

EMERGENCY MANAGEMENT REGULATION 217/2017

- Unofficial Copy

Updated To:

[Note: This is an Unofficial Copy. includes B.C. Reg. 202/2023, Sch. 3 amendments (effective September 1, 2023)]

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B.C. Reg. 217/2017

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[Provisions of the *Energy Resource Activities Act*, SBC 2008, c. 36, relevant to the enactment of this regulation: sections 106, 107 and 112]

PART 1 – Definitions and Interpretation

Definitions

1. In this regulation:

"**Act**" means the *Energy Resource Activities Act*;

"**airport zoning area**" means a geographical area that is subject to an airport zoning regulation under the *Aeronautics Act* (Canada);

"**arterial highway**" has the same meaning as in section 1 of the *Transportation Act*;

"**contact information**" means

- (a) a telephone number at which a person can be contacted, and
- (b) an email address, if any, at which a person can be contacted;

"**CSA Z246.2**" means the standard published by the Canadian Standards Association as CSA Z246.2, Emergency preparedness and response for petroleum and natural gas industry systems, as amended from time to time;

"**emergency**" means an incident classified in accordance with section 10 as a level 1, 2 or 3 incident that requires action by a permit holder to protect persons, property or the environment;

"**emergency management system**" means a system for the control, command and coordination of emergency response operations;

"**emergency planning zone**" means a geographical area that encompasses all the hazard planning zones for an energy resource activity that is the subject of a plan;

"**hazard**" has the same meaning as in CSA Z246.2;

"**hazard planning distance**" means a hazard planning distance within the meaning of section 7;

"**hazard planning zone**" means a geographical area

- (a) determined by using the hazard planning distance as a radius, and
- (b) within which persons, property or the environment may be affected by an emergency;

"**incident**" has the same meaning as in CSA Z246.2;

"**local authority**" means a municipality or a regional district;

"**local Indigenous nation**" , in relation to a hazard planning zone, means an Indigenous nation that is identified for the hazard planning zone in a manner specified by the regulator;

"**municipal highway**" has the same meaning as in section 1 of the *Transportation Act*;

"**mutual aid agreement**" has the same meaning as in CSA Z246.2;

"**plan**" means a response contingency plan within the meaning of section 5;

"**program**" means an emergency response program within the meaning of section 3;

"**qualified professional**" has the same meaning as in section 1 of the Drilling and Production Regulation;

"**rights holder**" has the same meaning as in section 1 of the Requirements for Consultation and Notification Regulation;

"**training association**" means a safety training association approved by an official.

[am. B.C. Regs. 50/2021, Sch. 2; 226/2021; 202/2023, Sch. 3.]

Application and interpretation of CSA Z246.2

2. (1) For the purposes of this regulation, a permit holder must comply with CSA Z246.2.
- (2) A reference in a clause of CSA Z246.2 or Annex A of CSA Z246.2 to a term set out in Column 1 of the following table is to be read as a reference to the term set out opposite in Column 2 as that term is defined in this regulation:

Item	Column 1 Term in CSA Z246.2 or Annex A of CSA Z246.2	Column 2 Term as defined in this regulation
1	emergency	emergency
2	emergency planning zone or EPZ	emergency planning zone
3	emergency preparedness and response program or EPRP	program
4	emergency response area	hazard planning zone
5	emergency response plan or ERP	plan

- (3) A reference in a clause of CSA Z246.2 or Annex A of CSA Z246.2 to "operator" is to be read as a reference to "permit holder" as defined in the Act.
- (4) Unless the context otherwise requires, a reference to "should" in a clause of CSA Z246.2 is to be read as a reference to "must".

PART 2 – Programs and Plans

Emergency response program

3. (1) A permit holder must prepare and maintain a program in accordance with CSA Z246.2.
- (2) A permit holder must review and, if necessary, update the program
 - (a) at least once every 3 years,
 - (b) after a significant change occurs in the types of hazards and risks arising from the permit holder's energy resource activities that are the subject of the permit holder's plan,
 - (c) after an evaluation of the response to a level 3 incident is completed in accordance with CSA Z246.2, and
 - (d) at any time the permit holder becomes aware of a deficiency in the program that risks the safety of emergency response staff, the permit holder's employees or the public.
- (3) A program is prescribed for the purposes of section 38 (1) (b) of the Act.
[am. B.C. Reg. 202/2023, Sch. 3.]

Training plan

4. A permit holder must develop a training plan that takes into account all of the elements referred to in clause A.4.9.2 of Annex A of CSA Z246.2.
[en. B.C. Reg. 226/2021.]

Full-scale exercise

- 4.1 (1) In this section:
"full-scale exercise" means a full-scale (major) exercise described in Annex A of CSA Z246.2;
"LNG facility" has the same meaning as in the Liquefied Natural Gas Facility Regulation;
"processing facility" has the same meaning as in the Oil and Gas Processing Facility Regulation.
- (2) A permit holder must conduct a full-scale exercise as follows:
 - (a) at least once every 3 years;
 - (b) before the first time process fluid is introduced to a facility, a pipeline or equipment described in subsection (3);
 - (c) at any time required by an official under section 4.3.
- (3) Subject to subsection (4), the following facilities, pipelines and equipment require a full-scale exercise in accordance with subsection (2) (b):
 - (a) a processing facility;
 - (b) an LNG facility;
 - (c) a petroleum or natural gas pipeline, other than a petroleum or natural gas pipeline that is part of a gathering system or a fuel gas system;
 - (d) any other facility, pipeline or equipment that has
 - (i) a supervisory control and data acquisition (SCADA) system, and
 - (ii) the potential to create a hazard.
- (4) A full-scale exercise is required in relation to the addition of a facility or pipeline or equipment referred to in subsection (3) (a) to (d) to an operating area only if
 - (a) a full-scale exercise has not previously been conducted in relation to another facility or pipeline, or equipment, in the operating area that is of a similar type and nature as the facility, pipeline or equipment to be added, or

- (b) the addition of the facility, pipeline or equipment does not increase the hazard planning zone for the energy resource activity.
- (5) At least 30 days before conducting a full-scale exercise, a permit holder must give the regulator notice that the exercise will be conducted and include with the notice a description of the exercise.

