

WELL HISTORY GEOTHERMAL

Operator: C.E. Exploration			Well Name & No.: 86-21		
Field: Newberry KGRA	County: Deschutes	Sec. 21	T. 21S	R. 12E	B&M

<u>DATE</u>	<u>HISTORY</u>
8/23/95-8/28/95	Rigged up.
8/29/95	Rig on day work at 0700 hours. Picked up mud motor. Drilled rathole. Lost all returns at 12' GL. Mixed mud. Cleaned out rathole and set rathole (no circulation). Laid down mud motor. Mixed mud and built volume. Picked up mud motor and drilled 17-1/2" pilot hole for conductor from 30' to 41'.
08/30/95	Drilled 17-1/2" pilot hole from 41' to 44' with mud motor. Hole started taking mud. POH and mixed mud/LCM to 20%. Attempted to drill pilot hole with mud motor - drill at 44' making no hole. POH and changed to 12-1/4" bit. Attempted to drill with mud motor at 44' - hard - won't drill. Laid down mud motor and picked up 10" drill collar and 12-1/4" bit. Drilled at 44' - broke through. POH - changed to 17-1/2" bit. RIH and drilled pilot hole to 65'.
08/31/95	Drilled 17-1/2" pilot hole from 65' to 79'. Started losing approx. 1/3 returns at 76'. Spotted thick LCM pill in hole. POH and mixed mud and LCM to 25%. Filled hole. Attempted to drill at 79' and lost approx. 1/2 returns. POH with BHA and RIH with open-ended drill pipe. Set 50 lin. ft. cement plug on bottom at 79'. WOC.
09/01/95	Picked up mud motor and RIH. Tagged cement at 56'. Cleaned out cement from 56' to 58', mud motor failed. POH and laid down mud motor. RIH with 17-1/2" bit, roller reamer and 10" DC. Cleaned out cement from 56' to 79'. Drilled 17-1/2" pilot hole from 79' to 110'. Picked up 26" hole opener. RIH and opened 17-1/2" hole to 26" from 30' to 79'.
09/02/95	Opened 17-1/2" hole to 26" from 79' to 100'. POH and laid down 26" hole opener. Picked up 36" hole opener. RIH and opened 26" hole to 36" from 33' to 69'.
09/03/95	Opened 26" hole to 36". POH and picked up 85' of 30" conductor. Snubbed conductor into ground. Cemented conductor with 260 cu.ft. of premium cement with 1-1 perlite, 40% SSA-1, 3% gel, .5% R-3 and .3% CC, followed by 337 cu.ft. of premium cement with 40% SSA-1, .5% CFR-3 and .3% CC. Displaced with 48 bbls. of water. Good returns to surface. WOC.

09/04/95 Cut off and removed 30" conductor. Welded on bell reducer set in 20" bag. Nipped up. Hooked up accumulator lines. Function tested 20" bag.

09/05/95 Drilled out cement from 93' to 110'. Drilled 17-1/2" hole from 110' to 284'.

09/06/95 Drilled 17-1/2" hole from 284' to 348' (lost returns at 337'). Mixed mud and LCM. Drilled to 352' - no returns. POH. RIH with open-ended drill pipe to 344' (10' fill). Pumped cement plug # 2. WOC. RIH open-ended To 332' - fluid level at 300'. Pumped cement plug #3. POH and WOC.

09/07/95 RIH to cement at 325' - fluid level at 276'. Pumped cement pug #4 at 312'. RIH to cement at 321' and mixed mud and LCM. Spotted 70 bbl. thick pill on bottom. RIH to cement at 255'. Picked up BHA and RIH to 239'. Drilled out cement from 255' to 355' - no losses.

09/08/95 Drilled 17-1/2" hole from 355' to 370'. Twisted off. POH. Top of fish at 333'. Picked up 3-1/8" spear and RIH. Worked over fish - no good. POH. RIH to top of fish with spear (beside fish). POH. RIH with 17" mill. Milled top of fish.

09/09/95 Milled on fish. POH and picked up overshot. RIH and worked over fish. POH. Recovered fish. Laid down fishing tools.

09/10/95 Drilled 17-1/2" hole from 370' to 616'. Started losing fluid at 600' (100 BPH). Mixed & spotted 90 bbls thick LCM pill on bottom. Drilled from 616' to 643'.

09/11/95 Drilled 17-1/2" hole from 643' to 908'. POH & laid down 17-1/2" tools. Nipped down. Cut off 20" swedge and welded on 30" conductor. Nipped up 30" and mixed mud. Opened 17-1/2" hole to 26" from 93' to 99'.

09/12/95 Opened 17-1/2" hole to 26" from 99' to 366 (lost approx. 60 BPH from 335'). POH. RIH with open-ended to 342' and set Plug #6. WOC.

09/13/95 RIH to top of cement at 323'. Drilled out cement from 323' to 345' and stringers to 359'. RIH and opened 17-1/2" hole to 26" from 366' to 565'.

09/14/95 Opened 17-1/2" hole to 26" from 565' to 908'. Losing approx 30 BPH.

