DATA FROM THE WOODLAND LAND-SUBSIDENCE MONITORING STATION, YOLO COUNTY, CALIFORNIA, WATER YEARS 1988-92

By Marti E. Ikehara

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Conversion Factors

Multiply	By	To obtain
acre	4,047	square meter
acre-foot (acre-ft)	1,233	cubic meter
cubic inch (in^3)	16.39	cubic centimeter
foot (ft)	0.3048	meter
foot per month (ft/mo)	0.3048	meter per month
foot per year (ft/yr)	0.3048	meter per year
inch (in.)	25.4	centimeter
mile (mi)	1.609	kilometer
pound, avoirdupois (lb)	0.4536	kilogram
pound per square inch (lb/in^2)	703.1	kilogram per square meter
square inch (in^2)	6.452	square centimeter

Air temperature is given in degrees Fahrenheit (°F), which can be converted to degrees Celsius (°C) by the following equation:

$$°C=(°F-32)/1.8$$

Vertical Datum

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929—a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

Abbreviations

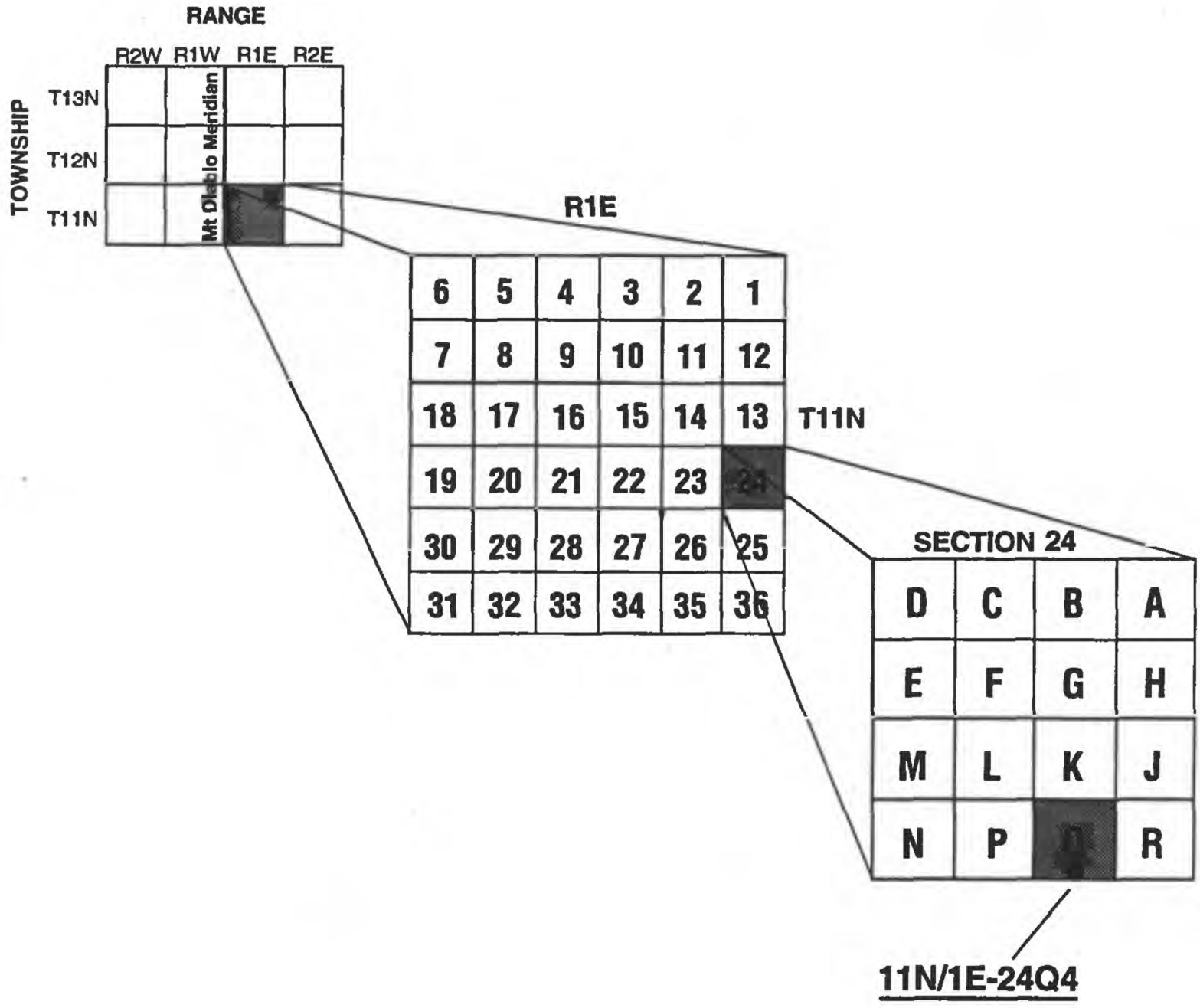
cm	centimeter
cm/s	centimeter per second
cm^3/s	cubic centimeter per second
k/Pa	kilopascal
mb,	millibar
mm	millimeter

Acronyms

LVDT	linear variable differential transformer
PVC	polyvinyl chloride
SDI-12	serial-to-digital interface, 12 volt
SP	spontaneous potential
USGS	U.S. Geological Survey

Well-Numbering System

Wells are identified and numbered according to their location in the rectangular system for the subdivision of public lands. Identification consists of the township number, north or south; the range number, east or west; and the section number. Each section is divided into sixteen 40-acre tracts lettered consecutively (except I and O), beginning with "A" in the northeast corner of the section and progressing in a boustrophedonic manner to "R" in the southeast corner. Within the 40-acre tract, wells are sequentially numbered in the order they are inventoried with the final letter referring to the base line and meridian. In California, there are three base lines and meridians: Humboldt (H), Mount Diablo (M), and San Bernardino (S). All wells in the study area are referenced to the Mount Diablo (M) base line and meridian. Well numbers consist of 15 characters and follow the format 011N001E24Q004M. In this report, well numbers are abbreviated and written 11N/1E-24Q4. The following diagram shows how the number for well 11N/1E-24Q4 is derived.



DATA FROM THE WOODLAND LAND-SUBSIDENCE MONITORING STATION, YOLO COUNTY, CALIFORNIA, WATER YEARS 1988-92

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Abstract

A land-subsidence monitoring study was initiated in 1985 for the purpose of collecting data in Sacramento Valley, California, to document land-surface subsidence and to measure sediment compaction in response to groundwater pumping. Lithologic and geophysical logs obtained from the deeper of two boreholes drilled in 1987 near Woodland, California, are presented. The results of geotechnical and hydraulic laboratory tests on four sediment core samples extracted at 137, 151, 301, and 474 feet below land surface from a third borehole, drilled in 1990, are also reported. Construction of the extensometer well and the piezometer wells and equipment installed in the boreholes are described and illustrated. Data measured or recorded at the Woodland land-subsidence monitoring station from December 1987 through September 1992 are presented in tabular and graphic formats. These data include water levels from five piezometers, barometric pressure, and cumulative net sediment compaction.

INTRODUCTION

A land-subsidence monitoring study of Sacramento Valley, California, was initiated in 1985 by the U.S. Geological Survey (USGS) in cooperation with the California Department of Water Resources. The purpose of the study was to determine the magnitude and locations of land subsidence throughout the Sacramento Valley (fig. 1) and to select one or more sites for more detailed study of the causes and mechanisms of subsidence. Yolo County, California, was selected as a primary site because: (1) historic (Lofgren and Ireland, 1973) and recent (Ikehara, 1994) measurements of land-surface elevations indicated significant magnitudes of subsidence and (2) the county relies on ground water for irrigation, industrial, municipal, and residential supply. Pumpage of ground water in excess of recharge to an aquifer system is a leading cause of subsidence in California.

Yolo County is west of Sacramento and Sutter Counties, with the Sacramento River forming a natural boundary (fig. 1). The terrain is a broad, almost flat, alluvial plain in southern Sacramento Valley. Cache Creek, north of Woodland, and Putah Creek, just south of Davis, are the major streams that flow eastward toward the Sacramento River from low hills in the west. Most of the water is diverted from these creeks into various irrigation canals; thus, streamflow often ceases in the summer, especially in downstream reaches. About 90 percent of the precipitation, which consists entirely of rainfall, occurs in the winter. Winter temperatures are moderate and seldom drop below freezing; summer temperatures are high, often over 90 °F. The mean annual temperature is about 60 °F, and the growing season is normally more than 8 months.

The mild Mediterranean-type climate and long growing season are conducive to agriculture, which is the predominant land use. The most prevalent crops in Yolo County (in the early 1990's) are canning tomatoes, wheat, safflower, and alfalfa, in decreasing order of harvested acreage (County of Yolo, 1994). Other important crops include rice, almonds, walnuts, corn, and sugar beets. Because of the predominance of agriculture, the principal industry is food processing. There are two primary urban centers in Yolo County. Woodland, the county seat, had about 33,000 residents in 1986 and is the location of agriculture-related businesses and industry. Davis is home to the University of California at Davis, with a campus population of about 25,000. In 1981, land classified as urban was only 3.6 percent of the 653,606 acres in Yolo County, whereas irrigated agriculture was 51.3 percent of the total (Yolo County Water Task Force, 1984). Native veg-

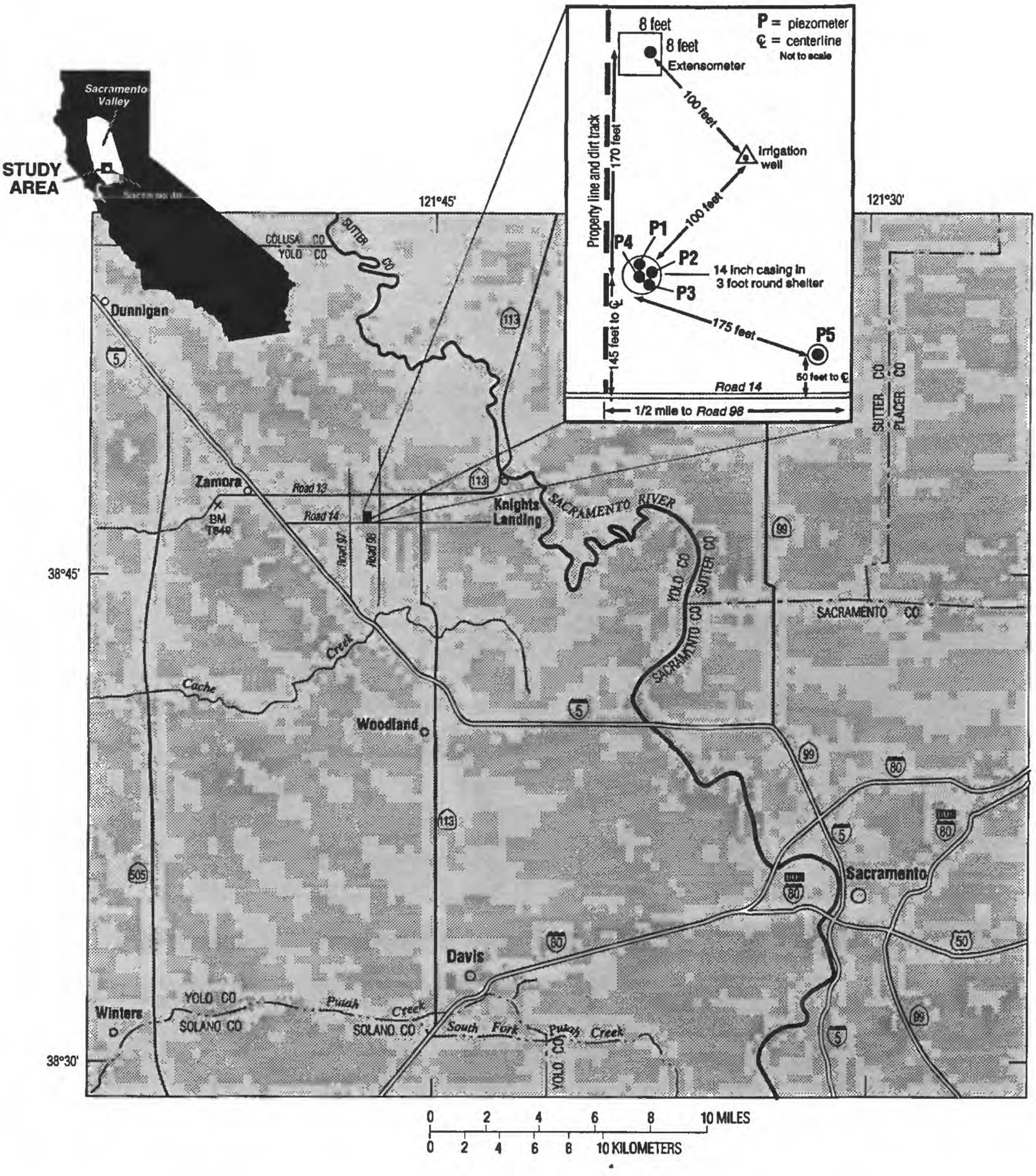


Figure 1. Location of wells at the Woodland land-subsidence monitoring station, Yolo County, California, and vicinity.

etation and surface-water bodies (31.1 percent) and nonirrigated agriculture (14.0 percent) constituted the remainder of the acreage. The amount of irrigated land increased nearly 50 percent between 1961 and 1981 (Yolo County Water Task Force, 1984).

Although irrigation-water sources include surface and ground water, the water used for industrial, municipal, and domestic residential purposes is supplied solely from ground water. In Yolo County, municipal and domestic water use was 34,000 acre-

ft in 1980, whereas agricultural water use was just over 1 million acre-ft in 1976 (Yolo County Water Task Force, 1984). Irrigation water accounts for over 95 percent of the total water used, 45 percent of which is from ground water. However, in the area north of Woodland, the source of irrigation water is exclusively ground water. Because of the high potential for land subsidence caused by a large quantity of ground-water pumpage without an equivalent amount of recharge, this area was selected for further study.

The location of the land-subsidence monitoring station was chosen on the basis of historic and recent geodetic leveling measurements made over the span of the last four decades in the Sacramento Valley. Historic leveling north of Davis by the National Geodetic Survey documented decreases of between 1.5 and 2 ft in land-surface elevations during a three-decade timeframe (Lofgren and Ireland, 1973). During the past decade, the USGS did several leveling surveys between Knights Landing and Zamora, originally in conjunction with surface-water studies of the Sacramento River (fig. 1). These surveys indicated that the location of the maximum measured subsidence, more than 4 ft since 1950, was midway between the two towns, which are 11 mi apart (Blodgett and others, 1990). A site within a mile of this location was selected for the monitoring station.

This report presents ground-water levels, cumulative net sediment compaction, geophysical logs, and geotechnical and other data collected during 1987-92 at the Woodland land-subsidence monitoring station in Yolo County, California. Three boreholes were drilled, and lithologic and geophysical logs were obtained. Sediment core samples were extracted from one borehole at four depths and were analyzed for geotechnical and hydraulic characteristics, including plastic limit, grain-size distribution, permeability, and compressibility. Water levels were monitored continuously in four wells and were measured about once a month at all five wells. Sediment compaction was measured continuously and was recorded both graphically and digitally.

The USGS is grateful to Mr. George Sharpnack, landowner, who graciously allowed the piezometers and extensometer to be sited on part of his land.

BOREHOLE DATA

Three boreholes were drilled at the Woodland land-subsidence monitoring station, which is about 7 mi north of Woodland in Yolo County (fig. 1). The boreholes are 0.5 mi west of County Road 98 on the north side of County Road 14. Four water-level monitoring wells, also known as piezometers P1 through P4, were installed during December 1987 in one borehole in the vicinity of the maximum subsidence previously measured. The State well numbers assigned to P1 through P4 are 11N/1E-24Q4 through 24Q7, respectively. Another borehole was drilled nearby at the same time and completed as a sediment-compaction monitoring well, also known as an extensometer; its State well number is 11N/1E-24Q8. These two boreholes were sited at a 90° separation and are equidistant (about 100 ft) from an active well that supplies water for irrigating adjacent fields. A third borehole was drilled in late 1990 to obtain cores of undisturbed sediment samples for geotechnical laboratory testing. A fifth piezometer, P5, was constructed in this borehole after coring was completed; its State well number is 11N/1E-24Q9.

Inclinometer Measurements

Inclinometer measurements relative to the drilling-rig mast were made periodically in the extensometer borehole to plumb the hole (table 1). The maximum deviation from vertical was 2.2° at 260 ft and 400 ft below land surface, but below 400 ft, the deviation decreased to between 1.1 and 1.6°. Borehole inclination ideally should not exceed 2° from the vertical to minimize the friction between the immobile extensometer element and the surrounding casing, which is prone to movement (Riley, 1986). Friction on the extensometer casing causes a stair-step effect on the graphic record of compaction as the surrounding casing is temporarily prevented from moving freely until downward stresses exceed frictional stresses in a repetitive cycle of "stick-and-slip" movement.

Table 1. Inclinometer measurements in extensometer borehole 11N/1E-24Q8

[ft, foot; °, degree]

Depth (ft)	Deviation from vertical (°)	Depth (ft)	Deviation from vertical (°)
50	1.9	600	1.4
100	2.0	660	1.2
160	2.1	700	1.1
260	2.2	760	1.4
300	1.8	800	1.5
400	2.2	860	1.6
500	1.4	900	1.6
540	1.5		

Lithologic and Geophysical Data

Lithologic logs were made of each borehole, and geophysical logs were run in the deepest of the three boreholes, which was the extensometer borehole, drilled to 1,003 ft below land surface. The geophysical logs were made using single-conductor Mt. Sopris borehole logging equipment and included spontaneous potential (SP), 64-in. and 16-in. normal resistivity, natural gamma, and caliper logs. The lithologic log (table 2) and geophysical logs (fig. 2) from the extensometer borehole only are

Table 2. Lithologic log from extensometer borehole 11N/1E-24Q8

[Colors are from Munsell color system (Geological Society of America, 1980). ft, foot; ls, land surface; in., inch]

Depth (ft below ls)		Description
From	To	
		WELL LOG: Total depth, 1,003 ft. Well completion depth, 1,001.5 ft.
0	18	Clay, light olive gray, with increasing sand.
18	33	Sand.
33	45	Gravel, increasing to 1 in.
45	60	Clay, olive gray.
60	75	Clay, sandy.
75	80	Clay, silty, greenish gray.
80	90	Sand.
90	118	Gravel.
118	140	Clay, light olive gray to bluish gray.
140	165	Clay, dark greenish gray.
165	180	Sand, black, some gravel.
180	230	Gravel, medium to coarse, up to 1.5 in.
230	240	Sand, very coarse; pebbles, very fine.
240	260	Clay, dusky yellow.
260	265	Gravel bed.
265	290	Clay, dusky yellow, interbedded silt, sand, and gravel.
290	300	Sand, very coarse-grained; clayey.
300	360	Clay, olive brown, some silt and sand.
360	370	Clay, with sand and gravel.
370	380	Sand and gravel.
380	390	Gravel, poorly sorted.
390	410	Clay, dusky yellow, with sand and gravel.
410	420	Sand, coarse-grained.
420	460	Gravel, medium to large, poorly sorted.
460	490	Clay, olive brown, with silt and sand.
490	530	Clay, silty, dark greenish gray.
530	590	Clay, traces sand and gravel.
590	595	Sand, clayey, and gravel.
595	620	Sand and gravel, fine.
620	680	Clay, light olive gray; fine gravel and sand, 30 percent.
680	720	Clay, greenish gray, with fine gravel.
720	730	Clay, dark greenish gray, with organics.
730	740	Sand.
740	750	Clay, with sand and gravel.
750	790	Clay, sandy, with increasing sand.
790	800	Sand, clayey, and gravel.
800	860	Clay, dark greenish gray, with sand lenses.
860	890	Sand and gravel.
890	905	Sand, clayey, and gravel.
905	955	Clay, light olive gray, with sand, coarse-grained.
955	965	Sand, clayey.
965	1,003	Clay, grayish green, with some sand.

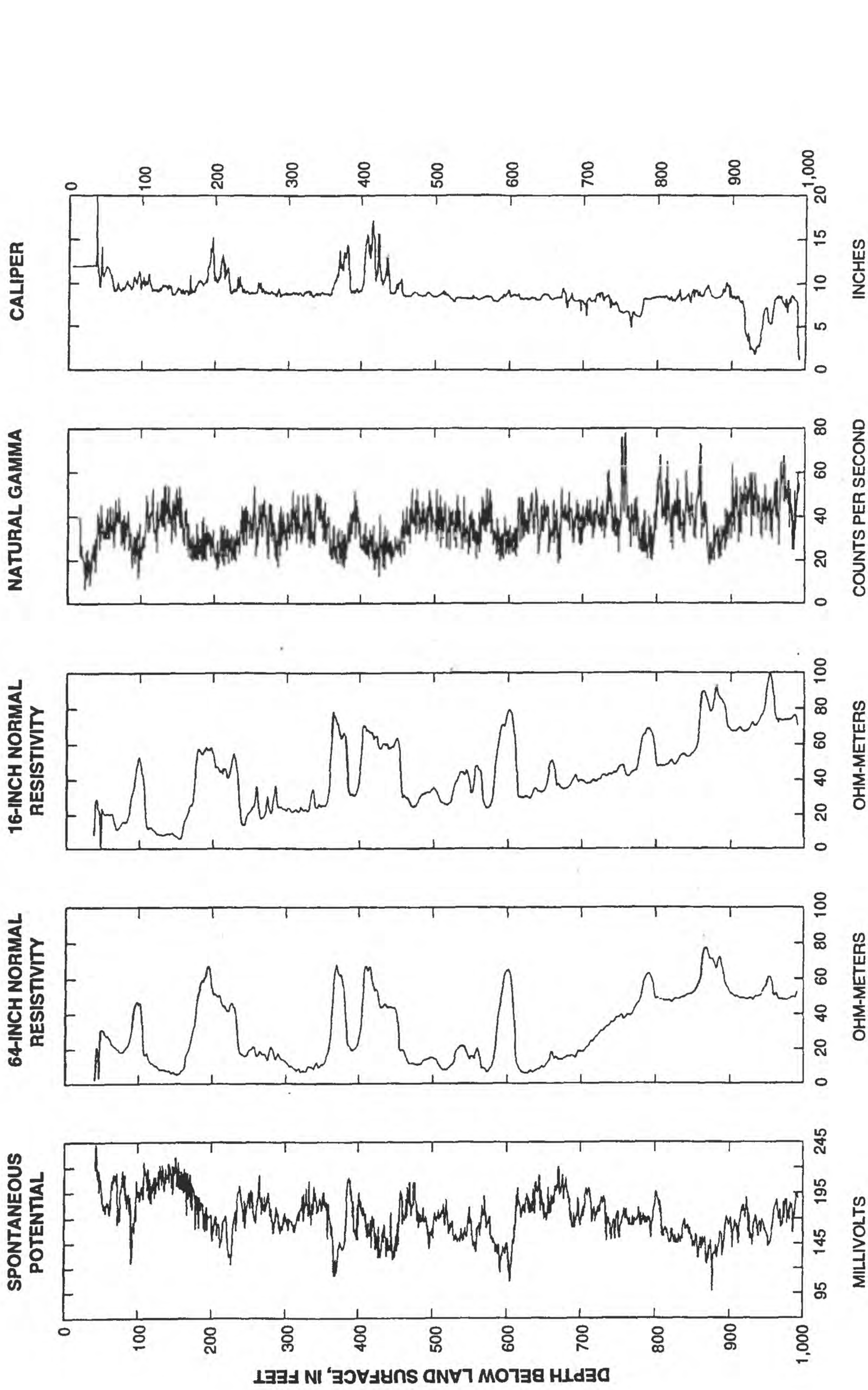


Figure 2. Geophysical logs from extensometer borehole 11N/1E-24Q8.

reproduced in this report. Lithologic data from the other boreholes were similar because of their close proximity (within 250 ft) to the extensometer borehole. Original logs are available for inspection in analog and digital format with data recorded every 0.5 ft. All logs are at the California District office of the USGS in Sacramento.

Geotechnical Laboratory Data

A 7-in.-diameter borehole (11N/1E-24Q9) was drilled with a hydraulic rotary rig in October 1990 at the Woodland land-subsidence monitoring station. Soil cores were extracted at several depths where geophysical logs in an adjacent borehole had indicated clay layers. An undisturbed sediment sample was obtained in a 4-in.-diameter steel cylinder about 17.5 in. long. This steel liner had a sample catcher at its base and was emplaced in a pitcher-type core barrel with industrial-grade diamonds embedded in the shoe to help advance the barrel (fig. 3). Core samples were taken at 137, 151, 301, and 474 ft

Figure 3. Pitcher-type core barrel used in sediment core sampling in borehole 11N/1E-24Q9.

Table 3. Selected soil-index properties for cores sampled in borehole 11N/1E-24Q9 at 137, 151, 301, and 474 feet below land surface

[Final height of solids, final sample height, and void ratio calculated from final weight and water content of total test specimen and assumed or measured specific gravity. ft, foot; in., inch; in^2, square inch; in^3, cubic inch; N/A, not applicable]

Properties	Depth (ft)			
	137	151	301	474
Specific gravity	[1]2.75	[1]2.75	[2]2.74	[1]2.75
Atterberg limits				
Liquid limit	47	46	42	31
Plastic limit	28	33	22	Soil is nonplastic
Plasticity index	19	13	20	N/A
Activity	.39	.24	.54	N/A
Water content (percent)				
Initial water content	32.19	31.90	22.79	25.29
Final water content	26.89	25.34	22.43	24.09
Void ratio				
Final void ratio	.739	.697	.617	.663
Final sample dimensions				
Diameter (in.)	2.50	2.50	2.50	2.50
Area (in^2)	4.91	4.91	4.91	4.91
Volume (in^3)	2.59	2.44	2.63	2.52
Final height of solids (in.)	.303	.293	.331	.308
Final sample height (in.)	.527	.497	.535	.513

[1]Assumed
[2]Measured

below land surface. After the liner was removed from the core barrel, excess sample was trimmed from the base, and drilling slough (cuttings and pebbles) was removed from the top of the sample. Excess space above the sample was filled with styrofoam pellets to prevent the sample from shifting during transit. Both ends and the welded seam along the length of the liner were sealed thoroughly by applying an industrial-grade melted mixture of natural beeswax and synthetic paraffin to maintain the natural moisture content of the sample.

Geotechnical testing was done under the supervision of Harold W. Olsen, USGS, in the Geotechnical Research Laboratory in Golden, Colorado, which is jointly operated by the USGS and the Colorado School of Mines. The liners containing the samples were stored in a temperature- and humidity-controlled room. The liners were cut in half lengthwise, and the part selected for testing was separated from the bulk of the core. The remainder of the sample was resealed with wax and returned to the sample-preservation room. Careful advancement of the sample ring into the gross sample and meticulous trimming of the excess soil resulted in an undisturbed final sample within a standard geotechnical laboratory 2.5-in.-diameter brass ring.

Geotechnical characteristics measured for the four sediment samples included Atterberg limits, water content, void ratio, final sample dimensions (table 3), and grain-size distribution (table 4). The percent of sample finer than a particular grain size is plotted as a function of grain diameter (fig. 4). Measured and calculated characteristics related

Table 4. Grain-size distribution data for cores sampled in borehole 11N/1E-24Q9 at 137, 151, 301, and 474 feet below land surface

[100 percent of each core sample passed no. 10 (2 mm) sieve. ft, foot; mm, millimeter; --, balance of sediment was finer than last grain diameter listed per core]

137 ft		151 ft		301 ft		474 ft	
Passing (percent)	Grain diameter (mm)	Passing (percent)	Grain diameter (mm)	Passing (percent)	Grain diameter (mm)	Passing (percent)	Grain diameter (mm)
Sieve analysis of material retained on no. 200 (7.50×10^{-2} mm) sieve							
99.9	7.50×10^{-2}	97.7	7.50×10^{-2}	99.6	6.00×10^{-1}	99.8	6.00×10^{-1}
--	--	--	--	98.8	3.00×10^{-1}	99.5	3.00×10^{-1}
--	--	--	--	97.4	1.50×10^{-1}	99.2	1.50×10^{-1}
--	--	--	--	92.9	7.50×10^{-2}	85.7	7.50×10^{-2}
Hydrometer test							
98.9	2.49×10^{-2}	96.2	2.53×10^{-2}	74.2	2.80×10^{-2}	60.4	4.82×10^{-2}
94.9	1.61×10^{-2}	93.2	1.63×10^{-2}	64.5	1.84×10^{-2}	52.8	4.30×10^{-2}
85.1	9.80×10^{-3}	86.4	9.74×10^{-3}	55.9	1.10×10^{-2}	44.3	3.62×10^{-2}
78.2	7.12×10^{-3}	79.5	7.08×10^{-3}	51.0	7.92×10^{-3}	36.8	3.22×10^{-2}
71.4	7.47×10^{-3}	74.6	5.13×10^{-3}	47.2	5.70×10^{-3}	34.0	2.91×10^{-2}
55.7	2.80×10^{-3}	61.8	2.87×10^{-3}	43.3	3.43×10^{-3}	32.1	2.67×10^{-2}
54.8	2.62×10^{-3}	59.9	2.68×10^{-3}	41.4	3.13×10^{-3}	29.2	2.33×10^{-2}
52.8	2.40×10^{-3}	57.9	2.44×10^{-3}	41.4	2.81×10^{-3}	27.4	1.92×10^{-2}
49.9	2.21×10^{-3}	55.9	2.22×10^{-3}	39.5	2.51×10^{-3}	25.5	1.67×10^{-2}
42.1	1.23×10^{-3}	44.2	1.22×10^{-3}	34.7	1.28×10^{-3}	24.5	1.50×10^{-2}
41.1	1.18×10^{-3}	42.2	1.10×10^{-3}	33.7	1.14×10^{-3}	23.6	1.32×10^{-2}
40.1	1.09×10^{-3}	--	--	--	--	21.7	1.20×10^{-2}
--	--	--	--	--	--	20.8	9.61×10^{-3}
--	--	--	--	--	--	33.0	3.26×10^{-2}
--	--	--	--	--	--	25.5	2.12×10^{-2}
--	--	--	--	--	--	21.7	1.24×10^{-2}
--	--	--	--	--	--	19.8	8.80×10^{-3}
--	--	--	--	--	--	17.9	6.19×10^{-3}
--	--	--	--	--	--	17.0	4.65×10^{-3}
--	--	--	--	--	--	17.0	4.02×10^{-3}
--	--	--	--	--	--	14.1	3.46×10^{-3}
--	--	--	--	--	--	14.1	2.99×10^{-3}
--	--	--	--	--	--	11.3	1.41×10^{-3}
--	--	--	--	--	--	11.3	1.34×10^{-3}

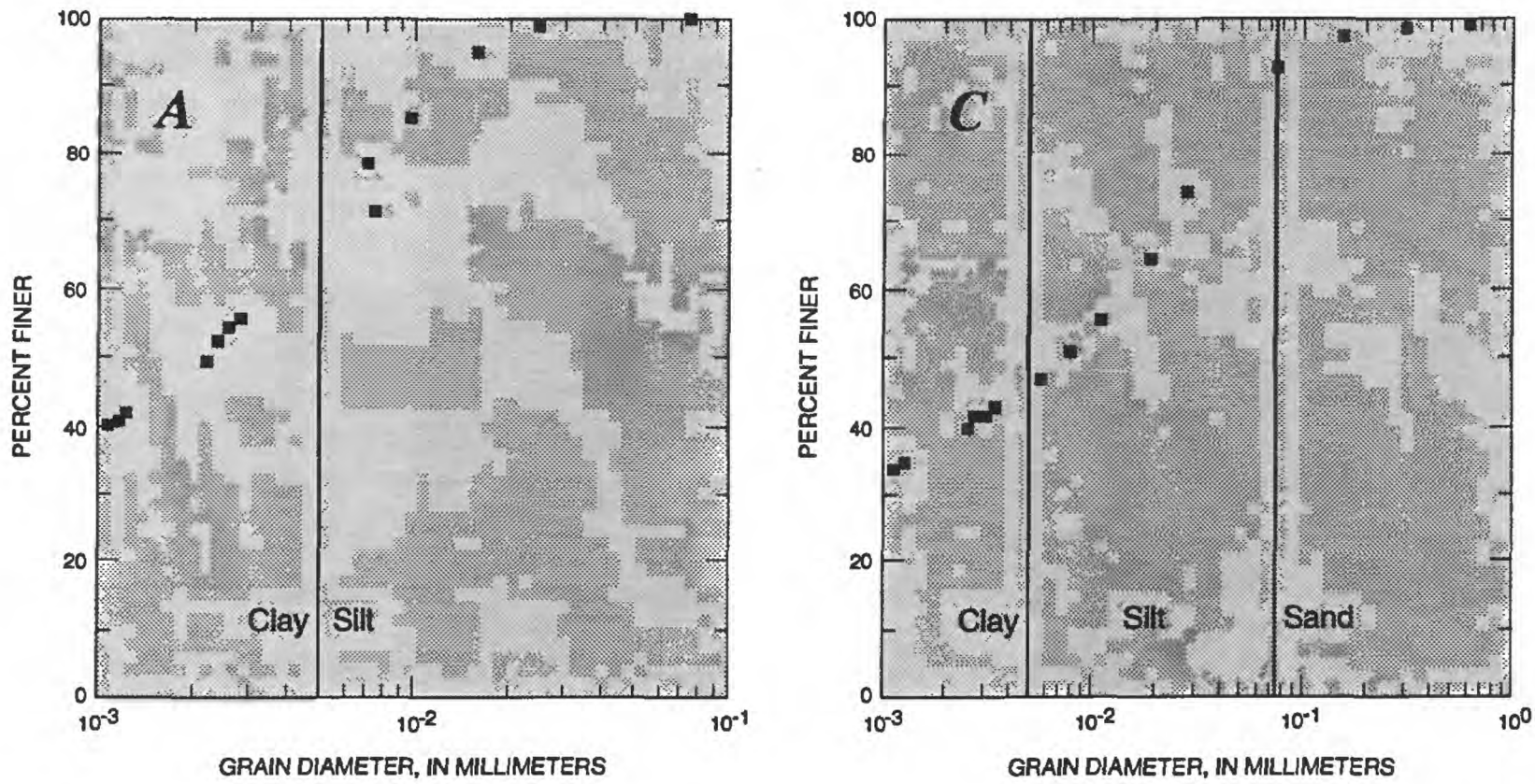


Figure 4. Grain-size distribution for cores sampled in borehole 11N/1E-24Q9 at 137, 151, 301, and 474 feet below land surface.

to the hydrologic aspects of a sediment sample included void ratio, permeability, vertical effective stress, compressibility, and specific storage. Rather than use a conventional step-loading consolidation test, a volume-controlled approach was used to measure compressibility and permeability simultaneously and directly. The laboratory method is described by Gill and others (1991). One flow pump consolidates the sample at a constant rate of volume change, while another periodically superimposes constant flow rates through the specimen. The testing apparatus is shown in figure 5. Thus, various hydraulic conditions were monitored continuously, and testing was done in a steady-state environment of pore pressure differences across the specimen.

Sediment-sample properties are defined in a key (table 5, at back of report) provided for use with

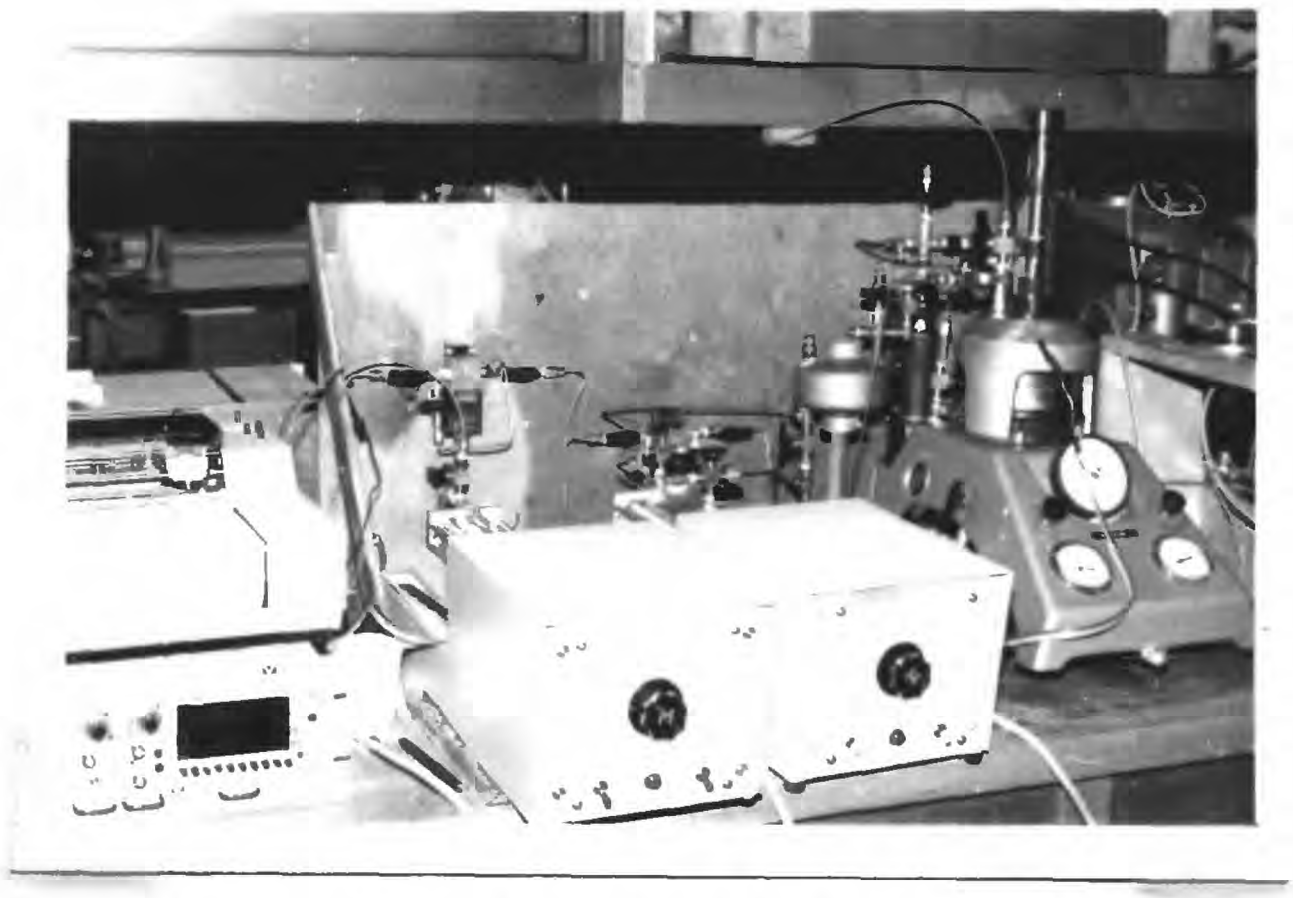


Figure 5. Volume-controlled consolidation and permeability testing apparatus.

measurements and calculations of consolidation and permeability results. Table 6 (at back of report) presents the geotechnical and hydraulic laboratory measurements and calculations for sample thickness, void ratio, head difference, flow-rate, permeability, vertical effective stress, compressibility, and specific storage relative to elapsed time. For each of the four samples, graphs were prepared to show permeability, void ratio, and specific storage as functions of effective stress (figs. 6-9). Examination of these graphs and the grain-size distribution graphs (fig. 4) and table (table 4) reveals that the upper three core samples were predominantly (45-75 percent) clay sediment, but the deepest sample was predominantly silt (<20 percent clay).

