

# ***Public Safety & Sour Gas***

*Provincial Advisory Committee on  
Public Safety and Sour Gas*

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**October 2000**

*Directions:  
A Work in Progress*



## **ACKNOWLEDGEMENT**

**The Advisory Committee on Public Safety and Sour Gas would like to acknowledge and sincerely thank all those who have provided assistance to the Advisory Committee. Their involvement has contributed significantly to the work of the Advisory Committee and it looks forward to their continuing involvement in the preparation of the final report, including reactions to the proposed Directions contained in this report. The Advisory Committee thanks all those who contributed in one or more of the following ways:**

- **Participating in the public outreach process by attending a session in your Community,**
- **Completing the Response Form,**
- **Providing written submissions or comments by telephone,**
- **Responding to the Random Sample Telephone Survey,**
- **Providing expert opinion on a variety of issues including toxicology, dispersion modelling, public consultation, risk communication, emergency response, resource development, and jurisdiction. This includes experts both within and outside of the Alberta Energy and Utilities Board,**
- **Serving as an alternate to a Advisory Committee member or on a working group when not a member of the Advisory Committee,**
- **Providing support to the overall process.**

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# ADVISORY COMMITTEE ON PUBLIC SAFETY AND SOUR GAS

## DIRECTIONS DOCUMENT

### 1 INTRODUCTION

The Alberta Energy and Utilities Board (EUB) formed the Advisory Committee on Public Safety and Sour Gas (the Advisory Committee) in January 2000 to review and make recommendations respecting the sour gas regulatory system as it relates to public safety. The Advisory Committee includes representation from a broad spectrum of stakeholder groups. Its work is to result in findings and recommendations being presented to the EUB. The EUB has expressed to the Advisory Committee its commitment to serious consideration of the Advisory Committees recommendations with implementation to follow. A similar process took place in 1993, resulting in a *Report and Recommendations to the ERCB on Public Safety and Sour Gas* dated February 1994. Copies of the 1994 report are available from the EUB's Information Services.

This Directions document provides background to the formation of the Advisory Committee, describes the Advisory Committee and its mandate, briefly outlines the process the Advisory Committee uses to conduct its work, summarizes the direction it is moving in with its recommendations, and describes how you can bring your views on the proposed directions forward to the Advisory Committee.

It is important to note that this report is a work in progress and the continued input from stakeholders is important to assist the Advisory Committee in finalizing its directions and recommendations.

#### 1.1 BACKGROUND

The sour gas industry has been well established in Alberta for more than 40 years. More than one-third of Alberta's natural gas is 'sour gas', which is gas containing hydrogen sulphide. Sour gas is very toxic to humans and animals at relatively low concentrations. Therefore, the exploration for and production of sour gas must be undertaken with specialized equipment and safety procedures to assure both worker and public safety.

The EUB is responsible for the regulation of the sour gas industry in Alberta. In doing so, it must ensure that development of the resource takes place in a responsible manner that balances the risks and benefits to all Albertans while assuring public safety. The EUB has established many regulatory requirements that industry must follow in exploring for and developing sour gas resources. These regulations are continuously reviewed to ensure that they remain appropriate and consider changes in technology and public acceptance.

As a result of increasing public safety issues and concerns regarding growth and operation of sour gas wells and facilities near both rural and urban development a review of the adequacy of current regulatory requirements was deemed desirable by the EUB. The EUB wanted this review to include the widest spectrum of input from those stakeholders ultimately affected by sour gas development. In particular, the EUB wanted the review to explore the expectations of the general public living in sour gas areas.

## 1.2 THE ADVISORY COMMITTEE

The Advisory Committee has 22 members who reflect a broad cross-section of stakeholders affected by sour gas development; it also includes experts from disciplines such as risk management and health. Funding, secretariat services, and support is provided by the EUB. The following are the members of the Advisory Committee. A short biosketch of each member is provided in Appendix A.<sup>1</sup>

<b>Members</b>	<b>Constituency Represented</b>
Gerry DeSorcy	Chairman
Marilyn Craig	Secretariat
Paul Jackson	Public-at-large
Brian Winter	Public-at-large
Judith Bugg	Public-at-large
Doreen Healy	Aboriginal Relations
Brent Friesen	Regional Health Authorities
Tim Lambert*	Regional Health Authorities
Bart Guyon	Alberta Association of Municipal Districts and Counties
Barry Virtue	Alberta Urban Municipalities Association
Marjorie Young	City of Calgary Administration
Harvey Rindfliesch*	City of Calgary
Randy Gossen	Oil and Gas Industry
Frank George	Oil and Gas Industry
John Squarek	Oil and Gas Industry
John Kerkhoven*	Oil and Gas Industry
Bob Clark	Land Development Industry
Robert Ollerenshaw	Land Development Industry
Kevin McLeod	Alberta Health and Wellness
David Spink	Alberta Environment
Maureen Bolen	Alberta Agriculture, Food and Rural Development
Cindy Miller Reade	Alberta Municipal Affairs, Local Government Services
Ron Wolsey	Alberta Municipal Affairs, Disaster Services
Ralph Holmes*	Alberta Municipal Affairs, Disaster Services
Dan Clarke	Alberta Human Resources and Employment
Steve Hrudehy	University Risk Research
David Wilson	University Risk Research

\*alternates to Advisory Committee members

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<sup>1</sup> The Appendices, which are substantial in length, are contained in a separate volume. Given the size of the Appendices, and since many readers will be primarily interested in the views and directions of the Advisory Committee, the Appendices are not being distributed with this report. The Appendices are available on the Committee's Web site at [www.publicsafetyandsourgas.org](http://www.publicsafetyandsourgas.org). You may also pick up or order copies at no charge from the EUB's Information Services (403) 297-8190 (this number may be reached toll-free in Alberta by dialing 310-000) or from any of the EUB's Field Centres throughout the province. You may call the Advisory Committee's toll free number at 1-888-882-1286 and request that a copy is mailed to you.

### **1.3 MANDATE**

The scope of the Advisory Committee's work is centred on a review and assessment of public health and safety-related requirements currently being applied to the approval, development, and operation of facilities respecting Alberta's sour natural gas resources.

The Advisory Committee's Terms of Reference are included as Appendix B. "Public Health and Safety" as used in the Terms of Reference includes immediate or long-term effects of short-term exposure to sour gas on human health. It does not include possible long-term or chronic effects of very low concentrations of sour gas on human health, as this issue is being dealt with through other initiatives.

Similarly, the mandate of the Advisory Committee does not include chronic animal health, sulphur recovery guidelines, flaring requirements, or compensation matters related to a sour gas release, as these issues are being dealt with through other initiatives.

Since these types of issues cannot be isolated from the work of the Advisory Committee, or from the community, they have been discussed and considered when directly relevant to the Advisory Committee's mandate. Observations and comments regarding these matters may be included in the Advisory Committee's final report and will be forwarded to the appropriate parties for consideration.

### **1.4 PURPOSE OF THE DIRECTIONS DOCUMENT**

Through public consultation and analysis, the Advisory Committee has evaluated existing sour gas policies, standards, and regulations. The purpose of this Directions Document is to:

- Summarize the overall process used by the Advisory Committee in its review (Section 2),
- Describe methods used to identify and group issues and to establish priorities (Section 3), and most important,
- Set out the direction the Advisory Committee is moving towards in terms of recommendations (Section 4).

Section 4, Directions, deals only with the key "driver" issues, that the Advisory Committee identified in Section 3 as having high priority. The Advisory Committee believes that if actions are taken to resolve these issues, many other underlying issues will also be resolved. Although no actual recommendations have yet been developed, this section describes the direction the Advisory Committee is taking in terms of recommendations for all of the key "driver" issues.

It is important to note that at this "directions" stage, the Advisory Committee's task and this report are very much a work in progress. Not all Advisory Committee members and their constituent groups are necessarily in agreement with all of the directions suggested.

## 1.5 REQUEST FOR REACTION

As detailed in Section 2, the Advisory Committee received input from many sources throughout the process, which assisted in identifying issues, prioritizing them, and developing possible solutions. The Advisory Committee is now requesting your feedback and reaction to its summarization of issues, identification of key issues, and direction in identifying solutions. Your input will be considered by the Advisory Committee as it develops its final recommendations to be presented to the EUB later this year. Personal information such as your name and address will be kept confidential and will not be used in any way in the report.

The Advisory Committee would like to know:

- Did we hear you correctly?
- Did we understand your concerns?
- What is your reaction to the suggested general direction of solutions, and why?

