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CANADA'S PETROLEUM INFORMATION NETWORK

TIP

Petrinex OFT Processes for Oil Marketing Users

Jurisdiction	Release/Revision Date	Location of Change in this Document	Comment
AB	October 5/22		Convert from Bulletin 010 to TIP

Audience: All Alberta Petrinex Marketing Users

Purpose: To provide Alberta industry marketing staff with an overview of the forecasting processes and the tools available in Petrinex. For more information on how to use the forecast tools in Petrinex please review the Tip titled "Petrinex Oil Forecast Tool Overview".

Background: The government of Alberta has a take-in-kind (TIK) royalty regime, for conventional oil, that requires producers to calculate and deliver the Crown's oil royalty volume share into the various pipelines and sales facilities on a monthly basis. Royalties are based on production versus sales as in the case for gas.

However, royalties are not a fixed percentage of production. Unlike the working interest ownership, the Crown's percentage of production can change every month based on a number of factors. In one month the Crown can be as low as 0 - 5%; the next month it might be as high as 25-35%. And when the Crown share of gross production changes, even if the WIO percentage remains unchanged, the volume available to other owners will change.

Form A Delivery Facility operators often use the last month's average Crown royalty rate to forecast the current forecast month but that can be problematic, particularly during times of high price volatility. See **Attachment 3** for examples of how forecasting the Crown volume at different levels including a Form A battery, a producing battery or at the well level can have a significant impact on Crown royalty volume estimates.

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Key Principles:

A number of inputs are required to calculate the Crown's oil royalty share including:

a. Individual well production volume,
b. Current month PAR price,
c. Royalty attributes (including mineral ownership, benefit program status etc.) , and
d. Appropriate royalty formula (ARF, MRF etc.)

Petrinex is the source of volumetric data including the well production volume (item a). The Department of Energy (DOE) provides to Petrinex the current month PAR price (item b) and the royalty attributes and appropriate royalty formula at the well level.

Reporting associated conventional oil is complex and involves a 3-stage, multi-month process. Since this process extends over several months for each production month, in any given calendar month operators steward the activities related to several individual production months. This multi-month dynamic is illustrated in the diagrams provided in **Attachment 2**.

1. Forecast Processes
   - Producers must forecast/estimate the **gross** (total) volume of oil that will be produced and delivered to the pipeline during the production month.
   - Producers must estimate the **net** share of production that will be delivered into each shipper's account (including the Crown's shippers' accounts); and identify the purchasers of the oil delivered into each shippers' account. Note: The Petrinex Oil Forecast Tool is available to operators to help identify the Crown's share of forecast gross production.
   - The above information is provided to the operators of facilities downstream of the production source (BT, TM, PL etc.) and to the affected owners, shippers and purchasers. The Crude Oil Logistics Committee (COLC) manages the processes associated with oil forecasting and logistics. The COLC's Form A, Form B and Form C are used to communicate forecasts to affected parties. See **Attachment 1** for more information on the COLC forms and other-forecast related processes.
   - This forecast process starts before the month of production, but forecasts can be revised throughout the production/delivery month.
   - Petrinex provides a set of functions called the Oil Forecast Tool (OFT) that can be used by operators to help calculate the forecasted Alberta Crown royalty volumes. See Petrinex Tip titled "Petrinex Oil Forecast Tool Overview" for more information on using the OFT.

2. Production/Delivery Processes
   Operators produce and deliver production into downstream facilities throughout the production month. For operational and marketing reasons the volume and destination of a well's production may differ from the original forecast, and this must be communicated to affected parties. In some cases, oil is produced and stored (i.e. not delivered to market during the production month). Note: The Crown's oil royalty share, however is deemed to be the first volume delivered and does not go into storage except for rare circumstances.

3. Accounting/Settlement Processes
   In the month following the month of production, affected parties perform accounting/settlement processes which include but not limited to:
   1. Gross volumetric reporting to the AER/DOE via Petrinex,
   2. Pipeline split reporting including the identification of owners, shippers and purchasers (including the Crown royalty share) via Petrinex,
   3. Definitive calculation of Crown royalty share (by the DOE),
   4. Reconciliation of volumes and accounts, and
   5. Settlement

Summary and Conclusions:

- While forecasts are only forecasts and can never be 100% accurate, accurately forecasting the Crown's conventional oil royalty share of production is the responsibility of the operator. Inaccurate forecasting can have negative financial consequences for the operator.

- The process of forecasting the Crown's royalty share is complex. It requires accurate forecasting of gross production and accurate calculation of royalties using correct formulae and the best available royalty calculation inputs.