DATA-PROCESSING PROCEDURES

Water levels, barometric pressure, and sediment compaction were monitored continuously, and electronic data were recorded every half-hour. The original analog and digital electronic data collected at the Woodland land-subsidence monitoring station are available at the California District office of the USGS. Data collection was discontinued by the USGS on October 1, 1992. Electronic data recorded by a C21X micrologger (manufactured by Campbell Scientific, Inc.) were transferred in the field from the memory chip to a cassette tape recorder. Data were downloaded from the tape into a personal computer netlinked to a mainframe computer. Data files were then uploaded into the USGS national database ADAPS (Automated Data Processing System). Daylight savings time was not incorporated into measurements during the first several years. The switch between Pacific Daylight Time and Pacific Standard Time was made during 1991 and 1992. The datalogger clock was set 1 hour forward to 1030 hours on May 3, 1991, back to 0900 hours on November 14, 1991, and forward to 1000 hours on April 20, 1992.

During data processing, spurious values and values indicative of sensor malfunction were deleted. Datum corrections, equal to the difference between the recorded and measured water levels obtained during periodic station inspections, were applied for the appropriate time periods, if necessary. Measurements were adjusted by the height of the measuring point above land surface so that all published piezometric head values are referenced to land surface rather than to well measuring points. Elevations of the land surface and the measuring points for the original four piezometers (and the extensometer) were determined by spirit leveling in August 1988 from origin bench mark T849 (fig. 1), which has an elevation of 116.397 ft above sea level. The elevation of the land surface at P1 through P4 was 42.1 ft above sea level. Elevations of the land surface and measuring points A, B

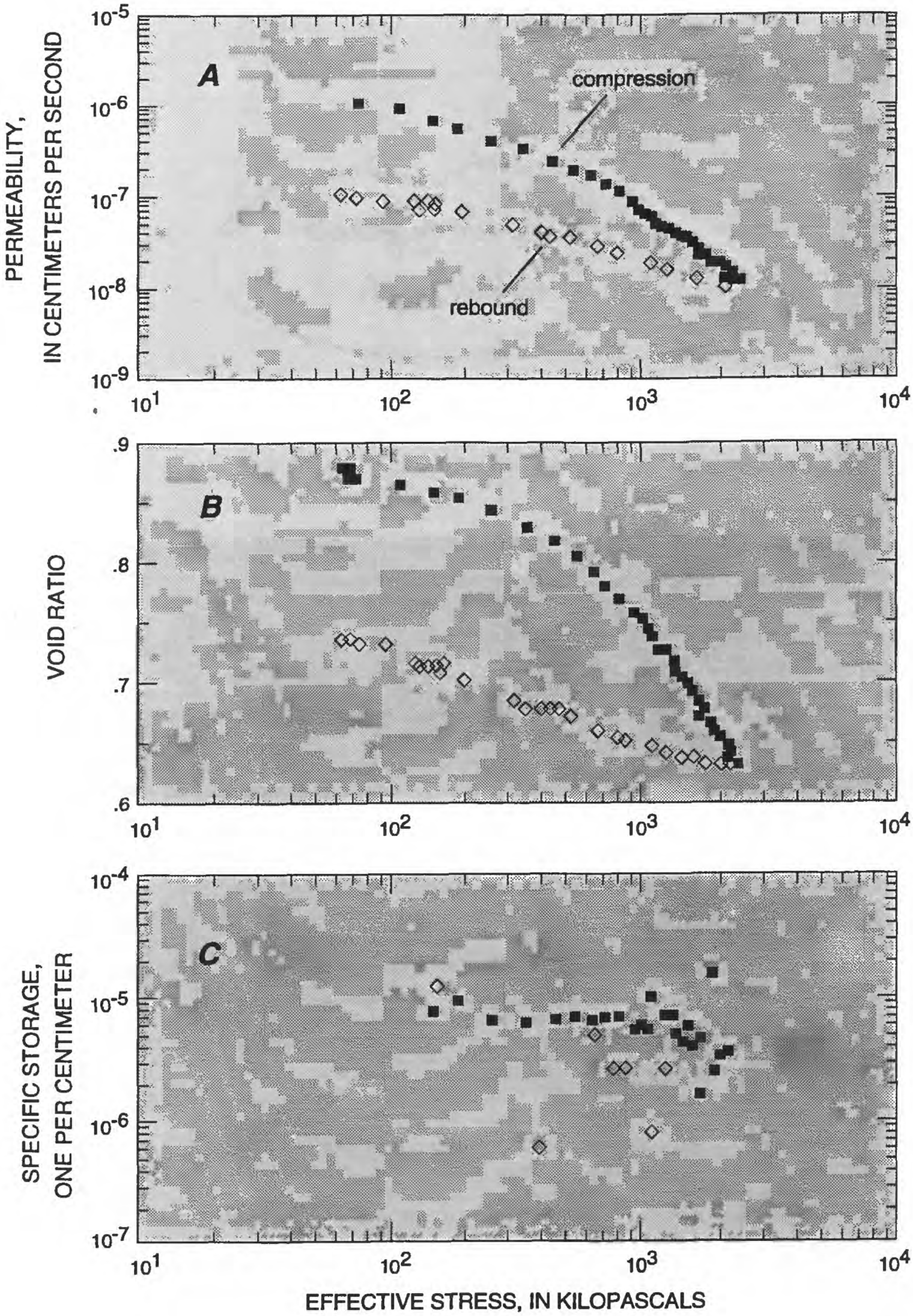


Figure 6. Permeability *(A)*, void ratio *(B)*, and specific storage *(C)* as functions of effective stress for the sample from the 137 foot level in borehole 11N/1E/24Q9.

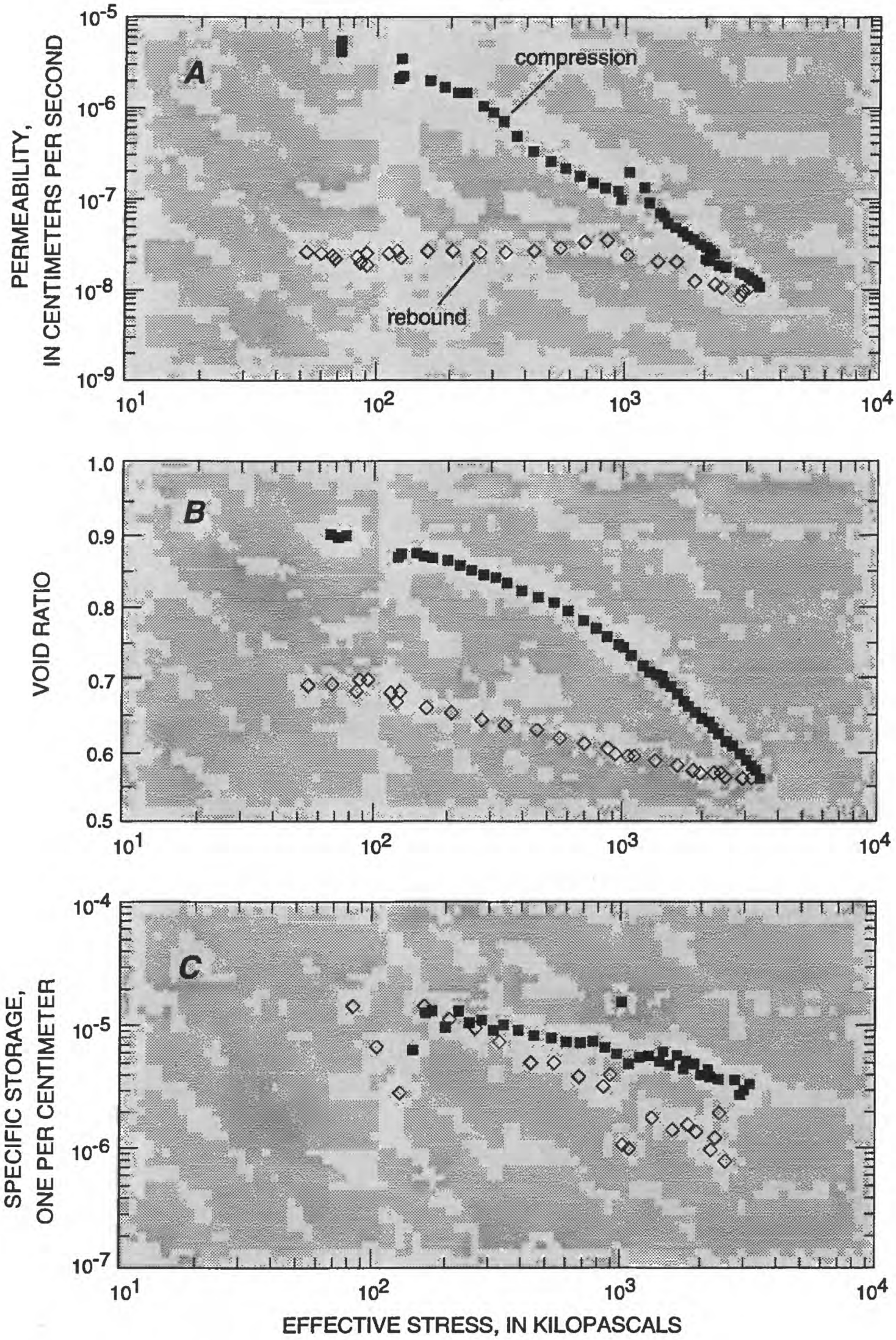


Figure 7. Permeability *(A)*, void ratio *(B)*, and specific storage *(C)* as functions of effective stress for the sample from the 151-foot depth in borehole 11N/1E-24Q9.

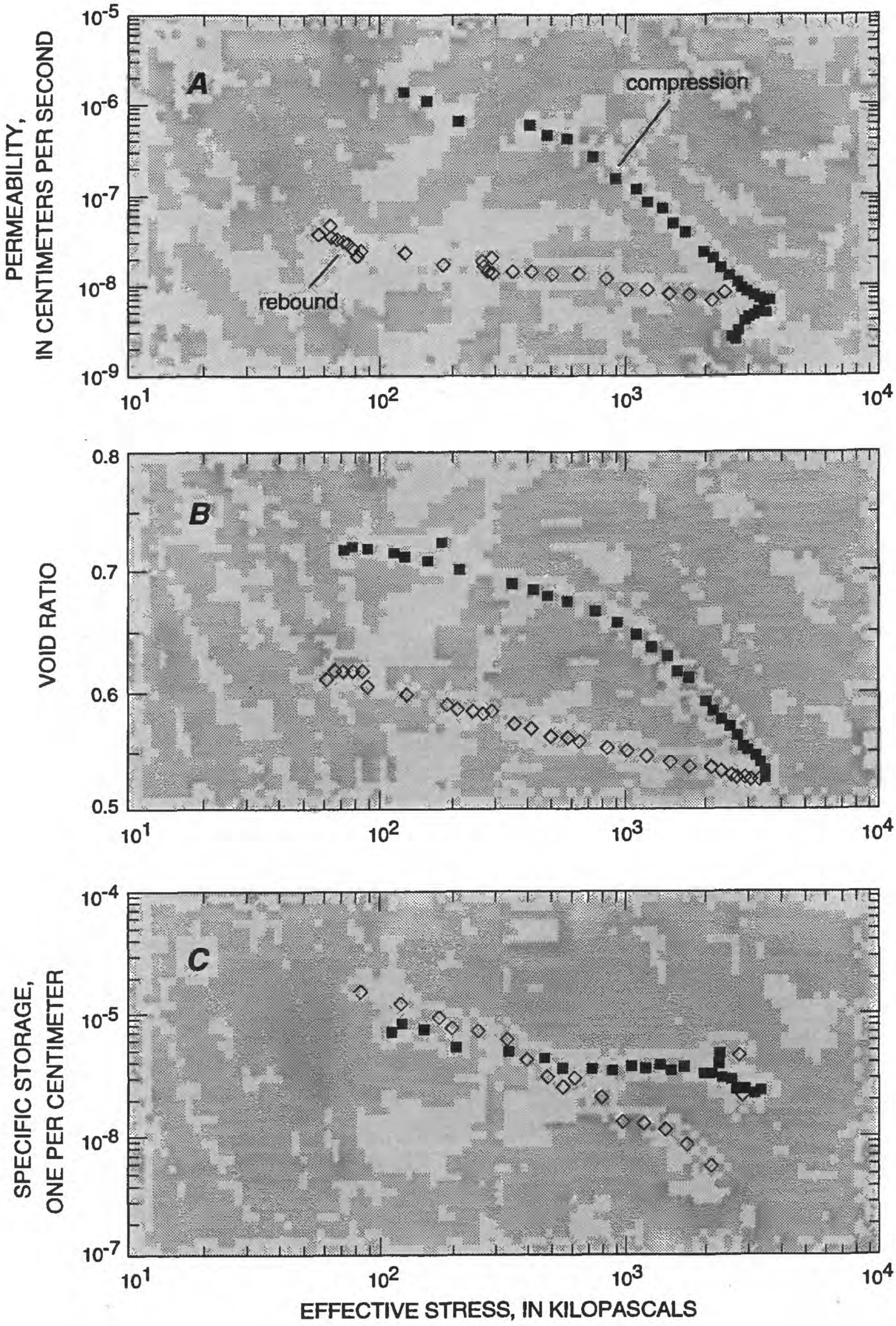


Figure 8. Permeability *(A)*, void ratio *(B)*, and specific storage *(C)* as functions of effective stress for the sample from the 301-foot depth from borehole 11N/1E-24Q9.

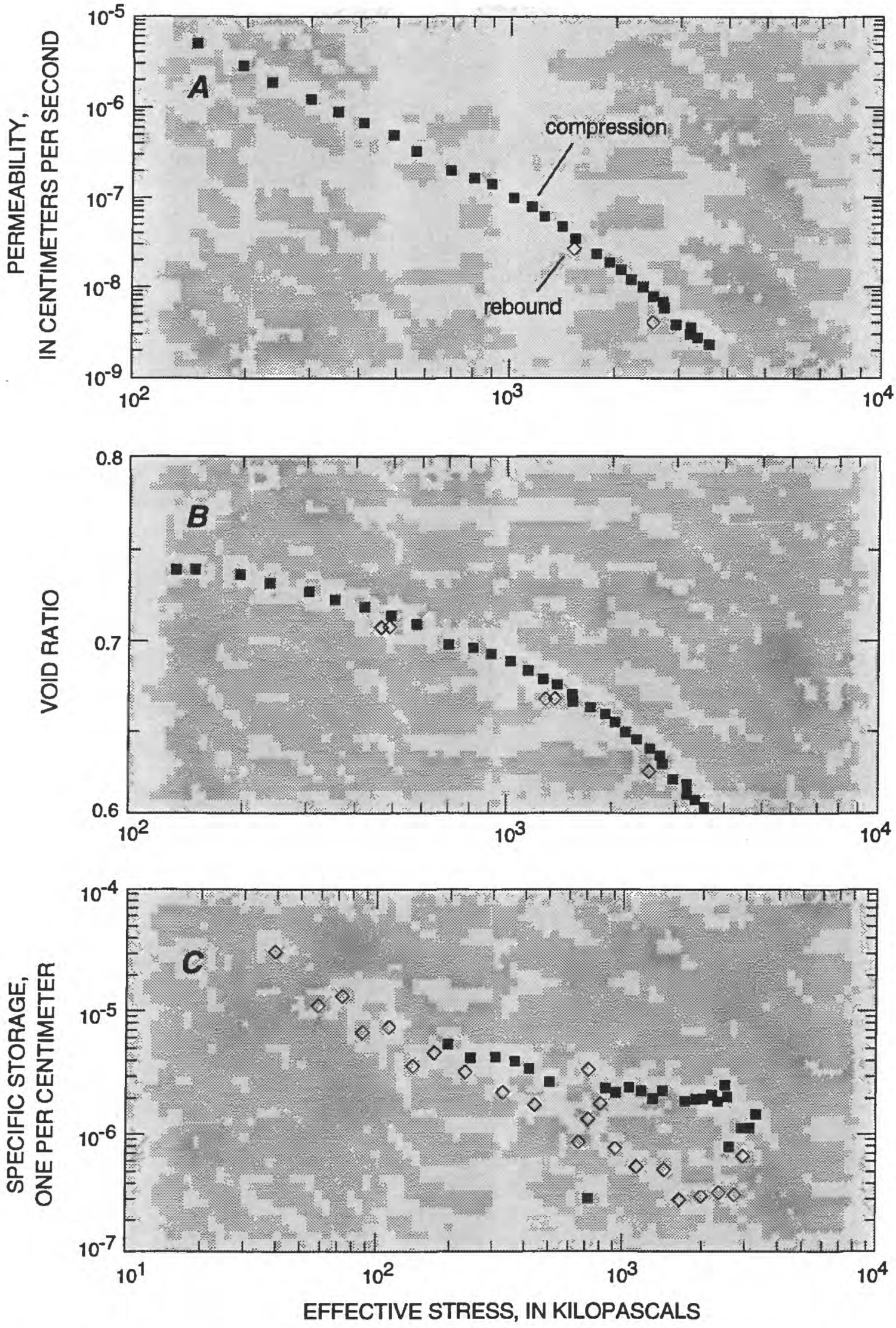


Figure 9. Permeability *(A)*, void ratio *(B)*, and specific storage *(C)* as functions of effective stress for the sample from the 474-foot depth in borehole 11N/1E-24Q9.

(most commonly used), and C for P5 were leveled in February 1991 from two nearby reference marks that had been leveled in August 1990. The land-surface elevation at P5 was 41.9 ft above sea level. Land-surface and measuring-point elevations were not adjusted by the amount of compaction recorded, but remained fixed for the period of record at the original elevations determined by spirit leveling.

WATER-LEVEL MONITORING WELLS

Construction

Four piezometers were constructed at different depths in the borehole drilled to 815 ft below land surface in December 1987 (fig. 10). The variety of depths in piezometers P1 through P4 allows monitoring of water levels at multiple zones in the partially confined aquifer. Construction characteristics of each well are shown in table 7. The surface casing for the borehole was set to 120 ft below land surface, and the borehole annulus was backfilled with cement. P1, P2, and P3 were constructed with 2-in.-diameter schedule 80 steel casing and stainless steel screens with wire-wrap 20-mm slotted perforations. The shallow well, P4, was constructed with 2-in.-diameter schedule 80 polyvinyl chloride (PVC) casing and screen. Information about extensometers in other subsidence areas (Riley, 1986) indicated that heavy-duty steel pipe, such as schedule 80 steel casing, minimizes the risk and incidence of casing failure or damage resulting from sediment-compaction stresses.

Examination of the geophysical logs run in this borehole and drillers' reports of other wells, filed with the California Department of Water Resources, provided information to characterize the local distribution of clay interbeds. Screens were placed at various depths to monitor the potentiometric heads that are representative of different degrees of confinement for the aquifer in this area. P1, the deepest well, is screened from 784 to 789 ft below land surface and gravel packed from 740 to 815 ft below land surface (table 7). P2 is screened from 583 to 588 ft below land surface and gravel packed from 540 to 640 ft below land surface. P3 is screened from 382 to 387 ft below land surface and gravel packed from 360 to about 440 ft below land surface. P4 is screened from 180 to 200 ft below land surface and gravel packed from 0 to 230 ft below land surface.

The borehole for P5 was sited at a right angle from the irrigation well relative to the other piezometers. P5 is constructed of 2-in.-diameter schedule 80 steel casing screened from 189 to 194 ft below land surface and gravel packed from 180 to 220 ft below land surface (fig. 11). Monthly (or less frequently) water-level measurements were made at this well in lieu of continuous monitoring.

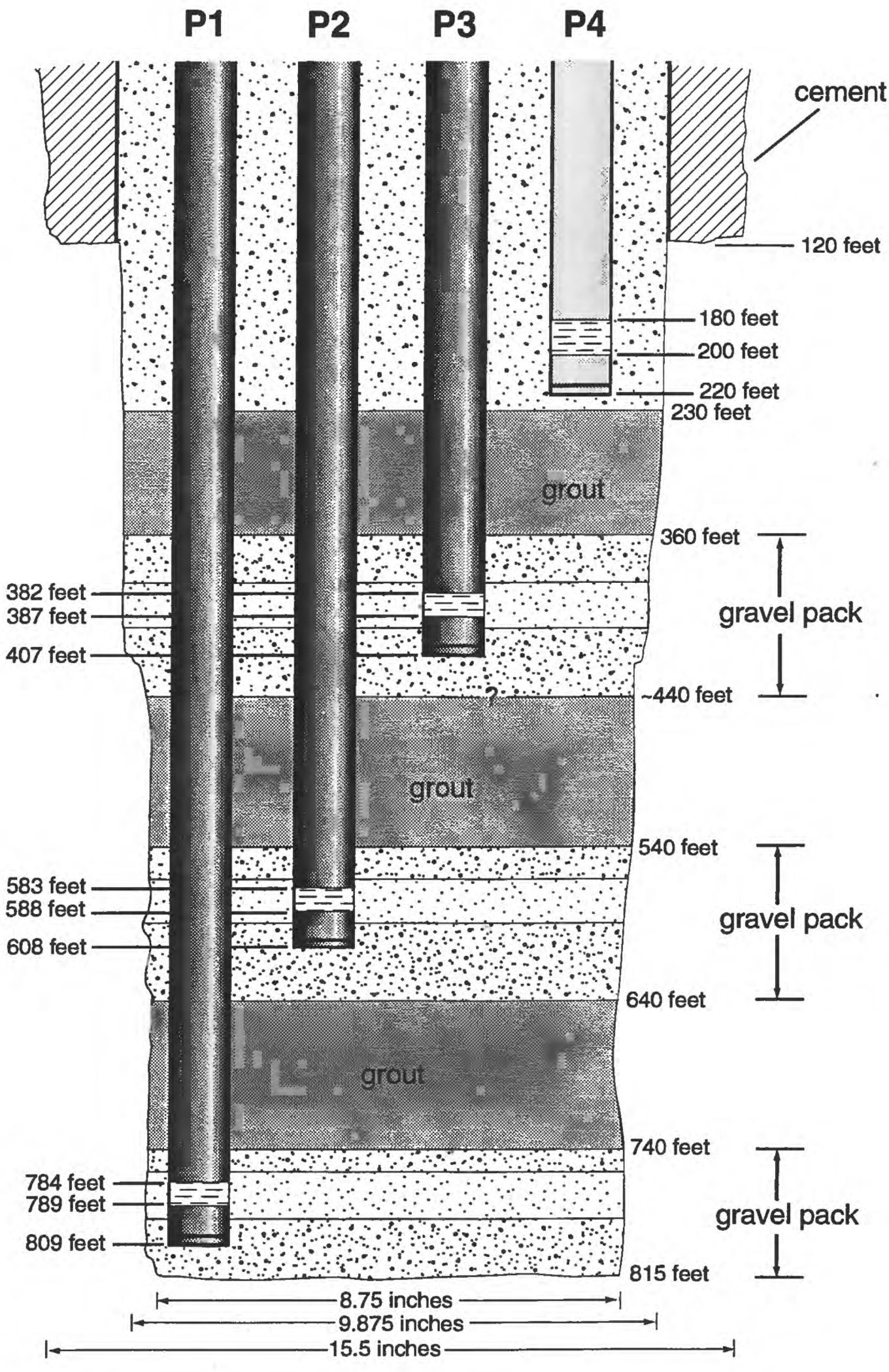
Instrumentation

Submersible pressure transducers were installed to measure water levels in each of the four nested piezometers in June 1988. Most of the transducers were a silicon strain-gauge type (Druck, model PDCR 830 series) and were referenced to the atmosphere by a breather tube so that the effect of barometric changes on potentiometric surfaces were incorporated into the measurement. In June 1991, a temperature-compensating transducer with serial-to-

Table 7. Construction characteristics of piezometers P1 through P5

[Values are depths in feet below land surface; PVC, polyvinyl chloride]

Characteristic	Piezometer				
	P1	P2	P3	P4	P5
Screened interval	784-789	583-588	382-387	180-200	189-194
Gravel-packed interval	740-815	540-640	360~440	0-230	180-220
Grouted interval(s)	640-740	~440-540	230-360		20-180, 220-474
Well depth	809	608	407	220	215
Casing material	Steel	Steel	Steel	PVC	Steel



NOT TO SCALE

Figure 10. Construction of nested piezometers P1 through P4.

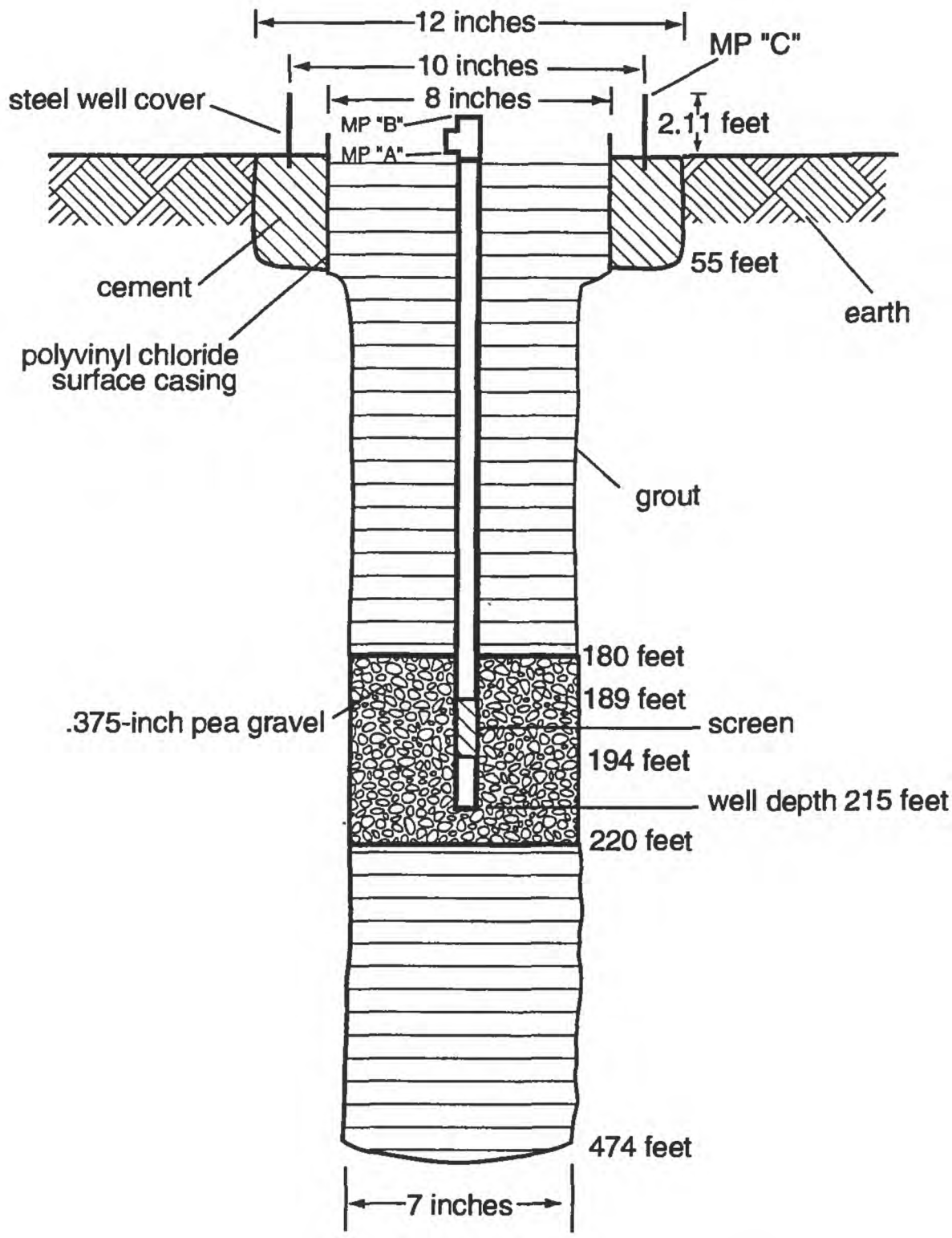


Figure 11. Construction of piezometer P5.

digital interface, 12-volt (SDI-12) output format capability was installed in P3. The sensors and datalogger were powered by two 9.5 ampere-hour 12-volt batteries wired in parallel, which were recharged by a solar panel.

The original water-level monitoring equipment included two transducers with a 0- to 15-lb/in^2 range (P1 and P2), and two with a 0- to 20-lb/in^2 range (P3 and P4), which is equivalent to a maximum pressure head of 34.6 and 46.2 ft of water, respectively. The range of water levels in the two shallower piezometers, which were strongly influenced by the adjacent irrigation well, was on the order of almost 150 ft between winter and summer water levels. Therefore, during the second year of monitoring water levels, the transducers in P3 and P4 were replaced with ones that have an operating range of 0 to 30 lb/in^2, equivalent to 69.2 ft of water. Transducers in all four piezometers had to be lowered and raised several times a year to accommodate the fluctuations in water levels and the sensing limitations of the transducers. The next higher range available in submersible transducers was 0 to 100 lb/in^2, and the resulting loss of precision was unacceptable.

Other research (Rosenberry, 1990) has documented an average absolute error, in comparison with steel-taped measurements, of nearly 0.10 ft for a dataset of 377 water-level measurements obtained under field conditions with submersible pressure transducers that have an operating range of 0 to 5 lb/in^2. It would be reasonable to conclude that water-levels measured with transducers having the same specifications, but ranges greater than 5 lb/in^2, similarly have an absolute error level of more than 0.10 ft. Therefore, an absolute error of at least ±0.05 ft is associated with these daily water levels. However, water-level data for P1 through P4 are published mostly to 0.01 ft because the relative error between consecutive (half-hour) measurements is on the order of 0.01 ft, according to manufacturer specifications. (In P2, P3, and P4, values greater than 69.99 ft were recorded to 0.1 ft rather than 0.01 ft for water year 1988 to reduce the demand on datalogger memory that the higher degree of precision required.)

The differential voltages of the transducers in P2 through P4 were measured using a six-wire, full-bridge configuration. Differential voltages of the transducer in P1 were measured using a half-bridge configuration because of the limited number of datalogger channels. A half-bridge configuration, which does not compensate for lead-length resistance, was acceptable for P1 because it had the transducer with the shortest cable. On June 18, 1991, a transducer with an SDI-12 communication port was installed in P3. The output from this sensor was recorded in a CR-10 data storage module (manufactured by Campbell Scientific, Inc.) and transferred directly into a mainframe computer.

Water-Level Data

The four nested piezometers (P1 through P4) are 100 ft southwest of an irrigation well (fig. 1) with a 50-horsepower pump. The well owner believes that the well is less than 250 ft deep. Water levels in the two shallower piezometers, P3 and P4, which are screened at 382 to 387 and 180 to 200 ft below land surface, respectively, are strongly influenced by pumping from the irrigation well. Throughout the period of record when the irrigation well was in use, the pump generally would be started at about 0700 hours (local time) and turned off at about 1530 hours if the pump was not operated at night. Water-level measurements at 0600 hours represented the maximum recovery and, thus, the most static water-level measurement possible on a daily basis during the summer pumping season. For this reason, the 0600-hour reading was the daily value chosen for publication rather than the mean daily water level.

The continuous-record tables and graphs in this report were generated using one value per day. Tables of recorded daily-value water levels and tables of periodic water-level measurements were prepared for the period of record, water years 1988-92, for P1 through P4 (wells 11N/1E-24Q4 through 24Q7) (tables 8-15, at back of report). The periodic water-level measurements made during water years 1990-92 at P5 (well 11N/1E-24Q9) are shown in table 16 (at back of report). The periodic measurements for P1 through P5 also have been published annually since 1989 in the USGS water-data reports (Lamb and others, 1989, 1990; Johnson and others, 1991, 1992; Johnson and Fong-Frydendal, 1993), but a few corrections to water-level values are not reflected in those publications. The water-level measurements made during station inspections (tables 8, 10, 12, and 14) are plotted on each hydrograph (figs. 12-16).

Ground-water levels were measured in the piezometers at the Woodland land-subsidence monitoring station from December 1987, when the first four wells were completed, to October 1992. Water levels were electronically measured and recorded throughout five summers and four winters of drought, and these levels reflect the influence of seasonal pumping for irrigation. State water officials had declared drought conditions for the period 1987-93. Water levels in the three shallower piezometers, P2 through P4, were lowest during the summer of 1990 and recovered the least during the following winter. Water levels in the deepest piezometer, P1, were lowest during the autumn of 1991 but, like the others, showed the least recovery during the winter of 1990-91. The lowest water levels in P1 occurred annually between mid-August and mid-September, whereas the lowest water levels in P2 through P5 generally occurred in mid-July. Data summaries based on examination of both field-measured and electronically-measured water levels for the period of record for the five piezometers follow.

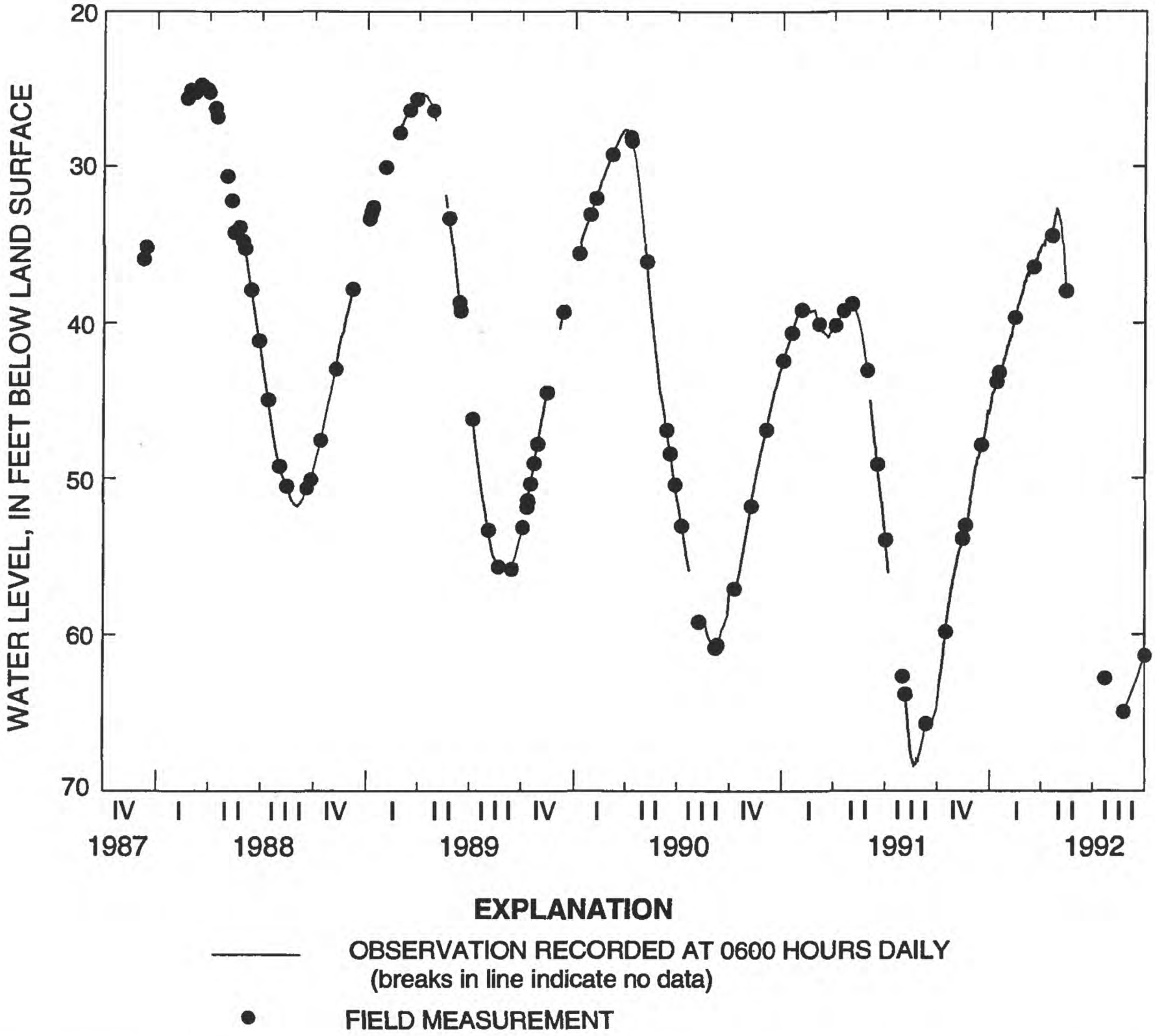


Figure 12. Period-of-record water levels for well 11N/1E-24Q4 (P1) at 0600 hours daily, water years 1988-92.

