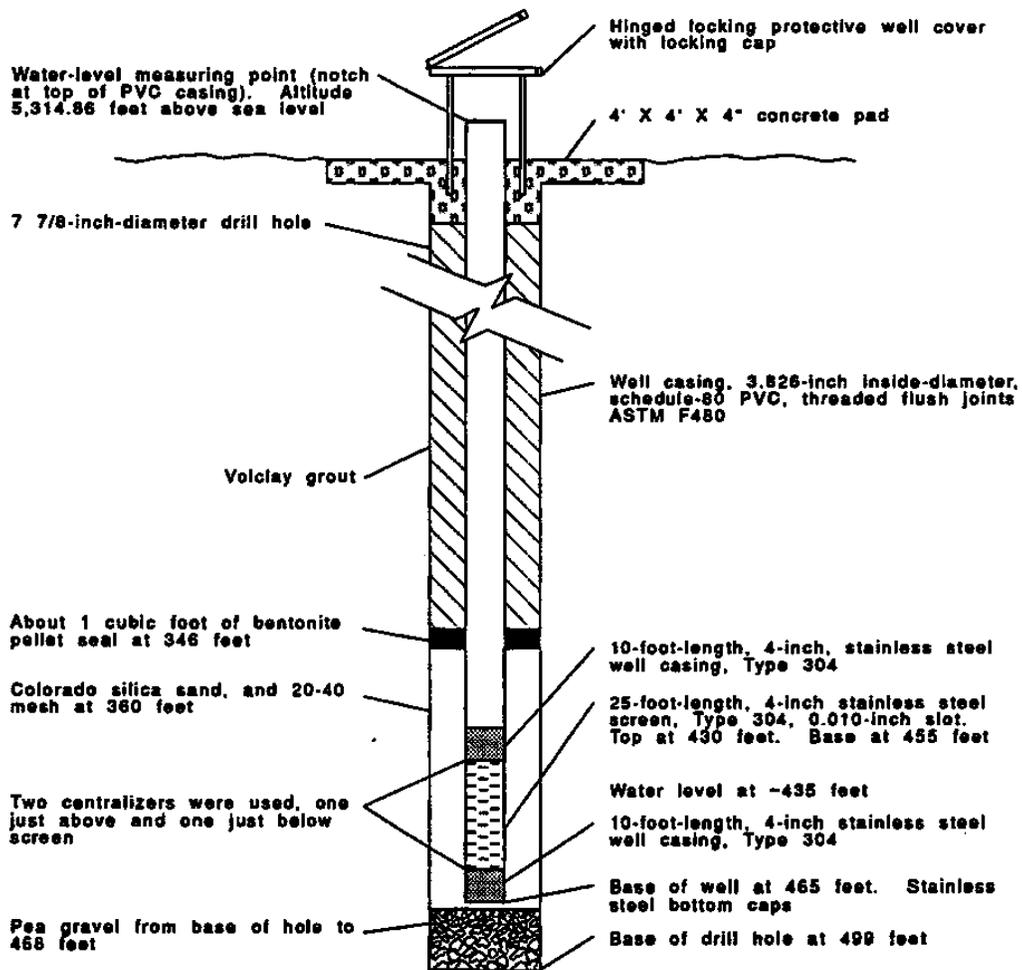


**KAFB-0417**





NOT TO SCALE

Well-completion diagram for monitoring well KAFB 0417. Drilled and completed by U.S. Geological Survey, Coal Branch, Denver, Colo. Started on 08-04-92, completed on 08-08-92. Well drilled using mud rotary method with Wyoming sodium bentonite drilling fluid. All depths are feet below land surface.

KAFB-0417

AR 1710

Borehole Log  
KAFB0417

Project name: Kirtland Air Force Base - Phase II, Stage 2A      Sheet 1 of 4  
 Project number: 463536001      Site: KAFB0417  
 Drilling Company: USGS      Location:      Surface Elevation:  
 Date Started drilling: 10 Nov. 91      Drilling Crew: Dan Sweney, Dean Bohn  
 Drilling Method: Hollow Stem Auger  
 Borehole diameter: 77/8      Date completed drilling: 6 June 92      Total Depth: 500  
 Drilling equipment: Gardner-Denver17w      Drilling Fluid:  
 Logged by: Roybal, Gebhardt      Sample type:

Date	Time	Depth(ft)	Drilling Speed (Min/ft)	Lithology and Remarks
10-Nov-91	0800	4-9	18"	Upper 13" of sample was a light brown (5YR 6/4) silty sand loosely-packed, with approx. 10% small pebbles and 10% caliche nodules. Lower 5" was similar but was darker (moderate brown 5YR 4/4) apparently due to a higher clay content (although silt and very fine sand still abundant).
	0915	24-28	47"	Upper 2 inches are moderate brown 5YR 4/4 silty clay, tightly packed, very "pure" and "clean." Next 30 inches are very-well-sorted, very fine sand with small amount of small pebbles distributed throughout. Several small caliche nodules seen distributed. Next 6 inches are very fine sand and caliche (powder and nodules - estimate > 50% content) (highly reactive to Hcl, unlike the sand above). Next 8 inches are "clean" very fine sand, same as just above the caliche lens just above.
	1130	48-51.5	41"	Upper 6 inches are 90% well-sorted fine sand with small amount of poorly-sorted (but generally small) gravel and volcanic ash (generally as small well rounded pieces of pumice). Next 6 inches are poorly-sorted sand and poorly-sorted gravel (pieces up to 60 mm diam.), no ash. (No reaction to Hcl). Next 6 inches are 80% caliche with some sand and gravel (very strong reaction to Hcl). Remainder of sample is poorly-sorted sand and poorly sorted gravel (50/50), very similar to just above caliche, however, this part of sample has some pulverized (powder) caliche mixed in. (Some reaction to Hcl).

AR 1710

Borehole Log  
KAFB0417

Project name: Kirtland Air Force Base - Phase II, Stage 2A      Sheet 2 of 4  
Project number: 463536001      Site: KAFB0417  
Drilling Company: USGS      Location:      Surface Elevation:  
Date Started drilling: 10 Nov. 91      Drilling Crew: Dan Sweney, Dean Bohn  
Drilling Method: Hollow Stem Auger  
Borehole diameter: 7 7/8      Date completed drilling: 6 June 92      Total Depth: 500  
Drilling equipment: Gardner-Denver17w      Drilling Fluid:  
Logged by: Roybal, Gebhardt      Sample type:

<u>Date</u>	<u>Time</u>	<u>Depth(ft)</u>	<u>Drilling Speed (Min/ft)</u>	<u>Lithology and Remarks</u>
11-Nov-91	0715	78-81	36"	Upper 6 inches is poorly-sorted sand and poorly-sorted gravel (some pieces up to 60 mm diam.) with about 10% volcanic ash (small rounded pumice pieces). Next 6 inches is moderate brown (5 YR 4/4) silt with some sand and ash mixed in. Remainder is moderately-well-sorted sand with 30-40% volcanic ash (largely finely-pulverized) and small amount of small pebbles (up to 20 mm diam.).

Borehole Log  
KAFB0417

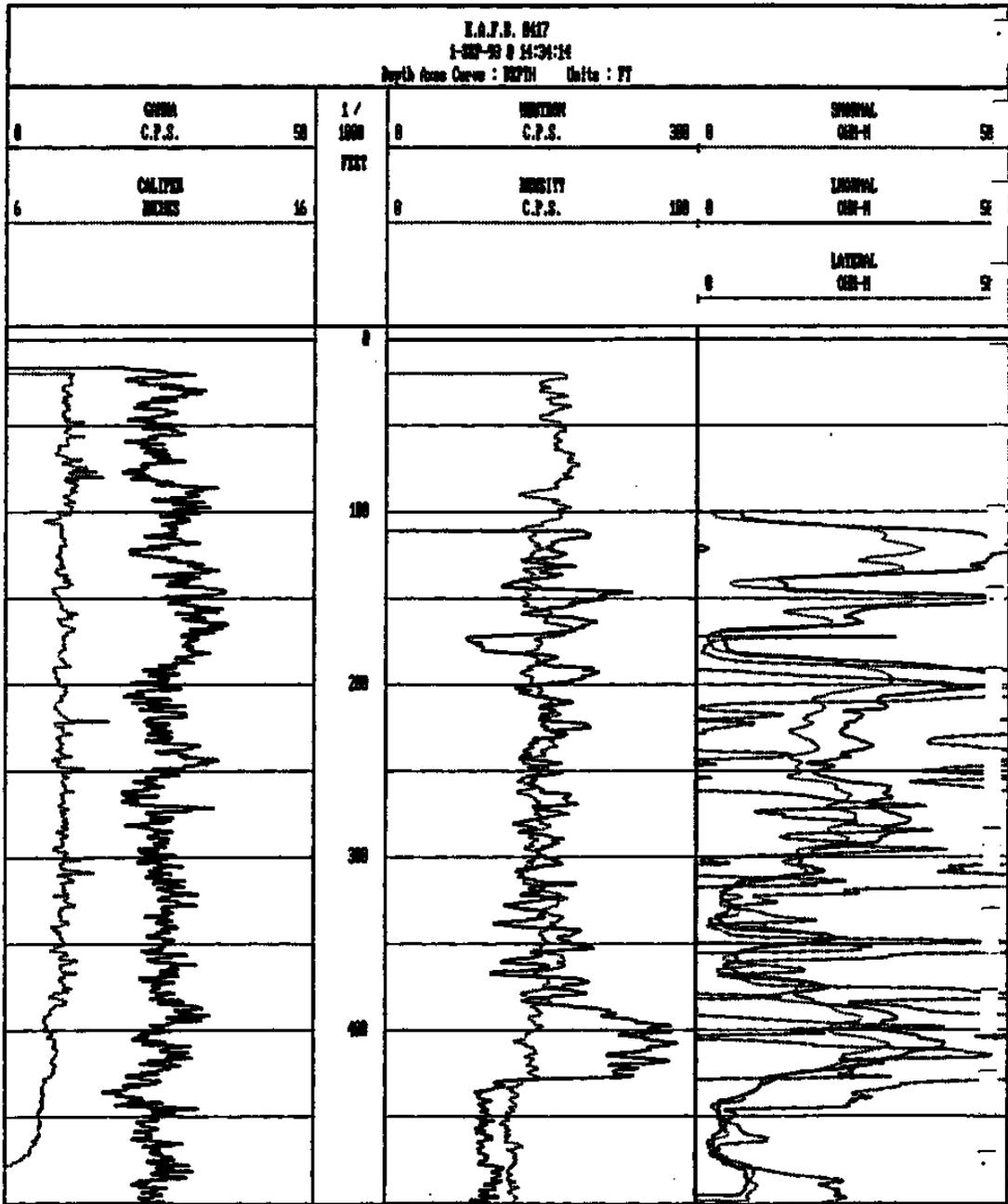
Project name: Kirtland Air Force Base - Phase II, Stage 2A		Sheet 3 of 4
Project number: 463536001	Site: KAFB0417	
Drilling Company: USGS	Location:	Surface Elevation:
Date Started drilling: 6 Apr. 92	Drilling Crew: Jeff Eman, Dean Bohn, Bob Gilliland	
Drilling Method: Mud rotary		
Borehole diameter: 7 7/8	Date completed drilling: 6 June 92	Total Depth: 500
Drilling equipment: Gardner-Denver17w	Drilling Fluid: Bentonite	
Logged by: G. Roybal		Sample type:

<u>Date</u>	<u>Time</u>	<u>Depth(ft)</u>	<u>Drilling Speed (Min/ft)</u>	<u>Lithology and Remarks</u>
4-May-92		100-115		Brown clay with some silt. Small amount of gravel (up to about 15 mm diam.). Trace of sand.
		115-130		About half is brown clay as above, the other half poorly-sorted sand (predominately coarse - granule-sized). Small amount of gravel up to 15 mm diam. Estimated 10-20% granule-sized, well-rounded "pebbles" of volcanic ash.
		130-145		Sand, (predominately granule-sized) poorly-sorted, some gravel (generally $\leq$ 10 mm diam.), small amount of volcanic ash "pebbles," small amount of brown clay.
		145-160		Brown clay, with poorly-sorted sand, (large amount granule-sized), trace of volcanic ash, small amount of small-sized gravel.
		160-310		Gravel, poorly-sorted but generally $\leq$ 15 mm diam., poorly-sorted sand (very coarse - granule-sized). Trace of volcanic ash "pebbles," slight trace of clay in some samples. NOTE - Coarser gravel (up to 25 mm diam.) from 245-255.
		310-315		Poorly-sorted sand and gravel (as above) with about 30% brown clay.
		315-335		Poorly-sorted gravel (up to about 20 mm diam.) and poorly sorted sand. Trace of clay.
		335-355		Roughly equal amounts of brown clay and gravel. (Gravel moderately well rounded and up to 25 mm diam.). Trace of poorly-sorted sand.

Borehole Log  
KAFB0417

Project name: Kirtland Air Force Base - Phase II, Stage 2A      Sheet 4 of 4  
 Project number: 463536001      Site: KAFB0417  
 Drilling Company: USGS      Location:      Surface Elevation:  
 Date Started drilling: 4 May 92      Drilling Crew: Jeff Eman, Dean Bohn, Bob Gilliland  
 Drilling Method: Mud rotary  
 Borehole diameter: 7 7/8      Date completed drilling: 6 June 92      Total Depth: 500  
 Drilling equipment: Gardner-Denver17w      Drilling Fluid: Bentonite  
 Logged by: G. Roybal      Sample type:

<u>Date</u>	<u>Time</u>	<u>Depth(ft)</u>	<u>Drilling Speed (Min/ft)</u>	<u>Lithology and Remarks</u>
6-June-92		355-390		Gravel (up to 25 mm diam.), brown clay (estimated 20-30% of sample), and small amount of poorly-sorted sand (predominately coarse - granule-sized).
		390-445		Sand, predominately coarse - granule-sized, small amount of clay (estimate 10-30% - depending on specific sample), very small amount of small gravel ( $\leq$ 10 mm diam.).
		445-460		Same as previous interval only more clay (and silt?) (up to 40-50%).
		460-500		Same as interval 390-445 above.



KAFB-0417

AR1710