Modernized Royalty Framework: Re-Entry Wells

For wells re-entered on or after January 1, 2017

Under the Modernized Royalty Framework (MRF), wells re-entered on or after January 1, 2017 will be subject to the Modernized Royalty Framework. In general, re-entered wells will receive an incremental Drilling and Completion Cost Allowance (C*). The incremental C* is calculated as a proxy for a well's re-entry costs.

The incremental activity will be awarded an incremental C* which will be added to any remaining C* balance and applied to the production from all the legs from the re-entered date forward. The remaining C* balance may equal zero if the well's cumulative revenue had exceeded its C* prior to re-entry or if the well was spud prior to January 1, 2017.

(For more details on how C* is calculated for new wells, see Drilling and Completion Cost Allowance (C*) and the frequently asked questions.)

When re-entry results in any combination of new legs, lengthening, deepening, or re-fracturing the incremental C* will be calculated as:

$C^*_{\text{after re-entry}} - C^*_{\text{prior to re-entry}}$

Where,

> $C^*_{\text{after re-entry}}$ is the Drilling and Completion Cost Allowance calculated for the entire well, including any incremental activity resulting from re-entry.
>
> $C^*_{\text{prior to re-entry}}$ is a notional Drilling and Completion Cost Allowance calculated at the time of re-entry which reflects the physical features in the well immediately prior to re-entry. The following formulas are used to calculate C*:

For wells with TVD_{MAX} shallower than or equal to 2,000 metres

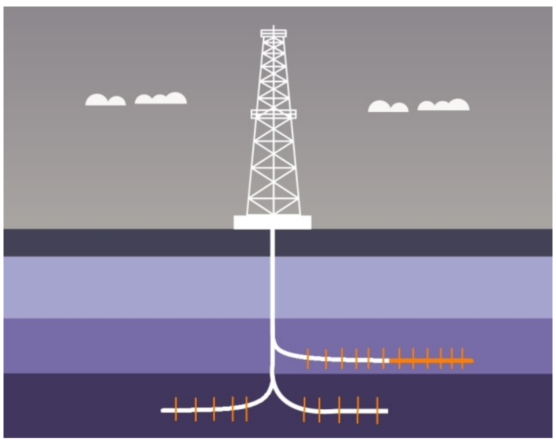
$$C^*(\$) = ACCI*((1{,}170*(TVD_{MAX}-249)) + (Y*800*TLL) + (0.6*TVD_{AVG}*TPPe))$$

For wells with TVD_{MAX} deeper than 2,000 metres

$$C^*(\$) = ACCI*((1{,}170*(TVD_{MAX}-249)) + (3{,}120*(TVD_{MAX}-2{,}000)) + (Y*800*TLL) + (0.6*TVD_{AVG}*TPPe))$$

Variables used to calculate C* include:

- ACCI = Alberta Capital Cost Index
- TVD_{MAX} = The deepest True Vertical Depth (m)
- TVD_{AVG} = The average True Vertical Depth (m) for all legs.
- TLL = Total Lateral Length (m)
- TLLi = Total Lateral Length (m) of incremental drilling
- TPP= Total equivalent proppant placed (tonnes); please see the frequently asked questions for the TPP equivalency factors.
- TMD = Total Measured Depth (m) (i.e. Combined total length)
- Y = a cost adjustment for multi-leg wells to better reflect actual costs
  - Y = 1 if the ratio of TMD/ TVD_{AVG} < 10
  - otherwise Y equals the greater of 0.24 and [1.39 - 0.04*(TMD/ TVD_{AVG})]

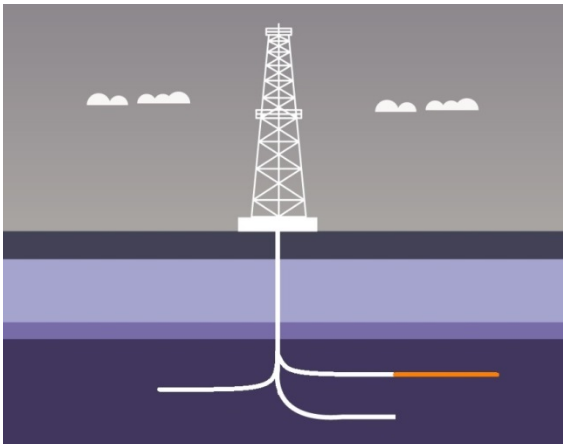


***** Re-fractures of existing well legs and additional well lengthening is represented by orange

Lengthening Only

When well re-entry results is lengthening only (without any deepening, additional re-fracturing or new legs), the incremental C* will be calculated based on the following revised formula. This adjustment is made to appropriately recognize costs for this activity.

C* ($) = ACCI*(1000*TLLi)



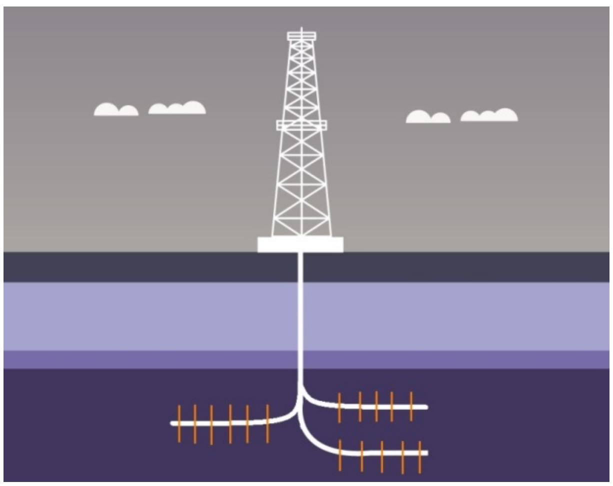
***** The lengthened portion of the existing well leg (the incremental lateral length) is represented by orange

Re-fracturing Only

When well re-entry results in re-fracturing of existing wells only (without any deepening, additional lengthening or new legs), the incremental C* will be calculated based on the following formula.

