

OCCIDENTAL PETROLEUM CORPORATION

Please contact your area engineer with any questions concerning this procedure.

6/13/2022

PLUG and ABANDONMENT PROCEDURE

WARDELL 20-6

API: 05-123-23511

**Step Description**

1	Review Previous Open Wells Reports/Well History. If you have questions or concerns, contact Foreman/Engineer.
2	COA: Provide 48 hour notice to COGCC prior to rig up per request on approved Form 6 (e.g. call field coordinator, submit Form 42, etc.).
3	Notify Automation Removal Group at least 24 hours prior to rig move. Request they catch and remove plunger, isolate production equipment, and remove any automation prior to rig MIRU.
4	MIRU Slickline. Pull production equipment and tag bottom. Record tag depth, casing/tubing pressures and fluid level in Open Wells. Directional Survey was run on 01/01/06. RDMO Slickline.
5	Prepare location for base beam equipped rig. Install perimeter fence as needed.
6	COA: Verify Form 17 (State Bradenhead Test) has been run within 60 days of RU.
7	Refer to the Rockies Well Services Guidelines document whenever rigging up BOP and WL, or whenever tripping in or out of the well. Consult with Foreman/Engineer before deviating from these guidelines. All cement jobs (excluding injections squeezes) must be pumped at 4-6 BPM. All cement plugs pumped through tubing must use the Diverter tool. Final top-out can be pumped between 2-4 BPM.
8	Upon RU, check and record bradenhead pressure. If bradenhead valve is not accessible, re-plumb so that valve is above GL. Blow down bradenhead and leave open during working hours. Re-check pressure each day and input value in the "Casing press." box in Open Wells.
9	MIRU & NIO-COD SQUEEZE
10	MIRU WO rig. Verify BOP and wellhead rating, inspect for appropriate API standards, pressure test BOP. Kill well as necessary using biocide treated fresh water. ND WH. NU BOP. Unland tbg. **Barrier Management** Fluid will be the only barrier while NU BOP. Stop and review JSA.
11	TOOH and SB 7180' of 2-3/8" tbg. LD remaining 2-3/8" tbg.
12	MIRU WL. PU and RIH with (4-1/2", 11.6#) gauge ring to 7200'. POOH.
13	PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbg. Set CICR at 7180'.
14	If water cannot be injected at 5000 psi max then sting out and spot cement a bbl short of the end of tubing then sting back in. With tubing full of cement max pressure is 3400 psi, unless pressure is increased on the backside. Discuss with forman and engineer if needed.
15	MIRU cementers. Pump Niobrara Injection Squeeze: 150 sx (40.7 bbl or 228 cf) of the Niobrara Cement blend: Class G with 0.4% B547 Gas Block (Latex) and 0.4% D255 FLA (Fluid Loss) and 35% D066 Silica Flour and 0.2% D800 (Retardant) and 0.3% D065 (Dispersant). Underdisplace by 1 bbls. Volume is based on 86' in the casing below the CICR, cement squeezed into formation, and 60' on top of the CICR. Collect wet and dry samples of cement to be left on rig. RDMO cementers.
16	Pull out of cement to 6900' and rev clean with 2x bottoms up. TOOH, SB 4440' of 2-3/8" tbg. LD remaining tbg.
17	SUSSEX SQUEEZE
18	PU and RIH with one 4', 3-1/8" deep penetrating perf gun with 4 spf. Shoot squeeze holes at 4470'. POOH. RDMO WL.
19	PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbg. Set CICR at 4440'.
14	If water cannot be injected at 4000 psi max then sting out and spot cement a bbl short of the end of tubing then sting back in. With tubing full of cement max pressure is 3400 psi (pipe neutral at 3582 psi). Discuss with forman and engineer if needed.
20	MIRU cementers. Pump Sussex Squeeze: 100 sx (21.2 bbl or 119 cf) of the Sussex AGM: Class G with 0.4% B547 Gas Block (Latex) and 2% D053 Expansion (Gyp) and 0.25% D255 FLA (Fluid Loss) 0.3% D065 (Dispersant). Underdisplace by 1 bbls. Volume is based on 30' in the casing below the CICR, cement squeezed into formation, and 60' on top of the CICR. Collect wet and dry samples of cement to be left on rig. RDMO Cementers.
21	Reverse clean at 4200' with 2x bottoms up then TOOH and SB 1860' of 2-3/8" tbg. LD stinger, and remaining tbg.
22	UPPER PIERRE ROLL-OVER

