Geohydrologic Data Collected from Shallow Neutron-Access Boreholes and Resultant-Preliminary Geohydrologic Evaluations, Yucca Mountain Area, Nye County, Nevada

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
gram (g)	0.03527	ounce (oz)
gram per cubic centimeter (g/cm^3)	0.03613	pound per cubic inch (lb/in^3)
kilometer (km)	0.6214	mile (mi)
kilopascal (kPa)	0.1450	14.5 pound per square inch (lb/in^2)
kilopascal (kPa)	0.01	bar
liter (l)	0.2642	gallon (gal)
meter (m)	3.281	foot (ft)
millimeter (mm)	0.03937	inch (in.)

Degree Fahrenheit (°F) may be converted to degree Celsius (°C) by using the following equation:

$$°C = 5/9 (°F-32).$$

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

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Abstract

In cooperation with the U.S. Department of Energy, 74 neutron-access boreholes were drilled in and near the southwestern part of the Nevada Test Site, Nye County, Nevada. Drilling, coring, sample collection and handling, and lithologic and preliminary geohydrologic data are presented in this report.

The boreholes were drilled in a combination of alluvium/colluvium, ash-flow tuff, ash-fall tuff, or bedded tuff to depths of 4.6 to 36.6 meters. Air was used as a drilling medium to minimize disturbance of the water content and water potential of drill cuttings, core, and formation rock. Drill cuttings were collected at approximately 0.6-meter intervals. Core was taken at selected intervals from the alluvium/colluvium using drive-coring methods and from tuff using rotary-coring methods. Nonwelded and bedded tuffs were continuously cored using rotary-coring methods.

Gravimetric water-content and water-potential values of core generally were greater than those of corresponding drill cuttings. Gravimetric water-content, porosity, and water-potential values of samples generally decreased, and bulk density values increased, as the degree of welding increased. Grain-density values remained fairly constant with changes in the degree of welding.

A high degree of spatial variability in water-content and water-potential profiles was noted in closely spaced boreholes that penetrate similar lithologic subunits and was also noted in adjacent boreholes located in different topographic positions. Variability within a thick lithologic unit usually was small.

INTRODUCTION

The U.S. Geological Survey has been conducting studies at Yucca Mountain, Nevada (fig. 1), to evaluate the hydrologic and geologic suitability of this potential site for storing high-level radioactive wastes in an underground mined repository (Waddell, 1982; Roseboom, 1983; Montazer and Wilson, 1984; Squires and Young, 1984; Waddell and others, 1984). These studies are a part of the Yucca Mountain Project, formerly the Nevada Nuclear Waste Storage Investigations (NNWSI), conducted in cooperation with the U.S. Department of Energy, Nevada Operations Office, as part of Interagency Agreement DE-AI08-78ET44802. Test drilling has been a principal method of geohydrologic investigation (Bentley and others, 1983; Thordarson and others, 1984). Work on the neutron-access boreholes was performed in accordance with the Yucca Mountain Project Quality Assurance Program.

Approximately 98 neutron-access boreholes have been planned to monitor natural infiltration in, and to collect matrix hydrologic-property data from, the surficial materials covering Yucca Mountain. Seventy-four of these boreholes were completed as of February 1986. The monitoring of natural infiltration with these boreholes is one of several shallow unsaturated-zone activities on Yucca Mountain designed to define upper flux-boundary conditions during both present-day and simulated wetter-climatic conditions. These flux-boundary conditions are necessary to model flow through the thick unsaturated zone beneath Yucca Mountain.

A majority of the 98 drilled and proposed neutron-access boreholes are located outside the boundaries of the Nevada Test Site (NTS). This land is administered by the Bureau of Land Management or the U.S. Air Force but has been designated as the Nevada Nuclear Waste Site Investigation permit area. For boreholes located off the NTS, the designation is USW UZ-Nxx; for boreholes located on the NTS, the designation is UE-25 UZN #xx, where xx is the borehole number and where 25 is the NTS area number.

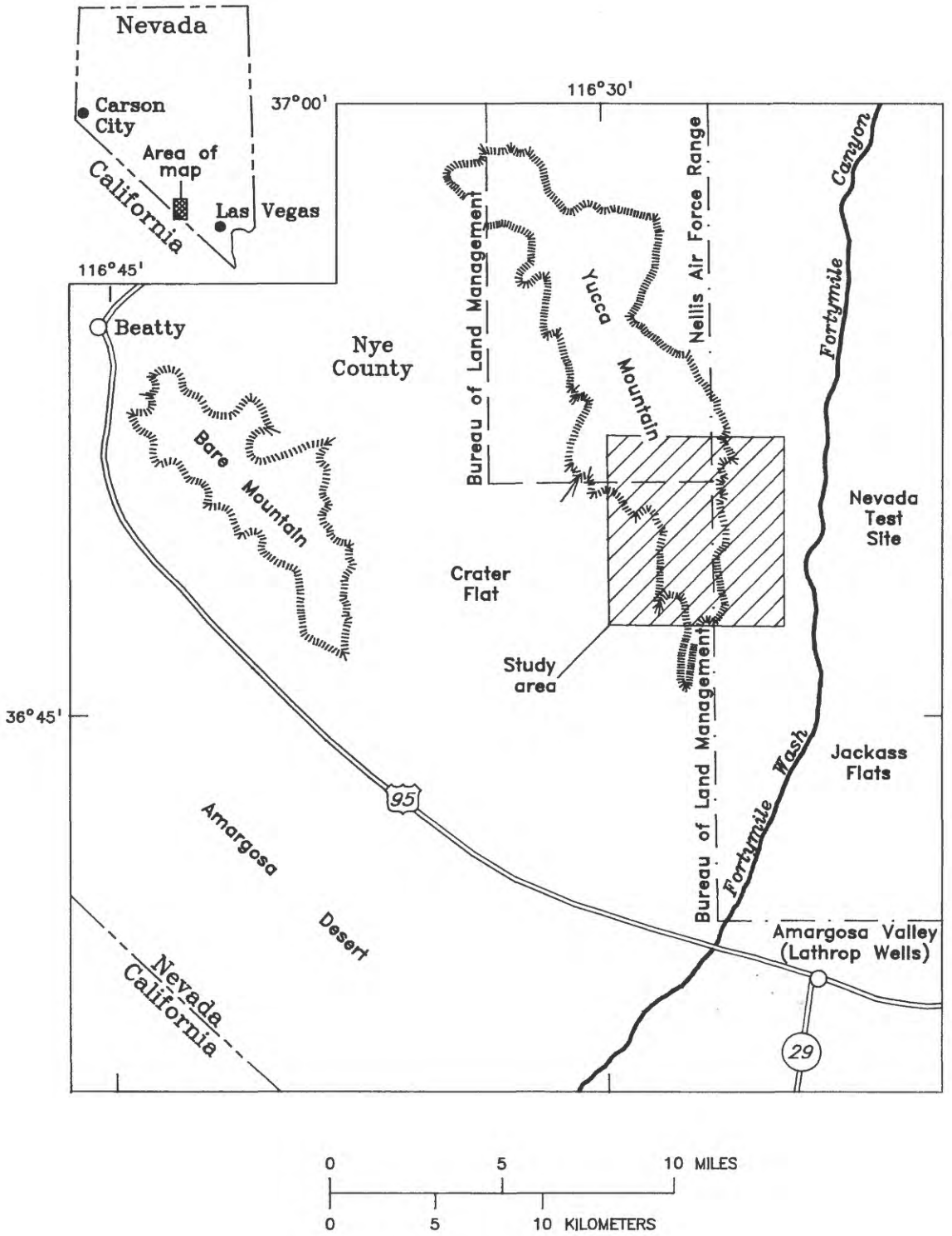

Figure 1.--Yucca Mountain study area and vicinity.

Hereafter, these boreholes will be referred to without the USW or UE-25 prefix in this report (in the text and figures) but are identified in table 1 in the "Supplemental Data" section at the back of the report.

This report presents drilling, coring, geologic, and preliminary hydrologic data from the 74 completed neutron-access boreholes. Methods for drilling, coring, collecting, handling, and testing of geologic samples have been described elsewhere (Hammermeister and others, 1986) and will be mentioned only briefly in this report. Lithologic information, water-content and water-potential data will be described in detail. Density values and tritium concentrations from a few selected boreholes will also be presented.

Hydrologic measurements made on geologic samples collected during drilling and coring have provided an initial determination of the vertical distribution of water-content and water-potential data in surficial materials. Water-content profiles in the formation rock adjacent to the boreholes have been monitored periodically by neutron-logging methods. The changes in the water-content profiles have been used to characterize water movement in the immediate vicinity of the boreholes since the time of drilling.

DATA COLLECTION

Location, Depth, and Preliminary Hydrogeologic Setting

The 74 neutron-access boreholes are located on Yucca Mountain near the southwestern part of the Nevada Test Site, Nye County, Nevada. Efforts have been made to locate the boreholes so that they encompass the range in hydrologic properties and conditions expected to be encountered in the surficial materials covering Yucca Mountain. Preliminary hydrogeologic-surficial units were identified from Scott and Bonk, 1984, and have been used as a guide for locating the neutron-access boreholes. The locations of the 74 completed boreholes and 24 additional proposed boreholes are shown in figure 2. The neutron-access borehole number, location, elevation, borehole depth, tuff/alluvium contact, preliminary hydrogeologic-surficial unit, and topographic position for each borehole (drilled and proposed) are summarized in table 1 in the "Supplemental Data" section at the back of the report.

Yucca Mountain initially was divided into two hydrogeologic-surficial units for the purpose of locating neutron-access boreholes: (1) An alluvium/colluvium unit in canyon bottoms, and (2) an upland-bedrock unit usually covered with a thin layer of unconsolidated material. Ideally, each hydrogeologic-surficial unit should be characterized by a set of substantially different infiltration properties. However, information from Yucca Mountain such as infiltration data, soil maps, or unconsolidated geologic-surficial material maps were not available to enable characterization of additional, more detailed, hydrogeologic-surficial units prior to drilling these boreholes. As a result, the first 30 neutron-access boreholes were located and drilled using this two-unit classification system.

Drilling and initial neutron-moisture logging of the first group of boreholes completed in the upland-bedrock unit indicated noticeably different infiltration characteristics, which appeared to be qualitatively related to observed fracture-densities. Because the consolidated surficial units defined by Scott and Bonk (1984) also indicated differences in fracture-densities (R.A. Spengler, U.S. Geological Survey, oral commun., 1986), it was decided to define hydrogeologic-surficial units in upland areas as equivalent to the consolidated geologic subunits defined by Scott and Bonk (1984). These preliminary hydrogeologic-surficial units, and a qualitative estimate of their fracture-density values, are summarized in table 2 in the "Supplemental Data" section at the back of the report, and have been used to locate all subsequent neutron-access boreholes.

Neutron-access boreholes were located in alluvium/colluvium in canyon bottoms along lines parallel, perpendicular, or both, to the main axes of those canyons. Boreholes were located perpendicular to the canyon axis to examine how natural-infiltration processes were affected by the thickness of unconsolidated deposits and the position of boreholes in relation to canyon walls and to the center of the most recently formed channels. Boreholes were located parallel to the main canyon axis to study the effects of increased drainage area on infiltration. All boreholes located in alluvial/colluvial deposits were drilled through the entire thickness of these deposits and at least 1 m into the underlying consolidated bedrock. These boreholes generally were drilled to depths greater than 10 m.

To determine the effects of slope and soil thickness on natural infiltration in upland areas adjacent to and above canyon bottoms, neutron-access boreholes were located in different topographic positions within the hydrogeologic surficial units. Most neutron-access boreholes in the upland hydrogeologic-surficial units generally were drilled to a depth of approximately 15 m.

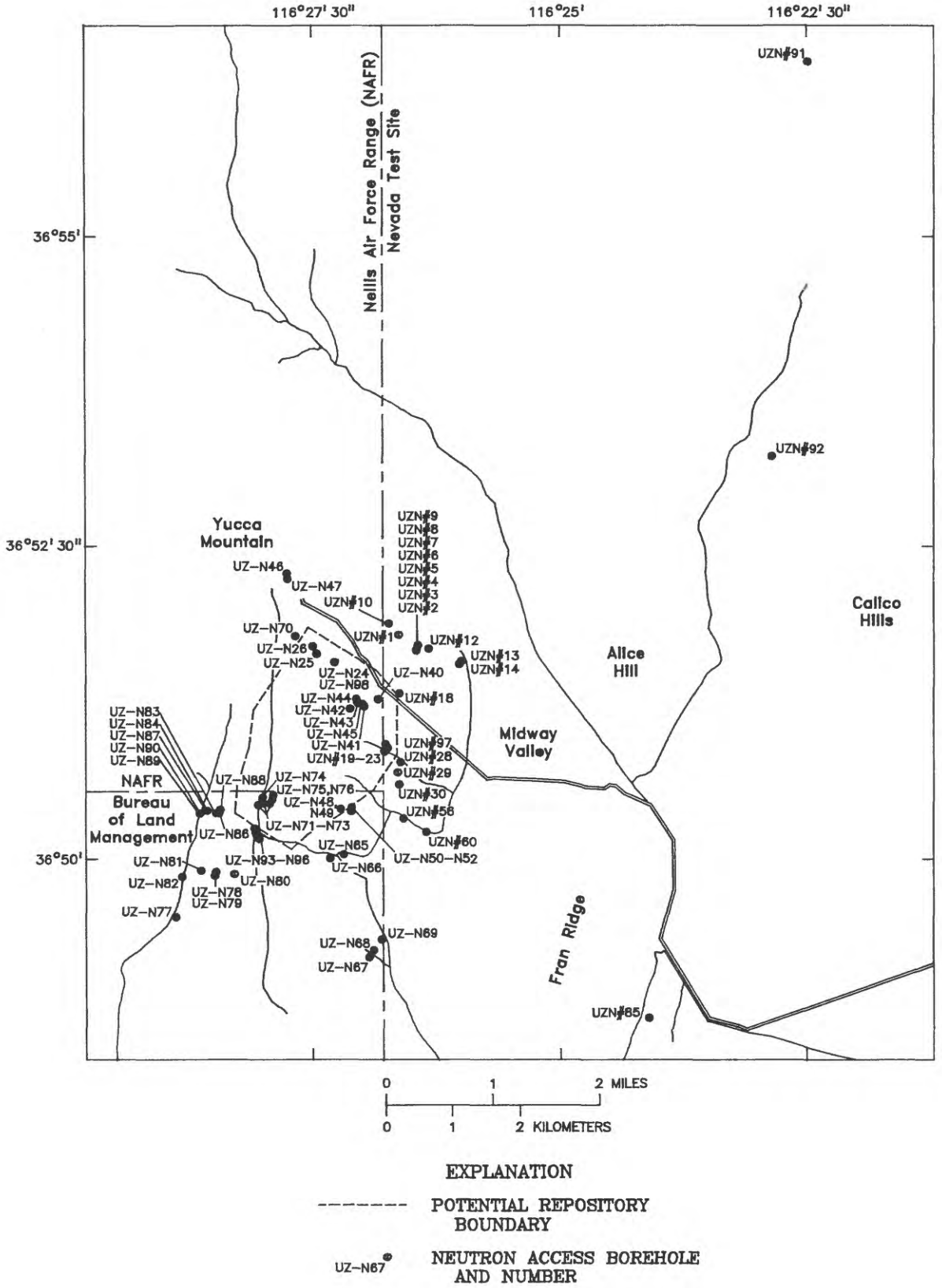

Figure 2.--Yucca Mountain and vicinity showing location of drilled neutron-access boreholes.

DRILLING AND CORING METHODS

Neutron-access boreholes were drilled using the ODEX 115 drilling system with air as the drilling fluid. Core samples were obtained from selected neutron-access boreholes by drive-core methods in unconsolidated alluvium/colluvium and by rotary-core methods in tuffs. These drilling and coring methods and equipment have been described in detail by Hammermeister and others (1986). These authors also have presented evidence that these methods minimally disturb the in-situ water content of the formation as well as that of the geologic samples (drill cuttings and core).

The ODEX 115 system of drilling uses a down-hole percussion hammer to drill and ream at the bottom of the casing. A pilot bit, in conjunction with an eccentric reamer, drills a hole slightly larger than the outside diameter of the casing. The diameter of the resulting hole is approximately 152 mm, the outside diameter of the casing is 140 mm, and the casing wall is approximately 13 mm thick. The percussion hammer also impacts on the casing through a shoe attached to the bottom joint of the casing. Thus, the casing is advanced downward as the borehole is drilled deeper. Drill cuttings are returned to the surface through the inside of the casing, thereby minimizing disturbance of the formation by drilling fluids.

Coring was done to collect intact geologic samples at selected intervals in designated neutron-access boreholes. The ODEX 115 casing was advanced downward until the desired coring depth was reached. Drive-core samples were obtained by driving a heavy-duty 101.6 mm inside-diameter by 0.61-m long solid-tube sampler attached directly to a percussion hammer approximately 0.61 m into alluvium/colluvium deposits. These unconsolidated core samples usually were collected at 1.52-m intervals. Even though this drive-coring method does not greatly disturb the gravimetric water content of samples, it has been shown to alter the porosity and related properties of drive-core samples compared to in-situ properties (Hammermeister and others, 1986).

Rotary coring was done with a 1.52 m triple-tube, HWD4-size wireline core barrel modified by Norton Christensen, Inc. for air coring. The resulting core was approximately 63.5 mm in diameter. Non-welded and bedded tuffs were cored continuously using a stagger-tooth carbide-tipped bit. Welded tuffs were cored for short intervals (usually less than 0.61 m) with diamond-set face-discharge bits. The welded tuffs are devitrified, and the rock is hard, brittle, and fractured, which in part caused shorter core runs.

After being cored to the desired depth interval, the borehole was enlarged (reamed), and the casing was advanced to the bottom of the borehole. The drilling, coring, reaming, and casing sequence was repeated until the total depth of the borehole was reached. Drill cuttings were collected at regular intervals from nearly all neutron-access boreholes; drive core and rotary core were collected from selected intervals of unconsolidated alluvium/colluvium and consolidated tuffaceous rock. Complete records, including depth, cored interval, sample interval, quantity of core recovered, and hydrologic test assignment, can be found on file at the U.S. Geological Survey, Hydrologic Research Facility, Nevada Test Site. A detailed history of drilling and coring of the boreholes is contained in a report (Fenix & Scisson, 1987).

SAMPLE COLLECTION AND HANDLING

During sample collection and handling, every effort was made to minimize the opportunity for water to evaporate from the samples from the time these samples were removed from the borehole to the time water-content or water-potential measurements could be made. Quality assurance procedures were followed (Colleen McBride, USGS, written commun., 1985) to meet these requirements. Because measurements of water-potential were not made on samples immediately after collection, the samples were stored in sealed, waxed containers at room temperature until such measurements could be made. Furthermore, samples collected onsite were divided into subsamples in a humidified glove box which minimized evaporation of water from these samples during handling. A detailed description of sample collection and handling methods is given in Hammermeister and others (1986).

The first three neutron-access boreholes drilled were UZN #18, UZN #20, and UZ-N70. These holes were drilled to test the ODEX drilling system. During drilling, cuttings were collected for lithologic description. There were no samples collected from these holes for hydrologic measurements.

Drill Cuttings

Drill cuttings were diverted from the borehole through a flexible hose to a dry cyclone separator. As drilling progressed, two drill-cutting samples were collected from the bottom of the cyclone separator through a gate valve that was opened by a hand lever, usually after an interval of 0.61 m had been drilled. One sample was collected in a paper carton for the purpose of a lithologic description of each drilled interval. These samples are archived at the Sample Management Facility at the NTS. A second sample was collected in an

airtight glass jar for laboratory measurements of water content and water potential. The jars were labeled, taped, waxed, and stored at approximately 20 to 25°C until measurements could be made.

Initially, during drilling of the first few neutron-access boreholes, drill-cutting samples designated for water-content and water-potential measurements were divided into composite, coarse, and fine particle-size fractions. The samples were sieved through a screen with 5-mm openings to separate the cuttings into coarse- and fine-size particles. Unsieved cuttings were designated as composite samples. These measurements were designed to determine the distribution of water-content and water-potential values among particle-size fractions of cuttings and to determine which fraction yielded water-content and water-potential values most representative of the formation rock. In later boreholes, generally only coarse samples were collected.

Drive Core

Solid-tube drive-core samples were immediately brought to the onsite-laboratory trailer and placed in a humidified glove box once they were collected from the borehole. The solid-tube drive-core samplers were fitted with six 100-mm outside-diameter brass liners to contain the unconsolidated geologic samples after removal from the tube samplers. These brass liners were divided into two 152-mm and four 76-mm lengths to facilitate the division of the drive core into subsamples for different hydrologic-property measurements. Initially, attempts were made to manually push the brass liners out of solid tube samplers. This proved impossible without disturbing the core. A power core-extrusion device then was designed and built to remove the brass liners. However, drive core was taken from a number of holes (including UZN #4, UZN #6, UZN #8, UZN #12, UZN #13, UZN #14, UZN #60, and UZ-N69) before the extrusion device was built. Drive-core samples from these boreholes were not further subdivided into different length intervals because of the disturbance and mixing that occurred during the removal of the liners from the solid-tube samples.

Different segments of the drive core were designated for the measurement of the following properties and conditions: tritium concentrations, gravimetric water-content and water-potential values, permeability and matric-potential values, and density and volumetric water-content values. In some instances, segments selected for gravimetric water-content and water-potential measurements were sieved into coarse and fine particle-size fractions to determine the distribution of values with particle size. Gravimetric water-content measurements were done at the onsite laboratory; samples for water-potential measurements were placed in glass jars and capped, taped, waxed, labeled, and transported to the U.S. Geological Survey hydrologic laboratory for testing. All samples in liner segments were capped, taped, waxed, labeled, and stored at approximately 20 and 25 °C until the specified test could be performed.

Rotary Core

After each core run was completed, the split inner tube was removed from the core barrel at the drill site and immediately taken to the onsite laboratory and placed in a humidified glove box for processing. The natural fractures of the core were described, and a preliminary lithologic description was made. Generally, this intact, 1.52-m piece of core was recovered from nonwelded and bedded tuffs. Two 76-mm segments of core were split from the upper and lower parts of the available core for water-potential and gravimetric water-content measurements. The samples for water-potential measurements were broken into rubble and stored in airtight glass jars until measurements could be made. The jars were labeled, taped, waxed, and stored at approximately 20 to 25°C until measurements could be made. Two 76-mm segments and two 152-mm segments were split from the bottom and midsections of the available core. The smaller segments were designated for matric-potential measurements, and the larger segments were designated for permeability-related measurements. These samples were placed in split polyvinyl chloride liners and capped, taped, labeled, waxed, and stored at approximately 20 to 25°C until designated laboratory testing could be done.

LITHOLOGY

The lithologic descriptions of the neutron-access boreholes were made from drill cuttings, drive core, and rotary-core samples. The lithologies penetrated by the boreholes include bouldery alluvial/colluvial deposits, poorly consolidated bedded tuffs, nonwelded tuffs, and fractured welded tuffs. The lithologic logs of the boreholes are presented in table 3 in the "Supplemental Data" section at the back of the report. The alluvial/colluvial material derived from these tuffs are of Quaternary/Tertiary age. Four of the boreholes (UZN #13, UZN #14, UZ-N68, and UZ-N69) were drilled into nonwelded to partially welded sections of

the Rainier Mesa Member of the Timber Mountain Tuff, which is of Tertiary age. Most of the boreholes penetrate tuffaceous members of the Tertiary Paintbrush Tuff. The Paintbrush Tuff consists of four members; they are, in descending stratigraphic order, Tiva Canyon, Yucca Mountain, Pah Canyon, and Topopah Spring. All bedded tuffs between each member encountered in the existing holes are part of the Paintbrush Tuff. Most boreholes penetrated a combination of lithologies. These descriptions include names of the lithologic subunits of the Tiva Canyon and the Topopah Spring Members of the Paintbrush Tuffs originally defined by Scott and Bonk (1984). The terms that describe degree of welding, in increasing order, are nonwelded, partially, moderately, and densely.

One exception was noted concerning the lithologic subunits as defined by Scott and Bonk (1984). The nonwelded to partially welded, vitric portion of the columnar zone in the lower Tiva Canyon Member is identified in this report as a separate subunit. This subunit, named the "shardy base," was encountered in boreholes UZN #10, UZ-N24, and UZ-N98. The shardy base has been separated from the columnar zone based on the degree of welding and fracture density, both of which influence the hydrologic properties of the subunit.

GEOPHYSICAL LOGS

After drilling was completed for each neutron-access borehole, the borehole was logged with a neutron-moisture meter. Logging is currently done only in the cased section of the borehole with the probe decentralized. All 74 holes are logged on a regular schedule and more frequently after substantial precipitation events.

TESTING PROCEDURES AND RESULTS

All testing procedures are described in detail in Hammermeister and others (1986). Gravimetric water-content procedures were followed in the onsite laboratory by standard gravimetric oven-drying methods (Gardner, 1986). Water-potential measurements were determined at the U.S. Geological Survey hydrologic laboratory on the Nevada Test Site, using a Richards psychrometer (Rawlins and Campbell, 1986). Bulk- and grain-density measurements were made on selected drive-core and rotary-core samples by Holmes and Narver Materials Testing Laboratory, Mercury, Nevada, using Standard American Society of Testing and Materials procedures. Porosity values were calculated from bulk and grain-density measurements. Tritium concentrations were measured by the U.S. Geological Survey Tritium Laboratory in Reston, Virginia. This laboratory uses vacuum-distillation methods to extract water from samples and standard scintillation methods to measure tritium concentrations.

PRELIMINARY GEOHYDROLOGIC EVALUATIONS

Water-Content Measurements

Gravimetric water-content measurements were determined on various types of geologic samples from the neutron-access boreholes. The results for drill-cutting samples are presented in table 4. The results for drive core and rotary core samples are presented in table 5. Both tables are in the "Supplemental Data" section at the back of the report. Each depth in table 4 represents a midpoint of a drilled interval.

Statistical methods used to describe the mean, standard deviation, and median of gravimetric water-content data as a function of major lithologic units and the degree of welding are presented in tables 6 and 7 in the "Supplemental Data" section at the back of the report. In nearly every lithologic unit, the median is less than the mean value of the hydrologic characteristic. This consistent trend is not typical of data that have a normal cumulative-frequency distribution. Probability plots of the cumulative-frequency distribution of hydrologic data, from a number of lithologic units, generally indicate that these data are log-normally distributed (Hald, 1952). In this report, the hydrologic data will be assumed to be log-normally distributed; therefore, the median will be used as the best estimate for the central tendency.

A comparison of coarse drill-cuttings data (table 6) with core data (table 7) indicates that drill cuttings have a slightly smaller median gravimetric water-content value than core for each major rock unit. This was expected because drill cuttings have a larger surface-area-to-volume ratio than core samples and, therefore, are more susceptible to water loss due to evaporation.

Even though coarse drill cuttings are slightly drier than core samples, in most instances, the gravimetric water-content values (and water-potential values, discussed later in the Water-Potential Measurements section) of coarse drill cuttings correlated with core-sample values obtained from the same depth interval. The results of a linear-regression analyses between gravimetric water-content values of these two different geologic samples, obtained from the same depth interval, for rock types defined on the basis of welding are summarized in table 8 in the "Supplemental Data" sec-

tion at the back of the report. Rock types were not further subdivided by lithology for this correlation (as in tables 6 and 7), in order to keep the sample size as large as possible. The relatively large coefficient of determination (table 8) indicates that coarse drill cuttings can be used in conjunction with regression equations to estimate the water content of core samples. Hammermeister and others (1986) also have presented evidence that indicates that the water-content values of core samples are, in turn, good estimates of the water-content values of the formation rock.

A high correlation was determined among water-content values of samples in moderately and densely welded tuffs (table 8). The average particle size of coarse drill cuttings from this rock type was generally much larger than the coarse particle size from other rock types. This, in addition to the smaller porosity (to be discussed later in the Bulk- and Grain-Density Measurements and Porosity Calculations section) of the moderately and densely welded tuffs, probably minimizes the alteration of water content by evaporation.

Hammermeister and others (1986) also have determined that, in general, water-content values of composite core samples had a higher correlation with water-content values of coarse particle-size fractions of drill cuttings at the same depth interval than either fine or composite particle-size fractions of drill cuttings. This analysis was made on data from a number of neutron-access boreholes drilled early in the program. As a result of this analysis, only sieved, coarse drill cuttings were collected for gravimetric water-content and water-potential measurements in the majority of all subsequently drilled neutron-access boreholes.

Examples of water-content profiles for different particle-size fractions of drill cuttings from boreholes drilled in different surficial rock units are shown in figure 3. The coarse and composite data are in fair agreement throughout UZN #56, which was drilled in alluvium/colluvium from the surface to a depth of 17.07 m, and in the lower part of UZ-N96, which was drilled in welded tuff from 0.61 m to 10.67 m. The fine particle-size fraction is wetter than the other fractions in alluvium/colluvium. In-situ fine particle-size fractions in alluvium/colluvium have a much different pore-size distribution than coarse fractions composed mainly of welded tuff fragments. These same differences in pore-size distribution probably occur in the drill cuttings. If the water in the fine and coarse particle-size fractions is in approximate energy equilibrium, the fine particle-size fraction will retain a greater quantity of water because of its larger porosity and greater average pore size. At this time, it is not known why fine particle-size cuttings (produced by the drilling process from consolidated rock) of the welded tuff in the upper section of UZ-N96 are wetter than other fractions. In the lower part of the hole, preferential drying of the fine particles due to the large surface-area-to-volume ratio probably explains the smaller water-content values that were measured.

The sieving of drive-core samples from selected boreholes also provides information on the distribution of water among particle-size fractions. Examples of results for two boreholes located in different topographic positions in a canyon bottom are shown in figure 4. The trends in data are similar to those that occur for alluvium/colluvium drill cuttings (fig. 3).

Some general trends in water-content data can be discerned from tables 6 and 7 without doing statistical analysis. In general, samples from nonwelded and bedded tuffs are wetter than samples from moderately welded tuffs which, in turn, are wetter than samples from densely welded tuffs. Moderately to densely welded tuffs were combined with densely welded tuffs in this analysis. The degree of welding in tuffaceous rock is known to affect the porosity and, therefore, the pore-size distribution of the matrix of this rock (Scott and others, 1983). Increases in the degree of welding result in a decrease in matrix porosity. Although little data exist, increased welding also results in a decrease in the median pore radius in samples. The pore-size distribution, in part, determines the quantity of water (water content) and the energy of the water (water potential) held in the porous matrix.

Statistics describing the central tendency and dispersion of water-content data for separate lithologic subunits in the welded sections of the Tiva Canyon Member are listed in tables 9 and 10 in the "Supplemental Data" section at the back of the report.

Differences in standard deviation (variances) are apparent in the data and also occurred in the log-transformed data. Because of these differences in variances, the mean values of these units cannot be compared by standard parametric statistical analysis. Comparisons of the mean or median values of these lithologic subunits, and the major lithologic units (also having unequal variances) noted in tables 6 and 7, need to be made using nonparametric methods.

Knowledge of the equality or inequality of mean values of water content and other hydrologic characteristics are needed to help define or redefine hydrogeologic surficial and subsurface units on Yucca Mountain. As mentioned earlier, preliminary hydrogeologic-surficial units have been defined mainly on the basis of the lithology of subunits of the welded Tiva Canyon Member. These preliminary definitions will be redefined based on the results of these statistical comparisons of hydrologic characteristics among rock units.

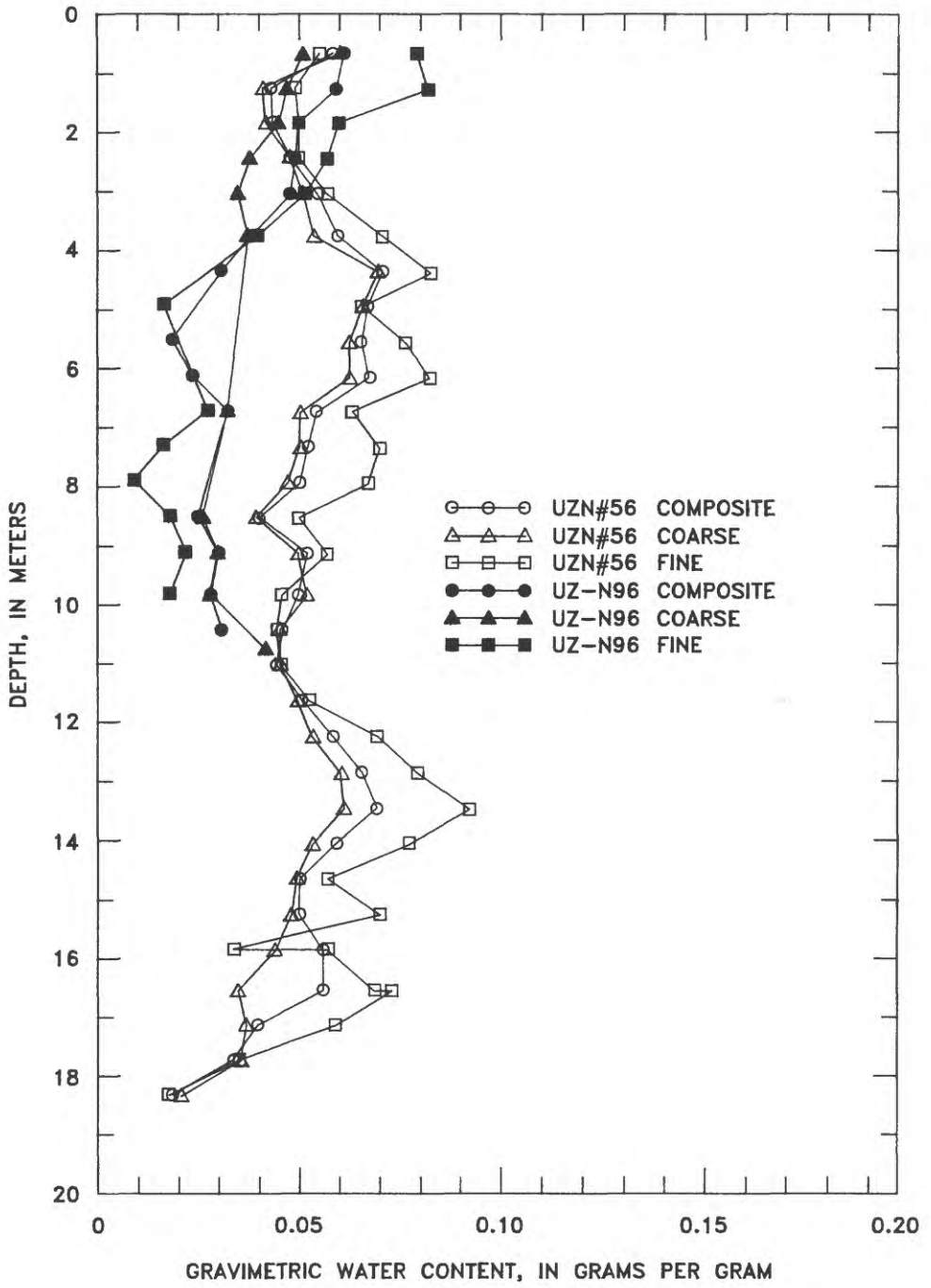

Figure 3.--Water-content profiles for different particle-size fractions of drill-cutting samples from two boreholes.

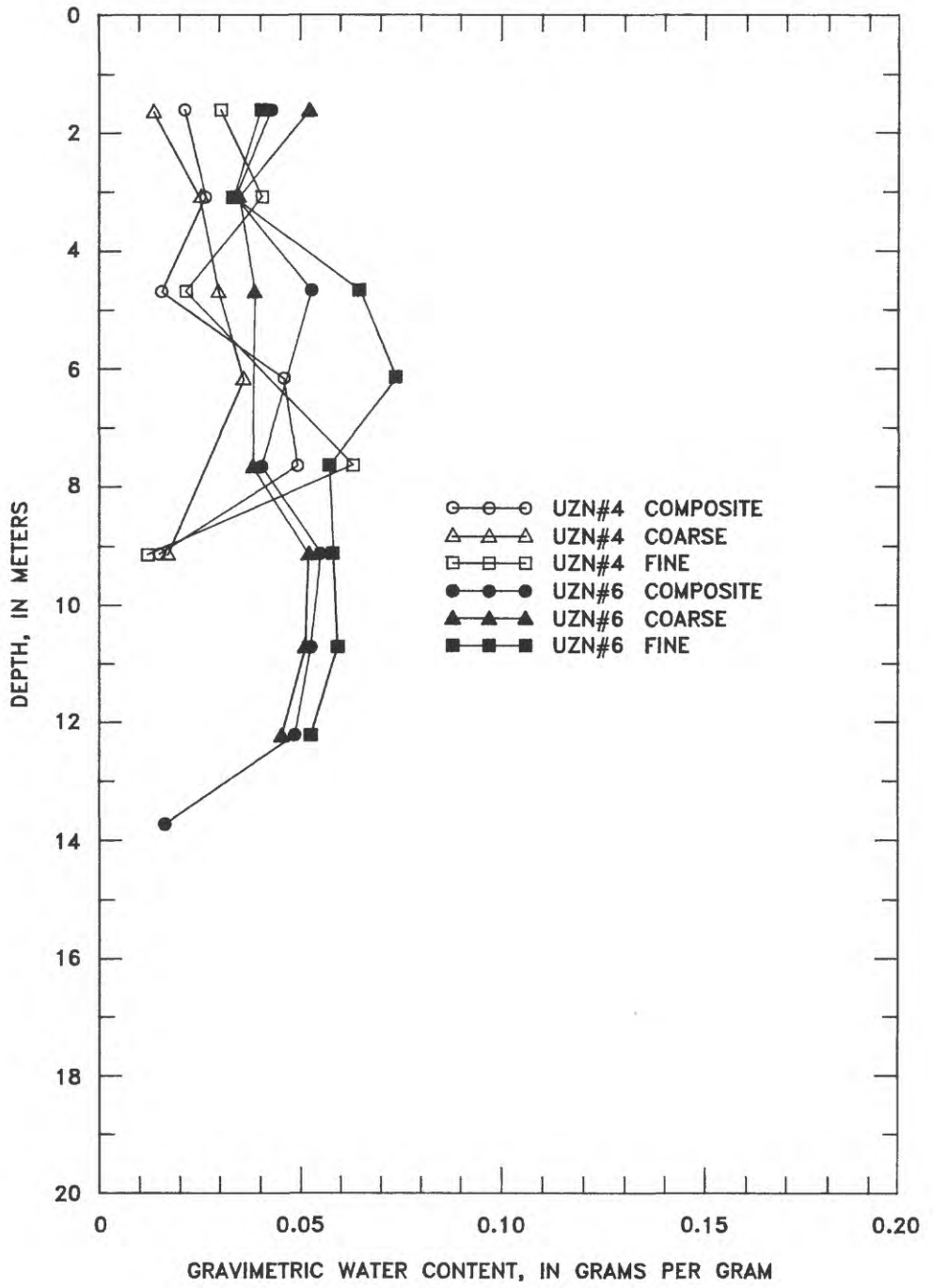

Figure 4.--Water-content profiles for different particle-size fractions of drive-core samples from two boreholes located in different topographic positions in alluvium/colluvium, UZN#4 is located on a terrace and UZN#6 is in an active drainage channel.

Large differences in median water-content values occurred among some welded lithologic surficial subunits of the Tiva Canyon Member penetrated by boreholes (tables 9 and 10). The drill cuttings of the densely welded upper lithophysal subunit seems to be much wetter than the other densely welded subunits (table 9).

Water-Potential Measurements

Water-potential measurements were done on various types of geologic samples from the neutron-access boreholes. The results for drill-cutting samples are presented in table 4. The results for drive-core and rotary-core samples are presented in table 5. Both tables are in the "Supplemental Data" section at the back of the report. Each depth in table 4 represents a midpoint of a drilled interval.

The water potential of a sample is dependent upon the water content of that sample and its previous wetting and drying history. Therefore, many of the same trends discussed previously for water-content data also are expected to occur in water-potential data. However, because the relation between the water potential and water content of a sample is very nonlinear, a number of substantial differences also are expected.

A comparison of the median water-potential values of drill-cuttings and core data collected for all major lithologic units divided on the basis of the degree of welding indicates that the median values of cuttings are generally smaller than those for core (tables 11 and 12 in the "Supplemental Data" section at the back of the report). Exceptions to this were values from the densely welded Tiva Canyon Member and the moderately welded Yucca Mountain Member.

At the same time, the results of regression analyses (table 8) indicated a fairly significant correlation of water-potential values of coarse drill cuttings compared to core samples obtained from the same depth intervals for alluvium/colluvium and moderately and densely welded tuffs. The smaller correlation that occurred in nonwelded and bedded units in part is because of the extra drying that occurred during the coring and reaming process. Continuous core was collected for long intervals in all nonwelded and bedded tuff sections of boreholes before these sections were reamed and cuttings were collected. This long exposure to circulating air during coring would preferentially dry these sections and would result in smaller water-content and water-potential values. Water potential is dependent upon water content and, in many instances, a small change in water content caused by drying can result in a very large change in water potential.

Median water-potential values (as with median water-content values) of drill cuttings and core samples vary with lithology and tend to decrease as the degree of welding increases within a particular lithologic unit (tables 11 and 12). The smaller water-potential values of drill cuttings from nonwelded to partially welded tuffs seem to be an exception to this trend. As mentioned earlier, these data may contain errors caused by the extra drying that occurred during the coring and reaming process.

Finally, noticeable differences in median water-potential values are apparent among some of the lithologic subunits of the moderately and densely welded sections of the Tiva Canyon Member (tables 13 and 14 in the "Supplemental Data" section at the back of the report).

Examples of the Spatial Variability of Water-Content and Water-Potential Data

This section will present specific examples of the spatial variability of hydrologic characteristics to explain the complexity of spatial relations at Yucca Mountain. The U.S. Geological Survey has developed comprehensive plans, and work is planned that will use geostatistical methods (Journel and Huijbregts, 1978) to describe the spatial variability of hydrologic characteristics over the surface of Yucca Mountain. The methods are to model the spatial relations of data collected at different locations, estimate the distribution of median values and variances of characteristics over the mountain, and determine the level of uncertainty associated with these median values.

Examples of ranges in the spatial variability of hydrologic characteristics in surficial rocks are most easily illustrated by examining water-content and water-potential profiles from a series of boreholes located on an approximately west-to-east transect over the proposed repository. Profiles will be compared in pairs of closely spaced boreholes that penetrate similar lithologic units and are located in similar topographic positions. Beginning in Solitario Canyon, on the west side of Yucca Mountain, almost identical profiles of both characteristics are shown in UZ-N89 and UZ-N90 (figs. 5 and 6), which are spaced approximately 1 m apart in the center of an alluvium/colluvium channel. Very different profiles are shown in UZ-N84 and UZ-N87 (figs. 7 and 8), drilled approximately 1 m apart on a terrace almost 100 m to the east of UZ-N89 and UZ-N90. Very large increases in water-content and water-potential values in UZ-N84 at approximately

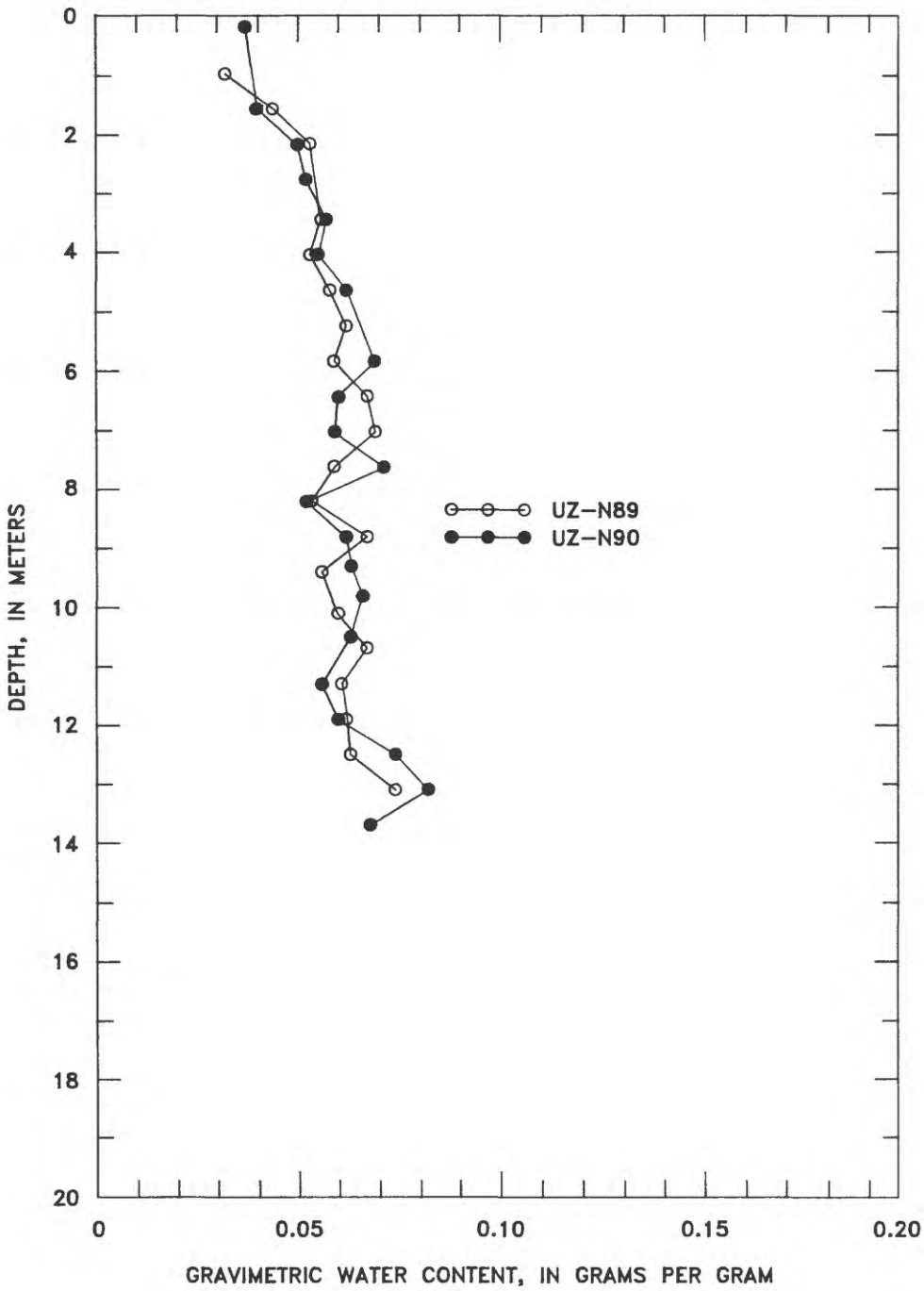

Figure 5.--Water-content profiles for boreholes UZ-N89 and UZ-N90 located approximately 1 meter apart in a channel in alluvium/colluvium.

