

APPLICATIONS FOR A WELL LICENCE
AND A PIPELINE PERMIT
RENAISSANCE ENERGY LTD.
PROVOST FIELD

Examiner Report 97-4
Applications No. 960977 and 1004244

1 INTRODUCTION

1.1 Applications

On 4 October 1996, Renaissance Energy Ltd. (Renaissance) submitted Application No. 960977 to the Alberta Energy and Utilities Board (the Board) pursuant to section 2.020 of the Oil and Gas Conservation Regulations for a licence to drill a well in Legal Subdivision 16 of Section 10, Township 36, Range 3, West of the 4th Meridian (16-10). The purpose of the proposed well is to obtain sweet natural gas production from the Lloydminster Formation.

On 5 December 1996, Renaissance submitted Application No. 1004244 pursuant to Part 4 of the Pipeline Act for a permit to construct approximately 1.1 kilometres of 114.3-millimetre outside diameter pipeline to transport sweet natural gas from the proposed 16-10 well to an existing pipeline located in LSD 4-14-36-3 W4M.

The locations of the proposed well and pipeline are shown on the attached figure.

1.2 Intervention

Mr. Brien Mouly, joint holder of a grazing lease and occupant of the Crown land in the northeast quarter of Section 10, Township 36, Range 3, West of the 4th Meridian (NE 10), objected to the development of the well and pipeline on this land. Mr. Mouly also objected to the proposed pipeline to be located on adjacent land in the south-east quarter of Section 15 and south-west quarter of Section 14, Township 36, Range 3, West of the 4th Meridian (SE 15/SW 14). Mr. Mouly was opposed to development of the well and pipeline anywhere on these lands because of his concern about the potential for the proposed development to create alkali problems, contaminate the water, and disrupt his cattle operation. Mr. Mouly pastures cattle in NE 10 and the cattle are watered at his two dugouts in the north-west quarter of Section 11, Township 36, Range 3, West of the 4th Meridian (NW 11).

1.3 Hearing

A public hearing to consider the applications was originally scheduled for 19 February 1997. Mr. Mouly requested a postponement of the hearing to give him more time to prepare for it. The hearing was re-scheduled and convened on 5 March 1997 in Provost, Alberta, before examiners appointed by the Board. The examiner panel consisted of G. W. Dilay, P.Eng., R. A. Marsh, P.Geol., and R. Elle. Those who appeared at the hearing and abbreviations used in the report are listed in the following table.

THOSE WHO APPEARED AT THE HEARING

Principals and Representatives (Abbreviations Used in Report)	Witnesses
Renaissance Energy Ltd. (Renaissance) T. R. Owen	J. C. Winton B. Houchin B. Smith D. Schoff, P.Geol.
B. Mouly	B. Mouly J. Kloberdanz
Alberta Energy and Utilities Board staff P.R. Forbes, C.E.T. D. C. Roberts	

2 ISSUES

The examiners consider the issues respecting the applications to be:

- the need for the well and, pipeline,
- the location of the well and pipeline, and
- the impacts of the well and pipeline and mitigation of the impacts.

3 NEED FOR THE WELL AND PIPELINE

3.1 Views of the Applicant

Renaissance stated that it has a petroleum and natural gas (P&NG) lease which allows it to drill for and produce the natural gas underlying Section 10, Township 36, Range 3, West of the 4th Meridian (Section 10) from the proposed target zone. The target zone is the Lloydminster sand and Renaissance expects to obtain sweet natural gas production at a rate of 28 to 56 thousand cubic meters per day (103 m³/d). It estimated the well would produce about 85 to 99 million (106) m³ of gas over a period of 3 to 5 years, although it acknowledged the life of the well could be longer than 5 years. Renaissance stated that currently the only well producing from the subject gas pool is 13-11-36-3 W4M (I 3-1 1), which is jointly owned by Renaissance and Poco Petroleum Ltd. Renaissance stated its preference to drill the proposed well as soon as possible so that it could recover the remaining gas reserves underlying Section 10. Because of the ongoing competitive production from the existing 13-11 well, Renaissance claimed that if it was not allowed to drill the 16-10 well until next winter, it would have to conduct further research before making a final decision to drill the well.

Renaissance also stated that it had built a sales line to deliver existing solution gas and potential natural gas from the Lloydminster Formation. According to Renaissance, currently only solution gas and production from the 13-11 well is being pipelined. Renaissance indicated that it would be beneficial to its pipeline economics to include the production from the 16-10 well in this sales line.

Renaissance initially stated there was a very high likelihood the proposed well would be successful, but it later commented that the proposed pipeline would only be built if the well proved to have sufficient reserves.

3.2 Views of the Intervener

Mr. Mouly did not present any evidence or argument at the hearing to dispute the need for the proposed well and pipeline.

3.3 Views of the Examiners

A statement made by Renaissance at the hearing that the 13-11 well had been recompleted into the Rex Formation has raised a question whether competitive gas production is occurring in Section 11, Township 36, Range 3, West of 4th Meridian (Section 11). However, except for this one instance, all other statements made by Renaissance indicated the 13-11 well was completed in the Lloydminster Formation. Therefore, the examiners accept that a competitive situation exists.

