

# Enhanced Hydrocarbon Recovery Program Guidelines

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Principles and Procedures

Version 1.0

SEPTEMBER 2020



# Document Version Register

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# 1. Introduction

The Government of Alberta is encouraging Enhanced Recovery (ER) projects intended for legacy fields to optimize the recovery of the province's hydrocarbon resources while using existing infrastructure (for example, minimizing new land disturbances). Establishing the Enhanced Hydrocarbon Recovery Program (EHRP) under the Modernized Royalty Framework (MRF) aligns with the Royalty Review Advisory Panel Report released in January 2016. In that report, the Panel recommended that "strategic programs for enhanced hydrocarbon recovery and high-risk experimental wells be introduced simultaneously with the final calibration of the MRF...". ER methods use the injection of fluids or other approved substances to recover additional hydrocarbon reserves. This program will run parallel to the Enhanced Oil Recovery Program (EORP) as of January 1, 2017. The EORP will continue to apply to schemes that were participating prior to January 1, 2017. The EORP ceased accepting applications on January 1, 2017 and will terminate on December 31, 2026.

These guidelines are issued to explain the administration of the EHRP under the [Enhanced Hydrocarbon Recovery Royalty Regulation](#) (the Regulation), and to assist operators in completing the application process. This document reflects policies and procedures effective January 1, 2017, unless otherwise noted.

In the event of any conflict among the Regulation, the [Mines and Minerals Act](#) (the Act), the [Natural Gas Royalty Regulation, 2017](#), the [Petroleum Royalty Regulation, 2017](#), the [Oil Sands Royalty Regulation, 2009](#), and these guidelines, the Act and the Regulation will prevail. Inquiries can be directed to:

Manager, Oil Royalty Programs and Rates **or**  
Manager, Gas Royalty Accounting  
Energy Operations Division  
Alberta Energy  
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9945-108 Street  
Edmonton AB T5K 2G6  
Email: [ENERGY.MRFPROGRAMS@GOV.AB.CA](mailto:ENERGY.MRFPROGRAMS@GOV.AB.CA)

## 2. Program Overview

The EHRP consists of two main components. The first component targets tertiary recovery schemes that enhance recovery of hydrocarbons from an oil or gas pool by miscible flooding, immiscible flooding, solvent flooding, chemical flooding or other methods approved by the Minister.

The second component targets secondary recovery schemes that enhance recovery of hydrocarbons from an oil or gas pool by water flooding, gas cycling, gas flooding, polymer flooding or other methods approved by the Minister.

Under both components of the program, a company will pay a flat royalty of five per cent on crude oil, natural gas, and natural gas liquids produced from wells in an approved scheme for up to 90 calendar months (for example, the benefit terms). After the benefit term ends, wells in these schemes will be subject to post C\* royalty rates under the Modernized Royalty Framework.

## 3. Program Eligibility

Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 3, 5 and 9

### 3.1 Scheme Eligibility

In order to be accepted into the EHRP, enhanced recovery schemes must meet all of the following eligibility criteria:

- The scheme must be an enhanced hydrocarbon recovery scheme as defined in the EHRP regulations, and the primary production phase (for example, base case production) has occurred in the pool.
- The scheme operator must apply to the AER for technical approval on or after October 23, 2016 and receive technical approval from the AER under Section 39 of the Oil and Gas Conservation Act prior to receiving approval from Alberta Energy.
- The scheme must be for single pools only, no multi pool schemes. The scheme must produce more hydrocarbons from the pool than could be produced under the base recovery scheme for that pool.
- The costs to implement and operate the scheme must be significantly greater than the costs to implement and operate the base recovery scheme.
- The scheme is currently non-commercial and unable to achieve commerciality without the program.

In addition, if water flooding, gas flooding, or gas cycling is proposed, the Minister is satisfied that:

- For a new scheme, it is located in a pool or part of a pool where water flooding, gas flooding, or gas cycling has not occurred previously.
- For an existing scheme, it is extended vertically into a pool or part of a pool where water flooding, gas flooding, or gas cycling has not occurred previously.

If a client has received any other government grants or benefits, these will be considered by Alberta Energy during the approval process.

Pre-development pilots are also eligible for the program.

If the scheme meets all the eligibility criteria, the Minister of Energy will determine whether a proposed project is in the public interest after performing an economic and technical review of the project application.

- The technical review of the data outlined in Section 4.2 will analyze the scheme area, scheme reserves, type of scheme, T-factor or S-factor, base and enhanced case production, and injection volumes.
- The economic review of the application will look at the production, costs, and timing. The review includes assessing net present value, profitability ratios, internal rate of return, and the payout period.

