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AD 667359

FINAL REPORT ON DRILLING OF PRESSURE INJECTION DISPOSAL WELL ROCKY MOUNTAIN ARSENAL DENVER, COLORADO

VOLUME II

Chronological Log
Daily Engineering Report

DDC
APR 4 1968

Contract DA-25-066-ENG-6033

CHRONOLOGICAL LOG

13 February 1961	Loffland Brothers Company received notice to proceed.
15 February 1961	Dirt Contractor was given working limits of location and commenced operations to construct location.
16 February 1961	Freezing weather hampered dirt work somewhat. Tuboscope Company arrived on location to begin checking tubular goods to be used.
17 February 1961	Tuboscope unable to work due to pipe being frozen. Reserve pit being dug.
19 February 1961	Tuboscope checking pipe. Dirt Contractor preparing location.
20 February 1961	Tuboscope checking pipe. Dirt Contractor preparing location.
21 February 1961	Moving in equipment.
22 February 1961	Water line being ditched
23 February 1961	Water line being ditched.
24 February 1961	Laying water line. Cementing collar.
27 February 1961	Began moving equipment into place.
28 February 1961	Moving equipment into place.
1 March 1961	Began rigging up equipment with all drilling crews working during daylight hours. Rig water line was installed and tested for leaks. The following items were placed: a. Substructure, b. Rotary table, c. Conductor casing, d. Drawworks, and e. Transmission. Due to 12" guide on 17 1/2" reamer, it was decided to drill the first 2,000' to facilitate the 13 3/8" casing, with a 12 1/4" bit. A 12 1/4" bit would also be nearer the I.D. of the 13 3/8" casing than an 11" bit, in drilling out cement. This could eliminate possible future trouble from mud contamination due to subsequent sloughing of the undisturbed sheath of cement that could remain if an 11" bit were utilized.

2 March 1961	Rigging up. The following items were placed: a. Two rig engines, b. Warning lights on crown, c. Shale Shaker, d. 3 mud tanks, e. Stand pipe, f. Mud and Stand-by pump, g. Toolhouse, and h. Fuel and water tanks.
3 March 1961	Shut down due to bad weather. Snow and moisture made location too muddy to work. Drill collars arrived on location.
4 March 1961	Rigging up. Placed: a. Dog house, b. Stairs, c. 3rd engine, and d. pipe and casing racks. Hardbanding was put on all drill pipe to be used.
5 March 1961	Rigging up. All drill pipe has been placed on the racks. The blocks were strung with eight lines, chains installed in compound, new liners, rods, heads, and seats installed in pumps. Inspected pin and box end of all drill pipe for proper facing. Caution Contractor that mast must be lighted at all time after raising.
6 March 1961	Flange up mud lines, steam lines, etc. Hook up lights and all electrical wiring.
7 March 1961	Finished flanging up all lines, accepted delivery of 20" and 13 3/8" casing. Started motors, raised mast and erected housing.
8 March 1961	Measured mud pits, erecting housing. Crew started on 24-hour per day basis as of 8:00 A.M.
9 March 1961	Finished erecting housing.
10 March 1961	Started mixing spud mud at 1:00 A.M. Tallied 20" casing total 127.58 feet plus landing joint of 26.80 feet. Ground level is top of cellar. Ground level to rotary table 14.30 feet. Ground level to kelly bushing 15.53 feet. Kelly bushing 1.23 feet. Cellar 3' deep.
3:45 A.M.	Spud 3:45 A.M. with bit No. 1-12 1/4" DT.
10:45 A.M.	T.D. 106'. Pipe tended to stick. Raise mud viscosity to 70 seconds.
4:00 P.M.	T.D. 139'. Rig up to ream 24" hole. Finish drilling 12 1/4" hole. Ran Eastco-deviation, 3/4° at 139'.
6:00 P.M.	Started reaming 24" hole. Viscosity raised to 130 seconds.

11 March 1961

12:01 A.M.	Ream 24" hole.
1:00 A.M.	Condition mud. Finish reaming 24" hole to 138. Halliburton standing by.
2:30 A.M.	Welded shoe on 20" casing with 4-3" beads.
3:00 A.M.	Run first joint 20" casing.
4:10 A.M.	Run second joint 20" casing.
4:50 A.M.	Run third joint 20" casing.
5:35 A.M.	Run fourth joint 20" casing, no obstructions in hole. Run landing joint and nipple up cementing equipment.

Total pipe plus landing joint	152.38'
Rotary table to top of landing joint	20.35'
Total pipe in hole	132.03'
Rotary table to ground level	14.30'
Ground level to shoe	117.73'
Plus shoe	2.00
Pipe set at	119.73 G.L.

8:05 A.M.	Cement 20" casing with 180 sacks regular cement plus 2% $CaCl_2$. Circulated 20 sacks and left 24 feet of cement in pipe.
8:55 A.M.	Plug down. Wait on cement at least 18 hours.
9:00 P.M.	Nipple up to drill 12 1/4" hole. Cut off 20" casing 1.5 feet above bottom of cellar.

12 March 1961

12:01 A.M.	Nipple up to drill 12 1/4" hole (changed rotary tables, cleaned mud pits, installed blowout preventers).
3:50 P.M.	Tested blind rams with 225 psi. Installed a mousehole.
5:05 P.M.	Tested pipe rams with 150 psi.
5:15 P.M.	Drill cement plug with water. Drilled 21' of cement.
6:00 P.M.	Pick up drill collars to drill ahead.
7:20 P.M.	Drilling ahead with bit No. 1 RR.
9:30 P.M.	Drill to 196'. Run Eastman survey 3/4°.
10:45 P.M.	Drill to 246'. Run Eastman survey 0°, drilling ahead.

13 March 1961

12:01 A.M.	Drilling at 325'.
12:30 A.M.	Run Eastman at 370', 1 1/2°. Checked this reading on trip out 1/2°.
12:35 A.M.	Cleaning out plugged flowline.
1:15 A.M.	Flowline open, drill ahead at 385'.
3:15 A.M.	Drill to 440', run Eastman 1/4°.
4:45 A.M.	Drill to 500', run Eastman 1/2°.
5:20 A.M.	Drill to 506'.

13 March 1961 (Continued)

6:15 A.M.	Drill to 569', clutch on drawworks heating up. Shut down for repairs.
9:15 A.M.	Work on transmission clutch 3 hours, completed. Valve on mud line washed out. Drilling ahead.
9:50 A.M.	Eastman at 599' 1/2°.
10:15 A.M.	Putting clamp on standpipe.
10:55 A.M.	Drilling ahead.
11:35 A.M.	Eastman at 660' 1/2°.
11:55 A.M.	Drilling ahead.
1:45 P.M.	Eastman at 820' 3/4°.
2:10 P.M.	Drilling ahead.
3:00 P.M.	Shut down to work on low clutch.
4:50 P.M.	Drilling ahead at 946'.
5:25 P.M.	Clean flowline plugged with shale.
6:05 P.M.	Drilling ahead.
8:15 P.M.	Eastman 3/4° at 1090'.
8:30 P.M.	Drilling ahead. Clutch on drawworks hot.
9:15 P.M.	Shale shaker plugged.
11:30 P.M.	Drilling ahead at 1135'.

14 March 1961

12:01 A.M.	Drilling ahead at 1145'.
12:30 A.M.	Condition mud to prevent balling up. Drilling ahead.
4:00 A.M.	Eastman 3/4° at 1300'.
4:15 A.M.	Drilling ahead.
6:15 A.M.	Eastman 1/2° at 1481'.
6:30 A.M.	Trip out.
7:30 A.M.	On bank with bit No. 1 RR. Repair air hose. Pick up 4-7" drill collars.
9:25 A.M.	Start in hole with bit No. 2, 12 1/4" YT-3.
10:20 A.M.	On bottom, drilling ahead.
2:20 P.M.	Eastman 1/4° at 1756'.
2:40 P.M.	Drilling ahead.
6:00 P.M.	Eastman 1/4° at 2007'.
6:30 P.M.	Drilling ahead.
7:00 P.M.	T.D. 2030'. Circulating and condition mud.
7:30 P.M.	Pull 5 stands for short trip, 12' fill-up.
8:40 P.M.	Condition mud.
9:45 P.M.	Trip out to log.
11:00 P.M.	On bank with bit No. 2, rig up to run logs.
11:30 P.M.	Log stopped at 800'.
11:40 P.M.	Trip in to condition mud. Driller's strap on trip out 2031.23'.

15 March 1961

12:01 A.M.	Tripping into hole.
1:10 A.M.	Mix mud and circulate.
4:00 A.M.	Trip to log.
5:30 A.M.	Sonde hit bridge at 115'.
6:00 A.M.	Trip in to condition hole.
7:00 A.M.	Hit bridge at 320'.
7:20 A.M.	Circulate and condition mud, on bottom.
11:30 A.M.	Trip out to log drilled tight spots at 1280' and 800'.
1:40 P.M.	Rig up to run logs, hit bridges at 1065', 1080' and 1160'.
2:30 P.M.	Trip in hole to drill bridges, hit bridges at 1280' and 1360', reamed 1280-1360. Hit bridge at 1980'.
5:10 P.M.	Circulate hole, 8' of fill-up.
6:00 P.M.	Trip out to log.
7:00 P.M.	On bank with drill pipe, no bridges, to run logs.
9:00 P.M.	Rig up to ream, have run IES & micrologs.

16 March 1961

12:01 A.M.	Rig up to ream.
2:00 A.M.	Trip into hole.
2:45 A.M.	Ream 12 1/4" hole to 17 1/2".
3:15 A.M.	Repair rig, gear box heating.
3:30 A.M.	Resume reaming, mixing mud.
10:10 A.M.	Repair high clutch.
11:00 A.M.	Ream to 910'.
5:45 P.M.	Shut down to repair mud valve.
7:00 P.M.	Resume reaming.
10:00 P.M.	Trip for new reamer. Reamed to 1200'.
11:00 P.M.	On bank with reamer. Pick up 3 more drill collars. Trip back in hole.

17 March 1961

12:01 A.M.	Repairing mud lines.
12:50 A.M.	Reaming ahead. Driller reports hole tight all the way.
3:15 A.M.	Flowline plugged.
5:25 A.M.	Resumed reaming. Bit tends to ball up with low volumes.
10:05 A.M.	Split compound put #1 engine on rotary. 1050 rpm on engine gives 210 rpm on rotary. #2 and #3 engines on pumps at 850 rpm gives #1 pump 48 spm; #2 pump 62 spm, 900 psi.
10:10 A.M.	Resumed reaming.
10:55 A.M.	Ream to 1650'.
1:40 P.M.	Reamed to 1746', shut down to jet shale pits.

17 March 1961 (Continued)

2:10 P.M.	Resume reaming.
2:35 P.M.	Lost prime on pump.
2:40 P.M.	Resumed reaming.
7:35 P.M.	Reamed to T.D. 2031'. Began circulating mud
9:00 P.M.	Trip out, tight 1st 8 stands, free rest of way, strap pipe 2031.63'.
10:40 P.M.	Trip in. Put kelly on at 1700 . Broke circulation, resume trip in.

18 March 1961

12:01 A.M.	Trip in.
1:10 A.M.	Mix mud, condition hole.
2:00 A.M.	Short trip 8 stands. Tight 1st 3 stands; 3 places on 5th stand; pulled 15-20,000 on 6th stand 30'.
2:35 A.M.	Circulate, condition mud.
4:00 A.M.	Trip out, rig up to run casing.
7:30 A.M.	Run 63 joints 13 3/8" casing. Torque to 6250 ft.lbs.
	22 joints J-55 bottom 707.5'
	26 joints H-40 middle 807.4'
	15 joints J-55 top 484.6'
	Total casing 1999.5'
	Hole tight 11 joints off bottom, working.
4:00 P.M.	Landed casing. Rig up to circulate.
	Total pipe 199.54
	Guide shoe 1.80
	Baffle collar 1.63
	2002.97
	1.60 Depth from top cellar
	Pipe set at 2004.57' Below top of cellar
	Centralizers at 15', 94', 185' above casing shoe
4:25 P.M.	Circulate hole.
5:50 P.M.	Drop wiper plug.
6:00 P.M.	Pump 25 barrels water.
6:15 P.M.	Pump 1450 sks. cement; 280 bbls. at 5 bbls./min. for 56 min.
7:12 P.M.	Displace plug
7:18 P.M.	66 spm equals 13.3 bbls./min.
7:29 P.M.	Got returns, circ. press. 900 psi.
7:35 P.M.	Rig pump out. Pumped 17 min. at 13.3 Bbls./min. = 226 bbls. Began displacing with Halliburton pumps.

18 March 1961 (Continued)

7:55 P.M.	Pump Halliburton 123 bbls.
	Total Disp. 312
	123
	189 ÷ 17 = 11.1 bbls./min.
	5 x 11.1 = 55.5 bbls. Rig pump
	125 bbls. Halliburton
	180.0 bbls. x 5 = 900 sks. cement circulated to surface.
	To wait on cement 36 hours.

19 March 1961

12:01 A.M.	Nippling up casing head equipment while waiting on cement.

20 March 1961

12:01 A.M.	Wait on cement.
8:00 A.M.	End of waiting on cement time. Shut down due to rig repairs. General rig cleanup while waiting on parts.

21 March 1961

12:01 A.M.	Shut down for rig repairs. General rig cleanup while waiting on repairing rig.

22 March 1961

12:01 A.M.	Shut down for rig repairs. General rig cleanup while waiting on repairing rig.

23 March 1961

12:01 A.M.	Shut down for repairing rig.
5:30 P.M.	Completed rig repairs. Pick up drill collars. Shut down for repairs 81 1/2 hrs - 3.4 days.
9:45 P.M.	Put on joint of drill pipe and kelly and displaced 70' mud with water.
10:00 P.M.	Closed pipe rams on joint of drill pipe and attempted to pressure up.
10:25 P.M.	Pressured up on pipe rams to 1000# and seemed to hold. Checked in cellar for leaks. Found leak in flange on BOP due to missing stud. Replaced missing stud. Also found leak in 4" valve on choke line. Repairing valve and tightening all bolts on tree.

24 March 1961

12:01 A.M.	Repairing valve on choke line.
12:30 A.M.	Found valve threads fouled and they stripped threads on replacement part. Crew is now attempting to locate another valve and replace faulty choke line valve. Did not have to replace valve. The fouled threads in the valve were repaired and new plug inserted. Repairs completed at 2:00 A.M.
2:00 A.M.	Pressured up on pipe rams to 1000# and held for 30 min. No visible leaks in cellar equipment or blowout preventers. No leak from top of rams. There was a slight leak from stem of 4" valve on No. 1 pump. Test completed at 2:30 A.M. Lost 50# during test.
2:40 A.M.	Shut Hydril on kelly and pressured to 1000#. Slight leak on blowout line valve. Released pressure and opened and closed fouled valve a few times to clean it out.
3:04 A.M.	Shut Hydril on kelly and pressured to 1000#. Slight leak in blowout line valve but less than before. No visible leak in Hydril or Hydril-BOP flange. There were 2 good sized leaks in 2-4" valves just off No. 1 pump. Completed test at 3:14 A.M. Lost 175# in 10 minutes.
3:15 A.M.	Tightened 2-4" valves on pump No. 1.
3:26 A.M.	Pressured up on Hydril, closed on kelly. Held for 10 minutes. Lost less than 25#. Still have slight leak from blowout line valve. Bled off pressure at 3:36 A.M.
3:40 A.M.	Started out of hole.
5:00 A.M.	Finished trip out of hole. Closed blind rams and started to pressure up but had leak in stand pipe valve. Had stand pipe valve replaced by 5.45 A.M.
5:45 A.M.	Pressured up on blind rams to 1000#. Held for 10 minutes. Have slight leak in blowout line valve, 4" pump valve, and stand pipe valve. Lost 25# in 10 minutes. No leak through blind rams.
5:55 A.M.	Closed Hydril on self and began to pressure up. Test failed. Bled fluid level in hole down to see Hydril.
6:00 A.M.	Closed Hydril on self. Saw approximate 2" opening in center of Hydril rubber.
6:15 A.M.	Prepared to run in hole to drill cement with bit No. 3-11", OSC3J, with 3-1/2" nozzles.
6:45 A.M.	Started in hole; ran 6 - 8" drill collars and 9 - 7" drill collars in string.
9:20 A.M.	Start drilling cement at 1980'. Cement firm.
9:40 A.M.	Shut down to repair leaky valve on choke line for positive test.

24 March 1961 (Continued)

10:30 A.M.	Pressure to 1025 held 30 minutes. Test okay.
11:00 A.M.	Resume drilling cement to 5' below shoe.
3:00 P.M.	Drilled cement, pressured up to 475#.
3:30 P.M.	Held pressure 30 minutes. Held okay. Displacing water prior to mixing mud in order to avoid the use of contaminated water in the preparation of the drilling mud.
5:00 P.M.	Preparing drilling fluid with driscose and condet. Figured total cumulative repairs according to Contract through 23 March 1961: Total time paid for by Government 10 hrs. Total time sustained by Contractor 81 hrs.
7:30 P.M.	T.D. 2033' (driller). Finished mixing mud. Started drilling with 24,000# on bit at 94 rpm. Pump pressure 600#.
8:30 P.M.	Check on mud showed: Density 8.4 #/gal. Filter cake Nil Viscosity 34 Sec. pH 11.5 Plastic Vis. 6 cp. Yield 1 Water loss 10.4 cc. Cl 400 ppm
11:00 P.M.	T.D. 2222'. Ran Eastman survey at 2205', 0°.
11:30 P.M.	T.D. 2222'. Resumed drilling after survey.

25 March 1961

12:01 A.M.	T.D. 2252'. Mud checks out all right. Made connection and found union on mud line leaking. Changed out bad union. Down from 12:01 to 12:45 A.M.
12:45 A.M.	T.D. 2252'. Resumed drilling.
3:00 A.M.	T.D. 2384'. Leak in mud line at pump No. 1. Switched to pump No. 2. Resumed drilling at 3:05 A.M.
7:50 A.M.	Drilled to 2629'. Ran the Eastman survey 1/4° and started out of the hole for a new bit. Hole tight. Swabbed some mud for 2 1/2 stands. Hole tight for 6 stands. Bit #3 made 599' in 11 hours to run average penetration rate of 54.5 ft./hr. Bit teeth were medium dull, bearings were green. Run bit #4, OSC-3J, with 1 13/32" nozzle and 2 - 14/32" nozzles.
11:30 A.M.	On bottom drilling, 23' fill-up.
1:10 P.M.	Shut down to repair mud line at 2,769'.
1:50 P.M.	Drilling mud viscosity 37 sec., water loss 6.6 cc's.
6:15 P.M.	Survey at 3098', 1/4° deviation.

25 March 1961 (Continued)

6:45 P.M.	Drilling ahead.
7:30 P.M.	T.D. 3156'. Mud check: Viscosity 35 Sec. Filter cake 1/32" Weight 9.2 #/gal. pH 8.5 Water loss 7.2 cc. Cl 400 ppm
11:00 P.M.	T.D. 3411'. Shut down to tighten mud gauge and fix spinning chain.
11:10 P.M.	Resumed drilling. Noticed red lights on crown not operating properly. One burned out, the other on steady. Checked with driller. He said derrick ladder was down due to welder repair. Told him as long as the one light was on, to fix it during daylight.

26 March 1961

12:01 A.M.	T.D. 3474', drilling.
1:40 A.M.	Drilling rate on last joint was 54 ft./hr. Told driller to increase weight on bit to 40,000#. T.D. 3538'.
2:05 A.M.	T.D. 3569'. Drilling rate on last joint was 72.8 ft./hr. Continue drilling with 40,000# on bit.
2:40 A.M.	T.D. 3600'. Ran Eastman survey at 3590', 1° deviation.
3:10 A.M.	Drilling ahead.
3:40 A.M.	Jet shale pit to lower mud weight.
3:45 A.M.	Will take another survey at 250' or about 3850'.
5:15 A.M.	T.D. [illegible]25'. Circulate hole prior to trip for bit.
5:30 A.M.	Mud check: Weight 9.5 #/gal. Viscosity 31 Sec. Water loss 6.8 cc.
5:45 A.M.	Finished circulating - dropped Eastman.
6:00 A.M.	Began coming out of hole.
8:00 A.M.	On bank with bit No. 4. Eastman at 3725' - 1 1/2°. Trip in with bit No. 5, DT.
10:24 A.M.	Back on bottom. Drilling at 3725'.
2:35 P.M.	T.D. 4008', ran deviation survey 1° at 4008'.
3:05 P.M.	Drilling ahead.

26 March 1961 (Continued)

Mud Checks

	12:00 A.M.	3:00 P.M.	5:00 P.M.	
Weight	9.5	9.5	9.5	#/gal.
Viscosity	35	33	32	Sec.
Water loss	6	5.8	7.4	cc.
Filter cake	2/32	1/32	1/32	in.
pH	9+	9	9	

4:15 P.M. T.D. 4059'. Gasket on pump No. 1 went out. Switched to stand-by pump, downtime 7 minutes. Resumed drilling.

8:00 P.M. T.D. 4294'. Bit plugged with bentonite. Pressured and bounced pipe to free bit.

8:25 P.M. Resumed drilling.

9:10 P.M. Jay DeMille, Baroid mud logger, informed of an increase in gas content in samples from about 4288' to 4300'. Recorded a maximum reading of 19 units of CH_4 or 7000 ppm. Sample was gray shale with trace of sandstone. No lithologic change from previous samples. Previous samples were running an average of 7 units or 2000 ppm CH_4.

10:30 P.M. T.D. 4385'. Ran Eastman survey 1 1/4° deviation at 4380'.

10:55 P.M. Drilling ahead.

27 March 1961

12:01 A.M. T.D. 4445'. Drilling.

6.04 A.M. T.D. 4770'. Circulating prior to pulling bit No. 5. Bit No. 5 made 1045' in 18 hours rotating time.

7:10 A.M. Finished circulating. Dropped Eastman. Started out of hole.

8:45 A.M. On bank with Bit No. 5. No. 1 cone on bit was loose, teeth were medium dull. Dumped shale pit and ran one more stand of drill collars. Total drill collar weight 66,000#, deviation at 4770' 3/4°. First 11 stands - 1000' was tight on trip out. Trip in with bit No. 6, OSC3.

27 March 1961 (Continued)

10:50 A.M.	On bottom, had 0 feet fill-up. Circulating for one hour prior to tripping bit No. 5. Apparently eliminated fill-up experienced on tripping bit No. 4. Drilling ahead.
8:10 P.M.	T.D. 5259'. Ran Eastman survey at 5255', 1° deviation.
8:50 P.M.	Drilling ahead.
11:30 P.M.	T.D. 5387'. Shut down to replace washed-out union on mud line.

28 March 1961

12:01 A.M.	T.D. 5387'. Shut down for repairs.
3:04 A.M.	T.D. 5387'. Started drilling after repairing mud line union. Also replaced valve on mud line.
4:50 A.M.	Cleaned shale pits.
4:55 A.M.	Drilling ahead.
6:15 A.M.	T.D. 5487'. Bit balled up.
6:22 A.M.	T.D. 5487'. Started circulating 1 hr. for trip.
7:22 A.M.	Bit #6 drilled 717' in 14 3/4 hrs. on bottom.
7:22 A.M.	Dropped Eastman. Start out of hole.
9:45 A.M.	On bank with bit #6. Bearings locked, teeth dull, some tooth breakage. Deviation 1° at 5470'. Hole free all the way out. Picked up all DC's and bit #7-DT. Weight in air 95,300#. In 9# mud 83,250#-weight of blocks 24,000#. Total weight 107,250#. Weight indicator showed 100,000#, approximately 7% error. Weight on bottom should be 172,850# at 5480', actual weight 160,000#, approximately 7.5% error.
12:25 P.M.	On bottom drilling. Attempted breaking in bit by adding one thousand pounds each minute to thirty thousand, then 5,000 pounds each minute to 60 thousand in order to avoid tooth breakage observed on bit No. 6.
10:07 P.M.	T.D. 5900'. Bit beginning to lock. Began circulating prior to trip.
11:00 P.M.	Finished circulating, dropped Eastman survey and blew out mud lines with steam.
11:20 P.M.	Started out of hole with bit No. 7.
11:30 P.M.	Mud check at 10:30 P.M.

Weight	9.5 #/gal.	pH	9
Viscosity	33 Sec.	Pl. Vis.	8
Water loss	7.6 cc.	Yield Pt.	3
Filter cake	1/32"		

29 March 1961

12:01 A.M.	T.D. 5900'. Tripping out of hole. Bit No. 7 made 413' in 9 1/2 hours on bottom.
1:45 A.M.	Out of hole with bit No. 7, teeth medium dull, many teeth broken. No. 3 cone bearing locked. Eastman survey at 5890' 1° deviation.
2:05 A.M.	Started back in hole with drill collars only. Bit No. 8 is OSC-3.
2:50 A.M.	Finished running drill collars and one stand of drill pipe in hole.
2:55 A.M.	Cut drilling line 150'.
4:00 A.M.	Install new sprocket on transmission shaft in order to slow transmission speed to 600 rpm.
6:30 P.M.	Cleaning mud lines.
7:30 P.M.	Resume trip in hole.
8:45 P.M.	On bottom drilling - noted 5' of fill-up. Tight spots in hole at 5250' and 5500'. String weighs 170,000#. Began drilling with 1,000# on the bit. Increased weight 1,000# per minute until 30,000# was reached at 9:15 P.M.
9:15 P.M.	Drilling with 30,000# on bit at 5910'.
9:45 P.M.	Drilling with 40,000# on bit at 5925'.
10:15 P.M.	Drilling with 40,000#. Made connection. Hole tight at 5900'. Pulled 90,000# over weight of string. Reciprocated and rotated through interval numerous times until no drag was noted.
10:50 P.M.	Drilling at 5936' with 50,000# on the bit.
11:59 P.M.	Drilling at 5967' with 50,000# on the bit.

30 March 1961

12:01 A.M.	T.D. 5967', drilling ahead. Tight hole noted on connection at 5925'. Mud logger notes that visual inspection of the shale shaker indicates a larger volume of material now coming over. Now running 60,000# on the bit.
3:00 A.M.	Tight hole on connections - noted water loss up to 11.2 cc's. Told driller to add 2 sacks of driscose instead of scheduled one.
6:00 A.M.	Water loss back down to 8.4 cc's.
7:30 A.M.	T.D. 6204'. Twisted drill pipe in two and started out of hole; left 21 - 7" and 6 - 8" drill collars, 1 sub, tool joint and 4" of drill pipe. Dressed American overshot with 5 3/4" slips and 5 3/4" packoff rubber. Layed down 5 joints of drill pipe. These 5 joints include section of twisted off joint, 1 joint of crooked pipe, and 3 joints which seemed to be badly rubber cut. Picked up 5 new joints of pipe including sub and overshot.

30 March 1961 (Continued)

11:15 A.M.	Run overshot to top of fish. Idled pump. Caught fish at 11:30 A.M. and started out of the hole. Locked the rotary and used spinning chain to uncouple the drill pipe.
12:25 P.M.	Hole tight first 4 stands, then free.
2:20 P.M.	Recovered overshot with fish. Bit No. 8, medium green; made 304' in 10 1/2 hrs. Start in hole with bit No. 9-YT3.

Discussed fishing job with O. E. Mechem, J. L. Wible, and after examining damaged joint and reviewing operating conditions, the following recommendations have been considered:

1. Reduce the rotary speed from 130 rpm to 100-110.
2. Alternate joint immediately above drill collar so as to reduce flexure stresses in critical joint every trip. This takes into consideration metallurgical variations in the pin area due to manufacturing processes.
3. Consideration has been given to use of stabilizers in recognition of the greater than normal hole clearances. This decision has been deferred until the results of previous recommendations can be evaluated.

A sample of the joint has been retained for possible metallurgical investigation in the event similar failures are experienced. Discussed procedures to be used in drilling Niobrara and from discussions with various field personnel confronted with problems in the Niobrara previously, the following procedure has been considered: While drilling the Niobrara, short trips should be made at the end of 1 1/2 hours, 2 1/4 hours, 3 1/2 hours, 5 1/4 hours, 7 1/2 hours and 10 hours. This procedure appears prudent in avoiding possible hole trouble.

6:00 P.M. On bottom with bit #9. Checked rotary combinations available after installation of new sprocket in transmission:

1150 rpm - Engines

Low Transmission, Low Rotary	30 rpm	Low Transmission, High Rotary	80 rpm
Second Transmission, Low Rotary	50 rpm	Second Transmission, High Rotary	125 rpm
Third Transmission, Low Rotary	65 rpm		

7:00 P.M. Drilling ahead at 6204'.

31 March 1961

12:01 A.M.	T.D. 6305'. Drilling.
2:35 A.M.	Drilling. Working drill pipe and making connection.
3:00 A.M.	Drilling at 6347'.

31 March 1961 (Continued)

6:30 A.M.	Experiencing tight hole on connections. Losing 15-20 minutes on each connection, working pipe.
7:30 A.M.	Started mixing 10 sacks of gel in order to raise viscosity. Bentonitic shales have resulted in some tight hole. If raising the viscosity does not clear up the shale problem, consideration will be given to an early conversion to a Gyp base mud.
9:30 A.M.	T.D. 6435'. Start circulating for trip. Mix 5 sacks of gel while circulating.
10:30 A.M.	Drop Eastman and start out of hole with bit No. 9. Mud properties prior to trip: weight 9.4, viscosity 32, W.L. 6.0.
1:20 P.M.	On surface with bit No. 9, teeth medium dull, all bearings loose, made 231' in 15 1/2 hours. Run in bit No. 10-OSC3 and DC's. Dumped pits. Weighed drill collars to see if any changes had occured in weight recorder as a result of cutting the drilling line. The reading was the same as previously recorded on 28 March. Trip out was free all the way with no tight hole experienced. Deviation at 6400' 3/4°. Resume trip in.
4:00 P.M.	On bottom, drilling at 6435'.
8:00 P.M.	Attempted to compound mud pumps but motors became overloaded.
9:00 P.M.	Logger notes large chunks of shale coming over shaker.

1 April 1961

12:01 A.M.	T.D. 6597'. Repairing air line on #2 engine. Drilling ahead.
2:30 A.M.	T.D. 6642'. Shut down to repair mud line. Washed out threads on connections, clutch out also. Worked 1 hour on drawworks.
7:10 A.M.	Resumed drilling at 6642'.
11:15 A.M.	T.D. 6700'. Began circulating 1 hr. before trip out with bit No. 10.
12:15 P.M.	Dropped Eastman. Started trip out of hole. First three stands tight. Free rest of way.
2:10 P.M.	Out of hole. Bit No. 10 description: teeth worn, no breakage, all bearings shot. Bit No. 10 made 265' in 14 1/2 rotating hours. Eastman survey was 1° deviation at 6690'. Loffland toolpusher observed and reported to engineer in charge scoured shoulder on 7" DC. Scoured shoulder was milled down and remaining 7" DC's were checked for same on tripping in with bit No. 11-OSC-3.

1 April 1961 (Continued)

4:10 P.M.	Resumed normal trip back in hole.
5:20 P.M.	On bottom at 6700' - observed 0 fill-up. Hit bridge going in at depth of approximately 6575'.
5:30 P.M.	Mud circulating. Drilling ahead, breaking in bit No. 11, same as bit No. 10 since no tooth breakage was observed on bit No. 10.
11:59 P.M.	Drilling at 6822'.

2 April 1961

12:01 A.M.	T.D. 6822'. Drilling ahead.
3:30 A.M.	Water loss increasing. Instructed driller to add 1 sack driscose. Since a large volume of water has been added to the system, also instructed 5 sacks of gel. There have been periodic intervals of "rough" drilling, probably due to bit "balling" up. In these intervals weight on the bit was slacked off, and then gradually increased back to 60,000#.
6:30 A.M.	Drilling has become considerably rougher since 6920'. Running only 40,000# and periodically attempting to increase weight.
9:15 A.M.	Drill to 7004'. Circulate 1 hr. prior to trip. Bit No. 11 made 304' in 15 3/4 hrs. Mud properties prior to trip: weight 9.4, viscosity 31 sec., water loss 9.2 cc's.
10:15 A.M.	Started out of hole with bit No. 11. Dropped Eastman.
12:01 P.M.	Broke out first stand of drill collars Shoulders were galled. Will break all 7" DC's and check for galling.
4:00 P.M.	Broke all 7" collars and faced all collars. Galling condition ranged from severe to mild. It appears as if the Brinell hardness on the shoulders is not adequate to prevent galling. On all future trips care will be taken to assure that the drill collars are broken on a different joint each time. Bit No. 11 teeth dull, bearings loose. Deviation was 2 1/2° at 7000'. Checked hoisting speeds with various gear combinations with 155,000-pound hook load. Low on the transmission and high on the drum clutch resulted in a total speed per stand of 75 sec. which is 15 sec. faster than the next fastest combination.
4:35 P.M.	Started in hole with bit No. 12-OSC-3.
5:15 P.M.	Had all DC's back in hole. Began running drill pipe. Hit bridge at 6570'. Had to put kelly on and drill bridge.
8:00 P.M.	On bottom - drilling at 7004'. Rotated last 5 stands to bottom.

3 April 1961

12:01 A.M.	T.D. 7117'. Drilling ahead.
1:00 A.M.	Ran survey at 7117', 3° deviation.
3:00 A.M.	Had 50 unit gas kick at 7130'. 9,000 ppm methane, 1,200 ppm ethane and propane. Notified geologist.
3:30 A.M.	Tightened weight indicator. New string weight 184,000#, carrying 60,000# on the bit.
5:45 A.M.	3 1/4° at 7211'.
10:20 A.M.	T.D. 7350', circulating 1 hr. prior to trip. Eastman dropped. Had 60 unit gas at 7300'. Bit No. 12 made 346' in 13 hrs.
11:30 A.M.	Start out of hole. Bit No. 12 teeth dull, bearings medium dull. 3 1/4° at 7350'. Conducted pilot test of mud conversion in order to ascertain if any prior treatment may prove necessary. Results indicated that no problems should be encountered. Trip in with bit No. 13-OSC-3.
7:30 P.M.	Tight hole last 5 joints. On bottom at 8:00 P.M. at 7350'.
9:00 P.M.	Added 120 sacks of Q-Broxin at 1 minute/sack to mud system. Also added 6 cans of Caustic at 20 minutes/can. Circulated. Added 60 sacks of Gypsum at 2 minutes/sack. No. 1 engine down, drilling ahead. Repaired mud line leak on circulating mud pump lines. No. 1 engine needs new manifold.
11:45 P.M.	Finished adding Q-Broxin and Caustic; began adding Gypsum. Noticed gas kicks since returning to bottom. 9,000 ppm at 7450', 6,000 ppm at 7440', and 5,500 ppm at 7400'. No lithologic change noticed. Contacted geologist.

4 April 1961

12:01 A.M.	T.D. 7474'. Converting mud system to Gypsum base and drilling ahead. De-sander not operating.
1:35 A.M.	Finished mixing Gypsum.
4:00 A.M.	De-sander operating. Since 7510' gas has been detected in the shale cuttings. 6,000 ppm ethane at 7570' to 7580'. Notified geologist.
6:45 A.M.	T.D. 7694', began circulating for trip. Added 1 sack of high viscosity driscose and circulated 45 minutes. Dropped straight hole survey.
7:50 A.M.	Start out of hole, tight first 7 stands. Bit No. 13 made 344' in 11 hours. Misrun on deviation survey. Inspected every third drill collar for galling; none was observed. Visually inspected all drill pipe on trip into hole to ascertain if any undue wear has occurred. This visual inspection revealed that drill pipe wear is at a minimum.

4 April 1961 (Continued)

1:20 P.M.	On bottom with bit No. 14-OSC-3, drilling ahead at 7694'. Bit No. 13 teeth medium dull, bearings loose. Held conference with O. E. Mechem and J. L. Wible concerning drilling techniques which may be employed in improving penetration rates. Consideration was given to the use of stabilizers in conjunction with higher rotary speeds or running additional weight on the bit. Pending the results of drilling rate tests currently being conducted, the final decision will be made. Mixed 3920 gallons of diesel in the mud.
11:45 P.M.	Short trip, 6 stands. Geologist calls Niobrara at 7720'.

5 April 1961

12:01 A.M.	T.D. 7945', drilling ahead.
12:30 A.M.	"Slugged" drill pipe with 10 sacks of "bar". Mud flow controlled. Pulled up 6 stands. Tight hole at 7700'. Waited 10 minutes. Back to bottom at 1:30 A.M. Tight hole at 7700'. 30' of fill-up.
2:30 A.M.	T.D. 7960'. Will circulate 60 minutes. Drop straight hole survey and trip bit No. 14 out.
3:45 A.M.	Start out of hole. Bit No. 14 made 266' in 10 hours. Teeth dull, bearings loose. Some tooth chippage noted.
6:45 A.M.	On bank with Bit No. 14. Drilling rate tests conducted on 4-4-61 showed that the penetration rate for 40,000# and 72 rpm was 24.0' per hour and for 60,000# 72 rpm was 31.3' per hour. This represents a 32% increase in penetration rate for a 50% increase in weight.
10:00 A.M.	On bottom with Bit No. 15-YT3.
12:15 P.M.	Short trip at 7993'. Second stand took 1 hour and 40 min.
2:40 P.M.	Hit bridge 57' off bottom, plugged bit.
3:55 P.M.	Unplugged bit. Began drilling.
6:30 P.M.	Short trip at 8039', pulled 6 stands.
8:00 P.M.	Drilling. First stand on short trip was slightly tight, the rest were free. Bit was off bottom for about 25 minutes while cleaning mud pit. Found 10' of fill on short trip in.
9:17 P.M.	T.D. 8074'. Had drilling break for 5'. Began circulating for possible Codell sample.
11:00 P.M.	Geologist found no sign of Codell Sand. Resumed drilling at 8074'. During circulating added 1 extra sack of driscose to raise viscosity for possible coring.

6 April 1961

12:01 A.M.	Drilling at 8102'. Tops geologist picked are: Niobrara 7680' Fort Hayes 8035' Base Fort Hayes 8069' Estimated "J" 8450'
1:15 A.M.	T.D. 8134'. Short trip. Pulled 6 stands. Slightly tight on first stand, free rest of way out.
1:55 A.M.	Started trip back in after cleaning pits. Found several bridges. Circulated to bottom.
2:45 A.M.	Resumed drilling at 8134'.
4:45 A.M.	T.D. 8178'. Began circulating 1 hr. and 15 min. prior to trip out with bit No. 15.
6:20 A.M.	Finished circulating. All samples out of hole. Dropped Eastman. Started trip out of hole.
6:30 A.M.	Mud check: Weight 9.3 #/gal. Filter cake 1/32" Viscosity 33 Sec. pH 7.2 Plastic Vis. 5 cp Yield 5 Water loss 8 cc
9:05 A.M.	On bank with bit No. 15, 218' in 9 1/2 hours. Teeth dull, bearings slightly loose. 3/4° at 8160'.
12:01 P.M.	On bottom, bit No. 16, DT2G, hit bridge 60' off bottom. Conducted drill-off tests.
2:55 P.M.	Short trip, pull 6 stands.
3:35 P.M.	On bottom drilling. Mix gel and driscose to raise viscosity to 40 sec.
8:00 P.M.	Short trip, 8 stands. Hole tight 1st two stands. Swabbed some mud to pits.
8:50 P.M.	Out 8 stands, repairing clutch.
10:25 P.M.	Start back in hole. 1 hr. and 25 min. down, repairing clutch.
11:10 P.M.	On bottom - rotated 2 stands down.

7 April 1961

12:01 P.M.	T.D. 8320'. Tight place in hole noted at 8110'. Twelve feet of fill-up, drilling ahead. Mud check not made since such a short period of time had elapsed after the short trip. Will check at 3:00 A.M.
4:00 A.M.	Short trip, 8 stands. First 3 stands tight. Waited 10 min. and went back to bottom. Hit bridge at 8200'. On bottom at 5:40 A.M. Six feet of fill-up. "D" sand at 8435'.
7:15 A.M.	T.D. 8482'. Starting to circulate. Plan to circulate 90 min.

7 April 1961 (Continued)

9:00 A.M.	Start out of hole for new bit and junk sub.
11:40 A.M.	Out of hole with bit No. 16, dull to medium dull, bearings loose; made 304' in 11 1/4 hrs.
12:20 P.M.	Start in hole with bit No. 17, Smith K2P regular, and junk sub.
3:00 P.M.	On bottom with bit No. 17. T.D. 8482'.
4:40 P.M.	T.D. 8492'. Started circulating. Plan to circulate for 2 hours.
6:30 P.M.	Start out of hole
9:45 P.M.	Out of hole. Bit No. 17, Smith K2P, teeth completely bald-headed, bearings worn; made 10' in 1 1/2 hrs. Discussed problem with O. E. Mechem and Lou Scopel, and it was decided that in lieu of the condition of the bit and the time sequence for running drill stem tests that the proper procedure would be to run a junk basket and W7R type bit in order to rid the hole of any junk. Made up core barrel and stood it back.

8 April 1961

12:01 A.M.	T.D. 8492'. Going in hole with bit No. 18, W7R, and junk sub. Bit No. 17 approximately 1/2" out of gauge. Bit No. 18 to attempt to ream to gauge.
4:30 A.M.	Reaming at 8482', 40' of fill-up. Reamed to T.D. 8492'.
7:30 A.M.	Start out of hole with bit No. 18.
10:45 A.M.	Out of hole with bit No. 18, teeth medium dull, bearings green, full gauge. Bit No. 18 reamed 10'. Picking up core barrel to run core. Discussed gauge problems with O. E. Mechem and Loffland toolpusher, Louis Brown. It was decided that in the event further gauge trouble is encountered, a suitable reamer would be employed above the bit in order to minimize the amount of out of gauge hole.
3:50 P.M.	On bottom at 8492' with core barrel, 34' of fill-up, Truco diamond bit C18404, size 8 7/8" x 4 3/8".
4:00 P.M.	Commenced cutting core No. 1.

9 April 1961

12:01 A.M.	T.D. 8506'. Coring ahead at rate of 2' per hr.
6:30 A.M.	Cored to 8519', 27' in 14 1/2 hrs. Pulled up to make connection, worked pipe 60 min., jarred up to 50,000# over the weight of the pipe in order to free the barrel.
8:00 A.M.	Started out of hole with core barrel.
12:40 P.M.	On bank with core No. 1, cut 27', recovered 27'. Inner barrel had come unscrewed and was stuck on top of bit. Pipe strap 8520', T.D. corrected to this depth. Repair core barrel 4 hours.

9 April 1961 (Continued)

5:20 P.M.	Start in hole with bit No. 19, W7R.
9:10 P.M.	On top of core rathole, reaming.

10 April 1961

12:01 A.M.	T.D. 8520'. Reaming core rathole at 8507', mixing mud.
1:35 A.M.	Start out of hole with bit No. 19, reamed 19' to 8511'. Viscosity had increased to 48 seconds. Baroid engineer reported increase in mud volume.
2:45 A.M.	Gauge mud pits in order to check for water flow while tripping.
4:35 A.M.	Out of the hole with bit No. 19. Recovered 7 pieces of iron debris from junk sub. Second gauge indicates no apparent increase in mud volume.
5:00 A.M.	Started back in hole with bit No. 20, W7R. Bit No. 19, teeth dull, 1/4" out of gauge. Bit was pinched, gauge teeth heeled off.
6:45 A.M.	On top of rathole 8511' with bit No. 20, reaming ahead. Began checking viscosity of mud every 5 minutes in order to determine if any unusual viscosity variation might be found which would indicate water influx. Ran test for 4 hours; found no indication of viscosity variation due to water influx.
12:01 P.M.	Mud check at 12:00 noon: Viscosity 49 Sec. Weight 9.6 #/gal. Water loss 7.2 cc.
1:55 P.M.	Reamed core hole to 8520'. Drilled 1' and circulated the hole at T.D. 8521'.
4:30 P.M.	Started out of hole to pick up core barrel.

Mud Checks

	3:30 P.M.	4:05 P.M	
Viscosity	102	74	Sec.
Weight	9.7	9.7	#/gal.
Cl	10,000	15,000	ppm
Water loss	6.1	6.4	cc.

The increased viscosity resulted in considerable hole cleaning of cavings. The previous mud tests would seem to indicate that increased salt concentration tends to inhibit the yield of gel solids and possibly Q-Broxin. Further tests will be necessary in order to determine what adjustments, if any, will be necessary.

7:15 P.M.	Out of the hole with bit No. 20-reamed 8', cut 1' new hole. Teeth medium green, bearings medium green and to gauge. Picking up core barrel with corehead C18404.

10 April 1961 (Continued)

10:35 A.M.	Finished making up core barrel and started in hole.

11 April 1961

12:01 A.M.	T.D. 8521'. Trip in core barrel.
1:30 A.M.	On bottom with core barrel, commenced coring. Dropped lag time marker and began taking 15-minute mud checks.
1:30 A.M.	75 second viscosity
1:45 A.M.	72 "
2:00 A.M.	75 "
2:15 A.M.	77 "
2:30 A.M.	80 "
2:45 A.M.	87 " 9.8 #/gal., 6.8 W.L., 9.0 pH, 18,000 ppm Cl
3:00 A.M.	86 "
3:15 A.M.	85 "
3:30 A.M.	88 "
3:45 A.M.	80 "
4:00 A.M.	78 "
4:15 A.M.	78 "
4:30 A.M.	87 "
4:30 A.M.	Coring rate increasing at 8529.
6:45 A.M.	Lag time noted to be 2 hrs.
1:35 P.M.	Core to 8556'. Start out of hole.
5:00 P.M.	On bank with core No. 2. Core 35' full recovery.
5:30 P.M.	Start back in hole with bit No. 21, W7R, with junk sub.
8:45 P.M.	On top of rathole at 8521'. Starting to ream core hole carrying 3000-5000# on bit.

12 April 1961

12:01 A.M.	T.D. 8556', reaming at 8543'. Reaming rate appeared to be slowing. Increased rpm from 50 to 80 and maintained 12,000# on bit.
1:50 A.M.	T.D. 8556'. Finished reaming. Starting to circulate.
4:20 A.M.	Start out of hole to pick up tester.
6:40 A.M.	Out of hole. Making up tester. Bit No. 21 green, reamed 35' corehole.
9:15 A.M.	Start in hole with test tool. Maximum pipe speed 60 sec. per stand.
12:01 P.M.	On bottom with test tool. Packer set at 8482'. Interval tested 8482' to 8556' for DST No. 1.
3:40 P.M.	Coming out of hole with test tool.
6:00 P.M.	Out of hole with test tool. Recovered 200' of gas cut mud.

Field Pressures Recorded (Uncorrected)

IH	4355	FF	170
ISI	447	FSI	278
IF	147	FH	4355

Tool open 1 hr. and shut in 1 hr. Packers failed after 1 hr shut in. Test successful.

12 April 1961 (Continued)

8:20 P.M.	Start back in hole with bit No. 22, OWSV.

13 April 1961

12:01 A.M.	T.D. 8556'. Trip in.
12:10 A.M.	On bottom. 10' of fill-up, drilling ahead.
3:00 A.M.	Mud check:
	Weight 9.8 #/gal. Filter cake 1/32"
	Viscosity 55 Sec. Cl 6000 ppm
	Water Loss 6.0 cc. pH 8.0
6:00 A.M.	Weight 9.4 #/gal. Filter cake 1/32"
	Viscosity 44 Sec. Cl 7000 ppm
	Water loss 6.8 cc. pH 8.0
	Pl. Vis. 18 cp.
	Reduced weight on bit to 40,000# and increased rpm to 74 because of rough drilling.
7:00 A.M.	Drilled to 8620' and circulated for samples. Lag time 1 hr. and 50 min.
9:10 A.M.	Drilling ahead.
10:00 A.M.	Drilled to 8623'. Circulated for samples. Mud check:
	Weight 9.4 #/gal. Filter cake 1/32"
	Viscosity 49 Sec. Cl 6000 ppm
	Water loss 6.8 cc. pH 8.5
	Pl. Vis. 15 cp.
11:30 A.M.	Weight 9.5 #/gal. Filter cake 1/32"
	Viscosity 49 sec. Cl 7000 ppm
	Water loss 6.7 cc. pH 8.5
	Pl. Vis. 19 cp.
12:01 P.M.	Started out of hole with rock bit to pick up core barrel for Dakota. Notified Art Jersin, Colorado Oil & Gas Commission of intent to core. Notified Jim Zeltinger who in turn notified Mr. Sikso of intent to core.
3:15 P.M.	One tight spot in hole approximately 40' off bottom. Strapped pipe out at 8621.72', no correction. Out of hole with bit No. 22, teeth dull, bearings good, 1/8" out of gauge; drilled 67' in 7 1/3 hrs.
3:30 P.M.	Two small cracks noticed on corehead. Called to attention of engineer-in-charge by D & S engineer.
4:30 P.M.	Rig up core barrel and start in hole with corehead C18404.
8:45 P.M.	On bottom coring; encountered 36' fill-up.
10:00 P.M.	Mud check:
	Weight 9.7 #/gal. Filter cake 1/32"
	Viscosity 55 Sec. Cl 7000 ppm
	Water loss 6.6 cc. pH 7.5

14 April 1961

12:01 A.M. Coring at 8632' and mixing driscose. Mud check:

Weight	9.8 #/gal.	Filter cake	1/32"
Viscosity	50 sec.	Cl	6000 ppm
Water loss	7.2 cc.	pH	8.0
Pl. Vis.	19 cp.		

Mixing "gel" to increase viscosity. With core barrel in the hole, the maximum mixing rate is 16-18 min./sk.

3:00 A.M. Mud check:

Weight	9.6 #/gal.	Filter cake	1/32"
Viscosity	61 sec.	Cl	7000 ppm
Water loss	6.8 cc.	pH	8.0
Pl. Vis.	25 cp.		

Mixing "gel".

4:50 A.M. Made connection at 8644'. 10' of cavings. Circulate through cavings.

5:35 A.M. Coring at 8,644 feet.

6:00 A.M. Mud check:

Weight	9.5 #/gal.	Filter cake	1/32"
Viscosity	58 sec.	Cl	7000 ppm
Water loss	7.0 cc.	pH	8.0
Pl. Vis.	20 cp.		

Mixing driscose at 45 min./sk.

1:20 P.M. Start out of hole at 8,657 feet.

6:15 P.M. On bank with core #3. Cut 34 feet, rec. 34 feet. Corehead had run on junk and had been grooved. Drilling and Service representative said that it would be necessary to run a junk sub and then a magnet in order to adequately clean the hole so that a full 50-foot core can be cut; otherwise, it would be necessary to cut only 30-foot cores. The decision was reached to run a kelly extension tube so that full cores could be taken without the necessity of making connections.

9:05 P.M. TD 8657', reaming corehole at 8623' with bit #23, W7R.

10:45 P.M. Mud check:

Weight	9.8 #/gal.	Filter cake	1/32"
Viscosity	51 sec.	Cl	10,200 ppm
Water loss	4.8 cc.	pH	7.0
Pl. Vis.	17 cp.		

15 April 1961

12:01 A.M. TD 8657', reaming corehole; repair shale shaker. Mud check:

Weight	9.8 #/gal.	Filter cake	1/32
Viscosity	60 sec.	Cl	6000 ppm
Water loss	5.2 cc.	pH	6.5
Pl. Vis.	20 cp.		

15 April 1961
(Continued)

2:15 A.M.	Finished reaming core hole to T.D. 8657'. Drilled to 8660'. Repairing shale shaker.
2:45 A.M.	Began circulating samples.
3:15 A.M.	Mud check:

Weight	9.9 #/gal.	Filter cake	1/32
Viscosity	75 sec.	Cl	6000 ppm
Water loss	4.6 cc.	pH	8.5
Pl. Vis.	24 cp.		

5:00 A.M.	Start out of hole with bit No. 23. Mud check:

Weight	9.9 #/gal.	Filter cake	1/32
Viscosity	100 sec.	Cl	6000 ppm
Water loss	5.8 cc.	pH	8.5
Pl Vis.	26 cp.		

8:00 A.M.	Out of hole with bit #23. Reamed 34', drilled 3 feet, 5 3/4 hrs., teeth dull, bearings loose, 1/8" out of gauge.
8:30 A.M.	Trip in hole. Truco diamond corehead C18350, size 8 9/16" x 4 3/8"
11:40 A.M.	On bottom, no fill-up. Circulating hole. Waiting on Kelly extension. Mud check 12:15 P.M.

Weight	9.7 #/gal.	Gel	5
Viscosity	81 sec.	NaCl	13,200 ppm
Water loss	4.6 cc.	pH	8
Pl. Vis.	23 cp.		

1:10 P.M.	Rig up kelly extension.
2:00 P.M.	Commenced coring at 8,660 feet.
6:30 P.M.	Coring. Mud check:

Weight	9.7 #/gal.	Filter cake	1/32
Viscosity	76 sec.	Cl	7000 ppm
Pl. Vis.	25 cp.	pH	8.5
Water loss	4.8 cc.		

8:35 P.M.	Removed kelly extension.
9:15 P.M.	Working stuck pipe. Mud check:

Weight	9.7 #/gal.	Filter cake	1/32
Viscosity	91 sec.	Cl	7000 ppm
Water loss	5.2 cc.	pH	8.5
Pl. Vis.	33 cp.		

9:20 P.M.	T.D. 8672'. Start out of hole with core bbl. Cored 12'.

16 April 1961

12:01 A.M.	T.D. 8672'. Tripping out core barrel.
12:30 A.M.	Out of hole with core #4, cut 12', recovered 10' of sandstone, fine, medium grey to light grey, quartzitic. Recovered 8660-70 feet.

16 April 1961 (Continued)

1:45 A.M.	Starting back in hole with bit No. 24, W7R. Coring engineer attributes jamming of core to fractured formation causing wedging in core barrel.
5:30 A.M.	Reaming corehole at 8660'.
6:00 A.M.	Mud check:

Weight	9.7 #/gal.	Filter cake	1/32
Viscosity	76 Sec.	Cl	6000 ppm
Water loss	5.6 cc.	pH	7.0
Pl. Vis.	25 cp.		

8:30 A.M.	T.D. 8675', reamed 12' corehole and drilled ahead 3'. Circulate prior to trip for core barrel.
11:30 A.M.	T.D. 8675'. Dropped Eastman. Start out of hole to pick up core barrel. Mud check:

Weight	9.6 #/gal.	Ca	600 ppm
Viscosity	66 Sec.	pH	8.5
Water loss	5.2 cc.		

2:30 P.M.	On bank with bit No. 24, teeth dull, bearings medium dull, 1/16" out of gauge. Reamed 12', drilled 3', 1/4° at 8675'.
3:40 P.M.	Check all bearings on core barrel, install stinger and start in hole with corehead C18350.
6:15 P.M.	On bottom. 4' fill-up, commenced coring.
9:00 P.M.	Mud check:

Weight	9.3 #/gal.	Filter cake	1/32
Viscosity	68 Sec.	Cl	7000 ppm
Water loss	6.5 cc.	pH	8.5
Pl. Vis.	15 cp.		

Coring - pressure fluctuation 1200# to 1400#.

10:40 P.M.	Attempting to free jammed core barrel. Picked barrel up and circulated, pump pressure 1200 psi. Sat down 24,000# on corehead, pressure increased to 1700 psi. Disengaged rotary table. Table had essentially no back lash. Pressure remained about 16-1700 psi.

17 April 1961

12:01 A.M.	T.D. 8681'. Start out of hole with core barrel. Mud check:

Weight	9.5 #/gal.	Filter cake	1/32
Viscosity	75 Sec.	Cl	7000 ppm
Water loss	6.6 cc.	pH	8.5
Pl. Vis.	19 Cp.		

17 April 1961
(Continued)

3:00 A.M. Tripping drill collars. Notified geologist of pulling of core barrel.

3:45 A.M. Out of hole. Cut 6', Recovered 6' of core. 8675-8681'.
1/2' of black shale, 2' sandstone, fine shaly cement, carbonaceous material disseminated throughout.
1/2' of black shale, 3' sandstone, fine shaly cement, carbonaceous material disseminated throughout.
Going back in hole with bit #25, W7R.
Truco diamond corehead C18350 grooved by either junk or formation.

7:00 A.M. Reaming at 8,675 feet. Examination of core indicates concentrations of pyrite in certain intervals which could have resulted in diamond damage. A telephone conversation between E. A. Polumbus, Jr., Bert Lear, L. J. Scopel and A. Samuels resulted in the following evaluation of procedure for Dakota, Lakota, Morrison section. The original plans, as outlined in the Final Design Report, for evaluating the Dakota, Lakota, and Morrison section included 110 feet of coring and 3 DST's.

Core analysis data from the 53 feet cored indicates that the sandstone encountered is a quartzitic sand with less than 1 Md permeability and less than 10% porosity.

Evaluation of this 53-foot interval has required 4 days rig time in cutting 3 cores of 34 feet, 12 feet, and 6', respectively and has resulted in damage to 2 diamond coreheads probably as a result of pyrite and/or bit teeth. Remedial measures taken after damaging the first core head included the use of a kelly extension while coring 50 feet. A full 50-foot core could be cut without the necessity of a rathole connection and the attendant risk in allowing bit debris to enter the core hole. However, this did not eliminate all problems as further coring revealed the presence of pyrite inclusions in the quartzitic sandstones encountered which also resulted in damage to the corehead similar to that produced by bit debris.

