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Selected Ground-Water Data for Yucca Mountain Region, Southern Nevada and Eastern California, January–December 2005

Open-File Report 2008–1265

U.S. Department of the Interior
U.S. Geological Survey

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By Glenn L. Locke

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U.S. Geological Survey

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U.S. Geological Survey
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Conversion Factors and Datums

Conversion Factors

Multiply	By	To obtain
acre	4,047	square meter (m^2)
acre-foot (acre-ft)	1,233	cubic meter (m^3)
foot (ft)	0.3048	meter (m)
gallon (gal)	0.003785	cubic meter (m^3)
gallon per minute (gal/min)	0.06309	liter per second (L/s)
inch (in.)	2.54	centimeter (cm)
mile (mi)	1.609	kilometer (km)
million gallons (Mgal)	3,785	cubic meter (m^3)
square inch (in^2)	6.4516	square centimeter (cm^2)
pound per square inch (lb/in^2)	6.895	kilopascal (kPa)

Datums

Vertical coordinate information is referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

Horizontal coordinate information is referenced to the North American Datum of 1927 (NAD 27).

Altitude, as used in this report, refers to distance above the vertical datum.

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Selected Ground-Water Data for Yucca Mountain Region, Southern Nevada and Eastern California, January–December 2005

By Glenn L. Locke

Abstract

The U.S. Geological Survey, in cooperation with the U.S. Department of Energy, Office of Civilian Radioactive Waste Management, collected, compiled, and summarized hydrologic data in the Yucca Mountain region of southern Nevada and eastern California. These data were collected to allow assessments of ground-water resources during activities to determine the potential suitability or development of Yucca Mountain for storing high-level nuclear waste.

Data collected from January through December 2005 are provided for ground-water levels at 35 boreholes and 1 fissure (Devils Hole), ground-water discharge at 5 springs, ground-water levels and discharge at 1 flowing borehole, and total reported ground-water withdrawals within Crater Flat, Jackass Flats, Mercury Valley, and the Amargosa Desert. Ground-water level, discharge, and withdrawal data collected by other agencies, or as part of other programs, are provided.

A statistical summary of ground-water levels at seven boreholes in Jackass Flats is presented for 1992–2005 to indicate potential effects of ground-water withdrawals associated with U.S. Department of Energy activities near Yucca Mountain. The statistical summary includes the annual number of measurements; maximum, minimum, and median water-level altitudes; and average deviation of measured water-level altitudes compared to the 1992–93 baseline period. At seven boreholes in Jackass Flats, median water levels for 2005 were slightly higher (0.4–2.7 feet) than the median water levels for 1992–93.

Introduction

Activities to assess the potential suitability or development of Yucca Mountain for storing high-level nuclear waste are in progress or are planned. The U.S. Department of Energy (DOE), Office of Civilian Radioactive Waste Management, has declared that all facilities and investigations associated with such activities will be operated in a manner that maintains or protects environmental quality, and has established programs to allow assessments of environmental quality. In April 1989, the U.S. Geological Survey (USGS) began a cooperative program with DOE to develop a ground-water-resources monitoring program near Yucca Mountain. The purposes of the monitoring program are to (1) document the historical and current conditions of ground-water resources, (2) detect and document changes in those ground-water resources during activities at Yucca Mountain, and (3) provide a basis for analyzing and identifying potential adverse effects on ground-water resources resulting from investigations and activities at Yucca Mountain.

Purpose and Scope

This report presents and summarizes hydrologic data collected as part of the USGS Environmental-Monitoring Program (USGS-EMP). Data collected during calendar year 2005 are provided for ground-water levels at 35 boreholes and 1 fissure (Devils Hole), ground-water discharge at 5 springs, ground-water levels and discharge at 1 flowing borehole, and total reported ground-water withdrawals within Crater Flat, Jackass Flats, Mercury Valley, and Amargosa Desert. Additional ground-water level, discharge, and withdrawal data collected by other agencies (or collected as part of other programs) also are included.

A discussion of ground-water data for Jackass Flats includes a statistical summary of those data to indicate the potential effects of withdrawals from boreholes in Jackass Flats on water levels near Yucca Mountain. Effects of these withdrawals may be detected in Jackass Flats before they are detected elsewhere in the Yucca Mountain region.

This report is the twelfth in a series of reports as part of the USGS-EMP. Hereafter, the first eleven reports are referred to as previous reports on selected ground-water data for the Yucca Mountain region. The previous reports and the data they contain are:

Report (see References Cited)	Data contained
La Camera and Westenburg (1994)	Earliest available data through 1992
Hale and Westenburg (1995)	Data collected in 1994
La Camera and others (1996)	Data collected in 1995
La Camera and Locke (1998)	Data collected in 1996
La Camera and others (1999)	Data collected in 1997
Locke (2001a)	Data collected in 1998
Locke (2001b)	Data collected in 1999
Locke and La Camera (2003)	Data collected in 2000 through 2002
La Camera and others (2005)	Data collected in 2003
La Camera and others (2006)	Data collected in 2004

Additional information for sites CF2, JF1, JF2, JF2a, J13, J11, and J12 are included in Robison (1984), Robison and others (1988), Gemmell (1990), McKinley and others (1991), O'Brien (1991, 1993), Luckey and others (1993), Boucher (1994), Lobmeyer and others (1995), O'Brien and others (1995), Graves and others (1996), Tucci and others (1996a, 1996b), Graves (1998), Graves and Goemaat (1998), Graves (2000), Savard (2001), and the Harry Reid Center for Environmental Studies at the University of Nevada, Las Vegas (HRC; 2006).

Description of Study Area

The study area is the Yucca Mountain region of southern Nevada and eastern California (fig. 1). The boundary of the Yucca Mountain region, for purposes of this report, roughly coincides with the northern parts of Crater Flat and Jackass Flats, eastern parts of Rock Valley, Mercury Valley, and Amargosa Desert, Nevada, and Death Valley Junction and Furnace Creek, California, to the south and west. The study area is within the Great Basin, a subdivision of the Basin and Range Province (Fenneman, 1931, p. 328).

The study area is in the Death Valley Ground-Water Regional Flow System (Harrill and others, 1988, sheet 1) which includes the Alkali Flat–Furnace Creek Ranch and Ash Meadows ground-water subbasins. Each ground-water subbasin consists of ground-water recharge areas and flow paths to points of discharge at land surface (Waddell and others, 1984, p. 36; Laczniak and others, 1996, p. 16 and pl. 1). Subbasin boundaries were defined based on the location of recharge and discharge areas, low-permeability rocks, hydraulic gradients, and water chemistry. These boundaries are general indicators of restrictions on ground-water movement in the region.

The study area also is subdivided by hydrographic areas[1] (fig. 1). As defined by Rush (1968, p. 4), hydrographic areas generally consist of valleys (topographic lows) extending to their surrounding surface-water drainage divides (topographic highs). Hydrographic areas include Crater Flat, Jackass Flats, and Rock Valley, most of Mercury Valley and Amargosa Desert, and part of Death Valley (Rush, 1968; Harrill and others, 1988, sheet 2).

Alkali Flat–Furnace Creek Ranch Ground-Water Subbasin

Crater Flat and Jackass Flats (which include Yucca Mountain), most of Rock Valley, the west-central part of the Amargosa Desert, and part of Death Valley are in the Alkali Flat–Furnace Creek Ranch ground-water subbasin (fig. 1). Primary sources of ground water within this subbasin are precipitation and subsurface inflow (Waddell and others, 1984, p. 36; Harrill and others, 1988, sheet 2; Laczniak and others, 1996, table 3). Precipitation occurs mainly on the higher mesas and mountains within the subbasin and along the north and northeast mountainous boundaries. Subsurface inflow into the subbasin occurs near Beatty from the Oasis Valley subbasin, near Ash Meadows from the Ash Meadows subbasin, and possibly from Cactus Flat (about 40 mi north of Beatty, Nev.). Ground water discharges from springs in Death Valley and as evapotranspiration from Alkali Flat and Death Valley. Ground water generally flows to the south, southeast, or southwest (Kilroy, 1991, p. 9–13; Tucci and Burkhardt, 1995, p. 8; Laczniak and others, 1996, pl. 1).

Ash Meadows Ground-Water Subbasin

Part of Rock Valley, Mercury Valley, and most of the eastern part of the Amargosa Desert are within the Ash Meadows subbasin (fig. 1). The southeastern part of the Amargosa Desert includes the Ash Meadows spring-discharge area. The Ash Meadows spring-discharge area is a gently sloping land watered by numerous springs (Dudley and Larson, 1976, p. 5) at the southwestern edge of the subbasin.

[1]The U.S. Geological Survey and Nevada Division of Water Resources delineated formal hydrographic areas in Nevada systematically in the late 1960s for scientific and administrative purposes (Cardinalli and others, 1968; Rush, 1968). The official hydrographic area names, numbers, and geographic boundaries continue to be used in U.S. Geological Survey scientific reports and administrative activities. Extensions of hydrographic areas from Nevada into California and selected hydrographic areas in California also have been delineated by Harrill and others (1988, sheet 2).

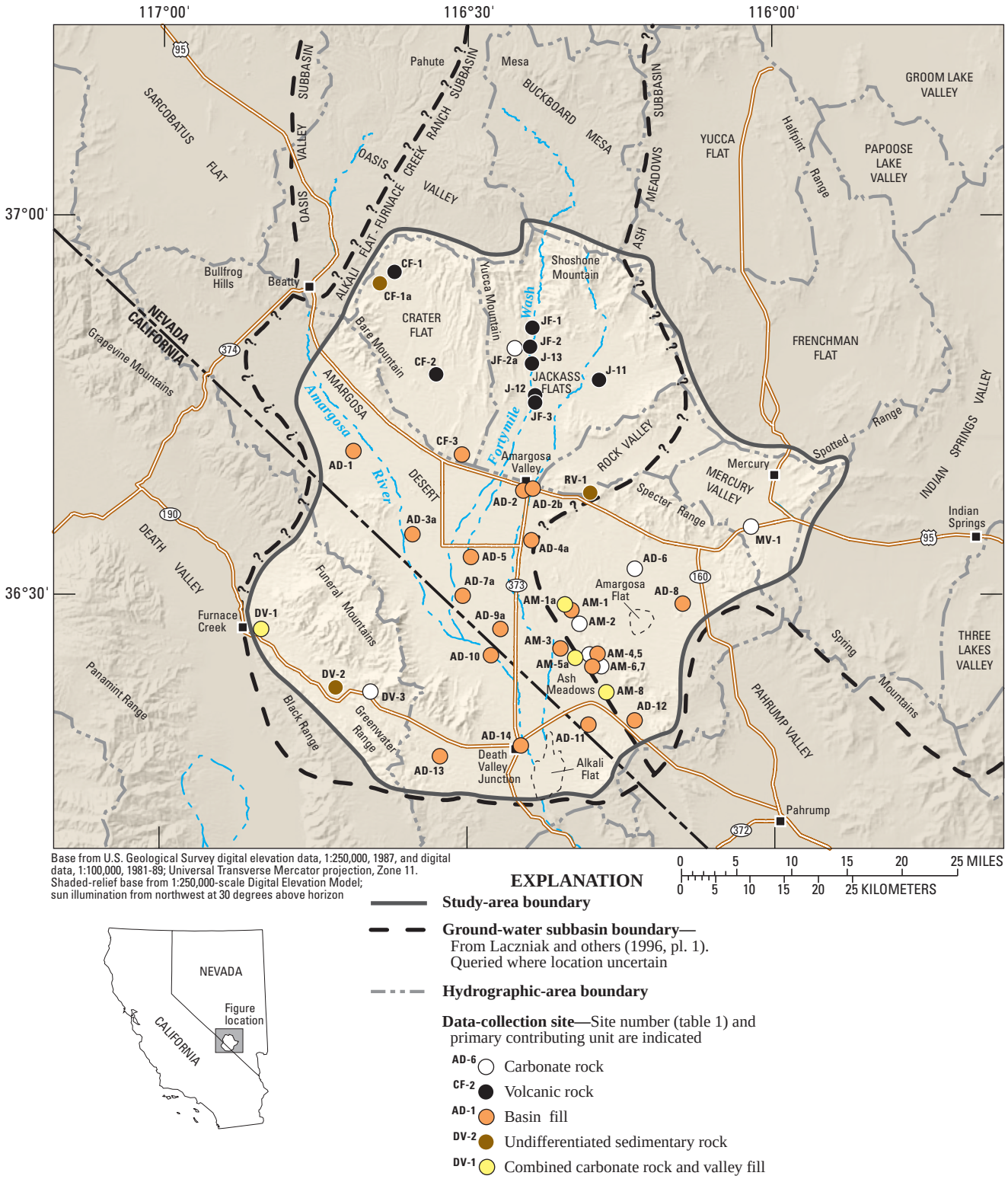

Figure 1. Location of data-collection sites in the Yucca Mountain region, southern Nevada and eastern California, 2005.

Primary sources of ground water in the Ash Meadows ground-water subbasin are precipitation and subsurface inflow (Laczniak and others, 1996, table 3). Precipitation occurs mainly on the higher mountains within the subbasin and along the north and northeast mountainous boundaries. Subsurface inflow may occur from Railroad Valley and Pahranagat Valley along the basin's north and northeast boundaries (about 100 mi north of Ash Meadows; Winograd and Thordarson, 1975; Laczniak and others, 1996). Ground water discharges from springs and as evapotranspiration in the Ash Meadows area and, possibly, as underflow into the Alkali Flat–Furnace Creek Ranch ground-water subbasin. Ground water in the subbasin generally flows to the south, west, or southwest (Harrill and others, 1988, sheet 2; Laczniak and others, 1996, p. 16–18 and pl. 1).

Data-Collection Sites

Locations of data-collection sites are shown in figure 1. Information on site identification, location and name, and type of data provided in this report are listed in table 1. The sequence of sites in table 1 is followed throughout the report. All sites are boreholes or springs except site AM4 (Devils Hole), which is an open fissure that intersects the ground-water table. Borehole-construction data, source of borehole-construction data, and contributing lithologic units are listed in table 2. Table 2 does not list springs and a fissure for which construction data are not applicable.

Table 1. Index to monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.

[**Site number:** Alphanumeric identifier used to designate sites on map and tables. First part represents hydrographic area in which site is located. **Hydrographic areas:** CF, Crater Flat; JF or J, Jackass Flats; RV, Rock Valley; MV, Mercury Valley; AD or AM, Amargosa Desert; DV, Death Valley. Second part is sequential numbering representing relative location of site within hydrographic area or Ash Meadows spring-discharge area; numbering order generally is north to south, then west to east. Sites J-13, J-11, and J-12 previously were numbered by Raytheon Services Nevada and herein were not renumbered. Site locations are shown in figure 1.

U.S. Geological Survey site identification: Unique identification number for sites as stored in files and data bases of U.S. Geological Survey.

Latitude and Longitude: In degrees, minutes, seconds, referenced to North American Datum of 1927. May be revised based on the subsequent availability of global positing system values or more-accurate maps.

Local site number: Alphanumeric identifier with hydrographic area number, based on location of site within hydrographic areas and rectangular subdivision of public lands. **Hydrographic-area numbers:** 225, Mercury Valley; 226, Rock Valley; 227A, Jackass Flats; 229, Crater Flat; 230, Amargosa Desert; 243, Death Valley. Referenced to Mount Diablo base line and meridian for sites in Nevada or San Bernardino base line and meridian for sites in California (U.S. Geological Survey, 1986a, b).

Data type: Type of data included in this report. D, ground-water discharge; L, ground-water level]

Site No.	U.S. Geological Survey site identification	Site name	Latitude	Longitude	Local site number	Data type
CF-1	365520116370301	Crater Flat 1	365515	1163655	229 S12 E48 04DBB 1	L
CF-1a	365445116383901	Crater Flat 1a	365442	1163841	229 S12 E48 07ADD 1	L
CF-2	364732116330701	USW VH-1	364732	1163307	229 S13 E48 27C 1	L
CF-3	364105116302601	Crater Flat 3	364106	1163026	229 S14 E48 36DDD 1	L
JF-1	365116116233801	UE-25 WT 15	365116	1162338	227A S12 E50 33A 1	L
JF-2	364945116235001	UE-25 WT 13	364943	1162351	227A S13 E50 18B 1	L
JF-2a	364938116252102	UE-25p 1 PTH	364938	1162521	227A S13 E49 14A 2	L
J-13	364828116234001	J-13 WW	364829	1162340	227A S13 E50 19C 1	L
J-11	364706116170601	J-11 WW	364706	1161706	227A S13 E51 31B 1	L
J-12	364554116232401	J-12 WW	364554	1162324	227A S14 E50 06A 2	L

Table 1. Index to monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Latitude	Longitude	Local site number	Data type
JF-3	364528116232201	JF-3 Well	364528	1162322	227A S14 E50 06D 1	L
RV-1	363815116175901	TW-5	363815	1161759	226 S15 E50 24A 1	L
MV-1	363530116021401	Army 1 WW	363530	1160214	225 S16 E53 05ADB 1	L
AD-1	364141116351401	NA-6 Well BGMW-10	364131	1164114	230 S14 E47 32DA 1	L
AD-2	363830116241401	Airport Well	363824	1162434	230 S15 E49 24ABB 1	L
AD-2b	363835116234002	NDOT Well 2	363836	1162357	230 S15 E50 18CCDB2	L
AD-3a	363521116352501	Amargosa Desert 3a	363526	1163527	230 S16 E48 05CAB 1	L
AD-4a	363428116234701	Amargosa Desert 4a	363429	1162349	230 S16 E50 07CABB1	L
AD-5	363310116294001	USBLM Well	363323	1162943	230 S16 E49 18DCCA1	L
AD-6	363213116133800	Tracer Well 3	363213	1161338	230 S16 E51 27BAA 3	L
AD-7a	363009116302702	Amargosa Desert 7a	363029	1163024	230 S17 E48 01ABA 1	L
AD-8	362929116085701	Amargosa Desert 8	362906	1160924	230 S17 E52 08CBD 1	L
AD-9a	362835116264102	Amargosa Desert 9a	362837	1162649	230 S17 E49 15BC 2	L
AD-10	362525116274301	NA-9 Well	362531	1162745	230 026N005E05F001S	L
AD-11	361954116181201	GS-3 Well	361955	1161751	230 S19 E50 01BBD 1	L
AD-12	362014116133901	GS-1 Well	362022	1161327	230 S18 E51 34CBD 1	L
AD-13	361724116324201	S-1 Well	361734	1163258	230 025N004E21M001S	L
AD-14	361817116244701	Death Valley Jct Well	361816	1162447	230 025N005E14M001S	L
AM-1	362858116195301	Rogers Spring Well	362855	1161949	230 S17 E50 10CDD 1	L
AM-1a	362924116203001	Fairbanks Spring	362926	1162028	230 S17 E50 09AD 1	D
AM-2	362755116190401	Five Springs Well	362753	1161906	230 S17 E50 23BBC1	D,L
AM-3	362555116205301	Ash Meadows 3	362556	1162051	230 S17 E50 33CAA1	L
AM-4	362532116172700	Devils Hole	362532	1161727	230 S17 E50 36DC 1	L
AM-5	362529116171100	Devils Hole Well	362529	1161715	230 S17 E50 36DDC 1	L
AM-5a	362502116192301	Crystal Pool	362513	1161927	230 S18 E50 03ADBA1	D
AM-6	362432116165701	Point of Rocks North Well	362434	1161657	230 S18 E51 07BBBB1	L
AM-7	362417116163600	Point of Rocks South Well	362420	1161637	230 S18 E51 07BDB 1	L
AM-8	362230116162001	Big Spring	362229	1161625	230 S18 E51 19ACB 1	D
DV-1	362728116501101	Texas Spring	362728	1165011	243 027N001E23BS01S	D
DV-2	362252116425301	Navel Spring	362252	1164253	243 026N002E13FS01S	D
DV-3	362230116392901	Travertine Point 1 Well	362231	1163932	243 026N003E21L001S	L

Table 2. Borehole-construction data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.

[**Site number:** Alphanumeric identifier used to designate sites on map and tables. First part represents hydrographic area in which site is located. **Hydrographic areas:** CF, Crater Flat; JF or J, Jackass Flats; RV, Rock Valley; MV, Mercury Valley; AD or AM, Amargosa Desert; DV, Death Valley. Second part is sequential numbering representing relative location of site within hydrographic area or Ash Meadows spring-discharge area; numbering order generally is north to south, then west to east. Sites J-13, J-11, and J-12 previously were numbered by Raytheon Services Nevada and herein were not renumbered. Site locations are shown in figure 1.

U.S. Geological Survey site identification: Unique identification number for site as stored in files and data bases of U.S. Geological Survey (USGS).

Accessible well depth: Borehole depths listed are as reported in sources listed in explanation for Data source (see below) or as measured by USGS personnel (noted with 's').

Casing diameter at land surface: Outside casing diameter of segment most prominent at land surface; rounded to nearest inch.

Top of open interval: Depth to top part(s) of well that can receive ground water from lithologic interval. Uncased borehole is designated open interval in this table. Open interval may be deeper than accessible well depth, which may reflect original drilled depth. As reported in sources listed in explanation for Data source (see below). U, unknown, no data.

Bottom of open interval: Depth to bottom part(s) of well that can receive ground water from lithologic interval. Uncased borehole is designated open interval in this table. Open interval may be deeper than accessible well depth, which may reflect original drilled depth. As reported in sources listed in explanation for Data source (see below). U, unknown, no data.

Diameter of open interval: Inside casing diameter; rounded to nearest inch. Hole diameter is listed where no casing is present. U, unknown, no data.

Type of open interval: Description of open interval. P, perforated or slotted casing; S, screened casing, type not known; U, unknown, no data; X, uncased borehole.

Data source: Source of information on well depth and open intervals. D, Well-driller's log, well-construction report, or Fenix and Scisson, Inc., or Raytheon Services Nevada hole-history data; J, Johnston (1968); M, no source, data not available; O, Owner of well; R, Robison and others (1988); T, Thordarson and others (1967).

