ALBERTA ENERGY AND UTILITIES BOARD
Calgary Alberta

BURLINGTON RESOURCES CANADA ENERGY LTD.
APPLICATION TO MODIFY AN EXISTING
SWEET GAS PLANT TO INCLUDE SOUR GAS
PROCESSING, ASSOCIATED PIPELINES,
ACID GAS DISPOSAL WELL, AND ACID GAS **Decision 2000-42**
DISPOSAL SCHEME **Applications No. 1044064, 1054047,**
PEMBINA AREA **1060027, 1062886, 1063172, and 1063841**

1 DECISION

Having considered all the evidence, the Alberta Energy and Utilities Board (EUB/Board) is prepared to approve Applications No. 1044064, 1054047, 1060027, 1062886, 1063172, and 1063841, subject to Burlington Resources Canada Energy Ltd. meeting all regulatory requirements, commitments made in the applications and at the hearing, and the Board's conditions as described in Section 7 of this report. The approvals will be issued in due course.

2 APPLICATIONS AND HEARING

2.1 Applications

Burlington Resources Canada Energy Ltd. (Burlington) submitted Applications No. 1044064, 1054047, 1060027, 1062886, 1063172, and 1063841 (the applications) to the EUB to obtain approval to:

- modify an existing sweet gas plant (the O'Chiese plant) located in Legal Subdivision 6, Section 25, Township 45, Range 10, West of the 5th Meridian (6-25-45-10W5M) to include sour gas processing;
- construct and operate 40.5 kilometres (km) of pipeline for the purpose of gathering and transporting sour gas to the proposed modified gas plant;
- amend an existing pipeline licence to change the approved substance from sweet gas to sour gas for the purpose of transporting sour gas to the proposed modified gas plant;
- drill a well at 6-25-45-10W5M for the purpose of acid gas disposal;
- construct and operate 0.65 km of pipeline for the purpose of transporting acid gas from the proposed modified gas plant to the proposed acid gas disposal well; and
- operate the proposed acid gas disposal well.

The locations of Burlington's proposed facilities are shown on Figure 1.

2.2 Interventions

The EUB received objections to Burlington's Pembina sour gas processing project from a number of interveners. Subsequently the Board directed, pursuant to Section 29 of the Energy Resources Conservation Act, that a public hearing be held to consider the applications. At the opening of the hearing, letters from the Pembina Institute, Penn West Petroleum, and Gulf Midstream Services Limited were filed stating that each party was withdrawing its objection and would not be participating in the hearing. The hearing proceeded with the Friends of Rose Creek Society as the only registered intervener opposing the applications.

2.3 Hearing

The applications and interventions were considered at a hearing in Drayton Valley, Alberta, on May 25, 2000, before Board Members B. F. Bietz, P.Biol., and G. J. Miller and Acting Board Member M. J. Bruni, Q.C. Those who appeared at the hearing are listed on the following table:

THOSE WHO APPEARED AT THE HEARING

Principals and Representatives (Abbreviations Used in Report)	Witnesses
Burlington Resources Canada Energy Ltd. (Burlington)	M. Smith, P.Eng.
R. A. Neufeld	J. Bell, P.Eng.
L. A. Olthafer	T. R. Smith, P.Eng.
	J. Strand of Greenpipe Industries Ltd.
	R. Martin, P.Eng.
The Friends of Rose Creek Society (Friends of Rose Creek)	
J. Elmont	J. Elmont
W. Porter	W. Porter
Alberta Energy and Utilities Board Staff	
D. Brezina, Board Counsel	
G. McLean, C.E.T.	
B. K. Eastlick, P.Eng.	
J. McIntosh, P.Eng.	
H. Groen	
L. Wilson-Temple	

3 ISSUES

The Board considers that the following are issues with respect to Burlington's application:

- need for the facilities,
- environmental impacts, and
- public safety.

4 NEED FOR THE FACILITIES

4.1 Views of the Applicant

Burlington stated that the proposed facilities were needed as there was a large amount of shut-in sour gas in the area that required processing. Burlington indicated that 13 wells had been drilled in the area since the initial well was drilled and completed in February 1997. It indicated that a total of 15 productive zones had been identified in wells that could be serviced by its proposed sour gas gathering and processing project. Burlington stated that it operated all but two of the wells and estimated the total gas in place to be between 1.127 and 1.268 billion cubic metres (10^9 m^3). Burlington estimated that it currently had between 480 and 700 thousand cubic metres per day (10^3 m^3/d) of shut-in sour gas production capability within economic reach of the O'Chiese gas plant. It added that other operators had between 200 and 280 10^3 m^3/d of shut-in sour gas production capability in the area. Burlington stated that its facility application was based on a sour gas inlet volume of 735 10^3 m^3/d and 14.54 tonnes/d (t/d) inlet sulphur; however, the facility had been designed to handle up to 986 10^3 m^3/d of gas and 19.55 t/d of sulphur. Burlington stated that it believed this would ensure flexibility to process additional sour gas volume if required as sweet gas production in the area declined.

