



Polaris Resources Ltd.

**Applications for a Well Licence, Special Gas Well Spacing,
Compulsory Pooling, and Flaring Permit
Livingstone Field**

December 16, 2003

ALBERTA ENERGY AND UTILITIES BOARD

Decision 2003-101: Polaris Resources Ltd.—Applications for a Well Licence, Special Gas Well Spacing, Compulsory Pooling, and Flaring Permit
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640 – 5 Avenue SW
Calgary, Alberta
T2P 3G4

Telephone: (403) 297-8311
Fax: (403) 297-7040

Web site: www.eub.gov.ab.ca

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**POLARIS RESOURCES LTD.
APPLICATIONS FOR A WELL LICENCE,
SPECIAL GAS WELL SPACING, COMPULSORY
POOLING, AND FLARING PERMIT
LIVINGSTONE FIELD**

**Decision 2003-101
Applications No. 1276521 and 1276489**

1 DECISION

Having carefully considered all of the evidence, the Alberta Energy and Utilities Board (EUB/Board) hereby denies the well licence Application No. 1276521, the special gas well spacing and compulsory pooling Application No. 1276489, and the flaring permit application without prejudice to any future applications.

2 INTRODUCTION

2.1 Applications

2.1.1 Well Licence Application No. 1276521

Polaris Resources Ltd. (Polaris) applied to the EUB pursuant to Section 2.020 of the Oil and Gas Conservation Regulations (OGCR) for a licence to drill a vertical level-3 critical gas well from a surface location in Legal Subdivision (LSD) 11 of Section 32, Township 10, Range 2, West of the 5th Meridian (11-32 well). The maximum hydrogen sulphide (H₂S) content for the well would be about 287.6 moles per kilomole (28.76 per cent), the cumulative drilling H₂S release rate would be 11.30 cubic metres per second (m³/s), and the producing release rate would be 3.06 m³/s. The corresponding emergency planning zone (EPZ) during the drilling phase of the well would be 13.54 kilometres (km). The purpose of the well is to obtain gas production from the Mississippian and Devonian Formations. The proposed well would be located about 32 km north of the Hamlet of Lundbreck near the Maycroft community. [Figure 1](#) shows the proposed well location, the EPZ, an area two times (27.08 km) the size of the EPZ, and the Whaleback region, comprising the Bob Creek Wildland Park and Black Creek Heritage Rangeland.

2.1.2 Special Gas Well Spacing and Compulsory Pooling Application No. 1276489

Polaris applied to the EUB pursuant to Section 4.040 of the OGCR for an order to establish a special drilling spacing unit (DSU) comprising Sections 32 and 33 of Township 10, Range 2, West of the 5th Meridian (Sections 32 and 33), with the target area being within the DSU and having sides 300 m from and parallel to the sides of the DSU, for the production of gas from all zones below the top of the Mississippian System. [Figure 2](#) shows the existing sections, mineral rights holders, and the proposed special DSU.

Polaris also applied pursuant to Section 80 of the Oil and Gas Conservation Act (OGCA) for an order prescribing that all tracts within the special DSU comprising Sections 32 and 33 be

operated as a unit for the production of gas from all zones below the top of the Mississippian System through the 11-32 well.

Polaris requested, among other things, that costs and revenues under the pooling order be allocated on a tract area basis and that Polaris be named the operator of the 11-32 well. Polaris also requested that the maximum penalty allowed under the OGCA be applied to a tract's share of the costs of drilling and completing the well if the tract owner does not pay its share of those costs within 30 days of whichever is later: the pooling order being issued, the tract owner being given written notice of its share of costs, or the well in question being placed on production.

2.1.3 Flaring Permit Application

Polaris applied pursuant to Section 7.055 of the OGCR for a flare permit for approval of the method, stack height, and equipment to be used to flare the gas from the 11-32 well during well completions and testing.

2.2 Interventions

Residents and landowners in the Maycroft community in the vicinity of Polaris's project, as well as other interested parties, corresponded with Polaris and the EUB expressing concerns about the proposed project. These concerns were expressed during Polaris's public consultation and notification process, at the time of the receipt of the applications by the EUB, and throughout the EUB process.

2.3 Prehearing Meeting

Having regard for the numerous unresolved concerns, the Board directed that the subject applications be considered at a public hearing. The Board also decided that before scheduling a hearing, it would be useful to obtain additional information from interested parties and Polaris to ensure that the public hearing would be conducted in the most efficient and effective manner possible. Therefore, the EUB held a prehearing meeting in Maycroft, Alberta, on April 16, 2003, and issued a memorandum of decision as *Decision 2003-030* on April 30, 2003. The Board received input from Polaris and interested parties on a number of issues, including the scope and purpose of the hearing, relevant issues to be examined, timing and location of the hearing, procedures, participant roles, funding, and other matters.

2.4 Hearing

The Board held a hearing in Maycroft, Alberta, commencing on September 9, 2003, before Presiding Board Member T. M. McGee and Acting Board Members M. J. Bruni, Q.C., and D. D. Waisman, C.E.T. The Board and staff visited the proposed location of the well and the general vicinity. Those who appeared at the hearing and a list of abbreviations used in this decision are set out in [Appendix 1](#).

2.5 Standing

In identifying who may participate at a public hearing, the Board is governed, first, by Section 26 of the Energy Resources Conservation Act (ERCA), which provides that those persons whose rights may be directly and adversely affected by the approval of an energy facility are entitled to

an opportunity to lead evidence, cross-examine, and give argument—in short, full participation at a hearing, or “standing.”

Others who may not be able to meet the standing test (for example, those persons not situated in close proximity to a proposed facility) are not afforded these participation rights by the statute. It is the long-standing practice of the Board to allow those persons who would otherwise not have standing to participate to some extent at a public hearing provided that they offer relevant information. However, funding to cover costs, as described below, is not available to persons who may participate but do not have standing.

In *Decision 2003-030*, the Board ruled that residents located within the 13.54 km calculated EPZ radius of the well and landowners within 1.5 km of the well have standing for the purposes of participating at the public hearing under Section 26 of the ERCA.

The Board heard presentations at the hearing from a number of parties who had registered their interest and who fell outside of the 13.54 km radius. Depending on whether they had joined a group with standing, the participation of some was limited to presenting a short statement of their position. They did not have full participation rights, such as leading evidence, cross-examining witnesses, and giving final argument. Those who provided a short statement of their position are listed in [Appendix 2](#).

2.6 The Public Interest

In considering issues before it, the Board must determine whether approval of a proposed project is in the public interest, in addition to establishing whether an application meets the specific regulatory and technical requirements prescribed. The Board is mandated by Section 3 of the ERCA to consider the public interest in all of its deliberations:

Where by any other enactment the Board is charged with the conduct of a hearing, inquiry or other investigation in respect of a proposed energy resource project, it shall, in addition to any other matters it may or must consider in conducting the hearing, inquiry or investigation, give consideration to whether the project is in the public interest, having regard to the social and economic effects of the project and the effects of the project on the environment.

Consideration of the public interest is in essence a question of finding the appropriate balance between the benefits of the proposed project and the potential risks of the project to the public and the environment. Where the potential for risk outweighs the possibility of gain, the Board will find that the specific proposed project is contrary to the public interest.

As all projects may have some element of risk, a great deal of the Board’s attention must be focused upon the level of risk and the ability and willingness of the applicant to mitigate or eliminate such risks. An applicant’s ability to take the appropriate measures to deal with risk is therefore critical to the Board’s final determination as to whether the project can be found to be in the public interest.

3 ISSUES

The Board considers the issues respecting the applications to be

- need for the applied-for well
- well design
- adequacy of public consultation efforts for the proposed well
- environmental effects of the proposed well
- quality of life and visual impacts
- safety implications of the proposed well
- financial security and technical/operational ability of Polaris
- special gas well spacing, compulsory pooling, and flaring permit

4 NEED FOR THE APPLIED-FOR WELL

4.1 Views of the Applicant

Polaris submitted that the proposed well could produce the gas it anticipated to find in the Mississippian and Devonian Formations underlying these lands. Polaris stated that the geophysical data it relied upon indicated that a prospective structure was present under Sections 32 and 33 and that this structure was characterized by faulting and folding. It believed that the subject well was required to test the possible accumulation of a very large gas deposit that may lie within Section 32.

In its submission, Polaris stated that the deepest potential target zone for the proposed well was the Devonian Palliser of the Wabamun Group. Polaris also stated that the nearest Devonian production was about 21 km away and that the potential reservoir and porosity development at the applied-for location were based on a regional study. Polaris interpreted that there was a probability for increased dolomitization of the Wabamun in the area of the Maycroft prospect, which it believed would result in a productive reservoir about 60 m thick.

Polaris identified the Mississippian rocks of the Turner Valley Formation as a significant secondary target for the subject well. It interpreted that there would be fracture porosity and permeability to locally enhance well productivity. Polaris expected all porous and permeable zones within the Turner Valley Formation to be potentially productive, with about 45 m of reservoir thickness.

According to Polaris, it is generally accepted that there is a large structural subsurface feature in the area that was previously targeted by Amoco Petroleum Canada Company Limited (Amoco). Polaris stated that its proposed well would also be targeting this same structural feature. Polaris considered the subject exploratory well essential to fully evaluate the potential of this prospect. Polaris confirmed that as the well was exploratory, the chance for discovering marketable hydrocarbons was small and the only certain gain would be the information obtained regarding

this structure. Polaris further stated that depending on the reservoir characteristics encountered, up to four wells might be needed at the subject location to fully develop the Devonian reservoir. Polaris stated that the selection of the proposed well location was based on seismic data as well as regional mapping. In response to questions regarding the distance between the proposed well location and the nearest seismic line, it stated that the success of an exploratory well depends totally on geological knowledge and interpretation. Additionally, it added that many fields were discovered without the benefit of seismic data. Polaris believed that the fact that the 11-32 well was 200 m off the nearest seismic line did not create significant uncertainty regarding the well.

4.2 Views of the Interveners

The Oldman River Coalition submitted that there was very little well control in the general area of the proposed well. It acknowledged that in such areas with limited well control, seismic data and the interpretation of that data provided the only information on the subsurface and the subsurface structure. The Oldman River Coalition was unconvinced that Polaris had reliable data on the structures it targeted, since it based the location of the 11-32 well on a single seismic line, but that the Oldman River Coalition's technical consultant admitted that a large structure could potentially be mapped, based on the review of Amoco's 1992-1993 seismic data.

The Whaleback Coalition also considered Polaris's geological information to be incomplete. It further believed that Polaris did not provide any convincing geophysical and geological data to support its assertion that the proposed location would provide the opportunity to explore the structural anomaly it identified.

4.3 Views of the Board

The Board accepts that an exploratory well would be needed to evaluate the subsurface structural feature Polaris interpreted to be present under its lands. The Board notes the limited subsurface/geological information available in this general area and Polaris's admission that the amount of seismic data available is limited. Further, due to the confidentiality agreements and the proprietary nature of the seismic data, this information was not made available during the proceeding. However, the Board notes that the target geological formations identified by Polaris are known to have hydrocarbon potential in this general area.

Given the nature of the well and the level of information available to the Board, the potential economic benefit of the well is unknown and, accordingly, the value of the proposed well to the Alberta public will be based solely on the information that the well will provide upon completion and testing.

The ultimate value of the well to the Alberta public is a critical element in the Board's determination of the public interest. In this case, having found that the need for the well is to obtain information, the need for this information must be balanced against the potential social and environmental costs in determining that the proposed well can be found to be in the public interest.

5 WELL DESIGN

5.1 Views of the Applicant

Polaris stated that the proposed drilling operations and control and monitoring measures to protect groundwater were the same as those previously proposed by Amoco to drill in this area. It also pointed out that in EUB *Decision 94-08*, the Board believed that the control and monitoring measures committed to by Amoco would adequately address groundwater issues. Polaris quoted the Board in its decision on page 25:

With regard to potential impacts on surface water and groundwater systems from contaminants associated with the construction and drilling operations, the Board believes that the control and monitoring measures committed to by Amoco at the hearing will adequately address those issues.

Polaris stated it intended to set 1000 m of surface casing both to protect the base of groundwater and to accommodate a well design. Although Polaris conceded that it had concerns about meeting the requirement contained in *Guide 9: Casing Cementing Minimum Requirements* for the proposed 1000 m of surface casing to be cemented full-length, it believed that it would be possible to achieve the full-length cementing requirement through top cementing, use of stage collars, and/or use of lightweight cements.

5.2 Views of the Interveners

The interveners did not significantly comment on the well design criteria of the proposed well.

5.3 Views of the Board

The Board notes that Polaris conceded it had concerns about meeting the requirement contained in *Guide 9* for the proposed 1000 m of surface casing to be cemented full length but believed it would be possible to achieve the full-length cementing requirement through top cementing, use of stage collars, and/or use of lightweight cements.

The Board believes the primary purpose of surface casing is well control, with a possible secondary benefit of providing protection to groundwater, depending on the depth of groundwater and the setting depth of surface casing.

