

Field Logs of Borehole Drilled for Nested Piezometers,  
Montesa Park Site

Prepared for  
City of Albuquerque

Richard M. Chamberlin, Senior Field Geologist  
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New Mexico Bureau of Mines and Mineral Resources  
a division of New Mexico Tech

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Socorro, New Mexico 87801

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## Field Logs of Monitoring Well Drilled at Montesa Park

A borehole was drilled at the Montesa Park site (Fig. 1) for the purpose of installing nested piezometers to monitor shallow, intermediate and deep ground-water levels in the Santa Fe Group aquifer. Historical data for this monitoring well are summarized in Table 1. The Montesa Park well was drilled to a depth of 1650 feet during the month of August 1997. This monitoring well also provides local characterization of the basin-fill aquifer in this area of the Middle Rio Grande Basin. This borehole log is submitted to the City of Albuquerque as partial fulfillment of an intergovernmental agreement between the City and the New Mexico Bureau of Mines and Mineral Resources, a division of New Mexico Tech.

Major textural units observed in the Montesa Park well are graphically summarized in Figure 2. This interpretation is based on all available data, especially geophysical logs including electrical conductivity, total gamma ray intensity, and caliper measurement of borehole diameter (which are provided as unnumbered attachments to this report). Drillers log and descriptions of cuttings collected from 10 foot intervals provide general lithologic data, which may be helpful in recognizing sediments derived from different source terranes and representing different depositional systems. Descriptions of cuttings include the following categories: 1) dominant texture (relative proportion of gravel, sand or silt/clay), 2) degree of grading (poorly graded = well sorted), 3) clast angularity, 4) major clast lithologies, and 5) color of moist sediment (Munsell Color Chart, 1975).

Major textural units have been classified with regard to hydrogeologic units using the system developed by Hawley (New Mexico Bureau of Mines and Mineral Resources Open-File Reports 387, 1992 and 402-D, 1996). Lithologic intervals have been assigned to informal hydrostratigraphic units such as upper Santa Fe (USF) and middle Santa Fe (MSF); basin-fill lithofacies classes (I to X) have also been assigned to the textural units. Descriptions of major textural units are summarized in Table 2. Lithofacies assigned to the Montesa Park well are summarized in Table 3.

A definitive interval of core was retrieved from 1205 to 1215 feet in the Montesa Park well (Table 4). This core strongly supports the interpretation that the dominantly fine grained interval from 1025 to 1215 feet most likely represents a thick sequence of fluvial overbank (floodplain) deposits. The core shows thin beds of red mudstone and well sorted sand containing heavy mineral laminations; the latter being a distinctly fluvial characteristic. The

composition of these laminated sands needs to be compared in detail with that of ancestral Rio Grande braid-plain deposits from shallower levels in the well (e.g. 580–1205) and deeper sands of uncertain hydrostratigraphic assignment (e.g. 1510–1650 ft). If these sands are of similar composition (e.g. bulk mineralogy and chemistry), then the most appropriate interpretation would be that the well bottoms in the upper Santa Fe Group (ancestral Rio Grande deposits). If the sand compositions are distinctly different, then units below 1025 feet would be appropriately assigned to the middle Santa Fe Group. Available bulk compositional data (in the form of a total gamma ray intensity log) suggest there is no significant change in the alkali feldspar concentration (dominant source of gamma radiation in most sands) from 25 to 1650 feet in the Montesa Park well. Sand intervals throughout most of the well yield an average gamma intensity of  $70 \pm 30$  counts per second; only the relatively granitic alluvial fill of Tijeras Arroyo has a significantly higher average gamma intensity ( $115 \pm 20$  cps).