You are invited to provide your feedback in the following ways:

- complete the enclosed response form and bring it to the session scheduled in your area (see below) as part of the informal discussion with Advisory Committee members;
- complete the enclosed response form and return it to the Advisory Committee by October 31, 2000;
- complete the response form on the Advisory Committee's Web site [www.publicsafetyandsourgas.org](http://www.publicsafetyandsourgas.org) before October 31, 2000;
- submit your written reaction to the Advisory Committee prior to October 31, 2000, by e-mail to [sourgas-review@praxis.ca](mailto:sourgas-review@praxis.ca), or to the following address:  
Advisory Committee on Public Safety and Sour Gas  
640 – 5 Avenue SW  
Calgary AB T2P 3G4;
- participate in a telephone interview with Advisory Committee members prior to October 31, 2000; you can arrange a suitable time by calling the Advisory Committee at 1-888-882-1286;
- attend one of the open house sessions which will provide an opportunity to have an informal discussion with Advisory Committee members, as well as, a facilitated group discussion of the proposed directions.

The following sessions have been scheduled and will provide opportunity for informal discussion between 5:00pm and 7:00pm with the facilitated group discussion from 7:00pm to 9:00pm:

October 16	Edson/Hinton	Edson and District Recreation Centre
October 17	Leduc	Leduc Inn
October 18	Drayton Valley	West Wind Motor Inn
October 19	Rocky Mountain House	Tamarack Inn
October 23	Sundre	Senior's Recreation Centre
October 24	Grande Prairie	Grande Prairie Inn
October 25	Red Deer	Red Deer Lodge
October 26	Calgary	Coast Plaza Hotel
October 30	Pincher Creek	Heritage Inn



## **2 PROCESS**

The Advisory Committee used a variety of methods to enhance its understanding of the current regulatory system and to receive input into its effectiveness.

### **2.1 ADVISORY COMMITTEE MEETINGS**

The diverse backgrounds, experience, and professional responsibilities of the Advisory Committee members provided a broad view of the issues associated with public health and safety and sour gas. In order to obtain a clear, common understanding of the current system, EUB experts provided the Advisory Committee with detailed information regarding current requirements and practices on many topics within the mandate of the Advisory Committee. These presentations and related discussions took place at meetings of the full Advisory Committee or at meetings of three small working groups formed by the Advisory Committee. These three working groups — Prevention, Policy and Jurisdictions; Event Consequence Management; and Communication and Compensation — were established to facilitate the work of the Advisory Committee. During these group meetings, Advisory Committee members brought forward views of their constituents as well. Advisory Committee members visited a sour gas plant, well site, and drilling rig.

The Advisory Committee as a whole held a four-day workshop in September to determine possible directions of solutions to the key “driver issues” identified. Section 3 of this report discusses the process used by the Advisory Committee to arrive at the final list of key issues.

### **2.2 EXPERTS**

In addition to a number of experts present on the Advisory Committee, the Advisory Committee, either as a whole or within working groups, sought information on various issues throughout the process from various experts, including the following:

- Toxicologists from the United States and Canada provided their expert opinions on what is known about the effects of hydrogen sulphide (H<sub>2</sub>S) and sulphur dioxide (SO<sub>2</sub>) on humans and the adequacy of public safety standards currently applied in Alberta.
- Emission dispersion modelling and risk assessment experts assisted the Advisory Committee in understanding these complex fields and provided valuable input into the Advisory Committee’s review of the adequacy of current setback distances and emergency planning zones.
- Public consultation specialists provided information on how the industry currently conducts its public interactions in sour gas areas, which assisted the Advisory Committee in its assessment of the adequacy of current public consultation practices.
- Risk communication experts provided advice on how best to communicate sensitive, complex issues.

- Industry representatives provided the Advisory Committee with a report on emergency response procedures carried out during an actual drilling emergency, including a critique of the effectiveness of the response and lessons learned.
- An expert from the Alberta Department of Resource Development provided information regarding the province's current mineral bidding and leasing system.
- A panel of experts in municipal and environmental law provided information on jurisdictional issues related to sour gas development and regulation. This assisted the Advisory Committee in its understanding of the roles, responsibilities, and mandate of various agencies, including ministries, boards, health authorities and municipalities.

### **2.3 REGIONAL DISCUSSION SESSIONS**

To identify the public's concerns and issues and possible solutions related to public health and safety and sour gas, the Advisory Committee undertook a public outreach and consultation program. Although the mandate of the Advisory Committee is to look at the immediate and long-term effects of short-term exposure to sour gas on human health, it agreed that all other sour gas issues would be noted, and therefore discussion of other matters was not restricted during any of the sessions.

This consultation process included regional discussion sessions held in June 2000 in 12 provincial locations directly affected by sour gas development. The Advisory Committee also conducted a consultation process with Aboriginal (First Nations and Metis) communities, which is discussed in Section 2.4. Through these sessions, Advisory Committee members gained an understanding of the public's issues, concerns and suggestions related to public safety and sour gas.

The regional discussion sessions provided the opportunity for individuals or small groups to speak freely with members of the Advisory Committee face to face. Members of the public either pre-registered to speak with the Advisory Committee at a designated time on the date the Advisory Committee was in their community or were accommodated as they arrived.

A total of 231 individuals attended the sessions and provided the Advisory Committee with valuable information regarding their views and experiences with public safety and sour gas and possible solutions to their concerns. Appendix C is a summary of all of the input received, the majority of which came via the regional discussion sessions and meetings in Aboriginal communities.

Several participants at these sessions indicated that they were acting as representatives of larger groups and/or organizations. However no official information regarding actual numbers represented was obtained. As such, the information gathered by the Advisory Committee during the discussion sessions is, in many cases, representative of a greater sample of the public than the number of participants would suggest.

The detailed summary of all that the Advisory Committee heard or received is organized into three topic categories: Prevention, Policy and Jurisdiction; Event Consequence Management; and

Communication and Compensation. These topic areas correspond with the Advisory Committee's three working groups referred to earlier. Those comments not related to the mandate of the Advisory Committee are also summarized in the appendix under different headings.

## **2.4 ABORIGINAL (FIRST NATIONS AND METIS) COMMUNITY CONSULTATION**

To provide the Aboriginal organizations and communities with the opportunity to present the Advisory Committee with their issues, concerns, and solutions related to sour gas and public health and safety, a series of ten discussion sessions were conducted from May to August. These small group meetings involved representatives from each of the participating First Nation and Metis organizations and communities, members of the Advisory Committee, and senior representatives from the EUB. Each of the discussion sessions was conducted within the local communities or organization offices. Written submissions were also received from a few Aboriginal communities or organizations.

The sessions and written input generated a series of common key issues related to sour gas. A summary of the material is provided in Appendix C, organized into the three topic categories indicated above.

## **2.5 RANDOM SAMPLE TELEPHONE SURVEY**

A random sample telephone survey was conducted to gather information from a broad representative group of Albertans about their awareness, perceptions, and concerns regarding sour gas activities in the province. The survey results are representative of two major geographic segments: rural communities and surrounding areas in proximity to sour gas activity, and portions of the urban centres of Edmonton, Calgary, and Red Deer in close proximity to sour gas activity.

A total of 1369 telephone surveys were completed, including 465 within the urban centres and 904 within the rural areas. Both the rural and the urban samples were drawn randomly from telephone lists matched to postal codes within the target areas using a stratified approach to ensure that all communities within the identified regions had representation.

A summary of the results of the telephone survey is included in Appendix D. A more detailed report on the survey is on the Advisory Committee's Web site, [www.publicsafetyandsourgas.org](http://www.publicsafetyandsourgas.org).

## **2.6 INPUT RECEIVED BY OTHER MEANS**

### **Response Forms**

The Advisory Committee provided the opportunity for the public to submit input by completing a response form either on the Advisory Committee's Web site or by mail. Forms were available at the discussion sessions or by requesting one directly by calling the Advisory Committee.

The response form asked the respondents to express their views by answering specific questions about public safety and sour gas, with the opportunity to provide any other general input they wished to include. Ten completed response forms were received; a summary of the responses is reflected in Appendix C.

### **Written Submissions**

Members of the public were invited to make written submissions stating their views to the Advisory Committee throughout the process. Some of the written submissions were submitted electronically. Ten submissions were received and a summary of the input received is also reflected in Appendix C.

## **2.7 PROCESS USED IN REVIEWING ISSUES**

The Advisory Committee meeting, as a full committee or in working groups, reviewed all of the input it received, grouped the concerns, prioritized them, and considered possible solutions to important issues. It took into account the comments of experts, its own views, its review of publications and other written material, requirements in other jurisdictions, and other relevant information sources. Further details of this process and the results are included in the next sections of the report.

## **3 ISSUES**

### **3.1 IDENTIFICATION AND GROUPING OF ISSUES**

Those who participated in the public outreach sessions raised many concerns and issues. Others were raised in completed response forms, written submissions, or replies to questions asked during the telephone survey. Also, members of the Advisory Committee, on their own behalf or on behalf of constituent groups, put forward concerns.

