

March 21, 2005

Via Courier and E-Mail

Alberta Energy and Utilities Board
640 -5th Avenue S.W.
Calgary, AB T2P 3G4

Paramount Energy Trust
500, 630 – 4th Avenue SW
Calgary, AB T2P 0J9

Attention: Gary D. Perkins

Attention: Susan L. Riddell Rose

Dear Mr. Perkins and Ms. Rose,

**ALBERTA ENERGY AND UTILITIES BOARD (EUB/BOARD)
BITUMEN CONSERVATION REQUIREMENTS
PHASE 3 FINAL PROCEEDING**

Pursuant to the Board's March 2, 2005 letter to interested parties, and pursuant to section 27 of the EUB's Rules of Practice, please find enclosed the Staff Submission Group's information requests for Paramount Energy Operating Corporation with respect to the Phase 3 Final proceeding.

Yours truly,

Original Signed by JP Mousseau

JP Mousseau
Counsel to
Staff Submission Group

Encl.

Copy: Interested Parties (Via E-Mail)

March 21, 2005
Phase 3, Bitumen Conservation Hearing
Application No. 1340975

Staff Submission Group Information Requests for Paramount Energy Operating Corp. (PEOC)

SSG-PEOC-01

Reference: PEOC February 14, 2005 Submission, Volume 3, page 27, Section 5.2

Request: Please provide the set of probability distributions of the multivariate parameters considered to be characteristic of each facies as described in Section 5.2.

SSG-PEOC-02

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 5

Request: Please provide the facies profiles for each of the wells for which core logging plots are included in Appendix 5.

SSG-PEOC-03

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 8, Page 11, Section 3.2

Preamble: In Section 3.2 PEOC states

“The Lower McMurray sequence is divided into a 0.5 m depth interval in the Z direction. In this sequence, the gridding in z direction was done parallel to the Paleozoic formation. In the A1 sequence, 3 layers with proportional thickness were built.”

Request:

- (a) Please clarify whether the grid co-ordinates are stratigraphic or Cartesian.
- (b) Are the model layers in the Lower McMurray parallel to the top of the Paleozoic or are the model layers horizontal in true spatial co-ordinates?
 - (i) If the latter, do the grid layers truncate against the top of Paleozoic?
- (c) Do the grid layers truncate against the top of the Lower McMurray?

- (d) Given that the A1 sequence was built with proportional thicknesses, does this mean that the absolute grid block thicknesses change with position within the A1 unit in the model?
 - (e) Do the grid layers in the A1 sequence truncate against the top of the grid or do they parallel the top of the grid?
 - (f) Please provide a schematic diagram showing the co-ordinate system.
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SSG-PEOC-04

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 8, Page 13, Section 4.1

Preamble: In Section 4.1 PEOC states

“Lithological facies were given to ECL Canada and Schlumberger SIS™ by PEOC and/or its independent contractor as one of the properties in the log data. The assignment of the facies at each logging interval was possible using discriminant analysis.”

Request: Please provide the error analysis results associated with the discriminant analysis (e.g., apparent error rate, cross-validation results).

SSG-PEOC-05

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 8, page 17, Section 4.1, Figure 11

Preamble: In Figure 11 the vertical facies proportion by layer indicate that in all of the original wells there are two zones where interbedded mudstone in the Lower McMurray always occurs, as evident by the green zones that extend right across the top part of the figure.

- Request:**
- (a) Please confirm that this is a correct interpretation of Figure 11?
 - (b) Please provide the original logs with the uppermost 20 geostatistical grid layers in the A1 sequence and Lower McMurray marked on them.
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SSG-PEOC-06

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 8, page 18, Section 4.2

Preamble: In Section 4.2 PEOC states

“Horizontal variograms are omni-directional for all the facies, except for Sand. Sand has an anisotropy angle of 0° (N-S orientation), which reflects the sand channel orientation in the region.”

- Request:**
- (a) Please provide all the experimental horizontal variograms.
 - (b) What kind of order-relation corrections were required to ensure internal consistency of the assumed horizontal, categorical indicator variogram models?
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SSG-PEOC-07

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 8, pages 19-22, Section 4.2, Figures 12-22

Preamble: It is difficult to interpret Figures 12 to 22. The following clarifications are required

- Request:**
- (a) What are the units on the axes of each graph?
 - (b) What are the black curves?
 - (c) What are the blue curves?
 - (d) Does the same vertical axis scaling apply to both the blue and the black curves?
 - (e) What are the blue squares?
 - (f) What are the black squares?
 - (g) Are these indicator variograms?
 - (i) If these are not indicator variograms, what kind of variograms are they?
 - (h) Are all of these variograms standardized (i.e., rescaled by the theoretical value of the sill)?
 - (i) If so, please provide the theoretical sill values used to standardize each variogram?

SSG-PEOC-08

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 8, page 22, Section 4.3

Preamble: In Section 4.3 PEOC states

“A simple kriging type was applied in simulation parameter setting.”

Request:

- (a) Please clarify whether the chosen kriging method was 2D by grid layer, or truly 3D within each unit?
- (b) Please provide the kriging and search parameters used in the implementation of sequential indicator simulation and sequential Gaussian co-simulation.