## 3.2 Well Eligibility

### 3.2.1 Minimum Level of Well Event Evaluation

To receive the five per cent royalty rate, the well event must:

- be classified as an oil or gas well event
- have oil or gas crown interest
- be tied to a scheme approved under the Regulation
- produce from the same pool as the rest of the scheme
- not be a commingled well event
- not have been previously tied to another scheme unless the new scheme is using a different technology.

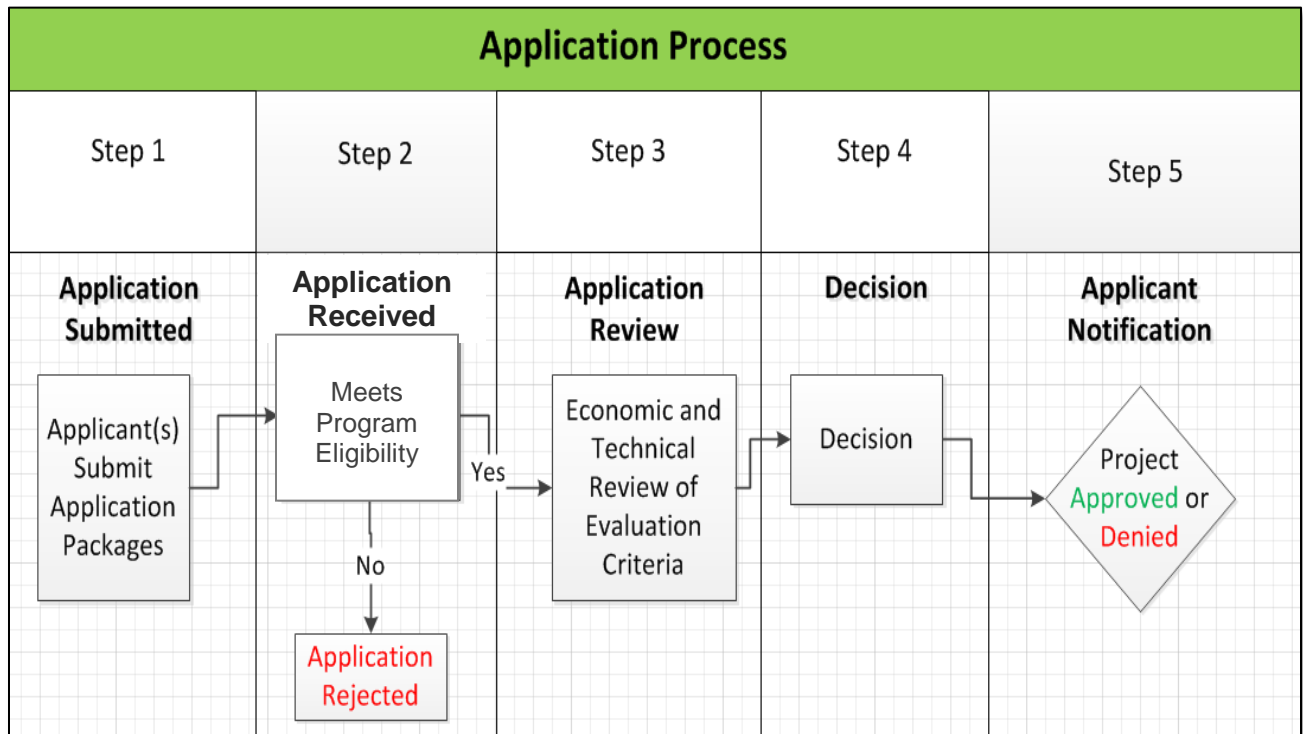
If a well event becomes ineligible, it will be terminated from the scheme on the last day of the month in which it became ineligible.

**Example:**

A well's status changes to abandoned on March 19, 2019. The well will be terminated from the scheme and removed on the last day of that month - March 31, 2019.

## 4. Application Process

Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 4



## 4.1 Submission

Operators must apply to Alberta Energy on or after January 1, 2017, under the Regulation, if they wish to have their ER scheme considered for inclusion in the program. The operator must also apply for scheme technical approval to the Alberta Energy Regulator (AER) under Section 39 of the *Oil and Gas Conservation Act*.

Applications can be submitted prior to the AER's technical approval. However, Alberta Energy will not approve a scheme without the AER's approval. It is the operator's responsibility to supply a copy of the AER's approval to Alberta Energy.

At any time, industry may begin completing an application that must include a detailed project summary, a checklist, and a spreadsheet with four tabs - Base Case Production, Enhanced Case Production, Base Case Cost, and Enhanced Case Cost.

