

Bulletin 2009-41

November 13, 2009

Processing of Applications for Sour Oil and Gas Development in Light of the Court of Appeal Decision in the Matter of *Kelly v. Alberta (Energy Resources Conservation Board) and Grizzly Resources Ltd.*

1 Introduction

On October 28, 2009, the Court of Appeal of Alberta issued its decision in the matter of *Kelly v. Alberta (Energy Resources Conservation Board) and Grizzly Resources Ltd.*¹ (the decision). The Court found that parties residing in the protective action zone² (PAZ) could be directly and adversely affected by an application for approval of a project to which the PAZ relates. The Court also found that applicants must include residents within the PAZ in their participant involvement programs under Energy Resources Conservation Board (ERCB/Board) *Directive 056: Energy Development Applications and Schedules*.

In light of the decision and to permit evaluation of impacts of the decision, the Board temporarily suspended the issuance of approvals of all sour applications pending addressing the various issues raised in the decision.

This bulletin outlines the process for and requirements applicable to outstanding and pending applications for approval of wells, facilities and pipelines that contain or are anticipated to contain hydrogen sulphide (H₂S). For the purposes of this bulletin, “sour applications” refers to those applications where an emergency planning zone (EPZ) needs to be calculated, i.e., where there is an expected H₂S level greater than or equal to 0.1 mole per kilomole of H₂S.

2 Background

In addition to being an ERCB requirement, site-specific emergency response planning has been a long-standing practice in the oil and gas industry to provide for the safety of the public. In April 2008, the ERCB issued a revised edition of *Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry*, which included the emergency response concept called a protective action zone (PAZ). The introduction of the PAZ was intended as an enhancement to identify the area within the EPZ downwind of a release in which responders should focus and prioritize their response efforts. The PAZ is a widely accepted concept in numerous jurisdictions and is used as a tool to guide responders in prioritizing and focusing their emergency response efforts. In other words, the PAZ is intended to be an area **within** the EPZ that takes priority for response purposes over other areas within the EPZ. The introduction of the PAZ was intended as an enhancement to emergency response **within** the EPZ following an incident. Calculation of the PAZ

¹ 2009 ABCA 349.

² As defined in Appendix 1 of ERCB *Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry* (November 2008 edition).

area is wholly dependent on wind conditions, the volume of H₂S released, and other factors that can only be determined at the time of an incident; the true size and location of the PAZ is not determined until immediately after an incident occurs. The PAZ is a concept and tool that the Board still considers valuable and necessary.

3 ERCBH2S Model and *Directive 071*

Directive 071 (November 2008 edition) defines the PAZ as “an area downwind of a hazardous release where outdoor pollutant concentrations may result in life-threatening or serious and possibly irreversible health effects on the public.” This definition is derived substantially from available literature on emergency response tools and is materially consistent with the PAZ definition used by several North American jurisdictions. The ERCBH2S model, also introduced in 2008, is a state-of-the-art computer model used to calculate EPZs and PAZs. The model was incorrectly calibrated to calculate the PAZ to an endpoint of 10 parts per million (ppm) concentration of H₂S averaged over a 3-minute exposure time (10 ppm endpoint). This endpoint is incorrect. The calculation should have been based on anticipated impacts of exposure based on 130 ppm for a 60-minute exposure time.

The ERCB recognizes that it made an error in adopting an endpoint for the PAZ that did not correspond to the definition in *Directive 071* and did not reflect the ERCB’s intent. The Court’s decision has assisted the ERCB in reevaluating and correcting *Directive 071* to reflect its actual intent. Parties in the vicinity of a 10 ppm endpoint are not expected to suffer life-threatening or serious and possibly irreversible health effects, as contemplated in the PAZ definition. For example, Alberta’s worker safety rules provide that people may work safely in an environment of up to 10 ppm H₂S for eight hours.

Currently, a portion of the PAZ is included within the EPZ. However, because the PAZ is calculated using a 10 ppm endpoint, a portion of the PAZ currently falls beyond the boundary of the EPZ. The outer boundary of the calculated EPZ for a well, pipeline, or facility is based on a very conservative endpoint of 100 ppm concentration of H₂S over a 60-minute exposure time. Evidence suggests that this concentration does not represent conditions that would result in life-threatening or serious and possibly irreversible health effects.³ In fact, evidence suggests that parties would have to be significantly closer to the source of the release than the currently calculated extent of the PAZ to suffer those effects. In fact, to suffer impacts contemplated in the PAZ definition, parties would have to be closer to the release than the outer boundary of the EPZ.