SSG-PEOC-09

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 8, page 22, Section 4.3

Preamble: In Section 4.3 PEOC states

“Five realizations of facies were generated, of which only one facies realization was chosen for further petrophysical properties modeling.”

“In this study, since the realizations had similar input data, the midpoint realization was chosen by visual inspection by Paramount and Schlumberger staff.”

Request: Please provide the specific visual inspection criteria used by PEOC and Schlumberger staff to choose the selected realization.

SSG-PEOC-10

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 8, Page 42, Section 5.1.4

Preamble: In Section 5.1.4 PEOC states

“PHIE was simulated simultaneously for all facies in the model, but was simulated separately for the two sub-sequences of the McMurray.”

Request: Provide the steps used to simultaneously simulate PHIE for all facies in model.

SSG-PEOC-11

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 8, Pages 51 and 56, Sections 5.2.1 and 5.2.3

Preamble: In Section 5.2.1 PEOC states

“A crossplot of V_{sh} versus PHIE shows good correlation between the two parameters (Figure 73). Therefore, this correlation between V_{sh} and PHIE will be used in V_{sh} simulation.”

In Section 5.2.3 PEOC states

“Sequential Gaussian Simulation was used for V_{sh} simulation. V_{sh} was also cokriged with PHIE. Correlation coefficients between V_{sh} and PHIE from Table 23 were used for each facies.”

- Request:**
- (a) With respect to the cokriging/cosimulation method used, please clarify whether a collocated (i.e., Markov) cosimulation with PHIE was used to estimate V_{sh} or a full linear model of coregionalization was used to estimate V_{sh} ?
 - (b) Please clarify whether only the known values of PHIE were incorporated in the co-simulation or did the software also use the simulated values of PHIE to co-simulate values of V_{sh} ?

SSG-PEOC-12

Reference: PEOC February 14, 2005 Submission, Volume 3, Appendix 8, page 89, Section 6.3

Preamble: In Section 6.3 PEOC states

“Facies properties were upscaled using the “Most Of” method, which takes the facies found most frequently in the original 3D finer grid into the coarser flow simulation grid. All other reservoir properties, except the vertical permeability, were upscaled using arithmetic averaging of properties from the original geological grid into the flow simulation grid.”

- Request:**
- (a) Please clarify whether the facies and petrophysical properties were upscaled independently.
 - (b) Was there any block-by-block internal consistency check conducted to ensure that facies were assigned reasonable petrophysical properties after upscaling?

- (i) If yes, please explain how this consistency check was done.
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SSG-PEOC-13

Reference: PEOC February 14, 2005 Submission, Volumes 1-4

Request: Please provide the datasets, in electronic format, that were directly input into the STARS simulator for the following model runs.

- (a) The four generic model runs discussed in Volumes 1 to 4 of PEOC's February 14, 2005 submission:
 - (i) run 3.1A-1900
 - (ii) run 3.1B-600
 - (iii) run 3.1C-Wat-1900
 - (iv) run 3.1D-Wat-600

 - (b) The six model runs for the 03-34 well discussed in Volume 3 of PEOC's February 14, 2005 submission:
 - (i) Geostatistical model case-200 kPa
 - (ii) Geostatistical model case-600 kPa
 - (iii) Geostatistical model case-1200 kPa
 - (iv) Good sand fill case-200 kPa
 - (v) Good sand fill case-600 kPa
 - (vi) Good sand fill case-1200 kPa

 - (c) The single model run for the 12-28 well discussed in Volume 4 of PEOC's February 14, 2005 submission.
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SSG-PEOC-14

Reference: PEOC February 23, 2004 Submission, Page 12, Table 1

Request: Please provide the datasets, in electronic format, that were directly input into the Exotherm simulator for model runs 7 and 8 discussed in PEOC's February 23, 2004 submission.

SSG-PEOC-15

Reference: PEOC February 14, 2005 Submission, Epic Consulting Services Ltd. Report, dated February 2005, pages B10 to B12.

Request: Please provide the Fekete Associates pressure transient-test study referred to on pages B10 to B12 including a list of the wells used in the study and the pressure analyses conducted.

SSG-PEOC-16

Reference: PEOC February 14, 2005 Submission, Epic Consulting Services Ltd. report, dated February 2005, pages 65-71

Preamble: A brief qualitative description and schematic diagram is given for a dual-tank model on pages 65 to 71

Request:

- (a) Please provide a detailed description of the dual-tank model and the methodology used to history match the non-linear P/Z curves for Epic's Hardy gas pools.
 - (i) To illustrate, please provide an example of the model input parameters and the process followed to obtain a P/Z curve match for one of the water-influx pools and one of the gas-influx pools described in Appendix C.

SSG-PEOC-17

Reference: PEOC February 14, 2005 Submission, Epic Consulting Services Ltd. report, dated February 2005, page B20, Table 3

Preamble: The wellhead pressure tests summarized on Table 3 are not available on the EUB's public database

Request:

- (a) Please submit these tests to the EUB so that they are available on the public database to the SSG and other hearing participants.
- (b) Please submit to the EUB any additional pressure tests that Paramount intends to rely on at the final hearing that have not been previously filed.
- (c) Please provide a list of the tests that have been submitted as per (a) and (b) above.