The Board notes Polaris's reference to Amoco's application and *Decision 94-08*, wherein the Board accepted that the control and monitoring measures committed to by Amoco would adequately address groundwater issues. However, the Board notes that Amoco's proposed design had significantly less surface casing proposed (450 m), with the next casing string set at a shallower depth (3750 m). The Board believes that the Amoco design posed significantly less risk for well control and groundwater protection, as the next string of casing would be cemented to surface. Therefore, the Board does not agree that the two scenarios are similar for purposes of determining the adequacy of Polaris's drilling plan.

The Board believes that the 1000 m of surface casing in Polaris's case would protect groundwater, but only if Polaris is capable of having surface casing cemented to surface. The Board understands that if cement returns to surface are not achieved and remediation is required by perforating the surface casing, the possibility exists that the well control function of the

surface casing could be compromised. In that instance, the Board would require Polaris to abandon the existing surface casing, relocate the drilling equipment, and start drilling a new hole, which would be a significant cost to Polaris. As such, the Board has doubt that the current drilling plan provides an adequate assurance of well control and groundwater protection.

6 ADEQUACY OF PUBLIC CONSULTATION EFFORTS FOR THE PROPOSED WELL

6.1 Views of the Applicant

Polaris stated that it began its public consultation in January 2002 with the stated corporate philosophy of being a “good neighbour”. In response to a question about whether it had a formal public consultation plan or policy, Polaris stated that it did not have an internal public consultation manual but relied upon an overall team of both company management and consultants to provide guidance in the area of public consultation.

Polaris stated that while it did not hire a full-time recognized expert in the field of public consultation for the duration of the public consultation process, in its view company management and its consultants had the necessary experience to conduct an appropriate public consultation program for the project. Polaris stated that at the outset there were some members of the community who were agreeable to have discussions about the proposed project, but others were adamantly opposed. Polaris believed it could resolve some of the community’s concerns, but not all, as some residents refused to discuss the project or negotiate in any meaningful way. Polaris described certain community members as being intransigent and expressed some consternation as to how it could proceed with an effective consultation process in the face of such attitudes.

Polaris said that in an attempt to identify and resolve issues, it conducted an open house in February 2002. Subsequent to that meeting, Polaris followed up with a suggestion to the community that an environmental advisory committee, a plume modelling committee, and an emergency preparedness committee be established. Polaris pointed out that it believed such advisory committees could have made use of common experts including Polaris contracted consultants, but acknowledged that Polaris itself had no such employees. Polaris also noted that it had offered to let the community choose the experts they wanted for the proposed advisory committees if the community was not prepared to use consultants already contracted by Polaris. Polaris indicated that the committee proposals failed, as residents took the position that participating in such advisory committees could be seen as endorsing the well.

Polaris stated that it had employed three companies specializing in public consultation for various periods of time. The first company, Land Solutions Inc. (Land Solutions), was hired because of its expertise in negotiating with landowners. Land Solutions conducted meetings and consultations with area residents and reported back to Polaris that there were people in the community who would not deal with Land Solutions personnel. Polaris then contracted Mitchell and Associates and Gay Robinson Public Relations, but these companies had a similar lack of positive results.

Polaris noted that it had expected a controversial public consultation process because it recognized that there were residents in the area “well known throughout Alberta to be the most

committed environmentalists in the province.” However, Polaris said it believed there were both proponents and opponents to the proposed project and it proceeded to work with the community to the best of its ability. In its closing argument, Polaris submitted that its public consultation program had resulted in all parties reaching a better understanding of the positions of the other side.

6.2 Views of the Interveners

The Oldman River Coalition noted that there were some people in the community who were prepared to accept some kind of investment or industrial development under very specific conditions. However, it was critical that Polaris had done a poor job overall of communicating with them.

Various members of the Oldman River Coalition voiced an opinion that Polaris repeatedly attempted to satisfy its own needs during meetings with area residents and did not pay adequate attention to local concerns. One member of the Oldman River Coalition indicated that if the company and area residents did not get along before a well licence was issued, there would be no reason for Polaris to talk with residents after it had a licence. The Oldman River Coalition members referred to Polaris’s public consultation as being intermittent and said that Polaris did not respond to questions, letters, or e-mails.

The Oldman River Coalition also said Polaris offered to sell interest in the prospect or to offer flow-through participation or a royalty agreement in the well to some members of the Oldman River Coalition. It thought this revealed a gap in understanding between Polaris and the community.

The Oldman River Coalition noted that a further example of this gap in understanding was Polaris’s use of Express Post mail-outs to announce when a public meeting would be held. It pointed out that there was no post office in Maycroft and no rural mail delivery, so area residents usually only picked their mail up once a week. The use of Express Post mail to inform residents of a public meeting was an example of a petroleum company not understanding how rural communities work.

Some members of the Oldman River Coalition stated that they would have preferred Polaris’s public consultation and communications efforts to occur through only one person or company representative. They said that the public consultation undertaken by Land Solutions on behalf of Polaris got off to what they believed was a good start but deteriorated when Polaris changed its approach and consultants.

The Oldman River Coalition stated that just because the community opposed the proposed project and was seen by the company as being intransigent, Polaris was not relieved of its obligations under EUB *Guide 56: Energy Development Applications Guide* and *Informational Letter (IL) 93-09: Oil and Gas Developments Eastern Slopes (Southern Portion)* to conduct a public consultation program that was proper and appropriate for the circumstances.

The Oldman River Coalition outlined a number of conditions that some, but not all, of its members had agreed to. These were offered as solutions that could mitigate some concerns should the proposed project be approved. With respect to public consultation, the Oldman River

Coalition stated that Polaris should be required to retain a public consultation expert and submit a plan to the EUB for approval of a public consultation and community relation program. Once that plan was approved by the EUB, Polaris should then be required to reinstate public consultation.

The Whaleback Coalition stated opposition both to the proposed well and to methods employed in Polaris's public consultation efforts. It believed that Polaris misrepresented the view of some residents, making it appear that Polaris had more support for the project than it actually did. The Whaleback Coalition also believed that Polaris should have spent its time and energy answering community information requests on a timely basis and building trust and good relations with the local community by providing consistent and accurate information, rather than attempting to discredit and marginalize the objections of certain individuals in the community.

The Martys and Ms. Huntley also submitted that materials were not provided to them by Polaris in a timely manner.

6.3 Views of the Board

The Board believes that notification and public consultation must be thorough enough to allow all parties who are or may be affected to be sufficiently aware of not only the proposed project but also the EUB process. The Board believes that the public must have sufficient information to participate meaningfully in the decision-making process, to be able to voice their concerns, and to have their concerns heard, properly addressed, and, if possible, resolved. The proponent's information must be extensive, consistent, factual, and disclosed in a timely way.

The Board believes it is primarily the proponent's responsibility to initiate, develop, and maintain appropriate relations with the community it works within. While the Board will assist in facilitating discussion, it intends to continue relying on applicants and licensees to fulfill their responsibilities in this area. In addition, the Board expects communities to fully participate in an open dialogue with industry so that issues can be properly identified and addressed on an ongoing basis.

The Board believes that Polaris significantly underestimated the depth of concern of local residents. Additionally, it appears that after a reasonably promising start on public consultation by Land Solutions, Polaris's decision to use its own team led to a severe breakdown in the public consultation process. Further, it also appears that Polaris's strategy of conducting one-on-one meetings with members of the community and making individual offers was seen by the residents as an attempt to avoid the issues that concerned the community as a whole. These choices by Polaris resulted in a failure to address community issues and concerns and may have resulted in a serious erosion of public confidence.

The Board is troubled by what appears to be either a misunderstanding or a misrepresentation of viewpoints between Polaris and some of the residents. It is incumbent upon the applicant to ensure that comments and concerns expressed by members of the public during the public consultation process are fairly and accurately recorded and represented.

The Board is concerned by the admission by some members of the community that they deliberately chose not to participate in the public consultation process. The Board requires that companies engage in meaningful consultation; however, it cannot require that members of the public do so. But by refusing to participate, a member of the public forgoes the opportunity to have their concerns heard by the company and to have those concerns recorded accurately, addressed meaningfully, and, if possible, resolved to the satisfaction of all. In the same way that a company must fulfill its consultation obligations, there are equal obligations on the public to participate in a meaningful, timely manner in the process. It is extremely unlikely that the Board would find that a public consultation process was not complete or had failed if the public had made a deliberate choice not to participate.

In any event, the Board believes that Polaris has mistaken the concept of notification for that of consultation, while there is a significant difference between the two. Notification is often used by the petroleum industry as a means of informing the public about a proposed project via such means as open houses, fact sheets, and Web sites. Some companies believe that providing this information constitutes consultation. This is not the view of the Board. True consultation has the objective of obtaining specific public feedback on issues, concerns, and other matters that are open for discussion. Consultation allows the public to see how their involvement and input have been considered and addressed by the proponent. It is not apparent from the evidence that Polaris meaningfully considered input from the public to either explain its rationale or clarify or modify its applications. Rather, the Board heard statements from the interveners that Polaris repeatedly attempted to satisfy its own needs during consultation and provided little or no written response to the concerns voiced by area residents.

The handling of public consultation by Polaris is troubling to the Board for another reason. To proceed with any development, many, if not all, of the risk mitigation efforts depend fundamentally upon Polaris being able to establish an effective communication and consultation presence within this community. Based on the evidence presented, it seems that to date Polaris has failed to achieve such a presence.

7 ENVIRONMENTAL EFFECTS OF THE PROPOSED WELL

7.1 Views of the Applicant

7.1.1 Effects on Air, Water, Soil, Vegetation, Wildlife, and Fish

Polaris noted that it had submitted the well test flare permit application consistent with recommendations of the EUB so that related issues could be identified and addressed, thus avoiding the potential for a second hearing on the permit application. Polaris said that it had followed the procedures set out in *EUB Guide 60: Upstream Petroleum Industry Flaring Guide* for evaluating proposed well test flaring. This included evaluation of complex terrain with appropriate computer dispersion models using screening meteorology, as well as evaluation of parallel airflow conditions based on a five-year Edson meteorological data set. It said that its evaluation indicated that test flaring could result in exceedance of the Alberta Ambient Air Quality Guidelines and, consistent with *Guide 60*, Polaris had developed a flare management plan to avoid guideline exceedances. Polaris said that its proposed well test flaring met the requirements set out in *Guide 60* and would be protective of human health and animal health.

Polaris stated that it had used screening meteorology data applicable to year-round conditions in its evaluation of complex terrain. It said that screening meteorology could be used to identify maximum potential concentrations when it was less important to know how frequently the conditions might occur. Polaris noted that it had evaluated the flaring with methods suited to parallel airflow and complex terrain methods, as both situations existed, depending on wind direction. This approach was used to identify times of the year when flaring could be done, to identify conditions when flaring must be shut in to avoid exceedances of air quality guidelines, and to identify locations for placement of air quality monitoring equipment. Polaris said that evaluation of fumigation conditions was not required and had not been done.

Polaris believed the interveners accepted its compliance with *Guide 60* requirements. However interveners had challenged worst-case scenario conditions of the Polaris flaring assessment. It noted that its flare permit application assumed worst-case scenarios as set out by the EUB. Polaris said that use of increasingly conservative modelling approaches yielded absurd air quality predications, which made it difficult to drill and test wells.

Polaris said that real-time ambient air quality monitoring had been successfully used to manage and mitigate situations that would otherwise have been limited by conservative model predictions. It said that in addition to monitoring, real-time meteorological data would be used to identify conditions when flaring would have to be shut in. Polaris said that an automated system would be used to determine unacceptable conditions and provide an alarm to alert well site personnel of the need to discontinue flaring. It said that it would use real-time modelling if this were required by the Board.

Polaris discussed issues related to flare combustion efficiency and related emissions. Polaris stated that research by the University of Alberta found that flare combustion efficiency was related to wind speed, flare exit velocity, and energy density (heat content) of the gas. It said that under high flare velocity conditions typical of well test flaring, combustion efficiencies would be very high.

Polaris conducted an environmental assessment of the proposed 11-32 well site and noted that protection of groundwater and surface water quality were issues of local concern. It said the proposed drilling management plan would mitigate potential effects upon groundwater resources. Polaris stated that it intended to set 1000 m of surface casing to protect the base of groundwater. It would use gel chem-based drilling fluids in drilling to limit contamination of potential aquifer zones. To protect groundwater, it would also use a flare tank, invert drilling fluids stored in tanks, and commit to groundwater monitoring in the vicinity of the well site. Polaris further proposed standard water well testing for nearby residents (Bob's Creek Ranch and the Nelsons) as a precaution against potential groundwater effects. Polaris did not believe its project would affect regional groundwaters.

Polaris identified the 11-32 well site lease boundary as less than 100 m from an unnamed tributary of Bob Creek. In light of this, Polaris proposed several mitigations, including berming of the well site with a clay-lined berm and silt fence, tankage to collect potential spill or blowout fluids, and construction of the lease using an impermeable liner. Polaris stated that its soil survey indicated that a seasonally high water table was present within the surface lease, likely from subsurface seepage. Although surface springs were not found within the well site area, Polaris

proposed construction of a rock drain to enable seepage from the well site to enter the unnamed tributary.

