



June 15, 2000

## INFORMATIONAL NOTICE 00-2

### DETERMINATION OF THIRD TIER OIL FROM NEW EOR PROJECTS

This Informational Notice has been prepared to explain the policies and procedures which will be used to administer the Crown royalty and freehold production tax applicable to incremental oil produced from approved EOR projects implemented after April 1, 1999.

The definition of third tier oil under the Crown Royalty and Incentives Regulation and the Oil and Gas Production Tax Regulation provides for a portion of the oil produced from a new waterflood, or other EOR project, to qualify as third tier oil for royalty/tax purposes as follows:

*“third tier oil” means oil that is produced from*

- a. a third tier oil well,*
- b. an inactive well that is reactivated after April 1, 1999 or*
- c. an old oil well or new oil well that, in the opinion of the director, can reasonably be attributed to an increase in reserves as a result of a project of enhanced recovery implemented after April 1, 1999.*

### **Third Tier EOR Factor**

For new waterfloods or other EOR projects approved after April 1, 1999, the Branch will determine a Third Tier EOR Factor. The Third Tier EOR Factor will be applied to old oil and new oil production from the approved project area to determine a project's Third Tier EOR Production. The Third Tier EOR Factor is determined by the Director at the time of project approval and is based on the ratio of incremental EOR recoverable reserves to total remaining recoverable reserves for the project area. The Third Tier EOR Factor is the fraction of old oil and new oil from the project area that qualifies as Third Tier EOR Production from the project

commencement date. Appendix 1 illustrates how the volume of Third Tier EOR Production will be calculated. The royalty/tax structure, old, new, or holiday, applicable to oil produced from wells in the project area, prior to commencement of the EOR project, continues to apply to the non-third tier portion of the wells' production.

The project commencement date, and the date on which Third Tier EOR Production begins, will be the first day of the month in which the project as approved is fully implemented. Normally this will be the first day of the month in which all the injection wells are on-injection.

When an EOR project is expanded by adding an additional injection well or drilling a new horizontal well the Director may review the Third Tier EOR Factor established for the project.

### **Crown Royalty and Production Tax from New EOR Projects**

Appendix 2 shows detailed royalty/tax formulas to be used to calculate Crown royalty and production tax for new EOR projects implemented after April 1, 1999. The royalty/tax example is for a unit producing a mix of old, new and third tier oil. The royalty/tax formulas shown are for the calculation of royalty/tax for each tract in a unit. This method of calculating the royalty/tax burden for a unit tract is termed the Incremental Production Method. The Incremental Production Method involves calculating old, new and third tier royalty/tax for a unit tract based on the incremental volume of each type of oil. Figure 1 is a graphical illustration of the Incremental Production Method using the Crown royalty curves.

For more information on determination of the Third Tier EOR Factor contact John Fox, Chief Petroleum Engineer at (204) 945-6574. For more information on royalty/tax calculations for new EOR projects, contact Carol Martiniuk, Manager, Administration and Geology at (204) 945-6570.

L.R. Dubreuil  
Director

*Cette information, sauf les annexes, est également disponible en français.*

## APPENDIX 1

### Determination of Third Tier EOR Factor (TTEF) and Third Tier EOR Production (TTEP)

#### A. Third Tier EOR Factor (TTEF)

$$\text{TTEF} = \frac{\text{Incremental EOR Recoverable Reserves (IERR)}}{\text{Total Remaining Recoverable Reserves (TRES)}}$$

Where:

IERR (m<sup>3</sup>) = Incremental EOR recoverable reserves, as determined by the Director, that are attributed to the approved EOR project

TRES (m<sup>3</sup>) = Total remaining recoverable reserves, as determined by the Director, for the approved EOR project

#### B. Third Tier EOR Production (TTEP)

The Third Tier EOR Factor (TTEF) is applied to the monthly old and new production from the EOR project to determine the Third Tier EOR Production (TTEP) for the project, as shown below:

$$\text{TTEP} = \text{TTEF} * (\text{Project Old Oil Production} + \text{Project New Oil Production})$$

