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Prepared in cooperation with the Victor Valley Water District, the Baldy Mesa Water District, and the Mojave Water Agency

Data from a Thick Unsaturated Zone Underlying Two Artificial Recharge Sites along Oro Grande Wash in the Western Part of the Mojave Desert, near Victorville, San Bernardino County, California, 2001-2006

Data Series 438

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

Cover photo:
Recharge pond near Victorville, San Bernardino County, California. (Photograph taken by John Izbicki, U.S. Geological Survey.)

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KEN SALAZAR, Secretary

U.S. Geological Survey
Suzette M. Kimball, Acting Director

U.S. Geological Survey, Reston, Virginia: 2009

Suggested citation:
Clark, D.A., Izbicki, J.A., Johnson, R.D., and Land, M.T., 2009, Data from a thick unsaturated zone underlying two artificial recharge sites along Oro Grande Wash in the Western Part of the Mojave Desert, near Victorville, San Bernardino County, California, 2001–2006: U.S. Geological Survey Data Series 438, 92 p.

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Conversion Factors, Abbreviations, and Acronyms

Inch/Pound to SI

Multiply	By	To obtain
	Length	
inch (in.)	2.54	centimeter (cm)
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Volume	
gallon (gal)	3.785	liter (L)
gallon (gal)	3,785	milliliter (mL)
acre-foot (acre-ft)	1,233	cubic meter (m^3)
acre-foot (acre-ft)	0.001233	cubic hectometer (hm^3)
	Flow rate	
acre-foot per year (acre-ft/yr)	1,233	cubic meter per year (m^3/yr)
foot per year (ft/yr)	0.3048	meter per year (m/yr)
gallon per minute (gal/min)	0.06309	liter per second (L/s)
inch per year (in/yr)	25.4	millimeter per year (mm/yr)
	Mass	
pound, avoirdupois (lb)	0.4536	kilogram (kg)
	Pressure	
bar	100	kilopascal (kPa)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$°F=(1.8×°C)+32$$

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:

$$°C=(°F-32)/1.8$$

Vertical coordinate information is referenced to the "North American Vertical Datum of 1988 (NAVD 88)."

Horizontal coordinate information is referenced to the "North American Datum of 1983 (NAD 83)."

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

*Transmissivity: The standard unit for transmissivity is cubic foot per day per square foot times foot of aquifer thickness [(ft^3/d)/ft^2]ft. In this report, the mathematically reduced form, foot squared per day (ft^2/d), is used for convenience.

Specific conductance is given in microsiemens per centimeter at 25 degrees Celsius (µS/cm at 25°C).

Concentrations of chemical constituents in water are given either in milligrams per liter (mg/L) or micrograms per liter (µg/L).

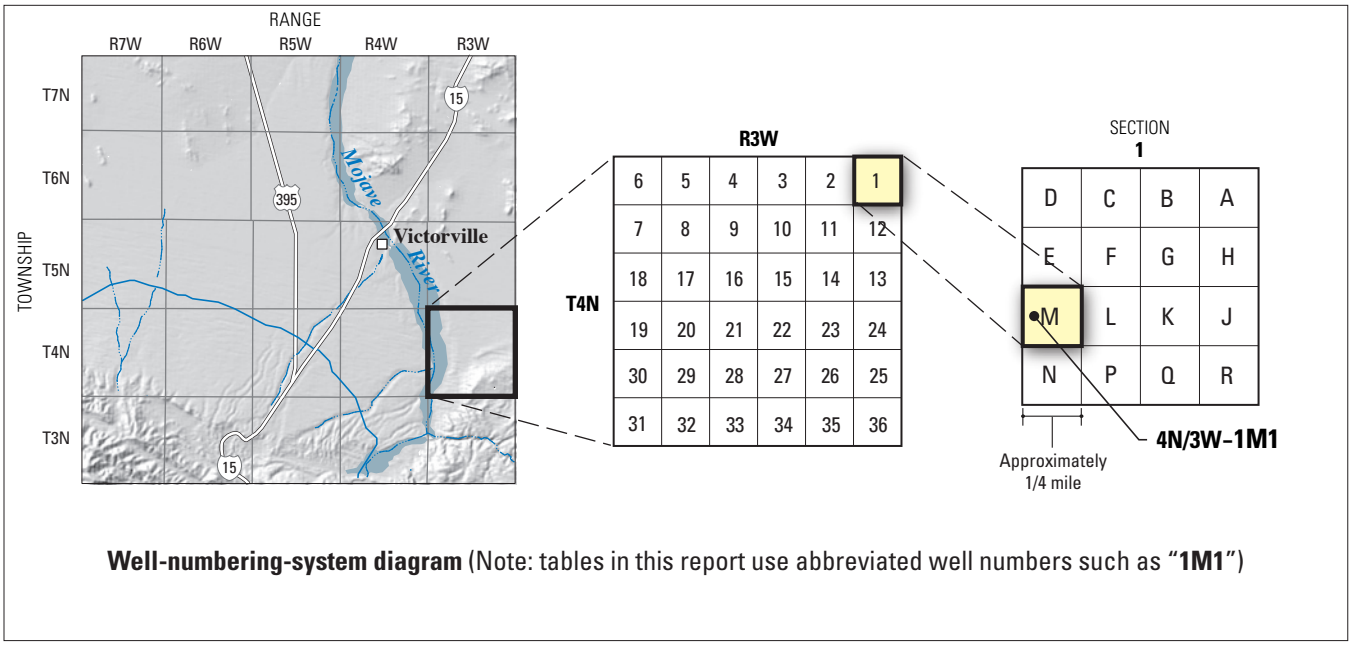
Abbreviations and Acronyms

J	joule
kPa	kilopascal
m	meter
mg/L	milligram per liter
mL	milliliter
mm	millimeter
µg/L	microgram per liter
µS/cm	microsiemens per centimeter
rpm	revolutions per minute
s	second
W	watt

AT	advanced tensiometer
Br	bromine
CAWSC	California Water Science Center
Cl	chlorine
HDP	heat-dissipation probe
INC	incremental titration
LYS	suction-cup lysimeter
N	nitrogen
NWIS	National Water Information System
P	phosphorus
PVC	polyvinyl chloride
SC	specific conductance in microsiemens per centimeter at 25° Celsius
USGS	U.S. Geological Survey
VVWD	Victor Valley Water District

Well-Numbering System

Wells are identified and numbered according to their location in the rectangular system for the subdivision of public lands. Identification consists of the township number, north or south; the range number, east or west; and the section number. Each section is divided into sixteen 40-acre tracts lettered consecutively (except I and O), beginning with "A" in the northeast corner of the section and progressing in a sinusoidal manner to "R" in the southeast corner. Within the 40-acre tract, wells are sequentially numbered in the order they are inventoried. The final letter refers to the base line and meridian. In California, there are three base lines and meridians: Humboldt (H), Mount Diablo (M), and San Bernardino (S). All wells in the study area are referenced to the San Bernardino base line and meridian (S). Well numbers consist of 15 characters and follow the format 004N005W01M001S. In this report, well numbers are abbreviated and written 4N/5W-01M1S.



Well-numbering-system diagram (Note: tables in this report use abbreviated well numbers such as "**1M1**")

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Data from a Thick Unsaturated Zone Underlying Two Artificial Recharge Sites along Oro Grande Wash in the Western Part of the Mojave Desert, near Victorville, San Bernardino County, California, 2001–2006

By Dennis A. Clark, John A. Izbicki, Russell D. Johnson, and Michael T. Land

Abstract

This report presents data on the physical and hydraulic properties of unsaturated alluvial deposits and on the chemical and isotopic composition of water collected at two recharge sites in the western part of the Mojave Desert, near Victorville, California, from 2001 to 2006. Unsaturated-zone monitoring sites were installed adjacent to the two recharge ponds using the ODEX air-hammer and air rotary method to depths of about 460 feet and 269 feet below land surface. Each of the two unsaturated-zone monitoring sites included a water-table well, matric-potential sensors, and suction-cup lysimeters installed in a single bore hole. Drilling procedures, lithologic and geophysical data, and site construction and instrumentation are described. Core material was analyzed for water content, bulk density, water potential, particle size, and water retention. The chemical composition of leachate from almost 400 samples of cores and cuttings was determined. Water from suction-cup lysimeters also was analyzed for chemical and isotopic composition. In addition, data on the chemical and isotopic composition of groundwater from the two water-table wells are reported along with chemical and isotopic composition of the surface water in the recharge ponds.

Introduction

The study area is in the western part of the Mojave Desert, about 80 miles (mi) east of Los Angeles (*figs. 1*, *2*) in San Bernardino County, California. Population in the area increased more than threefold in 20 years, from about 90,000 in 1980 to more than 300,000 in 1999 (Ron Rector, High Desert Regional Economic Development Authority, oral commun., 2000). Growth was especially rapid between 2000 and 2005; the population of communities such as Victorville increased by more than 40 percent (*http://www.city-data.com/city/Victorville-California.html*, 2006). Water supply in the area is derived almost entirely from groundwater, and pumping has increased to meet the needs of the expanding population. In the past, most groundwater was pumped from alluvial deposits along the Mojave River. In recent years, the pumping of groundwater from the surrounding regional aquifer, composed of partly consolidated alluvial fan and basin-fill deposits, has increased (Stamos and others, 2001a).

The quantity of recharge to the regional aquifer is small relative to the water in storage and the water being pumped from the aquifer. In recent years, water levels in some parts of the regional aquifer declined more than one foot per year (ft/yr) (Mendez and Christensen, 1997), and water levels in some areas declined more than 60 ft since 1950 (Stamos and others, 2004).

Description of the Study Area

The study area is in the upper part of the Mojave River Basin near Victorville, California, in the western part of the Mojave Desert about 80 mi east of Los Angeles, California (*figs.1, 2*), in San Bernardino County. The climate of the study area is characterized by low precipitation, low humidity, and high summer temperatures. Precipitation in most of the area is generally less than 6 inches per year (in/yr); however, precipitation near Cajon Pass, a gap between the San Bernardino and the San Gabriel Mountains, can exceed 30 in/yr (Izbicki and others, 2000b). Moist air from the Pacific Ocean can enter the Mojave Desert through Cajon Pass and precipitate without passing over the San Bernardino and the San Gabriel Mountains to the south of the study area. In these mountains, precipitation—much of it snow—can exceed 40 in/yr in liquid water equivalent.

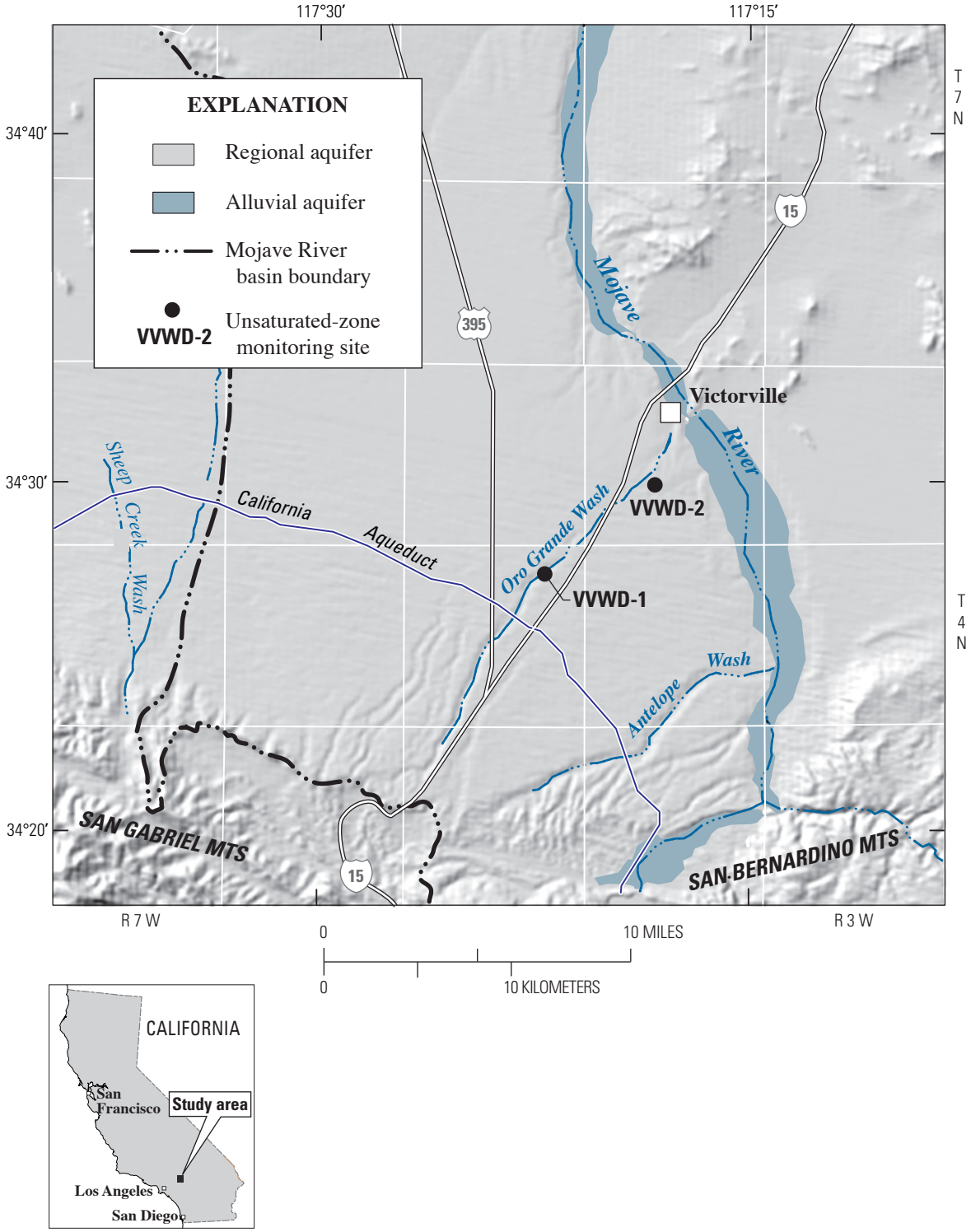


Figure 1. Location of the study area and the unsaturated-zone monitoring sites, near Victorville, San Bernardino County, California.

Figure 2. Oblique aerial photograph looking northeast towards the study area and the unsaturated-zone monitoring sites, near Victorville, San Bernardino County, California.

The study area contains alluvial deposits along the Mojave River. These deposits are extensively pumped for water supply and are readily recharged by infiltration from the Mojave River. These deposits, known locally as the floodplain aquifer (Lines, 1996), are surrounded and underlain by older alluvial deposits that compose the regional aquifer. The regional aquifer is extensively pumped, and pumping has increased with population growth (Stamos and others, 2001a,b, 2004). In some places, water levels in the regional aquifer declined by more than 1ft/yr over the last several years (Mendez and Christensen, 1997; Stamos and others 2004). Before groundwater was pumped for supply, the regional aquifer was recharged mainly from the infiltration of runoff in ephemeral stream channels from the surrounding mountains and highlands (Hardt, 1971) and, to a lesser extent, from infiltration along intermittent streams crossing the regional aquifer (Izbicki and others, 1998, 2000a, 2002; Izbicki 2007). The unsaturated zone overlying the regional aquifer ranges from about 180 ft thick on the bluffs overlooking the Mojave River to more than 1,000 ft thick along the western slopes on the alluvial fans near the base of the San Gabriel Mountains (Stamos and Predmore, 1995).

As a result of erosion and changes in the regional drainage pattern near Cajon Pass during the last 500,000 years (Meisling and Weldon, 1989), Oro Grande Wash no longer drains the mountains, and flows only as a result of runoff from precipitation near the pass and from precipitation that falls on the desert floor. Oro Grande Wash is deeply incised (about 30 to 60 ft) into the surface of the alluvial fan deposits, and streamflow along the wash has followed nearly the same course since the opening of Cajon Pass (Izbicki and others, 1998, 2000a, 2002). On the basis of channel-geometry data (Lines, 1996), average annual flow in Oro Grande Wash is about 430 acre-ft/yr (acre-feet per year). Infiltration of streamflow along Oro Grande Wash occurs in about the same location every year. Repeated wetting of the unsaturated zone beneath the wash has prevented the development of thick, impermeable caliche that would impede the downward movement of water, and groundwater recharge occurs along the wash even under present-day climatic conditions (Izbicki and others, 2002).

Purpose and Scope

In October 2002, the USGS, in cooperation with Victor Valley Water District, Baldy Mesa Water District, and Mojave Water Agency, initiated a study to test the feasibility of infiltrating water from ponds to recharge the underlying alluvial aquifer at two sites (VVWD-1 and VVWD-2) along the intermittent Oro Grande Wash (*figs. 1*, *2*). In August 2007, the Victor Valley Water District, Baldy Mesa Water District and the Victorville Water Department were consolidated into the city of Victorville Water District. This report presents data, collected as part of this cooperative study, on drilling, instrument installation, the physical properties of unsaturated earth materials, the chemical composition of leachate from cores and cuttings, and the chemical and isotopic composition of water collected from the unsaturated zone at the two recharge sites along Oro Grande Wash before, during, and after the infiltration of water from the ponds. In addition, the report presents data on the chemical and isotopic composition of groundwater, and water-level data from wells located at the two sites. Interpretation of these data is beyond the scope of this report. Data published in this report are similar in type and scope to data published as part of studies on the movement of natural recharge water through thick unsaturated zones in the Mojave Desert (Izbicki and others, 2000b).

Site Names and Instrument-Numbering System

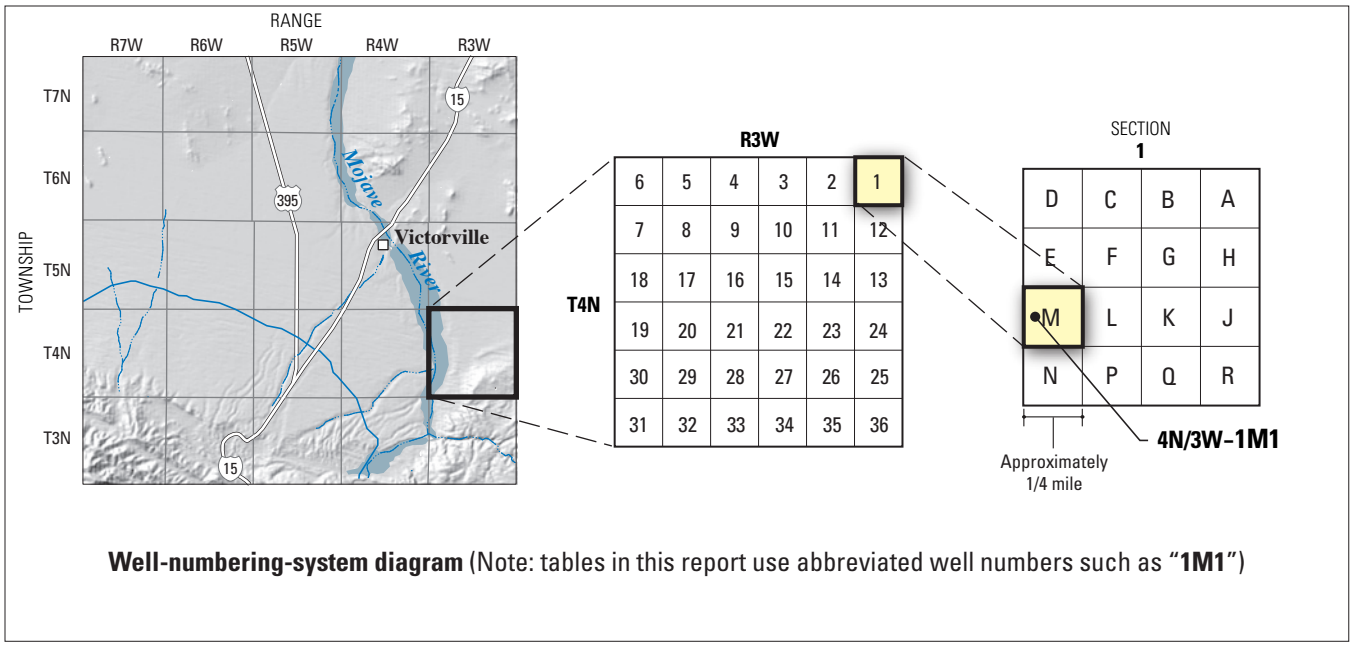
An unsaturated-zone monitoring site was installed at each of the two recharge sites prior to pond construction to collect data from the unsaturated zone and the top of the water table prior to and during tests that were designed to determine the potential for recharge from each site. Each unsaturated-zone monitoring site had a name assigned by the USGS (VVWD-1 and VVWD-2) at the time the site was built. In addition, each piece of instrumentation at each site had two unique numbers assigned according to its location in the rectangular system for the subdivision of public lands (State well number) and according to its location in the grid system of latitude and longitude (USGS site ID), respectively (*table 1* [see back of report for all tables]).

Each unsaturated-zone monitoring site was named according to the recharge site in which it was located or to which it was near—VVWD-1 for Victor Valley Water District Recharge Site One located near Bear Valley Road or VVWD-2 for Victor Valley Water District Recharge Site Two located near Yates Road (Bear Valley Road and Yates Road are not shown on *figure 1*).

Each piece of instrumentation at each site was named according to the site, type of instrumentation, and its depth. Wells were named "WELL," heat-dissipation probes were named "HDP," advanced tensiometers were named "AT," and suction-cup lysimeters were named "LYS." For example, "VVWD-1 AT @367" identified the advanced tensiometer at 367 ft below land surface at the VVWD-1 site.

The instrument at each unsaturated-zone monitoring site also was named according to its location in the system for the subdivision of public lands in the same manner as wells (State well name). Each name consists of the township number, north or south; the range number, east or west; and the section number. Each section is divided into sixteen 40-acre tracts lettered consecutively (except I and O), beginning with "A" in the northeast corner of the section and progressing in a sinusoidal manner to "R" in the southeast corner. Within the 40-acre tract, wells and instruments installed as part of this study (except bulk-precipitation collectors) are sequentially numbered in the order in which they were inventoried. The final letter refers to the base line and meridian. In California, there are three base lines and meridians: Humboldt (H), Mount Diablo (M), and San Bernardino (S). All wells and instrumentation in the study are referenced to the San Bernardino base line and meridian (S). These numbers consist of 15 characters and follow the format 004N005W01M001S. In this report, these numbers are abbreviated and written 4N/5W-01M001S. This numbering system is shown in *figure 3*. The suffixes HDP, AT, and LYS are used instead of sequence numbers to identify heat-dissipation probe, advanced tensiometer, and suction-cup lysimeters, respectively.

Instrumentation at each borehole also was assigned an identification number according to its location in the grid system of latitude and longitude. The number consists of 15 digits initially created from degrees, minutes, and seconds of latitude and longitude, and the last two digits (assigned sequentially from bottom to top in a borehole) identify different instruments. This station number has no location significance once established. As a result, if an error was made in the field location of a site and that error resulted in an incorrect calculation of latitude and longitude, the identification number associated with that site would not be changed after the error was discovered. However, the latitude and longitude location fields associated with that site would be corrected in the USGS's computerized National Water Information System (NWIS) database.



Well-numbering-system diagram (Note: tables in this report use abbreviated well numbers such as "**1M1**")

Figure 3. Well-numbering-system diagram.

Drilling Procedures and Data Collection

Two unsaturated-zone monitoring sites were drilled and installed as part of this study. The two sites (VVWD-1 and VVWD-2) were located near the channel of Oro Grande Wash. Both were installed by a USGS drill rig and crew using the ODEX (Overburden Drilling and Exploration) air hammer method, also known as the under-reamer method (Driscoll, 1986; Hammermeister and others, 1986). Drill depths ranged from about 269 to 460 ft. The diameter of the ODEX holes was 8.75 in. The ODEX drilling method minimized disturbance of the unsaturated material near the drill hole, eliminated contamination from drilling fluids, and allowed the collection of high-quality cuttings and cores. At night and at other times when drilling was not occurring, the ODEX pipe was sealed to prevent the movement of air into and out of the drill hole. The location of drill sites is shown in *figures 1* and *2*, and photographs of the sites are shown in *figure 4*.

At both drill sites, cuttings from 1-ft depth intervals were collected in buckets placed beneath the "cyclone" discharge of the drill rig. Sample collection was coordinated with drilling rates to allow cuttings to be collected from discrete intervals. The drill cuttings were laid out in the field so that changes in lithology could be visualized (*fig. 5*). After collection, the material from each sample was subsampled and saved in a heat-sealable aluminum pouch. The site, date, time, and depth of the cuttings were recorded on the pouch.

At selected depths, 2-foot-long cores were collected using a 4-inch-diameter piston-core barrel. Prior to core collection, the core barrel was lined with four 6-inch-long aluminum core liners. A core catcher was used to help retain loose unconsolidated material while the core was being collected. Immediately after the core was collected, (1) the core barrel was retrieved and disassembled, (2) material in the nose of the core barrel was collected and saved in a heat-sealable aluminum pouch, (3) cores and core liners were extruded from the core barrel, (4) the cores were capped with plastic end-caps and sealed with electrical tape, (5) the depth and orientation of the core was recorded on the end-caps, (6) the core was wrapped in plastic and placed into a heat-sealable aluminum pouch, and (7) the site, date, time, and depth of the core were recorded on the pouch. Four pouches, one for each 6-inch-long core liner, were used for each core. These pouches are commercially available and were used because they are specifically designed and tested to preserve moisture in core material.

Lithologic Data

Drill cuttings and core material collected at each borehole were described in the field for texture, sorting, rounding, color, mineralogy, and any other significant features. Detailed lithologic logs were compiled from these descriptions for sites VVWD-1 and VVWD-2 (*tables 2*, *3*). In addition to lithologic data, the specific conductance of a mixture of 50 mL (milliliter) of distilled water, and cuttings and core material that passed through a 1-mm-mesh-size sieve, about 50 g (gram), was measured and recorded in the field. In the office, cuttings and core material were re-examined and described in greater detail.

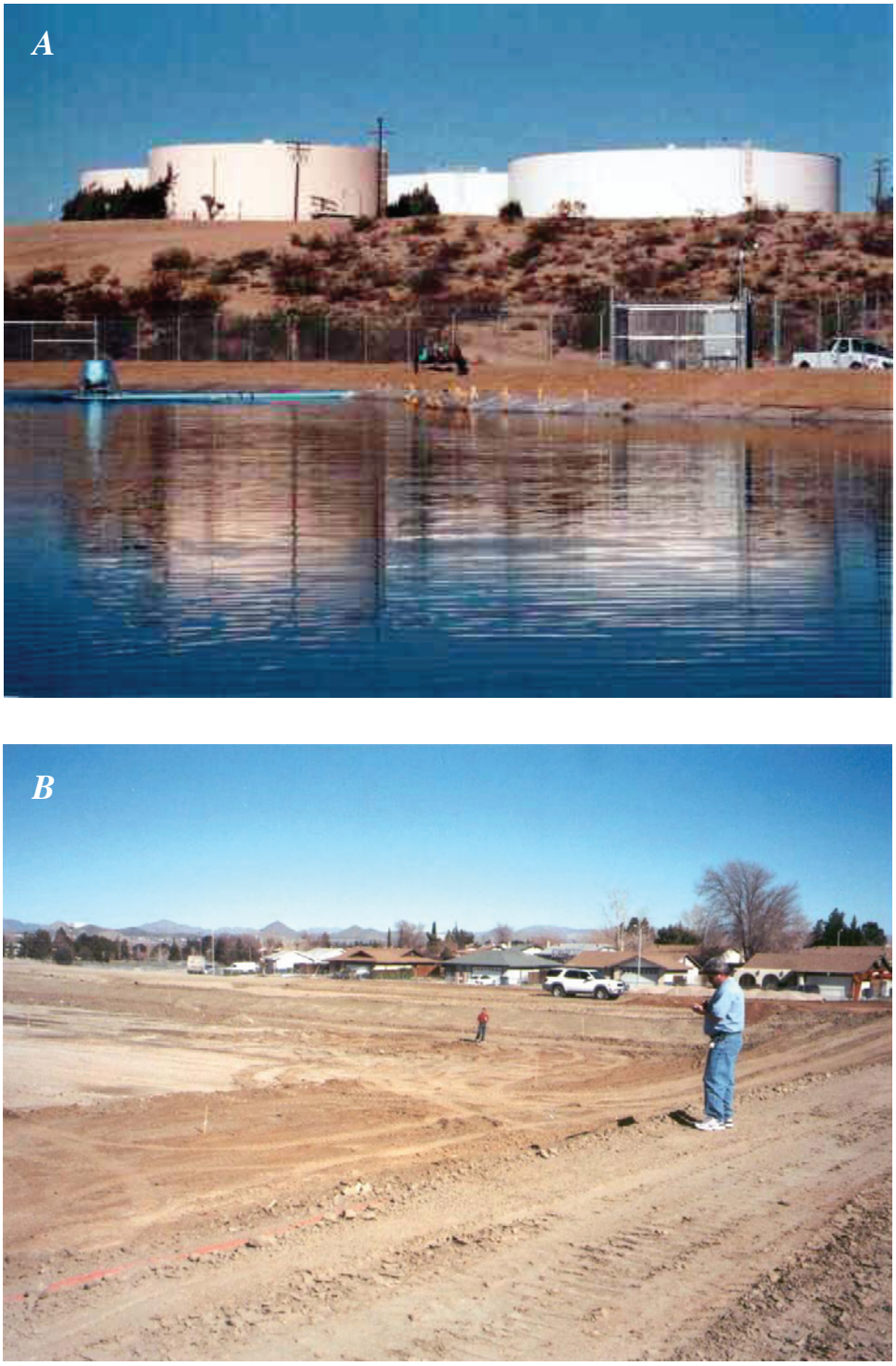


Figure 4. *A,* Bear Valley road recharge pond (VVWD-1) and *B,* Yates road recharge pond (VVWD-2), near Victorville, San Bernardino County, California.

Note: Cuttings from shallow depths are in the foreground.

Figure 5. Drill cuttings from 1-foot depth intervals at the *A,* 4N/5W-01M001S (VVWD-1) and *B,* 5N/4W-29B001S (VVWD-2) unsaturated-zone monitoring sites near Victorville, San Bernardino County, California.

Textures of all drill cuttings and core material were determined using a method developed by Folk (1954) (*fig. 6*), and the particle-size of the drill cuttings and core material were described using the National Research Council (1947) classification. This classification allows general grain-size terms (such as "sand") to be correlated to size limits in millimeters or inches. Color, determined on dry cuttings (except for those parts of the VVWD-1 borehole that were drilled using an air and foam mixture to remove cuttings from the borehole), follows the numerical designation in the Munsell Soil Color Charts (Munsell Color, 1975, 1994).

Geophysical Logs

Holes drilled using the ODEX method are continuously cased with steel pipe as the hole is drilled. As a result, it was not possible to collect an extensive suite of geophysical logs through the pipe. However, natural-gamma logs and neutron logs were collected in the cased borehole prior to instrument installation.

Natural-gamma logs measure the intensity of gamma-ray emissions resulting from natural decay of potassium-40 and the daughter products of uranium and thorium. These logs are used primarily as lithologic indicators and for geologic correlation. Clay, as well as feldspar-rich gravel, generally has more intense gamma-ray emissions than gravels that have less feldspar (Schlumberger, 1972; Hearst and Nelson, 1985; Driscoll, 1986). Natural-gamma logs for the drill holes are shown in *figures 7* and *8* at the end of the report.

Neutron logs measure the backscattering of neutrons generated from a nuclear source in the borehole. A direct relation exists between the water content and the backscatter neutron measurement (Schlumberger, 1972; Hearst and Nelson, 1985; Troxler, 1994). Prior to instrument installation, neutron logs were collected from within the 8-inch-diameter ODEX pipe in the borehole. At each measurement depth, the logs were affected by the ODEX pipe and by differences in the position of the neutron source within the pipe. As a result, neutron log data collected prior to instrument installation were used only to guide site construction and instrumentation placement and were not used to estimate moisture content of the unsaturated zone.

Electromagnetic resistivity (EM) logs were collected from the 2-in diameter PVC water-table well installed in the unsaturated-zone monitoring site after well construction was completed. The well was supported by the wire-line on the drill rig during construction to ensure that it was relatively straight to permit access by the EM tool. Sequential collection of EM logs during the recharge experiments and comparison of those logs with the initial log shown in this report were used to determine the position of the wetting front during the recharge (Izbicki and others, 2008; Ferre and others, 2008).

Site Construction and Instrumentation

The design of each unsaturated-zone monitoring site was determined on the basis of (1) data needs at the site; (2) examination of cuttings and core material (both lithology and specific conductance of leachate from the cuttings and cores), gamma logs, and neutron logs; and (3) limitations on the number of instruments that could be placed in a single 8.75-inch-diameter drill hole. Suction-cup lysimeters, advanced tensiometers (Hubbell and Sisson, 1998), and heat-dissipation probes (Phene and others, 1971) were installed in the borehole at each site. Site and instrumentation information is given in *table 1* and shown in *figures 7* and *8*.

The 2-inch PVC well was the first piece of instrumentation placed in the borehole. The well consists of 2-inch-diameter, 20-foot-long sections of threaded polyvinyl chloride (PVC) pipe with a screen section at the bottom. Advanced tensiometers, heat-dissipation probes and suction-cup lysimeters were installed in the same borehole in which the 2-inch PVC water-table well was installed. Advanced tensiometers were connected to the surface using a 1-inch-diameter PVC pipe. Heat-dissipation probes and suction-cup lysimeters were attached to the advanced tensiometer pipes and connected to the surface with wires and two 1/8-inch-diameter tubes, respectively.

