

# encana™



**Operator:** Encana Oil & Gas (USA) Inc.  
**Well Name:** DOUBLE WILLOW 8615B O16 497  
**Lease Number:** COC50950  
**Unit Number:** COC74105X  
**Location:** SWSE Sec.16 -T4S -R 97W  
**Field:** Willow Creek  
**County, State:** Rio Blanco, CO  
**API Number:** 05-103-09701-0000  
**Diagram Date:** As of August 23, 2011

## Plug and Abandonment Procedure

**August 23, 2011**

Prepared by: Nicholas Ronan 720-876-3838  
Workover Coordinator: Mitch Steinke 303-918-3844  
Production Group Lead: Jerry Dietz 720-876-5075

**Attachments:**

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

API Number: 05-103-09701-0000

WOE #: TBD

Working Interest: 100% - Encana Oil & Gas (USA) Inc.

KB Elevation: 7,302 ft

GL Elevation: 7,290 ft

PBTD: 5,956 ft MD

TD: 6,000 ft MD

Surface Casing: 8 – 5/8” OD, 24 lb/ft, set at 2,400 ft, J-55

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

Production Casing: 5 – 1/2” OD, 15.5 lb/ft, set at 5,986 ft, J-55

Production Casing OD	5 1/2	in.
Production Casing ID	4.950	in.
<b>Production Casing Drift</b>	<b>4.825</b>	<b>in.</b>
Production Hole size	7 7/8	in.
<b>Production Casing COLLAPSE (100%)</b>	<b>4,040</b>	<b>psi</b>
<b>Production Casing BURST (100%)</b>	<b>4,810</b>	<b>psi</b>
<b>Production Casing JOINT YIELD</b>	<b>217,000</b>	<b>lbs</b>

Tubing: 2-3/8” OD, 4.7 lb/ft, set 3,492 ft., J-55

Tubing Casing OD	2 3/8	in.
Tubing Casing ID	1.995	in.
<b>Tubing Casing Drift</b>	<b>1.901</b>	<b>in.</b>
<b>Tubing COLLAPSE (100%)</b>	<b>8,100</b>	<b>psi</b>
<b>Tubing BURST (100%)</b>	<b>7,700</b>	<b>psi</b>
<b>Tubing JOINT YIELD</b>	<b>71,730</b>	<b>lbs</b>

## 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 DOUBLE WILLOW 8615B O16 497 is a vertical well completed in the Ohio Creek formation in October, 1994. The well is currently producing with a packer that is isolating holes in the production casing. Encana has decided to plug and abandon the **DOUBLE WILLOW 8615B O16 497**.

## **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. Hold a pre-job safety meeting. Discuss all aspects of the procedure with any involved personnel. Identify and address any safety concerns before the job begins.
3. MIRU pulling unit. Blow down well and kill well as needed with produced water down the tubing (packer is set at 2,476 ft). ND production tree. NU BOPs.
4. Release packer. Note from well file: "PACKER IS SET IN COMPRESSION. IT IS A ARROW SET 1 PKR; SET DOWN TURN TO RIGHT & PICK UP TO RELEASE"
5. TOOH with 2-3/8", 4.7#, J-55 tubing and packer. Scope and tally while TOOH. Visually inspect all tubing for scale, corrosion, and wear. Replace joints as needed. **Report results of inspection in Wellcore Report.**

### **Isolate existing perforations and test casing ABOVE AND BELOW the suspected leak**

6. MIRU wireline. RIH with wireline and set CIBP in 5-1/2" casing at 5,512 ft (Must be placed >50 ft and <100 ft above top perf at 5,562 ft). Verify that CIBP will not be placed within 5 ft of a collar.
7. Dump bail 6 sks Class G cement on top of CIBP with wireline.

$$\text{Cement Plug Length} = [6 \text{ sks} * 1.15 \text{ ft}^3/\text{sk} / 0.1336 \text{ ft}^3/\text{ft}] = 51.65 \text{ ft}$$

8. Wait on cement for 4 hours. TIH with workstring tubing. Tag cement top. Pump more cement as needed to ensure at least 50 ft of cement is on top of the CIBP set at 5,512 ft.
9. RIH with workstring tubing and packer. Set packer at 2,400. Pump produced water down tubing and pressure test the production casing BELOW the packer to 300 psig surface pressure for at least 15 minutes.
10. Release packer, move up hole and set packer at 2,100 ft. Load backside with produced water and test the production casing ABOVE the packer to 300 psig surface pressure for at least 15 minutes.

