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May 12, 2003

Tery Abel, P. Eng.
Applications Branch
ALBERTA ENERGY AND UTILITIES BOARD
640 - 5 Avenue, SW
Calgary, AB T2P 3G4

Dear Mr. Abel:

Re: General Bulletin GB 2003-12 - Gas Production in Oil Sands Areas
Submission of Nexen Canada Ltd.

We enclose two copies of the submission on behalf of Nexen Canada Ltd. respecting the above noted hearing, as well as one electronic copy.

Yours truly,

BORDEN LADNER GERVAIS LLP

RANDALL W. BLOCK

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In the Matter of Alberta Energy and Utilities Board

General Bulletin 2003-12

**NEXEN CANADA LTD.
SUBMISSION ON
GENERAL BULLETIN
2003-12**

May 12, 2003

Submitted by:
Borden Ladner Gervais, LLP
Nexen Canada Ltd

NEXEN CANADA LTD SUBMISSION ON GB 2003-12

I. Introduction

Nexen Canada Ltd. (“Nexen”) provides this submission in response to General Bulletin 2003-12. The Board asks two questions in GB 2003-12:

(a) Whether existing gas production from the Wabiskaw-McMurray Formation in the Athabasca Oil Sands Area should be shut in, and/or

(b) any alternative measures that might be taken to ensure the conservation of bitumen in the Wabiskaw-McMurray Formation in the Athabasca Oil Sands Area.

The Board has exhaustively analyzed the conservation issues caused by ongoing gas production in the Athabasca Oil Sands Area in three major hearings. The Board’s seminal report “EUB Inquiry Gas/Bitumen Production in Oil Sands Areas” identified the significant risk to bitumen development caused by gas production, and the Board, in Decisions 2000-22 (the Surmont Shut-in Decision), and 2003-023 (the “Leismer/Chard Decision”) in the exercise of its public interest, mandated the shut-in of gas production in areas of significant risk to bitumen development.

Nexen submits that the existing gas/bitumen regulatory process is fundamentally about the Board managing, in the public interest, the unacceptable risks to bitumen development caused by ongoing gas production. The Board has all the necessary authority and power to ensure the conservation of resources and prevent waste. The overall recovery of hydrocarbon resources must be maximized. The Board has acknowledged that continued or increased gas production harms bitumen, and has determined that, in areas of significant risk to bitumen, it is in the public interest to shut in associated gas production. If gas production is halted, it can be reinstated when it is demonstrated on credible evidence to be in the public interest to do so.

GB 2003-12 is a significant step by the Board in the exercise of its public interest mandate to preserve the vast bitumen resources of the Province of Alberta. Although the Board’s analysis to date has focussed on the Surmont and Leismer/Chard hearing areas, gas and bitumen are reservoirized in the Wabiskaw/McMurray *throughout* the Athabasca Oil Sands Area and the risk to future bitumen development is pervasive. GB 2003-12 expands the focus on gas-over-bitumen issues to the entire Athabasca Oil Sands Area and, in Nexen’s submission, permits the findings made by the Board in the Public Inquiry, the Surmont Decision and the Leismer/Chard Decision to be applied to the entire Athabasca Oil Sands Area.

In the Leismer/Chard Decision, the Board identified specific wells that present significant risk to bitumen recovery and determined that similar depositional environments exist in the Athabasca Oil Sands Area, as follows:

With respect to Wabiskaw-McMurray grandfathered gas production in the Chard-Leismer area from wells not specifically considered at the subject hearing, the Board believes that some of the gas being produced by these 117 wells, shown in Appendix 3,

could present a significant risk to future bitumen recovery. The Board also believes that some grandfathered gas production in other areas of the Athabasca Wabiskaw-McMurray deposit with a depositional environment similar to that at Chard-Leismer (i.e., fluvial-estuarine) could present a significant risk to future bitumen recovery. Therefore, the Board believes that there is a need to develop and implement a process to address grandfathered gas production in the Athabasca Wabiskaw-McMurray deposit (including Chard-Leismer), and it intends to pursue this matter.

The Board further notes that in the Chard-Leismer area there are 22 wells, shown in Appendix 3, that were previously granted approval to produce Wabiskaw-McMurray gas. On the basis of its findings in this proceeding, the Board believes that some of the gas being produced by these wells could also present a significant risk to future bitumen recovery. Therefore, the Board believes that these wells also need to be addressed in any process developed to deal with grandfathered production. *AEUB Decision 2003-023, pp. 37-38.*

Nexen has bitumen interests in the Leismer/Chard hearing area and elsewhere in the Athabasca Oil Sands Area, and therefore Nexen welcomes the opportunity to provide input to the Board on the critical issues set forth in GB 2003-12.