Polaris indicated that Alberta Environment (AENV) had inspected the Polaris surface lease, because it had characteristics of an environmentally sensitive site. Polaris tabled as evidence the AENV Environmental Protection and Enhancement Act (EPEA) approval it had received for reducing the setback distance of its lease to 15 m from the unnamed tributary. Polaris confirmed that the approval was conditional upon implementation of the mitigative measures proposed by it in its application and stated that it would provide specific details of the engineering design upon receiving a drilling licence. Polaris further stated that it was committed to implement the AENV licence conditions.

Polaris believed that wetland vegetation and possibly some water quality and flow characteristics of the adjacent unnamed tributary had been affected by livestock grazing. Polaris recommended well site drainage control to maintain the site integrity and reduce soil erosion. Polaris stated that minor effects of flooding could be expected from a headwater tributary, but added that the well site would be visited regularly and actions taken. It stated that it would address water allocations for the proposed project by means of a Water Act application to AENV. Polaris concluded that the setback had been approved by AENV, environmental effects could be mitigated, and, the well site was acceptable to the present landowner.

Polaris assessed potential environmental effects of the proposed development on soils by conducting a soils survey of the lease and access road. The survey identified a depressionnal seepage area northeast of the well centre, as well as gleyed chernozem soils across much of the north and east half of the lease. It indicated that the gleyed soils occurring in lower elevations of the lease were likely associated with a seasonal water table. Polaris stated that soils occurring on the upper slopes of the lease were associated with a high risk of water erosion and that impacts to soils would be minimized by topsoil salvage and reclamation with berming to control runoff and erosion.

Polaris proposed to upgrade about 0.9 km of existing trail to an all-weather access road and to construct about 0.5 km of new road to complete the access to the proposed well site. It stated that a 5 m wide all-season road would be constructed within a 15 m right-of-way. Polaris added that use of the existing trail would minimize disturbance of rangeland vegetation, although it provided surface access for only a limited distance, ending close to the proposed well site. It recommended sod salvage and topsoil storage as reclamation practices to mitigate surface disturbance of the access road.

Polaris indicated that the disturbance of approximately 2.2 hectares (ha) would be necessary to construct a well pad. About 1.3 ha of aspen forest and 0.7 ha of timothy-dominated grassland from the 11-32 well site lease would be cleared. It proposed a larger well pad to accommodate potential drilling of three future wells, contingent on results of exploratory drilling.

Polaris said that it used a survey to assess the presence of rare plants of special status. However, when under cross-examination at the hearing it was pointed out that the survey did not identify any rare plants, Polaris agreed to additional surveying for rare plants if requested by the EUB. Polaris stated that invader species, such as timothy, had created some existing disturbance of the native grassland community at the well site. Further, it stated that incremental disturbance of the

fescue grasses would be minimal. Polaris believed that it would be unrealistic to expect rough fescue to be restored through well site reclamation. However, Polaris indicated that it would minimize the introduction of weeds and other undesirable species during construction and operation.

Polaris stated in its application that by environmental mitigations and project design, it had complied with the principles of EUB *IL 2002-1: Principles for Minimizing Surface Disturbance in Native Prairie and Parkland Areas*.

Polaris proposed a conceptual reclamation plan with measures to follow abandonment of the well site. It said it would use a reclamation seed mix containing one-third native species (i.e., by weight) and two-thirds cover crop in reclaiming the access road and well site, pointing out that it adopted the proposed seed mix in consideration of the Native Plant Revegetation Guidelines for Alberta and suggestions by Polaris's consultant. Polaris justified the inclusion of non-native species on the basis of landowner preferences. Polaris believed its proposed reclamation would increase the availability of forage grasses. Additionally, Polaris maintained that the landowner would determine any future requirements for road reclamation on the property and that the landowner was satisfied with the proposed road construction.

Polaris performed a site assessment of the proposed well and access road that included potential impacts on wildlife. It conducted an inventory of local fish habitat and populations for Bob Creek and the unnamed tributary adjacent to the 11-32 site. Its overview fisheries report identified Bob Creek as spawning and nursery habitat for rainbow trout.

Polaris indicated that it did not find fish in the unnamed tributary, due to its small channel size and ephemeral flow. Steep channel gradients near the confluence with Bob Creek acted as a barrier to fish movement upstream to the unnamed tributary. Polaris stated that it would not cross either of the two stream channels, construct culverts, or otherwise affect fish habitat with the proposed development. Polaris presented mitigations for spill prevention and management to address potential impacts to downstream fish-bearing waters of Bob Creek and the Oldman River.

Polaris identified minor loss of wildlife habitat associated with clearing of the proposed well and access road. Habitats mapped as part of the Polaris site assessment indicated that the well site and road were critical habitat for three species: elk, moose, and deer. The critical wildlife habitat rating was associated with wintering of ungulates. Polaris predicted some temporary displacement effects due to project activities for ungulates as well as minor loss of habitat. It claimed that changes to ungulate habitat would be offset by future reclamation, which would enhance forage grasses and site conditions. Overall, Polaris believed that the effects would not be significant or compromise the winter range for ungulates.

Polaris acknowledged that since ungulates are prey for wolves and cougars, there would be some temporary displacement effects on those species as well. It expected grizzly and black bears, which were occasional visitors to the development area, to experience minor displacement effects from increased human activity at the proposed development. No significant effects on bird species were predicted, as the project would avoid construction during the May–July nesting period. Reclamation would restore vegetation cover and habitat conditions for birds, thereby minimizing effects. Polaris maintained that impacts on wildlife would be minor, locally

occurring, and able to be mitigated. Polaris stated that some wildlife would adapt to human activity, citing elk in Banff National Park as examples. Polaris said it would take measures such as road gating and signage on the access road to reduce increased public access that might disturb wildlife.

Polaris committed to “no net loss” of wildlife habitat to mitigate possible impacts on wildlife. Habitat would be enhanced off site with the property owner or perhaps through the Management Plan of the Black Creek Heritage Rangeland or Bob Creek Wildland Park. Furthermore, Polaris stated that the project was designed to minimize surface disturbance and potential impacts to wildlife, and it was committed to drill future wells from the 11-32 well site pad, a benefit of the proposed two-section spacing unit.

7.1.2 Ecosystem Effects

Polaris stated that environmental and ecosystem effects of the proposed development were limited to private lands for which it had negotiated surface rights and could be mitigated. Polaris maintained that the proximity of the project (e.g., several hundred metres) to the Black Creek Heritage Rangeland was of no consequence. It referred to past actions of the Alberta Special Places Whaleback Local Committee, which voted to accept commercial oil and gas activity as a permitted land-use inside the boundaries of Special Places lands. Furthermore, Polaris pointed out that Alberta Energy’s *Information Letter 2003-25: Government of Alberta—Honouring Existing Mineral Commitments in Legislated Provincial Protected Areas* stated the Alberta Government policy to honour existing mineral commitments within legislated protected areas. Polaris interpreted this as enabling drilling for oil and gas within protected areas such as the Black Creek Heritage Rangeland or Bob Creek Wildland Park. Therefore, Polaris maintained that it was reasonable for holders of mineral rights, such as itself, to expect to drill on adjacent private lands.

Polaris cited the July 31, 2003, “Draft Management Plan: Bob Creek Wildland Park and Black Creek Heritage Rangeland,” which the Oldman River Coalition submitted, as evidence in rebutting the Oldman River Coalition. The plan contained draft management objectives and strategies proposed by Alberta Community Development and Alberta Sustainable Development in conjunction with a multistakeholder planning team. Polaris asserted that the management directions in the draft plan applied only to protected areas and not adjacent lands. Polaris concluded that oil and gas exploration and development were permitted activities both inside and outside of the protected lands of the Black Creek Heritage Rangeland and Bob Creek Wildland Park.

Polaris acknowledged that issues, including ecosystem integrity, from EUB *Decision 94-08* for Amoco Hunter Creek had been raised in reference to its application. Polaris requested the Board to evaluate applications each on its own merits in considering the role of protected lands. In terms of ecosystem effects, Polaris believed its application should be viewed differently from Amoco, since Polaris would not require protected or Crown lands or cause ecosystem effects. Polaris stated that the EUB was not charged with determining whether drilling for gas with H₂S was compatible with the unique character and qualities of the Whaleback area.

7.1.3 Cumulative Environmental Effects

Polaris supported its application with a discussion of its compliance with EUB *IL 93-09* regarding cumulative effects. Polaris believed that the small scale of land disturbance from the well and access road and their location on private land would not contribute significantly to regional land-use change or cumulative effects. Polaris determined that if the 11-32 well was successful, regional air emissions from flaring and gas plant processing would be increased. While it did not assess regional air quality quantitatively, Polaris provided a flare management plan with dispersion modelling of air quality. It stated it would use the flare management plan to comply with Alberta Ambient Air Quality Guidelines and that emissions would not have adverse cumulative effects. With respect to soils, vegetation, fish, wildlife, surface waters, and groundwater, Polaris did not identify adverse cumulative effects from the project.

If the 11-32 well were to be approved and be successful, Polaris believed there was potential for it to drill three additional gas wells. Polaris committed to drill these wells from the 11-32 well site pad to reduce surface disturbances. To do this, it would require pooling with the adjoining mineral rights owner, as well as an amended drilling spacing unit. Polaris did not provide information about future drilling by other operators, as it indicated that no immediate development plans had been disclosed by holders of adjoining petroleum and natural gas rights. In reference to freehold mineral rights occurring within the Bob Creek Wildland Park and Black Creek Heritage Rangeland, Polaris stated that there were three and one-half sections available for potential drilling.

In contemplating a successful well at the 11-32 well site, Polaris did not anticipate construction of a gas processing plant to bring its gas production on stream. It said there would be limited on-site production equipment and the gas would likely be transported via a new 43 km pipeline. A Polaris pipeline could be constructed to tie into an existing gas pipeline at Burmis for eventual processing at the Shell Waterton gas plant. A map of two pipeline routing options was attached to the application. Polaris did not evaluate environmental cumulative effects in its development plan, as it believed there were significant uncertainties associated with drilling an exploratory well. It said cumulative effects assessment of pipeline and facility development would be undertaken once the 11-32 well was proven successful.

7.2 Views of the Interveners

7.2.1 Effects on Air, Water, Soil, Vegetation, Wildlife, and Fish

The Oldman River Coalition stated that predicted sulphur dioxide (SO₂) concentrations contained in the Polaris well test flare permit application were 18 to 34 times above the applicable Alberta Ambient Air Quality Guideline. It was concerned that the evaluation was based on a combination of flat (parallel airflow) and complex terrain methods that used screening and historical Edson meteorology. The Oldman River Coalition said that the methods used by Polaris did not assess fumigation conditions and it did not believe that Edson meteorology data were representative of worst-case conditions in the valley. It noted that the dispersion model used by Polaris was dated and not as suited for evaluation of plume dispersion in complex terrain as models such as the California Puff Model (CALPUFF). The Oldman River Coalition further noted that the model modifications made by Polaris could not be verified from the information provided and did not conform to the Alberta Air Quality Model Guidelines. In its submission, the

Oldman River Coalition concluded that there was a need to assess the well test flaring with a refined assessment using real meteorology, since the results presented by Polaris should not be accepted as valid.

The Oldman River Coalition said that the proposed monitoring approach would not necessarily detect peak SO₂ concentrations, given the spacing of the monitors. It said that the proposed monitors might not detect the well test flare plume at all. It further stated that its evidence should give the Board great concern about whether the well can be flared at any time of the year without having unacceptable impacts on air quality.

The Martys' expert witness stated that Polaris had assumed overnight stable conditions or overnight inversions as the worst case for dispersion modelling. The Martys' expert witness also explained that warm Chinook winds could trap much colder air at ground level, creating inversions 20 to 30 times stronger than typical assumptions. They noted that this upper-air Type 1 Chinook corresponded with poor winter air quality events in Calgary, which can last several days. An area centred on Pincher Creek was noted as having the highest frequency of Chinooks in Alberta. It was therefore viewed that the Polaris evaluations were not based on worst-case dispersion conditions and consequently underestimated potential air quality impacts.

The Oldman River Coalition said there were potential flood hazards associated with local stream runoff. It indicated that Tetley Creek and Big Coulee Creek had experienced flood conditions capable of washing out road access and submitted photo exhibits of the 1995 flood of the Oldman River. It also raised concerns about the integrity of tanks stored on the proposed well site, the suitability of the 11-32 well site location, and possible constraints for future pipeline crossings of the Oldman River.

The Whaleback Coalition identified uncertainties regarding the implementation of several Polaris mitigations for protection of water resources. These uncertainties included design features of the well site berms, runoff collection system, liner construction, actual setback distance from the unnamed tributary, and locations for groundwater monitoring. The Whaleback Coalition questioned the adequacy of Polaris's mitigations plan in light of the lack of details provided for its implementation. It submitted that the proximity of the unnamed creek (15 m) to the proposed well site could increase risks of erosion, groundwater contamination, and chemical spills.

Regarding the issue of landowner preference for the proposed 11-32 well site and acceptability of environmental effects, the Whaleback Coalition stated that potential risks to groundwater and surface waters were not limited to deeded lands. It maintained that as a result of the applied-for development, there would be risks to public water resources, not just upon private lands.

