

## WELL HISTORY GEOTHERMAL

<b>Operator:</b> C.E. Exploration			<b>Well Name &amp; No.:</b> 23-22		
<b>Field:</b> Newberry KGRA	<b>County:</b> Deschutes	<b>Sec.</b> 22	<b>T.</b> 21S	<b>R.</b> 12E	<b>B&amp;M</b>

<u>DATE</u>	<u>HISTORY</u>
10/03/95	Rigged up.
10/04/95	Picked up mud motor and drilled rat hole. Hole sluffed in and mud motor quit working. Changed out mud motor. Redrilled rat hole. Laid down tools. Rigged turnbuckles on 48" conductor.
10/05/95	Filled pits. Made up BHA. Drilled 17-1/2" hole to 112'.
10/06/95	Drilled 17-1/2" hole from 112' to 114'. POH. Laid down 17-1/2" and picked up 26" tools. Opened hole to 26" from 47' to 54'. Lost circulation. Mixed thick LCM and gel pill and pumped. No success. Rigged up HOWCO and pumped 300 cu.ft. cement plug. WOC. Tagged top of cement at 45'. Cleaned out soft cement to 48'. WOC.
10/07/95	Drilled out hard cement from 48' to 64'. Opened 17-1/2" hole to 26" from 54' to 116'. POH. Laid down 26" tools. Cut off 40" conductor. Opened 26" hole to 36" from 47' to 64' no mud loss.
10/08/95	Opened 26" hole to 36" from 64' to 107'. Welded pins on 26" HO cones. Rotary beam pin came out - possible fish in hole. Fished for same with 11" magnet and winch line - no recovery. Opened hole to 36" from 107' to 114'.
10/09/95	Circulated mix and pumped gel sweep. Wiped hole. Pumped second gel sweep. POH and laid down 36" tools. Removed rotary table. <b>Ran 80' of 30" conductor casing.</b> Spudded casing at 70' and pumped down with HOWCO. Centered casing and tied down same. Rigged up, mixed and pumped 272 cu.ft. premium cement with 1-1 perlite, 40% SSA-1, 4% gel, 3.5% CFR-2, 3% CC, followed by tail slurry of 674 cu.ft. premium with 40% SSA-1, 3.5% CFR-2 and 3% CC. Good returns. WOC.
10/10/95	Slacked off 30" conductor. Nipped up 20" hydril and 20" flow nipple. Dropped API ring in hole. Fished for ring with magnet - no recovery. Laid down 36" hole opener. Made up 17-1/2" drill assembly. RIH and tagged top of cement at 90'. Drilled hard cement from 90' to 116'. No sign of fish. Drilled 17-1/2" hole from 116' to 142'. Lost circulation.

- 10/11/95 Drilled 17-1/2" hole from 142' to 144'. Lost circulation. Mixed and pumped gel and LCM pill. Let pill settle out. Drilled from 144' to 146' with partial returns (losing 120 bph). RIH with open-ended drill pipe to 146'. Pumped 167 cu.ft. premium cement with 1-1 perlite, 40% S.F., 3% gel, 5% CFR-3 and 3% CC. CIP. WOC. RIH and tagged cement plug at 79'. Cleaned out cement from 79' to 146'. Drilled 17-1/2" hole to 166'.
- 10/12/95 Drilled 17-1/2" hole from 166' to 292' (lost 20 bbls mud at 202'). Drilled to 352' with no losses. Surveyed. Drilled from 352' to 560', losing 60 bph. Pumped LCM and gel sweep at 474' - no mud loss.
- 10/13/95 Drilled 17-1/2" hole from 560' to 600'. Circulated and surveyed. Pumped LCM and gel sweep - no losses. Drilled to 712'.
- 10/14/95 Drilled 17-1/2" hole from 768' to 808'. Circulated and surveyed. Laid down 17-1/2" DA and picked up 26" hole opener. Unbolted hydril and set out. Cut off wellhead and removed. Welded on 30" conductor. Nipped up. Opened 17-1/2" hole to 26" from 79' to 120'.
- 10/15/95 Opened 17-1/2" hole to 26" from 120' to 390'.
- 10/16/95 Opened 17-1/2" hole to 26" from 390' to 650'.
- 10/17/95 Opened 17-1/2" hole to 26" from 650' to 808'. Wiped hole. POH. Rigged up and ran 21 jts. of 20", 94#, K-55 buttress casing with shoe set at 795' and float collar at 714'.
- 10/18/95 Circulated and conditioned. Pumped 20 bbls H2O ahead. Mixed and pumped 2166 cu.ft. cement with 25# spherelite, 40% SSA-1, 75% HALAD 322, 4% gel, 1% WG17 and 2% CC, followed by tail slurry of 401 cu.ft. cement with 40% SSA-1, 5% CFR-3 and 2% CC. Dropped plug. Displaced with 254 bbls mud. Bumped plug with 200 psi. Float held. Good returns. WOC. Cut off conductor and 20" hydril. Welded on 20" wellhead.
- 10/19/95 Welded wellhead on 20" and tested. Nipped up 20" double gate and annular preventer. Tested blind rams, wellhead and wing valves to 1000#. Tested pipe rams to 1000#. Tested annular preventer to 500#. All tests witnessed by Dennis Davis (BLM) and Dennis Olmstead (DOGAMI).
- 10/20/95 Rigged up and skidded rig back to align with hole. Leveled derrick.
- 10/21/95 Installed flow line and new steel kill line. Made up BHA and tripped in hole. Tagged cement at 711'. Circulated and conditioned. Cleaned out cement from 711' to 780' (drilled out float). Pressure tested BOE and 20" casing to 500 psi. Drilled out 20" shoe and cement to 810'. Circulated clean. Shut well in and

