

# **ALBERTA ENERGY AND UTILITIES BOARD**

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Calgary Alberta

**BEARSPAW PETROLEUM LTD.  
APPLICATION FOR A WELL LICENCE  
LSD 12-25-29-20W4M  
DRUMHELLER FIELD**

**Examiner Report 2000-1  
Application No. 1024638**

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## **1 RECOMMENDATION**

Having carefully considered all of the evidence, the examiners recommend that Application No. 1024638 be denied without prejudice to any future application, for the following reasons:

- unacceptable impacts from the proposed access to the well site;
- insufficient evidence with respect to potential impacts of the proposed re-entry and appropriate mitigation; and
- concerns about the completeness of information provided as part of the re-entry application to Alberta Environment (AENV).

## **2 INTRODUCTION**

### **2.1 Application**

Bearspaw Petroleum Ltd. (Bearspaw) made application to the Alberta Energy and Utilities Board (EUB/the Board), pursuant to Section 2.020 of the Oil and Gas Conservation Regulations (OGC Regulations) and EUB *Guide 56: Energy Development Application Guide and Schedules (Guide 56)*, for a well licence to re-enter an existing abandoned well located in Legal Subdivision 12 of Section 25, Township 29, Range 20, West of the 4th Meridian (LSD 12-25-29-20W4M) (12-25 well). Bearspaw proposes to obtain sweet crude oil production from the Basal Quartz zone at approximately 1344 metres (m) through the existing cased wellbore.

### **2.2 Intervention**

The EUB received a written objection on April 22, 1998, from Daniel and Michelle Lucas (the Lucases), registered landowners and residents of the northwest quarter of Section 25-29-20W4M (Section 25). The Lucases operate Pearl's Resort, a bed and breakfast business, on their property. Figures 1 and 2 illustrate the wells in the area and the surface lease site of the abandoned 12-25 well in relation to the Lucases' residence.

### **2.3 Hearing**

The Board directed, pursuant to Section 29 of the Energy Resources Conservation Act, that a public hearing be held to consider the application commencing on April 20, 1999. Following a request by the Lucases, the hearing was rescheduled to June 2, 1999. Bearspaw also requested additional time on two separate occasions to prepare for the hearing, which was rescheduled to June 15, 1999, and subsequently to October 19, 1999.

The application and intervention were considered at a public hearing in Drumheller, Alberta, on October 19, 1999, before Board-appointed examiners C. A. Langlo, P.Geol, H. W. Knox, P.Eng., and R. Elle. Prior to that, on October 18, 1999, the examiners and EUB staff viewed the surface location of the proposed 12-25 well re-entry, the Lucases' residence and bed and breakfast buildings, and the surrounding area. Those who appeared at the hearing and abbreviations used in this report are listed in the following table.

### **THOSE WHO APPEARED AT THE HEARING**

Principals and Representatives (Abbreviations Used in Report)	Witnesses
Bears paw Petroleum Ltd. (Bears paw) T. J. Taylor	P. Wright D. J. Cartwright, P.Eng., of Martin and Brusset Associates D. Ostermann D. Tian
The Lucases	D. Lucas M. Lucas
Alberta Energy and Utilities Board staff L. Morrison A. Beken, P.Eng., P.Geol. L. Grossin A. Domes, Board Counsel S. Kelemen, C.E.T. A. Rose	

### **3 BACKGROUND**

The original well licence for the 12-25 well was issued in 1952 to Western Leaseholds Limited for the purpose of obtaining crude oil production from the Nisku Formation. The 12-25 well was vertically drilled to a total depth of 1666.3 m and completed with 273 millimetre (mm) surface casing set to 208.5 m and 177.8 mm production casing set from surface to 1665.4 m. The well commenced production on April 24, 1952, produced oil and gas intermittently from the Nisku Formation for 32 years until 1989, and was subsequently abandoned on September 15, 1993.

On February 23, 1952, Lena Lucas and Western Leaseholds Limited entered into a surface lease agreement with an initial term of 25 years. The lease agreement has been continued to the present and provides access to the 12-25 well site via the Lucases' yard and south across a coulee (Figures 1 and 2). The 12-25 well site is located immediately adjacent to a coulee complex. Prior to Bears paw acquiring the well in 1994, the previous licensee had largely reclaimed the well site, including the access road. However, a reclamation certificate for the well site and access road has not been applied for and the well site area is currently under cultivation by the Lucases.

