



Canadian Natural Resources Limited

Application for Compulsory Pooling
Bellis Field

June 12, 2007

Alberta Energy and Utilities Board
Decision 2007-047: Canadian Natural Resources Limited, Application for Compulsory Pooling,
Bellis Field

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Published by

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ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

**CANADIAN NATURAL RESOURCES LIMITED
APPLICATION FOR COMPULSORY POOLING
BELLIS FIELD**

**Decision 2007-047
Application No. 1487310**

DECISION

The Alberta Energy and Utilities Board has considered the findings and recommendations set out in the following examiner report and adopts the recommendations.

Dated in Calgary, Alberta, on June 12, 2007.

ALBERTA ENERGY AND UTILITIES BOARD

[Original signed by]

B. T. McManus, Q.C.
Acting Chairman

ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

CANADIAN NATURAL RESOURCES LIMITED APPLICATION FOR COMPULSORY POOLING BELLIS FIELD

**Decision 2007-047
Application No. 1487310**

1 RECOMMENDATIONS

The examiners appointed by the Alberta Energy and Utilities Board (EUB/Board) have considered the evidence and recommend the following:

- The Board, with the approval of the Lieutenant Governor in Council, issue an order under Section 80 of the *Oil and Gas Conservation Act (OGCA)* designating that all tracts within Section 23 of Township 58, Range 17, West of the 4th Meridian (Section 23) be operated as a unit for the production of gas from all zones to the base of the Wabamun Formation through a well to be drilled in Legal Subdivision (LSD) 11 of the section (the 11-23 well).
- The order allocate the costs and revenues associated with the 11-23 well on a tract area basis, with each tract's share being the proportion of the area of each tract to the total area of the drilling spacing unit.
- The order provide for a penalty of 200 per cent to be applied to a tract owner's share of the actual costs of drilling and completing the well if the owner fails to pay such costs within 30 days of the later of the pooling order being issued, the owner being given notice in writing of its share of costs, or the well having commenced production.
- The order designate Canadian Natural Resources Limited (CNRL) as the operator of the 11-23 well.

2 APPLICATION, INTERVENTION, AND HEARING

CNRL applied under Section 80 of the *OGCA* for an order prescribing that all tracts within the drilling spacing unit (DSU) comprising Section 23 be operated as a unit for the production of gas from all zones to the base of the Wabamun Formation through the proposed 11-23 well.

Bowood Energy Corp. (Bowood) filed an objection to the application.

The application was considered at a public hearing on April 23, 2007, in Calgary, Alberta, before Board-appointed examiners C. D. Hill (Presiding Member), F. Rahnama, Ph.D., and B. C. Hubbard, P.Eng. Those who attended the hearing are listed in Appendix 1.

3 BACKGROUND

The gas rights in Section 23 are held for all zones to the base of the Wabamun Formation as follows:

Tract	Lessor	Lessee
Portion of east half (106 hectares)	Crown	CNRL (100%)
West half and portion of east half (150 hectares)	Freehold	CNRL (80%) Bowood (20%)

CNRL and Bowood commenced negotiations for a pooling agreement in October 2006 but were unable to agree on the allocation of costs and revenues between the tracts. In November 2006, CNRL submitted its application requesting that the EUB issue a pooling order. Subsequent to the filing of CNRL's application, the parties engaged in an Appropriate Dispute Resolution process. The parties were unable to conclude a voluntary pooling agreement, and CNRL's application was considered at a hearing on April 23, 2007.

4 PRELIMINARY MATTERS

Prior to the hearing, CNRL requested that the Board hold confidential certain information included in its April 12, 2007, submission, including information on three confidential wells located at LSD 14-10-58-17 W4M, 2-22-58-17 W4M, and 3-15-58-17 W4M. CNRL submitted that confidentiality was necessary on the grounds that disclosure of such information would negatively impact CNRL's competitive advantage. CNRL requested that the confidential information be removed from the public record and be given confidential treatment. The examiners reviewed CNRL's request and found that disclosure of the confidential information could reasonably be expected to harm CNRL's competitive advantage.