performed leak-off test. Well leaked off from 150 psi down to 30 psi in 1 hour. Performed static test - well stood full for 15 minutes. Test witnessed by Dennis Davis (BLM). Drilled 17-1/2" hole from 810' to 908'. Surveyed.

10/22/95 POH and made up mud motor. Oriented and drilled 17-1/2" hole to 1224'.

10/23/95 Drilled 17-1/2" hole with mud motor from 1224' to 1350'. POH and laid down mud motor. Reamed from 910' to 1350'. Drilled 17-1/2" hole to 1431'.

10/24/95 Drilled 17-1/2" hole from 1431' to 1712'.

10/25/95 Drilled 17-1/2" hole from 1712' to 1967'. BHT 108°F.

10/26/95 Drilled 17-1/2" hole from 1967' to 2185' BHT 118°F.

10/27/95 Reamed from 2085' to 2185'. Drilled 17-1/2" hole from 2185' to 2552'. BHT 120°F.

10/28/95 Drilled 17-1/2" hole from 2552' to 2661'. BHT 125°F. POH for mud motor. Function tested BOE. Drilled with mud motor to 2765'. BHT 123°F.

10/29/95 Drilled 17-1/2" hole with mud motor from 2765' to 2797'. POH and laid down mud motor. Reamed from 2661' to 2797'. Drilled from 2797' to 2930'. BHT 132°F.

10/30/95 Drilled 17-1/2" hole from 2930' to 3179'. BHT 142°F.

10/31/95 Drilled 17-1/2" hole from 3179' to 3624'. BHT 145°F.

11/01/95 Drilled 17-1/2" hole from 3624' to 3724'. Lost 70 bbls at 3660'. Drilled to 4017' with no losses. BHT 160°F.

11/02/95 Drilled 17-1/2" hole from 4017' to 4114'. Reamed from 4096' to 4114'. Drilled to 4237' with no losses. BHT 156°F.

11/03/95 Drilled 17-1/2" hole from 4237' to 4437'. Circulated and conditioned hole for electrical logs. POH for logs.

11/04/95 Rigged up and ran FIAC/SDD/HRTT/GR log on first run. Ran CAST/GR on second run. Rigged down. Lost 155 bbls mud while logging. RIH. No fill. Circulated and conditioned hole.