## 4.2 Application Requirements

Alberta Energy has an excel spreadsheet template available on the website at <https://www.alberta.ca/assets/documents/EHRPspreadsheets.xlsx> to collect the data required in a consistent format to expedite application approvals.

The application must include detailed technical and economic data on the base case and on the ER proposal.

All volumetric data must be submitted in metric units.

All capital costs and operating expenses for the forecasts are expressed in constant dollars (see 4.2.4); either for the year in which the application is made or for the starting year of injection.

Enhanced case should include incremental ER costs only.

The base recovery scheme will be conventional primary unless there is evidence otherwise. When moving to a new production technique, the previous scheme's production will be the base recovery scheme.

The following information must be included in an application:

### 4.2.1 Scheme Area

- maps showing the definition of scheme area
- all data to be submitted for both the total scheme area and the Crown portion only
- a copy of AER Section 39 approval (can be forwarded when approved)

### 4.2.2 Scheme Reserve and Technical Data

- type of scheme (secondary recovery/tertiary recovery)
- ER flood orientation (vertical/horizontal)
- oil density (Kg/M3)
- oil sulfur content (per cent wt.)
- solution gas oil ratio (GOR)
- raw gas heat content (Gj/M3)
- sales gas heat content (Gj/M3)
- condensate yield @ wellhead (M3/E3M3)
- initial hydrocarbon-in-place
- base case recovery volumes
- ultimate enhanced case recovery volumes
- net cumulative production as of injection date

## 4.2.3 Production – Base Case and Enhanced Case

- oil production by calendar year
- raw gas production by calendar year
- sales gas and NGLs by calendar year
- number of oil producing, gas producing, and injection wells
- injection volumes – water, gas, NGLs, and/or other CO<sub>2</sub>, Alkali Surfactant Polymer (ASP), nitrogen, etc.
- production start date (YYYY/MM) for base case and enhanced
- production end date (YYYY/MM) for base case and enhanced

## 4.2.4 Costs – Enhanced Case

### 4.2.4.1 Capital

Capital costs must be approved for expenditures (AFE) based on the selection of appropriate technology. Costs that are directly related and required to inject approved substances and increase hydrocarbon recovery above a base recovery scheme, should be included.

### 4.2.4.2 Injection

Alberta Energy will estimate the opportunity cost of injected hydrocarbons based on the applicant's production forecast and the department's production price forecast. Acquisition costs must be provided for non-hydrocarbon injectant (including water, CO<sub>2</sub>, acid gas, nitrogen, ASP, etc.). In cases where a fair market value cannot be established, a cost of service calculation must be provided.

### 4.2.4.3 Direct Operating

Costs directly related and required to inject approved substances and increase hydrocarbon recovery above the base recovery scheme.

### 4.2.4.4 Inflation

Adjustment from nominal values is required; a two per cent inflation rate should be used.

## 4.2.5 Technical Risk Analysis

Technical risks should be described for the enhanced case and related to reservoir characteristics and geological conditions.

## 4.2.6 Engineering Evaluation Report

A current Engineering Evaluation Report must be submitted with the filing of this application. The report must be authenticated by a registered member of the Association of Professional Engineers and Geoscientists of Alberta (APEGA) prepared in accordance with the Canadian Oil and Gas Evaluation Handbook (COGEH) or Petroleum Resources Management System (PRMS).



# 5. Administration of EHRP Schemes

## **Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 5, 6, 10, 11, 12, and 13**

If the application is approved, the Crown shares in the cost to develop the resource by reducing the amount of Crown royalty due on the hydrocarbon production from the scheme. Once AER scheme approval is received, all eligible well events producing Crown hydrocarbons from the scheme area will receive a five per cent flat royalty rate for the term.

The Royalty Operations Branch administers the EHRP under the Regulation.

Alberta Energy may, from time to time, request additional information to evaluate the continued inclusion in the EHRP. In addition, operators of approved schemes will be required to provide annual reports and/or presentations to Alberta Energy.

## 5.1 Approval

### **Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 5**

Alberta Energy, in consultation with the AER, evaluates each application under the Regulation. During the approval process, Alberta Energy will:

- contact the scheme operator to rectify any deficiencies in the application
- evaluate the application; including the recovery factor (the AER will be consulted)
- examine the technical risks associated with the scheme (the AER will be consulted)
- review projected costs in relation to expected incremental recovery
- make a recommendation to the Minister
- notify the applicant of the Minister's decision.

In the approval, Alberta Energy may establish terms and conditions relating to the scheme. Alberta Energy may also amend the approval to add, change, or delete those terms and conditions. Operators of approved schemes will be advised of the initial month of the five per cent royalty rate and the benefit term.