## 4 ISSUES

The examiners consider the issues respecting the application to be

- need for the re-entry of the well,
- impacts, and
- public consultation.

## 5 NEED FOR THE RE-ENTRY OF THE WELL

### 5.1 Views of the Applicant

Bearspaw submitted that it holds a valid Petroleum and Natural Gas Lease for Section 25 for all mineral rights from surface to the base of the Nisku Formation. It has identified the potential presence of oil in the Basal Quartz zone at the 12-25 well based on its discovery of a Basal Quartz oil pool in a well located in LSD 7-25-29-20W4M (7-25 well). Bearspaw stated that the Basal Quartz reservoir in the 12-25 well is separate from the one discovered in the 7-25 well. Bearspaw interpreted the Basal Quartz sand in the 12-25 well as oil bearing based on its evaluation of the spontaneous potential (SP) and the resistivity logs. It estimated a porosity of 20 to 25 per cent for the Basal Quartz zone based on the SP log and considered a zone with this porosity to be capable of economic production. Bearspaw interpreted that the same sand is also present in the wells located in LSD 5-25-29-20W4M (5-25 well) and LSD 6-25-29-20W4M (6-25 well) but interpreted a lower porosity of 12 to 15 per cent in these wells. Bearspaw also interpreted the Basal Quartz reservoir as having a small areal extent. It believed that neither the 5-25 well nor the 6-25 well can be produced economically. Further, it also believed that any offset drilling option other than the 12-25 well location would access a lesser-quality reservoir and result in lower productivity and lower recovery.

Bearspaw estimated the recoverable oil reserves for the Basal Quartz reservoir at between 6360 cubic metres ( $\text{m}^3$ ) (40 000 barrels) and 8267  $\text{m}^3$  (52 000 barrels). Because the reserves are subject to a considerable degree of risk due to the lack of porosity logs for the 12-25 well, it considered the reserves as possible rather than proven.

Bearspaw stated that it expects the 12-25 well to have an initial production rate of 8  $\text{m}^3$  per day ( $\text{m}^3/\text{d}$ ) (50 barrels per day [bbls/d]), but anticipates this rate would drop very quickly to a lower long-term average production rate of about 4  $\text{m}^3/\text{d}$  (25 bbls/d). Bearpaw also interpreted possible gas reserves in the Glauconitic zone and possible hydrocarbon potential in the Ostracod zone. Bearspaw stated that the Glauconitic reservoir has not been tested in the subject well or other wells in Section 25. Bearspaw estimated that the Basal Quartz reserves could be depleted by the year 2007, after which the production from the other potential zones could commence. The applicant also indicated, however, that the estimated productive life of the Basal Quartz zone could be as long as 16 years, based on an economic production cutoff of 0.5  $\text{m}^3/\text{d}$  (3.1 bbls/d).

Bearspaw submitted three scenarios to recover the prospective reserves encountered in the 12-25 well: re-entry of the existing 12-25 well; drilling a new vertical well 300 m away from the existing wellbore; or drilling a directional well from another surface location to the same bottomhole location. Bearspaw estimated that drilling, completion, and tie-in costs of the re-entry would be \$195 000, while a new well drilled vertically up to 300 m away would cost an estimated \$529 000 and would increase the potential for a lower-quality reserve. Further, it

submitted that drilling directionally to the same bottomhole location from an alternative surface location would cost approximately \$664 000. Bears paw concluded that re-entry of the existing 12-25 wellbore was the most economically viable way to develop its potential reserves.

## **5.2 Views of the Intervener**

The Lucases did not dispute Bears paw's right to recover reserves from the northwest (NW) quarter of Section 25.

## **5.3 Views of the Examiners**

The examiners acknowledge that Bears paw holds a valid Crown Petroleum and Natural Gas Lease that provides the right to access hydrocarbon reserves from the NW quarter of Section 25. The examiners accept Bears paw's evidence suggesting that potential reserves may be encountered through the 12-25 well and that the reservoirs penetrated by the subject wellbore are likely to be small and may be limited to the 12-25 well only. Based on the evidence presented regarding the quality of reservoirs in the area and the cost of the various alternatives, the examiners accept that the re-entry scenario is the most economically viable alternative for accessing reserves underlying the 12-25 well.