Ms. Huntley also stated that potential risks to groundwater and surface waters existed beyond private lands. She noted that there were potential impacts to flowing springs, including a primary spring near the unnamed tributary and lesser springs. She added that these springs had local importance in the well site area in maintaining a high water table and contributing water supply during dry conditions. From the perspective of a water deficit in the Oldman River basin and the historical decline of water flows in the Oldman River, Ms. Huntley questioned the full field development scenario of Polaris with its higher demands for water consumption.

Citing the importance of the Oldman River system to the local economy, Ms. Huntley identified risks of water contamination from the proposed well site via the unnamed tributary as unacceptable. In her view, there was reasonable doubt that mitigations proposed by Polaris for spill management would be effective under flood events. Ms. Huntley shared concerns that flood hazards could affect tank storage of fluids at the proposed well site. This would be exacerbated by the close proximity of the lease to the unnamed tributary of Bob Creek. Regarding potential contamination of residents' water wells, Ms. Huntley noted the difficulty in establishing liability in the absence of mapping or baseline data for aquifers.

The Oldman River Coalition objected to the increased surface disturbance, increased access and visual effects associated with the 15 m right-of-way for the proposed road. It stated that the existing trail was not readily visible and that with a wider all-weather road, visibility and access would increase. It maintained that an improved road would attract users to the well site and farther onto Whaleback Ridge, which would contribute to significant disturbance.

The Oldman River Coalition did not identify an alternative well site location that would have reduced its environmental concerns; however, it did agree that should a well licence be issued, it was desirable to avoid duplication of access roads and wells and thereby reduce surface disturbances and cumulative effects.

The Whaleback Coalition submitted that the Whaleback area, in which the proposed Polaris development was located, had been mapped within several planning documents as an Environmental Significant Area (ESA). It objected to the proposed road construction as a linear disturbance that could affect landscape aesthetics and have visual impacts on users within the Black Creek Heritage Rangeland. Similarly the development could affect historical and cultural values of the landscape for residents and other Albertans.

The Whaleback Coalition questioned the ability of Polaris to restore the proposed development sites through reclamation and cited the off-site "no net loss" mitigation for wildlife. It argued that native grassland reclamation would not be achieved with comparable species for the Polaris project. It stated that Polaris had not demonstrated that native grassland reclamation would achieve equivalent biodiversity, and this would be an irreversible impact of the Polaris development.

The Oldman River Coalition presented evidence requiring timing restrictions between December 1 and April 30 for purposes of wildlife management on Crown lands in the Whaleback region. It did not support Polaris's drilling and flaring in winter months, since those activities were normally restricted to protect critical habitat during winter months. The Oldman River Coalition submitted that grizzly and black bears frequented the proposed development area, and it questioned whether Polaris had received sufficient input from local residents to adequately assess wildlife.

The Whaleback Coalition raised concerns about the proximity of the 11-32 well site to the unnamed tributary, possible disruption of surface and seepage water flows, and the potential release of contaminants to surface drainage and groundwater. It believed that ultimately this could be harmful to fish and fish habitat of the Oldman River and Bob Creek. It maintained that impacts to fish and water resources should be viewed beyond the private lands containing the proposed development, since fish, water, and wildlife were public resources. Mitigation

measures proposed by Polaris for fish protection, such as the sandbag check dam or well site berm system, were viewed by the Whaleback Coalition as incomplete or lacking implementation details.

The Whaleback Coalition contested Polaris's evidence that wildlife impacts were minor and occurred locally. It cited the provincial and national importance of the Whaleback region based upon wildlife and ecosystem resources from both private and public lands. It believed that wildlife movements across public and private lands would be negatively affected by development. The Whaleback Coalition stated that wildlife effects from the Polaris development had potential to extend beyond the well site to protected lands, such as the Black Creek Heritage Rangeland. It stated this was likely since the well site was less than 0.5 km from the Heritage Rangeland boundary. It requested the EUB to apply the guidelines contained in the 1987 Livingstone-Porcupine Hills Sub-Regional Integrated Resource Plan to the Polaris project.

The Whaleback Coalition described the Polaris wildlife assessment as deficient for not recognizing use of the proposed development area by other significant wildlife species and for omitting some key wildlife references from the literature specific to the importance of wildlife resources of the Whaleback area. The Whaleback Coalition presented evidence from the literature of disturbance effects and avoidance behaviour of wildlife responding to road access and industrial activity. It believed the Polaris development could cause similar effects on wildlife, especially since the Polaris development was planned for winter months, when wildlife are most vulnerable to disturbance. Those impacts would not be temporary, based on the operating scenario of a successful 11-32 well and future development. The Whaleback Coalition stated that such impacts would be significant on regional wildlife even with successful mitigations proposed by Polaris.

7.2.2 Ecosystem Effects

The Oldman River Coalition believed that other areas of the province had already experienced detrimental effects caused by oil and gas activity and that it could reasonably expect detrimental effects upon the native prairie grasslands and the local community of the Whaleback region. It viewed those effects as incompatible with the environmental sensitivities of the landscape. Should the EUB approve the Polaris application, some members of the Oldman River Coalition requested that the EUB adopt various licence conditions to address their concerns. One concern was the ability of the Black Creek Heritage Rangeland and the Bob Creek Wildland Park management team to also consider adjacent land uses in management guidelines applicable to protected Crown lands. The Oldman River Coalition believed the Bob Creek Wildland Park and Black Creek Heritage Rangeland should have been considered as parts of the larger landscape and surrounding ecosystem.

The Whaleback Coalition cited correspondence and meeting minutes of the Alberta Special Places Whaleback Local Committee that pointed to the Alberta Government policy of honouring existing commitments and dispositions for Special Places lands. It said that the Alberta Government eventually confirmed that mineral rights would be honoured and that oil and gas development should be permitted activities within protected Crown lands of the Whaleback. However, this was done without further involvement with the Special Places Whaleback Local Committee.

The Whaleback Coalition took the position that the provincial and national rankings of the Whaleback area were dependent upon the combined ecosystem values of protected lands and the adjacent private lands. Excluding private lands would lower the ecological integrity of the protected lands. The Whaleback Coalition stressed the importance of maintaining viable ecological linkages and ecological integrity between protected Crown lands and the adjacent private lands through cooperative and sympathetic management. It viewed development of gas with H₂S as unacceptable, since this would compromise such linkages across the land. The Whaleback Coalition submitted the July 31, 2003, “Draft Management Plan: Bob Creek Wildland Park and Black Creek Heritage Rangeland.” The Whaleback Coalition disputed changes made in the recent draft plan, stating that these changes would not enable management objectives to apply to adjacent lands.

The Martys agreed with the Oldman River Coalition that an ecosystem management approach was needed for the protected lands and private lands to avoid fragmentation and isolation of the protected lands as islands. They said the ecosystems of the Whaleback region were relatively intact, with low disturbance compared to the Forestry Reserve lands farther west. They added that lands of the Whaleback area were a key component of the Eastern Slopes with inherent value for ongoing management of water supplies for Alberta. The Martys said it was important that the lands serve as a buffer zone with low disturbance to ensure water supplies.

7.2.3 Cumulative Environmental Effects

The Oldman River Coalition believed that private lands in close proximity to the Bob Creek Wildland Park and Black Creek Heritage Rangeland (Sections 6-11-2W5, 31-10-2W5, 30-10-2W5, 29-10-2W5, 27-10-2W5, and 34-10-2W5) and other lands to the south had potential for oil and gas drilling. Hence greater cumulative effects were possible than predicted by Polaris. The Oldman River Coalition suggested that following a successful Polaris well, other operators could drill two to four additional gas wells immediately adjacent to Sections 32 and 33. Cumulative effects of that development (e.g., wells and infrastructure) could include loss of critical wildlife habitat and reduce aesthetic and ecological values of the Maycroft valley. The Oldman River Coalition further objected to potential cumulative effects of pipelines and gas plants upon fescue grasslands. Based on past disturbances on the Waldron Grazing Co-operative, invader plant species would degrade the condition of the native range.

The Whaleback Coalition also objected to the Polaris application based on several issues related to cumulative effects. These included the lack of a coordinated review process for regional development, regional impacts of the Polaris project upon wildlife, and cumulative effects of subsequent energy projects if the Polaris application were to be approved.

The Martys recommended a change in the current practice of land-use planning, preferring a broader scale for regional landscape planning. They said that the Alberta Government was obligated to consult the public on matters of regional-scale development. For now, the Martys believed that there should be a moratorium on development in the Whaleback area. They supported the ecosystem approach as opposed to the current multiple-use planning approach.

Ms. Huntley stated that biological research had shown higher numbers of grizzly bears in the region between Chain Lakes and the Oldman River than in Waterton National Park. It was her view that habitat loss had already occurred regionally from the Lost Creek forest fire and that cumulative effects of the proposed well and full field development would significantly affect grizzly bears.

7.3 Views of the Board

7.3.1 Effects on Air, Water, Soil, Vegetation, Wildlife, and Fish

The Board notes that intervenor evidence on the flare dispersion evaluations carried out by Polaris did not include independent predictions of air quality. The Board would find it particularly helpful if parties, rather than seeking primarily to discount the evidence of others, would provide technically sound alternative evidence and supporting rationale. This would assist the Board in assessing the implications of the interventions and would provide an alternative basis for decisions. In this situation the only predicted ambient air quality evidence on the potential impacts of the well test flaring remains that of Polaris.

The purpose of the *Guide 60* well test flaring evaluation methods is to use representative meteorological data and conservative methods (that is, assumptions and evaluation tools that err on the side of overprediction and, hence, are protective of safety and the environment) to understand the potential for exceedance of ambient air quality guidelines. Unlike continuous emissions sources from major industrial facilities, one-time, short-duration well test flaring events can readily be scheduled or shut in to avoid unfavourable dispersion conditions.

The Board accepts that the Alberta Environment meteorological data sets from six long-term monitoring sites around the province may not be truly representative of specific individual locations. However, *Guide 60* provides that the Edson data set resulted in the highest predicted ambient air concentrations and thus represents a worst case relative to other readily available data sets.

The Board, however, recognizes the interveners' concerns that valley inversions during Chinooks and potential fumigation conditions may not be adequately represented by the methods used by Polaris and may represent worst-case plume trapping scenarios. The evidence presented fails to adequately demonstrate whether Chinook-induced air inversions or fumigation events will result in exceedances of the Alberta Ambient Air Quality Guidelines. Similarly, there is nothing in the proposed flare management plan to identify inversion and fumigation situations and to shut in well test flaring under those conditions with potential for exceedance of the Alberta Ambient Air Quality Guidelines. The Board finds that although Polaris complied with established protocols in evaluating plume dispersion from its proposed well test flaring, the Board believes evaluation of Chinook-induced air inversions and fumigation effects on flare emissions dispersion should have been evaluated in this case.

The Board is not convinced that Polaris has adequately addressed concerns with respect to flood hazards, storage and containment, maintenance of normal flows from springs, seepage areas, and surface runoff. Regarding the unnamed tributary, groundwater seepage, and slope conditions, the Board has concerns that Polaris was not thoroughly diligent in its well site selection criteria or identifying environmental constraints of the 11-32 well site to the landowner. The close

proximity of the unnamed tributary would require further mitigation than that proposed, whether by berm or dike construction around the well site perimeter or in combination with other means such as an elevated well pad, to avoid washouts or damage of on-site equipment and storage tanks during high water conditions.

Based on the site inspection and evidence presented at the hearing, the Board is concerned that environmental conditions of the 11-32 well site location may not be suitable during construction, drilling, and long-term operation of a well without significant mitigative measures. The Board notes that the interveners, although concerned with site conditions at 11-32 well site, did not propose a more acceptable well site location.

The Board believes that the application by Polaris contained limited information about the presence and distribution of native grasses. The Board notes that the rare plant survey that Polaris completed followed two consecutive years of dry growing seasons, which may have contributed to negative findings for rare plants. In the Board's view, the extent to which fescue grasses and rare plants would be affected by the proposed access road and well site has not been adequately addressed.

The location of the proposed 11-32 well site and high quality of downstream fish habitat present several challenges for environmental management. The close proximity of the well site and access route to the unnamed tributary presents increased risks to fish and fish habitat, as well as to the water quality of Bob Creek and potentially the Oldman River from contaminant release. The Board finds that the mitigations proposed by Polaris may not be appropriate in all cases for the level of environmental risk associated with flood hazard, well site integrity, primary and secondary containment, monitoring and contingency planning of spills and other releases from the well site and road access, and disruption of groundwater seepage. Some of this uncertainty relates to information concerning the design and implementation of mitigations not being provided to the Board.

The Board believes that under different well test or flaring conditions, restricted drilling in winter months would benefit wildlife management. Nevertheless, atmospheric stability conditions of summer months and higher public use for outdoor recreation could contribute to higher risks to public safety from drilling and flaring than if winter timing restrictions were applied for wildlife management. Habitat loss, access development, avoidance, and disturbance effects on wildlife associated with industrial activity need to be minimized for areas of critical wildlife habitat wherever feasible. In the circumstances of the 11-32 well site, the Board understands that localized effects of drilling and production activities upon wildlife may be reduced to acceptable levels by mitigation efforts (e.g., access management and "no net loss" of habitat) proposed by Polaris.