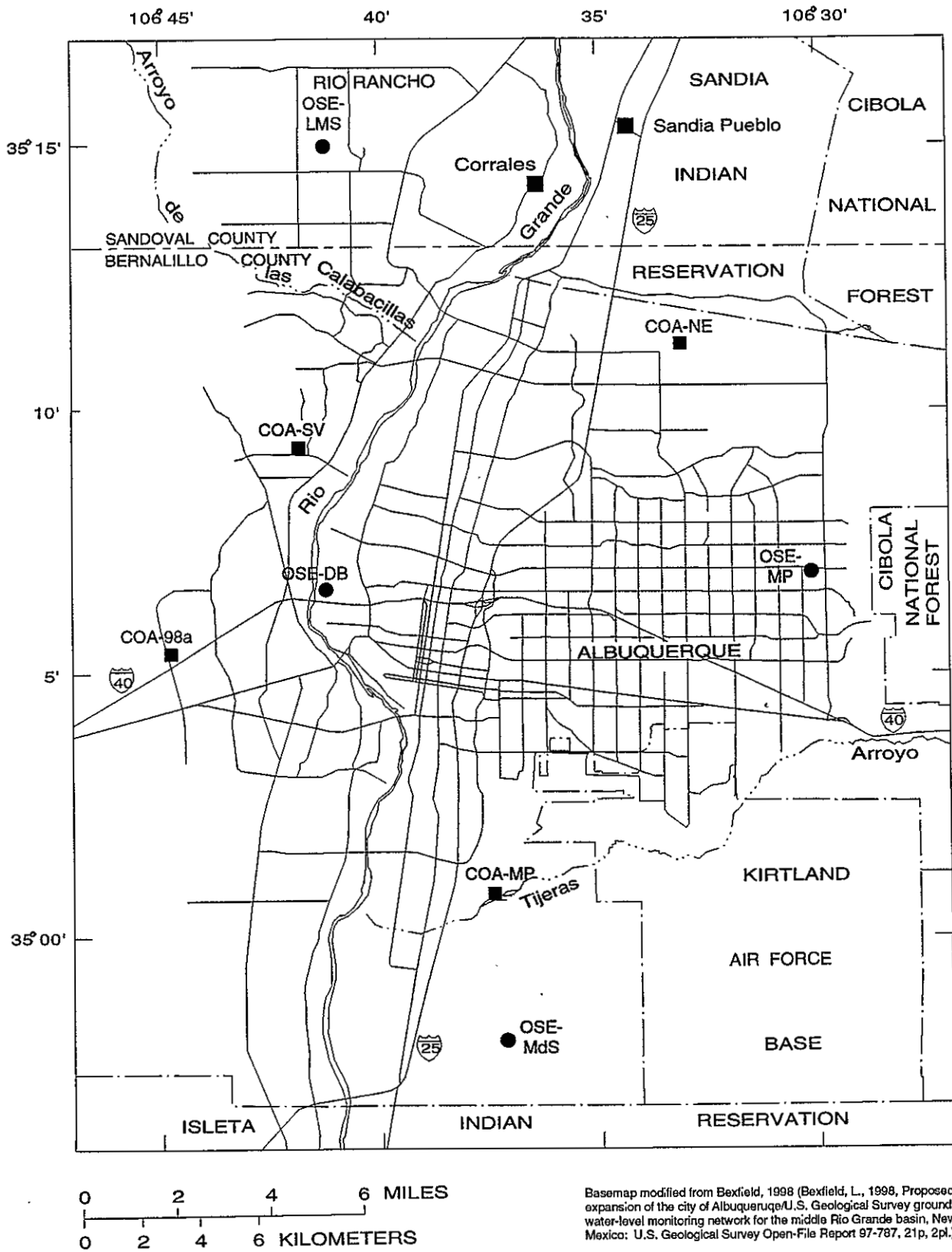


Figure 1. Index Map showing location of Montesa Park monitoring well (COA-MP).

# Montesa Park Monitoring Well

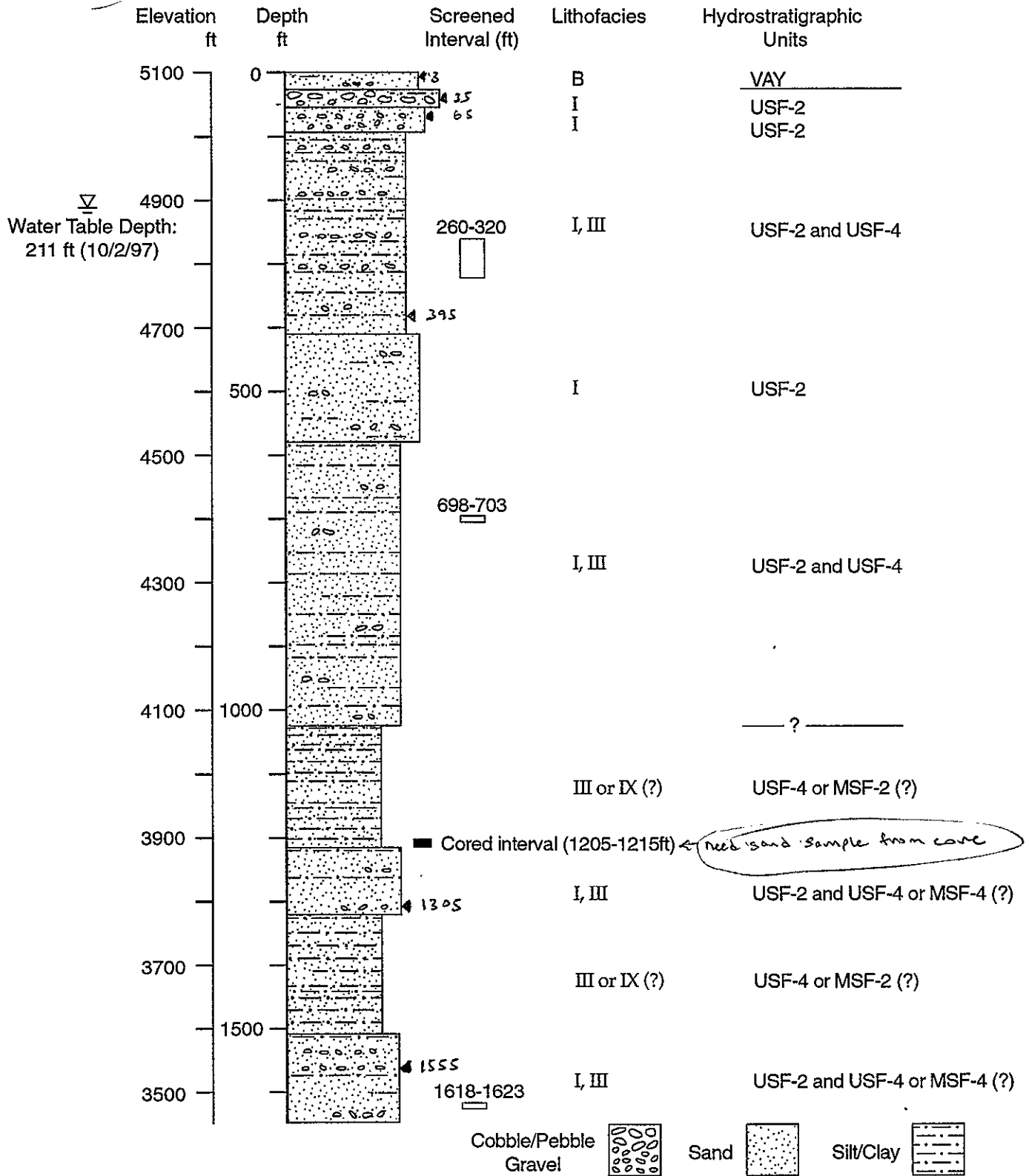


Figure 2. Summary of major textural units, lithofacies, and hydrostratigraphic units, Montesa Park monitoring well. Screened intervals of piezometers and cored interval also shown.

TABLE 1. Historical data for Montesa Park monitoring well.