In total, these issues numbered in the hundreds and related to almost all aspects of oil and gas operations. Many of the concerns, although expressed in different words, were similar to concerns raised by others. Some of them related to fundamental policy matters, such as whether or not sour gas resources should be developed and who should have jurisdiction if they are developed. Many related to the role of the EUB in regulating sour gas development. Others related to industry procedures and practices respecting sour gas. Some dealt with detailed technical matters, while others were more general in nature. Many expressed the importance of communication among all parties involved with sour gas.

In order to accomplish its task, the Advisory Committee believed it should first group the issues by subject matter. It noted that many of the issues were about policies and actions intended to prevent the release of sour gas. Actions to prevent sour gas releases are the first line of protection for public health and safety. However, releases do sometimes occur, and a second broad category of concerns was related to the management of the consequences of sour gas releases, should they occur. A third broad group of concerns related to communications, some of which were specific to prevention or to consequence management and some of which dealt with other aspects of sour gas.

Appendix C presents a summary of all of the concerns raised through the committee process, categorized into the following groups:

- **Prevention, Policy, and Jurisdiction:** including policies, procedures, and processes of the industry, the EUB, and other jurisdictions to prevent releases of sour gas and potential impacts on public health and safety.
- **Event Consequence Management:** including procedures and processes used to manage public health and safety consequences that result where releases do occur.
- **Communications and Compensation:** including processes of communication used among all involved parties regarding sour gas and public health and safety and compensation issues.

The Advisory Committee notes that a number of concerns were raised that did not relate to sour gas and public health and safety or were beyond the mandate of the Advisory Committee.

Appendix C also summarizes these issues in the following two categories:

- Related to sour gas and public health and safety but within areas specifically excluded from the Advisory Committee mandate because they are being addressed by other initiatives.
- Not related to sour gas and public health safety.

### **3.2 ESTABLISHING PRIORITY ISSUES**

As noted earlier, participants in the process raised many hundreds of concerns and issues. Even when combined and grouped, they numbered more than one hundred.

The Advisory Committee is of the view that each of the concerns raised should be noted and considered by the EUB and other relevant agencies or organizations. However, the Advisory Committee believes that it can optimize its contribution by identifying those issues of highest priority and making specific recommendations for changes. Because many of the concerns and issues are related, the Advisory Committee also believes that if actions are taken to address the highest priority issues, many of the underlying related issues will also be addressed.

The Advisory Committee has therefore reviewed each of the groupings of issues to determine those of highest priority. The basis of the review was that the concerns must be within the mandate of the Advisory Committee and have been raised by a number of participants. Also, the Advisory Committee had to be satisfied that the element or aspect of the regulatory system to which the concern related is in need of change and that beneficial changes that are practicable and feasible to implement could be identified.

The following are the highest priority areas of concern, listed in no particular order, related to public health and safety and sour gas that the Advisory Committee believes should be addressed with specific recommendations and are addressed in Section 4.2 with Direction Statements:

- 1 Planning
  - Sub-issues
    - Coordination of Surface and Subsurface Planning and Development
    - Subsurface Resource Planning and Development
  
- 2 EUB Role
  - Sub-issues
    - Regulations
    - Enforcement
    - Applications and Decisions
    - Interaction with Stakeholders
    - Involvement with Aboriginal (First Nations and Metis) People
  
- 3 Monitoring
  
- 4 Jurisdiction
  
- 5 Industry Procedures and Personnel
  
- 6 Emergency Response Planning and Preparedness
  
- 7 Understanding of Health Effects
  
- 8 Technical Knowledge
  - Sub-issues
    - Dispersion Modelling
    - Risk Assessment
  
- 9 Setbacks
  - Sub-issues
    - Criteria for Setbacks
    - Effects of Setbacks
  
- 10 Public Consultation by Industry
  
- 11 Public Awareness and Understanding
  
- 12 Aboriginal (First Nations and Metis) Issues
  
- 13 Implementation
  
- 14 Non-mandate but Important Issues

## 4 DIRECTIONS

This section indicates the direction the Advisory Committee is moving in with respect to its recommendations for each of the priority issues and sub-issues identified in Section 3. Without actually preparing detailed recommendations until it has heard further from stakeholders, the Advisory Committee has attempted to give sufficient detail so that the reader can appreciate what the general content of the recommendations might be.

### 4.1 OVERVIEW OF EXISTING SOUR GAS REGULATIONS

As part of its review, the Advisory Committee examined and had numerous presentations of current sour gas regulations being used or applicable in Alberta. It found that while the regulations are extensive and comprehensive, they seem to be very piecemeal, residing in many different statutes and other legislative instruments. This makes it easy for newcomers to the industry or from outsiders looking in to get the perception that Alberta's sour gas regulations are lacking. The Advisory Committee believes that this may be partly a result of the fragmented nature of the requirements. For example, EUB-administered sour gas regulations and requirements can be found in the following documents:

- *Oil and Gas Conservation Act and Regulations*
- *Pipeline Act and Regulations*
- Informational Letter (IL) 85-3: *Operational Use of Flare Guns—Forested Public Lands*
- (IL) 87-8: *Emergency Response Plans for Sour Gas Facilities*
- Interim Directive (ID) 88-2: *Proposed Wells, Production Facilities, and Pipelines Notification of Rural and Urban Administrations*
- IL 88-17: *Ignition Equipment for Drilling Critical Sour Wells*
- IL 89-4: *Public Involvement in the Development of Energy Resources*
- IL 89-15: *Evacuation and Ignition for Sour Wells*
- IL 89-20: *Compensation in Case of Well Blowout*
- ID 90-1: *Completion and Servicing of Sour Wells*
- IL 90-13: *Critical Sour Well Completion and Servicing Operations*
- IL 90-17: *Emergency Procedure Plans for Sour Gas Facilities – Biennial Meetings*
- ID 91-2: *Corporate-Level Emergency Response Plans*
- IL 91-2: *Sour Gas Flaring Requirements and Changes to Regulations*
- ID 94-3 : *Underbalanced Drilling*
- IL 95-1: *Government of Alberta Support Plan for the Upstream Petroleum Industry*
- IL 96-10: *A Memorandum of Understanding Between Alberta Environmental Protection and the Alberta Energy and Utilities Board Regarding Coordination of Release Notification Requirements and Subsequent Regulatory Response. Appendix A: Alberta Environmental Protection Release Reporting*
- IL 96-11: *Government of Alberta Emergency Response Support Plan for an Upstream Petroleum Industry Incident*
- ID 97-6: *Sour Well Licensing and Drilling Requirements*
- General Bulletin 99-7: *Hydrogen Sulphide (H<sub>2</sub>S) Release Rate Assessment and Audit Forms Guidelines.*

These documents are available from the EUB's Information Services in Calgary (403) 297-8190 or on the EUB's Web site at [www.eub.gov.ab.ca](http://www.eub.gov.ab.ca) .

## 4.2 DIRECTION STATEMENTS

The following Direction Statements for priority issues are not in any particular order of priority. The introduction to each issue includes a brief overview of the comments and concerns heard throughout the process. A complete summary of the input received during the public outreach process is in Appendix C.

### 4.2.1 DEVELOPMENT PLANNING

#### **Introduction**

Many of the participants in the outreach process expressed concerns regarding the degree to which sour gas facilities exist and are being built in relatively populated areas. Few suggested that sour gas production should not be allowed, but several expressed the view that sour gas production should be halted until technological improvements make it safer. Some suggested that there should be areas, for example near cities or recreational centres, where sour gas development is not allowed or is limited. Others raised general concern that there appears to be little coordinated planning between the development of the surface and the exploration and production of subsurface resources. Some suggested that changes to the sour gas leasing system as it relates to planning should be considered for lands that may produce of sour gas.

Many outreach participants also raised public health and safety concerns respecting the number or density (proliferation) of sour gas facilities in any one area and questioned whether these were necessary to recover the resources. There was a general view that only the minimum amount of facilities necessary to recover the resource should be allowed, regardless of ownership by different companies.

This area has been further divided into the following sub-issues

- Coordination of surface and subsurface planning and development.
- Subsurface resource planning and development.

**Major Driver Issue: The adequacy of coordinated planning at all levels (industry, government, local authorities, Aboriginal people) regarding surface and subsurface development as it relates to sour gas and public health and safety.**

#### **Statements of Direction**

##### **Coordination of Surface and Subsurface Planning and Development**

Increasing concerns regarding sour gas development near and adjacent to communities, including Aboriginal settlements, were expressed by many during the public outreach process. The Advisory Committee believes that the coordination and integration of sour gas resource development planning and municipal planning would help to mitigate potential conflicts between



land-use and sour gas development, thereby reducing negative impacts on public health and safety. It is also of the view that changes to the existing mineral leasing system should be considered in an effort to minimize the number of sour gas wells and other related facilities.

