

**Objective:**

Find well and prep to re-enter well. Drill out all plugs. Plug well again with improved plugging requirements. Mark casing stump per City of Erie code and in agreement with surface owner.

**Procedure:**

1. Meet with developer to move stock pile of soil. Contractor to obtain Line locates for ground disturbance. Locate well or casing stump. Have surveyor gather an as built survey of well location for records. Submit Form 2 for a temporary surface location and access for this site. Approvals from surface owner will be required. Submit Form 6 for approval of re-plug prior to hydraulic stimulation of proposed horizontal well. Refer to all COA's from approval from the COGCC.
2. Construct approved location and temporary access for the site after approvals have been made.
3. Submit Form 42 electronically to COGCC 48 hours prior to MIRU.
4. Dig up stump of original surface casing. Create bell hole to provide safe working area for welder. Cut off marker and prep for a slip on collar with pup joint to get surface flange to ground level. Install 7", 3K, flange with adapter spool to go to 9" or 11" depending upon availability of BOP, 3K Flange on top.
5. Back fill area and prep for rig. Spot Beam for pulling unit.
6. MIRU Pulling Unit, Pipe racks, Pipe Wrangler, Work String – 8000' (2-7/8", PH6 drill pipe), Eight (8) 4-3/4" Collars, subs and handling tools. Additional equipment to move in Pump, Power Swivel, Tanks (Clean fluid tank, Return tank, water tank for cement), Pre mix mud equipment. Prepare to have about 350 bbls of 9.2 to 9.5 ppg fresh water mud available in the system. Have Gas Buster with flare stack delivered to handle any gas that may be in the system. Use containment for all tanks and rig.
7. Install 9" or 11", 3K BOP, including pipe rams for work string, blind rams, annular, circulating head, mud cross with 3" line to choke manifold and 3" flow line to fluid system. Rig up a 2" kill line on bottom spool below Blind Rams. Test all equipment with a function test and a pressure test against test plug. Test surface casing patch to 1500 psi (65% of internal yield pressure of 2310 psi)
8. Pick up 6-1/4" or 6-1/8" rock bit, bit sub, xo sub, one 4-3/4" Drill Collar. Rig up to swivel and drill out surface plug from surface to about 58'. Continue to pick up BHA elements until the full BHA is picked up. BHA = Rock bit, bit sub, xo sub, eight (8) 4-3/4" OD Drill Collars, xo sub back to 2-7/8" PH6 work string. Gather measurements for all BHA components before they are picked up.
9. Circulate hole clean when surface plug is drilled out. Run in hole to the next plug. Expected top of 769'. Report the actual tag depth. Circulate hole with clean mud. Discard returned mud in waste tank. Have 9.5 ppg mud in system before drilling out plug.
10. Drill out next plug from 769' to about 962'. Circulate hole clean. Be prepared for gas kick. Circulate as needed to work gas out of system. Notify fire dispatch of any flaring or incinerator use.
11. Run in hole every 1000' and circulate hole with fresh mud. Discard the original well fluid in waste tank. Use proper manifest to haul waste mud to landfill. The circulating depths should be at about 2000', 3,000', 4000', 5000', and 7000'. Please note well conditions and adjust mud weight as needed to control well.
12. Tag next cement plug at about 7185'. Drill out plug to about 7385'. Please note actual depths in report. Circulate well with clean mud.
13. Run in hole to next cement plug at about 7544'. Tag plug and report to engineer. Please note actual depths in report. Circulate well with clean mud.
14. Rig up wireline or slick line to run Gyro Survey from PBTB (just above bit). File survey with electronic well file.
15. Condition mud as necessary to prepare for cement operations. Reduce viscosity to about 10 cp if possible.

16. Rig up cement equipment and pump plugs as follows:

- a. Plug 1: 7544' to 7000' (Original plug at Top of Codel to 400' above top of Niobrara) 130 sks of Class G cement, mixed at 15.8 ppg, with 4.97 gal/sk mix water, and 1.145 cu ft/sk yield. Pump a balanced plug based on tubulars and capacity. Assume 6-5/8" hole size, plus 10% excess. Trip out of hole to 6000' and circulate to clear tubing.
- b. Trip out of hole and lay down BHA. Run back in hole with bit and work string. Tag up to confirm plug top. Add additional cement to get plug top to 7000' if necessary. Repeat to tag top before moving to next plug.
- c. Lay down work string to 5400'.
- d. Plug 2: 5400' to 4400' (200' below base of Shannon to 200' above top of Sussex) 300 sks of Class G cement, mixed at 15.8 ppg, with 4.97 gal/sk mix water, and 1.145 cu ft/sk yield. Pump a balanced plug based on tubulars and capacity. Assume 7-1/2" hole size, plus 10% excess. Trip out of hole to 3000' and circulate to clear tubing. Circulate for 4 hours at slow pump rate to allow cement to cure.
- e. Run back in hole with bit and work string. Tag up to confirm plug top. Add additional cement to get plug top to 4400' if necessary. Repeat to tag top before moving to next plug.
- f. Lay down work string to 1760'.
- g. Plug 3: 1760' to surface' (200' below base of Upper Pierre to Surface) 460 sks of Class G cement, mixed at 15.8 ppg, with 4.97 gal/sk mix water, and 1.145 cu ft/sk yield. Pump cement back to surface. Plan on having an extra 200 sks of neat cement available. Assume 7-1/2" hole size to the base of surface casing, plus 10% excess. Trip out of hole laying down rest of work string.
- h. Top off casing to surface. Wash up to waste tank. Have all waste hauled to certified disposal with Crestone Peak Resources manifest for each load.

17. ND BOP's and surface equipment.

18. Rig down rig and all other auxiliary equipment. Move off location.

19. Cut off casing 4' below ground level or as approved by COA's and City code.

20. Weld on metal plate and/or dry hole marker for the developer to meet City code.

21. Restore surface location and reclaim per arrangements with the surface developer.

22. Ensure all cement tickets are mailed or emailed to the Denver office for subsequent reporting.