Burlington stated that it investigated several alternatives to the proposed plant modification and concluded that its project, based on the Board's mandate to ensure that energy development is undertaken on an economic, orderly, and efficient basis while being environmentally acceptable and in the public interest, was the superior choice. Burlington indicated that because there were no residents within the plant's 5 km emergency planning zone, its public and industry consultations focused on discussions with broadly based interest groups and local area producers and processors. These consultations included discussions with AltaGas Services Inc. (AltaGas), which operates two sweet gas plants in the Alder Flats area about 10 km east of the O'Chiese plant. Burlington stated that AltaGas is now a supporter and participant in the proposed project.

Burlington indicated that it also held several discussions with Penn West Petroleum Ltd., which operates the Minnehik-Buck Lake sour gas plant (Penn West Minnehik-Buck Lake), located about 30 km to the east of the proposed facility at 10-5-46-6W5M, and with Gulf Midstream Services, which operates the Brazeau River sour gas plant (GMS Brazeau River) located about 38 km west of the proposed facility at 3-12-46-14W5M.

Burlington concluded that its public and industry consultations had resulted in four possible processing options:

- the proposed project,
- a new pipeline to transport all of the sour gas to the Penn West Minnehik-Buck Lake plant;
- a new pipeline to transport all of the sour gas to the GMS Brazeau River plant, or
- an alternative proposed by Friends of Rose Creek for two gathering systems to transport sour gas reserves on the east side of the North Saskatchewan River to the Penn West Minnehik-Buck Lake plant and sour gas reserves on the west side of the North Saskatchewan River to the GMS Brazeau River plant.

Burlington noted that the second option to the Minnehik-Buck Lake plant would have two possible routes, a north route or a south route, and that the fourth option would have two possible routes to the GMS Brazeau River plant. The locations of the alternative processing facilities and pipeline routes for options 2 and 3 are shown on Figure 2. The geographical principle of option 4 is also represented on Figure 2.

Burlington provided the following details on the four options:

- The proposed project (option 1), would require the construction of approximately 42 km of pipeline.

- The second option, to the Penn West Minnehik-Buck Lake plant, would require the construction of approximately 72 km of pipeline for the north route and 63 km of pipeline for the south route. It would also require the construction of compression and dehydration facilities at 11-14-47-8W5M.

- The third option to the GMS Brazeau River plant would require the construction of approximately 92 km of pipeline and would also require the construction of compression and dehydration facilities at or near Section 10-45-10W5M.

- The fourth option would require the construction of about 55 km of pipeline to connect the gas on the east side of the North Saskatchewan River to the Penn West Minnehik-Buck Lake plant and either 70 or 39 km of pipeline for the north or south route respectively to connect the gas on the west side of the North Saskatchewan River to the GMS Brazeau River plant. The fourth option would also require the construction of two stand-alone compression dehydration facilities. Burlington recognized the suggestion by the Friends of Rose Creek that Burlington could utilize an existing Penn West pipeline from 2-23-47-7W5 to the Penn West Minnehik-Buck Lake plant ; however, Burlington argued that it could not be used as it was operating at near capacity and it would have to loop approximately 19 km of pipeline.

Burlington noted that the interveners did not dispute the need to produce the sour gas reserves or the need to construct sour gas gathering pipelines to transport the gas to one or more sour processing facilities. Burlington also noted that no application to the EUB had been made for any of the alternative processing options and that none of the related conservation and reclamation plans and other groundwork necessary for such applications had been completed. Consequently, Burlington estimated that choosing any one of the alternatives would delay production of the shut-in gas by approximately six months, compared to its proposed project.

Burlington said that it did not believe its proposed project constituted proliferation, as it would require less pipeline construction than the other options and as the sour gas processing facilities would be installed in an existing plant site.

Burlington stated that it was both in the private economic interests of Burlington and the broader public interest of the province to have the sour gas reserves on production. Burlington acknowledged that its economic analysis of the proposed project and options 2 and 3 suggested these three options were relatively comparable. However, Burlington stated that it had greater confidence in the cost estimates for its proposed project than in its estimate of the capital costs and third-party processing fees for any of the other options. Burlington also noted that the fourth option would reduce the net present value of the proposed project by approximately $9

million. Therefore Burlington did not consider the fourth option to be a reasonable economic alternative.