[en. B.C. Reg. 226/2021; am. B.C. Reg. 202/2023, Sch. 3.]

Tabletop exercise

- 4.2** (1) In this section:
"functional exercise" means a functional exercise described in Annex A of CSA Z246.2;
"tabletop exercise" means a tabletop exercise described in Annex A of CSA Z246.2.
- (2) A permit holder must conduct a tabletop exercise or a functional exercise as follows:
- (a) at least once in each year that a full-scale exercise referred to in section 4.1 is not conducted;
 - (b) within 3 months after the first day the permit holder carries out an energy resource activity;
 - (c) within 3 months after a change in the permit holder's emergency response staff, if both of the following conditions are met:
 - (i) there is a change in at least 1/3 of the permit holder's emergency response staff since the permit holder last conducted a tabletop exercise or a functional exercise;
 - (ii) none of the new emergency response staff have previously participated in a tabletop exercise or a functional exercise under the permit holder's program for a similar energy resource activity;
 - (d) as required by an official under section 4.3.
- (3) At least 30 days before conducting a tabletop exercise or a functional exercise, a permit holder must give the regulator notice that the exercise will be conducted and include with the notice a description of the exercise.

[en. B.C. Reg. 226/2021; am. B.C. Reg. 202/2023, Sch. 3.]

If official is not satisfied

- 4.3** If an official is not satisfied that a permit holder has conducted an exercise referred to in section 4.1 or 4.2 in accordance with Annex A of CSA Z246.2, the official may require the permit holder to do one or more of the following:
- (a) conduct the exercise again;
 - (b) provide additional information or training to its employees, directors or officers;
 - (c) implement a system or procedure that the official considers necessary to improve the permit holder's capacity to respond in an emergency.

[en. B.C. Reg. 226/2021.]

Regulator may publish

- 4.4** The regulator may publish information relating to a permit holder's conduct of an exercise, including
- (a) whether an official was satisfied with the permit holder's conduct of the exercise, and

- (b) a requirement imposed by an official under section 4.3.

[en. B.C. Reg. 226/2021; am. B.C. Reg. 202/2023, Sch. 3.]

Response contingency plans

5. (1) Subject to this section, a permit holder must prepare and maintain a plan in accordance with CSA Z246.2.
- (2) If both of the following conditions are met, the permit holder may prepare a single, coordinated plan for more than one of the permit holder's energy resource activities:
- (a) the site-specific hazards and risks of each energy resource activity that would be the subject of a plan are the same;
 - (b) the same emergency response staff are assigned, in accordance with the permit holder's emergency management system, to the energy resource activities.
- (3) A permit holder must prepare a plan in 2 parts so that the regulator can make one part of the plan publicly available.
- (4) A permit holder must not include the following information in the part of the plan to be made publicly available:
- (a) personal information, as defined in the *Freedom of Information and Protection of Privacy Act*;
 - (b) information the permit holder considers to be confidential business information.
- (5) If part of the emergency planning zone for an energy resource activity is located within an airport zoning area, a plan for the energy resource activity must include contact information for the operator of the airport.
- (6) A plan is prescribed for the purposes of section 38 (1) (b) of the Act.

[am. B.C. Regs. 226/2021; 202/2023, Sch. 3.]

Response contingency plans required

6. A permit holder must not carry out an energy resource activity that is the subject of a plan unless the permit holder has, in respect of a plan,
- (a) determined that there is no emergency planning zone, or
 - (b) complied with section 5.

[am. B.C. Reg. 202/2023, Sch. 3.]

Hazard planning distances

7. (1) For the purposes of this regulation, a hazard planning distance is
- (a) the greatest horizontal distance calculated under subsection (2) or (3), as applicable, in respect of an energy resource activity that is the subject of a plan, and
 - (b) measured from the site of the energy resource activity.
- (2) For a hazard involving hydrogen sulphide, the hazard planning distance must be equal to or greater than one of the following:
- (a) a distance recommended for the hazard in an assessment conducted by a qualified professional;
 - (b) a distance determined for the hazard using a table, software application or other resource evaluated and approved by a qualified professional;
 - (c) a distance determined in accordance with Schedule A, B or C, as applicable.

- (3) For a hazard other than a hazard involving hydrogen sulphide, the hazard planning distance must be equal to or greater than one of the following:
- (a) a distance recommended for the hazard in an assessment conducted by a qualified professional;
 - (b) a distance determined for the hazard using a table, software application or other resource evaluated and approved by a qualified professional;
 - (c) unless the hazard is a well, pipeline, or other energy resource activity with a fluid capacity greater than 200 m³, a distance recommended for the hazard by the Emergency Response Guidebook published by Transport Canada, as amended from time to time.

[en. B.C. Reg. 226/2021; am. B.C. Reg. 202/2023, Sch. 3.]

Review and update of plans

8. (1) A permit holder must review and, if necessary, update the information included in a plan
- (a) at least once a year,
 - (b) after an evaluation of the response to an emergency is completed in accordance with CSA Z246.2,
 - (c) if the site-specific hazards and risks of the energy resource activity that is the subject of the plan change significantly,
 - (d) at any time the permit holder becomes aware of a deficiency in the plan that risks the safety of emergency response staff, the permit holder's employees, or the public, and
 - (e) if a mutual aid agreement is cancelled, expires or is otherwise terminated.
- (2) As part of the review referred to in subsection (1), a permit holder must
- (a) review the information included in the plan,
 - (b) make reasonable efforts to determine whether the persons or other entities referred to in section 13 (1) (a) to (g) have changed, and
 - (c) consider any responses to requests under section 13 (2) (d) (ii) received after the permit holder submitted the plan or updated information to the regulator.
- (3) If, as a result of reviewing the plan, the permit holder determines that the persons or other entities referred to in section 13 (1) (a) to (g) have changed, the permit holder must, as soon as possible, give the information set out in section 13 (2) respecting the plan to the persons or other entities not previously given the information.
- (4) If, as a result of updating the plan, the information given under section 13 (2) has changed, the permit holder must, as soon as possible, give the updated information to those persons or other entities referred to in section 13 (1) (a) to (g) who are affected by the change.
- (5) A permit holder must give information that is updated under subsection (1) to all emergency response staff to whom powers and duties are assigned in accordance with the permit holder's emergency management system.

