



Bernum Petroleum Ltd.

Applications for One Facility Licence and Two Well
Licences
Lochend Area

April 4, 2013

ENERGY RESOURCES CONSERVATION BOARD

Decision 2013 ABERCB 004: Bernum Petroleum Ltd., Applications for One Facility Licence and Two Well Licences, Lochend Area

April 4, 2013

Published by

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ENERGY RESOURCES CONSERVATION BOARD

Calgary Alberta

**BERNUM PETROLEUM LTD.
APPLICATIONS FOR ONE FACILITY LICENCE
AND TWO WELL LICENCES
LOCHEND AREA**

**2013 ABERCB 004
Applications No. 1725984, 1726232, 1726089, 1726104,
1729096 and 1729100**

DECISION

[1] Having carefully considered all the evidence, the Energy Resources Conservation Board (ERCB/Board) hereby denies Applications 1725984, 1726232, 1726089, 1726104, 1729096, and 1729100 for the reasons outlined below. The Board Minority believes that Applications 1725984 and 1726232 should be approved based on the reasons outlined further in this report.

[2] This decision report reflects the unanimous views of the Board panel with the exception of the specific views of the Majority and the Minority in the Well Applications and Public Interest sections, as noted.

INTRODUCTION

Applications

[3] Bernum Petroleum Ltd. (Bernum) applied to the ERCB, pursuant to Sections 2.020 and 7.001 of the *Oil and Gas Conservation Regulations*, for licences to drill two wells and construct and operate a multiwell battery at either a surface location in Legal Subdivision (LSD) 1, Section 4, Township 26, Range 3, West of the 5th Meridian (1-4 surface location) or an alternative surface location at LSD 16-33-25-3W5M (16-33 surface location). The two horizontal wells would be drilled to projected bottomhole locations in LSD 16-4-26-3W5M (16-4 bottomhole location) and LSD 1-33-25-3W5M (1-33 bottomhole location). The purpose of the wells would be to obtain crude oil production with no hydrogen sulphide content from the Cardium Formation. The multiwell facility equipment would consist of two separators, four liquid storage tanks, a flare knockout tank, and a flare stack.

[4] The proposed wells and related multiwell battery would be located about 4.7 kilometres (km) east of the Town of Cochrane. Figure 1 shows the proposed surface locations and other relevant features of the area.

Interventions

[5] The ERCB received an objection to Bernum's applications from the landowners of the proposed surface locations, Timothy and Frances Bancroft. The Bancrofts are the registered owners of the southeast quarter of section 4-26-3W5M, the northeast quarter of section 33-25-3W5M, and the west half of section 34-25-3W5M. The Bancrofts expressed concerns about any proposed wells and facilities being located on their lands, Bernum's assessment of alternative surface locations, Bernum's future oil and gas development plans in the area,

potential restrictions on future development plans on their lands, and potential devaluation of their lands as a result of the proposed wells and facilities.

[6] Objections to the applications were also filed by several area residents from the Meskanaw and Glendale communities. The Board provided Orvel Miskiw, Madhavan Anapara, and Nick Trenke with the opportunity to make brief statements at the hearing. These area residents expressed concerns about the proposed surface locations, Bernum's future development plans, land devaluation, impact on groundwater, air pollution and odours from flaring/incineration, increased traffic and noise, aesthetics, and public health and safety.

Hearing

[7] On October 3, 2012, the Board panel assigned to the proceeding and ERCB staff members visited the proposed surface locations, the area of the Meskanaw and Glendale communities, areas south of Highway 1A, and other well sites currently operating north and east of the proposed sites.

[8] The Board held a public hearing in Calgary before Board Members T. L. Watson, P.Eng. (Presiding Member), R. C. McManus, M.E.Des., and G. Eynon, P.Geo. The hearing commenced on November 27, 2012, and closed on December 5, 2012.

[9] Those who appeared at the hearing are listed in Appendix 1.

[10] In reaching the determinations contained in this decision, the Board considered all materials constituting the record of this proceeding, including the evidence and argument provided by each party. Accordingly, references in this decision to specific parts of the record are intended to help the reader understand the Board's reasoning about a particular matter and should not be taken to mean that the Board did not consider all relevant portions of the record with respect to that matter.

THE FACILITY APPLICATIONS

The Board considers the issues with the facility applications to be

- the relative merits of continuous flaring/incineration and gas conservation, and
- the impact of flaring on the Bancrofts' future plans and potential for country residential development.

Evidence

[11] Bernum submitted that it plans to flare or incinerate the produced gas from the applied-for wells. It also stated it anticipates using an incinerator during the well completion, cleanup, and testing phases. Bernum also stated that, at the Bancrofts' request, it will consider using an incinerator during normal production operations. Bernum stated it would need the battery licence so it could produce its first well before drilling the second well.

[12] Bernum submitted that its only option is to flare or incinerate the produced gas given that its economic evaluation, as required under ERCB *Directive 060: Upstream Petroleum*

Industry Flaring, Incinerating and Venting (Directive 060), showed conservation of gas to be uneconomic. Bernum argued that, given the estimated volume of produced gas, the expected price of gas, the cost associated with possible tie-in locations, and the recoverable resources, conservation of gas is not economic at this time. Bernum also stated that if it were required to conserve the gas, it would not drill the wells.

[13] Bernum hopes to drill follow-up wells, tie in the produced gas some time in the future, and make the whole project (i.e., the full development of its mineral holdings in sections 33-25-3W5M and 4-26-3W5M) more economic. Bernum confirmed that it assessed the economics of tying in the gas based on a two-well scenario and not on a project-based case. Bernum noted that, while it did not believe the initial proposed well is high risk economically, it has exploratory risk in the sense that Bernum does not know what the flow rates will be. Bernum argued it needs to drill, complete, and test the initial well before it makes any future plans.

[14] With its applications, Bernum provided an economic evaluation for gas conservation. Bernum based the economic evaluation on the expected volume of produced gas from the two wells with recoverable reserves of approximately 16 300 thousand cubic metres (10^3 m^3) of gas (579.1 million cubic feet [MMCF]),¹ a capital cost of \$2.2 million, royalties of \$233 000 and operating expenses of \$2.0186 million, at a zero per cent discount rate. The results of the economic evaluation indicated the conservation of gas had a net present value (NPV) of negative \$1.22 million, before tax, at a zero per cent discount rate. At a 6 per cent discount rate, the NPV was negative \$1.50 million, thus indicating that gas conservation was uneconomic. However, Bernum admitted that the economic case submitted in its application should not have included royalties or contingencies.

