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SSG RESPONSES TO BOARD INFORMATION REQUEST

BR-SSG-1

Preamble: On page 4 of its submission, regarding the process the SSG used to determine where depletion may have occurred prior to gas production from a pool, the SSG states that the first step of the process was to determine the expected virgin pressure for an area.

Request:

- a) Explain how this was done.
- b) In the second step, the SSG states that wells with a depleted pressure were identified where the pressure was about 100 kPa less than the expected virgin pressure. What is the basis for this criterion?

Response: The SSG identified wells within each RGS-defined pool that had pressures taken prior to pool production. These pressures represent the virgin pressure in the pool. The average virgin pressure for all wells in an area (typically a township) was estimated. The 100 kPa criterion was considered to be greater than the random variation in pressures due to errors inherent in the testing procedures, and is likely to be an indication that drainage has occurred.

BR-SSG-2

Request: a) With respect to section 4.6 of the submission, Hangingstone McMurray DDD, McMurray ZZ and McMurray RRR Pools, clarify why the McMurray ZZ Pool was included in the title of this section since the SSG did not comment on this pool in the text of the section.

b) Should the McMurray ZZ Pool be allowed to continue to produce?

Response: The McMurray ZZ Pool should not have been included in the title of Section 4.6. The SSG interprets the McMurray ZZ Pool to be a single-well pool (A2 sequence) at the 2-17-82-9W4 well. The SSG recommendation for the McMurray ZZ Pool remains unchanged (i.e., produce).

BR-SSG-3

Preamble: With respect to section 4.7 of the submission, Hangingstone McMurray Y Pool, the EUB does not have any record of perforations or deliverability data for the McMurray Channel zone (454.0-455.0 m) in the 7-15 well.

Request: What is the basis on which the SSG has assigned proven gas pay to this interval?

Response: The SSG approach to assigning gas pay is consistent with that used in the RGS which identified gas pay independent of the interval being completed or production test data. At the 7-15-82-9W4 well, the SSG interprets gas pay over the log interval based on neutron-density log approach. At this well, the neutron and density logs are generally separated by 4 to 6 porosity units in sandy intervals such as from 455.0 to 457.0 m and from 477.5 to 500.0 m. However, the interval identified as gas pay (454.0 to 455.0 m) has a neutron-density separation of only 2 porosity units.

The SSG notes that gas pay has been proven in the following wells with similar log response.

11-12-076-13W4 well

- Perforated interval: 530.0 to 532.0 m
- On production March 2000
- $5.97 \times 10^6 \text{m}^3$ cumulative production

8-14-077-11W4 well

- Perforated interval: 452.5 to 454.0 m
- Produced from June 1995 to November 2003
- $4.5 \times 10^6 \text{m}^3$ cumulative production

9-26-077-11W4 well

- Perforated interval: 460.0 to 461.0 m
- Produced from March 1996 to October 1999
- $2.6 \times 10^6 \text{m}^3$ cumulative production

BR-SSG-4

Preamble: With respect to section 4.9 of the submission, Leismer McMurray I4I and McMurray J4J Pools, the SSG indicates the base of gas for the B1 Channel in the 9-18-79-7W4 well is at 315.2 m. There appears to be some cross-over on the density-neutron logs at about 319 m.

Request: Does the SSG agree there may be gas at that depth?

Response: The SSG agrees that there is some crossover of the neutron-density logs of 1 to 2 porosity units between 318.0 and 320.0 m, but interprets this interval to be bitumen-bearing. At this well, the neutron and density logs track very closely and occasionally cross-over in cleaner sand intervals (i.e., 304.5 to 306.5 m and 328.0 to 329.0 m). However, in similarly clean sand from about 301.0 to 303.0 m, the neutron and density logs cross-over by as much as 36 porosity units. This significant amount of cross-over is interpreted to be gas. In shalier sands such as from 299.0 to 300.0 m and from 314.5 to 315.5 m, the cross-over is about 6 porosity units. These intervals are also interpreted to be gas and the lesser amount of crossover is attributed to an increase in the volume of shale.

BR-SSG-5

Preamble: With respect to section 4.10 of the submission, Thornbury McMurray M5M, McMurray W4W and McMurray X4X Pools, the SSG states it reinterpreted the fluid contacts in these pools.

Request: Elaborate on the basis for these reinterpretations.

Response: The SSG reinterpreted the fluid contacts at 4 of the wells in these pools.