The Petrinex Oil Forecast Tool was developed to assist in calculating forecasted Crown take-in-kind royalties.

- With the accurate forecast of gross volumes at the well level and current royalty attributes the OFT consistently calculates accurate royalty share outputs.

- Operators in some cases cannot forecast at the detailed well level. Petrinex is designed to permit entry of higher-level forecast levels (production battery level and Facility View List level), however this functionality requires the OFT to "make assumptions" (prorate). This prorating can lead to erroneous

outputs. Ultimately, the tool and all of its functionality and limitations have to be understood and effectively managed by the operator.

- Field data capture system data can be imported to Petrinex and may generate more accurate forecasts.

The Petrinex Business Desk and Petrinex Industry Team are available to help operators fully lever the capabilities of the Petrinex Oil Forecast Tool.

More information:

Petrinex Business Desk
Phone: 297-6111 (Toll Free 1-800-992-1144)
E-mail: Petrinexsupport@petrinex.ca

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Attachment 1: Crude Oil Logistics Committee Role and Other Forecast-Related Processes

Processes associated with oil forecasting and logistics are managed under rules established by the Crude Oil Logistics Committee (COLC). The COLC is a decision-making body that consists of producers, shippers, pipelines, terminals, industry associations, government regulators and departments. For more information visit https://colcomm.com/.

- The COLC publishes a monthly calendar outlining the deadlines by which various activities must be performed.
- The COLC prescribes various forms (Form A, Form B, Form C etc.) to be used by the parties.
- While the COLC monitors participant adherence to COLC rules, it has no formal authority to enforce those rules.
- The COLC is made up of representatives of producer and facility operator companies. The APMC is a non-voting member of the COLC.

Petrinex incorporates COLC deadlines into monthly Petrinex reporting calendars; and publishes the COLC's online training modules.

COLC Forms include the following:

Form A (Producer) to Downstream Facility Operator

- Submitted by the production facility operator to another facility operator to which their production is being delivered for the upcoming production month.
- The forecast indicates the volume and the shipper(s)/purchaser(s) who will be marketing the oil/condensate. Some facilities require the ownership of the product to be reflected. The Form A could be sent to a pipeline, truck terminal, cleaning plant, rail transloader or another operator's battery/plant. The Form A can be revised throughout the forecast and production months.

Form A (Delivery Facility Operator) to Pipeline/Terminal Operator

- This is the final facility that delivers to the pipeline/terminal. The volumes on this Form A can include production at the facility along with receipts from multiple other facilities.

Form B (Producer) to Shipper/Purchaser

- Communicates the revised volume forecasted to the impacted shipper/purchaser.

- Whenever a Form A is revised, Form B's must be issued separately to each shipper listed on the revised Form A, indicating their revised volume.
- Notifies each shipper/purchaser listed on the Form A revision that a change in the operator's forecasted volume will affect a supply revision on their pipeline/terminal nomination.

Form C (Final Receiving Facility Operator to Shippers)

- Form Cs are issued only once a month – after the original Form As are received. The receiving facility (PL, TM, CT etc.) operator consolidates all forecasted volumes by shipper and receipt points to generate a document called Form C.
- The Form C identifies the forecasted shipper/purchaser's supply volume that is available to transact in the production month.
- The Form C is sent to each shipper and provides each shipper with a summary by producing location, of volume they must nominate into the pipeline/terminal's system.

Other Forecast-Related Processes include the following:

Apportionment

- The PL/TM process to allocate available capacity on a pipeline to all eligible shippers when the total volume of all the shippers nominated on Form As are greater than the pipeline capacity. This impacts the Form C calculations.

Notice of Shipment (NOS) Nomination

- The NOS is a document sent by shippers to a pipeline or facility summarizing intended receipts, purchases and sales and transfers in and out of that specific pipeline or facility.
- The purpose of the NOS is to identify to the receiving facility (TM/PL etc.) operator:
    - The shipper's intended use for their production volume outlined on their Form C.
    - The shipper's purchase and sale transactions.
    - Facility transfers as they relate to other shippers on the pipeline.
- The receipts and dispositions on the notice must be balanced to zero.
- NOS revisions are required any time a forecast in revised (Form A/B) and when there is an additional transaction to rebalance the position.

