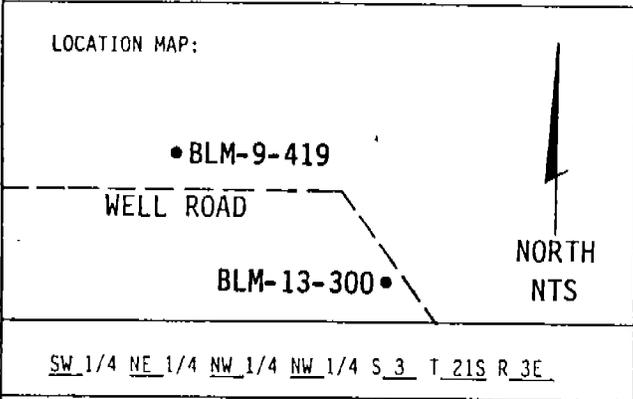


LITHOLOGIC LOG



SITE ID: NASA-WSTF LOCATION ID: BLM-13-300
 SITE COORDINATES (ft.):
 N 226664.58 E 410157.20
 GROUND ELEVATION (ft. MSL): 4665.98 (BRASS CAP)
 STATE: NEW MEXICO COUNTY: DOÑA ANA
 DRILLING METHOD: MUD/AIR-FOAM ROTARY
 DRILLING CONTR.: LARJON
 DATE STARTED: 16 AUGUST 1988 DATE COMPLETED: 2 SEPTEMBER 1988
 FIELD REP.: P. EGAN

COMMENTS: 7 7/8" pilot hole reamed to 12 1/4" with mud rotary,

0'-101'. 7 7/8" bit with air-foam 101'-322'. Top of bedrock = 220'. Total depth (T.D.) = 322'. Borehole drift = .5'

LOCATION DESCRIPTION:

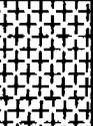
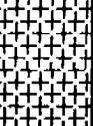
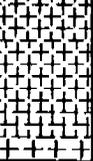
Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
5	=====+V		0'-100' drill time recorded in 5' or 10' intervals as noted below	0'-322' cuttings	0'-5' <u>SURFICIAL ALLUVIUM (Santa Fe Group):</u> The predominant color of the sample is moderate brown (5YR 4/4) when wet due to the high clay/silt content. Cuttings are large (up to 1 inch) and are angular chips and blocky fragments. Cuttings comprise 40% of the sample. Natural grains range from clay-size particles to very coarse-grained sand (.01 - .02 inches) and are angular to subrounded. The sample is poorly sorted and unconsolidated. The lithology is an unconsolidated gravel to cobble conglomerate with a clay/silt matrix. The alluvium contains clasts of limestone, rhyolite, siltstone, quartzite and caliche. A more detailed description of these clast lithologies follows.
10	+++++VVV:O		49		
15	++++VVV//:O				
20	++++VVV:EE		25		
25	++++VVV:EE				
30	++++VVV:EE		18		
35	++++VVV:V				
40	++++VVV:EE		20		
45	++++VVV:EE		11		
50	++++VVV:EE				
					5'-215' <u>ALLUVIUM (Santa Fe Group):</u> The predominant color of the samples throughout the interval is dark gray (N3) when wet. Average cutting size is 0.1 inches with cuttings up to 0.3 inches. Cuttings are angular chips or blocky fragments. Natural grains range from 0.05-0.2 inches and are angular to subrounded. The alluvium is a poorly-sorted, unconsolidated to possibly consolidated (longer drilling times), pebble to possibly boulder (longer drilling times, bit behavior) polygenetic conglomerate. Alluvial clasts are composed of medium dark gray (N4) to grayish black (N2) micritic limestone with occasional calcite-filled fractures 0.03 to 0.3 inches thick, white (N9) to moderate pink (5R 7/4) rhyolite with varying degrees of iron oxidation rimming mafic phenocrysts (pyrite or magnetite), light gray (N7) or grayish red purple (5RP 4/2) porphyritic andesite containing plagioclase and biotite or hornblende phenocrysts (alteration of plagioclase to epidote occurs frequently in lower part of section), transparent quartzite, dusky red (5R 3/4) and light olive gray (5Y 5/2) siltstone, moderate pink (5R 7/4) to moderate red (5R 4/6) granite and minor amounts of sandstone.