11/05/95 Rigged up and ran 15 jts 13-3/8", N-80, 72# and 17 jts L-80, 72# buttress casing. Ran 65 jts. K-55, 72#, and 12 jts L-80, 72# on top. Total of 109 jts in hole, with shoe set at 4417', float at 4370 and DV at 2883'. Pumped 20 bbls

- H2O ahead. Mixed and pumped 2030 cu.ft. cement with 35 sx Spherelite, 40% SSA-1, 4% gel, 1% HALAD, .2% HR-7 and .1% WG-17, followed by tail slurry of 210 cu.ft. cement with 40% SSA-1, .5% CFR-3 and .15% HR-7. Displaced with 648 bbls mud. Landed plug. Opened DV with 1800 psi. WOC. Circulated thru DV at 18 bpm (lost 140 bbls mud). Pumped two 10 bbl LCM sweeps.
- 11/06/95 WOC. Lifted BOP and installed centralizer on 13-3/8" casing. Pumped 20 bbls H2O ahead. Mixed and pumped lead for second stage of 3977 cu.ft. cement with 35 sx Spherelite, 40% SSA-1, 4% gel, .75% HALAD, and .1% WG-17, followed by tail of 139 cu.ft. cement with 40% SSA-1 and .5% CFR-3. Displaced with 427 bbls mud. Closed DV and tested. WOC.
- 11/07/95 Nipped down and set out 20" BOPE. Cut of 13-3/8" casing. Installed expansion spool. Completed 73 cu.ft. top job.
- 11/08/95 Nipped up 13-3/8" BOP and function tested. Tested blind rams and stack at 1000 psi. Tested pipe rams to 1000 psi. Tests witnessed by Dennis Davis (BLM) and Dan Wormiel (DOGAMI).
- 11/09/95 Tested upper kelly valve and function tested steel rams. RIH and tagged cement at 2628'. Drilled out cement and DV to 2905' - tested at 1000 psi. RIH and tagged cement at 4274'. Drilled out baffle and float collar - tested to 1000 psi. Drilled out shoe at 4417'. Drilled 12-1/4" hole from 4437' to 4439'. Circulated. Pressured up to 566 psi. Pressure dropped to 462 psi within 15 min. Checked all surface equipment and retested. Same results. POH.
- 11/10/95 RIH to 4432' for squeeze job. Pipe plugged. POH and laid down plugged joint. Circulated hole. Pumped 20 bbls H2O ahead and pumped 70 cu.ft. cement with 490% SSA-1, .5% CFR-3 and 3%CC. Squeezed cement with 800 psi for 1 hour. Squeezed away 5 bbls. , stabilized at 725 psi. WOC. Drilled out cement from 4380' to 4449'. Drilled 12-1/4" hole from 4439' to 4445'. Circulated. RU HOWCO. Closed pipe rams. Pressured up to 566 psi and held for 5 hours (witnessed by Dennis Davis, BLM). Drilled to 4543'.
- 11/11/95 Drilled 12-1/4" hole from 4543' to 4669', BHT 162°F. POH. Made up mud motor. Drilled with mud motor from 4669' to 4685'.
- 11/12/95 Drilled 12-1/4" hole with mud motor from 4685' to 4849'. POH and laid down mud motor. Made up BHA. Reamed from 4669' to 4695'.
- 11/13/95 Reamed to 4849'. Drilled 12-1/4" hole from 4849' to 6210'. BHT 162°F.
- 11/14/95 Drilled 12-1/4" hole from 5210' to 5423'. BHT 185°F. Circulated hole. Function tested BOE. Installed pipe protector rubbers on drill pipe while TIH.

Reamed from 5400' to 5423' - no fill. Drilled to 5476'.

11/15/95 Drilled 12-1/4" hole from 5476' to 5495'. BHT 196°F.

11/16/95 Drilled 12-1/4" hole from 5945' to 6362'. BHT 210°F.

11/17/95 Drilled 12-1/4" hole from 6362' to 6645'.

11/18/95 Reamed from 6570' to 6645'. Drilled 12-1/4" hole from 6645' to 6801'. Lost 45 bbls mud from 6770' to 6801'. Circulated for ½ hour off bottom checking for mud loss - none during circulation. Drilled to 6893' - no losses.

11/19/95 Drilled 12-1/4" hole from 6893' to 7154'.

11/20/95 Drilled 12-1/4" hole from 7154' to 7198'. BHT 228°F.

11/21/95 Reamed from 7100' to 7198'. Drilled 12-1/4" hole from 7198' to 7234'.

11/22/95 Drilled 12-1/4" hole from 7234' to 7457'. BHT 232°F.

11/23/95 Drilled 12-1/4" hole from 7457' to 7700'. BHT 234°F.