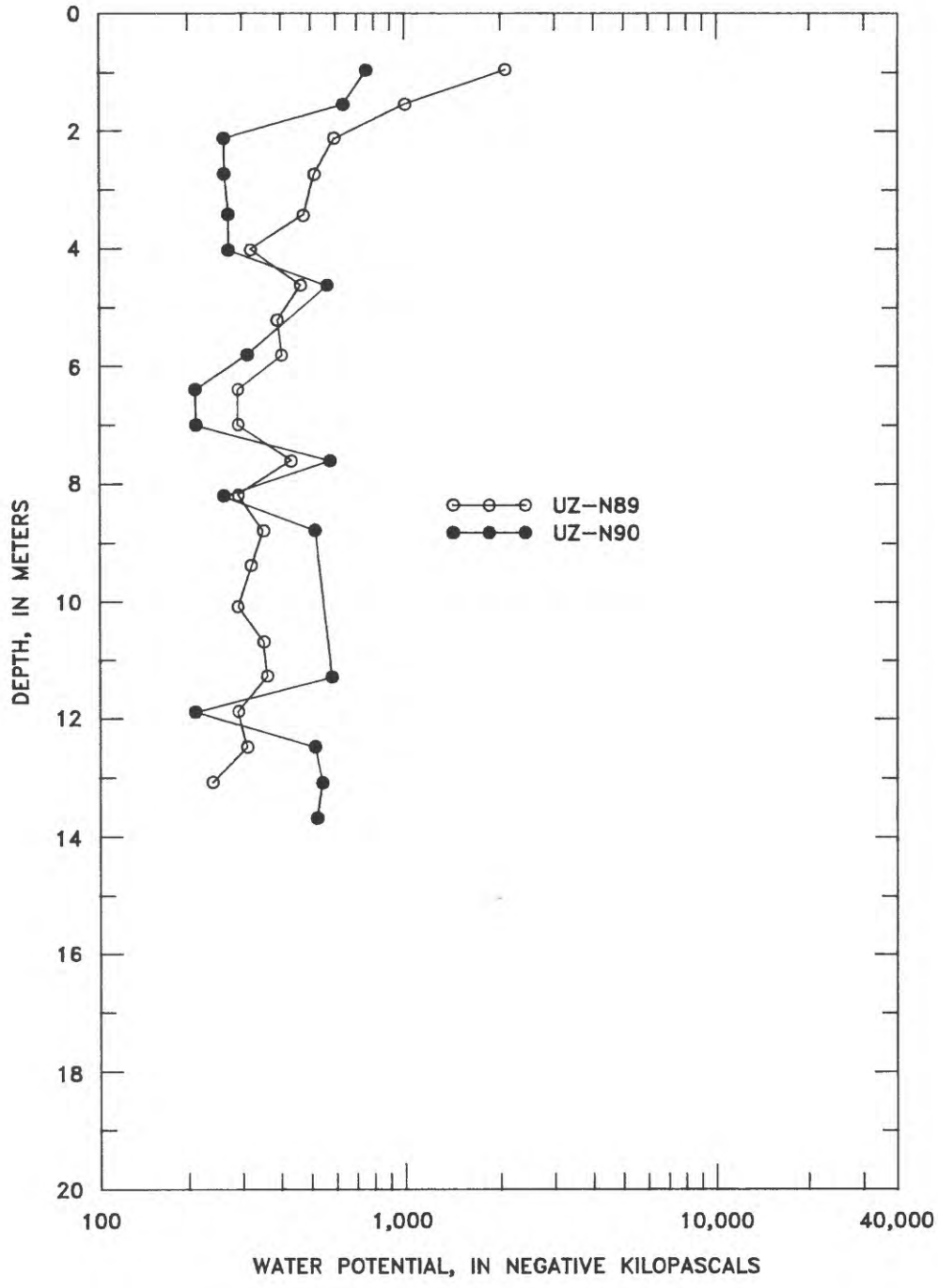

Figure 6.--Water–potential profiles for boreholes UZ–N89 and UZ–N90 located approximately 1 meter apart in a channel in alluvium/colluvium.

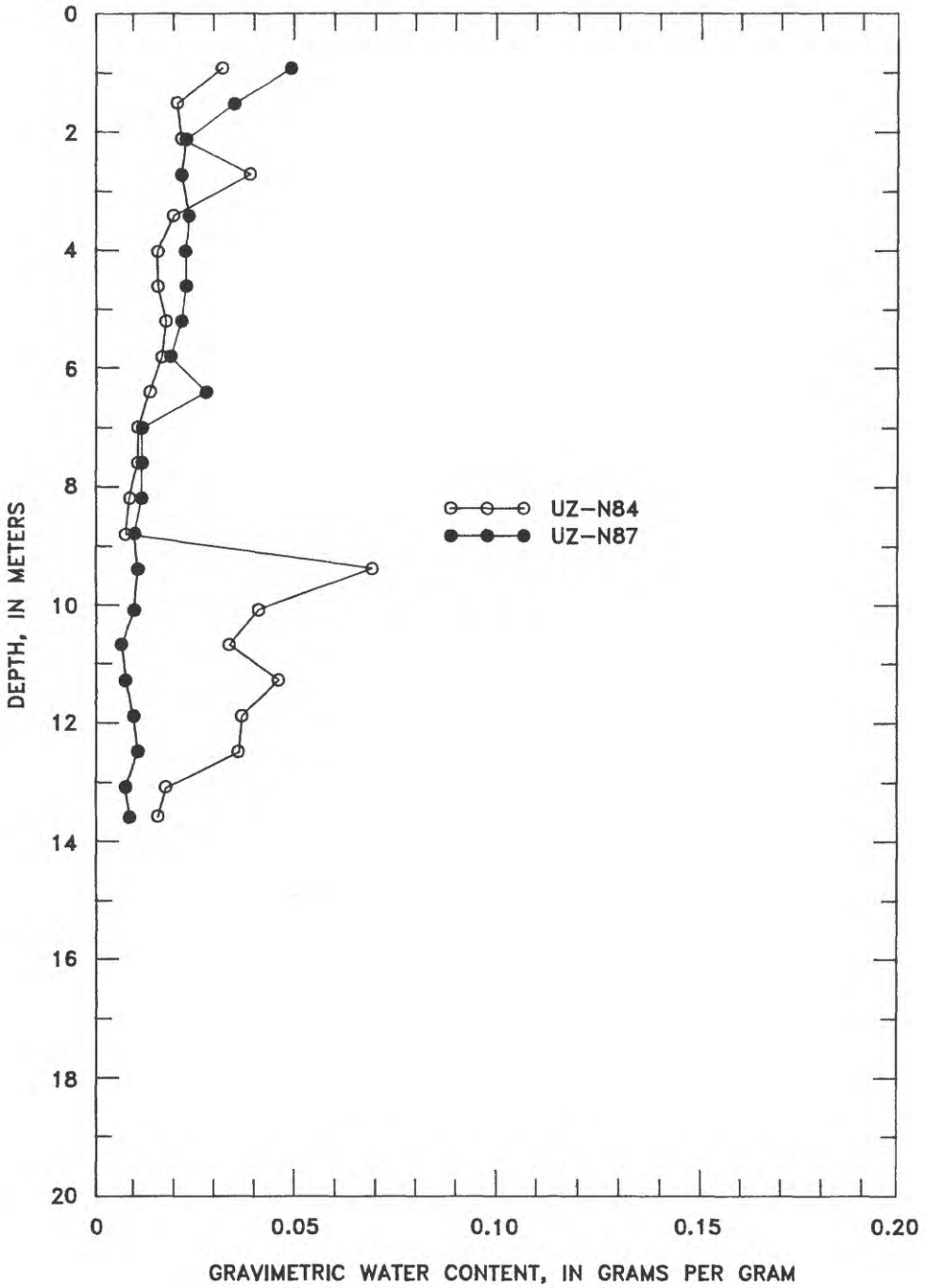

Figure 7.--Water-content profiles for boreholes UZ-N84 and and UZ-N87 located approximately 1 meter apart on a terrace where alluvium/colluvium overlies welded tuff.

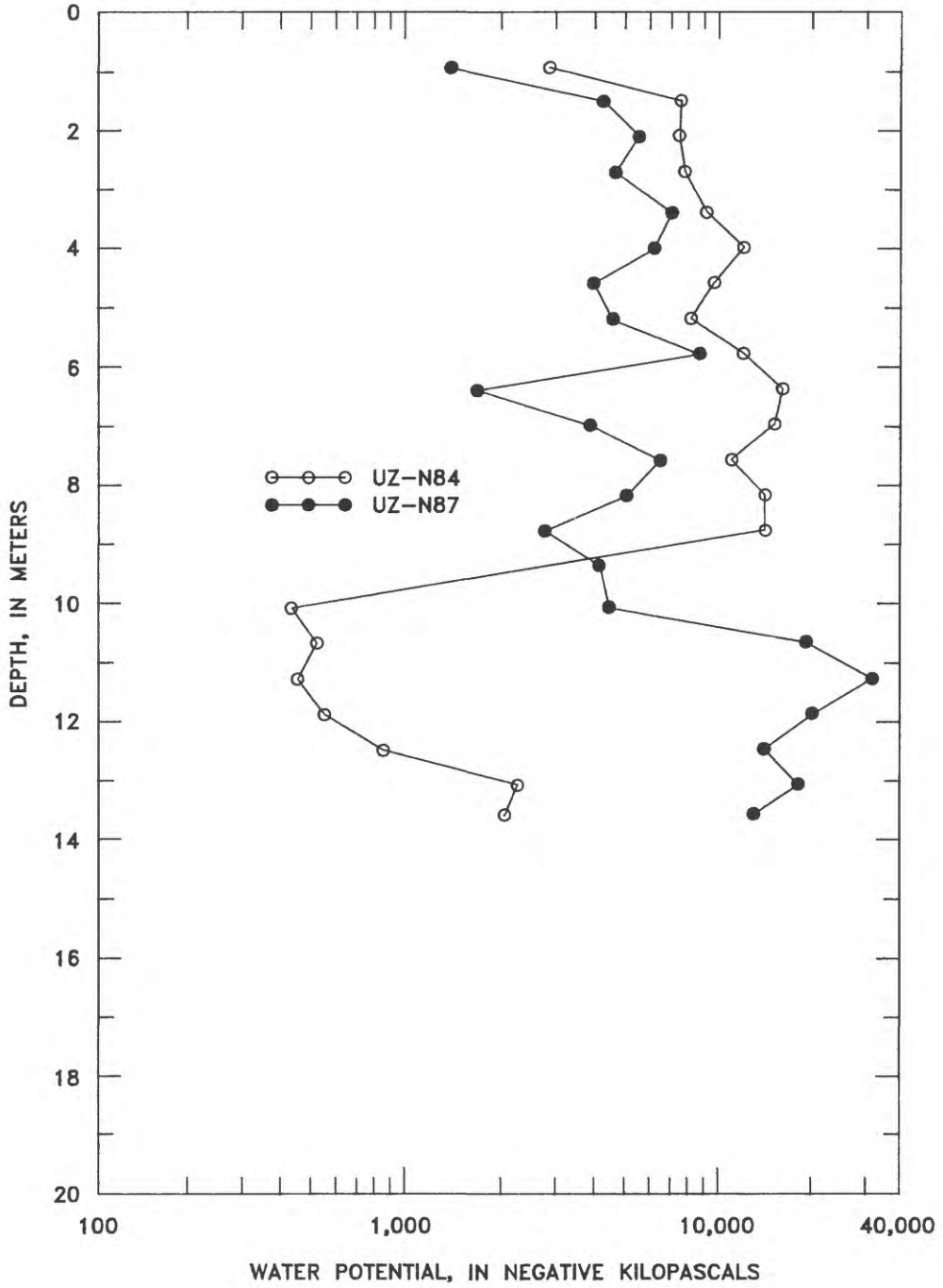

Figure 8.--Water–potential profiles for boreholes UZ–N84 and UZ–N87 located approximately 1 meter apart on a terrace where alluvium/colluvium overlies welded tuff.

9.4 m corresponds to a sharp change from moderately to densely welded lithology, probably caused by faulting (table 3). The faulting and lithology change are not observed in the nearby hole UZ-N87. No evidence of this faulting is observable at the ground surface. The water-content and water-potential values below 9.4 m in UZ-N84 are among the largest values recorded for welded tuff sections of holes at Yucca Mountain. Plans have been made to attempt to further characterize and understand the effects of faulting on the hydrologic flow system, using borehole, seismic, and geotomographic geophysical methods in conjunction with artificial infiltration techniques.

Approximately 175 m east of UZ-N87, two boreholes, UZ-N83 and UZ-N86, were drilled approximately 30 m apart in the same exposed lithologic unit in a channel bottom. Water content and water-potential profiles in these boreholes were very similar (figs. 9 and 10). Approximately 800 m to the east, UZN75 and UZ-N76 were drilled in moderately welded tuff near the crest of Yucca Mountain, also approximately 30 m apart. Profiles from these two boreholes are quite different (figs. 11 and 12). The lithologic log of UZ-N76 indicates a substantial degree of fracturing and abundant secondary carbonate the entire depth of the borehole (table 3). Again, there is no evidence of this fracturing at the ground surface.

Finally, approximately 2,000 m to the east of UZ-N75 and UZ-N76, UZN #28 and UZN #97 located 1 m apart in alluvium/colluvium in a braided channel area, are two boreholes that have similar water-content and different water-potential profiles (figs. 13 and 14). This pair of boreholes show much more variability in hydrologic characteristics than the two boreholes in alluvium/colluvium, discussed previously, at the west end of the transect (figs. 5 and 6).

As expected in shallow boreholes, some of the spatial variability seems to be related to topographic positions. Water-content profiles seem to be wetter and water-potential profiles less negative in boreholes drilled beneath channels in alluvium/colluvium than in those drilled beneath alluvial/colluvial terraces. Examples of this are shown in figures 15 and 16, where UZN #13 is located in the center of a channel, and UZN #14 is approximately 15 m away on a terrace. Differences in water-content profiles beneath channels (UZN #6) and terraces (UZN #4) are shown in figure 4.

In some instances, differences in water-content and water-potential profiles are noted between boreholes located in exposed welded tuff in channel bottoms with no alluvial/colluvial cover, and boreholes located in exposed bedrock on adjacent hillsides. These differences for different rock units are shown in figures 17, 18, 19, and 20. In figures 17 and 18, the lithology of the entire depth of UZ-N86 and the lower part of UZ-N88 is clinkstone (table 3). Water-content and water-potential values in the upper lithophysal unit in UZ-N88 (0.23–4.27 m) are less than those that occur in the clinkstone unit of UZ-N86. This is especially noticeable in water-potential data, which reach an extreme in the upper lithophysal unit near the clinkstone-unit contact. The entire depth of UZ-N72 and the lower part of UZ-N74 (5.79-11.28 m) penetrate the upper cliff lithologic subunit (figs. 19 and 20). The upper part of UZ-N74 is in the caprock unit. Again, water-content and especially water-potential values increase to a maximum near the contact of the two lithologic units. This phenomena of decreasing hydrologic characteristics in an upper unit near the contact with a lower unit was noted in other boreholes that penetrated welded lithologic subunits of the Tiva Canyon Member.

Very limited vertical spatial variability occurs within individual boreholes that penetrate thick lithologic units. Little variability in water-potential and water-content profiles is especially significant within a unit of constant lithology because it indicates a steady-state flow system in this unit. In these thick lithologic units, constant water-potential profiles permit the assumption of a unit hydrologic gradient and simplify the calculation of flux. Thick intervals of constant water potential and water content were noted in nearly all of the boreholes on the west-to-east transect mentioned above. These boreholes penetrate the majority of lithologic units that occur on or near the surface of Yucca Mountain.

Bulk- and Grain-Density Measurements and Porosity Calculations

Bulk- and grain-density measurements and porosity calculations are presented for rotary-core samples from a few selected boreholes that penetrated nonwelded and bedded tuff rock units (table 15 in the "Supplemental Data" section at the back of the report). These tests were done in conjunction with prototype borehole geophysical-logging tests designed to develop field calibration methods for moisture-sensitive nuclear-logging tools. A more comprehensive matrix hydrologic-testing program of rotary-core samples, which is designed to indicate the spatial variability of these properties, is planned for Yucca Mountain.

Bulk density, grain density, porosity, and volumetric water content were measured on drive-core samples from two boreholes. These data and associated problems have been described elsewhere (Ham-

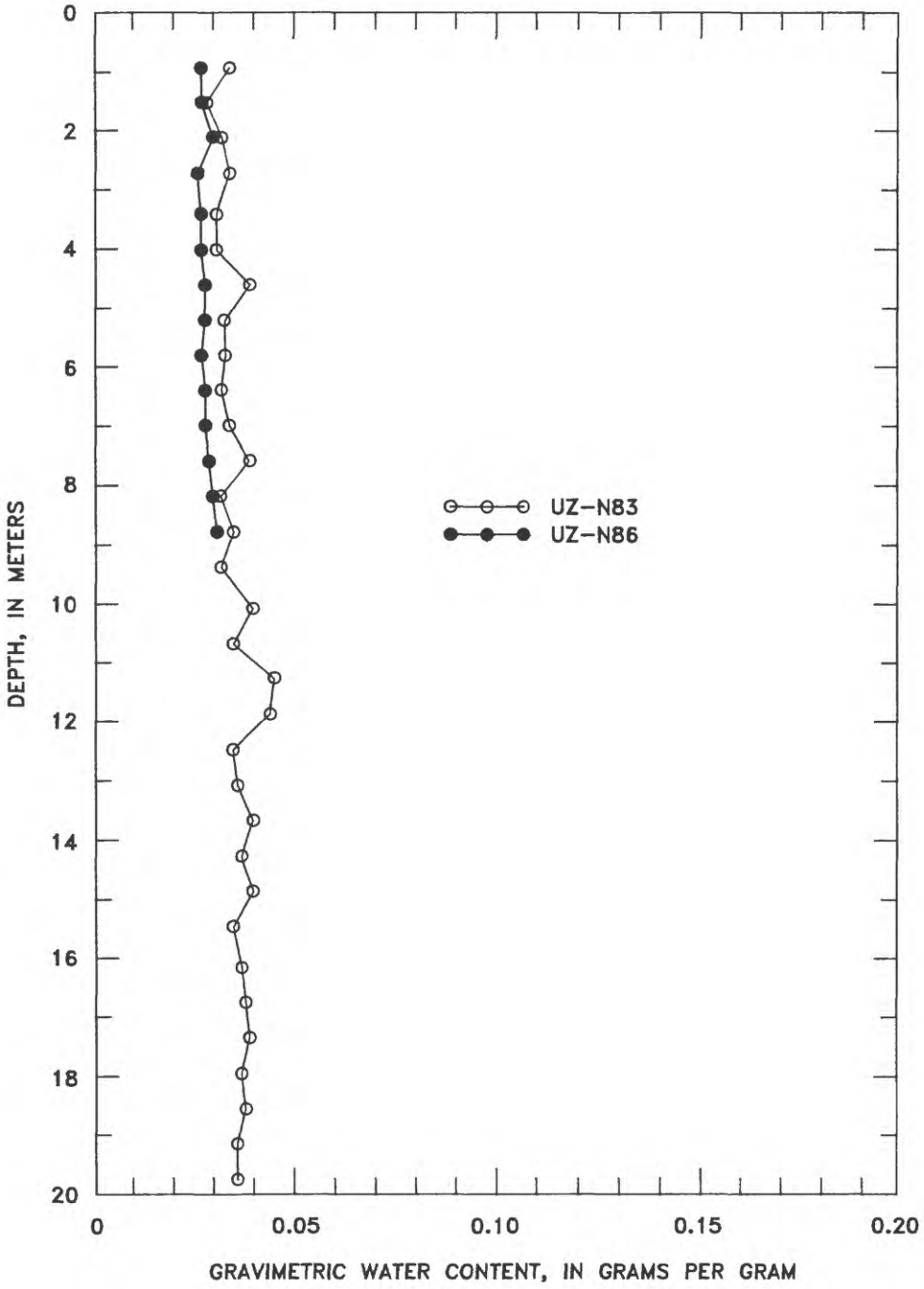

Figure 9.--Water–content profiles for boreholes UZ–N83 and and UZ–N86 located approximately 30 meters apart in welded tuff exposed in a channel.

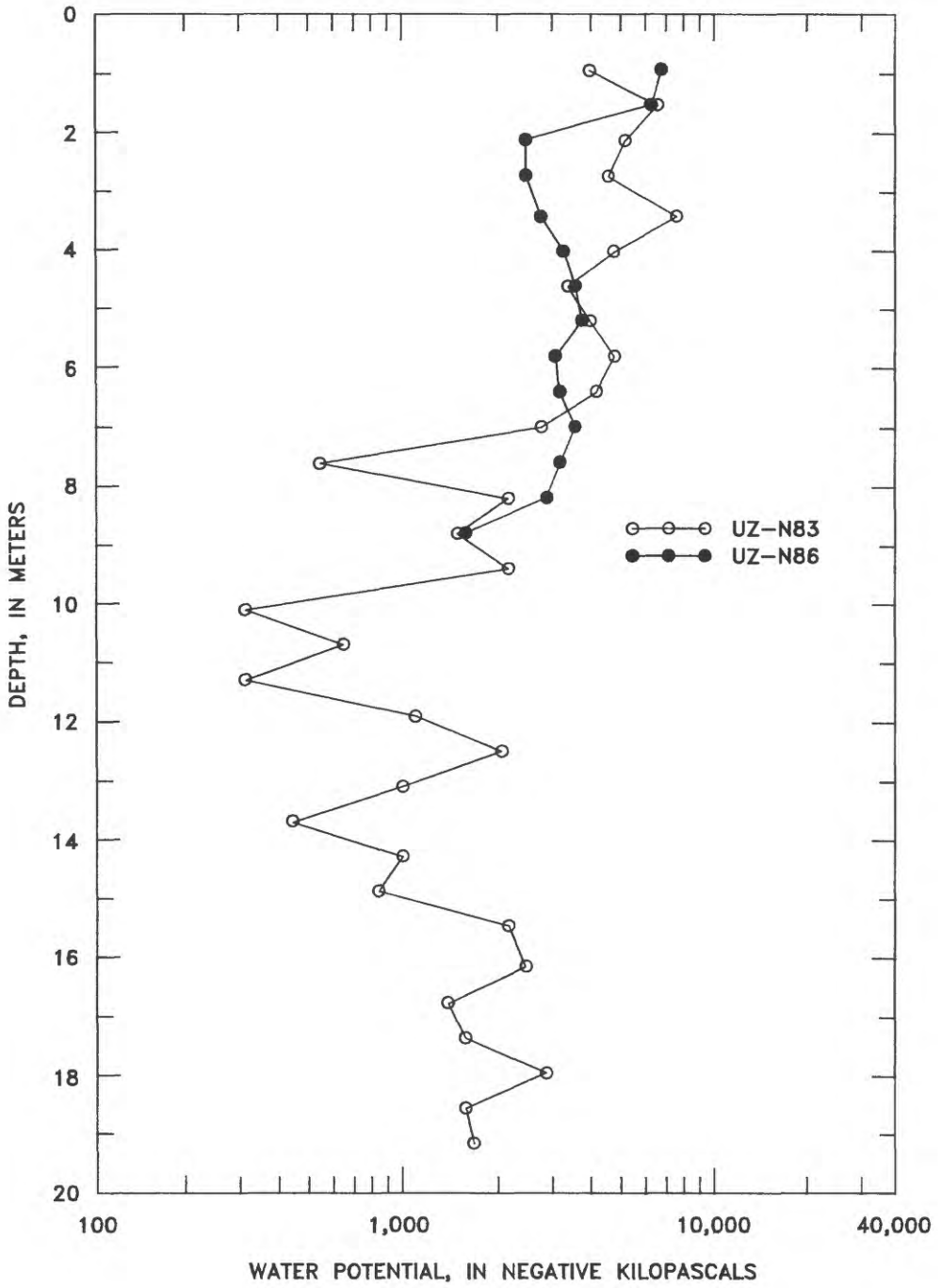

Figure 10.--Water-potential profiles for boreholes UZ-N83 and UZ-N86 located approximately 30 meters apart in welded tuff exposed in a channel.

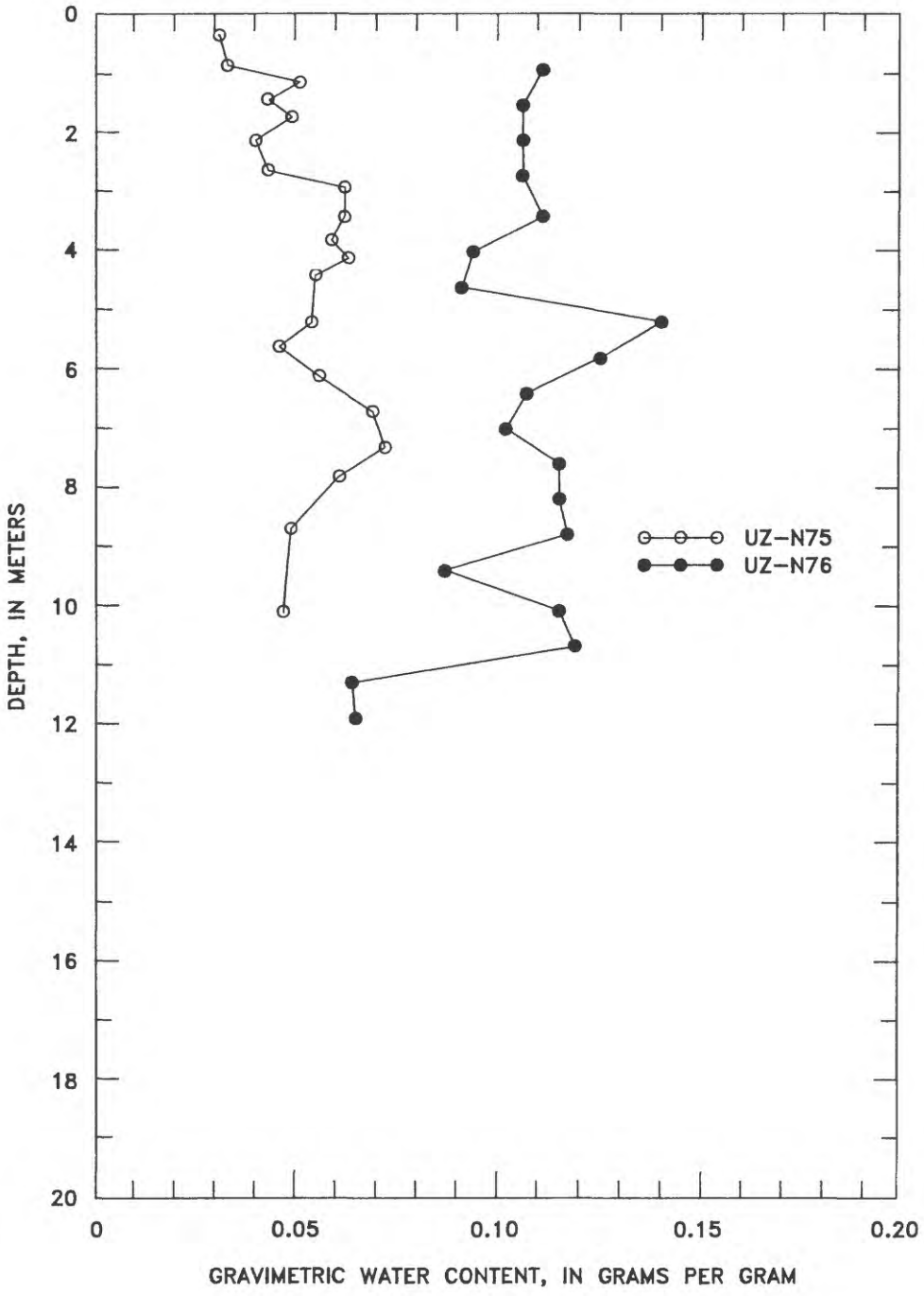

Figure 11.--Water-content profiles for boreholes UZ-N75 and UZ-N76 located approximately 10 meters apart in moderately welded tuff near the crest of Yucca Mountain.

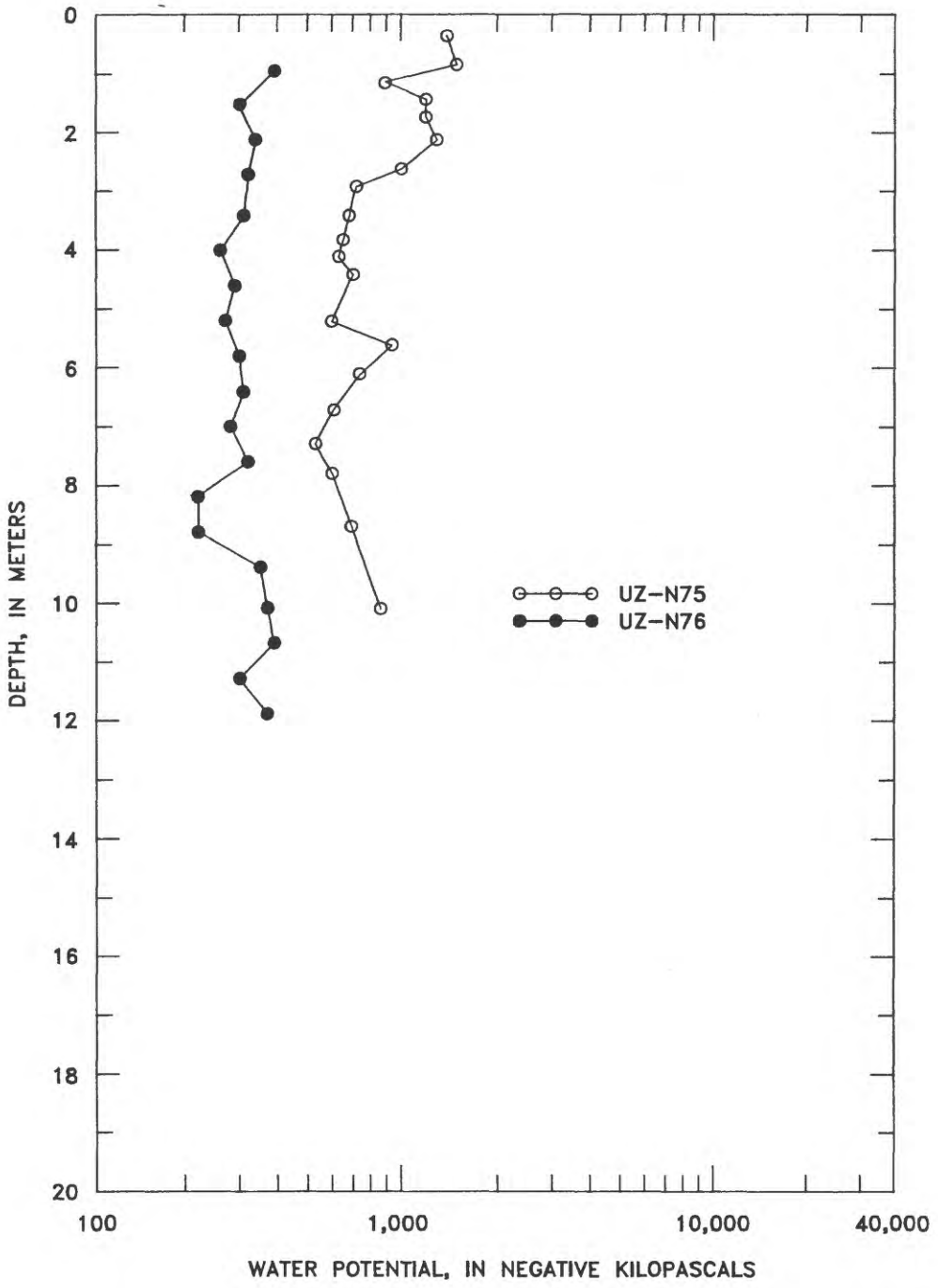

Figure 12.--Water–potential profiles for boreholes UZ–N75 and UZ–N76 located approximately 10 meters apart in moderately welded tuff near the crest of Yucca Mountain.

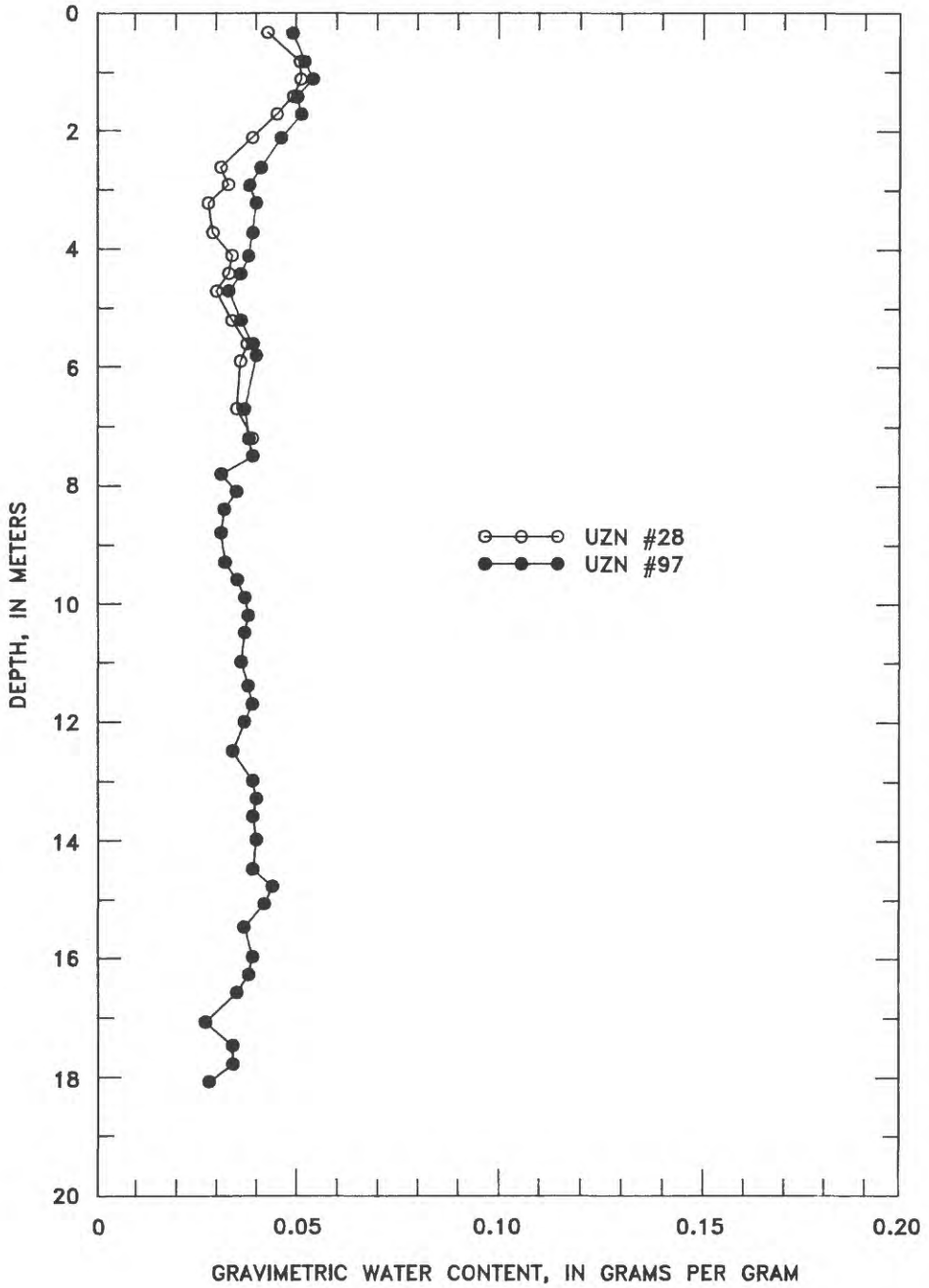

Figure 13.--Water-content profiles for boreholes UZN #28 and UZN #97 located approximately 1 meter apart in a braided channel area of alluvium/colluvium.

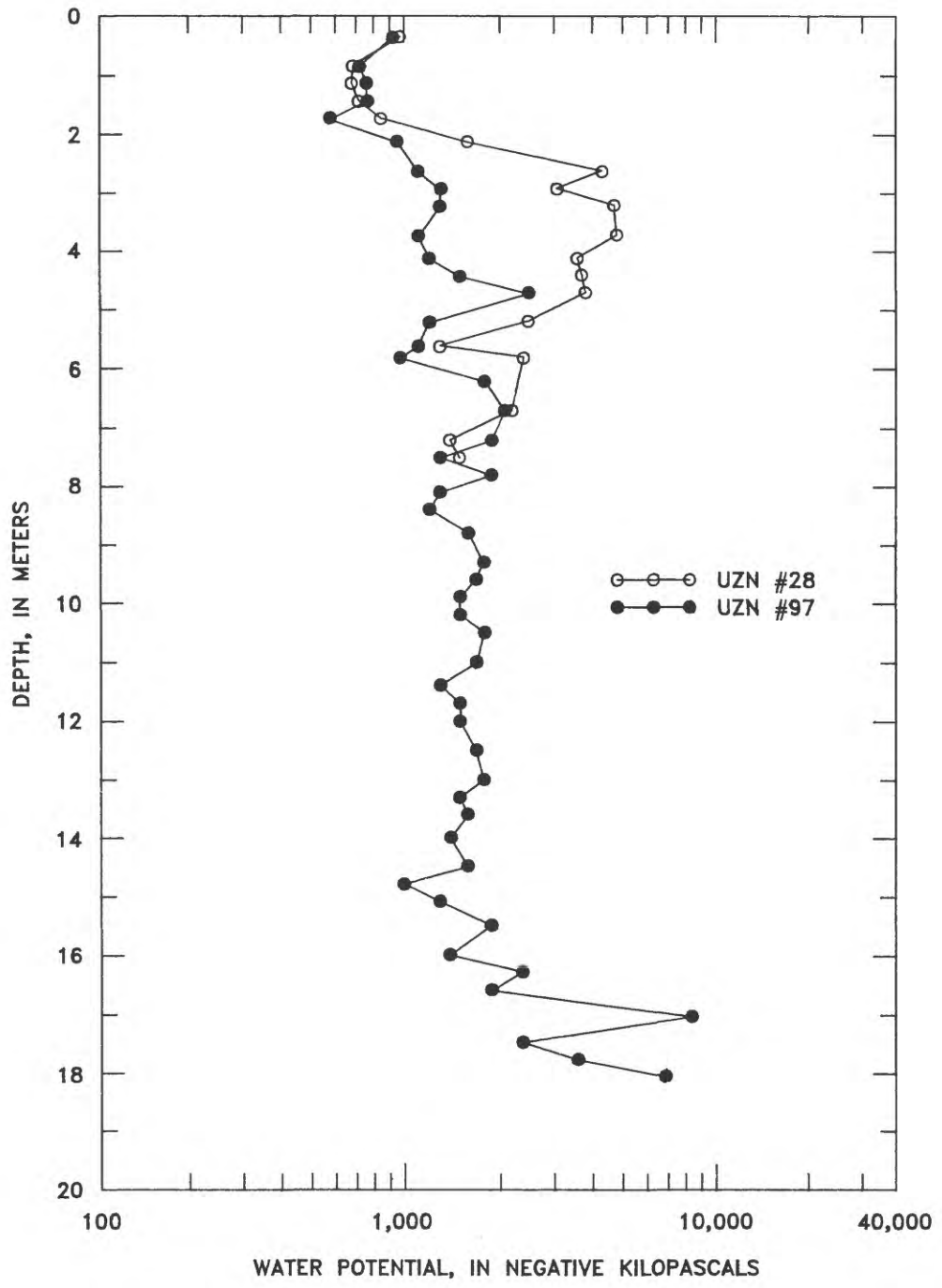

Figure 14.--Water-potential profiles for boreholes UZN #28 and UZN #97 located approximately 1 meter apart in a braided channel area of alluvium/colluvium.

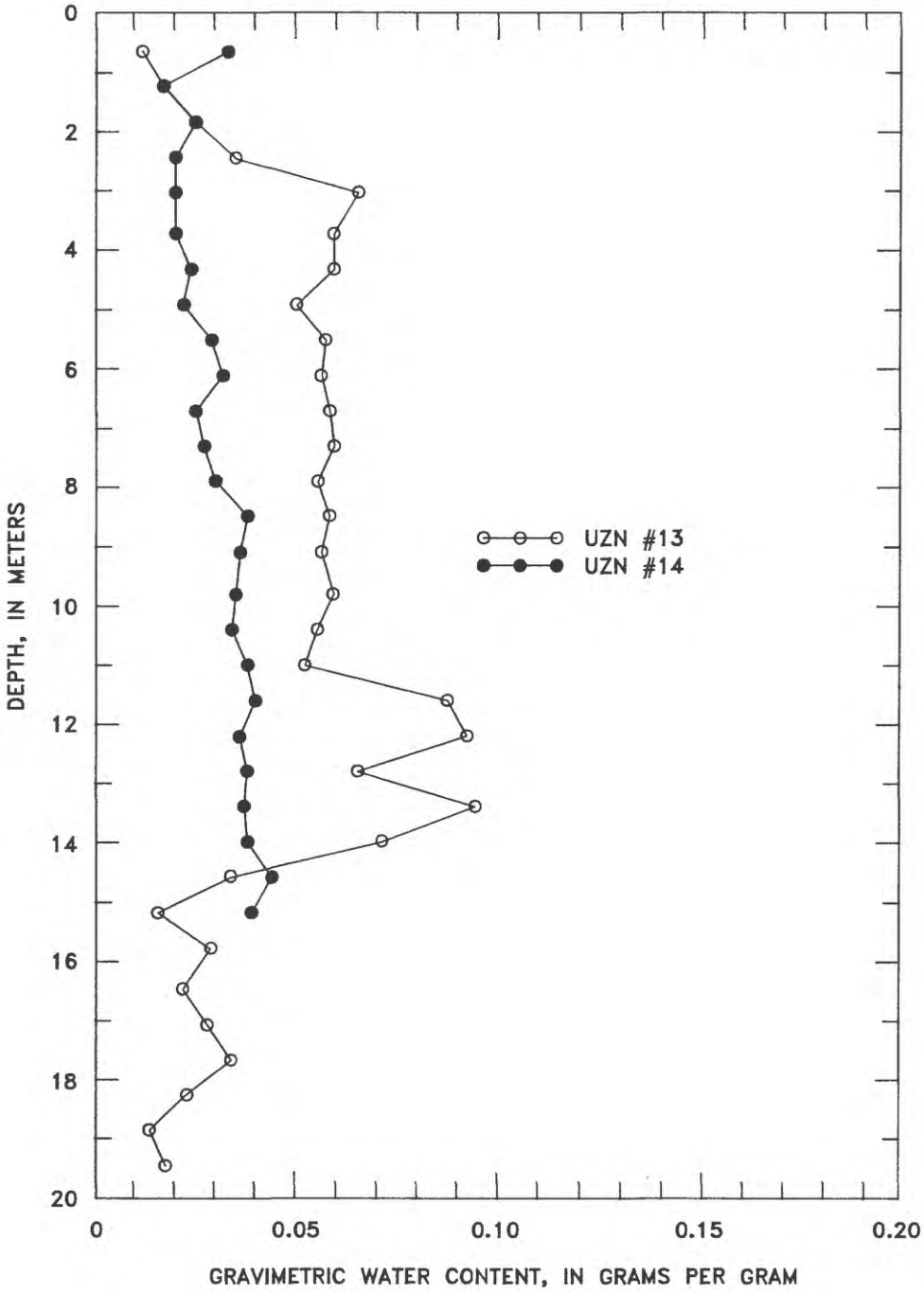

Figure 15.--Water-content profiles for boreholes UZN #13, located in an active drainage channel, and UZN #14, located on a terrace, both boreholes in alluvium/ colluvium.

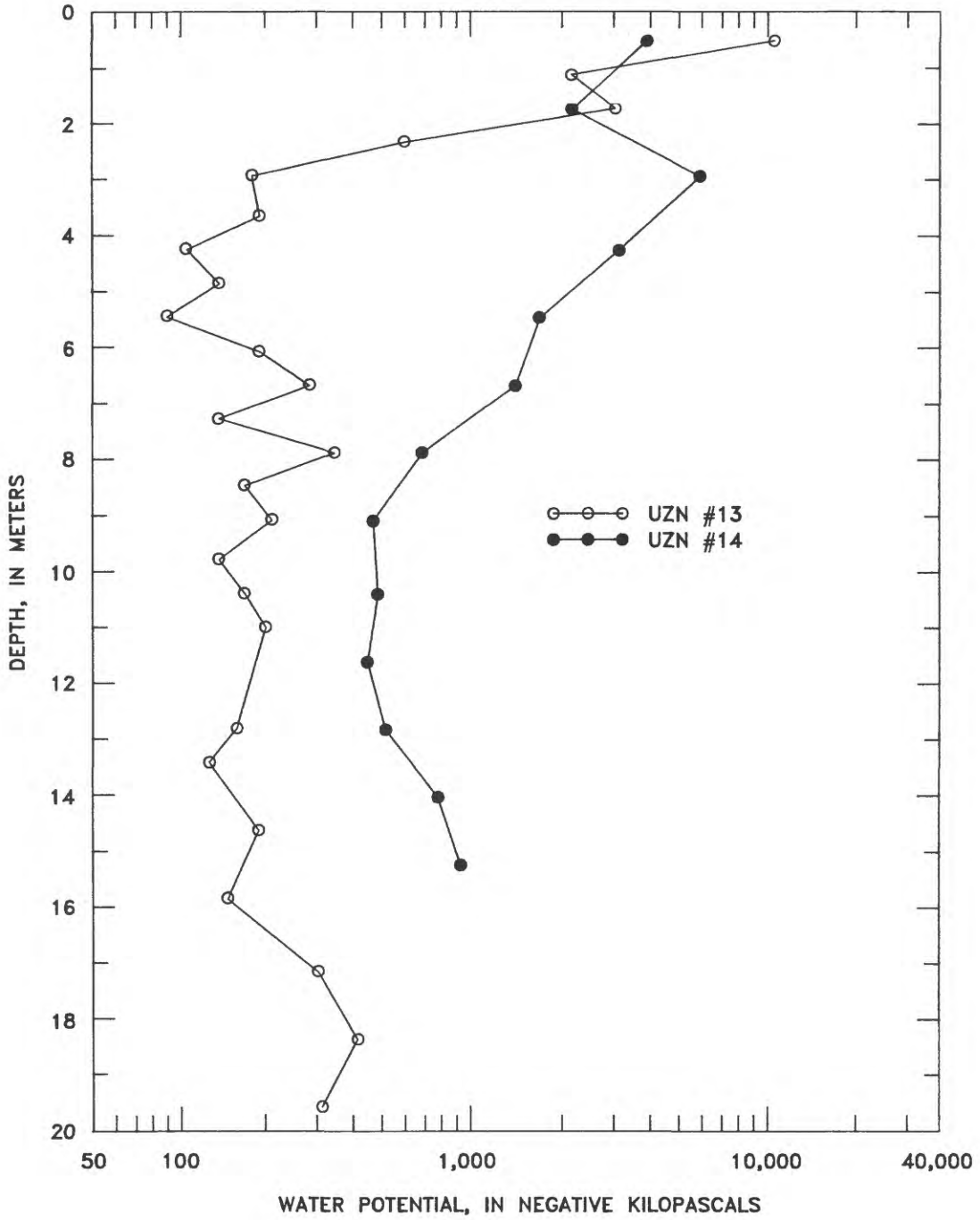

Figure 16.--Water-potential profiles for boreholes UZN #13, located in an active drainage channel, and UZN #14 located on a terrace, both boreholes in alluvium/ colluvium.