The Advisory Committee is therefore moving in the direction of recommendations towards greater coordination of resource and municipal development. This would involve integrative planning among industry, government, and other involved stakeholders, which could include matters such as

- coordination and integration of municipal development plans, area structure plans, land-use bylaws, and other municipally approved plans as they relate to sour gas development;
- delineation and recovery of sour gas reserves in a timely manner;
- increased community awareness of potential sour gas development;
- recognition of impacts of resource development on Aboriginal lands with respect to traditional lands and sacred sites;
- changes to the mineral (oil and gas) leasing system to minimize sour gas wells and other related facilities; and
- modification of the existing Crown Mineral Disposition Review Advisory Committee to address the possible impacts of sour gas development on public health and safety.

### **Subsurface Resource Planning and Development**

The Advisory Committee believes that efforts should be made to improve the coordination of subsurface planning of sour gas resources with the aim of minimizing proliferation of the number of sour gas facilities. The direction of the recommendations will be towards those measures or initiatives that would assist in minimizing the number of new facilities. These would include

- support for the recommendation in the report recently submitted to the EUB by the Sulphur Recovery Guidelines Review Group and its conclusions regarding more rigid enforcement by the EUB of its gas plant proliferation policy (this report is available on the EUB's Web site at [www.eub.gov.ab.ca](http://www.eub.gov.ab.ca), Sulphur Recovery Guidelines Review <bbs/products/report/srgag-2000-04.pdf>);
- possible extension of the gas plant proliferation policy to sour gas wells and pipelines; and
- greater use of mitigative measures, such as directional drilling, pipeline corridors, staged or phased development, and buffering techniques.

## 4.2.2 EUB ROLE

### Introduction

The results of the telephone survey on the role of the EUB indicate that those who had contact with the EUB respecting sour gas and public health and safety in the past year were generally satisfied with the contact. However, there was considerable critical comment from outreach participants about the EUB and how it carries out its role and, in some cases, suggestions that this role was not well understood.

A few of the participants in the outreach process from industry made comments somewhat critical of the EUB that were, in part, consistent with those made by participants from the public. They suggested that more enforcement by the EUB would help to level the playing field.

Outreach participants made numerous other comments regarding the EUB role including the following:

- Lack of sufficient regulations.
- Concerns with the EUB's enforcement and the complaint response processes.
- Not enough inspections and too much reliance on self-regulation.
- Communications between the EUB and the public need to be improved.
- Need for more qualified EUB field staff.
- Lack of interaction between the EUB and the public, including Aboriginal people (the Aboriginal communities were often not aware of the EUB role or jurisdiction).
- The EUB is often vague and unresponsive.
- The EUB's hearing process is too time consuming and expensive for the public.
- Better coordination is needed among the EUB, industry, government and the public to improve the effectiveness of the regulatory process.

Having regard for all of these matters and with the knowledge that the role of the EUB has changed significantly in the past five or so years, the Advisory Committee concludes that the EUB is doing a reasonable job, but there is room for improvement and a review of its role is timely regarding the following:

- content of the regulations,
- effectiveness of the field surveillance system and other enforcement measures,
- application and decision process,
- interaction with stakeholders, and

- involvement with Aboriginal people.

**Major Driver Issue: The adequacy of the EUB approval and regulatory systems for sour gas as they relate to public health and safety.**

## **Statements of Direction**

### **Regulations**

Some of the participants in the outreach program commented on the content of the regulations related to sour gas and public health and safety. Most comments were general in nature regarding the need for more regulations. There were some specific comments on emergency response and setbacks. (See Sections 4.2.6 and 4.2.9).

Some areas the Advisory Committee believes should be addressed are

- integrity of old sour pipelines
- third party damage to pipelines
- old standing sour wells, and
- conversion of facilities from sweet to sour operations

The Advisory Committee is considering recommendations to better ensure that the regulations are sufficient to protect public health and safety in these areas. This would include increased pressure testing when converting pipelines to sour service and more stringent drilling requirements when the target is sweet gas or oil but sour gas may be encountered.

### **Enforcement**

The EUB, like most regulatory authorities, relies heavily on industry to manage its activities to comply with the various regulations and directives. Many refer to this as self-regulation. However, many outreach participants expressed the opinion that industry self-regulation is not sufficiently validated through a process of EUB compliance audits. Moreover, concern was expressed that the EUB is slow to respond to complaints, while at the same time placing too great a reliance on complaints as the basis for enforcement.

In light of the concerns regarding enforcement, the Advisory Committee requested and heard from the EUB about its enforcement and compliance process. The EUB defined self-regulation as a means for industry to be proactive in ensuring that its operations meet requirements, realizing that it is being held responsible and accountable for the condition of those operations.

The Advisory Committee determined that the EUB has an extensive enforcement system and publishes an annual report outlining the results of its enforcement programs.

The direction of the recommendations by the Advisory Committee will be towards a greater involvement of EUB field staff in sour gas matters. This would include

- increased inspections and audits of sour gas facilities;
- increased inspections of critical sour wells being drilled;

- higher priority for sour gas complaints and more timely reports back to the complainants;
- greater involvement in resolving concerns and disputes respecting sour gas;
- more priority on enforcement and more severe penalties in areas where sour gas poses a higher threat to public health and safety; and
- making information respecting the results of inspections and audits of sour gas facilities more readily available.

The Advisory Committee expects that implementation of its recommendations could require an increase in the number of experienced EUB field staff and, perhaps, changes to where they are located throughout the province.

### **Applications and Decisions**

Many comments and concerns were raised respecting the application and decision processes of the EUB, including

- contents of applications for sour gas facilities, and the manner in which applications are processed;
- the hearing process, including how decisions are made and the report issued respecting those decisions;
- whether the EUB has sufficient expertise to make sour gas related decisions, particularly in matters such as health;
- criticisms regarding the appearance of bias by the EUB; and
- criticisms that the EUB favours industry and resource development and ignores views of the public.

The Advisory Committee is considering recommendations that will provide the following directions:

- An increased focus on the contents and review of sour gas facility applications, including more information on project area plans and having EUB staff conduct a more detailed and earlier review of critical sour well and facility applications.
- Developing a less formal and more user-friendly hearing process.
- Clarifying of jurisdiction roles and improving application-related communication among the EUB, municipalities, and regional health authorities, including early involvement in policy-making and decisions.
- Increasing involvement by EUB staff in mediating sour gas application disputes.
- Increasing recognition and attention to public views and providing a better explanation of the manner in which the public interest is determined in decision reports.
- Ensuring EUB access to sufficient expertise to fully assess public health, safety, and public interest matters.

The Advisory Committee believes that recommendations of the nature outlined previously respecting EUB enforcement and applications and decisions will address the matter of appearance of bias to a significant degree. Other specific recommendations are being considered that would result in the EUB placing greater emphasis on its role as a regulator on behalf of the public, particularly as it relates to public health and safety.

## **Interaction with Stakeholders**

The role of the EUB is unclear to some of the public. The credibility of the EUB is questioned when some members of the public view the EUB as an industry advocate. To increase the understanding of the role of the EUB and for better client service, improvements are needed.

As a result, the direction of the intended recommendation of the Advisory Committee will be for the EUB to:

- Strengthen relationships with stakeholders in the public consultation area, perhaps through forming a public consultation team, recognizing that improving the EUB's role as an unbiased source will take time.
- Improve communication material, both print and electronic. For example, the EUB should develop a brochure that is made available to the public and that focuses on its sour gas role. The brochure needs to be clear, succinct, and kept up to date. It would also be distributed to municipalities, government agencies, and involved community groups. It could include a checklist of what the public needs to consider asking the oil industry during public consultation respecting sour gas.

## **Involvement with Aboriginal People**

There is uncertainty respecting the jurisdiction of the EUB with respect to the lands of First Nations. It was clear from the meetings with Aboriginal representatives that the EUB and its role is not well known in Aboriginal settlements. These concerns are addressed in the direction statement in Section 4.2.12, Aboriginal (First Nations and Metis) Issues.

### **4.2.3 MONITORING**

#### **Introduction**

Some outreach participants expressed concerns about the adequacy of monitoring of concentrations of sour gas and other associated pollutants and the reporting of the monitoring results. In particular, questions were raised about monitoring during emergency episodes, as well as monitoring of complaints and compliance, and of human exposure. There was a common theme that there is insufficient air quality monitoring being done and that results are not readily available to the public. Some said that current monitoring systems are not sensitive enough to measure low levels of H<sub>2</sub>S and SO<sub>2</sub>, and others said that not enough of the pollutants that may pose a threat to health are being measured.

**Major Driver Issue: The adequacy and coordination of public health and safety related monitoring programs for sour gas and associated pollutants, and the reporting of monitoring results.**

#### **Statement of Direction**

Many activities associated with the development of sour gas resources have the potential to release substances, such as H<sub>2</sub>S and SO<sub>2</sub>, into the environment. These releases may be operational (e.g., blowdown of pipelines), emergency or episode related (e.g., blowouts) or ongoing (e.g., routine flaring). The Advisory Committee recognizes that monitoring strategies and programs are necessary to determine if these releases are adversely impacting animal and human health or the environment. It also recognizes that monitoring programs and capability need to be continuously evaluated and improved to reflect new issues, concerns and advances in monitoring technology.