[15] In its application, Bernum used a daily oil production rate of 63.3 cubic metres per day (m^3/day) and an initial gas production rate of $12.5 \times 10^3 \text{ m}^3/\text{day}$ for the proposed wells. Based on these values, Bernum calculated the gas-oil ratio (GOR) for the wells to be $197 \text{ m}^3/\text{m}^3$. Bernum stated this is consistent with data obtained from the producing wells further north that indicate an initial GOR in the range of 195 to $200 \text{ m}^3/\text{m}^3$. Bernum noted from these data that while the oil production rates declined, the gas rates remained the same; therefore the GOR increased over time. Based on the estimated gas rate and GOR, Bernum calculated a gas decline rate of over 50 per cent in the first year of production. The gas production rate then levelled off to about $2\text{--}5 \times 10^3 \text{ m}^3/\text{day}$ for both wells, giving a decline rate of less than 15 per cent.

[16] Bernum noted that the gas decline rate used in its economic evaluations was based on data from similar wells currently producing farther north in the Lochend Cardium trend. Bernum estimated the life of the wells to be about 20 years. However, Bernum acknowledged that its estimated production rates were based on a worst-case scenario.

[17] Bernum stated that since there is currently no production information from the immediate area and the proposed wells are exploratory, it had to make assumptions and consider the worst-case scenario for the gas production rates used in its economic evaluation.

¹ It is the Board's practice to use metric units. However, since participants at the hearing referred to some parameters in imperial units, the metric equivalent will also be provided throughout the report.

Bernum indicated that it looked at the best 15 wells currently producing to the north and applied the expected oil production and GORs from those wells to its proposed wells. It stated that it based the steep gas decline rates on the steep decline rates of the oil production shown in producing wells in the Lochend Cardium trend, and therefore the GOR remained constant. However, referencing the wells to the north, Bernum indicated that as oil rates declined, the gas volumes had stayed fairly constant; therefore, the GOR increased. Bernum was also unclear as to whether the Lochend Cardium oil reservoir was saturated or undersaturated with gas.

[18] Bernum identified the well at LSD 6-17-27-3W5M² (6-17 well) as an example well that could make 200 000 barrels (approximately 31 800 m³) of oil production over its anticipated lifetime, and noted that it hoped to be in that part of the trend. In fact, it stated that it considered this area to be a “sweet spot.” However, Bernum noted that many of the wells to the north would likely not produce 50 000 barrels (approximately 8 000 m³).

[19] The Board asked Bernum (Board’s undertaking) to run an economic analysis that did not include royalties (as *Directive 060* does not allow the inclusion of such), use an adjusted capital cost of \$1.8 million to account for an effluent pipeline that would not require a compressor, and use a gas decline rate of 15 per cent.

[20] However, in its response Bernum still included royalties of \$142 400 (discounted at zero per cent) when it was specifically asked not to. The economic analysis, as requested in the Board’s undertaking, used a gas decline rate of 15 per cent with total gas reserves of approximately 26 140 10³ m³ (923.2 MMCF), a capital expense of \$1.8 million, and an operating cost of \$1.32 million. This economic run provided a before tax cash flow of \$1.08 million at a zero per cent discount rate or \$189 900 at a 6 per cent rate.

[21] Bernum stated that when the economics are run on a gas-revenue-only basis, assuming an initial gas flow rate of 12.5 x 10³ m³/day, a 15 per cent decline rate, and gas reserves of approximately 26 400 10³ m³ (932 MMCF), gas conservation appears to be economic. Bernum argued that the parameters suggested in the Board’s undertaking were not realistic. However, it acknowledged that if it drilled future development wells, gas conservation might be economic.

[22] Bernum stated it would consider an effluent pipeline once it had established that the full development project was economic. Bernum would also consider centralizing its facilities to include an effluent pipeline to take the products off site to a tie-in location at LSD 15-22-26-3W5, thereby eliminating both trucking and flaring. Bernum confirmed that an effluent pipeline would also eliminate certain equipment costs, such as flare stack/incinerator, tanks, flare knockout drum, gas compressor, and battery piping.

[23] Bernum acknowledged there would likely be interest from other operators in the area to tie in to the pipeline once constructed, and confirmed that it had discussed this with other operators. Bernum recognized that participation of other operators in its tie-in pipeline would create revenues to offset part of the pipeline cost.

² Note that Bernum referenced a well at LSD 6-17-27-3W5M and a well at LSD 16-17-27-3W5M. The Board confirms that there is no well licensed at the 16-17 location, and it assumes that Bernum’s reference was in error and it meant to refer to the 6-17 well.

[24] Bernum was asked by the Bancrofts to calculate the economics for the 16-4 bottomhole location assuming an off-site battery at LSD 7-33-25-3W5M. Bernum said its calculation used recognized industry values for the Lochend Cardium trend. It said that, based on a lifetime production from each well of 90 000 barrels (approximately 14 310 m³) of oil, initial capital investment of \$4.5 million per well, no tie-in pipeline or facility, and a discount rate of 10 per cent, the wells would be marginally economic with an NPV of \$44 000 before tax.

[25] Bernum indicated that when the economic case is run with a total production of 130 000 barrels (approximately 20 670 m³) per well, and including the cost of a battery and pipeline to take effluent from the well site to the off-site battery, the well would still be marginally economic at an NPV of \$20 000. However, in this scenario, the gas would still be flared at the 7-33-25-3W5M location.

[26] The Bancrofts submitted that if the Board were to approve these applications, it would be in the public interest to require Bernum to conserve gas. The Bancrofts argued that without a requirement for gas conservation, the construction of a battery on their lands would result in continuous flaring and a greater impact on future use of their lands compared with just drilling two wells.

Analysis and Findings

[27] With respect to Bernum's conclusions about the economics of gas conservation, the Board is not convinced that gas conservation is uneconomic. The Board notes that Bernum itself indicated the analysis provided in the application is a worst-case scenario and that better economic results could be achieved. Based on the economic runs provided by Bernum in its application and in the Board's undertaking, the Board finds that Bernum could generate a positive NPV.