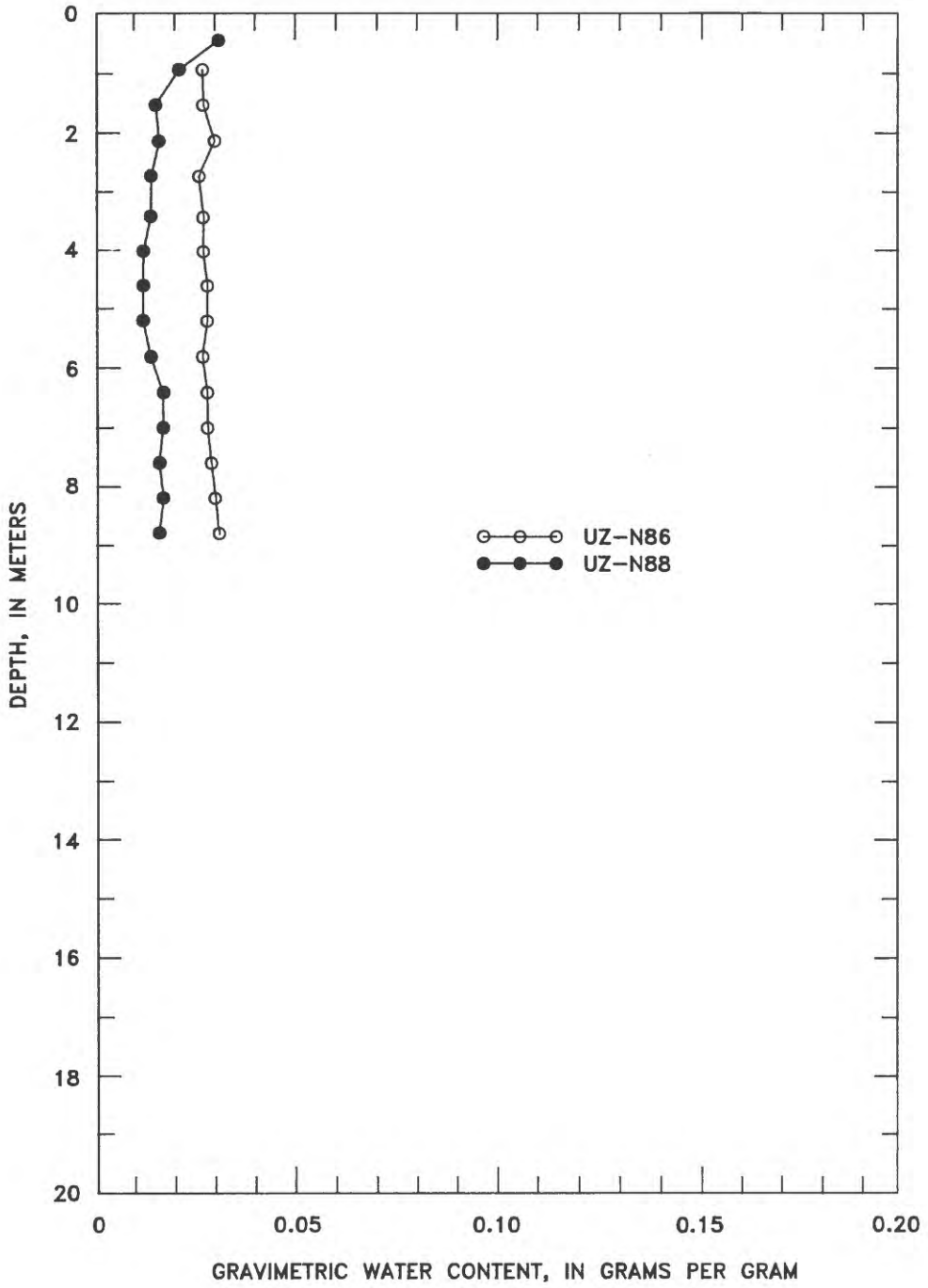

Figure 17.--Water-content profile for borehole UZ-N86 located on an exposed bedrock channel compared to a profile from borehole UZ-N88 located on exposed bedrock on an adjacent hill slope.

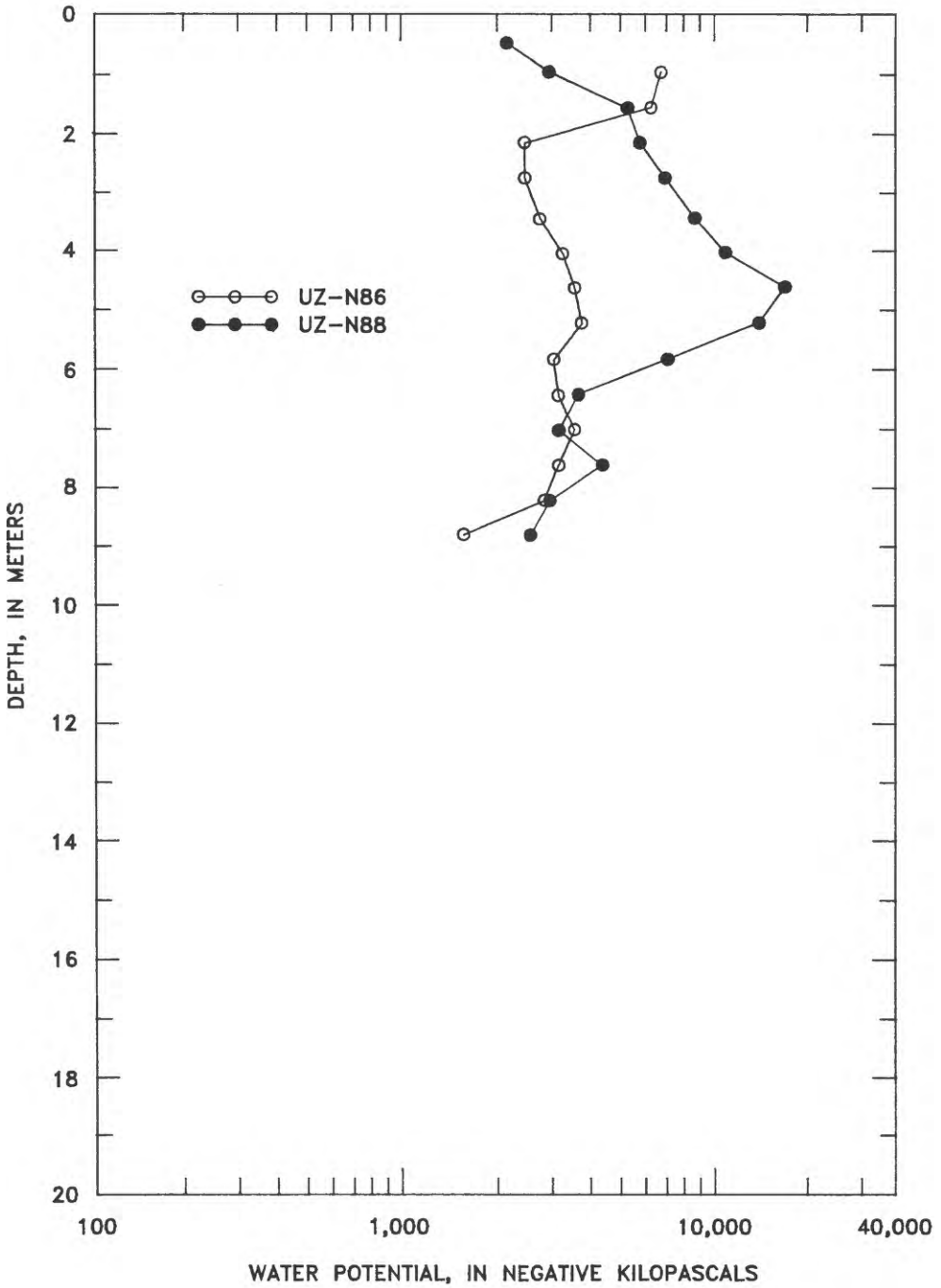

Figure 18.--Water-potential profile for borehole UZ-N86 located on an exposed bedrock channel compared to a profile from borehole UZ-N88 located on exposed bedrock on an adjacent hill slope.

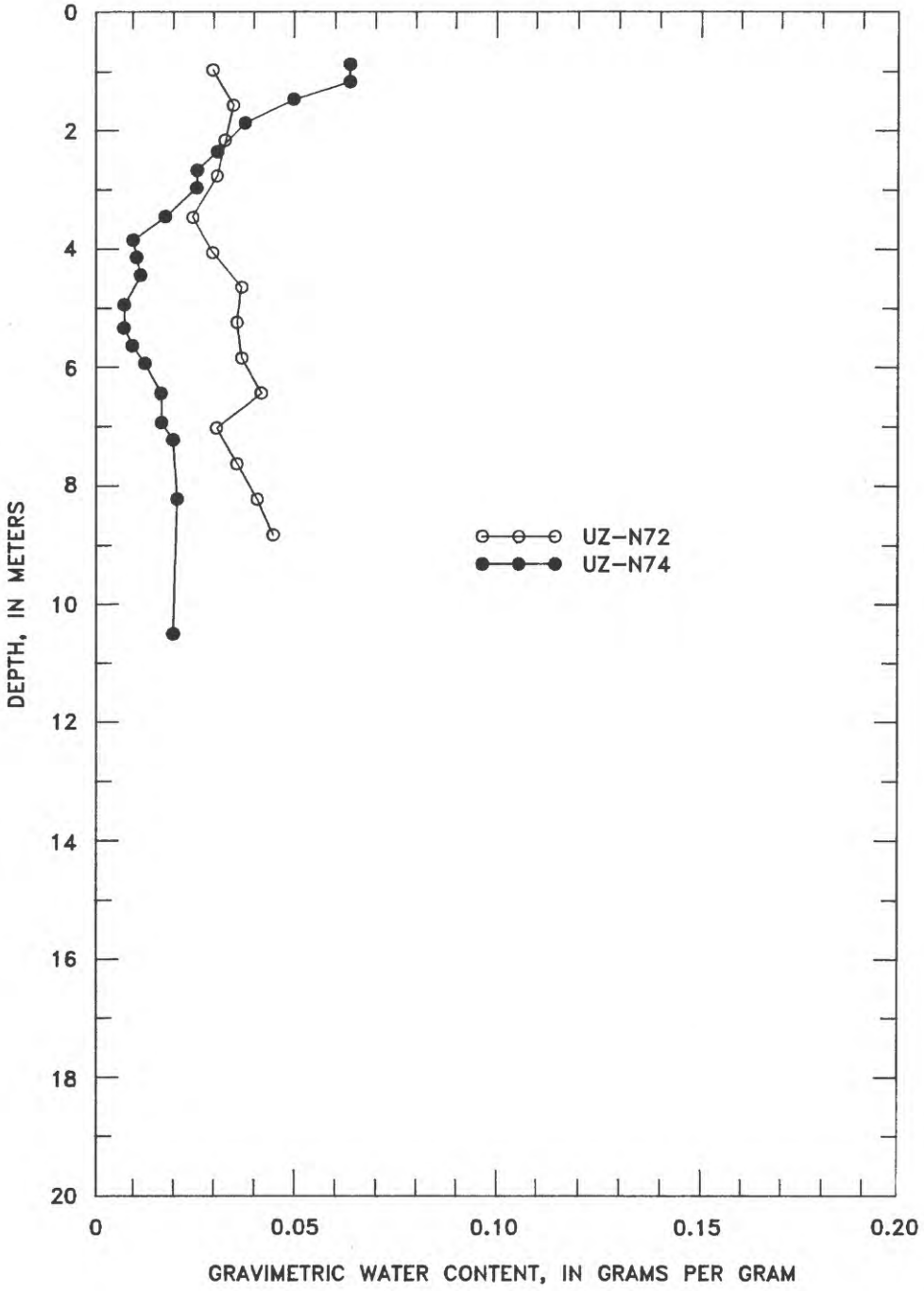

Figure 19.--Water-content profile for borehole UZ-N72 located on an exposed bedrock channel compared to a profile from borehole UZ-N74 located on exposed bedrock on an adjacent hill slope.

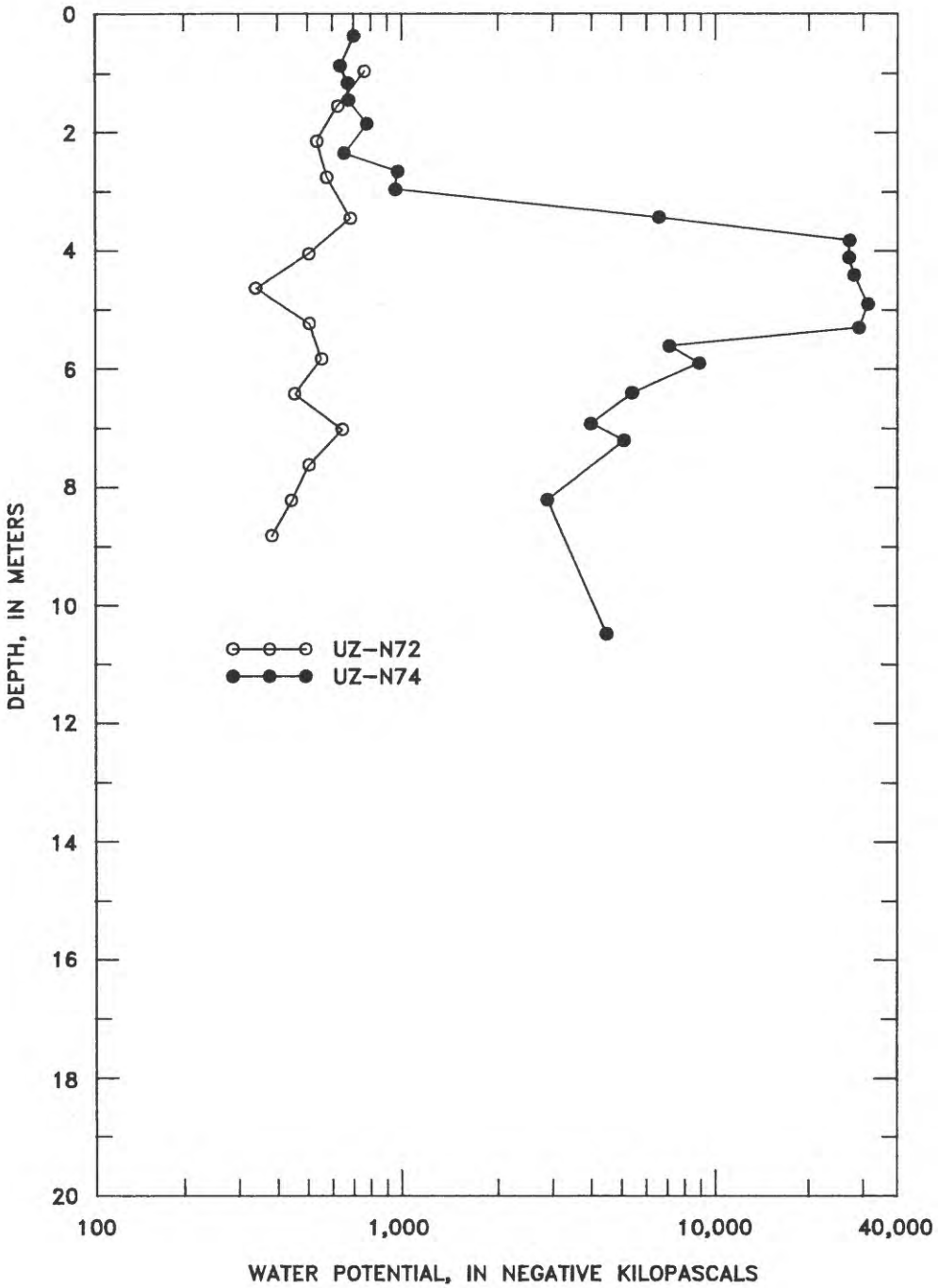

Figure 20.--Water-potential profile for borehole UZ-N72 located on an exposed bedrock channel compared to a profile from borehole UZ-N74 located on exposed bedrock on an adjacent hill slope.

mermeister and others, 1986). Briefly, these authors reported that the drive-core method alters the porosity and related properties of samples from in-situ conditions.

The effect of welding and lithology on the limited porosity and bulk-density data is shown in table 16 in the "Supplemental Data" section at the back of the report. Nonwelded tuffs have a greater median porosity and smaller bulk density than moderately welded tuffs. In addition, bedded tuffs have a greater median porosity and smaller bulk density than nonwelded tuffs. Grain-density values are relatively constant for all rock units (table 15).

Tritium Analyses

Tritium concentrations were measured on drive-core samples from selected neutron-access boreholes located in the major channels of several canyons on Yucca Mountain (table 17 in the "Supplemental Data" section at the back of the report) and profiles are shown in figure 21. These tritium data are only the first part of a comprehensive tritium-analysis program designed to help characterize natural-infiltration quantities and processes on Yucca Mountain. Additional tritium analyses are planned for samples from holes that encompass the range of hydrogeologic conditions that occur on Yucca Mountain.

Large quantities of tritium were released into the atmosphere during the period of large-scale thermonuclear atmospheric-bomb testing from 1952 to 1962 (Fritz and Fontes, 1980, p. 22). As a result of precipitation, some of this tritium has entered into the surficial materials covering Yucca Mountain. The addition of bomb-produced tritium to water in the unsaturated zone has resulted in increased tritium concentrations above background levels. Tritium concentrations greater than approximately 5 tritium units (one atom of tritium in 10^{18} atoms of hydrogen) are considered to be in excess of natural background levels (Fritz and Fontes, 1980, p. 22). The enhanced concentration of tritium in water samples makes tritium an excellent environmental tracer (Freeze and Cherry, 1979).

Average net water-flow velocity rates can be estimated from profiles of tritium concentrations versus depth, by analyzing samples for tritium concentrations. The maximum depth reached by tritium concentrations above background levels is estimated from the profiles. This depth then is divided by the time elapsed from the midpoint in the period of above-ground atmospheric testing (approximately 30 yr). This quotient is a mean net flow velocity for approximately the last 30 yr.

Preliminary results (table 17, fig. 21) indicate that increased tritium concentrations decrease to background levels before bedrock-contact depths in boreholes UZN #8 and UZ-N90 (12.19 m and 9.91 m, respectively). However, increased tritium concentrations do not decrease to background levels before the bedrock contact in UZN #1 (8.32 m).

Borehole UZ-N90 is in a channel that transported a large volume of water from aquifer tests made in USW H-6 (Craig and Reed, 1983). Infiltration of this pump-test water may have influenced the tritium concentrations in the profile.

Preliminary flow-velocity data indicate that mean downward flow velocity rates ranged from 0.10 mm to greater than 0.26 mm per year, depending upon borehole location. Additional testing will be needed to characterize more accurately the range in mean flow velocity rates in alluvium/colluvium and other rock units.

SUMMARY AND CONCLUSIONS

Gravimetric water-content and water-potential values of core were generally larger than those of cuttings obtained from the same depth. Reasonable correlations were determined for those hydrologic characteristics between core and cuttings; the only exceptions were water-potential values from nonwelded and bedded tuffs.

Gravimetric water-content and water-potential values of geologic samples tended to decrease as the degree of welding increased. Values were largest for nonwelded to partially welded and bedded tuffs, smaller in moderately welded tuffs, and smallest in densely welded tuffs. Values for alluvium/colluvium often were similar to those determined for moderately welded tuffs.

Bulk-density values increased, porosity values decreased, and grain-density values remained nearly constant as the degree of welding increased from nonwelded to moderately welded tuffs in the boreholes selected for these measurements.

Water-content and water-potential profiles from closely spaced boreholes that penetrated the same lithologic subunit often indicated a substantial degree of spatial variability. Differences in both types of profiles also occurred in adjacent boreholes located in different topographic positions. The vertical-spatial variability of water-content and water-potential data within a thick lithologic unit was very small. Finally, the values of these data tended to decrease near the bottom of welded tuff lithologic units located near the ground surface.

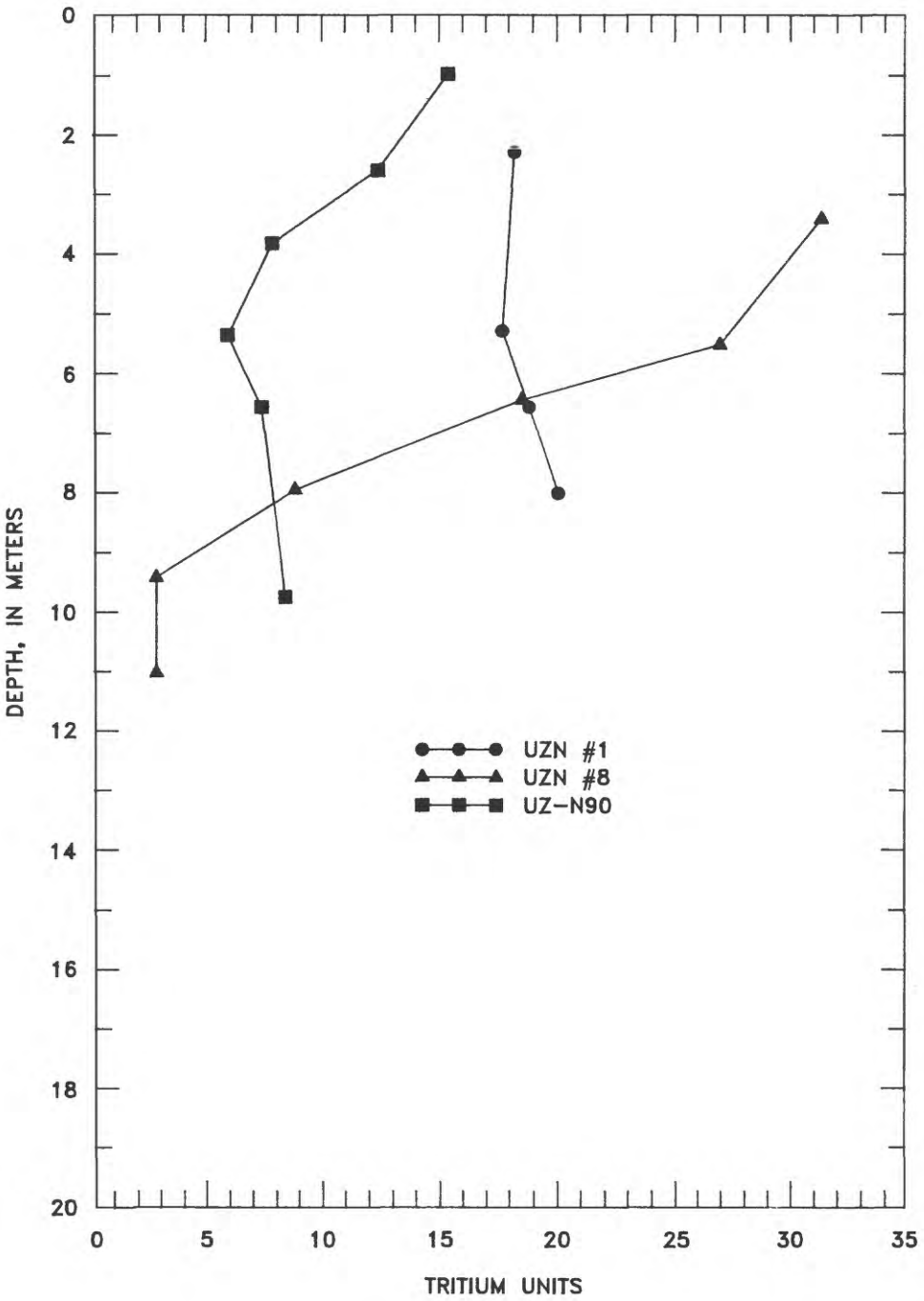

Figure 21.--Tritium profiles for selected neutron-access boreholes.

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NOTE: Parenthesized numbers following cited reference are for OCRWM Records Management purposes only and should not be used when ordering the publication.

(p. 33 follows)

SUPPLEMENTAL DATA

Table 1. Location, depth, and hydrogeologic setting of the neutron-access boreholes

[The neutron-access borehole number prefix UE-25 or UE-29 indicates the borehole is located on the Nevada Test Site, the USW prefix is for boreholes located off the Nevada Test Site; the coordinates are the Nevada Coordinate System, Central Zone]

Neutron-access borehole number	Borehole location	Ground elevation	Borehole depth	Tuff/ alluvium contact	Preliminary hydrogeologic surficial unit	Topographic position
		(meters)	(meters)	(meters)		
UE-25 UZN #1	N 234,494 E 172,282	1,218	15.24	8.32	Alluvium/colluvium	Large channel bottom
UE-25 UZN #2	N 234,274 E 172,554	1,203	15.24	0.0	Tiva Canyon hackly	Canyon wall
UE-25 UZN #3	N 234,281 E 172,555	1,201	4.57	2.74	Alluvium/colluvium	Terrace
UE-25 UZN #4	N 234,291 E 172,558	1,202	9.14	7.47	Alluvium/colluvium	Terrace
UE-25 UZN #5	N 234,229 E 172,560	1,201	15.24	13.56	Alluvium/colluvium	Terrace
UE-25 UZN #6	N 234,304 E 172,561	1,200	13.72	12.04	Alluvium/colluvium	Large channel bottom
UE-25 UZN #7	N 234,310 E 172,562	1,201	13.72	12.34	Alluvium/colluvium	Large channel bottom
UE-25 UZN #8	N 234,316 E 172,564	1,201	13.72	12.19	Alluvium/colluvium	Large channel bottom
UE-25 UZN #9	N 234,328 E 172,566	1,201	12.19	10.67	Alluvium/colluvium	Terrace
UE-25 UZN #10	N 234,659 E 172,136	1,231	30.18	.0	Nonwelded and bedded tuff	Large channel bottom
UE-25 UZN #12	N 234,288 E172,731	1,191	15.24	13.72	Alluvium/colluvium	Large channel bottom
UE-25 UZN #13	N 234,097 E 173,206	1,165	19.81	13.41	Alluvium/colluvium	Large channel bottom
UE-25 UZN #14	N 234,079 E 173,200	1,166	16.76	13.41	Alluvium/colluvium	Terrace

Table 1. Location, depth, and hydrogeologic setting of the neutron-access boreholes--Continued

Neutron-access borehole number	Borehole location	Ground elevation (meters)	Borehole depth (meters)	Tuff/ alluvium contact (meters)	Preliminary hydrogeologic surficial unit	Topographic position
UE-25 UZN #18	N 233,624 E 172,289	1,225	18.59	17.07	Alluvium/colluvium	Large channel bottom
UE-25 UZN #19	N 232,775 E 172,083	1,227	12.19	6.86	Alluvium/colluvium	Large channel bottom
UE-25 UZN #20	N 232,797 E 172,086	1,227	12.50	11.89	Alluvium/colluvium	Braided channel
UE-25 UZN #21	N 232,811 E 172,089	1,228	12.80	8.38	Alluvium/colluvium	Braided channel
UE-25 UZN #22	N 232,833 E 172,094	1,228	28.96	5.94	Alluvium/colluvium	Braided channel
UE-25 UZN #23	N 232,862 E 172,075	1,232	10.67	.0	Tiva Canyon lower lithophysal	Canyon wall lower slope
USW UZ-N24	N 234,091 E 171,316	1,288	22.86	.15	Alluvium/colluvium	Channel bottom
USW UZ-N25	N 234,220 E 171,062	1,321	17.98	.0	Tiva Canyon hackly	Channel bottom
USW UZ-N26	N 234,320 E 171,002	1,336	10.67	.0	Tiva Canyon lower lithophysal	Channel bottom
UE-25 UZN #28	N 232,593 E 172,312	1,206	8.08	?	Alluvium/colluvium	Braided channel
UE-25 UZN #29	N 232,447 E 172,267	1,211	10.67	.30	Alluvium/colluvium	Canyon wall lower slope
UE-25 UZN #30	N 232,275 E 172,285	1,207	10.67	.38	Alluvium/colluvium	Canyon wall lower slope
USW UZ-N40	N 233,533 E 171,977	1,243	10.67	.88	Alluvium/colluvium	Lower slope
USW UZ-N41	N 233,439 E 171,763	1,255	11.28	4.88	Alluvium/colluvium	Channel bottom

Table 1. Location, depth, and hydrogeologic setting of the neutron-access boreholes--Continued

Neutron-access borehole number	Borehole location	Ground elevation (meters)	Borehole depth (meters)	Tuff/ alluvium contact (meters)	Preliminary hydrogeologic surficial unit	Topographic position
USW UZ-N42	N 233,397 E 171,561	1,274	12.19	0.0	Tiva Canyon lower lithophysal	Channel bottom
USW UZ-N43	N 233,479 E 171,685	1,265	13.72	8.23	Alluvium/colluvium	Terrace
USW UZ-N44	N 233,538 E 171,647	1,269	10.97	.0	Tiva Canyon lower lithophysal	Channel bottom
USW UZ-N45	N 233,473 E 171,735	1,259	13.72	10.67	Alluvium/colluvium	Channel bottom
USW UZ-N46	N 235,388 E 170,613	1,372	30.18	.0	Nonwelded and bedded tuffs	Large channel bottom
USW UZ-N47	N 235,301 E 170,624	1,366	26.21	10.06	Alluvium/colluvium	Large channel bottom
USW UZ-N48	N 231,905 E 171,426	1,284	10.67	.0	Tiva Canyon hackly	Channel bottom
USW UZ-N49	N 231,913 E 171,398	1,289	10.97	.61	Alluvium/colluvium	Canyon wall
USW UZ-N50	N 231,887 E 171,578	1,272	6.10	2.74	Alluvium/colluvium	Terrace
USW UZ-N51	N 231,913 E 171,577	1,271	6.10	4.27	Alluvium/colluvium	Channel bottom
USW UZ-N52	N 231,923 E 171,577	1,272	7.62	2.13	Alluvium/colluvium	Terrace
UE-25 UZN #56	N 231,771 E 172,360	1,207	18.29	17.07	Alluvium/colluvium	Channel bottom
UE-25 UZN #60	N 231,577 E 172,692	1,186	10.67	8.08	Alluvium/colluvium	Channel bottom
USW UZ-N65	N 231,232 E 171,463	1,333	15.24	.0	Tiva Canyon upper cliff	Mid-ridge slope

Table 1. Location, depth, and hydrogeologic setting of the neutron-access boreholes--Continued

Neutron-access borehole number	Borehole location	Ground elevation (meters)	Borehole depth (meters)	Tuff/alluvium contact (meters)	Preliminary hydrogeologic surficial unit	Topographic position
USW UZ-N66	N 231,173 E 171,263	1,328	15.24	0.0	Tiva Canyon clinkstone	Mid-ridge slope
USW UZ-N67	N 229,710 E 171,848	1,195	7.62	5.79	Alluvium/colluvium	Channel bottom
USW UZ-N68	N 229,810 E 171,911	1,196	16.76	15.24	Alluvium/colluvium	Braided channel
USW UZ-N69	N 229,963 E 172,032	1,194	10.67	8.23	Alluvium/colluvium	Channel bottom
USW UZ-N70	N 234,471 E 170,740	1,384	10.67	.0	Tiva Canyon lower lithophysal	Channel bottom
USW UZ-N71	N 231,964 E 170,204	1,501	15.85	.0	Tiva Canyon caprock	Upper ridge
USW UZ-N72	N 231,976 E 170,271	1,490	9.14	.0	Tiva Canyon upper cliff	Upland channel bottom
USW UZ-N73	N 231,971 E 170,363	1,483	9.14	.0	Tiva Canyon upper lithophysal	Upland channel bottom
USW UZ-N74	N 232,066 E 170,251	1,495	11.28	.0	Tiva Canyon caprock	Upper ridge
USW UZ-N75	N 232,096 E 170,408	1,463	11.28	.61	Alluvium/colluvium	Upper ridge
USW UZ-N76	N 232,063 E 170,400	1,511	12.19	.0	Tiva Canyon upper cliff	Upper ridge
USW UZ-N77	N 230,287 E 168,982	1,189	15.24	11.58	Alluvium/colluvium	Large channel bottom
USW UZ-N78	N 230,906 E 169,551	1,275	9.14	.0	Tiva Canyon caprock	Canyon wall
USW UZ-N79	N 230,960 E 169,573	1,266	9.75	.0	Tiva Canyon upper lithophysal	Channel bottom

Table 1. Location, depth, and hydrogeologic setting of the neutron-access boreholes--Continued

Neutron-access borehole number	Borehole location	Ground elevation (meters)	Borehole depth (meters)	Tuff/alluvium contact (meters)	Preliminary hydrogeologic surficial unit	Topographic position
USW UZ-N80	N 230,930 E 169,837	1,320	15.85	0.0	Topopah Spring brick	Upland channel bottom
USW UZ-N81	N 230,982 E 169,347	1,239	21.34	1.83	Alluvium/colluvium	Channel bottom
USW UZ-N82	N 230,888 E 169,072	1,212	12.19	6.70	Alluvium/colluvium	Large channel
USW UZ-N83	N 231,841 E 169,577	1,267	21.34	.0	Tiva Canyon clinkstone	Small channel bottom
USW UZ-N84	N 231,869 E 169,437	1,253	13.72	6.09	Alluvium/colluvium	Terrace
UE-25 UZN #85	N 228,821 E 176,045	1,017	24.38	?	Alluvium/colluvium	Terrace
USW UZ-N86	N 231,838 E 169,611	1,272	9.14	.0	Tiva Canyon clinkstone	Small channel bottom
USW UZ-N87	N 231,868 E 169,436	1,253	13.72	5.79	Alluvium/colluvium	Terrace
USW UZ-N88	N 231,894 E 169,639	1,281	9.14	.23	Alluvium/colluvium	Canyon wall
USW UZ-N89	N 231,837 E 169,346	1,247	13.72	10.06	Alluvium/colluvium	Large channel bottom
USW UZ-N90	N 231,836 E 169,345	1,247	13.72	9.91	Alluvium/colluvium	Large channel bottom
UE-29 UZN #91	N 243,012 E 178,414	1,112	28.65	19.51	Alluvium/colluvium	Large channel bottom
UE-25 UZN #92	N 237,140 E177,871	1,118	36.58	17.68	Alluvium/colluvium	Large channel bottom
USW UZ-N93	N 231,524 E 170,178	1,501	12.19	.0	Tiva Canyon caprock	Disturbed area

Table 1. Location, depth, and hydrogeologic setting of the neutron-access boreholes--Continued

Neutron-access borehole number	Borehole location	Ground elevation (meters)	Borehole depth (meters)	Tuff/alluvium contact (meters)	Preliminary hydrogeologic surficial unit	Topographic position
USW UZ-N94	N 231,567 E 170,152	1,501	9.14	0.0	Tiva Canyon caprock	Disturbed area
USW UZ-N95	N 231,620 E 170,133	1,502	6.10	.0	Tiva Canyon caprock	Disturbed area
USW UZ-N96	N 231,482 E 170,203	1,491	10.67	.61	Alluvium/colluvium	Upper ridge
UE-25 UZN #97	N 232,594 E 172,312	1,206	18.29	17.68	Alluvium/colluvium	Braided channel
USW UZ-N98	N 234,087 E 171,325	1,287	22.86	.30	Alluvium/colluvium	Channel bottom

Table 2. Estimates of the relative area and selected properties of the preliminary hydrogeologic-surficial units

Preliminary hydrogeologic surficial unit	Percent area of study area	Relative degree of welding	Relative number and size of lithophysal cavities	Relative degree of fracturing
Alluvium/colluvium	10	Not applicable	Not applicable	Rare
Paintbrush Tuff nonwelded and bedded tuffs	3	Nonwelded	Not applicable	Low
Tiva Canyon Member caprock-upper cliff	25	Moderately to densely welded	Few to many/large	Moderate
Upper lithophysal	20	Moderately to densely welded	Many/large	Low to moderate
Clinkstone	25	Densely welded	None	High
Lower lithophysal	10	Densely welded	Many/small	Low to moderate
Hackly-columnar	5	Densely welded	Rare to few/small	Moderate to high
Topopah Spring Member upper units	2	Partially to moderately welded	Few/small	Moderate to high

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number UE-25 UZN #1		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded ash-flow tuff. Secondary carbonate coatings and discoloration present. Fresh surfaces on some fragments indicate they were chipped from larger pieces.	8.32	8.32
Paintbrush Tuff Bedded Tuff Tuff, bedded, white and light-brown, poorly indurated, vitric; pumice, white, vitric; phenocrysts, sanidine, and plagioclase; rhyolitic-lithic fragments; clear glass shards. No cuttings from 7.92 to 10.97 meters. Cuttings from 10.97 to 11.28 meters very fine. Contact from well-site log book.	3.26	11.58
Yucca Mountain Member Tuff, ash-flow, very light gray to light-gray, nonwelded, vitric; pumice, grayish-orange-pink to moderate-orange-pink, vitric; phenocrysts, sanidine and plagioclase; abundant clear glass shards.	3.66	15.24
	Total depth	15.24
Borehole number UE-25 UZN #2		
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, grayish-red with moderate-orange-pink halos surrounding some phenocrysts, moderately to densely welded, devitrified; pumice, medium-light-gray, devitrified; phenocrysts, 5 percent, sanidine, and plagioclase; rare medium-dark-gray rhyolitic-lithic fragments.	10.97	10.97
Tuff (columnar), ash-flow, dark-reddish-brown to pale-reddish-brown, moderately to densely welded, partially vitric; pumice, dark-reddish-brown, devitrified, flattened 3:1; phenocrysts, 3 to 5 percent, sanidine and plagioclase; manganese oxide dendrites in matrix; occasional gray-ish-red rhyolitic-lithic fragments.	4.27	15.24
	Total depth	15.24
Borehole number UE-25 UZN #3		
Alluvium and colluvium, consisting of silt-sized to pebble-gravel-sized, poorly sorted, subangular to subrounded, light-gray to medium-gray, moderately welded tuffs of the Tiva Canyon Member. The silt-sized portion is light-brown, consisting of tuffs and free phenocrysts. Some fragments with secondary carbonate coatings.	2.74	2.74
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, grayish-red to pale-red, densely welded, devitrified; pumice, medium-light-gray, devitrified; phenocrysts, 3 to 5 percent sanidine and plagioclase.	1.83	4.57
	Total depth	4.57
Borehole number UE-25 UZN #4		
Alluvium and colluvium, consisting of silt-sized to pebble-gravel-sized, poorly sorted, angular to rounded, light-gray, yellowish-gray, light-brown and grayish-red, partially to densely welded tuffs. Free sanidine, plagioclase and bronze biotite. Some secondary carbonate coatings on fragments.	7.47	7.47

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number UE-25 UZN #4--Continued		
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, grayish-red and light gray, mottled, densely welded, devitrified; pumice, pale brown to grayish-brown, devitrified; phenocrysts, less than 1 percent; manganese oxide dendrites in matrix and surrounding fragments.	1.06	8.53
Tuff (columnar), ash-flow, grayish-red, densely welded, devitrified; pumice, dark reddish-brown, devitrified; phenocrysts, 1 to 2 percent, sanidine and plagioclase; occasional moderate reddish brown, streaky coloration of matrix.	0.61	9.14
	Total depth	9.14
Borehole number UE-25 UZN #5		
Alluvium and colluvium, consisting of silt-sized to pebble-gravel-sized, poorly sorted, subangular to subrounded, light-gray to medium-light-gray and reddish-light-gray, moderately to densely welded tuffs of the Tiva Canyon Member. Some fragments with secondary carbonate coatings.	13.56	13.56
Paintbrush Tuff Tiva Canyon Member Tuff (columnar), ash-flow, grayish-red, densely welded, devitrified; pumice, 2 to 3 percent, dark-reddish-brown, devitrified, flattened 4:1; phenocrysts, 3 percent, sanidine and plagioclase; sparse light-gray rhyolitic-lithic fragments.	1.68	15.24
	Total depth	15.24
Borehole number UE-25 UZN #6		
Alluvium and colluvium, consisting of silt-sized to pebble-gravel-sized, poorly sorted, subangular to subrounded, light-gray to medium-light gray, moderately to densely welded tuff (with minor quantities of nonwelded to partially welded tuffs), mostly Tiva Canyon Member. The silt to fine-sand portion is grayish-orange-pink to light-brown. Some fragments with secondary carbonate coatings.	12.04	12.04
Paintbrush Tuff Tiva Canyon Member Tuff (columnar), ash-flow, moderate-brown, moderately to densely welded, devitrified; pumice, grayish-brown, devitrified; phenocrysts, 3 to 5 percent, sanidine, plagioclase, and biotite; rare grayish-red rhyolitic-lithic fragments.	1.68	13.72
	Total depth	13.72
Borehole number UE-25 UZN #7		
Alluvium and colluvium, consisting of silt-sized to pebble-gravel-sized, poorly sorted, subangular to subrounded, light-gray to medium-light-gray and grayish-red, moderately to densely welded tuffs of the Tiva Canyon Member. Angular fragments were chipped from larger fragments. The silt to fine-sand portion is grayish-orange-pink to light-brown, consisting of tuff and fragments of free phenocrysts.	12.34	12.34
Paintbrush Tuff Tiva Canyon Member Tuff (columnar), ash-flow, grayish-red to moderate-brown, moderately to densely welded, devitrified; pumice, unable to distinguish in the cuttings; phenocrysts, 3 to 5 percent, sanidine and plagioclase.	1.38	13.72
	Total depth	13.72

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number UE-25 UZN #8		
Alluvium and colluvium, consisting of silt-sized to pebble-gravel-sized, poorly sorted, subangular to subrounded, light-gray to medium-gray, moderately to densely welded tuffs of the Tiva Canyon Member. The silt to fine-sand portion is light brown, consisting of tuff and fragments of free phenocrysts. The angularity of some of the fragments indicate they were derived from larger pebbles, cobbles or boulders.	6.71	6.71
Alluvium and colluvium, consisting of predominantly granule-sized (some silt-sized to pebble-gravel-sized), light-gray to medium-gray subangular to subrounded, moderately to densely welded tuff fragments of the Tiva Canyon Member.	0.61	7.32
Alluvium and colluvium, consisting of silt-sized to pebble-gravel-sized, poorly sorted, subangular to subrounded, light-gray to medium-gray, moderately to densely welded tuffs of the Tiva Canyon Member. The light-brown silt-sized portion consists of tuff and phenocrysts. Angular fragments chipped from larger pebbles or boulders.	3.05	10.36
Alluvium and colluvium, predominantly silt-sized to granular-sized (some larger fragments), moderately sorted, subangular to subrounded, light-gray and medium-gray, moderately to densely welded tuff fragments.	1.83	12.19
Paintbrush Tuff Tiva Canyon Member Tuff (columnar), ash-flow, pale-red and pale-reddish-brown, moderately welded, devitrified; no pumice seen in the cuttings; phenocrysts; 3 to 5 percent, sanidine and plagioclase; rare grayish-red rhyolitic-lithic fragments.	1.53	13.72
	Total depth	13.72
Borehole number UE-25 UZN #9		
Alluvium and colluvium, consisting of silt-sized to boulder-gravel-sized, subangular to subrounded, moderately to densely welded ash-flow tuffs. Rare fragments of non-welded to partially welded ash-flow and ash-fall tuff. Fresh surfaces and angularity of some fragments indicate they were derived from larger fragments due to drilling.	10.67	10.67
Paintbrush Tuff Tiva Canyon Member Tuff (columnar), ash-flow, grayish-red and pale reddish-brown, densely welded, devitrified; pumice, medium-gray, devitrified; phenocrysts, 3 percent, sanidine, plagioclase, rare biotite and rare sphene; rare rhyolitic-lithic fragments. Manganese oxide dendrites on fracture surfaces.	1.52	12.19
	Total depth	12.19
Borehole number UE-25 UZN #10		
Paintbrush Tuff Tiva Canyon Member Tuff (shardy base), ash-flow, grayish-orange to light-brown, nonwelded to partially welded, vitric, partially argillized; pumice, very light-gray to light-gray, argillized, up to 30 millimeters, flattened 2:1; phenocrysts, 3 to 5 percent, sanidine and plagioclase; abundant black and amber glass shards. High-angle fracture with manganese oxide coating at 1.22 meters. Increase in black glass shards at 4.27 meters.	7.62	7.62