Advanced tensiometers measure matric potential in the tensiometer range (less negative than -0.8 bars) and positive pressure when saturated. Heat-dissipation probes measure the rate of movement of heat in a calibrated ceramic, which varies with water content (Phene and others, 1971). The probes were individually calibrated to allow raw data to be converted to matric potential (Flint and others, 2002), and they can measure matric potential in a range (–0.07 to –1000 bars) that is drier than that measured by the advanced tensiometers. In general, advanced tensiometers were installed above clay layers where wetter, even saturated, conditions were expected; heat-dissipation probes were installed beneath clay layers and in more massive lithologic units where drier conditions were expected.

Two types of commercially available suction-cup lysimeters were used to collect samples of water from the unsaturated zone. Both types were made of 1.5-foot-long, 2-inch-diameter polyvinyl chloride (PVC) tubes with porous-ceramic cups. Suction-cup lysimeters used at shallow depths (generally less than 60 ft) had a single chamber with pressure/vacuum and sample tubes at different depths in the same chamber. Suction-cup lysimeters used at greater depths were equipped with two chambers separated by stainless steel one-way valves. These lysimeters were designed to withstand the higher pressures needed to lift water samples from depths as great as 300 ft. The suction-cup lysimeters were connected to the surface using a nylon tube, through which pressure and vacuum could be applied, and a Teflon tube, through which samples could be collected.

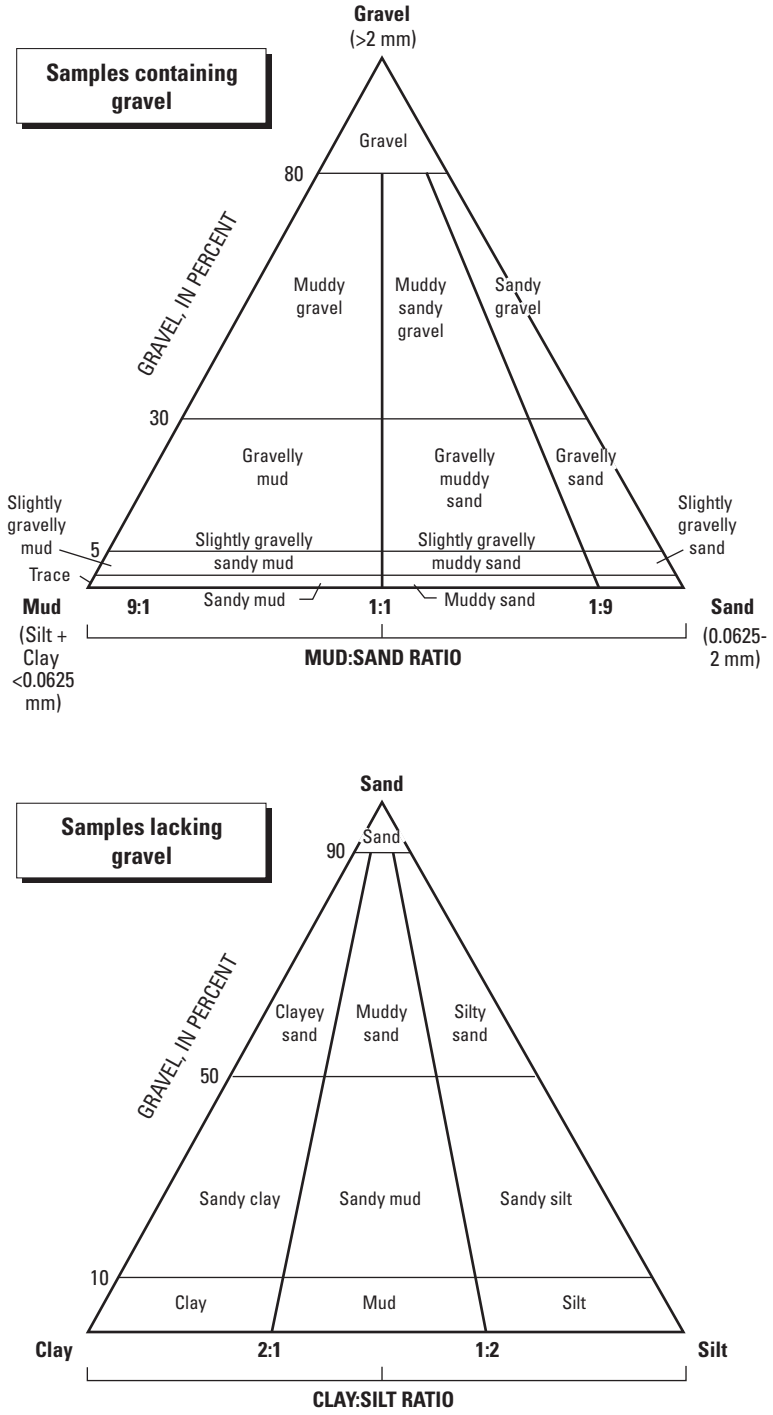
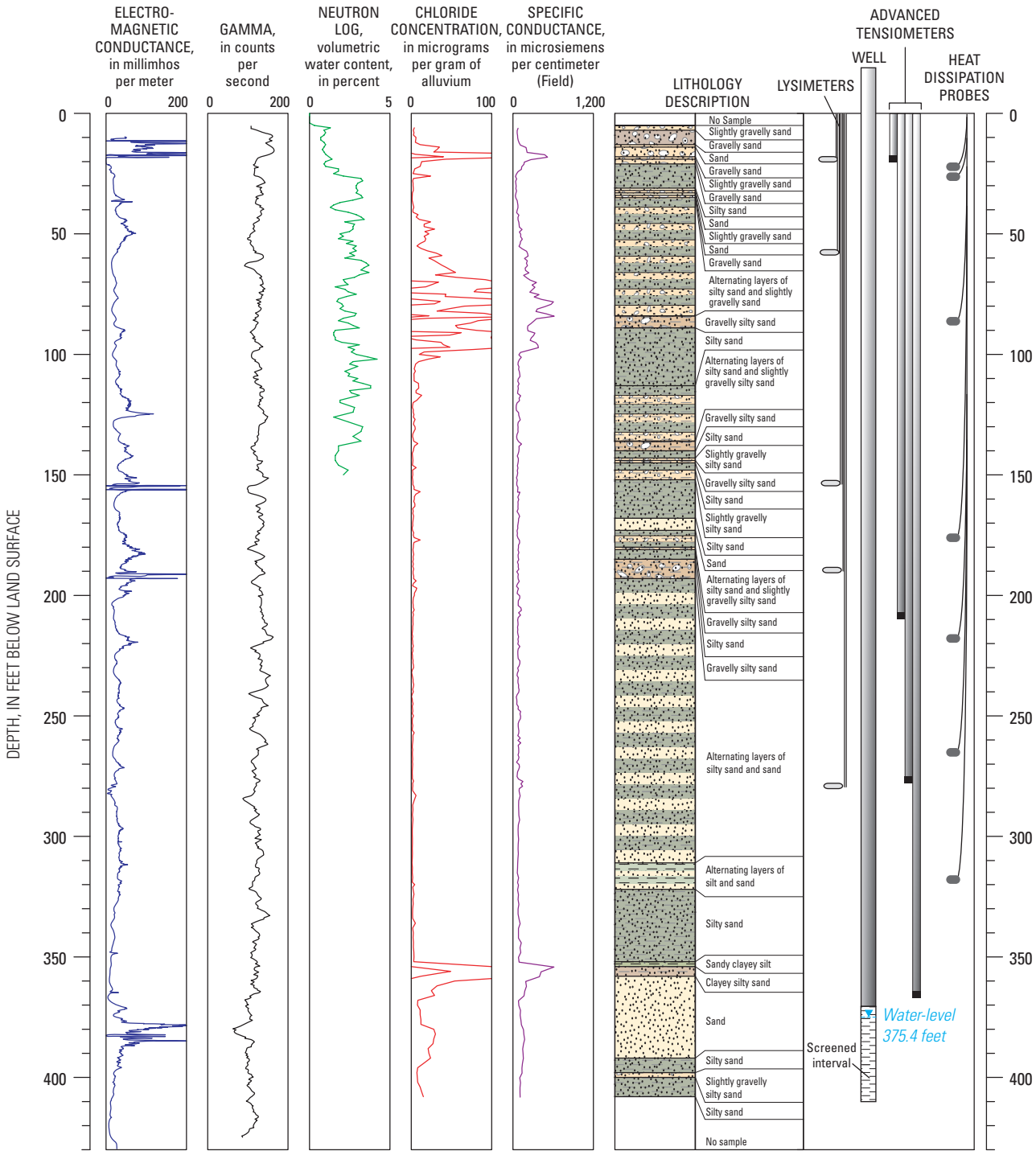
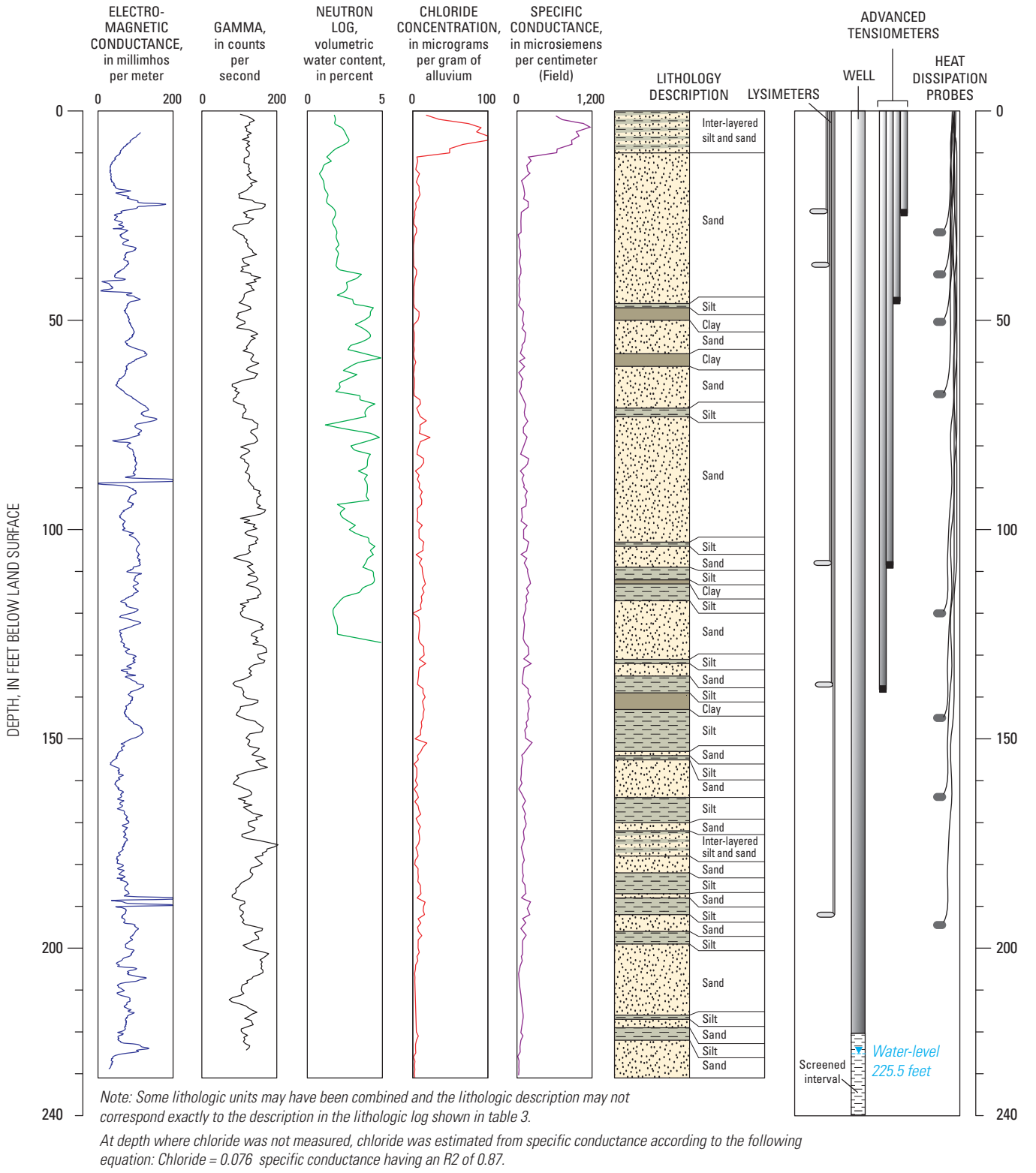


Figure 6. Rock-type nomenclature used to describe texture in lithologic logs. (Modified from Folk 1954. For samples containing gravel, the description "silt" includes silt and clay.)



Note: Some lithologic units may have been combined and the lithologic description may not correspond exactly to the description in the lithologic log shown in table 2.

Figure 7. Electro-magnetic conductance, a gamma log, chemical data, lithology, and instrumentation for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001), near Victorville, San Bernardino County, California.



Note: Some lithologic units may have been combined and the lithologic description may not correspond exactly to the description in the lithologic log shown in table 3.

At depth where chloride was not measured, chloride was estimated from specific conductance according to the following equation: Chloride = 0.076 specific conductance having an R2 of 0.87.

Figure 8. Electro-magnetic conductance, a gamma log, chemical data, lithology, and instrumentation for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003), near Victorville, San Bernardino County, California.

The depths at which suction-cup lysimeters, advanced tensiometers, and heat-dissipation probes were placed were determined on the basis of examination of cuttings and core material (both lithology and specific conductance of leachate from the cuttings and cores), gamma logs, and neutron logs. Suction-cup lysimeters and advanced tensiometers were installed in diatomaceous earth to ensure good contact between the porous-ceramic cup of the lysimeters and the unsaturated-zone materials. Heat-dissipation probes were packed in diatomaceous earth, wrapped in cheese-cloth, and saturated. The resulting package was installed in no. 60 graded sand. A three-part mixture of bentonite chip, granulated bentonite, and graded no. 3 sand was used as low-permeability backfill to separate instruments and prevent the downward movement of water through the borehole. Boreholes were sounded frequently during construction to determine the depth of the hole before, during, and after installing diatomaceous earth, grout, bentonite chips, and sand.

On the surface, sites were finished in vaults set at or below land surface with bentonite surface seals. Advanced tensiometers and tubes for suction-cup lysimeters were color coded for easy identification. Suction-cup lysimeter tubes were sealed with a radiator hose and clamps. The USGS drill rig configured for Odex drilling and instruments installed in the borehole are shown in *figure 9*.

Physical and Hydraulic Properties of Unsaturated Materials Data

Physical properties of unsaturated materials, such as water content (gravimetric and volumetric), bulk density, and water potential, which are relatively easy and inexpensive to measure, were determined for a large number of cores collected as part of this study. Other physical properties, such as particle-size distribution and saturated hydraulic conductivity, which are more expensive to measure, were determined for fewer cores. Measurements were made at the U.S. Geological Survey California Water Science Center (CAWSC) Hydrologic Research Laboratory, Sacramento, California.

Water content (gravimetric and volumetric), particle-size distribution, and saturated hydraulic conductivity were measured using American Society for Testing and Materials (1987) methods. Water potential was measured using the filter-paper method (Campbell and Gee, 1986) and a water-activity meter commonly known as a “chilled-mirror hygrometer” (Gee and others, 1992). Thermal properties were measured using a nanovoltmeter with a dual-needle probe consisting of a heating element and a thermocouple (Decagon Devices Inc., 1996). Results of laboratory analyses for water content, bulk density, and water potential are given in *table 4*. Results of particle-size analyses for selected cores are given in *table 5*. Results of saturated hydraulic conductivity are given in *table 6* and thermal property measurements in *table 7*.

Chemical Data

Extractions from Core Material and Cuttings

Soluble anions in the soil (and dissolved in soil water) were determined by analyzing leachate extracted from selected cuttings. Prior to extraction, core material and cuttings were oven-dried and then sieved to obtain 50 ± 0.005 grams of material having particles less than 1 mm in diameter. The sieved sample was mixed with 50 mL of distilled water. The mixture was shaken vigorously for 30 seconds, allowed to stand with occasional shaking for about 24 hours, and centrifuged at 4,000 rpm (revolutions per minute) for 20 minutes to allow the remaining solids to settle. The supernatant was pressure filtered, using a syringe, through a 0.45-mm pore-sized disk-filter. The first 10 mL of sample was used to rinse the filter and discarded. The remaining sample was filtered and analyzed for chloride, sulfate, nitrate, and nitrite ions by ion chromatography (American Public Health Association, 1992) at the U.S. Geological Survey CAWSC Laboratory in San Diego, California. Sample handling and extraction procedures were similar to those used by Izbicki and others (2000b). The ratio of core material to distilled water used for laboratory extractions was based on a weight per volume ratio, whereas the ratio used in the field for specific-conductance measurements was based on a volume per volume ratio. Concentrations of selected constituents in leach water extracted from cores and cuttings for field and laboratory data are given in *tables 8* and *9*.

Water from Wells

The wells installed at the recharge sites were developed, prior to sampling, by pumping using a positive-displacement piston pump. Development was not difficult because mud was not used as a drilling fluid. Water-quality samples were collected using a positive-displacement piston pump after at least three casing volumes had been pumped and temperature, specific conductance, and pH had stabilized. Samples were sent to the USGS National Water Quality Laboratory in Arvada, Colorado, to be analyzed for major ions, nutrients, and selected trace elements using methods developed by Fishman (1993). Samples of stable isotopes were analyzed using mass spectrophotometry at the Isotope Laboratory in Reston, Virginia. Results of chemical and isotopic analyses are given in *table 10*.

Figure 9. *A,* U.S. Geological Survey drill rig configured for ODEX drilling and *B,* selected instruments installed within the unsaturated-zone monitoring site at recharge ponds near Victorville, San Bernardino County, California.

Water from Suction-Cup Lysimeters

Suction-cup lysimeters installed at the recharge sites were used to sample water in the unsaturated zone by applying a vacuum (about 60 centibars) that induces water to flow into the lysimeters. If the matrix potential of the unsaturated zone near the lysimeter is more negative than the vacuum in the lysimeter, water will not enter the lysimeter. It was usually necessary to apply a vacuum many times over a period of several months before the lysimeters yielded water and the first sample could be collected. Once in the lysimeters, the water was forced to land surface by applying nitrogen gas pressure to one tube of the two-tube system. Although water-yielding characteristics varied considerably from one lysimeter to another, about 2 to 4 weeks was usually required between applying a vacuum and collecting the sample to ensure maximum accumulation of water within the lysimeter cups. Umari and others (1995) reported that short sampling periods resulted in incomplete water recovery, and long sampling periods resulted in partial loss of the sample through leakage back into the unsaturated zone.

The first water sample from each lysimeter and selected samples during the recharge tests were analyzed for major ions, selected trace elements, and the stable isotopes of oxygen and hydrogen (*table 10*). Samples were analyzed for major ions and selected trace elements at the U.S. Geological Survey National Water Quality Laboratory (NWQL) in Denver, Colorado, using various methods described by Fishman (1993). Samples were analyzed for the stable isotopes of oxygen and hydrogen at a U.S. Geological Survey laboratory in Reston, Virginia, by mass-spectrography (Thatcher and others, 1977).

Routine samples collected more frequently (approximately every six weeks) were analyzed for a more limited number of constituents, including selected anions by ion-chromatography, at the U.S. Geological Survey laboratory in San Diego, California (*table 11*), and for arsenic and chromium at the NWQL (*table 12*).

Water from Recharge Ponds

Water for the ponds was supplied by nearby public-supply wells operated by Victor Valley Water District and Baldy Mesa Water District. Recharge ponds were sampled approximately every six weeks from the pond inflow—samples were not collected when the pond was dry. Water-quality data for the ponds are in *tables 10*, *11,* and *12*. Monthly and cumulative recharge water deliveries to the ponds are presented in *table 13* and *figure 10*.

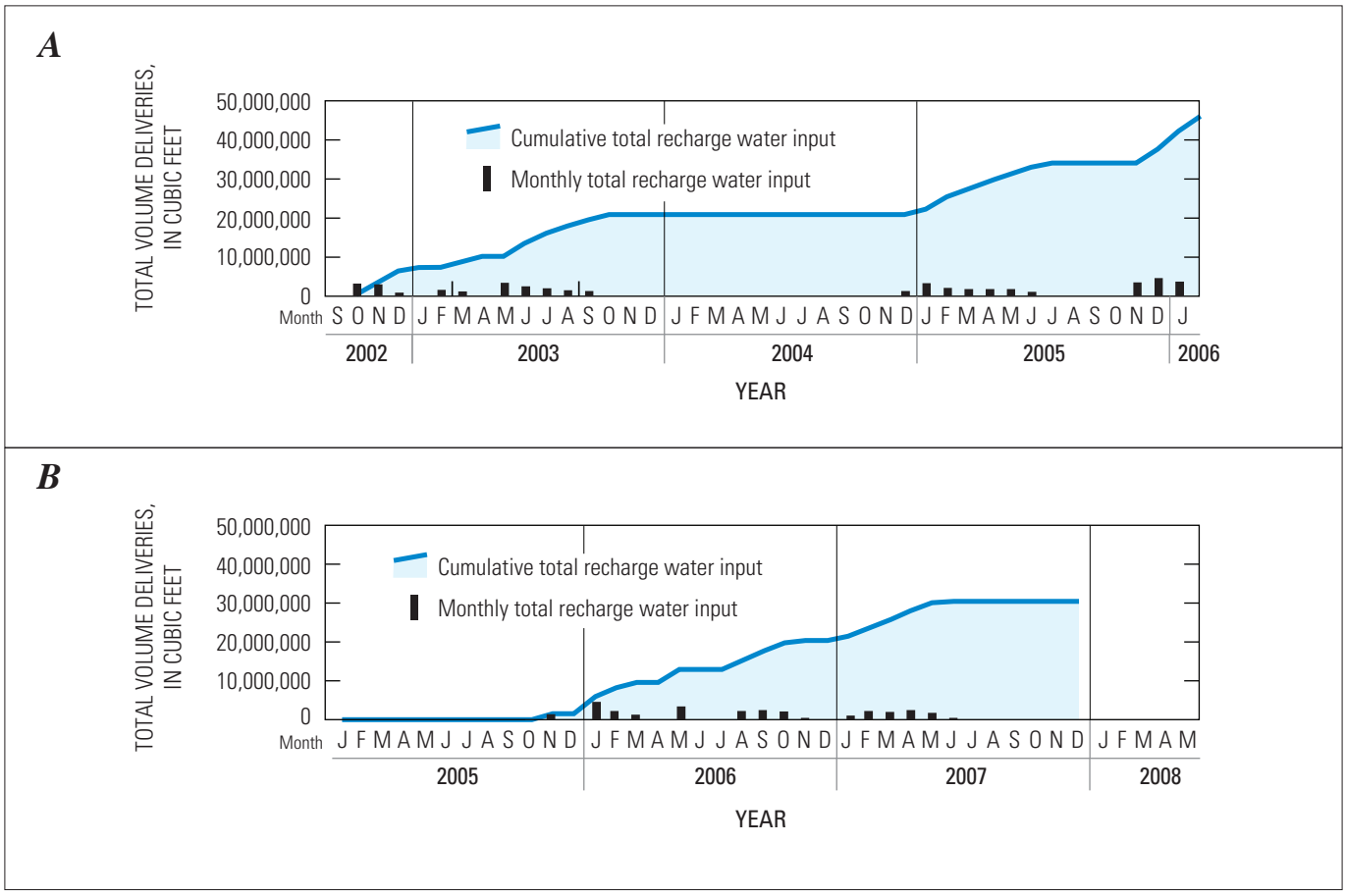


Figure 10. Monthly and cumulative total recharge water input for ponds at unsaturated-zone monitoring sites *A,* VVWD-1 and *B,* VVWD-2 (Pond-A, -B) near Victorville, San Bernardino County, California.

Accessing Data

Users of the data presented in this report are encouraged to access information through the USGS National Water Information System Web page (NWISWeb) located at *http://waterdata.usgs.gov/nwis/*

NWISWeb serves as an interface to a database network of site information, real-time, groundwater, surface-water, and water-quality data collected from locations throughout the 50 states and elsewhere. Data are updated from the database network on a regularly scheduled basis.

Data are retrieved by category and geographic area, and data searches can be selectively refined by specific location or parameter field. NWISWeb can output water-level and water-quality graphs, site maps, and data tables (in HTML and ASCII format) and can develop site-selection lists.

If the data presented in this report change, the U.S. Geological Survey's NWIS database will be updated. Additional geophysical logs, sample collection notes, and other information not contained in NWIS are kept on file at the USGS office in San Diego, California.

Acknowledgments

This study was funded by the Victor Valley Water District, the Baldy Mesa Water District, and the Mojave Water Agency in cooperation with the U.S. Geological Survey. The authors thank Randy Hill, Reggie Lampson, and Steve Dehagarza of the Victor Valley Water District; Don Bartz and Joe Ogg of the Baldy Mesa Water District; and the staff of both water districts and the Mojave Water Agency for their support during this study.

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Tables

Table 1. Site names, instrumentation names and numbers, and description of instrumentation for unsaturated-zone monitoring sites 4N/5W-01M001S (VVWD-1, drilled January 2001) and 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.

[Site locations are shown in *figure 1*. USGS, U.S. Geological Survey; ft, foot; AT, advanced tensiometer; HDP, heat dissipation probe; LYS, suction-cup lysimeter]

Site name	Descriptive name (number is depth below land surface)	State well number	USGS site identification number	Description of instrumentation (number is depth below land surface)
VVWD-1	VVWD-1 WELL	4N/5W-1M001S	342747117214301	Well, perforated from 370 to 410 ft.
	VVWD-1 AT @ 367′	4N/5W-1M002SAT	342747117214302	Advanced tensiometer at 367 ft.
	VVWD-1 HDP @ 318′	4N/5W-1M003SHDP	342747117214303	Heat dissipation probe at 318 ft.
	VVWD-1 LYS @ 280′	4N/5W-1M004SLYS	342747117214304	Lysimeter at 280 ft.
	VVWD-1 AT @ 278′	4N/5W-1M005SAT	342747117214305	Advanced tensiometer at 278 ft.
	VVWD-1 HDP @ 265′	4N/5W-1M006SHDP	342747117214306	Heat dissipation probe at 265 ft.
	VVWD-1 HDP @ 218′	4N/5W-1M007SHDP	342747117214307	Heat dissipation probe at 218 ft.
	VVWD-1 LYS @ 190′	4N/5W-1M008SLYS	342747117214308	Lysimeter at 190 ft.
	VVWD-1 HDP @ 176′	4N/5W-1M009SHDP	342747117214309	Heat dissipation probe at 176 ft.
	VVWD-1 LYS @ 154′	4N/5W-1M010SLYS	342747117214310	Lysimeter at 154 ft.
	VVWD-1 HDP @ 86′	4N/5W-1M011SHDP	342747117214311	Heat dissipation probe at 86 ft.
	VVWD-1 LYS @ 59′	4N/5W-1M012SLYS	342747117214312	Lysimeter at 59 ft.
	VVWD-1 HDP @ 26′	4N/5W-1M013SHDP	342747117214313	Heat dissipation probe at 26 ft.
	VVWD-1 HDP @ 22′	4N/5W-1M014SHDP	342747117214314	Heat dissipation probe at 22 ft.
	VVWD-1 AT @ 21′	4N/5W-1M015SAT	342747117214315	Advanced tensiometer at 21 ft.
	VVWD-1 LYS @ 20′	4N/5W-1M016SLYS	342747117214316	Lysimeter at 20 ft.
	VVWD-1 Recharge pond	4N/5W-1M017S Recharge pond	342747117214317	
VVWD-2	VVWD-2 WELL	5N/4W-29B001S	342954117190501	Well, perforated from 220 to 240 ft.
	VVWD-2 HDP @ 194.5′	5N/4W-29B002SHDP	342954117190502	Heat dissipation probe at 194.5 ft.
	VVWD-2 LYS @ 192′	5N/4W-29B003SLYS	342954117190503	Lysimeter at 192 ft.
	VVWD-2 HDP @ 164′	5N/4W-29B004SHDP	342954117190504	Heat dissipation probe at 164 ft.
	VVWD-2 HDP @ 145	5N/4W-29B005SHDP	342954117190505	Heat dissipation probe at 145 ft.
	VVWD-2 AT @ 138′	5N/4W-29B006SAT	342954117190506	Advanced tensiometer at 138 ft.
	VVWD-2 LYS @ 137′	5N/4W-29B007SLYS	342954117190507	Lysimeter at 137 ft.
	VVWD-2 HDP @ 120′	5N/4W-29B008SHDP	342954117190508	Heat dissipation probe at 120 ft.
	VVWD-2 AT @ 109′	5N/4W-29B009SAT	342954117190509	Advanced tensiometer at 109 ft.
	VVWD-2 LYS @ 108′	5N/4W-29B010SLYS	342954117190510	Lysimeter at 108 ft.
	VVWD-2 HDP @ 67.5′	5N/4W-29B011SHDP	342954117190511	Heat dissipation probe at 67.5 ft.
	VVWD-2 HDP @ 50.5′	5N/4W-29B012SHDP	342954117190512	Heat dissipation probe at 50.5 ft.
	VVWD-2 AT @ 46′	5N/4W-29B013SAT	342954117190513	Advanced tensiometer at 46 ft.
	VVWD-2 HDP @ 39′	5N/4W-29B014SHDP	342954117190514	Heat dissipation probe at 39 ft.
	VVWD-2 LYS @ 37′	5N/4W-29B015SLYS	342954117190515	Lysimeter at 37 ft.
	VVWD-2 HDP @ 29′	5N/4W-29B016SHDP	342954117190516	Heat dissipation probe at 29 ft.
	VVWD-2 AT @ 25′	5N/4W-29B017SAT	342954117190517	Advanced tensiometer at 25 ft.
	VVWD-2 LYS @ 24′	5N/4W-29B018SLYS	342954117190518	Lysimeter at 24 ft.
	VVWD-2 Recharge pond	5N/4W-29B019S Recharge pond	342954117190519	

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
0	5	No sample
5	6	Slightly gravelly sand; fine to coarse with some very coarse sand; granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; reddish brown (5YR 4/3); quartz and Pelona Schist; reworked Victor Valley fan deposit; SC = 78
6	7	Slightly gravelly sand; fine to medium with some very fine to very coarse sand; granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; quartz and Pelona Schist; reworked Victor Valley fan deposit; SC = 65
7	8	Gravelly sand; fine to coarse with some very fine to very coarse sand; granule- to medium pebble-sized gravel; minor silt; very poorly sorted; subangular to rounded; brown (7.5YR 4/4); quartz and Pelona Schist; reworked Victor Valley fan deposit, SC = 65
8	9	Gravelly sand; fine to coarse with very fine to very coarse sand; granule- to large pebble-sized gravel, silt; very poorly sorted; subangular to rounded; brown (7.5YR 4/4); quartz and Pelona Schist; reworked Victor Valley fan deposit; SC = 72
9	10	Gravelly sand; fine to medium with some very fine to very coarse sand; granule- to medium pebble-sized gravel, silt; very poorly sorted; subangular to rounded; brown (7.5YR 4/4); quartz and Pelona Schist; reworked Victor Valley fan deposit; SC = 73
10	11	No sample
11	12	Gravelly sand; very fine to medium with some coarse to very coarse sand; granule- to large pebble-sized gravel, silt; very poorly sorted; subangular to rounded; brown (7.5YR 4/4); quartz and Pelona Schist; reworked Victor Valley fan deposit; SC = 94
12	13	Gravelly sand; very fine to medium with some coarse to very coarse sand; granule- to medium pebble-sized gravel, silt; very poorly sorted; subangular to rounded; brown (7.5YR 4/4); quartz and Pelona Schist; reworked Victor Valley fan deposit; SC = 114
13	14	Sand; fine to medium with some very fine to coarse sand, occasional granule- to small pebble-sized gravel, silt; moderately sorted; subangular to subrounded; brown (7.5YR 4/4); quartz and Pelona Schist; reworked Victor Valley fan deposit; SC = 197
14	15	Gravelly sand; medium to very coarse with some very fine to fine sand, granule- to medium pebble-sized gravel, silt; poorly sorted; subangular to rounded; brown (7.5YR 4/4); quartz and schist; reworked Victor Valley fan deposit; SC = 205
15	16	Gravelly sand; fine to coarse with some very fine to very coarse sand, granule- to large pebble-sized gravel, silt; very poorly sorted; subangular to rounded; brown (7.5YR 4/4); quartz and Pelona Schist; reworked Victor Valley fan deposit; SC = 214
16	17	Gravelly sand; fine to coarse with some very fine to very coarse sand, granule- to medium pebble-sized gravel, silt; very poorly sorted; subangular to rounded; brown (7.5YR 4/4); quartz and Pelona Schist; reworked Victor Valley fan deposit; SC = 477
17	18	Sandy gravel; fine to medium with some very fine to very coarse sand, granule- to large pebble-sized gravel, silt; very poorly sorted; subangular to rounded; brown (7.5YR 4/4); reworked Victor Valley fan deposit; SC = 519
18	19	Slightly gravelly sand; fine to medium with some very fine to very coarse sand, granule- to large pebble-sized gravel, silt; very poorly sorted; subangular to rounded; brown (7.5YR 4/4); reworked Victor Valley fan deposit; SC = 269
19	20	Gravelly sand; fine to medium with some very fine to very coarse sand, granule- to large pebble-sized gravel, silt; very poorly sorted; subangular to rounded; brown (7.5YR 4/4); quartz and Pelona Schist; reworked Victor Valley fan deposit; SC = 173
20	21	Gravelly sand; very fine to medium with some coarse to very coarse sand, granule- to large pebble-sized gravel, silt; very poorly sorted; subangular to subrounded; brown (7.5YR 4/4); quartz; reworked Victor Valley fan deposit; SC = 165

