High Water-Cut Oil Well Program

Information Circular PR-IC12

May 2021
Version 1.0

Governing Legislation:

Acts: *The Crown Minerals Act*
The Freehold Oil and Gas Production Tax Act, 2010

Regulations: *The High Water-Cut Oil Well Program Regulations*

Saskatchewan

Record of Change

Revision	Date	Description
1.0	May 2021	This circular replaces the previous version of PR-IC12 dated April 2013 as the result of the amended program.

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1 Introduction

This Information Circular has been prepared by the Ministry of Energy and Resources (ER) to explain the policies and procedures which are used to administer the Crown Royalty and Freehold Production Tax (royalty/tax) applicable to the *High Water-Cut Oil Well Program* (Program). Reference should be made to Acts and Regulations for an exact statement of the law. In case of a conflict between this Information Circular and the provisions of the Acts and Regulations, the Acts and Regulations will govern.

2 General Program Descriptions

The Program has been amended and became effective April 1, 2021. The Program is designed to improve water handling capabilities and extend the producing lives of wells producing large volumes of water. Under the Program, after a qualifying investment is made to directly improve the water handling capabilities and extend the producing life of the high water-cut oil well, the royalty status will be re-assigned based upon the well's finished drilling date. Wells drilled before October 1, 2002, will receive Fourth Tier Oil Royalties on all future incremental high water-cut oil production and wells drilled on or after October 1, 2002, will obtain a 2% royalty rate deduction on all future oil production.

Eligible oil wells (horizontal and vertical) include individual oil wells or a group of oil wells that have been producing oil at an average water-cut of **90%** or greater during the last **three** reported months, with hours on production, prior to submitting an application under the program.

Applicants are required to make a minimum average investment of $20,000 per qualifying high water-cut oil well, on or after April 1, 2021, that would, in the opinion of the minister, extend the production life and increase the remaining recoverable reserves from the qualifying high water-cut oil well(s). Normal repair and maintenance expenditures will not be considered as qualifying investments under the program. **Appendix A** outlines examples of qualifying investments in more detail.

For investments to qualify under this program, an Investment Summary Submission must be submitted to ER through the Integrated Resource Management System (IRIS). ER must approve an incremental high water-cut oil factor for wells drilled prior to October 1, 2002. Please refer to the definition of incremental high water-cut oil factor in Section 3 for more details. Companies are encouraged to commence investments after ER has reviewed and approved the initial application, please refer to Section 4 for more details.

3 Definitions

Average Water-Cut means an amount, expressed as a percentage, determined in accordance with the following formula:

$$Average\ Water\ Cut = \frac{WP}{LP} \times 100$$

Where:

a) in the case of an application associated with an individual oil well:

WP is the total amount of water produced from the well during the well's evaluation period; and,

LP is the total amount of liquid (oil and water) produced from the well during the well's evaluation period; and,

b) in the case of an application associated with a group of oil wells:
WP is the summation of the total amount of water produced from each well in the group during each well's respective evaluation period; and,

LP is the summation of the total amount of liquid produced from each well in the group during each well's respective evaluation period.

Please refer to **Appendix B** for examples of calculating the average water-cut for a group of oil wells.

Evaluation Period for a qualifying high water-cut oil well means the most recent 3 or more months reported by a qualifying applicant to the minister, in which the oil well had hours on production, before the qualifying applicant submits an application to the Program.

Hours on Production means the hours on production as reported in Petrinex. This figure represents the number of hours during the month in which the well was actually pumping (with some exceptions related to the recovery of load oil or production of water and no oil upon initial completion).

Incremental High Water-Cut Oil means the quantity of oil determined by multiplying the total amount of oil produced, excluding incremental waterflood oil, in a month from a qualifying high water-cut oil well by the applicable incremental high water-cut oil factor.