The ERCB will revise the current ERCBH2S Model v.1.19 and subsequently v.1.20 Beta. Following a period of testing of ERCBH2S Model v.1.20 Beta, the ERCB will release a final version of v.1.20 and will rescind v.1.19 and v.1.20 Beta at that time.⁴ In all three updated versions of the ERCBH2S model, which will be effective immediately upon their release, the ERCB will have adopted an endpoint for calculation of the PAZ that reflects the PAZ as defined in *Directive 071*. The correct endpoint has been defined as a 130 ppm concentration of H₂S over a 60-minute exposure time.⁵ Based on scientific data, this endpoint is consistent with the PAZ definition and more appropriately indicates the area in which parties may suffer the impacts contemplated in the PAZ as defined.

³ See report *Health Effects Associated with Short-Term Exposure to Low Levels of Hydrogen Sulphide (H₂S) – A Technical Review* (October 2002), available on the Alberta Health and Wellness Web site at www.health.alberta.ca/newsroom/pub-environmental-health.html.

⁴ All references to ERCBH2S v.1.20 in this bulletin refer to v.1.20 Beta until such time as it is rescinded and replaced with the final v.1.20.

⁵ This endpoint is equivalent to a 100 ppm outdoor concentration of H₂S over a 150-minute exposure time.

The Board emphasizes that neither the error in the ERCBH2S model nor this change compromises public safety in any way. By better predicting the boundary to which the PAZ could extend, this change will allow licensees to focus and prioritize their immediate response efforts on those parties who may be at most risk of exposure to a hazard in the unlikely event of an incident.

The Board has also reviewed *Directive 071* and has concluded that because the EPZ area as calculated provides robust, comprehensive and conservative protective measures, other zones, such as the emergency awareness zone and the two sulphur dioxide (SO₂) zones calculated by ERCBH2S, do not add material public safety measures over those provided within the EPZ. The Board has therefore concluded they are unnecessary and inconsistent with the overall intent of the public safety and emergency response measures outlined in *Directive 071*. As result, those concepts and related requirements will be removed from *Directive 071* and the ERCBH2S model in the upcoming revisions.

Alberta Health and Wellness agrees with the methodology used in calculating the endpoints adopted by the ERCB. For more information on endpoints and the stakeholder consultation process that occurred before their adoption, see the document *ERCBH2S Response Planning Endpoints*, which is available on the ERCB Web site.⁶ The revised versions of the ERCBH2S model (v.1.19 and 1.20 Beta) will be released as soon as they are available. Additionally, the ERCB will publish errata to *Directive 071* to reflect the corrected endpoint of the PAZ and other related changes. The errata will be posted on the *Directive 071* Web page.

As a result of the changes to *Directive 071* outlined in this bulletin, the PAZ for a given well, facility, or pipeline will not extend beyond the boundary of the EPZ.

4 *Directive 056* and Public Involvement Programs

To ensure compliance with the Court's ruling related to public involvement programs set out in both *Directive 071* and *Directive 056*, the ERCB has also undertaken a detailed review and highlights changes to the various consultation programs below. Tables 5.1, 6.1, 6.2, and 7.1 of *Directive 056* will be revised to reflect the changes to the participant involvement program requirements applicable to sour applications and to more accurately reflect the ERCB's intent in adopting various participant involvement and emergency planning and response requirements in *Directives 056* and *071*. The revised tables are attached to this bulletin. The changes will be posted on the *Directive 056* Web page as errata to *Directive 056*.

The Board recognizes that the changes to the *Directive 056* participant involvement requirements represent a significant change in process for facility and pipeline applications where notification of residents within the EPZ did not previously occur until after construction and prior to the operational phase of a project. Such notification must now be done prior to submission of an application under *Directive 056*.

The changes are effective immediately.

