WELL SUMMARY

Location ID: ST-1-630 Field Representative(s): M. Canavan, D. Menzie

Date Started: 06/16/92 Date Completed: 07/21/92

Northing: 229180.70 Easting: 401046.29

Brass Cap: 4501.61 Outer Casing: no o.c. Inner Casing: 4502.39

Drilling Method: Mud Rotary Drilling Contractor: Larjon Drilling Co.

Driller: J. Gower

Total Depth Borehole: 698' Total Depth Well Casing: 645.65'

Total Depth Surface Casing: 18'

Diameter Well Casing: 4" Diameter Surface Casing: 10"

Length of Bottom Blank: 5.27'

Type of Screen: extra strength 0.02 slot

Screen Interval: 630.38' to 640.38'

Water First Detected: not detected while drilling Water Level Open Borehole: N/A (borehole filled with drilling mud)

Water Level Cased Borehole: 432.36' (07/30/92)

Quik-Foam Use: 2 gallons

Estimated Water Use: 44,800 gallons

Well Casing:

4in x 3ft SCD 40 PVC:
4in x 5ft SCD 40 PVC:
4in x 10ft SCD 40 PVC:
4in x 20ft SCD 40 PVC:
Total SCD 40 PVC pipe: ft

custom SS centralizers: 1
4"x2' SS locking riser:
4" SS locking cap: 1
4" SS female cap: 1

4in x 3ft SCD 5 SS pipe:
4in x 5ft SCD 5 SS pipe: 1
4in x 10ft SCD 5 SS pipe: 1
4in x 20ft SCD 5 SS pipe: 19'
Total SCD 5 SS pipe: 395'

4in x 5ft SCD 10 SS pipe: 2
4in x 10ft SCD 10 SS pipe: 1
4in x 20ft SCD 10 SS pipe: 11
Total SCD 10 SS pipe: 240'

Well Completion:

100# bags 16/40 sand:	4	bags
100# bags 8/20 sand:	71.5	bags
94# bags cement:	201	bags
50# bentonite powder:	254	bags
Benseal:	1	bags

Surface Casing:

94# bags cement:	3	bags
50# bags bentonite powder:	1/4	bags

Pertinent Field Notes:

06-12-92 Steam clean and mobilize mud rotary equipment to well pad. Begin filling mud pits with water. - Menzie

06-15-92 Finish filling mud pits with water (≈ 12,000 gallon capacity). Begin mixing mud. - Egan and Kirby

06-16-92 Continue mixing mud. Having some problems with mud separating. Added soda ash and drispak. Drilled 0-19', (12 1/4" borehole). Set and grouted 18' of 10" steel surface casing. Two samples taken from mudpits for biotreatability study (see page 108 of fieldbook #3, State Land Wells). - Kirby

06-17-92 Continue drilling 19'-135', 9 7/8" mill tooth bit. - Menzie

06-18-92 Continue drilling, 135'-150'. Pull string out, bit locked up on two of three cones. Get collar and new bit steam cleaned and hang bit/stabilizer/1st collar in surface casing. - Menzie

06/19/92 Add 80' of collars above stabilizer and new bit. Drill 150'-305'. Rescue clumsy roadrunner from mud pit. - Menzie

06/22/92 Drill 305'-380'. Get drill string stuck in hole because of swelling clays. Break hoist on rig. - Menzie

06/23/92 Demobilize DMX rig with broken hoist. Steam clean and mobilize BE rig to site. Pull stuck drill string from borehole using BE rig. - Menzie

06/24/92 Drill air foam rotary 380'-503'. Blew borehole for 1 hour to remove as much soap (foam) as possible. - Canavan

06/25/92 Steam cleaned and mobilized Franks rig to site (to use Franks mud pump for drilling with BE rig). Lined new mud pit. Cleaned mud out of old pit and will line it Monday (06/29) to use for mixing mud and as a discharge pit. - Canavan

Pertinent Field Notes: (cont'd)

06/26/92 Larjon removed clutch shaft from BE to take to town for repair. Replaced sleeves, rods and swabs on Franks mud pump. Brought out portable mud pump. - Canavan

06/29/92 Hauled water to fill both pits and started mixing mud. 80 sacks gel and 6 sacks soda ash were added to pit. Two samples were taken from mud pits for biotreatability control samples. See page # 150 in State Land Book III for information. - Canavan

06/30/92 Continued mixing mud to prepare to drill. Added 33 sacks gel and 1 sack soda ash to pits (for a total of 113 gel and 7 soda ash. Repaired leaking hydraulic line on BE. Drilled mud rotary 503'-540'. Cleaned borehole for 70 min. Took control mud samples for biotreatability study. See State Land Book III, page 154 for information. - Canavan

07/01/92 Assembled inner/outer core barrel (designed for biotreatability study) and attempted core from 540'-550'. Retrieved only 4" of core after 3 hours of drilling. - Canavan

07/02/92 Attempted to core again to retrieve sample for biotreatability study. No core retrieved. - Canavan

07/03/92 Holiday

07/06/92 Drilled mud rotary 540'-593'. - Canavan

07/07/92 Drilled 593'-698' (TD). Encountered tuff bedrock at 645'. - Canavan

07/08/92 Southwest Surveys ran full suite of geophysical logs. Started demobilizing equipment and cleaning up site. - Canavan

07/09/92 Designed well. Steamcleaned and mobilized completion materials to site. Poured filler sand to 652.83' and pumped bottom plug. - Menzie

07/10/92 Installed 646.85' of casing and gravel pack. Screened interval is 630.38'-640.38'. Bottom of sump is at 645.65' and stick-up is 1.2'. - Canavan

07/13/92 Completed installation of gravel pack and upper plug. Gravel pack and upper plug installation proved to be very difficult due to swelling clays in borehole. Therefore gravel pack interval is much thicker than ideal 20'. - Canavan

07/14/92 Sounded top of plug at 569.5'. Poured filler sand to 420.25'. Attempted to pour first load of grout, but discovered casing leak and had to dispose of grout. - Canavan

07/15/92 Spent the day locating leak in casing. Leak is at 80.58' (G.S.). - Canavan

Pertinent Field Notes: (cont'd)

07/16/92 Poured first load of grout very slowly to make sure we do not come up above seam. Bailed well and had no indication of grout invasion. - Canavan

07/17/92 Grout came up to 64' (above leaking seam) despite our efforts to prevent it. There was no grout invasion. Grouted remainder of annulus. - Canavan

07/20/92 Surged and bailed well for initial development. Installed 1 1/2 HP submersible pump at 609' (G.S.) - Canavan

07/21/92 Bailed and pumped a total of 2381.85 gallons of water from well. Parameters stabilized. Well is developed, pulled pump and turned well over to Lockheed.