After determination of the Third Tier EOR Production (TTEP), total project production, in most cases, will be made up of the following volumes:

$$\text{Net Old Oil Production} = (1 - \text{TTEF}) * (\text{Project Old Oil Production})$$

$$\text{Net New Oil Production} = (1 - \text{TTEF}) * (\text{Project New Oil Production})$$

$$\text{Third Tier Oil Production} = \text{TTEP} + \text{Third Tier Oil Well Production}^1$$

<sup>1</sup> Third Tier Oil Well Production includes both oil from third tier oil wells and oil from inactive wells that are reactivated after April 1, 1999.

## APPENDIX 2

### Third Tier EOR

#### Methodology and Derivation of Crown Royalty and Freehold Production Tax

##### Determine net unit production (NUP):

$$\text{NUP} = \text{TUP} - \text{HOV}$$

(total unit production) (holiday oil volume)

$$\text{NUP} = \text{NOOP} + \text{NNOP} + \text{NTOP}$$

(Net “old oil” production) (Net “new oil” production from “third tier” & EOR wells) (Net “third tier” oil “third tier” & EOR wells)

where,

$$\text{NOOP} = \text{Total Unit “old oil” production}^1 \times (1 - \text{TTEF})$$

<sup>1</sup> production from all “old oil” wells

$$\text{NNOP} = \text{Total Unit “new oil” production}^2 \times (1 - \text{TTEF})$$

<sup>2</sup> production from all “new oil” wells

$$\text{NTOP} = \text{Total Unit “third tier oil” production}^3 + \text{TTEF} \times (\text{Total Unit “old oil”} + \text{Total Unit “new oil”})$$

<sup>3</sup> production from “third tier” oil wells

##### Net Unit Production is allocated to unit tracts:

Allocated “old oil” production (AOOP)

$$\text{AOOP} = \text{NOOP} \times \text{tract factor}$$

Allocated “new oil” production (ANOP)

$$\text{ANOP} = \text{NNOP} \times \text{tract factor}$$

Allocated “third tier oil” production (ATOP)

$$\text{ATOP} = \text{NTOP} \times \text{tract factor}$$

Total allocated oil production (TAOP)

$$\text{TAOP} = \text{AOOP} + \text{ANOP} + \text{ATOP}$$

### **CROWN ROYALTY CALCULATION**

#### **Old Oil**

if  $\text{AOOP} > 50$ ,

$$\text{Crown Royalty Volume} = 1 \times [ 9.43 + 0.45(\text{AOOP} - 50) ]$$

$(\text{m}^3)$

if  $\text{AOOP} \leq 50$ ,

$$\text{Crown Royalty Volume} = 1 \times \frac{(\text{AOOP})^2}{265}$$

$(\text{m}^3)$

#### **New Oil**

if  $(\text{ANOP} + \text{AOOP}) > 50$  and  $\text{AOOP} > 50$ ,

$$\begin{aligned} \text{Crown Royalty Volume} &= 0.55 [ 9.43 + 0.45 ((\text{ANOP} + \text{AOOP}) - 50) ] \\ &\quad - 0.55 [ 9.43 + 0.45 (\text{AOOP} - 50) ] \\ &= 0.2475 \text{ ANOP} \end{aligned}$$

$(\text{m}^3)$

if  $(\text{ANOP} + \text{AOOP}) > 50$  and  $\text{AOOP} \leq 50$ ,

$$\text{Crown Royalty Volume} = 0.55 [ 9.43 + 0.45 ((\text{ANOP} + \text{AOOP}) - 50) ] - 0.55 \left[ \frac{(\text{AOOP})^2}{265} \right]$$

if  $(ANOP + AOO) \leq 50$  and  $AOOP \leq 50$ ,

$$\begin{aligned} \text{Crown Royalty Volume} &= \left[ \frac{0.55 (ANOP + AOO)^2}{265} \right] - \left[ \frac{0.55 (AOOP)^2}{265} \right] \\ &= 0.55 \left[ \frac{(ANOP)^2 + 2 (ANOP) (AOOP)}{265} \right] \end{aligned}$$

