SELECTED HYDROLOGIC DATA FOR THE MESILLA GROUND-WATER BASIN, 1987 THROUGH 1992 WATER YEARS, DOÑA ANA COUNTY, NEW MEXICO, AND EL PASO COUNTY, TEXAS

By Edward L. Nickerson

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BRUCE BABBITT, *Secretary*

U.S. GEOLOGICAL SURVEY

Gordon P. Eaton, *Director*

For additional information
write to:

District Chief
U.S. Geological Survey
Water Resources Division
4501 Indian School Rd. NE, Suite 200
Albuquerque, New Mexico 87110

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
inch	25.4	millimeter
foot	0.3048	meter
mile	1.609	kilometer
acre	4,047	square meter
square mile	2.590	square kilometer
acre-foot	1,233	cubic meter
cubic foot per second	0.02832	cubic meter per second

Temperature in degrees Celsius (^{o}C) can be converted to degrees Fahrenheit (^{o}F) by the equation:

$$°F=9/5\ (°C) + 32$$

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.

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ABSTRACT

The Mesilla ground-water basin monitoring program was established in 1987 to document hydrologic conditions and establish a long-term, continuous data base to permit future quantitative evaluation of the ground-water flow system and stream/aquifer relations. Data collection is divided into three program elements. These are the (1) Mesilla ground-water basin observation-well network; (2) Mesilla Valley hydrologic sections; and (3) Rio Grande seepage investigations. This report is a compilation of hydrologic data collected for the Mesilla ground-water basin monitoring program during the 1987 through 1992 water years. Hydrologic data presented in the report include well records and water levels from 181 wells; mean daily river stage and ground-water levels at 37 sites; seepage investigations of the Rio Grande from Radium Springs, New Mexico, to El Paso, Texas; and chemical analyses of 29 water samples collected from the Rio Grande.

INTRODUCTION

The recent population growth within the Mesilla ground-water basin and adjacent areas has resulted in a significant increase in ground-water withdrawals to meet increasing municipal water demand. In 1983, the U. S. Geological Survey began a study to help define the hydrologic system of the Mesilla ground-water basin in Doña Ana County, New Mexico, and El Paso County, Texas (Nickerson, 1986). The Mesilla ground-water basin study, completed in 1987, identified a significant hydraulic connection between the Rio Grande and the aquifer system (Nickerson, 1989; Nickerson and Myers, 1993).

Historical ground-water data collection efforts within the basin were limited to obtaining data on a nonrecurring, unsystematic basis. Recent studies indicate the need for a comprehensive monitoring network of the ground-water flow system in the basin. The Mesilla ground-water basin monitoring program was established in 1987 to document current ground-water conditions and stream/aquifer relations to identify changes with time.

Purpose and Scope

The purpose of this report is to present hydrologic data collected for the Mesilla ground-water basin monitoring program during the 1987 through 1992 water years. The report describes the monitoring program established in 1987 to document hydrologic conditions and establish a long-term, continuous data base to permit future quantitative evaluation of the ground-water flow system and stream/aquifer relations.

Description of the Study Area

The Mesilla drainage basin is located in Doña Ana County in south-central New Mexico; El Paso County, Texas; and northwestern Chihuahua, Mexico (fig. 1). The Mesilla drainage basin includes the Mesilla ground-water basin and the southern part of the Jornada del Muerto ground-water basin. The study area encompasses most of the Mesilla ground-water basin (fig. 1)--the portion that is within the United States. The study area is bounded on the north by the Robledo and Doña Ana Mountains, on the east by the Jornada fault zone and Franklin Mountains, on the south by the United States-Mexico boundary, and on the west by the East Potrillo and West Potrillo Mountains, Aden Hills, Sleeping Lady Hills, and Rough and Ready Hills. The Mesilla ground-water basin in this report refers only to the United States section. The study area is geographically divided into the Mesilla Valley along the Rio Grande in the east, and the West Mesa in the west (fig. 1). The surface of the West Mesa ranges from 300 to 350 feet above the Rio Grande. Most of the population and water use within the basin are in the Mesilla Valley.

Acknowledgments

The Mesilla ground-water basin monitoring program is conducted by the U.S. Geological Survey in cooperation with the New Mexico State Engineer Office, Elephant Butte Irrigation District, City of Las Cruces, New Mexico State University, El Paso Water Utilities, Jornada Resource Conservation and Development, and International Boundary and Water Commission--U.S. Section. Hydrologic data presented in this report were collected by the U.S. Geological Survey with assistance from the New Mexico State Engineer Office, U.S. Bureau of Reclamation, and International Boundary and Water Commission--U. S. Section.

Well-Numbering Systems

Two different systems of numbering wells were used because the study area is located in New Mexico and Texas. The system used by most Federal, State, and municipal agencies in their respective States was used in that part of the study area to ensure consistency.

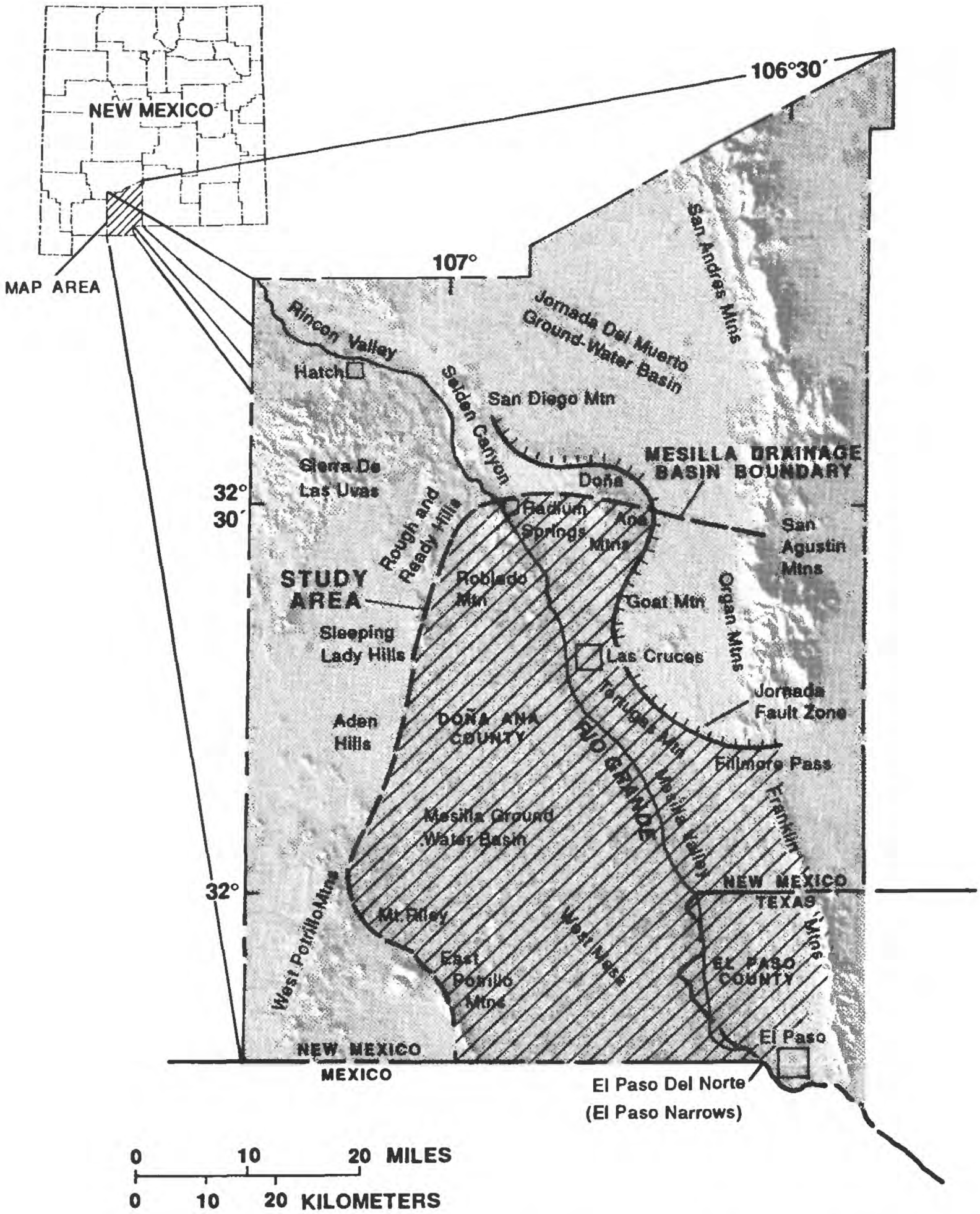


Figure 1.--Location of the study area (from Nickerson and Myers, 1993, fig. 1).

New Mexico System

The system of numbering wells and springs in New Mexico (fig. 2) is based on the common subdivision of public lands into sections. The well number, in addition to designating the well, locates its position to the nearest 10-acre tract in the land network. The number is divided by periods into four segments. The first segment denotes the township north or south of the New Mexico base line; the second denotes the range east or west of the New Mexico principal meridian; and the third denotes the section. The fourth segment of the number, which consists of three digits, denotes the 160-, 40-, and 10-acre tracts, respectively, in which the well is situated. For this purpose, the section is divided into four quarters, numbered 1, 2, 3, and 4 in the normal reading order, for the northwest, northeast, southwest, and southeast quarters, respectively. The first digit of the fourth segment gives the quarter section, which is a tract of 160 acres. Similarly, the 160-acre tract is divided into four 40-acre tracts numbered in the same manner, and the second digit denotes the 40-acre tract. Finally, the 40-acre tract is divided into four 10-acre tracts, and the third digit denotes the 10-acre tract. Thus, well 24S.02E.23.342 is in the NE 1/4 of the SE 1/4 of the SW 1/4, section 23, Township 24 South, Range 02 East. The letters a, b, c, etc. are added to the last segment to designate succeeding wells in the same 10-acre tract. Where sections are irregularly shaped, the well is located on the basis of a regular square-section grid that is superimposed on the irregular section with the southeast corner and eastern section lines matching. The well is then numbered by its location in the superimposed square grid. In valley areas where land grants existed when the public lands were subdivided into sections, the section lines have been extended and the artificial sections numbered.

Texas System

In Texas, the well-numbering system used in this report is the same as that used by the Texas Water Development Board (fig. 3). Under this system, which is based on latitude and longitude, each 1-degree quadrangle in the State is given a two-digit number from 01 through 89. These are the first two digits of the well number. El Paso County is in parts of quadrangles 48 and 49. Each 1-degree quadrangle is subdivided into 7 1/2-minute quadrangles that are given a two-digit number from 01 to 64. These are the third and fourth digits of the well number. Each 7 1/2-minute quadrangle is further subdivided into 2 1/2-minute quadrangles that are each given a single-digit number ranging from 1 through 9. This is the fifth digit of the well number. Finally, each well within a 2 1/2-minute quadrangle is given a two-digit number in the order in which the well was inventoried, starting with 01. These are the last two digits of the well number. In addition to the seven-digit well number, a two-letter prefix is used to identify the county; the prefix for El Paso County is JL. Thus, well JL-49-12-501 is well number 1 located in the 5th 2 1/2-minute quadrangle of the 12th 7 1/2-minute quadrangle in the 49th 1-degree quadrangle, which is in El Paso County (JL).

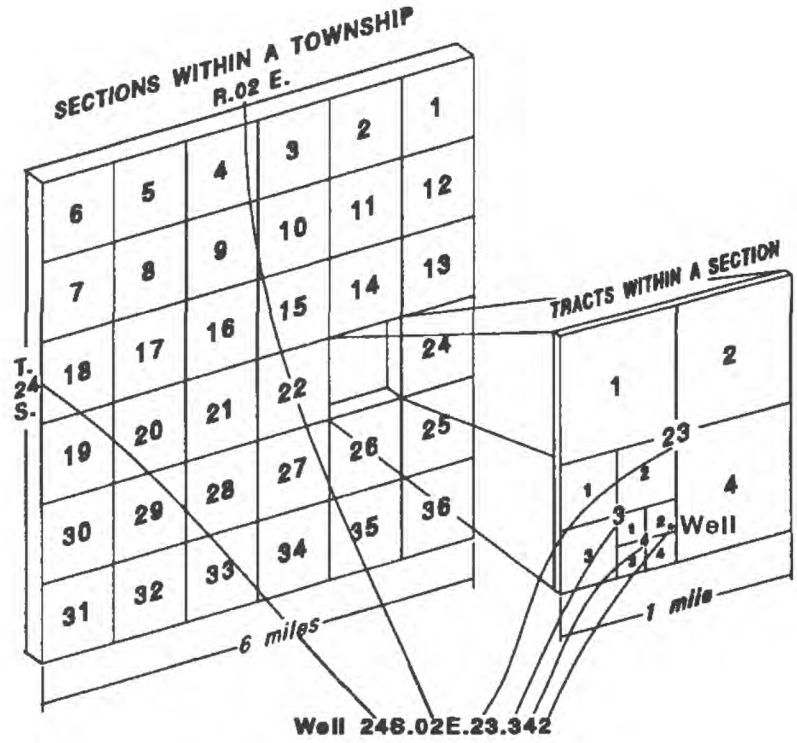
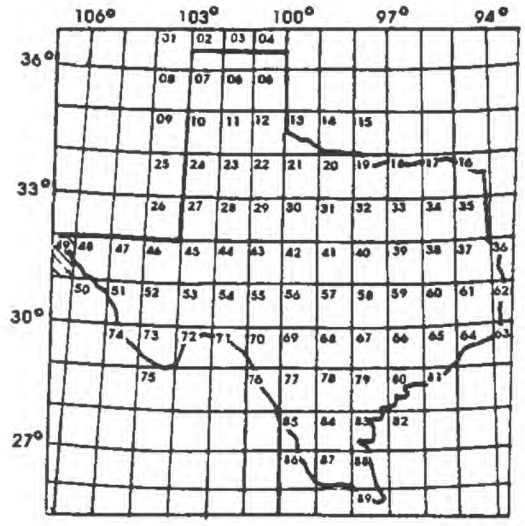


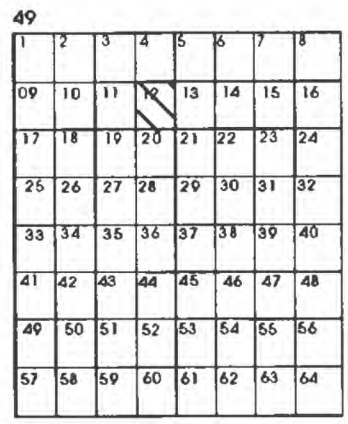
Figure 2.--System of numbering wells in New Mexico.



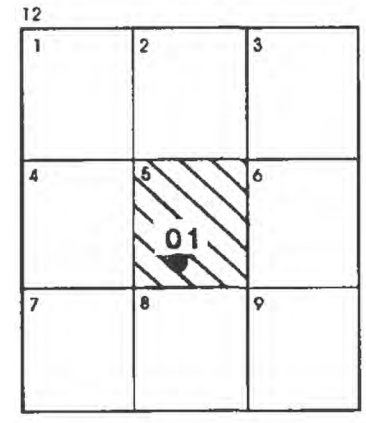
1-degree quadrangles

LOCATION OF WELL JL-49-12-501

JL	PREFIX FOR EL PASO COUNTY
49	1-degree quadrangle
12	7 1/2-minute quadrangle
5	2 1/2-minute quadrangle
01	Well number within 2 1/2-minute quadrangle



7 1/2-minute quadrangles



2 1/2-minute quadrangles

Figure 3.--System of numbering wells in Texas.

GEOHYDROLOGIC SETTING

The Mesilla ground-water basin primarily consists of a basin-fill aquifer system of unconsolidated alluvial deposits. The aquifer system in the Mesilla ground-water basin is composed of two stratigraphic units: (1) the Quaternary alluvium of the Rio Grande flood plain, and (2) the Santa Fe Group basin fill of Pleistocene to Miocene age (King and others, 1971). The Rio Grande flood-plain alluvium occurs beneath the Mesilla Valley in the eastern part of the basin. The flood-plain alluvium generally ranges in thickness from 50 to 125 feet (Wilson and others, 1981, p. 27) and consists of sand and gravel with lenses of silt and clay (Hawley, 1984). The Santa Fe Group, which extends throughout the basin, consists of clay, silt, sand, gravel, and caliche, and some occasional igneous rocks composed of volcanic ash and basalt. The thickness of the Santa Fe Group ranges from zero to greater than 5,000 feet (Hawley, 1984) within the study area.

Water in storage within the Rio Grande flood-plain alluvium/Santa Fe Group aquifer system occurs under phreatic and leaky-artesian conditions (Nickerson and Myers, 1993). Water in storage within the shallow flood-plain alluvium generally is unconfined and may occur under phreatic (water-table) conditions. Water generally occurs within the Santa Fe Group under leaky-artesian (semiconfined) conditions. The direction of ground-water flow in the study area is south to southeast toward the lower end of the basin.

The Rio Grande enters the Mesilla ground-water basin in the north from Rincon Valley through Selden Canyon and exits to the south at El Paso Narrows (fig. 1). The Rio Grande is predominantly a losing stream along most of the 62-mile reach in the Mesilla Valley and is considered a primary source of recharge to the aquifer (Nickerson and Myers, 1993). The length and seepage rate of losing reaches of the Rio Grande may fluctuate with annual and seasonal variations in streamflow, and with the hydraulic gradient in the surrounding aquifer.

MESILLA GROUND-WATER BASIN MONITORING PROGRAM

The Mesilla ground-water basin monitoring program was established in 1987 to document hydrologic conditions and establish a long-term, continuous data base to permit future quantitative evaluation of the ground-water flow system and stream/aquifer relations. Data collection is divided into three program elements. These are the (1) Mesilla ground-water basin observation-well network; (2) Mesilla Valley hydrologic sections; and (3) Rio Grande seepage investigations.

Hydrologic data are presented by water year to facilitate comparison of hydrologic conditions and seasonal events along the Mesilla Valley hydrologic sections. A water year in Geological Survey reports is the 12-month period, October 1 through September 30, and is designated by the calendar year in which it ends. Thus hydrologic data presented for the 1987 through 1992 water years represent October 1, 1986, through September 30, 1992.

Mesilla Ground-Water Basin Observation-Well Network

The Mesilla ground-water basin observation-well network was initiated in 1983 to monitor ground-water levels throughout the basin. The network currently consists of 181 water wells that were selected on the basis of geologic unit and location. Network wells are completed in the Rio Grande flood-plain alluvium/Santa Fe Group aquifer system; 129 wells are located in the Mesilla Valley and 52 wells are located in the West Mesa area. The location of network wells is shown in figure 4. Well records, including annual water-level measurements, are listed in table 1 (all tables are in back of report).

Mesilla Valley Hydrologic Sections

Three hydrologic sections were constructed in the Mesilla Valley. These hydrologic sections consist of a river-stage station and several observation-well groups aligned perpendicular to the Rio Grande. Each well group consists of several observation wells completed at depths ranging from 35 to 801 feet. The locations of the Las Cruces hydrologic section (A-A'), Mesquite hydrologic section (B-B'), and Cañutillo well-field hydrologic section (C-C') are shown in figure 4, and a diagram of each hydrologic section is shown in figures 5-7, respectively. Each well group consists of several observation wells completed at depth intervals ranging from 35 to 801 feet.

Observation wells and river-stage stations at the Mesilla Valley hydrologic sections were equipped with water-level recorders to collect continuous water-level data at 37 sites. Continuous water-level record was terminated at 14 observation wells as of February 1990: LC-1B, LC-2B, LC-3B, M-1B, M-2B, M-4B, well group CWF-3, and well group CWF-4. Water levels were measured at these wells on a monthly basis thereafter.

Water-level data at the Mesilla Valley hydrologic sections are presented by water year. Data for 1987 water year are presented in figures 10-22, for 1988 water year in figures 23-35, for 1989 water year in figures 36-48, for 1990 water year in figures 49-61, for 1991 water year in figures 62-74, and for 1992 water year in figures 75-87.

Las Cruces Hydrologic Section

The Las Cruces hydrologic section (A-A') is at the western edge of the city of Las Cruces, New Mexico (fig. 4). The section consists of a river-stage station on the Rio Grande and three observation-well groups aligned perpendicular to the Rio Grande (fig. 5).

River-stage station

The river-stage station, Rio Grande below Picacho Bridge, is located at the Las Cruces hydrologic section (fig. 5). The station is operated by the U.S. Geological Survey to record river stage (water-surface altitude). Hydrographs showing mean daily stage of the Rio Grande below Picacho Bridge during the 1987 through 1992 water years are presented in figures 10, 23, 36, 49, 62, and 75, respectively.

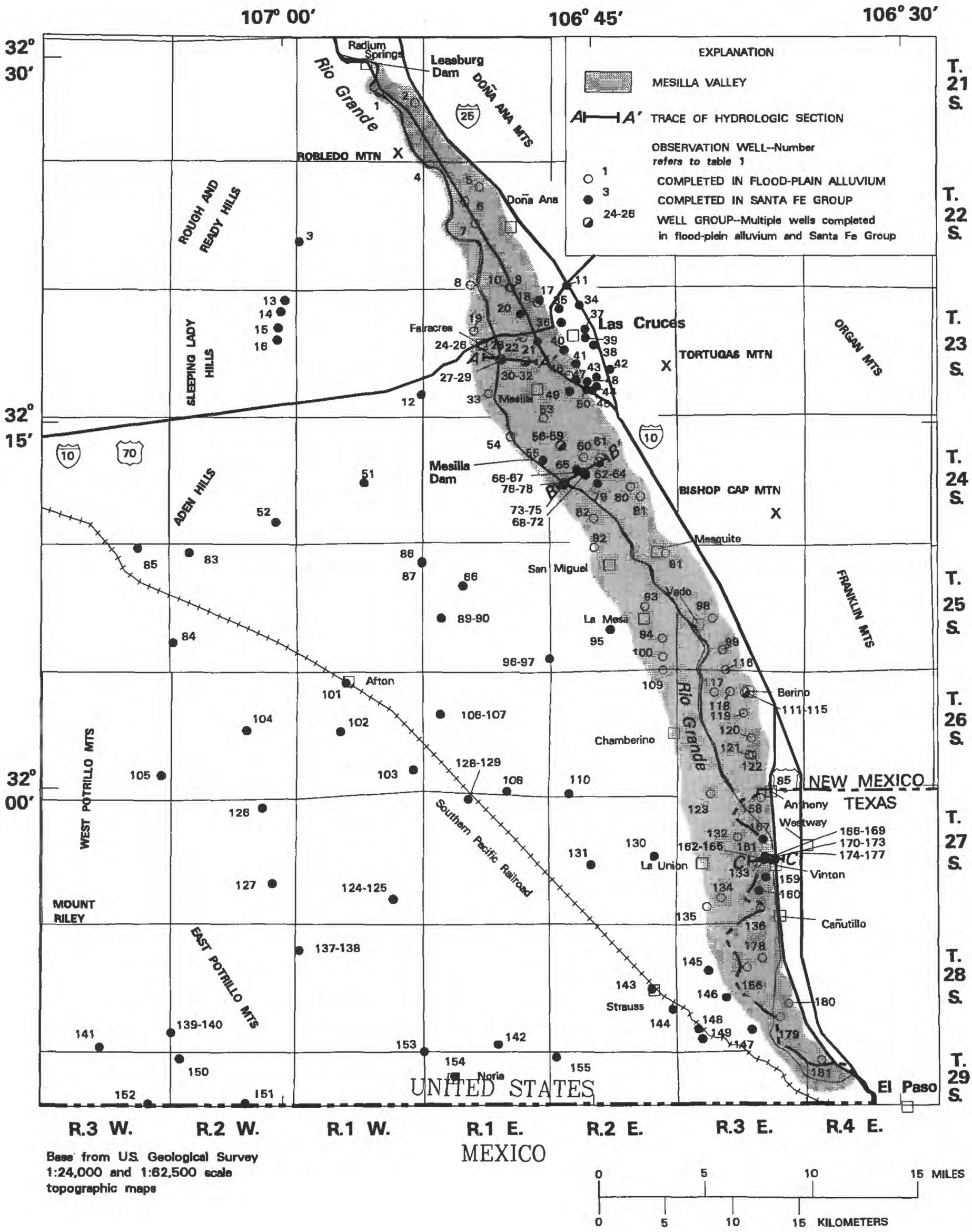


Figure 4.--Location of observation wells and hydrologic sections in the Mesilla ground-water basin, New Mexico and Texas.

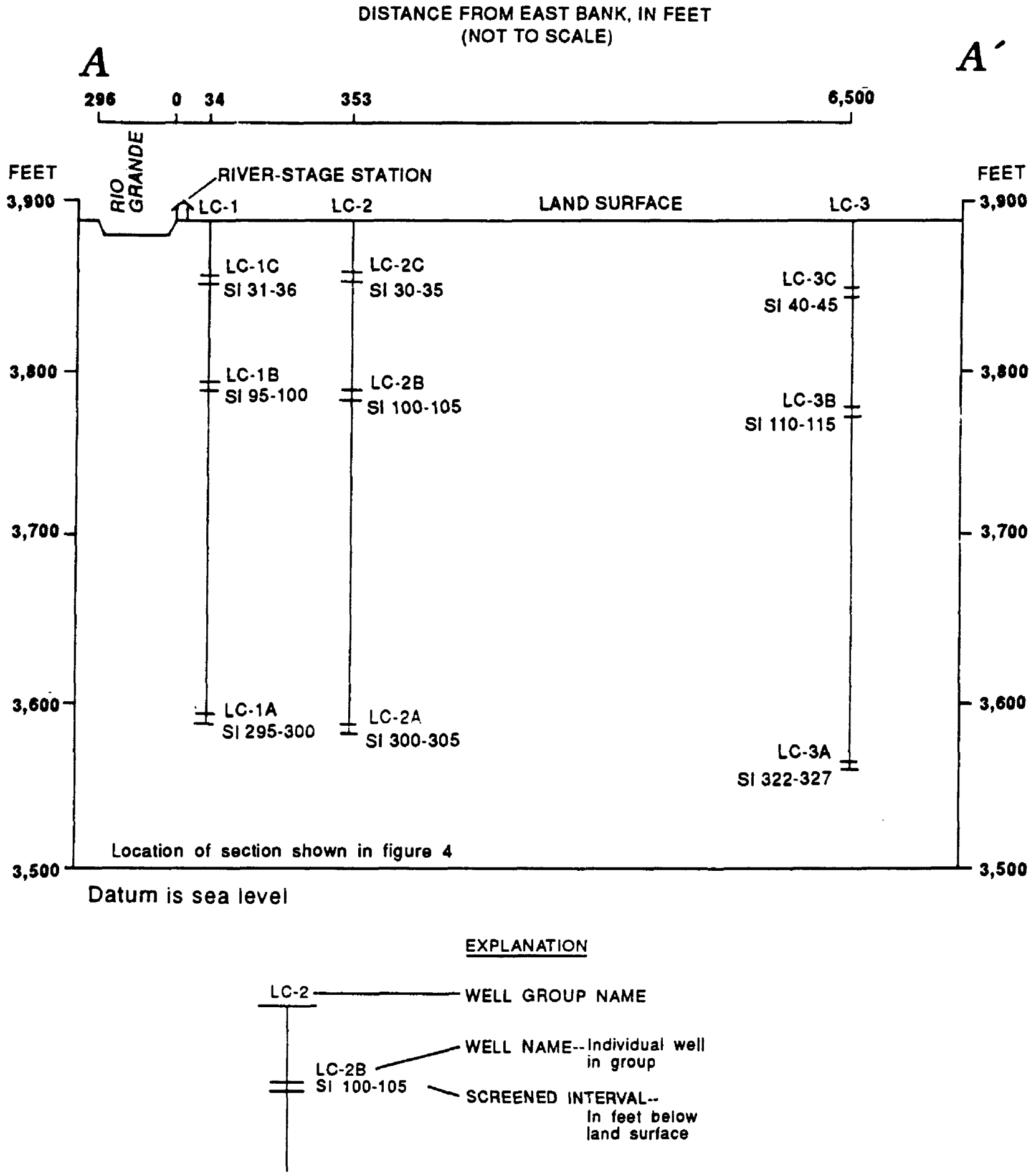


Figure 5.--Las Cruces hydrologic section (modified from Nickerson, 1986, fig. 8).

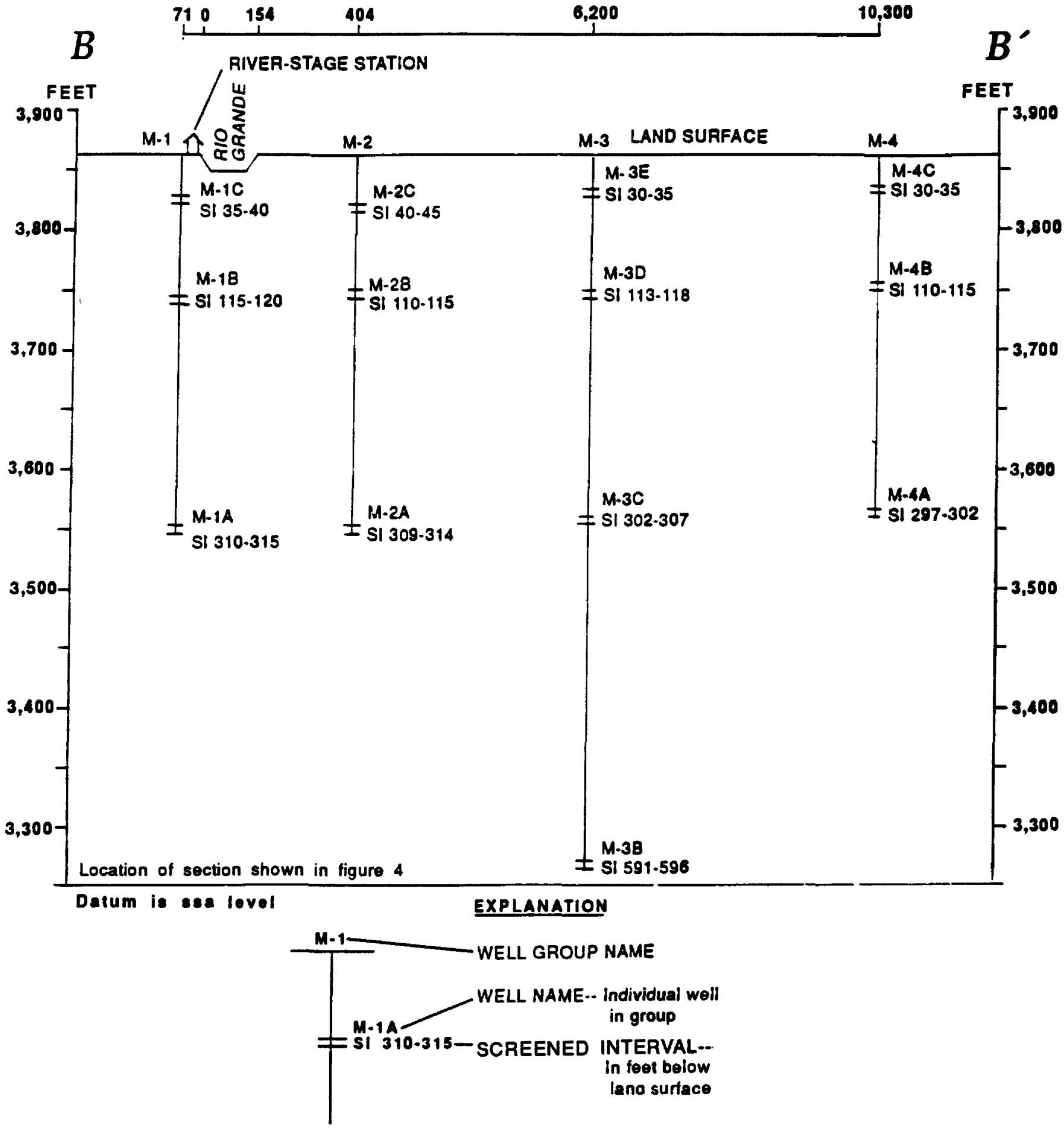


Figure 6.--Mesquite hydrologic section (modified from Nickerson, 1986, fig. 16).

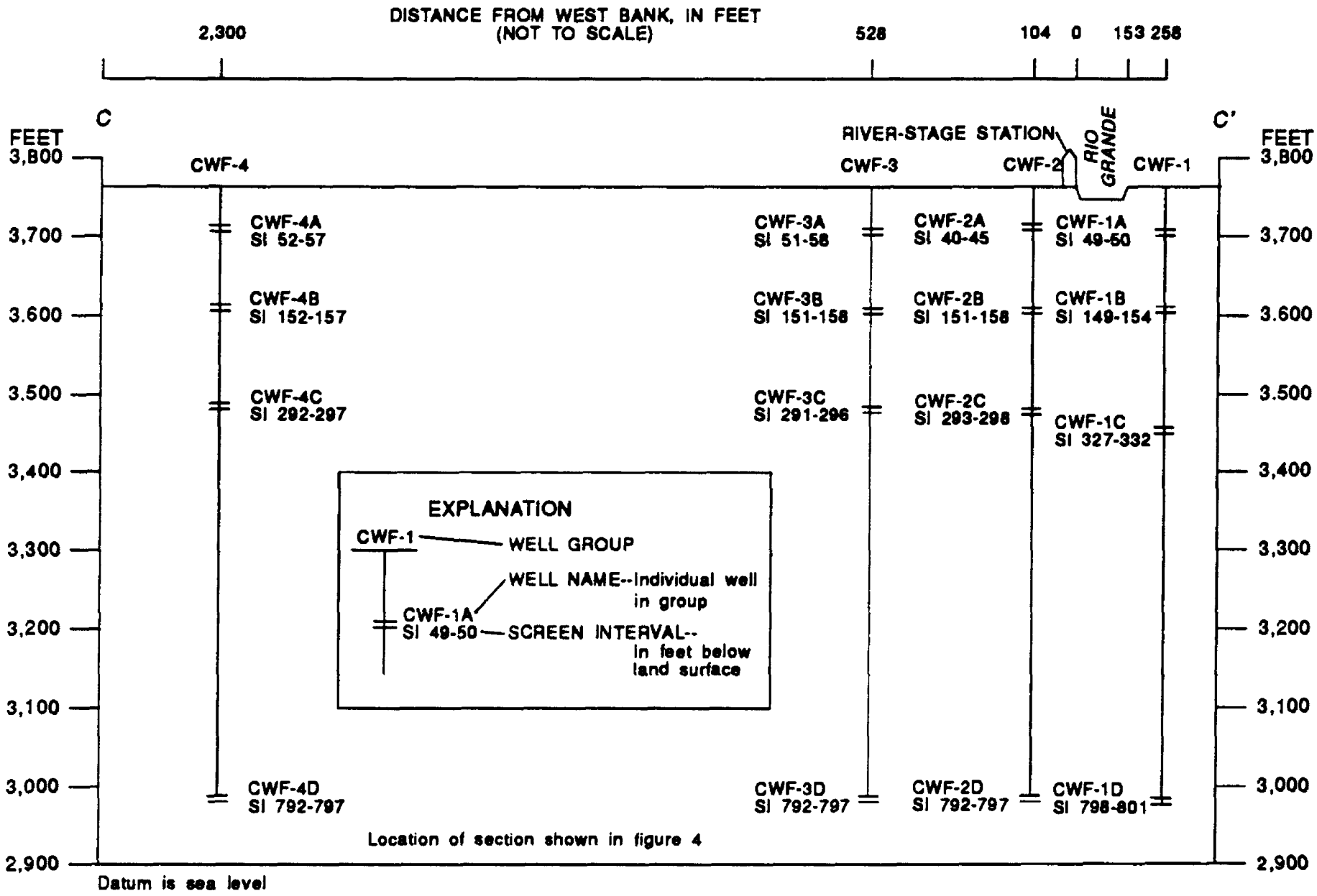


Figure 7.--Cañutillo well-field hydrologic section (modified from Nickerson, 1986, fig. 27).

Well group LC-1

Well group LC-1 consists of three observation wells: LC-1A (23S.1E.22.232a), LC-1B (23S.1E.22.232b), and LC-1C (23S.1E.22.232c). Drilling and construction of well group LC-1 were completed on October 12, 1984. Well records are listed by well number in table 1. The screened intervals are from 295 to 300 feet below land surface for well LC-1A, from 95 to 100 feet below land surface for well LC-1B, and from 31 to 36 feet below land surface for well LC-1C (fig. 5). Hydrographs showing mean daily water levels and miscellaneous water levels in well group LC-1 during the 1987 through 1992 water years are presented in figures 11, 24, 37, 50, 63, and 76, respectively.

Well group LC-2

Well group LC-2 consists of three observation wells: LC-2A (23S.1E.22.241a), LC-2B (23S.1E.22.241b), and LC-2C (23S.1E.22.241c). Drilling and construction of well group LC-2 were completed on October 22, 1984. Well records are listed in table 1. The screened intervals are from 300 to 305 feet below land surface for well LC-2A, from 100 to 105 feet below land surface for well LC-2B, and from 30 to 35 feet below land surface for well LC-2C (fig. 5). Hydrographs showing mean daily water levels and miscellaneous water levels in well group LC-2 during the 1987 through 1992 water years are presented in figures 12, 25, 38, 51, 64, and 77, respectively.

Well group LC-3

Well group LC-3 consists of three observation wells: LC-3A (23S.1E.23.244a), LC-3B (23S.1E.23.244b), and LC-3C (23S.1E.23.244c). Drilling and construction of well group LC-3 were completed on November 26, 1984. Well records are listed in table 1. The screened intervals are from 322 to 327 feet below land surface for LC-3A, from 110 to 115 feet below land surface for LC-3B, and from 40 to 45 feet below land surface for LC-3C (fig. 5). Hydrographs showing mean daily water levels and miscellaneous water levels in well group LC-3 during the 1987 through 1992 water years are presented in figures 13, 26, 39, 52, 65, and 78, respectively.

Rio Grande low-flow station

The river-stage station at the Las Cruces hydrologic section, Rio Grande below Picacho Bridge (321745106492510), was upgraded to a low-flow discharge station during the 1991 through 1992 water years. Discharge measurements were conducted and streamflow records computed for base flow during the nonirrigation season (November through February) when river discharge was less than 100 cubic feet per second. Low-flow discharge records for the 1991 and 1992 water years are presented in tables 2 and 3, respectively.

Mesquite Hydrologic Section

The Mesquite hydrologic section (B-B') is approximately 5 miles northwest of Mesquite, New Mexico (fig. 4). The section consists of a river-stage station on the Rio Grande and four observation-well groups aligned perpendicular to the Rio Grande (fig. 6).

River-stage station

The river-stage station Rio Grande below Mesilla Dam is located at the Mesquite hydrologic section (fig. 6). The station is operated by the U.S. Geological Survey to record river stage. Hydrographs showing mean daily stage of the Rio Grande below Mesilla Dam during the 1987 through 1992 water years are presented in figures 14, 27, 40, 53, 66, and 79, respectively.

Well group M-1

Well group M-1 consists of three observation wells: M-1A (24S.2E.19.214a), M-1B (24S.2E.19.214b), and M-1C (24S.2E.19.214c). Drilling and construction of well group M-1 were completed on November 14, 1983. Well records are listed in table 1. The screened intervals are from 310 to 315 feet below land surface for well M-1A, from 115 to 120 feet below land surface for well M-1B, and from 35 to 40 feet below land surface for well M-1C (fig. 6). Hydrographs showing mean daily water levels and miscellaneous water levels in well group M-1 during the 1987 through 1992 water years are presented in figures 15, 28, 41, 54, 67, and 80, respectively.

Well group M-2

Well group M-2 consists of three observation wells: M-2A (24S.2E.19.223a), M-2B (24S.2E.19.223b), and M-2C (24S.2E.19.223c). Drilling and construction of well group M-2 were completed on December 5, 1984. Well records are listed in table 1. The screened intervals are from 309 to 314 feet below land surface for well M-2A, from 110 to 115 feet below land surface for well M-2B, and from 40 to 45 feet below land surface for well M-2C (fig. 6). Hydrographs showing mean daily water levels in well group M-2 during the 1987 through 1992 water years are presented in figures 16, 29, 42, 55, 68, and 81, respectively.

Well group M-3

Well group M-3 consists of four observation wells: M-3B (24S.2E.17.423b), M-3C (24S.2E.17.423c), M-3D (24S.2E.17.423d), and M-3E (24S.2E.17.423e). Drilling and construction of well group M-3 were completed as part of a previous study (Wilson and White, 1984). Water levels in well group M-3 were measured on an annual basis. Well records and annual water levels are listed in table 1. The screened intervals in the wells are from 591 to 596 feet below land surface for well M-3B, from 302 to 307 feet below land surface for well M-3C, from 113 to 118 feet below land surface for well M-3D, and from 30 to 35 feet below land surface for well M-3E (fig. 6).

Well group M-4

Well group M-4 consists of three observation wells: M-4A (24S.2E.16.124a), M-4B (24S.2E.16.124b), and M-4C (24S.2E.16.124c). Drilling and construction of well group M-4 were completed on December 8, 1983. Well records are listed in table 1. The screened intervals are from 297 to 302 feet below land surface for well M-4A, from 110 to 115 feet below land surface for well M-4B, and from 30 to 35 feet below land surface for well M-4C (fig. 6). Hydrographs showing mean daily water levels in well group M-4 during the 1987 through 1992 water years are presented in figures 17, 30, 43, 56, 69, and 82, respectively.

Cañutillo Well-Field Hydrologic Section

The Cañutillo well-field hydrologic section (C-C') is within the city of El Paso's Cañutillo well field approximately 3 miles north of Cañutillo, Texas (fig. 4). The section consists of a river-stage station on the Rio Grande and four observation-well groups aligned perpendicular to the Rio Grande (fig. 7).

River-stage station

The river-stage station Rio Grande below Vinton Bridge is at the Cañutillo well-field hydrologic section (fig. 7). The station is operated by the U.S. Geological Survey to record river stage. Hydrographs showing mean daily stage of the Rio Grande below Vinton Bridge during the 1987 through 1992 water years are presented in figures 18, 31, 44, 57, 70, and 83, respectively.

Well group CWF-1

Well group CWF-1 consists of four wells: CWF-1A (JL 49-04-478), CWF-1B (JL 49-04-479), CWF-1C (JL 49-04-480), and CWF-1D (JL 49-04-481). Drilling and construction of well group CWF-1 were completed on February 13, 1985. Well records are listed in table 1. The screened intervals are from 45 to 50 feet below land surface for well CWF-1A, from 149 to 154 feet below land surface for well CWF-1B, from 327 to 332 feet below land surface for well CWF- 1C, and from 796 to 801 feet below land surface for well CWF-1D (fig. 7). Hydrographs showing mean daily water levels in well group CWF-1 during the 1987 through 1992 water years are presented in figures 19, 32, 45, 58, 71, and 84, respectively.

Well group CWF-2

Well group CWF-2 consists of four observation wells: CWF-2A (JL 49-04-474), CWF-2B (JL 49-04-475), CWF-2C (JL 49-04-476), and CWF-2D (JL 49-04-477). Drilling and construction of well group CWF-2 were completed on January 30, 1985. Well records are listed in table 1. The screened intervals are from 40 to 45 feet below land surface for well CWF-2A, from 151 to 156 feet below land surface for well CWF-2B, from 293 to 298 feet below land surface for well CWF-2C, and from 792 to 797 feet below land surface for well CWF-2D (fig. 7). Hydrographs showing mean daily water levels in well group CWF-2 during the 1987 through 1992 water years are presented in figures 20, 33, 46, 59, 72, and 85, respectively.

Well group CWF-3

Well group CWF-3 consists of four observation wells: CWF-3A (JL 49-04-470), CWF-3B (JL 49-04-471), CWF-3C (JL 49-04-472), and CWF-3D (JL 49-04-473). Drilling and construction of well group CWF-3 were completed on January 10, 1985. Well records are listed in table 1. The screened intervals are from 51 to 56 feet below land surface for well CWF-3A, from 151 to 156 feet below land surface for well CWF-3B, from 291 to 296 feet below land surface for well CWF-3C, and from 792 to 797 feet below land surface for well CWF-3D (fig. 7). Hydrographs showing mean daily water levels and miscellaneous water levels in well group CWF-3 during the 1987 through 1992 water years are presented in figures 21, 34, 47, 60, 73, and 86, respectively.

Well group CWF-4

Well group CWF-4 consists of four observation wells: CWF-4A (JL 49-04-466), CWF-4B (JL 49-04-467), CWF-4C (JL 49-04-468), and CWF-4D (JL 49-04-469). Drilling and construction of well group CWF-4 were completed on December 4, 1984. Well records are listed in table 1. The screened intervals are from 52 to 57 feet below land surface for well CWF-4A, from 152 to 157 feet below land surface for well CWF-4B, from 292 to 297 feet below land surface for well CWF-4C, and from 792.5 to 797.5 feet below land surface for well CWF-4 (fig. 7). Hydrographs showing mean daily water levels and miscellaneous water levels in well group CWF-4 during the 1987 through 1992 water years are presented in figures 22, 35, 48, 61, 74, and 87, respectively.

Rio Grande Seepage Investigations

Seepage investigations of the Rio Grande at low flow were conducted during the 1988 through 1992 water years to document river gain/loss including associated surface-water quality and shallow ground-water levels. Discharge measurements were conducted at approximately 34 sites along a 62-mile reach from the Rio Grande below Leasburg Dam, New Mexico, to the Rio Grande at El Paso, Texas (fig. 8). Specific conductance and water temperature were determined during discharge measurements. Water samples were collected for chemical analyses at six river sites to determine dissolved solids and concentrations of major ions, selected nutrients, and selected trace elements. Water levels were measured in approximately 50 shallow observation wells completed in the Rio Grande flood-plain alluvium.

The locations of discharge measurement sites, water-quality sites, and observation wells selected for the Rio Grande seepage investigations are shown in figure 8. Specific results of individual seepage investigations conducted on January 5-6, 1988, January 10-11, 1989, January 9-10, 1990, January 8-9, 1991, and December 17, 1991, are presented by water year in tables 4, 5, 6, 7, and 8, respectively. River miles are referenced upstream from the Rio Grande at El Paso, Texas, which is designated as river mile 1,249.9 (Hendricks, 1964). Indicated gain or loss of streamflow during seepage investigations of the Rio Grande from Radium Springs, New Mexico, to El Paso, Texas, is shown in figure 9. Chemical analyses of water samples collected from the Rio Grande during seepage investigations are listed in table 9. Water levels in selected observation wells completed in the shallow flood-plain alluvium during Rio Grande seepage investigations are listed in table 10.

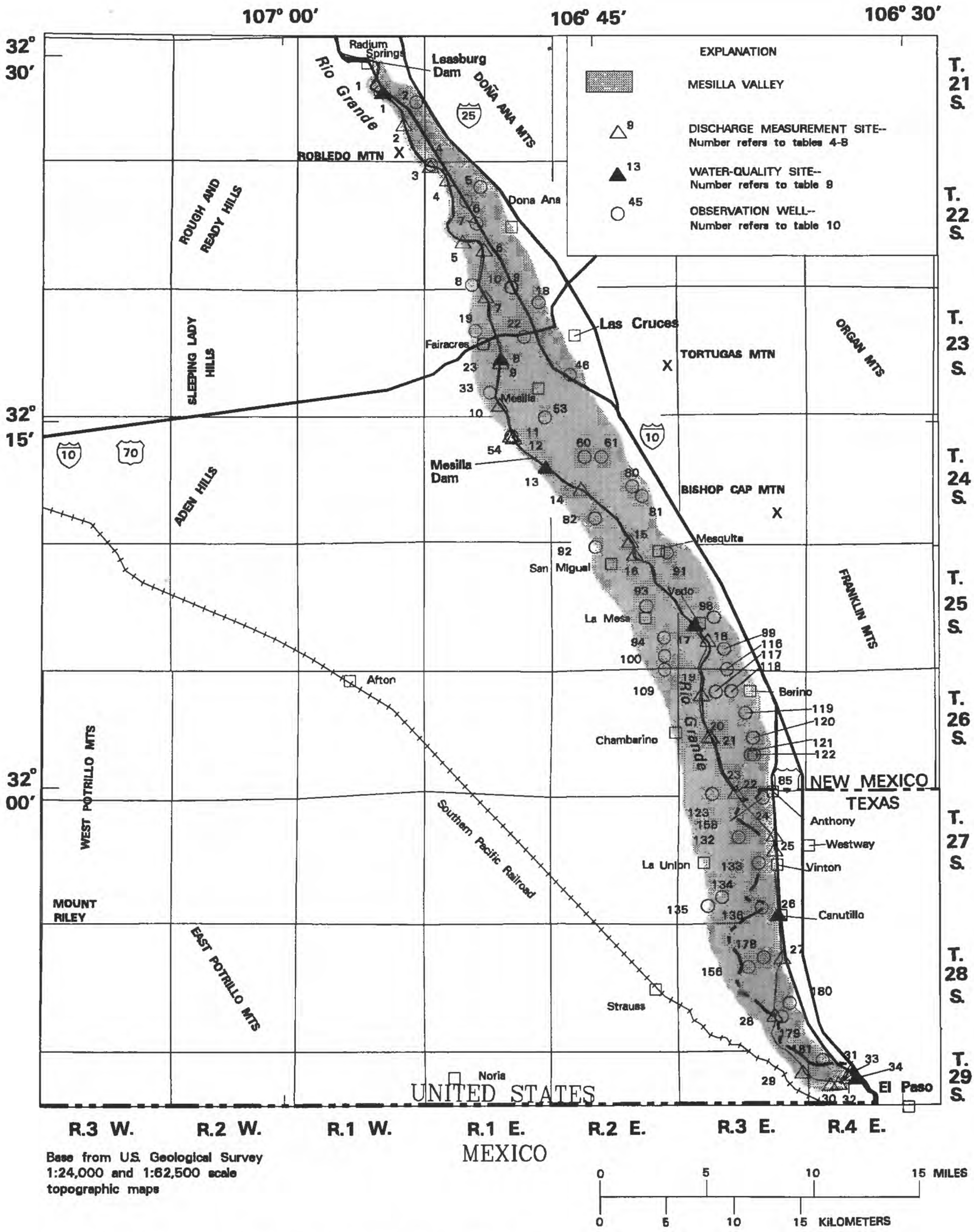


Figure 8.--Location of discharge measurement sites, water-quality sites, and selected observation wells during seepage investigations of the Rio Grande from Radium Springs, New Mexico, to El Paso, Texas, 1988 through 1992 water years.

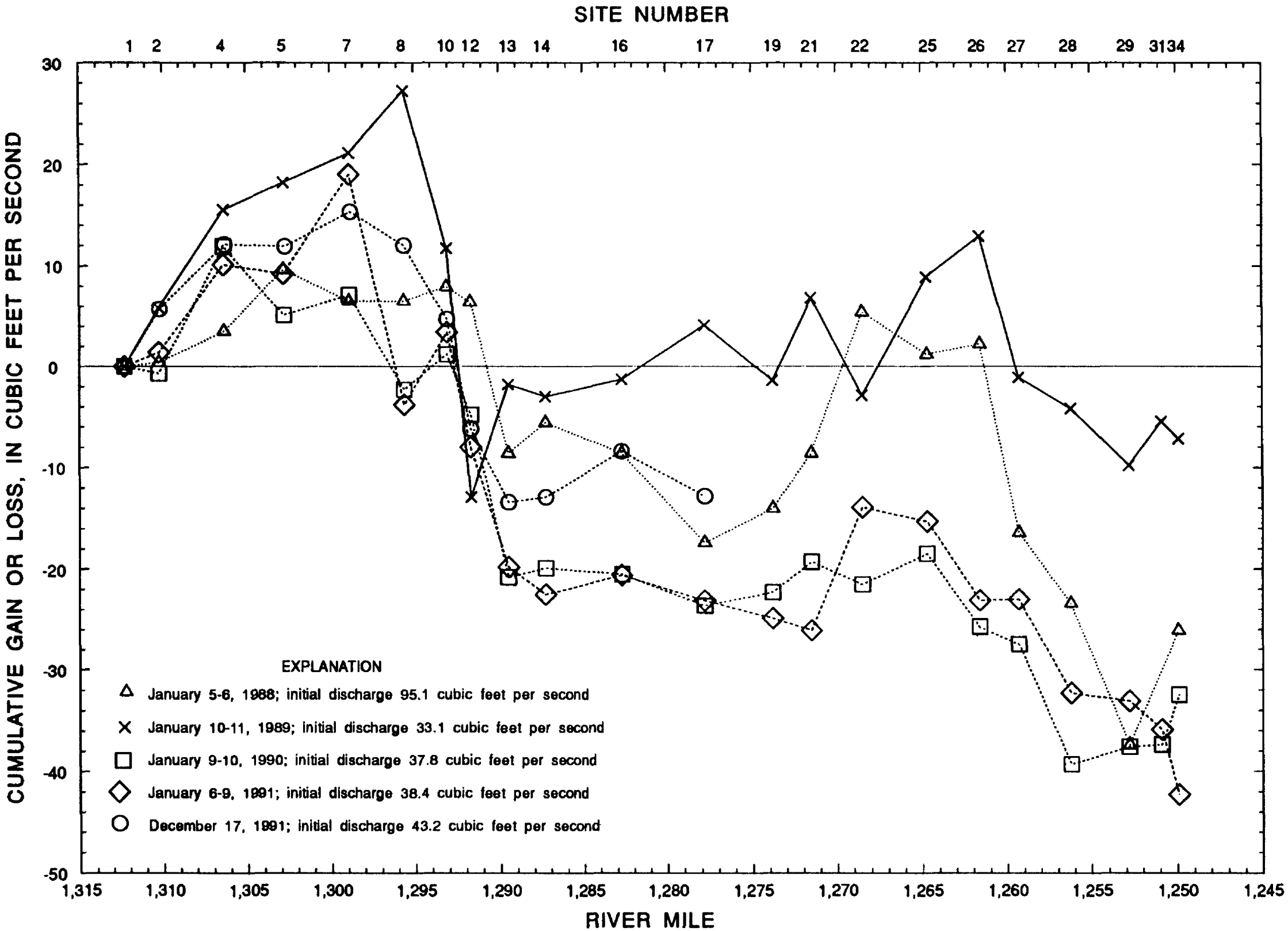


Figure 9.--Indicated gain or loss of streamflow during seepage investigations of the Rio Grande from Radium Springs, New Mexico, to El Paso, Texas, 1988 through 1992 water years.

1987 WATER YEAR

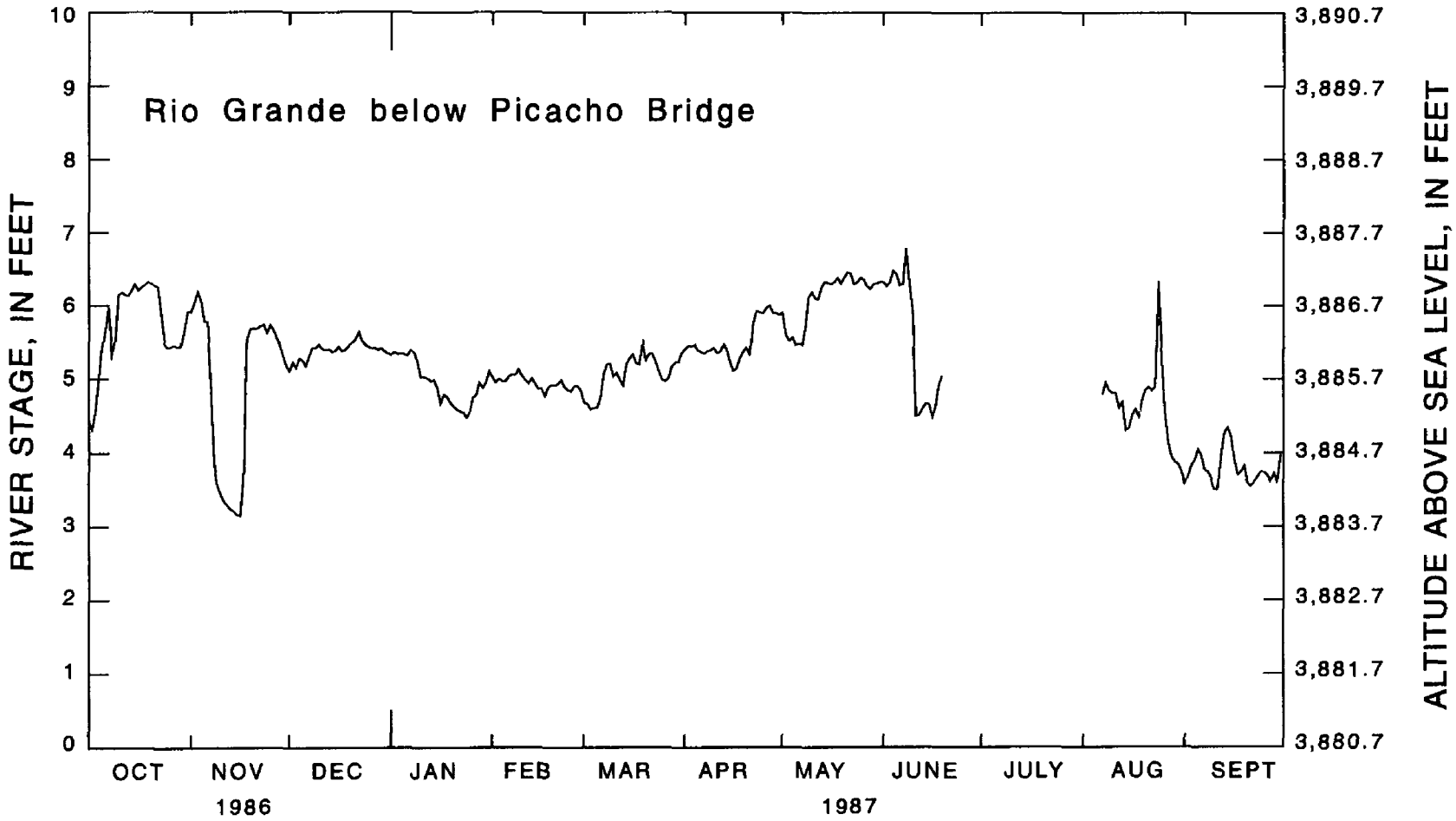


Figure 10.--Mean daily river stage of the Rio Grande below Picacho Bridge, 1987 water year.