[28] The Board is of the opinion that, even with Bernum's gas decline rate estimates but using a capital cost of \$1.8 million, an operating expense of \$1.32 million, and without including royalties, Bernum could realize an NPV in excess of \$100 000 at a zero per cent discount rate before tax. The Board would expect the NPV to be positive at a 6 per cent discount rate.

[29] Bernum indicated that it based its submitted economic runs on production information from wells currently producing to the north along the Lochend Cardium trend. However, the Board notes that data from the 6-17 well, referenced by Bernum at the hearing, indicates GORs that are higher than the GORs used by Bernum, and that increased over time. Furthermore, Bernum calculated the GOR for the wells to be 197 m³/m³, yet in its testimony it indicated that the average GOR of the wells to the north is about 305 m³/m³. The Board notes that public information on wells in the Lochend Cardium trend indicates an average GOR of 346 m³/m³.

[30] The Board finds that the gas decline rate used by Bernum in its economic runs is not supported by the evidence. The Board finds it more reasonable to remove the first month of flush production from the decline rate calculation and use a decline rate closer to the 15 per cent rate suggested in the Board's undertaking. The Board finds that Bernum's GOR calculations for the proposed wells are overly conservative, and that it is not consistent or

appropriate to assign a constant GOR to a reservoir of this type, given the information available from the representative wells.

[31] The economics Bernum presented in its application is based on an estimated gas production associated with approximately 14 310 m³ (90 000 barrels) of oil from each well. The Board accepts Bernum's position that this estimate would be a worst-case scenario and that oil production, in what Bernum described as a "sweet spot" on the trend, could be significantly higher, with commensurately higher gas production rates.

[32] The Board also notes that Bernum, in error, included royalties and contingencies in its economic runs. Furthermore, although Bernum's economic runs were based on a 6 per cent discount rate, it consistently referred to results at a 10 per cent discount rate in its oral testimony, giving the impression that the economics were even worse. *Directive 060* dictates that contingencies and royalties are to be excluded and that the appropriate discount rate must be equal to the prime lending rate of ATB Financial on loans payable in Canadian dollars plus 3 per cent, based on the month preceding the month during which the evaluation is conducted. At the time of the hearing, the prime lending rate was 3 per cent; therefore, a 6 per cent discount rate should have been referenced.

[33] As a result, the Board does not accept Bernum's negative conclusions regarding the economics of gas conservation. Further, the Board finds that economic analysis would support gas conservation when using the appropriate corrected factors, inputs, and discount rates.

[34] The Board notes Bernum's agreement that if the wells proved successful and it constructed an effluent pipeline, other operators in the area would likely tie into that line. Bernum confirmed that there will likely be an opportunity to apply access fees and transmission costs to other operators, thereby offsetting the initial capital costs and operating costs of the pipeline. The Board further notes, however, that Bernum's economic calculations did not account for the possibility of cost recovery on the pipeline from other operators in the area.

[35] The Board agrees that the construction of an effluent pipeline would make the overall project economics more favourable by reducing trucking and operating expenses. An effluent pipeline would also reduce traffic and associated nuisance issues such as dust, odours, and noise. The Board finds that, should a pipeline be constructed, the economics of future development in the area would be improved given a shorter and less expensive tie-in for additional wells. This would contribute to an overall reduction or elimination of flaring in the area.

[36] The Board also notes that construction of an effluent pipeline before the onset of production would eliminate the need for continuous flaring or incineration and the 500 m setback requirements. In addition, the Board notes that concerns about the visual aesthetics of flaring would be eliminated and concerns about the future marketability of country residential development in the area would be greatly reduced.

[37] However, the Board is aware that flaring or incineration would be required during completion, cleanup, and testing phases even if an effluent or gas pipeline is built. The Board finds that the use of an incinerator during these operations would mitigate potential concerns about visual aesthetics and noise usually associated with temporary use of a flare stack.

Furthermore, the Board is of the view that using an incinerator would ensure more efficient combustion of the produced gas during these activities.

[38] Given all the above, the Board denies the facility applications.

THE WELL APPLICATIONS

[39] The Board considers the relevant issues respecting the well applications to be

- the appropriateness of the proposed surface locations given the potential for future drilling and reserves development of Bernum's mineral holdings in the Lochend area
- the proliferation of surface activities related to oil and gas development
- the potential impacts of the proposed wells on future country residential development opportunities for the landowners

Evidence

[40] Bernum said it holds a freehold mineral lease for section 33-25-3W5M (section 33) and a Crown mineral lease for section 4-26-3W5M (section 4). Bernum also holds a freehold mineral lease for section 31-25-3W5M (section 31) and a combination of Crown and freehold lease for the northwest quarter of section 28-25-3W5M (section 28). These areas are in the Lochend field, defined by Bernum as the area encompassing townships 25 to 28, ranges 3 and 4, west of the 5th meridian, north of the Bow River.

[41] Bernum stated that the proposed wells are exploratory in nature because they are outside an established pool or field at the south end of the Lochend Cardium trend, and the wells are therefore classified as "new pool wildcat" wells. Bernum added that there is little well control in the area; only five wells have been drilled as oil wells deep enough to evaluate the Cardium Formation, of which three were drilled in the 1960s.

[42] Bernum noted that it considers the entirety of the sections 4 and 33 to be within a mapped "sweet spot" based on the 5 m contour of greater than 25 ohm-metres resistivity response. Bernum noted that the existing abandoned well at LSD 6-33-25-3W5M is the closest point of well control that confirms its "sweet spot" interpretation.

[43] Bernum confirmed its plan to drill the 16-4 bottomhole location first. Contingent upon the testing results of this well, Bernum proposes to produce the well for six to eight months to understand the potential reserves. If successful, it would then drill the well to the 1-33 bottomhole location. Bernum further confirmed that, if the proposed wells are drilled and prove to be economic, it intends to drill the west halves of sections 33 and 4. Bernum also indicated it has no immediate plans to drill the northwest quarter of section 28.

[44] Since Bernum plans to flare or incinerate the produced gas from the proposed wells, it reviewed potential alternative surface locations using the 500 m setback from existing residences as required by *Directive 060*. Bernum maintained that its assessment looked at every reasonable surface location from which to drill. All other locations were ruled out

because they either contravened the setback regulations or resulted in unnecessary environmental, residential, or economic impacts.