23	MIRU WL. PU and RIH with two 4', 3-1/8" perf guns with 4 spf. Shoot 16 squeeze holes at 2500' and 16 squeeze holes at 1800'. RDMO WL.
24	PU and TIH with (4-1/2", 11.6#) packer on 2-3/8" tbg. Set packer at 1860'.
25	Initiate circulation at low rate monitoring returns for fluid. Add mud thinner to hydrate/clean mud. Slowly increase circulation rate to 4-6 BPM using mud thinner and gel polymer sweeps as needed.
26	Pump 49 bbls of 160F HSF (0.5 gals/bbl or 1.5 lbs/bbl) and let soak for ~2 hours.
27	Continue circulating at 4-6 BPM if possible. If returns show hydrocarbons or a 1 hr build-up shows pressure, swab and vent well and clean open tank. Circulate clean fluid before pumping cement.
28	Release packer. TOO H, SB 2-3/8" tbg. LD packer.
29	PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbg. Set CICR at 1860'.
30	MIRU cementers. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Squeeze: 225 sx (48.5 bbl or 273 cf) of the Lower AGM blend: Class G with 0.4% B547 Gas Block (Latex) and 1% S001 CC (Calcium Chloride) and 4% D053 Expansion (Gyp). Underdisplace by 2.5 bbls. Volume is based on 640' in the casing below the CICR, 700' in the casing-hole annulus with 25% excess, and 160' on top of the CICR. Collect wet and dry samples of cement to be left on rig. RDMO Cementers.
31	Pull out of cement. TOO H to 1650'. Reverse circulate 2x bottoms up.
32	TOO H and SB 1650' of 2-3/8" tbg. LD stinger, and remaining tbg.
33	CUT AND PULL CASING
34	Discuss with engineer whether or not mud is needed before the shoe plug.
35	MIRU WL. RIH and jet cut 4-1/2", 11.6# casing at 1650'. RDMO WL.
36	Attempt to establish circulation with biocide treated fresh water.
37	ND BOP. ND TH. Un-land casing. Rig max pull shall be 100,000#. Max pull over string weight shall be 50,000#. If unable to unland, contact Foreman/Engineer. **Barrier Management** Fluid will be the only barrier while unlanding casing. Stop and review JSA.
38	Install BOP on casing head with 4-1/2", 11.6# pipe rams. **Barrier Management** Fluid will be the only barrier while NU BOP. Stop and review JSA.
39	TOO H and LD all 4-1/2", 11.6# casing. Remove 4-1/2", 11.6# pipe rams and install 2-3/8" pipe rams.
40	SHOE PLUG
41	TIH with 2-3/8" tubing to 1650'. Establish circulation to surface with biocide treated fresh water.
42	Initiate circulation at low rate monitoring returns for fluid. Add mud thinner to hydrate/clean mud. Slowly increase circulation rate to 4-6 BPM using mud thinner and gel polymer sweeps as needed.
43	Pump 100 bbls of 160F HSF (0.5 gals/bbl or 1.5 lbs/bbl) and let soak for ~2 hours. This volume will cover the HSF needs for the surface plug also.
44	Continue circulating at 4-6 BPM if possible. If returns show hydrocarbons or a 1 hr build-up shows pressure, swab and vent well and clean open tank. Circulate clean fluid before pumping cement.
45	COA: Verify and document that all pressure and fluid migration has been eliminated prior to placing the SC shoe plug at 1650'. If there is evidence of pressure or fluid migration, contact Engineering.
46	MIRU cementers. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Surface Casing Shoe Plug: Pump 420 sx (90.6 bbl or 509 cf) of the Upper AGM blend: Class G with 0.4% B547 Gas Block (Latex) and 1.5% S001 CC (Calcium Chloride) and 4% D053 Expansion (Gyp). Volume is based on 977' in 7.875" bit size open hole with 30% excess factor. 203' in the 8-5/8", 24# surface casing with no excess. The plug is designed to cover 1650'-470'. Plug length exceeds 500'. Consult with Foreman or Engineer on splitting up the plug. Collect wet and dry samples of cement to be left on rig. RDMO Cementers. Notify engineering if circulation is ever lost during job.
47	COA: If cement was not circulated to surface, then WOC 4 hours. Tag TOC. TOC must be 623' or shallower. If tag is too deep or there is evidence of pressure or fluid migration, contact Engineering.
48	Pull out of cement. TOO H to 260'. Forward circulate tbg clean with fresh water. TOO H & SB 260' of tubing. WOC 4 hours.
49	Note: Plug can be tagged after a 4 hour WOC, but must have a 6 hour WOC prior to pressure testing.
50	ND 7-1/16" BOP. NU 9" or 11" BOP. RIH with bit and scraper. Clean csg and tag TOC. Circulate Clean. POOH. PT casing to 500 psi. Contact engineering if test fails.
51	SURFACE PLUG
52	MIRU WL. PU and RIH with (8-5/8", 24#) CIBP and set at 260'. POOH. RDMO WL.

53	TIH with 2-3/8" tubing to 260'.
54	MIRU Cementers. Pump Surface Plug: Pump 90 sx (19.4 bbl or 109 cf) of the Surface AGM blend: Class G with 0.4% B547 Gas Block (Latex) and 2% S001 CC (Calcium Chloride) and 4% D053 Expansion (Gyp). Volume based on 260' inside 8-5/8", 24# surface casing with 10 sx excess. Cement will be from 260' to surface. Verify and document cement to surface. Collect wet and dry samples of cement to be left on rig.
55	TOOH. Insert ~5' of 2-3/8" Tbg. Circulate FW to clean Csg & Csg Valves. LD final joint of 2-3/8" Tbg. RDMO cementers. ND BOP. Install night cap. RDMO WO rig.
56	Instruct cementing and wireline contractors to e-mail copies of all job logs/job summaries to rscDJVendors@anadarko.com within 24 hours of completion of the job.
57	Supervisor submit paper copies of all invoices, logs, and reports to VWP Engineering Specialist.
58	Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
59	Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
60	Welder cut casing minimum 5' below ground level.
61	Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
62	Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
63	Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
64	Back fill hole with fill. Clean location, and level.
65	Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.