Location:	T9N, R3E, Section 10.342, on north side of Tijeras Arroyo west of Montesa Park (Lat. 35°00'56"N; Long. 106°37'01"W).
Elevation:	5100 (±10) ft above mean sea level
Project Coordinator:	Conde Thorn (USGS)
Drilling Contractor:	U.S. Geological Survey
Driller:	Dan Sweeney
Date Started:	August 8, 1997
Date Completed:	August 21, 1997
Total Depth:	1650 ft (driller)
Water Level:	211.22 ft (shallow piezometer, 10/2/97)
Screened Intervals:	260–320 ft; 698–703 ft, 1618–1623 ft
Sample Intervals:	10 ft (except for first 25 feet)
Geological Logging:	Michael Heynekamp (NMBMMR) John Hawley (NMBMMR, retired) Bruce Allen (NMBMMR) Richard Chamberlin (NMBMMR)
Geophysical Logging:	Conde Thorn (USGS): caliper, conductivity and natural gamma
Log Synthesis:	Richard Chamberlin (NMBMMR)

TABLE 2. Description of major textural units, Montesa Park monitoring well (City of Albuquerque). Colors represent that of moist sediment.

<u>Depth (ft)</u>	<u>Description</u>
0–25	Sand, silty sand and minor gravel. Brown to dark brown (7.5YR3/4 to 4/4). Above average gamma radiation (>100 cps) reflects greater fraction of potassium feldspar (from granite) than in underlying units. <i>Alluvial fill of Tijeras Arroyo (hydrostratigraphic unit VAY).</i>
25–50	Pebble to cobble gravels, sand and minor silty clay beds. Brown to dark brown (7.5YR3/4 to 5/4). Lowest occurrence of cobble gravel reported by driller. Unusually coarse ancestral Rio Grande deposits. <i>Top of Santa Fe Group (hydrostratigraphic unit USF).</i>
50–90	Sand and pebbly gravel. Brown to reddish brown (7.5YR5/4 to 5YR5/4). <i>USF-2.</i>
90–410	Sand and pebbly gravel beds (5–40 ft thick) with rhythmic interbeds of silty clay (1–10 ft thick). Mostly brown to yellowish brown (10YR5/3 to 10YR4/4). <i>Lowest occurrence of abundant pebble gravel as noted by driller. First appearance of partly cemented sand near water table at 215 feet. USF-2 and USF-4.</i>
410–580	Sand and silty sand, possibly with minor pebbly sands. Brown to yellowish brown (10YR5/3 to 4/3). <i>Caliper log indicates an increase in degree of consolidation and cementation below 516 ft. USF-2.</i>
580–1025	Coarse to fine-grained sand beds (10–40 ft thick) with numerous interbeds of silty clay (1–10 ft thick); minor pebbly sand lenses. Mostly brown to yellowish brown (10YR5/4 to 10YR5/3). <i>USF-2 and USF-4.</i>
1025–1215	Rhythmically bedded sand and silty clay. Most sand beds 3 to 10 ft thick, silty clays 1–3 ft thick. One unusually thick sand bed (20 ft) near middle of unit (1110–1130 ft). Strong brown to yellowish brown (7.5YR5/6 to 10YR5/4). <i>Core from 1205 to 1215 ft representative of this unit; silty clays are reddish brown in core. USF-4 or MSF-2(?).</i>
1215–1320	Thick sand beds (20–50 ft thick) grading upward into silty clay beds (2–5 ft thick). May include minor lenses of pebbly sand. Mostly grayish brown (10YR5/3). <i>USF-2 and USF-4, or MSF-4(?).</i>
1320–1510	Rhythmically bedded sand and silty clay. Most sand beds 5–10 feet thick, silty clays 1–5 ft thick. Grayish brown to yellowish brown (10YR5/2 to 10YR5/4). <i>Devitrified ash reported in this and adjacent intervals appears to represent poorly mixed drilling mud. Gamma intensity log does not indicate presence of rhyolitic ash beds. USF-4 or MSF-2(?).</i>
1510–1650	Thick sand beds (20–35 ft thick) and gravelly sand beds grading upward into silty clay beds (2–10 ft thick). Mostly brown (10YR5/3). <i>Pebbly sand lenses confirmed by drillers log. USF-2 and USF-4, or MSF-4(?).</i>



TABLE 3. Summary of lithofacies (modified from Hawley and Haase., 1992) assigned to major textural units in the Montesa Park monitoring well.

<u>Lithofacies</u>	<u>Dominant Textural Classes</u>	<u>Dominant Deposition Setting</u>
B	Sand, gravel, silt and clay	Arroyo channel
I	Sand and pebble gravel, lenses of silty clay	Basin-floor fluvial; braid plain
III	Interbedded sand and silty clay; lenses of pebbly sand	Basin-floor fluvial-deltaic and playa lake (or fluvial overbank); locally eolian
IX	Silty clay interbedded with sand, silty sand and clay	Basin-floor, playa lake and alluvial flat; distal piedmont alluvial (or fluvial overbank?)

TABLE 4. Description of core (depth interval 1205–1215 ft), Montesa Park monitoring well (described by B. D. Allen).

<u>Interval*</u>	<u>Texture/Structure</u>	<u>Color</u>
0.0–0.3	NR	
0.3–1.3	Thinly bedded silty clay, coarser grained at base (0.7–1.3).	5YR4/3—0.3–0.7 ft 10YR4/3 to 10YR6/3 —0.7–1.3 ft
1.3–3.35	Fine–coarse sand, faintly laminated silty clay laminae at 2.1 ft.	7.5–10YR4/3 (mostly 10YR4/3)
3.35–3.45	Soft silty clay	10YR4/3
3.45–3.55	Silty clay with minor very-fine sand	10YR4/3
3.55–3.7	Laminated silty clay, red and brown	5YR5/4; 10YR4/3
3.7–4.4	Fine–coarse sand, minor granules	10YR4/3
4.4–4.6	Silty, very-fine sand, with 5 mm thick silty clay laminae at top	10YR5/3
4.6–5.8	Well laminated, fine–medium sand, laminations weaken in upper part (4.6–4.9). Laminations are defined by irregularly spaced narrow bands of dark colored heavy minerals.	10YR5/3
5.8–6.95	Fine–coarse sand, comparatively massive	10YR4/3
6.95–7.15	Fine–medium sand, weakly cemented	10YR6/3
7.15–7.3	Laminated silty clay, red and brown	5YR5/4; 10YR4/3
7.3–7.6	Silty very fine–fine sand	10YR4/3
7.6–8.0	Silty fine sand. Clay partings at top (7.6 ft) and bottom (8.0 ft).	10YR4/3
8.0–9.1	Fine–medium sand, scattered coarse. Silty clay laminae at 8.1; silty, very fine sand bed 8.25–8.35 ft.	10YR5/3
9.1–10.0	Fine–medium sand, scattered coarse. Weakly cemented.	10YR6/3

\* add 1205 ft to calculate depth interval

**Field Lithologic descriptions: Montesa Park (City of Albuquerque)**

**NOTE:** The term "granite" used throughout implies sub-equal percentages of quartz, plagioclase, mica mineral assemblages and/or granite clasts.