Contributing units: Saturated lithologic interval yielding water to well. C, carbonate rock; F, basin fill; S, undifferentiated sedimentary rock; V, volcanic rock]

Site No.	U.S. Geological Survey site identification	Site name	Accessible well depth (feet below land surface)	Casing diameter at land surface (inches)	Open interval				Data source	Contributing units
					Feet below land surface		Diameter (inches)	Type		
					Top	Bottom				
CF- 1	365520116370301	Crater Flat 1	1,600	16	800	1,600	10	P	D	V
CF- 1a	365445116383901	Crater Flat 1a	700	7	208	313	6	P	D	S
					513	618	6	P		
					658	700	6	P		
CF- 2	364732116330701	USW VH- 1	2,501	10	911	912	9	X	R	V
					912	2,501	6	X		
CF- 3	364105116302601	Crater Flat 3	460	9	320	460	8	P	D	F
JF- 1	365116116233801	UE-25 WT 15	1,360	11	127	130	15	X	D	V
					130	1,360	9	X		
JF- 2	364945116235001	UE-25 WT 13	1,160	11	222	224	15	X	D	V
					224	1,150	9	X		
					1,150	1,160	8	X		
JF- 2a	364938116252102	UE-25p 1 PTH	5,923	24	4,256	4,279	10	X	R	C
					4,279	5,900	7	X		
					5,900	5,923	6	X		
J -13	364828116234001	J -13 WW	3,488	13	996	1,301	13	P	T	V
					1,301	1,386	11	P		
					2,690	3,312	5	P		
					3,385	3,488	8	X		
J -11	364706116170601	J -11 WW	1,327	13	1,075	1,095	12	P	D	V
					1,242	1,298	12	P		

Table 2. Borehole-construction data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Accessible well depth (feet below land surface)	Casing diameter at land surface (inches)	Open interval				Data source	Contributing units
					Feet below land surface		Diameter (inches)	Type		
					Top	Bottom				
J -12	364554116232401	J -12 WW	1,139	13	793	868	12	P	D	V
					887	1,139	12	X		
JF- 3	364528116232201	JF- 3 Well	1,138	9	735	1,138	8	P	D	V
RV- 1	363815116175901	TW- 5	800 s	7	735	800	6	P	T	S
					800	916	U	X		
MV- 1	363530116021401	Army 1 WW	1,953	11	800	1,050	11	P	D	C
					1,368	1,370	10	X		
					1,370	1,684	9	X		
					1,684	1,953	7	X		
AD- 1	364141116351401	NA-6 Well BGMW-10	960	2	930	940	2	S	D	F
AD- 2	363830116241401	Airport Well	750 s	14	360	777	14	P	D	F
AD- 2b	363835116234002	NDOT Well 2	518	8	418	518	8	P	D	F
AD- 3a	363521116352501	Amargosa Desert 3a	240 s	16	120	250	15	P	D	F
AD- 4a	363428116234701	Amargosa Desert 4a	269 s	13	147	213	12	P	D	F
					238	286	12	P		
AD- 5	363310116294001	USBLM Well	348 s	12	U	U	U	U	M	F
AD- 6	363213116133800	Tracer Well 3	678 s	9	620	807	6	X	J	C
AD- 7a	363009116302702	Amargosa Desert 7a	210	7	U	U	U	U	O	F
AD- 8	362929116085701	Amargosa Desert 8	215 s	15	U	U	U	U	M	F
AD- 9a	362835116264102	Amargosa Desert 9a	515	10	55	200	10	P	D	F
					200	515	10	X		
AD-10	362525116274301	NA-9 Well	1,090	2	1,063	1,066	2	S	D	F
AD-11	361954116181201	GS-3 Well	2,000	2	1,969	1,979	2	S	D	F
AD-12	362014116133901	GS-1 Well	1,580	2	1,549	1,559	2	S	D	F
AD-13	361724116324201	S-1 Well	2,000	2	1,969	1,979	2	S	D	F
AD-14	361817116244701	Death Valley Jct Well	225 s	12	160	200	12	S	D	F
AM- 1	362858116195301	Rogers Spring Well	202 s	16	100	240	12	P	D	F
					240	420	16	X		
AM- 2	362755116190401	Five Springs Well	123 s	14	0	100	13	P	D	C
					100	140	14	X		
AM- 3	362555116205301	Ash Meadows 3	202 s	9	140	180	8	P	O	F
AM- 5	362529116171100	Devils Hole Well	200 s	16	48	248	16	P	D	F
AM- 6	362432116165701	Point of Rocks North Well	500	16	139	500	16	P	D	F
AM- 7	362417116163600	Point of Rocks South Well	586 s	14	132	467	14	P	D	C
					468	818	U	X		
DV- 3	362230116392901	Travertine Point 1 Well	650 s	5	100	970	5	X	D	C

Contributing units (table 2) are the primary saturated lithologic intervals at the sites that yield water to the borehole. For purposes of this report, contributing units are one or a combination of four general types: carbonate rock, volcanic rock, basin-fill deposits, and undifferentiated sedimentary rock. Boreholes characterized as having a contributing unit of carbonate or volcanic rock are wells with open intervals in those consolidated rocks. In and near the Amargosa Desert, boreholes characterized as having a contributing unit of basin fill are those with open intervals in unconsolidated basin-fill deposits. Boreholes with open intervals in rocks that include argillite, limy sandstones and siltstones, or silty, sandy, and shaley limestones are characterized as having a contributing unit of undifferentiated sedimentary rock. Contributing units are identified by Thordarson and others (1967), Winograd and Thordarson (1975), Dudley and Larson (1976), Robison and others (1988), and McKinley and others (1991), or were derived from drillers' logs or well-construction reports that describe geology in the boreholes, open intervals in the boreholes, and measurements of depth to water.

Ground-Water Levels

Ground-water levels are reported as depths to water and altitudes of the water surface. Depth to water is the difference between land surface and water level in a borehole. Altitude of the water surface is the difference between the water level in a borehole and a point referenced to a common datum.

Depth to water is measured directly from a stable reference called the measuring point. Depth-to-water below a measuring point commonly is measured with a steel tape, an electric tape, or a pressure sensor. Measuring points typically are a marked point on the borehole's casing, but can be the top of a bolt as at Devils Hole (AM4). Depth to water is computed by subtracting the height of a measuring point above land surface from the depth to water below a measuring point.

Ground-water altitude is the difference between altitude of the measuring point and depth to water below the measuring point. The altitudes of all measuring points were surveyed. Altitudes at sites AD-9a and AM-2 were determined using survey grade Global-Positioning Systems (stationary systems left onsite for a minimum of 2 hours). Ground-water altitude is reported to indicate the general direction of ground-water flow.

Accuracy of depths to water and altitudes of the water surface contained in this report range between 0.1 and 1 ft. The level of accuracy at each borehole is largely dependent on determinations of heights of measuring points above land surface, surveying techniques, altitudes of benchmarks used as starting points for surveys, and deviations of borehole orientation from true vertical.

Precision of depths to water and altitudes, however, can be used to detect changing conditions through time. Precision is indicated by repeatability of water-level measurements (sequential measurements of similar conditions). Data recorded in the field during 2005 indicate that measurement precision generally is less than or equal to 0.02 ft for calibrated electric tapes and steel tapes. Overall, precision of water levels contained in this report are estimated to be less than or equal to 0.05 ft. Based on sequential measurements at sites with similar depths to water, precision of data collected by other agencies using uncalibrated electric tapes is assumed to be comparable.

Table 3 (at back of report) lists periodic measurements of depth to water and water-level altitude for 2005 and figures 2–5 (at back of report) show measurements of water levels from the earliest available information through 2005. Pumping water from or injecting water into a well or nearby well may result in short-term variations in water levels that differ from long-term or sustained ground-water levels. Such short-term variations are excluded from the figures showing variations in water levels through time.

Periodic data usually are from manual measurements of depth to water. Exceptions are water-level data determined by pressure sensors. These exceptions are listed in table 3 with data sources "HRC" or "NTS" and method "F." All water-level data collected by other agencies or programs are subject to revision upon further review by that agency or program.

Daily mean water levels measured during 2005 are listed in tables 4 and 5 at back of report) for sites JF3 and AD6, respectively. Missing data in these tables are due to pressure sensor failure, or sensor replacement and calibration. Daily mean water levels between 1992 and 2005 for sites JF3 and AD6 are shown in figure 6 (at back of report).

Electric Tape

Electric tapes were used by USGS-EMP personnel and were marked with a unique identifier for quality-assurance purposes and calibrated using reference steel tapes. At depths greater than 500 ft, the electric tapes were calibrated using the USGS-EMP calibrated steel tape (chain No. 5). At depths less than 500 ft, the electric tapes were calibrated using a steel tape maintained by USGS-EMP personnel and identified as the 500ft reference steel tape No. 1.

USGS-EMP chain No. 5 steel-tape measurements were adjusted to account for mechanical stretch and thermal expansion of the tape. No adjustments were necessary for the USGS-EMP 500ft reference steel tape No.1 because mechanical stretch and thermal expansion of the tape are considered negligible at the depths to water measured.

A correction factor (table 6; at back of report) is the difference between the reference steel-tape measurement and uncorrected electric-tape measurement. The correction factor for a measurement made between calibrations and at different depths is determined by linear interpolation between bracketing calibrations. For example, a water-level measurement of 327.96 ft was made on May 3, 2005 using electric tape YMP-13. This measurement is bracketed by the calibrations made in February 2005 at depths of 135.88 and 368.58 ft and by calibrations made in August 2005 at depths of 137.60 and 369.26 ft. The linearly interpolated correction factor for this depth and time is -0.13 ft.

Calibrated electric tapes were used at wells when frequent repetitive measurements were required due to fluctuating water levels, when depths to water were greater than 500 ft, or when wet conditions inside a well prevented measurements using chalked steel tapes. At least two measurements were made during each site visit. The second measurement serves as a check of the first measurement and the first measurement is reported. Supplemental measurements are made if the two measured depths differ by more than 0.05 ft. If supplemental measurements indicate the difference is due to rapidly changing water levels, the measured depth and appropriate site status are recorded.

Personnel of the HRC made water-level measurements using calibrated electric tapes at sites CF2, JF1, JF2, JF2a, J13, J11, and J12. These data-collection activities are governed by formal, unpublished technical procedures associated with the Yucca Mountain Office of Civilian Radioactive Waste Management. For measurements made by HRC personnel, depth to water was computed by subtracting the reported water-level altitude from the land-surface altitude, which has been surveyed to the nearest hundredth of a foot.

Personnel associated with the Nye County Nuclear Waste Repository Project Office (NWRPO) also made a water-level measurement using a calibrated electric tape at site AD-5. These data collection procedures are governed by a technical procedure available from the NWRPO (Nye County Nuclear Waste Repository Project Office, 2006). USGS personnel associated with the U.S. Department of Energy, National Nuclear Security Administration, Nevada Site Office (NTS) made water-level measurements using a calibrated electric tape at site J-13 in accordance with program-specific procedure NV-NTS-1, R0 (Robert P. Graves, U.S. Geological Survey, written commun., 2006). The U.S. Fish and Wildlife Service (USFWS) made additional water-level measurements at sites AM-1, AM5, AM6, and AM7. The Nevada Department of Conservation and Natural Resources, Division of Water Resources (NDWR) made additional water-level measurements at site AD-7a.

Steel Tape

In 2005, USGS-EMP personnel used two uniquely marked 300-ft steel tapes (ST7 and ST-14) and one uniquely marked 500ft steel tape (ST10) for measurements. These steel tapes were checked against the USGS-EMP 500ft reference steel tape No. 1 at several depths to water to define their accuracy. No corrections were needed to the measurements made with these steel tapes.

USGS-EMP personnel made a minimum of two measurements during each site visit to verify the initial measurement. The secondary measurement served as a check of the first measurement and the first measurement is reported when the two were within 0.05 ft. Supplemental measurements were made if the two measured depths differed by more than 0.05 ft. If supplemental measurements indicated the difference was due to fluctuating water levels, the measured depth and appropriate site status were recorded.

Pressure Sensor

Two sites, JF3 and AD6, were instrumented by USGS-EMP to record ground-water level and atmospheric pressure at 15-minute intervals. Instrumentation includes a vented pressure sensor installed below the water surface, a barometer, and a data logger. The pressure sensors measure height of the water above the sensor in pounds per square inch.

The pressure sensor was calibrated at each site for a range of depths that spans the anticipated range of water-level fluctuations. Water-level fluctuations were simulated by raising and lowering the pressure sensor. Raising the sensor 1 ft will decrease the amount of submergence of the pressure sensor by 1 ft, thereby decreasing the water pressure exerted on the sensor and simulating a 1 ft increase in depth to water. Lowering the sensor 1 ft will increase the amount of submergence of the pressure sensor by 1 ft, thereby increasing the water pressure exerted on the sensor and simulating a 1 ft decrease in depth to water. Upon completion of pressure-sensor calibration, another water-level measurement was made with a calibrated steel or electric tape to check for fluctuation of the water level during calibration of the sensor.

Data recorded while calibrating the sensor were used to develop a regression equation to convert pressure readings to water level below land surface. The pressure readings from the data logger and corresponding simulated depths were regressed using pressure, in pounds per square inch, as the independent variable and depth below land surface, in feet, as the dependent variable.

Water-level measurements were made with a calibrated steel or electric tape when a continual monitoring site was visited. The data logger records the pressure-sensor reading at the time of the measurement. The pressure reading was converted to depth to water using the established regression equation and recorded on a field sheet as computed water level. The steel tape or electric tape water-level reference measurement was then compared to the computed value. Any difference between the reference measurement and computed value was applied as a correction to the continual record. The correction was determined by linearly interpolating the difference with time between consecutive visits to account for drift in pressure-sensor output.

The applicable period for using a particular regression equation usually corresponds with calibrations at the beginning and ending of a period. If the applicable period for a regression equation does not correspond with calibrations, an applicable period is selected to minimize differences between reference measurements made during site visits and computed water levels. Equations developed from pressure-sensor calibration data, applicable periods for equations, and differences between reference and computed water levels are presented in table 7 (at back of report).

Sites JF2 and JF2a were instrumented to collect continual water-level data by HRC personnel for part of 2005. Data collection and processing of these data are governed by formal, unpublished technical procedures associated with the Yucca Mountain Office of Civilian Radioactive Waste Management. Site J-13 also was instrumented with a pressure sensor by USGS personnel associated with the Nevada Test Site for part of 2005.

Ground-Water Discharges

Ground-water discharges are reported to two significant figures and range from 0.88 gal/min at site DV2 to 3,000 gal/min at site AM5a. The accuracy of the measurements is directly related to the operational conditions of the equipment and to the environmental conditions at the time of measurement.

Measurements of ground-water discharge for 2005 are presented in table 8 (at back of report). Measurements of ground-water discharge between 1910 and 2005 are shown in figures 7–9 (at back of report). Discharge measured at site AM2 (fig. 8) represents a combination of flow directly through slotted casing at land surface and leakage through the casing's annular space. The increased discharge at site AM2 in 1996 is attributed to clearing the uppermost part of annular space of the casing. Data for site DV1 in table 8, reported with data source "NPS," represent monthly mean discharge collected from instrumentation operated by the National Park Service (NPS) and are reported for the 15th of the month based on daily data collected by NPS. Discharge data collected by other agencies or programs are subject to revision upon further review by that agency or program.

The most commonly used method for measuring discharge was the vertical-axis current meter or acoustic-Doppler velocimeter. Accuracy of these measurements is estimated to be poor, or no better than 15 percent of actual flow (Rantz and others, 1982, p. 179–180; U.S. Geological Survey, 2004).

Some discharge values were determined by measuring the depth of water inside a flume and comparing that depth to an applicable stage-discharge relation for the flume. Median discharges were computed for specific periods when an instrument was installed to continually record stage in a flume. Accuracy of these measurements was estimated to be fair or within 15 percent of actual flow (U.S. Geological Survey, 2005).

The volumetric method was used for measuring ground-water discharge from sites AM2 and DV2. All discharge was collected in a 5-gal container and the filling period was measured using a stopwatch. The discharge rate is the volume of discharge collected, divided by the elapsed time of collection. This method was repeated a minimum of three times and an average rate was computed for each site visit. Accuracy of these measurements was estimated to be good or within 10 percent of actual flow (U.S. Geological Survey, 2005).

Ground-Water Withdrawals

Withdrawals were estimated from data provided by NDWR, DOE, and USGS personnel associated with DOE's Hydrologic Resources Management Program (HRMP). Most data sources report data in gallons and for consistency all withdrawals presented in tables and figures in this report are converted to units of millions of gallons. Estimated annual ground-water withdrawals are based solely on available data. Years during which no withdrawals from a specific area are indicated may reflect the unavailability of data rather than the absence of withdrawals. In these instances, withdrawal may be underestimated.

Estimates of ground-water withdrawals from wells in the Yucca Mountain region for 2005 are presented in table 9 (at back of report). General locations of ground-water withdrawals during 2005 are shown in figure 10 (at back of report). General areas of ground-water withdrawals for all uses are townships or are parts of townships in which the majority of ground-water withdrawals occurred. Figures 11–12 (at back of report) show estimated annual ground-water withdrawals from wells from the earliest available information through

2005. Total bar heights shown in figures 11 and 12 equal the sum of withdrawals from all areas within the subbasin for a given year. Information on withdrawals provided by other agencies or programs is subject to revision upon further review by that agency or program.

Estimated ground-water withdrawals for calendar year 2005 are listed by hydrographic area (Amargosa Desert, Crater Flat, Jackass Flats, and Mercury Valley) within the Alkali Flat–Furnace Creek Ranch and the Ash Meadows ground-water subbasins. The Amargosa Desert spans both subbasins and is further subdivided into two areas within the Ash Meadows ground-water subbasin.

Withdrawals for irrigation account for most of pumpage in the study area. Those withdrawals commonly are estimated by multiplying irrigated acreages by water-application rates. Irrigated acreage in the Amargosa Desert during 2005 was about 2,676 acres (Nevada Division of Water Resources, written commun., 2006). The Amargosa Desert within the Alkali Flat–Furnace Creek Ranch subbasin has about 2,673 irrigated acres and the Amargosa Desert within the Ash Meadows subbasin has about 2 irrigated acres. Application rates in 2005 averaged about 4 ft (Nevada Division of Water Resources, written commun. 2006), but estimates of application rates in the Amargosa Desert ranged from 2 to 12 ft and averaged about 7 ft (Moreo and others, 2003). Withdrawals listed in this report, therefore, may be underestimated when part of the total withdrawal in an area is comprised of use for irrigation.

Withdrawals for domestic use account for the least pumpage within each part of the study area. Reported domestic use is based on the number and location of wells drilled for domestic purposes contained in the NDWR well-log database (when pumpage inventories were prepared).

Withdrawals from Alkali Flat–Furnace Creek Ranch Ground-Water Subbasin

Withdrawals from the Amargosa Desert hydrographic area within the Alkali Flat–Furnace Creek Ranch ground-water subbasin (4,207 Mgal) were recompiled from a ground-water pumpage inventory made by NDWR for the entire Amargosa Desert. The pumpage inventory in 2005 includes estimated withdrawals for irrigation, mining, quasi-municipal or commercial, and domestic uses. Most reported withdrawals for the Amargosa Desert were from the Alkali Flat–Furnace Creek Ranch ground-water subbasin. Within this subbasin, ground-water withdrawals in the Amargosa Desert were used for irrigation (83 percent), mining (2 percent), quasi-municipal or commercial (12 percent), and domestic use (3 percent).

Withdrawals from Crater Flat (about 13 Mgal in 2005) were measured with flowmeters at well USW VH2 and at sites CF2 and CF3. Estimated withdrawals for well USW VH2 (about 9 Mgal during 1997–2003; withdrawals in 2005 were estimated to be comparable) and site CF3 (about 4 Mgal) are from NDWR (Kim Groenewold, Nevada Division of Water Resources, written commun., 2006). Total withdrawals (about 0.4 Mgal) for site CF2 are from DOE (Karen Bull, Bechtel SAIC Company, LLC, written commun., 2006).

Withdrawals from Jackass Flats (about 24 Mgal in 2005) were measured with flowmeters at sites J13 and J12. Withdrawals for 2005 at these sites were recompiled from flowmeter readings provided by Bechtel Nevada (BN) to USGS personnel associated with DOE's HRMP (U.S. Geological Survey, 2006).

Withdrawals from Rock Valley were considered negligible. The valley is mostly within the Nevada Test Site, which limits public access and use. Within the valley, no known DOE water-supply wells exist, no pumpage is reported by DOE, and boreholes that are not pumped are not present in USGS or DOE data bases.

Withdrawals from Ash Meadows Ground-Water Subbasin

Withdrawals from Mercury Valley (about 80 Mgal in 2005) were recompiled from flowmeter readings for site MV1. Periodic flowmeter readings were provided by BN to USGS personnel associated with DOE's HRMP Management Program (U.S. Geological Survey, 2006).

Withdrawals from the Amargosa Desert hydrographic area within the Ash Meadows ground-water subbasin also were recompiled from the ground-water pumpage inventory made by NDWR for the entire Amargosa Desert. In 2005, about 27 Mgal of water were withdrawn from the Amargosa Desert within the Ash Meadows ground-water subbasin. The Amargosa Desert within this subbasin has been divided into two areas to provide information on withdrawals in the immediate vicinity of the environmentally sensitive Ash Meadows area. These areas are identified as the Amargosa Desert (excluding Ash Meadows area) and the Amargosa Desert (Ash Meadows area). Only minor withdrawals for irrigation, quasi-municipal, or mining uses (each less than 1 Mgal) were reported from these two areas. During 2005, withdrawals in the Amargosa Desert (excluding Ash Meadows area) include irrigation and quasi-municipal withdrawals from three wells in T. 17 S., R. 52 E. Also during 2005, withdrawals for quasi-municipal and mining uses from the Amargosa Desert (Ash Meadows area) include withdrawals from two wells in T. 18 S., R. 50 E. Within Ash Meadows subbasin, withdrawals for domestic use in 2005 from the two areas also were minor, about 14 and 2 percent, respectively, in comparison to total withdrawals for domestic use in the Amargosa Desert hydrographic area.

Ground-Water Levels and Ground-Water Withdrawals in Jackass Flats

Water-level altitudes for seven boreholes and estimated annual ground-water withdrawals in Jackass Flats from 1983 through 2005 are presented in figure 13 (at back of report). Annual ground-water withdrawals in Jackass Flats prior to 1983 are excluded because those data generally represent only the withdrawals from borehole J12 rather than total withdrawals from Jackass Flats.

Water-level altitudes (fig. 13) are based on periodic measurements contained in this and previously published reports or are daily mean water levels provided by USGS Site Characterization Program (SCP) personnel. Dashed lines indicate that no data were available.

Ground-water withdrawals in Jackass Flats increased 77 percent from 13.8 Mgal in 2004 to 24.4 Mgal in 2005 and consisted of combined pumpage from water-supply boreholes J13 and J12. Withdrawals in 2005 were about 53 percent less than the median withdrawal of 52 Mgal for 1983–91 (La Camera and Westenburg, 1994, p. 30). Median water-level altitudes in Jackass Flats usually corresponded with increases or decreases in withdrawals, although changes in water levels may be due to changes in recharge to the ground-water system rather than withdrawals (Fenelon and Moreo, 2002, p. 54–58). Ground-water withdrawals from borehole J13 increased from about 2.2 Mgal in 2004 to about 10.5 Mgal in 2005. Ground-water withdrawals from borehole J12 increased from about 11.6 Mgal in 2004 to 14 Mgal in 2005.

Minimum, maximum, median water-level altitudes and average deviation and change in median water-level altitudes are reported for seven boreholes in Jackass Flats (table 10; at back of report). Data for boreholes JF1, JF2, JF2a, J13, J11, J12, and JF3 are summarized for a baseline period of 1992–93 and for subsequent calendar years through 2005. For each period, the table lists the number of measurements, minimum, maximum, and median water-level altitude, and the average deviation of water levels from the median water level. Only one measurement was available for site JF2 in 2002, therefore, no statistics were calculated for that year. Continual data for the period following 2001 that has been subsequently released to the public can be obtained from HRC personnel by contacting them directly. The period 1992–93 was selected as a baseline because it is the earliest period when data were available for all sites.

The average deviation indicates the dispersion of individual measurements about the median. The average deviation equals the sum of the absolute differences between individual measurements and the median, divided by the number of individual measurements. This measure of measurement spread was selected rather than the standard deviation because it can be used to describe dispersion about a median value rather than dispersion about an arithmetic mean.

Figure 14 (at back of report) shows median water-level altitudes and the average deviation of water levels for boreholes JF1, JF2, JF2a, J13, J11, J12, and JF3 for 1992–93 and for subsequent years through 2005. The average deviation of measurements at borehole JF-2 in 2004 equaled 0.0; as a result no average deviation is indicated on the figure for that site and year. Median annual ground-water withdrawal in Jackass Flats for 1992–93 and estimated annual withdrawals for subsequent years through 2005 also are included.

From 2004 to 2005, median water-level altitudes in five of seven boreholes (JF-1, JF-2, J-13, J-11, and JF-3) in Jackass Flats increased 0.1 to 0.4 ft. At two boreholes in Jackass Flats (JF-2a and J-12) median water-level altitude was unchanged from 2004 to 2005.

The median water-level altitudes at all seven boreholes in Jackass Flats in 2005 were greater than (0.4–2.7 ft) the altitudes for the baseline period in 1992–93. All increases in median water-level altitudes exceeded historical variability in water levels exhibited during their baseline periods. Changes exceeding historical variability could be due to changes in monitoring instrumentation or frequency, limited lengths of historical baseline periods, withdrawals or recharge that differed from those during baseline periods, or a combination of effects.

