

Rule 020

Rules Respecting Gas Utility Pipelines

The Alberta Utilities Commission has approved amendments to this rule on November 15, 2017, which are effective on December 1, 2017.

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1 Introduction

1.1 Application

This rule applies to applications for the construction, operation, or modification of gas utility pipeline(s) or pipeline installation(s) of B category < 0.30 kilopascals (kPa) hydrogen sulphide (H₂S) partial pressure (pp); to flaring, incinerating and venting at gas utility pipelines and pipeline installations; and storage at pipeline installations.

1.2 Definitions

In this rule:

- (a) “act” means the [Alberta Utilities Commission Act](#);
- (b) “Commission” means the Alberta Utilities Commission;
- (c) “compressor station” means a pipeline installation which is listed on the associated pipeline licence;
- (d) “gas utility pipeline” has the same meaning as in the [Gas Utilities Act](#);
- (e) “licensee” means the holder of a licence for a pipeline according to the records of the Commission; and
- (f) “pipeline installations” has the same meaning as in Section 1(1)(l) of the *Pipeline Act*. Compressor stations are the only pipeline installations under Rule 020 that must be listed on the application.

Part 1: Applications for gas utility pipelines

2 Participant involvement

2.1 Requirements

An applicant must develop and complete the participant involvement program prior to filing a gas utility pipeline development application.

2.2 Consultation and notification

- (1) An applicant must ensure that the participant involvement program includes the radius recommended by tables 6.1 and 6.2.
- (2) The applicant must include all persons whose rights may be directly and adversely affected by the gas utility pipeline application. This includes parties with a direct interest in land, such as landowners, residents, occupants, other industry parties, local authorities, municipalities and other parties who have a right to conduct an activity on the land, such as Crown disposition holders.
- (3) The applicant must include people with special needs who reside in the area; for example, individuals with pre-existing medical conditions and those who require evacuation assistance. While these people are to be included, sensitive materials and information must be kept confidential.

- (4) The applicant must allow participants a minimum of 14 calendar days to receive, consider, and respond to notification of the proposed gas utility pipeline. The applicant may file an application prior to the 14-calendar-day period if certain conditions have been met. Refer to Section 2.4.2, for complete details.
- (5) The applicant is expected to consult with or to notify other parties that express an interest in the proposed gas utility pipeline whether located inside or outside the radius in tables 6.1 and 6.2, and allow the parties the opportunity to obtain information specific to the proposed gas utility pipeline and to understand its possible impacts.
- (6) During the planning of its participant involvement program, an applicant will have assessed its need to reach the broader public and may determine that an information session or public open house meeting is required. When holding broader public meetings or open houses, the applicant must disclose the same project-specific information as it would to those involved in personal consultation and notification. However, information sessions or public open houses may not be a substitute for meeting consultation requirements.

2.3 Information packages

- (1) An applicant must develop and distribute information packages to all persons included in the participant involvement program.
- (2) The applicant must use language and terminology in the written materials so that the participants can clearly understand the details of the proposed gas utility pipeline and the impact(s) it may have upon them. The information package must include the following Commission public information document:

- [Public involvement in a proposed utility development](#)

and the following specific details of the proposed gas utility pipeline:

1. Applicant name and contact numbers for further information.
2. Emergency contact number of the applicant/licensee.
3. Location of proposed gas utility pipeline development.
4. A description (category type) of the proposed gas utility pipeline development (e.g., gas transmission pipeline or facility).
5. Need for the proposed development and explanation of how it fits with existing and future plans.
6. Type of substance(s) that will be transported.
7. Description of proposed on-site equipment.
8. A description of the continuous flaring, incinerating, and/or venting that meets the information requirements of Part 2 of this rule.
9. Potential sources of emissions and odours during normal operating conditions (including trucking operations) and measures to control or eliminate them.
10. Proposed project schedule for construction and start-up.

11. Anticipated noise level and description of proposed noise attenuation measures (Rule 012: [Noise Control](#)), if required.
 12. Traffic impacts (types of vehicular traffic to be expected, duration, frequency and dust control measures).
- (3) If any of the above project details are not applicable to the proposed gas utility pipeline development, the applicant's project-specific information letter must explain why the detail is not applicable.