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number UE-25 UZN #10--Continued		
Paintbrush Tuff	7.62	7.62
Tiva Canyon Member		
Tuff (shardy base), ash-flow, grayish-orange to light-brown, nonwelded to partially welded, vitric, partially argillized; pumice, very light-gray to light-gray, argillized, up to 30 millimeters, flattened 2:1; phenocrysts,3 to 5 percent, sanidine and plagioclase; abundant black and amber glass shards. High-angle fracture with manganese oxide coating at 1.22 meters. Increase in black glass shards at 4.27 meters.		
Bedded tuff	0.61	8.23
Tuff, ash-fall, very light-gray, moderately indurated, vitric; pumice, grayish-pink, rounded; phenocrysts, less than 1 percent, sanidine; abundant clear glass shards.		
Tuff, ash-fall, white, moderately indurated, vitric, partially argillized; pumice, white, argillized; rare medium-dark-gray to dark-gray rhyolitic-lithic fragments.	1.52	9.75
Yucca Mountain Member	2.74	12.50
Tuff, ash-flow, grayish-orange-pink to light-brownish-gray, nonwelded to partially welded, vitric; pumice, pinkish-gray, argillic; phenocrysts, less than 1 percent, sanidine; rare rhyolitic-lithic fragments; common clear glass shards.		
Tuff, ash-flow, pale-yellowish-brown to pale-brown, partially welded, partially devitrified; pumice, white, vitric, flattened 4:1; phenocrysts, less than 1 percent, sanidine; common to abundant clear glass shards, quantity increases with depth.	4.27	16.76
Tuff, ash-flow, grayish-orange-pink, pale-yellowish-brown and pale-brown with increasing depth, nonwelded to partially welded, vitric; pumice, grayish-pink to moderate-orange-pink vitric, partially argillized, up to 10 millimeters, flattened 3:1; phenocrysts, 3 to 5 percent; rare rhyolitic-lithic fragments; abundant black glass shards.	4.27	21.03
Tuff, ash-flow, light-brownish-gray, nonwelded, vitric; pumice, white to grayish-orange-pink, vitric; phenocrysts, 1 percent, sanidine and plagioclase; sparse rhyolitic-lithic fragments; abundant clear glass shards.	3.05	24.08
Bedded Tuff	2.44	26.52
Tuff, ash-fall, white to very pale orange, partially argillized; pumice, white, argillized; abundant phenocrysts, quartz, sanidine and plagioclase; occasional rhyolitic-lithic fragments; sparse clear glass shards. Increase in size and quantity of lithic fragments at 25.30 meters, up to 10 millimeters and 15 percent.		
Tuff, ash-fall, weathered, moderate-orange-pink to grayish-orange, argillized; pumice, white to moderate-orange-pink, argillic; phenocrysts, common sanidine and plagioclase; abundant, rounded rhyolitic-lithic fragments.	3.66	30.18
	Total depth	30.18

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number UE-25 UZN #12		
Alluvium and colluvium, consisting of silt-sized to pebble-gravel-sized, subangular to subrounded, light-gray to medium-gray and pale-red to grayish-red, moderately to densely welded ash-flow tuff fragments. Secondary carbonate coatings and discoloration of fragments. Some fragments are angular with fresh surfaces indicating they were chipped from larger pieces.	13.72	13.72
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, pale-reddish-brown and grayish-red, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 5 percent, sanidine, plagioclase, biotite, rare hornblende and rare sphene; occasional rhyolitic-lithic fragments. Disseminated manganese oxide dendrites.	1.52	15.24
	Total depth	15.24
Borehole number UE-25 UZN #13		
Alluvium and colluvium, consisting of silt-sized to boulder-gravel-sized, subangular to subrounded, moderately to densely welded ash-flow tuffs. Rare fragments of non-welded to partially welded ash-flow and ash-fall tuff. Fresh surfaces and angularity of some fragments indicate they were derived from larger fragments due to drilling.	13.41	13.41
Timber Mountain Tuff Rainier Mesa Member Tuff, ash-flow, pale-red, partially welded, devitrified; pumice, very light gray, light-gray and medium-light-gray, vesicular with vapor phase crystallization; phenocrysts, 15 to 17 percent, sanidine, plagioclase, quartz and bronze biotite; abundant rhyolitic-lithic fragments.	6.40	19.81
	Total depth	19.81
Borehole number UE-25 UZN #14		
Alluvium and colluvium, consisting of very coarse sand to pebble-gravel-sized, light brown, light-gray to medium-gray, subangular to subrounded, moderately to densely welded tuffs of the Tiva Canyon Member. Some fragments with a grayish-orange, slightly calcareous coating.	1.22	1.22
Alluvium and colluvium, consisting of silt-sized to pebble-sized gravel, grayish-orange-pink to light brown and light gray, poorly sorted, subangular to subrounded, moderately to densely welded ash-flow tuffs of the Tiva Canyon Member. Silt-sized to medium sand-sized portion is grayish-orange-pink to light-brown. The angularity and unweathered surfaces of some of the chips indicate they are broken from larger pieces.	12.19	13.41
Timber Mountain Tuff Rainier Mesa Member Tuff, ash-flow, medium-light-gray and pale-red, partially welded, devitrified; pumice, medium-gray to medium-dark-gray, vesicular with evidence of vapor-phase crystallization; phenocrysts, 10 to 12 percent, feldspar, quartz and biotite. No lithic fragments were seen in the cuttings.	3.35	16.76
	Total depth	16.76

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number UE-25 UZN #18		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subangular to subrounded, light-gray to medium-gray and pale-red to grayish-red, moderately to densely welded ash-flow tuff fragments. Secondary carbonate coatings and discoloration of fragments. Fresh surfaces on some fragments indicates chipping from larger pieces.	17.07	17.07
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, pale-reddish-brown and grayish-red, densely welded, devitrified; pumice, medium-light-gray and medium-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine, plagioclase and biotite; sparse rhyolitic-lithic fragments. Disseminated manganese oxide dendrites. Siliceous fracture fill material and breccia in cuttings.	1.52	18.59
	Total depth	18.59
Borehole number UE-25 UZN #19		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subangular to subrounded, moderately to densely welded tuff fragments. Secondary carbonate coatings on some fragments. Fresh surfaces and angularity of some pieces indicate they were chipped from larger fragments.	6.86	6.86
Paintbrush Tuff Tiva Canyon Member Tuff (columnar), ash-flow, moderate-brown, densely welded, devitrified; pumice, medium-gray and medium-dark-gray, devitrified; phenocrysts, 3 percent, sanidine, plagioclase and biotite; occasional rhyolitic-lithic fragments. Sparse manganese oxide dendrites in matrix.	5.33	12.19
Borehole number UE-25 UZN #20		
Alluvium and colluvium, consisting of silt-sized to boulder-gravel-sized, subangular to subrounded, moderately to densely welded ash-flow tuff fragments. Rare fragments of nonwelded to partially welded ash-flow tuff and ash-fall tuff. Common secondary carbonate coatings on some fragments. Fresh surfaces and angularity of some pieces indicate they were derived from larger fragments due to drilling.	11.89	11.89
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, pale-red to pale-reddish-brown, densely welded, devitrified; pumice, light-gray to medium-light-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine, plagioclase and rare hornblende; sparse, light-gray rhyolitic-lithic fragments. Some calcium carbonate and manganese oxide coatings on fracture faces.	0.61	12.50
	Total depth	12.50
Borehole number UE-25 UZN #21		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subangular to subrounded, light-gray to medium-light-gray and grayish-red, moderately to densely welded ash-flow tuff.Secondary carbonate coatings and discoloration. Fresh surfaces on some fragments indicate they were chipped from larger pieces.	8.38	8.38

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number UE-25 UZN #21—Continued		
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, pale-red to pale-reddish-brown, densely welded, devitrified; pumice, light-gray to medium-light-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine and plagioclase; sparse, light-gray and very light gray rhyolitic-lithic fragments. Manganese oxide dendrites disseminated in matrix. Secondary carbonate coatings and manganese oxide dendrites on fracture faces.	4.42	12.80
	Total depth	12.80
Borehole number UE-25 UZN #22		
Alluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings and discoloration. Fresh surfaces on some fragments indicate they were chipped from larger pieces.	5.94	5.94
Paintbrush Tuff Tiva Canyon Member Tuff (lower lithophysal), ash-flow, grayish-red, densely welded, devitrified; pumice, medium-light-gray, devitrified; phenocrysts, 5 to 7 percent, sanidine, plagioclase; rare rhyolitic-lithic fragments. Manganese oxidedendrites disseminated in matrix. Lithophysal cavities with vapor-phase crystallization.	2.90	8.84
Tuff (hackly), ash-flow, pale-reddish-brown, densely welded, devitrified; pumice, light-gray to medium-light-gray, devitrified; phenocrysts, 5 to 7 percent, sanidine, plagioclase; rare rhyolitic-lithic fragments. Calcareous fracture fill material. Disseminated manganese oxide dendrites in matrix. Vapor-phase crystallization in lithophysal cavities.	20.12	28.96
	Total depth	28.96
Borehole number UE-25 UZN #23		
Paintbrush Tuff Tiva Canyon Member Tuff (lower lithophysal), ash-flow, pale-reddish-brown to grayish-red, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine and plagioclase. Common lithophysal cavities with vapor-phase crystallization. Disseminated manganese oxide dendrites.	10.06	10.06
Tuff (hackly), ash-flow, pale-reddish-brown, densely welded, devitrified; pumice, light-gray to medium-light-gray, devitrified; phenocrysts, 5 to 7 percent, sanidine and plagioclase; rare rhyolitic-lithic fragments. Disseminated manganese oxide dendrites in matrix. Vapor-phase crystallization in lithophysal cavities.	0.61	10.67
	Total depth	10.67
Borehole number USW UZ-N24		
Alluvium and colluvium, consisting of fine sand-sized to gravel-sized, densely welded Tiva Canyon tuff fragments.	.15	0.15

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N24--Continued		
Paintbrush Tuff	7.17	7.32
Tiva Canyon Member		
Tuff (columnar), ash-flow, pale-red, densely welded, devitrified; pumice, grayish-red, devitrified, flattened 4:1; phenocrysts, 3 percent, sanidine, plagioclase and black biotite; occasional medium-light-gray and medium-gray rhyolitic-lithic fragments. Minor caliche in upper interval.		
Tuff (columnar), ash-flow, pale-brown, moderately welded, devitrified; pumice, medium gray, devitrified; phenocrysts, 1 to 2 percent, sanidine, plagioclase and black biotite; occasional rhyolitic-lithic fragments.	1.52	8.84
Tuff (shardy base), ash-flow, light-brown, partially to moderately welded, argillized; pumice, light-gray, moderate-red, argillized, devitrified; phenocrysts, 1 percent, sanidine, plagioclase and biotite; disseminated manganese oxide; occasional gray and grayish-red rhyolitic-lithic fragments; amber glass shards.	1.83	10.67
Tuff (shardy base), ash-flow, light-brown, partially welded, vitric; pumice, grayish-pink and pinkish-gray, vitric and argillized; phenocrysts, 1 percent, sanidine and plagioclase; sparse moderate-red rhyolitic-lithic fragments; black glass shards, common to abundant with depth. Unit becomes argillized at 13.72 meters with moderate-orange-pink pumice.	6.71	17.37
Bedded Tuff	1.52	18.90
Tuff, ash-fall, weathered, grayish-orange-pink to light-brown, nonwelded, vitric; pumice, very pale orange and moderate-orange-pink, rounded; phenocrysts, 3 percent, sanidine and plagioclase; sparse rhyolitic-lithic fragments.		
Tuff, ash-fall, light-gray to grayish-orange-pink, nonwelded, vitric; pumice, light-gray and very pale orange, vitric; phenocrysts, 4 to 5 percent, sanidine and plagioclase; occasional rhyolitic-lithic fragments.	2.13	21.03
Tuff, ash-fall, weathered, very pale orange and grayish-orange, nonwelded, argillized; pumice, white, vitric, argillized; phenocrysts, 1 percent, sanidine and plagioclase; occasional rhyolitic-lithic fragments.	0.31	21.34
Tuff, ash-fall, white, nonwelded, vitric; pumice, white, vitric; phenocrysts, 1 percent, sanidine and plagioclase; common rhyolitic-lithic fragments.	.61	21.95
Yucca Mountain Member	.91	22.86
Tuff, ash-flow, light-brownish-gray, nonwelded to partially welded, vitric; pumice, white to very light gray, argillized; phenocrysts, 1 percent, sanidine and plagioclase; common rhyolitic-lithic fragments.		
	Total depth	22.86

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N25		
Paintbrush Tuff	8.23	8.23
Tiva Canyon Member		
Tuff (hackly), ash-flow, pale-brown to moderate-brown, densely welded, devitrified; pumice, medium-dark-brown, devitrified; phenocrysts, 3 percent, sanidine and plagioclase; sparse rhyolitic-lithic fragments. Disseminated manganese oxide dendrites.		
Tuff (columnar), ash-flow, light-brownish-gray to brownish-gray, densely welded, devitrified; pumice, dark-gray, devitrified; phenocrysts, 2 to 3 percent, sanidine, and plagioclase; occasional rhyolitic-lithic fragments. Manganese oxide dendrites on cooling joint surfaces.	9.75	17.98
	Total depth	17.98
Borehole number USW UZ-N26		
Paintbrush Tuff	10.67	10.67
Tiva Canyon Member		
Tuff (lower lithophysal), ash-flow, pale-reddish-brown and grayish-red, densely welded, devitrified; pumice, very light gray, light-gray, and medium-dark-gray, devitrified; phenocrysts, 2 to 3 percent, sanidine, plagioclase, and biotite, sparse rhyolitic-lithic fragments. Abundant to sparse lithophysal cavities with vapor-phase crystallization and very light gray to light-gray alteration halos. Disseminated manganese oxide dendrites.		
	Total depth	10.67
Borehole number UE-25 UZN #28		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings and discoloration of some fragments. Fresh surfaces and angularity of some fragments indicate they were chipped from larger pieces.	8.08	8.08
	Total depth	8.08
Borehole number UE-25 UZN #29		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings on some fragments. Fresh surface and angularity of some fragments indicate they were derived from larger fragments.	0.30	0.30
Paintbrush Tuff	1.83	2.13
Tiva Canyon Member		
Tuff (clinkstone), ash-flow, grayish-red, densely welded, devitrified; phenocrysts, 3 to 5 percent, sanidine and plagioclase; sparse rhyolitic-lithic fragments. Disseminated manganese oxide dendrites. Occasional calcareous coatings on fracture surfaces.		
Tuff (lower lithophysal), ash-flow, pale-red to grayish-red, densely welded, devitrified; pumice, grayish-pink, very light gray, and light-gray, devitrified; phenocrysts, 3 percent, sanidine and plagioclase; occasional rhyolitic-lithic fragments. Evidence of lithophysal cavities with vapor-phase crystallization. Disseminated manganese oxide dendrites.	8.53	10.66
	Total depth	10.66

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number UE-25 UZN #30		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings on some fragments. Fresh surfaces and angularity of some fragments indicate they were derived from larger fragments.	0.38	0.38
Paintbrush Tuff Tiva Canyon Member Tuff (lower lithophysal), ash-flow, pale-red to grayish-red, densely welded, devitrified; pumice, very light gray, devitrified; phenocrysts, 3 to 5 percent, sanidine and plagioclase. Occasional rhyolitic-lithic fragments. Disseminated manganese oxide dendrites. Evidence of lithophysal cavities with vapor-phase crystallization.	10.29	10.67
	Total depth	10.67
Borehole number USW UZ-N40		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings on some fragments. Fresh surfaces and angularity of some fragments indicate they were derived from larger fragments.	.88	.88
Paintbrush Tuff Tiva Canyon Member Tuff (lower lithophysal), ash-flow, grayish-red, densely welded, devitrified; pumice, light gray, devitrified; phenocrysts, 2 to 3 percent, sanidine, plagioclase and rare biotite. Abundant lithophysal cavities with vapor-phase crystallization and very light gray to light-gray alteration halos.	4.91	5.79
Tuff (hackly), ash-flow, grayish-red and moderate-reddish-brown, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine, plagioclase, rare biotite and rare hornblende; rare rhyolitic-lithic fragments.	4.88	10.67
	Total depth	10.67
Borehole number USW UZ-N41		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings on some fragments. Fresh surface and angularity of some fragments indicate they were derived from larger fragments.	4.88	4.88
Paintbrush Tuff Tiva Canyon Member Tuff (lower lithophysal), ash-flow, grayish-red, pale-reddish-brown, and moderate-reddish-brown, densely welded, devitrified; pumice, light-gray and medium-gray, devitrified; pheno-crysts, 2 to 3 percent, sanidine, plagioclase, sparse biotite, and rare sphene; sparse rhyolitic lithic fragments. Occasional lithophysal cavities with vapor-phase crystallization.	6.40	11.28
	Total depth	11.28

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N42		
Paintbrush Tuff Tiva Canyon Member Tuff (lower lithophysal), ash-flow, grayish-red, densely welded, devitrified; pumice, very light gray and light-gray, devitrified; phenocrysts, 3 percent, sanidine, plagioclase, rare biotite and rare sphene; occasional rhyolitic-lithic fragments. Abundant lithophysal cavities with vapor-phase crystallization and very light gray alteration halos.	12.19	12.19
	Total depth	12.19
Borehole number USW UZ-N43		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings on some fragments. Fresh surface and angularity of some fragments indicate they were derived from larger fragments.	8.23	8.23
Paintbrush Tuff Tiva Canyon Member Tuff (hackle), ash-flow, grayish-red, densely welded, devitrified; pumice, light-gray and medium-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine and plagioclase. Occasional rhyolitic-lithic fragments. Disseminated manganese oxide dendrites.	4.58	12.80
Tuff (columnar), ash-flow, grayish-red and moderate-reddish-brown, mottled, densely welded, devitrified; pumice, grayish-red, devitrified; phenocrysts, 3 to 5 percent, sanidine and plagioclase. Occasional rhyolitic lithic fragments.	0.91	13.72
	Total depth	13.72
Borehole number USW UZ-N44		
Paintbrush Tuff Tiva Canyon Member Tuff (lower lithophysal), ash-flow, grayish-red, densely welded, devitrified; pumice, very light gray and light-gray, devitrified; phenocrysts, 3 percent, sanidine, plagioclase and rare biotite; occasional rhyolitic-lithic fragments. Abundant lithophysal cavities with vapor-phase crystallization and very light gray alteration halos.	10.67	10.67
	Total depth	10.97
Borehole number USW UZ-N45		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings on some fragments. Fresh surfaces and angularity of some fragments indicate they were derived from larger fragments.	10.76	10.76
Paintbrush Tuff Tiva Canyon Member Tuff (hackle), ash-flow, grayish-red to moderate-reddish-brown, densely welded, devitrified; pumice, light-gray and medium-gray, devitrified; phenocrysts, 3 percent, sanidine, plagioclase, and rare biotite; occasional rhyolitic-lithic fragments.	2.96	13.72
	Total depth	13.72

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N46		
Paintbrush Tuff Yucca Mountain Member Tuff, ash-flow, light-gray to light-brownish-gray, nonwelded to partially welded, vitric; pumice, white, vitric; phenocrysts, less than 1 percent, sanidine, plagioclase; rare rhyolitic-lithic fragments; abundant clear glass shares.	2.13	2.13
Tuff, ash-flow, light-gray, partially welded, partially devitrified; pumice, very light gray, devitrified and medium-light-gray, partially devitrified, vuggy with vapor-phase crystallization, good alignment of small pumice, flattened 3:1; phenocrysts, less than 1 percent, sanidine, and plagioclase; rare rhyolitic-lithic fragments.	6.71	8.84
Tuff, ash-flow, light-brownish-gray, partially to moderately welded, devitrified; pumice, white and medium-light-gray, devitrified; phenocrysts, 1 percent, sanidine and plagioclase (very small), black biotite; sparse disseminated manganese oxide; rare rhyolitic-lithic fragments; rare clear glass shares; some vapor-phase crystallization at top of unit.	12.19	21.03
Tuff, ash-flow, pale-brown, moderately welded, devitrified; pumice, medium-light-gray, devitrified (vapor phase?), flattened 4:1; phenocrysts, 1 percent, sanidine and plagioclase; disseminated manganese oxide; rare rhyolitic-lithic fragments.	1.22	22.25
Tuff, ash-flow, pale-yellowish-brown grading to light-brown, partially welded, devitrified; disseminated manganese oxide common; rare rhyolitic-lithic fragments.	1.83	24.08
Tuff, ash-flow, pale-brown to moderate-brown, nonwelded, vitric; pumice, grayish-orange-pink, argillized; abundant black glass shards.	2.74	26.82
Tuff, ash-flow, pale-yellowish-brown to light-brown, nonwelded, vitric; pumice, grayish-orange-pink to moderate-orange-pink, argillized; disseminated manganese oxide; abundant clear glass shards, sparse black glass shards.	1.22	28.04
Bedded tuff Tuff, ash-fall, white, partially argillic; pumice, white argillized; phenocrysts, abundant quartz, sanidine and plagioclase; common rhyolitic-lithic fragments.	2.13	30.18
	Total depth	30.18
Borehole number USW UZ-N47		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, poorly sorted, subangular to subrounded, light-gray, medium-light-gray and pale-yellowish-brown, moderately to densely welded tuffs.	10.06	10.06
Paintbrush Tuff Yucca Mountain Member Tuff, ash-flow, light-brownish-gray, moderately welded, devitrified; pumice, medium-light-gray to medium-gray, devitrified, vapor-phase crystallization; phenocrysts, 1 percent, sanidine and plagioclase; disseminated manganese oxide; rare, small rhyolitic-lithic fragments. Gradational color change with underlying unit.	8.84	18.90

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N47--Continued		
Tuff, ash-flow, pale-yellowish-brown grading to light-brown, partially welded, devitrified; disseminated manganese oxide common; rare rhyolitic-lithic fragments.	3.05	21.95
Tuff, ash-flow, pale-brown to moderate-brown, nonwelded, vitric; pumice, grayish-orange-pink to moderate orange pink, argillized; abundant black glass shards.	1.22	23.17
Tuff, ash-flow, pale-yellowish-brown to light-brownish-gray, nonwelded, vitric; pumice, grayish-orange-pink to moderate-orange-pink, argillized; disseminated manganese oxide; abundant clear glass shards, sparse black glass shards.	1.22	24.39
Bedded tuff Tuff, ash-fall, weathered, white, partially argillic; pumice, white, argillized; phenocrysts, abundant quartz, sanidine and plagioclase; common rhyolitic-lithic fragments.	1.82	26.21
	Total depth	26.21
Borehole number USW UZ-N48		
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, brownish-gray, densely welded, devitrified; pumice, medium dark gray, devitrified; phenocrysts, 3 percent, sanidine, plagioclase and rare biotite; occasional rhyolitic-lithic fragments. Occasional vapor-phase crystallization in pumice.	10.67	10.67
	Total depth	10.67
Borehole number USW UZ-N49		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Fragments are weathered with secondary carbonate coatings.	0.61	0.61
Paintbrush Tuff Tiva Canyon Member Tuff (lower lithophysal), ash-flow, grayish-red, densely welded, devitrified; pumice, medium-light-gray and medium-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine, plagioclase, and sparse biotite; occasional light-gray to medium-dark-gray rhyolitic-lithic fragments. Disseminated manganese oxide dendrites. Abundant lithophysal cavities with vapor-phase crystallization and light-gray alteration halos. Calcareous fracture fill material in upper 6.10 meters of hole.	10.36	10.97
	Total depth	10.97
Borehole number USW UZ-N50		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to angular fragments of Tiva Canyon ash-flow tuffs. Secondary carbonate coatings and discoloration of some fragments. Fresh surfaces on some fragments indicate they were broken from larger pieces.	2.74	2.74
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, grayish-red, densely welded, devitrified; pumice, medium-light-gray, devitrified with spherulites; phenocrysts, 3 percent, sanidine, rare hornblende and rare biotite; rare light-gray rhyolitic-lithic fragments; rare lithophysal cavities with vapor-phase crystallization. Secondary carbonate to 4.27 meters.	3.36	6.10
	Total depth	6.10

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N51		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to angular fragments of partially to densely welded Tiva Canyon ash-flow tuffs. Secondary carbonate coatings and discoloration of some fragments. Fresh surfaces on some fragments indicate they were broken from larger pieces.	4.27	4.27
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, grayish-red and moderate-reddish-brown, densely welded, devitrified; pumice, medium-light-gray and medium-gray, devitrified; phenocrysts, 3 percent, sanidine, plagioclase, hornblende and rare sphene; occasional light-gray rhyolitic-lithic fragments. Evidence of caliche filled fractures.	1.83	6.10
	Total depth	6.10
Borehole number USW UZ-N52		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to angular fragments of partially to densely welded Tiva Canyon ash-flow tuffs. Secondary carbonate coatings on some fragments.	2.13	2.13
Paintbrush Tuff Tiva Canyon Member Tuff (hackly), ash-flow, grayish-red and moderate-reddish-brown, densely welded, devitrified; pumice, medium-light-gray, medium-gray and moderate-reddish-orange, devitrified; phenocrysts, 3 percent, sanidine, plagioclase and hornblende. Evidence of sparse lithophysal cavities with vapor-phase crystallization. Secondary carbonate to 5.61 meters.	5.49	7.62
	Total depth	7.62
Borehole number UE-25 UZN #56		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings and discoloration present. Fresh surfaces on some fragments indicate they were from larger pieces.	17.07	17.07
Paintbrush Tuff Tiva Canyon Member Tuff (columnar), ash-flow, pale-brown, densely welded, devitrified; pumice, brownish-gray and dark-gray, devitrified; phenocrysts, 1 to 2 percent, sanidine, plagioclase, and rare biotite; occasional rhyolitic-lithic fragments. Brecciated material in cuttings and evidence of mineralization on fracture surfaces.	1.22	18.29
	Total depth	18.29
Borehole number UE-25 UZN #60		
Alluvium and colluvium, consisting of silt-sized to boulder-sized, subrounded to subangular, moderately to densely welded ash-flow tuffs. Rare fragments of nonwelded to partially welded ash-flow and ash-fall tuff. Secondary carbonate coatings on some fragments. Fresh surfaces and angularity of some fragments indicate they were derived from larger fragments during drilling.	8.08	8.08

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number UE-25 UZN #60--Continued		
Paintbrush Tuff Tiva Canyon Member Tuff (clinkstone), ash-flow, pale-red, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 2 to 3 percent, sanidine and plagioclase. Disseminated manganese oxide dendrites in matrix.	2.59	10.67
	Total depth	10.67
Borehole number USW UZ-N65		
Paintbrush Tuff Tiva Canyon Member Tuff (upper cliff), ash-flow, light-gray, moderately welded, devitrified; pumice, very light gray, devitrified; phenocrysts, 10 to 12 percent, sanidine, plagioclase and bronze biotite. Common vapor-phase crystallization and lithophysal cavities.	6.10	6.10
Tuff (upper lithophysal), ash-flow, medium-gray to light-brownish-gray, moderately welded, devitrified; pumice, very light gray, devitrified; phenocrysts, 5 percent, sanidine, plagioclase and biotite. Disseminated manganese oxide dendrites. Very light gray alteration halos surrounding lithophysal cavities. Vapor-phase crystallization.	9.14	15.24
	Total depth	15.24
Borehole number USW UZ-N66		
Paintbrush Tuff Tiva Canyon Member Tuff (clinkstone), ash-flow, light-brownish-gray to pale-red, densely welded, devitrified; pumice, very light gray, devitrified; phenocrysts, 3 to 5 percent, sanidine, plagioclase and biotite; rare light-gray rhyolitic-lithic fragments. Evidence of weathering in fractures to 7.32 meters.	15.24	15.24
	Total depth	15.24
Borehole number USW UZ-N67		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings and discolorations of some fragments. Fresh surfaces and angularity of some fragments indicate they were chipped from larger pieces. Rare to sparse nonwelded to partially-welded fragments of ash-flow and ash-fall tuff.	5.79	5.79
Tiva Canyon Member Tuff (caprock), ash-flow, very light gray and grayish-orange-pink, partially welded, devitrified; pumice, light-gray, and medium-light-gray, devitrified, vesicular with vapor-phase crystallization; phenocrysts, 15 to 20 percent, alkali feldspar, plagioclase, and bronze biotite.	1.83	7.62
	Total depth	7.62
Borehole number USW UZ-N68		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings and discoloration of some fragments. Fresh surfaces and angularity of some fragments indicate they were chipped from larger pieces.	15.24	15.24

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N68--Continued		
Rainier Mesa Member Tuff, ash-flow, white, nonwelded, vitric; pumice, white, vitric, good tubular structure; phenocrysts, 10 percent, quartz, biotite, and sphene; occasional small (less than 1 millimeter) rhyolitic-lithic fragments. Common bipyramidal aquartz phenocrysts.	1.52	16.76
	Total depth	16.76
Borehole number USW UZ-N69		
Alluvium and colluvium, consisting of silt-sized to boulder-sized, subrounded to subangular, moderately to densely welded ash-flow tuff fragments. Rare to common nonwelded to partially welded ash-flow and ash-fall tuff fragments. Fresh surfaces and angularity of some fragments indicate they were derived from larger fragments due to drilling.	8.23	8.23
Rainier Mesa Member Tuff, ash-flow, medium-light-gray, partially welded, devitrified; pumice, light-gray and medium-light-gray, devitrified, vesicular with vapor-phase crystallization; phenocrysts, 15 to 20 percent, alkali feldspar, plagioclase, quartz, bronze biotite and rare sphene.	2.44	10.67
	Total depth	10.67
Borehole number USW UZ-N70		
Paintbrush Tuff Tiva Canyon Member Tuff (lower lithophysal), ash-flow, pale-reddish-brown to grayish-red, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 2 to 3 percent, sanidine, plagioclase, and sparse biotite. Occasional disseminated manganese oxide dendrites. Lithophysal cavities with light-gray alteration halos and vapor-phase crystallization.	10.67	10.67
	Total depth	10.67
Borehole number USW UZ-N71		
Paintbrush Tuff Tiva Canyon Member Tuff (caprock), ash-flow, light-gray to light-brownish-gray, moderately welded, devitrified; pumice, white and medium-gray, devitrified, vesicular with vapor-phase crystallization; phenocrysts, 15 to 20 percent, sanidine, plagioclase, and biotite; occasional rhyolitic-lithic fragments.	10.67	10.67
Tuff (upper cliff), ash-flow, light-gray to light-brownish-gray, moderately welded, devitrified; pumice, white and very light gray, devitrified; phenocrysts, 7 to 10 percent, sanidine, plagioclase, biotite, and rare sphene; sparse rhyolitic-lithic fragments.	5.18	15.85
	Total depth	15.85
Borehole number USW UZ-N72		
Paintbrush Tuff Tiva Canyon Member Tuff (upper cliff), ash-flow, light-gray to medium-light-gray and light-brownish-gray, moderately welded, devitrified; pumice, very light gray and grayish brown, devitrified, vapor-phase crystallization; phenocrysts, 10 to 12 percent, sanidine, plagioclase, bronze biotite, sparse sphene and rare hornblende.	4.88	4.88
Tuff (upper cliff), ash-flow, light-gray to light-brownish-gray, moderately welded, devitrified; pumice, very light gray and light-brown, devitrified; phenocrysts, 10 percent, sanidine, plagioclase and biotite. Rare rhyolitic-lithic fragments.	3.05	7.93

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N72--Continued		
Tuff (upper cliff), ash-flow, light-gray to light-brownish-gray, moderately welded, devitrified; pumice, very light gray, devitrified; phenocrysts, 5 to 7 percent, sanidine, plagioclase and biotite. Lithophysal cavities with light-gray alteration halos and vapor-phase crystallization.	1.22	9.15
	Total depth	9.15
Borehole number USW UZ-N73		
Paintbrush Tuff	9.14	9.14
Tiva Canyon Member		
Tuff (upper lithophysal), ash-flow, light-gray to light-brownish-gray, moderately welded, devitrified; pumice, light-gray and medium-gray, devitrified; phenocrysts, 7 percent, sanidine, plagioclase and biotite. Disseminated manganese oxide dendrites. Lithophysal cavities with vapor-phase crystallization.		
	Total depth	9.14
Borehole number USW UZ-N74		
Paintbrush Tuff	5.79	5.79
Tiva Canyon Member		
Tuff (caprock), ash-flow, very light gray and light-brownish-gray, moderately welded, devitrified; pumice, white, medium-light-gray, and medium-dark-gray, devitrified, vapor-phase crystallization; phenocrysts, 12 to 15 percent, sanidine, plagioclase, biotite, and sphene.		
Tuff (upper cliff), ash-flow, light-gray to light-brownish-gray, moderately welded, devitrified; pumice, very light gray and light-brown, devitrified; phenocrysts, 10 percent, sanidine, plagioclase, and biotite; rare rhyolitic-lithic fragments.	5.49	11.28
	Total depth	11.28
Borehole number USW UZ-N75		
Alluvium and colluvium, consisting of silt-sized to boulder-sized, subrounded to subangular, moderately welded ash-flow tuff fragments (Tiva Canyon caprock). Some fragments have discolored surfaces, most have fresh angular surfaces.	0.61	0.61
Paintbrush Tuff	7.01	7.62
Tiva Canyon Member		
Tuff (upper cliff), ash-flow, light-gray to light-brownish-gray, moderately welded, devitrified; pumice, very light gray and light-brown, devitrified; phenocrysts, 10 percent, sanidine, plagioclase, and biotite; rare rhyolitic-lithic fragments.		
Tuff (upper lithophysal), ash-flow, light-gray to light-brownish-gray, moderately welded, devitrified; pumice, very light gray, devitrified; phenocrysts, 5 to 7 percent, sanidine, plagioclase, and biotite. Sparse lithophysal cavities with vapor-phase crystallization and light-gray alteration halos.	3.66	11.28
	Total depth	11.28

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N76		
Paintbrush Tuff Tiva Canyon Member Tuff (upper cliff), ash-flow, light-gray to medium-light-gray, moderately welded, devitrified; pumice, white, very light gray and light-gray, partially devitrified, possible clay alteration; phenocrysts, 15 percent, sanidine, plagioclase, black and bronze biotite. Vapor phase crystallization in lithophysal cavities and in vesicular pumice. Secondary carbonate coatings on fragments indicates extensive fracturing to total depth. Abundant smectitic clay in cuttings. Manganese oxide and siliceous coatings on some fracture surfaces.	7.32	7.32
Paintbrush Tuff Tiva Canon Member--Continued Tuff (upper lithophysal), ash-flow, light-gray, light-brownish-gray and pale-red, moderately welded, devitrified; pumice, very light gray, devitrified; phenocrysts, 7 percent, sanidine, plagioclase and sparse biotite. Disseminated vapor-phase crystallization. Abundant secondary manganese oxide dendrites. Sparse lithophysal cavities with carbonate and clay indicate fracturing. Some calcite at 10.97 to 11.58 meters.	4.88	12.19
	Total depth	12.19
Borehole number USW UZ-N77		
Alluvium and colluvium, consisting of silt-sized to gravel-sized fragments of nonwelded to densely welded Paintbrush Tuff. The angularity and fresh surfaces on some of the fragments indicate that they were derived from larger blocks. The cuttings from 10.36- to 10.67-meter intervals are composed of 75 percent of Tiva Canyon Member (upper cliff unit).	11.58	11.58
Paintbrush Tuff Tiva Canyon Member Tuff (clinkstone), ash-flow, pale-red and grayish-pink, densely welded, devitrified; pumice, very light gray to light-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine, rare biotite and a trace of hornblende; rare rhyolitic-lithic fragments; occasional calcite with included brecciated fragments.	3.66	15.24
	Total depth	15.24
Borehole number USW UZ-N78		
Paintbrush Tuff Tiva Canyon Member Tuff (caprock), ash-flow, light-gray to moderate-light-gray, moderately welded, devitrified; pumice, white to very light gray, moderate-brown and medium-gray pumice is vesicular, white pumice is devitrified; phenocrysts, 12 to 15 percent, sanidine, plagioclase, bronze biotite and rare sphene; abundant vapor-phase crystallization.	3.66	3.66
Tuff (upper cliff), ash-flow, light-gray, pale-red, light-brownish-gray, moderately welded, devitrified; pumice, white and medium-light-gray, partially devitrified; phenocrysts, 10 to 12 percent, sanidine, plagioclase, bronze biotite and rare sphene; rare rhyolitic-lithic fragments; common vapor-phase crystallization.	2.44	6.10
Tuff (upper lithophysal), ash-flow, light-gray and pale-red, moderately welded, devitrified; pumice, white, partially devitrified; phenocrysts, 5 percent, sanidine, plagioclase, bronze and black biotite and rare sphene; occasional disseminated manganese oxide; lithophysal cavities with vapor-phase crystallization.	3.05	9.14
	Total depth	9.14

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N79		
Tiva Canyon Member Tuff (upper lithophysal), ash-flow, light-gray to light-brownish-gray, moderately welded, devitrified; pumice, very light gray, devitrified; phenocrysts, 3 to 5 percent, sanidine, plagioclase, biotite; rare rhyolitic-lithic fragments; lithophysal cavities with vapor-phase crystallization; manganese oxide in matrix; calcium carbonate filled fractures.	3.05	3.05
Tuff (clinkstone), ash-flow, light-brownish-gray to pale-red, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 3 percent, sanidine, plagioclase and biotite; no lithic fragments seen; disseminated manganese oxide dendrites; calcium carbonate filled fractures.	6.71	9.76
	Total depth	9.76
Borehole number USW UZ-N80		
Paintbrush Tuff Topopah Spring Member Tuff (brick), ash-flow, moderate-reddish-brown, moderately to densely welded, devitrified; pumice, grayish-red and moderate-light-gray, devitrified, flattened 3:1 to 6:1; phenocrysts, 3 percent, plagioclase and biotite; rare light-gray rhyolitic-lithic fragments; manganese oxide staining on apparent fracture surfaces.	15.85	15.85
	Total depth	15.85
Borehole number USW UZ-N81		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, very light gray, light-gray, pale-red and light-brown, subrounded to subangular, moderately to densely welded ash-flow tuffs. Secondary carbonate coatings on some fragments.	1.83	1.83
Paintbrush Tuff Tiva Canyon Member Tuff (clinkstone), ash-flow, pale-red and light-gray, mottled, densely welded, devitrified; pumice, very light gray, devitrified; phenocrysts, 5 percent, sanidine, rare biotite; rare rhyolitic-lithic fragments; disseminated manganese oxide in matrix. Brecciated fragments and evidence of fracture coatings. Rare lithophysal cavities at 20.73 to 21.34 meters, with vapor-phase crystallization.	19.51	21.34
	Total depth	21.34
Borehole number USW UZ-N82		
Alluvium and colluvium, consisting of silt-sized to gravel-sized fragments of partially to densely welded Paintbrush Tuff. Fragments are subrounded to angular with some secondary carbonate coatings. Fresh surface on some fragments indicate they were derived from larger fragments.	6.70	6.70
Paintbrush Tuff Tiva Canyon Member Tuff (upper lithophysal), ash-flow, light-brownish-gray to brownish-gray and pale-red, densely welded, devitrified; pumice, very light gray, devitrified; phenocrysts, 5 percent, sanidine, rare biotite; disseminated manganese oxide in matrix. Very light gray alteration halos around lithophysal cavities.	2.44	9.14
Tuff (clinkstone), ash-flow, light-brownish-gray, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine, rare biotite and hornblende; disseminated manganese oxide dendrites in matrix.	3.05	12.19
	Total depth	12.19

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N83		
Paintbrush Tuff Tiva Canyon Member Tuff (clinkstone), ash-flow, pale-red, densely welded, devitrified; pumice, very light gray, flattened 4:1; phenocrysts, 3 percent, sanidine, plagioclase and a trace of sphene; manganese oxide dendrites in matrix; rare light-gray rhyolitic-lithic fragments. Secondary carbonate coatings on fragments to 4.89 meters.	21.34	21.34
	Total depth	21.34
Borehole number USW UZ-N84		
Alluvium and colluvium, consisting of silt-sized to boulder-sized fragments of nonwelded to densely welded rhyolitic tuff. Secondary carbonate down to 3.66 meters.	6.09	6.09
Paintbrush Tuff Tiva Canyon Member Tuff (caprock), ash-flow, pale-reddish-brown to moderate-reddish-brown, partially welded, vitric; pumice, moderate-reddish-brown, dark-reddish-brown and medium-gray, vitric, vesicular, some vapor-phase crystallization; phenocrysts, 10 to 12 percent, sanidine, plagioclase biotite and rare sphene; scarce, less than 1 millimeters, rhyolitic-lithic fragments.	2.44	8.53
Tuff (caprock), ash-flow, pale-red, moderately welded, devitrified; pumice, very light gray, medium-light-gray and moderate-brown, partially vitric; vapor-phase crystallization, vesicular; phenocrysts, 15 percent, sanidine, plagioclase, biotite and rare sphene; rare, less than 2 millimeters, rhyolitic-lithic fragments.	1.22	9.75
Normal fault at 9.75 meters. Tuff (upper lithophysal), ash-flow, grayish-red, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 5 percent, sanidine, plagioclase, biotite and rare hornblende; a trace (less than 1 percent), rhyolitic-lithic fragments; manganese oxide dendrites on fracture surfaces.	1.83	11.58
Reverse fault at 11.58 meters. Tuff (upper cliff), ash-flow, very light gray, moderately welded, devitrified; pumice, white and light-gray, partially devitrified, light-gray pumice is vesicular; phenocrysts, 12 to 15 percent, sanidine, plagioclase, bronze biotite and rare sphene; rare rhyolitic-lithic fragments; vapor-phase crystallization.	0.61	12.19
Tuff (upper lithophysal), ash-flow, grayish-red, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 5 percent, sanidine, plagioclase and biotite; rare rhyolitic-lithic fragments. Lithophysal cavities with vapor-phase crystallization. Disseminated manganese oxide dendrites on fracture surfaces.	.61	12.80
Reverse fault at 12.80 meters. Tuff (upper cliff), ash-flow, very light gray, moderately welded, devitrified; pumice, white and light-gray, partially devitrified, light-gray pumice is vesicular; phenocrysts, 12 to 15 percent, sanidine, plagioclase, bronze biotite and rare sphene; rare rhyolitic-lithic fragments; vapor-phase crystallization.	.61	13.41

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N84--Continued		
Paintbrush Tuff	0.30	13.72
Tiva Canyon Member Tuff (upper lithophysal), ash-flow, grayish-red, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 5 percent, sanidine, plagioclase and biotite; rare rhyolitic-lithic fragments. Lithophysal cavities with vapor-phase crystallization. Disseminated manganese oxide dendrites and dendrites on fracture surfaces.		
	Total depth	13.72
Note: Intervals from 9.75 to 13.72 meters may be composed of blocks of tuff which have been dragged or have fallen into the fault plane.		
Borehole number UE-25 UZN #85		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, rounded to subangular, moderately to densely welded, ash-flow tuff, rhyolitic-lava, and basaltic-lava fragments. Secondary carbonate coatings and discoloration of some fragments. Fresh surfaces on some fragments indicate they were derived from larger pieces.	24.38	24.38
	Total depth	24.38
Borehole number USW UZ-N86		
Paintbrush Tuff	9.14	9.14
Tiva Canyon Member		
Tuff (clinkstone), ash-flow, grayish-red, densely welded, devitrified; pumice, light-gray to medium-light-gray, devitrified, flattened 4:1; phenocrysts, 1 to 2 percent, sanidine and plagioclase; manganese oxide dendrites in matrix; rare medium-light-gray rhyolitic-lithic fragments; fracture fill material at 3.66 meters. Abundant secondary carbonate coating fragments from 0 to 1.83 meters.		
	Total depth	9.14
Borehole number USW UZ-N87		
Alluvium and colluvium, consisting of silt-sized to boulder-sized, partially to densely welded rhyolitic-lithic fragments. Secondary carbonate and siliceous coatings on some fragments.	5.79	5.79
Paintbrush Tuff	2.13	7.92
Tiva Canyon Member		
Tuff (caprock), ash-flow, pale-red to pale-reddish-brown, partially welded, devitrified, vesicular; pumice, moderate-reddish-brown, dark-reddish-brown and light-gray, devitrified, vesicular; phenocrysts, 7 to 10 percent, saniphase crystallization.		
Tuff (upper cliff), ash-flow, grayish-red, moderately welded, devitrified; pumice moderate-reddish-brown and light-gray, devitrified, vesicular; phenocrysts, 12 to 15 percent, sanidine, plagioclase and bronze biotite; vapor-phase crystallization.	3.05	10.97
Tuff (upper cliff), ash-flow, pale-red, moderately welded, devitrified; pumice, moderate-reddish-brown and light-gray, devitrified, vapor-phase crystallization, vesicular; phenocrysts, 12 to 15 percent, sanidine, plagioclase and bronze biotite; no lithic fragments identified.	2.74	13.72
	Total depth	13.72

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N88		
Alluvium and colluvium, consisting of silt-sized to boulder-sized, partially to densely welded rhyolitic-lithic fragments. Secondary carbonate and siliceous coatings on some fragments.	0.23	0.23
Paintbrush Tuff	4.04	4.27
Tiva Canyon Member		
Tuff (upper lithophysal), ash-flow, grayish-red to grayish-brown, densely welded, devitrified; pumice, dusky-brown, devitrified, flattened 5:1; phenocrysts, 3 percent, sanidine, plagioclase, and a trace of biotite; common rhyolitic-lithic fragments, very light gray and dark-gray. Secondary carbonate coatings on fragments.		
Tuff (clinkstone), ash-flow, grayish-red, densely welded, devitrified; pumice, light-gray and dark-reddish-brown, devitrified, flattened 6:1; phenocrysts, 2 percent, sanidine and plagioclase, traces of biotite; common rhyolitic-lithic fragments.	4.88	9.15
	Total depth	9.15
Borehole number USW UZ-N89		
Alluvium and colluvium, consisting of silt-sized to boulder-sized fragments of moderately to densely welded rhyolitic-lithic fragments. Secondary carbonate coating on fragments.	10.06	10.06
Paintbrush Tuff	3.66	13.72
Tiva Canyon Member		
Tuff (clinkstone), ash-flow, pale-red, densely welded, devitrified; pumice, rare, light-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine and plagioclase; manganese oxide dendrites in matrix; no lithic fragments seen in cuttings.		
	Total depth	13.72
Borehole number USW UZ-N90		
Alluvium and colluvium, consisting of silt-sized to boulder-sized, nonwelded to densely welded rhyolitic ash-flow tuff fragments.	9.91	9.91
Paintbrush Tuff	3.81	13.72
Tiva Canyon Member		
Tuff (upper lithophysal), ash-flow, pale-red, moderately to densely welded, devitrified; pumice, very light gray, devitrified, flattened 4:1; phenocrysts, 1 to 2 percent, sanidine and plagioclase; rare rhyolitic-lithic fragments; lithophysal cavities with vapor-phase crystallization.		
	Total depth	13.72
Borehole number UE-29 UZN #91		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, welded ash-flow tuff, rhyolitic-lava fragments, and basaltic-lava fragments. Secondary carbonate coatings and discoloration of some fragments. Fresh surfaces on some fragments indicate they were chipped from larger pieces.	19.51	19.51
Tuff, undifferentiated	1.83	21.34
Tuff, ash-flow, light-brown to moderate-brown, moderately welded, devitrified; pumice, white argillized; phenocrysts, less than 1 percent, biotite.		