5-4-80-11W4 well

The SSG interprets the RGS B1 (428.0 to 437.0 m) and B2 (437.0 to 447.0 m) sequences to be a B1 channel (428.0 to 445.0 m) cutting into a B2 sequence (445.0 to 447.0 m). The RGS describes the B1 sequence as follows:

It can consist of a single cleaning-upward package or two (or more) thinner cleaning-upward packages, but the unit does not clean upward in every instance and very clean sands are rare.¹

Contrary to this description, the log interval from 428.0 to 441.0 m is clean, with fining-upward character over the upper 5 metres, typical of channel sands. The interval from 441.0 to 445.0 m could be interpreted as either the basal portion of the channel or a preserved remnant of the underlying B2 sequence. In this case, because the density porosity appears to be continuous between this and the overlying interval, the SSG interprets it to be part of the channel. The interval from 445.0 to 447.0 m is interpreted to be a B2 mudstone.

The SSG interprets the B1 channel to have a gas/water contact at 435.0 m (250.9 m ss) and a water/bitumen contact at 437.0 m (248.9 m ss).

11-22-79-11W4 well

The RGS interprets a gas/water contact at 437.0 m and a water/bitumen contact at 441.5 m in the McMurray channel. The SSG interprets that low resistivity readings from 437.0 to 438.8 m and from 440.5 to 441.5 m to reflect increases in volume of shale. This is denoted by the increased gamma ray from 55 API at 436.5 m to 80 API at 437.0 m and 70 API at 441.0 m. The SSG interprets the increase in the resistivity and crossover of the neutron-density from 438.8 to 439.3 m to be gas. The SSG believes that the deep and medium resistivity tools are reading anomalously low throughout the Wabiskaw-McMurray interval at this well.

¹ EUB Report 2003-A: Athabasca Wabiskaw-McMurray Regional Geological Study, December 31, 2003, page 15.

The SSG interprets a gas/bitumen contact at 439.3 m (250.0 m ss) in the McMurray Channel.

10-17-79-11W4 well

The RGS interprets a gas/bitumen contact at the base of the neutron-density crossover at 435.5 m in the McMurray channel. The SSG notes that there are two thin (< 0.5 m thick) sands within the interval from 436.0 to 438.0 m for which the gamma ray is reading low, the neutron and density curves are approaching each other, and the shallow resistivity curve is increasing. This indicates that, although these sands are gas-bearing, they are too thin to have the true readings resolved by the logging tools. This interpretation moves the gas/bitumen contact lower to a depth of 438.0 m (248.3 m ss).

9-20-79-11W4 well

The RGS interprets a gas/bitumen contact at the base of the neutron-density crossover at 435.2 m in the McMurray channel. The interval immediately below the crossover (i.e., from 435.2 to 437.5 m) is a clean, porous interval with a resistivity of 20 ohm-meters. A similarly clean, porous interval from 437.5 to 440.5 m has a resistivity of 60 ohm-meters. Given the relative difference in resistivity readings, the SSG interprets the 20 ohm-meter interval to be wet and the 60 ohm-meter interval to be bitumen-bearing.

The SSG interprets a gas/water contact at 435.5 m (250.1 m ss) and a water/bitumen contact at 437.5 m (248.1 m ss) in the McMurray channel.

BR-SSG-6

Preamble: With respect to section 5.1 of the submission, Kirby Upper Mannville I Pool, the SSG is recommending that wells 12-36-74-7W4M, 11-5-75-6W4M and 7-1-75-7W4M be considered part of the Kirby Upper Mannville I Pool and not be allowed to produce. In Decision 2004-045, these wells along with wells 11-29, 12-32, 11-33, 10-34-74-7W4M and 9-4-75-7W4M were allowed to produce.

Request: Why does the SSG not put these eight wells in a common pool?

Response: The SSG interprets gas/water contacts at about 248 m ss and water/bitumen contacts at about 246 m ss in the Wabiskaw B valley-fill in the 12-36, 11-5 and 7-1 wells. The SSG interprets gas/bitumen contacts of 243.8 and 244.8 m ss at the 11-33 and 10-34 wells, respectively. Based on this interpretation, the gas at the 11-33 and 10-34 wells is below the water at the 12-36, 11-5 and 7-1 wells. In order for the gas to be continuous between the 12-36 and the 10-34 wells, a structural high must exist between them such that the base of the gas and water zones (i.e., the top of the bitumen interval) is above 246 m ss. This situation would allow for the water to be trapped to the east of this high, while allowing the gas to be continuous overtop of the high. However, the existing data indicates that there is a structural low in the Wabiskaw B valley-fill between the 10-34 and 12-36 wells. This low occurs in a northeast-southwest direction defined by the 10-11-75-7W4 and 10-34-74-7W4 wells where the top of the Wabiskaw B valley-fill occurs at 244.5 and 246.3 m ss, respectively. As a result, the SSG does not interpret the gas to be continuous between the 12-36 and 10-34 wells.

