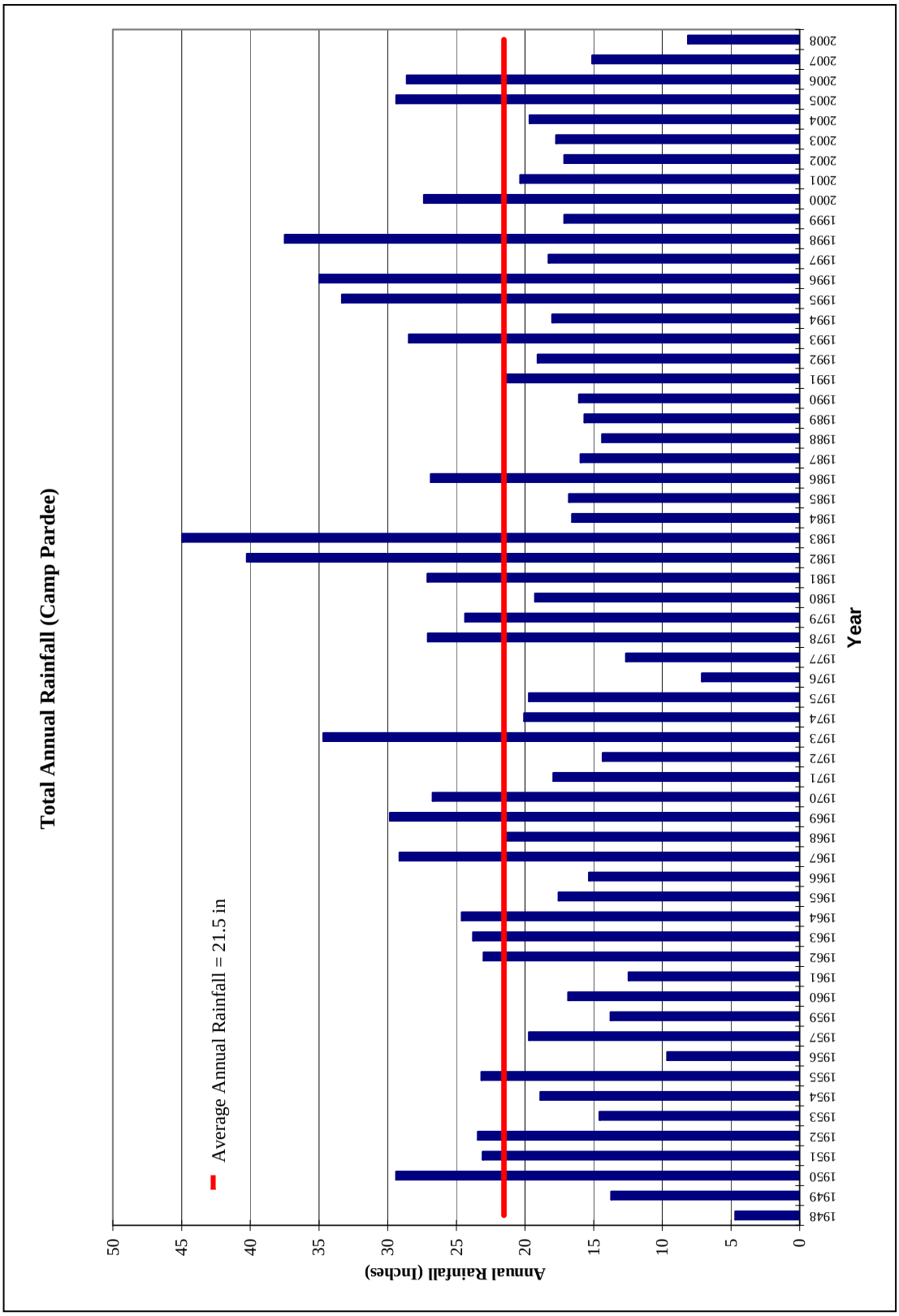

Figure 1-3: Total Annual Rainfall (Camp Pardee)

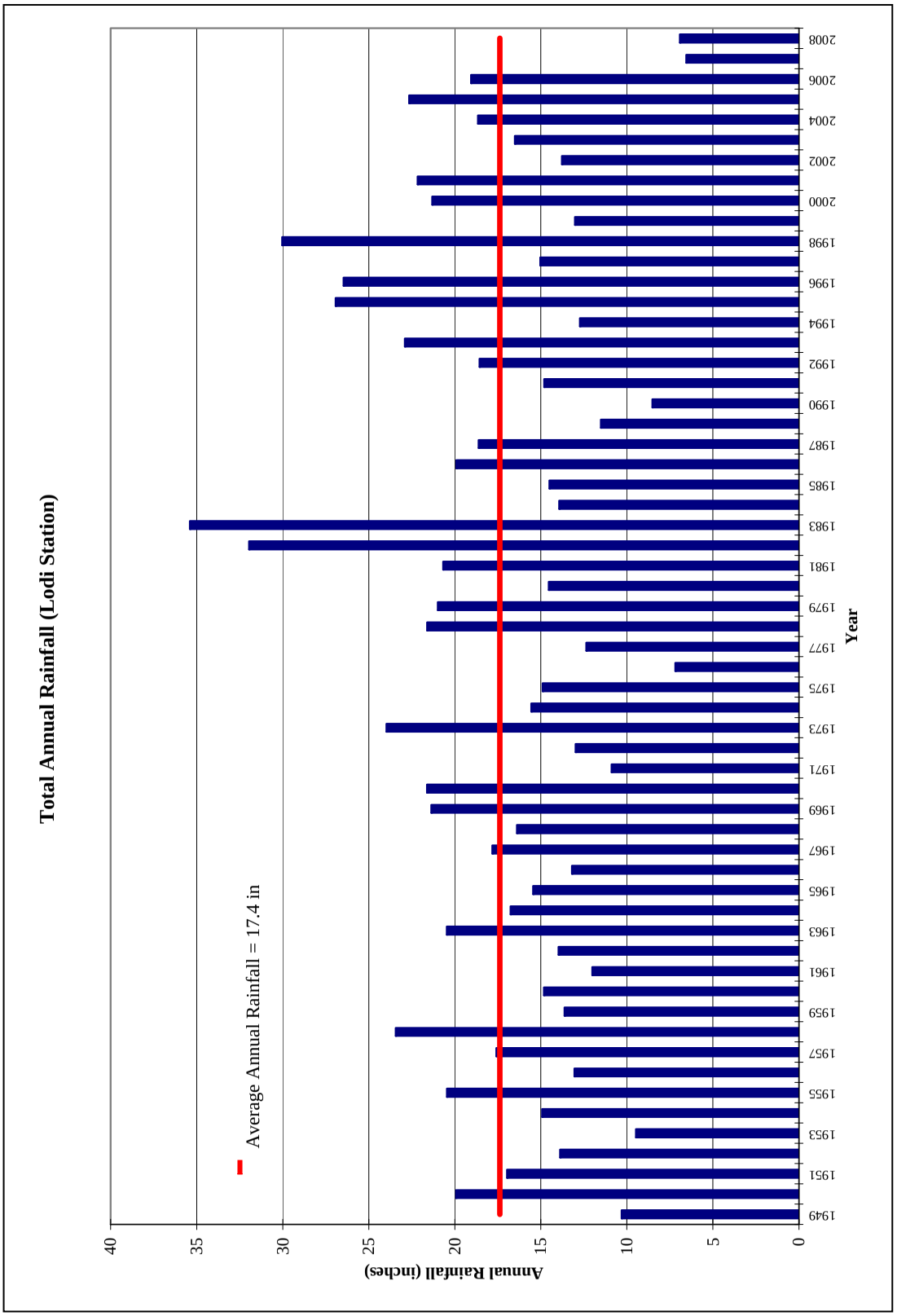

Figure 1-4: Total Annual Rainfall (Lodi Station)

Monthly Rainfall Distribution

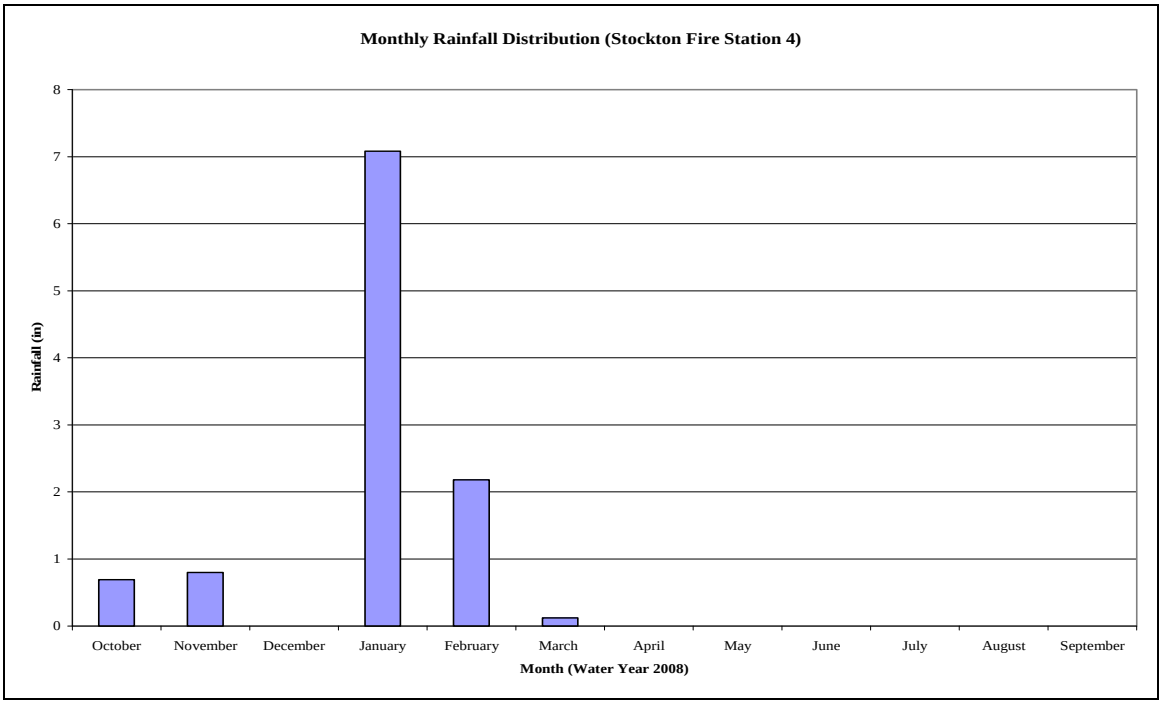

Figure 1-5: Monthly Rainfall Distribution (Stockton Fire Station 4)

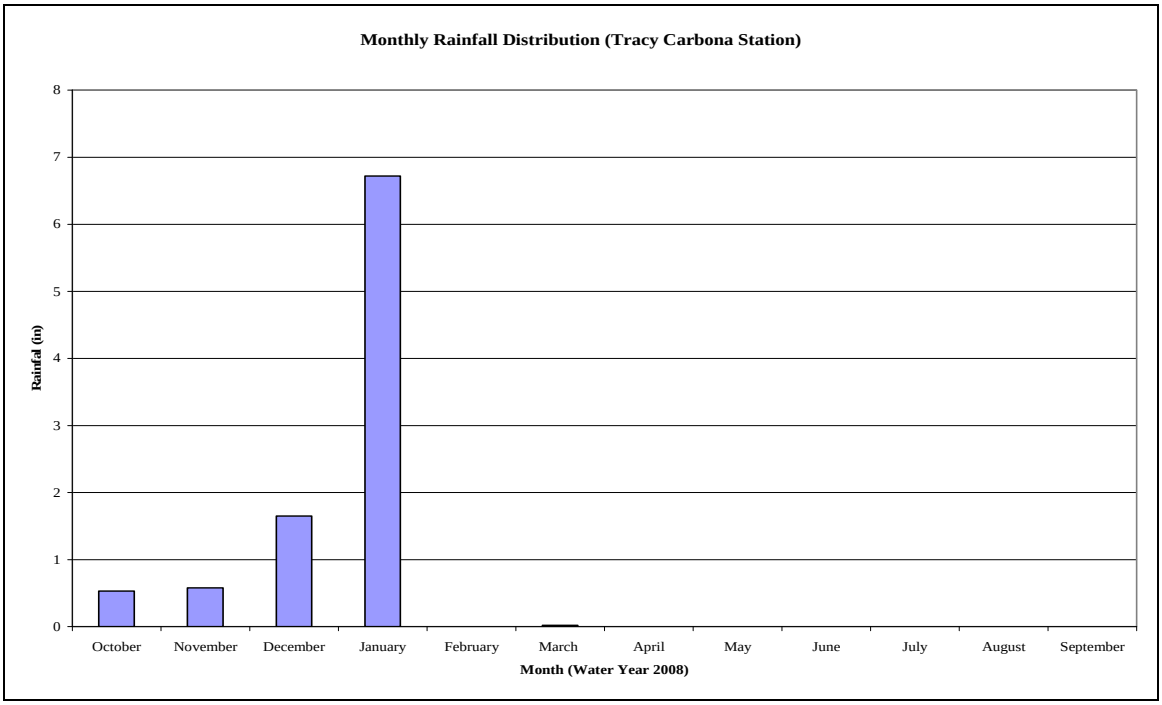

Figure 1-6: Monthly Rainfall Distribution (Tracy Carbona Station)

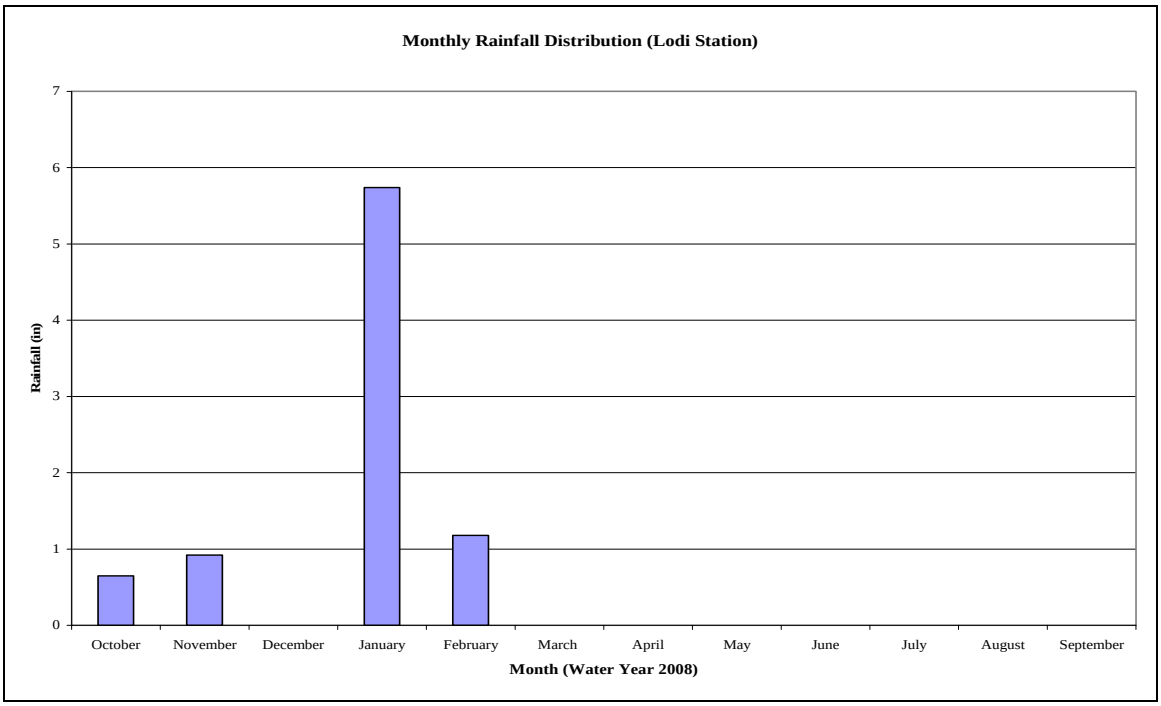

Figure 1-7: Monthly Rainfall Distribution (Lodi Station)

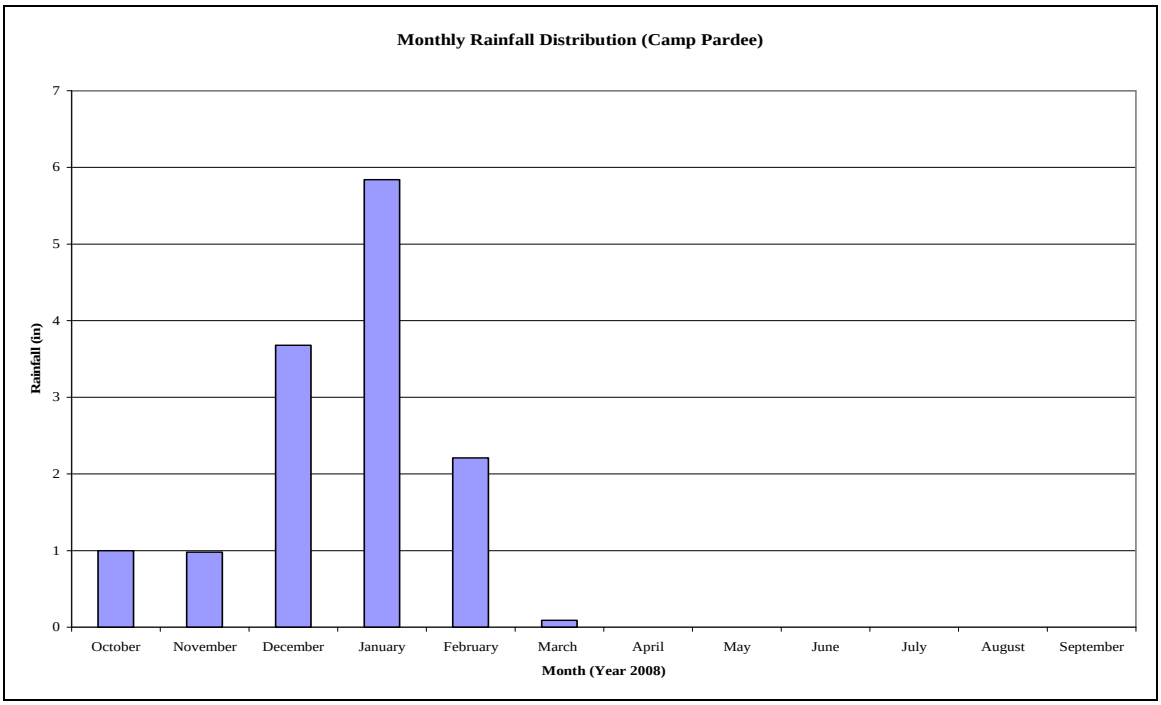

Figure 1-8: Monthly Rainfall Distribution (Camp Pardee)

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Section 2 – Groundwater Elevation Monitoring

Summary of Groundwater Elevations

The information contained in the Spring 2008 Groundwater Report is summarized as follows:

GROUNDWATER LEVELS

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

Oakdale Irrigation District (OID) – Four wells were measured in the OID area. Three wells show a decrease in groundwater levels. One well increased in groundwater level by two feet.

South San Joaquin Irrigation District (SSJID) – Fifteen wells were measured in the SSJID area. Eight wells show decreases in groundwater levels. Six wells show increases in groundwater levels.

Central San Joaquin Water Conservation District (CSJWCD) – Forty-eight wells were measured in CSJWCD. Thirty-seven show decreases in groundwater levels. Ten wells show an increase in groundwater levels. One well's groundwater level remained constant.

North San Joaquin Water Conservation District (NSJWCD) – Thirty-six wells were measured in NSJWCD. Twenty-two wells decreased in groundwater levels. Thirteen wells increased in groundwater levels. One well experienced no change in groundwater level.

Stockton East Water District (SEWD) – Seventy-five wells were measured in SEWD. Fifty-two wells decreased in groundwater levels. Twenty-three wells show increases in groundwater levels.

Woodbridge Irrigation District (WID) – Twenty seven wells were measured in the WID. Twelve wells decreased in groundwater levels. Fourteen wells show increases in groundwater levels.