09/15/95 RIH with open-ended to 530' and pumped Plug #7. WOC. RIH and tagged top of cement at 548'. Drilled out cement stringers from 548' to 615'. RIH to 908' and circulated. Wiped hole to shoe. POH. Rigged up and ran 23 jts. 20", 94#, K-55 buttress casing with shoe set at 905' and float at 864'.

09/16/95	Cemented 20" casing with 2506 cu.ft. premium cement with 25# per sx. Spherelite, 40% SSA-1, 45 GEL, .75% Halad 322, .1% WG17, .3% CC, followed by tail slurry of 318 cu.ft. Cement with 40% SSA-1, .5% CFR-3 and .2% CC. CIP. WOC. Cut off 30". Welded on 20" wellhead. Tested to 500 psi.
09/17/95	Nippled up BOE. Picked up 17-1/2" BHA. Tested blind rams, pipe rams, kelly cock and annular to 1000 psi, witnessed by BLM. Drilled out float collar at 864' and shoe at 905'. Drilled to 910'. Conducted leak off test. Pressured to 100# - 30 min. POH. RIH with open-ended to 910' and pumped plug #8.
09/18/95	Squeezed plug at 500#. WOC. Picked up BHA and RIH to top of cement at 873'. Drilled out cement to 910'. Circulated hole and conducted leak-off test. Drilled 17-1/2" hole from 910' to 1022'. POH. Picked up mud motor and drilled to 1098'.
09/19/95	Drilled 17-1/2" hole with mud motor from 1092' to 1474'.
09/20/95	Drilled 17-1/2" hole with mud motor from 1474' to 1680'.
09/21/95	Reamed from 1022' to 1680'. Drilled 17-1/2" hole from 1680' to 1848'.
09/22/95	Drilled 17-1/2" hole from 1848' to 2084'.
09/23/95	Drilled 17-1/2" hole from 2084' to 2359'.
09/24/95	Drilled 17-1/2" hole from 2359' to 2691'.
09/25/95	Drilled 17-1/2" hole from 2691' to 3153'.
09/26/95	Drilled 17-1/2" hole from 3153' to 3359'.
09/27/95	Reamed from 3269' to 3359'. Drilled 17-1/2" hole from 3359' to 3732'.
09/28/95	Drilled 17-1/2" hole from 3732' to 4203'. Circ. and conditioned mud.
09/29/95	Wiped hole. Rigged up and ran 33 jts., 13-3/8", 72#, L-80 and 70 jts. 13-3/8", 72#, K-55. Ran L-80 from surface to 522', K-55 from 522' to 3280', and L-80 from 3280' to 4199'. Shoe set at 4199' and float collar at 4151'.

09/30/95	Cemented casing with 20 bbl H ₂ O ahead followed by lead of 1736 cu.ft. premium with 35#/sx sphearlite, 40% SSA-1, 4% gel, .1% halad 322, .5% HR-7 and .1% WG-17, followed by tail slurry of 414 cu.ft. premium with 40% SSA-1, .5% CFR-3 and .25% HR-7. Displaced with 608 bbls mud. Landed plug in DV collar with 800 psi. Opened DV collar with 2000 psi. CIP.
10/01/95	WOC. Cement fell in annulus.
10/02/95	Pumped top job with 157 cu.ft premium with 40% SSA-1, .5% CFR-3 and .3% CACL ₂ . WOC. Slacked off and cut off 13-3/8" casing. Installed expansion spool and pack off assembly. Tested to 2300 psi. Set in 13-3/8" BOE and nipped up.
10/03/95	Function tested blind rams to 1000 psi, witnessed by DOGAMI & BLM. RIH to top of cement at 2960' and drilled out cement and DV collar at 3004'. Closed pipe rams and tested DV collar to 1000 psi. Drilled out cement from 3006' to 3180'.
10/04/95	Drilled out cement from 3180' to 3242'. Drilled out float collar at 4151' and shoe at 4199'. Drilled 12-1/4" hole to 4204'. Circulated. Closed pipe rams and ran leak off test to 960# for 30 min., witnessed by BLM. Drilled from 4204' to 4330'. POH. Picked up mud motor, oriented and drilled 12-1/4" hole from 4330' to 4386'.
10/05/95	Directionally drilled 12-1/4" hole from 4386' to 4483'. POH and laid down mud motor.
10/06/95	Reamed from 4315' to 4483'. Drilled 12-1/4" hole from 4483' to 4877'.
10/07/95	Drilled 12-1/4" hole from 4877' to 4978'. Reamed from 4876' to 4978'. Drilled from 4978' to 5085'.
10/08/95	Drilled 12-1/4" hole from 5085' to 5465'.
10/09/95	Drilled 12-1/4" hole from 5465' to 5730'.
10/10/95	Drilled 12-1/4" hole from 5730' to 5883'. Reamed from 5746' to 5863'.
10/11/95	Drilled 12-1/4" hole from 5883' to 6240'
10/12/95	Drilled 12-1/4" hole from 6240' to 6545'.