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
21	22	Silty sand; fine to medium with some very fine sand and silt, occasional coarse to very coarse sand and medium to large pebble-sized gravel, minor clay; moderately sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; SC = 133
22	23	Silty gravelly sand; fine to medium with some very fine sand and silt, minor clay; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; SC = 128
23	24	Silty sand; fine to medium with some very fine sand and silt, minor clay; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; SC = 79
24	25	Silty sand; fine to medium with some very fine sand and silt, minor clay, occasional coarse to very coarse sand; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; SC = 53
25	26	Silty sand; very fine to medium with occasional coarse to very coarse sand, silt, minor clay; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; SC = 40
26	27	Silty sand; very fine to fine with some medium sand and silt, occasional coarse sand, clay; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; SC = 57
27	28	Silty sand; very fine to fine with occasional medium to coarse sand, silt, minor gravel; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; SC = 42
28	29	Silty sand; very fine to medium with occasional coarse sand, silt; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; SC = 46
29	30	Silty sand; very fine to medium sand and silt; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; SC = 49
30	31	Silty sand; very fine to medium with occasional coarse sand, silt; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; occasional Pelona Schist grain; SC = 47
31	32	Sand; very fine to fine with some medium to occasional very coarse sand, minor silt; well sorted; subangular to subrounded; quartz and Pelona Schist; alluvium deposit; SC = 56
32	33	Gravelly sand; very fine to medium with some coarse to very coarse sand, granule- to large pebble-sized gravel, silt; poorly sorted; subangular to rounded; quartz and Pelona Schist; alluvium deposit; SC = 46
33	34	Sand; very fine to medium with some coarse to very coarse sand, silt, occasional granule- to small pebble-sized gravel; well sorted; subangular to rounded; quartz and Pelona Schist; alluvium deposit; SC = 39
34	35	Gravelly sand; very fine to medium with coarse to very coarse sand, granule- to medium pebble-sized gravel, silt; very poorly sorted; subangular to rounded; quartz and Pelona Schist; alluvium deposit; SC = 47
35	36	Silty sand; very fine to fine with some medium sand, occasional small to medium pebble-sized gravel, silt; well sorted; subangular to rounded; quartz and Pelona Schist; SC = 65
36	37	Silty sand; very fine to fine with some medium to very coarse sand, occasional granule- to small pebble-sized gravel, silt; well sorted; subangular to rounded; quartz and Pelona Schist; SC = 72
37	38	Silty sand; very fine to fine sand with silt, minor clay; very well sorted; subangular to rounded; SC = 76
38	39	Silty sand; very fine to fine sand with silt; very well sorted; subangular to subrounded; SC = 77
39	40	Silty sand; very fine to medium with some coarse to very coarse sand, silt, occasional granule- to medium pebble-sized gravel; moderately sorted; subangular to subrounded; quartz and occasional Pelona Schist; SC = 66
40	41	Silty sand; very fine to fine with some medium to coarse sand, silt; well sorted; subangular to subrounded; quartz and Pelona Schist; SC = 58
41	42	Silty sand; very fine to fine with some minor medium to very coarse sand, silt, occasional granule- to medium pebble-sized gravel; well sorted; subangular to subrounded; quartz and Pelona Schist; SC = 90
42	43	Silty sand; very fine to fine sand, silt, occasional medium to very coarse sand and granule- to small pebble-sized gravel; well sorted; subangular to subrounded; quartz and Pelona Schist; SC = 77

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
43	44	Silty sand; very fine to fine with some medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 78
44	45	Slightly gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; quartz; increase in Pelona Schist; alluvium deposit; SC = 90
45	46	Silty sand; very fine to fine with some medium to coarse sand, silt, occasional granule-sized gravel; well sorted; subangular to subrounded; quartz and Pelona Schist; alluvium deposit; SC = 94
46	47	Silty sand; very fine to fine with some medium to very coarse sand, silt; well sorted; subangular to subrounded; quartz and Pelona Schist; SC = 97
47	48	Silty sand; very fine to fine with some medium to very coarse sand, silt, occasional granule- to medium pebble-sized gravel; well sorted; subangular to rounded; quartz and Pelona Schist; SC = 139
48	49	Silty sand; very fine to fine with some medium to very coarse sand, silt; well sorted; subangular to subrounded; quartz and Pelona Schist; SC = 97
49	50	Silty sand; very fine with occasional fine to very coarse sand, silt; well sorted; subangular to subrounded; SC = 119
50	51	Silty sand; very fine with occasional fine to very coarse sand, silt; well sorted; subangular to subrounded; SC = 117
51	52	Silty sand; very fine with occasional fine to very coarse sand, silt; well sorted; subangular to subrounded; SC = 143
52	53	Silty sand; very fine with occasional fine to very coarse sand, silt; well sorted; subangular to subrounded; SC = 115
53	54	Silty sand; very fine with occasional fine to very coarse sand, silt; well sorted; subangular to subrounded; SC = 110
54	55	Slightly gravelly silty sand; very fine with occasional fine to very coarse sand, silt, granule- to medium pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; SC = 92
55	56	Silty sand; very fine to fine with occasional medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 141
56	57	Silty sand; very fine to fine with occasional medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 205
57	58	Gravelly silty sand; very fine to fine with occasional medium to very coarse sand, silt, minor gravel; well sorted; subangular to subrounded; SC = 220
58	59	Silty sand; very fine to fine with occasional medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 228
59	60	Silty sand; very fine to fine with some medium sand, occasional coarse to very coarse sand, silt, granule-sized gravel; moderately sorted; subangular to rounded; SC = 174
60	61	Silty sand; very fine to fine with occasional medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 216
61	62	Silty sand; very fine to medium with occasional coarse to very coarse sand, silt; moderately sorted; subangular to rounded; SC = 204
62	63	Silty sand; very fine to fine with occasional medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 219
63	64	Silty sand; very fine to fine with occasional medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 184
64	65	Silty sand; very fine to fine with occasional medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 190
65	66	Silty sand; very fine to fine with occasional medium to very coarse sand, silt, occasional granule-sized gravel; well sorted; subangular to subrounded; Pelona Schist; SC = 240
66	67	Silty sand; very fine to medium with some coarse to very coarse sand, silt, occasional granule-sized gravel; moderately sorted; subangular to rounded; Pelona Schist and quartz; SC = 162

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
67	68	Silty sand; very fine to fine with occasional medium to very coarse sand, silt; moderately sorted; subangular to subrounded; Pelona Schist; SC = 207
68	69	Silty sand; very fine to fine with occasional medium to very coarse sand, granule- to small pebble-sized gravel, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 260
69	70	Silty sand; very fine to medium with occasional coarse to very coarse sand, silt; well sorted; subangular to subrounded; SC = 353
70	71	Silty sand; fine to medium with some very fine to coarse sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 288
71	72	Silty sand; very fine to fine with some medium sand, occasional coarse to very coarse sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 330
72	73	Slightly gravelly silty sand; fine to medium with some very fine to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to subrounded; Pelona Schist; SC = 289
73	74	Silty sand; fine to coarse with some very fine to very coarse sand, silt; moderately sorted; subangular to subrounded; Pelona Schist; SC = 254
74	75	Silty sand; very fine to fine with occasional medium to coarse sand, silt; well sorted; subangular to subrounded; SC = 391
75	76	Silty sand; very fine to fine with occasional medium to coarse sand, silt; well sorted; subangular to subrounded; SC = 319
76	77	Silty sand; very fine to fine with some medium sand, occasional coarse to very coarse sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 429
77	78	Silty sand; very fine to fine with some medium to coarse sand, silt, minor clay; well sorted; subangular to subrounded; SC = 606
78	79	Silty sand; very fine to fine with occasional medium to coarse sand, silt; well sorted; subangular to subrounded; SC = 573
79	80	Silty sand; fine to coarse with some very fine sand, silt; moderately sorted; subangular to subrounded; Pelona Schist; SC = 480
80	81	Slightly gravelly silty sand; fine to coarse with some very fine to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to subrounded; Pelona Schist; SC = 364
81	82	Silty sand; very fine to fine with some medium to coarse sand, occasional very coarse sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 346
82	83	Silty sand; very fine to fine with occasional medium to very coarse sand, silt, granule- to medium pebble-sized gravel; moderately sorted; subangular to rounded; dark yellowish brown (10YR 4/4); Pelona Schist; paleosol; SC = 499
83	84	Silty sand; very fine to fine with occasional medium to very coarse sand, silt, occasional granule- to medium pebble-sized gravel; moderately sorted; subangular to rounded; dark yellowish brown (10YR 4/4); Pelona Schist; paleosol; SC = 619
84	85	Gravelly silty sand; very fine to very coarse sand, silt, granule- to large pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist and quartz; alluvium deposit; SC = 353
85	86	Gravelly silty sand; very fine to medium with some coarse to very coarse sand, silt, granule- to medium pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist and quartz; alluvium deposit; SC = 312
86	87	Slightly gravelly silty sand; very fine to medium with some coarse to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 273
87	88	Gravelly sand; very fine to medium with some coarse to very coarse sand, silt, granule- to large pebble-sized gravel, minor silt; very poorly sorted; subangular to rounded; Pelona Schist and quartz; alluvium deposit; SC = 224

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
88	89	Gravelly silty sand; very fine to medium with some coarse to very coarse sand, silt, granule- to small pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist and quartz; alluvium deposit; SC = 218
89	90	Silty sand; very fine with some fine to very coarse sand, silt, occasional granule- to large pebble-sized gravel; moderately sorted; subangular to rounded; Pelona Schist and quartz; alluvium deposit; SC = 227
90	91	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; SC = 331
91	92	Silty sand; very fine with occasional fine to coarse sand, silt; well sorted; subangular to subrounded; SC = 309
92	93	Silty sand; very fine with occasional fine to coarse sand, silt; well sorted; subangular to subrounded, SC = 275
93	94	Silty sand; very fine to fine with occasional medium to coarse sand, silt; well sorted; subangular to subrounded; SC = 260
94	95	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; SC = 345
95	96	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; SC = 374
96	97	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 382
97	98	Slightly gravelly silty sand; very fine to fine sand, silt, minor gravel; well sorted; subangular to subrounded; SC = 252
98	99	Silty sand; very fine to fine with occasional medium to very coarse sand, silt; well sorted; subangular to rounded; Pelona Schist and quartz; SC = 115
99	100	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 91
100	101	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 127
101	102	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; SC = 97
102	103	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; SC = 81
103	104	Silty sand; very fine with some fine to medium sand, silt; well sorted; subangular to subrounded; SC = 76
104	105	Silty sand; very fine with some fine sand, silt; well sorted; subangular to subrounded; SC = 93
105	106	Silty sand; very fine with some fine sand, silt; well sorted; subangular to subrounded; SC = 86
106	107	Silty sand; very fine with occasional fine to very coarse sand, silt, granule- to small pebble-sized gravel; well sorted; subangular to subrounded; SC = 97
107	108	Silty sand; very fine sand and silt; very well sorted; subangular to subrounded; SC = 103
108	109	Silty sand; very fine sand and silt; very well sorted; subangular to subrounded; SC = 108
109	110	Silty sand; very fine to fine with occasional medium to coarse sand, silt; well sorted; subangular to subrounded; SC = 81
110	111	Silty sand; very fine to fine with occasional medium to coarse sand, silt; well sorted; subangular to subrounded; SC = 75
111	112	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 94
112	113	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; SC = 77
113	114	Slightly gravelly silty sand; fine with some very fine to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; alluvium deposit; SC = 83
114	115	Slightly gravelly silty sand; fine with some very fine to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 75
115	116	Slightly gravelly silty sand; fine to medium with some very fine to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 72
116	117	Silty sand; very fine to fine with some medium to coarse sand, silt; moderately sorted; subangular to subrounded; Pelona Schist; SC = 118
117	118	Slightly gravelly silty sand, very fine to fine with some medium sand, silt, minor gravel; well sorted; subangular to rounded; Pelona Schist; SC = 95
118	119	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to rounded; Pelona Schist; SC = 100

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
119	120	Sand; fine to medium with some very fine to coarse sand, silt; moderately sorted; subangular to subrounded; Pelona Schist; SC = 64
120	121	Slightly gravelly silty sand; fine to medium with some very fine to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 52
121	122	Silty sand; fine to medium with some very fine to very coarse sand, silt, occasional granule-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 49
122	123	Slightly gravelly silty sand; fine to medium with some very fine to very coarse sand, silt, granule- to small pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 53
123	124	Silty sand; fine to medium with some very fine to coarse sand, silt, occasional very coarse sand and granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 86
124	125	Silty sand; very fine to fine sand, silt, occasional medium to coarse sand; well sorted; subangular to subrounded; SC = 88
125	126	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; SC = 100
126	127	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; SC = 111
127	128	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; SC = 81
128	129	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; SC = 75
129	130	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; SC = 79
130	131	Silty sand; very fine with occasional fine sand, silt; well sorted; subangular to subrounded; SC = 76
131	132	Silty sand; very fine with occasional fine sand, silt; well sorted; subangular to subrounded; SC = 79
132	133	Silty sand; very fine to fine with some medium to coarse sand, silt, occasional very coarse sand, and granule- to small pebble-sized gravel; moderately sorted; subangular to rounded; Pelona Schist; SC = 63
133	134	Silty sand; very fine to very coarse sand, silt; poorly sorted; subangular to rounded; Pelona Schist; SC = 57
134	135	Slightly gravelly silty sand; very fine to medium with some coarse to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 64
135	136	Silty sand; very fine sand, silt, occasional granule-sized gravel; well sorted; subangular to subrounded; alluvium deposit; SC = 86
136	137	Gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to large pebble-sized gravel; very poorly sorted; subangular to well rounded; Pelona Schist; alluvium deposit; SC = 130
137	138	Silty gravelly sand; very fine with some fine sand, silt, granule- to medium pebble-sized gravel, occasional medium to very coarse sand; very poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 92
138	139	Gravelly silty sand; very fine with some fine to very coarse sand, silt, granule- to large pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 95
139	140	Gravelly silty sand; very fine with some fine to very coarse sand, silt, granule- to large pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 91
140	141	Silty sand; very fine sand and silt, with some fine to very coarse sand; poorly sorted; subangular to rounded; Pelona Schist; SC = 81
141	142	Silty sand; very fine sand and silt, occasional fine to coarse sand; well sorted; subangular to rounded; Pelona Schist; SC = 68
142	143	Silty sand; very fine with some fine to medium sand, silt; well sorted; subangular to subrounded; SC = 82
143	144	Slightly gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 82
144	145	Gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to medium pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 76

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
145	146	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 69
146	147	Silty sand; very fine to medium with some coarse sand, occasional very coarse sand, silt; moderately sorted; subangular to rounded; Pelona Schist; SC = 77
147	148	Silty sand; very fine to very coarse sand, silt, occasional granule-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; SC = 68
148	149	Slightly gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to medium pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 73
149	150	Slightly gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to large pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 68
150	151	Slightly gravelly silty sand; very fine to very coarse sand, silt, granule- to large pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 56
151	152	Slightly gravelly silty sand; very fine to very coarse sand, silt, granule- to medium pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 57
152	153	Silty sand; very fine to fine with some medium to coarse sand, silt; moderately sorted; subangular to rounded; Pelona Schist; SC = 60
153	154	Silty sand; very fine to medium sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 60
154	155	Silty sand; very fine with occasional fine sand, silt; well sorted; subangular to subrounded; SC = 77
155	156	Silty sand; very fine to fine with some medium sand, silt, occasional granule- to small pebble-sized gravel; well sorted; subangular to subrounded; SC = 72
156	157	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; paleosol; SC = 106
157	158	Silty sand; very fine to fine with some medium to coarse sand, silt; well sorted; subangular to subrounded; paleosol; SC = 92
158	159	Silty sand; very fine to medium with occasional coarse to very coarse sand, silt; moderately sorted; subangular to subrounded; paleosol; SC = 75
159	160	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; paleosol; SC = 89
160	161	Silty sand; very fine to medium with occasional coarse to very coarse sand, silt; moderately sorted; subangular to subrounded; paleosol; SC = 77
161	162	Silty sand; very fine to medium sand, silt; moderately sorted; subangular to subrounded; Pelona Schist; SC = 78
162	163	Silty sand; very fine to fine with some medium sand, silt; moderately sorted; subangular to subrounded; SC = 77
163	164	Silty sand; very fine to fine with some medium to coarse sand, silt; moderately sorted; subangular to subrounded; Pelona Schist and quartz; SC = 79
164	165	Silty sand; very fine to fine with some medium sand, silt, occasional coarse to very coarse sand; moderately sorted; subangular to subrounded; Pelona Schist and quartz; SC = 64
165	166	Silty sand; very fine to fine with occasional medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 86
166	167	Silty sand; very fine with some fine sand, silt; well sorted; subangular to subrounded; SC = 101
167	168	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; SC = 86
168	169	Sand; fine with some very fine to medium sand, silt; well sorted; subangular to subrounded; SC = 85
169	170	Sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; SC = 78
170	171	Sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 73
171	172	Sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 75
172	173	Sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; SC = 64

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
173	174	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; SC = 70
174	175	Slightly gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 66
175	176	Slightly gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to medium pebble-sized gravel; poorly sorted; subangular to rounded; alluvium deposit; SC = 77
176	177	Silty sand; very fine to fine with occasional medium to very coarse sand, silt, granule-sized gravel; moderately sorted; subangular to subrounded; alluvium deposit; SC = 100
177	178	Silty gravelly sand; very fine with some fine to very coarse sand, silt, granule- to large pebble-sized gravel; poorly sorted; subangular to subrounded; alluvium deposit; SC = 101
178	179	Silty sand; very fine to fine with some medium to very coarse sand, silt; moderately sorted; subangular to rounded; Pelona Schist; SC = 84
179	180	Slightly gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 84
180	181	Gravelly silty sand; very fine to very coarse sand, silt, granule- to medium pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 79
181	182	Silty sand; very fine with some fine and occasional medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 90
182	183	Silty sand; very fine to fine sand, silt, occasional granule- to small pebble-sized gravel; well sorted; subangular to subrounded; SC = 78
183	184	Silty sand; very fine with some fine and occasional medium to coarse sand, silt, granule- to large pebble-sized gravel; well sorted; subangular to subrounded; SC = 80
184	185	Silty sand; very fine with some fine and occasional medium to very coarse sand, silt; well sorted; subangular to subrounded; SC = 88
185	186	Gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to very large pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 69
186	187	Gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to very large pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 83
187	188	Gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 80
188	189	Slightly gravelly silty sand; very fine to medium with some coarse to very coarse sand, silt, granule- to medium pebble-sized gravel; poorly sorted; subangular to rounded; alluvium deposit; SC = 88
189	190	Slightly gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to medium pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 59
190	191	Gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to very large pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 82
191	192	Gravelly silty sand; very fine to fine with some medium to very coarse sand, silt, granule- to large pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 76
192	193	Gravelly silty sand; very fine to fine with some medium to very coarse, silt, granule- to large pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 80
193	194	Silty sand; very fine with some fine and occasional medium sand, silt; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); paleosol; SC = 98
194	195	Sand; very fine to fine with some silt; well sorted; subangular to subrounded; Pelona Schist; SC = 72
195	196	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 55

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
196	197	Silty sand; very fine to fine with some medium and occasional coarse to very coarse sand, silt; well sorted; subangular to rounded; Pelona Schist; SC = 84
197	198	Gravelly silty sand; very fine to fine with some medium sand, occasional coarse to very coarse sand, silt, occasional granule- to medium pebble-sized gravel; moderately sorted; subangular to rounded; Pelona Schist; alluvium deposit; SC = 71
198	199	Silty sand; very fine to fine with some medium sand, silt, occasional coarse to very coarse sand and granule- to small pebble-sized gravel; moderately sorted; subangular to rounded; SC = 65
199	200	Silty sand; very fine to fine sand, silt, minor clay; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 104
200	201	Silty sand; very fine to fine with occasional medium sand, silt, minor clay; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 104
201	202	Silty sand; very fine to fine sand, silt, occasional medium sand; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 82
202	203	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 81
203	204	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 81
204	205	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 121
205	206	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 129
206	207	Silty sand; very fine sand, silt, minor clay; very well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 86
207	208	Silty sand; very fine sand, silt, minor clay; well sorted; subangular to subrounded; SC = 116
208	209	Silty sand; very fine with some fine sand, silt; well sorted; subangular to subrounded; SC = 80
209	210	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 73
210	211	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; clay balls; SC = 77
211	212	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 79
212	213	Silty sand; fine to coarse with some very fine to very coarse sand, silt; poorly sorted; subangular to rounded; Pelona Schist; SC = 72
213	214	Silty sand; fine to coarse with some very fine to very coarse sand, silt, occasional granule- to medium pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; SC = 75
214	215	Silty sand; fine to medium with some very fine to very coarse sand, silt, occasional granule- to small pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; SC = 72
215	216	Slightly gravelly silty sand; very fine to medium with some coarse to very coarse sand, silt, granule- to large pebble-sized gravel; very poorly sorted; subangular to rounded; Pelona Schist; SC = 77
216	217	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 86
217	218	Gravelly silty sand; very fine to fine with some medium sand, silt, occasional granule- to small pebble-sized gravel; moderately sorted; subangular to subrounded; Pelona Schist; SC = 77
218	219	Silty sand; very fine with some fine to medium sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 82
219	220	Silty sand; very fine with some fine sand, silt, occasional granule- to small pebble-sized gravel; well sorted; subangular to subrounded; Pelona Schist; SC = 74
220	221	Silty sand; very fine sand, silt, occasional granule- to small pebble-sized gravel; well sorted; subangular to subrounded; olive gray (5Y 4/2); SC = 106
221	222	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 80

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
222	223	Sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; Pelona Schist; olive brown (2.5Y 4/3); SC = 75
223	224	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to rounded; olive gray (5Y 4/2); Pelona Schist; SC = 75
224	225	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; olive gray (5Y 4/2); SC = 77
225	226	Silty sand; very fine sand and silt; very well sorted; subangular to subrounded; olive gray (5Y 4/2); SC = 80
226	227	Silty sand; very fine sand and silt; well sorted; subangular to subrounded; olive gray (5Y 4/2); SC = 105
227	228	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; dark grayish brown (2.5Y 4/2); SC = 106
228	229	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; dark grayish brown (2.5Y 4/2); SC = 95
229	230	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; dark grayish brown (2.5Y 4/2); SC = 73
230	231	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; dark grayish brown (2.5Y 4/2); SC = 84
231	232	Sand; very fine, silt; well sorted; subangular to subrounded; dark grayish brown (2.5Y 4/2); Pelona Schist; SC = 69
232	233	Sand; very fine, silt; well sorted; subangular to subrounded; dark grayish brown (2.5Y 4/2); Pelona Schist; SC = 63
233	234	Sand; very fine to fine sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 82
234	235	Silty sand; very fine with some fine sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 77
235	236	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 77
236	237	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 86
237	238	Slightly gravelly silty sand; very fine sand, silt, minor gravel; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 84
238	239	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; brown (10YR 4/3); SC = 95
239	240	Silty sand; very fine with some fine to medium sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 89
240	241	Sand; fine to medium with some very fine to coarse sand, silt; moderately sorted; subangular to rounded; olive brown (2.5Y 4/3); Pelona Schist; SC = 66
241	242	Sand; fine to medium; well sorted; subangular to rounded; brown (10YR 4/3); SC = 61
242	243	Sand; fine to medium with some very fine sand; well sorted; subangular to rounded; Pelona Schist; SC = 60
243	244	Sand; fine to medium with some very fine sand; well sorted; subangular to rounded; Pelona Schist; SC = 62
244	245	Sand; fine to medium with some very fine and occasional coarse sand, silt; moderately sorted; subangular to rounded; Pelona Schist; SC = 59
245	246	Sand; fine to medium with some very fine and occasional coarse sand, silt, occasional granule- to medium pebble-sized gravel; poorly sorted; subangular to rounded; Pelona Schist; SC = 83
246	247	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; SC = 79
247	248	Silty sand; fine to medium with some very fine and occasional coarse sand, silt; moderately sorted; subangular to rounded; Pelona Schist; SC = 118
248	249	Silty sand; fine to medium with some very fine and occasional coarse sand, silt; moderately sorted; subangular to rounded; Pelona Schist; SC = 108
249	250	Silty sand; very fine sand and silt; well sorted; subangular to subrounded; SC = 113
250	251	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; SC = 114
251	252	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 93

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
252	253	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 80
253	254	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 81
254	255	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 84
255	256	Silty sand; very fine to fine with some medium sand, silt; moderately sorted; subangular to rounded; Pelona Schist; SC = 90
256	257	Silty sand; very fine to fine with occasional medium to coarse sand, silt; well sorted; subangular to subrounded; SC = 88
257	258	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 75
258	259	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; occasional clay ball; SC = 112
259	260	Silty sand; very fine with some fine sand, silt; well sorted; subangular to subrounded; SC = 77
260	261	Silty sand; very fine to fine sand, silt, minor clay; well sorted; subangular to subrounded; SC = 120
261	262	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 80
262	263	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 87
263	264	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; SC = 88
264	265	Silty sand; very fine to fine with some medium to coarse sand, silt; poorly sorted; subangular to subrounded; Pelona Schist; SC = 89
265	266	Silty sand; very fine to fine with some medium sand, silt; moderately sorted; subangular to subrounded; SC = 79
266	267	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; SC = 92
267	268	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 82
268	269	Sand; very fine to fine with some medium sand, silt; moderately sorted; subangular to subrounded; Pelona Schist; SC = 56
269	270	Silty sand; very fine with some fine sand, silt; well sorted; subangular to subrounded; SC = 95
270	271	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 100
271	272	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; SC = 88
272	273	Silty sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; SC = 72
273	274	Silty sand; very fine to fine with some medium to coarse sand, silt; poorly sorted; subangular to rounded; Pelona Schist; approximately* 8-mm thick clay layer; SC = 68
274	275	Sand; fine to medium with some very fine to coarse sand, silt; poorly sorted; subangular to subrounded; Pelona Schist; SC = 64
275	276	Silty sand; very fine to fine with some medium to coarse sand, silt, occasional granule-sized gravel; poorly sorted; subangular to subrounded; Pelona Schist; SC = 84
276	277	Silty sand; very fine to fine sand, silt, minor clay; moderately sorted; subangular to subrounded; SC = 152
277	278	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 121
278	279	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; SC = 146
279	280	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 96
280	281	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; SC = 95
281	283	Gravelly silty sand; very fine with occasional fine to medium sand, silt, minor gravel; well sorted; subangular to subrounded; SC = 109
283	285	Silty sand; very fine with some fine to medium sand, silt; well sorted; subangular to subrounded; SC = 89
285	287	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 87
287	289	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 88

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
289	291	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 90
291	293	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 102
293	295	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 82
295	297	Silty sand; very fine with occasional fine sand, silt; well sorted; subangular to subrounded; SC = 78
297	299	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 80
299	301	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 86
301	303	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 81
303	305	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 79
305	307	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; SC = 82
307	309	Silty sand; very fine with occasional fine sand, silt; well sorted; subangular to subrounded; SC = 76
309	311	Silty sand; very fine with occasional fine sand, silt; well sorted; subangular to subrounded; SC = 73
311	313	Sand; very fine to fine; well sorted; subangular to subrounded; quartz; Pelona Schist; SC = 71
313	315	Sand; very fine to fine with some medium sand, silt; well sorted; subangular to subrounded; quartz; Pelona Schist; SC = 68
315	317	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 86
317	319	Sand; very fine to medium sand, silt; moderately sorted; subangular to subrounded; quartz; Pelona Schist; SC = 72
319	321	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; Pelona Schist; SC = 79
318	320	Sand; very fine to fine with some medium sand, silt; moderately sorted; subangular to subrounded; SC = 84
320	322	Sand; very fine to fine with some medium to very coarse sand, silt; poorly sorted; subangular to subrounded; SC = 71
322	324	Silty sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; SC = 84
324	326	Silty sand; very fine to fine sand, silt; well sorted; subangular to subrounded; SC = 78
326	328	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; SC = 91
328	330	Silty sand; very fine with occasional fine sand, silt; well sorted; subangular to subrounded; SC = 79
330	332	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to rounded; SC = 79
332	334	Silty sand; very fine sand, silt; very well sorted; subangular to subrounded; SC = 92
334	336	Silty sand; very fine with occasional fine to medium sand, silt; well sorted; subangular to subrounded; SC = 110
336	338	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; SC = 85
338	340	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; SC = 85
340	342	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; SC = 84
342	344	Silty sand; very fine with some fine sand, silt; well sorted; subangular to subrounded; SC = 126
344	346	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; SC = 108
346	348	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; SC = 120
348	350	Silty sand; very fine sand, silt; well sorted; subangular to subrounded; SC = 85
350	352	Silty sand; very fine with some fine sand, silt; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 95
352	354	Sandy clayey silt; silt, with some clay and very fine sand; moderately sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 615
354	356	Clayey silty sand; very fine sand, silt and some clay; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); SC = 422

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
356	358	Clayey silty sand; very fine sand, silt and some clay; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); SC = 398
358	360	Gravelly silty sand; very fine to fine sand, silt, minor gravel; well sorted; subangular to subrounded; grayish brown (2.5Y 5/2); SC = 192
360	362	Sand; very fine to fine with occasional medium sand, silt; well sorted; subangular to subrounded; grayish brown (2.5Y 5/2); SC = 204
362	364	Sand; very fine to fine with some medium sand, silt; moderately sorted; subangular to subrounded; grayish brown (2.5Y 5/2); SC = 178
364	366	Sand; very fine to fine with some medium to coarse sand, silt; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); SC = 167
366	368	Sand; very fine to fine with some medium sand; well sorted; subangular to subrounded; light olive brown (2.5Y 5/3); Mojave River type deposit; SC = 85
368	370	Sand; very fine to medium; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); Mojave River type deposit; SC = 90
370	372	Sand; very fine to medium with occasional coarse sand, silt; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); Mojave River type deposit; SC = 116
372	374	Sand; very fine to medium sand, silt; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); Mojave River type deposit; SC = 109
374	376	Sand; very fine to medium with occasional coarse sand, silt; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); Mojave river type deposit; SC = 121
376	378	Sand; very fine to fine with some medium sand, silt; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); Mojave river type deposit; SC = 129
378	380	Sand; fine to coarse with some very fine to very coarse sand; moderately sorted; subangular to rounded; brown (10YR 5/3); quartz and pink feldspars; Mojave river type deposit; SC = 160
380	382	Sand; fine to coarse with some very fine to very coarse sand, occasional silt balls; moderately sorted; subangular to subrounded; brown (10YR 5/3); quartz and pink feldspars; Mojave river type deposit; SC = 165
382	384	Sand; fine to medium with some very fine to very coarse sand, silt; moderately sorted; subangular to subrounded; brown (10YR 5/3); quartz and pink feldspars; Mojave river type deposit; SC = 176
384	386	Sand; very fine to medium with some coarse sand, silt; moderately sorted; subangular to subrounded; brown (10YR 5/3); quartz and pink feldspars; Mojave river type deposit; SC = 160
386	388	Sand; fine to medium with some very fine and occasional coarse sand, silt; moderately sorted; subangular to subrounded; brown (10YR 5/3); quartz and pink feldspars; Mojave river type deposit; SC = 148
388	390	Sand; fine to medium with some very fine to coarse sand, silt; moderately sorted; subangular to subrounded; brown (10YR 5/3); quartz and pink feldspars; Mojave river type deposit; SC = 153
390	392	Sand; fine to medium with some very fine to coarse sand, silt; moderately sorted; subangular to subrounded; brown (10YR 5/3); quartz and pink feldspars; Mojave river type deposit; SC = 158
392	394	Silty sand; very fine to fine with some medium sand, silt; moderately sorted; subangular to subrounded; brown (10YR 5/3); quartz and pink feldspars; Mojave river type deposit; SC = 144
394	396	Silty sand; very fine to fine with some medium to coarse sand, silt; moderately sorted; subangular to subrounded; gray (5Y 5/1); some clay# >10%; SC = 137
396	398	Silty sand; very fine to fine with some medium to coarse sand, silt; moderately sorted; subangular to subrounded; gray (5Y 5/1); SC = 139
398	400	Slightly gravelly silty sand; fine to medium with some very fine to very coarse sand, silt, granule- to medium pebble-sized gravel; very poorly sorted; subangular to subrounded; olive gray (5Y 5/2); SC = 103

Table 2. Lithologic log for unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 3,227 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 285 feet and air rotary to 460 ft, January 2001, by U.S. Geological Survey using ODEX. Total depth drilled 460 ft. Well casings to 440 ft. Screened interval, 370-410 ft. Construction data and instrumentation given in *table 1* and *figure 7*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); >, greater than; <, less than]