In light of the information obtained from visual inspection of the cores and their physical analysis, further evaluation of these zones by the coring technique is not justified by the time and expense involved until sufficient porosity and permeability is encountered in the drilled cuttings. Further, the information obtained from the cores does not warrant that this zone be drill stem tested until more section has been exposed.

17 April 1961
(Continued)

11:50 A.M.	Reamed corehole to 8681' and began circulating samples. Drill to 8699'.
2:30 P.M.	Fish for junk.
3:20 P.M.	Trip out with bit #25. Reamed 6' and drilled 18' in 5 hrs. Mud check prior to trip:

Weight	9.7 #/gal.	pH	9.0
Viscosity	71 Sec.	NaCl	9800 ppm
Water loss	6.0 cc.	Ca	1160 ppm

8:50 P.M.	On bottom T.D. 8699'. Had 10' fill-up. Drilling ahead with bit #26, T2.

18 April 1961

12:01 A.M.	T.D. 8714'. Drilling ahead. Mud check:

Weight	9.8 #/gal.	Filter cake	2/32
Viscosity	71 Sec.	pH	8.5
Water loss	5.6 cc.	Cl	6500 ppm
Pl. Vis.	23 cp.	Ca	1000 ppm
Yield	17		

1:00 A.M.	T.D. 8721'. Had drilling break. Circulated for samples.
3:15 A.M.	T.D. 8721'. Geologist found no porosity in sand samples. Resumed drilling.
3:30 A.M.	Mud check:

Weight	9.8 #/gal.	Filter cake	2/32
Viscosity	67 Sec.	pH	8.5
Water loss	5.4 cc.	Cl	7000 ppm
Pl. Vis.	20 cp.		

6:00 A.M.	Mud check:

Weight	9.8 #/gal.	Filter cake	2/32
Viscosity	74 Sec.	pH	8.0
Water loss	6.2 cc.	Cl	7000 ppm
Pl. Vis.	18 cp.		

6:20 A.M.	T.D. 8753'. Bit bouncing badly and drilling slow. Circulating approximately 2 hrs. for samples.
8:45 A.M.	Trip out bit #26.
12:01 P.M.	On bank with bit #26. Made 54' in 6 3/4 hrs. Teeth dull, bearings loose, 1/4" out of gauge. Recovered piece of tong die from junk sub.
2:50 P.M.	In hole with bit #27, W7R. Reamed 20' to bottom.
4:30 P.M.	On bottom drilling.

18 April 1961
(Continued)

6:00 P.M.	Mud check:
	Weight 9.7 #/gal. Filter cake 2/32"
	Viscosity 71 sec. pH 9.0
	Water Loss 5.8 cc.
	Pl. Vis. 20 cp.
9:00 P.M.	Drilling. Mud check:
	Weight 9.8 #/gal. Filter cake 2/32
	Viscosity 70 sec. pH 9.0
	Water loss 5.6 cc. Cl 6,500 ppm
	Pl. Vis. 20 cp. Ca 1000 ppm
10:30 P.M.	T.D. 8778', circulate samples for geologist.
11:00 P.M.	Fish for junk and drop straight hole survey.
11:30 P.M.	Trip out bit #27. Mud check:
	Weight 9.8 #/gal. Filter cake 2/32"
	Viscosity 75 sec. pH 9.0
	Water loss 6.0 cc. Cl 5000 ppm
	Pl. Vis. 20 cp. Ca 1000 ppm

19 April 1961

12:01 A.M.	T.D. 8778'. Trip out bit #27.
2:40 A.M.	Out of hole with bit #27. Teeth and bearings medium green. Bit was to gauge. No metal recovered in junk sub. 1/2° at 8,778 feet.
3:00 A.M.	Dump shale pit and repair cathead. No downtime.
3:50 A.M.	Start in hole with bit #28, W7. Bit #27 made 25' in 6 hrs.
6:30 A.M.	On bottom. No fill-up. Drilling ahead.
6:45 A.M.	Called Morning Report to Mr. Sikso, Corps of Engineers, Omaha.
11:00 A.M.	TD 8,798 feet. Started building mud up to 80 viscosity. Preparatory to DST.
6:00 P.M.	TD 8,821 feet. Starting to circulate. Mud check:
	Weight 9.8 #/gal. pH 9
	Viscosity 90 sec. Cl 7000 ppm
	Water Loss 6 cc. Ca 1000 ppm
	Pl. Vis. 20 cp.
7:00 P.M.	Viscosity check results

4:30 P.M.	68 seconds	5:20 P.M.	71 seconds
4:40 P.M.	68 seconds	5:30 P.M.	80 seconds
4:50 P.M.	61 seconds	5:45 P.M.	71 seconds
5:00 P.M.	65 seconds	6:00 P.M.	90 seconds
5:10 P.M.	70 seconds	6:30 P.M.	76 seconds
		7:00 P.M.	74 seconds

19 April 1961
(Continued)

8:15 P.M.	Mud check:
	Weight 9.8 #/gal. Filter cake 2/32"
	Viscosity 79 sec. pH 9.0
	Water loss 5.6 cc. Cl 7500 ppm
	Pl. Vis. 20 cp. Ca 1000 ppm
8:30 P.M.	Start off bottom - bit #28. Made 43 feet in 11 1/2 hrs.
10:00 P.M.	Attempted to notify Colorado Oil & Gas Commission of intent to test. No answer.
11:30 P.M.	Out of hole. Bit #28 medium dull teeth and bearings. Bit to gauge. Some metal in sub.

20 April 1961

12:01 A.M.	T.D. 8821'. Make up DST tool for #2 test.
	TD 8,821.00' 7' of open perforated pipe
	Tool 193.38' 1/2" bottom hole choke
	Bottom of packer 8,627.62' 3 pressure recorders
	5.15' Thermometer
	Top of packer 8,622.47' No water cushion
12:15 A.M.	Dump shale pit.
12:30 A.M.	Start in hole with test tool.
1:00 A.M.	Cut drilling line.
1:30 A.M.	Continue going in hole.
3:30 A.M.	On bottom with test tool waiting for daylight.
5:30 A.M.	Open test tool.
5:35 A.M.	Close tool 24 minutes.
5:59 A.M.	Open tool 60 minutes.
7:00 A.M.	Close tool 120 minutes.
9:00 A.M.	Start out of hole.
12:01 P.M.	On bank with test tool. Recovered 400 feet of slightly gas cut mud. Interval test for DST #2, 8628'-8821'.
	ISI 1996 FSI 1854
	IF 190 IH 4490
	FF 190 FH 4490
	Pick up 4 - 8" DC's.
5:15 P.M.	On bottom bit #29, YM.
9:00 P.M.	Mud check:
	Weight 9.7 #/gal. Filter cake 2/32"
	Viscosity 63 sec. pH 8.0
	Water lost 4.8 cc. NaCl 11,000 ppm
	Pl. Vis. 21 cp. Cl 960 ppm
9:30 P.M.	Two visitors to rig from Humble Oil Co. Marketing Div.
10:00 P.M.	Visitors left. Mr. Hermanepan and Mr. Henson, Denver office.

21 April 1961

12:01 A.M. T.D. 8854'. Drilling ahead. Mud check:

Weight	9.7 #/gal.	Filter cake	2/32
Viscosity	65 Sec.	pH	8.0
Water loss	5.6 cc.	NaCl	10,700 ppm
Pl. Vis.	20 cp.	Ca	960 ppm

3:00 A.M. Mud Check:

Weight	9.7 #/gal.	Filter cake	2/32
Viscosity	51 Sec.	pH	8.0
Water loss	5.4 cc.	NaCl	11,550 ppm
Pl. Vis.	18 cp.	Ca	920 ppm

5:00 A.M. T.D. 8871'. Begin circulating prior to trip. Bit #29 made 50' in 11 1/2 hrs.

5:30 A.M. Start out of hole. Mud check:

Weight	9.6 #/gal.	Filter cake	2/32
Viscosity	60 Sec.	pH	8.0
Water loss	5.4 cc.	NaCl	9,900 ppm
Pl. Vis.	13 cp.		

9:25 A.M. On bank with bit #29, teeth dull, bearings medium dull, considerable tooth breakage. Pick up 4 - 8" drill collars.

Total drill collar weight

14 - 8" x 3" = 4,400 x 14 = 61,600#
21 - 7" x 2 3/4" = 3,324 x 21 = 69,804#
Wt. in air 131,404#
Wt. in 10.0 #/gal. mud 115,000#

11:10 A.M. Pick up 4 - 8" drill collars. Start in hole bit #30, C2. All drill collars plus blocks weighed 119,000#. Blocks indicated 20,000#. Collars weighed 100,000#; should weigh 131,000#. Indicator error 23.6% low. Will check O.D. of drill collars next trip to ascertain if previous calculations are correct.

2:40 P.M. On bottom bit #30, drilling ahead. Added 1,000 #/min. up to 40,000#, then 10,000# each hr. up to a maximum of 80,000#.

6:00 P.M. Mud check:

Weight	9.4 #/gal.	Filter cake	2/32
Viscosity	59 Sec.	pH	8.0
Water loss	5.2 cc.	NaCl	9,900 ppm
Pl. Vis.	20 cp.	Ca	1,200 ppm

9:00 P.M. Mud check:

Weight	9.4 #/gal.	Filter cake	2/32
Viscosity	53 Sec.	pH	8.0
Water loss	5.2 cc.	NaCl	12,400 ppm
Pl. Vis.	20 cp.	Ca	1,200 ppm

22 April 1961

12:01 A.M.	T.D. 8925', drilling ahead. Mud check:			
	Weight	9.5 #/gal.	Filter cake	2/32
	Viscosity	53 Sec.	pH	8.0
	Water loss	5.6 cc.	NaCl	13,200 ppm
	Pl. Vis.	20 cp.	Ca	1,200 ppm
3:00 A.M.	Mud check:			
	Weight	10.1 #/gal.	Filter cake	2/32
	Viscosity	55 Sec.	pH	8.5
	Water loss	5.6 cc.	NaCl	11,500 ppm
	Pl. Vis.	13 cp.		
	Drop straight hole survey instrument and start out of hole with bit #30; made 66' in 11 3/4 hrs.			
6:00 A.M.	Block and collars have indicated weight of 125,000#. Calipered collars.			
9:30 A.M.	On bank bit #30, teeth and bearings medium dull, deviation 1/4° at 8925'. Run in all DC's and string up 10 lines.			
3:00 P.M.	Start back in hole.			
6:00 P.M.	On bottom bit #31, OWC. Hit bridge at 8487', had 14' fill-up, drilling ahead. Indicator weight 230,000#.			
	Mud check:			
	Weight	9.8 #/gal.	Filter cake	2/32
	Viscosity	63 Sec.	pH	8.0
	Water loss	5.6 cc.	NaCl	11,550 ppm
	Pl. Vis.	25 cp.	Ca	1,000 ppm
9:00 P.M.	Mud check:			
	Weight	9.9 #/gal.	Filter cake	2/32
	Viscosity	58 Sec.	pH	8.0
	Water loss	4.8 cc.	NaCl	13,200 ppm
	Pl. Vis.	23 cp.	Ca	1,120 ppm
10:45 P.M.	T.D. 8955', start out of hole bit #31, made 18' in 4 1/4 hrs. Mud check prior to trip:			
	Weight	9.8 #/gal.	Filter cake	2/32
	Viscosity	53 Sec.	pH	8.0
	Water loss	6.0 cc.	NaCl	9,900 ppm
	Pl. Vis.	20 cp.		

23 April 1961

12:01 A.M.	T.D. 8955'. Trip out.
12:30 A.M.	Traveling block binding and heating up.
12:55 A.M.	Resume trip out of hole.
1:05 A.M.	Blocks heating up and binding.
2:00 A.M.	Resume trip.

23 April 1961
(Continued)

3:20 A.M.	Out of hole with #31, teeth dull, bearings medium dull, 1/8" out of gage.
3:30 A.M.	Ran back in hole with bit #32, W7R, and drill collars.
4:30 A.M.	Replacing traveling block.
3:35 P.M.	Resume trip to bottom.
5:15 P.M.	On bottom, no fill-up drilling ahead.

24 April 1961

12:01 A.M.	T.D. 8973', drilling ahead.
1:30 A.M.	T.D. 8978'. Start out of hole with bit #32, made 23' in 7 1/4 hrs.
4:35 A.M.	Out of hole. No cones on bit.
5:25 A.M.	Going in hole with bit #33, 2C, and junk sub to drill on cones.
8:00 A.M.	Reaming to bottom 8978'.
1:35 P.M.	Start out of hole.
5:10 P.M.	Out of hole, Recovered 1/4 to 1/3 junk left in hole. Bit #33, medium dull, no new hole; mill on junk.
5:45 P.M.	Trip in bit #34, 2C.
9:00 P.M.	On bottom with bit #34. Drilling on junk.

25 April 1961

12:01 A.M.	T.D. 8978', milling on junk.
1:50 A.M.	Start out of hole with bit #34.
5:30 A.M.	Out of hole with bit #34. Medium green, small amount of tooth chippage and to gauge. Recovered twice as much junk as last run; drill no new hole.
6:20 A.M.	Start in hole with bit #18 RR, W7R. Running junk sub.
9:00 A.M.	On bottom. Found 23' of fill. Circulating and going to bottom.
9:30 A.M.	Milling on junk.
12:15 P.M.	Broke air line on rotary clutch.
1:30 P.M.	Milling on junk.
5:15 P.M.	Began circulating to catch junk in junk sub.
7:00 P.M.	Start out of hole with bit #18 RR.
9:30 P.M.	Cut drilling line.
10:45 P.M.	Resume trip out.
11:30 P.M.	Out of hole with bit #18 RR. Teeth completely worn off, bearings loose, 1/4" under gauge. Recovered large chunks of cones and smaller pieces of metal in junk sub.

26 April 1961

12:01 A.M.	T.D. 8978'. Out of hole. Waiting on Bowen milling tool to arrive from Casper.
3:05 A.M.	Bowen tool arrived along with magnet.
3:45 A.M.	Started in hole with Bowen tool and junk sub.
6:45 A.M.	On bottom with Bowen tool. Pipe strap going into hole at 8979.70', no correction. Estimated approximately 10' of fill-up on bottom.
7:00 A.M.	T.D. 8978'. Drilling ahead with Bowen milling tool.
11:40 A.M.	Milled approximately 1' and started out of hole.
3:20 P.M	On bank with junk basket and junk sub, recovered two large chunks of shale and 4 small pieces of iron. Shoe worn on one quarter, no wear otherwise. Pick up bit #35, W7R, and trip in hole.
6 30 P.M.	On bottom, drilling on junk.
10:00 P.M.	Drilled on junk, made approximately 2' new hole. Circulating to catch junk.
11:00 P.M.	Started out of hole.

27 April 1961

12:01 A.M. T.D. 8981'. Tripping out of hole. Mud check prior to trip:

Weight	10.1 #/gal.	Filter cake	2/32
Viscosity	51 Sec.	pH	7.6
Water loss	6.0 cc.	Salt	11,000 ppm
Pl. Vis.	18 cp	Ca	1,200 ppm
Yield	8	Oil	5 %
		Solids	16 %

2:45 A.M.	Out of hole. Bit #35, teeth worn, to gauge, bearings loose, recovered 3 pieces of junk in junk sub.
3:00 A.M.	Trip in hole with bit #36, W7R.
6:30 A.M.	Found about 40' of fill on bottom. Circulating through fill to T.D. 8981'. Drilling ahead. Told Baroid to raise viscosity to 65 seconds.
11.30 A.M.	Drill to 8989'. Fish for junk. Mud properties prior to trip:

Weight	10.1 #/gal.	Water loss	7.2 cc.
Viscosity	50 Sec.	pH	7.5

3:15 P.M.	On bank bit #36. Made 8' in 5 hrs., teeth medium dull, bearings green. Dumped shale pit. No junk recovered.

27 April 1961
(Continued)

4:05 P.M.	Start in hole bit #37, OWC.
6:50 P.M.	On bottom drilling. Breaking in bit to 25,000#, then increasing weight by 10,000#/hr. to 80,000#.
7:00 P.M.	Mud check:

Weight	10.0 #/gal.	pH	8.8
Viscosity	48 Sec.	Cl	5,000 ppm
Water loss	6.4 cc.	NaCl	8,250 ppm
Filter cake	2/32	Ca	1,000 ppm

8:37 P.M.	T.D. 9000'.
9:30 P.M.	Mud check:

Weight	9.9 #/gal.	pH	7.5
Viscosity	56 Sec.	Salt	9,900 ppm
Water loss	8.0 cc.	Yield	9
Filter cake	2/32	Ca	1,200 ppm
Pl. Vis.	18 cp.		

10:00 P.M.	Started desander.

28 April 1961

12:01 A.M.	T.D. 9022' drilling. Mud check:

Weight	9.9 #/gal.	Yield	9
Viscosity	54 Sec.	pH	8.0
Water loss	7.6 cc.	Salt	9,900 ppm
Pl. Vis.	18 cp.	Cl	6,000 ppm
Filter cake	2/32	Ca	1,200 ppm

3:00 A.M.	Mud check:

Weight	9.6 #/gal.	Yield	7
Viscosity	52 Sec.	pH	7.0
Water loss	7.6 cc.	Salt	9,900 ppm
Pl. Vis.	20 cp.	Cl	6,000 ppm
Filter cake	2/32	Ca	1,200 ppm

3:45 A.M.	Checked viscosity; was 48 seconds. Started adding gel.
4:30 A.M.	Began circulating 1 hr. prior to trip out with bit #37.
5:25 A.M.	T.D. 9049'. Started out of hole. Bit #37 made 60' in 9 2/3 hrs.

28 April 1961
(Continued)

8:45 A.M.	On bank bit #37, teeth medium dull, bearings tight. Pick up bit #38, C2. No junk sub. Cut drilling line. Run in hole.
12:45 P.M.	T.D. 9049'. On bottom. 4' of fill-up, drilling ahead.
6:45 P.M.	Drilling at 9086. Checked rotary torque; 50,000# bit weight 2 1/4 turns, 80,000# 3 1/2 turns, and 85,000# 5 turns.
7:25 P.M.	T.D. 9093'. Made connection and increased weight on bit to 90,000#.
8:15 P.M.	Shut down to weld new nipple on mud line.
8:35 P.M.	Drilling ahead.
9:00 P.M.	Mud check:

Weight	9.7	#/gal.	pH	7.5
Viscosity	50	Sec.	Yield	7
Water loss	6.4	cc.	Salt	9,900 ppm
Pl. Vis.	18	cp.	Ca	1,120 ppm

29 April 1961

12:01 A.M.	T.D. 9130'. Mud check:

Weight	9.8	#/gal.	pH	8.0
Viscosity	54	Sec.	Yield	10
Water loss	6.0	cc.	Ca	1,200 ppm
Pl. Vis.	20	cp.	Cl	6,000 ppm

Filter cake 2/32

12:10 A.M.	T.D. 9131'. Dropped Eastman survey prior to trip out.
12:30 A.M.	Started out of hole bit #38. Made 82' in 11 hrs.
3:30 A.M.	Out of hole with bit #38, teeth medium worn, bearings tight, to gauge. Deviation 1/2° at 9130'.
4:00 A.M.	Started in hole with bit #39, OSC-1G.
6:35 A.M.	On bottom. Circulating through 18' of fill. Drilling ahead.
6:00 P.M.	Mud check:

Weight	9.8	#/gal.	pH	8.0
Viscosity	48	Sec.	Salt	9,700 ppm
Water loss	8.6	cc.	Cl	5,900 ppm
Pl. Vis.	15	cp.		

Filter cake 2/32

8:15 P.M.	T.D. 9221'. Washed out mud line nipple. Started out of hole with bit #39, made 90' in 13 3/4 hrs. Mud check:

Weight	9.6	#/gal.	pH	8
Viscosity	44	Sec.	Salt	9,240 ppm
Water loss	8.4	cc.	Cl	5,600 ppm
Pl. Vis.	10	cp.	Ca	1,200 ppm

Filter cake 2/32

30 April 1961

12:01 A.M.	T.D. 9221'. Trip out of hole with bit #39.
12:30 A.M.	On bank with bit #39. Teeth medium dull, bearings slightly loose, to gauge. Started in hole with bit #40, OSC-1G.
3:15 A.M.	Found 18' of fill. Circulating through fill.
4:15 A.M.	T.D. 9221' on bottom drilling ahead with 35,000#. Increasing bit weight to 80,000# by 10,000# every 40 min.
6:00 A.M.	Mud check:

Weight	9.7 #/gal.	pH	8.0
Viscosity	50 sec.	Salt	9,070 ppm
Water loss	8.6 cc.	Cl	5,500 ppm
Pl. Vis.	14 cp.	Ca	1,800 ppm
Filter cake	2/32		

1:30 P.M.	Conducted drilling rate tests to determine if continued use of additional drill collars is economical, affirmative.
9:15 P.M.	TD 9,344 feet. Dropped Eastman Survey and started out of hole. Bit #40 made 123 feet in 17 hrs. Mud check prior to trip:

Weight	9.8 #/gal.	Filter cake	2/32
Viscosity	63 sec.	pH	8.5
Water loss	8.0 cc.	Salt	9,080 ppm
Pl. Vis.	15 cp.	Cl	5,500 ppm

1 May 1961

12:01 A.M.	T.D. 9344'. Trip out bit #40.
1:00 A.M.	On bank bit #40, teeth medium worn, bearings loose, to gauge. Ran collars and bit #41, OSC-1G in hole, jet mud pit, cut drilling line. Eastman Survey 3/4° at 9,343 feet.
2:00 A.M.	Resume trip in hole.
5:15 A.M.	Found 36' of fill on bottom. Circulating through fill.
6:00 A.M.	TD 9,344 feet. Drilling ahead with 35,000# on bit and increasing weight to 80,000# at 10,000# every 40 min. Mud check:

Weight	9.8 #/gal.	pH	8.5
Viscosity	66 sec.	Yield	9
Water loss	8.4 cc	Salt	9,075 ppm
Pl. Vis.	19 cp	Ca	1,000 ppm
Filter cake	2/32		

	Drilling. Mixing water, oil and driscose into mud to bring down weight and water loss.
7:00 P.M.	TD 9,440 feet. Drilling ahead.

2 May 1961

12:01 A.M.	T.D. 9473'. Drilling ahead.
12:15 A.M.	T.D. 9475'. Dropped Eastman survey and started out of hole with bit #41, made 131' in 19 hrs.
4:10 A.M.	On bank with bit #41, teeth dull, bearings loose, to gauge. Eastman survey 1 1/4° at 9470'.
4:40 A.M.	Started in hole with bit #42, YTL.
7:15 A.M.	On bottom drilling ahead.
1:10 P.M.	T.D. 9523'. Start out with bit #42, made 48' in 7 hrs. Pilot tested 1/2 #/bbl. of Q-Broxin to see how water loss would be affected. If reduced water loss to 7.0 cc and improved the properties of the cake. Will add 12 sks, when on bottom with new bit. Bit #42, teeth dull, breakage. Recovered several broken teeth in junk sub.
7:45 P.M.	T.D. 9523'. On bottom with 18' fill with bit #43, OWS, drilling ahead.
8:25 P.M.	Broke rotary chain.
8:45 P.M.	Drilling ahead.

3 May 1961

12:01 A.M.	T.D. 9,553'. Drilling ahead.
12:35 A.M.	TD 9,556 feet. Reverse drilling break will drill 10'.
2:52 A.M.	TD 9,566 feet. Circulate for samples and condition mud.
3:30 A.M.	Circulating. Mud check:

Weight	10.0 #/gal.	pH	9.0
Viscosity	64 sec.	Yield	15
Water loss	6.0 cc.	Ca	1,200 ppm
Pl. Vis.	22 cp.	NaCl	10,725 ppm
Filter cake	2/32		

6:00 A.M.	Circulating. Mud check:

Weight	10.0 #/gal.	pH	9.0
Viscosity	57 sec.	Yield	12
Water loss	6.0 cc.	Ca	1,240 ppm
Pl. Vis.	20 cp.	NaCl	12,375 ppm
Filter cake	2/32		

6:15 A.M.	Fishing for junk.
6:30 A.M.	Started out of hole with bit #43, made 43' in 6 3/4 hrs.
9:35 A.M.	On bank, teeth medium dull, bearings tight, in gauge. No junk recovered in sub.
10:00 A.M.	Start in hole bit #44, T2, and junk sub. Analysis of drilling rate tests conducted on 30 April 1961 indicates that the additional drill collars procured through amendment to Loffland's drilling contract resulted in an 81% increase in penetration rates over what could have been obtained

3 May 1961
(Continued)

10:00 A.M. with the original collar string. This has resulted in a net savings since the collars were procured of 70 hrs. which represents a total savings to date of approximately $4,600.

1:10 P.M. On bottom bit #44, 3' fill-up, drilling ahead.

6:00 P.M. Had drilling break at 9589'. Drilled to 9592' and circulated hole.

9:45 P.M. Geologist found no sand in samples. Began fishing for junk prior to trip with bit #44. Will strap pipe out of hole.

10:30 P.M. T.D. 9592'. Started trip out of hole with bit #44.

Mud check:

Weight	10.0	#/gal.	Yield	20	
Viscosity	80	Sec.	pH	9.0	
Water loss	6.0	cc.	Ca	1,200	ppm
Pl. Vis.	25	cp.	NaCl	13,860	ppm

Filter cake 2/32

4 May 1961

12:01 A.M. T.D. 9592'. Trip out bit #44, made 26' in 6 3/4 hrs.

2:45 A.M. On bank with bit #44, teeth worn, bearings medium tight, 1/8" out of gauge. No junk in junk sub. Pipe strap 9594.76', no correction. Started in hole with bit #45, W7R.

5:45 A.M. On top of 8' of fill. Circulating through fill and reaming out of gauge hole to T.D. 9592'.

6:35 A.M. On bottom with 40,000#. Drilling ahead.
Talked with Herb McKay of Drilling and Service concerning the condition of the hole with respect to junk. He said that the only positive way to be sure the hole is clean would be to run a magnet, but in light of past experience with the junk subs, use of the kelly extension would probably be adequate.

10:30 A.M. T.D. 9604'. Started circulating prior to trip for core barrel. Accepted delivery of 27 joints of X line 40# 8 5/8" S.L. casing. Fish for junk, drop Eastman. Bit #45 made 12' in 4 1/2 hrs. Trip out bit #45.

8:00 P.M. On bank with bit #45, teeth dull, bearings tight, to gauge. Survey at 9600' - 1°. Making up core bbl. to run in hole.

8:15 P.M. Accepted delivery of 26 joints 40# 8 5/8" S.L. casing and 1 joint 49# 8 5/8" casing. Checked total delivery today of 53 joints 40# and 1 joint 49# casing.

4 May 1961
(Continued)

8:45 P.M.	Started in hole with core barrel. Corehead serial No. R-18182 (8 7/8" x 4 3/8").
	Core Barrel 59.80' Sub 0.91'
	Jars 7.55' Bottom-hole 7" collar 30.35'

5 May 1961

12:01 A.M.	T.D. 9604', preparing to core.
12:35 A.M.	T.D. 9604'. Started coring 40 rotary rpm, 18,000# bit weight, 37 spm pump #1, 1200 psi.
1:55 A.M.	Cut 10' of core to T.D. 9614'. Lost circulation.
3:35 A.M.	Mix mud and lost circulation material in an attempt to control lost circulation. Lost approximately 150 barrels of drilling mud after pumping mud and lost circulation material. Static pressure remaining after pumping was 500 psi. Assuming all fluid in the drill pipe was water, the hydrostatic pressure at the bottom of the hole would be 500 plus 433 x 96.14 = 500 plus 4163 = 4663 psi. 8990' of 10#/gal. mud in the annulus would produce the same pressure. In order to circulate fluid, the mud weight must be reduced to 9.3#/gal. After mixing new mud without lost circulation material and pumping down the drill pipe, the static pressure was 250 psi with 9.0#/gal. fluid. This would produce a hydrostatic head of 4480 plus 250 = 4730 which is in close agreement with previous calculations.
9:00 A.M.	Start out with core #6, cut 10', no recovery. Discussed problems of evaluating top 25' of Lyons with O. E. Mechem, Bert Lear, Lou Scopel, all of E.A. Polumbus, Jr. & Associates, Inc., and Louis Brown with Loffland, J. Zeltinger, Corps of Engineers, J. Neighbours, Chemical Corps and H. McKay, Drilling and Service. This discussion included the possible reasons for not obtaining any core recovery and the methods available for evaluation of the 25' cut in the Lyons which are: 1. Core could be unconsolidated in which case no core could be recovered. 2. Core could have been dropped which might allow for some recovery in junk sub. 3. Core could still be on bottom and could possibly be recovered complete by going in with the core barrel and new catcher and setting over core.

5 May 1961 (Continued)	In light of the problems involved, particularly with lost circulation, the decision was reached to go in with an 11" bit and attempt to stop lost circulation, then ream corehole and drill 1 or 2' to see if lost circulation has been stopped. If samples from reaming indicate that the formation is hard, then evaluation of the top zone can be obtained through a DST. If samples are friable, evaluation can be made on basis of zone below and electric logs.
12:30 P.M.	T.D. 9614', on bank with core #6.
2:30 P.M.	Start in hole with bit #46, W7R. Will break circulation at 2000', 5000', 6000' and 9600'.
7:20 P.M.	Finished going in hole. Starting to build up pump pressure.
9:05 P.M.	T.D. 9614', start reaming corehole at 9604'.
6 May 1961	
12:01 A.M.	T.D. 9614. Reaming corehole at 9612'.
1:25 A.M.	Finish reaming corehole. Fish for junk.
2:00 A.M.	Drilling at 9614'.
2:30 A.M.	T.D. 9616', fish for junk.
3:00 A.M.	Circulate samples.
6:00 A.M.	Start out of hole.
9:45 A.M.	On bank with bit #46, reamed 10' corehole, drilled 2' new hole; gauge teeth heeled off, bit 1/4" out of gauge. Recovered some pieces of Lyons in junk sub and 3 small pieces of junk. Cut drilling line.
11:00 A.M.	Start in hole to cut core #7, Corehead No. R-18182
1:45 P.M.	On bottom, 19' fill-up.
3:00 P.M.	Circulate to bottom. Rig up, kelly extension, run to bottom. Circulate prior to coring.
3:30 P.M.	T.D. 9616', commence coring. Mud check:
	Weight 9.8 #/gal. pH 7
	Viscosity 45 Sec. Ca 1,280 ppm
	Water loss 5.2 cc.
	Mixing lime and gel to raise pH and viscosity.
4:30 P.M.	Mud check:
	Weight 9.8 #/gal Water loss 7.6 cc.
	Viscosity 40 Sec. pH 7.0
	Mixing gel, zeogel, and driscose to raise viscosity and lower water loss. The low pH is probably due to the addition of cottonseed hulls as a lost circulation material and has caused a decrease in the viscosity and an increase in the water loss. At the present time, lime is being mixed to raise the viscosity and the hulls are being removed from the system.

6 May 1961 (Continued)

Mud checks:

Time	Weight	Viscosity	pH
6:00 P.M.	10.1 #/gal.	47 Sec.	9.0
7:00 P.M.	9.8	61	9.0
8:00 P.M.	9.8	53	7.0
9:00 P.M.	9.8	59	9.0

6:10 P.M. Removed kelly extension.

6:50 P.M. Resumed coring.

8:30 P.M. Started mixing polyflakes to mud to restrict partial lost circulation.

7 May 1961

12:01 A.M. T.D. 9635', coring ahead.

1:00 A.M. TD 9639'. Core barrel jamming. Cannot drill further. Trying to free jammed barrel.

2:15 A.M. Had conference with Alvin Samuels, O. E. Mechem, B. A. Lear with Herb McKay. Decided to pull core and try to test 23' of rathole which exists, after examination of recovered core.

3:00 A.M. T.D. 9639'. Started out of hole with core barrel.

Mud checks:	Weight	Viscosity	pH	Water Loss
12:01 A.M.	10.1 #/gal.	59 Sec.	9.0	6.4 cc.
1:00 A.M.	10.0	63	10.0	6.0
2:00 A.M.	9.5	55	7.2	-
3:00 A.M.	9.6	40	9.0	6.8

4:00 A.M. Notified Halliburton (Otis Hamberlin-Sterling, Colorado) of intent to test.

6:30 A.M. On bank with core #7.

7:00 A.M. Pulled core #7 (Lyons 9616-39). Full recovery. Visual examination of core showed multiple vertical fracturing.

9:00 A.M. Conference with O. E. Mechem, Al Samuels, B. A. Lear. Decided to ream corehole.

9:15 A.M. Going in hole to ream with bit #47, 2C, with junk sub.

12:30 P.M. T.D. 9639', reaming at 9588'.

5:30 P.M. Start out for new bit. Corehole reamed to 9629'.

Mud check prior to trip out:

Weight	9.7 #/gal.	pH	8.5
Viscosity	55 Sec.	Filter cake	2/32

Water loss 5.0 cc.

9:00 P.M. On bank with bit #47, 2C, reamed 13' corehole; gauge teeth badly worn, bearings exposed on both small cones, 1/8" out of gauge. Had some difficulty breaking bit due to lack of a 4-cone bit breaker. Have 1 on location, but will not fit into rotary table. Found 5 large pieces of junk in junk sub.

9:45 P.M. Decided to run W7R, as bit #48 rather than another 2C because of bit breaker absence. Started in hole with bit #48, W7R, to ream corehole.

8 May 1961

12:01 A.M.	T.D. 9639', tripping in bit #48.
12:15 A.M.	Reaming at 9624'.
5:30 A.M.	Noticed loss in mud volume, started mixing lost circulation material.
6:00 A.M.	Mud check:

Weight	9.6 #/gal.	Yield	10
Viscosity	57 Sec.	pH	9.0
Water loss	6.4 cc.	Ca	1,200 ppm
Filter cake	2/32	NaCl	11,550 ppm
Pl. Vis.	20 cp.		

9:00 A.M.	T.D. 9639', ream to 9639', began circulating. Checked pit volume, lost 2" last hr. (20 barrels).
11:50 A.M.	Fish for junk.
12:45 P.M.	Pull bit #48. Hole tight, 450' off bottom. Plugged bit working through tight places, pulled wet string.
5:50 P.M.	On bank bit #48, reamed 10'. Gauge teeth heeled off, 1/4" out of gauge. Recovered several small pieces of junk. One joint of drill pipe was badly cut and had to be removed from string.
6:15 P.M.	Start in hole bit #49, W7R.
7:00 P.M.	Cut drilling line and removed damaged joint of drill pipe from string.
8:05 P.M.	Continued trip in hole. Running in at about 30 sec. per stand.
9:15 P.M.	Stopped trip in to hole with 44 stands to go. Can't fill hole due to low mud volume in tanks. Started mixing mud.
10:10 P.M.	Accepted delivery of 150 sacks Aquagel from Baroid (Sterling). Accepted delivery Baroid (Casper). Will have ticket later.

Polyflakes	19 sacks	Driscose	10 sacks
Jell Flakes	41 sacks	Q-Broxin	200 sacks

11:55 P.M.	Mud mixing completed. Resume trip in hole.

9 May 1961

12:01 A.M.	T.D. 9639', tripping in bit #49.
1:15 A.M.	20' off bottom washing down and reaming.
2:15 A.M.	Fishing for junk.
2:45 A.M.	T.D. 9639'. Drilling ahead.
3:00 A.M.	Mud check:

Weight	9.9 #/gal.	Filter cake	2/32
Viscosity	70 Sec.	pH	9.0
Water loss	4.8 cc.	NaCl	7,000 ppm
		Ca	1,100 ppm

9 May 1961
(Continued)

6:00 A.M.	Mud Check:

Weight	9.6 #/gal.	Filter cake	2/32
Viscosity	55 sec.	pH	8.0
Water loss	6.0 cc.	Yield	9
Pl. Vis.	23 cp.	Ca	760 ppm
		NaCl	6650 ppm

6:10 A.M.	TD 9651. Started circulating prior to tripwithbit #49. Bit #49 made 16' in 3 1/2 hrs.
11:40 A.M.	Strap 9654.89'. On bank with bit #49. Teeth dull, bearings tight, 1/4" under gauge. Corrected T.D. to pipe strap 9655'. One small piece of junk recovered.
12:35 P.M.	Trip in bit #50, W7R.
3:25 P.M.	On bottom with 21' of fill and/or out of gauge hole. Because of spotty nature of the mud, bit #50 was run rather than going in with core barrel. The final decision on evaluation of the Lyons formation was outlined by Mr. O. E. Mechem in a letter dated May 9, 1961 and discussed with Mr. John Neighbours, Mr. J. M. Zeltinger, Mr. Louis Brown and Mr. A. Samuels.
3:45 P.M.	Checking mud viscosity every 600 pump strokes in order to smooth out variations in the mud system.
5:30 P.M.	Finished circulating through fill. On bottom 9655' drilling and conditioning mud to 70 viscosity.
7:45 P.M.	TD 9663'. Bit not drilling off. Began circulating to condition mud.

10 May 1961

12:01 A.M.	TD 9663' Circulating.
1:30 A.M.	Mud in condition for coring. Began fishing for junk.
2:00 A.M.	Started out of hole.
5:45 A.M.	On bank with bit #50, made 8' in 5 1/4 hrs. Teeth medium worn to gauge, bearings tight, no junk recovered.
6:00 A.M.	Dropped stripper rubber in BOP. Getting it out.
6:30 A.M.	Picked up core barrel. Put on corehead R-18182 and started in hole at rate of 30 sec/stand.
10:45 A.M.	On bottom 0' fill-up. Commenced coring.
12:01 P.M.	Mud Check:

Weight	9.8 #/gal.	pH	7.5
Viscosity	63 sec.	Ca	1,040 ppm
Water loss	6.0 cc.		

Mixing lime and Gyp to raise pH and Ca concentration.

10 May 1961
(Continued)

2:00 P.M.	Barrel started jamming.
3:00 P.M.	Mud check: Weight 9.8 #/gal. pH 7.5 Viscosity 65 Sec. Ca 1,240 ppm Water loss 5.6 cc.
3:55 P.M.	T.D. 9672', barrel jammed, started out of hole.
6:40 P.M.	On bank with core #8, cut 9', recovered 9'. Serviced core barrel. Picked up bit #51, W7R.
9:00 P.M.	Ran bit #51, junk sub and drill collars in hole.
9:20 P.M.	Cut drilling line.
10:00 P.M.	Resumed trip in with bit #51. Running in at velocity of not less than 30 sec./stand.

11 May 1961

12:01 A.M.	T.D. 9672'. Trip in bit #51.
12:15 A.M.	On top of rathole 9663'. Reaming 8 7/8" hole to 11". Had 9' of fill, circulated through fill, started reaming at 1:00 A.M.
4:15 A.M.	Corehole reamed to 9672'. Commenced drilling.
5:15 A.M.	T.D. 9676'. Began circulating for samples and to condition mud prior to trip out. Bit #51 reamed 9' in 3 1/4 hrs. and drilled 4' in 1 hr.
8:15 A.M.	Fish for junk.
9:00 A.M.	Trip out.
12:20 P.M.	Bit #51, teeth dull, 1/2" out of gauge, bearings medium tight Recovered several small pieces of junk in sub.
1:15 P.M.	Start in hole with corehead No. R-18182.
3:20 P.M.	On bottom, 4' fill-up, circulating.
4:20 P.M.	Commence coring. 21' kelly in with 10,000#.
6:22 P.M.	T.D. 9681', cored 5' and lost circulation, approximately 150 bbls.
7:00 P.M.	Mixing mud.
9:30 P.M.	T.D. 9681'. Start out with core #9. Strapping out.

12 May 1961

12:01 A.M.	Trip out.
1:30 A.M.	T.D. 9681'. On bank with core #9, cut 5', rec. 5'. Piece of junk lodged in corehead water course. Pipe strap tallied 9703' or 22' long. Driller's T.D. is 9681'. No correction.

12 May 1961
(Continued)

3:30 A.M.	T.D. 9681'. Start in hole with bit #52, W7R and junk sub to ream corehole. Strapping in.
7:15 A.M.	T.D. 9674', on bottom, reaming corehole. Strapped 9680', 1' short. Drill pipe tally is accurate. Corrected geolograph to 9674' from 9681' and will carry geolograph with 20,000# of bit weight rather than 60,000#. As a result of this correction, core #8 is from 9656' to 9665' and core #9 is from 9669' to 9674'.
11:00 A.M	T.D. 9676'. Circulate samples up.
2:00 P.M.	Trip out bit #52.
5:05 P.M.	On bank bit #52, teeth medium dull, 1/2" out of gauge. Reamed 5', drilled 2' new hole. Recovered several small pieces of junk.
6:05 P.M.	Pick up corehead No. R-18182 and start in hole. Core barrel assembly 6.40' longer than drilling assembly.
9:10 P.M.	T.D 9676'. On bottom with 6' fill-up. Circulating through fill.
9:15 P.M.	Began coring.
9:45 P.M.	T.D. 9678'. Cored 2', lost circulation. Consulted with Mr. O. E. Mechem. Decided to pull off bottom and mix mud. Slug bottom with lost circulation material and pulled off bottom. Removed kelly extension, pulled 2 stands, and began mixing mud. Had lost approximately 2' in mud tanks, are mixing 300 barrels mud now.

13 May 1961

12:01 A.M.	T.D. 9678', mixing mud.
2:15 A.M.	Started circulating, took approximately 45 barrels to get returns. Circulated slug of lost circulation material to bottom.
3:30 A.M.	Stopped circulating. Letting pressure flow back.
3:50 A.M.	Started out of hole with core #10.
7:30 A.M.	Out with core #10, cut 2', recovered 1 1/2' Lyons sandstone with 2 vertical fractures. Service core barrel. Start in hole with bit #53, W7R.
12:30 P.M.	On bottom reaming corehole at 9676'.
1:45 P.M.	T.D. 9678', corehole reamed, began drilling ahead.
3:30 P.M.	T.D. 9681'. Lost circulation. Initial loss approximately 50 bbls. mud. Total loss 210 bbls.

13 May 1961
(Continued)

3:30 P. M.	Mud Check at 3:00 P M. prior to loss: Weight 9.8 #/gal. Filter cake 2/32 Viscosity 103 sec. pH 8.0 Water Loss 6.0 cc. Yield 20 Pl. Vis. 30 cp. Ca 1200 ppm NaCl 3500 ppm Began mixing mud.
8:00 P. M.	Tried to establish circulation. Could not. Mixing mud.
8:35 P. M.	Mud Check: Weight 9.4 #/gal. Viscosity 46 sec. Water loss 9.2 cc. pH 8.5
9:45 P. M.	Pulled 10 stands out of hole.
0:30 P. M.	Mud Check: Weight 9.4 #/gal. pH 8.0 Viscosity 77 sec. Filter cake 2/32 Water loss 6.8 cc. Yield 13 Pl. Vis. 18 cp. Ca 2000 ppm NaCl 3300 ppm
11:15 P. M.	Mud mixed with approximately 6 percent lost circulation material in 300 barrels in mud tanks. Tried to establish circulation with 10 stands out of hole. Successful in establishing circulation. Running 10 stands in hole to try and establish circulation on bottom.
11:55 P. M.	Ten stands back in hole, Kelly on, Rotated, established circulation. Will try to increase pump pressure to 1100 psi gradually without losing circulation. Will mix lost circulation material (jell flakes) at rate of one sack per 15 minutes while circulating.

14 May 1961

12:01 A. M.	T.D. 9681' circulating, increasing pump pressure and mixing lost circulation material. Pressure up to 1100 psi, circulating through 10' of fill-up in hole. Checked pipe stretch, 1'10" between zero and 20,000 weight on bit.
2:45 A. M.	T.D. 9681'. Began fishing for junk. Lost approximately 3" in tanks while circulating.

14 May 1961
(Continued)

3:30 A.M. T.D. 9681'. Started out of hole with bit #53. Kelly up 2'10" with 20,000# on bit.

Mud Checks

	2:30 A.M.	3:00 A.M.	
Weight	9.7	9.5	#/gal.
Viscosity	110	85	Sec.
Water loss	6.8	6.6	cc.
Filter Cake	2/32	2/32	inches
pH	8.0	8.0	
Plastic Vis.	25	23	cp.
Yield	-	14	
NaCl	3500	3400	ppm
Ca	2000	2000	ppm

6:45 A.M. On bank with bit #53, reamed 2' corehole, drilled 3'. Teeth medium dull, in gauge. Recovered 4 small pieces of junk. Pick up corehead R-18182. Start in hole.

11:15 A.M. T.D. 9681'. On Bottom 5' fill-up. Broke circulation with 600 psi. Circulate for 1 hr.

12:15 P.M. Pick up to install kelly extension, had 33' kelly in with 20,000#.

1.00 P.M. Commence coring at 9681'.

9:00 P.M. T.D. 9690' - Viscosity checks for one full circulation are as follows:

6:00 P.M. - 63	7:30 P.M - 62
6:30 P.M. - -	8:00 P.M. - -
7:00 P.M. - 63	8:30 P.M. - 60
	9:00 P.M. - 62

Stopped adding water to mud. Began adding lime at 30 minutes to sack to raise pH.

10:30 P.M. Pump #1 lost gland packing, switched to pump #2. #2 was running 70 spm and could not keep up. Checked #2, had washed out valve and seat. #1 repaired and put on hole.

10.50 P.M. Resumed coring.

11:59 P.M. Have lost 2" in tanks since 7:00 P.M. Approximately 20 barrels mud lost.

15 May 1961

12:01 A.M. T.D. 9693'. Coring ahead.

1:00 A.M. Lost 2" in tanks during last 45 min. Slowed pump from 35 spm to 32 spm. Pressure dropped from 1100 psi to 975 psi, rotary speed reduced from 76 rpm to 40 rpm. Coring rate observed about the same (40 min./ft.) after change. Slight loss of mud after change. Mixing mud slowly to increase mud volume.

15 May 1961
(Continued)

4:00 A.M. TD 9698'. Began pressuring up to 1400 psi. Came off bottom and found no increased pressure. Back on bottom and pressuring up again. Herb McKay (D&S) determined core head was ringed.

4:15 A.M. Started out of hole with core #11, cored 17 feet.
Mud Check prior to pulling core:

Weight	9.6 #/gal.	Filter cake	2/32
Viscosity	60 sec.	pH	7.2
Water loss	8.4 cc.	Yield	
Pl. Vis.	15 cp.	Ca	3,000 ppm
		NaCl	6,600 ppm

7:55 A.M. On bank. Recovered 16 1/2'. Inner barrel parted at swivel. Core head ringed on junk.

11:45 A.M. Repaired core bbl. Started in hole with #54, W7R.

2:15 P.M. T.D. 9698', on bottom bit #54, reaming at 9681'. Adding water at the rate of 12 gals./min. in order to build the mud volume. Mixing gel, Driscose, Gyp and lime in order to maintain desired properties while adding water.

Gel	5 min./sk.
Driscose	45 min./sk.
Lime	45 min./sk.
Gyp	30 min./sk.

Fluid level in mud pits:

Shale Pit	Middle	Suction	
*34"		17"	
x 3.2 bbls/"	x 2.8 bbls/"	x 2.6 bbls/"	
109 bbls.	56 bbls.	44 bbls.	= 209 bbls.

Check 14 May

	28"	27"	
x 3.2 bbls/"	x 2.8 bbls/"	x 2.6 bbls/"	
115	78	70	= 263 bbls.

Lost 54 barrels in last 24-hour period.
For ease in measuring pits, all future measurements will be of distance to fluid, from top of pit. Example below:

Shale Pit	Middle Pit	Suction
* 14"	19"	28"

* These measurements correspond to those checks above.

7:10 P.M. Blew out vibrating hose on #1 pump. Shut down, Switched to #2.

7:40 P.M. Resumed reaming.

9:10 P.M. Shut down to replace control valve (pump) on Drillers console.

15 May 1961
(Continued)

9:55 P.M.	Repairs completed. Started fishing for junk.
10:30 P.M.	Dropped Eastman survey and started out of hole with bit #54. Reamed 11' to 9692'.
10:45 P.M.	Clutch release on drawworks not operating properly. Shut down for repairs.
11:20 P.M.	Resumed trip out.

16 May 1961

12:01 A.M.	T.D. 9698'. Reamed to 9692'. Trip out with bit #54.
3:00 A.M.	On bank with bit #54, gauge teeth worn, 3/16" under gauge, bearings tight. Eastman survey 3/4° at 9675'. No junk.
3:30 A.M.	Start in with bit #55, 2C.
6:20 A.M.	Reaming hole at 9630'. Tank measurements: Shale 16" from top Middle 21 1/2" from top Suction 24" from top.
7:00 A.M.	Mud check: Weight 9.7 #/gal. pH 7.0 Viscosity 72 Sec. Yield 20 Filtrate 7.0 cc. Ca 1200 ppm Pl. Vis. 20 cp.
12:55 P.M.	Reamed to 9698', drilled 1/2'. Circulate and condition mud. Tabulation of log time data from Baroid Mud Logging Unit indicates that the average hole size at the present time is 13". The mud volume therefore is between 1800 and 2000 bbls.
4:30 P.M.	Fish for junk.
5:15 P.M.	Start out of hole. Kelly in 22 1/2', 20,000# and 800 psi pump pressure. Mud check prior to trip: Weight 9.7 #/gal. Pl. Vis. 27 cp. Viscosity 86 Sec. Yield 16 Water loss 6.6 cc.
6:15 P.M	Shut down to repair broken chain in compound.
7:25 P.M.	Resumed trip.
10:00 P.M.	On bank with bit #55, reamed 6'. Broke bit breaker breaking out bit. Did not break bit from junk sub. Broke off junk sub. Bit #55, gauge teeth worn, bearings loose, 1/16" out of gauge. Many small (less than 1/2") pieces of junk recovered in sub.

16 May 1961

10:45 P.M. Started in with corehead #418007(8 7/8"x4 3/8") to cut core #12.

11:20 P.M. Drill collars in hole. Shut down to cut drilling line.

17 May 1961

12:01 A.M. TD 9698'. Cutting drilling line.

12:35 A.M. Resumed trip in with core barrel.

2:30 A.M. On bottom. Circulating through 5' of fill-up.

3:45 A.M. Began coring at 9698'. Kelly down 19' with 20,000#. Pressure drop across core head 200 psi. Pump pressure 1000 psi, rotary speed 40 rpm, bit weight 22,000#. Mud check:

Weight	9.7 #/gal.	Filter cake	2/32
Viscosity	88 Sec.	pH	7.6
Water loss	7.4 cc.	Yield	27
Pl. Vis.	25 cp.	Ca	1120 ppm
		NaCl	4950 ppm

Pit Straps - Shale 16" From Top
Middle 21" From Top
Suction 26" From Top

6:30 A.M. Have lost about 1" of mud in pits since start of coring.

9:00 A.M. TD 9705' Mud check.

Weight	9.7 #/gal.	pH	8.5
Viscosity	135 Sec.	Yield	30
Water loss	7.6 cc.	Ca	1200 ppm
Pl. Vis.	30 cp.	NaCl	5000 ppm

11:30 A.M. TD 9707'. Barrel jammed. Cut 9', core #12. Mud check prior to trip:

Weight	9.7 #/gal.	pH	8.5
Viscosity	118 Sec.	Yield	20
Water loss	7.4 cc.	Ca	1200 ppm
Pl. Vis.	30 cp.		

3:45 P.M. On bank with core #12. Cut 9', recovered 9'.

4:45 P.M. Start in hole with bit #56, W7R.

5:40 P.M. Shut down to repair compound chain.

6:20 P.M. Resume trip.

8:00 P.M. Found about 12' of tight hole above core rathole.

10:45 P.M. Finished reaming tight hole. Started reaming core hole at 9698'.

11:15 P.M. 9699' reaming. Losing mud. (slow). Started mixing mud-Gel, Gyp, Driscose and Q-Broxin. Mud check:

Weight	9.7 #/gal.	pH	8.0
Viscosity	111 Sec.	Ca	1120 ppm
Water loss	6.6 cc.	NaCl	3630 ppm
Pl. Vis.	30 cp.		

18 May 1961

12:01 A.M.	T.D. 9707'. Reaming corehole at 9702'.
4:05 A.M.	T.D. 9707'. Finished reaming corehole, starting to circulate.
6:30 A.M.	Fish for junk.
7:00 A.M.	Start out of hole with bit #56. Mud check before starting out of hole:

Weight	9.7 #/gal.	Filter cake	2/32
Viscosity	62 Sec.	pH	8.0
Water loss	7.4 cc.	Ca	960 ppm
Pl. Vis.	17 cp.	Cl	2800 ppm

10:20 A.M.	On bank bit #56, reamed 9', 1/4" out of gauge, teeth heeled off, recovered several pieces of junk. Reamed 9' corehole plus 12' above corehole.
10:45 A.M.	Trip in with corehead #R-18007 for core #13.
12:10 P.M.	Shut down to increase mud volume.
2:30 P.M.	Resume trip in hole. Mud check:

Weight	9.1 #/gal.	pH	9.0
Viscosity	79 Sec.	Yield	14
Water loss	6.0 cc.	Ca	600 ppm
Pl. Vis.	17 cp.		

4:10 P.M.	Circulate prior to coring.
5:32 P.M.	T.D. 9707', commence coring.
9:00 P.M.	Core jammed. Broke core off. Back on bottom. Resumed coring.

19 May 1961

12:01 A.M.	T.D. 9716'. Shut down to remove kelly extension.
12:30 A.M.	Resumed coring.
5:45 A.M.	T.D. 9727'. System pressuring up. Indication that bit is ringed. Start out of hole. Cored 20' (core #13). Lost approximately 2" out of pits during cutting of core #13. Mud check prior to trip out:

Weight	9.6 #/gal.	Filter cake	2/32
Viscosity	89 Sec.	pH	7.8
Water loss	6.4 cc.	Yield	20
Pl. Vis.	25 cp.	Ca	1000 ppm
		NaCl	4950 ppm

10:15 A.M.	On bank. Corehead ringed. Recovered 20'.
11:00 A.M.	Pick up bit #57, W7R. Start in hole.
1:00 P.M.	T.D. 9727'. On bottom reaming corehole at 9707'. Had 2' out of gauge above rathole. Regauged bit #56, 1/8" out of gauge.

19 May 1961
(Continued)

5:45 P.M.	Ream to 9727'. Fish for junk.
6:30 P.M.	Start out with bit #57.
11:00 P.M.	On bank with bit #57, reamed 20'. Outer teeth dull, bearings slightly loose on cone #1. Other 2 cones tight. 1/4" under gauge.
11:30 P.M.	Start in hole with bit #58, W7R. (Strap out with bit #57, showed 9728' T.D., no correction)

20 May 1961

12:01 A.M.	T.D. 9727'. Trip in with bit #58 and junk sub.
2:00 A.M.	Start washing down hole and reaming undergauge section.
5:30 A.M.	On bottom at 9727' and drilling ahead.
6:00 A.M.	T.D 9729'. Start circulating up samples prior to pulling bit #58. Mud check:

Weight	9.8	#/gal.	Filter cake	2/32
Viscosity	60	Sec.	Yield	33
Water loss	8.0	cc.	Initial Gel	8
Pl. Vis.	19	cp.		

9:00 A.M.	Fish for junk.
10:00 A.M.	Start out of hole.
3:45 P.M.	On bank with bit #58, reamed out of gauge hole, drilled 2' new hole, teeth dull, 1/8" out of gauge. Recovered numerous pieces of junk in sub.
7:15 P.M.	On bottom with bit #59, W7R. Bridge 47' off bottom. Reaming to bottom.

21 May 1961

12:01 A.M.	T.D. 9729'. Washed to bottom with bit taking sporadic amounts of weight. Last 50' of hole was tight. Mud check:

Weight	9.7	#/gal.	Filter cake	2/32
Viscosity	55	Sec.	pH	8.0
Water loss	9.2	cc.	Yield	14
Pl. Vis.	18	cp.	Ca	640 ppm
			NaCl	3300 ppm

1:20 A.M.	Mixing gel and driscose to bring up viscosity and reduce water loss.
2:15 A.M.	Short trip 2 stands. Slight drag noted on 1st joint then free. Circulated 15 minutes and went back to bottom. No fill-up or obstructions.

21 May 1961
(Continued)

3:05 A.M. Mixing mud. Viscosity checks:

1:00 A.M.	57	3:15 A.M.	57
1:30 A.M.	65	4:30 A.M.	60
2:00 A.M.	55	4:45 A.M.	65
2:30 A.M.	45	5:00 A.M.	71
2:40 A.M.	54		

4:00 A.M. Mud check:

Weight	9.8 #/gal.	Yield	15
Viscosity	57 Sec.	Filter cake	2/32
Water loss	8.8 cc.	pH	8.3
Pl. Vis.	19 cp.	Ca	1200 ppm
		NaCl	4100 ppm

5:00 A.M. Fishing for junk. Obtained 5 gallons mud sample. Preparing to trip out to log. Mud check:

Weight	9.8 #/gal.	Filter cake	2/32
Viscosity	71 Sec.	pH	8.3
Water loss	8.4 cc.	Yield	21
Pl. Vis.	22 cp.	Ca	1200 ppm
		NaCl	4100 ppm

Resistivities:

Mud Filtrate	0.87
Mud	0.90
Cake	1.40

5:25 A.M. Start out of hole.

9:30 A.M. T.D. 9729', on bank with bit #59, reamed out of gauge hole. Bit green, bearings ok, 1/16 undergauge.