Sample No.	Depth (ft)	Description
MPCOA-1	3-10	Gravels with sand (50% sand, 50% gravel). Moderately graded, subangular to subrounded. Basalt, granite, bipyramidal quartz, Pedernal chert. Sand is 7.5YR4/4.
MPCOA-2	10-20	Silty sand (~85% sand, 15% silt/clay, <5% gravel). Poorly graded subangular (sand), subrounded (gravel). Sand is 7.5YR3/4.
MPCOA-3	20-25	Silty sand (85% sand, 15% silt/clay, <5% gravel). Poorly graded, subangular (sand); subrounded (gravel). Sand is 5YR3/4.
MPCOA-4	25-35	Gravel and sand (50% sand, 50% gravel). Moderately to poorly graded, subangular to subrounded. Basalt, silicic-volcanics, granite, limestone and caliche. Sand is 7.5YR4/4.
MPCOA-5	35-45	Cobble gravel (95% gravel, 5% sand). Poorly graded, subangular to subrounded. Granite, limestone, basalt, silicic-volcanics. Sand is 7.5YR3/4.
MPCOA-6	45-55	Cobble gravel (>95% gravel, trace of sand). Poorly graded, subrounded. Granite, schist, limestone, basalt, silicic volcanics. Sand is 7.5YR5/4.
MPCOA-7	55-65	Gravel and sand (80% gravel, 20% sand). Poorly graded, subangular (sand); subrounded (gravel). Granite, basalt, chert. 7.5YR5/4.
MPCOA-8	65-75	Gravel and sand (70% gravel, 30% sand). Poorly graded, subangular (sand), subrounded (gravel). Granite, quartzite, basalt, schist. 5YR5/4, sand.
MPCOA-9	75-85	Gravel and sand (90% gravel, 10% sand). Poorly graded, subangular (sand), subangular to subrounded (gravel). Basalt, granite, quartzite, chert. 7.5YR5/4, sand.
MPCOA-10	85-95	Gravel and sand (90% gravel, 10% sand). Poorly graded, subangular (sand), subrounded (gravel). Basalt, granite, chert, silicic-volcanics. 5YR5/3, sand.
MPCOA-11	95-105	Gravel and sand (95% gravel, 5% sand). Poorly graded, subangular (sand), subrounded (gravel). Basalt, pink granite, limestone, silicic-volcanics, chert. 7.5YR4/4, sand.
MPCOA-12	105-115	Gravel and sand (95% gravel, 5% sand). Poorly graded, subangular (sand), subangular to subrounded (gravel). Silicic-volcanics, basalt, granite, chert. 7.5YR5/4, sand.
MPCOA-13	115-125	Sand and gravel (60% sand, 40% gravel). Moderately graded, subangular to subrounded (sand), subrounded (gravel). Silicic-volcanics, basalt, chert. 10YR5/4, sand.
MPCOA-14	125-135	Sand and gravel (50% sand, 50% gravel). Moderately graded, subangular (sand), subangular to subrounded (gravel). Silicic-volcanics, chert, basalt, granite. 10YR5/4, sand.
MPCOA-15	135-145	Sand and gravel (80% sand, 20% gravel). Poorly graded, subangular. Chert, silicic-volcanics, basalt. 10YR5/3, sand.
MPCOA-16	145-155	Silty sand (90% sand, 5% gravel, 5% silt/clay). Poorly graded. Chert. 5YR5/4, silt/clay; 10YR5/3, sand.
MPCOA-17	155-165	Sand with gravel (70% sand, 30% gravel). Moderately to poorly graded, subangular (sand), subangular to subrounded (gravel). Granite, chert. 10YR5/4, sand.
MPCOA-18	165-175	Gravel and sand (70% gravel, 30% sand). Moderately graded, subangular. Chert, granite, basalt. 10YR5/3, sand.
MPCOA-19	175-185	Silty sand (95% sand, 5% gravel). Poorly graded, subangular. 10YR5/3, sand.
MPCOA-20	185-195	Gravel and sand (85% gravel, 15% sand). Poorly graded, subangular (sand), subangular to subrounded (gravel). Granite, basalt, chert. 10YR4/4, sand.