[45] Bernum stated that it used a two-step process in selecting its surface locations. First, it accounted for technical considerations, and second, it looked at surface impact issues such as restrictions on flaring near existing residences. The three main technical criteria used in the assessment were (1) to drill both wells from one pad site to minimize the environmental footprint and surface land acquisition costs, (2) to drill straight horizontal wellbores in a north-south direction to minimize operational and drilling risks and costs, and (3) to drill about a 1400 m horizontal leg within the Cardium Formation to maximize well productivity and resource recovery. Bernum further submitted that its proposed surface locations maximize potential recovery and production while minimizing operational cost and risk.

[46] Bernum stated that until gas conservation becomes economic, it plans to continuously flare the produced gas. This limited its options for potential surface locations given the 500 m setback from existing residences in *Directive 060*. Bernum further said that even if it used the 100 m setback imposed by the category type of the wells, there would only be two additional possible surface locations—one at LSD 4-3-26-3W5M and another at LSD 13-34-25-3W5M, both immediately east of the applied-for locations.

[47] The Bancrofts submitted that Bernum failed to recognize the sensitivity of the area in which it proposed the project—that it is situated between the Calgary and Cochrane urban areas and has considerable country residential development. The Bancrofts further submitted that any oil and gas development in the area should require careful planning to avoid conflict in the neighborhood.

[48] The Bancrofts argued that the only real benefit of Bernum's proposed surface locations is that the wells and battery are on one site. However, it argued that this benefit completely fails the test of reasonableness given Bernum's evidence that additional surface locations would be required farther west, likely in the same quarter section, for any follow-up wells. The Bancrofts further argued that the motivation for Bernum to combine the wells and battery on a single site and limit the current application to two wells was driven by the desire to keep the costs of its project as low as possible.

[49] The Bancrofts submitted a technical report by Bissett Resource Consultants Ltd. (the Bissett report) that assessed Bernum's proposed surface locations and proposed viable alternatives either not considered or rejected by Bernum. The Bancrofts said the site selection criteria used in the Bissett report were that (1) the proposed wellbores should not be a greater technical challenge than the ones proposed by Bernum, (2) the wellbores should be drilled horizontally in a north-south orientation, (3) the sites should not be located within the boundaries of Glenbow Ranch Provincial Park, and (4) the alternative sites should comply with prevailing regulatory requirements.

[50] At the hearing, Mr. Bissett also acknowledged that he was told to make sure that none of the alternative locations were to be on any land owned by the Bancrofts. He admitted that this criterion was not referenced in his report.

[51] The Bancrofts argued that, from a technical perspective, all alternative locations proposed by the Bissett report are acceptable alternatives to Bernum's proposed locations and

that the only disadvantage of those locations is that the wells and the associated battery are located on separate sites.

[52] Bernum stated that the surface locations proposed by the Bissett report result in increased infrastructure proliferation, environmental and residential impacts, additional cost, pipeline construction footprint, and land fragmentation.

[53] Bernum further argued that the only reason the Bissett alternatives are in the report is that they are not on the Bancrofts' land. Bernum noted that when Mr. Bissett was asked for his professional opinion on a surface location if surface ownership were to be ignored, he admitted that he would prefer either the 1-4 or the 16-33 surface locations proposed by Bernum over his recommended surface location at LSD 4-3-26-3W5M.

[54] The Bancrofts submitted that Bernum's assessment of alternative surface locations is deficient because Bernum has not completed a full area development plan that would factor the location of future wells into its current applications.

[55] Bernum argued that it would be irresponsible and meaningless to prepare a development plan at this stage with so many unknown variables. Bernum questioned the value of a development plan that would be largely conceptual for an exploration activity. Bernum emphasized that it did not have plans to drill additional wells at this time, and that any future drilling would be contingent on successful production from the two exploratory wells.

[56] However, Bernum did note that, based on the current spacing unit in the Lochend Cardium field, it could be drilling up to four wells per section; that is, a total of eight wells for the two sections (sections 33 and 4) for which it holds the mineral rights. Bernum confirmed that it would not be able to access its minerals in the west halves of sections 33 and 4 from the proposed surface locations and would, therefore, require another surface location.

[57] Bernum further acknowledged that all eight wells could be drilled from a single pad site near the existing radio tower, which is in LSD 2-4-26-3W5M. Bernum said it considered this area but discarded it given the proximity to the Meskanaw and Glendale communities and the initial negative responses it received from residents.

[58] The Bancrofts submitted that by applying for only two of the eight potential wells, Bernum placed a higher burden than necessary on the Bancrofts because they could ultimately end up with more than one surface location on their lands instead of a single surface location, had Bernum planned the total project better. The Bancrofts admitted that a location to the west near the radio tower would be less of a problem, but it would not be the ideal solution for them as they do not want any wells on their lands.

[59] Bernum submitted an environmental assessment of the proposed locations that considers land disturbance; groundwater issues, proximity of the locations to surface water, topography, and drainage; and aesthetic issues including visibility, noise, and traffic. Bernum stated that the proposed sites were preferred from an environmental perspective given that any issues with the proposed locations are relatively minor. The Bancrofts agreed that environmental issues are not significant for the proposed development and said that the wells could be drilled from any of the proposed Bernum or Bissett report locations with minimal environmental impact.

[60] Bernum stated that the risk to groundwater from the proposed wells is extremely low. Nevertheless, Bernum offered to test the Bancrofts' water well before and after drilling, and it committed to set surface casing below 600 m rather than the applied-for 378 m to cover the entire base of the groundwater protection zone; to use water- and polymer-based drilling fluids; and to monitor wellbore pressure throughout the life of the well to ensure wellbore integrity.

[61] Bernum indicated it had tried to mitigate concerns of residents about noise, visual aesthetics, and traffic when it assessed alternative locations. Bernum stated that criteria for its site selection were to be as close as possible to existing road infrastructure and as far as possible from existing residences. Surface access was planned to avoid passing near to residences and avoid using private rights-of-way. Bernum noted that these actions would minimize construction and acquisition costs, reduce surface disturbance, and generally reduce landowner concerns.

[62] Bernum confirmed that access to the proposed well sites would be directly from Highway 1A onto Range Road 33, an existing high-grade gravel road. Bernum would need to construct about 52 m of new access road along an undeveloped road allowance to connect Range Road 33 to either of the proposed well sites. Bernum said there would be little impact on the community given the distance of 680 m to the nearest residence, the direction of prevailing winds, and the screening effect of trees around the proposed sites.