The Advisory Committee assessed the current monitoring activities associated with sour gas development and identified five general types of monitoring. These are

- Emergency/episode response monitoring.
- Human/animal exposure monitoring.
- Complaint response monitoring.
- Routine/ongoing monitoring.
- Special study/research-type monitoring.

Emergency/episode response monitoring and human/animal exposure monitoring are considered directly relevant to the public health and safety mandate of the Advisory Committee, which focuses on possible short-term (acute) rather than long-term exposures of people to sour gas related releases. The other types of monitoring are generally directed at longer-term, lower-level (chronic) exposures and impacts.

The Advisory Committee believes that its environmental and exposure monitoring recommendations should focus on

- ensuring the availability of adequate monitoring capability in terms of numbers of monitors, detection capability, and the ability to measure different compounds, in order to be able to respond quickly and efficiently to emergency/episode release events;
- ensuring that the monitoring roles and responsibilities of all parties are clearly understood and well coordinated during an emergency/episode release event;
- using personal exposure monitoring in certain circumstances to measure the actual concentrations of sour gas constituents to which people are being exposed;
- using monitoring programs and systems to track and assess health effects associated with acute exposures, such as knockdowns; and
- undertaking monitoring programs, as necessary, to improve understanding of the immediate or long-term health and environmental effects of short-term exposures to sour gas and to assess the appropriateness of related current health and environmental guidelines and standards.

The Advisory Committee is also anticipating some recommendations on complaint-related monitoring and long-term monitoring programs and capability. These recommendations will likely focus on

- ensuring a good complaint response monitoring capability and
- ensuring that there is a surveillance and network- monitoring program to provide good information on general air quality in areas with significant sour gas development.

This monitoring should include Aboriginal lands, as appropriate.

#### **4.2.4 JURISDICTION**

##### **Introduction**

Many participants in the outreach process expressed concerns about coordination among various agencies involved with sour gas development. It was also observed that mechanisms for managing the overlapping/complementary jurisdictions of various agencies in public safety and sour gas were not clear, often contributing to confusion as to which agency they should call. A few people indicated that when they contacted staff from one agency, they were advised that their particular concern was not an area dealt with by that agency, which contributed to the public's impression that agencies were passing the buck. This results in loss of credibility and lack of confidence in the regulatory system. Some suggested that health officials need to play a greater role in sour gas decisions.

Activities related to sour gas, from initial licensing to abandonment and reclamation, require the input or involvement of various agencies. While in most cases the final decision-making authority for sour gas facilities rests with the EUB, other agencies may have an interest or some regulatory responsibilities. This creates a potential for jurisdictional overlaps and a need to ensure that all interested agencies are appropriately involved.

**Major Driver Issue: The need to integrate and coordinate government services and regulations regarding the approach to sour gas development, including the need to recognize the roles and interests that other government agencies may have respecting sour gas, while still ensuring an effective and efficient regulatory regime. (Examples of other agencies include regional health authorities, First Nations, Alberta Environment, Alberta Health and Wellness, Municipal Affairs, Municipalities, Indian Oil and Gas Canada, Workplace Health and Safety, Disaster Services.)**

##### **Statement of Direction**

The Advisory Committee examined the legislation related to sour gas to get an appreciation of the involvement of agencies over a variety of stages in the lifecycle of a sour gas facility and identified some possible areas for improvement. As a result of its review, the Advisory Committee believes that its recommendations related to jurisdiction should focus on

- ensuring that the responsibilities and relationships of federal and provincial government agencies, regional health authorities, and municipalities are clear and overlaps are minimized;
- where overlaps do appear to exist, ensuring that the jurisdictional relationships are better understood and integrated, and that formal working agreements are developed where appropriate;
- clarifying the role and responsibility of the federal government for First Nations health and safety related to sour gas;
- involving relevant agencies, such as regional health authorities, in establishing standards and policies that can be used to consistently evaluate individual applications;
- developing and defining appropriate one-window concepts; and
- clarifying to the public and industry the roles and responsibilities of the government agencies involved in sour gas and public health and safety.

#### **4.2.5 INDUSTRY PROCEDURES AND PERSONNEL**

##### **Introduction**

Many outreach participants raised concerns respecting the sour gas and public health and safety related procedures and equipment used by industry and the personnel responsible for those procedures and equipment. There was little specific comment on the equipment and procedures, but some emphasized that industry should use the best available technology, procedures, and equipment, regardless of cost.

The major areas of concern related to the training and reliability of workers and to the attitudes and philosophies of management regarding public health and safety.

There were some comments on sour gas pipelines and changing from sweet to sour operations. These are dealt with in Section 4.2.2. Others related to industry's role in emergency response are covered in Section 4.2.6.

**Major Driver Issue: The adequacy of industry sour gas procedures and personnel to maintain public health and safety.**

##### **Statement of Direction**

The Advisory Committee reviewed the current regulatory requirements regarding sour gas procedures and training and believe that they are generally adequate, with the following exceptions.



The Committee is considering recommendations in the direction of

- ensuring that sour gas drilling operations and other industry practices maintain pace with technology and operational developments;
- greater assurance that all relevant industry management take sour gas issues and concerns more seriously and impart that position and attitude to all personnel involved. This should be reflected in the choice of equipment and procedures, the overall approach to public health and safety, and the manner of dealing with the public; and
- improving the training and knowledge of sour gas workers (company personnel, contractors, and those working in sour gas fields) to clearly recognize the dangers to themselves and the public from sour gas and to be familiar with proper procedures to minimize sour gas hazards.

#### **4.2.6 EMERGENCY RESPONSE PLANNING AND PREPAREDNESS**

##### **Introduction**

Emergency response plans (ERPs) and emergency planning zones (EPZs) are required by the EUB and seen by the Advisory Committee as means of protecting the health and safety of those living near sour gas development who may be directly affected by an accidental release. A standardized approach for establishing EPZs is used. The Advisory Committee reviewed the EUB's existing requirements for emergency response planning and preparedness and believe they are comprehensive and well documented.

However, a number of participants in the outreach program raised concerns including

- the standardized approach for determining EPZs, maintaining that it results in an arbitrary radius and does not adequately consider such site-specific factors as weather, wind, topography, proximity to population, and other community issues;
- the scope, effectiveness, and quality of ERPs and the adequacy of the size of the planning areas;
- the lack of appropriate coordination with other relevant plans (eg. municipal and industry ERPs), involvement of stakeholders and agencies;
- resident information packages;
- availability of resources, capability to implement the plans, testing and exercises of the plans, and appropriate training for all responders; and
- inadequate EUB review and enforcement regarding ERPs and the company's ability to put them into effect.

Based on the Advisory Committee's random sample telephone survey, most people affected by an EPZ believe that the plan provides a sense of safety. However, many did not believe that they are kept current with changes to the plan and most of them have not had the plan or response actions explained to them by the facility operator.

While a few did indicate that their experience working with industry on ERPs had been positive, a number of individuals expressed concerns about such items as

- the absence of phones and related technology in some areas,
- language barriers,
- inability for evacuation because of dead-end roads, and
- poor to no response when calling a company emergency telephone number.

**Major Driver Issue: The adequacy and coordination of emergency response planning and preparedness to ensure a high level of public health and safety.**

### **Statement of Direction**

ERPs are recognized as an integral part of public safety as it relates to sour gas development. The Advisory Committee believes that ERPs need to contain information and criteria that ensure they are effective in providing a maximum level of public safety should an incident occur. Issues such as ignition criteria, evacuation, and sheltering need clearly defined triggers that remove any discretion that might lead to delays in initiating any of these actions. Also, the EUB must ensure that ERPs are complete and operational and that the company has the resources and trained individuals to implement the plan.

The Advisory Committee believes that another key area for improvement in the development of ERPs is in coordination of all potential responders to an emergency, including industry, municipalities, regional health authorities, provincial and federal government agencies, First Nations, Metis, and the EUB. This is necessary to identify and maximize resources, define roles in the event of an emergency, and minimize public safety risk. In areas with intensive sour gas development and where there are several operators there should be coordinated ERPs that allow for clarity of roles and communication to the public, as well as consideration for emergency response “co-ops.” The Advisory Committee is moving in a direction to better ensure that all of these parties have the resources to carry out their roles and that they cooperate with each other in doing so.