Sample No.	Depth (ft)	Description
MPCOA-21	195-205	Gravel (90% gravel, 10% sand). Poorly graded, subrounded. Granite, basalt, silicic-volcanics. 10YR5/3, sand.
MPCOA-22	205-215	Clayey gravel (85% gravel, 10% sand, 5% silt/clay). Poorly graded, subangular (sand), subangular to subrounded (gravel). Basalt, granite, silicic-volcanics. 7.5YR5/6, silt/clay; 7.5YR5/4, sand.
MPCOA-23	215-225	Silty sand (65% sand, 35% silt/clay). Poorly graded, subangular. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-24	225-235	Silty sand (60% sand, 40% silt/clay). Poorly graded, subangular. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-25	235-245	Silty sand (65% sand, 35% silt/clay). Poorly graded, subangular. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-26	245-255	Clayey gravel (90% gravel, 5% sand, 5% silt/clay). Poorly graded, subangular (sand), subangular to subrounded (gravel). Granite, silicic-volcanics, chert. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-27	255-265	Sandy gravel (>90% gravel, 5% sand, <5% silt/clay). Poorly graded, subangular. Granite, silicic-volcanics, chert, basalt. 7.5YR5/6, silt/clay; 10YR5/3, sand.
MPCOA-28	265-275	Gravel and sand (75% gravel, 25% sand). Poorly graded, subangular. Silicic-volcanics, granite, basalt, chert. 10YR5/3, sand.
MPCOA-29	275-285	Gravel and sand (75% gravel, 25% sand). Moderately to poorly graded, subangular. Granite, silicic-volcanics, chert. 10YR5/4, sand.
MPCOA-30	285-295	Gravelly sand (90% sand, 10% gravel). Granite, basalt. 7.5YR5/4, sand.
MPCOA-31	295-305	Gravelly sand (95% sand, <5% gravel). Poorly graded, subangular (sand), subangular to subrounded (gravel). 10YR5/3, sand.
MPCOA-32	305-315	Sand (95% sand, 5% gravel). Poorly graded, subangular. Chert. 10YR5/3, sand.
MPCOA-33	315-325	Silty sand (90% sand, 5% silt/clay, 5% gravel). Poorly graded, subangular. Granite, chert. 7.5YR5/6, silt/clay; 10YR5/3, sand.
MPCOA-34	325-335	Gravelly sand (90% sand, 10% gravel). Poorly graded, subangular to subrounded (sand), subrounded (gravel). Pedernal chert, basalt. 10YR5/3, sand.
MPCOA-35	335-345	Sand and gravel (50% gravel, 45% sand, 5% silt/clay). Poorly graded, subangular to subrounded. Chert, basalt, granite. 7.5YR5/6, silt/clay; 10YR5/3, sand.
MPCOA-36	345-355	Silty sand and gravel (85% sand, 10% gravel, 5% silt/clay). Poorly graded, subangular to subrounded. Granite, silicic-volcanics. 7.5YR5/6, silt/clay; 10YR5/3, sand.
MPCOA-37	355-365	Sand (90% sand, 10% gravel). Poorly graded, subrounded (sand), subangular (gravel). Chert, granite, sanidine. 10YR5/3, sand.
MPCOA-38	365-375	Sand and gravel (70% sand, 30% gravel). Moderately to poorly graded, subrounded (sand), subangular (gravel). Granite, silicic-volcanics, chert. 10YR5/3.
MPCOA-39	375-385	Sandy gravel (70% gravel, 30% sand). Poorly graded, subangular to subrounded (sand), subangular (gravel). Silicic-volcanics, chert, granite. 10YR5/3, sand.
MPCOA-40	385-395	Sandy gravel (60% gravel, 40% sand). Poorly graded, subangular. Granite, silicic-volcanics, chert. 10YR4/3, sand.
MPCOA-41	395-405	Sandy gravel (60% gravel, 40% sand). Poorly graded, subangular (sand), subangular to subrounded (gravel). Chert, basalt, silicic-volcanics, granite. 10YR5/3, sand.
MPCOA-42	405-415	Sandy gravel (70% gravel, 30% sand). Poorly graded, subangular (sand), subangular to subrounded (gravel). Granite, basalt, chert. 10YR5/4.
MPCOA-43	415-425	Sand and gravel (50% gravel, 50% sand). Moderately graded. Granite, chert, basalt, silicic-volcanics. 10YR5/3, sand.

Sample No.	Depth (ft)	Description
MPCOA-44	425-435	Gravelly sand (90% sand, 10% gravel). Poorly graded, subangular. Basalt, chert. 10YR5/4, sand.
MPCOA-45	435-445	Sand (95% sand, 5% gravel). Poorly graded, subangular. Basalt.
MPCOA-46	445-455	Sand (95% sand, 5% gravel). Poorly graded, subangular (sand), subangular to subrounded (gravel). Chert, basalt. 10YR5/3, sand.
MPCOA-47	455-465	Silty sand (90% sand, 5% silt/clay, 5% gravel). Poorly graded, subangular. Chert. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-48	465-475	Sand (95% sand, 5% gravel). Poorly graded, subangular. Chert. 10YR5/4, sand.
MPCOA-49	475-485	Sand (95% sand, 5% gravel). Poorly graded, subangular. Chert, silicic-volcanics, basalt. 10YR5/3, sand.
MPCOA-50	485-495	Gravelly sand (90% sand, 10% gravel). Poorly graded, subangular. Chert, basalt, granite. 10YR4/3, sand.
MPCOA-51	495-505	Sandy gravel (70% gravel, 30% sand). Poorly graded, subangular. Basalt, granite, silicic-volcanics, chert. 10YR5/3, sand.
MPCOA-52	505-515	Gravelly sand (70% sand, 30% gravel). Moderately graded, subangular to subrounded. Granite, basalt, chert. 10YR4/3, sand.
MPCOA-53	515-525	Sand and gravel (50% sand, 50% gravel). Moderately graded, subangular to subrounded. Granite, chert, basalt. 10YR5/3, sand.
MPCOA-54	525-535	Gravelly sand (70% sand, 30% gravel). Moderately to poorly graded, subangular to subrounded. Chert, granite, basalt. 7.5YR5/4, sand.
MPCOA-55	535-545	Gravelly sand (75% sand, 25% gravel). Moderately to poorly graded, subangular to subrounded (sand), subangular (gravel). Chert, basalt, granite. 10YR4/3.
MPCOA-56	545-555	Gravelly sand (85% sand, 15% gravel). Poorly graded, subrounded (sand), subangular (gravel). Chert, granite. 10YR4/3, sand.
MPCOA-57	555-565	Gravelly sand (75% sand, 25% gravel). Poorly graded, subrounded. Basalt, silicic-volcanics. 10YR5/4, sand.
MPCOA-58	565-575	Silty sand and gravelly sand (70% sand, 25% gravel, 5% silt/clay). Poorly graded, subangular (sand), subrounded (gravel). Chert, basalt. 7.5YR7/6, silt/clay; 10YR5/4, sand.
MPCOA-59	575-585	Silty sand (90% sand, 5% gravel, 5% silt/clay). Poorly graded, subangular (sand), subrounded (gravel). Silicic-volcanics, chert. 7.5YR7/6, silt/clay; 10YR5/3, sand.
MPCOA-60	585-595	Gravelly silty sand (70% sand, 25% gravel, 5% silt/clay). Poorly graded, subangular (sand), subangular to subrounded (gravel). Silicic-volcanics, chert, basalt. 7.5YR7/6, silt/clay; 10YR5/3, sand.
MPCOA-61	595-605	Silty sand (90% sand, 5% gravel, 5% silt/clay). Poorly graded, subangular (sand), subrounded (gravel). Chert. 5YR6/6, silt/clay; 10YR5/3, sand.
MPCOA-62	605-615	Sand (95% sand, 5% gravel). Poorly graded, subangular (sand), subangular to subrounded (gravel). Plagioclase, clast. 10YR5/3, sand.
MPCOA-63	615-625	Gravelly sand (70% sand, 30% gravel). Poorly graded, subangular. Granite, chert. 10YR5/3, sand.
MPCOA-64	625-635	Gravelly sand (80% sand, 20% gravel). Poorly graded, subangular. Chert. 10YR5/3, sand.
MPCOA-65	635-645	Gravelly sand (70% sand, 30% gravel). Poorly graded, subangular. Granite, chert, basalt. 10YR5/3, sand.
MPCOA-66	645-655	Gravelly sand (60% sand, 40% gravel). Poorly graded, subangular. Granite, chert. 10YR5/3, sand.
MPCOA-67	655-665	Gravelly sand (70% sand, 30% gravel). Poorly graded, subangular. Granite, chert. 10YR5/3, sand.