10/13/95	Drilled 12-1/4" hole from 6545' to 6577'. Rigged up Sandia and ran temperature survey. BHT 428°F after 12 hours.
10/14/95	Reamed from 6426' to 6577'. Drilled 12-1/4" hole from 6577' to 6910'.
10/15/95	Drilled 12-1/4" hole from 6910' to 7060'.
10/16/95	Reamed from 6916' to 7060'. Drilled 12-1/4" hole from 7060' to 7241'.
10/17/95	Drilled 12-1/4" hole from 7241' to 7482'.
10/18/95	Drilled 12-1/4" hole from 7482' to 7627'.
10/19/95	Reamed from 7541' to 7627'. Drilled 12-1/4" hole from 7627' to 7891'.
10/20/95	Drilled 12-1/4" hole from 7891' to 8125'.
10/21/95	Drilled 12-1/4" hole from 8125' to 8224'.
10/22/95	Reamed from 8075' to 8224'. Drilled 12-1/4" hole from 8224' to 8395'.
10/23/95	Drilled 12-1/4" hole from 8395' to 8505'.
10/24/95	Drilled 12-1/4" hole from 8505' to 8601'.
10/25/95	Drilled 12-1/4" hole from 8601' to 8733'.
10/26/95	Reamed from 8645' to 8733'. Drilled 12-1/4" hole from 8733' to 8846'. Lost 163 bbls mud from 8738' to 8778' at rate of 22 BPH. Surveyed at 8811' - lost 9 bbls mud on survey.
10/27/95	Drilled 12-1/4" hole from 8846' to 9053' - no losses.
10/28/95	Drilled 12-1/4" hole from 9053' to 9200'. Circulated and conditioned mud for logs. Surveyed at 9154'. Stuck pipe during survey at 9175'. Spotted 22 bbl. pipe lax and mineral oil. Displaced with 142 bbl. mud.
10/29/95	Worked stuck pipe free. Reamed from 9099' to 9200'.
10/30/95	Rigged up Schlumberger and ran logs.

- 10/31/95 Hooked up blooie line and rigged for air. RIH unloading well to 9150'. Tight at 9150' and pulled to 9129'. Pumped soap slugs. Reamed from 9129' to 9200'. Pumped soap slugs and circulated clean. POH.
- 11/01/95 Built and installed 5" test orifice. Shut in pressure 290#. Opened well and tested for 6 hours. Final pressure: 15.1#, 233°F. Shut well in. Monitored pressure build up.
- 11/02/95 Monitored pressure build-up. Final shut-in pressure 804# (still rising). Opened well. Bled off CO2 and H2S gas. Well stopped flowing. Hooked up air compressors and pumped 800# air cap. Let well heat up. Surged well. Unloading large amounts of rocks and mud. Well bridged off. RIH and blew well every 10 stands to 3965'.
- 11/03/95 Continued to blow well every 10 stands to bridge at 7494'. Drilled out bridge from 7494' to 7576'. Well came in unloading rocks and dirt. Pressure peaked at 46#, temperature 281°F. RIH and blew well every 10 stands to bridge at 8763'. Cleaned out to 8775'. Stuck pipe at 8775'. Worked free. Reamed from 8775' to 8792'. Pumped soap slugs. Pulled to shoe. Tight hole at 4749'. Mixed mud and built volume. Killed well.
- 11/04/95 POH to 2314'. Well started flowing. Mixed mud. Killed well with 600 bbls. POH. Closed master valve. Mixed mud. Rigged up for mud drilling. Pumped 625 bbls mud to fill hole. RIH. Broke circulation every 10 stands to fill at 8766'. Cleaned out fill from 8766' to 8805'.
- 11/05/95 Cleaned out hard bridge from 8805' to 8847'. POH to change bit. RIH to 4199' and broke circulation.
- 11/06/95 RIH to 8780' and reamed to 8847'. Cleaned out fill from 8780' to 9200'. Pumped gel sweeps. Circulated hole clean. Wiped hole to shoe. RIH (7' of fill). Pumped gel sweeps. Circulated hole clean. Wiped hole to shoe.
- 11/07/95 Wiped hole to shoe. RIH (10' of fill). Circulated & conditioned hole. Installed 9-5/8" casing rams in top of double gate. Rigged up and ran 78 jts. 9-5/8" 40# K-55 buttress casing with shoe set at 9185' and top of hanger at 3987'. Installed blank on flow line. Opened blooie line valve. Installed muffler drain.
- 11/08/95 Removed casing rams and installed blind rams. RIH unloading every 10 stands to 9200'. Pumped soap slugs. POH to 13-3/8". Closed blooie line valve. Pressure to 450#. Surged well.

11/09/95	POH. Pumped 600# air cap. Surged well. Well did not unload. RIH to fill at 9148'. Tried to unload hole. Pulled 10 stands and tried to unload. RIH - unloading every 10 stands.
11/10/95	RIH unloading every 10 stands. Well started flowing at 5674'. Top of fill at 9123'. Drilled out fill from 9123' to 9185'. Pumped soap slugs. Blew well clean. Laid down drill, collars and Kelly. Out of hole blooie line pressure 2#, temperature 198°, and 825 ppm H ₂ S. Closed master valve. Nipped down BOE.
11/11/95	Nipped down BOE. Released rig at 0800 hours.

Well History
Newbery 86-21