10:00 A.M. Rig up Schlumberger equipment and start running IE log.

7:00 P.M. IE log, sonic, micro-caliper log completed. Running temperature log.

9:30 P.M Finished running temperature log. Rigging up formation tester. Running formation tester in hole.

22 May 1961

12:01 A.M. T.D. 9729', running formation tester.

1:30 A.M. On bank with formation tester.

Summary of logging and testing operations:

1. Es-Ind. Log	9719-2020 (TD 9725)
2. Sonic Log	9718-2020 (TD 9721)
3. Microlog	9717-2020 (TD 9718)
4. Temperature Log	9710- 10

Logs indicate that Lyons Formation is highly fractured from 9604 to present TD and is most probably water bearing.

5. Ran Schlumberger formation interval tester and set at 9662 (ES log). Fired perf. shot to open tool to Formation. Had no indication of flow into tool.

22 May 1961
(Continued)

1:30 A.M.	Left tool open for 15 min. and pulled tool. This formation tester operation is designated as DST#3. Found that tool was completely plugged with lost circulation material. Recovered no fluid and obtained no pressure data. Decided that additional attemps to obtain test would not be warranted due to high probability that tool would again be plugged by lost circulation material. Note: Lost 1 rubber seal ring from test tool in hole.
2:00 A.M.	Schlumberger rigged down. Started in hole with bit #60, W7R. Running 5-8" drill collars. Running in at rate of 30 seconds or more per stand. Notified Baroid mud logger (Harold Newman) to be on location at 7:00 A.M. 5-22-61.
5:45 A.M.	Reaming 40' off bottom.
9:30 A.M.	T.D. 9729'. On bottom drilling. Mud check:

Weight	9.7 #/gal.	pH	9.0
Viscosity	61 Sec.	Yield	15
Water loss	9.6 cc.	Gels	6-22
Pl. Vis.	20 cp.	Ca	960

12:10 P.M.	T.D. 9734'. Began circulating prior to trip.
3:00 P.M.	Started out with bit #60. Lost approximately 1' of mud in pits (100 bbls.) while circulating and tripping out bit #60.
6:50 P.M.	On bank with bit #60, reamed out of gauge hole and drilled 5', teeth worn, bearings tight, 1/16" under gauge. Rec. 1 small tooth and 2 very small pieces of junk in junk sub.
7:30 P.M.	Started in hole with bit #61, RG2BJ. Strapped pipe out with bit #60, had 27.80' kelly (with 20,000#) down, strap gave T.D. as 9730.60', no correction.
10:30 P.M.	Reaming 70' off bottom. Mixing mud and adding 50 bbls. of diesel to mud system.

23 May 1961

12:01 A.M.	T.D. 9734', reaming to bottom and mixing mud.
2:00 A.M.	Found bottom with 35 1/2' kelly down (with 20,000#). Corrected T.D. to 9738. Breaking in bit, varying weight, rpm, and pump pressure to find optimum drilling rate. Bit bouncing occasionally, seems to torque up then bounce then torque again. Pull off bottom a few feet and go back and bouncing stopped. Drilling ahead.
3:00 A.M.	Very little bouncing last 1/2 hr. Split engines to vary rpm and pressure separately

23 May 1961
(Continued)

5:10 A.M. Started losing mud.

5:30 A.M. Mud loss stopped, reduced pump pressure from 1400 psi to 900 psi. Lost approximately 32 bbls. mud. Began equalizing pits.

5:52 A.M. TD 9748'. Lost complete returns. Lost pump suction due to loss of mud. Shut down pump, equalized pits, got pump suction, tried to regain circulation, no returns. Pulled 5 stands, established circulation, mixing mud to increase mud volume. Mud check prior to loss (approximately 5:45 A.M.):

Weight	9.6 #/gal.	pH	8
Viscosity	56 Sec.	Yield	9
Water loss	7.2 cc.	Filter cake	2/32
Pl. Vis.	19 cp.	Ca	1080 ppm
Oil	7 %	NaCl	4950 ppm
Solids	11 %		

8:50 A.M. On bottom drilling. Losing small amount of mud while drilling. Mud check:

Weight	9.6 #/gal.	pH	8.0
Viscosity	56 Sec.	Yield	9
Water loss	7.2 cc.	Ca	1080 ppm
Pl. Vis.	19 cp.		

12:01 P.M. Mud properties:

Weight	9.6 #/gal.	pH	9.0
Viscosity	52 Sec.	Yield	5
Water loss	7.6 cc.		
Pl. Vis.	20 cp.		

7:00 P.M. Drilling at 9776'.

7:20 P.M. Lost circulation at 9777'. Lost 112 bbls. mud. Pulled up 5 stands and filled hole through fill-up line. Level dropped rapidly.

7:45 P.M. T.D. 9777'. Shut down, mixing mud. Lost approximately 150 bbls. mud total.

11:15 P.M. Broke circulation and washed down a few feet to bottom.

11:30 P.M. Resumed drilling at 9777'.

11:59 P.M. Drilling at 9778'.

24 May 1961

12:01 A.M. T.D. 9778', drilling ahead. Mud check:

Viscosity	86 Sec.	Pl. Vis.	28 cp.
Water loss	7.2 cc.	pH	9.0

5:30 A.M. Lost 50-70 bbls. mud at 9799'. Continuing drilling, mixing mud and lost circulation material.

24 May 1961
(Continued)

7:00 A.M.	Drilling at 9810'.
8:00 A.M.	Circulating drilling break at 9815'. Calculations based on the amount of mud material mixed yesterday indicate that the mud volume lost was approximately 800 bbls. Pit level check from 9:00 a.m., 5-22 to 7:30 A.M. 5-24 showed 120" lost which is approximately 1,000 bbls.
12:01 P.M.	T.D. 9815'. Trip out. Mud check:

Weight	9.2 #/gal.	Pl. Vis.	10 cp
Viscosity	36 Sec.	Yield	0
Water loss	10.6 cc.	Ca	740 ppm

2:40 P.M.	On bank with bit #61, drilled 81' in 20 3/4 hrs, teeth good, bearings slightly loose, in gauge. No junk recovered in junk sub. Run bit #62, RG2BJ.
6:00 P.M.	On bottom 30 feet fill-up. Circulating through fill-up.
7:40 P.M.	On bottom with no weight.
8:00 P.M.	On bottom with 20,000# kelly 17' down. Drilling ahead.
9:00 P.M.	TD 9820' drilling. Losing some mud but mixing more.

25 May 1961

12:01 A.M.	TD 9835' Drilling ahead. Mud loss decreasing, volume beginning to hold steady. Stopped mixing mud. Pressure decreased to 950 psi.
1:25 A.M.	Pump down, valve plugged with lost circulation material.
1:45 A.M.	Resumed drilling.
4:00 A.M.	No mud loss since reducing pressure to 950 psi. Water loss is 10.2, began treating mud system with Q-Broxin, driscose and lime for 1 circulation.
2:40 P.M.	Switch to #2 pump. Replace liner in pump #1. No downtime.
6:30 P.M.	Pump #1 back on hole.
8:00 P.M.	TD 9892'. Began circulating for samples. Bit #62 made 77' in 23 2/3 hrs.
10:40 P.M.	Mud check:

Weight	9.5 #/gal.	Filter cake	2/32	
Viscosity	83 Sec.	Yield	17	
Water loss	8.0 cc.	pH	9.0	
Pl. Vis.	25 cp.	Salt	3300	ppm
		Ca	860	ppm

10:50 P.M.	Finished circulating. Started short trip. Kelly down 33' with 20,000#.
11.30 P.M.	10 stands out. Letting fill-up accumulate for 1 hr.

26 May 1961

12:01 A.M.	T.D. 9892'. Shut down. Checking fill-up with 10 stands out of hole.
12:45 A.M.	Start back to bottom.
1:00 A.M.	On bottom with 4' of fill-up. Fish for junk 15 minutes. Dropped Eastman Survey.
1:30 A.M.	Started trip out with bit #62 to pick up magnets.
4:25 A.M.	On bank with bit #62, teeth good, bearings slightly loose, to gauge. Rec. 8 pieces of junk, including 2 recognizable bit teeth and 2 carbide buttons from RG2 bit.
5:00 A.M.	Eastman survey 1 3/4° at 9860'. Start in hole with 10 1/2" magnet and junk sub.
7:45 A.M.	T.D. 9892', on bottom. Magnet plugged and stuck. Worked pipe 300,000#.
10:15 A.M.	Pipe free. Pulling wet string.
3:15 P.M.	On bank. Magnet plugged with cavings.
4:10 P.M.	Trip in bit #59 RR.
5:00 P.M.	Cut drilling line.
6:00 P.M.	Resume trip in hole.
7:50 P.M.	Establish circulation. Approximately 300' off bottom.
8:35 P.M.	On top of 15' fill-up. Circulating through fill. Pump #2 down. Repairing valves. Will begin mixing mud when pump repairs are completed.
10:00 P.M.	Started mixing mud.
11:25 P.M.	Pump #1 down. Valves in crooked.
11:50 P.M.	Put #2 pump on hole to circulate. Cannot mix mud.

27 May 1961

12:01 A.M.	TD 9892'. Circulating with pump #2. Repairing pump #1.
1:00 A.M.	Pump #1 on hole. Mixing mud with #2 pump. Conditioning mud. Running viscosity checks every 20 minutes.
8:00 A.M.	Fish for junk.
9:00 A.M.	Trip out for magnet. Mud check prior to trip:

Weight 9.5 #/gal. pH 9.0
Viscosity 82 Sec. Yield 15
Pl. Visc. 25 cp. C 80" ppm
Water loss 8.2 cc.

Checked viscosity every 20 minutes in order to treat low spots in the system.

1:40 A.M.	67	4:00 A.M.	84	6:25 A.M.	74
2:00 A.M.	62	4:20 A.M.	67	6:45 A.M.	76
2:20 A.M.	64	4:40 A.M.	80	7:05 A.M.	78
2:40 A.M.	65	5:05 A.M.	104	7:25 A.M.	78
3:00 A.M.	53	5:25 A.M.	84	7:45 A.M.	82
3:20 A.M.	60	5:45 A.M.	71	8:05 A.M.	81
3:40 A.M.	74	6:05 A.M.	70	8:25 A.M.	80

12:20 P.M.	On bank. Lay down 6-8" drill collars. Rec. no junk in sub. Start in with 9" magnet and 2 junk subs.

27 May 1961
(Continued)

3:45 P.M.	Broke circulation half way in hole.
4:05 P.M.	Resume trip.
4:40 P.M.	Break circulation 5 stands off bottom.
5:05 P.M.	Resume trip.
5:35 P.M.	On bottom 8' fill-up.
6:00 P.M.	Mud check prior to trip out: Weight 9.4 #/gal. pH 8.5 Viscosity 82 Sec. Yield 15 Water loss 8.0 cc. Ca 920 ppm Pl. Vis. 30 cp.
6:45 P.M.	Started trip out with magnet. Checked size of diamond corehead #R18674. O.D. 7 13/16", I.D. 4 3/8". Stabilizer O.D. 7 13/16". New corehead.
10:45 P.M.	On bank with magnet. Recovered no junk in subs or magnet.
11:30 P.M.	Start in with corehead #R18674.

28 May 1961

12:01 A.M.	T.D. 9892', trip in core bbl.
2:00 A.M.	On top of 4' fill-up. Barrel plugged. Unplugging bbl.
3:00 A.M.	Circulating through fill to tag bottom.
3:30 A.M.	Rigging up kelly extension.
3:51 A.M.	Began coring core #14.
11:30 A.M.	TD 9907'. Shut down to remove kelly extension.
11:40 A.M.	Resume coring.
3:00 P.M.	9915'. Mud check: Weight 9.4 #/gal. pH 9.0 Viscosity 73 Sec. Yield 3 Water loss 8.6 cc. Ca 880 ppm Pl. Vis. 33 cp. Mixing gyp and driscose to increase Ca and decrease water loss.
8:30 P.M.	TD 9928'. Bbl. seems to be jammed. No torque in table, broke core off String indicated wt. 220,000#, 10,000 less than previously thought due to temperature variation (night) on indicator. Had been coring with only 10,000# on bit since sundown.
8:45 P.M.	Resumed coring.
11:00 P.M.	T.D. 9935', core jamming, pressuring up to 1800 psi. Pulling core. Core #14, cut 43' in 13 3/4 hr. Kelly down 46 1/2'. Strapping out.

29 May 1961

12:01 A.M. TD 9935'. Trip and strap out core #14. Mud check prior to trip.

Weight	9.4 #/gal.	Filter cake	2/32
Viscosity	76 Sec.	Yield	15
Pl. Vis.	25 cp.	pH	9.0
Water loss	7.6 cc.	Ca	900 ppm
		NaCl	3,000 ppm

Lost circulation material 1%.

4:00 A.M. On bank with core. Waiting on geologist.

4:30 A.M. Tried to lay down core. Pipe tally TD 9934.60', no correction. Core jammed in bbl., inner bbl. parted, dismantling bbl. to remove core. Core #14 cut 43', rec. 35 1/2'.

9:30 A.M. Finished servicing core barrel. Bearings locked in swivel and parted at swivel, probably due to jamming of the bbl.

11:00 A.M. Trip in bit #62 RR, RG2BJ and knobby reamer. Gauged knobby reamer and it appeared to be over gauge too far. Checked with Drilco in Midland, Texas and they said that top layer of buttons should be a maximum of 3/32" over gauge and that the gauge ring should pass freely when rollers are properly oriented. The gauge ring could not be made to pass this layer of buttons. Midland is checking now on whether a mistake has been made in the size block used in the body of the reamer. Mr. Rollins (Drilco Oil Tool) called back to say that the tool on location is properly designed as to gauge clearance.

2:30 P.M. Trip in with reamer and bit. All tight spots indicated on caliper log have been noted and extreme care will be used in passing these sections.

6:30 P.M. Reaming 300' from top of cored rathole.

9:30 P.M. Reaming core hole at 9892'. Mud check:

Weight	9.4 #/gal.	Filter cake	2/32
Viscosity	75 Sec.	pH	9.0
Water loss	7.6 cc.	Yield point	15
Pl. Vis.	30 cp.	Ca	960 ppm
		NaCl	3,300 ppm

30 May 1961

12:01 A.M. T.D. 9935', reaming corehole at 9905'. Mud check:

Weight	9.4 #/gal.	Filter cake	2/32
Viscosity	77 Sec.	pH	9.0
Water loss	6.8 cc.	Yield point	15
Pl. Vis.	25 cp.	Ca	1,000 ppm
		NaCl	1,650 ppm

30 May 1961
(Continued)

3:00 A.M.	Reaming corehole at 9916'. Mud check.				
	Weight	9.3 #/gal.	Pl. Vis.	24	cp.
	Viscosity	69 Sec.	Yield Point	14	
	Water loss	7 cc.	pH	9.0	
	Filter cake	2/32	Ca	1000	ppm
			NaCl	1600	ppm
6:25 A.M.	Finish reaming corehole. Mud check:				
	Weight	9.4 #/gal.	Filter cake	2/32	
	Viscosity	58 Sec.	pH	9.0	
	Water loss	7.2 cc.	Yield point	10	ppm
	Pl. Vis.	20 cp.	Ca	1000	ppm
			NaCl	2100	ppm

7:45 A.M. Start circulating for samples. Measured 3 1/2' kelly up with 20,000#.

11:45 A.M. Start out with bit #62 RR, RG2BJ and reamer. Scopel found no apparent porosity in samples and decision was made to run bit and reamer.

3:00 P.M. On bank with bit #62 RR, reamer 43' corehole. Knobs on reamer broken off. 1/2" under gauge. Bit was missing 3 knobs, same as when this RR bit went in. Bearings loose, 1/16" undergauge as before.

3:15 P.M. Start in with bit #63, RG2BJ, and junk basket. Strapped pipe in. No correction on T.D.; still 9935 .

6:00 P.M. Nearing bottom with toolpusher on brake. Carefully washing down with no weight on bit.

8:00 P.M. T.D. 9935', on bottom. Drilling ahead. Fished for junk off and on since 6:00 P.M. Mud Check:

Weight	9.4 #/gal.	Filter cake	2/32		
Viscosity	165 Sec.	Yield	20		
Water loss	6.4 cc.	pH	9.0		
Pl. Vis.	45 cp.	Ca	1120	ppm	
		NaCl	1650	ppm	

8:40 P.M. Began fishing for junk.

9:40 P.M. Resumed drilling.

10:30 P.M. Bit not drilling at all, no torque in table. Fish for junk prior to trip out

11:30 P.M. T.D. 9935'. Start out with bit #63.

31 May 1961

12:01 A.M. T.D. 9935'. Tripping out with bit #63.

2:50 A.M. On bank with bit #63, made no new hole. Bit green.

3:20 A.M. Start in hole with bit #64, W7R.

31 May 1961
(Continued)

6:00 A.M.	On top of 3' of fill-up.
6:15 A.M.	TD 9935'. Drilling ahead.
2:00 P.M.	T.D. 9960', began circulating for samples.
4:25 P.M.	Moved pipe and lost circulation.
4:45 P.M.	Started out of hole with bit #64.
7:45 P.M.	On bank with bit #64, drilled 25' in 8 hrs., teeth medium dull, bearings tight, to gauge. No junk rec. in sub. Dressed 11" reamer with Q-type cutters.
8:55 P.M.	Began running drill collars in hole with reamer, junk sub and bit #65, 4W4. Checked gauge on reamer, 11" gauge ring would not move freely over Q-type cutters.
9:30 P.M.	Drill collars in hole, began mixing mud.

1 June 1961

12:01 A.M.	T.D. 9960', mixing mud.
12:20 A.M.	Began trip in hole with bit #65. Will shut down every 25 stands, put kelly on and establish circulation. Going in hole slowly looking for first under gauge hole at about 8750' (microlog).
3:30 A.M.	Began reaming 10 stands + one joint off bottom (approximately 8990'). Found no tight hole at 8750'.
4:40 A.M.	Finished reaming tight spot. Reamed about 20'. Continuing trip in hole slowly.
5:15 A.M.	Tight spot 2 stands + 2 joints off bottom (approximately 9700'). Reaming through tight spot.
5:30 A.M.	Broke rotary chain. Shut down for repairs.
6:05 A.M.	Resumed reaming. Losing a little mud. Began adding water and mixing mud while reaming.
9:00 A.M.	Mud check: Weight 9.3 #/gal. pH 9.0 Viscosity 79 Sec. Yield point 20.0 Water loss 7.0 cc. Ca 920 ppm Pl. Vis. 20 cp. Reaming 270 feet off bottom.
12:01 P.M.	Reaming 120 feet off bottom. Mud check: Weight 9.2 #/gal. pH 9.0 Viscosity 94 Sec. Ca 880 ppm Water loss 8.0 cc.
3:00 P.M.	Reaming 30' off bottom. Mud check: Weight 9.2 #/gal. Pl. Vis. 20 Viscosity 70 Sec. pH 9.0 Water loss 6.8 cc. Yield 15 Lost returns 5 feet off bottom.

1 June 1961
(Continued)

4:00 P.M.	On bottom, drilling ahead. Lost 9" mud, 80 bbls. in 30 min. Mixing lost circulation material, adding 2" stream of water.
6:00 P.M.	T.D. 9968'. Total mud lost 12", 108 bbls. Mud check: Weight 9.4 #/gal. Yield 9 Viscosity 67 Sec. Ca 1,000 ppm Water loss 8.0 cc. Pl. Vis. 22 cp. Drilling ahead.
10:00 P.M.	Losing mud, adding water and mixing mud. Keeping up with loss. Drilling ahead.

2 June 1961

12:01 A.M.	TD 9991'. Drilling ahead.
12:20 A.M.	Pump aired up.
12:40 A.M.	Resumed drilling.
3:00 A.M.	TD 10,000'. Fishing for junk prior to trip out with bit #65 drilled 40' in 10 3/4 hrs.
4:00 A.M.	Dropped Eastman survey.
4:15 A.M.	Started out of hole.
6:45 A.M.	About 9/10 out of hole. Ran 2000' of pipe back in hole.
7:15 A.M.	Circulating and conditioning mud with about 3000' of pipe in hole.
8:10 A.M.	Resumed trip out.
9:50 A.M.	On bank with bit #65, 1/2" out of gauge. Reamer 1/16" out of gauge. Deviation misrun.
10:50 A.M.	Dress reamer with "Q" cutters. Start in hole with bit #66, W7R.
11:30 A.M.	String up new drilling line.
1:30 P.M.	Resume trip.
3:30 P.M.	On bottom, 30' out of gauge, hole losing mud.
6:10 P.M.	On bottom, drilling ahead.

3 June 1961

12:01 A.M.	TD 10,015'. Drilling ahead. Losing no mud.
12:25 A.M.	TD 10,016'. Began circulating for samples.
3:30 A.M.	Fish for junk and drop Eastman survey.
4:00 A.M.	Start trip out with bit #66, drilled 16' in 6 1/4 hrs. Mud check prior to trip: Weight 9.4 #/gal. pH 9.0 Viscosity 70 Sec. Yield 8 Water loss 7.0 cc. Ca 1,000 ppm Pl. Vis. 23 cp. NaCl 1,650 ppm Filter cake 2/32 Rm 1.3 Rmf 1.2 Rmc 1.9

3 June 1961
(Continued)

7:45 A.M.	On bank with bit #66, teeth medium worn, bearings slightly loose, 1/32" under gauge. Reamer to full 11" gauge. Eastman survey 3/4° at 10,016'. Make up test tool 171 ft. anchor.
9:25 A.M.	Trip in hole with DST tool, 60 sec./stand.
10:45 A.M.	Shut down to fill water cushion, 1,500'.
1:45 P.M.	On bottom. No fill. Packer failed. Set at 9845'.
5:45 P.M.	DST #4 (10,016 -9,845). Recovered 1500' water cushion plus 893' of drilling mud. Packer had been set in fractured zone, no test.
6:30 P.M.	Start in hole with bit #64 RR, W7R, to condition mud.
9:30 P.M.	On top of 40' of fill-up. Circulating to bottom.
10:00 P.M.	On bottom, conditioning mud. Mud check:

Weight	9.4	#/gal.	Filter cake	2/32	
Viscosity	107	Sec.	Yield point	12	
Water loss	7.2	cc.	pH	8.0	
Pl. Vis.	33	cp.	Ca	1160	ppm
			NaCl	1650	ppm

4 June 1961

12:01 A.M.	T.D. 10,016'. Circulating on bottom to condition mud.
1:00 A.M.	Start out of hole with bit #64 RR.
4:15 A.M.	On bank with bit #64 RR. Start picking up DST tool.
5:45 A.M.	Start in hole with DST tool at 60 sec./stand, 2024' water cushion.
11:30 A.M.	Set 2 packers 9836' and 9833'. Packer failed.
12:20 P.M.	Working packer free. Trip out.
4:50 P.M.	On bank with test tool - DST #5 (10,016-9,836). Recovered 2024' water, 1280' of drilling mud. When tool was opened initially, approximately 16 barrels of mud were bypassed around the packer. Test misrun.
7:00 P.M.	Trip in hole with bit #67, W7R, plus reamer and junk sub.
10:45 P.M.	On bottom with bit #67, 22' fill-up, drilling ahead. Analysis of DST mud for gas.

C_1	310 ppm	C_3	120 ppm
C_2	60 ppm	C_4 +	Trace

Mud sample with traces of oil shows bright white fluoresence - brighter than sample of diesel used in mud.
Recovered - water analysis:

	Sample 1	Sample 2
Ca ppm	120	1080
NaCl ppm	330	1650

5 June 1961

12:01 A.M.	T.D. 10,020'. Drilling ahead.
3:00 A.M.	Mud check:
	Weight 9.4 #/gal. pH 9
	Viscosity 90 Sec. Cl 1000 ppm
	Water loss 8 cc.
5:45 A.M.	T.D. 10,033'. Circulating samples prior to trip.
6:00 A.M.	Mud check:
	Weight 9.5 #/gal. pH 9.0
	Viscosity 70 Sec. Cl 1000 ppm
	Water loss 7.8 cc. Ca 1120 ppm
9:00 A.M.	Trip out with bit #67, drilled 17' in 7 hrs. Mud properties prior to trip:
	Weight 9.5 #/gal. pH 8.5
	Viscosity 70 Sec. Yield 9
	Water loss 9.6 cc. Ca 1200 ppm
	Pl. Vis. 23 cp. NaCl 1650 ppm
12:45 P.M.	On bank with bit #67, bit medium dull, in gauge. Reamer in gauge.
1:20 P.M.	Ran bit #68, W7R plus new reamer and cutters.
3:45 P.M.	Hit bridge 120' off bottom.
4:30 P.M.	On bottom, drilling. 6' fill.
6:00 P.M.	Mud check:
	Weight 9.5 #/gal. pH 8.5
	Viscosity 58 Sec. Yield 8
	Water loss 8.4 cc. Ca 940 ppm
	Pl. Vis. 21 cp.
10:30 P.M.	Began losing mud. Started adding water and mixing mud to system.
11:00 P.M.	Could not keep up with mud loss. T.D. 10,050'. Began circulating without drilling.

6 June 1961

12:01 A.M.	T.D. 10,050'. Circulating and mixing mud.
12:20 A.M.	Lost complete returns. Started to pull 5 stands and mix pit of mud. Pipe stuck, could not establish circulation. Working stuck pipe.
1:00 A.M.	Pipe free, pulling 25 stands out to mix mud.
4:30 A.M.	Mud mixed. Circulation established with 8 minutes pumping before returns. Circulated light mud out of hole, pulling bit #68.
8:00 A.M.	Out of hole with bit #68, drilled 17' in 6 1/2 hrs. Bit medium green
8:20 A.M.	Start in hole with bit #69, W7R, to condition hole and mud for DST.
9:20 A.M.	Shut down, rig repairs.
10:05 A.M.	Resume trip in hole.
12:00 P.M.	Hit bridge about 176' off bottom.

6 June 1961
(Continued)

4:05 P.M. On bottom, drilling ahead at 10,050'. Losing some mud.

6:05 P.M. TD 10,057'. Losing mud pulled off bottom, circulating and mixing mud.

6:30 P.M. TD 10,057'. Pulling up above Lyons to build up mud volume.

7:00 P.M. Ten stands out, building mud volume.

7:30 P.M. Mud check:

Weight	9.5 #/gal.		Filter cake	2/32	
Viscosity	92	Sec.	pH	9.0	
Water loss	7.0 cc.		Yield	15	
Pl. Vis.	30	cp.	Ca	920	ppm
			NaCl	1,650	ppm

9:30 P.M. Start back to bottom. Mud check:

Weight	9.5 #/gal.		Filter cake	2/32	
Viscosity	75	Sec.	pH	9.0	
Water loss	7.3 cc.		Yield	13	
Pl. Vis.	28	cp.	Ca	1,000	ppm
			NaCl	1,650	ppm

10:00 P.M. On bottom circulating. Had 6' fill-up in 2 1/2 hrs. off bottom. Losing no mud with 800 psi, increased pressure to 950 psi. Started losing mud. Reduce pressure to 800 psi. Mixing mud and checking viscosity every 20 minutes. Will circulate up samples.

10:20 P.M.	70	12:20 A.M.	79
10:40 P.M.	71	12:40 A.M.	98
11:00 P.M.	75	1:00 A.M.	92
11:20 P.M.	74	1:20 A.M.	70
11:40 P.M.	78	1:40 A.M.	70
12:01 A.M.	80	2:00 A.M.	72

7 June 1961

12:01 A.M. TD 10,057'. Circulating samples and conditioning mud.

2:00 A.M. Mud loss slight during circulating. Began trip out with bit #69. Mud check:

Weight	9.5 #/gal.		pH	9.0	
Viscosity	72	Sec.	Filter cake	2/32	
Water loss	7.0 cc.		Yield	14	
Pl. Vis.	26	cp.	Ca	1,000	ppm
			NaCl	1,650	ppm

6:00 A.M. On bank with bit #69, drilled 7' in 2 hrs., teeth medium worn, 1/32" out of gauge, bearings tight. Picked up DST tool with 195.21' anchor, started in hole with DST tool.

7 June 1961
(Continued)

7:20 A.M.	Fill cushion 9 stands.
11:25 A.M.	On bottom, no fill. Open packer, failed.
11:31 A.M.	Reset packer, holding 9862'.
11:38 A.M.	Closed in.
12:38 A.M.	Open.
1:08 P.M.	Close.
3:08 P.M.	Start out.
7:20 P.M.	On bank with DST #6 (10,057-9862'). Rec. 6 stands water, 2 stands water cut mud, 18 stands mud. Lay down DST tool.
8:30 P.M.	Start in hole with bit #70, W7R.
9:30 P.M.	Cut drilling line.
10:15 P.M.	Resume trip in hole. Estimated mud loss for June 5, 1961 is 200 barrels for June 6, 1961, 150 barrels.

8 June 1961

12:01 A.M.	T.D. 10,057', trip in bit #70, hit bridge 80' off bottom. Circulating and reaming to bottom, Field pressures from DST #6.

IF	1113	FSIP	3958
FF	1238	IHP	4862
ISIP	3040	FHP	4815

Temperature 220°. Left 1 packer rubber in hole.

2:00 A.M.	On bottom, drilling ahead.
3:00 A.M.	Pump #1 plugged with packer rubber. Switched to #2.
6:00 A.M.	Began losing mud. Turned 3" and 1" water in system. Started mixing gel and lost circulation material.
6:10 A.M.	Pump #1 plugged with packer rubber, switched to #2.
6:45 A.M.	T.D. 10,065', still losing mud. Can't keep up with water. Pulling 10 stands and will mix mud. Estimated mud loss 200 barrels.
9:30 A.M.	Start back to bottom after breaking circulation.
9:50 A.M.	On bottom 10,065'. Nine feet of fill-up.
10:40 A.M.	On bottom drilling.
11:25 A.M.	Bit bouncing. 10,067'. Losing mud. Shut down to mix mud.
12:25 P.M.	Build up pit. Volume broke circulation.
12:45 P.M.	Lost returns, 200 barrels. Shut down to mix mud.
2:40 P.M.	Build up mud volume. Broke circulation. Commence drilling.

8 June 1961
(Continued)

3:00 P.M.	Mud check: Weight 9.5 #/gal. pH 8.5 Viscosity 75 Sec. Ca 1,040 ppm Water loss 8.2 cc.
5:45 P.M.	T.D. 10,076'. Trip out bit #70, drilled 19' in 8 3/4 hrs.
9:15 P.M.	On bank with bit #70, teeth worn (bald), bearings loose, 1/4" under gauge. Reamer over 11" gauge. Recovered no junk in sub.
9:30 P.M.	Start in with bit #63 RR, RC2BJ with 2-7/8" and 1-1/2" jets.

9 June 1961

12:01 A.M.	T.D. 10,076'. Trip in bit #63 RR.
12:20 A.M.	Ream and circulate 25' to bottom. Build mud volume and mix mud.
2:00 A.M.	Drilling ahead.
6:00 A.M.	TD 10,087'. Have lost no mud since drilling began.
9:00 A.M.	10,092'. Mud holding steady. Mud check: Weight 9.4 #/gal. pH 9.0 Viscosity 100 Sec. Yield 15 Water loss 6.6 cc. Ca 1,080 ppm Pl. Vis. 35 cp.
12:01 P.M.	10,102'. Mud check: Weight 9.4 #/gal. pH 9.5 Viscosity 87 Sec. Yield 15 Water loss 6.4 cc. Ca 1,280 ppm Pl. Vis. 30 cp.
1:45 P.M.	Started losing mud 10,112'.
2:15 P.M.	Shut down to mix mud. Lost 160 barrels.
3:40 P.M.	Tried to break circulation.
3:55 P.M.	Stopped pumping, lost 120 bbls.
4:50 P.M.	Mix up new mud. Mud check: Weight 9.3 #/gal. pH 7.5 Viscosity 60 Sec. Yield point 8 Water loss 6 cc. Ca 920 ppm Pl. Vis. 17 cp. Lcm 24 %
5:25 P.M.	Pumped in 215 bbls. Pull up 10 stands to mix mud. Total loss 160 + 120 + 215 = 495 bbls.
7:15 P.M.	Mud volume built up. Pumping in hole with 300 psi. Got returns after filling hole with 125 bbls. mud. Returns diminished, then stopped. Kicked pump out, mud level in hole dropped quickly. Shut down, mixing mud and increasing mud volume.

9 June 1961
(Continued)

9:30 P.M.	Mud volume built up. Viscosity 200+, water loss 5.4 cc. LCM 20%. Began pumping in hole, got returns with 97 bbls. to fill hole. Returns diminished to almost nothing. Shut down. Pulled 10 stands, total of 20 stands out, mixed mud and building mud volume. Will wait 5 hours before trying to establish circulation. Total mud loss for day: 160 120 215 125 97 717 Barrels

10 June 1961

12:01 A.M.	T.D. 10,112'. Mixing mud and increasing mud volume. Waiting 5 hours to break circulation.
3:30 A.M.	TD 10,112'. Began pumping mud in hole. Got returns in 10 minutes with 83 bbls. Returns diminishing, tried to keep up with losses with 1" and 3" water lines, could not keep up with losses. Shut down to mix mud.
8:05 A.M.	Pull up 25 stands total, 45 stands out, pump 20 min. got returns with 250-325 psi. Losing mud slowly.
9:50 A.M.	Pumped in total of 240 barrels. Mixing mud.
11:40 A.M.	Started pumping with 175-250 psi.
11:45 A.M.	Mud circulating 175-275 psi.
12:20 P.M.	Increased pump pressure to 500 psi.
12:35 P.M.	Increased pump pressure to 700 psi.
12:55 P.M.	Run in 20 stands. Lost a total of 60 barrels. Mud check at 12:50: Weight 9.5 #/gal. Viscosity 146 Sec. Water loss 6.6 cc. Pl. Vis. 43 cp. Yield point 22
1:45 P.M.	Start pump. Mud returns in 2 minutes, increased pump pressure gradually to 600 psi. Pumped in 70 barrels. Shut down to mix mud.
3:30 P.M.	Start pump returns in 3 minutes.
3:45 P.M.	Run to bottom.
4:30 P.M.	Hole full when on bottom.
4:45 P.M.	Tag bottom 5' fill-up.
5:00 P.M.	Commence drilling. Total loss since 12:01 A.M. 450 barrels.

10 June 1961	
6:00 P.M.	T.D. 10,121'. Hit drilling break at 10,109'.
6:30 P.M.	Circulate samples.
7:00 P.M.	Lose complete returns. Pulled off bottom and mixed pit of mud. Al called Mechem in Fraser and decision was made to come out of hole and go back in with core barrel.
8:30 P.M.	Got mud returns after pumping in about 100 barrels. Start out of hole to pick up core barrel.
11:45 P.M.	On bank with bit #63 RR. Bit medium green, 1/16" under gauge. Reamer in gauge. Total mud loss 450 - 150 = 600 bbls. Bit #66RR made 45' in 13 3/4 hrs.
11 June 1961	
12:01 A.M.	TD 10,121'. On bank getting ready to go in hole with core barrel. Welder enlarged two holes in water course of core barrel in order to handle more lost circulation material.
2:00 A.M.	Start in hole. Ran in corehead #R18674, core barrel and drill collars. Shut down to mix a pit of mud.
4:00 A.M.	Finished mixing mud, continue in hole. Broke circulation ok at 4,000' and 7,000'. Plan to break circulation again at 9,000'.
7:30 A.M.	Start pump 9,000'. Returns in one minute.
7:37 A.M.	Resume trip.
8:00 A.M.	On bottom 30' fill, probably lost circulation material. Circulating fill.
9:00 A.M.	Mud check:

Weight	9.0	#/gal.	pH	9.0	
Viscosity	89	Sec.	Yield	20	
Water loss	6.0	cc.	Ca	1,600	ppm
Pl. Vis.	29	cp.	LCM	10	%

9:45 A.M.	Shut down to rig up kelly extension.
10:15 A.M.	Commence coring. Losing some mud. Keeping up with 3" line and mixing.
12 June 1961	
12:01 A.M.	T.D. 10,152. Coring ahead.
3:45 A.M.	TD 10,158'. Started pulling core #15.
7:30 A.M.	On bank with core #15. Recovered 36' of 37' cut. Core shows high incidence of vertical fracturing. All fine grained red sandstone serviced core barrel; diaphragm broken and will have to be replaced before next core. Corehead in excellent condition.
11:30 A.M.	Cut drilling line 1 hr.

12 June 1961
(Continued)

12:30 P.M. Start in hole with bit #61 RR, RG2BJ to ream core hole (core #15). From 10,121 to 10,158 TD.

3:00 P.M. Repair rig 1 hr.

4:00 P.M. Reaming and washing down hole.

5:00 P.M. Reaming core hole.

6:00 P.M. Calculation of mud loss during cutting of core #15.
3" line in system 10:13 A.M. 6-11 to 3:00 A.M. 6-12
Total of 16 3/4 hrs. Flow rate 5 gals./11 seconds.

$$16.75 \text{ hrs.} \times \frac{60 \text{ min.}}{\text{hr.}} \times \frac{60 \text{ secs.}}{\text{min.}} \times \frac{5 \text{ gals.}}{11 \text{ secs.}} \times \frac{\text{Bbl.}}{42 \text{ gals.}}$$

Total mud loss while cutting core #15 = 653 bbls.

6:30 P.M. Reaming core hole. Mud check:

Weight	9.3 #/gal.		Yield	10
Viscosity	57	Sec.	Filter cake	2/32
Water loss	8.0 cc.		pH	9.0
Pl. Vis.	20	cp.	Ca	1,400 ppm
			NaCl	1,485 ppm

Running 1" stream to keep up with losses.

10:00 P.M. Reaming ahead. Losing some mud, but keeping up with losses with 1" line. Mixing mud. Mud check:

Weight	9.2 #/gal.		Filter cake	2/32
Viscosity	55	Sec.	pH	8.5
Water loss	8.0 cc.		Yield	9
Pl. Vis.	17	cp.	Ca	1,480 ppm
			NaCl	1,620 ppm

13 June 1961

12:01 A.M. TD 10,158'. Reaming core hole.

1:10 A.M. Reamed to TD 10,158'. Drop Eastman survey, start out with bit #61 RR. Bit reamed 37' in 8 hrs.

5:15 A.M. On bank with bit 61 RR.1/32" under gauge, same as when it was run, teeth good, bearings loose. Reamer to gauge.

5:30 A.M. Start trip in with bit #71, RG2BJ with 3-7/8" jets, 11" reamer and junk sub. Eastman survey was 1 3/4° at 10,158'.

8:45 A.M. Washing down and reaming.

9:45 A.M. On bottom and drilling at 10,158 TD.

7:00 P.M. Drilling at 10,199'.

14 June 1961

12:01 A. M. Drilling at 10,211'. Had slight loss of mud about 9:00 P. M. but came back. Had about 5' reverse drilling break at 10,199 to 10,204. Notified geologist. Seems to be shale stringer although a few pieces of dolomite are present in samples. Drilling ahead.

9:00 A. M. 10,236' drilling ahead.

11:30 A. M. TD 10,242'. Trip out bit #71, lay down 15 jts. of #2 drill pipe, bit #71 made 84 ft. in 25-1/2 hours for a total of 62,400 revolutions at 55,000#. tests will be run on the next bit run to determine most economical weight and rpm combination to run on "R" type bit.

4:15 P. M. On bank bit #71, bearings loose, bit and reamer in gauge, picked up other reamer and bit #72 RG2BJ. Survey 2 1/4° 10,242'. Start in hole with bit #72.

7:30 P. M. On bottom with bit #72, tried to break circulation, both pumps in need of repairs. Shut down to repair pumps.

8:45 P. M. T.D. 10,242'. Drilling ahead.

10:00 P. M. Mud check:

Weight	9.2 #/gal.		pH	9.0
Viscosity	85	Sec.	Filter cake	2/32
Water Loss	7.4 cc.		Yield	15
Pl. Vis.	30	cp.	Ca	1,400 ppm
			NaCl	1,300 ppm

15 June 1961

12:01 A. M. T.D. 10,251'. Drilling ahead. Down 1/2 hr. since 9:00 P. M. for pump repairs.

2:00 A. M. Have lost mud for last hour. Will begin mixing mud and build mud volume to stay ahead of loss.

3:00 A. M. Baroid mud logger notified increase in gas reading from 6 to 8 units to 20 to 22 units. Notified geologist. No change noted in samples.

6:00 A. M. Baroid mud logger feels gas increase was a recycle of trip gas which he was not looking for at the time it came around, due to frequent pump changes since on bottom.

6:30 A. M. Mud volume back to original level. Mud loss estimated at: Water in at 20 gal/min for 4 hours, 20 x 60 x 4 x 1/42 = 114 barrels total loss to 6:30 A. M.

9:00 A. M. 10,279'. Mud check:

Weight	9.3 #/gal.		pH	9.5
Viscosity	78	Sec.	Yield point	5
Water Loss	8.0 cc.		Ca	1,400 ppm
Pl. Vis.	40	cp.	Gels	4-38

15 June 1961
(Continued)

6:00 P.M. T.D. 10,309'. Mud check:

Weight	9.3 #/gal.		pH	9.0
Viscosity	92	Sec.	Yield Pt.	15
Pl. Vis.	30	cp.	Ca	1340 ppm
Water loss	8	cc.		

9:30 P.M. T.D. 10,317' Start out of hole to pick up DST tool. Kelly down 13.50' with 20,000#. Mud check.

Weight	9.3 #/gal.		pH	8.0
Viscosity	83	Sec.	Filter cake	2/32
Pl. Vis.	27	cp.	Yield	11
Water loss	8.0	cc.	Ca	1460 ppm
Rm	2.05		NaCl	1320 ppm
Rmf	1.3		Rmc	1.5

16 June 1961

12:01 A.M. T.D. 10,317'. Trip out bit #72, 75' in 22 1/2 hrs.

1:00 A.M. On bank with bit #72, teeth good, bearings locked or binding, to gauge. Began making up DST tool and running in hole with 17 stands water cushion. Top of top packer will be set at 10,070'.

8:45 A.M. On bottom, packer failed, attempted to reset twice, failed both times.

1:20 P.M. On bank with DST tool. Lay down test tool, pick up core-barrel. No recovery, DST #7 (10,317-10,076') failed.

4:00 P.M. Trip in with corehead #R18674.

7:00 P.M. Hit bridge 120' off bottom. Washing to bottom slowly. Hook up kelly extension.

9:05 P.M. On bottom and coring at T.D. 10,317'.

9:30 P.M. Pump pressure rose to 2,300# after coring 1'. Came off bottom a few feet and resumed coring.

10:30 P.M. Pump pressure again high. Circulated 1/2 hr.

17 June 1961

12:01 A.M. T.D. 10,319'. Coring.

1:15 A.M. T.D. 10,321'. Core not cutting.

1:30 A.M. Begin pulling core #16.

5:30 A.M. On bank with core #16, cored 4', recovered 2' of shale, inner barrel parted at swivel

9:15 A.M. Trip in bit #73, RG2BJ and reamer and junk sub. Hit tight spot on trip with bit yesterday at 7100, could be keyseat.

17 June 1961

(Continued)

11:25 A.M. T.D. 10,321'. On bottom, no fill-up.

11:50 A.M. Work on pumps.

12:01 P.M. Commence drilling.

3:00 P.M. 10,327'. Mud check:

Weight	9.3 #/gal.	pH	8.5
Water Loss	7.0 cc.	Yield	12
Viscosity	106 Sec.	Ca	1,000 ppm
Pl. Vis.	29	NaCl	1,200 ppm

5:30 P.M. Mud check: Total depth 10,333.

Weight	9.8 #/gal.	pH	9.0
Viscosity	80 Sec.	Filter cake	2/32
Water Loss	8.0 cc.	Yield	16
Pl. Vis.	24 cp.	Ca	980 ppm
LCM	12 %	NaCl	1,155 ppm

8:30 P.M. Total depth 10,339. Began circulating samples up prior to trip out for DST tool.

11:00 P.M. Drop Totco, start trip out. Mud check:

Weight	9.4 #/gal.	pH	8.0
Viscosity	87 Sec.	Filter cake	2/32
Water Loss	8.0 cc.	Yield	8
Pl. Vis.	36 cp.	Ca	1,300 ppm
Rm	1.3	NaCl	1,320 ppm
Rmf	1.5	Rmc	1.1

Bit #73 made 18' in 8 1/2 hour.

18 June 1961

12:01 A.M. TD 10,339'. Trip out bit #73

3:00 A.M. On bank with bit #73. Bit green. Bit and reamer to gauge. Pick up DST tool and run same in hole. Top of top packer will be set at 10,130'. Deviation survey - 2 1/2° at 10,339'.

4:00 A.M. Start in hole with test tool.

9:00 A.M. On bottom with tool. No tight places going in. Negligible fill-up.

1:00 P.M. Preparing to start out of hole with test tool. 1:00 to 1:40 working test tool free. Starting out of hole.

5:00 P.M. On bank with DST #8. (10,339'-10,137').

IHP	4,940	FF	1,197	
ISIP	4,092	FSIP	4,030	(Field Pressures)
IF	808	FHP	4,898	

DST recovery:

1,395' Water Cushion

93' Muddy Water

1,188' Mud

18 June 1961
(Continued)

5:00 P.M. Approximately 768' of mud was recovered in excess of that lost during testing. Mud check on mud recovered during test:

Weight	9.3 #/gal.	Cl	1000 ppm
Water loss	7.6 cc.	Rm	1.2 at 80°F
pH	8.0	Rmf	1.1

6:30 P.M. Start in hole with bit #73 RR, reamer and junk sub.

9:30 P.M. On top of 30' fill-up. Circulating to bottom.

10:00 P.M. T.D. 10,339'. Drilling ahead. Mixing one circulation of mud with 1" stream in system to increase mud volume.

19 June 1961

12:01 A.M. T.D. 10,346'. Drilling ahead.

8:00 A.M. 10,369'. Drilling. Mud check:

Weight	9.3 #/gal.	Yield point	15
Viscosity	88 Sec.	pH	8
Water loss	8.2 cc.	Ca	880 ppm
Pl. Vis.	30 cp.		

4:00 P.M. T.D. 10,388'. Circulate samples prior to trip. Mud check:

Weight	9.3 #/gal.	Yield	10
Viscosity	66 Sec.	pH	9.5
Water loss	7.0 cc.	Ca	1040 ppm
Pl. Vis.	25 cp.		

Bit #73 RR made 67' in 26 1/2 hrs.

6:45 P.M. Trip out to pick up core bbl.

Weight	9.3 #/gal.	pH	8.5
Viscosity	67 Sec.	Ca	1120 ppm
Water loss	7.6 cc.		

10:15 P.M. On bank with bit #73 RR, teeth good, bearings very loose. Reamer full gauge. No junk recovered. Pick up core-head R18674, bbl. and run in hole with drill collars

11:15 P.M. Cut drilling line.

11:45 P.M. Resume trip in hole.

20 June 1961

12:01 A.M. T.D. 10,388'. Trip core bbl. in hole to cut core #17.

2:30 A.M. On top of 35' fill-up. Circulate through fill to bottom.

3:30 A.M. Rig up kelly extension and circulate.

4:40 A.M. Commence coring at 10,388'.

1:50 P.M. T.D. 10,401'. Barrel jammed. Cored 13' in 9 1/4 hrs. Strapping pipe out of hole. Remove kelly extension.

2:15 P.M. Commence trip out.

5:45 P.M. On bank with core barrel.

20 June 1961
(Continued)

7:00 P.M.	Lay down core #17, cut 13' recovered 12'. Inner barrel jammed with lost circulation material and fractures.
8:45 P.M.	Start in hole with bit #74, RC 2BJ, reamer and junk sub.
11:00 P.M.	On top of 35' fill-up, circulating to bottom.
11:30 P.M.	On top of core rathole, reaming to bottom.

21 June 1961

12:01 A.M.	TD 10,401'. Reaming core hole.
4:00 A.M.	Core hole reamed. Drilling ahead at 10,401'.
7:45 A.M.	Pipe strap yesterday. 10,402' (no correction). Received copy of letter concerning techniques of combatting lost circulation as per conference held with W. E. Gorham, Baroid; and O. E. Mechem, E. A. Polumbus, Jr. and Associates, Inc. on 6-15.
9:00 A.M.	10,415'. Mud check:

Weight	9.4 #/gal.	pH	9.0
Viscosity	73 Sec.	Yield Point	15
Water loss	8.0 cc.	Ca	1,200 ppm
Pl. Vis.	25 cp.		

7:00 P.M.	TD 10,428'. Baroid mud logging unit inoperable due to short in unit and no more fuses.
10:45 P.M.	Hit drilling break at 10,433'. Seem to be back in sand.
11:45 P.M.	Baroid mud logging unit operating.

22 June 1961

12:01 A.M.	T.D. 10,437', drilling ahead. Mud check:

Weight	9.5 #/gal.	Yield	11	
Viscosity	67 Sec.	Filter cake	2/32	
Water loss	6.8 cc.	pH	8.5	
Pl. Vis.	27 cp.	Ca	1,120	ppm
		NaCl	1,155	ppm

3:00 A.M.	T.D. 10,441'. Begin circulating for samples.
4:00 A.M.	Start trip out with bit #74, made 40' in 22 1/2 hrs. plus 13' ream.
8:00 A.M.	On bank with bit #74, bit in gauge, reamer 1/32 under gauge. Bearings loose.
8:30 A.M.	Pick up bit #75, W7R. Reamer and junk sub, start in hole. Will dress reamer with new cutters.
11:05 A.M.	On bottom 4' of fill-up.
3:00 P.M.	Mud check:

Weight	9.3 #/gal.	pH	9.0
Viscosity	94 Sec.	Yield	19
Water loss	7.0 cc.	Ca	1,000 ppm
Pl. Vis.	27 cp.		

22 June 1961
(Continued)

9:00 P.M. 10,483'. Drilling at 12 to 15 minutes per foot.
Mud check:

Weight	9.5 #/gal.	Filter cake	2/32
Viscosity	83 Sec.	pH	8.5
Water loss	7.0 cc.	Ca	1,100 ppm
		Cl	700 ppm

23 June 1961

12:01 A.M. TD 10,494'. Drilling at average rate of 4.2 ft./hr.
3:45 A.M. TD 10,506'. Starting to circulate.
5:20 A.M. Start out of hole for new bit. Bit #75 made 65' in 16 1/4 hrs. or 4'/hr.
9:10 A.M. On bank, bit in gauge, medium dull, reamer 1/32 under-gauge.
9:30 A.M. Pick up bit #76, W7, and reamer with new cutters.
12:30 P.M. On bottom 7' of fill-up. Drilling ahead.
3:00 P.M. 10,515'. Drilling. Mud check:

Weight	9.4 #/gal.	pH	8.5
Viscosity	99 Sec.	Yield	13
Water loss	8.2 cc.	Ca	1,000 ppm
Pl. Vis.	35 cp.		

Lou Scopel advised as to setting top of top packer at 10,330'
10:00 P.M. TD 10,542'. Began circulating samples prior to trip out.

24 June 1961

12:01 A.M. TD 10,542'. Circulating samples prior to trip out for DST.
1:00 A.M. Start trip out with bit #76. Made 36' in 8 1/2 hrs. Dropped Eastman survey. Mud check:

Weight	9.5 #/gal.	Filter cake	2/32
Viscosity	87 Sec.	Ca	1,120 ppm
Water loss	7.6 cc.	NaCl	1,155 ppm
Pl. Vis.	26 cp.	Rm	0.9
pH	8.5	Rmf	1.1
Yield	14		

5:15 A.M. On bank with bit #76, medium dull, to gauge, bearings slightly loose. On trip out pipe was tight for 5 stands beginning with the 8th stand off bottom. Eastman survey 3 1/4° at 10,530'.
5:30 A.M. Pick up test tool and start in hole.
11:04 A.M. On bottom open tool. Open 2 minutes, close tool.
11:34 A.M. Open tool, no blow.
11:55 A.M. Close tool and open bypass to determine if tool is plugged. Fluid level dropped 1 foot.

24 June 1961
(Continued)

12:03 P.M.	Opened tool, weak blow, tool not plugged.
1:43 P.M.	Close tool, lay down top joint.
1:55 P.M.	Start working packer.
2:05 P.M.	Packer loose, pulling DST # 9, 10,326-10,542'.
5:30 P.M.	On bank with DST tool. Recovered 17 stands water cushion (1,560') 1 1/2 stands (126') mud.

IHP	5,088'	FSIP	1,550'	Field Pressures
ISIP	1,300'	FHP	5,088'	
IFP	603'	Temp.	212° F	
FFP	685'	Test Successful.		

Lay down DST tool and clean suction pit. Left half a packer rubber and half of two packer cushions in hole.

7:15 P.M.	Start in with bit #77, W7R, junk sub and reamer with new Q-cutters.
10:30 P.M.	Hit tight spot of about 15', 150' off bottom. Put kelly on, reamed tight hole.
11:00 P.M.	On top of 30' fill-up. Reaming and circulating to bottom.

25 June 1961

12:01 A.M.	TD 10,542'. Circulating and reaming to bottom through 30' fill-up.
12:20 A.M.	Commenced drilling.
1:30 A.M.	Mud check:

Weight	9.4 #/gal.	Filter cake	2/32	
Viscosity	213 Sec.	pH	8.5	
Water loss	8.4 cc.	Ca	1,100	ppm
Pl. Vis.	31 cp.	NaCl	1,155	ppm

3:00 A.M.	TD 10,557'. Have cut 15' since start of drilling at about 6'/hr. Bit #76 was cutting about 4'/hr. when pulled, medium dull. Notified geologist, began circulating samples.
5:00 A.M.	TD 10,557'. Resumed drilling.
7:00 A.M.	TD 10,565'. Losing mud.
7:30 A.M.	Losing mud at rate of 150 bbls./hr. for last 15 minutes. (Rate from Baroid pit watcher). Still getting some returns but mud volume very low. Pulled out 12 stands to mix mud and lost circulation material.
12:30 P.M.	Pumped 210 bbls. mud with 30% lost circulation material on bottom. Pumping at 400#. Got some circulation in 8 minutes.
12:45 P.M.	Small returns. Total loss estimated at 280 bbls.

25 June 1961
(Continued)

1:00 P. M.	Pulled 12 stands and shut down to mix mud and lost circulation material.
5:00 P. M.	Work on pump to 6:00 P. M.
6:00 P. M.	Broke circulation with 400# pump pressure, took 200 barrels to get circulation.
6:15 P. M.	Getting small returns.
6:30 P. M.	Losing mud at 150 barrels/hour rate, still pumping at 400#.
6:45 P. M.	Lost suction on pump.
7:00 P. M.	T. D. 10,567', start out of hole with bit #77. Total loss for day estimated at 600 ± barrels.

Mud checks on two pits pumped in:

Pit #1 (12:30 P. M.)

Weight	9.2	#/gal.	Yield	14	
Viscosity	90	Sec.	Filter cake	2/32	
Water loss	8.0	cc.	pH	9.0	
Pl. Vis.	23	cp.	Ca	800	ppm
L. C. M.	30	%	NaCl	700	ppm

Pit #2 (6:00 P. M.)

Weight	9.3	#/gal.	Yield	10	
Viscosity	68	Sec.	Filter cake	2/32	
Water loss	7.6	cc.	pH	9.0	
Pl. Vis.	20	cp.	Ca	1,000	ppm
L. C. M.	30	%	NaCl	700	ppm

11:45 P. M.	TD 10,567'. Still pulling bit #77. String wet all the way out, bit plugged, bit #77 made 25' in 4.8 hours.

26 June 1961

12:01 A. M.	TD 10,567'. Pulling bit #77, bit plugged, pipe wet. Waiting 15 hours (to 10:00 A. M.) on lost circulation to heal.
2:00 A. M.	On bank with bit #77, green. No junk. Bottom drill collar was completely full of cuttings. Reamer to gauge. Picked up bit #78, W7. Running bit #78 reamer, junk sub and collars in hole.
3:10 A. M	Drill Collars in hole. Began mixing mud and LCM.
9:36 A. M.	Began pumping.
9:55 A. M.	Pressure on pump after pumping 160 barrels.
10:00 A. M.	Returns after pumping 240 barrels total.
10:10 A. M.	Run in 70 stands.
11:38 A. M.	Broke circulation 41 stands off bottom.

26 June 1961
(Continued)

12:08 P. M.	Resume trip.
12:30 P. M.	Broke circulation 26 stands off bottom, build up mud volume.
2:54 P. M.	Broke circulation. Resume trip to bottom.
3:45 P. M.	Broke circulation.
4:00 P. M.	T. D. 10, 567'. On bottom, no fill-up, drilling ahead.
5:40 P. M.	T. D. 10, 574'. Started losing mud. Lost 7' in 21 minutes. Shut down to mix mud. Pulled 3 stands. Total loss 60 barrels since midnight. 240 plus 60 equals 300 barrels.
9:32 P. M.	Break circulation.
9:40 P. M.	Mud to surface after pumping 50 barrels.
9:55 P. M.	Complete lost returns, total loss 180 barrels.
10:05 P. M.	Pulled 12 more stands. Will wait 10 hours before trying to circulate again. Total mud loss for the day is 240 plus 60 plus 180, equals 480 barrels.