Considering the competitive gas production occurring in Section 11, the examiners recognize Renaissance's desire to drill the proposed well as soon as possible, so that it can maximize the recovery of its gas reserves underlying Section 10. However, the examiners believe there was insufficient evidence presented at the hearing to confirm that the life of the proposed well would only be 3 to 5 years; some information supplied by Renaissance indicates that the life of the well could be significantly longer. The examiners note that the intervener did not present any evidence or argument at the hearing to dispute the need for the proposed well and pipeline.

Based on the statements made by Renaissance, the examiners accept the need for the proposed well and pipeline, but are not convinced of its urgency nor its short production life.

4 LOCATION OF THE WELL AND PIPELINE

4.1 Views of the Applicant

Renaissance stated there is a strong geological reason for the proposed bottom-hole location of the well. The Lloydminster sand is modelled after a barrier island type of depositional setting, which tends to have a long, linear trend. The sand starts at zero thickness in the east, builds to 12-m thickness at the "spine", and then falls off to zero thickness in the west. The "spine" of the formation is the target for the proposed well. As the bottom-hole location of the well moves off the proposed location in either the east or west direction, it falls off the thick part of the sand and loses structure. A well drilled in a southerly direction away from the proposed location would be moving down the regional dip of the formation and closer to the abandoned 6-10-36-3 W4M well, which has produced about 239 x 106 m³ of gas. Renaissance stated that a well drilled in a northerly direction away from the proposed location would be moving out of the gas spacing unit, and would be in violation of spacing requirements. Renaissance believed that the structural position of the proposed well in the pool was very important, because of the amount of gas that has already been produced from the pool. Renaissance, therefore, concluded that the applied-for bottom-hole location was the optimum location.

In preparing its application, Renaissance had discussions with Mr. Mouly regarding the surface

location for the proposed well; five different surface locations were considered.

1. The proposed location (the applied-for location) in NE 10. This location would allow a vertical well to be drilled.
2. A location (location 2) in NE 10, approximately 245 m directly north of the proposed location. Renaissance indicated there would be an additional cost of \$55 000 to \$65 000 to directionally drill the well from this location. Renaissance offered this location to Mr. Mouly if the matter could be resolved outside the hearing process, but Mr. Mouly did not agree.
3. A location (location 3) in NE 10, approximately 150 m south of the proposed location. Renaissance indicated there would be an additional cost of \$25 000 to directionally drill the well from this location. This location would place the well in Mr. Mouly's hay field and change the access to the east. This eastern access would also be through the hay field. Renaissance stated that this location was not acceptable to Mr. Mouly because it was in his hay field.
4. A location (location 4) in SE 15, approximately 375 m north of the proposed location, on land adjacent to Mr. Mouly's grazing lease but occupied by a person who has consented to the pipeline. Regarding the directional drilling of a well from this location, Renaissance explained that the largest total angle that it is comfortable drilling is about 30 degrees, but even when the drilling angle only exceeds 16 degrees, the well cannot be tested. To directionally drill the well from this location would require an angle of about 38 degrees, and would involve an additional cost of \$85 000 to \$95 000. If Renaissance attempted to drill such a well, it expected there would be difficulty maintaining a stable wellbore, risk of getting stuck in the hole, compromised integrity of the cement job, risk of not hitting the target zone, and it would not be able to test the well. For these reasons, Renaissance was not prepared to drill a well from this location.
5. A location (location 5) in NE 10 approximately 500 m north-west of the applied-for location. This location, suggested by Mr. Mouly, would place the well on a knoll. Renaissance believed that drilling from this location was not possible because of the large distance from the proposed bottom-hole location.

Since locations 4 and 5 were unacceptable to Renaissance and locations 2 and 3 were not acceptable to Mr. Mouly, at least not without soil testing, Renaissance applied for the location that would allow a vertical well to be drilled. Renaissance submitted evidence showing that it had consent for the proposed surface location for the well from Ms. E. Mohr, who shares the joint grazing lease with Mr. Mouly on NE 10. Renaissance indicated that the Special Areas Board (SAB) had no objections to the applied-for well location.

Regarding the location of the pipeline, Renaissance stated that it had obtained consent from the occupant of SE 15/SW 14 (the land on which the majority of the pipeline would be located) and from Ms. Mohr. It had also received approval from the SAB for the pipeline on SE 15/SW 14. Renaissance indicated that the SAB had no objections to the pipeline on NE 10.

Other than indicating that location 3 would have an eastern road access, and hence an easterly-oriented pipeline from the wellhead to the boundary of Sections 10 and 11, Renaissance did not discuss any alternative pipeline locations.

4.2 Views of the Intervener

Mr. Mouly indicated that he did not have enough time to properly prepare for the hearing. He was advised by his counsel that he needed an expert witness and required more time to get soil and water samples to present as evidence at the hearing regarding the appropriate location of the well and pipeline, if any. Mr. Mouly was also advised by counsel that, without more time to prepare for the hearing, counsel would not be well enough informed to present evidence and represent him.