For water years 1988-92, water levels in P1, screened from 784 to 789 ft below land surface, fluctuated about 43 ft, between about 25 and 68 ft below land surface (tables 8 and 9). The lowest water level recorded per year declined about 16.7 ft (68.41–51.72 ft) between 1988 and 1991, whereas the highest water level declined about 14.0 ft (38.66–24.68 ft) between 1988 and 1991. In spring 1992, water levels in P1 were about 6 ft higher than they had been in 1991.

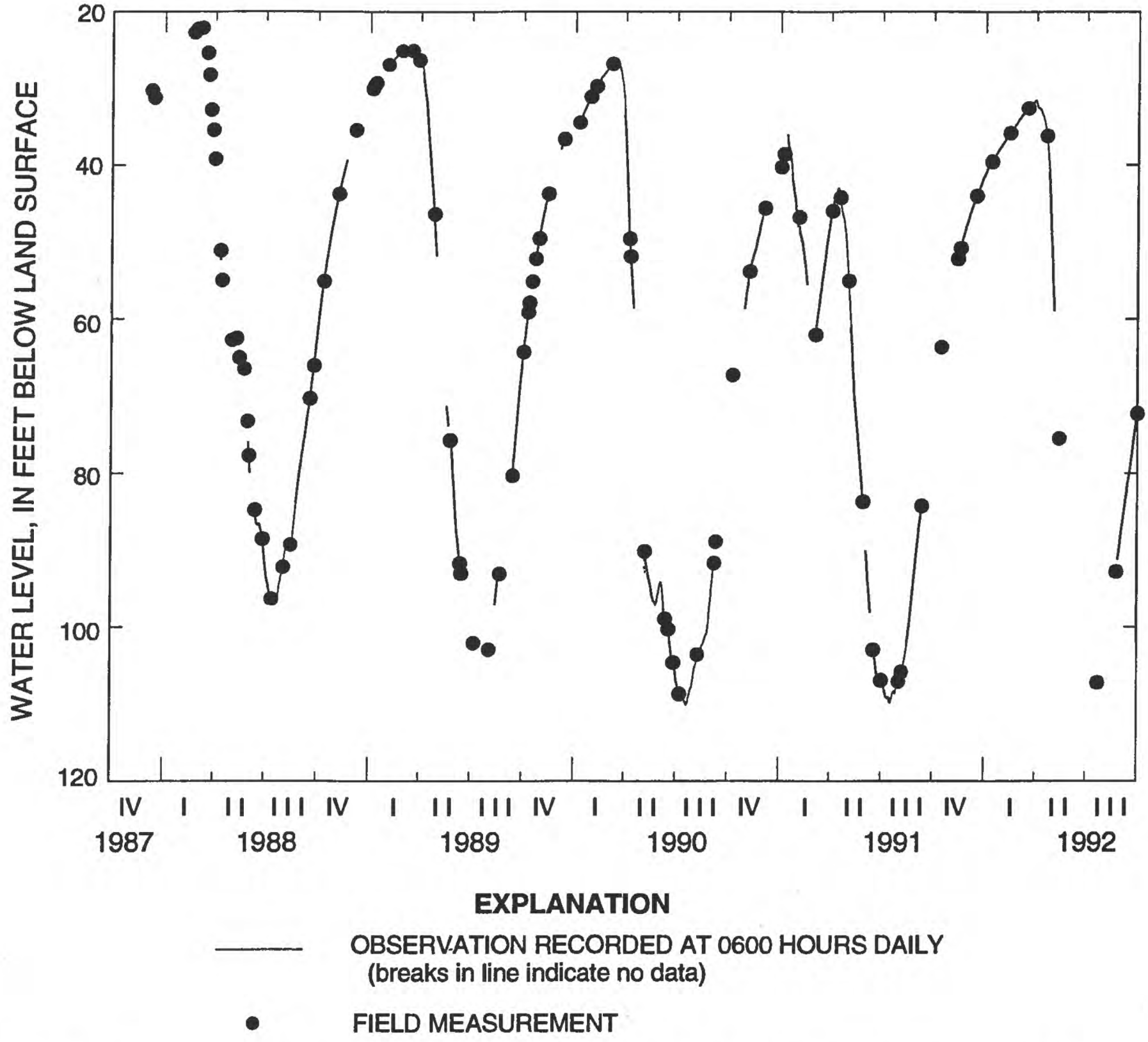


Figure 13. Period-of-record water levels for well 11N/1E-24Q5 (P2) at 0600 hours, water years 1988-92.

Water levels in P2, screened from 583 to 588 ft below land surface, fluctuated about 88 ft, between about 22 and 110 ft below land surface (tables 10 and 11). The lowest water levels were not measured in 1988 and 1989 because of malfunctions or inadequate cable length of the submersible transducer, but the low probably was not more than 100 and 105 ft below land surface, respectively. If so, the lowest water levels in subsequent years were on the order of 10 ft lower than in 1988. The highest water levels have declined about 9.5 ft (31.61–22.10 ft) between 1988 and 1992.

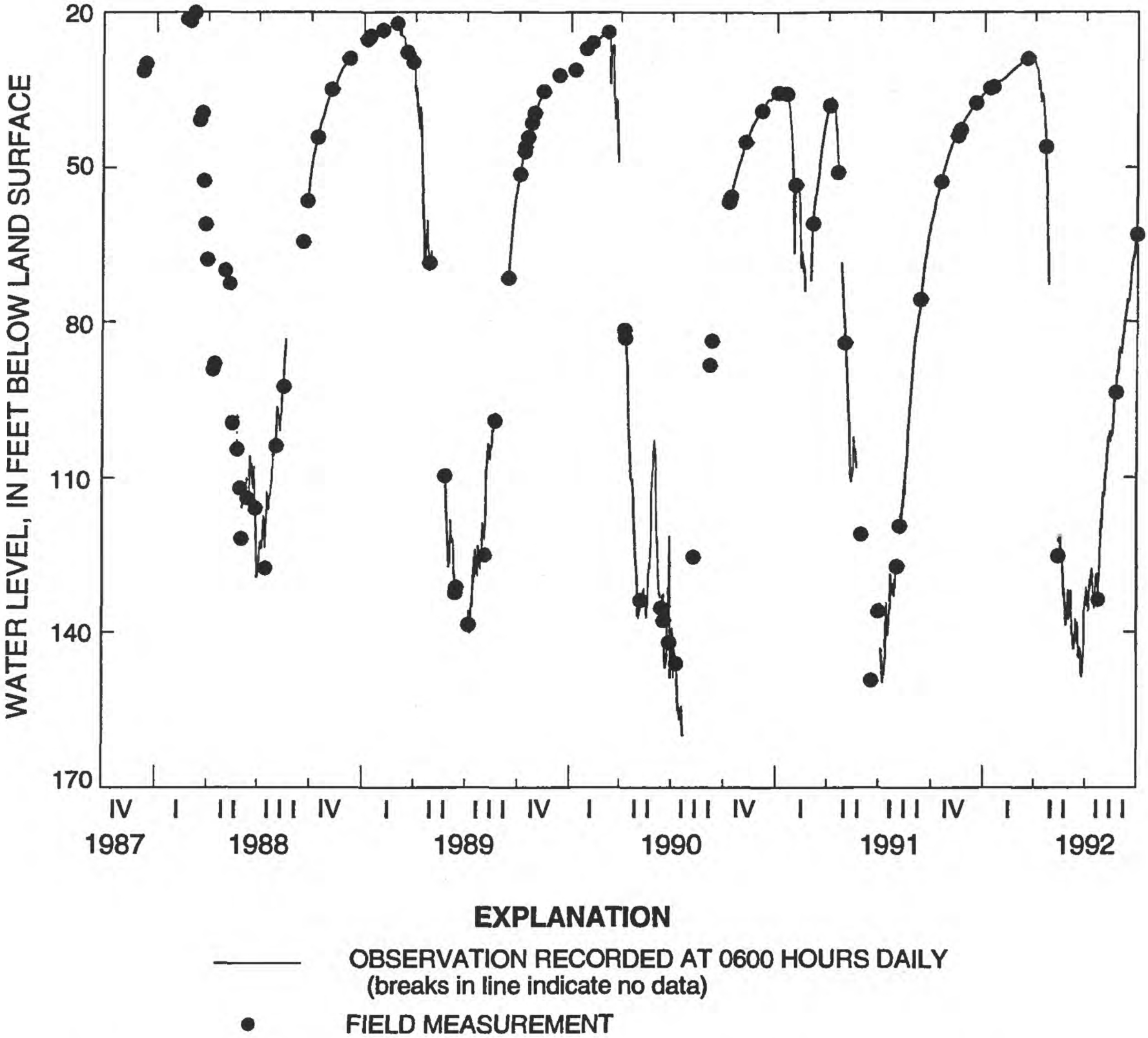


Figure 14. Period-of-record for well 11N/1E-24Q6 (P3) at 0600 hours daily, water years 1988-92.

Water levels in P3, screened from 382 to 387 ft below land surface, fluctuated about 140 ft, between about 20 and 160 ft below land surface (tables 12 and 13). The lowest water level in 1990 was not measured because of inadequate cable length for the submersible transducer, but the water level probably was not more than about 5 ft greater than the 160 ft recorded. The lowest water level recorded declined about 30.6 ft (159.85–129.2 ft) between 1988 and 1992, whereas the highest water level declined about 14.4 ft (34.49–20.08 ft) for the same period.

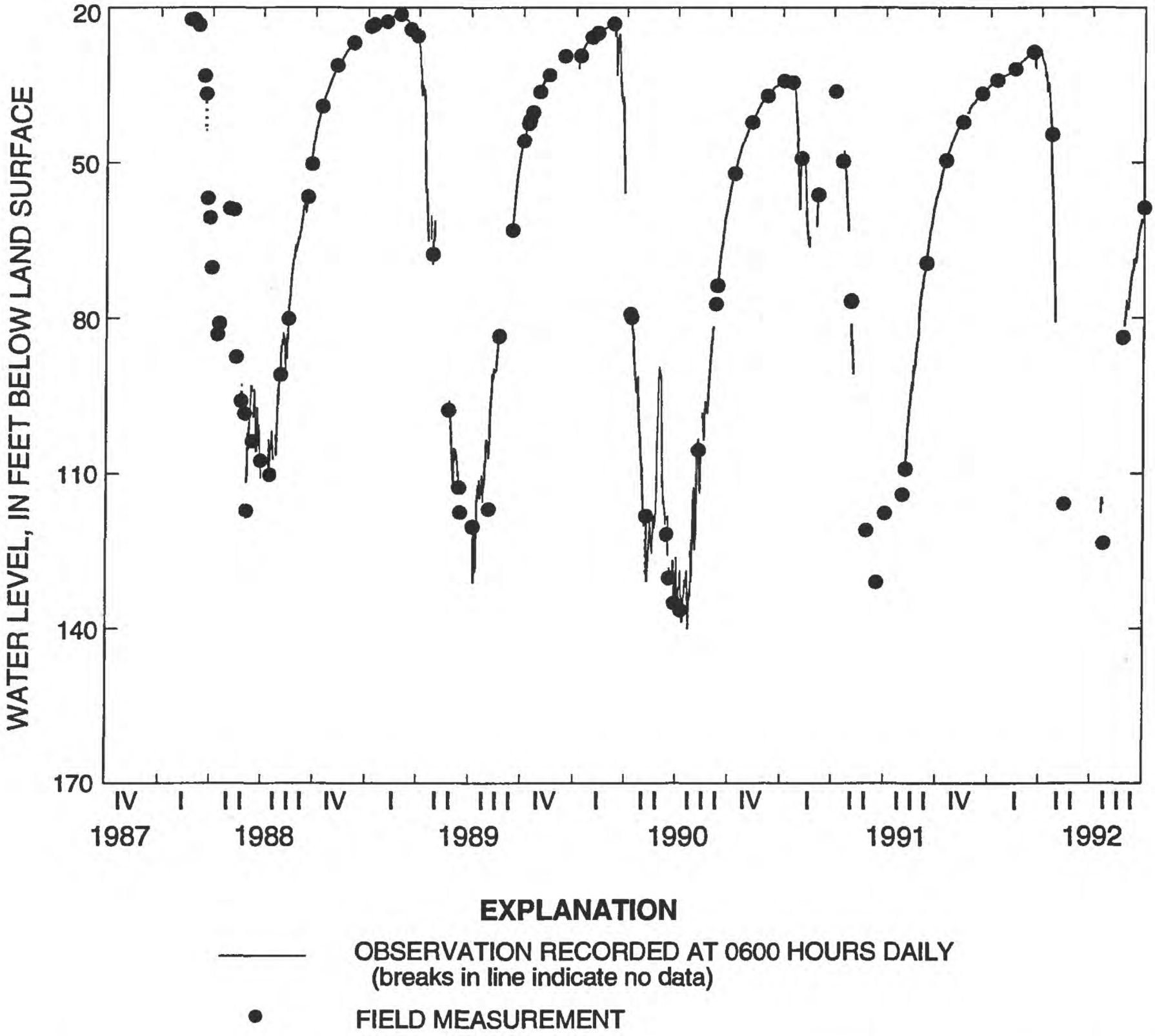


Figure 15. Period-of-record water levels for well 11N/1E-24Q7 (P4) at 0600 hours daily, water years 1988-92.

Water levels in P4, screened at 180 to 200 ft below land surface, fluctuated about 124 ft, between about 22 and 146 ft below land surface (tables 14 and 15). The lowest water levels probably were not measured in 1991 and 1992, but the decline between 1988 and 1990 was about 29 ft (146.45–117.24 ft). The decline in the highest water levels for the period of record was about 6.7 ft (27.97–21.31 ft).

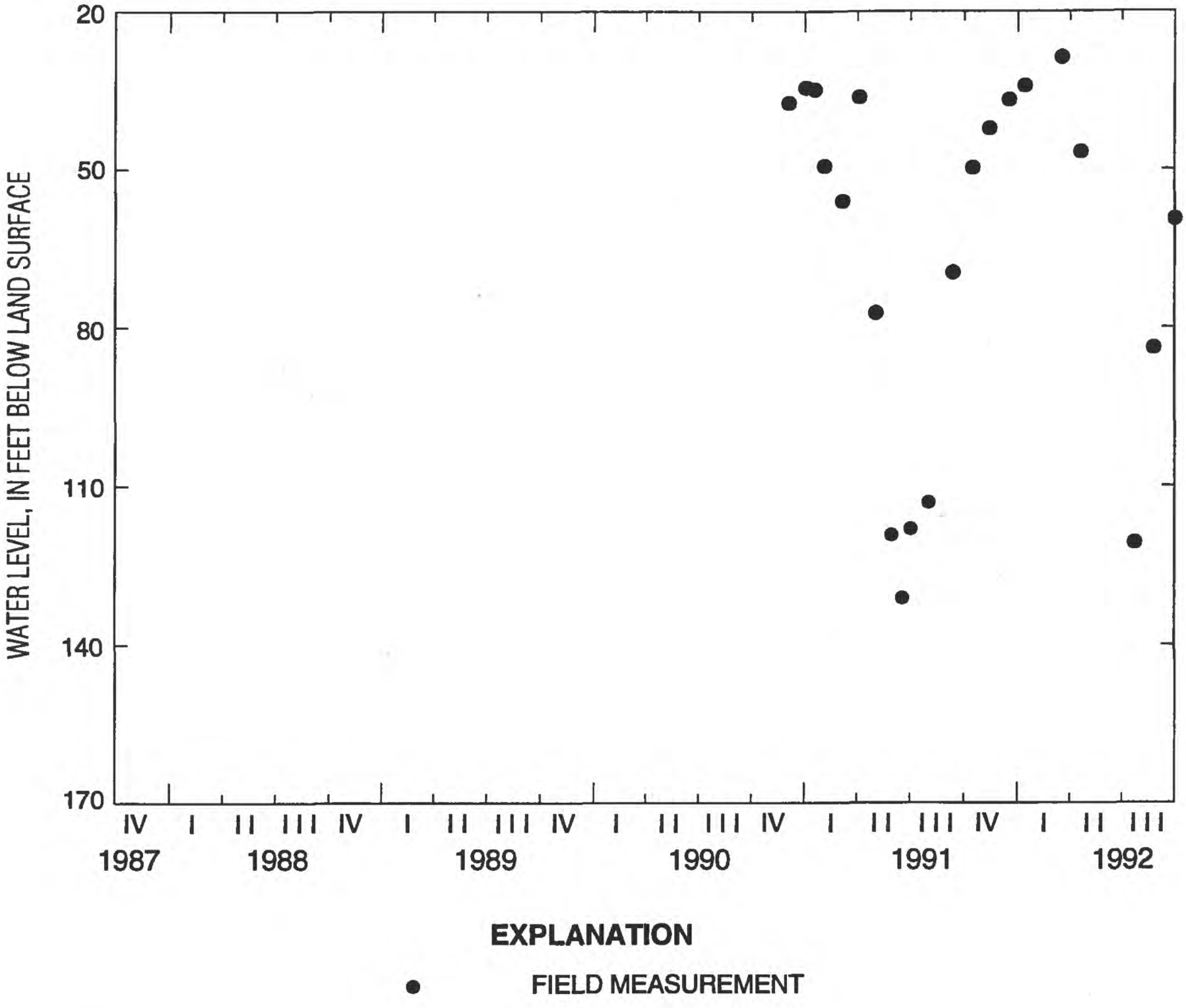


Figure 16. Periodic water levels in well 11N/1E-24Q9 (P5), water years 1991-92.

Water levels in P5, measured between 1991 and 1992, fluctuated about 103 ft, between 28.63 and 131.14 ft below land surface (table 16). P5 is screened from 189 to 194 ft below land surface, similar to the screened interval in P4, but P5 is farther from the irrigation well.

Water levels in piezometers P3 through P5 are influenced by the nearby irrigation well, so more variation occurs in the lowest water levels, which are measured during nonstatic conditions. Trends of the long-term effects of pumping stress on an aquifer are better represented by water levels in the recovery phase than those in the drawdown phase because they represent static or near-static conditions in the aquifer. However, knowledge of the lowest water levels in an aquifer is important with respect to the occurrence of sediment compaction and land subsidence. Compaction is induced when groundwater levels become lower than previous levels.

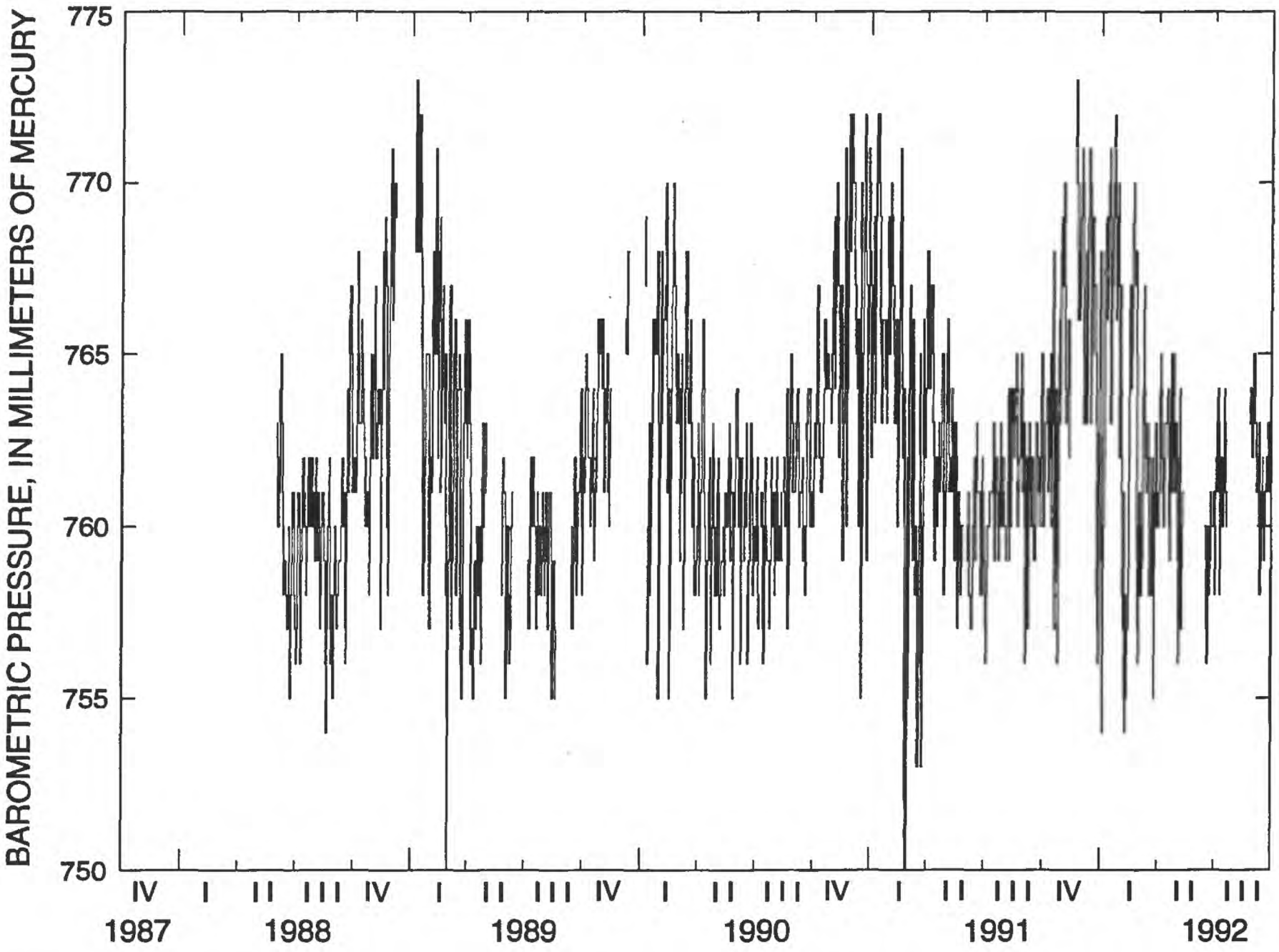


Figure 17. Mean daily barometric pressure at the study site, water years 1988-92.

Barometric-Pressure Data

Atmospheric pressure was monitored by a barometer inside the vented shelter. The barometer used a laser-trimmed, piezo-resistive sensing element to transform a change in atmospheric pressure in the 600 to 1,100 mb range into analog voltage. These data are reported as mean daily barometric pressure, in millimeters of mercury (table 17, at back of report; fig. 17).

EXTENSOMETER WELL

An extensometer was installed at the Woodland land-subsidence monitoring station to measure sediment compaction. Compaction is the decrease in the thickness of subsurface sediments, whereas subsidence is the lowering of land-surface elevations over a long-term period of time.

Construction

The extensometer well casing, extending to a depth of 1,001.5 ft below land surface, is embedded in a cement plug at the bottom of the borehole (fig. 18). Two cubic yards of 6-sack sand-slurry cement mix were pumped down the 2-in.-diameter extensometer casing to construct the plug at the bottom of the borehole. Extensometer wells are suitable as

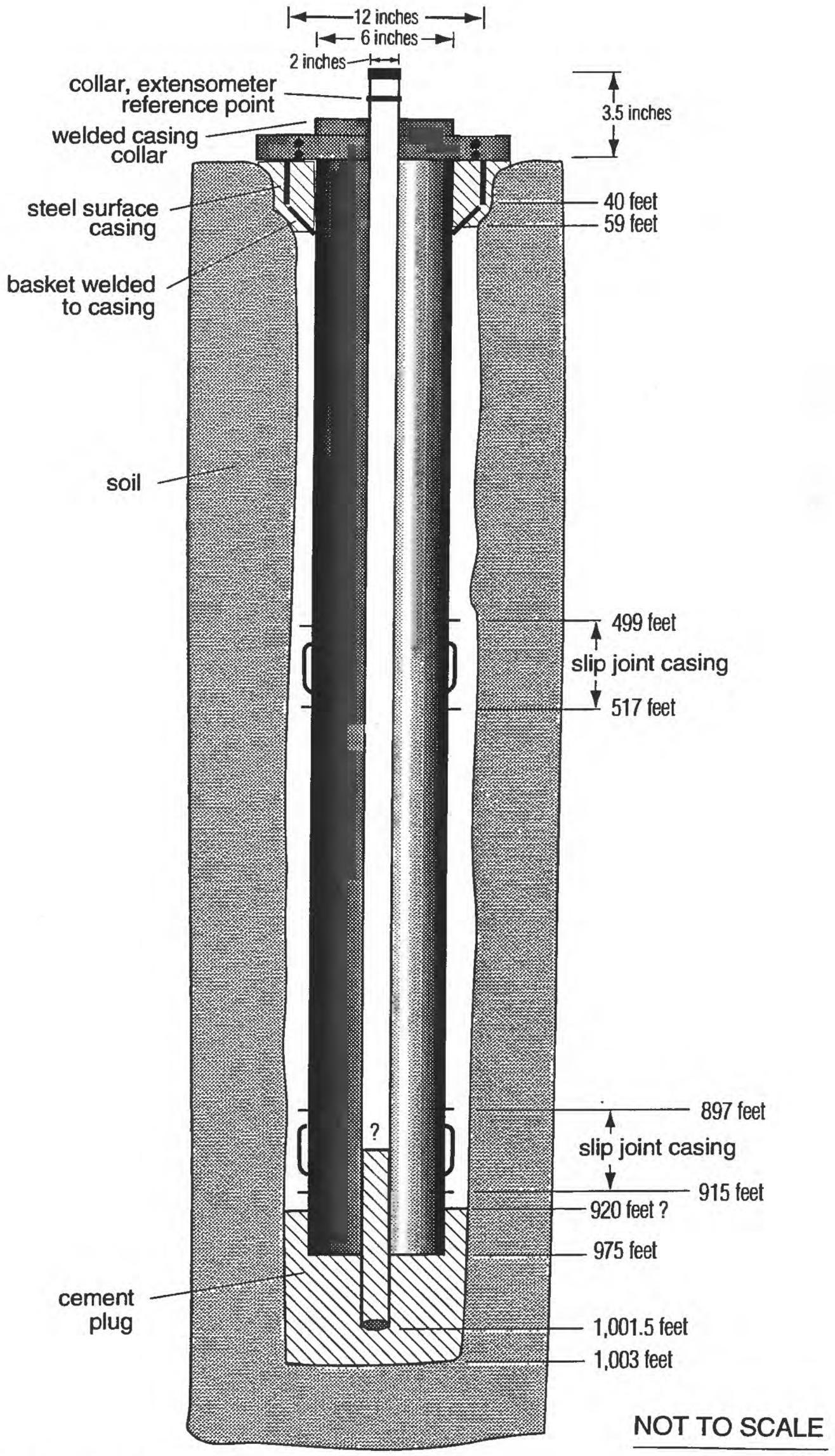


Figure 18. Construction of extensometer.

a stable geodetic bench mark relative to other vertical control marks in the region (Riley, 1986). Near the top of the extensometer well, a collar, consisting of two semicircular steel rings encompassing the 2-in.-diameter casing, was attached securely with hex bolts to serve as the permanent reference point of the extensometer. Negative skin friction on the extensometer casing (the pile effect) can result from the transmission of downward stresses in the vicinity of sediment compaction (Riley, 1986). The deleterious effect of these forces on the compaction record and the extensometer casing were eliminated by the installation of a protective 6-in.-diameter steel casing. The 6-in. casing string was modified to minimize the risk of rupture or other damage that could result from compression of sediments at depth. Two steel slip joints were installed in the casing string, one extending from 499 to 517 ft below land surface and the other from 897 to 915 ft below land surface (fig. 18). Each slip joint allows for 6 ft of casing-length reduction as the sediments above them compact and exert downward forces on the casing string.

To eliminate shallow sediment movement—another source of measurement noise—from the record, the 12-in.-diameter casing (installed to prevent contamination from the surface) and the two instrument table piers were surrounded by cardboard forms to decouple them from the concrete pad constructed for the shelter foundation (fig. 19). The extensometer measures the compaction of sediment between 1,000 ft below land surface and the bottom of the instrument table piers. This table is supported by two 3-in.-diameter steel piers, installed and cemented to a depth of 16 ft below land surface, 3 ft away from and along a plane perpendicular to the extensometer and fulcrum assembly. The balance beam fulcrum, with 82 lb of lead weights, counterbalances the weight of the extensometer casing and minimizes the possibility of the 2-in. casing fittings getting caught on the 6-in. casing joints if the larger diameter pipe moves up and down with the subsurface sediment (Riley, 1986).

Instrumentation

The movement of the instrument table, relative to the stable extensometer, was measured and recorded by analog (graphic) and digital methods. The analog record was made on graph paper when the pen of a Stevens Type F drum recorder reflected the movement of the recorder sheave, over which a thin beaded cable, affixed to the top of the extensometer casing, was threaded. An electronic transducer, a linear variable differential transformer (LVDT), with an output range of ±5 volts measured vertical movement. Voltage output varied as the transducer body, which is attached to a piece of angle aluminum affixed to the instrument table, moved vertically relative to the transducer core rods, which are connected to the extensometer on the counterweight side of the beaded cable. The voltage signals were converted to and recorded as an equivalent linear displacement relative to a zero initial value. Thus, the sediment-compaction data are cumulative values, relative to the first day of the period of record.

Sediment-Compaction Data

The most appropriate measurement of sediment compaction to publish was also the daily 0600-hour value (table 18, at back of report). Whenever a water-level trend was recorded in P3 and P4, the same trend was echoed by the sediment-compaction record within the hour. Thus, water-level and compaction values recorded simultaneously best represent similar aquifer-system conditions.

In this report, compaction values are cumulative net sediment compaction, beginning with the first day of measurement (June 15, 1988). The downward trend illustrated in figure 20 represents a downward direction of the land surface, and an upward trend is indicative of rebound. Positive values in the data tables indicate that the elevation of the land surface is higher than when monitoring began. Negative values are indicative that cumulative net compaction has exceeded rebound for the period of record ending on that date. In this dataset, rebound can be identified when a value for a preceding day is less (usually, more negative) than that of the subsequent day.

The elevation of the measuring point of the extensometer was determined in August 1988. The elevation of the collar was 43.98 ft above sea level, as determined by spirit leveling from origin bench mark T849, which had an elevation of 116.397 ft above sea level. The datum for sediment compaction data was not adjusted by the amount of compaction recorded. However, two datum shifts were applied so that the compaction data would be cumulative. As the instrument table subsided relative to the extensometer, the LVDT body had to be adjusted twice to give the LVDT core rods enough range during the 4^{+}-year period of data collection. Long

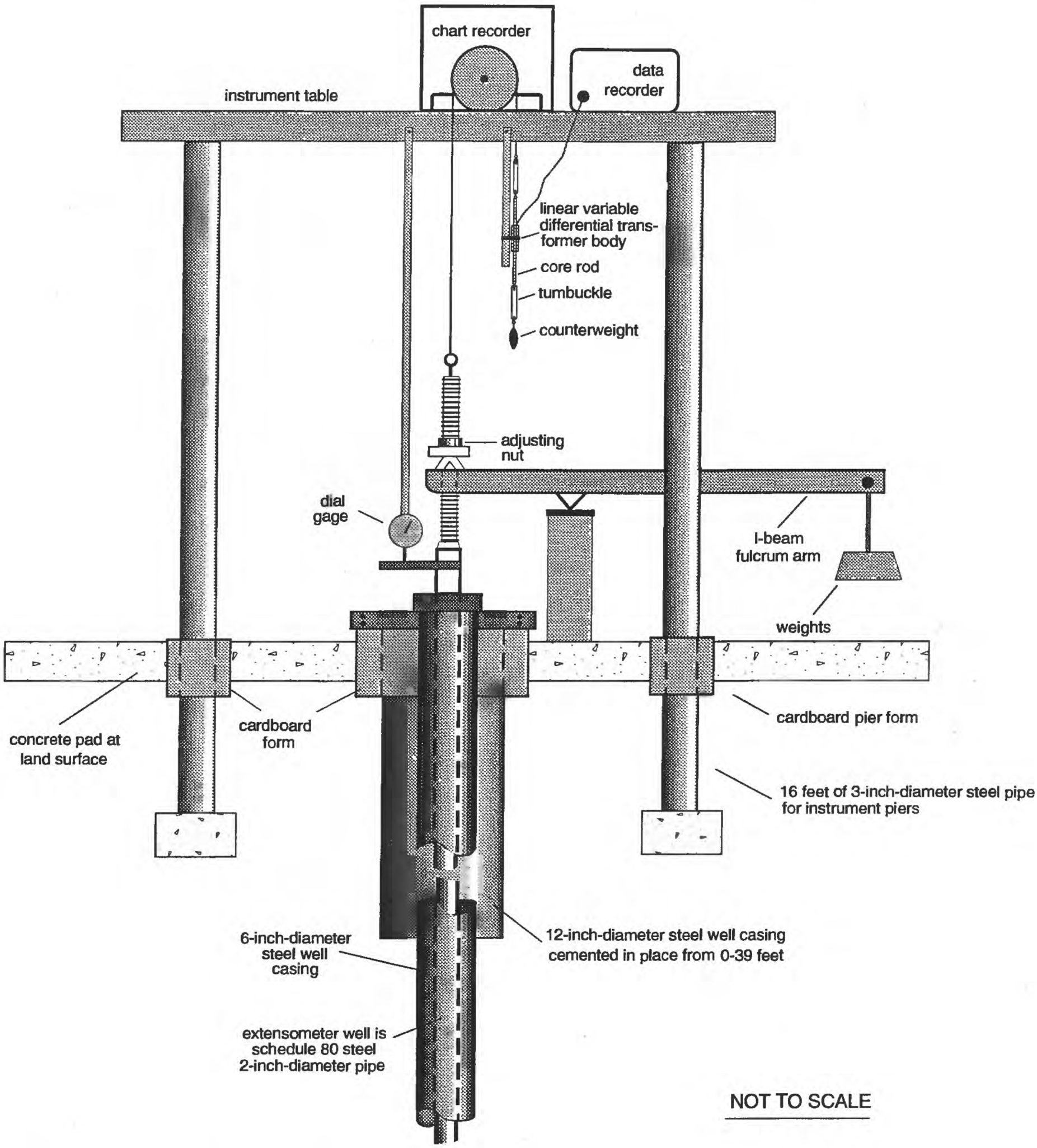


Figure 19. Instrumentation of the extensometer.

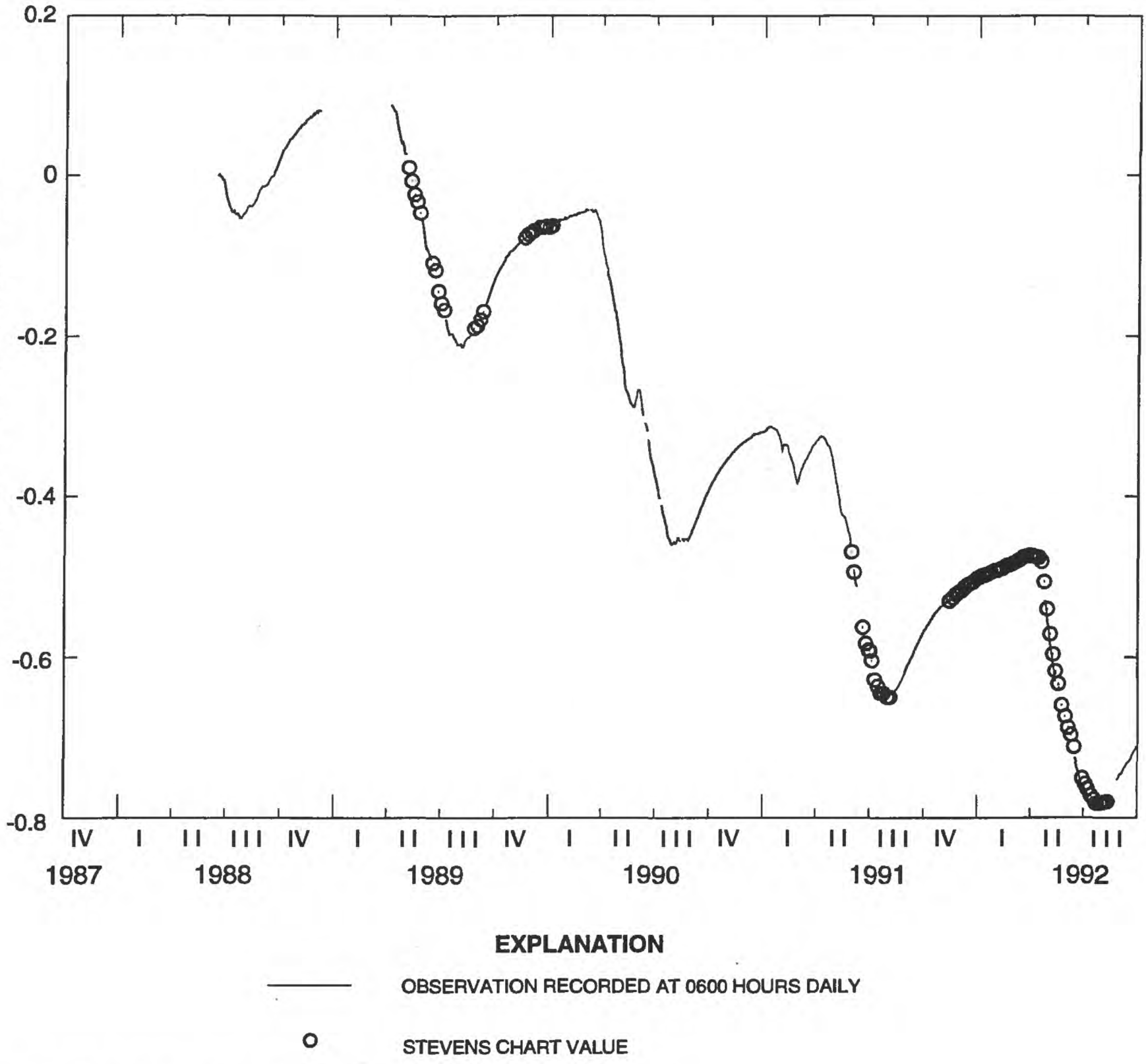


Figure 20. Cumulative net sediment compaction, water years 1988-92.

periods of missing digital record were supplemented by values computed from the Stevens drum recorder chart (table 19, at back of report).