## 5.2 Scheme Amendment or Expansion

### **Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 10**

#### **5.2.1 Scheme Amendment**

Revised operating strategies, which continue to meet eligibility requirements and conditions of the AER approval and the Alberta Energy EHRP approval (same technology and no change of injectant), do not require approval by Alberta Energy.

If the AER amends the scheme boundary to include wells outside the original boundary, the operator must notify Alberta Energy to have the wells added to the scheme. Alberta Energy will then update the current scheme to include the wells. If changes include an injection pattern change, a new application for EHRP will be required (see Scheme Expansion).

## 5.2.2 Scheme Expansion

An expansion requires at least one new injection pattern consisting of at least one injection well and one producing well. An expansion to an existing scheme area requires that a new application for EHRP be submitted to Alberta Energy and the application must contain all the information requirements for a new scheme.

Expansions are considered new schemes and upon approval will be issued a unique scheme number and benefit term. More than one scheme can be approved in a pool. However, a scheme can only be for one pool. For an expansion to an EORP scheme, the expanded area will receive royalty benefits under the EHRP, while all other wells from within the original pre-expansion boundaries of the scheme will continue to receive benefits under the EORP.

## 5.2.3 Change of Injectant

Schemes that change injectant or recovery technique will require a new program application and approval. Schemes that received benefit under previous ER Programs (for example, EORP), may apply as a new scheme if a different recovery technique or injectant that uses hydrocarbons, carbon dioxide, nitrogen, chemicals, or other material approved by the Minister as a technique for enhanced recovery.

# 5.3 Termination or Suspension of Approval

## Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 12 and 13

### 5.3.1 Termination or Suspension by Operator

An operator may request termination or suspension of the EHRP approval for a scheme before the end of the scheme's term under the program. Requests must be made by the operator on official company letterhead. The operator must specify the date they want the EHRP approval to be suspended or terminated. The date must be the last day of the requested month. A suspension of an approval for an approved scheme will not cause the benefit term to be extended.

### 5.3.2 Termination of ER Scheme Approval by AER

Termination of the AER approval will, in all instances, result in the EHRP approval being terminated. The termination date will be the last day of the month in which AER terminates the approval. This may result in a recalculation of the royalty for any months after the termination date that have already been processed.

### 5.3.3 Termination or Suspension by Alberta Energy

Alberta Energy may choose to suspend or terminate an EHRP approval according to Sections 12 and 13 of the Regulation. The suspension or termination will be effective on the last day of the month in which it is enacted. The Operator will be notified of the intention of suspension or termination, prior to the records of the department being updated. This may result in a recalculation of royalty. A suspension of an approval for an approved scheme will not cause the benefit term to be extended. Schemes with suspended approvals will not receive the five per cent royalty rate. If the scheme approval is reinstated after a suspension, then royalty will be recalculated back to the effective date that the approval was suspended.

## 5.4 Establish a Benefit Term

### Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 6 and 8

The length of term will be applied at the scheme level.

- **For tertiary recovery**, the benefit term for the five per cent royalty rate is determined by the T-factor (see Section 6) and will have a minimum of two consecutive calendar months (T-factor of 0.224); and a maximum of 90 consecutive calendar months (T-factor between 0.781 and 1.000).
- **For secondary recovery**, the benefit term for the five per cent royalty rate is determined by the S-factor (see Section 6) and will have a minimum of two consecutive calendar months (T-factor of 0.224); and a maximum of 72 consecutive calendar months (T-factor between 0.781 and 1.000).

Once the scheme has reached the end of its term, all well events within that scheme are no longer eligible for the five per cent royalty rate; except for wells that were eligible for a C\* and have a remaining C\* balance.

## 5.5 Benefit Term Start Date

### Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 6

#### Tertiary Recovery Schemes

The benefit term start date is the first day of the month that the scheme begins to receive the five per cent royalty rate under the program. The operator of a tertiary scheme has the option of requesting the start date of the five per cent royalty rate. Alberta Energy must be notified in writing within 36 months from the date of first injection. Notice must be received prior to the first day of the month requested by the operator. If notice is not received, the first day of the month following 36 calendar months after the date of first injection will be used.

#### Example 1 - Operator provides notice

Date of First injection: January 15, 2017

- Operator notifies Alberta Energy of requested start date of May 1, 2018 on March 15, 2018
- EHRP start date: May 1, 2018

#### Example 2 - Operator does not provide notice

Date of first injection: January 15, 2017

- No notice received from operator
- EHRP start date: February 1, 2020

The operator does not have to wait until Alberta Energy approves the scheme to send notice. However, the rate will not be applied using that start date until after the scheme is approved.

An operator may choose to amend the EHRP start date they have initially selected, provided that it is still within the 36-month time frame and the five per cent royalty rate has not yet been applied.