Mr. Mouly did not present any evidence or argument at the hearing to dispute the proposed bottom-hole location of the well.

With respect to the surface location of the proposed well, in response to statements by Renaissance, Mr. Mouly stated that location 3 was unacceptable to him not only because he did not want it in his hay field, but also because it would not necessarily eliminate the cattle or alkali problems. Mr. Mouly acknowledged that location 2 would eliminate some problems and was his preferred location, assuming that appropriate soil testing did not reveal a serious potential alkali problem. Mr. Mouly indicated that he had suggested location 5 because it was on higher, although less level, ground and therefore less likely to have an alkali problem. Mr. Mouly also believed that the applied-for location might prove to be the best site if that was what the soil testing found. However, his final position was that proper soil sampling had to be done before the well and pipeline could be located anywhere on NE 10.

Mr. Mouly also objected to the pipeline being located on SE 15/SW 14 because of its potential to bring alkali to the surface.

Mr. Mouly briefly discussed his understanding of the routing of the pipeline from location 3 and seemed to be of the opinion that its impacts were not significantly different from the proposed pipeline location. He did not suggest any alternate pipeline locations.

Mr. Mouly indicated his concerns with respect to the applied-for well location, pipeline, and access road were heightened because the lands involved are native prairie with alkali present in the soil.

4.3 Views of the Examiners

With regard to Mr. Mouly's concern that he did not have enough time to prepare for the hearing, the examiners note that the original hearing was scheduled for 19 February 1997 and notice dated 27 January 1997 was issued pursuant to the Energy Resources Conservation Act and Rules of Practice. The notice was sent to Mr. Mouly, as well as others, and at his request, the hearing was postponed until 5 March 1997 to provide additional time for Mr. Mouly to obtain the necessary legal counsel and expert advice. The examiners believe that the preparation time afforded to Mr. Mouly was in accordance with the Board's accepted practices, and, therefore, was appropriate.

Regarding the bottom-hole location of the well, the examiners believe there is some potential to move the location to the north. Although this would place the well outside the current target area, it is possible that an off-target penalty would not be applied, based on Renaissance's statements that it owns the P&NG rights in Section 14 and possibly the P&NG rights in Section 15. Alternatively, it is possible that Renaissance could make a successful application to change the target area. Moving the bottom-hole location to the north would not violate the Board's spacing requirements since there would still be only one well producing in Section 10. The isopach map provided by Renaissance indicates the bottom-hole location could be moved 150 m or so to the north and still remain in the thickest part of the sand.

Regarding the surface location of the well, the examiners agree with Renaissance that location 5 is least acceptable because of its distance from the proposed bottom-hole location. However, if the bottom-hole location was to be moved to the north, the examiners believe that location 4 could

become a viable option. Since the occupant of SE 15/SW 14 has consented to the pipeline location, it is possible he would also consent to a well site. The examiners believe that location 3, or any site east or south-east of the applied-for location, would minimize the damage to native prairie because it would be within Mr. Mouly's hay field. The examiners believe that both Renaissance and Mr. Mouly should have given greater consideration to this possible location, although the potential disruption to Mr. Mouly's cattle and haying operations is acknowledged. Of the four surface locations on NE 10, the examiners believe that location 2 is the most appropriate location since it would likely create minimal impact on native prairie and cause the least amount of disturbance to Mr. Mouly's cattle operation. Although this location would still be on native prairie, it would significantly reduce the impact by eliminating an area of approximately 3600 m² (240 m x 15 m) for lease road use and pipeline construction. The examiners are disappointed that Renaissance did not include this site in its application as this would have been in line with Information Letter 96-9 (IL 96-9) (*Revised Guidelines for Minimizing Disturbance on Native Prairie Areas*) with respect to reducing the impact to native prairie by slant or directional drilling. This location is one of Mr. Mouly's more preferred sites. As a result, the only location for the examiners to consider for approval is the applied-for location and both it and the associated access road would be on native prairie with known alkali conditions in the area. Approval of the applied-for location depends on the impacts of the well, access road, associated pipeline, and whether Renaissance has the ability to successfully mitigate potential problems that the development might cause. This is discussed in section 5 of this report.

The examiners note that Renaissance initially indicated that the SAB had given consent to the proposed well site but later acknowledged that the SAB simply had no objections to the applied-for well location. The examiners also note that Ms. Mohr consented to the proposed surface location of the well.

The examiners note that the proposed pipeline route minimizes the amount of pipeline on land occupied by Mr. Mouly, and that Ms. Mohr and the occupant of SE 15/SW 14 have consented to the pipeline. From information supplied by Mr. Mouly, the examiners believe that a pipeline located in an easterly direction from the proposed well would not necessarily lessen the total disturbance to the native prairie in the area.