**Contact Nicholas Ronan (720-876-3838) or Mitch Steinke (303-918-3844) if the casing fails the pressure test. NOTE: THE CASING LEAK IS SUSPECTED TO BE BETWEEN 2,177 ft AND 2,375 ft**

11. Release Packer. POOH with tubing.

**Cement plug in Casing and Annulus at the Surface Casing Shoe**

12. TIH with wireline and set CIBP in 5-1/2" casing at 2,450 ft. Verify that the CIBP will not be placed within 5 ft of a collar. TOOH and pick up perforation gun.

13. TIH with wireline and perforate 4 squeeze holes at 2,440 ft. POOH with perforating gun. Verify all shots fired.

14. TIH and set CICR at 2,077 ft

15. TIH with workstring tubing. Sting into CICR and pump 373 ft (117 sks) of Class G cement below the CICR.

$$\text{Annular Cement} = [373 \text{ ft} * 0.1926 \text{ ft}^3/\text{ft} / 1.15 \text{ ft}^3/\text{sk}] = 62.47 \text{ sks}$$

$$\text{Casing Cement} = [373 \text{ ft} * 0.1336 \text{ ft}^3/\text{ft} / 1.15 \text{ ft}^3/\text{sk}] = 43.35 \text{ sks}$$

$$\text{TOTAL CEMENT with 10\% excess} = (62.47 \text{ sks} + 43.35 \text{ sks}) * 1.10 = 116.39 = \mathbf{117 \text{ sks}}$$

16. Sting out of CICR. Pump 100 ft (13 sks) of Class G cement on top of CICR.

$$\text{Casing Cement} = [100 \text{ ft} * 0.1336 \text{ ft}^3/\text{ft} / 1.15 \text{ ft}^3/\text{sk}] = 11.62 \text{ sks}$$

$$\text{With 10\% Excess} = 11.62 \text{ sks} * 1.10 = 12.78 \text{ sks} = \mathbf{13 \text{ sks}}$$

17. Wait on cement for 4 hours. Tag cement top. Pump more cement as needed to ensure at least 100 ft of cement is on top of the CICR set at 2,077 ft.

18. Pressure test production casing to 300 psig surface pressure for at least 15 minutes.

**Contact Nicholas Ronan (720-876-3838) or Mitch Steinke (303-918-3844) if the casing fails the pressure test.**

19. Circulate hole with produced water. POOH with tubing.

**Cement Plug in Annulus and Casing from Surface**

20. RIH on wireline and perforate four squeeze holes at 100'. POOH with perforating gun. Verify all shots fired. RDMO wireline unit.

21. RIH with workstring tubing. Ensure tbg/csg annulus is shut-in. Establish injection into squeeze holes to surface. Pump 100 ft (17 sks) of Class G cement up annulus until returns are seen at surface. Fill casing up to surface with 100 ft (12 sks) of Class G cement.

$$\text{Annular Cement} = [0.1926 \text{ ft}^3/\text{ft} * 100 \text{ ft} / 1.15 \text{ ft}^3/\text{sk}] = 16.75 \text{ sks} = \mathbf{17 \text{ sks}}$$

$$\text{Casing Cement} = [0.1336 \text{ ft}^3/\text{ft} * 100 \text{ ft} / 1.15 \text{ ft}^3/\text{sk}] = 11.62 \text{ sks} = \mathbf{12 \text{ sks}}$$