II. Should Existing Gas Production From the Wabiskaw-McMurray Formation in the Athabasca Oil Sands Area Be Shut In?

(a) The Athabasca Oil Sands Area

In Nexen's view, the previous findings of the Board, coupled with a focused and streamlined hearing process, will permit the Board to effectively and with due process exercise its conservation mandate in the Athabasca Oil Sands Area.

As set forth in GB 2003-12, the Leismer/Chard hearing was the third major hearing addressing the resource conflict between bitumen development and associated gas production. Additional hearings, where no new substantive evidence is brought forward, are unnecessary. Gas production continues unabated while protracted hearings are held. The Board has made critical findings in the Public Inquiry, in Decision 2000-22 and in the Leismer/Chard Decision that can be applied to manage the ongoing conservation issues caused by continued gas production in the Athabasca Oil Sands Area.

To properly assess the risk of gas production in the Athabasca Oil Sands Area, the critical first step is the development of a regional geologic model for the Athabasca Oil Sands Area.¹

¹ Additional data must be gathered to continually assess lateral pressure communication. Although the regional geologic model may identify high risk areas to vertical pressure communication, ongoing pressure measurements are necessary to assess lateral pressure communication.

Without such a model, new gas applications are necessarily dealt with on a piece-meal basis and the variability of the McMurray Formation is misused to attempt to justify additional gas production. A regional geologic model allows the Board to determine, based on available well control, where the risk of ongoing gas production to bitumen development is significant.

The Board, in the Leismer/Chard Decision developed a regional model that may be extended throughout the Athabasca Oil Sands Area. Once extended throughout the Athabasca Oil Sands Area, all producing gas wells (whether wells subject to ID 99-1 or grandfathered wells) should be reviewed in light of a regional geologic model. The regional geological model should be completed by the Board, as part of its conservation mandate, and published to industry.²

The regional geologic model provides a framework for both the Board and industry to assess the risk posed by: a) grandfathered wells, and b) wells for which approvals may have already been granted based on inadequate data. A regional geologic model will allow the Board to develop a catalogue of wells that present a significant risk to bitumen development, similar to the list of high risk wells developed by the Board and set forth at Appendix 3 of the Leismer/Chard Decision.³

Once wells have been identified to present a significant risk to future bitumen recovery, then the following regulatory process may be followed:

- If the pressure is below 800 kPaa⁴, the Board has the power to issue an immediate shut-in order, with a direction to an expedited regional show cause hearing to either lift or ratify the shut-in;
- Assuming that the pressure is above 800 kPaa, then the Board should direct that the wells that pose a significant risk to bitumen recovery be immediately subject to an expedited regional show cause proceeding as set forth below;
- At the regional show cause hearing, which would include both wells to which the interim shut-in order applies, and other wells deemed to be a risk to bitumen development, the gas producers should be required to show cause why gas production in the areas of significant risk as disclosed through the regional geologic map should not immediately cease, or

² This is a vital and necessary first step. In the Oil Sands Area, there are large areas of unleased crown. Please see Appendix A for a map depicting unleased Crown bitumen lands.

³ Appendix 3 of Decision 2003-023 contains both wells that previous ID 99-1 approval was obtained and grandfathered wells. The central, unifying theme is the high risk to bitumen development, based on the regional geologic model.

⁴ Nexen is of the view that the less gas zone depressuring the better (see Decision 2000-22, at page 79). However, there will be areas where, due to the level of pressure depletion, the Board must act urgently. In Decision 2000-22, the Board concluded that "artificial lift becomes increasingly difficult as the steam chamber pressure is decreased below 800 kPaa until at some point it is not likely to be technically feasible to lift the fluids at all", and that "the minimum steam chamber pressure required for artificial lift to be technically feasible would be in the range of 400 to 600 kPaa" (*AEUB Decision 2000-22*, pp. 79). In Decision 2001-63, the Board cites the same conclusion in ordering the interim shut-in of associated gas production from specific perforated intervals within the McMurray Formation in 10 wells in the Chard Area (*AEUB Decision 2001-63*: pp. 1, 7, Appendix 1).

continue to be shut in. The Board, similar to Leismer/Chard, should utilize a regional hearing format for the show cause hearing;