Polaris proposed several mitigation measures for the protection of wildlife. These included commitments to access management, reduced surface disturbance by the use of existing access, avoidance of higher quality winter range sites for ungulates, and adoption of "no net loss of habitat." As with a number of other mitigations proposed by Polaris, the Board has concerns about mitigation effectiveness without adequate detail as to their design and implementation. The Board particularly notes the commitment of Polaris to "no net loss" of wildlife habitat and the uncertainty of how compensation would be achieved. The Board concludes that without

acceptable mitigation, the Polaris development of a single exploration well and access road are likely to have some undetermined environmental effects upon wildlife.

7.3.2 Ecosystem Effects

The Board believes that while the potential for oil and gas exploration clearly exists for these lands, the fact that they are adjacent to protected areas cannot be ignored. All parties admitted that the lands in question were part of the unique ecosystem of the Whaleback and as such share similar sensitivities as the lands located within the protected areas. The Board therefore has applied the principles of EUB *IL 93-09* to the subject application and, based on the evidence provided at the hearing, is unable to reach conclusions regarding either ecosystem effects or appropriate mitigation measures. In determining the public interest, the Board must be convinced that Polaris is able and prepared to take all actions necessary to mitigate any disturbance to the lands in question and to the Whaleback ecosystem as a whole.

7.3.3 Cumulative Environmental Effects

The Board notes the issues identified by the interveners that relate to full field development, pipeline routing, and cumulative effects through Polaris's public consultation program. As such, Polaris should have done more to specifically address the concerns of the community. The Board believes that Polaris did not adequately address the minimum requirements set out in EUB *IL 93-09* in filing its application because Polaris chose not to submit a conceptual development plan that addressed cumulative environmental effects issues raised in its public consultation, the EUB's regulatory review, and the hearing. The Board is disappointed that Polaris chose not to submit such a plan in support of its application.

8 QUALITY OF LIFE AND VISUAL IMPACTS

8.1 Views of the Applicant

Polaris submitted evidence on the precautions and measures it would follow to protect public safety in the unlikely event of a gas blowout. It also outlined planned measures for public safety related to well testing and flaring. Consequently, it believed that persons within the EPZ of 13.54 km would not be adversely affected. Polaris was prepared to temporarily relocate the closest residents during drilling of the zones with H₂S as a remedy for their safety concerns.

Polaris said that it had negotiated satisfactory terms with the landowner and had made reasonable efforts through public consultation to address the concerns of the local residents, including possible effects on lifestyles. Polaris believed that it had addressed resident concerns that road traffic with heavy equipment would be unsafe. Polaris said that, for the most part, traffic in and out of the site would be light and that it would consult with residents on ways to coordinate and manage local traffic at such times as rig moves. Further, it said that it would install "no trespassing" signs and a control gate to limit public access onto the proposed lease road.

In addressing the visual impacts of the proposed access road, Polaris identified the existing trail as an already existing visual disturbance and that it would rely on future reclamation that might be requested by the landowner as primary mitigations. Further, it said that the proposed location

for the 11-32 well, with its topography and tree cover, would offer some screening against visual impacts at the well site.

8.2 Views of the Interveners

The Oldman River Coalition raised concerns about the proximity of the well to local residents and questioned the risks associated with flaring and blowout scenarios versus the benefits of the proposed well. It objected to the potential disturbance to the unique character and qualities of the Maycroft valley by Polaris and stated that its community, economy, and way of life would be irreversibly changed by oil and gas activity. It said that the local economy of ranching was well established and it believed that the short-term industrial activity would have negative social and economic impacts. In support of the environmental uniqueness and ranching characteristics of the Whaleback area, the Oldman River Coalition presented the video *Journey in the Whaleback*.

The Whaleback Coalition testified to the high importance of the Whaleback area for its historical and cultural values inherent to the landscape. It said that industrial activity such as the Polaris proposal would create lasting change to the landscape. The Whaleback Coalition believed that the linkage between prehistoric and historic events that happened on the land would be impaired by the Polaris development. Further, visual impacts of road development and industrial activity would decrease the wilderness, spiritual and cultural values of the natural landscape. The Whaleback Coalition maintained that the establishment of protected areas in the Whaleback and EUB *Decision 94-08* confirmed the high aesthetic value of the Whaleback area.

The Whaleback Coalition requested the Board to recommend to the Alberta Government that Polaris and the Section 32 freehold mineral rights owner negotiate by means of mineral rights exchange, land exchange, or royalty credits for an agreement to extinguish freehold mineral rights in the Whaleback.

The Martys agreed with other interveners that approval of the Polaris project would contribute to future development in the form of additional access roads, pipelines, wells, and facilities. They stated that these cumulative effects associated with the Polaris development had the potential for irrevocable changes both to the environment and the quality of life for residents. They did not support granting an EUB licence that might contain approval conditions.

8.3 Views of the Board

The Board believes that this well could be drilled without undue harm to the quality of life of the area residents and with minimum visual impact. This would require a high degree of communication between the company and the residents and an overall climate of confidence, along with a commitment to work with the community to minimize the visual impacts and to develop and implement specific plans for access management.

9 SAFETY IMPLICATIONS OF THE PROPOSED WELL

9.1 Views of the Applicant

Polaris stated that the most important activity would be to ensure that practical and effective measures were in place to protect the health and safety of employees, clients, property,

environment, and the public in all areas of its operations. It indicated that its ERP model was considered to be cutting edge in terms of public safety, ease of training, and ease of implementation. To complete the ERP, Polaris had drawn on Bissett Resource Consultants Ltd (Bissett), which had significant experience in emergency response planning, a wealth of technical expertise, and contact with the residents, grazing leaseholders, businesses, and government agencies.

Polaris noted that Bissett's knowledge, along with insight and information gathered during visits with contacted parties, allowed for the creation of a precise, effective, and efficient site-specific emergency response team. It indicated that positive enhancements would be added to the ERP after further discussions with the Maycroft area residents. The first draft of the site-specific ERP was Polaris's first step in maximizing safety of the Maycroft area public. Polaris believed that gathering information through the public hearing process, ensuring that the site-specific ERP was current through an emergency planning update process, and providing the Polaris responders, government agencies, and public with an extensive training program would be the next steps to maximizing the safety of the Maycroft area public.

Polaris stated that concerns expressed about this project had nothing to do with safety, Polaris's ability, or environmental protection, but rather the community rejecting this project. It anticipated that an emergency preparedness committee would be established to allow Polaris to seek input from the community on the ERP. Polaris said that the issue of safety was raised regularly at open house meetings by residents. Polaris presented the idea of the committee at the open house to encourage local residents to become involved in the project. Polaris said that although residents were not receptive to the drilling of the well and viewed participation in the committee as endorsement of the project, they indicated that they would participate in the committee after Polaris received a licence. Polaris believed that the committee would address issues such as evacuation of livestock.

Polaris stated that an efficient and effective ERP was created by input, particularly from the local residents. It noted that it intended to identify resident issues and concerns and then build the mitigative measures into the ERP. Although Polaris stated that it was still its intention to organize such a committee, it noted that due diligence in community consultation, safety, environmental protection, and EPZ planning had not been a problem with the people who support the project.

Polaris stated that the preliminary ERP had been developed with appropriate safeguards to ensure that the EPZ could be evacuated in a reasonable time. Polaris acknowledged that it had concerns with respect to notification of transients and grazing leaseholder range riders and indicated that the plan would adequately address that issue. Further, Polaris noted that with rovers monitoring the area daily, it would be aware of any transients in the area.

Polaris stated that the ERP was based on the concept that the hazard would be removed if the people could not be removed. It stated that the ERP would not wait for an emergency to occur. The plan was based upon the assumption that there would be time to react between when a potential well control incident was identified and the incident itself occurred. Polaris indicated that evacuation of people would occur before there was a release of H₂S and a subsequent release of SO₂, which would occur after ignition of the well.

Polaris said it had categorized those who would be at highest risk and those at lowest risk. Some of the considerations taken into account were proximity to the well, pre-existing health conditions, age, and dead-end roads. A contact schedule would be set up based upon these parameters. Polaris indicated that it planned to remove the people before there was a release and that the backup measure would be immediate ignition of the well.

Polaris indicated that it had considered some enhancements to the ERP after reassessing the draft plan as follows:

- have two pairs of rovers (four in total) working 12-hour shifts during critical H₂S operations; the number of rovers might increase to four pairs (eight in total) working 12-hour shifts (two rover pairs south and two rover pairs north of the Oldman River once the operational schedule and corresponding public activities are known);
- identify a backup remote command post and add the location to the ERP;
- place stationary downwind air quality monitors at strategic locations in or around the calculated EPZ, if beneficial;
- identify a public safety coordinator to man a 24-hour telephone at the remote command post during normal H₂S gas operations, particularly if requested by the residents;
- to lessen the burden on the remote command post coordinator/public safety coordinator, consider adding a rover captain (particularly if the number of rovers increases) and a roadblock captain to the remote command post team;
- if the public safety coordinator becomes reality, install a minimum of six telephone lines into the remote command post;
- position security personnel at the entrance to the lease road during any critical H₂S gas operations to control access to the well site;
- develop a workable protocol with affected public to locate family members/workers/recreational users if they were within the EPZ during an emergency; and
- decide if livestock evacuation was required, which might include the location, type, and number of animals that might have to be evacuated.

Polaris indicated that continued consultation and communication with stakeholders in an open, timely, and forthcoming manner would allow all parties to complete a final ERP that would fully protect people and livestock in the Maycroft area. Additionally, it noted that the ERP was a living document and would never be finalized until the well was completed. If the well were licensed, Polaris indicated that it would not have any difficulty agreeing with the community on reasonable protective mitigation and compensation measures.

9.2 Views of the Interveners

The Oldman River Coalition led evidence regarding potential negative effects of H₂S and SO₂ on animals. It listed eye and respiratory irritation, chemical pneumonia, reproductive problems, cold intolerance, and immune system problems in cattle, as well as exercise intolerance and eye irritation in horses. The Oldman River Coalition also presented information that exposure to SO₂ concentrations decreased immune function and increased metabolic rates for cattle.

The Oldman River Coalition's experts indicated that the relationship between the company and the community was very important. They believed that when companies did not have a well-established relationship with residents, residents felt that H₂S gas was potentially lethal to them and they were in great danger of an exposure that could be extremely damaging to them. Further, they believed that residents who had a relationship with a company did not have any fear because they had confidence in the company to do the right thing. The Oldman River Coalition indicated that Land Solutions was receptive to its concerns. However, during contact by Bissett, it appeared that Bissett only wanted to read its document and was not receptive to concerns raised by residents. The Oldman River Coalition stated that the repetition of simple matters gave rise to concerns about trusting Polaris.

The Oldman River Coalition expressed growing concerns about Polaris, a small company with no reputation in dealing with H₂S gas. It indicated that there had been no feeling of assurance that an ERP described on paper was going to be effective in its implementation and said that Polaris had displayed a very paternalistic attitude towards it during the consultation process. It stated that it had no substantial evidence to prove it could trust Polaris with its members' lives if an H₂S gas well were drilled in their community, given the outstanding issues. The Oldman River Coalition stated that further concerns were created when Polaris indicated that there would be no reason for communication with area residents after the licence was issued. This created a lack of confidence in the feasibility of implementing the ERP under less than ideal circumstances. The Oldman River Coalition indicated that it considered the risk versus the benefits for its community and felt that over the last two years, its concerns and fears had escalated, and not decreased. It felt there would be considerable increased risk to health with this well, quoting information from a study referenced in the Petroleum Communication Foundation brochure. The study reported a higher incidence of respiratory problems in children living downwind from facilities with H₂S.

The Oldman River Coalition expressed concerns about the effect of a blowout and the release of H₂S into the valley, including concerns about members' livelihood and care of livestock if some of its members were relocated from their ranches during drilling operations in the zones containing H₂S. Its main concerns were health, safety, and security and the health and profitability of their cattle, implying that the coalition's members had everything to lose and nothing to gain from the drilling of this well. By way of example, the Oldman River Coalition noted that the ERP was still based on a telephone call-out. It said that despite feedback, Polaris did not understand that rural communities worked differently and that communication by phone did not work well in a rural setting. In many cases, residents were not in their homes and did not have access to a cell phone; in some instances, no cellular service existed in the area. Additionally, it said that most homes had only one phone line, which could easily be tied up.

The Oldman River Coalition had numerous concerns about safety and evacuation issues and expressed doubts as to whether evacuation would be successful. In support of its concerns about evacuation, it cited factors such as terrain of the area combined with limited road access, adverse weather conditions that may cause road closures, ranchers on horseback who could not be reached, and the numbers of recreational users in the area over a wide range. The Oldman River Coalition was further concerned that there were no alternate exit roads from the valley and, in many cases, people had to exit through the danger zone. Although Polaris responded to these egress concerns by stating that it would add additional rovers to aid in location and evacuation, the coalition failed to understand how additional rovers would be able to help with a quick

evacuation when the road was closed due to adverse weather conditions. The Oldman River Coalition believed that evacuation would require personal contact, because no other form of communication would work in this area; and, given the time constraints, it believed that many people would not be contacted and therefore not be removed from the hazard.