[am. B.C. Reg. 202/2023, Sch. 3.]

Access to plans

9. A permit holder must make a copy of the permit holder's plans, in paper or electronic form, available to emergency response staff as follows:
- (a) at the permit holder's head office, a copy of each of the permit holder's plans;
 - (b) at the permit holder's regional offices, a copy of each plan relevant to the regional office.

Incident classification and management

10. (1) Immediately after a permit holder becomes aware of an incident, the permit holder must classify the incident according to the event or consequence in the Incident Classification Matrix in Schedule D that most closely describes the most severe event or consequence of the incident.
- (2) A permit holder must adopt the Incident Command System as the permit holder's emergency management system.
- [am. B.C. Regs. 226/2021; 181/2022, App. 2.]

During emergencies

11. (1) When an emergency occurs, a permit holder must do the following:
- (a) immediately respond to the emergency in accordance with the permit holder's plan;
 - (b) notify local Indigenous nations as soon as possible, after the permit holder has taken any immediate actions necessary
 - (i) for public safety, or
 - (ii) to minimize immediate environmental impacts;
 - (c) notify the regulator within one hour of becoming aware of the incident.
- (2) During an emergency involving a special sour well, a permit holder must do all of the following:
- (a) ensure that a person certified in accordance with subsection (4) is available and equipped to ignite the well within the time limits set out in the plan in respect of which the emergency planning zone was determined;
 - (b) ensure that a dual ignition system is on site during
 - (i) drilling or completion operations, or
 - (ii) workover operations being carried out at any time when the wellhead is not in place;
 - (c) ensure that a person authorized to ignite flammable liquids or ignitable vapours released from the well is on site.
- (3) For the purposes of subsection (2), a sour well is special if either of the following applies:
- (a) the hydrogen sulphide release rate from the well is equal to or greater than 2.0 m³/s;
 - (b) the hydrogen sulphide release rate from the well is less than 2.0 m³/s but greater than 0.5 m³/s and the well is located within a distance that is twice the hazard planning distance from the corporate boundaries of an urban centre.
- (4) For the purposes of subsection (2) (a), the person must have a vapour plume ignition certificate issued by a training association.

[am. B.C. Regs. 226/2021; 202/2023, Sch. 3.]

Notify regulator after a minor incident

- 11.1 A permit holder must notify the regulator within 24 hours of becoming aware of an incident classified in accordance with section 10 as a minor incident.

[en. B.C. Reg. 226/2021; am. B.C. Reg. 202/2023, Sch. 3.]

Emergency communication system

12. Each year, a permit holder must

- (a) test the permit holder's procedures for communication during an emergency to ensure the procedures are effective, and
- (b) ensure any equipment needed by the permit holder for communication during an emergency is functional.

PART 3 – General

Obligation to provide information – general

13. (1) Before submitting a plan to the regulator, a permit holder must give the information set out in subsection (2) to the following persons or other entities:
 - (a) a person who occupies land that is located within the emergency planning zone;
 - (b) a local authority, if
 - (i) any part of the emergency planning zone is located within the boundary of the local authority's territory, or
 - (ii) the local authority is identified in the plan as a party to a mutual aid agreement;
 - (c) the government of Canada, if an existing building or structure owned by the government of Canada is within the emergency planning zone;
 - (d) a local Indigenous nation;
 - (e) a rights holder, if an area subject to a right of the rights holder is located within the emergency planning zone;
 - (f) the ministry of the minister responsible for the administration of the *Transportation Act* and the municipal council, if any part of the emergency planning zone is located within a municipality and within the right of way of an arterial highway or municipal highway;
 - (g) a health authority, if any part of the emergency planning zone is located within the geographic area for which the health authority is responsible;
 - (h) the operator of an airport, if part of the airport zoning area for the airport is located within the emergency planning zone.
- (2) The information given under subsection (1) must include all of the following:
 - (a) the name and contact information of the permit holder;
 - (b) a map that shows the location of the emergency planning zone in relation to
 - (i) roads, including energy resource roads,
 - (ii) dwellings, schools and public facilities, and
 - (iii) private property the permit holder has identified in a plan as property that may potentially be used by the public in an emergency;
 - (c) a description of
 - (i) the site-specific hazards and risks of the energy resource activity that is the subject of the plan,
 - (ii) how the permit holder's response to an emergency may affect the person or other entity receiving the information,
 - (iii) how the permit holder will notify the person or other entity receiving the information if and when the permit holder thinks the person or other entity should shelter in place or evacuate in an emergency, and
 - (iv) how the person or other entity receiving the information can get to safety in an emergency;
 - (d) a statement requesting that the person or other entity receiving the information provide to the permit holder
 - (i) the name and contact information of a contact person,

- (ii) a description of how the person or other entity may be affected by an emergency, and
 - (iii) if the person or other entity is a local Indigenous nation, a description of any sites or areas in the emergency planning zone that are likely to be in use by members of the local Indigenous nation.
- (3) If a permit holder receives a response to a request under subsection (2) (d) (ii) or (iii) before submitting a plan to the regulator, the permit holder must consider the response in the preparation of the plan.

[am. B.C. Regs. 226/2021; 202/2023, Sch. 3.]

Obligation to provide information – temporary change

- 14.** (1) This section applies if both of the following circumstances exist:
- (a) there is a change in operations that temporarily increases the site-specific hazards and risks of an energy resource activity that is the subject of a plan;
 - (b) in respect of the plan, a permit holder determines an expanded emergency planning zone because of the temporary increase in the site-specific hazards and risks of the energy resource activity.
- (2) In the circumstances set out in subsection (1), a permit holder must give a person or other entity referred to in section 13 (1) (a) to (g) the following information:
- (a) all of the information described in section 13 (2) if the person or other entity located within the expanded emergency planning zone was not previously given that information;
 - (b) only the information described in section 13 (2) (b) and (c) (i) and (ii) if the person or other entity located within the expanded emergency planning zone was previously given the information described in section 13 (2).