#### Secondary Recovery Schemes

The benefit term start date for secondary recovery schemes is determined by the Minister, but no later than 36 months after the month in which the first injection of material using the method under the approved scheme occurred. An operator may propose a benefit term start date for the Minister's consideration.

## 5.6 Termination Date

### Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 13

The termination date is the date that the five per cent royalty rate ends. All well events in the scheme will cease to receive the five per cent royalty rate unless they have a remaining C\*. Wells that are part of the scheme but were drilled prior to January 1, 2017, and are not early opted-in wells, will be fully transitioned into MRF and be subject to pay post C\* royalty rate. The termination date will be the last day of the month.

## 6. T-Factor or S-Factor Calculation

### Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 8

The T or S-factor (the factor) of an approved scheme is used to determine the length of time, in calendar months, that the five per cent royalty rate will apply.

T-factor applies to tertiary schemes; S-factor applies to secondary schemes.

The factor is defined as the greater of 0.224 or the ratio between the incremental recoverable hydrocarbon reserves estimated for the scheme and the recoverable hydrocarbon reserves at the start of the scheme.

In other words, the incremental hydrocarbons recoverable from the scheme area over the life of the scheme (itr), divided by the total amount of hydrocarbons that, in the Minister's opinion, remains to be recovered from the scheme area (tco).

$$\text{Factor} = \frac{\text{Incremental hydrocarbons recoverable from the scheme area over the scheme}}{\text{Remaining recoverable hydrocarbon reserves at start of the scheme}}$$

**Note:** The maximum factor allowed is 1.000. The minimum factor allowed is 0.224

#### Example:

$i_{\text{enhanced case}} = 75,000$  units

$i_{\text{base case}} = 50,000$  units

$t_{\text{co}} = 100,000$  units \*based upon evaluation from the Ministers opinion (AER input on reserves recognition)

factor = 0.25

|         |  |                                     |        |
|---------|--|-------------------------------------|--------|
| factor= | $\text{itr} = i_{\text{enhanced case}} - i_{\text{base case}}$ | $\frac{(75,000 - 50,000)}{100,000}$ | = 0.25 |
|         | tco  |                                     |        |

Alberta Energy establishes the factor based on AER reserve recognition. It is the scheme operator's responsibility to submit applications to the AER for reserve recognition for new schemes, and any subsequent revisions to a scheme as to the size of the established reserves.

Hydrocarbon migration will be considered in determining the remaining recoverable value when reservoirs are partially miscible flooded as in the case of staged development of large horizontal floods.

Alberta Energy may request the AER to review the reserves for a pool with regard to the scheme's current performance, its projected performance, and the appropriateness of the established reserves. The T or S-factor will be revised by Alberta Energy to be consistent with any changes to scheme reserves.

The operator will be advised of the Factor that Alberta Energy has established for the scheme based on the AER reserves.

## 6.1 Established Reserves

If the AER has established reserves assigned to the pool when the scheme is approved, Alberta Energy will use these reserves to calculate a factor for the scheme, and the appropriate program term will be established. If the factor:

- increases during the term, the term will be extended accordingly as long as the AER effective date falls within the term.
- decreases during the already established term, the term will be adjusted accordingly.
- changes after the scheme is terminated or completed, no recalculation will occur.

A royalty recalculation will not go back into statute barred years.

## 6.2 No Established Reserves

### 6.2.1 T-Factor - No Established Reserves

Alberta Energy has developed a temporary T-factor for new or expanded schemes. The temporary T-factor is intended for those schemes using new or less established methodologies for enhanced hydrocarbon recovery, where the information necessary to establish a T-factor is not readily available.

- A temporary T-factor of 0.324 applies to new schemes in the absence of established AER reserves.
- If the T-factor on the operator's application is less than 0.324, the application's recovery factor will be used to determine the benefit term.
- At the end of the shorter term, the scheme will be suspended until the reserves are established or the 18 calendar month term has passed.
- If the AER does not establish reserves within 18 months for tertiary schemes, the scheme may be terminated.
- The temporary T-factor may be increased to 0.381 under exceptional circumstances upon application to Alberta Energy.
- If reserve information is not received at the end of the extended period, the scheme will be terminated and the five per cent royalty rate will only apply to the initial 18 months.

A royalty recalculation will not go back into statute barred years.

### 6.2.2 S-Factor - No Established Reserves

Alberta Energy has developed a temporary S-factor for new or expanded schemes. The temporary S-factor is intended for those schemes using new or less established methodologies for enhanced hydrocarbon recovery, where the information necessary to establish an S-factor is not readily available.