BR-SSG-7

Request: With respect to section 5.5 of the submission, Hangingstone Wabiskaw-McMurray D, McMurray K3K, and McMurray B2B Pools, explain the rationale for applying the gas/bitumen contact tolerance of ± 5 m from the RGS to gas pay porosity bases.

Response: In circumstances where the base of gas pay is defined as a porosity base (i.e., gas/shale), generally no consideration is given to variations in the elevations of porosity base for gas pooling so long as the interval is correlative and continuous. In circumstances where the base of gas pay is defined by a contact with water or oil, the elevation of the contact must be considered and is expected to be similar within a limited tolerance (i.e., +/- 1 metre).

In the RGS area, where mobile oil has been degraded to immobile bitumen, gas/bitumen contacts might be expected to be similar in a common gas pool since the original gas/oil contact would have been flat. However, post-degradation structural changes due to Devonian salt dissolution have caused variations in gas/bitumen elevations that are beyond the +/- 1 metre tolerance, but have not caused the gas to be discontinuous. Since the bitumen is immobile and equalization of fluids relative to the new structural position is not possible, the gas/bitumen contact can be viewed the same as a gas/shale contact. Additionally, variations in gas/shale contacts between correlatable units in the RGS area may be due to salt dissolution.

With respect to Section 5.5 of the submission, the SSG believes that the 6.1 metre difference in the gas/shale contacts between the 6-17-81-7W4 and 11-13-81-8W4 wells in the newly defined McMurray K3K Pool is due to salt dissolution. If this difference is an acceptable pooling tolerance, then the 6.5 metre difference between the gas/bitumen at the 11-20-81-7W4 well and the gas/shale at the 6-17 well should also be an acceptable pooling tolerance.

BR-SSG-8

Preamble: With respect to wells 11-35-82-8W4M and 7-2-83-8W4M in the Hangingstone Wabiskaw A Pool, which are wells #11 and #12 in Appendix 1:

- Request:**
- a) What is the basis for the SSG revising its original recommendation for the Wabiskaw C sand for these two wells from produce to shut-in?
 - b) Why has the SSG recommended shut-in of only these two wells for what is understood to be a 5-well pool?

- Response:**
- a) The Hangingstone Wabiskaw A Pool consists of 5 wells: 7-30-82-7W4, 11-35 and 16-36-82-8W4, and 16-1 and 7-2-83-8W4. The SSG revised its original recommendation for the Wabiskaw C sand for the 11-35 and 7-2 wells from produce to shut-in based on its determination that the Wabiskaw D shale is not a reliable regional barrier. In the absence of the Wabiskaw D shale as a regional barrier, either the McMurray A2 or B2 mudstones must underlie the extent of the gas pool to be deemed nonassociated. However, both the McMurray A2 and B2 mudstones are absent at the 7-30 and 11-35 wells, allowing association with potentially recoverable bitumen. As a result, the SSG changed its production status recommendation for the 11-35 and 7-2 wells.
 - b) The three other wells in the Hangingstone Wabiskaw A Pool (i.e., 7-30, 16-36 and 6-1 wells) were shut in pursuant to EUB *Decision 2000-22: Gulf Canada Resources Limited, Request for the Shut-in of Associated Gas, Surmont Area*, March 2000. The SSG understands that gas shut in pursuant to *Decision 2000-22* is not subject to this proceeding.