Miscellaneous County Areas – Twenty-eight wells measured across the County in areas that are not a part of any major irrigation district. Fourteen wells descended in groundwater levels. Thirteen wells increased in groundwater levels. One well's groundwater level remained constant.

Table 2-1 Comparison of BCID Area Water Elevations

State Well ID	Spring 2007	Spring 2008	Change
02S06E31N001	53.5	53.0	-0.5
03S06E27N001	75.8	73.8	-2.0

Total Number of Wells	2
Number of Wells with Decrease	2
Number of Wells with Increase	0
Number of Wells with No Change	0

Table 2-2 Comparison of SSJID Area Water Elevations

State Well ID	Spring 2007	Spring 2008	Change
01S07E25E001	14.0	13.5	-0.5
01S07E26G001	14.5	13.0	-1.5
01S07E27K001	13.2	13.0	-0.2
01S09E29M002	38.1	36.5	-1.6
01S09E34A001	61.5	61.0	-0.5
02S07E07D002	7.9	11.0	3.1
02S07E11N002	33.3	34.0	0.7
02S07E19H001	20.0	21.0	1.0
02S07E26B001	31.0	30.0	-1.0
02S08E04M001	24.5	32.5	8.0
02S08E06J001	26.4	25.5	-0.9
02S08E07R001	35.0	48.0	13.0
02S08E08A001	31.5	31.5	0.0
02S08E08E001	30.2	29.2	-1.0
02S09E03K001	64.5	70.5	6.0

Total Number of Wells	15
Number of Wells with Decrease	8
Number of Wells with Increase	6
Number of Wells with No Change	1

Table 2-3: Comparison of CSJWCD Area Water Elevations

State Well ID	Spring 2007	Spring 2008	Change
01N07E11L001	-31.0	-32.0	-1.0
01N07E11M001	-35.5	-31.2	4.3
01N07E13J002	-47.5	-44.5	3.0
01N07E14J002	-37.6	-38.6	-1.0
01N07E15M002	-34.5	-32.0	2.5
01N07E24A001	-45.1	-37.6	7.5
01N07E24R001	-44.0	-49.5	-5.5
01N07E26H003	-28.0	-30.0	-2.0
01N08E07M001	-54.6	-49.6	5.0
01N08E11L001	-29.2	-33.0	-3.8
01N08E13J001	-15.2	-16.7	-1.5
01N08E16G001	-28.3	-30.2	-1.9
01N08E16H002	-26.6	-28.5	-1.9
01N08E18A002	-46.0	-30.5	15.5
01N08E22J001	-25.5	-26.0	-0.5
01N08E26A002	-13.3	-13.3	0.0
01N08E27R002	-17.5	-19.5	-2.0
01N08E35F001	-23.4	-21.9	1.5
01N08E36F001	-6.3	-8.0	-1.7
01N09E01C001	15.7	16.3	0.6
01N09E05J001	-6.5	-7.0	-0.5
01N09E06N001	-21.9	-22.0	-0.1
01N09E13D001	20.1	21.0	0.9
01N09E15B002	4.6	4.5	-0.1
01N09E17D001	-11.7	-23.5	-11.8
01N09E17M001	-10.8	-21.5	-10.7
01N09E19C001	-11.0	-18.0	-7.0
01N09E29R001	-16.5	1.0	17.5
01N09E30C005	-3.2	-11.7	-8.5
01N09E31J001	5.6	4.1	-1.6
01S07E01J001	-15.9	-19.1	-3.2
01S07E02J001	-25.0	-25.5	-0.5
01S07E12H001	-10.0	-13.0	-3.0
01S08E04R001	-12.7	-15.0	-2.3
01S08E06D001	-17.6	-20.1	-2.5
01S08E09Q001	-6.9	-9.9	-3.0
01S08E11F001	-2.9	-5.4	-2.5
01S08E12B001	4.9	0.8	-4.1
01S08E14B001	4.3	1.8	-2.5
01S08E15P001	0.7	-0.3	-1.0

State Well ID	Spring 2007	Spring 2008	Change
01S08E20B001	-0.2	-1.2	-1.0
01S08E23A001	8.5	5.5	-3.0
01S09E05H002	22.3	13.5	-8.8
01S09E07A001	10.4	8.7	-1.7
01S09E07N001	13.7	11.2	-2.5
01S09E09R001	24.3	16.8	-7.5
01S09E18R003	22.8	20.5	-2.3
01S09E19Q002	25.8	24.5	-1.3

Total Number of Wells	48
Number of Wells with Decrease	37
Number of Wells with Increase	10
Number of Wells with No Change	1

Table 2-4: Comparison of OID Area Water Elevations

State Well ID	Spring 2007	Spring 2008	Change
01S09E21J002	47.1	45.0	-2.1
01S09E23N001	57.6	55.5	-2.1
01S09E24R001	74.1	72.6	-1.5
01S09E28M002	41.7	43.7	2.0

Total Number of Wells	4
Number of Wells with Decrease	3
Number of Wells with Increase	1
Number of Wells with No Change	0

Table 2-5: Comparison of Miscellaneous County Areas Water Elevations

State Well ID	Spring 2007	Spring 2008	Change
01S05E31R002	-0.4	1.1	1.5
01S06E04J001	-1.5	0.0	1.5
01S06E14F001	2.4	0.4	-2.0
01S07E13J001	0.5	1.5	1.0
01S07E14M001	5.6	3.9	-1.7
01S07E14P003	4.7	-2.8	-7.5
01S07E15F002	3.4	4.4	1.0
01S08E19R001	3.3	8.3	5.0
01S08E29K001	12.0	11.5	-0.5
01S08E30C002	14.6	9.0	-5.6
01S09E02R001	39.9	39.8	-0.1
01S09E11J002	43.2	37.2	-6.0
02S05E08B001	-2.7	-4.7	-2.0
02S05E13N001	11.1	10.7	-0.4
02S06E10K001	3.4	4.0	0.6
02S06E25J001	14.6	15.5	0.9
02S06E26B001	7.4	7.5	0.1
02S06E27E001	8.5	9.0	0.5
02S07E31N001	12.5	12.5	0.0
03N06E15C004	-21.5	-16.8	4.7
03N06E29C001	-25.3	-23.3	2.0
03S05E04H001	58.0	57.5	-0.5
03S06E03F002	16.0	13.5	-2.5
03S06E23C001	17.8	23.3	5.5
04N05E03D003	-2.6	-3.7	-1.1
04N05E16N001	-7.5	-6.5	1.0
04N06E34J002	17.6	15.4	-2.2
05N05E28L003	-2.1	-3.5	-1.4

Total Number of Wells	28
Number of Wells with Decrease	14
Number of Wells with Increase	13
Number of Wells with No Change	1

Table 2-6: Comparison of NSJWCD Area Water Elevations

State Well ID	Spring 2007	Spring 2008	Change
03N07E03R001	-27.3	-12.8	14.5
03N07E08E002	-13.3	-17.0	-3.7
03N07E09C001	-13.2	-15.7	-2.5
03N07E15C004	-21.5	-25.5	-4.0
03N07E17D004	-17.5	-19.9	-2.4
03N07E17K002	-23.4	-26.5	-3.1
03N07E18D012	-19.2	-22.5	-3.3
03N07E19J004	-43.5	-35.0	8.5
03N07E23C002	-29.5	-31.0	-1.5
03N07E25G001	-33.4	-38.3	-4.9
03N08E19C001	-49.3	-36.3	13.0
03N08E22A001	-35.4	-36.5	-1.1
04N06E12C004	-17.7	-13.5	4.2
04N06E23K00	-2.0	-3.5	-1.5
04N06E24F001	-5.0	-9.5	-4.5
04N06E25R001	-4.0	-0.5	3.5
04N06E27D002	19.0	16.2	-2.8
04N07E12E001	-36.0	-26.0	10.0
04N07E17N001	-35.8	-27.8	8.0
04N07E19K001	-18.6	-13.6	5.0
04N07E21F001	-13.5	-15.8	-2.3
04N07E27C002	-23.0	-23.0	0.0
04N07E28J002	-16.7	-16.2	0.5
04N07E33H001	27.5	26.0	-1.5
04N07E36L001	-13.1	-15.5	-2.4
04N08E06N002	-25.2	-26.7	-1.5
04N08E14K001	-12.8	2.9	15.7
04N08E17A001	-26.3	-14.3	12.0
04N08E17J001	-16.6	-18.0	-1.4
04N08E21M001	-19.6	-22.1	-2.5
04N08E32N001	-25.8	-26.1	-0.3
05N06E36R001	-16.6	-23.3	-6.7
05N07E31J001	-35.5	-27.0	8.5
05N07E34G001	-30.6	-32.1	-1.5
05N07E34Q001	-28.7	-30.4	-1.7
03N06E36N001	-58.4	-56.8	1.6

Total Number of Wells	36
Number of Wells with Decrease	22
Number of Wells with Increase	13
Number of Wells with No Change	1

Table 2-7: Comparison of SEWD Area Water Elevations

State Well ID	Spring 2007	Spring 2008	Change
01N06E05M004	-6.5	-5.5	1.0
01N06E27R002	-7.2	-0.2	7.0
01N07E01A002	-35.5	-39.0	-3.5
01N07E03M001	11.0	8.0	-3.0
01N07E04R001	-9.2	-18.0	-8.8
01N07E09E004	-25.0	-31.0	-6.0
01N07E09Q003	-28.0	-36.0	-8.0
01N07E10D001	-17.0	-29.0	-12.0
01N07E10G001	-27.2	-31.5	-4.3
01N08E03P001	-37.5	-42.0	-4.5
01N08E04E001	-41.5	-34.0	7.5
01S06E01C002	-7.2	-6.0	1.2
01S06E10G001	-4.3	-3.3	1.0
01S07E06M002	-6.1	-7.0	-0.9
01S07E08J002	-1.5	-5.0	-3.5
02N06E24F001	-28.5	-30.5	-2.0
02N07E03D001	-35.0	-49.5	-14.5
02N07E08D001	-51.2	-49.2	2.0
02N07E08K003	-40.9	-44.5	-3.6
02N07E11F001	-50.0	-44.0	6.0
02N07E15C001	-49.8	-47.3	2.5
02N07E16F002	-41.4	-43.9	-2.5
02N07E16L001	-41.8	-45.8	-4.0
02N07E20N002	-32.0	-34.5	-2.5
02N07E21A002	-44.2	-47.3	-3.1
02N07E21N001	-38.0	-43.0	-5.0
02N07E23B001	-45.0	-48.0	-3.0
02N07E24B001	-42.6	-42.1	0.5
02N07E24Q001	-44.3	-47.0	-2.7
02N07E26N001	-39.2	-43.2	-4.0
02N07E28K002	-42.0	-45.0	-3.0
02N07E28N004	-32.3	-36.0	-3.7
02N07E29M002	-30.2	-34.0	-3.8
02N07E30E001	-27.3	-35.5	-8.2
02N07E30H001	-30.7	-35.0	-4.3
02N07E31M001	-20.8	-23.3	-2.5
02N07E32J002	-22.0	-28.0	-6.0
02N07E32M002	-22.0	-28.0	-6.0

State Well ID	Spring 2007	Spring 2008	Change
02N07E32R001	-22.1	-27.6	-5.5
02N07E33L001	-24.0	-30.0	-6.0
02N07E34R001	-21.3	-27.5	-6.2
02N07E35L001	-38.0	-43.0	-5.0
02N07E36H001	-42.5	-46.5	-4.0
02N08E03G002	-35.3	-36.7	-1.4
02N08E04C001	-39.5	-39.0	0.5
02N08E05C001	-36.5	-50.5	-14.0
02N08E08N001	-49.5	-48.5	1.0
02N08E09G002	-39.0	-40.0	-1.0
02N08E10H002	-33.4	-35.6	-2.2
02N08E12C002	-22.2	-19.2	3.0
02N08E13K001	-41.6	-28.1	13.5
02N08E14C001	-41.5	-47.0	-5.5
02N08E15M002	-36.1	-37.7	-1.6
02N08E16D001	-32.1	-43.1	-11.0
02N08E18C001	-48.5	-60.7	-12.3
02N08E24J001	-65.1	-73.1	-8.0
02N08E24P001	-27.4	-30.4	-3.0
02N08E28H002	-56.6	-46.1	10.5
02N08E32L002	-38.4	-35.2	3.2
02N08E33E001	-45.6	-38.6	7.0
02N09E03A001	83.1	82.1	-1.0
02N09E04H001	57.3	57.1	-0.2
02N09E09D001	-13.8	-12.3	1.5
02N09E18Q001	-29.9	-30.1	-0.2
02N09E22D001	5.6	-5.4	-11.0
02N09E28N001	-14.6	-2.1	12.5
03N07E35C002	-34.5	-36.8	-2.3
03N07E35L001	-42.5	-36.5	6.0
03N07E36J001	-44.3	-33.3	11.0
03N08E27R001	-36.4	-37.0	-0.6
03N09E25R001	93.5	90.0	-3.5
03N09E36G001	79.2	85.2	6.0
02N06E03A003	-29.8	-27.3	2.5
02N06E06C002	-11.9	-12.0	-0.1
02N06E24J002	-37.5	-30.3	7.2

Total Number of Wells	75
Number of Wells with Decrease	52
Number of Wells with Increase	23
Number of Wells with No Change	0

Table 2-8: Comparison of WID Area Water Elevations

State Well ID	Spring 2007	Spring 2008	Change
03N05E13L001	-10.0	-8.0	2.0
03N05E14C001	-4.3	-3.8	0.5
03N06E05N003	-8.0	-8.5	-0.5
03N06E07H003	-9.0	-11.5	-2.5
03N06E10D001	-12.4	-7.4	5.0
03N06E17A004	-21.7	-18.7	3.0
03N06E18M003	-11.1	-12.6	-1.5
03N06E20D002	-12.5	-15.5	-3.0
03N06E26P002	-22.1	-20.7	1.4
03N06E27E001	-20.2	-24.2	-4.0
03N06E30R001	-19.0	-19.0	0.0
03N06E32R001	-23.0	-21.0	2.0
04N05E05H001	-3.3	-2.5	0.8
04N05E09D001	-7.3	-5.3	2.0
04N05E10K001	-3.6	-2.5	1.1
04N05E13H001	1.5	0.0	-1.5
04N05E13R004	1.6	-1.0	-2.6
04N05E14B002	1.9	4.1	2.3
04N05E14P001	-3.0	1.0	4.0
04N05E22H001	-6.0	-5.5	0.5
04N05E24J004	4.4	2.4	-2.0
04N05E26F001	1.2	-5.3	-6.5
04N05E36H003	2.6	0.5	-2.1
04N06E29N002	2.9	0.0	-2.9
04N06E30E001	4.7	2.7	-2.0
05N05E32M001	-5.2	-4.2	1.0
02S04E15R001	53.0	53.5	0.5

Total Number of Wells	27
Number of Wells with Decrease	12
Number of Wells with Increase	14
Number of Wells with No Change	1