- A regional hearing format is appropriate and essential to manage the ongoing conflict between gas production and bitumen development in the Athabasca Oil Sands Area. The regional hearing format, combined with a focussed issues list and hearing directions, should permit the Board to address any new issues in a timely and efficient manner. The resource conflict in the Athabasca Oil Sands Area cannot be managed, and the Board cannot discharge its mandate to conserve the energy resources of Alberta, if there are well by well applications, either on new gas applications or on grandfathered wells;
- The Board should direct a precise and focused issues list. In particular, the findings in the Public Inquiry, Surmont Decision 2000-22, and the Leismer/Chard Decision must be adhered to. Settled issues should not be allowed to be reargued with no substantive new evidence. This straightforward change to existing procedures would streamline the process and stop the endless revisiting of issues without any new substantive evidence. In particular, the following issues, among others, have been settled by the Board:

i) Extent of Affected Resources/Reserves

Wabiskaw-McMurray bitumen resources in the Chard-Leismer area are on trend with Alberta's most significant bitumen deposits, and most announced and approved commercial SAGD projects fall within this trend. (Decision 2002-23, p. 11)

Given the geological complexity of the McMurray Formation, a regional geological picture should be used as a starting point to assess the bitumen resource. (Decision 2002-23, p. 11)

A significant amount of potentially recoverable bitumen occurs in the Chard-Leismer area and warrants consideration for protection for future development. (Decision 2002-23, p. 11)

If even a small portion of the bitumen resource at Leismer is recoverable, the energy value of this bitumen would far exceed the total energy equivalent of the remaining recoverable gas reserves in the Leismer Field. (Decision 2002-23, pp. 11, 12)

Commercial bitumen cutoffs should not be applied at the stage when a bitumen resource is being prospected and delineated so as not to inappropriately designate bitumen resources as unworthy of protection prior to being properly assessed. (Decision 2002-23, p. 12)

ii) Reservoir and Aquifer Continuity

The Wabiskaw/Upper McMurray strata form a regional-scale, hydraulically continuous weak aquifer. (Decision 2000-22, pp. 12)

The overall transgressive event that resulted in deposition of the Wabiskaw-McMurray Formation was interrupted by periods of sea-level drop and during these periods of lower sea level the previously deposited sediments were eroded. (Decision 2002-23, p. 15)

The continuity of regionally correlatable units within the upper part of the McMurray in the Chard-Leismer area is limited by erosion due to channelling. (Decision 2002-23, p. 15)

These regionally correlatable units within the upper part of the McMurray in the Chard-Leismer area can be identified on geophysical well logs or in core and these units occur in a predictable sequence at a consistent depth below a regional Wabiskaw marker over much of the Chard-Leismer area. (Decision 2002-23, pp. 16, 18)

Mudstones within channel sequences, including channel abandonment mudstones, mudstones within IHS intervals, and mudstone breccias, are limited in extent and indicate the presence of channels that may be sand-filled a short distance away. (Decision 2002-23, p. 20)

Mudstones within channel sequences will act only as baffles to pressure transmission, not as barriers, due to their limited lateral extent. (Decision 2002-23, p. 21)

The occurrence of thick, sand-filled channels is extensive and randomly distributed in the channel environments at Chard-Leismer, similar to Surmont. (Decision 2002-23, p. 20)

All McMurray channel gas in the Chard-Leismer area is or has the potential to be associated with underlying bitumen, either through direct vertical continuity or indirectly through lateral continuity of the gas and water zones. (Decision 2002-23, p. 29)

iii) Effect of Associated Gas Production on SAGD Bitumen Recovery

Artificial repressuring should not be relied on until it has been proven to be feasible and practical in the Wabiskaw-McMurray Formation on the basis of field tests. (Decision 2002-23, p. 34)

The risks associated with SAGD bitumen production increase at lower operating pressures. (Decision 2002-23, p. 35)

Gas zone depressuring should be kept to a minimum to better ensure successful SAGD operations in terms of resource recovery and minimizing the technical difficulty of lifting SAGD fluids. (Decision 2002-23, p. 35)

In the absence of field data, the Board's previous conclusion in *Decision 2000-22* that the minimum steam chamber pressure required for artificial lift to

be technically feasible would be in the range of 400 to 600 kPaa is still a reasonable estimate. (Decision 2002-23, p. 35)

- Finally, Nexen urges the Board to establish and enforce strict deadlines for pre-hearing submissions, and hearing length.