BR-SSG-9

Preamble: With respect to section 6.2 of the Submission, Core-based Study:

- Request:**
- a) What criteria were used to differentiate the Wabiskaw C shale from the Wabiskaw D shale in core?
 - b) What is the vertical resolution of the gamma ray log, the resistivity logs, the neutron log and the density log?
 - c) Provide a copy of the core analysis, the core gamma ray log and the equivalent open hole gamma ray log, neutron/density log and resistivity log of the cored intervals used to determine the capability of well logs to indicate the presence and thickness of the Wabiskaw C and/or D shale.
 - c.1) Indicate on the open hole logs the interpreted top and base of the Wabiskaw C and/or D shale interval.
 - d) Do the core gamma ray log thicknesses of the Wabiskaw C and/or D shale match the open hole gamma ray log thicknesses?
 - d.1) If no, provide your interpretation of why this occurs.
 - e) When a core gamma log was not run, how was the core correlated to the open hole logs (i.e., what criteria or method was used)?
 - f) From the cross-plot of core vs. log thickness values included on the CD, it appears there are many instances where the RGS interpreted log values were less than the core measured values. Explain why this would occur.
 - f.1) How was the slope of the line on the cross-plot determined?
 - g) Are there any processes that could occur during coring operations which would cause a poor recovery of the Wabiskaw C and/or D shale and result in a discrepancy between core thickness and log thickness?
 - h) Why is there a good core to log match in some wells and not in others?

Response:

- a) The Wabiskaw D shale has marked fissility, relatively little bioturbation (mainly small horizontal burrows where present), a dark grey to steel blue grey colour, and a low sand content (generally less than 30 per cent). The sand component of the Wabiskaw D shale is either quartz (i.e., reworked McMurray sediment) or litharenite. Glauconite is rare, and is present only as burrow fills where burrows bring down glauconitic litharenites from the overlying Wabiskaw C sand.

The Wabiskaw C mudstone lacks fissility, has generally moderate to high bioturbation (including, vertical, horizontal and oblique types, in some cases up to 1-2 cm wide, and up to 10 cm or more in length). The colour is a light to medium grey and light to medium green-gray where glauconite is present. Glauconite is common as burrow fills, thin interbeds within the mudstone, and as a dispersed background sand component to the mudstone. The sand component of the Wabiskaw C mudstone is litharenite, commonly glauconitic.

In cases where both Wabiskaw D shale and Wabiskaw C mudstone occur in core, the Wabiskaw C mudstone always overlies the Wabiskaw D shale. The Wabiskaw C mudstone can underlie, overlie or be interbedded with Wabiskaw C sands.

- b) The SSG did not investigate the vertical resolution of the logging tools. The focus of the Wabiskaw D Shale study was to compare two datasets; the intervals identified by the RGS as Wabiskaw D shale versus the lithology present within the available core.
- c) The SSG did not use the core analyses data or the core gamma ray logs. Correlation of core to log was done through visual examination of the core.

The SSG is providing the following material:

- 1) The core photos of the RGS interpreted Wabiskaw D shale interval for 161 of the 166 wells ([Appendix 1](#)). Photos were not taken of 5 of the cores.
 - 2) Copies of the well logs for the 166 wells annotated with the RGS interpreted Wabiskaw D shale interval ([Appendix 2](#)).
 - 3) The RGS log depths for the Wabiskaw D shale interval and the log- and core-derived thicknesses ([Table 6-1: Supplemental](#)). The SSG interpreted unit identified from core is also included in Table 6-1: Supplemental.
- c.1) See response to c).
 - d) See response to c).
 - d.1) See response to c).
 - e) See response to c).
 - f) The SSG believes that in many of the wells where the RGS log interpreted Wabiskaw D shale thickness values are less than the SSG measured core

values, the difference is within the error expected from log measurements. In others, the core indicates the presence of vertical sand burrows or coals within the Wabiskaw D shale interval which could affect the log response. The differences in the remainder are related to small inconsistencies in picking either the top or base of the Wabiskaw D shale interval on logs.

- f.1) The equation of the line on the cross-plot was determined using least-squares linear regression.
- g) The SSG is not aware of any processes that could occur during coring operations that would consistently and preferentially cause poor recovery of the Wabiskaw D Shale.
- h) The SSG notes that in several instances where RGS log thickness is greater than SSG core thickness, the logs are reading the combined Wabiskaw C mudstone – Wabiskaw D Shale or Wabiskaw D Shale – Wabiskaw D valley-fill interval where they occur together at a well. However, the SSG is unable to explain the poor correlation for the other instances.

For an explanation of where RGS log thickness is less than SSG core thickness, see response to f).

BR-SSG-10

Preamble: In section 7 of the submission, Interim Directive 99-1 Applications, the SSG states that it believes it would be helpful for the Board to clarify whether an application and approval are still required under ID 99-1 prior to production from intervals that may be given a production status of produce as a result of this proceeding but without an ID 99-1 application.