4.2 Views of the Interveners

The Friends of Rose Creek did not contest the need to produce the shut-in reserves and the need to construct sour gas gathering pipelines to transport the gas to appropriate processing facilities, but were concerned with the impacts associated with proposed project. They believed that available capacity in the existing Penn West Minnehik-Buck Lake and the GMS Brazeau River sour gas plants should be used before any new sour processing capacity was constructed. The Friends of Rose Creek proposed that the sour gas reserves on the east side of the North Saskatchewan River should be processed at the Penn West Minnehik-Buck Lake plant and the sour gas reserves on the west side of the North Saskatchewan River should be processed at the GMS Brazeau River plant. No specific pipeline routes were presented ; however, a main gathering point at 2-23-47-7W5 was suggested as it is at the north end of an existing Penn West pipeline that connects to the Penn West Minnehik-Buck Lake plant. They suggested that with the influx of new gas this would result in upgrading of sulphur recovery at both plants. They maintained that given the available processing capacity in existing facilities, the proposed project should not be approved.

The Friends of Rose Creek did not make specific economic comparisons of the proposed project and the alternatives. However, they quoted the Board's proliferation policies that state that high processing fees are not sufficient grounds for rejection of the use of an available existing facility for processing and that require an applicant to investigate the possibility of creating new commercial partnerships with existing operators. The Friends of Rose Creek stated that they were not opposed to natural resource development in the province and appreciated the many economic and employment benefits that the industry provided. They also stated that such development should not be allowed where it was unnecessary and was part of a piecemeal development approach that demonstrated no consideration of future growth and would also impact the environment. The Friends of Rose Creek stated that they recognized that oil and gas development in the area had increased dramatically and that many residents depended upon the industry for their livelihood. They also believed that there were already enough plants and facilities in the area and that, although production of gas may be in the public interest, the construction of more sour facilities was not.

4.3 Views of the Board

The Board accepts the need for Burlington to produce its and other sour gas reserves in the area. It also accepts the need to construct sour gas gathering pipelines to transport the raw gas to one or more sour gas processing facilities. The Board notes that the interveners did not directly object to the need to produce the shut-in sour gas reserves or to the need to construct sour gas gathering pipelines to transport the gas to appropriate processing facilities, but rather were concerned with the impacts associated with the project as proposed.

The Board accepts that Burlington conducted a comprehensive review and consultation program appropriate to its project. However, the Board is also aware of the importance of area development planning so that individual projects can be considered in conjunction with other energy developments contemplated by competitors. The Board believes that these plans assist interested parties and industry in anticipating and addressing issues. Notwithstanding,

Burlington expressed no view regarding the concern expressed by the intervener about what it interpreted as a piecemeal approach to development in the area. Given its significant holdings in the area, the Board encourages Burlington and other operators to be proactive in initiating an area development plan in the Pembina area. This is of particular importance for effective mitigation of the regional impacts perceived by the Friends of Rose Creek.

The Board recognizes that it is required to evaluate the need of the proposed project in the broader public interest. The Board considers this interest in terms of economic, orderly, and efficient development of Alberta's oil and gas resources. The Board accepts the public's view that there is a need to avoid facility proliferation whenever possible and practical. In this case, the Board believes that Burlington had adequately explored various options for processing the sour gas, including the proposed project and two options to use existing sour gas processing plants in the area. The Board notes that Burlington examined a fourth option proposed by the Friends of Rose Creek and believes that this option was also adequately explored by Burlington. The Board recognizes that some of the options explored are not as attractive as might first appear due to the lack of capacity in existing pipelines and the need to loop those pipelines.

The Board believes that the most desirable option is the one that represents an appropriate cost/benefit trade-off while minimizing the risks and impacts of the development. In its assessment of the alternatives, the Board generally considers all of the options to be technically and economically viable. Therefore, in reaching its decision on the preferred location for the processing facilities and associated pipelines, the Board must turn its attention to relative environmental and social impacts.

5 ENVIRONMENTAL IMPACTS

5.1 Views of the Applicant

Burlington stated that its proposed project would result in less environmental impact than the other alternatives for processing the gas. Burlington stated that the acid gas from sweetening the sour gas would, instead of being flared, be injected into the wet Wabamun Formation thereby minimizing emissions. Burlington indicated that it intended to use a new injection well to be drilled at 6-25-45-10W5M (the 6-25 injection well) proximal to the plant. As a result, the only emissions from the proposed modified gas plant would be from the incineration of vapours off the water storage tank and the dehydration still column. This would limit sulphur emissions to 0.093 tonnes/day (t/d). It would also reduce carbon dioxide (CO_2) greenhouse gas emissions, since CO_2 that would normally be vented from a conventional sulphur recovery plant would also be injected, with the H_2S, into the 6-25 injection well.

Burlington compared emissions of its proposed plant to emissions that would occur if one of the other processing options were chosen. Burlington noted that, unlike its preferred option, new compression and dehydration facilities would be required for transporting the gas to any of the three alternatives to the proposed plant. Sulphur would be emitted from the dehydration process for all three alternative options, and in the case of option 4, Burlington stated that sulphur emissions associated with the compression and dehydration process alone would be similar to those from its proposed plant.

