

STATE OF OREGON  
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
800 NE Oregon Street #28, Portland OR 97232

HISTORY OF OIL OR GAS WELL  
(In compliance with rules and regulations pursuant to ORS 520)

NW Natural (Company or Operator)	Northwest Natural Gas (Lease)	IW 32H-22-65 (Well No.)
Sec. 22    T. 6N    R. 5W	Surveyed Coordinates (if directional, BHL & SHL): SHL; N86°47'54"E 2085.04' & S03°12'06"E 1827.47' from the NE corner of section 22, T6N; R5W, BHL; 1078.63' S & 896.51' W from surface location	
Wildcat:	(or) Field Name: Calvin Creek Storage Field	County: Columbia
		Signature: _____
Date: <u>2/23/98</u>	Position: Storage Development Engineer	

Use this form in reporting the daily operations at the well. (Operator may use his own forms, but heading of this form must also be completed and submitted.) Please submit a complete history of the well. Include such information as bit sizes, mud weights, casing sizes and depths set, amount of cement used, drilling depths, fishing, logging, perforating, and plugging procedures, and anything else pertinent to the operation. Do not include lithology.

Date	
11/18/97	Rig up, make up bit, mix mud. Pick up drill collars, spud well with 17 1/2" bit. Drilling f/ 35' t/ 138'.
11/19/97	Drilling 17 1/2" hole f/ 138' t/ 390'. Circulate & wipe hole to surface. Tight hole. Wipe hole to surface. Slick. POH for casing. Rig up and run 380' of 13 3/8", 48#/ft, H-40 casing to 377'. Circulate hole clean. Cement casing w/ 300 sx type III cement w/ 2% sodium metasilicate + 3% CaCl. Lost returns. Bump plug @ 10 pm. WOC.
11/20/97	WOC. Cut off casing and weld on wellhead. Test weld to 1000 psi. Nipple up BOPE. Test BOPE with State Rep witnessing. Condition mud & RIH. Drill plug, baffle plate, cement, & shoe.
11/21/97	Drill cement & shoe. Drilling 12 1/4" hole f/ 390' t/ 441'. POH and pick up directional drilling assembly. RIH. Directional drilling f/ 441' t/ 715'. Wipe hole to shoe. Directional drilling f/ 715' t/ 865'. Mud weight = 8.9 MD=514', TVD=514', 3.5° N53.1W; MD=694', TVD=691.7', 14.7° N65.7W
11/22/97	Wipe hole to shoe. Directional drilling f/ 865' t/ 1080'. Circulate and wipe hole to 800'. Tight in spots. Circulate. Directional drilling f/ 1080' t/ 1205'. Wipe hole to shoe. Directional drilling f/ 1205' t/ 1362'. Circulate, wipe hole 4 stds, tight on 1 <sup>st</sup> std. Kelly up & circulate out. RIH & circulate. Directional drilling f/ 1362' t/ 1393'. Mud weight = 10.0 MD=935', TVD=914', 28.3° S78.6W; MD=1091', TVD=1050', 32° S67.9W; MD=1216', TVD=1156', 32.3° S47.2W; MD=1371', TVD=1281', 40.7° S37.6W
11/23/97	Directional drilling f/ 1393' t/ 1423'. Circulate and wipe hole. Tight at 1 <sup>st</sup> tool jts then slick. Circulate hole clean. Directional drilling f/ 1423' t/ 1486'. Wipe hole to bit. Tight f/ 1486' t/ 1230'. Change jets. RIH. Directional drilling f/ 1486' t/ 1609'. Circulate on connections. Mud weight = 10.0 MD=1525', TVD=1390', 51.4° S42.1W
11/24/97	Wipe hole 5 stds & circulate. Directional drilling f/ 1609' t/ 1702'. Wipe hole 7 stds & circulate. Directional drilling f/ 1702' t/ 1826'. Circulate & POH to lay down directional tools. Make up hole opener & RIH & circulate. POH for logs. Mud weight = 10.0; MD=1650', TVD=1457', 61.3° S40.4W; MD=1775', TVD=1506', 72.1° S37.6W
11/25/97	Rig up loggers & run DIL, Sonic, GR, SP, FDCN, FMS. Rig down loggers. RIH, tight @ 1586'. Circulate & POH for drill pipe conveyed logs. Rig up Schlumberger & run drill pipe logs. Rig down Schlumberger & POH. Mud weight =9.9
11/26/97	POH, lay down logging tools. RIH with hole opener. Pull up to shoe & wait on cementers. RIH, circulate. POH Run 42 jts (1779') 8 5/8", 32#, J-55, modified LT&C casing with guide shoe, float collar, and annulus casing packer to 1802'. Cement casing with lead slurry, 350 sx type III + 2% metasilicate + 0.5% CD-32 and tail with 350 sx type III + 5% KCl + 0.8% FL-62 + 0.4% CD-32 + 0.6% BA-61. Inflate casing packer w/ .5 bbl of class "G" cement w/ 0.3% FL-52 + 0.65% CD-32 + 0.2% SM. Pressure test ACP. Nipple down BOP, set casing slips.