Incremental High Water-Cut Oil Factor means the factor with respect to a qualifying high water-cut oil well, expressed as a percentage that is:

a) determined in accordance with the following formula:

$$Incremental\ High\ Water\ Cut\ Oil\ Factor = \frac{AR}{TR} \times 100$$

Where

(i) in the case of an application associated with an individual oil well:
AR is the additional recoverable reserves of oil from the qualifying high water-cut oil well, as determined by the minister, that are attributable to the qualifying investments; and

TR is the total remaining recoverable reserves of oil respecting the qualifying high water-cut oil well, as determined by the minister, that include the additional recoverable reserves that are attributable to the qualifying investments.

(ii) in the case of an application associated with a group of oil wells:
AR is the additional recoverable reserves of oil respecting the group of qualifying high water-cut oil wells, as determined by the minister, that are attributable to the qualifying investments; and

TR is the total remaining recoverable reserves of oil respecting the group of qualifying high water-cut oil wells, as determined by the minister, that include the additional recoverable reserves that are attributable to the qualifying investments; ***** or,

b) equal to 100% for qualifying high water-cut oil wells that have been shut-in or suspended for a period of six or more consecutive months before the qualifying investments are made; or

c) equal to 100% for qualifying high water-cut oil wells with a finished drilling date on or after October 1, 2002.

***Note:** Qualifying high water-cut oil wells which fall into categories (b) and (c) will not be used in the group calculation for incremental high water-cut oil.

Please refer to **Appendix C** for example calculations of the Incremental High Water-Cut Oil Factor.

Qualifying High Water-Cut Oil Well means a horizontal oil well or vertical oil well that:

a) is not part of an EOR project;
b) has an average water-cut of 90% or greater during the evaluation period or is part of a group of oil wells that produce at an average water-cut of 90% or greater the evaluation period; and
c) in the opinion of the minister, benefits from the qualifying investment, please refer to **Appendix A**.

Note: The Program includes a minimum requirement of at least 50% water-cut for every individual well to be eligible. If a well has an average water-cut of 50% or greater and is part of a group of oil wells that produce at an average water-cut of 90% or greater during the evaluation period and benefits from the qualifying investment, then the group of wells would qualify for the program.

Qualifying Investment means a minimum average investment of $20,000 in eligible costs, as determined by the minister, per qualifying high water-cut oil well that will result in incremental high water-cut oil being produced from that qualifying high water-cut oil well.

Note: Normal repair and maintenance activities are considered ineligible costs towards the qualifying investment threshold of at least $20,000, on average, per eligible well.

4 Application Process

The application process for the Program consists of two separate applications:

1) The Initial High Water-Cut Application
    - Application form can be found on the Program webpage and must be submitted through the *High Water-Cut Initial Application* in IRIS.
    - The purpose of the application is to confirm the oil well(s) meet the eligibility criteria, clearly describe the qualifying investment that will directly improve water handling capabilities and extend the producing life of the well, and calculate an incremental high water-cut oil factor.
    - The application may be made for an individual oil well or a group of oil wells.

    Note: Companies are encouraged to commence investments after ER has reviewed and approved the Initial *High Water-Cut Application* and incremental high water-cut oil factor (if applicable), however, qualifying investments must be made after April 1, 2021, to be considered eligible.
2) The Investment Summary Submission Form
    - The submission form can be found on the Program webpage and must be submitted through the *High Water-Cut – Qualifying Investment Summary* application in IRIS after the qualifying investment has been executed.
    - The purpose of the submission form is to substantiate the qualifying investments and confirm the incremental high water-cut oil factor approved in the initial application is still appropriate.
    - A description of the investment type(s) as described in the application, the amount of incurred costs for each type of investment, and date each investment was incurred must be included.
    - If the initial application approved multiple wells, then a single combined submission form may be used for all wells accounted for in the application.

    Note: Individual invoices may be asked for at the minister's discretion.

5 Approval Process

After ER has reviewed and processed the High Water-Cut Initial Application in IRIS, the applicant will be notified of the incremental high water-cut oil factor that was approved by the minister (if applicable) and any other conditions that may apply.