[am. B.C. Reg. 202/2023, Sch. 3.]

Submission of information to regulator

- 15.** (1) Within 14 days after appointing a coordinator in accordance with clause 4.6 of CSA Z246.2, a permit holder must submit to the regulator the name and contact information of the coordinator.
- (2) Within 60 days after completing an exercise described in sections 4.1 or 4.2, a permit holder must submit to the regulator the report described in section 16 (2).
- (3) Within 30 days after preparing a plan under section 5, a permit holder must submit to the regulator, in both paper and electronic form, a copy of the plan.
- (4) Within 30 days after reviewing a plan under section 8, a permit holder must submit to the regulator, in both paper and electronic form, the following, as applicable:
- (a) a copy of any information updated under section 8 (1);
 - (b) if no information is updated under section 8 (1), a record showing the date the plan was reviewed and the name of the permit holder's representative who is responsible for the review.

[am. B.C. Regs. 226/2021; 202/2023, Sch. 3.]

Reports and records

- 16.** (1) A permit holder must prepare and maintain a written record of participants in training or in an exercise described in sections 4.1 or 4.2.
- (2) On completing an exercise described in sections 4.1 or 4.2, a permit holder must prepare a report that does all of the following:

- (a) states whether the objectives of the exercise were met;
 - (b) makes recommendations for improvement, including improvement to the exercise plan or training plan;
 - (c) includes a strategy to implement the recommendations for improvement referred to in paragraph (b).
- (2.1) If spillage that is reportable under section 91.2 (1) (a) of the *Environmental Management Act* occurs in relation to an energy resource activity, a permit holder for the energy resource activity must provide a written report to the regulator at the following times:
- (a) within 30 days of the date on which the spillage was discovered;
 - (b) at least once every 30 days after the first report, until the spillage is contained and eliminated, and
 - (c) within 30 days of the date on which the spillage has been contained and eliminated.
- (3) A permit holder must prepare a report of the results of an evaluation of a response to an emergency and maintain the report until the permit for the energy resource activity that is the subject of the plan is cancelled by the regulator or declared by the regulator to be spent.
- (4) A report under subsection (3) must include
- (a) a description of the emergency, including the cause or suspected cause,
 - (b) a description of the permit holder's response to the emergency, and
 - (c) an assessment of the permit holder's response.
- (5) A report or a record required by this regulation or CSA Z246.2 is prescribed for the purposes of section 38 (1) (a) of the Act.

[am. B.C. Regs. 226/2021; 202/2023, Sch. 3.]

Information in writing

17. Information required to be given or submitted under this regulation must be given or submitted in writing and, except for the information required by section 15 (3) and (4), may be in either paper or electronic form.

Exemptions

18. (1) An official may exempt a permit holder from complying with one or more provisions of this regulation if the official is satisfied that, in the circumstances,
- (a) compliance with the provision or provisions is not reasonably practicable, or
 - (b) the exemption is in the public interest.
- (2) In granting an exemption under subsection (1), an official may impose any conditions on the exemption the official considers necessary.

Schedule A*(section 7)***Facility Distances**

Hazard planning distances for facilities are determined by reference to the maximum potential hydrogen sulphide (H₂S) release volume from any pipeline entering or leaving the facility, calculated in accordance with the applicable of the following equations. The hazard planning distance for facilities is the distance indicated on the vertical axis of Chart A that corresponds to the release volume indicated on the horizontal axis of the chart, as indicated by the graphline on the chart.

Equations**Gas pipeline H₂S release volume**

The equation for calculating the maximum potential H₂S release volume from a gas pipeline is as follows:

$$V = \frac{2.232 \times 10^{-6} D^2 L (P + 101.325) H}{Z(T + 273)}$$

where

V = maximum potential H₂S release volume at standard conditions in cubic metres (m³);

D = internal diameter of pipeline in millimetres (mm);

L = length of pipeline between emergency shutdown valves in kilometres (km);

P = licensed maximum operating pressure in kilopascals (kPa);

H = licensed H₂S content (moles/kilomole) for the pipeline;

Z = compressibility factor at reduced pressure and reduced temperature;

T = pipeline minimum operating temperature in degrees Celsius (°C).

Sour liquid multiphase pipeline H₂S release volume

The equation for calculating the maximum potential H₂S release volume from a sour liquid multiphase pipeline is as follows:

$$V = \frac{(GLR \times GVF)}{1\,000(GLR + GVF)} \times V_{pl} \times H$$

where

V = maximum potential H₂S release volume at standard conditions in cubic metres (m³);

GLR = produced gas-liquid ratio at maximum operating pressure (MOP) (m³/m³);

GVF = ratio of produced gas volume at standard conditions to the volume of gas at MOP (m³/m³);

V_{pl} = volume of the pipeline in cubic metres (m³);

H = licensed H₂S content (moles/kilomole) for the pipeline.

Gas multiphase pipeline H₂S release volume

The equation for calculating the maximum potential H₂S release volume from a gas multiphase pipeline is as follows:

$$V = 0.785 \times 10^{-6} D^2 L \frac{(GLR \times GVF)}{(GLR + GVF)} \times H$$

where

V = maximum potential H₂S release volume at standard conditions in cubic metres (m³);

D = internal diameter of pipeline in millimetres (mm);