At the commencement of the hearing, the examiners granted CNRL's request of confidentiality and issued a Confidentiality Order with respect to Application No. 1487310. See Appendix 2 for the terms of the Confidentiality Order.

5 ISSUES

The examiners consider the issues respecting the application to be

- the need for the pooling order, and
- the provisions of the pooling order if issued and, in particular, the basis for allocation of costs and revenues.

6 CONSIDERATION OF THE APPLICATION

6.1 Views of CNRL

CNRL submitted that on a tract area basis, it had an 88.281 per cent interest in the gas rights for all zones to the base of the Wabamun Formation in Section 23 and, therefore, should have an opportunity to obtain its fair share of the gas underlying the one section DSU. CNRL said that it had been unsuccessful in its efforts with Bowood to obtain a voluntary pooling agreement for Section 23 and, therefore, concluded that a pooling order was needed to allow for the drilling and production of a well in the section.

CNRL proposed that the costs for drilling and completing the proposed 11-23 well and the revenue generated from the well be shared on a tract area basis. It submitted that trying to attribute reserves to one part of Section 23 over another was beyond the resolution of the data available. Therefore, it considered that pooling on a tract area basis would be the most equitable allocation under the pooling order.

CNRL presented its geological interpretation, based on structural cross-sections and its seismic coverage of the area, to support its argument for pooling on a tract area basis. CNRL considered the Wabamun Formation to be the primary target for Section 23. It noted that Wabamun gas reservoirs could include adjacent Detrital material as part of the reservoir. CNRL proposed locating the subject well in LSD 11, on what it interprets to be the highest point on the Paleozoic structure to most effectively capture the reserves.

CNRL interpreted Section 23 to be on the subcrop edge of the Upper Devonian Wabamun Formation. The Paleozoic unconformity is characterized by Wabamun highs flanked by channels deeply eroded into the Paleozoic surface. The remnant Wabamun high consists of limestones and dolomites. The sediments deposited in the intervening lows were interpreted to be a Detrital sequence of similar lithology to the Wabamun and of indeterminate age. Overlying the Wabamun are Cretaceous sands, silts, shales and coals, which reflect the influence of the underlying structure of the Paleozoic unconformity surface.

CNRL stated that natural gas could be trapped where structural closure is present on the Paleozoic unconformity within the Devonian sediments or within the adjacent Detrital sediments as a continuation of the reservoir. CNRL interpreted the structural closure of the Paleozoic high to trend in a north-northwest to south-southeast direction, and to be present in much of Section 23. CNRL acknowledged that seismic interpretation of the Paleozoic unconformity is difficult, particularly off the Wabamun highs.

CNRL believed that the Sparky sand, which can be productive in the area, had been eroded in Section 23 by a younger Waseca channel, located in the west half and part of the northeast quarter of Section 23. CNRL did not consider the Waseca channel to be a target for the proposed well; however, CNRL acknowledged that it could have some potential, albeit minor. When questioned about the potential of the seismic bright spots interpreted by Bowood to indicate gas at the Sparky level, CNRL noted that bright spots could also be caused by tight streaks in the Waseca channel. CNRL further stated that gas and/or oil could accumulate within a structural high without indicating bright spots on seismic. Although CNRL considered the Wabamun to be the primary target, it submitted that the Clearwater and Colony zones could also have potential to be productive in the 11-23 well. In response to questioning about potential zones to include in any pooling order, CNRL stated that the area is complex and the geology unclear; therefore, all zones to the base of the Wabamun Formation should be included in the pooling order.

CNRL requested that it be named the operator of the well subject to the pooling order because it held the largest working interest in the DSU, and it was recommending the drilling of the 11-23 well.