HYDROGRAPHS

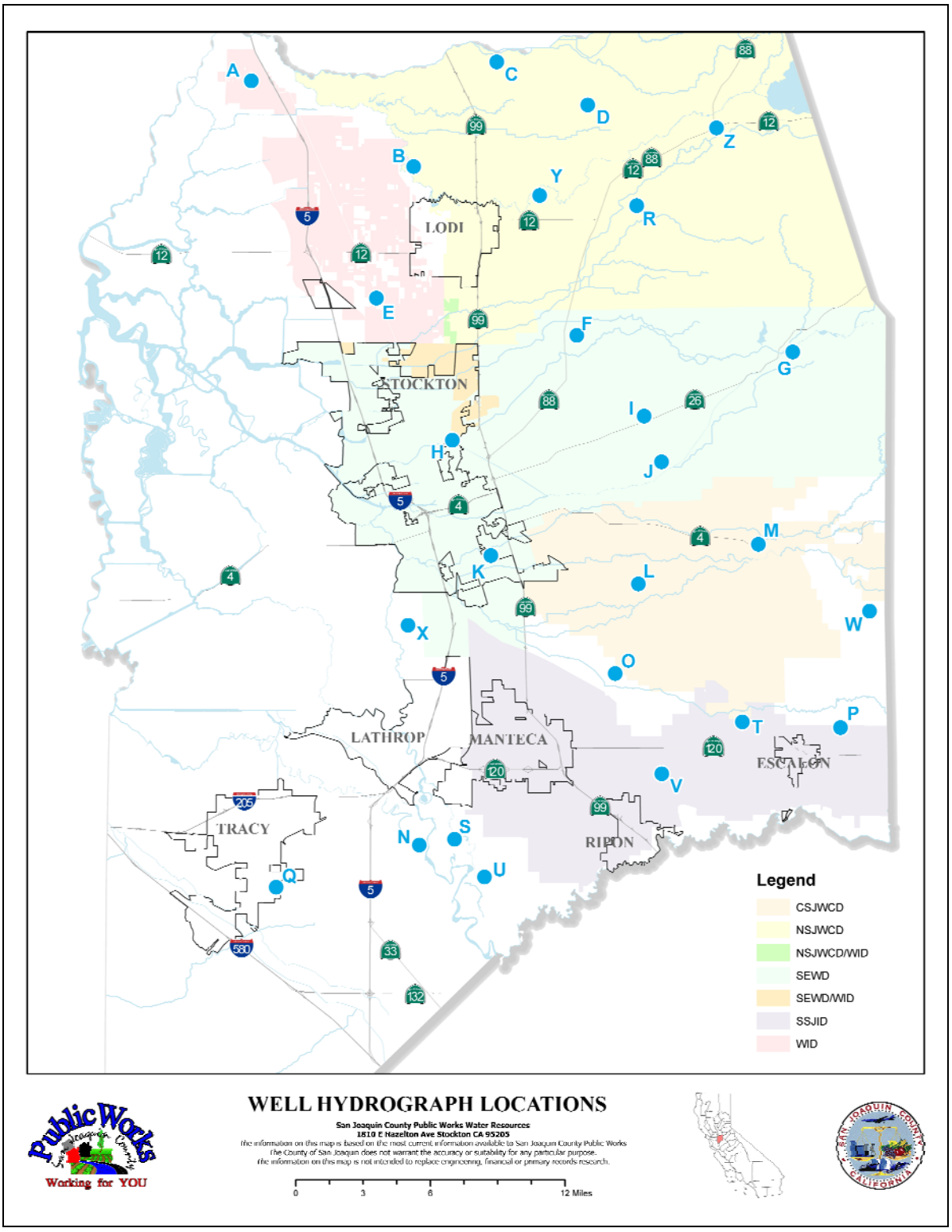


Figure 2-1: Well Hydrograph Locations

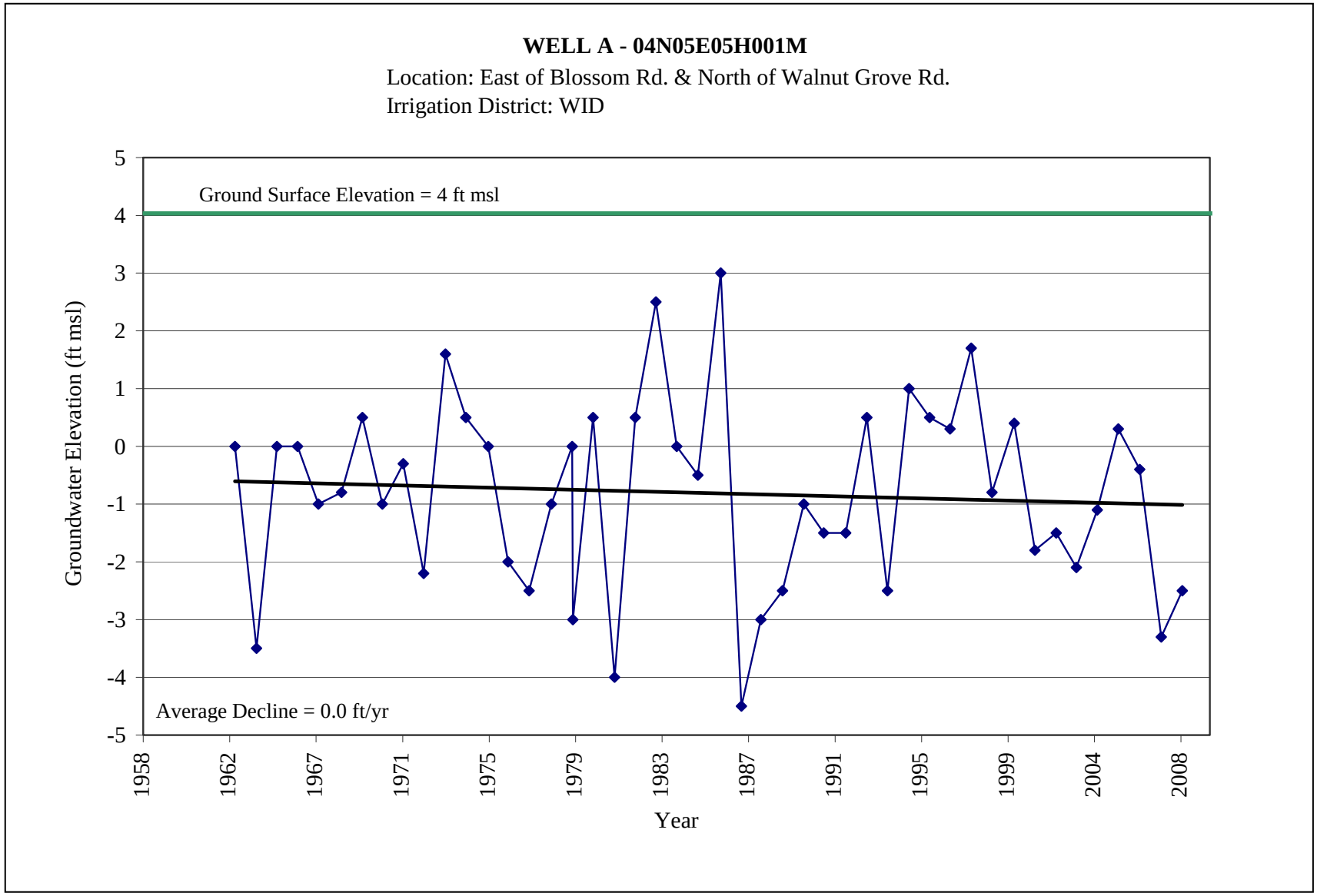


Figure 2-2: Spring Hydrograph Well A

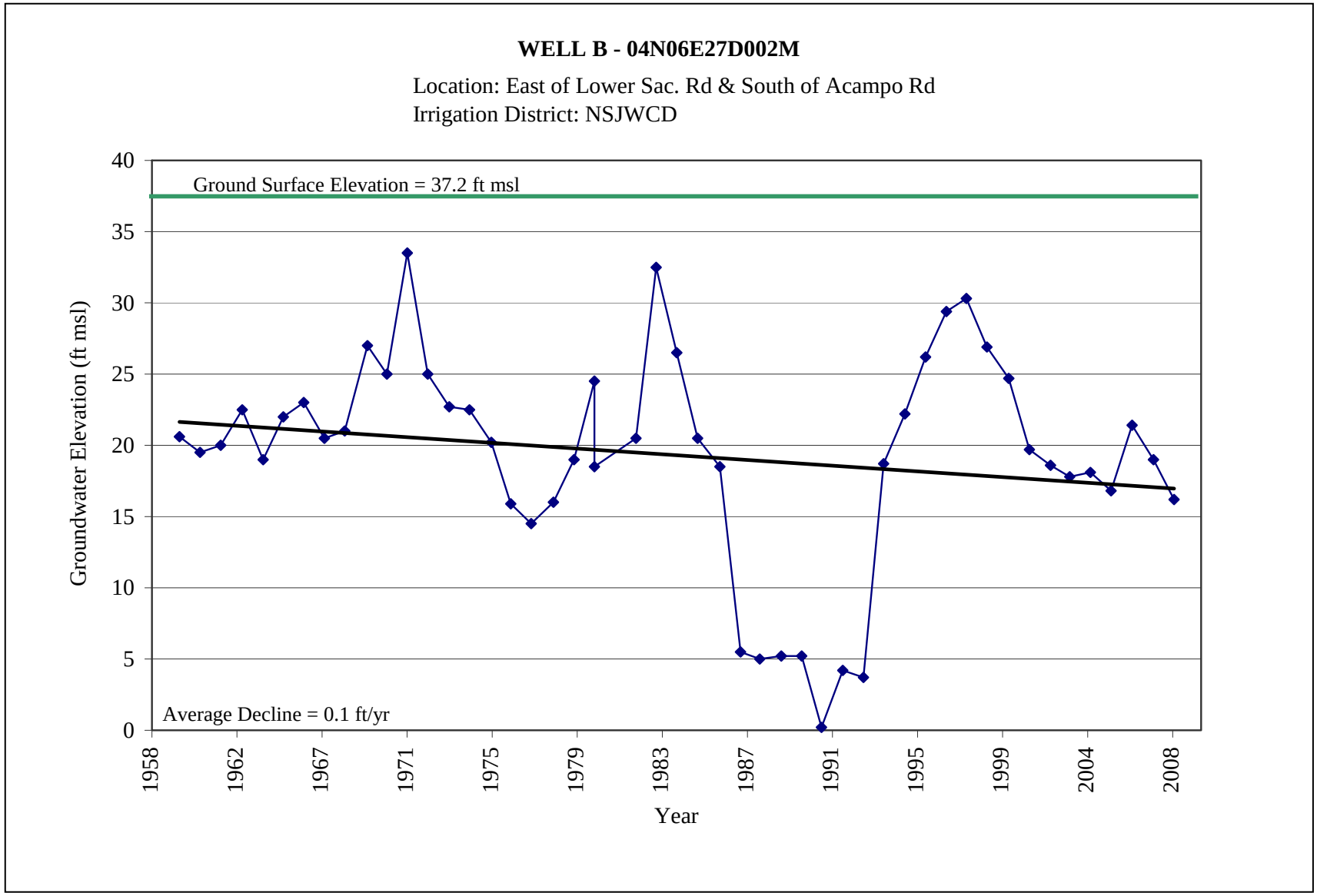


Figure 2-3: Spring Hydrograph Well B

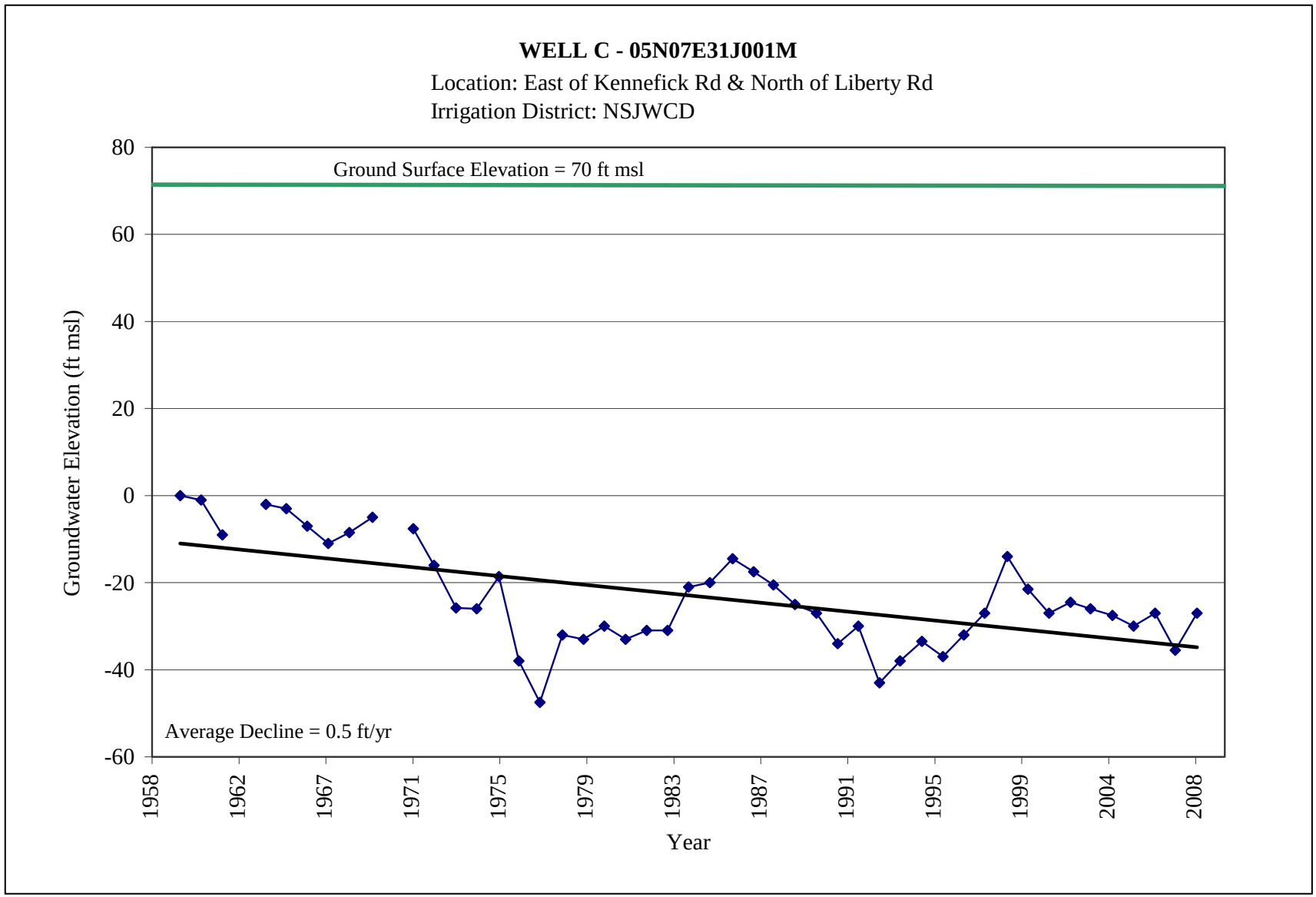


Figure 2-4: Spring Hydrograph Well C

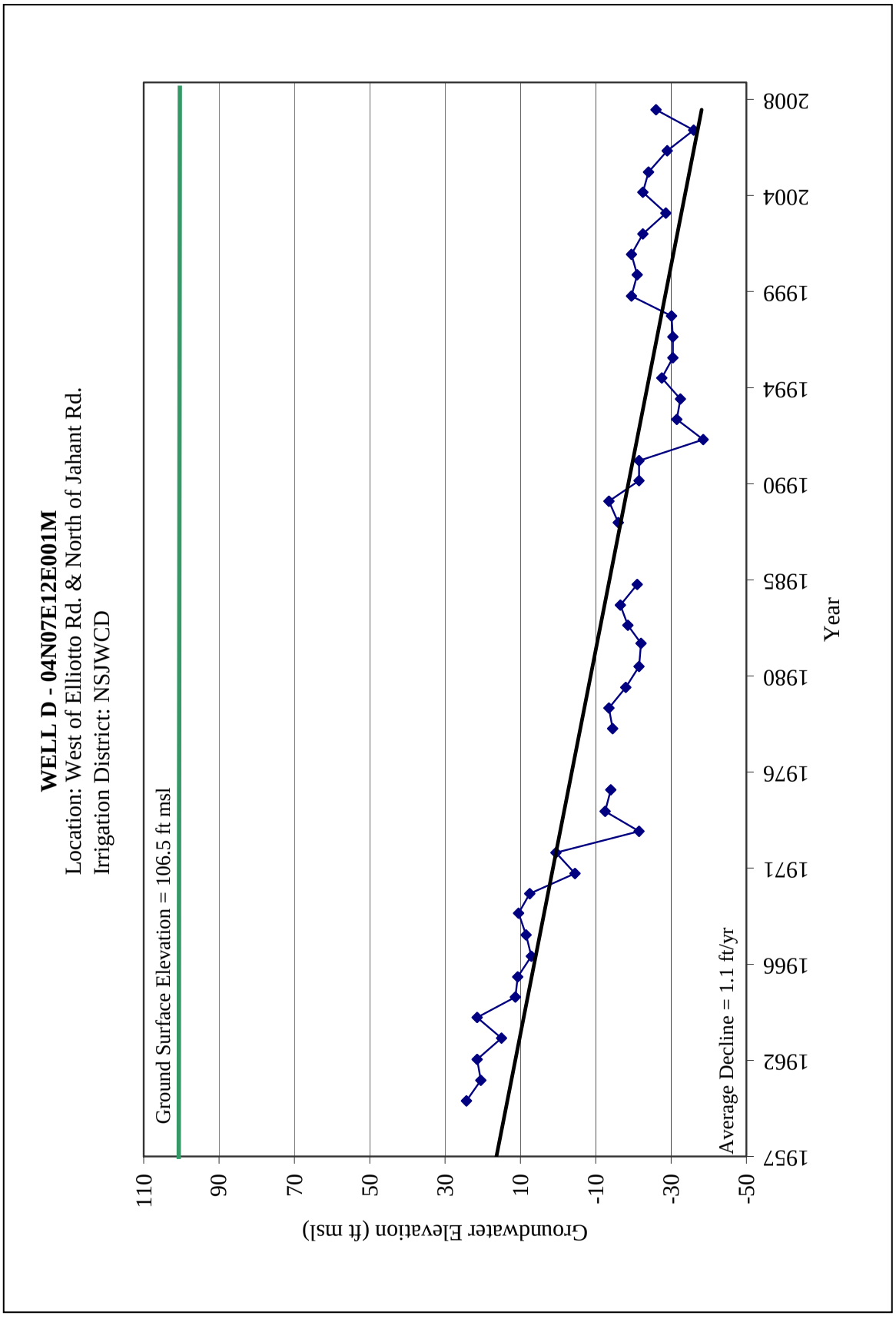


Figure 2-5: Spring Hydrograph Well D

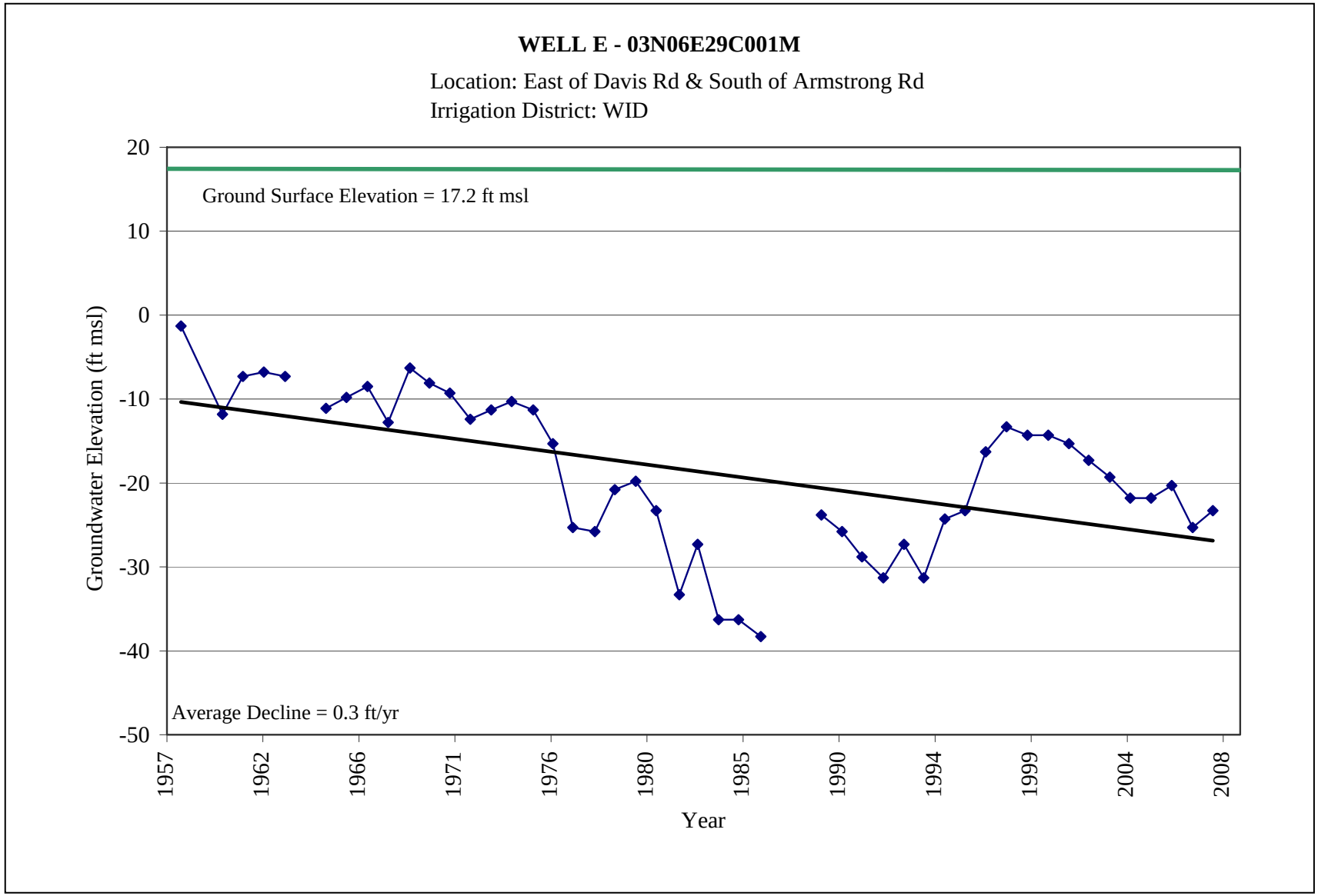