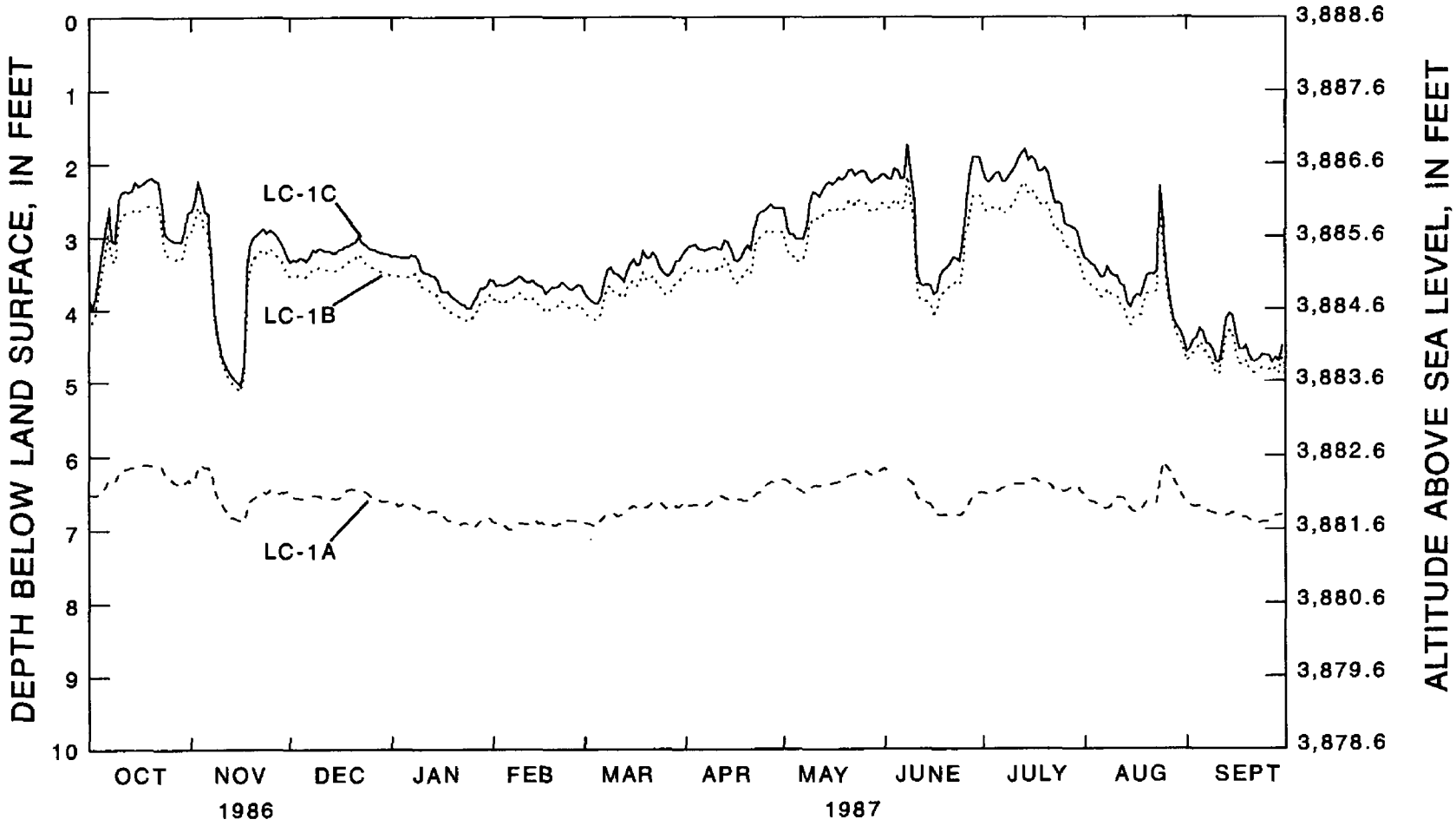


Figure 11.--Mean daily water levels in well group LC-1, 1987 water year.

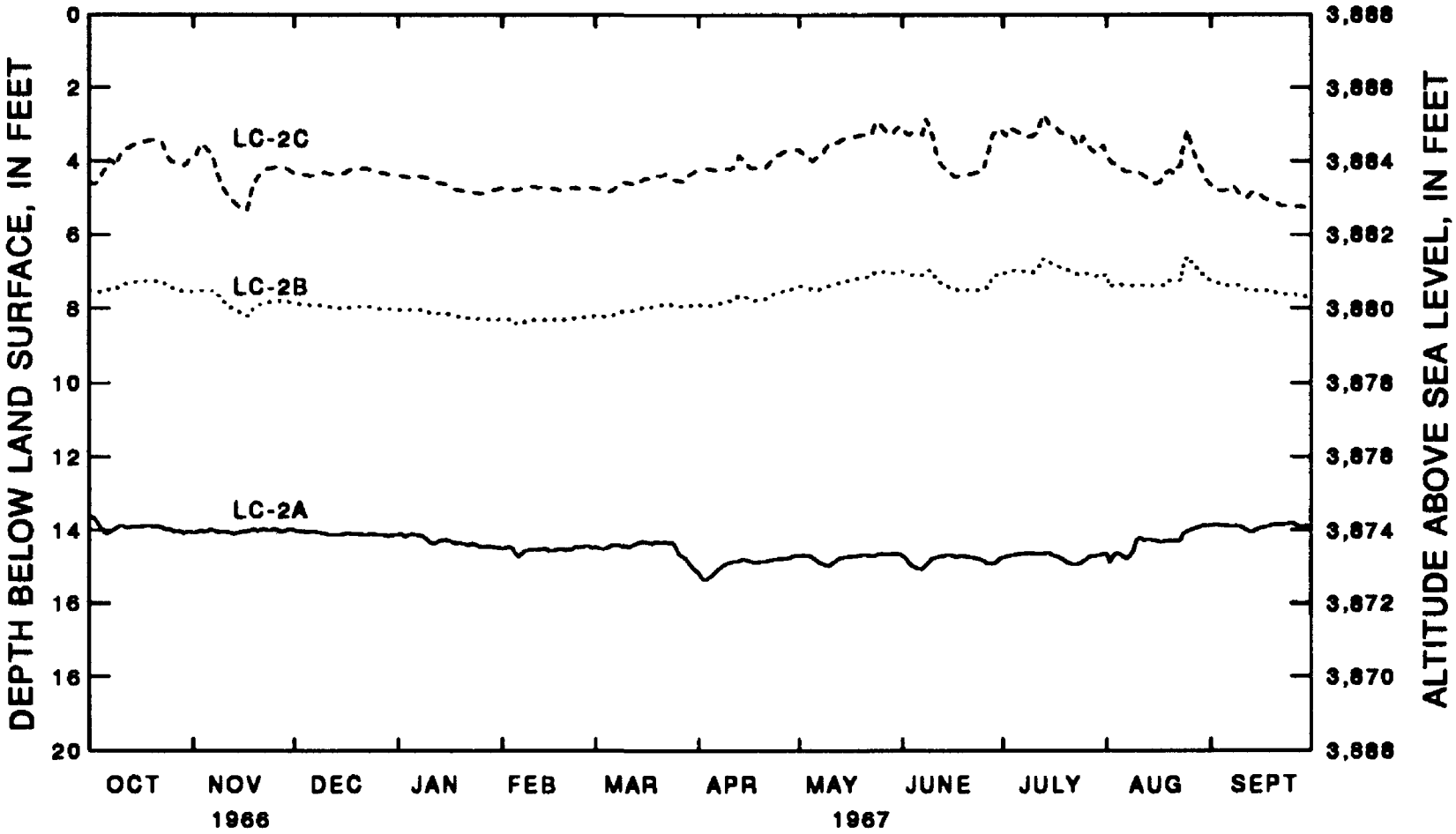


Figure 12.--Mean daily water levels in well group LC-2, 1987 water year.

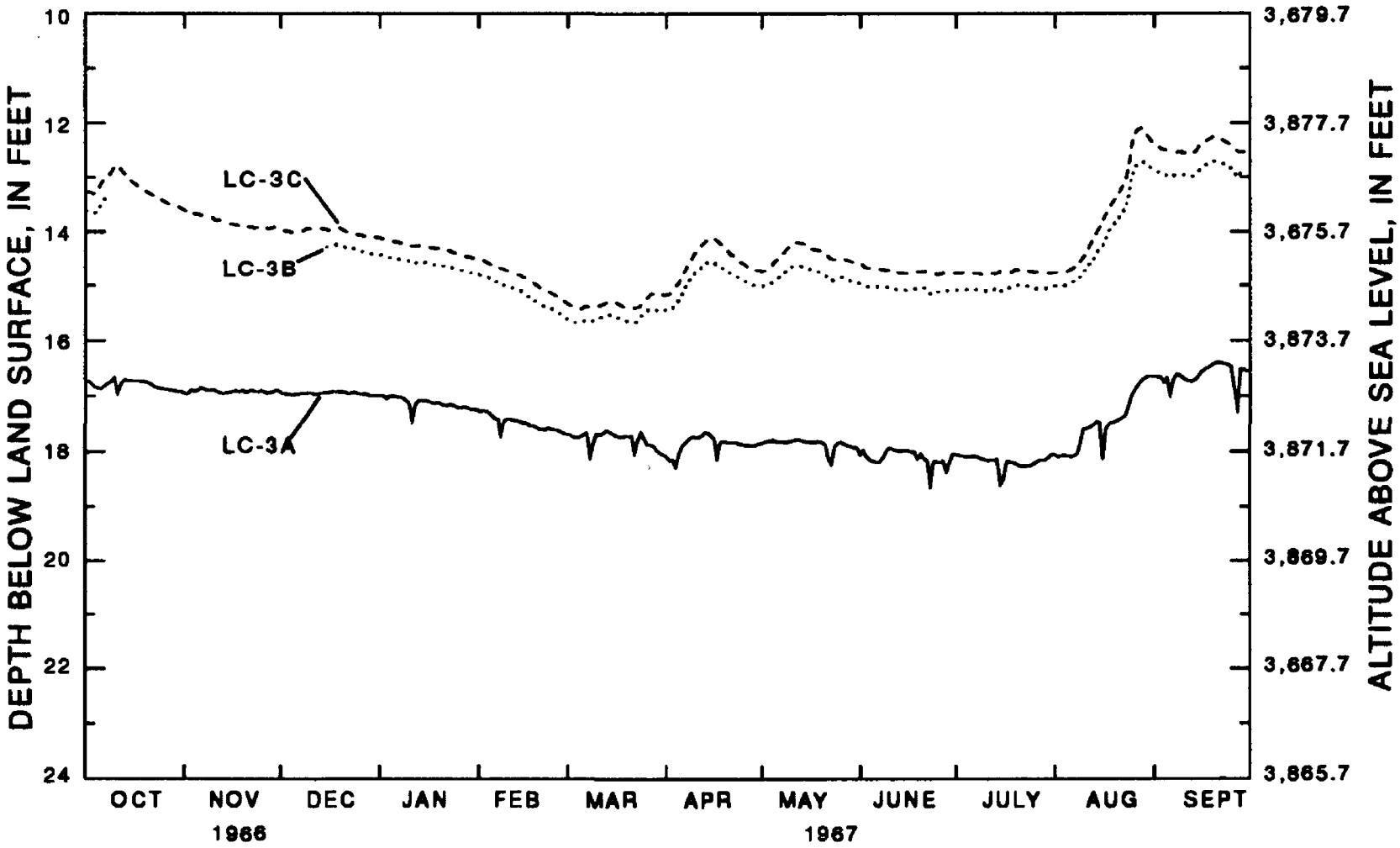


Figure 13.--Mean daily water levels in well group LC-3, 1987 water year.

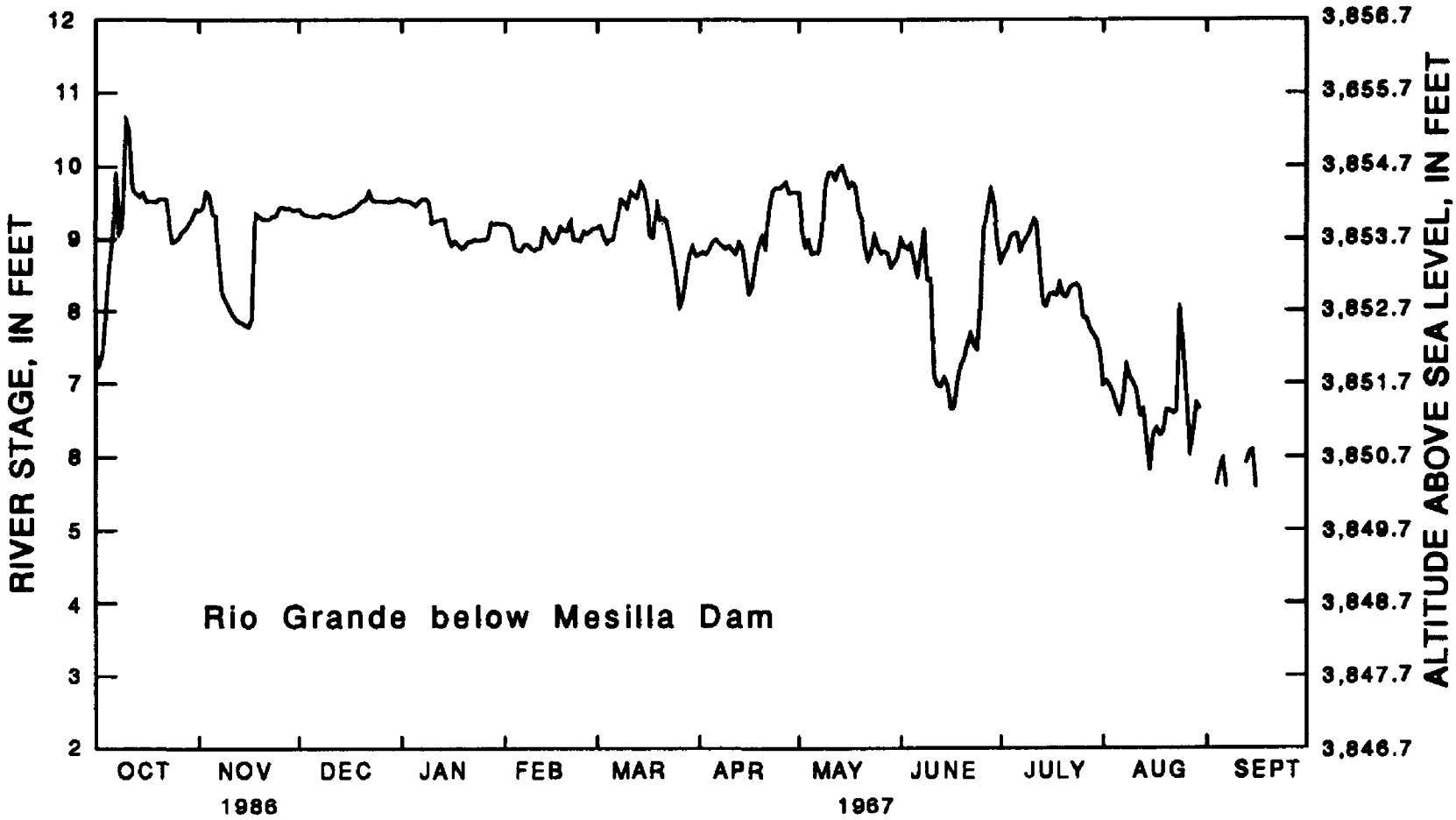


Figure 14.--Mean daily river stage of the Rio Grande below Mesilla Dam, 1987 water year.

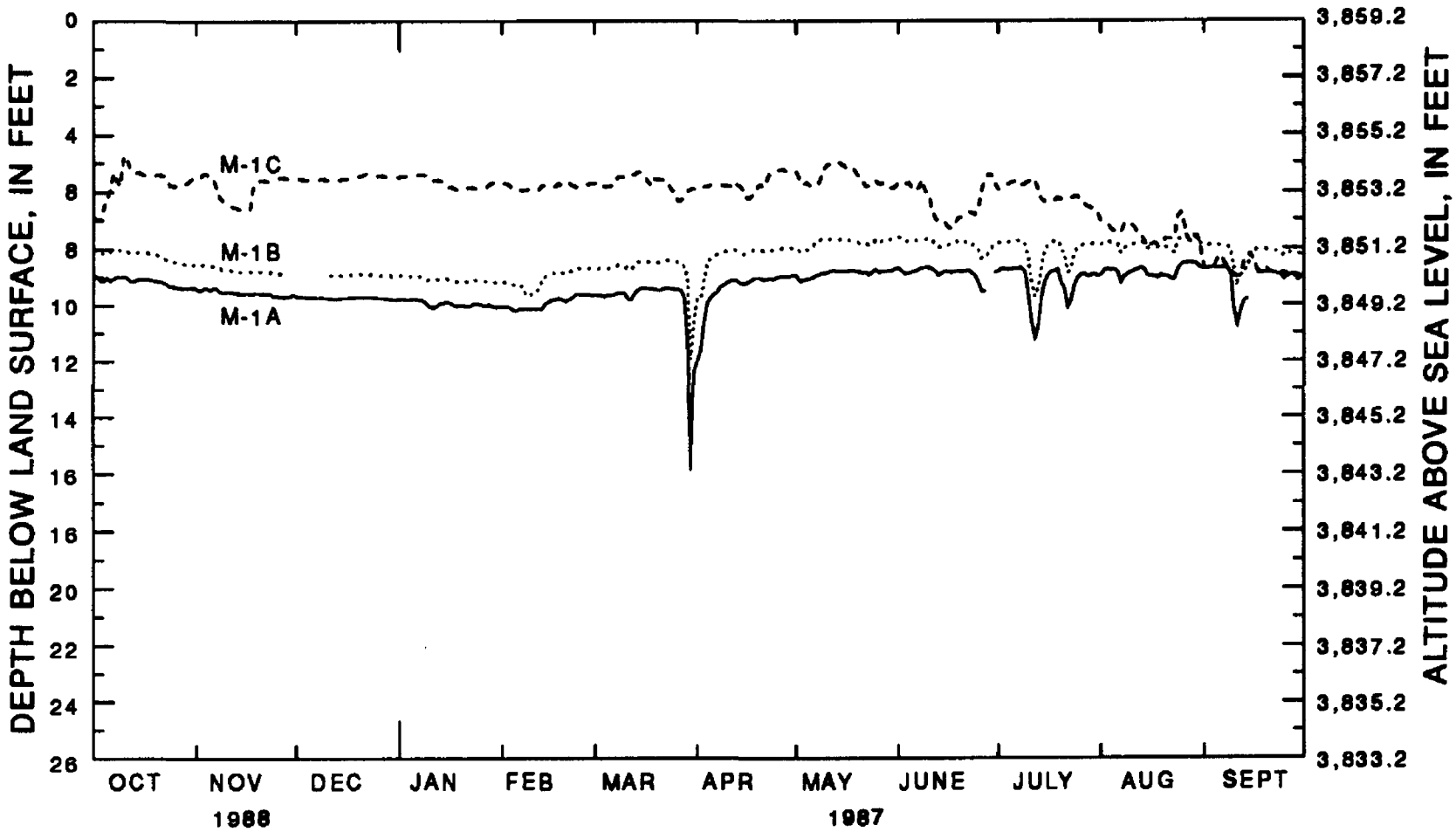


Figure 15.--Mean daily water levels in well group M-1, 1987 water year.

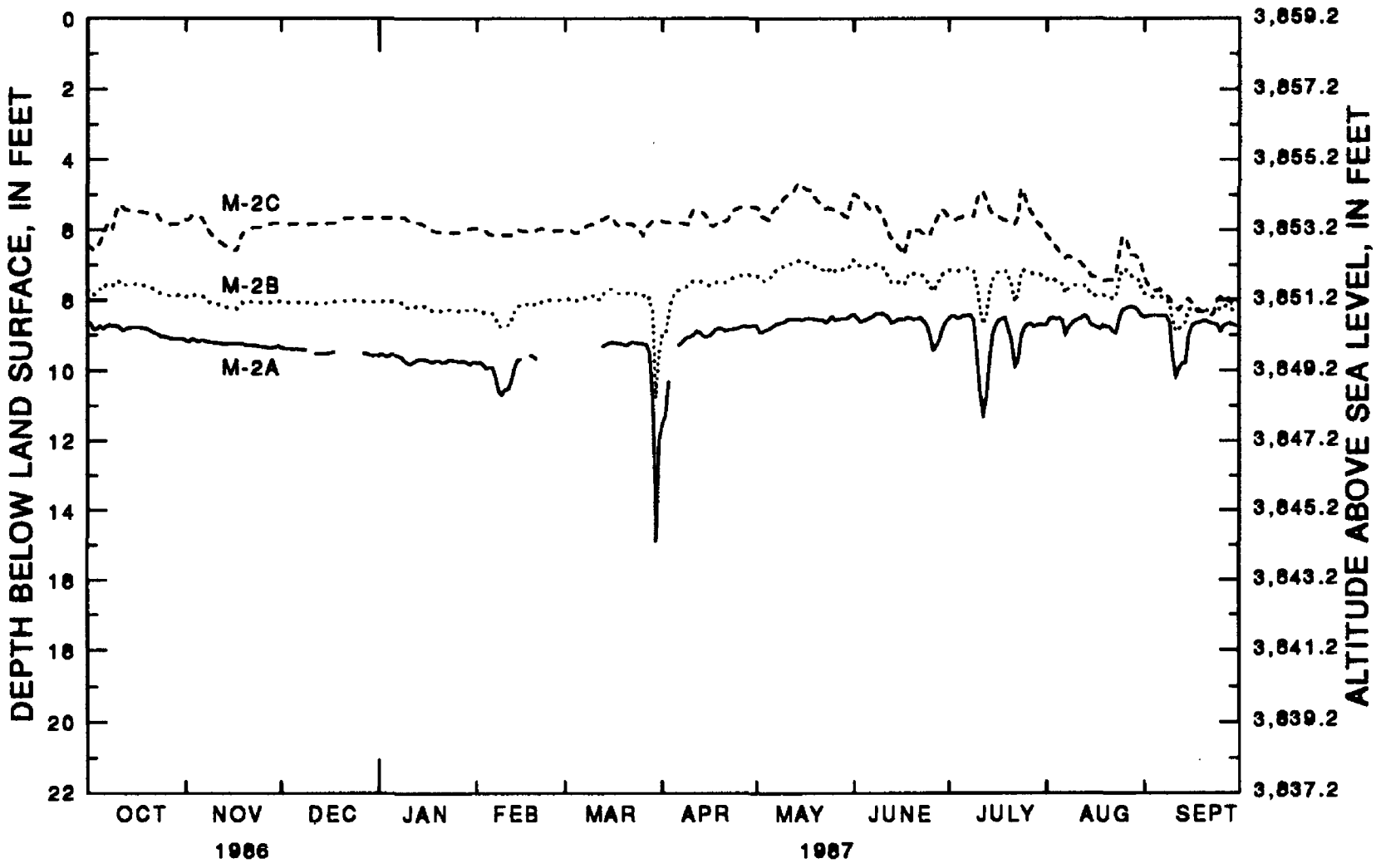


Figure 16.--Mean daily water levels in well group M-2, 1987 water year.

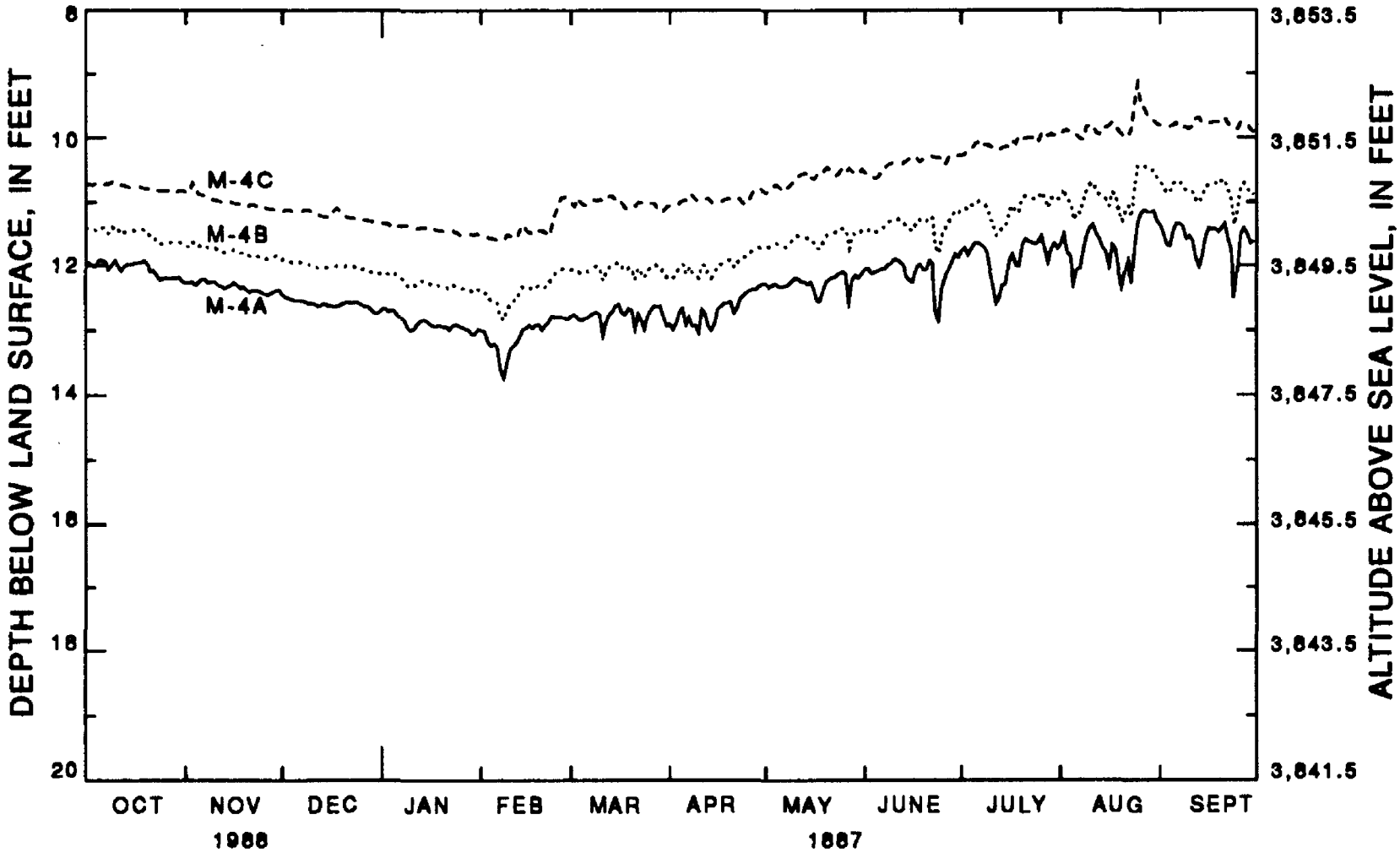


Figure 17.--Mean daily water levels in well group M-4, 1987 water year.

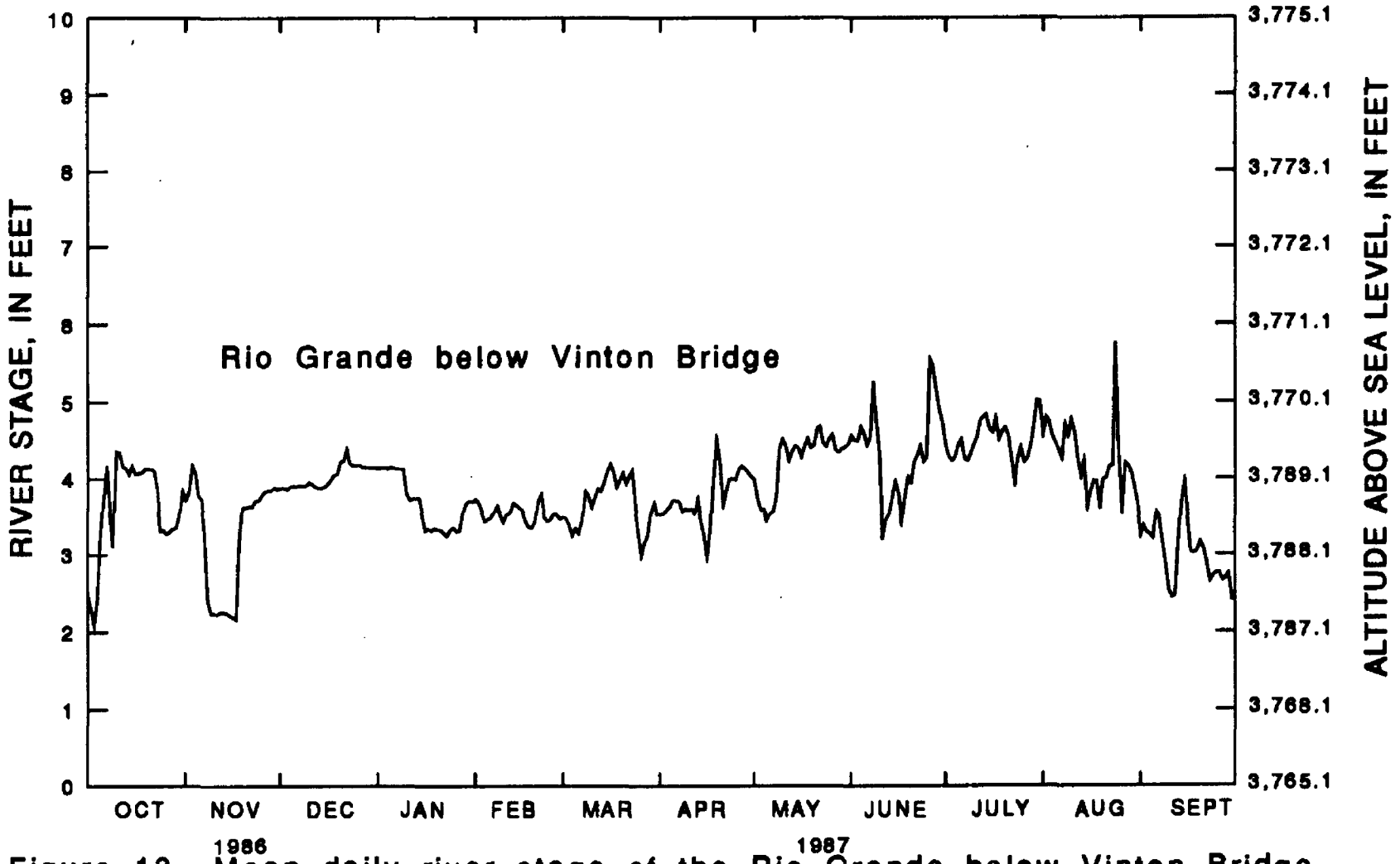


Figure 18.--Mean daily river stage of the Rio Grande below Vinton Bridge, 1987 water year.

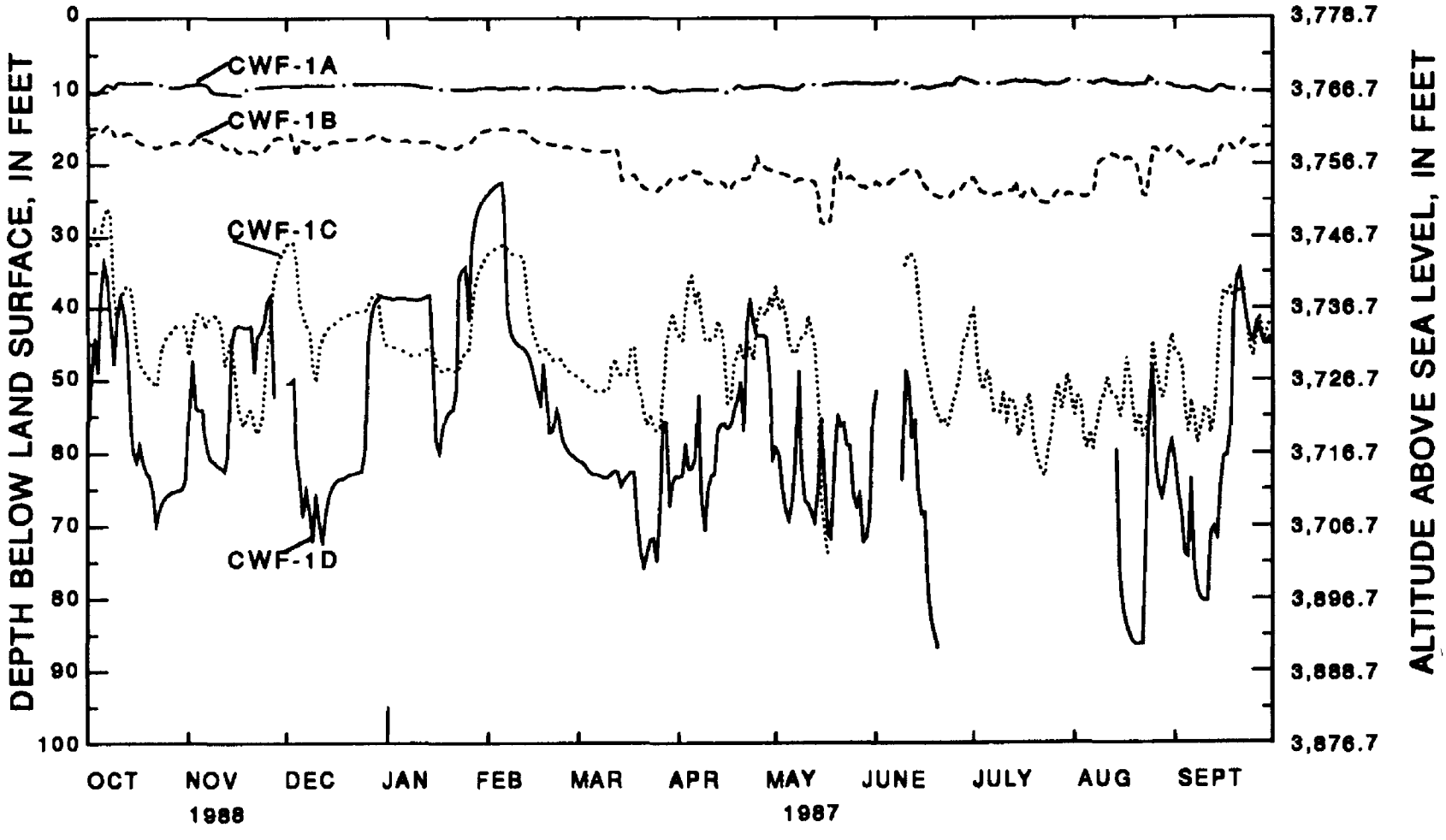


Figure 19.--Mean daily water levels in well group CWF-1, 1987 water year.

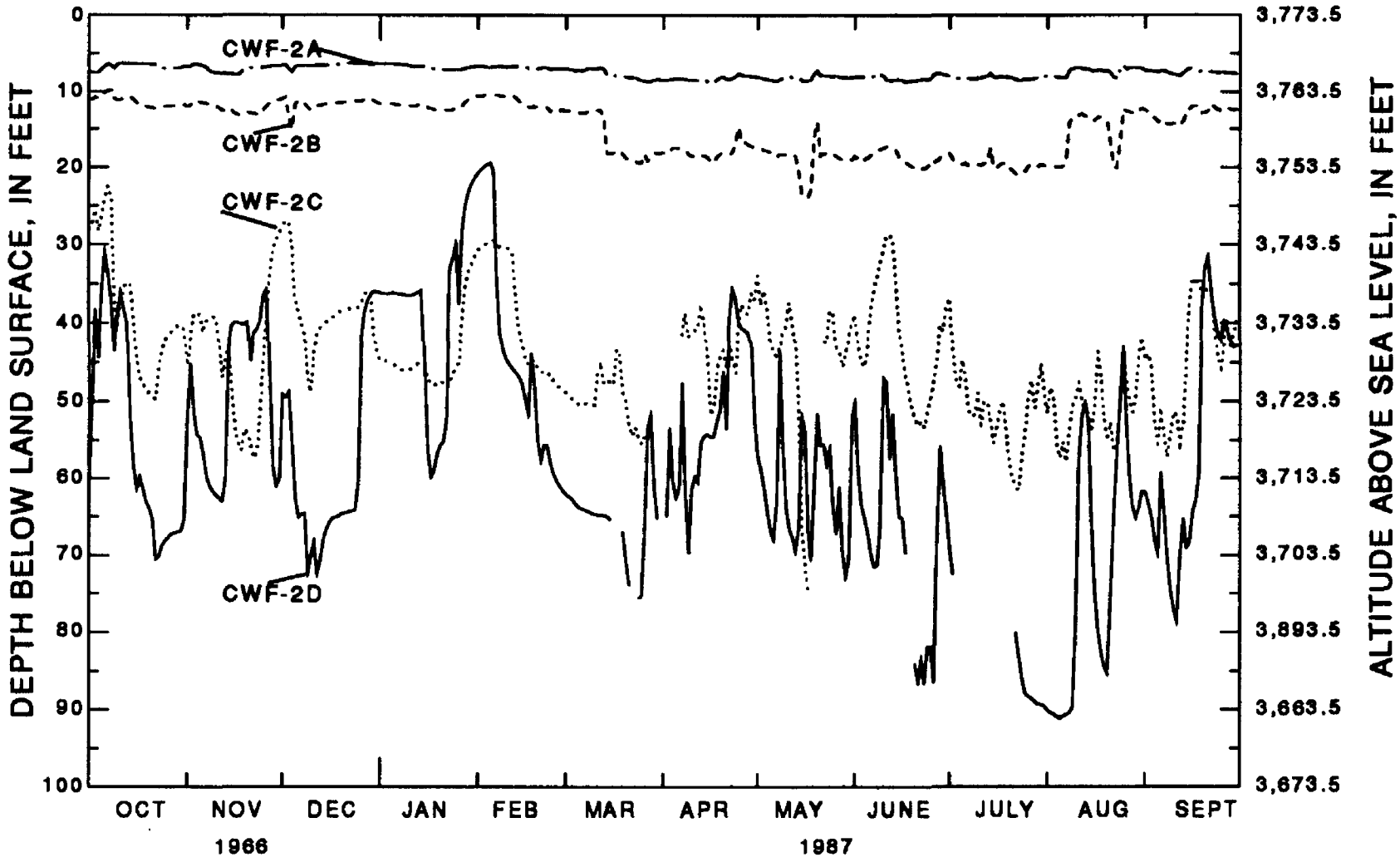


Figure 20.--Mean daily water levels in well group CWF-2, 1987 water year.

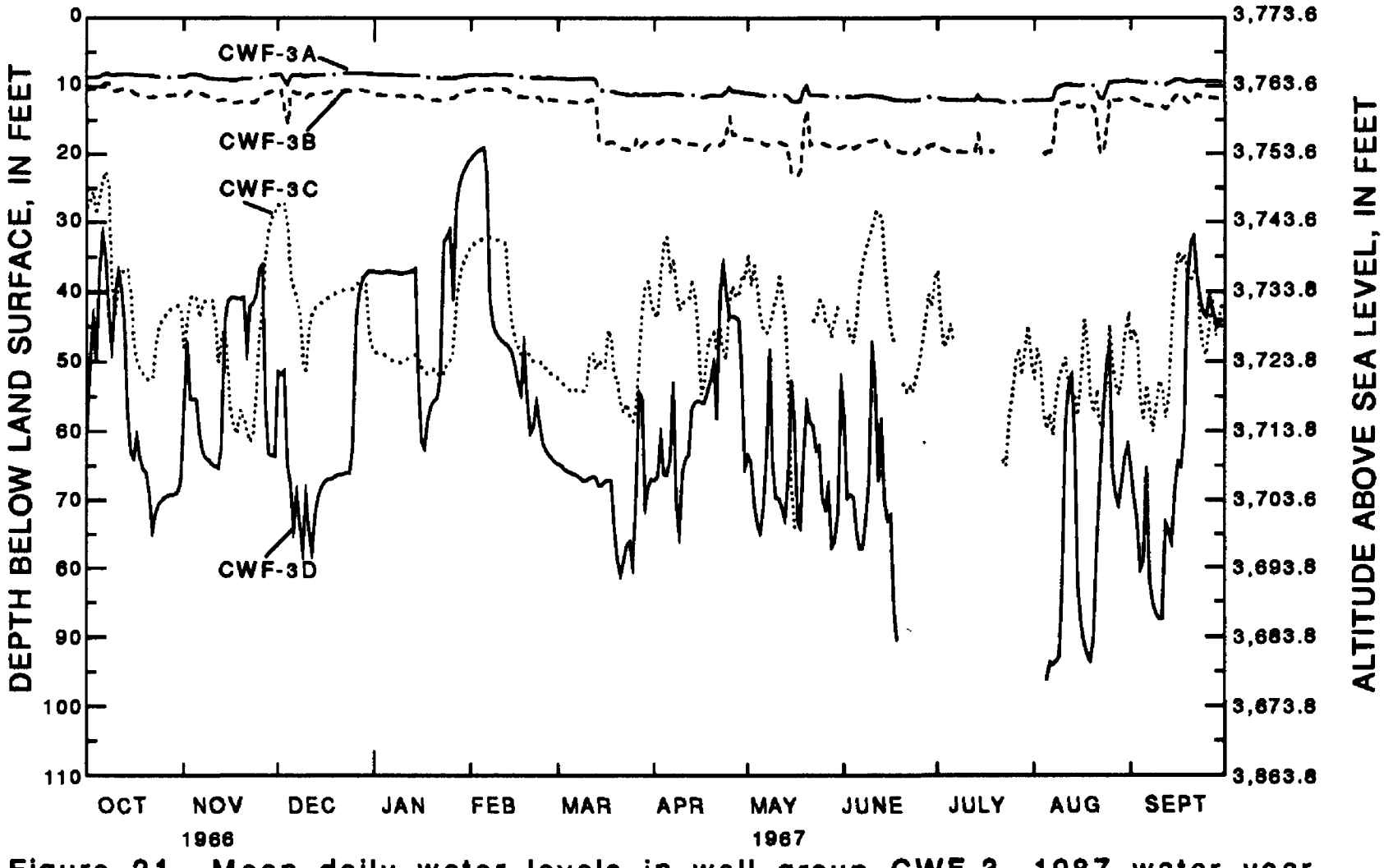


Figure 21.--Mean daily water levels in well group CWF-3, 1987 water year.

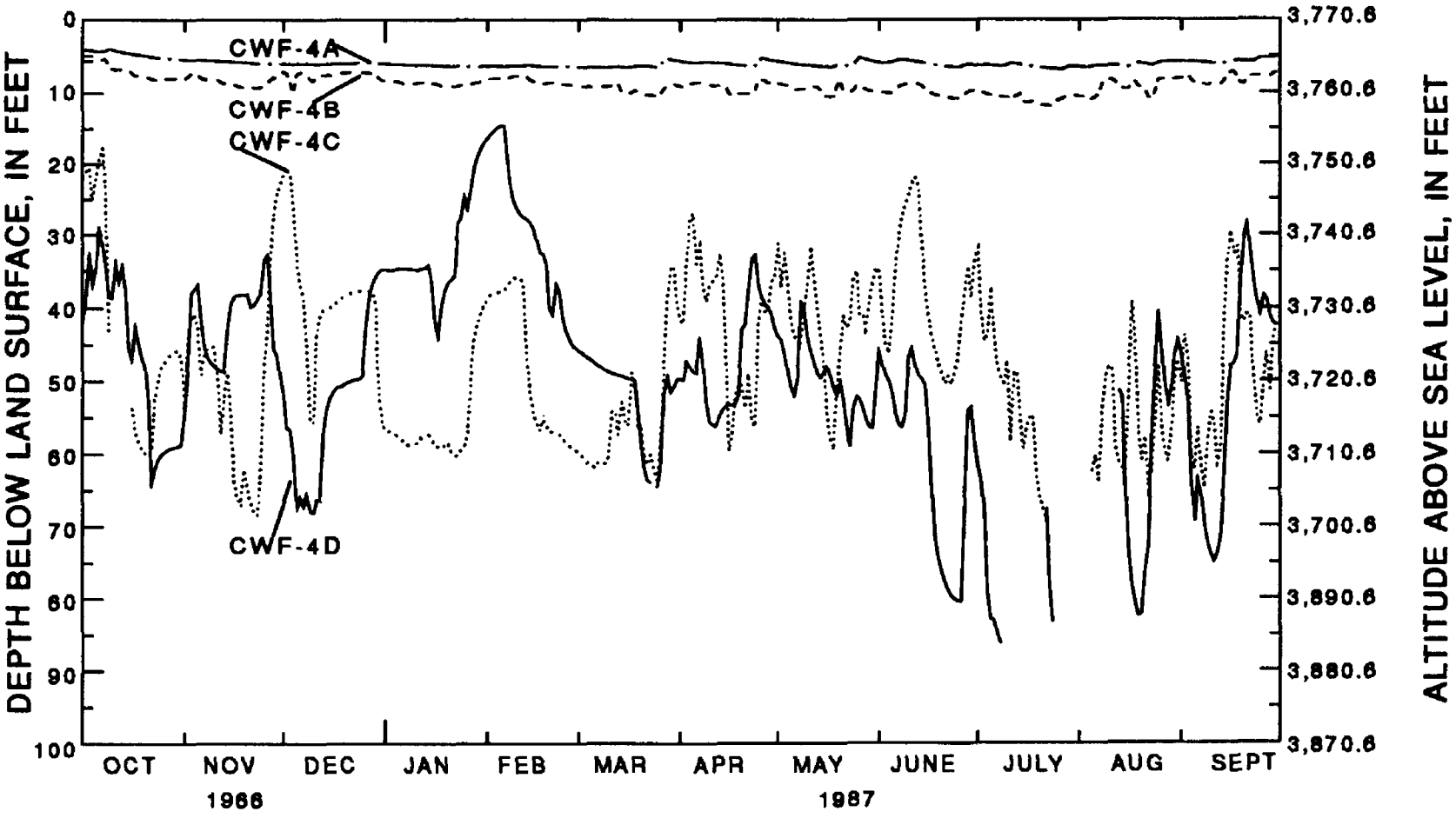


Figure 22.--Mean daily water levels in well group CWF-4, 1987 water year.

1988 WATER YEAR

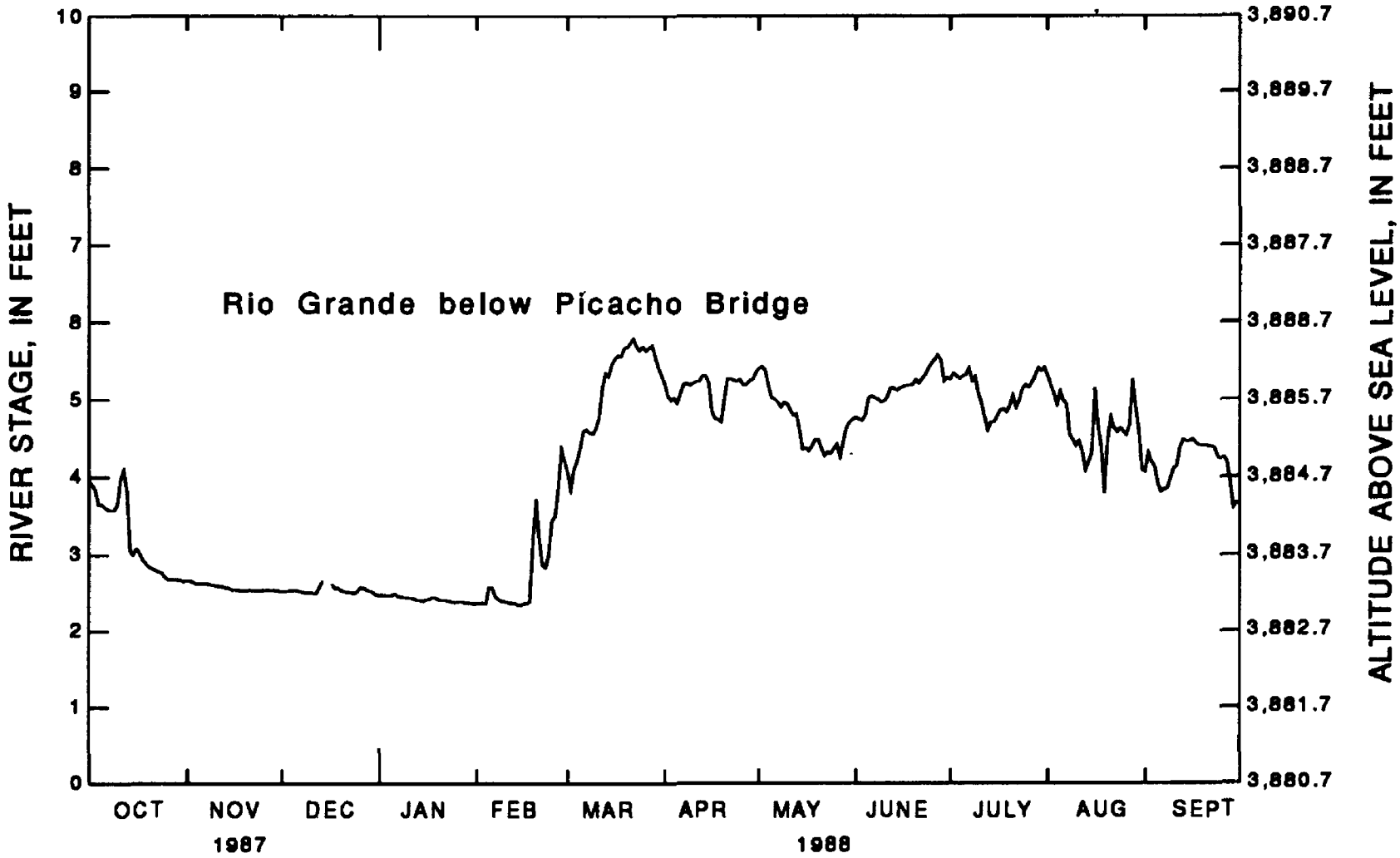


Figure 23.--Mean daily river stage of the Rio Grande below Picacho Bridge, 1988 water.

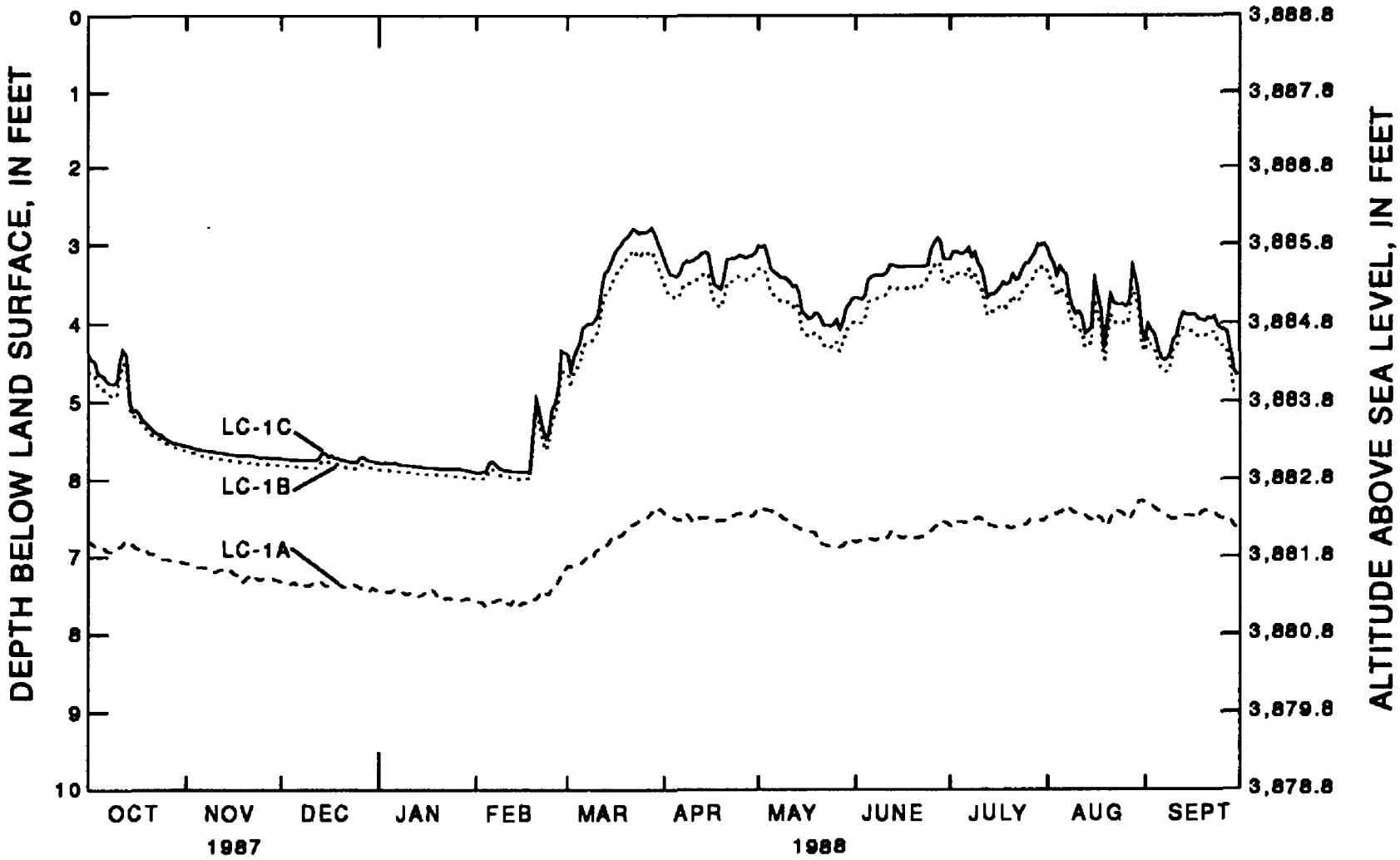


Figure 24.--Mean daily water levels in well group LC-1, 1988 water year.

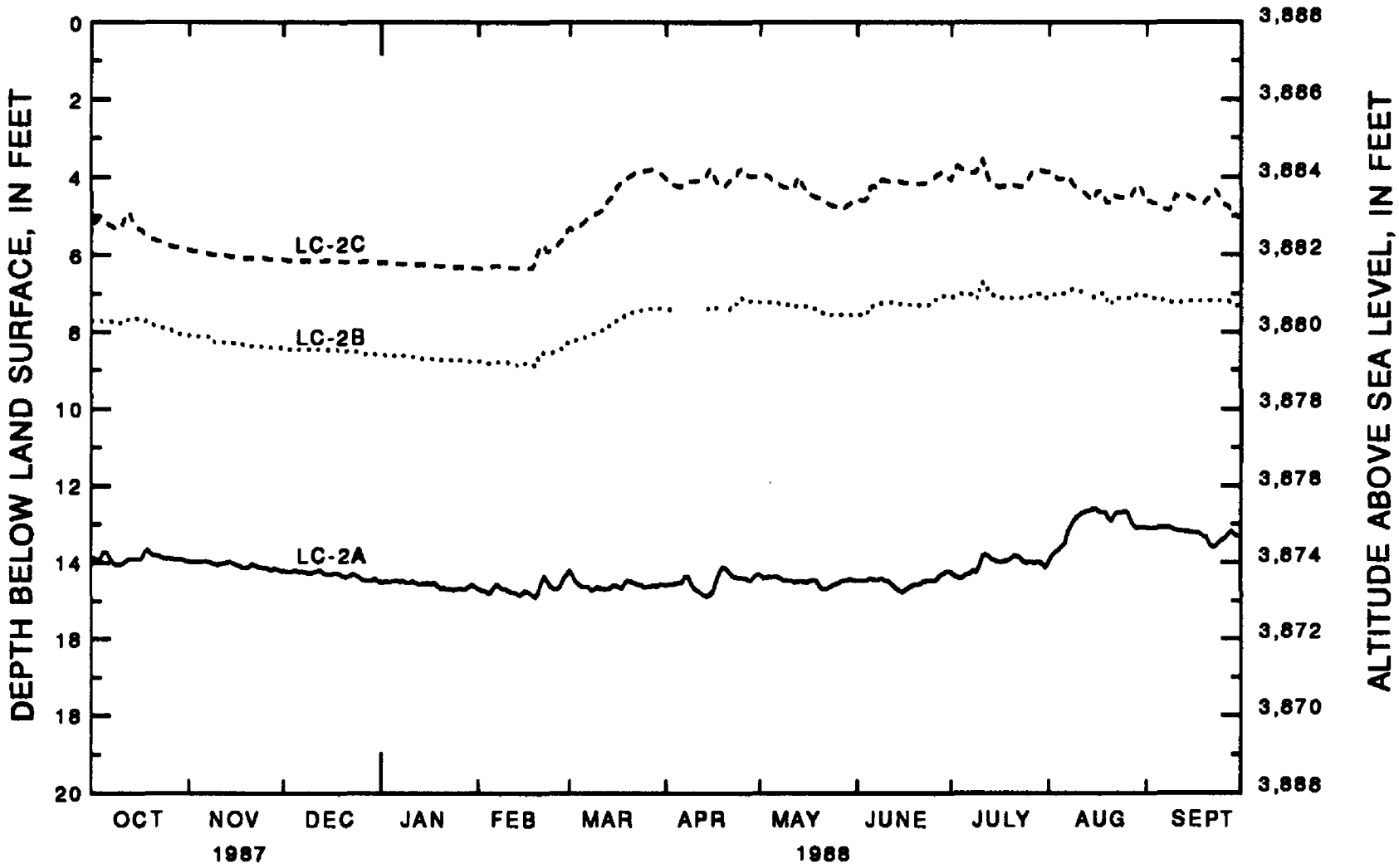


Figure 25.--Mean daily water levels in well group LC-2, 1988 water year.

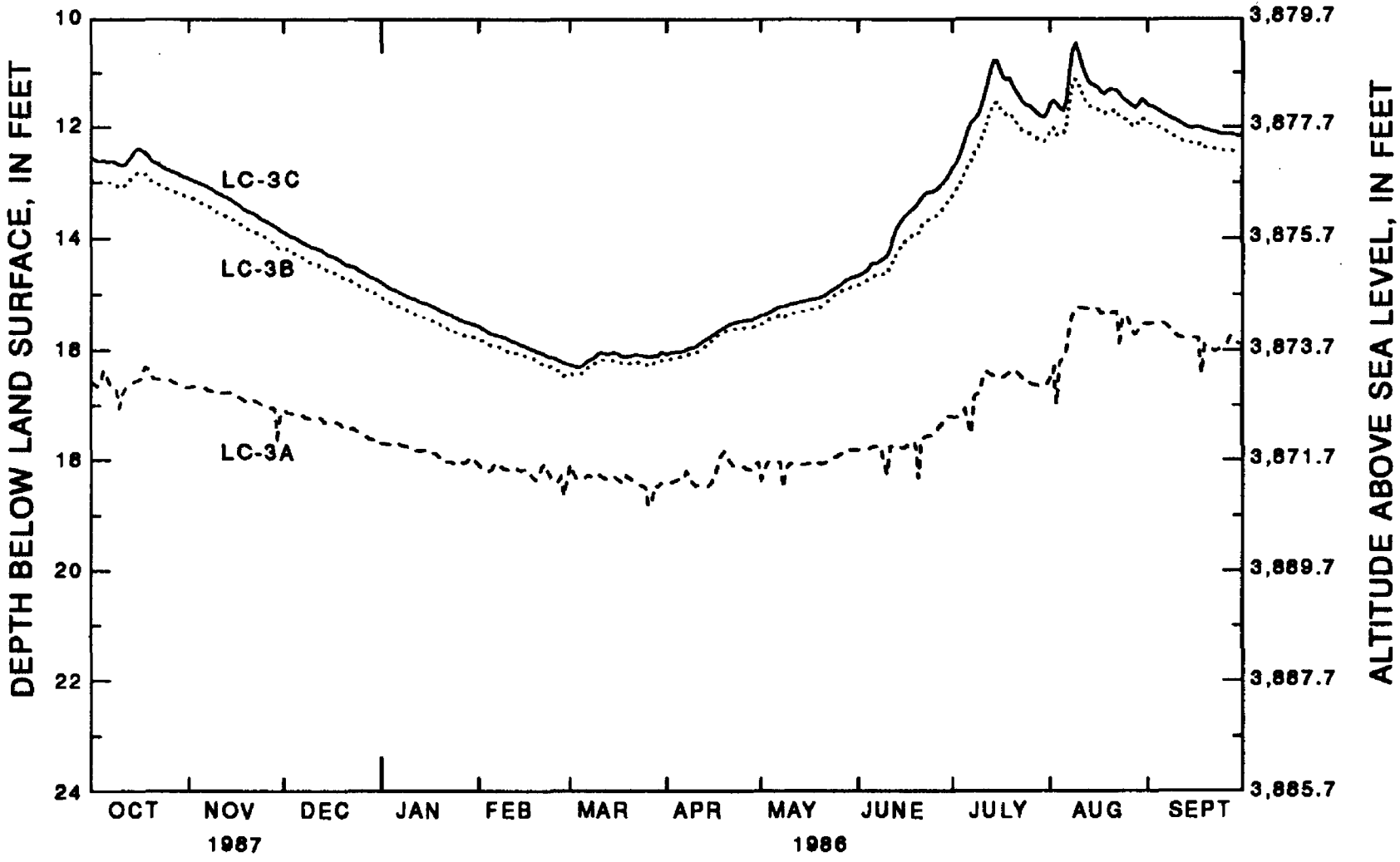


Figure 26.--Mean daily water levels in well group LC-3, 1988 water year.