27 June 1961

12:01 A. M.	TD 10, 574'. Waiting 10 hours to break circulation, 8:00 A. M., mixing mud and L. C. M.
1:45 A. M.	Mud mixed. Mud check:

Weight	9.2	#/gal.	Yield	17	
Viscosity	78	Sec.	Filter cake	2	
Water loss	6.4	cc.	pH	9.5	
Pl. Vis.	22	cp.	Ca	800	ppm
L. C. M.	30		NaCl	700	ppm

6:04 A. M.	Break circulation.
8:12 A. M.	Returns after pumping, drilling ahead 50 bbls. at 325 psi.
8:30 A. M.	Trip to bottom.
8:57 A. M.	T. D. 10, 574'. On bottom. No fill-up.
12:01 P. M.	Drilling 10, 586'. Hit drilling break at 10, 582'.
3:30 P. M.	TD 10, 594'. Circulate samples for core barrel. Mud check:

Weight	9.3	#/gal.	pH	9.0	
Viscosity	82	Sec.	Yield point	12	
Water loss	7.8	cc.	Ca	1,040	ppm
Pl. Vis.	26	cp.			

	Bit #78 made 27 feet in 7 3/4 hours.
7:00 P. M.	Start out of hole with bit #78.
11:00 P. M.	On bank with bit #78.
11:01 P. M.	Start in with core barrel. Bit #78 medium green, to gauge.

28 June 1961

12:01 A.M.	TD 10,594'. Going in hole with corehead R 18674 and bbl.
12:45 A.M.	Broke circulation at 3000'. Circulation ok. Resumed trip.
1:40 A.M.	Broke circulation at 7000' (15 minutes) ok. Resumed trip.
2:20 A.M.	Broke circulation at 9000' (15 minutes) ok. Resumed trip.
3:30 A.M.	On bottom. Circulating for 2 hours prior to coring.
5:30 A.M.	Began tagging bottom.
6:00 A.M.	T.D. 10,594'. Commenced coring. Mud check:

Weight	9.3	#/gal.	Filter cake	2/32	
Viscosity	74	Sec.	pH	9.0	
Water loss	7.6	cc.	Ca	1,040	ppm
Pl. Vis.	24	cp.	NaCl	800	ppm
Yield	12		LCM	15	%

9:00 A.M.	TD 10,601'. Coring. Mud check:

Weight	9.3	#/gal.	Yield point	3	
Viscosity	72	Sec.	pH	9.0	
Water loss	7.8	cc.	Ca	1,040	ppm
Pl. Vis.	22	cp.			

3:00 P.M.	Checked all valves on choke manifold to assure they were in proper working order. Mud check:

Weight	9.3	#/gal.	Yield point	10	
Viscosity	72	Sec.	pH	9.0	
Water loss	7.6	cc.	Ca	1,040	ppm
Pl. Vis.	25	cp.			

29 June 1961

12:01 A.M.	T.D. 10,623'. Coring ahead. (Core #18). Remove kelly extension.
7:00 A.M.	Coring at 10,639'. Mr. N. L. Barnes with Hughes Tool Company picked up an RG2BJ.
9:00 A.M.	10,644'. Cut 50' in 26 hrs. Start trip out with core #18. Mud check:

Weight	9.3	#/gal.	pH	8.5	
Viscosity	74	Sec.	Ca	980	ppm
Water loss	7.6	cc.			

1:00 A.M.	On bank with core #18.
1:50 P.M.	Start laying down core. Diamond core head in good condition.
3:00 P.M.	Finish laying down core, cut 50', recovered 51'. Pick up bit #59 RR, W7R. New reamer and junk sub. Trip in hole. Pipe strap 10,643.04. No correction.

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29 June 1961
(Continued)

6:20 P. M.	On top of core hole. Reaming ahead.
10:30 P. M.	Began losing mud. Mixed LCM.
11:15 P. M.	Reamed to 10,611'. Pulled off bottom. Building mud volume and LCM percentage. Mud loss 75 barrels.

30 June 1961

12:01 A. M.	TD 10,644'. Reamed to 10,611'. Lost some mud. Shut down building mud volume and LCM percentage.
2:00 A. M.	Resumed reaming. Mud check:

Weight	9.6	#/gal.	Yield	17	
Viscosity	90	Sec.	pH	9.0	
Water loss	5.6	cc.	NaCl	600	ppm
Pl. Vis.	33	cp.	Filter cake	2/32	
L. C. M.	28	%			

4:05 A. M.	Losing mud, cannot keep up with 3" stream. Shut down to mix mud and LCM. Estimated loss 280 barrels. Reamed to 10,619'.
5:45 A. M.	Mud volume and LCM% up. Began pumping at 300 psi. Pumped 33 minutes. No returns, pumped in 200 barrels mud. Have slug of high LCM % mud on bottom. Pulling 15 stands. Will let hole stand for 8 hours, to 2:30 P. M.
6:20 A. M.	Started pulling up 15 stands.
7:00 A. M.	Out with 15 stands. Will let hole stand until 3:00 P. M. and then try to get circulation.
3:00 P. M.	Broke circulation, got returns in 10 minutes. Started losing immediately, could not keep up with losses. Losing about 60-70 barrels per hour while mixing. Mixed mud and circulated until 4:15 P. M. Quit mixing mud. Pumped remaining mud in hole. Mud loss 250 barrels.
5:00 P. M.	Start out of hole.
9:00 P. M.	T. D. 10,644'. On bank with bit #59 RR, reamed to 10,619' (25'). Bit worn, 1/16" under gauge, bearings loose. Reamer full gauge. Pick up bit #79, W7R, reamer, junk sub and crows foot, start in hole. Recovered no junk with bit #59 RR.
10:30 P. M	Collars in hole, cutting drilling line. Laid down 10 joints of drill pipe on trip out, picking up 10 joints of grade 3 drill pipe. Total mud loss for 6-30-61 730 barrels.

1 July 1961

12:01 A.M. TD 10,644'. Reamed core hole to 10,619'. Picking up 10 joints of drill pipe.

12:05 A.M. Began mixing mud and LCM.

2:15 A.M. Mud check:

Weight	9.2	#/gal.	Yield	9	
Viscosity	62	Sec.	Filter cake	2/32	
Water loss	6.4	cc.	Ca	1,000	ppm
Pl. Vis.	18	cp.	NaCl	600	ppm
pH	9.0		LCM	30	%

2:30 A.M. Broke circulation at 2,000'. No apparent mud loss. Took 96 barrels to get return.

3:00 A.M. Resumed trip in hole.

4:00 A.M. Broke circulation at 7,000'. No mud losses.

4:15 A.M. Resumed trip in.

4:50 A.M. Broke circulation at 9,000'. No mud losses.

5:05 A.M. Resumed trip in.

6:00 A.M. T.D. 10,644'. On bottom letting hole stand.

6:15 A.M. Broke circulation on bottom.

6:30 A.M. Repairing rotary clutch, continuing to circulate.

9:00 A.M. Reaming and drilling ahead. Mud check:

Weight	9.2	#/gal.	pH	8.5	
Viscosity	69	Sec.	Yield Pt.	15	
Water loss	8.0	cc.	Ca	1,040	ppm
Pl. Vis.	25	cp.			

3:00 P.M. 10,657'. Appear to have made some fluid, instructed toolpusher to advise driller of this condition and to observe further development.

6:00 P.M. 10,671. Mud check:

Weight	9.3	#/gal.	pH	8.5	
Viscosity	68	Sec.	Yield point	12	
Water loss	8.4	cc.	Ca	940	ppm
Pl. Vis.	24	cp.	LCM	20	%

9:00 P.M. TD 10,679'. Began circulating samples for 1 1/2 hours.

10:35 P.M. Dropped Eastman survey.

11:10 P.M. Started trip out with bit #79, reamed 25' of rat hole and drilled 35' in 14 1/2 hours. Mud check:

Weight	9.4	#/gal.	Yield	15	
Viscosity	91	Sec.	Filter cake	2/32	
Water loss	9.2	cc.	Ca	1,680	ppm
Pl. Vis.	25	cp.	NaCl	450	ppm
pH	9.0		LCM	30	%

2 July 1961

12:01 A.M. TD 10,679'. Trip out

3:00 A.M. On bank with bit #79, dull, bearings loose, full gauge. Reamer under 11 & 1/32" gauge. No junk recovered. Picked up bit #80, W7R, new reamer, junk sub and start in hole. Eastman survey 3 3/4° at 10,649'.

6:00 A.M. Broke circulation at 8,000'. No apparent mud loss.

6:15 A.M. Resumed trip in.

7:00 A.M. On bottom, no fill-up, drilling ahead.

9:00 A.M. Pilot tested the drilling mud to determine what additions would be necessary in order to lower the water loss from the reading recorded last night and also to determine what might be causing the low reading.

	Base mud	1/4#/bbl. Lime	1/2#/bbl Lime 1/4#/bbl. Driscose	1/4#/bbl. Driscose
Weight	9.3			
Vis.	68			
W. L.	8.0	8.0	6.4	6.8
Pl. Vis.	23	18	17	16
Yield	19	12	17	18
LCM	20%	20%	20%	20%
Pm	.2	.6	1.0	.3
Pf	.2	.3	.3	.2
pH	8.0	9.0	9.5	8.0
Ca	800	800	800	800
Cake	Soft	Med firm	Firm	Firm

The addition of 1/2#/bbl. lime and 1/4#/bbl. of driscose gives the most desirable properties from the standpoint of water loss, alkalinity and flow characteristics. Lime additions were commenced at 8:45 A.M. and driscose at 9:30 A.M.

The increase in the water loss and the reduction in alkalinity can be related to the high LCM concentration which would tend to cause the mud to sour, and therefore reduce the effectiveness of the driscose additions.

5:05 P.M. TD 10,722'. Shut down to repair rotary clutch.

2 July 1961
(Continued)

6:10 P. M.	Resumed drilling.
8:30 P. M.	TD 10,729'. Began circulating for samples.

3 July 1961

12:01 A. M.	TD 10,729'. Finished circulating samples, start trip out with bit #80, made 50 in 12 1/2 hrs.
4:00 A. M.	On bank with bit #80, medium dull, bearings slightly loose, to gauge. Reamer to gauge. Pipe was slightly tight the first 11 stands out and on the 33rd stand. Pick up DST tool and start in hole. Top of top packer to be set at 10,510' with 17 stands water cushion.
9:24 A. M	Open test tool. Weak blow.
9:27 A. M.	Close tool.
9:57 A. M.	Open tool. No blow.
10:21 A. M.	By pass tool.
10:20 A. M.	Open tool. Weak blow.
10:50 A. M	Close tool.
12:50 P. M.	Working packer.
1:00 P. M.	Loose, pull DST #10. Additional pilot tests on the mud indicated the following:

Base Mud			4#/Bbl. Starch		
Water loss	9.2	cc.	Water loss	3.8	cc.
Pl. Vis.	24	cp.	Pl. Vis.	16	cp.
Yield	15		Yield	17	
P. mud	65		P. mud	7.0	

1/2#/Bbl. Driscose 1#/Bbl. Q-Broxin			1#/Bbl. Starch 1#/Bbl. Q-Broxin		
Water loss	5.6	cc.	Water loss	6.8	cc.
Pl. Vis.	20	cp.	Pl. Vis.	16	cp.
Yield	20		Yield	8	
P. mud	.62		P. mud	.61	

2#/Bbl. Starch		
Water loss	5.0	cc.
Pl. Vis.	20	cp.
Yield	12	

Starch and preservative have been ordered for use in the mud. The preservative should prevent any additional decomposition of the driscose and will

3 July 1961
(Continued)

prevent the starch from fermenting. The starch will provide a greater particle size selection for water loss control, and although it is subject to temperature degradation, should allow for more economical water loss control than with driscose alone.

5:40 P.M. On bank with DST #10 (10,729-10,517). Recovered 17 stands water cushion and 90' of mud.

6:15 P.M. Trip in bit #81, W7R, and reamer and junk sub.

Field Pressures DST #10

	Bomb #1376	Bomb #212	Bomb #193
IHP	5193	5162	5276
ICIP	1043	1008	1126
IF	693	723	868
FF	693	743	868
FCIP	1278	1365	1476
FHP	5193	5142	5259

8:20 P.M. Broke circulation at 8000'.

8:40 P.M Resumed trip in.

9:45 P.M. Hit bridge at 10,549'. Washing to bottom. Had approximately 80' fill-up.

11:00 P.M. T.D. 10,729'. Drilling ahead.

4 July 1961

12:01 A.M. T.D. 10,732'. Drilling ahead.

5:30 A.M. Hit drilling break at 10,760'.

6:35 A.M. T.D. 10,770'. Got 10' of fast drilling. Informed geologist. Began circulating samples.

10:30 A.M. Commence drilling ahead.

4:10 P.M. T.D. 10,796'. Start circulating samples.

7:45 P.M. Start out of hole to pick up core barrel. Mud check before starting out of hole:

Weight	9.5 #/gal.	Yield	28
Viscosity	119 Sec.	Filter cake	2/32
Water loss	7.2 cc.	Ca	1600 ppm
Pl. Vis.	32 cp.	Cl	700 ppm
pH	8		

11:30 P.M. On bank with bit #81. Bit medium dull. 67' in 12.2 hrs.

5 July 1961

12:01 A.M. T.D. 10,796'. Making up core barrel.

12:30 A.M. Start in hole with corehead #R18674.

4:30 A.M. On bottom with core barrel, 3' of fill-up. Circulating to bottom. Rigging up kelly extension.

5:30 A.M. Starting to core.

9:00 A.M. Coring 10,804'. Mud check:

Weight	9.5	#/gal.	Yield	18
Viscosity	128	Sec.	LCM	18%
Water loss	6.0	cc.	P. mud	.8
Pl. Vis.	36	cp.	Preservative	.3
pH	9.5			

Addition of starch and preservative to the mud system seems to have temporarily halted the fermenting process. Close observation will be made to assure that this condition does not become severe.

12:01 P.M. Mud check:

Weight	9.5	#/gal.	Yield point	18
Viscosity	119	Sec.	Ca	1260 ppm
Pl. Vis.	32	cp.	LCM	20 %
Water loss	5.2	cc.	Preservative	.3 #/bbl.
pH	9.5			

3:00 P.M. Coring 10,815'. Discussed cementing program with Bob Graham, Division Engineer for Howco, and J. W. Hall also of Howco. Final planning will be consummated after the last caliper logs are run.

6 July 1961

12:01 A.M. T.D. 10,840' coring ahead.

12:45 A.M. Repairing rotary chain

1:10 A.M. Resumed coring.

3:10 A.M. T.D. 10,846', 50' core cut, start trip out with core #19

7:00 A.M. On bank with core #19. Cored 10,796'-10,846' (50')
Recovered 48'. Core arkosic with some shale and occasional limestone inclusions. No appreciable porosity or permeability visible.

9:50 A.M. Cut drilling line.

10:30 A.M. Start in hole with bit #82, W7R, reamer and junk sub to ream corehole.

12:30 P.M. On bottom reaming ahead.

8:30 P.M. Reaming. Broke rotary chain. Repairing same.

9:15 P.M. Resumed reaming.

7 July 1961

12:01 A.M.	T.D. 10,846'. Reaming corehole.
2:15 A.M.	Corehole reamed. Drilling ahead.
9:00 A.M.	10,873'. Mud check:

Weight	9.5	#/gal.	pH	9.0	
Viscosity	124	Sec.	Yield point	22	
Water loss	7.0	cc.	Ca	980	ppm
Pl. Vis.	32	cp.	Preservative	.15	

11:00 A.M.	T.D. 10,878'. Circulate samples.
12:15 P.M.	Pull bit #82. Ream 50' in 13 3/4 hrs. Drill 32' in 8 3/4 hrs. Total 22 1/2 hrs.
4:45 P.M.	On bank bit #82. Teeth green, bearings slightly loose, bit and reamer in gauge. Pick up bit #83, W7, and reamer and junk sub.
5:40 P.M.	Dump shale pit.
5:40 P.M.	Trip in with bit.
9:15 P.M.	Circulating through 18' fill-up.
10:00 P.M.	T.D. 10,846', drilling ahead.

8 July 1961

12:01 A.M.	T.D. 10,893'. Drilling ahead. Mud check:

Weight	9.5	#/gal.	Yield	15	
Viscosity	105	Sec.	Filter cake	2/32	
Water loss	6.8	cc.	Ca	2000	ppm
Pl. Vis.	30	cp.	NaCl	700	ppm
pH	8.5				

9:00 A.M.	10,942', drilling ahead.
12:01 P.M.	10,955' drilling ahead. Joe Peters, Cameron, inspected christmas tree assembly to ascertain that all equipment was on hand and correct. Mud check:

Weight	9.5	#/gal.	pH	9.0	
Viscosity	81	Sec.	Yield	14	
Water loss	6.2	cc.	Ca	1200	ppm
Pl. Vis.	26	cp.	Preservative	.25	

2:00 P.M.	T.D. 10,962'. Circulate samples prior to trip for test tool. Bit #83 made 84' in 15 1/2 hrs.
7:00 P.M.	Start out of hole with bit #83 to pick up DST tool. Strapping pipe out.
11:15 P.M.	On bank with bit #83, teeth dull, bearings medium loose, to gauge. Reamer slightly under 11 and 1/32" gauge. No junk recovered. Picking up DST tool and run in hole.

9 July 1961

12:01 A. M. TD 10,962'. Running DST tool in hole. Packer (bottom of top packer) to be set at 10,750'. Running 22 stands approximately 2,000' water cushion.

5:00 A. M. On bottom with test tool.

8:00 A. M. Pipe strap 10,959'. No correction.

8:32 A. M. Pull DST #11 (10,962'-10,755'), initial open 2 min. Initial shut-in 20 minutes. Final open 60 minutes. Final shut-in 120 minutes.

12:30 P. M. On bank with test tool. Recover 22 stands and 1 single of water cushion, 1 stand of drilling mud.

Mud sample:

Weight	9.5	#/gal.	C_1	800
Water loss	7.6	cc.	C_2	300
Pl. Vis.	23	cp.	C_3	100
pH	7.5		C_4	Trace
Yield	17		Rm	1.25
Ca	160	ppm	Rmf	1.2
Cl	800	ppm	Rmc	1.7

Water cushion Resistivity 10.0 ohms

1:45 P. M Pick up bit #84, OWC. Reamer and junk sub.

2:30 P. M. Cut drilling line.

3:00 P. M. Resume trip

5:10 P. M. T.D. 10,962'. On bottom. Work on pumps.

5:45 P. M. Finish work on pumps.

5:50 P. M. On bottom. No fill. Drilling ahead.

6:00 P. M. Field pressures from top recorder on DST #11:

IH	5350	FF	960
ICIP	1735	FCIP	1957
IF	904	FH	5350

9:00 P. M. 10,983' drilling. Mud check

Weight	9.4	#/gal.	Filter cake	2/32	
Viscosity	76	Sec.	Ca	1400	ppm
Water loss	7.4	cc.	NaCl	1000	ppm
Pl. Vis.	24	cp.	LCM	8	%
pH	8.0		Preservative	.25	#/bbl.
Yield	15				

10 July 1961

12:01 A. M. TD 11,006'. Drilling ahead.

5:45 A. M. TD 11,044'. Began circulating samples.

10 July 1961
(Continued)

9:15 A.M.	Drop Eastman survey. Bit #84 made 82' in 11 3/4 hrs. Mud check:

Weight	9.5 #/gal.	pH	9.0
Viscosity	66 Sec.	Yield	13
Water loss	7.2 cc.	Ca	1280 ppm
Pl. Vis.	22 cp.	Preservative	.2

10:00 A.M.	Trip out. Deviation 4 3/4° at 11,044'. Trip in with corehead #R18675 (7 3/16" x 4 3/8").
6:10 P.M.	T.D. 11,044'. On bottom and coring.

11 July 1961

12:01 A.M.	T.D. 11,067'. Coring ahead.
5:30 A.M.	T.D. 11,080'. Lost circulation. Had drilling break at 11,078-80'. Lost 140bbls. of mud. No returns. Broke off core, pulled up out of rathole and began mixing mud and lost circulation material.
8:24 A.M.	Start pump. No returns, pump mud at 500 psi.
9:00 A.M.	Stop pump after pumping 180 bbls. of mud.
9:05 A.M.	Pull core #20, cut 36' in 11 hrs.
12:45 P.M.	On bank. Lay down core. Recovered 34'.
1:30 P.M.	Finished laying down core. Mixing mud, will attempt to break circulation at 5000' at 2:00 A.M. Total mud loss: 320 bbls. Trip in bit #85, W7R.

12 July 1961

12:01 A.M.	T.D. 11,080'. Waiting until 2:00 A.M. to break circulation.
2:00 A.M.	Began pumping slowly, got returns after pumping 110 bbls. in hole. Kicked pump out, fluid level dropped about 4' and remained fairly steady for 15 min. Resumed trip in hole.
2:45 A.M.	Mud level falling in hole. Will run to 9000' slowly and try to break circulation.
4:00 A.M.	Tried to break circulation at 9000'. Returns after pumping 60 bbls. in hole. Mud volume low. Shut down to mix mud. Were losing mud at about 100 bbls./hr.
8:00 A.M	Broke circulation at T.D. Returns in 5 min. (Partial returns). Lost complete returns after 30 min. Pumped in 200 bbls. Pulled up 30 stands. Pumped in 200 bbls. Pulled up 30 stands. Mixing pit of mud.
4:00 P.M.	Decision was made to spot slug of mud containing a high percentage of lost circulation material on bottom

12 July 1961
(Continued)

and let set for 5 hours. Ran to TD. Gained full returns after 10 minutes. Pumped in about 40 barrels of mud.

4:15 P.M. Starting to ream core hole, getting full mud returns.

6:45 P.M. Losing some mud. Still reaming.

7:10 P.M. Had reamed to 11,076'. Lost complete returns. Pull out 15 stands. Mixing mud. Check on mud [illegible] ing over shaker while getting returns.

Weight	9.5	#/gal.	Yield	20	
Viscosity	81	Sec.	Filter cake	2/32	
Water loss	10.4	cc.	Ca	1420	ppm
Pl. Vis.	22	cp.	NaCl	1100	ppm
pH	8.0		LCM	12	%

11:20 P.M. Ran back to bottom. Working on pump. Total mud loss for day is 550 barrels.

13 July 1961

12:01 A.M. T.D. 11,080'. Working on pump. Had reamed corehole to 11,076'.

12:10 A.M. Began pumpimg. Mud level visible about 200' down hole. Coming up. Level rose to about 50' from top of hole and remained steady. Pumped in 250 barrels mud and got no returns. Pump pressure: 400 psi.

1:00 A.M. Pulling 20 stands. Will let hole stand for at least 8 hours and will try to establish circulation 8 stands off bottom. Mud check on mud just pumped in:

Weight	9.4	#/gal.	Yield	20	
Viscosity	90	Sec.	Filter cake	2/32	
Water loss	6.0	cc.	Ca	1240	ppm
Pl. Vis.	25	cp.	NaCl	1000	ppm
pH	9.0		LCM	37	%

2:00 A.M. 20 stands out, kelly on. Began mixing mud and LCM.

1:00 P.M. Broke circulation with 350 pounds.

1:23 P.M. Circulation [illegible] er pumping 40 barrels.

1:25 P.M. Start to bottom.

2:00 P.M. Rotate pipe 10' off bottom for 6 minutes.

2:06 P.M. Start pumping slowly. Pumped away 50 barrels of 35% LCM mud. No returns.

2:55 P.M. Pump mud, partial returns.

3:25 P.M. Pump 130 barrels. Pull out to 5,000'. Met with Bill Gorham, Baroid; Fred Lang, Baroid; and O. E. Mechem, E. A. Polumbus, Jr. & Assoc., Inc. to determine what new approach may prove expedient in solving the lost circulation last encountered.

13 July 1961
(Continued)

6:45 P.M. Broke circulation at 5,000'. Adding water, Q-Broxin, lime, gypsum and preservative to obtain mud properties of:

Weight	9.2-9.3 #/gal.	Water loss	6-8 cc.
Viscosity	70 Sec.	Preservative	0.5 #/bbl.

Total mud loss 470 barrels.

14 July 1961

12:01 A.M. TD 11,080'. Reamed to 11,076'. Circulating at 5,000' while conditioning mud.

1:00 A.M. Lost 4" of mud in last 15 minutes, but leveling out.

1:30 A.M. No mud loss since 1:00 A.M.

8:45 A.M. Run in 20 stands. Mud check:

Weight	9.4 #/gal.	Yield	12
Viscosity	78 Sec.	pH	9.0
Water loss	6.4 cc.	Ca	1,400 ppm
Pl. Vis.	25 cp.	LCM	18%
		Preservative	.3 #/Bbl.

9:30 A.M. Rotate pipe prior to circulating, 54 rpm.

9:42 A.M. Break circulation.

11:07 A.M. Bypass contaminated mud.

11:55 A.M. Turn mud back in pits. Bypassed 160 barrels
Mix 126 barrels of new mud, circulate system, condition mud.

4:30 P.M. Run 20 stands.

5:10 P.M. Break circulation.

7:15 P.M. Contaminated mud up. Began treating 2,000' contaminated mud.

8:50 P.M. Run pipe to bottom.

9:50 P.M. On bottom. No fill-up. Began circulating. Losing no mud.

15 July 1961

12:01 A.M. TD 11,080'. Reamed to 11,076'. Circulating on bottom to condition mud.

2:20 A.M. Began reaming remaining 4 feet of core rathole.

2:35 A.M. Drilling ahead, no mud losses.

9:00 A.M. Drilling 11,105. Mud check:

Weight	9.3 #/gal.	Yield	10
Viscosity	89 Sec.	pH	9.0
Water loss	6.4 cc.	Ca	1,620 ppm
Pl. Vis.	22 Cp.	LCM	12 %
		Preservative	.2 #/Bbl.

15 July 1961 (Continued)	Mud checks since 1:00 A.M. every 30 minutes indicate that the mud properties are uniform throughout the mud system. Bill Gorham, Baroid, checked preservative kit against a new kit and determined that the readings from the old kit were low.
3:00 P.M.	11,112. Mud check:

Weight	9.3	#/gal.	Yield point	15	
Viscosity	75	Sec.	Ca	1,600	ppm
Water loss	6.4	cc.	LCM	15	%
Pl. Vis.	20	cp.	Preservative	.5	
pH	8.5				

5:21 P.M.	T.D. 11,129'. Circulate for samples prior to trip.
9:45 P.M.	Start out of hole to pick up core barrel.
16 July 1961	
12:01 A.M.	T.D. 11,129'. Trip out bit #85.
1:50 A.M.	On bank with bit #85, cut 49' in 15 hrs. and reamed 36'. Medium green, bearings slightly loose, 1/16" under gauge. Reamer to gauge. Pick up core bbl. Service core bbl.
4:30 A.M.	Start trip in with corehead #R18675.
5:00 A.M.	Collars in hole. Shut down. Cut drilling line.
6:00 A.M.	Resume trip in hole.
7:20 A.M.	Break circulation 50 stands off bottom.
8:15 A.M.	Resume trip.
8:45 A.M.	Break circulation 17 stands off bottom.
9:00 A.M.	Resume trip.
9:40 A.M.	On bottom 15' fill up. Rig up kelly extension.
10:45 A.M.	T.D. 11,129'. Commence coring.
3:00 P.M.	11,143. Coring mud check:

Weight	9.3	#/gal.	Yield	16	
Viscosity	78	Sec.	Ca	1,540	ppm
Water loss	7.6	cc.	LCM	15	%
Pl. Vis.	22	cp.	Preservative	.5	
pH	8.5				

17 July 1961	
12:01 A.M.	TD 11,162. Have cored a total of 33' in 13 hours.
5:20 A.M.	TD 11,178. Finish coring. Broke off core with 40,000# plus jars. Cut 49' in 18 1/4 hours.
5:30 A.M.	Start out of hole.
9:25 A.M.	On bank lay down core #21, rec. 48'. Mr. Hall and Mr. Blakemore, Halliburton, inspected the downhole equipment.

F. A. POLUMBUS JR. AND ASSOCIATES, INC.

17 July 1961
(Continued)

to determine that all necessary equipment is available. Es Lok Clamps were not available but will be ordered

12:01 P. M — Run bit #86, W7R. Reamer and junk sub.

2:30 P. M — Broke circulation 8,000'.

2:55 P. M. — Resume trip.

3:45 P. M. — On bottom. Reaming corehole.

6:00 P. M. — Reaming 11,146'. Mud check:

Weight	9.3	#/gal.	pH	7.5	
Viscosity	70	Sec.	Yield point	15	
Water loss	9.4	cc.	Ca	1,320	ppm
Pl. Vis.	20	cp.			

10:00 P. M. — T.D. 11,178'. Reamed corehole. Began circulating samples.

18 July 1961

12:01 A. M. — T.D. 11,178'. Circulating for samples.

12.45 A. M. — Dropped Eastman survey.

1:00 A. M. — Start out of hole with bit #86 to pick up DST tool. Bit #86 reamed 49' in 6 1/4 hours.

2:30 A. M. — Hole tight, working pipe. Have had to put kelly on and circulate, and also pull up to 300,000# on string to free pipe. Pipe tight on 36th and 37th stand out (7696' - 7786'). Freed pipe, pulled 5 stands with only slight trouble, 6th stand or 42nd stand out tight again (7156' - 7246'). Working stuck pipe and circulating through kelly.

6:10 A. M. — Working stuck pipe. Mud check:

Weight	9.3	#/gal.	Yield	18	
Viscosity	74	Sec.	Filter cake	2/32	
Water loss	8.6	cc.	Ca	1,420	ppm
Pl. Vis.	20	cp.	LCM	12	%
pH	8.0		Preservative	0.4	#/Bbl.

Pipe free. Waiting on key seat wiper and sub to use on 7" drill collars with 11" bit.

8:30 P. M. — Mud check:

Weight	9.3	#/gal.	Yield	10	
Viscosity	78	Sec.	Filter cake	2/32	
Water loss	4.4	cc.	Ca	1,440	ppm
Pl. Vis.	24	cp.	NaCl	1,000	ppm
pH	9.5		Preservative	0.3	

Start trip out, first two joints free, 3rd tight, first two on second stand (46th stand off bottom) tight, 3rd joint will not come. Working stuck pipe.

19 July 1961

12:01 A.M.	T.D. 11,178'. Working stuck pipe, have 45 2/3 stands out of hole. Keyseat wiper and 11" bit to 7" drill collar sub are both on location.
6:00 A.M.	Pipe free. Resume trip out.
9:00 A.M.	On bank with bit #86, bit medium green, 1/8" under gauge, no damage to bit, reamer or collars. Cut drilling line, remove desander.
12:01 P.M.	Start in hole with bit #87, W7R, reamer, 7" collars and Homco, keyseat reamer (7 3/8" O.D.) on top of collars.
2:00 P.M.	Hit bridge at 6,950'±, put on kelly and washing down slowly.
3:30 P.M.	Kelly down, pulled up to make connection and kelly would not go down. Did this twice. Have 10' fill-up.
4:45 P.M.	Got kelly down and new joint in. Washing down.
5:00 P.M.	O. E. Mechem called and advised pulling up above trouble spot and circulating.
6:30 P.M.	Back in and drilling on bridge.
9:15 P.M.	Start trip out to remove reamer and replace W7R with shale bit. Run bit #88, OWC, and junk sub.

20 July 1961

12:01 A.M.	T.D. 11,178' Tripping.
3:20 A.M.	Hit bridge 45 stands and one double off bottom (6933').
5:15 A.M.	Make connection, 5' fill.
6:15 A.M.	Make connection, 7' fill.
6:45 A.M.	Run one stand.
7:00 A.M.	Pick up kelly.
7:45 A.M.	Make connection. Ream.
10:20 A.M.	Connection, 15' fill.
11:00 A.M.	Connection, 15' fill.
12:35 P.M.	Reamed from 6933' to 7272'. Start short trip
2:05 P.M.	Pulled 8 stands plus one double, 1st stand tight, layed down 2 joints on 2nd stand and picked up the kelly. Circulate till 1:45 P.M. Resumed trip, rest of pipe came free.
2:45 P.M.	Resume trip in.
3:00 P.M.	Hit fill-up 70' up (7200')
3:25 P.M.	Made connection (7230')
3:40 P.M.	Made connection (7260')
3:47 P.M.	Made connection (7290')
4:05 P.M.	Set back lelly.
4:10 P.M.	Stand wouldn't go.

20 July 1961
(Continued)

4:15 P.M.	Pick up kelly, wash down.
4:20 P.M.	Connection and wash down. 7320.
4:27 P.M.	Set back kelly. Run 5 stands, free 7320 - 7810.
5:00 P.M.	Hit bridge. 7810'. Pick up single wash down.
5:30 P.M.	Connection 7840'.
6:00 P.M.	Connection 7873'.
6:20 P.M.	Circulate hole at 7920'.
6:30 P.M.	Pipe free. Circulate hole 34 stands and 2 singles off bottom. (7956')
8:20 P.M.	Start short trip out.
9:50 P.M.	Pulled 22 stands to 5888'. Put kelly on, circulating while cutting drilling line.
11:15 P.M.	Start trip to bottom.
11:50 P.M.	Hit bridge at 7140'. Put kelly on. Circulating and reaming through bridge.

21 July 1961

12:01 A.M.	TD 11,178'. Circulating and reaming bridge at 7140'.
12:10 A.M.	Pipe free, resume trip in.
12:15 A.M.	Hit bridge at 7264'. Put on kelly.
12:25 A.M.	Pipe free, resume trip in.
1:05 A.M.	Hit bridge at 8345'. Put on kelly.
1:30 A.M.	Pipe free, resume trip in.
2:00 A.M.	Hit bridge at 9075'. Put on kelly.
2:45 A.M.	Pipe free. Resume trip in.
2:50 A.M.	Hit bridge at 9134'. Put on kelly.
3:30 A.M.	Pipe free, resume trip in.
4:45 A.M.	On top of 4' fill up. Circulating to bottom.
5:00 A.M.	T.D. 11,178'. On bottom drilling ahead. Drilling string now 14.90' longer.
6:00 A.M.	11,186'. Drilling. Mud check:

Weight	9.4	#/gal.	Yield	16	
Viscosity	98	Sec.	Filter cake	2/32	
Water loss	4.6	cc.	Ca	1,900	ppm
Pl. Vis.	25	cp.	NaCl	1,000	ppm
pH	9.5		LCM	14	%

2:30 P.M.	T.D. 11,225'. Bit #88 made 47' in 9 1/2 hrs. Circulate hole prior to short trip.
6:00 P.M.	Mud check:

Weight	9.4	#/gal.	pH	9.0	
Viscosity	100	Sec.	Yield	21	
Water loss	4.0	cc.	LCM	10	%
Pl. Vis.	32	cp.	Preservative	.35	

21 July 1961
(Continued)

6:30 P.M.	T.D. 11,225'. Begin short trip out. Tight at 10,251'. Tight at 7,608' Tight at 8,279' Tight at 7,588' Tight at 8,227' Tight at 7,549' Tight at 8,187' Tight at 7,514' Very tight at 8,137' Very tight at 7,445' - Pulled to 300,000#, jumped free, worked spot till free. Tight at 8,097'
10:05 P.M.	Tight spot at 7445'. Worked free.
10:20 P.M.	End short trip. Let hole stand.
11:10 P.M.	Start trip to bottom.
11:50 P.M.	Hit bridge at 9014'. Pick up kelly, circulate and ream through bridge.

22 July 1961

12:01 A.M.	T.D. 11,225'. Short trip in. Circulating and reaming through bridge at 9014'.
12:50 A.M.	Connection.
12:55 A.M.	Set kelly back, resume trip.
1:20 A.M.	Hit bridge at 9943', pick up kelly. Wash through bridge.
1:35 A.M.	Set back kelly, resume trip.
1:50 A.M.	Hit bridge at 10,445'. Pick up kelly. Circulate and ream bridge. Bit not making any headway.
2:50 A.M.	Began trip out with bit #88. Strapping pipe out.
6:30 A.M.	Tripping out bit #88 at 7" collars. Experienced no tight hole on trip out to this point, Began laying down 3 stands off 7" collars. Bit dull 1/4" out of gauge. Lay down 6-8" drill collars. Pipe strap 11,228.34, no correction
1:30 P.M.	Trip in bit #89, W7. Tight spot 19 stands (9,461) off bottom.
1:55 P.M.	Bridge 12 stands plus double (10,112') Wash with kelly.
2:15 P.M.	Set kelly back.
2:35 P.M.	Bridge 6 stands plus 45' (10,445'). Pick up kelly.
4:00 P.M.	Connection.
4:10 P.M.	Resume trip.
4:15 P.M.	Bridge 4 stands plus single off bottom, pick up kelly, wash down.
4:30 P.M.	Set back kelly.
4:35 P.M.	Bridge 3 stands off bottom, pick up kelly.
4:45 P.M.	Set kelly back. Circulating to bottom.
5:00 P.M.	80' fill-up.
5:40 P.M.	Pipe stuck at 11,160'. Working free.
5:45 P.M.	Pipe free, circulating through fill.

22 July 1961
(Continued)

6:12 P. M.	Pipe stuck at 11, 175'. Working free.
6:35 P. M.	Pipe free, circulating through fill.
9:30 P. M.	Pipe stuck at 11, 204'. Working free.
9:37 P. M.	Pipe free, circulating through fill.
11:15 P. M.	Pipe stuck at 11, 213', Working free.
11:35 P. M.	Pipe free, circulating through fill.

23 July 1961

12:01 A. M.	TD 11, 225'. Circulating through fill to bottom; also reaming out of gauge hole.
3:00 A. M.	On bottom circulating. Hole clean for 4 hours.
9:50 A. M.	Start short trip.
10:30 A. M.	Tite spot on 40th stand. Work key seated spot.
1:20 P. M.	Run 2 stands in attempt to reorient pipe.
1:30 P. M.	Pull pipe.
3:00 P. M.	Run 3 stands, hit bridge, pull up and work pipe.
6:00 P. M.	Run 4 stands - wiping up the hole.
9:25 P. M.	Pipe wiped, hit key seat, working pipe free. At 7, 513'.
11:05 P. M.	Pipe free, resume trip out. Had tight bump at 7, 487'.
11:13 P. M.	Pipe stuck at 7, 440'. Cannot go up or down. Working pipe.
11:25 P. M.	Pipe free to move down, picked up kelly, working pipe free. Pipe freed for 5', then 10', then stuck.

24 July 1961

12:01 A. M.	TD 11, 225'. Trip out of hole, pipe stuck at 7, 425'. Working pipe free.
12:45 A. M.	Pipe free, resume trip out of hole.
4:30 A. M.	On bank with bit #89, medium green, 1/8" under gauge, bit pinched. Picked up approximately 6 stands of drill pipe which was laid down while wiping hole.
5:00 A. M.	Pick up bit #90, OWC, and run in hole. Pick up 9-7" collars, total collars now 21-7". Ran in hole with key seat wiper and 2 stands drill pipe. Cleaned middle mud pit.
7:30 A. M.	Put kelly on, waiting on string reamer to arrive on location.
10:30 A. M.	String reamer arrived. Resumed trip in hole. Reamer will be placed 38 stands up.

24 July 1961	
(Continued)	Shut down to repair dynamatic.
1:00 P.M.	Resume trip. Meeting with O. E. Mechem, J. H. Garrett, A. Samuels, (EAP) J. W. Hall, Blakemore and Northcutt (HOWCO) concerning cementing. Consideration was given to use of guide shoe rather than float shoe in order to reduce the possibility of lost circulation due to pressure surges. Called Connors (Loffland) to determine rig capabilities in terms of additional load due to not floating pipe.
3:25 P.M.	Hit bridge at 7,841'. Pick up kelly. Circulate and ream bridge.
6:25 P.M.	Finished reaming 3 joints through bridge. Pulled pipe through bridged zone free. Resume trip.
6:50 P.M.	Hit bridge at 8,499'. Pick up kelly. Ream and circulate through bridge.
7:00 P.M.	Set kelly back. Resumed trip.
7:14 P.M.	Hit bridge at 8,750'. Pick kelly up, circulate and ream bridge.
8:00 P.M.	Set kelly back. Resumed trip.
8:30 P.M.	Hit bridge at 10,191'. Pick up kelly. Does not act like a bridge, but like string reamer is grabbing. Began reaming key seat with string reamer at 6,619'. Reaming down one joint at a time, approximately one hour per joint with rotary turning at 52 rpm.
25 July 1961	
12:01 A.M.	TD 11,225'. Reaming key seat with string reamer.
8:00 A.M.	Reaming key seat tight spot at 6,888' caused severe torque. Air line on brake broke. After reaming through tight spot 5 joints of drill pipe were laid down and 2 stands of drill pipe were run in. Slight binding was noted while pulling 5th joint. The two stands went in without further binding or excessive drag.
6:30 P.M.	Reaming key seat at about 6,970'. No more tight spots causing excessive torque were encountered during day. After kelly was down each time drill pipe was pulled or moved up and down about 50-60 feet before adding next joint.
6:45 P.M.	Hit tight spot, table torquing slightly, reaming slowly.
7:15 P.M.	Through tight spot 6,975-83'. Reaming ahead.
11:00 P.M.	Added 2,000 gal. of oil to mud system today.

26 July 1961

12:01 A.M.	TD 11,225'. Reaming key seat with string reamer at 7,030'.
5:05 A.M.	Lost returns while reaming at 7,107', bit at 10,679'. Broke off kelly, began pulling pipe. Conference with A. Samuels and Louis Brown about trying to spot heavy LCM mud on bottom before starting out. Decided to trip out without spotting pill because pipe was hard to pull and a good possibility of sticking the pipe exists.
5:15 A.M.	Tripping out slowly, pipe trying to stick.

Mud check prior to lost circulation:

Weight	9.4	#/gal.	pH	8.5	
Viscosity	141	Sec.	Yield point	30	
Water loss	3.4	cc.	LCM	8	%
Pl. Vis.	32	cp.	Preservative	.30	

8:10 A.M.	Pull 16 stands, mix mud and LCM.
10:45 A.M.	Start pump.
10:55 A.M.	Returns after pumping 35 bbls., displace 140 bbls.
11:55 A.M.	Resume trip. Tite 28th stand.
12:55 P.M.	Tite 38th stand 7,037', 39th, 40th, 41st.
1:20 P.M.	Finished working 38th stand.
4:30 P.M.	On bank with bit #90, reamer and keyseat wiper all in good shape. Test BOP's and will run reamer between 15th and 16th stands above drill collars. Will start reaming 26 stands off bottom and stop 18 stands
4:45 P.M.	Ran same reamer and bit #90 back in hole.
6:35 P.M.	Broke circulation at 5,000'.
6:45 P.M.	Resumed trip in hole.
7:10 P.M.	Hit bridge at 6,880'. Pick up kelly.
7:15 P.M.	Resumed trip in.
7:25 P.M.	Hit bridge at 7,183'. Pick up kelly.
7:40 P.M.	Resumed trip in.
7:43 P.M.	Hit bridge at 7,214'. Pick up kelly.
8:00 P.M.	Resumed trip in.
8:05 P.M.	Hit bridge at 7,245'. Pick up kelly.
8:40 P.M.	Resumed trip in.
8:55 P.M.	Hit bridge at 7,685'. Pick up kelly.
9:25 P.M.	Resumed trip in.
9:30 P.M.	Hit bridge at 7,873'. Pick up kelly.
10:15 P.M.	Began reaming with string reamer at 6,741'. Ream at least 1/2 hour per joint to 7,107'. Added 2,000 gal. of oil to mud today.

27 July 1961

12:01 A.M.	TD 11,225'. Reaming key seat with string reamer at 6,810'.
3:00 A.M.	Reaming with string reamer at 6,970'. Observed only occasional slight torque.
5:30 A.M.	Began reaming with 2,000-4,000# bit weight. Table torquing, but not excessively. Reaming depth 7,086'.
7:30 A.M.	Reaming with string reamer at 7100'.

Weight	9.2	#/gal.	Pl. Vis.	27
Viscosity	119	sec.	pH	8.5
Water loss	4.0	cc.	Yield	26

8:30 A.M. Connection 7,130'. Mud check:

Weight	9.2	#/gal.	pH	9.0	
Viscosity	99	sec.	Ca	4,000	ppm
Water loss	3.6	cc.	LCM	12	%
Pl. Vis.	32	cp.	Preservative	.35#/bbl.	
Yield point	16		Oil	9	%

10:20 A.M.	Connection 7,161'.
11:15 A.M.	Connection 7,191'.
12:01 P.M.	Mud check:

Weight	9.2	#/gal.	Yield	15	
Viscosity	96	sec.	Ca	4,000	ppm
Water loss	3.8	cc.	LCM	15	%
Pl. Vis.	25	cp.	Preservative	.35#/bbl.	
			pH	9.0	

12:30 P.M.	Connection 7,221'.
9:30 P.M.	Reaming at 7,527'. Considerable torque.
11:30 P.M.	Reamed 3' since 9:30 P.M.
11:45 P.M.	Broke air line on rotary clutch.

28 July 1961

12:01 A.M.	T.D. 11,225'. Reaming at 7531'.
5:30 A.M.	Reaming at 7,550'.
8:30 A.M.	Clean shale pit.
9:00 A.M.	Resume reaming 7,551'.
11:30 A.M.	Clean middle pit.
11:50 A.M.	Resume reaming 7,560'. Mud check:

Weight	9.1	#/gal.	Ca	4,000	ppm
Viscosity	120	sec.	LCM	10	%
Pl. Vis.	28	cp.	Preservative	.35#/bbl.	
pH	8.0		Oil	11	%
Yield	29		Solids	19	%

28 July 1961
(Continued)

2:30 P.M.

Mud check:

Weight	9.1	#/gal.	Ca	3,600	ppm
Viscosity	117	sec.	LCM	10	%
Water loss	3.6	cc.	Oil	15	%
Pl. Vis.	28	cp.	Solids	17	%
Yield	29		Preservative	.25#/bbl.	

Reaming.

4:00 P.M.

Mud check:

Weight	8.9	#/gal.	pH	8.5	
Viscosity	105	sec.	Ca	4,000	ppm
Water loss	3.8	cc.	LCM	8	%
Pl. Vis.	30	cp.	Preservative	.15#/bbl.	
Yield	25				

6:00 P.M.

Ream 7565'. Pipe seemed to free up. Mud check:

Weight	9.0	#/gal.	pH	8.5	
Viscosity	101	sec.	LCM	8	%
Water loss	3.8	cc.	Oil	13	%
Pl. Vis.	24	cp.	Solids	15	%
Yield	22		Preservative	.4 #/bbl.	

9:50 P.M. Finished reaming to about 7,704'. Pipe appears to be free. Starting to circulate samples.

29 July 1961

12:01 A.M. T.D. 11,225'. Circulate samples preparatory to coming out of hole.

12:15 A.M. Start out of hole with string reamer and bit #90. First stand was tight. Next 15 stands pulled practically free. Strapping pipe out.

5:20 A.M. On bank with bit #90. Bit pinched and slightly loose. Seven loose joints below reamer, 4 drill pipe joints, 2 drill collar joints, key seat wiper joint. Bit 3/16" out of gauge.

5:45 A.M. Start in hole with bit 91, OWC.

8:30 A.M. Hit bridge approximately 1,450' off bottom. Pulling loose, pulled one joint and circulating to 9:30 p.m.

9:30 P.M. Reaming and washing 15, 14 and 13 stands. Mud check:

Weight	9.1	#/gal.	Gel	3
Viscosity	86	sec.	Yield point	14
Water loss	4.8	cc.	pH	8.5
Pl. Vis.	26	cp.		

2:30 P.M. Couldn't make connection. Began circulating and conditioning mud to raise viscosity.

4:30 P.M. Made connection and got in 1 joint of 12th stand off bottom. Reaming and washing ahead.

29 July 1961
(Continued)

5:00 P.M. With 9 stands out, pipe sta[illegible] ru[illegible]ning in freely. Ran pipe to within 300' of botton [illegible]tting on Kelly 7th and 5th stands out.

6:30 P.M. Hit bridge or fill 300' off bottom Washing and reaming to bottom.

30 July 1961

12:01 A.M. TD 11,225'. Reaming and washing at 11,210'.

12:30 A.M. On bottom and circulating to condition mud.

7:00 A.M. Circulating at 11,225 TD.

8:00 A.M. Clean suction pit and shale pit.

9:30 A.M. Circulating and conditioning mud. Mu[illegible] check 7:00 A.M.

Weight	9.5	#/gal.	Yield	9	
Viscosity	108	sec.	Ca	3,800	ppm
Water loss	4.8	cc.	LCM	8	%
Pl. Vis.	33	cp.	Preservative	.30	#/bbl.
pH	9.5				

12:30 P.M. Short trip. Mud check:

Weight	9.4	#/gal.	pH	9.5	
Viscosity	111	sec.	Ca	4,000	ppm
Water loss	4.6	cc.	Yield	12	
Pl. Vis.	36	cp.	Preservative	.3	#/bbl.

3:00 P.M. Pulled 45 stands, tight 1st stand and 41st stand.

4:30 P.M. Resume trip to bottom.

4:50 P.M. Clean middle pit.

5:30 P.M. Resume trip.

6:20 P.M. 70' fill-up.

7:00 P.M. Circulating through fill. Began circulating 7 hours prior to short trip.

9:00 P.M. Mud check:

Weight	9.5	#/gal.	Filter cake	2/32	
Viscosity	109	sec.	Ca	4,000	ppm
Water loss	4.8	cc.	NaCl	900	ppm
Pl. Vis.	34	cp.	LCM	8	%
Yield	16		Preservative	0.25	#/bbl.
pH	9.5				

9:20 P.M. Called Rex Curtis with Schlumberger to have logging equipment on location at 12:00 noon tomorrow 7-31-61.

31 July 1961

12:01 A.M. TD 11,225'. Circulating hole.

2:00 A.M. Start short trip out, 45 stands.

3:55 A.M. Hit tight bump 39 stands plus single off bottom.

31 July 1961
(Continued)

3:57 A.M.	Hit tight bump 40th stand off bottom.
4:01 A.M.	Hit tight bump 41 stands plus double off bottom.
4:05 A.M.	Hit tight bump 42 stands plus double off bottom.
4:10 A.M.	On bank with 45 stands, wait 2 hrs. (6:10 A.M.) to trip to bottom.
6:10 A.M.	Start trip to bottom.
7:15 A.M.	On top of 40' fill-up. Circulating to bottom. No bridges encountered on trip in.
7:30 A.M.	On bottom, circulating. Will circulate hole for 4 hrs.
10:00 A.M.	Started filling water storage tank.
12:01 P.M.	Trip out to log. Mud logging unit on stand by.

Mud check prior to trip:

Weight	9.3	#/gal.	Ca	3,400	ppm
Viscosity	105	sec.	Oil	14	%
Water loss	4.6	cc.	Solids	19	%
Pl. Vis.	32	cp.	LCM	8	%
Yield	14		Preservative	.3	#/bbl.
pH	9.5		Rm	1.0 at 139°	
			Rf	.8 at 78°	
			Rmc	1.75	

3:30 P.M.	On bank with bit #91. Green.
4:40 P.M.	Run IES to 11,242'.
6:05 P.M.	11,242' pulling log.
7:05 P.M.	On bank with IES. No bridges or tight spots encountered.
7:20 P.M.	Start in with sonic log.
8:05 P.M.	Hit bridge with tool at 8,755'. Working tool through bridge.
8:15 P.M.	Resume run in.
8:23 P.M.	Hit bridge at 9,900'. Working tool.
8:26 P.M.	Resume run in.
8:45 P.M.	Tool at 11,234', pulling log.
9:00 P.M.	Power failure stops logging, hook up to rig power.
9:10 P.M.	Resume logging.
9:25 P.M.	Hitting some tight hole. Encountered tight hole between 6,700' to 6,500'. Pulled up to 1,000# to free. Tight spot at 6,360, pulled 1,000# to free. Very tight spot at 6,335', pulled to 2,000# to free.
10:15 P.M.	On bank with sonic log tool. Ran free from 6,335'.
10:30 P.M.	Inspection of sonic logging tool showed that one rubber torpedo covering was missing and lost in hole. It is 2 1/2' long and 1 1/2" O.D. It covered the upper plug connection between the logging line and the tool bridle. A conference between Bert Lear, Alvin Samuels and O. E. Mechem determined that probable trouble in hole was due to the logging line key seating itself in the

31 July 1961
(Continued)

10:30 P.M. (Contd. existing key seat trouble portion of the hole. It was decided to cease logging operations, run carbide lags to determine hole volume, and condition hole to run casing.

11:55 P.M. Began laying down core barrel.

1 August 1961

12:01 A.M. TD 11,225'. Laying down core barrel.

1:00 A.M. Core barrel laid down. Herb McKay, D & S, picked up two diamond core heads, serial Nos. R-18675 and R-18674 for salvage. Began laying down 9-7" drill collars

3:00 A.M. Collars laid down, cutting drilling line.

4:00 A.M. Began trip in hole with bit #91RR, 4 stands of 7" collars and key seat wiper.

5:15 A.M. Bit at 4,500'. Working on D-700 pump. No bridges on trip in.

5:30 A.M. Baroid mud logger on location.

5:55 A.M. Began running carbide lag at 4,500' with D-500 pump, 650 psi 73 spm.

6:45 A.M. Carbide lag up in 2,900 strokes, 50 minutes at 73 spm. Resume trip in.

8:05 A.M. Bit at 9,000'. Circulating.

8:20 A.M. Dropped carbide, circulating at 800 psi and 44 spm. No bridges encountered to this depth.

10:00 A.M. Mud check:

Weight	9.2	#/gal.	Ca	4,000	ppm
Viscosity	115	sec.	NaCl	800	ppm
Water loss	5.8	cc.	LCM	10	%
Pl. Vis.	36	cp.	Oil	14	%
Yield	20		pH	9.0	
Filter cake	2/32		Preservative	.35#/bbl.	

10:25 A.M. Carbide lag up in 5,980 strokes. 125 minutes at 48 spm. Pump rate of 44 spm lasted first 10 minutes of carbide lag.

10:40 A.M. Resume trip to bottom.

11:15 A.M. On top of 37' fill-up, circulating to bottom. Encountered no bridges during complete trip to bottom.

11:35 A.M. Dropped carbide.

1:00 P.M. Mud check:

Weight	9.0	#/gal.	Filter cake	2/32	
Viscosity	120	sec.	pH	9.0	
Water loss	6.0	cc.	Ca	3,600	ppm
Pl. Vis.	32	cp.	NaCl	900	ppm
Yield	16		Oil	14	%
Solids	16	%	Preservative	.3	#/bbl.

1 August 1961
(Continued)

3:15 P. M.	Carbide lag up in 9880 strokes 220 minutes. First 120 minutes pump rate was 48 spm. next 40 minutes pump rate was 46 spm, last 60 minutes pump rate was 44 spm.
3:30 P. M.	Cleaned Baroid sample catcher box. Circulating hole.
4:00 P. M.	No cuttings in sample catcher box. Start short trip out of 45 stands. Baroid mud logging unit on stand by.
4:45 P. M.	Shut down due to heavy rain.
5:15 P. M.	Resume trip.
6:15 P. M.	On bank with 45 stands. No tight spots encountered. Began filling back water tank with mud from pits. Clean all pits that need cleaning. Build mud volume.
8:00 P. M.	All down-hole equipment, threads and plug seats were inspected and checked by Northcutt and Blackmore (Halliburton) and Alvin Samuels (E. A. Polumbus). Cementing tool dimensions as follows:

Third stage:	Tool I. D.	7 15/16"
	Opening	5 7/8"
	Closing	6 3/4"
Second stage:	Opening	4 15/16"
	Closing	5 7/16"
First stage:	Baffel opening	4 7/16"

10:15 P. M.	Start trip to bottom.

2 August 1961

12:01 A. M.	T. D. 11,225'. On top of 16' fill-up, circulating to bottom. Will circulate 6 hours to 6:00 A. M. prior to trip out to run casing. Encountered no bridges on trip in.
6:00 A. M.	Dropped 12° Eastman Survey. Laid 3" line from main sump at treatment plant to rig for use in cementing while circulating hole.
6:30 A. M.	Start trip out. Strapping pipe. Mud check prior to trip (6:00 A. M.)

Weight	9.2	#/gal.	pH	9.0	
Viscosity	110	Sec.	Ca	4,000	ppm
Water loss	4.6	cc.	NaCl	900	ppm
Pl. Vis.	29	cp.	LCM	6	%
Yield	20		Preservative	0.3	#/bbl.
Filter cake	2/32				

10:30 A. M.	At drill collars on trip out began laying down 12-7" collars.
11:40 A. M.	Finish laying down drill collars. Cut drilling line 300'. Install 8 5/8" rams in blowout preventers. Deviation 6°. Pipe strap 11,229', no correction. Rigging up to run casing.
5:50 P. M.	Start in hole with first joint of casing.

3 August 1961

12:01 A.M.	T.D. 11,225'. Running casing.
2:15 P.M.	Casing in position at 11,156 (GL).
4:00 P.M.	Broke circulation.
6:30 P.M.	Mixing cement for 1st stage (11,156' to 9,000'). 1,440 sacks (including 30% excess).
7:35 P.M.	Cement mixed and in pipe. Top plug placed in casing (casing on vacuum).
9:35 P.M.	Stop displacement. Drop plug to open 1st stage ports (8,997').
10:35 P.M.	Apply 800 psi pump pressure to open tool. 500 psi to break circulation.