Burlington observed that both Penn West and Gulf had committed to upgrade the sulphur recovery at their respective plants. Burlington noted, however, that even if the Penn West Minnehik-Buck Lake plant sulphur recovery process was upgraded, its proposed modifications to the O'Cheise plant would result in 0.14 t/d lower net sulphur emissions. It noted that relative sulphur emissions would also be greater for an upgraded GMS Brazeau River alternative. Burlington stated that, compared to processing at either of the existing sulphur recovery plants, its proposed project would also reduce CO_2 greenhouse gas emissions by 8000 t/year because CO_2 associated with the acid gas would be injected.

Burlington noted that land and groundwater contamination risks associated with sulphur production would also be reduced by its acid gas injection proposal, as would the production of wastes relative to alternative sulphur recovery processes.

Burlington stated that it believed that as the acid gas was injected into the formation, it could form a localized bubble around the wellbore for a short period of time. It would then diffuse away from the wellbore, since H_2S and CO_2 are extremely soluble in water. Therefore Burlington did not anticipate a significant increase in formation pressure due to the total volume of gas injected. It stated that the method proposed for completion of the well and the evaluation of the success of that completion would help to ensure that groundwater was protected.

Burlington also described the process it would use to eventually abandon the acid gas disposal well. This would be accomplished by setting a bridge plug over the injection zone, capping it with cement, and then setting up to three abandonment plugs up hole. Finally, the casing would be cut off and a cap welded on. If a leak should occur later, Burlington believed that the hydrostatic head of the fluid leaking would be greater than the formation pressure and this would essentially kill the flow at around 500 m from surface. For this calculation it estimated the pressure gradient of the fluid to be close to that of water, since the injected H_2S is extremely soluble in the formation water. Burlington noted that the base of groundwater protection in this area was at 500 m. However, according to data from Alberta Environment, Groundwater Protection Branch, the nearest water well had a depth of only 115 m. Burlington stated that it did not pursue any other additional sources of information on groundwater, since there was no population around the plant.

Burlington committed to incinerating the sour vent gas streams from the sour water and sour condensate storage tanks. It stated that any gas from the compressor distance piece vents, truck-loading vapour return lines, and acid gas dehydrator vents would be incinerated. It said that it expected any sour condensate to be sufficiently stabilized that it could be transported by truck at atmospheric pressure. However, Burlington stated that pressurized trucks would be used if condensate odour problems arose. Burlington also committed to limiting acid gas flaring associated with outages of the acid gas injection system to the minimal volumes necessary to safely depressure equipment. It said that it would not continuously flare acid gas during such outages.

With regards to environmental impacts from the proposed pipelines, Burlington stated that its proposed pipeline system was planned using existing linear disturbances (pipeline, seismic, and road rights-of-way) as much as possible and that 88 per cent of its pipeline system would use existing rights-of-way. It said that it had investigated the pipelines required for the alternative processing options and noted that greater lengths of pipelines, involving more stream and road crossings, would be involved. Burlington noted that although the Penn West Minnehik-Buck

Lake gathering system was nearby, portions of that system were already fully utilized and looping with parallel pipelines would be required to accommodate the new gas. It stated that it had not determined the extent of new linear disturbances that would be required for either the Penn West Minnehik-Buck Lake or GMS Brazeau River gas processing options.

Burlington noted that option 4, as proposed by the interveners, would require construction of two compressor-dehydration facilities (one on each side of the North Saskatchewan River) and two systems to interconnect to the Minnehik-Buck Lake and Brazeau River plants. It stated that either of these options would double the length of pipelines related to its proposal.

In response to concerns of the Friends of Rose Creek, Burlington noted that its O'Chiese gas plant was located about 0.8 km from the Brazeau River at an elevation 76 m higher than the river. Therefore flooding would not be an issue. It also noted that its North Saskatchewan River pipeline crossing would be located at the same site as existing Burlington and NOVA crossings. Burlington noted that it had drilled under the river to install its pipeline in order to reduce impacts and would follow this procedure again. Burlington also stated the characteristics of the river crossing were well known and that it had taken scour into account in the design of the crossing.

5.2 Views of the Interveners

The Friends of Rose Creek were concerned about the effects of extensive petroleum industry development in the area. They expressed frustration that resource exploration and development had been implemented on a piecemeal basis in the area without coordinated planning to effectively utilize facilities and minimize adverse impacts. They noted that land developers' planning requirements, including integration with master plans, did not have analogs in the resource industry. They also raised concerns about the relationship between resource industry emissions and public health statistics and were concerned about the well, pipeline, and seismic line disturbance to the Rose Creek Forest. They noted that the forest had been extensively affected by resource development over the past 20 years and that overall environmental impacts needed to be considered, not just the option with the lowest air emissions. For example, the Friends of Rose Creek noted that while sustainable forestry was implemented in the Rose Creek Forest five years ago, the timber removed by resource companies was still not incorporated into the forestry plans.

