Stylus Exploration Inc.

Application for Approval to Produce Gas
Hardy Field

November 4, 2003

Alberta Energy and Utilities Board

ALBERTA ENERGY AND UTILITIES BOARD

Decision 2003-080: Stylus Exploration Inc., Application for Approval to Produce Gas, Hardy Field

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ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

STYLUS EXPLORATION INC. **Decision 2003-080**
APPROVAL TO PRODUCE GAS **Applications No. 1095525,**
HARDY FIELD **1095526, 1095602, and 1275288**

1 INTERIM DECISION

Having considered the evidence submitted at the interim hearing, the Alberta Energy and Utilities Board (EUB/Board) concludes that gas production from the identified intervals in the wells operated by Stylus Exploration Inc. (Stylus), listed in Table 1, be denied pursuant to Section 3(5) of the Oil Sands Conservation Regulations (OSCR).

Table 1. Stylus Application Wells

Well	Perforated Interval	Stylus Terminology	EUB-Defined Pool*
06-28-076-04W4M	347.0-347.5	McMurray C	McMurray V
	349.25-350.0	McMurray D	McMurray V
06-33-076-04W4M	339.0-340.0	McMurray C	McMurray U/D
	341.0-343.5; 347.0-349.0	McMurray D	McMurray U/D
11-30-075-04W4M	382.0-382.5	McMurray A	Wabiskaw U/D
	386.25-386.75	McMurray B	Wabiskaw U/D
	387.5-389.5; 392.75-393.25	McMurray D	McMurray U/D
02-35-075-05W4M	380.5-382.5	Wabiskaw B	Wabiskaw U/D
	389.8-391.5; 393.8-394.5	McMurray C & D	McMurray Z

Gas production from the identified intervals in the wells listed in Table 2 must also remain shut in as a result of this interim decision.

Table 2. Wells Remaining Shut In

Well	Perforated Interval	EUB-Defined Pool*
01-01-76-05W4M	376.5 –381.0	McMurray Z Pool (Devon)
06-22-76-04W4M	379.5-380.5	McMurray V Pool (Talisman)
13-14-76-04W4M	372.0-374.0	McMurray V Pool (Talisman)
08-13-76-04W4M	364.0-366.0 373.0-382.0	McMurray V Pool (Talisman)
04-18-76-03W4M	383.5-384.8 385.5-386.5 381.0-383.0	McMurray V Pool (Talisman)

* Pools as defined in EUB Pool Orders as they existed on August 28, 2003, the date the notice for this interim hearing was issued.

2 THE APPLICATIONS AND HEARING

Stylus applied to the EUB for approval, pursuant to Section 3(4) of the OSCR, to produce gas from the perforated intervals in the wells listed in Table 1. Stylus contended that the gas production proposed at the applied-for wells is not associated with potentially recoverable bitumen.

The Board received a submission from the EUB Staff Submission Group[1] (SSG) stating that all gas production at the applied-for wells should be denied. SSG contended that a significant amount of bitumen existed along with important gas accumulations in the subject area. It asserted that most of the Wabiskaw-McMurray gas in the Hardy area was or had the potential to be associated with underlying incised valley-fill/channel bitumen, either through direct vertical continuity or indirect lateral continuity, similar to both Surmount and parts of the Chard-Leismer areas.

A public hearing on the applications and intervention was held in Calgary, Alberta, on October 1, 2003, before Board Member J. D. Dilay, P.Eng. (Presiding Member) and Acting Board Members C. A. Langlo, P.Geol., and R. J. Willard, P.Eng. Those who appeared at the hearing and abbreviations used in this report are set out in the Appendix.

3 BACKGROUND

After consultation with interested parties in the Hardy Field, the Board decided to conduct an expedited interim hearing to consider the Stylus applications. As stated in the Notice of Hearing, an interim decision would preclude the need for any Phase 2 proceeding as described in *General Bulletin (GB) 2003-28: Bitumen Conservation Requirements*, and opportunity to review this interim decision would only be available as part of a final Phase 3 review following the completion of all or a portion of the EUB's regional geological study as described in *GB 2003-28.*

As established in EUB *Interim Directive (ID) 99-1: Gas/Bitumen Production in Oil Sands Areas, Applications, Notifications, and Drilling Requirements*, applications for approval to produce gas must provide evidence

- that the gas is not associated with bitumen within the region of influence, or
- if the gas is in association with bitumen within the regions of influence, why gas production should be allowed, considering the potential effect on future bitumen recovery.

[1] The SSG comprises EUB staff and is represented by designated EUB counsel. The Board directed neither the composition of the SSG nor the nature of its submission, which was filed pursuant to Section 43 of the EUB's *Rules of Practice*. The SSG participated in the proceeding as an independent party and was treated as such. All communication between the Board and the SSG with respect to the proceeding was conducted by correspondence through the SSG's counsel and counsel assisting the Board panel. Neither the SSG's counsel nor the SSG members had any contact with the Board and the staff assisting the Board with respect to matters related to the proceeding.

Associated gas refers to gas that is in pressure communication with bitumen within the region of influence either directly or through a connected aquifer. The region of influence is taken to be the extent of the gas pool in the case of gas directly overlying bitumen or the combined extent of the gas pool and water zone in the case of gas overlying water overlying bitumen. Given the interim nature of this decision, the Board prescribed that the extent of the gas pools was sufficient to make a determination of the communication between the gas and bitumen in the application wells.

4 ISSUES

The Board considers the issues respecting the applications to be

- whether or not there is potentially recoverable bitumen within the area of application,
- whether or not there is gas in association with potentially recoverable bitumen, and
- extent of the gas pools.