C* ($) = ACCI*(1.5*(0.6*$TVD_{AVG}$*TPPe) + 150,000)

Incremental C*=0 if TPP < 50 tonnes per leg in a horizontal well or TPP< 10 tonnes in a vertical well.



***** Re-fractures of existing well legs are represented by orange

Abandoned well legs

Well legs (i.e., well events) that are abandoned prior to the well's production date are not included in the original C* calculation.

There is no change to the original C* calculation if well legs produce but are subsequently abandoned.

Re-Entering Abandoned Wells

Once a well is abandoned, and has been classified with an abandoned well license status by the Alberta Energy Regulator, any remaining C* balance is no longer available to any operators that may re-enter the well. Wells coming back into production, without lengthening, deepening or re-fracturing will operate at a post-C* rate.

Re-Entering wells subject to the Alberta Royalty Framework

Wells with a spud date prior to January 1, 2017 are subject to the Alberta Royalty Framework (ARF) until December 2026.[1] If these wells are re-entered on or after January 1, 2017 (i.e., lengthening, deepening, new drilling, re-fracturing), a Drilling and Completion Cost Allowance (C*) will be calculated on the incremental activity using the formulas outlined in this document. Royalty will be calculated based on production from all legs according to the MRF rules until cumulative revenue generated by the well after re-entry equals C*, after which royalty will be calculated under ARF rules.

If the well is receiving benefit under ARF royalty programs (e.g., New Well Royalty Rates, Natural Gas Deep Drilling Program), those benefits will run concurrently with the C* benefit and will not change their benefit caps. Once cumulative revenue from the well equals C*, royalty will be calculated under ARF rules, including any benefit remaining under the ARF royalty programs.

Example:

The First well event (00) was spud 2014/01/01 (TVD=2500m; TLL=1500m; TPP=75 tonnes) and currently qualifies for the Shale Gas New Well Royalty Rate (SGNWRR) and Natural Gas Deep Drilling Program (NGDDP). The second well event (02) is added to the licence[2] on 2017/02/01 (TVD=2300m; TLL=1700m; TPP=100 tonnes).

$C^*_{\text{prior to re-entry}}$ = 1.0*[(1,170*(2,500-249)) + (3,120*(2,500-2,000)) + (1*800*1,500) + (0.6*2,500*75)]

= $ 5,506,170

$C^*_{\text{after re-entry}}$ = 1.0*[(1,170*(2,500-249)) + (3,120*(2,500-2,000)) + (1*800*(1,500+1,700)) + (0.6*((2,500+2300)/2)*(75+100))]

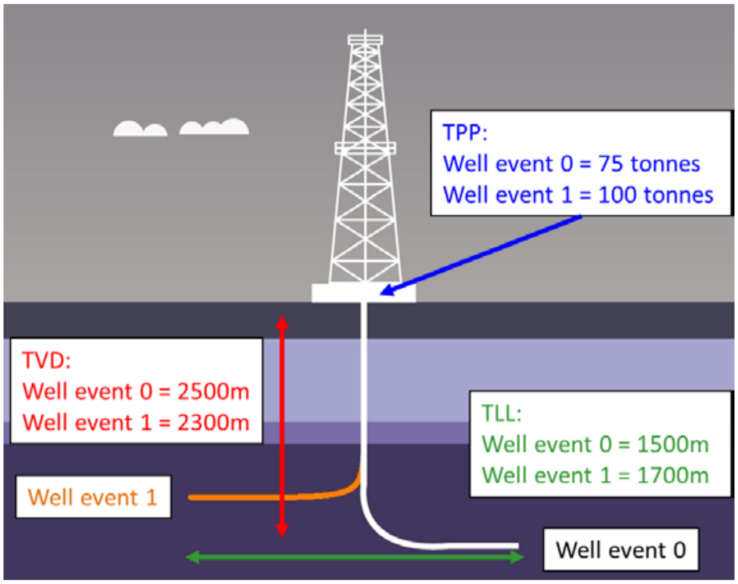
= $ 7,005,670

$C^*_{\text{after re-entry}} - C^*_{\text{prior to re-entry}}$ = $ 1,499,500

All production from Well event 00 and Well event 02 receive five per cent royalty until total revenue from the well since 2017/02/01 equals $1,499,500. All volumes produced during this time from Well event 00 and Well event 02 will be applied against the SGNWRR and NGDDP caps. When total cumulative revenue from the well equals $1,499,500, all volumes from Well event 00 and Well event 02 will be subject to ARF royalty calculations, including any benefit remaining under the SGNWRR and NGDDP caps.

[1] Wells spud between July 13, 2016 and December 31, 2016 that were approved to opt in early to the Modernized Royalty Framework will be treated as per the rules outlined for wells spud on or after January 1, 2017.

[2] ACCI=1.00 because the well event is added in 2017.



* A new leg (i.e., well event 1) is represented by orange, and example figures for TVD, TLL and TPP are included for the example calculation above.