After ER verifies the Investment Summary and approves the High Water-Cut Qualifying Investment Summary application in IRIS, the royalty status re-assignment and incremental high water-cut oil factor will be applied.

6 Effective Date of the Incremental High Water-Cut Oil Factor and Royalty Re-Assignment

ER will assign the incremental high water-cut oil factor and royalty status within its billing system once the applicant has submitted the Investment Summary described in Section 4 and ER confirms that the incremental high water-cut oil factor is still appropriate.

For oil wells that have been shut-in or suspended for six or more consecutive reported months, the incremental high water-cut oil factor and royalty re-assignment is effective on the first day of the month in which each well is brought back onto production.

For actively producing oil wells, the incremental high water-cut oil factor and royalty re-assignment is effective the later of:

- the first day of the month in which the investments associated with each well are completed; or,
- the first day of the month after the investment is brought to the attention of ER, in the case where the investment is made to a qualifying high water-cut well before an Initial High Water-Cut Application is submitted to ER. This provision will be effective as of August 1, 2021.

7 Royalty/Tax Regime

7.1 Incremental High Water-Cut Oil

Qualifying high water-cut oil wells will receive a royalty status re-assignment on oil produced after the eligible investment has been incurred based upon the well's finished drilling date:

a) Oil wells drilled prior to October 1, 2002, will receive Fourth Tier Oil Royalties on their incremental high water-cut oil;
b) Oil wells drilled on or after October 1, 2002, will receive a royalty rate deduction of 2% on all future oil production*

*Royalty and tax rates is the greater of zero and the rate determined pursuant to 10(a) of *The Crown Oil and Gas Royalty Regulations, 2012* and clause 9(a) of *The Freehold Oil and Gas Production Tax Regulations, 2012*, less the high water-cut deduction.

The monthly oil production (MOP) factor used within the royalty/tax rate formula is based on the total oil produced from the well in a month, including the incremental high water-cut oil.

7.2 Non-Incremental Oil

The royalty/tax regime applicable to oil produced from a qualifying high water-cut oil well prior to the incremental high water-cut oil factor being implemented will continue to apply to the portion of the oil that is not incremental high water-cut oil.

Appendix A: Qualifying Investments

Cost Allowable Table*	**Eligible**	**Ineligible**
Capital Costs		
Converting to a disposal well	X	
Drilling a disposal well	X	
Flowline construction to handle the produced water.	X	
Pumps that have been upgraded to handle larger volumes	X	
Recompletion costs (i.e. perforating, cementing, acidizing, and fracturing)	X	
Rod string replacement to a non-corrosive material	X	
Tubing size increase	X	
Water handling facility upgrades (i.e. flowlines, disposal equipment)	X	
Water shut off activities (i.e., packing, liners, bridge plug placements, conformance gel treatments)	X	
Battery/water handling facility expansion costs related to drilling a new well		X
Other normal repair and maintenance activities**		X
Pump replacements of equal volume capacity**		X
Repairing casing leaks**		X
Replacing tubing**		X
Treating Water for reinjection (i.e. bulk chemical set ups).		X
Trucking of Production Fluid		X
Well cleanouts**		X

*Any other investment may be approved by the minister as a qualifying investment for the purpose of this program.

** These costs **may be considered eligible** if related to a well that has been suspended for 6 or more consecutive months before submitting an application under the program.

Appendix B: Examples of Average Water-Cut Determination

Assumptions for all scenarios below:

- An application under the program is received by ER in April 2021;
- Investments are being made on a battery facility that will enable more oil to be recovered from **both wells** associated with the facility;
- March 2021 is the most recent month for which production information is available for each well.