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
45'-60'					Increase in average cutting size to 0.25 inches.
50	VVVV:EE				
55	VVVV:DE		21		
60	VVVV:V//		12		60'-70' Decrease in average cutting size to 0.01 inches.
65	VVVV:V//				
70	VVVV:V//		16		70'-80' Increase in average cutting size to 0.25 inches.
75	VVVV:V//		11		75'-80' Clay-rich interval.
80	EEEE+VVVV				80'-100' Decrease in average cutting size to 0.01 inches.
85	VVVV:V//		16		
90	VVVV:V//		15		
95	VVVV:V//				
100	VVVV:V//		34		
105	EEEE+VVVV		100'-108' Drill time not available		105'-110' Clay-rich interval.
110	EEEE+VVVV:V//		108'-175' Drill rate reported in 20' intervals because of rapid rates		110'-120' Dramatic increase in clast size from approximately 0.4 inches to 1 inch. Limestone clasts exhibit large (up to 0.3 inches) fractures filled with calcite.
115	VVVV:V//				

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
115	+V /				
120	+V /		8		120'-125' First occurrence of both gray and purple andesite in volcanic fraction.
125	+V /				120'-135' Decrease in average cutting size to 0.3 inches.
130	+V /				
135	+V /				135'-140' Clay-rich interval with decreased average cutting size of 0.1 inches.
140	+V /		8		140'-155' Increase in cutting size to an average of 0.3 inches. Purple and gray andesite more abundant in volcanic fraction. Alteration of plagioclase to epidote more noticeable.
145	+V /				
150	+V /				
155	+V /				155'-160' Decrease in average cutting size to 0.1 inches.
160	+V /		11		160'-175' Increase in average cutting size to 0.3 inches.
165	+V /				
170	+V /				
175	+V /		6		
180	+V /		9		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
180	+++++VVVV: //		9		
185	+++++VVVV: //		13		185'-240' Cuttings are very uniform in size and shape. Average cutting size 0.05 inches.
190	+++++VVV: //		7		
195	+++++VVVV: //		23		195'-200' Slight increase in amount of purple andesite in volcanic fraction.
200	+++++VVVV: //		12		
205	+++++VVVV: //		8		
210	+++++VVVV: //		16		
215	+++++VVVV: //		16		<u>Rhyolite</u> 215'-322' <u>PORPHYRITIC ANDESITE (Oregon)</u> : The color of the andesite is grayish red purple (5RP 4/2). Cuttings average 0.3 inches in size are angular and uniform in size and shape. The lithology is a porphyritic andesite exhibiting propylitic alteration. Phenocrysts of plagioclase are predominantly euhedral and up to 0.1 inches in size. Hornblende phenocrysts are lath-shaped and up to 0.05 inches in size. Hornblende present in the altered andesite exhibits iron oxidation rims. Some sample intervals exhibit varying degrees of hydrothermal alteration that changes the color of the cuttings from purple to a pale yellowish brown (10YR 6/2), dark yellowish orange (10YR 6/6) and/or moderate red (5R 5/4). Some sample intervals contain both altered and unaltered andesite in varying amounts. The presence and amount of altered andesite in samples are recorded below. The andesite is relatively soft.
220	V →		35		
225	V →		10		
230	V →		11		
235	V →		11		
240	V →		15		215'-220' Sample consists mostly of pale yellowish brown (10YR 6/2) altered andesite. Some purple andesite is present.
245	V →		12		230'-235' Sample consists mostly of (greater than 50%) altered andesite.

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
245	V		12		
250	V		6.5		
255	V		7.5		
260	V		13		
265	V		9		265'-275' Samples consist mostly of altered andesite.
270	V		5		
275	V		4		275'-285' Samples contain some (less than 50%) altered andesite.
280	V		9		
285	V		13.5		
290	V		15.5		
295	V		14		295'-305' Samples contains some (less than 50%) altered andesite.
300	V		13		
305	V		9		
310	V		13		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
310	V →		13		
315	V →		14		
320	V →		11		
			6		Total depth = 322'.
325					
330					
335					
340					
345					
350					
355					
360					
365					
370					
375					