- A temporary S-factor of 0.324 applies to new schemes in the absence of established AER reserves for a period of 14 calendar months.
- If the S-factor on the operator's application is less than 0.324, the application's recovery factor will be used to determine the benefit term.
- At the end of the shorter term, the scheme will be suspended until the reserves are established or the 14 calendar month term has passed.
- If the AER does not establish reserves within 14 months for secondary schemes, the scheme may be terminated.
- The temporary S-factor may be increased to 0.381 under exceptional circumstances upon application to Alberta Energy.
- If reserve information is not received at the end of the extended period, the scheme will be terminated and the five per cent royalty rate will only apply to the initial 14 months.

A royalty recalculation will not go back into statute barred years.

## 7. Terms for Tertiary Schemes

### Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 8 and Schedule

| T-Factor Range | Term (months) | T-Factor Range | Term (months) | T-Factor Range | Term (months) |
|----------------|---------------|----------------|---------------|----------------|---------------|
| 0.001 - 0.223  | 0             | 0.405 - 0.409  | 31            | 0.596 - 0.600  | 61            |
| 0.224 - 0.228  | 2             | 0.410 - 0.419  | 32            | 0.601 - 0.609  | 62            |
| 0.229 - 0.233  | 3             | 0.420 - 0.423  | 33            | 0.610 - 0.614  | 63            |
| 0.234 - 0.238  | 4             | 0.424 - 0.428  | 34            | 0.615 - 0.619  | 64            |
| 0.239 - 0.247  | 5             | 0.429 - 0.438  | 35            | 0.620 - 0.628  | 65            |
| 0.248 - 0.252  | 6             | 0.439 - 0.442  | 36            | 0.629 - 0.633  | 66            |
| 0.253 - 0.257  | 7             | 0.443 - 0.447  | 37            | 0.634 - 0.638  | 67            |
| 0.258 - 0.266  | 8             | 0.448 - 0.457  | 38            | 0.639 - 0.647  | 68            |
| 0.267 - 0.271  | 9             | 0.458 - 0.461  | 39            | 0.648 - 0.652  | 69            |
| 0.272 - 0.276  | 10            | 0.462 - 0.466  | 40            | 0.653 - 0.657  | 70            |
| 0.277 - 0.285  | 11            | 0.467 - 0.476  | 41            | 0.658 - 0.666  | 71            |
| 0.286 - 0.290  | 12            | 0.477 - 0.480  | 42            | 0.667 - 0.671  | 72            |
| 0.291 - 0.295  | 13            | 0.481 - 0.485  | 43            | 0.672 - 0.676  | 73            |
| 0.296 - 0.304  | 14            | 0.486 - 0.495  | 44            | 0.677 - 0.685  | 74            |
| 0.305 - 0.309  | 15            | 0.496 - 0.500  | 45            | 0.686 - 0.690  | 75            |
| 0.310 - 0.314  | 16            | 0.501 - 0.504  | 46            | 0.691 - 0.695  | 76            |
| 0.315 - 0.323  | 17            | 0.505 - 0.514  | 47            | 0.696 - 0.704  | 77            |
| 0.324 - 0.328  | 18            | 0.515 - 0.519  | 48            | 0.705 - 0.709  | 78            |
| 0.329 - 0.333  | 19            | 0.520 - 0.523  | 49            | 0.710 - 0.714  | 79            |
| 0.334 - 0.342  | 20            | 0.524 - 0.533  | 50            | 0.715 - 0.723  | 80            |
| 0.343 - 0.347  | 21            | 0.534 - 0.538  | 51            | 0.724 - 0.728  | 81            |
| 0.348 - 0.352  | 22            | 0.539 - 0.542  | 52            | 0.729 - 0.733  | 82            |
| 0.353 - 0.361  | 23            | 0.543 - 0.552  | 53            | 0.734 - 0.742  | 83            |
| 0.362 - 0.366  | 24            | 0.553 - 0.557  | 54            | 0.743 - 0.747  | 84            |
| 0.367 - 0.371  | 25            | 0.558 - 0.561  | 55            | 0.748 - 0.752  | 85            |
| 0.372 - 0.380  | 26            | 0.562 - 0.571  | 56            | 0.753 - 0.761  | 86            |
| 0.381 - 0.385  | 27            | 0.572 - 0.576  | 57            | 0.762 - 0.766  | 87            |
| 0.386 - 0.390  | 28            | 0.577 - 0.580  | 58            | 0.767 - 0.771  | 88            |
| 0.391 - 0.400  | 29            | 0.581 - 0.590  | 59            | 0.772 - 0.780  | 89            |
| 0.401 - 0.404  | 30            | 0.591 - 0.595  | 60            | 0.781 - 1.000  | 90            |

## 8. Terms for Secondary Schemes

### Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 6(2)(b) and Schedule

The Minister may re-determine the term.

### Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 6(4)

| S-factor Range | Term (Months) | S-factor Range | Term (Months) | S-factor Range | Term (Months) |
|----------------|---------------|----------------|---------------|----------------|---------------|
| 0 - 0.223      | 0             | 0.405 - 0.409  | 25            | 0.596 - 0.600  | 49            |
| 0.224 - 0.233  | 2             | 0.410 - 0.423  | 26            | 0.601 - 0.614  | 50            |
| 0.234 - 0.238  | 3             | 0.424 - 0.428  | 27            | 0.615 - 0.619  | 51            |
| 0.239 - 0.247  | 4             | 0.429 - 0.438  | 28            | 0.620 - 0.628  | 52            |
| 0.248 - 0.252  | 5             | 0.439 - 0.442  | 29            | 0.629 - 0.633  | 53            |
| 0.253 - 0.266  | 6             | 0.443 - 0.457  | 30            | 0.634 - 0.647  | 54            |
| 0.267 - 0.271  | 7             | 0.458 - 0.461  | 31            | 0.648 - 0.652  | 55            |
| 0.272 - 0.276  | 8             | 0.462 - 0.466  | 32            | 0.653 - 0.657  | 56            |
| 0.277 - 0.285  | 9             | 0.467 - 0.476  | 33            | 0.658 - 0.666  | 57            |
| 0.286 - 0.295  | 10            | 0.477 - 0.485  | 34            | 0.667 - 0.676  | 58            |
| 0.296 - 0.304  | 11            | 0.486 - 0.495  | 35            | 0.677 - 0.685  | 59            |
| 0.305 - 0.309  | 12            | 0.496 - 0.500  | 36            | 0.686 - 0.690  | 60            |
| 0.310 - 0.314  | 13            | 0.501 - 0.504  | 37            | 0.691 - 0.695  | 61            |
| 0.315 - 0.328  | 14            | 0.505 - 0.519  | 38            | 0.696 - 0.709  | 62            |
| 0.329 - 0.333  | 15            | 0.520 - 0.523  | 39            | 0.710 - 0.714  | 63            |
| 0.334 - 0.342  | 16            | 0.524 - 0.533  | 40            | 0.715 - 0.723  | 64            |
| 0.343 - 0.347  | 17            | 0.534 - 0.538  | 41            | 0.724 - 0.728  | 65            |
| 0.348 - 0.361  | 18            | 0.539 - 0.552  | 42            | 0.729 - 0.742  | 66            |
| 0.362 - 0.366  | 19            | 0.553 - 0.557  | 43            | 0.743 - 0.747  | 67            |
| 0.367 - 0.371  | 20            | 0.558 - 0.561  | 44            | 0.748 - 0.752  | 68            |
| 0.372 - 0.380  | 21            | 0.562 - 0.571  | 45            | 0.753 - 0.761  | 69            |
| 0.381 - 0.390  | 22            | 0.572 - 0.580  | 46            | 0.762 - 0.771  | 70            |
| 0.391 - 0.400  | 23            | 0.581 - 0.590  | 47            | 0.772 - 0.780  | 71            |
| 0.401 - 0.404  | 24            | 0.591 - 0.595  | 48            | 0.781 - 1.000  | 72            |

## 9. Alberta Royalty Framework (ARF) Wells

### **Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 7**

Any ARF wells that become part of an EHRP scheme will be fully transitioned into MRF and will forfeit any remaining ARF benefits. These wells will pay a flat five per cent royalty as long as the scheme stays in the program; after the scheme benefit term ends, these wells will be subject to pay post C\* royalty rates under the Petroleum Royalty Regulation, 2017 or Natural Gas Royalty Regulation, 2017.

## 10. Issue Resolution Process

These guidelines describe existing EHRP business practices. The operator may request further interpretation of any part of these guidelines as it applies to the administration of EHRP.

Request should be directed to:

Executive Director, Royalty Operations  
Energy Operations Division  
Alberta Energy  
7th Floor, North Petroleum Plaza 9945 -  
108 Street  
Edmonton AB T5K 2G6

## 11. Reporting and review

### **Enhanced Hydrocarbon Recovery Royalty Regulation (Alberta Regulation 210/2016), Section 11**

Alberta Energy requires an annual report from the project representative that will be reviewed by the department for program monitoring and performance measurement activities.

### 11.1 Annual Approval Status Update Report Requirements

The report must contain a brief summary describing the project's progress over the past year, including:

- interpretation of overall operational performance of the scheme relative to the application forecasts and benchmarks, including the volume of incremental hydrocarbon recovery as a result of net/total amount of injection volume
- identification of any problems and remedial action taken
- future plans for scheme performance, especially if they have changed significantly from the application or previous year.