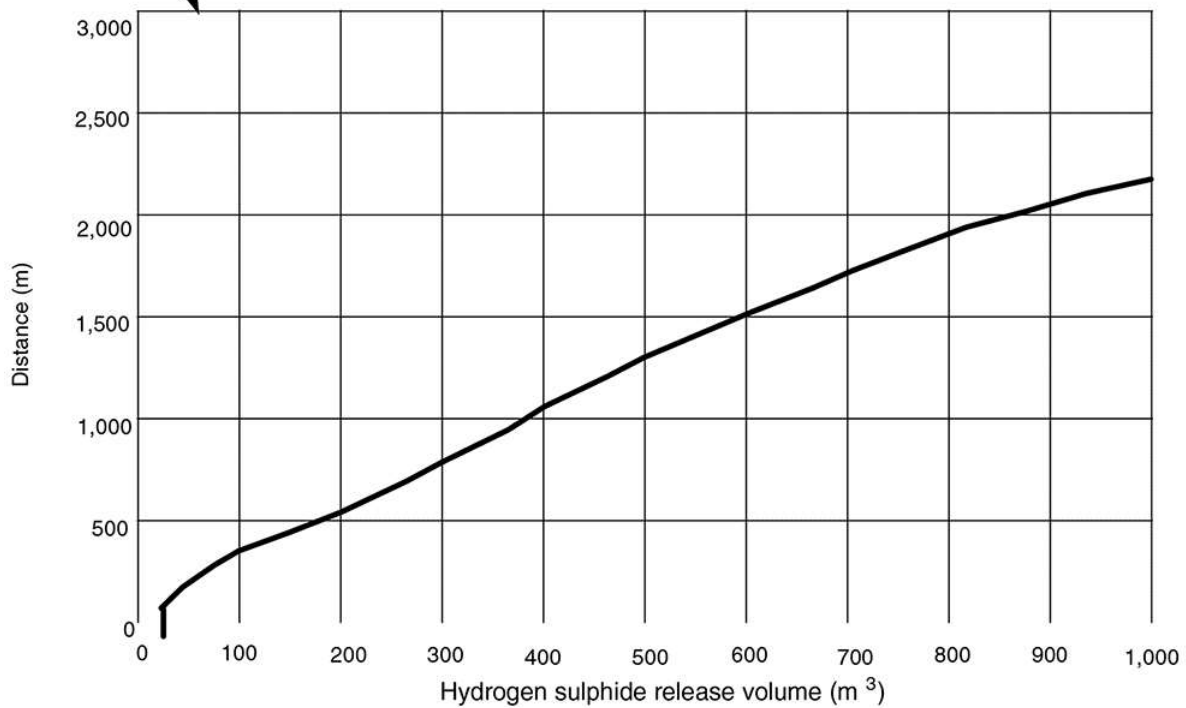
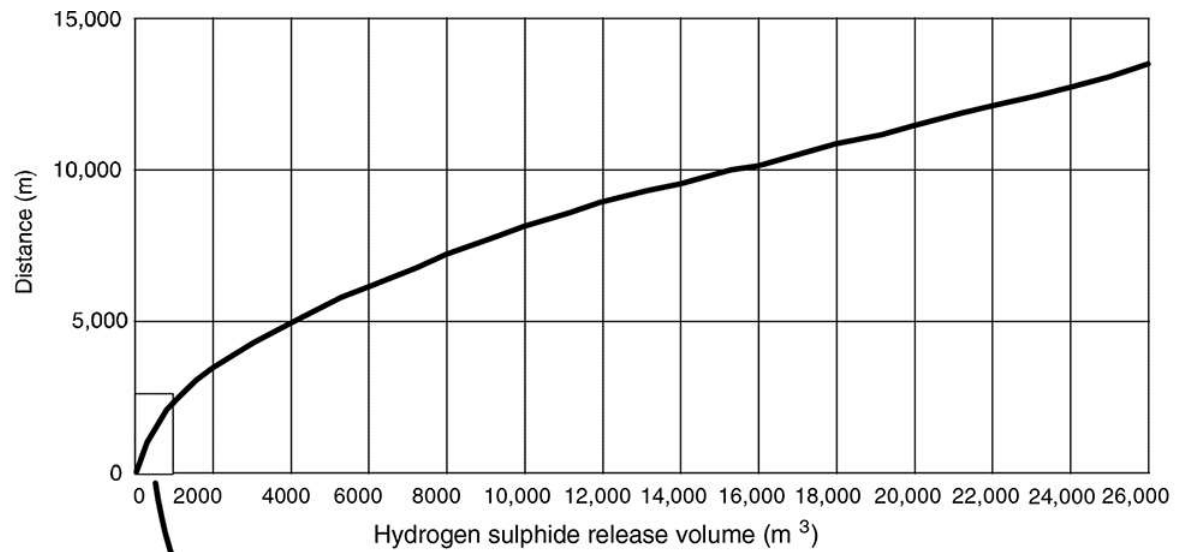
L = length of pipeline between emergency shutdown valves in kilometres (km);

GLR = produced gas-liquid ratio at maximum operating pressure (MOP) (m³/m³);

GVF = ratio of produced gas volume at standard conditions to the volume of gas at MOP (m³/m³);

H = licensed H₂S content (moles/kilomole) for the pipeline.

Chart A: Facility Distances



Schedule B*(section 7)***Well Distances**

Hazard planning distances for wells are determined by reference to the maximum potential hydrogen sulphide (H₂S) release rates from a well during disposal, drilling, completion, re-completion or production operations.

H₂S Release Rates**Disposal operations**

The maximum potential H₂S release rates during disposal operations must be determined using the maximum reservoir pressure value set out in the order, made under section 75 of the Act, designating the disposal well as a special project for disposal operations.

Drilling operations

The maximum potential H₂S release rates during drilling operations must be determined as follows:

- 1 For a proposed well, the maximum gas rate (AOF) values and maximum H₂S concentrations for each H₂S-bearing formation must be determined for each of at least 5 wells drilled and tested in an analogous geological area or pool within 5 km of the proposed well.
- 2 The H₂S release rates for all potential H₂S-bearing formations in the proposed well must be determined based on the highest AOF and highest H₂S concentration for each formation and the sum of the H₂S release rates for all the formations that will be open to the well bore during drilling operations.
- 3 If appropriate data does not exist or is otherwise inadequate, the hazard planning distance is 3 km.

Completion or re-completion operations

For completion or re-completion operations in an existing well, data from the appropriate formation in the well must be used to determine H₂S release rates, but if the appropriate data does not exist or is otherwise inadequate, H₂S release rates must be determined in accordance with the equations and notes set out below for production operations.

