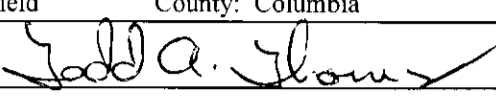


STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
800 NE Oregon Street #28, Portland OR 97232

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 23a-22-65 (Well No.)
Sec. 22 T. 6N R. 5W	Surveyed Coordinates (if directional, BHL & SHL): SHL; N03°03'15"E 2280.65' & S86°56'45"E 1923.76' BHL; 371.31' S & 732.85' E from surface location	
Wildcat:	(or) Field Name: Calvin Creek Storage Field	County: Columbia
Date: 2/10/98	Signature: 	
	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	
9/19/97	Rig up, make up bit, mix mud. Pick up drill collars, spud well with 17 1/2" bit. Drilling f/ 37' t/ 140'
9/20/97	Unplug flow line. Drilling 17 1/2" hole f/ 140' t/ 369'. Wipe hole to surface & circulate. POH for casing. Rig up and run 8 jts, 359' of 13 3/8", 48#/ft, H-40 casing to 355'.
9/21/97	Circulate hole clean. Cement casing w/ 193 sx type III cement w/ 2% sodium metasilicate. Tail with 76 sx of type III cement w/ 2% sodium metasilicate + 3% CaCl. Bump plug @ 12:35 am. WOC. Cut off casing and weld on wellhead. Test weld to 1000 psi. Nipple up BOPE.
9/22/97	Nipple up BOPE. Test BOPE with State Rep witnessing. Drill plug Float, cement. Drilling 12 1/4" hole f/ 359' t/ 382'. POH and pick up directional drilling assembly. RIH.
9/23/97	Directional drilling f/ 382' t/ 618'. Circulate and POH to change BHA & jets. Drilling f/ 618' t/ 672'. Circulate and POH to check MWD electronics. Directional drilling f/ 672' t/ 778'. Mud weight = 8.9. MD=604', TVD=603.9', 3.6° S41.8E; MD=728', TVD=726.8', 11.3° S76.2E; MD=884', 874.2', 25.7° S76.5E
9/24/97	Wipe hole to shoe. Pulled tight. Directional drilling f/ 778' t/ 934'. Condition mud and wipe hole to shoe. Directional drilling f/ 934' t/ 1025'. Tight connections. Condition mud, raise mud weight. Directional drilling f/ 1025' t/ 1119'. Circulate, increase mud weight, work tight hole. POH to clean BHA. RIH, circulate clean. Directional drilling f/ 1119' t/ 1149'. Mud weight = 9.5. MD=944', TVD=927.4', 29.6° S77.6E; MD=1131', TVD=1087, 32.6° S58.9E
9/25/97	Directional drilling f/ 1149' t/ 1273'. Circulate & POH to pick up core barrel. Pick up 9 7/8" core bit & RIH. Ream 90' to bottom. Coring f/ 1273' t/ 1303'. POH with core #1 and lay down (cut 30', recovered 0'). Dress core Barrel & RIH. Attempt to slide over core #1. Core f/ 1303' t/ 1307'. POH with core #2 and lay down (cut 4', recovered 2.3'). Pick up core barrel & RIH. Wash 60' to bottom. Coring f/ 1307' t/ 1311'. Core jammed. POH. Mud weight = 9.5
9/26/97	POH with core #3 and lay down (cut 4', recovered 3.5'). Pick up core barrel & RIH. Wash 60' to bottom. Coring f/ 1311' t/ 1340'. POH with core #4 and lay down (cut 29', recovered 29.4'). Pick up core barrel & RIH. Wash 60' to bottom. Coring f/ 1340' t/ 1370'. POH with core #5 and lay down (cut 30', recovered 29.8'). Pick up core barrel & RIH. Wash 60' to bottom. Coring f/ 1370' t/ 1372'. Jammed core, POH with core #6 and lay down (cut 2', recovered 2'). Pick up core barrel & RIH. Wash 60' to bottom. Coring f/ 1372' t/ 1402'. POH with core #7 and lay down (cut 30', recovered 30'). Mud weight = 9.5
9/27/97	Make up hole opener and RIH. Ream f/ 739' t/ 779', f/ 819' t/ 859', f/ 1150' t/ 1190', f/ 1242' t/ 1273'. Reamed cored section f/ 1273' t/ 1403'. Circulate hole clean & POH for logs. Rig up loggers & run DIL, Sonic. RIH for