5 IMPACTS OF THE WELL AND PIPELINE AND MITIGATION OF THE IMPACTS

5.1 Views of the Applicant

In order to minimize environmental impacts, Renaissance stated that the proposed well would be drilled using a zero disturbance or no strip method. This would involve setting the drilling rig on top of the sod layer without actually stripping the soil. All fluids would be contained in tanks and there would not be open sumps or pits, except for a flare pit which would be eliminated if Renaissance was directed by the Board to use tanks. The drilling mud would be disposed by spreading it on neighbouring lands. Prior to spreading, the drilling mud and the soil on which it would be spread would be tested to ensure there was no significant impact. The conductor pipe would be set in hard clay to about 13 m and surface casing would be set to protect the groundwater aquifers. At the hearing Renaissance committed to setting surface casing to 200 m instead of the applied-for 180 m, to give extra assurance to Mr. Mouly that the groundwater would be protected. After the well has finished producing gas, if any, it would be abandoned downhole and the site reclaimed.

Renaissance stated that the well site would have minimal surface impact. The site would only contain the wellhead, a steel shack (sitting on piles set in the ground) placed over the meter run, and a 9800-litre underground tank to contain any produced water; the tank would be surrounded by a dyke that is designed to contain the entire capacity of the tank. Renaissance stated that it preferred to separate the water at the well site rather than pipe it to the battery because of a concern about corrosion of the pipeline. Renaissance acknowledged that at the time of abandonment of the well, it

would have to excavate a hole some 3 m or larger in diameter to cut off the casing and that this would cause additional disturbance. In order to minimize surface disturbance from the access road, Renaissance stated the road would not be built up.

The pipeline ditch would be approximately 1 m wide, 1.5 m deep, and would be located within the 15-m wide access road right-of-way. Renaissance would use a trackhoe and committed to digging the ditch, and all other excavations associated with the development, using a three-lift method instead of the usual two-lift method. This method involves sequentially removing the topsoil (which may only be several centimetres deep in this area), then the subsoil, and finally the parent material. Each layer is stored in separate piles. The pipe is welded, laid in the ditch, tested, and then the soils are placed back over the pipe in the appropriate order. The site is then ploughed and seeded using seed that is certified as being alkali tolerant for native prairie. If any residual traces of spoiled subsoil or parent material are left on the surface, Renaissance stated it would use rakes, shovels and other small implements to clean the site by hand. Renaissance submitted that the proposed method of digging the pipeline ditch is better than trenching since trenching would mix the different soil layers. Renaissance also stated that it did not believe that ploughing was a practical alternative since it would cost about three times as much as using the trackhoe. The land disturbance would likely be about the same because of the need to use heavy equipment to pull the plough.

Renaissance acknowledged that the proposed development is within the area subject to the Board's IL 96-9 and stated that the construction and reclamation of the well site and pipeline would be in accordance with IL 96-9.

Regarding the alkali issue, Renaissance acknowledged there is alkali in the general area, although it stated there was no evidence that alkali is present under the specific land in question. Renaissance said it wanted to do soil testing but Mr. Mouly would not agree to testing during the winter. If the applications were approved, Renaissance stated it would take soil samples before the site is disturbed in order to be able to reclaim the site as close as possible to its original state. Renaissance planned to take 12 samples from the site and analyse them for topsoil and subsoil depths and textures. Renaissance also stated that, while not normally done, it would perform detailed soil analysis. Notwithstanding the lack of evidence of the presence of alkali, Renaissance stated it was proceeding on the basis that alkali is present under the land in question. It believed that its drilling and pipeline installation methods would minimize any alkali problems. Renaissance pointed out that alkali is primarily spread by constant cultivation or disturbance, but the land in question is not being cultivated or constantly disturbed. Renaissance said it would return the area to grassland as soon as possible to minimize the spread of any alkali. It also claimed over the past 2 years it has had a 95 per cent success rate in reclaiming well sites with soils of all types (including soils with an acid, saline, or alkali nature), based on the receipt of Reclamation Certificates from Alberta Environmental Protection (AEP). Renaissance pointed out that it primarily drills wells in dry land areas with alkali soils. Renaissance believed it could drill the proposed well in the summer without unduly impacting the soil and any alkali that may be present. Drilling operations during wet conditions could cause problems but these problems were not insurmountable and Renaissance would not start to drill the well until it had some assurance that there would be good weather for a week to 10 days.

Renaissance stated it was committed to keeping the proposed site free of weeds and garbage. It would have an on-going weed maintenance program whereby weeds would be controlled by hand. The seeds that would be used for reclamation would meet the weed content specification set by AEP. Initially, Renaissance planned to only steam-clean the trackhoe, but it later stated it was prepared to steam-clean any machinery that would be used in digging the dirt as well as the vehicles that were used to transport the machinery. Renaissance did not see a need to steamclean the drilling rig since rig washes are done on a regular basis. To keep the site free of garbage during the drilling phase, Renaissance would use rental storage bins that would be maintained by Newalta Corporation. During the operation of the well, the site would be kept free of garbage as part of the regular daily maintenance program.