Sample No.	Depth (ft)	Description
MPCOA-68	665-675	Sand (95% sand, 5% silt/clay). Poorly graded, subangular. 5YR6/6, silt/clay; 10YR5/3, sand.
MPCOA-69	675-685	Same as above.
MPCOA-70	685-695	Same as above.
MPCOA-71	695-705	Sand (95% sand, 5% gravel). Poorly graded, subangular (sand), subrounded (gravel). Granite, chert. 10YR5/4, sand.
MPCOA-72	705-715	Sand (90% sand, 10% gravel). Poorly graded, subangular (sand), subrounded (gravel). Granite, chert. 10YR5/4, sand.
MPCOA-73	715-725	Silty sand (90% sand, 5% gravel, <5% silt/clay). Poorly graded, subangular (sand), subrounded (gravel). Granite, chert. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-74	725-735	Sand (>95% sand, <5% gravel). Poorly graded, subangular. 10YR5/4, sand.
MPCOA-75	735-745	Same as above.
MPCOA-76	745-755	Sand (95% sand, 5% gravel). Poorly graded, subangular. Chert, granite. 10YR5/3, sand.
MPCOA-77	755-765	Sand (100% sand). Poorly graded, subangular. 10YR5/4, sand.
MPCOA-78	765-775	Same as above.
MPCOA-79	775-785	Sand (100% sand). Poorly graded, subangular. 10YR5/3, sand.
MPCOA-80	785-795	Sand (100% sand). Poorly graded, subangular. 10YR5/4, sand.
MPCOA-81	795-805	Sand (90% sand, 5% gravel, 5% silt/clay). Poorly graded, subangular. Granite. 7.5YR5/4, silt/clay; 10YR5/3, sand.
MPCOA-82	805-815	Silty sand (85% sand, 10% gravel, 5% silt/clay). Poorly graded, subangular. Granite, chert, basalt. 10YR5/4, silt/clay; 10YR5/3, sand.
MPCOA-83	815-825	Sand (95% sand, 5% gravel). Poorly graded, subangular (sand), subrounded (gravel). Chert. 10YR5/4, sand.
MPCOA-84	825-835	Silty sand (90% sand, 5% gravel, 5% silt/clay). Poorly graded, subangular (sand), subrounded (gravel). Chert. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-85	835-845	Clayey sand (90% sand, 10% silt/clay). Poorly graded, subangular. 7.5YR5/6, silt/clay; 7.5YR5/4, sand.
MPCOA-86	845-855	Silty sand (>85% sand, 10% silt/clay, <5% gravel). Poorly graded, subangular (sand), subrounded (gravel). Chert. 7.5YR5/6, silt/clay; 7.5YR5/4, sand.
MPCOA-87	855-865	Sand (95% sand, 5% gravel). Poorly graded, subangular (sand), subrounded (gravel). Chert. 10YR5/4, sand.
MPCOA-88	865-875	Gravelly sand (75% sand, 25% gravel). Moderately to poorly graded, subangular. Chert, granite, mica. 10YR5/4, sand.
MPCOA-89	875-885	Sand and gravel (60% sand, 40% gravel). Poorly graded, subangular. Quartz, granite, chert. 10YR5/3, sand.
MPCOA-90	885-895	Sand and gravel (50% sand, 50% gravel). Moderately to poorly graded, subangular (sand), subangular to subrounded (gravel). Chert, granite, basalt. 10YR5/4, sand.
MPCOA-91	895-905	Sand (90% sand, 10% gravel). Poorly graded, subangular (sand), subangular to subrounded (gravel). Granite, chert, basalt. 10YR5/4, sand.
MPCOA-92	905-915	Sand (95% sand, 5% gravel). Poorly graded, subangular (sand), subangular to subrounded (gravel). Chert, granite. 10YR5/4, sand.
MPCOA-93	915-925	Silty sand (>90% sand, 5% silt/clay, <5% gravel). Poorly graded, subangular (sand), subrounded (gravel). Chert. 10YR6/3, silt/clay; 10YR5/4, sand.
MPCOA-94	925-935	Sand (>95% sand, <5% gravel). Poorly graded, subangular. Chert. 10YR5/4, sand.
MPCOA-95	935-945	Sandy gravel (75% gravel, 25% sand). Moderately graded, subangular (sand), subangular to subrounded (gravel). Granite, chert. 10YR5/3, sand.