Figure 2-6: Spring Hydrograph Well E

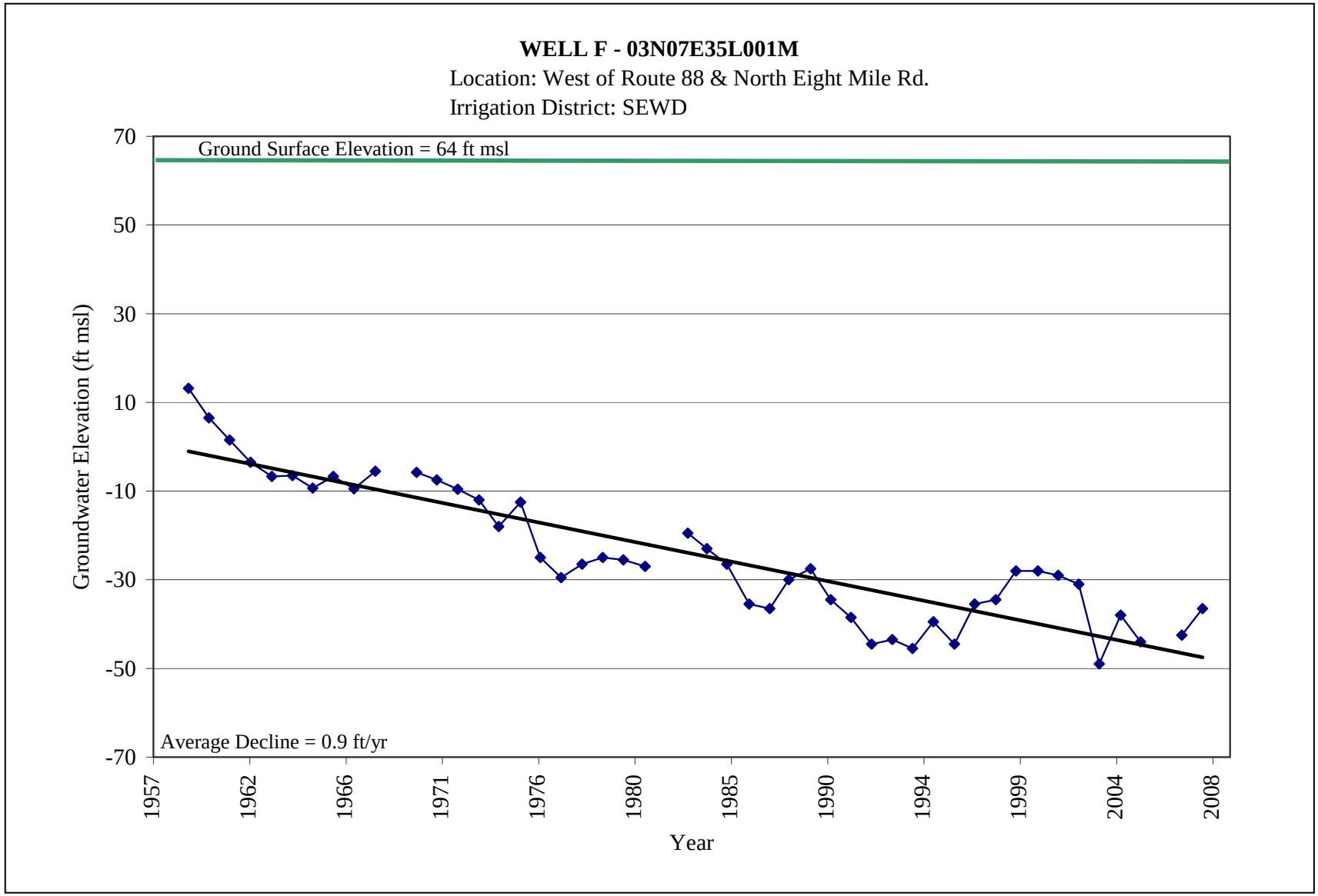


Figure 2-7: Spring Hydrograph Well F

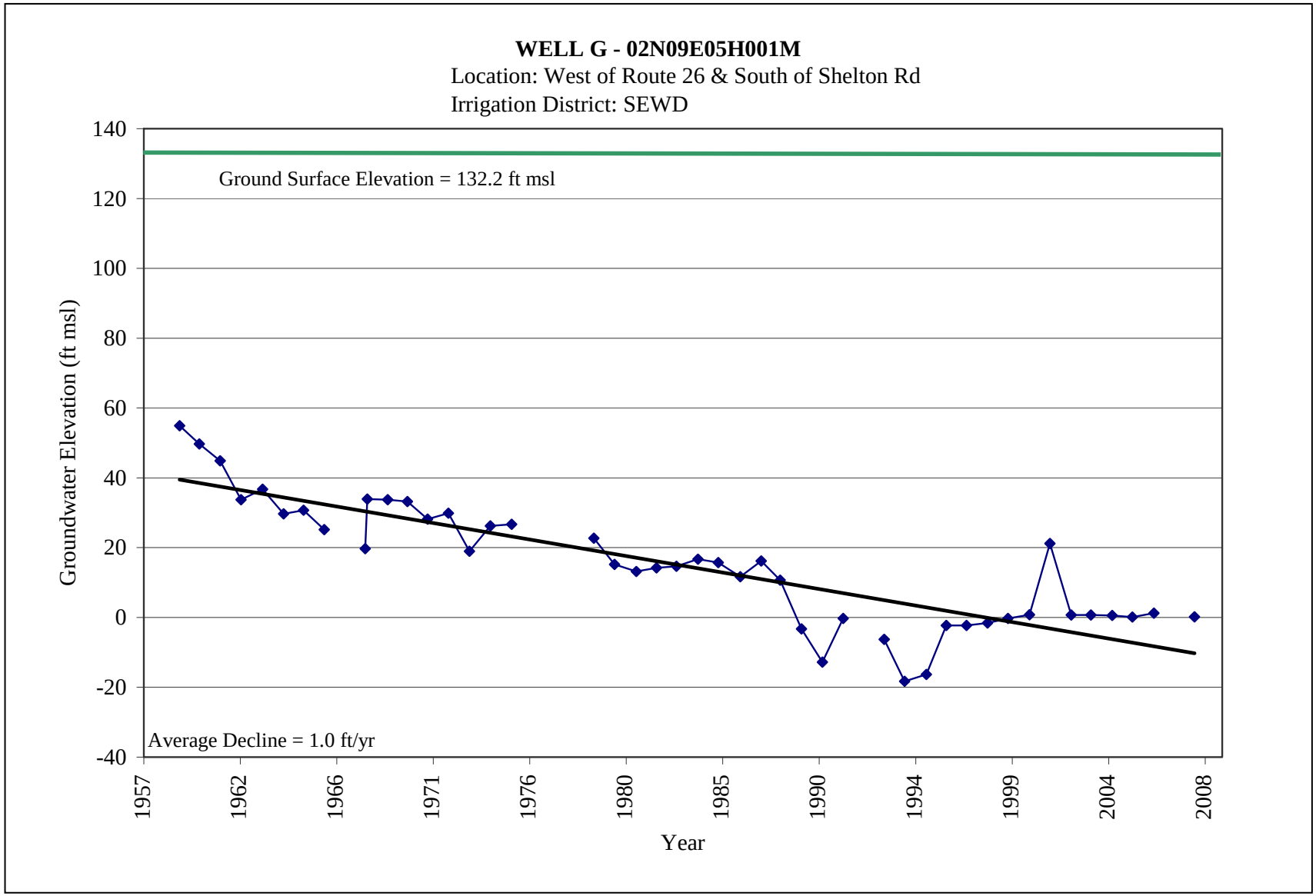


Figure 2-8: Spring Hydrograph Well G

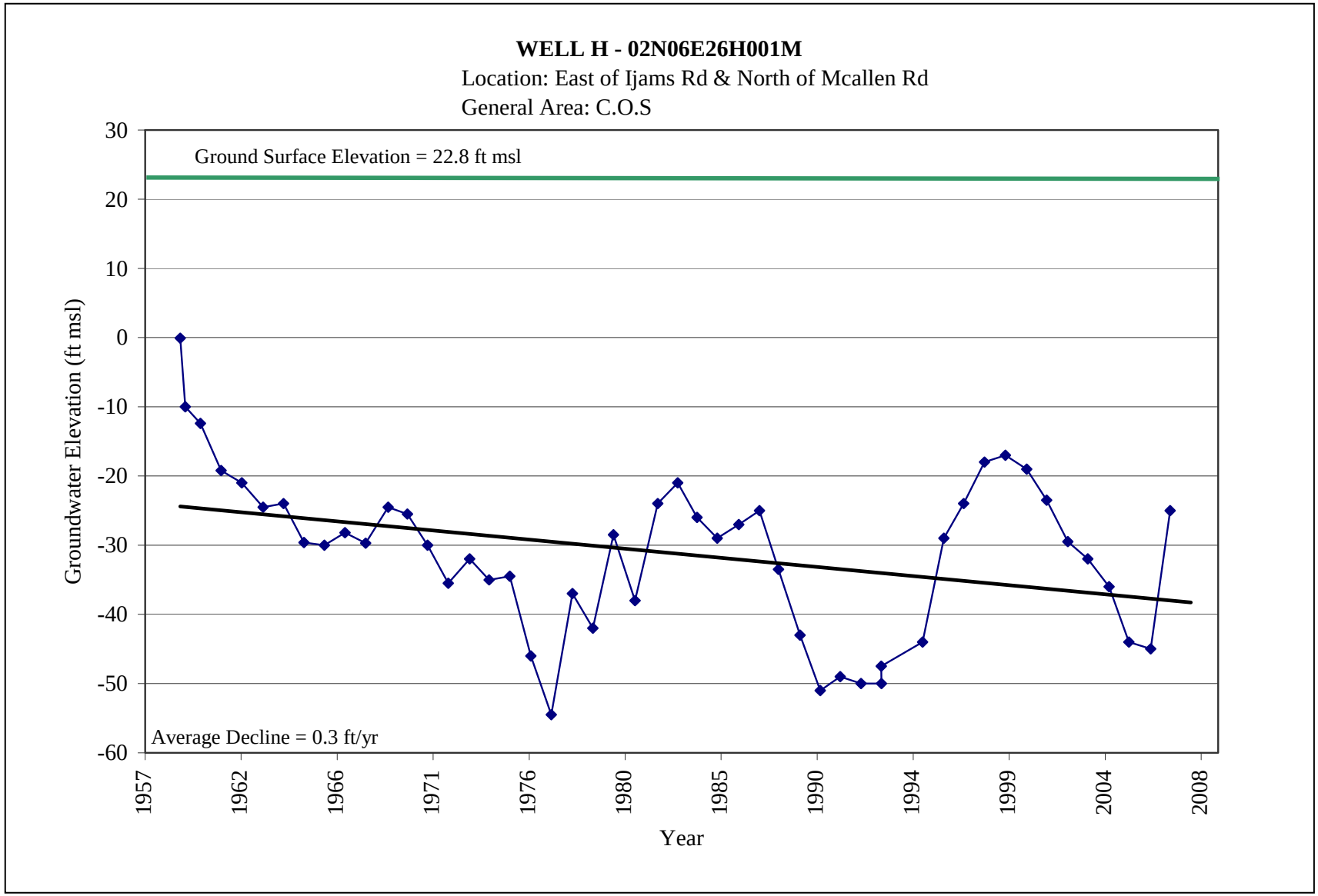


Figure 2-9: Spring Hydrograph Well H

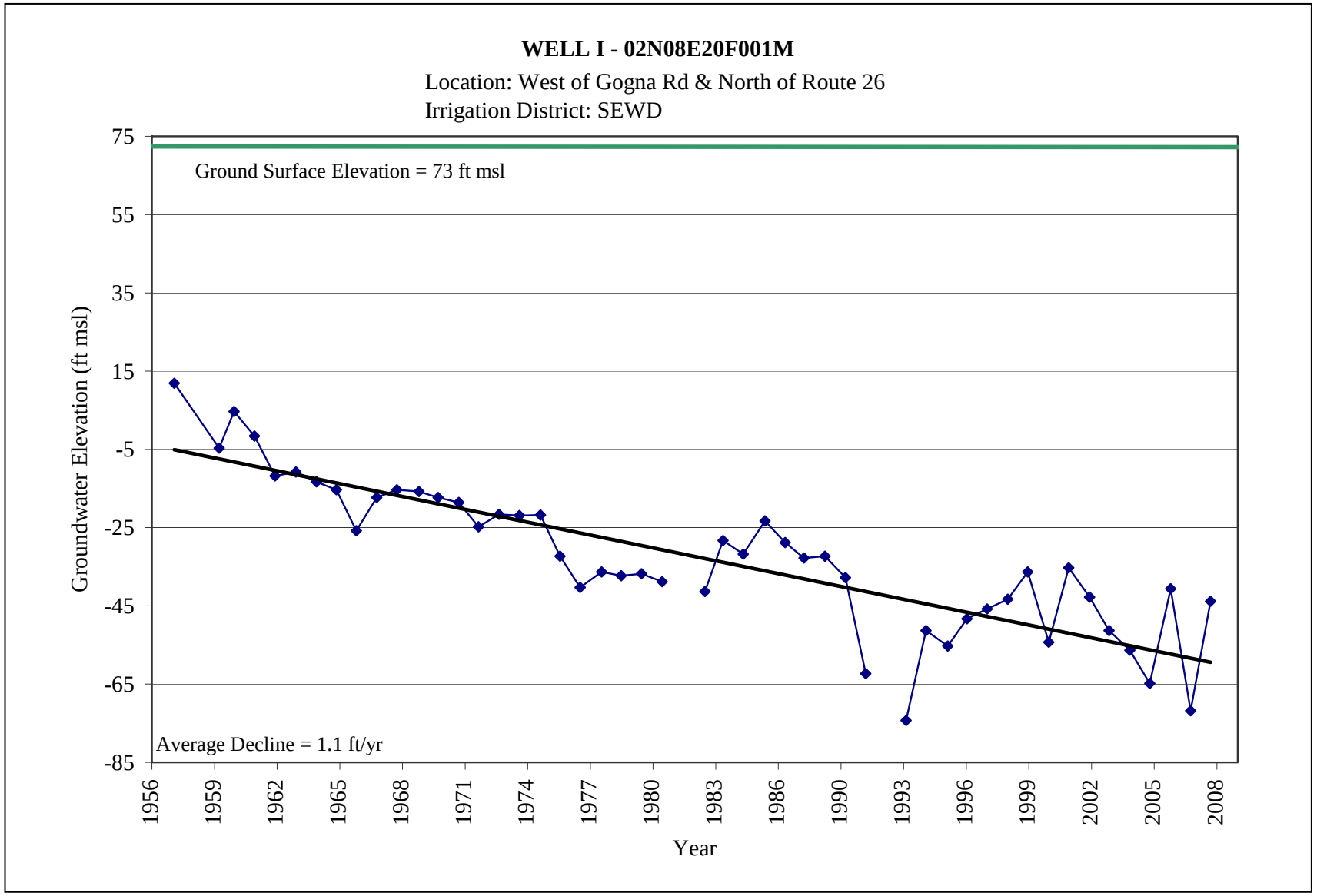


Figure 2-10: Spring Hydrograph Well I

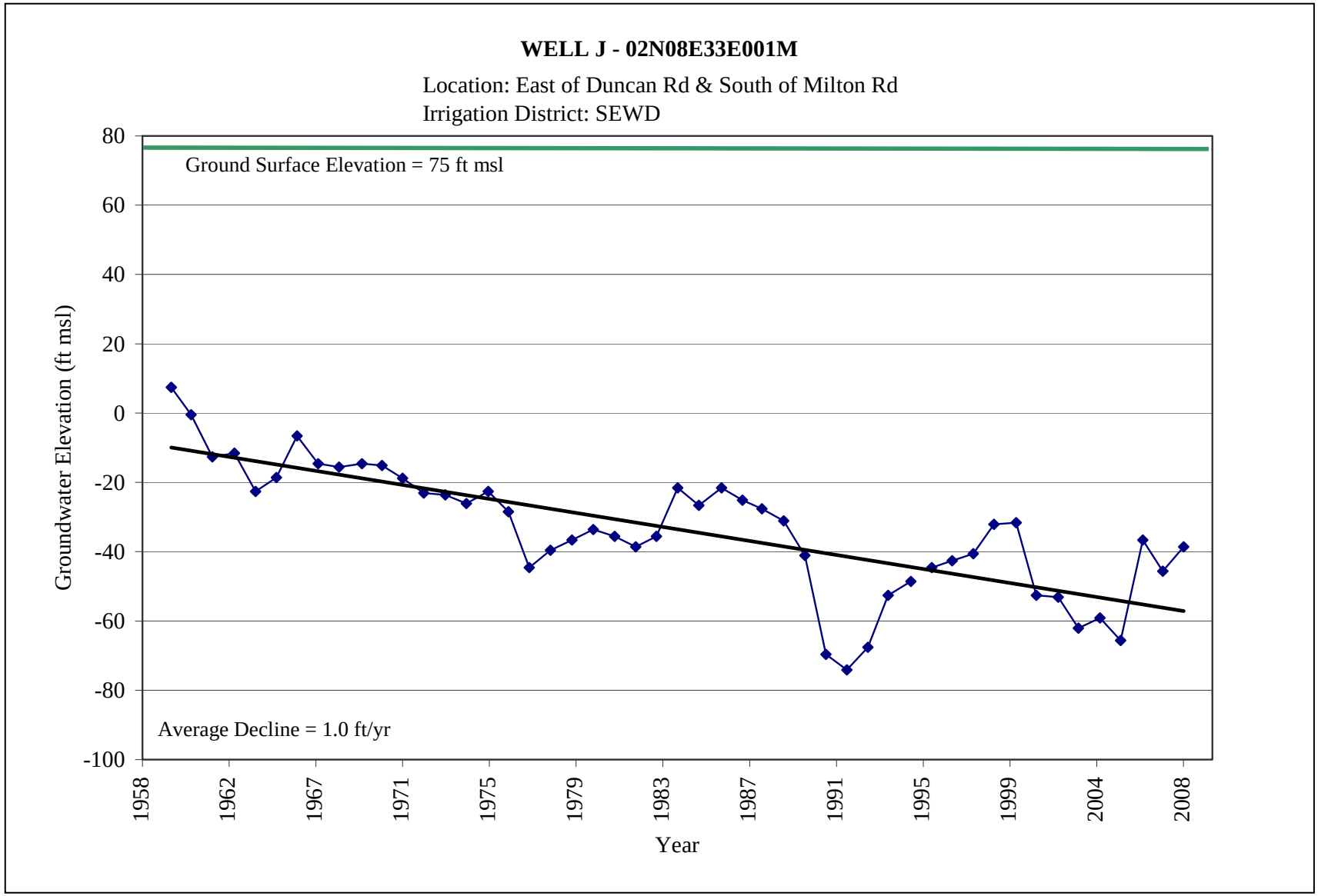


Figure 2-11: Spring Hydrograph Well J

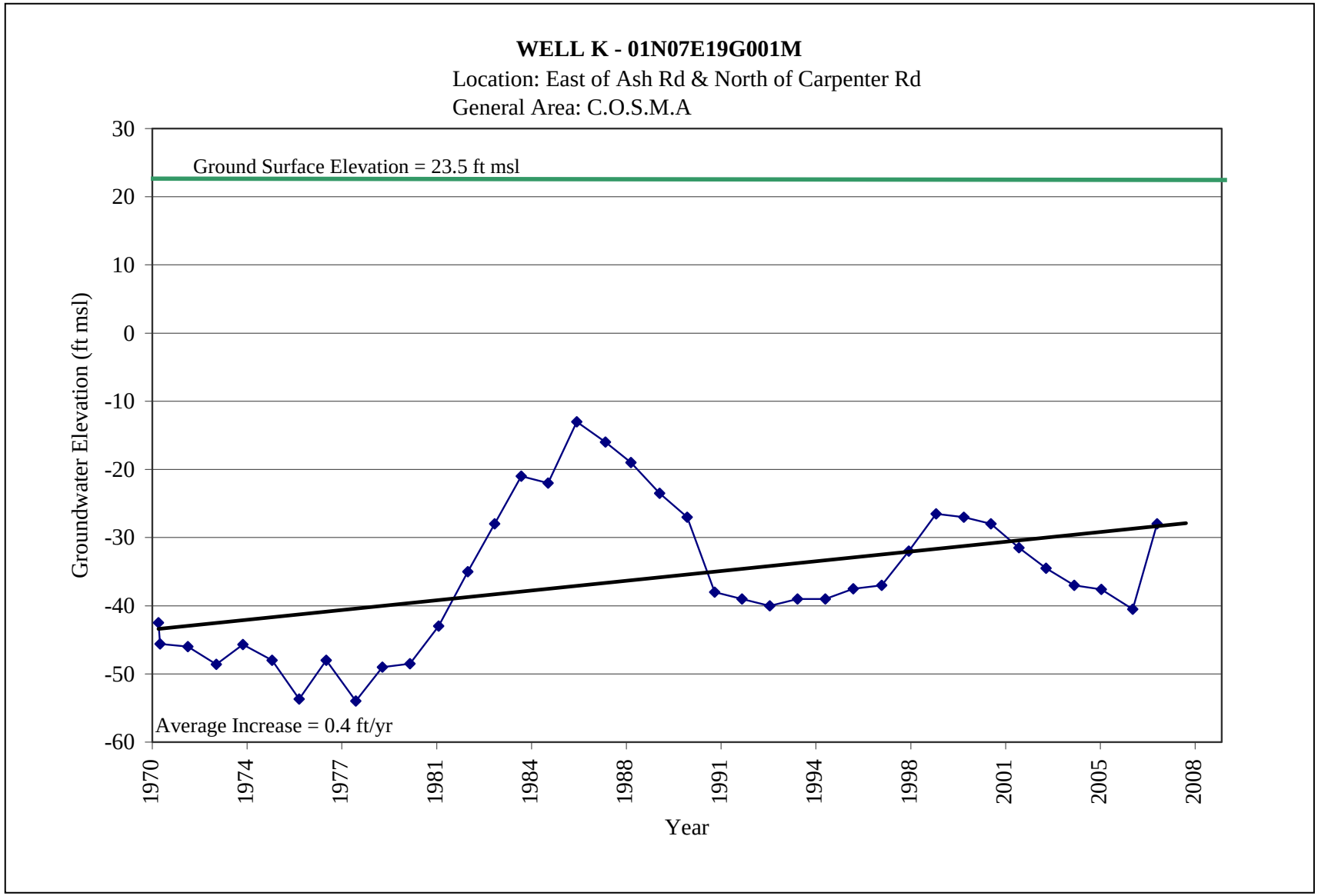