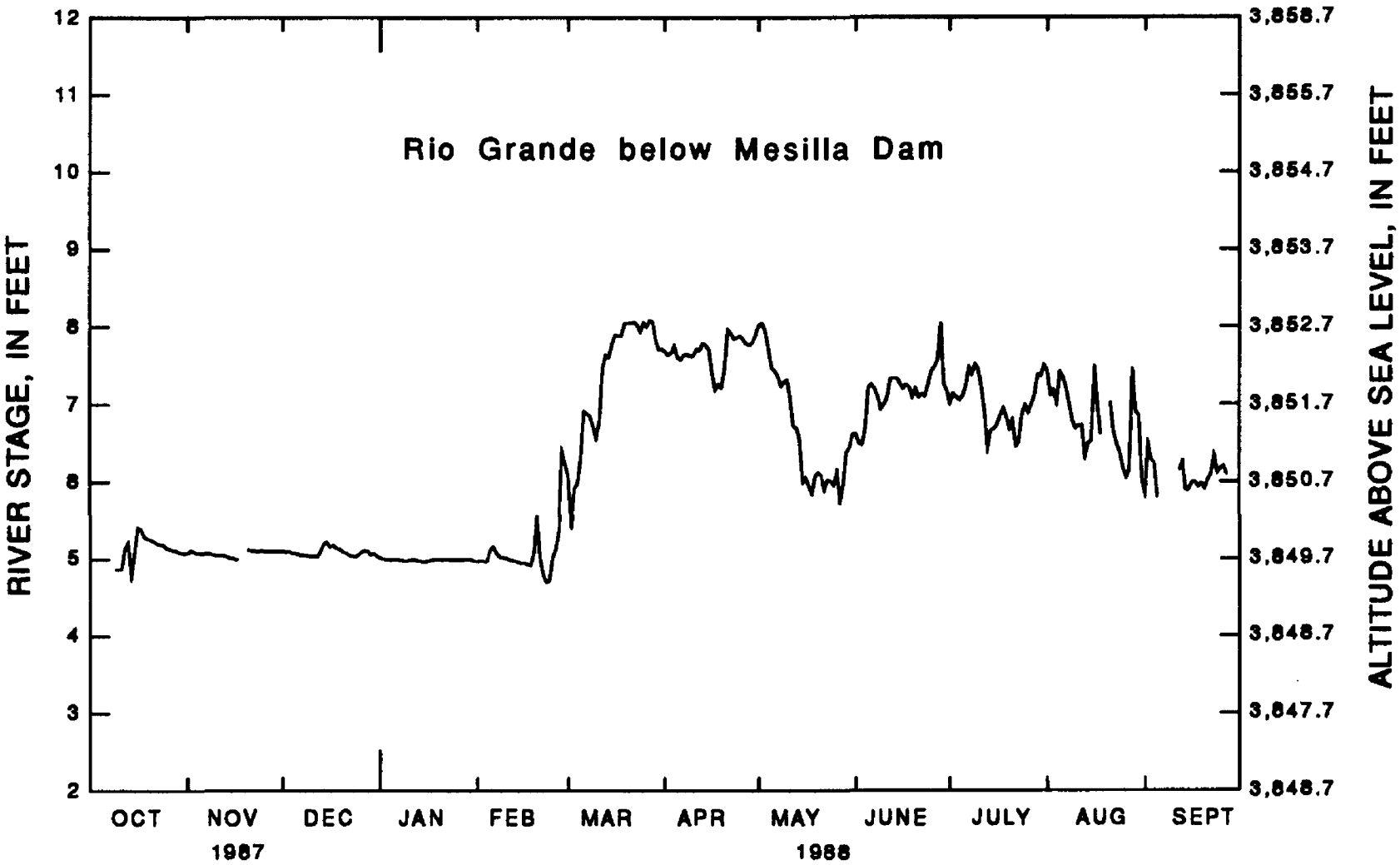


Figure 27.--Mean daily river stage of the Rio Grande below Mesilla Dam, 1988 water year.

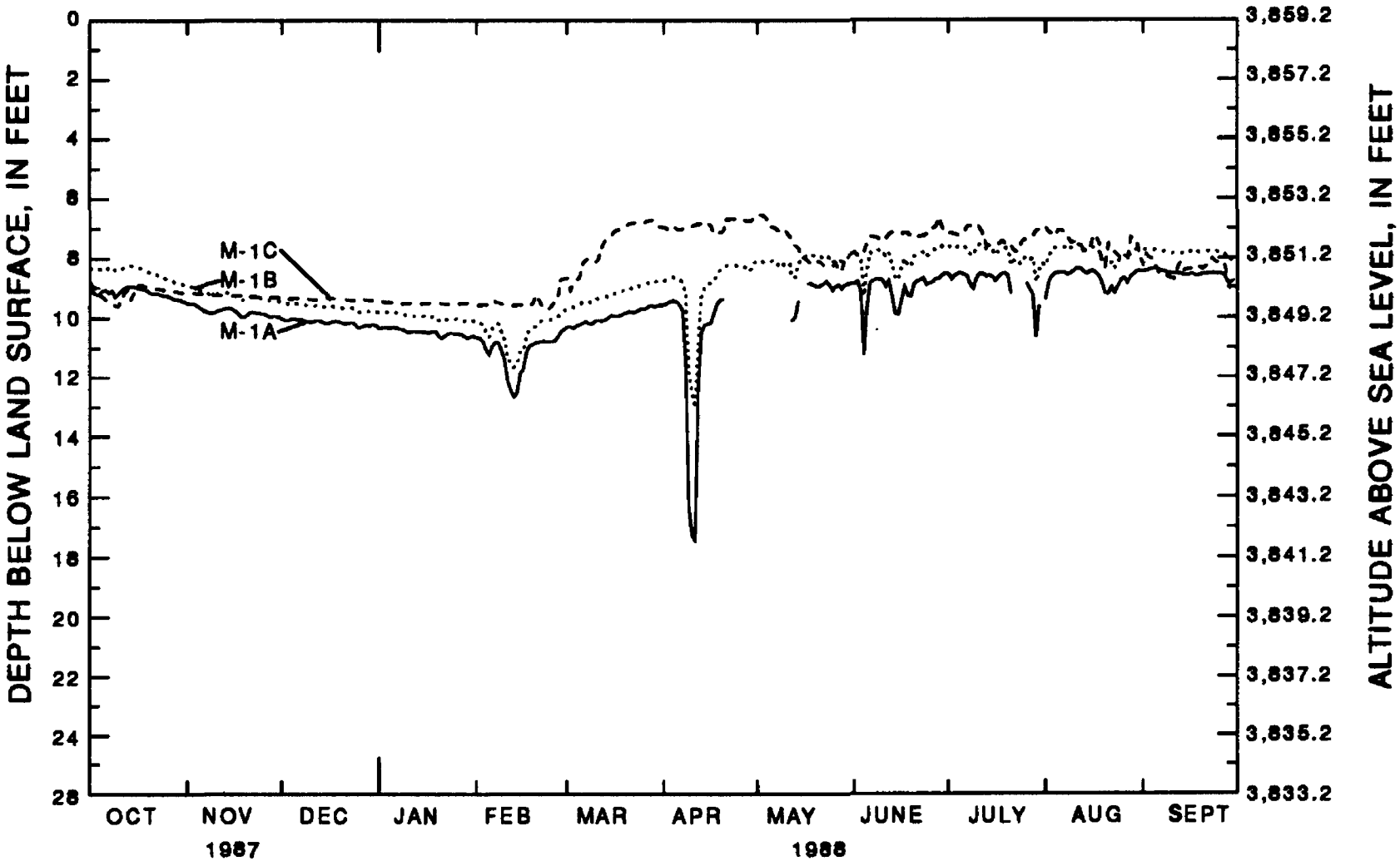


Figure 28.--Mean daily water levels in well group M-1, 1988 water year.

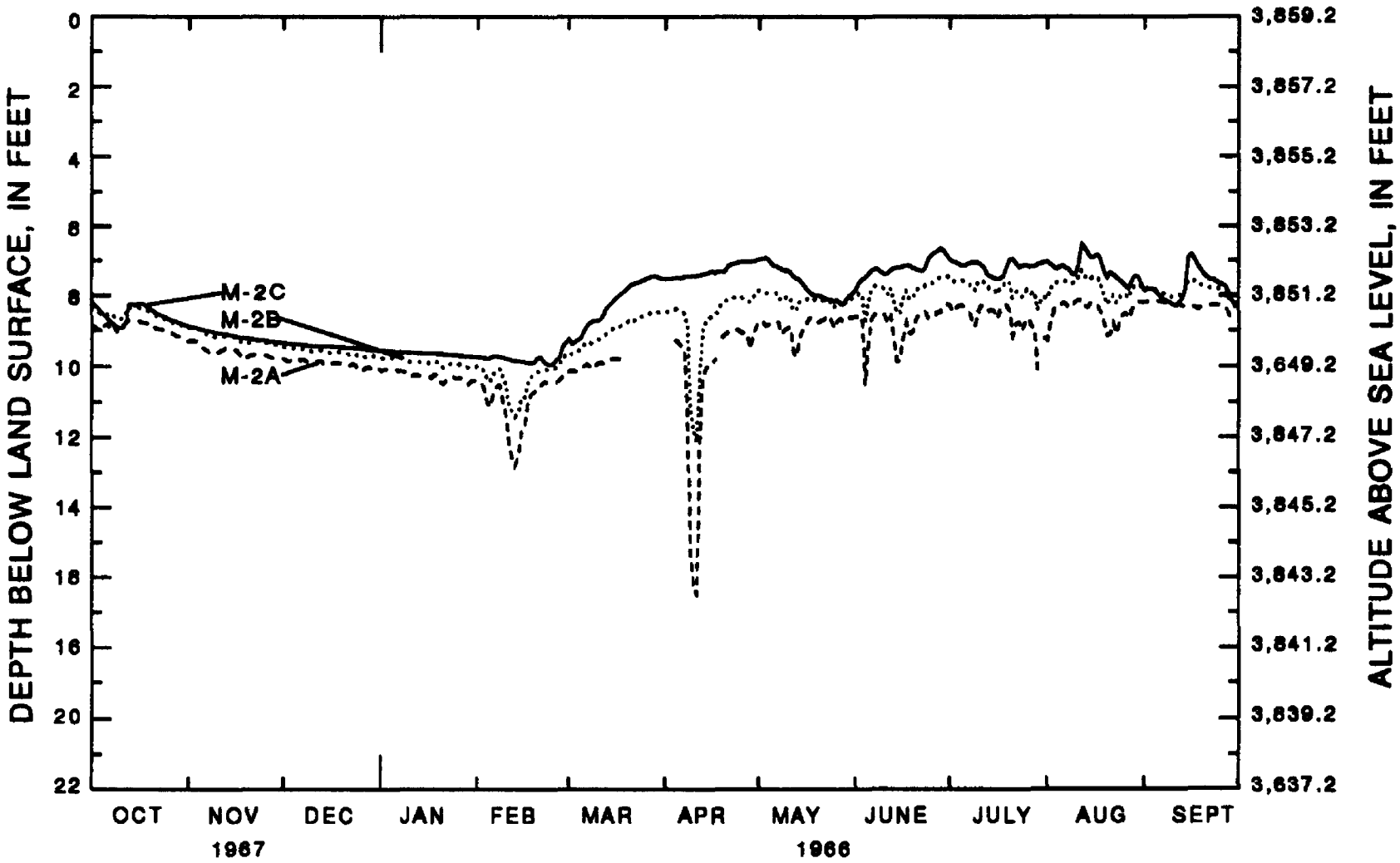


Figure 29.--Mean daily water levels in well group M-2, 1988 water year.

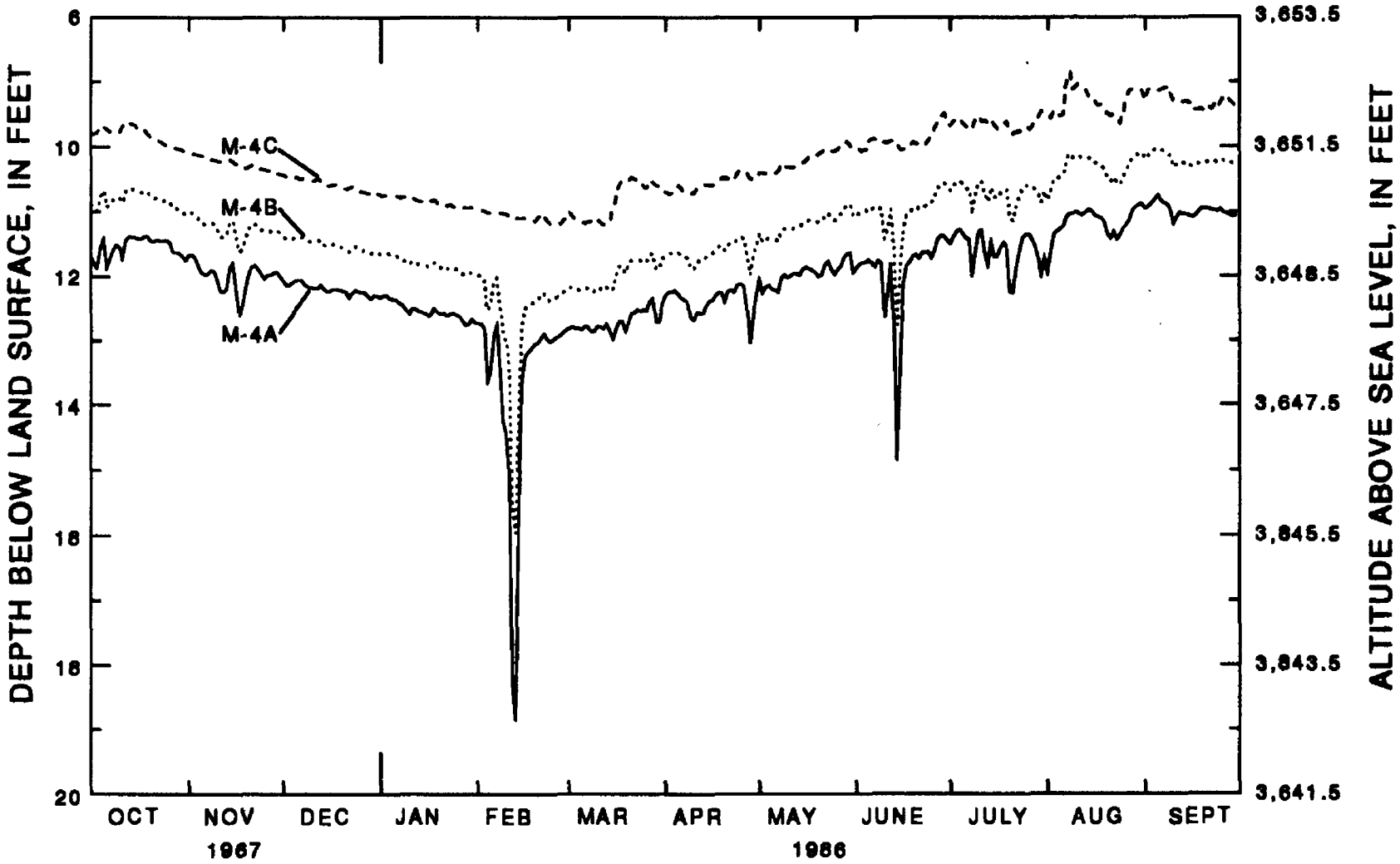


Figure 30.--Mean daily water levels in well group M-4, 1988 water year.

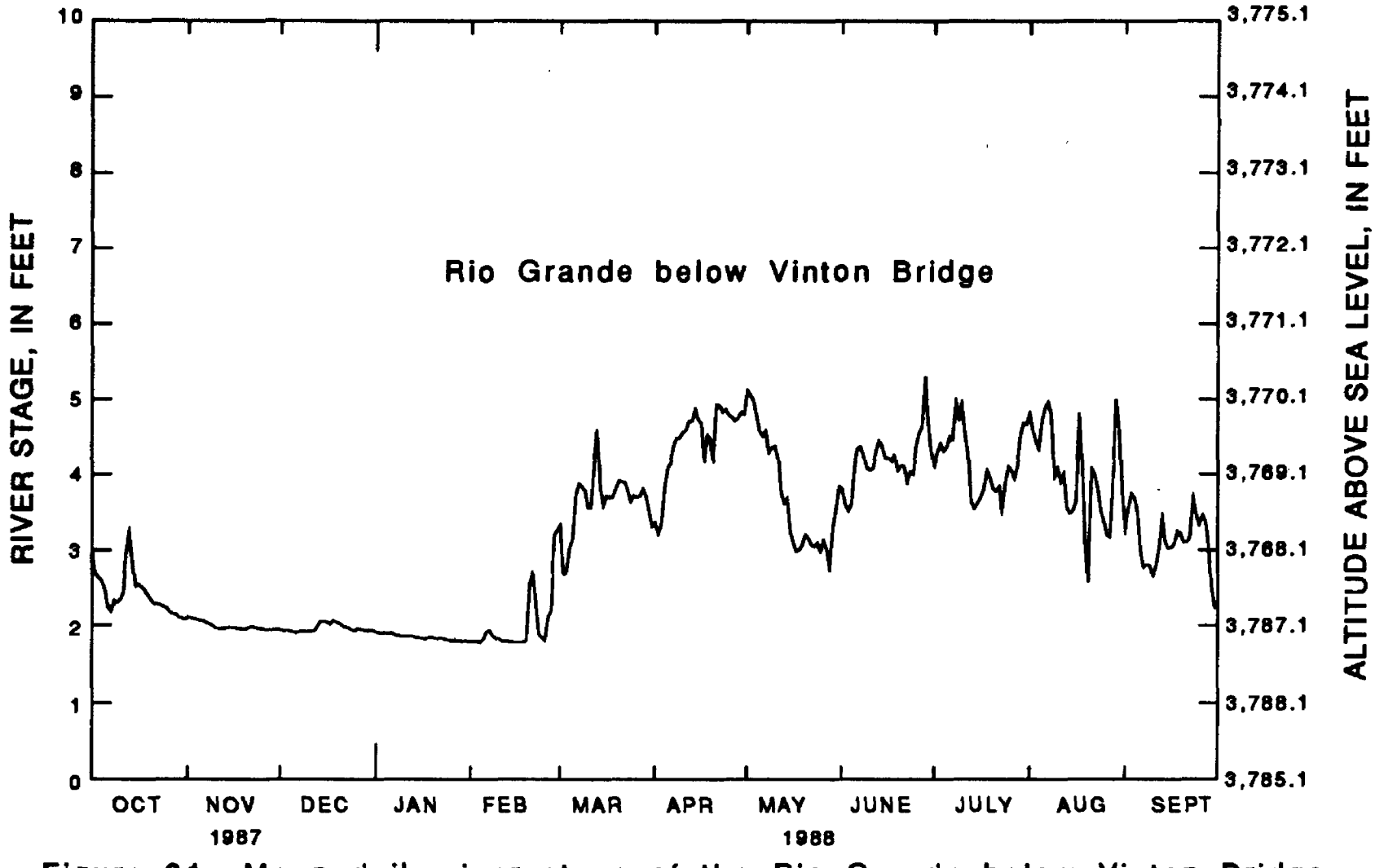


Figure 31.--Mean daily river stage of the Rio Grande below Vinton Bridge, 1988 water year.

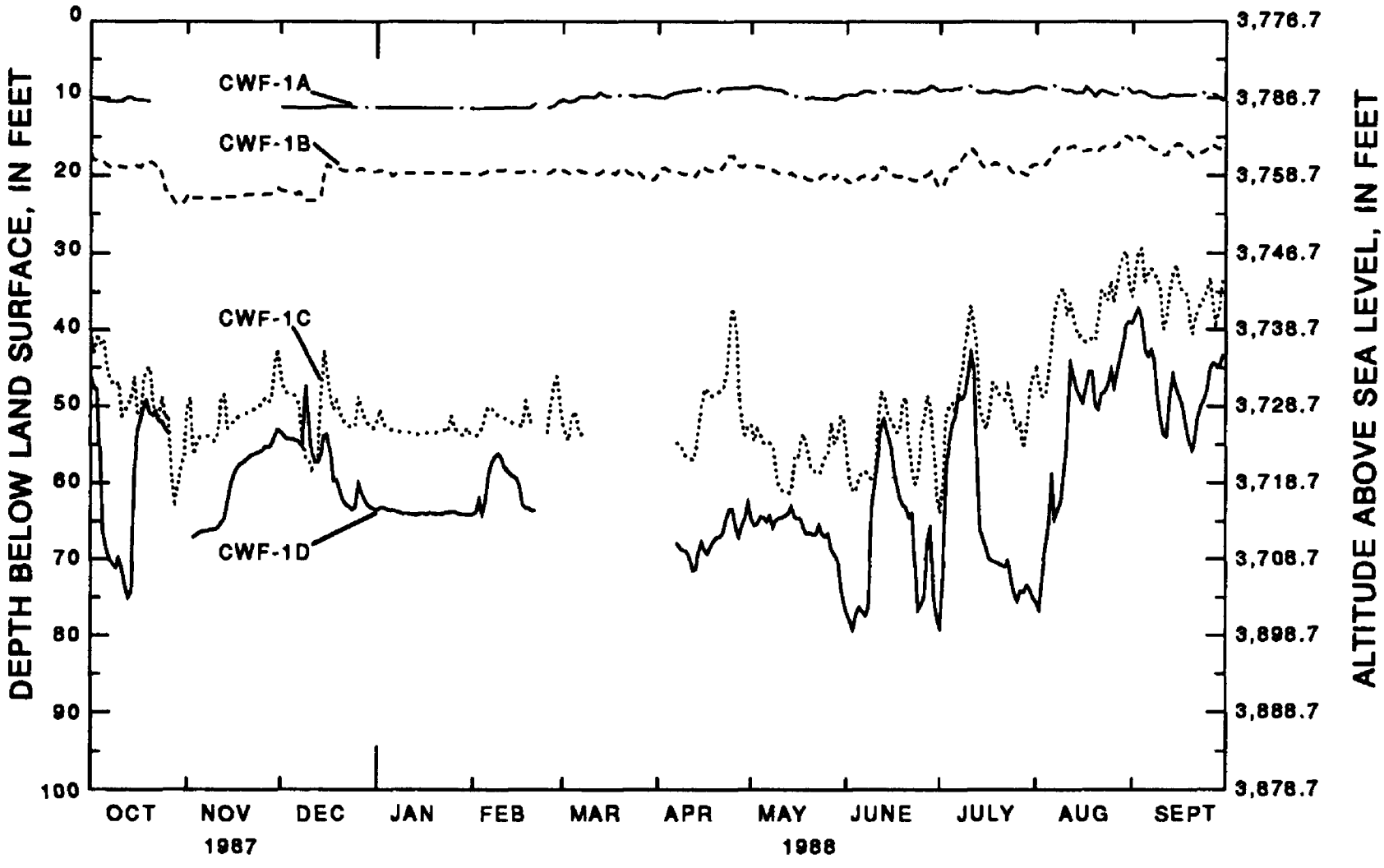


Figure 32.--Mean daily water levels in well group CWF-1, 1988 water year.

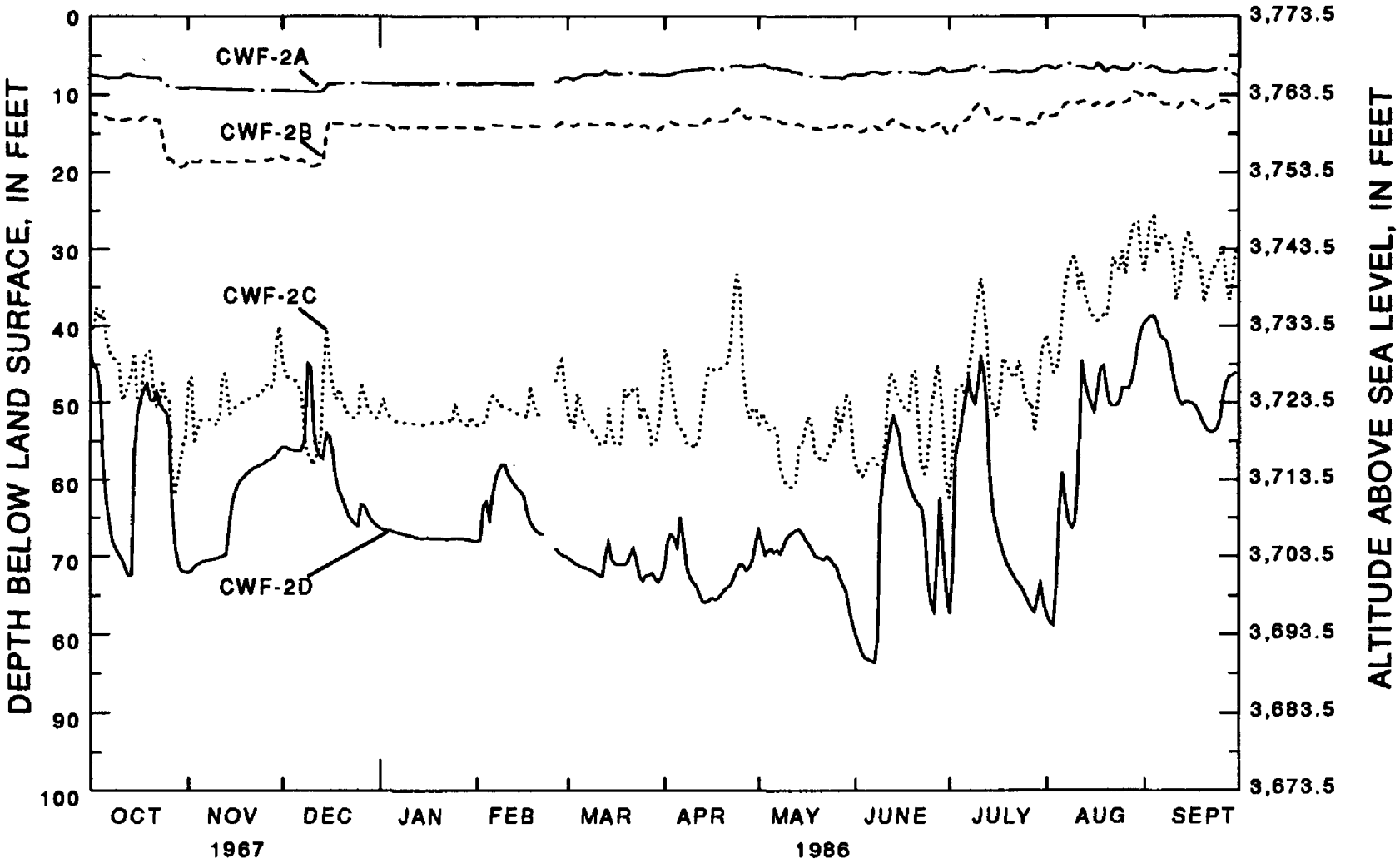


Figure 33.--Mean daily water levels in well group CWF-2, 1988 water year.

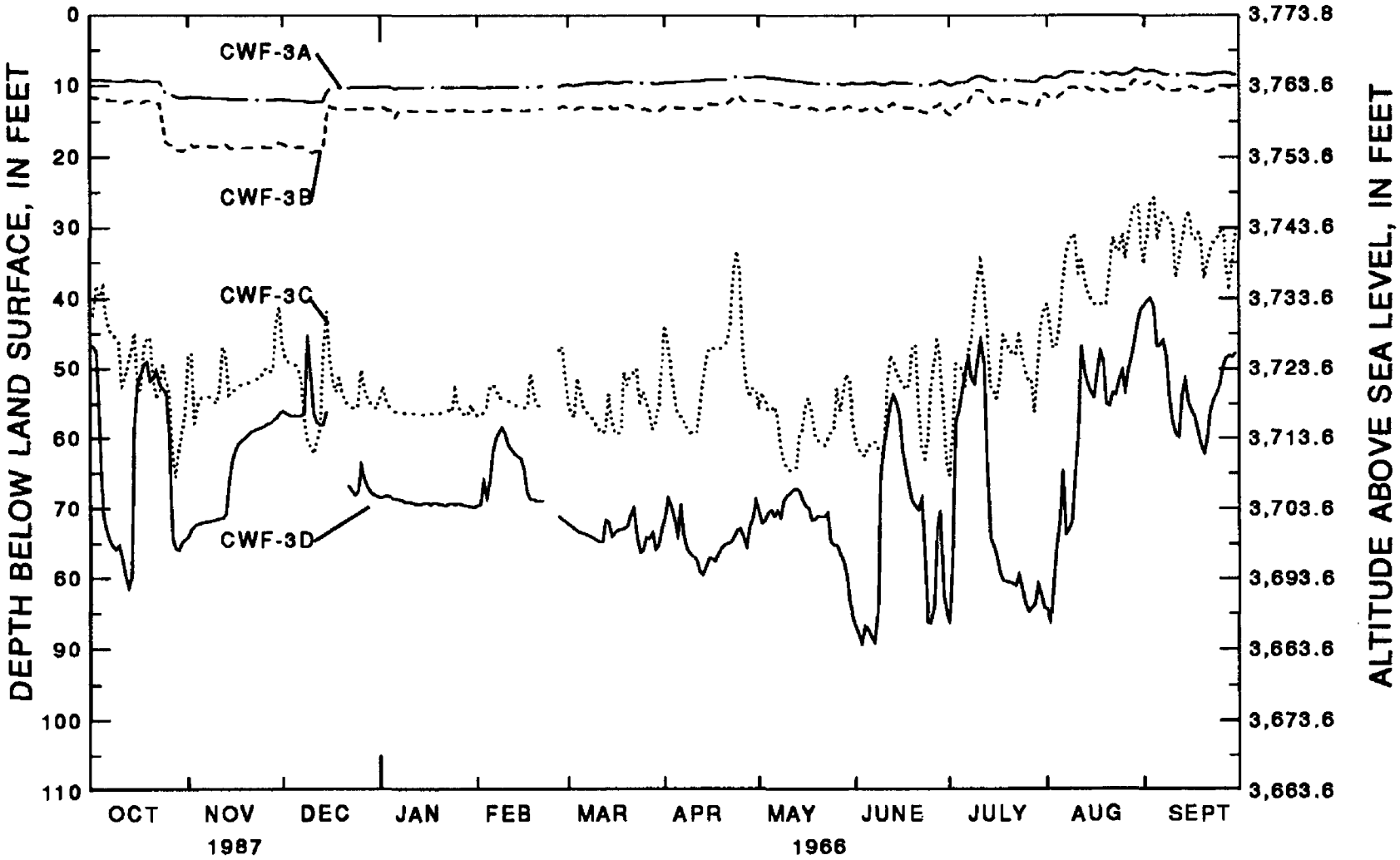


Figure 34.--Mean daily water levels in well group CWF-3, 1988 water year.

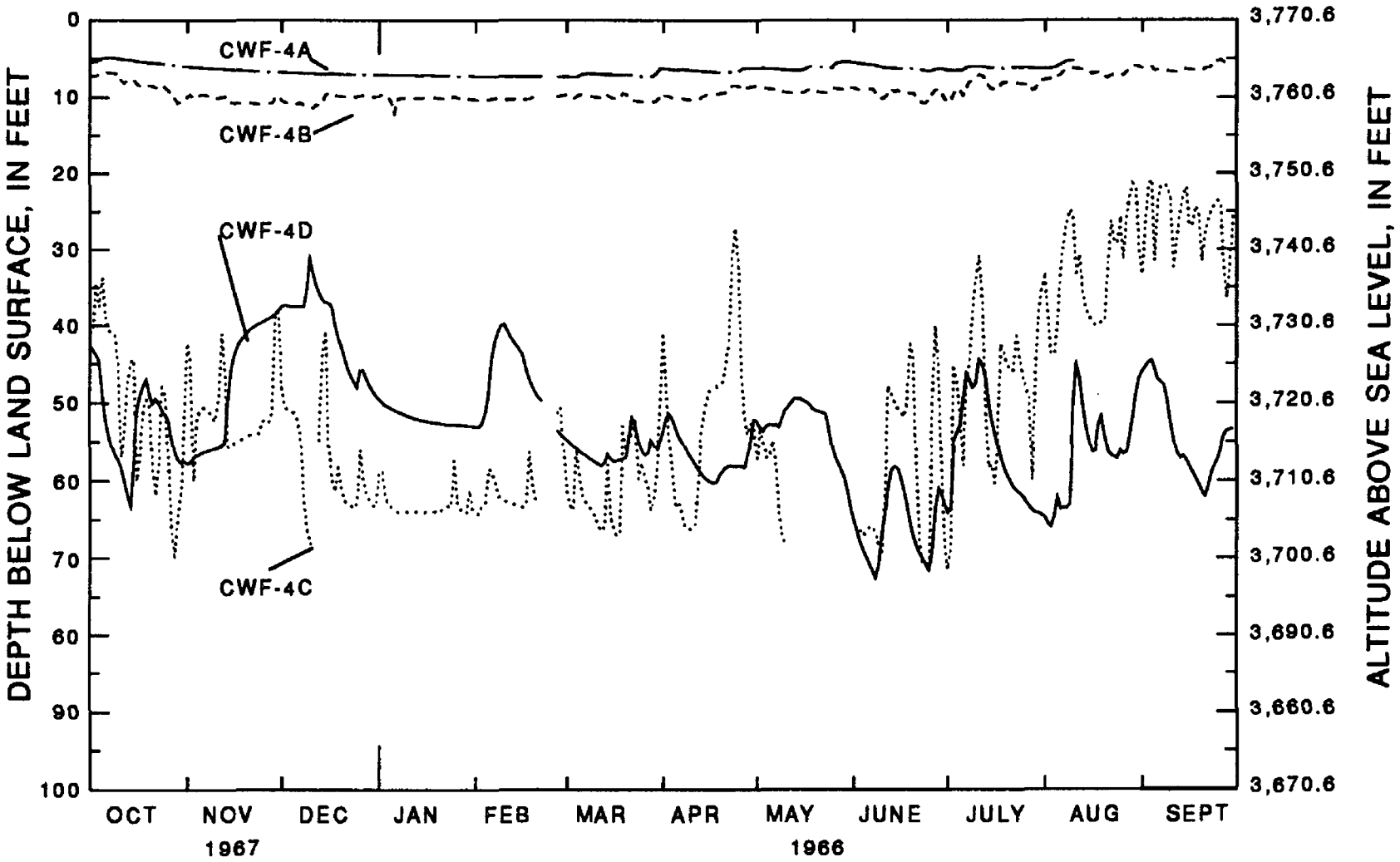


Figure 35.--Mean daily water levels in well group CWF-4, 1988 water year.

1989 WATER YEAR

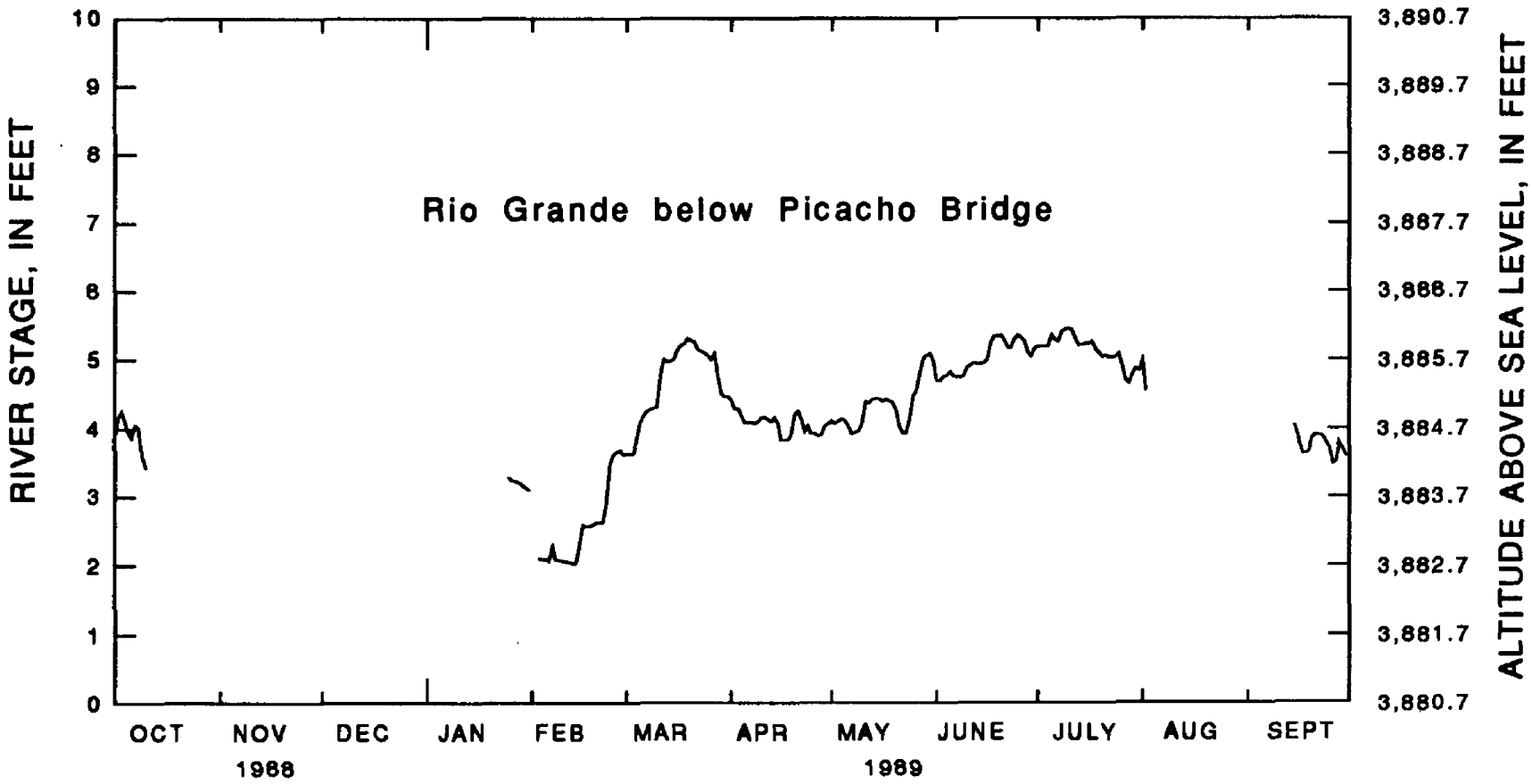


Figure 36.--Mean daily river stage of the Rio Grande below Picacho Bridge, 1989 water year.

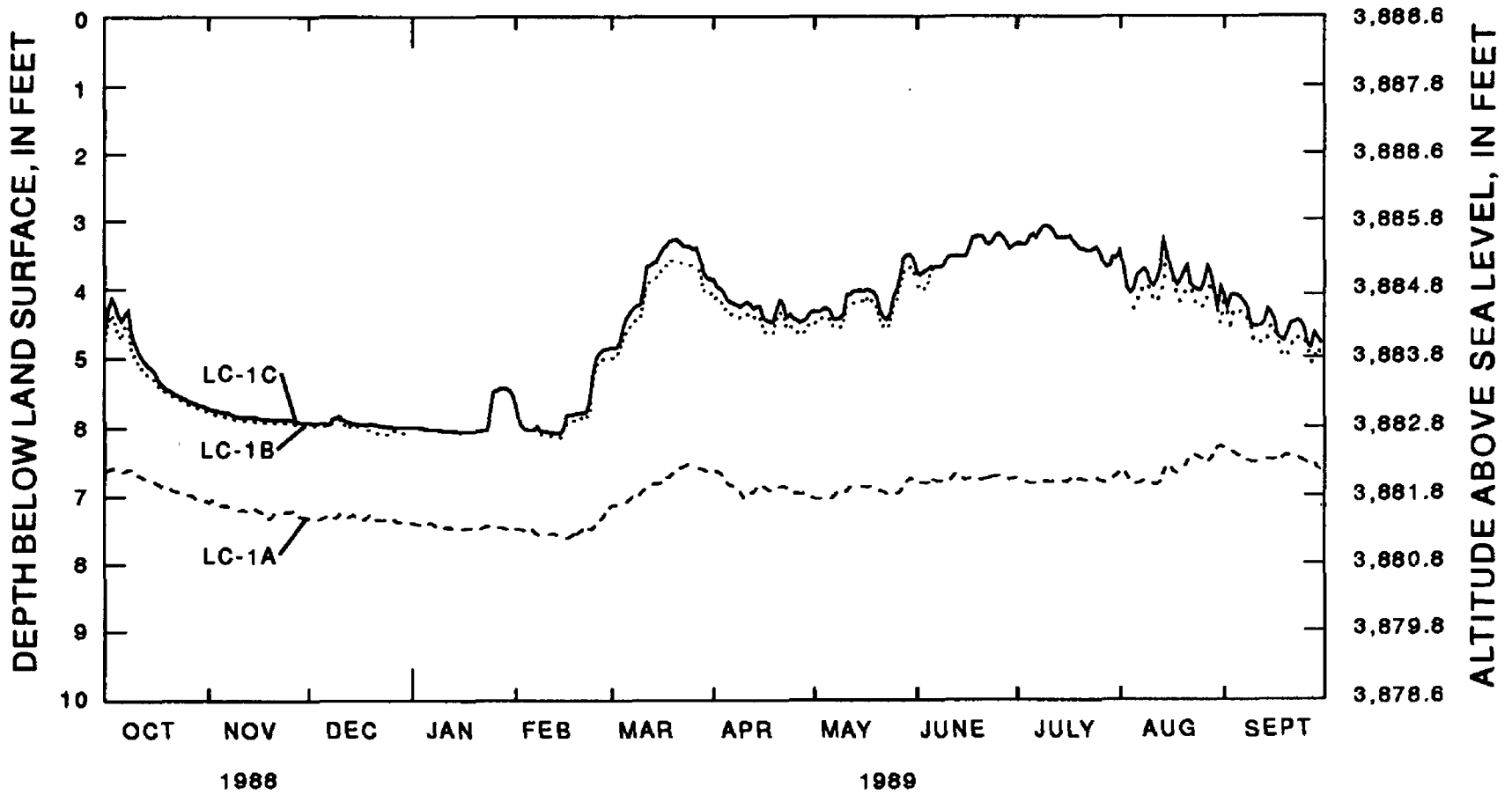


Figure 37.--Mean daily water levels in well group LC-1, 1989 water year.

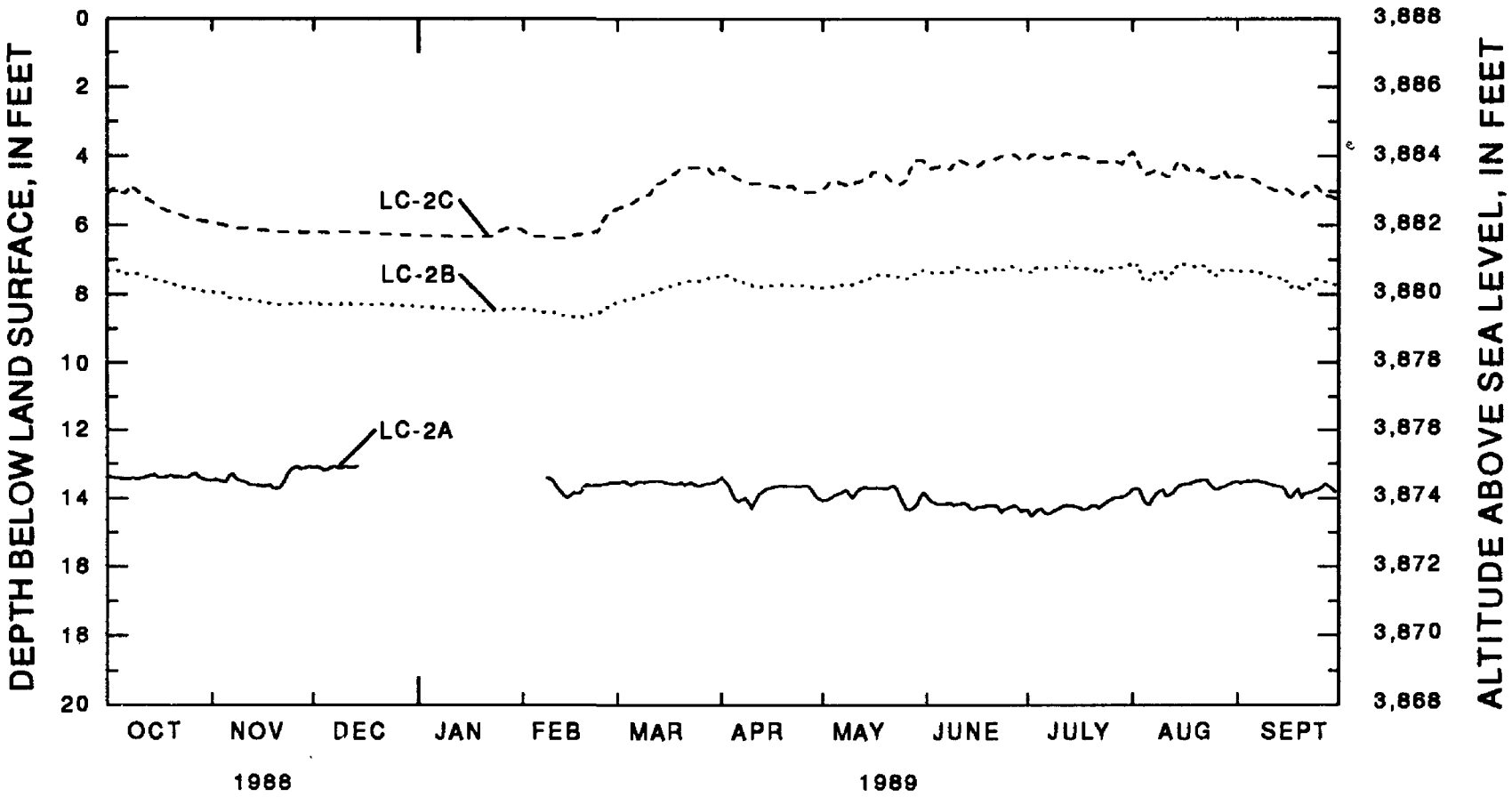


Figure 38.--Mean daily water levels in well group LC-2, 1989 water year.

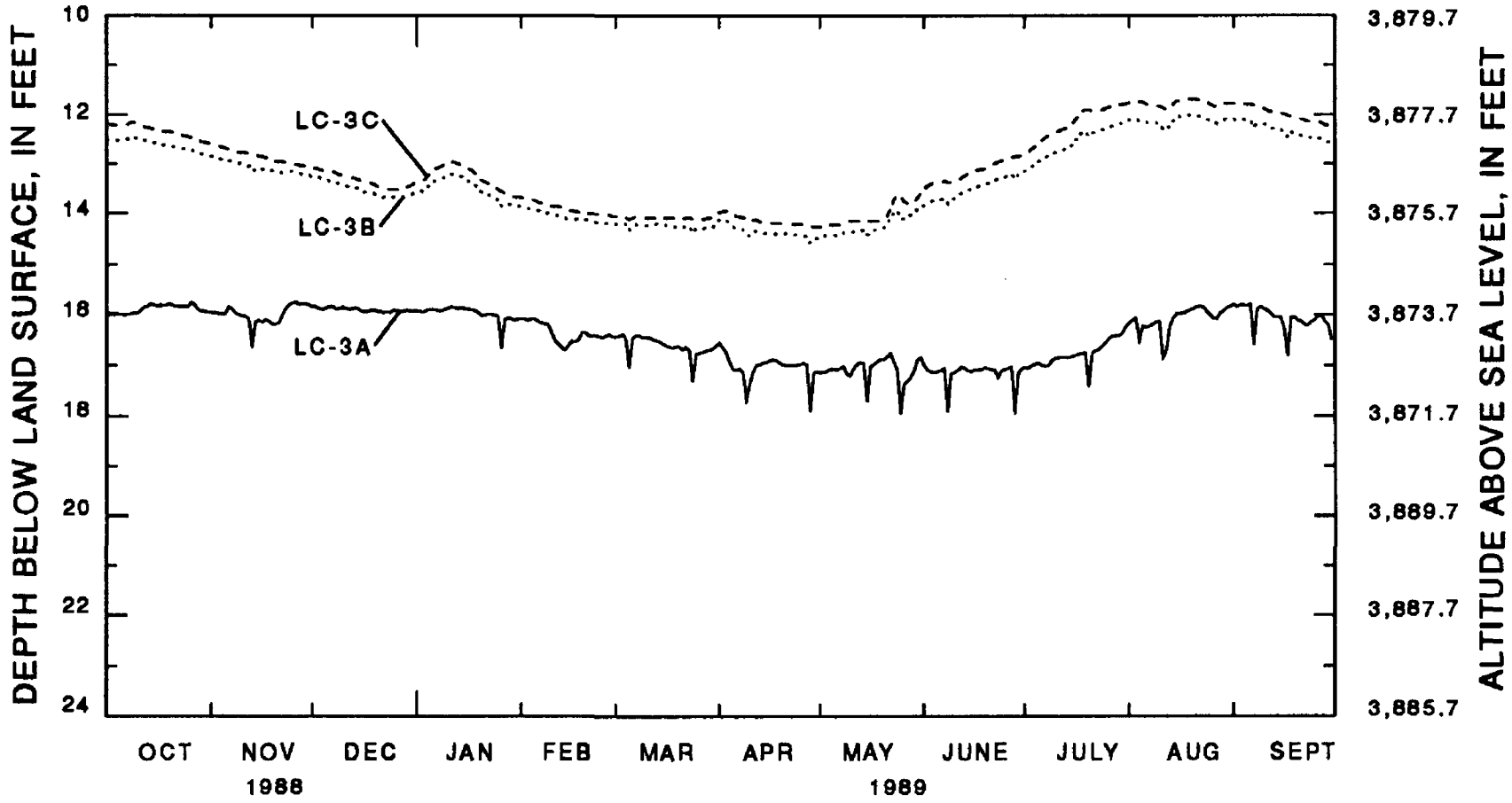


Figure 39.--Mean daily water levels in well group LC-3, 1989 water year.

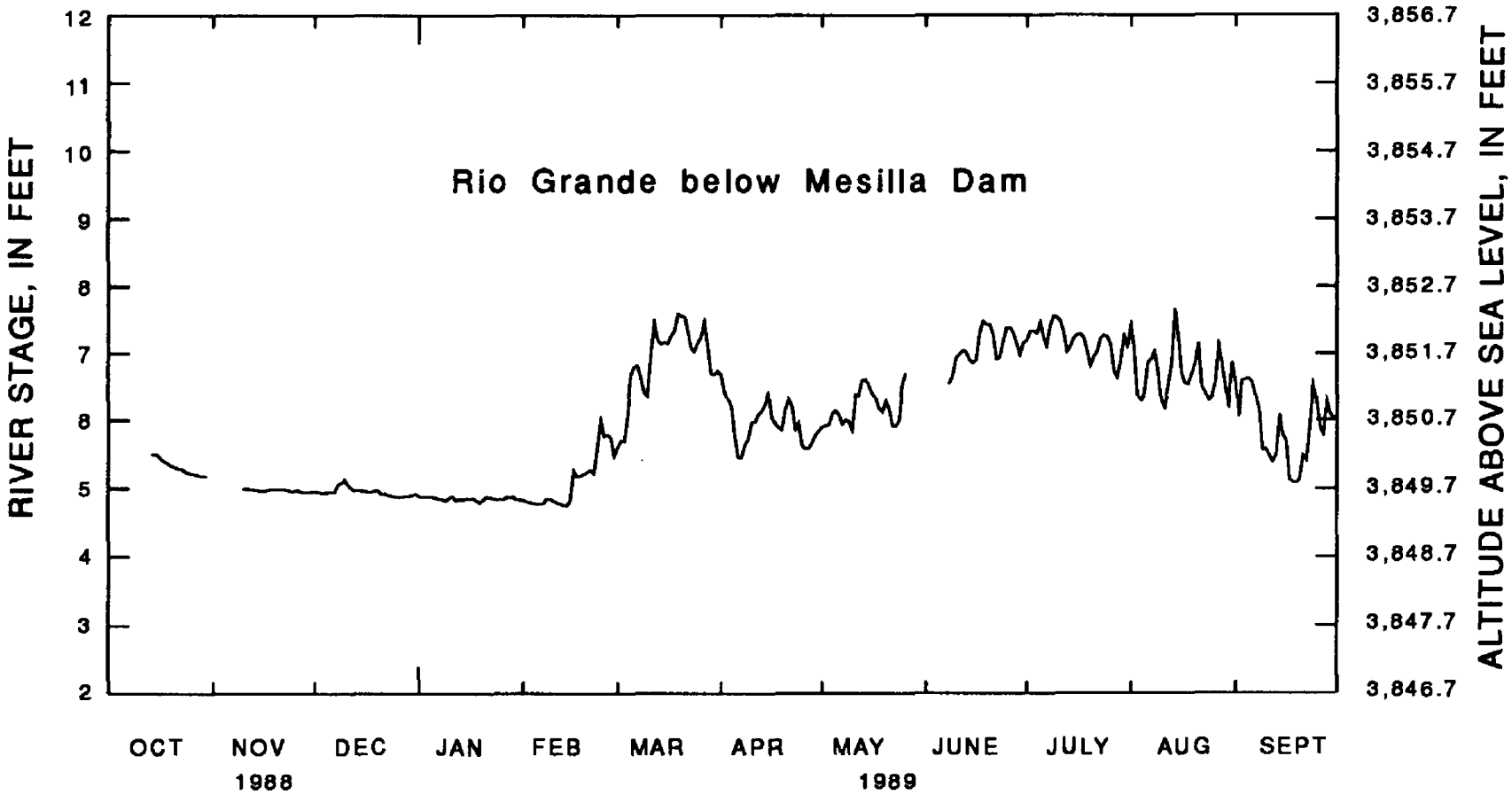


Figure 40.--Mean daily river stage of the Rio Grande below Mesilla Dam, 1989 water year.

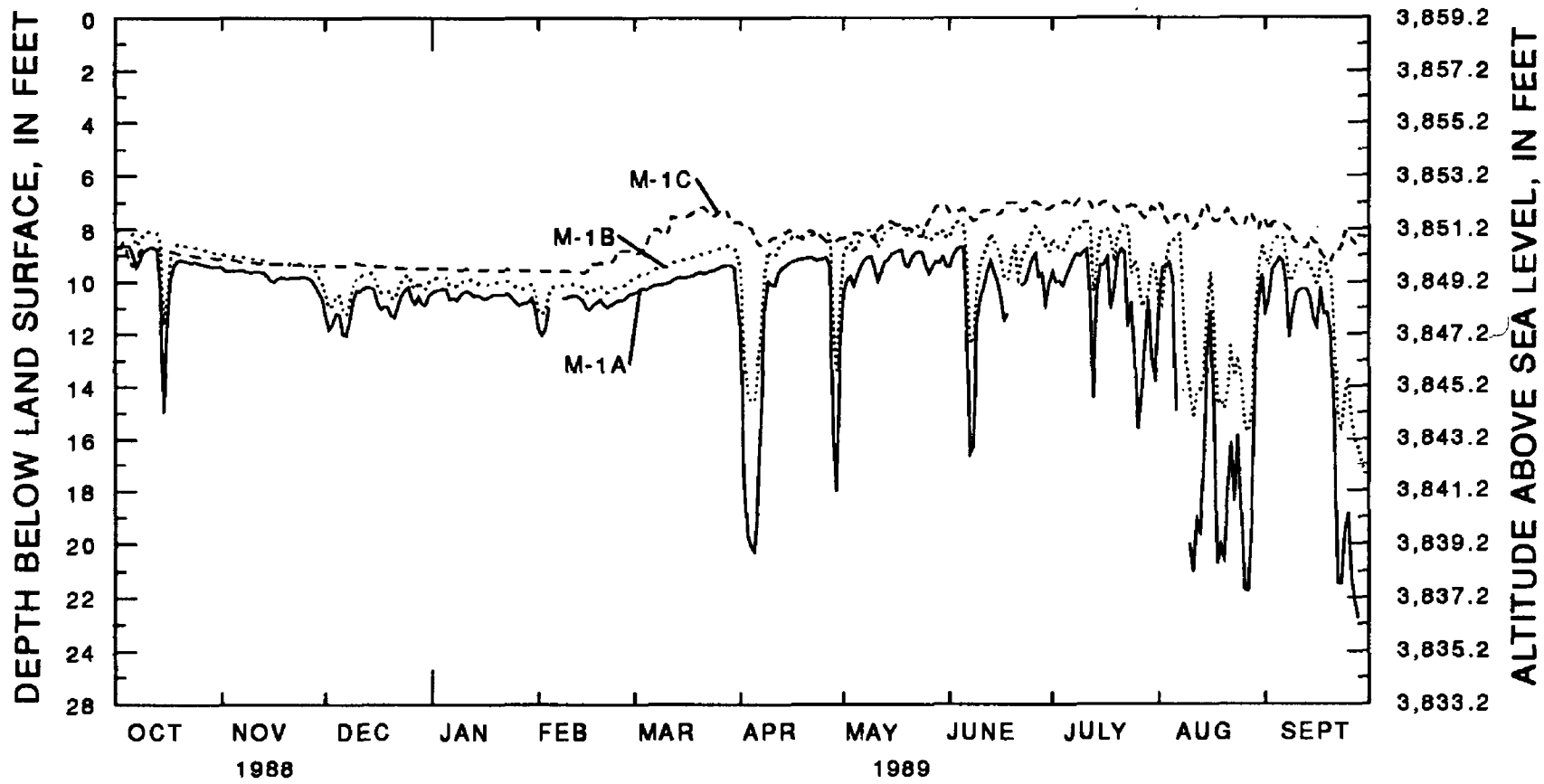


Figure 41.--Mean daily water levels in well group M-1, 1989 water year.