Regarding the concern about water contamination, Renaissance pointed out that Mr. Mouly's dugouts for watering his cattle are 500 to 600 m away from the proposed well site. Also, the surface drainage is primarily in a northeasterly direction with a slight grade towards the dugouts, which are east and south-east from the proposed well site. Therefore, Renaissance believed there was very little risk of the water in the dugouts being contaminated by the applied-for development. Renaissance has already tested the water in the dugouts and, after the proposed well is drilled, Renaissance would continue to test the water (including testing for hydrocarbons) in the early spring and late fall on an annual basis. Renaissance said it was also prepared to test the water in any new dugouts that Mr. Mouly might dig near the proposed well. If water testing showed contamination, Renaissance would look for the source of the contamination and then rectify the problem if it was caused by Renaissance's operations. Renaissance was confident that drilling operations would not cause any water contamination since all the drilling fluids would be contained in the closed loop system that would be used. Likewise, production operations should not cause any water contamination since the only liquid that would be produced is formation water and it would be stored in an underground double-walled tank which would be dyked to contain any surface spills. Regarding the effects of any natural flooding that might occur in the area, Renaissance stated that any alkali would likely be dissolved in the water and move with the water, thereby decreasing the alkali level in the soil. Renaissance stated that the proposed pipeline on SE 15/SW 14 would not impact the land Mr. Mouly occupies on NE 10, as the natural drainage is in a northeasterly direction; furthermore, the existing road between the lands would act as a barrier. Renaissance also believed that the proposed pipeline on SE 15/SW 14 would not impact Mr. Mouly's land in the north-west quarter of Section 14, Township 36, Range 3, West of the 4th Meridian (NW 14), since that land is approximately 800 m from the pipeline.

Regarding the impacts to Mr. Mouly's cattle operation, Renaissance stated it would install a locking steel gate and a Texas gate at the entrance to the access road. The well site facilities would have a locking gate and be surrounded by a barbed-wire fence; however, if this proved to be inadequate to Mr. Mouly, a three-bar steel fence would be installed. Since the access road to the well site would not be fenced, Renaissance believed there would be no effect on the grazing habits of Mr. Mouly's cattle, nor would the cattle be cut off from the water supply. Renaissance acknowledged that the cattle would eat some of the new vegetation along the reclaimed pipeline route, but it did not believe this would be a major problem to the success of the reclamation such that it would be required to install a fence.

In summary, Renaissance acknowledged that Mr. Mouly had valid concerns but its position was that it had made commitments and supplied evidence that adequately addressed his concerns. If problems did occur, Renaissance stated that it had given Mr. Mouly the name of one of its senior operators as a contact person and that it would expeditiously resolve any problems that might arise.

5.2 Views of the Intervener

Mr. Mouly was concerned about the effects the proposed well and pipeline would have on the land he occupies, and believed he needed an expert witness to properly determine what the effects would be. One of his major concerns was that the proposed development could bring alkali to the surface which would, among other things, prevent the growth of vegetation. Mr. Mouly referred to a problem with poor vegetation growth along an existing pipeline on NE 10, which he attributed to alkali being brought to surface. He also made reference to a road built by the SAB adjacent to his lands where the ditches of the road were white with alkali. Mr. Mouly had a major concern with the access road because he believed the topsoil would be eroded, even with minimal traffic, but especially with the winter snow ploughing. Mr. Mouly explained that he did not agree to Renaissance's proposal to do soil sampling this past winter because Renaissance would have to plough the snow to get into the area and this would likely disturb the soil. Mr. Mouly further explained that ploughing any access road during the winter on an ongoing basis would disturb the

surface, as had been done on other access roads he was aware of, and this would ultimately create an alkali problem. He was also concerned about the surface disturbance that would be created by installing the underground tank and the surrounding dyke, and preferred to have the produced water separated at the battery. Mr. Mouly doubted whether the three-lift method proposed by Renaissance to dig the pipeline ditch would really prevent the mixing of any alkali that might be present, and believed the ploughing method should be seriously considered. Mr. Mouly was strongly opposed to any well being drilled in the summer because he believed the heavy equipment would damage the surface of the land, especially if the drilling occurred during wet weather.

Mr. Mouly was also concerned that the proposed development could result in alkali or hydrocarbon contamination of the water supply for his cattle. If alkali was brought to surface, it could migrate into his dugouts, either by way of the groundwater aquifer or during periods of flooding in the spring. Mr. Mouly's witness, Mr. Kloberdanz, stated that significant spring-time flooding typically occurs about three times over an 8-year cycle. Mr. Mouly's main concern relating to hydrocarbon contamination was with the possibility of spillage of oil and he was only partly satisfied with Renaissance's assurance that there would be no oil produced from the proposed well. Mr. Mouly was also concerned with the possibility of the produced water-tank being within the water-table as it might rupture and leak contaminants into the water supply. Mr. Mouly stated that his dugouts were spring-fed, and he indicated that the contamination of the groundwater of NE 10 might have an adverse effect on his dugouts in NW 11. Mr. Mouly wanted water testing to be done closer to the proposed site, either by digging another dugout or by drilling water wells. He stated that the primary reason for the wells or dugout was to monitor possible water contamination but acknowledged that another purpose for this was to supply water for his cattle. Mr. Mouly was also concerned about Renaissance's plan to spread the drilling fluid on his neighbour's land, because contaminants from the drilling fluid might get into the groundwater. He objected to the proposed pipeline on SE 15/SW 14 because any problems with alkali could affect his land in NW 14, as the surface drainage is in a northeasterly direction. Mr. Mouly raised the concern that if a significant amount of alkali was brought to the surface, spring flooding would carry it to a depression (Pete's Lake) within the centre of Section 14. This alkali might then be deposited around the edge of the lake, including his land in NW 14.