11/24/95 Reamed from 7620' to 7700'. Drilled 12-1/4" hole to 7832'. Surveyed. Pipe stuck while surveying. Circulated. Worked stuck pipe. Mixed and pumped 50 bbls pipe lax and mineral oil. Spotted around BHA. Worked stuck pipe.

11/25/95 Worked stuck pipe.

11/26/95 Worked stuck pipe. Rigged up air compressor. Aerated mud with 1200 CFM air and 200 GPM mud. Brought bubble to surface. Pipe came free. Circulated air out of hole. POH to shoe. Circulated and built volume.

11/27/95 RIH to 7511' and reamed to 7832'. Drilled 12-1/4" hole from 7832' to 8110'.

11/28/95 Drilled 12-1/4" hole from 8110' to 8271'. Reamed from 8201' to 8271'.

11/29/95 Drilled 12-1/4" hole from 8271' to 8328'. Surveyed. Pipe stuck in hole. Worked stuck pipe with full circulation. Mixed 50 bbl mineral oil and 12 pails pipe lax. Spotted 38 bbls outside and 12 bbls inside pipe. Worked pipe - came free. Reamed from 8220' to 8328'. Drilled to 8530'.

11/30/95 Drilled 12-1/4" hole from 8530' to 8756'.

12/01/95 Drilled 12-1/4" hole from 8756' to 8808'.

12/02/95 Drilled 12-1/4" hole from 8808' to 8900'. Started wiping hole - pipe stuck at 8761'. Worked stuck pipe. Spotted 50 bbl mineral oil. Pipe came free. Drilled from 8900' to 8954'.

12/03/95 Drilled 12-1/4" hole from 8954' to 8963'. Stuck pipe while making connection. Worked **stuck pipe at 8956'**.

12/04/95 Worked stuck pipe. Rigged up and aerated mud.

12/05/95 Aerated mud. **Pipe came free.** RIH to 4355'. Installed RBOP. Mixed mud.

12/06/95 Conditioned mud. Staged in hole. Tight hole at 7481'. Reamed from 7481' to 7541'. Drilled 12-1/4" hole from 8963' to 9133'.

12/07/95 Drilled 12-1/4" hole from 9133' to 9265'. Circulated and spotted LCM sweep at 7400'.

12/08/95 Reamed from 9181' to 9265'. Drilled 12-1/4" hole from 9265' to 9381'.

12/09/95 Drilled 12-1/4" hole from 9381' to 9488'. Spotted LCM at 7400'.

12/10/95 Reamed from 9406' to 9488'. Drilled 12-1/4" hole from 9488' to **9602'**. Wiped hole to shoe for logs. TD

12/11/95 Wiped hole. Conditioned mud. Rigged up and ran Schlumberger FMS log from 9100' to 7100' - tool failed. POH. Ran dip meter from 7100' to 4410'. Rigged down loggers.

12/12/95 Circulated hole.

12/13/95 Wiped hole to shoe. POH. Made up Midway hanger. Rigged up and ran 21 jts 9-5/8" perforated 40#, K-55 casing and 69 jts. **9-5/8"**, **perforated** 40#, L-80 casing, then ran 2 jts 40# blank K-55 casing and 51 jts 40# blank L-80 casing and midway double **slip hanger**. Rigged down casing crew. Made up hanger. RIH and set double slip hanger **at 4200'**. Blank casing from 4200' to 6488', and perforated casing from 6488' to bullnose **shoe at 9577'**.

12/14/95 Filled pits. Circulated out mud. POH. Removed flow line and installed blank flange. Rigged up Dia-Log and ran caliper log. Hooked up bleeder lines and anchor muffler. Removed blank from banjo box. Broke swivel spool and turn stack.

12/15/95 Hooked up blooie line. Tightened swivel spool. Picked up sawtooth single and RIH unloading every 10 stands. Flowed well for 1-1/2 hour. POH.

12/16/95 POH. Flowed well at 4089' RIH to 9570'. Unloaded and flowed well. POH. Laid down 12-1/4" tools. ?

12/17/95 Laid down drill pipe and collars. Shut in well. Opened blow down line. Nipped down BOE.

12/18/95 Rigged up Solid wireline. Ran pressure and temperature logs. Rigged down.

12/19/95 Rigged down. Rigged up Solid wireline and ran pressure and temperature survey. Rigged down wireline unit. Filled hole with 250 bbls clear water and performed injection test.. Hole taking 105 gpm at 900#.