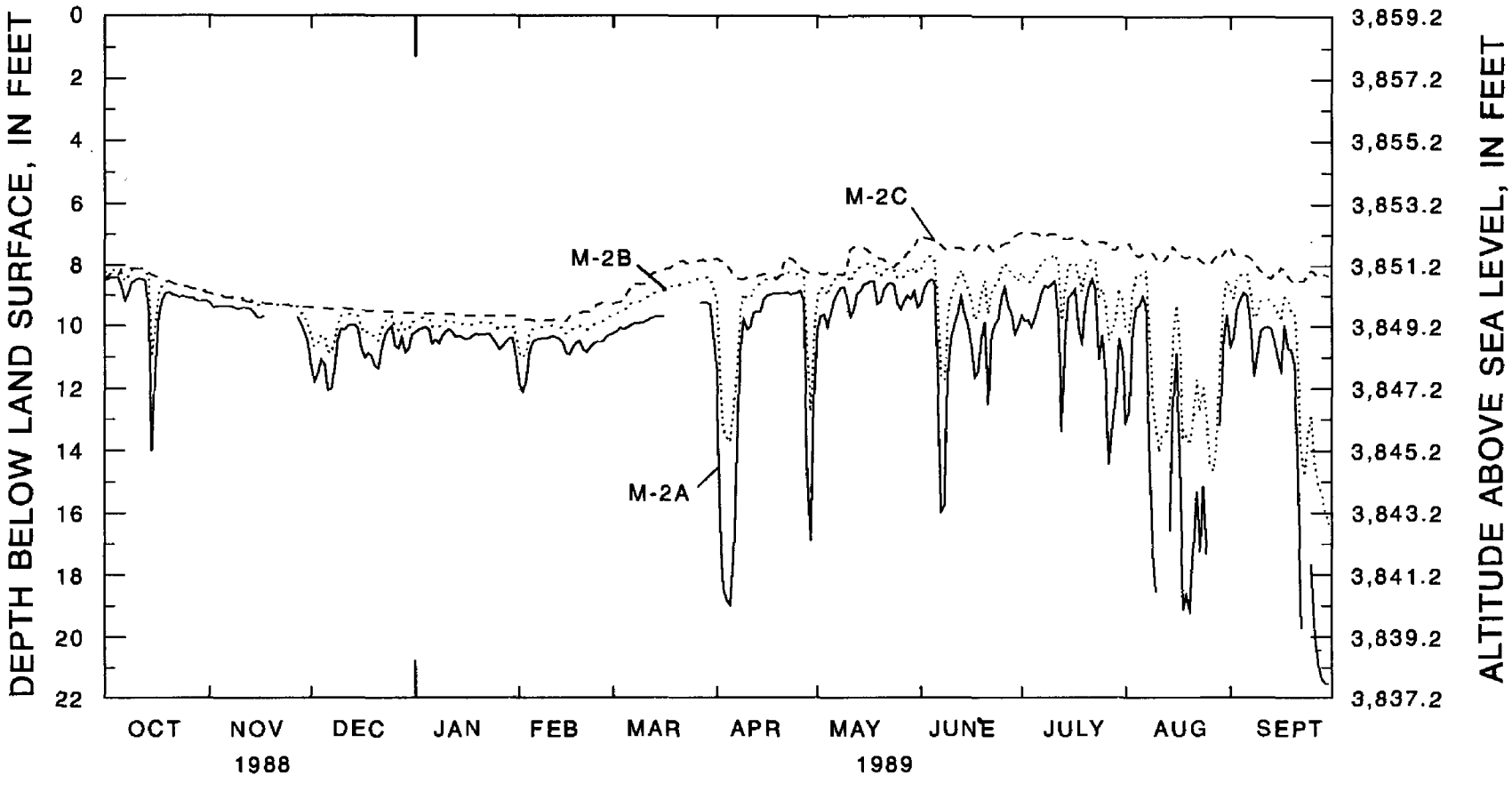


Figure 42.--Mean daily water levels in well group M-2, 1989 water year.

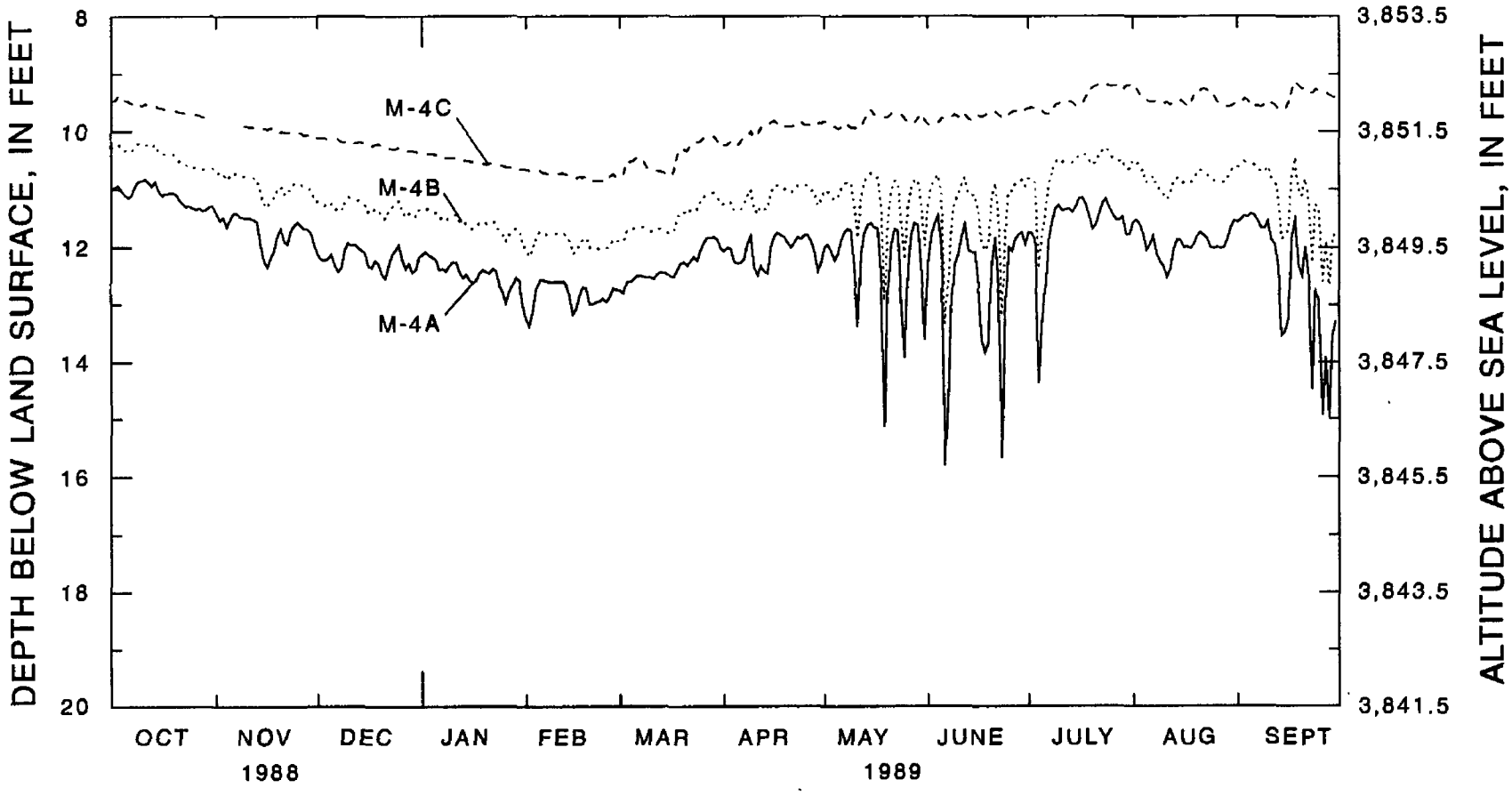


Figure 43.--Mean daily water levels in well group M-4, 1989 water year.

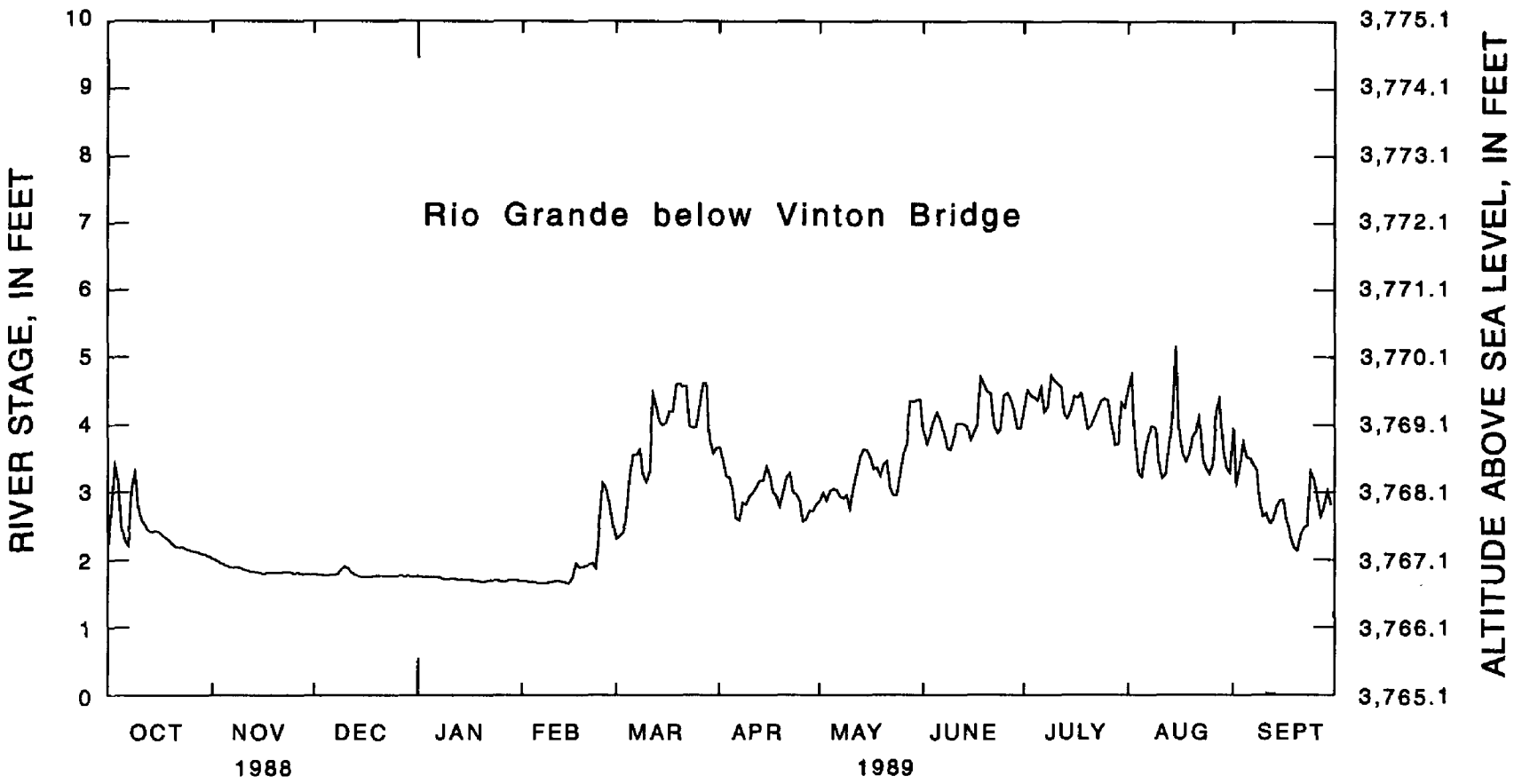


Figure 44.--Mean daily river stage of the Rio Grande below Vinton Bridge, 1989 water year.

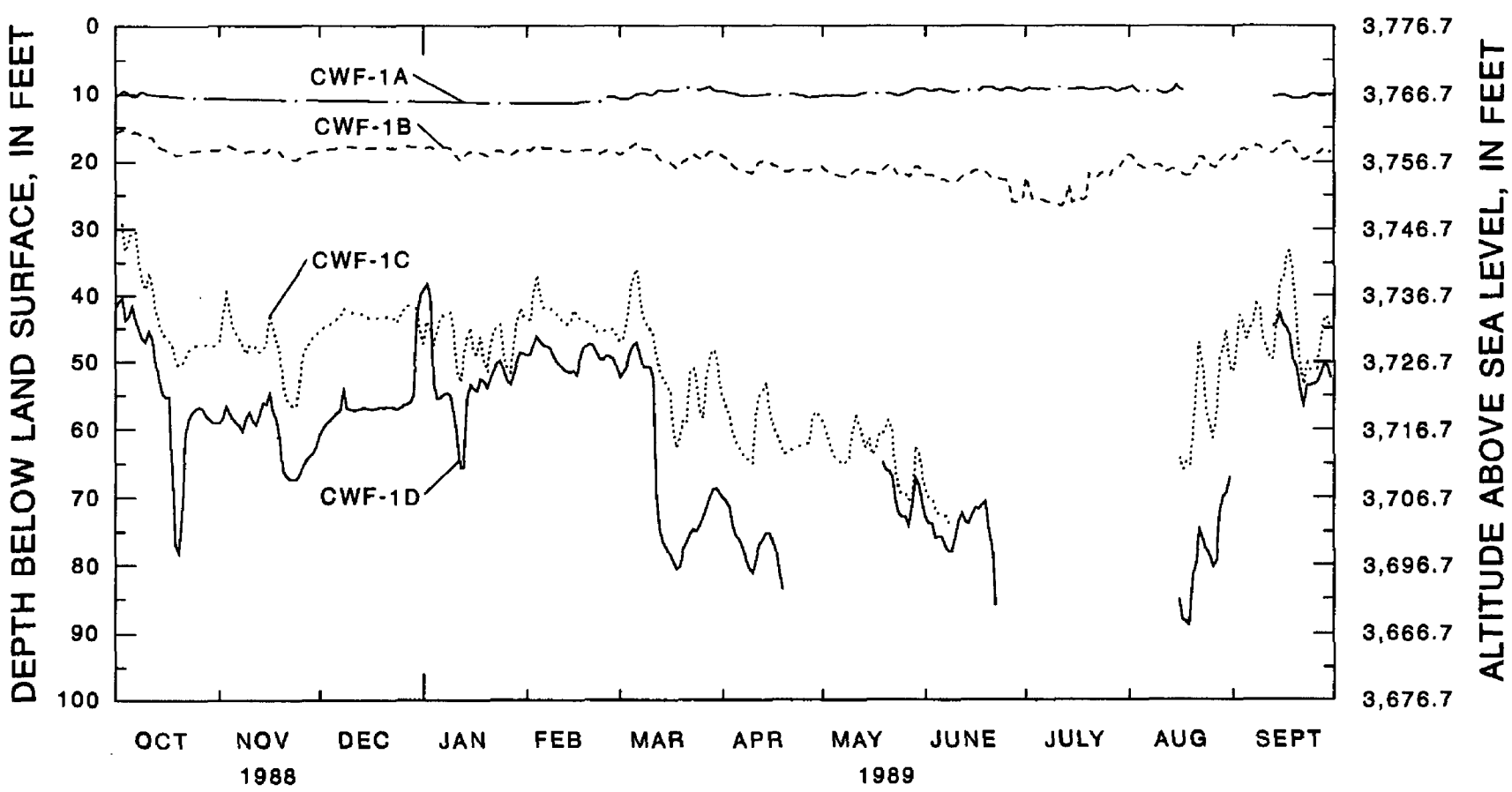


Figure 45.--Mean daily water levels in well group CWF-1, 1989 water year.

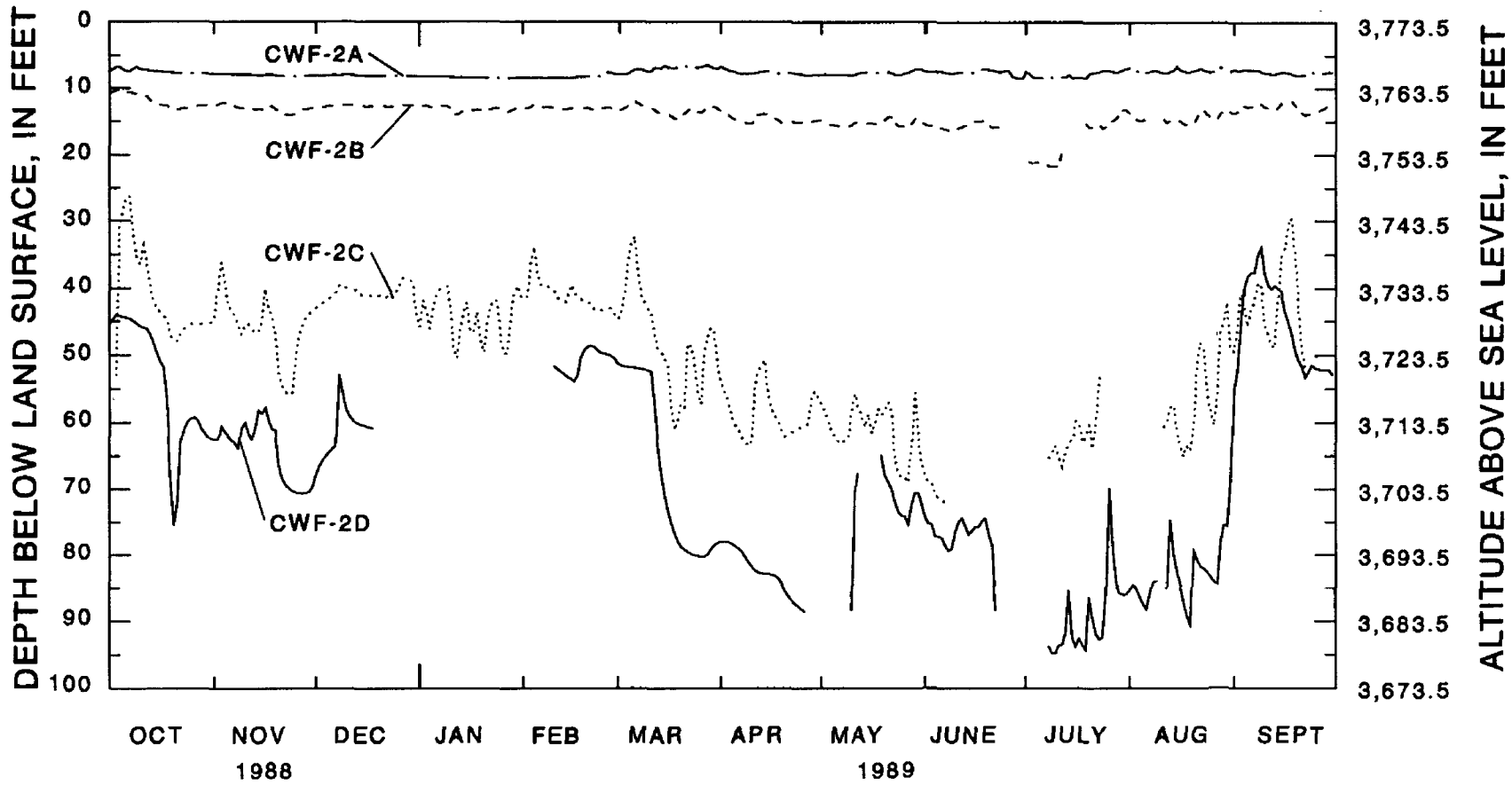


Figure 46.--Mean daily water levels in well group CWF-2, 1989 water year.

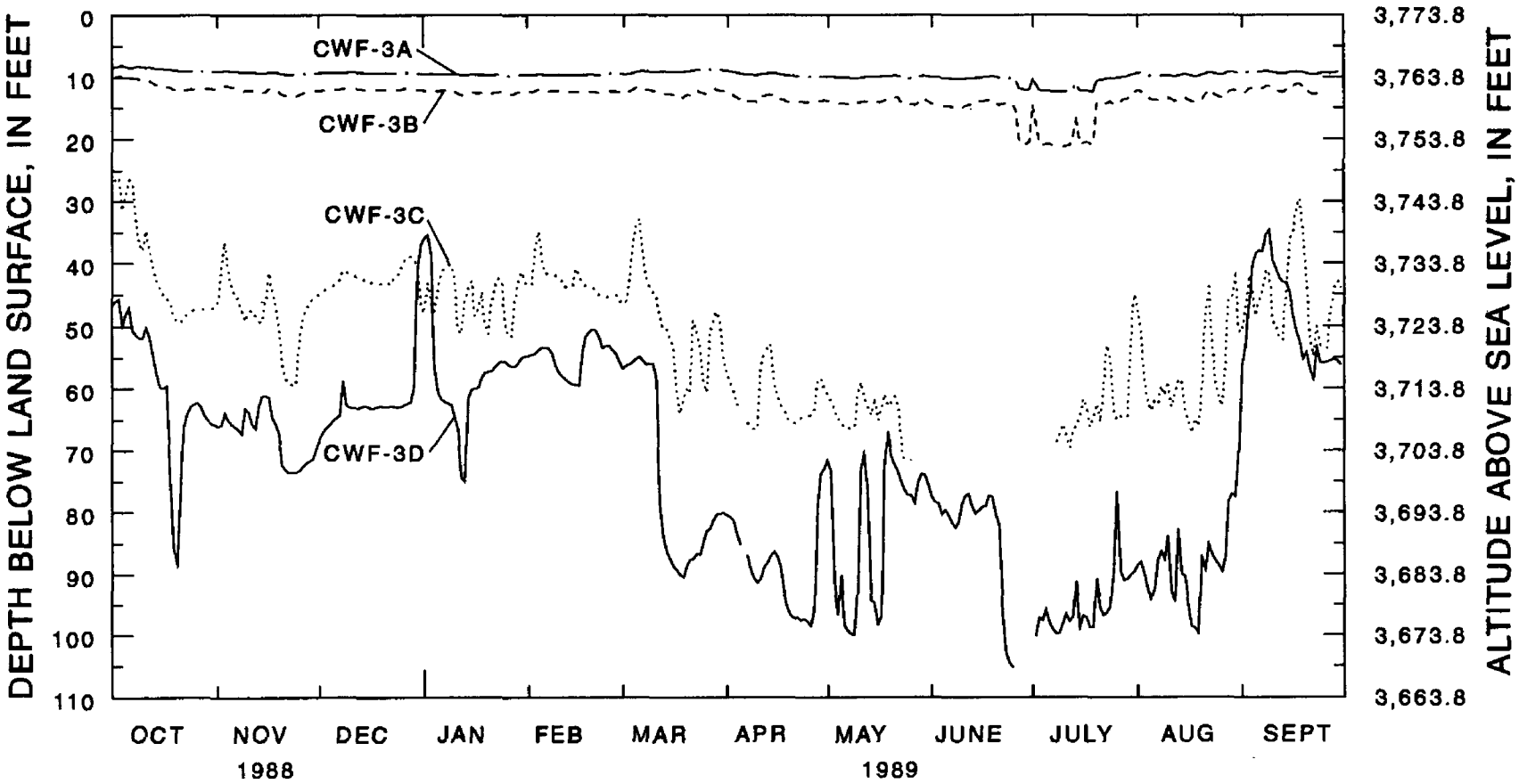


Figure 47.--Mean daily water levels in well group CWF-3, 1989 water year.

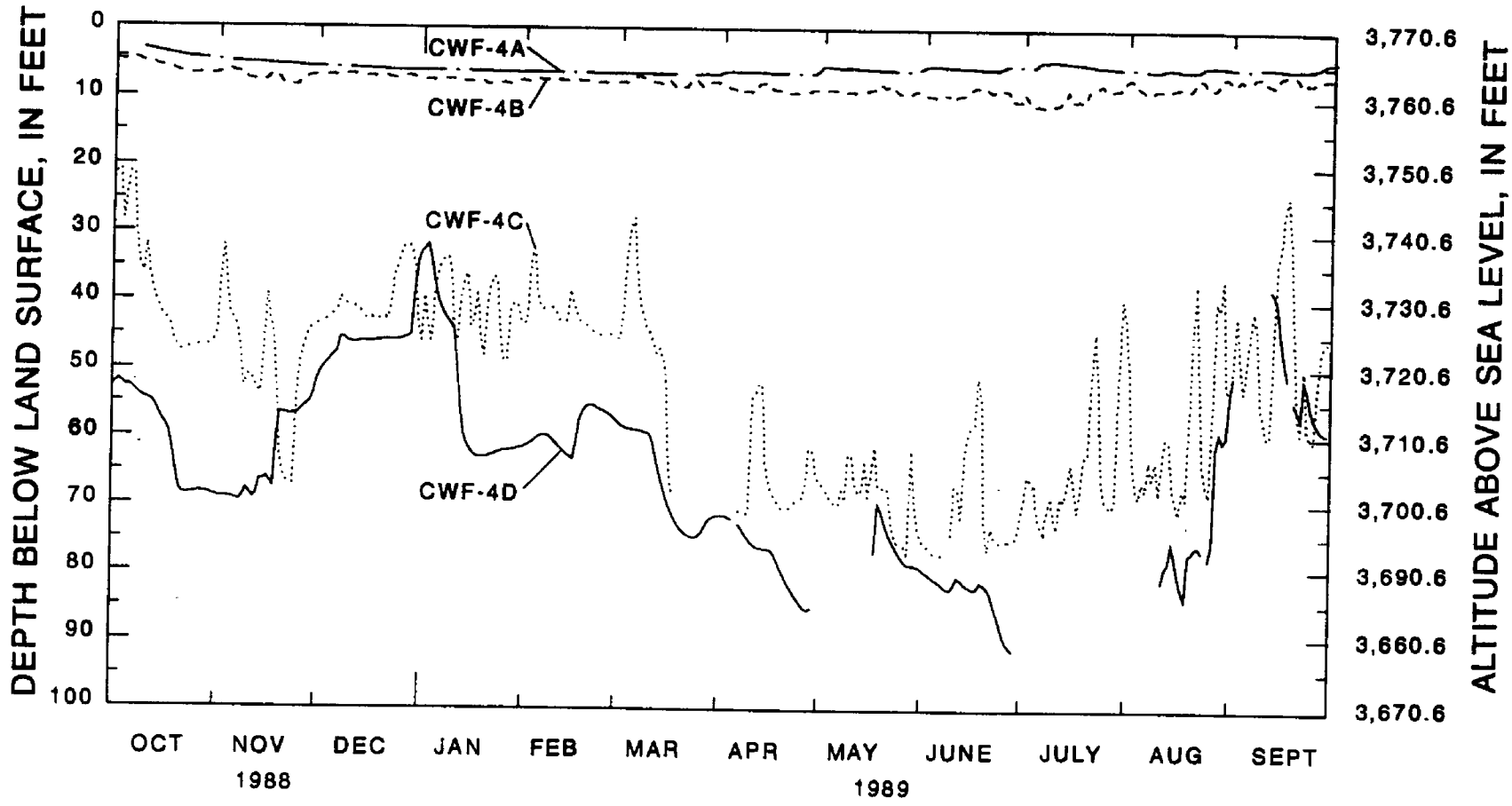


Figure 48.--Mean daily water levels in well group CWF-4, 1989 water year.

1990 WATER YEAR

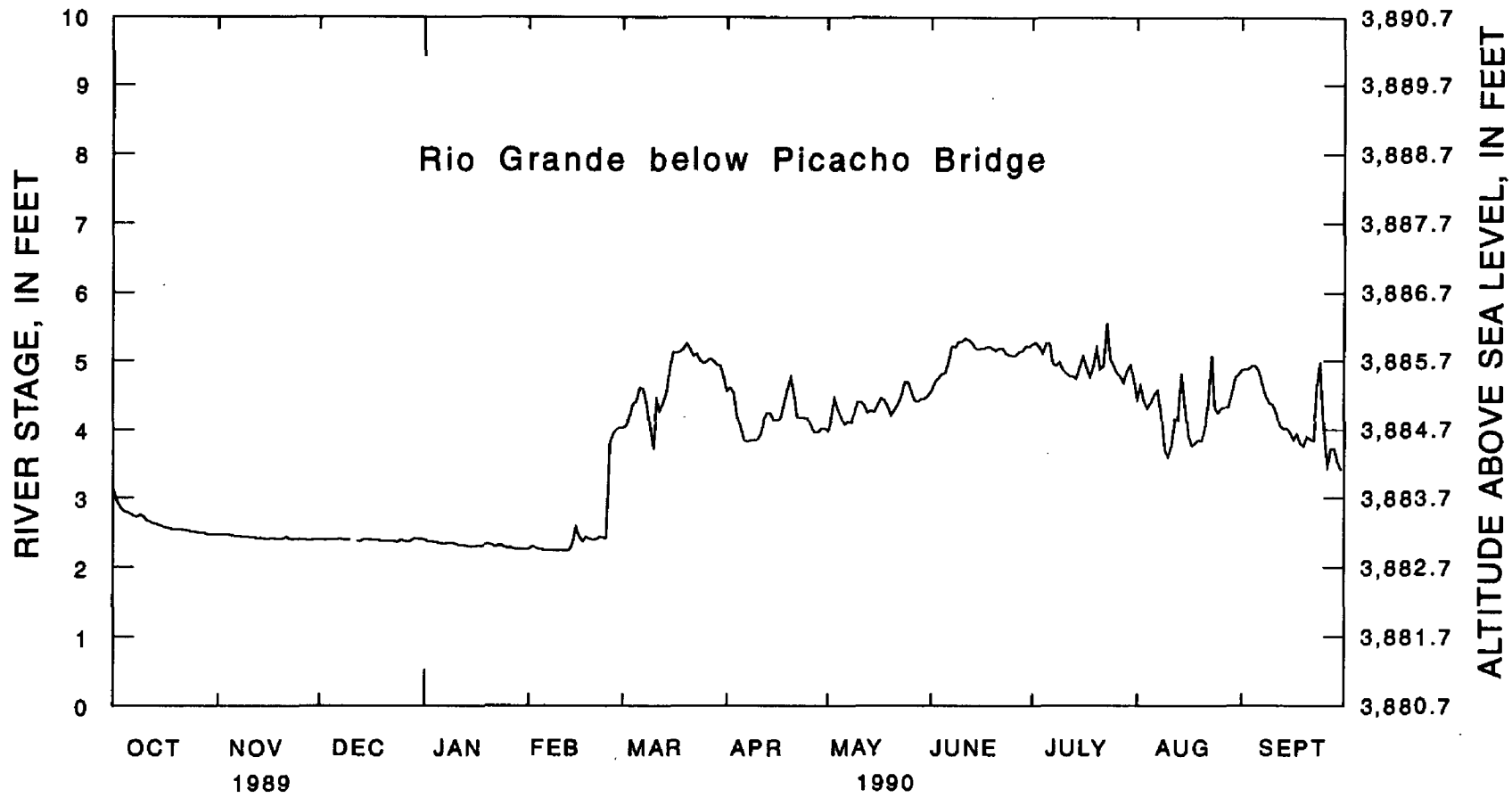


Figure 49.--Mean daily river stage of the Rio Grande below Picacho Bridge, 1990 water year.

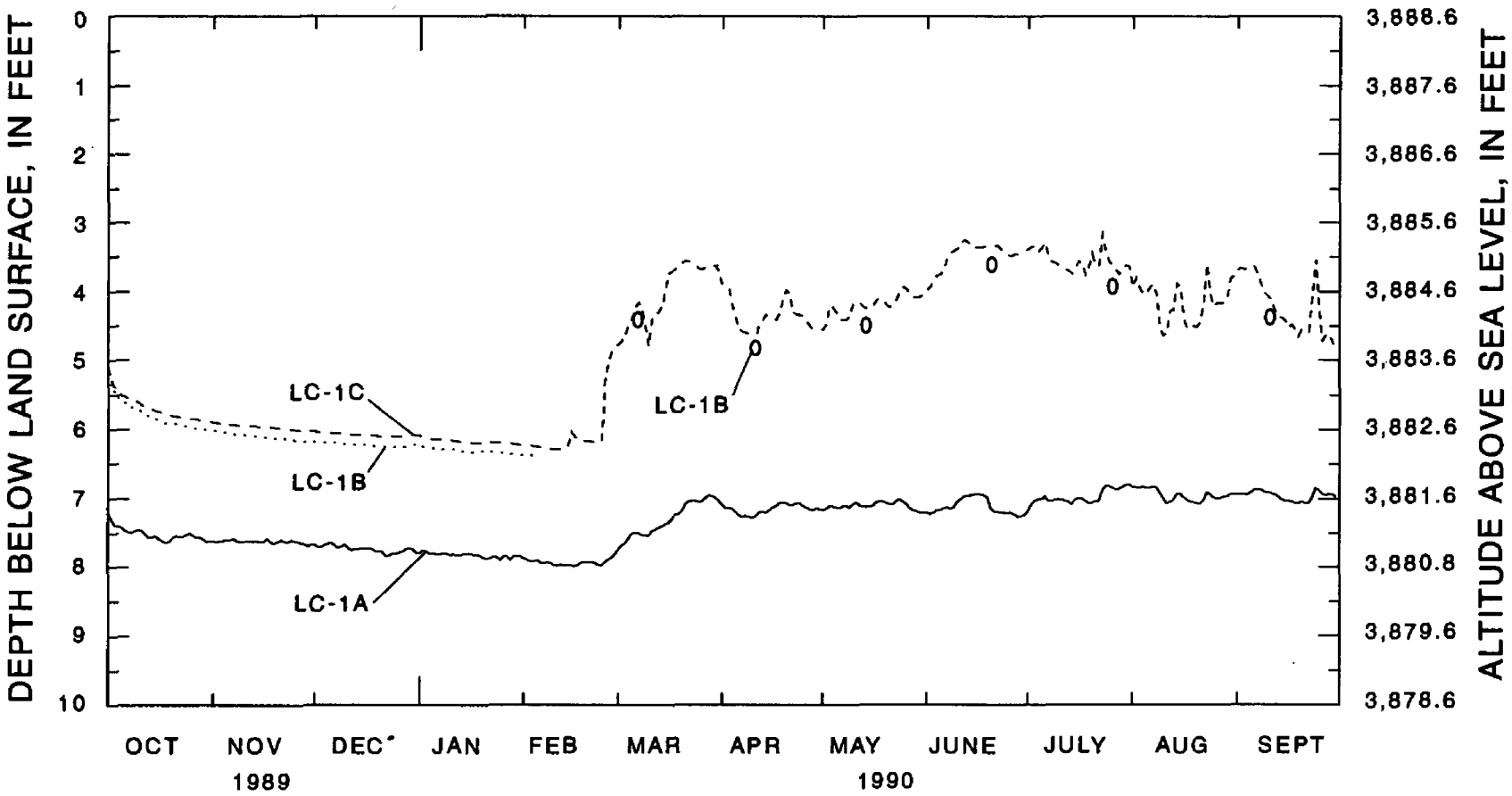


Figure 50.--Mean daily water levels and miscellaneous water levels in well group LC-1, 1990 water year.

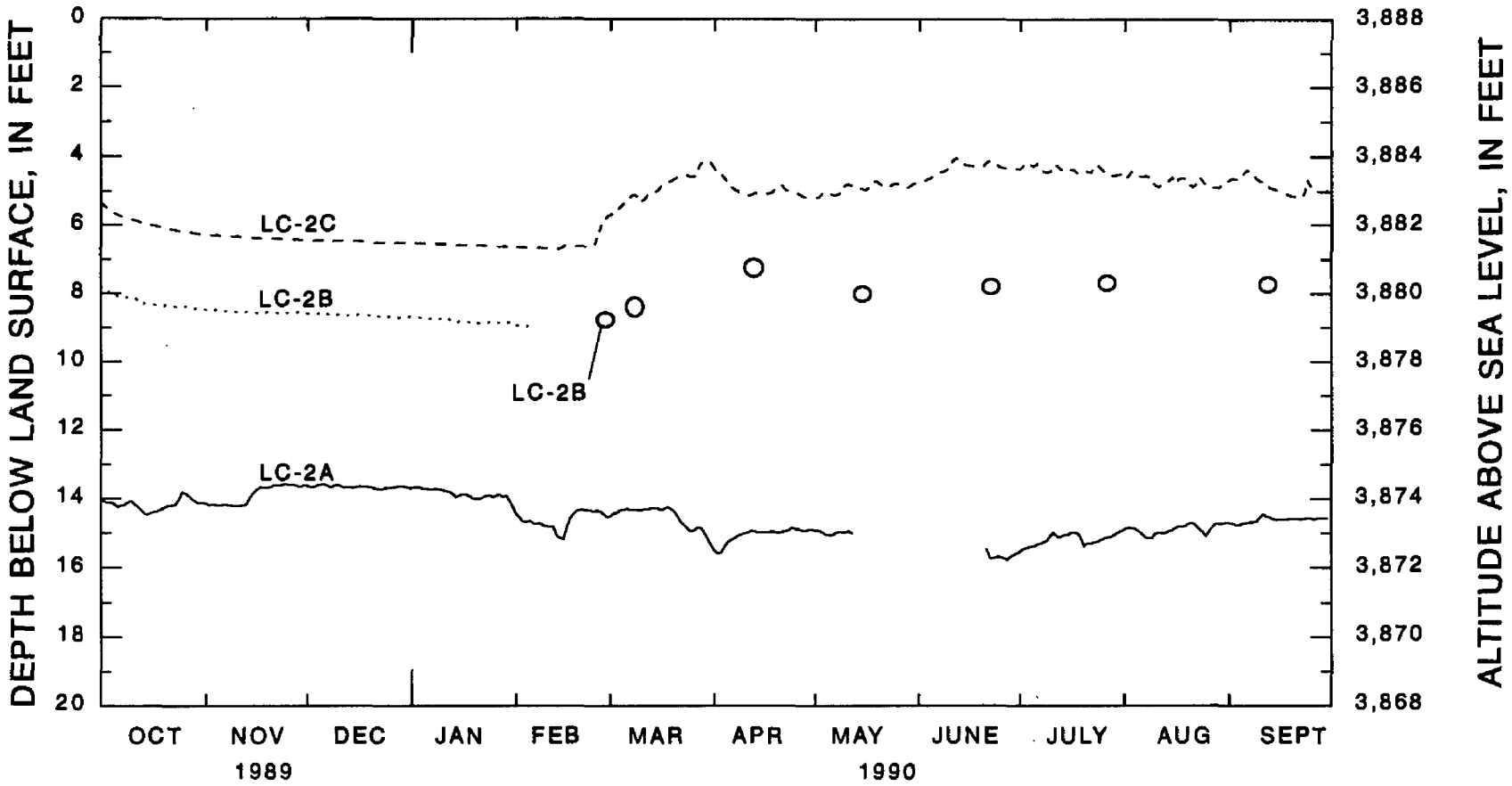


Figure 51.--Mean daily water levels and miscellaneous water levels in well group LC-2, 1990 water year.

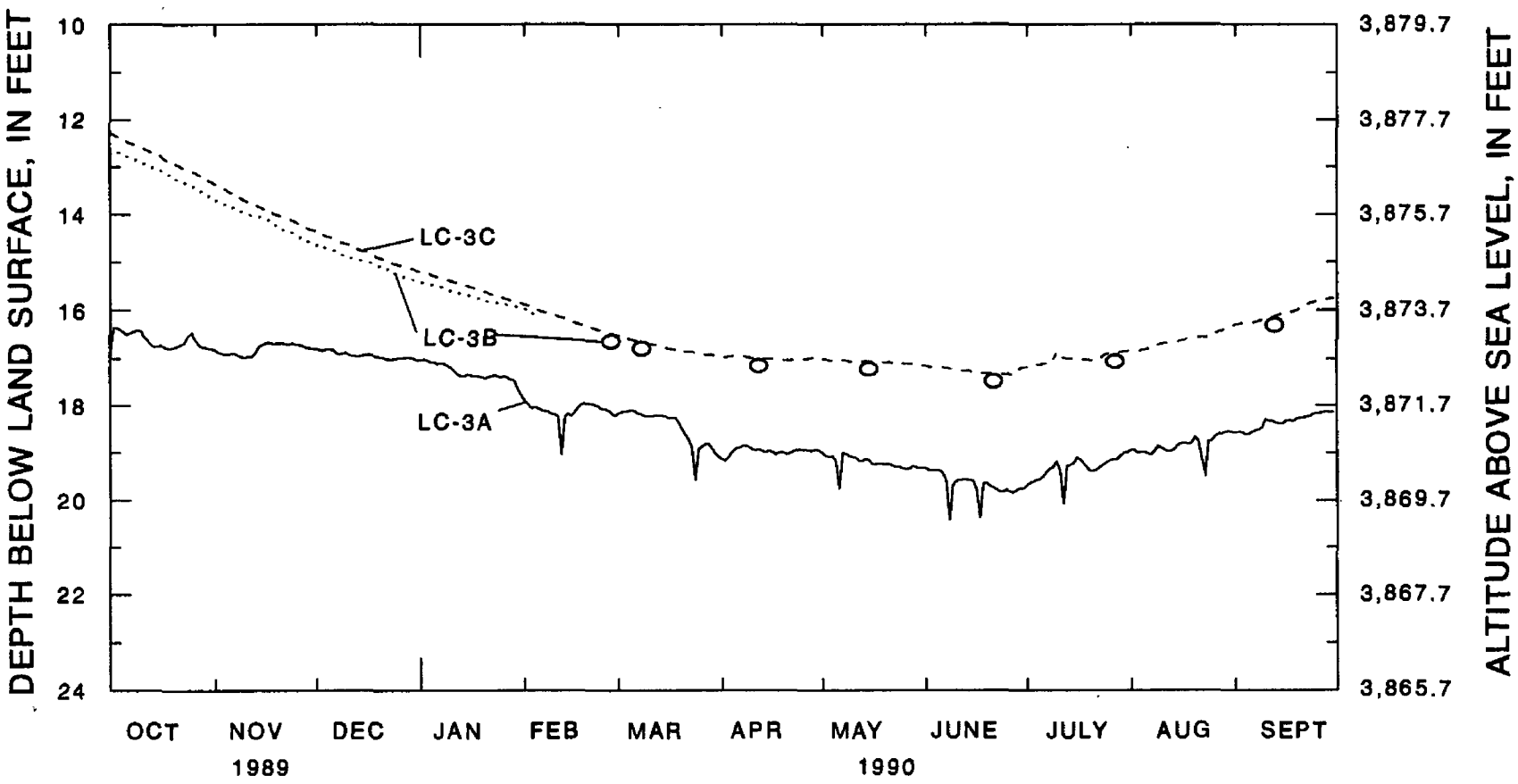


Figure 52.--Mean daily water levels and miscellaneous water levels in well group LC-3, 1990 water year.

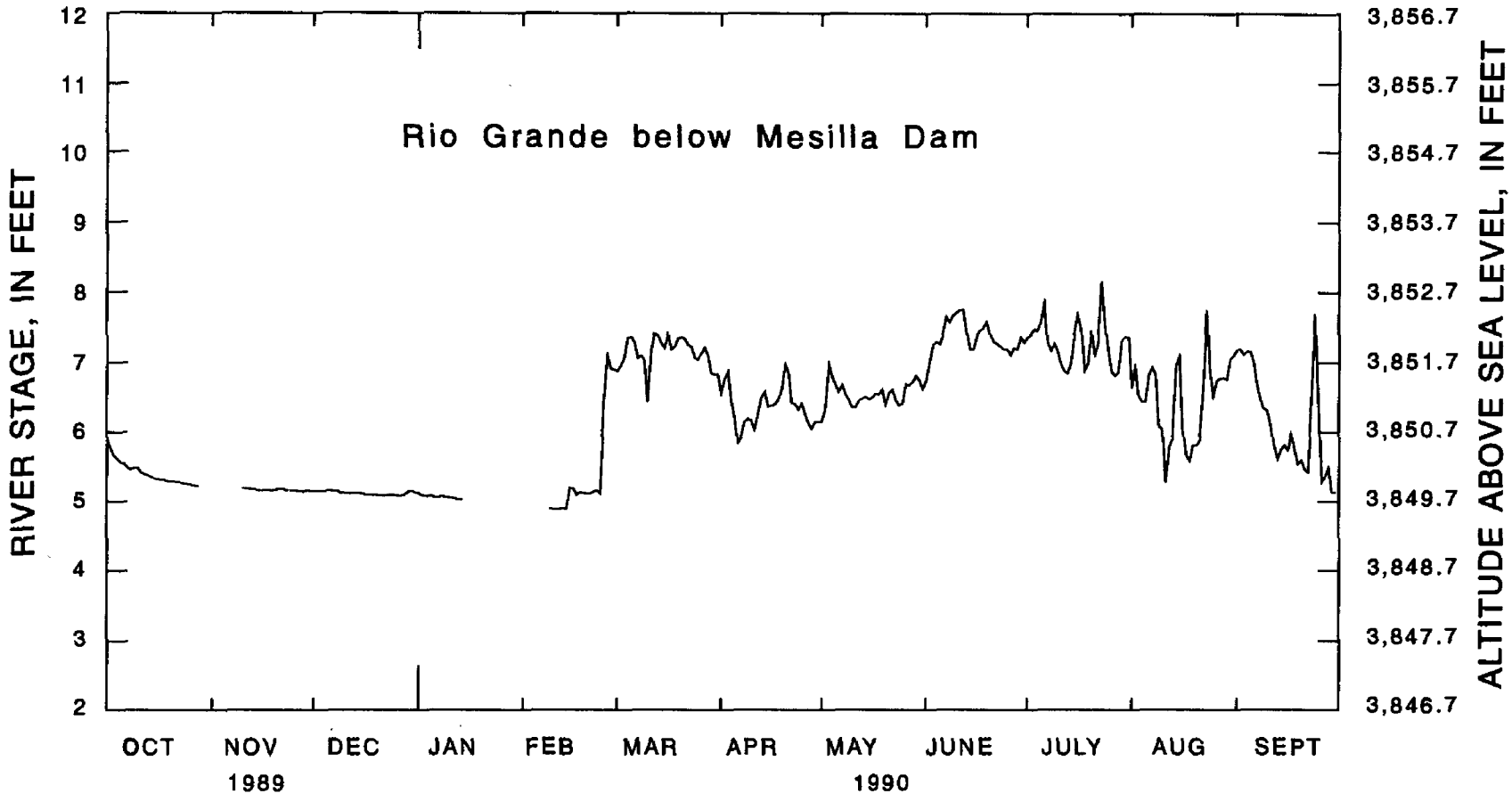


Figure 53.--Mean daily river stage of the Rio Grande below Mesilla Dam, 1990 water year.

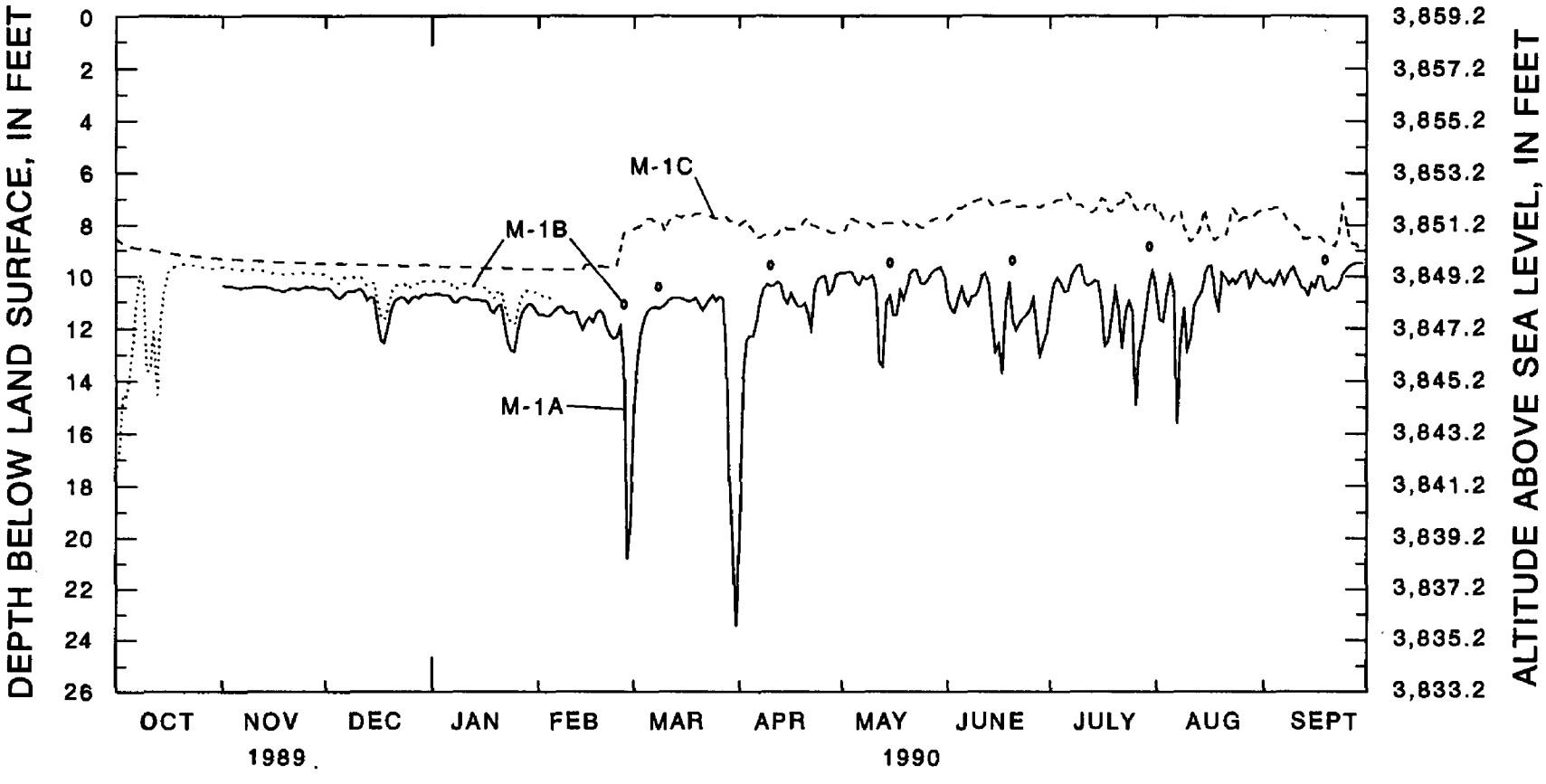


Figure 54.--Mean daily water levels and miscellaneous water levels in well group M-1, 1990 water year.

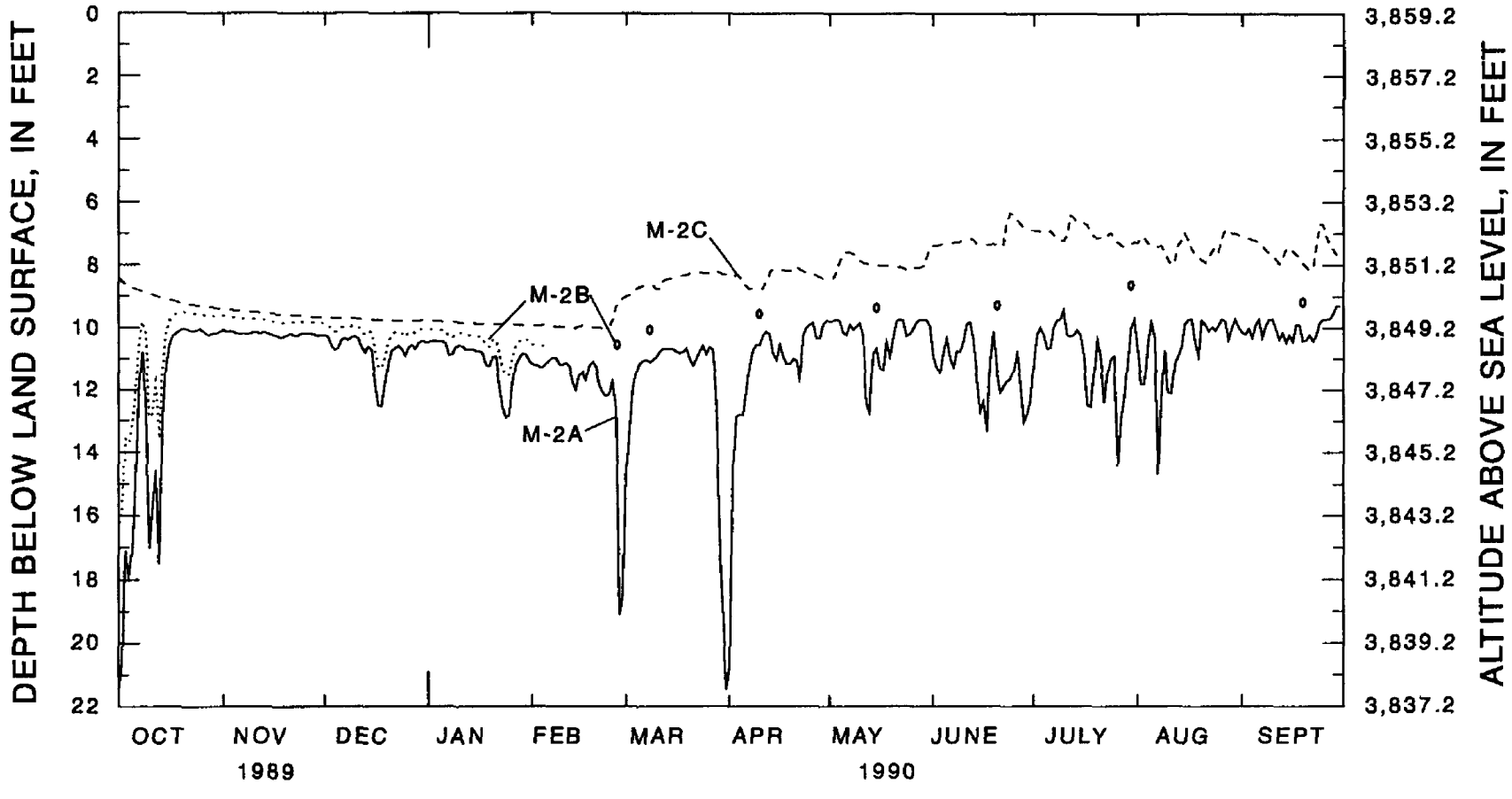


Figure 55.--Mean daily water levels and miscellaneous water levels in well group M-2, 1990 water year.

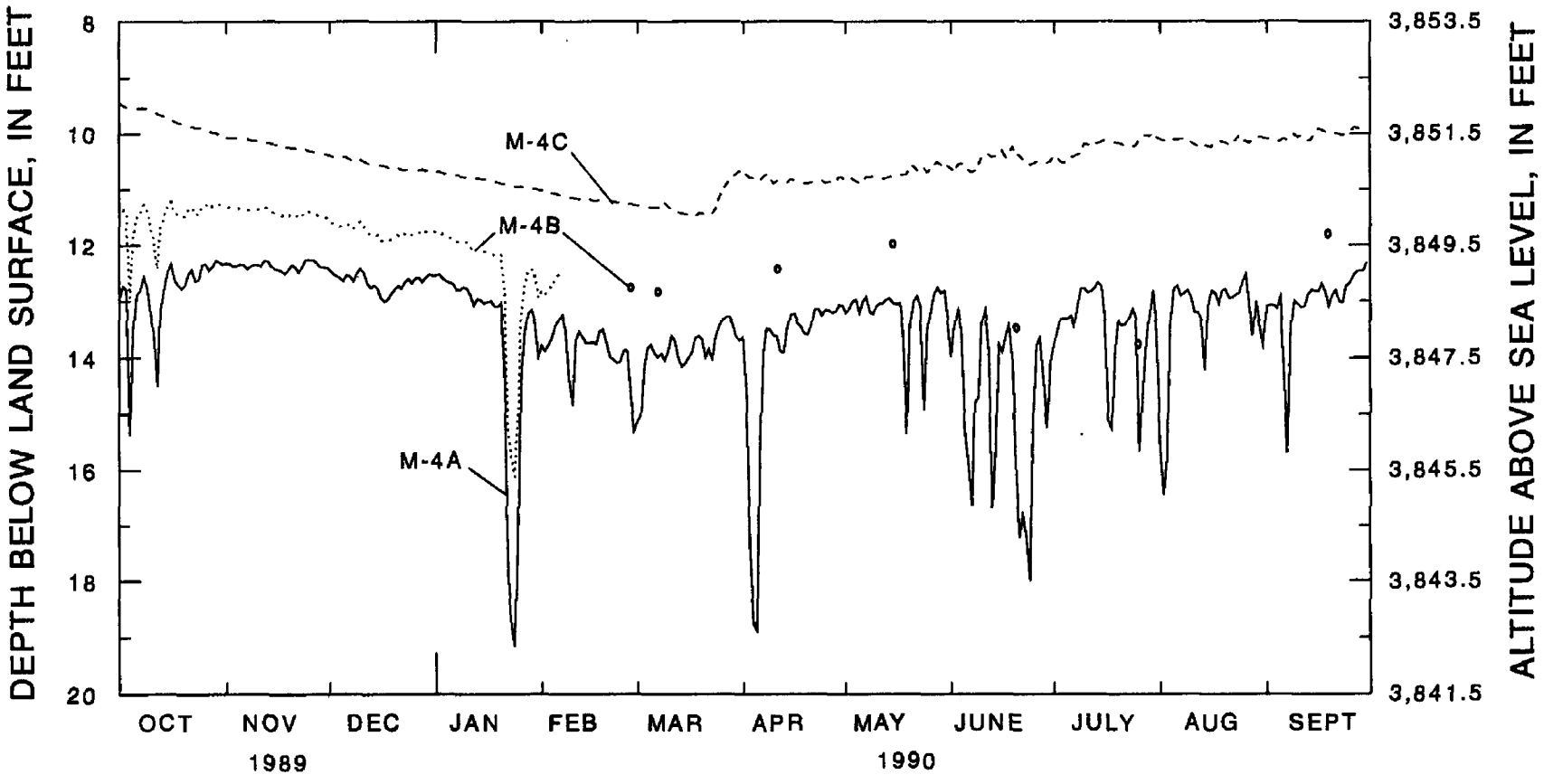


Figure 56.--Mean daily water levels and miscellaneous water levels in well group M-4, 1990 water year.

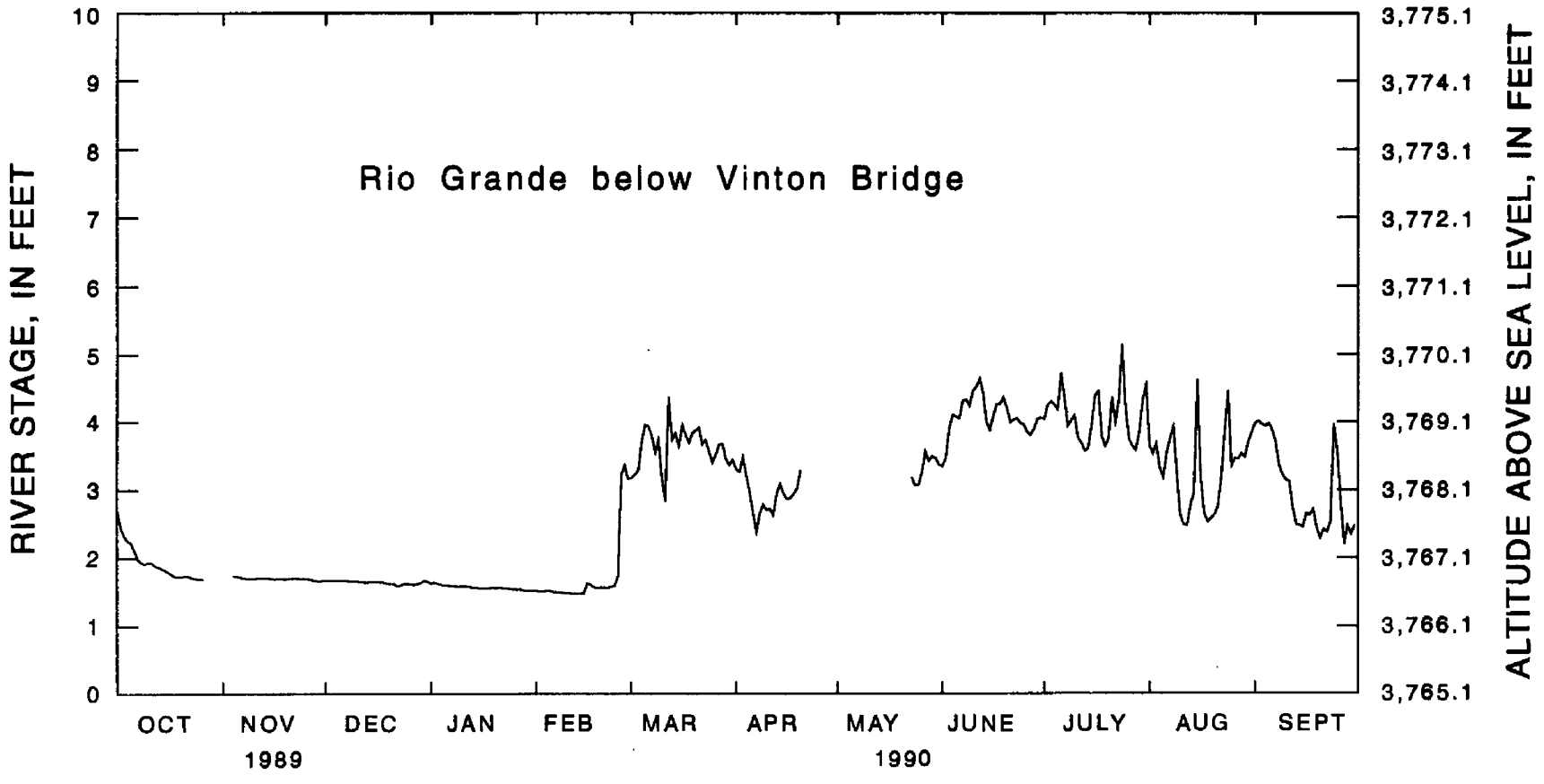


Figure 57.--Mean daily river stage of the Rio Grande below Vinton Bridge, 1990 water year.