Additional information that may periodically be requested by the department to support the brief summary above includes:

- actual cost vs. forecast (major cost variances from application/previous reports)
- actual production vs. forecast
- actual injection vs. forecast
- results and evaluation of all monitoring done during the reporting period including, but not limited to: bottom hole pressure, wellhead injection pressure, fluid analysis, logs, and any measurements or observations that are pertinent to the interpretation of scheme operations
- verification that all conditions of the approval has met AER compliance during the reporting period – all non-compliance events should be summarized and should be voluntarily self-disclosed to the Department
- operational updates for what has changed over the past year (scheme boundary, ownership, scheme wells, reserves, injection fluid or recovery technology)
- additional information that may be requested by the Minister from time to time.

## 11.2 Report Timing

Approval Status Update Reports must be provided within three calendar months from the anniversary date (Benefit Term Start Date).

Failure to provide the information requested may lead to the suspension or termination of the approval. If the scheme does not pass the review criteria, the approval may be terminated and/or the royalty rate for the well events may be recalculated.

## 12. Public Disclosure of Information

Alberta Energy may disclose to the public certain data pertaining to schemes participating in the EHRP; as described in Section 26.3(3) of the Mines and Minerals Administration Regulation (262/1997), including:

- operator of the approved scheme
- total number of wells or well events in the approved scheme that produced hydrocarbons
- pool associated with the approved scheme
- total volume of hydrocarbons produced from well events in the approved scheme
- total revenue received or receivable for the sale of hydrocarbons produced from well events in the approved scheme
- total royalty or royalty compensation paid or payable in respect of hydrocarbons produced from the approved scheme
- length and start date of the term of the approved scheme as determined under the Regulation
- expiry date of the approved scheme.

To support government communication, project operators are required to submit a separate document along with the Approval Status Update Report related to the above mentioned, that approves items that can be made public.

## 13. Glossary of Terms

|   |  |
|---|--|
| Base Recovery Scheme                          | In respect of an area that is, or is proposed to be, subject to an enhanced hydrocarbon recovery scheme.   |
| Enhanced Hydrocarbon Recovery Scheme          | Operations in a specific area to stimulate a pool and enhance production.  |
| Enhanced Recovery                             | A method of injection of substances into a pool.   |
| Hydrocarbon                                   | Includes any crude oil, natural gas, gas product or oil sands product that is subject to a determination of royalties.   |
| Operator                                      | In respect of a scheme or proposed scheme, means the person who is the operator of the wells that are within the scheme or proposed scheme according to the records of the Department.   |
| Previous Enhanced Hydrocarbon Recovery Scheme | Enhanced recovery operations that were in place prior to the new enhanced recovery methodology being employed.   |
| Scheme Amendment                              | The AER may amend the scheme boundary to include wells outside the original boundary, the operator must notify Alberta Energy to have the wells added to the scheme. Alberta Energy will then update the current scheme to include the wells.  |
| Scheme Expansion                              | An expansion requires at least one new injection pattern consisting of at least one injection well and one producing well. Expansions require a new application for EHRP be submitted to Alberta Energy. Expansions are considered new schemes and upon approval will be issued a unique scheme number and benefit term. For an expansion to an EORP scheme, the expanded area will receive royalty benefits under the EHRP, while all other wells from within the original pre-expansion boundaries of the scheme will continue to receive benefits under the EORP. |
| Secondary Recovery Scheme                     | A scheme for the enhanced recovery of hydrocarbons from a pool by water flooding, polymer flooding, gas cycling, gas flooding or other methods approved by the Minister.   |
| Tertiary Recovery Scheme                      | A scheme for the enhanced recovery of hydrocarbons from a pool by immiscible flooding, solvent flooding, miscible flooding, chemical flooding or other methods approved by the Minister, but does not include a secondary recovery scheme.   |

# 14. Appendices

## 14.1 Appendix 1 - Acronyms

AER – Alberta Energy Regulator

AFE – Approved for Expenditure

ASP – Alkali Surfactant Polymer

ER – Enhanced Recovery

EORP – Enhanced Oil Recovery Program

EHRP – Enhanced Hydrocarbon Recovery Program

GOR – Gas Oil Ratio

HCMF – Hydro Carbon Miscible Flood

ITR - Incremental hydrocarbons recoverable from the scheme area over the scheme life

NGL – Natural Gas Liquids

S-Factor – Secondary Factor

T- Factor – Tertiary Factor

TCO - Remaining recoverable hydrocarbon reserves at start of the scheme