The Board, in the absence of a specific complainant, has the power and the mandate to address grandfathered well production⁵. Critically, Section 3(5) of the Oil Sands Conservation Regulations provides that *‘where it appears to the Board that the ultimate recovery of crude bitumen in the oil sands strata may be affected by gas production, the Board may, on its own initiative or on application by an affected party, make any order or directive it considers necessary to effect the conservation of crude bitumen in any particular case’*.

Conservation and the prevention of waste are paramount. Since the Public Inquiry was held in 1997, the Board has proactively exercised its conservation mandate to preserve bitumen in the public interest. The resource conflict, as it relates to new gas wells, is being managed. However, the conservation issues are the same with grandfathered wells: associated gas production has a serious impact on ultimate bitumen recovery. If there is any equity issue, it was satisfied when the gas producers recovered their sunk costs for the drilling and equipping of a gas well which was drilled prior to the Public Inquiry. Since the Public Inquiry, each industry participant knew or ought to have known of the significant conservation issue caused by associated gas production. In reality, the “equity issue” that the gas producers complain of is the loss of the ability to produce into the future and commit waste.

The only reasonable conclusion is that the sunk costs incurred for grandfathered wells have paid out. In short, there is no longer any credible justification for continued gas production from grandfathered wells in the Athabasca Oil Sands Area where gas production creates a significant risk to bitumen development. Therefore, Nexen shares the concern of the Board expressed in GB 200312 that “steps taken to date have not adequately addressed the impact of existing or “grandfathered” gas production.”

In summation, development of a regional geologic model is the vital first step to managing the conservation issues caused by ongoing gas production in the Athabasca Oil Sands Area. A regional geologic model should be published to the industry and set forth those wells which, in the Board’s view, present significant risk to bitumen development. In the event that ongoing production presents an immediate risk, then gas production should immediately cease. A regional show-cause proceeding should be instituted by the Board which builds on the previous findings of the Board. The regional show cause hearing will address all wells that pose a risk to bitumen development, including the wells to which the interim shut-in applies. A clear and focussed issues list that builds on the previous significant findings of the Board will streamline the regulatory process.

⁵ In addition, ID-99-1 is subject to revision by the Board.

(b) The Leismer/Chard Hearing Area

The Leismer/Chard hearing area is a subset of the greater Athabasca Oil Sands Area. The Leismer/Chard hearing resulted in a focussed review of the geology of the Leismer/Chard hearing area and an extensive review of a myriad of other issues. The impact on the bitumen resource has been thoroughly examined with input from all interested parties.

Within the Leismer/Chard hearing area, the Board has already taken the critical first step of developing a regional geological model, and has applied it to identify areas where gas production presents a significant risk to future bitumen development. In doing so, the Board has determined, in the public interest, that there is a significant risk to bitumen development created by some ongoing gas production from 139 wells.

Nexen submits that the regulatory process for dealing with these wells, which comprise both grandfathered wells and wells approved under ID 99-1, should be the same as suggested by Nexen for the Athabasca as a whole: An immediate shut-in order should be issued by the Board to wells where the pressure is below 800 kPaa, and all wells identified as posing a risk to bitumen recovery, including those affected by the interim shut-in order, should be directed to an expedited regional show cause hearing in which gas producers should be required to show cause why gas production in the areas of significant risk as disclosed through the regional geologic map should not immediately cease, or continue to be shut in. The necessity of a regional format for the show cause hearing is discussed *infra*, page 4. The necessity of, and suggestions for, a focussed and precise issues list, to prevent reargument of settled issues, is discussed *infra*, pages 4-6.

III. Alternative Measures that Might be Taken to Ensure the Conservation of Bitumen in the Wabiskaw McMurray Formation in the Athabasca Oil Sands Area

Beginning with the Public Inquiry, the Board has considered several measures advanced by hearing participants as alternatives to the hearing process and rejected most. In Nexen's view, each alternative to the hearing process has failed to satisfy the fundamental objective of conserving the vast bitumen resources of the Wabiskaw-McMurray Formation. As the Board has stated repeatedly, it must consider a broader set of interests than the immediate plans of oil and gas companies active in the Athabasca Oil Sands Area. As with the numerous technical findings detailed above, the "alternative measures" already considered and already rejected should not be revisited as part of GB 2003-12. For example, the purchase of gas by the bitumen owner is not a solution. It was debated at length at the Public Inquiry and rejected by the Board. If no purchase is made on terms acceptable to the gas producer, gas production continues and conservation issues are not addressed.

Furthermore, unitization has been rejected virtually by all participants at all hearings as being unworkable. It should not be reconsidered as an "alternative" to ensure bitumen conservation.