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Basic Data

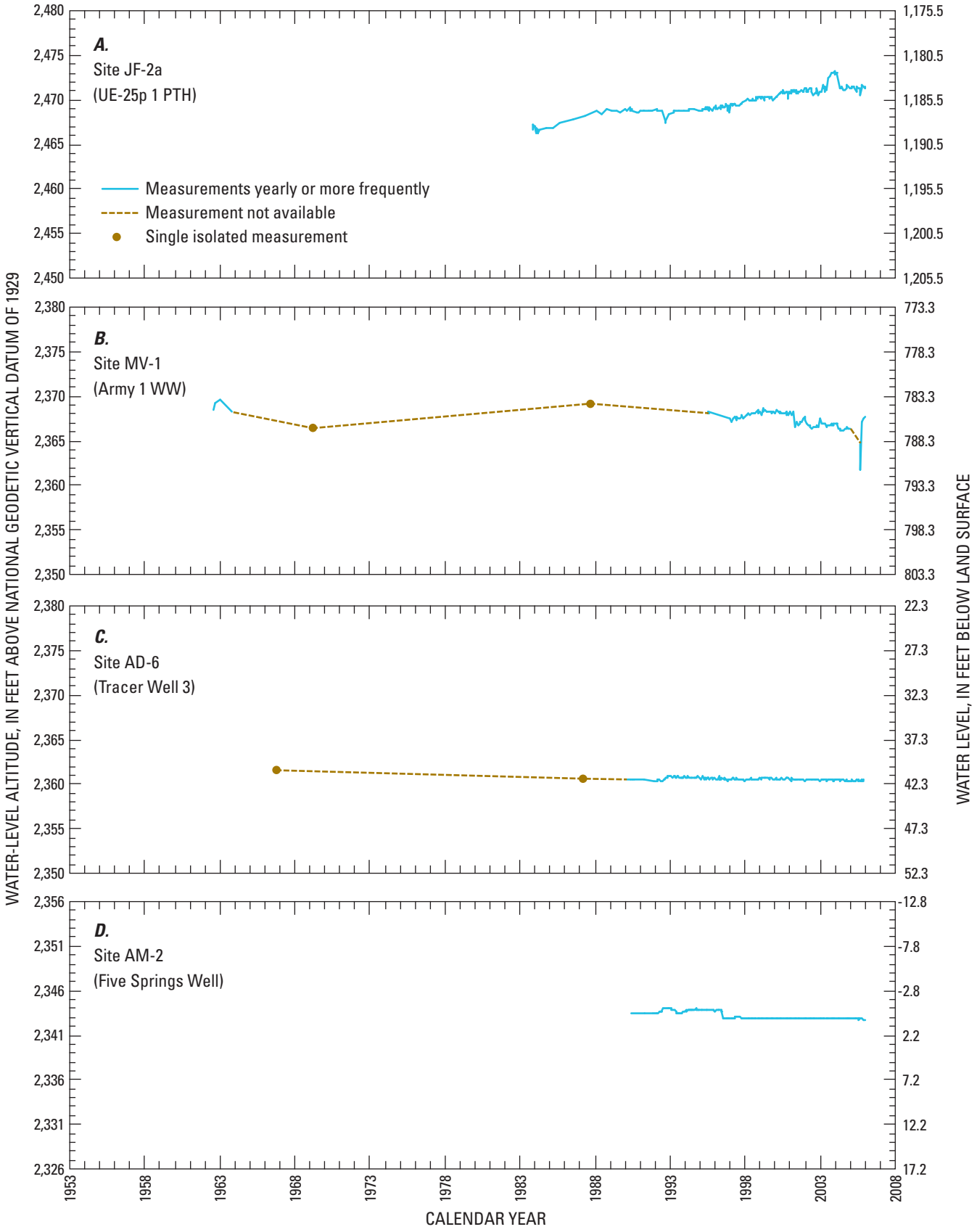
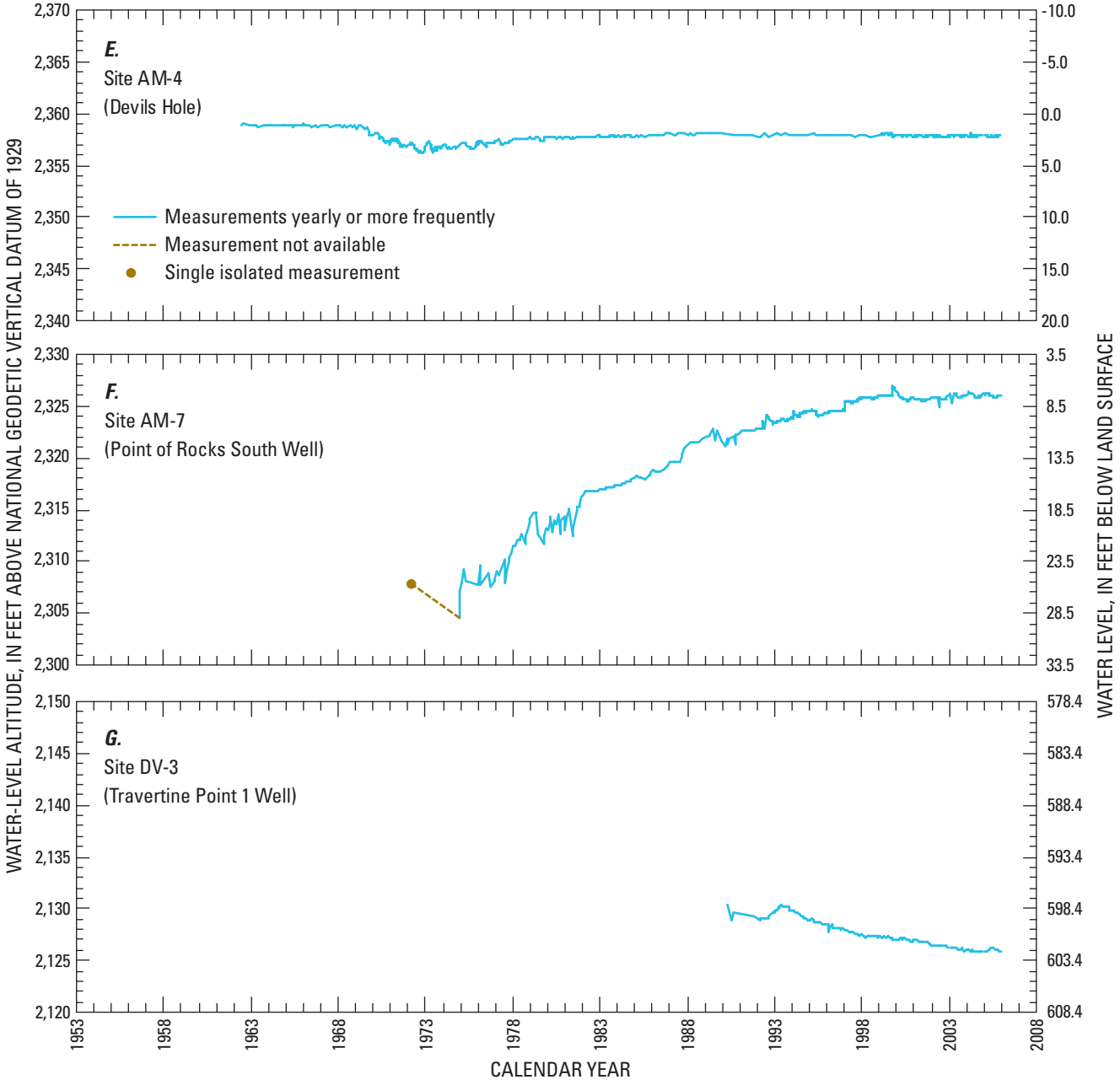


Figure 2. Periodic water levels for selected sites through 2005 at which primary contributing unit is carbonate rock, Yucca Mountain region, southern Nevada and eastern California.



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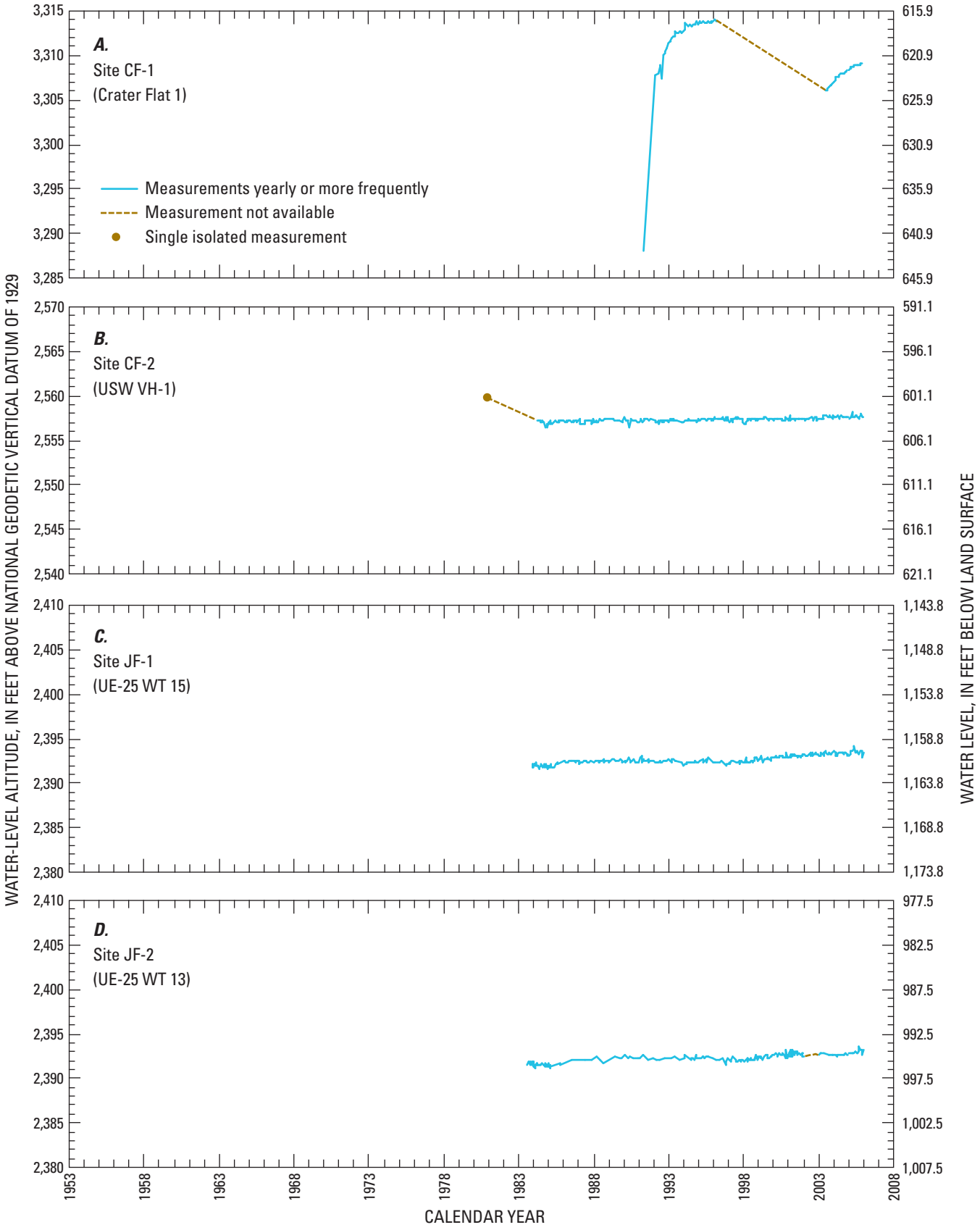
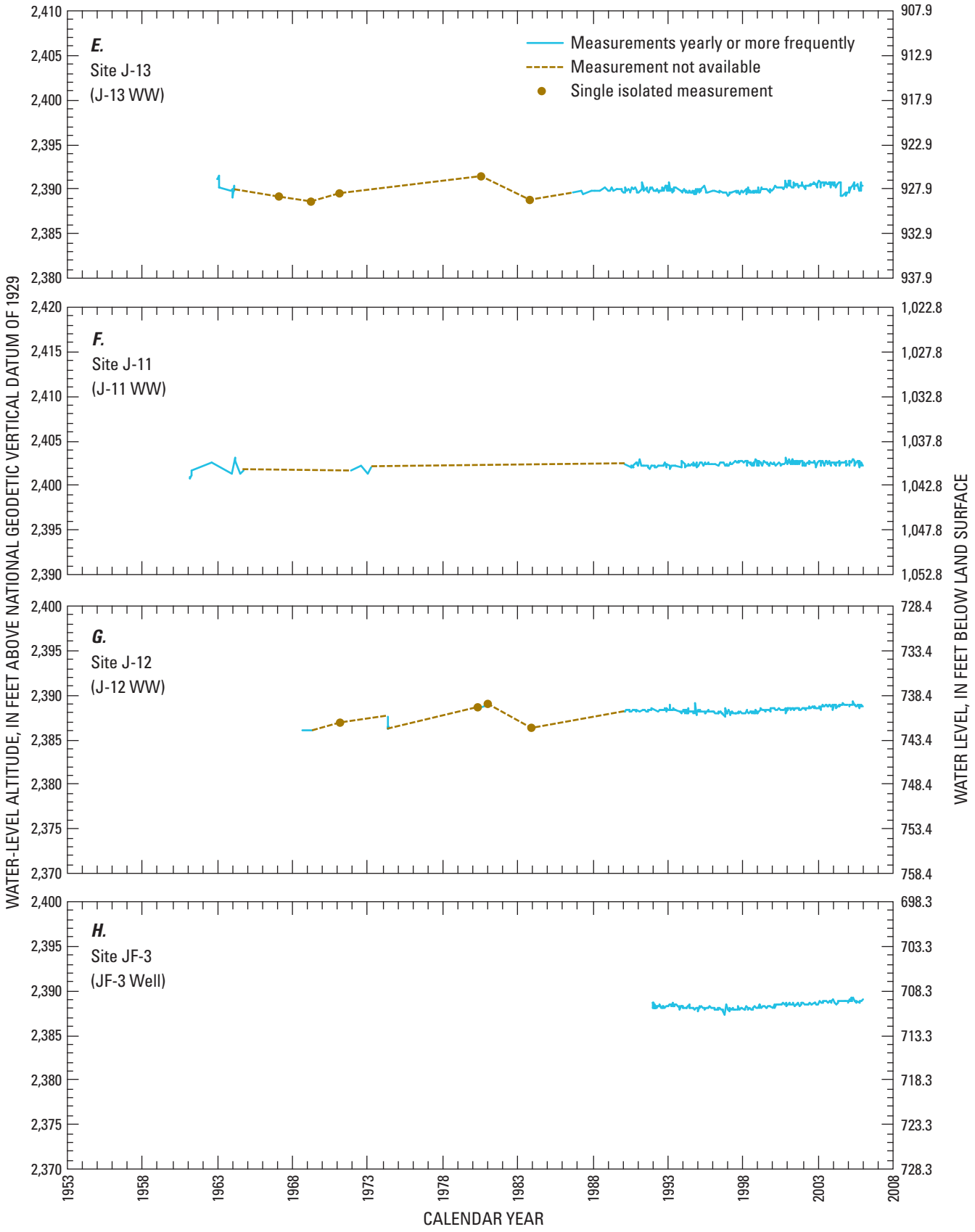


Figure 3. Periodic water levels for selected sites through 2005 at which primary contributing unit is volcanic rock, Yucca Mountain region, southern Nevada and eastern California.



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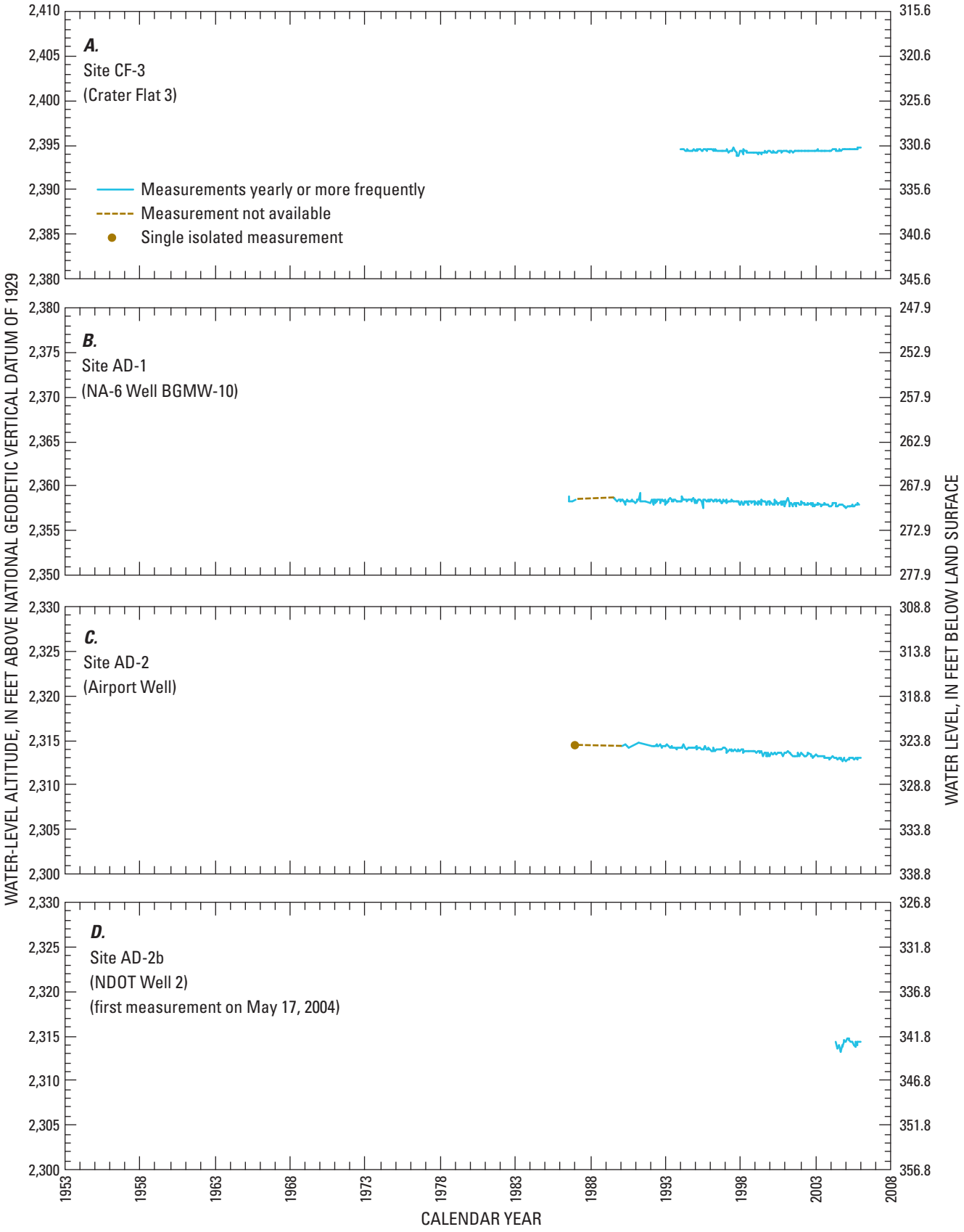
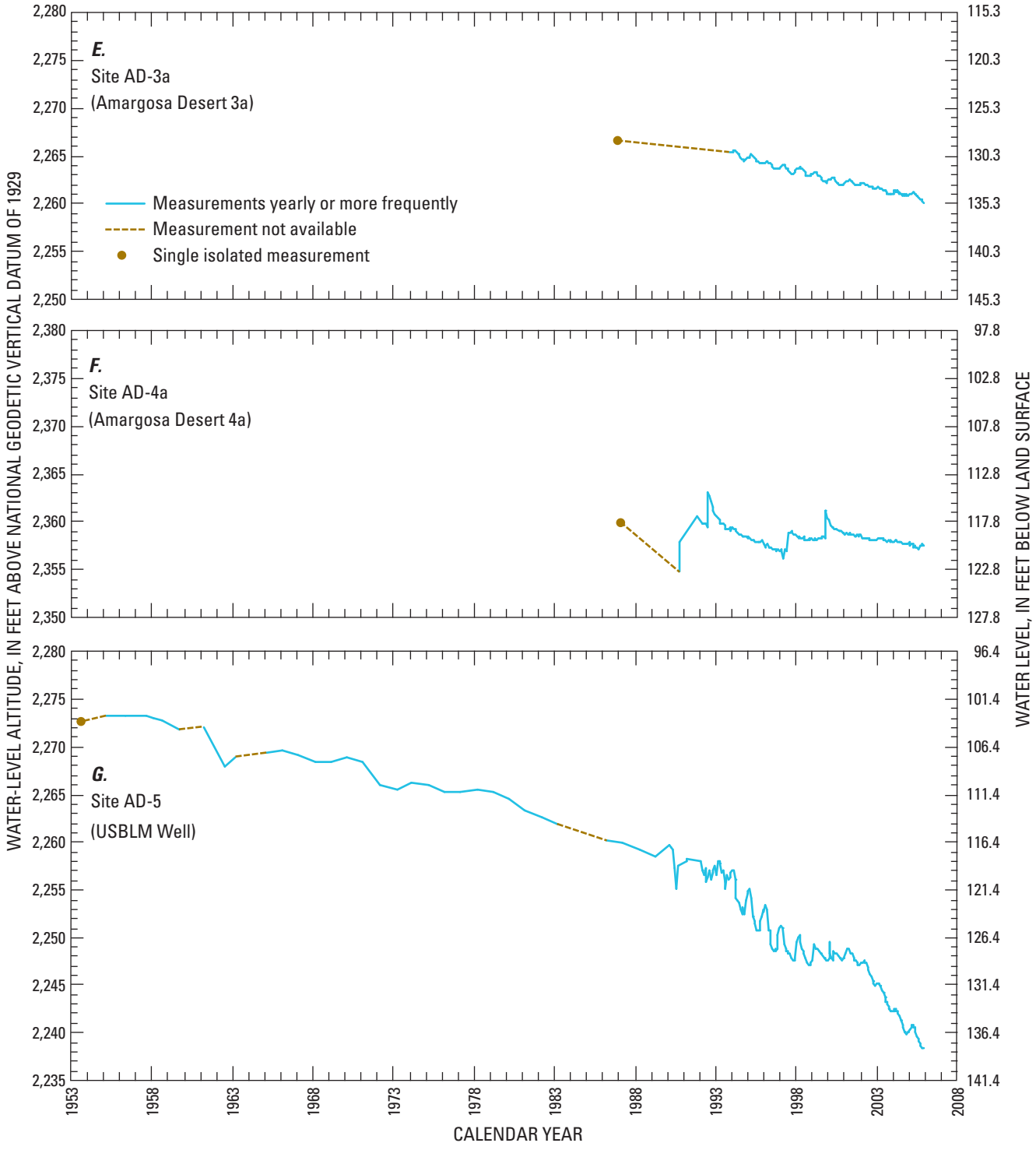


Figure 4. Periodic water levels for selected sites through 2005 at which primary contributing unit is basin fill, Yucca Mountain region, southern Nevada and eastern California.