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Date	
9/27/97 (cont.)	out run. Circulate and condition hole. POH for logs. Rig up Schlumberger & run FMS, LDT, CNL. Tight hole @ 1260' & 1230'. RIH w/ bit & ream tight hole. Circulate & condition mud. Wipe hole 2 stds. Ream tight spots. Circulate hole. Mud weight = 9.5+
9/28/97	Circulate & wait on services. POH for casing, lay down tools. Rig up and run 32 jts (1373') 8 5/8", 32#, J-55, Modified LT&C casing with guide shoe, float collar, and annulus casing packer to 1395'. Cement casing with lead slurry, 125 sx type III + 2% metasilicate + 2 ghs FP-12L and tail with 235 sx type III + 3% KCl + 0.7% FL-62 + 0.4% CD-32 + 0.9% BA-61. Inflate casing packer w/ 1bbl of class "G" cement w/ 0.3% FL-52 + 0.65% CD-32 + 0.2% SM. Pressure test ACP. Set casing slips. Nipple up & test tubing spool. Nipple up BOPE.
9/29/97	Test BOPE with State Rep witnessing. Lay down tools, make up new BHA & RIH. Drilling cement, float, cement & shoe f/ 1105' t/ 1403'. Clean mud pits.
9/30/97	Clean mud pits, lines, and mud cleaning equipment. Mix & condition new KCl/polymer mud system. Displace hole with new mud. POH to pick up core barrel. RIH with 7 7/8" core bit. Coring f/ 1403' t/ 1418'. POH with core #8 and lay down (cut 15', recovered 12.1'). Pick up core barrel & RIH. Coring f/ 1418' t/ 1444'. Circulate gas out, POH with core #9 and lay down (cut 26', recovered 15'). Pick up core barrel & RIH. Circulate bottoms up. Coring f/ 1444' t/ 1452'. Mud weight = 8.4
10/1/97	Coring f/ 1452' t/ 1474'. Circulate, POH with core #10 and lay down (cut 22', recovered 5.5'). Pick up core barrel & RIH. Circulate bottoms up. Coring f/ 1474' t/ 1494'. POH with core #11 and lay down (cut 22', recovered 15.6'). Pick up core barrel & RIH. Coring f/ 1494' t/ 1519'. POH with core #12 and lay down (cut 25', recovered 24'). Pick up core barrel & RIH. Coring f/ 1519' t/ 1544'. POH with core #13 and lay down (cut 25', recovered 24.7'). Pick up core barrel & RIH. Coring f/ 1544' t/ 1569'. POH with core #14 and lay down (cut 25', recovered 11.2'). Pick up core barrel & RIH. Circulate. Coring f/ 1569' t/ 1574'. Mud weight = 8.5
10/2/97	Coring f/ 1574' t/ 1594'. POH with core #15 and lay down (cut 25', recovered 23.5'). Pick up core barrel & RIH. Circulate. Coring f/ 1594' t/ 1619'. POH with core #16 and lay down (cut 25', recovered 22.7'). Pick up core barrel & RIH. Circulate & wash 30' to bottom. Coring f/ 1619' t/ 1649'. POH with core #17 and lay down (cut 25', recovered 26.2'). Pick up core barrel & RIH. Circulate & wash 30' to bottom. Coring f/ 1649' t/ 1673'. POH with core #18 and lay down (cut 24', recovered 22.5'). Lay down core barrel. Make up new BHA & RIH. Ream f/ 1395' t/ 1677'. Circulate hole clean. Survey. Wipe hole to shoe. Drilling 7 7/8" hole f/ 1673' t/ 1708'. Mud weight = 8.6
10/3/97	Drilling 7 7/8" hole f/ 1708' t/ 1834'. Wipe hole to shoe. Drilling 7 7/8" hole f/ 1834' t/ 2019'. Wipe hole to shoe. Drilling 7 7/8" hole f/ 2019' t/ 2298'. Wipe hole to shoe. Circulate hole clean & POH for logs. Rig up Schlumberger and run DIL, Sonic, CET, logs. Mud weight = 8.7+
10/4/97	Run wireline VSP logs. RIH with bit. Circulate hole clean. POH for logs. Rig up Schlumberger and run FMS, LDT, CNL, ETT. Trip in with open ended drill pipe to 1735'. Circulate & condition mud. Rig up BJ Services and pump cement plug w/ 77 sx f/ 1735' t/ 1435'. WOC.
10/5/97	WOC. RIH & tag cement plug at 1454', polish to 1472'. Circulate hole clean, condition mud. POH, lay down DP. Pick up under reamer & RIH. Scrape casing f/ 1269' t/ 1340'. Under ream open hole f/ 1395' t/ 1472'. Circulate & pull to shoe. Run to bottom, check for fill, circulate. POH, rig up Schlumberger & run caliper.
10/6/97	Rig down Schlumberger, pick up under reamer #2 & RIH. Under ream f/ 1395' t/ 1472'. POH, rig up Schlumberger & run caliper. RIH, ream f/ 1395' t/ 1472'. Pull inside casing. Dump & clean mud pits, build Volume. Rig up filter unit, filter fluid & displace hole with filtered fluid. POH & lay down under reamer. Rig up & run 110' of 5 1/2" liner, .012" wire wrap, 10' of 5 1/2" blank pipe & packer assembly to 1470'.
10/7/97	Conduct safety meeting, break circulation, set packer @ 1312'. Test annulus to 1000 psi. Gravel pack liner with 82 cu. ft. of 20/40 gravel. Reverse circulate ~ 1 cu. ft. Rig down Halliburton. POH & lay down DP, gravel pack tools & BHA. Rig up & run 30 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. Rig up slick line and install isolation valve below packer. Nipple down BOPE. Install production tree.
10/8/97	Test packer to 350 psi. Pump corrosion inhibitor + oxygen scavenger. Rig up nitrogen & displace corrosion inhibitor w/ 20,000 cu. ft. Rig up slick line and install gas lift valve in mandrel. Test packer & tree. RIH with slick line & remove isolation plug. Nipple down production tree to bottom master valve until final completion. Rig down. Release Taylor Drilling Rig #4.

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