Depth (ft)		Description
From	To	
400	402	Silty sand; very fine to fine with some medium to coarse sand, silt, occasional granule- to small pebble-sized gravel; poorly sorted; subangular to subrounded; olive gray (5Y 5/2); SC = 116
402	404	Silty sand; very fine to fine with some medium to coarse sand, silt; moderately sorted; subangular to subrounded; olive gray (5Y 5/2); SC = 108
404	406	Silty sand; very fine to fine with some medium sand, silt; moderately sorted; subangular to subrounded; olive gray (5Y 5/2); SC = 108
406	408	Silty sand; very fine to fine with some medium and occasional coarse sand, silt; moderately sorted; subangular to subrounded; olive gray (5Y 5/2); SC = 108
408	460	No samples collected due to drilling with foam

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
0	1	Sandy silt; silt with very fine to medium sand; poorly sorted, subangular to subrounded; olive (5Y 4/4); quartz, pelona schist, and $CaCO_3$ present; SC = 611
1	2	Sandy silt; silt with very fine to fine sand; poorly sorted; subangular to subrounded; olive (5Y 4/4); pelona schist and $CaCO_3$ present; SC = 714
2	3	Sand; very fine to fine sand with minor medium to coarse sand and some silt and trace clay; poorly sorted; angular to subrounded; brown (10YR 4/3); pelona schist and $CaCO_3$ present; slightly sticky; SC = 1,045
3	4	Sandy silt; silt with very fine sand and some fine to coarse sand and occasional gravel and approximately 15 percent clay; poorly sorted; subangular to subrounded; olive (5Y 4/3); pelona schist and $CaCO_3$ present; plastic; rolls to thin rod; SC = 1,176
4	5	Sandy silt; silt with very fine sand, minor gravel, fine to coarse sand, and approximately 15 percent clay; poorly sorted; subangular to subrounded; olive (5Y 4/3); sticky, can roll to a rod, pelona schist and $CaCO_3$ present; SC = 947
5	6	Sandy silt; silt with very fine to coarse sand, minor gravel and clay; poorly sorted; subangular to subrounded; olive (5Y 4/3); pelona schist and $CaCO_3$ present; SC = 1,005
6	7	Silty sand; very fine with some fine to medium sand, silt, >25 percent clay, occasional gravel; poorly sorted; subangular to subrounded; olive (5Y 4/3); pelona schist and $CaCO_3$ present, plastic rolls to thin rod and bends; SC = 891
7	8	Sandy silt; silt and very fine to fine sand clay, approximately 15 percent occasional gravel; moderately sorted; subangular to subrounded; olive (5Y 4/3); pelona schist and $CaCO_3$ present plastic rolls breaks when bent; SC = 874
8	9	Silty sand; very fine to very coarse with silt; poorly sorted; subangular to subrounded; olive (5Y 5/2); pelona schist present; SC = 643
9	10	Sandy silt; silt with very fine sand, minor fine to very coarse sand, occasional granule to small pebbles; poorly sorted; subangular to subrounded; olive (5Y 4/3); SC = 643
10	11	Sand; very fine to medium with some coarse to very coarse sand, occasional granule to medium pebbles, silt; poorly sorted; angular to subrounded; brown (7.5YR 4/4); pelona schist present, mostly quartz ,soil horizon, non sticky; non plastic; SC = 192
11	12	Sand; very fine to medium with some coarse to very coarse sand, occasional granule to medium pebbles, no silt; poorly sorted; angular to subrounded; brown (7.5YR 4/4); pelona schist present, mostly quartz, non sticky, non plastic; SC = 233
12	13	Sand; very fine to medium with some coarse to very coarse sand, minor granule to small pebbles, no silt; poorly sorted; brown (10YR 4/3); angular to subrounded; pelona schist present, mostly quartz, non sticky, non plastic, $CaCO_3$ present; SC = 165
13	14	Gravelly sand; very fine to medium with some coarse to very coarse sand, granules to small pebbles, silt; poorly sorted; angular to subrounded; yellowish brown (10YR 5/4); pelona schist present, non sticky, non plastic; SC = 148
14	15	Silty sand; very fine to fine with some medium to very coarse sand, minor granule to small pebbles, silt; poorly sorted; angular to subrounded; light olive brown (2.5Y 5/3); pelona schist present, non sticky, non plastic; SC = 206
15	16	Gravelly sand; fine to coarse with some very fine to very coarse, granules to medium pebbles, silt; poorly sorted; angular to subrounded; light yellowish brown (2.5Y 6/4); pelona schist present, $CaCO_3$ present; SC = 132
16	17	Gravelly sand; medium to coarse with some fine to very coarse, granules to large pebbles, some silt; poorly sorted; angular to subrounded; yellowish brown (10YR 5/4); pelona schist present; mostly quartz; SC = 77
17	18	Yellowish brown (10YR 5/4); SC = 110
18	19	Yellowish brown (10YR 5/4); SC = 110
19	20	Yellowish brown (10YR 5/4); SC = 125
20	21	Gravelly sand; fine to very coarse with some very fine sand, granules to medium pebbles, no silt; poorly sorted; angular to rounded; brown (7.5YR 4/4); pelona schist present, non plastic; SC = 114

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
21	22	Gravelly sand; medium to very coarse with some very fine to fine sand, granules to large pebbles, trace silt; poorly sorted; angular to subrounded; strong brown (7.5YR 4/6);pelona schist present; non sticky, non plastic; SC = 187
22	23	Gravelly sand; fine to coarse with some very fine to very coarse sand, granules to medium pebbles, trace silt; poorly sorted; angular to subrounded; brown (7.5YR 4/4); pelona schist present, non sticky, non plastic; SC = 182
23	24	Gravelly sand; fine to very coarse with some very fine sand, granules to large pebbles, silt; poorly sorted; angular to rounded; dark yellowish brown (10YR 4/4); pelona schist present, slightly sticky, non plastic; SC = 95
24	25	Gravelly sand; fine to coarse with some very fine to very coarse sand, granules to small pebbles, similar to above; poorly sorted; angular to rounded; olive brown (2.5Y 4/4); pelona schist present; SC = 66
25	26	Gravelly sand; fine to coarse with some very fine sand, granules to large pebbles, silt; poorly sorted; subangular to rounded; strong brown (7.5YR 4/6); pelona schist present, slightly sticky, non plastic; SC = 64
26	27	Gravelly sand; fine to coarse with some very coarse sand, granule to small pebbles, silt; poorly sorted; subangular to rounded; dark gray (7.5YR 4/1); pelona schist present, slightly sticky, non plastic, rework alluvial deposits – last 25'; SC = 65
27	28	Dark gray (7.5YR 4/1); SC = 65
28	29	Dark gray (7.5YR 4/1); SC = 65
29	30	Strong brown (7.5YR 4/6); SC = 30
30	31	Gravelly sand; fine to coarse with some very fine to very coarse sand, granules to medium pebbles, silt; poorly sorted; subangular to subrounded; strong brown (7.5YR 4/6); pelona schist present, slightly sticky, non plastic, rework alluvial fan; SC = 47
31	32	Gravelly sand; medium to coarse with some very coarse sand, granules to medium pebbles; poorly sorted; subangular to subrounded; dark brown (7.5YR 3/4); present abundant pelona schist; SC = 39
32	33	Gravelly sand; medium to coarse with some very coarse sand, granules to medium pebbles, some silt; poorly sorted; subangular to subrounded; strong brown (7.5YR 4/6); abundant pelona schist present; SC = 54
33	34	Gravelly sand; medium to coarse with some very coarse sand, granules to large pebbles; poorly sorted; rounded to subangular; brown (7.5YR 4/4); abundant pelona schist present, rework fan deposit; SC = 52
34	35	Gravelly sand; medium to coarse with some very coarse sand, granules to medium pebbles, silt, trace clay; poorly sorted; subangular to rounded; brown (10YR 4/3); abundant pelona schist present, slightly sticky; rework; SC = 60
35	36	Gravelly sand; medium to coarse with minor very coarse sand, granules to large pebbles, some silt; poorly sorted; rounded to subangular; strong brown (7.5YR 4/6); pelona schist present, slightly sticky, rework; SC = 40
36	37	Gravelly sand; fine to medium sand, minor gravel and silt; moderately sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); pelona schist present, rework; SC = 49
37	38	Dark yellowish brown (10YR 4/6) SC = 64
38	39	Sand, some coarse, some gravel, silt, medium; moderately sorted; dark yellowish brown (10YR 4/6); sticky; slightly plastic; white salty grains; SC = 64
39	40	Sand, medium to coarse, some gravel, silt; moderately sorted; dark yellowish brown (10YR 4/6); sticky; slightly plastic; white salty grains; SC = 39
40	41	Sand; medium to coarse with some fine sand, silt; well sorted; subangular to subrounded; yellowish brown (10YR 5/6); MRS, sand, possible Mojave River Sand Deposits; white quartz; no pelona schist; soil horizon 40' to 42'; SC = 34
41	42	Sand; fine to medium with minor very fine sand, few large gravels; well sorted; subangular to subrounded; reddish brown (5YR 5/4); Mojave River Sand Deposits, white salty quartz; no pelona schist; SC = 34
42	43	Sand; medium to coarse with some fine sand, trace silt; well sorted; subangular to subrounded; yellowish red (5YR 5/6); Mojave River Sand Deposits, non sticky; non plastic; quartz; no pelona schist; SC = 37
43	44	Sand; medium to coarse with some fine to very coarse; moderately well sorted; subangular to subrounded; strong brown (7.5YR 5/6); Mojave River Sand Deposits; SC = 32

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
44	45	Sand; medium to coarse with some fine, little silt; well sorted; subangular to rounded; strong brown (7.5YR 5/6); Mojave River Sand Deposits, non sticky; non plastic; SC = 58
45	46	Sand; medium to coarse with some fine sand, silt, few gravel; moderately well sorted; subangular to subrounded; strong brown (7.5YR 5/6); Mojave River Sand Deposits; SC = 40
46	47	Clayey silt; silt with some clay and very fine sand; well sorted; reddish brown (2.5Y 5/3); silt with clay to clayey silt last half, change from sand to clay occurs in this interval; SC = 53
47	48	reddish brown (2.5Y 5/3); SC = 110
48	49	Clay; >25 percent clay; reddish brown (2.5Y 5/3); very sticky; very plastic, rolls and bends; positive on acid test; white flakes that fizz with acid; SC = 110
49	50	Clay; >25 percent clay reddish brown (2.5Y 5/3); very sticky; very plastic, rolls and bends; positive on acid test; white flakes that fizz with acid; SC = 90
50	51	Silty sand; very fine to fine sand with silt, minor medium sand, clay lens, silt, clay > 25 percent; moderately sorted; subangular to subrounded; brown (10YR 4/3); Mojave River Sand deposits; very sticky; plastic, rolls and bends; white gravels fizz with acid; some schist fragments; some pink K-spar; SC = 111
51	52	Sand; very fine to fine with minor medium to very coarse sand ,silt, clay approximately 15 percent; well sorted; subangular to subrounded; brown (7.5YR 4/4); Mojave River Sand Deposits; sticky; plastic, rolls, breaks on bend; blocky; SC = 91
52	53	Silty sand; very fine sand and silt; well sorted; subangular to subrounded; reddish brown (5YR 4/4); Mojave River deposits, lens of clay, silt, fine sand, clay > 25 percent; very sticky; plastic, rolls and bends; blocky; SC = 144
53	54	Silty sand; very fine sand and silt; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); some clay balls, Mojave River Sand Deposits; SC = 135
54	55	Silty sand; very fine sand and silt; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); clays (lens), mixed with Mojave River Sand Deposits; SC = 152
55	56	Sand; very fine to fine with minor medium to coarse sand; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); Mojave River Sand Deposits; SC = 75
56	57	Silty sand; very fine to fine with minor medium sand, silt; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); Mojave River Sand Deposits; dry unit, clay lens; SC = 94
57	58	Sand; fine to medium sand; well sorted; subangular to subrounded; yellowish brown (10YR 5/4); Mojave River Sand Deposits; SC = 54
58	59	Core interval, >25 percent clay; brown (10YR 4/3); rolls to thin bendable rod; white nodules; crushable; do not fizz with acid; very hard drilling; SC = 126
59	60	Core interval, >25 percent clay; brown (10YR 4/3); rolls to thin bendable rod; white nodules; crushable; do not fizz with acid; very hard drilling; SC = 52
60	61	Sandy clay; clay with some very fine to medium sand, silt, clay; poorly sorted; subangular to subrounded; dark grayish brown (10YR 4/2); white nodules; no fizz; blocky; hard drilling; SC = 126
61	62	Sand; very fine to fine with minor medium sand; well sorted; subangular to subrounded; Mojave River Sand Deposits; brown (10YR 4/3); SC = 65
62	63	Sand; fine with minor very fine to medium sand, silt, clay >15 percent; well sorted; subangular to subrounded; brown (10YR 4/3); Mojave River Sand Deposits; rolls to thin rod, breaks on bending; SC = 54
63	64	Sand; very fine with minor fine sand, silt, clay >15 percent; well sorted; subangular to subrounded; brown (10YR 4/3); Mojave River Sand Deposits; SC = 98
64	65	Sand; fine with some very fine to medium sand, and silts; well sorted; subangular to subrounded; brown (10YR 4/3); Mojave River Sand Deposits; SC = 70

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
65	66	Sand; fine to medium with some very fine to coarse sand, occasional granule to small pebbles, silt, trace clay; poorly sorted; subangular to subrounded; brown (10YR 4/3); Mojave River Sand Deposits; SC = 69
66	67	Sand; fine to medium with some very fine sand, silt and 25 percent clay; well sorted; subangular to subrounded; brown (10YR 4/3); Mojave River Sand Deposits; quartz; SC = 48
67	68	Sand; fine to medium with minor very fine to coarse sand, occasional granule to small pebbles; moderately sorted; subangular to subrounded; brown (10YR 4/3); Mojave River Sand Deposits; SC = 74
68	69	Core interval, fine sand, silt, clay >25 percent; brown (10YR 4/3); rolls and bends; SC = 101
69	70	Core interval, fine sand, silt, clay >25 percent; brown (10YR 4/3); rolls and bends; SC = 135
70	71	Silty sand; very fine sand and silt, minor fine and medium sand, minor clay; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); Mojave River Sand Deposits, clay balls; SC = 124
71	72	Sandy silt; silt with very fine to coarse sand; poorly sorted; subangular to subrounded; brown (10YR 4/3); clay chunks; SC = 114
72	73	Sandy silt; silt with very fine to fine sand and minor medium to very coarse sand, occasional granule to small pebbles; poorly sorted; subangular to rounded; yellowish brown (10YR 5/4); some pelona schist gravels; SC = 73
73	74	Silty sand; very fine sand and silt, occasional fine to coarse sand; well sorted; subangular to subrounded; brown (7.5YR 5/3); shines when pressed; SC = 172
74	75	Sand; fine to medium with some very fine to coarse sand, silt, trace clay; moderately sorted; subangular to subrounded; brown (7.5YR 4/4); Mojave River Sand deposits; some large chunks white caliche; SC = 126
75	76	Sand; very fine to coarse sand, little silt or clay; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); Mojave River Sand deposits, quartz with pink f-spars; very clean; SC = 87
76	77	Sand; very fine to very coarse, minor granules, silt; poorly sorted; angular to rounded; medium sand; well sorted; yellowish brown (10YR 5/4); Mojave River Sand deposits, quartz with pink f-spar; SC = 100
77	78	Sand; very fine with some fine to medium sand, silt, some gravel, clay >25 percent; moderately sorted; subangular to rounded; brown (10YR 5/3); some pelona gravels; SC = 159
78	79	Core interval, fine sand, silt, clay approximately 15 percent; well sorted; dark yellowish brown (10YR 4/4); white crushable nodules; SC = 135
79	80	Core interval, fine sand, silt, clay approximately 15 percent; well sorted; dark yellowish brown (10YR 4/4); white crushable nodules; SC = 105
80	81	Sand; fine to medium with some coarse to very coarse sand, granules to small pebbles; moderately sorted; subangular to rounded; yellowish brown (10YR 5/4); white nodules; SC = 84
81	82	Sand; fine to medium with some coarse to very coarse sand, occasional granule to small pebbles; poorly sorted; subangular to subrounded; pale brown (10YR 6/3); SC = 73
82	83	Silty sand; fine to medium with some coarse to very coarse sand, silt; poorly sorted; subangular to subrounded; brown (10YR 5/3); change in interval to higher fine content, moister material; SC = 187
83	84	Silty sand; very fine to fine sand with silt, minor medium to coarse sand, clay; moderately sorted; subangular to subrounded; brown (10YR 5/3); clay balls and chunks present; rollable; SC = 191
84	85	Silty sand; very fine to fine sand and silt, occasional medium sand, clay >25 percent; moderately sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); rolls to fine bendable rod; crushable white nodules; SC = 143
85	86	Silty sand; very fine to fine sand and silt, clay >25 percent; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/6); rolls to bendable rod; few crushable nodules; SC = 47
86	87	Sand; very fine to medium sand, some silt, clay approximately 15 percent; well sorted; subangular to subrounded; yellowish brown (10YR 5/4); sticky; rolls, breaks when bent; many white salty flakes; SC = 108
87	88	Sand; fine to medium with some very fine to coarse sand, some silt, clay; moderately sorted; subangular to subrounded; brown (7.5YR 5/6); few pink f-spar gravels; core compacted a little; SC = 80

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
88	89	Core interval, fine sand, some silt, trace clay; reddish brown (5YR 5/4); slightly sticky; white "salty"; SC = 120
89	90	Core interval, fine sand, some silt, trace clay; reddish brown (5YR 5/4); slightly sticky; white "salty"; SC = 110
90	91	Clayey sand; very fine to fine sand and clay, occasional medium sand, silt, some clay balls, occasional small gravels; moderately sorted; subangular to subrounded; reddish brown (5YR 5/4); SC = 166
91	92	Clayey sand; very fine to fine sand and clay > 25 percent, minor medium sand, silt; poorly sorted; subangular to rounded; reddish brown (5YR 5/4); rolls to fine bendable rod; occasional pink f-spars; SC = 128
92	93	Silty sand; very fine to fine sand and silt; well sorted; subangular to subrounded; strong brown (7.5YR 5/6); SC = 156
93	94	Clayey sand; very fine sand and clay > 25 percent, minor fine to medium sand, silt; moderately sorted; subangular to subrounded; brown (7.5YR 5/4); SC = 153
94	95	Sand; fine to coarse with some very fine to very coarse sand; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); Mojave River Sand Deposits, quartz; pink f-spars, hematite; SC = 78
95	96	Silty sand; fine to medium with some coarse to very coarse sand, occasional granule to small pebbles; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); SC = 85
96	97	Sand; medium to coarse with some fine to very coarse sand, granules to small pebbles; poorly sorted; subangular to subrounded; yellowish brown (10YR 5/4); Mojave River Sand deposits, quartz; pink f-spars; hematite; SC = 84
97	98	Gravelly sand; medium to coarse sand with some granules to small pebbles; poorly sorted; subangular to subrounded; yellowish brown (10YR 5/4); SC = 74
98	99	Mojave River Sand deposits, some clay balls, sand, fine to medium; yellowish brown (10YR 5/4); SC = 165
99	100	Mojave River Sand deposits, some clay balls, sand, fine to medium; yellowish brown (10YR 5/4); SC = 106
100	101	Sand; medium to very coarse, occasional granule to small pebble; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); Mojave River Sand Deposits, SC = 108
101	102	Sand; fine to coarse, minor very coarse sand to granules; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); Mojave River Sand deposits; SC = 110
102	103	Silty sand; very fine to fine sand and silt with some medium sand; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); Mojave River Sand Deposits, blocky; SC = 193
103	104	Sandy silt; silt with some very fine sand, clay present; well sorted; subangular to subrounded; brown (10YR 4/3); clay chunks; some pelona schist gravel; SC = 175
104	105	Silty sand; very fine to fine with minor medium to coarse sand, silt; moderately sorted; subangular to subrounded; brown (10YR 5/3); SC = 178
105	106	Sand; very fine to fine with minor medium to coarse sand; well sorted; angular to subrounded; yellowish brown (10YR 5/4); SC = 59
106	107	Silty sand; very fine sand and silt with occasional fine to coarse sand, clay blocks present; well sorted; subangular to subrounded; brown (10YR 4/3); clay blocks; SC = 157
107	108	Sand; very fine to fine with occasional medium to coarse sand; well sorted; subangular to rounded; brown (10YR 4/3); SC = 114
108	109	Sand; very fine to fine, minor medium to coarse; well sorted; subangular to subrounded; brown (10YR 4/3); SC = 164
109	110	Silt; minor very fine sand, clay 15 percent; well sorted; subangular to subrounded; brown (10YR 4/3); rolls, doesn't bend; SC = 168
110	110	Silt; clay <25 percent; rolls and bends; SC = 168
110	111	Sandy silt; silt with minor very fine to medium sand; well sorted; subangular to subrounded; brown (10YR 4/3); SC = 180
111	112	Sandy silt; silt with some very fine to coarse sand; well sorted; subangular to subrounded; brown (10YR 4/3); SC = 200

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
112	113	Silty clay; clay > 25 percent and silt with minor very fine to medium sand; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); very slow drilling; SC = 220
113	114	Silt; with minor very fine sand, clay; well sorted; subangular to subrounded; brown (10YR 5/3); SC = 164
114	115	Sandy silt; silt with very fine sand, some fine to medium sand, clay; well sorted; subangular to subrounded; brown (10YR 5/3); drilling still slow; lost most of sample – blows from cyclone; SC = 194
115	116	Sandy silt; silt with very fine sand, clay; well sorted; subangular to subrounded; brown (10YR 5/3); SC = 148
116	117	Silt; minor very fine sand, clay; well sorted; clay; brown (10YR 4/3); drilling slightly faster and still slow; SC = 160
117	118	Silty sand; very fine to coarse sand and some silt; poorly sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); non sticky; non plastic; SC = 135
118	119	Silty sand; very fine to coarse sand with some silt, granules to small pebbles; poorly sorted, trace clay; angular to rounded; yellowish brown (10YR 5/6); slightly sticky; non plastic; SC = 145
119	120	Gravelly sand; medium to coarse with some fine to very coarse sand, granules to medium pebbles, no silt; poorly sorted; angular to rounded; yellowish brown (10YR 5/4); non sticky; non plastic
120	121	Sand; medium to coarse with some fine to very coarse, granules to large pebbles, some silt, trace clay; poorly sorted; angular to rounded; dark yellowish brown (10YR 4/4); slightly sticky; non plastic; SC = 103
121	122	Sand; fine to medium, minor very fine sand, occasional large pebbles, some silt, trace clay; well sorted; subangular to rounded; brown (7.5YR 5/3); sticky; non plastic; SC = 113
122	123	Sand; fine to medium with some very fine to very coarse, occasional granule to large pebbles, trace silt; poorly sorted; subangular to rounded; brown (7.5YR 4/4); non plastic; SC = 120
123	124	Gravelly sand; fine to coarse with some very coarse sand, granules to medium pebbles, silt; poorly sorted; subangular to rounded; yellowish brown (10YR 5/4); sticky; non plastic; SC = 116
124	125	Sand; fine to coarse with occasional granule to medium pebbles, silt trace clay; poorly sorted; angular to rounded; light olive brown (2.5Y 5/4); slightly sticky; SC = 107
125	126	Gravelly sand; fine to coarse with some very coarse sand, granule to medium pebbles, silt; poorly sorted; subangular to rounded; light olive brown (2.5Y 5/3); SC = 100
126	127	Sand; very fine to very coarse with occasional granule to medium pebbles, silt; poorly sorted; angular to rounded; light olive brown (2.5Y 5/4); matrix plastic and rolls but doesn't bend; SC = 122
127	128	Silty sand; fine to medium with some very fine to coarse sand, silt approximately 15 percent clay, occasional gravel; poorly sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); sticky; plastic, rolls but doesn't bend; SC = 191
128	129	Sand; fine to coarse with some very coarse sand, occasional granule to small pebbles, silt; moderately sorted; subangular to subrounded; olive brown (2.5Y 4/4); quartz with pink f-spars and hematite; non sticky; non plastic; a few pelona schist fragments; SC = 191
129	130	Sand; fine to coarse, occasional very coarse, silt; poorly sorted; subangular to subrounded; olive brown (2.5Y 4/4); less sample recovery; white salty pieces; SC = 198
130	131	Silty sand; very fine to medium with some coarse sand, silt, clay pebbles are <15 percent, occasional granule to small pebbles; moderately sorted; subangular to subrounded; olive brown (2.5Y 4/3); sticky, slightly plastic, few large pelona schist gravels, white salty; SC = 112
131	132	Sandy silt; silt with very fine to medium sand, occasional coarse to very coarse sand; moderately sorted; subangular to subrounded; olive brown (2.5Y 4/3); white salty chunks, blocky chunks; SC = 226
132	133	Sand; very fine to fine, silt, clay approximately 15 percent; well sorted; subangular to subrounded; dark grayish brown (10YR 4/2); sticky, plastic, rolls break, occasional crushable yellow balls; SC = 115

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
133	134	Silty sand; very fine to fine with occasional medium sand, silt; moderately sorted; subangular to subrounded; dark grayish brown (10YR 4/2); sticky, slightly plastic, difficult to roll, occasional salty flakes, small gravels and pink K-spars; SC = 102
134	135	Silty sand; very fine to fine, some medium to coarse sand, silt, occasional gravel; moderately sorted; subangular to subrounded; dark grayish brown (10YR 4/2); blocky chunks; SC = 100
135	136	Clayey silt; silt with 15-20 percent clay, some very fine sand, few coarse sand; moderately sorted; subangular to subrounded; dark brown (10YR 3/3); sticky, plastic, rolls, breaks on bending; blocky crushable tan balls; SC = 91
136	137	Sandy silt; silt with very fine to coarse sand, 15-25 percent clay; poorly sorted; subangular to subrounded; brown (10YR 4/3); sticky, plastic, rolls, bends on breaking; SC = 81
137	138	Sandy silt; silt with very fine to fine sand, clay >25 percent; moderately sorted; angular to subrounded; olive brown (2.5Y 4/3); very sticky, very plastic, rolls and bends; non gritty; SC = 178
138	139	Sandy silt; silt with minor very fine to medium sand, clay >25 percent; few small gravels; moderately sorted; subangular to subrounded; olive brown (2.5Y 4/4); very sticky, plastic, rolls and bends, few crushable balls; SC = 178
139	140	Clay; with some silt and very fine to fine sand; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); SC = 215
140	141	Silty clay; clay and silt with minor very fine to medium sand, minor coarse sand; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); SC = 169
141	142	Silty clay; clay and silt with minor very fine to medium sand; moderately sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); blocky; SC = 182
142	143	Silty clay; clay and silt with some very fine to medium sand, some clay balls; moderately sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); SC = 199
143	144	Clayey silt; silt and clay with minor very fine sand, occasional fine to medium sand; well sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); SC = 179
144	145	Sandy silt; silt with some very fine to coarse sand, clay approximately 15 percent; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); slightly sticky, plastic, rolls, does not bend; SC = 181
145	146	Sandy silt; silt with some very fine to coarse sand; poorly sorted; subangular to subrounded; as above; yellowish brown (10YR 5/4); SC = 148
146	147	Sandy silt; silt with some very fine to coarse sand; poorly sorted; subangular to subrounded; as above; yellowish brown (10YR 5/4); SC = 156
147	148	Sandy silt; silt with some very fine to medium sand; poorly sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); SC = 134
148	149	Silt; occasional very fine to fine sand; well sorted; dark yellowish brown (10YR 4/4); SC = 138
149	150	Sandy silt; silt with some very fine to medium sand, clay >25 percent, occasional coarse sand; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); sticky, plastic, rolls, bends; SC = 142
150	151	Silt; minor very fine to fine sand, 25 percent clay, occasional gravel; well sorted; subangular to subrounded; yellowish brown (10YR 5/4); sticky, plastic, rolls, does not bend, SC = 246
151	152	Sandy silt; silt with minor very fine to coarse sand, approximately 15 percent clay, some gravel; moderately sorted; subangular to subrounded; brown (10YR 5/3); sticky, plastic, rolls, breaks; SC = 177
152	153	Sandy silt; silt with some very fine to coarse sand, approximately 15 percent clay, few gravels; poorly sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); sticky, plastic, rolls, breaks, blocky clays; SC = 140
153	154	Gravelly sand; very fine to very coarse sand with some granules to medium pebbles, silt, approximately 5 percent clay; poorly sorted; subangular to rounded; brown (7.5YR 5/4); sticky, non plastic, forms balls; SC = 82
154	155	Sandy silt; silt with very fine to very coarse sand, granule to small pebbles, approximately 5 percent clay; poorly sorted; subangular to rounded; brown (7.5YR 5/3); sticky, non plastic, forms balls; SC = 97

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
155	156	Silty sand; very fine to very coarse sand, silt, granules to small pebbles, approximately 5 percent clay; poorly sorted; subangular to subrounded; brown (7.5YR 5/3); sticky, non plastic, forms balls; SC = 85
156	157	Silty sand; very fine to fine with some medium to very coarse sand, silt, granules, approximately 5 percent clay; poorly sorted; subangular to subrounded; brown (7.5YR 5/3); sticky, non plastic, forms balls; SC = 70
157	158	Silty sand; very fine to medium with some coarse to very coarse sand, silt, occasional granule to small pebbles, approximately 5 percent clay; poorly sorted; angular to subrounded; brown (7.5YR 5/3); sticky, non plastic, forms balls; SC = 72
158	159	Silty sand; very fine to very coarse sand, silt, occasional granule to small pebbles, some silt, approximately 5 percent clay; moderately sorted; subangular to subrounded; brown (7.5YR 5/3); Mojave River Sand Deposits, slightly sticky, non plastic, balls up, very clean; SC = 69
159	160	Sand; fine to medium with some very fine to very coarse sand, silt, approximately 5 percent clay; moderately sorted; subangular to rounded; brown (7.5YR 5/2); sticky, non plastic, balls up, clean; Mojave River Sand Deposits; SC = 64
160	161	Gravelly sand; fine to medium with some very fine to very coarse sand, granules to large pebbles, silt, trace clay; poorly sorted; angular to rounded; brown (7.5YR 5/3); slightly sticky; non plastic, poorly balls, some pelona schist fragments, Mojave River Sand Deposits, large rounded gravels very abundant in bucket; SC = 84
161	162	Sand; coarse with some fine to very coarse, silt, granules; moderately sorted; subangular to rounded; light yellowish brown (10YR 6/4); slightly sticky, non plastic, poorly cohesive, clean, some pelona schist fragments; SC = 25
162	163	Sand; fine to coarse with some very fine to very coarse sand, silt, trace clay; moderately sorted; subangular to subrounded; light yellowish brown (10YR 6/4); slightly sticky, non plastic, poorly cohesive; SC = 72
163	164	Silty sand; fine to medium with some very fine to very coarse sand, silt, 25 percent clay; poorly sorted; angular to subrounded; light yellowish brown (10YR 6/4); sticky, plastic, rolls and bends, changes in interval from above; SC = 98
164	165	Silt; with minor very fine to medium sand, clay >25 percent, very large rounded gravels at bottom of bucket; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); very sticky, plastic, rolls and bends, cohesive; SC = 138
165	166	Sandy silt; silt with very fine to coarse sand, occasional very coarse sand, approximately 5 percent clay; poorly sorted; angular to subrounded; olive brown (2.5Y 4/3); sticky, non plastic, cohesive; SC = 93
166	167	Sandy silt; silt with very fine to very coarse sand, approximately 5 percent clay; poorly sorted; subangular to rounded;; light olive brown (2.5Y 5/3); sticky, non plastic, cohesive; SC = 106
167	168	Sandy silt; silt with fine to coarse sand, approximately 5 percent clay; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); sticky; non plastic, cohesive; SC = 138
168	169	Sandy silt; silt with fine to medium and some very fine sand; poorly sorted; subangular to subrounded; silt, some very fine to fine, approximately 15 percent clay; olive brown (2.5Y 4/3); sticky, plastic, rolls, bends, cohesive, few white salty flakes; SC = 122
169	170	Sandy silt; silt with very fine to fine sand, occasional medium to very coarse sand, clay; moderately sorted; subangular to subrounded; silt, clay >25 percent, some sand, very fine to fine; clay chunks; olive brown (2.5Y 4/3); sticky; plastic, rolls and bends, cohesive, common white salty flakes; SC = 147
170	171	Sand; very fine to fine, occasional medium to coarse sand, silt; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); sticky, plastic, rolls, breaks on bending, cohesive, common white salty flakes, Mojave River Sand Deposits, few pink f-spars in coarse sand range; SC = 131
171	172	Silty sand; very fine to fine with minor medium to coarse sand, silt; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); sticky, slightly plastic, sort of rolls, breaks on bending; cohesive; SC = 101
172	173	Sandy silt; silt with very fine sand to fine sand, clay >25 percent; well sorted; subangular to subrounded; grayish brown (2.5Y 5/2); sticky, plastic, rolls and bends, cohesive; SC = 112
173	174	Silty sand; very fine with occasional fine to coarse sand, silt, clay approximately 15 percent; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); sticky, plastic, rolls and breaks, cohesive, some chunks, occasional white flakes; SC = 120