Net sediment compaction of nearly 0.8 ft (table 18) has been measured by the extensometer at the Woodland land-subsidence monitoring station from June 15, 1988, through October 1, 1992. Compaction of 0.78 ft for the 51.5-month period corresponds to a net compaction rate of 0.015 ft/mo or 0.182 ft/yr. At this rate, compaction of more than 1.8 ft would occur in 10 years, a relatively high rate of compaction and related land subsidence.

On an annual basis, sediments rebounded each winter about half the amount of compaction that

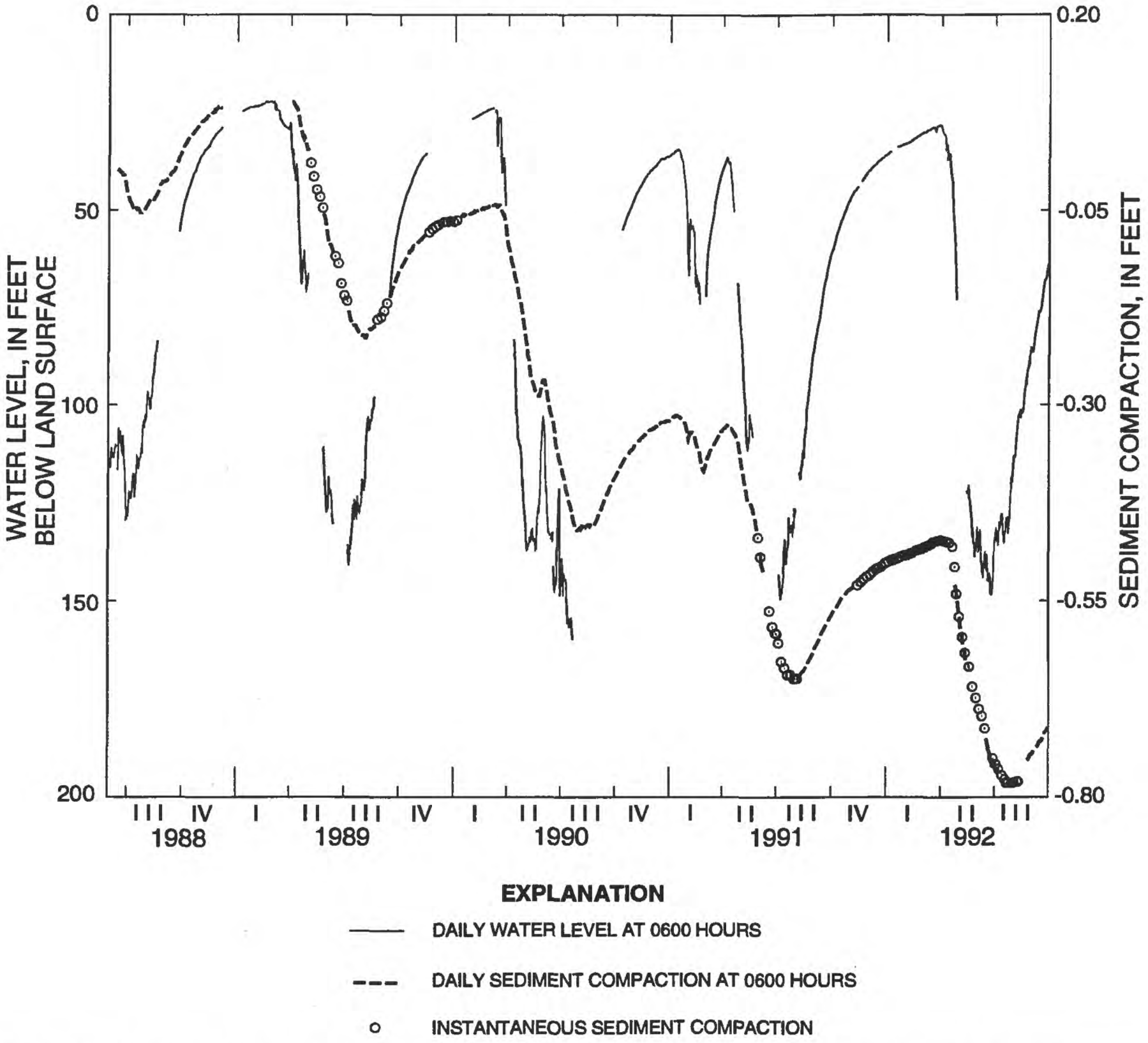


Figure 21. Cumulative net sediment compaction superimposed on hydrograph of well 11N/1E-24Q6 (P3), water years 1988-92.

had occurred during the previous summer (fig. 20). The full magnitude of compaction was not measured in 1989 because more rebound had occurred than was expected, and the LVDT body moved above the range of the core rods. The magnitude of compaction recorded in 1989 was 0.302 ft (0.088+ 0.214 ft); rebound the following winter was 0.171 ft (0.214–0.043 ft), which is 57 percent of the magnitude of the incompletely measured compaction. In 1990, the magnitude of compaction totaled 0.417 ft (0.460–0.043 ft); rebound the following winter was only 0.147 ft (0.460–0.313 ft), which is 35 percent of the compaction. The graphic record (fig. 20) shows a bimodal peak for rebound during spring 1991; similar bimodal peaks are in all the hydrographs for the same period. Frequent and significant precipitation occurred during March, allowing irrigators to stop pumping ground water until April. The sediment-compaction record mirrored the timing of the changes in ground-water levels (fig. 21) and is especially distinct for this period. In 1991, the magnitude of compaction totaled 0.337 ft (0.650–0.313 ft); re-bound the following winter was 0.177 ft (0.650–0.473 ft), which is 53 percent of the compaction. In 1992, the magnitude of compaction totaled 0.309 ft (0.782–0.473 ft); measurements

were discontinued at the end of the water year, after the maximum magnitude of compaction had occurred that year.

SUMMARY

A variety of data were collected at the Woodland-subsidence monitoring station for water years 1988-92. During drilling operations, lithologic and geophysical logs were generated to characterize sediment types. Geophysical logs included spontaneous potential, 64-inch and 16-inch normal resistivity, natural gamma, and caliper. Further detail about the physical and hydraulic characteristics of the subsurface soil was obtained by geotechnical laboratory testing of four sediment cores sampled at 137, 151, 301, and 474 feet below land surface. Attributes measured included Atterberg limits, water content, void ratio, final sample dimensions, and grain-size distribution. Hydraulic characteristics measured during a volume-controlled consolidation test for each sample included void ratio, permeability, vertical effective stress, compressibility, and specific storage as functions of elapsed time.

Five piezometers and an extensometer were constructed in three boreholes. Sensors were installed in four of the piezometers and at the extensometer to measure and record water levels, barometric pressure, and sediment compaction every half hour. Daily values of these measurements are presented in graphic and tabular form in this report, as are the monthly water-level measurements. Between 1988 and 1992, static water levels in the four piezometers declined between 6 and 15 feet during the non-pumping season. Water levels in the fifth piezometer were measured for only 2 years, so a long-term trend could not be defined.

Cumulative net sediment compaction of 0.78 feet was measured at the extensometer between June 15, 1988, and October 1, 1992. At this rate, net compaction of more than 1.8 feet would occur in 10 years. Each winter, as water levels recovered, the amount of sediment rebound varied between 35 and 57 percent of compaction measured during the previous summer. Sediment compaction of between 0.30 and 0.42 feet occurred in the summers of 1989, 1990, and 1991, and rebound of between 0.15 and 0.18 feet occurred in the succeeding winters, resulting in an average net compaction of more than 0.18 feet per year.

REFERENCES CITED

Blodgett, J.C., Ikehara, M.E., and Williams, G.E., 1990, Monitoring land subsidence in Sacramento Valley, California, using GPS: ASCE Journal of Surveying Engineering, v. 116, no. 2, p. 112-130.

County of Yolo, 1994, Agricultural production of Yolo County for calendar year 1993: Woodland, Calif., 8 p.

Geological Society of America, 1980, Rock-color chart: Boulder, Colo., Geological Society of America.

Gill, J.D., Olsen, H.W., Nelson, K.R., 1991, Volume-controlled approach for direct measurements of compressibility and hydraulic conductivity: Geotechnical Engineering Congress, American Society of Civil Engineers, Geotechnical Special Publication no. 27, p. 1100-1111.

Ikehara, M.E., 1994, Global Positioning System surveying to monitor land subsidence in Sacramento Valley, California, USA: Hydrological Sciences Journal, v. 39, no. 5, p. 417-429.

Johnson, J.A., and Fong-Frydendal, L.J., 1993, Water resources data—California, water year 1992. Volume 5. Ground-water data for California: U.S. Geological Survey Water-Data Report CA-92-5, 443 p.

Johnson, J.A., Fong-Frydendal, L.J., and Baker, J.B., 1991, Water resources data—California, water year 1990 Volume 5. Ground-water data for California: U.S. Geological Survey Water-Data Report CA-90-5, 387 p.

Johnson, J.A., Fong-Frydendal, L.J., and Baker, J.B., 1992, Water resources data—California, water year 1991. Volume 5. Ground-water data for California: U.S. Geological Survey Water-Data Report CA-91-5, 427 p.

Lamb, C.E., Fogelman, R.P., and Grillo, D.A., 1989, Water resources data—California, water year 1988. Volume 5. Ground-water data for California: U.S. Geological Survey Water-Data Report CA-88-5, 357 p.

Lamb, C.E., Johnson, J.A., Fogelman, R.P., and Grillo, D.A., 1990, Water resources data—California, water year 1989. Volume 5. Ground-water data for California: U.S. Geological Survey Water-Data Report CA-89-5, 385 p.

Lofgren, B.E., and Ireland, R.L., 1973, Preliminary investigation of land subsidence in the Sacramento Valley, California: U.S. Geological Survey Open-File Report, 32 p.

Riley, F.S., 1986, Developments of borehole extensometry *in* Johnson, A.I., Carbognin, Laura, and Ubertini, L., eds., Land subsidence: International Association of Hydrological Sciences Publication no. 151, 939 p.

Rosenberry, D.O., 1990, Effect of sensor error on interpretation of long-term water-level data: Groundwater, v. 28, no. 6, p. 927-936.

Yolo County Water Task Force, 1984, Yolo County water plan, 1984: Woodland, Calif., 24 p.

(page 31 follows)

TABLES

(page 33 follows)

Table 5. *Key to properties measured in consolidation and permeability tests on sediment samples*

[(c), calculated; k/Pa, kilopascal; lb/in^2, pound per square inch; LVDT, linear variable differential transformer; (m), measured]

Time (m)	from real time on first day of test (hours)
Sample thickness (c)	(LVDT reading)(LVDT slope) + intercept from LVDT calibration
Void ratio, e (c)	(height of sample - height of solids)/(height of solids)
Head difference (m)	head drop across the sample
Flowrate, Q (m)	flowrate used to conduct permeability test
Permeability (c)	(Q/head difference)(sample thickness/cross-sectional area)
Vertical effective stress	
(m)	pressure on piston in contact with sample (lb/in^2)
(c)	effective stress on sample (k/Pa)
	Real vertical effective stress on the sample is about two times the measured effective stress because the area of the piston in contact with the sample is approximately half the area of the bottom of the loading chamber.
Compressibility (c)	(e1 - e2)/(effective stress 1 - effective stress 2), [equivalent to the slope of the "void ratio versus effective stress" curve as shown in figures 6*B*, 7*B*, 8*B*, and 9*B*]
Specific storage (c)	(compressibility)(specific gravity of water)/(1+e) [see void ratio]

Table 6. Consolidation and permeability test data and associated calculated hydraulic data for cores sampled in borehole 11N/1E-24Q9 at 137, 151, 301, and 474 feet below land surface

[cm, centimeter; cm/s, centimeter per second; cm^3/s, cubic centimeters per second; k/Pa, kilopascal; lb/in^2, pound per square inch; --, no data]

Time (hours)	Sample thickness, (cm)	Void ratio	Head difference (lb/in^2)	Flowrate (cm^3/s)	Perme-ability (cm/s)	Vertical effective stress		Compress-ibility ($1/lb/in^2$)	Specific storage (1/cm)
						Measured (lb/in^2)	Calculated (k/Pa)		
					137 feet				
2.0	1.447	0.880	--	--	--	5.39	69.646	--	--
3.0	1.447	.880	--	--	--	5.20	67.191	--	--
4.0	1.447	.880	--	--	--	5.20	67.191	--	--
5.0	1.447	.880	--	--	--	5.13	66.286	--	--
6.0	1.447	.880	--	--	--	5.11	66.028	--	--
7.0	1.447	.880	--	--	--	5.07	65.511	--	--
8.0	1.447	.880	--	--	--	5.18	66.932	--	--
9.0	1.447	.880	--	--	--	5.29	68.354	--	--
10.0	1.447	.880	--	--	--	5.15	66.545	--	--
11.0	1.447	.880	--	--	--	5.17	66.803	--	--
12.0	1.447	.880	--	--	--	5.12	66.157	--	--
13.0	1.447	.880	--	--	--	5.24	67.707	--	--
14.0	1.447	.880	--	--	--	5.02	64.865	--	--
15.0	1.447	.880	--	--	--	5.24	67.707	--	--
16.0	1.447	.880	--	--	--	5.21	67.320	--	--
17.0	1.447	.880	--	--	--	5.21	67.320	--	--
18.0	1.447	.880	--	--	--	5.14	66.415	--	--
19.0	1.447	.880	--	--	--	5.13	66.286	--	--
19.4	1.447	.880	--	--	--	5.14	66.415	--	--
19.5	1.442	.874	--	--	--	5.15	66.545	--	--
19.6	1.442	.874	--	--	--	5.50	71.067	--	--
20.7	1.442	.874	--	--	--	5.39	69.646	--	--
21.4	1.442	.874	--	--	--	5.51	71.196	--	--
22.8	1.442	.874	0.42	7.55×10^{-4}	1.16×10^{-6}	5.62	72.618	--	--
23.1	1.442	.874	--	--	--	--	--	--	--
24.2	1.437	.868	.24	3.78×10^{-4}	1.02×10^{-6}	8.40	108.539	1.02×10^{-3}	7.79×10^{-6}
25.8	1.433	.862	.33	3.78×10^{-4}	7.36×10^{-7}	11.59	149.758	1.04×10^{-3}	7.92×10^{-6}
27.4	1.428	.856	.40	3.78×10^{-4}	6.05×10^{-7}	14.74	190.459	1.26×10^{-3}	9.66×10^{-6}
29.5	1.419	.844	.53	3.78×10^{-4}	4.54×10^{-7}	19.92	257.392	8.94×10^{-4}	6.89×10^{-6}
32.0	1.409	.831	.66	3.78×10^{-4}	3.62×10^{-7}	27.23	351.846	8.33×10^{-4}	6.47×10^{-6}
34.5	1.400	.819	.88	3.78×10^{-4}	2.70×10^{-7}	35.07	453.149	8.92×10^{-4}	6.97×10^{-6}
37.0	1.390	.807	1.10	3.78×10^{-4}	2.14×10^{-7}	42.39	547.733	8.91×10^{-4}	7.01×10^{-6}
39.5	1.381	.795	1.26	3.78×10^{-4}	1.86×10^{-7}	49.72	642.445	8.62×10^{-4}	6.83×10^{-6}
42.1	1.372	.782	1.58	3.78×10^{-4}	1.47×10^{-7}	57.30	740.389	8.88×10^{-4}	7.08×10^{-6}
44.4	1.362	.770	1.89	3.78×10^{-4}	1.22×10^{-7}	64.66	835.489	9.04×10^{-4}	7.26×10^{-6}
46.8	1.353	.758	1.03	1.51×10^{-4}	8.91×10^{-8}	71.89	928.910	6.82×10^{-4}	5.51×10^{-6}
48.4	1.348	.752	1.17	1.51×10^{-4}	7.81×10^{-8}	76.68	990.803	6.99×10^{-4}	5.68×10^{-6}
49.8	1.343	.746	1.30	1.51×10^{-4}	7.01×10^{-8}	81.35	1,051.145	6.72×10^{-4}	5.47×10^{-6}
51.4	1.339	.740	1.45	1.51×10^{-4}	6.26×10^{-8}	86.21	1,113.943	1.26×10^{-3}	1.03×10^{-5}
52.8	1.329	.727	.82	7.55×10^{-5}	5.50×10^{-8}	91.40	1,181.004	--	--
53.2	--	--	--	--	--	92.90	1,200.386	--	--
54.4	1.329	.727	.88	7.55×10^{-5}	5.12×10^{-8}	96.63	1,248.582	--	--
55.8	1.323	.719	.96	7.55×10^{-5}	4.67×10^{-8}	101.75	1,314.739	9.03×10^{-4}	7.47×10^{-6}
57.4	1.315	.709	1.03	7.55×10^{-5}	4.33×10^{-8}	107.54	1,389.553	5.99×10^{-4}	4.99×10^{-6}
58.8	1.310	.703	1.13	7.55×10^{-5}	3.93×10^{-8}	112.99	1,459.974	5.22×10^{-4}	4.36×10^{-6}
60.4	1.307	.699	1.20	7.55×10^{-5}	3.69×10^{-8}	117.37	1,516.569	6.96×10^{-4}	5.83×10^{-6}
61.8	1.301	.691	1.32	7.55×10^{-5}	3.34×10^{-8}	123.47	1,595.389	4.75×10^{-4}	3.99×10^{-6}
63.4	1.296	.685	1.54	7.55×10^{-5}	2.85×10^{-8}	130.35	1,684.287	--	--
64.8	1.292	.678	1.64	7.55×10^{-5}	2.67×10^{-8}	136.46	1,763.236	--	--
66.4	1.287	.672	1.79	7.55×10^{-5}	2.44×10^{-8}	130.38	1,684.675	--	--
67.8	1.282	.666	1.83	7.55×10^{-5}	2.38×10^{-8}	147.49	1,905.758	1.81×10^{-3}	1.55×10^{-5}
69.4	1.278	.660	2.16	7.55×10^{-5}	2.01×10^{-8}	149.29	1,929.016	2.93×10^{-4}	2.51×10^{-6}

Table 6. Consolidation and permeability test data and associated calculated hydraulic data for cores sampled in borehole 11N/1E24Q9 at 137, 151, 301, and 474 feet below land surface--*Continued*

Time (hours)	Sample thickness, (cm)	Void ratio	Head difference (lb/in^2)	Flowrate (cm^3/s)	Perme-ability (cm/s)	Vertical effective stress		Compress-ibility ($1/lb/in^2$)	Specific storage (1/cm)
						Measured (lb/in^2)	Calculated (k/Pa)		
137 feet--*Continued*									
70.8	1.273	0.654	2.23	7.55×10^{-5}	1.94×10^{-8}	160.44	2,073.088	3.95×10^{-4}	3.39×10^{-6}
72.4	1.268	.648	2.43	7.55×10^{-5}	1.77×10^{-8}	168.71	2,179.947	--	--
73.8	1.263	.642	2.73	7.55×10^{-5}	1.57×10^{-8}	176.53	2,280.992	--	--
75.4	1.259	.636	3.04	7.55×10^{-5}	1.40×10^{-8}	170.22	2,199.458	--	--
76.1	1.254	.630	--	--	--	186.54	2,410.333	--	--
76.6	1.254	.630	3.42	7.55×10^{-5}	1.24×10^{-8}	188.04	2,429.715	--	--
77.0	1.254	.630	--	--	--	183.67	2,373.249	--	--
77.6	1.254	.630	--	--	--	180.94	2,337.974	--	--
78.4	1.254	.630	3.42	7.55×10^{-5}	1.24×10^{-8}	178.16	2,302.053	--	--
79.8	1.254	.630	3.49	7.55×10^{-5}	1.22×10^{-8}	175.56	2,268.458	--	--
81.4	1.254	.630	3.50	7.55×10^{-5}	1.21×10^{-8}	173.63	2,243.520	--	--
82.8	1.254	.630	3.58	7.55×10^{-5}	1.19×10^{-8}	172.54	2,229.436	--	--
84.4	1.254	.630	3.56	7.55×10^{-5}	1.19×10^{-8}	171.32	2,213.672	--	--
85.7	1.254	.630	3.66	7.55×10^{-5}	1.16×10^{-8}	170.31	2,200.621	--	--
87.4	1.254	.630	3.61	7.55×10^{-5}	1.18×10^{-8}	169.68	2,192.481	--	--
88.8	1.254	.630	3.69	7.55×10^{-5}	1.15×10^{-8}	169.18	2,186.020	--	--
90.1	1.254	.630	3.88	7.55×10^{-5}	1.10×10^{-8}	168.91	2,182.531	--	--
90.6	1.254	.630	--	--	--	158.90	2,053.190	--	--
91.2	1.254	.630	--	--	--	137.34	1,774.607	--	--
91.8	1.259	.636	3.25	7.55×10^{-5}	1.31×10^{-8}	123.00	1,589.316	--	--
92.6	1.259	.636	--	--	--	108.24	1,398.598	--	--
93.4	1.263	.642	2.60	7.55×10^{-5}	1.65×10^{-8}	95.34	1,231.914	3.04×10^{-4}	2.63×10^{-6}
94.8	1.268	.648	2.14	7.55×10^{-5}	2.01×10^{-8}	84.59	1,093.010	9.13×10^{-5}	7.88×10^{-7}
95.8	1.270	.651	--	--	--	66.70	861.849	3.03×10^{-4}	2.61×10^{-6}
96.4	1.273	.654	1.71	7.55×10^{-5}	2.52×10^{-8}	61.31	792.203	3.06×10^{-4}	2.63×10^{-6}
97.8	1.278	.660	1.42	7.55×10^{-5}	3.05×10^{-8}	50.64	654.333	5.87×10^{-4}	5.03×10^{-6}
99.4	1.287	.672	1.17	7.55×10^{-5}	3.73×10^{-8}	39.52	510.649	--	--
100.8	1.292	.678	1.08	7.55×10^{-5}	4.06×10^{-8}	33.31	430.407	--	--
101.3	1.292	.678	--	--	--	31.24	403.660	--	--
117.2	1.292	.678	--	--	--	36.47	471.239	--	--
117.4	1.291	.678	1.04	7.55×10^{-5}	4.21×10^{-8}	31.37	405.340	6.78×10^{-5}	5.74×10^{-7}
118.2	1.292	.678	--	--	--	26.55	343.060	1.18×10^{-3}	1.00×10^{-5}
118.8	1.296	.685	.80	7.55×10^{-5}	5.49×10^{-8}	23.79	307.397	--	--
120.4	1.303	.693	.69	7.55×10^{-5}	6.40×10^{-8}	--	0.000	--	--
121.8	1.310	.703	.60	7.55×10^{-5}	7.41×10^{-8}	15.17	196.016	--	--
123.4	1.315	.709	.51	7.55×10^{-5}	8.74×10^{-8}	12.03	155.443	1.46×10^{-3}	1.21×10^{-5}
124.9	1.320	.716	.48	7.55×10^{-5}	9.33×10^{-8}	9.57	123.657	--	--
125.4	1.320	.715	--	--	--	10.30	133.089	--	--
126.4	1.320	.715	.49	7.55×10^{-5}	9.13×10^{-8}	10.83	139.937	--	--
127.8	1.320	.715	.49	7.55×10^{-5}	9.13×10^{-8}	11.02	142.392	--	--
129.4	1.320	.715	.51	7.55×10^{-5}	8.77×10^{-8}	11.23	145.106	--	--
130.8	1.320	.715	.53	7.55×10^{-5}	8.44×10^{-8}	11.54	149.111	--	--
132.4	1.320	.715	.57	7.55×10^{-5}	7.85×10^{-8}	11.63	150.274	--	--
133.8	1.320	.715	.59	7.55×10^{-5}	7.59×10^{-8}	11.77	152.083	--	--
135.4	1.320	.715	.59	7.55×10^{-5}	7.59×10^{-8}	12.08	156.089	--	--
136.8	1.320	.715	.59	7.55×10^{-5}	7.59×10^{-8}	12.15	156.993	--	--
138.4	1.320	.715	.59	7.55×10^{-5}	7.59×10^{-8}	12.09	156.218	--	--
139.6	1.320	.716	--	--	--	12.25	158.286	--	--
139.8	1.320	.715	.58	7.55×10^{-5}	7.72×10^{-8}	9.86	127.404	--	--
140.3	--	--	--	--	--	8.74	112.932	--	--
141.4	1.334	.733	.46	7.55×10^{-5}	9.83×10^{-8}	7.26	93.808	--	--
142.8	1.334	.733	.41	7.55×10^{-5}	1.10×10^{-7}	5.70	73.651	--	--
144.4	1.338	.738	.39	7.55×10^{-5}	1.16×10^{-7}	4.87	62.927	--	--
146.2	1.338	.738	--	--	--	5.38	69.516	--	--

Table 6. Consolidation and permeability test data and associated calculated hydraulic data for cores sampled in borehole 11N/1E24Q9 at 137, 151, 301, and 474 feet below land surface--*Continued*

Time (hours)	Sample thickness, (cm)	Void ratio	Head difference (lb/in^2)	Flowrate (cm^3/s)	Perme-ability (cm/s)	Vertical effective stress		Compress-ibility ($1/lb/in^2$)	Specific storage (1/cm)
						Measured (lb/in^2)	Calculated (k/Pa)		
				151 feet					
13.2	--	--	--	--	--	4.97	64.219	--	--
14.2	1.417	0.903	--	--	--	5.36	69.258	--	--
15.2	1.417	.903	--	--	--	5.18	66.932	--	--
16.2	1.416	.902	--	--	--	5.28	68.224	--	--
17.2	1.416	.902	--	--	--	5.43	70.162	--	--
18.2	1.416	.902	--	--	--	5.50	71.067	--	--
19.2	1.416	.902	--	--	--	5.39	69.646	--	--
20.2	1.416	.902	--	--	--	5.44	70.292	--	--
21.2	1.416	.902	--	--	--	5.74	74.168	--	--
22.2	1.416	.902	--	--	--	5.44	70.292	--	--
23.2	1.416	.902	--	--	--	5.49	70.938	--	--
24.2	1.416	.902	--	--	--	5.48	70.809	--	--
25.2	1.416	.902	--	--	--	5.43	70.162	--	--
26.2	1.415	.901	--	--	--	5.40	69.775	--	--
27.2	1.415	.901	--	--	--	5.58	72.101	--	--
28.2	1.415	.901	--	--	--	5.53	71.455	--	--
29.2	1.415	.901	--	--	--	5.62	72.618	--	--
30.3	1.415	.901	--	--	--	5.43	70.162	--	--
31.3	1.415	.901	--	--	--	5.68	73.393	--	--
32.3	1.415	.900	--	--	--	5.59	72.230	--	--
33.4	1.415	.900	--	--	--	5.50	71.067	--	--
33.9	1.415	.900	--	--	--	5.60	72.359	--	--
35.2	1.415	.900	--	--	--	5.44	70.292	--	--
37.3	1.415	.900	0.06	7.55×10^{-4}	7.99×10^{-6}	5.42	70.033	--	--
38.6	1.415	.900	.08	7.55×10^{-4}	6.00×10^{-6}	5.44	70.292	--	--
39.3	1.415	.900	--	--	--	5.58	72.101	--	--
39.7	1.415	.900	.08	7.55×10^{-4}	6.00×10^{-6}	5.55	71.713	--	--
41.1	1.415	.901	--	--	--	5.41	69.904	--	--
42.0	1.415	.901	.04	3.78×10^{-4}	6.00×10^{-6}	5.47	70.679	--	--
43.2	1.415	.901	--	--	--	5.36	69.258	--	--
44.4	1.415	.901	.05	3.78×10^{-4}	4.80×10^{-6}	5.46	70.550	--	--
45.9	1.415	.901	--	--	--	5.44	70.292	--	--
47.1	1.415	.901	.05	3.78×10^{-4}	4.80×10^{-6}	5.48	70.809	--	--
48.3	1.415	.901	--	--	--	5.44	70.292	--	--
49.5	1.415	.901	.05	3.78×10^{-4}	4.80×10^{-6}	5.49	70.938	--	--
50.9	1.415	.901	--	--	--	5.54	71.584	--	--
51.6	1.415	.901	--	--	--	5.50	71.067	--	--
52.0	1.415	.901	.05	3.78×10^{-4}	4.80×10^{-6}	5.47	70.679	--	--
52.9	1.415	.901	--	--	--	5.47	70.679	--	--
54.4	1.415	.901	.05	3.78×10^{-4}	4.80×10^{-6}	5.51	71.196	--	--
55.6	1.415	.901	--	--	--	5.48	70.809	--	--
56.6	1.411	.895	--	--	--	5.56	71.842	--	--
60.5	1.397	.876	--	--	--	--	--	--	--
64.4	1.397	.876	.06	3.78×10^{-4}	3.95×10^{-6}	9.75	125.982	--	--
65.6	1.397	.876	--	--	--	9.75	125.982	--	--
67.0	1.397	.876	.10	3.78×10^{-4}	2.37×10^{-6}	9.52	123.010	--	--
69.0	1.397	.876	.10	3.78×10^{-4}	2.37×10^{-6}	9.51	122.881	--	--
71.4	1.397	.876	.10	3.78×10^{-4}	2.37×10^{-6}	9.62	124.303	--	--
74.0	1.397	.876	.11	3.78×10^{-4}	2.15×10^{-6}	9.46	122.235	--	--
76.4	1.397	.876	.11	3.78×10^{-4}	2.15×10^{-6}	9.43	121.848	--	--
79.0	1.397	.876	.11	3.78×10^{-4}	2.15×10^{-6}	9.47	122.364	--	--
80.2	1.397	.876	--	--	--	9.53	123.140	--	--
80.9	1.394	.872	--	--	--	9.35	120.814	--	--
81.2	1.396	.875	--	--	--	11.03	142.522	--	--
81.6	1.395	.873	--	--	--	12.20	157.639	1.71×10^{-3}	1.30×10^{-5}
82.0	1.393	.871	.11	3.78×10^{-4}	2.15×10^{-6}	12.99	167.847	1.83×10^{-3}	1.39×10^{-5}

Table 6. Consolidation and permeability test data and associated calculated hydraulic data for cores sampled in borehole 11N/1E24Q9 at 137, 151, 301, and 474 feet below land surface--*Continued*

Time (hours)	Sample thickness, (cm)	Void ratio	Head difference (lb/in^2)	Flowrate (cm^3/s)	Perme-ability (cm/s)	Vertical effective stress		Compress-ibility ($1/lb/in^2$)	Specific storage (1/cm)
						Measured (lb/in^2)	Calculated (k/Pa)		
151 feet--*Continued*									
83.0	1.388	0.865	0.13	3.78×10^{-4}	1.81×10^{-6}	14.65	189.297	1.34×10^{-3}	1.02×10^{-5}
84.0	1.385	.860	.15	3.78×10^{-4}	1.56×10^{-6}	16.66	215.268	1.75×10^{-3}	1.33×10^{-5}
85.0	1.380	.854	.15	3.78×10^{-4}	1.56×10^{-6}	18.40	237.751	1.44×10^{-3}	1.10×10^{-5}
86.0	1.376	.848	.20	3.78×10^{-4}	1.17×10^{-6}	20.51	265.015	1.51×10^{-3}	1.16×10^{-5}
87.0	1.372	.843	.24	3.78×10^{-4}	9.69×10^{-7}	22.52	290.987	1.27×10^{-3}	9.81×10^{-6}
88.0	1.368	.837	.32	3.78×10^{-4}	7.25×10^{-7}	24.91	321.869	1.38×10^{-3}	1.07×10^{-5}
89.5	1.361	.828	.45	3.78×10^{-4}	5.13×10^{-7}	28.34	366.189	1.24×10^{-3}	9.66×10^{-6}
91.5	1.353	.817	.66	3.78×10^{-4}	3.47×10^{-7}	33.23	429.374	1.13×10^{-3}	8.86×10^{-6}
93.4	1.345	.806	.86	3.78×10^{-4}	2.65×10^{-7}	38.30	494.885	1.09×10^{-3}	8.56×10^{-6}
95.4	1.336	.795	1.04	3.78×10^{-4}	2.18×10^{-7}	43.89	567.114	9.93×10^{-4}	7.87×10^{-6}
97.4	1.328	.783	1.20	3.78×10^{-4}	1.88×10^{-7}	50.01	646.193	9.85×10^{-4}	7.85×10^{-6}
99.4	1.319	.772	1.42	3.78×10^{-4}	1.58×10^{-7}	56.18	725.917	9.76×10^{-4}	7.83×10^{-6}
101.5	1.310	.760	1.57	3.78×10^{-4}	1.41×10^{-7}	62.75	810.810	8.44×10^{-4}	6.82×10^{-6}
103.4	1.302	.749	1.84	3.78×10^{-4}	1.20×10^{-7}	69.55	898.674	7.32×10^{-4}	5.95×10^{-6}
105.4	1.298	.744	2.08	3.78×10^{-4}	1.06×10^{-7}	73.70	952.297	1.91×10^{-3}	1.56×10^{-5}
107.4	1.290	.733	1.14	3.78×10^{-4}	1.92×10^{-7}	76.70	991.061	6.11×10^{-4}	5.02×10^{-6}
109.6	1.282	.721	1.55	3.78×10^{-4}	1.40×10^{-7}	86.64	1,119.499	7.04×10^{-4}	5.82×10^{-6}
111.6	1.274	.711	.91	1.51×10^{-4}	9.49×10^{-8}	94.79	1,224.807	6.77×10^{-4}	5.63×10^{-6}
113.2	1.268	.703	1.10	1.51×10^{-4}	7.81×10^{-8}	101.27	1,308.537	6.69×10^{-4}	5.58×10^{-6}
114.6	1.262	.695	1.26	1.51×10^{-4}	6.79×10^{-8}	107.33	1,386.840	7.31×10^{-4}	6.14×10^{-6}
116.1	1.256	.687	1.45	1.51×10^{-4}	5.87×10^{-8}	113.33	1,464.367	5.93×10^{-4}	5.00×10^{-6}
117.6	1.250	.679	1.68	1.51×10^{-4}	5.05×10^{-8}	120.16	1,552.620	6.48×10^{-4}	5.49×10^{-6}
119.2	1.244	.670	1.90	1.51×10^{-4}	4.44×10^{-8}	127.45	1,646.816	5.47×10^{-4}	4.66×10^{-6}
120.6	1.238	.663	2.10	1.51×10^{-4}	4.00×10^{-8}	134.24	1,734.551	6.06×10^{-4}	5.18×10^{-6}
122.2	1.232	.655	2.34	1.51×10^{-4}	3.57×10^{-8}	142.04	1,835.337	5.85×10^{-4}	5.02×10^{-6}
123.6	1.226	.647	2.60	1.51×10^{-4}	3.20×10^{-8}	148.97	1,924.881	4.94×10^{-4}	4.27×10^{-6}
125.2	1.220	.639	2.81	1.51×10^{-4}	2.94×10^{-8}	157.85	2,039.622	5.05×10^{-4}	4.38×10^{-6}
126.6	1.214	.631	3.08	1.51×10^{-4}	2.67×10^{-8}	165.88	2,143.380	4.64×10^{-4}	4.05×10^{-6}
128.2	1.208	.623	2.00	7.55×10^{-5}	2.05×10^{-8}	175.33	2,265.486	4.47×10^{-4}	3.91×10^{-6}
129.6	1.203	.615	2.17	7.55×10^{-5}	1.88×10^{-8}	184.40	2,382.682	5.44×10^{-4}	4.79×10^{-6}
131.2	1.197	.607	2.34	7.55×10^{-5}	1.73×10^{-8}	192.47	2,486.957	3.82×10^{-4}	3.38×10^{-6}
132.6	1.191	.600	2.41	7.55×10^{-5}	1.68×10^{-8}	203.07	2,623.922	3.99×10^{-4}	3.55×10^{-6}
133.4	1.188	.595	--	--	--	208.99	2,700.416	4.24×10^{-4}	3.77×10^{-6}
134.2	1.184	.591	2.57	7.55×10^{-5}	1.56×10^{-8}	214.57	2,772.517	3.01×10^{-4}	2.69×10^{-6}
135.6	1.182	.588	2.64	7.55×10^{-5}	1.52×10^{-8}	220.17	2,844.876	3.44×10^{-4}	3.08×10^{-6}
137.2	1.176	.579	2.85	7.55×10^{-5}	1.40×10^{-8}	232.92	3,009.622	3.68×10^{-4}	3.31×10^{-6}
138.6	1.170	.572	3.20	7.55×10^{-5}	1.24×10^{-8}	243.93	3,151.885	--	--
140.2	1.164	.564	3.52	7.55×10^{-5}	1.12×10^{-8}	256.79	3,318.053	--	--
140.5	1.164	.564	--	--	--	259.59	3,354.232	--	--
141.0	1.164	.564	--	--	--	254.09	3,283.165	--	--
141.6	1.164	.564	3.31	7.55×10^{-5}	1.19×10^{-8}	251.42	3,248.665	--	--
141.8	1.164	.564	--	--	--	247.55	3,198.660	--	--
143.2	1.164	.564	3.21	7.55×10^{-5}	1.23×10^{-8}	242.04	3,127.464	--	--
144.4	1.164	.564	3.50	7.55×10^{-5}	1.13×10^{-8}	238.69	3,084.178	--	--
146.2	1.164	.564	3.63	7.55×10^{-5}	1.09×10^{-8}	235.35	3,041.021	--	--
147.6	1.164	.564	3.59	7.55×10^{-5}	1.10×10^{-8}	233.16	3,012.723	--	--
149.2	1.164	.564	3.80	7.55×10^{-5}	1.04×10^{-8}	231.20	2,987.397	--	--
150.6	1.164	.564	3.64	7.55×10^{-5}	1.08×10^{-8}	229.73	2,968.403	--	--
152.2	1.164	.564	3.78	7.55×10^{-5}	1.04×10^{-8}	228.49	2,952.381	--	--
153.6	1.164	.564	3.86	7.55×10^{-5}	1.02×10^{-8}	227.07	2,934.032	--	--
155.2	1.164	.564	3.95	7.55×10^{-5}	9.99×10^{-9}	221.48	2,861.803	--	--
156.6	1.164	.564	4.18	7.55×10^{-5}	9.44×10^{-9}	220.93	2,854.696	--	--
159.0	1.164	.564	3.93	7.55×10^{-5}	1.00×10^{-8}	219.27	2,833.247	--	--
160.8	1.164	.564	4.24	7.55×10^{-5}	9.31×10^{-9}	218.13	2,818.516	--	--
162.3	1.164	.564	4.54	7.55×10^{-5}	8.69×10^{-9}	216.76	2,800.814	--	--
163.8	1.164	.564	4.46	7.55×10^{-5}	8.85×10^{-9}	216.03	2,791.382	--	--