Nexen is of the view that in the Athabasca Oil Sands Area, gas and bitumen are reservoired in the same formation and the conflict is pervasive. Concurrent production, in areas of significant risk, is not presently possible. The continued production of the gas resource has a significant detrimental effect on the bitumen resource, or certainly a very significant risk of a detrimental

effect. The status quo is not maintained while gas production continues. The harm and risk to bitumen development only increases. Although mitigative measures may (or may not) be developed in the future, the industry is simply not there and it would be imprudent to risk the vast bitumen resources on the hope of future technological development.

Therefore, Nexen submits that the risk must be managed first through curtailing gas production in areas of significant risk while technical solutions are investigated. To date, a number of alternatives have been discussed:

Technical Forums

Technical forums may assist in investigating issues and possible solutions, however, it is unlikely that the divergent positions of the bitumen owners and gas producers can be reconciled at this time. Nevertheless, Nexen is active in industry groups that are seeking technical solutions⁶.

Focus by Industry on Technical Solutions

At Surmont, gas remains shut-in while technical solutions are explored. This is the prudent course of action and one that has been charted by the Board. Gas production should not continue while technical solutions are explored and debated. The Board has clearly advised industry, on at least three occasions, that mitigative measures must be feasible and practical based on field tests. If and when mitigative measures are established to be feasible and practical, the Board may determine it is in the public interest to resume gas production.

Voluntary Resolution Alternatives

Both bitumen owners and gas producers have rights to the Wabiskaw-McMurray Formation as granted by the Crown. The resources within the Wabiskaw-McMurray Formation are in conflict and the conflict is inherent in the depositional environment. Nexen concurs with the Board that “the existing shared ownership regime, itself, makes resolution, whether voluntary or otherwise, extremely difficult.”⁷

Nexen is prepared to engage in the industry process planning exercise suggested by the Board in the Leismer/Chard Decision.⁸ However, this process will require time and planning, and a successful outcome is very much in doubt. Therefore, for at least the near term, formal regulatory involvement is necessary.

For technical solutions to be explored, and the risk to bitumen assessed, proper data is essential. Appropriate data must be gathered and the existing procedures and regulations must be enforced. The Board needs timely and accurate data on all gas wells in the Athabasca Oil Sands Area, particularly from the wells located in areas of significant risk as determined through the regional

⁶ Industry and Government Collaboration for Gas-Over-Bitumen Technical Solutions, Lateral and Vertical Pressure Communication Subcommittee.

⁷ 2003-023, p. 40.

⁸ 2003-023, p. 40.

geologic model. There should be no relaxation of the requirement to collect and submit proper pressure data pursuant to Guide 40. There should be no exemptions on the collection and filing of pressure data. Continuous recording devices must be installed in both the gas and bitumen zones. The party seeking the data should bear the cost. In some instances, the Board itself may require information and be responsible for the cost. If particulars cannot be agreed upon, they should be settled by the Board.

All wells must be logged through the entire Wabiskaw/McMurray, as per ID99-1 and logs submitted to the Board to be released subject to existing confidentiality rules. Gas producers should be required to obtain core and log through the entire Wabiskaw/McMurray interval for a minimum of one well per section. Bitumen owners must core in accordance with the lease tenure rules.

IV. Conclusion

Nexen submits that continued grandfathered gas production in a fluvial-estuarine depositional environment presents significant risk to future *in situ* bitumen development in the Athabasca Oil Sands Area. At Leismer/Chard, the areas of significant risk have been identified following a regional hearing, and the Board in the exercise of its conservation mandate should immediately shut in gas production from those wells that the Board considers present a significant risk to bitumen development. There should be no distinction drawn between “new” wells and “grandfathered wells”: the conservation issues are the same. In the greater Athabasca Oil Sands Area, the Board, building on its findings in the Leismer/Chard Decision, should develop a regional geologic model that identifies areas where ongoing gas production places future bitumen development at significant risk. Where pressures have been reduced to critical levels, immediate shut-in orders should be issued. A regional show cause regulatory process should be employed by the Board with a focussed hearing direction to streamline the existing regulatory framework for the gas over bitumen dispute to address all wells that pose a significant risk to bitumen development.