4.1 Notification and Consultation Requirements for Sour Applications

4.1.1 Applications Currently Under Review by the ERCB

The ERCB recognizes that companies that have submitted or will submit new sour applications to the ERCB will have conducted and completed a participant involvement program based on calculations

⁶ www.ercb.ca/docs/public/sourgas/EUBModelsDraft/Volume2_ERPEndPoints.pdf.

from the previous versions of either ERCBH2S Model v.1.19 or v.1.20 Beta or the requirements of *Directive 056*. The following requirements apply to those applications.

Previously Submitted Well Licence Applications

Applicants must provide written confirmation to the ERCB application coordinator assigned to the application regarding which ERCBH2S model was used to calculate the EPZ and that it notified and consulted those parties noted in attached new Table 7.1 of *Directive 056*. Because parties located in these areas will also be residents in the PAZ, which is fully contained within the EPZ, the program undertaken and completed should comply with ERCB requirements. The ERCB requires applicants to confirm this in writing.

Previously Submitted Facilities or Pipeline Licence Applications

Applicants have three options for these types of applications:

- 1) Retain the existing EPZ size: Applicants may rely on the calculation and participant involvement program previously conducted for the application (provided there are no residents within the EPZ who require notification); or
- 2) Retain the existing EPZ size: Applicants may conduct a supplementary participant involvement program with notification to residents within the calculated EPZ; or
- 3) Recalculate the EPZ size: Applicants may conduct a new participant involvement program as outlined in the attached new Tables 5.1, 6.1, and 6.2 of *Directive 056* and use the updated ERCBH2S v.1.20 Beta or the final v.1.20 to calculate the appropriate EPZ. Applicants choosing this option may elect to replace their application previously filed and not delay the processing of their application.

Under each option, the applicant must provide written confirmation to the application coordinator assigned to the application regarding which ERCBH2S model was used to calculate the EPZ, how many residents are within that EPZ, and the date that notification was completed to the residents as well as to the other parties noted in Tables 5.1, 6.1, and 6.2 as applicable.⁷

If applicants can provide the above information to the application coordinators, the ERCB will resume processing of the application on a priority basis, barring any material deficiencies.

If the notification and/or consultation areas intersect with a large town or urban centre, the ERCB may consider a participant involvement program tailored to the specific application, even if it does not strictly comply with the notification and consultation requirements in *Directive 056*. In these circumstances, applicants must file a nonroutine participant involvement application. The ERCB will consider such applications on a case-by-case basis.

4.1.2 Applications Not Yet Submitted to the ERCB

The ERCB is aware that applicants will have initiated and possibly completed participant involvement programs based on ERCBH2S Model v.1.19 or v.1.20 Beta. The ERCB will accept those applications provided that the applicant confirms in writing that it has adopted the EPZ size calculated in ERCBH2S v.1.19 or v.1.20 Beta, identifies the number of residents within the EPZ, and provides

⁷ Because parties located in these areas will also be residents in the PAZ, which is fully contained within the EPZ, the program undertaken and completed should comply with ERCB requirements.

the date the participant involvement program was completed. If such confirmation is not submitted with new applications, the ERCB will assume that the applicant has conducted a participant involvement program for the application that follows the new requirements and has used the updated version of ERCBH2S Model v.1.20 Beta or the final v.1.20 to calculate the EPZ/PAZ.

5 Conclusions

Applicants that hold valid approvals or licences for applications previously approved by the ERCB are not required to notify and/or consult parties residing in the previously calculated EPZ/PAZ for the facility contemplated in the approval or licence.

The ERCB advises that the above requirements are being implemented as a result of and in response to the Court of Appeal decision and apply only to PAZs associated with sour applications. All other applications, objections, and review applications will continue to be processed as before and be considered and adjudicated on their merits.

Questions regarding the application processing procedures outlined in this bulletin may be directed to Paul Forbes, Facilities Applications, at 403-297-3199. Questions relating to *Directive 071*, including calculation of the EPZ/PAZ, may be directed to the Emergency Planning and Assessment Help Line at 403-297-2625 or by e-mail to epassessment@ercb.ca.