Figure 2-12: Spring Hydrograph Well K

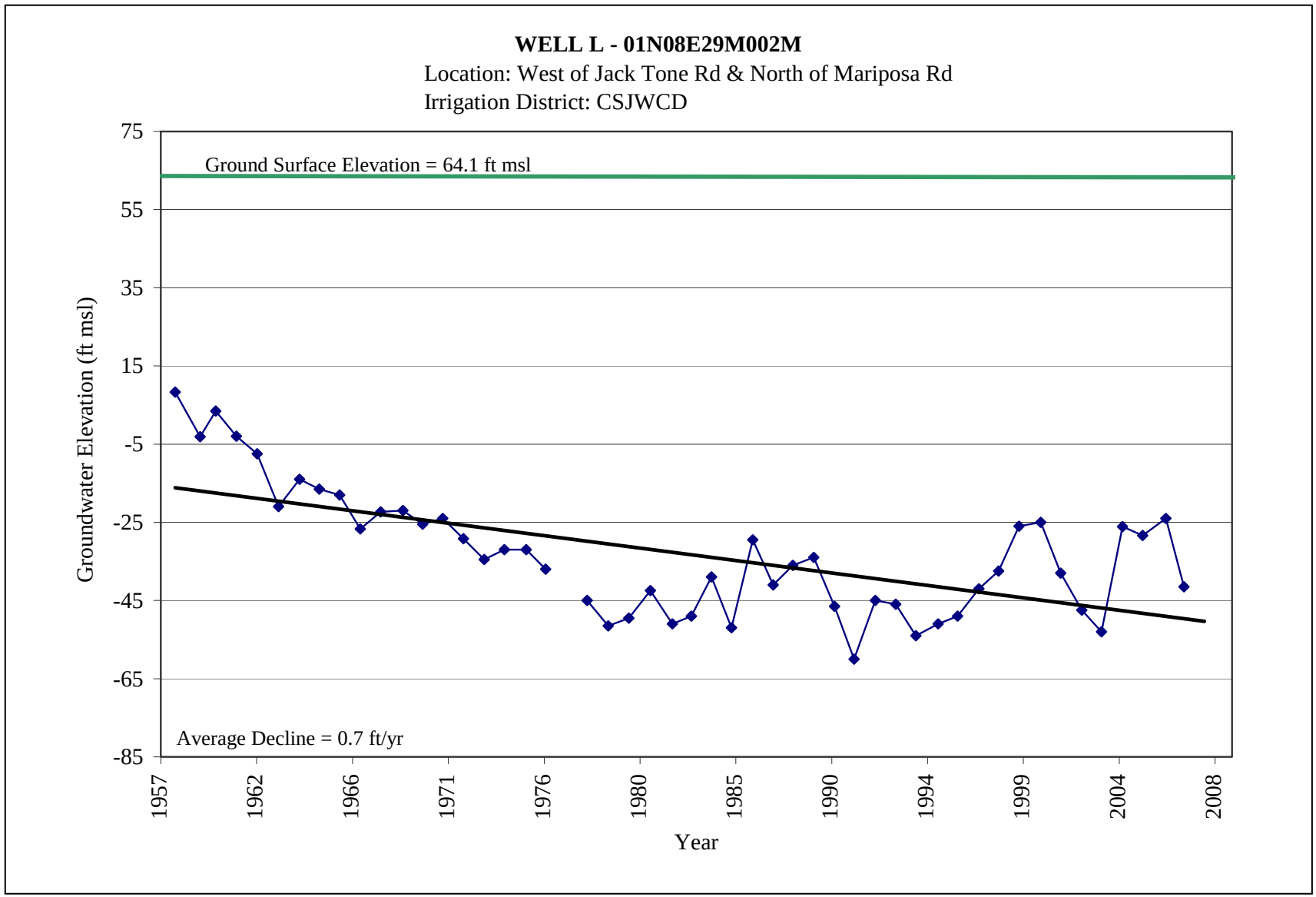


Figure 2-13: Spring Hydrograph Well L

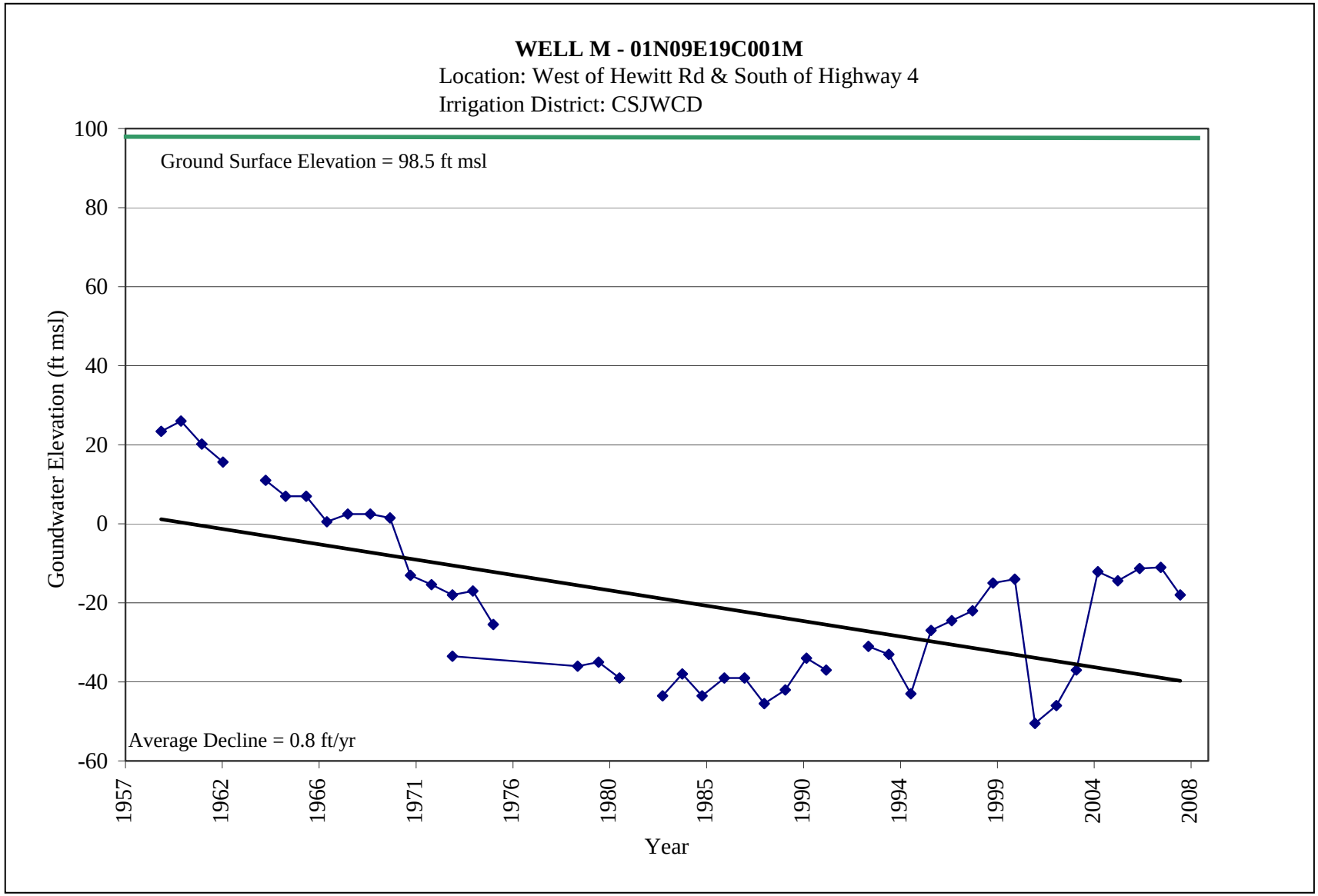


Figure 2-14: Spring Hydrograph Well M

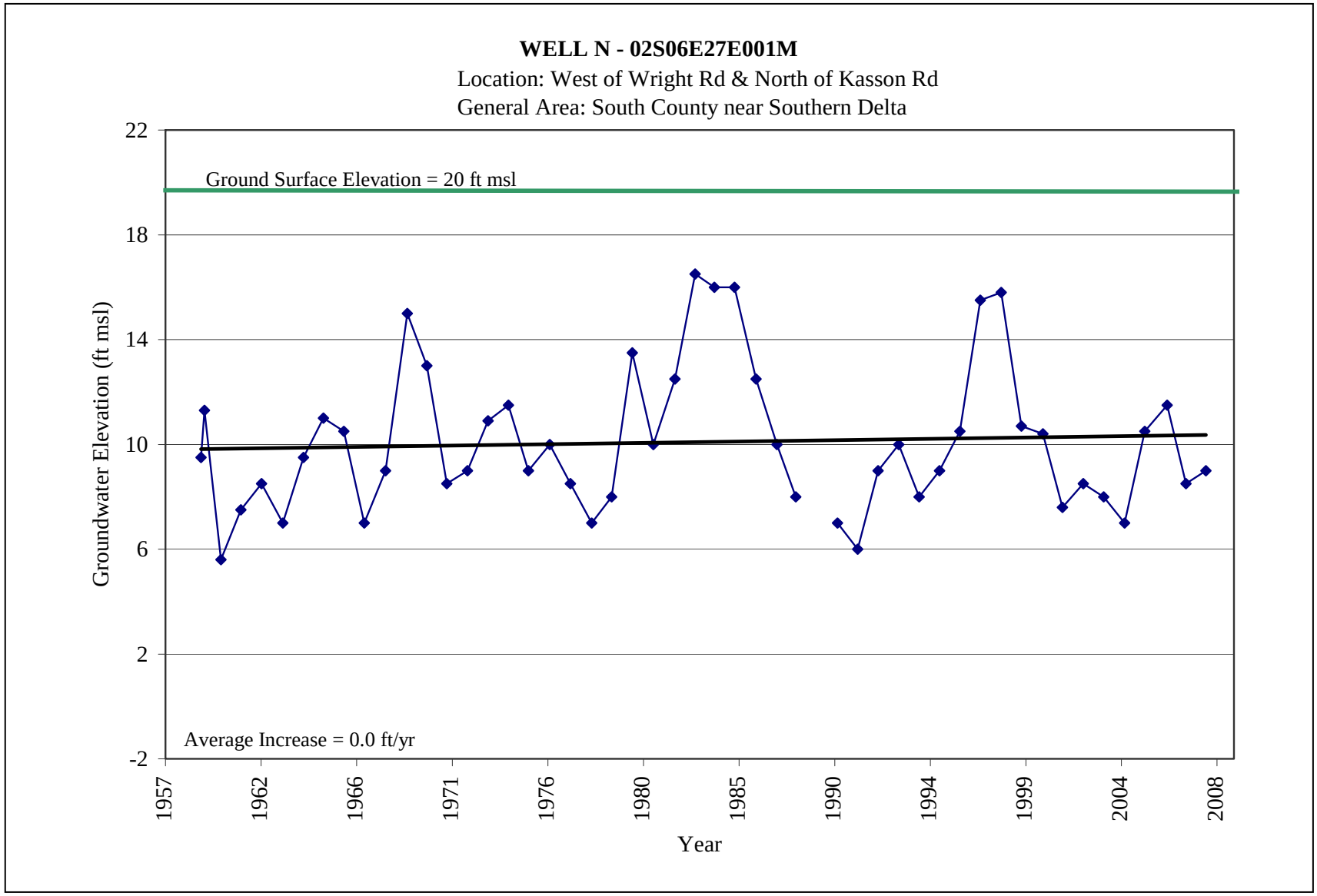


Figure 2-15: Spring Hydrograph Well N

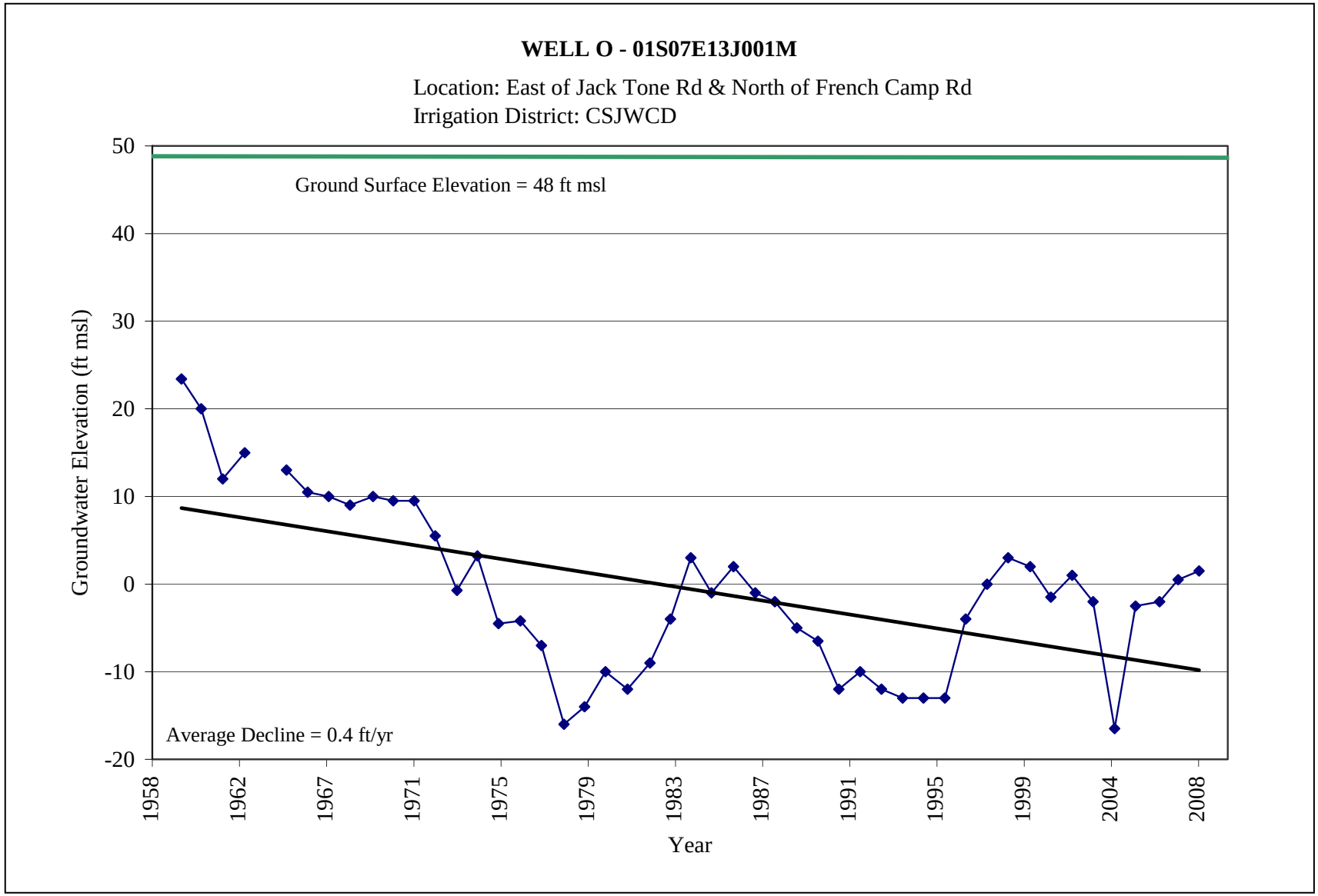


Figure 2-16: Spring Hydrograph Well O

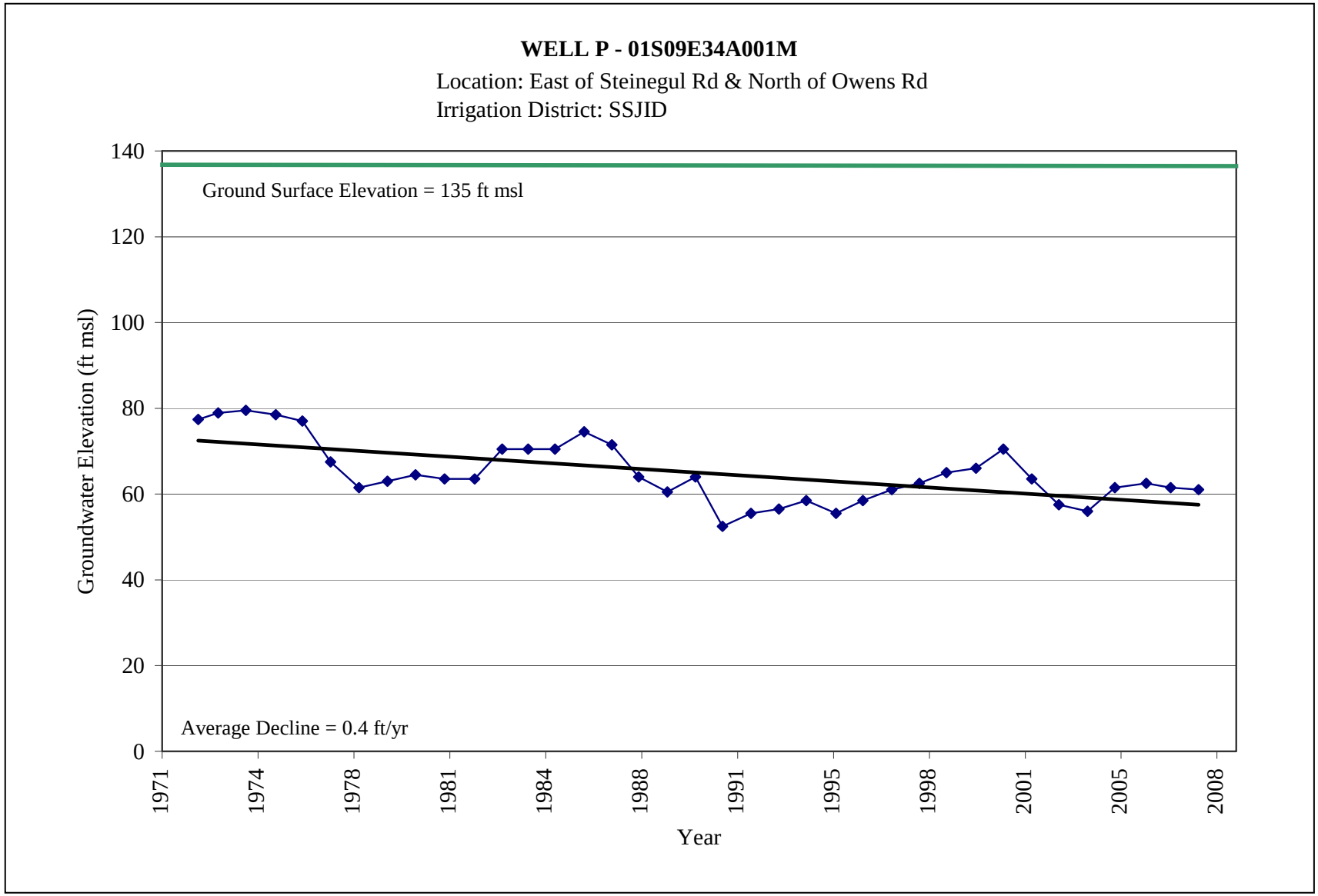


Figure 2-17: Spring Hydrograph Well P