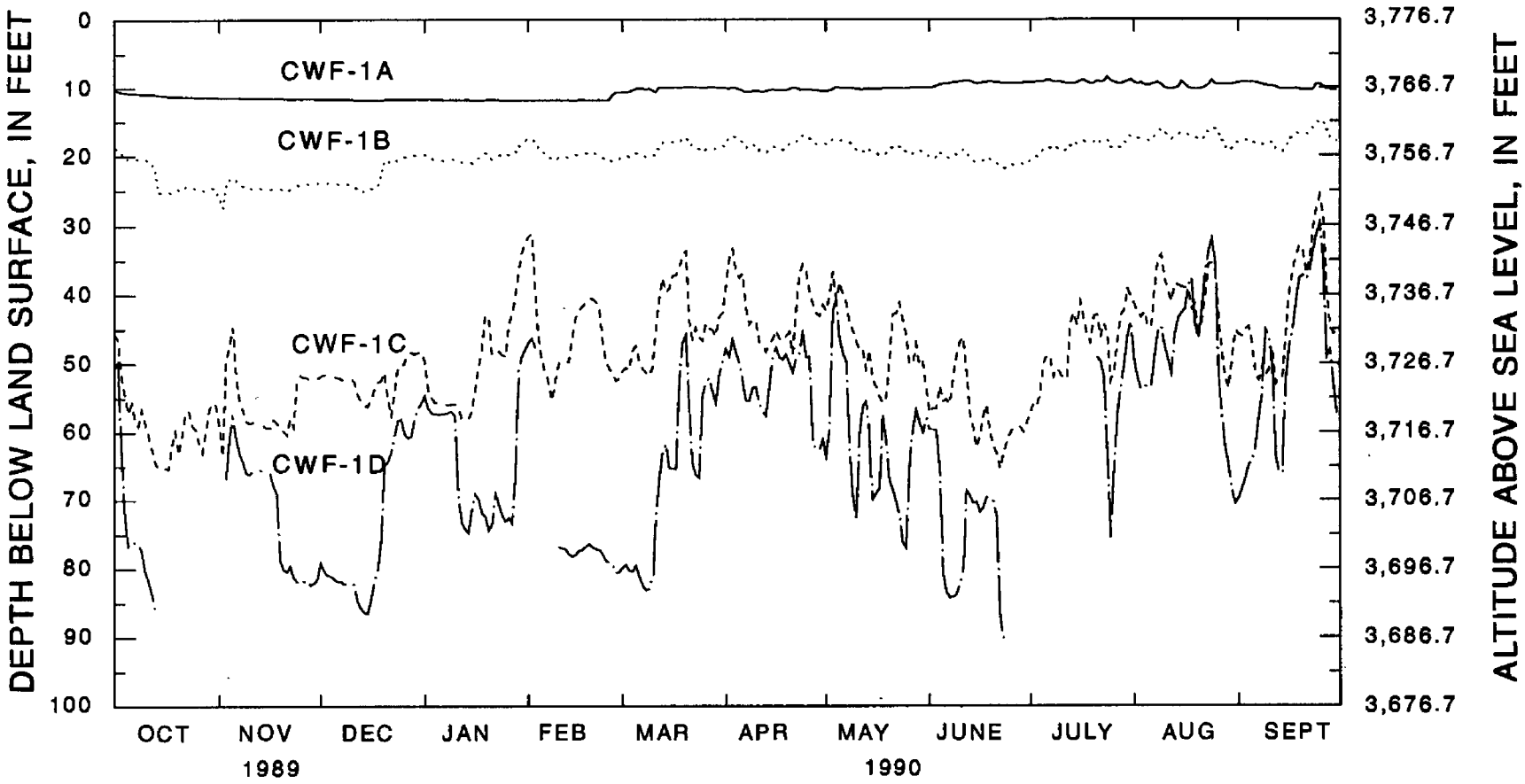


Figure 58.--Mean daily water levels in well group CWF-1, 1990 water year.

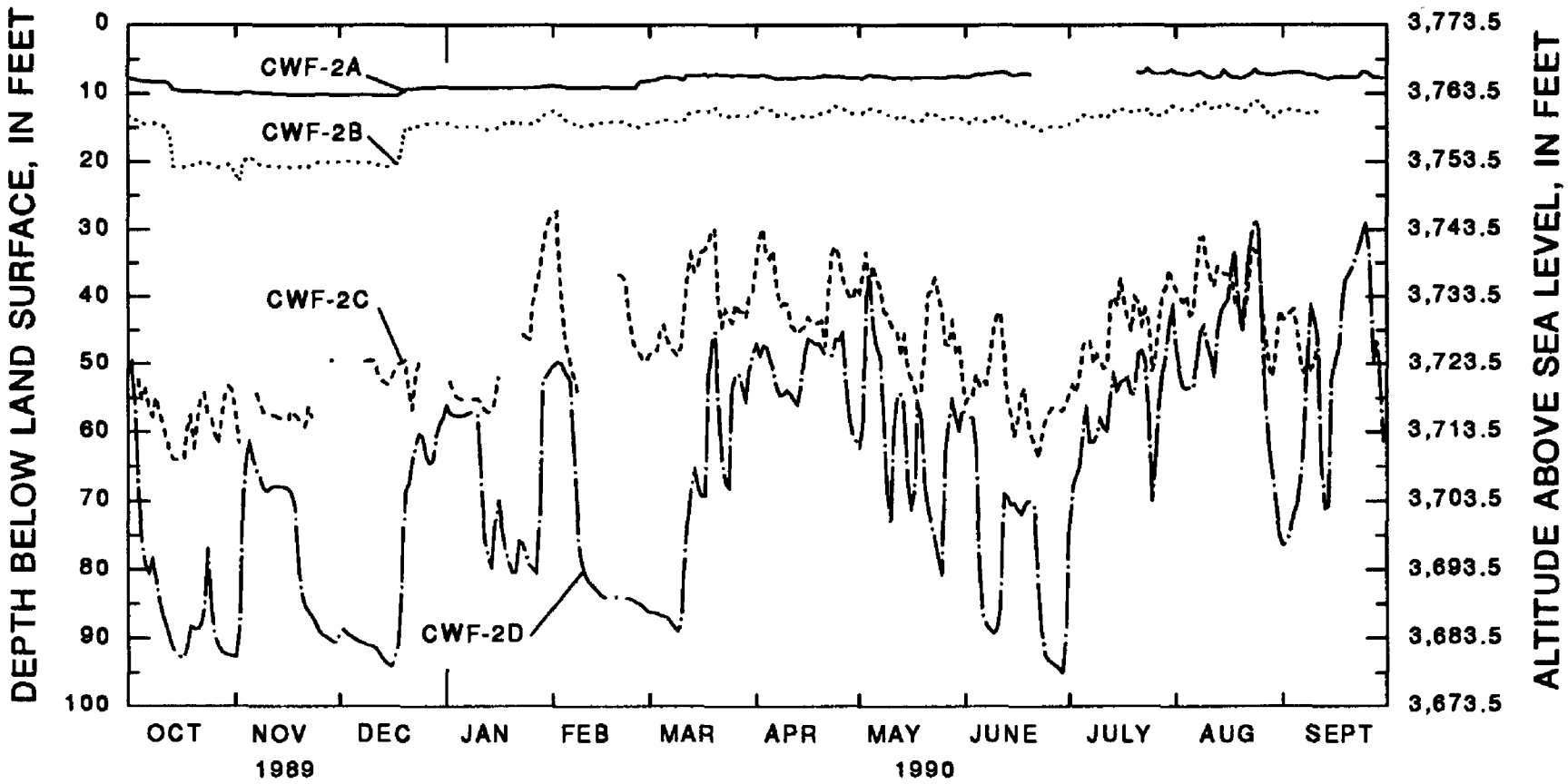


Figure 59.--Mean daily water levels in well group CWF-2, 1990 water year.

Figure 60.--Mean daily water levels and miscellaneous water levels in well group CWF-3, 1990 water year.

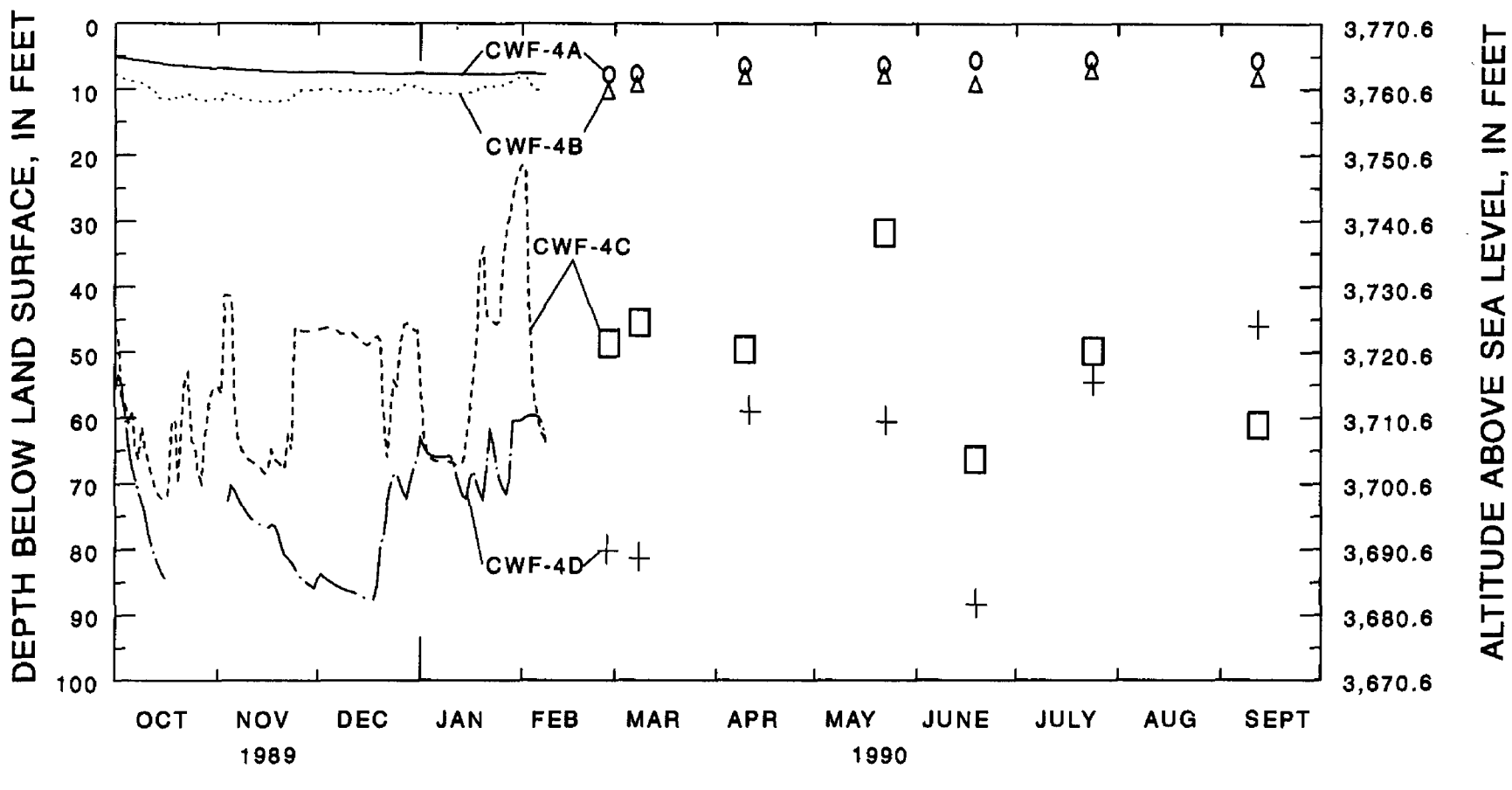


Figure 61.--Mean daily water levels and miscellaneous water levels in well group CWF-4, 1990 water year.

1991 WATER YEAR

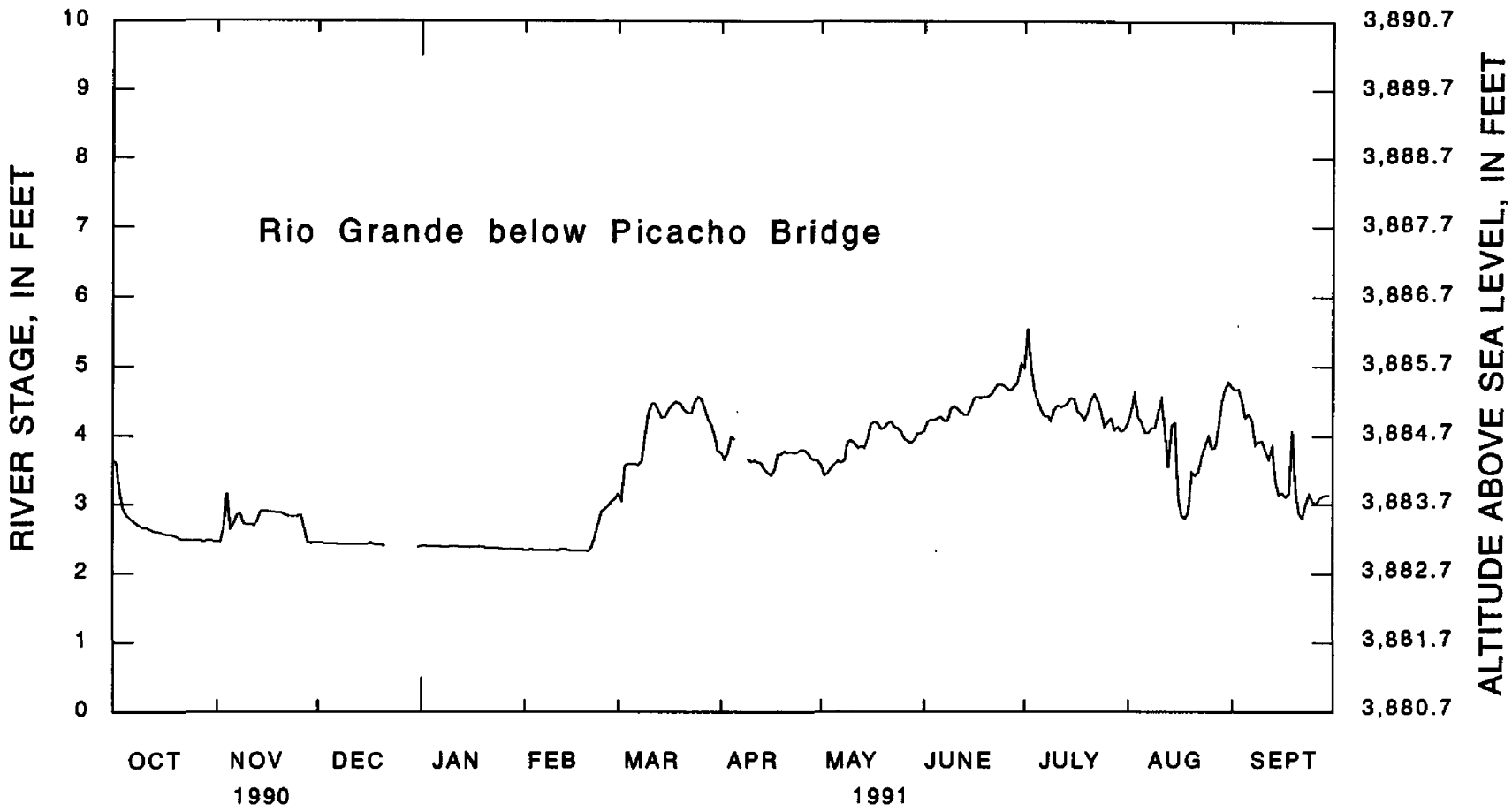


Figure 62.--Mean daily river stage of the Rio Grande below Picacho Bridge, 1991 water year.

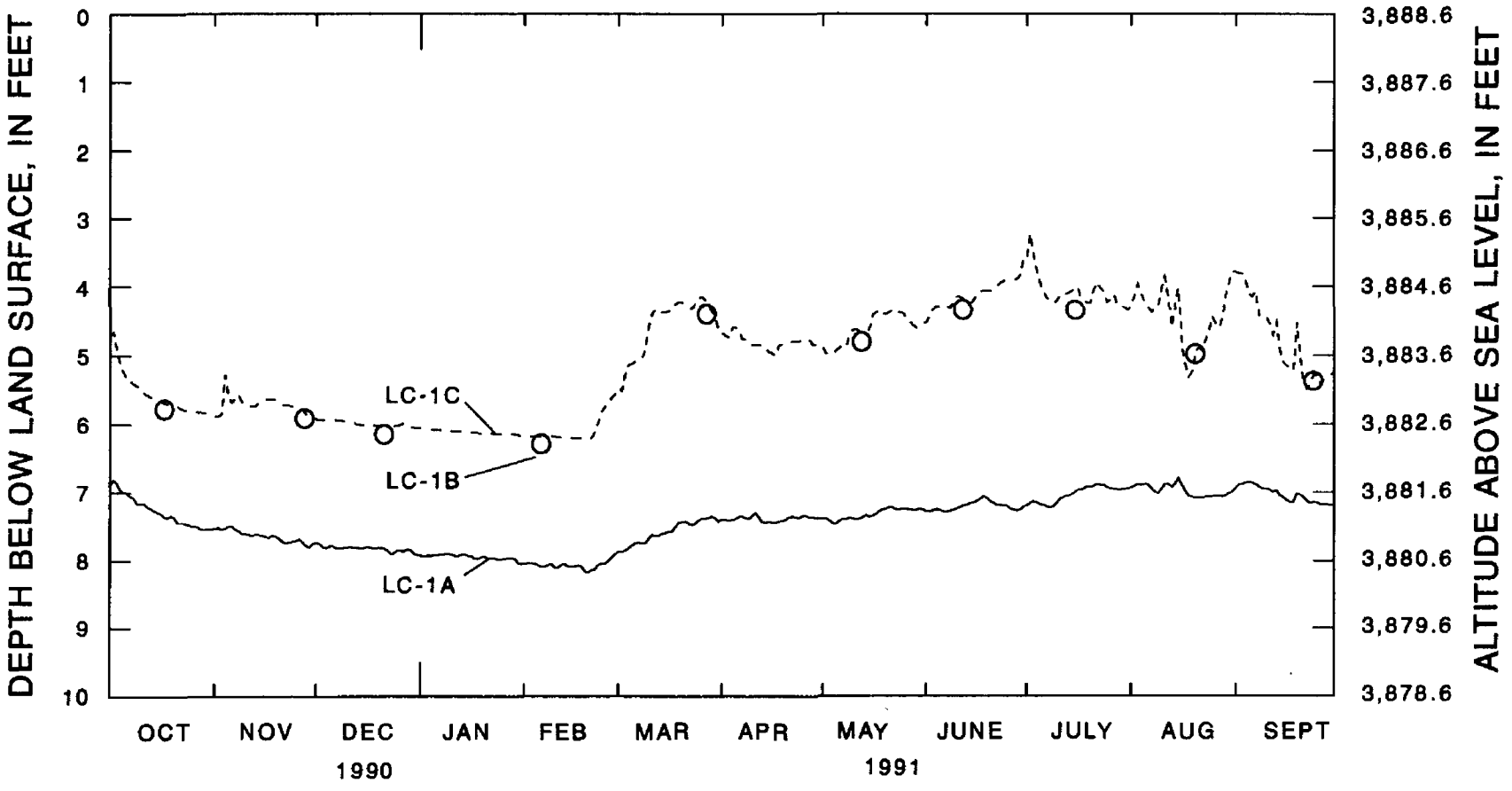


Figure 63.--Mean daily water levels and miscellaneous water levels in well group LC-1, 1991 water year.

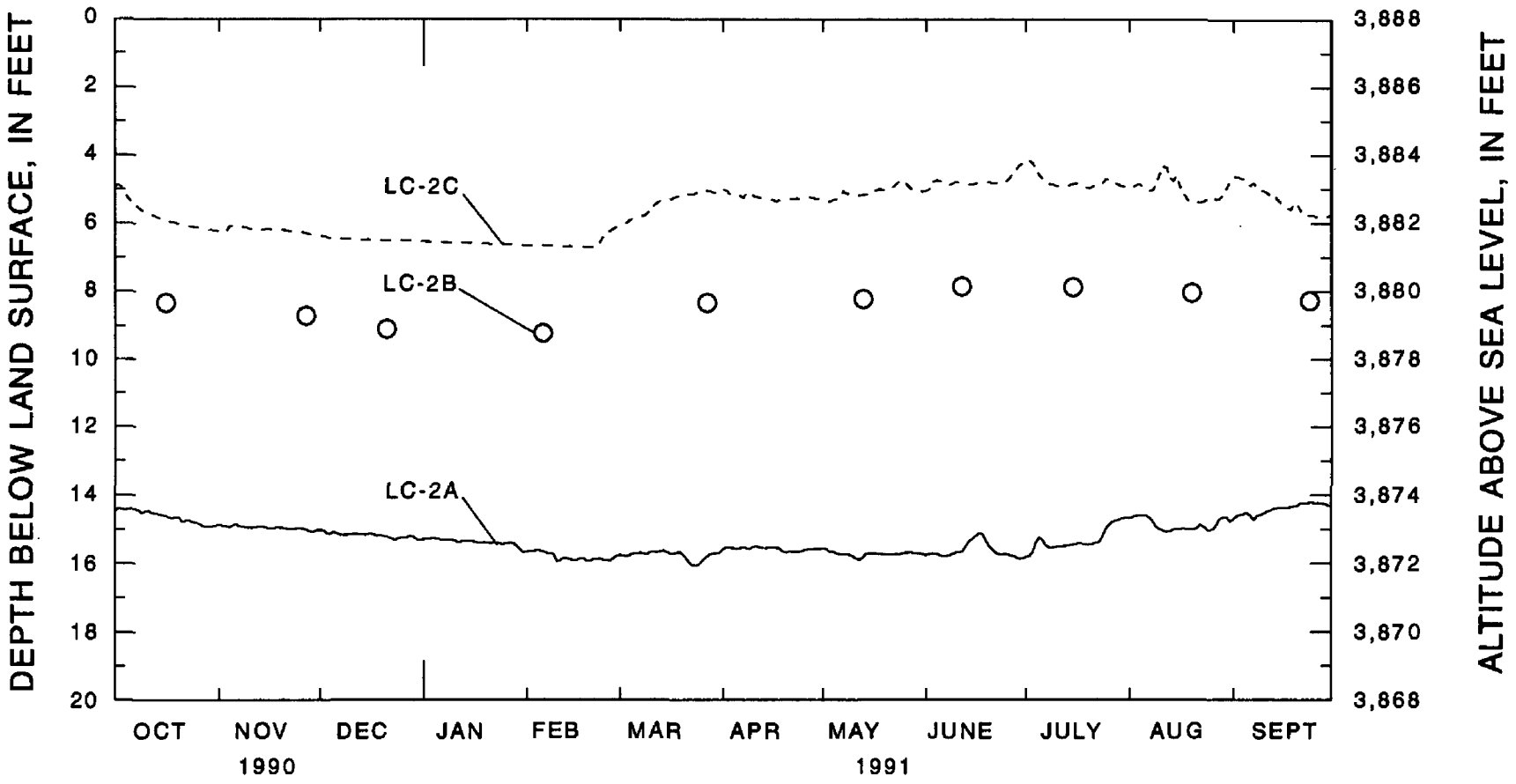


Figure 64.--Mean daily water levels and miscellaneous water levels in well group LC-2, 1991 water year.

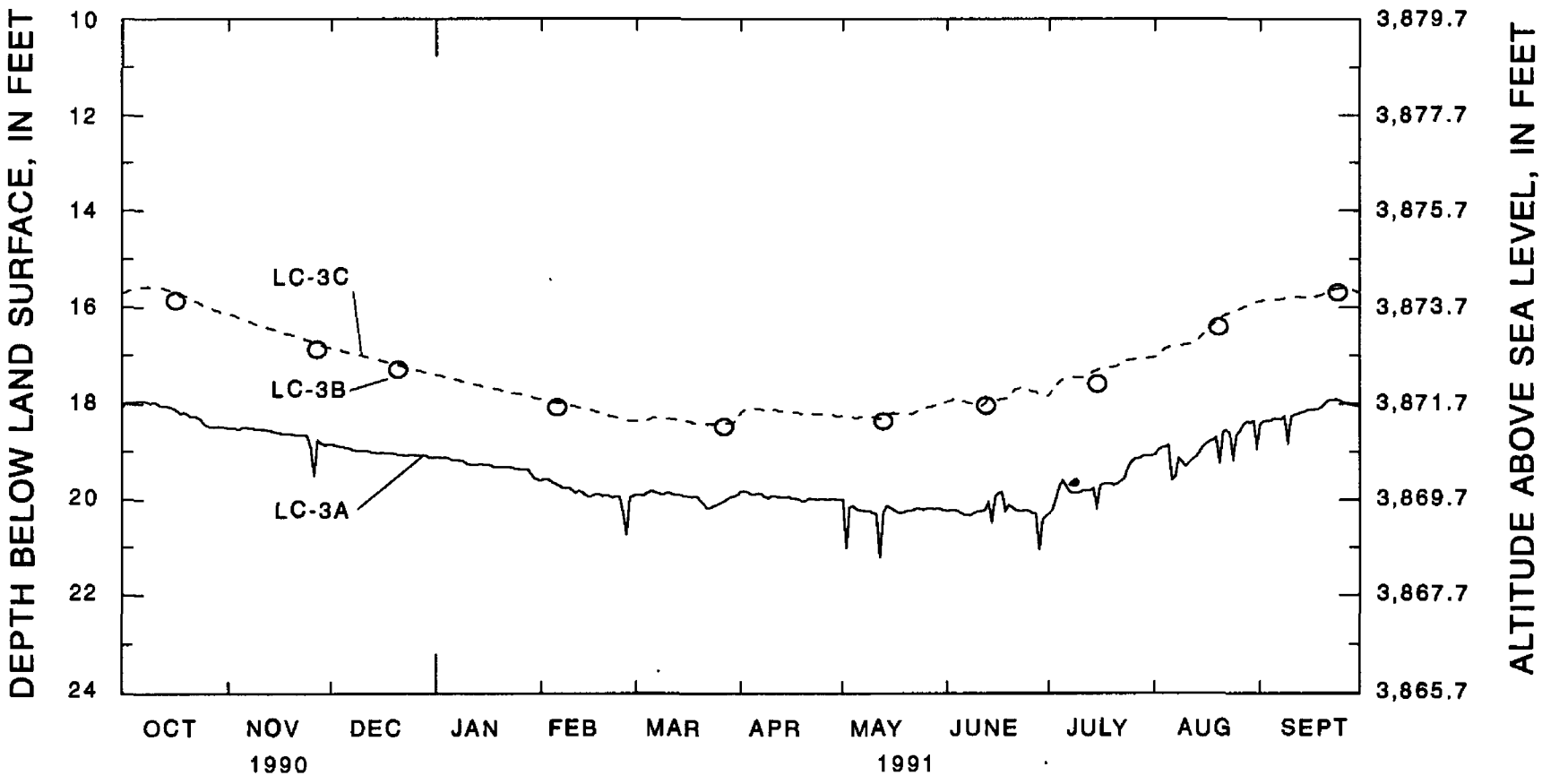


Figure 65.--Mean daily water levels and miscellaneous water levels in well group LC-3, 1991 water year.

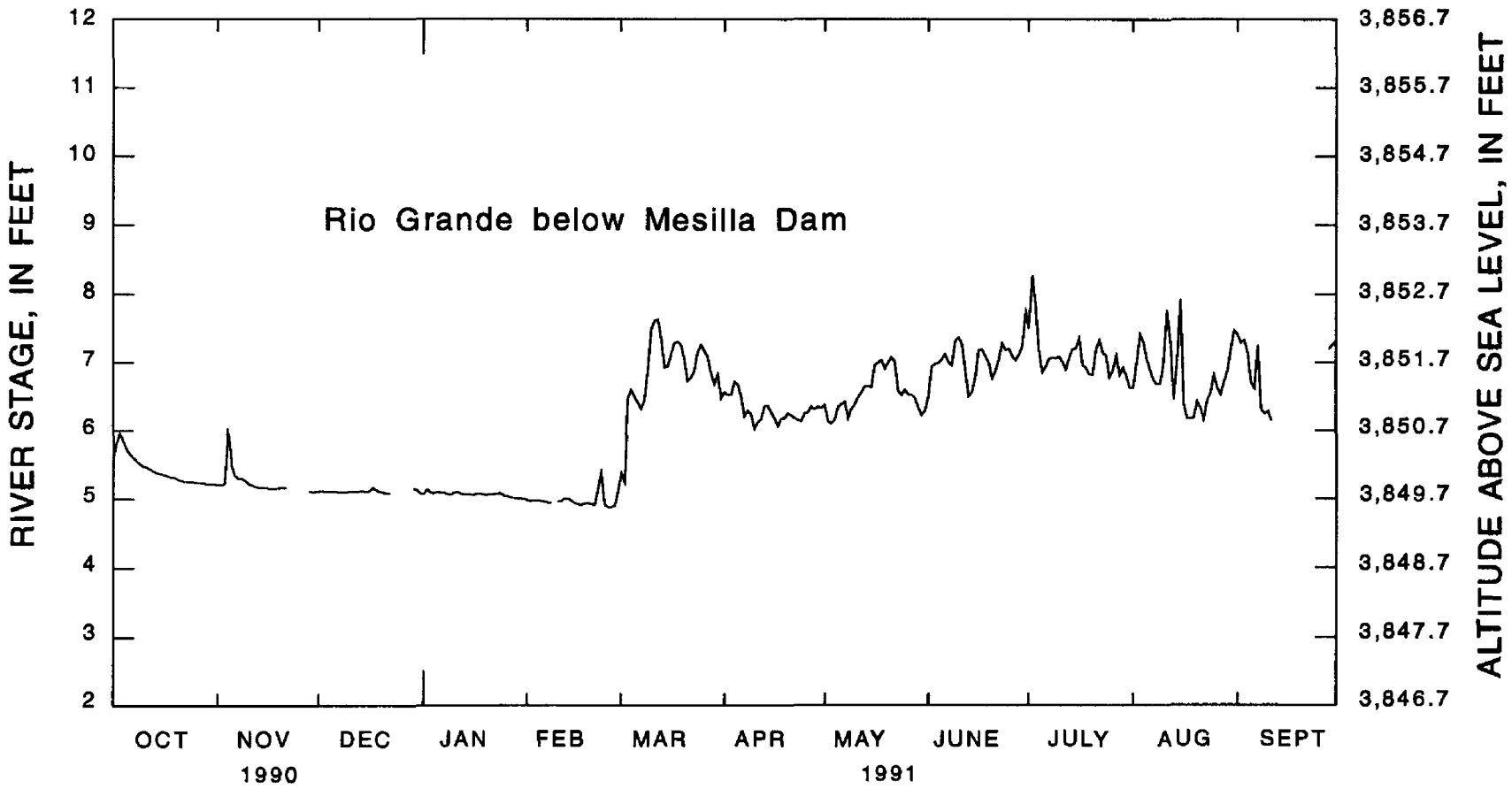


Figure 66.--Mean daily river stage of the Rio Grande below Mesilla Dam, 1991 water year.

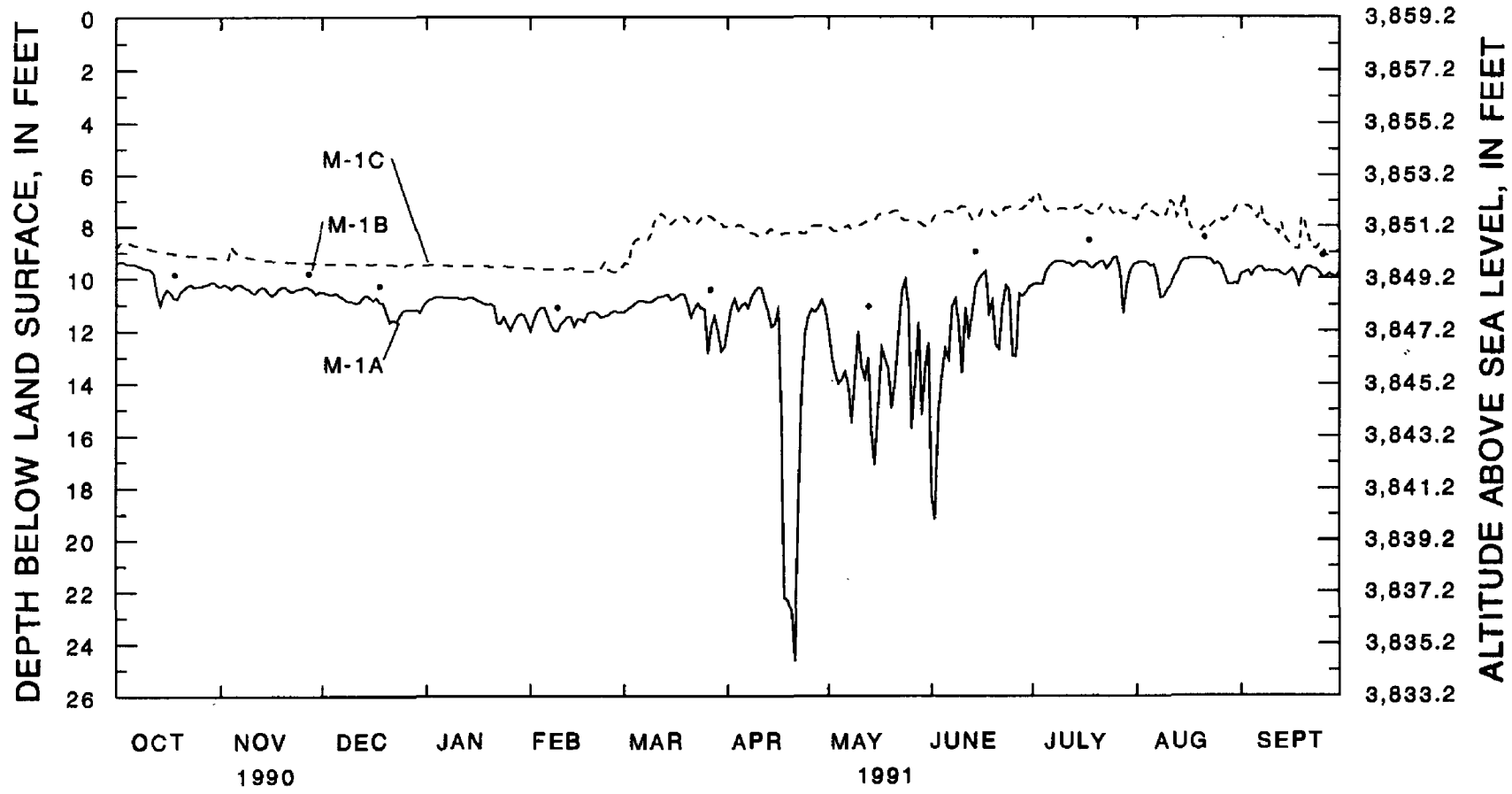


Figure 67.--Mean daily water levels and miscellaneous water levels in well group M-1, 1991 water year.

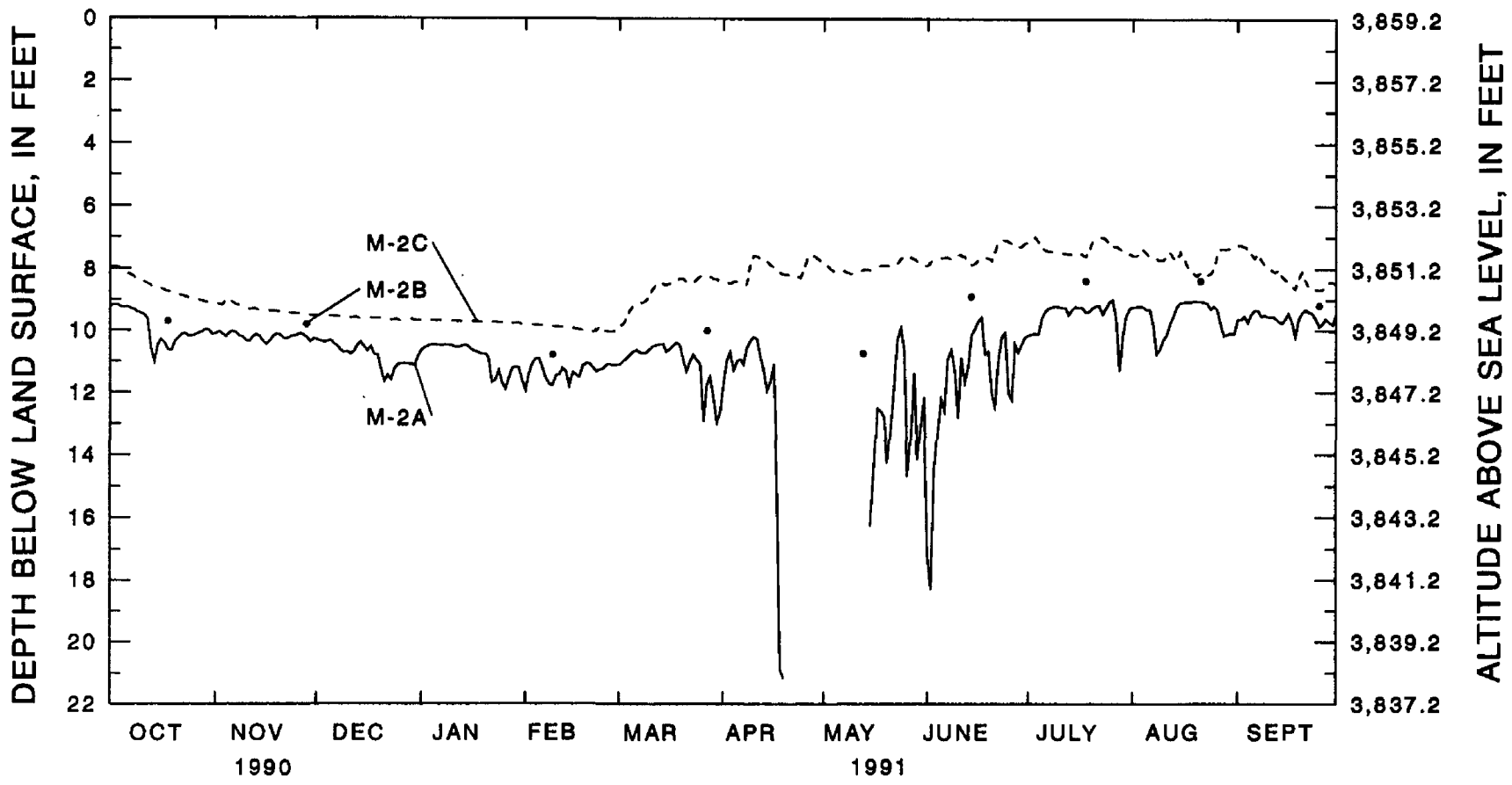


Figure 68.--Mean daily water levels and miscellaneous water levels in well group M-2, 1991 water year.

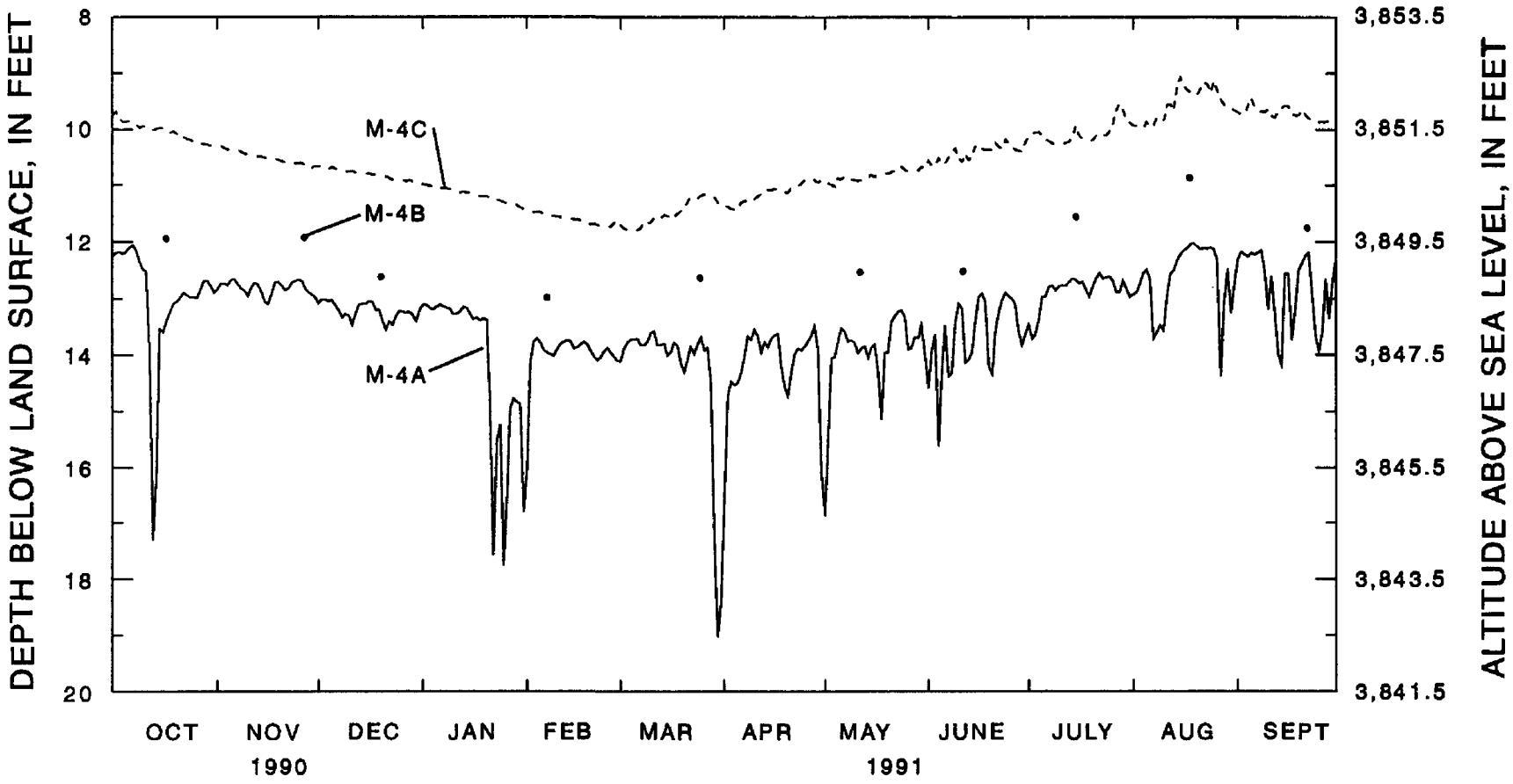


Figure 69.--Mean daily water levels and miscellaneous water levels in well group M-4, 1991 water year.

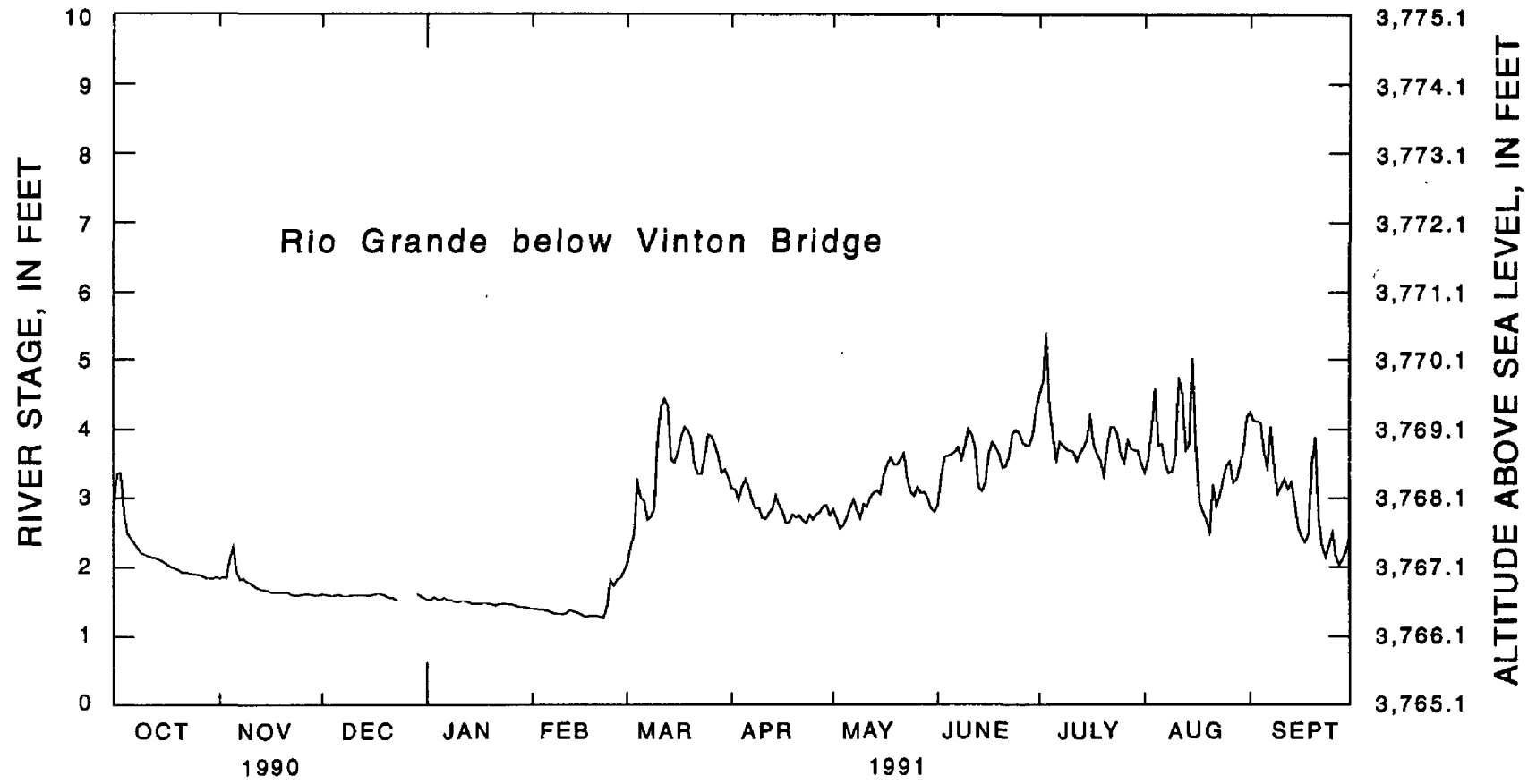


Figure 70.--Mean daily river stage of the Rio Grande below Vinton Bridge, 1991 water year.

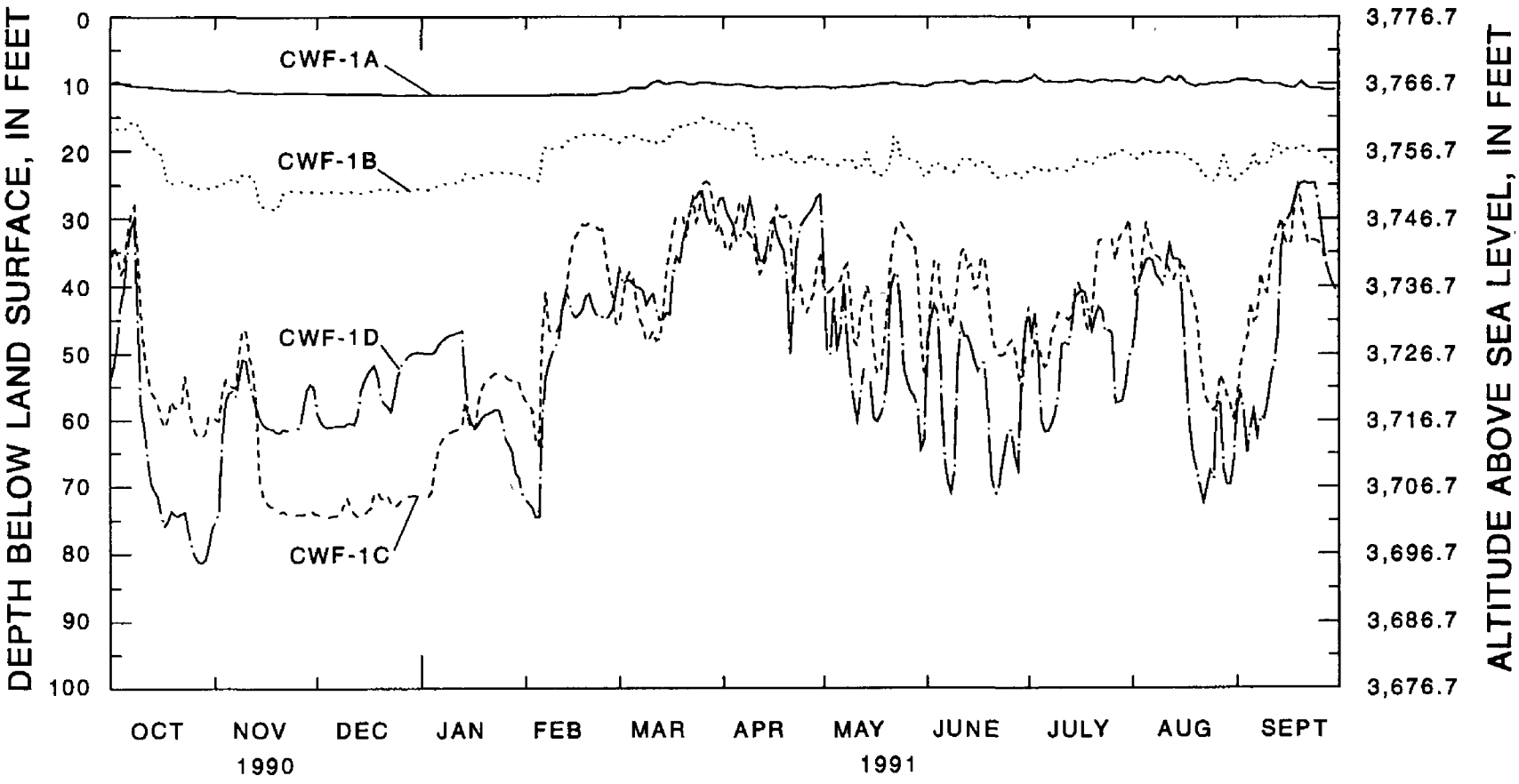


Figure 71.--Mean daily water levels in well group CWF-1, 1991 water year.

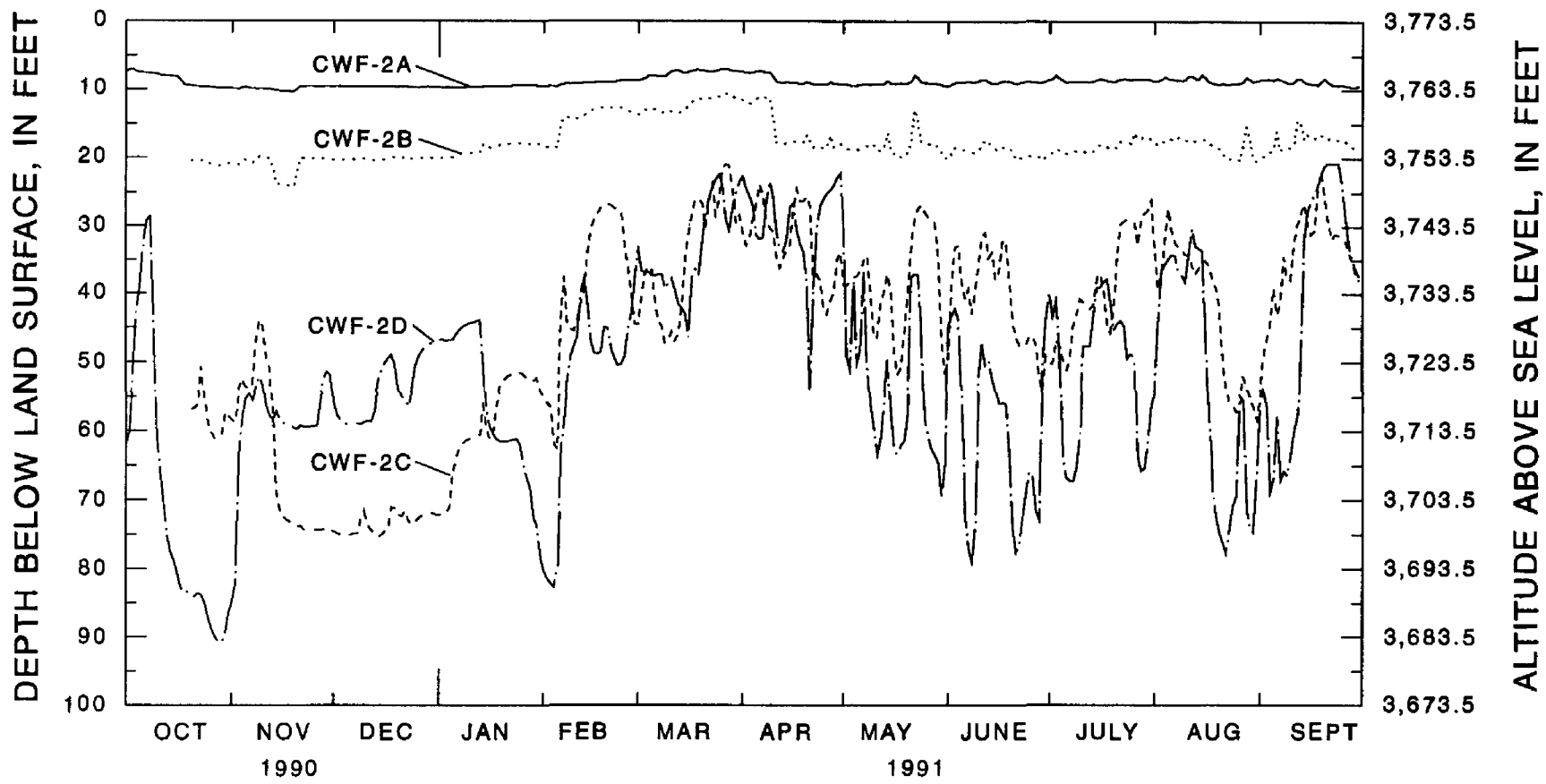


Figure 72.--Mean daily water levels in well group CWF-2, 1991 water year.

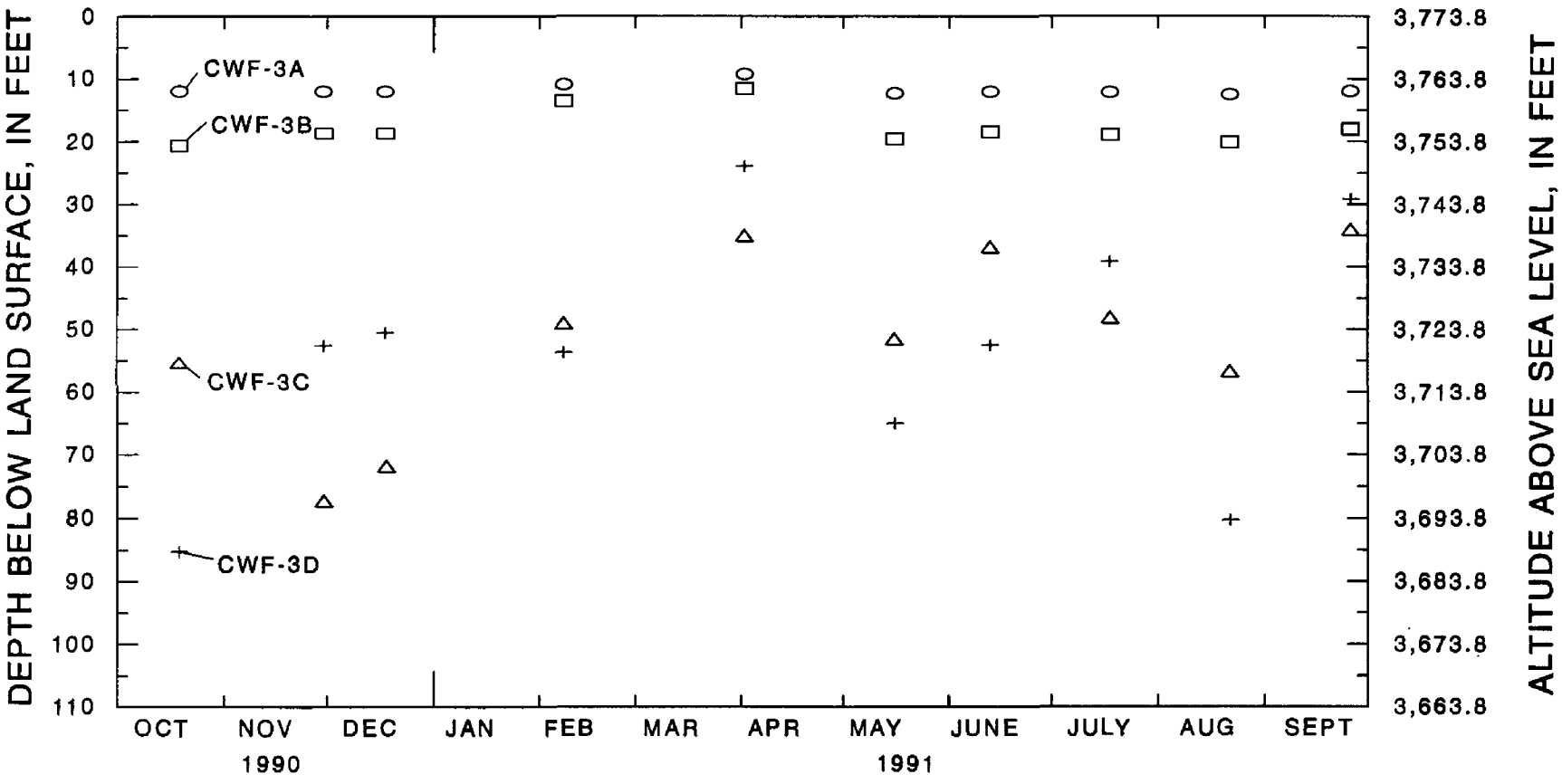


Figure 73.--Miscellaneous water levels in well group CWF-3, 1991 water year.