4 August 1961

12:01 A.M.	T.D. 11,225'. Circulated 75 bbls. of cement that was above 1st stage collar.
12:01 P.M.	Circulating hole and conditioning mud while waiting for Howco bulk trucks.
3:15 P.M.	Last Halliburton truck arrived on location.
3:45 P.M.	Injected 1000 gallons of mud acid.
3:50 P.M.	Begin pumping cement. Second stage 9,000'-4,500'. 2,500 sacks (includes 30% excess). 50-50 Pozmix-Portland with 6% Bentonite and 0.4% HR4 retarder. Cement properties: water 7.66 gal./sk., weight 13.3 #/bbl., volume 1.53 cu.ft./sk.
5:15 P.M.	Cement displaced into casing.
5:25 P.M.	Positioned plug in casing; begin displacing cement.
6:08 P.M.	Plug positioned in stage tool (2500 psi).
6:30 P.M.	Dropped bomb to open stage tool.
6:52 P.M.	800 psi opened tool. Circulated with 300 psi.
8:00 P.M.	Circulated approximately 100 bbls. of cement. Waiting to 6:00 A.M. to perform 3rd stage cementing job. Waiting on cement.
11:15 P.M.	While circulating through DV tool at 4500', the system pressured up to 3000# and blew the nail on the pop valve on the D-700 pump. Replaced nail, pressured to 1400#. No returns, no pressure bleed-off. Called Halliburton for pump truck operator.
11:30 P.M.	Pressured to 2000#. Blew nail. Waiting on Halliburton. Mud in suction pit seemed heavier than that which was following the cement returns but did not contain any visible cement.

5 August 1961

12:01 A.M.	T.D. 11,225'. Called Lane-Wells to perforate above stage collar. Pressured to 2000 psi with Halliburton, no pressure bleed-off.

5 August 1961
(Continued)

9:00 A.M.	Lane-Wells arrived on location.
9:30 A.M.	Start in hole with perforating gun.
10:20 A.M.	Fire #1 shot at 4502'.
10:23 A.M.	Fire #2 shot.
10:26 A.M.	Fire #3 shot.
10:29 A.M.	Fire #4 shot.
10:32 A.M.	Fire #5 shot.
10:35 A.M.	Fire #6 shot. Density 6 shots/ft. at 4502'.
11:55 A.M.	Broke circulation at 400 psi.
12:30 P.M.	Pumping acid and cement, 1000 gals. MCA and 2020 sacks cement.
1:50 P.M.	Circulated cement (70 bbls.)
2:05 P.M.	Cement displaced. Closed pipe rams and pumped 10 bbls.
2:23 P.M.	Cement job complete.
4:00 P.M.	Casing landed 80,000#.

6 August 1961

12:01 A.M.	T.D. 11,225, waiting on cement.
7:00 A.M. - 7:00 P.M.	Waiting on cement - bleed pressure off 8 5/8" casing, remove landing joint. Cut off 8 5/8" casing 5 3/4" above flange, remove Hydril type preventers. Install tubing spools.

7 August 1961

12:01 A.M.	T.D. 11,225'. Nippling up and pick up, caliper, weigh and strap string of 4 7/8" drill collars.
5:00 A.M.	Pressure test blank rams on BOP. Held Ok.
5:30 A.M.	Start in hole with bit #92, W7R, size 7 3/8", junk sub, no float to drill out plugs.
6:15 A.M.	Pressure test 4 1/2" pipe rams on BOP.
9:10 A.M.	Pressure to 2100 psi. 4" Cameron leaking.
10:30 A.M.	Pressure to 1750, wing valve on choke manifold leaked.
11:40 A.M.	Pressure to 1990 dropping slowly; repair wing valve.
1:20 P.M.	Pressure to 2070. Lost 20 psi, filled valve with cement.
1:40 P.M.	Pressure to 1940 holding.
2:10 P.M.	Resume trip in hole. Installing rubbers every stand.
3:40 P.M.	Hit bridge 4103' in. 404' of cement to perforations. Drilling top plug.
7:00 P.M.	Plug drilled. Drilling ahead in cement.

8 August 1961	
12:01 A.M.	T.D. 11,225'. Drilling cement at 4375'.
2:45 A.M.	Hit 3' section with no cement from 4499' to 4501'.
3:00 A.M.	Hit stage tool at 4507'. Drilling tool.
3:15 A.M.	Drilled through tool, ran one stand in free. Circulating.
3:31 A.M.	Pressured to 2,050 psi.
3:35 A.M.	Lost 400 psi in 4 minutes. Slight leak in wing valve. Repairing valve.
5:15 A.M.	Changed out leaking valves, tested at 2,000 psi. Stopped all leaks and saw no more. Lost 250 psi in 8 minutes, still losing. Notified Al Samuels.
5:45 A.M.	Notified Halliburton of intent to squeeze. Estimate Halliburton will be on location between 10:00 a.m. and noon today with 200 sacks cement and retrievable squeeze tool.
6:00 A.M.	Continued trip in hole slowly with pipe strap. To rubber remaining unrubbered drill pipe.
9.50 A.M.	Pressured to 1,850 psi, slow leak through swivel.
11:00 A.M.	Repacked swivel, pressured to 1,850 psi, slow leak.
11:15 A.M.	Circulate out all mud to assure that perforations are covered with water.
12:20 P.M.	Circulate to water.
12:30 P.M.	Pressure to 1,800, drop to 1,600 in 15 minutes. (Valves leaking).
12:55 P.M.	Pressure to 1,810, drop to 1,400 in 30 minutes. (Valves leaking).
3:30 P.M.	Repair valves. Pressure to 1,900, drop to 1,575 in 30 minutes. No apparent leaks.
4:00 P.M.	Discussed pressure tests with Jim Garrett, E. A. Polumbus and decision was reached to test casing with Halliburton pump truck. Circulating hole.
9:15 P.M.	Halliburton on location. Rigging up to pressure test.
10:20 P.M.	Began pressure testing leak in X-hole sub on top joint of drill pipe, tighten with tongs, held OK.
10:23 P.M.	Pressure to 500 psi with 2 barrels of water. Check connections. No leaks.
10:25 P.M.	Pressure to 1,000 psi.
10:26 P.M.	Pressure to 1,500 psi.
10:28 P.M.	Pressure to 2,000 psi. 7 1/2 barrels of water to 2,000 psi.
10:30 P.M.	2,000 psi.
10:32 P.M.	Leak in line.
10:33 P.M.	1,800 psi.
10:34 P.M.	Bleed pressure off.

10:35 P.M.	Repair leak.
10:42 P.M.	Resume test.
10:45 P.M.	1,800 psi.
10:46 P.M.	2,000 psi.
10:51 P.M.	1,550 psi.
10:56 P.M.	1,350 psi.
11:01 P.M.	1,250 psi.
11:30 P.M.	Repressure to 2,000 psi, took 2 barrels.
11:53 P.M.	1,200 psi.
11:55 P.M.	Rig down Halliburton, start trip out.

9 August 1961

12:01 A.M.	T.D. 11,225'. Trip out of hole.
2:00 A.M.	On bank to pick up Halliburton RTTS tool.
3:30 A.M.	Trip in with RTTS tool. (Strap in).
5:40 A.M.	Set tool, 4532'. Pressure drill pipe to 2000 psi. union leaked.
5:42 A.M.	Repressured 2,000 psi.
6:02 A.M.	Pressure bled to 1,700. Set additional 5,000# on packer.
6:07 A.M.	Pressure to 2,000.
6:37 A.M.	Pressure to 1,600 psi.
6:40 A.M.	Pressure annulus 2,000 psi.
6.43 A.M.	Pressure to 1,200 psi.
6:44 A.M.	1,000 psi.
7:03 A.M.	1,000 psi.
7:25 A.M.	Pull 2 joints, set tool, 4470', pressure annulus.
7:40 A.M.	Break top connection to check for drill pipe leak. Installed pressure gauge on drill pipe. Noted that any drop in annular pressure was counteracted by increase in drill pipe pressure indicating communication between drill pipe and annulus.
8:45 A.M.	Trip out prior to squeeze.
11:30 A.M.	Wait on repairs to Howco truck.
12:35 P.M.	Pressure test Howco lines to 4,000 psi.
12:45 P.M.	Pressured casing to be sure it was still taking pressure.
1:15 P.M.	Start mixing cement.
1:22 P.M.	Start displacing cement.
1:40 P.M.	Displace 60.75 bbls and 50 sks. Latex cement. Pull 5 stands.
1:50 P.M.	Squeeze 5 3/4 bbls. to 2,500 psi, pressure dropping. Leak in blowout preventers.
2:00 P.M.	WOC. Drill pipe at 4,486 while displacing cement. cement weighed 14.6 #/gal.

10 August 1961

12:01 A.M.	11,225' waiting on cement.
11:50 A.M.	Trip in to drill cement, strapping in.
1:00 P.M.	Hit cement top 4318', pressured top with Howco to 2000 psi. Cement should occupy 205' of casing.
1:30 P.M.	Pressure 2000 psi. Released pressure and commenced drilling cement.
5:30 P.M.	Drilled 145' cement, bottom of cement at 4466' which is above where cement was spotted. It appears that approximately 60' of cement fell out while cementing. Weighed cement, used total of 5150# which is 54.6 sacks. 4.6 sacks could have remained in hopper and tub. 50 sacks of cement weighing 15.1 would have occupied 192'. 50 sacks of cement weighing 14.6 would have occupied 215'. Therefore between 45 and 70' of cement fell out. Pipe strap coming out of hole showed that bottom of cement was actually at 4505' which is where it should have been.
10:15 P.M.	Strap in hole to attempt squeeze #2.
11:45 P.M.	Run in to 4494'. Strap in.

11 August 1961

12:01 A.M.	T.D. 11,225'. Run in.
12:15 A.M.	Pressure up to determine formation taking fluid.
12:30 A.M.	Mix Latex 45 gals.
12:45 A.M.	Mix cement.
12:52 A.M.	Displace cement with 60 bbls. of water.
1:10 A.M.	Finish displacement, pull 5 stands.
1:20 A.M.	Pressure to 2000 psi, 4 1/4 bbls.
1:30 A.M.	Pressure to 2800 psi, 1 1/2 bbls. additional.
6:30 A.M.	Release pressure after holding for 5 hrs. Start out of hole.
8:00 A.M.	On bank. Waiting on cement.
11:00 P.M.	Start trip in hole.

12 August 1961

12:01 A.M.	T.D. 11,225'. Trip in hole.
2:00 A.M.	On top of cement at 4318.70'. Drilling ahead. Pressured to 2000#. No loss in 30 minutes.
6:45 A.M.	Through cement at 4514'. Drilled 196' of cement. Rigged up Halliburton.
7:33 A.M.	Pressure to 1000 psi.
7:48 A.M.	Lost approximately 50 psi. Pressured to 1500 psi.
8:03 A.M.	Lost approximately 125 psi. Pressured to 2000 psi. Slight leak in Howco head.
8:33 A.M.	Lost approximately 450 psi. Bled off pressure. Tightened head.

12 August 1961
(Continued)

8:37 A.M.	Repressured to 2,000 psi.
9:40 A.M.	Bled to 1,500 psi. Took 1 barrel to build pressure to 2,000 psi.
10:10 A.M.	Pressure bled to 1,775 psi. This pressure loss is probably due to air in the system as the pressure loss is less each time the pressure is bled off and built up. This allows any air in the system to bleed out. If the perforations had been taking fluid, the cement probably would have cut out and allowed an increase in pressure drop each time the system was pressured up. Expansion of the casing temperature changes and air in the system could have accounted for the pressure drop recorded.
10:15 A.M.	Resume trip to drill 2nd stage collar at 8,997'.
12:05 P.M.	Second stage collar hit cement at 8,944'.
3:00 P.M.	Finished drilling plug and 80' cement.
3:15 P.M.	Pressure test 2nd stage collar. The 80' of cement drilled could actually have been frictional drag in the casing.
3:45 P.M.	Pressure bled to 1,900 psi while testing. This would seem to indicate that the pressure losses noted previously were due to air in the system.
4:00 P.M.	Resume trip.
4:45 P.M.	Hit cement 160' above baffle collar.
5:42 P.M.	Hit baffle collar at approximately 11,102'. Drilling collar.
7:00 P.M.	Baffle collar drilled, drilling ahead in cement.
7:35 P.M.	Drilling float collar at approximately 11,136'.
7:55 P.M.	Float collar drilled. Drilling ahead in cement.
8:30 P.M.	Drilled float shoe at 11,167'. Drilling ahead in cement.
10:10 P.M.	On bottom. Strap 11,232.48', no correction. Drilled approximately 30' cement below float shoe and 30' cement and fill. Began circulating on bottom. Circulating contaminated water up hole. Then will displace entire system with clean water, clean pits and begin mudding up.

13 August 1961

12:01 A.M.	T.D. 12,225'. Displacing contaminated water in fluid system.
2:00 A.M.	Displacement and pit cleaning completed. Start mixing mud.
3:00 A.M.	D & S core engineer on location with 2 new coreheads. Serial Nos. R18778, 6 11/16" x 3 1/2" R18779, 6 11/16" x 3 1/2"

13 August 1961

6:45 A.M.	Displacement of mud system 2 hrs.
10:00 A.M.	Finished mudding up. Started trip out.
1:45 P.M.	Pick up core bbl. Rec. considerable junk from broken bit teeth and DV collars. Will rerun bit and junk basket in order to recover additional junk.
3:45 P.M.	Set back core bbl. Pick up bit #93, 6 3/4" W7RJ (3-3/8" jets), and junk sub.
6:30 P.M.	On bottom fishing for junk.
7:30 P.M.	Began drilling at 11,225'.
11:55 P.M.	T.D. 11,249'. Began fishing for junk.

14 August 1961

12:01 A.M.	T.D. 11,249'. Fishing for junk.
12:55 A.M.	Start trip out for junk basket.
3:30 A.M.	On bank with bit #93, made 24' in 4 1/2 hrs , medium green. Rec. some junk. Start in hole with Bowen junk basket.
7:50 A.M.	On bottom, fish for junk.
8:50 A.M.	Drilling with junk basket.
9:00 A.M.	Mud check.

Weight	8.6 #/gal.	Pl. Vis.	12 cp.
Viscosity	40 Sec.	pH	10
Water loss	7.6 cc.	Yield	6

12:01 P.M.	T.D. 11,251', cut 2'. Circulate and fish for junk.
12:30 P.M.	Trip out with junk basket.
3:30 P.M.	On bank. No junk recovered in basket or sub.
4:15 P.M.	Run corehead #R18778. Connections provided by D&S for the core bbl. were not the correct connections. Shut down to wait for proper sub to be flown in.
5:00 P.M.	Found the proper connections to go from core barrel to jars to drill collars. Trip in core bbl.
9:30 P.M.	Commence coring at 11,262' after cleaning 23' fill-up. Corrected T.D. to 11,262'.

15 August 1961

12:01 A.M.	T.D. 11,275'. Coring.
9:00 A.M.	Coring at 11,300'. Mud check:

Weight	8.6 #/gal.	Pl. Vis.	13 cp.
Viscosity	39 Sec.	Yield	6
Water loss	7.6 cc.		

6:00 P.M.	Mud check:

Weight	8.6 #/gal.	Pl. Vis.	15 cp.
Viscosity	42 Sec.	Yield	5
Water loss	7.8 cc.		

Shut down to repair valve on pump. Coring ahead.

15 August 1961
(Continued)

9:30 P.M.	T.D. 11,326'. Start out with core bbl. Last 2' cored at 61 and 76 min./ft. Cut total of 64' from 11,262 to 11,326'. Total coring time 23 hrs. Strapping out.

16 August 1961

12:01 A.M.	T.D. 11,326'. Trip out with core bbl.
1:30 A.M.	On bank with core #22, corehead shows minor erosion at water courses. Core catcher came off with corehead. Top 1/2" of catcher worn off, inner bbl parted.
2:00 A.M.	Began disassembly of bbl. and found top section of inner bbl. had backed off, threads worn and galled. Rec. 40' of 64' cut. Core was tightly wedged in bbl. Had to lay bbl. sections on catwalk and ram core out with 2" pipe.
5:30 A.M.	Start in hole with bit #94, W7R.
8:30 A.M.	Top of corehole reaming to bottom.
11:30 A.M.	T.D. 11,326'. On bottom, drilling ahead.
8:00 P.M.	Fish for junk. T.D. 11,364'.
9:00 P.M.	Drop Eastman survey.
9:30 P.M.	Start trip out of hole. Wet string strap out. Bit #94 made 38' in 8 1/2 hrs.

17 August 1961

12:01 A.M.	T.D. 11,364'. Trip out bit #94.
2:00 A.M.	On bank with bit #94, worn. Rec. a few small pieces of junk. Picked up new core bbl (50').
3:00 A.M.	Start in hole with bbl. and diamond bit R18778.
7:00 A.M.	On top of 12' fill-up. Wash to bottom and clean up hole Pipe strap showed depth should be 11,364'. Geolograph and pipe tally were corrected from 11,351' to 11,364'.
8:45 A.M.	Commence coring 11,364'.
3:00 P.M.	11,385'. Mud check: Weight 8.7 #/gal. Pl. Vis. 14 cp Viscosity 42 Sec. Yield 5 Water loss 6.6 cc.
3:20 P.M.	Remove kelly extension.
6:50 P.M.	T.D. 11,394'. Pressure fluctuating. Start trip out. Cored 30' in 10 hrs. core #23.
10:45 P.M.	On bank with core #23. Diamond corehead #R18778 badly ringed on outer portion of bit face. Lay down core. Rec. 26' of 30' cut. Service core bbl. Replaced core catcher, otherwise bbl. in good shape.

17 August 1961
(Continued)

11:30 P.M.	Dump shale pit.

18 August 1961

12:01 A.M.	T.D. 11,394'. Shale pit cleaned. Began trip in with bit #95, W7R, and junk sub.
3:00 A.M.	On top of corehole reaming ahead. On trip in bit hit something at approximately 11,144'. Bit would not go. Turned rotary 1/2 turn, bit would fall free. Repeated this process and it did the same thing.
4:20 A.M.	Drilling ahead at 11,402'.
9:00 A.M.	11,414' drilling ahead
10:31 A.M.	11,420', pull 4 stands off bottom in attempt to locate tight spot noticed above. No tight spot was noticed. Cement caving off the walls of the casing probably bridged over causing tight spot.
12:01 P.M.	Resume drilling.
4:00 P.M.	T.D. 11,439'. Circulate samples.
6:00 P.M.	Fish for junk.
7:00 P.M.	Trip out.
10:45 P.M.	On bank with bit #95, drilled 45' in 9 3/4 hrs, medium dull. Cut drilling line.

19 August 1961

12:01 A.M.	T.D. 11,439'. Drilling line cut. Began picking up DST tool. Run RTTS tool in hole with 3000' water cushion. Strap in.
6.00 A.M.	Pipe tally showed T.D. as 11,440', no correction. Will set tool at 11,090' in 3rd joint of casing off bottom. DST #12 (11,439-11,172' casing shoe). Open 32 min., SI 1 hr. and 2 min. Rec. 120' mud and 3040' water cushion.

Field Pressures

IHP	4962
ISIP	2008
IFP	1400
FFP	1400
FSIP	1694
FHP	4942

BHT = 230°F

Top water sample R = 7.0 at 80° F.
Bottom water sample Rm = 2.6 at 96° F.

Mud characteristics:

Weight	8.8 #/gal.	Filter cake	1/32
Water loss	6.8 cc.	Cl	1100 ppm
pH	9.5	Pl. Vis.	12 cp.
Yield pt.	10		

19 August 1961

9:15 A.M.	Start out of [illegible]e with test tool.
1:30 P.M.	On bank wi[illegible] est tool. Break down test tool, jet suction pit
3:05 P.M.	Start in h[illegible] with bit #93 RR, W7RJ, [illegible]-3/8" jets to condition hole and mud preparatory to coring.
5:40 P.M.	On bottom 14' fill. Circulate to bottom - conditioning hole.
7:20 P.M.	Mud volume built up, fill circulated, drilling ahead.
10:50 P.M.	T.D. 11,447'. Began circulating samples prior to trip out for core bbl.

20 August 1961

12:01 A.M.	T.D. 11,447'. Circulating.
12:20 A.M.	Picked up off bottom. Hole tight, let stand for 15 min. Had 5' fill-up on bottom. Began circulating.
1:30 A.M.	Picked up off bottom. No tight hole experienced. 1 1/2' fill on bottom.
1:45 A.M.	Start trip out with bit #93 RR, made 8' in 3 1/2 hrs.
4:40 A.M.	On bank with bit #93 RR, medium dull. Rec. 1 small piece of junk in junk sub. Began picking up core bbl. and Truco bit #R18796.
5:15 A.M.	Start in hole with core bbl.
8:15 A.M.	Hit 37' fill-up.
8:35 A.M.	T.D. 11,447' on bottom. Core string is 4 1/2' longer than drill string, coring ahead.
4:00 P.M.	T.D. 11,473'. Pressure increase to 1250 psi. Barrel appeared to have parted. Cored 26' in 8 hrs. Started trip out of hole with core #24.
8:15 P.M.	On bank with core #24. Diamond corehead R18796 (6 11/16" x 3 1/2") badly ringed as was diamond corehead R18778. Inner barrel was partially backed off at swivel. Laid down core #24. Rec. 21' of 26' cut. Service core bbl. Replaced core catcher and sleeve.
9:30 P.M.	Start in hole with Bowen junk basket.

21 August 1961

12:01 A.M.	T.D. 11,473'. Trip in with Bowen junk basket.
12:30 A.M.	Circulate through 20' fill.
12:45 A.M.	Drilling ahead with junk basket.
1:45 A.M.	T.D. 11,475', cut 2' with junk basket start trip out.
6:00 A.M.	On bank with junk basket. Rec. 1' old core, 1' new core and some pieces of rubber.
7:00 A.M.	Start in hole with bit #96, W7RJ, with 3-3/8" jets.
10:15 A.M.	Wash and ream 16' to bottom.
11:55 A.M.	T.D. 11,475'. On bottom, drilling ahead.
4:15 P.M.	Hit drilling break at 11,505' for approximately 7'.

21 August 1961
(Continued)

10:00 P.M.	T.D. 11,543'. Start out of hole to pick up Bowen junk basket. Dropped Eastco. Bit #96, HTC-W7RJ. Made 68' in 10 hrs. for an average of 6.8 ft./hr.

22 August 1961

12:01 A.M.	T.D. 11,543'. Coming out of hole.
1:20 A.M.	On bank with bit #96. Bit dull and out of gauge but bearings good. Eastco deviation showed 5 1/2° at 11,530'
2:20 A.M.	Start in hole with Bowen junk sub. On bottom at 5:45 A.M. after washing and reaming to bottom through 21' of fill. Coring ahead.
7:00 A.M.	11,544'. Cutting core with junk sub.
8:20 A.M.	T.D. 11,545'. Finished cutting 2'.
8:45 A.M.	Start trip out, shut down to repair high clutch.
12:01 P.M.	Resume trip out.
3:00 P.M.	On bank with core #25 (11,543-11,545'), cut 2', recovered 2' of shale and arkose. Break down core bbl. to check if core had been left in bbl. after last run.
4:00 P.M.	Resume trip in with bit #97, W7RJ, with 3-3/8" jets.
7:10 P.M.	On top of 11' fill-up. Circulating to bottom.
7:20 P.M.	Reaming 2' out of gauge hole caused by cutting core with Bowen basket.
7:25 P.M.	T.D. 11,545'. Drilling ahead.
9:00 P.M.	Weight 8.9 #/gal. pH 9.5 Viscosity 45 Sec. Yield 12 Water loss 8.0 cc. Filter cake 1/32 Pl. Vis. 20 cp. NaCl 300 ppm

23 August 1961

12:01 A.M.	T.D. 11,577'. Drilling ahead.
6:30 A.M.	T.D. 11,609'. Began fishing for junk. Bit #97 made 64' in 11 hrs.
6:45 A.M.	Dropped Eastman survey.
7:00 A.M.	Start trip out of hole with bit #97.
11:00 A.M.	On bank with bit #97. Bit full gauge, medium dull, cones slightly loose. No junk recovered. Deviation survey 7° at 11,609'.
11:30 A.M.	Start trip in with bit #98, W7RJ, with 3-3/8" jets, and junk sub.
2.40 P.M.	Hit bridge 145' off bottom. Washed down series of small bridges.
3:05 P.M.	T.D. 11,609'. On bottom, drilling ahead.

23 August 1961
(Continued)

4:00 P.M.	Shut down 15 min. to measure pump and drive sheaves.
4:15 P.M.	Resume drilling.
7:00 P.M.	Shut down to repair pump #1.
7:15 P.M.	Resumed drilling.

24 August 1961

12:01 A.M.	T.D. 11,671'. Drilling ahead.
1:10 A.M.	T.D. 11,675'. Fish for junk.
1:40 A.M.	Drop Eastman survey.
2:00 A.M.	Start out of hole with bit #98, made 66' in 9 3/4 hrs.
5:00 A.M.	On bank, bit medium dull, 1/8" out of gauge.
5:45 A.M.	Trip in Bowen basket.
9:00 A.M.	On bottom 46' fill, coring ahead. Checked with Loffland on amount of dry pipe on DST's. They agreed to 9,000'.
10:30 A.M.	Mud check:

Weight	9.0 #/gal.	pl. Vis.	23 cp.
Viscosity	50 Sec.	pH	9.5
Water loss	5.6 cc.	Yield	17

12:10 P.M.	T.D. 11,677'. Finish coring with Bowen basket. Trip out. Accepted delivery of Baker casing scraper.
4:10 P.M.	On bank with Bowen basket, no recovery.
4:25 P.M.	Trip in bit #99, W7J, with 3-3/8" jets, Drilco reamer.
4:45 P.M.	Run drill collars. Shut down to reline brakes on compound.
6:55 P.M.	Finish brakes, dump mud pits.
7:30 P.M.	Resume trip in.
9:40 P.M.	5' off bottom reaming. No tight spots encountered to this point.
10:00 P.M.	T.D. 11,677' on bottom drilling ahead. Building mud volume and mixing mud.

25 August 1961

12:01 A.M.	T.D. 11,693' drilling ahead. Mud check:

Weight	8.9 #/gal.	pH	9.0
Viscosity	52 Sec.	Yield	8
Water loss	5.4 cc.	Filter cake	1/32
Pl. Vis.	25 cp.	NaCl	300 ppm

7:15 A.M.	T.D. 11,729'. Began circulating samples.

25 August 1961
(Continued)

9:15 A.M.	Fish for junk. Bit #99 made 52' in 9.0 hrs. (5.8 ft./hr.). Mud check prior to trip:

Weight	9.0 #/gal.	pH	9.5
Viscosity	48 Sec.	Yield point	10
Water loss	6.4 cc.	Pl. Vis.	20 cp.

9:35 A.M.	Drop Eastman survey.
10:00 A.M.	Trip out.
1:40 P.M.	On bank, bit dull, 5° at 11,720', bit and reamer in gauge.
2:00 P.M.	Pick up bit #100, W7RJ, with 2 11/32 and 1-3/8" jets and 9 joints of 3 1/2" drill pipe.
5:45 P.M.	T.D. 11,729'. On bottom. Drilling ahead.
8:00 P.M.	Mud viscosity 42 seconds, weight 8.9 #/gal. Dumped some mud from shale pit. Will continue to add water to mud system. Began mixing gel, driscose, and Tannex.
9:00 P.M.	T.D. 11,762'. Mud check:

Weight	8.8 #/gal.	pH	8.5
Viscosity	43 Sec.	Yield	2
Water loss	10.0 cc.	Filter cake	1/32
Pl. Vis	17 cp.	NaCl	350 ppm

10:30 P.M.	Weight 8.9 #/gal., viscosity 48 seconds. Stopped mixing mud. Cut water out.

26 August 1961

12:01 A.M.	T.D. 11,780'. Drilling ahead.
4:25 A.M.	T.D. 11,798'. Circulate samples. Bit #100 made 69' in 10 3/4 hrs.
5:55 A.M.	Trip out.
10:00 A.M.	On bank. Bit dull, gauge teeth heeled off, in gauge. Pick up bit #101, W7RJ, with 3-3/8" jets and reamer. Pipe strap 11,811, no correction. Will restrap next trip. Survey 5° at 11,790'.
1:30 A.M.	Hit bridge 11,485'.
2:10 A.M.	T.D. 11,780'. On bottom. Drilling ahead.
8:10 P.M.	T.D. 11,826'. Table torquing badly. Began circulating samples.
10:00 P.M.	Samples circulated. No granite observed. Start trip out. Strapping pipe. Bit #101 made 28' in 6.2 hrs.

27 August 1961

12:01 A.M.	T.D. 11,826'. Trip out bit.
2.00 A.M.	On bank with bit #101. All cones missing from bit plus 2 shanks worn off. Bit 1" under gauge. Reamer full gauge. All collars tight. Reamer, junk sub and bit very tight. Trying to break tight jts. in reamer, junk sub

27 August 1961
(Continued)

2:00 A.M.	and bit. Pipe strap 11,833.24, 7' long, no correction.
5:00 A.M.	Start in hole with Bowen junk basket. Threads on bit and junk sub were fouled when finally broken apart, so did not run junk sub. Rec. 10 to 15 bearings in junk sub.
9:00 A.M.	Received shipment of 6" magnet with 4 shoes and junk sub from Acme Tool, Inc., Sterling, Colorado.
9:20 A.M.	T.D. 11,826'. On bottom, no fill.
1:00 P.M.	Finished milling with Bowen basket. Start out. Mud check:

Weight	8.9 #/gal.	Yield point	8
Viscosity	51 Sec.	pH	8.5
Water loss	4.8 cc.	Pl. Vis.	22 cp.

5:00 P.M.	On bank. Recovered 1 cone and a few small pieces of shale. Pick up bit #102, W7RJ, with 3-3/8" jets, reamer and junk sub. (Rental).
8:30 P.M.	On bottom. Ream 3'.
11:00 P.M.	Milling on junk.

28 August 1961

12:01 A.M.	T.D. 11,826'. Milling on junk.
2:30 A.M.	Drilled 1 1/2 feet of new hole. Commenced fishing for junk.
3:30 A.M.	T.D. 11,827'. Started trip out.
7:00 A.M.	On bank with bit #102, made 1' milling on junk. Bit had locked on junk and all 3 cones milled flat. One cone milled to bearings. Bit 1/16" under gauge. Recovered half handful of very small metal pieces in junk basket.
7.15 A.M.	Clean shale and middle pits.
9:30 A.M.	Start in hole with Bowen basket and junk sub. (Rental).
12:25 P.M.	T.D. 11,827'. On bottom. Washed through 8' fill-up. Pump pressure 550 psi-625 psi at 38 spm. Rotary speed 30 rpm, engine speed 700 rpm.
5:15 P.M.	T.D. 11,829'. Pump pressure increased to 1600 psi. Core #26 cored 2', recovered 2' with Bowen basket, broke the core and started out the hole.
9:15 P.M.	On bank with Bowen junk basket. Recovered 2' core. Bottom foot shale, top foot sand. No junk in basket. Recovered 17 bearings plus a few pieces of junk in junk sub. Picked up bit #103, W7RJ, with 3-3/8" jets. Two junk subs (1 rental) and reamer and trip in hole.

29 August 1961

12:01 A.M.	T.D. 11,829'. Trip in hole with bit #103.
1:15 A.M.	On bottom, fish for junk.
1:45 A.M.	Drilling ahead.
3:00 A.M.	T.D. 11,837'. Mud check:

Weight	9.0 #/gal.	Yield	2
Viscosity	37 Sec.	pH	9.5
Water loss	6.0 cc.	Filter cake	1/32
Pl. Vis	12 cp.	NaCl	450 ppm

4:40 A.M.	T.D. 11,843'. Fish for junk.
5:00 A.M.	Drop Eastman survey.
5:15 A.M.	Start out of hole strapping with bit #103. Made 14' in 3 hrs.
9:30 A.M.	On bank with bit #103. Bit dull and dubbed off. In gauge and bearings good. Pipe strap out of hole indicated T.D. at 11,843.65 vs. 11,843' on geolograph, no correction. Deviation survey 5 1/2° at 11,830'. Recovered about a tablespoon of small junk pieces from junk subs.
10:30 A.M.	Start in hole with bit #104, W7RJ, with 3-3/8" jets. Junk subs (1 rental) located 1 between bit and reamer and one above reamer.
1:40 P.M.	T.D 11,843'. On bottom drilling ahead after circulating and drilling through 18' of fill.
5:30 P.M.	T.D. 11,855'. Pulled up to circulate samples. Bit #104 drilled 12' in 3 hrs. 50 min.
7:45 P.M.	Samples circulated. Began fishing for junk.
8:00 P.M.	Start trip out with bit #104.
8:15 P.M.	Hit tight spot at 11,243'. Pulled loose with 25,000#.
11:30 P.M.	On bank with bit #104, bit dull, bit and reamer to gauge. Rec. 6 very small pieces of junk. Shut down working on drawworks.

30 August 1961

12:01 A.M.	T.D. 11,855'. On bank with bit #104. Working on drawworks.
2:45 A.M.	Drawworks repaired. Replaced water cooling hose in break drum. Began trip in with Bowen baskets and 2 junk subs (1 rental).
5:45 A.M.	On bottom. Circulating 5' fill.
6:45 A.M.	T.D. 11,855'. Commenced cutting core with Bowen basket.
9:30 A.M.	Cut approximately 2'. Will continue running basket until pump pressure increases.
10:55 A.M.	T.D. 11,857'. Finished core.
1:10 P.M.	Trip out.
2:30 P.M.	On bank. No recovery from junk basket, rec. a considerable quantity of cavings and cuttings from the junk subs.

30 August 1961

4:00 P.M.	Trip in with bit #105, W7RJ, with 3-3/8" jets and reamer and junk sub. Cut drilling line.
8:10 P.M.	On bottom, no fill. Reaming corehole.
9:05 P.M.	Began circulating 1 hr. on bottom. Mud check:

Weight	9.0	#/gal.	Yield	1
Viscosity	41	Sec.	Filter cake	2/32
Water loss	7.4	cc.	pH	9.5
Pl. Vis.	17	cp.	NaCl	400 ppm

10:00 P.M.	T.D. 11,857'. Drilling ahead.

31 August 1961

12:01 A.M.	T.D. 11,865'. Drilling ahead.
3:00 A.M.	T.D 11,872'. Began circulating samples.
4:45 A.M.	Start out with bit #105. Bit made 15' in 5 hrs. plus reaming 2'.
8:05 A.M.	On bank, bit dull, 1/16" out of gauge, reamer in gauge. Pick up bit #106, RG1J, with 3-3/8" jets, reamer and junk sub.
8:50 A.M.	Trip in.
9:30 A.M.	Geologists examined cuttings and determined possibility of granite. The decision was reached to pull the bit and run the core bbl. to cut a 20' core in order to verify that granite was observed.
10:10 A.M.	On bank, pick up core bbl. and jars. Had to lay down 25' section as inner barrel was split.
11:45 A.M.	Trip in to cut core #27, with diamond corehead #R18779.
3:00 P.M.	On bottom, installed kelly extension. Commenced reaming out of gauge hole.
3:45 P.M.	Finished reaming to bottom. Commenced circulating hole prior to coring.
4:05 P.M.	T.D. 11,872'. Commence coring.
7:25 P.M.	Shut down to remove kelly extension.
7:35 P.M.	Resumed coring.
8:55 P.M.	Pressure jumped to 1200 psi from 900 psi. Began bleeding back to 1050, then back up to 1200 psi.
9:13 P.M.	Quit rotating.
9:20 P.M.	T.D. 11,885'. Core #27 (11,872-11,885') cored 13'. Broke core off and began trip out. Strapping pipe out. Cut 13' in 4.8 hrs.
9:45 P.M.	Shut down to repair, break out cat head controls.
10:10 P.M.	Resumed trip out.

1 September 1961

12:01 A.M.	T.D. 11,885'. Tripping out core #27.
1:45 A.M.	On bank with core #27. Diamond corehead R18779 was worn over 1/2 the face of the corhead. Rec. 13' of 13' cut. Core bbl. ok. Service core bbl.

1 September 1961
(Continued)

2:45 A.M.	Pick up bit #106, RG1J, with 3-3/8" jets, junk sub and reamer and start in hole.
6:00 A.M.	T.D. 11,885'. Began drilling. Discussed injection testing with Loffland engineer, and he said that 5000 psi would be entirely safe and 7500 psi would be considered a maximum pressure
8:30 A.M.	Hit shale break at 11,903'.
3:00 P.M.	Drilling at 11,910'. Still in shale. Mud check:

Weight	8.8 #/gal.		Water loss	5.4 cc.
Viscosity	46	Sec.	Yield	4
Pl. Vis.	18	cp.	pH	9.0

6:30 P.M.	11,916'. Hit fast drilling break for 6'.
8:00 P.M.	T.D. 11,926'. Began circulating samples.
9:50 P.M.	Samples up, no granite. Began fishing for junk.
10:20 P.M.	Start trip out of hole with bit #106, made 41' in 14 hrs. 2.9 ft./hr.

2 September 1961

12:01 A.M.	T.D. 11,926'. Trip out bit #106.
1:35 A.M.	On bank with bit #106, medium dull to gauge. Pick up bit #107, RG1J, with 3-3/8" jets, junk sub and reamer. Trip in hole.
4:00 A.M.	T.D. 11,926'. On bottom. Drilling ahead.
9:00 A.M.	11,942'. Mud check:

Weight	9.1 #/gal.		Water loss	6.0 cc.
Viscosity	41	Sec.	Yield	3
Pl. Vis.	17	cp.	pH	9.5

	Geologists have tentatively picked the bottom of the Fountain at 11,873'.
9:00 P.M.	T.D. 11,976'. Drilled 50' in 17 hrs. with bit #107 for rate of 2.9 ft./hr. Circulating samples before coming out of hole.
11:20 P.M.	Start out of hole to pick up core bbl.

3 September 1961

12:01 A.M.	T.D. 11,976'. Tripping out for core bbl.
3:10 A.M.	On bank with bit #107, bit green.
4:00 A.M.	Start in hole with corehead R18779.
7:30 A.M.	On bottom and coring at 11,976'.
11:15 A.M.	Lost circulation at 11,985'. Drilling break to 10 min./ft. on last 3'. Lost 200 bbls Pulled up 30', regained some circulation with pump idling. Went to bottom, lost circulation again.

3 September 1961
(Continued)

12:01 P.M.	T.D. 11,985'. Start out with core #28.
2:00 P.M.	Shut down 45 min. to repair drive chain.
4:00 P.M.	On bank with core #28, cut 9', rec. 6.7'. Core #28: (11,976-85'). Core was Pre-Cambrian granite.
6:35 P.M.	Advised G. D. Haugse that granite had been reached at 11,970', and the completion phase of the operation was commenced. Waiting on Schlumberger.
9:20 P.M.	Began filling hole with mud. Pumped approximately 50 bbls. to fill hole. Pulled 6 stands that were in hole and tried to fill hole. Pumped approximately 150 bbls. mud in hole. No returns. Total mud loss 200 bbls.
10:15 P.M.	Schlumberger on location. Rigging up and running IES log.

4 September 1961

12:01 A.M.	T.D. 11,985'. Running IES log.
1:00 A.M.	On bank with IES log. Run sonic log.
3:00 A.M.	On bank with sonic log. Running microcaliper log.
6:00 A.M.	On bank with microcaliper log. Running temperature log.
8:00 A.M.	On bank with temperature log, misrun.
8:30 A.M.	Rerun temperature log. Schlumberger logs have indicated T.D. to be 11,991'.

5 September 1961

12:01 A.M.	T.D. 11,985'. Begin picking up DST tool.
12:25 A.M.	Begin trip in with DST tool - strap in - will set packer at 11,000'. Fill drill collars plus 15 stands of drill pipe as water cushion.
3:30 A.M.	Differential valve tripped, opening bottom of drill pipe.
4:00 A.M.	Trip out DST tool and reset valve.
5:15 A.M.	Trip in DST tool with no water cushion.
8:15 A.M.	On bottom with DST tool.
8:20 A.M.	Open tool.
8:24 A.M.	Close tool.
8:50 A.M.	Open tool.
9:50 A.M.	Close tool.
11:57 A.M.	Pull DST #13 (11,985-11,171'). Pipe weight had increased 23,000# which would indicate that 2700 gals. of fluid had been produced. The fluid level in the annulus remained static. While pulling the DST, the hole was kept full with water so as to lessen the possibility of losing any of the fluid which had been produced during the test.

5 September 1961
(Continued)

11:57 A.M. The BOP's were tested prior to pulling the tool Test tool set in 8 5/8" casing at 9660'. Rec. 5330' of drilling mud.

4:25 P.M. On bank with DST #13. Start in hole with drill collars and 5 stands drill pipe. Field Pressures:

	Pressure Chart #221	Pressure #193
IH	3883	4078
ICIP	3824	3842
IF	602	645
FF	2480	2572
FCIP	3687	3714
FH	4242	4262

5:00 P.M. Waiting on DST #14.

10:45 P.M. Starting out of the hole.

11:30 P.M. On bank. Wait on DST #14.

6 September 1961

12:01 A.M. T.D. 11,985'. Wait on DST #14.

12:50 A.M. Making up tool.

1:45 A.M. Start in the hole with DST tool.

3:30 A.M. Packer stopped at 1800' (DC's plus 13 stands). Starting out of the hole.

4:55 A.M. On bank with DST tool. Tool all right but pieces of rubber in the slips and perforations.

5:35 A.M. Starting in the hole with used bit.

7:15 A.M. On bank. No bridges encountered. Pick up DST tool.

8:45 A.M. Fill drill collars and 15 stands of water cushion. Test tool has 1/4" bottom-hole choke.

12:45 P.M. On bottom. Set packer in 8 5/8" casing at 11,020'. Initial opening of tool resulted in a very weak blow which would indicate the possibility that partial plugging of the tool had occurred.

3:30 P.M. SI tool. Still had weak blow.

5.00 P.M. Start out with tool.

9:30 P.M. On bank with tool. Rec. 2000' water cushion, 5400' of salt water.

10:50 P.M. Trip in W7R RR to check bottom. DST #14. Field Pressures:

	Chart #221	Pressure #193
IH	4902 psi	4910 psi
ICIP	None taken.	None taken.
IF	1597	1642
FF	3370	3417
FCIP	4022	4042
FH	4822	4910

(temperature 250° F)

7 September 1961

12:01 A. M.	T. D. 11,985'. Trip in with used W7R bit to clean fill-up.
1:35 A. M.	Tight hole at 11, 340' - stuck.
2:10 A. M.	Put kelly on.
2:30 A. M.	Broke circulation. Working on tight spot.
4:00 A. M.	Salt water started to come out of the hole. Start mixing mud.
5:00 A. M.	Finished by-passing salt water. Mixing gel, driscose, and water to raise viscosity and build volume.
8:00 A. M.	Pipe free, trip out with bit.
11:30 A. M.	On bank. Pick up bit #107 RR, RG1J. Removed all jets from bit.
11:45 A. M.	Trip in.
1:30 P. M.	Notified mud logging unit that they have been released.
2:55 P. M.	Hit bridge 11, 685'.
3:30 P. M.	Hit bridge 11, 835. Appears to be fill-up. Condition hole and mud.
4:30 P. M.	Mud check:
	Weight 8.5 #/gal. Pl. Vis. 14
	Viscosity 42 Sec. Yield 4
	Water loss 7.4 cc. Cl 2, 200 ppm
7:00 P. M.	Mud check:
	Weight 8.5 #/gal. pH Vis. 8.0
	Viscosity 46 Sec. Cl 3, 000 ppm
	Water loss 7.6
9:00 P. M.	On bottom. Circulate hole.

8 September 1961

12:01 A. M.	T. D. 11, 985'. Start short trip out to 11, 100'.
12:35 A. M.	Pulled out 10 stands. Waiting 30 minutes.
1:05 A. M.	Going down the hole.
1:30 A. M.	30' fill-up. Broke circulation.
1:40 A. M.	Lost 1' of mud from pits. Pump pressure down to 150 psi. Put water in the tanks.
2:10 A. M.	Pressure up to 750 psi. Start mixing mud.
3:40 A. M.	Still losing mud. Condition hole and mud.
4:15 A. M.	Stop supplying water. Level in the pits remains constant.
5:55 A. M.	Start short trip out, 10 stands.
6:20 A. M.	Waiting half an hour at 11, 100'.
6:50 A. M.	Start trip down.
7:00 A. M.	Hit bridge 200' off bottom. Mud check: Weight 8.6 #/gal. Viscosity 46 Sec.
7:30 A. M.	Drill on bridge and wait on orders.
8:30 A. M.	Circulating hole and drilling bridge.
9:00 A. M.	On bottom, 20' fill-up.

8 September 1961
(Continued)

9.30 A. M.	Mud check:

Weight	8.6 #/gal.	Pl. Vis.	20 cp.
Viscosity	51 Sec.	Yield	7
Water loss	6.0 cc.	pH	7.6
		Cl	2,400 ppm

	Circulate hole.
12:01 P. M.	Lost partial returns of 40 bbls.
12:45 P. M.	Started displacing mud in drill pipe with water.
1:07 P. M.	Finished displacing mud with 144 bbls. of water.
1:18 P. M.	Pull 12 stands.
2:00 P. M.	Prepare to run injection tests.
4:00 P. M.	Decision was reached to run radioactive tracer survey prior to injection water so as to avoid the possibility of sticking the tool.
4:30 P. M.	Run to bottom after displacing the water in the drill pipe with mud. 15' of fill-up.
6:45 P. M.	Commence running surveys.
8:00 P. M.	Couldn't get instrument through drill collars, pulled out.
9:00 P. M.	Took out 12 stands prior to injection test.
9:45 P. M.	Start injection test. Closed rams and pressured up to 1,000 psi. Injected 134 gpm water at 1,000 psi for 5 minutes. Stopped pump, pressure fell to 300 psi in 1 minute, 100 psi in 2 minutes, 25 psi in 4 minutes. Start pumping maximum capacity of D-700 pump. Injected 256 gpm water for 5 minutes. Stop pump. Pressured to 400 psi in 1 minute; 30# in 4 minutes.
11:00 P. M.	Start out of hole.

9 September 1961

12:01 A. M.	T. D. 11,985'. Trip out.
2:00 A. M.	On bank with bit. Start changing liners on both pumps.
9:30 A. M.	Trip in open ended.
12:15 P. M.	In hole with 11,058' of 4 1/2" drill pipe open ended. Rig up to run spinner survey.
1:45 P. M.	Hit bridge with logging tool at 11,270'.
2:07 P. M.	Displaced mud in drill pipe with 160 bbls. water.
2:33 P. M.	Finished displacing mud, pressured to 1,250 psi in attempt to break down formation. Formation would not take fluid.
2:50 P. M.	Pulling spinner survey.
3:30 P. M.	Trip out.
7:15 P. M.	On bank. Pick up bit #108, RG1J, with 3-3/8" jets plus reamer, junk sub and 3 additional jts. of 3 1/2" DP.

9 September 1961
(Continued)

8:10 P. M.	Trip in.
11:15 P. M.	T. D. 11,985'. On bottom, 15' loose fill-up. Corrected total depth 11,990', drilling ahead.

10 September 1961

12:01 A. M.	TD 11,994'. Drilling ahead.
2:40 A. M.	12,002' drilling ahead. Made a connection. Mud check: Weight 8.5 #/gal., Viscosity 36 Sec.
6:00 A. M.	TD 12,017'. Drilling ahead. Lost a total of 10" of mud in the pits since started drilling.
11:30 A. M.	Lost 40 bbls. of mud last hr.
11:45 A. M.	TD 12,045'. Bit #108 made 55' in 12.5 hrs.
12:15 P. M.	Pull 12 stands to run injection tests. 1st stand tight.
1:10 P. M.	Rig up to run injection tests.
1:30 P. M.	Began testing. Pressured to 1,500 psi. Pressure bled off very slowly. Pressure to 2,000 psi, bled off slowly. Hole appears to be bridged.
2:30 P. M.	Displaced water to mud prior to trip in to check for bridging.
3:15 P. M.	Resume trip to bottom.
3:40 P. M.	Hit bridge 160' off bottom.
6:00 P. M.	Circulating at 12,025'. 20' of fill-up remaining.
7:00 P. M.	Lost returns - 350 bbls lost at 6 bbls./min.
7:30 P. M.	Pull out 12 stands - 1 slightly tight spot 6 stands off bottom.
8:15 P. M.	Injection test. Closed rams. Pressured up to 2,000 psi, released three times. Pressure bled off slowly. No injection.
9:40 P. M.	Start mixing mud.

11 September 1961

12:01 A. M.	T.D. 12,045' circulating, conditioning mud.
2:00 A. M.	Mud viscosity, 34 Sec.
3:00 A. M.	Mud viscosity, 37 Sec.
6:00 A. M.	Mud check: Weight 8.5 #/gal. Viscosity 43 Sec. pH 9.5 Lost about 20 bbls. mud since started mixing.
7:00 A. M.	Mud check: Weight 8.5 #/gal. Yield 8 Viscosity 49 Sec. Filter cake 1/32 Pl. Vis. 18 cp. pH 9.5 Water loss 5.2 cc. Cl 1,600 ppm

11 September 1961
(Continued)

8:15 A. M.	Viscosity 58 Sec.
8:20 A. M.	Resume trip in to 11, 970' with bit #108.
8:40 A. M.	Hit bridge at 11, 246'. Pick up kelly. Drill bridge.
8:45 A. M.	Resume trip in.
8:50 A. M.	Hit bridge at 11, 306'. Pick up kelly. Drill bridge. Also drill bridge at 11, 351'.
9:05 A. M.	Resume trip in.
9.10 A. M.	Hit bridge at 11, 394'. Pick up kelly. Drill bridge.
9:30 A. M.	Resume trip in.
9:40 A. M.	Hit bridge at 11, 817'. Pick up kelly, drill bridge. Bit plugged. Unplugging bit.
10:00 A. M.	Began circulating and washing to bottom.
12:01 P. M.	Circulating at 11, 970'. Had to wash down last 5 joints. Can wash kelly to 11, 970'. Pull up kelly, go back and have 5' fill-up.
1:00 P. M.	Mud check:

Weight	8.6 #/gal.	Filter cake	1/32
Viscosity	62 Sec.	Yield	10
Pl. Vis.	20 cp.	pH	9.0
Water loss	5.0 cc.	Cl	1,600 ppm

3:00 P. M.	Mud check:

Weight	8.6 #/gal.	Filter cake	1/32
Viscosity	52 Sec.	pH	9.0
Pl. Vis.	18 cp.	Yield	8
Water loss	5.2 cc.	Cl	1,400 ppm

3:20 P. M.	Start short trip out. Pulled 50' up from 11, 970' (11, 920') and pipe stuck. Let pipe down and would not go freely. Put kelly on. Broke circulation. Conference with O. E. Mechem and Lewis Brown. Decided to trip out bit #108 as possibility for pipe to get stuck is eminent.
3:30 P. M.	Start trip out with bit #108. First 8 stands were dragging. Tight spots noted on 2nd, 4th and 7th stands. Pipe free after 8th stand out from 11, 970'.
7:00 P. M.	On bank with bit #108, green, bearings slightly loose, to gauge. Removed 3/8 jets on bit #108.
7:15 P. M.	Trip in with bit #108 RR.
7:40 P. M.	Cut line 100'.
8:40 P. M.	Resume trip in.
10.35 P. M.	Down at 11, 300'. Broke circulation. Condition hole and mud.

12 September 1961

12:01 A. M.	T. D. 12,045'. Circulating at 11,300'. Mud check: Weight 8.0 #/gal., Viscosity 59 Sec.
1:05 A. M.	Made one connection.
3:35 A. M.	Made one connection. Mud viscosity 52 - start mixing to raise it up to 60.
6:40 A. M.	Made one connection. Hit bridge 11,580'. Mud check: Weight 8.8 #/gal., Viscosity 59 Sec.
8:00 A. M.	Conditioning mud at 11,590'.
9:30 A. M.	Ran in one more stand to 11,685'. Pipe dragged when stand was lowered.
10:00 A. M.	Mud check:

Weight	8.8 #/gal.		Filter cake	2/32
Viscosity	91	Sec.	Yield	54
Pl. Vis.	38	cp.	pH	8.0
Water loss	4.0 cc.		Cl	1,400 ppm

10:15 A. M.	Larger sizes of particles coming over shaker.
12:15 P. M.	Run additional stand. Circulating at 11,790'.
3:00 P. M.	Circulating at 11,880'. Mud weight: 8.8 #/gal., Viscosity 60 Sec.
6:00 P. M.	Circulating at 11,940'. Losing partial returns. Mud check:

Weight	8.8 #/gal.		Filter cake	2/32
Viscosity	60	Sec.	pH	8.0
Pl. Vis.	22	cp.	Water loss	4.0
Yield	12		Cl	1,500 ppm

8:00 P. M.	Short trip. Pull 11 stands, tight 40, 60, 80 feet on 1st stand. Free rest of way.
8:40 P. M.	Wait 30 minutes.
9:10 P. M.	Trip back to bottom. Hit bridge at 11,880'. Circulate down last 3 joints.
9:50 P. M.	Lost all mud in pits with bit at 11,890'. Lost 200 bbls. of mud. Pull 12 stands and mixing mud.
11:30 P. M.	Start mixing oil.

13 September 1961

12:01 A. M.	T. D. 12,045'. Mixing oil in the mud.
3:45 A. M.	Finish adding oil, 3580 gals. Start trip in.
5:00 A. M.	Hit 96' of fill-up.
8:15 A. M.	Start short trip (12 stands)out.
8:45 A. M.	Start cleaning mud pits.
10:15 A. M.	Start in the hole.
10:30 A. M.	Broke circulation, 25' fill-up above 11,910'.
12:30 P. M.	Oil Well Perforators on location.
1:20 P. M.	Added 60 bbls. diesel oil to the mud. Mud check: Weight 8.7 #/gal., Viscosity 72 Sec. Circulating.

13 September 1961
(Continued)

4:00 P.M.	Mud check:
	Weight 8.5 #/gal. Filter cake 1/32
	Viscosity 71 Sec. pH 8
	Water loss 2.5 cc. Cl 1100 ppm
	Pl. Vis. 38 cp. Oil 14 %
	Yield 14 Solids 6 %
	Start conditioning hole from 11,910' down.
4:30 P.M.	11,970'. Tight hole going down on last 30'. Circulating.
5:20 P.M.	Still not free on last 6'. Driller says it feels like a piece of rubber dragged by the bit.
7:05 P.M.	Short trip. Tight 1st stand.
8:20 P.M.	At 11,970' with no fill-up. Circulate up bottom.
11:00 P.M.	Start out with short trip.
11:30 P.M.	Complete short trip of 12 stands. Cleaning mud pits.

14 September 1961

12:01 A.M.	T.D. 12,045'. Cleaning pits.
12:10 A.M.	Trip in.
12:40 A.M.	Circulating at 11,970'. Had 4' of fill-up.
3:00 A.M.	Made connection.
3:30 A.M.	Circulating at 12,000'. Intermittent mud losses. Have lost total of 20 bbls. since midnight.
5:00 A.M.	Loss increased to 20 bbls. per hr. Pulling up to mix slug of lost circulation material and build mud volume.
7:10 A.M.	Start trip in. Hit 30' loose fill.
7:50 A.M.	At 12,000'. Pumping lost circulation material.
8:20 A.M.	Pull up 12 stands.
8:50 A.M.	In casing - will wait one hour.
9:50 A.M.	Trip in.
10:10 A.M.	Hit 40' fill-up. Broke circulation at 11,960'.
10:50 A.M.	Lost 12 bbls. of mud in 30 min. Start mixing lost circulation material.
11:10 A.M.	Lost 15 bbls in 20 min. Start to pull 12 stands out.
11.45 A.M.	In casing - start mixing lost circulation material and build mud volume.
1:10 P.M.	Trip in.
1:40 P.M.	Had 40' fill-up. Mud check:
	Weight 8.6 #/gal.
	Viscosity 78 Sec.
	LCM 45 %
2:15 P.M.	Pull out 12 stands.

14 September 1961
(Continued)

2:45 P.M.	12 stands out.
4:45 P.M.	Start short trip in.
5:05 P.M.	Kelly on. Hit 2 easy bridges 60' and 40' above 12,000'. 3' fill-up. Circulating.
5:20 P.M.	Lost 4 bbls. mud in 5 minutes.
5:45 P.M.	Gained back 3 bbls.
7:30 P.M.	Start out of hole. Lost total of 45 bbls. of mud in 2 1/2 hrs. Mud check: Weight 8.9 #/gal., Viscosity 75 sec.
10:45 P.M.	On bank with bit #108 RR. Bit and reamer in same condition as when run. Rig up Oilwell Perforators to run Baker bridge plug.
11:00 P.M.	Start in with Baker bridge plug.
11:15 P.M.	Ken Kurtz-Baker on location.
11:50 P.M.	Tagged bottom with bridge plug at 11,994'. Set top of bridge plug at 11,984'. Apparent good set. Came loose from bridge plug and started out of hole.