[63] Bernum presented photographs of similar oil well sites currently operating near residential developments, some as close as 100 m, to demonstrate the ability for oil and gas development to co-exist acceptably with residential development. During cross examination; however, Bernum acknowledged that none of the well sites in the photographs had flaring batteries.

[64] Bernum said that it would comply with ERCB *Directive 38: Noise Control* and with Rocky View County (the County) noise and dust requirements. Bernum agreed to use noise suppression equipment where reasonably possible during drilling and completion activities, and to organize the timing of trucking activities to further reduce noise impacts to residents.

[65] Bernum submitted that the alternative locations in the Bissett report included separate and/or combined well sites and battery sites that would require either longer access routes, new construction across private lands and along public road allowances, or the use of existing private roads. Bernum also stated that some of the Bissett alternative locations would be visible from nearby residences. In terms of aesthetics, Bernum said that given the topography and screening by tree cover, the proposed sites would not be visible to residents of the Meskanaw and Glendale communities. However, the Bancrofts argued that the facility, and in particular the flare stack, would be visible from Range Road 33 and from residences to the west.

[66] Bernum argued that many Board decisions made it clear that it is not in the public interest to deny a mineral owner the right to explore its minerals on the basis of future land development plans, referencing *Decision 2010 ABERCB 004* as an example of similar circumstances. Bernum argued that the Board in that decision found it was not in the public interest to preempt oil and gas development for potential surface development that is

sometime in the distant future and for which the required planning approvals had not been secured or even sought.

[67] Bernum submitted a report by CityTrend that examined the County's land use planning process, particularly the development potential of the lands on which the wells are proposed. CityTrend concluded, among other things, that the proposed Bernum sites are the optimal ones for well site development compared to the alternatives.

[68] Bernum noted the uncertainty around the County's land planning policies and suggested that the likelihood of it accepting new applications and approving a conceptual scheme for country residential development is, at this time, low. Bernum stated that in the past three years only two such conceptual schemes were submitted and neither was approved. Bernum estimated that approval of a conceptual scheme would take about six years from submission date.

[69] The Bancrofts submitted a report by Brown & Associates Planning Group that assessed the impact of the proposed Bernum wells and flaring battery on the future residential development potential of the Bancrofts' lands. The report provided alternative locations for the wells and battery in accordance with prevailing County land use policies. The report concluded that it is reasonable to expect that a development application, if submitted, would be approved by the County and that the proposed Bernum project would have a detrimental effect on the development potential of the Bancrofts' lands.

[70] The Bancrofts acknowledged that the County's current municipal development plan is under review, but they said that this would not preclude the submission of a conceptual scheme, and they submitted that the County would be required to review all applications under the existing regulatory structure. The Bancrofts noted that, even if it were to take six years to start country residential development, Bernum's wells and battery will be on their land for a lot longer than that.

[71] The Bancrofts acknowledged that they had no immediate plans to develop the southeast quarter of section 4-26-3W5M or the northeast quarter of section 33-25-3W5M and that they planned to continue farming those lands and also provide some undisturbed habitat for wildlife. However, they acknowledged that the lands have considerable value for development and represent their children's inheritance and a comfortable retirement for the Bancrofts.

Analysis and Findings

Unanimous Findings of the Board

[72] The Board notes that Bernum has the necessary mineral rights to access the resources for the subject applications. The Board further notes that the Government of Alberta is the owner of the resource for the proposed 16-4 bottomhole location and that Bernum possesses a mineral lease that gives it the right to explore and develop the Crown's resources. The Board also acknowledges that Bernum has the right to access minerals at the 1-33 bottomhole location, a right it obtained from the freehold mineral owners for the northeast quarter of section 33.

[73] The Board confirms that Bernum applied for “new pool wildcat” well status and accepts the evidence put forth by Bernum that the applied-for wells are exploratory in nature.

[74] Based on Bernum’s mapping of the “sweet spot,” the Board notes that an exploratory well, such as that applied for in section 4, could be drilled to any bottomhole location on Bernum’s two sections of mineral rights and still qualify for “new pool wildcat” status and the concomitant beneficial royalty reduction treatment under the current rules. The Board further notes that such exploratory bottomhole locations could be drilled from surface locations other than those applied for.

[75] The Board acknowledges Bernum’s efforts in assessing potential surface locations before selecting its proposed well sites. The Board notes that the criteria used in selecting the surface locations are reasonable given that Bernum designed its applications to allow for flaring of the produced gas and to place the wells and associated facility on a single surface location.

[76] The Board notes Bernum’s assertion that, without the 500 m flaring setback from residences, there would only be two additional surface locations. The Board finds Bernum’s testimony to be inconsistent in this respect. In one instance Bernum said it would have only two additional options for a surface location if flaring is not allowed. However, in several other instances it indicated that the applied-for wells, and the six potential future wells, could be drilled from a site close to the existing radio tower. Such a site is in addition to the two mentioned previously at LSD 4-3-26-3W5M and LSD 13-34-25-3W5M, both immediately east of the applied-for locations.

[77] The Board notes that although the alternative surface locations proposed by the Bissett report could accommodate the proposed wells, these locations would result in multiple surface locations being required that would affect other landowners, but not the Bancrofts.

[78] The Board finds it troubling that Mr. Bissett only disclosed at the hearing, and not in his expert report, that his primary criterion for alternative sites was that they would not be located on Bancrofts’ land.

[79] The Board does not accept Bernum’s contention that the findings in *Decision 2010 ABERCB 004* are relevant to this project. *Decision 2010 ABERCB 004* is different in almost every fact from the current matter. The Board notes the Bancrofts’ lands are located between Calgary and Cochrane in the Lochend area, which has a significant amount of country residential development, and the Board is of the view that country residential development in the area will continue. The area discussed in *Decision 2010 ABERCB 004* does not have this level of development.

[80] The Board acknowledges the uncertainty about the current County planning bylaws for country residential development, about whether the municipal authority would approve any particular conceptual plan, and about the amount of time it would take to obtain an approval. However, based on the development of the area to date and the location of the property between Calgary and Cochrane beside Highway 1A, the Board finds it reasonable to assume that country residential development is likely to occur.

[81] The Board notes that surface access to the proposed well sites is from Highway 1A and acknowledges Bernum's efforts to minimize traffic impacts on area residents.