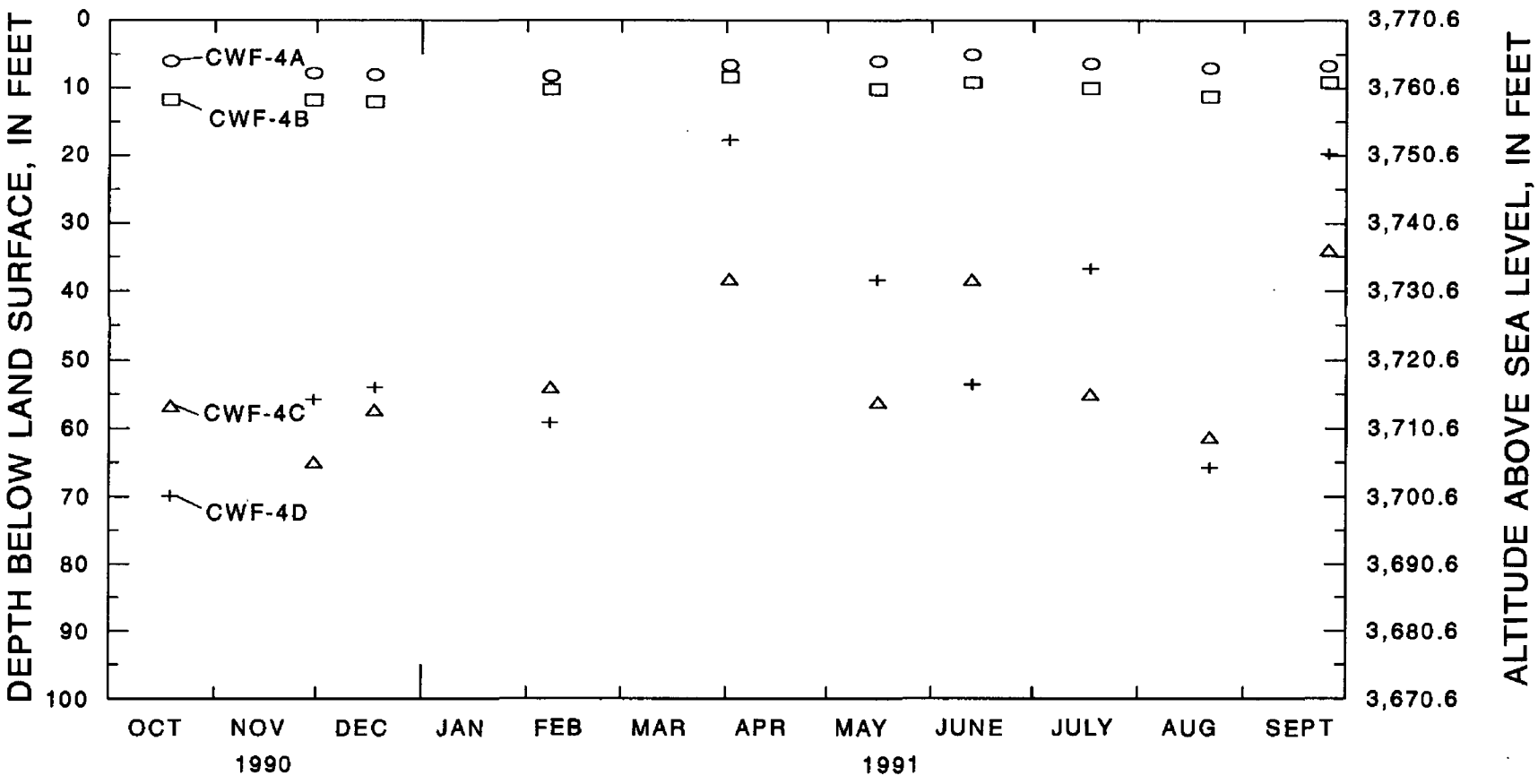


Figure 74.--Miscellaneous water levels in well group CWF-4, 1991 water year.

1992 WATER YEAR

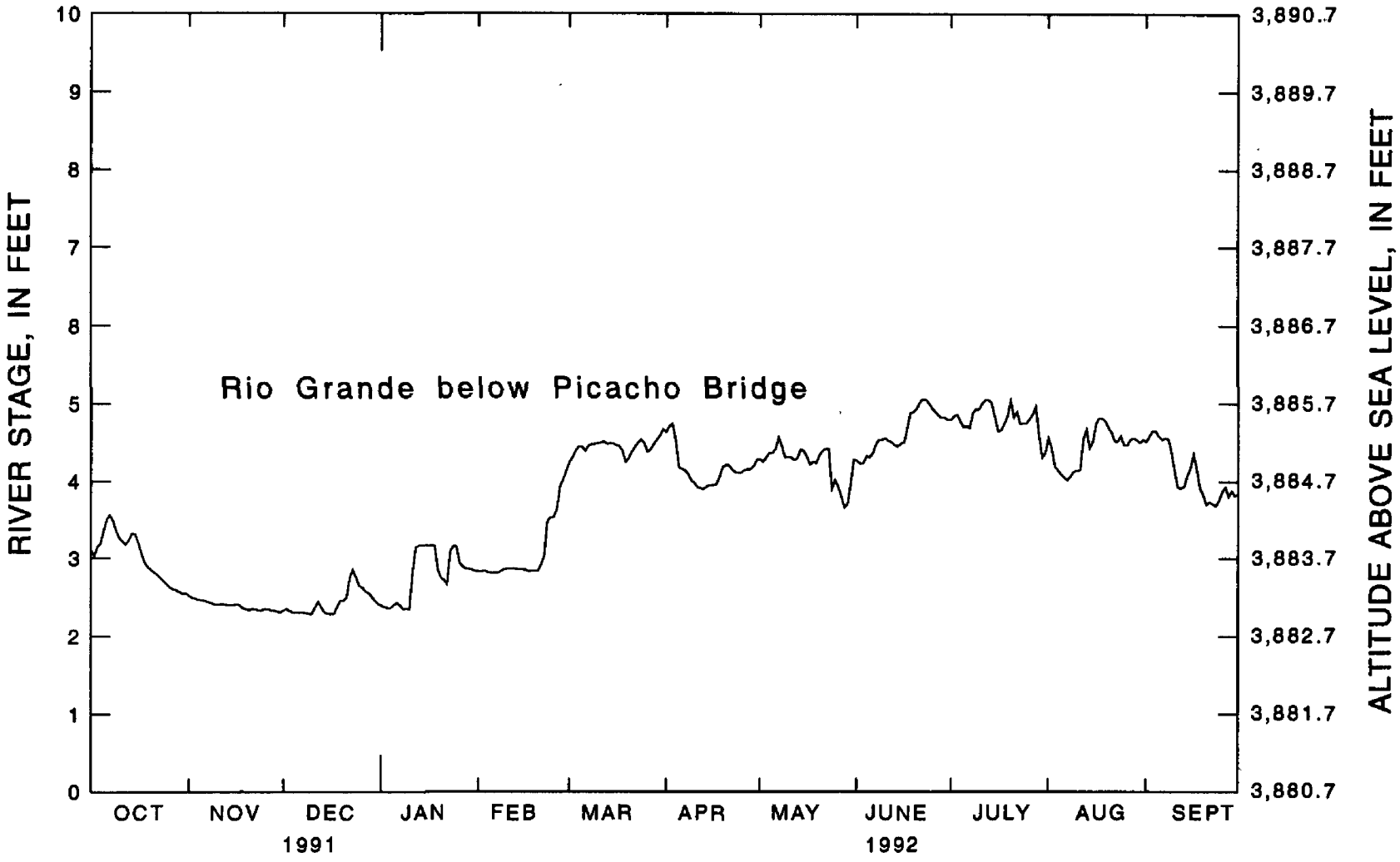


Figure 75.--Mean daily river stage of the Rio Grande below Picacho Bridge, 1992 water year.

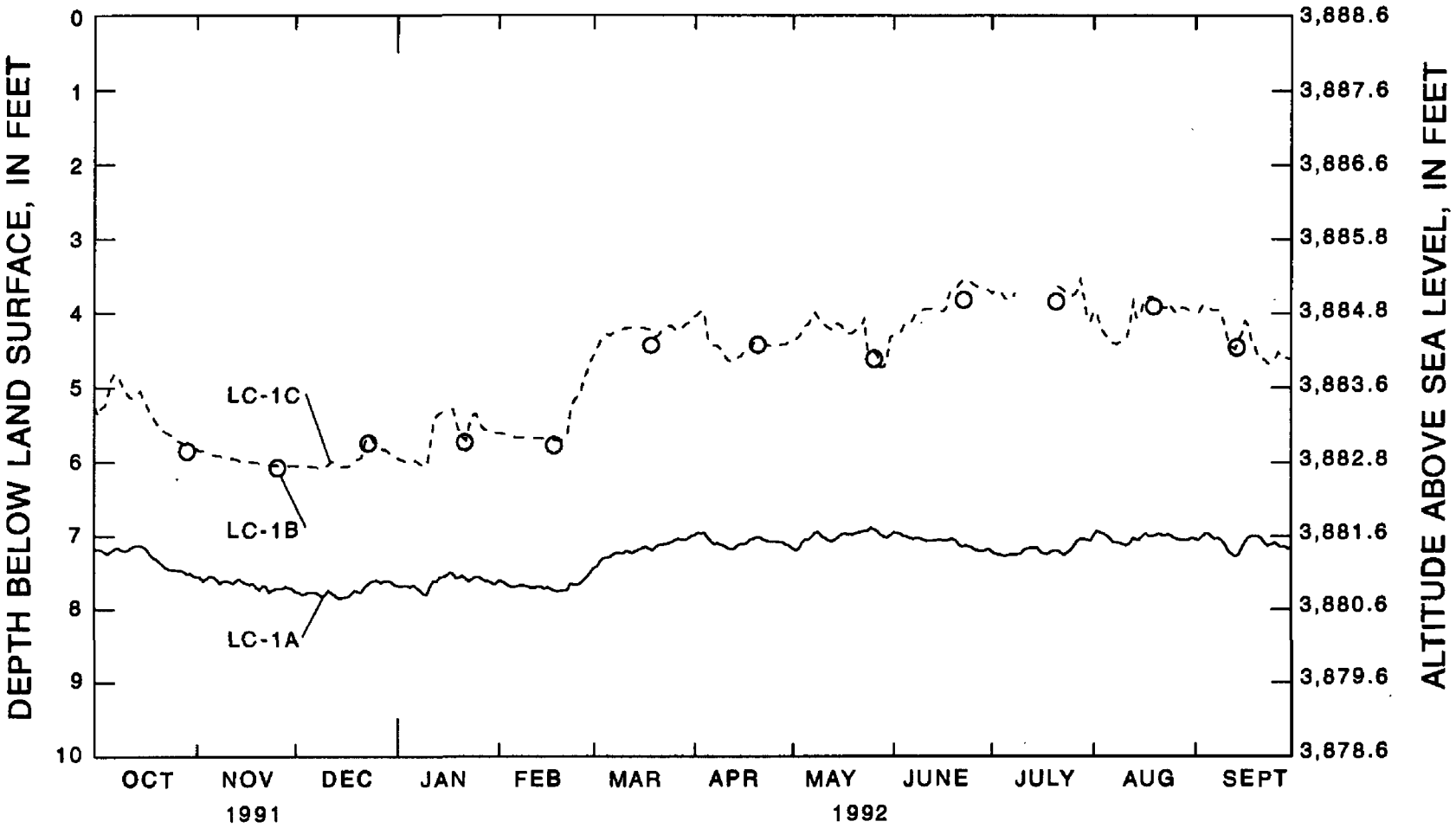


Figure 76.--Mean daily water levels and miscellaneous water levels in well group LC-1, 1992 water year.

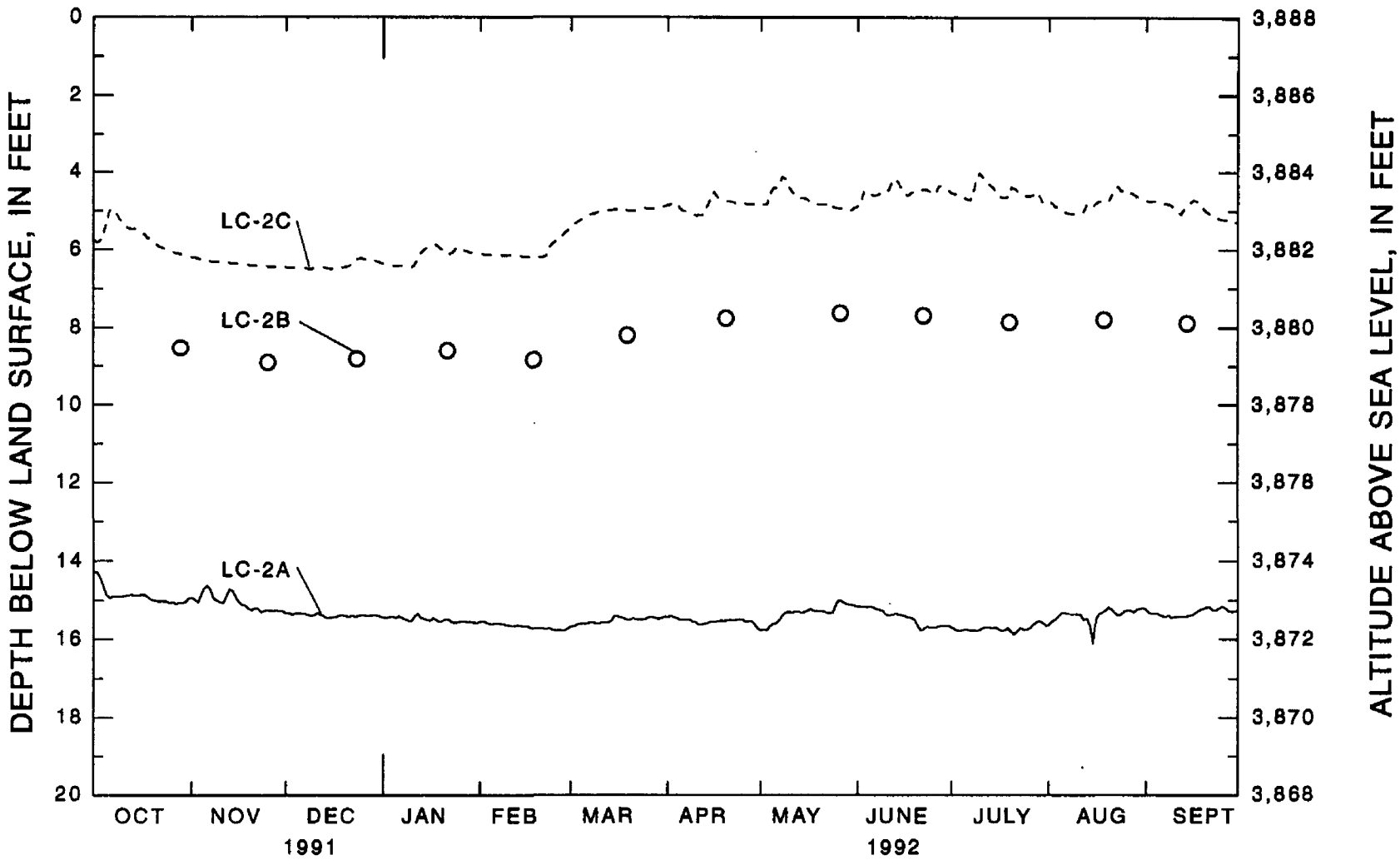


Figure 77.--Mean daily water levels and miscellaneous water levels in well group LC-2, 1992 water year.

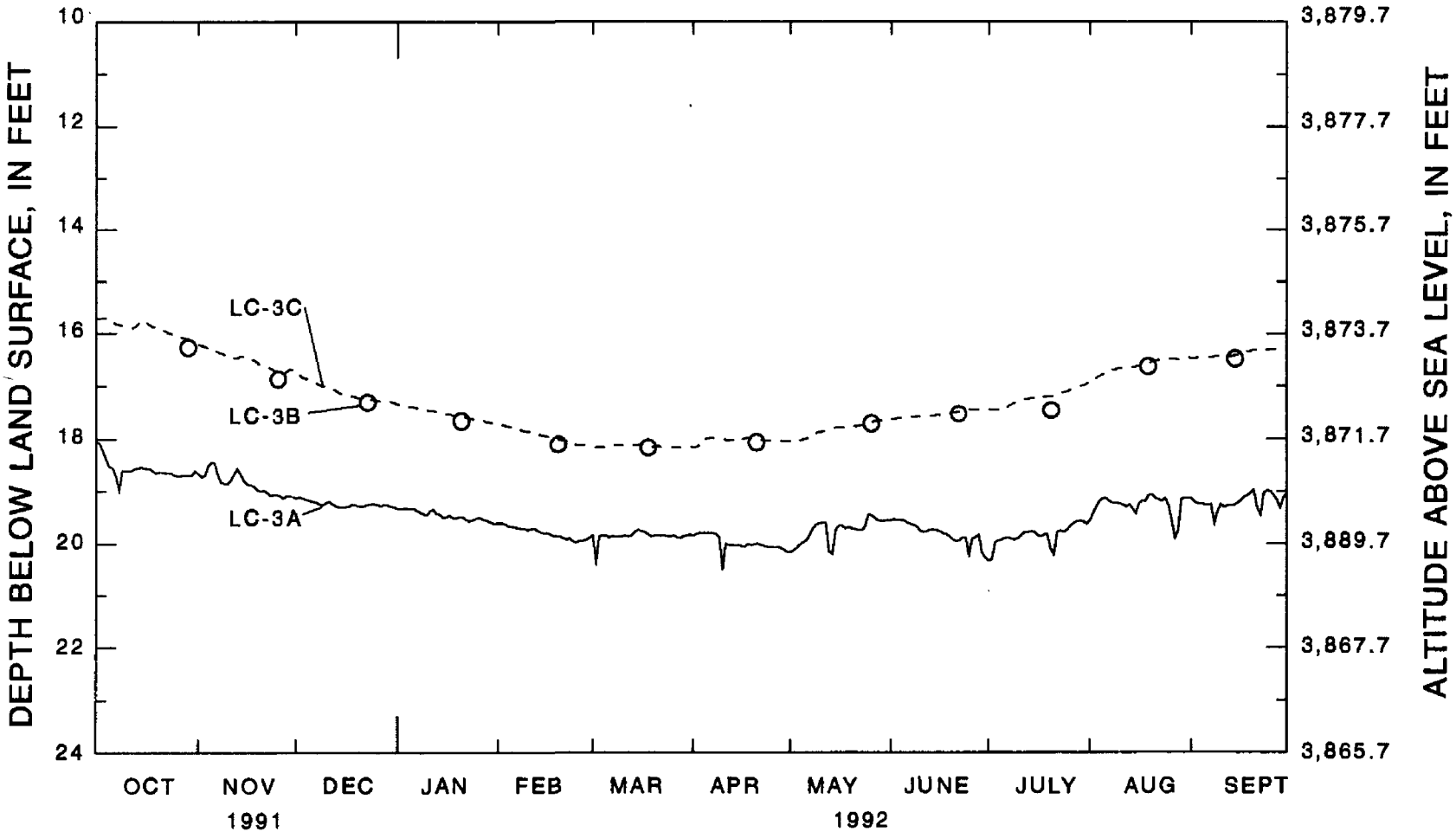


Figure 78.--Mean daily water levels and miscellaneous water levels in well group LC-3, 1992 water year.

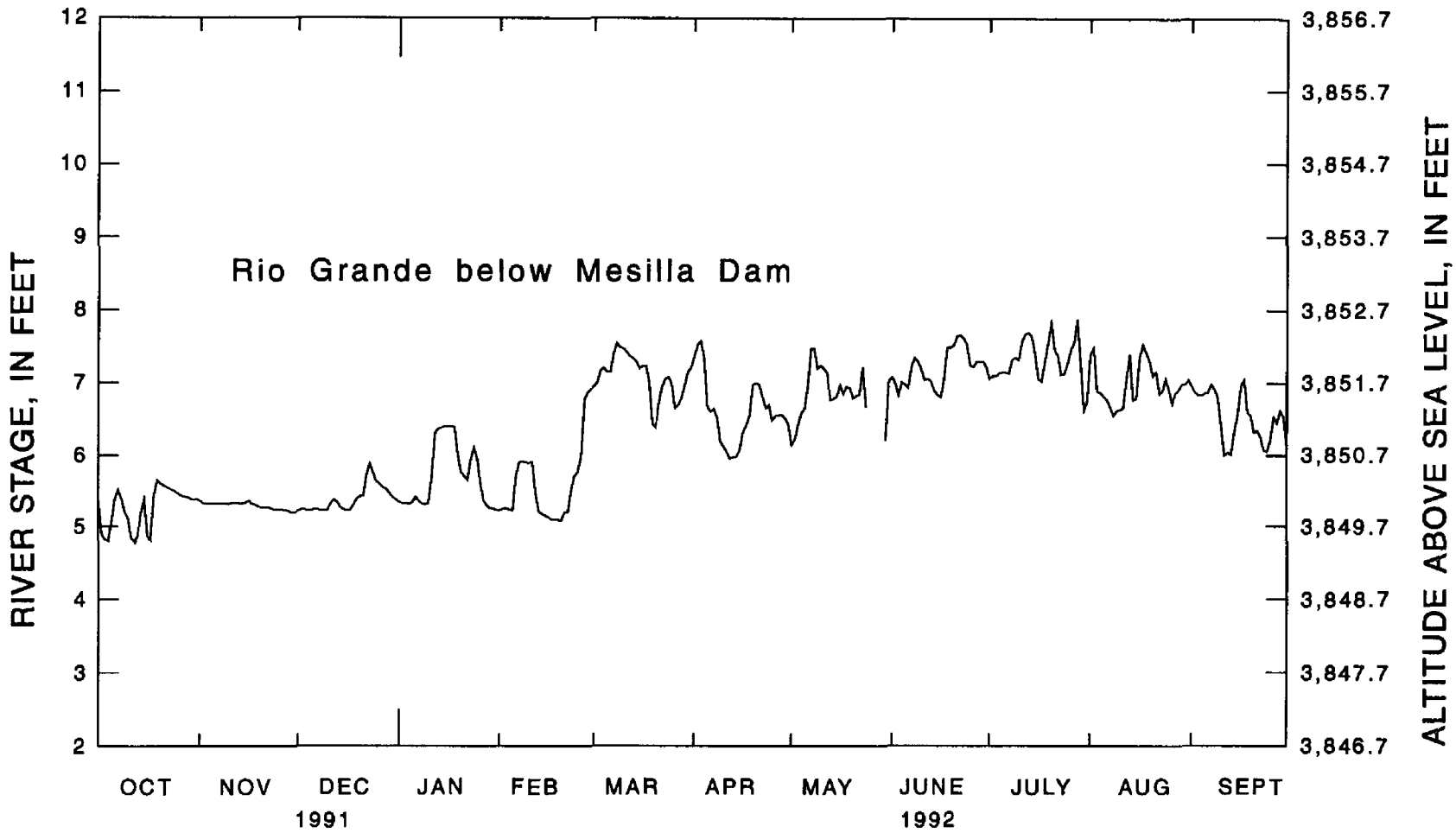


Figure 79.--Mean daily river stage of the Rio Grande below Mesilla Dam, 1992 water year.

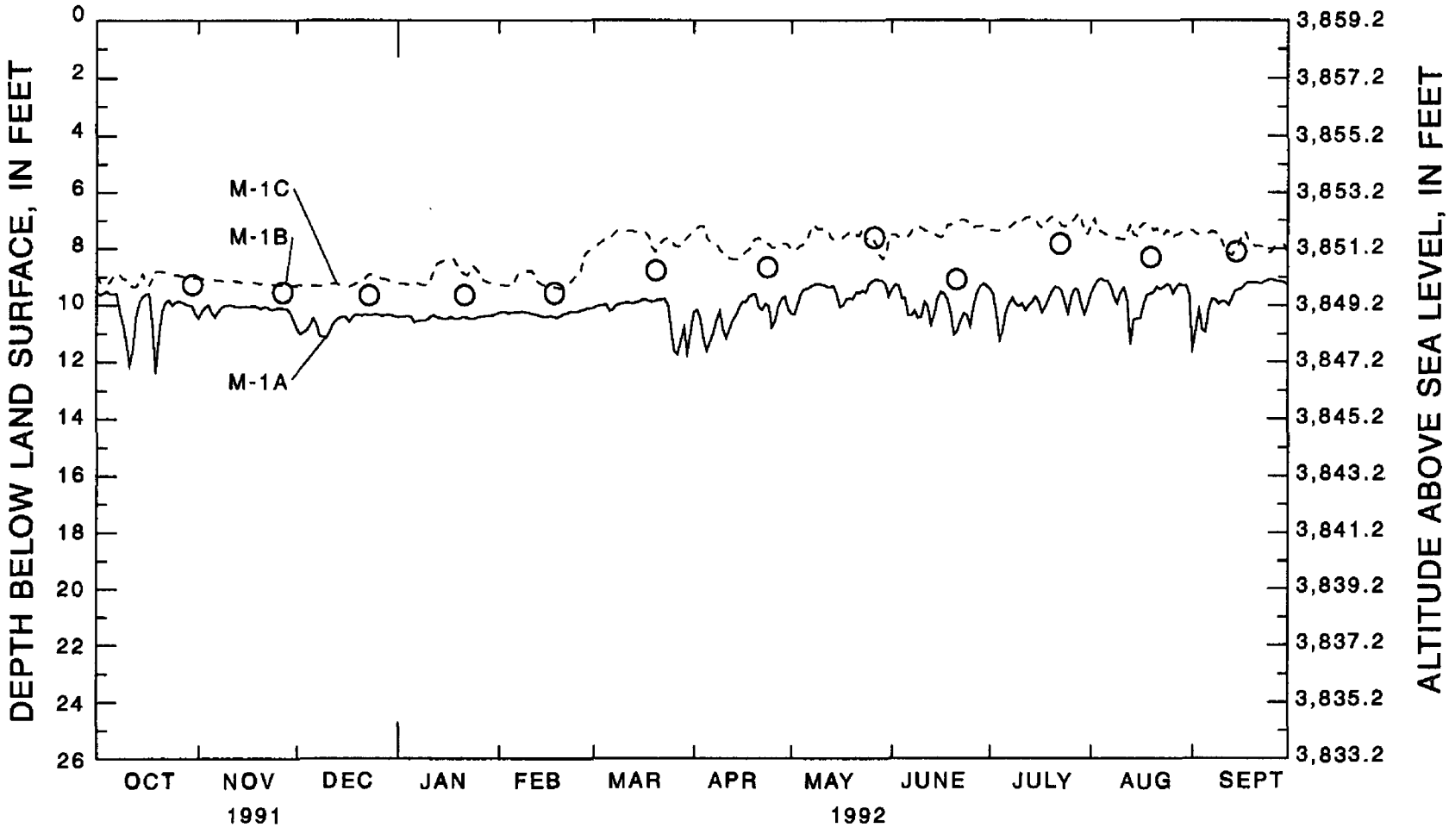


Figure 80.--Mean daily water levels and miscellaneous water levels in well group M-1, 1992 water year.

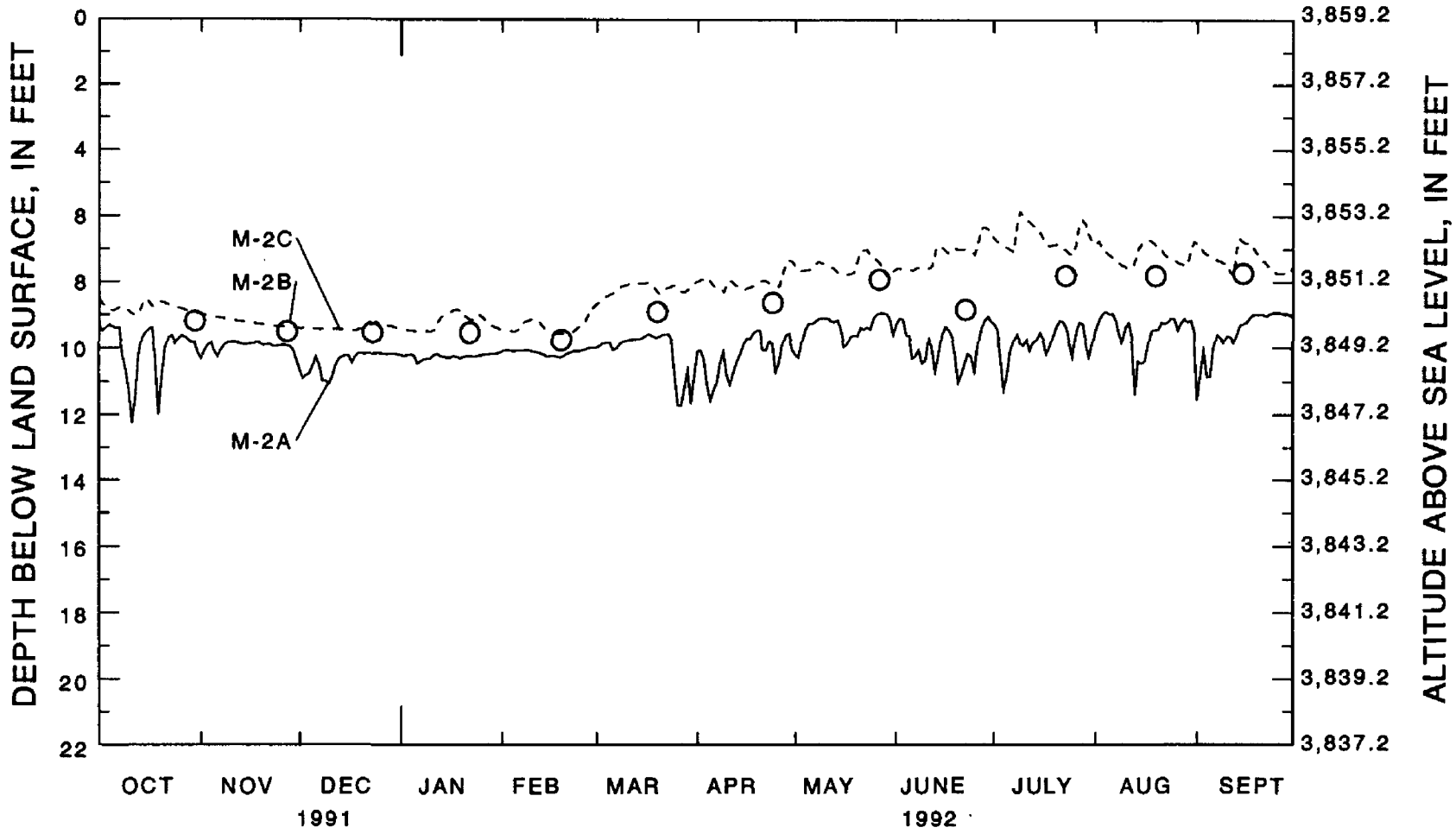


Figure 81.--Mean daily water levels and miscellaneous water levels in well group M-2, 1992 water year.

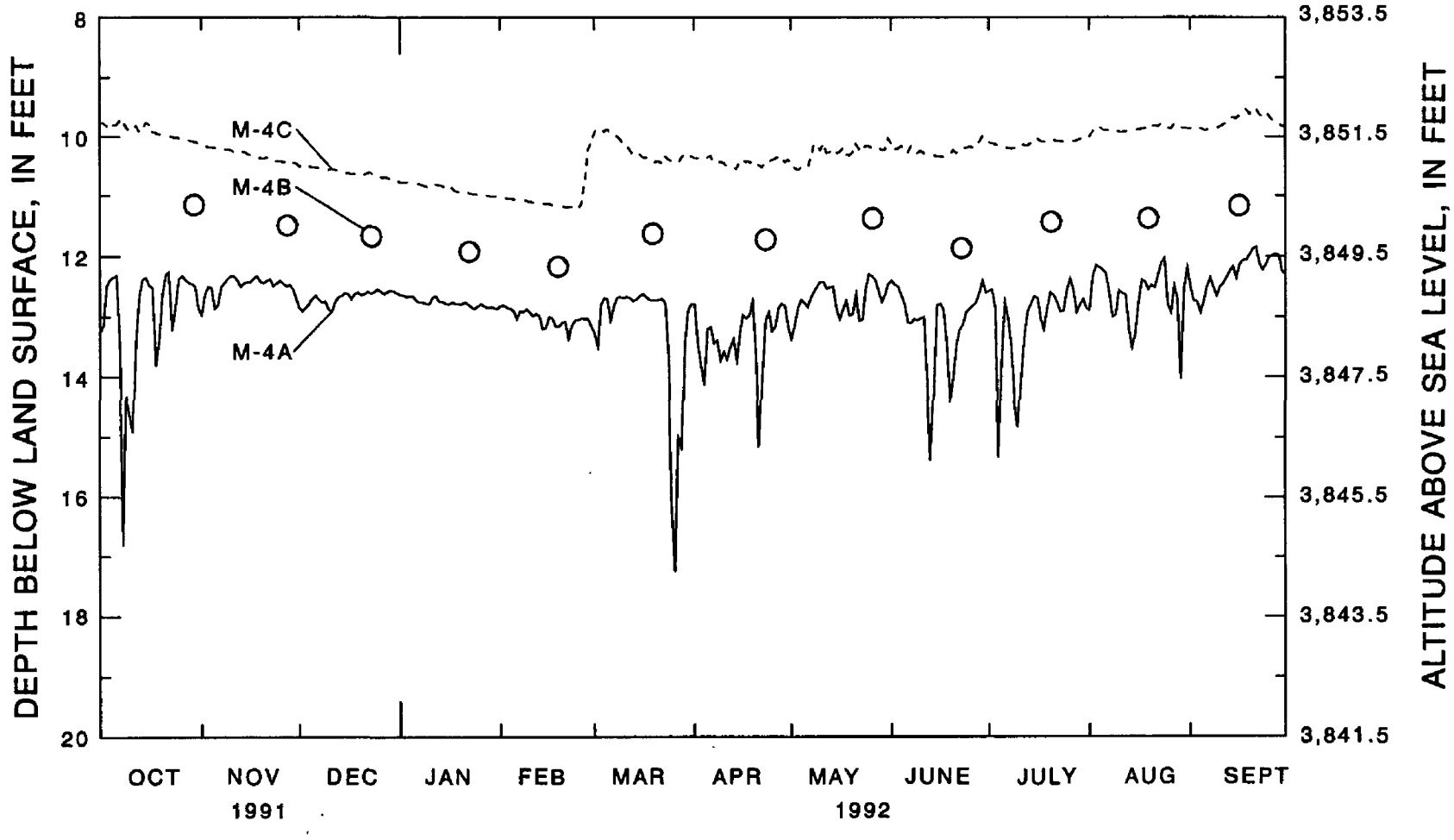


Figure 82.--Mean daily water levels and miscellaneous water levels in well group M-4, 1992 water year.

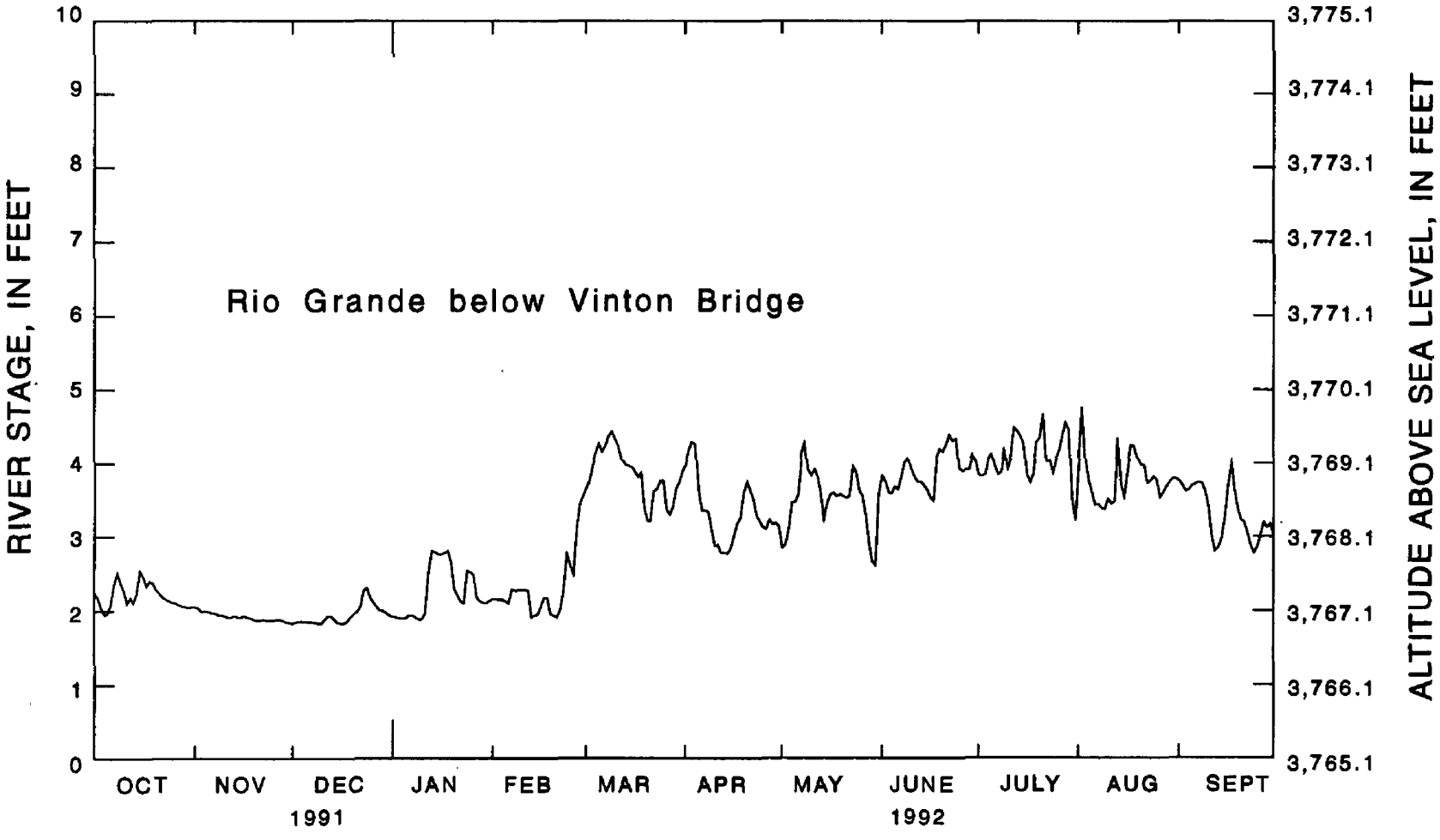


Figure 83.--Mean daily river stage of the Rio Grande below Vinton Bridge, 1992 water year.

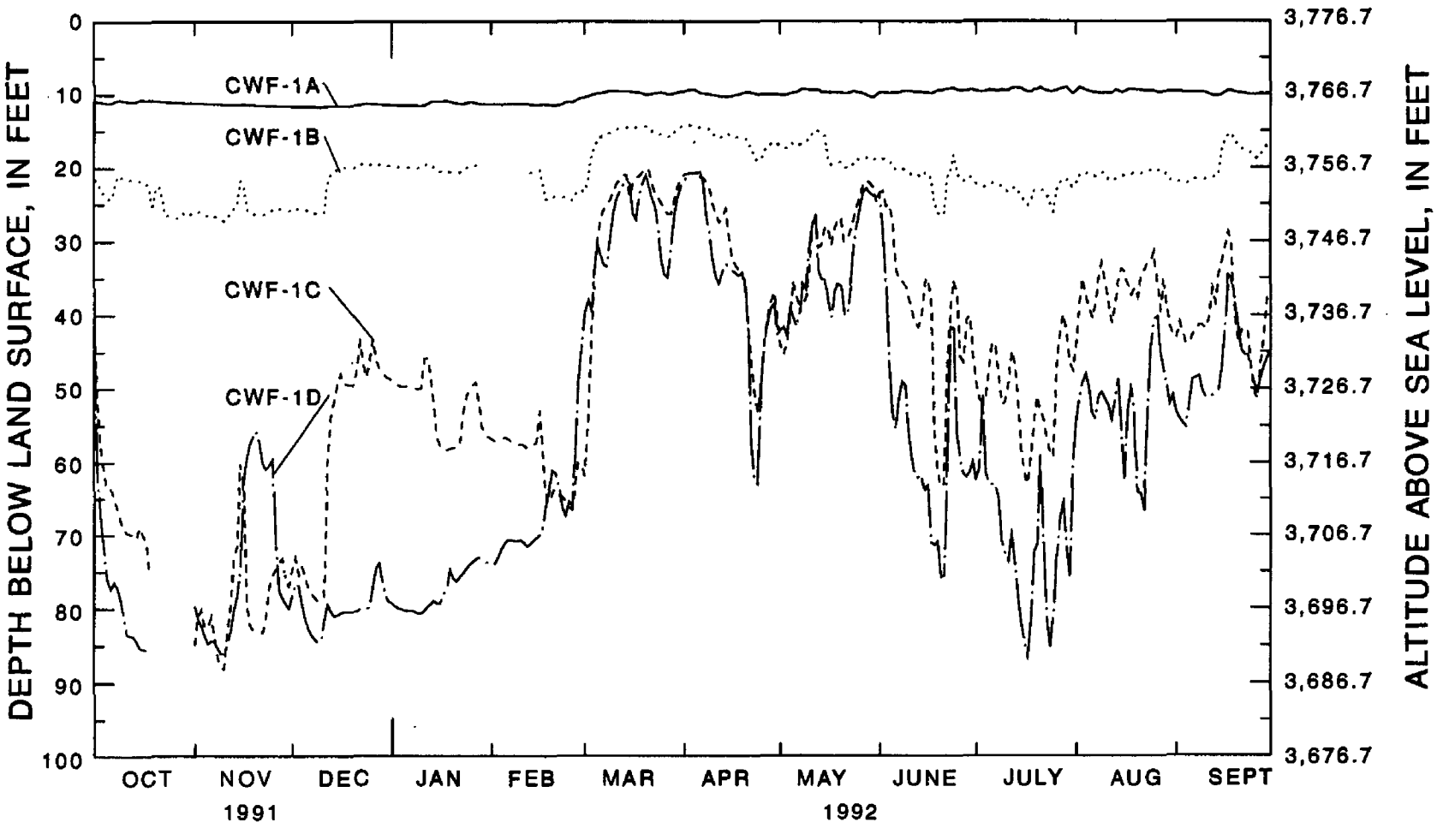


Figure 84.--Mean daily water levels in well group CWF-1, 1992 water year.

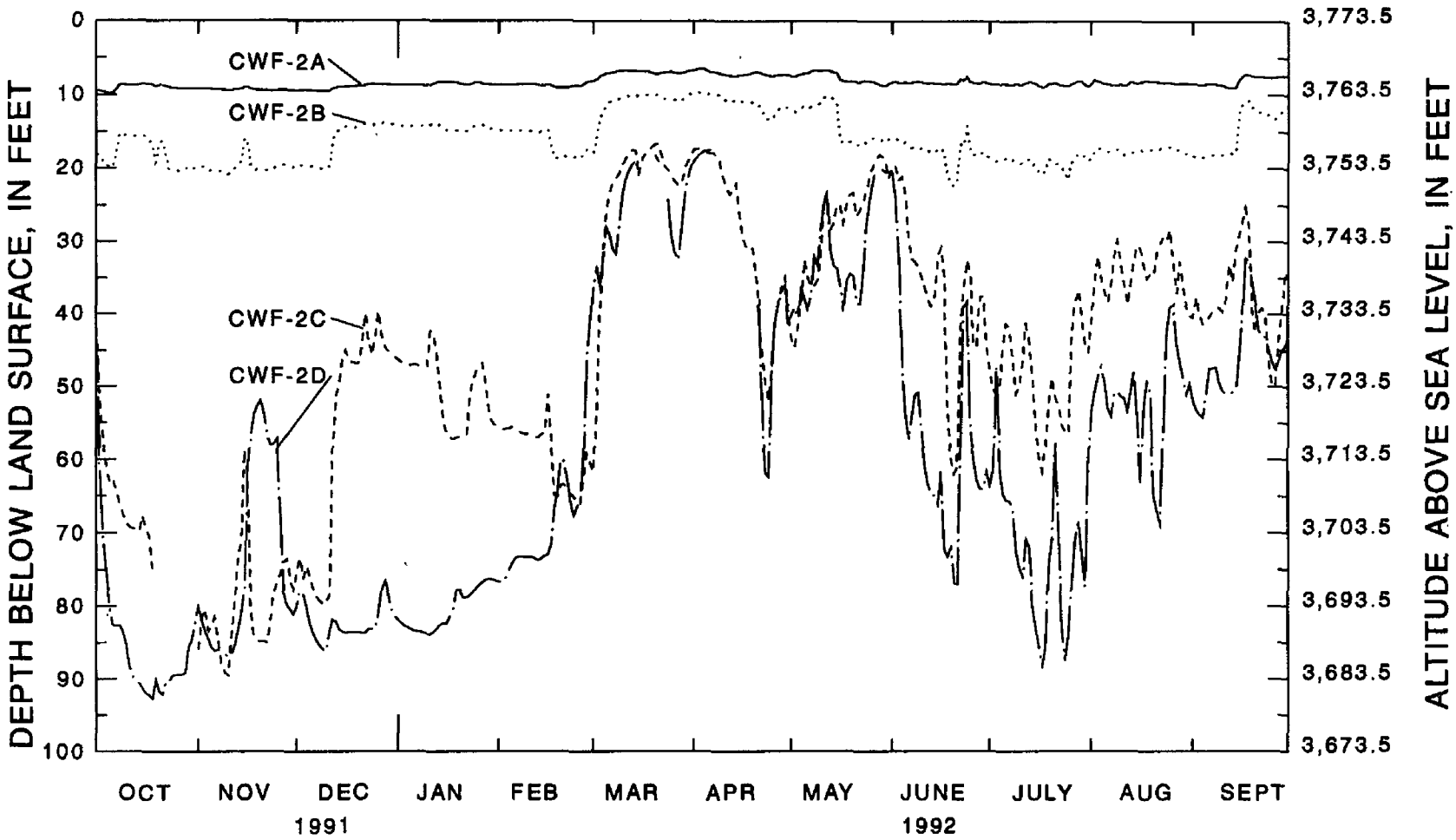


Figure 85.--Mean daily water levels in well group CWF-2, 1992 water year.

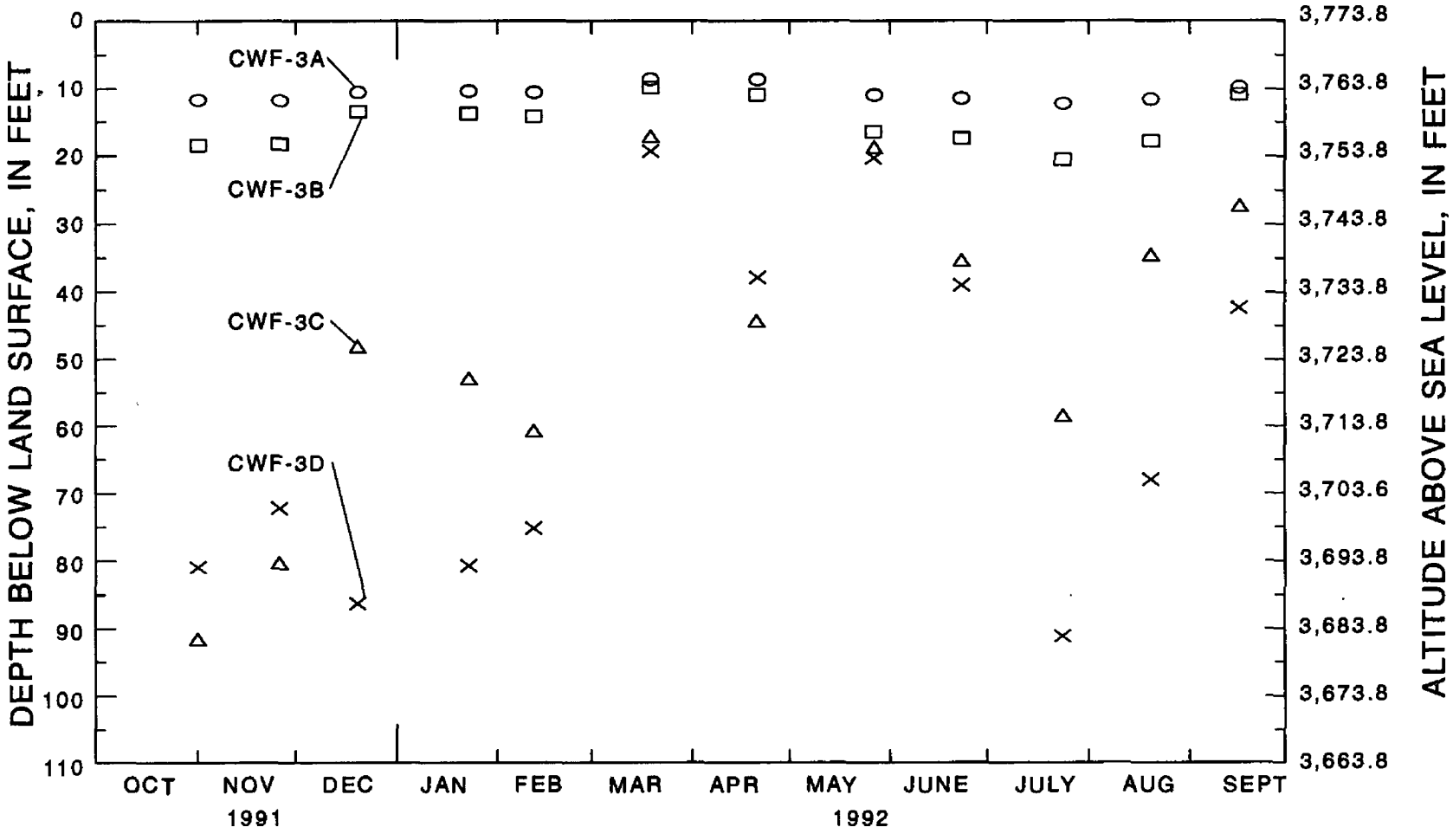


Figure 86.--Miscellaneous water levels in well group CWF-3, 1992 water year.

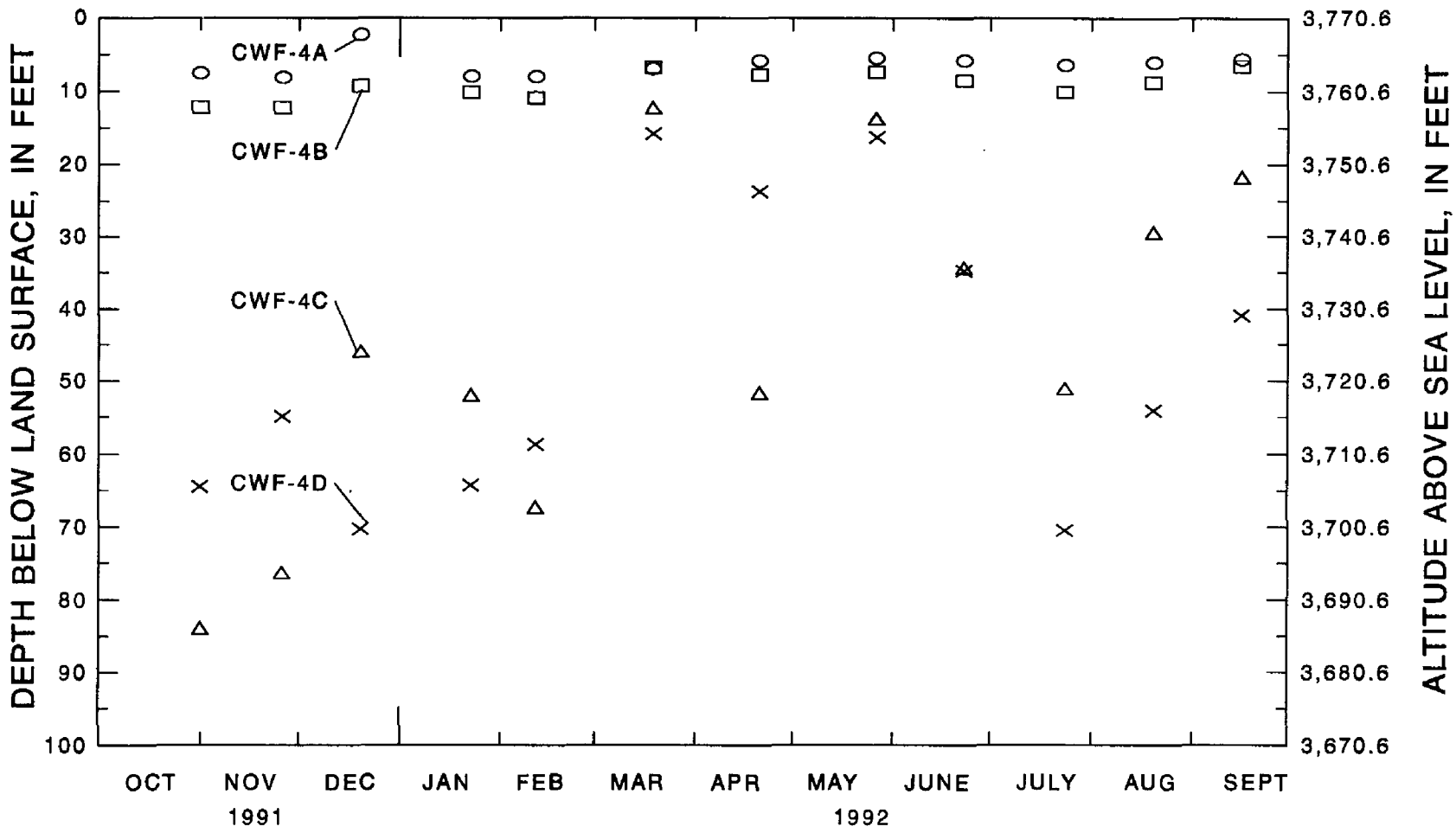


Figure 87.--Miscellaneous water levels in well group CWF-4, 1992 water year.