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
174	175	Silt; with some very fine to fine sand, clay >25 percent; well sorted; subangular to subrounded; brown (10YR 4/3); sticky, plastic, rolls and bends, cohesive; SC = 102
175	176	Silty sand; very fine to fine sand and silt, minor medium sand, clay approximately 15 percent; moderately sorted; subangular to subrounded; brown (10YR 4/3); sticky, plastic, rolls, breaks, cohesive; SC = 73
176	177	Silty sand; very fine to fine with minor medium sand, silt, occasional rounded gravel, clay <15 percent; moderately sorted; subangular to subrounded; dark yellowish brown (10YR 4/4); sticky, slightly plastic, sort of rolls, breaks, cohesive; SC = 80
177	178	Sandy silt; silt with very fine sand, minor fine to medium sand, clay 5-15 percent; moderately sorted; subangular to subrounded; brown (10YR 4/3); occasional clay balls, sticky, slightly plastic, rolls with difficulty, cohesive; SC = 92
178	179	Sand; fine with some very fine to very coarse, silt, trace clay, occasional granule to small pebble; poorly sorted; angular to subrounded; yellowish brown (10YR 5/4); Mojave River Sand Deposits, non sticky, non plastic, slightly cohesive, clean, many p f-spars; SC = 116
179	180	Sand; fine to coarse with some very coarse, silt, trace clay; poorly sorted; angular to subrounded; brown (10YR 4/3); non sticky, non plastic, poorly cohesive; SC = 91
180	181	Silty sand; very fine to very coarse sand, silt, occasional granule to small pebble, trace clay; poorly sorted; subangular to subrounded;; olive brown (2.5Y 4/3); non sticky, non plastic, poorly cohesive, clean, occasional pelona schist gravel; SC = 93
181	182	Silty sand; very fine to fine with some medium to coarse sand, occasional very coarse sand, silt, trace clay; poorly sorted; subangular to subrounded;; light olive brown (2.5Y 5/3); non sticky, non plastic, cohesive, occasional white salty flakes, occasional gravel of pelona schist; SC = 91
182	183	Silt; with some very fine to fine sand, minor medium sand; well sorted; subangular to subrounded; light olive brown (2.5Y 5/3); Mojave River Sand Deposits, sticky, plastic, rolls and breaks, cohesive, some white salty flakes, occasionally blocky; SC = 97
183	184	Sandy silt; silt with some very fine to coarse sand; poorly sorted; subangular to subrounded; light olive brown (2.5Y 5/3); Mojave River Sand deposits, sticky, non plastic, cohesive; SC = 87
184	185	Silt; with some fine to medium sand; well sorted; subangular to subrounded; silt; light olive brown (2.5Y 5/3); sticky, plastic, rolls and breaks, cohesive, not gritty; SC = 132
185	186	Silt; with some very fine to fine sand, occasional medium sand, clay approximately 15 percent; well sorted; subangular to subrounded; light olive brown (2.5Y 5/3); sticky, plastic, rolls, breaks, cohesive, gritty; abundant blocky chunks; SC = 133
186	187	Silt; with some very fine sand, with occasional fine sand, approximately 15 percent clay; well sorted; subangular to subrounded;; light olive brown (2.5Y 5/3); sticky, plastic, rolls and breaks, cohesive, gritty; SC = 142
187	188	Sand; fine to medium with some very fine to very coarse, silt; moderately sorted; subangular to rounded; light olive brown (2.5Y 5/3); Mojave River Sand Deposits, slightly sticky, non plastic, cohesive; SC = 76
188	189	Sandy silt; silt with some very fine to fine sand, occasional medium sand, clay >25 percent; moderately sorted; subangular to subrounded; light olive brown (2.5Y 5/3); sticky, plastic, rolls and bends, cohesive; SC = 216
189	190	Silt; silt, no sand; well sorted; light olive brown (2.5Y 5/3); SC = 188
190	191	Silt; some very fine to fine sand; well sorted; subangular to subrounded; olive brown (2.5Y 4/3); SC = 180
191	192	Sandy silt; silt with very fine to medium; moderately sorted; subangular to subrounded; silt, clay >25 percent, abundant clay balls; light olive brown (2.5Y 5/3); very sticky, very plastic, rolls and bends; SC = 205
192	193	Sand; very fine with occasional fine to coarse sand, silt, clay approximately 15 percent; well sorted; angular to subrounded; light olive brown (2.5Y 5/3); Mojave River Sand Deposits, slightly sticky, plastic, bends but breaks, cohesive, abundant pink f-spars; SC = 92
193	194	Silty sand; very fine with occasional fine sand, silt, occasional large pebble silt, clay >25 percent; moderately sorted; subangular to rounded; light olive brown (2.5Y 5/3); very sticky, plastic, rolls and bends, cohesive; SC = 141

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
194	195	Sand; very fine, minor fine; well sorted; subangular to subrounded; sand, fine; well sorted; dark grayish brown (10YR 4/2); same as above, abundant mica; SC = 84
195	196	Sand; fine, silt; well sorted; dark grayish brown (10YR 4/2); abundant mica; SC = 99
196	197	Silt; with occasional fine to medium sand; well sorted; subangular to subrounded; as above; light olive brown (2.5Y 5/3); few mica; SC = 156
197	198	Silt; with minor very fine to fine sand; well sorted; subangular to subrounded; as above; light olive brown (2.5Y 5/3); some mica; SC = 94
198	199	Silt; with minor very fine to fine sand; well sorted; subangular to subrounded; No sample
199	200	Silty sand; very fine to medium with minor coarse and very coarse sand, silt; poorly sorted; angular to subrounded; dark yellowish brown (10YR 4/4); SC = 93
200	201	Silty sand; very fine to fine with some medium to very coarse sand, silt; poorly sorted; subangular to subrounded; brown (10YR 4/3); SC = 112
201	202	Sand; very fine to fine with some medium to very coarse, silt, occasional granule; poorly sorted; subangular to rounded; yellowish brown (10YR 5/6); SC = 73
202	203	Sand; very fine with some fine to coarse, silt; poorly sorted; subangular to subrounded; yellowish brown (10YR 5/6); SC = 87
203	204	Sand; fine to medium with some very fine to very coarse sand, occasional granule; poorly sorted; angular to subrounded; yellowish brown (10YR 5/4); SC = 51
204	205	Sand; fine to medium with some coarse to very coarse sand, occasional granule to medium pebbles; poorly sorted; subangular to rounded; yellowish brown (10YR 5/4); SC = 46
205	206	Gravelly sand; medium to very coarse with some fine sand, granule to large pebbles; poorly sorted; angular to rounded; yellowish brown (10YR 5/4); SC = 31
206	207	Gravelly sand; medium to very coarse with some fine sand, granule to small pebbles; poorly sorted; angular to rounded; yellowish brown (10YR 5/4); SC = 37
207	215	No sample collected
215	216	Sand; medium to coarse with some fine to very coarse, occasional granule; moderately sorted; angular to subrounded; yellowish brown (10YR 5/4)
216	217	Sandy silt; silt with very fine to fine sand, minor medium sand, occasional granule; poorly sorted; subangular to rounded; yellowish brown (10YR 5/4)
217	218	Sand; fine to medium, some coarse sand, silt; moderately sorted; subangular to subrounded; dark yellowish brown (10YR 4/4)
218	219	No sample collected; dark yellowish brown (10YR 4/4)
219	220	Silt; with minor very fine to medium sand, occasional granule to medium pebble; well sorted; subangular to subrounded; yellowish brown (10YR 5/4); SC = 63
220	221	Sandy silt; silt with some very fine to very coarse sand; poorly sorted; subangular to rounded; strong brown (7.5YR 5/6); SC = 96
221	222	Sandy silt; silt with very fine to coarse sand, occasional granule; poorly sorted; angular to subrounded; strong brown (7.5YR 5/6); SC = 65
222	223	Silty sand; very fine to very coarse sand and silt; poorly sorted; subangular to rounded; brown (7.5YR 4/4); SC = 48
223	224	Silty sand; very fine to medium with some coarse sand, silt; poorly sorted; subangular to subrounded; brown (7.5YR 4/4); SC = 49
224	225	Silty sand; very fine to very coarse sand and silt; poorly sorted; subangular to subrounded; yellowish brown (10YR 5/4); SC = 53

Table 3. Lithologic log for unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) in Victorville, San Bernardino County, California.—Continued

[Site locations are shown in *figure 1*. Altitude of land surface is approximately 2,964 ft (foot) above vertical datum. Depth is in feet below land surface. Soil and rock color notation are from Munsell Color (1994). Drilled to 269 ft, August 2003, by U.S. Geological Survey using ODEX. Total depth drilled, 269 ft. Well casings to 240 ft. Screened interval, 220–240 ft. Construction data and instrumentation given in *table 1* and *figure 8*. SC, specific conductance in microsiemens per centimeter at 25 degrees Celsius (°C); $CaCO_3$, calcium carbonate; >, greater than; <, less than]

Depth (ft)		Description
From	To	
225	226	Silty sand; very fine to coarse with some very fine sand, silt; poorly sorted; subangular to subrounded; yellowish brown (10YR 5/4); SC = 12
226	227	Silty sand; coarse to very coarse with some fine to medium sand, silt, occasional granule; poorly sorted; subangular to rounded; yellowish brown (10YR 5/4); SC = 38
227	228	Sand; coarse with some medium to very coarse, silt; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); SC = 29
228	229	Sand; medium to very coarse with some fine sand, silt; moderately sorted; subangular to subrounded; yellowish brown (10YR 5/4); SC = 36
229	230	Sand; medium to coarse with some fine; well sorted; subangular to subrounded; yellowish brown (10YR 5/4); SC = 28
230	231	Sand; medium with some fine to coarse; well sorted; subangular to rounded; yellowish brown (10YR 5/4); SC = 35
231	269	No sample collected

Table 4. Water content, bulk density, and water-potential data for selected core material from unsaturated-zone monitoring sites 4N/5W-01M001S (VVWD-1, drilled January 2001) and 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.

[Data were analyzed at the U.S. Geological Survey Laboratory, Sacramento, California. Depth is in feet below land surface. Water content was analyzed gravimetrically and volumetrically, and water was analyzed using a water activity meter and filter paper. Site locations are shown in *figure 1*. ft, foot; g, gram; cm^3, cubic centimeter; kPa, kilopascal]

Site name	Depth interval (ft)	Water content		Bulk density (g/cm^3)	Water potential (kPa)	
		Gravimetric (g/g)	Volumetric (cm^3/cm^3)		Water activity meter	Filter paper
VVWD-1	1.5–2.0	0.08	0.14	1.67	–13.42	–42.30
	7.5–8.0	0.03	0.05	1.74	–3.67	–14.60
	11.5–12.0	0.16	0.28	1.77	–2.22	–7.84
	17.5–18.0	0.05	0.11	2.12	–0.78	–0.60
	22.5–23.0	0.09	0.18	1.96	–0.39	–0.07
	27.5–28.0	0.15	0.26	1.72	–0.36	–0.18
	32.5–33.0	0.04	0.07	1.93	–0.44	–0.03
	37.5–38.0	0.22	0.34	1.57	–0.34	–0.02
	47.5–48.0	0.10	0.18	1.85	–0.28	–0.03
	57.5–58.0	0.13	0.24	1.87	–0.37	–0.05
	67.5–68.0	0.09	0.16	1.86	–0.45	–0.03
	77.5–78.0	0.13	0.24	1.84	–0.56	–0.02
	87.5–88.0	0.04	0.07	1.88	–0.64	–0.01
	97.5–98.0	0.13	0.24	1.82	–0.52	–0.02
	117.5–118.0	0.10	0.18	1.89	–0.47	–0.03
	137.5–138.0	0.02	0.05	1.88	–0.58	–0.09
	157.5–158.0	0.08	0.15	1.88	–0.72	–0.84
	177.5–178.0	0.02	0.05	1.95	–1.76	–2.86
	197.5–198.0	0.08	0.16	1.85	–1.04	–2.67
	217.5–218.0	0.08	0.14	1.74	–1.49	–0.90
	237.5–238.0	0.03	0.06	1.72	–1.76	–1.57
	257.5–258.0	0.05	0.09	1.73	–0.94	–0.89
	282.5–283.0	0.11	0.20	1.88	–0.65	–0.50
	319.5–320.0	0.01	0.02	1.76	–1.08	–0.91
	359.5–360.0	0.14	0.21	1.57	–0.54	–0.15
VVWD-2	8.0–8.5	0.01	0.02	1.92	–0.83	–0.11
	19.0–19.5	0.01	0.01	1.89	–0.90	–0.43
	29.0–29.5	0.03	0.05	1.91	–0.22	–0.02
	38.5–39.0	0.12	0.22	1.84	–0.22	–0.01
	49.0–49.5	0.22	0.33	1.47	–0.13	–0.01
	59.0–59.5	0.21	0.34	1.65	–0.51	–0.38
	69.5–70.0	0.09	0.15	1.73	–0.23	–0.02
	79.5–80.0	0.15	0.25	1.74	–0.16	–0.01
	89.5–90.0	0.15	0.26	1.76	–0.23	–0.03
	99.5–100.0	0.08	0.14	1.83	–0.15	–0.01
	119.5–120.0	0.02	0.04	2.01	–0.15	–0.01
	139.5–140.0	0.39	0.49	1.24	–0.12	0.00
	159.5–160.0	0.05	0.10	1.95	–0.23	–0.02

Table 5. Particle-size data using the dry-sieve method for selected core material from unsaturated-zone monitoring sites 4N/5W-01M001S (VVWD-1, drilled January 2001) and 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.

[Data were analyzed at the U.S. Geological Survey laboratory in Sacramento, California. Site locations are shown in *figure 1*. Depth is in feet below land surface. The percentage total may be less than or greater than 100 percent because of rounding. Grain-size descriptions are modified from National Research Council, 1947. ft, foot; mm, millimeter; >, greater than; <, less than]

Site name	Depth interval (ft)	Overall sample percentages			
		Gravel	Sand	Silt	Clay
VVWD-1	1.5–2.0	6	70	17	6
	7.5–8.0	25	70	4	1
	11.5–12.0	16	80	3	1
	17.5–18.0	68	28	3	2
	22.5–23.0	38	47	12	4
	27.5–28.0	7	63	22	7
	32.5–33.0	30	64	3	3
	37.5–38.0	3	56	31	10
	47.5–48.0	6	71	20	3
	57.5–58.0	13	61	22	3
	67.5–68.0	2	76	20	2
	77.5–78.0	2	68	24	6
	87.5–88.0	32	65	2	0
	97.5–98.0	7	63	25	5
	117.5–118.0	13	61	24	3
	137.5–138.0	26	68	6	1
	157.5–158.0	3	75	14	8
	177.5–178.0	21	72	7	1
	197.5–198.0	10	71	13	6
	217.5–218.0	10	71	15	4
	237.5–238.0	2	90	8	0
	257.5–258.0	0	81	17	2
	282.5–283.0	12	46	34	8
	319.5–320.0	9	85	6	0
	359.5–360.0	11	61	25	3

Site name	Depth interval (ft)	Overall sample percentages			
		Gravel	Sand	Silt	Clay
VVWD-2	8.1–8.5	7	79	8	7
	19.0–19.5	28	68	1	3
	29.0–29.5	37	57	1	5
	39.0–39.5	3	70	20	8
	49.0–49.5	0	42	42	16
	59.0–59.5	0	40	12	48
	69.5-70.0	2	65	26	7
	79.5–80.0	2	76	15	7
	89.5–90.0	0	68	17	14
	99.5–100.0	8	86	1	5
	119.5–120.0	65	32	1	2
	139.5–140.0	0	36	47	17
	159.0–160.0	36	58	2	4

Table 5. Particle-size data using the dry-sieve method for selected core material from unsaturated-zone monitoring sites 4N/5W-01M001S (VVWD-1, drilled January 2001) and 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at the U.S. Geological Survey laboratory in Sacramento, California. Site locations are shown in *figure 1*. Depth is in feet below land surface. The percentage total may be less than or greater than 100 percent because of rounding. Grain-size descriptions are modified from National Research Council, 1947. ft, foot; mm, millimeter; >, greater than; <, less than]

Site name	Depth interval (ft)	Gravel fraction percentages			
		>19 mm	9.5–19.0	4.75–9.5	2.0–4.75
VVWD-1	1.5–2.0	0	0	1	5
	7.5–8.0	0	1	5	19
	11.5–12.0	0	1	3	12
	17.5–18.0	37	10	10	12
	22.5–23.0	0	0	30	8
	27.5–28.0	0	0	1	6
	32.5–33.0	16	4	4	7
	37.5–38.0	0	0	0	3
	47.5–48.0	0	0	1	5
	57.5–58.0	0	0	6	7
	67.5–68.0	0	0	1	1
	77.5–78.0	0	0	0	2
	87.5–88.0	5	6	7	14
	97.5–98.0	0	0	1	5
	117.5–118.0	3	1	3	6
	137.5–138.0	0	3	5	18
	157.5–158.0	0	0	0	3
	177.5–178.0	5	2	3	10
	197.5–198.0	0	0	1	8
	217.5–218.0	0	0	3	7
	237.5–238.0	0	0	0	2
	257.5–258.0	0	0	0	0
	282.5–283.0	0	0	3	9
	319.5–320.0	0	3	4	3
	359.5–360.0	9	0	1	1

Site name	Depth interval (ft)	Gravel fraction percentages			
		>19 mm	9.5–19.0	4.75–9.5	2.0–4.75
VVWD-2	8.1–8.5	1	1	1	4
	19.0–19.5	1	4	7	16
	29.0–29.5	1	3	9	25
	39.0–39.5	0	0	0	2
	49.0–49.5	0	0	0	0
	59.0–59.5	0	0	0	0
	69.5–70.0	0	0	0	2
	79.5–80.0	0	0	1	2
	89.5–90.0	0	0	0	0
	99.5–100.0	0	0	0	7
	119.5–120.0	16	23	11	15
	139.5–140.0	0	0	0	0
	159.0–160.0	0	4	7	25

Table 5. Particle-size data using the dry-sieve method for selected core material from unsaturated-zone monitoring sites 4N/5W-01M001S (VVWD-1, drilled January 2001) and 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at the U.S. Geological Survey laboratory in Sacramento, California. Site locations are shown in *figure 1*. Depth is in feet below land surface. The percentage total may be less than or greater than 100 percent because of rounding. Grain-size descriptions are modified from National Research Council, 1947. ft, foot; mm, millimeter; >, greater than; <, less than]

Site name	Depth interval (ft)	Sand fraction percentages				
		1–2 (mm)	0.60 (mm)	0.25 (mm)	0.125 (mm)	<0.125 (mm)
VVWD-1	1.5–2.0	7	19	28	23	23
	7.5–8.0	20	44	27	7	3
	11.5–12.0	27	43	22	6	2
	17.5–18.0	19	23	25	21	12
	22.5–23.0	6	13	24	33	26
	27.5–28.0	3	4	12	32	49
	32.5–33.0	13	26	31	21	9
	37.5–38.0	8	7	10	22	53
	47.5–48.0	8	14	17	29	33
	57.5–58.0	6	12	22	29	30
	67.5–68.0	6	11	26	30	27
	77.5–78.0	6	9	22	30	33
	87.5–88.0	27	31	29	10	3
	97.5–98.0	3	11	24	30	31
	117.5–118.0	9	16	21	24	31
	137.5–138.0	21	34	25	13	8
	157.5–158.0	6	13	22	32	26
	177.5–178.0	21	31	27	13	8
	197.5–198.0	7	12	20	29	31
	217.5–218.0	7	14	21	29	29
	237.5–238.0	3	2	16	45	34
	257.5–258.0	0	5	30	38	27
	282.5–283.0	12	13	14	24	36
	319.5–320.0	12	28	27	20	13
	359.5–360.0	0	1	11	39	48

Site name	Depth interval (ft)	Sand fraction percentages				
		1–2 (mm)	0.60 (mm)	0.25 (mm)	0.125 (mm)	<0.125 (mm)
VVWD-2	8.1–8.5	10	20	26	25	19
	19.0–19.5	21	31	27	16	5
	29.0–29.5	27	30	24	13	5
	39.0–39.5	8	17	25	26	24
	49.0–49.5	7	16	13	23	42
	59.0–59.5	0	2	10	21	66
	69.5–70.0	5	7	10	25	52
	79.5–80.0	4	14	17	44	21
	89.5–90.0	1	4	17	49	29
	99.5–100.0	21	35	27	12	4
	119.5–120.0	35	33	18	9	5
	139.5–140.0	5	14	16	24	41
	159.0–160.0	31	28	22	14	5

Table 6. Saturated hydraulic conductivity data for selected core material from unsaturated-zone monitoring sites 4N/5W-01M001S (VVWD-1, drilled January 2001) and 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.

[Data were analyzed at the U.S. Geological Survey laboratory in Sacramento, California. Site locations are shown in *figure 1*. Depth is in feet below land surface. The gradient is the pressure gradient at which saturated conductivity was measured. ft, foot; cm, centimeter; s, second; d, day; psi, pressure per square inch]

Depth interval (ft)	Saturated hydraulic conductivity (cm/s)	Saturated hydraulic conductivity (ft/d)	Gradient
VVWD-1			
1.5–2.0	1.1E-4	3.2E-1	1 psi
1.5–2.0	8.5E-5	2.4E-1	5 psi
7.5–8.0	1.1E-4	3.1E-1	1 psi
7.5–8.0	1.7E-4	4.7E-1	2 psi
11.5–12.0	2.2E-4	6.1E-1	1 psi
11.5–12.0	1.8E-4	5.1E-1	2 psi
17.5–18.0	7.9E-6	2.3E-2	3 psi
17.5–18.0	9.1E-6	2.6E-2	6 psi
22.5–23.0	6.8E-6	1.9E-2	2 psi
22.5–23.0	5.0E-6	1.4E-2	10 psi
27.5–28.0	9.1E-5	2.6E-1	1 psi
27.5–28.0	1.2E-4	3.3E-1	2 psi
32.5–33.0	6.6E-4	1.9E+0	1 psi
32.5–33.0	4.3E-4	1.2E+0	2 psi
37.5–38.0	2.0E-4	5.6E-1	1 psi
37.5–38.0	1.5E-4	4.2E-1	2 psi
47.5–48.0	4.5E-5	1.3E-1	4 psi
47.5–48.0	4.1E-5	1.2E-1	8 psi
57.5–58.0	2.5E-6	7.0E-3	4 psi
57.5–58.0	3.7E-6	1.1E-2	8 psi
57.5–58.0	4.3E-6	1.2E-2	16 psi
67.5–68.0	1.4E-5	4.0E-2	4 psi
67.5–68.0	1.9E-5	5.3E-2	8 psi
77.5–78.0	3.1E-5	8.9E-2	5 psi
77.5–78.0	3.0E-5	8.5E-2	10 psi
87.5–88.0	2.8E-4	7.9E-1	1 psi
87.5–88.0	2.2E-4	6.3E-1	3 psi
97.5–98.0	5.5E-6	1.6E-2	4 psi
97.5–98.0	6.9E-6	2.0E-2	8 psi
117.5–118.0	2.9E-5	8.2E-2	5 psi
117.5–118.0	3.1E-5	8.7E-2	10 psi
137.5–138.0	4.4E-4	1.2E+0	1 psi
137.5–138.0	4.2E-4	1.2E+0	2 psi
157.5–158.0	2.5E-6	7.1E-3	9 psi
157.5–158.0	5.0E-6	1.4E-2	13 psi
177.5–178.0	3.1E-4	8.9E-1	1 psi
177.5–178.0	2.2E-4	6.3E-1	2 psi
197.5–198.0	9.5E-6	2.7E-2	6 psi
197.5–198.0	8.9E-6	2.5E-2	12 psi
217.5–218.0	1.1E-4	3.0E-1	1 psi
217.5–218.0	1.1E-4	3.0E-1	2 psi
237.5–238.0	1.1E-4	3.0E-1	1 psi
237.5–238.0	1.1E-4	3.1E-1	2 psi
257.5–258.0	2.0E-4	5.6E-1	1 psi
257.5–258.0	1.5E-4	4.1E-1	2 psi
282.5–283.0	5.2E-6	1.5E-2	4 psi
282.5–283.0	6.3E-6	1.8E-2	8 psi
319.5–320.0	5.5E-4	1.6E+0	1 psi
319.5–320.0	6.9E-4	2.0E+0	2 psi
359.5–360.0	4.7E-5	1.3E-1	4 psi
359.5–360.0	3.6E-5	1.0E-1	8 psi
VVWD-2			
8.1–8.6	6.7E-5	1.9E-1	2 psi
8.1–8.6	5.4E-5	1.5E-1	4 psi
19.0–19.5	2.3E-4	6.5E-1	1 psi
19.0–19.5	2.3E-4	6.4E-1	2 psi
29.0–29.5	4.8E-5	1.4E-1	1psi
29.0–29.5	4.5E-5	1.3E-1	2 psi
38.5–39.0	8.6E-6	2.4E-2	5 psi
38.5–39.0	8.9E-6	2.5E-2	9 psi
49.0–49.5	3.1E-5	8.8E-2	5 psi
49.0–49.5	2.9E-5	8.3E-2	9 psi
59.0–59.5	6.1E-9	1.7E-5	24 psi
59.0–59.5	8.4E-9	2.4E-5	44 psi
69.5–70.0	2.4E-5	6.8E-2	4 psi
69.5–70.0	2.3E-5	6.6E-2	8 psi
79.5–80.0	1.9E-5	5.5E-2	8 psi
79.5–80.0	2.0E-5	5.5E-2	11 psi
89.5–90.0	1.4E-6	4.1E-3	8 psi
89.5–90.0	2.5E-6	7.2E-3	15 psi
99.5–100.0	2.3E-4	6.7E-1	1 psi
99.5–100.0	2.6E-4	7.2E-1	3 psi
119.5–120.0	1.3E-4	3.8E-1	3 psi
119.5–120.0	1.4E-4	4.1E-1	9 psi
139.5–140.0	3.0E-6	8.4E-3	13 psi
139.5–140.0	3.4E-6	9.5E-3	24 psi
159.5–160.0	4.1E-4	1.2E+0	1 psi
159.5–160.0	3.5E-4	9.9E-1	2 psi

Table 7. Thermal properties for selected core material from unsaturated-zone monitoring sites 4N/5W-01M001S (VVWD-1, drilled January 2001) and 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.

[Data were analyzed at the U.S. Geological Survey laboratory in Sacramento, California. The site locations are shown in *figure 1*. Depth is in feet below land surface. ft, foot; J, joule; cm^3, cubic centimeter; °C, degree Celsius, W, watt; m, meter; mm^2, square millimeter; s, second]

Depth interval (ft)	Volumetric specific heat [J/(cm^3 °C)]	Thermal conductivity [W/(m °C)]	Thermal diffusivity (mm^2/s)
VVWD-1			
1.5–2.0	1.43	0.39	0.275
7.5–8.0	1.36	0.34	0.251
11.5–12.0	1.39	0.42	0.304
17.5–18.0	1.35	0.79	0.582
22.5–23.0	1.60	2.39	1.496
27.5–28.0	1.92	1.61	0.838
32.5–33.0	1.34	0.99	0.741
37.5–38.0	2.35	1.90	0.809
47.5–48.0	1.88	1.91	1.016
57.5–58.0	4.17	2.78	0.666
67.5–68.0	1.66	1.75	1.053
77.5–78.0	2.12	2.11	0.994
87.5–88.0	2.25	1.65	0.732
97.5–98.0	2.36	1.77	0.749
117.5–118.0	2.38	2.13	0.897
137.5–138.0	1.46	0.91	0.622
157.5–158.0	1.62	1.09	0.673
177.5–178.0	1.64	0.57	0.346
197.5–198.0	1.66	1.31	0.787
217.5–218.0	1.55	1.34	0.859
237.5–238.0	1.49	0.71	0.476
257.5–258.0	1.55	0.98	0.631
282.5–283.0	1.64	1.74	1.064
319.5–320.0	1.54	0.63	0.407
359.5–360.0	1.62	1.00	0.621

Sample interval (ft)	Volumetric specific heat [J/(cm^3 °C)]	Thermal conductivity [W/(m °C)]	Thermal diffusivity (mm^2/s)
VVWD-2			
8.1–8.6	2.84	1.55	0.546
8.1–8.6	2.44	1.61	0.660
8.1–8.6	1.39	0.26	0.189
19.0–19.5	1.48	0.78	0.531
19.0–19.5	2.56	1.49	0.582
19.0–19.5	1.24	0.25	0.205
29.0–29.5	1.25	1.64	1.308
29.0–29.5	1.96	1.32	0.673
29.0–29.5	1.13	0.20	0.175
38.5–39.0	2.48	1.09	0.439
38.5–39.0	2.33	1.12	0.479
38.5–39.0	0.95	0.16	0.168
49.0–49.5	2.90	1.76	0.609
49.0–49.5	3.12	1.41	0.452
49.0–49.5	0.88	0.16	0.177
59.0–59.5	2.37	1.31	0.554
59.0–59.5	2.59	1.20	0.463
59.0–59.5	1.19	0.17	0.146
69.5–70.0	2.53	1.95	0.768
69.5–70.0	2.66	1.20	0.452
69.5–70.0	1.06	0.18	0.169
79.5–80.0	2.52	1.28	0.505
79.5–80.0	2.95	1.77	0.600
79.5–80.0	1.10	0.18	0.166
89.5–90.0	2.45	1.50	0.611
89.5–90.0	2.92	2.52	0.863
89.5–90.0	1.12	0.22	0.192
99.5–100.0	2.40	1.32	0.547
99.5–100.0	2.24	1.79	0.802
99.5–100.0	1.03	0.18	0.173
119.5–120.0	1.50	0.90	0.601
119.5–120.0	2.29	2.02	0.884
119.5–120.0	1.77	0.36	0.202
139.5–140.0	3.94	1.02	0.259
139.5–140.0	3.23	0.89	0.275
139.5–140.0	1.11	0.17	0.156
159.5–160.0	1.26	1.14	0.908
159.5–160.0	1.25	1.60	1.281
159.5–160.0	1.05	0.20	0.189

Table 8. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.