[82] The Board understands that one of the main reasons Bernum chose the proposed sites is to enable the construction of a battery and allow for flaring, thus not conserving the produced gas. Since the Board is denying the facility applications, for the reasons previously outlined, there would be no battery at the well site, and continuous flaring would not occur.

Findings of the Board Majority

[83] The views expressed herein are those of Board Members T. L. Watson and G. Eynon (the Majority).

[84] The Majority notes that, while it did not submit applications for future wells, Bernum indicated that it had leased the mineral rights to the west halves of sections 33 and 4, the development of which would require additional wells. The Majority understands that Bernum would not be able to drill wells into the west halves of those sections from the proposed surface locations. However, Bernum acknowledged it could drill the applied-for wells, as well as additional development wells, to access its full mineral holdings from a location near the existing radio tower.

[85] The Majority finds that Bernum could drill the two applied-for bottomhole locations from a site that could also accommodate future development drilling, particularly given that the Board is denying the applications for the facilities with their associated flaring. The Majority finds that Bernum failed to consider the possibility of future wells and the impact those would have on the number of sites required on Bancrofts' land.

[86] The Majority notes that Bernum discounted a location near the radio tower given the proximity of the Meskanaw community, but that it provided photographic evidence showing oilfield developments (without flaring facilities) close to other residential development. The Majority also notes that a future site to access the remainder of Bernum's minerals would be required further west and nearer the Meskanaw community. The Majority is of the view that the 100 m setback from a residence for an oil well with no hydrogen sulphide content could be appropriate, particularly if Bernum applied mitigation measures similar to those it intends to implement at the proposed sites (e.g., sound masking techniques, and landscaping to address visual aesthetic issues).

[87] The Majority notes that under sections 2.2.1(11) and 2.2.2 (16e) of *Directive 056: Energy Development Applications and Schedules (Directive 056)*, if a proposed development is part of a larger project the applicant is expected, before submitting the application, to discuss the entire project and explain how it complements other energy development in the area. The Majority finds that in this case it is necessary to understand the full extent of Bernum's project on sections 4 and 33 so it can consider the impacts on the landowners, residents, and community before making a decision on an application.

[88] The Majority also finds that where it is reasonable to plan full resource development, applicants should propose locations that limit surface disturbance, particularly in areas where competing land uses could be incompatible.

[89] While it agrees that the minerals Bernum has acquired should be developed, the Majority finds that the applied-for surface locations are neither the optimal nor the only locations from which the wells could be drilled to recover those minerals, a fact that Bernum itself confirmed. The Majority therefore encourages Bernum and the Bancrofts to find a single, mutually acceptable location that would minimize surface impacts on Bancrofts' lands.

[90] Based on the above, the Majority denies the well applications on the basis that the proposed surface locations are not the optimal locations to accommodate the two proposed exploratory wells and the potential development wells that Bernum would require in order to fully access its minerals.

Findings of the Board Minority

[91] The views expressed below are those of Board Member R. C. McManus (the Minority).

[92] The Minority finds that the Board's role in this matter is to determine if the two Bernum wells, as applied for, are in the public interest with respect to environmental, social, and economic considerations.

[93] The Minority notes that under section 2.2.1(11) of *Directive 056*, the Board expects applicants to consider the entire project, if the proposed development is part of a larger project, before submitting the applications. The Minority is of the view that due to the exploratory nature of the proposed wells, a full consideration of a development plan may not be possible at this time, and the Board, in considering this application, need not take into account the impacts of future potential development wells. The Minority finds that the above-mentioned expectation of *Directive 056* for a development plan would not apply in this case.

[94] The Minority is of the view that if Bernum were to provide a development plan without information on the two proposed exploratory wells, such a plan would be of limited assistance in determining the need for future wells and associated surface locations for future wells or other infrastructure.

[95] If the proposed wells proved successful, Bernum would gain information about the pool and about any future developments that may be required. At that time, Bernum would be expected to create a more comprehensive development plan and conduct the required consultation before proceeding with future well applications for consideration by the Board.

[96] If the wells are unsuccessful, drilling and completion at the 1-4 surface location will have minimized the noise, dust, visual, and general disturbance impacts to the Glendale/Meskanaw and other area residents.

[97] The Minority finds that approval of the well licences would facilitate drilling and the evaluation of Bernum's mineral interests, and it would provide the actual production figures necessary for Bernum to determine what its future development plans would be.

[98] The Minority agrees that by eliminating flaring and the associated 500 m setback as considerations in locating Bernum's proposed exploratory wells, Bernum may determine that the proposed 1-4 surface location is not optimal. Should Bernum make such a determination,

the Minority strongly encourages Bernum and the Bancrofts to collaboratively identify a new and mutually suitable surface location for the wells.

[99] Given the exploratory nature of the wells as applied for, without consideration for future development, the Minority finds that the proposed 1-4 surface location is the most suitable location.

PUBLIC INTEREST

Evidence

[100] Bernum argued that the proposed wells are in the public interest given the revenue that would be received by the Crown, the Province, the County, the mineral owner, and the surface owner in the event of success. Bernum stated that: 1) the estimated royalties payable on the 16-4 bottomhole location would be about \$2 million; 2) the 1-33 bottomhole location would be subject to freehold mineral tax of about \$400 000; 3) about \$2.9 million in royalties would be payable to the mineral lessors of section 33; and 4) the County would benefit from linear taxes on the equipment at the well site. Bernum noted that the project would also create jobs for the drilling and operating phases of these wells.

[101] The Bancrofts argued that the economic benefits of this particular project are not nearly as obvious as they are typically in other cases considered by the Board. They noted that the economic benefits of the 1-33 bottomhole location would accrue primarily to the freehold mineral owners and to Bernum. The Bancrofts further noted that the 16-4 bottomhole location on a Crown minerals lease would, by virtue of its exploratory status and favourable royalty treatment, pay royalties of 5 per cent for the first three years.

[102] Bernum argued that economics is a key issue in considering the public interest given Bernum's desire to flare the produced gas. Bernum argued that there was no value in issuing the well licences and burdening the Bancrofts with a well site on their land if the Board found flaring unacceptable and required Bernum to conserve gas from the very beginning, as this would render the project uneconomic. Bernum acknowledged that economics come into play when planning a project, but argued that it would not be in the public interest to burden its two-well project with extra costs that would render it uneconomic from the outset.

[103] Bernum argued that there is nothing on the record that would disqualify it from getting these well licences based on the Board's public interest mandate.