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11/26/97 cont.	Cut off casing, install tubing head and test. Nipple up BOPE & pitcher nipple. Test BOPE w/ State representative witnessing.
11/27/97	Lay down hole opener. RIH and tag cement @ 1409'. Drilling cement, plugs, float & shoe f/ 1409' t/ 1802'. Circulate clean. Clean mud pits.
11/28/97	Clean mud pits. Fill pits with water and mix mud. Pump 30 bbl water spacer. Displace hole with drill in fluid. Circulate & shear fluid. POH & pick up directional drilling tools. Drilling 7 7/8" hole f/ 1826' t/ 1851'. Orient directional tools. Drilling f/ 1851' t/ 1912'. Pull to shoe & check compressor valves. POH to check tools. Low circulating pressure suspicious. Mud weight = 8.5
11/29/97	Make up new mud motor & RIH. Orient tools and drilling f/ 1912' t/ 2020' with 600 psi pump pressure. Wipe hole to shoe and rearrange BHA. Drilling f/ 2020' t/ 2183'. Wipe hole to shoe. Drilling f/ 2183' t/ 2244'. Mud weight = 8.5; MD=1982', TVD=1555', 82.4° S31.3W; MD=2162', TVD=1577', 83.2° S26.4W
11/30/97	Drilling f/ 2244' t/ 2305'. Circulate, wipe new hole. Survey, POH to inspect directional tools. Make up tools & RIH. Drilling f/ 2305' t/ 2600'. Circulate & POH. Lay down directional tools. Pick up hole opener. Mud weight = 8.5; MD=2342', TVD=1588', 86.8° S25W; MD=2548', TVD=1616', 80.1° S22.1W
12/1/97	RIH w/ hole opener. Tool too large for casing ID. Make up bit & RIH. Circulate clean & POH for logs. Rig up Schlumberger & run CET. Run DIL, Sonic, GR, SP, FDCN, FMS drill pipe logs. POH and lay down logging tools. RIH. Mud weight = 8.5
12/2/97	RIH & circulate hole clean. Pull up inside casing and circulate. Mix & filter 2% KCl fluid. Mix, shear viscous pill. Unload and strap tubing, liner. RIH to 2600' and circulate hole clean. Rig up BJ Services & displace open hole with viscous pill. Pull up inside casing and displace with filtered 2% KCl fluid. POH & lay down drilling tools. Rig up to run liner.
12/3/97	Run 22 jts of Baker "Excluder" liner and tools (900'). Strap, pick up, and run 2 3/8" inner string. Make up isolation valve. Pick up packer assembly & RIH. Set packer & test. Circulate breaker fluid into liner annulus. Pull out of circulating shoe & circulate breaker inside liner. POH, lay down drill pipe, lay down 2 3/8" tubing, lay down Baker tools and lay down HWDP.
12/4/97	Lay down pipe. Rig up & run 40 jts of 5 1/2", 15.5#, J-55, LTC modified tubing with side pocket mandrel & seal assy. Tag packer, space out tubing with pup jts and land tubing hanger and test packer annulus. Mix & circulate corrosion inhibitor. Land tubing hanger. Nipple down BOPE. Install production tree. Rig down.
12/5/97	Rig down. Clean mud pits, load out trucks. Released Taylor Drilling Rig #4 @ 2 pm 12/5/97.