[Data were analyzed at U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The depth is in feet below land surface. ft, foot; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C) (00095)	Bromide, water, filtered, (mg/L as Br) (71870)	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus ortho, water, filtered (mg/L as P) (00671)
5	6	65	<0.8	3.8	28	0.1	0.04	<1.2
6	7	65	<0.8	2.6	22	0.1	0.03	<1.2
7	8	72	<0.4	3.4	17	0.1	0.03	<0.6
8	9	72	<0.2	2.8	20	0.1	0.02	<0.3
9	10	80	<0.2	5.9	16	0.3	0.03	<0.3
11	12	94	<0.2	5.2	8	0.3	<0.02	<0.3
12	13	114	<0.2	11	12	<0.04	<0.02	<0.3
13	14	197	<0.2	35	11	<0.04	<0.02	0.6
14	15	205	<0.2	32	10	<0.04	<0.02	0.9
15	16	214	<0.2	28	13	<0.04	<0.02	0.9
16	17	477	0.4	100	26	<0.04	<0.02	<0.3
17	18	519	0.9	140	70	<0.04	<0.02	0.4
18	19	269	<0.2	43	51	<0.04	<0.02	0.7
19	20	173	<0.2	13	25	<0.04	<0.02	0.8
20	21	165	<0.2	12	28	<0.04	<0.02	0.8
21	22	133	<0.2	11	22	<0.04	<0.02	0.8
22	23	128	<0.2	4.3	13	<0.04	<0.02	1.1
23	24	79	<0.2	3.3	15	<0.04	0.07	0.9
24	25	53	<0.2	2.1	20	<0.04	<0.02	1.1
25	26	40	<0.2	24	28	<0.04	<0.02	<0.3
26	27	57	<0.2	2.8	19	<0.04	<0.02	0.7
27	28	42	0.7	1.8	14	<0.04	0.06	0.6
28	29	46	<0.2	2.2	28	<0.04	0.05	0.5
29	30	49	<0.2	2.2	20	<0.04	<0.02	0.5
30	31	47	<0.2	2.5	10	<0.04	<0.02	0.7
31	32	56	<0.2	2.5	22	<0.04	<0.02	<0.03
32	33	46	<0.2	1.5	10	<0.04	<0.02	0.5
33	34	39	<0.2	1.2	14	<0.04	<0.02	0.5
34	35	47	<0.2	1.1	8	<0.04	<0.02	0.4
35	36	65	<0.2	1.1	12	<0.04	<0.02	0.5
36	37	72	<0.2	1.7	18	<0.04	<0.02	0.6
37	38	76	<0.2	2.4	28	<0.04	<0.02	0.3
38	39	77	<0.2	3.2	36	<0.04	<0.02	0.3
39	40	66	<0.2	2.1	31	<0.04	<0.02	<0.3
40	41	58	<0.2	2.1	34	<0.04	<0.02	0.03
41	42	90	<0.2	8.5	37	<0.04	<0.02	<0.3
42	43	77	<0.2	6.1	46	<0.04	<0.02	<0.3
43	44	78	<0.2	10	41	<0.04	<0.02	<0.3
44	45	90	<0.2	24	28	<0.04	<0.02	<0.3
45	46	94	<0.2	16	29	<0.04	<0.02	<0.03
46	47	97	<0.2	16	29	<0.04	<0.02	0.4
47	48	139	<0.2	29	58	<0.04	<0.02	<0.3

Table 8. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The depth is in feet below land surface. ft, foot; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than value shown]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C) (00095)	Bromide, water, filtered, (mg/L as Br) (71870)	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus ortho, water, filtered (mg/L as P) (00671)
48	49	97	<0.2	17	50	<0.04	<0.02	<0.3
49	50	119	<0.2	22	75	<0.04	<0.02	<0.3
50	51	117	<0.2	16	65	<0.04	<0.02	<0.3
51	52	143	<0.2	18	29	<0.04	<0.02	<0.3
52	53	115	<0.2	17	69	<0.04	<0.02	<0.3
53	54	110	<0.2	11	68	<0.04	<0.02	<0.3
54	55	92	<0.2	7	56	<0.04	0.06	<0.3
55	56	141	<0.2	12	87	<0.04	<0.02	<0.3
56	57	205	<0.2	20	110	<0.04	<0.02	<0.3
57	58	220	<0.2	31	88	<0.04	<0.02	<0.3
58	59	228	<0.2	38	95	<0.04	<0.02	<0.3
59	60	174	<0.2	22	72	<0.04	<0.02	<0.3
60	61	216	<0.2	28	72	<0.04	<0.02	<0.3
62	63	219	<0.2	38	84	<0.04	0.02	<0.3
63	64	184	<0.2	44	53	<0.04	<0.02	<0.3
64	65	190	<0.2	49	41	<0.04	<0.02	<0.3
65	66	240	0.3	55	51	<0.04	<0.02	<0.3
66	67	240	0.6	30	20	<0.04	<0.02	<0.3
67	68	216	<0.2	56	23	<0.04	<0.02	<0.3
68	69	260	0.3	92	20	<0.04	<0.02	<0.3
69	70	353	0.4	130	18	<0.04	<0.02	<0.3
71	72	330	0.5	120	5	<0.04	<0.02	<0.3
72	73	289	<0.2	82	10	<0.04	<0.02	<0.3
73	74	254	<0.2	78	4	<0.04	<0.02	<0.3
74	75	391	0.4	140	9	0.9	<0.02	<0.3
75	76	319	0.5	140	25	<0.04	<0.02	<0.3
77	78	606	2.3	240	<16	<0.04	<0.02	<0.6
78	79	610	1.3	230	<4	<0.04	<0.02	<0.6
79	80	480	<0.4	170	<8	<0.04	<0.02	<0.6
80	81	364	<0.4	150	<8	<0.04	<0.02	<0.6
81	82	346	0.5	130	4	<0.04	<0.02	<0.3
82	83	499	<0.2	190	5	<0.04	<0.02	<0.3
83	84	619	<0.4	220	<8	<0.04	<0.02	<0.6
84	85	353	0.3	120	5	<0.04	<0.02	<0.3
85	86	312	0.2	83	<4	<0.04	<0.02	<0.3
86	87	273	<0.2	74	11	<0.04	<0.02	<0.3
87	88	224	<0.2	55	10	<0.04	0.05	<0.3
88	89	218	<0.2	58	<4	<0.04	<0.02	<0.3
89	90	227	<0.2	81	7	<0.04	<0.02	<0.3
90	91	331	<0.4	160	5	<0.04	<0.02	<0.6
91	92	320	<0.4	150	<8	<0.04	<0.02	<0.6
92	93	275	<0.4	99	10	0.1	<0.02	<0.6

Table 8. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The depth is in feet below land surface. ft, foot; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than value shown]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C) (00095)	Bromide, water, filtered, (mg/L as Br) (71870)	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus ortho, water, filtered (mg/L as P) (00671)
93	94	260	<0.4	110	10	<0.04	0.02	<0.6
94	95	345	<0.8	140	<16	0.1	0.02	<1.2
95	96	374	<0.2	140	<16	0.1	<0.02	<0.3
96	97	382	<0.8	150	<16	0.2	0.05	<1.2
97	98	252	<0.8	77	<16	0.1	0.09	<1.2
98	99	112	<0.2	16	11	<0.04	<0.02	<0.3
99	100	91	<0.2	10	6	<0.04	<0.02	<0.3
100	101	127	<0.2	36	<4	<0.04	<0.02	<0.3
101	102	97	<0.2	21	<4	<0.04	<0.02	<0.3
102	103	81	<0.2	9.3	<4	<0.04	<0.02	<0.03
103	104	76	<0.2	5.4	<4	<0.04	<0.02	<0.3
105	106	86	<0.2	3.6	<4	<0.04	<0.02	<0.3
106	107	97	<0.2	5.1	<4	<0.04	<0.02	<0.3
107	108	103	<0.2	3.4	5	<0.04	<0.02	<0.3
109	110	81	<0.2	3.5	6	<0.04	<0.02	<0.3
110	111	75	<0.2	3.5	6	<0.04	<0.02	<0.3
111	112	94	<0.2	9	4	<0.04	<0.02	<0.3
112	113	77	<0.2	9.2	6	<0.04	<0.02	<0.3
113	114	83	<0.2	9.3	7	3.5	<0.02	<0.3
114	115	75	<0.2	5.9	5	<0.04	<0.02	<0.3
115	116	72	<0.2	5.9	5	<0.04	<0.02	<0.3
116	117	118	<0.2	13	14	<0.04	<0.02	<0.3
117	118	95	<0.2	9.7	6	<0.04	<0.02	<0.3
118	119	100	<0.2	7	8	<0.04	<0.02	0.3
119	120	64	<0.2	2.4	<4	0.04	<0.02	<0.3
120	121	52	<0.2	1.8	10	<0.04	<0.02	<0.3
121	122	49	<0.2	1.5	8	<0.04	<0.02	<0.3
122	123	53	<0.2	2.5	5	4.7	<0.02	<0.3
123	124	86	<0.2	2.4	6	<0.04	<0.02	<0.3
124	125	88	<0.2	3.4	<4	<0.04	<0.02	<0.3
125	126	100	<0.2	2.5	5	<0.04	<0.02	<0.3
126	127	111	<0.2	4.8	6	<0.04	<0.02	<0.3
127	128	81	<0.2	3.3	5	<0.04	<0.02	<0.3
128	129	75	<0.2	2.8	4	<0.04	<0.02	<0.3
129	130	79	<0.2	4.7	7	0.4	<0.02	<0.3
130	131	76	<0.2	5	5	<0.04	<0.02	<0.3
131	132	79	<0.2	3.3	<4	<0.04	<0.02	<0.3
132	133	63	<0.2	1.9	<4	<0.04	<0.02	<0.3
133	134	57	<0.2	1.6	4	<0.04	<0.02	<0.3
134	135	64	<0.2	2.4	6	<0.04	<0.02	<0.3
135	136	86	<0.2	3.1	8	<0.04	<0.02	<0.3
136	137	130	<0.2	8.2	23	<0.04	<0.02	<0.03

Table 8. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The depth is in feet below land surface. ft, foot; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than value shown]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C) (00095)	Bromide, water, filtered, (mg/L as Br) (71870)	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus ortho, water, filtered (mg/L as P) (00671)
137	138	92	<0.2	4.1	7	<0.04	<0.02	<0.3
138	139	95	<0.2	3	10	<0.04	<0.02	<0.3
139	140	91	<0.2	2.5	11	<0.04	<0.02	<0.3
140	141	81	<0.2	1.2	<4	<0.04	<0.02	<0.3
143	144	82	<0.2	2	5	<0.04	<0.02	<0.3
144	145	76	<0.2	1.7	4	<0.04	<0.02	<0.3
145	146	69	<0.2	1.5	<4	<0.04	<0.02	<0.3
146	147	77	<0.2	6.1	9	<0.04	<0.02	<0.3
147	148	69	<0.2	1.6	5	<0.04	<0.02	<0.3
148	149	73	<0.2	1.7	<4	<0.04	<0.02	<0.3
149	150	68	<0.2	1.9	5	<0.04	<0.02	<0.3
150	151	56	<0.2	1.2	< 4	<0.04	<0.02	<0.3
151	152	67	<0.2	1.7	<4	<0.04	<0.02	<0.3
152	153	60	<0.2	2	<4	<0.04	<0.02	<0.3
153	154	60	<0.2	1.9	<4	<0.04	<0.02	<0.3
154	155	77	<0.2	3.5	6	<0.04	<0.02	<0.3
155	156	72	<0.2	3.3	8	<0.04	<0.02	<0.3
156	157	106	<0.2	11	8	<0.04	<0.02	<0.3
157	158	92	<0.2	5.7	10	<0.04	<0.02	<0.03
158	159	75	<0.2	3.8	12	<0.04	<0.02	<0.3
159	160	89	<0.2	3.8	8	<0.04	<0.02	<0.3
160	161	77	<0.2	3.1	5	<0.04	<0.02	<0.3
161	162	78	<0.2	4.4	11	<0.04	<0.02	<0.3
162	163	77	<0.2	4.5	10	<0.04	<0.02	<0.3
163	164	79	<0.2	1.7	<4	<0.04	<0.02	<0.3
164	165	64	<0.2	2.4	6	<0.04	<0.02	<0.3
165	166	86	<0.2	1.9	<4	<0.04	<0.02	<0.3
166	167	101	<0.2	2.9	8	<0.04	<0.02	<0.3
169	170	78	<0.2	1.8	5	<0.04	<0.02	<0.3
170	171	73	<0.2	1.9	7	<0.04	<0.02	<0.3
171	172	75	<0.2	1.1	<4	<0.04	<0.02	<0.3
172	173	64	<0.2	1.6	<4	<0.04	<0.02	<0.3
173	174	70	<0.2	3.1	10	<0.04	0.04	<0.3
174	175	66	<0.2	2.4	4	<0.04	<0.02	<0.3
175	176	77	<0.2	3.5	9	<0.04	<0.02	<0.03
176	177	100	<0.2	11	10	<0.04	<0.02	<0.3
177	178	101	<0.2	3.4	10	<0.04	<0.02	<0.3
178	179	84	<0.2	2.8	8	0.1	<0.02	<0.3
179	180	84	<0.2	2.6	7	<0.04	<0.02	<0.3
180	181	79	<0.2	2.1	5	<0.04	<0.02	<0.3
181	182	90	<0.2	2.4	5	<0.04	<0.02	<0.3
182	183	78	<0.2	3	6	<0.04	<0.02	<0.3

Table 8. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The depth is in feet below land surface. ft, foot; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than value shown]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C) (00095)	Bromide, water, filtered, (mg/L as Br) (71870)	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus ortho, water, filtered (mg/L as P) (00671)
183	184	80	<0.2	2.2	8	<0.04	<0.02	<0.3
184	185	88	<0.2	1.9	6	<0.04	<0.02	<0.3
185	186	69	<0.2	1.9	6	<0.04	<0.02	<0.3
186	187	83	<0.2	2.5	7	<0.04	<0.02	<0.3
187	188	80	<0.2	1.9	4	<0.04	<0.02	<0.3
188	189	88	<0.2	3	7	0	<0.02	<0.3
189	190	59	<0.2	2.2	8	<0.04	<0.02	<0.3
190	191	82	<0.2	2.3	<4	<0.04	<0.02	<0.3
191	192	76	<0.2	3.1	5	<0.04	<0.02	<0.3
192	193	80	<0.2	2.9	<4	<0.04	<0.02	<0.3
193	194	106	<0.2	6.1	8	<0.04	<0.02	<0.3
194	195	72	<0.2	2.8	<4	<0.04	<0.02	<0.3
195	196	55	<0.2	1.6	<4	<0.04	<0.02	<0.3
196	197	84	<0.2	6.9	12	<0.04	<0.02	<0.3
197	198	71	<0.2	5.8	8	<0.04	<0.02	<0.3
198	199	65	<0.2	4	7	<0.04	<0.02	<0.3
199	200	104	<0.2	3.9	8	<0.04	<0.02	<0.3
200	201	104	<0.2	2.5	10	<0.04	<0.02	<0.3
201	202	82	<0.2	2.2	5	<0.04	<0.02	<0.3
202	203	81	<0.2	2	7	<0.04	<0.02	<0.3
203	204	81	<0.2	2.4	5	<0.04	<0.02	<0.3
204	205	121	<0.2	2.4	4	<0.04	<0.02	<0.3
205	206	129	<0.2	3.6	6	<0.04	<0.02	<0.3
206	207	86	<0.2	1.9	<4	<0.04	<0.02	<0.3
207	208	116	<0.2	2.7	<4	<0.04	<0.02	<0.3
208	209	80	<0.2	2.1	<4	<0.04	<0.02	<0.3
209	210	73	<0.2	2.1	<4	<0.04	<0.02	<0.3
210	211	77	<0.2	2	<4	<0.04	<0.02	<0.3
211	212	79	<0.2	2.3	4	<0.04	<0.02	<0.3
212	213	72	<0.2	1.5	5	<0.04	<0.02	<0.3
213	214	75	<0.2	1.7	5	<0.04	<0.02	<0.3
214	215	72	<0.2	1.5	5	<0.04	<0.02	<0.3
215	216	77	<0.2	1.1	<4	<0.04	<0.02	<0.3
216	217	86	<0.2	1.8	<4	<0.04	<0.02	<0.3
217	218	77	<0.2	1.3	<4	<0.04	<0.02	<0.3
218	219	—	<0.2	1.7	5	<0.04	<0.02	<0.3
219	220	74	<0.2	1.7	5	<0.04	<0.02	<0.3
220	221	106	<0.2	2.5	4	<0.04	<0.02	<0.3
221	222	80	<0.2	1.6	<4	<0.04	<0.02	<0.3
222	223	75	<0.2	2.1	<4	<0.04	<0.02	<0.3
223	224	75	<0.2	1.1	<4	0.1	<0.02	<0.3
224	225	77	<0.2	1.6	6	<0.04	<0.02	<0.3

Table 8. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The depth is in feet below land surface. ft, foot; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than value shown]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C) (00095)	Bromide, water, filtered, (mg/L as Br) (71870)	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus ortho, water, filtered (mg/L as P) (00671)
225	226	80	<0.2	1.6	<4	<0.04	<0.02	<0.3
226	227	105	<0.2	2.2	7	<0.04	<0.02	<0.3
227	228	106	<0.2	2	10	<0.04	<0.02	<0.3
228	229	95	<0.2	2.8	5	<0.04	<0.02	<0.3
229	230	73	<0.2	2.9	5	<0.04	<0.02	<0.3
230	231	84	<0.2	1.2	<4	<0.04	<0.02	<0.3
231	232	—	<0.2	0.5	<4	<0.04	<0.02	<0.3
232	233	63	<0.2	<0.3	<4	<0.04	<0.02	<0.3
233	234	82	<0.2	1.7	5	<0.04	<0.02	<0.3
234	235	77	<0.2	2.2	6	<0.04	<0.02	<0.3
235	236	77	<0.2	2.2	6	0.1	<0.02	<0.3
236	237	86	<0.2	3.1	8	<0.04	<0.02	<0.3
237	238	85	<0.2	2.6	12	<0.04	<0.02	<0.3
238	239	95	<0.2	1.8	6	<0.04	<0.02	<0.3
239	240	89	<0.2	2.6	8	<0.04	<0.02	<0.3
240	241	66	<0.2	1.2	5	<0.04	<0.02	<0.3
241	242	61	<0.2	0.4	<4	<0.04	<0.02	<0.3
242	243	60	<0.2	1.2	<4	0.1	<0.02	<0.3
243	244	62	<0.2	1.5	5	<0.04	<0.02	<0.3
244	245	59	<0.2	2.3	4	0.1	<0.02	<0.3
245	246	83	<0.2	1.2	<4	<0.04	<0.02	<0.3
246	247	79	<0.2	1.6	<4	<0.04	<0.02	<0.3
247	248	118	<0.2	1.9	<4	<0.04	<0.02	<0.3
248	249	108	<0.2	1.3	7	<0.04	<0.02	<0.3
249	250	113	<0.2	2.7	11	<0.04	<0.02	<0.3
250	251	121	<0.2	1.5	4	<0.04	<0.02	<0.3
251	252	108	<0.2	1.3	<4	<0.04	<0.02	<0.3
252	253	96	<0.2	1.2	6	<0.04	<0.02	<0.3
253	254	98	<0.2	1.9	4	0.1	<0.02	<0.3
254	255	102	<0.2	1.4	<4	<0.05	<0.02	<0.3
255	256	102	<0.2	1.2	7	<0.05	<0.02	<0.3
256	257	88	<0.2	3.6	9	<0.04	<0.02	<0.3
257	258	75	<0.2	2.1	4	<0.04	<0.02	<0.3
258	259	112	<0.2	2.1	4	<0.04	<0.02	<0.3
259	260	77	<0.2	2	4	<0.04	<0.02	<0.3
260	261	120	<0.2	1.7	<4	<0.04	<0.02	<0.3
261	262	80	<0.2	1.5	<4	<0.04	<0.02	<0.3
262	263	87	<0.2	1.2	<4	<0.04	<0.02	<0.3
263	264	88	<0.2	1.7	<4	<0.04	<0.02	<0.3
264	265	89	<0.2	1.4	<4	<0.04	<0.02	<0.3
265	266	79	<0.2	1.5	4	<0.04	<0.02	<0.3
266	267	92	<0.2	1.6	6	<0.04	<0.02	<0.3

Table 8. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The depth is in feet below land surface. ft, foot; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than value shown]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C) (00095)	Bromide, water, filtered, (mg/L as Br) (71870)	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus ortho, water, filtered (mg/L as P) (00671)
267	268	82	<0.2	1.7	6	<0.04	<0.02	<0.3
268	269	56	<0.2	1.5	<4	<0.04	<0.02	<0.3
269	270	95	<0.2	1.8	5	<0.04	<0.02	<0.3
272	273	72	—	1.2	<4	<0.04	<0.02	<0.3
273	274	68	0.3	1.3	5	<0.04	<0.02	<0.3
274	275	64	<0.2	1.5	5	0.1	<0.02	<0.3
275	276	84	<0.2	1.4	7	0.1	<0.02	<0.3
276	277	152	<0.2	2.9	9	<0.04	<0.02	<0.3
277	278	121	<0.2	1.7	6	<0.04	<0.02	<0.3
278	279	146	<0.2	1.9	5	<0.04	<0.02	<0.3
279	280	96	<0.2	1.6	8	<0.04	<0.02	<0.3
280	281	95	<0.2	1.7	6	<0.04	<0.02	<0.3
282	283	—	<0.2	6	8	<0.04	<0.02	<0.3
284	285	—	<0.2	3.6	8	<0.04	<0.02	<0.3
286	287	87	<0.2	1.8	6	<0.04	<0.02	<0.3
288	289	88	<0.2	2.1	5	<0.04	<0.02	<0.3
290	291	90	<0.2	1.5	4	<0.04	<0.02	<0.3
292	293	102	<0.2	2.1	5	<0.04	<0.02	<0.3
294	295	82	<0.2	1.6	5	<0.04	<0.02	<0.3
296	297	78	<0.2	1.3	<4	<0.04	<0.02	<0.3
298	299	80	<0.2	1.3	<4	<0.04	<0.02	<0.3
300	301	86	<0.2	1.5	<4	0.1	<0.02	<0.3
302	303	81	<0.2	1.4	5	<0.04	<0.02	<0.3
304	305	79	<0.2	1.3	<4	<0.04	<0.02	<0.3
306	307	82	0.3	1.4	5	<0.04	<0.02	<0.3
308	309	76	<0.2	1.2	<4	<0.04	<0.02	<0.3
310	311	73	<0.2	0.9	<4	<0.04	<0.02	<0.3
312	313	71	<0.2	1.4	<4	<0.04	<0.02	<0.3
314	315	68	<0.2	1.3	<4	<0.04	<0.02	<0.3
316	317	86	<0.2	1.8	5	<0.04	<0.02	<0.3
318	319	72	<0.2	1.2	<4	<0.04	<0.02	<0.3
319	320	79	<0.2	4.3	5	<0.04	<0.02	<0.3
320	321	79	<0.2	1.9	5	<0.04	<0.02	<0.3
321	322	71	<0.2	2.3	5	<0.04	<0.02	<0.3
323	324	84	<0.2	3.3	6	<0.04	<0.02	<0.3
325	326	78	<0.2	2	<4	<0.04	<0.02	<0.3
327	328	91	<0.2	2.4	4	<0.04	<0.02	<0.3
329	330	79	<0.2	1.8	4	<0.04	<0.02	<0.3
331	332	79	<0.2	1.6	<4	<0.04	<0.02	<0.3
333	334	92	<0.2	1.7	<4	0.2	<0.02	<0.3
335	336	110	<0.2	5.1	7	<0.04	<0.02	<0.3
337	338	85	<0.2	1.8	<4	0.1	<0.02	<0.3

Table 8. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 4N/5W-01M001S (VVWD-1, drilled January 2001) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The depth is in feet below land surface. ft, foot; µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than value shown]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C) (00095)	Bromide, water, filtered, (mg/L as Br) (71870)	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus ortho, water, filtered (mg/L as P) (00671)
339	340	85	<0.2	2.6	5	<0.04	<0.02	<0.3
341	342	84	<0.2	2.3	4	0.1	<0.02	<0.3
343	344	126	<0.2	2.7	5	<0.04	<0.02	<0.3
345	346	108	<0.2	2.5	5	0.3	<0.02	<0.3
347	348	120	<0.2	3.2	6	<0.04	<0.02	<0.3
349	350	85	<0.2	3.4	6	<0.04	<0.02	<0.3
351	352	98	<0.2	3	4	<0.04	<0.02	<0.3
355	356	422	0.3	150	61	<0.04	<0.02	<0.3
357	358	398	0.9	110	41	<0.04	<0.02	<1.2
359	360	192	<0.2	54	38	<0.04	<0.02	<0.3
361	362	204	<0.2	32	25	<0.04	<0.02	<0.3
363	364	178	<0.2	25	21	<0.04	<0.02	<0.3
365	366	167	<0.2	29	27	<0.04	<0.02	<0.3
367	368	85	<0.2	8.2	9	<0.04	<0.02	<0.3
369	370	90	<0.2	7.7	7	<0.04	<0.02	<0.3
371	372	116	<0.2	11	10	<0.04	<0.02	<0.3
373	374	109	<0.2	11	12	<0.04	<0.02	<0.3
375	376	121	<0.2	12	13	<0.04	<0.02	<0.3
377	378	129	<0.2	12	12	<0.04	<0.02	<0.3
379	380	160	<0.2	28	21	<0.04	<0.02	<0.3
381	382	165	<0.2	30	21	<0.04	<0.02	<0.3
383	384	176	<0.2	28	23	<0.04	<0.02	<0.3
385	386	160	<0.2	27	20	<0.04	<0.02	<0.3
387	388	148	<0.2	21	14	<0.04	<0.02	<0.3
389	390	153	<0.2	22	18	<0.04	<0.02	<0.3
391	392	158	<0.2	24	15	<0.04	<0.02	<0.3
393	394	144	<0.2	16	16	<0.04	<0.02	<0.3
395	396	137	<0.2	8	11	<0.04	<0.02	<0.3
397	398	139	<0.2	7	11	<0.04	<0.02	<0.3
401	402	116	<0.2	8	11	<0.04	<0.02	<0.3
403	404	108	<0.2	11	11	<0.04	<0.02	<0.3
405	406	108	<0.2	13	12	<0.04	<0.02	<0.3
407	408	110	<0.2	15	12	<0.04	<0.02	<0.3

Table 9. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.

[Data were analyzed at the U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Gelogical Survey parameter code used to uniquely identify a specific constituent or property. The sample depth is in feet below land surface. ft, foot. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C (00095)	Bromide, water, filtered (mg/L as Br) (71870	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus, ortho, water, filtered (mg/L as P) (00671)
0	1	611	<0.3	18	85	0.31	<0.03	91
1	2	714	<0.3	35	110	4.5	0.02	30
2	3	1,045	0.5	74	300	16	<0.03	<0.5
3	4	1,176	<0.3	91	420	20	<0.03	<0.5
4	5	947	0.7	85	250	19	0.02	<0.5
5	6	1,005	0.8	100	240	23	<0.03	<0.5
6	7	891	1	100	210	24	0.01	<0.5
7	8	874	—	—	—	—	—	—
8	9	643	—	—	—	—	—	—
9	10	643	—	—	—	—	—	—
10	11	192	0.2	5.4	17	9.6	<0.03	<0.5
11	12	233	0.2	6.5	23	9.3	<0.03	<0.5
12	13	165	0.1	5.1	16	5.4	0.01	<0.5
13	14	148	0.1	4	10	3.8	0.01	<0.5
14	15	206	0.1	8.9	21	4.8	<0.03	<0.5
15	16	132	<0.3	6.5	11	2.5	<0.03	<0.5
16	17	77	<0.3	4.8	4.1	0.86	<0.03	<0.5
17	18	110	—	—	—	—	—	—
18	19	110	—	—	—	—	—	—
19	20	125	—	—	—	—	—	—
20	21	114	<0.3	7.1	10	0.16	<0.03	0.5
21	22	187	<0.3	3.8	6.5	0.21	<0.03	0.7
22	23	182	<0.3	4.5	13	0.21	<0.03	1.1
23	24	95	<0.3	2.5	7.2	<0.06	<0.03	1.1
24	25	66	<0.3	2.7	9.2	<0.06	<0.03	1.3
25	26	64	<0.3	1.4	7.5	<0.06	<0.03	1.6
26	27	65	<0.3	1.5	7.1	<0.06	<0.03	1.7
27	28	65	—	—	—	—	—	—
28	29	65	—	—	—	—	—	—
29	30	29.5	—	—	—	—	—	—
30	31	47	<0.3	1.8	8.5	<0.06	<0.03	1.6
31	32	39	<0.3	0.9	7.1	<0.06	<0.03	1.2
32	33	54	<0.3	0.8	6.4	<0.06	<0.03	0.9
33	34	52	<0.3	1	6	<0.06	<0.03	1.1

Table 9. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at the U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Gelogical Survey parameter code used to uniquely identify a specific constituent or property. The sample depth is in feet below land surface. ft, foot. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C (00095)	Bromide, water, filtered (mg/L as Br) (71870	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus, ortho, water, filtered (mg/L as P) (00671)
34	35	60	<0.3	1	6.2	<0.06	<0.03	1.4
35	36	40	<0.3	1.1	5.8	<0.06	<0.03	1.1
36	37	49	<0.3	1.1	6.3	0.02	<0.03	0.7
37	38	64	—	—	—	—	—	—
38	39	64	—	—	—	—	—	—
39	40	39	—	—	—	—	—	—
40	41	34	<0.3	2.5	5.6	<0.06	<0.03	0.8
41	42	34	<0.3	1.4	4.9	<0.06	<0.03	0.7
42	43	37	<0.3	1.4	4.5	<0.06	<0.03	<0.5
43	44	32	<0.3	1.5	3.8	<0.06	<0.03	0.7
44	45	58	<0.3	1.2	4.5	<0.06	<0.03	0.6
45	46	40	<0.3	1.2	3.7	<0.06	<0.03	1.1
46	47	53	<0.3	2.3	9.4	0.26	<0.03	<0.5
47	48	110	—	—	—	—	—	—
48	49	110	—	—	—	—	—	—
49	50	90	—	—	—	—	—	—
50	51	111	<0.3	1.6	4.3	<0.06	<0.03	<0.5
51	52	91	<0.3	0.8	1.9	0.021	<0.03	<0.5
52	53	144	<0.3	1.9	6.8	0.06	<0.03	<0.5
53	54	135	<0.3	1.9	6.3	<0.06	<0.03	<0.5
54	55	152	<0.3	1.7	6.6	<0.06	<0.03	<0.5
55	56	75	<0.3	1.2	3.7	<0.06	<0.03	<0.5
56	57	94	<0.3	2.1	8.3	<0.06	<0.03	<0.5
57	58	54	<0.3	1.1	2.9	<0.06	<0.03	0.3
58	59	126	<0.3	1.8	12	<0.06	<0.03	<0.5
59	60	52	—	—	—	—	—	—
60	61	126	<0.3	2	16	0.08	<0.03	<0.5
61	62	65	<0.3	1.7	18	<0.06	<0.03	<0.5
62	63	54	<0.3	1	13	<0.06	<0.03	<0.5
63	64	98	<0.3	2	29	<0.06	<0.03	<0.5
64	65	70	<0.3	2.1	18	<0.06	<0.03	<0.5
65	66	69	<0.3	1.9	14	<0.06	<0.03	<0.5
66	67	48	<0.3	1.4	13	<0.06	<0.03	<0.5
67	68	74	<0.3	1.9	16	<0.06	<0.03	<0.5

Table 9. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at the U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Gelogical Survey parameter code used to uniquely identify a specific constituent or property. The sample depth is in feet below land surface. ft, foot. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than]

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68	69	101	<0.3	9.4	15	0.025	<0.03	<0.5
69	70	135	—	—	—	—	—	—
70	71	124	<0.3	5.3	21	<0.06	<0.03	<0.5
71	72	114	<0.3	7.5	16	<0.06	<0.03	<0.5
72	73	128	<0.3	9.9	13	<0.06	<0.03	0.5
73	74	172	<0.3	18	24	<0.06	<0.03	<0.5
74	75	126	—	—-	—	—	—	—
75	76	87	<0.3	9.7	9.3	<0.06	<0.03	<0.5
76	77	100	<0.3	8.7	8.3	<0.06	<0.03	<0.5
77	78	159	<0.3	23	26	<0.06	<0.03	<0.5
78	79	135	—	—	—	—	—	—
79	80	105	—	—	—	—	—	—
80	81	84	—	—	—	—	—	—
81	82	73	—	—	—	—	—	—
82	83	187	—	—	—	—	—	—
83	84	191	—	—	—	—	—	—
84	85	143	—	—	—	—	—	—
85	86	47	—	—	—	—	—	—
86	87	108	—	—	—	—	—	—
87	88	80	—	—	—	—	—	—
88	89	120	—	—	—	—	—	—
89	90	110	—	—	—	—	—	—
90	91	166	—	—	—	—	—	—
91	92	128	—	—	—	—	—	—
92	93	156	—	—	—	—	—	—
93	94	153	—	—	—	—	—	—
94	95	78	—	—	—	—	—	—
95	96	85	—	—	—	—	—	—
96	97	84	—	—	—	—	—	—
97	98	74	—	—	—	—	—	—
98	99	165	—	—	—	—	—	—
99	100	106	—	—	—	—	—	—
100	101	108	—	—	—	—	—	—
101	102	110	—	—	—	—	—	—
102	103	193	—	—	—	—	—	—

Table 9. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.—Continued

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Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C (00095)	Bromide, water, filtered (mg/L as Br) (71870	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus, ortho, water, filtered (mg/L as P) (00671)
103	104	175	—	—	—	—	—	—
104	105	178	—	—	—	—	—	—
105	106	59	—	—	—	—	—	—
106	107	157	—	—	—	—	—	—
107	108	114	—	—	—	—	—	—
108	109	164	—	—	—	—	—	—
109	110	168	—	—	—	—	—	—
110	111	180	—	—	—	—	—	—
111	112	200	—	—	—	—	—	—
112	113	220	—	—	—	—	—	—
113	114	164	—	—	—	—	—	—
114	115	194	—	—	—	—	—	—
115	116	148	—	—	—	—	—	—
116	117	160	—	—	—	—	—	—
117	118	135	—	—	—	—	—	—
118	119	145	—	—	—	—	—	—
119	120	—	—	—	—	—	—	—
120	121	103	—	—	—	—	—	—
121	122	113	—	—	—	—	—	—
122	123	120	—	—	—	—	—	—
123	124	116	—	—	—	—	—	—
124	125	107	—	—	—	—	—	—
125	126	100	—	—	—	—	—	—
126	127	122	—	—	—	—	—	—
127	128	191	—	—	—	—	—	—
128	129	191	—	—	—	—	—	—
129	130	198	—	—	—	—	—	—
130	131	112	—	—	—	—	—	—
131	132	226	—	—	—	—	—	—
132	133	115	—	—	—	—	—	—
133	134	102	—	—	—	—	—	—
134	135	100	—	—	—	—	—	—
135	136	91	—	—	—	—	—	—
136	137	81	—	—	—	—	—	—
137	138	178	—	—	—	—	—	—
138	139	178	—	—	—	—	—	—

Table 9. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at the U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Gelogical Survey parameter code used to uniquely identify a specific constituent or property. The sample depth is in feet below land surface. ft, foot. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C (00095)	Bromide, water, filtered (mg/L as Br) (71870	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus, ortho, water, filtered (mg/L as P) (00671)
139	140	215	—	—	—	—	—	—
140	141	169	—	—	—	—	—	—
141	142	182	—	—	—	—	—	—
142	143	199	—	—	—	—	—	—
143	144	179	—	—	—	—	—	—
144	145	181	—	—	—	—	—	—
145	146	148	—	—	—	—	—	—
146	147	156	—	—	—	—	—	—
147	148	134	—	—	—	—	—	—
148	149	138	—	—	—	—	—	—
149	150	142	<0.3	3.1	2.8	<0.06	<0.03	<0.5
150	151	246	—	—	—	—	—	—
151	152	177	—	—	—	—	—	—
152	153	140	—	—	—	—	—	—
153	154	82	—	—	—	—	—	—
154	155	97	—	—	—	—	—	—
155	156	85	<0.3	1.9	1.5	<0.06	<0.03	<0.5
156	157	70	—	—	—	—	—	—
157	158	72	—	—	—	—	—	—
158	159	69	—	—	—	—	—	—
159	160	64	<0.3	3.5	4.3	<0.06	<0.03	<0.5
160	161	84	—	—	—	—	—	—
161	162	25	—	—	—	—	—	—
162	163	72	—	—	—	—	—	—
163	164	98	—	—	—	—	—	—
164	165	138	<0.3	2.7	2.5	<0.06	<0.03	<0.5
165	166	93	—	—	—	—	—	—
166	167	106	—	—	—	—	—	—
167	168	138	—	—	—	—	—	—
168	169	122	<0.3	4.5	4.6	0.13	<0.03	<0.5
169	170	147	<0.3	6.8	6	<0.06	<0.03	<0.5
170	171	131	—	—	—	—	—	—
171	172	101	—	—	—	—	—	—
172	173	112	—	—	—	—	—	—
173	174	120	—	—	—	—	—	—