Production operations

The maximum potential H₂S release rates during production operations must be determined in accordance with the following equation and the notes that follow:

$$\text{H}_2\text{S Release Rate} = \frac{\text{H}_2\text{S}\% \times \text{AOF}}{8\,640\,000}$$

where

$H_2S\%$ = volume of H_2S expressed as a percentage of the total volume of gas;

AOF = maximum gas rate (m^3/d).

Notes:

- 1 For gas wells, if an AOF test has been conducted and value determined for a formation in a well, that value must be used. If an AOF test value has not been determined, a theoretical AOF must be calculated using the following formula:

$$AOF = \frac{\text{Gas Test Rate} \times Pr^2}{(Pr^2 - Pf^2)}$$

where

$H_2S\%$ = volume of H_2S expressed as a percentage of the total volume of gas;

AOF = maximum gas rate (m^3/d).

- 2 For oil wells, the AOF must be calculated using the following formula:

$$AOF = \frac{\text{Oil Test Rate} \times GOR}{[1 - 0.2 \times (Pf/Pr) - 0.8 \times (Pf/Pr)^2]}$$

where

AOF = maximum gas rate (m^3/d);

Oil Test Rate = oil flow rate during testing (m^3/d);

GOR = gas-oil ratio from oil test rate well (m^3/m^3);

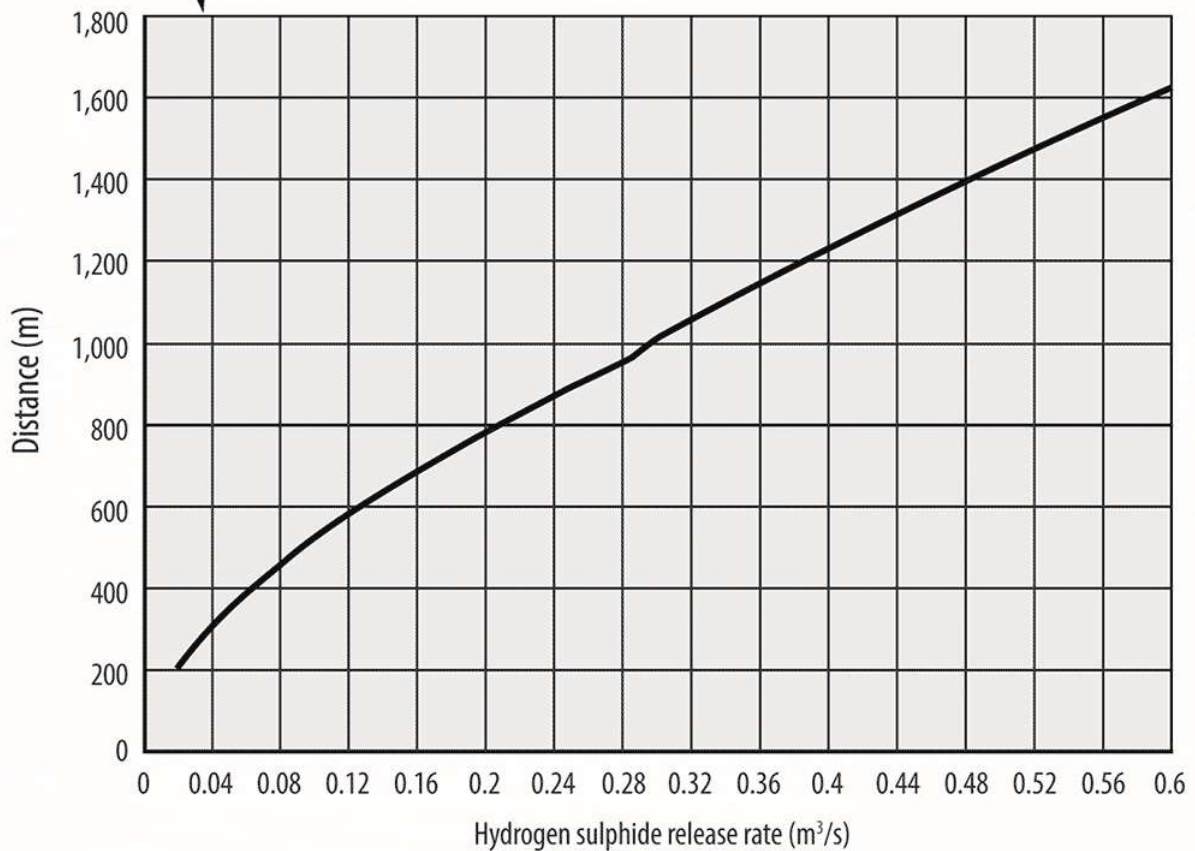
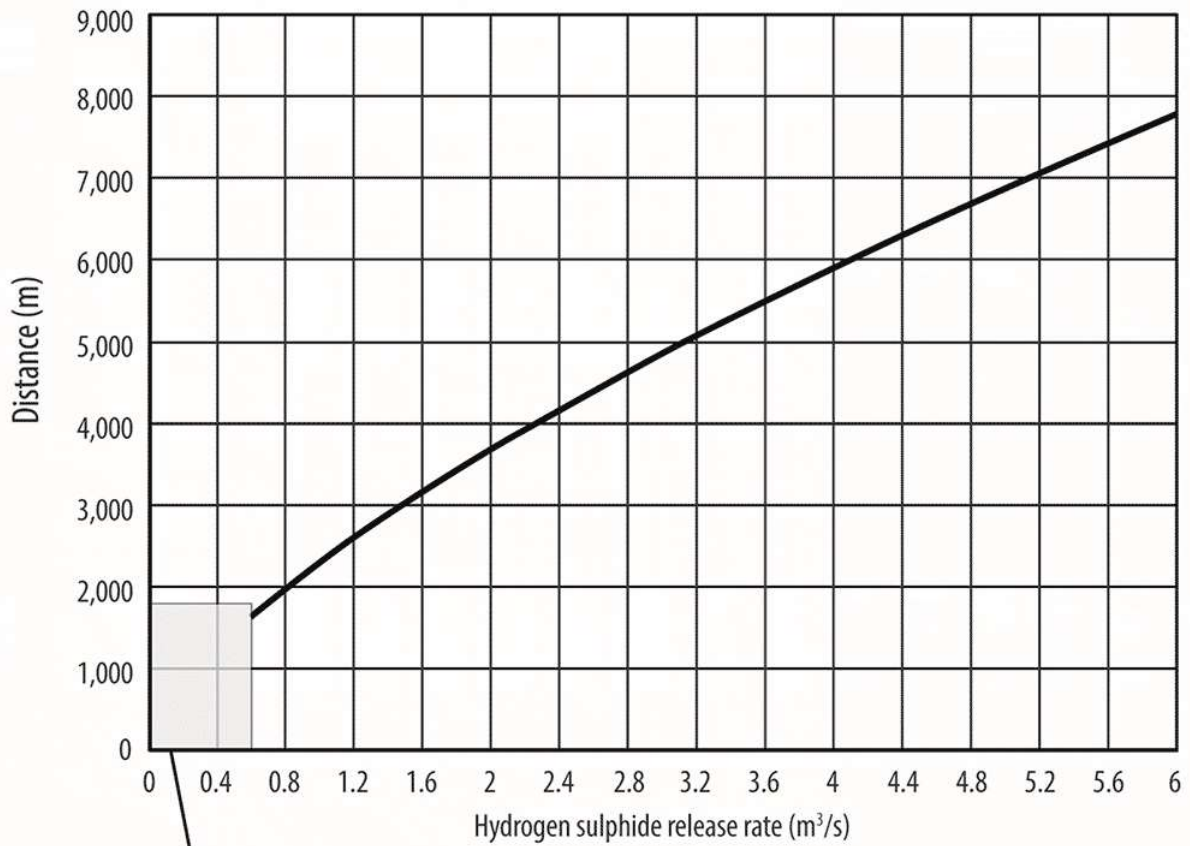
Pf = flowing bottom hole pressure (kPa);

