



Operator: Encana Oil & Gas (USA) Inc.
Well Name: CATHEDRAL FEDERAL 20-1
Lease
Number: COC1633
Unit
Number: COC047603C
NWNW Sec.20 -T3S -
Location: R101W
Field: Cathedral
County,
State: Rio Blanco, CO
API Number: 05-103-07813-0000
Diagram
Date: As of May 17, 2011

Plug and Abandonment Procedure

May 17, 2011

Prepared by: Nicholas Ronan 720-876-3838

Attachments:

Attachment 1 – Proposed Wellbore Diagram
Attachment 2 – Current Wellbore Diagram

API Number: 05-103-07813-0000

KB Elevation: 6,685 ft

GL Elevation: 6,675 ft

PBTD: 3,084 ft MD (The date and depth of the most recent wireline tag is unknown.)

TD: 3,128 ft MD

Surface Casing: 8 – 5/8" OD, 24 lb/ft, set at 158 ft, assumed J-55

Surface Casing OD	8 5/8	in.
Surface Casing ID	8.097	in.
Surface Casing Drift	7.972	in.
Surface Hole size	12 1/4	in.
Surface Casing COLLAPSE (100%)	1,370	psi
Surface Casing BURST (100%)	2,950	psi
Surface Casing JOINT YEILD	244,000	lbs

Production Casing: 4 – 1/2" OD, 10.5 lb/ft, set at 3,128 ft, assumed J-55

Production Casing OD	4 1/2	in.
Production Casing ID	4.052	in.
Production Casing Drift	3.927	in.
Production Hole size	7 7/8	in.
Production Casing COLLAPSE (100%)	4,010	psi
Production Casing BURST (100%)	4,790	psi
Production Casing JOINT YEILD	132,000	lbs

Tubing: 2-1/16" OD, 3.25 lb/ft, set at 2,726 ft., assumed J-55

Tubing Casing OD	2 1/16	in.
Tubing Casing ID	1.751	in.
Tubing Casing Drift	1.657	in.
Tubing COLLAPSE (100%)	7,690	psi
Tubing BURST (100%)	7,280	psi
Tubing JOINT YEILD	49,070	lbs

Safety

Safety meetings are to be held with all service company personnel prior to each job. Wellsite supervisor must notify contractors as to known hazards of which the contractors may be unaware. Well site supervisor must ensure that all workers are aware of their responsibilities and duties under the EH&S guidelines. All safety meetings will be recorded on the EnCana daily completion reports in Wellcore.

Regulations

All verbal notifications and approval from government regulatory agencies will be recorded on the EnCana daily report. The name of the individual contacted and the subject matter of approval or notification will be recorded.

*****Please note Chemical Inventory on Wellcore Report. Note amount of chemicals pumped downhole and amount stored on location each evening.***

JOB OBJECTIVE

The CATHEDRAL FEDERAL 20-1 was completed in the Emery formation in May, 1976. The well has not produced since October, 2007. Currently, there is a hole in the flow line that must be fixed in order to return the well to production. The well has very low production potential; therefore the **CATHEDRAL FEDERAL 20-1 will be plugged and abandoned.**

PROCEDURE

Rig Up and Pull Tubing

1. Notify State of Colorado and BLM (White River Field Office) at least 48 hours prior to start of operations.
2. MIRU pulling unit. Hold rig inspections and pre-job safety meeting.
3. Blow well down.
4. Kill well.
5. ND WH and NU BOP.
6. POOH with 2-1/16" tubing.

Isolate Current Perforations

7. RIH and set CIBP in 4-1/2" casing at 2,600' (Must be placed >50 ft and <100 ft above top perf at 2,668').
Verify that CIBP will not be placed within 5' of a collar.
8. Dump bail 4 sks Class G cement on top of CIBP with wireline.

$$\text{Cement Volume} = [4 \text{ sx} * 1.15 \text{ ft}^3/\text{sk} / 0.08955 \text{ ft}^3/\text{ft}] = 51.4 \text{ ft}$$

Cement Annulus across Casing Shoe

9. RIH and set CIBP in 4-1/2" casing at 220'. Verify that CIBP will not be placed within 5' of a collar.
10. RIH on wireline and perforate four squeeze holes at 210'. POOH with perforating gun. Verify all shots fired.
RDMO wireline unit.
11. RIH with OE tubing. Ensure tbg/csg annulus is shut-in. Establish injection into sqz holes.
12. Squeeze 210 ft (47 sks) of Class G cement into annular space through perforations at 210'. Annular plug must extend minimum of 50 ft above and below the casing shoe at 158' in the annulus.

$$\text{Annular Cement Vol} = [210 \text{ ft} * 0.2471 \text{ ft}^3/\text{ft} / 1.15 \text{ ft}^3/\text{sk}] = 45.1 \text{ sks}$$

$$\text{With 2.10\% Excess} = 45.1 \text{ sks} * 1.021 = 46.1 \text{ sks} = \mathbf{47 \text{ sks}}$$

Cement Plug in Casing from CIBP to Surface

13. Pump 220 ft of Class G cement (18 sks) in casing on top of CIBP (set at 220 ft). Casing plug must extend a minimum of 50 ft above and below casing shoe at 158' in 4-1/2" casing.

$$\text{Casing Cement Vol} = [220 \text{ ft} * 0.08955 \text{ ft}^3/\text{ft} / 1.15 \text{ ft}^3/\text{sks}] = 17.1 \text{ sks}$$

$$\text{With 2.20\% Excess} = 17.1 \text{ sks} * 1.022 = 17.5 \text{ sks} = \mathbf{18 \text{ sks}}$$

14. WOC for four hours.
15. Top off annulus and casing as necessary. WOC and continue to top off as necessary.
16. ND BOP. RDMO pulling unit.
17. Cut off anchors.
18. Cut off all casing at the base of the cellar or 4 ft below final restored ground level; whichever is deeper.
19. Weld on metal plate at least 1/4" thick and dry hole marker.
20. Restore surface location.
21. Ensure that CMT tickets are mailed (or scanned and emailed) to the Denver office for subsequent reporting.