The Friends of Rose Creek stated that the proposed sour gas processing facilities represented an unnecessary proliferation of facilities in the area. They believed that existing plants could be used and that the associated interconnecting pipelines need not create additional significant levels of surface disturbance. In order to avoid a new sour gas pipeline crossing the North Saskatchwan River, they recommended that gas on the west side of the North Saskatchewan River should be processed in the GMS Brazeau River plant and gas from wells on the east side of the river should be directed to the Penn West Minnehik-Buck Lake plant. The Friends of Rose Creek felt that the processing of additional gas at existing facilities would also result in upgrading of the sulphur recovery of those plants and have a net environmental benefit while addressing public concerns by avoiding construction of additional sour processing and pipeline facilities in the area.

The Friends of Rose Creek also raised issues around the long-term effects of the acid gas disposal scheme. They expressed concern over what would happen to the acid gas when it was

injected, where it went in the formation, and how long it would stay there. Fifty years from now, they queried, would other companies drilling in the area be aware of the acid gas injection? They further suggested that more work should be done in this area regarding monitoring the changes in the depths of water wells over time.

5.3 Views of the Board

The Board recognizes the commitments made by Burlington with respect to emissions management at the proposed sour gas processing facility and Burlington's commitment to shut in the facility during injection system outages, as opposed to flaring for any extended period beyond normal depressurization of equipment. The Board also accepts Burlington's commitments on incinerating vent gas streams.

The Board believes that sulphur emissions from the proposed Burlington sour gas sweetening and acid gas injection plant, which would be limited to 0.093 t/d, will be less than the alternatives. The Board believes that taking the O'Chiese area gas to any of the alternative plants, even if the proposed upgrades to those plants were completed, would not reduce the overall emissions in the area. The Board accepts that CO_2 emissions will also be lower for the proposed project than for any of the alternatives discussed at the hearing.

The Board believes that the Burlington acid gas injection proposal is based on proven technology and expects that Burlington's proposal will meet or exceed regulatory requirements. It agrees that there is a high probability that the injected acid gas will be absorbed into the formation water within a short time and does not anticipate, based on the geological data to date, the formation pressure rising much above the initial state. The Board also believes that the EUB requirements for completing injection and disposal wells, as described in EUB *Guide 51*: *Injection and Disposal Wells*, are adequate for ensuring that groundwater and other formations will be isolated during operations. The Board does not consider the disposal scheme to be a significant risk to other companies drilling in the area, since the disposal well would always be prefixed in a manner that indicated that acid gas had been injected there.

While the Board does believe that the proposed acid gas injection well can be operated and ultimately abandoned safely, the Board notes that the technology associated with well completions and abandonments continues to evolve. The Board also notes that the long-term protection of the environment, and particularly groundwater, from leaking wells is a concern that it shares with the public. Therefore, the Board intends to continue to explore the issue, through the EUB staff, in order to assure itself that current industry practices remain appropriate.

With regards to terrestrial and aquatic impacts, the Board agrees that the alternative processing options would involve greater lengths of pipeline, with greater linear surface disturbance. Therefore the Board believes that construction and associated ground disturbances from the proposed project will also be less than for the alternatives. The Board also believes that the proposed pipeline stream crossings can be carried out without unacceptable impacts. The Board also does not believe that the risk of flooding, given the elevation of the plant above the Brazeau River, is significant.

The Board acknowledges that the Friends of Rose Creek expressed frustration in the apparent lack of coordinated resource planning for the area. The Board's views on the importance of area development planning are included in Section 4.3 of this report. It also strongly supports the

involvement and valuable contribution of the public and groups such as the Friends of Rose Creek in that process.

6 PUBLIC SAFETY

6.1 Views of the Applicant

Burlington stated that the potential social issues related to sour gas plants generally included such things as noise, odour, visual impacts, property values, and public safety effects. However, it pointed out that its O'Chiese facility is 7.5 km from the nearest residence. Consequently the noise, odour, visual, and property value impacts, which were issues in the recent Northrock Pembina hearing (EUB *Decision 99-31*), were not present in this case.

With regard to public safety, Burlington noted the extensive automated monitoring and shutdown system planned for its field and plant facilities. It stated that the supervisory control and data acquisition system (SCADA) for the wells would be radio-linked to the gas plant programmable logic control computer (PLC). Field controls at individual sites would be designed to operate independently. The plant and field controls would be configured to render the facilities in a safe condition upon detection of H_2S, combustible gas, fire or out-of-range process conditions (e.g., high levels or pressures). Systems would be designed to fail in a safe mode in the event of control failure. Burlington believed that the automated approach would ensure facility safety under staffed and unattended conditions. It noted that the existing sweet gas operation had similar automated shutdowns and SCADA systems, which had operated satisfactorily to date. Burlington stated that it intended to incorporate emergency shutdown (ESD) valves for the sour gas gathering pipelines and committed to install ESD valves on both sides of the North Saskatchewan River crossing. Burlington also noted that there were no residents within the emergency planning zone for the project.