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Table 1.--Records of selected wells in the Mesilla ground-water basin

[Main geologic unit: AVMB, flood-plain alluvium; SNTF, Santa Fe Group. Depth of well: R, reported. Altitude: datum is sea level. Water level: P, pumping; RP, recently pumped; NP, nearby pumping. Use of water: H, domestic; I, irrigation; M, municipal supply; S, stock; U, unused. Remarks: OWN, other well numbers or names; USBR, Bureau of Reclamation; CLC, City of Las Cruces; NMSU, New Mexico State University; EBID, Elephant Butte Irrigation District; SI, screened interval; QW, chemical analysis available; WL, additional water-level measurements available; RW, replaced well casing--new depth of well and construction date; -- indicates no data. Well locations shown in figure 4]

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
1	21S.1W.14.313	AVMB	28.5	3,960	11.04	08-31-89	U	OWN: USBR-41; SI:26.5-28.5
					14.4	02-02-90		
					14.8	02-07-91		
					13.9	02-10-92		
2	21S.1W.24.214	AVMB	28.6	3,950	11.36	08-31-89	U	OWN: USBR-42; SI: 26.6-28.6
					15.2	02-02-90		
					15.1	02-07-91		
3	22S.1W.19.332	SNTF	250	4,460	156.08	01-23-84	U	--
					158.62	02-26-85		
					160.50	03-20-86		
					161.82	02-09-87		
					163.26	02-08-8		
					163.57	02-13-89		
					165.63	01-29-90		
					166.6	02-14-91		
					167.28	01-23-92		
4	22S.1E.06.124	AVMB	28.2	3,935	8.81	08-31-89	U	OWN: USBR-43; SI: 26.2-28.2
					10.7	02-05-90		
					10.9	02-07-91		
					10.5	02-10-92		
5	22S.1E.09.241a	AVMB	23.4	3,930.1	7.7	02-01-84	U	OWN: USBR-26; QW; WL; RW: 28.4, 05-02-89
					9.3	02-01-85		
					8.6	02-01-86		
					7.2	02-01-87		
					10.8	02-06-90		
					11.4	02-07-91		
					11.4	02-10-92		
6	22S.1E.09.333	AVMB	--	3,928.1	6.9	02-01-84	U	OWN: USBR-20; QW; WL
					7.7	02-01-85		
					6.9	02-01-86		
					7.0	02-01-87		
					7.7	02-01-88		
					8.0	02-02-89		
					8.2	02-06-90		
					8.1	02-07-91		
					7.5	02-10-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin—Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
7	22S.1E.16.433	AVMB	--	3,923.4	9.4	02-01-84	U	OWN: USBR-19; QW; WL
					9.2	02-01-85		
					8.5	02-01-86		
					8.2	02-01-87		
					9.3	02-01-88		
					9.2	02-02-89		
					8.9	02-06-90		
					9.2	02-07-91		
					9.2	02-10-92		
8	22S.1E.33.341	AVMB	--	3,906.4	7.9	02-01-84	U	OWN: USBR-15; QW; WL
					8.0	02-01-85		
					6.7	02-01-86		
					6.5	02-01-87		
					8.7	02-01-88		
					8.1	02-21-89		
					8.0	02-06-90		
					8.3	02-01-91		
					8.1	02-13-92		
9	22S.1E.35.334	AVMB	--	3,909.9	13.9	02-01-84	U	OWN: USBR-18; QW; WL; RW: 30.0, 05-02-89
					14.0	02-01-85		
					13.3	02-01-86		
					12.9	02-01-87		
					13.1	02-01-88		
					13.0	02-02-89		
					13.6	02-06-90		
					14.1	02-01-91		
					14.0	02-10-92		
10	22S.1E.35.334b	AVMB	--	3,909.6	15.0	02-01-84	U	OWN: USBR-17; QW; WL
					15.9	02-01-85		
					15.4	02-01-86		
					13.9	02-01-87		
					15.4	02-01-88		
					15.0	02-02-89		
					15.9	02-06-90		
					16.4	02-01-91		
					16.2	02-10-92		
11	22S.2E.31.444	SNTF	596	4,068	229.48	01-15-92	M	OWN: CLC-23; SI: 456-596; WL
12	23S.1W.25.444	SNTF	380	4,197	329.70	02-22-84	U	SI: 330-380; WL
					327.11	02-01-85		
					327.62	02-10-87		
					327.69	02-02-88		
					327.82	02-13-89		
					327.40	01-30-90		
					327.75	02-15-91		
					327.9	03-25-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin—Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
13	23S.2W.01.422	SNTF	--	4,460	200.58	02-23-83	U	--
					212.38	01-23-84		
					215.37	02-27-85		
					210.75	02-13-89		
					211.37	01-29-90		
					204.9	01-14-91		
					203.6	01-23-92		
14	23S.2W.12.122	SNTF	--	4,463	175.1	01-23-84	U	--
					217.34	02-27-85		
					219.83	03-20-86		
					215.2	02-09-87		
					214.9	02-08-88		
					219.72	02-13-89		
					206.57	02-14-91		
					205.17	01-23-92		
15	23S.2W.12.341	SNTF	--	4,429	213.10	01-23-84	I	OWN: 23S.02W.13.311; QW; WL
					199.5	02-27-85		
					202.08	03-20-86		
					201.35	02-09-87		
					197.9	02-08-88		
					192.93	02-13-89		
					188.9	01-29-90		
					188.47	02-14-91		
					187.63	01-23-92		
16	23S.2W.13.134	SNTF	--	4,431	182.85	01-23-84	--	--
					185.62	02-27-85		
					188.04	03-20-86		
					183.43	02-09-87		
					180.97	02-08-88		
					178.9	02-13-89		
					175.37	01-29-90		
					174.97	02-14-91		
					179.92	01-23-92		
17	23S.1E.01.411	SNTF	605	3,905	51.58	07-16-91	M	OWN: CLC-33; SI: 400-600
					47.72	01-15-92		
18	23S.1E.01.413	AVMB	28.5	3,900	19.48	08-31-89	U	OWN: USBR-44; SI: 26.5-28.5
					20.8	02-02-90		
					21.4	02-01-91		
					21.6	02-06-92		
19	23S.1E.09.433	AVMB	--	3,894.7	8.3	02-01-84	U	OWN: USBR-16; QW; WL
					9.2	02-01-85		
					8.5	02-01-88		
					7.9	02-02-89		
					8.7	02-06-90		
					9.0	02-01-91		
					9.5	02-13-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin—Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
20	23S.1E.11.214a	SNTF	617	3,903	11.63 11.77	07-16-91 01-15-92	M	OWN: CLC-31; SI: 465-617
21	23S.1E.13.411b	SNTF	629	3,890	P	01-15-92	M	OWN: CLC-29; SI: 429-629; WL
22	23S.1E.14.241	AVMB	28.3	3,890	15.51 16.3 17.3 17.6	08-30-89 02-02-90 02-01-91 02-13-92	U	OWN: USBR-45; SI: 26.3-28.3
23	23S.1E.16.424	AVMB	--	3,865.7	13.4 14.4 13.4 13.6 13.9 13.9 13.4 13.3 13.8 13.7	02-01-84 02-01-85 02-01-86 02-01-87 02-01-88 02-01-89 02-06-89 02-02-90 02-01-91 02-13-92	U	OWN: USBR-12; QW; WL
24	23S.1E.22.232a	SNTF	305	3,888.6	7.91 8.09 7.55	01-16-85 02-06-91 01-21-92	U	OWN: LC-1A; SI: 295-300; QW; WL
25	23S.1E.22.232b	SNTF	105	3,888.6	5.88 6.31 5.8	01-16-85 02-06-91 01-21-92	U	OWN: LC-1B; SI: 95-100; QW; WL
26	23S.1E.22.232c	AVMB	41	3,888.6	6.34 6.18 5.68	01-17-85 02-06-91 01-21-92	U	OWN: LC-1C; SI: 31-36; QW; WL
27	23S.1E.22.241a	SNTF	310	3,888.0	16.23 15.68 15.48	01-17-85 02-06-91 01-21-92	U	OWN: LC-2A; SI: 300-305; QW; WL
28	23S.1E.22.241b	SNTF	110	3,888.0	9.92 9.35 8.94	01-17-85 02-06-91 01-21-92	U	OWN: LC-2B; SI: 100-105; QW; WL
29	23S.1E.22.241c	AVMB	40	3,888.0	6.44 6.68 6.09	01-17-85 02-06-91 01-21-92	U	OWN: LC-2C; SI: 30-35; QW; WL

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
30	23S.1E.23.244a	SNTF	332	3,889.7	22.26 19.71 19.49	03-06-85 02-06-91 01-21-92	U	OWN: LC-3A; SI: 322-327; QW; WL
31	23S.1E.23.244b	SNTF	120	3,889.7	21.32 18.13 17.72	03-06-85 02-06-91 01-21-92	U	OWN: LC-3B; SI: 110-115; QW; WL
32	23S.1E.23.244c	AVMB	50	3,889.7	21.20 17.99 17.58	03-06-85 02-06-91 01-21-92	U	OWN: LC-3C; SI: 40-45; QW; WL
33	23S.1E.27.334	AVMB	--	3,882.3	6.3 6.2 5.4 5.4 6.3 6.3 6.0 6.0 5.8	02-01-84 02-01-85 02-01-86 02-01-87 02-01-88 02-06-89 02-02-90 02-01-91 02-13-92	U	OWN: USBR-11; QW; WL
34	23S.2E.05.342	SNTF	751	4,063	236.79 222.88	07-16-91 01-15-92	M	OWN: CLC-28; SI: 420-751; WL
35	23S.2E.07.122	SNTF	360	3,944	96.51 88.35	07-16-91 01-15-92	U	OWN: CLC-11; SI: 213-360; WL
36	23S.2E.07.411	SNTF	381	3,935	73.84	01-15-92	M	OWN: CLC-10; SI: 281-381; WL
37	23S.2E.08.443	SNTF	730	4,047	223.45	01-15-92	M	OWN: CLC-27; SI: 457-730; WL
38	23S.2E.16.314	SNTF	591	4,025	P	01-15-92	M	OWN: CLC-24; SI: 381-591; WL
39	23S.2E.17.243	SNTF	700	4,013	187.72 176.39	07-16-91 01-15-92	M	OWN: CLC-26; SI: 410-510, 600-700; WL
40	23S.2E.18.441	SNTF	700	3,890	51.79	01-15-92	M	OWN: CLC-32; SI: 456-552, 592-696
41	23S.2E.20.322	SNTF	685	3,880	P	01-15-92	M	OWN: CLC-35; SI: 320-490, 510-575, 615-685

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
42	23S.2E.21.444	SNTF	507	4,057	208.8	02-02-90	U	OWN: NMSU-4; SI: 350-507
43	23S.2E.28.123	SNTF	665	3,966	120.1	02-02-90	U	OWN: NMSU-3; SI: 590-665
44	23S.2E.28.314	SNTF	626	3,954	109.82 100.44 100.18	01-03-89 04-19-91 01-17-92	I	OWN: NMSU-8; SI: 330-626; WL
45	23S.2E.28.333	SNTF	525	3,932	78.72 79.89 78.72	02-14-90 04-19-91 01-17-92	H	OWN: NMSU-9; SI: 310-525
46	23S.2E.29.113	AVMB	29	3,880	16.82 18.4 18.8 19.6	08-30-89 02-06-90 02-01-91 02-13-92	U	OWN: USBR-47; SI: 27-29
47	23S.2E.29.141	SNTF	712	3,882	32.18 44.97	01-03-89 01-17-92	H	OWN: NMSU-14; SI: 323-463, 547-667; WL
48	23S.2E.29.243a	SNTF	485	3,903	61.64 69.29 63.40	01-03-89 04-19-91 01-17-92	U	OWN: NMSU-2; SI: 362-485; WL
49	23S.2E.29.331	SNTF	470	3,875	P	01-15-92	M	OWN: CLC-30; SI: 249-323, 338-458; WL
50	23S.2E.29.441	SNTF	766	3,912	73.76 68.09	02-14-90 01-17-92	H	OWN: NMSU-10; SI: 316-766
51	24S.1W.22.121	SNTF	--	4,230	353.25 353.85 353.33 356.20 356.7 358.6	01-24-83 02-28-85 03-20-86 02-09-88 02-15-89 01-30-90	S	OWN: 24S.01W.22.123; QW; WL
52	24S.2W.36.111	SNTF	--	4,319	332.12 437.4P P 334.15	03-06-85 03-20-86 02-27-89 02-06-90	S	--
53	24S.1E.01.223	AVMB	35	3,880	13.92 15.5 16.3 16.6	08-30-89 02-06-90 02-07-91 02-13-92	U	OWN: USBR-46; SI: 33-35

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
54	24S.1E.11.112	AVMB	28.2	3,870	4.77 6.1 6.3 6.1	08-30-89 02-02-90 02-01-91 02-13-92	U	OWN: USBR-48; SI: 26.2-28.2
55	24S.1E.13.221a	SNTF	370	3,863	9.52 8.94 8.44 8.91 8.77 9.56 9.57 8.94	02-01-85 02-06-86 02-09-87 02-02-88 02-13-89 02-08-90 02-18-91 01-16-92	U	OWN: EBID-5; SI: 145-370; QW; WL
56	24S.2E.07.231	SNTF	460	3,870	15.55 14.51 13.52	02-01-85 02-10-86 02-09-87	U	OWN: EBID-2; SI: 180-460; WL
57	24S.2E.07.234	SNTF	310	3,871	17.88 16.83 15.86	02-01-85 02-10-86 02-09-87	U	SI: 305-310; QW; WL
58	24S.2E.07.234a	SNTF	125	3,871	17.26 15.88 14.78	02-01-85 02-10-86 02-09-87	U	SI: 120-125; QW; WL
59	24S.2E.07.234b	AVMB	80	3,871	17.16 15.70 14.49	02-01-85 02-10-86 02-09-87	U	SI: 75-80; QW; WL
60	24S.2E.08.434a	AVMB	21	3,862.9	12.4 11.5 9.7 9.0 10.1 9.3	02-01-84 02-01-85 02-01-86 02-01-90 02-08-91 02-20-92	U	OWN: USBR-13; WL; RW: 30.2, 04-21-89
61	24S.2E.09.433	AVMB	--	3,861.9	13.0 12.3 10.8 10.5 9.8 9.6 9.4 10.3 10.1	02-01-84 02-01-85 02-01-86 02-01-87 02-01-88 02-21-89 02-01-90 02-08-91 02-20-92	U	OWN: USBR-14; QW; WL
62	24S.2E.16.124a	SNTF	307	3,861.5	16.68 14.93 14.01 12.81	01-26-84 01-15-85 02-09-91 01-22-92	U	OWN: M-4A; SI: 297-302; QW; WL

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
63	24S.2E.16.124b	SNTF	120	3,861.5	16.09	01-26-84	U	OWN: M-4B; SI: 110-115; QW; WL
					14.40	01-15-85		
					12.98	02-09-91		
					11.98	01-22-92		
64	24S.2E.16.124c	AVMB	40	3,861.5	13.85	01-30-84	U	OWN: M-4C; SI: 30-35; QW; WL
					13.17	01-15-85		
					11.54	02-09-91		
					10.95	01-22-92		
65	24S.2E.17.322	SNTF	464	3,860	14.97	02-01-85	U	OWN: EBID-3; SI: 180-464; QW; WL
					13.23	02-10-86		
					13.68	02-09-87		
					12.95	02-02-88		
					12.96	02-13-89		
					13.95	02-08-90		
					13.94	02-18-91		
					12.89	01-16-92		
66	24S.2E.17.414a	SNTF	312	3,858	11.14	02-01-85	U	SI: 292-297; QW; WL
					10.34	02-10-86		
					11.19	02-09-87		
					9.91	02-02-88		
					10.09	02-13-89		
					11.07	02-08-90		
					10.98	02-18-91		
					9.86	01-16-92		
67	24S.2E.17.414b	SNTF	618	3,858	16.28	02-01-85	U	SI: 612-617; QW; WL
					16.50	02-10-86		
					15.85	02-09-87		
					15.44	02-02-88		
					14.98	02-13-89		
					16.46	02-08-90		
					16.54	02-18-91		
					15.45	01-16-92		
68	24S.2E.17.423a	SNTF	686	3,858	12.26	02-01-84	U	OWN: EBID-1; SI: 310-680; QW; WL
					10.96	02-01-85		
					10.31	02-10-86		
					11.09	02-09-87		
					9.43	02-02-88		
					9.84	02-13-89		
					11.14	02-08-90		
					11.00	02-18-91		
					9.53	01-16-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
69	24S.2E.17.423b	SNTF	610	3,859.8	15.72	02-01-85	U	OWN: M-3B; SI: 591-596; QW; WL
					15.87	02-10-86		
					15.30	02-09-87		
					14.85	02-02-88		
					14.37	02-13-89		
					15.60	02-08-90		
					15.73	02-18-91		
					14.77	01-16-92		
70	24S.2E.17.423c	SNTF	310	3,859.8	11.04	02-01-85	U	OWN: M-3C; SI: 302-307; QW; WL
					10.27	02-10-86		
					11.10	02-09-87		
					9.72	02-02-88		
					9.98	02-13-89		
					10.97	02-08-90		
					10.85	02-18-91		
					9.66	01-16-92		
71	24S.2E.17.423d	SNTF	121	3,859.8	10.28	02-01-85	U	OWN: M-3D; SI: 113-118; QW; WL
					9.24	02-10-86		
					9.42	02-09-87		
					9.33	02-02-88		
					9.30	02-13-89		
					9.74	02-08-90		
					10.15	02-18-91		
					9.20	01-16-92		
72	24S.2E.17.423e	AVMB	35	3,859.8	9.95	02-01-85	U	OWN: M-3E; SI: 30-35; QW; WL
					8.42	02-10-86		
					8.66	02-09-87		
					9.20	02-02-88		
					9.06	02-13-89		
					9.38	02-08-90		
					9.89	02-18-91		
					9.06	01-16-92		
73	24S.2E.19.214a	SNTF	320	3,859.2	10.45	12-01-83	U	OWN: M-1A; SI: 310-315; QW; WL
					10.96	01-15-85		
					11.97	02-09-91		
					10.43	01-22-92		
74	24S.2E.19.214b	SNTF	125	3,859.2	9.95	12-01-83	U	OWN: M-1B; SI: 115-120; QW; WL
					9.91	01-15-85		
					11.09	02-09-91		
					9.88	01-22-92		
75	24S.2E.19.214c	AVMB	45	3,859.2	6.17	12-01-83	U	OWN: M-1C; SI: 35-40; QW; WL
					6.42	01-15-85		
					9.67	02-09-91		
					8.94	01-22-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
76	24S.2E.19.223a	SNTF	319	3,859.2	10.59	01-15-85	U	OWN: M-2A; SI:
					11.74	02-09-91		309-314; QW; WL
77	24S.2E.19.223b	SNTF	120	3,859.2	9.28	01-15-85	U	OWN: M-2B; SI:
					10.79	02-09-91		110-115; QW; WL
					9.66	01-22-92		
78	24S.2E.19.223c	AVMB	50	3,859.2	6.61	01-15-85	U	OWN: M-2C; SI:
					9.87	02-09-91		40-45; QW; WL
					9.16	01-22-92		
79	24S.2E.21.123	SNTF	480	3,855	12.73	02-01-85	U	OWN: EBID-4; SI:
					9.82	02-08-86		170-480; QW; WL
					10.66	02-13-89		
					10.86	02-18-91		
					9.75	01-16-92		
80	24S.2E.22.242	AVMB	19	3,851.4	10.1	02-01-84	U	OWN: USBR-10; WL;
					9.8	02-01-85		RW: 30.5, 04-24-89
					9.0	02-01-86		
					8.3	02-01-87		
					7.9	02-01-88		
					7.8	02-09-89		
					8.0	02-01-90		
					8.5	02-08-91		
					8.5	02-10-92		
81	24S.2E.23.342	AVMB	20.7	3,848.6	10.9	02-01-84	U	OWN: USBR-9; QW; WL;
					11.3	02-01-85		RW: 30.6, 04-24-89
					9.0	02-01-86		
					8.9	02-01-90		
					9.6	02-08-91		
					9.6	02-20-92		
82	24S.2E.28.334	AVMB	--	3,850.5	11.8	02-01-84	U	OWN: USBR-8;
					10.7	02-01-85		WL
					10.4	02-01-86		
					9.9	02-01-87		
					10.7	02-01-88		
					9.2	02-03-89		
					10.7	02-01-90		
					11.5	02-07-91		
					12.1	02-25-92		
83	25S.2W.05.133	SNTF	--	4,432	120.11	03-06-85	S	OWN: 25S.02W.05.134;
					119.52	03-20-86		WL
					117.65	02-10-87		
					116.70	02-09-88		
					115.95	02-15-89		
					115.76	02-06-90		
					114.53	02-15-91		
					114.0	01-27-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
84	25S.2W.30.324	SNTF	--	4,288	219.98	02-16-84	H	--
					218.85	02-27-85		
					216.15	03-21-86		
					215.74	02-11-87		
					215.44	02-10-88		
					216.87	02-27-89		
					214.76	02-13-90		
					214.82	02-15-91		
					213.2	02-03-92		
85	25S.3W.02.214	SNTF	527R	4,499	404.18	01-24-84	S	WL
					392.62	02-27-85		
					387.75	03-02-87		
					387.90	02-09-88		
					386.28	02-15-89		
					385.30	02-06-90		
					384.80	02-15-91		
					384.3	01-27-92		
86	25S.1E.06.331	SNTF	400R	4,210	368.30	09-22-83	U	--
					368.24	02-20-85		
					367.60	03-21-86		
					368.43	02-10-87		
					368.50	02-09-88		
					368.45	02-15-89		
					368.5	02-06-90		
					366.42	02-15-91		
					368.52	01-27-92		
87	25S.1E.06.333	SNTF	680	4,209	366.52	06-20-86	U	OWN: Afton test hole;
					366.08	02-10-87		SI: 665-675; QW
					371.20	02-09-88		
					369.15	02-15-89		
					367.55	02-06-90		
					368.45	02-15-91		
					366.0	01-27-92		
88	25S.1E.16.111	SNTF	1,650	4,190	352.82	01-24-84	U	OWN: 25S.01E.16.114;
					352.85	02-27-85		WL
					352.48	02-04-87		
					352.00	02-09-88		
					352.64	02-17-89		
					352.35	02-06-90		
					352.80	02-07-91		
					352.1	03-25-92		
89	25S.1E.19.424a	SNTF	--	4,154	323.93	01-24-84	S	--
90	25S.1E.19.424b	SNTF	--	4,154	307.01	02-28-85	S	--
					309.78	03-21-86		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
91	25S.2E.01.411	AVMB	12.27	3,835.3	8.3	02-01-84	U	OWN: USBR-25; QW; WL
					9.3	02-01-85		
					7.5	02-01-86		
					7.5	02-01-87		
					7.1	02-01-88		
					7.6	02-09-89		
					---	Silted		
92	25S.2E.04.114	AVMB	--	3,847	12.7	02-01-84	U	OWN: USBR-7; QW; WL
					11.5	02-01-85		
					12.1	02-01-86		
					12.4	02-01-87		
					12.0	02-01-88		
					11.3	02-02-89		
					12.0	02-01-90		
					12.0	02-07-91		
					12.2	02-10-92		
93	25S.2E.23.212	AVMB	--	3,828.6	9.1	02-01-84	U	OWN: USBR-6; WL
					8.9	02-01-85		
					8.7	02-01-86		
					8.8	02-01-87		
					8.8	02-01-88		
					8.5	02-02-89		
					8.6	02-01-90		
					8.7	02-07-91		
					8.8	02-25-92		
94	25S.2E.25.322	AVMB	21	3,821.3	9.3	02-01-84	U	OWN: USBR-5; QW; WL; RW: 21.2, 04-21-89
					10.4	02-01-85		
					9.2	02-01-86		
					9.7	02-01-87		
					9.6	02-01-88		
					9.6	02-02-89		
					9.8	02-01-90		
					9.9	02-07-91		
					10.4	02-25-92		
95	25S.2E.28.222b	SNTF	120	3,922	104.60	02-16-84	S	WL
					103.97	01-09-85		
					103.85	02-13-87		
					103.74	02-02-88		
					103.70	02-14-89		
					103.72	02-12-90		
					103.90	02-19-91		
					103.68	02-24-92		
96	25S.2E.31.312a	SNTF	--	4,171	356.73	03-21-86	U	--
					355.16	02-13-87		
					355.13	02-04-88		
					354.85	02-14-89		
					354.76	02-12-90		
					355.09	02-19-91		
					354.98	03-25-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
97	25S.2E.31.312b	SNTF	1,000R	4,171	349.77	02-19-85	S	--
98	25S.3E.20.421	AVMB	--	3,818.9	7.6	02-01-84	U	OWN: USBR-24; QW; WL
					7.9	02-01-85		
					6.6	02-01-86		
					6.8	02-01-87		
					7.2	02-01-88		
					7.1	02-09-89		
					7.2	02-01-90		
					6.9	02-01-91		
					6.8	02-19-92		
99	25S.3E.28.343a	AVMB	--	3,814.6	8.4	02-01-84	U	OWN: USBR-27; WL
					9.2	02-01-85		
					7.8	02-01-86		
					8.3	02-01-87		
					8.5	02-01-88		
					8.4	02-06-89		
					8.4	02-02-90		
					8.6	02-01-91		
					8.4	02-19-92		
100	25S.3E.31.143	AVMB	--	3,814.3	7.6	02-01-84	U	OWN: USBR-4; WL
					7.4	02-01-85		
					7.3	02-01-86		
					7.6	02-01-87		
					7.6	02-01-88		
					7.7	02-02-89		
					7.5	02-01-90		
					7.8	02-01-91		
					7.6	02-19-92		
101	26S.1W.04.412	SNTF	445	4,211	414.19P	01-24-84	S	OWN: 26S.01W.04.322
					384.85	02-27-85		
102	26S.1W.16.334	SNTF	1,000R	4,210	388.75	02-27-85	S	--
					P	02-27-89		
					386.40	02-22-90		
103	26S.1W.25.412b	SNTF	--	4,194	375.42	03-26-86	U	--
					375.32	02-12-87		
					375.38	02-03-88		
					375.62	02-15-89		
					375.26	02-13-90		
					375.58	02-20-91		
104	26S.2W.15.434	SNTF	437R	4,250	409.17	02-27-85	S	QW
					409.90	03-24-86		
					408.41	02-11-87		
					409.10	02-10-88		
					408.85	02-27-89		
					409.05	02-13-90		
					409.24	02-15-91		
					409.0	02-03-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
105	26S.3W.25.443	SNTF	800	4,333	489.58	03-07-85	S	--
					488.00	03-21-86		
					P	02-27-89		
					P	02-13-90		
					P	02-03-92		
106	26S.1E.18.222a	SNTF	430	4,213	394.40	02-16-84	S	QW; WL
107	26S.1E.18.222b	SNTF	600R	4,213	393.1	02-28-85	H,S	--
					393.5	03-21-86		
					393.16	02-10-87		
					393.18	02-04-88		
					393.3	02-15-89		
					393.5	02-22-90		
					393.4	02-07-91		
					393.4	01-27-92		
108	26S.1E.35.332	SNTF	500R	4,158	358.39	03-05-85	U	OWN: 26S.01E.35.333;
					358.40	03-26-86		WL
					363.99	02-12-87		
					358.38	02-03-88		
					358.56	02-15-89		
					358.55	02-13-90		
					358.69	02-20-91		
					358.63	02-24-92		
109	26S.2E.01.211	AVMB	--	3,812.6	8.5	02-01-84	U	OWN: USBR-3; WL
					8.5	02-01-85		
					8.1	02-01-86		
					6.4	02-01-87		
					8.0	02-01-88		
					7.7	02-02-89		
					8.0	02-01-90		
					8.2	02-01-91		
					7.8	02-19-92		
110	26S.2E.32.333	SNTF	--	4,128	332.38	02-20-84	U	--
					333.18	02-15-85		
111	26S.3E.03.344	AVMB	26	3,812	10.06	02-01-85	U	SI: 16-26; QW; WL
					9.71	02-06-86		
					9.47	02-09-87		
					9.69	02-02-88		
					9.93	02-08-90		
					9.88	02-18-91		
					9.17	01-16-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
112	26S.3E.03.344a	AVMB	36	3,812	10.11	02-01-85	U	SI: 26-36; QW; WL
					9.75	02-06-86		
					9.53	02-09-87		
					9.73	02-02-88		
					9.88	02-14-89		
					9.99	02-08-90		
					9.93	02-18-91		
					9.24	01-16-92		
113	26S.3E.03.344b	AVMB	48	3,812	10.07	02-01-85	U	SI: 45-48; QW; WL
					9.73	02-06-86		
					9.48	02-09-87		
					9.71	02-02-88		
					10.06	02-08-90		
					9.98	02-18-91		
					8.94	01-16-92		
114	26S.3E.03.344c	AVMB	75	3,812	10.62	02-01-85	U	SI: 72-75; QW; WL
					10.51	02-06-86		
					9.98	02-02-88		
					10.10	02-08-90		
					10.06	02-18-91		
					9.48	01-16-92		
115	26S.3E.03.344d	SNTF	150	3,812	10.95	02-01-85	U	SI: 147-150; QW; WL
					10.57	02-06-86		
					10.07	02-09-87		
					9.78	02-02-88		
					9.86	02-14-89		
					10.40	02-08-90		
					10.30	02-18-91		
116	26S.3E.04.122	AVMB	--	3,810.5	9.9	02-01-84	U	OWN: USBR-21; QW; WL
					10.1	02-01-85		
					9.3	02-01-86		
					9.6	02-01-87		
					9.6	02-01-88		
					9.7	02-02-89		
					9.9	02-01-90		
					9.6	02-01-91		
					9.6	02-19-92		
117	26S.3E.08.221	AVMB	--	3,809.0	9.3	02-01-84	U	OWN: USBR-23; WL
					10.0	02-01-85		
					9.9	02-01-86		
					9.3	02-01-87		
					10.0	02-01-88		
					9.8	02-09-89		
					9.8	02-01-90		
					10.4	02-01-91		
					9.6	02-19-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
118	26S.3E.09.221a	AVMB	--	3,804.7	6.8	02-01-84	U	OWN: USBR-22; WL
					7.2	02-01-85		
					6.9	02-01-86		
					6.7	02-01-87		
					6.9	02-01-88		
					7.0	02-02-89		
					7.1	02-01-90		
					7.0	02-01-91		
					6.9	02-19-92		
119	26S.3E.15.112	AVMB	--	3,806.5	6.9	02-01-84	U	OWN: USBR-28; WL
					7.8	02-01-85		
					7.2	02-01-86		
					7.8	02-01-87		
					7.8	02-01-88		
					7.8	02-06-89		
					7.7	02-01-90		
					7.6	02-01-91		
					7.6	02-19-92		
120	26S.3E.22.211	AVMB	--	3,794.5	4.6	02-01-84	U	OWN: USBR-30; QW;
					4.0	02-01-85		WL
					4.4	02-01-86		
					4.6	02-01-87		
					4.4	02-01-88		
					4.6	02-21-89		
					4.8	02-01-90		
					4.6	02-01-91		
					4.6	02-25-92		
121	26S.3E.27.211	AVMB	--	3,793.6	6.8	02-01-84	U	OWN: USBR-32; QW;
					6.5	02-01-85		WL
					6.3	02-01-86		
					6.6	02-01-87		
					6.7	02-01-88		
					6.4	02-02-89		
					7.1	02-01-90		
					6.6	02-01-91		
					6.1	02-25-92		
122	26S.3E.27.212	AVMB	--	3,792.9	5.5	02-01-84	U	OWN: USBR-31; WL
					5.8	02-01-85		
					5.3	02-01-86		
					5.4	02-01-87		
					4.6	02-01-88		
					5.3	02-21-89		
					5.8	02-01-90		
					5.4	02-01-91		
					5.1	02-25-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
123	26S.3E.32.441	AVMB	--	3,790.0	9.0	02-01-84	U	OWN: USBR-39; QW; WL
					8.6	02-01-85		
					8.9	02-01-86		
					9.3	02-01-87		
					8.8	02-01-88		
					8.8	02-09-89		
					8.9	02-01-90		
					8.7	02-01-91		
					8.7	02-25-92		
124	27S.1W.26.433	SNTF	314R	4,095	284.48	02-26-85	S	Well destroyed 06-18-90
					284.46	02-03-88		
					284.53	02-15-89		
					284.62	02-16-90		
125	27S.1W.26.433a	SNTF	475	4,095	285.35	02-21-91	S	SI: 375-475
					285.26	02-24-92		
126	27S.2W.02.413	SNTF	406	4,203	P	02-16-85	S	--
					367.10	02-13-90		
					368.7	02-26-91		
					377.7	01-24-92		
127	27S.2W.25.111	SNTF	600	4,167	361.44	02-21-84	I	QW; WL
					361.68	02-13-85		
					374.45	03-24-86		
					374.86	02-11-87		
					375.75	02-10-88		
					376.27	02-17-89		
					376.14	02-13-90		
					372.8	02-26-91		
					363.3	01-24-92		
128	27S.1E.04.121	SNTF	560	4,189	382.89	06-13-86	U	OWN: Phillips 66; SI: 440-560
					382.81	02-12-87		
					382.79	02-03-88		
					383.00	02-15-89		
					382.68	02-13-90		
					383.12	02-20-91		
					383.06	02-24-92		
129	27S.1E.04.121a	SNTF	--	4,189	--	--	--	WN: Lanark test hole; QW
130	27S.2E.13.331	SNTF	722	4,098	316.59	08-23-86	U	OWN: La Union test hole; SI: 707-717; QW
					316.59	02-13-87		
					317.23	02-03-88		
					317.69	02-15-89		
					317.56	02-09-90		
					317.29	02-20-91		
					317.48	02-24-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
131	27S.2E.21.111	SNTF	--	4,092	304.20	02-15-85	U	OWN: 27S.02E.21.113
					303.72	03-26-86		
					303.91	02-12-87		
					303.76	02-03-88		
					303.82	02-14-89		
					303.83	02-13-90		
					304.12	02-20-91		
					303.87	02-24-92		
132	27S.3E.09.444	AVMB	--	3,779.1	6.9	02-01-84	U	OWN: USBR-38; QW; WL
					3.5	02-01-85		
					5.8	02-01-86		
					5.9	02-01-87		
					4.6	02-01-88		
					3.7	02-09-89		
					5.4	02-01-90		
					6.8	02-01-91		
					5.8	02-25-92		
133	27S.3E.22.221	AVMB	28.1	3,775	5.96	08-31-89	U	OWN: USBR-49;
					8.4	02-01-90		SI: 26.1-28.1
					8.8	02-06-91		
					8.6	02-13-92		
134	27S.3E.28.314	AVMB	--	3,771.2	8.6	02-01-84	U	OWN: USBR-1; QW; WL
					8.7	02-01-85		
					7.9	02-01-86		
					8.3	02-01-87		
					8.0	02-01-88		
					14.8	02-03-89		
					8.1	02-01-90		
					7.9	02-06-91		
					7.8	02-25-92		
135	27S.3E.32.124a	AVMB	--	3,773.2	9.7	02-01-84	U	OWN: USBR-2; WL
					9.2	02-01-85		
					8.6	02-01-86		
					8.5	02-01-87		
					8.5	02-01-88		
					8.3	02-01-90		
					8.5	02-06-91		
					8.6	02-25-92		
136	27S.3E.35.113	AVMB	29	3,767	9.59	08-31-89	U	OWN: USBR-50;
					12.0	02-01-90		SI: 27-29
					13.2	02-06-91		
					12.3	02-25-92		
137	28S.1W.07.113a	SNTF	--	4,111	308.86	02-22-84	U	WL
					310.49	03-25-86		
					309.21	02-15-89		
					309.16	02-13-90		
					309.4	02-05-91		

Table 1.--Records of selected wells in the Mesilla ground-water basin—Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
138	28S.1W.07.113b	SNTF	600	4,111	309.34	02-22-84	U	--
					309.74	02-12-85		
					310.95	03-25-86		
					309.57	02-12-87		
					309.48	02-03-88		
					309.90	02-17-89		
					309.55	02-13-90		
					309.8	02-05-91		
139	28S.2W.31.111a	SNTF	--	4,153	315.89	03-02-84	S	--
					316.84	02-13-85		
					316.23	02-16-89		
					328.75RP	02-25-92		
140	28S.2W.31.111b	SNTF	--	4,153	320.76NP	02-22-91	U	--
					321.19	02-25-92		
141	28S.3W.33.443	SNTF	--	4,142	226.10	03-02-84	S	--
					280.76RP	02-13-85		
					289.08	03-25-86		
					268.99	02-12-88		
					267.31	02-16-89		
					266.99RP	02-25-92		
142	28S.1E.34.414	SNTF	533	4,127	327.35	09-04-86	U	OWN: Noria test hole;
					327.53	02-12-87		SI: 518-528; QW
					327.63	02-04-88		
					327.68	02-16-89		
					327.78	02-13-90		
					327.79	02-27-91		
					327.85	02-25-92		
143	28S.2E.23.222	SNTF	--	4,111	333.78	03-06-84	--	--
					334.08	02-14-86		
					333.98	03-26-86		
					335.18	02-12-87		
					334.78	02-04-88		
					335.12	02-14-89		
					335.36	02-09-90		
					335.94	02-27-91		
144	28S.2E.24.444	SNTF	--	4,079	313.50	01-22-85	U	WL
					314.46	12-02-86		
					P	01-18-89		
					317.18	12-27-89		
					314.04	01-03-91		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
145	28S.3E.17.214	SNTF	330	3,828	70.30	01-23-85	U	WL
					70.22	12-02-86		
					70.06	01-11-88		
					70.41	01-18-89		
					70.61	12-26-89		
					70.44	01-03-91		
					70.52	12-10-91		
146	28S.3E.21.144	SNTF	300	3,803	54.64	01-23-85	U	WL
					54.48	12-02-86		
					54.16	01-11-88		
					55.06	01-18-89		
					54.83	12-26-89		
					54.06	01-03-91		
					55.01	12-10-91		
147	28S.3E.27.434	SNTF	300	3,822	72.07	01-23-85	U	WL
					71.43	12-02-86		
					71.11	01-11-88		
					71.34	01-18-89		
					71.65	12-26-89		
					71.14	01-03-91		
					71.75	12-10-91		
148	28S.3E.29.344	SNTF	550	4,065	325.56	01-22-85	U	WL
					326.58	12-02-86		
					P	01-18-89		
149	28S.3E.32.143	SNTF	605	4,095	328.86	01-22-85	U	WL
150	29S.2W.06.231	SNTF	715R	4,109	263.73	02-26-85	U	WL
					263.79	03-25-86		
					263.95	02-12-87		
					264.60	02-04-88		
					264.39	02-16-89		
					264.20	02-16-90		
					264.13	02-21-91		
					264.18	02-25-92		
151	29S.2W.15.234	SNTF	--	4,037	196.37	02-22-84	S	WL
152	29S.3W.13.143	SNTF	--	4,050	202.04	02-22-84	S	--
					191.92	02-20-85		
					192.08	03-25-86		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
153	29S.1E.06.111	SNTF	--	4,130	326.63	03-01-84	S	--
					326.77	02-15-85		
					326.96	02-04-88		
					326.26	02-24-89		
					326.84	02-13-90		
					326.92	02-27-91		
					326.98	02-25-92		
154	29S.1E.08.124	SNTF	565	4,121	324.52	02-29-84	S	WL
					323.96	02-15-85		
					333.72	03-25-86		
					324.12	02-16-89		
					324.09	02-13-90		
					323.99	02-22-91		
					324.16	02-25-92		
155	29S.2E.06.122b	SNTF	600	4,108	307.54	02-21-85	H,S	--
					309.10	03-25-86		
					307.01	02-12-87		
					307.14	02-04-88		
					307.27	02-16-89		
					307.36	02-13-90		
					P	02-22-91	P	--
					307.52	02-25-92		
156	JL 49-03-916	AVMB	29.6	3,754.7	7.9	02-01-84	U	OWN: USBR-36; QW;
					7.1	02-01-86		RW: 29.3, 04-20-89
					7.4	02-01-87		
					7.2	02-01-88		
					7.3	02-06-89		
					7.9	02-01-90		
					7.7	02-06-91		
					7.8	02-25-92		
157	JL 49-04-111	SNTF	1,060	3,775.8	25.45	02-26-85	U	OWN: CR-6; SI: 740-
					61.04	12-04-86		860, 980-1,060; WL
					41.68	12-22-87		
					50.90	02-21-89		
					76.12	12-19-89		
					41.28	12-24-90		
					74.65	01-17-92		
158	JL 49-04-121	AVMB	--	3,788.4	7.0	02-01-84	U	OWN: USBR-29; QW;
					5.5	02-01-85		WL
					6.5	02-01-86		
					6.3	02-01-87		
					6.1	02-01-88		
					6.2	02-06-89		
					6.8	02-01-90		
					7.2	02-01-91		
					7.9	02-25-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
159	JL 49-04-416	SNTF	1,013	3,768.5	21.42	02-26-85	U	OWN: CR-3; SI: 528-1,013; WL
					27.71	12-04-86		
					23.12	12-22-87		
					25.64	02-21-89		
					26.88	12-19-89		
					22.56	12-24-90		
					22.40	01-17-92		
160	JL 49-04-418	SNTF	545	3,769.8	37.78	02-26-85	U	OWN: CR-5; SI: 445-545; WL
					18.52	12-04-86		
					37.13	12-22-87		
					38.82	02-21-89		
					25.38	12-19-89		
					28.57	12-24-90		
					26.07	01-17-92		
161	JL 49-04-419	SNTF	1,050	3,772.5	33.62	02-26-85	U	OWN: CR-2; SI: 585-1,050; WL
					67.95	12-04-86		
					56.73	12-22-87		
					52.96	02-21-89		
					88.64	12-19-89		
					56.10	12-24-90		
					76.29	01-17-92		
162	JL 49-04-466	AVMB	59	3,770.6	7.86	12-05-84	U	OWN: CWF-4A; SI: 52-57; QW; WL
					8.22	02-08-91		
					7.85	01-23-92		
163	JL 49-04-467	SNTF	159	3,770.6	10.20	12-05-84	U	OWN: CWF-4B; SI: 152-157; QW; WL
					10.16	02-08-91		
					10.12	01-23-92		
164	JL 49-04-468	SNTF	299	3,770.6	53.40	12-05-84	U	OWN: CWF-4C; SI: 292-297; QW; WL
					54.02	02-08-91		
					52.00	01-23-92		
165	JL 49-04-469	SNTF	800	3,770.6	41.11	12-05-84	U	OWN: CWF-4D; SI: 792.5-797.5; QW; WL
					59.17	02-08-91		
					64.27	01-23-92		
166	JL 49-04-470	AVMB	58	3,773.8	9.48	01-16-85	U	OWN: CWF-3A; SI: 51-56; QW; WL
					10.88	02-08-91		
					10.35	01-23-92		
167	JL 49-04-471	SNTF	158	3,773.8	12.48	01-16-85	U	OWN: CWF-3B; SI: 151-156; QW; WL
					13.58	02-08-91		
					13.75	01-23-92		

Table 1.--Records of selected wells in the Mesilla ground-water basin--Continued

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
168	JL 49-04-472	SNTF	298	3,773.8	48.60 49.02 52.85	01-16-85 02-08-91 01-23-92	U	OWN: CWF-3C; SI: 291-296; QW; WL
169	JL 49-04-473	SNTF	799	3,773.8	37.05 53.62 80.66	01-16-85 02-08-91 01-23-92	U	OWN: CWF-3D; SI: 792-797; QW; WL
170	JL 49-04-474	AVMB	47	3,773.5	8.74 9.17 8.66	02-04-85 02-08-91 01-23-92	U	OWN: CWF-2A; SI: 40-45; QW; WL
171	JL 49-04-475	SNTF	158	3,773.5	13.48 14.15 14.70	02-04-85 02-08-91 01-23-92	U	OWN: CWF-2B; SI: 151-156; QW; WL
172	JL 49-04-476	SNTF	300	3,773.5	44.44 45.62 50.97	02-04-85 02-08-91 01-23-92	U	OWN: CWF-2C; SI: 293-298; QW; WL
173	JL 49-04-477	SNTF	799	3,773.5	51.31 51.50 78.58	02-04-85 02-08-91 01-23-92	U	OWN: CWF-2D; SI: 792-797; QW; WL
174	JL 49-04-478	AVMB	52	3,776.7	12.05 11.79 11.34	02-15-85 02-08-91 01-23-92	U	OWN: CWF-1A; SI: 45-50; QW; WL
175	JL 49-04-479	SNTF	156	3,776.7	19.42 19.42 20.46	02-15-85 02-08-91 01-23-92	U	OWN: CWF-1B; SI: 149-154; QW; WL
176	JL 49-04-480	SNTF	334	3,776.7	48.73 46.75 53.46	02-15-85 02-08-91 01-23-92	U	OWN: CWF-1C; SI: 327-332; QW; WL
177	JL 49-04-481	SNTF	803	3,776.7	53.19 51.05 75.21	02-15-85 02-08-91 01-23-92	U	OWN: CWF-1D; SI: 798-803; QW; WL
178	JL 49-04-701	AVMB	--	3,755.5	6.8 6.9 6.6 6.5 6.4 6.4 7.2 7.1 7.1	02-01-84 02-01-85 02-01-86 02-01-87 02-01-88 02-06-89 02-01-90 02-06-91 02-25-92	U	OWN: USBR-37; QW; WL

Table 1.--Records of selected wells in the Mesilla ground-water basin--Concluded

Well number	Location	Main geologic unit	Depth of well (feet)	Altitude of land surface (feet)	Water level: Depth below land surface (feet)	Water level: Date measured	Use of water	Remarks
179	JL 49-12-101	AVMB	21.6	3,748.1	6.0	02-01-86	U	OWN: USBR-35; WL;
					5.7	02-01-87		RW: 30.7, 04-20-89
					6.3	02-01-88		
					7.0	02-06-89		
					7.0	02-01-90		
					6.9	02-06-91		
					6.2	02-25-92		
180	JL 49-12-117	AVMB	17.7	3,747.3	6.3	02-01-84	U	OWN: USBR-33; QW; WL;
					6.5	02-01-85		RW: 31.8, 05-03-89
					6.0	02-01-86		
					5.7	02-01-87		
					5.8	02-01-88		
					6.6	02-02-89		
					7.6	02-01-90		
					6.1	02-06-91		
					5.7	02-25-92		
181	JL 49-12-501	AVMB	--	3,735.5	6.6	02-01-84	U	OWN: USBR-34; WL
					6.7	02-01-85		
					6.8	02-01-86		
					6.5	02-01-87		
					6.9	02-01-88		
					7.1	02-02-89		
					7.6	02-01-90		
					6.8	02-06-91		
					5.9	02-25-92		

Table 2.--Low-flow discharge record for the Rio Grande below Picacho Bridge near Las Cruces, New Mexico, 1991 water year

LOCATION--Lat 32°17'45", long 106°49'25", in NE1/4SW1/4NE1/4 sec. 22, T. 23 S., R. 1 E., Doña Ana County, hydrologic unit 13030102, on left bank 1.0 mile downstream from Picacho Bridge on U.S. Highway 70, 1.2 miles west of Las Cruces, and at river mile 1,295.6.

DRAINAGE AREA--31,000 square miles approximately, including 2,940 square miles in closed basin in San Luis Valley, Colorado.

PERIOD OF RECORD--October 1990 to February 1991. Operated as a low-flow station only; streamflow computed for discharge less than 100 cubic feet per second during the nonirrigation season.

GAGE--Water-stage recorder. Datum of gage is 3,880.7 feet above sea level.

REMARKS--Records good from October 17 through November 2. Records poor from November 3 through February 21; channel excavation resulted in poor channel conditions at low flow. Flow regulated by Caballo Reservoir (station 08362000) 62 miles upstream and Elephant Butte Reservoir (station 08360500) 88 miles upstream. Diversions and ground-water withdrawals for irrigation of about 840,000 acres upstream from station.

MINIMUM FOR WATER YEAR 1991--Minimum discharge during period October 1990 to February 1991, 22 cubic feet per second on February 19-21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991, MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
1	---	74	49	38	28	---	---	---	---	---	---	---
2	---	72	49	40	29	---	---	---	---	---	---	---
3	---	---	43	35	30	---	---	---	---	---	---	---
4	---	---	43	34	29	---	---	---	---	---	---	---
5	---	e72	43	34	28	---	---	---	---	---	---	---
6	---	e68	43	35	29	---	---	---	---	---	---	---
7	---	e66	41	33	28	---	---	---	---	---	---	---
8	---	e65	42	34	28	---	---	---	---	---	---	---
9	---	e64	42	33	28	---	---	---	---	---	---	---
10	---	e63	41	41	27	---	---	---	---	---	---	---
11	---	e62	40	40	26	---	---	---	---	---	---	---
12	---	e61	40	37	32	---	---	---	---	---	---	---
13	---	e60	41	36	33	---	---	---	---	---	---	---
14	---	e59	42	38	29	---	---	---	---	---	---	---
15	---	e58	38	36	25	---	---	---	---	---	---	---
16	---	e57	42	36	26	---	---	---	---	---	---	---
17	98	e56	49	38	26	---	---	---	---	---	---	---
18	93	e55	42	39	26	---	---	---	---	---	---	---
19	94	e54	39	40	24	---	---	---	---	---	---	---
20	88	e53	41	38	23	---	---	---	---	---	---	---
21	81	e52	36	35	41	---	---	---	---	---	---	---
22	76	e52	e36	34	---	---	---	---	---	---	---	---
23	78	e51	e36	35	---	---	---	---	---	---	---	---
24	75	e51	e36	33	---	---	---	---	---	---	---	---
25	73	e50	e35	33	---	---	---	---	---	---	---	---
26	75	e50	e35	32	---	---	---	---	---	---	---	---
27	77	e49	e35	32	---	---	---	---	---	---	---	---
28	75	52	e34	30	---	---	---	---	---	---	---	---
29	77	46	e34	30	---	---	---	---	---	---	---	---
30	82	48	39	28	---	---	---	---	---	---	---	---
31	75	---	32	30	---	---	---	---	---	---	---	---
Total	---	---	1,238	1,087	---	---	---	---	---	---	---	---
Mean	---	---	39.9	35.1	---	---	---	---	---	---	---	---
Maximum	---	---	49	41	---	---	---	---	---	---	---	---
Minimum	---	---	32	28	---	---	---	---	---	---	---	---
Acre-feet	---	---	2,460	2,160	---	---	---	---	---	---	---	---

e Estimated

Table 3.—Low-flow discharge record for the Rio Grande below Picacho Bridge near Las Cruces, New Mexico, 1992 water year

LOCATION—Lat 32°17'45", long 106°49'25", in NE1/4SW1/4NE1/4 sec. 22, T. 23 S., R. 1 E., Doña Ana County, hydrologic unit 13030102, on left bank 1.0 mile downstream from Picacho Bridge on U.S. Highway 70, 1.2 miles west of Las Cruces, and at river mile 1,295.6.

DRAINAGE AREA—31,000 square miles , approximately, including 2,940 square miles in closed basin in San Luis Valley, Colorado.

PERIOD OF RECORD—October 1990 to January 1992. Operated as a low-flow station only; streamflow computed for discharge less than 100 cubic feet per second during the nonirrigation season. Low-flow station discontinued on February 1, 1992.

GAGE—Water-stage recorder. Datum of gage is 3,880.7 feet above sea level.

REMARKS—Records good from November 2 through January 10. Discharge less than 100 cubic feet per second from November 2 through December 11, December 13 through 18, and December 30 through January 10. Flow regulated by Caballo Reservoir (station 08362000) 62 miles upstream and Elephant Butte Reservoir (station 08360500) 88 miles upstream. Diversions and ground-water withdrawals for irrigation of about 840,000 acres upstream from station.

MINIMUM FOR PERIOD OF RECORD—Minimum discharge, 22 cubic feet per second, February 19-21, 1991.

MINIMUM FOR WATER YEAR 1992—Minimum discharge during period November 1991 to January 1992, 34 cubic feet per second on January 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992, DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
1	---	---	61	58	---	---	---	---	---	---	---	---
2	---	86	67	56	---	---	---	---	---	---	---	---
3	---	82	58	54	---	---	---	---	---	---	---	---
4	---	79	53	56	---	---	---	---	---	---	---	---
5	---	79	53	74	---	---	---	---	---	---	---	---
6	---	75	54	79	---	---	---	---	---	---	---	---
7	---	75	52	73	---	---	---	---	---	---	---	---
8	---	70	50	57	---	---	---	---	---	---	---	---
9	---	70	47	62	---	---	---	---	---	---	---	---
10	---	66	47	60	---	---	---	---	---	---	---	---
11	---	73	79	---	---	---	---	---	---	---	---	---
12	---	72	---	---	---	---	---	---	---	---	---	---
13	---	69	73	---	---	---	---	---	---	---	---	---
14	---	68	52	---	---	---	---	---	---	---	---	---
15	---	73	47	---	---	---	---	---	---	---	---	---
16	---	81	46	---	---	---	---	---	---	---	---	---
17	---	73	47	---	---	---	---	---	---	---	---	---
18	---	66	79	---	---	---	---	---	---	---	---	---
19	---	61	---	---	---	---	---	---	---	---	---	---
20	---	60	---	---	---	---	---	---	---	---	---	---
21	---	64	---	---	---	---	---	---	---	---	---	---
22	---	66	---	---	---	---	---	---	---	---	---	---
23	---	61	---	---	---	---	---	---	---	---	---	---
24	---	61	---	---	---	---	---	---	---	---	---	---
25	---	65	---	---	---	---	---	---	---	---	---	---
26	---	64	---	---	---	---	---	---	---	---	---	---
27	---	63	---	---	---	---	---	---	---	---	---	---
28	---	63	---	---	---	---	---	---	---	---	---	---
29	---	57	---	---	---	---	---	---	---	---	---	---
30	---	54	76	---	---	---	---	---	---	---	---	---
31	---	---	65	---	---	---	---	---	---	---	---	---
Total	---	---	---	---	---	---	---	---	---	---	---	---
Mean	---	---	---	---	---	---	---	---	---	---	---	---
Max	---	---	---	---	---	---	---	---	---	---	---	---
Min	---	---	---	---	---	---	---	---	---	---	---	---
Acre-feet	---	---	---	---	---	---	---	---	---	---	---	---

Table 4.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 5-6, 1988

EXPLANATION

REACH--The seepage investigation was conducted along a 62.4-mile reach from the Rio Grande below Leasburg Dam near Radium Springs, New Mexico, to the Rio Grande at El Paso, Texas (08364000). River miles are referenced upstream from the Rio Grande at El Paso, Texas, which is designated as river mile 1,249.9 (Hendricks, 1964).

WEATHER--Weather was favorable for the seepage investigation; there was no measurable precipitation 10 days prior to the investigation. Light precipitation occurred overnight during the investigation (0.11 inch at Las Cruces, New Mexico) with no significant accumulation. Precipitation did not affect streamflow conditions.

STREAMFLOW--The seepage investigation was conducted during a period of constant base flow. Discharge measurements indicate a net seepage loss of 26.1 cubic feet per second from river mile 1,312.3 to river mile 1,249.9. Indicated gains (+) and losses (-) throughout the reach are shown below. Tributary flow recorded as inflow is considered a contribution and not a gain; no outflow (diversions) occurred during the investigation. Evaporation from the water surface of the river in January is considered negligible.

WATER QUALITY--Chemical analyses of water samples collected from the Rio Grande (six sites) during the seepage investigation are listed in table 9. Water samples were analyzed for major ions, selected nutrients, and selected trace elements.

GROUND-WATER LEVELS--Ground-water levels were steady during the seepage investigation. Water levels in selected observation wells completed in the shallow flood-plain alluvium are listed in table 10.

REMARKS--The seepage investigation is rated good based upon steady streamflow conditions and discharge measurement notes.

°C, degrees Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; ft^3/s, cubic feet per second; –, no data or not applicable. Site number locations are shown in figure 8. Locations are in New Mexico unless otherwise indicated.

Table 4.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 5-6, 1988--Continued

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft³/s: Main stream	Discharge, in ft³/s: Inflow	Discharge, in ft³/s: Gain or loss
			January 5, 1988						
1	1,312.3	Rio Grande	Below Leasburg Dam, Radium Springs Lat 32°28'41", long 106°55'10"	0900	6	1,100	95.1		--
2	1,310.2	Rio Grande	Near Leasburg Lat 32°27'21", long 106°54'08"	1025	7	1,100	95.5		+0.4
3	1,307.6	Selden Drain	Near Leasburg Lat 32°25'38", long 106°52'50"	1125	7	1,450		1/0.3	--
4	1,306.3	Rio Grande	Near Hill Lat 32°25'05", long 106°52'01"	1200	8	1,250	98.9		+3.1
5	1,302.7	Rio Grande	At Shalem Bridge near Doña Ana Lat 32°22'34", long 106°51'16"	1305	8.5	1,300	105		+6.1
6	1,301.2	Wasteway no. 5	Near Doña Ana Lat 32°22'14", long 106°50'14"	1350	11	1,850		1/0.1	--
7	1,298.8	Rio Grande	Near Picacho Lat 32°20'18", long 106°50'09"	0900	5.5	1,300	102		-3.1
8	1,295.6	Rio Grande	Below Picacho Bridge near Las Cruces Lat 32°17'45", long 106°49'25"	1030	7	1,300	102		0
9	1,295.4	Wastewater inflow	City of Las Cruces Lat 32°17'35", long 106°49'26"	1130	16	1,100		2/9.6	--
10	1,293.1	Rio Grande	At NM-359 Bridge near Mesilla Lat 32°15'49", long 106°49'29"	1145	8	1,300	113		+1.4
11	1,291.8	Picacho Drain	Above Mesilla Dam Lat 32°14'34", long 106°48'56"	1300	9	1,500		3.5	--
12	1,291.7	Rio Grande	Below Picacho Drain Lat 32°14'30", long 106°48'49"	1620	9	1,250	115		-1.5
			January 6, 1988						
13	1,289.5	Rio Grande	Below Mesilla Dam Lat 32°13'17", long 106°47'15"	0730	4	1,250	100		-15
14	1,287.3	Rio Grande	At NM-28 Bridge near San Pablo Lat 32°12'24", long 106°45'32"	0930	6	1,250	103		+3
15	1,283.6	Santo Tomas River Drain	Near San Miguel Lat 32°10'16", long 106°43'11"	1035	--	--		0	--

Table 4.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 5-6, 1988--Continued

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft³/s: Main stream	Discharge, in ft³/s: Inflow	Discharge, in ft³/s: Gain or loss
			January 6, 1988						
16	1,282.7	Rio Grande	NM-228 Bridge near San Miguel Lat 32°09'43", long 106°42'58"	0930	8	1,250	100		-3
17	1,277.8	Rio Grande	At NM-227 Bridge near Vado Lat 32°06'48", long 106°40'05"	0815	8.5	1,250	91.2		-8.8
18	1,276.6	Del Rio Drain	Near Vado Lat 32°06'09", long 106°39'27"	0955	13	1,300		36.4	--
19	1,273.8	Rio Grande	At NM-226 Bridge near Berino Lat 32°03'56", long 106°39'45"	1105	12	1,300	131		+3.4
20	1,271.6	La Mesa Drain	Near Chamberino Lat 32°02'15", long 106°39'23"	1245	14	1,900		12.6	--
21	1,271.5	Rio Grande	Below La Mesa Drain near Chamberino Lat 32°02'12", long 106°39'18"	1340	14	1,350	149		+5.4
22	1,268.5	Rio Grande	At NM-225 Bridge near Anthony Lat 31°59'58", long 106°38'07"	1030	11	1,350	163		+14
23	1,268.5	Pipe inflow	At NM-225 Bridge near Anthony Lat 31°59'58", long 106°38'07"	--	--	--	--		--
24	1,265.4	East Drain	Near Vinton, Tex. Lat 31°58'09", long 106°36'17"	1135	12	3,050		11.2	--
25	1,264.7	Rio Grande	At Vinton Bridge near Vinton, Tex. Lat 31°57'33", long 106°36'16"	1215	12	1,400	170		-4.2
26	1,261.6	Rio Grande	At TX-259 Bridge, Cañutillo, Tex. Lat 31°54'54", long 106°36'06"	1315	12	1,500	171		+1
26A	1,260.8	Temporary well inflow	Near Cañutillo, Tex. Lat 31°54'19", long 106°36'06"	--	--	--		[3]7.6	--
27	1,259.3	Rio Grande	At Borderland Bridge near Borderland, Tex. Lat 31°53'09", long 106°35'55"	1415	13.5	1,500	160		-18.6
28	1,256.2	Rio Grande	At TX-260 Bridge near Santa Teresa Lat 31°50'46", long 106°36'18"	1135	11.5	1,500	153		-7
28A	1,253.4	Wastewater inflow	Riverside Plant, City of Sunland Park Lat 31°48'46", long 106°35'11"	--	--	--		[2]0.05	--
29	1,252.8	Rio Grande	Near Sunland Park Lat 31°48'24", long 106°34'57"	1255	11	1,450	139		-14

Table 4.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 5-6, 1988--Concluded

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft^3/s		
							Main stream	Inflow	Gain or loss
			January 6, 1988						
30	1,252.4	Wastewater inflow	Sunland Plant, City of Sunland Park Lat 31°48'05", long 106°34'44"	--	--	--		2/0.14	--
31	1,250.9	Rio Grande	At Sunland Park Bridge, Sunland Park Lat 31°47'56", long 106°33'16"	--	--	--	--		--
32	1,250.3	Montoya Drain	Near Sunland Park Lat 31°48'10", long 106°32'47"	1425	14	2,600		42.9	--
32A	1,250.3	Temporary well inflow	At Sunland Park Lat 31°48'08". long106°32'45"	1530	--	--		3/0.5	--
33	1,250.1	Keystone Reservoir outlet	Near El Paso, Tex. Lat 31°48'18", long 106°32'39"	1550	--	--		1/0.2	--
34	1,249.9	Rio Grande	At Courchesne Bridge, El Paso, Tex. Lat 31°48'09", long 106°32'26"	1530	13	1,900	194		+11.3

1/Estimated discharge.
2/Reported mean daily discharge.
3/Temporary well inflow from shallow wells completed in the flood-plain alluvium within 500 feet of the Rio Grande. Wells were pumped for the purpose of dewatering at construction sites.

Table 5.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 10-11, 1989

EXPLANATION

REACH--The seepage investigation was conducted along a 62.4-mile reach from the Rio Grande below Leasburg Dam near Radium Springs, New Mexico, to the Rio Grande at El Paso, Texas (08364000). River miles are referenced upstream from the Rio Grande at El Paso, Texas, which is designated as river mile 1,249.9 (Hendricks, 1964).

WEATHER--No measurable precipitation had occurred since January 4 (0.02 inch). Air temperatures were lower than normal during the seepage investigation. Temperature extremes at Las Cruces, New Mexico, ranged from a low of minus 8 degrees Celsius on January 10 at 0700 hours to a high of 20 degrees Celsius on January 11 at 1500 hours.

STREAMFLOW--The seepage investigation was conducted during a period of constant base flow. Discharge measurements indicate a net seepage loss of 7.2 cubic feet per second from river mile 1,312.3 to river mile 1,249.9. Indicated gains (+) and losses (-) throughout the reach are shown below. Tributary flow recorded as inflow is considered a contribution and not a gain; no outflow (diversions) occurred during the investigation. Evaporation from the water surface of the river in January is considered negligible.

WATER QUALITY--Chemical analyses of water samples collected from the Rio Grande (six sites) during the seepage investigation are listed in table 9. Water samples were analyzed for major ions, selected nutrients, and selected trace elements.

GROUND-WATER LEVELS--Ground-water levels were measured during the seepage investigation. Water levels in selected observation wells completed in the shallow flood-plain alluvium are listed in table 10.

