

OCCIDENTAL PETROLEUM CORPORATION

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

11/2/2021

PLUG and ABANDONMENT PROCEDURE

GRAY 31-16

API: 05-123-26915

WINS: 94470

**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 and Core Tech. Pull production equipment and tag bottom. Record tag depth, casing/tubing pressures and fluid level in Open Wells. RUN GYRO to 7615' , making stops every 100'. RDMO Slickline and Core Tech.
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.
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 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 tbq. **Barrier Management** Fluid will be the only barrier while NU BOP. Stop and review JSA.
10	TOOH and SB 4315' of 2-3/8" tbq. LD remaining 2-3/8" tbq.
11	MIRU WL. PU and RIH with (4-1/2", 11.6#) gauge ring to 7230'. POOH.
12	PU and RIH with (4-1/2", 11.6#) CIBP and set at +/- 7220' (collars at 7190' & 7233'). POOH. Slowly top fill well to clear out all gas. Pressure test CIBP to 1000 psi. RIH and dump 2 sx cement on CIBP. POOH.
13	PU and RIH with one 4', 3-1/8" deep penetrating perf gun wth 4 spf. Shoot squeeze holes at 4345'. POOH. RDMO WL.
14	PU and TIH with 4-1/2" packer on 2-3/8" tbq. Set packer at 4315'.
15	Establish an injection rate with treated water. Record rate and pressure results and report them to the Foreman/Engineer. Plugging orders may change based on results. When 1 bpm is achieved, record pressure and successful test has been completed.
16	Release packer. TOOH, SB 2-3/8" tbq. LD packer.
17	PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbq. Set CICR at 4315'.
18	Note: Please order at least 120 sx of cement. Pump the entire volume as injection pressure allows.
19	MIRU cementers. Pump Sussex Squeeze: 100 sx (21.5 bbl) of the Sussex AGM blend (1% CaCl & 12% Gyp, 14 ppg & 1.39 cf/sx). Underdisplace by 3 bbls. Volume is based on 30' in the casing below the CICR, cement squeezed into formation, and 190' on top of the CICR. Collect wet and dry samples of cement to be left on rig. RDMO Cementers.
20	Pull out of cement. TOOH to 4000'. Reverse circulate to ensure no cement is left in the tbq.
21	TOOH and SB 2800' of 2-3/8" tbq. LD stinger, and remaining tbq.
22	PU and RIH with one 4', 3-1/8" deep penetrating perf gun wth 4 spf. Shoot squeeze holes at 2840'. POOH. RDMO WL.
23	PU and TIH with 4-1/2" packer on 2-3/8" tbq. Set packer at 2800'.
24	Establish an injection rate with treated water. Record rate and pressure results and report them to the Foreman/Engineer. Plugging orders may change based on results. When 1 bpm is achieved, record pressure and successful test has been completed.
25	Release packer. TOOH, SB 2-3/8" tbq. LD packer.
26	PU and TIH with (4-1/2", 11.6#) CICR on 2-3/8" tbq. Set CICR at 2800'.