Table 9. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at the U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Gelogical Survey parameter code used to uniquely identify a specific constituent or property. The sample depth is in feet below land surface. ft, foot. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C (00095)	Bromide, water, filtered (mg/L as Br) (71870	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus, ortho, water, filtered (mg/L as P) (00671)
174	175	102	—	—	—	—	—	—
175	176	73	<0.3	4.2	2.2	<0.06	<0.03	<0.5
176	177	80	—	—	—	—	—	—
177	178	92	—	—	—	—	—	—
178	179	116	<0.3	3.4	4.7	<0.06	<0.03	<0.5
179	180	91	<0.3	2.5	2.2	<0.06	<0.03	<0.5
180	181	93	—	—	—	—	—	—
181	182	91	—	—	—	—	—	—
182	183	97	—	—	—	—	—	—
183	184	87	—	—	—	—	—	—
184	185	132	—	—	—	—	—	—
185	186	133	—	—	—	—	—	—
186	187	142	—	—	—	—	—	—
187	188	76	—	—	—	—	—	—
188	189	216	—	—	—	—	—	—
189	190	188	—	—	—	—	—	—
190	191	180	—	—	—	—	—	—
191	192	205	—	—	—	—	—	—
192	193	92	—	—	—	—	—	—
193	194	141	—	—	—	—	—	—
194	195	84	—	—	—	—	—	—
195	196	99	—	—	—	—	—	—
196	197	156	—	—	—	—	—	—
197	198	94	—	—	—	—	—	—
199	200	93	—	—	—	—	—	—
200	201	112	—	—	—	—	—	—
201	202	73	—	—	—	—	—	—
202	203	87	—	—	—	—	—	—
203	204	51	—	—	—	—	—	—
204	205	46	—	—	—	—	—	—
205	206	31	—	—	—	—	—	—
206	207	37	—	—	—	—	—	—
207	208	35	—	—	—	—	—	—
219	220	63	—	—	—	—	—	—
220	221	96	—	—	—	—	—	—

Table 9. Chemical composition of leachate for selected core material and cuttings from unsaturated-zone monitoring site 5N/4W-29B001S (VVWD-2, drilled August 2003) near Victorville, San Bernardino County, California.—Continued

[Data were analyzed at the U.S. Geological Survey laboratory in San Diego, California, except specific conductance, which was analyzed in the field. Site location is shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Gelogical Survey parameter code used to uniquely identify a specific constituent or property. The sample depth is in feet below land surface. ft, foot. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than]

Depth to top of sample interval (ft) (72015)	Depth to bottom of sample interval (ft) (72016)	Specific conductance, field, unfiltered (µS/cm at 25 °C (00095)	Bromide, water, filtered (mg/L as Br) (71870	Chloride, water, filtered (mg/L as Cl) (00940)	Sulfate, water, filtered (mg/L as SO_4) (00945)	Nitrate, water, filtered (mg/L as N) (00618)	Nitrite, water, filtered (mg/L as N) (00613)	Phosphorus, ortho, water, filtered (mg/L as P) (00671)
221	222	65	—	—	—	—	—	—
222	223	48	—	—	—	—	—	—
223	224	49	—	—	—	—	—	—
224	225	53	—	—	—	—	—	—
225	226	12	—	—	—	—	—	—
226	227	38	—	—	—	—	—	—
227	228	29	—	—	—	—	—	—
228	229	36	—	—	—	—	—	—
229	230	28	—	—	—	—	—	—
230	231	35	—	—	—	—	—	—

Table 10. Chemical and isotopic composition of water from wells, suction-cup lysimeters in unsaturated-zone monitoring sites, and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Arvada, Colorado. Site locations are shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; µg/L, microgram per liter; per mil, per thousand; FET, fixed end-point titration; INC, incremental titration; —, no data; <, less than; E, estimated value]

Site name	State well number	Date	Depth of well, feet below land surface	Dissolved oxygen, water unfiltered, mg/L (00300)	pH water, unfiltered field, standard units (00400)	pH water, unfiltered laboratory, standard units (00403)	Specific conductance, water, unfiltered, laboratory, µS/cm @ 25 °C (90095)
VVWD-1	4N/5W-01M001S	05/03/01	430	6.4	8.3	7.8	354
		12/03/03	—	2.5	8.9	8.0	338
		12/13/06	—	4.7	8.7	8.1	336
	4N/5W-01M004SLYS	02/11/04	—	—	8.4	—	—
		12/13/06	—	—	8.5	—	417
	4N/5W-01M008SLYS	06/26/03	—	—	7.8	—	1,380
		02/11/04	—	—	8.2	—	—
	4N/5W-01M010SLYS	10/31/02	—	—	8.2	—	—
		02/11/04	—	—	8.2	—	—
	4N/5W-01M012SLYS	01/11/02	—	—	—	—	—
		10/31/02	—	—	8.2	—	2,690
	4N/5W-01M016SLYS	01/11/02	—	—	—	—	—
		10/03/02	—	—	7.8	—	1,200
		12/03/03	—	—	8.5	—	—
		12/13/06	—	—	8.5	—	602
	4N/5W-01M017S Recharge pond	10/03/02	—	—	9.2	8.9	233
VVWD-2	5N/4W-29B001S	12/02/03	240	6.6	8.7	8.1	202
		12/13/06	—	7.0	8.7	8.3	198
	5N/4W-29B003LYS	02/11/04	—	—	8.3	—	—
		12/13/06	—	—	8.2	—	416
	5N/4W-29B007LYS	02/11/04	—	—	8.0	—	—
		12/13/06	—	—	8.3	—	859
	5N/4W-29B010LYS	02/11/04	—	—	8.0	—	—
		12/13/06	—	—	8.2	—	1,140

Table 10. Chemical and isotopic composition of water from wells, suction-cup lysimeters in unsaturated-zone monitoring sites, and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Arvada, Colorado. Site locations are shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; µg/L, microgram per liter; per mil, per thousand; FET, fixed end-point titration; INC, incremental titration; —, no data; <, less than; E, estimated value]

Site name	State well number	Date	Specific conductance, water, unfiltered, field, µS/cm @ 25 °C (00095)	Temperature, water, °C (00010)	Calcium, water filtered, mg/L as Ca (00915)	Magnesium, water filtered, mg/L as Mg (00925)	Potassium, water filtered, mg/L as K (00935)
VVWD-1	4N/5W-01M001S	05/03/01	350	24.0	23.1	9.39	3.20
		12/03/03	348	23.0	22.8	9.46	3.03
		12/13/06	343	19.9	21.8	9.01	3.01
	4N/5W-01M004SLYS	02/11/04	432	—	23.2	13.3	5.26
		12/13/06	417	—	27.8	11.8	2.75
	4N/5W-01M008SLYS	06/26/03	1,460	—	141	56.4	6.06
		02/11/04	292	—	23.8	6.64	2.06
	4N/5W-01M010SLYS	10/31/02	11,000	—	381	249	60.5
		02/11/04	250	—	23.3	3.08	1.20
	4N/5W-01M012SLYS	01/11/02	—	—	242	154	43.8
		10/31/02	2,790	—	78.8	50.5	16.4
	4N/5W-01M016SLYS	01/11/02	—	—	347	189	35.5
		10/03/02	1,260	—	30.7	7.27	1.57
		12/03/03	916	—	45.2	11.2	1.02
		12/13/06	602	—	16.6	3.77	0.53
	4N/5W-01M017S Recharge pond	10/03/02	260	—	3.79	0.181	0.82
VVWD-2	5N/4W-29B001S	12/02/03	201	20.5	19.8	3.89	1.82
		12/13/06	199	20.7	19.4	3.81	1.69
	5N/4W-29B003LYS	02/11/04	398	—	24.9	8.39	5.37
		12/13/06	420	—	32.1	10.9	2.41
	5N/4W-29B007LYS	02/11/04	1180	—	69.1	28.7	6.77
		12/13/06	870	—	68.8	20.4	4.90
	5N/4W-29B010LYS	02/11/04	1,250	—	171	94.8	1,260
		12/13/06	1,160	—	112	13.4	9.79

Table 10. Chemical and isotopic composition of water from wells, suction-cup lysimeters in unsaturated-zone monitoring sites, and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Arvada, Colorado. Site locations are shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; µg/L, microgram per liter; per mil, per thousand; FET, fixed end-point titration; INC, incremental titration; —, no data; <, less than; E, estimated value]

Site name	State well number	Date	Sodium, water filtered mg/L as Na (00930)	Alkalinity, water filtered, FET field, mg/L as $CaCO_3$ (39036)	Alkalinity, water filtered, FET laboratory, mg/L as $CaCO_3$ (29801)	Alkalinity, water filtered, INC field, mg/L as $CaCO_3$ (39086)	Bicarbonate, water filtered, FET field, mg/L as HCO_3 (29804)
VVWD-1	4N/5W-01M001S	05/03/01	35.3	120	127	—	—
		12/03/03	35.3	130	124	119	154
		12/13/06	35.5	120	124	119	147
	4N/5W-01M004SLYS	02/11/04	52.6	120	—	122	150
		12/13/06	38.8	—	—	—	—
	4N/5W-01M008SLYS	06/26/03	160	69	—	69	84
		02/11/04	31.7	110	—	110	135
	4N/5W-01M010SLYS	10/31/02	1,970	—	—	—	—
		02/11/04	27.6	100	—	100	122
	4N/5W-01M012SLYS	01/11/02	1,800	—	—	—	—
		10/31/02	512	—	—	—	—
	4N/5W-01M016SLYS	01/11/02	1,130	—	—	—	—
		10/03/02	227	—	—	—	—
		12/03/03	149	—	—	—	—
		12/13/06	120	—	—	—	—
	4N/5W-01M017S Recharge pond	10/03/02	51.5	91	E92	90	93
VVWD-2	5N/4W-29B001S	12/02/03	17.2	90	91	87	105
		12/13/06	16.9	92	89	87	106
	5N/4W-29B003LYS	02/11/04	47.0	120	—	108	139
		12/13/06	34.5	—	—	—	—
	5N/4W-29B007LYS	02/11/04	133	190	—	180	229
		12/13/06	61.5	—	—	—	—
	5N/4W-29B010LYS	02/11/04	1,530	200	—	192	244
		12/13/06	84.5	—	—	—	—

Table 10. Chemical and isotopic composition of water from wells, suction-cup lysimeters in unsaturated-zone monitoring sites, and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Arvada, Colorado. Site locations are shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; µg/L, microgram per liter; per mil, per thousand; FET, fixed end-point titration; INC, incremental titration; —, no data; <, less than; E, estimated value]

Site name	State well number	Date	Bicarbonate, water filtered, INC field, mg/L as HCO_3 (00453)	Carbonate, water filtered, FET field, mg/L as CO_3 (29807)	Carbonate, water filtered, INC field, mg/L as CO_3 (00452)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)
VVWD-1	4N/5W-01M001S	05/03/01	—	—	—	0.09	13.4
		12/03/03	140	4.0	—	0.09	13.3
		12/13/06	141	2.2	2	0.08	12.9
	4N/5W-01M004SLYS	02/11/04	146	1.2	1	0.16	39.6
		12/13/06	—	—	—	0.16	29.8
	4N/5W-01M008SLYS	06/26/03	83	.3	0.0	1.77	366
		02/11/04	131	1.5	1	0.04	10.2
	4N/5W-01M010SLYS	10/31/02	—	—	—	11.9	3,600
		02/11/04	120	1.2	1	0.04	9.88
	4N/5W-01M012SLYS	01/11/02	—	—	—	10.1	3,060
		10/31/02	—	—	—	0.85	243
	4N/5W-01M016SLYS	01/11/02	—	—	—	8.38	2,410
		10/03/02	—	—	—	1.07	206
		12/03/03	—	—	—	0.06	8.64
		12/13/06	—	—	—	0.07	7.22
	4N/5W-01M017S Recharge pond	10/03/02	92	8.1	8	0.05	7.41
VVWD-2	5N/4W-29B001S	12/02/03	102	2.3	2	0.04	6.07
		12/13/06	100	2.8	3	0.02	5.75
	5N/4W-29B003LYS	02/11/04	121	5.6	5	0.17	39.5
		12/13/06	—	—	—	0.17	35.3
	5N/4W-29B007LYS	02/11/04	211	4.1	4	0.78	218
		12/13/06	—	—	—	0.69	150
	5N/4W-29B010LYS	02/11/04	230	2.4	2	2.44	3,250
		12/13/06	—	—	—	1.00	220

Table 10. Chemical and isotopic composition of water from wells, suction-cup lysimeters in unsaturated-zone monitoring sites, and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

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Site name	State well number	Date	Fluoride, water filtered, mg/L as F (00950)	Iodide, water filtered, mg/L as L (71865)	Silica, water filtered, mg/L as SiO_2 (00955)	Sulfate, water filtered, mg/L as SO_4 (00945)	TDS, residue at 180 °C, mg/L (70300)
VVWD-1	4N/5W-01M001S	05/03/01	0.43	0.001	24.2	11.5	213
		12/03/03	0.40	E.001	24.7	10.8	214
		12/13/06	0.45	<0.002	25.3	9.96	211
	4N/5W-01M004SLYS	02/11/04	—	0.004	21.5	17.5	—
		12/13/06	—	0.002	21.4	37.9	—
	4N/5W-01M008SLYS	06/26/03	—	0.020	24.5	51.0	—
		02/11/04	—	0.004	23.0	14.0	—
	4N/5W-01M010SLYS	10/31/02	—	1.37	29.8	1,030	—
		02/11/04	—	0.003	22.3	7.68	—
	4N/5W-01M012SLYS	01/11/02	—	0.992	23.7	1,230	—
		10/31/02	—	0.077	27.3	890	—
	4N/5W-01M016SLYS	01/11/02	—	0.638	22.1	834	—
		10/03/02	—	0.029	18.4	117	—
		12/03/03	—	0.005	21.6	15.6	—
		12/13/06	—	0.004	16.7	9.99	—
	4N/5W-01M017S Recharge pond	10/03/02	0.53	0.010	17.2	9.96	145
VVWD-2	5N/4W-29B001S	12/02/03	<0.17	<0.002	18.8	5.30	129
		12/13/06	0.23	<0.002	18.9	5.22	122
	5N/4W-29B003LYS	02/11/04	—	0.004	23.5	33.2	—
		12/13/06	—	0.003	19.7	30.3	—
	5N/4W-29B007LYS	02/11/04	—	0.031	70.7	66.2	—
		12/13/06	—	0.003	28.6	55.2	—
	5N/4W-29B010LYS	02/11/04	—	0.054	29.1	1,510	—
		12/13/06	—	0.002	28.2	83.6	—

Table 10. Chemical and isotopic composition of water from wells, suction-cup lysimeters in unsaturated-zone monitoring sites, and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Arvada, Colorado. Site locations are shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; µg/L, microgram per liter; per mil, per thousand; FET, fixed end-point titration; INC, incremental titration; —, no data; <, less than; E, estimated value]

Site name	State well number	Date	Ammonia + organic nitrogen, water filtered, mg/L as N (00623)	Ammonia, water filtered, mg/L as N (00608)	Nitrate + nitrite, water filtered, mg/L as N (00631)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)
VVWD-1	4N/5W-01M001S	05/03/01	<0.10	<0.04	2.56	2.49	0.064
		12/03/03	<0.10	<0.04	5.72	—	<0.008
		12/13/06	<0.10	<0.020	5.98	—	<0.002
	4N/5W-01M004SLYS	02/11/04	—	—	—	4.25	<0.030
		12/13/06	—	—	—	—	—
	4N/5W-01M008SLYS	06/26/03	—	—	—	—	—
		02/11/04	—	—	—	1.81	0.030
	4N/5W-01M010SLYS	10/31/02	—	—	—	5.16	1.08
		02/11/04	—	—	—	1.23	0.030
	4N/5W-01M012SLYS	01/11/02	—	—	—	—	—
		10/31/02	—	—	—	9.29	0.180
	4N/5W-01M016SLYS	01/11/02	—	—	—		—
		10/03/02	—	—	—	6.51	<0.030
		12/03/03	—	—	—	—	—
		12/13/06	—	—	—	—	—
	4N/5W-01M017S Recharge pond	10/03/02	<0.10	<0.04	1.79	1.91	<0.008
VVWD-2	5N/4W-29B001S	12/02/03	<0.10	<0.04	0.68	—	<0.008
		12/13/06	<0.10	<0.020	0.69	—	<0.002
	5N/4W-29B003LYS	02/11/04	—	—	—	1.03	0.060
		12/13/06	—	—	—	—	—
	5N/4W-29B007LYS	02/11/04	—	—	—	2.62	1.30
		12/13/06	—	—	—	—	—
	5N/4W-29B010LYS	02/11/04	—	—	—	6.20	2.50
		12/13/06	—	—	—	—	—

Table 10. Chemical and isotopic composition of water from wells, suction-cup lysimeters in unsaturated-zone monitoring sites, and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Arvada, Colorado. Site locations are shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; µg/L, microgram per liter; per mil, per thousand; FET, fixed end-point titration; INC, incremental titration; —, no data; <, less than; E, estimated value]

Site name	State well number	Date	Ortho-phophate, water filtered, mg/L as P (00671)	Phosphorus, water filtered, mg/L as P (00666)	Aluminum, water filtered, µg/L as Al (01106)	Arsenic, water filtered, µg/L as As (01000)	Barium, water filtered, µg/L as Ba (01005)
VVWD-1	4N/5W-01M001S	05/03/01	E0.02	<0.06	<20	2.7	28.9
		12/03/03	E0.01	<0.04	2.5	2.1	88.2
		12/13/06	0.015	<0.04	27.2	2.1	79.8
	4N/5W-01M004SLYS	02/11/04	<0.500	—	—	5.7	7.3
		12/13/06	—	—	—	1.8	141
	4N/5W-01M008SLYS	06/26/03	—	—	—	2.8	18.3
		02/11/04	<0.500	—	—	1.9	50.2
	4N/5W-01M010SLYS	10/31/02	<5.00	—	—	18.7	72.4
		02/11/04	<0.500	—	—	1.6	42.9
	4N/5W-01M012SLYS	01/11/02	—	—	—	17.4	45.3
		10/31/02	0.400	—	—	14.3	34.0
	4N/5W-01M016SLYS	01/11/02	—	—	—	12.1	46.7
		10/03/02	0.300	—	—	2.6	2.9
		12/03/03	—	—	—	1.1	71.3
		12/13/06	—	—	—	2.0	26.4
	4N/5W-01M017S Recharge pond	10/03/02	E0.01	<0.04	21.3	9.2	3.8
VVWD-2	5N/4W-29B001S	12/02/03	0.03	0.04	10.8	2.1	E1.9
		12/13/06	0.015	<0.04	6.9	1.7	32.8
	5N/4W-29B003LYS	02/11/04	<0.500	—	—	2.4	29.7
		12/13/06	—	—	—	0.95	62.0
	5N/4W-29B007LYS	02/11/04	2.00	—	—	23.3	22.0
		12/13/06	—	—	—	0.80	116
	5N/4W-29B010LYS	02/11/04	<3.00	—	—	58.1	153
		12/13/06	—	—	—	3.0	96.0

Table 10. Chemical and isotopic composition of water from wells, suction-cup lysimeters in unsaturated-zone monitoring sites, and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Arvada, Colorado. Site locations are shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; µg/L, microgram per liter; per mil, per thousand; FET, fixed end-point titration; INC, incremental titration; —, no data; <, less than; E, estimated value]

Site name	State well number	Date	Boron, water filtered, µg/L as B (01020)	Chromium, water filtered, µg/L as Cr (01030)	Iron, water filtered, µg/L as Fe (01046)	Lithium, water filtered, µg/L as Li (01130)	Manganese, water filtered, µg/L as Mn (01056)
VVWD-1	4N/5W-01M001S	05/03/01	19	—	<10	9	E2.7
		12/03/03	17	23.2	<6	10	<0.8
		12/13/06	19	21.4	<6	11	0.6
	4N/5W-01M004SLYS	02/11/04	54	42.9	127	—	161
		12/13/06	18	18.5	19	—	2.7
	4N/5W-01M008SLYS	06/26/03	84	18.8	32	—	107
		02/11/04	17	10.6	17	—	3.5
	4N/5W-01M010SLYS	10/31/02	2,000	9.7	153	—	249
		02/11/04	18	8.7	17	—	2.0
	4N/5W-01M012SLYS	01/11/02	987	6.2	E28	—	8.4
		10/31/02	582	9.0	1920	—	114
	4N/5W-01M016SLYS	01/11/02	1,300	6.2	<50	—	E.9
		10/03/02	545	8.6	E7	—	4.0
		12/03/03	44	6.7	67	—	3.7
		12/13/06	28	12.4	E4	—	0.3
	4N/5W-01M017S Recharge pond	10/03/02	21	9.3	<10	E3	<2.0
VVWD-2	5N/4W-29B001S	12/02/03	15	2.6	<6	4	<0.8
		12/13/06	13	2.6	<6	4	0.4
	5N/4W-29B003LYS	02/11/04	36	E0.5	131	—	46.0
		12/13/06	18	6.1	72	—	5.9
	5N/4W-29B007LYS	02/11/04	327	384	14	—	5.9
		12/13/06	23	1.2	34	—	3.9
	5N/4W-29B010LYS	02/11/04	365	493	134	—	70.4
		12/13/06	15	2.5	32	—	9.2

Table 10. Chemical and isotopic composition of water from wells, suction-cup lysimeters in unsaturated-zone monitoring sites, and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Arvada, Colorado. Site locations are shown in *figure 1*. The numbering system for sites is explained in the text. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; µg/L, microgram per liter; per mil, per thousand; FET, fixed end-point titration; INC, incremental titration; —, no data; <, less than; E, estimated value]

Site name	State well number	Date	Strontium, water filtered, µg/L as Sr (01080)	Vanadium, water filtered, µg/L as V (01085)	delta Deuterium, per mil (82082)	delta Oxygen-18, per mil (82085)
VVWD-1	4N/5W-01M001S	05/03/01	624	—	–77.80	–10.66
		12/03/03	619	—	–76.60	–10.68
		12/13/06	612	—	–78.20	–10.70
	4N/5W-01M004SLYS	02/11/04	—	—	–77.60	–10.08
		12/13/06	—	—	—	—
	4N/5W-01M008SLYS	06/26/03	—	—	–74.20	–9.72
		02/11/04	—	—	–73.00	–10.34
	4N/5W-01M010SLYS	10/31/02	—	—	–72.80	–9.91
		02/11/04	—	—	–62.80	–8.94
	4N/5W-01M012SLYS	01/11/02	—	—	—	—
		10/31/02	—	—	–73.10	–10.43
	4N/5W-01M016SLYS	01/11/02	—	—	—	—
		10/03/02	—	17.8	–74.50	–10.32
		12/03/03	—	—	—	—
		12/13/06	—	—	—	—
	4N/5W-01M017S Recharge pond	10/03/02	149	55.9	–78.20	–10.96
VVWD-2	5N/4W-29B001S	12/02/03	495	—	–58.80	–8.90
		12/13/06	495	—	–59.00	–8.82
	5N/4W-29B003LYS	02/11/04	—	—	–60.90	–8.92
		12/13/06	—	—	—	—
	5N/4W-29B007LYS	02/11/04	—	—	–67.60	–9.06
		12/13/06	—	—	—	—
	5N/4W-29B010LYS	02/11/04	—	—	–70.90	–9.05
		12/13/06	—	—	—	—

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conductance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophosphate, water filtered, mg/L as P (00671)
				VVWD-1						
4N/5W-01M004 LYS @ 280′	02/11/04	1600	8.4	432	0.16	39.6	17.5	4.25	<0.030	<0.500
	03/18/04	0950	8.4	390	E0.1	26.0	11.0	4.54	<0.030	<0.500
	04/23/04	0940	8.1	383	E0.1	26.0	11.0	4.18	<0.030	<0.500
	07/08/04	1010	8.3	498	0.5	37.0	16.0	4.43	E0.010	<0.500
	08/26/04	1445	8.1	502	0.3	60.0	27.0	4.15	<0.030	<0.500
	10/06/04	1200	8.6	568	0.3	86.0	45.0	3.86	<0.030	<0.500
	11/30/04	1510	8.0	574	0.5	83.0	50.0	3.74	<0.030	<0.500
	01/20/05	1300	8.0	579	—	—	—	—	—	—
	02/23/05	1550	8.0	580	0.3	73.0	53.0	3.69	<0.030	<0.500
	05/11/05	1100	8.1	543	—	—	—	—	—	—
	07/07/05	1100	8.1	535	0.3	64.0	48.0	2.75	E0.010	<0.500
	09/15/05	0720	8.0	530	0.3	57.0	49.0	3.20	<0.030	<0.500
	11/02/05	1500	8.1	522	0.3	56.0	48.0	3.33	<0.030	<0.500
	12/15/05	1100	8.2	509	E0.2	57.0	49.0	3.06	<0.030	<0.500
	01/18/06	1250	8.2	501	—	—	—	—	—	—
	02/15/06	1130	8.3	483	—	—	—	—	—	—
	04/13/06	1615	8.0	476	—	—	—	—	—	—
	06/07/06	1730	8.0	440	—	—	—	—	—	—
	07/18/06	1835	8.2	430	—	—	—	—	—	—
	09/20/06	0730	8.1	425	—	—	—	—	—	—
	12/13/06	0925	8.5	417	0.16	29.8	37.9	—	—	—

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conductance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophosphate, water filtered, mg/L as P (00671)
4N/5W-01M008 LYS @ 190′	06/26/03	0850	7.8	1,460	1.77	366	51.0	—	—	—
	08/23/03	1115	7.8	873	0.7	—	—	4.51	0.040	—
	10/09/03	1445	8.0	321	0.1	15.0	16.0	2.05	<0.030	<0.500
	02/11/04	1540	8.2	292	0.04	10.2	14.0	1.81	0.030	<0.500
	03/18/04	0940	8.8	311	<0.3	11.0	16.0	1.71	—	<0.500
	04/23/04	0925	8.2	306	E0.1	11.0	17.0	1.65	0.210	E0.400
	07/08/04	1000	8.4	346	—	—	—	—	—	—
	08/26/04	1330	8.6	373	<0.3	15.0	26.0	2.94	0.090	<0.500
	10/06/04	1140	8.6	387	<0.3	17.0	33.0	3.89	0.060	<0.500
	11/30/04	1530	—	—	E0.2	19.0	38.0	4.64	<0.030	0.600
	01/20/05	1320		430	—	—	—	—	—	—
	02/23/05	1540	—	—	<0.3	18.7	50.0	5.34	0.190	<0.500
	05/11/05	1045	8.2	434	<0.3	12.0	47.0	2.97	<0.030	<0.500
	07/07/05	1050	8.3	365	E0.1	11.0	29.0	1.78	<0.030	<0.500
	09/15/05	0740	8.1	256	<0.3	9.2	8.8	1.49	<0.030	<0.500
	11/02/05	1140	8.2	264	—	—	—	—	—	—
	11/02/05	1440	—	—	<0.3	9.4	10.0	1.69	<0.030	<0.500
	12/15/05	1045	8.3	266	<0.3	9.3	10.0	1.66	<0.030	<0.500
	01/18/06	1245	8.3	292	—	—	—	—	—	—
	02/15/06	1115	8.4	267	—	—	—	—	—	—
	04/13/06	1600	8.2	252	—	—	—	—	—	—
	06/07/06	1715	8.2	240	—	—	—	—	—	—
	07/18/06	1825	8.4	244	—	—	—	—	—	—
	09/20/06	0800	8.3	251	—	—	—	—	—	—
	12/13/06	0935	8.8	255	—	—	—	—	—	—

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conductance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophosphate, water filtered, mg/L as P (00671)
4N/5W-01M010 LYS @ 154′	07/18/01	1100	8.0	—	—	—	—	—	—	—
	10/03/01	1150	8.0	34,800	—	—	—	—	—	—
	10/31/02	0905	8.2	11,000	11.9	3,600	1,030	5.16	1.08	<5.00
	11/12/02	1330	—	—	10.0	3,400	1,100	6.38	1.83	<20.0
	12/12/02	1016	8.2	933	0.3	140	88.0	13.1	0.130	0.200
	01/17/03	0900	7.8	779	—	—	—	—	—	—
	03/11/03	0825	7.6	3,080	6.0	910	53.0	15.1	<0.300	<5.00
	05/06/03	1525	7.8	850	1.1	150	26.0	4.13	0.140	<1.00
	06/26/03	0840	7.8	300	<0.3	11.0	14.0	2.26	0.080	<0.500
	08/23/03	1100	8.2	291	<0.3	10.0	14.0	1.86	0.110	<0.500
	10/09/03	1435	8.0	294	<0.3	11.0	14.0	1.84	E0.020	<0.500
	02/11/04	1530	8.2	250	0.04	9.88	7.68	1.23	0.030	<0.500
	03/18/04	0930	9.0	256	<0.3	11.0	8.4	1.24	0.040	<0.500
	04/23/04	0915	8.4	267	<0.3	11.0	10.0	1.47	E0.010	<0.500
	07/08/04	0945	8.4	286	—	—	—	—	—	—
	08/26/04	1315	8.6	301	<0.3	15.0	18.0	1.86	0.550	<0.500
	10/06/04	1130	8.5	313	<0.3	13.0	19.0	2.77	0.420	<0.500
	12/14/04	1145	—	—	E0.3	76.0	290	8.45	E0.050	20.0
	01/20/05	1335	—	337	—	—	—	—	—	—
	02/23/05	1530	8.2	345	<0.3	11.0	25.0	2.01	0.050	<0.500
	05/11/05	1030	8.0	266	<0.3	9.8	13.0	1.05	E0.010	<0.500
	07/07/05	1040	8.1	249	<0.3	9.2	8.8	1.34	<0.030	<0.500
	09/15/05	0730	8.0	240	<0.3	9.0	11.0	1.63	<0.030	<0.500
	11/02/05	1420	8.1	236	<0.3	9.4	11.0	1.59	<0.030	<0.500
	12/15/05	1030	8.3	255	<0.3	9.4	14.0	1.72	<0.030	<0.500
	01/18/06	1240	8.3	235	—	—	—	—	—	—
	02/15/06	1100	8.4	230	—	—	—	—	—	—

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conductance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophosphate, water filtered, mg/L as P (00671)
4N/5W-01M010 LYS @ 154′	04/13/06	1545	8.4	233	—	—	—	—	—	—
	06/07/06	1700	7.9	230	—	—	—	—	—	—
	07/18/06	1815	8.7	244	—	—	—	—	—	—
	12/13/06	0950	—	256	—	—	—	—	—	—
4N/5W-01M012 LYS @ 59′	05/03/01	1430	8.4	27,500	—	—	—	—	—	—
	08/22/01	1030	8.0	24,300	—	—	—	—	—	—
	10/03/01	1040	8.3	18,700	—	—	—	—	—	—
	01/11/02	0915	—	—	10.1	3,060	1,230	—	—	—
	10/31/02	0850	8.2	2,790	0.85	243	890	9.29	0.180	0.400
	11/12/02	1305	8.3	1,830	<0.5	110	520	6.08	0.080	<0.500
	11/12/02	1828	8.3	1,830	0.2	59.0	330	4.58	0.050	0.500
	11/15/02	1230	8.6	1,200	0.2	59.0	330	4.58	0.050	0.500
	01/17/03	0855	8.6	550	—	—	—	—	—	—
	03/11/03	0815	8.7	616	0.1	18.0	88.0	3.81	<0.030	0.500
	05/06/03	1515	8.6	560	0.1	18.0	110	4.16	<0.030	0.400
	06/26/03	0830	8.7	586	<0.3	18.0	79.0	3.91	<0.030	0.500
	08/23/03	1045	8.5	520	<0.3	12.0	46.0	2.94	<0.030	1.10
	10/09/03	1425	—	—	0.1	47.0	74.0	3.54	.040	0.500
	04/23/04	0910	—	599	0.3	16.0	52.0	3.30	E0.020	0.800
	10/06/04	1120	8.9	605	E0.2	15.0	52.0	4.88	<0.030	0.800
	11/30/04	1540	8.7	596	0.3	16.0	60.0	6.31	<0.030	0.800
	01/20/05	1355	—	487	—	—	—	—	—	—
	02/23/05	1510	8.5	454	<0.3	10.0	25.0	2.43	<0.030	0.800
	05/11/05	1010	8.3	351	<0.3	9.8	15.0	2.31	<0.030	0.700
	07/07/05	1030	8.3	293	<0.3	8.7	13.0	1.78	<0.030	0.800
	09/15/05	0750	—	320	—	—	—	—	—	—