Request: What is the SSG's view on this question (i.e. should an ID 99-1 application be required) and what is the basis for the SSG's view.

Response: The SSG believes that it would be prudent for the Board to require an *ID 99-1* application for wells with gas intervals given a produce status as a result of this proceeding, but have never produced and/or been completed. The SSG submits that this would allow for the assessment of data collected subsequent to the completion of the interval, along with any additional data that may have been collected since the completion of the RGS (i.e., newly drilled wells and additional pressure tests). Given the complex geology in the RGS area, such an approach is essential to ensuring appropriate gas production decisions (both past and future) as more new data becomes available.

BR-SSG-11

Preamble: In section 8 of the submission, Pressure Monitoring at Producing Wells, the SSG states that it believes it would be prudent to perform pressure testing in those wells where one interval has been allowed to produce and another interval was required to be shut in.

Request:

- a) Elaborate on the kind of pressure testing the SSG believes should be done.
- b) Comment on whether and how this testing would be different from the zonal segregation tests that are required under section 11.150(1) and (2) of the Oil and Gas Conservation Regulations.

Response: a) Pressure Monitoring

The Board states in EUB *Decision 2004-045*, “*In overlapping gas pools where one pool is allowed to produce and another is required to be shut in, there must be segregation between the pools in all wellbores or both pools must be shut in. In order to demonstrate segregation in the wellbore, zonal segregation tests shall be conducted and submitted to the EUB in accordance with Section 11.150 (1) and (2) of the Oil and Gas Conservation Regulations to confirm that segregation has been established between a pool that is permitted to produce gas and a pool that is not permitted to produce gas*”.

Segregation testing in accordance with Section 11.150, however, is insufficient in the RGS area to ensure that pressure communication does not exist between pools that are closely stacked vertically. The SSG believes that ongoing pressure monitoring of the shut-in zones would determine both wellbore segregation and if natural pressure communication is occurring between defined pools.

The following test procedure is recommended for all wells in overlapping gas pools where one pool is allowed to produce and another is required to be shut in:

- Tubing must be permanently set through the segregating packer.
- A bottom-hole gauge should be used to monitor the pressure in the shut-in zone. The gauge must have a full scale reading appropriate for the pressure being measured. It must be sensitive enough to detect a small drop in pressure over the testing period.
- The initial pressure test of the shut-in zone should be taken while production is occurring in the well from the adjacent zone approved for production. The test duration should be at least one week. This should ensure that any limited

communication behind the casing or through a leaky packer will be detected. If the packer is subsequently disturbed, this test would need to be repeated.

- The initial pressure test should be submitted to the EUB in accordance with Guide 40, with the exception that the test be filed within 30 days.
- Annual testing is needed to confirm that ongoing depletion is not occurring. These tests need only establish that the pressure has not decreased in the shut-in zone since the previous test, and can therefore be of short duration (i.e., static gradient).
- Annual tests and analyses should be submitted to the EUB in accordance with Guide 40.
- Each company should file a single annual report detailing all its segregation test results in the RGS area on a pool basis. This should include a comparison of the test results to the established baseline pressure for the shut-in zone.
- If at any time an operator determines from a test that pressure communication is occurring, the well should be immediately shut in and the EUB advised.
- In wells with more than one shut-in zone, confirming the isolation of the zone immediately adjacent to the producing zone should be sufficient.

The SSG does not recommend that segregation for overlapping pools be accomplished through abandoning one of the zones. However, if the Board chooses to accept segregation by abandonment, the SSG recommends that the abandoned perforations be cement-squeezed to better ensure segregation behind casing, as opposed to using a bridge plug.

The above quote from *Decision 2004-045* indicates that an alternative to segregating a producing pool from a shut-in pool in all wellbores is to shut in both pools. The SSG interprets this statement to mean that where both pools are shut-in the Board will not require segregation. The SSG is concerned that shutting in the pools without segregation will allow cross-flow that could cause further pressure depletion of the shut-in zone. To avoid the potential for cross-flow in the wellbore or behind casing, the SSG recommends that the perforations of at least one zone be abandoned, and the abandoned perforations be cement-squeezed.

b) Requirements of Section 11.150

Section 11.150 and *ID 90-3: Reporting of Segregation Tests Results*, do not specify a segregation-test procedure. The SSG believes that the situation existing in the RGS area is unique and requires a specific testing procedure for the following reasons:

- In the RGS area the distance between pool perforations is often too small to land the upper packer needed to pressure up the lower packer to test for leaks.
- The shale or mudstone being relied upon for reservoir segregation can be as thin as 0.5 metres and averages only one or two metres. Gaps in the cement bond are more likely to exist over such short distances. Further, a cement bond log may not have sufficient resolution to confirm bond integrity over these distances.
- Where perforations are close to the sealing shale or mudstone, as is common in the RGS area, there is potential for the perforations to disturb the natural seal.