The Oldman River Coalition believed that topography would further make it difficult to find people in the region. It stated that there were many unknowns and that evacuation would encounter serious difficulties not addressed by Polaris in its ERP. It noted that ignition would be guaranteed if evacuation were not practical, but expressed concern about the uncertainties with respect to SO₂ emissions, noting that Polaris did not provide SO₂ modelling in a blowout scenario. It further noted that while Polaris said that modelling was under way, it was not prepared for the hearing. The Oldman River Coalition believed that the modelling should have been presented at the hearing, since it understood that this modelling was being conducted to alleviate concerns. Further, it indicated that its members did not want to be moved out of the area during drilling operations due to concerns about the health of their livestock and it indicated that Polaris did not have a plan that included managing livestock in the event of an emergency. The Oldman River Coalition noted that given the extensive grazing leases in the area, there could be thousands of cattle that could not be evacuated. Without being privy to SO₂ modelling results for a blowout scenario, it had concerns about livestock exposure to SO₂ and noted that there was no plan for assessing the impact of SO₂ on their animals.

The Oldman River Coalition said Polaris was dismissive of the safety and technical issues it raised because it believed local people were not experts. The coalition felt that it could provide valuable information and local expertise that could be crucial in planning for the safety of the community. It believed that there were no suitable alternatives with an acceptable degree of safety; therefore, to be safe meant no H₂S gas operations. It said that answers provided by Polaris at the hearing raised further concerns among its members and it expressed reservations about placing the health and safety of their families with this company. It felt there was a lack of commitment to the project from Polaris and that, if offered money, Polaris would take the easy way out by abandoning the project.

The Whaleback Coalition repeated concerns about the difficulty in searching for and finding people in this area. It noted that much of the EPZ fell within special recreational areas where activities were restricted and where people might consider it a safe place to be.

The Whaleback Coalition was concerned about the view of the medical officer, David Brown, from the Chinook Regional Health Authority, since he had stated very clearly that there were issues to be resolved. Mr. Brown indicated that the Health Authority had a mandate not only to provide medical services to their communities but also to ensure human activities do not negatively influence the health and well-being of their citizens. Of special interest to the Health Authority was the number and relevant health conditions of people within the EPZ. As local hospitals have limits to available resources in the event of a disaster, the Chinook Health Region wishes to ensure they can plan for disaster events well. The Health Authority also wished to ensure that municipal disaster plans “mesh” with their own internal disaster plans and partner with those agencies whose resources may be vital with a mass casualty incident. The Whaleback Coalition saw no evidence that those issues had been addressed. With respect to Ms. Huntley and her needs, the Whaleback Coalition said that it was not aware of Polaris asking about or providing for any special needs that she may have with evacuation.

The Martys expressed concerns about their family's health and safety during an incident. They stated their family actively hiked, rode, fished, and hunted in the country around their home and in the Whaleback area. They also had one road to get to their home, which got snowed in during winter storms. During those times, they did not have a way to get out until the road was ploughed or a neighbour came by with a tractor. The Martys reiterated concerns about how their family would evacuate during an emergency.

Ms. Huntley reiterated her concerns about health, safety, and notification issues that affected herself and her family. She raised concerns about statements regarding adequate notice prior to an emergency becoming dangerous and indicated that she had been involved twice in an emergency situation where evacuation was required and there had been no warning. Ms. Huntley indicated that her family enjoyed the therapeutic benefits of the surrounding countryside and spent a substantial amount of time in the hills. She was concerned that her family would be unaware of a dangerous incident if it occurred and did not want to be in a situation where she constantly had to worry about her safety.

9.3 Views of the Board

The Board requires that emissions from H₂S gas operations, including well test flaring, comply with the Alberta Ambient Air Quality Guidelines established by Alberta Environment. The Board, in *Guide 60*, prohibits venting of gas containing more than 1 per cent H₂S or venting of gas with lesser concentrations if it results in off-lease odours. The Board notes that the maximum one-hour guidelines for H₂S and SO₂ of 14 µg/m³ (0.01 ppm) and 450 µg/m³ (0.17 ppm) respectively are less than the effects levels exposures noted by the interveners.

In the improbable event of an uncontrolled well release, the Board recognizes that H₂S and SO₂ concentrations may exceed in the short term, human and animal health impact levels. Where such a hazard exists, the Board's requirements focus on public safety and effective emergency response.

The Board believes there are two key issues that it must address in determining the adequacy of Polaris's emergency preparedness. These are

- notification, evacuation, and implementation of the ERP in a unique area, and
- ignition-related concerns, coupled with the uncertainties surrounding SO₂ emissions.

The Board, in reaching its conclusions on these two issues, has been particularly cognizant of the interveners' evidence regarding the unique features of the area. In this case, the terrain and size of the area holds significant barriers to effective notification and evacuation in the case of an emergency. This would be particularly evident in winter months, when road access could be limited. Polaris presented no plan to deal with restricted or reduced access or egress during adverse weather conditions.

The Board notes that Polaris proposes to use an automated telephone call-out system as its primary method of notification in the event of an emergency. The Board is not convinced that this is an appropriate plan for emergency communication when the specific aspects of this area and its population are considered. In an area without cellular telephone coverage, such as this, it is difficult to imagine how emergency messages communicated via a call-out system could reach

the numerous residents who spend much of their working day in remote locations. Communication with these area occupants may be limited to personal contact. The Board is not convinced that the additional rovers contemplated would be able to overcome the communication challenges and locate all users in the region.

The Board agrees with residents that there is a high degree of uncertainty as to whether an evacuation could be carried out effectively during an uncontrolled release in some parts of the area, considering the size and terrain of the EPZ. Interveners were concerned that they have no alternate exit roads from the valley and in some cases would be required to egress through the hazard zone.

The Board understands that Polaris had proposed to evacuate some residents from their homes for the duration of the drilling program in the critical gas zone to alleviate their concerns. The Board believes that this approach, commonly used by industry, has often been successful in addressing resident concerns. In this particular case, however, residents were also very concerned about the health of their livestock. Interveners indicated there could be thousands of cattle in the area that could not be evacuated and were concerned about exposure of livestock to SO₂. The Board notes that while Polaris did not initially include livestock protection measures in its draft ERP, Polaris did indicate that in the event of an emergency both people and livestock would be fully protected, without providing any further detail as to how that would be accomplished.

The Board notes that Polaris may have encountered some resistance from residents during discussions of the proposed project. However, despite the lack of resident participation and as noted by the Board in [Section 6.3](#) of this report, Polaris could have been more diligent in fully consulting with and listening to the area residents to become reasonably aware of many of the specific local concerns. These included the potential for extreme weather conditions to restrict travel, ranchers who work on horseback, and special considerations needed for the terrain and size of the area. The Board expects industry to recognize special needs and concerns pertaining to all residents within an EPZ and develop acceptable procedures to address those special needs in its ERP prior to submitting a well licence application. The Board also expects industry to respond to public concerns by adjusting the size and configuration of an EPZ and, if necessary, establishing reasonable site-specific procedures in consultation with the public. The Board believes that while Polaris has identified a number of approaches to address these individual concerns, substantial issues remain related to an emergency.

The Board is of the view that in this case the critical element in protecting the safety of residents is ignition in the event of loss of control. The Board notes that the ignition plan submitted by Polaris contains no SO₂ modelling in a blowout scenario. In the Board's view, such modelling would have been helpful in considering an ERP in this particular locale.

10 FINANCIAL SECURITY AND TECHNICAL/OPERATIONAL ABILITY OF POLARIS

10.1 Views of the Applicant

Polaris stated that no evidence was presented that it did not have the financial or technical capability to drill the well properly. Polaris said that it would accept a Board condition that it evaluate potential liabilities and maintain adequate related insurance coverage.

Polaris explained that with the exception of John and Douglas Maher, the other members of its project management team were consultants. It stated that its project manager and drilling superintendent would be engaged full time during the drilling of the well. Its emergency response contractor, Bissett, would not be dedicated full time to the project but would have up to 25 people who could become dedicated in the event of an emergency. Polaris said that it would not have a common office for its project team.

Polaris noted that in the Amoco hearing there was a concern expressed about the lack of senior personnel; it further noted that every one on the Polaris team, including John Maher, had long experience in their fields. Polaris stated that members of its team had significant deep H₂S drilling experience. It also pointed out that well licences for gas wells containing H₂S are issued by the EUB to small companies regularly, often without hearings.

Polaris said that its Project Management Plan was based on well-established international safety management principles, such as the Hazards and Effects Management Process and ISO 14001 environmental management standards, as well as the world-class Industry Recommended Practices (IRPs) for drilling wells with H₂S. It stated that its plan outlined roles and responsibilities of each member of the project management team and required that major contractors have appropriate health, safety, and environment management programs. The plan further set out Polaris's requirements for contractor health, safety, and environment program audits, related safety and planning meetings, and technical peer review of design team programs. Polaris stated that the plan would provide a strong, state-of-the-art process similar to those successfully used on many critical wells and other complex well projects.

Polaris stated that its management plan did not specifically identify a team member responsible for public consultation but indicated that Fire Creek Resources Ltd. was expected to continue in that role. It said that well site supervisors and staff would be selected and qualified according to applicable IRPs.

Polaris said that through its management plan, it was committed to selecting the best qualified drilling rig, service rig, and production test contractors for the project. Contractor selection criteria would include experience with wells containing H₂S, technical and operational capability, and health, safety, and environment performance and management systems, as well as the commercial terms. It said that its contractor selection process included checking out potential contractors with major petroleum industry operators.

Polaris stated that its Safety Manual included an incident investigation and reporting procedure. The manual (Exhibit 126) included Polaris's safety, environmental, and maintenance policies, as well as sections on safe work practices, H₂S code of practice, training, safety, inspections, investigations, and emergency preparedness.

Polaris stated that it had no employees in Alberta and that its primary Alberta asset was the mineral rights in Section 32. It noted that its partner, Knight Resources Ltd., had no Alberta employees or any Alberta assets beyond its mineral interest in Section 32. Polaris said that although it had participated in Alberta wells, it had not operated any of these. It noted, however, that its prior company, Polaris Petroleum, had drilled and operated a number of gas wells in Alberta.

10.2 Views of the Interveners

The Oldman River Coalition said that it did not believe that Polaris had the capability to carry this project out prudently, because it lacked the expertise and financial resources. It noted that Polaris was a very small company with limited resources and had assembled a team of companies and individuals that had not worked together before. The coalition was concerned that companies with inadequate financial resources may resist or ignore the EUB's regulatory requirements or may not be in a financial position to comply.

The Oldman River Coalition did not support the concept of hiring a group of experts and hoping they would develop a plan that was going to work. It said that in-house management, expertise, and bench strength were needed to be able to hire and draw on experts. The Oldman River Coalition said that it was concerned about Polaris's consulting team approach with respect to the potential for lack of accountability among contractors. It noted that Polaris's team had already changed members a couple of times and, should the Board grant the licence, it questioned who might be on the team when the well was drilled next year. It asked whether consultants would be available on short notice if technical problems or emergencies developed and raised concerns about continuity should contracted consultants resign or be incapacitated.

The Oldman River Coalition said that the proposed well was not a small-company project. It stated that the well involved was in an extremely challenging environment, both on the surface, in the subsurface and operationally. It did not believe that a company that had not operated a well, let alone a critical gas well, could carry the project off.

The Oldman River Coalition said there must be clear evidence to the Board that the company and all its contractors were fully capable, available, and organized in such a manner that appropriate emergency measures could be carried out. It maintained that this capability must be assured throughout the life of this project.

10.3 Views of the Board

The Board believes that it is essential that a company proposing to develop oil and gas resources be capable of safely carrying out the project. This requirement becomes acute where the project will involve gas with the level of H₂S expected to be encountered here. In this particular application, the Board must also take into consideration the unique environmental concerns present at this location. Therefore, in order to find that the drilling of the proposed well in these circumstances can be carried out in the public interest, the Board must be convinced that the company is capable of taking all actions necessary to mitigate the identified risks to an acceptable level. Moreover, the Board must be cognizant of the company's ability to communicate its plans to the community and thereby inspire confidence in residents that the company has their best interests in mind. Industry has recognized the importance of the

sufficiency of a company's infrastructure in determining its ability to safely and responsibly drill a critical well by the adoption of the IRPs. In assessing such capability in these circumstances, the Board would have regard to the following:

- The proponent's plan must have an adequate system of management controls to ensure quality engineering design, proper drilling/construction, safe operations, adequate procedures to maintain equipment integrity, and appropriate abandonment and reclamation in compliance with regulatory requirements, industry codes, and recommended practices.
- The proponent must have adequate expertise and person-power to implement project plans and the system of management. This management, technical, and operational expertise must not only include individuals from key disciplines but also sufficient numbers of supporting staff to be able to respond to technical problems, upsets, and emergencies effectively and on a timely basis. Further, the concept of adequate expertise must necessarily include provision for succession or backup in the event key individuals are unavailable or become incapacitated.
- The proponent must have sufficient financial resources to safely carry out projects according to design, respond to problems that may be encountered in project execution, implement effective emergency response programs, assume liabilities that may arise from emergencies, sustain safe operations, and satisfactorily reclaim projects following decommissioning. The financial capability must not only enable companies to respond to issues on a timely basis but also protect the larger public from having to assume unfunded liabilities that may arise from the proponent's projects.