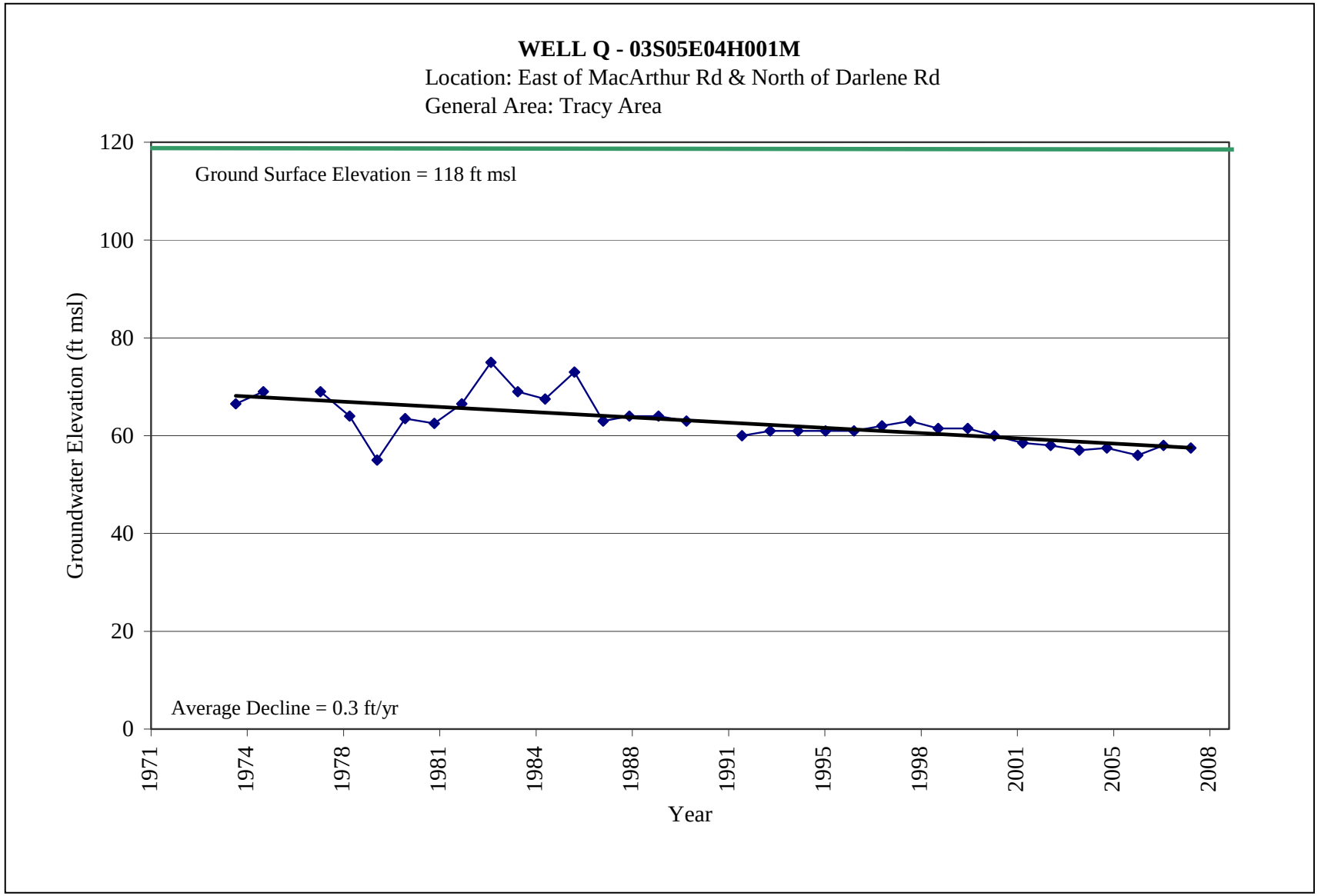


Figure 2-18: Spring Hydrograph Well Q

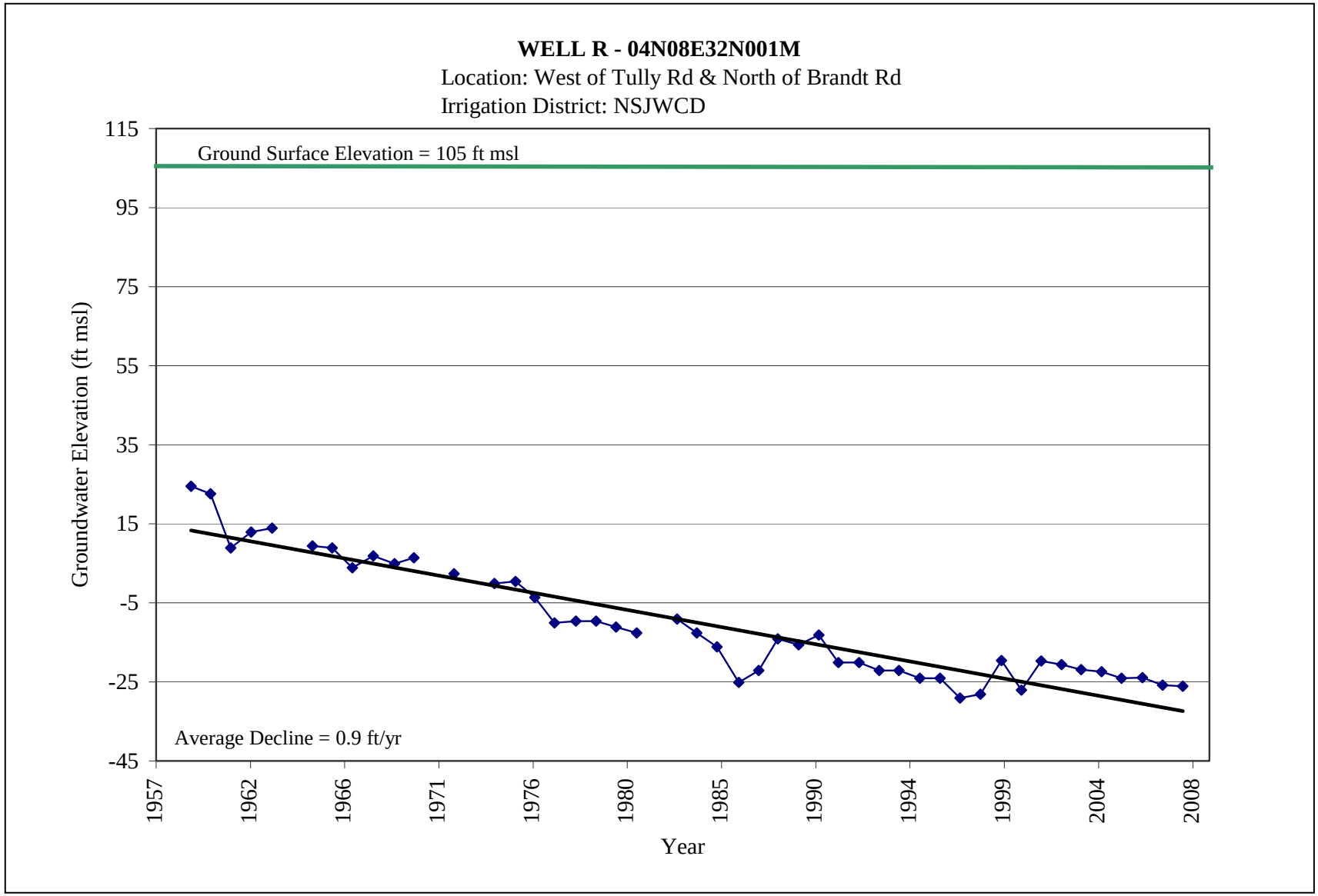


Figure 2-19: Spring Hydrograph Well R

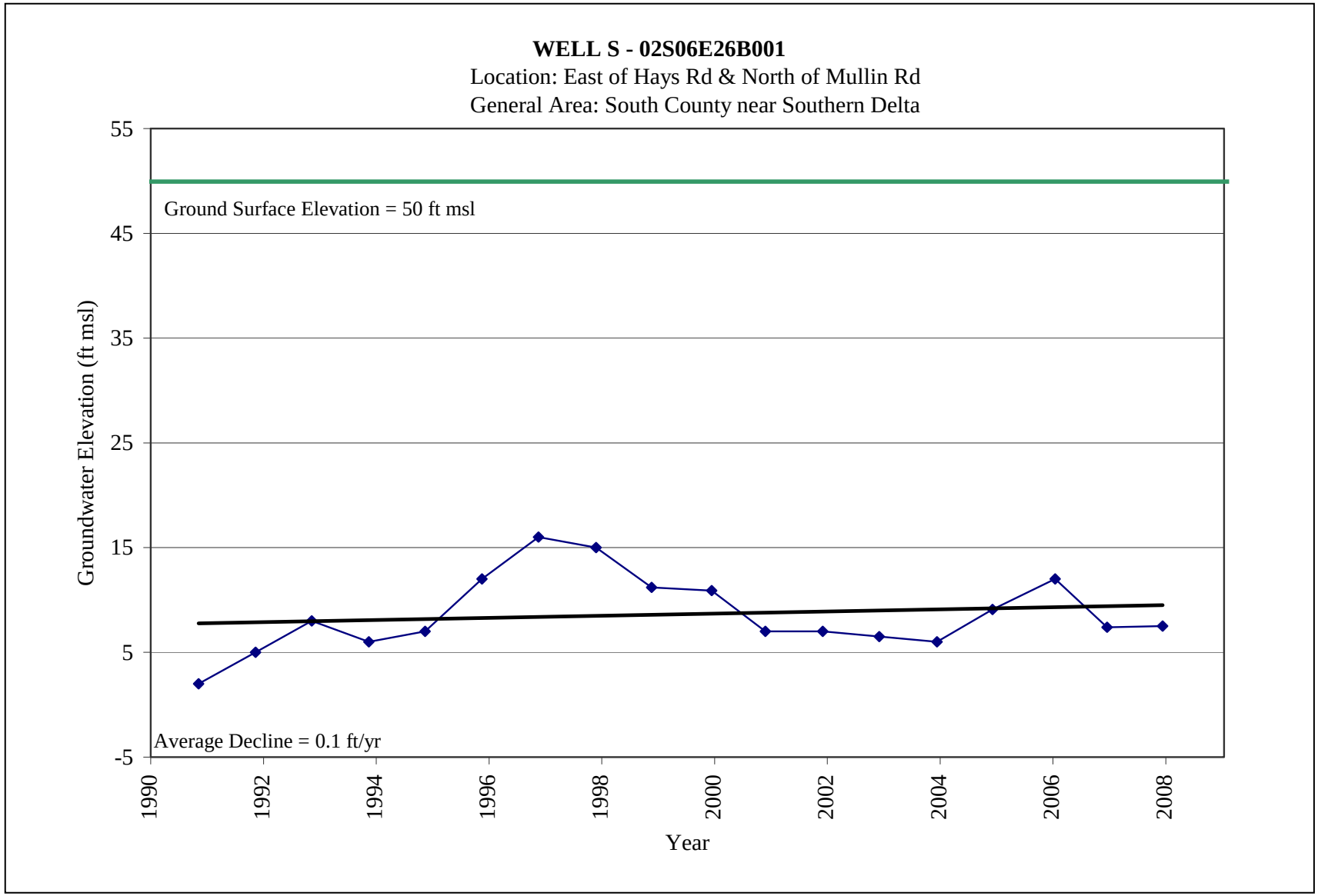


Figure 2-20: Spring Hydrograph Well S

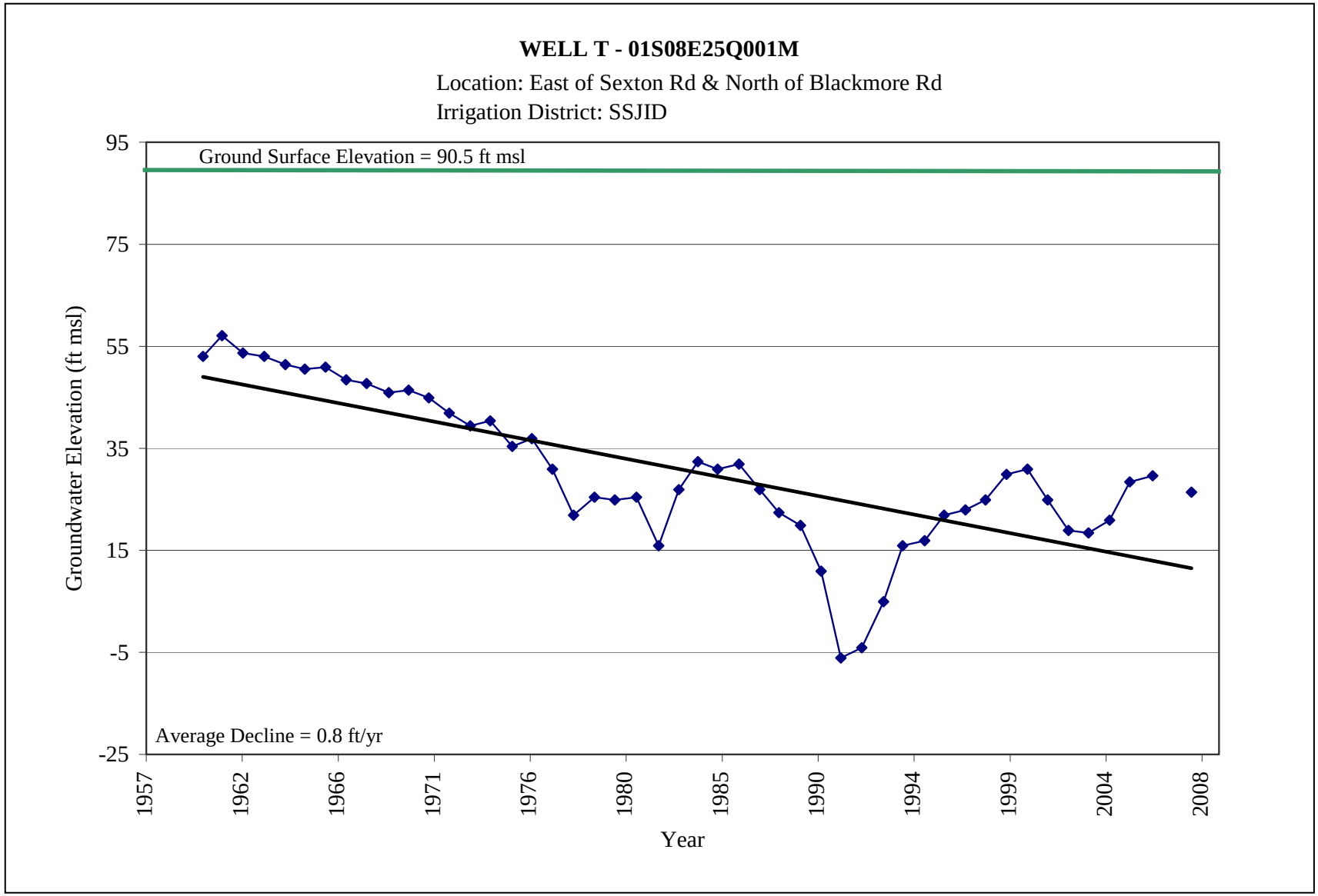


Figure 2-21: Spring Hydrograph Well T

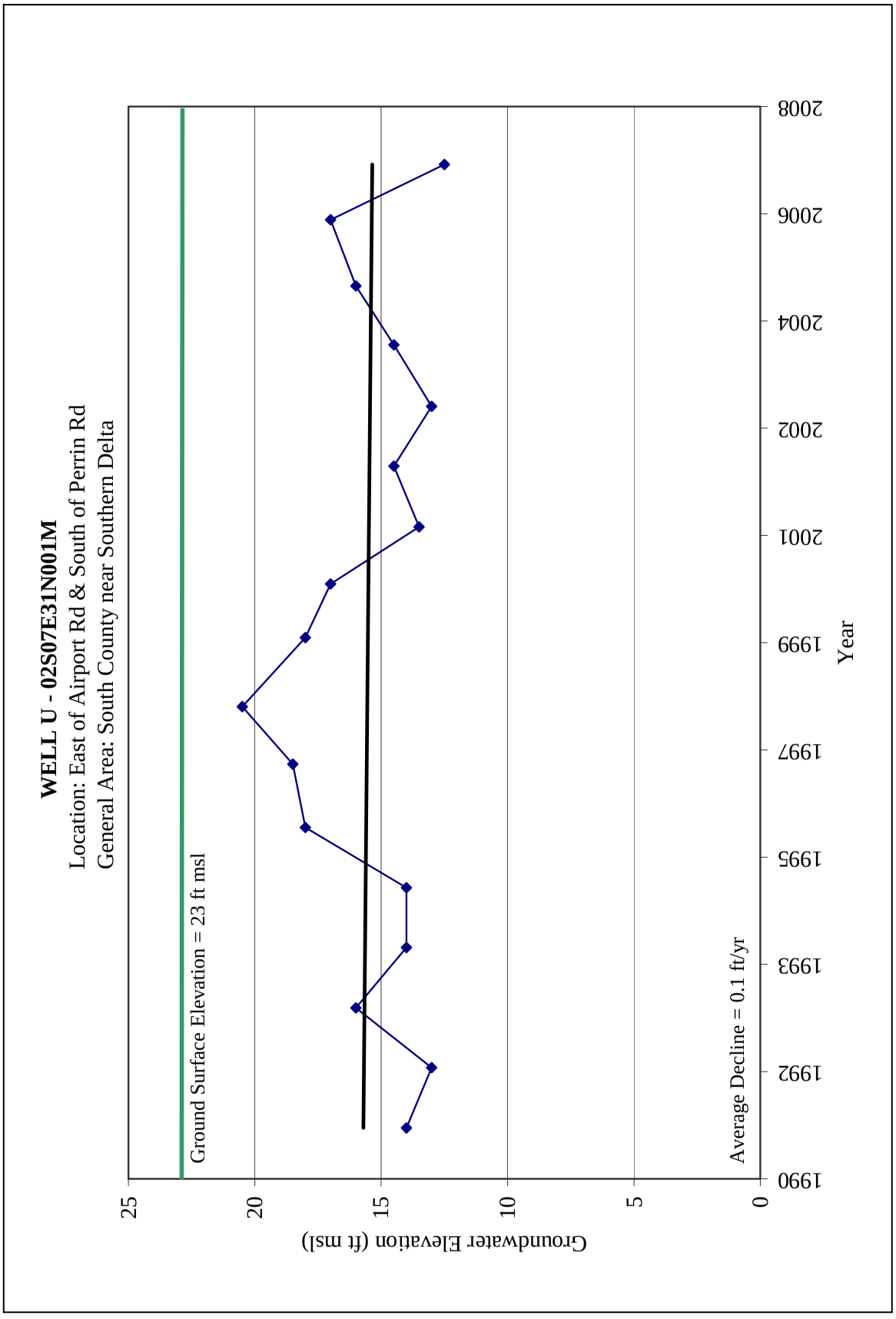


Figure 2-22: Spring Hydrograph Well U

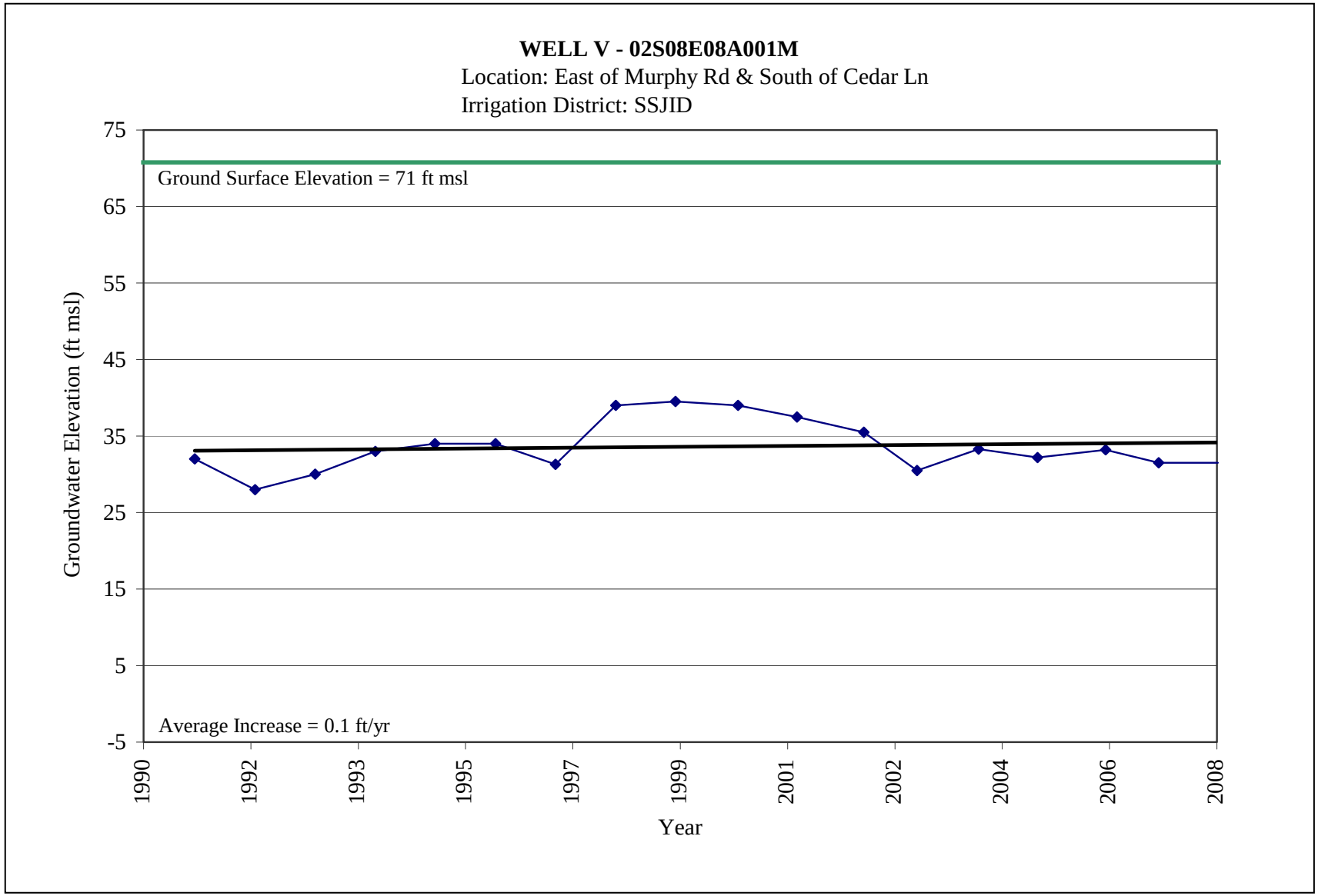


Figure 2-23: Spring Hydrograph Well V