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Attachment

Directive 056: Energy Development Applications and Schedules, Tables 5.1, 6.1, 6.2, and 7.1

Table 5.1 Facility category type and consultation and notification requirements					
Category	Name	Type	Description	Personal consultation and confirmation of nonobjection	Notification
B	Facilities < 0.01 mol/kmol H ₂ S in inlet stream	001	Exempt single-well facility (deemed nonroutine with concerns/objections)	<ul style="list-style-type: none"> • Landowner and occupants • Residents within 0.3 km 	<ul style="list-style-type: none"> • Local authority • Crown disposition holders
	Facilities < 0.01 mol/kmol H ₂ S in inlet stream	010	Gas processing plant	<ul style="list-style-type: none"> • Landowner and occupants • Residents within 0.5 km 	<ul style="list-style-type: none"> • Crown disposition holders • Local authority • Landowners, occupants and urban authorities within 1.5 km
		011	Gas fractionation plant		
		020	Gas battery—multiwell		
		030	Oil battery—multiwell		
		031	Bitumen battery—multiwell		
		040	Compressor station		
		070	Oil satellite—multiwell	<ul style="list-style-type: none"> • Landowner and occupants 	<ul style="list-style-type: none"> • Crown disposition holders
		071	Bitumen satellite—multiwell		
		080	Custom treating facility	<ul style="list-style-type: none"> • Landowner and occupants • Residents within 0.5 km 	<ul style="list-style-type: none"> • Crown disposition holders • Local authority • Landowners, occupants and urban authorities within 1.5 km
		090	Injection/disposal facility—water	<ul style="list-style-type: none"> • Landowner and occupants • Residents within 0.5 km 	<ul style="list-style-type: none"> • Crown disposition holders • Local authority • Landowners, occupants and urban authorities within 1.5 km
		091	Injection/disposal facility—EOR		
		200	Straddle plant	<ul style="list-style-type: none"> • Landowner and occupants • Residents within 0.5 km 	<ul style="list-style-type: none"> • Crown disposition holders • Local authority • Landowners, occupants and urban authorities within 1.5 km
C	Facilities < 1 t/d sulphur inlet	300	Gas processing plant (deemed nonroutine application for new gas plants only)	<ul style="list-style-type: none"> • Landowner and occupants • Residents within 1.5 km 	<ul style="list-style-type: none"> • Crown disposition holders • Local authorities • Landowners, occupants and urban authorities within 2.0 km <p>When H₂S ≥ 0.1 mol/kmol: - Residents in the EPZ/PAZ</p>
		301	Gas fractionation plant		
		302	Straddle plant		
		310	Gas battery—single well		
		311	Gas battery—multiwell		
		320	Oil battery—single well		
		321	Oil battery—multiwell		
		330	Bitumen battery—single well		
		331	Bitumen battery—multiwell		
		340	Compressor station		
		350	Oil satellite—single or multiwell	<ul style="list-style-type: none"> • Landowner and occupants 	<ul style="list-style-type: none"> • Crown disposition holders <p>When H₂S ≥ 0.1 mol/kmol: - Residents in the EPZ/PAZ</p>
		351	Bitumen satellite—single or multiwell		
		351	Bitumen satellite—single or multiwell		

(continued)

D	Facilities ≥ 1 t/d sulphur inlet	400	Gas processing plant (deemed nonroutine application for new gas plants only)	<ul style="list-style-type: none"> • Landowner and occupants • Residents within 1.5 km 	<ul style="list-style-type: none"> • Crown disposition holders • Local authority • Landowners, occupants and urban authorities within 3.0 km When $H_2S \geq 0.1$ mol/kmol: - Residents in the EPZ/PAZ
		401	Gas fractionation plant		
		410	Gas battery—single well		
		411	Gas battery—multiwell		
		420	Oil battery—single well		
		421	Oil battery—multiwell		
		430	Bitumen battery—single well		
		431	Bitumen battery—multiwell		
		440	Compressor station		
		450	Oil satellite—single or multiwell		
		451	Bitumen satellite—single or multiwell		
E	Sulphur recovery facilities	600	Gas processing plant (deemed nonroutine)	<ul style="list-style-type: none"> • Landowner and occupants • Residents within 1.5 km 	<ul style="list-style-type: none"> • Crown disposition holders • Local authority • Landowners, occupants and urban authorities within 5.0 km When $H_2S \geq 0.1$ mol/kmol: - Residents in the EPZ/PAZ