Burlington stated that the facility would normally be staffed with two plant and two field operators between 7:30 a.m. and 4:30 p.m. The facilities would normally operate unattended from 4:30 p.m. to 7:30 a.m., but an automated call-out system would contact operators if problems were detected. Burlington noted that on-call staff could also access the plant PLC-SCADA system remotely by computer modem. This would enable operators to monitor facility status, make control adjustments, and shut down facilities from a remote location. However, it pointed out that compressors and other equipment would have to be started by on-site personnel.

It said that its policy was not to allow remote start-up to ensure that operators inspected facilities before attempting to start equipment. Burlington said that two operators would respond from Drayton Valley to after-hour call-outs and could be on site within 45 to 60 minutes.

Burlington stated that it had addressed public concerns about risks involved in its original plan to inject the acid gas at 12-32-44-9W5M (the 12-32 well) by applying for a new injection well at the 6-25-45-10W5M plant site. The revised injection well location would reduce the risks associated with the long high-pressure acid gas pipeline needed to transport acid gas to the 12-32 well. Burlington said that it no longer viewed the 12-32 well as even a backup to the proposed 6-25 injection well, but if the 6-25 location were unsuccessful, it noted that it would be required to reapply for any new location.

Burlington explained that the acid gas injection system, comprising acid gas compression,

dehydration, injection well, and interconnecting piping, would incorporate several safety features. These features would include H_2S detection at the well and plant fence and shutdowns for high and low pressure, high and low flow, high moisture content, and high corrosion. The acid gas system would include ESD valves at the plant fence, injection wellhead, and 50 m below grade in the injection well. Burlington said that a fuel gas supply would be installed to the injection wellhead to ensure combustion should it be necessary to ignite an uncontrolled release from the well.

Burlington stated that there were no reasons to conclude that the project would present an unacceptable public safety risk.

6.2 Views of the Interveners

The Friends of Rose Creek stated that they were particularly concerned with the remoteness of the sour gas processing facility and the fact that Burlington intended to operate the plant in an unattended mode between 4:30 p.m. and 7:30 a.m. They noted that operators responding to an emergency would have to travel 67 km to the plant and that during heavy snowfall response times could be greater. They maintained that if a serious incident occurred, this extended response time could allow pollutants to affect populated areas. The Friends of Rose Creek raised the concern that approval of the proposed operating approach might result in a trend to semi-attended operation of other sour gas plants in the region.

The Friends of Rose Creek expressed their concern that the 12-32 well may be used for acid gas injection if the proposed 6-25 acid gas injection well proved unsuitable. They stated that the risks involved in an 8 km high-pressure acid gas pipeline to the 12-32 well, involving river crossings, would be an unnecessary and unacceptable hazard.

6.3 Views of the Board

The Board believes that careful attention to the design and operation of safety monitoring and shutdown systems is essential for sour gas production and processing systems. The Board is satisfied in this case that Burlington has adequately considered safety monitoring and shutdown systems for its proposed project and notes that elements of the system are already used in Burlington's existing sweet gas operation. The Board believes that such systems can allow for the safe semi-attended operation of oil and gas production facilities. The Board, however, does expect that operator response to upset and emergency conditions, especially at sour gas production and processing facilities, will be prompt.

Notwithstanding its confidence in the proposed automated technology, the Board also notes the substantial distance and potential time that could be involved in after-hours operator response to the proposed O'Chiese facility. The Board expects that Burlington will ensure that systems design and on-call procedures are in place so that its staff can promptly respond to upsets and emergencies when the proposed operation is in unattended mode. Should adverse impacts (e.g., excessive flaring) arise from delays in responding to facility upsets or emergencies, the Board may, among other measures, review the acceptability of unattended operations in this case.

Based on the proposed facility design and safety systems, the fact that there are no residences in the emergency planning zone, and the relatively remote location of the proposed plant, the Board is satisfied that Burlington's proposed project has adequately considered and provided for

protection of public safety. The Board also confirms that should the current location proposed for the acid gas injection prove to be unsuitable, the company would be required to reapply for any new well. Any such application would require appropriate levels of public consultation.