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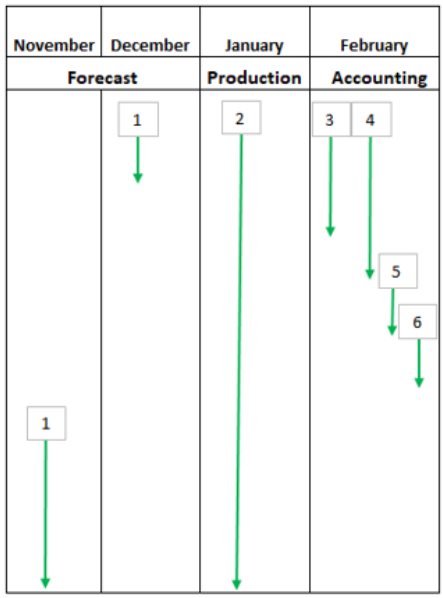
Attachment 2: Multi-Month Reporting Timeline Examples

Producing Operators Reporting Timeline – January Production

Date	Event
4	Form A - COLC Forecast
13	Plsplit - TAOC Cr Roy Delivered Volume
20	Volumetric Deadline Gross volumes
23	DOE Calculated Cr Royalty
25	DOE/Industry Reconcilation Settlement date
27	Industry start Cr Roy Calc - forecast Prior Month's Volmetric data PARR Price Royalty Program Information
31	Month end



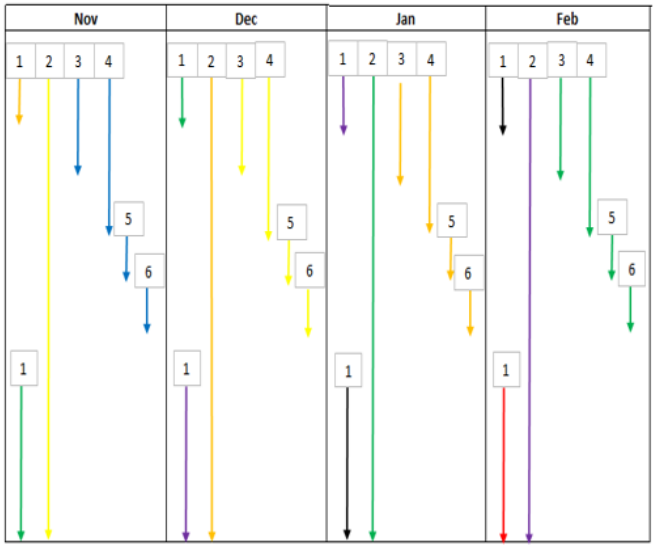
Legend - Production month
January →

Legend - Activities
1. Calc Forecast
2. Delivery/Production, Forecast Adj
3. Calc Actual PLSplits and TAOC volumes
4 Volumetric deadline
5. MRS DOE Oil Royalty Calculation
6. Reconcilation & Settlement

"Forecast month" – the month prior to production (processes actually start at end of previous month)
"Production month" – the month of physical delivery
"Accounting/Settlement month" – the month after production

Producing Operators reporting Timeline – Multiple Months

Date	Event
4	Form A - COLC Forecast
13	PlsplIt - TAOC Cr Roy Delivered Volume
20	Volumetric Deadline Gross volumes
23	DOE Calculated Cr Royalty
25	DOE/Industry Reconcilation Settlement date
27	Industry start Cr Roy Calc - forecast October Volmetric data PARR Price Royalty Program Information
31	Month end



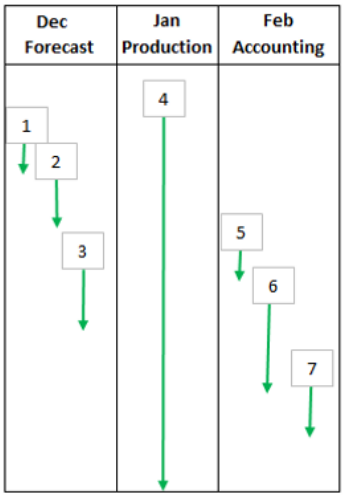
Legend - Production Month
April
March
Febuary
January
December
November
October

Legend - Activities
1. Calc Forecast
2. Delivery/Produciton, Forecast Adj
3. Calc Actual PLSplits and TAOC volumes
4 Volumetric deadline
5. MRS DOE Oil Royalty Calculation
6. Reconcilation & Settlement

In each Calendar month there are processes related to forecasting, production and accounting for various months.