Annual segregation tests are required under Section 11.150 (2), unless the EUB requires otherwise. The SSG does not believe a less frequent interval should be allowed in the RGS area.

Section 11.150 relies upon an audit process for enforcement. The initial test proving segregation must be submitted to the EUB within 30 days, but subsequent tests do not have to be submitted. Records of these subsequent tests must be kept for 5 years and submitted to the EUB upon request. Currently, the EUB focuses its audit and enforcement on packer isolation tests in salt water disposal wells and sour gas wells. The EUB does not audit or enforce segregation test requirements for multi-zone wells under Section 11.150. Even if the EUB conducted random audit and enforcement of these requirements in the RGS area, the SSG does not believe this would be sufficiently rigorous to safeguard bitumen conservation.

SSG RESPONSES TO CANADIAN NATURAL RESOURCES LIMITED (CNRL) INFORMATION REQUESTS

CNRL-SSG-1

Reference: In its February 14, 2005 Submission, SSG presented evidence relating to the Wabiskaw D Shale which was based on the examination of 166 core. In the submission and associated appendices only 7 core photos and a summary table of findings were included.

Request: In order to more fully evaluate the evidence presented, CNRL seeks the complete data set on which this submission was based. In particular, CNRL seeks the core photos and/or core descriptions for all 166 core examined, picks (top, base and any depth corrections) on which the Wabiskaw D shale thickness was made, and any pick pertaining to the intervals that were mapped by the RGS as Wabiskaw D shale, but which the SSG claims is not.

Response: The SSG is providing the following material:

- 1) The core photos of the RGS interpreted Wabiskaw D shale interval for 161 of the 166 wells ([Appendix 1](#)). Photos were not taken of 5 of the cores.
- 2) Copies of the well logs for the 166 wells annotated with the RGS interpreted Wabiskaw D shale interval ([Appendix 2](#)).
- 3) The RGS log depths for the Wabiskaw D shale interval and the log- and core-derived thicknesses ([Table 6-1: Supplemental](#)). The SSG interpreted unit identified from core is also included in Table 6-1: Supplemental.

SSG RESPONSES TO DEVON CANADA CORPORATION (DEVON) INFORMATION REQUESTS

DEVON-SSG-1

Reference: SSG Declaration and Supporting Evidence
Appendix 1: SSG Contested Wells and Intervals #27-28
Hardy Wabiskaw G Pool

Request: Please provide the SSG's technical justification for changing the recommendation for the Hardy Wabiskaw G pool from produce to shut-in. Please confirm that the mapping provided on the CD in respect of this pool has been updated to reflect the further data provided by the SSG. To the extent that the mapping provided on the CD does not reflect the further data provided by the SSG, kindly provide updated mapping in that regard. Please also include any further mapping (structure, net gas pay, net underlying bitumen pay etc.) or data relied upon by the SSG in assessing this pool. The well of particular interest to Devon is 00/01-01-076-05W4.

Response: The single-well Hardy Wabiskaw G Pool (1-1-76-5W4 well) contains gas within the Wabiskaw C sand. The SSG revised its original recommendation for the Wabiskaw C sand for the 1-1 well from produce to shut-in based on its determination that the Wabiskaw D shale is not a reliable regional barrier. In the absence of the Wabiskaw D shale as a regional barrier, either the McMurray A2 or B2 mudstones must underlie the extent of the gas pool to be deemed nonassociated. However, both the McMurray A2 and B2 mudstones are absent at the 1-1 well, allowing association with potentially recoverable bitumen. As a result, the SSG changed its production status recommendation for the 1-1 well.

Figure 6-4 on the CD attached to the February 14, 2005 submission was updated to reflect the absence of the Wabiskaw D shale as a regional barrier. In addition to this map, all data relied upon had been filed previously.