22. WOC for four hours.

23. Top off annulus and casing as needed to bring cement to surface.

24. ND BOP. RDMO pulling unit.

25. Cut off anchors.

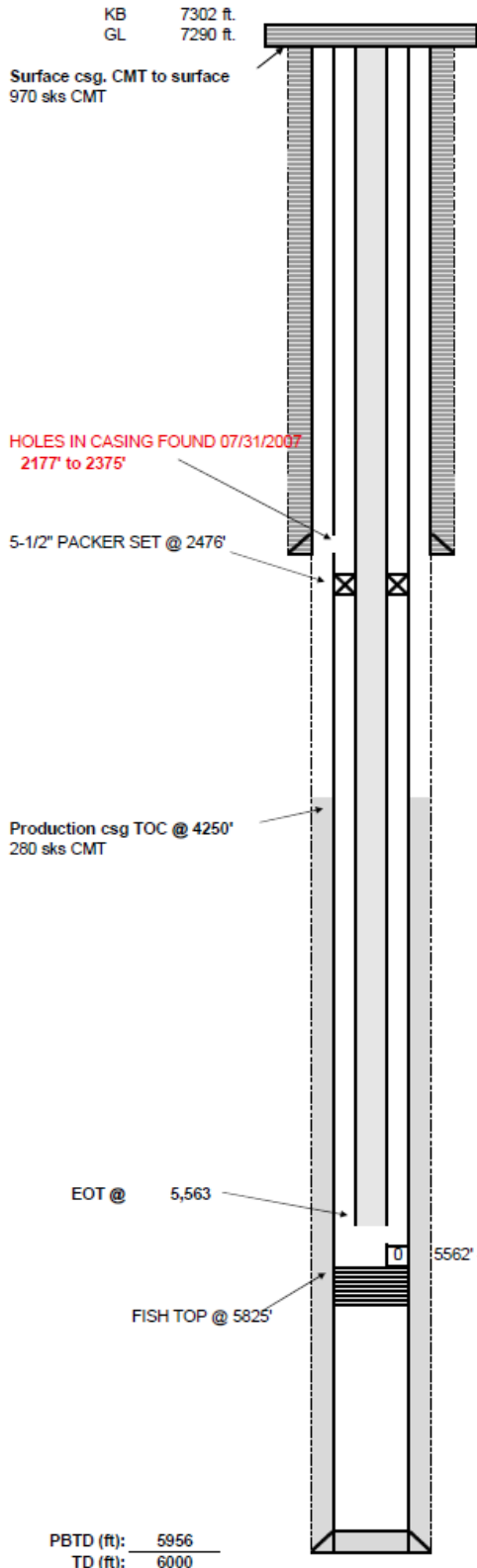
26. Cut off all casing at the base of the cellar or 4 ft below final restored ground level; whichever is deeper.

27. Weld on metal plate at least 1/4" thick and dry hole marker. Restore surface location. Ensure that cement tickets are mailed (or scanned and emailed) to the Denver office for subsequent reporting.

**Attachment #1 – Current Wellbore Diagram**

**CURRENT WELLBORE DIAGRAM**

Operator: Encana Oil & Gas (USA) Inc.  
 Well Name: DOUBLE WILLOW 8615B O16 497  
 Lease Number: COC50950  
 Unit Number: COC74105X  
 Location: SWSE Sec.16 -T4S -R.97W  
 Field: Willow Creek  
 County, State: Rio Blanco, CO  
 API Number: 05-103-09701-0000  
 Diagram Date: As of August 23, 2011



**CASING RECORD**

SIZE (in)	WT (lb/ft)	GRADE	Hole D(in)	TOP (ft)	BTM (ft)	Date Run
8 5/8	24	J-55	12 1/4	0	2,400	
5 1/2	15.5	J-55	7 7/8	0	5,986	

**TUBING RECORD**

SIZE (in)	WT (lb/ft)	GRADE	TOP (ft)	BTM (ft)	Date Run
2 3/8	4.7	J-55	0	5,563	08/15/2007

**JEWELRY RECORD**

ITEM	MAKER	SIZE (in)	Max ID	TOP (ft)	Date Run

**PERFORATION RECORD**

ZONE	TOP (ft)	BTM (ft)	SPF	Holes	Date Shot
Ohio Creek	5562	5896		35	

**COMMENTS/HISTORY:**

HOLES IN CSG FROM 2177' TO 2376'