The Advisory Committee is considering recommendations to have the EUB better define a series of EPZs to strengthen the effectiveness of emergency response and further improve the protection of public safety. Actions in the EPZ immediately surrounding the well must be immediate and effective, but other zones, such as the awareness zone further out from the well, must not be ignored, and appropriate preplanning and coordination among all potential responders must take place. Additionally, the Advisory Committee would see strengthening of the EUB’s current regulations and role to provide clear, prescriptive requirements that cover matters such as

- plan approval, auditing, and enforcement programs;
- handling of situations where the operator changes because of ownership change or other reasons;
- plan validation via responder training and plan exercises with tests of all aspects of the plan, including communications, and involving all relevant responders, such as municipalities;
- ensuring that applicants are capable of carrying out plans;
- better definition of plan requirements within the EPZ, the awareness zone, and beyond;

- potential emergency response approaches outside both the EPZ and awareness zone in conjunction with other relevant responders, including municipalities;
- annual review and update requirements, including individual resident details and other users of land (such as forestry, trappers, surface mineral claims, licence of occupations);
- evacuation, ignition, and sheltering requirements;
- criteria for introducing a planning zone that is reduced from that determined by dispersion modelling;
- clearer definition of the additional requirements and special planning necessary where an applicant proposes a “reduced” EPZ;
- integrated plans for circumstances when one hazard (H<sub>2</sub>S) is converted to another (SO<sub>2</sub>) as a result of ignition to ensure that an ERP exists for the new hazard;
- the need for a better understanding and clarification of SO<sub>2</sub> evacuation criteria in ERPs;
- more specific detailed requirements for resident information packages and the timing of their availability;
- expectations for the operator to consult with potential responder authorities and agencies to agree and document roles and responsibilities;
- the need for the operator to identify resource needs and where these resources are currently situated and provide reassurance that they can be available when and if needed;
- encouragement for operators to establish mutual aid agreements or emergency response “co-ops” in areas with intensive industry activity and multiple operators (similar to Western Canada Spill Services for oil spill response);
- encouragement for operators to coordinate mutual aid with other industries (such as forestry sector, petrochemical industries) in emergency response planning;
- definition of requirements for “post-event” debriefs and follow-up activities; and
- specific details addressing how isolated communities and individuals (such as trappers, Aboriginals, farmers, and transients) are handled, including those where there is a lack of cellular coverage causing communication delays.

#### **4.2.7 UNDERSTANDING OF HEALTH EFFECTS**

##### **Introduction**

The Advisory Committee heard concerns from many public outreach participants respecting the degree of understanding of the effects of sour gas mixtures (particularly SO<sub>2</sub> and H<sub>2</sub>S) on the health of humans, including those with special sensitivities. In addition, of those surveyed in the random sample telephone survey, only 44 per cent indicated that they somewhat or strongly agreed with the statement “scientists have a clear understanding about the effects of sour gas on public health”, while 24 per cent somewhat or strongly disagreed.

Many in the public believe that there is a lack of human exposure monitoring and testing of short-term episodic events and that standards are not stringent enough, especially in view of the concentration of several facilities within a localized area. This is seen to be even more problematic because of the lack of scientific data regarding the relationship of cumulative effects to human, animal, and environmental health. It was suggested that there should be more research into cumulative effects and its associated risks.

Health effects were a dominant issue for participants in the public outreach program. Although the Advisory Committee's mandate was limited to a review of immediate or long-term effects of short-term exposure to sour gas, it heard many concerns about long-term effects of long-term exposure to low concentration levels of sour gas mixtures. Also of significant concern was the impact to human and animal health from the cumulative effects in a localized vicinity of sour gas development.

The Advisory Committee's work included a detailed questionnaire sent out to a number of experts on toxicology. Public comments appeared to agree with the wide divergence of views of the experts consulted on the nonlethal effects. Therefore, the Advisory Committee believes that overall there is a low level of understanding and confidence regarding health-related information used by regulators and the industry in making decisions that may affect public health and safety.

**Major driver issue: The adequacy of our understanding of the health effects caused by sour gas mixtures.**

### **Statement of Direction**

- Lethality of H<sub>2</sub>S

Through expert responses to the questionnaire and other work, the Advisory Committee believes the approach to considering lethal effects recommended by the Energy Resources Conservation Board (ERCB; now the EUB) in 1990 continues to be a reasonable predictor of lethality (ERCB, 1990, Report 90b, Vols. 5 and 7) for emergency response planning purposes. It is the Advisory Committee's view that the EUB's approach to determining EPZs (e.g., for wells a 100 parts per million (ppm) H<sub>2</sub>S [3 minute average] isopleth is used) is reasonable and provides a good basis for any adjustments using revised models. An isopleth is the distance at which a specific concentration could extend.

- Nonlethal Health Effects

There is a wide divergence of views from recognized experts on the nonlethal health effects, both temporary and irreversible, of acute exposure to H<sub>2</sub>S, SO<sub>2</sub> and other constituents of sour gas. The different views of the experts, along with the limited scientific information available, make it difficult to assess whether the current approaches are adequate. Differing views of the experts, as well as variation in the manner that the EUB has applied this information, have created confusion and eroded public confidence in the sour gas regulatory environment intended to protect public health and safety.

The Advisory Committee received little information from the experts with respect to SO<sub>2</sub>. The health effects of SO<sub>2</sub> are relevant, as ignition of H<sub>2</sub>S releases is sometimes used as a mitigative measure. This converts H<sub>2</sub>S to SO<sub>2</sub>.

To address these concerns, the Advisory Committee is considering recommending that a revised comprehensive health effects table be developed as soon as practical. The table would cover both the constituents of sour gas mixtures and the products of incomplete combustion of sour gas, including SO<sub>2</sub>, reduced sulphur compounds, and possibly complex hydrocarbons. A multi-stakeholder team could be struck to develop this information, which might be published as part of a "primer" that addresses the important health-related questions the public has about sour gas

in a manner understandable to the broad public. It could perhaps be an update of the 1988 Alberta Health and Wellness pamphlet titled *Guidelines for Action Regarding Hydrogen Sulphide*. (this pamphlet is available from Alberta Health) The revised health effects table would then be used in decision or policy making by the EUB and other Alberta departments and agencies involved in the regulation of sour gas. The Advisory Committee is of the view that a revised comprehensive health effects table is an urgent matter. As a first priority, the multi-stakeholder team would be asked to determine if any interim changes to the standards are justified pending the completion of the full review.

Although the Advisory Committee is aware that there have been recent reviews about health effects of low-level exposure to H<sub>2</sub>S and SO<sub>2</sub>, it believes that important areas to be addressed include the lack of:

- peer-reviewed research,
- measurement of exposure concentrations and times, and
- coordinated follow-up on those exposed.

The Advisory Committee is considering recommending that the multi-stakeholder team identify further research focused on nonlethal toxicological effects needed to improve understanding of how people and animals might be affected. The Advisory Committee is aware that the detailed multi-government *Western Canada Study on Animal and Human Health Effects Associated with Exposure to Flare Emissions* (a draft document outlining the scope of this project can be found on the Advisory Committee's Web site at [www.publicsafetyandsourgas.org](http://www.publicsafetyandsourgas.org)) research project has recently begun. Any research recommended by the Advisory Committee should complement this and other ongoing research. The focus could be on the nonlethal effects of short-term acute exposures related to events that threaten public safety.

Section 4.2.3, Monitoring, also outlines some health related matters.

## **4.2.8 TECHNICAL KNOWLEDGE**

### **Introduction**

The first line of defence against sour gas impacts on public health and safety is the prevention of sour gas releases. However, in the event that a release does occur, we need to predict what could happen and understand the uncertainty associated with our predictions. Many stakeholders expressed a lack of understanding and confidence in the dispersion modelling and risk assessment methods used by regulators and industry to make decisions about EPZs, setbacks, and other measures intended to protect public health and safety. Some of the public outreach participants suggested that there has not been sufficient research or a successful track record in the use of risk and hazard assessment related to sour gas operations.

A number of public outreach participants suggested that there was a wide variation in the results of dispersion modelling and risk assessments performed by different experts. The public questioned how, with this variation, reasonable decisions could be made by the EUB about public health and safety.

The Advisory Committee believes that dispersion modelling and risk assessment are important elements in protecting public health and safety because they provide the scientific basis for assessing what happens when sour gas is released to the atmosphere and people are exposed. They will be addressed as two separate sub-issues:

- Dispersion Modelling
- Risk Assessment

**Major driver issue: The adequacy and understanding of the methods and mathematical models used in assessing potential effects on public health and safety from sour gas developments.**

### **Statements of Direction**

#### **Dispersion Modelling**

Dispersion modelling is a method for estimating the dilution of a release by atmospheric air and the extent of impact from a release. The computational complexity of the atmospheric dispersion models makes the details and results difficult to understand. The Advisory Committee noted that there is disagreement among experts about

- the suitability and applicability of certain dispersion models,
- how sensitive the models might be based on input data, and
- the level of expertise required for their use by the EUB and others.