Scenario 1 – Two Active Wells:

	WELL #1			**WELL #2**			**GROUP**	
Date	Oil (m^3)	Water (m^3)	Hours on Production	Oil (m^3)	Water (m^3)	Hours on Production	Oil (m^3)	Water (m^3)
2020-12	75.2	500.0	720				75.2	500.0
2021-01	0	0	0	80.4	1,510.8	680	80.4	1,510.8
2021-02	60.0	450.1	720	85.4	1,595.9	719	145.4	2,046.0
2021-03	100.9	602.1	697	80.4	1,200.4	704	181.3	1,802.5
TOTAL	236.1	1,552.2		246.2	4,307.1		482.3	5,859.3
Average Water-Cut	86.8%			94.6%			92.4%	

Where:

WELL #1 - the evaluation period starts in December 2020, and ends in March 2021. It consists of the most recent four months reported, three of which have hours on production.

WELL #2 – the evaluation period starts in January 2021, and ends in March 2021. It consists of the most recent three months reported, three of which have hours on production.

The average water-cut of Well #1 is 86.8% it does not qualify for the program on its own. However, since there are two oil wells that will benefit from the qualifying investment, the calculation for average water-cut can be performed for the group of wells to qualify. To calculate the average water-cut for the group of wells, sum the total water production from each well in the group during each well's respective evaluation period and divide the sum of the total liquid production (oil and water) from each well in the group during the respective evaluation period.

Average water-cut for the group of wells is:

$$\frac{(1{,}552.2 + 4{,}307.1)}{(236.1 + 1{,}552.2) + (246.2 + 4{,}307.1)} = 0.924 = 92.4\%$$

Since the average water-cut for the group of wells is greater than 90% and each individual well has an average water-cut of 50% or greater, the wells are considered qualifying high water-cut oil wells. Appendix C outlines how to calculate the Incremental High Water-Cut Oil Factor for this scenario.

Scenario 2 – Two Suspended Wells:

	WELL #1			**WELL #2**			**GROUP**	
Date	Oil (m^3)	Water (m^3)	Hours on Production	Oil (m^3)	Water (m^3)	Hours on Production	Oil (m^3)	Water (m^3)
2020-06	70.2	500.3	720	0	0	0	70.2	500.3
2020-07	0	0	0	80.0	1,200.0	715	80.0	1,200.0
2020-08	40.8	407.2	720	85.0	1,400.0	719	125.8	1,807.2
2020-09	46.1	222.6	697	0	0	0	46.1	222.6
2020-10	0	0	0	92.4	1,000.0	698	92.4	1,000.0
2020-11	0	0	0	0	0	0	0	0
2020-12	0	0	0	0	0	0	0	0
2021-01	0	0	0	0	0	0	0	0
2021-02	0	0	0	0	0	0	0	0
2021-03	0	0	0	0	0	0	0	0
TOTAL	157.1	1,130.1		257.4	3,600.0		414.5	4,730.1
Average Water-Cut	87.8%			93.3%			91.9%	

Where:

WELL #1 - the evaluation period starts in June 2020, and ends in March 2021. It consists of the most recent ten months reported, three of which have hours on production and the most recent six consecutive months being suspended.

WELL #2 – the evaluation period starts in July 2020, and ends in March 2021. It consists of the most recent nine months reported, three of which have hours on production and the most recent five consecutive months being suspended.

Average water-cut for the group of wells is:

$$\frac{(1{,}130.1 + 3{,}600.0)}{(157.1 + 1{,}130.1) + (257.4 + 3{,}600.1)} = 0.919 = 91.9\%$$

Since the average water-cut for the group of wells is greater than 90% and each individual well has an average water-cut of 50% or greater, the wells are considered qualifying high water-cut oil wells. Appendix C outlines how to calculate the Incremental High Water-Cut Oil Factor for this scenario.