Table 6.1. Pipeline category type and consultation and notification requirements

Category	Name	Type	Description	Personal consultation and Confirmation of nonobjection	Notification
B, C, D	Records correction	000	All		
B	Pipelines, gas ≤ 0.30 kPa H_2S partial pressure (pp)	100	Natural gas ≤ 323.9 mm OD	<ul style="list-style-type: none"> • Landowners and occupants of the right-of-way 	<ul style="list-style-type: none"> • Crown disposition holders • Local authorities along the right-of-way • Urban authorities within 1.5 km • For Category Type B101, B111 and B121, landowners and occupants within 0.2 km When $H_2S \geq 0.1$ mol/kmol: - Residents in the EPZ/PAZ
		101	Natural gas > 323.9 mm OD		
	Pipelines, oil effluent ≤ 0.30 kPa H_2S pp or <u>effective pp</u> *	110	Oil effluent ≤ 323.9 mm OD		
		111	Oil effluent > 323.9 mm OD		
	Pipelines, other (gas-free)	120	Other ≤ 323.9 mm OD		
		121	Other > 323.9 mm OD		
	Pipeline downstream facilities	130	Pipeline tank farm	<ul style="list-style-type: none"> • Landowner and occupants • Residents within 0.5 km 	<ul style="list-style-type: none"> • Crown disposition holders • Local authorities • Landowners, occupants and urban authorities within 1.5 km When $H_2S \geq 0.1$ mol/kmol: - Residents in the EPZ/PAZ
		131	Pipeline oil loading or unloading terminal		
		132	Compressor station		
		133	Pump station		
C	Pipelines, gas > 0.30 kPa H_2S pp but ≤ 10 mol/kmol	380	Sour service natural gas ≤ 323.9 mm OD	<ul style="list-style-type: none"> • Landowners and occupants of the right-of-way 	<ul style="list-style-type: none"> • Crown disposition holders • Local authorities along the right-of-way • Urban authorities within 1.5 km • For Category Type C381 and C383, landowners and occupants within 0.2 km When $H_2S \geq 0.1$ mol/kmol: - Residents in the EPZ/PAZ
		381	Sour service natural gas > 323.9 mm OD		
	Pipelines, oil effluent > 0.30 kPa H_2S pp or <u>effective pp</u> *	382	Sour service oil effluent ≤ 323.9 mm OD		
		383	Sour service oil effluent > 323.9 mm OD		
	Pipeline upstream facilities	384	Pipeline line heater	<ul style="list-style-type: none"> • Landowner and occupants 	<ul style="list-style-type: none"> • Crown disposition holders When $H_2S \geq 0.1$ mol/kmol: - Residents in the EPZ/PAZ

(continued)

D	Pipelines, gas > 10 mol/kmol H ₂ S	452	Level 1 natural gas \leq 323.9 mm OD	• Landowners and occupants of the right-of-way	<ul style="list-style-type: none"> • Crown disposition holders • Local authorities along the right-of-way • Landowners, occupants and residents within 0.5 km • Urban authorities within 1.5 km When H₂S \geq 0.1 mol/kmol: - Residents in the EPZ/PAZ)
		453	Level 1 natural gas > 323.9 mm OD		
	Pipelines, gas > 10 mol/kmol H ₂ S	454	Level 2 natural gas \leq 323.9 mm OD	• Landowners and occupants of the right-of-way and within 0.1 km setback	<ul style="list-style-type: none"> • Crown disposition holders • Local authorities along the right-of-way • Landowners, occupants, and residents within 0.5 km • Urban authorities within 2.0 km When H₂S \geq 0.1 mol/kmol: - Residents in the EPZ/PAZ
		455	Level 2 natural gas > 323.9 mm OD		
		461	Level 3 natural gas \leq 323.9 mm OD	• Landowners and occupants of the right-of-way and within 0.1 km setback	<ul style="list-style-type: none"> • Crown disposition holders • Local authorities along the right-of-way • Landowners, occupants, and residents within 1.5 km • Urban authorities within 3.0 km When H₂S \geq 0.1 mol/kmol: - Residents in the EPZ/PAZ
		462	Level 3 natural gas > 323.9 mm OD		
		463	Level 4 natural gas \leq 323.9 mm OD	• Landowners and occupants of the right-of-way and within 0.1 km setback	• Same as Level 3 unless otherwise specified by ERCB
		464	Level 4 natural gas > 323.9 mm OD		
	HVP pipelines	530	HVP pipelines	• Landowners and occupants of the right-of-way	<ul style="list-style-type: none"> • Crown disposition holders • Local authorities along the right-of-way • Landowners, occupants, and residents within 0.2 km • Urban authorities within 1.5 km
	Pipeline upstream facilities	531	Pipeline line heater	• Landowners and occupants	<ul style="list-style-type: none"> • Crown disposition holders When H₂S \geq 0.1 mol/kmol: - Residents in the EPZ/PAZ