5 VIEWS OF THE BOARD

Given the interim nature of the subject application and the need to issue an expedited decision, this report does not contain views of the hearing participants, as is the EUB's normal practice, but only the views of the Board. Table 3 shows a comparison between the geological nomenclature used by Stylus, SSG, and the EUB. This report uses the EUB's zone and pool definitions.

Table 3. Comparison of Geological Nomenclature Used by the Participants

STYLUS (2001)[1]	STYLUS (2002)[2]	SSG	EUB
McMurray A	Wabiskaw A	Wabiskaw C	Wabiskaw
McMurray B	Wabiskaw B	Wabiskaw C	
McMurray C	Red Parasequence	Wabiskaw D	McMurray
McMurray D	Green Parasequence Blue Parasequence Indigo Parasequence	McMurray	

[1] Applications No. 1095526 and 1095525.
[2] Application No. 1275288.

5.1 Whether or Not There Is Potentially Recoverable Bitumen Within the Area of Application

The criterion used for potentially recoverable bitumen in the McMurray, as discussed in *ID 99-1*, has been confirmed by *GB 2003-28* as bitumen having a minimum thickness of 10 metres (m) with a minimum pore volume saturation of 50 per cent.

The Board agrees with Stylus that the available information indicates that bitumen in the Wabiskaw and upper portion of the McMurray is either absent or does not meet this criterion.

The Board further notes that Stylus has consistently identified greater than 10 m of continuous bitumen, meeting the 50 per cent saturation cutoff, in what it defines as the McMurray D zone in all of the application wells (see Table 1). The Board notes that SSG's mapping also indicates the presence of 10 m or more of bitumen within the McMurray over most of the area surrounding Stylus's wells. Having regard for this evidence, the Board finds that potentially recoverable bitumen is present within the McMurray zone and as such warrants protection.

5.2 Whether or Not There Is Gas in Association With Potentially Recoverable Bitumen

In prior decisions, the Board used the extent and thickness of the mudstones in the applied-for wells to determine if communication exists between the gas zones and the potentially recoverable bitumen.

Isolation of Wabiskaw Gas from McMurray Bitumen

The Board agrees with the evidence presented by Stylus based on well logs that the regional mudstone separating the Wabiskaw from the underlying McMurray in the 6-28 and 6-33 wells appears to be widespread and of sufficient thickness (i.e., greater than 0.5 m) to provide isolation of gas from the underlying bitumen. The Board believes, consistent with *Decision 2003-023*, that where this basal mudstone is more than 0.5 m thick, the risk of communication is low. Accordingly, the Board believes that the earlier approved gas production from the Wabiskaw zones in the 6-28 and 6-33 wells should be allowed to continue.

The regional mudstone between Wabiskaw and McMurray is also present in the 11-30 and 2-35 wells. However, the Board accepts the evidence presented by SSG, again based on logs, that its thickness is less than 0.5 m. Stylus contended that laterally continuous impermeable breaks existed and were capable of providing an effective seal between the Wabiskaw and McMurray. However, the Board does not accept that these mudstones are laterally correlatable or provide adequate segregation. The Board continues to be concerned that in areas such as this, where the mudstone thickness is less than 0.5 m, it may not provide an effective seal between the Wabiskaw gas and McMurray bitumen. Therefore, the Board believes that the proposed gas production from the Wabiskaw zones in the 11-30 and 2-35 presents an unacceptable risk to future potential bitumen recovery in the McMurray.

Isolation of McMurray Gas from McMurray Bitumen

The isolation of gas from underlying bitumen within the McMurray in all four application wells is questionable, as there is no evidence of a mudstone with characteristics or thickness similar to the mudstone between the Wabiskaw and McMurray intervals in the 6-28 and 6-33 wells. The Board agrees with the SSG that the McMurray in this area consists of a series of incised valley-fill and channel sediments and that the potential for communication is therefore considerable. Stylus's evidence also indicated that impermeable breaks between the reservoir sands within the McMurray were not laterally continuous, although they may provide local vertical segregation. The Board therefore concludes that the proposed gas production from the McMurray in the application wells and their respective pools would create an unacceptable risk for future recovery of the bitumen within the McMurray Formation.

5.3 Extent of the Gas Pools

The Board found that no definitive evidence was presented that would result in revisions to the existing EUB pool designations, and therefore the Board concludes that no changes to the present pool orders for the subject pools are warranted. The Board has, however, determined that gas production should remain shut in for all wells within the pools noted in Table 1.

Dated in Calgary, Alberta, on November 4, 2003.

ALBERTA ENERGY AND UTILITIES BOARD

J. D. Dilay, P.Eng.
Board Member

C. A. Langlo, P.Geol.
Acting Board Member

(Originally signed by R. J. Willard)

R. J. Willard, P.Eng.
Acting Board Member

APPENDIX HEARING PARTICIPANTS

Principals and Representatives (Abbreviations used in report)	Witnesses
Stylus Exploration Inc. D. W. Rowbotham	M. Ranger, Ph.D. P. D. Evans, P.Geol. U. W. Seggewiss, P.Eng. L. Mattar, P.Eng., of Fekete Associates Inc. J. K. Wilhelm, P.Eng.
Staff Submission Group G. Perkins	C. Smith, P.Geol. F. Hein, P.Geol., Ph.D. T. Keelan, P.Eng.
Paramount Energy Trust L. Sali, Q.C.	
EnCana Corporation D. Castellino	
Nexen Canada Limited S. Young	
Petro-Canada S. Miller	
Imperial Oil Limited D. Schultz	
Devon Canada Corporation S. M Munro	
Talisman Energy Inc. F. Basham	
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