Finally, CNRL requested that the maximum penalty of 200 per cent allowed under the OGCA be imposed against a tract owner's share of drilling and completion costs if the owner does not pay its share of such costs within 30 days after the later of the pooling order being issued, the tract

owner being notified in writing of its share of drilling and completion costs, or the well having commenced production.

6.2 Views of Bowood

Bowood submitted that its initial position was that CNRL's application should be denied as it felt that the issue could have been resolved with cooperation from both parties and that there was no need for the pooling order.

Bowood further submitted that if the Board decided to issue a pooling order, it would be inequitable to pool the interests in Section 23 on a tract area basis as proposed by CNRL. Bowood argued that the best reserve potential is located on the west portion of Section 23. Bowood objected to the forced pooling of the entire section based on tract area because Bowood's interest in the west half would be diluted by including CNRL's tract on the east half which Bowood considered to be unproductive. Bowood argued that there is significant geophysical effect evident only on the west half, which it concluded to be an anomaly at the Sparky level. Based on this anomaly, it suggested that the section be divided into east and west halves with each half pooled separately on a tract area basis for all zones. Bowood alternatively argued that if a pooling order were issued for the whole section, its interpretation of geophysical and geological data supported a reserves-based allocation of 20 per cent for Bowood and 80 per cent for CNRL.

Bowood interpreted the surface of the Devonian age carbonates underlying Section 23 to exhibit significant structural relief resulting from pre-Cretaceous subareal exposure and erosion. Bowood contended that the subsequent early Cretaceous sediments infilled the Paleozoic lows with a series of fluvial sediments, followed by marine sediments deposited during sea level fluctuations. Bowood argued that the structure on the Devonian erosional surface is difficult to determine from seismic data and therefore to map because it changes significantly over short distances. Bowood stated that it has more confidence in mapping a shallow marker horizon and noted that it had acquired seismic data from which it interpreted the geophysical anomaly at the Sparky level. Bowood contended that the Sparky structural anomaly closely corresponds with the structure on the Paleozoic erosional surface.

Bowood considered the Sparky sand to be the primary target for Section 23. It interpreted the Sparky sand to be a nearshore marine or beach deposit with moderate areal extent and an associated water leg. Based on its Sparky structure map, Bowood believes the only potential to encounter Sparky gas above the water leg is in the west half of Section 23. It accepted CNRL's interpretation of a Waseca channel in Section 23; however, Bowood argued that the Sparky is not completely eroded, and that the Waseca channel could be a trapping mechanism for underlying Sparky gas.

To further substantiate its interpretation of potential gas only in the west half of Section 23, Bowood submitted a seismic amplitude anomaly map showing two amplitude anomalies located in the west half of the section. Bowood acknowledged that amplitude anomalies or "bright spots" could indicate the presence of coal, depleted gas, or potentially productive gas. Bowood stated that it has no seismic information for the south portion of Section 23 and based the trend of its seismic anomaly on the general trend seen in the area and the interpretation of its structure map. It agreed that the zero edge of the gas sand could extend beyond the feature outlined on the map.

Bowood interpreted the seismic bright spots to be Upper Mannville but agreed that it is difficult to determine if the amplitude anomaly is within the Sparky zone or the Waseca channel.

Bowood interpreted several potential secondary targets for Section 23, including the Wabamun Formation, the marine Glauconite sand, and other Upper Mannville sediments. Bowood believed gas could be trapped within the Paleozoic structural closure itself or within the drape of the overlying sediments.

Bowood did not agree with CNRL's proposed LSD 11 well location. Bowood stated that it did not know the actual proposed coordinates for the well, nor had it had the opportunity to discuss with CNRL the 11-23 location or propose any alternative location. Based on its interpretation of available data and well control in the west, Bowood stated that it would have suggested a location in LSD 12.