2.4 Implementing the participant involvement program

- (1) An applicant must:
- distribute the project-specific information package and Commission public information documents listed in Section 2.3
 - respond to participants' questions and concerns
 - discuss options, alternatives, and mitigating measures
 - seek confirmation of non-objection through cooperative efforts
- (2) The applicant must inform all persons included in the participant involvement program by correspondence and information updates during the development, implementation, and outcome of the proposed gas utility pipeline or if the application is withdrawn.
- (3) If the scope of the gas utility pipeline changes, such as a change to the surface location, the applicant must notify all parties included in the initial consultation program of the proposed change.
- (4) If the gas utility pipeline changes results in the inclusion of new participants, the applicant must meet all participant involvement requirements in regard to the new participants as well.
- (5) The applicant must advise all persons included in its participant involvement program if it decides not to proceed with the proposed project after having initiated a participant involvement program.
- (6) The applicant must provide notification to all participants and the Commission when a change in circumstances does not allow previous commitments to be met.

2.4.1 Personal consultation and confirmation of non-objection

- (1) An applicant must conduct face-to-face visits or telephone conversations with all identified parties. A company representative with full knowledge of the overall plans and direction of future development options must be available to answer questions either in person or by telephone.
- (2) An applicant may distribute the required information packages referred to in Section 2.3 during the personal consultation meeting or forwarded later as follow-up to the personal consultation phone call or meeting. Packages may be forwarded by courier, mail, fax, email, or other means as agreed upon by the parties.

- (3) If the participant does not want a copy of the required information package(s), the applicant must document the refusal. The refusal of an information package does not require that a non-routine application be submitted.
- (4) When confirmation of non-objection is required, the applicant must inform the Commission that there are no outstanding concerns or objections to the proposed gas utility pipeline.
- (5) The applicant must keep a log of the dates that personal consultation and confirmation of non-objection occurred, when materials were distributed and to whom.
- (6) The applicant is accountable for the outcomes of personal consultation completed on its behalf by contracted personnel. Therefore, the applicant must ensure that individuals conducting personal consultation on its behalf:
 - (a) possess a sound understanding of the participant involvement requirements, and
 - (b) use appropriate language and terminology in the written materials so that the participants can clearly understand the details of the proposed development and the impact it may have upon them.

2.4.2 Notification

- (1) Notification differs from personal consultation in that the initial communication may take place through written correspondence rather than face-to-face or in telephone conversations. An applicant may choose to use registered mail or courier to ensure that the participants receive the information packages or to document attempts made to notify the participants. If the notified person indicates he or she prefers personal consultation, a representative of the applicant with full knowledge of the proposed gas utility pipeline must be available to answer questions either in person or by telephone.
- (2) An applicant must allow a minimum of 14 calendar days for the participants to receive, consider, and respond to the notification and be prepared to discuss the project as necessary.
- (3) If an applicant has fulfilled the personal consultation requirements in lieu of the notification requirements, the applicant may file the gas utility pipeline development application once it has completed personal consultation and acquired confirmation of non-objection, as described in Table 6.1.
- (4) The applicant is accountable for the outcome of notification completed on its behalf by contracted personnel. Therefore, the applicant must ensure that individuals conducting notification on its behalf:
 - (a) possess a sound understanding of participant involvement requirements and expectations, and

- (b) use appropriate language and terminology in the written materials so that the participants can clearly understand the details of the proposed development and the impact it may have upon them.

2.4.3 Extended absences

- (1) In cases where landowners and residents may be away for extended periods, such as on vacation, or they may reside out of the province and an applicant must personally consult with those persons and is unable to do so, the applicant must use courier or registered mail to send letters and information packages.
- (2) If the applicant is unable to fulfil all participant involvement requirements, it must file a non-routine application and demonstrate the efforts made to contact the participants in the notification radius.

2.4.4 Addressing concerns or objections

- (1) At any time during the planning of a gas utility pipeline, an applicant must attempt to address outstanding concerns or objections raised by persons that may be affected
 - (a) to reconcile differences where possible, and
 - (b) to obtain confirmation of non-objection.
- (2) The applicant must attempt to address all questions and concerns or objections regarding the proposed gas utility pipeline prior to filing and during the review of the gas utility pipeline application, regardless of whether the person involved is inside or outside the radius set out in tables 6.1 and 6.2.
- (3) To address outstanding concerns or objections, an applicant may choose to:
 - meet with objectors and attempt to resolve issues through informal discussions
 - pursue resolution through a more formalized third-party mediation process
 - request that the Commission hold a hearing
- (4) If the applicant pursues discussion or mediation and the concerns or objections are subsequently resolved and confirmation of non-objection is obtained where required, the applicant may file a routine application. However, if the application is non-routine for technical reasons, the applicant must file a non-routine application. If concerns or objections cannot be resolved, an applicant must file a non-routine application on the basis of participant involvement. When filing a non-routine application for reasons of participant involvement, an applicant must include a written summary of the outstanding concerns or objections to the application.