### **Third Tier Oil**

if  $(ATOP + ANOP + AOO) > 50$  and  $ANOP + AOO > 50$ ,

$$\begin{aligned} \text{Crown Royalty Volume} &= 0.47 [ 9.43 + 0.45 ((ATOP + ANOP + AOO) - 50) ] \\ (\text{m}^3) &\quad - 0.47 [ 9.43 + 0.45 ((ANOP + AOO) - 50) ] \\ &= 0.2115 (ATOP) \end{aligned}$$

if  $(ATOP + ANOP + AOO) > 50$  and  $(ANOP + AOO) \leq 50$ ,

$$\begin{aligned} \text{Crown Royalty Volume} &= 0.47 [ 9.43 + 0.45 ((ATOP + ANOP + AOO) - 50) ] \\ (\text{m}^3) &\quad - 0.47 \left[ \frac{(ANOP + AOO)^2}{265} \right] \end{aligned}$$

if  $(ATOP + ANOP + AOO) \leq 50$  and  $(ANOP + AOO) \leq 50$ ,

$$\begin{aligned} \text{Crown Royalty Volume} &= \left[ \frac{0.47 (ATOP + ANOP + AOO)^2}{265} \right] - \left[ \frac{0.47 (ANOP + AOO)^2}{265} \right] \\ (\text{m}^3) & \\ &= 0.47 \left[ \frac{(ATOP)^2 + 2 (ATOP)(ANOP) + 2 (ATOP)(AOOP)}{265} \right] \end{aligned}$$

### **TOTAL CROWN ROYALTY:**

$$\text{Total Royalty Volume (TRV)} = [ (\text{Royalty Volume})_{\text{“old oil”}} + (\text{Royalty Volume})_{\text{“new oil”}} + (\text{Royalty Volume})_{\text{“third tier oil”}} ]$$

$$\text{Value (\$)} = (\text{TRV}) \times \text{Wellhead Price} \times \text{Crown Interest} \times \text{Working Factor}$$

## FREEHOLD PRODUCTION TAX CALCULATION

### Old Oil

if AOOP  $\leq$  20,

$$\text{Freehold Tax Volume (m}^3\text{)} = 0$$

if  $20 < \text{AOOP} < 65$ ,

$$\text{Freehold Tax Volume (m}^3\text{)} = [0.43 \times (\text{AOOP}) - 8.24] \left[ \frac{\text{AOOP}}{100} \right]$$

if AOOP  $\geq$  65,

$$\text{Freehold Tax Volume (m}^3\text{)} = \left[ \frac{42.76 - (1500)}{\text{AOOP}} \right] \left[ \frac{\text{AOOP}}{100} \right]$$

### New Oil

if  $(\text{ANOP} + \text{AOOP}) \geq 65$  and AOOP  $\geq$  65,

$$\begin{aligned} \text{Freehold Tax Volume (m}^3\text{)} &= \left[ 19.59 - \left( \frac{820}{\text{ANOP} + \text{AOOP}} \right) \right] \left[ \frac{\text{ANOP} + \text{AOOP}}{100} \right] \\ &\quad - \left[ 19.59 - \frac{820}{(\text{AOOP})} \right] \left[ \frac{\text{AOOP}}{100} \right] \\ &= 0.1959 (\text{ANOP}) \end{aligned}$$

if  $(\text{ANOP} + \text{AOOP}) \geq 65$  and  $36 < \text{AOOP} < 65$ ,

$$\begin{aligned} \text{Freehold Tax Volume (m}^3\text{)} &= \left[ 19.59 - \left( \frac{820}{\text{ANOP} + \text{AOOP}} \right) \right] \left[ \frac{\text{ANOP} + \text{AOOP}}{100} \right] \\ &\quad - [0.23 (\text{AOOP}) - 8.11] \left[ \frac{\text{AOOP}}{100} \right] \end{aligned}$$