With respect to operatorship of the proposed well, initially Bowood argued that if the section was split into east and west halves as it proposed, the west half would be governed under an existing joint operating agreement between itself and CNRL. For the east half, it agreed that CNRL would be the operator. Bowood also stated that penalty provisions were provided for in its joint operating agreement with CNRL and, as such, any pooling order issued need not address this. However, upon clarification of the provisions of the *OGCA*, Bowood agreed that should a pooling order be issued, it should name CNRL operator of the 11-23 well, and it should include the penalty provision as requested by CNRL.

6.3 Views of the Examiners

The examiners note the inability of CNRL and Bowood to reach a voluntary pooling agreement, and conclude that there is a need for a pooling order.

In considering whether the allocation of costs and revenues under the pooling order should be on a tract area basis or a reserves basis, the examiners note that Section 80(4)(c) of the *OGCA* states that allocation of production under a pooling order "shall be on an area basis unless it can be shown to the Board that that basis is inequitable."

In determining the appropriate allocation of costs and revenues under the pooling order, the examiners note the limited well control in the area and the lack of a well in Section 23. Further, the examiners note that CNRL and Bowood have geological interpretations that significantly differ with respect to the potential reserves distribution within Section 23. In this regard, the examiners note that CNRL's primary target in Section 23 is the Wabamun Formation. CNRL interpreted the structural closure of the Paleozoic high to trend in the north-northwest to south-southeast direction and to be present in most of Section 23, whereas Bowood interpreted a geophysical anomaly at the Sparky level and considered the Sparky to be the primary target for Section 23. Bowood, based on its mapping of two amplitude anomalies, interpreted reserves potential only on the west half of the section. The examiners note that Bowood acknowledged that the zero edge of the gas sand could extend beyond the features outlined on its map.

The examiners note Bowood's request to split Section 23 into east and west halves and then allocate costs and revenues based on tract area within each separate half. The examiners further note that Section 23 is a standard one section gas DSU and that a pooling agreement among the tract owners, either voluntary or by EUB pooling order as applied for by CNRL, is required to

allocate costs and revenues among the owners in the DSU. The examiners therefore do not accept Bowood's proposed splitting of Section 23 as an appropriate solution.

In the examiners' opinion, reserves-based allocation requires clear and convincing evidence to show that it would be inequitable to allocate otherwise. The examiners do not believe that Bowood provided sufficient evidence to confirm its interpretation of the presence of a gas pool at the Sparky level. While seismic data and geological information were submitted by both parties, the examiners believe that to justify a reserves-based allocation, pay maps based on wells with proven pay and using reasonable interpretation techniques are required. In this regard, the examiners note that gas pay maps were not provided by either party for any of the potential zones, including the Wabamun and Sparky. Accordingly, the examiners do not consider that Bowood's proposed 80/20 allocation for the section is justified. The examiners therefore conclude that the distribution of gas reserves underlying each tract cannot be reasonably determined for any of the potential zones and, therefore, the pooling of tracts on a reserves basis would be inappropriate.

With respect to which zones should be included in the pooling order, the examiners note that in addition to the Wabamun and Sparky Formations, which CNRL and Bowood respectively identified as their primary targets, both parties have identified other potential zones in Section 23. The examiners accept that the area is geologically complex and that there is limited information available to identify which formations could be productive upon drilling the 11-23 well. Therefore, the examiners are prepared to recommend approval of CNRL's request to include all zones to the base of the Wabamun in the pooling order. The examiners note that Bowood was in agreement with this.

Having concluded that pooling on a tract area basis would be appropriate and equitable, the examiners accept that CNRL's proposed well location in LSD 11 is suitable to recover any reserves encountered in Section 23.

With respect to what party should be appointed as the operator of the well, the normal EUB practice is to name the well licensee as operator under a pooling order. CNRL initiated this application and proposed to drill the well. Further, the examiners note that Bowood is in agreement with CNRL regarding the operatorship of the well. The examiners conclude that the pooling order should name CNRL as operator of the 11-23 well.