15 September 1961

12:01 A.M.	T.D. 12,045. Trip out.
12:20 A.M.	Out of hole with hydraulic setting tool. Fluid level indicated at 2,600'.
12:45 A.M.	Start in hole with bailer and 1 sack of Pozmix 140 "A" cement. Baker representative left location.
1:30 A.M.	Dumped bailer at 11,984'.
2:00 A.M.	On bank with bailer. Rig down Oil Well Perforators.
2:10 A.M.	Start in hole with bit #108 RR. Strapping in hole.
2:30 A.M.	Oil Well Perforators left location.
6:30 A.M.	Circulating at 11,950'.
8:25 A.M.	Tagged top fill-up at 11,977', had 3' of fill-up. Circulating.
10:00 A.M.	Notification given to the Colorado Oil & Gas Commission of the intention to run casing (Mr. Art Jersin).
10:15 A.M.	Notified Franklin Supply of intent to run Extremeline liner (Mr. Jim Blaine).
10:25 A.M.	Notified Baker of intent to run float shoe.
11:30 A.M.	Start trip out, strapping.
12:05 P.M.	Broke chain and oil line on main shaft. Repairing.
1:10 P.M.	Baroid arrived on location.
1:15 P.M.	Halliburton arrived on location.
1:20 P.M.	Chain and oil line repaired. Resume trip out.
4:00 P.M.	Franklin Supply Co. on location.
5:00 P.M.	On bank with bit #108 RR. Tally shows 11,975' as top of cement.
5:50 P.M.	Start running 1st joint liner in, shoe and 2 centralizers.

15 September 1961	
6:00 P.M.	2nd joint in.
6:15 P.M.	3rd joint in.
6:20 P.M.	4th joint in. - 1 centralizer 5' above joint.
6:23 P.M.	5th joint in.
6:25 P.M.	6th joint in.
6:28 P.M.	7th joint in. - 1 centralizer 5' above joint.
6:30 P.M.	8th joint in.
6:33 P.M.	9th joint in.
6:37 P.M.	10th joint in. - 1 centralizer 5' above jt.
6:39 P.M.	11th joint in.
6:42 P.M.	12th joint in.
6:45 P.M.	13th joint in.
6:47 P.M.	14th joint in.
6:48 P.M.	15th joint in. - Depth 480'.
6:52 P.M.	16th joint in. - 1 centralizer 5' above joint.
6:54 P.M.	17th joint in.
6:56 P.M.	18th joint in.
6:59 P.M.	19th joint in. - 1 centralizer 5' above joint (581')
7:01 P.M.	20th joint in.
7:03 P.M.	21st joint in.
7:07 P.M.	22nd joint in. - 1 centralizer 5' above joint.
7:09 P.M.	23rd joint in - Depth 740'.
7:11 P.M.	24th joint in.
7:15 P.M.	25th joint in. - 1 centralizer 5' above joint.
7:17 P.M.	26th joint in.
7:19 P.M.	27th joint in.
7:22 P.M.	28th joint in.
7:24 P.M.	29th joint in.
7:27 P.M.	30th joint in. - Liner length: 964.04'.
8:15 P.M.	Tried to put casing hanger (4.10') and setting tool (3.74') on top of 30th joint but rubber packer on bottom of stinger does not fit in. 23 lb./ft. 5 1/2 casing - will try to get right size rubber and ring.
10:30 P.M.	Filed on liner packing cups but could not achieve adequate clearance. Will pull liner and get new tool rather than run the risk of sticking the tool due to temperature changes.
16 September 1961	
12:01 A.M.	T.D. 12,045'. Trip in hole to check fill-up.
2:30 A.M.	On bottom. No fill-up, no bridges.
5:00 A.M.	Trip out to run liner.
9:00 A.M.	On bank and preparing to run 5 1/2" liner.

16 September 1961
(Continued)

9:30 A.M.	Start running liner. Making up with 2500-3000 ft./lb. torque.
10:15 A.M.	Put on casing hanger setting tool.
10:30 A.M.	Put on kelly, fill and weigh liner.
11:00 A.M.	Liner, setting tools and one stand drill pipe, weigh 40,000#. Start running drill pipe.
2:30 P.M.	Pipe tally: 11,022' Need 11,002' to tag bottom. Tag bottom ok with 20' drill pipe up. Measured 17.40' up. Bottom checks at 11,978'.
2:45 P.M.	Complete string weight 180,000# on indicator.
3:00 P.M.	Hook up circulating head. Check BOP, blocks weigh 22,000#. Liner weight = 40,000 - 22,000 = 18,000#. Set packer.
3:15 P.M.	Pressure test lines. Leak in head, install new bull plug.
3:50 P.M.	Circulate hole and pump in 10 bbl. water spacer.
3:55 P.M.	Pump in 500 gal. acid followed by 10 bbl. water spacer.
4:15 P.M.	Pump in 250 sacks 140 "A" Cement with 0.590 HR-4 retarder.
4:30 P.M.	Drop plug and displace cement.
4:55 P.M.	Bumped plug with 2000#
5:00 P.M.	Bottom plug down at 1000 psi. Pulled string free of liner and began reversing out.
6:00 P.M.	No cement, water or acid returns after circulating 1 hr. Start out of hole.
9:45 P.M.	Truck from Casper (Loffland) on location with 4 1/4" hole drilling equipment.
10:50 P.M.	On bank with Baash Ross tool. Tool complete and in good shape.
11:15 P.M.	Baash Ross left location. Cutting line 100 ft. WOC.

17 September 1961

12:01 A.M.	T.D. 12,045'. Waiting on cement.
9:00 A.M.	Pick up 31 joints of 2 7/8 drill pipe and 4 joints of 3 3/4" x 1 1/2" drill collars, bit #109, W7, (4 1/4"). 1,083' of drill pipe and drill collars.
11:15 A.M.	Trip in with bit #109.
2:30 P.M.	Run in to 9,838'. Wait till 4:30 P.M. to proceed further.
4:30 P.M.	Resume trip.
4:50 P.M.	Hit top of liner at 11,007'.
6:10 P.M.	Hit top cement 11,908'.
7:15 P.M.	Drilling casing shoe after 64' of cement.

18 September 1961

12:01 A.M.	T.D. 12,045'. Drilling casing shoe at 11,975'.
1:05 A.M.	Blew up the nail on pump.
1:20 A.M.	Drilling magnesium plug 11,982'.
6:15 A.M.	Plug drilled. Corrected bottom magnesium plug 11,982'.
8:00 A.M.	12,005', washing to bottom.
12:30 P.M.	Washed to 12,038'. Broke through bridge plug approximately 12:25. Have lost 90 bbls. of mud since 9:30 A.M.
2:30 P.M.	Short trip, tight spot at 12,000'. Could be plug.
3:15 P.M.	On bottom from short trip, no fill.
3:40 P.M.	Clean suction pit.
4:30 P.M.	No fill-up after short trip. Circulating hole with partial returns.
5:25 P.M.	Adding water to mud.
6:05 P.M.	Displace mud with water, pump 9,100 gals. in 38 min.
6:50 P.M.	Commence injection test at 1,500 psi. Pump 16" out of back tank in 5 min. (260 gpm).
7:50 P.M.	Start displacing mud remaining in the annulus with water. Pressure dropped down to 250 psi, lost 280 bbls. in 40 min.
8:45 P.M.	Tagged bottom, no fill-up. Start trip out, strapping.
11:30 P.M.	Baker on location.

19 September 1961

12:01 A.M.	T.D. 12,045'. Trip out.
12:35 A.M.	On bank with bit #109, dull, bearings loose. Rigging up for Baker, laid down kelly extension and core barrel. Changed rings on Baker tool to fit in 44 lb./ft. 8 5/8 casing.
3:20 A.M.	Trip in with Baker retrievable packer, strapping.
3:30 A.M.	Dowell on location.
5:45 A.M.	Depth of Baker tool 9,983.95'.
8:05 A.M.	Commence pumping 500 gals. mud acid. Displace with 100 bbls. water.
8:30 A.M.	Set Baker packer.
8:35 A.M.	Squeeze acid with 110 bbls. of water.
8:55 A.M.	Pump 110 bbls. water at 700 psi and 5 BPM.
9:35 A.M.	Pump 3 bbls. of water and disconnect Dowell. Rig up to run injection tests with rig pump.
10:25 A.M.	Commence injection tests with rig pump. Pump 360 bbls. in 45 min. for an injection rate of 336 GPM at 975 psi.

Pressure Fall Off Test

Time	Pressure	Time	Pressure
10 sec.	825	60 sec.	205
20	525	70	205
30	250	100	190
40	220	130	175
50	210	160	125
		5 min.	110

19 September 1961
(Continued)

10:47 A.M. Finish test. Commence filling all tanks with water.

1:30 P.M. Ran five-minute injection test at 250 psi, 216 GPM

Fall Off Test	
0	250
10	175
20	90
30	25
40	0

1:45 P.M. Run injection test with pumps compounded. Pump total of 8,220 gallons in 18 minutes for an injection rate of 538 GPM at 1,450 psi.

Fall Off Test

Time	Pressure	Time	Pressure
0 sec.	1,475	90 sec.	110
10	225	120	100
20	225	150	80
30	210	180	75
40	190	210	50
50	175	5 min.	0
60	160		

Increase in fall off rate may be due to increased radius at which acid has penetrated.

3:20 P.M. Unseat packer and start out of hole.

6:30 P.M. Out of hole with packer.

7:30 P.M. Pick up 6 3/4" RG1J RR bit and casing scraper and trip in. Strapping in.

20 September 1961

12:01 A.M. T.D. 12,045'. Trip in with casing scraper.

12:30 A.M. 10,700 feet in. "Cable" on location.

2:00 A.M. Start in the hole with Amerada pressure bomb.

3:10 A.M. On bank with pressure bomb. Depth to fluid: 615', weight of fluid: 0.434 psi per ft. The pressure was measured at 8,000' (3,207 psi), 7,000' (2,773 psi) 4,000' (1,488 psi) and 2,000' (609 psi).

3:45 A.M. Trip in with Amerada bomb and 12-hr. clock. Set at 8,000'.

4:20 A.M. Injection test - pressure up to 500 psi, leak on line. Pulled Amerada bomb to 7,000'.

4:35 A.M. Injection test, 475 psi, 245 GPM, 5 minutes.

4:55 A.M. Amerada bomb pulled to 6,000'. Pressure 800 psi. 213 GPM, 15 minutes.

5:16 A.M. Injection test, 215 GPM, 800 psi, 6 minutes.

5:55 A.M. Injection test, 250 GPM, 700 psi, 1 hr. 50 minutes.

7:45 A.M. Shut in after injecting 498 barrels. Pressure down to 200 psi in 1 minute, 100 psi in 10 minutes, 0 psi in 20 minutes. Will shut in 4 hours. Acc. injection 1,472 barrels to date.

20 September 1961
(Continued)

11:45 A.M.	Start out with bomb.
12:15 P.M.	Bomb on bank.
1:45 P.M.	Start in hole with bomb.
2:20 P.M.	On bottom at 6,000'.
3:08 P.M.	On bank
3:45 P.M.	Start in hole with bomb.
4:15 P.M.	On bank with bomb.
5:00 P.M.	Strap tanks. Start source pump.
5:25 P.M.	Start in hole with pressure bomb.
5:32 P.M.	Bomb at 5,000'.
5:37 P.M.	Start injection test.
8:01 P.M.	Stop injection at 1,100 psi and 41 spm.
8:31 P.M.	Open drill pipe to atmosphere, therefore approx 0 psi at surface Injection total of 939 8 bbls. of water in 2 hrs 24 min. average rate 263 gpm. Acc. injection volume now approx. 2,500 bbls.

21 September 1961

12:01 A.M.	T.D. 12,045'. Taking pressure test.
3:30 A.M.	Pull pressure bomb from 5,000'. Chart shows static pressure at 1,994 # prior to injection; half-hour after start of injection test pressure at 3,094# maximum 2,887# minimum, 2991# average. At end of injection test (144 minutes) pressure at 3,053# maximum, 2,930# minimum, 2,991# average. After injection test:

SI Time, Min.	Pressure
2	2807
10	2783
20	2524
30	2390
40	2287
60	2202
120	2143
180	2116
240	2105
300	2090
360	2084
420	2073

4:50 A.M.	Reran pressure bomb to 5,000' for penultimate reading. After 540 minutes, pressure at 2,050#.
7:00 A.M.	Rerun bomb to 5,000'. Reading 2,027# after 660 minutes.

21 September 1961
(Continued)

8:00 A.M.	Trip out to run logs
11:20 A.M.	On bank with casing scraper and 6 3/4" bit. No metal missing from scraper or bit. Scraper blades had scattered scores
1:25 P.M.	Lane Wells arrived on location rigging up to run logs
3:40 P.M.	Start in hole with sonde
	Top of liner 11,006'
	Ind. Bottom of liner 11,985' (B.P.)
	Total Depth 12,041'
5:50 P.M.	Out of hole with sonde
7:20 P.M.	Lane Wells rigged down logs.
7:40 P.M.	Rigging up to run swab tests with air compressors
8:00 P.M.	Well Completions on location.
11:10 P.M.	Well Completions rigged up. Waiting on welder to finish blooey line.

22 September 1961

12:01 A.M.	T.D. 12,045'
1:15 A.M.	Welder finished.
2:00 A.M.	Run in 32 stands.
3:14 A.M.	Commence air injection along with rig pump
3:35 A.M.	Hole began to unload at 300 psi.
3:42 A.M.	Kick out rig pump.
3:50 A.M.	Pressure increased to 750 psi, hole unloaded.
4:10 A.M.	Measured mud pits
4:45 A.M.	Injection pressure, 300 psi
5:10 A.M.	Produced 61 bbls. of fluid last hr, lost considerable fluid over mud pit.
5:30 A.M.	Pressure 290 (steady)
6:10 A.M.	Produced 78 bbls. last hr., all fluid retained in pits. Started pumping fluid to Pond F, 28 spm. Injecting 2 gals. of well foam #1 plus 2 quarts Kronox 211 in 20 bbls. of fluid every 4 hrs. Will stop use of foaming agent but continue Kronox 211. Total fluid produced 266 bbls., 110 bbls. unload hole. Air equipment consists of 1 Joy rated at 750 cfm, 1 at 900 cfm at 125# and 1 booster at 2800 cfm at 1,000 psi
6:30 A.M.	Pressure down to 260 psi. Booster 700 rpm., #1 compressor 1,350 rpm, #2 compressor 900 rpm
6:55 A.M.	Pressure 250, measure pits
7:40 A.M.	Pressure 190, stop injection foaming agent
7:55 A.M.	Pressure 210, produce 80 bbls. of fluid last hr. Total prod. assume 4 hrs. at 75 BPH = 300

22 September 1961
(Continued)

8:30 A.M.	Flow in heads may be due to stopping the foaming agent.
8:50 A.M.	Measure pits.
9:50 A.M.	Flowed 70 bbls last hr. Total flow 456 bbls.
10:50 A.M.	Flowed 65 bbls. last hr. Total flow 521 bbls.
12:30 P.M.	Mud check: Cl 1600.
12:40 P.M.	Pressure 280, producing 70 BPH, cumulative 661 bbls. Pressure of 280 was taken from compressor gauge.
1:40 P.M.	Pressure 280 psi. Producing at rate of 70 BPH. Cumulative recovery is 731 bbls.
3:35 P.M.	Pressure 280 psi. Had been 210 psi at 2:00 p.m. and 250 psi at 3:00 p.m. Producing rate 51 BPH cumulative production 831 bbls.
5:35 P.M.	Pressure 260 psi. Producing rate 61 BPH. Cumulative production 940 bbls.
6:40 P.M.	Shut air down. Pressure was 280 psi.
6:44 P.M.	Bleed off pressure.
6:48 P.M.	Break off kelly, start in hole with 11 more stands of 4 1/2" drill pipe. Will have a total of 43 stands in hole.
7:10 P.M.	Compressors on - pressure 1000 psi.
10:30 P.M.	Pressure 325 - Production rate 486, cumulative 1038.
11:30 P.M.	Pressure 250, production rate 62, cumulative 1100.

23 September 1961

12:01 A.M.	T.D. 12,045'. Pressure 250.
12:30 A.M.	Pressure 250.
1:30 A.M.	Pressure 250. Prod. rate 53 bbls., cumulative prod. 1214.
2:30 A.M.	Pressure 250. Prod. rate 46 bbls., cumulative prod. 1260.
3:30 A.M.	Pressure 275. Prod. rate 32 bbls., cumulative prod. 1292.
4:30 A.M.	Pressure 275.
5:30 A.M.	Pressure 275. Prod. rate 41 bbls., cumulative prod. 1369.
6:00 A.M.	Pressure 225.
6:30 A.M.	Pressure 230. Prod. rate 46.5, cumulative prod. 1416.
7:00 A.M.	Pressure 260.
7:30 A.M.	Pressure 250. Prod. rate 41 bbls., cumulative prod. 1457 bbls.
8:00 A.M.	Pressure 280.
8:30 A.M.	Pressure 260, Prod. rate 31 bbls., cumulative prod. 1488 bbls.
9:15 A.M.	Pressure 260.
9:30 A.M.	Prod. rate 27 bbls., but hole was heading up.
11:00 A.M.	Pressure 210. Prod. 48 bbls., cumulative 1859.

23 September 1961
(Continued)

12:01 P.M.	T.D. 12,045'. Pressure 210, Prod. 18 bbls., cumulative 1877.
1:00 P.M.	Pressure 200, Prod. 18 bbls., cumulative 1895.
1:20 P.M.	Hole appears to be plugging off. Will run in with a bit to clean up.
2:15 P.M.	Out of hole. Cut drilling line and replace slip buttons.
4:50 P.M.	Start in hole with bit #110, OW (4 1/4").
7:40 P.M.	On bottom 5' of fill-up.
8:15 P.M.	Attempt to break circulation. Would not circulate. Wait on Dowell.
11:30 P.M.	Dowell on location.

24 September 1961

12:01 A.M.	T.D. 12,045'.
1:15 A.M.	Pressure test Dowell line, 4100 psi.
1:35 A.M.	Displaced 72 bbls. (3000 gals.) acid, no returns.
1:57 A.M.	Displaced 80 bbls. of water, got returns after 20 bbls. water have been displaced. Shut the rams.
2:20 A.M.	Pumped 80 bbls. water, pressure 1200 psi.
2:45 A.M.	Starting out of the hole, strapping.
3:15 A.M.	Dowell left location.
6:45 A.M.	On bank with bit #110, green.
6:55 A.M.	Started trip in with 4 1/2" drill pipe, open ended. Run 40 stands.
8:05 A.M.	Start injecting air along with pump.
8:35 A.M.	Stopped rig pump. Hole started unloading at 650 psi.
9:30 A.M.	Pressure 250 and fluctuating.
11:00 A.M.	Production 125 bbls. last hr., 90 of which was pumped from reserve pit. Will eliminate pumping from reserve pit next test Cl 4000 ppm.
1:00 P.M.	Production 40 bbls., pressure 210. Cumulative production 2075 bbls.
1:15 P.M.	Run in 45 stands to 7990'.
2:30 P.M.	Start injecting air. Pressure to 1100 psi at 3:00 p.m. Kick in rig pump.
3:20 P.M.	Head on booster went out. Wait on mechanic to fix air compressor.
4:45 P.M.	Compressor fixed. Start air.
5:45 P.M.	Hole started to unload.
6:10 P.M.	Pump out.
7:20 P.M.	Hole unloading in heads. Pressure 580 to 950.
9:30 P.M.	Pressure 620 psi. Flow seems to get steadier. Will make a production test at 10:00 p.m.
11:00 P.M.	Pressure 800, production rate 23 bbls./hr. Cumulative 1945. Conference with J. Garrett and A. Samuels. Will pull up 20 stands and see if the slow rate we had was not due to overloading the compressors.

25 September 1961

12.01 A.M.	T.D. 12,045'. Pressure 500, rate 55 bbls./hr. Cumulative production 2,0[illegible] bbls.
12:15 A.M.	Production died. Pull 20 stands.
1:15 A.M.	Open ended 4 1/2 drill pipe at 6,100'. Start rig pump and air.
2:15 A.M.	Hole started to unload. Put rig pump out. Pressure 350 - fluctuating.
3:50 A.M.	Pressure 350. Flow begins to remain constant. Will make a production test from 4:00 a.m. to 5.00 a.m.
5:00 A.M.	Pressure 325, production rate 22 bbls./hr. Cumulative production 2,060 bbls.
6:00 A.M.	Pressure 350, production rate 30 bbls./hr. Cumulative production 2,090 bbls., Cl 13,000 ppm.
7:00 A.M.	Pressure 350, production rate 21 bbls./hr. Cumulative production 2,115 bbls., Cl 13,000 ppm.
8:00 A.M.	Pressure 250, production rate 22 bbls./hr. Cumulative production 2,137 bbls.
9:00 A.M.	Pressure 225, production rate 26 bbls./hr. Cumulative production 2,163 bbls.
10:00 A.M.	Pressure 225, production rate 26 bbls./hr. Cumulative production 2,199 bbls.
10.30 A.M.	Pull 35 stands in order to check for corrosion of drill pipe.
11:40 A.M.	Start air, no returns. 125 psi. Will stand back 5 stands of bottom pipe to be inspected by Kronox representative.
12:10 P.M.	Rerun 20 stands of drill pipe to 5,054'.
1:35 P.M.	Start air.
2:00 P.M.	Fluid returns 225 psi.
3.00 P.M.	Production rate 10 bbls. Cumulative production 2,377 bbls.
4:30 P.M.	Production rate 18 bbls. Cumulative production 2,404 bbls. Run in 10 stands.
5:05 P.M.	Air on.
6:20 P.M.	Hole unloaded 900 psi.
7:30 P.M.	Pressure 300.
7:45 P.M.	Welder on location.
8.30 P.M.	Stopped Well Completion compressors.
9:05 P.M.	Start in the hole to lay down drill pipe.
12:00 P.M.	100 joints of 4 1/2 drill pipe laid down.

26 September 1961

12:01 A.M.	T.D. 12,045'. Laying down 4 1/2 drill pipe.
3:00 A.M.	Baker and Oil Well Perforators on location.
3:30 A.M.	Casper rental tool Co. on location.

26 September 1961

7:30 A.M.	Breaking kelly down. Install 5 1/2" rams in blowout preventors. Run gauge ring on wireline.
12:01 P.M.	Run Baker Model D packer #3665, 127-38 DCM.
2:00 P.M.	Set Baker packer 8,998'.
3:30 P.M.	Baroid hauled 78 sacks of gel from location.

Baker packer dimensions:

O.D.	7.375"
I.D.	3.875"
Length	3' 10"

Seal nipples.

O.D.	3 3/4"
I.D.	2 7/8"
Total length	12.935'

Production tube:

Collar O.D.	3.75"
Tube O.D.	2 7/8"
Tube I.D.	2 5/16"
Length	5'

Overall length of stinger:

Prod. Tube	5.00
Seal Nipples	12.93
Shoulder	0.83
Total	18.76'

3:40 P.M.	Commence running 5 1/2" tubing.
9:45 P.M.	Have 5 1/2" tubing in hole to 8991'. Hit packer with stinger. Set 20,000# on packer, filling hole with water.
10:20 P.M.	Hole full, closed pipe rams. Pressured to 410 psi. Held pressure for 5 minutes. Lost 20 psi. No apparent surface leaks.
10:30 P.M.	Released pressure. Jetting cellar prior to removing BOP's.

27 September 1961

12:01 A.M.	T.D. 12,045'. Removing BOP's.
12:30 A.M.	Landed tubing in slips with 65,000# on packer. Broke out landing joint.
1:00 A.M.	Began removing rotary table, BOP's and installed adapter flange on top of 5 1/2" tubing spool.
9:20 A.M.	Cut 5 1/2" tubing 8 1/2' above slips. Nipple up flange.

Although the tubing was not landed until 12:15 P.M. on the 28th, some rigging down could proceed along with the other operations. As a result, the rig was released as of 6:00 A.M. on 9-28-61.

28 September 1961

1:00 P.M. John Neighbours called in. Chloride ion test of samples dropped off at Government lab. this morning.

	ppm
City Water	38
Rig Water	36
Circulated annulus sample	39

1:45 P.M. Pressured up and held okay at 350 psi.

2:30 P.M. Contractor lowered derrick.

A review of operations for the past few days indicated that salt water was in the casing-tubing annulus. Due to the fact that this can prove to be a corrosive medium, the decision was reached to circulate the salt water with fresh water. A Bowen circulating spear was secured for this purpose. Checks were made on the salt content of the circulated fluid and fresh water was obtained at the surface for 1 1/2 hrs. before the tubing was relanded with 65,000#.

2 October 1961 Contractor finished moving rig off location. Tuboscope inspecting pipe for damage due to corrosion.

3 October 1961 Tuboscope inspecting pipe.

4 October 1961 Tuboscope finished pipe inspection. Ordered tubing and rods for pumping installation. Tubing arrived on location.

5 October 1961

8:00 A.M. Commence rigging up pulling unit to run tubing.

12:01 P.M. Run mud anchor, 1 jt. tubing. Tubing anchor 34' up and landing nipple 65' up.

3:15 P.M. Hit fluid at 2,180'. Accepted delivery of 1,700'-1" rods, 2,000'-7/8" rods, 4,250'-3/4" rods, and 1,000' line pipe.

5 October 1961 (Continued)	
8:00 P.M.	Finished running tubing.
6 October 1961	
6:00 A.M.	Commence running tubing.
7:30 A.M.	Finish running tubing.
9:00 A.M.	Rig up to run bottom-hole pressure bomb after setting tubing anchor with 30,000 pounds weight. Hit fluid with Amerada bomb at 2,187'. Tagged bottom at 8,006'. Seating nipples are located at 7,938'.
10:15 A.M.	Run Oilmaster 2 1/2' x 1 1/2" x 12' x 17'. Improved insert pump to 4,280'.
4:30 A.M.	Rods run to 6,550' due to extreme difficulty in making up 1" rods. It will prove expedient to set the pump at this depth. Oilmaster representatives supervised the proper setting of the pump.
6 00 P.M.	Released pulling unit.
7 October 1961	
7:00 A.M.	Accepted delivery of 18 yds. of sand for foundation. Roustabout crew began preparation of foundation for pumping unit.
10:00 A.M.	Set substructure of pumping unit.
10:30 A.M.	Set Pitman and engine.
11:30 A.M.	Finish setting pumping unit except for engine. Released crane. Lay 3" pipeline to Pond F. Hook up engine to butane.
6:00 P.M.	Roustabout crew released.
10 October 1961	
8:00 A.M.	Pumper and helper finished hooking up engine and adjusted stroke and speed on pump.
11:00 A.M.	The regulator on the butane tank was not functioning properly, and it was necessary to procure connections to bypass the regulator.
12:45 P.M.	New connections were installed, motor started.
1:15 P.M.	Pump started, extreme vibration of motor unit noted.
2:20 P.M.	Fluid to surface. Crew finishing staking of engine.
3:15 P.M.	Pumping unit ready. Bulldozer stuck in path of water line.
5:00 P.M.	Released 2-man roustabout crew. Bulldozer still stuck. Start meter reading 5290204 gallons.

10 October 1961 (Continued)	
6:30 P.M.	Start pumping 10 spm.
11:30 P.M.	Pump running 10 spm. Had pumped 880 gallons since 6:30 P.M.
11 October 1961	
8:30 A.M.	Meter reading 5293538. 3,334 gallons or 79 barrels in 14 hours or a rate of 136 bbls./day. The governor on the engine will not allow for a speed over 10 spm, butane 67%.
3:30 P.M.	Meter reading 5296041. 11 spm, 2,500 gallons in 7 hours or 358 gals./hr. ± 204 bbls./day. Additional speed due to increased pressure of supply gas. Original problem of slow speed was caused by low gas pressure.
4:00 P.M.	Installed 1,000-gallon propane tank.
4:30 P.M.	Started unit. The addition of the 1,000-gallon tank seemed to eliminate any of the problems associated with the slow pumping speeds. Present pump speed 12 spm.
12 October 1961	
8:30 A.M.	Meter reading 5304711 gallons. 54% propane 65 psi 12 spm, 11,173 gallons last 24 ours or 264 barrels, 11 bbls./hr. Pump is operating at 100% efficiency, cumulative production 346 bbls, Cl 10,000 ppm.
9:45 A.M.	Shut down pump to install heat safety switch and walking beam safety switch.
10:30 A.M.	Start pump.
3:30 P.M.	Meter 5308125. Propane 48% 80 psi, pump 12 spm, cumulative production 17,921 gallons, 427 bbls. 11.7 bbls./hr. Sample #2 Cl 13,000 ppm.
13 October 1961	
8:30 A.M.	Meter reading 5312605. Produced last 24 hours 11,173 gallons or 188 bbls. Propane 40%, cumulative production 534 bbls, Cl 12,000 ppm. Pump had died during the night.
10:00 A.M.	Shut down pump in order to finish dirt work.
4:15 P.M.	Start pump. Propane 36%, 95 psi, 11 spm. Meter reading 5313500, Cl 12,000 ppm.
4:30 P.M.	Engine stopped. Partially covered radiator and restarted engine.
9:00 P.M.	Motor died. Cannot seem to supply an adequate amount of gas and air.

13 October 1961 (Continued)	
10:00 P.M.	Motor and pump running. Engine running very rough.
11:00 P.M.	Motor stopped.
14 October 1961	
7:00 A.M.	Call National Supply to send mechanic to adjust timing and regulator.
10:00 A.M.	National Supply checking on mechanic. Started motor. Still seems to be running rough.
10:30 A.M.	Meter reading 5314674. Motor died. Have pumped 49 bbls. since 8:30 A.M. yesterday. Cumulative production 583 bbls.
3:50 P.M.	Mechanic on the way from Ft. Morgan.
6:00 P.M.	Mechanic arrived on location.
10:00 P.M.	Adjustments on the inlet pressures and volumes of gas still has not produced a satisfactory running condition. It will be necessary to hook up a volume tank in order to adequately control the gas supply.
15 October 1961	
10:00 A.M.	Install volume tank and attempt to adjust fuel regulator.
1:00 P.M.	Motor still would not run. Mechanic not available until Monday morning.
16 October 1961	
8:00 A.M.	Wait on mechanic. Meter reading 5315361. Cumulative production 600 bbls.
9:15 A.M.	Mechanic on location. Had to disconnect waterline in order to finish dirt work.
2:30 P.M.	Pump started.
4:00 P.M.	Meter reading 5316239. #5 sample Cl 15,000 ppm, propane 26%, 100 psi; pump 14 spm.
6:00 P.M.	Motor stopped.
7:00 P.M.	Could not get motor started. Called Mr. Hull with National Supply, and they will send a man out in the morning.
17 October 1961	
8:00 A.M.	Waiting on National Supply representative.
10:00 A.M.	Representative not available. Obtained additional gas regulator and hooked into system.
1:30 P.M.	Motor started. Meter reading 5317570. Pump speed 12 spm, propane 87% 155 psi, pressure to volume tank 15 psi.
4:00 P.M.	Motor died. Mechanic has not arrived.

18 October 1961	
8:30 A.M.	Ajax representative arrived to repair engine. The governor was not operating properly as a part was broken.
11:30 A.M.	Governor repaired, motor started.
19 October 1961	
8:30 A.M.	Meter reading 5327100, cumulative production 876 bbls., propane 75%, 55 psi, volume tank 40 psi, and #6 sample Cl 15,000 ppm, 11 spm.
9:30 A.M.	Had to shut down pump to finish dirt work.
11:00 A.M.	Pump started.
3:30 P.M.	Meter reading 5329830, 2,730 gals. in 5 1/2 hrs. = 11.8 bbls./hr., propane 72%, 90 psi, volume tank 40 psi; #7 sample Cl 17,000 ppm.
20 October 1961	
8:30 A.M.	Meter reading 5339060, 11 spm, 285 bbls. yesterday, cumulative production 1,157 bbls., propane 58%, 60 psi, #8 sample Cl 17,000 ppm.
12:30 P.M.	Dirt Contractor finished.
3:00 P.M.	Meter reading 5342690, cumulative production 1,240 bbls., propane 55%, 60 psi, #9 sample Cl 17,500 ppm.
21 October 1961	
12:01 P.M.	Meter reading 5349443, cumulative production 1,401 bbls., propane 46%, 80 psi, 13 spm, sample #10 Cl 21,000 ppm.
5:00 P.M.	Meter reading 5352776, cumulative production 1,490 bbls., propane 43%, 90 psi, 13 spm, sample #11 Cl 18,000 ppm.
23 October 1961	
3:00 A.M.	Unit stopped. Meter reading 5367055, cumulative production 1,825 bbls., propane 20%, 55 psi.
8:30 A.M.	Unit started. Would not pump fluid
10:30 A.M.	Pump still not pumping. Pump acts as if formation has pumped off. Called for pulling unit in order to check the pump.
24 October 1961	
8:00 A.M.	Rig up pulling unit.
10:30 A.M.	Picked up to unseat pump. Rods have parted. Began pulling rods.

23 October 1961	
(Continued)	
12:30 P.M.	Rods had unscrewed at 5,625'. Waiting on fishing tools. 225 joints.
2:00 P.M.	Trip in with overshot.
3:30 P.M.	Slips hanging up over fish, start out of hole 1st & 2nd stands.
4:30 P.M.	Slips freed up on 2nd stand.
6:00 P.M.	On bank, no recovery.
25 October 1961	
8:00 A.M.	Trip in with jars and overshot.
10:00 A.M.	Over fish.
11:00 A.M.	Overshot pulled loose and could not be reset. Start out of hole.
11:30 A.M.	Floorman injured hand when elevators were set down.
1:45 P.M.	On bank, no recovery. Fishing tool okay.
1:50 P.M.	Trip in hole with jars 1 stand up in attempt to screw into rod.
3:45 P.M.	Screw into rods, jarred to 30,000# then 35,000 #. Would not come free.
5:00 P.M.	Jarring did not free pump. Will have to pull rods and tubing.
27 October 1961	
2:00 P.M.	Pulling unit arrived on location.
4:00 P.M.	Began jarring on rods.
4:45 P.M.	Jarred free, pulled 50'. Stuck.
5:00 P.M.	Pulled free, but dragging.
28 October 1961	
8:30 A.M.	Started pulling rods.
10:30 A.M.	Recovered pump. Some damage was noted to the slips and mandrel, although the pump seemed to be operating satisfactorily. Waiting on pump manufacturer representative to inspect pump.
11:45 A.M.	Checked balls and seat in travelling valve and standing valve. Okay.
12:15 P.M.	Start in with pump.
4:45 P.M.	Finished running rods. Had to tighten every joint.
5:30 P.M.	Commence pumping.
29 October 1961	
10:00 A.M.	Pump down. No fluid pumped. Trying to start motor.
4:00 P.M.	Could not get engine started. Mechanic arrived on location 5:30 P.M. Worked till 7:30 P.M. Could not start engine.

30 October 1961	
7:30 A.M.	Took starter motor to Wisconsin engines to be repaired.
10:30 A.M.	Engine repaired and pump running.
12:15 P.M.	Fluid to surface. Meter reading 536700, cumulative production 1,830 bbls., propane 34%, 65 psi, 13 spm, sample #11 Cl 26,000 ppm.
3:30 P.M.	Meter reading 5369320, cumulative production 1,885 bbls., propane 30%, sample #12 Cl 25,000 ppm.
31 October 1961	
8:15 A.M.	Meter reading 5370386, cumulative production 1,910 bbls., propane 28%, sample #13 Cl 25,000 ppm. Unit stopped 9:00 P.M. last night.
2:15 P.M.	Meter reading 5374240, cumulative production 2,002 bbls., sample #14 Cl 25,000 ppm.
4:00 P.M.	Meter reading 5374676, cumulative production 2,010 bbls., Cl 21,000 ppm. Unit not pumping fluid.
1 November 1961	
8:00 A.M.	Pump started. No fluid. Called for pulling unit.
2 November 1961	
6:00 A.M.	Started pump, no fluid. Waiting on pulling unit.
7:00 A.M.	Rigging up pulling unit.
8:30 A.M.	Rods have parted. Couldn't screw in.
9:00 A.M.	Started out with rods.
2:00 P.M.	On bank rods parted, 157 doubles plus 1 single, approximately 7875'. Start in hole with BJ overshot 3/4" slips.
5:30 P.M.	Shut down for night; 12 stands up.
3 November 1961	
6:15 A.M.	Run 12 stands.
7:15 A.M.	Pulled pump loose. Start out.
10:30 A.M.	Recovered pump. Seals damaged. Waiting on Cable.
2:00 P.M.	Run bottom-hole pressure bomb.
2:50 P.M.	Retrieve bomb. Hit fluid at 4980'.
3:00 P.M.	Trip in with pump.
5:30 P.M.	Shut down for night.
4 November 1961	
6:00 A.M.	Finish running rods.
7:30 A.M.	Hook up pump and polish rod.
8:30 A.M.	Commence pumping.

4 November 1961	
(Continued)	
8:35 A.M.	Stop pump to rig down.
9:05 A.M.	Start pump.
11:00 A.M.	Fluid to surface.
6:00 P.M.	Stopped pump to allow build-up over night. #15 28,000 ppm Cl, meter reading 5378746, cumulative production 2110 barrels.
5 November 1961	
10:00 A.M.	Unit started.
6:00 P.M.	Meter reading 5379255. Shut unit down for night. Substructure cracked through welds, cumulative production 2120 barrels. Take sample #15, #2 and #11.
6 November 1961	
8:00 A.M.	Welder called to repair subbase.
11:45 A.M.	Commence pumping. Meter reading 5379275, cumulative production 2121 barrels, sample #16 32,000 ppm.
3:15 P.M.	Meter reading 5381706, cumulative production 2175 barrels, propane 27% 90 psi, sample #17 Cl 29,500 ppm.
11:00 P.M.	Meter reading 5384092, Cumulative production 2231 barrels, sample #18 29,500 ppm, belts thrown off.
7 November 1961	
8:00 A.M.	Started [illegible]tor, belts would not hold.
3:15 P.M.	Installe[illegible] [illegible] belts, started pump.
8 November 1961	
8:15 A.M.	Belts thrown off pumps. Meter reading 5385464, cumulative production 2266 barrels, sample #19 29,500 ppm.
9:45 A.M.	Reinstalled belts, unit running.
3:00 P.M.	Meter reading 5388050. cumulative production 2327 barrels, propane 11%,50 psi, sample #20 33,500 ppm 12 spm.
9 November 1961	
8:30 A.M.	Meter reading 5389542, cumulative production 2363 barrels. Unit would not pump fluid. Called for pulling unit.

10 November 1961	
10:30 A.M.	Pulling unit on location.
12:01 P.M.	Screw onto rods seem to be pumping okay. Caught sample #21 Cl 33,500 ppm.
2:00 P.M.	Reseated pump and hooked up unit.
2:15 P.M.	Shut down for welder.
3:00 P.M.	Finished rigging down pulling unit. Install 24" sheave on engine belts, too short.
4:30 P.M.	Wait on new belts.
7:00 P.M.	Reinstalled old belts, cut sub base to allow additional movement.
10:15 P.M.	Start pump.
11 November 1961	
9.45 A.M.	Unit stopped during night. Had not pumped fluid. Restarted pump.
1:30 P.M.	No fluid pumped. Apparently seating rings were damaged on the pump when the pump was unseated to install polish rod. Operations will have to be suspended until Monday as pulling units cannot travel from Saturday noon till Monday at daylight.
13 November 1961	
8:00 A.M.	Wait on orders from Corps of Engineers.
2:45 P.M.	Corps of Engineers representative gave orders to proceed with pumping operation
14 November 1961	
9:30 A.M.	Pulling unit arrived on location.
10:45 A.M.	Started pulling rods, pump did not appear to be seated or else rods had parted.
2:00 P.M.	On bank. Seals on pump had torn off. Put on new seals.
2:15 P.M.	Start in hole.
4:30 P.M.	On bottom. Move counter balance.
5:30 P.M.	Commence pumping.
15 November 1961	
7:30 A.M.	Pump stopped during night. Did not pump up. Started pump.
9:30 A.M.	Shut down to change 1/4 ' propane line to 1".
10:00 A.M.	Resumed pumping.
11:30 A.M.	Reset pump to pound bottom in order to clear valves and seats.
12:10 P.M.	Fluid to surface.
1:45 P.M.	Caught 10-gallon sample. Cumulative production 2375 barrels, meter reading 5390040, sample #22 28,400 ppm.

15 November 1961	
2:45 P.M.	Meter reading 5390395, 8.5 barrels last hour.
3:45 P.M.	Meter reading 5390780, 9.2 barrels last hour, cumulative production 2393 barrels, Cl check at 1.45 P.M. made with new mix of $AgNO_3$ solution.
4:00 P.M.	Sample #23 Cl 24,526 ppm, meter reading 5390840, cumulative production 2393 barrels.
4:45 P.M.	Meter reading 5391153, 8.9 barrels, cumulative production 2402 barrels. Mechanic arrived on location in attempt to keep unit running through the night.
16 November 1961	
8:30 A.M.	Meter reading 5391426 pumped 6.9 barrels through the night. Unit would not continue running except spasmodically, cumulative production 2409 barrels.
17 November 1961	Began installation of electric motor.
18 November 1961	
1:45 P.M.	Completed motor installation. Started pump, meter reading 5392345.
2:30 P.M.	Shut down to respace pump.
3:30 P.M.	Restarted pump.
5:30 P.M.	Meter reading 5393675, cumulative production 2440 barrels, sample #25 27,000 ppm Cl.
7:30 P.M.	Meter reading 5394555, cumulative production 2461 barrels.
9:30 P.M.	Cumulative production 2483 barrels.
19 November 1961	
12:30 A.M.	Cumulative production 2517 barrels.
4:30 A.M.	Cumulative production 2554 barrels, sample #26 26,000 ppm.
5:30 A.M.	Cumulative production 2562 barrels.
6:30 A.M.	Cumulative production 2570 barrels.
7:30 A.M.	Cumulative production 2580 barrels, sample #27, 26,000 ppm.
8:30 A.M.	Cumulative production 2589 barrels.
9:30 A.M.	Cumulative production 2595 barrels.
10:30 A.M.	Cumulative production 2602 barrels.
11:30 A.M.	Cumulative production 2609 barrels, sample #28 27,000 ppm. Shut down to space pump.
12:01 P.M.	Start pump.
2:00 P.M.	Cumulative production 2626 barrels.
3:00 P.M.	Cumulative production 2653 barrels, sample #29 26,000 ppm.
3:30 P.M.	Cumulative production 2654 barrels. Shut in well, pumped off and pounding fluid.

20 November 1961	
7:00 A.M.	Start pump, flow line and meter frozen.
7:30 A.M.	Start pumping on ground while repairing flange.
9:30 A.M.	Well pumped off.
10:00 A.M.	Shut well down.
12:01 P.M.	Start pump.
1:00 P.M.	Meter reading 5402315, cumulative production 2664 barrels.
1:15 P.M.	Shut down to respace pump.
1:45 P.M.	Start pump.
2:00 P.M.	Meter reading 5402510, cumulative production 2668 barrels, sample #30 (5-gal.) 29,000 ppm Cl.
3:00 P.M.	Meter reading 5402710, cumulative production 2673 bbls.
4:00 P.M.	Meter reading 5402900, cumulative production 2678 bbls.
5:00 P.M.	Meter reading 5403115, cumulative production 2683 barrels, Sample #31 31,000 ppm Cl.
6:00 P.M.	Meter reading 5403340, cumulative production 2688 bbls.
7:00 P.M.	Meter reading 5403545, cumulative production 2693 bbls.
8:30 P.M.	Meter reading 5403830, cumulative production 2700 bbls. shut down pump, sample #32, 31,000 ppm.
21 November 1961	
5:00 A.M.	Start pump.
6:00 A.M.	Meter reading 5404150, cumulative production 2708 bbls.
7:00 A.M.	Meter reading 5404435, cumulative production 2714 bbls.
8:00 A.M.	Meter reading 5404696, cumulative production 2721 bbls. Well pumped off.
9:00 A.M.	Meter reading 5404940, cumulative production 2725 bbls. Sample #33 31,000 ppm; pounding fluid.
10:00 A.M.	Meter reading 5405132, cumulative production 2730 bbls.
12:01 P.M.	Meter reading 5405557, cumulative production 2740 bbls., sample #34 32,700 ppm.
1:00 P.M.	Meter reading 5405723, cumulative production 2744 bbls.
2:00 P.M.	Meter reading 5405870, cumulative production 2748 bbls.
3:00 P.M.	Meter reading 5406020, cumulative production 2751 bbls.
4:00 P.M.	Meter reading 5406165, cumulative production 2754 bbls.
5:00 P.M.	Meter reading 5406275, cumulative production 2757 bbls., sample #35 34,250 ppm.
5:15 P.M.	Meter reading 5406299, cumulative production 2758 barrels, shut down.
22 November 1961	
8:00 A.M.	Shorten stroke from 84" to 54".
4:00 P.M.	Start pump.
5:00 P.M.	Meter reading 5406482, cumulative prod. 2762 bbls.
6:00 P.M.	Meter reading 5406685, cumulative prod. 2767 bbls.
7:00 P.M.	Meter reading 5406885, cumulative prod. 2772 bbls.
8:00 P.M.	Meter reading 5407080, cumulative prod. 2776 bbls., sample #36 32,500 ppm.

22 November 1961 (Continued)	Meter Reading	Cumulative Prod. (bbls.)	Sample No.	Cl-ppm
9:00 P.M.	5407275	2781		
11:00 P.M.	5407640	2790		
23 November 1961				
5:00 A.M.	5408580	2795	37	31,500
6:00 A.M.	5408697	2798		
7:00 A.M.	5408810	2800		
8:00 A.M.	5408920	2803		
9:00 A.M.	5409020	2806	38	31,500
10:00 A.M.	5409074	2807		
10:35 A.M.	5409107	2808		
	Shut well in.			
24 November 1961				
2:30 A.M.	Start pump.			
3:30 A.M.	5409310	2812		
4:30 A.M.	5409520	2817		
5:30 A.M.	5409725	2822		
6:30 A.M.	5409925	2827		
7:30 A.M.	5410095	2830	39	32,000
8:30 A.M.	5410210	2833		
9:30 A.M.	5410303	2835		
10:30 A.M.	5410430	2838		
11:30 A.M.	5410530	2840		
1:30 P.M.	5410690	2844	40	31,000
2:30 P.M.	5410749	2845		
3:30 P.M.	5410791	2846		
4:30 P.M.	5410844	2848		
5:30 P.M.	5410911	2849		
6:30 P.M.	5410967	2851		
7:30 P.M.	5411022	2852	41	31,500
8:30 P.M.	5411072	2853		
	Shut well in.			
25 November 1961				
7:00 A.M.	5411619	2866	42	33,000
8:00 A.M.	5411665	2867		
9:00 A.M.	5411696	2868		
10:00 A.M.	5411740	2869		
11:00 A.M.	5411776	2870	43	31,500
12:01 P.M.	5411817	2871		
2:00 P.M.	5411915	2873		
3:00 P.M.	5411965	2874		

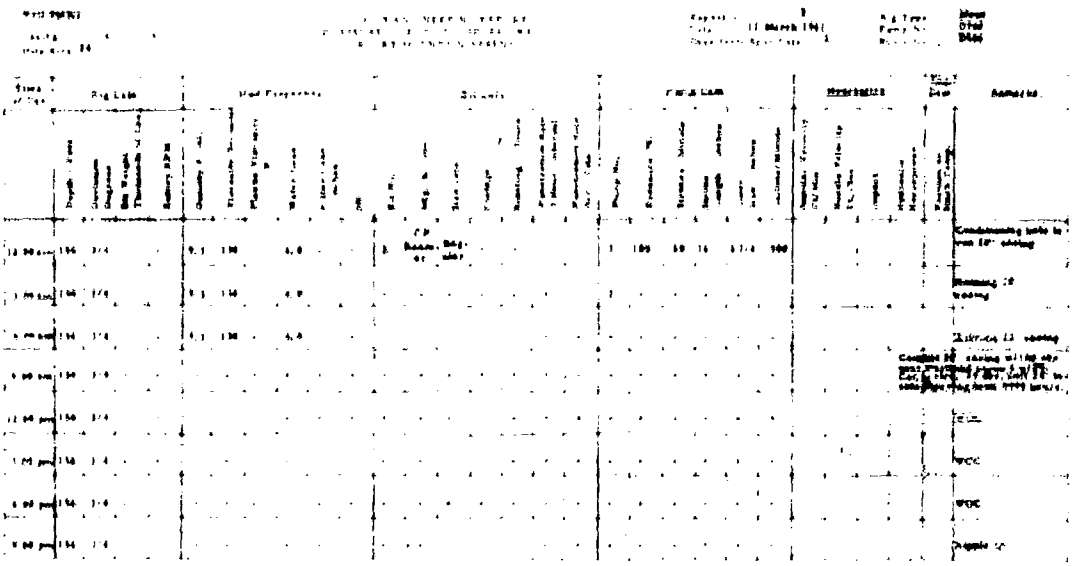
25 November 1961 (Continued)	Meter Reading	Cumulative Prod. (bbls.)	Sample No.	Cl-ppm
4:00 P.M.	5412017	2875		
5:00 P.M.	5412074	2877	44	31,000
6:00 P.M.	5412120	2878		
8:00 P.M.	5412214	2880		
9:00 P.M.	5412225	2881		
10:00 P.M.	5412291	2882		
11:00 P.M.	5412334	2883		
11:59 P.M.	5412368	2884		
26 November 1961				
7:00 A.M.	5412713	2892	45	31,250
8:00 A.M.	5412755	2893		
9:00 A.M.	5412786	2894		
10:00 A.M.	5412832	2895		
11:00 A.M.	5412863	2896		
12:01 P.M.	5412893	2896		
2:00 P.M.	5412958	2896	46	32,000
3:00 P.M.	5413000	2897		
4:00 P.M.	5413030	2898		
5:00 P.M.	5413062	2899		
6:00 P.M.	5413093	2899		
7:00 P.M.	5413130	2900		
8:00 P.M.	5413164	2901	47	32,500
9:00 P.M.	5413201	2902		
27 November 1961				
7:00 A.M.	5413566	2911		
8:00 A.M.	5413605	2911	48	32,500
10:00 A.M.	5413674	2913		
10:30 A.M.	5413689	2914	(10-gal. sample)	
	Shut pump down to pull rods and tubing.			
10:45 A.M.	Pulling unit stuck in mud.			
4:00 P.M.	Unit rigged up to pull rods.			
5:00 P.M.	Pulled 17 rods and shut down for night.			
28 November 1961				
6:30 A.M.	Commence pulling rods.			
12:01 P.M.	Finish pulling rods.			
12:30 P.M.	Rig up to pull tubing.			
5:00 P.M.	Tubing would not unseat, pulled to 75,000#, but unable to pull more due to soft sub base. Shut down for night.			
29 November 1961				
6:30 A.M.	Move pulling unit to other side of the well in order to secure firmer footing for pulling unit.			

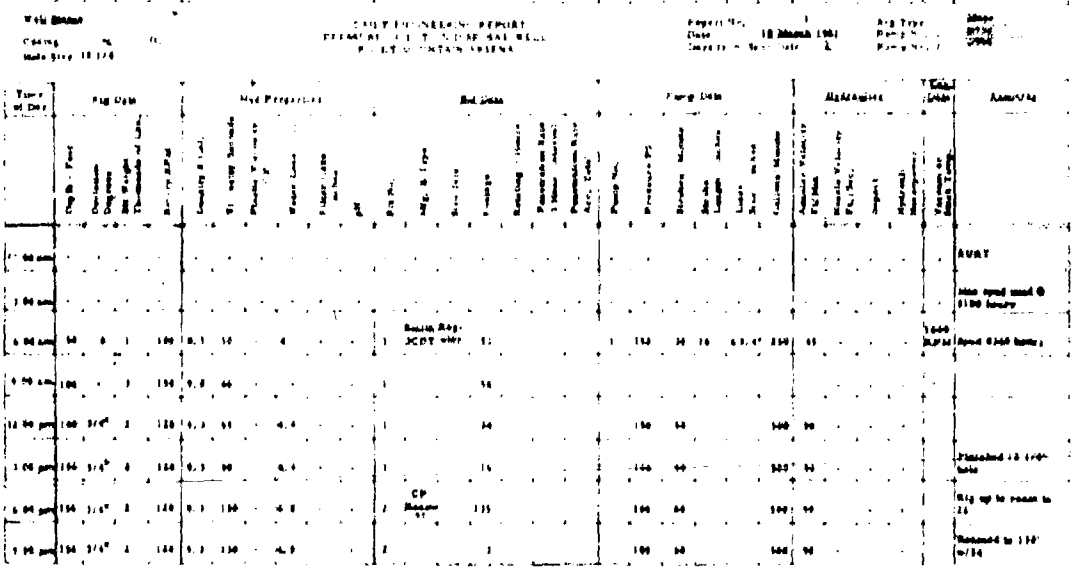
29 November 1961
(Continued)

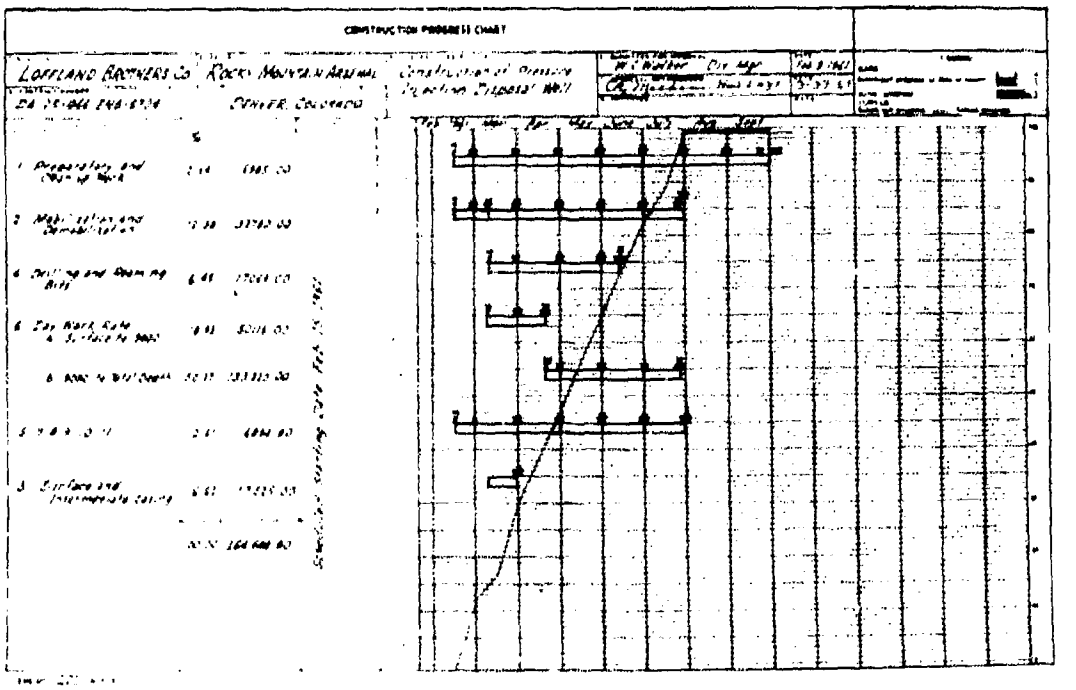
7:45 A.M.	Trucks arrived to move pumping unit.
10:45 A.M.	Pulling unit rigged up.
2:30 P.M.	Prepare foundation and rigged up work space around well head.

30 November 1961

7:00 A.M.	Pulling tubing.
1:30 P.M.	Finished pulling tubing.
1:45 P.M.	Install christmas tree.
3:30 P.M.	Tear down pulling unit.