PL/TM Operators Reporting Timeline – January Production

Date	Event
4	Form A - COLC Forecast Rec'd
10	Form C created b PL/TM & sent to Shippers
13	Pipeline Splits data rec'd
16	NOS to PL/TM from Shippers
17	Shippers Balance from PL/TM to Shippers
25	Settlement date
31	Month end

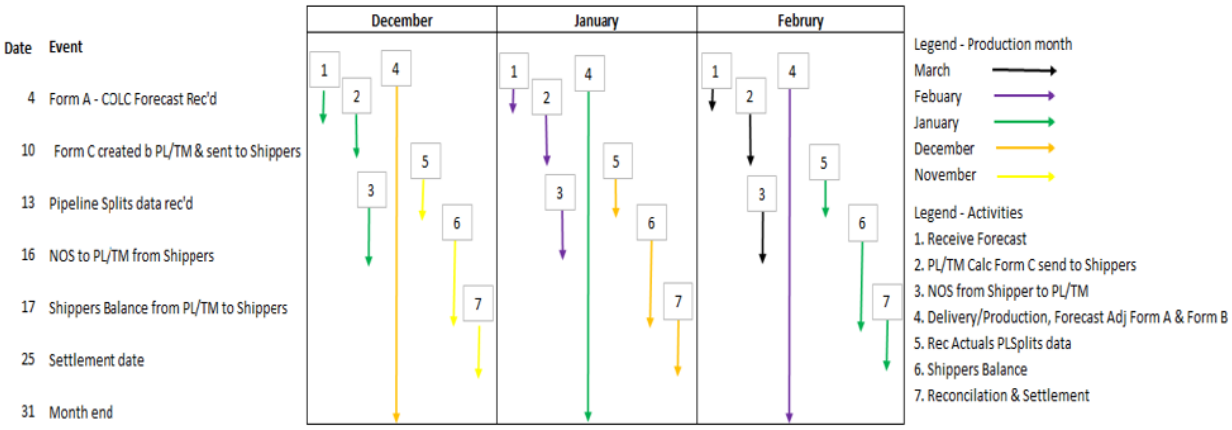


Legend - Production month
January

Legend - Activities
1. Receive Forecast
2. PL/TM Calc Form C send to Shippers
3. NOS from Shipper to PL/TM
4. Delivery/Production, Forecast Adj Form A & Form B
5. Rec Actuals PLSplits data
6. Shippers Balance
7. Reconcilation & Settlement

"Forecast month" – the month prior to production (processes actually start at end of previous month)
"Production month" – the month of physical delivery
"Accounting/Settlement month" – the month after production

PL/TM Operators Reporting Timeline – Multiple Months



In each Calendar month there are processes related to forecasting, production and accounting for various months.

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Attachment 3: Example of the impact of reporting forecasts at the available various levels

The Crown royalty take-in-kind volume is calculated by the APMC/DOE based on the each individual well's production volume. All wells are associated with a producing battery and many industry companies provide their forecasts at the Form A delivery facility (Facility View List/group) level. The OFT allows for three levels of forecasting.

The following is an example demonstrating impact of different approaches to using the Oil Forecast Tool:

Scenario:
Total production has increased from 780 m3 to 1000 m3 from the previous "actual" period that was used to generate the "starting forecast" in the OFT for the current forecast period.
Did this significant increase (220 m3) come from one well or an overall improvement in field productivity?

1. If the change is input by the forecaster at the Form A Delivering Facility (Facility View list) level, the OFT will prorate that change in volume across all wells and producing batteries associated with that Form A battery (Facility View list).
2. If the change is input at only one Producing Battery that delivers to the Form A battery, the OFT will prorate that change in volume across the all wells producing to just that battery.
3. If the change is input at the Well Level, the OFT does not need to "make assumptions".

Results:
The forecast Crown share of production changes significantly based on the information provided to the OFT. The following are the results as calculated by the OFT using the three different approaches:

1. Form A Delivering Facility: 1,000.0 Gross Calculated Crown = 92.4 m3 (9.24%)
2. Producing Battery Level: 1,000.0 Gross Calculated Crown = 114.5 m3 (11.45%)
3. Well Level: 1,000.0 Gross Calculated Crown = 130.5 m3 (13.05%)

In addition to the Crown's royalty volume share, all other owners and shippers will be impacted based on the forecasting approach taken:

Scenario and Shipper/Owner shares		1.	2.	3
Crown	Shipper APMC	92.4	114.5	130.5
WIO A 50.0%	Shipper D	453.8	442.7	434.8
WIO B 25.0%	Shipper D	226.9	221.4	217.3
WIO C 25.0%	Shipper E	226.9	221.4	217.3
Total Production		1000.0	1000.0	1000.0

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