

Location ID: BW-7-211 Field Representative(s): J. KaszubaNorthing: 231556.89 Easting: 413849.70Date Started: 11 November 1988 Date Completed: 1 December 1988Drilling Method: Mud/Air-Foam Rotary Drilling Contractor: LarjonDriller: T. CrawfordTotal Depth Borehole: 230' Total Depth Well Casing: 224.9'Total Depth Surface Casing: 66 feetDiameter Well Casing: 4 inch Diameter Surface Casing: 8 inchLength of Bottom Blank: 3.3'Type of Screen: regular strength 0.02 slotScreen Interval: 211.3' to 221.6'Water First Detected: ≈190' Water Level Open Borehole: 190.6'  
(surface casing)

Water Level Cased Borehole: \_\_\_\_\_

Quik-Foam Use: 1 1/2 gallon

Estimated Water Use: 4090 gal. used during drilling  
5060 gal. circulated to surface  
970 gal. formation water circulated to surfaceWell Casing:

4in x 3ft SCD 40 PVC:	2	stock SS centralizers:	0
4in x 5ft SCD 40 PVC:	1	custom SS centralizers:	1
4in x 10ft SCD 40 PVC:	16	4"x2' SS locking riser:	1
4in x 20ft SCD 40 PVC:	0	4" SS locking cap:	1
Total SCD 40 PVC pipe:	171 ft	4" SS female cap:	1
4in x 3ft SCD 5 SS pipe:	1		
4in x 5ft SCD 5 SS pipe:	0	4in x 5ft SCD 10 SS pipe:	0
4in x 10ft SCD 5 SS pipe:	4	4in x 10ft SCD 10 SS pipe:	0
4in x 20ft SCD 5 SS pipe:	0	4in x 20ft SCD 10 SS pipe:	0
Total SCD 5 SS pipe:	43 ft	Total SCD 10 SS pipe:	0 ft

Well Completion:

100# bags 16/40 sand: 4 bags  
100# bags 10/20 sand: 0 bags  
100# bags 8/14 sand: 0 bags  
100# bags 8/20 sand: 11 bags

94# bags cement: 62 bags

5 gal. buckets bentonite: 1 buckets

50# bentonite powder: 8 bags

Surface Casing:

94# bags cement: 40 bags

50# bags bentonite powder: 1 bags

Grout 0 bags

Pertinent Field Notes:

- 11/11/88 Steam clean and mobilize mud rotary drilling equipment to well site.
- 11/12/88 Set up to drill. Drill with mud rotary and 12-inch tri-cone bit, 0'-33'. Lost circulation at 33.
- 11/13/88 Drill with mud rotary, 33'-66'. Use 23 sacks bentonite with 2000 gal. water in two days drilling. Set 66' feet of 8-inch surface casing.
- 11/14/88 Grout surface casing. Demobilize mud rotary equipment, steam clean and mobilize air-foam rotary equipment.
- 11/15/88 Set up to drill. Drill with air-foam rotary and 7 7/8-inch tri-cone bit, 66'-230'. Use 1 1/2 gal. of Quik-Foam in 2090 gal. of water. Alluvium is not saturated. Bedrock encountered at 175' (Orejon Andesite). Probable water encountered at approximately 190', substantial amounts of water encountered in a fracture at 217'.
- 11/16/88 Demobilize drilling equipment. Static measured at 192.3' (surface casing). Borehole sounded at 225.9' (4.1' of slough in borehole).

- 11/17/88 D. Pearson of Southwest Surveys runs standard suite of geophysical logs plus drift. Sound borehole at 225.2' (0.7' of additional slough has accumulated). Install casing. 3' sump installed to complete well in best production zone (siltation problems unlikely in fractures where screen is set). No bottom plug installed. Install filter pack to secure screen.
- 11/18/88 Install balance of filter pack, upper plug, and filler sand to above static. Completion zone consumed more sand than predicted (approximately 4.5 ft<sup>3</sup>) to fill fractures. Install grout from 171.3' to 77'. Grout contains 6% bentonite to slow curing process and reduce heat generation in large borehole containing PVC pipe.
- 11/28/88 Install second stage of grout. This load was calculated to raise grout levels to the surface, but the borehole consumed more grout than predicted and the level measured on 11/18/88 was inaccurate.
- 11/29/88 Install third stage of grout from 72.5' to 0'.
- 11/30/88 Develop the completed well. Details on development data sheet.
- 12/01/88 Pour pad and set brass survey cap.