CONSTRUCTION PROGRESS CHART
LOFFLAND BROTHERS CO.
ROCKY MOUNTAIN ARSENAL
DENVER, COLORADO

Well Status

Casing [illegible]

Hole Size [illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. [illegible]
Date [illegible] March 1961
Date from Spud Date [illegible]

Rig Type [illegible]
Pump No. [illegible]
Pump No. [illegible]

Time of Day	Rig Data				Mud Properties						Bit Data							Pump Data						Hydraulics					Est. Data	Remarks
	Depth - Feet	Deviation Degrees	Bit Weight Thousands of Lbs	Rotary RPM	Density Ft/Gal	Viscosity Seconds	Plastic Viscosity CP	Water Loss cc	Filter Cake Inches	pH	Bit No.	Mfg. & Type	Size Inches	Footage	Rotating Hours	Penetration Rate Ft/Hour	Penetration Rate Ft/Hour	Pump No.	Pressure PSI	Stroke Minute	Stroke Length Inches	Liner Size Inches	Gallons Minute	Annular Velocity Ft/Min	Nozzle Velocity Ft/Sec	Impact	Hydraulic Horsepower	Vacuum or Stack Temp		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]			1	Smith Reg. 3CDT [illegible]	[illegible]	[illegible]		[illegible]		1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						Hole [illegible] Plugged
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								[illegible]		[illegible]		1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						Hole trouble w/ [illegible] Adding phosphate to mud system
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								[illegible]				1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						Reduced [illegible] speed to allow mud to [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								[illegible]																[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					1	Reed Reg. [illegible]	[illegible]	[illegible]				1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								[illegible]				1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						Started to build up mud at about 1000' per [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								[illegible]				1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]								[illegible]				1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						

Well Status

Casing [illegible]

Hole Size [illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. [illegible]
Date [illegible] March 1961
Date from Spud Date [illegible]

Rig Type [illegible]
Pump No. [illegible]
Pump No. [illegible]

Time of Day	Rig Data				Mud Properties						Bit Data							Pump Data						Hydraulics					Est. Data	Remarks
	Depth - Feet	Deviation Degrees	Bit Weight Thousands of Lbs	Rotary RPM	Density Ft/Gal	Viscosity Seconds	Plastic Viscosity CP	Water Loss cc	Filter Cake Inches	pH	Bit No.	Mfg. & Type	Size Inches	Footage	Rotating Hours	Penetration Rate Ft/Hour	Penetration Rate Ft/Hour	Pump No.	Pressure PSI	Stroke Minute	Stroke Length Inches	Liner Size Inches	Gallons Minute	Annular Velocity Ft/Min	Nozzle Velocity Ft/Sec	Impact	Hydraulic Horsepower	Vacuum or Stack Temp		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]	1	Smith Reg. 3CDT [illegible]	[illegible]	[illegible]				1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	1			[illegible]				1	[illegible]	[illegible]			[illegible]	[illegible]						
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					1			[illegible]				1	[illegible]	[illegible]			[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					1			[illegible]				1	[illegible]	[illegible]			[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]			1			[illegible]				1	[illegible]	[illegible]			[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]			1			[illegible]				1	[illegible]	[illegible]			[illegible]	[illegible]						

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DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. [illegible]
Date [illegible] March 1961
Date from Spud Date [illegible]

Rig Type [illegible]
Pump No. [illegible]
Pump No. [illegible]

Time of Day	Rig Data				Mud Properties						Bit Data							Pump Data						Hydraulics					Est. Data	Remarks
	Depth - Feet	Deviation Degrees	Bit Weight Thousands of Lbs	Rotary RPM	Density Ft/Gal	Viscosity Seconds	Plastic Viscosity CP	Water Loss cc	Filter Cake Inches	pH	Bit No.	Mfg. & Type	Size Inches	Footage	Rotating Hours	Penetration Rate Ft/Hour	Penetration Rate Ft/Hour	Pump No.	Pressure PSI	Stroke Minute	Stroke Length Inches	Liner Size Inches	Gallons Minute	Annular Velocity Ft/Min	Nozzle Velocity Ft/Sec	Impact	Hydraulic Horsepower	Vacuum or Stack Temp		
[illegible]	[illegible]	[illegible]			[illegible]	[illegible]		[illegible]																						Nipping up to drill second
[illegible]	[illegible]	[illegible]			[illegible]	[illegible]		[illegible]																						Working up BOP
[illegible]	[illegible]	[illegible]			[illegible]	[illegible]		[illegible]																						Change out RT & Nipple up BOP
[illegible]	[illegible]	[illegible]																												[illegible]
[illegible]	[illegible]	[illegible]																												[illegible]
[illegible]	[illegible]	[illegible]																												[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]	1	Smith Reg. 3CDT [illegible]						1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]	1			[illegible]				1												

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Time Log	Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Time Log	Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Time Log	Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL

Report No. 14
Date 11 March 1981
Days from Spot Date 11

Rig Type IDECO
Pump No. 1 D700
Pump No. 2 D700

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Modulation	Eng. Data	Remarks
12:00 am							Repair Transmission
1:00 am							Install New Mount
2:00 am							
3:00 am							
4:00 am							
5:00 am							
6:00 am							6:10 P.M. Start picking up drill collars
7:00 am							Picking up drill pipe

Report No. 13
Date 11 March 1981
Days from Spot Date 11

Rig Type IDECO
Pump No. 1 D700
Pump No. 2 D700

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Modulation	Eng. Data	Remarks
12:00 am							Repair Transmission
1:00 am							
2:00 am							
3:00 am							
4:00 am							
5:00 am							
6:00 am							
7:00 am							
8:00 am							
9:00 am							
10:00 am							
11:00 am							
12:00 pm							
1:00 pm							
2:00 pm							
3:00 pm							
4:00 pm							
5:00 pm							

Well Status
Casing 771.8 [illegible]
Hole Size [illegible]

Rig Type IDECO
Pump No. 1 D700
Pump No. 2 D700

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Modulation	Eng. Data	Remarks
12:00 am							Repair Transmission
1:00 am							
2:00 am							
3:00 am							
4:00 am							
5:00 am							
6:00 am							
7:00 am							
8:00 am							
9:00 am							
10:00 am							
11:00 am							
12:00 pm							
1:00 pm							
2:00 pm							
3:00 pm							
4:00 pm							
5:00 pm							

IDECO

Testing Blowout Preventers.

Testing Blowout Preventers. Repair leaky valves

Testing Blowout Preventers. Repair leaky valves

Coring in Hole W/Bit 6 m Between Drlg

[illegible] Status

[illegible] 2004 [illegible]

[illegible] REPORT
[illegible]

[illegible] 19 March 1961 [illegible]

Rig Type IDECO
[illegible] D700
[illegible] D500

Rig Data	[illegible]	Dil Data	Pump Data	Hydraulics	Eng. Data	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Trip for Bit #11 Started Trip at 10 07 P.M.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SD to repair Sprocket at 8 50 A.M.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SD for Repair
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Commence drilling at 8 45 A.M. 5' of fill-up

[illegible] Status

[illegible] 2004 [illegible]

[illegible] REPORT
[illegible]

Report No. 19
Date 20 March 1961
Days from Spud Date 18

Rig Type IDECO
Pump No. 1 D700
Pump No. 2 D500

Rig Data	[illegible]	Dil Data	Pump Data	Hydraulics	Eng. Data	Remarks
01 5387 1255	[illegible]	Higher OSC-3	[illegible]	[illegible]	[illegible]	Shut Down For Repairs To Mud Line
5387 5255	60 [illegible]	Higher OSC-3	Zero Zero	[illegible]	[illegible]	Resumed Drilling at 1 04 A.M.
5446 5255	[illegible]	Higher OSC-3	[illegible]	[illegible]	[illegible]	
5447 5470						Trip for bit #10
5590 5470	[illegible]	Sharp DT	[illegible]	[illegible]	[illegible]	Trip for bit #10 #9 Cones locked Teeth dull
5713 5470	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	On bottom 12 30 P.M.
5855 5470	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Air in pump
						Drilling

[illegible] 2004

[illegible] REPORT
[illegible]

[illegible] 19 March 1961 [illegible]

Rig Type IDECO
[illegible] D700
[illegible] D500

Rig Data	[illegible]	Dil Data	Pump Data	Hydraulics	Eng. Data	Remarks
01 [illegible]	[illegible]	Smith DT	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Trip for bit #9 #8 [illegible] 18 hours
[illegible]	[illegible]	Higher [illegible]	[illegible]	[illegible]	[illegible]	Start drilling 12 55
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Drilling
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Drilling
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Drilling

[illegible]

Casing [illegible] 2006

Hole Size [illegible]

PRESSURE [illegible]

[illegible] 22 [illegible] IDECO

Date [illegible] April [illegible] 22 [illegible] D700

Days from Spud Date [illegible] D500

Time of Day	Rig Data				Mud Properties						Bit Data							Pump Data						Hydraulics				Remarks
	Depth Feet	Inclination Degrees	Bit Weight Thousands of Pounds	Rotary RPM	Density Pounds	Viscosity Seconds	Plastic Viscosity	Water Loss	Filter Cake Inches	pH	Bit No.	Mfg. & Type	Size Inches	Footage	Rotating Hours	Penetration Rate Feet/Hour	Penetration Rate Acc. Total	Pump No.	Pressure PSI	Stroke Minute	Stroke Length Inches	Liner Size Inches	Gallons Minute	Annular Velocity Feet/Min	Nozzle Velocity Feet/Sec	Pressure Drop	Hydraulic Hp	Remarks
11 01 am	6447	1/4° 6437	62	80	9.4	31	-	8.4	1/32	8.5	13	OSC3 HTC	Reg.	64	3	22.6	20.3	1	1200	62	16	6 3/4	520	125	-	-	-	1100 RPM 150° Avg.
[illegible]	6642				-	-	-	-	-	-				45	21/8	29	28.7	-	-	-	-	-	-	-	-	-	-	2 30 P. M. - 40 m Repair Mud Line
[illegible]	6642				-	-	-	-	-	-																		Repairing Mud Line
[illegible]	6644		65	80	9.5	31	-	8.4	1/32	9.0				24	1.83	13.1	19.9	1	1275	64	16	6 3/4	540	125			1-1600° 2-4000° 3-4000°	1 1100 1-1 1100	Prove SD includes one hour work on Drawworks Removed Drlg. at 7 10 A. M.
12 [illegible]	6700	19° 6690	-		9.5	32		8.2	1/32	9.0				34	2.25	15.1	16.8	-	-	-	-	-	-	-	-	-	-	Trip for Bit #14 out Starting at 12 15 P. M. Start circ. at 11 15 A. M.
[illegible]	[illegible]		-		-	-	-	-	-	-																		Trip for Bit #14 Trip in start at 2 15 P. M.
[illegible]	[illegible]		22	75	-	-	-	-	-	-	16	OSC3 HTC	Reg.	6	.10	12	12	1	1300	64	16	6 3/4	540	-			1-540° 2-400° 3-475°	1 1 1	Bit #14 Drilling at 5 15 P. M.
[illegible]	6760		66	80	9.5	31	5	7.6	1/32	8.5				54	3	16	17.2	1	1500	62	16	6 3/4	520	125	-	-	-	1100 RPM 475° Avg.

[illegible]

[illegible] 2006

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

[illegible] 22 Date 31 March 1961 Days from Spud Date 21 Rig Type IDECO Pump No. D700 Pump No. D500

	Rig Data				Mud Properties						Bit Data							Pump Data						Hydraulics				Remarks
	Depth Feet	Inclination Degrees	Bit Weight Thousands of Pounds	Rotary RPM	Density Pounds	Viscosity Seconds	Plastic Viscosity	Water Loss	Filter Cake Inches	pH	Bit No.	Mfg. & Type	Size Inches	Footage	Rotating Hours	Penetration Rate Feet/Hour	Penetration Rate Acc. Total	Pump No.	Pressure PSI	Stroke Minute	Stroke Length Inches	Liner Size Inches	Gallons Minute	Annular Velocity Feet/Min	Nozzle Velocity Feet/Sec	Pressure Drop	Hydraulic Hp	Remarks
01	6381	-	50	66	9.4	31	-	8.4	1/32	9	12	Reed YT3		53	3	17.7	15.2	1	1200	64	16	6 3/4						
	6387	-	50	80	9.4	30	-	9.4	1/32	9				42	2.75	15.3	15.2	1	1150	65	16	6 3/4						
	6390	-	50	80	9.5	31	-	9	1/32	9				47	2.5	18.8	16.9	1	1000	60	16	6 3/4						
			50	80	9.4	32	-	9.8	1/32	9																		
	6435				9.3	32	-	6.0	1/32	9				231'	14		16.9											Trip out for Bit #13 @12 231' 14 hrs
	6435	1/4° 6430			9.3	32		6.0	1/32	-	13	Higbee OSC3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	Trip in Bit #13
	6470	-	50	80	9.6	30	-	6.0	-	-				35	1.75	20	20	1	1200	60	16	6 3/4	500	120	-	-	-	On bottom at 4 P. M.
	6529	-	60	60	9.4	30	6	7.6	1/32	8.5				59	3	19.7	19.8	1	1200	62	16	6 3/4	520	125	-	-	-	1100 RPM 400° Avg.

[illegible] 2006

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

[illegible] 21 Date 30 March 1961 Days from Spud Date 20 Rig Type IDECO Pump No. D700 Pump No. D500

	Rig Data				Mud Properties						Bit Data							Pump Data						Hydraulics				Remarks
	Depth Feet	Inclination Degrees	Bit Weight Thousands of Pounds	Rotary RPM	Density Pounds	Viscosity Seconds	Plastic Viscosity	Water Loss	Filter Cake Inches	pH	Bit No.	Mfg. & Type	Size Inches	Footage	Rotating Hours	Penetration Rate Feet/Hour	Penetration Rate Acc. Total	Pump No.	Pressure PSI	Stroke Minute	Stroke Length Inches	Liner Size Inches	Gallons Minute	Annular Velocity Feet/Min	Nozzle Velocity Feet/Sec	Pressure Drop	Hydraulic Hp	Remarks
01	6467		60	130	9.5	36	6.0	8.2	1/32	8.0	1	HTC OSC3	Reg.	61	3	21	20.6	1	1000	60	16	6 3/4	500	120	-	-	-	1100 RPM 400° Avg.	Tight hole at 5900' & 5925'
	6614		60	130	9.2	29	3	[illegible]	1/32	8.5				91	3	30.3	26.2								-	-	-	1100 RPM 475° Avg.	Adding dilution
	6160		60	130	9.4	35	-	8.4	1/32	9.0				102	3	34	26.2		1150	60	16	6 3/4	500	125			-	1050 RPM 450° Avg.	
	6204		60	130	9.4	35		8.4	1/32	9.0				66	13/2	29.3	28.7	1	1150	60	16	6 3/4	500	125					Tentated off at 7 10 P. M. Left 27 DC's
																												Fishing
																												Fishing
																												Fishing
	6292		50	60	9.4	33	-	[illegible]	[illegible]	9	2	Reed YT3		48	3	16	16	1	1200	65	16	6 3/4	540	125				

Well Status
Casing 13 3/8 @ 2006 ft

Report 24 · Date 4 April 1961 · IDECO D700 D500

Time of Day	Depth	Rig data / Mud properties / Bit data / Pump data / Hydraulics (as legible)	Remarks
[illegible]	[illegible]	1° [illegible] 60 ... MTC Reg. OSC-3 ... [illegible]	1100 rpm 650°
[illegible] am	[illegible]	... [illegible]	1100 rpm 650°
5:00 am	[illegible]	60 ... [illegible]	1100 rpm 650°
[illegible] am	7600	60 ... [illegible]	
[illegible] pm	7600	2 1/2° ... [illegible]	8:15 A.M. trip bit #14 300' 15 3/4 hrs.
1:00 pm			Break and lines all 7 drill collars
[illegible] pm			Trip in hole, bit #15
[illegible] pm	[illegible]	60 ... MTC Reg. OSC-3 ... [illegible]	1100 rpm Drilling at 6:00 P.M.

Well Status
Casing 13 3/8 2006 ft

Report 25 · 5 April 1961 · IDECO D700 D500

Time of Day	Depth	Rig data / Mud properties / Bit data / Pump data / Hydraulics (as legible)	Remarks
12:01 am	7117	2 1/2° 7000' 60 ... MTC Reg. OSC-3 ... 6 3/4 ... 125	1100 rpm 625°
1:00 am	7190	3° 7117 ... 125	
[illegible] am	7237	3 1/4° 7211 ... 125	
5:30 am	7317	... 125	
11:00 pm	7330	... [illegible]	Trip bit #15 340' 13 hrs.
[illegible] pm	7330		Trip bit #15
[illegible] pm	7330		Trip bit #15
[illegible]	7382	3 1/4° 7311 60 ... Converted to gyp base mud ... MTC Reg. OSC-3 ... 1100 ... 675 110	1100 rpm 625° One engine down on bottom 8:00 P.M.

Well Status
Casing 13 3/8 2006 ft

Report 26 · 6 April 1961 · IDECO D700 D500

Time of Day	Depth	Rig data / Mud properties / Bit data / Pump data / Hydraulics (as legible)	Remarks
[illegible]	7474	3 3/4° 7371 60 70 ... MTC Reg. OSC-3 ... 6 3/4 ...	2 drums 1100 rpm Conditioning mud
	7571	76 ... [illegible]	2 drums 1075 rpm Completed mud conversion at 1:30 A.M.
	7691	76 ... [illegible]	2 drums 1100 rpm 650°
	7696	74 ... [illegible]	
[illegible]	7696		Trip bit #16 300' 11 hrs. Tooth mud-line dull, bottom hole [illegible]
[illegible]	7727	... MTC OSC-3 ... 470 110	
[illegible] pm	7800	... 470 110	Running weight vs. Penetration rate
[illegible] pm	7863	... [illegible]	1100 rpm 650°

Date 3 April 1961

Time of Day	Rig Data			Mud Properties							Bit Data							Pump Data						Hydraulics				Remarks
	1 3/4"											HTC Reg.																
12 01 am	7066	1211	64	70	9.1/2	35	-	9.0	1/32	2.5	17	OSC-1 Star		30	2.5	30.0	27.0	1	1300	52	16	6 370	520	123	-	-	-	1:30 p.m. 8/7/61 Short trip. Pulled 5 stands.
2 00 am	7066				9 1/2	31	-	9.0	2/32	2.5				15	.35	26.0	26.0											Circ. prior to trip out.
3 15 am	3 1/2" 7066 7066																											Trip
5.00 am	7066																											Bit 017 266' 10 hours
12 00 pm	7091		50	74	9 1/2	35	8	9.0	2/32	6.0	10	Reed YT3		31	2.0	15.0	15.0		1400	51		515		122	-	-	-	On bottom at 10 00 A. M.
3 00 pm	7091		50	74										2														Short trip. 5 stands through Mississippi
6 00 pm	7134		50	74	9.6	35	8	9.0	2/32	6.0				30	3.33	22.3	18.6		1300	52		520		125	-	-	-	Drilling
9 00 pm	7163		50	74	9.5	34	-	9.0	1/32	-				32	3.33	23.6	20.4		1300	54		470		115				9:30 p.m. 7/8/61 Drilling

Alva Reynolds
Engineer in Charge (Civil)
J. Hardy Garrett, Jr.
Engineer in Charge (Civil)

IDECO
D700
D300

Trip

Trip in

Pick up Core Bbl.

Trip in with Bbl.

Coring

Time of Day | Rig Data | Mud Properties | Bit Data | Pump Data | Hydraulics | Remarks

Smith Reg.

IDECO
D700
D300

Time of Day | Rig Data | Mud Properties | Bit Data | Pump Data | Hydraulics | Remarks

Reed Reg.

11 April 1967

IDECO
D160
D660

Trip in commenced.

Trip out core 82 at 11:30 P.M.

Trip in core 83

HTC Reg.

18 April 1967

IDECO
D160
D556

Rig Data

Depth Feet

Reaming at 8507

Reamed to 8513. Start out of hole at 3:15 A.M.

HTC Reg.

Trip in cut 822

Ream at 8519

On trip

9 April 1967

IDECO
D160
D660

Coring

Coring

Coring

Trip

Trip

Recovering core

HTC Reg.

Trip

Circulating

Well Name

Casing 13 3/8 @ 1000 ft

Date 9-11-

[illegible] ENGINEERING REPORT

[illegible] DEEP WELL WELL

ROCKY MOUNTAIN ARSENAL

Date 16 April 1961

Rig Type [illegible]

Rig [illegible]

Pump [illegible]

Time in Day	Rig Data				Mud Properties							Bit Data						Drilling Data							Hydraulics					Time Log	Remarks
	Time	Depth	Degrees	Deviation	Drill Pipe RPM	Density	Viscosity	Plastic Viscosity	Yield Point	Gels	Filtrate		Bit No.	Type	Jets	Depth Out	Footage	Hours	Feet/Hour	Pump Pressure	Strokes	Bit Weight	Rotary RPM	Torque	Pump Pressure	Pump Strokes	Bit Jet Velocity	Bit Impact Force	Bit Horsepower		
12 01 am	0640	9000	19	22	9.4	50	19	5.2	1/32	8.0	Dia. Trace Core		9	3.0	3	3	3	1300	44	16	6 3/4	170	90	-	-	-	-	-		Coring Details
1 01 am	0640	9000	20	24	9.4	61	20	6.0	1/32	8.0			9	3.0	3.7	3.0	3	1000	44	16	6 3/4	170	90	-	-	-	-	-		Coring Details
2 01 am	0641	9000	16	16	9.4	52	16	5.0	1/32	8.0			9	0.25	3.0	3.7	3	1000	44	16	6 3/4	170	90	-	-	-	-	-		Coring Details
3 01 am	0641	9000	21	16	9.4	65	15	5.0	1/32	8.0			9	3.0	3.4	3.5	3	1400	36	16	6 3/4	300	72	-	-	-	-	-		
4 01 am	0641	9000	21	16	-	-	-	-	-	-			9	-	-	-	3	1400	36	16	6 3/4	300	72	-	-	-	-	-		
5 01 am	0641																													Trip to pull core #3
6 01 am	0641																													Trip
7 00 am	0641											26	HTC WTR	Regular																Trip

Date 15 April 1961

Time in Day	Rig Data				Mud Properties							Bit Data						Drilling Data							Hydraulics					Time Log	Remarks
12 01 am	0641	9641			9.4	50	13	4.5	1/32	7.0	HTC OWSVular	Regular																			Trip in
1 00 am	0641		60	64	9.4	55	-	6.0		8.0			31	2.75	11.2	11.2		1300	44	16	6 3/4	500	190							1100 rpm 450#	On bottom 12 01 A.M. 19 drilling
2 00 am	0643		60	72	9.4	44	18	6.0		8.0			24	2.75	9.4	10.1														1100 rpm 450#	Drilling
3 00 am	0643		52	74	9.4	49	15	6.0		8.5			7	3.0	3.0	3.0														1100 rpm 450#	1 00 A.M. Circulate pumpkin
4 00 am	0643		50	74	9.4	49	15	6.0		8.5			3	.80	3.4	3.3														1100 rpm 450#	4 00 A.M. Circulate pumpkin
5 00 am	0643																														Trip in pick up core bbl.
6 00 am	0643																														Trip in hole w core bbl.
7 00 am	0643		70	65	9.4	55	15	6.7	-	8.0	Dia-mond Trace Core							1300	30	16	6 3/4	320	17							700 rpm 450#	Coring at 9643' at 5 45 P.M.

12 3/4 3200

Date 16 April 1961

Time in Day	Rig Data				Mud Properties							Bit Data						Drilling Data							Hydraulics					Time Log	Remarks
											HTC	Reg																			
1 00 am	0644		72	84	9.4	50	20	5.0	1/32	7.0			32	2.75	11.2	11.2		1300	44	16	6 3/4	500	190								Reaming core hole
2 00 am	0644																														Circulating preparatory to trip out DST #1
3 00 am	0644																														DST #1
4 00 am	0644																														
5 00 am	0644																														
6 00 am	0644																														
7 00 am	0644																														DST #1 Trip in hole w/ [illegible] Ran Tool [illegible] [illegible]

Well Status
Casing 13 3/8 @ 1006 ft
Hole Size 11

IDECO
D700
D500

30
17 April 1961
36

Time of Day	Depth	Data (as legible)	Remarks
[illegible]	8681	8678 ... 9.1 75 ... 17 6.6 3.32 8.8 ... Dia. Trans Core 3 ... 2.2 ...	7000 ppm Cl. Trip out core barrel
[illegible]	8681		Trip out core barrel.
[illegible]	8681	34 HTC W7R Reg.	Trip in bit #69.
[illegible]	8681		Reaming at 7:00 A. M.
12 pm	8690	64 54 9.1 56 18 6.6 8.32 9.0 ... 4/H1 ... 1 1413 41 16 ... 110 132	Drill to 11:30 A. M. Circulate samples.
[illegible] pm	8690	9.1 33 6.0 9.0	Circulate Samples.
5:30 pm	8690		Trip out 3:10 A. M. bit #70.
9:30 pm	8690	34 64 ... Smith T2 Reg. ... 1 1350 ... 16 ...	900 ppm 1-1-3. Trip out #69

Well Status
Casing 13 3/8 @ 1006 ft
Hole Size 11

31
18 April 1961
37

IDECO
D700
D500

Time of Day	Depth	Data (as legible)	Remarks
12:01 am	8678	8680 ... 9.1 41 33 6.2 1/32 8.5	Trip out core barrel.
1:00 am	8612	17 HTC W7R Reg.	Trip in bit #64. Rem. 18' [illegible] [illegible]
6:00 am	8672	18 70 9.1 76 43 6.6 1/32 7.0 37 ... 1/2 ... 1 1800 76 16 6 445 110	On bottom at 8 ... at 6:30 A. M. Reaming at [illegible]
8:30 am	8678	8675 34 70 9.0 44 20 5.2 1/32 8.5 37 ... 2.4 ... 1 1800 71 16 ... 445 112	Ream to 8674 Drill to 8675
[illegible] pm	8675		Trip out Bit #[illegible] [illegible] [illegible]
[illegible] pm	8675		
6:00 pm	8675		On Bottom 6:15 P. M.
8:30 pm	8676	8675 34 60 9.1 48 18 6.6 1/32 8.5 Dia. Trans Core 3 ... 1.1 1.1 1 1300 38 16 ... 278 61	7000 ppm Cl

Well Status
Casing 13 3/8 @ 1006 ft
Hole Size 11

37
13 April 1961
36

IDECO
D700
D500

Time of Day	Depth	Data (as legible)	Remarks
[illegible]	8651	8650 14 70 9.0 60 40 5.2 1/32 8.5 34 HTC W7R Reg. 14' ... 1 1333 64 16 ... 545 130	Reaming at 8647'
[illegible]	8640	64 18 9.0 75 34 6.6 1/32 8.5 ... 1 1333 64 16 ... 545 130	Ream to 8647' Drill to 8662' and Circulate samples.
[illegible]	8660	9.1 100 34 5.8 1/32 8.5	Circulating, short out of hole at 3:00 A. M.
[illegible]	8662		Trip for core bbl.
[illegible] pm	8661		On bottom
[illegible] pm	8661	34 64 9.1 74 ... 6.0 ... Trans ... 1 1 1.1 1.0 1 1150 60 16 ... 445 60	Commence coring 3:00 P. M.
[illegible] pm	8666	34 64 9.1 96 33 6.0 1 32 8.5 ... 6 3.5 1.6 2.9 1 1100 60 16 ... 444 63	7000 ppm Cl
[illegible] pm	8673	34 64 9.1 81 33 5.6 1 32 8.5 ... 6 2.15 ... 1.9 1 1100 60 16 ... 444 63	Trip out core bbl.

DAILY ENGINEERING REPORT

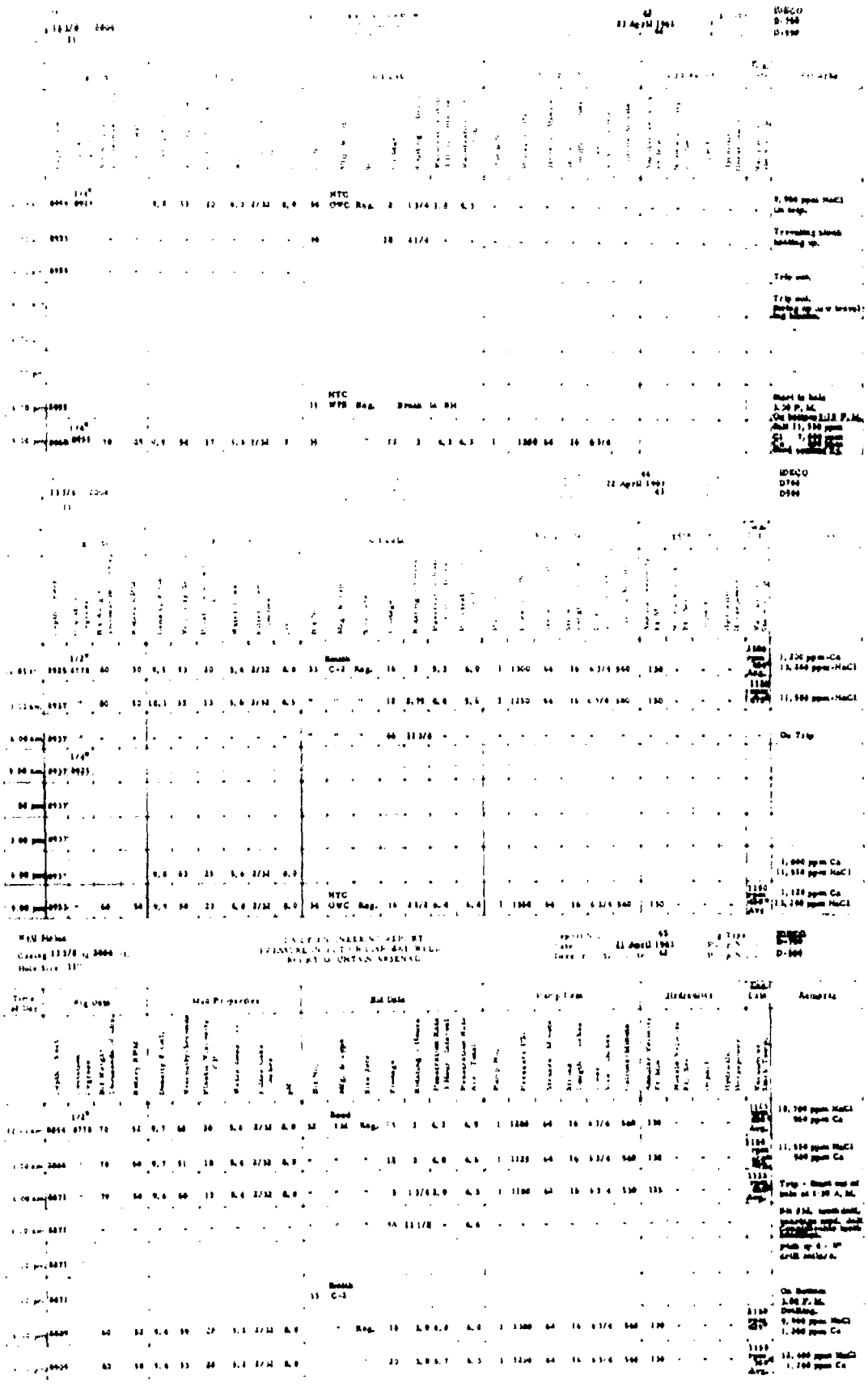
Time of Day | Rig Data | Mud Properties | Bit Data | Pump Data | Hydraulics | Remarks

DAILY ENGINEERING REPORT

Time of Day | Rig Data | Mud Properties | Bit Data | Pump Data | Hydraulics | Remarks

DAILY ENGINEERING REPORT

Time of Day | Rig Data | Mud Properties | Bit Data | Pump Data | Hydraulics | Remarks



Time of Day	Wtg Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Log Data	Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 46
Date 26 April 1966
Days from Spud Date 67

Rig Type LOECO
Pump No. D-300
Pump No. D-350

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Deviation	Time Data	Remarks
			Ream HTC-W3R Reg.				Out of hole at 11:50 P.M.
							Working on Dowell and milling tool
							Trip in with milling tool
							Milling on junk
							Milling on junk.
							1:30 P.M. Parted milling tool.
			HTC-14 W3R Reg				Ream HTC-14. Milling on junk
							Fishing on junk.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 47
Date 27 April 1966
Days from Spud Date 68

Rig Type
Pump No.
Pump No.

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Deviation	Time Data	Remarks
			Reed 17 ZC Reg				Milling on junk
			Ream HTC-21 W3R				Trip in at 6:30 A.M.
							Trip in at 8:30 A.M.
							Trip to bottom at 9:30 A.M.
							Milling on junk.
							Milling on junk
							Milled to 11:15 A.M. Pulled at 12:30
							Trip

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 48
Date 28 April 1966
Days from Spud Date 69

Rig Type LOECO
Pump No. D-300
Pump No. D-350

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Deviation	Time Data	Remarks
			HTC-W3R Reg				Fishing
			Reed 17 ZC Reg				Milled to 2:30 A.M. Pulled at 3:30 A.M.
							Drilling on junk
							Milling on junk
							Trip at 6:30 A.M.
							Trip at 8:30 A.M.
			Reed 17 ZC Reg				Circulating
			Reed 17 ZC Reg				

Well Status
Casing 13 3/8" @ 2000 ft
Hole Size 11"

[illegible] INFERRED REPORT
[illegible]

Report No. 51
Date 29 April 1961
Days from Spud Date 50

Rig Type IDECO
Pump No. 1 D-700
Pump No. 2 D-500

Time of Day	Rig Data: Depth - Feet	Rig Data: Deviation Degrees	Rig Data: Bit Weight Thousands of Lbs	Rig Data: Rotary RPM	Mud Properties: Density # Cal.	Mud Properties: Viscosity Seconds	Mud Properties: Plastic Viscosity	Mud Properties: Water Loss	Mud Properties: Filter Cake	Mud Properties: pH	Bit Data: Bit No.	Bit Data: Mfg. & Type	Bit Data: Size	Bit Data: Depth	Bit Data: Rotating Hours	Bit Data: Penetration Rate	Bit Data: Penetration Rate	Bit Data: Penetration Rate	Pump Data: Pump No.	Pump Data: Pressure PSI	Pump Data: Strokes	Pump Data: Strokes	Pump Data: Strokes	Pump Data: Drilling Minutes	Hydraulics: Number Velocity	Hydraulics: Nozzle Velocity	Hydraulics: Impact	Hydraulics: Hydraulic Horsepower	Hydraulics: Volume	Remarks
01 am	9130	1/4° 8455	90	45	9.9	54	20	6.0	2/32	8.0	41	Smith C2	Reg.	26	3.0	6.55	9.67	1	1150	62	16	6 3/4	522	126	-	-	-	-	1000 rpm 1-328 2-350 3-370	Drilling.
[illegible] am	9131	1/2° 9130	-	-	-	-	-	-	-	-	41	Smith C2	Reg.	1	.17	6.00	7.41	-	-	-	-	-	-	-	-	-	-	-	-	Trip out for bit #41 at 12:01 A.M. - Drayland Kaufman
[illegible] am	9132	-	-	-	-	-	-	-	-	-	42	Hughes tool IC	Reg.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Trip.
[illegible] am	9136	-	65	45	9.9	49	-	7.6	2/32	8.0				15	2.50	6.00	6.00	1	1250	62	16	6 3/4	522	126					1000 rpm 1-350	10' of Fill. Drilling with bit #42 @ 6:35 A.M.
11:00 pm	9165		70	49	9.9	53	17	7.6		-				19	3.09	6.35	6.19	1	1175	58	-	-	490	119						Drilling.
[illegible] pm	9187		80		9.9	52	18	7.6	-					22	3.00	7.38	6.60	1	1150	63			530	127						
[illegible] pm	9204		80	45	9.8	46	15	6.6	2/32	8.0				19	3.00	6.35	6.52	1	1200	63			505	120						
[illegible] am	9221		-	-	9.6	46	10	6.4	2/32	8.0				15	2.25	6.67	6.55	-	-	-	-	-	-	-	-	-	-	-	-	Trip out bit #42 at 8:15 P.M.

[illegible] 30 28 April 1961 Rig Type IDECO
[illegible] 49 Pump No. D-700
[illegible] D-500

Time of Day	Rig Data: Depth - Feet	Rig Data: Deviation Degrees	Rig Data: Bit Weight Thousands of Lbs	Rig Data: Rotary RPM	Mud Properties: Density # Cal.	Mud Properties: Viscosity Seconds	Mud Properties: Plastic Viscosity	Mud Properties: Water Loss	Mud Properties: Filter Cake	Mud Properties: pH	Bit Data: Bit No.	Bit Data: Mfg. & Type	Bit Data: Size	Bit Data: Depth	Bit Data: Rotating Hours	Bit Data: Penetration Rate	Bit Data: Penetration Rate	Bit Data: Penetration Rate	Pump Data: Pump No.	Pump Data: Pressure PSI	Pump Data: Strokes	Pump Data: Strokes	Pump Data: Strokes	Pump Data: Drilling Minutes	Hydraulics: Number Velocity	Hydraulics: Nozzle Velocity	Hydraulics: Impact	Hydraulics: Hydraulic Horsepower	Hydraulics: Volume	Remarks
01	9222	1/4° 8155	80	45	9.9	54	18	7.6	2/32	8.0	40	HTC OWC	Reg.	22	3.0	6.67	6.33	1	1102	62	16	6 3/4	522	126	-	-	-	-	1000 rpm 1-328 2-350 3-370	Drilling.
	9040		80	44	9.6	52	20	7.6	2/32	7.6	40	HTC OWC	Reg.	18	3.0	6.0	6.25	-	1300	64	16	6 3/4	535	130	-	-	-	-	1000 rpm 1-350 2-350 3-370	Drilling.
	9049		-	-	-	-	-	-	-	-	40	HTC OWC	Reg.	9	1.5	6.0	6.25													Circulated 1 hr. prior to trip out with bit #40.
[illegible] am	9049		-	-	-	-	-	-	-	-	40			40	9.67		6.40	-	-	-	-	-	-	-	-	-	-	-	-	Bit #40 used, dull bearings tight, No junk recovered.
[illegible]	9049		-	-	-	-	-	-	-	-	41	Smith C2	Reg.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Cut drilling line. Trip in bit #41.
	9063		60	50	9.7	52	-	5.0	-	9.1				13	2.25	5.8	5.8	1	1250	63	16	6 3/4	535	127	-	-	-	-		On bottom 12:45 4' fill-up.
	9083		85	48	.8	52	-	6.0	-	8.0				21	3.00	7.0	6.5	1	1150	61	16	6 3/4	542	122						Drilling.
	9105		90	45	9.7	50	18	6.4		7.5	41	Smith C2	Reg.	22	2.67	6.25	7.07	1	1200	62	16	6 3/4	522	126	-	-	-	-	1000 rpm 1-350 2-350 3-370	Drilling. Welded on new pipe on mud line.

[illegible] 31 April 1961 Rig Type IDECO
[illegible] 49 Pump No. D-700
[illegible] Spud Date 49 Pump No. D-500

Time of Day	Rig Data: Depth - Feet	Rig Data: Deviation Degrees	Rig Data: Bit Weight Thousands of Lbs	Rig Data: Rotary RPM	Mud Properties: Density # Cal.	Mud Properties: Viscosity Seconds	Mud Properties: Plastic Viscosity	Mud Properties: Water Loss	Mud Properties: Filter Cake	Mud Properties: pH	Bit Data: Bit No.	Bit Data: Mfg. & Type	Bit Data: Size	Bit Data: Depth	Bit Data: Rotating Hours	Bit Data: Penetration Rate	Bit Data: Penetration Rate	Bit Data: Penetration Rate	Pump Data: Pump No.	Pump Data: Pressure PSI	Pump Data: Strokes	Pump Data: Strokes	Pump Data: Strokes	Pump Data: Drilling Minutes	Hydraulics: Number Velocity	Hydraulics: Nozzle Velocity	Hydraulics: Impact	Hydraulics: Hydraulic Horsepower	Hydraulics: Volume	Remarks
01	9[illegible]	8155	-																											Trip out bit #38
												H Wtr	Reg.																	Trip in bit #39.
	9[illegible]		64	45	[illegible]	52		[illegible]	[illegible]	[illegible]					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				1000 rpm 300	On bottom at 6:15 P.M.
	9[illegible]		[illegible]	[illegible]				[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					11:30 A.M. Trip w/ bit #38, teeth used, dull, bearings good
														[illegible]	[illegible]	[illegible]	[illegible]													Run bit #40.
												HTC OWC	Reg.																	On bottom drilling at 6:50 P.M.
	9[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	40			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				1000 rpm 250	Drilling at 9,040' at 6:37 P.M.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 34 | Date 2 May 1961 | Rig Type IDECO D-700

Time of Day | Rig Data | Mud Properties | Bit Data | Pump Data | Hydraulics | Remarks

Time	Bit No.	Mfg. & Type	Size	Footage	Hours	Accumulated Footage	Accumulated Hours	Pump No.	Pressure PSI	Strokes	Length	Liner Size	Total Pump Strokes	Pump Pressure	Nozzle Size	Impact	Velocity	Remarks
12:00 am	44	HTC OWV Reg.	22	3	7.33	7.17	1	1300	60	16	6 3/4	843	126					Cir 1500 rpm
1:00 am	44		2	.25	0.50	7.18												Trip out bit #44.
2:00 am		Reed 9 7/8 Reg.																Trip in bit #45.
3:00 am	9474	42	60	9.4	42	17	6.4	19	2.75	6.9	5.7	1	1300	60	16	6 3/4	5.6	123	Drilling.
4:00 pm	9519	35	60	9.4	42	16	6.4	25	3.00	6.3	7.4	1	1300	62	16	6 3/4	582	126	Drilling.
5:00 pm	9573	35	62	9.4	42	15	6.4	6	3.17	2.42	6.94								Start out of hole @ 10 A.M.
6:00 pm	9623																		Bit #45 badly dull, bearings tight. Cone [illegible]
7:00 pm	9673	35	64					6	0.83	7.25	7.25	1	1250	53	16	6 3/4	607	118	On bottom at 7:45 P.M. Broke rotary chain. Down 45 min.

HTC OWV Reg.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 35 | Date 1 May 1961 | Rig Type Moss D-700

Time	Bit No.	Mfg. & Type	Size	Footage	Hours	Accumulated Footage	Accumulated Hours	Pump No.	Pressure PSI	Strokes	Length	Liner Size	Total Pump Strokes	Pump Pressure	Nozzle Size	Impact	Velocity	Remarks
12:00 am	44	HTC OWV-IG Reg.	3	0.25	0.50	7.23												Trip
1:00 am	9344	35	65	9.4	46	19	6.4	2/32	6.5	44	5	1	1200	75	16"	6	600	117	Trip - out drilling line, dump mud pit
2:00 am	9344	35	65	9.4	46	19	6.4				0		1200	74			605	117	Trip
3:00 am	9363	45	66	9.4	47	19	6.4				19	1	6.3	6.3	1	1150	72	610	113	1100 rpm drilling 300#
4:00 am	9380	40	66	10.0	35	17	7.6				20	1	6.3	7.35	1	1150	72	619	113	1000 rpm drilling 300#
5:00 am	9410	40	54	10.1	46	17	6.6				22	1	7.1	7.35	1	1150	60	6 3/4 590	121	Drilling
6:00 pm	9436	40	44	9.5	15	16	6.6				26	1	6.8	7.1	1	1300	60	590	121	Drilling
7:00 pm	9462	40	50	9.6	60	19	6.6				17	1	6.6	7.14	1	1400	63	590	118	1000 rpm drilling 300#

HTC OWV-IG Reg.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 36 | Date 30 April 1961 | Rig Type IDECO D-700

Time	Bit No.	Mfg. & Type	Size	Footage	Hours	Accumulated Footage	Accumulated Hours	Pump No.	Pressure PSI	Strokes	Length	Liner Size	Total Pump Strokes	Pump Pressure	Nozzle Size	Impact	Velocity	Remarks
12:00 am	44	HTC OWV-IG Reg.																Trip
1:00 am	9421																	Trip
2:00 am	9436	40	40	9.7	50	16	6.4	2/32	6.5			15	1.75	7.37	6.37	1	1300	60	31" 6 1/4 604	122	Cir Remove B [illegible] Drilling.
3:00 am	9466	40	46	10.0	51	20	6.2	2/32	6.5			24	3.00	6.00	6.27	1	1200	62	16" 606	122	
4:00 am	9483	40	42	10.0	51	22	6.2		6.5			24	3.00	6.00	6.14	1	1150	54	603	114	
5:00 am	9503	40	45	10.0	51	18	6.2		6.5			25	3.00	6.00	7.33	1	1150	54	470	115	Conducted Drill out Tower
6:00 am	9521	40	50	9.6	57	19	6.2		6.5			27	3.50	7.35	7.33	1	1150	54	470	111	
7:00 am	9542	40	50	9.6	63	15	6.2	2/32	6.5			31	3.00	7.00	7.33	1	600	54	16 6 1/4 530	115	Drilling

HTC OWV-IG Reg.

Well Name
Casing [illegible]
Hole Size [illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. [illegible]
Date [illegible]
Days from Spud Date [illegible]

Rig Type IDECO
Pump No. 1 D-[illegible]
Pump No. 2 D-[illegible]

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Time Depth	Remarks
	Depth - Feet; Inclination - Degrees; Bit Weight - Thousands of Lbs; Rotary RPM	Density - Lb/Gal; Viscosity - Sec/Qt; Plastic Viscosity - Cp; Water Loss - cc; Filter Cake - In/32; pH	Bit No.; Mfg. & Type; Size - In; Footage; Rotating - Hours; Penetration Rate - Feet/Hour; Penetration Rate Adj. Total	Pump No.; Pressure - PSI; Strokes - Minute; Stroke Length - In; Liner - In; Liner Inches; Calibrated Minutes	Annular Velocity - Ft/Min; Bottom Velocity - Ft/Sec; Impact; Hydraulic Horsepower	Volume of Mud Tank	
01 am [illegible]			SA-1 Tricone				Preparing to run. Started casing at 12:15 a.m. Cement 18" Last circulation at 1:55 a.m.
2:00 am	[illegible] 18 10		18 1.33 7.5 7.5	1 1000 37 16 5 3/4 318	76		
4:00 am			7.5				
6:00 am							
8:00 am							
10:00 am							
12:00 pm							
2:00 pm							
4:00 pm			MTC 49 WTA Reg.				Casing in hole w/ [illegible] 649.
6:00 pm	[illegible] 10 44			1300 40 16 5 3/4 345 121			Started reaming at 6:05.

Well Name
Casing [illegible]
Hole Size [illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. [illegible]
Date [illegible]
Days from Spud Date [illegible]

Rig Type IDECO
Pump No. 1 D-[illegible]
Pump No. 2 D-[illegible]

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Time Depth	Remarks
	Depth - Feet; Inclination - Degrees; Bit Weight - Thousands of Lbs; Rotary RPM	Density - Lb/Gal; Viscosity - Sec/Qt; Plastic Viscosity - Cp; Water Loss - cc; Filter Cake - In/32; pH	Bit No.; Mfg. & Type; Size - In; Footage; Rotating - Hours; Penetration Rate - Feet/Hour; Penetration Rate Adj. Total	Pump No.; Pressure - PSI; Strokes - Minute; Stroke Length - In; Liner - In; Liner Inches; Calibrated Minutes	Annular Velocity - Ft/Min; Bottom Velocity - Ft/Sec; Impact; Hydraulic Horsepower	Volume of Mud Tank	
							Trip out for bit #17.
							Trip in bit #66.
3:00 am			MTC 16 [illegible] Pro				Trip in, circulating through [illegible]
6:00 am							
9:00 am			2	1 [illegible] 2.61 [illegible]	1 IDECO 61 16 5 3/4 [illegible] 35		1075 gpm 6537 Drilling.
12:00 pm			2	4 [illegible] 2.61 [illegible]			Drill to 7000. Circulate [illegible] to trip [illegible] barrel.
3:00 pm							Circ. for samples. Break [illegible] Salt [illegible] ppm. Ca [illegible] ppm.
6:00 pm							Trip out bit #48. Trip in [illegible] and barrel.
9:00 pm							Pipe [illegible]

Well Name
Casing [illegible] 2994 ft.
Hole Size [illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 33
Date [illegible]
Days from Spud Date 34

Rig Type IDECO
Pump No. 1 D-[illegible]
Pump No. 2 D-[illegible]

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Time Depth	Remarks
	Depth - Feet; Inclination - Degrees; Bit Weight - Thousands of Lbs; Rotary RPM	Density - Lb/Gal; Viscosity - Sec/Qt; Plastic Viscosity - Cp; Water Loss - cc; Filter Cake - In/32; pH	Bit No.; Mfg. & Type; Size - In; Footage; Rotating - Hours; Penetration Rate - Feet/Hour; Penetration Rate Adj. Total	Pump No.; Pressure - PSI; Strokes - Minute; Stroke Length - In; Liner - In; Liner Inches; Calibrated Minutes	Annular Velocity - Ft/Min; Bottom Velocity - Ft/Sec; Impact; Hydraulic Horsepower	Volume of Mud Tank	
[illegible]	[illegible] 70 40 9.5 [illegible] 19 6.8 2 32 6.5 44		MTC DWA Reg. 24 3.00 6.0 7.04	1 1200 55 5 5 3/4 [illegible] 111			Drilling.
3:00 am	[illegible]	3.0 44 42 6.2 9	12 2.58 6.5 6.40				Circulate for samples.
6:00 am		12 37 2 6.6 9	13 5.71 6.40				Circulate for samples.
9:00 am							Trip with bit #46.
12:00 pm							Trip.
3:00 pm	[illegible]	52 13 60 21 1.8 8/32 9	47 Smith T2 Reg. 9 2.71 3.20 3.24	1 1500 44 16 5 3/4 [illegible] 130			On bottom. [illegible] P.M.
6:00 pm	19	70 52 [illegible] 53 5.8	16 3.00 3.34 6.35	2 1550 40 16 5 [illegible] 130			Drilling break at 5,107 by Lynes.
9:00 pm	[illegible]	[illegible] 40 23 6.2 8/32 9	1.00 1.00 1.00				Circulate samples.

Well Status
Casing
Hole Size

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No.
Date
Days from Spud Date

Rig Type
Pump No. 1
Pump No. 2

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Materials	"Eng." Data	Remarks
	Depth - Feet; Deviation Degrees; Bit Weight - M Lbs; Drillstring - Lbs; Rotary RPM	Density - P.C.F.; Viscosity Seconds; Plastic Viscosity; Water Loss - cc; Filter Cake; pH	Bit No.; Mfg. & Type; Size Inch; Footage; Cumulative Hours; Penetration Rate - Ft. / Hour; Penetration Rate - Ft. / Day	Pump No.; Pressure PSI; Strokes Minute; Stroke Length; Liner Size; Liner Area; Capacity Gallons Minute	Mud Volumes - Barrels; Mud Volume - P.C.F.; Water Volume - Barrels; Impact; Hydraulic Horsepower		
12:00 am			1 TC 34 WTR Reg.				Trip in hole.
3:00 am			2.75				Reaming.
6:00 am			2.00				Reaming.
9:00 am							Circulating and conditioning mud.
12:00 pm							Trip out at 12 hr.
1:00 pm							Trip with bit. Flow rate 600 gal. per min., pressure [illegible] On bank 1:15.
6:00 pm			HTC 34 WTR Reg.				Tank backed 1/4 out of gauge.
9:00 pm							Trip in hit 892.

Well Status
Casing
Hole Size

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 54
Date 7 May 1961
Days from Sp. Date 58

Rig Type
Pump No. 1
Pump No. 2

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Materials	"Eng." Data	Remarks
	Depth - Feet; Deviation Degrees; Bit Weight - M Lbs; Drillstring - Lbs; Rotary RPM	Density - P.C.F.; Viscosity Seconds; Plastic Viscosity; Water Loss - cc; Filter Cake; pH	Bit No.; Mfg. & Type; Size Inch; Footage; Cumulative Hours; Penetration Rate - Ft. / Hour; Penetration Rate - Ft. / Day	Pump No.; Pressure PSI; Strokes Minute; Stroke Length; Liner Size; Liner Area; Capacity Gallons Minute	Mud Volumes - Barrels; Mud Volume - P.C.F.; Water Volume - Barrels; Impact; Hydraulic Horsepower		
3:00 am			Trace dia. 1 HTC 47/8				Circulating
3:00 am							Circulating and conditioning mud.
6:00 am							Trip out at 8 hr. [illegible]
9:00 am							Trip out at 8 hr. [illegible]
12:00 pm							Start trip in at 9:30 [illegible]
3:00 pm			Reed JC ream 2.5				Reaming at 12 hr. [illegible]
6:00 pm			2.5				Start at 3 pm with [illegible]
9:00 pm							On bank 6:30 [illegible] Start trip out at 6:30 pm.

Well Status
Casing
Hole Size

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 56
Date 9 May 1961
Days from Sp. Date 57

Rig Type
Pump No. 1
Pump No. 2

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Materials	"Eng." Data	Remarks
	Depth - Feet; Deviation Degrees; Bit Weight - M Lbs; Drillstring - Lbs; Rotary RPM	Density - P.C.F.; Viscosity Seconds; Plastic Viscosity; Water Loss - cc; Filter Cake; pH	Bit No.; Mfg. & Type; Size Inch; Footage; Cumulative Hours; Penetration Rate - Ft. / Hour; Penetration Rate - Ft. / Day	Pump No.; Pressure PSI; Strokes Minute; Stroke Length; Liner Size; Liner Area; Capacity Gallons Minute	Mud Volumes - Barrels; Mud Volume - P.C.F.; Water Volume - Barrels; Impact; Hydraulic Horsepower		
12:00 am			HTC 34 WTR Reg. ream				Reaming [illegible] Pulled reaming and drilled 8' [illegible]
3:00 am			ream				Start out of hole with [illegible]
6:00 am							Pulling out [illegible]
9:00 am							
12:00 pm			Trace dia. 1 HTC 47/8				
3:00 pm							
6:00 pm							Start [illegible]
9:00 pm							[illegible]

Well Status

Casing [illegible]

Hole Size [illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 63
Date 11 May 1961
Days from Spur Date 54

Rig Type [illegible]
Pump No. 1 D-100
Pump No. 2 D-[illegible]

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	End Data	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Trip in.
3:00 am	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Reaming core hole. Ca. 1200 [illegible]
6:00 am	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Reaming to [illegible]
9:00 am	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Ca. 1000 ppm
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
3:00 pm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
6:00 pm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Ca. [illegible] ppm
9:00 pm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Mixing mud prior to starting cut with Core #1.

Well Status

Casing [illegible]

Hole Size [illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 64
Date 18 May 1961
Days from Spur Date 64

Rig Type [illegible]
Pump No. 1 D-100
Pump No. 2 D-500

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	End Data	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Circulating
3:00 am	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Trip out with Bit #13
6:00 am	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Trip out with bit #13. Preparing to go in with core barrel.
9:00 am	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Bit #13 medium dull to gauge. No junk recovered.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Coring
3:00 pm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Barrel Jammed
6:00 pm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Started out [illegible]
9:00 pm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Pulled core #8 rev [illegible]. Corrected TD to [illegible]. Run in bit #14. Cut drilling.

Well Status

Casing [illegible]

Hole Size [illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 65
Date 9 May 1961
Days from Spur Date 65

Rig Type [illegible]
Pump No. D700
Pump No. D500

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	End Data	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Trip in bit #12
3:00 am	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Ream [illegible] to bottom. Fish for junk
6:00 am	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Drilling
9:00 am	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Pulled bit #12 [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Trip in bit #13
3:00 pm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Trip
6:00 pm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Drilling
9:00 pm	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Core

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Time of Day | Rig Data | Mud Properties | Bit Data | Pump Data | Materials | Mud Data | Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Time of Day | Rig Data | Mud Properties | Bit Data | Pump Data | Materials | Mud Data | Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Time of Day | Rig Data | Mud Properties | Bit Data | Pump Data | Materials | Mud Data | Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Rig Data | Mud Properties | Bit Data | Pump Data | Mechanics | Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Rig Data | Mud Properties | Bit Data | Pump Data | Mechanics | Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Rig Data | Mud Properties | Bit Data | Pump Data | Mechanics | Remarks

Well Status

DAILY ENGINEER'S REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 15
Date 2 May 84
Date of Spud 23

Rig Type
Pump No. 1
Pump No. 2

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Ins. Data	Remarks

Well Status

DAILY ENGINEER'S REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 16
Date 22 May 1984
Date of Spud 23

Rig Type
Pump No. 1
Pump No. 2

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Ins. Data	Remarks

Well Status

DAILY ENGINEER'S REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 18
Date 31 May 84
Date of Spud 23

Rig Type
Pump No. 1
Pump No. 2

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Ins. Data	Remarks

Well Status

DAILY ENGINEER'S REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 19
Date 31 May 84
Date of Spud 23

Rig Type
Pump No. 1
Pump No. 2

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Ins. Data	Remarks

Condition Note

Well Status

Casing 13 3/8 @ 1004 ft.

Hole Size 11

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 74
Date 26 May 1961
Days from Spud Date 77

Rig Type Mesa
Pump No. 1 D-700
Pump No. 2 D-500

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Mechanics	Time Lost	Remarks
							Have trip in tomorrow to check Dilog.
							Pick for hook. Trip out w/ [illegible]
							Pick up [illegible] on hook 1:35 Recovered 8 pieces of hook
		Mixed					5:30 Trip in with magnet check
							7:15 on bottom, mag. not plugged with rubbage
			RR HTC 64 WTA Reg				Trip in with fit AIRR.
			RR HTC 64 WTA Reg				Circulating through 15 Dilog.

Well Status

Casing 13 3/8 @ 1004 ft.

Hole Size 11

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 77
Date 29 May 1961
Days from Spud Date 78

Rig Type Mesa
Pump No. 1 D-700
Pump No. 2 D-500

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Mechanics	Time Lost	Remarks
12:00 am			HTC 1-5-6 [illegible]				Drilling MaCl 1300 Ca 1100
3:00 am							Drilling MaCl 1300 Ca 600
6:00 am							Drilling MaCl 1300 Ca 600
9:00 am							Drilling MaCl 1300 Ca 700
12:00 pm							Drilling MaCl 1300 ppm Ca 1100 ppm
3:00 pm							Drilling MaCl 1300 ppm Ca 600 ppm
6:00 pm							Drilling
9:00 pm							Pump circulating [illegible]

Well Status

Casing 13 3/8 @ 1004 ft.

Hole Size

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 78
Date 30 May 1961
Days from Spud Date 79

Rig Type Lobco
Pump No. 1 D700
Pump No. 2 D700

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Mechanics	Time Lost	Remarks

[illegible]

Trip

Trip. Laying down core

Trip with bit & Reamer

Trip

Reaming to bottom

Reaming

[illegible]

Trip in core bbl.

Ca 600 NaCl 4620

Coring

Coring

Coring

Coring Ca 900 NaCl 3300

Coring Ca 600 NaCl 3300

[illegible]

Circulating to condition mud. Pump [illegible]

Pump [illegible] Circ. to cond. mud. Ca 600 NaCl 3300

Trip out to pick up magnet

Lay down [illegible] DC's trip in magnet [illegible] pick mud

Trip in.