7 BURLINGTON'S COMMITMENTS AND EUB CONDITIONS

The Board notes that Burlington has made certain commitments, which are summarized below. It is the Board's view that when a company makes commitments of this nature, it has satisfied itself that the activity will benefit both the project and the public, and the Board takes these commitments into account when arriving at its decision. The Board expects the applicant, having made the commitments, to fully carry out the undertaking or advise the Board if, for whatever reason, it cannot fulfill the commitments. At that time, the Board will assess whether the circumstances of the failed commitments may be sufficient to trigger a review of the original approval. Affected parties also have the right to ask the Board to review an approval if certain commitments made by an applicant remain unfulfilled. The Board expects that the following commitments by Burlington, in particular, will be met during the implementation of its proposed project:

1) During outages of the acid gas injection system, Burlington will only flare volumes of acid gas necessary to safety depressure equipment. Sour gas processing facilities will be shut down during such outages to prevent continuous flaring of acid gas.

2) Gas from compressor distance piece vents, sour condensate and water truck-loading vapour return lines, sour water tank vents, sour condensate tank vents, and acid gas dehydrator vents will be burned in an incinerator.

3) ESD valves will be installed at both sides of the North Saskatchewan River crossing.

While the Board is satisfied that acid gas injection is a viable method to minimize sour gas processing emissions, the Board views development of a suitable injection well in close proximity to the O'Chiese gas plant as an essential component of the proposed project. Therefore, the Board expects Burlington to drill and complete the acid gas disposal well at 6-25 such that it meets all the requirements of *Guide 51* for a Class III disposal well and that these activities will precede the other components of Burlington's O'Chiese project.

8 OTHER ISSUES

The Board notes that it often hears about deteriorated relationships between the oil industry and individuals at public hearings. The Board wishes to comment on and take particular note of the collaborative approach of the participants at this hearing. While they maintained differing viewpoints on the proposed project, it was clear to the Board, and acknowledged by the participants, that constructive and respectful dialogue had occurred in all of the discussions between the parties. This kind of exchange is precisely what the Board envisions in its public consultation expectations and was very pleased to see the professionalism displayed by everyone present.

Dated at Calgary, Alberta, on June 23, 2000.

ALBERTA ENERGY AND UTILITIES BOARD

(Original signed by)

B. F. Bietz, Ph.D., P.Biol.
Board Member

(Original signed by)

G. J. Miller
Board Member

(Original signed by)