Table 6. Consolidation and permeability test data and associated calculated hydraulic data for cores sampled in borehole 11N/1E24Q9 at 137, 151, 301, and 474 feet below land surface--*Continued*

Time (hours)	Sample thickness, (cm)	Void ratio	Head difference (lb/in^2)	Flowrate (cm^3/s)	Perme-ability (cm/s)	Vertical effective stress		Compress-ibility ($1/lb/in^2$)	Specific storage (1/cm)
						Measured (lb/in^2)	Calculated (k/Pa)		
151 feet--*Continued*									
165.3	1.164	0.564	4.55	7.55×10^{-5}	8.67×10^{-9}	215.12	2,779.623	--	--
165.7	1.164	.564	--	--	--	211.75	2,736.079	--	--
166.2	1.165	.565	--	--	--	191.46	2,473.906	8.21×10^{-5}	7.46×10^{-7}
166.8	1.166	.567	3.73	7.55×10^{-5}	1.06×10^{-8}	183.24	2,367.693	2.08×10^{-4}	1.89×10^{-6}
167.6	1.168	.569	--	--	--	178.38	2,304.896	1.31×10^{-4}	1.19×10^{-6}
168.3	1.170	.571	3.44	7.55×10^{-5}	1.15×10^{-8}	168.09	2,171.936	1.02×10^{-4}	9.23×10^{-7}
169.2	1.172	.574	--	--	--	151.54	1,958.089	1.46×10^{-4}	1.32×10^{-6}
169.8	1.174	.577	3.03	7.55×10^{-5}	1.31×10^{-8}	142.31	1,838.826	1.66×10^{-4}	1.50×10^{-6}
171.3	1.179	.584	1.91	7.55×10^{-5}	2.09×10^{-8}	119.98	1,550.294	1.59×10^{-4}	1.43×10^{-6}
172.8	1.184	.590	1.87	7.55×10^{-5}	2.15×10^{-8}	98.72	1,275.588	1.91×10^{-4}	1.71×10^{-6}
174.3	1.189	.596	--	--	--	81.09	1,047.786	1.09×10^{-4}	9.73×10^{-7}
174.4	1.189	.597	1.64	7.55×10^{-5}	2.46×10^{-8}	78.00	1,007.859	1.16×10^{-4}	1.04×10^{-6}
174.9	1.190	.599	--	--	--	69.30	895.444	4.41×10^{-4}	3.92×10^{-6}
175.8	1.194	.604	1.10	7.55×10^{-5}	3.68×10^{-8}	63.17	816.237	3.65×10^{-4}	3.23×10^{-6}
177.3	1.200	.612	1.21	7.55×10^{-5}	3.36×10^{-8}	51.13	660.664	4.35×10^{-4}	3.84×10^{-6}
178.8	1.206	.620	1.38	7.55×10^{-5}	2.96×10^{-8}	41.05	530.418	5.67×10^{-4}	4.97×10^{-6}
180.3	1.213	.629	1.44	7.55×10^{-5}	2.86×10^{-8}	32.71	422.655	5.77×10^{-4}	5.04×10^{-6}
181.8	1.219	.637	1.53	7.55×10^{-5}	2.70×10^{-8}	25.11	324.453	8.72×10^{-4}	7.57×10^{-6}
183.4	1.226	.646	1.59	7.55×10^{-5}	2.61×10^{-8}	19.69	254.420	1.11×10^{-3}	9.57×10^{-6}
184.8	1.232	.655	1.54	7.55×10^{-5}	2.71×10^{-8}	15.73	203.252	1.27×10^{-3}	1.09×10^{-5}
186.3	1.238	.663	1.49	7.55×10^{-5}	2.82×10^{-8}	12.27	158.544	1.66×10^{-3}	1.42×10^{-5}
187.8	1.244	.672	1.51	7.55×10^{-5}	2.79×10^{-8}	9.42	121.718	--	--
189.4	1.251	.680	1.63	7.55×10^{-5}	2.60×10^{-8}	6.97	90.061	--	--
190.8	1.251	.680	1.70	7.55×10^{-5}	2.50×10^{-8}	8.51	109.960	--	--
192.3	1.251	.680	1.80	7.55×10^{-5}	2.36×10^{-8}	8.75	113.061	--	--
193.8	1.251	.680	1.81	7.55×10^{-5}	2.34×10^{-8}	9.04	116.808	--	--
195.3	1.251	.680	1.84	7.55×10^{-5}	2.31×10^{-8}	9.33	120.555	--	--
196.8	1.251	.680	1.87	7.55×10^{-5}	2.27×10^{-8}	9.49	122.623	--	--
198.3	1.251	.680	1.89	7.55×10^{-5}	2.24×10^{-8}	9.67	124.949	--	--
198.9	1.251	.680	--	--	--	9.88	127.662	--	--
199.2	1.251	.680	--	--	--	10.02	129.471	--	--
199.4	1.252	.682	--	--	--	8.01	103.499	8.09×10^{-4}	6.84×10^{-6}
199.9	1.254	.684	1.69	7.55×10^{-5}	2.52×10^{-8}	6.34	81.921	1.79×10^{-3}	1.51×10^{-5}
201.4	1.260	.692	1.54	7.55×10^{-5}	2.77×10^{-8}	4.08	52.719	--	--
202.0	1.262	.695	--	--	--	--	--	--	--
202.8	1.262	.695	1.62	7.55×10^{-5}	2.64×10^{-8}	4.66	60.213	--	--
204.4	1.262	.695	1.73	7.55×10^{-5}	2.47×10^{-8}	5.09	65.769	--	--
205.8	1.262	.696	1.78	7.55×10^{-5}	2.40×10^{-8}	5.30	68.483	--	--
207.4	1.262	.696	--	--	--	--	--	--	--
208.0	1.262	.696	--	--	--	5.54	71.584	--	--
272.4	1.263	.696	1.70	7.55×10^{-5}	2.52×10^{-8}	6.95	89.803	--	--
273.9	1.263	.696	1.71	7.55×10^{-5}	2.50×10^{-8}	6.87	88.769	--	--
275.4	1.263	.696	1.80	7.55×10^{-5}	2.38×10^{-8}	6.61	85.410	--	--
276.9	1.263	.696	1.79	7.55×10^{-5}	2.39×10^{-8}	6.54	84.505	--	--
278.4	1.263	.696	1.84	7.55×10^{-5}	2.33×10^{-8}	6.68	86.314	--	--
279.9	1.263	.696	1.87	7.55×10^{-5}	2.29×10^{-8}	6.65	85.926	--	--
281.4	1.263	.696	1.91	7.55×10^{-5}	2.24×10^{-8}	6.59	85.151	--	--
283.0	1.263	.696	1.96	7.55×10^{-5}	2.18×10^{-8}	6.60	85.280	--	--
284.4	1.263	.696	1.98	7.55×10^{-5}	2.16×10^{-8}	6.74	87.089	--	--
285.8	1.263	.696	2.05	7.55×10^{-5}	2.09×10^{-8}	6.84	88.381	--	--
287.4	1.263	.696	2.10	7.55×10^{-5}	2.04×10^{-8}	6.71	86.702	--	--
288.9	1.263	.696	2.11	7.55×10^{-5}	2.03×10^{-8}	7.02	90.707	--	--
290.4	1.263	.696	2.18	7.55×10^{-5}	1.96×10^{-8}	6.95	89.803	--	--
291.9	1.263	.696	2.20	7.55×10^{-5}	1.95×10^{-8}	7.04	90.966	--	--
293.4	1.263	.696	2.28	7.55×10^{-5}	1.88×10^{-8}	7.14	92.258	--	--
294.8	1.263	.696	--	--	--	7.25	93.679	--	--
296.2	1.263	--	--	--	--	--	--	--	--

Table 6. Consolidation and permeability test data and associated calculated hydraulic data for cores sampled in borehole 11N/1E24Q9 at 137, 151, 301, and 474 feet below land surface--*Continued*

Time (hours)	Sample thickness, (cm)	Void ratio	Head difference (lb/in^2)	Flowrate (cm^3/s)	Perme-ability (cm/s)	Vertical effective stress		Compress-ibility ($1/lb/in^2$)	Specific storage (1/cm)
						Measured (lb/in^2)	Calculated (k/Pa)		
				301 feet					
8.0	1.447	0.720	--	--	--	5.50	71.067	--	--
10.0	1.448	.721	--	--	--	5.64	10.555	--	--
12.0	1.448	.721	--	--	--	5.62	10.517	--	--
14.0	1.448	.721	--	--	--	5.71	10.686	--	--
16.0	1.448	.721	--	--	--	5.58	10.442	--	--
18.0	1.448	.721	--	--	--	5.67	10.611	--	--
20.0	1.448	.721	--	--	--	5.90	11.041	--	--
22.0	1.448	.721	--	--	--	5.82	10.892	--	--
40.0	1.448	.721	--	--	--	5.70	10.667	--	--
26.0	1.448	.721	--	--	--	5.73	10.723	--	--
28.0	1.448	.721	--	--	--	5.72	10.704	--	--
30.0	1.448	.721	--	--	--	5.61	10.499	--	--
30.8	1.448	.721	--	--	--	5.49	10.274	--	--
32.0	1.448	.721	--	--	--	6.51	12.183	--	--
32.9	1.443	.716	--	--	--	8.41	15.738	9.15×10^{-4}	7.58×10^{-6}
33.3	1.442	.714	0.21	7.55×10^{-4}	2.33×10^{-6}	9.39	17.572	1.03×10^{-3}	8.51×10^{-6}
34.3	1.438	.710	.26	7.55×10^{-4}	1.88×10^{-6}	11.72	21.933	9.51×10^{-4}	7.91×10^{-6}
35.7	1.432	.703	.37	7.55×10^{-4}	1.31×10^{-6}	15.49	28.988	6.35×10^{-4}	5.30×10^{-6}
38.3	1.422	.691	--	--	--	25.37	47.477	5.66×10^{-4}	4.76×10^{-6}
39.5	1.418	.686	.40	7.55×10^{-4}	1.20×10^{-6}	30.65	57.358	4.98×10^{-4}	4.20×10^{-6}
40.5	1.414	.681	.47	7.55×10^{-4}	1.02×10^{-6}	35.45	66.341	4.93×10^{-4}	4.17×10^{-6}
41.9	1.408	.674	.26	3.78×10^{-4}	9.18×10^{-7}	42.73	79.965	4.19×10^{-4}	3.56×10^{-6}
43.9	1.401	.666	.34	3.78×10^{-4}	6.98×10^{-7}	54.13	101.299	4.20×10^{-4}	3.58×10^{-6}
45.9	1.393	.656	.53	3.78×10^{-4}	4.45×10^{-7}	66.24	123.962	3.93×10^{-4}	3.38×10^{-6}
48.0	1.385	.646	.66	3.78×10^{-4}	3.56×10^{-7}	79.16	148.140	4.20×10^{-4}	3.62×10^{-6}
49.9	1.377	.638	.81	3.78×10^{-4}	2.88×10^{-7}	90.55	169.455	4.08×10^{-4}	3.54×10^{-6}
51.9	1.370	.629	.95	3.78×10^{-4}	2.44×10^{-7}	102.28	191.407	4.21×10^{-4}	3.68×10^{-6}
53.9	1.362	.619	1.20	3.78×10^{-4}	1.92×10^{-7}	114.34	213.976	3.83×10^{-4}	3.37×10^{-6}
55.9	1.354	.610	1.49	3.78×10^{-4}	1.54×10^{-7}	126.81	237.312	4.08×10^{-4}	3.60×10^{-6}
59.7	1.339	.592	.84	1.51×10^{-4}	1.08×10^{-7}	150.24	281.159	3.70×10^{-4}	3.30×10^{-6}
61.3	1.333	.585	.96	1.51×10^{-4}	9.42×10^{-8}	160.75	300.828	3.63×10^{-4}	3.26×10^{-6}
62.8	1.327	.578	1.08	1.51×10^{-4}	8.33×10^{-8}	170.62	319.298	4.90×10^{-4}	4.41×10^{-6}
63.0	1.326	.577	--	--	--	171.84	321.581	4.01×10^{-4}	3.62×10^{-6}
64.4	1.324	.574	.60	7.55×10^{-5}	7.48×10^{-8}	176.31	329.947	3.45×10^{-4}	3.12×10^{-6}
65.9	1.318	.568	.66	7.55×10^{-5}	6.77×10^{-8}	185.83	347.762	3.30×10^{-4}	2.99×10^{-6}
67.4	1.313	.561	.78	7.55×10^{-5}	5.71×10^{-8}	196.70	368.104	2.72×10^{-4}	2.48×10^{-6}
68.9	1.308	.555	.82	7.55×10^{-5}	5.41×10^{-8}	208.79	390.730	2.47×10^{-4}	2.26×10^{-6}
70.3	1.303	.549	.92	7.55×10^{-5}	4.80×10^{-8}	220.89	413.374	2.71×10^{-4}	2.48×10^{-6}
71.9	1.297	.542	.95	7.55×10^{-5}	4.63×10^{-8}	234.14	438.170	2.49×10^{-4}	2.30×10^{-6}
73.3	1.293	.537	1.01	7.55×10^{-5}	4.34×10^{-8}	246.12	460.589	--	--
74.9	1.287	.530	1.02	7.55×10^{-5}	4.28×10^{-8}	260.10	486.751	--	--
76.3	1.283	.526	1.24	7.55×10^{-5}	3.51×10^{-8}	258.83	484.374	--	--
77.9	1.283	.526	1.17	7.55×10^{-5}	3.72×10^{-8}	248.44	464.931	--	--
79.3	1.283	.526	1.19	7.55×10^{-5}	3.66×10^{-8}	244.00	456.622	--	--
80.9	1.283	.526	1.22	7.55×10^{-5}	3.57×10^{-8}	240.39	449.866	--	--
82.3	1.283	.526	1.21	7.55×10^{-5}	3.60×10^{-8}	238.37	446.086	--	--
84.3	1.283	.526	1.34	7.55×10^{-5}	3.25×10^{-8}	236.13	441.894	--	--
86.6	1.283	.526	1.35	7.55×10^{-5}	3.22×10^{-8}	233.95	437.814	--	--
88.6	1.283	.526	1.42	7.55×10^{-5}	3.06×10^{-8}	232.48	435.063	--	--
90.5	1.283	.526	1.45	7.55×10^{-5}	3.00×10^{-8}	230.86	432.031	--	--
92.6	1.283	.526	1.42	7.55×10^{-5}	3.06×10^{-8}	229.39	429.280	--	--
94.5	1.283	.526	1.48	7.55×10^{-5}	2.94×10^{-8}	228.27	427.184	--	--
96.5	1.283	.526	1.44	7.55×10^{-5}	3.02×10^{-8}	227.21	425.201	--	--
98.5	1.283	.526	1.43	7.55×10^{-5}	3.04×10^{-8}	226.50	423.872	--	--
100.5	1.283	.526	1.41	7.55×10^{-5}	3.09×10^{-8}	225.14	421.327	--	--
102.5	1.283	.526	1.47	7.55×10^{-5}	2.96×10^{-8}	224.08	419.343	--	--

Table 6. Consolidation and permeability test data and associated calculated hydraulic data for cores sampled in borehole 11N/1E24Q9 at 137, 151, 301, and 474 feet below land surface--*Continued*

Time (hours)	Sample thickness, (cm)	Void ratio	Head difference (lb/in^2)	Flowrate (cm^3/s)	Perme-ability (cm/s)	Vertical effective stress		Compress-ibility ($1/lb/in^2$)	Specific storage (1/cm)
						Measured (lb/in^2)	Calculated (k/Pa)		
301 feet--*Continued*									
104.5	1.283	0.526	1.55	7.55×10^{-5}	2.81×10^{-8}	223.32	417.921	--	--
106.5	1.283	.526	1.54	7.55×10^{-5}	2.82×10^{-8}	221.75	414.983	--	--
108.6	1.283	.526	1.50	7.55×10^{-5}	2.90×10^{-8}	221.05	413.673	--	--
110.6	1.283	.526	1.57	7.55×10^{-5}	2.77×10^{-8}	220.24	412.157	--	--
112.5	1.283	.526	1.64	7.55×10^{-5}	2.65×10^{-8}	219.69	411.128	--	--
114.5	1.284	.526	1.56	7.55×10^{-5}	2.79×10^{-8}	218.37	408.658	--	--
116.4	1.284	.526	1.68	7.55×10^{-5}	2.59×10^{-8}	217.77	407.535	--	--
118.5	1.284	.526	1.68	7.55×10^{-5}	2.59×10^{-8}	216.86	405.832	--	--
120.5	1.284	.527	1.70	7.55×10^{-5}	2.56×10^{-8}	215.80	403.848	--	--
122.5	1.284	.527	1.69	7.55×10^{-5}	2.58×10^{-8}	215.10	402.538	--	--
124.5	1.284	.527	1.69	7.55×10^{-5}	2.58×10^{-8}	214.39	401.209	--	--
126.5	1.285	.527	1.68	7.55×10^{-5}	2.59×10^{-8}	213.78	400.068	--	--
128.5	1.285	.528	1.74	7.55×10^{-5}	2.50×10^{-8}	212.58	397.822	--	--
130.5	1.285	.528	1.73	7.55×10^{-5}	2.52×10^{-8}	211.41	395.633	--	--
132.5	1.285	.528	1.84	7.55×10^{-5}	2.37×10^{-8}	210.20	393.368	--	--
134.5	1.285	.528	1.83	7.55×10^{-5}	2.38×10^{-8}	209.18	391.459	--	--
136.5	1.285	.528	1.89	7.55×10^{-5}	2.31×10^{-8}	207.87	389.008	--	--
138.5	1.285	.528	1.78	7.55×10^{-5}	2.45×10^{-8}	207.21	387.773	--	--
140.5	1.285	.528	1.92	7.55×10^{-5}	2.27×10^{-8}	206.66	386.744	--	--
142.5	1.285	.527	1.82	7.55×10^{-5}	2.39×10^{-8}	206.01	385.527	--	--
144.5	1.285	.527	1.94	7.55×10^{-5}	2.24×10^{-8}	205.81	385.153	--	--
146.5	1.285	.527	1.86	7.55×10^{-5}	2.34×10^{-8}	204.85	383.356	--	--
148.5	1.285	.527	1.98	7.55×10^{-5}	2.20×10^{-8}	205.07	383.768	--	--
150.5	1.285	.527	1.98	7.55×10^{-5}	2.20×10^{-8}	204.21	382.159	--	--
152.5	1.285	.527	1.91	7.55×10^{-5}	2.28×10^{-8}	202.74	379.408	--	--
154.5	1.285	.527	2.00	7.55×10^{-5}	2.18×10^{-8}	202.12	378.247	--	--
156.5	1.285	.527	2.04	7.55×10^{-5}	2.13×10^{-8}	201.52	377.125	--	--
158.5	1.285	.527	2.05	7.55×10^{-5}	2.12×10^{-8}	201.19	376.507	--	--
164.5	1.285	.528	2.08	7.55×10^{-5}	2.09×10^{-8}	198.72	371.885	--	--
170.5	1.285	.528	2.06	7.55×10^{-5}	2.11×10^{-8}	197.86	370.275	--	--
176.5	1.285	.528	1.94	7.55×10^{-5}	2.25×10^{-8}	195.99	366.776	--	--
177.5	1.288	.532	.88	7.55×10^{-5}	4.96×10^{-8}	182.69	341.886	5.57×10^{-5}	5.17×10^{-7}
177.9	1.290	.534	1.03	7.55×10^{-5}	4.25×10^{-8}	166.59	311.757	6.07×10^{-5}	5.63×10^{-7}
179.0	1.293	.537	.94	7.55×10^{-5}	4.66×10^{-8}	132.13	247.268	8.87×10^{-5}	8.20×10^{-7}
180.0	1.296	.541	.92	7.55×10^{-5}	4.78×10^{-8}	108.54	203.122	1.21×10^{-4}	1.12×10^{-6}
180.9	1.300	.545	.87	7.55×10^{-5}	5.06×10^{-8}	91.28	170.821	1.35×10^{-4}	1.24×10^{-6}
181.9	1.303	.549	.85	7.55×10^{-5}	5.20×10^{-8}	75.77	141.796	1.41×10^{-4}	1.29×10^{-6}
182.9	1.306	.553	.71	7.55×10^{-5}	6.24×10^{-8}	63.03	117.954	2.16×10^{-4}	1.98×10^{-6}
184.5	1.311	.559	.65	7.55×10^{-5}	6.84×10^{-8}	47.81	89.472	3.27×10^{-4}	2.98×10^{-6}
185.1	1.313	.561	.64	7.55×10^{-5}	6.96×10^{-8}	43.24	80.919	2.70×10^{-4}	2.46×10^{-6}
185.9	1.316	.564	.66	7.55×10^{-5}	6.76×10^{-8}	37.70	70.552	3.28×10^{-4}	2.98×10^{-6}
187.0	1.319	.568	.63	7.55×10^{-5}	7.10×10^{-8}	31.33	58.631	4.43×10^{-4}	4.02×10^{-6}
187.9	1.322	.572	.61	7.55×10^{-5}	7.35×10^{-8}	26.61	49.798	6.57×10^{-4}	5.94×10^{-6}
190.0	1.329	.580	.52	7.55×10^{-5}	8.66×10^{-8}	20.24	37.877	--	--
190.7	1.331	.583	--	--	--	18.33	34.303	--	--
192.0	1.331	.583	.56	7.55×10^{-5}	8.06×10^{-8}	19.88	37.203	--	--
194.0	1.331	.583	.61	7.55×10^{-5}	7.40×10^{-8}	20.28	37.952	--	--
196.0	1.331	.583	.58	7.55×10^{-5}	7.78×10^{-8}	20.77	38.869	--	--
198.0	1.331	.583	.64	7.55×10^{-5}	7.05×10^{-8}	21.13	39.543	--	--
200.0	1.331	.583	.48	7.55×10^{-5}	9.40×10^{-8}	21.48	40.198	--	--
200.1	1.331	.583	--	--	--	20.36	38.102	--	--
201.1	1.333	.586	--	--	--	15.69	29.362	8.50×10^{-4}	7.62×10^{-6}
202.0	1.336	.589	.56	7.55×10^{-5}	8.09×10^{-8}	13.58	25.414	1.03×10^{-3}	9.24×10^{-6}
204.0	1.343	.597	.42	7.55×10^{-5}	1.08×10^{-7}	9.53	17.834	1.37×10^{-3}	1.22×10^{-5}
205.9	1.349	.604	.42	7.55×10^{-5}	1.09×10^{-7}	6.70	12.538	--	--
207.7	1.355	.611	.32	7.55×10^{-5}	1.44×10^{-7}	4.56	8.534	--	--
209.0	1.359	.616	.28	7.55×10^{-5}	1.65×10^{-7}	4.76	8.908	--	--

Table 6. Consolidation and permeability test data and associated calculated hydraulic data for cores sampled in borehole 11N/1E24Q9 at 137, 151, 301, and 474 feet below land surface--*Continued*

Time (hours)	Sample thickness, (cm)	Void ratio	Head difference (lb/in^2)	Flowrate (cm^3/s)	Perme-ability (cm/s)	Vertical effective stress		Compress-ibility ($1/lb/in^2$)	Specific storage (1/cm)
						Measured (lb/in^2)	Calculated (k/Pa)		
301 feet--*Continued*									
210.5	1.360	0.617	0.33	7.55×10^{-5}	1.40×10^{-7}	5.08	9.507	--	--
212.0	1.360	.617	.35	7.55×10^{-5}	1.32×10^{-7}	5.26	9.844	--	--
214.0	1.360	.617	.38	7.55×10^{-5}	1.21×10^{-7}	5.53	10.349	--	--
216.0	1.360	.617	.39	7.55×10^{-5}	1.18×10^{-7}	5.60	10.480	--	--
218.0	1.360	.617	.40	7.55×10^{-5}	1.15×10^{-7}	5.88	11.004	--	--
220.1	1.360	.617	.41	7.55×10^{-5}	1.12×10^{-7}	6.07	11.359	--	--
222.0	1.360	.617	.40	7.55×10^{-5}	1.15×10^{-7}	6.02	11.266	--	--
224.1	1.360	.617	.43	7.55×10^{-5}	1.07×10^{-7}	6.29	11.771	--	--
231.6	1.360	.617	.46	7.55×10^{-5}	1.00×10^{-7}	6.35	11.883	--	--
474 feet									
0.0	1.362	0.740	--	1.51×10^{-2}	--	10.32	133.347	--	--
5.0	1.362	.740	--	1.51×10^{-2}	--	10.40	134.381	--	--
8.0	1.362	.740	--	1.51×10^{-2}	--	10.42	134.640	--	--
9.2	1.362	.740	0.12	1.51×10^{-2}	7.70×10^{-5}	11.54	149.111	--	--
10.3	1.360	.737	.16	1.51×10^{-2}	5.76×10^{-5}	15.11	195.240	6.96×10^{-4}	5.69×10^{-6}
11.2	1.357	.733	.20	1.51×10^{-2}	4.60×10^{-5}	18.34	236.976	5.48×10^{-4}	4.49×10^{-6}
12.3	1.353	.728	.24	1.51×10^{-2}	3.82×10^{-5}	23.03	297.577	5.27×10^{-4}	4.34×10^{-6}
13.2	1.350	.724	.29	1.51×10^{-2}	3.16×10^{-5}	27.29	352.621	5.17×10^{-4}	4.26×10^{-6}
14.2	1.346	.719	.33	1.51×10^{-2}	2.77×10^{-5}	32.26	416.840	4.51×10^{-4}	3.73×10^{-6}
15.2	1.342	.714	.38	1.51×10^{-2}	2.40×10^{-5}	37.96	490.491	3.49×10^{-4}	2.89×10^{-6}
16.1	1.339	.710	.47	1.51×10^{-2}	1.93×10^{-5}	44.40	573.704	--	--
20.0	1.337	.708	--	1.51×10^{-2}	--	38.59	498.632	--	--
25.1	1.337	.708	--	1.51×10^{-2}	--	37.47	484.160	--	--
30.1	1.337	.708	--	1.51×10^{-2}	--	36.91	476.924	--	--
32.1	1.337	.708	.46	1.51×10^{-2}	1.97×10^{-5}	43.97	568.148	--	--
33.1	1.330	.698	.58	1.51×10^{-2}	1.55×10^{-5}	54.22	700.591	3.57×10^{-5}	2.99×10^{-7}
34.2	1.329	.697	.64	1.51×10^{-2}	1.41×10^{-5}	63.21	816.753	2.95×10^{-4}	2.47×10^{-6}
35.1	1.326	.693	.06	1.51×10^{-2}	1.50×10^{-4}	70.83	915.213	2.65×10^{-4}	2.23×10^{-6}
36.2	1.322	.688	.70	1.51×10^{-2}	1.28×10^{-5}	80.52	1,040.421	2.97×10^{-4}	2.50×10^{-6}
37.2	1.318	.684	.94	1.51×10^{-2}	9.51×10^{-6}	89.18	1,152.319	2.80×10^{-4}	2.36×10^{-6}
38.1	1.315	.679	1.06	1.51×10^{-2}	8.41×10^{-6}	97.21	1,256.077	2.60×10^{-4}	2.20×10^{-6}
39.2	1.311	.675	1.22	1.51×10^{-2}	7.29×10^{-6}	107.09	1,383.739	--	--
40.3	1.307	.669	1.43	1.51×10^{-2}	6.20×10^{-6}	117.47	1,517.861	--	--
45.0	1.305	.667	--	1.51×10^{-2}	--	105.54	1,363.711	--	--
50.0	1.305	.667	--	1.51×10^{-2}	--	103.15	1,332.829	--	--
55.0	1.305	.667	--	1.51×10^{-2}	--	101.40	1,310.217	--	--
56.2	1.305	.666	.81	7.55×10^{-3}	5.46×10^{-6}	116.79	1,509.075	1.31×10^{-4}	1.12×10^{-6}
57.1	1.302	.663	.86	7.55×10^{-3}	5.13×10^{-6}	131.49	1,699.018	2.20×10^{-4}	1.88×10^{-6}
58.3	1.298	.657	.97	7.55×10^{-3}	4.54×10^{-6}	144.63	1,868.803	2.28×10^{-4}	1.96×10^{-6}
59.1	1.295	.654	1.05	7.55×10^{-3}	4.18×10^{-6}	153.07	1,977.859	2.33×10^{-4}	2.00×10^{-6}
60.2	1.291	.649	1.21	7.55×10^{-3}	3.62×10^{-6}	164.09	2,120.251	2.42×10^{-4}	2.09×10^{-6}
61.1	1.288	.645	1.26	7.55×10^{-3}	3.47×10^{-6}	173.36	2,240.031	2.30×10^{-4}	1.99×10^{-6}
62.4	1.283	.639	1.45	7.55×10^{-3}	3.00×10^{-6}	185.93	2,402.451	2.71×10^{-4}	2.35×10^{-6}
63.4	1.280	.634	1.54	7.55×10^{-3}	2.82×10^{-6}	195.40	2,524.816	--	--
64.2	1.277	.631	1.67	7.55×10^{-3}	2.59×10^{-6}	201.98	2,609.838	--	--
152.7	1.273	.626	2.06	7.55×10^{-3}	2.10×10^{-6}	191.08	2,468.996	--	--
153.7	1.270	.622	2.11	7.55×10^{-3}	2.04×10^{-6}	215.92	2,789.960	--	--
154.8	1.267	.618	2.21	7.55×10^{-3}	1.94×10^{-6}	231.76	2,994.633	--	--
155.8	1.263	.613	2.40	7.55×10^{-3}	1.78×10^{-6}	231.74	2,994.375	--	--
156.7	1.260	.610	2.46	7.55×10^{-3}	1.74×10^{-6}	245.71	3,174.885	--	--
157.6	1.258	.606	2.65	7.55×10^{-3}	1.61×10^{-6}	256.92	3,319.732	--	--
159.0	1.258	.606	1.43	3.78×10^{-3}	1.49×10^{-6}	242.76	3,136.767	--	--
159.7	1.258	.606	1.46	3.78×10^{-3}	1.46×10^{-6}	239.70	3,097.228	--	--

Table 6. Consolidation and permeability test data and associated calculated hydraulic data for cores sampled in borehole 11N/1E24Q9 at 137, 151, 301, and 474 feet below land surface--*Continued*

Time (hours)	Sample thickness, (cm)	Void ratio	Head difference (lb/in^2)	Flowrate (cm^3/s)	Perme-ability (cm/s)	Vertical effective stress		Compress-ibility ($1/lb/in^2$)	Specific storage (1/cm)
						Measured (lb/in^2)	Calculated (k/Pa)		
474 feet--*Continued*									
160.6	1.258	0.606	1.53	3.78×10^{-3}	1.39×10^{-6}	237.18	3,064.666	--	--
165.0	1.258	.606	--	3.78×10^{-3}	--	231.62	2,992.824	--	--
170.0	1.258	.606	--	3.78×10^{-3}	--	227.75	2,942.819	--	--
175.0	1.258	.606	--	3.78×10^{-3}	--	225.62	2,915.297	--	--
176.3	1.258	.607	1.52	3.78×10^{-3}	1.40×10^{-6}	225.40	2,912.454	8.03×10^{-5}	7.11×10^{-7}
177.0	1.260	.609	1.51	3.78×10^{-3}	1.41×10^{-6}	209.41	2,705.843	3.64×10^{-5}	3.22×10^{-7}
177.7	1.261	.611	1.47	3.78×10^{-3}	1.45×10^{-6}	182.97	2,364.204	3.97×10^{-5}	3.50×10^{-7}
178.3	1.263	.613	1.48	3.78×10^{-3}	1.45×10^{-6}	158.70	2,050.605	3.75×10^{-5}	3.31×10^{-7}
179.0	1.264	.615	1.42	3.78×10^{-3}	1.51×10^{-6}	133.05	1,719.175	3.34×10^{-5}	2.94×10^{-7}
179.6	1.265	.616	1.39	3.78×10^{-3}	1.54×10^{-6}	113.80	1,470.440	5.95×10^{-5}	5.24×10^{-7}
180.6	1.267	.619	1.32	3.78×10^{-3}	1.63×10^{-6}	86.84	1,122.083	6.67×10^{-5}	5.86×10^{-7}
181.4	1.269	.621	1.26	3.78×10^{-3}	1.71×10^{-6}	72.40	935.500	9.09×10^{-5}	7.97×10^{-7}
182.1	1.270	.622	1.20	3.78×10^{-3}	1.79×10^{-6}	61.80	798.534	2.11×10^{-4}	1.85×10^{-6}
182.6	1.272	.624	1.16	3.78×10^{-3}	1.86×10^{-6}	57.23	739.484	3.99×10^{-4}	3.49×10^{-6}
183.2	1.273	.625	1.14	3.78×10^{-3}	1.89×10^{-6}	55.62	718.681	1.70×10^{-4}	1.49×10^{-6}
183.5	1.274	.627	1.13	3.78×10^{-3}	1.91×10^{-6}	51.85	669.968	1.10×10^{-4}	9.60×10^{-7}
184.4	1.275	.628	1.08	3.78×10^{-3}	2.00×10^{-6}	43.08	556.648	--	--
190.0	1.276	.630	--	3.78×10^{-3}	--	41.12	531.323	--	--
195.0	1.276	.630	--	3.78×10^{-3}	--	41.86	540.884	--	--
200.0	1.276	.630	--	3.78×10^{-3}	--	42.54	549.671	--	--
200.7	1.278	.632	1.02	3.78×10^{-3}	2.12×10^{-6}	34.22	442.166	2.15×10^{-4}	1.88×10^{-6}
201.4	1.281	.636	.95	3.78×10^{-3}	2.29×10^{-6}	25.28	326.650	2.76×10^{-4}	2.40×10^{-6}
202.3	1.283	.639	.79	3.78×10^{-3}	2.75×10^{-6}	18.29	236.330	4.03×10^{-4}	3.49×10^{-6}
203.1	1.286	.643	.62	3.78×10^{-3}	3.52×10^{-6}	13.51	174.566	5.61×10^{-4}	4.85×10^{-6}
203.7	1.288	.645	.59	3.78×10^{-3}	3.70×10^{-6}	11.22	144.977	4.56×10^{-4}	3.94×10^{-6}
204.1	1.290	.647	.56	3.78×10^{-3}	3.90×10^{-6}	9.11	117.713	8.96×10^{-4}	7.73×10^{-6}
204.9	1.292	.651	.39	3.78×10^{-3}	5.62×10^{-6}	6.96	89.932	8.30×10^{-4}	7.15×10^{-6}
205.4	1.294	.652	.64	7.55×10^{-3}	6.85×10^{-6}	5.80	74.943	1.65×10^{-3}	1.42×10^{-5}
206.2	1.297	.656	.52	7.55×10^{-3}	8.45×10^{-6}	4.63	59.825	1.39×10^{-3}	1.19×10^{-5}
207.0	1.299	.660	.31	7.55×10^{-3}	1.42×10^{-5}	3.24	41.865	--	--
207.8	1.302	.663	.30	7.55×10^{-3}	1.47×10^{-5}	2.83	36.567	--	--
208.8	1.302	.663	--	--	--	3.36	43.415	--	--

Table 8. Water levels in well 11N/1E-24Q4 (P1) recorded at 0600 hours daily, water years 1988-92

[Latitude 38°46'46"; longitude 121°48'38". Water levels in feet below land surface; land-surface elevation is 42.1 feet above sea level. Water year: October 1 to September 30. Gravel-packed interval: 740 to 815 feet below land surface; screened interval: 784 to 789 feet below land surface. max, maximum; med, median; min, minimum; * indicates statistics are for partial months; --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1988						
1	--	--	--	--	--	--	--	--	--	41.70	48.85	51.69
2	--	--	--	--	--	--	--	--	35.00	41.96	48.99	51.71
3	--	--	--	--	--	--	--	--	35.20	42.17	49.17	51.72
4	--	--	--	--	--	--	--	--	35.44	42.45	49.31	51.69
5	--	--	--	--	--	--	--	--	35.69	42.77	49.42	51.62
6	--	--	--	--	--	--	--	--	35.95	42.98	49.56	51.58
7	--	--	--	--	--	--	--	--	36.18	43.21	49.66	51.55
8	--	--	--	--	--	--	--	--	36.47	43.50	49.75	51.51
9	--	--	--	--	--	--	--	--	36.67	43.67	49.83	51.47
10	--	--	--	--	--	--	--	--	36.91	43.93	49.88	51.42
11	--	--	--	--	--	--	--	--	37.16	44.20	49.96	51.36
12	--	--	--	--	--	--	--	--	37.37	44.49	50.04	51.32
13	--	--	--	--	--	--	--	--	37.58	44.75	50.17	51.28
14	--	--	--	--	--	--	--	--	37.83	44.91	50.26	51.19
15	--	--	--	--	--	--	--	--	--	45.15	50.31	51.09
16	--	--	--	--	--	--	--	--	38.24	45.41	50.44	50.98
17	--	--	--	--	--	--	--	--	38.53	45.64	50.52	50.88
18	--	--	--	--	--	--	--	--	38.79	45.87	50.65	50.80
19	--	--	--	--	--	--	--	--	38.98	46.12	50.74	50.68
20	--	--	--	--	--	--	--	--	39.22	46.34	50.84	50.57
21	--	--	--	--	--	--	--	--	39.50	46.60	50.95	50.52
22	--	--	--	--	--	--	--	--	39.71	46.84	51.10	50.47
23	--	--	--	--	--	--	--	--	39.98	47.04	51.19	50.34
24	--	--	--	--	--	--	--	--	40.17	47.30	51.29	50.22
25	--	--	--	--	--	--	--	--	40.42	47.53	51.36	50.15
26	--	--	--	--	--	--	--	--	40.69	47.77	51.40	50.08
27	--	--	--	--	--	--	--	--	40.91	47.94	51.46	50.05
28	--	--	--	--	--	--	--	--	41.11	48.17	51.55	49.89
29	--	--	--	--	--	--	--	--	41.31	48.34	51.62	49.76
30	--	--	--	--	--	--	--	--	41.45	48.52	51.63	49.61
31	--	--	--	--	--	--	--	--	--	48.68	51.64	--
Max	--	--	--	--	--	--	--	--	41.45*	48.68	51.64	51.72
Min	--	--	--	--	--	--	--	--	35.00*	41.70	48.85	49.61
Med	--	--	--	--	--	--	--	--	38.38*	45.41	50.44	51.03