Scenario 3 – One Active and One Suspended Well:

	WELL #1			**WELL #2**			**GROUP**	
Date	Oil (m^3)	Water (m^3)	Hours on Production	Oil (m^3)	Water (m^3)	Hours on Production	Oil (m^3)	Water (m^3)
2020-07	0	0	0	80.4	1,510.8	710	80.4	1,510.8
2020-08	0	0	0	85.4	1,595.9	719	85.4	1,595.9
2020-09	0	0	0	96.7	1,200.4	724	96.7	1,200.4
2020-10	0	0	0	0	0	0	0	0
2020-11	0	0	0	0	0	0	0	0
2020-12	60.7	500.3	720	0	0	0	60.7	500.3
2021-01	0	0	0	0	0	0	0	0
2021-02	36.4	407.2	720	0	0	0	36.4	407.2
2021-03	41.8	222.6	697	0	0	0	41.8	222.6
TOTAL	138.9	1,130.1		262.5	4,307.1		401.4	5,437.2
Average Water-Cut	89.1%			94.3%			93.1%	

Where:

WELL #1 - the evaluation period starts in December 2020, and ends in March 2021. It consists of the most recent four months reported, three of which have hours on production.

WELL #2 – the evaluation period starts in July 2020, and ends in March 2021. It consists of the most recent nine months reported, three of which have hours on production and the most recent six consecutive months being suspended.

Average water-cut for the group of wells is:

$$\frac{(1{,}130.1 + 4{,}307.1)}{(138.9 + 1{,}130.1) + (262.5 + 4{,}307.1)} = 0.931 = 93.1\%$$

Since the average water-cut for the group of wells is greater than 90% and each individual well has an average water-cut of 50% or greater, the wells are considered qualifying high water-cut oil wells. Appendix C outlines how to calculate the Incremental High Water-Cut Oil Factor for this scenario.

Appendix C: Examples of Incremental High Water-Cut Oil Factor Calculations

Assumptions for scenarios below:

- The wells from scenarios 1 to 3 in Appendix B are used;
- All wells have a finished drilling date prior to October 1, 2002;
- The High Water-Cut royalty classification is shown below as "TR4 WC".

Scenario 1 – Two Active Wells:

	WELL #1	**WELL #2**	**GROUP**
Average Water-Cut	86.8%	94.6%	92.4%
Current Oil Royalty Classification	NEW 10	OLD	N/A

Since the average water-cut for the group of wells is greater than 90% and each individual well has an average water-cut of 50% or greater, the wells are considered qualifying high water-cut oil wells, and an incremental high water-cut oil factor will be established for the **group of wells** based on the additional recoverable reserves attributable to the qualifying investments.

The estimated additional reserves for each of the wells is found below:

	Remaining Reserves m^3	**Additional Reserves (AR) m^3**	**Total Remaining Reserves (TR) m^3**
WELL #1	1,000	4,000	5,000
WELL #2	1,500	5,000	6,500
GROUP	2,500	9,000	11,500

Since both wells are currently active, the Incremental High Water-Cut Oil Factor will be calculated for the group.

$$Incremental\ High\ Water\ Cut\ Oil\ Factor = \frac{AR}{TR} \times 100$$

$$\frac{9{,}000}{11{,}500} \times 100 = 78.3\%$$

Both Well #1 and Well #2 will be assigned an Incremental High Water-Cut Oil Factor of 78.3%. The royalties assigned after the Investment Summary Submission Form is approved by ER will be:

- Well #1
  - 78.3% TR4 WC
  - 21.7% NEW10
- Well #2
  - 78.3% TR4 WC
  - 21.7% OLD

Scenario 2 – Two Suspended Wells

	WELL #1	WELL #2	GROUP
Average Water-Cut	87.8%	93.3%	91.9%
Current Oil Royalty Classification	NEW 10	TR3	N/A

Since the average water-cut for the group of wells is greater than 90% and each individual well has an average water-cut of 50% or greater, the wells are considered qualifying high water-cut oil wells. An **incremental high water-cut oil factor of 100% will be assigned to Well #1** since it has been suspended for a period of six or more consecutive months before the qualifying investments are made. An **incremental high water-cut oil factor will be established for Well #2** based on the additional recoverable reserves attributable to the qualifying investments.