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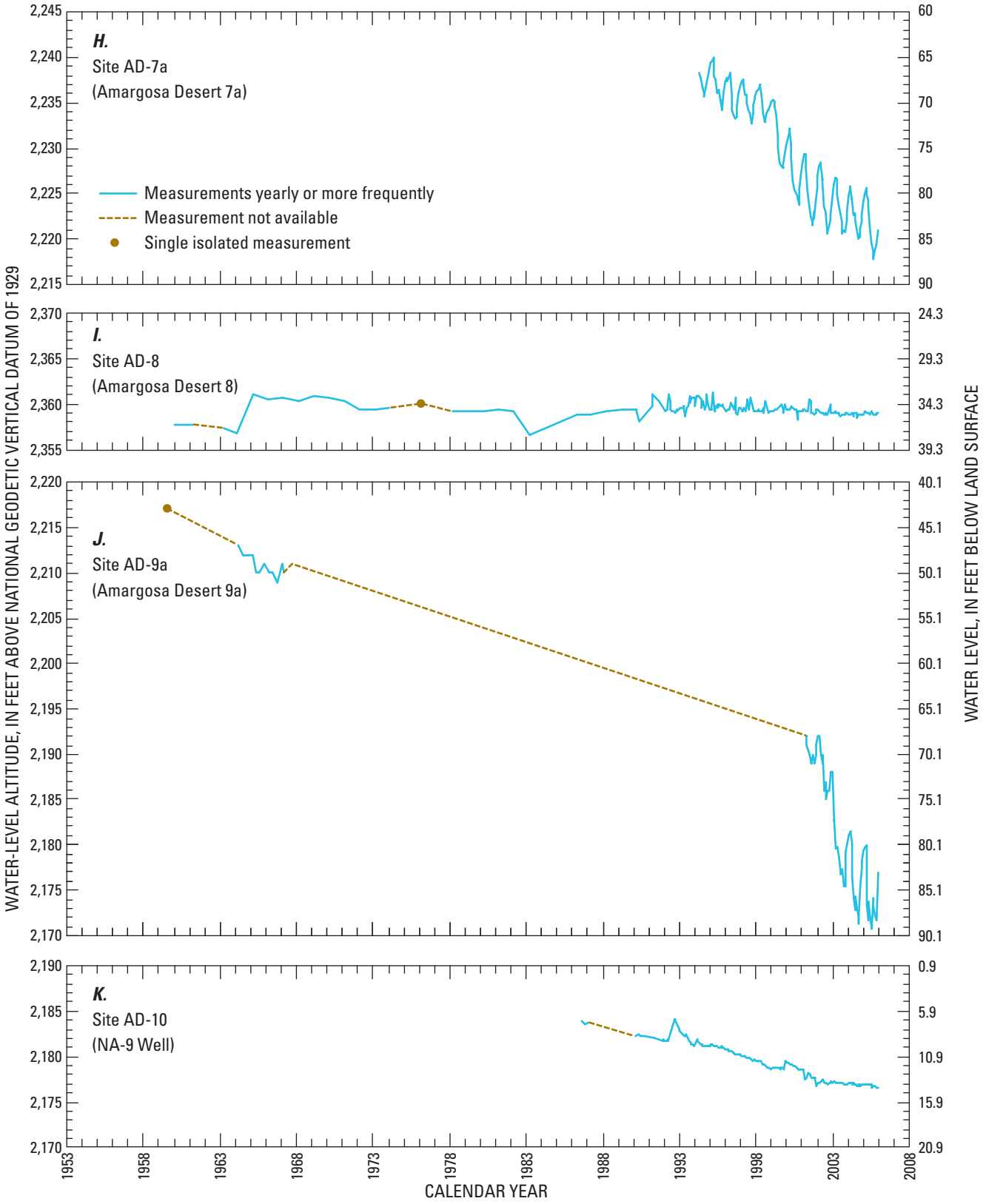

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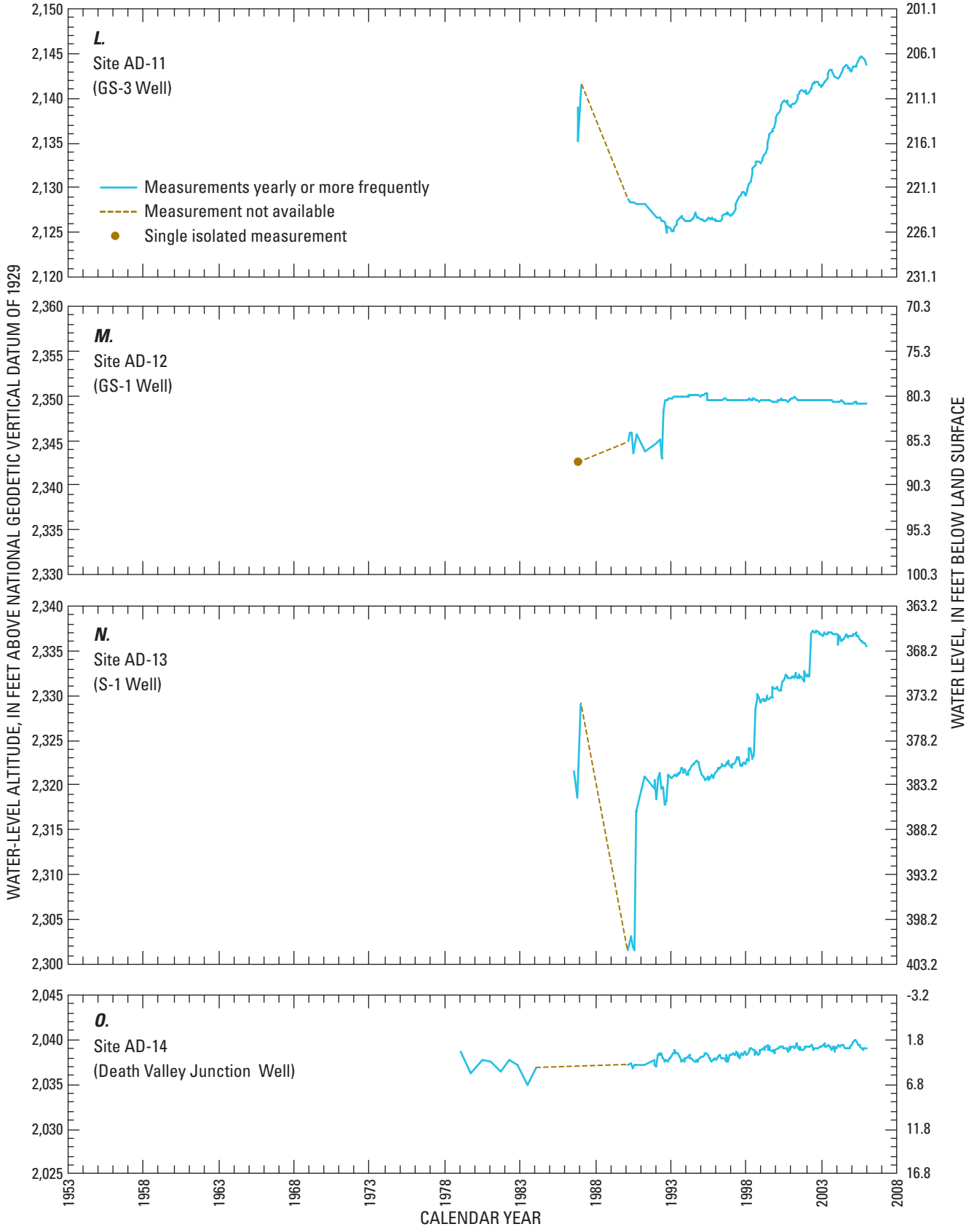

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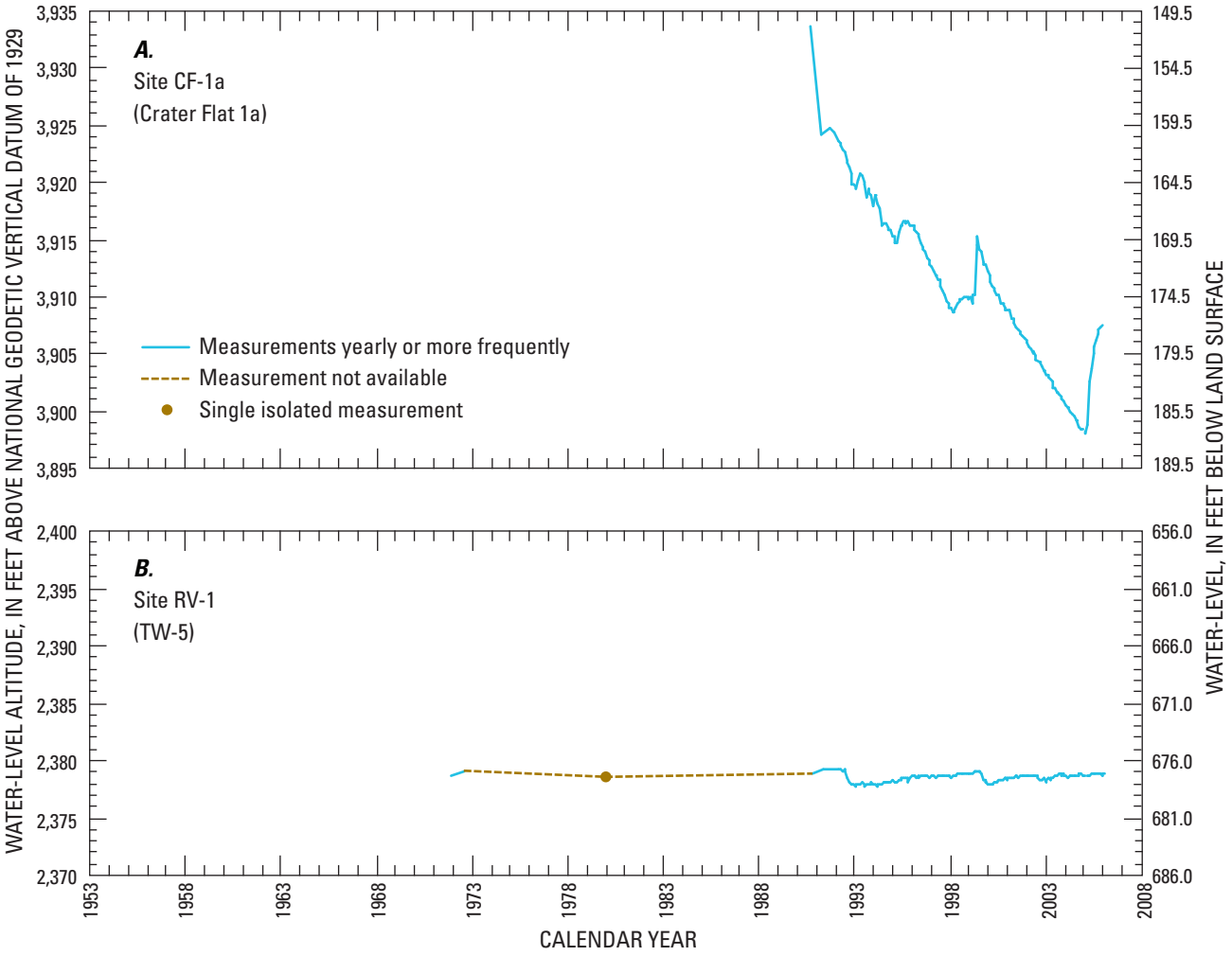


Figure 5. Periodic water levels for selected sites through 2005 at which primary contributing unit is undifferentiated sedimentary rock, Yucca Mountain region, southern Nevada and eastern California.

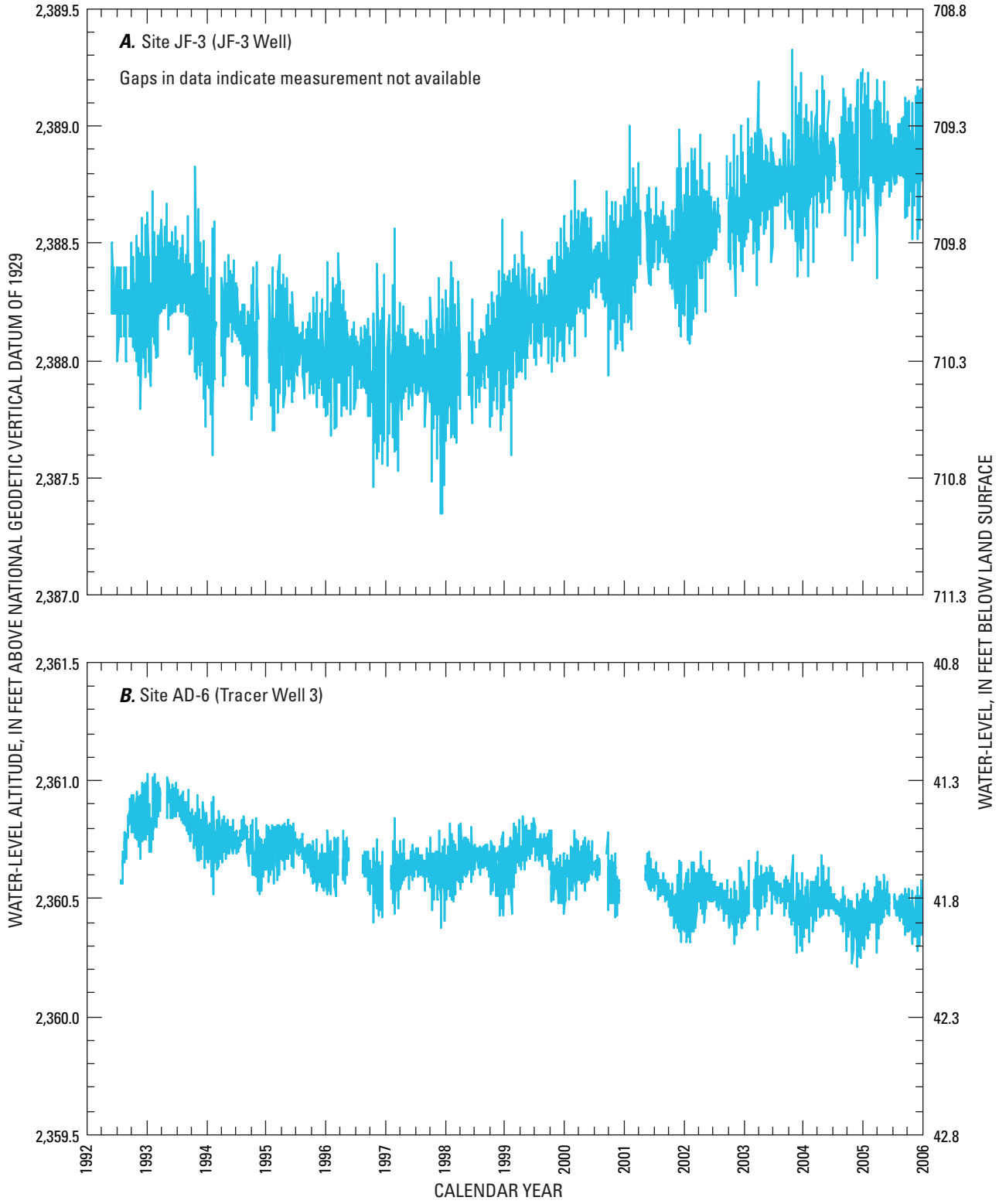


Figure 6. Daily average water levels in (*A*) borehole JF3, May 1992–December 2005 and in (*B*) borehole AD6, July 1992–December 2005, Yucca Mountain region, southern Nevada and eastern California.

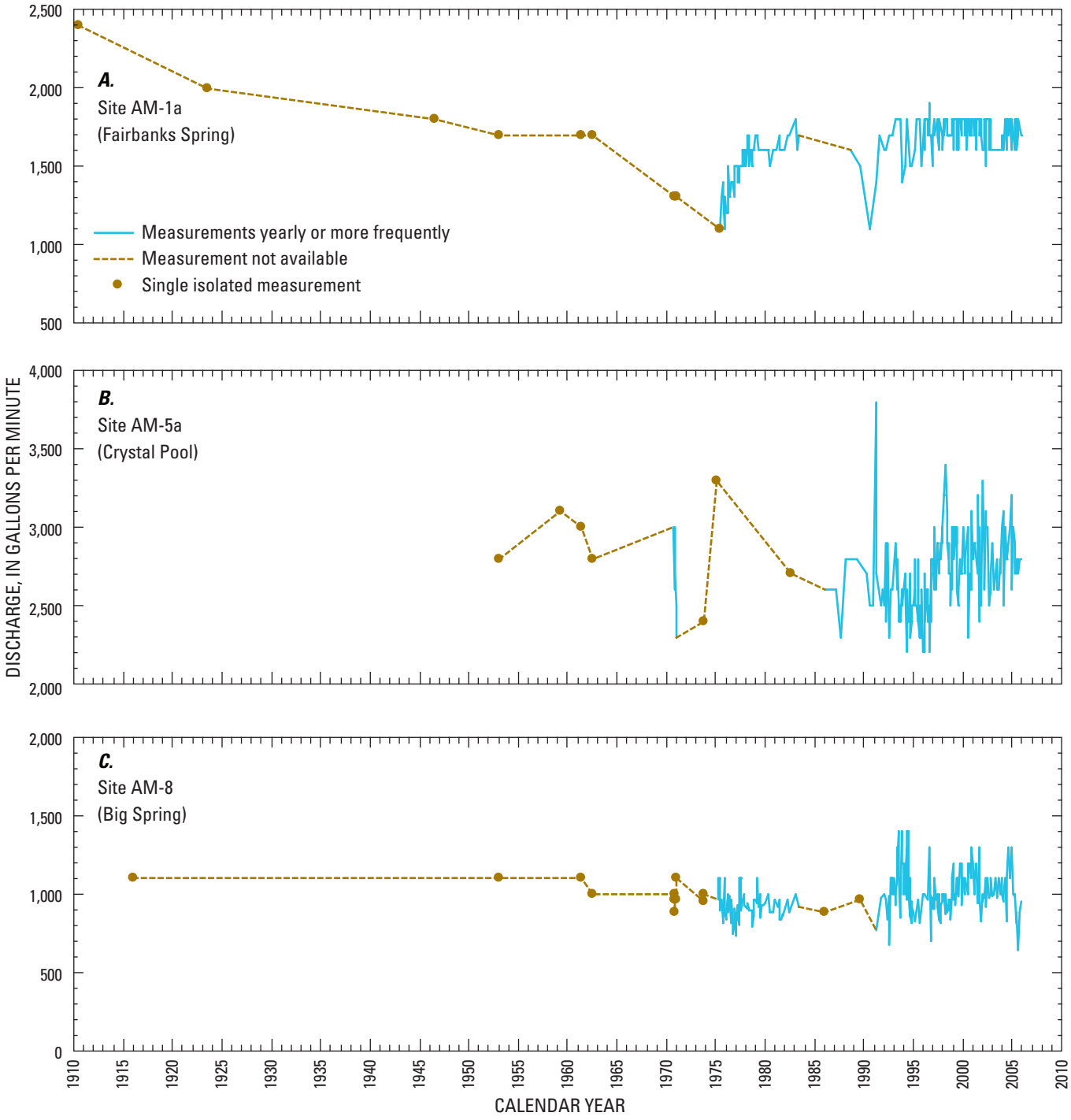


Figure 7. Discharge at sites AM-1a, AM-5a (Crystal Pool), and AM-8 (Big Spring), Yucca Mountain region, southern Nevada and eastern California, 1910–2005.

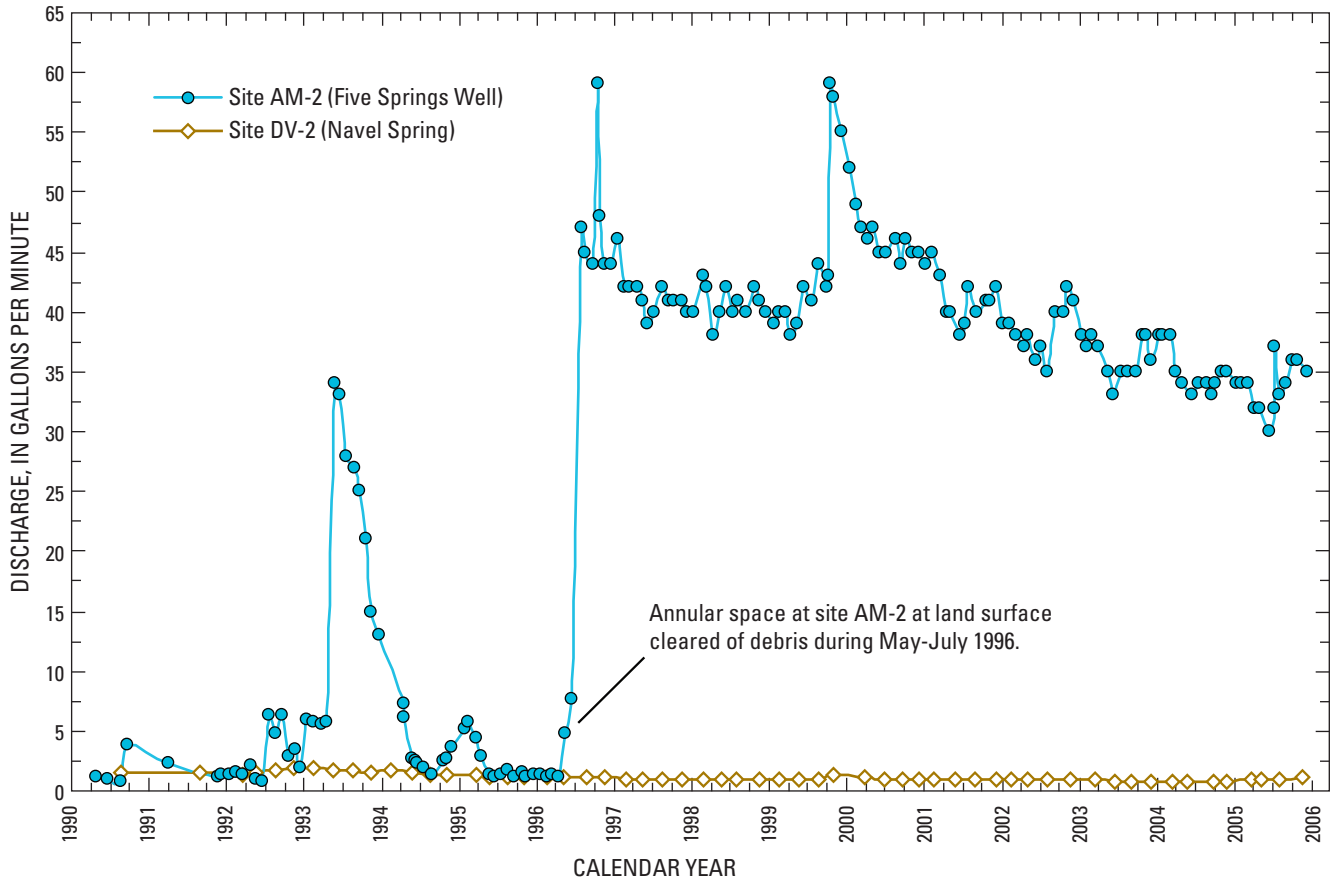


Figure 8. Discharge at sites AM-2 (Five Springs Well) and DV-2 (Navel Spring), Yucca Mountain region, southern Nevada and eastern California, 1990–2005.

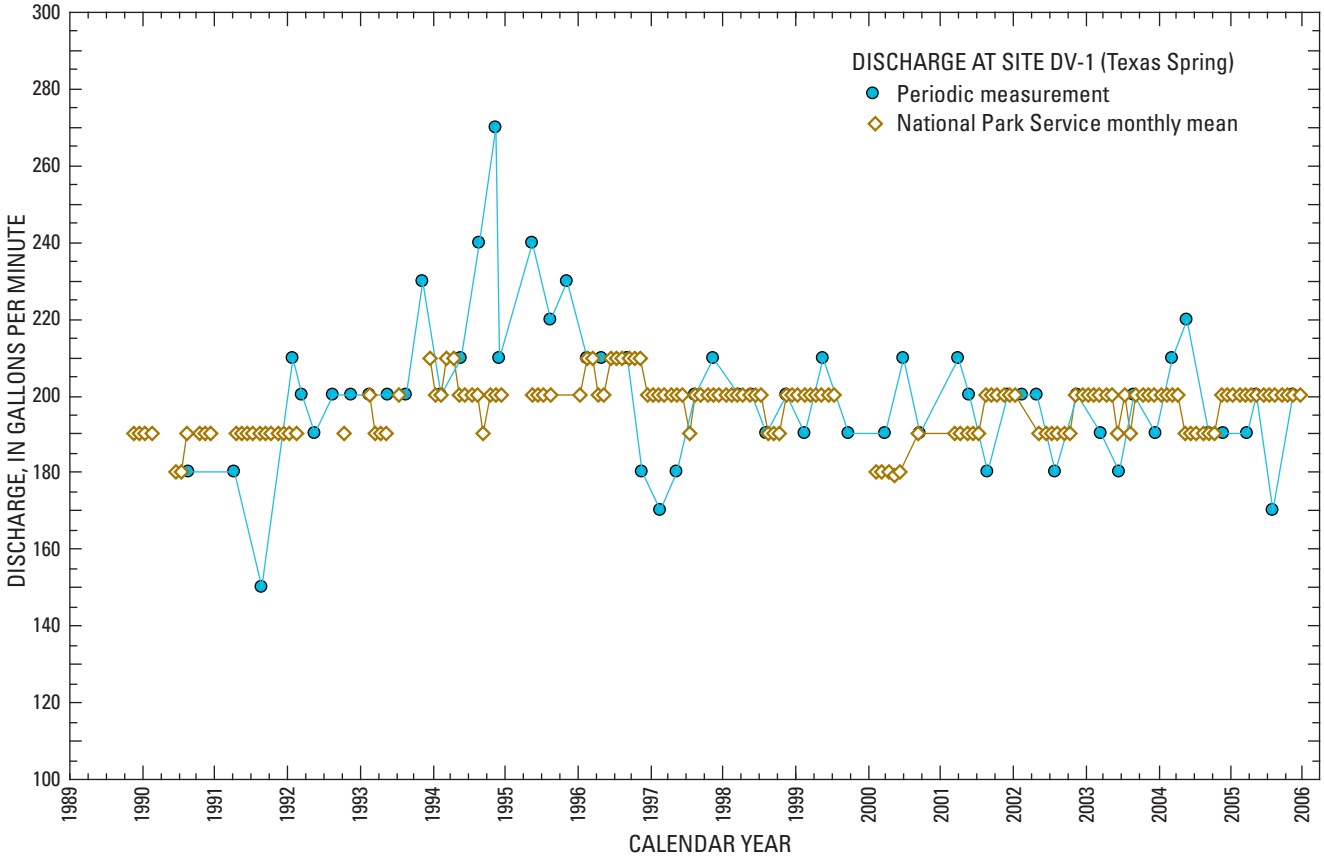


Figure 9. Discharge at site DV-1 (Texas Spring), Yucca Mountain region, southern Nevada and eastern California, 1989–2005.

