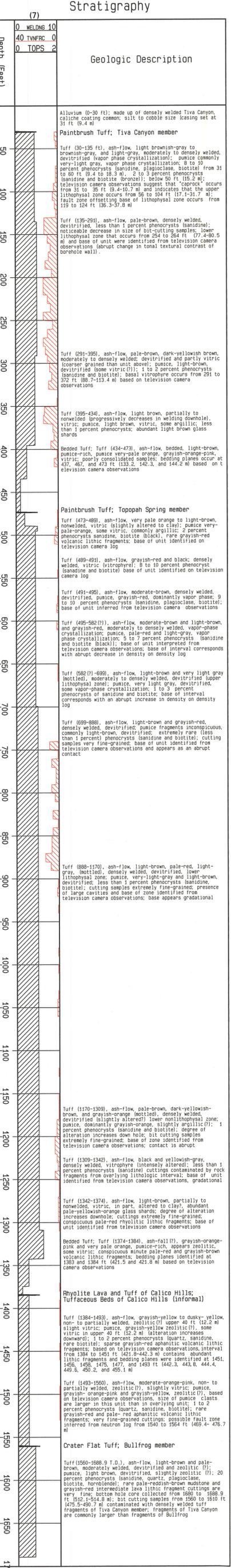
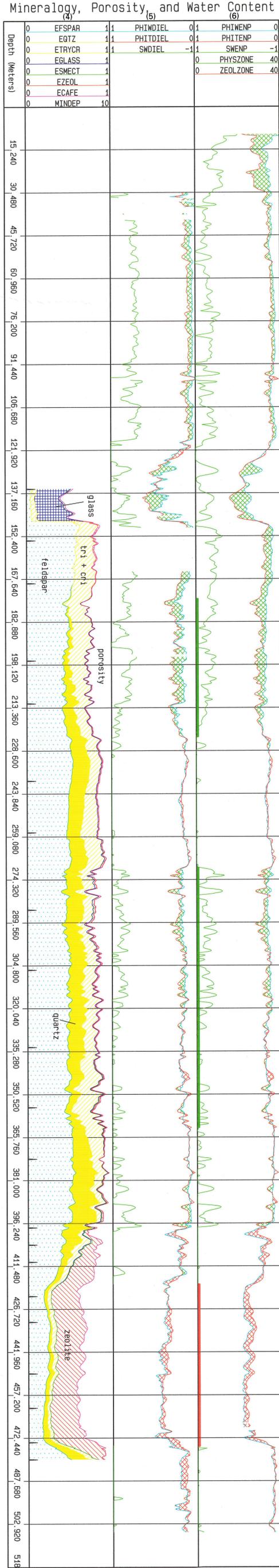
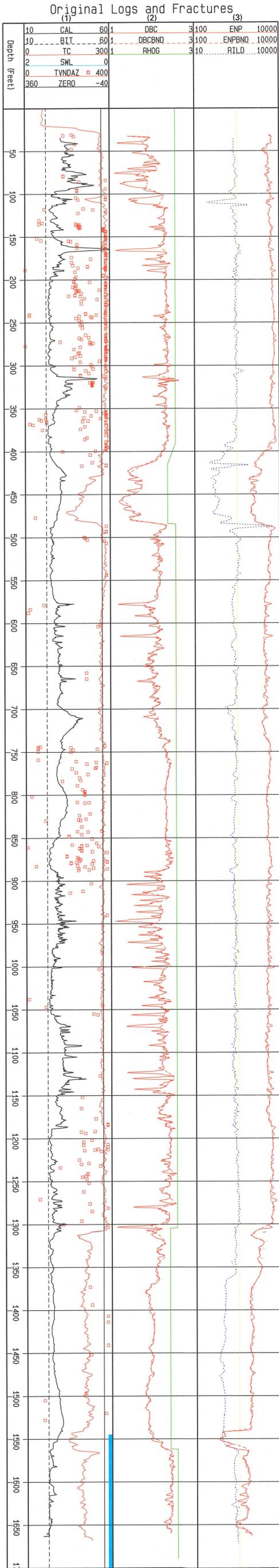


USW WT-1



BOREHOLE USW WT-1, YUCCA MOUNTAIN, NEVADA

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Borehole USW WT-1 was completed in May, 1983 to a total depth of 1689 feet. The hole was rotary drilled using air foam consisting of air, detergent, and water (Muller and Kibler, 1989). Depth on the plot is measured along hole, and has not been corrected for deviation. Hole deviation is 2 to 3 degrees, (Plate 17 in Nelson and others, 1991); at a measured depth of 1625 feet, the computed true vertical depth is 1623.85 feet, and the horizontal offset is 53 feet.