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number UE-29 UZN #91--Continued		
Tuff, ash-flow, moderate-brown, moderately welded, partially devitrified; pumice, very pale orange, white silicified, and black vitric, concentric banded; phenocrysts, 1 to 2 percent, biotite, and feldspar; sparse lithic fragments. Matrix became vitric at 23.17 meters.	2.74	24.08
Tuff, ash-flow (?), medium-dark-gray, vitric; phenocrysts, 1 percent, biotite and feldspar.	0.91	24.99
Tuff, ash-flow, dark-yellowish-brown to grayish-brown, densely welded, partially devitrified; pumice, moderate-orange-pink and very pale orange, devitrified; 1 to 2 percent, feldspar and biotite, occasional rhyolitic-lithic fragments. Black flamme in matrix.	0.61	25.60
Tuff, ash-flow, pale-red to grayish-red, densely welded, devitrified; pumice, grayish-yellow and light-greenish-gray, devitrified, zeolitized; phenocrysts, 5 percent, biotite, sanidine, plagioclase, and quartz; common rhyolitic-lithic fragments.	1.22	26.82
Tuff, ash-flow, very pale orange to moderate-orange-pink, densely welded, devitrified, partially silicified matrix; pumice, white, devitrified; phenocrysts, 5 to 7 percent, sanidine, plagioclase, biotite, and rose quartz; abundant grayish-red purple, rhyolitic-lithic fragments. Common siliceous-filled hairline fractures.	1.83	28.65
	Total depth	28.65
Borehole number UE-25 UZN #92		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, welded ash-flow tuff, rhyolitic-lava fragments, and basaltic lava fragments. Secondary carbonate coatings and discoloration of some fragments. Fresh surfaces on some fragments indicate they were chipped from larger fragments.	17.68	17.68
Tuffs, undifferentiated Tuff, ash-flow, very light gray, partially welded, partially devitrified; pumice, white, partially devitrified, vapor-phase crystallization; phenocrysts, 10 to 12 percent, plagioclase, biotite, quartz, and alkali feldspar.	.61	18.29
Tuff, ash-fall (?), silicified, moderate-brown to dark-yellowish-brown, well indurated; phenocrysts, 1 percent black biotite. Abundant, healed hairline fractures with clear and white siliceous filling material.	1.22	19.51
Lava flow, rhyolitic, light-bluish-gray, pale-yellowish-green, and light-gray, vitric; phenocrysts, less than 1 percent, biotite. Conspicuous concentric layering.	1.22	20.73
Lava flow, rhyolitic, medium-gray to dark-gray, and light-brownish-gray, vitric; phenocrysts, 1 percent, alkali feldspar and biotite. Abundant siliceous filled hairline fractures.	15.85	36.58
	Total depth	36.58

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N93		
USW UZ-6 drill pad material	3.65	3.65
Paintbrush Tuff Tiva Canyon Member Tuff (caprock), ash-flow, very light gray, light-gray and light-brown, moderately welded, devitrified; pumice, very light gray, brownish-gray and moderate-brown, devitrified, vapor-phase crystallization;phenocrysts, 15 to 20 percent, sanidine, plagioclase, bronze biotite and rare sphene. Calcareous and siliceous fracture fill material to 5.49 meters.	3.05	6.70
Tuff (upper cliff), ash-flow, light-gray and grayish-pink, moderately welded, devitrified; pumice, white and medium-gray, devitrified, vapor-phase crystallization; phenocrysts, 10 to 12 percent, sanidine, plagioclase, biotite, rare sphene and rare hornblende.	5.49	12.19
	Total depth	12.19
Borehole number USW UZ-N94		
Paintbrush Tuff Tiva Canyon Member Tuff (caprock), ash-flow, very light gray and light-brown, moderately welded, devitrified; pumice, white, medium-light-gray and medium-dark-gray, devitrified, vesicular vapor-phase crystallization; phenocrysts, 15 percent, sanidine, plagioclase, biotite and rare sphene.	6.09	6.09
Tuff (upper cliff), ash-flow, very light gray, light-gray and grayish-pink, moderately welded, devitrified; pumice, white and light-gray, devitrified, vesicular vapor-phase crystallization; phenocrysts, 10 to 12 percent, sanidine, plagioclase, biotite, rare sphene and rare hornblende. Lithophysal cavities with vapor-phase crystallization.	3.05	9.14
	Total depth	9.14
Borehole number USW UZ-N95		
Paintbrush Tuff Tiva Canyon Member Tuff (caprock), ash-flow, very light gray and light-brown, moderately welded, devitrified; pumice, very light gray, light-gray and brownish-gray, vesicular vapor-phase crystallization; phenocrysts, 15 percent, sanidine, plagioclase, biotite and rare sphene and rare hornblende.	6.10	6.10
	Total depth	6.10
Borehole number USW UZ-N96		
Alluvium and colluvium, consisting of silt-sized to boulder-sized, subrounded to subangular, moderately welded ash-flow tuff fragments (Tiva Canyon caprock). Some fragments have discolored surfaces, most have fresh angular surfaces.	0.61	0.61
Paintbrush Tuff Tiva Canyon Member Tuff (caprock), ash-flow, very light gray, light-gray, moderately welded, devitrified; pumice, white and brownish-gray, devitrified, vesicular vapor-phase crystallization, phenocrysts, 15 percent, sanidine, plagioclase, biotite and rare sphene and rare quartz.	1.22	1.83
Tuff (upper cliff), ash-flow, very light gray to light-gray, moderately welded, devitrified; pumice, very light gray, devitrified, vesicular vapor-phase crystallization; phenocrysts, 12 to 15 percent, sanidine, plagioclase, occasional bronze biotite and rare sphene.	7.32	9.15

Table 3. *Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued*

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N96--Continued		
Tuff (upper lithophysal), ash-flow, light-gray to light-brownish-gray, moderately welded, devitrified; pumice, very light gray, devitrified, vesicular vapor-phase crystallization; pheno-crysts, 10 percent, sanidine, plagioclase and occasional bronze biotite; rare rhyolitic-lithic fragments. Manganese oxide dendrites in matrix.	1.52	10.67
	Total depth	10.67
Borehole number UE-25 UZN #97		
Alluvium and colluvium, consisting of silt-sized to gravel-sized, subrounded to subangular, moderately to densely welded, ash-flow tuff fragments. Secondary carbonate coatings and discoloration of some fragments. Fresh surfaces of some fragments indicate they were derived from larger pieces. Interval from 15.85 to 17.68 meters consists of alluvium and colluvium, and weathered, fractured bedrock.	17.68	17.68
Paintbrush Tuff	0.61	18.29
Tiva Canyon Member		
Tuff (lower lithophysal), ash-flow, grayish-red and moderate-reddish-brown to dark-reddish-brown, densely welded, devitrified; pumice, light-gray, devitrified; phenocrysts, 3 to 5 percent, sanidine and plagioclase. Sparse lithophysal cavities with vapor-phase crystallization. Occasional manganese oxide dendrites.		
	Total depth	18.29
Borehole number USW UZ-N98		
Alluvium and colluvium, consisting of fine-sand-sized to gravel-sized, densely welded Tiva Canyon tuff fragments.	.30	0.30
Paintbrush Tuff	7.32	7.62
Tiva Canyon Member		
Tuff (columnar), ash-flow, pale-red, densely welded, devitrified; pumice, grayish-red, devitrified, flattened 4:1; phenocrysts, 3 percent, sanidine, plagioclase and black biotite; occasional medium-light-gray and medium-gray rhyolitic-lithic fragments. Minor secondary carbonate in upper part of interval.		
Tuff (columnar), ash-flow, pale-brown, moderately welded, devitrified; pumice, medium-light-gray, devitrified; phenocrysts, 1 to 2 percent, sanidine, plagioclase and black biotite; occasional rhyolitic-lithic fragments.	1.52	9.14
Tuff (shardy base), ash-flow, light-brown, moderately to partially welded, argillized; pumice, light-gray, moderate-red, argillized, devitrified; phenocrysts, 1 percent, sanidine, plagioclase and biotite; disseminated manganese oxide; occasional medium-gray and reddish-gray rhyolitic-lithic fragments; amber glass shards.	3.05	12.19
Tuff (shardy base), ash-flow, light-brown, partially welded, vitric; pumice, grayish-pink and pinkish-gray, vitric and argillized; phenocrysts, 1 percent, sanidine and plagioclase; sparse moderate-red rhyolitic-lithic fragments; black glass shards, common to abundant with depth. Unit becomes argillized at 13.72 meters with moderate-orange-pink pumice.	5.18	17.37

Table 3. Lithologic logs of the neutron-access boreholes at Yucca Mountain--Continued

Stratigraphic and lithologic description	Thickness of interval (meters)	Depth to bottom of interval (meters)
Borehole number USW UZ-N98--Continued		
Bedded tuff Tuff, ash-fall, weathered, grayish-orange-pink to light-brown, nonwelded, vitric; pumice, very pale orange and moderate-orange-pink, rounded; phenocrysts, 3 percent, sanidine and plagioclase; sparse rhyolitic-lithic fragments.	2.13	19.50
Tuff, ash-fall, light-gray to grayish-orange-pink, nonwelded, vitric; pumice, light-gray and very pale orange, vitric; phenocrysts, 4 to 5 percent, sanidine and plagioclase; occasional rhyolitic-lithic fragments.	0.91	20.41
Tuff, ash-fall, weathered, very pale orange and grayish-orange, nonwelded, argillized; pumice, white, vitric, argillized; phenocrysts, 1 percent, sanidine and plagioclase; occasional rhyolitic-lithic fragments.	.91	21.32
Tuff, ash-fall, white, nonwelded, vitric; pumice, white, vitric; phenocrysts, 1 percent, sanidine and plagioclase; common rhyolitic-lithic fragments.	.61	21.93
Yucca Mountain Member Tuff, ash-flow, light-brownish-gray, nonwelded to partially welded, vitric; pumice, white to very light gray, argillized; phenocrysts, 1 percent, sanidine and plagioclase; common rhyolitic-lithic fragments.	.91	22.86
	Total depth	22.86

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes

[Depth is the midpoint of the drilled interval; A, alluvium/colluvium; B, bedrock; <, less than; --, no data]