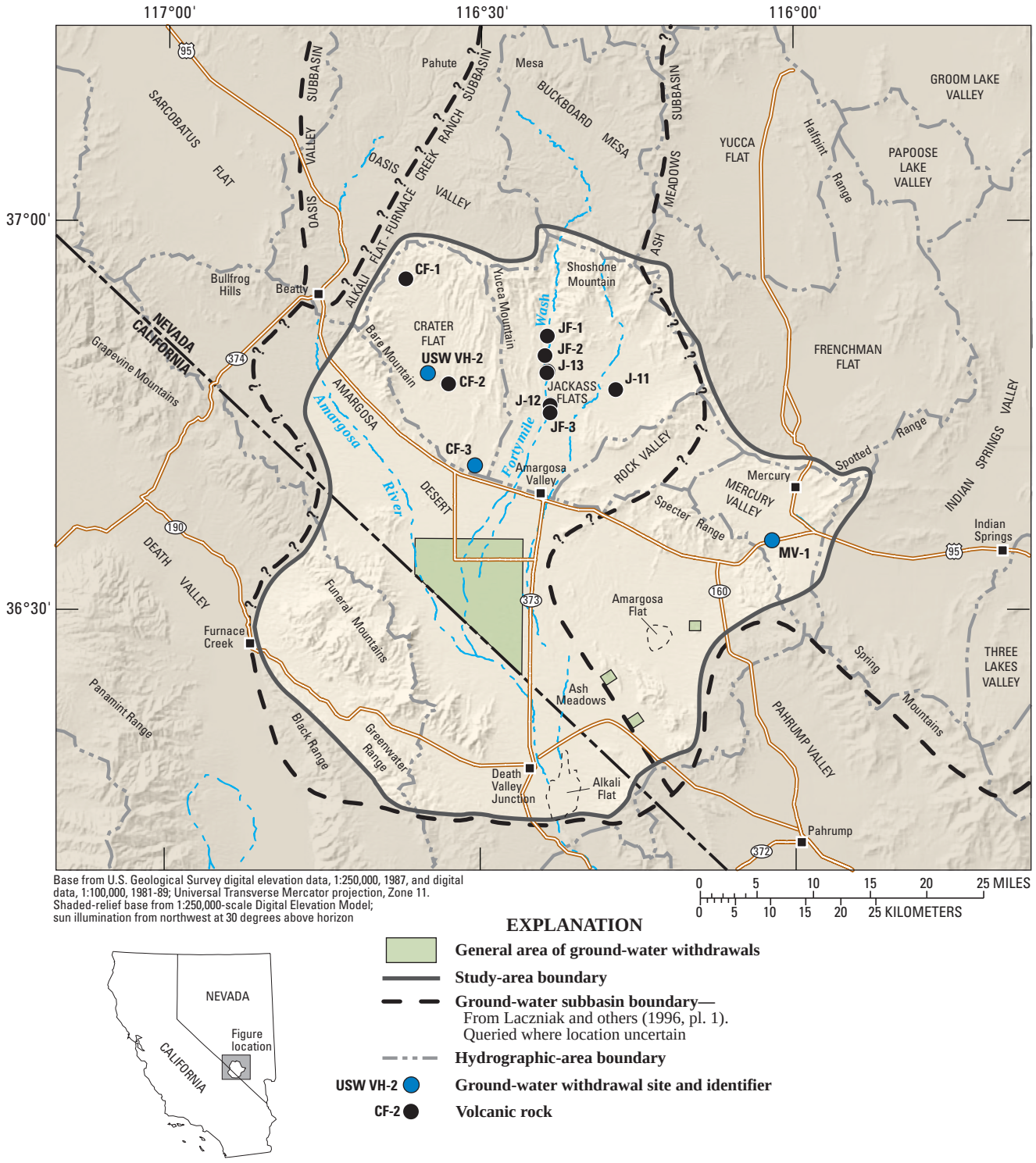


Figure 10. Location of ground-water withdrawal sites and general areas of ground-water withdrawals, Yucca Mountain region, southern Nevada and eastern California, January–December, 2005.

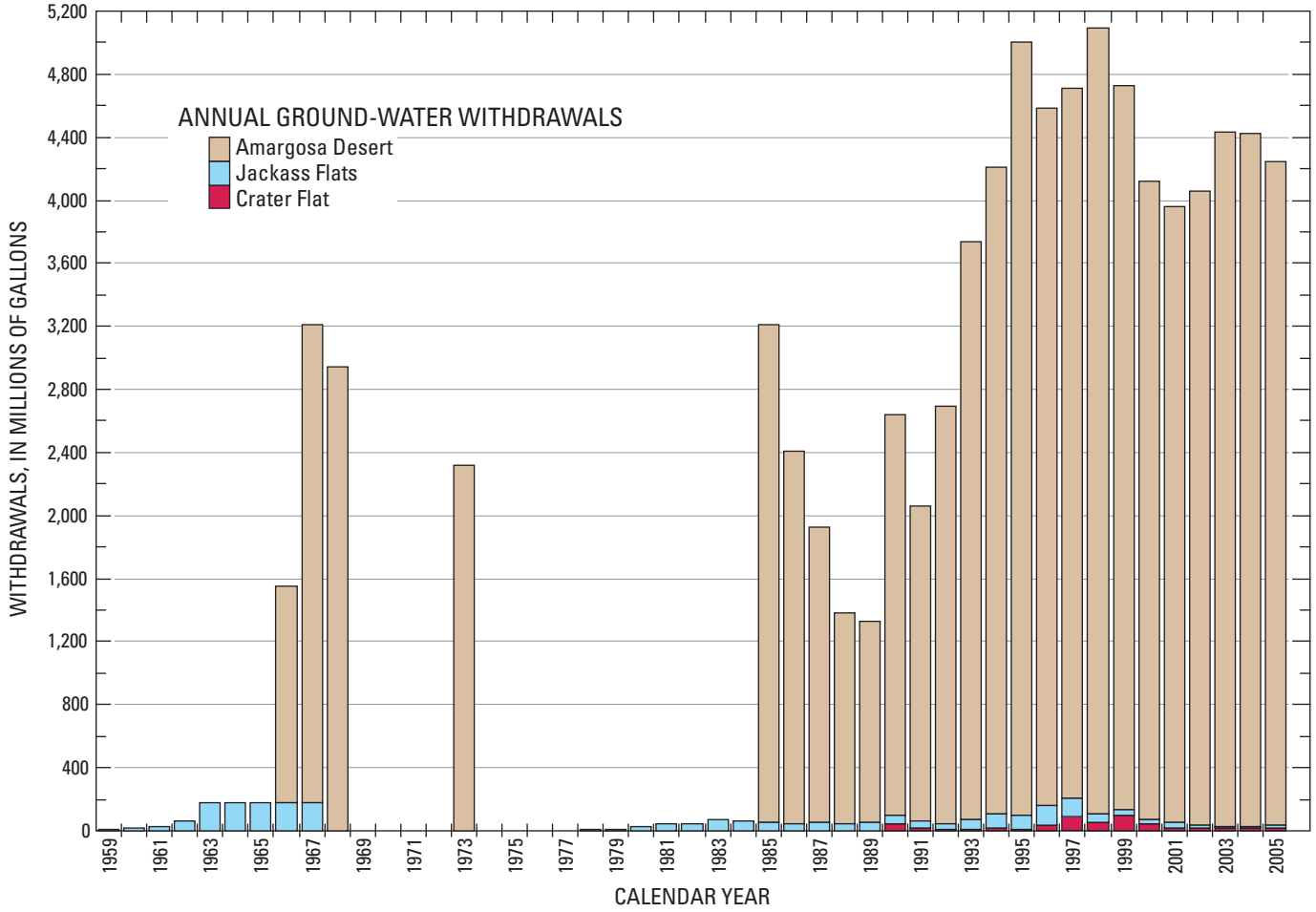


Figure 11. Available estimates of annual ground-water withdrawals for selected areas within Alkali Flat–Furnace Creek Ranch ground-water subbasin, Yucca Mountain region, southern Nevada and eastern California, 1959–2005.

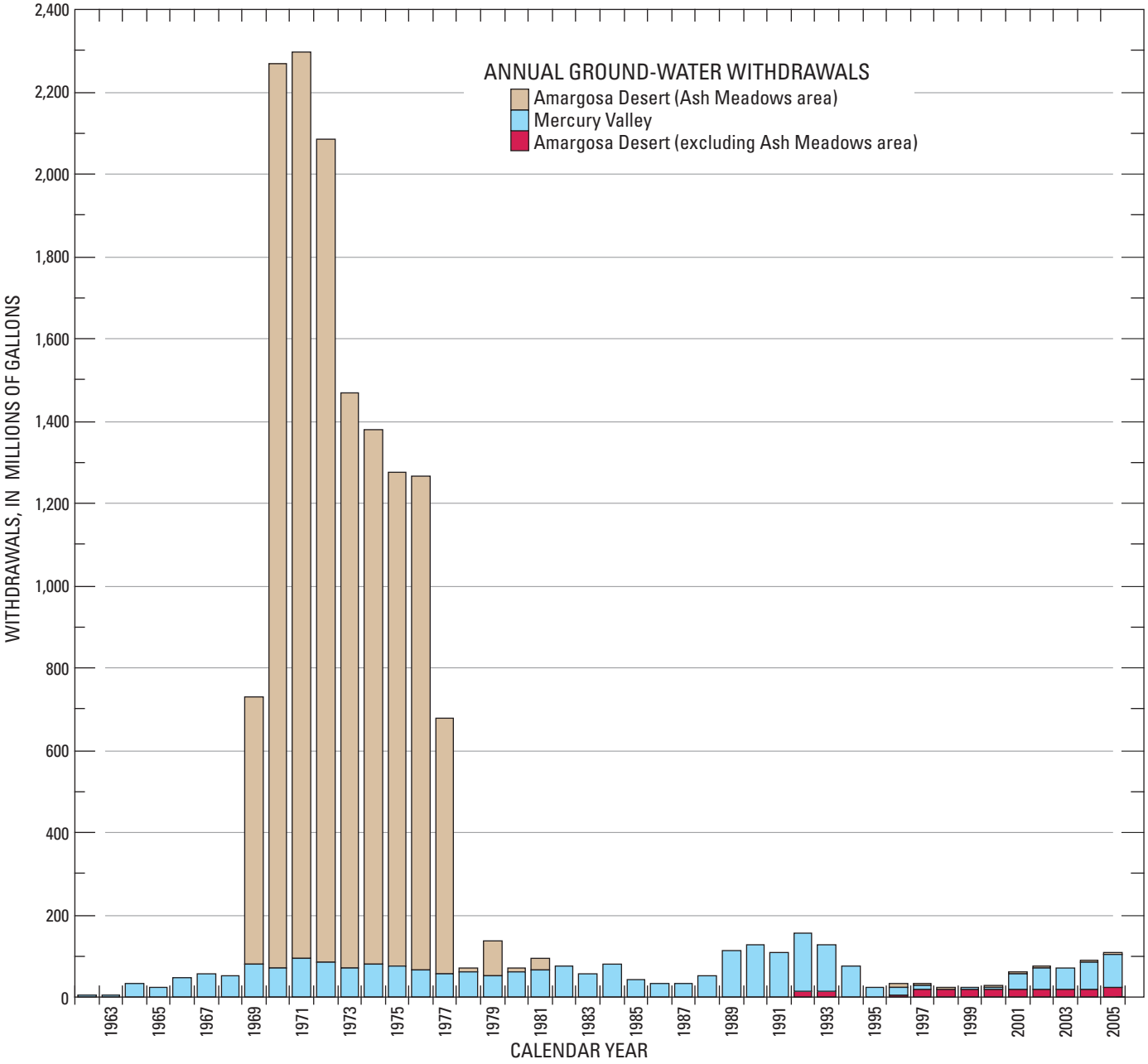


Figure 12. Available estimates of annual ground-water withdrawals for selected areas within Ash Meadows ground-water subbasin, Yucca Mountain region, southern Nevada and eastern California, 1962–2005.

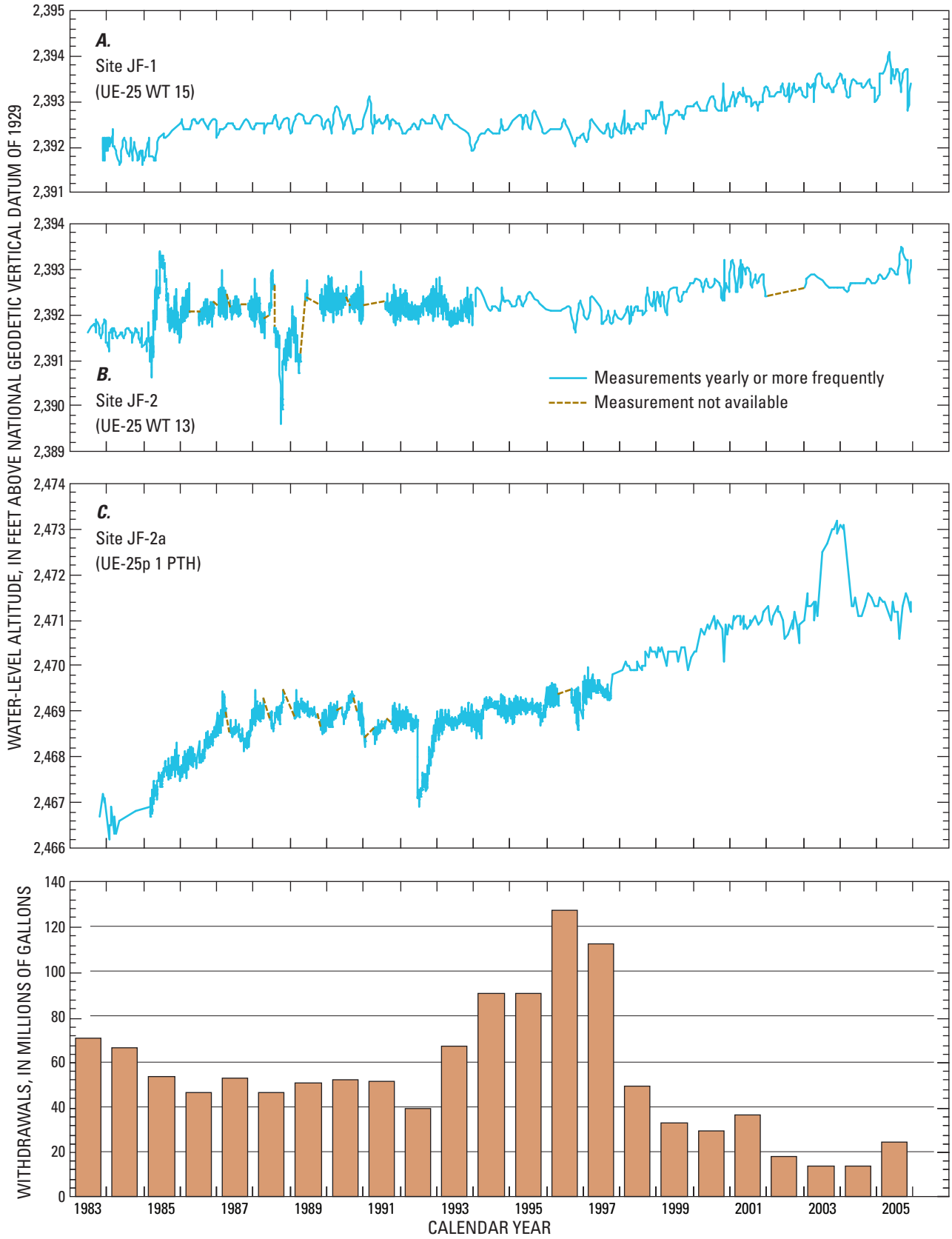
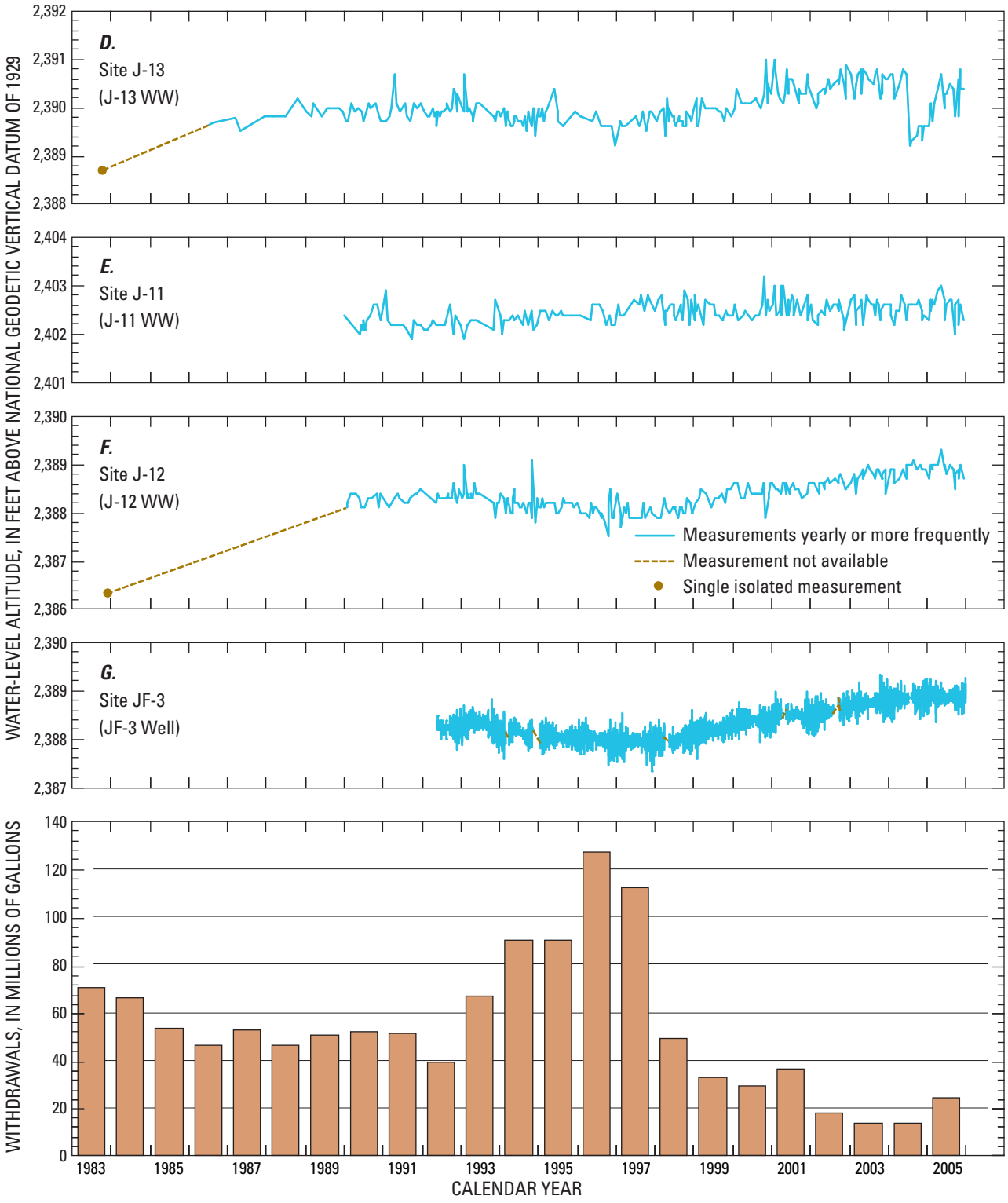


Figure 13. Water-level altitudes in boreholes JF-1, JF-2, JF-2a, J-13, J-11, J-12, and JF-3, and estimated annual ground-water withdrawals from Jackass Flats, Yucca Mountain region, southern Nevada and eastern California, 1983–2005.



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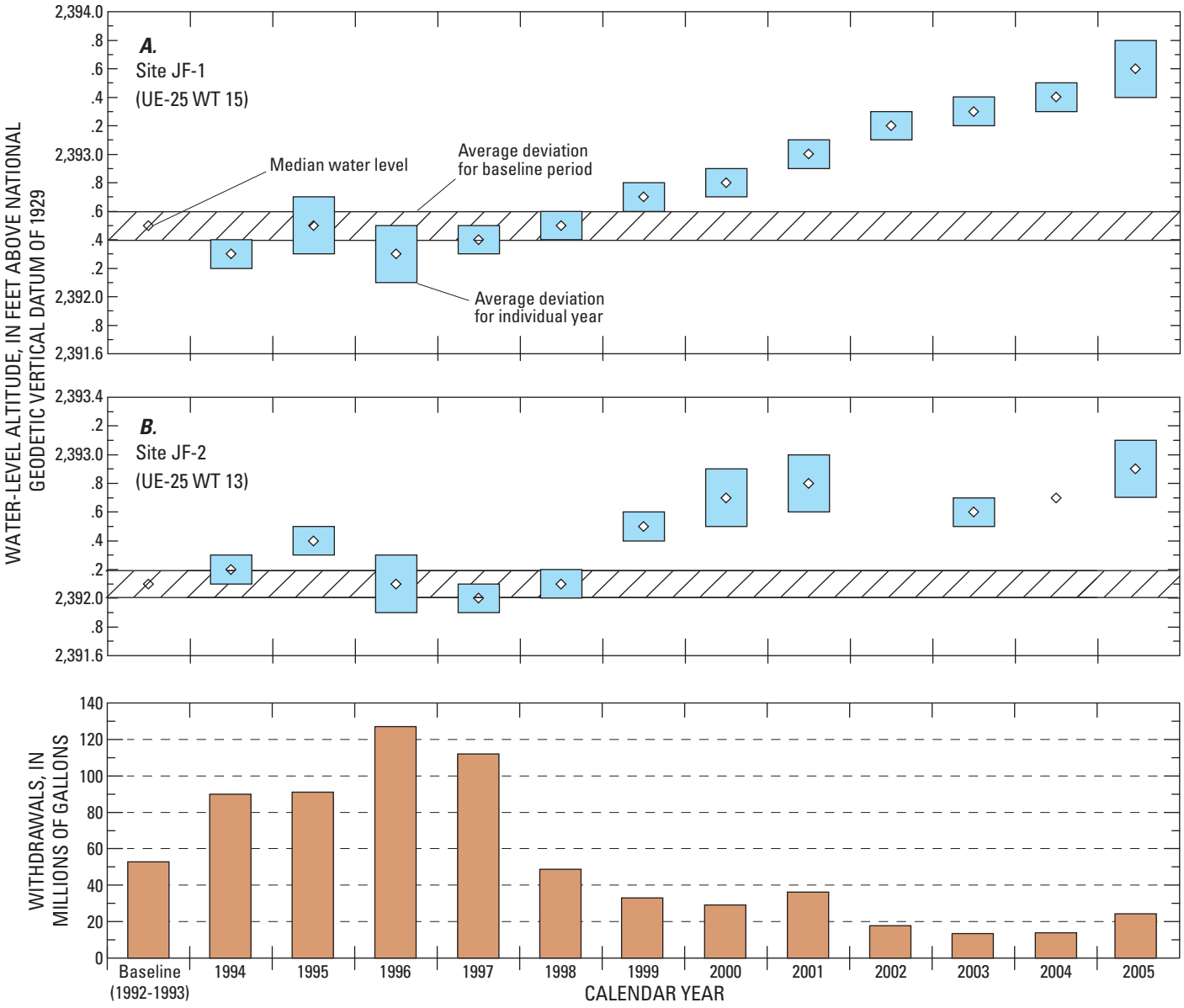
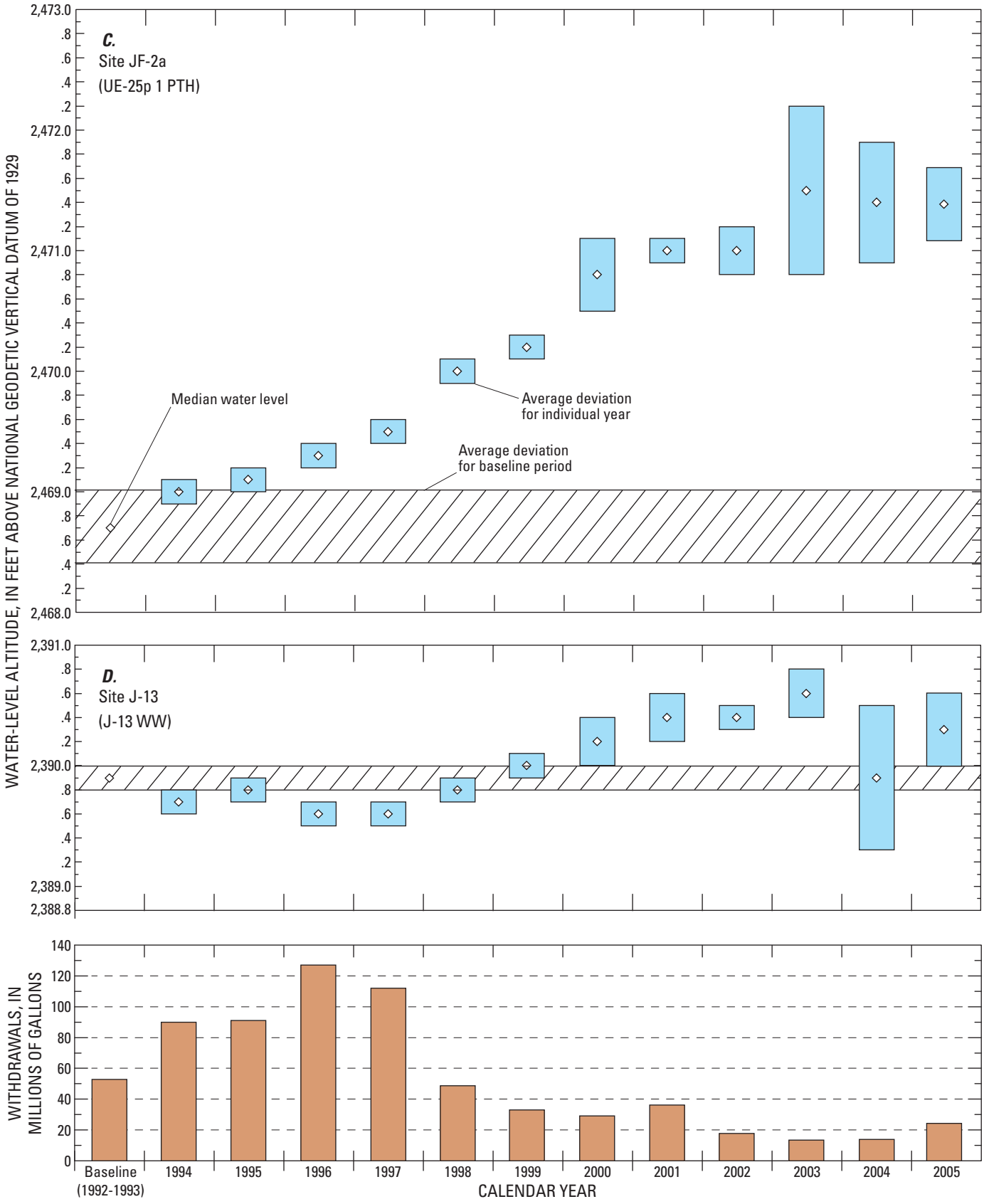


Figure 14. Median water-level altitudes and average deviation of water levels for boreholes JF-1, JF-2, JF-2a, J-13, J-11, J-12, and JF-3, and estimated annual ground-water withdrawals from Jackass Flats, 1992–93 and 1994–2005, Yucca Mountain region, southern Nevada and eastern California.