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

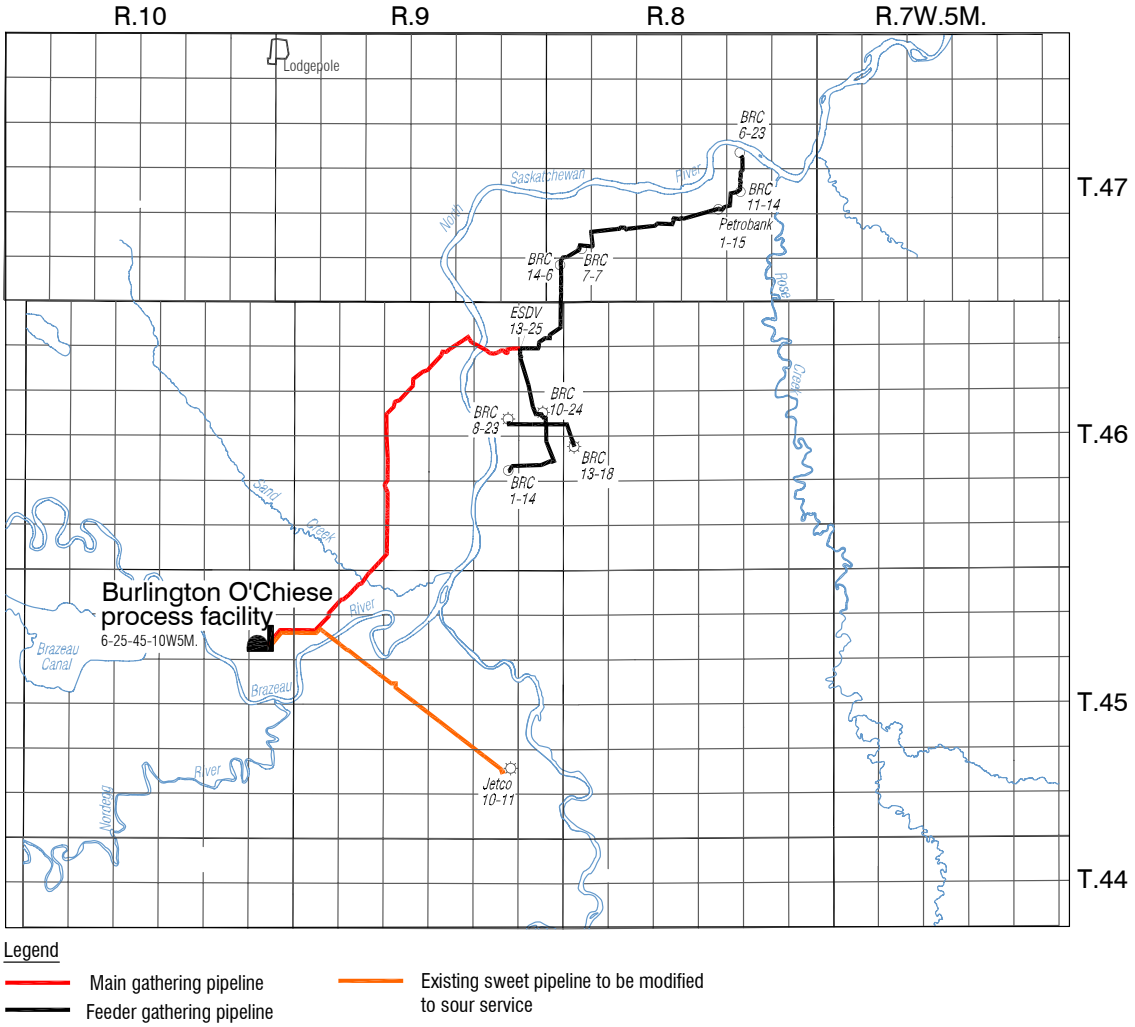

Figure 1. Proposed Sour Gas Gathering Pipeline System for O'Chiese Gas Plant
Applications no. 1044064, 1054047, 1060027,1062886, 1063172 & 1063841
Burlington Resources Canada Energy Ltd.

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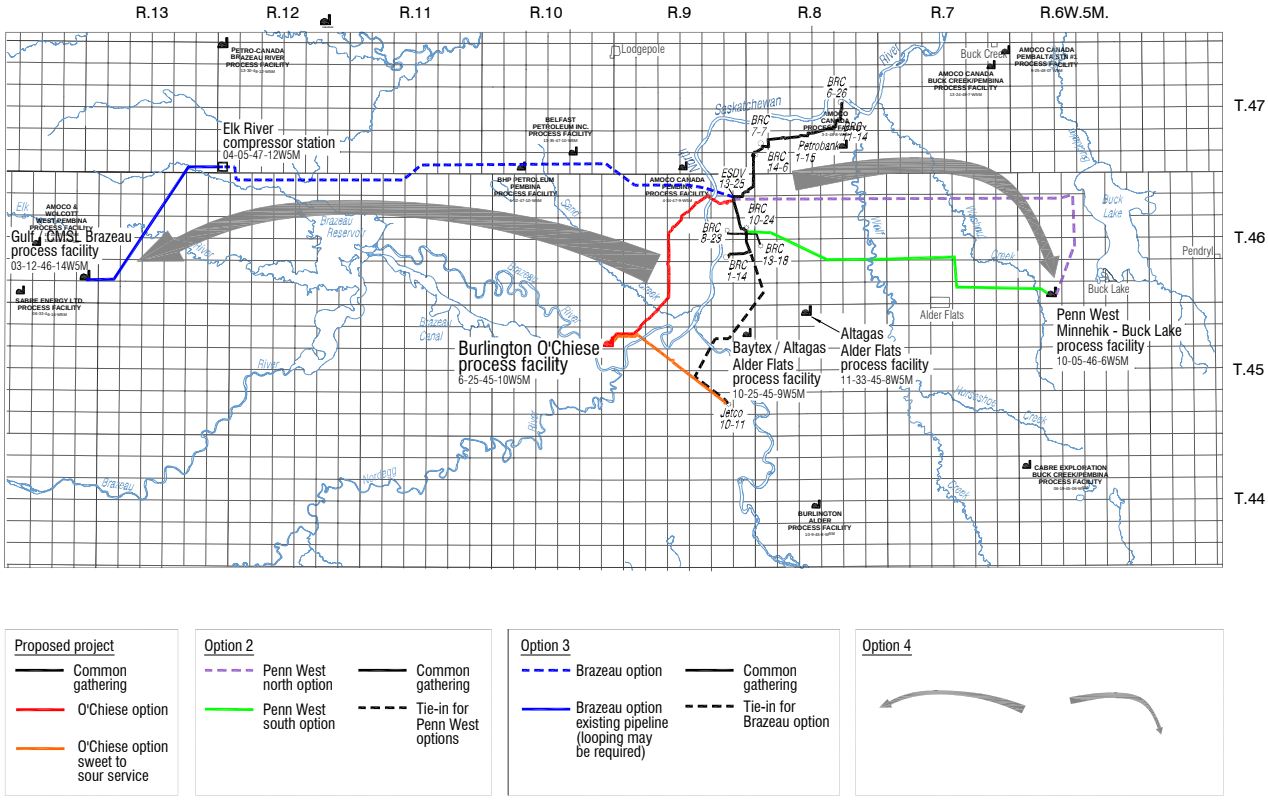

Figure 2. Pipeline Routing Options
Applications no. 1044064, 1054047, 1060027,1062886, 1063172 & 1063841
Burlington Resources Canada Energy Ltd.

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