The estimated additional reserves for each of the wells is found below:

	Remaining Reserves (m^3)	Additional Reserves (AR) (m^3)	Total Remaining Reserves (TR) (m^3)
WELL #1	N/A	N/A	N/A
WELL #2	200	3,500	3,700
GROUP	N/A	N/A	N/A

Since Well #1 has been suspended for six or more consecutive months before the qualifying investment is made, it will automatically receive an Incremental High Water-Cut Oil Factor of 100% - therefore, Well #1 will be excluded from the calculation. The Incremental High Water-Cut Oil factor will be calculated for Well #2.

$$Incremental\ High\ Water\ Cut\ Oil\ Factor = \frac{AR}{TR} \times 100$$

$$\frac{3{,}500}{3{,}700} \times 100 = 94.6\%$$

As mentioned above, Well #1 will be assigned an incremental high water-cut oil factor of 100%, while Well #2 will be assigned an Incremental High Water-Cut Oil Factor of 94.6%. The royalties assigned after the Investment Summary Submission Form is approved by ER will be:

- Well #1
  - 100% TR4 WC
- Well #2
  - 5.4% TR3
  - 94.6% TR4 WC

Scenario 3 – One Active and One Suspended Well:

	WELL #1	**WELL #2**	**GROUP**
Average Water-Cut	89.1%	94.3%	93.1%
Current Oil Royalty Classification	TR3	TR3	N/A

Since the average water-cut for the group of wells is greater than 90% and each individual well has an average water-cut of 50% or greater, the wells are considered qualifying high water-cut oil wells, and an **incremental high water-cut oil factor will be established for well #1 based on the additional recoverable reserves** attributable to the qualifying investments. An **incremental high water-cut oil factor of 100% will be assigned for well #2 since it has been suspended for a period of six** or more consecutive months before the qualifying investments are made.

The estimated additional reserves for each of the wells is found below:

	Remaining Reserves (m^3)	**Additional Reserves (AR) (m^3)**	**Total Remaining Reserves (TR) (m^3)**
WELL #1	2,000	2,000	4,000
WELL #2	N/A	N/A	N/A
GROUP	N/A	N/A	N/A

Since Well #2 has been suspended for six or more consecutive months before the qualifying investment is made, it will automatically receive an Incremental High Water-Cut Oil Factor of 100% - therefore, Well #2 will be excluded from the calculation. The Incremental High Water-Cut Oil factor will be calculated for Well #1.

$$Incremental\ High\ Water\ Cut\ Oil\ Factor = \frac{AR}{TR} \times 100$$

$$\frac{2{,}000}{4{,}000} \times 100 = 50.0\%$$

As mentioned above, Well #2 will be assigned an incremental high water-cut oil factor of 100%, while Well #1 will be assigned an Incremental High Water-Cut Oil Factor of 50.0%. The royalties assigned after the Investment Summary Submission Form is approved by ER will be:

- Well #1
  - 50% TR3
  - 50% TR4 WC
- Well #2
  - 100% TR4 WC

Scenario 4 –Waterflood Oil Well:

An oil well has been producing at an average water-cut of 93% for the most recent three reporting months within an approved waterflood project. The oil royalties currently assigned to the well are:

- 40% TR4 WF
- 60% NEW 10

The incremental high water-cut oil factor will be established for Well #1 based on the additional recoverable reserves attributable to the qualifying investment.

The estimated additional reserves for each of the wells is found below:

	Remaining Reserves (m^3)	**Additional Reserves (AR) (m^3)**	**Total Remaining Reserves (TR) (m^3)**
WELL #1	2,000	2,000	4,000

The Incremental High Water-Cut Oil factor will be calculated for Well #1 on its own.

$$Incremental\ High\ Water\ Cut\ Oil\ Factor = \frac{AR}{TR} \times 100$$

$$\frac{2{,}000}{4{,}000} \times 100 = 50.0\%$$

An Incremental High Water-Cut Oil Factor of 50.0% will be assigned to Well #1. Since the definition of Incremental High Water-Cut Oil excludes incremental waterflood oil (TR4 WF), the royalties assigned after the Investment Summary Submission Form is approved by ER will be:

- 40% TR4 WF
- 30% NEW 10
- 30% TR4 WC

FOR FURTHER INFORMATION, PLEASE CONTACT:

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