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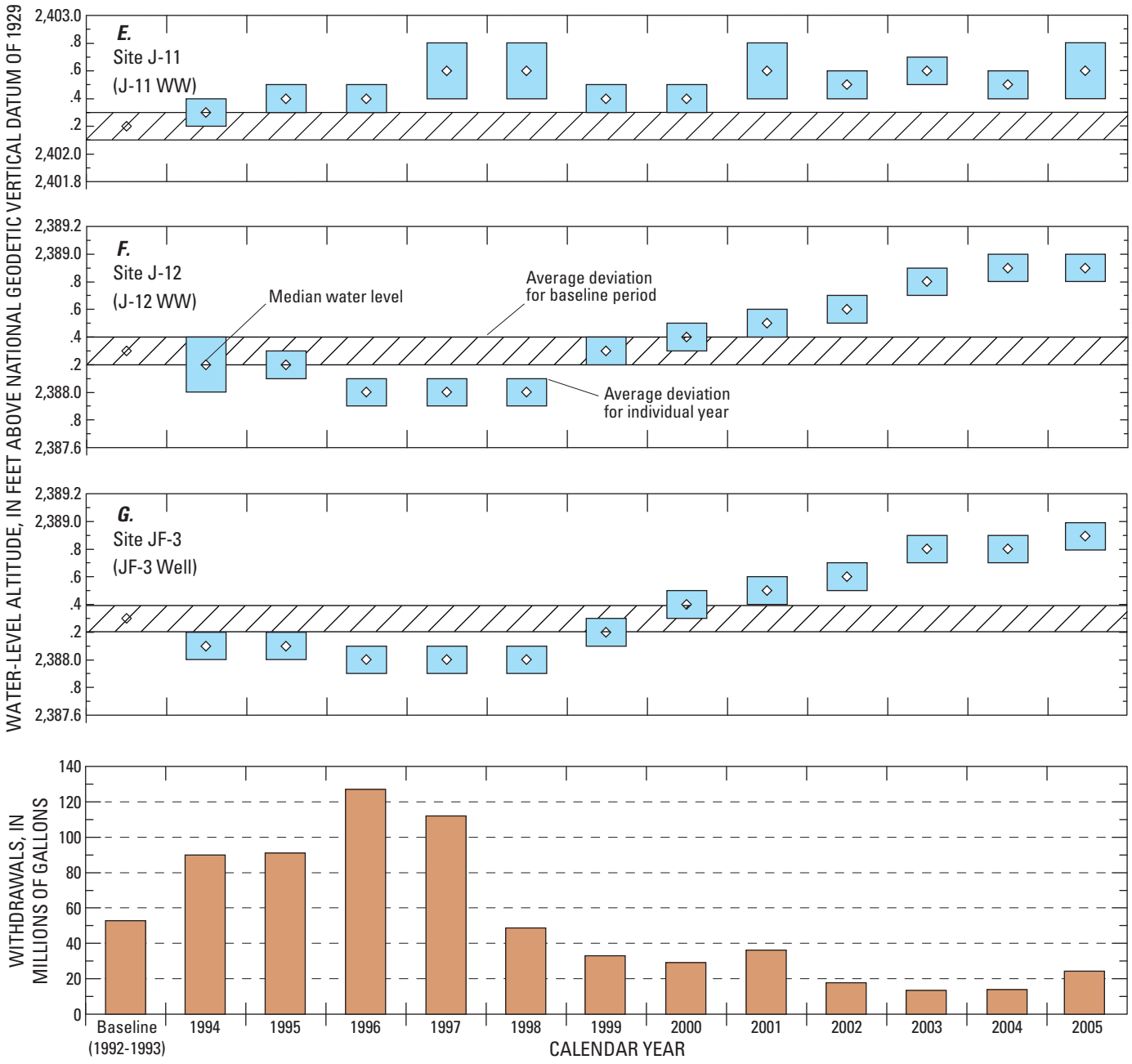

Figure 14.—Continued.

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.

[**Site Number**: Alphanumeric identifier used to designate sites on map and tables. First part represents hydrographic area in which site is located. **Hydrographic areas:** CF, Crater Flat; JF or J, Jackass Flats; RV, Rock Valley; MV, Mercury Valley; AD or AM, Amargosa Desert; DV, Death Valley. Second part is sequential numbering representing relative location of site within hydrographic area or Ash Meadows spring–discharge area; numbering order generally is north to south, then west to east. Sites J–13, J–11, and J–12 previously were numbered by Raytheon Services Nevada and herein were not renumbered. Site locations are shown in figure 1.

U.S. Geological Survey site identification: Unique identification number for site as stored in files and data bases of U.S. Geological Survey (USGS).

Land–surface altitude: Referenced to the National Geodetic Vertical Datum of 1929. Representative altitude of land surface in vicinity of site. Exception is altitude for site AM–4, which is altitude of bolt that serves as measurement point. Altitudes are reported to nearest 0.1 foot and were derived from land surveys.

Height of measurement point: Height of measurement point (MP) used. MP is stable, recoverable point from which periodic measurements of depth to water are made. MP at site AM-4 is bolt fastened to south wall of fissure, and is not referenced to land surface. Negative number indicates MP is below land surface.

Time: —, Time of measurement not provided by data source.

Depth to water: Depths listed generally represent water level below land surface. An exception is site AM–4, where data represent water levels below measurement point. Apparent differences in depth to water at sites that list data from several sources may result from differing estimates of distance from land surface to measurement point used.

Altitude of water surface: Referenced to the National Geodetic Vertical Datum of 1929. Land–surface altitude minus depth to water, reported to nearest 0.1 foot.

Method: Method used to measure depth to water. F, pressure sensor; R, reported (measurement method unknown); S, steel tape; T, electric tape; V**,** calibrated electric tape.

Site status: Known conditions at site that may have affected measured depth to water. F, flowing; Z, measurement made in pump–discharge column; –, no known conditions.

Data source: BN, Bechtel Nevada; EMP, Environmental–Monitoring Program (USGS); HRC, Harry Reid Center for Environmental Studies (University of Nevada, Las Vegas); NDWR, Nevada Division of Water Resources; NPS, National Park Service; NWRPO, Nye County Nuclear Waste Repository Project Office; NTS, U.S. Department of Energy, National Nuclear Security Administration, Nevada Site Office; USFWS, U.S. Fish and Wildlife Service]

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
CF–1	365520116370301	Crater Flat 1	3,930.9	1.77	01–05–05	1127	622.48	3,308.4	V	–	EMP
					02–08–05	1135	622.39	3,308.5	V	–	EMP
					03–08–05	1034	622.36	3,308.5	V	–	EMP
					04–18–05	1052	622.10	3,308.8	V	–	EMP
					05–09–05	1159	622.06	3,308.8	V	–	EMP
					06–16–05	1137	621.96	3,308.9	V	–	EMP
					07–11–05	1610	621.98	3,308.9	V	–	EMP
					08–09–05	1003	622.00	3,308.9	V	–	EMP
					09–19–05	1224	622.03	3,308.9	V	–	EMP
					10–11–05	1236	621.90	3,309.0	V	–	EMP
					11–02–05	1100	621.84	3,309.1	V	–	EMP
					12–13–05	1241	621.80	3,309.1	V	–	EMP
CF–1a	365445116383901	Crater Flat 1a	4,080.9	1.68	01–05–05	1206	182.74	3,898.2	S	–	EMP
					02–08–05	1213	182.87	3,898.0	S	–	EMP
					03–08–05	1121	182.11	3,898.8	S	–	EMP
					04–18–05	1136	178.34	3,902.6	S	–	EMP
					05–09–05	1234	177.23	3,903.7	S	–	EMP
					06–16–05	1211	175.76	3,905.1	S	–	EMP
					07–11–05	1644	175.20	3,905.7	S	–	EMP
					08–09–05	1031	174.66	3,906.2	S	–	EMP
					09–19–05	1146	174.18	3,906.7	S	–	EMP
					10–11–05	1306	173.80	3,907.1	S	–	EMP
					11–02–05	1147	173.59	3,907.3	S	–	EMP
					12–13–05	1353	173.28	3,907.6	S	–	EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
CF–2	364732116330701	USW VH– 1	3,161.1	1.17	01–05–05	1403	603.64	2,557.5	V	–	EMP
					02–16–05	1131	603.45	2,557.6	V	–	EMP
					02–24–05	1054	603.45	2,557.6	S	–	EMP
					03–15–05	1115	603.48	2,557.6	V	–	EMP
					03–28–05	—	602.97	2,558.1	V	–	HRC
					04–14–05	1421	603.46	2,557.6	V	–	EMP
					05–03–05	1205	603.38	2,557.7	V	–	EMP
					05–12–05	—	603.46	2,557.6	V	–	HRC
					06–23–05	1311	603.29	2,557.8	V	–	EMP
					07–07–05	1244	603.30	2,557.8	V	–	EMP
					08–16–05	0742	603.43	2,557.7	V	–	EMP
					08–25–05	—	603.69	2,557.4	T	–	HRC
					09–01–05	0913	603.37	2,557.7	S	–	EMP
					10–11–05	1503	603.29	2,557.8	V	–	EMP
					11–02–05	1245	603.08	2,558.0	V	–	EMP
					12–20–05	1453	603.41	2,557.7	V	–	EMP
					12–22–05	—	603.51	2,557.6	T	–	HRC
CF–3	364105116302601	Crater Flat 3	2,725.6	-3.20	01–12–05	1310	331.13	2,394.5	V	–	EMP
					02–10–05	1300	330.99	2,394.6	V	–	EMP
					03–15–05	1229	331.00	2,394.6	V	–	EMP
					04–13–05	1516	331.03	2,394.6	V	–	EMP
					05–03–05	1435	331.03	2,394.6	V	–	EMP
					06–16–05	1314	331.02	2,394.6	V	–	EMP
					07–11–05	1448	331.02	2,394.6	V	–	EMP
					08–09–05	1327	331.01	2,394.6	V	–	EMP
					09–19–05	1350	331.14	2,394.5	V	–	EMP
					10–11–05	1543	330.99	2,394.6	V	–	EMP
					11–02–05	1515	330.90	2,394.7	V	–	EMP
					12–21–05	1329	330.92	2,394.7	V	–	EMP
JF–1	365116116233801	UE–25 WT 15	3,553.8	0.18	01–18–05	1231	1,160.71	2,393.1	V	–	EMP
					02–09–05	—	1,160.59	2,393.2	V	–	HRC
					02–14–05	1458	1,160.21	2,393.6	V	–	EMP
					03–16–05	1515	1,160.22	2,393.6	V	–	EMP
					04–19–05	1327	1,160.02	2,393.8	V	–	EMP
					05–16–05	1554	1,159.72	2,394.1	V	–	EMP
					06–09–05	—	1,160.37	2,393.4	V	–	HRC
					06–15–05	1527	1,160.13	2,393.7	V	–	EMP
					07–12–05	1041	1,160.31	2,393.5	V	–	EMP
					08–08–05	1407	1,160.08	2,393.7	V	–	EMP
					09–08–05	—	1,160.63	2,393.2	T	–	HRC
					09–27–05	1154	1,160.19	2,393.6	V	–	EMP
					10–26–05	1329	1,160.09	2,393.7	V	–	EMP
					11–14–05	1305	1,160.14	2,393.7	V	–	EMP
					11–15–05	—	1,160.99	2,392.8	T	–	HRC
					12–20–05	1249	1,160.36	2,393.4	V	–	EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
JF–2	364945116235001	UE–25 WT 13	3,387.5	1.00	01–15–05	0936	994.70	2,392.8	F	–	HRC
					02–15–05	0936	994.64	2,392.9	F	–	HRC
					03–15–05	0936	994.66	2,392.8	F	–	HRC
					04–05–05	1036	994.66	2,392.8	F	–	HRC
					05–05–05	1036	994.62	2,392.9	F	–	HRC
					06–05–05	1036	994.52	2,393.0	F	–	HRC
					07–15–05	1036	994.59	2,392.9	F	–	HRC
					08–11–05	—	994.57	2,392.9	T	–	HRC
					08–16–05	1515	994.38	2,393.1	V	–	EMP
					09–12–05	1217	993.99	2,393.5	S	–	EMP
					10–26–05	1256	994.32	2,393.2	V	–	EMP
					11–14–05	1213	994.32	2,393.2	V	–	EMP
					12–06–05	—	994.85	2,392.6	T	–	HRC
					12–20–05	1326	994.34	2,393.2	V	–	EMP
JF–2a	364938116252102	UE–25p 1 PTH	3,655.5	0.63	01–15–05	0945	1,184.22	2,471.3	F	–	HRC
					02–15–05	0945	1,184.04	2,471.5	F	–	HRC
					03–15–05	0945	1,184.10	2,471.4	F	–	HRC
					03–24–05	0845	1,184.05	2,471.4	V	–	HRC
					06–07–05	1324	1,184.46	2,471.0	V	–	HRC
					06–15–05	1008	1,184.13	2,471.4	V	–	EMP
					07–12–05	1134	1,184.30	2,471.2	V	–	EMP
					08–08–05	1444	1,184.25	2,471.2	V	–	EMP
					08–18–05	—	1,184.89	2,470.6	T	–	HRC
					09–27–05	1237	1,184.19	2,471.3	V	–	EMP
					10–26–05	1420	1,183.91	2,471.6	V	–	EMP
					11–14–05	1354	1,183.97	2,471.5	V	–	EMP
					12–12–05	—	1,184.27	2,471.2	T	–	HRC
					12–20–05	1207	1,184.12	2,471.4	V	–	EMP
J–13	364828116234001	J –13 WW	3,317.9	0.98	01–18–05	1001	928.29	2,389.6	V	–	EMP
					02–14–05	1230	927.81	2,390.1	V	–	EMP
					02–17–05	—	928.18	2,389.7	V	–	HRC
					03–16–05	1556	927.81	2,390.1	V	–	EMP
					04–19–05	1151	927.54	2,390.4	V	–	EMP
					05–16–05	0958	927.25	2,390.6	V	–	EMP
					06–14–05	—	927.91	2,390.0	V	–	HRC
					06–15–05	1608	927.60	2,390.3	V	–	EMP
					07–12–05	0732	927.64	2,390.3	V	–	EMP
					08–08–05	1138	927.39	2,390.5	V	–	EMP
					09–13–05	0950	927.47	2,390.4	S	–	EMP
					09–27–05	—	928.10	2,389.8	T	–	HRC
					10–26–05	1219	927.33	2,390.6	V	–	EMP
					11–03–05	—	928.06	2,389.8	T	–	HRC
					11–07–05	1638	927.13	2,390.8	V	–	EMP
					11–08–05	0935	927.51	2,390.4	V	–	NTS
					12–15–05	1200	927.52	2,390.4	F	–	NTS