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25	0.9	A	0.038	0.034	--	--	-1,000	--
UZN #1	1.5	A	.038	.041	--	--	-600	--
	2.7	A	.049	.049	--	--	-290	--
	3.4	A	.045	.042	--	--	-570	--
	4.0	A	.049	.045	--	--	-400	--
	4.6	A	.058	.054	--	--	-370	--
	5.2	A	.049	.043	--	--	-460	--
	5.8	A	.053	.052	--	--	-380	--
	6.4	A	.019	.062	--	--	-290	--
	7.0	A	.057	.059	--	--	-370	--
	7.6	A	.061	.064	--	--	-450	--
	11.1	B	.288	--	--	-270	--	--
	11.6	B	.249	--	--	-270	--	--
	12.2	B	.105	--	--	-1,000	--	--
	12.8	B	.081	--	--	-1,300	--	--
	14.0	B	.088	--	--	-920	--	--
	14.8	B	.104	--	--	-720	--	--
UE-25	1.5	B	--	.008	--	--	-29,000	--
UZN #2	3.0	B	--	.011	--	--	-19,000	--
	4.6	B	--	.015	--	--	-9,900	--
	6.1	B	--	.023	--	--	-3,900	--
	7.6	B	--	.011	--	--	-17,000	--
	9.1	B	--	.013	--	--	-12,000	--
	10.7	B	--	.010	--	--	-18,000	--
	12.2	B	--	.013	--	--	-13,000	--
	13.7	B	--	.012	--	--	-15,000	--
	15.2	B	--	.012	--	--	-18,000	--
UE-25	1.5	A	.024	.021	--	--	-3,700	--
UZN #3	3.0	B	.032	.039	--	--	-2,500	--
	4.6	B	.020					
UE-25	1.5	A	.023	.015	0.032	--	-4,400	-4,100
UZN #4	3.0	A	.028	.027	.042	--	-4,200	-4,300
	4.6	A	.017	.031	.023	--	-2,700	-3,500
	6.1	A	.047	.037	--	--	-160	-250
	7.6	B	.050	--	.064	--	-140	-280
	9.1	B	.016	.018	.013	--	-9,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25	1.5	A	0.021	--	0.022	--	-3,700	--
UZN #5	3.0	A	.045	.050	.060	--	-3,300	--
	4.6	A	.037	.017	.043	--	-2,700	--
	6.1	A	.082	.058	--	--	-600	-610
	7.6	A	.050	.055	--	--	-310	--
	9.1	A	.039	.034	.049	--	-610	-660
	10.7	A	.053	.044	.061	--	-640	-4,400
	10.7	A	--	--	--	--	-670	--
	12.2	A	.053	.043	--	--	-510	-250
	13.7	B	.021	.022	.020	--	-4,800	-5,000
	15.2	B	.017	.020	.015	--	-8,300	-10,000
	15.2	B	--	--	--	--	-6,600	--
UE-25	1.5	A	.044	.054	.042	--	-290	-380
UZN #6	3.0	A	.035	.036	.035	--	-600	-820
	3.0	A	--	--	--	--	-590	--
	4.6	A	.054	.040	.066	--	-730	-810
	4.6	A	--	--	--	--	-400	--
	6.1	A	.060	.052	.075	--	-250	-260
	7.6	A	.041	.039	.058	--	-240	-370
	9.1	A	.056	.053	.059	--	-270	-270
	10.7	A	.053	.052	.060	--	-280	-280
	12.2	A	.049	.046	.053	--	-220	-350
	13.7	B	.016	--	--	-6,600	--	--
	13.7	B	.017	--	--	--	--	--
UE-25	1.5	A	.034	--	--	--	-470	--
UZN #7	1.5	A	.034	--	--	--	--	--
	3.0	A	.058	--	--	--	-220	--
	3.0	A	.062	--	--	--	--	--
	4.6	A	.060	--	--	--	-290	--
	4.6	A	.062	--	--	--	--	--
	6.1	A	.060	--	--	--	-250	--
	6.1	A	.058	--	--	--	-90	--
	6.7	A	.061	--	--	--	-420	--
	6.7	A	.062	--	--	--	--	--
	7.3	A	.058	--	--	--	-280	--
	7.3	A	.059	--	--	--	--	--
	7.9	A	.055	--	--	--	-270	--
	7.9	A	.056	--	--	--	--	--
	8.5	A	.057	--	--	--	-280	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #7--Continued								
	8.5	A	0.058	--	--	--	--	--
	9.1	A	.060	--	--	--	-340	--
	9.1	A	.064	--	--	--	--	--
	9.8	A	.065	--	--	--	-350	--
	9.8	A	.066	--	--	--	--	--
	10.4	A	.068	--	--	--	-160	--
	10.4	A	.069	--	--	--	--	--
	11.0	A	.058	--	--	--	-100	--
	11.0	A	.056	--	--	--	--	--
	11.6	A	.072	--	--	--	-110	--
	11.6	A	.069	--	--	--	--	--
	12.2	A	.062	--	--	--	-98	--
	12.2	A	.062	--	--	--	--	--
	12.8	B	.016	--	--	--	-4,100	--
	12.8	B	.017	--	--	--	--	--
	13.4	B	.016	--	--	--	-5,800	--
	13.4	B	.015	--	--	--	--	--
UE-25	1.2	A	.029	--	--	--	-690	--
UZN #8	1.2	A	.029	--	--	--	--	--
	1.8	A	.040	--	--	--	-330	--
	1.8	A	.036	--	--	--	--	--
	2.4	A	.072	--	--	--	-130	--
	2.4	A	.073	--	--	--	--	--
	3.0	A	.045	--	--	--	-110	--
	3.0	A	.046	--	--	--	--	--
	3.7	A	.063	--	--	--	<-50	--
	3.7	A	.066	--	--	--	--	--
	4.3	A	.062	--	--	--	<-50	--
	4.3	A	.064	--	--	--	--	--
	4.9	A	.074	--	--	--	-240	--
	4.9	A	.075	--	--	--	--	--
	5.5	A	.062	--	--	--	-200	--
	5.5	A	.063	--	--	--	--	--
	6.1	A	.057	--	--	--	-190	--
	6.1	A	.055	--	--	--	--	--
	6.7	A	.060	--	--	--	-180	--
	6.7	A	.060	--	--	--	--	--
	7.3	A	.055	--	--	--	-110	--
	7.3	A	.056	--	--	--	--	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #8--Continued								
	7.9	A	0.055	--	--	--	--	--
	7.9	A	.055	--	--	--	--	--
	8.5	A	.062	--	--	--	--	--
	8.5	A	.063	--	--	--	--	--
	9.1	A	.058	--	--	--	--	--
	9.1	A	.059	--	--	--	--	--
	9.8	A	.053	--	--	--	--	--
	9.8	A	.053	--	--	--	--	--
	10.4	A	.052	--	--	--	--	--
	10.4	A	.054	--	--	--	--	--
	11.0	A	.055	--	--	--	-150	--
	11.0	A	.048	--	--	--	--	--
	11.6	A	.050	--	--	--	--	--
	11.6	A	.045	--	--	--	--	--
	12.2	B	.035	--	--	--	-410	--
	12.2	B	.035	--	--	--	--	--
	12.8	B	.013	--	--	--	-6,900	--
	12.8	B	.013	--	--	--	--	--
	13.4	B	.020	--	--	--	-4,800	--
	13.4	B	.021	--	--	--	--	--
UE-25	1.8	A	.012	--	--	--	-2,600	--
UZN #9	1.8	A	.012	--	--	--	--	--
	2.4	A	.015	--	--	--	-5,000	--
	2.4	A	.016	--	--	--	--	--
	3.0	A	.056	--	--	--	-320	--
	3.0	A	.059	--	--	--	--	--
	3.7	A	.051	--	--	--	-77	--
	3.7	A	.052	--	--	--	--	--
	4.3	A	.052	--	--	--	-600	--
	4.3	A	.050	--	--	--	--	--
	4.9	A	.048	--	--	--	-340	--
	4.9	A	.052	--	--	--	--	--
	5.5	A	.043	--	--	--	-370	--
	5.5	A	.043	--	--	--	--	--
	6.1	A	.041	--	--	--	-290	--
	6.1	A	.042	--	--	--	--	--
	6.7	A	.040	--	--	--	-500	--
	6.7	A	.042	--	--	--	--	--
	7.3	A	.038	--	--	--	-520	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #9--Continued								
	7.3	A	0.040	--	--	--	--	--
	7.9	A	.035	--	--	--	-580	--
	7.9	A	.035	--	--	--	--	--
	8.5	A	.037	--	--	--	-380	--
	8.5	A	.038	--	--	--	--	--
	9.1	A	.039	--	--	--	-460	--
	9.1	A	.039	--	--	--	--	--
	9.8	A	.037	--	--	--	-520	--
	9.8	A	.038	--	--	--	--	--
	10.4	A	.036	--	--	--	-550	--
	10.4	A	.037	--	--	--	--	--
	11.0	B	.037	--	--	--	-660	--
	11.0	B	.038	--	--	--	--	--
	11.6	B	.016	--	--	--	-5,900	--
	11.6	B	.016	--	--	--	--	--
	12.2	B	.019	--	--	--	-4,100	--
	12.2	B	.020	--	--	--	--	--
UE-25	4.0	B	--	0.201	--	--	-620	--
UZN #10	6.9	B	--	--	0.167	--	-920	--
	7.9	B	--	--	.184	--	-680	--
	8.5	B	--	.223	.192	--	-720	--
	9.0	B	--	--	.179	--	-690	--
	9.4	B	--	--	.195	--	-630	--
	10.1	B	--	.214	--	--	-730	--
	10.5	B	--	.203	--	--	-830	--
	11.0	B	--	.207	--	--	-680	--
	11.6	B	--	.175	--	--	-660	--
	12.2	B	--	--	.112	--	-780	--
	12.8	B	--	.127	--	--	-720	--
	13.4	B	--	.131	--	--	-660	--
	14.0	B	--	.140	--	--	-810	--
	14.6	B	--	.138	--	--	-730	--
	15.2	B	--	.153	--	--	-780	--
	15.8	B	--	.161	--	--	-560	--
	16.5	B	--	.167	--	--	-670	--
	17.1	B	--	.154	--	--	-730	--
	17.7	B	--	.161	--	--	-520	--
	18.3	B	--	.154	--	--	-540	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #10--Continued								
	18.9	B	--	0.149	--	--	-490	--
	19.5	B	--	.139	--	--	-490	--
	20.1	B	--	.131	--	--	-530	--
	20.7	B	--	.127	--	--	-490	--
	21.3	B	--	.122	--	--	-650	--
	21.9	B	--	.121	--	--	-580	--
	22.4	B	--	--	.109	--	-620	--
	22.7	B	--	--	.106	--	-640	--
	23.0	B	--	.108	.102	--	-690	--
	23.3	B	--	.102	--	--	-640	--
	23.6	B	--	.104	--	--	-710	--
	23.9	B	--	--	.101	--	-520	--
	24.2	B	--	--	.100	--	-560	--
	24.5	B	--	--	.100	--	-510	--
	24.8	B	--	.111	--	--	-430	--
	25.1	B	--	--	.087	--	-480	--
	25.5	B	--	.106	--	--	-620	--
	25.8	B	--	--	.084	--	-730	--
	26.1	B	--	.127	--	--	-690	--
	26.4	B	--	.121	--	--	-680	--
	26.7	B	--	.124	--	--	-620	--
	27.0	B	--	.153	--	--	-650	--
	27.3	B	--	--	.129	--	-460	--
	27.6	B	--	.113	--	--	-560	--
	27.9	B	--	--	.148	--	-470	--
	28.2	B	--	.148	--	--	-420	--
	28.5	B	--	--	.101	--	-450	--
UE-25	0.6	A	0.069	--	--	--	-170	--
UZN #12	.6	A	.071	--	--	--	--	--
	1.2	A	.070	--	--	--	-170	--
	1.2	A	.071	--	--	--	--	--
	1.8	A	.054	--	--	--	-210	--
	1.8	A	.055	--	--	--	--	--
	2.4	A	.065	--	--	--	--	--
	2.4	A	.058	--	--	--	--	--
	3.0	A	.049	--	--	--	-400	--
	3.0	A	.047	--	--	--	--	--
	3.7	A	.037	--	--	--	--	--
	3.7	A	.040	--	--	--	--	--
	4.3	A	.044	--	--	--	-300	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #12--Continued								
	4.3	A	0.045	--	--	--	--	--
	4.9	A	.042	--	--	--	--	--
	4.9	A	.042	--	--	--	--	--
	5.5	A	.036	--	--	--	-280	--
	5.5	A	.036	--	--	--	--	--
	6.1	A	.036	--	--	--	--	--
	6.1	A	.041	--	--	--	--	--
	6.7	A	.054	--	--	--	-290	--
	6.7	A	.051	--	--	--	--	--
	7.3	A	.049	--	--	--	--	--
	7.3	A	.052	--	--	--	--	--
	7.9	A	.046	--	--	--	-280	--
	7.9	A	.057	--	--	--	--	--
	8.5	A	.041	--	--	--	--	--
	8.5	A	.041	--	--	--	--	--
	9.1	A	.054	--	--	--	-260	--
	9.1	A	.051	--	--	--	--	--
	9.8	A	.048	--	--	--	--	--
	9.8	A	.050	--	--	--	--	--
	10.4	A	.025	--	--	--	-190	--
	10.4	A	.037	--	--	--	--	--
	11.0	A	.052	--	--	--	--	--
	11.6	A	.035	--	--	--	-270	--
	11.6	A	.040	--	--	--	--	--
	12.2	A	.037	--	--	--	--	--
	12.2	A	.032	--	--	--	--	--
	12.8	A	.031	--	--	--	-830	--
	12.8	A	.033	--	--	--	--	--
	13.4	A	.038	--	--	--	--	--
	13.4	A	.039	--	--	--	--	--
	14.0	B	.034	--	--	--	-500	--
	14.0	B	.037	--	--	--	--	--
	14.6	B	.018	--	--	--	--	--
	14.6	B	.021	--	--	--	--	--
	15.2	B	.020	--	--	--	-2,000	--
	15.2	B	.020	--	--	--	--	--
UE-25	0.6	A	.012	--	--	--	-11,000	--
UZN #13	.6	A	.012	--	--	--	--	--
	1.2	A	.017	--	--	--	-2,200	--
	1.2	A	.017	--	--	--	--	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #13--Continued								
	1.8	A	0.022	--	--	--	-3,100	--
	1.8	A	.027	--	--	--	--	--
	2.4	A	.035	--	--	--	-580	--
	2.4	A	.036	--	--	--	--	--
	3.0	A	.064	--	--	--	-170	--
	3.0	A	.066	--	--	--	--	--
	3.7	A	.058	--	--	--	-180	--
	3.7	A	.060	--	--	--	--	--
	4.3	A	.059	--	--	--	-100	--
	4.3	A	.060	--	--	--	--	--
	4.9	A	.048	--	--	--	-130	--
	4.9	A	.051	--	--	--	--	--
	5.5	A	.056	--	--	--	-86	--
	5.5	A	.058	--	--	--	--	--
	6.1	A	.056	--	--	--	-180	--
	6.1	A	.057	--	--	--	--	--
	6.7	A	.059	--	--	--	-270	--
	6.7	A	.056	--	--	--	--	--
	7.3	A	.059	--	--	--	-130	--
	7.3	A	.060	--	--	--	--	--
	7.9	A	.055	--	--	--	-330	--
	7.9	A	.056	--	--	--	--	--
	8.5	A	.059	--	--	--	-160	--
	8.5	A	.057	--	--	--	--	--
	9.1	A	.056	--	--	--	-200	--
	9.1	A	.057	--	--	--	--	--
	9.8	A	.060	--	--	--	-130	--
	9.8	A	.058	--	--	--	--	--
	10.4	A	.054	--	--	--	-160	--
	10.4	A	.057	--	--	--	--	--
	11.0	A	.052	--	--	--	-190	--
	11.0	A	.053	--	--	--	--	--
	11.6	A	.083	--	--	--	<-50	--
	11.6	A	.091	--	--	--	--	--
	12.2	A	.095	--	--	--	<-50	--
	12.2	A	.088	--	--	--	--	--
	12.8	A	.062	--	--	--	-150	--
	12.8	A	.067	--	--	--	--	--
	13.4	A	.094	--	--	--	-120	--
	13.4	A	.094	--	--	--	--	--
	14.0	A	.071	--	--	--	--	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #13--Continued								
	14.0	A	0.071	--	--	--	--	--
	14.6	B	.033	--	--	--	-180	--
	14.6	B	.035	--	--	--	--	--
	15.2	B	.016	--	--	--	--	--
	15.2	B	.017	--	--	--	--	--
	15.8	B	.030	--	--	--	-140	--
	15.8	B	.028	--	--	--	--	--
	16.5	B	.022	--	--	--	--	--
	16.5	B	.023	--	--	--	--	--
	17.1	B	.028	--	--	--	-290	--
	17.1	B	.029	--	--	--	--	--
	17.7	B	.031	--	--	--	--	--
	17.7	B	.037	--	--	--	--	--
	18.3	B	.024	--	--	--	-400	--
	18.3	B	.022	--	--	--	--	--
	18.9	B	.014	--	--	--	--	--
	18.9	B	.015	--	--	--	--	--
	19.5	B	.019	--	--	--	-300	--
	19.5	B	.017	--	--	--	--	--
UE-25	0.6	A	.024	--	--	--	-4,000	--
UZN #14	.6	A	.041	--	--	--	--	--
	1.2	A	.016	--	--	--	--	--
	1.2	A	.018	--	--	--	--	--
	1.8	A	.024	--	--	--	-3,000	--
	1.8	A	.027	--	--	--	-1,300	--
	2.4	A	.020	--	--	--	--	--
	2.4	A	.020	--	--	--	--	--
	3.0	A	.019	--	--	--	-8,100	--
	3.0	A	.021	--	--	--	-4,100	--
	3.7	A	.020	--	--	--	--	--
	3.7	A	.021	--	--	--	--	--
	4.3	A	.024	--	--	--	-4,100	--
	4.3	A	.024	--	--	--	-2,400	--
	4.9	A	.022	--	--	--	--	--
	4.9	A	.022	--	--	--	--	--
	5.5	A	.030	--	--	--	-2,000	--
	5.5	A	.027	--	--	--	-1,400	--
	6.1	A	.032	--	--	--	--	--
	6.1	A	.031	--	--	--	--	--
	6.7	A	.024	--	--	--	-1,400	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #14--Continued								
	6.7	A	0.025	--	--	--	--	--
	7.3	A	.026	--	--	--	--	--
	7.3	A	.028	--	--	--	--	--
	7.9	A	.029	--	--	--	-670	--
	7.9	A	.031	--	--	--	--	--
	8.5	A	.038	--	--	--	--	--
	8.5	A	.037	--	--	--	--	--
	9.1	A	.036	--	--	--	-450	--
	9.1	A	.037	--	--	--	--	--
	9.8	A	.034	--	--	--	--	--
	9.8	A	.036	--	--	--	--	--
	10.4	A	.034	--	--	--	-470	--
	10.4	A	.033	--	--	--	--	--
	11.0	A	.038	--	--	--	--	--
	11.0	A	.039	--	--	--	--	--
	11.6	A	.040	--	--	--	-430	--
	11.6	A	.039	--	--	--	--	--
	12.2	A	.036	--	--	--	--	--
	12.2	A	.035	--	--	--	--	--
	12.8	A	.038	--	--	--	-500	--
	12.8	A	.039	--	--	--	--	--
	13.4	A	.036	--	--	--	--	--
	13.4	A	.037	--	--	--	--	--
	14.0	B	.042	--	--	--	-760	--
	14.0	B	.035	--	--	--	--	--
	14.6	B	.045	--	--	--	--	--
	14.6	B	.043	--	--	--	--	--
	15.2	B	.039	--	--	--	-910	--
UE-25	0.3	A	--	0.016	--	--	-40,000	--
UZN #19	.8	A	--	--	--	--	-12,000	--
	1.1	A	--	.021	--	--	-6,700	--
	1.4	A	--	.024	--	--	-4,200	--
	1.7	A	--	.025	--	--	-4,300	--
	2.1	A	--	.038	--	--	-850	--
	2.6	A	--	.056	--	--	-750	--
	2.9	A	--	.057	--	--	-760	--
	3.2	A	--	.054	--	--	-730	--
	3.7	A	--	.058	--	--	-680	--
	4.1	A	--	.056	--	--	-740	--
	4.4	A	--	.068	--	--	-520	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access borehc les--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #19--Continued								
	4.7	A	--	0.065	--	--	-500	--
	5.2	A	--	.050	--	--	-630	--
	5.6	A	--	.049	--	--	-740	--
	5.9	A	--	.050	--	--	-720	--
	6.2	A	--	.048	--	--	-530	--
	6.7	A	--	.046	--	--	-730	--
	7.2	B	--	.038	--	--	-2,000	--
	7.5	B	--	.020	--	--	-8,300	--
	7.8	B	--	.029	--	--	-6,000	--
	8.2	B	--	.027	--	--	-4,000	--
	8.7	B	--	.036	--	--	-1,200	--
	9.0	B	--	.038	--	--	-1,200	--
	9.3	B	--	.039	--	--	-990	--
	9.6	B	--	.030	--	--	-2,500	--
	9.9	B	--	.029	--	--	-2,700	--
	10.4	B	--	.029	--	--	-1,600	--
	10.8	B	--	.033	--	--	-1,200	--
	11.1	B	--	.040	--	--	-740	--
	11.4	B	--	.047	--	--	-740	--
	11.7	B	--	.041	--	--	-620	--
	12.0	B	--	.045	--	--	-650	--
UE-25	0.3	A	--	.008	--	--	-17,000	--
UZN #21	.8	A	--	.011	--	--	-11,000	--
	1.1	A	--	.021	--	--	-18,000	--
	1.4	A	--	.011	--	--	-14,000	--
	1.7	A	--	.017	--	--	-18,000	--
	2.1	A	--	.017	--	--	-7,400	--
	2.6	A	--	.029	--	--	-1,700	--
	2.9	A	--	.025	--	--	-2,400	--
	3.2	A	--	.025	--	--	-3,100	--
	3.7	A	--	.030	--	--	-2,500	--
	4.1	A	--	.024	--	--	-5,700	--
	4.4	A	--	.020	--	--	-6,300	--
	4.7	A	--	.014	--	--	-8,800	--
	5.2	A	--	.015	--	--	-11,000	--
	5.6	A	--	.019	--	--	-6,700	--
	5.9	A	--	.017	--	--	-8,500	--
	6.2	A	--	.015	--	--	-9,600	--
	6.7	A	--	.017	--	--	-9,900	--
	7.2	A	--	.017	--	--	-17,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #21--Continued								
	7.5	A	--	0.020	--	--	-11,000	--
	7.8	A	--	.019	--	--	-8,200	--
	8.2	A	--	.023	--	--	-6,500	--
	8.7	B	--	.023	--	--	-5,300	--
	9.0	B	--	.028	--	--	-3,200	--
	9.3	B	--	.029	--	--	-4,600	--
	9.6	B	--	.023	--	--	-5,500	--
	9.9	B	--	.033	--	--	-3,100	--
	10.2	B	--	.033	--	--	-2,500	--
	10.5	B	--	.032	--	--	-2,500	--
	10.8	B	--	.031	--	--	-3,200	--
	11.1	B	--	.030	--	--	-2,800	--
	11.4	B	--	.029	--	--	-3,900	--
	11.7	B	--	.029	--	--	-6,200	--
	12.0	B	--	.028	--	--	-6,400	--
UE-25	0.3	A	--	.056	--	--	-680	--
UZN #22	.8	A	--	.025	--	--	-5,000	--
	1.1	A	--	.016	--	--	-15,000	--
	1.4	A	--	.019	--	--	-6,000	--
	1.7	A	--	.019	--	--	-8,800	--
	2.1	A	--	.017	--	--	-7,800	--
	2.6	A	--	.023	--	--	-5,500	--
	2.9	A	--	.028	--	--	-5,900	--
	3.2	A	--	.027	--	--	-5,400	--
	3.5	A	--	.024	--	--	-5,200	--
	3.8	A	--	.063	--	--	-780	--
	4.1	A	--	.054	--	--	-740	--
	4.4	A	--	.054	--	--	-590	--
	4.7	A	--	.047	--	--	-550	--
	5.0	A	--	.069	--	--	-510	--
	5.3	A	--	.051	--	--	-570	--
	5.6	A	--	.044	--	--	-670	--
	5.9	A	--	.037	--	--	-640	--
	6.2	B	--	.028	--	--	-2,700	--
	6.6	B	--	.035	--	--	-1,700	--
	6.9	B	--	.026	--	--	-4,500	--
	7.2	B	--	.028	--	--	-4,200	--
	7.5	B	--	.027	--	--	-6,800	--
	7.8	B	--	.027	--	--	-6,400	--
	8.1	B	--	.026	--	--	-8,100	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #22--Continued								
	8.4	B	--	0.029	--	--	-7,600	--
	8.7	B	--	.030	--	--	-3,100	--
	9.0	B	--	.029	--	--	-4,000	--
	9.3	B	--	.033	--	--	-2,000	--
	9.6	B	--	.034	--	--	-2,600	--
	9.9	B	--	.037	--	--	-1,100	--
	10.2	B	--	.037	--	--	-830	--
	10.5	B	--	.039	--	--	-790	--
	10.8	B	--	.039	--	--	-780	--
	11.4	B	--	.023	0.012	--	-7,800	--
	12.0	B	--	.024	--	--	-6,200	--
	12.3	B	--	.035	--	--	-840	--
	12.6	B	--	.040	--	--	-660	--
	13.0	B	--	.043	--	--	-540	--
	13.3	B	--	.043	--	--	-560	--
	13.6	B	--	.038	--	--	-640	--
	13.9	B	--	.038	--	--	-1,400	--
	14.2	B	--	.034	--	--	-1,700	--
	14.5	B	--	.032	--	--	-3,500	--
	14.8	B	--	.025	--	--	-6,100	--
	15.1	B	--	.022	--	--	-11,000	--
	15.4	B	--	.024	--	--	-9,400	--
	15.7	B	--	.019	--	--	-11,000	--
	16.0	B	--	.020	--	--	-11,000	--
	16.3	B	--	.019	--	--	-12,000	--
	16.6	B	--	.019	--	--	-13,000	--
	16.9	B	--	.018	--	--	-15,000	--
	17.2	B	--	.019	--	--	-14,000	--
	17.5	B	--	.022	--	--	-7,500	--
	17.8	B	--	.024	--	--	-4,100	--
	18.1	B	--	.022	--	--	-5,100	--
	18.4	B	--	.031	--	--	-3,300	--
	18.7	B	--	.033	--	--	-1,400	--
	19.0	B	--	.028	--	--	-4,100	--
	19.4	B	--	.026	--	--	-5,600	--
	19.7	B	--	.027	--	--	-6,900	--
	20.0	B	--	.025	--	--	-6,100	--
	20.3	B	--	.023	--	--	-8,200	--
	20.6	B	--	.023	--	--	-8,500	--
	20.9	B	--	.022	--	--	-11,000	--
	21.2	B	--	.021	--	--	-16,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #22--Continued								
	21.5	B	--	0.028	--	--	-7,200	--
	21.8	B	--	.028	--	--	-7,000	--
	22.1	B	--	.031	--	--	-7,000	--
	22.4	B	--	.032	--	--	-6,100	--
	22.7	B	--	.052	--	--	-630	--
	23.0	B	--	.038	--	--	-1,500	--
	23.3	B	--	.035	--	--	-1,800	--
	23.6	B	--	.033	--	--	-3,700	--
	23.9	B	--	.032	--	--	-3,500	--
	24.2	B	--	.031	--	--	-3,500	--
	24.5	B	--	.026	--	--	-8,200	--
	24.8	B	--	.024	--	--	-9,400	--
	25.1	B	--	.026	--	--	-5,100	--
	25.5	B	--	.027	--	--	-5,300	--
	25.8	B	--	.028	--	--	-4,300	--
	26.1	B	--	.025	--	--	-6,900	--
	26.4	B	--	.026	--	--	-7,100	--
	26.7	B	--	.024	--	--	-7,700	--
	27.0	B	--	.022	--	--	-12,000	--
	27.3	B	--	.021	--	--	-16,000	--
	27.6	B	--	.021	--	--	-12,000	--
	27.9	B	--	.021	--	--	-11,000	--
	28.2	B	--	.020	--	--	-11,000	--
	28.5	B	--	.020	--	--	-10,000	--
UE-25	3.2	B	--	.025	--	--	-6,100	--
UZN #23	3.5	B	--	.024	--	--	-6,400	--
	4.0	B	--	.020	--	--	-8,300	--
	4.6	B	--	.038	--	--	-1,300	--
	5.0	B	--	.025	--	--	-4,700	--
	5.3	B	--	.031	--	--	-3,500	--
	5.6	B	--	.046	--	--	-640	--
	5.9	B	--	.028	--	--	-5,500	--
	6.2	B	--	.027	--	--	-5,700	--
	6.6	B	--	.029	--	--	-5,000	--
USW	0.6	B	--	--	0.025	--	-14,000	--
UZ-N24	1.4	B	--	--	.029	--	-11,000	--
	1.7	B	--	--	.025	--	-10,000	--
	2.0	B	--	--	.024	--	-9,900	--
	2.3	B	0.021	--	--	--	-15,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access borehc les--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N24--Continued								
	2.6	B	--	--	0.022	--	-8,900	--
	2.9	B	--	--	.021	--	-8,100	--
	3.2	B	--	--	.018	--	-8,500	--
	3.5	B	--	0.029	--	--	-5,900	--
	3.8	B	--	--	.029	--	-8,500	--
	4.1	B	--	.041	--	--	-2,800	--
	4.4	B	--	.046	--	--	-1,700	--
	4.9	B	--	--	.042	--	-1,900	--
	5.3	B	--	.037	--	--	-2,400	--
	5.6	B	--	.034	--	--	-3,000	--
	5.9	B	--	.078	--	--	-680	--
	6.2	B	--	.071	--	--	-890	--
	6.6	B	0.057	--	--	--	-1,100	--
	6.9	B	--	.084	--	--	-840	--
	7.2	B	--	.096	--	--	-720	--
	7.5	B	--	.098	--	--	-650	--
	7.9	B	--	.093	--	--	-630	--
	8.5	B	--	.116	--	--	-2,900	--
	9.0	B	--	.097	--	--	-1,100	--
	9.3	B	--	.230	--	--	-4,700	--
	9.8	B	--	.213	--	--	-670	--
	10.4	B	--	.204	--	--	-940	--
	10.8	B	--	.156	--	--	-950	--
	11.3	B	--	.144	--	--	-890	--
	11.9	B	--	.156	--	--	-1,000	--
	12.5	B	--	.165	--	--	-650	--
	13.0	B	--	.179	--	--	-570	--
	13.3	B	--	.182	--	--	-490	--
	13.6	B	--	.191	--	--	-570	--
	13.9	B	--	.199	--	--	-520	--
	14.2	B	--	.217	--	--	-500	--
	14.5	B	--	.291	--	--	-490	--
	14.8	B	--	.297	--	--	-530	--
	15.1	B	--	.235	--	--	-470	--
	15.4	B	--	.181	--	--	-490	--
	15.7	B	--	.528	--	--	-350	--
	16.0	B	--	.283	--	--	-280	--
	16.3	B	--	.421	--	--	-350	--
	16.6	B	--	--	--	--	--	--
	17.1	B	--	.293	--	--	-760	--
	17.7	B	--	--	.209	--	-710	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N24--Continued								
	18.1	B	--	--	0.201	--	-830	--
	18.7	B	--	--	.191	--	-850	--
	19.5	B	--	--	.168	--	-440	--
	20.1	B	--	--	.150	--	-520	--
	20.7	B	--	--	.210	--	-440	--
	21.2	B	--	--	.306	--	-470	--
	21.6	B	--	0.166	--	--	-470	--
	22.3	B	--	--	.167	--	-530	--
	22.7	B	--	--	.183	--	-550	--
USW	0.3	B	--	.051	--	--	-1,500	--
UZ-N25	.8	B	--	.042	--	--	-2,700	--
	1.1	B	--	.032	--	--	-5,000	--
	1.4	B	--	.033	--	--	-3,800	--
	1.8	B	--	.032	--	--	-3,500	--
	2.3	B	--	.042	--	--	-1,400	--
	2.6	B	--	.045	--	--	-950	--
	2.9	B	--	.047	--	--	-830	--
	3.2	B	--	--	--	--	--	--
	3.5	B	--	.046	--	--	-1,100	--
	3.8	B	--	.047	--	--	-1,000	--
	4.1	B	--	.053	--	--	-940	--
	4.4	B	--	.037	--	--	-790	--
	4.7	B	--	--	--	--	--	--
	5.2	B	--	.031	--	--	-990	--
	5.6	B	--	.026	--	--	-3,300	--
	5.9	B	--	.029	--	--	-3,800	--
	6.2	B	--	.029	--	--	-3,200	--
	6.6	B	--	.035	--	--	-1,500	--
	6.9	B	--	.035	--	--	-1,600	--
	7.2	B	--	.036	--	--	-1,100	--
	7.5	B	--	.035	--	--	-1,300	--
	7.8	B	--	.034	--	--	-1,700	--
	8.1	B	--	.031	--	--	-3,200	--
	8.4	B	--	.043	--	--	-1,200	--
	8.7	B	--	.035	--	--	-2,000	--
	9.0	B	--	.045	--	--	-900	--
	9.3	B	--	.041	--	--	-3,500	--
	9.6	B	--	.065	--	--	-620	--
	9.9	B	--	.060	--	--	-630	--
	10.2	B	--	.060	--	--	-600	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N25--Continued								
	10.5	B	--	0.070	--	--	-620	--
	10.8	B	--	.075	--	--	-610	--
	11.1	B	--	.073	--	--	-640	--
	11.4	B	--	.069	--	--	-440	--
	11.7	B	--	.078	--	--	-400	--
	12.0	B	--	.078	--	--	-530	--
	12.5	B	--	.064	--	--	-570	--
	13.1	B	--	.063	--	--	-600	--
	13.7	B	--	.062	--	--	-410	--
	14.3	B	--	.064	--	--	-600	--
	14.9	B	--	.067	--	--	-580	--
	15.5	B	--	.071	--	--	-650	--
	16.2	B	--	.069	--	--	-640	--
	16.8	B	--	.074	--	--	-630	--
	17.4	B	--	.078	--	--	-680	--
	17.8	B	--	.082	--	--	--	--
USW	0.3	B	--	.051	--	--	-540	--
UZ-N26	.8	B	--	.044	--	--	-350	--
	1.1	B	--	.032	--	--	-2,200	--
	1.4	B	--	.024	--	--	-3,900	--
	1.8	B	--	.015	--	--	-9,000	--
	2.3	B	--	.018	--	--	-8,100	--
	2.6	B	--	.020	--	--	-7,100	--
	2.9	B	--	.024	--	--	-3,600	--
	3.4	B	--	.023	--	--	-5,800	--
	3.8	B	--	.022	--	--	-6,600	--
	4.1	B	--	.016	--	--	-10,000	--
	4.4	B	--	.016	--	--	-13,000	--
	4.7	B	--	.012	--	--	-24,000	--
	5.0	B	--	.010	--	--	-26,000	--
	5.3	B	--	.021	--	--	-9,100	--
	5.6	B	--	.029	--	--	-3,700	--
	5.9	B	--	.032	--	--	-1,600	--
	6.4	B	--	.026	--	--	-2,700	--
	6.9	B	--	.026	--	--	-3,900	--
	7.2	B	--	.030	--	--	-3,400	--
	7.5	B	--	.026	--	--	-3,600	--
	7.8	B	--	.027	--	--	-2,800	--
	8.1	B	--	.020	--	--	-7,400	--
	8.4	B	--	.026	--	--	-3,200	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N26--Continued								
	8.7	B	--	0.024	--	--	-4,700	--
	9.0	B	--	.025	--	--	-6,000	--
	9.3	B	--	.018	--	--	-11,000	--
	9.6	B	--	.021	--	--	-10,000	--
	9.9	B	--	.036	--	--	-3,900	--
	10.2	B	--	.021	--	--	-11,000	--
	10.5	B	--	.016	--	--	-16,000	--
UE-25	0.3	A	--	.043	--	--	-960	--
UZN #28	.8	A	--	.051	--	--	-680	--
	1.1	A	--	.051	--	--	-670	--
	1.4	A	--	.049	--	--	-710	--
	1.7	A	--	.045	--	--	-830	--
	2.1	A	--	.039	--	--	-1,600	--
	2.6	A	--	.031	--	--	-4,300	--
	2.9	A	--	.033	--	--	-3,100	--
	3.2	A	--	.028	--	--	-4,700	--
	3.7	A	--	.029	--	--	-4,800	--
	4.1	A	--	.034	--	--	-3,600	--
	4.4	A	--	.033	--	--	-3,700	--
	4.7	A	--	.030	--	--	-3,800	--
	5.2	A	--	.034	--	--	-2,500	--
	5.6	A	--	.038	--	--	-1,300	--
	5.9	A	--	.036	--	--	-2,400	--
	6.2	A	--	--	--	--	--	--
	6.7	A	--	.035	--	--	-2,200	--
	7.2	A	--	.039	--	--	-1,400	--
	7.5	A	--	.039	--	--	-1,500	--
UE-25	.3	A	--	.040	--	--	-2,300	--
UZN #29	.8	B	--	.033	--	--	-2,100	--
	1.1	B	--	.038	--	--	-1,000	--
	1.4	B	--	.038	--	--	-1,700	--
	1.8	B	--	.034	--	--	-3,800	--
	2.3	B	--	.035	--	--	-4,000	--
	2.6	B	--	.033	--	--	-3,800	--
	2.9	B	--	.037	--	--	-2,200	--
	3.2	B	--	.030	--	--	-7,600	--
	3.7	B	--	.033	--	--	-4,800	--
	4.1	B	--	.035	--	--	-3,100	--
	4.4	B	--	.038	--	--	-1,200	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #29--Continued								
	4.7	B	--	0.038	--	--	-1,300	--
	5.2	B	--	.037	--	--	-2,800	--
	5.6	B	--	.044	--	--	-890	--
	5.9	B	--	.045	--	--	-680	--
	6.2	B	--	.051	--	--	-620	--
	6.6	B	--	.035	--	--	-3,200	--
	7.0	B	--	.042	--	--	-770	--
	7.5	B	--	.043	--	--	-780	--
	7.8	B	--	.042	--	--	-730	--
	8.2	B	--	.038	--	--	-1,000	--
	8.7	B	--	.027	--	--	-4,500	--
	9.0	B	--	.032	--	--	-3,300	--
	9.3	B	--	.033	--	--	-4,000	--
	9.6	B	--	.039	--	--	-1,300	--
	10.1	B	--	.033	--	--	-5,000	--
	10.5	B	--	.037	--	--	-3,200	--
UE-25	0.3	A	--	--	--	--	-6,800	--
UZN #30	.8	B	--	.040	--	--	-1,500	--
	1.1	B	--	.039	--	--	-1,900	--
	1.4	B	--	.040	--	--	-2,500	--
	1.8	B	--	.039	--	--	-1,200	--
	2.3	B	--	.037	--	--	-1,500	--
	2.6	B	--	.039	--	--	-2,100	--
	2.9	B	--	.043	--	--	-1,400	--
	3.2	B	--	--	--	--	--	--
	3.5	B	--	.035	--	--	-2,800	--
	3.8	B	--	.042	--	--	-1,200	--
	4.1	B	--	.050	--	--	-680	--
	4.4	B	--	.050	--	--	-480	--
	4.7	B	--	.048	--	--	-540	--
	5.0	B	--	.049	--	--	-620	--
	5.3	B	--	.045	--	--	-550	--
	5.6	B	--	.042	--	--	-950	--
	5.9	B	--	.048	--	--	-730	--
	6.2	B	--	.051	--	--	-820	--
	6.6	B	--	.048	--	--	-820	--
	6.9	B	--	.045	--	--	-1,100	--
	7.2	B	--	.043	--	--	-1,100	--
	7.5	B	--	.038	--	--	-1,800	--
	7.8	B	--	.042	--	--	-1,400	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #30--Continued								
	8.1	B	--	0.044	--	--	-670	--
	8.4	B	--	.046	--	--	-640	--
	8.7	B	--	.037	--	--	-730	--
	9.0	B	--	.039	--	--	-820	--
	9.3	B	--	.039	--	--	-1,300	--
	9.6	B	--	.035	--	--	-2,400	--
	9.9	B	--	.036	--	--	-1,100	--
	10.2	B	--	.037	--	--	-1,600	--
	10.5	B	--	.037	--	--	-950	--
USW	0.6	A	--	.030	0.047	--	-6,000	--
UZ-N40	1.1	B	--	.038	--	--	-1,200	--
	1.4	B	--	.031	--	--	-2,300	--
	1.7	B	--	.031	--	--	-1,900	--
	2.1	B	--	.023	--	--	-3,500	--
	2.6	B	--	.038	--	--	-940	--
	2.9	B	--	.046	--	--	-760	--
	3.2	B	--	.043	--	--	-900	--
	3.7	B	--	.036	--	--	-1,100	--
	4.1	B	--	.036	--	--	-440	--
	4.4	B	--	.048	.043	--	-540	--
	4.7	B	--	.044	--	--	-700	--
	5.2	B	--	.033	--	--	-720	--
	5.6	B	--	.026	--	--	-2,300	--
	5.9	B	--	.024	--	--	-3,100	--
	6.2	B	--	.024	--	--	-4,000	--
	6.7	B	--	.019	--	--	-4,800	--
	7.2	B	--	.022	--	--	-5,300	--
	7.5	B	--	.029	--	--	-3,100	--
	7.8	B	--	.030	--	--	-2,500	--
	8.1	B	--	.027	--	--	-3,800	--
	8.4	B	--	.023	--	--	-5,800	--
	8.7	B	--	.021	--	--	-6,600	--
	9.0	B	--	.021	--	--	-7,300	--
	9.3	B	--	.020	--	--	-7,600	--
	9.8	B	--	.016	--	--	-9,000	--
	10.2	B	--	.017	--	--	-9,300	--
	10.5	B	--	.017	--	--	-7,300	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.3	A	--	0.069	--	--	-980	--
UZ-N41	.8	A	--	.042	--	--	-1,400	--
	1.1	A	--	.037	--	--	-2,100	--
	1.4	A	--	.025	--	--	-3,400	--
	1.7	A	--	.022	--	--	-8,000	--
	2.1	A	--	.032	--	--	-2,800	--
	2.6	A	--	.037	--	--	-2,600	--
	2.9	A	--	.040	--	--	-1,300	--
	3.2	A	--	.050	--	--	-840	--
	3.7	A	--	.052	--	--	-760	--
	4.1	A	--	.038	--	--	-2,300	--
	4.4	A	--	.038	--	--	-2,700	--
	4.7	A	--	.038	--	--	-2,300	--
	5.2	B	--	.032	--	--	-1,100	--
	5.6	B	--	.022	--	--	-4,500	--
	5.9	B	--	.027	--	--	-3,300	--
	6.2	B	--	.029	--	--	-3,600	--
	6.7	B	--	.021	--	--	-8,400	--
	7.2	B	--	.022	--	--	-5,700	--
	7.5	B	--	.028	--	--	-3,900	--
	7.8	B	--	.026	--	--	-4,200	--
	8.1	B	--	.025	--	--	-4,100	--
	8.4	B	--	.023	--	--	-6,300	--
	8.7	B	--	.022	--	--	-4,800	--
	9.0	B	--	.019	--	--	-8,200	--
	9.3	B	--	.021	--	--	-4,200	--
	9.6	B	--	.018	--	--	-4,600	--
	9.9	B	--	.021	--	--	-4,300	--
	10.2	B	--	.019	--	--	-4,200	--
	10.5	B	--	.015	--	--	-8,900	--
USW	.5	B	--	--	--	--	-36,000	--
UZ-N42	1.1	B	--	.019	--	--	--	--
	1.2	B	--	--	--	--	-14,000	--
	1.4	B	--	--	--	--	--	--
	1.7	B	--	.020	--	--	-13,000	--
	2.0	B	--	--	--	--	-15,000	--
	2.3	B	--	.028	--	--	-6,600	--
	2.6	B	--	.027	--	--	-6,600	--
	2.9	B	--	.025	--	--	-8,500	--
	3.2	B	--	.028	--	--	-7,400	--
	4.1	B	--	.026	--	--	-10,000	--
	5.0	B	--	.024	--	--	-7,500	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N42--Continued								
	5.3	B	--	0.026	--	--	-7,100	--
	5.6	B	--	.028	--	--	-7,500	--
	5.9	B	--	.030	--	--	-2,400	--
	6.2	B	--	.030	--	--	-4,300	--
	6.9	B	--	.017	--	--	-9,700	--
	7.5	B	--	.015	--	--	-13,000	--
	7.8	B	--	.023	--	--	-7,100	--
	8.1	B	--	.026	--	--	-5,200	--
	8.4	B	--	.028	--	--	-4,900	--
	8.7	B	--	.030	--	--	-3,700	--
	9.0	B	--	.034	--	--	-2,700	--
	9.3	B	--	.025	--	--	-5,400	--
	9.6	B	--	.030	--	--	-5,600	--
	9.9	B	--	.024	--	--	-7,200	--
	10.2	B	--	.019	--	--	-8,800	--
	10.5	B	--	.026	--	--	-6,200	--
USW	0.3	A	--	--	0.045	--	--	-7,200
UZ-N43	.9	A	--	--	--	--	--	-20,000
	1.5	A	--	.028	--	--	-3,100	--
	2.1	A	--	.033	--	--	-5,100	--
	2.7	A	--	.029	--	--	-3,700	--
	3.2	A	--	.024	--	--	-7,200	--
	3.7	A	--	.021	--	--	-9,000	--
	4.3	A	--	.025	--	--	-9,600	--
	4.7	A	--	.033	--	--	-7,100	--
	5.2	A	--	.023	--	--	-11,000	--
	5.8	A	--	.025	--	--	-2,900	--
	6.2	A	--	.025	--	--	-3,200	--
	6.7	A	--	.026	--	--	-2,800	--
	7.2	A	--	.025	--	--	-4,300	--
	7.5	A	--	.024	--	--	-5,600	--
	7.8	A	--	.025	--	--	-4,800	--
	8.1	A	--	.027	--	--	-3,600	--
	8.4	B	--	.023	--	--	-6,500	--
	8.7	B	--	.019	--	--	-11,000	--
	9.0	B	--	.024	--	--	-9,100	--
	9.3	B	--	.018	--	--	-11,000	--
	9.8	B	--	.019	--	--	-11,000	--
	10.2	B	--	.019	--	--	-15,000	--
	10.5	B	--	.021	--	--	-14,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW UZ-N43--Continued								
	11.0	B	--	0.017	--	--	-15,000	--
	11.6	B	--	.019	--	--	-14,000	--
	12.0	B	--	.022	--	--	-8,100	--
	12.3	B	--	.026	--	--	-6,200	--
	12.6	B	--	.027	--	--	-4,000	--
	13.0	B	--	.025	--	--	-7,400	--
	13.3	B	--	.026	--	--	-5,600	--
	13.6	B	--	.026	--	--	-6,400	--
USW UZ-N44	0.3	B	--	.049	--	--	-630	--
	.8	B	--	.029	--	--	-1,300	--
	1.1	B	--	--	--	--	-6,600	--
	1.4	B	--	.022	--	--	-5,100	--
	2.3	B	--	.019	--	--	-5,600	--
	3.2	B	--	.024	--	--	-2,500	--
	3.5	B	--	.026	--	--	-2,800	--
	3.8	B	--	.018	--	--	-4,200	--
	4.1	B	--	.009	--	--	-14,000	--
	4.4	B	--	.018	--	--	-6,900	--
	5.0	B	--	.014	--	--	-7,900	--
	5.6	B	--	.020	--	--	-6,800	--
	5.9	B	--	.019	--	--	-8,000	--
	6.2	B	--	.020	--	--	-7,500	--
	6.6	B	--	.019	--	--	-11,000	--
	6.9	B	--	.019	--	--	-9,500	--
	7.2	B	--	.016	--	--	-13,000	--
	7.5	B	--	.015	--	--	-11,000	--
	7.8	B	--	.016	--	--	-9,500	--
	8.1	B	--	--	--	--	--	--
	8.4	B	--	.018	--	--	-10,000	--
	8.7	B	--	.025	--	--	-6,500	--
	9.0	B	--	.027	--	--	-5,100	--
	9.3	B	--	.021	--	--	-10,000	--
	9.6	B	--	.023	--	--	-6,000	--
	9.9	B	--	.019	--	--	-11,000	--
	10.2	B	--	.019	--	--	-12,000	--
	10.5	B	--	.023	--	--	-9,200	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.3	A	--	0.048	--	--	-870	--
UZ-N45	.8	A	--	.041	--	--	-1,400	--
	1.1	A	--	.018	--	--	-8,700	--
	1.4	A	--	.024	--	--	-65,000	--
	1.7	A	--	.026	--	--	-78,000	--
	2.1	A	--	.022	--	--	-6,200	--
	2.6	A	--	.025	--	--	-3,600	--
	2.9	A	--	.054	--	--	-730	--
	3.2	A	--	.065	--	--	-800	--
	3.7	A	--	.069	--	--	-1,000	--
	4.1	A	--	.065	--	--	-830	--
	4.4	A	--	.069	--	--	-890	--
	4.7	A	--	.068	--	--	-900	--
	5.2	A	--	.067	--	--	-850	--
	5.6	A	--	.063	--	--	-620	--
	5.9	A	--	.054	--	--	-620	--
	6.2	A	--	.050	--	--	-690	--
	6.7	A	--	.057	--	--	-590	--
	7.2	A	--	.056	--	--	-580	--
	7.5	A	--	.058	--	--	-500	--
	7.9	A	--	.069	--	--	-520	--
	8.4	A	--	.061	--	--	-470	--
	8.7	A	--	.059	--	--	-660	--
	9.0	A	--	.057	--	--	-700	--
	9.4	A	--	.060	--	--	-610	--
	9.9	A	--	.058	--	--	-580	--
	10.2	A	--	.058	--	--	-610	--
	10.5	A	--	.061	--	--	-540	--
	11.0	B	--	.024	--	--	-15,000	--
	11.7	B	--	.023	--	--	-11,000	--
	12.6	B	--	.022	--	--	-14,000	--
	13.4	B	--	.024	--	--	-12,000	--
USW	.3	B	--	.142	--	--	-750	--
UZ-N46	.8	B	--	.154	--	--	-700	--
	1.1	B	--	.178	--	--	-670	--
	1.4	B	--	.146	--	--	-610	--
	1.8	B	--	.099	--	--	-630	--
	2.3	B	--	.082	--	--	-640	--
	2.6	B	--	.092	--	--	-720	--
	2.9	B	--	.092	--	--	-610	--
	3.4	B	--	.048	--	--	-850	--
	3.8	B	--	--	--	--	--	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N46--Continued								
	4.1	B	--	--	--	--	--	--
	4.4	B	--	0.040	--	--	-940	--
	4.9	B	--	.047	--	--	-850	--
	5.3	B	--	.051	--	--	-510	--
	5.6	B	--	.035	--	--	-820	--
	5.9	B	--	.038	--	--	-600	--
	6.4	B	--	.043	--	--	-640	--
	6.9	B	--	.046	--	--	-690	--
	7.2	B	--	.041	--	--	-530	--
	7.5	B	--	.040	--	--	-770	--
	7.9	B	--	.040	--	--	-720	--
	8.4	B	--	.046	--	--	-600	--
	8.7	B	--	.044	--	--	-610	--
	9.0	B	--	.044	--	--	-660	--
	9.4	B	--	.082	--	--	-580	--
	9.9	B	--	.084	--	--	-450	--
	10.2	B	--	.084	--	--	-420	--
	10.5	B	--	.076	--	--	-470	--
	11.0	B	--	.065	--	--	-410	--
	11.4	B	--	.061	--	--	-440	--
	11.7	B	--	.067	--	--	-610	--
	12.0	B	--	.073	--	--	-610	--
	12.5	B	--	.068	--	--	-530	--
	13.0	B	--	.068	--	--	-560	--
	13.3	B	--	.067	--	--	-590	--
	13.6	B	--	.057	--	--	-750	--
	14.0	B	--	.042	--	--	-860	--
	14.5	B	--	.045	--	--	-730	--
	14.8	B	--	.043	--	--	-650	--
	15.1	B	--	.046	--	--	-650	--
	15.5	B	--	.047	--	--	-840	--
	16.0	B	--	.047	--	--	-790	--
	16.3	B	--	.042	--	--	-1,600	--
	16.6	B	--	.038	--	--	-950	--
	16.9	B	--	.042	--	--	-950	--
	17.2	B	--	.039	--	--	-1,800	--
	17.5	B	--	.035	--	--	-2,400	--
	17.8	B	--	.033	--	--	-2,700	--
	18.1	B	--	.039	--	--	-1,800	--
	18.4	B	--	.040	--	--	-960	--
	18.7	B	--	.039	--	--	-1,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N46--Continued								
	19.0	B	--	0.039	--	--	-910	--
	19.4	B	--	.042	--	--	-900	--
	19.7	B	--	.044	--	--	-1,300	--
	20.0	B	--	.040	--	--	-1,800	--
	20.3	B	--	.045	--	--	-1,000	--
	20.6	B	--	.048	--	--	-1,200	--
	20.9	B	--	.049	--	--	-1,300	--
	21.2	B	--	.047	--	--	-2,100	--
	21.5	B	--	.052	--	--	-1,900	--
	21.8	B	--	.055	--	--	-2,600	--
	22.1	B	--	.065	--	--	-2,100	--
	22.4	B	--	.067	--	--	-1,700	--
	22.7	B	--	.066	--	--	-2,000	--
	23.0	B	--	.097	--	--	-1,200	--
	23.3	B	--	.258	--	--	-670	--
	23.6	B	--	.243	--	--	-2,800	--
	23.9	B	--	.216	--	--	-1,000	--
	24.2	B	--	.172	--	--	-1,000	--
	24.5	B	--	.213	--	--	-720	--
	24.8	B	--	.231	--	--	-650	--
	25.1	B	--	.274	--	--	-490	--
	25.5	B	--	.290	--	--	-470	--
	25.9	B	--	.259	--	--	-530	--
	26.5	B	--	.191	--	--	-600	--
	27.1	B	--	.132	--	--	-460	--
	27.7	B	--	.185	--	--	-520	--
	28.3	B	--	.131	--	--	-420	--
	29.0	B	--	.170	--	--	-510	--
	29.6	B	--	.164	--	--	-490	--
	30.0	B	--	.160	--	--	-470	--
USW	0.3	A	--	.060	--	--	-660	--
UZ-N47	.8	A	--	.061	--	--	-580	--
	1.1	A	--	.064	--	--	-650	--
	1.4	A	--	.054	--	--	-860	--
	1.8	A	--	.065	--	--	-640	--
	2.3	A	--	.068	--	--	-670	--
	2.6	A	--	.068	--	--	-680	--
	2.9	A	--	.063	--	--	-730	--
	3.4	A	--	.066	--	--	-560	--
	3.8	A	--	.064	--	--	-560	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access borehcles--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N47--Continued								
	4.1	A	--	.056	--	--	-670	--
	4.4	A	--	0.054	--	--	-1,200	--
	4.9	A	--	.025	--	--	-4,700	--
	5.3	A	--	.020	--	--	-9,300	--
	5.6	A	--	.019	--	--	-8,200	--
	5.9	A	--	.022	--	--	-5,500	--
	6.4	A	--	.018	--	--	-10,000	--
	6.9	A	--	.020	--	--	-9,400	--
	7.2	A	--	.019	--	--	-15,000	--
	7.5	A	--	.018	--	--	-12,000	--
	7.9	A	--	.024	--	--	-11,000	--
	8.4	A	--	.033	--	--	-2,200	--
	8.7	A	--	.034	--	--	-2,600	--
	9.0	A	--	.031	--	--	-4,000	--
	9.4	A	--	.034	--	--	-3,200	--
	9.9	A	--	.035	--	--	-4,500	--
	10.2	B	--	.028	--	--	-7,500	--
	10.5	B	--	.023	--	--	-5,900	--
	11.0	B	--	.034	--	--	-820	--
	11.4	B	--	.034	--	--	-960	--
	11.7	B	--	.050	--	--	-610	--
	12.0	B	--	.039	--	--	-730	--
	12.0	B	--	--	--	--	-770	--
	12.5	B	--	.060	--	--	-700	--
	13.0	B	--	.052	--	--	-710	--
	13.3	B	--	.048	--	--	-720	--
	13.6	B	--	.052	--	--	-690	--
	14.0	B	--	.061	--	--	-660	--
	14.5	B	--	.054	--	--	-790	--
	14.8	B	--	.057	--	--	-660	--
	15.1	B	--	.068	--	--	-560	--
	15.5	B	--	.061	--	--	-600	--
	16.0	B	--	.057	--	--	-660	--
	16.3	B	--	.055	--	--	-880	--
	16.6	B	--	.051	--	--	-950	--
	17.1	B	--	.047	--	--	-910	--
	17.5	B	--	.039	--	--	-1,200	--
	17.8	B	--	.036	--	--	-2,100	--
	18.1	B	--	.046	--	--	-940	--
	18.6	B	--	.048	--	--	-1,300	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N47--Continued								
	19.0	B	--	0.045	--	--	-2,100	--
	19.4	B	--	.051	--	--	-1,800	--
	19.7	B	--	.057	--	--	-1,300	--
	20.0	B	--	.065	--	--	-910	--
	20.3	B	--	.071	--	--	-980	--
	20.6	B	--	.082	--	--	-900	--
	20.9	B	--	.116	--	--	-790	--
	21.2	B	0.152	.180	--	--	-3,400	--
	21.6	B	--	.230	--	--	-780	--
	22.3	B	--	.215	--	--	-720	--
	22.9	B	--	.249	--	--	-640	--
	23.5	B	--	.247	--	--	-560	--
	24.1	B	--	.228	--	--	-660	--
	24.7	B	--	.175	--	--	-640	--
	23.5	B	--	.247	--	--	-560	--
	24.1	B	--	.228	--	--	-660	--
	24.7	B	--	.175	--	--	-640	--
	25.3	B	--	.163	--	--	-740	--
	25.8	B	--	.168	--	--	-1,300	--
USW	0.5	B	--	.018	--	--	-33,000	--
UZ-N48	1.1	B	--	.016	--	--	-60,000	--
	1.4	B	--	.013	--	--	-36,000	--
	1.7	B	--	.011	--	--	-56,000	--
	2.0	B	--	.030	--	--	-8,900	--
	2.3	B	--	.026	--	--	-9,500	--
	2.6	B	--	.026	--	--	-8,300	--
	2.9	B	--	.025	--	--	-13,000	--
	3.2	B	--	.024	--	--	-13,000	--
	3.5	B	--	.025	--	--	-9,800	--
	3.8	B	--	.024	--	--	-15,000	--
	4.1	B	--	.025	--	--	-13,000	--
	4.4	B	--	.025	--	--	-9,900	--
	4.7	B	--	.020	--	--	-13,000	--
	5.0	B	--	.023	--	--	-10,000	--
	5.3	B	--	.022	--	--	-11,000	--
	5.6	B	--	.028	--	--	-9,600	--
	5.9	B	--	.025	--	--	-10,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N48--Continued								
	6.2	B	--	0.022	--	--	-12,000	--
	6.6	B	--	.020	--	--	-17,000	--
	6.9	B	--	.018	--	--	-22,000	--
	7.2	B	--	.019	--	--	-15,000	--
	7.5	B	--	.016	--	--	-27,000	--
	7.8	B	--	.020	--	--	-12,000	--
	8.1	B	--	.022	--	--	-9,900	--
	8.4	B	--	.025	--	--	-9,000	--
	8.7	B	--	.019	--	--	-10,000	--
	9.0	B	--	.020	--	--	-13,000	--
	9.3	B	--	.019	--	--	-17,000	--
	9.6	B	--	.016	--	--	-24,000	--
	9.9	B	--	.018	--	--	-14,000	--
	10.2	B	--	.015	--	--	-15,000	--
	10.5	B	--	.018	--	--	-24,000	--
USW	0.3	A	--	--	--	--	--	--
UZ-N49	.8	B	--	.030	--	--	-8,200	--
	1.1	B	--	.039	--	--	-4,900	--
	1.4	B	--	.028	--	--	-8,500	--
	1.7	B	--	.032	--	--	-7,300	--
	2.0	B	--	.032	--	--	-6,400	--
	2.3	B	--	.023	--	--	-9,400	--
	2.6	B	--	.024	--	--	-11,000	--
	2.9	B	--	.024	--	--	-13,000	--
	3.2	B	--	.024	--	--	-15,000	--
	3.5	B	--	.023	--	--	-18,000	--
	3.5	B	--	--	--	--	-21,000	--
	3.8	B	--	.020	--	--	-27,000	--
	3.8	B	--	.020	--	--	-31,000	--
	4.1	B	--	.023	--	--	-14,000	--
	4.1	B	--	.023	--	--	-16,000	--
	4.4	B	--	.029	--	--	-8,700	--
	4.7	B	--	.029	--	--	-7,600	--
	5.0	B	--	.028	--	--	-8,900	--
	5.3	B	--	.026	--	--	-13,000	--
	5.6	B	--	.026	--	--	-11,000	--
	5.9	B	--	.025	--	--	-13,000	--
	6.2	B	--	.029	--	--	-9,000	--
	6.6	B	--	.024	--	--	-9,800	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N49--Continued								
	6.9	B	--	0.027	--	--	-9,100	--
	7.2	B	--	.030	--	--	-6,100	--
	7.5	B	--	.033	--	--	-4,000	--
	7.8	B	--	.032	--	--	-5,300	--
	8.1	B	--	.030	--	--	-8,800	--
	8.4	B	--	--	--	--	--	--
	8.7	B	--	.026	--	--	-12,000	--
	9.0	B	--	.027	--	--	-8,500	--
	9.0	B	--	--	--	--	-9,000	--
	9.3	B	--	.030	--	--	-4,100	--
	9.6	B	--	.033	--	--	-4,000	--
	9.9	B	--	.035	--	--	-1,900	--
	10.2	B	--	.036	--	--	-1,700	--
	10.5	B	--	.036	--	--	-2,300	--
USW	0.6	A	0.107	.098	.144	--	--	--
UZ-N50	.6	A	.112	.105	--	--	--	--
	1.2	A	.082	.070	.095	--	--	--
	1.2	A	.085	.077	--	--	--	--
	1.8	A	.082	.068	.096	--	--	--
	1.8	A	.080	.072	--	--	--	--
	2.4	A	.091	.074	.119	--	--	--
	2.4	A	.086	.084	--	--	--	--
	3.0	B	.042	.037	.045	--	--	--
	3.0	B	.044	.036	--	--	--	--
	3.7	B	.033	.033	.030	--	--	--
	3.7	B	.032	.032	--	--	--	--
	4.3	B	.020	.023	.016	--	--	--
	4.3	B	.020	.022	--	--	--	--
	4.9	B	.020	.022	.016	--	--	--
	4.9	B	.019	.021	--	--	--	--
	5.5	B	.021	.025	.015	--	--	--
	5.5	B	.021	.024	--	--	--	--
	6.1	B	.023	.026	.020	--	--	--
	6.1	B	.024	.027	--	--	--	--
USW	.6	A	.055	--	.047	--	--	--
UZ-N51	.6	A	.060	--	--	--	--	--
	1.2	A	.068	.064	.061	--	--	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N51--Continued								
	1.2	A	0.068	0.066	--	--	--	--
	1.8	A	.074	.070	0.077	--	--	--
	1.8	A	.076	.075	--	--	--	--
	2.4	A	.080	.074	.092	--	--	--
	2.4	A	.078	.077	--	--	--	--
	3.0	A	.084	.077	.096	--	--	--
	3.0	A	.083	.080	--	--	--	--
	3.7	A	.086	.084	.114	--	--	--
	3.7	A	.087	.079	--	--	--	--
	4.3	B	.060	.051	.073	--	--	--
	4.3	B	.059	.049	--	--	--	--
	4.9	B	.035	.041	.035	--	--	--
	4.9	B	.036	.034	--	--	--	--
	5.5	B	.022	.023	.022	--	--	--
	5.5	B	.023	.023	--	--	--	--
	6.1	B	.023	.024	.021	--	--	--
	6.1	B	.025	.023	--	--	--	--
USW	0.6	A	.059	--	.077	--	--	--
UZ-N52	.6	A	.063	--	--	--	--	--
	1.2	A	.065	.058	.074	--	--	--
	1.2	A	.065	.063	--	--	--	--
	1.8	A	.069	.067	.070	--	--	--
	1.8	A	.068	.065	--	--	--	--
	2.4	B	.024	.027	.132	--	--	--
	2.4	B	.024	--	--	--	--	--
	3.0	B	.024	.026	.023	--	--	--
	3.0	B	.024	.030	--	--	--	--
	3.7	B	.024	.024	.021	--	--	--
	3.7	B	.024	.031	--	--	--	--
	4.3	B	.021	.023	.019	--	--	--
	4.3	B	.027	.022	--	--	--	--
	4.9	B	.017	.020	.014	--	--	--
	4.9	B	.017	.019	--	--	--	--
	5.5	B	.015	.019	.013	--	--	--
	5.5	B	.017	.018	--	--	--	--
	6.1	B	.017	.019	.013	--	--	--
	6.1	B	.017	.017	--	--	--	--
	6.7	B	.016	.017	.012	--	--	--
	6.7	B	.016	.018	--	--	--	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N52--Continued								
	7.3	B	0.018	0.017	0.012	--	--	--
	7.3	B	.017	.018	--	--	--	--
UE-25	0.6	A	.056	.059	.055	--	-590	--
UZN #56	.6	A	.059	--	--	--	--	--
	1.2	A	.043	.041	.049	--	-520	--
	1.2	A	.043	.041	--	--	--	--
	1.8	A	.044	.042	.050	--	-1,500	--
	1.8	A	.044	.041	--	--	--	--
	2.4	A	.048	.046	.050	--	-570	--
	2.4	A	.048	.049	--	--	--	--
	3.0	A	.054	.051	.057	--	-790	--
	3.0	A	.055	.051	--	--	--	--
	3.7	A	.059	.053	.071	--	<-50	--
	3.7	A	.060	.055	--	--	--	--
	4.3	A	.070	.068	.083	--	-570	--
	4.3	A	.071	.071	--	--	--	--
	4.9	A	.066	.063	.066	--	-590	--
	4.9	A	.067	.068	--	--	--	--
	5.5	A	.065	.062	.077	--	-740	--
	5.5	A	.066	.064	--	--	--	--
	6.1	A	.067	.062	.083	--	-330	--
	6.1	A	.068	.064	--	--	--	--
	6.7	A	.054	.050	.064	--	-350	--
	6.7	A	.055	.051	--	--	--	--
	7.3	A	.052	.051	.071	--	-320	--
	7.3	A	.053	.051	--	--	--	--
	7.9	A	.050	.047	.068	--	-8,800	--
	7.9	A	.051	.048	--	--	--	--
	8.5	A	.039	.039	.051	--	-760	--
	8.5	A	.042	.040	--	--	--	--
	9.1	A	.053	.052	.058	--	-300	--
	9.1	A	.053	.049	--	--	--	--
	9.8	A	.053	.053	.047	--	-570	--
	9.8	A	.049	--	.048	--	--	--
	10.4	A	.047	.046	.046	--	-900	--
	10.4	A	.046	.045	--	--	--	--
	11.0	A	.046	.046	.047	--	-250	--
	11.0	A	.046	.047	--	--	-530	--
	11.6	A	.052	.049	.054	--	-14,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #56--Continued								
	11.6	A	0.052	0.053	--	--	--	--
	12.2	A	.060	.054	.071	--	-360	--
	12.2	A	.060	.055	--	--	--	--
	12.8	A	.068	.060	.081	--	-540	--
	12.8	A	.065	.064	--	--	--	--
	13.4	A	.071	.062	.094	--	-240	--
	13.4	A	.070	.064	--	--	--	--
	14.0	A	.061	.055	.079	--	-290	--
	14.0	A	.061	.055	--	--	--	--
	14.6	A	.053	.051	.059	--	-310	--
	14.6	A	.050	.050	--	--	--	--
	15.2	A	.052	.049	.072	--	-270	--
	15.2	A	.051	.051	--	--	--	--
	15.8	A	.056	.046	.036	--	-240	--
	15.8	A	.059	--	.059	--	--	--
	16.5	A	.064	.037	.071	--	-330	--
	16.5	A	.052	--	.075	--	--	--
	17.1	B	.045	.040	.061	--	-300	--
	17.1	B	.038	.037	--	--	--	--
	17.7	B	.036	.037	.037	--	-610	--
	17.7	B	.035	.038	--	--	--	--
	18.3	B	.021	.023	.020	--	-2,300	--
	18.3	B	.021	.023	.021	--	--	--
UE-25	1.2	A	.053	.052	.074	--	-160	--
UZN #60	1.2	A	.054	.049	--	--	--	--
	1.8	A	.059	.055	.077	--	-120	--
	1.8	A	.062	.056	--	--	--	--
	2.4	A	.068	.060	.089	--	-280	--
	2.4	A	.070	.066	--	--	--	--
	3.0	A	.064	.068	.056	--	-200	--
	3.0	A	.063	--	--	--	--	--
	3.7	A	.070	.067	.080	--	-160	--
	3.7	A	.070	.069	--	--	--	--
	4.3	A	.069	.062	.083	--	-420	--
	4.3	A	.072	.065	--	--	--	--
	4.9	A	.059	.054	.065	--	-120	--
	4.9	A	.059	.056	--	--	--	--
	5.5	A	.066	.058	.088	--	-280	--
	5.5	A	.069	.058	--	--	--	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #60--Continued								
	6.1	A	0.069	0.064	0.086	--	-180	--
	6.1	A	.071	.060	--	--	--	--
	6.7	A	.080	.067	.094	--	-110	--
	6.7	A	.077	--	--	--	--	--
	7.3	A	.073	.067	.089	--	-100	--
	7.3	A	.073	.068	--	--	--	--
	7.9	A	.045	.042	.054	--	-420	--
	7.9	A	.045	.043	--	--	--	--
	8.5	B	.035	.038	.034	--	-420	--
	8.5	B	.036	.037	--	--	--	--
	9.1	B	.031	.031	.024	--	-2,700	--
	9.1	B	.032	.030	--	--	--	--
	9.8	B	.033	.034	--	--	-1,800	--
	9.8	B	.034	--	--	--	--	--
	10.4	B	.032	.033	.030	--	-600	--
	10.4	B	.033	.033	--	--	--	--
USW	0.9	B	--	.028	--	--	-420	--
UZ-N65	1.5	B	--	.037	--	--	-510	--
	2.1	B	--	.022	--	--	-760	--
	2.7	B	--	.021	--	--	-830	--
	3.4	B	--	.024	--	--	-1,100	--
	4.0	B	--	.025	--	--	-840	--
	4.6	B	--	.023	--	--	-890	--
	5.2	B	--	.032	--	--	-520	--
	5.8	B	--	.032	--	--	-560	--
	6.4	B	--	.031	--	--	-650	--
	7.0	B	--	.034	--	--	-670	--
	7.6	B	--	.038	--	--	-610	--
	8.2	B	--	.045	--	--	-330	--
	8.8	B	--	.039	--	--	-490	--
	9.4	B	--	.039	--	--	-620	--
	10.1	B	--	.045	--	--	-560	--
	10.7	B	--	.041	--	--	-560	--
	11.3	B	--	.038	--	--	-530	--
	11.9	B	--	.039	--	--	-700	--
	12.5	B	--	.044	--	--	-600	--
	13.1	B	--	.037	--	--	-720	--
	13.7	B	--	.034	--	--	-920	--
	14.3	B	--	.043	--	--	-570	--
	14.9	B	--	.043	--	--	-560	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.9	B	--	0.038	--	--	-2,900	--
UZ-N66	1.5	B	--	.032	--	--	-3,300	--
	2.1	B	--	.035	--	--	-4,000	--
	2.7	B	--	.034	--	--	-1,400	--
	3.4	B	--	.028	--	--	-4,300	--
	4.0	B	--	.029	--	--	-3,700	--
	4.5	B	--	.029	--	--	-1,900	--
	5.2	B	--	.030	--	--	-2,000	--
	5.8	B	--	.032	--	--	-1,700	--
	6.4	B	--	.032	--	--	-2,200	--
	7.0	B	--	.042	--	--	-380	--
	7.6	B	--	.033	--	--	-720	--
	8.2	B	--	.042	--	--	-580	--
	8.8	B	--	--	--	--	--	--
	9.4	B	--	.037	--	--	-650	--
	10.1	B	--	.041	--	--	-550	--
	10.7	B	--	.040	--	--	-540	--
	11.3	B	--	.041	--	--	-550	--
	11.9	B	--	.041	--	--	-450	--
	12.5	B	--	.044	--	--	-430	--
	13.1	B	--	.045	--	--	-370	--
	13.7	B	--	.045	--	--	-490	--
	14.3	B	--	.039	--	--	-550	--
	14.9	B	--	.041	--	--	-500	--
USW	.6	A	0.044	--	--	--	-180	--
UZ-N67	.6	A	.041	--	--	--	--	--
	1.2	A	.043	--	--	--	-110	--
	1.2	A	.044	--	--	--	--	--
	1.8	A	.042	--	--	--	-170	--
	1.8	A	.045	--	--	--	--	--
	2.4	A	.026	--	--	--	-1,400	--
	2.4	A	.027	--	--	--	--	--
	3.0	A	.029	--	--	--	-190	--
	3.0	A	.030	--	--	--	--	--
	3.7	A	.036	--	--	--	-160	--
	3.7	A	.038	--	--	--	--	--
	4.3	A	.038	--	--	--	-350	--
	4.3	A	.039	--	--	--	--	--
	4.9	A	.040	--	--	--	-310	--
	4.9	A	.041	--	--	--	--	--
	5.5	A	.053	--	--	--	-400	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N67--Continued								
	5.5	A	0.054	--	--	--	--	--
	6.1	B	.028	--	--	--	-510	--
	6.1	B	.030	--	--	--	--	--
	6.7	B	.014	--	--	--	-630	--
	6.7	B	.015	--	--	--	--	--
	7.3	B	.016	--	--	--	-750	--
	7.3	B	.016	--	--	--	--	--
USW	0.6	A	.046	--	--	--	-390	--
UZ-N68	.6	A	.045	--	--	--	--	--
	1.2	A	.059	--	--	--	--	--
	1.2	A	.059	--	--	--	--	--
	1.8	A	.085	--	--	--	-200	--
	1.8	A	.084	--	--	--	--	--
	2.4	A	.069	--	--	--	--	--
	2.4	A	.068	--	--	--	--	--
	3.0	A	.061	--	--	--	-110	--
	3.0	A	.059	--	--	--	--	--
	3.7	A	.061	--	--	--	--	--
	3.7	A	.058	--	--	--	--	--
	4.3	A	.056	--	--	--	-95	--
	4.9	A	.047	--	--	--	--	--
	4.9	A	.047	--	--	--	--	--
	5.5	A	.051	--	--	--	-57	--
	5.5	A	.053	--	--	--	--	--
	6.1	A	.048	--	--	--	--	--
	6.1	A	.051	--	--	--	--	--
	6.7	A	.056	--	--	--	-190	-720
	6.7	A	.051	--	--	--	--	--
	7.3	A	.050	--	--	--	--	--
	7.3	A	.050	--	--	--	--	--
	7.9	A	.051	--	--	--	-450	--
	7.9	A	.053	--	--	--	--	--
	8.5	A	.045	--	--	--	--	--
	8.5	A	.048	--	--	--	--	--
	9.1	A	.057	--	--	--	-370	--
	9.1	A	.053	--	--	--	--	--
	9.8	A	.049	--	--	--	--	--
	9.8	A	.051	--	--	--	--	--
	10.4	A	.039	--	--	--	-330	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N68--Continued								
	10.4	A	0.038	--	--	--	--	--
	11.0	A	.040	--	--	--	--	--
	11.0	A	.039	--	--	--	--	--
	11.6	A	.045	--	--	--	-140	--
	11.6	A	.043	--	--	--	--	--
	12.2	A	.046	--	--	--	--	--
	12.2	A	.048	--	--	--	--	--
	12.8	A	.042	--	--	--	-440	--
	12.8	A	.047	--	--	--	--	--
	13.4	A	.038	--	--	--	--	--
	13.4	A	.045	--	--	--	--	--
	14.0	A	.039	--	--	--	-140	--
	14.0	A	.039	--	--	--	--	--
	14.6	A	.077	--	--	--	--	--
	14.6	A	.084	--	--	--	--	--
	15.2	A	.081	--	--	--	-350	--
	15.2	A	.085	--	--	--	--	--
	15.8	B	.105	--	--	--	--	--
	15.8	B	.121	--	--	--	--	--
	16.5	B	.125	--	--	--	-240	--
	16.5	B	.121	--	--	--	--	--
USW	0.6	A	.059	--	--	--	-300	--
UZ-N69	.6	A	.058	--	--	--	--	--
	1.2	A	.062	--	--	--	--	--
	1.2	A	.061	--	--	--	--	--
	1.8	A	.065	--	--	--	-390	--
	1.8	A	.064	--	--	--	--	--
	2.4	A	.056	--	--	--	--	--
	2.4	A	.058	--	--	--	--	--
	3.0	A	.044	--	--	--	-710	--
	3.0	A	.042	--	--	--	--	--
	3.7	A	.045	--	--	--	--	--
	3.7	A	.045	--	--	--	--	--
	4.3	A	.047	--	--	--	-340	--
	4.3	A	.046	--	--	--	--	--
	4.9	A	.044	--	--	--	--	--
	4.9	A	.044	--	--	--	--	--
	5.5	A	.043	--	--	--	-340	--
	5.5	A	.042	--	--	--	--	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N69--Continued								
	6.1	A	0.038	--	--	--	--	--
	6.1	A	.037	--	--	--	--	--
	6.7	A	.039	--	--	--	-450	--
	6.7	A	.039	--	--	--	--	--
	7.3	A	.045	--	--	--	--	--
	7.3	A	.044	--	--	--	--	--
	7.9	A	.040	--	--	--	-59	--
	7.9	A	.044	--	--	--	--	--
	8.5	B	.046	--	--	--	--	--
	8.5	B	.043	--	--	--	--	--
	9.1	B	.024	--	--	--	-720	--
	9.1	B	.026	--	--	--	--	--
	9.8	B	.021	--	--	--	--	--
	9.8	B	.023	--	--	--	--	--
USW	0.5	B	--	0.021	--	--	-6,600	--
UZ-N70	.8	B	--	.025	--	--	-1,200	--
	1.1	B	--	.034	--	--	-1,400	--
	1.4	B	--	.034	--	--	-760	--
	1.7	B	--	.074	--	--	-480	--
	2.0	B	--	.062	--	--	-370	--
	2.3	B	--	.029	--	--	-630	--
	2.6	B	--	.050	--	--	-550	--
	2.9	B	--	.038	--	--	-680	--
	3.2	B	--	.057	--	--	-590	--
	3.5	B	--	.056	--	--	-510	--
	3.8	B	--	.036	--	--	-650	--
	4.1	B	--	.043	--	--	-640	--
	4.4	B	--	.044	--	--	-830	--
	4.7	B	--	.053	--	--	-710	--
	5.0	B	--	.051	--	--	-660	--
	5.5	B	--	.030	--	--	-980	--
	5.9	B	--	.034	--	--	-890	--
	6.2	B	--	.036	--	--	-610	--
	6.6	B	--	.039	--	--	-970	--
	7.0	B	--	.027	--	--	-1,300	--
	7.5	B	--	.035	--	--	-880	--
	7.8	B	--	.039	--	--	-660	--
	8.1	B	--	.037	--	--	-740	--
	8.5	B	--	.024	--	--	-4,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW UZ-N70--Continued								
	9.0	B	--	0.037	--	--	-720	--
	9.3	B	--	.031	--	--	-790	--
	9.6	B	--	.027	--	--	-1,900	--
	10.1	B	--	.034	--	--	-910	--
	10.5	B	--	.044	--	--	-570	--
USW UZ-N72	0.9	B	--	.030	--	--	-760	--
	1.5	B	--	.035	--	--	-620	--
	2.1	B	--	.033	--	--	-530	--
	2.7	B	--	.031	--	--	-570	--
	3.4	B	--	.025	--	--	-680	--
	4.0	B	--	.030	--	--	-500	--
	4.6	B	--	.037	--	--	-340	--
	5.2	B	--	.036	--	--	-500	--
	5.8	B	--	.037	--	--	-550	--
	6.4	B	--	.042	--	--	-450	--
	7.0	B	--	.031	--	--	-640	--
	7.6	B	--	.036	--	--	-500	--
	8.2	B	--	.041	--	--	-440	--
	8.8	B	--	.045	--	--	-380	--
USW UZ-N73	.3	B	--	.024	--	--	-2,000	--
	.9	B	--	.022	--	--	-1,500	--
	1.5	B	--	.026	--	--	-1,100	--
	2.1	B	--	.019	--	--	-3,400	--
	2.7	B	--	.018	--	--	-2,200	--
	3.4	B	--	.024	--	--	-1,200	--
	4.0	B	--	.035	--	--	-830	--
	4.6	B	--	.036	--	--	-380	--
	5.2	B	--	.044	--	--	-390	--
	5.8	B	--	.041	--	--	-450	--
	6.4	B	--	.045	--	--	-490	--
	7.0	B	--	.065	--	--	-460	--
	7.6	B	--	.055	--	--	-440	--
	8.2	B	--	.062	--	--	-400	--
	8.8	B	--	.054	--	--	-410	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.3	B	--	0.313	--	--	-700	--
UZ-N74	.8	B	--	.064	--	--	-630	--
	1.1	B	--	.064	--	--	-670	--
	1.4	B	--	.050	--	--	-670	--
	1.8	B	--	.038	--	--	-770	--
	2.3	B	--	.031	--	--	-650	--
	2.6	B	--	.026	--	--	-960	--
	2.9	B	--	.026	--	--	-950	--
	3.4	B	--	.018	--	--	-6,600	--
	3.8	B	--	.010	--	--	-27,000	--
	4.1	B	--	.011	--	--	-27,000	--
	4.4	B	--	.012	--	--	-28,000	--
	4.9	B	--	.008	--	--	-31,000	--
	5.3	B	--	.008	--	--	-29,000	--
	5.6	B	--	.010	--	--	-7,100	--
	5.9	B	--	.013	--	--	-8,900	--
	6.4	B	--	.017	--	--	-5,400	--
	6.9	B	--	.017	--	--	-4,000	--
	7.2	B	--	.020	--	--	-5,100	--
	7.6	B	--	--	--	--	--	--
	8.2	B	--	.021	--	--	-2,900	--
	9.4	B	--	--	--	--	--	--
	10.5	B	--	.020	--	--	-4,500	--
USW	.3	B	--	.031	--	--	-1,400	--
UZ-N75	.8	B	--	.033	--	--	-1,500	--
	1.1	B	--	.051	--	--	-890	--
	1.4	B	--	.043	--	--	-1,200	--
	1.7	B	--	.049	--	--	-1,200	--
	2.1	B	--	.040	--	--	-1,300	--
	2.6	B	--	.043	--	--	-1,000	--
	2.9	B	--	.062	--	--	-720	--
	3.4	B	--	.062	--	--	-680	--
	3.8	B	--	.059	--	--	-650	--
	4.1	B	--	.063	--	--	-630	--
	4.4	B	--	.055	--	--	-700	--
	4.7	B	--	--	--	--	--	--
	5.2	B	--	.054	--	--	-600	--
	5.6	B	--	.046	--	--	-930	--
	6.1	B	--	.056	--	--	-740	--
	6.7	B	--	.069	--	--	-610	--
	7.3	B	--	.072	--	--	-530	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N75--Continued								
	7.8	B	--	0.061	--	--	-600	--
	8.7	B	--	.049	--	--	-690	--
	10.1	B	--	.047	--	--	-860	--
USW	0.9	B	--	.111	--	--	-390	--
UZ-N76	1.5	B	--	.106	--	--	-300	--
	2.1	B	--	.106	--	--	-340	--
	2.7	B	--	.106	--	--	-320	--
	3.4	B	--	.111	--	--	-310	--
	4.0	B	--	.094	--	--	-260	--
	4.6	B	--	.091	--	--	-290	--
	5.2	B	--	.140	--	--	-270	--
	5.8	B	--	.125	--	--	-300	--
	6.4	B	--	.107	--	--	-310	--
	7.0	B	--	.102	--	--	-280	--
	7.6	B	--	.115	--	--	-320	--
	8.2	B	--	.115	--	--	-220	--
	8.8	B	--	.117	--	--	-220	--
	9.4	B	--	.087	--	--	-350	--
	10.1	B	--	.115	--	--	-370	--
	10.7	B	--	.119	--	--	-390	--
	11.3	B	--	.064	--	--	-300	--
	11.9	B	--	.065	--	--	-370	--
USW	0.9	A	--	.046	--	--	-490	--
UZ-N77	1.5	A	--	.053	--	--	-500	--
	2.1	A	--	.052	--	--	-500	--
	2.7	A	--	.061	--	--	-450	--
	3.4	A	--	.063	--	--	-490	--
	4.0	A	--	.101	--	--	-860	--
	4.6	A	--	.081	--	--	-440	--
	5.2	A	--	.076	--	--	-560	--
	5.8	A	--	.070	--	--	-710	--
	6.4	A	--	.050	--	--	-1,100	--
	7.0	A	--	.082	--	--	-13,000	--
	7.6	A	--	.048	--	--	-14,000	--
	8.2	A	--	.061	--	--	-5,600	--
	8.8	A	--	.055	--	--	-5,000	--
	9.4	A	--	.073	--	--	-3,900	--
	10.1	A	--	.071	--	--	-2,500	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Cc ntinued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N77--Continued								
	10.7	A	--	0.052	--	--	-3,600	--
	11.3	A	--	.047	--	--	-3,700	--
	11.9	B	--	.033	--	--	-1,200	--
	12.5	B	--	.040	--	--	-510	--
	13.1	B	--	.034	--	--	-700	--
	13.7	B	--	.037	--	--	-670	--
	14.3	B	--	.036	--	--	-700	--
	14.9	B	--	.041	--	--	-910	--
USW	0.9	B	--	.022	--	--	-5,500	--
UZ-N78	1.5	B	--	.019	--	--	-5,000	--
	1.5	B	--	--	--	--	-5,200	--
	2.1	B	--	.020	--	--	-2,100	--
	2.1	B	--	--	--	--	-2,300	--
	2.7	B	--	.018	--	--	-5,900	--
	2.7	B	--	--	--	--	-6,300	--
	3.4	B	--	.016	--	--	-11,000	--
	3.4	B	--	--	--	--	-6,800	--
	4.0	B	--	.018	--	--	-7,100	--
	4.6	B	--	.018	--	--	-3,300	--
	4.6	B	--	--	--	--	-5,600	--
	5.2	B	--	--	--	--	-9,500	--
	5.2	B	--	.016	--	--	-8,500	--
	5.8	B	--	.022	--	--	-3,400	--
	6.4	B	--	.022	--	--	-1,700	--
	7.0	B	--	.019	--	--	-4,200	--
	7.6	B	--	.018	--	--	-5,900	--
	8.2	B	--	.019	--	--	-6,900	--
	8.8	B	--	.032	--	--	-1,000	--
USW	.9	B	--	.054	--	--	-460	--
UZ-N79	1.5	B	--	.032	--	--	-740	--
	2.1	B	--	.036	--	--	-640	--
	2.7	B	--	.034	--	--	-600	--
	3.4	B	--	.036	--	--	-560	--
	4.0	B	--	.046	--	--	-870	--
	4.6	B	--	.040	--	--	-1,300	--
	5.2	B	--	.042	--	--	-850	--
	5.8	B	--	.039	--	--	-520	--
	6.4	B	--	.038	--	--	-650	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N79--Continued								
	7.0	B	--	0.038	--	--	-800	--
	7.6	B	--	.037	--	--	-1,100	--
	8.2	B	--	.039	--	--	-690	--
	8.8	B	--	.038	--	--	-780	--
	9.4	B	--	.038	--	--	-1,700	--
USW	0.9	B	--	.029	--	--	-1,700	--
UZ-N80	1.5	B	--	.027	--	--	-1,400	--
	2.1	B	--	.018	--	--	-4,500	--
	2.7	B	--	.019	--	--	-3,700	--
	3.4	B	--	.015	--	--	-7,500	--
	4.0	B	--	.022	--	--	-3,600	--
	4.6	B	--	.022	--	--	-3,400	--
	5.2	B	--	.022	--	--	-3,700	--
	5.8	B	--	--	--	--	-4,200	--
	6.4	B	--	.021	--	--	-4,200	--
	7.0	B	--	.026	--	--	-2,200	--
	7.6	B	--	.028	--	--	-2,600	--
	8.2	B	--	.024	--	--	-3,700	--
	8.8	B	--	.025	--	--	-2,900	--
	9.4	B	--	.031	--	--	-2,500	--
	10.1	B	--	.030	--	--	-2,700	--
	10.7	B	--	.027	--	--	-3,000	--
	11.3	B	--	.028	--	--	-2,900	--
	11.9	B	--	.040	--	--	-1,700	--
	12.5	B	--	.027	--	--	-4,100	--
	13.1	B	--	.026	--	--	-4,800	--
	13.7	B	--	.020	--	--	-7,600	--
	14.3	B	--	.018	--	--	-5,500	--
	14.9	B	--	.020	--	--	-4,300	--
	15.5	B	--	.024	--	--	-3,500	--
USW	.9	A	--	.030	--	--	-980	--
UZ-N81	1.5	A	--	.027	--	--	-870	--
	2.1	A	--	.036	--	--	-840	--
	2.7	B	--	.032	--	--	-4,600	--
	3.4	B	--	.029	--	--	-5,700	--
	4.0	B	--	.026	--	--	-10,000	--
	4.6	B	--	.029	--	--	-3,700	--
	5.2	B	--	.028	--	--	-2,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N81--Continued								
	5.8	B	--	0.027	--	--	-4,100	--
	6.4	B	--	.034	--	--	-1,800	--
	7.0	B	--	.024	--	--	-5,900	--
	7.6	B	--	.027	--	--	-5,500	--
	8.2	B	--	.029	--	--	-4,300	--
	8.8	B	--	.033	--	--	-1,200	--
	9.4	B	--	.029	--	--	-2,300	--
	10.1	B	--	.029	--	--	-3,000	--
	10.7	B	--	.029	--	--	-2,700	--
	11.3	B	--	.030	--	--	-2,700	--
	11.9	B	--	.029	--	--	-2,400	--
	12.5	B	--	.029	--	--	-4,100	--
	13.1	B	--	.035	--	--	-740	--
	13.7	B	--	.030	--	--	-1,900	--
	14.3	B	--	.032	--	--	-980	--
	17.4	B	--	.037	--	--	-570	--
	18.0	B	--	.032	--	--	-840	--
	18.6	B	--	.041	--	--	-460	--
	19.2	B	--	.039	--	--	-580	--
	19.8	B	--	.035	--	--	-1,000	--
	20.4	B	--	.036	--	--	-960	--
	21.0	B	--	.038	--	--	-610	--
USW	0.9	A	--	.040	--	--	-600	--
UZ-N82	1.5	A	--	.041	--	--	-480	--
	2.1	A	--	.043	--	--	-290	--
	2.7	A	--	.053	--	--	-360	--
	3.4	A	--	.049	--	--	-330	--
	4.0	A	--	.049	--	--	-360	--
	4.6	A	--	.055	--	--	-300	--
	5.2	A	--	.068	--	--	-340	--
	5.8	A	--	.067	--	--	-370	--
	6.4	A	--	.069	--	--	-380	--
	7.0	A	--	.046	--	--	-540	--
	7.6	B	--	.048	--	--	-450	--
	8.2	B	--	.044	--	--	-470	--
	8.8	B	--	.043	--	--	-520	--
	9.4	B	--	.048	--	--	-490	--
	10.1	B	--	.051	--	--	-530	--
	10.7	B	--	.056	--	--	-460	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N82--Continued								
	11.3	B	--	0.046	--	--	-590	--
	11.9	B	--	.046	--	--	-480	--
USW	0.9	B	--	.034	--	--	-4,000	--
UZ-N83	1.5	B	--	.028	--	--	-6,600	--
	2.1	B	--	.032	--	--	-5,200	--
	2.7	B	--	.034	--	--	-4,600	--
	3.4	B	--	.031	--	--	-7,600	--
	4.0	B	--	.031	--	--	-4,800	--
	4.6	B	--	.039	--	--	-3,400	--
	5.2	B	--	.033	--	--	-4,000	--
	5.8	B	--	.033	--	--	-4,800	--
	6.4	B	--	.032	--	--	-4,200	--
	7.0	B	--	.034	--	--	-2,800	--
	7.6	B	--	.039	--	--	-540	--
	8.2	B	--	.032	--	--	-2,200	--
	8.8	B	--	.035	--	--	-1,500	--
	9.4	B	--	.032	--	--	-2,200	--
	10.1	B	--	.040	--	--	-310	--
	10.7	B	--	.035	--	--	-640	--
	11.3	B	--	.045	--	--	-310	--
	11.9	B	--	.044	--	--	-1,100	--
	12.5	B	--	.035	--	--	-2,100	--
	13.1	B	--	.036	--	--	-1,000	--
	13.7	B	--	.040	--	--	-440	--
	14.3	B	--	.037	--	--	-1,000	--
	14.9	B	--	.040	--	--	-840	--
	15.5	B	--	.035	--	--	-2,200	--
	16.2	B	--	.037	--	--	-2,500	--
	16.8	B	--	.038	--	--	-1,400	--
	17.4	B	--	.039	--	--	-1,600	--
	18.0	B	--	.037	--	--	-2,900	--
	18.6	B	--	.038	--	--	-1,600	--
	19.2	B	--	.036	--	--	-1,700	--
	19.8	B	--	.036	--	--	--	--
	20.4	B	--	.037	--	--	-2,300	--
	21.0	B	--	.036	--	--	-980	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.9	A	--	0.032	--	--	-2,900	--
UZ-N84	1.5	A	--	.021	--	--	-7,600	--
	2.1	A	--	.022	--	--	-7,500	--
	2.7	A	--	.039	--	--	-7,800	--
	3.4	A	--	.020	--	--	-9,200	--
	4.0	A	--	.016	--	--	-12,000	--
	4.6	A	--	.016	--	--	-9,700	--
	5.2	A	--	.018	--	--	-8,200	--
	5.8	A	--	.017	--	--	-12,000	--
	6.4	A	--	.014	--	--	-16,000	--
	7.0	B	--	.011	--	--	-15,000	--
	7.6	B	--	.011	--	--	-11,000	--
	8.2	B	--	.009	--	--	-14,000	--
	8.8	B	--	.008	--	--	-14,000	--
	9.6	B	--	.069	--	--	--	--
	10.1	B	--	.041	--	--	-430	--
	10.7	B	--	.034	--	--	-520	--
	11.3	B	--	.046	--	--	-450	--
	11.9	B	--	.037	--	--	-550	--
	12.5	B	--	.036	--	--	-850	--
	13.1	B	--	.018	--	--	-2,300	--
	13.6	B	--	.016	--	--	-2,100	--
UE-25	.8	A	--	.025	--	--	-39,000	--
UZN #85	1.1	A	--	.022	--	--	-12,000	--
	1.4	A	--	.023	--	--	-5,800	--
	1.7	A	--	.027	--	--	-4,600	--
	2.0	A	--	.031	--	--	-5,200	--
	2.3	A	--	.017	--	--	-13,000	--
	2.6	A	--	.039	--	--	-25,000	--
	2.9	A	--	.026	--	--	-12,000	--
	3.2	A	--	.021	--	--	-8,400	--
	3.5	A	--	.026	--	--	-3,600	--
	3.8	A	--	.021	--	--	-7,500	--
	4.1	A	--	.015	--	--	-15,000	--
	4.4	A	--	.011	--	--	-16,000	--
	4.7	A	--	.013	--	--	-15,000	--
	5.0	A	--	.013	--	--	-10,000	--
	5.3	A	--	.019	--	--	-13,000	--
	5.6	A	--	.015	--	--	-23,000	--
	5.9	A	--	.018	--	--	-8,000	--
	6.2	A	--	.017	--	--	-7,900	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #85--Continued								
	6.6	A	--	0.014	--	--	-6,300	--
	6.9	A	--	.012	--	--	-11,000	--
	7.2	A	--	.017	--	--	-10,000	--
	7.5	A	--	.022	--	--	-12,000	--
	7.8	A	--	.026	--	--	-13,000	--
	8.1	A	--	.014	--	--	-11,000	--
	8.4	A	--	.017	--	--	-14,000	--
	8.7	A	--	.015	--	--	-24,000	--
	9.0	A	--	.018	--	--	-12,000	--
	9.3	A	--	.019	--	--	-8,600	--
	9.6	A	--	.017	--	--	-6,800	--
	9.9	A	--	.009	--	--	-45,000	--
	9.9	A	--	--	--	--	-33,000	--
	10.2	A	--	.021	--	--	-19,000	--
	10.2	A	--	--	--	--	-16,000	--
	10.5	A	--	.023	--	--	-14,000	--
	10.5	A	--	--	--	--	-15,000	--
	10.8	A	--	.019	--	--	-15,000	--
	10.8	A	--	--	--	--	-12,000	--
	11.1	A	--	.020	--	--	-6,800	--
	11.4	A	--	.018	--	--	-20,000	--
	11.4	A	--	--	--	--	-16,000	--
	11.7	A	--	.025	--	--	-14,000	--
	12.0	A	--	.022	--	--	-8,000	--
	12.3	A	--	.027	--	--	-7,100	--
	12.6	A	--	.018	--	--	-5,800	--
	13.0	A	--	.019	--	--	-10,000	--
	13.3	A	--	.024	--	--	-7,000	--
	13.6	A	--	.024	--	--	-4,700	--
	13.9	A	--	.023	--	--	-6,000	--
	14.2	A	--	.021	--	--	-6,000	--
	14.5	A	--	.022	--	--	-18,000	--
	14.8	A	--	.023	--	--	-9,400	--
	15.1	A	--	.022	--	--	-9,800	--
	15.4	A	--	.024	--	--	-5,000	--
	15.7	A	--	.021	--	--	-5,100	--
	16.0	A	--	.021	--	--	-14,000	--
	16.3	A	--	.025	--	--	-7,700	--
	16.6	A	--	.021	--	--	-10,000	--
	16.9	A	--	.023	--	--	-6,100	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #85--Continued								
	17.2	A	--	0.028	--	--	-3,900	--
	17.5	A	--	.025	--	--	-15,000	--
	17.8	A	--	.029	--	--	-7,100	--
	18.1	A	--	.036	--	--	-4,700	--
	18.4	A	--	.032	--	--	-2,600	--
	18.7	A	--	.030	--	--	-3,000	--
	19.0	A	--	.026	--	--	-6,700	--
	19.4	A	--	.026	--	--	-7,200	--
	19.7	A	--	.025	--	--	-6,900	--
	20.0	A	--	.028	--	--	-4,600	--
	20.3	A	--	.028	--	--	-5,700	--
	20.6	A	--	.017	--	--	-11,000	--
	20.9	A	--	.018	--	--	-14,000	--
	21.2	A	--	.020	--	--	-12,000	--
	21.5	A	--	.020	--	--	-10,000	--
	21.8	A	--	.027	--	--	-5,600	--
	22.1	A	--	.022	--	--	-8,500	--
	22.4	A	--	.028	--	--	-6,700	--
	22.7	A	--	.025	--	--	-4,600	--
	23.0	A	--	.032	--	--	-4,500	--
	23.3	A	--	.028	--	--	-3,200	--
	23.6	A	--	.035	--	--	-8,000	--
	23.9	A	--	.027	--	--	-3,800	--
	24.2	A	--	.026	--	--	-4,200	--
USW	0.9	B	--	.027	--	--	-6,800	--
UZ-N86	1.5	B	--	.027	--	--	-6,300	--
	2.1	B	--	.030	--	--	-2,500	--
	2.7	B	--	.026	--	--	-2,500	--
	3.4	B	--	.027	--	--	-2,800	--
	4.0	B	--	.027	--	--	-3,300	--
	4.6	B	--	.028	--	--	-3,600	--
	5.2	B	--	.028	--	--	-3,800	--
	5.8	B	--	.027	--	--	-3,100	--
	6.4	B	--	.028	--	--	-3,200	--
	7.0	B	--	.028	--	--	-3,600	--
	7.6	B	--	.029	--	--	-3,200	--
	8.2	B	--	.030	--	--	-2,900	--
	8.8	B	--	.031	--	--	-1,600	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.9	A	--	0.049	--	--	-1,400	--
UZ-N87	1.5	A	--	.035	--	--	-4,300	--
	2.1	A	--	.023	--	--	-5,600	--
	2.7	A	--	.022	--	--	-4,700	--
	3.4	A	--	.024	--	--	-7,100	--
	4.0	A	--	.023	--	--	-6,200	--
	4.6	A	--	.023	--	--	-4,000	--
	5.2	A	--	.022	--	--	-4,600	--
	5.8	B	--	.019	--	--	-8,700	--
	6.4	B	--	.028	--	--	-1,700	--
	7.0	B	--	.012	--	--	-3,900	--
	7.6	B	--	.012	--	--	-6,500	--
	8.2	B	--	.012	--	--	-5,100	--
	8.8	B	--	.010	--	--	-2,800	--
	9.4	B	--	.011	--	--	-4,200	--
	10.1	B	--	.010	--	--	-4,500	--
	10.7	B	--	.007	--	--	-19,000	--
	11.3	B	--	.008	--	--	-31,000	--
	11.9	B	--	.010	--	--	-20,000	--
	12.5	B	--	.011	--	--	-14,000	--
	13.1	B	--	.008	--	--	-18,000	--
	13.6	B	--	.009	--	--	-13,000	--
USW	.1	A	--	.125	--	--	--	--
UZ-N88	.1	A	--	.166	--	--	--	--
	.4	B	--	.031	--	--	-2,200	--
	.9	B	--	.021	--	--	-3,000	--
	1.5	B	--	.015	--	--	-5,300	--
	2.1	B	--	.016	--	--	-5,800	--
	2.7	B	--	.014	--	--	-7,000	--
	3.4	B	--	.014	--	--	-8,700	--
	4.0	B	--	.012	--	--	-11,000	--
	4.6	B	--	.012	--	--	-17,000	--
	5.2	B	--	.012	--	--	-14,000	--
	5.8	B	--	.014	--	--	-7,100	--
	6.4	B	--	.017	--	--	-3,700	--
	7.0	B	--	.017	--	--	-3,200	--
	7.6	B	--	.016	--	--	-4,400	--
	8.2	B	--	.017	--	--	-3,000	--
	8.8	B	--	.016	--	--	-2,600	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.9	A	--	0.032	--	--	-2,100	--
UZ-N89	1.5	A	--	.044	--	--	-1,000	--
	2.1	A	--	.053	--	--	-590	--
	2.7	A	--	--	--	--	-510	--
	3.4	A	--	.056	--	--	-470	--
	4.0	A	--	.053	--	--	-320	--
	4.6	A	--	.058	--	--	-460	--
	5.2	A	--	.062	--	--	-390	--
	5.8	A	--	.059	--	--	-400	--
	6.4	A	--	.067	--	--	-290	--
	7.0	A	--	.069	--	--	-290	--
	7.6	A	--	.059	--	--	-430	--
	8.2	A	--	.053	--	--	-290	--
	8.8	A	--	.067	--	--	-350	--
	9.4	A	--	.056	--	--	-320	--
	10.1	B	--	.060	--	--	-290	--
	10.7	B	--	.067	--	--	-350	--
	11.3	B	--	.061	--	--	-360	--
	11.9	B	--	.062	--	--	-290	--
	12.5	B	--	.063	--	--	-310	--
	13.1	B	--	.074	--	--	-240	--
USW	.9	A	--	.037	--	--	-750	--
UZ-N90	1.5	A	--	.040	--	--	-630	--
	2.1	A	--	.050	--	--	-260	--
	2.7	A	--	.052	--	--	-260	--
	3.4	A	--	.057	--	--	-270	--
	4.0	A	--	.055	--	--	-270	--
	4.6	A	--	.062	--	--	-560	--
	5.2	A	--	--	--	--	--	--
	5.8	A	--	.069	--	--	-310	--
	6.4	A	--	.060	--	--	-210	--
	7.0	A	--	.059	--	--	-210	--
	7.6	A	--	.071	--	--	-570	--
	8.2	A	--	.052	--	--	-260	--
	8.8	A	--	.062	--	--	-510	--
	9.3	A	--	.063	--	--	-570	--
	9.8	A	--	.066	--	--	-500	--
	10.5	B	--	.063	--	--	-540	--
	11.3	B	--	.056	--	--	-580	--
	11.9	B	--	.060	--	--	-210	--
	12.5	B	--	.074	--	--	-510	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access borehcles--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N90--Continued								
	13.1	B	--	0.082	--	--	-540	--
	13.7	B	--	.068	--	--	-520	--
UE-29	0.3	A	--	.068	--	--	-540	--
UZN #91	.8	A	--	.081	--	--	-550	--
	1.1	A	--	.102	--	--	-490	--
	1.4	A	--	.102	--	--	-420	--
	1.8	A	--	.095	--	--	-640	--
	2.3	A	--	.090	--	--	-350	--
	2.6	A	--	.081	--	--	-610	--
	2.9	A	--	.082	--	--	-360	--
	3.4	A	--	.080	--	--	-320	--
	3.8	A	--	.079	--	--	-380	--
	4.1	A	--	.100	--	--	-450	--
	4.4	A	--	.091	--	--	-480	--
	4.9	A	--	.062	--	--	-480	--
	5.3	A	--	.063	--	--	-740	--
	5.6	A	--	.069	--	--	-2,400	--
	5.9	A	--	.065	--	--	-650	--
	6.4	A	--	.104	--	--	-960	--
	6.9	A	--	.082	--	--	-770	--
	7.2	A	--	.077	--	--	-410	--
	7.5	A	--	.071	--	--	-550	--
	7.9	A	--	.065	--	--	-670	--
	8.4	A	--	.062	--	--	-430	--
	8.7	A	--	.057	--	--	-710	--
	9.0	A	--	.065	--	--	-650	--
	9.4	A	--	.079	--	--	-410	--
	9.9	A	--	.075	--	--	-510	--
	10.2	A	--	.078	--	--	-420	--
	10.5	A	--	.056	--	--	-460	--
	10.8	A	--	.032	--	--	-4,100	--
	11.1	A	--	.083	--	--	-440	--
	11.4	A	--	.077	--	--	-430	--
	11.7	A	--	.078	--	--	-400	--
	12.0	A	--	.078	--	--	-380	--
	12.5	A	--	.084	--	--	-970	--
	13.0	A	--	.073	--	--	-1,200	--
	13.3	A	--	.069	--	--	-520	--
	13.6	A	--	.075	--	--	-390	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-29								
UZN #91--Continued								
	13.9	A	--	0.025	--	--	-26,000	--
	14.2	A	--	.030	--	--	-8,300	--
	14.5	A	--	.071	--	--	-640	--
	14.8	A	--	.068	--	--	-450	--
	15.1	A	--	.104	--	--	-450	--
	15.5	A	--	.077	--	--	-430	--
	16.0	A	--	.083	--	--	-600	--
	16.3	A	--	.080	--	--	-840	--
	16.6	A	--	.078	--	--	-740	--
	17.2	A	--	.093	--	--	-560	--
	17.8	A	--	--	--	--	--	--
	18.1	A	--	.088	--	--	-540	--
	18.7	A	--	.182	--	--	-460	--
	19.4	A	--	.110	--	--	-450	--
	20.0	B	--	.081	--	--	-1,300	--
	20.7	B	--	--	0.077	--	-14,000	--
UE-25	0.3	A	--	.078	--	--	-460	--
UZN #92	.8	A	--	.082	--	--	-16,000	--
	1.1	A	--	.080	--	--	-3,800	--
	1.4	A	--	.077	--	--	-1,700	--
	1.7	A	--	.089	--	--	--	--
	1.8	A	--	--	--	--	-13,000	--
	2.0	A	--	.089	--	--	--	--
	2.3	A	--	.083	--	--	-770	--
	2.6	A	--	.084	--	--	-470	--
	2.9	A	--	.071	--	--	-480	--
	3.4	A	--	--	--	--	-570	--
	3.8	A	--	.081	--	--	-570	--
	4.1	A	--	.071	--	--	-27,000	--
	4.4	A	--	.051	--	--	-440	--
	4.9	A	--	.058	--	--	-3,300	--
	5.3	A	--	.077	--	--	-3,700	--
	5.6	A	--	.081	--	--	-740	--
	5.9	A	--	.063	--	--	-580	--
	6.4	A	--	.078	--	--	-2,500	--
	6.9	A	--	.079	--	--	-630	--
	7.2	A	--	.091	--	--	-630	--
	7.5	A	--	--	--	--	-2,000	--
	7.9	A	--	.067	--	--	-4,200	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #92--Continued								
	8.4	A	--	0.065	--	--	-1,700	--
	8.7	A	--	.063	--	--	-1,500	--
	9.0	A	--	.054	--	--	-2,200	--
	9.4	A	--	.079	--	--	-1,500	--
	9.9	A	--	.086	--	--	-450	--
	10.2	A	--	.076	--	--	-320	--
	10.5	A	--	.074	--	--	-540	--
	11.0	A	--	.073	--	--	-380	--
	11.4	A	--	.073	--	--	-480	--
	11.7	A	--	.064	--	--	-860	--
	12.0	A	--	.069	--	--	-7,200	--
	12.5	A	--	.080	--	--	-240	--
	13.0	A	--	.073	--	--	-330	--
	13.3	A	--	.070	--	--	-510	--
	13.6	A	--	.067	--	--	-350	--
	14.0	A	--	.074	--	--	-650	--
	14.5	A	--	.060	--	--	-630	--
	14.8	A	--	.064	--	--	-450	--
	15.1	A	--	.066	--	--	-400	--
	15.5	A	--	.066	--	--	-870	--
	16.0	A	--	.065	--	--	-400	--
	16.3	A	--	.065	--	--	-510	--
	16.6	A	--	.068	--	--	-500	--
	16.9	A	--	.075	--	--	-450	--
	17.2	A	--	.066	--	--	-370	--
	17.5	A	--	.058	--	--	-700	--
	17.8	B	--	.061	--	--	-490	--
	18.1	B	--	.058	--	--	-760	--
	18.6	B	--	--	0.034	--	-43,000	--
	19.0	B	--	.038	--	--	-58,000	--
	19.4	B	--	.056	--	--	-35,000	--
	19.7	B	--	.041	--	--	-52,000	--
	20.0	B	--	.026	--	--	-60,000	--
	20.3	B	--	.030	--	--	-57,000	--
	20.6	B	--	.023	--	--	-51,000	--
	20.9	B	--	.028	--	--	-58,000	--
	21.2	B	--	.027	--	--	-55,000	--
	21.6	B	--	.022	--	--	-59,000	--
	22.1	B	--	.025	--	--	-64,000	--
	22.4	B	--	.033	--	--	-52,000	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #92--Continued								
	22.7	B	--	0.029	--	--	-38,000	--
	23.0	B	--	.026	--	--	-59,000	--
	23.3	B	--	.039	--	--	-38,000	--
	23.6	B	--	.026	--	--	-46,000	--
	23.9	B	--	.018	--	--	-45,000	--
	24.2	B	--	.016	--	--	-53,000	--
	24.7	B	--	.021	--	--	-42,000	--
	25.1	B	--	.020	--	--	-45,000	--
	25.5	B	--	.023	--	--	-46,000	--
	25.8	B	--	.022	--	--	-50,000	--
	26.1	B	--	.023	--	--	-48,000	--
	26.4	B	--	.026	--	--	-42,000	--
	26.7	B	--	.025	--	--	-71,000	--
	27.0	B	--	.023	--	--	-82,000	--
	27.3	B	--	.016	--	--	-88,000	--
	27.7	B	--	.024	--	--	-85,000	--
	28.2	B	--	.031	--	--	-82,000	--
	28.5	B	--	.039	--	-	110,000	--
	28.8	B	--	.039	--	--	-50,000	--
	29.1	B	--	.024	--	--	-62,000	--
	29.4	B	--	.037	--	--	-59,000	--
	29.7	B	--	.035	--	--	-57,000	--
	30.0	B	--	--	--	--	-57,000	--
	30.2	B	--	.028	--	--	--	--
	30.3	B	--	--	--	--	-59,000	--
	30.8	B	--	.020	--	--	-71,000	--
	31.2	B	--	.032	--	--	-86,000	--
	31.5	B	--	.031	--	--	-72,000	--
	31.9	B	--	.047	--	--	-75,000	--
USW	0.6	B	0.018	--	--	--	-7,100	--
UZ-N93	1.2	B	--	--	--	--	--	--
	1.8	B	--	--	--	--	--	--
	2.4	B	.015	--	--	--	-25,000	--
	2.4	B	.017	--	--	--	--	--
	3.0	B	.018	--	--	--	-22,000	--
	3.0	B	.019	--	--	--	--	--
	3.7	B	.065	--	--	--	--	--
	3.7	B	.065	--	--	--	--	--
	4.3	B	.055	--	--	--	-540	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N93--Continued								
	4.3	B	0.055	--	--	--	--	--
	4.9	B	.045	--	--	--	--	--
	4.9	B	.047	--	--	--	--	--
	5.5	B	.037	--	--	--	-350	--
	5.5	B	.036	--	--	--	--	--
	6.1	B	.033	--	--	--	-330	--
	6.1	B	.032	--	--	--	--	--
	6.7	B	.031	--	--	--	--	--
	6.7	B	.029	--	--	--	--	--
	7.3	B	.031	--	--	--	-300	--
	7.3	B	.032	--	--	--	--	--
	7.9	B	.028	--	--	--	--	--
	7.9	B	.028	--	--	--	--	--
	8.5	B	.023	--	--	--	-270	--
	8.5	B	.023	--	--	--	--	--
	9.1	B	.020	--	--	--	--	--
	9.1	B	.020	--	--	--	--	--
	9.8	B	.029	--	--	--	-610	--
	9.8	B	.028	--	--	--	--	--
	10.4	B	.030	--	--	--	--	--
	10.4	B	.031	--	--	--	--	--
	11.0	B	.030	--	--	--	-710	--
	11.0	B	.032	--	--	--	--	--
	11.6	B	.036	--	--	--	--	--
	11.6	B	.037	--	--	--	--	--
	12.2	B	.044	--	--	--	-320	--
	12.2	B	.044	--	--	--	--	--
USW	0.6	B	.062	0.061	0.064	--	-270	--
UZ-N94	.6	B	.063	--	--	--	--	--
	1.2	B	.038	.042	.036	--	-260	--
	1.2	B	.043	--	--	--	--	--
	1.8	B	.039	.040	.036	--	-300	--
	1.8	B	.038	--	--	--	--	--
	2.4	B	.033	.033	.028	--	-240	--
	2.4	B	.031	--	.028	--	--	--
	3.0	B	.031	.033	.030	--	-330	--
	3.0	B	.031	.033	--	--	--	--
	3.7	B	.028	.032	.028	--	-380	--
	3.7	B	.030	--	--	--	--	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N94--Continued								
	4.3	B	0.029	0.029	0.024	--	-540	--
	4.3	B	--	--	.023	--	--	--
	4.9	B	.030	.032	.027	--	-470	--
	4.9	B	.031	--	--	--	--	--
	5.5	B	.029	.031	.027	--	-510	--
	5.5	B	.030	--	--	--	--	--
	6.1	B	.022	.024	.018	--	-490	--
	6.1	B	.022	--	.018	--	--	--
	6.7	B	.015	.018	.014	--	-430	--
	6.7	B	.015	--	--	--	--	--
	7.3	B	.015	.016	.014	--	-440	--
	7.3	B	.015	--	--	--	--	--
	7.9	B	.019	.020	.018	--	-350	--
	7.9	B	.018	--	--	--	--	--
	8.5	B	.020	.021	.019	--	-400	--
	8.5	B	.020	--	--	--	--	--
USW	0.6	B	.084	.077	.091	--	-420	--
UZ-N95	.6	B	.083	--	--	--	--	--
	1.2	B	.073	.067	.078	--	-490	--
	1.2	B	.072	.071	--	--	--	--
	1.8	B	.056	.060	.058	--	-330	--
	1.8	B	.058	--	--	--	--	--
	2.4	B	.028	.036	.030	--	-530	--
	2.4	B	.037	--	.030	--	--	--
	3.0	B	.029	--	.026	--	-410	--
	3.0	B	.029	--	--	--	--	--
	3.7	B	.021	.022	.021	--	-670	--
	3.7	B	.021	--	--	--	--	--
	4.3	B	.022	--	.022	--	-1,500	--
	4.3	B	.022	--	--	--	--	--
	4.9	B	.027	.027	.026	--	-440	--
	4.9	B	.026	.027	--	--	--	--
	5.5	B	.023	.023	.018	--	-750	--
	5.5	B	.021	--	--	--	--	--
	6.1	B	.017	--	.014	--	-800	--
	6.1	B	.017	--	--	--	--	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.6	A	0.063	0.051	0.079	--	-360	--
UZ-N96	.6	A	.058	--	--	--	--	--
	1.2	B	.061	.047	.082	--	-340	--
	1.2	B	.057	--	--	--	--	--
	1.8	B	.050	.045	.060	--	-290	--
	1.8	B	.049	.045	--	--	--	--
	2.4	B	.049	.038	.057	--	-410	--
	2.4	B	.048	--	--	--	--	--
	3.0	B	.048	.035	.052	--	-370	--
	3.0	B	.048	--	--	--	--	--
	3.7	B	.038	.038	.040	--	-620	--
	3.7	B	.038	--	--	--	--	--
	4.3	B	.031	--	--	--	-370	--
	4.9	B	--	--	.017	--	-2,800	--
	5.5	B	.019	--	--	--	-2,300	--
	6.1	B	.024	--	--	--	-1,800	--
	6.7	B	.033	.033	.028	--	-610	--
	6.7	B	.032	.033	--	--	--	--
	7.3	B	--	--	.017	--	-2,300	--
	7.9	B	--	--	.010	--	-9,900	--
	8.5	B	.026	.027	.019	--	-1,100	--
	8.5	B	.025	--	--	--	--	--
	9.1	B	.030	.032	.023	--	-490	--
	9.1	B	.031	.030	--	--	--	--
	9.8	B	.029	.029	.019	--	-2,000	--
	9.8	B	.028	.029	--	--	--	--
	10.4	B	.021	--	--	--	-3,300	--
	10.7	B	.043	.043	--	--	-370	--
	10.7	B	.044	--	--	--	--	--
UE-25	.3	A	--	.049	--	--	-910	--
UZN #97	.8	A	--	.052	--	--	-710	--
	1.1	A	--	.054	--	--	-750	--
	1.4	A	--	.050	--	--	-750	--
	1.7	A	--	.051	--	--	-570	--
	2.1	A	--	.046	--	--	-940	--
	2.6	A	--	.041	--	--	-1,100	--
	2.9	A	--	.038	--	--	-1,300	--
	3.2	A	--	.040	--	--	-1,300	--
	3.7	A	--	.039	--	--	-1,100	--
	4.1	A	--	.038	--	--	-1,200	--
	4.4	A	--	.036	--	--	-1,500	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #97--Continued								
	4.7	A	--	0.033	--	--	-2,500	--
	5.2	A	--	.036	--	--	-1,200	--
	5.6	A	--	.039	--	--	-1,100	--
	5.8	A	--	.040	--	--	-960	--
	6.2	A	0.044	--	--	--	-1,800	--
	6.7	A	--	.037	--	--	-2,100	--
	7.2	A	--	.038	--	--	-1,900	--
	7.5	A	--	.039	--	--	-1,300	--
	7.8	A	--	.031	--	--	-1,900	--
	8.1	A	--	.035	--	--	-1,300	--
	8.4	A	--	.032	--	--	-1,200	--
	8.8	A	--	.031	--	--	-1,600	--
	9.3	A	--	.032	--	--	-1,800	--
	9.6	A	--	.035	--	--	-1,700	--
	9.9	A	--	.037	--	--	-1,500	--
	10.2	A	--	.038	--	--	-1,500	--
	10.5	A	--	.037	--	--	-1,800	--
	11.0	A	--	.036	--	--	-1,700	--
	11.4	A	--	.038	--	--	-1,300	--
	11.7	A	--	.039	--	--	-1,500	--
	12.0	A	--	.037	--	--	-1,500	--
	12.5	A	--	.034	--	--	-1,700	--
	13.0	A	--	.039	--	--	-1,800	--
	13.3	A	--	.040	--	--	-1,500	--
	13.6	A	--	.039	--	--	-1,600	--
	14.0	A	--	.040	--	--	-1,400	--
	14.5	A	--	.039	--	--	-1,600	--
	14.8	A	--	.044	--	--	-990	--
	15.1	A	--	.042	--	--	-1,300	--
	15.5	A	--	.037	--	--	-1,900	--
	16.0	A	--	.039	--	--	-1,400	--
	16.3	A	--	.038	--	--	-2,400	--
	16.6	A	--	.035	--	--	-1,900	--
	17.1	A	--	.027	--	--	-8,400	--
	17.5	A	--	.034	--	--	-2,400	--
	17.8	B	--	.034	--	--	-3,600	--
	18.1	B	--	.028	--	--	-6,900	--