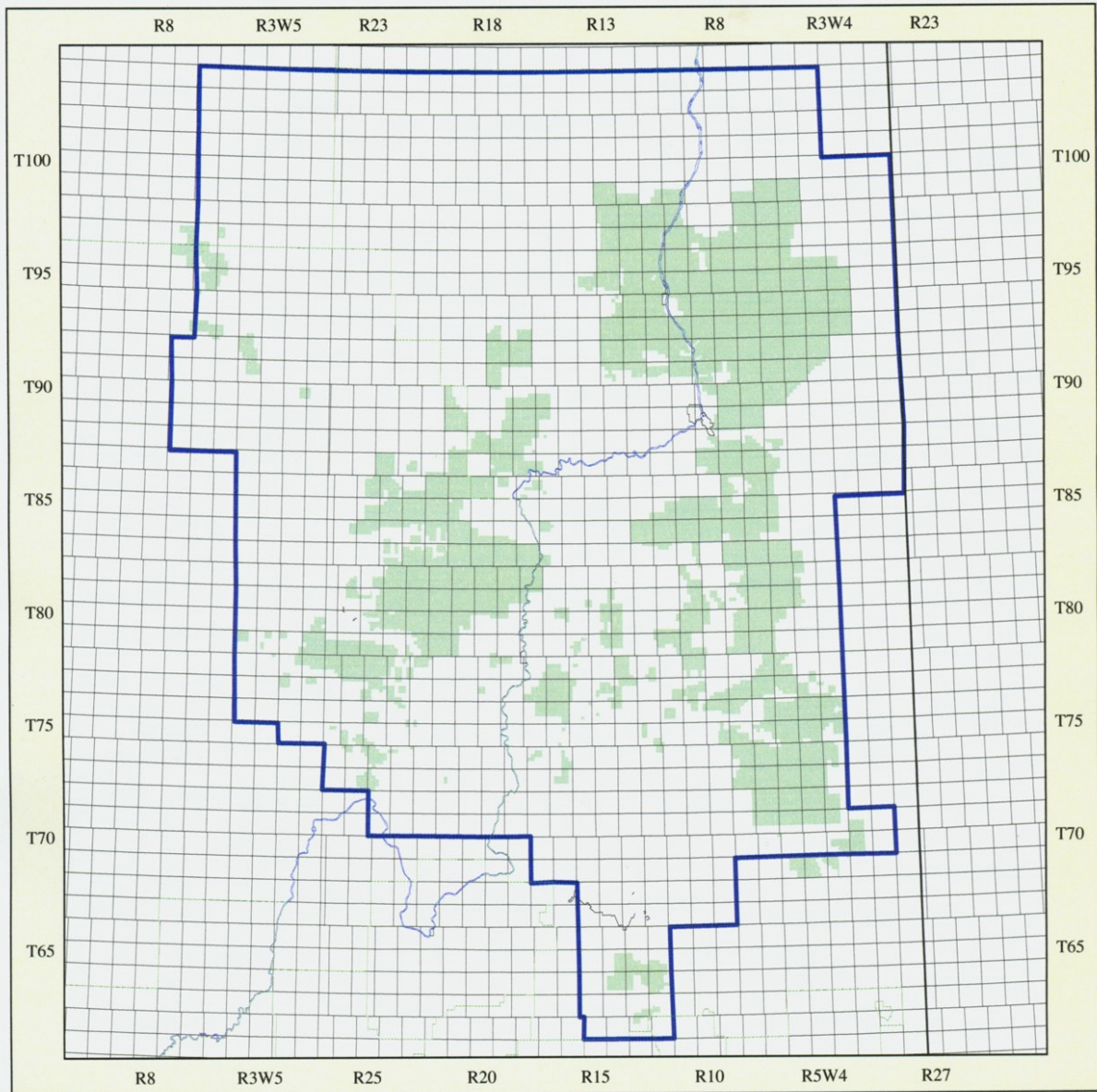
ALL OF WHICH IS RESPECTFULLY SUBMITTED ON BEHALF OF NEXEN CANADA LTD. THIS 12TH DAY OF MAY, 2003.

NEXEN CANADA LTD.

Per: _____
**Randall W. Block of Borden Ladner
Gervais, LLP, counsel to Nexen
Canada Ltd.**

Per: _____
**Shannon Young of Nexen Canada
Ltd.**

Appendix A




LAND LEGEND

Land Lists:

- Athabasca disposed oil sands

NEXEN Canada Inc.

Athabasca Oil Sands Area
Leased Bitumen Lands (green)

 <p>Map Software by IHS Energy Vol. 13 No. 04, Apr. 3 2003 (403) 770-6646</p>	<p>Author: CLS Date: May 9, 2003 File: Athabasca Oil Sands Area.MAP Scale: 1:2265740</p>
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