REMARKS--The seepage investigation is rated poor based upon unsteady streamflow. Temperature extremes during the investigation resulted in diurnal fluctuations in river stage. Shore ice was observed at many of the discharge measurement sites. Recorded river stage in the Rio Grande at NM-227 Bridge near Vado, New Mexico (site 17), indicates a change in gage height from minus 0.36 foot on January 10 at 1530 hours to minus 0.44 foot on January 11 at 1045 hours. Individual discharge measurements were rated good (within 5 percent) to fair (within 8 percent); accuracy of discharge measurements needs to be considered when evaluating indicated gains and losses.

°C, degrees Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; ft^3/s, cubic feet per second; --, no data or not applicable. Site number locations are shown in figure 8. Locations are in New Mexico unless otherwise indicated.

Table 5.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 10-11, 1989--Continued

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft^3/s: Main stream	Discharge, in ft^3/s: Inflow	Discharge, in ft^3/s: Gain or loss
			January 10, 1989						
1	1,312.3	Rio Grande	Below Leasburg Dam, Radium Springs Lat 32°28'41", long 106°55'10"	1105	4	1,500	33.1		--
2	1,310.2	Rio Grande	Near Leasburg Lat 32°27'21", long 106°54'08"	1225	7	1,570	38.9		+5.8
3	1,307.6	Selden Drain	Near Leasburg Lat 32°25'38", long 106°52'50"	1320	5	1,270		1/0.2	--
4	1,306.3	Rio Grande	Near Hill Lat 32°25'05", long 106°52'01"	1405	9	1,700	48.8		+9.7
5	1,302.7	Rio Grande	At Shalem Bridge near Doña Ana Lat 32°22'34", long 106°51'16"	1520	8.5	1,650	51.5		+2.7
6	1,301.2	Wasteway no. 5	Near Doña Ana Lat 32°22'14", long 106°50'14"	1545	9	1,780		1/0.1	--
7	1,298.8	Rio Grande	Near Picacho Lat 32°20'18", long 106°50'09"	1040	2	1,710	54.5		+2.9
8	1,295.6	Rio Grande	Below Picacho Bridge near Las Cruces Lat 32°17'45", long 106°49'25"	1200	5	1,670	60.6		+6.1
9	1,295.4	Wastewater inflow	City of Las Cruces Lat 32°17'35", long 106°49'26"	1205	10	1,270		2/10.0	--
10	1,293.1	Rio Grande	At NM-359 Bridge near Mesilla Lat 32°15'49", long 106°49'29"	1330	8	1,620	55.1		-15.5
11	1,291.8	Picacho Drain	Above Mesilla Dam Lat 32°14'34", long 106°48'56"	1410	8	1,500		2.86	--
12	1,291.7	Rio Grande	Below Picacho Drain Lat 32°14'30", long 106°48'49"	1500	8	1,580	33.4		-24.6
13	1,289.5	Rio Grande	Below Mesilla Dam Lat 32°13'17", long 106°47'15"	1150	5	1,580	44.5		+11.1
14	1,287.3	Rio Grande	At NM-28 Bridge near San Pablo Lat 32°12'24", long 106°45'32"	1250	4	1,620	43.3		-1.2
15	1,283.6	Santo Tomas River Drain	Near San Miguel Lat 32°10'16", long 106°43'11"	1310	--	--		0	--
16	1,282.7	Rio Grande	At NM-228 Bridge near San Miguel Lat 32°09'43", long 106°42'58"	1425	7	1,580	45.0		+1.7
17	1,277.8	Rio Grande	At NM-227 Bridge near Vado Lat 32°06'48", long 106°40'05"	1530	7	1,520	50.4		+5.4

Table 5.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 10-11, 1989--Continued

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft^3/s		
							Main stream	Inflow	Gain or loss
			January 11, 1989						
17	1,277.8	Rio Grande	At NM-227 Bridge near Vado Lat 32°06'48", long 106°40'05"	1045	3	1,540	42.4		--
18	1,276.6	Del Rio Drain	Near Vado Lat 32°06'09", long 106°39'27"	1215	9	1,300		33.2	--
19	1,273.8	Rio Grande	At NM-226 Bridge near Berino Lat 32°03'56", long 106°39'45"	1310	10	1,460	70.1		-5.5
20	1,271.6	La Mesa Drain	Near Chamberino Lat 32°02'15", long 106°39'23"	1415	10	1,900		12.0	--
21	1,271.5	Rio Grande	Below La Mesa Drain near Chamberino Lat 32°02'12", long 106°39'18"	1530	11	1,650	90.3		+8.2
22	1,268.5	Rio Grande	At NM-225 Bridge near Anthony Lat 31°59'58", long 106°38'07"	1100	4	1,530	80.6		-9.7
23	1,268.5	Pipe inflow	At NM-225 Bridge near Anthony Lat 31°59'58", long 106°38'07"	--	--	--	--		--
24	1,265.4	East Drain	Near Vinton, Tex. Lat 31°58'09", long 106°36'17"	1150	6	3,100		8.59	--
25	1,264.7	Rio Grande	At Vinton Bridge near Vinton, Tex. Lat 31°57'33", long 106°36'16"	1330	8	1,680	101		+11.8
26	1,261.6	Rio Grande	At TX-259 Bridge, Cañutillo, Tex. Lat 31°54'54", long 106°36'06"	1440	8	1,670	105		+4
27	1,259.3	Rio Grande	At Borderland Bridge near Borderland, Tex. Lat 31°53'09", long 106°35'55"	1540	9	1,680	91.0		-14.0
28	1,256.2	Rio Grande	At TX-260 Bridge near Santa Teresa Lat 31°50'46", long 106°36'18"	1130	4	1,740	87.9		-3.1
29	1,252.8	Rio Grande	Near Sunland Park Lat 31°48'24", long 106°34'57"	1315	7.5	1,750	82.3		-5.6
30	1,251.0	Wastewater inflow	Sunland Plant, City of Sunland Park Lat 31°47'55", long 106°33'25"	1430	18	1,750		0.9	--
31	1,250.9	Rio Grande	At Sunland Park Bridge, Sunland Park Lat 31°47'56", long 106°33'16"	1415	9	1,680	87.5		+4.3
32	1,250.3	Montoya Drain	Near Sunland Park Lat 31°48'10", long 106°2'47"	1620	11	2,260		36.2	--

Table 5.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 10-11, 1989--Concluded

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft^3/s		
							Main stream	Inflow	Gain or loss
			January 11, 1989						
33	1,250.1	Keystone Reservoir outlet	Near El Paso, Tex. Lat 31°48'18", long 106°32'39"	1625	--	--		0.04	--
34	1,249.9	Rio Grande	At Courchesne Bridge, El Paso, Tex. Lat 31°48'09", long 106°32'26"	1510	10	1,975	122		-1.7

1/Estimated discharge.
2/Reported mean daily discharge.

Table 6.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 9-10, 1990

EXPLANATION

REACH--The seepage investigation was conducted along a 62.4-mile reach from the Rio Grande below Leasburg Dam near Radium Springs, New Mexico, to the Rio Grande at El Paso, Texas (08364000). River miles are referenced upstream from the Rio Grande at El Paso, Texas, which is designated as river mile 1,249.9 (Hendricks, 1964).

WEATHER--Weather was favorable for the seepage investigation; no measurable precipitation had occurred since December 30, 1989 (0.57 inch). Temperature extremes at Las Cruces, New Mexico, ranged from a low of minus 4 degrees Celsius on January 9 to a high of 20 degrees Celsius on January 10.

STREAMFLOW--The seepage investigation was conducted during a period of constant base flow. Discharge measurements indicate a net seepage loss of 32.5 cubic feet per second from river mile 1,312.3 to river mile 1,249.9. Indicated gains (+) and losses (-) throughout the reach are shown below. Tributary flow recorded as inflow is considered a contribution and not a gain; no outflow (diversions) occurred during the investigation. Evaporation from the water surface of the river in January is considered negligible.

WATER QUALITY--Chemical analyses of water samples collected from the Rio Grande (six sites) during the seepage investigation are listed in table 9. Water samples were analyzed for major ions, selected nutrients, and selected trace elements.

GROUND-WATER LEVELS--Ground-water levels were measured during the seepage investigation. Water levels in selected observation wells completed in the shallow flood-plain alluvium are listed in table 10.

REMARKS--The seepage investigation is rated good based upon steady streamflow conditions. Recorded river stage in the Rio Grande at NM-227 Bridge near Vado, New Mexico (site 17), showed no change in gage height during the seepage investigation. Individual discharge measurements were rated good (within 5 percent) to fair (within 8 percent); acccuracy of discharge measurements needs to be considered when evaluating indicated gains and losses.

°C, degrees Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; ft^3/s, cubic feet per second; --, no data or not applicable. Site number locations are shown in figure 8. Locations are in New Mexico unless otherwise indicated.

Table 6.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 9-10, 1990--Continued

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft^3/s: Main stream	Discharge, in ft^3/s: Inflow	Discharge, in ft^3/s: Gain or loss
			January 9, 1990						
1	1,312.3	Rio Grande	Below Leasburg Dam, Radium Springs Lat 32°28'41", long 106°55'10"	1100	6.5	1,480	37.8		--
2	1,310.2	Rio Grande	Near Leasburg Lat 32°27'21", long 106°54'08"	1150	9.5	1,510	37.1		-0.7
3	1,307.6	Selden Drain	Near Leasburg Lat 32°25'38", long 106°52'50"	1220	--	--		0	--
4	1,306.3	Rio Grande	Near Hill Lat 32°25'05", long 106°52'01"	1315	12	1,680	49.7		+12.6
5	1,302.7	Rio Grande	At Shalem Bridge near Doña Ana Lat 32°22'34", long 106°51'16"	1415	12	1,640	42.9		-6.8
6	1,301.2	Wasteway no. 5	Near Doña Ana Lat 32°22'14", long 106°50'14"	1435	--	1,980		0.004	--
7	1,298.8	Rio Grande	Near Picacho Lat 32°20'18", long 106°50'09"	1030	7	1,670	44.9		+2.0
8	1,295.6	Rio Grande	Below Picacho Bridge near Las Cruces Lat 32°17'45", long 106°49'25"	1145	8.5	1,640	35.5		-9.4
9	1,295.4	Wastewater inflow	City of Las Cruces Lat 32°17'35", long 106°49'26"	1200	15.5	1,410		1/9.7	--
10	1,293.1	Rio Grande	At NM-359 Bridge near Mesilla Lat 32°15'49", long 106°49'29"	1250	10.5	1,630	48.7		+3.5
11	1,291.8	Picacho Drain	Above Mesilla Dam Lat 32°14'34", long 106°48'56"	1410	7.5	1,520		2.31	--
12	1,291.7	Rio Grande	Below Picacho Drain Lat 32°14'30", long 106°48'49"	1450	11.5	1,610	45.0		-6.0
13	1,289.5	Rio Grande	Below Mesilla Dam Lat 32°13'17", long 106°47'15"	1050	7.5	1,590	29.0		-16.0
14	1,287.3	Rio Grande	At NM-28 Bridge near San Pablo Lat 32°12'24", long 106°45'32"	1225	9.5	1,560	29.9		+0.9
15	1,283.6	Santo Tomas River Drain	Near San Miguel Lat 32°10'16", long 106°43'11"	1255	--	--		0	--
16	1,282.7	Rio Grande	At NM-228 Bridge near San Miguel Lat 32°09'43", long 106°42'58"	1440	12.5	1,570	29.3		-0.6
17	1,277.8	Rio Grande	At NM-227 Bridge near Vado Lat 32°06'48", long 106°40'05"	1550	13	1,580	26.2		-3.1

Table 6.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 9-10, 1990--Continued

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft^3/s		
							Main stream	Inflow	Gain or loss
			January 10, 1990						
17	1,277.8	Rio Grande	At NM-227 Bridge near Vado Lat 32°06'48", long 106°40'05"	0950	5	1,580	26.2		--
18	1,276.6	Del Rio Drain	Near Vado Lat 32°06'09", long 106°39'27"	1030	9.5	1,320		27.4	--
19	1,273.8	Rio Grande	At NM-226 Bridge near Berino Lat 32°03'56", long 106°39'45"	1150	10	1,450	54.9		+1.3
20	1,271.6	La Mesa Drain	Near Chamberino Lat 32°02'15", long 106°39'23"	1245	10.5	1,890		9.77	--
21	1,271.5	Rio Grande	Below La Mesa Drain near Chamberino Lat 32°02'12", long 106°39'18"	1340	10.5	1,520	67.7		+3.0
22	1,268.5	Rio Grande	At NM-225 Bridge near Anthony Lat 31°59'58", long 106°38'07"	1005	5.5	1,550	65.5		-2.2
23	1,268.5	Pipe inflow	At NM-225 Bridge near Anthony Lat 31°59'58", long 106°38'07"	0920	13	1,330		0.05	--
24	1,265.4	East Drain	Near Vinton, Tex. Lat 31°58'09", long 106°36'17"	1050	6.5	3,270		5.56	--
25	1,264.7	Rio Grande	At Vinton Bridge near Vinton, Tex. Lat 31°57'33", long 106°36'16"	1130	7.5	1,700	74.1		+3.0
26	1,261.6	Rio Grande	At TX-259 Bridge, Cañutillo, Tex. Lat 31°54'54", long 106°36'06"	1300	9.5	1,680	66.8		-7.3
27	1,259.3	Rio Grande	At Borderland Bridge near Borderland, Tex. Lat 31°53'09", long 106°35'55"	1400	11.5	1,690	65.1		-1.7
28	1,256.2	Rio Grande	At TX-260 Bridge near Santa Teresa Lat 31°50'46", long 106°36'18"	1035	6.5	1,670	53.3		-11.8
29	1,252.8	Rio Grande	Near Sunland Park Lat 31°48'24", long 106°34'57"	1150	9.5	1,700	55.0		+1.7
30	1,251.0	Wastewater inflow	Sunland Plant, City of Sunland Park Lat 31°47'55", long 106°33'25"	1350	17.5	1,740		1/0.9	--
31	1,250.9	Rio Grande	At Sunland Park Bridge, Sunland Park Lat 31°47'56", long 106°33'16"	1400	12.0	1,690	56.1		+0.2
32	1,250.3	Montoya Drain	Near Sunland Park Lat 31°48'10", long 106°32'47"	1510	14.5	2,550		36.6	--

Table 6.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 9-10, 1990--Concluded

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft^3/s		
							Main stream	Inflow	Gain or loss
			January 10, 1990						
33	1,250.1	Keystone Reservoir outlet	Near El Paso, Tex. Lat 31°48'18", long 106°32'39"	1520	--	--		0	--
34	1,249.9	Rio Grande	At Courchesne Bridge, El Paso, Tex. Lat 31°48'09", long 106°32'26"	1510	13.5	2,010	97.6		+4.9

1/Reported mean daily discharge.

Table 7.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 8-9, 1991

EXPLANATION

REACH--The seepage investigation was conducted along a 62.4-mile reach from the Rio Grande below Leasburg Dam near Radium Springs, New Mexico, to the Rio Grande at El Paso, Texas (08364000). River miles are referenced upstream from the Rio Grande at El Paso, Texas, which is designated as river mile 1,249.9 (Hendricks, 1964).

WEATHER--Weather was favorable for the seepage investigation; no precipitation occurred. Temperature extremes at Las Cruces, New Mexico, ranged from a low of 0 degrees Celsius on January 8 to a high of 16 degrees Celsius on January 8.

STREAMFLOW--The seepage investigation was conducted during a period of constant base flow. Discharge measurements indicate a net seepage loss of 42.3 cubic feet per second from river mile 1,312.3 to river mile 1,249.9. Indicated gains (+) and losses (-) throughout the reach are shown below. Tributary flow recorded as inflow is considered a contribution and not a gain; no outflow (diversions) occurred during the investigation. Evaporation from the water surface of the river in January is considered negligible.

WATER QUALITY--Chemical analyses of water samples collected from the Rio Grande (six sites) during the seepage investigation are listed in table 9. Water samples were analyzed for major ions, selected nutrients, and selected trace elements.

GROUND-WATER LEVELS--Ground-water levels were measured during the seepage investigation. Water levels in selected observation wells completed in the shallow flood-plain alluvium are listed in table 10.

REMARKS--The seepage investigation is rated good based upon steady streamflow conditions. Recorded river stage in the Rio Grande at NM-227 Bridge near Vado, New Mexico (site 17), indicates a change in gage height from minus 0.76 foot on January 8 at 1500 hours to minus 0.78 foot on January 9 at 0925 hours. Individual discharge measurements were rated good (within 5 percent) to fair (within 8 percent) throughout most of the stream reach. Discharge measurements were rated poor from river miles 1,295.6 through 1,293.1; recent channel excavation resulted in poor channel conditions at low flow. Accuracy of discharge measurements needs to be considered when evaluating indicated gains and losses.

°C, degrees Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; ft^3/s, cubic feet per second; --, no data or not applicable. Site number locations are shown in figure 8. Locations are in New Mexico unless otherwise indicated.

Table 7.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 8-9, 1991--Continued

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft³/s: Main stream	Discharge, in ft³/s: Inflow	Discharge, in ft³/s: Gain or loss
			January 8, 1991						
1	1,312.3	Rio Grande	Below Leasburg Dam, Radium Springs Lat 32°28'41", long 106°55'10"	0955	8	1,400	38.4		--
2	1,310.2	Rio Grande	Near Leasburg Lat 32°27'21", long 106°54'08"	1110	8.5	1,420	39.8		+1.4
3	1,307.6	Selden Drain	Near Leasburg Lat 32°25'38", long 106°52'50"	1150	--	--	--	0	--
4	1,306.3	Rio Grande	Near Hill Lat 32°25'05", long 106°52'01"	1220	--	1,590	48.5		+8.7
5	1,302.7	Rio Grande	At Shalem Bridge near Doña Ana Lat 32°22'34", long 106°51'16"	1330	11	1,580	47.6		-0.9
6	1,301.2	Wasteway no. 5	Near Doña Ana Lat 32°22'14", long 106°50'14"	1415	--	--		0	--
7	1,298.8	Rio Grande	Near Picacho Lat 32°20'18", long 106°50'09"	1000	5.5	1,580	57.4		+9.8
8	1,295.6	Rio Grande	Below Picacho Bridge near Las Cruces Lat 32°17'45", long 106°49'25"	1120	9	1,580	[1]34.6		-22.8
9	1,295.4	Wastewater inflow	City of Las Cruces Lat 32°17'35", long 106°49'26"	1200	--	1,100		[2]12.9	--
10	1,293.1	Rio Grande	At NM-359 Bridge near Mesilla Lat 32°15'49", long 106°49'29"	1315	10.5	1,500	54.7		+7.2
11	1,291.8	Picacho Drain	Above Mesilla Dam Lat 32°14'34", long 106°48'56"	1410	9.5	1,450		2.16	--
12	1,291.7	Rio Grande	Below Picacho Drain Lat 32°14'30", long 106°48'49"	1445	9.5	1,500	45.5		-11.4
13	1,289.5	Rio Grande	Below Mesilla Dam Lat 32°13'17", long 106°47'15"	1030	9	1,450	33.7		-11.8
14	1,287.3	Rio Grande	At NM-28 Bridge near San Pablo Lat 32°12'24", long 106°45'32"	1345	--	1,460	31.0		-2.7
15	1,283.6	Santo Tomas River Drain	Near San Miguel Lat 32°10'16", long 106°43'11"	1400	--	--		0	--
16	1,282.7	Rio Grande	At NM-228 Bridge near San Miguel Lat 32°09'43", long 106°42'58"	1530	13.5	1,400	32.9		+1.9
17	1,277.8	Rio Grande	At NM-227 Bridge near Vado Lat 32°06'48", long 106°40'05"	1530	14	1,440	30.4		-2.5

Table 7.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 8-9, 1991--Continued

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft^3/s		
							Main stream	Inflow	Gain or loss
			January 9, 1991						
17	1,277.8	Rio Grande	At NM-227 Bridge near Vado Lat 32°06'48", long 106°40'05"	0915	5	1,450	29.0		--
18	1,276.6	Del Rio Drain	Near Vado Lat 32°06'09", long 106°39'27"	1000	10.5	1,280		26.2	--
19	1,273.8	Rio Grande	At NM-226 Bridge near Berino Lat 32°03'56", long 106°39'45"	1045	9	1,380	53.4		-1.8
20	1,271.6	La Mesa Drain	Near Chamberino Lat 32°02'15", long 106°39'23"	1130	10.5	1,940		9.47	--
21	1,271.5	Rio Grande	Below La Mesa Drain near Chamberino Lat 32°02'12", long 106°39'18"	1215	10.5	1,680	61.7		-1.2
22	1,268.5	Rio Grande	At NM-225 Bridge near Anthony Lat 31°59'58", long 106°38'07"	0945	7.5	1,500	73.9		+12.2
23	1,268.5	Pipe inflow	At NM-225 Bridge near Anthony Lat 31°59'58", long 106°38'07"	1020	--	--		0.10	--
24	1,265.4	East Drain	Near Vinton, Tex. Lat 31°58'09", long 106°36'17"	1040	9	3,190		6.77	--
25	1,264.7	Rio Grande	At Vinton Bridge near Vinton, Tex. Lat 31°57'33", long 106°36'16"	1140	9	1,670	79.4		-1.4
26	1,261.6	Rio Grande	At TX-259 Bridge, Cañutillo, Tex. Lat 31°54'54", long 106°36'06"	1305	10	1,630	71.6		-7.8
27	1,259.3	Rio Grande	At Borderland Bridge near Borderland, Tex. Lat 31°53'09", long 106°35'55"	1355	10.5	1,610	71.7		+0.1
28	1,256.2	Rio Grande	At TX-260 Bridge near Santa Teresa Lat 31°50'46", long 106°36'18"	1040	9.5	1,600	62.4		-9.3
29	1,252.8	Rio Grande	Near Sunland Park Lat 31°48'24", long 106°34'57"	1230	11	1,620	61.6		-0.8
30	1,251.0	Wastewater inflow	Sunland Plant, City of Sunland Park Lat 31°47'55", long 106°33'25"	1300	19	1,870		[2]0.75	--
31	1,250.9	Rio Grande	At Sunland Park Bridge, Sunland Park Lat 31°47'56", long 106°33'16"	1405	12.5	1,600	59.6		-2.8
32	1,250.3	Montoya Drain	Near Sunland Park Lat 31°48'10", long 106°32'47"	1640	--	2,640		34.7	--

Table 7.--Rio Grande seepage investigation from Radium Springs, New Mexico, to El Paso, Texas, January 8-9, 1991--Concluded

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft^3/s		
							Main stream	Inflow	Gain or loss
			January 9, 1991						
33	1,250.1	Keystone Reservoir outlet	Near El Paso, Tex. Lat 31°48'18", long 106°32'39"	1500	13	5,720		0.08	--
34	1,249.9	Rio Grande	At Courchesne Bridge, El Paso, Tex. Lat 31°48'09", long 106°32'26"	1350	12	2,010	88.0		-6.4

1/ Rating.
2/ Reported discharge.

Table 8.--Rio Grande seepage investigation from Radium Springs to Vado, New Mexico, December 17, 1991

EXPLANATION

REACH--The seepage investigation was conducted along a 34.5-mile reach from the Rio Grande below Leasburg Dam near Radium Springs, New Mexico, to the Rio Grande at NM-227 Bridge near Vado, New Mexico. River miles are referenced upstream from the Rio Grande at El Paso, Texas (08364000), which is designated as river mile 1,249.9 (Hendricks, 1964).

WEATHER--Weather was favorable for the seepage investigation on December 17. Light rain occurred throughout the Mesilla Valley on December 18 with intermittent heavy rain showers at El Paso, Texas. Temperature extremes at Las Cruces, New Mexico, ranged from a low of 2 degrees Celsius to a high of 11 degrees Celsius on December 17.

STREAMFLOW--The seepage investigation was conducted during a period of constant base flow. Discharge measurements indicate a net seepage loss of 12.8 cubic feet per second from river mile 1,312.3 to river mile 1,277.8. Indicated gains (+) and losses (-) throughout the reach are shown below. Tributary flow recorded as inflow is considered a contribution and not a gain; no outflow (diversions) occurred during the investigation. Evaporation from the water surface of the river in December is considered negligible.

WATER QUALITY--Chemical analyses of water samples collected from the Rio Grande (five sites) during the seepage investigation are listed in table 9. Water samples were analyzed for major ions, selected nutrients, and selected trace elements.

GROUND-WATER LEVELS--Ground-water levels were measured during the seepage investigation. Water levels in selected observation wells completed in the shallow flood-plain alluvium are listed in table 10.

REMARKS--The seepage investigation was conducted from Radium Springs, New Mexico, to El Paso, Texas, on December 17-18, 1991. Precipitation on December 18 resulted in rising river stage downstream from the Rio Grande at the NM-227 Bridge near Vado, New Mexico. Rio Grande seepage results are reported for December 17 only along the upstream reach from Radium Springs to Vado, New Mexico. Individual discharge measurements were rated good (within 5 percent) to fair (within 8 percent). Accuracy of discharge measurements needs to be considered when evaluating indicated gains and losses.

°C, degrees Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; ft^3/s, cubic feet per second; --, no data or not applicable. Site number locations are shown in figure 8. Locations are in New Mexico.

Table 8.--Rio Grande seepage investigation from Radium Springs to Vado, New Mexico, December 17, 1991--Concluded

Site number	River mile	Stream	Location	Time	Water temperature (°C)	Specific conductance (µS/cm)	Discharge, in ft³/s: Main stream	Discharge, in ft³/s: Inflow	Discharge, in ft³/s: Gain or loss
			December 17, 1991						
1	1,312.3	Rio Grande	Below Leasburg Dam, Radium Springs Lat 32°28'41", long 106°55'10"	1020	6	1,480	43.2		--
2	1,310.2	Rio Grande	Near Leasburg Lat 32°27'21", long 106°54'08"	1200	7	1,450	48.9		+5.7
3	1,307.6	Selden Drain	Near Leasburg Lat 32°25'38", long 106°52'50"	1215	--	--		0	--
4	1,306.3	Rio Grande	Near Hill Lat 32°25'05", long 106°52'01"	1340	7	1,530	55.3		+6.4
5	1,302.7	Rio Grande	At Shalem Bridge near Doña Ana Lat 32°22'34", long 106°51'16"	1500	8	1,520	55.1		-0.2
6	1,301.2	Wasteway no. 5	Near Doña Ana Lat 32°22'14", long 106°50'14"	1520	--	--		0	--
7	1,298.8	Rio Grande	Near Picacho Lat 32°20'18", long 106°50'09"	0925	5	1,500	58.5		+3.4
8	1,295.6	Rio Grande	Below Picacho Bridge near Las Cruces Lat 32°17'45", long 106°49'25"	1025	5	1,580	55.2		-3.3
9	1,295.4	Wastewater inflow	City of Las Cruces Lat 32°17'35", long 106°49'26"	1100	--	1,020		1/ 11.5	--
10	1,293.1	Rio Grande	At NM-359 Bridge near Mesilla Lat 32°15'49", long 106°49'29"	1145	7	1,510	59.4		-7.3
11	1,291.8	Picacho Drain	Above Mesilla Dam Lat 32°14'34", long 106°48'56"	1315	7	1,400		4.30	--
12	1,291.7	Rio Grande	Below Picacho Drain Lat 32°14'30", long 106°48'49"	1400	9	1,520	52.8		-10.9
13	1,289.5	Rio Grande	Below Mesilla Dam Lat 32°13'17", long 106°47'15"	1040	5.5	1,540	45.6		-7.2
14	1,287.3	Rio Grande	At NM-28 Bridge near San Pablo Lat 32°12'24", long 106°45'32"	1300	8.5	1,500	46.1		+0.5
15	1,283.6	Santo Tomas River Drain	Near San Miguel Lat 32°10'16", long 106°43'11"	1330	--	--		0	--
16	1,282.7	Rio Grande	At NM-228 Bridge near San Miguel Lat 32°09'43", long 106°42'58"	1520	9.5	1,490	50.6		+4.5
17	1,277.8	Rio Grande	At NM-227 Bridge near Vado Lat 32°06'48", long 106°40'05"	1525	11	1,490	46.2		-4.4

1/ Reported discharge.

Table 9.--Chemical analyses of water samples collected from the Rio Grande during seepage investigations, 1988 through 1992 water years

[deg C, degrees Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; dis it, dissolved incremental titration; tot it, total incremental titration; µg/L, micrograms per liter; --, no data; cols/100 mL, colonies per 100 milliliters; <, less than; site number locations are shown in figure 8]

Site number	Station name	Date	Time	Disharge, instan-taneous (cubic feet per second)	Spe-cific conduct-ance (µS/cm)	pH, water, whole field (standard units)	Temper-ature, air (deg C)	Temper-ature, water (deg C)
1	Rio Grande below Leasburg Dam, N. Mex.	01-05-88	0930	95	1,180	8.5	6.0	5.5
		01-10-89	1105	33	1,650	8.2	7.5	3.0
		01-09-90	1040	38	1,480	8.2	14.5	6.5
		01-08-91	1030	38	1,370	8.3	9.0	8.0
		12-17-91	1015	43	1,480	--	8.0	5.5
8	Rio Grande below Picacho Bridge near Las Cruces, N. Mex.	01-05-88	1145	102	1,350	8.3	17.0	8.0
		01-10-89	1300	61	1,850	8.4	9.5	4.5
		01-09-90	1330	36	1,650	8.3	19.5	12.0
		01-08-91	1315	35	1,490	8.4	13.0	12.0
		12-17-91	1230	55	1,580	8.3	12.0	7.0
13	Rio Grande below Mesilla Dam near Santo Tomas, N. Mex.	01-05-88	1345	100	1,360	8.4	16.0	10.0
		01-10-89	1510	45	1,650	8.3	10.5	9.0
		01-09-90	1520	29	1,650	8.3	20.5	13.5
		01-08-91	1500	34	1,470	8.7	17.0	14.0
		12-17-91	1450	46	1,540	8.4	13.0	11.0
17	Rio Grande at NM-227 Bridge near Vado, N. Mex.	01-06-88	0915	91	1,300	8.4	9.5	8.0
		01-11-89	1005	42	1,600	8.3	13.0	1.5
		01-10-90	0915	26	1,680	8.3	5.0	4.0
		01-09-91	0900	29	1,450	9.0	9.0	6.5
		12-18-91	0925	48	1,490	8.4	8.0	7.5
26	Rio Grande at TX-259 Bridge, Cañutillo, Tex.	01-06-88	1115	171	1,540	8.5	15.5	11.0
		01-11-89	1215	105	1,800	8.4	12.5	6.5
		01-10-90	1150	67	1,780	8.4	16.0	9.0
		01-09-91	1115	72	1,590	8.6	18.5	9.0
		12-18-91	1215	107	1,660	8.4	10.0	9.0
34	Rio Grande at El Paso, Tex.	01-06-88	1345	194	1,740	8.5	16.5	12.5
		01-11-89	1500	122	2,100	8.4	13.5	10.5
		01-10-90	1440	98	2,100	8.5	25.0	8.5
		01-09-91	1510	88	2,010	8.7	13.5	13.0

Table 9.--Chemical analyses of water samples collected from the Rio Grande during seepage investigations, 1988 through 1992 water years--Continued

Site number	Date	Oxygen, dissolved (mg/L)	Turbidity (NTU)	Coliform, fecal, 0.7 um-mf (cols/100 mL)	Streptococci fecal, kf agar (cols/100 mL)	Hardness, total (mg/L as $CaCO_3$)	Hardness, noncarb dissolved, field, as $CaCO_3$ (mg/L)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Sodium adsorption ratio	Potassium, dissolved (mg/L as K)	Bicarbonate, water, dis it, field (mg/L as HCO_3)
1	01-05-88	--	1.9	--	--	330	150	100	20	120	3	6.7	225
	01-10-89	--	3.4	--	--	450	230	140	25	170	3	7.7	275
	01-09-90	--	1.0	--	--	400	180	120	23	160	4	7.8	249
	01-08-91	--	9.1	--	--	370	190	110	23	160	4	7.3	205
	12-17-91	--	4.0	--	--	400	170	120	23	160	4	8.5	251
8	01-05-88	--	1.8	--	--	360	160	110	21	140	3	8.6	237
	01-10-89	--	2.6	--	--	460	220	140	26	190	4	11	276
	01-09-90	--	0.20	--	--	430	200	130	24	190	4	11	263
	01-08-91	--	15	--	--	400	210	120	24	190	4	11	217
	12-17-91	--	18	--	--	400	160	120	24	180	4	11	278
13	01-05-88	--	2.3	--	--	360	150	110	20	140	3	9.3	232
	01-10-89	--	4.3	--	--	400	170	120	25	190	4	13	281
	01-09-90	--	7.4	--	--	400	180	120	23	180	4	12	249
	01-08-91	--	23	--	--	370	180	110	22	180	4	12	203
	12-17-91	--	20	--	--	370	160	110	23	180	4	11	239
17	01-06-88	--	2.9	--	--	360	150	110	20	140	3	9.2	225
	01-11-89	--	5.8	--	--	410	180	120	26	190	4	10	276
	01-10-90	--	2.7	--	--	400	180	120	24	180	4	11	249
	01-09-91	--	7.6	--	--	370	150	110	22	180	4	11	225
	12-18-91	--	8.8	--	--	370	150	110	22	180	4	11	239
26	01-06-88	--	6.2	--	--	370	140	110	23	180	4	11	256
	01-11-89	--	2.8	--	--	440	190	130	27	220	5	11	271
	01-10-90	--	4.7	--	--	400	150	120	24	200	4	13	276
	01-09-91	--	9.4	--	--	400	160	120	24	210	5	12	246
	12-18-91	--	6.0	--	--	380	120	110	24	210	5	11	281
34	01-06-88	--	9.1	--	--	380	140	110	24	220	5	9.9	260
	01-11-89	--	4.5	--	--	420	160	120	29	280	6	10	276
	01-10-90	--	12	--	--	420	150	120	29	290	6	9.5	295
	01-09-91	10.4	13	130	240	--	--	--	27	300	--	11	288

Table 9.--Chemical analyses of water samples collected from the Rio Grande during seepage investigations, 1988 through 1992 water years--Continued

Site number	Date	Carbonate water, dissolved, incremental titration, field (mg/L as CO_3)	Alkalinity water, dissolved, tot it, field (mg/L as $CaCO_3$)	Sulfate, dissolved (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 180 deg C, dissolved (mg/L)	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrate, total (mg/L as N)	Nitrogen, nitrate, dissolved (mg/L as N)	Nitrogen, nitrite, total (mg/L as N)	Nitrogen, nitrite, dissolved (mg/L as N)
1	01-05-88	2	188	290	100	0.60	14	784	766	0.180	--	--	<0.010
	01-10-89	0	225	380	150	0.50	20	1,020	1,030	0.340	0.340	--	0.020
	01-09-90	7	216	360	130	0.40	18	984	951	0.210	--	--	<0.010
	01-08-91	7	180	350	140	0.20	14	930	914	0.090	--	0.010	<0.010
	12-17-91	10	222	370	150	0.60	17	1,160	986	0.460	0.490	0.010	0.010
8	01-05-88	7	206	300	120	0.60	15	845	841	0.160	--	--	<0.010
	01-10-89	7	238	400	180	0.50	20	1,110	1,110	0.280	0.280	--	0.020
	01-09-90	7	228	380	170	0.50	19	1,090	1,060	0.180	--	--	<0.010
	01-08-91	7	190	370	170	0.40	15	1,030	1,020	--	--	<0.010	<0.010
	12-17-91	5	236	380	180	0.70	17	1,150	1,060	0.350	0.360	0.010	0.010
13	01-05-88	12	210	290	130	0.60	16	847	847	0.280	0.280	--	0.040
	01-10-89	0	230	360	180	0.50	21	1,030	1,060	0.970	0.970	--	0.230
	01-09-90	10	220	350	170	0.60	20	1,080	1,020	1.45	1.45	--	0.250
	01-08-91	12	186	320	170	0.40	15	972	953	1.23	1.33	0.170	0.170
	12-17-91	12	216	340	160	0.70	17	1,050	980	0.990	0.990	0.110	0.110
17	01-06-88	12	204	290	130	0.60	16	832	845	0.590	0.590	--	0.060
	01-11-89	0	226	350	180	0.60	20	1,040	1,050	1.27	1.27	--	0.130
	01-10-90	10	220	330	170	0.60	18	1,120	1,000	2.32	2.32	--	0.280
	01-09-91	22	220	310	170	0.30	10	940	960	1.80	1.82	0.200	0.180
	12-18-91	10	212	320	150	0.70	14	1,110	946	1.48	1.48	0.120	0.120
26	01-06-88	10	226	340	160	0.60	18	987	985	0.600	0.600	--	0.060
	01-11-89	14	246	390	190	0.60	21	1,140	1,140	0.870	0.870	--	0.050
	01-10-90	12	246	370	180	0.70	19	1,140	1,080	1.20	1.20	--	0.100
	01-09-91	22	238	360	180	0.40	16	1,090	1,070	1.03	1.03	0.070	0.070
	12-18-91	12	250	380	180	0.70	17	1,090	1,090	1.20	1.20	0.100	0.100
34	01-06-88	14	237	400	180	0.70	20	1,130	1,110	0.500	0.500	--	0.070
	01-11-89	19	258	470	220	0.60	25	1,320	1,320	0.700	0.700	--	0.030
	01-10-90	17	270	470	230	0.60	25	1,400	1,340	0.760	0.760	--	0.060
	01-09-91	17	264	440	250	0.30	21	1,360	--	0.750	0.760	0.050	0.040

Table 9.--Chemical analyses of water samples collected from the Rio Grande during seepage investigations, 1988 through 1992 water years--Continued

Site number	Date	Nitrogen, NO_2+NO_3, total (mg/L as N)	Nitrogen NO_2+NO_3, dissolved (mg/L as N)	Nitrogen, ammonia, total (mg/L as N)	Nitrogen, ammonia, dissolved (mg/L as N)	Nitrogen, organic, total (mg/L as N)	Nitrogen, ammonia + organic, total (mg/L as N)	Nitrogen, total (mg/L as N)	Phosphorus, total (mg/L as P)	Phosphorus, dissolved (mg/L as P)	Phosphorus ortho, total (mg/L as P)	Phosphorus ortho, dissolved (mg/L as P)
1	01-05-88	--	0.180	0.040	0.050	0.26	0.30	0.48	0.010	0.020	--	0.010
	01-10-89	--	0.360	0.070	0.070	0.43	0.50	0.86	0.020	0.020	--	0.010
	01-09-90	--	0.210	0.050	0.050	0.35	0.40	0.61	<0.010	<0.010	--	<0.010
	01-08-91	0.100	0.100	0.020	0.020	--	<0.20	--	0.010	<0.010	<0.010	0.010
	12-17-91	0.470	0.500	0.030	0.020	0.27	0.30	0.77	0.020	<0.010	<0.010	<0.010
8	01-05-88	--	0.160	0.080	0.070	0.12	0.20	0.36	<0.010	<0.010	--	<0.010
	01-10-89	--	0.300	0.090	0.090	0.41	0.50	0.80	0.020	<0.010	--	0.020
	01-09-90	--	0.180	0.050	0.050	0.55	0.60	0.78	0.010	<0.010	--	0.010
	01-08-91	<0.100	<0.100	0.010	0.020	--	<0.20	--	<0.010	<0.010	<0.010	0.010
	12-17-91	0.360	0.370	0.040	0.030	0.26	0.30	0.66	0.020	<0.010	<0.010	<0.010
13	01-05-88	--	0.320	0.780	0.770	0.32	1.1	1.4	0.440	0.450	--	0.400
	01-10-89	--	1.20	2.40	1.90	0.60	3.0	4.2	1.20	1.10	--	1.10
	01-09-90	--	1.70	1.60	1.30	1.0	2.6	4.3	1.10	1.10	--	1.00
	01-08-91	1.40	1.50	0.860	0.800	0.14	1.0	2.4	1.10	0.970	0.950	0.950
	12-17-91	1.10	1.10	1.00	0.770	0.70	1.7	2.8	0.560	0.460	0.470	0.440
17	01-06-88	--	0.650	0.570	0.560	0.53	1.1	1.7	0.570	0.570	--	0.510
	01-11-89	--	1.40	1.30	1.20	0.80	2.1	3.5	1.10	1.10	--	1.00
	01-10-90	--	2.60	1.00	0.920	1.0	2.0	4.6	1.40	1.50	--	1.10
	01-09-91	2.00	2.00	0.240	0.210	0.36	0.60	2.6	1.20	1.20	1.10	1.00
	12-18-91	1.60	1.60	0.740	0.570	0.66	1.4	3.0	0.590	0.490	0.480	0.470
26	01-06-88	--	0.660	0.270	0.290	0.43	0.70	1.4	0.400	0.380	--	0.350
	01-11-89	--	0.920	0.250	0.290	0.95	1.2	2.1	0.470	0.430	--	0.400
	01-10-90	--	1.30	0.260	0.290	0.74	1.0	2.3	0.460	0.430	--	0.430
	01-09-91	1.10	1.10	0.070	0.090	0.23	0.30	1.4	0.580	0.550	0.570	0.600
	12-18-91	1.30	1.30	0.160	0.200	0.74	0.90	2.2	0.330	0.240	0.230	0.220
34	01-06-88	--	0.570	0.180	0.200	0.52	0.70	1.3	0.280	0.240	--	0.210
	01-11-89	--	0.730	0.140	0.180	0.36	0.50	1.2	0.400	0.370	--	0.320
	01-10-90	--	0.820	0.160	0.160	0.84	1.0	1.8	0.360	0.320	--	0.320
	01-09-91	0.800	0.800	0.060	0.050	0.24	0.30	1.1	0.550	0.470	0.450	0.420

Table 9.--Chemical analyses of water samples collected from the Rio Grande during seepage investigations, 1988 through 1992 water years--Continued

Site number	Date	Aluminum, dissolved (µg/L as Al)	Arsenic, dissolved (µg/L as As)	Barium, dissolved (µg/L as Ba)	Beryllium, dissolved (µg/L as Be)	Boron, dissolved (µg/L as B)	Bromide, dissolved (mg/L as Br)	Cadmium, dissolved (µg/L as Cd)	Chromium, dissolved (µg/L as Cr)	Cobalt, dissolved (µg/L as Co)	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)
1	01-05-88	<10	2	85	<0.5	--	--	<1.0	<1	<3	3	4
	01-10-89	<10	2	87	<0.5	210	0.25	<1.0	<1	<3	1	4
	01-09-90	<10	2	84	<0.5	--	--	2.0	1	<3	<10	8
	01-08-91	10	2	98	<0.5	--	--	2.0	<1	<3	2	7
	12-17-91	10	2	95	--	--	--	<1.0	<1	<3	<1	11
8	01-05-88	<10	3	91	<0.5	--	--	<1.0	1	<3	5	3
	01-10-89	<10	2	94	<0.5	240	0.27	<1.0	<1	<3	1	6
	01-09-90	<10	2	90	<0.5	--	--	<1.0	1	<3	<10	5
	01-08-91	20	2	110	<0.5	--	--	1.0	1	<3	1	10
	12-17-91	<10	<1	100	--	--	--	<1.0	<1	<3	<1	7
13	01-05-88	<10	1	91	<0.5	--	--	<1.0	1	<3	3	4
	01-10-89	<10	2	99	<0.5	240	0.22	<1.0	<1	<3	3	8
	01-09-90	10	2	94	<0.5	--	--	<1.0	1	<3	<10	13
	01-08-91	20	2	110	<0.5	--	--	2.0	<1	<3	1	31
	12-17-91	<10	2	97	--	--	--	<1.0	<1	<3	<1	<3
17	01-06-88	<10	1	98	<0.5	--	--	<1.0	<1	<3	7	5
	01-11-89	<10	2	110	<0.5	240	0.21	1.0	<1	<3	4	8
	01-10-90	<10	2	100	<0.5	--	--	<1.0	1	<3	<10	9
	01-09-91	<10	2	110	<0.5	--	--	<1.0	<1	<3	2	12
	12-18-91	<10	2	110	--	--	--	<1.0	<1	<3	2	11
26	01-06-88	<10	2	82	<0.5	--	--	<1.0	1	<3	3	4
	01-11-89	<10	2	80	<0.5	250	0.23	<1.0	<1	<3	3	4
	01-10-90	<10	2	76	<0.5	--	--	<1.0	<1	<3	<10	7
	01-09-91	<10	3	82	<0.5	--	--	<1.0	2	<3	1	9
	12-18-91	<10	2	79	--	--	--	<1.0	<1	<3	2	7
34	01-06-88	<10	3	81	<0.5	--	--	<1.0	1	<3	2	5
	01-11-89	<10	3	100	<10	330	0.28	<1.0	<1	<1	2	10
	01-10-90	<10	4	100	<10	--	--	<1.0	<1	1	2	10
	01-09-91	20	4	<100	<10	--	--	<1.0	2	<1	2	<10

Table 9.--Chemical analyses of water samples collected from the Rio Grande during seepage investigations, 1988 through 1992 water years--Concluded

Site number	Date	Lead, dissolved (µg/L as Pb)	Lithium, dissolved (µg/L as Li)	Manganese, dissolved (µg/L as Mn)	Mercury, dissolved (µg/L as Hg)	Molybdenum, dissolved (µg/L as Mo)	Nickel, dissolved (µg/L as Ni)	Selenium, dissolved (µg/L as Se)	Silver, dissolved (µg/L as Ag)	Strontium, dissolved (µg/L as Sr)	Vanadium, dissolved (µg/L as V)	Zinc, dissolved (µg/L as Zn)
1	01-05-88	<5	96	22	0.2	10	<1	<1	<1.0	1,100	<6	11
	01-10-89	<5	130	75	<0.1	<10	1	<1	1.0	1,500	<6	22
	01-09-90	<10	120	46	0.1	<10	<10	<1	<1.0	1,400	<6	25
	01-08-91	<1	120	37	0.1	<10	<1	<2	<1.0	1,300	<6	14
	12-17-91	<1	110	35	<0.1	<10	<1	<1	<1.0	1,400	<6	<10
8	01-05-88	<5	120	7	0.2	<10	<1	<1	<1.0	1,200	<6	<3
	01-10-89	<5	170	43	<0.1	<10	2	<1	<1.0	1,600	<6	15
	01-09-90	<10	150	29	0.1	<10	<10	<1	<1.0	1,500	<6	19
	01-08-91	<1	160	7	<0.1	<10	<1	<1	<1.0	1,400	<6	51
	12-17-91	<1	140	17	<0.1	<10	<1	<1	<1.0	1,500	<6	<10
13	01-05-88	<5	120	3	0.1	<10	2	<1	<1.0	1,200	<6	25
	01-10-89	<5	150	9	<0.1	<10	2	<1	1.0	1,500	<6	16
	01-09-90	10	140	15	0.1	10	<10	<1	<1.0	1,500	<6	36
	01-08-91	<1	140	13	0.2	<10	<1	<1	<1.0	1,300	<6	79
	12-17-91	<1	130	8	<0.1	<10	<1	<1	<1.0	1,400	<6	<10
17	01-06-88	<5	110	6	0.2	10	2	<1	<1.0	1,200	<6	19
	01-11-89	<5	150	17	<0.1	<10	<1	<1	<1.0	1,500	<6	20
	01-10-90	10	140	29	<0.1	<10	<10	<1	<1.0	1,500	<6	10
	01-09-91	<1	140	23	<0.1	<10	<1	<1	<1.0	1,300	<6	65
	12-18-91	<1	130	16	<0.1	<10	<1	<1	<1.0	1,300	<6	<10
26	01-06-88	<5	140	18	0.1	<10	2	<1	1.0	1,400	<6	11
	01-11-89	<5	170	29	<0.1	<10	<1	<1	3.0	1,600	<6	13
	01-10-90	<10	150	24	0.1	<10	<10	<1	<1.0	1,500	<6	7
	01-09-91	<1	160	18	<0.1	10	1	<1	<1.0	1,400	<6	30
	12-18-91	<1	150	10	<0.1	10	<1	<1	<1.0	1,400	<6	<10
34	01-06-88	<5	160	62	0.1	10	2	<1	<1.0	1,400	<6	7
	01-11-89	<5	200	100	<0.1	10	<1	<1	<1.0	1,700	2	20
	01-10-90	<1	40	80	0.1	11	2	<1	<1.0	1,800	2	20
	01-09-91	<1	190	60	<0.1	8	<1	<1	<1.0	1,700	7	<10

Table 10.--Water levels in selected observation wells completed in the shallow flood-plain alluvium during Rio Grande seepage investigations, 1988 through 1992 water years

[Well locations shown in figure 8. USBR, Bureau of Reclamation]

Well number	Well location	Altitude of land surface (feet)	Water level, in feet below land surface	Date measured	Remarks
1	21S.01W.14.313	3,960	14.3	01-09-90	New well
			14.4	01-09-91	USBR-41
			14.4	12-16-91	
2	21S.01W.24.214	3,950	15.0	01-09-90	New well
			--	01-09-91	USBR-42
			14.0	12-16-91	
4	22S.01E.06.124	3,935	10.6	01-09-90	New well
			10.8	01-09-91	USBR-43
			10.6	12-16-91	
5	22S.01E.09.241a	3,930.1	--	01-05-88	Well dry
			--	01-11-89	Well dry
			10.5	01-09-90	USBR-26
			10.8	12-16-91	
6	22S.01E.09.333	3,928.1	7.1	01-05-88	USBR-20
			7.4	01-10-89	
			8.1	01-09-90	
			7.6	01-09-91	
			7.5	12-16-91	
7	22S.01E.16.433	3,923.4	8.7	01-05-88	USBR-19
			8.8	01-10-89	
			8.7	01-09-90	
			9.0	01-09-91	
			8.9	12-16-91	
8	22S.01E.33.341	3,906.4	7.9	01-05-88	USBR-15
			7.7	01-10-89	
			8.0	01-09-90	
			--	-- -- --	
			8.1	12-16-91	
9	22S.01E.35.334	3,909.9	12.7	01-05-88	USBR-18
			12.6	01-10-89	
			13.2	01-09-90	
			13.7	01-09-91	
			13.1	12-16-91	

Table 10.--Water levels in selected observation wells completed in the shallow flood-plain alluvium during Rio Grande seepage investigations, 1988 through 1992 water years--Continued

Well number	Well location	Altitude of land surface (feet)	Water level, in feet below land surface	Date measured	Remarks
10	22S.01E.35.334b	3,909.6	14.9	01-05-88	USBR-17
			15.3	01-10-89	
			15.5	01-09-90	
			16.1	01-09-91	
			15.6	12-16-91	
18	23S.01E.01.413	3,900	20.4	01-09-90	New well
			21.1	01-09-91	USBR-44
			21.2	12-16-91	
19	23S.01E.09.433	3,894.7	7.5	01-05-88	USBR-16
			7.8	01-10-89	
			8.7	01-09-90	
			8.9	01-09-91	
			8.8	12-16-91	
22	23S.01E.14.241	3,890	16.2	01-09-90	New well
			17.2	01-09-91	USBR-45
			17.4	12-16-91	
23	23S.01E.16.424	3,865.7	13.5	01-05-88	USBR-12
			13.2	01-10-89	
			13.3	01-09-90	
			13.7	01-09-91	
			13.5	12-16-91	
33	23S.01E.27.334	3,882.3	6.1	01-05-88	USBR-11
			6.0	01-10-89	
			5.9	01-09-80	
			6.1	01-09-91	
			6.0	12-16-91	
46	23S.02E.29.113	3,880	18.0	01-09-90	New well
			18.6	01-09-91	USBR-47
			19.1	12-16-91	
53	24S.01E.01.223	3,880	15.4	01-09-90	New well
			16.1	01-09-91	USBR-46
			16.0	12-16-91	

Table 10.--Water levels in selected observation wells completed in the shallow flood-plain alluvium during Rio Grande seepage investigations, 1988 through 1992 water years--Continued

Well number	Well location	Altitude of land surface (feet)	Water level, in feet below land surface	Date measured	Remarks
54	24S.01E.11.112	3,870	5.8	01-09-9	New well
			6.1	01-09-91	USBR-48
			6.3	12-16-91	
60	24S.02E.08.434a	3,862.9	--	01-05-88	Well plugged
			--	01-10-89	Well plugged
			8.7	01-09-90	USBR-13
			9.4	01-08-91	
			8.8	12-16-91	
61	24S.02E.09.433	3,861.9	9.8	01-05-88	USBR-14
			9.1	01-10-89	
			9.1	01-09-90	
			9.8	01-08-91	
			9.4	12-16-91	
80	24S.02E.22.242	3,851.4	7.4	01-05-88	USBR-10
			10.3	01-10-89	
			7.3	01-09-90	
			8.1	01-08-91	
			7.7	12-16-91	
81	24S.02E.23.342	3,848.6	--	01-05-88	Well plugged
			--	01-10-89	Well plugged
			8.5	01-09-90	USBR-9
			9.3	01-08-91	
			9.0	12-16-91	
82	24S.02E.28.334	3,850.5	11.0	01-05-88	USBR-8
			10.6	01-10-89	
			10.6	01-09-90	
			11.9	01-08-91	
			11.8	12-16-91	
91	25S.02E.01.411	3,835.3	7.1	01-05-88	USBR-25
			7.5	01-11-89	
			--	01-10-90	Silted
			--	01-09-91	Silted
			--	12-16-91	Silted

Table 10.--Water levels in selected observation wells completed in the shallow flood-plain alluvium during Rio Grande seepage investigations, 1988 through 1992 water years--Continued

Well number	Well location	Altitude of land surface (feet)	Water level, in feet below land surface	Date measured	Remarks
92	25S.02E.04.114	3,847	11.9	01-05-88	USBR-7
			11.6	01-10-89	
			11.9	01-09-90	
			12.0	01-08-91	
			11.8	12-16-91	
93	25S.02E.23.212	3,828.6	8.6	01-05-88	USBR-6
			8.2	01-10-89	
			8.5	01-09-90	
			7.2	01-08-91	
			7.8	12-16-91	
94	25S.02E.25.322	3,821.3	9.9	01-05-88	USBR-5
			9.3	01-10-89	
			9.8	01-09-90	
			9.6	01-08-91	
			9.7	12-16-91	
98	25S.03E.20.421	3,818.9	7.1	01-05-88	USBR-24
			6.8	01-11-89	
			7.1	01-10-90	
			6.8	01-08-91	
			6.5	12-16-91	
99	25S.03E.28.343a	3,814.6	8.3	01-05-88	USBR-27
			8.2	01-11-89	
			8.3	01-10-90	
			8.3	01-08-91	
			7.9	12-16-91	
100	25S.03E.31.143	3,814.3	8.0	01-05-88	USBR-4
			7.3	01-10-89	
			7.4	01-09-90	
			7.6	01-08-91	
			7.3	12-16-91	
109	26S.02E.01.211	3,812.6	8.2	01-05-88	USBR-3
			7.6	01-10-89	
			8.0	01-09-90	
			8.2	01-08-91	
			7.9	12-16-91	

Table 10.--Water levels in selected observation wells completed in the shallow flood-plain alluvium during Rio Grande seepage investigations, 1988 through 1992 water years--Continued

Well number	Well location	Altitude of land surface (feet)	Water level, in feet below land surface	Date measured	Remarks
116	26S.03E.04.122	3,810.5	9.5	01-05-88	USBR-21
			9.4	01-11-89	
			9.9	01-09-90	
			9.6	01-08-91	
			9.2	12-16-91	
117	26S.03E.08.221	3,809.0	9.4	01-05-88	USBR-23
			9.4	01-11-89	
			9.6	01-10-90	
			10.1	01-08-91	
			9.3	12-16-91	
118	26S.03E.09.221a	3,804.7	6.9	01-05-88	USBR-22
			6.8	01-11-89	
			7.0	01-09-90	
			6.9	01-08-91	
			6.5	12-16-91	
119	26S.03E.15.112	3,806.5	7.8	01-05-88	USBR-28
			7.4	01-11-89	
			7.6	01-10-90	
			7.4	01-08-91	
			7.2	12-16-91	
120	26S.03E.22.211	3,794.5	4.4	01-05-88	USBR-30
			4.2	01-11-89	
			4.6	01-10-90	
			4.6	01-08-91	
			4.3	12-16-91	
121	26S.03E.27.211	3,793.6	6.4	01-05-88	USBR-32
			6.2	01-11-89	
			7.0	01-10-90	
			6.4	01-08-91	
			6.1	12-16-91	
122	26S.03E.27.212	3,792.9	5.0	01-05-88	USBR-31
			5.2	01-11-89	
			5.4	01-10-90	
			4.9	01-08-91	
			5.1	12-16-91	

Table 10.--Water levels in selected observation wells completed in the shallow flood-plain alluvium during Rio Grande seepage investigations, 1988 through 1992 water years--Continued

Well number	Well location	Altitude of land surface (feet)	Water level, in feet below land surface	Date measured	Remarks
123	26S.03E.32.441	3,790.0	9.0	01-05-88	USBR-39
			8.7	01-11-89	
			8.7	01-10-90	
			8.5	01-08-91	
			8.4	12-16-91	
132	27S.03E.09.444	3,779.1	3.5	01-05-88	USBR-38
			3.3	01-11-89	
			5.4	01-10-90	
			6.5	01-08-91	
			5.8	12-16-91	
133	27S.03E.22.221	3,775	8.2	01-10-90	New well
			8.6	01-08-91	USBR-49
			8.5	12-16-91	
134	27S.03E.28.314	3,771.2	7.9	01-05-88	USBR-1
			7.7	01-10-89	
			7.6	01-10-90	
			7.7	01-08-91	
			7.4	12-16-91	
135	27S.03E.32.124a	3,773.2	7.8	01-05-88	USBR-2
			8.1	01-10-89	
			8.1	01-10-90	
			8.3	01-08-91	
			8.0	12-16-91	
136	27S.03E.35.113	3,767	10.9	01-10-90	New well
			13.1	01-08-91	USBR-50
			12.1	12-16-91	
156	JL 49-03-916	3,754.7	7.1	01-05-88	USBR-36
			7.2	01-11-89	
			7.6	01-10-90	
			7.5	01-08-91	
			7.4	12-18-91	

Table 10.--Water levels in selected observation wells completed in the shallow flood-plain alluvium during Rio Grande seepage investigations, 1988 through 1992 water years--Concluded

Well number	Well location	Altitude of land surface (feet)	Water level, in feet below land surface	Date measured	Remarks
158	JL 49-04-121	3,788.4	6.1	01-05-88	USBR-29
			6.1	01-11-89	
			6.5	01-10-90	
			7.2	01-08-91	
			6.8	12-16-91	
178	JL 49-04-701	3,755.5	6.4	01-05-88	USBR-37
			6.2	01-11-89	
			7.1	01-10-90	
			7.0	01-08-91	
			6.8	12-18-91	
179	JL 49-12-101	3,748.1	6.3	01-05-88	USBR-35
			6.6	01-11-89	
			7.0	01-10-90	
			6.8	01-08-91	
			6.5	12-18-91	
180	JL 49-12-117	3,747.3	5.7	01-05-88	USBR-33
			6.3	01-11-89	
			8.4	01-10-90	
			6.1	01-08-91	
			5.8	12-18-91	
181	JL 49-12-501	3,735.5	7.1	01-05-88	USBR-34
			7.1	01-11-89	
			7.6	01-10-90	
			7.2	01-08-91	
			6.3	12-18-91	

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