Table 4. Results of laboratory analyses of hydrologic characteristics of drill cuttings from neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Rock type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.3	B	--	0.092	--	--	-430	--
UZ-N98	.8	B	--	.093	--	--	-600	--
	1.1	B	--	.078	--	--	-460	--
	1.4	B	--	.071	--	--	-950	--
	1.8	B	--	.069	--	--	-470	--
	2.3	B	--	.068	--	--	-740	--
	2.6	B	--	.078	--	--	-440	--
	2.9	B	--	.073	--	--	-610	--
	3.4	B	--	.075	--	--	-430	--
	3.8	B	--	.072	--	--	-420	--
	4.1	B	--	.068	--	--	-430	--
	4.4	B	--	.073	--	--	-490	--
	4.9	B	--	.079	--	--	-400	--
	5.3	B	--	.083	--	--	-600	--
	5.6	B	--	.085	--	--	-600	--
	5.9	B	--	.091	--	--	-470	--
	6.4	B	--	.093	--	--	-590	--
	6.9	B	--	.091	--	--	-550	--
	7.2	B	--	.081	--	--	-960	--
	7.5	B	--	.079	--	--	-1,800	--
	7.8	B	--	.110	--	--	-2,000	--
	8.5	B	--	.131	--	--	-2,500	--
	9.9	B	--	.279	--	--	-1,800	--
	11.4	B	--	.285	--	--	-450	--
	13.0	B	--	.254	--	--	-490	--
	14.5	B	--	.305	--	--	-580	--
	15.5	B	--	--	0.232	--	-710	--
	16.2	B	--	.249	--	--	-750	--
	16.6	B	--	.227	--	--	-950	--
	17.1	B	--	--	.164	--	-18,000	--
	17.7	B	--	.194	--	--	-4,500	--
	18.1	B	--	.176	--	--	-7,200	--
	18.6	B	--	.177	--	--	-2,900	--
	19.2	B	--	--	.172	--	-5,900	--
	19.7	B	--	--	.147	--	-5,600	--
	20.1	B	--	--	.162	--	-3,500	--
	20.7	B	--	--	.342	--	-440	--
	21.2	B	--	.176	--	--	-900	--
	21.6	B	--	--	.152	--	-3,200	--
	22.3	B	--	.184	--	--	-530	--
	22.7	B	--	.254	--	--	-3,500	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes

[--, no data; D, drive core; R, rotary core]