The examiners conclude that there is a need to re-enter the 12-25 well, providing the impacts from the proposed re-entry are acceptable.

# **6 IMPACTS**

## **6.1 Views of the Applicant**

Bears paw noted that the access right-of-way and lease area associated with the existing surface lease had been largely reclaimed prior to 1994 and cited a consultant's report that indicated that only limited additional work would be required in order to apply for a reclamation certificate. Notwithstanding, it proposed to use the original access right-of-way for its proposed re-entry of the 12-25 well. Bears paw believed that the costs associated with surface preparation and reclamation of the existing lease, including the access road, would not add significantly to the cost of the re-entry program when compared to the cost of preparing a new well site.

Bears paw acknowledged that the existing access right-of-way traverses the Lucases' farm yard and agreed that if the well proved to be economic it would be willing to consider alternative access for operational purposes. Bears paw noted access from an existing well site at LSD 14-25-29-20W4M (14-25 well) following an existing pipeline right-of-way or from other wells to the south of the 12-25 location as possible alternatives. It also noted that these alternatives would cross open fields and require it to enter into additional surface lease agreements. Bears paw stated that it had not discussed access alternatives with the Lucases prior to the hearing.

Bears paw stated in its communication to AENV by way of the Notification of Proposed Well Site Construction — Environmentally Sensitive Area that the proposed re-entry program would cause no surface disturbance. However, Bears paw acknowledged that considerable surface

disturbance would be required to access the 12-25 well site along the existing access right-of-way and that minor surface disturbance would also be required at the well site location.

Bears paw acknowledged that it would need to construct a substantial new access road in the existing access right-of-way in order to cross the coulee north of the 12-25 well site. It suggested that if alternative access from the 14-25 well site were used, it could be via a low-profile road. In either case, Bears paw agreed that some road construction would be required.

Bears paw indicated that the re-entry program would be similar to a normal service rig operation and be easily contained in the 80 m by 80 m lease area. The primary equipment on site would include the rig, rig tank, blowout preventors (BOPs), and crew shack. Surface disturbance at the well site would be limited to an area 1-2 m (3-4 feet) square around the wellhead, where excavation would be required, as well as some minor additional surface disturbance in association with the four rig anchors and vehicle access. Surface disturbance in the form of a teardrop turn around area would remain during the operational period of the well. Bears paw stated the current timing of its application, if approved, would facilitate winter construction and hence minimize the potential for surface disturbance.

Bears paw acknowledged that due to the proximity of the 12-25 well to the coulee, the site may not meet current AENV land-siting criteria. It stated that AENV should have known the lease was on the edge of a coulee from the survey plan.

Regarding operations at the well site, Bears paw stated that it would be willing to erect a straw berm to protect the coulee from potential site runoff or spills but could not confirm if a straw berm would provide sufficient containment if produced water were spilled. Bears paw stated that spill response would be covered as part of its emergency response plan and handled by the local operator.

Bears paw stated that noise associated with the re-entry program would be typical for that of a standard service rig operation and would meet EUB noise guidelines. Further, Bears paw outlined that the most likely scenario for production operations would be a pump-jack with an electric motor on site, consistent with the other wells in the area. Bears paw noted that its existing wells, including the pump jack located at LSD 9-26-29-20W4M (9-26 well), operate within the EUB noise guidelines. However, Bears paw stated that it was aware that the noise from the pump jack at the 9-26 well was an issue to the Lucases. Bears paw acknowledged that it had received noise complaints from the Lucases and was directed by the EUB to conduct a noise study on the 9-26 well. Bears paw stated that the study concluded that the well met the EUB noise guidelines. However, the report made two recommendations for improving the noise situation. Bears paw said that it would consider taking measures to eliminate the squeak and other possible noise sources from the pump jack in order to improve its relationship with the Lucases.

## **6.2 Views of the Intervener**

The Lucases stated that their family has owned the land in question since 1952 and that they are third-generation landowners who purchased the northwest quarter of Section 25 in 1980. Following the abandonment and reclamation of the 12-25 well in September 1993, the Lucases decided to diversify their farming practice to include agro-tourism and eventually to construct a new family home on land to the south of their existing farm yard (see Figure 2). The Lucases

stated that they opened Pearl's Resort in May 1994 after obtaining a development permit and they plan to further expand and diversify their tourism business.