DEVON-SSG-2

Reference: SSG Declaration and Supporting Evidence
Sections 4.6, 4.7 and 5.5

Request: Please confirm that the mapping provided on the CD in respect of the Hangingstone McMurray RRR, the Hangingstone McMurray Y, and the Hangingstone Wabiskaw-McMurray D pools has been updated to reflect the further data provided by the SSG. To the extent that the mapping provided on the CD does not reflect the further data provided by the SSG, kindly provide updated mapping in that regard. Please provide any further mapping (structure, net gas pay, net underlying bitumen pay etc.) or data relied upon by the SSG in assessing these pools. The wells of particular interest to Devon are 00/02-17-082-09W4 (437.5-439.0 mKB), 00/10-09-082-09W4 (439.5-440.1 mKB), and 00/14-01-081-08W4 (399.0-402.0 mKB).

Response: The SSG has not updated its gas pool maps. However, the February 14, 2005 submission identifies specifically the data that is relied upon in assessing these pools.

DEVON-SSG-3

Reference: SSG Addendum and Errata dated March 24, 2005
Section 4.11
McMurray G3G Pool

Request: Please provide updated mapping for the McMurray G3G Pool. Please also include any further mapping (structure, net gas pay, net underlying bitumen pay etc.) or data relied upon by the SSG in assessing this pool. The well of particular interest to Devon is 00/01-22-084-11W4.

Response: The SSG has not updated its gas pool maps. However, the March 24, 2005 submission identifies specifically the data that is relied upon in assessing this pool.

SSG RESPONSES TO PARAMOUNT ENERGY OPERATING CORP. (PEOC) INFORMATION REQUESTS

PEOC-SSG-1

Preamble: In its submission the SSG states “As shown in Figure 6-1 (included on the CD), there is significant scatter between the log- and core-thickness such that no reasonable correlation can be discerned.”, page 15, Section 6.2 and “The only exception to this is along the south border of the Surmont leases where the Wabiskaw D shale thickness observed in the core analysis correlates with the thickness interpreted from logs.”, page 16, Section 6.2.

Request:

1. Revise Figure 6-1 to highlight or identify the 11 wells in which log- and core-thickness correlates.
2. Specify or explain the criteria used to quantify log and core thickness.

Response: The statement on page 16, Section 6.2 of the submission has been incorrectly quoted by PEOC. The actual statement is:

The only exception to this is along the south border of the Surmont leases where the Wabiskaw D shale thickness observed in the 11 cores available correlates with the thickness interpreted from logs.

The SSG visually examined the physical core and did not rely on core analyses as the incorrect quote suggests.

1. The individual log- and core-thicknesses do not have a 1:1 match at these 11 wells. Rather, the above statement was based on the observation that both the RGS isopach map of the Wabiskaw D shale (that was derived from the log data) and the core indicate an area where the Wabiskaw D shale is greater than 1.0 m thick. The SSG determined that in this area, the Wabiskaw D shale may be more reliably identified from logs and may be more continuous. However, as stated in the February 14, 2005 submission, pressures in this area indicate that the Wabiskaw D shale cannot be relied upon as a regional barrier.

[Figure 6-1: Supplemental](#) highlights the 11 subject wells.

2. The SSG derived the log thickness from the RGS tops database. The RGS identified the Wabiskaw D shale based on log characteristics described in *EUB Report 2003-A*². The SSG determined the core thickness through visual examination of the core and measuring the interval.

² EUB Report 2003-A: Athabasca Wabiskaw-McMurray Regional Geological Study, December 31, 2003, page 24.

SSG RESPONSES TO PETRO-CANADA (PC) INFORMATION REQUESTS

PC-SSG-1

Reference: In its submission dated February 14, 2005, the SSG refers to eleven (11) cored wells along the south border of the Surmont leases (page 16). The cored wells, as well as the well 00/10-11-080-07W4/0, are also referenced in Figure 6-2 (Areal Distribution of Core_8.5x11.pdf) and Table 6-1 (Wabiskaw D Shale Core Study Data). The cored wells and core intervals are:

Location Interval	
00/10-30-80-6W4	240.2-324.9
AA/11-30-80-6W4	247.0-319.0
AA/10-3-80-7W4	315.7-387.3
AA/10-10-80-7W4	312.5-393.3
00/10-11-080-07W4	316.0-374.5
AA/10-22-80-7W4	324.1-404.9
02/9-24-80-7W4	268.0-356.8
AA/10-26-80-7W4	314.0-392.5
AA/10-29-80-7W4	342.0-418.0
00/3-32-80-7W4	338.0-420.8
AA/7-26-80-8W4	392.0-447.0
00/3-34-80-8W4	394.0-444.5

Request: Please provide the complete Wabiskaw and McMurray core descriptions and relevant core photos prepared by the SSG for the twelve (12) foregoing wells. In addition, for those wells, please provide any core analyses or special core analyses undertaken, including weight % bitumen, porosity, permeability, or dean stark analysis.