Original logs in columns 1-3, acquired on May 15 and 16, 1983, were described and presented by Nelson and others, 1991. USW WT-1 was drilled for the purpose of monitoring water levels; the static water level is indicated by a cyan bar in column 1 (Robison, 1984).

Mineralogy in column 4 is derived from X-ray diffraction data by Bish and Chipera (1989). Their data have been converted to volume percent, combined with porosity, and in several places extrapolated to boundaries inserted where marked changes in log response occur.

Porosity and water content computed from the dielectric and density logs are shown in column 5 as phwidiel and phwienp, using a method described by Nelson, 1993. Porosity and water content computed from the epithermal neutron and density logs are shown in column 6 as phitenp and phwienp (Nelson, 1994). Green hatching between the porosity and water content curves denotes air-filled porosity. Red hatching appears where water content exceeds porosity, often indicating the presence of zeolitic minerals.

Saturation (swidiel in column 5, swenp in column 6) is computed as the ratio of water content to porosity. It has been nulled in zones flagged as zeolone. The flags physzone and zeolone (green and red bars in column 6) denote the presence of abundant lithophysae and extensive alteration, respectively. Their depth extent is taken from inspection of the green and red hatch areas in columns 5 and 6 and from consideration of other logs, especially resistivity, rild.

Stratigraphic tops and degree of welding, given in column 7, and the geologic description, in the text column, are from R. Spengler, U.S. Geological Survey, written communication, 1995. The degree of welding (welding) increases to the right, in accordance with the geologic description.

Plots of individual fractures, column 1, observed on television (tvndaz) logs are plotted to show the azimuth of the dip of each fracture. The same data are plotted as fracture density (tvnfric) in column 7.

EXPLANATION OF CURVES AND SYMBOLS

Column 1
 CAL Caliper in cm, black curve.
 BIT Bit size in cm, black dash line.
 SWL Static water level, vertical cyan bar.
 TC Azimuth in API units, red curve.
 TVNDAZ Dip azimuth of fractures, from television, red squares. Undetermined azimuth is coded as 380 or 390 degrees.

Column 2
 DBC Density in g/cc, red curve.
 DBCBOUND Density bound in g/cc, red dash curve.
 RHOG Grain density in g/cc, green curve.

Column 3
 ENP Epithermal neutron in counts/sec, red curve.
 ENPBND Epithermal bound, red dash curve.
 RILD Induction resistivity in ohm-m, blue dot curve.
 DIEL Dielectric permittivity, ratio, green curve.

Column 4 [shaded areas represent volume fractions]
 EFSPAR Feldspar, blue dotted area to left-hand edge.
 EQTZ Quartz, dark yellow area.
 ETRVCR Tridymite + cristobalite + opal, light yellow.
 EGLASS Glass, blue gridded area.
 ESMECT Smectite + kaolinite, green slanted area.
 EZEOL Clinoptilolite + mordenite, red slant.
 ECAFE Calcite + hematite, magenta hatch.
 Porosity Unshaded area to the right-hand edge.
 MINDEP Depth of x-ray diffraction samples, ticks.

Column 5 [fractional volume of whole rock, increasing to left]
 PHWIDIEL Water content, from DIEL and DBCBOUND logs, cyan curve.
 PHITWENP Porosity, from DIEL and DBCBOUND logs, red curve. (green hatch where PHITWENP > PHWIDIEL, red where PHITWENP < PHWIDIEL.)
 SWIDIEL Saturation, ratio of PHWIDIEL to PHITWENP.

Column 6 [fractional volume of whole rock, increasing to left]
 PHWENP Water content, from ENPBND and DBCBOUND logs, cyan curve.
 PHITENP Porosity, from ENPBND and DBCBOUND logs, red curve. (green hatch where PHITENP > PHWENP, red where PHITENP < PHWENP.)
 SWENP Water saturation, ratio of PHWENP to PHITENP, green curve.
 PHYSZONE Lithophysal zone, picked from logs, green bar.
 ZEOLZONE Zeolitic zone, picked from logs, red bar.

Column 7
 TOPS Stratigraphic boundaries, black ticks.
 WELDNG Degree of welding from core inspection, black slant.
 TVNFRIC Number of fractures per 10 feet, from television, red.

NOTES

Date of last computation: February 1996
 Plot Date: February 1996
 Scientific Notebook: SN-0092

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A dielectric log was run in borehole WT1 but the DIEL curve was omitted from this plot. However, the derived logs PHWIDIEL and SWIDIEL are on the plot.