[104] The Bancrofts argued that of the three aspects of the public interest, the issues in this case are mainly social and economic, and less related to environmental effects.

[105] The Bancrofts argued that clause 2(a) of the mineral lease agreement between Bernum and the freehold mineral lessors restricts surface development on lands south of Highway 1A. They further argued that this provision effectively constitutes a fetter or constraint on the ERCB in its role to assess all possible surface locations. Bernum argued that it is common in Alberta, where there is a separation of surface and mineral titles, for a surface owner to bear the burden of a well while a different mineral owner gets the benefit of the royalties. Bernum noted that in Alberta, the Crown owns a large percentage of minerals but it does not own the

same percentage of the surface land; the Crown gets the benefit of the royalty while a different surface owner is compensated for the surface lease.

[106] The Bancrofts argued that if flaring were to be allowed, it would be preferable to locate the facility south of Highway 1A, farther from the community and farther from lands with country residential development potential. The Bancrofts also maintained that Bernum had not planned its project to account for the sensitive nature of the area (that is, its proximity to Calgary, Cochrane, and nearby dense country residential communities) in which it proposes to continuously flare. The Bancrofts argued that, as a result, Bernum failed to meet the social aspects of the public interest test. The Bancrofts submitted that the Board must consider interference with future land use potential when assessing the Bernum applications.

[107] The Bancrofts' land use planning expert said that, especially in the context of a comprehensive planned country residential subdivision, it does not make sense that the *Directive 060* setback of flaring facilities from existing residences is 500 m while new residences can be built as close as 100 m to a flaring facility site. He also noted that once the ERCB approves a facility, the municipality has jurisdiction to regulate land use conflicts and perhaps, if needed, impose setbacks for future development that might be greater than those established by the ERCB. Furthermore, the Bancrofts' land use planning expert stated his opinion that a residential project closer than 500 m from a flaring facility site would not be marketable in a country residential community such as Bears paw and that *Directive 060* does not take this into consideration.

[108] Both parties agreed that the environmental component of the public interest is not significant in this case and that the proposed sites are suitable from an environmental perspective.

Analysis and Findings

Unanimous Findings of the Board

[109] As mandated in section 3 of the *Energy Resources Conservation Act*, the Board's assessment of whether an application is in the public interest involves considering the social, economic, and environmental impacts of a project. To be in the public interest, a project must not only benefit the applicant and those directly connected to it, it must benefit Albertans in general. The Board recognizes that while determination of the public interest is subjective, constrained only by the objectives of the legislation and the Board's power to carry out those purposes, such a determination must arise from the evidence presented and from the careful and fair consideration of that evidence by the Board.

[110] In describing the benefits of a particular energy project, it is common for the applicant to point out the direct economic benefit that a productive well will bring to the province through royalty payments. With respect to royalties and Crown minerals, the Province of Alberta establishes certain royalty programs that may apply to Bernum's Crown well. As such, this aspect of the public interest is already determined by the Province and is not a factor in the Board's decision. In regards to Bernum's private agreements with the freehold mineral owners, the Board maintains that the discretion to establish the conditions in those agreements is between the parties themselves and market forces, and as such those private agreements are not a factor in the Board's decision.

[111] The Board confirms that it attempts to determine whether new projects are in the public interest by comparing the potential value to society of successful development with the potential costs to society imposed by that development. These costs may include effects on local landowners as well as commercial, social, and environmental impacts—in general, all identifiable adverse effects attributable to the project.

[112] The Board determines the appropriateness of a surface location based on many factors. In Alberta, it is often the case with horizontal drilling that the surface location is different from the location where the minerals are produced. In this situation, the Board finds that clause 2(a) is irrelevant to its decision on the appropriateness of the applied-for surface locations.

[113] Despite no documentation being on file with the County, the Board recognizes that future development on the Bancrofts' lands is highly probable and will likely occur during the life of the wells. To reduce the impact on potential future development, the Board recognizes the benefits of gas conservation and notes that eliminating flaring will limit the impact on current and future landowners.

[114] The Board notes that exploring for and, if successful, producing oil from Bernum's mineral lease in a timely manner would also reduce conflicts over future land development in the area while allowing the public interest benefits of hydrocarbon development to be realized.

[115] The Board notes the perception that land is being rendered unusable for country residential development, given that *Directive 060* does not allow flaring within 500 m of an existing dwelling. While the Board acknowledges that development is allowed to within 100 m of pre-existing flaring facilities, it agrees that this appears to be inconsistent and may have a negative impact on future land development. The Board is sympathetic to municipal authorities that may have to deal with more complaints in the area because of flaring, as was suggested by the Bancrofts' land planning expert.

Findings of the Board Majority

[116] The Majority finds that a balance has yet to be struck that first, recognizes the likelihood of some form of country residential development on the Bancrofts' lands; second, allows Bernum to move forward with development of its mineral leases; and third, at the same time, minimizes the impact of that development on residential development.

[117] The Majority is of the view that in areas of competing surface land use, applicants should consider the potential full resource development when deciding on initial project location. The Majority encourages applicants to look at a success scenario when planning a project.

[118] The Majority finds that the applied-for surface locations are not in the public interest given that the applications failed to consider the full development project. The Majority finds that approval of the applied-for surface locations could result in more surface impacts and proliferation of sites on the Bancrofts' land if Bernum were to develop its full mineral holdings.

[119] The Majority notes that the alternative locations proposed by the Bancrofts would require sites for the battery that are separate from and in addition to the sites submitted by Bernum. The Board finds that this would not constitute orderly development.

[120] Given all the above, the Majority finds it is not in the public interest to approve either the facility or the wells at the proposed surface locations. Given that the flaring facility is denied, there are alternative sites that would have less overall impact for this and future development and would better meet the public interest test.

Findings of the Board Minority

[121] The Minority notes Mr. Bancroft's evidence that he does not intend to develop his lands. Approving the proposed wells at the 1-4 surface location, while denying the flaring facility application, strikes a balance between the Bancrofts' desire to minimize the effects of resource development on their lands and Bernum's interest in exploring for and determining the economic potential of its mineral rights in sections 33 and 4.

[122] The Minority finds that it is in the public interest to drill the initial wells to determine the economic viability of production from Bernum's mineral rights. The Minority finds that Bernum would then be able to plan appropriate full development in consultation with area residents and landowners.