As a direction the Advisory Committee intends to ask the EUB to take steps to work with experts, the public, and other stakeholders to adopt a standardized approach for selecting and using dispersion models for sour gas releases. The models would be mathematically and physically sound and would include the following

- published specifications for standardized assumptions used in adopted models;
- improved modelling of pipeline blowdown, well release rates and other inputs; and
- setting EPZs with consideration for site-specific topographic and atmospheric conditions.

#### **Risk Assessment**

Risk assessment is used to calculate the chances of a release occurring and the public health and safety consequences of exposure to sour gas. The Advisory Committee believes risk assessment plays a valuable role for the public, industry, and regulators in understanding and evaluating the potential impact of existing or proposed sour gas facilities and alternatives on public health and safety. To enhance the usefulness of risk assessments, the Advisory Committee believes steps should be taken to eliminate from the public consultation and hearing processes the frequent and sometimes counterproductive argument surrounding the variables used in the analysis.

The Advisory Committee is considering asking the EUB to work with other stakeholders to develop a standardized approach to risk assessment that will allow all parties to understand the differences between alternative proposals. In developing this proposed direction, the Advisory

Committee consulted with and was given consistent advice from several independent experts in risk assessment. The Advisory Committee believes that a standardized approach to risk assessment might include

- accepted specifications for assumptions used in the recommended risk assessment procedure,
- a standard method to evaluate and quantify probability of failure,
- development of updated sour gas release incident databases that are user friendly and publicly available, and
- a clear explanation of what the assumptions are and how the results are used by decision-makers, in a form understandable to all stakeholders, particularly the public.

## **4.2.9 SETBACKS**

### **Introduction**

A setback is the minimum distance that must be maintained between an energy facility (i.e., well, pipeline, gas plant) and a dwelling, public facility, rural housing development, or urban centre. One important reason for the establishment of setbacks is to create a buffer zone between an energy facility and other surface development (i.e.; residence). Setbacks for sour gas facilities are categorized into four levels. Minimum setback distances are reflected in a chart (EUB Interim Directives ID 81-3 and ID 97-6), which considers both the category of sour gas facility and the type of existing or proposed surface development in proximity to the proposed facility. These minimum setbacks are applied to both oil and gas development and surface development.

In addition to the setbacks regulated by the EUB, some municipalities establish “nuisance” (i.e., dust, noise, visual) setbacks larger than those of the EUB to restrict land development near sour gas facilities.

Some of the public participants questioned the reasonableness of the setbacks currently used by the EUB. Their general view was that the criteria used to establish setbacks are not well understood and that overall they are inadequate. During the public outreach discussions, many participants expressed concern that the minimum setbacks for sour gas facilities are too small and that they should be increased. However, in the random telephone survey, 48 per cent of rural respondents who have land affected by a sour gas setback believed the distances are reasonable, while 30 per cent did not.

Some public participants suggested that setbacks need to be more site specific and that regulations should consider factors such as topography, long-range urban development plans, adjacent landowners, settlement patterns, weather, company performance, risk and hazard assessment, and consequences of an incident. There is also a perception that a rural resident is considered to have less value than an urban resident based on the setback criteria.

Some participants commented about the impact of setbacks from sour gas facilities preventing certain types of surface developments. They questioned the fairness of these restrictions, particularly when a landowner suffers a demonstrable loss due to a setback from a sour gas facility.

The Advisory Committee believes it should address the following setback sub-issues:

- criteria for setbacks, and
- effects of setbacks.

**Major driver issues: The need for and the basis of establishing setbacks as a means of protecting public health and safety from sour gas development.**

### **Statements of Direction**

#### **Criteria for Setbacks**

The Advisory Committee engaged a number of experts to assist it with this complex subject. After its consideration of the matter, the Advisory Committee believes that once a standardized dispersion model and risk assessment methodology are finalized (as suggested in Section 4.2.8, Technical Knowledge), they should form the basis for a detailed re-examination of the current sour gas setbacks. This should be done through a multi-stakeholder process including representatives from the relevant regulatory agencies, government departments, municipalities, health authorities, general public, land development industry, and oil and gas industry.

Objectives should be to determine if

- the current approach to setbacks is appropriate,
- the number of levels of categories is acceptable,
- the actual setback distances are appropriate, and
- a common set of setback distances can be agreed upon by different jurisdictions.

#### **Effects of Setbacks**

Setbacks can effectively sterilize land from certain uses until such time as the well or facility has been abandoned and reclaimed to regulatory standards. In most cases, the landowner on whose land the facility is located negotiates surface rights access with the respective oil and gas developer. In certain cases, however, landowner ability to develop (as conferred by a municipal development plan, area structure plan, or other municipally approved documents) may be impacted by a setback caused by a sour gas facility. Some see this as an unfair effect of setbacks.

As indicated in Section 4.2.1, Development Planning, the Advisory Committee is moving in the direction of better early planning between the surface and subsurface owners to try to minimize conflicts between people and sour gas. Further, the Advisory Committee believes that there could be a specific expectation that sour facilities be located, when possible, so as to not result in the setbacks crossing adjacent property boundaries. This would help ensure that a landowner affected by the setback is in direct discussions with the oil and gas developer regarding surface access, but may be inconsistent with the aims and objectives of some surface rights groups respecting the siting of facilities.



The Advisory Committee believes that the problem of the effects of setbacks on the ability to proceed with certain surface developments and possible solutions requires further study and evaluation. The Advisory Committee is considering recommendations towards the formation of a multi-stakeholder group to deal with these issues.

#### **4.2.10 PUBLIC CONSULTATION BY INDUSTRY**

##### **Introduction**

Most outreach participants expressed concern that there was a lack of consistent interaction between the public and industry to keep the public informed about operations in their area and to help resolve concerns about sour gas development. Many stated that industry's poor public communications (especially the initial contact by land agents) is a consistent problem. They said that they did not trust industry because promises were often not kept. Some companies were difficult and frustrating to deal with, and arrogance and intimidation from some companies was not uncommon. Some were critical that land agents were simply looking for quick signatures at the lowest cost possible.

Many of the outreach participants indicated frustration by an apparent lack of empowerment and respect for individual rights and concerns and suggested that this has contributed to health concerns among individuals and communities. There is a need to ensure that acceptable public consultation practices are being followed by all of the industry.

A few added that companies were often more communicative during the development of new sour facilities than they were once their development was in production.

Some industry and public participants in the outreach process indicated that difficulties between industry and the public are specific to certain companies, and that other companies consult and communicate effectively.

Many of the outreach participants said that the effectiveness of the communication about the risks related to sour gas activity is not good. Risk communication and consultation are imperative to improve understanding. The information needs to be more user friendly and not include so many technical terms. Respondents expressed concern that they are not receiving complete information, that the risks are downplayed, and that they are being misled. Credibility of communication is an issue.

Many people mentioned that communication regarding emergency response plans is poor. A few suggested that the current approach used by industry to provide information about the emergency response plan increases public anxiety.

Most of the outreach participants suggested that there is an overall lack of public awareness of the decision-making process and contact information, and that this needs to be resolved. People should be made aware that they do have the opportunity to provide input into the application review and decision-making processes.

Results of the random telephone survey found that most of those involved in public consultation related to sour gas issues believed that the process does reduce public anxiety.

However, when asked about the degree of satisfaction with the responsiveness of industry to concerns within their community, approximately one-third of the respondents to the telephone survey indicated that they were either very dissatisfied or somewhat dissatisfied.

Most Aboriginal communities also expressed concern regarding their lack of knowledge and the timeliness of involvement in sour gas operations in their areas.

**Major driver issue: The lack of consistent and appropriate public consultation by the industry to help resolve concerns about sour gas development, the lack of understanding as to what benefits related to sour gas development flow back to the community, and the need to encourage ways that both industry and the community can work together to assess both the benefits and the negative impacts.**

### **Statement of Direction**

In the past, the EUB has encouraged industry to use appropriate public consultation practices for sour gas development. The Advisory Committee is aware and supportive of industry efforts to improve in this area, including the development by the Canadian Association of Petroleum Producers (CAPP) of a *Guide for Effective Public Involvement* (available from the Canadian Association of Petroleum Producers) in 1998. However, more needs to be done, and the Advisory Committee believes that this “encouragement” has not been sufficiently effective.

Additionally, industry, the provincial government, and municipalities must do a better job of researching and defining the benefits of sour gas development to local areas. When more clearly defined, the balance between negative impacts and benefits can be more clearly assessed and communicated.

The direction of the intended recommendations of the Advisory Committee will be to ensure that public consultation is a requirement for sour gas development, rather than only strongly encouraged. This could involve

- developing an EUB informational letter for early, effective public consultation that is in the form of a requirement by industry rather than a “guideline”;
- encouraging the EUB to have a staff resource team that focuses on public consultation to assist industry in providing a more consistent approach to the public including Aboriginal people;
- developing a set of public consultation practices endorsed by both the EUB and industry that encourages decision-making processes where the public has input so they are kept more informed and involved;
- ensuring that EUB public consultation resource materials are updated and key messages are clear, understandable, and succinct, including providing a new checklist to the public on what questions they should ask during consultation with industry and a summary of the rights of both surface and sub-surface owners; and

- having industry, the provincial government, and municipal representatives conduct a study to better define local benefits (such as property taxes and local business opportunities) from sour gas development and communicate the results.