Sample No.	Depth (ft)	Description
MPCOA-96	945-955	Sandy gravel (70% gravel, 30% sand) Well to moderately graded, subangular to subrounded. Granite, basalt, chert. 10YR5/3, sand.
MPCOA-97	955-965	Sand (90% sand, 10% gravel). Poorly graded, subangular to subrounded. Chert, granite. 10YR5/4, sand.
MPCOA-98	965-975	Sand (95% sand, 5% gravel). Poorly graded. Chert, granite. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-99	975-985	Sand (>95% sand, <5% gravel). Poorly graded. Chert, granite. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-100	985-995	Same as above.
MPCOA-101	995-1005	Silty sand (70% sand, 30% silt/clay). Poorly graded, subangular. 7.5YR5/6, silt/clay; 10YR5/4, sand. Change in color and clay rich, maybe beginning "middle red"?
MPCOA-102	1005-1015	Same as above.
MPCOA-103	1015-1025	Silty sand (80% sand, 20% silt/clay). Poorly graded, subangular. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-104	1025-1035	Sand (95% sand, 5% silt/clay). Poorly graded, subangular. 7.5YR5/4, silt/clay; 10YR5/4, sand.
MPCOA-105	1035-1045	Silty sand (80% sand, 20% silt/clay). Poorly graded, subangular. 7.5YR5/6, silt/clay; 10YR5/4, sand.
MPCOA-106	1045-1055	Same as above.
MPCOA-107	1055-1065	Silty sand (70% sand, 30% silt/clay). Poorly graded, subangular. 7.5YR5/6, silt/clay; 7YR5/4, sand.
MPCOA-108	1065-1075	Silty sand (80% sand, 20% silt/clay). Poorly graded, subangular. 7.5YR5/6, silt/clay; 7.5YR5/4, sand.
MPCOA-109	1075-1085	Silty sand (90% sand, 10% silt/clay). Poorly graded, subangular. 7.5YR5/4, silt/clay; 7.5YR5/4, sand.
MPCOA-110	1085-1095	Gravelly sand (70% sand, 25% gravel, 5% silt/clay). Well to moderately graded, subangular (sand), subangular to subrounded (gravel). Granite, chert. 7.5YR5/4, silt/clay; 10YR5/4, sand.
MPCOA-111	1095-1105	Silty sand (90% sand, 5% gravel, 5% silt/clay). Moderately to poorly graded, subangular to subrounded (sand), subangular (gravel). Granite, chert. 7.5YR5/4, silt/clay; 10YR4/4, sand. Lots of devitrified glass, ash. (See Table 2, 1320 ft)
MPCOA-112	1105-1115	Silty sand (85% sand, 10% silt/clay, 5% gravel). Poorly graded, subangular. Granite, chert. 7.5YR5/6, silt/clay; 10YR5/6, sand.
MPCOA-113	1115-1125	Silty sand (90% sand, 10% silt/clay). Poorly graded, subangular. 7.5YR5/4, silt/clay; 10YR5/6, sand.
MPCOA-114	1125-1135	Silty sand (85% sand, 15% silt/clay). Poorly graded. 7.5YR5/4, silt/clay; 7.5YR4/4, sand. Cemented with micritic CaCO <sub>3</sub> ; contains a lot of devitrified volcanic ash.
MPCOA-115	1135-1145	Silty sand (80% sand, 15% silt/clay, 5% gravel). Poorly graded, subangular (sand), subrounded (gravel). Chert. 7.5YR5/4, silt/clay; 7.5YR4/4, sand. Cemented with micritic CaCO <sub>3</sub> ; contains a lot of devitrified volcanic ash.
MPCOA-116	1145-1155	Silty sand (90% sand, 10% silt/clay). Poorly graded, subangular. 7.5YR5/4, silt/clay; 7.5YR5/4, sand.
MPCOA-117	1155-1165	Sand (95% sand, 5% silt/clay). Poorly graded, subangular. 7.5YR5/6, silt/clay; 7.5YR5/4, sand.
MPCOA-118	1165-1175	Same as above.
MPCOA-119	1175-1185	Sand (95% sand, 5% silt/clay). Poorly graded, subangular. 7.5YR5/4, silt/clay; 7.5YR5/4, sand.

Sample No.	Depth (ft)	Description
MPCOA-120	1185-1195	Sand (95% sand, 5% silt/clay). Poorly graded, subangular. 7.5YR5/4, silt/clay; 10YR5/4, sand.
MPCOA-121	1195-1205	Sand (>95% sand, <5 silt/clay). Poorly graded, subangular to subrounded. 7.5YR5/4, sand.
MPCOA-122	1205-1215	Core retrieved from this interval (Table 4).
MPCOA-123	1215-1225	Same as 1195-1205.
MPCOA-124	1225-1235	Silty clay (60% silt/clay, 40% sand). Poorly graded, subangular. 7.5YR5/4, silt/clay; 7.5YR5/4, sand.
MPCOA-125	1235-1245	Silty sand (90% sand, 10% silt/clay). Poorly graded, subangular. 7.5YR5/4, silt/clay; 10YR5/2, sand. Contains lots of devitrified volcanic ash, zeolites?, and micritic cement.
MPCOA-126	1245-1255	Sand (90% sand, 10% gravel). Poorly graded, subangular. Volcanic ash?, chert, granite. 10YR5/2, sand. Contains lots of devitrified volcanic ash, zeolites?, and micritic cement.
MPCOA-127	1255-1265	Sand (95% sand, 5% gravel). Poorly graded, subangular. Volcanic ash?, chert, granite. 10YR5/2, sand. Contains lots of devitrified volcanic ash, zeolites?, and micritic cement.
MPCOA-128	1265-1275	Silty sand (75% sand, 30% silt/clay, 5% gravel). Poorly graded, subangular. Volcanic ash?, chert. 10YR5/4, silt/clay; 10YR5/2, sand. Contains lots of devitrified volcanic ash, zeolites?, and micritic cement.
MPCOA-129	1275-1285	Sand (95% sand, 5% gravel). Poorly graded, subangular. Volcanic ash?, chert, granite. 10YR5/2, sand.
MPCOA-130	1285-1295	Sand (95% sand, 5% gravel). Poorly graded, subangular. Chert, volcanic ash. 10YR5/2, sand.
MPCOA-131	1295-1305	Gravelly sand (70% sand, 30% gravel). Poorly graded, subangular. Granite, volcanic ash? 10YR5/2, sand.
MPCOA-132	1305-1315	Gravelly sand (70% sand, 30% gravel). Poorly graded subangular. Granite, volcanic ash?, chert. 10YR5/2, sand.
MPCOA-133	1315-1325	Sand and gravel (60% sand, 40% gravel). Poorly graded, subangular. Granite, volcanic ash?, chert. 10YR5/2, sand.
MPCOA-134	1325-1335	Gravelly sand (80% sand, 20% gravel). Poorly graded, subangular. Granite, volcanic ash?. 10YR5/2, sand.
MPCOA-135	1335-1345	Sand (95% sand, 5% gravel). Poorly graded, subangular. Granite, chert. 10YR5/3, sand.
MPCOA-136	1345-1355	Sand (95% sand, 5% gravel). Poorly graded, subangular. Granite, chert, volcanic ash?. 10YR5/3, sand.
MPCOA-137	1355-1365	Silty sand ( $\geq$ 95% sand, <5% gravel, <5% silt/clay). Poorly graded, subangular. Granite, chert. 10YR5/4, silt/clay and sand.
MPCOA-138	1365-1375	Sand (95% sand, 5% gravel). Poorly graded, subangular. Chert. 10YR5/4, sand.
MPCOA-139	1375-1385	Clay (100% silt/clay). Poorly graded. Clay. 10YR5/2, silt/clay.
MPCOA-140	1385-1395	Silty clay (55% sand, 40% silt/clay, 5% gravel). Poorly graded, subangular. Chert. 10YR5/2, silt/clay; 10YR5/4, sand.
MPCOA-141	1395-1405	Silty sand (65% sand, 30% silt/clay, 5% gravel). Poorly graded, subangular. Chert, granite. 10YR4/3, silt/clay; 10YR5/3, sand.
MPCOA-142	1405-1415	Sand (>90% sand, <5% gravel, <5% silt/clay). Poorly graded, subangular. Chert. 10YR5/3, sand.
MPCOA-143	1415-1425	Sand (>95% sand, <5% silt/clay). Poorly graded, subangular. 10YR5/3, silt/clay and sand.
MPCOA-144	1425-1435	Same as above.