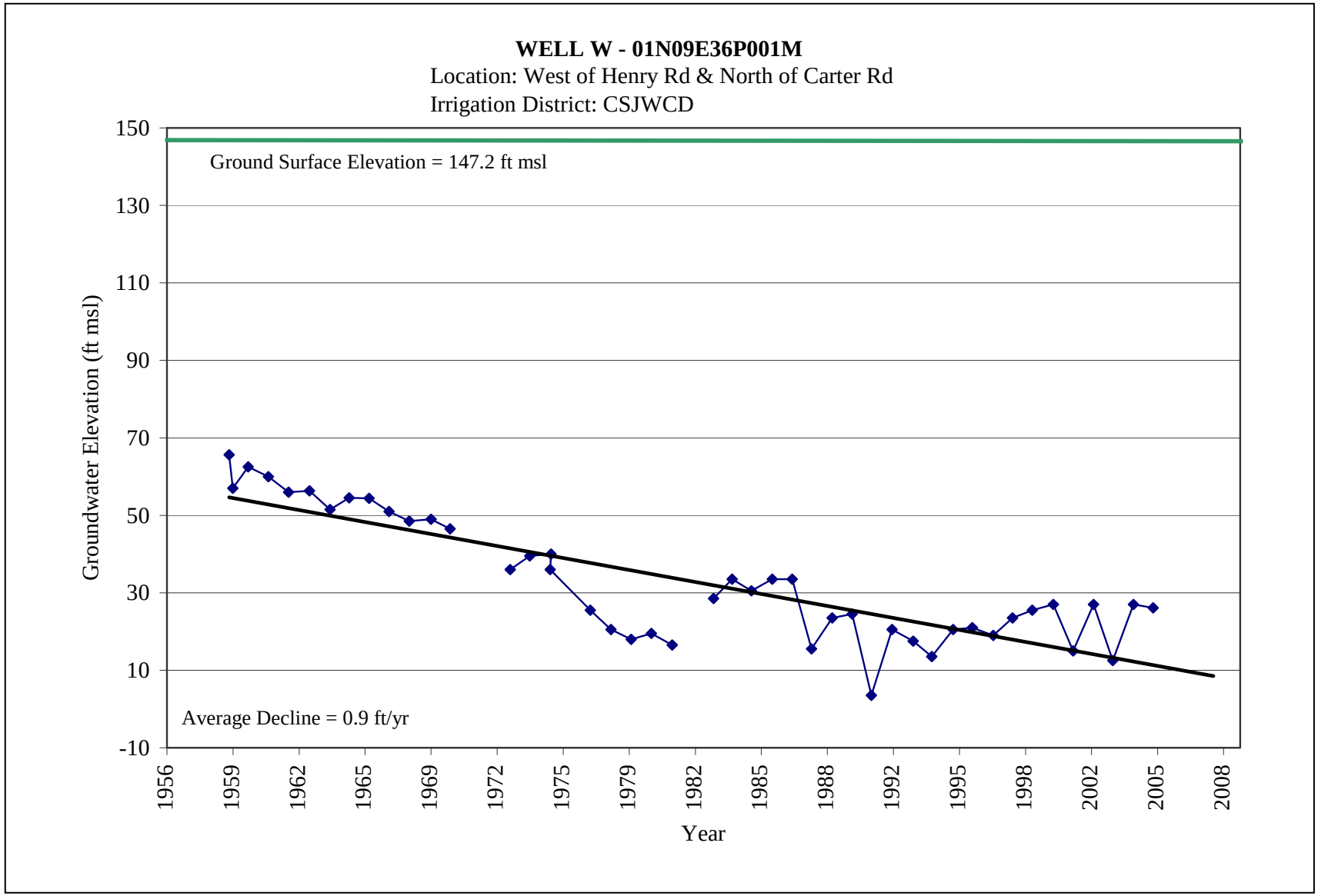


Figure 2-24: Spring Hydrograph Well W

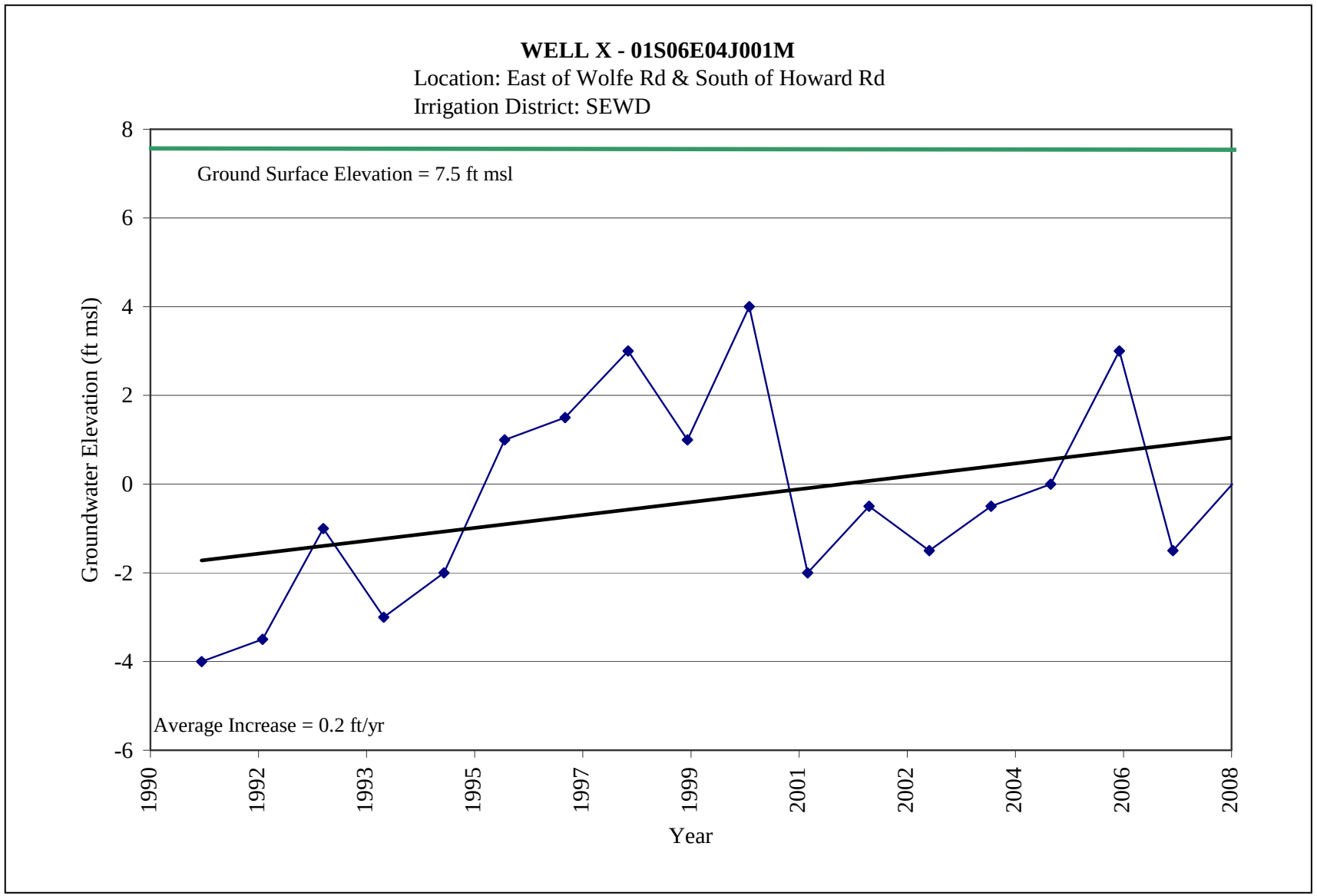


Figure 2-25: Spring Hydrograph Well X

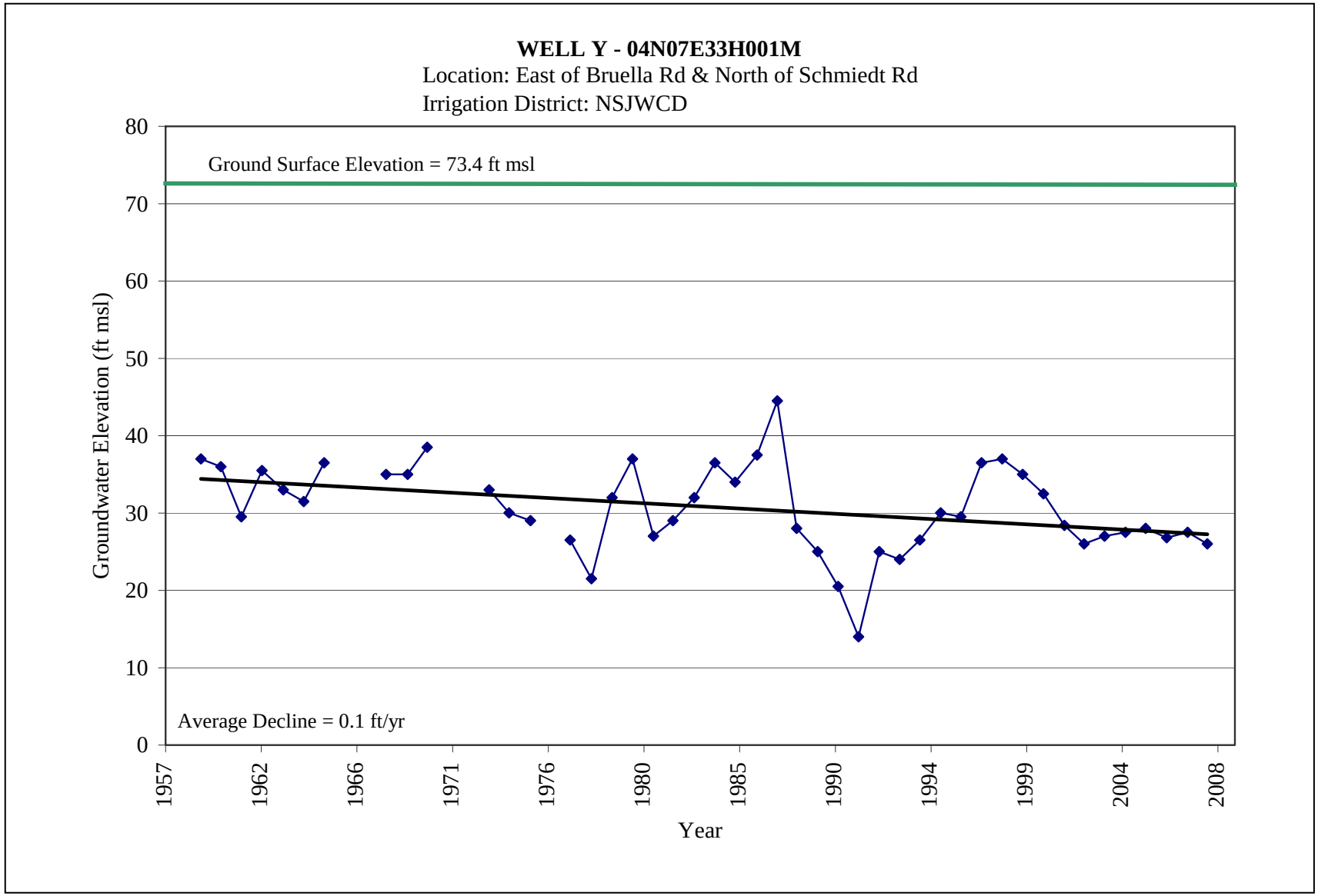


Figure 2-26: Spring Hydrograph Well Y

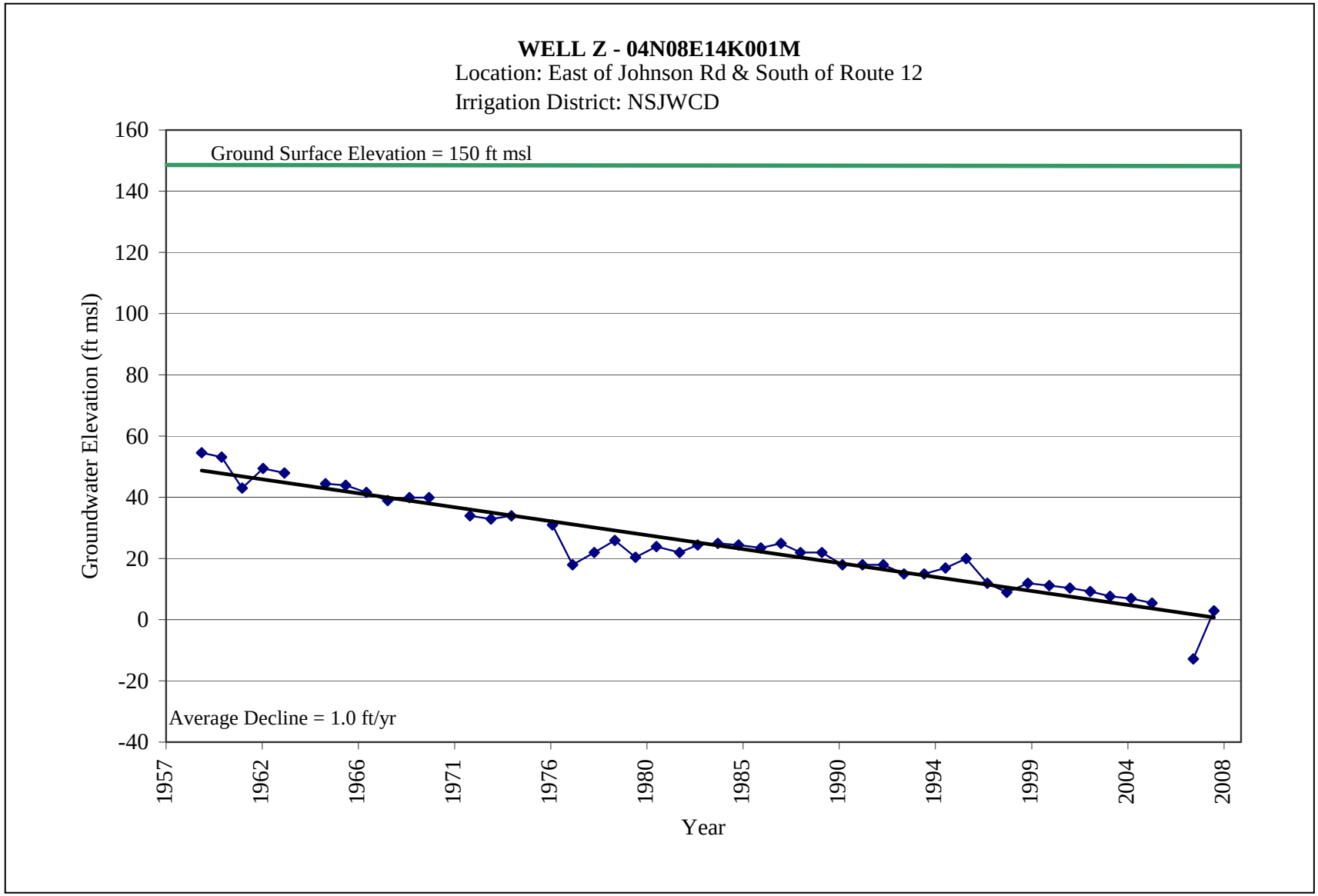


Figure 2-27: Spring Hydrograph Well Z

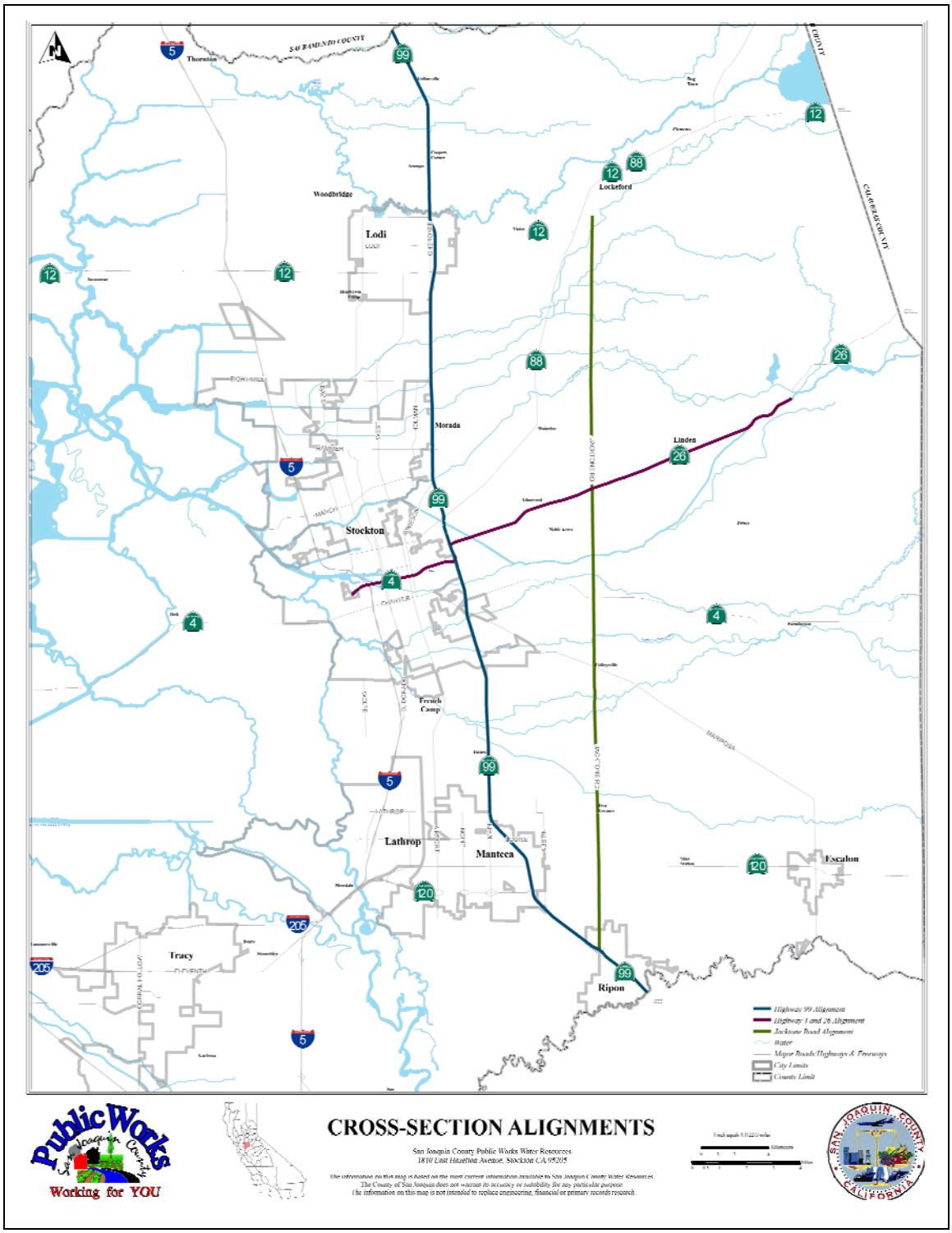


Figure 2-28: Cross Section Alignments

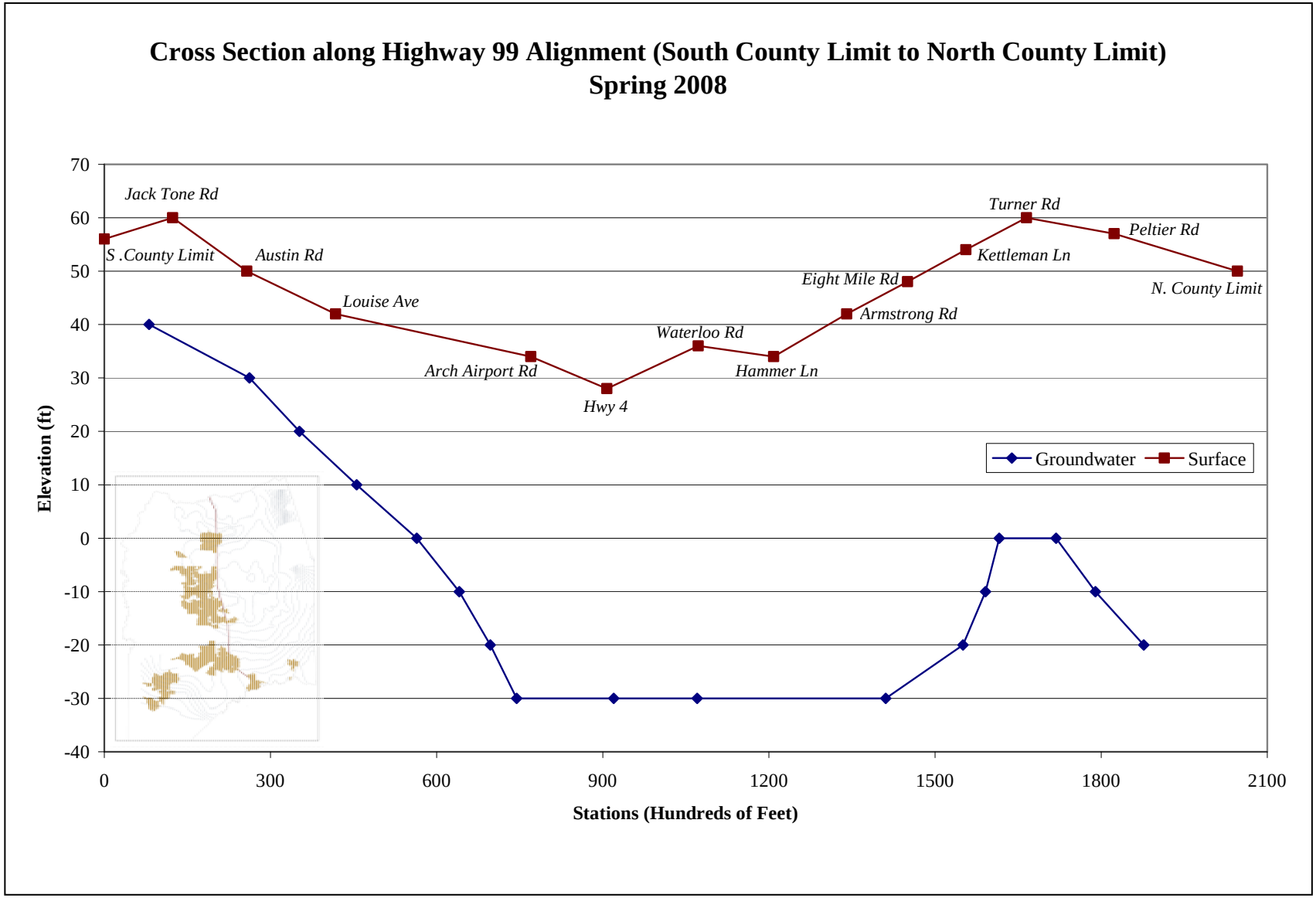