Response: The core photos for 11 of the 12 wells are shown in [Appendix 1](#). The 10-11-080-07W4 well had lost core over the interval of interest and so no photo was taken. The SSG interpreted unit identified from core is included in [Table 6-1: Supplemental](#). No core analyses or special core analyses were reviewed in the SSG Wabiskaw D Shale study.

SSG RESPONSE TO STYLUS ENERGY INC. (STYLUS) INFORMATION REQUESTS

Stylus-SSG-1

Reference: Staff Submission Group ("SSG") Submission dated February 14, 2005, as amended February 17, 2005 (the "SSG Submission") – Section 4.1 - pages 4 and 5.

Preamble: In Section 4.1 of the SSG Submission it is stated that the SSG revised the pooling of the single-well McMurray R Pool for the 7-28-82-12 W4 well (the "7-28 well") and the single-well McMurray Undefined 074 pool for the 6-27-82-12 W4 well (the "6-27 well") resulting in a new two-well pool. The SSG goes on to recommend the shut-in of the 7-28 well.

Request:

- a) Please provide all data assessed by the SSG with respect to the 7-28 well and the 6-27 well which caused the SSG to change its interpretation of the single well pools for each of the subject wells.
- b) With respect to the data provided in response to Question 1.a) above, please identify all data received or assessed by the SSG subsequent to the preparation of SSG's submission for the 1st Interim Phase 3 Proceeding in respect of which the AEUB issued Decision 2004-45 dated May 31, 2004.
- c) Please advise as to any specific interpretations of data which have changed by the SSG which have led the SSG to change its recommendation with respect to the 7-28 well.

Response:

- a) The SSG relied upon the well log data from the 7-28 and 6-27 wells to correlate between them and compare fluid contact elevations.
- b) The SSG relied upon the same well log data that had been used in the RGS.
- c) The SSG notes that the fluid contacts at the two wells, as identified by the RGS, are at similar elevations and within the tolerances used by the RGS. Based on this, the SSG interprets the 7-28 and 6-27 wells to be in a common pool.

Stylus-SSG-2

Reference: AEUB Decision 2004-45, Table 2 Divide 00/07-28-082-12 W4/0 well.

Preamble: In Table 2 it is stated by the AEUB that the reason for the AEUB decision to approve production from the 7-28 well is the presence of a regional mudstone/shale.

Request: Please provide all data assessed and interpretations made by the SSG which have caused the SSG to dispute the AEUB's conclusion that there is a sealing regional mudstone or shale present in the 7-28 well.

Response: The second last paragraph of Section 4.1 of the SSG's February 14, 2005 submission, page 5, states,

Although the B2 mudstone is present at the 7-28 well, the B2 gas is indirectly associated with potentially recoverable bitumen through pooling.

The SSG agrees with the Board's conclusion that there is a sealing regional mudstone or shale present at the 7-28 well. The SSG also agrees with the RGS interpretation that the B2 mudstone is absent at the 6-27 well. Therefore, the B2 gas at the 7-28 well is indirectly associated with potentially recoverable bitumen through pooling with the 6-27 well.

ATTACHMENT 1 - EXPLANATION OF APPENDICES AND SUPPLEMENTAL FILES

<http://www.eub.gov.ab.ca/BBS/applications/Submissions/Phase3-Final.htm>

APPENDIX 1 - CORE PHOTOS: WABISKAW D SHALE CORE STUDY

<http://www.eub.gov.ab.ca/BBS/applications/Submissions/Phase3-Final.htm>

APPENDIX 2 - LOG COPIES: WABISKAW D SHALE CORE STUDY

<http://www.eub.gov.ab.ca/BBS/applications/Submissions/Phase3-Final.htm>

TABLE 6-1: SUPPLEMENTAL

<http://www.eub.gov.ab.ca/BBS/applications/Submissions/Phase3-Final.htm>

FIGURE 6-1: SUPPLEMENTAL

<http://www.eub.gov.ab.ca/BBS/applications/Submissions/Phase3-Final.htm>

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