Pr = reservoir pressure (kPa).

Determination of Well Distances

The hazard planning distance for wells is the distance indicated on the vertical axis of Chart B that corresponds to the release rate indicated on the horizontal axis of the chart, as indicated by the graphline on the chart.

Chart B: Well Distances



Schedule C*(section 7)***Pipeline Distances**

Hazard planning distances for pipelines are determined by reference to the maximum potential hydrogen sulphide (H₂S) release volume from the pipeline, calculated in accordance with the applicable of the following equations. The hazard planning distance for pipelines is the distance indicated on the vertical axis of Chart C that corresponds to the release volume indicated on the horizontal axis of the chart, as indicated by the graphline on the chart.

Equations**Gas pipeline H₂S release volume**

The equation for calculating the maximum potential H₂S release volume from a pipeline is as follows:

$$V = \frac{2.232 \times 10^{-6} D^2 L (P + 101.325) H}{Z(T + 273)}$$

where

V = maximum potential H₂S release volume at standard conditions in cubic metres (m³);

D = internal diameter of pipeline in millimetres (mm);

L = length of pipeline between emergency shutdown valves in kilometres (km);

P = licensed maximum operating pressure in kilopascals (kPa);

H = licensed H₂S content (moles/kilomole) for the pipeline;

Z = compressibility factor at reduced pressure and reduced temperature;

T = pipeline minimum operating temperature in degrees Celsius (°C).

Sour liquid multiphase pipeline H₂S release volume

The equation for calculating the maximum potential H₂S release volume from a sour liquid multiphase pipeline is as follows:

$$V = \frac{(GLR \times GVF)}{1\,000(GLR + GVF)} \times V_{pl} \times H$$

where

V = maximum potential H₂S release volume at standard conditions in cubic metres (m³);

GLR = produced gas-liquid ratio at maximum operating pressure (MOP) (m³/m³);

GVF = ratio of produced gas volume at standard conditions to the volume of gas at MOP (m³/m³);

V_{pl} = volume of the pipeline in cubic metres (m^3);

H = licensed H_2S content (moles/kilomole) for the pipeline.

Gas multiphase pipeline H_2S release volume

The equation for calculating the maximum potential H_2S release volume from a gas multiphase pipeline is as follows:

$$V = 0.785 \times 10^{-6} D^2 L \frac{(GLR \times GVF)}{(GLR + GVF)} \times H$$

where

V = maximum potential H_2S release volume at standard conditions in cubic metres (m^3);

D = internal diameter of pipeline in millimetres (mm);