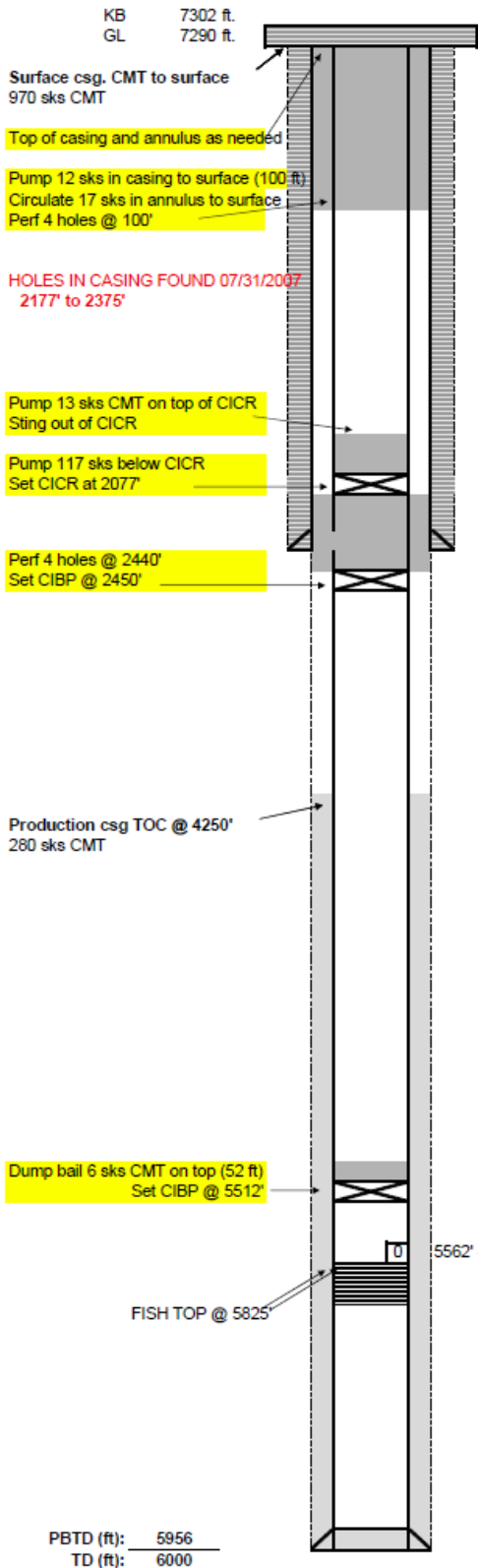
PACKER IS SET IN COMPRESSION. IT IS A ARROW SET 1 PKR;  
 SET DOWN TURN TO RIGHT & PICK UP TO RELEASE

FISH = 20' SAND LINE & 1 3/4" SINKER BARS & JARS IN HOLE @ 5825'

**Attachment #2 – Proposed Wellbore Diagram**

**PROPOSED WELLBORE DIAGRAM**

Operator: Encana Oil & Gas (USA) Inc.  
 Well Name: DOUBLE WILLOW 8615B O16 497  
 Lease Number: COC50850  
 Unit Number: COC74105X  
 Location: SWSE Sec.16 -T4S -R.97W  
 Field: Willow Creek  
 County, State: Rio Blanco, CO  
 API Number: 05-103-09701-0000  
 Diagram Date: As of August 23, 2011



**CASING RECORD**

SIZE (in)	WT (lb/ft)	GRADE	Hole D(in)	TOP (ft)	BTM (ft)	Date Run
8 5/8	24	J-55	12 1/4	0	2,400	
5 1/2	15.5	J-55	7 7/8	0	5,986	

**TUBING RECORD**

SIZE (in)	WT (lb/ft)	GRADE	TOP (ft)	BTM (ft)	Date Run

**JEWELRY RECORD**

ITEM	MAKER	SIZE (in)	Max ID	TOP (ft)	Date Run

**PERFORATION RECORD**

ZONE	TOP (ft)	BTM (ft)	SPF	Holes	Date Shot
Ohio Creek	5562	5896		35	

**COMMENTS/HISTORY:**

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FISH = 20' SAND LINE & 1 3/4" SINKER BARS & JARS IN HOLE @ 5825'