Sample No.	Depth (ft)	Description
MPCOA-145	1435-1445	Sand (95% sand, 5% gravel). Poorly graded, subangular. Granite, chert. 10YR5/3, sand.
MPCOA-146	1445-1455	Same as above.
MPCOA-147	1455-1465	Silty sands (85% sand, 10% silt/clay, 5% gravel). Poorly graded, subangular (sand), subangular to subrounded (gravel). Granite, chert. 10YR4/3, silt/clay; 10YR5/3, sand.
MPCOA-148	1465-1475	Silty, clayey sands (70% sand, 30% silt/clay). Poorly graded, subangular. 10YR4/3, silt/clay; 10YR5/3, sand.
MPCOA-149	1475-1485	Same as above.
MPCOA-150	1485-1495	Same as above.
MPCOA-151	1495-1505	Silty sand (85% sand, 10% silt/clay, 5% gravel). Poorly graded, subangular. Granite. 10YR5/3, silt/clay and sand.
MPCOA-152	1505-1515	Sand (95% sand, 5% silt/clay). Poorly graded, subangular. 10YR5/3, silt/clay and sand.
MPCOA-153	1515-1525	Silty sand (80% sand, 15% silt/clay, 5% gravel). Poorly graded, subangular. Granite, chert. 10YR5/3, silt/clay and sand.
MPCOA-154	1525-1535	Same as above.
MPCOA-155	1535-1545	Sand (95% sand, 5% gravel). Poorly graded, subangular. Granite. 10YR5/3, sand.
MPCOA-156	1545-1555	Sand (90% sand, 10% gravel). Poorly graded, subangular (sand), subangular to subrounded (gravel). Granite, chert. 10YR5/3, sand.
MPCOA-157	1555-1565	Gravelly sand (80% sand, 15% gravel, 5% silt/clay). Moderately to poorly graded, subangular (sand), subangular to subrounded (gravel). Granite. 10YR6/3, silt/clay; 10YR5/3, sand.
MPCOA-158	1565-1575	Gravelly sand (75% sand, 20% gravel, 5% silt/clay). Moderately to poorly graded, subangular (sand), subrounded (gravel). Granite, chert. 10YR5/4, silt/clay; 10YR5/3, sand.
MPCOA-159	1575-1585	Gravelly sand (80% sand, 20% gravel). Poorly graded, subangular (sand), subangular to subrounded (gravel). Granite, chert, basalt?. 10YR5/3, sand.
MPCOA-160	1585-1595	Gravelly sand (80% sand, 20% gravel). Poorly graded, subangular. Granite, chert. 10YR5/3, sand.
MPCOA-161	1595-1605	Sand (95% sand, <5% silt/clay). Poorly graded, subangular. 10YR5/3, sand.
MPCOA-162	1605-1615	Sand (95% sand, 5% gravel). Poorly graded, subangular (sand), subrounded (gravel). Volcanic ash. 10YR5/3, sand. Very well sorted sand (vfu-cl).
MPCOA-163	1615-1625	Sand (95% sand, 5% gravel). Poorly graded, subangular. Pedernal chert. 10YR5/3, sand. Very well sorted sand (vfu-cl).
MPCOA-164	1625-1635	Sand (100% sand). Poorly graded, subangular. 10YR5/3, sand. Very well sorted sand (vfu-cl).
MPCOA-165	1635-1645	Sand (95% sand, 5% gravel). Poorly graded, subangular. Granite. 10YR5/3, sand. Very well sorted sand (vfu-cl).
MPCOA-166	1645-1655	Sand (100% sand). Poorly graded, subangular. 10YR5/3, sand. Very well sorted sand (vfu-cl).



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Well Name: Montessa Park Site (USGS-COA Piezometer Nest)

File Name: C:\VLWWELLLO~1\MPS\INDUCT.HDR

Location: Albuquerque East 7.5' Quad. (T9N, R03E, Section 10.342)

Elevation: 0 Reference: Ground Surface