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25	1.90-2.06	D	--	0.056	0.096	-280	-300	--
UZN #1	2.36-2.44	D	--	--	--	-240	--	--
	3.35-3.96	D	--	.066	.101	-240	-250	--
	4.95-5.11	D	--	.091	.149	-92	-320	-330
	5.18-5.26	D	--	--	--	-230	--	--
	6.40-6.71	D	--	.059	.105	-270	-230	-220
	7.92-8.08	D	--	.074	.165	-350	-310	-170
	8.15-8.23	D	--	--	--	-250	--	--
	8.53-8.60	R	0.252	--	--	-300	--	--
	8.76-8.92	R	.186	--	--	-370	--	--
	10.45-10.53	R	.202	--	--	-370	--	--
	12.05-12.09	R	--	--	--	-210	--	--
	13.47-13.56	R	.174	--	--	-250	--	--
	13.96-14.08	R	.148	--	--	-210	--	--
UE-25	1.5-2.1	D	.044	.035	.067	--	-3,400	-2,600
UZN #4	1.5-2.1	D	--	--	.065	--	-3,200	--
	3.0-3.7	D	.026	.023	.040	--	-2,500	-1,900
	3.0-3.7	D	--	.023	.041	--	-2,700	--
	4.6-5.2	D	.042	.033	.076	--	-540	-520
	4.6-5.2	D	--	.037	.072	--	-460	--
	6.1-6.7	D	.075	.076	.134	--	-86	-250
	6.1-6.7	D	.076	--	.135	--	-220	--
UE-25	1.5-2.1	D	.081	.067	.092	--	-270	-350
UZN #6	1.5-2.1	D	.088	.061	.094	--	--	--
	4.3-4.9	D	.086	.065	.105	--	-83	-570
	4.3-4.9	D	.081	.066	--	--	-210	--
	6.1-6.7	D	.056	.084	.125	--	-600	-150
	6.1-6.7	D	.089	.066	.135	--	--	--
	7.6-8.2	D	.067	.068	.102	--	-140	-110
	7.6-8.2	D	.070	.073	.096	--	--	-71
	9.1-9.8	D	.070	.056	.106	--	-140	-270
	9.1-9.8	D	.075	.061	--	--	-240	-120
	10.7-11.3	D	.081	.078	.095	--	-110	-100
	10.7-11.3	D	.076	.072	--	--	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25	1.5-2.1	D	0.147	--	--	-140	-99	-260
UZN #8	1.5-2.1	D	.062	--	--	--	--	--
	3.0-3.7	D	.078	--	0.127	-200	-130	-180
	3.0-3.7	D	--	--	--	-200	--	--
	4.6-5.2	D	.090	--	--	-250	-88	-160
	4.6-5.2	D	.067	--	--	-250	--	--
	6.1-6.7	D	.076	--	--	-360	-88	-150
	6.1-6.7	D	.078	--	--	-270	--	--
	7.6-8.2	D	.067	--	--	-210	-82	-150
	9.1-9.8	D	.067	0.060	.094	-360	-120	-180
	9.1-9.8	D	--	--	--	-330	--	-170
	10.7-11.3	D	.067	.055	.081	-300	-140	-160
UE-25	0.0-0.12	R	.284	--	--	-530	--	--
UZN #10	1.22-1.31	R	.183	--	--	-700	--	--
	1.83-1.89	R	.178	--	--	-500	--	--
	2.74-2.93	R	.169	--	--	-580	--	--
	4.34-4.88	R	.190	--	--	--	--	--
	4.50-4.57	R	.189	--	--	-540	--	--
	4.88-4.94	R	.182	--	--	-480	--	--
	5.64-5.73	R	.184	--	--	-540	--	--
	6.04-6.13	R	.187	--	--	-510	--	--
	6.46-6.61	R	.182	--	--	-420	--	--
	7.59-7.71	R	.166	--	--	-580	--	--
	8.84-8.96	R	.161	--	--	-650	--	--
	10.09-10.18	R	.184	--	--	-600	--	--
	10.97-11.13	R	.159	--	--	-700	--	--
	11.43-11.52	R	.162	--	--	-530	--	--
	11.89-12.04	R	.132	--	--	-2,000	--	--
	12.31-12.44	R	.159	--	--	-590	--	--
	13.41-13.47	R	.133	--	--	-970	--	--
	13.84-13.99	R	.148	--	--	-790	--	--
	14.33-14.48	R	.154	--	--	-770	--	--
	15.06-15.18	R	.148	--	--	-740	--	--
	15.94-16.09	R	.176	--	--	-740	--	--
	16.67-16.82	R	.161	--	--	-720	--	--
	17.56-17.65	R	.187	--	--	-610	--	--
	18.07-18.17	R	.149	--	--	-750	--	--
	19.11-19.20	R	.163	--	--	-690	--	--
	19.42-19.51	R	.140	--	--	-610	--	--
	19.69-19.81	R	.119	--	--	-530	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #10--Continued								
	20.36-20.48	R	0.108	--	--	-460	--	--
	20.57-20.63	R	.163	--	--	-430	--	--
	20.94-21.03	R	.099	--	--	-490	--	--
	21.43-21.52	R	.119	--	--	-480	--	--
	22.01-22.10	R	.112	--	--	-430	--	--
	22.40-22.43	R	.165	--	--	-630	--	--
	22.59-22.71	R	.103	--	--	-640	--	--
	23.32-23.38	R	.089	--	--	-550	--	--
	29.11-29.17	R	.185	--	--	-570	--	--
	29.93-3.08	R	.123	--	--	-950	--	--
UE-25	1.5-2.1	D	.083	--	--	-340	-220	-350
UZN #12	3.0-3.7	D	.054	--	--	-370	-260	-390
	4.6-5.2	D	.056	--	--	-150	-300	-280
	6.1-6.7	D	.058	--	--	-110	-78	-280
	6.1-6.7	D	--	--	--	-200	-350	-580
	7.6-8.2	D	.053	--	--	-170	-120	-200
	9.1-9.8	D	.053	--	--	-180	-270	-330
	9.1-9.8	D	--	--	--	-150	--	-260
	10.7-11.3	D	.036	--	--	-230	-92	-300
	12.2-12.8	D	.041	--	--	-210	-220	-320
UE-25	1.5-2.1	D	.048	--	--	--	--	--
UZN #13	3.0-3.7	D	.084	--	--	-190	-140	--
	3.0-3.7	D	--	--	--	--	-180	--
	4.6-5.2	D	.067	--	--	-200	-110	-67
	4.6-5.2	D	--	--	--	--	-160	--
	6.1-6.7	D	.073	--	--	-150	-150	--
	7.6-8.2	D	.061	--	--	--	-140	-94
	7.6-8.2	D	--	--	--	--	-200	-160
	9.1-9.8	D	.070	--	--	-260	-53	-50
	9.1-9.8	D	--	--	--	--	-180	--
	10.7-11.3	D	.084	--	--	-190	-100	-88
	10.7-11.3	D	--	--	--	--	-250	--
	12.2-12.8	D	.099	--	--	-150	-160	-50
	12.2-12.8	D	--	--	--	--	-50	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25	1.5-2.1	D	0.044	--	--	--	-210	-290
UZN #14	1.5-2.1	D	--	--	--	--	-450	--
	3.0-3.7	D	.031	--	--	--	-3,300	2,800
	3.0-3.7	D	--	--	--	--	-4,200	--
	4.6-5.2	D	.038	--	--	--	-800	-1,700
	4.6-5.2	D	--	--	--	--	-1,100	--
	6.1-6.7	D	.043	--	--	--	-820	-980
	7.6-8.2	D	--	--	--	--	-800	-560
	9.1-9.8	D	.055	--	--	--	-570	-390
	10.7-11.3	D	.043	--	--	--	-540	-340
	12.2-12.8	D	.048	--	--	--	-540	-230
	13.7-14.3	D	.046	--	--	--	-450	-320
UE-25	0.53-0.61	D	.035	--	--	-3,400	--	--
UZN #19	2.13-2.21	D	.048	--	--	-500	--	--
	3.66-3.73	D	.067	--	--	-400	--	--
	5.26-5.33	D	.078	--	--	-380	--	--
	6.40-6.48	D	.067	--	--	-410	--	--
	7.92-8.00	R	.029	--	--	-17,000	--	--
	9.45-9.54	R	.031	--	--	-1,300	--	--
UE-25	0.00-0.53	D	.022	--	--	--	--	--
UZN #21	0.23-0.30	D	.028	--	--	-2,800	--	--
	1.83-1.98	D	.017	--	--	-6,000	--	--
	1.83-2.44	D	.022	--	--	--	--	--
	3.35-3.43	D	.031	--	--	-3,300	--	--
	3.35-3.66	D	.042	--	--	--	--	--
	4.88-5.33	D	.029	--	--	--	--	--
	5.26-5.33	D	.024	--	--	-7,000	--	--
	6.40-6.55	D	.024	--	--	-13,000	--	--
	6.40-7.01	D	.031	--	--	--	--	--
	7.92-8.08	D	.033	--	--	-20,000	--	--
	7.92-8.38	D	.031	--	--	--	--	--
	10.97-11.09	R	.033	--	--	-610	--	--
	12.19-12.31	R	.030	--	--	-4,100	--	--
UE-25	0.00-0.61	D	.098	--	--	--	--	--
UZN #22	0.30-0.38	D	.053	--	--	-540	--	--
	1.83-2.44	D	.025	--	--	--	--	--
	2.06-2.13	D	.024	--	--	-6,700	--	--
	4.88-5.03	D	.069	--	--	--	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #22--Continued								
	4.88-5.18	D	0.089	--	--	--	--	--
	4.95-5.03	D	--	--	--	-600	--	--
	11.19-11.31	R	.030	--	--	-10,000	--	--
	28.86-28.93	R	.028	--	--	-6,900	--	--
UE-25	0.30-0.43	R	.033	--	--	-1,600	--	--
UZN #23	0.91-1.02	R	.051	--	--	-1,300	--	--
	1.02-1.17	R	.025	--	--	-10,000	--	--
	1.52-1.62	R	.034	--	--	-8,500	--	--
	1.94-2.01	R	.028	--	--	-7,500	--	--
	2.74-2.85	R	.030	--	--	-8,300	--	--
	5.18-5.24	R	.028	--	--	-9,600	--	--
	6.71-6.83	R	.027	--	--	-3,600	--	--
	7.86-7.92	R	.027	--	--	-890	--	--
	8.66-8.75	R	.025	--	--	-10,000	--	--
	9.36-9.45	R	.029	--	--	-10,000	--	--
	9.60-9.69	R	.025	--	--	-11,000	--	--
	10.42-10.52	R	.052	--	--	-5,100	--	--
USW	0.0-0.15	R	.076	--	--	-520	--	--
UZ-N24	2.56-2.71	R	.063	--	--	-700	--	--
	5.52-5.56	R	.091	--	--	-580	--	--
	8.08-8.15	R	.097	--	--	-760	--	--
	8.72-8.79	R	.242	--	--	-1,000	--	--
	8.99-9.05	R	.250	--	--	-720	--	--
	9.28-9.36	R	.311	--	--	-720	--	--
	9.75-9.81	R	.235	--	--	-610	--	--
	9.88-9.97	R	.215	--	--	-580	--	--
	10.61-10.67	R	.164	--	--	-740	--	--
	10.81-10.90	R	.165	--	--	-940	--	--
	11.02-11.06	R	.149	--	--	-1,200	--	--
	11.48-11.60	R	.155	--	--	-880	--	--
	11.73-11.86	R	.166	--	--	-690	--	--
	12.19-12.34	R	.168	--	--	-740	--	--
	13.66-13.72	R	.197	--	--	-580	--	--
	13.72-13.81	R	.206	--	--	-470	--	--
	14.72-14.78	R	.303	--	--	-420	--	--
	15.58-15.64	R	.350	--	--	-410	--	--
	15.91-16.00	R	.342	--	--	-430	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N24--Continued								
	16.84-16.95	R	0.311	--	--	-430	--	--
	17.37-17.47	R	.260	--	--	-430	--	--
	17.82-17.89	R	.246	--	--	-430	--	--
	18.17-18.24	R	.231	--	--	-440	--	--
	18.29-18.59	R	.218	--	--	-460	--	--
	19.05-19.14	R	.210	--	--	-420	--	--
	19.51-19.57	R	.202	--	--	-380	--	--
	20.12-20.25	R	.195	--	--	-350	--	--
	20.82-20.91	R	.443	--	--	-390	--	--
	21.21-21.55	R	.415	--	--	-330	--	--
	21.58-21.67	R	.196	--	--	-330	--	--
	21.82-21.92	R	.185	--	--	-330	--	--
	22.16-22.25	R	.180	--	--	-490	--	--
	22.66-22.77	R	.180	--	--	-530	--	--
USW	1.83-1.98	R	.031	--	--	-6,400	--	--
UZ-N25	3.35-3.38	R	.039	--	--	-5,300	--	--
	4.88-5.00	R	.023	--	--	-9,000	--	--
	1.52-1.68	R	.021	--	--	-8,000	--	--
	4.88-5.03	R	.022	--	--	-12,000	--	--
	7.92-8.08	R	.023	--	--	-8,800	--	--
UE-25	0.0-0.08	D	.070	--	--	-410	--	--
UZN #28	1.83-2.44	D	.044	--	--	--	--	--
	2.21-2.29	D	.048	--	--	-1,300	--	--
	3.35-3.96	D	.038	--	--	--	--	--
	3.58-3.66	D	.039	--	--	-1,100	--	--
	4.88-5.49	D	.059	--	--	--	--	--
	5.26-5.33	D	.061	--	--	-790	--	--
	6.40-7.01	D	.061	--	--	--	--	--
	6.78-6.86	D	.055	--	--	-960	--	--
UE-25	0.12-0.15	D	.078	--	--	-450	--	--
UZN #29	1.68-1.77	R	.034	--	--	-5,800	--	--
	3.44-3.51	R	.047	--	--	-4,800	--	--
	4.88-4.94	R	.038	--	--	-2,500	--	--
	6.61-6.71	R	.041	--	--	-640	--	--
	7.92-8.38	R	.047	--	--	-690	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25	0.20-0.23	D	0.029	--	--	-490	--	--
UZN #30	3.58-3.66	R	.038	--	--	-3,200	--	--
	9.85-9.97	R	.037	--	--	-3,100	--	--
USW	0.08-0.15	D	.082	--	--	-690	--	--
UZ-N40	0.70-0.76	R	.024	--	--	-4,200	--	--
	2.38-2.44	R	.040	--	--	-530	--	--
	3.35-3.47	R	.028	--	--	-760	--	--
	5.39-5.43	R	.029	--	--	--	--	--
	5.39-5.49	R	--	--	--	-3,200	--	--
	6.86-7.01	R	.022	--	--	-5,400	--	--
	9.91-10.06	R	.026	--	--	-3,900	--	--
USW	0.38-0.46	D	.096	--	--	-770	--	--
UZ-N41	0.38-0.46	D	.089	--	--	--	--	--
	1.98-2.06	D	.043	--	--	-1,600	--	--
	1.98-2.06	D	.050	--	--	--	--	--
	3.81-3.96	D	.071	--	--	-680	--	--
	4.88-5.06	R	.022	--	--	-5,900	--	--
	6.52-6.71	R	.026	--	--	--	--	--
	10.67-10.76	R	.022	--	--	-9,300	--	--
USW	0.61-0.73	R	.025	--	--	-10,000	--	--
UZ-N42	3.54-3.66	R	.025	--	--	-21,000	--	--
	4.51-4.75	R	.028	--	--	-8,200	--	--
	6.40-6.49	R	.024	--	--	-11,000	--	--
	6.92-7.01	R	.025	--	--	-13,000	--	--
	10.76-10.88	R	.021	--	--	-22,000	--	--
	11.89-12.04	R	.022	--	--	-9,900	--	--
USW	0.0-0.15	D	.110	--	--	-570	--	--
UZ-N43	1.83-1.98	D	--	--	--	-6,100	--	--
	4.88-5.03	D	.027	--	--	-8,100	--	--
	6.55-6.63	D	.029	--	--	-7,300	--	--
	9.33-9.39	R	--	--	--	-36,000	--	--
	9.97-10.03	R	.022	--	--	-23,000	--	--
	10.67-10.82	R	.021	--	--	-26,000	--	--
	11.37-11.46	R	.021	--	--	-35,000	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	1.74-1.86	R	0.019	--	--	-14,000	--	--
UZ-N44	2.71-2.83	R	.024	--	--	-7,900	--	--
	4.57-4.69	R	.020	--	--	-42,000	--	--
	5.09-5.18	R	.017	--	--	-37,000	--	--
	7.92-8.08	R	.020	--	--	-40,000	--	--
	8.38-8.53	R	.024	--	--	-42,000	--	--
	10.97-11.00	R	.023	--	--	-17,000	--	--
USW	0.30-0.38	D	.066	--	--	-480	--	--
UZ-N45	2.06-2.13	D	.032	--	--	-6,100	--	--
	3.35-3.96	D	.080	--	--	--	--	--
	3.58-3.66	D	.113	--	--	-630	--	--
	4.88-5.49	D	.068	--	--	--	--	--
	5.11-5.18	D	.065	--	--	-550	--	--
	6.40-7.01	D	.063	--	--	--	--	--
	6.71-6.78	D	.067	--	--	-590	--	--
	7.62-8.23	D	.057	--	--	--	--	--
	7.92-8.00	D	.083	--	--	-570	--	--
	9.14-9.75	D	.061	--	--	--	--	--
	9.45-9.52	D	.070	--	--	-460	--	--
	10.67-10.76	D	.066	--	--	--	--	--
	10.76-10.82	R	.016	--	--	-35,000	--	--
	10.82-11.00	R	.019	--	--	-28,000	--	--
	11.52-11.58	R	.024	--	--	-11,000	--	--
	12.19-12.28	R	.022	--	--	--	--	--
	12.89-12.98	R	.032	--	--	--	--	--
USW	0.0-0.12	R	.151	--	--	-620	--	--
UZ-N46	0.94-1.04	R	.191	--	--	-430	--	--
	1.52-1.62	R	.112	--	--	-500	--	--
	2.87-2.96	R	.095	--	--	-480	--	--
	3.57-3.66	R	.079	--	--	-620	--	--
	4.12-4.21	R	.081	--	--	-640	--	--
	4.57-4.66	R	.044	--	--	-990	--	--
	5.36-5.46	R	.069	--	--	-550	--	--
	6.10-6.19	R	.039	--	--	-750	--	--
	7.16-7.32	R	.047	--	--	-530	--	--
	7.99-8.11	R	.053	--	--	-580	--	--
	8.66-8.81	R	.069	--	--	-590	--	--
	9.14-9.30	R	.059	--	--	-530	--	--
	9.82-9.94	R	.080	--	--	-610	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N46--Continued								
	10.67-10.85	R	0.062	--	--	-58O	--	--
	11.58-11.70	R	.059	--	--	-830	--	--
	12.25-12.34	R	.067	--	--	-1,100	--	--
	13.93-13.99	R	.043	--	--	-5,700	--	--
	15.15-15.24	R	.070	--	--	-720	--	--
	15.48-15.58	R	.039	--	--	-860	--	--
	16.25-16.31	R	.041	--	--	-1,100	--	--
	16.98-17.04	R	.032	--	--	-1,000	--	--
	17.56-17.68	R	.043	--	--	-750	--	--
	23.47-23.59	R	.247	--	--	-8,300	--	--
	23.71-23.80	R	.281	--	--	-5,400	--	--
	23.99-24.08	R	.172	--	--	-600	--	--
	24.32-24.38	R	.231	--	--	-340	--	--
	24.78-24.84	R	.233	--	--	-480	--	--
	25.60-25.70	R	.172	--	--	-350	--	--
	26.34-26.43	R	.194	--	--	-340	--	--
	27.04-27.13	R	.289	--	--	-360	--	--
	27.22-27.26	R	.177	--	--	-390	--	--
	27.68-27.77	R	.182	--	--	-350	--	--
	28.53-28.65	R	.136	--	--	-340	--	--
	28.77-28.83	R	.256	--	--	-340	--	--
	29.32-29.41	R	.177	--	--	-310	--	--
	30.05-30.18	R	.187	--	--	-330	--	--
USW	0.30-0.38	D	.078	--	--	-590	--	--
UZ-N47	1.83-1.90	D	.073	--	--	-630	--	--
	3.35-3.43	D	.083	--	--	-500	--	--
	4.72-4.95	D	.034	--	--	-5,200	--	--
	6.32-6.40	D	.032	--	--	-5,800	--	--
	7.92-8.00	D	.033	--	--	-5,100	--	--
	9.22-9.30	D	.043	--	--	-2,400	--	--
	10.67-10.76	R	.042	--	--	-1,000	--	--
	11.70-11.80	R	.059	--	--	-900	--	--
	12.16-12.24	R	.067	--	--	-690	--	--
	12.44-12.50	R	.070	--	--	-900	--	--
	16.82-16.92	R	.051	--	--	-1,700	--	--
	17.25-17.37	R	.054	--	--	-920	--	--
	21.46-21.52	R	.326	--	--	-860	--	--
	21.64-21.73	R	.224	--	--	-560	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW								
UZ-N47--Continued								
	22.31-22.40	R	0.251	--	--	-380	--	--
	22.74-22.80	R	.326	--	--	-520	--	--
	23.09-23.16	R	.297	--	--	-460	--	--
	23.56-23.64	R	.294	--	--	-430	--	--
	23.99-24.08	R	.314	--	--	-600	--	--
	24.32-24.38	R	.223	--	--	-560	--	--
	24.64-24.72	R	.199	--	--	-550	--	--
	25.02-25.12	R	.183	--	--	-650	--	--
	25.51-25.59	R	.155	--	--	-580	--	--
	26.06-26.12	R	.265	--	--	-600	--	--
USW	1.62-1.68	R	.027	--	--	-28,000	--	--
UZ-N48	4.82-4.88	R	.024	--	--	-42,000	--	--
	7.62-7.68	R	.023	--	--	-31,000	--	--
USW	0.0-0.61	D	.101	--	--	--	--	--
UZ-N49	0.23-0.30	D	.106	--	--	-540	--	--
	3.66-3.75	R	.029	--	--	-12,000	--	--
	3.66-3.75	R	--	--	--	-14,000	--	--
	10.67-10.76	R	.026	--	--	-24,000	--	--
	10.67-10.76	R	--	--	--	-26,000	--	--
	0.0-0.6	D	.068	--	--	-50	-50	--
UZ-N69	1.8-2.4	D	.062	--	--	-170	-160	-180
	2.4-3.0	D	.052	--	--	-230	-200	-210
USW	2.13-2.38	R	.032	--	--	-2,800	--	--
UZ-N70	5.67-5.79	R	.033	--	--	-740	--	--
	6.71-6.83	R	.027	--	--	-2,500	--	--
	8.75-8.81	R	.037	--	--	-700	--	--
	10.06-10.12	R	.038	--	--	-630	--	--
USW	3.93-3.99	R	.038	--	--	-570	--	--
UZ-N74	4.11-4.27	R	.020	--	--	-2,500	--	--
	7.92-7.96	R	.032	--	--	--	--	--
	8.05-8.08	R	.035	--	--	-15,000	--	--
	10.67-10.76	R	.036	--	--	-1,100	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.09-0.15	D	0.126	--	--	-840	--	--
UZ-N75	1.83-1.98	R	.046	--	--	-740	--	--
	2.87-3.05	R	.049	--	--	-910	--	--
	5.09-5.18	R	.043	--	--	-1,300	--	--
	8.11-8.20	R	.046	--	--	-1,000	--	--
	10.88-11.00	R	.051	--	--	-600	--	--
UE-25	1.07-1.22	D	.027	--	--	--	--	--
UZN #85	2.13-2.29	D	.059	--	--	--	--	--
	4.04-4.19	D	.025	--	--	--	--	--
	4.04-4.19	D	.023	--	--	--	--	--
	5.18-5.33	D	.017	--	--	--	--	--
	5.18-5.33	D	.020	--	--	--	--	--
	8.53-8.38	D	.017	--	--	--	--	--
	8.53-8.38	D	.016	--	--	--	--	--
	9.75-9.91	D	.021	--	--	--	--	--
	9.75-9.91	D	.021	--	--	--	--	--
	11.28-11.43	D	.017	--	--	--	--	--
	12.80-12.95	D	.029	--	--	--	--	--
	12.80-12.95	D	.037	--	--	--	--	--
	14.33-14.48	D	.035	--	--	--	--	--
	14.33-14.48	D	.025	--	--	--	--	--
	16.46-16.61	D	.029	--	--	--	-3,400	--
	16.84-16.99	D	.038	--	--	--	--	--
	17.37-17.53	D	.035	--	--	--	--	--
	17.75-17.91	D	.035	--	--	--	-2,300	--
	17.75-17.91	D	.044	--	--	--	--	--
	18.90-19.05	D	.032	--	--	--	-2,700	--
	18.90-19.05	D	.039	--	--	--	--	--
	19.28-19.43	D	.035	--	--	--	--	--
	20.42-20.57	D	.017	--	--	--	-6,500	--
	20.80-20.96	D	.033	--	--	--	--	--
	21.95-22.10	D	.030	--	--	--	-3,500	--
	23.47-23.62	D	.032	--	--	--	-2,300	--
	23.47-23.62	D	.048	--	--	--	--	--
	23.85-24.00	D	.023	--	--	--	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	0.6-1.2	D	0.041	--	--	-570	-800	-720
UZ-N90	1.8-2.4	D	.061	--	--	-280	-390	-460
	1.8-2.4	D	.066	--	--	--	--	--
	3.4-4.0	D	.068	--	--	--	-450	-300
	3.4-4.0	D	.075	--	--	--	--	--
	4.9-5.5	D	.074	--	--	-310	-340	-370
	4.9-5.5	D	.077	--	--	--	--	--
	6.1-6.7	D	.082	--	--	-280	-270	-370
	6.1-6.7	D	.111	--	--	--	--	--
	7.9-8.5	D	.083	--	--	--	--	--
	7.9-8.5	D	.070	--	--	--	--	--
	9.4-9.9	D	--	--	--	-190	--	--
UE-29	0.15-0.23	D	.057	--	--	-430	--	--
UZN #91	1.75-1.83	D	.073	--	--	-670	--	--
	3.43-3.51	D	.097	--	--	-370	--	--
	4.80-4.88	D	.089	--	--	-380	--	--
	6.25-6.32	D	.071	--	--	-1,000	--	--
	7.77-7.85	D	.058	--	--	-710	--	--
	9.52-9.60	D	.072	--	--	-660	--	--
	12.19-12.34	D	.081	--	--	-540	--	--
	15.54-15.62	D	.110	--	--	-450	--	--
	16.92-16.99	D	.105	--	--	-370	--	--
	18.67-18.74	D	.161	--	--	-440	--	--
	21.03-21.09	R	.042	--	--	-65,000	--	--
	21.03-21.09	R	--	--	--	-56,000	--	--
	22.37-22.49	R	.032	--	--	-70,000	--	--
	22.37-22.49	R	--	--	--	-65,000	--	--
	22.74-22.83	R	.026	--	--	-74,000	--	--
	22.74-22.83	R	--	--	--	-69,000	--	--
	23.99-24.08	R	.025	--	--	-49,000	--	--
	23.99-24.08	R	--	--	--	-54,000	--	--
	27.80-27.86	R	.055	--	--	-34,000	--	--
	27.80-27.86	R	--	--	--	-39,000	--	--
	28.07-28.19	R	.080	--	--	-730	--	--
UE-25	0.0-0.61	D	.070	--	--	-1,100	--	--
UZN #92	0.30-0.38	D	.078	--	--	-1,500	--	--
	1.75-1.83	D	.087	--	--	-800	--	--
	3.05-3.20	D	.056	--	--	-3,900	--	--
	4.57-4.72	D	.085	--	--	-2,800	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
UE-25								
UZN #92--Continued								
	6.10-6.25	D	0.080	--	--	-1,300	--	--
	9.14-9.30	D	.073	--	--	-540	--	--
	10.90-10.97	D	.072	--	--	-700	--	--
	12.19-12.34	D	.059	--	--	-830	--	--
	13.87-13.94	D	.073	--	--	-19,000	--	--
	15.39-15.47	D	.079	--	--	-1,800	--	--
	18.29-18.38	R	.022	--	--	-81,000	--	--
	18.99-19.08	R	.053	--	--	-73,000	--	--
	19.69-19.81	R	.030	--	--	-77,000	--	--
	19.81-19.84	R	.033	--	--	-88,000	--	--
	20.12-20.27	R	.023	--	--	-82,000	--	--
	20.82-20.91	R	.023	--	--	-79,000	--	--
	21.70-21.79	R	.020	--	--	-76,000	--	--
	22.49-22.56	R	.022	--	--	-71,000	--	--
	27.52-27.64	R	.009	--	--	-89,000	--	--
	27.89-28.04	R	.026	--	--	-40,000	--	--
	32.13-32.22	R	.016	--	--	-92,000	--	--
	32.70-32.80	R	.013	--	--	-90,000	--	--
	33.19-33.53	R	.028	--	--	-69,000	--	--
	33.53-33.59	R	.040	--	--	-67,000	--	--
	34.90-35.05	R	.008	--	--	-75,000	--	--
	35.30-35.54	R	--	--	--	-35,000	--	--
	35.30-35.54	R	--	--	--	-35,000	--	--
	36.52-36.58	R	.015	--	--	-760	--	--
UE-25	0.27-0.30	D	.122	--	--	-520	--	--
UZN #97	1.83-2.44	D	--	--	--	-980	--	--
	2.13-2.21	D	.045	--	--	--	--	--
	3.35-3.51	D	--	--	--	-1,000	--	--
	3.66-3.73	D	.054	--	--	--	--	--
	5.18-5.26	D	.058	--	--	-640	--	--
	6.71-6.78	D	.048	--	--	-740	--	--
	7.62-7.70	D	.020	--	--	-990	--	--
	9.37-9.45	D	.045	--	--	-810	--	--
	10.90-10.97	D	.073	--	--	-680	--	--
	12.50-12.57	D	.025	--	--	-1,100	--	--
	14.02-14.10	D	.048	--	--	-820	--	--
	16.92-17.07	R	.031	--	--	-1,600	--	--

Table 5. Results of laboratory analyses of hydrologic characteristics of core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth interval (meters)	Core type	Gravimetric water content (grams per gram)			Water potential (kilopascals)		
			Composite	Coarse	Fine	Composite	Coarse	Fine
USW	7.92-8.23	R	0.230	--	--	-11,000	--	--
UZ-N98	8.69-8.84	R	.322	--	--	-720	--	--
	9.45-9.63	R	.398	--	--	-410	--	--
	10.36-10.49	R	.369	--	--	-340	--	--
	11.25-11.34	R	.271	--	--	-350	--	--
	11.70-11.80	R	.266	--	--	-570	--	--
	12.13-12.19	R	.251	--	--	-470	--	--
	12.62-12.71	R	.246	--	--	-400	--	--
	13.44-13.56	R	.307	--	--	-360	--	--
	13.72-13.84	R	.356	--	--	-290	--	--
	14.51-14.63	R	.312	--	--	-270	--	--
	15.24-15.36	R	.320	--	--	-390	--	--
	16.70-16.76	R	.339	--	--	-270	--	--
	16.76-16.82	R	.329	--	--	-210	--	--
	17.37-17.47	R	.310	--	--	-330	--	--
	17.74-17.83	R	.279	--	--	-480	--	--
	18.23-18.29	R	.259	--	--	-310	--	--
	18.53-18.59	R	.264	--	--	-380	--	--
	19.00-19.08	R	.257	--	--	-280	--	--
	19.57-19.66	R	.256	--	--	-320	--	--
	20.04-20.12	R	.325	--	--	-290	--	--
	20.45-20.54	R	.505	--	--	-350	--	--
	20.97-21.06	R	.390	--	--	-330	--	--
	21.24-21.34	R	.198	--	--	-300	--	--
	21.55-21.64	R	.189	--	--	-320	--	--
	22.10-22.22	R	.169	--	--	-350	--	--
	22.52-22.62	R	.162	--	--	-300	--	--

Table 6. Description of central tendency and dispersion of gravimetric water-content data from coarse drill cuttings as a function of lithology and degree of welding

Lithologic unit	Degree of welding	Number of samples	Gravimetric water content (grams per gram)			
			Data range	Mean	Standard deviation	Median
Alluvium/colluvium	Does not apply	543	0.008 to 0.182	0.047	0.023	0.046
Timber Mountain Tuff Rainier Mesa Member[1]	Nonwelded to partially	17	0.020 to 0.062	.039	.014	.041
Paintbrush Tuff Bedded tuffs	Nonwelded	21	0.106 to 0.223	.155	.030	.163
Tiva Canyon Member	Nonwelded to partially	12	0.009 to 0.305	.112	.122	.028
Tiva Canyon Member	Moderately	186	0.007 to 0.313	.050	.048	.036
Tiva Canyon Member	Densely	682	0.008 to 0.096	.034	.015	.031
Yucca Mountain Member	Nonwelded to partially	74	0.035 to 0.290	.137	.071	.139
Yucca Mountain Member	Moderately	62	0.023 to 0.084	.051	.014	.048
Topopah Spring Member	Densely	24	0.015 to 0.040	.025	.005	.025

[1]Composite of drill-cuttings samples

Table 7. Description of central tendency and dispersion of gravimetric water-content data from composite core samples as a function of lithology and degree of welding

Lithologic unit	Degree of welding	Number of samples	Gravimetric water content (grams per gram)			
			Data range	Mean	Standard deviation	Median
Alluvium/colluvium	Does not apply	169	0.017 to 0.161	0.058	0.026	0.058
Paintbrush Tuff Bedded tuffs	Nonwelded	38	0.123 to 0.505	.238	.084	.210
Tiva Canyon Member	Nonwelded to partially	34	0.149 to 0.398	.246	.077	.246
Tiva Canyon Member	Moderately	18	0.020 to 0.322	.128	.111	.051
Tiva Canyon Member	Densely	76	0.016 to 0.091	.029	.011	.027
Yucca Mountain Member	Nonwelded to partially	59	0.039 to 0.326	.165	.071	.162
Yucca Mountain Member	Moderately	17	0.032 to 0.080	.055	.013	.059

Table 8. Summary of linear-regression analyses for water-content and water-potential values of coarse drill cuttings versus composite core samples for rock types that have different degrees of welding

Rock type	Independent variable	Dependent variable	Number of samples	Linear regression equation parameters		
				Coefficient of determination	Intercept	Slope
Alluvium/colluvium	Gravimetric water content of coarse drill-cutting samples	Gravimetric water content of composite core samples	115	0.627	0.019	0.851
Nonwelded and bedded tuff	Gravimetric water content of coarse drill-cutting samples	Gravimetric water content of composite core samples	67	.569	.05	.799
Moderately and densely welded tuff	Gravimetric water content of coarse drill-cutting samples	Gravimetric water content of composite core samples	77	.783	-.011	1.503
Alluvium/colluvium	Water potential of coarse drill-cutting samples	Water potential of composite core samples	102	.316	-518	.563
Nonwelded and bedded tuff	Water potential of coarse drill-cutting samples	Water potential of composite core samples	54	.024	-546	.175
Moderately and densely welded tuff	Water potential of coarse drill-cutting samples	Water potential of composite core samples	44	.217	-5060	.554

Table 9. Description of central tendency and dispersion of water-content data of coarse drill cuttings from moderately and densely welded lithologic units of the Tiva Canyon Member

Lithologic unit	Degree of welding	Number of samples	Gravimetric water content (grams per gram)			
			Data range	Mean	Standard deviation	Median
Caprock	Moderately	40	0.008 to 0.313	0.040	0.048	0.031
Upper cliff	Moderately	72	0.007 to 0.072	.031	.016	.031
Upper lithophysal	Densely	63	0.018 to 0.140	.058	.034	.044
Clinkstone	Densely	19	0.012 to 0.082	.040	.024	.036
Lower lithophysal	Densely	146	0.012 to 0.074	.035	.009	.035
Hackly	Densely	258	0.008 to 0.074	.030	.011	.029
Columnar	Densely	185	0.011 to 0.053	.027	.008	.025

Table 10. Description of central tendency and dispersion of water-content data of composite core samples from moderately and densely welded lithologic units of the Tiva Canyon Member

Lithologic unit	Degree of welding	Number of samples	Gravimetric water content (grams per gram)			
			Data range	Mean	Standard deviation	Median
Caprock	Moderately	8	0.020 to 0.049	0.037	0.009	0.038
Upper lithophysal	Densely	2	0.046 to 0.051	.048	.004	.051
Clinkstone	Densely	1	0.034			
Lower lithophysal	Densely	54	0.017 to 0.051	.029	.007	.027
Hackly	Densely	16	0.016 to 0.052	.026	.008	.024
Columnar	Densely	9	0.023 to 0.322	.126	.110	.091

Table 11. Description of central tendency and dispersion of water-potential data from coarse drill cuttings as a function of lithology and degree of welding

Lithologic unit	Degree of welding	Number of samples	Water potential (kilopascals)			
			Data range	Mean	Standard deviation	Median
Alluvium/colluvium	Does not apply	651	-78,000 to -50	-3,411	6,304	-750
Timber Mountain Tuff Rainier Mesa Member	Nonwelded to partially	9	-910 to -140	-438	239	-300
Paintbrush Tuff Bedded tuffs	Nonwelded	43	-7,200 to -420	-1,267	1,650	-630
Tiva Canyon Member	Nonwelded to partially	18	-18,000 to -490	-4,762	5,936	-920
Tiva Canyon Member	Moderately	204	-31,000 to -220	-2,651	5,575	-650
Tiva Canyon Member	Densely	687	-60,000 to -140	-4,671	5,921	-3,200
Yucca Mountain Member	Nonwelded to partially	80	-3,500 to -22	-837	576	-670
Yucca Mountain Member	Moderately	63	-7,500 to -410	-1,193	1,158	-840
Topopah Spring Member	Moderately	24	-7,600 to -1,400	-3,654	1,568	-3,500

Table 12. Description of central tendency and dispersion of water-potential data from composite core samples as a function of lithology and degree of welding

Lithologic unit	Degree of welding	Number of samples	Water Potential			
			Data range	Mean	Standard deviation	Median
Alluvium/colluvium	Does not apply	117	-20,000 to-50	-1,647	3,162	-550
Paintbrush Tuff Bedded tuffs	Nonwelded	38	-950 to -280	-422	142	-350
Tiva Canyon Member	Nonwelded to partially	33	-1,200 to -210	-517	209	-470
Tiva Canyon Member	Moderately	17	-15,000 to -570	-2,343	4,098	-760
Tiva Canyon Member	Densely	73	-42,000 to -530	-11,882	11,971	-8,300
Yucca Mountain Member	Nonwelded to partially	60	-8,300 to -210	-779	1,194	-550
Yucca Mountain Member	Moderately	17	-5,700 to -530	-1,170	1,198	-900

Table 13. Description of central tendency and dispersion of water-potential data of drill cuttings from moderately and densely welded lithologic units of the Tiva Canyon Member

Lithologic unit	Degree of welding	Number of samples	Water potential			
			Data range	Mean	Standard deviation	Median
Caprock	Moderately	45	-31,000 to -240	-4,774	8,915	-670
Upper cliff	Moderately	83	-31,000 to -270	-2,945	5,248	-720
Upper lithophysal	Moderately	64	-6,900 to -220	-947	1,258	-530
Upper lithophysal	Densely	19	-11,000 to -210	-2,617	3,277	-580
Clinkstone	Densely	145	-17,000 to -240	-2,296	2,398	-1,600
Lower lithophysal	Densely	262	-36,000 to -140	-5,327	5,309	-4,000
Hackly	Densely	177	-60,000 to -220	-7,768	8,068	-6,100
Columnar	Densely	84	-15,000 to -400	-3,104	4,054	-890
Columnar	Moderately	14	-2,900 to -450	-1,561	949	-1,800

Table 14. Description of central tendency and dispersion of water-potential data of composite core samples from moderately and densely welded lithologic units of the Tiva Canyon Member

Lithologic unit	Degree of welding	Number of samples	Water potential			
			Data range	Mean	Standard deviation	Median
Caprock	Moderately	7	-15,000 to -570	-3,160	5,259	-1,100
Upper lithophysal	Densely	2	-1,000 to -600	-800	283	-600
Clinkstone	Densely	1	-5,800			
Lower lithophysal	Densely	52	-42,000 to -530	-10,105	10,550	-8,200
Hackly	Densely	15	-42,000 to -610	-20,941	14,330	-26,000
Columnar	Densely	9	-11,000 to -580	-3,940	4,097	-1,000

Table 15. Results of laboratory analyses of physical properties of rotary-core samples from selected neutron-access boreholes

[Analyses by Holmes & Narver Materials Testing Laboratory, Inc., Mercury, Nevada; g/cm^3, grams per cubic centimeter; cm^3/cm^3, cubic centimeter per cubic centimeter]

Neutron-access borehole number	Depth (meters)	Bulk density (g/cm^3)	Grain density (g/cm^3)	Porosity (cm^3/cm^3)
UE-25 UZN #10	1.22	1.52	2.44	0.377
	1.83	1.54	2.42	.364
	2.74	1.47	2.42	.393
	4.88	1.32	2.43	.457
	5.64	1.28	2.43	.473
	6.04	1.33	2.39	.444
	6.46	1.32	2.43	.457
	7.59	1.26	2.41	.477
	8.84	1.23	2.40	.488
	1.09	1.28	2.39	.464
	10.97	1.31	2.38	.450
	11.43	1.34	2.39	.439
	11.89	1.35	2.41	.440
	12.31	1.38	2.40	.425
	13.41	1.46	2.42	.397
	13.84	1.50	2.39	.372
	14.33	1.52	2.40	.367
	15.06	1.55	2.41	.357
	15.94	1.60	2.38	.328
	16.67	1.58	2.40	.342
	17.56	1.57	2.42	.351
	18.07	1.55	2.37	.346
	19.11	1.49	2.39	.377
	19.42	1.50	2.38	.370
	19.69	1.48	2.37	.376
	20.36	1.40	2.37	.409
	20.57	1.40	2.38	.412
	20.94	1.33	2.36	.436
	21.43	1.28	2.37	.460
	22.01	1.34	2.37	.435
	22.40	1.35	2.38	.433
	22.59	1.36	2.39	.431
	23.32	1.31	2.38	.450
	29.11	1.01	2.44	.586
	29.93	1.22	2.42	.496
USW UZ-N24	8.08	1.94	2.49	.221
	8.72	1.64	2.55	.357
	8.99	1.56	2.50	.376
	9.30	1.45	2.52	.425
	9.75	1.54	2.46	.374

Table 15. Results of laboratory analyses of physical properties of rotary-core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Bulk density (g/cm^3)	Grain density (g/cm^3)	Porosity (cm^3/cm^3)
USW	9.88	1.59	2.49	0.361
UZ-N24--Continued	10.61	1.70	2.43	.300
	10.82	1.72	2.43	.292
	11.49	1.71	2.42	.293
	11.73	1.70	2.42	.298
	12.19	1.71	2.44	.299
	13.66	1.61	2.43	.337
	13.72	1.57	2.43	.354
	14.72	1.42	2.51	.434
	15.58	1.27	2.50	.492
	15.91	1.24	2.50	.504
	16.86	1.25	2.48	.496
	17.37	1.29	2.49	.482
	17.83	1.30	2.50	.480
	18.17	1.34	2.47	.457
	18.29	1.36	2.46	.447
	19.05	1.35	2.45	.449
	19.51	1.32	2.38	.445
	20.12	1.16	2.39	.515
	20.82	0.96	2.42	.603
	21.21	.99	2.43	.593
	21.58	1.32	2.43	.457
	21.82	1.34	2.39	.439
	22.16	1.28	2.38	.462
	22.68	1.33	2.42	.450
USW UZ-N46	0.12	1.18	2.39	.506
	.94	1.22	2.44	.500
	1.52	1.34	2.46	.455
	2.87	1.51	2.46	.386
	3.57	1.59	2.48	.359
	4.11	1.65	2.45	.327
	4.57	1.64	2.46	.333
	5.36	1.63	2.48	.343
	6.10	1.78	2.48	.282
	7.16	1.77	2.47	.283
	7.99	1.81	2.48	.270
	8.66	1.84	2.48	.258
	9.14	1.83	2.47	.259
	9.81	1.87	2.49	.249
	10.67	1.91	2.50	.236
	11.58	2.06	2.48	.169
	12.25	2.01	2.50	.196

Table 15. Results of laboratory analyses of physical properties of rotary-core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Bulk density (g/cm^3)	Grain density (g/cm^3)	Porosity (cm^3/cm^3)
USW	13.93	2.01	2.51	0.199
UZ-N46--Continued	15.15	2.06	2.51	.179
	15.48	2.03	2.46	.175
	16.25	2.03	2.51	.191
	16.98	2.02	2.49	.189
	17.56	2.12	2.49	.149
	23.47	1.50	2.48	.395
	23.71	1.53	2.51	.390
	23.99	1.74	2.43	.284
	24.32	1.60	2.48	.355
	24.78	1.54	2.45	.371
	25.60	1.35	2.42	.442
	26.34	1.41	2.43	.420
	27.04	1.38	2.41	.427
	27.22	1.39	2.41	.423
	27.68	1.42	2.43	.416
	28.53	1.48	2.39	.381
	28.77	1.25	2.42	.483
	29.32	1.33	2.43	.453
	30.05	1.30	2.41	.461
USW UZ-N47	10.67	1.97	2.49	.209
	11.70	2.05	2.48	.173
	12.16	2.06	2.50	.176
	16.83	2.12	2.48	.145
	17.25	2.11	2.49	.153
	21.46	1.51	2.55	.408
	21.64	1.53	2.47	.381
	22.74	1.34	2.47	.457
	23.10	1.44	2.46	.415
	23.56	1.41	2.41	.415
	23.68	1.40	2.44	.426
	24.32	1.41	2.43	.420
	24.66	1.30	2.42	.463
	25.02	1.42	2.41	.411
	25.51	1.47	2.43	.395
	26.06	1.31	2.48	.472
USW UZ-N98	7.92	1.97	2.52	.218
	8.69	1.13	2.52	.552
	9.45	1.39	2.53	.451
	10.36	1.39	2.53	.451
	11.25	1.54	2.51	.386

Table 15. Results of laboratory analyses of physical properties of rotary-core samples from selected neutron-access boreholes--Continued

Neutron-access borehole number	Depth (meters)	Bulk density (g/cm^3)	Grain density (g/cm^3)	Porosity (cm^3/cm^3)
USW	11.70	1.57	2.48	0.367
UZ-N98--Continued	12.13	1.55	2.46	.370
	12.62	1.53	2.47	.381
	13.44	1.43	2.53	.435
	13.72	1.38	2.56	.461
	14.51	1.45	2.49	.418
	15.24	1.42	2.45	.420
	16.70	1.25	2.46	.492
	16.76	1.26	2.48	.492
	17.37	1.24	2.51	.506
	17.74	1.27	2.50	.492
	18.23	1.30	2.46	.472
	18.53	1.34	2.46	.455
	19.02	1.29	2.46	.476
	19.57	1.32	2.44	.459
	20.06	1.20	2.51	.522
	20.45	0.94	2.57	.634
	20.97	.99	2.44	.594
	21.24	1.28	2.43	.473
	21.55	1.30	2.42	.463
	22.10	1.25	2.41	.481
	22.52	1.26	2.40	.475

Table 16. Description of central tendency and dispersion of density and porosity data as a function of lithology and degree of welding

Lithologic unit	Degree of welding	Number of samples	Bulk density (grams per cubic centimeter)				Porosity (cubic centimeter per cubic centimeter)			
			Data range	Mean	Standard deviation	Median	Data range	Mean	Standard deviation	Median
Paintbrush Tuff Bedded Tuff	Nonwelded	31	0.94 to 1.48	1.258	0.141	1.300	0.381 to 0.634	0.484	0.060	0.472
Tiva Canyon Member	Nonwelded to partially	27	1.24 to 1.72	1.426	.164	1.420	.292 to .506	.420	.071	.435
Tiva Canyon Member	Moderately	11	1.39 to 1.70	1.538	.096	1.550	.300 to .451	.383	.044	.374
Yucca Mountain Member	Nonwelded to partially	57	1.18 to 1.84	1.460	.153	1.420	.258 to .506	.398	.058	.412
YuccaMountain Member	Moderately	16	1.83 to 2.12	2.016	.085	2.030	.145 to .259	.190	.034	.189

Table 17. Results of laboratory analyses of tritium in drive-core samples from selected neutron-access boreholes

Neutron-access borehole number	Depth interval (meters)	Decay date	Tritium		Extracted water (grams per gram)
			(Tritium units)	(Picocuries per liter)	
UE-25 UZN #1	2.12-2.36	10-10-84	18.2 ± 0.8	58.1 ± 2.4	0.055
	4.88-5.49	10-10-84	17.7 ± 0.7	56.5 ± 2.4	.102
	6.40-6.71	10-10-84	18.8 ± 0.8	60.0 ± 2.7	.080
	7.92-8.08	10-10-84	20.0 ± 0.8	63.9 ± 2.5	.066
UE-25 UNZ #8	3.05-3.66	7-18-84	31.3 ± 1.2	99.9 ± 3.7	.087
	4.57-5.18	7-18-84	26.9 ± 1.0	86.0 ± 3.3	.081
	6.10-6.71	7-18-84	18.5 ± .8	59.1 ± 2.5	.073
	7.62-8.23	7-18-84	8.8 ± 0.5	28.1 ± 1.7	.066
	9.14-9.75	7-18-84	2.8 ± 0.4	9.1 ± 1.4	.074
	10.67-11.28	7-18-84	2.8 ± 0.4	9.0 ± 1.3	.069
UE-25 UZN #13	1.52-2.13	7-18-84	22.3 ± 1.0	71.1 ± 3.1	.048
USW UZ-90	0.61-1.22	12-17-84	15.4 ± 0.7	49.1 ± 2.2	.045
	2.21-2.36	12-17-84	12.4 ± 0.6	39.4 ± 1.9	.072
	3.73-3.88	12-17-84	7.8 ± 0.5	24.8 ± 1.5	.097
	5.26-5.41	12-17-84	5.9 ± 0.4	18.9 ± 1.4	.086
	6.48-6.63	12-17-84	7.4 ± 0.5	23.6 ± 1.5	.097
	9.68-9.83	12-17-84	8.4 ± 0.5	26.8 ± 1.6	.092

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MEMORANDUM

Date: January 16, 1998

To: Distribution

From: Becci Clayton, Reports Processing Unit, ESIP, YMPB, Denver, CO, MS 421

Re: PUBLICATIONS -- Errata sheet for Open-File Report 92-657, "Geohydrologic data collected from shallow neutron-access boreholes and resultant-preliminary geohydrologic evaluations, Yucca Mountain area, Nye County, Nevada", by D.O. Blout, D.P. Hammermeister, C.L. Loskot, and M.P. Chornack

An error was made in the above listed report on page 143, Table 15, in the depth column for UE-25 UZN #10: depth **1.09** meters should be **10.09** meters.

Apologies are made for any inconvenience this may have caused.