27	Note: Please order at least 120 sx of cement. Pump the entire volume as injection pressure allows.
28	MIRU cements. Pump Squeeze: 100 sx (21.5 bbl) of the AGM blend (0.4% Latex, 2% Gypsum, 1% CaCl, 15.8 ppg & 1.21 cf/sx). Underdisplace by 3 bbls. Volume is based on 30' in the casing below the CICR, cement squeezed into formation, and 190' on top of the CICR. Collect wet and dry samples of cement to be left on rig. RDMO Cements.
29	Pull out of cement. TOOH to 2200'. Reverse circulate to ensure no cement is left in the tbg.
30	TOOH and SB 1300' of 2-3/8" tbg. LD stinger, and remaining tbg.
31	MIRU WL. PU and RIH with one 4', 3-1/8" perf gun with 4 spf. Shoot 16 squeeze holes at 2000'. RDMO WL.
32	Establish circulation down the casing and out the bradenhead with treated water. Reverse circulate as needed. Use mud thinner, gel sweeps, and surfactant if required. Continue to circulate until the hole is clean. Start at a low rate and slowly increase rate to at least 4bpm while cleaning the hole.
33	Pump 35 bbls 160F HSF (0.5 gal/bbl or 1.5lbs/bbl) and let soak for ~2 hours (volume calculated for 700' open hole with 25% excess). Circulate HSF out with FW. If gas pressure is present, consider Swab & Vent well for 1 day.
34	MIRU cements. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Squeeze at 4-6 bpm: 185 sx (38.9 bbl or 224 cf) of the Upper AGM blend (0.4% Latex, 2% Gypsum, 1% CaCl, 1% CaCl) 15.8 ppg & 1.21 cf/sx down the casing. Volume is based on 700' in the casing-hole annulus with no excess, and 700' in the casing. Displace cement with Water to 1300'. Collect wet and dry samples of cement to be left on rig. RDMO Cements.
35	Leave valves open for 10 minutes to allow cement to balance between the production and surface casing. If 2 bbls or more of displacement fluid flows back through the production casing, shut in well to ensure TOC remains at a workable depth.
36	TIH with 2-3/8" tubing and tag cement top to verify TOC inside production casing. TOOH and SB 1125' of tubing.
37	PU and TIH with mechanical cutter on 2-3/8" tbg. Cut 4-1/2", 11.6# casing at 1125'. TOOH and LD cutter.
38	Attempt to establish circulation and circulate (77 bbl) with biocide treated fresh water.
39	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.
40	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.
41	TOOH and LD all 4-1/2", 11.6# casing. Remove 4-1/2", 11.6# pipe rams and install 2-3/8" pipe rams.
42	TIH with spiral diverter tool on 2-3/8" tubing to 1125'. Establish circulation to surface with biocide treated fresh water and pump at least two hole-volumes (155 bbl) to clean up wellbore. Start at a low rate and slowly increase rate to at least 4bpm while cleaning the hole.
43	Pump 25 bbls 160F HSF (0.5 gal/bbl or 1.5 lbs/bbl) and let soak for ~2 hours (volume calculated for 102' in open hole with 100% excess and 203' into surface casing with no excess). Circulate HSF out using FW until clean.
44	COA: Verify and document that all pressure and fluid migration has been eliminated prior to placing the SC shoe plug at 1125'. If there is evidence of pressure or fluid migration, contact Engineering.
45	MIRU cements. Pump 10 bbls (min) of pre-flush, followed by 5 bbls fresh water spacer. Pump Stub Plug at 4-6 bpm: Pump 120 sx (25.9 bbl or 146 cf) of the Upper AGM blend (0.4% Latex, 1% CaCl & 4% Gyp, 15.8 ppg & 1.21 cf/sx). Volume is based on 102' in 7.875" bit size open hole with 100% excess factor. 203' in the 8-5/8", 24# surface casing with no excess. The plug is designed to cover 1125'-820'. Collect wet and dry samples of cement to be left on rig. RDMO Cements. Notify engineering if circulation is ever lost during job.
46	COA: If cement was not circulated to surface, then WOC 4 hours. Tag TOC. TOC must be 973' or shallower. If tag is too deep or there is evidence of pressure or fluid migration, contact Engineering.
47	Pull out of cement. TOOH to 300'. Forward circulate tbg clean. WOC.
48	ND BOP. NU 9" or 11" BOP.
49	TIH with 8-5/8" bit and scraper on 2-3/8" tbg. TIH to 820' to tag cement to verify appropriate coverage above the surface casing shoe. Clean casing 2-3 times from 270'-250'. Consult with Foreman/Engineer on when to PT casing. Notify engineering if tag is low. TOOH, SB tbg, LD bit and scraper.
50	PT Surface Csg to 500 psi for 30 minutes.
51	MIRU WL. RIH with 8-5/8" CIBP. Set CIBP at 260'. POOH. RDMO WL.

52	TIH to 260' with diverter tool on 2-3/8" Tbg. Establish circulation to surface. Pump Min 20 bbls 160F HSF (0.125 gal/bbl or 0.5 lbs/bbl) and soak for ~1 hour (volume based on 260' in surface casing rounded up to the nearest 5bbls). Circulate HSF out with fresh water. Swab well down to 260'.
53	MIRU Cementers. Pump Surface Plug at 2-4 bpm: DO NOT PUMP WATER AHEAD OF CEMENT . Pump 80 sx (17.3 bbl or 97 cf) of the Upper AGM blend (2% CaCl & 4% Gyp, 15.8 ppg & 1.21 cf/sx). Volume based on 260' inside 8-5/8", 24# surface casing with no 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.
54	Lay down all Tubing. Insert 5' 2-3/8" Tbg into well. Circulate clean with FW to clean Csg & Csg Valves . RDMO cementers. ND BOP. Install night cap. RDMO WO rig.
55	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.
56	Supervisor submit paper copies of all invoices, logs, and reports to VWP Engineering Specialist.
57	Excavation crew to notify One Call to clear excavation area around wellhead and for flow lines.
58	Excavate hole around surface casing enough to allow welder to cut casing a minimum 5' below ground level.
59	Welder cut casing minimum 5' below ground level.
60	Spot weld on steel marker plate. Marker should contain Well name, Well number, legal location (1/4 1/4 descriptor) and API number.
61	Obtain GPS location data as per COGCC Rule 215 and send to rscDJVendors@anadarko.com.
62	Properly abandon flow lines per Rule 1103. File electronic Form 42 once abandonment is complete.
63	Back fill hole with fill. Clean location, and level.
64	Submit Form 6 to COGCC ensuring to provide 'As performed' WBD identifying operations completed.