Partial water year 1988: High 35.00 Low 51.72 Med 48.92

Table 8. Water levels in well 11N/1E-24Q4 (P1) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1989						
1	49.40	44.20	38.90	--	--	27.53	25.47	27.06	34.85	--	52.72	--
2	49.28	44.03	38.77	--	--	27.30	25.41	--	35.11	--	52.94	--
3	49.13	43.85	38.62	--	--	27.33	25.40	--	35.37	--	53.14	--
4	48.98	43.71	38.51	--	--	27.30	25.35	--	35.68	--	53.32	--
5	48.82	43.48	38.26	--	--	27.25	25.33	--	36.09	--	53.55	--
6	48.66	43.29	38.11	--	--	27.09	25.32	--	36.43	--	53.78	--
7	48.54	43.09	37.90	33.15	--	26.98	25.29	--	36.76	--	53.96	--
8	48.43	42.94	--	33.12	--	26.90	25.29	--	37.08	46.44	54.14	--
9	48.24	42.81	--	--	--	26.82	25.30	--	37.41	46.71	54.34	--
10	48.04	42.60	--	--	--	26.79	25.34	--	37.73	46.94	54.53	--
11	47.89	42.33	--	--	--	26.74	25.41	--	38.04	47.28	54.70	--
12	47.73	42.10	--	--	--	26.69	25.40	--	38.37	47.65	54.82	--
13	47.56	41.86	--	--	--	26.64	25.41	--	--	47.90	54.94	--
14	47.40	41.58	--	--	--	26.56	25.46	--	--	48.15	55.02	--
15	47.25	41.37	--	--	--	26.46	25.44	--	--	48.47	55.09	55.69
16	47.07	41.26	--	--	--	26.34	25.49	--	--	48.78	55.16	55.57
17	46.87	41.07	--	--	--	26.37	25.58	--	--	49.05	55.24	55.35
18	46.70	40.88	--	--	--	26.30	25.67	--	--	49.27	55.34	55.27
19	46.52	40.77	--	--	--	26.20	25.69	--	--	49.58	55.42	55.19
20	46.31	40.69	--	--	--	26.14	25.77	31.82	--	49.81	55.43	55.11
21	46.15	40.63	--	--	--	26.09	25.80	32.14	--	50.06	55.56	54.99
22	45.96	40.58	--	--	--	25.99	25.89	32.37	--	50.34	55.64	54.83
23	45.78	40.38	--	--	--	25.89	25.93	32.64	--	50.61	--	54.67
24	45.58	40.00	--	--	--	25.79	26.02	--	--	50.83	--	54.55
25	45.41	39.90	--	--	--	25.74	26.14	--	--	51.03	--	54.42
26	45.25	39.60	--	--	--	25.71	26.25	--	--	51.30	--	54.26
27	45.03	39.50	--	--	--	25.72	26.37	33.49	--	51.57	--	54.11
28	44.89	39.40	--	--	27.60	25.69	26.48	33.80	--	51.79	--	53.96
29	44.77	39.28	--	--	--	25.64	26.84	34.05	--	52.01	--	53.78
30	44.61	39.16	--	--	--	25.60	26.83	34.31	--	52.25	--	53.67
31	44.40	--	--	--	--	25.54	--	34.55	--	52.51	--	--
Max	49.40	44.20	38.90*	33.15*	27.60*	27.53	26.84	34.55*	38.37*	52.51*	55.64*	55.69*
Min	44.40	39.16	37.90*	33.12*	27.60*	25.54	25.29	27.06*	34.85*	46.44*	52.72*	53.67*
Med	47.07	41.32	38.51*	33.14*	27.60*	26.37	25.48	33.06*	36.60*	49.69*	54.76*	54.75*

Water year 1989: High 25.29 Low 55.69 Med 41.32

Table 8. Water levels in well 11N/1E-24Q4 (P1) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1990						
1	53.48	47.40	--	--	32.71	29.88	27.63	33.45	44.28	51.11	--	60.46
2	53.29	47.20	--	--	32.70	29.79	27.69	33.78	44.54	51.39	--	60.51
3	53.18	46.97	--	--	32.55	29.68	27.66	34.21	44.55	51.55	--	60.55
4	--	46.74	--	--	32.41	29.56	27.65	34.55	44.77	51.78	--	60.57
5	--	46.51	--	--	32.34	29.48	27.68	34.89	44.94	52.01	--	60.65
6	--	46.33	--	35.98	32.22	29.43	27.71	35.24	45.14	52.23	--	60.70
7	--	46.12	40.36	35.84	32.13	29.29	27.77	35.59	45.43	52.47	--	60.76
8	--	45.92	40.19	35.66	32.03	29.21	27.90	35.96	45.59	52.68	--	--
9	--	45.72	39.99	35.53	31.96	--	28.05	36.27	45.81	53.00	--	60.69
10	--	45.48	39.82	--	31.87	28.97	28.17	36.95	46.06	53.21	--	60.64
11	--	45.25	39.67	--	31.72	28.91	28.31	37.32	46.39	53.21	--	60.61
12	--	45.03	39.54	35.07	31.56	28.87	28.45	37.69	46.63	53.44	--	60.53
13	--	44.87	39.32	34.85	31.50	28.81	28.59	38.06	--	53.72	--	60.39
14	51.17	44.68	--	34.72	31.42	28.70	28.76	38.38	47.13	53.92	--	60.31
15	50.98	44.51	--	34.61	31.31	28.64	28.94	38.77	47.40	54.15	--	60.19
16	50.79	--	--	34.44	31.12	28.56	29.08	39.10	47.68	54.35	--	60.04
17	50.61	--	--	34.34	30.96	28.48	29.31	39.41	47.84	54.64	59.03	59.95
18	50.44	--	--	34.26	30.90	28.42	29.55	39.79	48.15	54.88	59.07	59.67
19	50.21	--	--	34.14	30.84	28.35	29.77	40.07	--	55.09	59.12	59.59
20	49.97	--	--	34.06	30.77	28.26	30.05	40.38	48.51	55.26	59.22	59.57
21	49.77	--	--	33.97	30.66	28.15	30.31	40.74	48.70	55.46	59.36	59.43
22	49.58	--	--	33.84	30.55	28.06	30.58	41.06	48.93	55.62	59.51	59.39
23	49.32	--	--	33.74	30.46	28.00	30.79	41.32	49.18	55.88	59.69	59.35
24	49.10	--	--	33.62	30.36	27.94	31.17	41.74	49.44	--	59.80	59.17
25	48.86	--	--	33.53	30.25	27.87	31.47	41.98	49.72	--	59.97	59.05
26	48.68	--	--	33.39	30.14	27.86	31.80	42.34	49.94	--	60.10	58.95
27	48.45	--	--	33.32	30.06	27.74	32.07	42.60	50.15	--	60.19	58.88
28	48.25	--	--	33.23	29.98	27.71	32.39	42.87	50.37	--	60.27	58.80
29	48.03	--	--	33.08	--	27.68	32.74	43.27	50.60	--	60.33	58.64
30	47.85	--	--	32.86	--	27.64	33.09	43.59	50.86	--	60.37	58.20
31	47.59	--	--	32.81	--	27.63	--	43.95	--	--	60.41	--
Max	53.48*	47.40*	40.36*	35.98*	32.71	29.88*	33.09	43.95	50.86*	55.88*	60.41*	60.76*
Min	47.59*	44.51*	39.32*	32.81*	29.98	27.63*	27.63	33.45	44.28*	51.11*	59.03*	58.20*
Med	49.77*	45.92*	39.82*	34.10*	31.36	28.52*	29.01	39.10	47.54*	53.44*	59.80*	60.04*

Water year 1990: High 27.63 Low 60.76 Med 41.06

Table 8. Water levels in well 11N/1E-24Q4 (P1) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1991						
1	57.57	53.26	47.51	42.69	39.09	39.41	40.29	38.73	--	53.48	--	67.75
2	57.37	53.05	47.38	42.57	39.03	39.67	40.27	38.73	--	53.88	--	67.58
3	57.30	52.84	47.23	42.39	39.08	39.74	40.17	38.81	--	54.32	--	67.52
4	57.15	52.63	47.04	42.30	39.10	39.73	40.12	38.74	--	54.72	--	67.34
5	57.18	52.35	46.91	42.22	39.08	39.84	40.06	38.81	44.95	55.02	--	67.07
6	57.22	52.13	46.73	42.09	39.04	40.00	40.08	38.90	45.25	55.36	--	66.91
7	57.25	51.94	46.55	41.90	39.00	40.05	40.00	38.95	45.64	55.70	--	66.84
8	57.25	51.75	46.37	41.81	38.99	40.13	39.96	39.00	45.96	56.03	64.07	66.62
9	57.16	51.52	46.19	41.61	39.01	40.26	39.94	39.12	46.30	--	64.37	66.26
10	57.05	51.32	45.97	41.58	38.99	40.39	39.84	39.18	46.64	--	64.67	66.22
11	57.01	51.10	45.77	41.47	38.99	40.49	39.73	39.29	46.92	--	65.14	66.01
12	56.89	50.91	45.60	41.37	38.97	40.54	39.72	39.43	47.28	--	65.63	65.72
13	56.77	50.68	45.45	41.23	39.00	40.48	39.57	39.50	47.69	--	66.04	65.72
14	56.78	50.47	45.31	41.10	38.97	40.46	39.50	39.62	47.80	--	66.28	65.72
15	56.64	50.33	45.05	40.99	38.97	40.53	39.37	39.77	48.10	--	66.70	65.85
16	56.57	50.16	44.95	40.83	39.00	40.64	39.35	39.92	48.49	--	67.09	65.96
17	56.42	49.96	44.83	40.77	39.11	40.67	39.29	40.11	48.86	--	67.41	65.94
18	56.24	49.73	44.66	40.62	39.12	40.69	39.22	40.26	49.14	--	67.69	65.92
19	56.08	49.50	44.38	40.44	39.18	40.69	39.12	40.43	49.46	--	67.96	65.89
20	55.91	49.33	44.28	40.32	39.23	40.72	39.06	40.59	49.90	--	68.10	65.87
21	55.74	49.23	44.18	40.26	39.20	40.80	39.10	40.79	50.21	--	68.25	65.80
22	55.44	49.10	44.07	40.13	39.17	40.87	39.00	41.03	50.55	--	68.41	65.83
23	55.22	48.90	43.98	40.02	39.16	40.85	39.05	41.24	50.83	--	68.34	65.77
24	55.01	48.66	43.83	39.89	39.17	40.86	39.03	41.48	51.12	--	68.28	65.66
25	54.79	48.45	43.64	39.77	39.15	40.71	39.04	41.68	51.44	--	68.31	65.50
26	54.60	48.28	43.48	39.66	39.14	40.62	38.98	41.95	51.78	--	68.25	65.32
27	54.38	48.17	43.32	39.58	39.13	40.60	38.86	42.21	52.16	--	67.98	65.24
28	54.13	48.03	43.11	39.43	39.29	40.57	38.77	42.49	52.44	--	68.11	65.08
29	53.89	47.86	43.01	39.34	--	40.48	38.66	42.70	52.87	--	68.15	65.00
30	53.68	47.66	42.97	39.26	--	40.48	38.74	--	53.21	--	67.98	64.88
31	53.45	--	42.85	39.21	--	40.36	--	--	--	--	67.91	--
Max	57.57	53.26	47.51	42.69	39.29	40.87	40.29	42.70*	53.21*	56.03*	68.41*	67.75
Min	53.45	47.66	42.85	39.21	38.97	39.41	38.66	38.73*	44.95*	53.48*	64.07*	64.88
Med	56.57	50.25	44.95	40.83	39.08	40.49	39.36	39.77*	49.00*	54.87*	67.93*	65.88

Water year 1991: High 38.66 Low 68.41 Med 44.95

Table 8. Water levels in well 11N/1E-24Q4 (P1) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1992						
1	64.73	56.00	50.81	45.67	41.50	37.63	35.09	33.07	--	--	--	64.43
2	64.32	55.76	50.63	45.47	41.52	37.39	35.04	33.16	--	--	--	64.36
3	64.00	55.66	50.37	45.18	41.38	37.32	34.99	33.34	--	--	--	64.26
4	63.64	55.49	50.10	45.04	41.20	37.34	34.96	33.45	--	--	--	64.17
5	63.36	55.22	49.81	44.62	41.11	37.15	35.00	33.59	--	--	--	64.09
6	63.09	54.98	49.58	44.56	40.97	36.97	35.02	33.82	--	--	--	63.97
7	62.80	54.85	49.32	44.44	40.81	36.86	34.84	34.37	--	--	--	63.88
8	62.57	54.68	49.18	44.43	40.86	36.79	34.71	34.68	--	--	--	63.78
9	62.33	54.54	49.14	44.33	40.68	36.88	34.68	35.04	--	--	--	63.67
10	62.06	54.45	48.90	44.19	40.41	36.97	34.65	35.47	--	--	--	63.59
11	61.75	54.38	48.68	44.01	40.24	36.86	34.53	36.19	--	--	--	63.51
12	61.45	54.36	48.68	43.87	39.94	36.80	34.40	36.66	--	--	--	63.38
13	61.00	54.11	48.62	43.84	39.77	36.74	34.37	37.23	--	--	--	63.30
14	60.62	53.88	48.47	43.63	39.79	36.67	34.32	37.74	--	--	--	63.19
15	60.32	--	48.31	43.50	39.32	36.56	34.24	--	--	--	--	63.10
16	59.77	--	48.15	43.44	39.31	36.50	34.30	--	--	--	--	63.00
17	59.41	--	47.90	43.16	39.38	36.51	34.32	--	--	--	--	62.91
18	59.23	--	47.69	43.13	39.27	36.33	34.37	--	--	--	--	62.82
19	58.96	--	47.78	43.15	39.05	36.34	34.34	--	--	--	--	62.71
20	58.58	--	47.64	43.08	38.84	36.11	34.33	--	--	--	--	62.62
21	58.31	--	47.50	43.01	38.81	35.96	34.06	--	--	--	--	62.50
22	58.00	53.11	47.35	42.96	38.75	35.91	33.94	--	--	--	--	62.37
23	57.92	52.92	47.28	42.88	38.58	35.93	33.82	--	--	--	--	62.25
24	57.64	52.60	47.07	42.69	38.47	36.05	33.61	--	--	--	--	62.11
25	57.43	52.24	46.88	42.51	38.31	35.77	33.31	--	--	--	--	62.01
26	56.98	51.93	46.65	42.29	38.22	35.61	33.10	--	--	--	--	61.91
27	57.06	51.65	46.37	42.32	38.13	35.44	33.03	--	--	--	--	61.76
28	56.81	51.53	46.00	42.17	38.00	35.40	32.89	--	--	--	64.75	61.67
29	56.46	51.15	45.67	42.04	37.81	35.42	32.74	--	--	--	64.69	61.55
30	56.35	51.04	45.78	41.89	--	35.32	32.85	--	--	--	64.61	61.49
31	56.21	--	45.79	41.72	--	35.19	--	--	--	--	64.52	--
Max	64.73	56.00*	50.81	45.67	41.52	37.63	35.09	37.74*	--	--	64.75*	64.43
Min	56.21	51.04*	45.67	41.72	37.81	35.19	32.74	33.07*	--	--	64.52*	61.49
Med	59.77	54.36*	48.15	43.44	39.38	36.51	34.33	34.53*	--	--	64.65*	63.05

Water year 1992: High 32.74 Low 64.75 Med 44.38

Table 9. Water-level measurements for well 11N/1E-24Q4 (P1), water years 1988-92

[Water levels in feet below land surface; land-surface elevation is 42.1 feet above sea level]

Date	Water level	Date	Water level	Date	Water level	Date	Water level
12-09-87	35.90	7-14-88	44.92	10-13-89	51.40	1-18-91	40.59
12-14-87	35.15	8-03-88	49.19	10-18-89	50.35	2-04-91	39.11
2-23-88	25.60	8-16-88	50.47	10-24-89	49.04	3-06-91	40.03
2-24-88	25.48	9-19-88	50.60	10-30-89	47.79	4-04-91	40.13
2-25-88	25.46	9-26-88	50.07	11-15-89	44.46	4-18-91	39.18
2-29-88	25.08	10-13-88	47.54	12-13-89	39.27	5-03-91	38.75
3-08-88	25.22	11-08-88	42.95	1-09-90	35.53	5-30-91	43.02
3-18-88	24.73	12-07-88	37.83	1-29-90	33.06	6-18-91	49.10
3-21-88	24.84	1-06-89	33.33	2-08-90	32.03	7-02-91	53.94
3-22-88	24.85	1-09-89	32.96	3-08-90	29.22	8-02-91	62.67
3-25-88	24.95	1-12-89	32.62	4-09-90	28.11	8-07-91	63.84
3-29-88	25.04	2-03-89	30.06	4-11-90	28.36	9-12-91	65.74
4-01-88	25.23	2-27-89	27.84	5-08-90	36.05	10-16-91	59.82
4-12-88	26.24	3-17-89	26.36	5-09-90	36.30	11-14-91	53.83
4-13-88	26.43	3-29-89	25.66	6-13-90	46.86	11-19-91	52.98
4-15-88	26.81	4-27-89	26.39	6-19-90	48.39	12-17-91	47.85
5-03-88	30.64	5-26-89	33.31	6-28-90	50.38	1-13-92	43.75
5-11-88	32.16	6-13-89	38.68	7-09-90	53.01	1-17-92	43.16
5-16-88	34.21	6-15-89	39.21	8-09-90	59.17	2-14-92	39.65
5-25-88	33.89	7-07-89	46.18	9-07-90	60.83	3-18-92	36.39
5-26-88	33.92	8-04-89	53.31	9-10-90	60.64	4-20-92	34.41
5-31-88	34.78	8-22-89	55.66	10-10-90	57.02	5-14-92	37.92
6-03-88	35.22	9-14-89	55.80	11-08-90	51.73	7-23-92	62.77
6-14-88	37.87	10-03-89	53.13	12-05-90	46.83	8-25-92	64.97
6-28-88	41.13	10-11-89	51.82	1-03-91	42.36	10-01-92	61.36
Highest	24.73	3-18-88					
Lowest	65.74	9-12-91					

Table 10. Water levels in well 11N/1E-24Q5 (P2) recorded at 0600 hours daily, water years 1988-92

[Latitude 38°46'46"; longitude 121°48'38". Water levels in feet below land surface; land surface elevation is 42.1 feet above sea level. Water year: October 1 to September 30. Gravel-packed interval: 540 to 640 feet below land surface; screened interval: 583 to 588 feet below land surface. max, maximum; med, median; min, minimum; * indicates statistics are for partial months; --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1988						
1	--	--	--	--	--	--	--	--	--	90.6	93.0	80.1
2	--	--	--	--	--	--	--	--	75.9	91.3	92.5	79.5
3	--	--	--	--	--	--	--	--	77.4	92.0	92.2	79.0
4	--	--	--	--	--	--	--	--	78.8	92.6	91.8	78.4
5	--	--	--	--	--	--	--	--	79.9	93.2	91.2	77.9
6	--	--	--	--	--	--	--	--	--	93.6	90.6	77.4
7	--	--	--	--	--	--	--	--	--	94.0	90.2	76.9
8	--	--	--	--	--	--	--	--	--	94.4	89.7	76.4
9	--	--	--	--	--	--	--	--	--	94.7	89.4	75.9
10	--	--	--	--	--	--	--	--	--	95.1	89.2	75.5
11	--	--	--	--	--	--	--	--	--	95.6	89.3	74.9
12	--	--	--	--	--	--	--	--	--	95.9	89.4	74.4
13	--	--	--	--	--	--	--	--	--	96.2	89.6	73.8
14	--	--	--	--	--	--	--	--	--	96.3	89.6	73.1
15	--	--	--	--	--	--	--	--	--	--	89.4	72.6
16	--	--	--	--	--	--	--	--	85.6	--	89.4	72.1
17	--	--	--	--	--	--	--	--	86.2	--	89.1	71.7
18	--	--	--	--	--	--	--	--	86.5	--	89.0	71.2
19	--	--	--	--	--	--	--	--	86.7	--	88.7	70.7
20	--	--	--	--	--	--	--	--	86.7	--	88.2	70.0
21	--	--	--	--	--	--	--	--	86.6	--	87.6	69.42
22	--	--	--	--	--	--	--	--	86.5	--	86.7	68.82
23	--	--	--	--	--	--	--	--	86.6	--	85.8	68.14
24	--	--	--	--	--	--	--	--	86.8	--	85.1	67.47
25	--	--	--	--	--	--	--	--	87.3	96.0	84.3	66.84
26	--	--	--	--	--	--	--	--	87.5	95.5	83.7	66.20
27	--	--	--	--	--	--	--	--	87.9	95.0	83.1	65.46
28	--	--	--	--	--	--	--	--	88.4	94.5	82.6	64.76
29	--	--	--	--	--	--	--	--	89.0	94.1	81.9	64.08
30	--	--	--	--	--	--	--	--	89.7	93.7	81.2	63.37
31	--	--	--	--	--	--	--	--	--	93.4	80.7	--
Max	--	--	--	--	--	--	--	--	89.7*	96.3*	93.0	80.1
Min	--	--	--	--	--	--	--	--	75.9*	90.6*	80.7	63.37
Med	--	--	--	--	--	--	--	--	86.6*	94.4*	89.2	72.4

Partial water year 1988: High 63.37 Low 96.3 Med 86.7

Table 10. Water levels in well 11N/1E-24Q5 (P2) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1989						
1	62.70	46.35	--	--	--	24.97	26.35	51.71	80.67	--	--	--
2	62.02	45.97	--	--	--	24.78	26.34	--	81.28	--	--	--
3	61.32	45.60	--	--	--	24.85	26.49	--	82.70	--	--	--
4	60.63	45.24	--	--	26.76	24.85	26.84	--	83.82	--	--	--
5	59.96	44.83	--	--	26.73	24.83	27.24	--	85.44	--	--	--
6	59.30	44.47	--	--	26.68	24.76	27.60	--	86.36	--	--	--
7	58.68	44.09	--	29.97	26.60	24.73	28.31	--	87.27	--	--	--
8	58.08	43.77	--	29.89	26.50	24.70	29.18	--	87.99	--	--	--
9	57.44	43.45	--	29.75	26.40	24.68	29.96	--	88.61	--	--	--
10	56.82	43.11	--	29.54	26.36	24.73	30.41	--	89.43	--	--	--
11	56.24	42.74	--	29.45	26.28	24.72	30.96	--	90.24	--	--	--
12	55.67	42.42	--	29.34	26.17	24.74	31.60	--	90.96	--	--	--
13	55.10	42.11	--	29.14	26.06	24.75	32.47	--	91.58	--	--	--
14	54.55	41.75	--	28.95	26.00	24.77	33.52	--	--	--	--	--
15	54.03	41.47	--	--	25.97	24.80	34.53	--	--	--	97.10	79.60
16	53.52	41.24	--	--	25.90	24.84	35.68	--	--	--	96.14	78.67
17	53.00	40.92	--	--	25.81	25.04	36.72	--	--	--	95.48	77.74
18	52.50	40.58	--	--	25.68	25.15	37.62	--	--	--	94.81	76.87
19	52.00	40.30	--	--	25.60	25.22	38.49	--	--	--	94.15	76.01
20	51.49	40.02	--	--	25.57	25.33	39.38	71.40	--	--	93.79	75.21
21	51.04	39.71	--	--	25.52	25.45	40.28	72.22	--	--	93.52	74.28
22	50.58	39.40	--	--	25.42	25.53	41.25	72.80	--	--	93.06	73.41
23	50.11	--	--	--	25.35	25.62	42.20	73.88	--	--	--	72.50
24	49.66	--	--	--	25.27	25.68	43.10	--	--	--	--	71.65
25	49.23	--	--	--	25.24	25.79	43.99	--	--	--	--	70.81
26	48.80	--	--	--	25.18	25.92	45.08	--	--	--	--	69.97
27	48.35	--	--	--	25.09	26.06	46.28	75.58	--	--	--	69.14
28	47.96	--	--	--	25.00	26.17	47.48	76.00	--	--	--	68.33
29	47.58	--	--	--	--	26.28	48.99	77.01	--	--	--	67.51
30	47.19	--	--	--	--	26.35	50.50	77.93	--	--	--	66.74
31	46.76	--	--	--	--	26.37	--	79.35	--	--	--	--
Max	62.70	46.35*	--	29.97*	26.76*	26.37	50.50	79.35*	91.58*	--	97.10*	79.60*
Min	46.76	39.40*	--	28.95*	25.00*	24.68	26.34	51.71*	80.67*	--	93.06*	66.74*
Med	53.52	42.58*	--	29.49*	25.90*	24.97	35.10	74.73*	87.27*	--	94.48*	72.96*

Water year 1989: High 24.68 Low 97.10 Med 42.31

Table 10. Water levels in well 11N/1E-24Q5 (P2) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1990						
1	65.95	48.75	--	--	30.66	27.43	35.13	--	95.58	105.36	107.18	96.55
2	65.17	48.35	--	--	30.59	27.33	36.73	--	95.09	106.06	106.69	95.75
3	64.47	47.94	--	--	30.42	27.22	38.23	--	94.69	106.57	106.20	94.89
4	63.77	47.54	--	--	30.24	27.11	39.86	--	94.38	107.08	105.71	94.07
5	63.05	47.15	--	--	30.14	27.03	41.68	--	94.14	107.49	105.32	93.30
6	62.40	46.79	--	34.75	29.97	26.99	43.55	--	94.13	107.90	105.23	92.55
7	61.74	46.43	37.99	34.72	29.87	26.86	45.46	--	94.49	108.31	104.94	91.76
8	61.06	46.06	37.77	34.64	29.74	26.77	47.40	--	94.98	108.62	104.55	--
9	60.40	45.72	37.54	34.50	29.63	--	49.16	--	95.76	108.73	103.66	--
10	59.76	45.35	37.31	--	29.53	26.65	50.45	91.17	96.66	108.88	103.48	--
11	59.13	45.00	37.13	--	29.37	26.62	51.64	91.73	97.55	108.89	103.20	--
12	58.55	44.67	36.96	34.06	29.20	26.61	52.72	92.22	98.26	108.90	103.31	--
13	57.97	44.38	36.73	33.81	29.13	26.59	53.79	92.62	--	108.91	103.23	--
14	--	44.07	--	33.62	29.03	26.61	54.91	92.97	99.21	109.02	103.04	--
15	--	43.78	--	33.47	28.91	26.78	56.08	93.41	99.26	109.32	--	--
16	--	--	--	33.23	28.71	26.86	57.15	93.73	99.33	109.43	102.77	--
17	--	--	--	33.07	28.55	26.86	58.56	94.02	99.45	109.54	102.59	--
18	--	--	--	32.92	28.47	26.88	--	94.39	99.88	109.55	102.40	--
19	--	--	--	32.75	28.41	26.90	--	94.71	--	109.66	102.32	--
20	--	--	--	32.60	28.34	26.93	--	95.22	100.60	109.77	102.23	--
21	--	--	--	32.44	28.21	27.08	--	95.78	101.24	109.98	101.95	--
22	--	--	--	32.25	28.11	27.31	--	96.06	101.88	110.09	101.66	--
23	--	--	--	32.10	28.01	27.63	--	96.26	102.52	109.90	101.38	--
24	--	--	--	31.93	27.91	28.06	--	96.56	103.06	109.71	101.20	--
25	51.79	--	--	31.80	27.79	28.47	--	96.70	103.70	109.22	101.01	--
26	51.37	--	--	31.61	27.69	28.95	--	96.82	104.04	108.93	100.93	--
27	50.90	--	--	31.49	27.61	29.34	--	96.95	104.38	108.64	100.74	--
28	50.46	--	--	31.35	27.53	30.00	--	97.02	104.62	108.35	99.86	--
29	50.02	--	--	31.16	--	31.10	--	96.77	104.84	108.06	99.05	--
30	49.61	--	--	30.92	--	32.31	--	96.37	105.05	107.97	98.21	--
31	49.16	--	--	30.82	--	33.67	--	95.99	--	107.67	97.41	--
Max	65.95*	48.75*	37.99*	34.75*	30.66	33.67*	58.56*	97.02*	105.05*	110.09	107.18*	96.55*
Min	49.16*	43.78*	36.73*	30.82*	27.53	26.59*	35.13*	91.17*	94.13*	105.36	97.41*	91.76*
Med	59.44*	46.06*	37.31*	32.67*	28.97	27.06*	49.16*	95.50*	99.29*	108.89	102.68*	94.07*

Water year 1990: High 26.59 Low 110.09 Med 58.56

Table 10. Water levels in well 11N/1E-24Q5 (P2) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1991						
1	--	57.96	46.88	--	47.34	--	47.30	52.31	--	107.31	107.48	91.95
2	--	57.39	46.36	--	47.97	--	46.88	53.53	--	107.08	107.20	91.23
3	--	56.81	46.09	--	--	--	46.44	54.83	--	106.67	106.94	90.51
4	--	56.23	45.98	--	--	--	46.00	56.09	--	106.63	106.70	89.74
5	--	55.76	45.59	--	47.90	--	45.56	57.41	90.04	106.96	106.46	88.97
6	--	55.00	--	--	48.81	--	45.12	58.63	91.20	107.42	106.15	88.27
7	--	54.46	--	--	49.15	61.47	44.74	59.82	92.43	107.70	--	87.61
8	--	53.92	--	--	49.42	60.85	44.34	61.20	93.53	107.97	105.66	86.90
9	--	53.59	--	--	49.82	60.22	44.01	62.57	94.49	108.31	105.49	86.17
10	--	53.32	--	--	49.91	59.62	43.87	63.92	95.42	108.68	105.46	85.55
11	--	52.91	--	--	50.61	59.06	43.82	65.32	96.21	108.95	105.25	84.93
12	--	52.65	--	32.31	51.05	58.50	43.59	66.81	97.11	109.18	104.82	84.30
13	--	52.41	--	--	51.57	57.82	43.33	68.19	98.12	109.28	104.39	83.62
14	--	52.10	--	36.06	52.20	57.27	43.11	69.42	--	109.35	103.95	--
15	--	51.85	--	36.92	52.70	56.69	43.01	70.53	--	109.32	103.54	--
16	--	51.56	--	37.67	53.13	56.18	43.23	71.52	--	109.15	103.09	--
17	--	51.32	--	37.74	53.93	55.60	43.54	72.50	--	109.26	102.57	--
18	--	51.03	--	38.71	54.69	55.04	44.08	73.20	--	109.70	101.96	--
19	--	50.94	--	39.36	55.54	54.38	44.76	73.92	103.37	109.84	101.32	--
20	--	50.51	--	39.13	--	53.76	45.46	74.70	103.75	109.70	100.69	--
21	--	50.17	--	39.86	--	53.23	45.92	75.52	104.03	109.45	100.08	--
22	--	49.63	--	40.90	--	52.72	46.24	76.39	104.46	109.15	99.36	--
23	64.58	49.32	--	42.01	--	52.14	46.55	77.21	104.94	108.81	98.59	--
24	--	49.07	--	42.26	--	51.52	46.92	78.09	105.71	108.63	97.84	--
25	--	48.79	--	42.80	--	50.79	47.37	78.94	106.39	108.49	97.12	--
26	--	48.51	--	43.52	--	50.22	47.88	79.78	106.93	108.43	96.37	--
27	--	47.91	--	43.80	--	49.73	48.41	80.61	107.24	108.52	95.60	--
28	--	47.67	--	44.18	--	49.29	49.17	81.46	107.48	108.66	94.86	--
29	--	47.42	--	44.96	--	48.77	50.11	82.46	107.57	108.42	94.10	--
30	--	47.11	--	46.21	--	48.27	51.15	83.55	107.55	108.06	93.36	--
31	58.64	--	--	46.67	--	47.77	--	--	--	107.78	92.66	--
Max	64.58*	57.96	46.88*	46.67*	55.54*	61.47*	51.15	83.55	107.57*	109.84	107.48*	91.95*
Min	58.64*	47.11	45.59*	32.31*	47.34*	47.77*	43.01	52.31	90.04*	106.63	92.66*	83.62*
Med	61.61*	51.70	46.09*	40.90*	50.61*	54.38*	45.51	71.02	103.75*	108.63	102.83*	87.61*

Water year 1991: High 32.31 Low 109.84 Med 58.63

Table 10. Water levels in well 11N/1E-24Q5 (P2) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1992						
1	--	--	47.53	41.34	37.29	34.21	31.61	50.92	--	--	--	88.85
2	--	--	47.30	41.17	37.24	34.10	31.85	52.74	--	--	--	88.21
3	--	--	47.04	40.97	37.14	34.02	32.21	54.79	--	--	--	87.62
4	--	--	46.80	40.82	37.03	33.97	32.44	56.92	--	--	--	87.13
5	--	--	46.54	40.58	36.94	33.83	32.55	58.90	--	--	--	86.61
6	--	--	46.31	40.48	36.83	33.69	32.60	--	--	--	--	86.11
7	--	--	46.05	40.33	36.70	33.56	32.61	--	--	--	--	85.61
8	--	--	45.85	40.22	36.65	33.47	32.66	--	--	--	--	85.07
9	--	--	45.68	40.10	36.54	33.43	32.80	--	--	--	--	84.48
10	--	--	45.44	39.96	36.37	33.38	32.93	--	--	--	--	83.94
11	--	--	45.22	39.80	36.23	33.27	33.05	--	--	--	--	83.40
12	--	--	45.06	39.67	36.05	33.17	33.26	--	--	--	--	82.88
13	--	--	44.89	39.59	35.92	33.07	33.56	--	--	--	--	82.31
14	--	--	44.68	39.44	35.87	32.98	33.78	--	--	--	--	81.73
15	--	--	44.48	39.32	35.63	32.85	34.00	--	--	--	--	81.18
16	--	--	44.27	39.20	35.57	32.76	34.30	--	--	--	--	80.69
17	--	--	44.03	39.03	35.54	32.69	34.68	--	--	--	--	80.21
18	--	--	43.81	38.90	35.45	32.59	35.15	--	--	--	--	79.71
19	--	--	43.68	38.83	35.33	32.51	35.65	--	--	--	--	79.22
20	--	--	43.49	38.72	35.19	32.39	36.17	--	--	--	--	78.70
21	--	--	43.30	38.61	35.12	32.29	36.71	--	--	--	--	78.14
22	--	49.89	43.11	38.50	35.04	32.24	37.52	--	--	--	--	77.55
23	--	49.64	42.94	38.39	34.94	32.20	38.44	--	--	--	--	76.97
24	--	49.36	42.76	38.26	34.86	32.20	39.36	--	--	--	--	76.36
25	--	49.08	42.59	38.13	34.76	32.05	40.36	--	--	--	--	75.77
26	--	48.80	42.41	37.99	34.67	31.96	41.61	--	--	--	--	75.22
27	--	48.52	42.21	37.92	34.58	31.85	43.24	--	--	--	--	74.71
28	--	48.30	41.98	37.79	34.48	31.81	45.06	--	--	--	91.19	74.17
29	--	47.99	41.72	37.68	34.34	31.77	47.09	--	--	--	90.62	73.58
30	--	47.78	41.62	37.56	--	31.69	49.09	--	--	--	90.08	73.05
31	--	--	41.49	37.43	--	31.61	--	--	--	--	89.51	--
Max	--	49.89*	47.53	41.34	37.29	34.21	49.09	58.90*	--	--	91.19*	88.85
Min	--	47.78*	41.49	37.43	34.34	31.61	31.61	50.92*	--	--	89.51*	73.05
Med	--	48.80*	44.27	39.20	35.63	32.76	34.15	54.79*	--	--	90.35*	80.93

Water year 1992: High 31.61 Low 91.19 Med 39.34

Table 11. Water-level measurements for well 11N/1E-24Q5 (P2), water years 1988-92

[Water levels in feet below land surface; land-surface elevation is 42.1 feet above sea level]