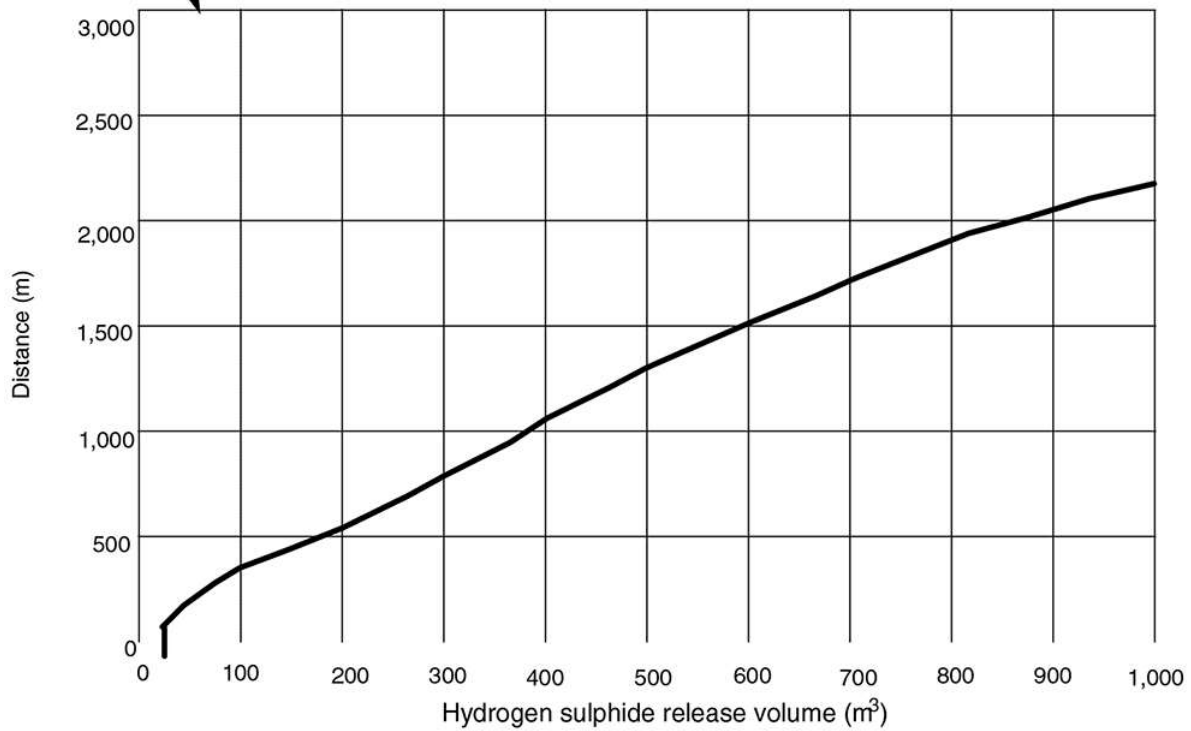
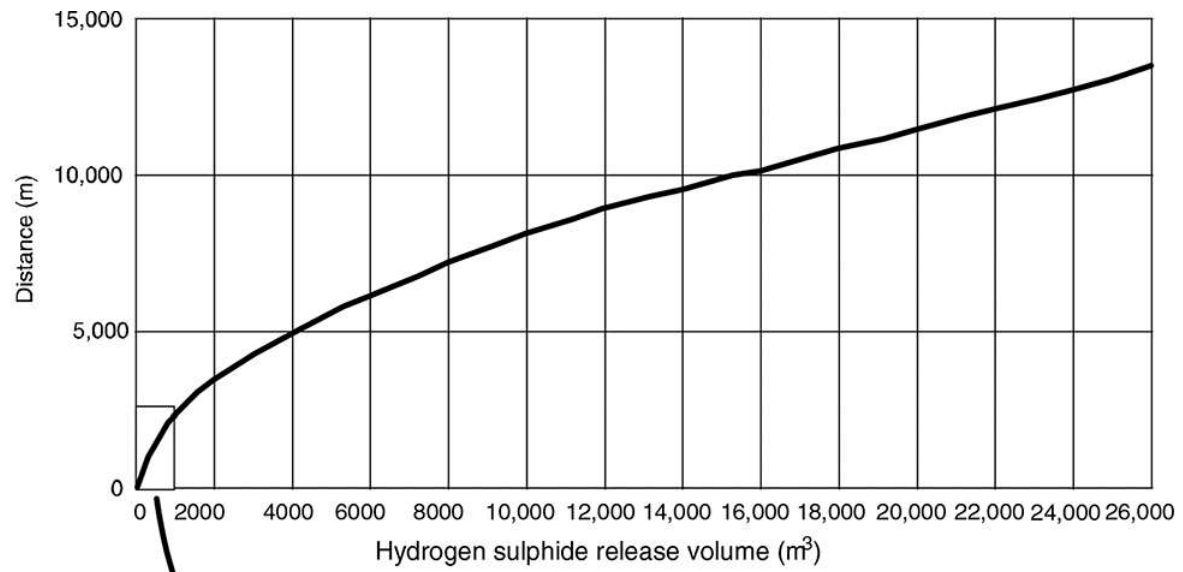
L = length of pipeline between emergency shutdown valves in kilometres (km);

GLR = produced gas-liquid ratio at maximum operating pressure (MOP) (m^3/m^3);

GVF = ratio of produced gas volume at standard conditions to the volume of gas at MOP (m^3/m^3);

H = licensed H_2S content (moles/kilomole) for the pipeline.

Chart C: Pipeline Distances



Schedule D

[am. B.C. Reg. 226/2021.]

(section 10)

Incident Classification Matrix

The classification of an incident is determined for each event or consequence in the following matrix by identifying the probability of escalation or control of the event or consequence,

Item	Event or consequence	Probability of escalation or control				
		Uncontrolled; control unlikely in near term	Escalation possible; under or imminent control	Escalation unlikely; controlled or likely imminent control	Escalation highly unlikely; controlled or imminent control	Will not escalate; no hazard; no monitoring required
1	<ul style="list-style-type: none"> Major on-site equipment or infrastructure loss Persistent and malicious equipment damage or tampering Liquid spill or gas release beyond site, affecting persons, property or the environment 	Level 3 incident	Level 3 incident	Level 2 incident	Level 2 incident	Level 1 incident
2	<ul style="list-style-type: none"> Major on-site equipment failure Malicious equipment damage or tampering Liquid spill or gas release beyond site, potentially affecting persons, property or the environment 	Level 3 incident	Level 2 incident	Level 2 incident	Level 1 incident	Level 1 incident

3	<ul style="list-style-type: none"> • Major on-site equipment damage • Kick size in excess of 3 cubic metres or shut-in casing pressure in excess of 1 000 kilopascals • Persistent / multiple minor vandalism or security incidents • Liquid spill or gas release on site or potentially beyond site, not affecting persons, property or the environment 	Level 2 incident	Level 2 incident	Level 1 incident	Level 1 incident	Minor incident
4	<ul style="list-style-type: none"> • Moderate on-site equipment damage • Minor vandalism or facility security incident • Liquid spill or gas release confined to site 	Level 2 incident	Level 1 incident	Level 1 incident	Minor incident	Minor incident
5	<ul style="list-style-type: none"> • No consequential impacts 	Level 1 incident	Level 1 incident	Minor incident	Minor incident	No reporting requirement

[Provisions of the *Energy Resource Activities Act*, SBC 2008, c. 36, relevant to the enactment of this regulation: sections 106, 107 and 112]