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
J–11	364706116170601	J –11 WW	3,442.8	2.11	01–18–05	1400	1,040.46	2,402.3	V	–	EMP
					02–15–05	1326	1,040.10	2,402.7	V	–	EMP
					02–17–05	—	1,040.33	2,402.5	V	–	HRC
					02–23–05	1133	1,040.13	2,402.7	S	–	EMP
					03–16–05	1159	1,040.19	2,402.6	V	–	EMP
					04–19–05	1437	1,039.95	2,402.9	V	–	EMP
					05–16–05	0915	1,039.79	2,403.0	V	–	EMP
					06–15–05	0900	1,040.14	2,402.7	V	–	EMP
					06–21–05	—	1,040.46	2,402.3	V	–	HRC
					07–12–05	1246	1,040.25	2,402.6	V	–	EMP
					08–08–05	1029	1,040.15	2,402.7	V	–	EMP
					08–30–05	1019	1,040.07	2,402.7	S	–	EMP
					09–27–05	—	1,040.76	2,402.0	T	–	HRC
					09–27–05	1337	1,040.17	2,402.6	V	–	EMP
					10–26–05	1512	1,040.06	2,402.7	V	–	EMP
					11–03–05	—	1,040.60	2,402.2	T	–	HRC
					11–14–05	1053	1,040.23	2,402.6	V	–	EMP
					12–20–05	1028	1,040.47	2,402.3	V	–	EMP
J–12	364554116232401	J –12 WW	3,128.4	3.95	01–18–05	1036	739.68	2,388.7	V	–	EMP
					02–15–05	1227	739.40	2,389.0	V	–	EMP
					02–17–05	—	739.48	2,388.9	V	–	HRC
					02–23–05	1356	739.40	2,389.0	S	–	EMP
					03–16–05	1329	739.41	2,389.0	V	–	EMP
					04–19–05	1230	739.39	2,389.0	V	–	EMP
					05–16–05	1027	739.09	2,389.3	V	–	EMP
					06–14–05	—	739.49	2,388.9	V	–	HRC
					06–15–05	1321	739.40	2,389.0	V	–	EMP
					07–12–05	0758	739.57	2,388.8	V	–	EMP
					08–08–05	1208	739.40	2,389.0	V	–	EMP
					08–31–05	1016	739.52	2,388.9	S	–	EMP
					09–27–05	—	739.89	2,388.5	T	–	HRC
					09–27–05	1052	739.56	2,388.8	V	–	EMP
					10–26–05	1143	739.46	2,388.9	V	–	EMP
					11–03–05	—	739.72	2,388.7	T	–	HRC
					11–14–05	1135	739.43	2,389.0	V	–	EMP
					12–20–05	1110	739.66	2,388.7	V	–	EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
JF–3	364528116232201	JF– 3 Well	3,098.3	2.27	01–18–05	1115	709.64	2,388.7	V	–	EMP
					02–14–05	1330	709.35	2,389.0	V	–	EMP
					02–15–05	1045	709.45	2,388.8	V	–	EMP
					03–16–05	1400	709.40	2,388.9	V	–	EMP
					04–07–05	1200	709.24	2,389.1	V	–	EMP
					04–07–05	1509	709.13	2,389.2	V	–	EMP
					04–12–05	1045	709.47	2,388.8	V	–	EMP
					04–12–05	1208	709.43	2,388.9	V	–	EMP
					04–12–05	1300	709.40	2,388.9	V	–	EMP
					05–16–05	1100	709.03	2,389.3	V	–	EMP
					06–15–05	1345	709.43	2,388.9	V	–	EMP
					06–23–05	1130	709.48	2,388.8	V	–	EMP
					07–12–05	0830	709.60	2,388.7	V	–	EMP
					08–08–05	1245	709.39	2,388.9	V	–	EMP
					09–27–05	1015	709.56	2,388.7	V	–	EMP
					10–26–05	1100	709.50	2,388.8	V	–	EMP
					11–10–05	1045	709.43	2,388.9	V	–	EMP
					12–12–05	1230	709.25	2,389.0	V	–	EMP
RV–1	363815116175901	TW– 5	3,056.0	1.6	01–05–05	1531	677.33	2,378.7	V	–	EMP
					02–09–05	1434	677.26	2,378.7	V	–	EMP
					03–09–05	1059	677.28	2,378.7	V	–	EMP
					04–13–05	1600	677.17	2,378.8	V	–	EMP
					05–09–05	1400	677.21	2,378.8	V	–	EMP
					06–16–05	1409	677.17	2,378.8	V	–	EMP
					07–06–05	1427	677.25	2,378.8	V	–	EMP
					08–03–05	1534	677.25	2,378.8	V	–	EMP
					09–22–05	1340	677.22	2,378.8	V	–	EMP
					10–27–05	1048	677.27	2,378.7	V	–	EMP
					11–02–05	1613	677.16	2,378.8	V	–	EMP
					12–21–05	1423	677.18	2,378.8	V	–	EMP
MV–1	363530116021401	Army 1 WW	3,153.3	3.10	08–15–05	0825	788.63	2,364.7	V	Z	EMP
					09–19–05	0844	791.63	2,361.7	V	Z	EMP
					10–26–05	0919	786.16	2,367.1	V	Z	EMP
					11–21–05	0906	785.79	2,367.5	V	Z	EMP
					12–20–05	0825	785.70	2,367.6	V	Z	EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AD–1	364141116351401	NA–6 Well BGMW–10	2,627.9	1.7	01–12–05	1412	270.19	2,357.7	S	–	EMP
					02–10–05	1140	269.96	2,357.9	S	–	EMP
					03–09–05	1340	269.97	2,357.9	S	–	EMP
					04–14–05	1321	270.11	2,357.8	S	–	EMP
					05–03–05	1304	269.98	2,357.9	S	–	EMP
					06–21–05	1538	269.92	2,358.0	S	–	EMP
					07–07–05	1352	269.97	2,357.9	S	–	EMP
					08–09–05	1232	270.02	2,357.9	S	–	EMP
					09–08–05	1448	269.81	2,358.1	S	–	EMP
					10–11–05	1406	269.95	2,358.0	S	–	EMP
					11–02–05	1401	269.70	2,358.2	S	–	EMP
					12–13–05	1503	269.91	2,358.0	S	–	EMP
AD–2	363830116241401	Airport Well	2,638.8	1.15	01–13–05	1014	326.06	2,312.7	S	–	EMP
					02–09–05	1038	325.87	2,312.9	S	–	EMP
					03–15–05	1304	325.89	2,312.9	S	–	EMP
					04–13–05	1149	325.72	2,313.1	S	–	EMP
					05–03–05	1532	325.81	2,313.0	S	–	EMP
					06–21–05	1627	325.82	2,313.0	S	–	EMP
					07–06–05	1341	325.85	2,313.0	S	–	EMP
					08–09–05	1401	325.92	2,312.9	S	–	EMP
					09–08–05	1359	325.81	2,313.0	S	–	EMP
					10–11–05	1702	325.87	2,312.9	S	–	EMP
					11–03–05	1202	325.83	2,313.0	S	–	EMP
					12–21–05	1146	325.85	2,313.0	S	–	EMP
AD–2b	363835116234002	NDOT Well 2	2,656.8	0.76	01–13–05	0928	342.49	2,314.3	V	–	EMP
					02–10–05	1343	342.08	2,314.7	V	–	EMP
					03–18–05	1429	342.07	2,314.7	V	–	EMP
					04–13–05	1127	342.31	2,314.5	V	–	EMP
					05–03–05	1613	342.52	2,314.3	V	–	EMP
					06–23–05	1505	342.36	2,314.4	V	–	EMP
					07–12–05	1457	342.80	2,314.0	V	–	EMP
					08–16–05	1013	342.96	2,313.8	V	–	EMP
					09–22–05	1248	342.49	2,314.3	V	–	EMP
					10–11–05	1830	342.85	2,314.0	V	–	EMP
					11–03–05	1128	342.47	2,314.3	V	–	EMP
					12–21–05	1214	342.47	2,314.3	V	–	EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AD–3a	363521116352501	Amargosa Desert 3a	2,395.3	1.00	01–07–05	1404	134.18	2,261.1	S	–	EMP
					02–09–05	1332	134.17	2,261.1	S	–	EMP
					03–18–05	1626	134.14	2,261.2	S	–	EMP
					04–13–05	1415	134.12	2,261.2	S	–	EMP
					05–05–05	1235	134.23	2,261.1	S	–	EMP
					05–11–05	0830	134.32	2,261.0	S	–	EMP
					06–08–05	1428	134.36	2,260.9	S	–	EMP
					07–11–05	1345	134.50	2,260.8	S	–	EMP
					08–10–05	1427	134.63	2,260.7	S	–	EMP
					09–07–05	1524	134.82	2,260.5	S	–	EMP
					10–07–05	1723	134.95	2,260.4	S	–	EMP
					11–03–05	1503	135.07	2,260.2	S	–	EMP
					12–19–05	1708	135.21	2,260.1	S	–	EMP
AD–4a	363428116234701	Amargosa Desert 4a	2,477.8	1.0	01–07–05	1515	120.02	2,357.8	S	–	EMP
					02–09–05	1103	120.26	2,357.5	S	–	EMP
					03–18–05	1455	120.13	2,357.7	S	–	EMP
					03–28–05	1611	120.18	2,357.6	S	–	EMP
					04–13–05	1210	120.38	2,357.4	S	–	EMP
					05–03–05	1702	120.31	2,357.5	S	–	EMP
					06–08–05	1233	120.53	2,357.3	S	–	EMP
					07–06–05	1319	120.45	2,357.4	S	–	EMP
					08–03–05	1451	120.60	2,357.2	S	–	EMP
					09–07–05	1552	120.29	2,357.5	S	–	EMP
					10–11–05	1629	120.28	2,357.5	S	–	EMP
					11–03–05	1222	120.24	2,357.6	S	–	EMP
					12–21–05	1248	120.30	2,357.5	S	–	EMP
AD–5	363310116294001	USBLM Well	2,376.4	0.0	01–02–05	0836	136.33	2,240.1	V	–	NWRPO
					01–07–05	1325	136.28	2,240.1	S	–	EMP
					02–09–05	1258	135.97	2,240.4	S	–	EMP
					02–25–05	1242	135.80	2,240.6	S	–	EMP
					03–18–05	1605	135.72	2,240.7	S	–	EMP
					04–13–05	1349	135.68	2,240.7	S	–	EMP
					05–05–05	1213	135.85	2,240.6	S	–	EMP
					05–11–05	0907	135.93	2,240.5	S	–	EMP
					06–08–05	1400	136.24	2,240.2	S	–	EMP
					07–11–05	1322	136.71	2,239.7	S	–	EMP
					08–10–05	1400	137.11	2,239.3	S	–	EMP
					08–29–05	1118	137.35	2,239.1	S	–	EMP
					09–07–05	1455	137.49	2,238.9	S	–	EMP
					10–07–05	1700	137.83	2,238.6	S	–	EMP
					11–03–05	1440	138.08	2,238.3	S	–	EMP
					12–19–05	1642	138.12	2,238.3	S	–	EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AD–6	363213116133800	Tracer Well 3	2,402.3	0.4	01–14–05	1345	41.95	2,360.4	S	–	EMP
					02–10–05	1500	41.87	2,360.4	S	–	EMP
					02–17–05	1115	41.84	2,360.5	S	–	EMP
					03–15–05	1430	41.92	2,360.4	S	–	EMP
					04–14–05	1645	41.90	2,360.4	S	–	EMP
					05–11–05	1630	41.89	2,360.4	S	–	EMP
					06–16–05	1515	41.77	2,360.5	S	–	EMP
					07–12–05	1700	41.87	2,360.4	S	–	EMP
					07–26–05	1030	41.84	2,360.5	S	–	EMP
					08–16–05	1130	41.98	2,360.3	S	–	EMP
					09–22–05	1430	41.81	2,360.5	S	–	EMP
					09–29–05	1145	41.94	2,360.4	S	–	EMP
					10–12–05	1145	41.94	2,360.4	S	–	EMP
					11–10–05	1200	41.83	2,360.5	S	–	EMP
					12–08–05	1045	41.90	2,360.4	S	–	EMP
AD–7a	363009116302702	Amargosa Desert 7a	2,305.0	0.78	01–07–05	1247	80.91	2,224.1	S	–	EMP
					02–09–05	1233	79.92	2,225.1	S	–	EMP
					03–18–05	1547	79.45	2,225.6	S	–	EMP
					03–22–05	—	80.22	2,224.8	T	–	NDWR
					04–13–05	1316	80.70	2,224.3	S	–	EMP
					05–05–05	1122	81.43	2,223.6	S	–	EMP
					06–08–05	1340	83.85	2,221.2	S	–	EMP
					07–11–05	1300	85.61	2,219.4	V	–	EMP
					08–10–05	1338	86.16	2,218.8	S	–	EMP
					09–07–05	1454	87.22	2,217.8	S	–	EMP
					10–07–05	1644	86.29	2,218.7	S	–	EMP
					11–03–05	1415	85.48	2,219.5	S	–	EMP
					12–19–05	1620	84.04	2,221.0	S	–	EMP
AD–8	362929116085701	Amargosa Desert 8	2,394.3	0.60	01–12–05	1646	35.48	2,358.8	S	–	EMP
					02–10–05	1639	35.20	2,359.1	S	–	EMP
					03–15–05	1616	35.32	2,359.0	S	–	EMP
					04–13–05	1717	35.29	2,359.0	S	–	EMP
					05–05–05	1341	35.34	2,359.0	S	–	EMP
					06–08–05	1638	35.52	2,358.8	S	–	EMP
					07–06–05	1523	35.24	2,359.1	S	–	EMP
					08–09–05	1447	35.60	2,358.7	S	–	EMP
					09–29–05	1010	35.55	2,358.8	S	–	EMP
					10–27–05	1145	35.46	2,358.8	S	–	EMP
					11–03–05	1608	35.45	2,358.8	S		EMP
					12–21–05	1630	35.44	2,358.9	S		EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AD–9a	362835116264102	Amargosa Desert 9a	2,260.1	0.40	01–07–05	1139	80.67	2,179.4	V	–	EMP
					02–09–05	1200	80.30	2,179.8	V	–	EMP
					03–18–05	1516	80.08	2,180.0	V	–	EMP
					04–13–05	1242	86.82	2,173.3	V	–	EMP
					05–05–05	1053	88.37	2,171.7	V	–	EMP
					05–11–05	1040	86.30	2,173.8	V	–	EMP
					06–08–05	1253	88.10	2,172.0	V	–	EMP
					07–11–05	1137	89.34	2,170.8	V	–	EMP
					08–10–05	1309	85.86	2,174.2	V	–	EMP
					09–07–05	1410	86.92	2,173.2	V	–	EMP
					10–07–05	1625	87.81	2,172.3	V	–	EMP
					11–03–05	1346	88.38	2,171.7	V	–	EMP
					12–19–05	1453	83.22	2,176.9	V	–	EMP
AD–10	362525116274301	NA–9 Well	2,190.9	1.3	01–06–05	1500	13.98	2,176.9	S	–	EMP
					02–09–05	1130	14.00	2,176.9	S	–	EMP
					03–14–05	1435	13.94	2,177.0	S	–	EMP
					03–28–05	1440	13.92	2,177.0	S	–	EMP
					04–11–05	1459	13.93	2,177.0	S	–	EMP
					05–04–05	1433	13.94	2,177.0	S	–	EMP
					05–11–05	1110	13.92	2,177.0	S	–	EMP
					06–09–05	1609	13.95	2,177.0	S	–	EMP
					07–07–05	1126	13.95	2,177.0	S	–	EMP
					08–10–05	1133	14.34	2,176.6	S	–	EMP
					08–29–05	1249	14.20	2,176.7	S	–	EMP
					09–08–05	1250	14.19	2,176.7	S	–	EMP
					10–07–05	1509	14.20	2,176.7	S	–	EMP
					11–01–05	1339	14.31	2,176.6	S	–	EMP
					12–19–05	1346	14.28	2,176.6	S	–	EMP
AD–11	361954116181201	GS–3 Well	2,351.3	2.0	01–14–05	1022	208.26	2,143.0	S	–	EMP
					02–07–05	1544	207.70	2,143.6	S	–	EMP
					03–14–05	1240	207.78	2,143.5	S	–	EMP
					04–11–05	1608	207.83	2,143.5	S	–	EMP
					05–04–05	1544	207.56	2,143.7	S	–	EMP
					06–09–05	1035	207.14	2,144.2	S	–	EMP
					07–07–05	1002	206.92	2,144.4	S	–	EMP
					08–10–05	0914	206.83	2,144.5	S	–	EMP
					09–08–05	1050	206.73	2,144.6	S	–	EMP
					10–06–05	1139	206.88	2,144.4	S	–	EMP
					11–01–05	1551	207.01	2,144.3	S	–	EMP
					12–19–05	1121	207.53	2,143.8	S	–	EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AD–12	362014116133901	GS–1 Well	2,430.3	2.0	01–06–05	0921	81.13	2,349.2	S	–	EMP
					02–07–05	1129	81.09	2,349.2	S	–	EMP
					03–10–05	1143	81.04	2,349.3	S	–	EMP
					04–11–05	1101	81.02	2,349.3	S	–	EMP
					05–02–05	1118	81.05	2,349.2	S	–	EMP
					06–20–05	1006	81.11	2,349.2	S	–	EMP
					07–06–05	0918	81.13	2,349.2	S	–	EMP
					08–03–05	0854	81.19	2,349.1	S	–	EMP
					09–07–05	0914	81.21	2,349.1	S	–	EMP
					10–06–05	1109	81.23	2,349.1	S	–	EMP
					11–01–05	1004	81.22	2,349.1	S	–	EMP
					12–14–05	1041	81.21	2,349.1	S	–	EMP
AD–13	361724116324201	S–1 Well	2,703.2	2.0	01–14–05	1118	366.60	2,336.6	S	–	EMP
					02–16–05	1337	366.48	2,336.7	S	–	EMP
					02–24–05	1404	366.43	2,336.8	S	–	EMP
					03–14–05	1334	366.44	2,336.8	S	–	EMP
					04–18–05	1613	366.23	2,337.0	S	–	EMP
					05–04–05	1311	366.48	2,336.7	S	–	EMP
					06–09–05	1430	366.54	2,336.7	S	–	EMP
					07–07–05	0834	366.96	2,336.2	S	–	EMP
					08–10–05	1012	367.10	2,336.1	S	–	EMP
					08–29–05	1008	367.12	2,336.1	S	–	EMP
					09–08–05	1142	367.15	2,336.0	S	–	EMP
					10–06–05	1602	367.27	2,335.9	S	–	EMP
					11–01–05	1455	367.42	2,335.8	S	–	EMP
					12–19–05	1217	367.65	2,335.6	S	–	EMP
AD–14	361817116244701	Death Valley Jct Well	2,041.8	0.70	01–06–05	1425	2.36	2,039.4	S	–	EMP
					02–08–05	1554	2.09	2,039.7	S	–	EMP
					03–14–05	1412	1.83	2,040.0	S	–	EMP
					04–11–05	1527	1.83	2,040.0	S	–	EMP
					05–04–05	1359	2.02	2,039.8	S	–	EMP
					06–09–05	1513	2.41	2,039.4	S	–	EMP
					07–07–05	1050	2.25	2,039.6	S	–	EMP
					08–10–05	1110	2.53	2,039.3	S	–	EMP
					09–08–05	1226	2.83	2,039.0	S	–	EMP
					10–06–05	1214	3.00	2,038.8	S	–	EMP
					11–01–05	1529	2.68	2,039.1	S	–	EMP
					12–19–05	1320	2.67	2,039.1	S	–	EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AM–1	362858116195301	Rogers Spring Well	2,265.9	0.14	01–13–05	1100	2.49	2,263.4	S	–	EMP
					01–25–05	1100	2.48	2,263.4	T	–	USFWS
					02–07–05	1336	2.54	2,263.4	S	–	EMP
					03–03–05	0916	2.30	2,263.6	T	–	USFWS
					03–10–05	1638	2.35	2,263.6	S	–	EMP
					04–07–05	1149	2.65	2,263.2	T	–	USFWS
					04–11–05	1432	2.69	2,263.2	S	–	EMP
					05–02–05	1537	2.89	2,263.0	S	–	EMP
					06–20–05	1349	3.82	2,262.1	S	–	EMP
					07–06–05	1245	4.10	2,261.8	S	–	EMP
					07–21–05	0735	4.34	2,261.6	T	–	USFWS
					08–03–05	1242	4.46	2,261.4	S	–	EMP
					09–07–05	1245	4.56	2,261.3	S	–	EMP
					09–29–05	—	4.19	2,261.7	T	–	USFWS
					10–07–05	1403	4.09	2,261.8	S	–	EMP
					11–01–05	1305	3.72	2,262.2	S	–	EMP
					12–14–05	1408	3.33	2,262.6	S		EMP
AM–2	362755116190401	Five Springs Well	2,343.2	1.17	01–13–05	1121	0.34	2,342.9	S	F	EMP
					02–07–05	1406	.33	2,342.9	S	F	EMP
					03–10–05	1548	.32	2,342.9	S	F	EMP
					04–11–05	1347	.32	2,342.9	S	F	EMP
					05–02–05	1432	.33	2,342.9	S	F	EMP
					06–20–05	1314	.31	2,342.9	S	F	EMP
					07–06–05	1200	.32	2,342.9	S	F	EMP
					07–11–05	0946	.31	2,342.9	S	F	EMP
					07–11–05	1014	.34	2,342.9	S	F	EMP
					08–03–05	1210	.35	2,342.8	S	F	EMP
					09–07–05	1201	.34	2,342.9	S	F	EMP
					10–07–05	1330	.34	2,342.9	S	F	EMP
					11–01–05	1233	.35	2,342.8	S	F	EMP
					12–14–05	1338	.37	2,342.8	S	F	EMP
AM–3	362555116205301	Ash Meadows 3	2,157.0	1.29	01–13–05	1508	20.31	2,136.7	S	–	EMP
					02–07–05	1505	19.36	2,137.6	S	–	EMP
					02–25–05	1119	18.74	2,138.3	S	–	EMP
					03–10–05	1437	18.53	2,138.5	S	–	EMP
					04–11–05	1255	18.44	2,138.6	S	–	EMP
					05–02–05	1342	18.56	2,138.4	S	–	EMP
					06–20–05	1206	19.47	2,137.5	S	–	EMP
					07–06–05	1123	19.67	2,137.3	S	–	EMP
					08–03–05	1122	20.15	2,136.8	S	–	EMP
					09–07–05	1114	20.71	2,136.3	S	–	EMP
					10–07–05	1246	21.06	2,135.9	S	–	EMP
					11–01–05	1144	21.21	2,135.8	S	–	EMP
					12–14–05	1249	21.10	2,135.9	S	–	EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AM–4	362532116172700	Devils Hole	2,360.0	—	02–14–05	1044	2.12	2,357.9	R	–	NPS
					03–01–05	1013	2.13	2,357.9	R	–	NPS
					03–01–05	1039	2.13	2,357.9	R	–	NPS
					03–16–05	1445	2.16	2,357.8	R	–	NPS
					04–01–05	0938	2.19	2,357.8	R	–	NPS
					04–01–05	1006	2.19	2,357.8	R	–	NPS
					04–15–05	1136	2.15	2,357.8	R	–	NPS
					04–29–05	0947	2.17	2,357.8	R	–	NPS
					04–29–05	1006	2.18	2,357.8	R	–	NPS
					05–07–05	0826	2.24	2,357.8	R	–	NPS
					06–01–05	1336	2.03	2,358.0	R	–	NPS
					06–14–05	1508	2.09	2,357.9	R	–	NPS
					06–19–05	1228	2.25	2,357.8	R	–	NPS
					06–19–05	1240	2.24	2,357.8	R	–	NPS
					07–05–05	1136	2.27	2,357.7	R	–	NPS
					07–05–05	1154	2.27	2,357.7	R	–	NPS
					07–28–05	0930	2.17	2,357.8	R	–	NPS
					08–02–05	1740	1.98	2,358.0	R	–	NPS
					08–31–05	0933	2.27	2,357.7	R	–	NPS
					09–13–05	1202	2.21	2,357.8	R	–	NPS
					10–04–05	1054	2.24	2,357.8	R	–	NPS
					10–04–05	1112	2.25	2,357.8	R	–	NPS
					10–19–05	0758	2.12	2,357.9	R	–	NPS
					11–02–05	0843	2.08	2,357.9	R	–	NPS
					11–02–05	0905	2.09	2,357.9	R	–	NPS
					11–04–05	1406	2.06	2,357.9	R	–	NPS
					12–01–05	1451	1.98	2,358.0	R	–	NPS

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AM–5	362529116171100	Devils Hole Well	2,404.1	0.9	01–13–05	1306	48.26	2,355.8	S	–	EMP
					01–25–05	0950	48.26	2,355.8	T	–	USFWS
					02–07–05	1304	48.16	2,355.9	S	–	EMP
					03–03–05	1030	48.23	2,355.9	T	–	USFWS
					03–10–05	1324	48.18	2,355.9	S	–	EMP
					03–28–05	1404	48.19	2,355.9	S	–	EMP
					04–06–05	0910	48.30	2,355.8	T	–	USFWS
					04–11–05	1232	48.26	2,355.8	S	–	EMP
					05–02–05	1319	48.18	2,355.9	S	–	EMP
					06–20–05	1146	48.26	2,355.8	S	–	EMP
					07–06–05	1056	48.21	2,355.9	S	–	EMP
					07–20–05	1825	48.11	2,356.0	T	–	USFWS
					08–03–05	1058	48.30	2,355.8	S	–	EMP
					09–07–05	1053	48.22	2,355.9	S	–	EMP
					09–29–05	—	48.30	2,355.8	T	–	USFWS
					10–07–05	1227	48.18	2,355.9	S	–	EMP
					11–01–05	1128	48.26	2,355.8	S	–	EMP
					12–14–05	1233	48.24	2,355.9	S	–	EMP
AM–6	362432116165701	Point of Rocks North Well	2,318.8	0.0	01–13–05	1348	21.05	2,297.8	S	–	EMP
					01–20–05	1328	20.98	2,297.8	T	–	USFWS
					02–07–05	1209	21.27	2,297.5	S	–	EMP
					03–03–05	1225	21.90	2,296.9	T	–	USFWS
					03–10–05	1229	21.17	2,297.6	S	–	EMP
					03–28–05	1318	21.21	2,297.6	S	–	EMP
					04–06–05	1035	21.27	2,297.5	T	–	USFWS
					04–11–05	1142	21.32	2,297.5	S	–	EMP
					05–02–05	1217	21.38	2,297.4	S	–	EMP
					06–20–05	1047	21.66	2,297.1	S	–	EMP
					07–06–05	0959	21.70	2,297.1	S	–	EMP
					07–20–05	1410	21.70	2,297.1	T	–	USFWS
					08–03–05	0946	21.78	2,297.0	S	–	EMP
					09–07–05	0954	21.77	2,297.0	S	–	EMP
					09–29–05	—	21.66	2,297.1	T	–	USFWS
					10–07–05	1141	21.70	2,297.1	S	–	EMP
					11–01–05	1039	21.59	2,297.2	S	–	EMP
					12–14–05	1147	21.54	2,297.3	S	–	EMP

Table 3. Periodic water-level data at monitoring sites in Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Land–surface altitude (feet above sea level)	Height of measurement point (feet above land surface)	Water-level measurement						
					Date	Time	Depth to water (feet below land surface)	Altitude of water surface (feet above sea level)	Method	Site status	Data source
AM–7	362417116163600	Point of Rocks South Well	2,333.5	0.8	01–13–05	1414	7.40	2,326.1	S	–	EMP
					01–20–05	1401	7.32	2,326.2	T	–	USFWS
					02–07–05	1237	7.34	2,326.2	S	–	EMP
					03–03–05	1205	7.26	2,326.2	T	–	USFWS
					03–10–05	1300	7.25	2,326.2	S	–	EMP
					03–28–05	1338	7.25	2,326.2	S	–	EMP
					04–06–05	1058	7.35	2,326.2	T	–	USFWS
					04–11–05	1206	7.37	2,326.1	S	–	EMP
					05–02–05	1241	7.39	2,326.1	S	–	EMP
					06–20–05	1116	7.54	2,326.0	S	–	EMP
					07–06–05	1026	7.57	2,325.9	S	–	EMP
					07–20–05	1625	7.58	2,325.9	T	–	USFWS
					08–03–05	1014	7.69	2,325.8	S	–	EMP
					09–07–05	1026	7.64	2,325.9	S	–	EMP
					09–29–05	—	7.56	2,325.9	T	–	USFWS
					10–07–05	1207	7.47	2,326.0	S	–	EMP
					11–01–05	1103	7.41	2,326.1	S	–	EMP
					12–14–05	1211	7.40	2,326.1	S	–	EMP
DV–3	362230116392901	Travertine Point 1 Well	2,728.4	2.0	01–06–05	1040	602.57	2,125.8	V	–	EMP
					02–08–05	1501	602.58	2,125.8	V	–	EMP
					03–08–05	1559	602.54	2,125.9	V	–	EMP
					04–18–05	1458	602.33	2,126.1	V	–	EMP
					05–04–05	1152	602.35	2,126.1	V	–	EMP
					06–09–05	1212	602.24	2,126.2	V	–	EMP
					07–07–05	0741	602.24	2,126.2	V	–	EMP
					08–04–05	0717	602.29	2,126.1	V	–	EMP
					09–22–05	1107	602.31	2,126.1	V	–	EMP
					10–06–05	1450	602.34	2,126.1	V	–	EMP
					11–21–05	1128	602.49	2,125.9	V	–	EMP
					12–14–05	1540	602.54	2,125.9	V	–	EMP

Table 4. Daily mean water levels in borehole JF-3, Yucca Mountain region, southern Nevada and eastern California, 2005.

[**Abbreviation:** – not available]

Day	Daily mean water level (feet below land surface) calendar year January to December 2005											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	709.44	709.56	709.45	709.72	709.44	709.31	709.44	709.37	709.44	709.27	709.49	709.22
2	709.44	709.61	709.36	709.32	709.47	709.24	709.38	709.35	709.47	709.20	709.20	709.13
3	709.30	709.49	709.45	709.10	709.48	709.46	709.42	709.44	709.50	709.30	709.25	709.50
4	709.21	709.34	709.40	709.33	709.42	709.44	709.47	709.48	709.48	709.57	709.31	709.78
5	709.64	709.09	709.44	709.72	709.29	709.32	709.44	709.50	709.48	709.68	709.41	709.63
6	709.51	709.07	709.50	709.56	709.35	709.40	709.42	709.45	709.48	709.53	709.36	709.40
7	709.26	709.26	709.54	–	709.45	709.53	709.45	709.37	709.45	709.33	709.30	709.33
8	709.29	709.49	709.54	709.19	709.43	709.46	709.43	709.36	709.35	709.19	709.39	709.44
9	709.46	709.53	709.52	709.31	709.30	709.45	709.38	709.42	709.26	709.49	709.46	709.50
10	709.38	709.44	709.37	709.57	709.42	709.41	709.42	709.44	709.30	709.64	709.39	709.47
11	709.12	709.26	709.44	709.54	709.50	709.35	709.50	709.38	709.42	709.54	709.39	709.35
12	709.64	709.34	709.28	–	709.55	709.49	709.55	709.29	709.52	709.57	709.54	709.27
13	709.77	709.51	709.23	709.30	709.55	709.60	709.50	709.29	709.47	709.63	709.56	709.32
14	709.70	709.41	709.42	709.55	709.47	709.44	709.39	709.36	709.51	709.53	709.45	709.48
15	709.74	709.40	709.48	709.51	709.34	709.41	709.35	709.51	709.50	709.21	709.64	709.31
16	709.63	709.44	709.43	709.47	709.11	709.37	709.38	709.50	709.44	709.40	709.58	709.15
17	709.57	709.37	709.27	709.33	709.37	709.30	709.39	709.40	709.41	709.52	709.49	709.31
18	709.59	709.24	709.20	709.20	709.45	709.45	709.36	709.34	709.44	709.42	709.54	709.57
19	709.51	709.23	709.27	709.33	709.53	709.54	709.35	709.42	709.61	709.58	709.40	709.74
20	709.31	709.40	709.36	709.59	709.46	709.58	709.47	709.51	709.69	709.57	709.46	709.64
21	709.24	709.38	709.51	709.64	709.51	709.53	709.50	709.46	709.50	709.49	709.42	709.43
22	709.38	709.40	709.24	709.53	709.46	709.46	709.48	709.34	709.37	709.37	709.36	709.29
23	709.41	709.45	709.19	709.34	709.35	709.43	709.54	709.32	709.18	709.38	709.27	709.44
24	709.38	709.48	709.47	709.27	709.41	709.42	709.52	709.37	709.26	709.48	709.25	709.43
25	709.35	709.41	709.62	709.46	709.51	709.34	709.39	709.49	709.51	709.49	709.17	709.14
26	709.17	709.41	709.77	709.51	709.45	709.37	709.42	709.51	709.55	709.43	709.24	709.18
27	709.28	709.51	709.48	709.38	709.38	709.41	709.43	709.43	709.55	709.32	709.53	709.53
28	709.39	709.49	709.17	709.42	709.35	709.42	709.45	709.35	709.62	709.44	709.54	709.38
29	709.37	–	709.39	709.58	709.29	709.49	709.48	709.27	709.51	709.56	709.33	709.28
30	709.56	–	709.69	709.54	709.48	709.48	709.51	709.37	709.38	709.69	709.34	709.22
31	709.60	–	709.95	–	709.50	–	709.45	709.45	–	709.78	–	709.03
Mean	709.44	709.39	709.43	709.44	709.42	709.43	709.44	709.40	709.46	709.47	709.40	709.38
Maximum	709.77	709.61	709.95	709.72	709.55	709.60	709.55	709.51	709.69	709.78	709.64	709.78
Minimum	709.12	709.07	709.17	709.10	709.11	709.24	709.35	709.27	709.18	709.19	709.17	709.03

(2005 annual summary: Mean: 709.43 Maximum: 709.95 Minimum: 709.03)

Table 5. Daily mean water levels in borehole AD-6, Yucca Mountain region, southern Nevada and eastern California, 2005.