The Board has been provided with Polaris's Project Management Plan, as well as its Safety Manual, supplemented by the testimony of John Maher as evidence of the system in place for the proposed project. The combination of these documents does not, in the Board's view, constitute a coherent project management plan. The Board notes the absence of environmental practices and key regulatory compliance elements that would be expected in a comprehensive program for operations with H₂S gas, especially in environmentally sensitive areas. The safety manual does not extend to elements such as engineering controls, contractor selection, critical aspects of H₂S gas facilities operations, and maintenance, nor does it include details of system evaluation and audit protocols. In an application such as this, where the applicant relies entirely on contractors for every aspect of its program, the Board would have expected a plan that dealt directly with the unique challenges of managing this project.

The Board must be certain that in addition to appropriate plans and programs, the applicant has access to the qualified people and resources necessary to effectively implement those programs. In this case, the Board views that Polaris has not provided sufficient evidence that it has the protection programs and capabilities to safely drill and operate the proposed critical gas well.

The Board is concerned that Polaris does not operate any facilities with H₂S gas and has no permanent drilling or operations employees. The Board is not satisfied that Polaris has experienced field staff readily available to respond to problems or emergencies. Further, Polaris has very limited backup within its own organization. The Board is concerned that if one or both principals of Polaris, John Maher and Doug Maher, should become incapacitated, there may not be provision for senior leadership or for maintaining adequate contract personnel to assume Polaris's responsibilities for care, custody, and control of critical H₂S gas facilities.

The Board acknowledges that Polaris has assembled a team of qualified consultants, each with its own set of expertise and experience. The Board notes, as well, that there have been changes in the team in the months leading up to the hearing. The interveners have suggested that these changes led to concerns with respect to continuity and who ultimately would be available in an emergency. The Board shares these concerns. Changes in consultants are not, however, unexpected and in and of itself do not cause concern so long as there is a clear and consistent entity in place that the Board, local residents, and other parties can look to at all times to ensure compliance, receive complaints or concerns, and take emergency action. In the Board's view, this entity must be the licensee. In this instance, the proposed licensee, Polaris, does not possess the ability to provide the necessary assurances that it has the ability to provide backup and ensure continuity of personnel in the event of changes in consultants. As such, the Board does not feel Polaris has the ability to execute a project of this type in a manner consistent with the public interest.

In regard to Polaris's financial capability, the Board notes that in the weeks prior to the hearing, Polaris lost its primary partner in this enterprise. Polaris has indicated that it will obtain a new equity partner to complete the project. John Maher expressed confidence that if a licence were granted, he would be able to raise the necessary capital, as he had already been approached by a number of companies to participate in the project. The Board notes further that Polaris's partner, Knight Resources Ltd., which holds a 25 per cent interest in the project, indicated in its recent financial statements that it too would need to raise further capital to continue as a participant in the proposed venture. In short, Polaris would require financial participation from other yet unknown parties to be able to finance this project.

In the Board's view, the current financial status of Polaris is not determinative of this application. The Board recognizes that the raising of necessary capital commonly follows the issuance of a licence. In a project such as this, however, where certainty of a company's ability to conduct the project in a manner consistent with the public interest is paramount, the Board believes that financial stability is one of the factors to be considered. As such, the Board is of the view that the company's financial position adds to the previously stated concerns surrounding this company's ability to execute this project in a manner consistent with the public interest. All of the above points to a level of financial uncertainty that concerns the Board.

11 CONCLUSION

In considering whether to grant the well licence, the Board must return to the initial question: Can this well be drilled by this applicant in this location at this time in a manner consistent with the public interest? After a careful review of all the evidence, the Board has concluded that it must deny the well licence application.

First the Board repeats that the need for the well is solely to provide information. To grant the application, the Board would have to be satisfied that the well's inherent risks to the environment and the public, were sufficiently mitigated as to not outweigh the benefits for the well. The evidence set out above has not provided that measure of satisfaction in this matter.

The Board's conclusion is based on the following:

- the inadequacies identified in Polaris's drilling plan;

- the overall failure of Polaris to engage in an effective plan of consultation and communication, which not only hampered its initial dealings with local residents but caused serious doubt as to Polaris's ability to properly consult and communicate on an ongoing basis, thereby undermining its ability to implement many of its plans for mitigation;
- the inadequacies in Polaris's assessment and mitigations of environmental impacts;
- the inadequacies of Polaris's development plan;
- the inadequacies in Polaris's ERP; and
- the lack of a coherent management plan that would outline how Polaris would be able to deal with the eventualities of a project of this magnitude in light of its size and Polaris's lack of experience coupled with its own lack of resources.

In light of these considerations, collectively the Board is of the view that it cannot in the public interest grant the application. However, the Board must emphasize that any future application would be considered on its own merits and that this decision should not be perceived as necessarily excluding resource development in this area.

The Board concludes that as a result of the foregoing findings, it will not approve the applied-for licence for the 11-32 well. This disposition of the well licence application renders moot the special spacing and compulsory pooling applications. However, the Board sees significant benefit in completing its analysis of and decision on these applications as well. In addition, the Board believes that the flaring permit application is a unique item bearing further consideration here. In light of this, the Board herein provides the reasons for its disposition of these applications without the normal recitation of applicant and intervener evidence.

12 SPECIAL GAS WELL SPACING, COMPULSORY POOLING, AND FLARING PERMIT

12.1 Special Gas Well Spacing and Compulsory Pooling

The Board notes the references to *Decision 90-11* by hearing participants and believes that the considerations noted in that decision are relevant to the subject application for a special two-section DSU. The considerations noted in that decision and the Board's review of each of the factors in the context of the subject application are as follows:

- Resource conservation, that is, whether the proposed special spacing would affect the recovery of the resource:

The Board notes that no wells have been drilled into the prospective pool and there is no well control in the area to establish the geological and productive characteristics of the pool. In the Board's view, the number of wells required to adequately recover the resource in a reasonable period of time is unknown at this time. The Board agrees with the statement in *Decision 90-11* that where there are insufficient data to establish the geological and productive characteristics of a pool, the Board would normally maintain the standard size of spacing unit for the area.

- Economics and efficiency, that is, whether the altered facilities could effectively recover the resources such that the economics of the special spacing were more favourable than the economics of standard spacing:

The Board believes that because the characteristics of the pool are unknown, it is not possible to determine at this time whether a single well could effectively recover the resource underlying a two-section DSU, and therefore it is not possible to credibly determine whether the economics of a special two-section DSU are more favourable than the economics of the standard one-section DSU.

- Equity, that is, whether the special spacing would have any unacceptable effects on another party's opportunity to recover its share of the resource:

The Board notes the interveners' arguments that forming a two-section DSU would allow the leases for the east half of Section 32 and for Section 33, which expire in April 2004, to be purchased by Polaris in a private sale. The applicant candidly admitted that this would place it in a position of commercial advantage with respect to other companies that may wish to commence activity in the area. The Board is concerned that this would be inequitable to any other party that wanted to obtain and develop mineral leases and resources in the area. On the basis of the foregoing, the Board concludes that the establishment of a two-section DSU in this case raises an equity issue in respect of other parties that might wish to acquire mineral rights.

- Land use, that is, whether the proposed spacing would have any significant effects on land surface use:

The Board considers that if there were some reasonable certainty that only one well could adequately drain the pool underlying both Sections 32 and 33, there would be some advantage to the formation of a two-section DSU to minimize surface impacts. However, the character of the reservoir and the number of wells needed to adequately drain it in a reasonable period of time are unknown at this time. The Board also notes that Polaris has indicated that it would drill up to four wells to recover the resource underlying the two sections, with additional wells possibly being drilled even if the initial well had high productivity. Polaris has indicated that it would drill additional wells from the current surface location to minimize surface impact. However, the Board believes that it would be necessary to drill a first well to obtain information before any real decision could be made on the necessity or location of future wells.

- Land tenure policy, that is, whether the proposed spacing would be contrary to the intent of the legislation governing land tenure policy:

In the Board's view, a two-section DSU would be consistent with the intent of the land tenure system only if there were a known productive reservoir underlying both sections. In the present case, there are no data to provide this information, and on that basis the Board concludes that the requested two-section DSU would not be consistent with the intent of the land tenure system at this time.

The Board also notes Polaris's submission that a two-section DSU would be desirable because it would offer a competitive advantage to Polaris by allowing the purchase of the mineral rights that will be expiring in April 2004 by private sale rather than through the normal competitive bidding process. In this regard, the Board agrees with the statement in *Decision 90-11* that special spacing is not intended as a tool to prevent normal competitive operations and believes that the establishment of a two-section DSU for that purpose would be a misuse of the regulatory provisions allowing for the establishment of special DSUs.

On the basis of the foregoing factors, the Board concludes that there is no justification for the establishment of a two-section DSU at this time. The special gas well spacing portion of Application No. 1276489 is denied.

The Board notes that in response to past pooling applications to the EUB, the Board has determined that there is a need for a compulsory order in the situation where an operator wishing to drill a well has made reasonable attempts to obtain a voluntary arrangement with other mineral holders in the DSU but has been unsuccessful. In the present case, Polaris has been unsuccessful in its attempts to obtain any voluntary arrangement with the Nature Conservancy of Canada (Nature Conservancy). Consistent with previous decisions, the Board would therefore normally be inclined to grant the pooling order to allow for the drilling and production of a well. However, given that the Board has decided not to approve the well licence application, it does not see any purpose in issuing a pooling order, and accordingly that portion of Application No. 1276489 requesting a pooling order, is denied.

If a pooling order had been issued, the Board believes that it should have applied only to Section 32, as the Board does not see any justification for a special two-section DSU. Although the subject pooling application specifically requested a pooling order applying to Sections 32 and 33, the Board believes it would have had the authority under the provisions of Section 15(3)(f) of the Alberta Energy and Utilities Board Act to issue a pooling order for Section 32 as if it had been applied for, subject to the approval of the Lieutenant Governor in Council.

The Board notes that Polaris had requested terms and conditions for the pooling order that are consistent with the standard form of order used by the EUB. That is, the applicant requested that the allocation of costs and revenues under the pooling order be on a tract area basis, that it be named as the operator of the well to be produced under the order, and that the order include a penalty provision as allowed by the OGCA. The Board notes that a specific concern was raised only with respect to the proposed penalty. In this regard, the Board notes that item 13 of Section 1.5.3 of EUB *Guide 65: Resources Applications for Conventional Oil and Gas Reservoirs* states that a penalty provision is a standard clause of a pooling order involving disputes between companies. In this case, the Nature Conservancy, as the other party involved in addition to the applicant, is not involved in the energy industry. Therefore the Board believes that the situation warrants further consideration.

The penalty provision of a pooling requires a tract owner to make a decision within a specified period of time whether or not to pay its share of drilling and completion costs "up front" or to allow those costs plus the penalty to be taken from the proceeds of production. In the case of disputes involving industry, the expectation is that each party has the knowledge and background to make an informed decision on the matter that meets the party's situation at the time. Furthermore, an industry player is considered as having the financial resources to pay up front

costs if that is the decision the party makes. However, in this case, the Board is doubtful that the Nature Conservancy specifically would have the type of industry knowledge and experience that would allow it to make an informed decision on whether to incur the penalty or not, and further it is doubtful whether the Nature Conservancy would have the resources or could justify using resources to make any up front payment. On that basis, the Board considers that if the pooling order had been granted, no penalty provision would have been included.

12.2 Flaring Permit

The Board encourages gas well testing methods that conserve gas and avoid flaring where it is practical to do so. In situations such as the proposed Polaris well, pipeline infrastructure does not exist in reasonable proximity to the well, and the Board recognizes that flare testing is necessary to establish whether production rates and gas reserves warrant investments necessary to produce, transport, and process the gas.

The Board has established guidelines in *Guide 40* and *Guide 60* that define routine flare volume allowances and set out requirements for justifying larger flare volumes. The requirements for justifying large tests are based on reservoir evaluation practices and investment risk management considerations. The Board views that while economic justification is necessary to support large volume flare permit applications, it must also consider public safety and environmental aspects of such tests. In this case, Polaris has proposed up to 2200 10^3 m³ of flaring, involving 865 tonnes of sulphur emissions for each of the two prospective zones. In terms of volumes and emissions, the proposed test is among the largest flare permit applications considered by the Board in recent years. The Board notes that it seldom approves well test flaring sulphur emissions in excess of 300 tonnes.

The Board believes that with adequate flare management plans, Polaris could likely flare the maximum volumes it has requested in compliance with environmental protection guidelines. However, the Board is concerned that widespread large-volume testing of high H₂S content wells could add significantly to provincial flaring and sulphur emissions.

The Board believes that Polaris has demonstrated that its proposed well is remote from existing infrastructure and that a substantial investment would be required to produce the gas. The Board, therefore, recognizes the need for a flare permit to test the well. That said, the Board is concerned about the total flare volumes, sulphur emissions, and flare duration proposed by Polaris. The Board must consider not only the local implications of the proposed Polaris test but also the potential for increased flaring and sulphur emissions in Alberta if multiple tests of this nature are proposed as new H₂S gas opportunities are assessed across the province. The Board believes that it is important that its decision in this case be consistent with broader approaches for minimizing flaring and sulphur emissions.