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conductance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophosphate, water filtered, mg/L as P (00671)
4N/5W-01M012 LYS @ 59′	12/15/05	1015	8.4	321	<0.3	9.5	15.0	2.73	<0.030	0.700
	01/18/06	1230	8.4	280	—	—	—	—	—	—
	04/13/06	1520	8.7	285	—	—	—	—	—	—
4N/5W-01M016 LYS @ 20′	05/03/01	1430	8.3	21,900	—	—	—	—	—	—
	07/18/01	1020	—	23,900	—	—	—	—	—	—
	10/03/01	1020	8.2	20,400	—	—	—	—	—	—
	01/11/02	0900	—	—	8.38	2,410	834	—	—	—
	10/03/02	1030	7.8	1,260	1.07	206	117	6.51	<0.030	0.300
	10/09/02	1615	7.8	1,360	<0.5	200	190	5.03	0.040	<0.500
	10/10/02	1600	—	—	1.6	120	120	3.57	<0.030	1.10
	10/31/02	0840	8.0	410	<0.5	25.0	45.0	2.15	0.010	1.50
	11/12/02	1300	8.1	278	<0.5	12.0	17.0	2.19	0.020	1.20
	11/14/02	1220	8.3	276	<0.5	11.0	15.0	2.13	0.020	1.20
	12/12/02	0945	8.8	276	<0.5	11.0	17.0	2.07	0.040	0.900
	01/17/03	0840	7.7	296	—	—	—	—	—	—
	03/11/03	0805	8.0	383	<0.3	10.0	37.0	2.98	0.070	0.400
	05/06/03	1505	7.8	250	<0.3	8.8	13.0	1.99	<0.030	0.400
	06/26/03	0815	8.0	229	<0.3	9.8	11.0	1.79	<0.030	0.600
	08/23/03	1030	7.7	248	<0.3	11.0	13.0	1.87	<0.030	0.400
	10/09/03	1415	7.5	299	<0.3	10.0	9.0	1.65	<0.030	0.500
	12/03/03	1330	8.5	916	0.06	8.64	15.6	—	—	—
	02/11/04	1510	7.9	967	<0.3	8.0	20.0	3.44	<0.030	<2.00
	03/18/04	0910	8.1	965	<0.3	8.3	27.0	4.70	<0.030	<0.500
	04/23/04	0900	7.7	936	<0.3	8.4	30.0	4.74	<0.030	<1.00
	07/08/04	0910	7.8	934	<0.6	9.9	33.0	5.49	<0.030	<0.500
	08/26/04	1250	7.7	1,050	<0.3	37.0	32.0	6.04	<0.030	<2.00
	10/06/04	1110	8.0	1,090	<0.3	10.4	42.0	7.27	<0.030	<0.500

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conduc-tance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophos-phate, water filtered, mg/L as P (00671)
4N/5W-01M016 LYS @ 20′	11/30/04	1550	8.0	1,100	<0.3	13.0	53.0	9.52	<0.030	<0.500
	01/20/05	1405	8.0	385	—	—	—	—	—	—
	02/23/05	1455	8.3	236	<0.3	10.0	11.0	2.00	<0.030	<0.500
	05/11/05	1000	8.2	241	<0.3	9.2	9.3	1.86	<0.030	E0.300
	07/07/05	1020	8.2	259	E0.1	8.8	11.0	2.11	<0.030	<0.500
	09/15/05	0750	7.8	392	<0.3	8.8	14.0	5.26	<0.030	<0.500
	11/02/05	1400	8.0	712	<0.3	9.7	16.0	7.08	<0.030	<0.500
	12/15/05	1000	7.9	255	<0.3	9.1	9.8	1.98	0.030	E0.300
	01/18/06	1215	8.6	230	—	—	—	—	—	—
	02/15/06	1030	9.1	230	—	—	—	—	—	—
	04/13/06	1520	8.7	247	—	—	—	—	—	—
	06/07/06	1630	8.4	255	—	—	—	—	—	—
	07/18/06	1800	8.6	275	—	—	—	—	—	—
	09/20/06	0845	8.0	298	—	—	—	—	—	—
	12/13/06	0940	8.5	602	0.07	7.22	9.99	—	—	—

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conductance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophosphate, water filtered, mg/L as P (00671)
4N/5W-01M017S RECHARGE POND	10/03/02	0940	9.2	260	0.05	7.41	9.96	1.91	<0.008	E0.01
	10/10/02	1600	9.3	238	<0.5	8.1	10.0	1.83	<0.030	<0.500
	10/31/02	0930	9.2	247	<0.5	11.0	12.0	2.21	<0.030	<0.500
	11/12/02	1400	9.2	249	<0.5	11.0	10.0	2.32	<0.030	<0.500
	11/14/02	1245	—	—	<0.5	10.0	9.0	2.15	<0.030	<0.500
	11/15/02	1250	9.1	236	—	—	—	—	—	—
	12/12/02	1100	9.0	268	<0.5	12.0	11.0	2.44	<0.030	<0.500
	03/11/03	0905	9.0	256	<0.3	10.0	12.0	2.33	<0.030	<0.500
	05/06/03	1540	9.0	220	<0.3	7.7	4.0	1.41	<0.030	<0.500
	06/26/03	0915	8.9	229	<0.3	10.0	10.0	2.07	<0.030	<0.500
	08/23/03	1130	9.0	232	<0.3	9.7	7.0	1.79	<0.030	<0.500
	01/20/05	1420	9.2	238	—	—	—	—	—	—
	02/23/05	1640	9.2	242	<0.3	11.0	11.0	2.39	<0.030	<0.500
	05/11/05	1110	9.2	243	—	—	—	—	—	—
	05/15/05	1150	—	—	<0.3	9.7	11.0	2.18	<0.030	<0.500
	11/02/05	1530	9.2	243	<0.3	9.7	10.0	2.07	<0.030	<0.500
	12/15/05	1115	9.4	235	<0.3	8.1	9.8	1.70	<0.030	<0.500
	01/18/06	1300	9.3	235	—	—	—	—	—	—

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conductance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophosphate, water filtered, mg/L as P (00671)
				VVWD-2						
5N/4W-29B003 LYS @ 192′	02/11/04	1110	8.3	398	0.17	39.5	33.2	1.03	0.060	<0.500
	03/18/04	1230	8.4	411	E0.1	37.0	30.0	1.30	0.030	<0.500
	04/22/04	1445	7.7	410	E0.1	38.0	29.0	1.22	E0.010	<0.500
	07/08/04	1225	8.2	412	E0.2	41.0	32.0	1.63	<0.030	<0.500
	08/26/04	1020	8.1	407	E0.1	39.0	31.0	1.74	<0.030	<0.500
	10/06/04	1510	8.0	411	<0.3	42.0	33.0	1.95	<0.030	<0.500
	11/30/04	1150	7.9	396	<0.3	41.0	31.0	1.92	<0.030	<0.500
	02/24/05	1030	8.2	416	<0.3	42.0	32.0	1.84	<0.030	<0.500
	05/11/05	1440	7.8	393	E0.1	38.0	29.0	1.68	<0.030	<0.500
	07/07/05	0915	8.2	398	E0.2	36.0	28.0	1.80	<0.030	<0.500
	09/15/05	1040	8.0	388	E0.1	37.0	28.0	1.88	<0.030	<0.500
	11/02/05	1030	8.1	407	E0.1	38.0	30.0	2.07	<0.030	<0.500
	12/14/05	1200	8.2	424	E0.1	38.0	31.0	2.17	<0.030	<0.500
	01/17/06	1530	8.1	417	—	—	—	—	—	—
	02/16/06	1030	8.3	415	—	—	—	—	—	—
	04/13/06	1030	8.0	426	—	—	—	—	—	—
	06/07/06	1000	7.8	411	—	—	—	—	—	—
	07/18/06	1615	8.3	415	—	—	—	—	—	—
	09/20/06	1200	8.1	408	—	—	—	—	—	—
	12/13/06	1300	8.2	420	0.17	35.3	30.3	—	—	—

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conductance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophosphate, water filtered, mg/L as P (00671)
5N/4W-29B007 LYS @ 137′	02/11/04	1005	8.0	1,180	0.78	218	66.2	2.62	1.30	2.00
	03/18/04	1215	7.9	1,440	0.6	300	84.0	4.58	0.260	<2.00
	04/22/04	1430	7.8	1,540	0.6	300	83.0	5.32	0.250	<2.00
	07/08/04	1240	7.9	1,570	0.9	350	96.0	6.59	<0.030	<1.00
	08/26/04	0940	7.7	1,520	1.0	300	97.0	6.45	0.160	<2.00
	10/06/04	1530	7.8	1,460	0.5	320	107	8.08	0.140	<0.500
	11/30/04	1200	8.3	1,380	0.7	310	118	8.88	<0.030	<0.500
	02/24/05	1020	7.8	1,430	0.7	294	119	8.62	0.290	0.500
	05/11/05	1430	7.5	1,260	0.6	260	110	8.30	0.240	<1.00
	07/07/05	0900	7.8	1,260	0.6	240	120	7.75	0.320	<2.00
	09/15/05	1030	7.8	1,290	0.6	240	130	7.56	0.160	<1.00
	11/02/05	1025	8.0	1,100	0.6	200	94.0	5.97	<0.060	<1.00
	12/14/05	1145	7.8	1,270	1.6	190	97.0	5.80	0.190	<2.00
	01/17/06	1515	7.8	1,140	—	—	—	—	—	—
	02/16/06	1015	8.0	1,120	—	—	—	—	—	—
	04/13/06	1020	7.7	1,030	—	—	—	—	—	—
	06/07/06	0950	7.5	902	—	—	—	—	—	—
	07/18/06	1550	7.9	859	—	—	—	—	—	—
	09/20/06	1145	7.8	842	—	—	—	—	—	—
	12/13/06	1310	8.3	870	0.69	150	55.2	—	—	—

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conductance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophosphate, water filtered, mg/L as P (00671)
5N/4W-29B010 LYS @ 108′	02/11/04	0955	8.0	1,250	2.44	3,250	1,510	6.20	2.50	<3.00
	03/18/04	1200	8.0	3,170	1.8	600	330	5.93	2.89	2.00
	04/22/04	1415	7.8	1,870	2.1	350	190	6.11	1.39	<1.00
	07/08/04	1300	7.9	1,760	2.9	340	140	6.08	1.40	<1.00
	08/26/04	0930	7.9	1,560	1.6	290	120	5.84	0.850	2.00
	10/06/04	1550	7.8	1,470	1.3	320	110	6.75	<0.030	1.30
	11/30/04	1210	7.8	1,440	2.0	360	106	6.75	0.620	1.40
	02/24/05	1010	7.8	1,530	1.9	338	100	6.18	0.770	4.90
	05/11/05	1420	7.7	1,310	1.2	290	78.0	5.53	0.440	<2.00
	07/07/05	0845	7.6	1,270	1.3	280	70.0	6.38	0.220	<2.00
	09/15/05	1100	7.8	1,310	1.1	280	70.0	6.41	0.250	<1.00
	11/02/05	1010	7.9	1,280	2.0	260	77.0	6.24	0.200	<2.00
	12/14/05	1130	7.8	1,260	2.3	250	87.0	6.10	0.120	<2.00
	01/17/06	1500	7.9	1,220	—	—	—	—	—	—
	02/16/06	1000	7.9	1,220	—	—	—	—	—	—
	04/13/06	1000	7.7	1,150	—	—	—	—	—	—
	06/07/06	0930	7.6	1,150	—	—	—	—	—	—
	07/18/06	1540	7.9	1,120	—	—	—	—	—	—
	09/20/06	1130	7.8	1,140	—	—	—	—	—	—
	12/13/06	1319	8.2	1,160	1.00	220	83.6	—	—	—

Table 11. Field measurements and concentrations of selected anions in water from suction-cup lysimeters in unsaturated-zone monitoring sites and adjacent recharge ponds near Victorville, San Bernardino County, California, 2001–06.—Continued

[Data analyzed by the U.S. Geological Survey Laboratory in San Diego, California. Location of sites shown in *figure 1*. Dates sites were drilled given in *table 2–3*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; —, no data; <, less than; E, estimated value]

State well number	Date	Time	pH, water, unfiltered field, standard units (00400)	Specific conductance, water unfiltered field, µS/cm at 25°C (00095)	Bromide, water filtered, mg/L as Br (71870)	Chloride, water filtered, mg/L as Cl (00940)	Sulfate, water filtered, mg/L as SO_4 (00945)	Nitrate, water filtered, mg/L as N (00618)	Nitrite, water filtered, mg/L as N (00613)	Orthophosphate, water filtered, mg/L as P (00671)
5N/4W-29B019s Recharge pond	11/02/05	1100	8.9	224	<0.3	7.8	15.0	0.59	<0.030	<0.500
	12/14/05	1230	9.1	234	<0.3	9.3	17.0	0.67	<0.030	<0.500
	01/17/06	1545	9.0	234	—	—	—	—	—	—
	02/16/06	1100	9.2	234	—	—	—	—	—	—
	06/07/06	1030	8.8	190	—	—	—	—	—	—
	07/19/06	0730	9.7	216	—	—	—	—	—	—
	09/20/06	1215	9.5	200	—	—	—	—	—	—

Table 12. Field measurements and arsenic and chromium concentrations in water from suction-cup lysimeters in unsaturated-zone monitoring sites and from adjacent recharge ponds near Victorville, San Bernardino County, California, 2002–06.

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Denver, Colorado. Location of sites shown in *figure 1*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; µg/L, microgram per liter; E, estimated value; —, no data; M, presence of compound verified but not quantified]

State well number	Date	Time	pH, water, unfiltered, field, standard units (00400)	Specific conductance, water, unfiltered, field, µS/cm at 25°C (00095)	Arsenic, water, filtered, µg/L as As (01000)	Chromium, water, filtered, µg/L as Cr (01030)
			VVWD-1			
4N/5W-01M004 LYS @ 280´	02/11/04	1600	8.4	432	5.7	42.9
	07/08/04	1010	8.3	498	1.6	40
	08/26/04	1445	8.1	502	1.6	36.4
	10/06/04	1200	8.6	568	1.8	35.5
	11/30/04	1510	8.0	574	1.6	34.1
	01/20/05	1300	8.0	579	1.5	35.3
	02/23/05	1550	8.0	580	1.6	32.1
	05/11/05	1100	8.1	543	1.7	32.7
	07/07/05	1100	8.1	535	1.4	30.7
	09/15/05	0720	8.0	530	1.4	24.6
	11/02/05	1500	8.1	522	1.6	26.4
	12/15/05	1100	8.2	509	1.5	26.4
	01/18/06	1250	8.2	501	1.4	23.7
	02/15/06	1130	8.3	483	1.5	23.0
	04/13/06	1615	8.0	476	1.5	25.0
	06/07/06	1730	8.0	440	1.6	23.1
	07/18/06	1835	8.2	430	1.6	22.1
	09/20/06	0730	8.1	425	1.6	20.9
	12/13/06	0925	8.5	417	1.8	18.5
4N/5W-01M008 LYS @ 190´	06/26/03	0850	7.8	1,460	2.8	18.8
	02/11/04	1540	8.2	292	1.9	10.6
	07/08/04	1000	8.4	346	2.3	12.3
	05/11/05	1045	8.2	434	5.9	13.2
	07/07/05	1050	8.3	365	2.1	10.7
	09/15/05	0740	8.1	256	2.0	9.3
	11/02/05	1140	8.2	264	2.0	9.2
	12/15/05	1045	8.3	266	2.0	9.9
	01/18/06	1245	8.3	292	2.5	10.3
	02/15/06	1115	8.4	267	2.1	8.9
	04/13/06	1600	8.2	252	2.1	9.4
	06/07/06	1715	8.2	240	2.3	10.1
	07/18/06	1825	8.4	244	2.3	9.9
	09/20/06	0800	8.3	251	2.2	9.8

Table 12. Field measurements and arsenic and chromium concentrations in water from suction-cup lysimeters in unsaturated-zone monitoring sites and from adjacent recharge ponds near Victorville, San Bernardino County, California, 2002–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Denver, Colorado. Location of sites shown in *figure 1*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; µg/L, microgram per liter; E, estimated value; —, no data; M, presence of compound verified but not quantified]

State well number	Date	Time	pH, water, unfiltered, field, standard units (00400)	Specific conductance, water, unfiltered, field, µS/cm at 25°C (00095)	Arsenic, water, filtered, µg/L as As (01000)	Chromium, water, filtered, µg/L as Cr (01030)
4N/5W-01M010 LYS @ 154'	10/31/02	0905	8.2	11,000	18.7	9.7
	02/11/04	1530	8.2	250	1.6	8.7
	02/23/05	1530	8.2	345	3.4	11.8
	05/11/05	1030	8.0	266	2.0	11.8
	07/07/05	1040	8.1	249	2.2	11.5
	09/15/05	0730	8.0	240	2.3	9.2
	11/02/05	1420	8.1	236	2.2	9.4
	12/15/05	1030	8.3	255	2.6	10.6
	01/18/06	1240	8.3	235	2.2	9.2
	02/15/06	1100	8.4	230	1.9	9.1
	04/13/06	1545	8.4	233	2.2	10.1
	06/07/06	1700	7.9	230	2.1	10.1
4N/5W-01M012 LYS @ 59′	01/11/02	0915	—	—	17.4	6.2
	10/31/02	0850	8.2	2,790	14.3	9.0
	02/23/05	1510	8.5	454	23.1	10.1
	05/11/05	1010	8.3	351	20.9	11.3
	07/07/05	1030	8.3	293	18.8	10.7
	12/15/05	1015	8.4	321	20.7	11.4
	01/18/06	1230	8.4	280	23.4	10.6
4N/5W-01M016 LYS @ 20′	01/11/02	0900	—	—	12.1	6.2
	10/03/02	1030	7.8	1,260	2.6	8.6
	12/03/03	1330	8.5	916	1.1	6.7
	07/08/04	0910	7.8	934	0.9	M
	08/26/04	1250	7.7	1,050	1.0	M
	10/06/04	1110	8.0	1,090	1.2	5.4
	11/30/04	1550	8.0	1,100	1.1	8.9
	01/20/05	1405	8.0	385	0.9	9.3
	02/23/05	1455	8.3	236	1.2	9.4
	05/11/05	1000	8.2	241	2.1	10.2
	07/07/05	1020	8.2	259	2.3	10.0
	09/15/05	0750	7.8	392	2.3	9.1
	11/02/05	1400	8.0	712	1.2	9.8
	12/15/05	1000	7.9	255	2.5	10.6
	01/18/06	1215	8.6	230	4.1	9.9
	02/15/06	1030	9.1	230	4.0	9.7

Table 12. Field measurements and arsenic and chromium concentrations in water from suction-cup lysimeters in unsaturated-zone monitoring sites and from adjacent recharge ponds near Victorville, San Bernardino County, California, 2002–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Denver, Colorado. Location of sites shown in *figure 1*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; µg/L, microgram per liter; E, estimated value; —, no data; M, presence of compound verified but not quantified]

State well number	Date	Time	pH, water, unfiltered, field, standard units (00400)	Specific conductance, water, unfiltered, field, µS/cm at 25°C (00095)	Arsenic, water, filtered, µg/L as As (01000)	Chromium, water, filtered, µg/L as Cr (01030)
	04/13/06	1520	8.7	247	4.1	11.0
	06/07/06	1630	8.4	255	3.9	12.6
	07/18/06	1800	8.6	275	3.8	13.8
	09/20/06	0845	8.0	298	3.6	14.0
	12/13/06	0940	8.5	602	2.0	12.4
4N/5W-01M017S Recharge pond	10/03/02	0940	9.2	260	9.2	9.3
	01/20/05	1420	9.2	238	10.4	11.1
	02/23/05	1640	9.2	242	8.5	10.6
	05/11/05	1110	9.2	243	8.2	11.5
	11/02/05	1530	9.2	243	8.5	10.6
	12/15/05	1115	9.4	235	9.7	11.1
	01/18/06	1300	9.3	235	10.2	10.0
			VVWD-2			
5N/4W-29B003 LYS @ 192′	02/11/04	1110	8.3	398	2.4	E0.5
	07/08/04	1225	8.2	412	1.0	M
	08/26/04	1020	8.1	407	1.1	M
	10/06/04	1510	8.0	411	1.0	7.0
	11/30/04	1150	7.9	396	1.4	7.1
	02/24/05	1030	8.2	416	1.0	7.2
	05/11/05	1440	7.8	393	1.1	7.6
	07/07/05	0915	8.2	398	1.1	7.6
	09/15/05	1040	8.0	388	0.91	6.5
	11/02/05	1030	8.1	407	1.0	6.8
	12/14/05	1200	8.2	424	0.97	6.7
	01/17/06	1530	8.1	417	0.87	6.2
	02/16/06	1030	8.3	415	0.81	5.9
	04/13/06	1030	8.0	426	0.79	6.2
	06/07/06	1000	7.8	411	0.86	6.1
	07/18/06	1615	8.3	415	0.85	6.2
	09/20/06	1200	8.1	408	0.87	6.0
	12/13/06	1300	8.2	420	0.95	6.1

Table 12. Field measurements and arsenic and chromium concentrations in water from suction-cup lysimeters in unsaturated-zone monitoring sites and from adjacent recharge ponds near Victorville, San Bernardino County, California, 2002–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Denver, Colorado. Location of sites shown in *figure 1*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; µg/L, microgram per liter; E, estimated value; —, no data; M, presence of compound verified but not quantified]

State well number	Date	Time	pH, water, unfiltered, field, standard units (00400)	Specific conductance, water, unfiltered, field, µS/cm at 25°C (00095)	Arsenic, water, filtered, µg/L as As (01000)	Chromium, water, filtered, µg/L as Cr (01030)
5N/4W-29B007 LYS @ 137′	02/11/04	1005	8.0	1,180	23.3	384
	04/22/04	1430	7.8	1,540	2.6	4.8
	07/08/04	1240	7.9	1,570	1.9	M
	08/26/04	0940	7.7	1,520	1.4	M
	10/06/04	1530	7.8	1,460	1.5	1.3
	11/30/04	1200	8.3	1,380	0.9	3.3
	02/24/05	1020	7.8	1,430	1.1	1.3
	05/11/05	1430	7.5	1,260	1.3	E0.5
	07/07/05	0900	7.8	1,260	1.1	E0.4
	09/15/05	1030	7.8	1,290	0.90	0.33
	11/02/05	1025	8.0	1,100	0.79	0.99
	12/14/05	1145	7.8	1,270	0.84	0.37
	01/17/06	1515	7.8	1,140	0.78	0.26
	02/16/06	1015	8.0	1,120	0.80	0.61
	04/13/06	1020	7.7	1,030	0.76	0.34
	06/07/06	0950	7.5	902	0.65	0.56
	07/18/06	1550	7.9	859	0.64	0.96
	09/20/06	1145	7.8	842	0.66	0.97
	12/13/06	1310	8.3	870	0.80	1.2
5N/4W-29B010 LYS @ 108′	02/11/04	0955	8.0	1,250	58.1	493
	04/22/04	1415	7.8	1,870	8.8	2.4
	07/08/04	1300	7.9	1,760	8.1	M
	08/26/04	0930	7.9	1,560	7.2	M
	10/06/04	1550	7.8	1,470	6.9	2.5
	11/30/04	1210	7.8	1,440	4.9	2.4
	02/24/05	1010	7.8	1,530	4.9	2.4
	05/11/05	1420	7.7	1,310	5.4	1.2
	07/07/05	0845	7.6	1,270	4.2	1.4
	09/15/05	1100	7.8	1,310	4.4	1.1
	11/02/05	1010	7.9	1,280	3.8	1.0
	12/14/05	1130	7.8	1,260	3.2	0.78
	01/17/06	1500	7.9	1,220	2.8	1.3
	02/16/06	1000	7.9	1,220	2.5	2.1
	04/13/06	1000	7.7	1,150	2.5	1.3
	06/07/06	0930	7.6	1,150	2.8	2.7
	07/18/06	1540	7.9	1,120	2.8	2.5
	09/20/06	1130	7.8	1,140	2.8	2.3
	12/13/06	1319	8.2	1,160	3.0	2.5

Table 12. Field measurements and arsenic and chromium concentrations in water from suction-cup lysimeters in unsaturated-zone monitoring sites and from adjacent recharge ponds near Victorville, San Bernardino County, California, 2002–06.—Continued

[Data analyzed by the U.S. Geological Survey National Water Quality Laboratory in Denver, Colorado. Location of sites shown in *figure 1*. Instrumentation name from *table 1*. The five-digit number in parentheses below the constituent name is the U.S. Geological Survey parameter code used to uniquely identify a specific constituent or property. µS/cm at 25 °C, microsiemens per centimeter at 25 degrees Celsius; µg/L, microgram per liter; E, estimated value; —, no data; M, presence of compound verified but not quantified]

State well number	Date	Time	pH, water, unfiltered, field, standard units (00400)	Specific conductance, water, unfiltered, field, µS/cm at 25°C (00095)	Arsenic, water, filtered, µg/L as As (01000)	Chromium, water, filtered, µg/L as Cr (01030)
5N/4W-29B019S Recharge pond	11/02/05	1100	8.9	224	4.3	3.7
	12/14/05	1230	9.1	234	5.3	4.7
	01/17/06	1545	9.0	234	5.6	4.3
	02/16/06	1100	9.2	234	6.0	4.7
	06/07/06	1030	8.8	190	3.0	3.8
	07/19/06	0730	9.7	216	11.4	9.5
	09/20/06	1215	9.5	200	9.1	8.5

Table 13. Recharge pond water delivery for VVWD-1 (Bear Valley Road) and VVWD-2 (Yates Road), Victorville, San Bernardino County, California, September 2002–December 2007.

[All values are in cubic feet]

VVWD-1			VVWD-2								
POND- A			POND - A (East Pond)			POND - B (West Pond)			Sum of Pond A and B		
Date (month/ year)	Monthly total	Cumulative total	Date (month/ year	Monthly total	Cumulative total	Date (month/ year	Monthly total	Cumulative total	Date (month/ year	Monthly total	Cumulative total
09/02	0	0	09/02	0	0	09/02	0	0	09/02	0	0
10/02	3,223,300	3,223,300	10/02	0	0	10/02	0	0	10/02	0	0
11/02	3,054,567	6,277,867	11/02	0	0	11/02	0	0	11/02	0	0
12/02	891,833	7,169,700	12/02	0	0	12/02	0	0	12/02	0	0
01/03	0	7169,700	01/03	0	0	01/03	0	0	01/03	0	0
02/03	1,570,425	8,740,125	02/03	0	0	02/03	0	0	02/03	0	0
03/03	1,207,075	9,947,200	03/03	0	0	03/03	0	0	03/03	0	0
04/03	0	9,947,200	04/03	0	0	04/03	0	0	04/03	0	0
05/03	3,433,200	13,380,400	05/03	0	0	05/03	0	0	05/03	0	0
06/03	2,508,700	15,889,100	06/03	0	0	06/03	0	0	06/03	0	0
07/03	2,006,000	17,895,100	07/03	0	0	07/03	0	0	07/03	0	0
08/03	1,507,700	19,402,800	08/03	0	0	08/03	0	0	08/03	0	0
09/03	1,323,000	20,725,800	09/03	0	0	09/03	0	0	09/03	0	0
10/03	0	20,725,800	10/03	0	0	10/03	0	0	10/03	0	0
11/03	0	20,725,800	11/03	0	0	11/03	0	0	11/03	0	0
12/03	0	20,725,800	12/03	0	0	12/03	0	0	12/03	0	0
01/04	0	20,725,800	01/04	0	0	01/04	0	0	01/04	0	0
02/04	0	20,725,800	02/04	0	0	02/04	0	0	02/04	0	0
03/04	0	20,725,800	03/04	0	0	03/04	0	0	03/04	0	0
04/04	0	20,725,800	04/04	0	0	04/04	0	0	04/04	0	0
05/04	0	20,725,800	05/04	0	0	05/04	0	0	05/04	0	0
06/04	0	20,725,800	06/04	0	0	06/04	0	0	06/04	0	0
07/04	0	20,725,800	07/04	0	0	07/04	0	0	07/04	0	0
08/04	0	20,725,800	08/04	0	0	08/04	0	0	08/04	0	0
09/04	0	20,725,800	09/04	0	0	09/04	0	0	09/04	0	0
10/04	0	20,725,800	10/04	0	0	10/04	0	0	10/04	0	0
11/04	0	20,725,800	11/04	0	0	11/04	0	0	11/04	0	0
12/04	1,321,945	22,047,745	12/04	0	0	12/04	0	0	12/04	0	0
01/05	3,313,555	25,361,300	01/05	0	0	01/05	0	0	01/05	0	0
02/05	2,098,100	27,459,400	02/05	0	0	02/05	0	0	02/05	0	0
03/05	1,781,000	29,240,400	03/05	0	0	03/05	0	0	03/05	0	0
04/05	1,856,500	31,096,900	04/05	0	0	04/05	0	0	04/05	0	0
05/05	1,814,100	32,911,000	05/05	0	0	05/05	0	0	05/05	0	0

Table 13. Recharge pond water delivery for VVWD-1 (Bear Valley Road) and VVWD-2 (Yates Road), Victorville, San Bernardino County, California, September 2002–December 2007.—Continued

[All values are in cubic feet]

VVWD-1			VVWD-2								
POND- A			POND - A (East Pond)			POND - B (West Pond)			Sum of Pond A and B		
Date (month/ year)	Monthly total	Cumulative total	Date (month/ year	Monthly total	Cumulative total	Date (month/ year	Monthly total	Cumulative total	Date (month/ year	Monthly total	Cumulative total
06/05	1,080,700	33,991,700	06/05	0	0	06/05	0	0	06/05	0	0
07/05	0	33,991,700	07/05	0	0	07/05	0	0	07/05	0	0
08/05	0	33,991,700	08/05	0	0	08/05	0	0	08/05	0	0
09/05	0	33,991,700	09/05	0	0	09/05	0	0	09/05	0	0
10/05	0	33,991,700	10/05	18,800	18,800	10/05	0	0	10/05	18,800	18,800
11/05	3,525,600	37,517,300	11/05	593,600	612,400	11/05	869,000	869,000	11/05	1,462,600	1,481,400
12/05	4,632,650	42,149,950	12/05	0	612,400	12/05	0	869,000	12/05	0	1,481,400
01/06	3,744,450	45,894,400	01/06	1,513,200	2,125,600	01/06	3,041,700	3,910,700	01/06	4,554,900	6,036,300
02/06	0	0	02/06	1,819,400	3,945,000	02/06	401,400	4,312,100	02/06	2,220,800	8,257,100
03/06	0	0	03/06	0	3,945,000	03/06	1,277,500	5,589,600	03/06	1,277,500	9,534,600
04/06	0	0	04/06	0	3,945,000	04/06	0	5,589,600	04/06	0	9,534,600
05/06	0	0	05/06	3,051,600	6,996,600	05/06	374,500	5,964,100	05/06	3,426,100	12,960,700
06/06	0	0	06/06	0	6,996,600	06/06	0	5,964,100	06/06	0	12,960,700
07/06	0	0	07/06	0	6,996,600	07/06	0	5,964,100	07/06	0	12,960,700
08/06	0	0	08/06	786,600	7,783,200	08/06	1,446,800	7,410,900	08/06	2,233,400	15,194,100
09/06	0	0	09/06	2,060,700	9,843,900	09/06	390,000	7,800,900	09/06	2,450,700	17,644,800
10/06	0	0	10/06	2,144,300	11,988,200	10/06	0	7,800,900	10/06	2,144,300	19,789,100
11/06	0	0	11/06	86,600	12,074,800	11/06	426,200	8,227,100	11/06	512,800	20,301,900
12/06	0	0	12/06	0	12,074,800	12/06	0	8,227,100	12/06	0	20,301,900
01/07	0	0	01/07	1,041,000	13,115,800	01/07	200	8,227,300	01/07	1,041,200	21,343,100
02/07	0	0	02/07	1,676500	14,792,300	02/07	591,300	8,818,600	02/07	2,267,800	23,610,900
03/07	0	0	03/07	448,500	15,240,800	03/07	1,598,800	10,417,400	03/07	2,047,300	25,658,200
04/07	0	0	04/07	2,238,700	17,479,500	04/07	250,200	10,667,600	04/07	2,488,900	28,147,100
05/07	0	0	05/07	1,074,900	18,554,400	05/07	762,400	11,430,000	05/07	1,837,300	29,984,400
06/07	0	0	06/07	459,600	19,014,000	06/07	100	11,430,100	06/07	459,700	30,444,100
07/07	0	0	07/07	0	19,014,000	07/07	0	11,430,100	07/07	0	30,444,100
08/07	0	0	08/07	0	19,014,000	08/07	0	11,430,100	08/07	0	30,444,100
09/07	0	0	09/07	0	19,014,000	09/07	0	11,430,100	09/07	0	30,444,100
10/07	0	0	10/07	0	19,014,000	10/07	0	11,430,100	10/07	0	30,444,100
11/07	0	0	11/07	0	19,014,000	11/07	0	11,430,100	11/07	0	30,444,100
12/07	0	0	12/07	0	19,014,000	12/07	0	11,430,100	12/07	0	30,444,100

Manuscript appproved on March 10, 2009
Prepared by the USGS Publishing Network,
Publishing Service Center, Sacramento, California

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