The Lucases argued that re-entry of the 12-25 well would have a negative impact on their privacy, the operation and planned expansion of their bed and breakfast business, and their plans for construction of a new home. They noted that the nearby 9-26 well is extremely noisy and that Bearspaw was unwilling or unable to remedy the situation to their satisfaction. As a result, the Lucases were concerned that the 12-25 well would also be noisy and especially disturbing due to its closer proximity to their home and business. The Lucases stated the proximity of the 12-25 well site to both their present home and the alternative locations for their proposed new home made safety and aesthetics more of a concern than with other well sites farther away. They believed that drilling from an alternative location over the horizon to the southeast would be acceptable because it would be out of view and suitably farther from their home and business.

The Lucases opposed the use of the existing access right-of-way due to concerns regarding noise, dust, and the safety of their children and bed and breakfast guests from traffic and equipment moving through their yard. The Lucases noted that the previous access road had caused water ponding on land adjacent to their yard and were concerned about a recurrence of this problem if a new road were constructed. The interveners stated that access from the 14-25 well site along the existing pipeline right-of-way would not be acceptable because it would bisect their field and adversely impact their farming operation. The Lucases acknowledged that if access were ultimately required, they would prefer that it come in from existing wells to the south and follow along the west edge of their field to the 12-25 well location.

With respect to surface disturbance in general, the Lucases characterized local soil conditions as "gumbolike" and expressed concern that traffic and equipment would result in compaction and rutting, even in winter. The Lucases noted that although the historic access road and well site were reclaimed by the previous owner, they had ongoing concerns with respect to the presence of shale along the access route and lower crop production from the lease area. Mr. Lucas noted that some spills had occurred at the 12-25 well site during its operational history and that there had been some pits on site. He expressed concern that subsurface contaminants may still be present and could potentially impact the quality of water in a pond that they plan to develop.

### **6.3 Views of the Examiners**

The examiners note that Bearspaw has a valid surface lease for the 12-25 location. However the examiners have concerns regarding Bearspaw's re-entry application, including the proposed use of the existing access right-of-way, the accuracy of information provided by Bearspaw to AENV, and Bearspaw's inability to provide information relating to environmental protection and reclamation issues.

The examiners note both from the evidence presented and the site visit that the existing access right-of-way has been largely reclaimed and therefore new road construction is required regardless of the access route chosen. The examiners are concerned that Bearspaw was able to provide only minimal information on potential environmental impacts and suitable protection measures associated with road construction through the coulee complex. Further, Bearspaw was not able to respond to questions regarding appropriate reclamation measures that would be required in the future. The examiners believe that the development of a new road within the

existing access right-of-way that crosses a coulee north of the 12-25 well site will require appropriate protection measures and note that other access alternatives are available that would avoid the coulee complex entirely.

The northwest corner of the 12-25 well site is situated on the surveyed slope break of an adjacent coulee, with the well centre set back approximately 50 m. The examiners are aware that AENV typically recommends a 100 m setback from the slope break of coulees and believe that the location of the lease site may be considered unacceptable by today's standards. Further, the examiners also believe that Bearspaw should have provided more information respecting the potential for surface disturbance in its communication with AENV.

The examiners acknowledge that for sites that are essentially level, AENV may allow re-entry programs to proceed over top of frozen soil conditions if the existing soil conditions are suitable and there will be no other surface disturbance. However, Bearspaw did not provide evidence regarding the soil conditions at the 12-25 well site or the suitability of its minimal surface disturbance approach to protect the soil resource. The examiners note Mr. Lucas's description of the local soil as gumbo and believe there is a risk of compaction and rutting associated with site access and the re-entry program if soil resources are not adequately protected. The examiners also note that the proposed re-entry program and subsequent operation of the well would require considerable redisturbance of the soil, particularly in association with access. The examiners understand that impact to the soil resource and the risk of soil degradation increases with each additional disturbance of the land and that this may impact Bearspaw's ability to achieve suitable reclamation success in the future.