#### **4.2.11 PUBLIC AWARENESS AND UNDERSTANDING**

##### **Introduction**

Most participants in the outreach process expressed concern about the lack of awareness and opportunity for education regarding sour gas issues. Concerns included difficulty in accessing information, the general lack of public awareness, the uneven playing field regarding public consultation, misinformation, the lack of informed public participation in decision-making, and concerns about getting consistent information from the media, industry, the EUB, and environmental groups.

There is generally poor understanding of scientific information and safety-related information requirements, such as emergency response planning and preparedness, determination of emergency planning zones and their purpose, setback distances, dispersion modelling and risk assessment. This lack of understanding reduces confidence that the EUB or industry can ensure adequate public safety.

Most participants indicated a need for better understanding and awareness of potential public safety and sour gas related issues and therefore a need for readily available information that is fair and accurate. Many said that current communication about the risks related to sour gas activities is not effective and that people should be better informed. Information should be user friendly and written in understandable terms. Some outreach participants stated that there is a need for credible information by an independent source that is clearly written and understandable.

Most people also suggested that there is an overall lack of public awareness about the EUB's decision-making process. Some participants felt that there is a need for more understandable information regarding regulations and that EUB decision reports are difficult to understand and should be written in plain language.

Most of the Aboriginal outreach participants suggested that there is very little public awareness within their communities about the issues related to sour gas. Some suggested that community workshops would be beneficial for raising public awareness.

The results of the telephone survey indicated that there was good general awareness of sour gas issues in the areas sampled. However, respondents also felt that the communication mechanisms among the public, the regulator, and companies could be improved, as they believed that information was not adequate or readily accessible.

**Major Driver Issue: Lack of public awareness and understanding regarding sour gas issues.**

## **Statement of Direction**

The Advisory Committee is aware of communication initiatives including the development of the *Sour Gas Questions and Answers* Backgrounder by the Petroleum Communication Foundation (copies are available from the Petroleum Communication Foundation). This information is helpful but does not go far enough in addressing the need. Accordingly, the direction of the intended recommendations of the Advisory Committee is towards the following:

- Formation of an information office, located either within or independent of the EUB, and possibly supported by a stakeholder committee. The role of this office would be to provide credible, unbiased information related to sour gas development; act as a key contact for referring the public to the right source of information; help build trust and understanding among industry, the public, and the EUB; and liaise with stakeholder groups throughout the province.
- Training, perhaps leading to certification, might be offered to industry in risk communication methodology and emergency response consultation, so that the information sent out by companies is more understandable.
- Informational sessions could be conducted for the public and Aboriginal people specifically focusing on building understanding of sour gas development.
- Preparation by the EUB of material (i.e., brochures) providing clear information on technical matters such as ERPs, EPZs, setbacks, rights of surface and subsurface owners, and standardization of the requirements for the information package given to the public living within an EPZ.
- Preparation of an EUB brochure containing information about risk, using understandable language, that sets out what risk assessment is, when it is applied, and what needs to be considered. This would be part of the package given to the public during the public consultation process.

### **4.2.12 ABORIGINAL (FIRST NATIONS AND METIS) ISSUES**

#### **Introduction**

Many of the concerns raised in the Aboriginal communities were similar to those raised by other participants in the outreach process. Therefore, a number of the directions outlined in the preceding sections also address those concerns. However, some of the concerns raised by Aboriginal people were unique to their communities and are addressed in this section. Additionally, there is uncertainty respecting the jurisdiction of the EUB with respect to the lands of First Nations. For these reasons and for the convenience of the Aboriginal people, the Advisory Committee is including here, all of its comments and directions that relate specifically to the issues raised by the Aboriginal communities.

It is clear from the meeting with Aboriginal representatives that the EUB is not well known in Aboriginal settlements. Aboriginal representatives expressed strong desire respecting the need to develop emergency response plans, and they raised questions regarding the role the EUB might play in that regard. Another matter frequently mentioned was the desire for better understanding of sour gas and the role of the EUB as a regulator. The Advisory Committee's consideration of each of these concerns is complicated by the jurisdictional uncertainty.

**Major Driver Issue: Lack of awareness and understanding among Aboriginal people regarding sour gas related issues and the role and relationship between the EUB and other relevant provincial and federal departments including Health Canada and Indian Oil and Gas Canada.**

### **Statements of Direction**

#### **Interaction with the EUB**

The EUB, as the lead regulator for sour gas development in Alberta must improve its relationship with Aboriginal people. The Advisory Committee believes that the increasing concern Aboriginal people have regarding sour gas development and its potential impact on health and safety, as well as traditional lands and sacred sites, might be effectively addressed by the following actions

- The EUB would engage appropriate staff to ensure more interactions among the EUB, Aboriginal communities, and industry. These staff would ensure that informational sessions were designed and conducted for Aboriginal people, specifically focusing on building understanding of sour gas development, and would assist industry in providing a more consistent approach with Aboriginal people.
- Additionally, the EUB might consider forming an Aboriginal advisory committee to better ensure that Aboriginal issues are recognized.

Other directions the Advisory Committee is considering in the area of interaction with the EUB are presented in Section 4.2.2.

#### **Emergency Response Planning and Preparedness**

The Advisory Committee believes that another key area for improvement as it relates to Aboriginal people is in the development of emergency response planning and preparedness programs. These programs would in turn provide for the coordination of all potential responders to a sour gas emergency on or adjacent to Aboriginal communities. Special consideration would have to be made for language barriers, lack of technology, such as cellular coverage causing communication delays, and isolated communities and individuals (hunters, trappers). The Advisory Committee is considering recommendations which would see the EUB take responsibility for initiating a process to achieve this direction.

Other directions the Advisory Committee is considering in the area of emergency response planning and preparedness are presented in Section 4.2.6.

## **Jurisdiction**

The area of jurisdictional responsibility is a complex one regarding Aboriginal people, especially First Nations, in part because of the role of both the federal and provincial governments. The Advisory Committee believes this could be a barrier to improving Aboriginal people's understanding regarding sour gas development, where and how to raise complaints and concerns, and how to properly responded to incidents that may have an impact on health and safety. As a direction, the Advisory Committee is considering recommendations towards

- a greater sense of clarity in the relationships among federal and provincial government agencies, Aboriginal people, and adjacent municipalities and minimization of gaps and overlaps in jurisdiction; and
- ensuring that an effective complaint/incident response program exists with clear jurisdictional lines that would have monitoring capability as well as ensuring surveillance and network monitoring programs that provide information on general air quality in Aboriginal communities with or adjacent to significant sour gas development.

Other directions the Advisory Committee is considering in the area of Jurisdiction are presented in Section 4.2.4.

### **4.2.13 IMPLEMENTATION**

The direction in which the Advisory Committee is moving with respect to consideration and implementation of its recommendations is to request that the EUB issue public quarterly status reports on what has been done respecting each recommendation until action has occurred on all recommendations.

### **4.2.14 NON-MANDATE BUT IMPORTANT ISSUES**

Many concerns were raised that relate to matters either unrelated to sour gas and public health and safety or related but excluded from the mandate of the Advisory Committee because they are being addressed by other initiatives. These concerns are summarized in Appendix C, Sections V and VI. The Advisory Committee recommends that the EUB and others involved in or subject to the regulation of the oil and gas industry review these concerns and explore how these issues could be addressed.

Some of the non-mandate issues were raised by many participants and, in the view of the Advisory Committee, are of particular importance if the EUB is to address the concerns that led to the formation of the Advisory Committee. For these important non-mandate issues, the Advisory Committee may, in its final report, offer comments, as opposed to recommendations.

Examples of issues that it may address with comments include

- flaring,
- monitoring of long-term, low-levels of H<sub>2</sub>S or SO<sub>2</sub>,
- research on health effects from long-term, low-level exposures,
- protection of ground water,
- compensation, and
- definition of local intervener and intervener funding.

## APPENDICES

APPENDIX A	Advisory Committee Members and Biosketches	7 pages
APPENDIX B	Terms of Reference	5 pages
APPENDIX C	Concerns and Issues	46 pages
APPENDIX D	Summary Results – Random Sample Telephone Survey	2 pages

As indicated previously, the Appendices are included in a separate volume, which is NOT being distributed with the report.

The Appendices are available on the Advisory Committee Web site at [www.publicsafetyandsourgas.org](http://www.publicsafetyandsourgas.org). Copies may also be obtained at no charge from the EUB's Information Services in Calgary (403) 297-8190, or from any of the EUB's Field Centres, or by phoning 1-888-882-1286.