[123] The Minority finds that given the social, economic, and environmental considerations, it is in the public interest to drill the proposed exploratory wells at the 1-4 surface location.

CONCLUSION

[124] The Board unanimously agrees that Bernum has the right to develop the minerals and is of the view that those minerals should be developed.

[125] The Board unanimously finds that the facility applications should be denied, as a flaring battery is not acceptable. The Board bases its conclusion on the economic evaluations of gas conservation and on the nature of the area, which has the high probability of country residential development near where flaring is proposed.

[126] However, the Board panel disagrees over whether to assess the applications narrowly as two exploratory wells, as applied for, or to include consideration of the broader issues of project development and potential surface development.

[127] The Majority, in addressing the broader issues referred to, finds that the wells, as applied for, should be denied on the grounds that Bernum has not considered alternative sites that would have less overall impact.

Dated in Calgary, Alberta, on April 4, 2013.

ENERGY RESOURCES CONSERVATION BOARD

T. L. Watson, P.Eng.
Presiding Member

R. C. McManus, M.E.Des.
Board Member

G. Eynon, P.Geo.
Board Member

APPENDIX 1 HEARING PARTICIPANTS

Principals and Representatives (Abbreviations used in report)

Witnesses

Bernum Petroleum Ltd.
M. B. Niven, Q.C.
L. Grice

B. E. Brausen, P.Eng.
M. K. Ponto
D. Stewart, P.Geoph.
D. W. Clarke, P.S.L., of
McNally Land Services Ltd.
G. J. Johnson, M. Sc., P.Eng. consultant
G. Melenka, A.P.P.I. of CityTrend
B. Romanesky of CityTrend

T. Bancroft and C. Bancroft
G. Fitch

T. Bancroft
K. R. Bissett of
Bissett Resource Consultants Ltd.
K. Venner, M.C.I.P. of
Brown & Associates Planning Group

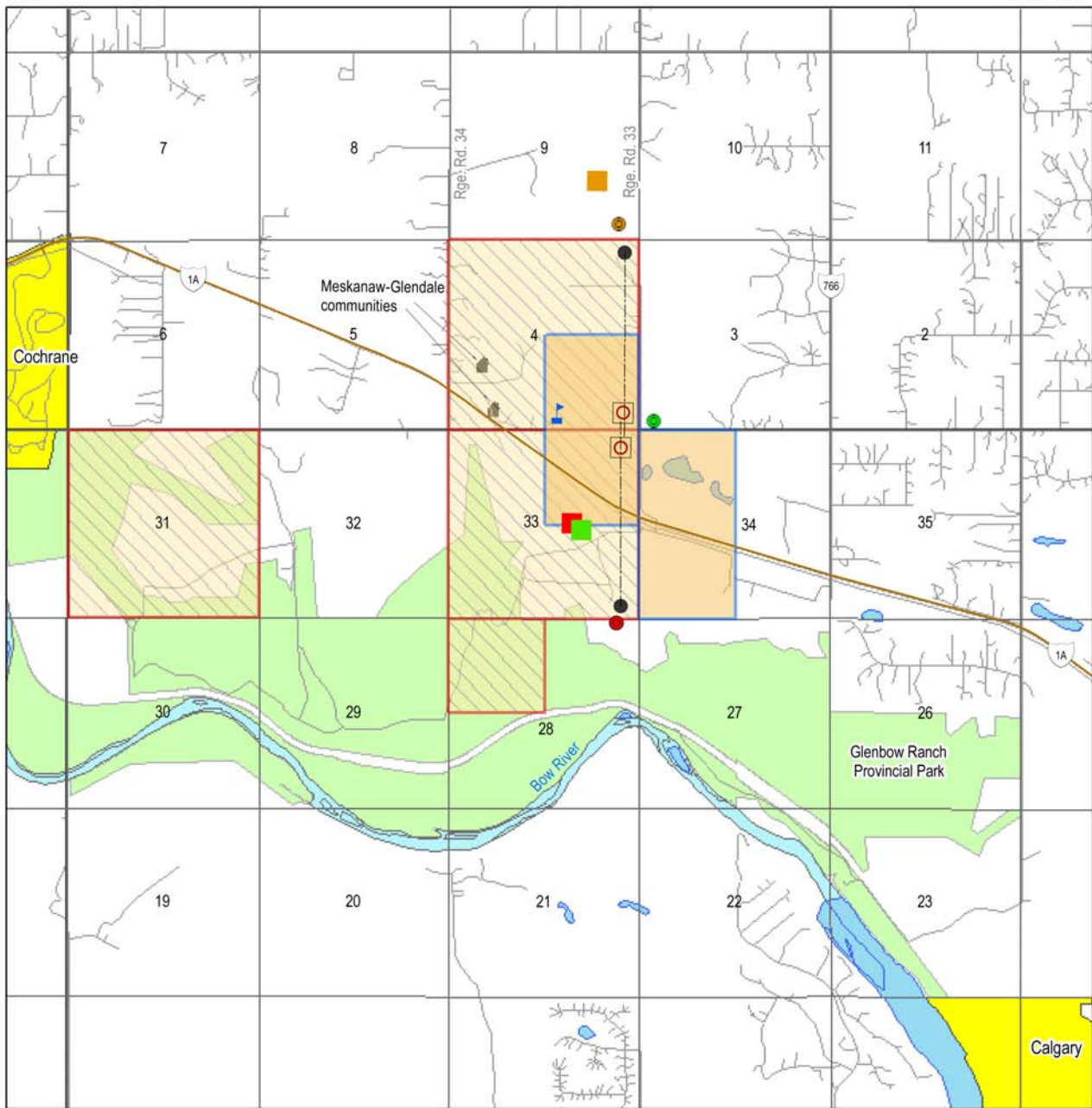
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J. Vaughan
C. Tamblyn
R. MacDonald



T.26

T.25

Legend

- Proposed wells surface location
- Proposed wells bottomhole location
- Proposed surface location
- Trajectory of horizontal leg
- Highway 1A
- Township road
- Community
- Existing radio tower
- Bissette alternate location # 1 battery
- Bissette alternate location # 2 battery
- Bissette alternate location # 3 battery
- Bissette alternate location # 1 well
- Bissette alternate location # 2 well
- Bissette alternate location # 3 well
- Bancrofts' owned lands
- Bernum mineral holding
- Glenbow Ranch Provincial Park

Figure 1 Map of project area