[**Abbreviation:** –, not available]

Day	Daily mean water level (feet below land surface) calendar year January to December 2005											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	41.91	41.93	41.87	41.92	41.82	41.75	41.75	41.82	41.84	41.79	41.87	41.79
2	41.90	41.97	41.83	41.78	41.84	41.73	41.73	41.81	41.85	41.78	41.77	41.75
3	41.83	41.91	41.88	41.71	41.85	41.84	41.84	41.85	41.87	41.82	41.81	41.93
4	41.81	41.86	41.85	41.82	41.81	41.81	41.81	41.86	41.87	41.92	41.84	42.02
5	42.00	41.77	41.87	41.97	41.77	41.76	41.76	41.87	41.87	41.94	41.88	41.95
6	41.91	41.78	41.89	41.87	41.81	41.81	–	41.85	41.87	41.88	41.84	41.87
7	41.81	41.85	41.90	41.73	41.85	41.86	–	41.82	41.85	41.81	41.82	41.86
8	41.83	41.93	41.89	41.75	41.83	41.82	–	41.82	41.82	41.76	41.85	41.91
9	41.89	41.92	41.88	41.81	41.79	41.82	–	41.86	41.79	41.90	41.87	41.91
10	41.84	41.88	41.82	41.90	41.84	41.80	–	41.86	41.82	41.94	41.85	41.89
11	41.74	41.82	41.86	41.87	41.87	41.78	–	41.83	41.87	41.89	41.86	41.85
12	41.98	41.86	41.80	41.80	41.88	41.84	–	41.79	41.91	41.90	41.92	41.83
13	42.01	41.93	41.79	41.77	41.86	41.87	41.84	41.80	41.87	41.93	41.92	41.85
14	41.97	41.87	41.87	41.89	41.83	41.79	41.80	41.83	41.89	41.89	41.87	41.91
15	42.00	41.88	41.89	41.85	41.78	41.80	41.79	41.89	41.88	41.76	41.96	41.83
16	41.95	41.90	41.87	41.83	41.70	–	41.80	41.88	41.86	41.86	41.93	41.79
17	41.93	41.85	41.80	41.77	41.82	–	41.80	41.83	41.85	41.88	41.90	41.86
18	41.95	41.81	41.78	41.73	41.83	–	41.79	41.81	41.86	41.85	41.93	41.95
19	41.91	41.82	41.82	41.80	41.84	–	41.78	41.85	41.93	41.93	41.87	42.00
20	41.84	41.89	41.84	41.91	41.81	–	41.83	41.88	41.95	41.91	41.90	41.95
21	41.82	41.85	41.90	41.90	41.84	–	41.84	41.85	41.87	41.87	41.89	41.87
22	41.88	41.86	41.76	41.85	41.81	–	41.84	41.81	41.83	41.83	41.87	41.82
23	41.89	41.87	41.75	41.78	41.77	–	41.86	41.80	41.76	41.84	41.83	41.90
24	41.87	41.88	41.87	41.77	41.81	–	41.86	41.83	41.81	41.88	41.83	41.87
25	41.86	41.85	41.92	41.85	41.84	–	41.81	41.88	41.91	41.87	41.79	41.76
26	41.78	41.86	41.97	41.85	41.80	–	41.82	41.87	41.90	41.85	41.83	41.80
27	41.85	41.90	41.84	41.80	41.78	–	41.83	41.83	41.90	41.81	41.96	41.95
28	41.88	41.89	41.73	41.83	41.78	–	41.83	41.81	41.93	41.88	41.94	41.85
29	41.87	–	41.84	41.90	41.76	–	41.86	41.78	41.88	41.92	41.85	41.82
30	41.95	–	41.95	41.86	41.85	–	41.87	41.83	41.84	41.97	41.86	41.80
31	41.95	–	42.03	–	41.84	–	41.85	41.85	–	41.99	–	41.72
Mean	41.89	41.87	41.86	41.83	41.82	41.81	41.83	41.84	41.87	41.87	41.87	41.87
Maximum	42.01	41.97	42.03	41.97	41.88	41.87	41.87	41.89	41.95	41.99	41.96	42.02
Minimum	41.74	41.77	41.73	41.71	41.70	41.73	41.78	41.78	41.76	41.76	41.77	41.72

(2005 annual summary: Mean: 41.85 Maximum: 42.06 Minimum: 41.70)

Table 6. Electric-tape calibration data used to derive correction factors, Yucca Mountain region, southern Nevada and eastern California, 2005.

[**Uncorrected depth to water:** Measured depth to water below measuring point using electric tape.
Correction factor: Difference between depth to water measurements using reference steel tape and electric tape.
Device: Electric tape used to measure depth to water.
Abbreviations: YMP-13 and YMP-15, 1,000-foot electric tapes; PRT-2, 2,000-foot electric tape]

Date	Uncorrected depth to water (feet)	Correction factor (feet)
Device YMP-13		
02-25-05	20.06	-0.03
08-29-05	15.53	-.03
01-24-06	15.58	-.04
02-11-04	133.98	-.04
02-25-05	135.88	-.04
08-29-05	137.60	-.05
01-24-06	138.02	-.06
02-11-04	369.49	-.13
02-24-05	368.58	-.15
08-29-05	369.26	-.14
01-23-06	369.74	-.12
02-04-04	604.86	-.26
02-24-05	605.00	-.23
09-01-05	604.91	-.21
01-26-06	604.82	-.20
02-04-04	743.47	-.35
02-23-05	743.70	-.35
08-31-05	743.79	-.32
01-25-06	743.46	-.34
03-02-05	920.56	-.47
09-13-05	928.86	-.42
01-25-06	928.42	-.41

Date	Uncorrected depth to water (feet)	Correction factor (feet)
Device YMP-15		
09-01-05	604.82	-0.12
01-26-06	604.72	-.10
08-31-05	743.58	-.11
01-25-06	743.24	-.12
Device PRT-2		
02-04-04	743.47	-0.12
02-23-05	743.51	-.16
08-31-05	743.59	-.12
01-25-06	743.26	-.14
03-02-05	920.28	-.19
09-13-05	928.60	-.16
01-25-06	928.14	-.13
02-05-04	1,042.47	-.14
02-23-05	1,042.40	-.16
08-30-05	1,042.32	-.14
01-25-06	1,042.33	-.15
02-05-04	1,137.31	-.16
02-28-05	1,137.14	-.15
09-12-05	1,137.14	-.16
01-26-06	1,136.98	-.16
02-28-05	1,319.84	-.14
08-30-05	1,319.77	-.13
01-26-06	1,319.72	-.10

Table 7. Summary of pressure-sensor calibrations and associated error at boreholes JF-3 and AD-6, Yucca Mountain region, southern Nevada and eastern California, 2005.

[Site locations are shown in figure 1. **Regression equation** developed to convert pressure readings in pounds per square inch recorded by on-site instrumentation to water level in feet below land surface: (WL). **Coefficient of determination:** value representing fraction of the total variation in water level that can be explained by variation in pressure. A value of 1.00 implies all variations in water level can be explained by variations in pressure. **Number of points:** number of pressure-sensor depths used to develop regression equation during calibration procedure. **Differences between measured and computed water levels:** differences between periodic water levels determined using electric or steel tapes and computed water levels determined by use of regression equation. **Abbreviations:** ft, foot; >, greater than value indicated]

Site No.	Date of calibration	Regression equation (ft below land surface)	Coefficient of determination	Number of points	Equation applied		Differences between measured and computed water levels			
					Begin date	End date	Minimum (ft)	Date	Maximum (ft)	Date
JF-3	02-15-05	WL = (-2.322 × PSI) + 715.389	>0.99	13	09-22-04	04-07-05	-0.02	02-14-05 02-15-05 03-16-05	-0.04	01-18-05 04-07-05
	04-12-05	WL = (-2.314 × PSI) + 715.167	>.99	14	04-07-05	09-27-05	.01	04-12-05 05-16-05 06-23-05 08-08-05	.03	06-15-05
	01-18-06	WL = (-2.336 × PSI) + 715.268	>.99	11	09-27-05	12-31-05	-.02	10-25-04	.03	09-27-04 12-14-04
AD-6	01-16-04	WL = (-2.310 × PSI) + 48.921	>.99	13	08-28-03	02-17-05	.00	01-14-05 02-10-05	.02	02-17-05
	02-17-05	WL = (-2.316 × PSI) + 48.972	>.99	15	02-17-05	04-14-05	-.02	02-17-05 03-15-05	-.04	04-14-05
	01-23-06	WL = (-2.323 × PSI) + 48.943	>.99	16	04-14-05	12-31-05	.00	09-29-05	.02	05-11-06

Table 8. Ground-water-discharge data at monitoring sites, Yucca Mountain region, southern Nevada and eastern California, 2005.

[**Site number:** Alphanumeric identifier used to designate sites on map and tables. First part represents hydrographic area in which site is located. Hydrographic areas: AD or AM, Amargosa Desert; DV, Death Valley. Second part is sequential numbering representing relative location of site within hydrographic area or Ash Meadows spring-discharge area; numbering order generally is north to south, then west to east. Site locations are shown in figure 1.

U.S. Geological Survey site identification: Unique identification number for site as stored in files and data bases of U.S. Geological Survey (USGS).

Discharge: Reported to two significant figures. Discharge measured at site AM-2 represents a combination of flow directly through slotted casing at land surface and leakage from the casing's annular space. Water-level data for site AM-2 are listed in table 3.

Method: Method used to measure discharge. A, acoustic-doppler velocimeter; C, vertical-axis current meter; F, flume; V, volumetric; Z, discharge represents monthly mean discharge on basis of continually recorded stage.

Data source: EMP, Environmental-Monitoring Program (USGS); NPS, National Park Service; USFWS, U.S. Fish and Wildlife Service.

Abbreviation: –, measurement time not available or not applicable]

Site No.	U.S. Geological Survey site identification	Site name	Discharge measurement				
			Date	Time	Discharge (gallons per minute)	Method	Data source
AM- 1a	362924116203001	Fairbanks Spring	03-29-05	1152	1,600	C	EMP
			03-29-05	1200	1,800	F	USFWS
			05-11-05	1400	1,800	F	USFWS
			05-11-05	1430	1,600	C	EMP
			08-03-05	1350	1,700	C	EMP
			08-03-05	1400	1,800	F	USFWS
			11-22-05	1525	1,700	C	EMP
			11-23-05	1500	1,700	F	USFWS
AM- 2	362755116190401	Five Springs Well	01-13-05	1135	34	V	EMP
			02-07-05	1412	34	V	EMP
			03-10-05	1554	34	V	EMP
			04-11-05	1355	32	V	EMP
			05-02-05	1439	32	V	EMP
			06-20-05	1320	30	V	EMP
			07-11-05	0953	32	V	EMP
			07-11-05	1021	37	V	EMP
			08-03-05	1217	33	V	EMP
			09-07-05	1207	34	V	EMP
			10-07-05	1336	36	V	EMP
			11-01-05	1238	36	V	EMP
			12-14-05	1344	35	V	EMP
AM- 5a	362502116192301	Crystal Pool	01-20-05	1056	3,000	C	USFWS
			03-24-05	1452	2,900	A	EMP
			04-07-05	1407	2,700	C	USFWS
			06-01-05	1034	2,700	A	EMP
			06-01-05	1145	2,800	C	EMP
			07-20-05	1132	2,800	C	USFWS
			08-02-05	1320	2,700	A	EMP
			10-10-05	1045	2,800	C	USFWS
			11-22-05	1250	2,800	A	EMP

Table 8. Ground-water-discharge data at monitoring sites, Yucca Mountain region, southern Nevada and eastern California, 2005.—Continued

Site No.	U.S. Geological Survey site identification	Site name	Discharge measurement				
			Date	Time	Discharge (gallons per minute)	Method	Data source
AM- 8	362230116162001	Big Spring	01-24-05	1050	1,000	C	USFWS
			03-24-05	1152	990	A	EMP
			04-06-05	1445	1,000	C	USFWS
			06-02-05	1214	820	A	EMP
			06-02-05	1446	880	C	EMP
			07-20-05	1745	890	C	USFWS
			08-02-05	1051	640	A	EMP
			10-10-05	1520	880	C	USFWS
			11-21-05	1434	950	A	EMP
DV- 1	362728116501101	Texas Spring	01-15-05	–	200	Z	NPS
			02-15-05	–	200	Z	NPS
			03-15-05	–	200	Z	NPS
			03-23-05	1441	190	C	EMP
			04-15-05	–	200	Z	NPS
			05-12-05	1457	200	C	EMP
			05-15-05	–	200	Z	NPS
			06-15-05	–	200	Z	NPS
			07-15-05	–	200	Z	NPS
			08-04-05	1155	170	C	EMP
			08-15-05	–	200	Z	NPS
			09-15-05	–	200	Z	NPS
			10-15-05	–	200	Z	NPS
			11-15-05	–	200	Z	NPS
			11-16-05	1029	200	C	EMP
			12-15-05	–	200	Z	NPS
DV- 2	362252116425301	Navel Spring	03-23-05	1114	.88	V	EMP
			05-12-05	1133	.90	V	EMP
			08-04-05	0954	.96	V	EMP
			11-17-05	1342	1.1	V	EMP

Table 9. Estimated annual ground-water withdrawals from wells, Yucca Mountain region, southern Nevada and eastern California, 2005.

[Ground-water subbasin and hydrographic area locations are shown in figure 1]

Ground-water subbasin	Hydrographic area	Ground-water withdrawal (millions of gallons)
Alkali Flat-Furnace Creek Ranch	Amargosa Desert[1]	4,207
	Crater Flat[2]	13.4
	Jackass Flats[2]	24.4
Ash Meadows	Amargosa Desert[1] (excluding Ash Meadows area)	24
	Amargosa Desert[1] (Ash Meadows area)	3
	Mercury Valley[2]	80.3

[1] Data recompiled from ground-water pumpage inventory (by Nevada Divison of Water Resources) for entire Amargosa Desert. Data are converted to millions of gallons (325,851 gallons per acre-foot) for consistency with other data tabulated and are rounded to nearest 1 million gallons.

[2] Data reported, estimated, or recompiled from flowmeter readings and listed to the nearest 0.1 million gallons.

Table 10. Minimum, maximum, and median water-level altitudes, and average deviation of measurements, at selected boreholes in Jackass Flats for base period 1992–93 and calendar years 1994 through 2005, Yucca Mountain region, southern Nevada and eastern California.

[Table does not include water-level altitudes that may reflect short-term conditions at a site. Site locations are shown in figure 1.
Calendar year(s): Years for which measurements were used to calculate summary statistics.
Number: Number of water-level measurements for year(s) specified. For JF-2 (1992–93), JF-2a (1992–97), and JF-3, value represents number of daily mean water levels.
Water level: Based on periodic water-level measurements for JF-1, JF-2 (after 1993), JF-2a (after 1997), J-13, J-11, and J-12. Based on daily mean water levels for JF-2 (1992-93), JF-2a (1992-97), and JF-3.

Minimum: minimum water-level altitude or minimum daily mean water-level altitude for year(s) specified.
Maximum: maximum water-level altitude or maximum daily mean water-level altitude for year(s) specified.
Median: statistically representative water-level altitude calculated from periodic measurements or daily mean water levels for year(s) specified

Average deviation: Calculated dispersion of measurements about median water-level altitude. Average deviation is equal to sum of absolute differences between measured water levels and median, divided by number of measurements.
Change in median: Calculated dispersion of measurements about median water-level altitude. Average deviation is equal to sum of absolute differences between measured water levels and median, divided by number of measurements.
Abbreviations and symbols: N/A, not applicable (data field is not related to referenced data set); –, transducer installed in site JF-2 prevented periodic measurement for most of 2002]

Site No.	Calendar year(s)	Water level (feet above sea level)				Average deviation (feet)	Change in median (feet)
		Number	Minimum	Maximum	Median		
JF-1	1992–93	20	2,391.9	2,392.7	2,392.5	0.1	N/A
	2005	16	2,392.8	2,394.1	2,393.6	.2	1.1
	2004	16	2,393.0	2,393.6	2,393.4	.1	.9
	2003	16	2,393.0	2,393.6	2,393.3	.1	.8
	2002	16	2,393.0	2,393.4	2,393.2	.1	.7
	2001	18	2,392.8	2,393.3	2,393.0	.1	.5
	2000	14	2,392.8	2,393.4	2,392.8	.1	.3
	1999	12	2,392.3	2,393.0	2,392.7	.1	.2
	1998	22	2,392.3	2,392.8	2,392.5	.1	.0
	1997	10	2,392.1	2,392.6	2,392.4	.1	-.1
	1996	8	2,392.0	2,392.6	2,392.3	.2	-.2
	1995	7	2,392.3	2,392.8	2,392.5	.2	.0
	1994	12	2,392.1	2,392.6	2,392.3	.1	-.2
JF-2	1992–93	718	2,391.7	2,392.8	2,392.1	.1	N/A
	2005	14	2,392.6	2,393.5	2,392.9	.2	.8
	2004	12	2,392.5	2,392.8	2,392.7	.0	.6
	2003	10	2,392.6	2,392.9	2,392.6	.1	.5
	2002	1	–	–	–	–	–
	2001	18	2,392.4	2,393.2	2,392.8	.2	.7
	2000	14	2,392.3	2,393.2	2,392.7	.2	.6
	1999	13	2,392.0	2,392.7	2,392.5	.1	.4
	1998	21	2,391.8	2,392.6	2,392.1	.1	.0
	1997	11	2,391.8	2,392.4	2,392.0	.1	-.1
	1996	7	2,391.6	2,392.3	2,392.1	.2	.0
	1995	9	2,392.2	2,392.5	2,392.4	.1	.3
	1994	9	2,392.0	2,392.6	2,392.2	.1	.1
JF-2a	1992–93	707	2,466.9	2,469.2	2,468.7	.3	N/A
	2005	14	2,470.6	2,471.6	2,471.4	.2	2.7
	2004	12	2,471.1	2,473.1	2,471.4	.5	2.7
	2003	14	2,471.0	2,473.2	2,471.5	.7	2.8
	2002	16	2,470.5	2,471.3	2,471.0	.2	2.3
	2001	18	2,470.8	2,471.2	2,471.0	.1	2.3
	2000	14	2,470.1	2,471.1	2,470.8	.3	2.1
	1999	13	2,469.8	2,470.4	2,470.2	.1	1.5
	1998	20	2,469.8	2,470.4	2,470.0	.1	1.3
	1997	267	2,468.8	2,470.0	2,469.5	.1	.8
	1996	214	2,468.6	2,469.6	2,469.3	.1	.6
	1995	357	2,468.7	2,469.3	2,469.1	.1	.4
	1994	356	2,468.4	2,469.4	2,469.0	.1	.3

Table 10. Minimum, maximum, and median water-level altitudes, and average deviation of measurements, at selected boreholes in Jackass Flats for base period 1992–93 and calendar years 1994 through 2005, Yucca Mountain region, southern Nevada and eastern California.—Continued

Site No.	Calendar year(s)	Water level (feet above sea level)				Average deviation (feet)	Change in median (feet)
		Number	Minimum	Maximum	Median		
J-13	1992–93	37	2,389.6	2,390.7	2,389.9	0.1	N/A
	2005	17	2,389.6	2,390.8	2,390.3	.3	0.4
	2004	16	2,389.2	2,390.8	2,389.9	.6	.0
	2003	19	2,390.2	2,390.9	2,390.6	.2	.7
	2002	15	2,390.0	2,390.8	2,390.4	.1	.5
	2001	17	2,390.1	2,390.9	2,390.4	.2	.5
	2000	13	2,390.0	2,391.0	2,390.2	.2	.3
	1999	13	2,389.6	2,390.2	2,390.0	.1	.1
	1998	20	2,389.4	2,390.2	2,389.8	.1	-.1
	1997	11	2,389.5	2,389.9	2,389.6	.1	-.3
	1996	8	2,389.2	2,389.9	2,389.6	.1	-.3
	1995	11	2,389.6	2,390.4	2,389.8	.1	-.1
	1994	23	2,389.4	2,390.0	2,389.7	.1	-.2
J-11	1992–93	20	2,401.9	2,402.7	2,402.2	.1	N/A
	2005	18	2,402.0	2,403.0	2,402.6	.2	.4
	2004	16	2,402.2	2,402.8	2,402.5	.1	.3
	2003	17	2,402.2	2,402.8	2,402.6	.1	.4
	2002	16	2,402.1	2,402.7	2,402.5	.1	.3
	2001	18	2,402.3	2,403.0	2,402.6	.2	.4
	2000	14	2,402.3	2,403.2	2,402.4	.1	.2
	1999	14	2,402.2	2,402.8	2,402.4	.1	.2
	1998	20	2,402.2	2,402.9	2,402.6	.2	.4
	1997	10	2,402.2	2,402.8	2,402.6	.2	.4
	1996	8	2,402.2	2,402.6	2,402.4	.1	.2
	1995	11	2,402.2	2,402.5	2,402.4	.1	.2
	1994	12	2,402.0	2,402.5	2,402.3	.1	.1
J-12	1992–93	36	2,387.9	2,389.0	2,388.3	.1	N/A
	2005	18	2,388.5	2,389.3	2,388.9	.1	.6
	2004	16	2,388.6	2,389.1	2,388.9	.1	.6
	2003	18	2,388.4	2,389.0	2,388.8	.1	.5
	2002	16	2,388.4	2,388.8	2,388.6	.1	.3
	2001	18	2,388.3	2,388.6	2,388.5	.1	.2
	2000	14	2,387.9	2,388.6	2,388.4	.1	.1
	1999	12	2,388.1	2,388.5	2,388.3	.1	.0
	1998	17	2,387.9	2,388.3	2,388.0	.1	-.3
	1997	16	2,387.7	2,388.4	2,388.0	.1	-.3
	1996	18	2,387.5	2,388.5	2,388.0	.1	-.3
	1995	16	2,388.0	2,388.3	2,388.2	.1	-.1
	1994	24	2,387.8	2,389.1	2,388.2	.2	-.1
JF-3	1992–93	582	2,387.7	2,388.8	2,388.3	.1	N/A
	2005	363	2,388.4	2,389.3	2,388.9	.1	.6
	2004	327	2,388.4	2,389.2	2,388.8	.1	.5
	2003	365	2,388.3	2,389.3	2,388.8	.1	.5
	2002	314	2,388.1	2,389.0	2,388.6	.1	.3
	2001	331	2,388.1	2,389.0	2,388.5	.1	.2
	2000	366	2,387.9	2,388.8	2,388.4	.1	.1
	1999	365	2,387.6	2,388.6	2,388.2	.1	-.1
	1998	316	2,387.6	2,388.6	2,388.0	.1	-.3
	1997	345	2,387.4	2,388.8	2,388.0	.1	-.3
	1996	359	2,387.5	2,388.5	2,388.0	.1	-.3
	1995	347	2,387.7	2,388.4	2,388.1	.1	-.2
	1994	284	2,387.6	2,388.6	2,388.1	.1	-.2

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