Mr. Mouly was not satisfied with Renaissance's plan to install a barbed-wire fence around the proposed well site. As he had experienced problems with his cattle getting into other well sites where wire fences had been used, Mr. Mouly wanted a six-bar steel fence constructed around any well site. Regarding Renaissance's statement that it would not fence the access road at any time, Mr. Mouly believed that the only way to reclaim the pipeline route would be to fence it in order to get the vegetation well established; otherwise the cattle would preferentially eat the new grass. This fencing would then disrupt the grazing habits of his cattle and restrict their access to the water supply.

Because Mr. Mouly was concerned with the spread of noxious weeds, he wanted all machinery cleaned before it was brought onto the site. He did not want sprays to be used to control weeds

Mr. Mouly raised a concern about odours created by the surrounding oilfield activities, as well as the possibility that the 16-10 well would create annoying odours.

Mr. Mouly made several references to cases where various operators, including Renaissance, failed to either live up to commitments made or to address specific concerns raised with them. As a result, Mr. Mouly stated that he did not have much confidence in Renaissance being able or willing to follow through with any commitments that it had made concerning the drilling and operation of the 16-10 well. However, he did acknowledge that with respect to two areas of concern, namely well site clean-up and oilfield odours, Renaissance had at least proven to be somewhat better than the previous operator.

In summary, Mr. Mouly's position was that his concerns could not be adequately addressed until soil and water testing could be performed, and that he was not confident that mitigation commitments made by Renaissance would actually be carried out in an effective or timely manner.

5.3 Views of the Majority Examiners

The following views are those of examiners G. W. Dilay and R. A. Marsh (the majority examiners).

Regarding Mr. Mouly's statement that he required an expert witness to obtain samples and to assist him in preparing for the hearing, the majority examiners believe that while intervenors are not precluded from retaining expert witnesses and/or providing evidence which may be helpful at hearings, such witnesses and/or evidence were not necessary, in this case, for the examiners to make their recommendations. The onus is on the applicant to provide evidence and expert opinions on how its operations will not adversely impact the environment and not significantly affect the owners, residents, or adjacent residents.

The majority examiners agree that Renaissance's plan to use a zero disturbance method to drill the proposed well and a three-lift method to dig the pipeline ditch and to do any other excavation work will minimize the possibility of bringing alkali to the surface. The majority examiners are concerned about the potential for alkali to be brought to the surface if the proposed well is drilled when the ground is not frozen, particularly if the well is drilled during wet weather. Therefore, the majority examiners believe it would be appropriate to require the well to be drilled on frozen ground. The majority examiners recognize there would likely be additional costs if the pipeline ditch is dug during frozen ground conditions. The majority examiners are not convinced of the need for an underground tank to store produced water. Statements made by Renaissance suggested the proposed well may produce only a small amount of water, and the majority examiners do not believe Renaissance has adequately considered the options available to minimize pipeline corrosion (such as corrosion inhibitors or internally lined pipe) if the produced water is separated at the battery rather than at the well. With respect to Renaissance's proposal that it would eliminate the flare pit if the Board directed it to use flare tanks, the majority examiners refer Renaissance to the Board's IL 96-12 (*Use of Flare Tanks as an Alternative to Flare Pits*).

With respect to mitigating any problems that do occur as a result of bringing alkali to the surface, the majority examiners are concerned that Renaissance was not able, when asked, to provide a detailed management plan of how it would deal with these problems. However, the majority examiners note that Renaissance did commit to abide by all the reclamation procedures required by AEP and that Renaissance would be required to obtain a Reclamation Certificate from AEP. Considering Renaissance's extensive experience in dealing with alkali soils and its success in obtaining Reclamation Certificates, the majority examiners believe that Renaissance should be able to mitigate problems if they occur. However, this would require that Renaissance give proper attention to this matter. In an attempt to ensure that this occurs, the majority examiners believe that any approval should include the following conditions.

- Renaissance is to conduct a pre-disturbance soil sampling program on the well site and pipeline route to ensure that the reclaimed land resembles the original land as closely as possible. The majority examiners recognize that Renaissance has committed to do soil sampling on the site, but it is not clear to the majority examiners whether Renaissance's commitment applies to both the well site and pipeline route or just to the well site.
- Snow removal from the access road and well site is to be done in a manner that does not disturb the ground surface. Any damage that is done to the ground surface during snow ploughing is to be remediated as soon as possible.

