

Directive 042: Measurement, Accounting, and Reporting Plan (MARP) Requirement for Thermal Bitumen Schemes

September 6, 2006

Effective June 17, 2013, the Energy Resources Conservation Board (ERCB) has been succeeded by the Alberta Energy Regulator (AER).

As part of this succession, the title pages of all existing ERCB directives now carry the new AER logo. However, no other changes have been made to the directives, and they continue to have references to the ERCB. As new editions of the directives are issued, these references will be changed.

Some phone numbers in the directives may no longer be valid. Contact AER Inquiries at 1-855-297-8311 or inquiries@er.ca.



Measurement, Accounting, and Reporting Plan (MARP) Requirement for Thermal Bitumen Schemes

September 6, 2006

Effective January 1, 2008, the Alberta Energy and Utilities Board (EUB) has been realigned into two separate regulatory bodies, the Energy Resources Conservation Board (ERCBC), which regulates the energy industry, and the Alberta Utilities Commission (AUC), which regulates the utilities industry.

As part of this realignment, the title pages of all existing EUB directives now carry the new ERCBC logo. However, no other changes have been made to the directives, and they continue to have references to "EUB." As new editions of the directives are issued, these references will be changed.

ENERGY RESOURCES CONSERVATION BOARD

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Directive 042

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Measurement, Accounting, and Reporting Plan (MARP) Requirement for Thermal Bitumen Schemes

The Alberta Energy and Utilities Board (EUB/Board) has approved this directive on September 5, 2006.

[Original signed by]

M. N. McCrank, Q.C., P.Eng.
Chairman

The Alberta Energy and Utilities Board (EUB) has modified the submission requirements for thermal bitumen schemes as required under the *Oil Sands Conservation Act (OSCA)*. From this time forward, and in addition to the current EUB application requirements, a measurement, accounting, and reporting plan (MARP) must be submitted for these types of schemes (see attached figure). This directive explains what the MARP must contain. While a conceptual measurement plan is required as part of the scheme application, a MARP must be submitted and approved by the EUB Production Operations Section prior to *Directive 056* licensing application submission of the associated surface facilities.

If the licensee of an existing thermal bitumen scheme does not have an approved MARP and an OSCA scheme expansion approval has been obtained, the licensee is required to submit a MARP for approval including the entire scheme prior to *Directive 056* licensing application of surface facilities. If the thermal bitumen scheme with an approved MARP is to be changed to include new or additional wells and surface facilities within an existing scheme, a new MARP submission will not be required when the licensee incorporates the same production, operating, measurement, and accounting processes approved under the original MARP.

For existing schemes without an approved MARP, the EUB's Production Operations Section has initiated a process whereby each existing scheme will be audited. Priority will be given to recently approved schemes where production has not commenced.

This change has been made to clarify existing EUB requirements and improve compliance. It is also expected to better allow the EUB to work collaboratively with applicants and licensees to identify potential problems and develop appropriate solutions during the development phase of a scheme and throughout the scheme's life.

MARP Submission

Licensees are now required to submit the following information regarding EUB measurement, accounting, and reporting that includes water balancing. For some items, a statement that the licensee will meet the requirements of related EUB documents may be sufficient.

1 General Scheme Information

- 1) Full company name

- 2) Scheme name and number
- 3) Application number
- 4) Company contact(s)
- 5) General scheme/process description and location

2 Process and Measurement Diagram

A simplified process flow or block and accounting measurement diagram(s) for the proposed scheme showing the following information:

- 1) all surface facilities associated with the scheme, including process equipment for bitumen treating and upgrading, proration testing, water treatment, steam generation, cogeneration, waste handling, and disposal;
- 2) all wells associated with the scheme, indicating how each well will tie into the surface facilities; include and identify crude bitumen wells, steam/solvent/noncondensable gases/water injection and disposal wells, and water source wells;
- 3) all applicable receipt points, whether by truck or pipeline; indicate what fluids will be received (e.g., diluent), the source of the fluids if known (e.g., reporting facility code);
- 4) all applicable disposition points, whether by truck or pipeline; indicate what fluids will be disposed (e.g., dilbit) and the destination of the fluids (e.g., reporting facility code);
- 5) all applicable flow lines, fuel lines, flare lines, recycle lines, skim lines, gas-lift lines, solvent injection lines, and utility lines;
- 6) all applicable bitumen, emulsion, condensate/diluent and water tanks/storage ponds/vessels, with the dimensions and capacity of each; and
- 7) all applicable measurement devices (e.g., meters, gauges, product analyzers), measurement points, and sample points:
 - label and indicate the type of measurement device(s),
 - provide documentation showing maximum uncertainty of measurement devices when requested by the EUB after the initial MARP submission,
 - if electronic flow measurement (EFM) is used, indicate where measurement devices are configured with EFM; and
- 8) boundaries of applicable production facilities, such as batteries and injection facilities, that report to the Petroleum Registry of Alberta (Registry), with the appropriate Registry subtype codes.

3 Description of Proposed Operating Procedures

- 1) **Calibration and Proving** – For each measurement device used for accounting and EUB reporting purposes, outline the frequency and method of calibration, checking, or proving.
- 2) **Gauging** – Outline the method of gauging tanks/storage ponds/vessels and the frequency of calibrating applicable gauging devices.
- 3) **Trucking** – Outline the method(s) of measuring, sampling, and recording production moved by truck to or from the facilities associated with the scheme.

- 4) **Sediments and Water (S&W) Procedures** – Outline the frequency and method of determining the water cut of proration test production.
 - 5) **Valid Test Criteria** – Provide the criteria for accepting or rejecting proration tests.
 - 6) **Load Fluid Recovery** – Outline the method used to determine well production rates during load fluid recovery.
 - 7) **Common Flow Lines** – Outline the proration test procedure and purge time for wells on common flow lines.
 - 8) **Field Headers** – Outline the proration test procedure and purge time for wells producing to field headers. Provide test line capacity and test and group operating line pressures.
 - 9) **Casing Head Gas** – List wells using casing head gas and/or produced gas for lease fuel.
 - 10) **Gas Lift** – List the wells using gas lift.
- 4 Accounting Calculations and Reporting
- 1) **Estimated Production Worksheet** – For proration batteries that make up the thermal bitumen schemes, provide a sample worksheet for determining the estimated bitumen, gas, and water production for each well.
 - 2) **Accounting Formulas** – For each production facility reporting to the Registry, provide the calculations and cite the applicable measurement points used to determine the following:
 - bitumen production, disposition(s), and inventories
 - gas production, disposition(s), and receipts
 - water production, disposition(s), receipts, and inventories
 - water source production, disposition, receipts, and inventories; include copies of the most recent water analysis for fresh and brackish water wells and sources
 - condensate, solvent, and noncondensable gases receipts, injection, disposition, and inventories
 - total lease fuel, flare, and vented gas
 - 3) **Outline the methods used to**
 - calculate/estimate the volume of water vapour in the metered gas streams and procedures used to adjust metered gas volumes for gas streams operating at a temperature greater than 100 degrees Celsius (corrected to 101.325 kilopascals absolute)
 - determine shrinkage when blending hydrocarbon liquids with densities differing more than 40.0 kilograms per cubic metre
 - determine shrinkage when condensate (diluent) is flashed through bitumen treating and other process equipment
 - estimate unmetered flare, fuel, vented, and other gas streams; include sample calculations showing all particulars
 - estimate gas in solution with oil dumped to stock tanks and with oil at proration test conditions
 - determine production of injected solvent and noncondensable gases distinct from bitumen and solution gas production

- 4) **Other** – Describe any other estimate, correction, or adjustment procedures used to calculate volumes.

Bitumen Scheme Approval Process