Date	Water level	Date	Water level	Date	Water level	Date	Water level
12-09-87	30.27	7-14-88	96.33	10-13-89	57.87	1-08-91	32.31
12-14-87	31.22	8-03-88	92.15	10-18-89	55.15	2-04-91	46.75
2-23-88	22.71	8-16-88	89.26	10-24-89	52.16	3-06-91	62.06
2-24-88	22.31	9-19-88	70.40	10-30-89	49.51	4-04-91	45.94
2-25-88	22.29	9-26-88	66.08	11-15-89	43.73	4-18-91	44.21
2-29-88	22.21	10-13-88	55.08	12-13-89	36.67	5-03-91	55.02
3-08-88	22.10	11-08-88	43.73	1-09-90	34.50	5-30-91	83.67
3-18-88	25.36	12-07-88	35.51	1-29-90	31.10	6-18-91	103.04
3-21-88	28.22	1-06-89	30.06	2-08-90	29.73	7-02-91	107.01
3-22-88	28.91	1-09-89	29.62	3-08-90	26.59	8-02-91	107.17
3-25-88	32.80	1-12-89	29.29	4-09-90	49.53	8-07-91	105.94
3-29-88	35.48	2-03-89	26.88	4-11-90	51.84	9-12-91	84.22
4-01-88	39.22	2-27-89	25.08	5-08-90	90.12	10-16-91	63.66
4-12-88	51.07	3-17-89	25.07	5-09-90	92.75	11-14-91	52.14
4-13-88	52.19	3-29-89	26.30	6-13-90	98.95	11-19-91	50.77
4-15-88	54.95	4-27-89	46.31	6-19-90	100.29	12-17-91	43.98
5-03-88	62.73	5-26-89	75.74	6-28-90	104.70	1-13-92	39.57
5-11-88	62.50	6-13-89	91.69	7-09-90	108.75	2-14-92	35.86
5-16-88	65.01	6-15-89	92.99	8-09-90	103.65	3-18-92	31.61
5-25-88	66.49	7-07-89	102.20	9-07-90	91.66	4-20-92	36.25
5-26-88	67.32	8-04-89	103.04	9-10-90	88.85	5-14-92	75.51
5-31-88	73.33	8-22-89	93.05	10-10-90	67.35	7-23-92	107.25
6-03-88	77.69	9-14-89	80.31	11-08-90	53.79	8-25-92	92.78
6-14-88	84.71	10-03-89	64.29	12-05-90	45.59	10-01-92	72.34
6-28-88	88.49	10-11-89	59.12	1-03-91	40.29		
Highest	22.10	3-08-88					
Lowest	108.75	7-09-90					

Table 12. Water levels in well 11N/1E-24Q6 (P3) recorded at 0600 hours daily, water years 1988-92

[Latitude 38°46'46"; longitude 121°48'38". Water levels in feet below land surface; land-surface elevation is 42.1 feet above sea level. Water year: October 1 to September 30. Gravel-packed interval: 360 to ~440 feet below land surface; screened interval: 382 to 387 feet below land surface. max, maximum; med, median; min, minimum; * indicates statistics are for partial months; --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1988						
1	--	--	--	--	--	--	--	--	--	129.0	103.0	--
2	--	--	--	--	--	--	--	--	--	126.9	103.9	--
3	--	--	--	--	--	--	--	--	--	127.7	103.4	--
4	--	--	--	--	--	--	--	--	115.9	125.2	98.9	--
5	--	--	--	--	--	--	--	--	112.0	122.5	96.5	--
6	--	--	--	--	--	--	--	--	110.8	123.4	97.7	--
7	--	--	--	--	--	--	--	--	113.0	122.6	98.3	--
8	--	--	--	--	--	--	--	--	112.5	123.7	98.4	--
9	--	--	--	--	--	--	--	--	112.3	123.6	101.0	--
10	--	--	--	--	--	--	--	--	113.5	121.5	101.0	--
11	--	--	--	--	--	--	--	--	111.4	118.5	98.1	--
12	--	--	--	--	--	--	--	--	110.8	117.5	97.9	--
13	--	--	--	--	--	--	--	--	110.2	117.6	96.0	--
14	--	--	--	--	--	--	--	--	110.5	123.6	94.0	--
15	--	--	--	--	--	--	--	--	--	121.9	92.6	--
16	--	--	--	--	--	--	--	--	116.5	120.2	91.8	--
17	--	--	--	--	--	--	--	--	112.3	117.5	89.9	--
18	--	--	--	--	--	--	--	--	105.8	113.0	88.4	--
19	--	--	--	--	--	--	--	--	109.7	113.3	86.4	--
20	--	--	--	--	--	--	--	--	108.0	114.5	85.0	--
21	--	--	--	--	--	--	--	--	107.3	116.3	83.4	--
22	--	--	--	--	--	--	--	--	110.1	114.5	--	--
23	--	--	--	--	--	--	--	--	111.7	113.7	--	--
24	--	--	--	--	--	--	--	--	112.2	113.4	--	--
25	--	--	--	--	--	--	--	--	107.8	112.3	--	--
26	--	--	--	--	--	--	--	--	111.9	110.5	--	--
27	--	--	--	--	--	--	--	--	115.2	111.3	--	55.49
28	--	--	--	--	--	--	--	--	116.3	105.7	--	54.30
29	--	--	--	--	--	--	--	--	121.5	104.5	--	53.30
30	--	--	--	--	--	--	--	--	129.2	105.9	--	52.29
31	--	--	--	--	--	--	--	--	--	104.5	--	--
Max	--	--	--	--	--	--	--	--	129.2*	129.0	103.9*	55.49*
Min	--	--	--	--	--	--	--	--	105.8*	104.5	83.4*	52.29*
Med	--	--	--	--	--	--	--	--	112.0*	117.5	97.7*	53.80*

Partial water year 1988: High 52.29 Low 129.2 Med 111.4

Table 12. Water levels in well 11N/1E-24Q6 (P3) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1989						
1	51.37	36.70	29.88	--	23.37	22.43	27.95	66.10	123.98	--	119.08	--
2	50.53	36.42	29.81	--	23.45	22.66	34.11	--	127.38	--	119.38	--
3	49.68	36.12	29.64	--	23.58	22.49	35.00	--	125.38	--	120.38	--
4	48.93	35.79	29.46	--	23.48	22.37	35.77	--	126.58	--	121.38	--
5	48.39	35.47	29.26	--	23.42	24.22	35.16	--	118.18	--	120.28	--
6	47.66	35.21	29.07	--	23.34	24.41	37.31	--	119.38	--	118.19	--
7	47.09	34.89	--	--	23.31	22.85	39.15	--	122.28	--	110.99	--
8	46.77	34.69	--	--	23.26	24.32	39.97	--	121.98	135.78	108.20	--
9	46.28	34.70	--	--	23.25	24.44	40.85	--	121.88	138.68	106.10	--
10	45.71	34.48	--	24.79	23.16	24.58	42.51	--	123.88	140.18	104.21	--
11	45.22	34.29	--	24.71	23.09	24.63	38.21	--	127.98	138.98	103.51	--
12	44.54	34.14	--	24.64	23.00	24.74	39.60	--	129.08	134.38	106.51	--
13	44.17	34.08	--	24.50	22.90	24.84	43.06	--	--	135.08	106.52	--
14	43.87	33.63	--	24.42	22.86	26.32	46.61	--	--	131.88	104.92	--
15	43.47	33.75	--	24.37	22.87	27.08	53.02	--	--	130.68	103.93	70.98
16	42.94	33.24	--	24.28	22.84	27.08	54.67	--	--	126.38	104.13	69.87
17	42.47	32.90	--	24.18	--	27.52	58.47	--	--	125.38	103.74	67.80
18	41.96	32.58	--	24.09	22.48	27.78	60.82	--	--	129.28	101.04	66.15
19	41.52	32.34	--	23.99	22.30	27.95	67.55	--	--	123.98	101.05	64.72
20	41.05	32.11	--	23.91	22.27	28.18	69.00	--	--	126.88	100.85	63.40
21	40.64	31.86	--	23.82	22.50	28.44	66.30	--	--	127.98	98.35	62.13
22	40.51	31.64	--	23.72	22.43	28.61	62.81	--	--	128.58	--	60.92
23	40.20	31.49	--	23.65	22.43	28.73	64.30	--	--	125.18	--	59.80
24	39.84	31.10	--	23.63	22.39	28.80	60.17	--	--	123.18	--	58.78
25	39.46	30.96	--	23.61	22.40	28.96	64.65	--	--	125.88	--	57.80
26	38.90	30.67	--	23.57	22.37	29.11	66.14	--	--	127.18	--	56.87
27	38.43	30.55	--	23.67	22.31	29.26	67.87	111.78	--	127.48	--	55.99
28	38.04	30.42	--	23.74	22.31	29.37	70.08	111.28	--	125.98	--	55.17
29	37.78	30.24	--	23.66	--	29.47	69.06	116.38	--	125.78	--	54.35
30	37.50	30.08	--	23.55	--	28.52	68.78	118.88	--	125.08	--	53.58
31	37.09	--	--	23.45	--	27.81	--	121.88	--	122.08	--	--
Max	51.37	36.70	29.88*	24.79*	23.58*	29.47	70.08	121.88*	129.08*	140.18*	121.38*	70.98*
Min	37.09	30.08	29.07*	23.45*	22.27*	22.37	27.95	66.10*	118.18*	122.08*	98.35*	53.58*
Med	42.94	33.43	29.55*	23.86*	22.87*	27.08	53.84	114.08*	123.93*	127.33*	106.10*	60.36*

Water year 1989: High 22.27 Low 140.18 Med 38.67

Table 12. Water levels in well 11N/1E-24Q6 (P3) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1990						
1	52.81	38.74	--	--	26.54	24.24	--	127.31	103.32	148.78	--	--
2	52.06	38.56	--	--	26.51	24.19	--	128.47	104.16	145.05	--	--
3	51.44	38.32	--	--	26.39	24.12	--	131.81	105.44	146.22	--	--
4	50.88	37.99	--	--	26.24	24.03	--	136.88	107.09	139.17	--	--
5	50.25	37.67	--	--	26.17	23.97	--	136.05	115.86	141.50	--	--
6	49.65	37.40	--	--	26.06	23.96	--	136.81	122.65	148.71	--	--
7	49.08	37.13	--	--	25.99	23.88	--	136.05	121.40	142.95	--	--
8	48.53	36.89	--	--	25.89	23.81	--	135.68	127.49	143.95	--	--
9	47.99	36.64	--	--	25.83	--	--	133.77	129.51	144.25	--	--
10	47.47	36.43	--	--	25.76	24.96	--	134.93	132.40	144.69	--	--
11	46.99	36.27	--	--	25.65	24.46	--	134.83	132.34	144.69	--	--
12	46.50	36.06	--	--	25.51	24.56	83.08	132.91	133.29	149.47	--	--
13	46.05	35.85	--	--	25.47	26.96	84.44	132.01	--	150.90	--	--
14	45.57	35.62	--	--	25.41	33.82	87.41	131.66	134.20	155.12	--	--
15	45.26	35.45	--	--	25.34	28.45	87.44	134.44	133.95	154.40	--	--
16	44.92	--	--	--	25.19	26.67	94.64	134.17	132.62	154.71	--	--
17	44.56	--	--	--	25.05	26.34	102.69	134.75	135.04	156.86	--	--
18	44.25	--	--	--	25.00	26.30	101.07	134.48	132.46	155.62	--	--
19	43.81	--	--	--	24.98	26.43	104.05	135.82	--	156.83	--	--
20	43.38	--	--	--	24.93	34.29	108.53	137.32	141.22	154.19	--	--
21	42.97	--	--	--	24.84	36.10	109.01	133.71	145.67	155.39	--	--
22	42.62	--	--	--	24.75	37.54	109.99	129.18	146.89	159.65	--	--
23	42.15	--	--	--	24.67	40.60	110.47	127.89	144.56	159.85	--	--
24	41.65	--	--	--	24.59	36.66	110.40	126.50	145.49	--	--	--
25	41.14	--	--	--	24.50	37.98	111.88	127.66	144.60	--	--	--
26	40.83	--	--	--	24.43	36.77	113.02	123.97	131.50	--	--	--
27	40.49	--	--	--	24.38	40.13	120.20	122.61	131.70	--	--	--
28	40.17	--	--	--	24.31	44.99	119.65	112.80	125.41	--	--	--
29	39.85	--	--	--	--	48.83	123.92	111.00	121.29	--	--	--
30	39.49	--	--	26.72	--	--	126.16	108.20	146.42	--	--	--
31	39.01	--	--	26.65	--	--	--	104.53	--	--	--	--
Max	52.81	38.74*	--	26.72*	26.54*	48.83*	126.16*	137.32	146.89*	159.85*	--	--
Min	39.01	35.45*	--	26.65*	24.31*	23.81*	83.08*	104.53	103.32*	139.17*	--	--
Med	44.92	36.89*	--	26.69*	25.37*	26.55*	109.01*	132.91	132.37*	149.47*	--	--

Water year 1990: High 23.81 Low 159.85 Med 52.06

Table 12. Water levels in well 11N/1E-24Q6 (P3) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1991						
1	--	47.32	39.59	35.91	60.75	--	39.31	79.56	--	--	127.38	85.75
2	--	46.90	39.51	35.74	66.65	--	38.95	82.56	--	--	126.68	84.25
3	--	46.51	39.30	35.56	55.22	71.89	38.58	82.58	--	--	--	83.55
4	--	46.25	39.13	35.54	52.05	67.08	38.24	84.91	--	--	--	82.45
5	--	45.86	39.06	35.51	54.63	63.71	37.75	87.98	--	--	--	81.65
6	--	45.52	38.89	35.44	54.47	61.09	37.31	89.49	--	143.17	--	80.95
7	--	45.27	38.71	35.29	54.19	59.85	37.01	93.38	--	145.26	--	80.05
8	--	45.03	38.61	35.10	53.98	58.63	36.59	96.26	--	147.86	117.58	79.04
9	--	44.76	38.49	34.92	54.65	57.46	36.84	98.17	--	149.66	117.28	78.44
10	--	44.46	38.21	34.83	55.31	56.50	37.86	100.04	--	146.85	118.98	77.94
11	--	44.20	37.94	34.68	55.75	55.60	37.98	105.86	--	148.25	116.88	76.94
12	--	43.99	37.76	34.55	63.48	54.76	37.77	109.05	--	146.55	115.27	75.84
13	55.07	43.79	37.58	34.53	67.11	53.83	38.92	110.01	--	144.85	115.47	74.58
14	54.53	43.43	37.39	34.52	69.54	52.98	39.93	110.89	--	139.54	113.47	73.68
15	53.95	43.10	37.20	34.49	66.33	52.15	42.79	109.57	--	134.24	111.57	72.28
16	53.53	42.81	37.07	34.89	68.14	51.34	42.61	108.89	--	137.44	113.47	71.28
17	53.07	42.60	36.90	35.25	68.00	50.44	45.98	102.18	--	140.53	108.57	70.28
18	52.59	42.31	36.86	35.69	70.18	48.96	48.78	104.21	--	140.53	107.67	69.38
19	52.11	41.94	36.76	36.16	69.02	47.74	50.18	104.90	--	139.23	105.97	68.44
20	51.76	41.74	36.88	36.60	70.73	46.80	--	104.74	--	134.82	105.97	67.81
21	51.38	41.56	36.94	37.00	73.92	46.08	--	106.16	--	135.22	101.06	67.35
22	50.96	41.38	36.84	37.37	--	45.44	--	108.08	--	128.62	99.46	66.60
23	50.56	41.10	36.78	38.38	--	44.64	--	--	--	132.11	98.46	65.70
24	50.19	40.80	36.62	39.98	--	43.89	--	--	--	132.31	96.76	64.85
25	49.87	40.63	36.42	41.28	--	43.08	--	--	--	131.71	96.16	64.02
26	49.54	40.52	36.27	42.24	--	42.43	68.48	--	--	130.50	93.66	63.24
27	49.17	40.34	36.27	44.06	--	41.87	71.24	--	--	132.20	92.66	62.85
28	48.83	40.10	36.28	46.11	--	41.38	73.04	--	--	133.00	91.16	62.13
29	48.47	39.86	36.37	48.13	--	40.82	76.99	--	--	129.69	89.76	61.41
30	48.13	39.67	36.29	51.62	--	40.30	79.18	--	--	131.39	88.55	60.80
31	47.74	--	36.11	54.25	--	39.79	--	--	--	126.29	86.75	--
Max	55.07*	47.32	39.59	54.25	73.92*	71.89*	79.18*	110.89*	--	149.66*	127.38*	85.75
Min	47.74*	39.67	36.11	34.49	52.05*	39.79*	36.59*	79.56*	--	126.29*	86.75*	60.80
Med	50.96*	42.95	37.07	35.69	63.48*	50.44*	39.13*	103.19*	--	136.33*	106.82*	71.78

Water year 1991: High 34.49 Low 149.66 Med 53.53

Table 12. Water levels in well 11N/1E-24Q6 (P3) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1992						
1	60.52	46.89	40.16	35.81	33.17	30.38	29.17	--	131.78	134.05	117.39	85.30
2	60.06	46.57	39.99	35.69	33.14	30.29	29.89	--	132.99	132.46	115.19	85.65
3	59.59	46.30	39.89	35.52	33.06	30.23	30.31	--	137.69	131.26	113.10	86.25
4	59.17	46.00	39.74	35.40	32.99	30.20	30.56	--	135.60	134.57	113.30	86.26
5	58.75	45.70	39.58	35.22	32.95	30.20	30.89	--	134.20	134.17	113.40	85.22
6	58.23	45.41	39.38	35.14	32.84	29.92	30.89	--	131.81	132.18	112.20	84.29
7	57.45	45.11	39.19	35.04	32.74	29.82	31.57	--	135.91	135.99	109.30	82.77
8	56.75	45.03	39.05	--	32.75	29.72	34.37	--	137.52	132.29	107.70	81.55
9	56.18	44.98	38.92	--	32.65	29.68	33.72	--	140.43	129.80	106.31	80.41
10	55.78	44.82	38.78	--	32.50	29.64	33.43	--	140.63	131.30	104.51	79.52
11	55.29	44.46	38.64	--	32.39	29.61	34.57	--	142.54	130.71	102.71	78.78
12	54.82	44.28	38.49	--	32.25	29.51	37.44	--	143.34	128.31	102.41	78.05
13	54.38	44.22	38.35	--	32.14	29.39	35.53	--	141.05	127.82	102.11	77.46
14	53.92	44.00	38.22	--	32.11	29.29	--	--	139.45	128.03	101.61	75.91
15	53.40	--	38.04	--	31.90	29.17	35.73	121.98	137.46	132.03	102.81	76.17
16	52.90	--	37.92	--	31.83	29.08	37.08	122.29	141.37	133.94	102.02	75.96
17	52.56	--	37.74	--	31.78	29.03	39.00	122.00	141.77	135.44	101.42	75.59
18	52.19	--	37.56	34.01	31.69	28.94	40.61	121.10	138.18	133.05	101.92	75.03
19	51.81	--	37.48	33.98	31.56	28.86	42.14	123.71	139.78	132.35	101.52	73.71
20	51.37	42.56	37.37	33.90	31.39	28.97	42.91	124.01	144.69	129.26	99.92	72.39
21	50.87	42.29	37.25	33.83	31.32	29.79	49.37	125.22	144.79	129.77	97.98	71.12
22	50.55	42.01	37.10	33.77	31.22	29.99	51.34	127.02	144.90	129.97	96.17	69.80
23	50.18	41.87	36.97	33.70	31.10	29.04	53.94	129.13	143.41	128.48	95.14	68.81
24	49.79	41.78	36.85	33.61	31.00	28.82	57.34	132.84	143.91	132.98	93.46	67.96
25	49.41	41.41	36.73	33.51	30.89	28.66	63.10	132.04	148.02	129.88	94.19	67.90
26	48.89	41.15	36.60	33.42	30.80	28.53	67.89	134.95	148.32	129.68	92.05	67.34
27	48.57	40.93	36.46	33.39	30.73	28.41	72.78	135.25	147.43	125.39	90.63	66.86
28	48.23	40.74	36.27	33.33	30.62	28.43	--	136.36	145.23	122.39	90.41	65.57
29	47.83	40.51	36.04	33.29	30.50	28.46	--	138.76	143.74	121.49	88.91	64.68
30	47.54	40.34	35.97	33.28	--	28.43	--	136.27	135.45	118.79	89.39	63.94
31	47.21	--	35.91	33.22	--	28.46	--	132.98	--	119.39	86.12	--
Max	60.52	46.89*	40.16	35.81*	33.17	30.38	72.78*	138.76*	148.32	135.99	117.39	86.26
Min	47.21	40.34*	35.91	33.22*	30.50	28.41	29.17*	121.10*	131.78	118.79	86.12	63.94
Med	52.90	44.22*	37.92	33.83*	31.90	29.29	36.40*	129.13*	140.84	130.71	101.92	75.93

Water year 1992: High 28.41 Low 148.32 Med 50.55

Table 13. Water-level measurements for well 11N/1E-24Q6 (P3), water years 1988-92

[Water levels in feet below land surface; land-surface elevation is 42.1 feet above sea level]

Date	Water level	Date	Water level	Date	Water level	Date	Water level
12-09-87	31.32	7-14-88	127.53	10-13-89	45.99	1-03-91	35.55
12-14-87	29.86	8-03-88	103.85	10-18-89	44.06	1-18-91	35.80
2-23-88	21.27	8-16-88	92.63	10-24-89	41.51	2-04-91	53.36
2-24-88	21.27	9-19-88	64.45	10-30-89	39.43	3-06-91	60.80
2-25-88	21.31	9-26-88	56.45	11-15-89	35.41	4-04-91	38.18
2-29-88	21.70	10-13-88	44.15	12-13-89	32.25	4-18-91	50.87
3-08-88	20.08	11-08-88	34.86	1-09-90	31.03	5-03-91	84.06
3-18-88	40.84	12-07-88	28.89	1-29-90	26.87	5-30-91	120.96
3-21-88	39.53	1-06-89	25.11	2-08-90	25.89	6-18-91	149.66
3-22-88	39.74	1-09-89	24.87	3-08-90	23.83	7-02-91	135.81
3-25-88	52.49	1-12-89	24.62	4-09-90	81.59	8-02-91	127.11
3-29-88	60.99	2-03-89	23.60	4-11-90	83.17	8-07-91	119.49
4-01-88	67.84	2-27-89	22.03	5-08-90	133.81	9-12-91	75.58
4-12-88	89.13	3-17-89	27.62	5-09-90	134.93	10-16-91	52.81
4-13-88	90.04	3-29-89	29.46	6-13-90	135.25	11-14-91	43.88
4-15-88	88.21	4-27-89	68.46	6-19-90	137.61	11-19-91	42.69
5-03-88	69.92	5-26-89	109.64	6-28-90	141.93	12-17-91	37.68
5-11-88	72.54	6-13-89	132.36	7-09-90	146.11	1-13-92	34.70
5-16-88	99.52	6-15-89	131.16	8-09-90	125.34	1-17-92	34.43
5-25-88	104.53	7-07-89	138.62	9-07-90	88.49	3-18-92	28.94
5-26-88	98.08	8-04-89	125.05	9-10-90	83.70	4-20-92	46.06
5-31-88	112.05	8-22-89	99.07	10-10-90	56.68	5-14-92	125.22
6-03-88	121.81	9-14-89	71.54	10-12-90	55.64	7-23-92	133.68
6-14-88	114.11	10-03-89	51.26	11-08-90	45.00	8-25-92	93.80
6-28-88	115.79	10-11-89	46.96	12-05-90	39.02	10-01-92	63.04
Highest	20.08	3-08-88					
Lowest	149.12	6-18-91					

Table 14. Water levels in well 11N/1E-24Q7 (P4) recorded at 0600 hours daily, water years 1988-92

[Latitude 38°46'46"; longitude 121°48'38". Water levels in feet below land surface; land-surface elevation is 42.1 feet above sea level. Water year: October 1 to September 30. Gravel-packed interval: 0 to 230 feet below land surface; screened interval: 180 to 200 feet below land surface. max, maximum; med, median; min, minimum; * indicates statistics are for partial months; --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1988						
1	--	--	--	--	--	--	--	--	--	--	91.4	65.81
2	--	--	--	--	--	--	--	--	107.9	--	91.3	65.85
3	--	--	--	--	--	--	--	--	--	--	90.6	64.72
4	--	--	--	--	--	--	--	--	111.7	111.4	88.5	64.42
5	--	--	--	--	--	--	--	--	109.5	--	85.5	64.60
6	--	--	--	--	--	--	--	--	102.1	--	85.2	63.68
7	--	--	--	--	--	--	--	--	105.4	--	84.9	63.10
8	--	--	--	--	--	--	--	--	101.9	--	83.4	62.77
9	--	--	--	--	--	--	--	--	100.4	--	84.0	61.50
10	--	--	--	--	--	--	--	--	98.5	--	84.4	60.85
11	--	--	--	--	--	--	--	--	95.6	109.6	85.9	60.10
12	--	--	--	--	--	--	--	--	94.3	110.2	90.4	58.44
13	--	--	--	--	--	--	--	--	92.9	103.4	84.6	58.49
14	--	--	--	--	--	--	--	--	94.1	109.2	83.1	58.00
15	--	--	--	--	--	--	--	--	--	108.0	87.9	58.26
16	--	--	--	--	--	--	--	--	99.1	104.6	80.2	59.48
17	--	--	--	--	--	--	--	--	97.1	105.4	78.0	59.20
18	--	--	--	--	--	--	--	--	93.6	102.5	77.7	58.17
19	--	--	--	--	--	--	--	--	98.0	101.7	76.2	56.94
20	--	--	--	--	--	--	--	--	105.8	104.1	75.6	56.01
21	--	--	--	--	--	--	--	--	104.7	107.3	74.3	--
22	--	--	--	--	--	--	--	--	105.2	106.6	71.7	--
23	--	--	--	--	--	--	--	--	97.2	--	71.2	--
24	--	--	--	--	--	--	--	--	104.1	--	70.3	--
25	--	--	--	--	--	--	--	--	101.6	--	69.05	--
26	--	--	--	--	--	--	--	--	101.1	102.5	68.63	--
27	--	--	--	--	--	--	--	--	105.1	106.5	68.60	48.94
28	--	--	--	--	--	--	--	--	106.7	102.7	67.51	47.72
29	--	--	--	--	--	--	--	--	110.9	96.4	66.44	46.89
30	--	--	--	--	--	--	--	--	--	93.5	67.09	45.99
31	--	--	--	--	--	--	--	--	--	96.6	66.83	--
Max	--	--	--	--	--	--	--	--	111.7*	111.4*	91.4	65.85*
Min	--	--	--	--	--	--	--	--	92.9*	93.5*	66.44	45.99*
Med	--	--	--	--	--	--	--	--	101.8*	104.6*	80.2	59.34*

Partial water year 1988: High 45.99 Low 111.7 Med 88.2

Table 14. Water levels in well 11N/1E-24Q7 (P4) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1989						
1	45.17	33.05	27.53	--	22.18	21.74	25.51	61.29	105.61	--	103.42	--
2	44.45	32.78	27.46	--	22.27	21.98	27.86	--	108.31	--	103.51	--
3	43.70	32.53	27.37	--	22.64	21.73	28.67	--	110.00	--	103.91	--
4	43.10	32.26	27.23	--	22.40	21.64	31.80	--	111.70	--	107.00	--
5	42.97	31.98	27.04	--	22.30	22.23	32.12	--	104.99	--	106.10	--
6	42.18	31.83	26.91	--	22.19	22.30	34.39	--	107.39	--	103.39	--
7	41.78	31.54	26.80	23.55	22.23	21.89	37.80	--	106.88	--	98.59	--
8	41.42	31.36	--	23.51	22.22	22.17	35.92	--	105.68	119.84	96.38	--
9	41.00	31.36	--	23.43	22.24	22.27	36.34	--	106.47	119.43	95.18	--
10	40.46	31.18	--	23.31	22.00	22.36	38.01	--	108.07	131.23	93.77	--
11	39.95	30.99	--	23.25	21.89	22.38	36.91	--	110.56	128.42	91.17	--
12	39.47	30.86	--	23.21	21.81	22.44	38.50	--	109.46	120.02	91.66	--
13	39.03	30.76	--	23.11	21.71	22.49	43.17	--	112.75	128.91	91.26	--
14	38.73	30.50	--	23.04	21.66	23.00	47.97	--	--	128.61	89.95	--
15	38.44	30.36	--	23.00	21.66	23.52	55.47	--	--	115.50	90.25	62.30
16	38.10	30.17	--	22.93	21.64	23.75	57.48	--	--	113.80	90.34	61.47
17	37.70	29.90	--	22.85	21.58	24.09	56.83	--	--	112.99	90.04	59.74
18	37.29	29.64	--	22.78	21.48	24.30	60.87	--	--	114.09	90.03	58.35
19	36.93	29.45	--	22.69	21.43	24.43	64.93	--	--	111.18	88.43	57.17
20	36.58	29.28	--	22.62	21.39	24.58	67.31	--	--	114.88	87.12	55.95
21	36.39	29.09	--	22.55	21.64	24.75	--	--	--	113.77	85.12	54.83
22	36.08	28.93	--	22.46	21.55	24.89	--	--	--	113.77	83.71	53.77
23	35.87	28.79	--	22.40	21.55	24.93	--	--	--	112.36	--	52.82
24	35.54	28.48	--	22.38	21.50	24.99	62.64	--	--	110.26	--	51.95
25	35.24	28.35	--	22.37	21.49	25.08	67.32	--	--	115.55	--	51.13
26	34.87	28.14	--	22.34	21.41	25.18	--	--	--	112.25	--	50.35
27	34.49	28.04	--	22.65	21.31	25.28	--	96.74	--	112.44	--	49.62
28	34.20	27.94	--	22.78	21.50	25.37	69.84	96.23	--	111.74	--	48.96
29	33.96	27.78	--	22.54	--	25.42	65.20	96.93	--	108.03	--	48.28
30	33.67	27.67	--	22.37	--	25.20	65.02	99.52	--	108.23	--	47.64
31	33.36	--	--	22.26	--	24.92	--	102.92	--	104.12	--	--
Max	45.17	33.05	27.53*	23.55*	22.64	25.42	69.84*	102.92*	112.75*	131.23*	107.00*	62.30*
Min	33.36	27.67	26.80*	22.26*	21.31	21.64	25.51*	61.29*	104.99*	104.12*	83.71*	47.64*
Med	38.10	30.26	27.23*	22.78*	21.66	23.75	43.17*	96.83*	108.07*	113.79*	91.46*	53.29*

Water year 1989: High 21.31 Low 131.23 Med 34.08

Table 14. Water levels in well 11N/1E-24Q7 (P4) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1990						
1	47.01	35.65	--	--	25.40	23.47	--	108.17	89.70	136.30	113.95	86.55
2	46.40	35.47	--	--	25.39	23.43	--	113.88	90.17	126.37	112.67	84.18
3	45.87	35.24	--	--	25.29	23.36	--	114.52	90.86	135.40	123.29	82.50
4	45.34	34.98	--	--	25.15	23.31	--	118.04	90.98	135.89	124.87	81.69
5	44.76	34.73	--	--	25.10	23.25	--	120.35	98.42	137.25	120.39	--
6	44.21	34.51	--	31.77	25.00	23.24	--	119.27	112.75	132.01	113.05	--
7	43.67	34.29	29.57	30.93	24.95	23.17	--	119.25	111.36	132.39	106.52	--
8	43.17	34.08	29.43	29.95	24.88	23.11	--	117.05	116.05	132.17	104.16	--
9	42.73	33.88	29.30	29.32	24.82	--	--	121.41	115.24	128.87	103.83	--
10	42.49	33.69	29.25	--	24.76	25.53	--	129.23	116.75	133.66	103.20	--
11	42.40	33.54	29.17	--	24.67	23.67	--	131.00	117.41	133.65	113.09	73.22
12	42.07	33.39	29.11	28.79	24.55	23.63	80.06	128.56	119.98	137.43	113.78	72.54
13	41.68	33.25	29.00	28.25	24.52	28.63	81.29	126.08	--	138.79	108.18	71.87
14	41.40	33.10	--	27.91	24.47	33.10	82.44	124.30	118.93	136.87	105.81	70.72
15	41.24	33.02	--	27.67	24.42	29.43	83.05	119.44	118.61	133.90	--	69.40
16	41.03	--	--	27.42	24.29	25.83	83.52	121.07	118.40	133.44	99.12	68.74
17	40.70	--	--	27.23	24.15	25.49	88.37	122.57	125.75	130.63	98.20	67.50
18	40.47	--	--	27.06	24.11	25.10	88.56	123.23	125.98	132.09	100.12	66.78
19	--	--	--	26.90	24.09	25.22	91.12	124.13	--	130.89	103.48	66.18
20	--	--	--	26.77	24.05	30.86	92.21	125.57	128.38	129.84	98.60	65.12
21	--	--	--	26.65	23.97	33.43	94.11	119.05	130.34	128.74	97.63	64.13
22	--	--	--	26.49	23.90	34.99	94.21	118.74	131.55	134.12	96.02	63.20
23	--	--	--	26.41	23.85	37.23	92.91	120.75	131.46	140.10	96.96	62.19
24	--	--	--	26.31	23.79	37.58	91.20	118.19	131.40	134.60	98.01	61.26
25	--	--	--	26.22	23.70	38.17	97.60	119.55	128.73	134.53	98.25	60.41
26	--	--	--	26.05	23.63	37.15	100.59	115.74	128.40	132.66	97.21	59.86
27	--	--	--	25.97	23.59	41.55	101.87	112.50	126.85	133.10	94.72	59.36
28	--	--	--	25.88	23.54	45.40	102.20	104.00	130.01	125.05	92.72	58.67
29	--	--	--	25.75	--	49.57	106.46	99.61	136.51	131.03	90.60	58.11
30	--	--	--	25.58	--	55.91	107.81	95.07	135.37	123.32	89.73	57.57
31	35.92	--	--	25.50	--	--	--	91.77	--	116.47	88.07	--
Max	47.01*	35.65*	29.57*	31.77*	25.40	55.91*	107.81*	131.00	136.51*	140.10	124.87*	86.55*
Min	35.92*	33.02*	29.00*	25.50*	23.54	23.11*	80.06*	91.77	89.70*	116.47	88.07*	57.57*
Med	42.49*	34.08*	29.25*	26.83*	24.44	25.83*	92.21*	119.27	119.45*	133.10	101.66*	66.48*

Water year 1990: High 23.11 Low 140.10 Med 80.06

Table 14. Water levels in well 11N/1E-24Q7 (P4) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1991						
1	56.90	43.97	37.55	--	55.38	--	--	--	--	--	--	78.01
2	56.19	43.65	37.55	--	59.19	--	--	--	--	--	--	76.54
3	55.51	43.34	37.30	--	52.72	--	--	--	--	--	--	76.06
4	54.91	43.12	37.16	--	49.38	62.36	--	81.17	--	--	--	75.10
5	54.44	42.85	37.07	--	49.10	59.09	--	85.23	--	--	--	74.63
6	53.92	42.59	36.95	--	48.67	56.63	--	85.19	--	--	--	74.06
7	53.32	42.32	36.89	--	48.30	--	--	84.85	--	--	--	73.17
8	52.81	42.19	36.83	--	48.10	--	--	88.35	--	--	107.71	72.09
9	52.56	42.01	36.77	--	48.49	--	--	90.75	--	--	106.43	71.61
10	52.13	41.85	36.49	--	49.16	--	--	--	--	--	105.38	71.36
11	51.84	41.60	36.28	--	49.66	--	--	--	--	--	102.10	70.59
12	51.35	41.40	36.10	--	53.50	--	--	--	--	--	100.47	69.79
13	50.95	41.27	35.97	--	56.98	--	--	--	--	--	100.04	68.76
14	50.46	40.92	35.82	--	60.25	--	--	--	--	--	98.09	67.76
15	49.82	40.61	35.64	--	62.26	--	--	--	--	--	96.98	66.95
16	49.54	40.37	35.55	--	63.74	--	--	--	--	--	96.60	66.00
17	49.16	40.21	35.41	--	64.75	--	--	--	--	--	95.21	65.14
18	48.72	39.96	35.35	--	65.86	--	--	--	--	--	93.92	64.31
19	48.27	39.59	35.22	34.65	66.19	--	49.75	--	--	--	92.28	63.24
20	48.00	39.46	35.22	34.95	64.41	--	49.48	--	--	--	93.91	62.86
21	47.59	39.26	35.22	35.30	--	--	47.78	--	--	--	91.59	62.61
22	47.18	39.10	35.11	35.60	--	--	49.31	--	--	--	89.11	61.98
23	46.79	38.87	34.96	36.20	--	--	50.99	--	--	--	90.00	61.00
24	46.39	38.62	34.79	37.92	--	--	52.32	--	--	--	89.19	60.36
25	46.12	38.42	--	39.59	--	--	54.34	--	--	--	89.00	59.58
26	45.82	38.29	--	40.82	--	--	56.51	--	--	--	87.00	58.73
27	45.47	38.18	--	42.68	--	--	59.51	--	--	--	86.14	58.24
28	45.18	38.00	--	44.42	--	--	60.74	--	--	--	85.32	57.75
29	44.87	37.81	--	46.58	--	--	63.25	--	--	--	84.05	57.12
30	44.62	37.67	--	49.67	--	--	--	--	--	--	82.83	56.62
31	44.28	--	--	52.42	--	--	--	--	--	--	79.04	--
Max	56.90	43.97	37.55*	52.42*	66.19*	62.36*	63.25*	90.75*	--	--	107.71*	78.01
Min	44.28	37.67	34.79*	34.65*	48.10*	56.63*	47.78*	81.17*	--	--	79.04*	56.62
Med	49.54	40.49	36.03*	39.59*	54.44*	59.09*	52.32*	85.21*	--	--	93.10*	66.47