[illegible]

Trip out magnet Start trip [illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Rig Type: IDECO
Pump No. 1: F-700
Pump No. 2: F-500

Mud Properties							Bit Data								Pump Data							Hydraulics							Daily Data	Remarks
							HTC																							Trip out bit #66.
							15	9-28-31-1-1																						Bit #66 grooved, trip in with #67 HTC W7B.
							HTC																							
							17	W7B	Reb																					Circulating through 3" line up.
																														Drilling
																														Circ. for sam ples & [illegible] Trip out bit #67.
																														Ch. hole w/ bit #67 work. dull, bearings tight, 1/2 gauge

Rig Type: IDECO
Pump No. 1: F-700
Pump No. 2: F-500

							HTC																							
							23																							Reaming Ca 1000 at 9.7 NaCl 1000
							24																							Reaming Ca 1000 at 9.7 NaCl 1500
							25																							Reaming Ca 1000 at 9.7 NaCl 1500
																														Circulating for sample
																														Trip out bit #66 RR & reamer.
																														Ch. hole w/ bit #65 RR @ 3:00 P.M. All added on reamer. Washed off
																														Trip in bit #66
							HTC																							Evening for mud. [illegible] NaCl [illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. [illegible]
Date [illegible]
Days from Spud Date [illegible]

Rig Type [illegible]
Pump No. [illegible]
Pump No. [illegible]

Mud Properties	Bit Data	Pump Data	Hydraulics	Est. Data	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Coming out with DST tool.

Breaking down DST tool.

Going in hole with bit #7

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. [illegible]
Date [illegible]
Days from Spud Date [illegible]

Rig Type [illegible]
Pump No. [illegible]
Pump No. [illegible]

Mud Properties	Bit Data	Pump Data	Hydraulics	Est. Data	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Reamer in gauge

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. [illegible]
Date [illegible]
Days from Spud Date [illegible]

Rig Type [illegible]
Pump No. [illegible]
Pump No. [illegible]

Mud Properties	Bit Data	Pump Data	Hydraulics	Est. Data	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

DAILY ENGINEERING REPORT
PRESSURE INJECTION CAPSULAR WELL
ROCKY MOUNTAIN ARSENAL

DAILY ENGINEERING REPORT
PRESSURE INJECTION CAPSULAR WELL
ROCKY MOUNTAIN ARSENAL

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 34
Date 11 June 1961
Date from Spud Date 74

Rig Type IDECO
Pump No. D-152
Pump No. D-151

Well Status
Casing
Hole Size

Time of Day	Rig Data	Hole Properties	Bit Data	Pump Data	Hydraulics	Time Lost Data	Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 34
Date 11 June 1961
Date from Spud Date

Rig Type IDECO
Pump No. D-152
Pump No. D-151

Well Status
Casing
Hole Size

Time of Day	Rig Data	Hole Properties	Bit Data	Pump Data	Hydraulics	Time Lost Data	Remarks

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Rig Type: MACO
Pump No. 1: D-700
Pump No. 2: D-300

Time of Day	Bit No.	Bit Size	Type	Manufacturer	Jets	Footage	Hours	Bit Weight	Rotary RPM	Mud Weight	Viscosity	Water Loss	Filter Cake	pH	Pump No.	Pressure PSI	Strokes	Liner Size	Length	Remarks
	8 1/2"																			
1:00 am	8311																			
3:00 am	8312																			
5:00 am	8313																			
7:00 am	8314																			
11:00 am	8315																			
1:00 pm	8316																			
3:00 pm	8317																			
5:00 pm	8318																			

Total Time 15 8/24/1961 19 32.0 1.1

Dist. Trans 0 01/01/1

Trip out at 8318 at 11:30 P.M.

Rig down at 1:00 A.M. Break grant, hardware backed, to gauge.

Run to 8317 w.o.l.

4:00 A.M. Washing hard and failed.

1:30 p.m. on bank with hard tool.

4:00 p.m., trip in core barrel.

Trip with core barrel.

Washing core barrel to bottom.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 56
Date 13 June 1961
Days from Spud Date 62

Rig Type: MACO
Pump No. 1: D-700
Pump No. 2: D-300

Time of Day	Bit No.	Bit Size	Type	Manufacturer	Jets	Footage	Hours	Bit Weight	Rotary RPM	Mud Weight	Viscosity	Water Loss	Filter Cake	pH	Pump No.	Pressure PSI	Strokes	Liner Size	Length	Remarks
1:00 am	8312	11	46	9.2	110	14/15	3.6	2/34	9.0	14					1	900	60	16	6	770
1:30 am	8313	11	47	9.2	110	14/15	3.6	2/34	9.0	9	3.0	3.3	3.6		1	900	60	16	6	770
4:00 am	8314	11	47	9.2	101	14/15	3.6	2/34	9.0	11	3.0	3.7	3.6		1	900	60	16	6 3/4	770
5:00 am	8315	11	16	9.3	10	8	3.6	2/34	9.0	6	3.0	3.7	3.6		1	900	60	16	6 3/4	770
7:00 am	8316	11	18	9.3	11	11	3.6	2/34	9.0	12	3.0	3.6	3.3		1	900	60	16	6 3/4	770
1:00 pm	8316	11	52	9.3	10	11	3.6	2/34	9.0	7	3.0	3.5	3.3		1	900	60	16	6 3/4	770
4:00 pm	8317	11	52	9.3	12	15	3.6	2/34	9.0	11	3.0	3.7	3.3		1	900	60	16	6 3/4	770
5:00 pm	8318	11	10	9.3	11	11	3.6	2/34	9.0	6	3.0	3.7	3.3		1	850	60	16	6 3/4	770

Drilling, Form 1 hour for pump
Ca 1600 NaCl 1600
Drilling
Ca 1600 NaCl 1600
Drilling
Ca 1300 NaCl 900
Drilling
Ca 1600 NaCl 1600
Drilling
Ca 1300 NaCl 1600
Drilling
Ca 1600
Drilling
Ca 1300
Drilling
Ca 1400 NaCl 1300

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 57
Date 14 June 1961
Days from Spud Date 63

Rig Type: MACO
Pump No. 1: D-700
Pump No. 2: D-300

Time of Day	Bit No.	Bit Size	Type	Manufacturer	Jets	Footage	Hours	Bit Weight	Rotary RPM	Mud Weight	Viscosity	Water Loss	Filter Cake	pH	Pump No.	Pressure PSI	Strokes	Liner Size	Length	Remarks
	8 1/2"																			
1:00 am	8	11	44	9.3	44	14/15	3.6	2/34	9.0	10	3.0	3.3	3.6		1	900	60	16	6 3/4	770
3:00 am	8321	11	44	9.3	44	14/15	3.6	2/34	9.0	10	3.0	3.3	3.3		1	900	60	16	6 3/4	770
5:00 am	8322	11	44	9.3	44	14/15	3.6	2/34	9.0	9	3.0	3.4	3.6		1	900	70	16	6	770
7:00 am	8323	11	44							6	3.0	3.6	3.6		1	900	60	16	6	770
11:30 am	8324									6	3.0	3.6	3.3							

Drilling
Ca 1600 NaCl 1600
Drilling
Ca 1600 NaCl 1600
Drilling
Ca 1600 NaCl 1300
Drilling
11:30 a.m., pull bit etc.
Trip out at 8324.
Trip back with bit #24 at 8324 P.M., hardtoge lower, bit and remainder to gauge.
Rig down with bit at 8:15 P.M.

Total Time 64 15 13

HTC

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 191
Date 17 June 1961
Days from Spud Date 99

Well Status
Casing 13 3/8 @ 2004 ft.
Hole Size 11

Rig Type DRECO
Pump No. D-7A
Pump No. D-5A

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Eng. Data	Remarks
	2 1/2"						
7:00 am	10319						Trip out bit #76.
	10319						On bottom with bit #76 at 5:00 A.M. Bit grooved. Bit 1/8 reamer in gauge.
	10319						Pick up and run DST tool in hole.
	10319						On bottom with test tool at 9:00 A.M.
	10319						Drill stem testing, packers leaking slightly.
	10319						Coming out of hole with test tool.
	10319		76 MTC RR R.G.B./S-99				Going in hole with bit 76RR.
	10319						Trip in bit #76RR.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 190
Date 17 June 1961
Days from Spud Date 99

Well Status
Casing 13 3/8 @ 2004 ft.
Hole Size 11

Rig Type DRECO
Pump No. D-7A
Pump No. D-5A

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Eng. Data	Remarks
	3 1/2"						
7:00 am	10319 10342	20 46	Dia. 5 Truco 10474	2 2 1	1 950 2150 20 16 6 3/4		Coring Core #16
	10321			2 2 1			Trip out with core #16.
4:00 pm	10321						
5:00 pm							
1:00 pm	10321	55 51	9.3 100 19 12 7.0	6.5 76 MTC RR R.G.B./S-99	5 2 2.0 2.0 1 950 50 16 6 3/4 420 100		500 rpm Drilling.
6:00 pm	10322	55 50	9.3 80 14 16 6.0	5.0 - 5 2 2.0 2.0 1 960 54 16 6 3/4 455 100			500 rpm Drilling. LCM 2%
7:00 pm	10324		9.4 87 36 6.0 2 1/2	6.0 - 5 2.0 2.0 2.1			Began circulating samples at 5:30 p.m.

[illegible] ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 103 | Date 21 June 1981 | Rig Type IDECO | Pump No. D-700 | Pump No. D-300

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Mechanics	Ins. Data	Remarks
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

Ins. Trace Core
[illegible]

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Mechanics	Ins. Data	Remarks
12:00 am	[illegible]		MTC 77 [illegible]				Ream core hole.
3:00 am	[illegible]	[illegible]					Ream core hole.
6:00 am	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	Drilling at 4:00 A.M.
9:00 am	[illegible]	[illegible]		[illegible]	[illegible]		Drilling Co 1200
12:00 pm	[illegible]	[illegible]		[illegible]	[illegible]		
3:00 pm	[illegible]	[illegible]					
6:00 pm	[illegible]			[illegible]	[illegible]		
9:00 pm	[illegible]			[illegible]	[illegible]	[illegible]	Drilling.

Well Status
Casing [illegible]
Hole Size [illegible]

[illegible]

Report No. 103 | Date 22 June 1981 | Rig Type IDECO | Pump No. D-700 | Pump No. D-300

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Mechanics	Ins. Data	Remarks
12:00 am	[illegible]	[illegible]	MTC 77 [illegible]				
3:00 am	[illegible]	[illegible]					
6:00 am	[illegible]	[illegible]					
9:00 am	[illegible]	[illegible]					
12:00 pm	[illegible]	[illegible]					
3:00 pm	[illegible]	[illegible]					
6:00 pm	[illegible]						
9:00 pm	[illegible]	[illegible]					

Ins. Data
[illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Mud Properties | Bit Data | Pump Data | Hydraulics | Remarks

HTC
WTR Reg.

Total

Drilling at

Drilling at

Drilling at

Drilling at

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Mud Properties | Bit Data | Pump Data | Hydraulics | Remarks

HTC
WTR Reg.

Total

HTC
WTR Reg.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Mud Properties | Bit Data | Pump Data | Hydraulics | Remarks

HTC
WTR Reg.

Drilling.

Drilling.

Drilling.

HTC
WTR Reg.

Drilling.

Drilling
Ca ..00 MgCl 330

Drilling
Ca ..00 MgCl ..33

[illegible]

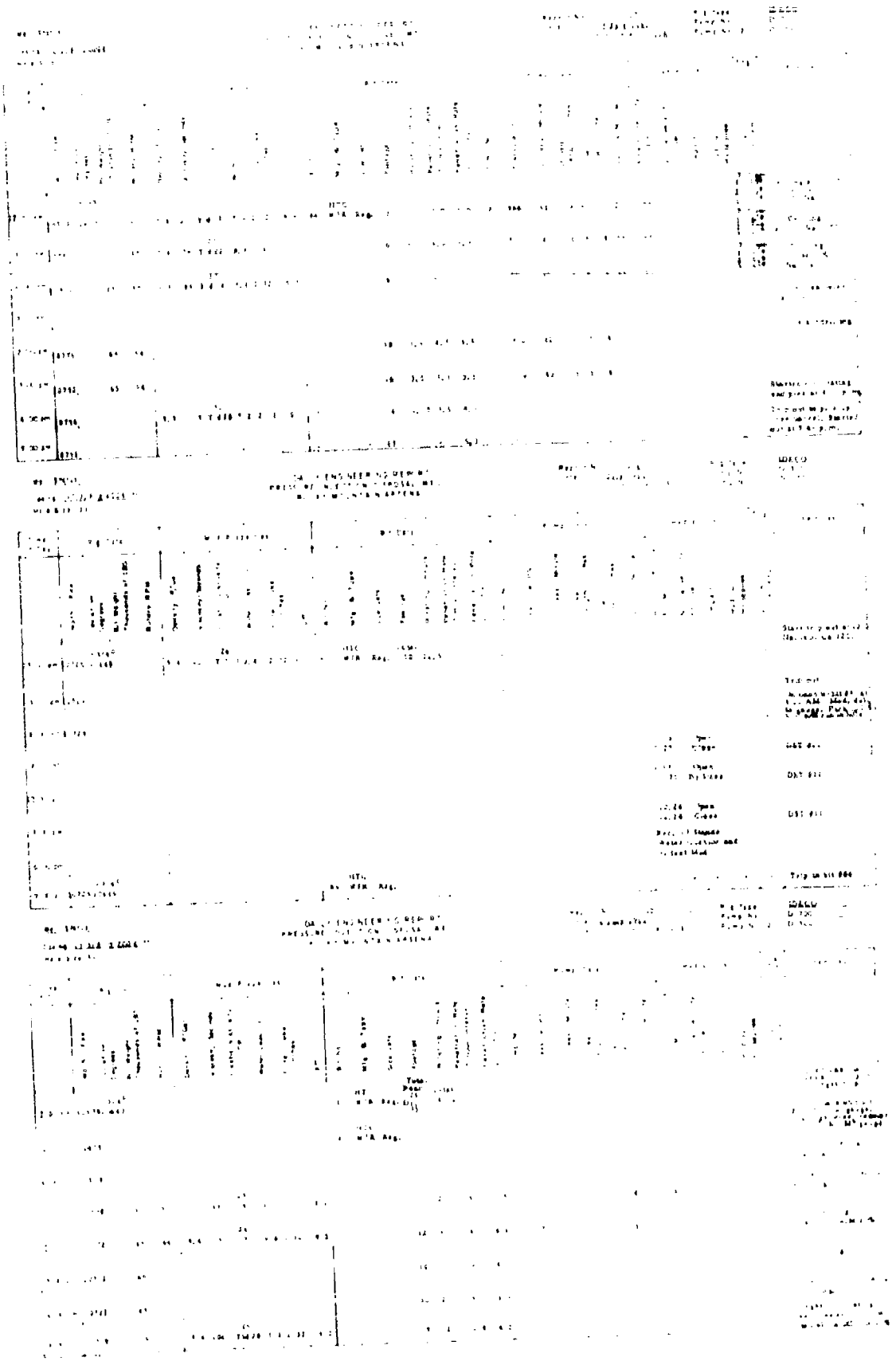
[illegible]

[illegible]

[illegible]

[illegible]

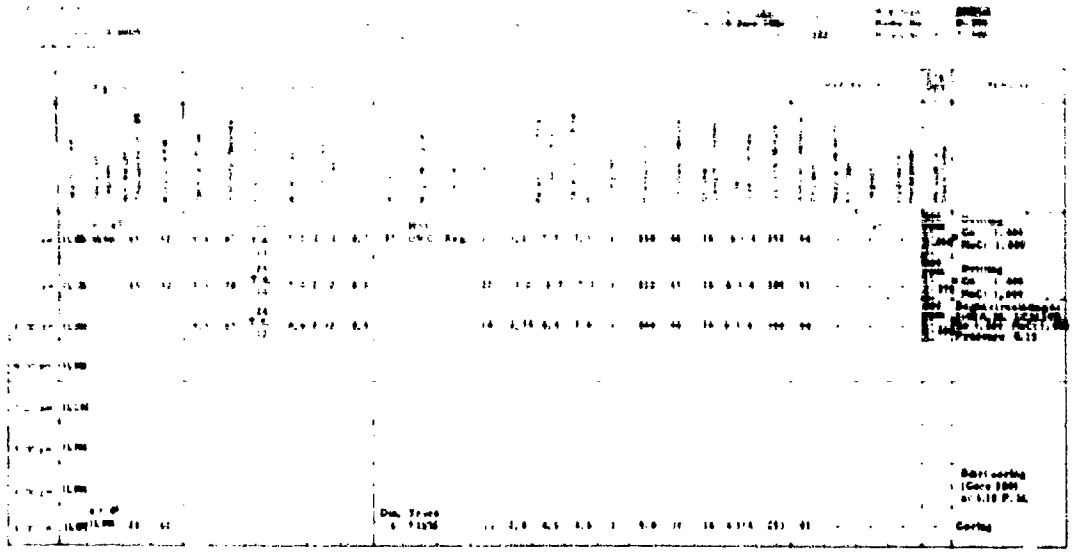
[illegible]

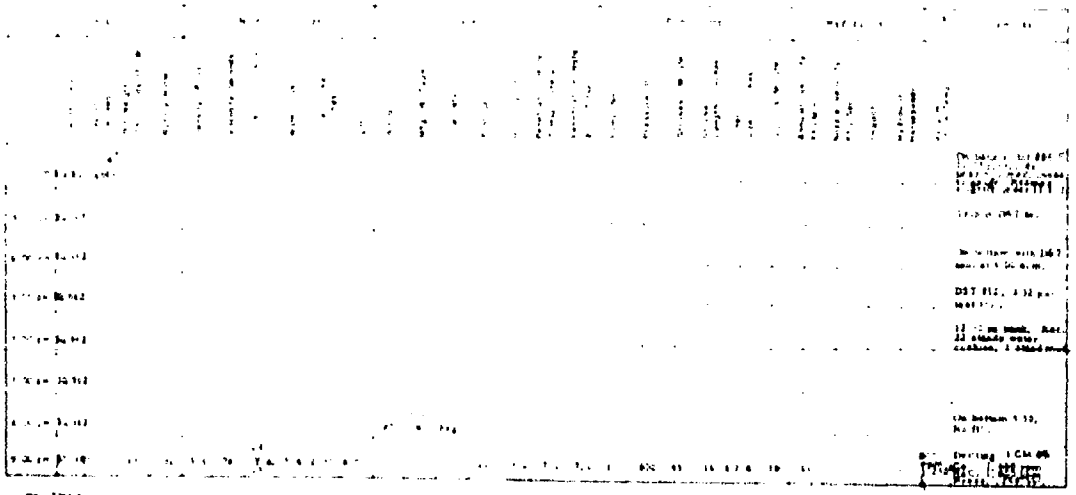


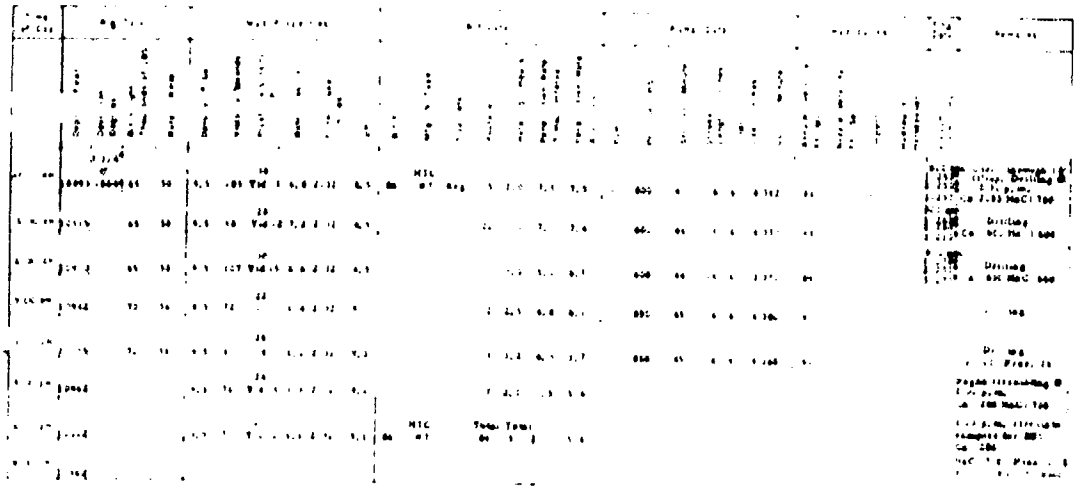
DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL





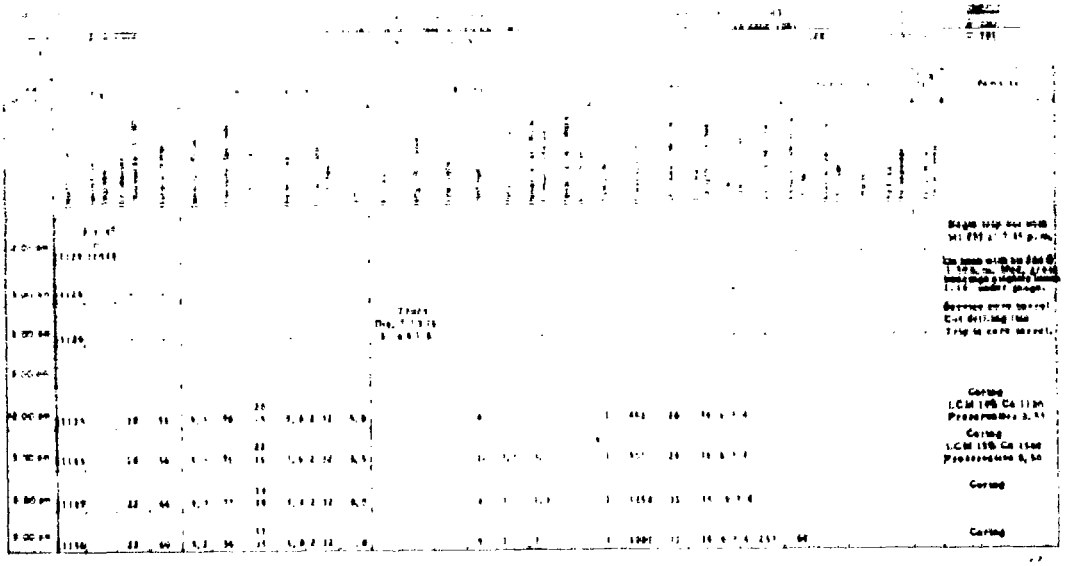


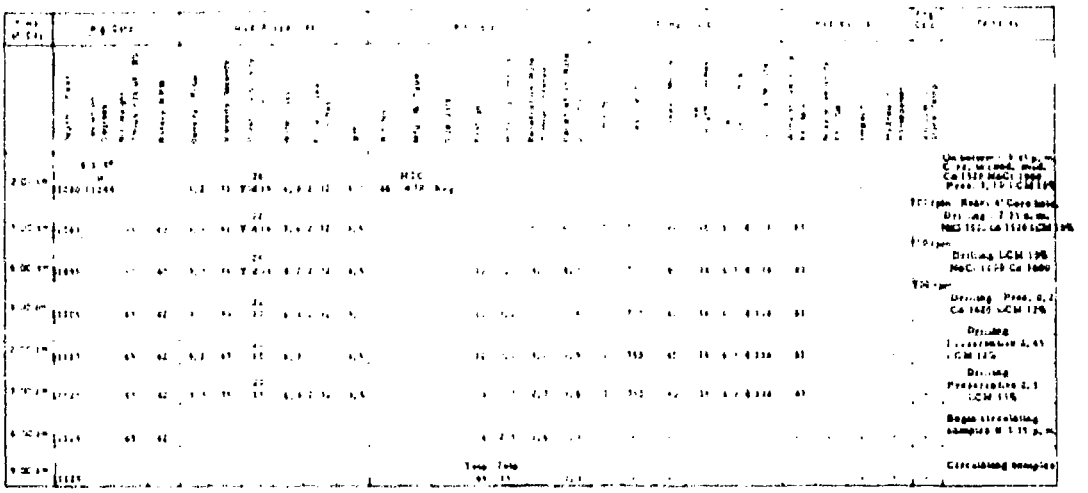
DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

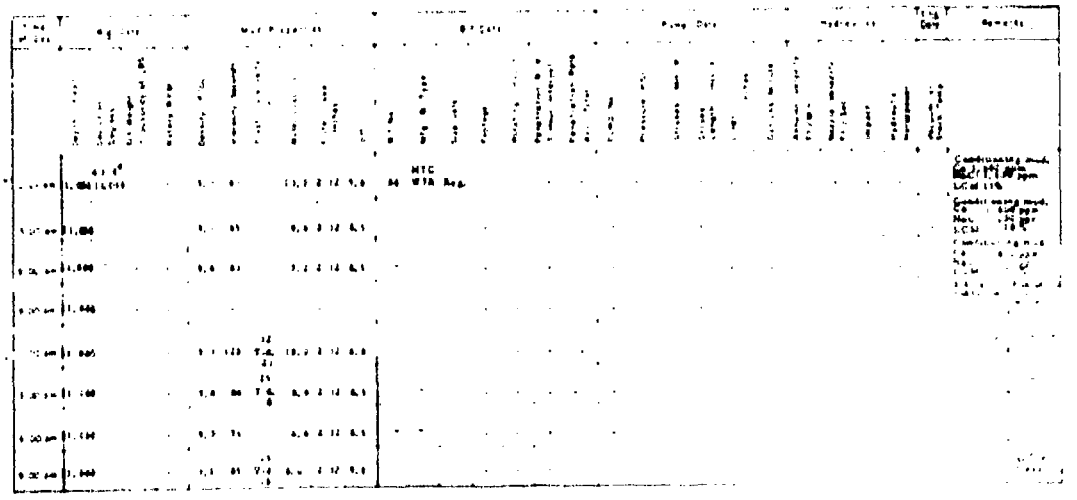
Time of Day	Rig Data		Mud Properties		Bit Data		Remarks
	11,[illegible]	8 1/4			HTC W7R Reg.		Waiting to break circulation at [illegible] a.m.
							Broke circulation at [illegible]. Trip in to [illegible]
3:00 am	[illegible]						Mixing mud.
6:00 am	[illegible]						
9:00 am	[illegible]		[illegible] 19				Mixing mud Ca [illegible] ppm Cl [illegible] ppm LCM [illegible]
12:00 pm	[illegible]						Waiting to break circulation.
3:00 pm	[illegible]						Waiting to break circulation.
6:00 pm	[illegible]		[illegible] 10		HTC W7R Reg. [illegible]		Broke circulation [illegible]
9:00 pm	[illegible]						[illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

HTC W7R Reg.



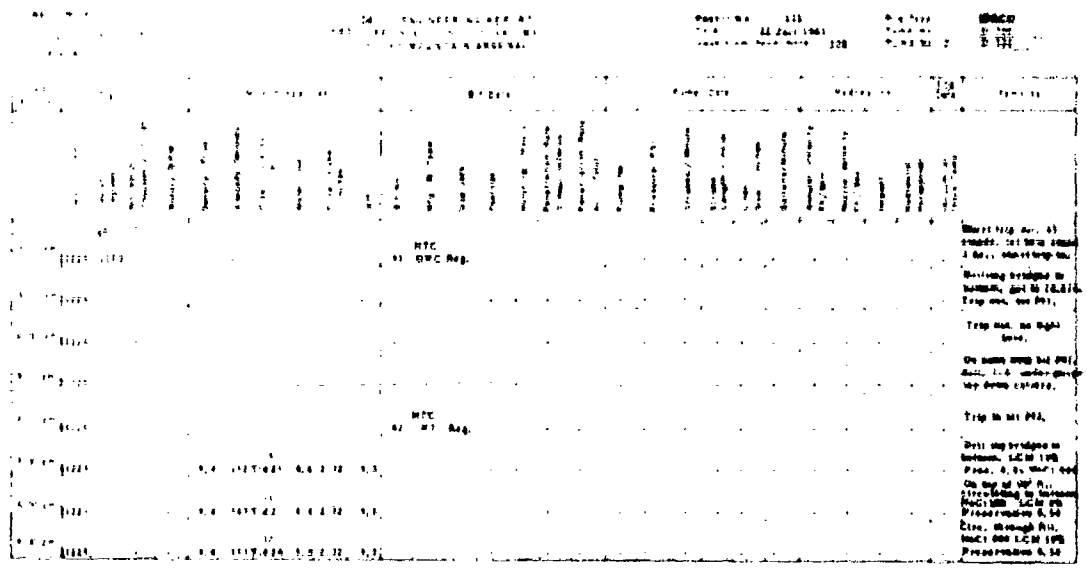


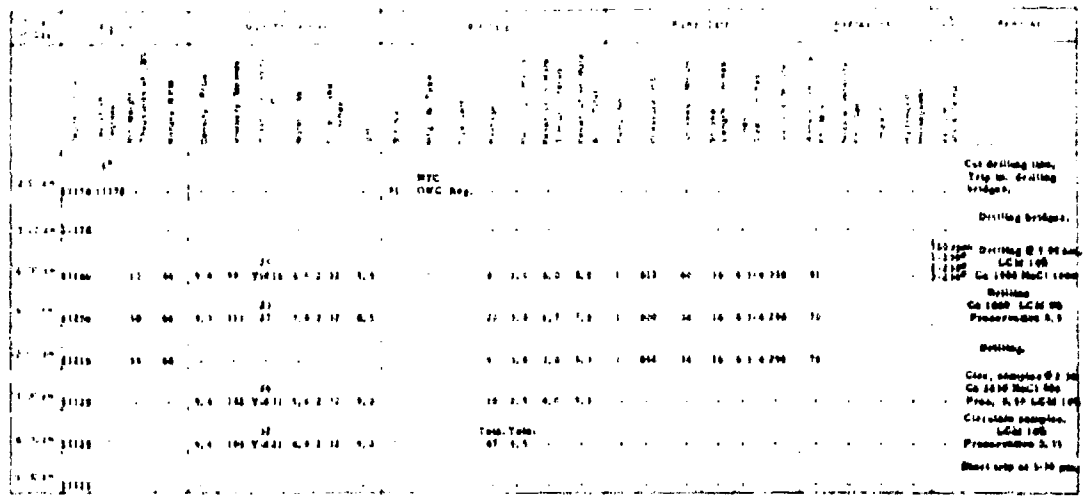


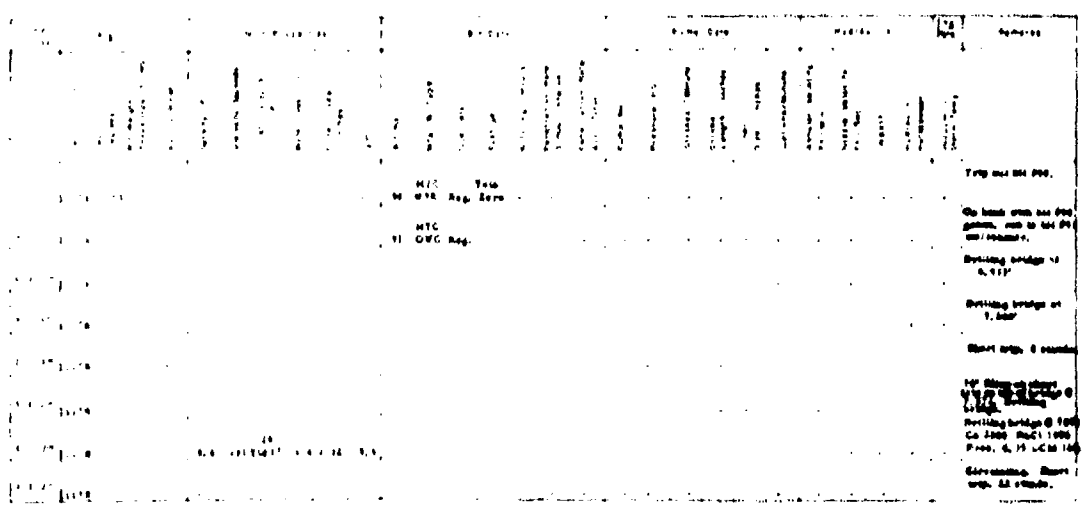
[illegible]

[illegible]

[illegible]







[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

[illegible]

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

[illegible]

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

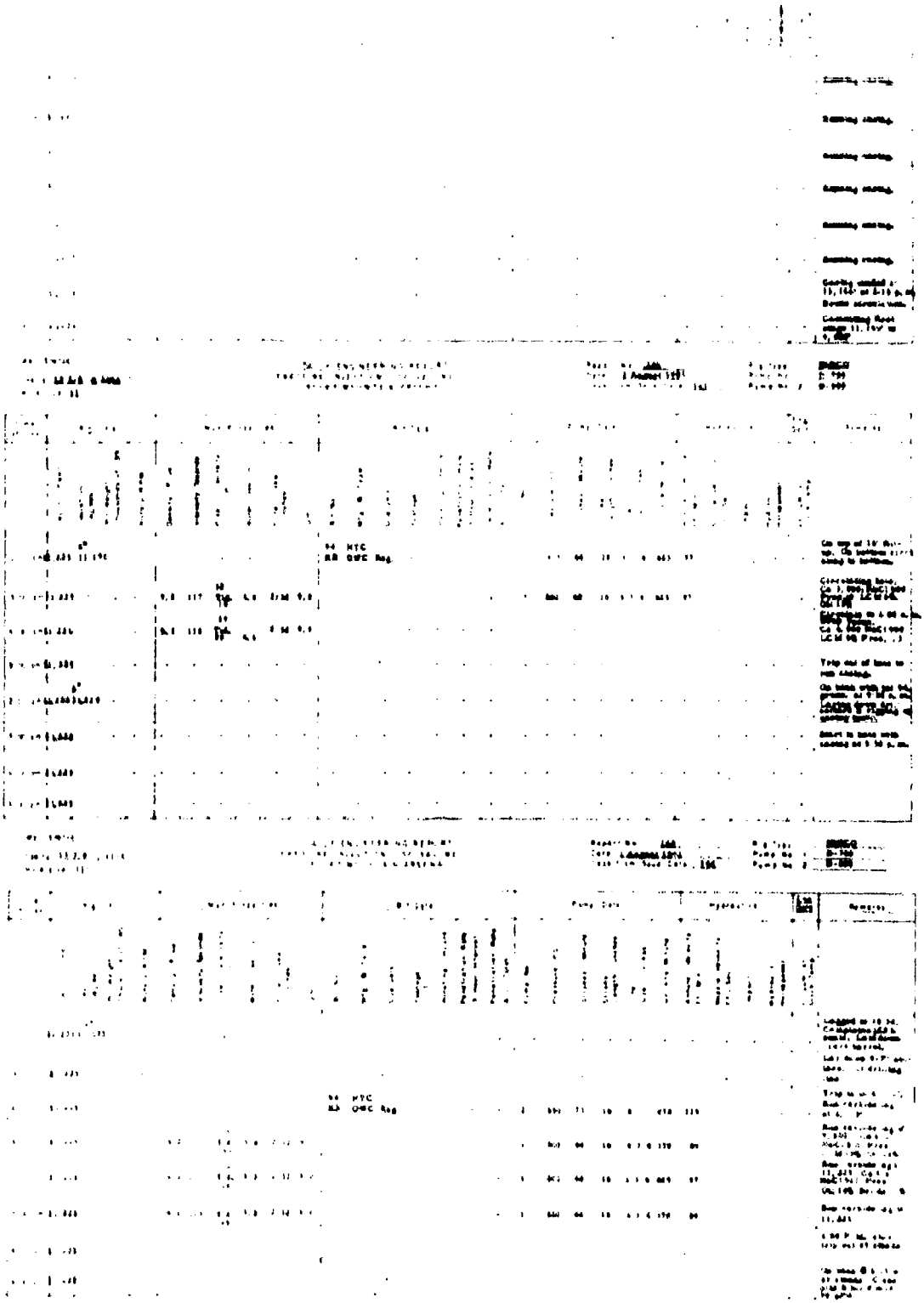
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W.O.C.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W.O.C.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W.O.C.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W.O.C.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] pressure [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W.O.C. Remove [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W.O.C. [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W.O.C.

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Pressured to [illegible] psi with Hooper. No blood oil. Called Lane Wells to perforate
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W.O. perforators.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W.O. perforators.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	9:00 a.m. Perforators on location.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Perforated 4 shots 4,516 to 4,521. Brake [illegible]. Cemented 3rd stage 4,507' to surface. Displaced cement.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4:00 p.m. closing [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W.O.C.

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Displacement. Pump down [illegible] Clean [illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Circulating
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

DAILY ENGINEERING REPORT

PRESSURE WELL ON DISPOSAL WELL

ROCKY MOUNTAIN ARSENAL

Report No. 133

Date 8 August 1961

Well Type DRECO

Pump No. D-190

Pump No. 2 D-189

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Time Log	Remarks
		WATER	HTC WTA Reg.				Testing pressure [illegible]
1:00 PM							
2:00 PM							Testing [illegible]
3:00 PM							Trip out [illegible]
4:00 PM							Trip in to Rockwell
5:00 PM							Servicing [illegible]
6:00 PM							WOC
7:00 PM							WOC

DAILY ENGINEERING REPORT

PRESSURE WELL ON DISPOSAL WELL

ROCKY MOUNTAIN ARSENAL

Report No. 134

Date 6 August 1961

Well Type DRECO

Pump No. D-190

Pump No. 2 D-189

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Time Log	Remarks
12:00 PM	1,225 1,225	10 66	HTC WTA Reg. 95	1 800 62 16 5 271 124		1100 mm 1,250 1,260 1,270 1,280	Drilling cement at 1,197'.
1:00 PM	1,225	10 66	95	1 800 62 16 5 271 124		1100 mm 1,260 1,270 1,280 1,290	Hole enlarged at 1,197'. Drilling cellar.
2:00 PM	1,225		95	1 2000 16 5			Pressure tested perfs(blank, non-held, Hydraulic test failure to repeat).
3:00 PM	1,225						Testing performance.
4:00 PM	1,225						Testing performance.
5:00 PM	1,225						Testing performance.
6:00 PM	1,225						W.O. Halliburton.
7:00 PM	1,225						Rig up to test with Halco.

DAILY ENGINEERING REPORT

PRESSURE WELL ON DISPOSAL WELL

ROCKY MOUNTAIN ARSENAL

Report No. 135

Date 9 August 1961

Well Type DRECO

Pump No. D-190

Pump No. 2 D-189

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Time Log	Remarks
			HTC WTA Reg.				Rig up [illegible]
							Rigging up. [illegible]
							Prepare to test BOP [illegible]
							[illegible]
							Press [illegible]
							[illegible]
							[illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 136
Date 12 August 1961

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Cost Data	Remarks
		WATER	SS MSC AR WTR Aug.				Trip in
7:30 pm	5,225	10 60		1 800 62 16 5 275 125			Washing cement. Tag cement at 5,210'.
8:00 pm	5,225	10 60		1 800 62 16 5 275 125			Drilling cement.
9:00 pm	5,225						Continue testing perforations.
2:00 pm	5,225						Trip in to drill out stage collar.
3:00 pm	5,225						Drilling stage collar and 5" cement.
6:00 pm	5,225						Drilling cement below table collar.
9:30 pm	5,225	10 60		1 275 62 16 5 275 125			Drilling cement at 5,300'.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

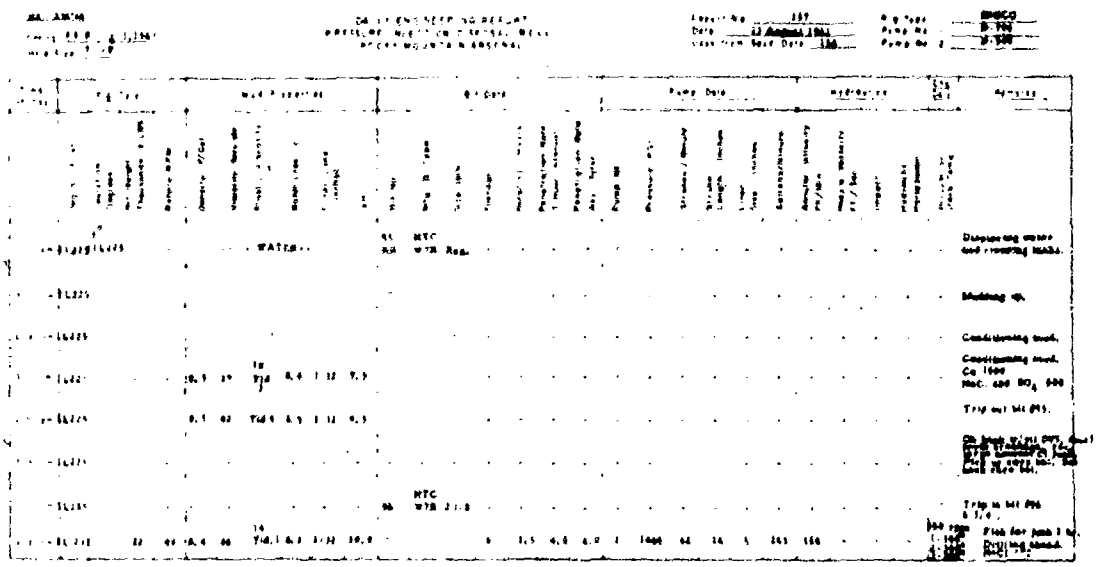
Report No. 135
Date 11 August 1961

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Cost Data	Remarks
11:01 am	5,225	WATER					Trip in to squeeze.
3:00 pm	5,225						Pressured up. Squeezed perforations. WOC w/ system pressured.
6:00 pm	5,225						WOC.
9:00 pm	5,225						6:10 A.M. Release pressure. WOC.
12:00 am	5,225						WOC.
3:00 am	5,225						WOC.
6:00 am	5,225						WOC.
9:30 am	5,225						WOC.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 135
Date 10 August 1961

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Hydraulics	Cost Data	Remarks
2:00 pm	5,225 5,225	WATER					
3:00 pm	5,225						WOC.
6:30 pm	5,225						WOC.
9:30 pm	5,225						WOC.
2:00 pm	5,225		SS MSC AR WTR Aug				Trip in to drill out stage collar.
3:30 pm	5,225	10 60					
6:30 pm	5,225	10 60		1 800 62 16 5 275 125			
9:30 pm	5,225						



DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 146
Date 14 August 1961
Days from Spud Date 146

Rig Type: IDECO
Pump No. 1: D-700
Pump No. 2: D-700

Time of Day	Rig Data									Mud Properties										Bit Data									Pump Data									Hydraulics									Bit Dull	Remarks
																																															Trip out with core barrel.
																																															On hook with core at 1:30 A.M. Unloading bit. Trip in with bit #97. HTC - 9YRJ
																				HTC 9YRJ 3																											Reaming
		34	48	6.7	44	14 9	7.2	1:12	16.0					3.3	3.3	3.3	5.0	1	1150	44	16	5	200	200																							11:30 am bottom
		34	48			14 9								10	3.3	3.3	5.0	1	1150	44	16	5	200	200																							
4:00 pm		34	48	6.7	46	14 9	6.4		16.0					11	3.3	3.7	4.8	1	994	48	16	5	235	185																							
														9	2.4	4.0	4.1																													Trip out bit #97. Pick bit junk. Drop Tables.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 155
Date 15 August 1961
Days from Spud Date 156

Rig Type: IDECO
Pump No. 1: D-700
Pump No. 2: D-700

Time of Day	Rig Data									Mud Properties										Bit Data									Pump Data									Hydraulics									Bit Dull	Remarks
2:00 am		18	54	6.5 10		14 9	7.2	1:12	10.0					Bit. 6 1/16 Core 11 2.5	3.8	5.2		1	900	44	16	5	195	145																							Began coring at 1:30 NaCl 440
3:00 am		18	54	6.5 10		14 9	7.4	1:12	10.0					7	3.0	3.3	3.8	1	900	44	16	5	195	145																							Coring. NaCl 440
4:00 am		18	54											10	3.0	3.3	3.5	1	950	44	16	5	195	145																							Coring
5:00 am		16	62	6.5 10		14 9	7.4	1:14						8	3.0	3.7	3.7	1	1000	44	16	5	195	145																							Coring
6:00 am		16	64	6.5 10		14 9	7.8	1:12						9	3.0	3.9	3.9	1	1140	44	16	6	150	145																							Coring
7:00 am		16	64	6.5 41		14 9	7.6							6	3.0	3.0	3.0	1																													
8:00 am		16	70	6.5 42		14 9	7.8							6	2.5	3.6	3.8	1	850	42	16	5	176	126																							
9:00 am		16	64	6.5 35		14 9	7.8							4	2.5	6.0	3.7	1	840		16	6																									Coring. Trip out at 9:30 P.M.

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 156
Date 16 August 1961
Days from Spud Date 157

Rig Type: IDECO
Pump No. 1: D-700
Pump No. 2: D-700

Time of Day	Rig Data									Mud Properties										Bit Data									Pump Data									Hydraulics									Bit Dull	Remarks
2:00 am				6.5 40		14 9	7.8	1:12	16.0					HTC 9YRJ 3.8 14				1	6.0	5.3																											Built to 11:05 P.M. Began Reaming for Junk. NaCl 440
3:00 am														Trip- Trip 24 4.7																																	Trip out bit #96
4:00 am																																															On hook with bit #96. Medium green. Trip in Reverse Junk Basket
5:00 am				6.5 41		14 9	7.8	1:12	16.0																																						Pick up junk
6:00 am																																															Circulating with Junk Basket
7:00 am																																															Trip out junk basket. Recovered no junk
8:00 am																																															Trip in core barrel
9:00 am																																															Trip in core barrel

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Report No. 183
Date 18 August 1961
Days from Spud Date 183

Rig Type DRECO
Pump No. D-700
Pump No. 2 D-500

| Time of Day | Bit Data | | |

DAILY ENGINEERING REPORT

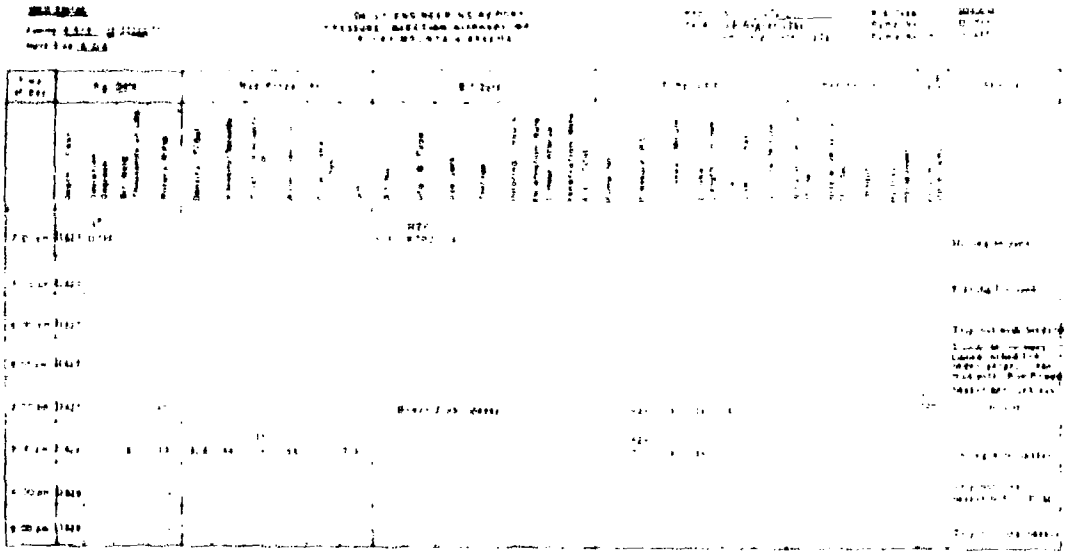
DAILY ENGINEERING REPORT

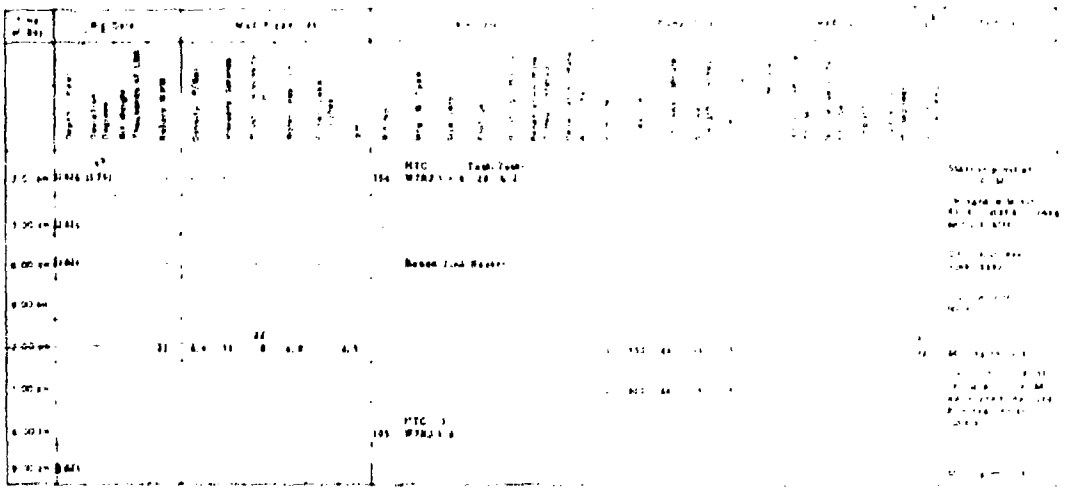
DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

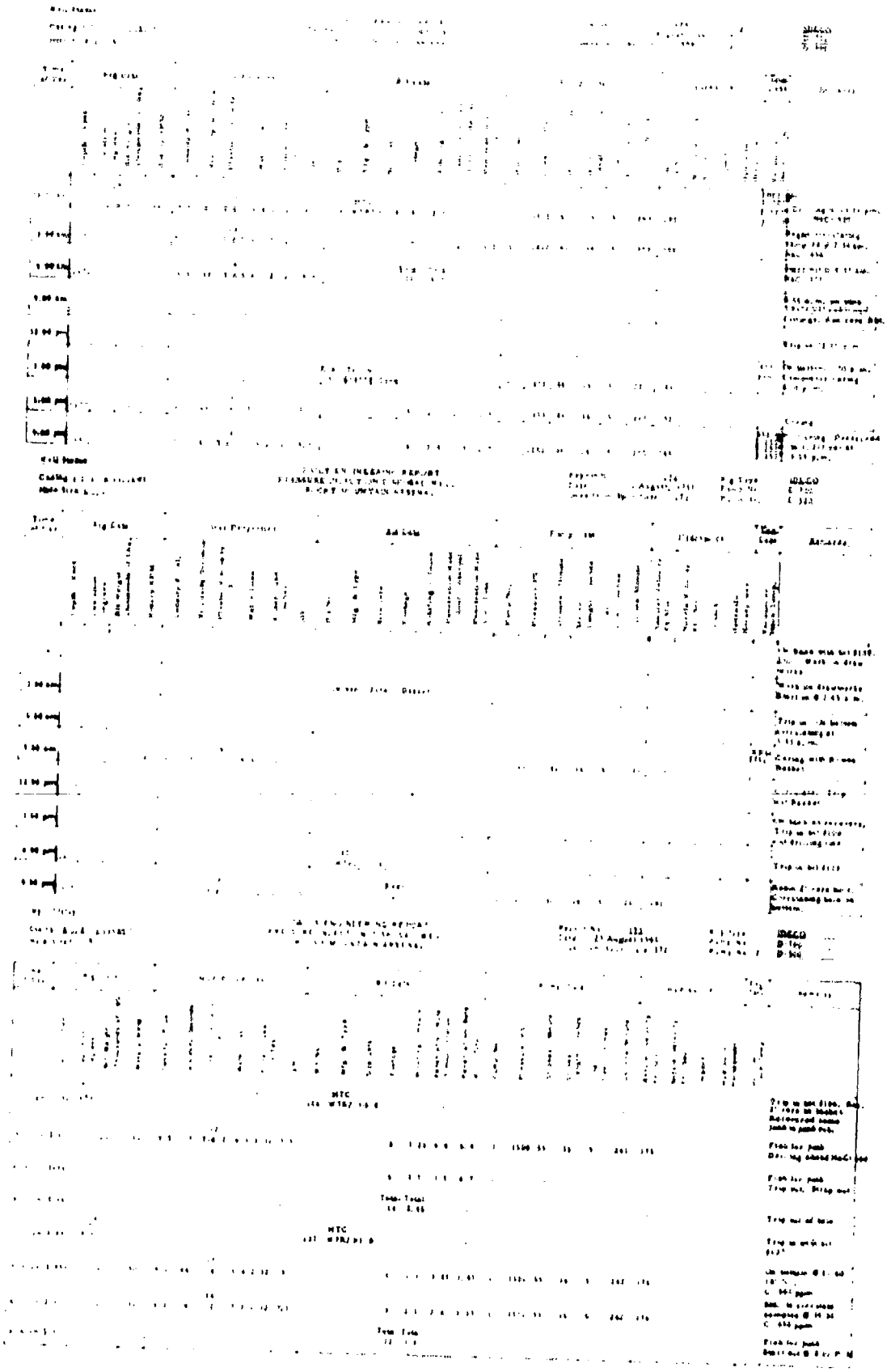
Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Maintenance	Eng. Data	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

DAILY ENGINEERING REPORT
PRESSURE INJECTION DISPOSAL WELL
ROCKY MOUNTAIN ARSENAL

Time of Day	Rig Data	Mud Properties	Bit Data	Pump Data	Maintenance	Eng. Data	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]







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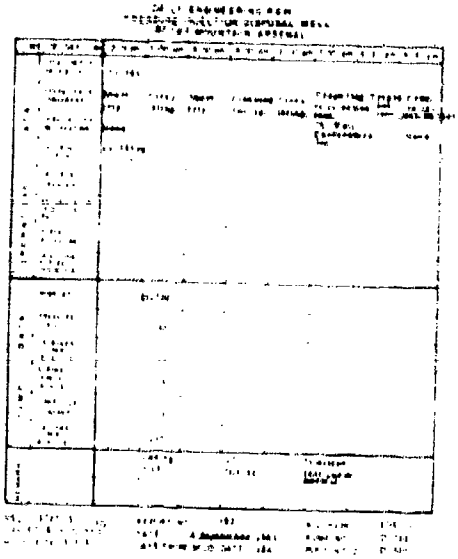

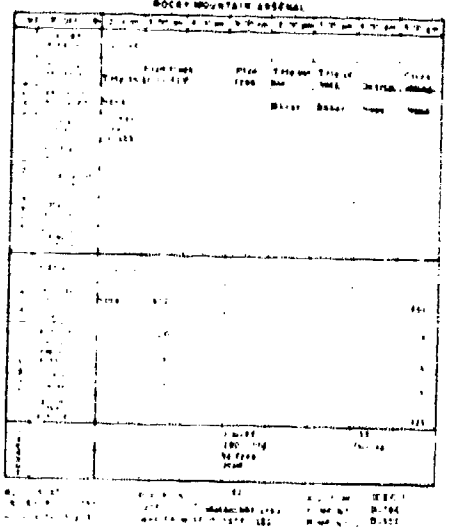

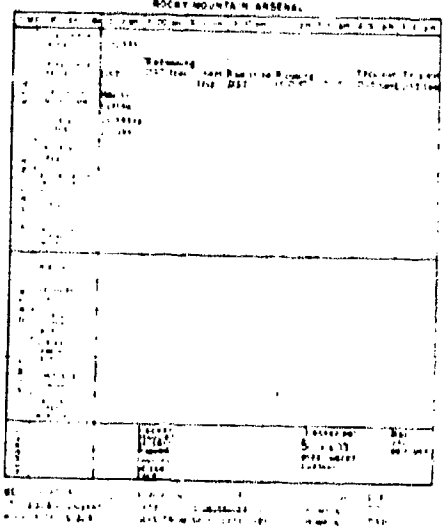

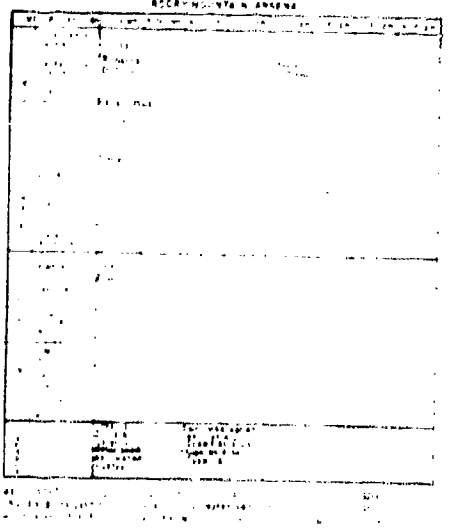

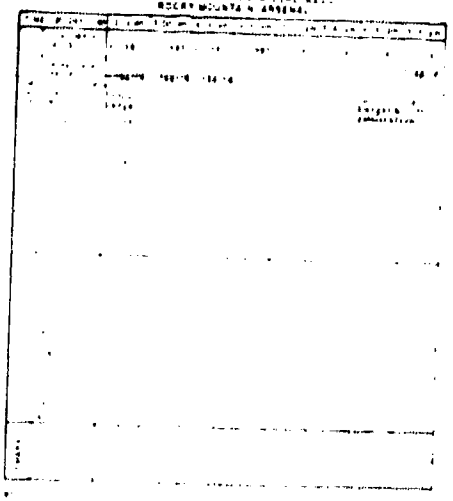

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ROCKY MOUNTAIN ARSENAL

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