Table 6.2 Licence Amendment requirements for pipeline/pipeline installations activities		
Activity	Participant Involvement	Application
Complete removal (including all crossings)	Notification must occur prior to the filing of an application and the removal operation and must include <ul style="list-style-type: none"> • landowners and occupants of the entire pipeline right-of-way and within the associated setbacks, and • residents within the distances specified in Table 6.1 for Category D pipelines. 	Application deemed nonroutine; licence must be obtained before commencing the removal operation.
Not constructed	Notification must be provided to <ul style="list-style-type: none"> • landowners and occupants of the entire pipeline right-of-way and within the associated setbacks, and • residents within the distances specified in Table 6.1 for Category D pipelines. 	Application is filed routine 30 days prior to expiry of pipeline licence.
Abandonment or partial removal	Notification must occur prior to the abandonment or partial removal operation and must include <ul style="list-style-type: none"> • landowners and occupants of the entire pipeline right-of-way and within the associated setbacks, and • residents within the distances specified in Table 6.1 for Category D pipelines. 	Application is filed within 90 days of completing the abandonment operation to advise the ERCB of the abandonment. Licence must be obtained before commencing removal operations.

(continued)

Discontinuation	Notification is not mandatory for discontinuations.	Application is filed within 90 days of completing the discontinuation operation to advise the ERCB of the discontinuation.
H ₂ S change, MOP change, substance change, flow reversal, line split	<p>Notification is not mandatory for these activities.</p> <p>If any of these activities result in the pipeline changing to a Category D or the setbacks increase, personal consultation with nonobjection and notification must occur prior to the filing of an application and commencing operations.</p> <p>This must include</p> <ul style="list-style-type: none"> landowners and occupants of the entire pipeline right-of-way and within the associated setbacks, and residents within the distances specified in Table 6.1 for Category D pipelines. <p>If any of these activities result in a setback decrease or the setback no longer exists, notification must occur with landowners and occupants of the entire pipeline right-of-way and within the associated setbacks.</p> <p>When the EPZ is affected by the proposed amendment, notification to residents in the EPZ/PAZ must occur prior to the filing of the application.</p>	Licence must be obtained prior to commencing operations.
Resumption of discontinued pipeline	<p>Notification is not mandatory for resumption of a discontinued pipeline.</p> <p>If other activities are conducted in conjunction with the resumption that result in the pipeline changing to a Category D or the setbacks increase, personal consultation with nonobjection and notification is required prior to filing of application and commencing operation.</p> <p>This must include</p> <ul style="list-style-type: none"> landowners and occupants of the entire pipeline right-of-way and within the associated setbacks, and residents within the distances specified in Table 6.1 for Category D pipelines. <p>When the EPZ is affected by the proposed amendment, notification to residents in the EPZ/PAZ must occur prior to the filing of the application.</p>	Licence must be obtained before commencing resumption operations.
Resumption of abandoned pipeline/pipeline installations	<p>Personal consultation with confirmation of nonobjection and notification must occur prior to the filing of application and resumption of operation and must include</p> <ul style="list-style-type: none"> landowners and occupants of the entire pipeline right-of-way and within the associated setbacks, and residents within the distances specified in Table 6.1 for Category D pipelines. <p>When the EPZ is affected by the proposed amendment, notification to residents in the EPZ/PAZ must occur prior to the filing of the application.</p>	Application deemed nonroutine; licence must be obtained before commencing operations (comprehensive engineering assessment required).
Liner installation	Notification is not mandatory for liner installations.	Licence must be obtained prior to commencing liner installation.