Given the exploratory nature of the proposed well and its remoteness from existing H₂S gas infrastructure, the Board believes that a flare test involving sulphur emissions greater than 300 tonnes may be necessary. However, the Board believes that permitting the potential sulphur emissions requested by Polaris would be inappropriate and that maximum test sulphur emissions would need to be significantly limited. It is understood that the flare permit application was based on worst-case H₂S concentrations and that drilling results may well determine lower levels. Depending on the actual H₂S concentration of the gas, the Board believes that a

significantly lower total well test volume than that proposed would be appropriate based on determining the minimum reserves necessary to justify well tie-in costs. However, given the Board's decision with regard to the well licence, it does not see any purpose in issuing a flaring permit, and accordingly, the flare permit application is denied.

Dated in Calgary, Alberta, on December 16, 2003.

ALBERTA ENERGY AND UTILITIES BOARD

[Original signed by]

T. M. McGee
Presiding Member

[Original signed by]

M. J. Bruni, Q.C.
Acting Board Member

[Original signed by]

D. D. Waisman, C.E.T.
Acting Board Member

APPENDIX 1 HEARING PARTICIPANTS WITH FULL PARTICIPATION RIGHTS

Principals and Representatives
 (Abbreviations used in report)

Witnesses

Polaris Resources Ltd. (Polaris)

B. K. O’Ferrall, Q.C.

D. K. Naffin

J. B. Maher, P.Geol., of

Polaris Resources Ltd.

K. R. Bissett, of

Bissett Resource Consultants Ltd.

O. R. Cole, of

Fire Creek Resources Ltd.

I. Dowsett, R.E.T., of

RWDI West Inc.

R. D. Glaholt, P.Biol., of

Tera Environmental Consultants

M. A. Read, P.Eng., of

DeepWell Projects Inc.

M. S. Santo, of

Fekete Associates Inc.

M. J. Zelensky, P.Eng., of

Public Safety and Air Quality Management

Oldman River Coalition

G. S. Fitch

L. M. Berg

C. Bateman

J. Horejsi

M. Moulson

T. Moulson

E. Nelson

J. Nelson

H. Smith

T. Smith

M. Swinton

T. Swinton

P. Wilkin, M.D.

J. L. Anhorn, of

Gilbert Laustsen Jung Associates Ltd.

C. Chattaway, of

Waldron Grazing Co-op

R. W. Coppock, D.V.M., of

Toxicologist and Associates, Ltd.

B. W. Hrebenyk, of

Senes Consultants Limited

B. McMillan, of

Equus Consulting Group Inc.

(continued)

APPENDIX 1 HEARING PARTICIPANTS WITH FULL PARTICIPATION RIGHTS
(continued)

Principals and Representatives
(Abbreviations used in report)**Witnesses**

Whaleback Coalition

R. C. Secord

J. Unger

J. Tweedie

D. Pachal, of

Wild Country Consulting

I. Urquhart, of

Alberta Wilderness Association

C. Wershler, P.Biol., of

Cottonwood Consultants Ltd.

Nature Conservancy of Canada (Nature
Conservancy)

S. K. Luft

S. and M. Marty (Martys)

M. Bronaugh

S. Marty

L. C. Nkemdirim, of

University of Calgary

J. Huntley

J. Huntley

J. L. Lawson

Alberta Energy and Utilities Board staff

J. R. McKee, Board Counsel

B. Kapel Holden, Board Counsel

P. R. Forbes, C.E.T.

B. K. Eastlick, P.Eng.

H. Nychkalo

A. S. Lewis, E.I.T.

P. Hunt

G. Gilbertson

APPENDIX 2 NONHEARING PARTICIPANTS WHO MADE STATEMENTS OF CONCERN

Principals and Representatives (Abbreviations used in report)	Major Concerns
Municipal District of Ranchlands Reeve R. Davies	M.D. of Ranchlands does not have the needed resources for the Disaster Response Plan.
D. Friesen	Flaring and its effects on human health, animals, and the environment; dispersion model does not take into account the unique wind patterns in area.
Pekisko Landowners Association R. Wideman M. Blades F. Gardner J. Cross	Effects of proposed project on the native grassland (rough fescue) and the ecosystem; would like a resource management plan for the area to be developed.
C. Strikes with a Gun	Polaris did not consult with her; intervener status; EUB's inability to deal with aboriginal issues
R. Bell	Emissions and its affects on humans; would like moratorium on all critical H ₂ S gas wells until it can be determined that all emissions, even long-term, low doses are safe.
Pat Dwyer Construction Three River Rental P. Dwyer	Supportive of oil and gas development in community.
Canadian Parks and Wilderness Society D. Poulton	Compulsory pooling and the transfer of mineral rights from Amoco to the Nature Conservancy; land use adjacent and complementary to protected area designations; specifically the effects of proposed project on animals and the environment within protected areas

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APPENDIX 2 NONHEARING PARTICIPANTS WHO MADE STATEMENTS OF CONCERN (continued)

Principals and Representatives (Abbreviations used in report)	Major Concerns
Rescue the Rockies M. Judd	Effects of proposed project on animals and the surrounding public lands, equipment failure, cumulative development, industrial traffic, flaring
J. Emmett	Beneficial contribution of protected areas to mental health
A. Nikiforuk	Compulsory pooling, position of the Nature Conservancy, effects of H ₂ S on human and animal health, equipment failure, property land values, mercury pollution
J. Lawson	Effects of H ₂ S on human and animal health implementation of emergency response plan, flaring, cumulative development, aesthetic value, property land values, definition of public interest

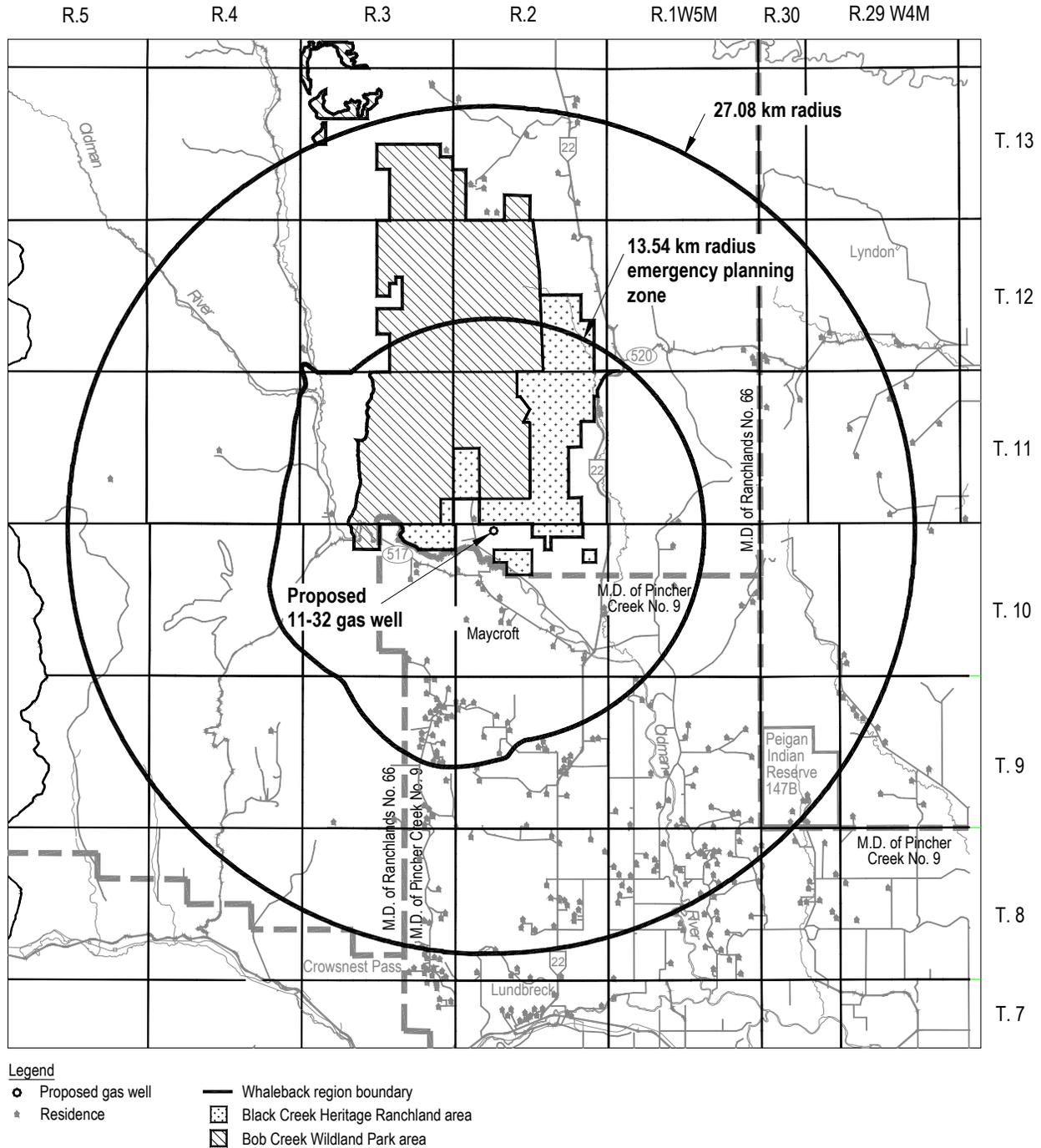


Figure 1. Proposed well location, the emergency planning zone, and an area two times the size of the emergency planning zone

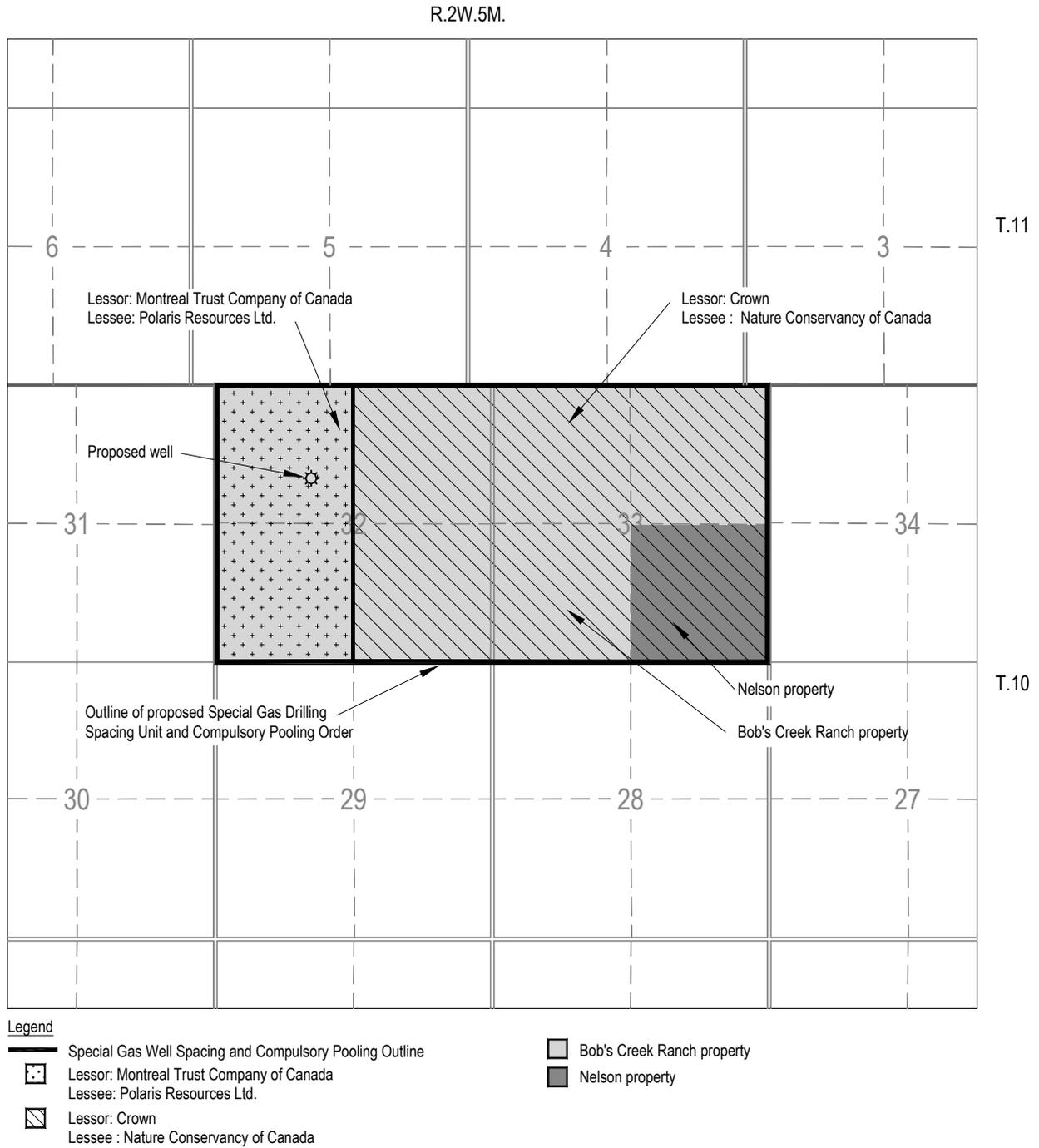


Figure 2. Existing sections, mineral rights holders, and the proposed special drilling spacing unit