Bearspaw stated that a local operator is responsible for spill response but could not provide specific details regarding its spill response program. The Examiners believe that Bearspaw's proposed use of a straw bale berm for spill containment would be inadequate in the event of a spill of produced water. Further, any alternative containment methods will likely result in greater surface disturbance at the site.

The examiners believe that prior to any further consideration of the proposed re-entry program Bearspaw should resubmit its Notification of Proposed Well Site Construction to AENV with more accurate and complete information and note that inspection of the site by AENV may be required.

The examiners note that the Lucases began their bed and breakfast business following the abandonment of the 12-25 well. The examiners also acknowledge the Lucases' belief that reclamation of the access road and well site was essentially complete. The examiners believe that access through the Lucases' yard would result in unacceptable impacts (noise, dust, and traffic) for the Lucas family and their bed and breakfast guests. The examiners believe that alternatives to the existing access right-of-way should be explored that would have less impact on the Lucases.

The examiners acknowledge the concerns raised by the Lucases regarding the potential impacts of a producing well on their property. However, the examiners also believe that it would be possible to mitigate most, if not all, of the potential impacts for a well located on the 12-25 well site. Although not presented with any definite or detailed plans, the examiners note that the Lucases' preferred location for a new home would be more than 100 m from the 12-25 well site.

The OGC Regulations state that no well should be drilled at any point within 100 m of any surface improvement other than a surveyed roadway.

The examiners acknowledge the Lucases' concerns regarding potential noise impacts. However the examiners note that there are noise guidelines and mechanisms in place to deal with noise issues that may arise.

In summary, the examiners find that Bearspaw has failed to provide sufficient supporting evidence with respect to potential impacts of the proposed re-entry, in particular for the access via the existing access right-of-way. Therefore the examiners conclude that the re-entry program at the 12-25 site as proposed is unacceptable.

## **7 PUBLIC CONSULTATION**

### **7.1 Views of the Applicant**

Bearspaw stated that its initial contact with the Lucases was through two letters in 1997 that dealt with site reclamation and a lease payment review. In April 1998, Bearspaw notified the Lucases in writing of its intent to re-enter the 12-25 well and offered to continue to pay the current rental fee. Bearspaw explained that it participated in a subsequent meeting and site visit with the Lucases and EUB staff in an attempt to discuss and resolve issues. Bearspaw stated that the Lucases were unwilling to discuss other alternatives, as they did not want the well re-entered. Bearspaw contended that it notified the Lucases in accordance with *Guide 56*, including written and personal consultation.

### **7.2 Views of the Intervener**

The Lucases confirmed Bearspaw's initial contacts of January and November 1997. The Lucases advised that their second contact with Bearspaw was when they were awakened by a phone call at 10:45 p.m. one day in March 1998, at which time Bearspaw stated that it planned to bring a service rig onto their property the next day. The Lucases stated that they were quite upset by the phone call because they believed the well site and access road to be virtually reclaimed. According to the Lucases, this was also the first time that Bearspaw had notified them about its intent to re-enter the 12-25 well. The Lucases acknowledged that in April 1998 they received a notification letter from Bearspaw of its intent to re-enter the 12-25 well with an offer to continue to pay the current annual lease payment.

The Lucases expressed their concerns with the numerous and enduring problems with Bearspaw employees using their road as an access road to other wells and practising unsafe driving on the road outside their home. They also noted the presence of an extinguished flare stack from a nearby facility, as well as noise from the 9-26 well located across the road from their residence. The Lucases stated that they believed Bearspaw did not listen to their concerns and did not attempt to resolve issues or include them in the initial planning of the re-entry program. Consequently, the Lucases found it difficult to trust Bearspaw's commitments and questioned Bearspaw's ability to respond to their concerns.



### 7.3 Views of the Examiners

The examiners note that *Guide 56* outlines an expectation for industry to provide the landowners with sufficient information about the proposed project to enable the landowners to identify potential issues and discuss concerns during the initial planning stages. The examiners believe that a meaningful consultation program should provide potentially affected parties with the opportunity to obtain an adequate understanding of the proposal and its possible impacts. An applicant is expected to be proactive and to ensure that technical information is consistent, factual, and conveyed in a manner understandable to the public. An applicant is also expected to listen to concerns from affected parties and to attempt to reach a reasonable solution.