The majority examiners do not believe that construction of the pipeline in SE 15/SE 14 would

seriously affect Mr. Mouly's land in NW 14, considering that land is approximately 800 m away from the proposed pipeline.

With respect to the possible contamination of the water supply of NE 10 and of Mr. Mouly's dugouts in NW 11, the majority examiners believe that any impacts on the surface and groundwater would not be significant, if any. The majority examiners would not expect any significant amounts of alkali to be flooded into the dugouts because of the large distance between the proposed development and the dugouts and the large amount of dilution that would occur during such flooding. The majority examiners believe there is little likelihood of any oilfield contaminants being generated since the proposed well is a gas well, not an oil well. The majority examiners also believe there would be no significant water contamination caused by the land spreading of the drilling fluids as the land spreading would not occur on the land occupied by Mr. Mouly, and there are well established practices for the spreading of such fluids. The majority examiners note Renaissance's commitment to conduct water analysis (including testing for hydrocarbons) on a semi-annual basis for the existing dugouts and any new dugouts Mr. Mouly might dig near the proposed well.

The majority examiners' views on the other concerns raised by Mr. Mouly are summarized below.

- Regarding Mr. Mouly's concern about the spread of noxious weeds, the majority examiners believe Renaissance's commitment to clean all equipment and steam-clean equipment used in conjunction with excavation prior to entry onto the subject land as well as to control any weeds by hand should adequately address this issue.
- Regarding Mr. Mouly's concern about the clean-up of garbage, the majority examiners believe that the use of storage bins and Renaissance's regular maintenance program should prevent garbage from being left on the site.
- Regarding Mr. Mouly's concern that it may be necessary for Renaissance to fence the pipeline route, the majority examiners believe it should be possible for Renaissance to use other methods to prevent the cattle from eating the new vegetation along the reclaimed pipeline route.
- Regarding Mr. Mouly's concern about adequate fencing around the well site, the majority examiners believe Renaissance's commitment to install fencing satisfactory to Mr. Mouly's needs should alleviate this concern.
- Regarding Mr. Mouly's concerns about odours, the majority examiners do not believe this should be a problem since the well is expected to produce sweet natural gas.

The majority examiners conclude that Renaissance has planned to use adequate methods to minimize the impacts of the proposed development. Considering Renaissance's extensive experience in dealing with alkali soils, the majority examiners believe the impacts of the development could be adequately mitigated by Renaissance. The majority examiners are, therefore, prepared to recommend that the applications be approved. However, in this case, the majority examiners are concerned that Renaissance does not seem to have a specific plan in place to deal with the problems that might occur if alkali is brought to the surface. Therefore, in an attempt to ensure that any problems are properly dealt with and that Renaissance lives up to its commitments, the majority examiners believe there is a need to place several conditions on the approvals.

5.4 Views of the Minority Examiner

The following views are those of examiner R. Elle (the minority examiner).

The minority examiner concurs with the views of the majority examiners regarding Mr. Mouly's

issue regarding the need to obtain an expert witness and soil and water analysis.

The minority examiner acknowledges both Renaissance's efforts in attempting to reach an agreement and Mr. Mouly's equally sincere concerns for the potential environmental problems he is attempting to alleviate or minimize. However, the minority examiner believes that the onus is on the operator of a proposed activity on native prairie complicated by evidence of alkali to be familiar with the recommendations of IL 96-9 and the landowner or lessee concerns. In order to take the necessary steps to minimize impacts on native prairie, action plans could have been developed such as site visitation, investigating options for pipeline construction, using methods to determine soil horizons, and cleaning of all equipment. These steps would have given the minority examiner confidence that Renaissance was familiar with the site, the contents of IL 96-9, and had considered all the alternatives available to mitigate environmental impacts.

The minority examiner believes the greatest concern with any surface disturbance in NE 10 is the impact of bringing the alkali to surface in sufficient quantities that would inhibit or prevent vegetation growth on native prairie in the area of disturbance and beyond. Although Renaissance has indicated it would approach the area with the assumption that alkali is present, the minority examiner is concerned how this will be achieved without conducting appropriate sampling to determine the depth of the alkali or the amount of topsoil specific to this quarter section. Although Renaissance indicated soil analyses are conducted on a site prior to development activities in order to restore the site to its former state, this work had not been performed in the initial stages of site locating and surveying in August and September 1996 when such activities would have been much easier to conduct. This would have provided not only an insight into the suitability of the site chosen but enabled Renaissance to develop a detailed management plan to address environmental issues.

Although the minority examiner agrees with Renaissance's proposal to utilize a zero disturbance method to drill the proposed well and a three-lift method to dig the pipeline ditch, the minority examiner reiterates his concern on how this can be conducted successfully without a proper soil profile analysis. As well, the minority examiner questions how this could be performed in the winter as Renaissance indicated that if the well was to be drilled in winter conditions, the pipeline construction would not wait until summer. In addition, the minority examiner is concerned with Renaissance's proposed ploughing of the pipeline right-of-way prior to the seeding. Depending on the amount of topsoil, depth of possible alkali, and the width of the plough, this could result in the mixing of these horizons and inability or increased timeframe for the native grasses to establish a reasonable and sufficient cover to prevent erosion and possible spreading of alkali to the immediate area.