Finally, the examiners note that CNRL's requested penalty provisions are consistent with those provided for in the OGCA and that Bowood did not oppose them. The examiners therefore recommend that the penalty provisions requested by CNRL be included in the pooling order.

7 CONCLUSION

The examiners conclude from a review of the evidence that a pooling order with the provisions noted above should be issued to address the matters raised by the hearing participants. The examiners note that this report does not disclose any information considered to be confidential, as stipulated in the Confidentiality Order, and conclude that there is no need to issue a separate confidential report.

Dated in Calgary, Alberta, on June 12, 2007.

ALBERTA ENERGY AND UTILITIES BOARD

[Original signed by]

C. D. Hill
Presiding Member

[Original signed by]

F. Rahnama, Ph.D.
Examiner

[Original signed by]

B. C. Hubbard, P.Eng.
Examiner

APPENDIX 1 HEARING PARTICIPANTS

Principals and Representatives
(abbreviations used in report)

Witnesses

Canadian Natural Resources Limited (CNRL)
P. McGovern

D. McLachlan, P.Geoph.
T. Nyitrai
B. Rypien, P.Geol.
J. Urdanta
E. McCoy Lunn

Bowood Energy Corp. (Bowood)
R. Mercier

D. Cassidy, P.Geol.
M. Doty, P.Geoph.
M. Kryczka, P.Land

Alberta Energy and Utilities Board Staff
J. P. Mousseau, Board Counsel
K. Fisher
S. Mangat
K. Bieber

APPENDIX 2 TERMS OF THE CONFIDENTIALITY ORDER

1. Safeguarding of Confidential Information

Bowood Energy Corp. (Bowood) shall hold the Confidential Information¹ in confidence and use it only for the purpose of the hearing. Bowood shall strictly safeguard and retain in strict confidence its copy of the Confidential Information as well as all related materials, which safeguarding shall consist of ensuring that only Bowood shall have access to the Confidential Information.

2. Hearing

Throughout the hearing, the Examiners, Board Staff, CNRL and Bowood, (including counsel, and panel witnesses) shall give prior notice of their intention to raise any matter relating to the Confidential Information including, motions, questions to witness, witness answers and oral argument. When matters relating to the Confidential Information are raised, all persons other than the Examiners, Board Staff, the court reporter, CNRL and Bowood will be excluded from the hearing and it shall be held in camera.

3. Transcripts

Transcripts will be separated into two documents, one containing a record of the entire proceeding, the other excluding any discussion of the Confidential Information. Only the Board and its staff, CNRL and Bowood shall be entitled to receive a copy of the transcript containing the Confidential Information.

4. Court Reporter

After completion of the transcript, the court reporter shall deliver to the Board all of his/her notes in written or electronic form, taken at the hearing that contain references to the Confidential Information as well as all copies of the transcript containing the Confidential Information which are not distributed to the Board, CNRL and Bowood.

5. Decision

Should the Board determine that it must refer to the Confidential Information in its decision report, the Board shall prepare two decision reports, one which contains the Board's consideration of the Confidential Information (the Confidential Decision), and one which excludes the Confidential Information. The Confidential Decision shall be made available only to CNRL and Bowood.

6. Post Proceeding

Following the issuance of its decision on the proceeding, the Board will destroy the Confidential Information provided by CNRL and Bowood and any related materials created in the course of the proceeding that are in the possession of the Board, except for a single copy thereof which shall form a confidential part of the record, which copy shall remain confidential until this order expires.

¹ Confidential Information as described in EUB's Confidentiality Order issued on April 23, 2007.

7. **Expiration of Confidentiality**

The confidentiality of this order shall expire on February 24, 2008, at which time the entire record of the proceeding, including all submissions, transcripts, related materials that include or refer to the Confidential Information, and if necessary, the Confidential Decision will be available to the public.