Table 7.1. Well category type and consultation and notification requirements

Category	Name	Type	Description	Personal consultation and confirmation of nonobjection	Notification
B	Wells 0.00 mol/kmol H ₂ S	140	Single well	<ul style="list-style-type: none"> Landowners and occupants with regard to well-site location Landowners and occupants with regard to well-site access Residents within 0.2 km Residents within 0.3 km, if single oil wells with 0.0 mol/kmol H₂S and continuous flaring 	<ul style="list-style-type: none"> Crown disposition holders Local authorities Freehold coal rights owner or coal rights lessee Landowners within 0.1 km Urban authorities within 1.5 km Unlighted airports within 1.6 km Lighted airports within 5 km
		141	Commercial or source water well		
		150	Multiwell pad		

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C	Wells >0.00 mol/kmol H ₂ S <0.01 m ³ /s H ₂ S release rate	280	Single well	<ul style="list-style-type: none"> • Landowners and occupants with regard to well-site location • Landowners and occupants with regard to well-site access • Landowners within 0.1 km with regard to setbacks • Residents within 0.2 km or the EPZ/PAZ radius, whichever is greater 	<ul style="list-style-type: none"> • Crown disposition holders • Local authorities • Freehold coal rights owner or coal rights lessee • Urban authorities within 1.5 km • Unlighted airports within 1.6 km • Lighted airports within 5 km
		290	Multiwell pad		
	Wells ≥ 0.01 m ³ /s but < 0.3 m ³ /s H ₂ S release rate	360	Single well		
		370	Multiwell pad		
D	Wells ≥ 0.3 m ³ /s but < 2.0 m ³ /s H ₂ S release rate	570	Single well	<ul style="list-style-type: none"> • Landowners and occupants with regard to well-site location • Landowners and occupants with regard to well-site access • Landowners within 0.5 km with regard to setbacks • Residents within 0.2 km or the EPZ/PAZ radius, whichever is greater 	<ul style="list-style-type: none"> • Crown disposition holders • Local authorities • Freehold coal rights owner or coal rights lessee • Urban authorities within 1.5 km • Unlighted airports within 1.6 km • Lighted airports within 5 km
E	Wells ≥ 2.0 m ³ /s H ₂ S release rate (deemed nonroutine)	610	Single well	<ul style="list-style-type: none"> • Landowners and occupants with regard to well-site location • Landowners and occupants with regard to well-site access • Landowners within 1.5 km with regard to setbacks • Residents, local authorities, and urban authorities within the EPZ/PAZ 	<ul style="list-style-type: none"> • Crown disposition holders • Freehold coal rights owner or coal rights lessee • Unlighted airports within 1.6 km • Lighted airports within 5 km
	Wells ≥ 0.01 but < 0.1 m ³ /s release rate and within 0.5 km of urban centre (deemed nonroutine)	620	Proximity critical well	<ul style="list-style-type: none"> • Landowners and occupants with regard to well-site location • Landowners and occupants with regard to well-site access • Landowners within 0.1 km with regard to setbacks • Residents and local authorities within 0.2 km or the EPZ/PAZ radius, whichever is greater • Urban authorities within 1.5 km 	<ul style="list-style-type: none"> • Crown disposition holders • Freehold coal rights owner or coal rights lessee • Unlighted airports within 1.6 km • Lighted airports within 5 km
	Wells ≥ 0.1 but < 0.3 m ³ /s release rate and within 1.5 km of urban centre (deemed nonroutine)	621	Proximity critical well	<ul style="list-style-type: none"> • Landowners and occupants with regard to well-site location • Landowners and occupants with regard to well-site access • Landowners within 0.1 km with regard to setbacks • Residents and local authorities within 0.2 km or the EPZ/PAZ radius, whichever is greater • Urban authorities within 1.5 km 	<ul style="list-style-type: none"> • Crown disposition holders • Freehold coal rights owner or coal rights lessee • Unlighted airports within 1.6 km • Lighted airports within 5 km
	Wells ≥ 0.3 but < 2.0 m ³ /s release rate and well is within 5.0 km of urban centre (deemed nonroutine)	622	Proximity critical well	<ul style="list-style-type: none"> • Landowners and occupants with regard to well-site location • Landowners and occupants with regard to well-site access • Landowners within 0.5 km with regard to setbacks • Residents and local authorities within 0.2 km or the EPZ/PAZ radius, whichever is greater • Urban authorities within 5.0 km 	<ul style="list-style-type: none"> • Crown disposition holders • Freehold coal rights owner or coal rights lessee • Unlighted airports within 1.6 km • Lighted airports within 5 km