The minority examiner is not convinced of the need for an underground tank to store produced water. Statements made by Renaissance suggested that the proposed well may only produce a small amount of water and therefore could initially be transported to the oil separation facilities for separation. With regard to the concern for corrosion, the minority examiner feels that there are options available to minimize pipeline corrosion that were not investigated thoroughly, in addition to the weekly pigging operations that Renaissance indicated it would be undertaking as a routine operation. The minority examiner is also concerned that Renaissance failed to realize that IL 96-9 recommended the use of portable concrete cement dykes around the storage tanks instead of the hauling in of clay for dyke construction in the unlikely event of a water spill. The minority examiner is concerned that Renaissance is not as familiar or concerned about the mitigation of environmental issues on native prairie as it portrayed at the hearing.

With respect to mitigating or preventing any problems that could occur as a result of bringing alkali to the surface, the minority examiner notes that Renaissance was not able, when asked, to provide a detailed management plan of how it would deal with these issues. Although Renaissance indicated that it had approximately 95 per cent success rate in reclamation activities, and that a Reclamation Certificate was required in any event before it was released of its obligations, the minority examiner

is not convinced that Renaissance has adequately addressed all issues regarding condition of the soil or vegetation on the well site, access road, pipeline right-of-way, and impact of traffic during drilling and operating/servicing operations.

Regarding Mr. Mouly's concern about fencing of the pipeline right-of-way to prevent cattle from eating new vegetation along the disturbed areas and not allowing the grass to become established, the minority examiner notes that Renaissance did not indicate how it would address this issue. The minority examiner feels that if Renaissance had adequately determined the effect of its activity on the soils and vegetation in the area, it would have been able to respond to Mr. Mouly's concern.

With regard to Mr. Mouly's concerns about possible contamination of water supply, weed control, clean-up of garbage, fencing of well site, and odours; the minority examiner concurs with the view of the majority examiners.

The minority examiner concludes that Renaissance has not demonstrated or presented sufficient evidence that it has considered all the impacts its activity would have in this native prairie area, further complicated by the presence of alkali. The evidence it presented was general in nature, and the fact that it referred several times to IL 96-9 but was utilizing procedures or practices that were contrary to the recommended practice without supporting rationale, has left the minority examiner with the concern that Renaissance was either not serious about following the recommended or equivalent practices or was not fully cognizant of its content. The fact that Renaissance did not have a specific plan in place to deal with the problems that might occur if alkali is brought to surface or revegetation did not occur, is of great concern to the minority examiner.

6 RECOMMENDATION

6.1 Recommendation of Majority Examiners

The majority examiners recommend that Applications No. 960977 and 1004244 for a well licence and pipeline permit, respectively, be approved subject to the following conditions.

- Prior to any disturbance, Renaissance is to conduct a soil sampling program on the well site and pipeline route to ensure that the reclaimed land resembles the original land as closely as possible. A copy of the soil sampling report is to be provided to Mr. Mouly.
- The 16-10 well is to be drilled using a zero disturbance method and during frozen ground conditions,
- All excavations are to be done using the three-lift method such that the topsoil, subsoil, and parent material are stored separately.
- No buried tanks are to be used to store produced water without the prior approval of the Board.
- Snow removal from the access road and well site is to be done in a manner that does not disturb the ground surface. Any damage that is done to the ground surface during snow ploughing is to be remediated as soon as possible.

6.2 Recommendation of Minority Examiner

The minority examiner recommends that Applications No. 960977 and 1004244 for a well licence and pipeline permit, respectively, be denied.

7 MAJORITY EXAMINERS' COMMENTS

Although the majority examiners have recommended that Renaissance's applications be approved with conditions, the majority examiners see a need to provide comments to Renaissance regarding its participation at the hearing. The majority examiners do not believe that Renaissance was adequately prepared for the hearing. There were instances of wrong information being supplied (for example, the P&NG agreement for Section 10), confusing evidence (for example, the statement that the 13-11 well was recompleted into the Rex Formation rather than the Lloydminster Formation), and inaccurate statements (for example, reference to the 13 -11 well as the 11-3 well). Also, several of the responses to questions were quite general and not helpful to the majority examiners. Finally, the witnesses did not seem to have a very good knowledge of the land in question. The majority examiners want to point out to Renaissance that it is important for witnesses at Board hearings to be well prepared to present evidence and answer questions.

The majority examiners would also like to provide comments to Mr. Mouly. The majority examiners believe that affected parties have a responsibility to provide input in a reasonably expeditious manner (for example, requesting soil samples to be taken prior to winter conditions if there is a concern with sampling during the winter) and to take the necessary steps to ensure proper representation at Board hearings (for example, obtaining expert witnesses and legal representation).

Dated at Calgary, Alberta on 24 June 1997.

G.W. Dilay, P.Eng.

R.A. Marsh, P.Geol

R. Elle