Based on the evidence presented at the hearing, the examiners do not believe that Bears paw's consultation with the Lucases met the spirit and intent of *Guide 56*, Volume 2, Public Involvement Guidelines. The examiners note that the notification letter did not specify the type of substance(s) that may be encountered during the re-entry or production operations or give a description of how the development complements or is part of the existing development in the area. There was also no evidence to show that Bears paw had provided information to the Lucases about the equipment to be installed, the amount and type of vehicular traffic, and potential sources of noise.

The examiners recommend that Bears paw critically evaluate its public consultation practices with a goal to meet or exceed the expectations detailed in *Guide 56*. Given the issues raised at the hearing and the history of interaction between Bears paw and the Lucases, the examiners also recommend that if Bears paw intends to reapply for the subject well licence for the 12-25 well, it consider utilizing a third party to facilitate discussions.

Dated at Calgary, Alberta, on January 24, 2000.

#### **ALBERTA ENERGY AND UTILITIES BOARD**

*<Original signed by>*

C. A. Langlo, P.Geol.

*<Original signed by>*

H. W. Knox, P.Eng.

R. Elle \*

\* Mr. Elle was unavailable for signature but concurs with the contents and the issuing of this report.

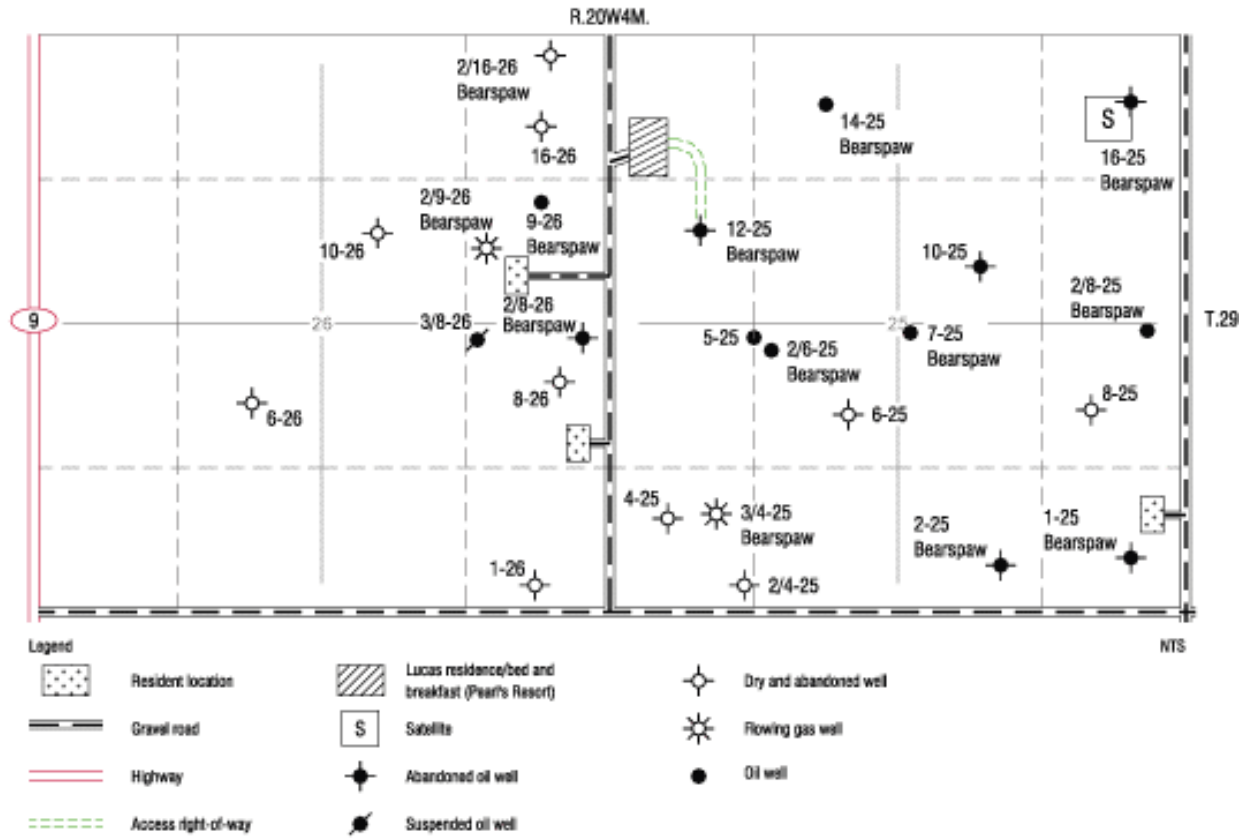


Figure 1. Drumheller area

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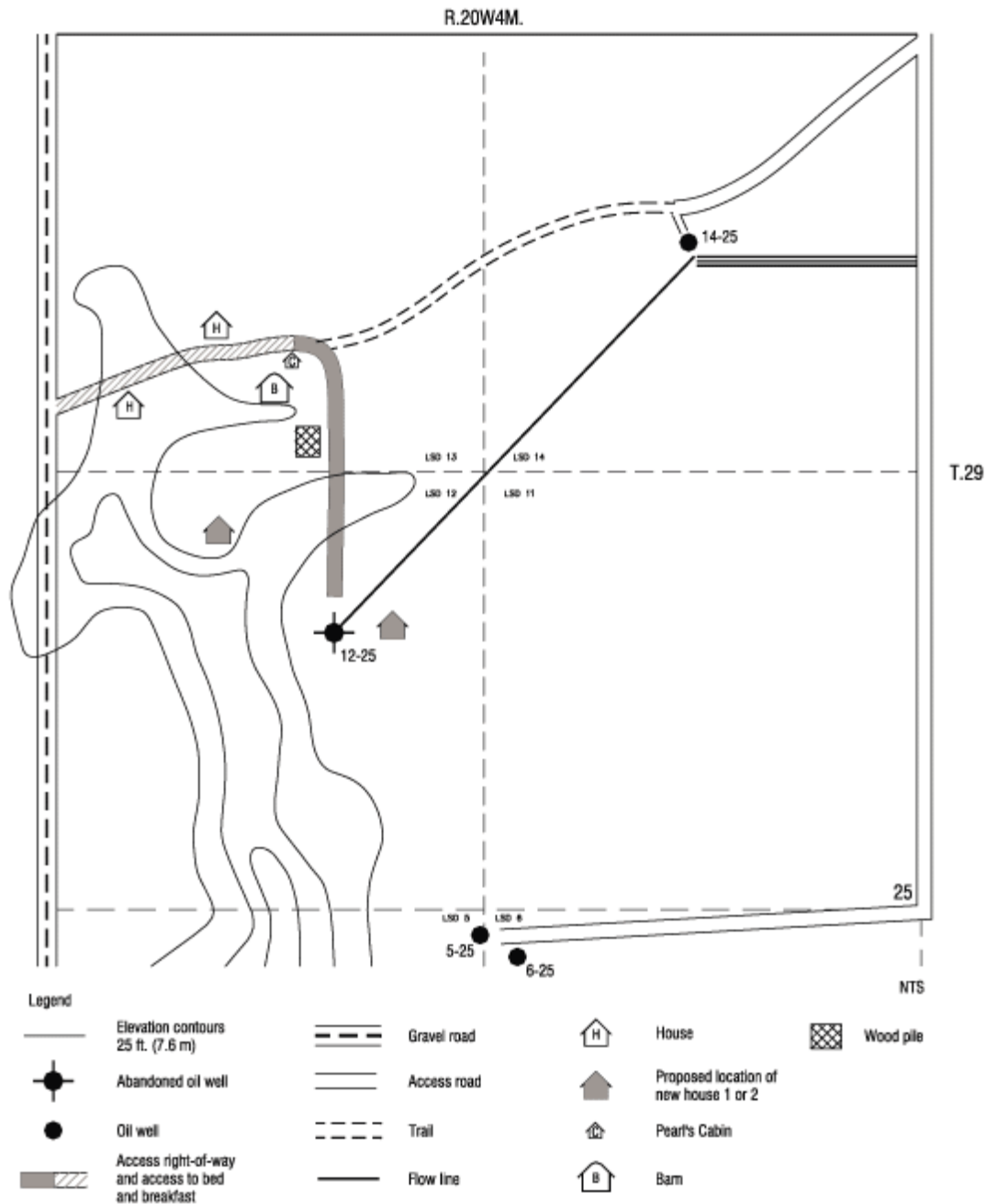


Figure 2. 12-25 Well site and Lucas property

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