if  $(ANOP + AOOP) \geq 65$  and  $AOOP \leq 36$ ,

$$\begin{aligned} \text{Freehold Tax Volume (m}^3\text{)} &= \left[ 19.59 - \left( \frac{820}{ANOP + AOOP} \right) \right] \left[ \frac{ANOP + AOOP}{100} \right] - 0 \\ &= 0.1959 (ANOP + AOOP) - 8.2 \end{aligned}$$

if  $36 < (ANOP + AOOP) < 65$  and  $36 < AOOP < 65$ ,

$$\begin{aligned} \text{Freehold Tax Volume (m}^3\text{)} &= \left[ 0.23 (ANOP + AOOP) - 8.11 \right] \left[ \frac{ANOP + AOOP}{100} \right] \\ &\quad - \left[ 0.23 (AOOP) - 8.11 \right] \left[ \frac{AOOP}{100} \right] \\ &= 0.23 \left[ \frac{(ANOP^2 + 2(AOOP)(ANOP))}{100} \right] - 0.0811 (ANOP) \end{aligned}$$

if  $36 < (ANOP + AOOP) < 65$  and  $AOOP \leq 36$ ,

$$\text{Freehold Tax Volume (m}^3\text{)} = \left[ 0.23 (ANOP + AOOP) - 8.11 \right] \left[ \frac{ANOP + AOOP}{100} \right] - 0$$

if  $(ANOP + AOOP) \leq 36$  and  $AOOP \leq 36$ ,

$$\text{Freehold Tax Volume (m}^3\text{)} = 0$$

### **Third Tier Oil**

if  $(ATOP + ANOP + AOOP) > 46$  and  $(ANOP + AOOP) > 46$ ,

$$\begin{aligned} \text{Freehold Tax Volume (m}^3\text{)} &= \left[ 11 - \left( \frac{465}{ATOP + ANOP + AOOP} \right) \right] \left[ \frac{ATOP + ANOP + AOOP}{100} \right] \\ &\quad - \left[ 11 - \left( \frac{465}{ANOP + AOOP} \right) \right] \left[ \frac{ANOP + AOOP}{100} \right] \\ &= 0.11 (ATOP) \end{aligned}$$



if  $(ATOP + ANOP + AOOP) > 46$  and  $(ANOP + AOOP) \leq 46$ ,

$$\begin{aligned} \text{Freehold Tax Volume} &= \left[ 11 - \left( \frac{465}{(ATOP + ANOP + AOOP)} \right) \right] \left[ \frac{ATOP + ANOP + AOOP}{100} \right] - 0 \\ (\text{m}^3) & \\ &= [0.11 (ATOP + ANOP + AOOP)] - 4.65 \end{aligned}$$

if  $(ATOP + ANOP + AOOP) \leq 46$  and  $(ANOP + AOOP) \leq 46$ ,

$$\begin{aligned} \text{Freehold Tax Volume} &= 0 \\ (\text{m}^3) & \end{aligned}$$

### **TOTAL FREEHOLD PRODUCTION TAX:**

Total Freehold Tax Volume (TFTV)  
( $\text{m}^3$ )

$$= [ (\text{Freehold Tax Volume})_{\text{“old oil”}} + (\text{Freehold Tax Volume})_{\text{“new oil”}} + (\text{Freehold Tax Volume})_{\text{“third tier oil”}} ]$$

$$\begin{aligned} \text{Total Tax Payable} &= (\text{TFTV}) \times \text{Wellhead Price} \times \text{Freehold Interest} \times \text{Working Factor} \\ (\$) & \end{aligned}$$

#### Note:

- AOOP, ANOP and ATOP are rounded to the nearest 0.1 decimal place
- TRV and TFTV are rounded to the nearest 0.01 decimal place
- The determination of Project Production in Appendix 1 is not limited to unit production. For the purposes of Appendix 2, Unit Production = Project Production