Water year 1991: High 34.65 Low 107.71 Med 50.70

Table 14. Water levels in well 11N/1E-24Q7 (P4) recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1992						
1	56.55	44.43	38.58	34.96	32.81	29.93	28.45	--	--	--	--	77.16
2	56.08	44.17	38.44	34.86	32.70	29.83	29.11	--	--	--	--	77.91
3	55.65	43.93	38.43	34.73	32.63	29.75	29.80	--	--	--	--	78.10
4	55.33	43.65	38.31	34.63	32.59	29.69	30.13	--	--	--	--	78.23
5	55.01	43.40	38.15	34.46	32.59	29.58	30.52	--	--	--	--	77.12
6	54.47	43.20	37.94	34.40	32.45	29.44	30.49	--	--	--	--	75.82
7	53.70	42.91	37.79	34.34	32.34	29.34	31.29	--	--	--	--	74.63
8	53.02	42.92	37.64	34.28	32.42	29.25	33.05	--	--	--	--	73.52
9	52.54	42.99	37.52	34.23	32.27	29.20	33.26	--	--	--	--	72.41
10	52.05	42.90	37.43	34.15	32.12	29.16	32.80	--	--	--	--	71.98
11	51.55	42.49	37.28	34.06	32.01	29.14	33.73	--	--	--	--	71.28
12	51.18	42.33	37.18	33.97	31.88	29.04	36.25	--	--	--	--	70.96
13	50.77	42.47	37.08	33.93	31.77	28.91	34.57	--	--	--	--	70.83
14	50.49	42.21	36.98	33.85	31.73	28.82	34.52	--	--	--	--	68.93
15	50.09	--	36.82	33.86	31.51	28.70	36.15	--	--	--	--	68.97
16	49.60	--	36.71	33.87	31.43	28.62	37.95	--	--	--	--	68.70
17	49.33	--	36.57	33.73	31.37	28.56	39.49	--	--	--	--	69.29
18	49.01	--	36.41	33.58	31.27	28.48	40.94	--	--	--	--	68.97
19	48.70	--	36.31	33.52	31.16	28.42	42.46	--	--	117.75	--	67.22
20	48.41	--	36.20	33.45	30.98	28.84	43.46	--	--	114.80	--	66.12
21	47.89	--	36.11	33.38	30.89	31.09	51.35	--	--	114.76	--	65.16
22	47.67	40.24	35.99	33.33	30.79	31.44	53.07	--	--	115.97	--	64.09
23	47.33	40.19	35.87	33.27	30.68	28.80	55.17	--	--	--	--	63.40
24	47.02	40.25	35.80	33.19	30.57	28.80	58.35	--	--	--	--	62.85
25	46.68	39.75	35.72	33.10	30.46	28.28	64.10	--	--	--	--	62.71
26	46.20	39.47	35.63	33.02	30.37	28.14	68.24	--	--	--	--	61.94
27	45.88	39.25	35.53	32.99	30.29	28.04	72.43	--	--	--	--	61.77
28	45.59	39.10	35.38	32.93	30.19	27.99	80.80	--	--	--	81.61	60.99
29	45.26	38.88	35.15	32.88	30.07	28.01	--	--	--	--	80.28	--
30	45.00	38.74	35.09	32.83	--	27.97	--	--	--	--	79.90	--
31	44.69	--	35.05	32.78	--	28.00	--	--	--	--	78.10	--
Max	56.55	44.43*	38.58	34.96	32.81	31.44	80.80*	--	--	117.75*	81.61*	78.23*
Min	44.69	38.74*	35.05	32.78	30.07	27.97	28.45*	--	--	114.76*	78.10*	60.99*
Med	49.60	42.47*	36.71	33.85	31.51	28.84	36.20*	--	--	115.38*	80.09*	69.13*

Water year 1992: High 27.97 Low 117.75 Med 36.49

Table 15. Water-level measurements for well 11N/1E-24Q7 (P4), water years 1988-92

[Water levels in feet below land surface; land-surface elevation is 42.1 feet above sea level]

Date	Water level	Date	Water level	Date	Water level	Date	Water level
12-09-87	17.82	7-14-88	110.21	10-11-89	42.37	1-03-91	34.14
2-23-88	22.24	8-03-88	90.86	10-13-89	41.63	1-18-91	34.42
2-24-88	22.22	8-16-88	80.13	10-18-89	40.19	2-04-91	49.20
2-25-88	22.23	9-19-88	56.59	10-30-89	36.23	3-06-91	56.26
2-29-88	22.27	9-26-88	50.18	11-15-89	32.96	4-04-91	36.17
3-08-88	23.30	10-13-88	38.99	12-13-89	29.23	4-18-91	49.77
3-18-88	33.10	11-08-88	31.05	1-09-90	29.24	5-03-91	76.84
3-21-88	36.59	12-07-88	26.74	1-29-90	25.71	5-30-91	121.00
3-22-88	43.59	1-06-89	23.61	2-08-90	24.88	6-18-91	130.93
3-25-88	56.78	1-09-89	23.40	3-08-90	23.13	7-02-91	117.74
3-29-88	60.62	1-12-89	23.22	4-09-90	79.26	8-02-91	113.96
4-01-88	70.33	2-03-89	22.66	4-11-90	79.89	8-07-91	109.03
4-12-88	83.04	2-27-89	21.31	5-08-90	118.32	9-12-91	69.54
4-13-88	82.80	3-17-89	24.17	5-09-90	129.22	10-16-91	49.53
4-15-88	81.00	3-29-89	25.43	6-13-90	121.84	11-14-91	42.06
5-03-88	58.81	4-27-89	67.86	6-19-90	130.26	12-17-91	36.52
5-11-88	59.06	5-26-89	97.74	6-28-90	135.10	1-13-92	33.92
5-16-88	87.42	6-13-89	112.67	7-09-90	146.45	2-14-92	31.71
5-25-88	95.91	6-15-89	117.56	8-09-90	105.41	3-18-92	28.49
5-26-88	92.89	7-07-89	120.36	9-07-90	77.27	4-20-92	44.48
5-31-88	98.31	8-04-89	116.99	9-10-90	73.88	5-14-92	115.87
6-03-88	117.24	8-22-89	83.48	10-10-90	52.12	7-23-92	123.47
6-14-88	103.67	9-14-89	63.09	11-08-90	42.16	8-25-92	83.73
6-28-88	107.46	10-03-89	45.74	12-05-90	37.03	10-01-92	58.77
Highest	17.82	12-09-87					
Lowest	146.45	7-09-90					

Table 16. Water-level measurements for well 11N/1E-24Q9 (P5), water years 1990-92

[Latitude 38°46'45"; longitude 121°48'38". Water levels in feet below land surface; land-surface elevation is 41.9 feet above sea level. Gravel-packed interval: 180 to 220 feet below land surface; screened interval: 189 to 194 feet below land surface]

Date	Water level	Date	Water level	Date	Water level	Date	Water level
12-05-90	37.27	5-03-91	77.17	9-12-91	69.57	3-18-92	28.63
1-03-91	34.39	5-30-91	119.20	10-16-91	49.61	4-20-92	46.68
1-18-91	34.77	6-18-91	131.14	11-14-91	42.16	7-23-92	120.58
2-04-91	49.35	7-02-91	118.09	12-17-91	36.65	8-25-92	83.73
3-06-91	56.13	8-02-91	113.10	1-13-92	34.03	10-01-92	59.58
4-04-91	36.24						
Highest	28.63	3-18-92					
Lowest	131.14	6-18-91					

Table 17. Mean daily barometric pressure, water years 1988-92

[Latitude 38°46'47"; longitude 121°48'38". Barometric pressure in millimeters of mercury. Water year: October 1 to September 30. max, maximum; min, minimum; * indicates statistics are for partial months; --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1988						
1	--	--	--	--	--	--	--	--	--	757	759	758
2	--	--	--	--	--	--	--	--	763	757	759	760
3	--	--	--	--	--	--	--	--	762	756	762	760
4	--	--	--	--	--	--	--	--	760	757	761	759
5	--	--	--	--	--	--	--	--	760	761	759	757
6	--	--	--	--	--	--	--	--	761	760	760	757
7	--	--	--	--	--	--	--	--	764	760	761	758
8	--	--	--	--	--	--	--	--	765	761	761	758
9	--	--	--	--	--	--	--	--	763	758	759	759
10	--	--	--	--	--	--	--	--	763	756	757	759
11	--	--	--	--	--	--	--	--	761	759	758	759
12	--	--	--	--	--	--	--	--	760	762	760	760
13	--	--	--	--	--	--	--	--	758	760	761	762
14	--	--	--	--	--	--	--	--	759	760	761	762
15	--	--	--	--	--	--	--	--	--	762	761	761
16	--	--	--	--	--	--	--	--	759	761	759	760
17	--	--	--	--	--	--	--	--	758	760	759	760
18	--	--	--	--	--	--	--	--	758	759	759	761
19	--	--	--	--	--	--	--	--	757	758	756	757
20	--	--	--	--	--	--	--	--	758	760	754	756
21	--	--	--	--	--	--	--	--	760	762	757	761
22	--	--	--	--	--	--	--	--	758	761	760	764
23	--	--	--	--	--	--	--	--	757	760	761	762
24	--	--	--	--	--	--	--	--	755	762	762	761
25	--	--	--	--	--	--	--	--	758	762	760	766
26	--	--	--	--	--	--	--	--	761	760	757	767
27	--	--	--	--	--	--	--	--	760	761	756	767
28	--	--	--	--	--	--	--	--	760	762	758	765
29	--	--	--	--	--	--	--	--	761	760	757	763
30	--	--	--	--	--	--	--	--	758	760	755	761
31	--	--	--	--	--	--	--	--	--	761	755	--
Mean	--	--	--	--	--	--	--	--	760*	760	759	761
Max	--	--	--	--	--	--	--	--	765*	762	762	767
Min	--	--	--	--	--	--	--	--	755*	756	754	756

Partial water year 1988: Mean 760 Max 767 Min 754

Table 17. Mean daily barometric pressure, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1989						
1	761	762	767	--	757	758	762	763	761	--	760	--
2	762	764	766	--	762	750	763	--	759	--	759	--
3	761	765	768	--	761	759	766	--	755	--	758	--
4	762	767	770	--	761	765	766	--	756	--	759	--
5	761	762	770	--	766	767	765	--	760	--	761	--
6	761	763	769	--	768	762	763	--	760	--	761	--
7	765	762	--	768	767	758	761	--	758	--	759	--
8	768	762	--	773	765	757	757	--	757	759	757	--
9	765	764	--	773	767	759	756	--	756	757	757	--
10	763	764	--	768	771	761	757	--	757	757	760	--
11	763	763	--	772	769	765	756	--	760	760	761	--
12	763	764	--	772	765	765	755	--	761	762	761	--
13	763	763	--	768	762	766	758	--	--	762	761	--
14	766	757	--	770	764	764	759	--	--	760	759	--
15	765	763	--	772	768	759	759	--	--	761	756	760
16	764	768	--	770	769	758	757	--	--	762	755	757
17	763	764	--	768	766	764	760	--	--	761	757	757
18	763	764	--	767	761	764	760	--	--	760	759	759
19	762	768	--	764	762	765	758	--	--	760	759	759
20	760	769	--	764	766	764	758	--	--	758	757	762
21	762	768	--	761	767	764	758	--	--	757	755	761
22	761	767	--	758	765	760	760	--	--	758	--	759
23	761	762	--	759	764	757	757	--	--	761	--	758
24	760	760	--	762	763	756	756	--	--	760	--	760
25	761	761	--	765	765	755	759	--	--	758	--	761
26	760	758	--	765	765	758	762	--	--	759	--	761
27	758	765	--	765	760	763	763	758	--	760	--	761
28	762	768	--	765	758	765	760	761	--	759	--	762
29	765	770	--	765	--	766	761	762	--	758	--	763
30	765	771	--	764	--	766	761	761	--	759	--	764
31	763	--	--	759	--	763	--	761	--	761	--	--
Mean	763	764	768*	766*	764	761	760	761*	758*	760*	759*	760*
Max	768	771	770*	773*	771	767	766	763*	761*	762*	761*	764*
Min	758	757	766*	758*	757	750	755	758*	755*	757*	755*	757*

Water year 1989: Mean 762 Max 773 Min 750

Table 17. Mean daily barometric pressure, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1990						
1	760	766	--	--	762	764	760	759	764	760	759	761
2	758	766	--	--	768	763	763	758	764	760	758	761
3	762	764	--	--	763	764	760	761	764	759	759	761
4	762	761	--	--	765	759	758	762	762	761	761	762
5	761	761	--	--	766	763	759	761	760	762	762	763
6	764	763	--	--	766	765	761	758	761	760	761	763
7	765	764	--	769	767	761	761	757	762	757	759	764
8	764	765	766	767	766	--	764	758	759	758	760	763
9	764	765	765	--	770	--	766	759	756	--	759	761
10	762	763	765	--	769	757	766	759	760	--	760	760
11	762	761	768	--	764	759	764	759	762	761	760	761
12	762	760	768	757	761	764	761	760	--	760	761	761
13	762	762	--	756	762	768	760	759	--	761	759	761
14	760	764	--	760	764	768	759	758	759	760	--	762
15	761	--	--	763	763	764	757	761	760	757	--	762
16	761	--	--	758	755	764	755	761	761	756	762	759
17	763	--	--	760	757	763	759	760	760	760	761	759
18	764	--	--	762	764	763	759	760	763	762	761	760
19	761	--	--	763	767	765	761	760	--	760	760	759
20	759	--	--	766	770	766	762	762	758	759	760	758
21	760	--	--	766	768	764	760	763	756	759	764	760
22	762	--	--	765	767	762	759	762	759	759	762	763
23	761	--	--	766	767	763	756	759	759	759	757	764
24	763	--	--	766	766	760	760	762	761	757	758	764
25	764	--	--	766	764	762	763	761	763	757	761	764
26	766	--	--	765	763	762	762	761	762	759	764	764
27	766	--	--	768	764	759	760	756	761	762	765	761
28	765	--	--	768	765	758	759	755	758	761	764	760
29	766	--	--	763	--	758	758	761	758	760	763	760
30	766	--	--	755	--	758	760	760	760	760	763	761
31	764	--	--	758	--	759	--	762	--	761	761	--
Mean	763	763*	766*	763*	765	762*	760	760	760*	760*	761*	761
Max	766	766*	768*	769*	770	768*	766	763	764*	762*	765*	764
Min	758	760*	765*	755*	755	757*	755	755	756*	756*	757*	758

Water year 1990: Mean 762 Max 770 Min 755

Table 17. Mean daily barometric pressure, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1991						
1	760	765	770	768	765	747	764	760	--	759	762	761
2	760	767	772	767	765	762	768	761	--	759	761	762
3	762	768	771	763	770	762	768	763	--	758	760	763
4	763	769	770	762	769	755	767	765	--	757	760	760
5	762	764	770	766	768	764	764	766	759	756	759	756
6	762	766	770	768	767	767	764	764	760	758	--	759
7	764	768	768	769	767	766	765	762	761	760	--	762
8	767	770	767	765	766	764	767	761	758	760	764	759
9	767	769	766	763	765	760	767	761	758	760	760	757
10	763	767	765	769	763	759	767	761	758	760	759	762
11	762	767	765	770	764	766	765	762	757	761	761	763
12	763	766	764	772	766	764	763	764	757	761	764	762
13	762	762	766	772	766	760	763	761	758	761	764	761
14	761	764	765	772	763	759	760	763	760	761	760	760
15	761	767	760	770	760	758	759	762	760	761	--	762
16	761	767	766	769	762	760	760	759	762	763	764	762
17	762	766	770	769	766	759	762	762	761	763	763	760
18	763	763	765	766	768	758	761	763	759	759	762	759
19	764	759	755	765	771	753	760	762	762	759	763	760
20	766	763	760	763	769	753	761	759	763	761	764	759
21	766	768	765	766	765	760	763	757	761	762	765	760
22	764	771	769	766	764	765	761	759	761	761	764	763
23	764	768	772	766	762	761	761	761	761	761	761	763
24	765	764	771	766	764	756	762	760	761	760	760	762
25	765	760	768	764	764	753	763	759	761	759	761	762
26	764	764	767	766	760	753	764	758	760	760	761	761
27	764	769	764	764	752	760	765	760	758	762	762	761
28	764	772	759	763	745	766	764	760	758	763	764	760
29	764	770	765	765	--	764	761	760	762	761	765	762
30	763	768	771	769	--	764	758	--	761	760	764	765
31	763	--	770	768	--	762	--	--	--	761	762	--
Mean	763	766	767	767	764	760	763	761*	760*	760	762*	761
Max	767	772	772	772	771	767	768	766*	763*	763	765*	765
Min	760	759	755	762	745	747	758	757*	757*	756	759*	756

Water year 1991: Mean 763 Max 772 Min 745

Table 17. Mean daily barometric pressure, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1992						
1	765	767	770	768	763	757	760	763	--	761	--	762
2	761	767	771	764	767	756	761	763	--	761	--	764
3	760	770	770	759	764	760	760	762	--	758	--	765
4	760	770	767	757	762	761	761	759	--	761	--	765
5	762	767	765	754	761	758	764	756	--	762	--	763
6	763	764	763	760	758	760	765	760	--	761	--	763
7	763	764	763	762	757	758	764	764	--	763	--	763
8	763	763	765	768	761	759	762	760	--	764	--	762
9	764	764	768	769	755	764	762	757	--	763	--	761
10	763	764	763	768	754	767	761	757	--	761	--	761
11	761	766	763	766	758	764	760	760	--	758	--	762
12	762	766	769	767	755	763	760	761	--	760	--	763
13	764	762	771	770	757	762	763	761	--	762	--	760
14	765	--	771	769	757	762	763	--	--	762	--	758
15	762	--	770	771	758	761	763	--	--	761	--	759
16	760	--	768	769	762	762	763	--	--	760	--	761
17	763	--	763	763	767	763	764	--	760	761	--	762
18	768	--	765	763	766	762	763	--	760	764	--	761
19	764	--	769	767	764	762	762	--	759	763	--	760
20	759	--	769	768	765	758	760	--	757	761	--	759
21	757	--	767	770	769	758	759	--	756	760	--	760
22	759	770	767	772	770	758	764	--	760	761	--	761
23	764	773	767	772	768	760	765	--	759	--	--	762
24	763	770	765	769	768	762	764	--	758	--	--	762
25	761	768	765	767	767	761	761	--	759	--	--	761
26	756	766	763	766	768	758	762	--	761	--	--	762
27	765	766	758	769	768	755	765	--	760	--	--	763
28	766	768	757	770	765	760	763	--	760	--	763	762
29	763	766	756	769	759	763	761	--	760	--	763	761
30	768	769	764	767	--	763	761	--	760	--	764	763
31	769	--	768	762	--	761	--	--	--	--	763	--
Mean	763	767*	766	766	763	761	762	760*	759*	761*	763*	762
Max	769	773*	771	772	770	767	765	764*	761*	764*	764*	765
Min	756	762*	756	754	754	755	759	756*	756*	758*	763*	758

Water year 1992: Mean 763 Max 773 Min 754

Table 18. Cumulative net sediment compaction for extensometer well 11N/1E-24Q8 recorded at 0600 hours daily, water years 1988-92

[Latitude 38°46'47"; longitude 121°48'38". Cumulative net sediment compaction, in feet; positive values are indicative of rebound. Water year: October 1 to September 30. Well depth, 1,001.5 feet. max, maximum; min, minimum; * indicates statistics are for partial months; --, no data]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1988						
1	--	--	--	--	--	--	--	--	--	-0.028	-0.046	-0.014
2	--	--	--	--	--	--	--	--	--	-.030	-.045	-.014
3	--	--	--	--	--	--	--	--	--	-.033	-.045	-.013
4	--	--	--	--	--	--	--	--	--	-.034	-.042	-.013
5	--	--	--	--	--	--	--	--	--	-.037	-.040	-.013
6	--	--	--	--	--	--	--	--	--	-.039	-.039	-.012
7	--	--	--	--	--	--	--	--	--	-.041	-.039	-.011
8	--	--	--	--	--	--	--	--	--	-.042	-.038	-.011
9	--	--	--	--	--	--	--	--	--	-.045	-.039	-.009
10	--	--	--	--	--	--	--	--	--	-.046	-.039	-.007
11	--	--	--	--	--	--	--	--	--	-.045	-.039	-.006
12	--	--	--	--	--	--	--	--	--	-.045	-.039	-.004
13	--	--	--	--	--	--	--	--	--	-.044	-.038	-.003
14	--	--	--	--	--	--	--	--	--	-.047	-.037	-.002
15	--	--	--	--	--	--	--	--	--	-.048	-.036	-.002
16	--	--	--	--	--	--	--	--	-0.001	-.048	-.035	-.001
17	--	--	--	--	--	--	--	--	.000	-.049	-.033	-.001
18	--	--	--	--	--	--	--	--	.001	-.048	-.032	.000
19	--	--	--	--	--	--	--	--	.000	-.048	-.031	.002
20	--	--	--	--	--	--	--	--	-.002	-.049	-.029	.004
21	--	--	--	--	--	--	--	--	-.002	-.051	-.028	.006
22	--	--	--	--	--	--	--	--	-.003	-.052	-.024	.007
23	--	--	--	--	--	--	--	--	-.003	-.054	-.023	.009
24	--	--	--	--	--	--	--	--	-.006	-.054	-.021	.011
25	--	--	--	--	--	--	--	--	-.006	-.054	-.019	.013
26	--	--	--	--	--	--	--	--	-.006	-.052	-.018	.016
27	--	--	--	--	--	--	--	--	-.010	-.051	-.017	.017
28	--	--	--	--	--	--	--	--	-.013	-.050	-.016	.019
29	--	--	--	--	--	--	--	--	-.018	-.049	-.014	.021
30	--	--	--	--	--	--	--	--	-.024	-.048	-.014	.023
31	--	--	--	--	--	--	--	--	--	-.048	-.014	--
Mean	--	--	--	--	--	--	--	--	-.006*	-.045	-.031	.000
Max	--	--	--	--	--	--	--	--	.001*	-.028	-.014	.023
Min	--	--	--	--	--	--	--	--	-.024*	-.054	-.046	-.014

Partial water year 1988: Mean -0.023 Max 0.023 Min -0.054

Table 18. Cumulative net sediment compaction for extensometer well 11N/1E-24Q8 recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1989						
1	0.025	0.060	0.081	--	--	--	--	0.028	-0.075	--	-0.210	--
2	.027	.062	.081	--	--	--	--	--	-.081	--	-.210	--
3	.029	.063	.082	--	--	--	--	--	-.086	--	-.211	--
4	.031	.064	.081	--	--	--	0.088	--	-.091	--	-.213	--
5	.032	.064	.081	--	--	--	.088	--	-.090	--	-.214	--
6	.034	.064	.081	--	--	--	.087	--	-.093	--	-.214	--
7	.035	.065	--	--	--	--	.085	--	-.094	--	-.211	--
8	.036	.066	--	--	--	--	.084	--	-.095	-0.179	-.209	--
9	.038	.066	--	--	--	--	.083	--	-.097	-.183	-.207	--
10	.039	.067	--	--	--	--	.081	--	-.099	-.188	-.205	--
11	.040	.069	--	--	--	--	.081	--	-.103	-.191	-.204	--
12	.042	.070	--	--	--	--	.080	--	-.105	-.192	-.203	--
13	.043	.070	--	--	--	--	.076	--	--	-.195	-.203	--
14	.045	.071	--	--	--	--	.072	--	--	-.198	-.202	--
15	.045	.072	--	--	--	--	.066	--	--	-.197	-.202	-0.161
16	.046	.072	--	--	--	--	.061	--	--	-.197	-.202	-.159
17	.046	.073	--	--	--	--	.058	--	--	-.197	-.201	-.157
18	.047	.074	--	--	--	--	.054	--	--	-.197	-.200	-.153
19	.048	.073	--	--	--	--	.050	--	--	-.197	-.199	-.151
20	.049	.074	--	--	--	--	.047	--	--	-.199	-.199	-.149
21	.050	.074	--	--	--	--	.043	--	--	-.201	-.197	-.147
22	.051	.075	--	--	--	--	.042	--	--	-.202	--	-.145
23	.052	.077	--	--	--	--	.040	--	--	-.204	--	-.143
24	.053	.078	--	--	--	--	.042	--	--	-.204	--	-.141
25	.054	.077	--	--	--	--	.039	--	--	-.206	--	-.139
26	.055	.079	--	--	--	--	.037	--	--	-.208	--	-.137
27	.056	.079	--	--	--	--	.033	-.055	--	-.211	--	-.135
28	.057	.080	--	--	--	--	.030	-.057	--	-.211	--	-.133
29	.058	.081	--	--	--	--	.027	-.060	--	-.211	--	-.131
30	.059	.079	--	--	--	--	.027	-.064	--	-.211	--	-.129
31	.059	--	--	--	--	--	--	-.069	--	-.211	--	--
Mean	.045	.071	.081*	--	--	--	.059*	-.046*	-.092*	-.200*	-.206*	-.144*
Max	.059	.081	.082*	--	--	--	.088*	.028*	-.075*	-.179*	-.197*	-.129*
Min	.025	.060	.081*	--	--	--	.027*	-.069*	-.105*	-.211*	-.214*	-.161*

Water year 1989: Mean -0.042 Max 0.088 Min -0.214

Table 18. Cumulative net sediment compaction for extensometer well 11N/1E-24Q8 recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1990						
1	-0.127	-0.091	--	--	-0.053	-0.045	-0.089	-0.206	-0.268	-0.376	-0.458	-0.446
2	-.126	-.091	--	--	-.052	-.045	-.093	-.212	-.268	-.377	-.457	-.443
3	-.124	-.090	--	--	-.052	-.043	-.097	-.217	-.268	-.381	-.458	-.441
4	-.123	-.089	--	--	-.051	-.044	-.099	-.223	-.268	-.384	-.459	-.440
5	-.121	-.088	--	--	-.052	-.043	-.103	-.229	-.271	-.388	-.458	-.438
6	-.120	-.087	--	--	-.051	-.044	-.106	-.233	-.277	-.393	-.457	-.436
7	-.118	-.087	--	-0.063	-.051	-.044	-.111	-.237	-.280	-.397	-.454	-.434
8	-.117	-.086	-0.067	-.062	-.051	--	-.113	-.240	-.287	-.401	-.452	-.433
9	-.116	-.085	-.066	--	-.050	--	-.115	-.245	-.292	-.403	-.453	-.430
10	-.114	-.084	-.066	--	-.050	-.044	-.123	-.259	-.296	---	-.452	-.428
11	-.113	-.084	-.066	--	-.050	-.043	-.125	-.264	-.299	---	-.455	-.427
12	-.112	-.083	-.066	-.059	-.049	-.043	-.128	-.267	---	-.411	-.456	-.425
13	-.111	-.082	--	-.058	-.050	-.044	-.131	-.268	---	-.415	-.455	-.423
14	-.109	-.081	--	-.057	-.050	-.046	-.134	-.269	-.309	-.420	---	-.421
15	-.108	--	--	-.056	-.049	-.046	-.137	-.271	-.310	-.423	---	-.419
16	-.107	--	--	-.057	-.049	-.045	-.140	-.273	-.312	-.425	-.453	-.417
17	-.106	--	--	-.056	-.048	-.044	-.146	-.275	-.316	-.427	-.453	-.415
18	-.102	--	--	-.057	-.047	-.044	-.149	-.278	-.319	-.430	-.454	-.413
19	-.102	--	--	-.056	-.047	-.044	-.153	-.281	---	-.434	-.455	-.412
20	-.101	--	--	-.056	-.048	-.046	-.158	-.284	-.330	-.436	-.453	-.410
21	-.101	--	--	-.056	-.047	-.048	-.162	-.284	-.337	-.439	-.453	-.408
22	-.099	--	--	-.056	-.047	-.050	-.167	-.285	-.344	-.446	-.453	-.406
23	-.099	--	--	-.055	-.047	-.052	-.169	-.287	-.348	-.451	-.453	-.404
24	-.096	--	--	-.055	-.047	-.054	-.170	-.287	-.353	-.452	-.454	-.402
25	-.095	--	--	-.055	-.047	-.056	-.175	-.289	-.356	-.453	-.454	-.400
26	-.095	--	--	-.053	-.046	-.056	-.180	-.289	-.358	-.454	-.455	-.399
27	-.094	--	--	-.055	-.046	-.059	-.186	-.287	-.361	-.457	-.453	-.397
28	-.094	--	--	-.055	-.046	-.063	-.191	-.282	-.364	-.458	-.452	-.396
29	-.094	--	--	-.054	--	-.068	-.197	-.279	-.369	-.460	-.450	-.395
30	-.093	--	--	-.054	--	-.075	-.202	-.276	-.372	-.460	-.449	-.393
31	-.092	--	--	-.054	--	-.082	--	-.271	--	-.459	-.447	---
Mean	-.107	-.086*	-.066*	-.056*	-.049	-.050*	-.142	-.263	-.316*	-.424*	-.454*	-.418
Max	-.092	-.081*	-.066*	-.053*	-.046	-.043*	-.089	-.206	-.268*	-.376*	-.447*	-.393
Min	-.127	-.091*	-.067*	-.063*	-.053	-.082*	-.202	-.289	-.372*	-.460*	-.459*	-.446

Water year 1990: Mean -.223 Max -.043 Min -.460

Table 18. Cumulative net sediment compaction for extensometer well 11N/1E-24Q8 recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1991						
1	-0.392	-0.354	-0.332	-0.320	-0.338	-0.381	-0.332	-0.365	--	--	--	-0.615
2	-.390	-.353	-.331	-.319	-.343	-.381	-.331	-.370	--	--	--	-.612
3	-.388	-.352	-.331	-.319	-.340	-.377	-.330	-.374	--	--	--	-.611
4	-.387	-.352	-.330	-.319	-.337	-.373	-.330	-.379	--	--	--	-.609
5	-.385	-.351	-.330	-.318	-.335	-.371	-.328	-.384	-0.491	--	--	-.608
6	-.384	-.350	-.329	-.318	-.335	-.369	-.327	-.386	-.498	--	--	-.607
7	-.382	-.349	-.329	-.317	-.336	-.366	-.326	-.390	-.504	--	--	-.605
8	-.381	-.348	-.328	-.315	-.335	-.365	-.326	-.395	-.507	--	-0.645	-.603
9	-.380	-.347	-.328	-.315	-.335	-.363	-.325	-.400	-.510	--	-.645	-.602
10	-.379	-.346	-.327	-.314	-.336	-.361	-.326	-.404	-.512	--	-.645	-.601
11	-.377	-.345	-.327	-.314	-.337	-.359	-.326	-.411	--	--	-.644	-.600
12	-.376	-.345	-.326	-.313	-.339	-.358	-.326	-.417	--	--	-.643	-.598
13	-.375	-.344	-.325	-.313	-.343	-.356	-.326	-.420	--	--	-.642	-.597
14	-.373	-.343	-.324	-.313	-.347	-.355	-.327	-.422	--	--	-.641	-.595
15	-.372	-.342	-.323	-.313	-.348	-.354	-.328	-.423	--	--	-.640	-.593
16	-.371	-.341	-.322	-.314	-.350	-.353	-.329	-.424	--	--	-.640	-.591
17	-.370	-.341	-.323	-.315	-.352	-.352	-.330	-.424	--	--	-.639	-.589
18	-.369	-.340	-.322	-.315	-.355	-.349	-.333	-.425	--	--	-.637	-.588
19	-.367	-.339	-.322	-.315	-.356	-.348	-.334	-.426	--	--	-.636	-.586
20	-.366	-.338	-.322	-.316	-.358	-.346	-.336	-.427	--	--	-.635	-.584
21	-.365	-.338	-.322	-.316	-.360	-.345	-.336	-.430	--	--	-.634	-.583
22	-.364	-.337	-.322	-.317	-.365	-.344	-.337	-.432	--	--	-.631	-.582
23	-.363	-.336	-.322	-.317	-.369	-.343	-.338	-.436	--	--	-.630	-.580
24	-.362	-.336	-.322	-.318	-.372	-.341	-.340	-.439	--	--	-.629	-.579
25	-.361	-.335	-.321	-.320	-.376	-.338	-.342	-.443	--	--	-.628	-.577
26	-.360	-.334	-.321	-.321	-.380	-.338	-.345	-.445	--	--	-.625	-.576
27	-.359	-.334	-.321	-.323	-.383	-.336	-.349	-.447	--	--	-.624	-.574
28	-.358	-.333	-.320	-.324	-.384	-.336	-.352	-.451	--	--	-.622	-.573
29	-.357	-.333	-.320	-.327	--	-.335	-.356	-.459	--	--	-.621	-.571
30	-.356	-.332	-.320	-.330	--	-.334	-.361	--	--	--	-.619	-.570
31	-.355	--	-.320	-.333	--	-.333	--	--	--	--	-.617	--
Mean	-.372	-.342	-.325	-.318	-.352	-.354	-.334	-.415*	-.504*	--	-.634*	-.592
Max	-.355	-.332	-.320	-.313	-.335	-.333	-.325	-.365*	-.491*	--	-.617*	-.570
Min	-.392	-.354	-.332	-.333	-.384	-.381	-.361	-.459*	-.512*	--	-.645*	-.615

Water year 1991: Mean -.401 Max -.313 Min-.645

Table 18. Cumulative net sediment compaction for extensometer well 11N/1E-24Q8 recorded at 0600 hours daily, water years 1988-92--*Continued*

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
						Water year 1992						
1	-0.569	-0.536	--	--	--	--	--	-0.557	--	-0.761	--	-0.747
2	-.567	-.536	--	--	--	--	--	-.563	--	-.761	--	-.746
3	-.566	-.535	--	--	--	--	--	-.571	--	-.761	--	-.746
4	-.565	-.534	--	--	--	--	--	-.577	--	-.763	--	-.746
5	-.564	-.534	--	--	--	--	--	-.584	--	-.764	--	-.745
6	-.563	-.533	--	--	--	--	--	-.589	--	-.765	--	-.744
7	-.561	-.532	--	--	--	--	--	-.594	--	-.768	--	-.742
8	-.560	-.532	--	--	--	--	--	-.599	--	-.769	--	-.741
9	-.559	-.532	--	--	--	--	--	-.604	--	-.768	--	-.739
10	-.558	-.531	--	--	--	--	--	-.608	--	--	--	-.738
11	-.557	-.531	--	--	--	--	--	-.613	--	--	--	-.737
12	-.556	-.531	--	--	--	--	--	-.620	--	--	--	-.736
13	-.554	-.531	--	--	--	--	--	-.626	--	--	--	-.734
14	-.553	-.530	--	--	--	--	--	-.630	--	--	--	-.733
15	-.552	--	--	--	--	--	--	--	--	--	--	-.732
16	-.551	--	--	--	--	--	--	--	--	--	--	-.731
17	-.549	--	--	--	--	--	--	--	-0.726	--	--	-.731
18	-.548	--	--	--	--	--	--	--	-.727	--	--	-.730
19	-.548	--	--	--	--	--	--	--	-.730	--	--	-.728
20	-.546	--	--	--	--	--	--	--	-.734	--	--	-.727
21	-.545	--	--	--	--	--	--	--	-.738	--	--	-.725
22	-.545	--	--	--	--	--	--	--	-.740	--	--	-.723
23	-.544	--	--	--	--	--	--	--	-.742	--	--	-.721
24	-.543	--	--	--	--	--	--	--	-.744	--	--	-.720
25	-.542	--	--	--	--	--	--	--	-.748	--	--	-.718
26	-.541	--	--	--	--	--	-0.530	--	-.752	--	--	-.717
27	-.540	--	--	--	--	--	-.532	--	-.755	--	--	-.716
28	-.539	--	--	--	--	--	-.538	--	-.760	--	-0.753	-.715
29	-.538	--	--	--	--	--	-.544	--	-.760	--	-.752	-.713
30	-.537	--	--	--	--	--	-.551	--	-.759	--	-.751	-.712
31	-.537	--	--	--	--	--	--	--	--	--	-.749	--
Mean	-.552	-.533*	--	--	--	--	-.539*	-.595*	-.744*	-.764*	-.751*	-.731
Max	-.537	-.530*	--	--	--	--	-.530*	-.557*	-.726*	-.761*	-.749*	-.712
Min	-.569	-.536*	--	--	--	--	-.551*	-.630*	-.760*	-.769*	-.753*	-.747

Water year 1992: Mean -0.643 Max -0.530 Min -0.769

Table 19. Cumulative net sediment compaction for extensometer well 11N/1E-24Q8 at noon on selected days, computed from analog chart records, water years 1989-92

[Latitude 38°46'47"; longitude 121°48'38". Water year: October 1 to September 30. Positive value indicates rebound. Well depth, 1,001.5 feet. ft, foot]

Day	Net sediment compaction (ft)	Day	Net sediment compaction (ft)	Day	Net sediment compaction (ft)
05-05-89	0.010	07-31-91	-0.650	03-25-92	-0.474
05-10-89	-.007	08-02-91	-.650	03-31-92	-.473
05-15-89	-.024	08-05-91	-.650	04-01-92	-.473
05-20-89	-.033	11-14-91	-.530	04-05-92	-.474
05-25-89	-.047	11-15-91	-.529	04-10-92	-.475
06-15-89	-.109	11-20-91	-.526	04-15-92	-.476
06-20-89	-.118	11-25-91	-.522	04-20-92	-.481
06-25-89	-.144	11-30-91	-.519	04-25-92	-.506
06-30-89	-.159	12-05-91	-.517	04-30-92	-.540
07-05-89	-.167	12-10-91	-.513	05-05-92	-.571
08-25-89	-.190	12-15-91	-.510	05-10-92	-.596
08-31-89	-.187	12-17-91	-.509	05-14-92	-.617
09-05-89	-.179	12-20-91	-.508	05-15-92	-.620
09-10-89	-.169	12-25-91	-.506	05-19-92	-.633
11-20-89	-.078	12-31-91	-.502	05-20-92	-.638
11-25-89	-.074	01-05-92	-.500	05-25-92	-.660
11-30-89	-.071	01-10-92	-.498	05-31-92	-.674
12-05-89	-.069	01-13-92	-.498	06-05-92	-.688
12-15-89	-.065	01-15-92	-.497	06-10-92	-.697
12-20-89	-.065	01-20-92	-.496	06-15-92	-.712
12-25-89	-.064	01-25-92	-.494	06-30-92	-.751
12-31-89	-.065	01-31-92	-.492	07-05-92	-.758
01-05-90	-.063	02-05-92	-.492	07-09-92	-.764
05-31-91	-.469	02-10-92	-.490	07-10-92	-.765
06-05-91	-.494	02-14-92	-.489	07-15-92	-.772
06-20-91	-.563	02-15-92	-.488	07-20-92	-.777
06-25-91	-.583	02-20-92	-.485	07-23-92	-.782
06-30-91	-.591	02-25-92	-.488	07-25-92	-.782
07-02-91	-.592	02-29-92	-.484	07-31-92	-.782
07-05-91	-.604	03-05-92	-.482	08-02-92	-.782
07-10-91	-.628	03-10-92	-.480	08-05-92	-.781
07-15-91	-.636	03-15-92	-.478	08-10-92	-.780
07-20-91	-.645	03-18-92	-.476	08-12-92	-.780
07-25-91	-.645	03-20-92	-.475		