Figure 2-29: Highway 99 Cross Section Spring 2008

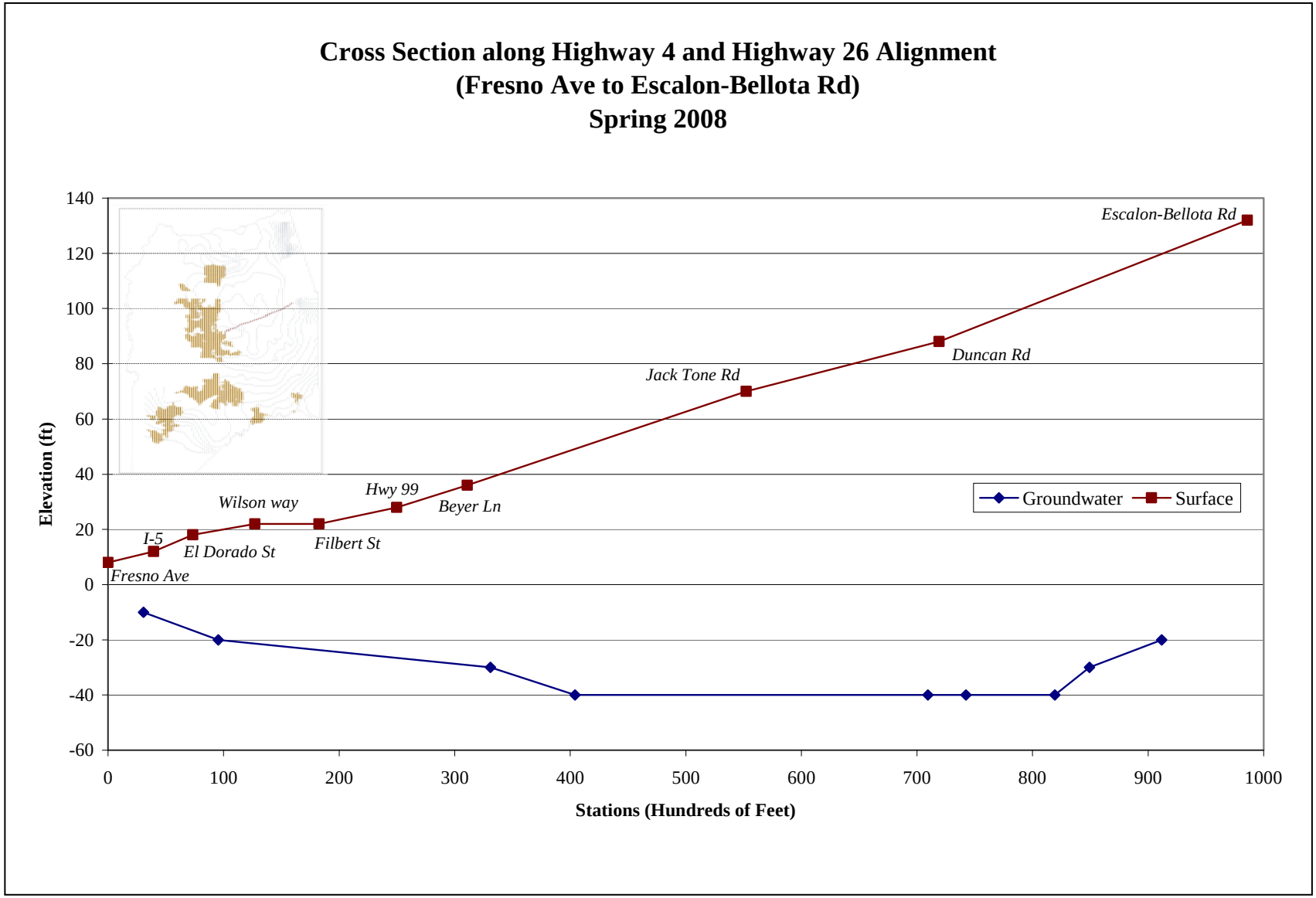


Figure 2-30: Highway 4 & Highway 26 Cross Section Spring 2008

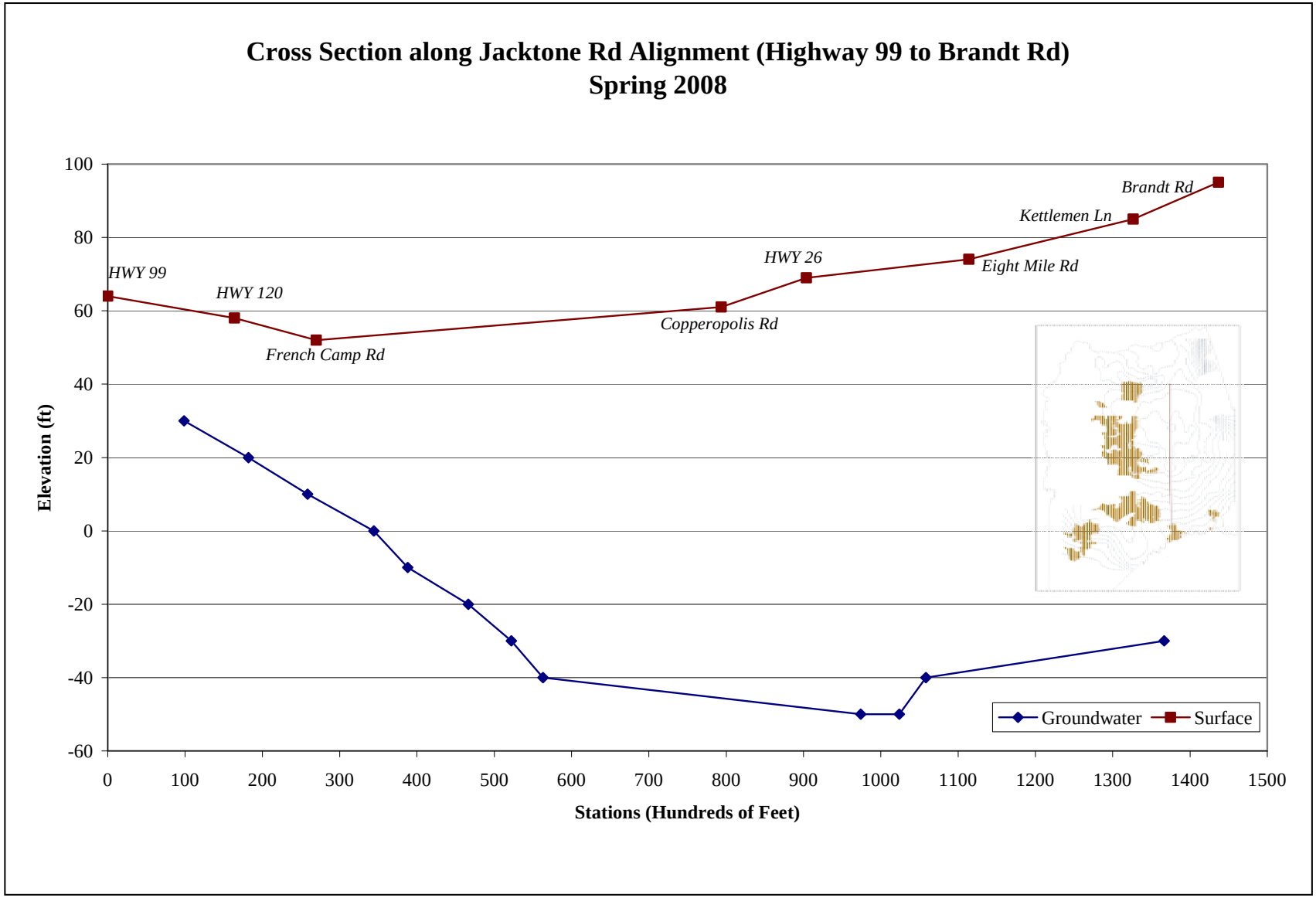
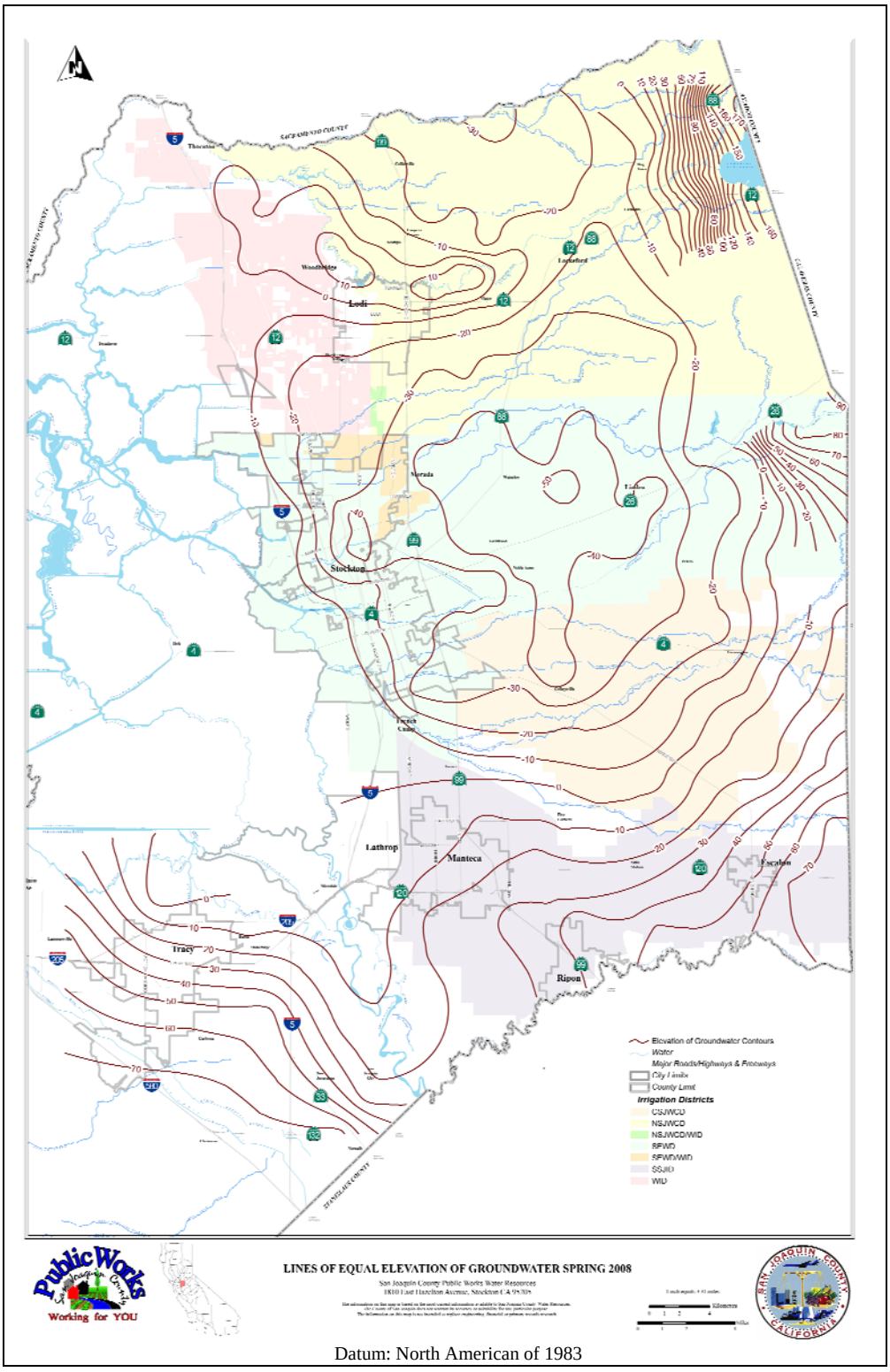


Figure 2-31: Jacktone Rd Cross Section Spring 2008



Datum: North American of 1983

Figure 2-32: Lines of Equal Elevation of Groundwater Spring 2008

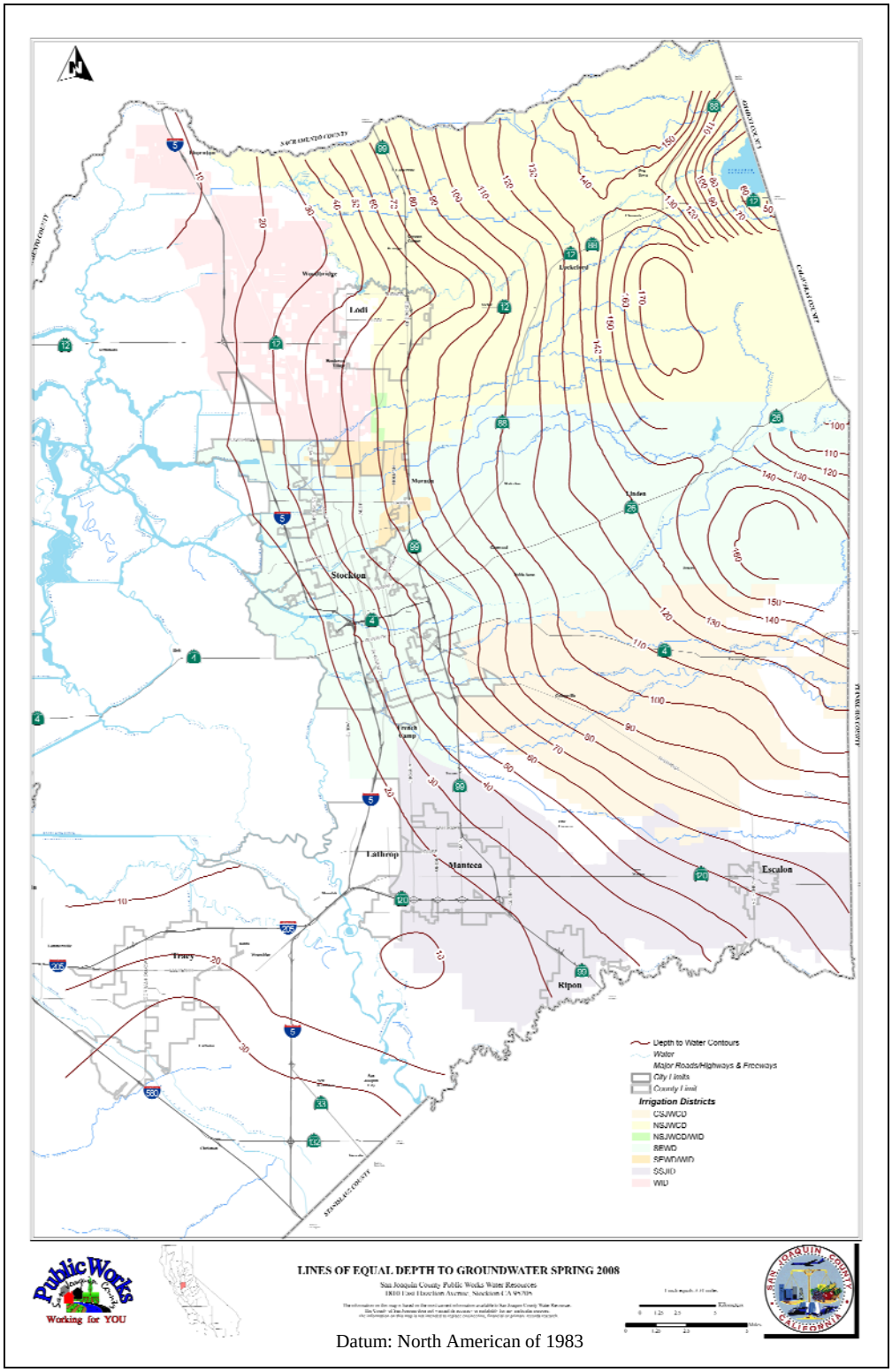


Figure 2-33: Lines of Equal Depth to Groundwater Spring 2008