2.4.5 Financial compensation

- (1) Matters of financial compensation are not within the Commission's jurisdiction respecting right-of-way agreements or other surface rights agreements. An applicant may file a routine licence application if the landowner confirms in writing that compensation is the only issue and there are no concerns or objections to the Commission issuing a licence, so that the parties may proceed to the Surface Rights Board.
- (2) If landowner confirmation as described above cannot be obtained or there are unresolved compensation issues identified by participants other than the surface landowner, an applicant must file a non-routine application.

2.4.6 Documenting the participant involvement program

- (1) For documentation purposes, an applicant must retain:
 - communication logs
 - records of confirmation of non-objection letters
 - registered mail and courier tracking
 - personal consultation and notification documents
 - documentation of resolution of concerns or objections that occurred prior to filing an application
- (2) Further discussion related to documentation requirements is addressed in sections 7 and 8.

2.5 Expiry of the personal consultation and notification program

- (1) A gas utility pipeline licence expires one year from date of issue, if the licence is not acted on (i.e., if clearing or construction has not begun). If a licence expires and the licensee intends to proceed with the gas utility pipeline, the licensee must submit a new licence application to the Commission and must consult and notify again on the proposed gas utility pipeline or be able to demonstrate that personal consultation or notification updates have been conducted.
- (2) A personal consultation and notification program is only valid for one gas utility pipeline project. Therefore, an applicant must initiate a new or updated personal consultation and notification program for additional gas utility pipeline applications. In some instances the complexity of a project may require that personal consultation and notification be initiated well in advance of the licence application being submitted to the Commission.
- (3) The participant involvement program must be current when the application is filed regardless of when the program was initiated.
- (4) If personal consultation and notification is initiated well in advance of the application submission date, an applicant must continue personal consultation and notification throughout the application process by providing participants with status updates on the proposed gas utility pipeline.
- (5) The Commission may direct an applicant to fulfil participant involvement requirements if the Commission determines that the initial communication was incomplete or that the consultation is no longer current.

3 Establish project need

3.1 General requirements

- (1) Need must be established before a licence will be granted.¹ Need for a project should be addressed only one time, although need may be reconsidered if there is a material change in circumstances. Applicants should conduct need assessments in a fashion commensurate with the scope and cost of a project.
- (2) Need assessment includes:
 - project justification
 - project cost
 - identification of viable alternatives and associated costs
 - assessment of the implications of the alternatives on the public and the environment
 - rationale for selecting the applied-for project including an economic evaluation comparing the alternatives
- (3) Sufficient information must be provided by the applicant such that the licence issued by the Commission can describe where, when and how the need has been established and include reference to the estimated project cost.
- (4) Projects that are part of a multi-component, integrated program should be identified and reviewed as part of that larger program to ensure that the Commission has a full understanding of the program scope and implications.
- (5) Applicants must provide information that is sufficient to clearly match the projects for which capital additions are requested with respect to the facility application, the rate application and all associated decisions, including the specific licences issued. In the event that the functional specification or scope of a specific project is changed for any reason between the approval of the need and the issuance of the licence, applicants must provide a clear explanation of both the nature and timing of the changes that have occurred.
- (6) Persons that may be directly and adversely affected must have an opportunity to understand the project impact, have their concerns addressed by the applicant, or heard by the Commission if not addressed by the applicant. Additional details regarding participant involvement are provided in Section 2 of this rule. The Commission intends to provide flexibility to review cost-related evidence and consider cost-related issues in facilities proceedings, to the extent that such issues have not already been considered in a previous proceeding. Participation by interveners who are focused primarily on issues of cost should be permitted in those facility proceedings in such circumstances.
- (7) Under the *Gas Utilities Act*, rates associated with gas utility pipeline facilities are considered and approved as part of the rate application process. Rates are established on a prospective basis with a subsequent true-up process to ensure that the projects entering rate base are used and required to be used, and that only prudently incurred costs enter rate base.

¹ All gas utility pipeline owners must comply with the need requirements described in Rule 020 in order to obtain an operating licence no matter what form of rate regulation (cost of service regulation or performance based regulation) is being used for the associated facilities.

3.2 Procedures

- (1) Need will be addressed, to the extent practical, in the first instance an applicant files a gas utility pipeline capital project proposal with the Commission, either as part of a rate filing (i.e., general rate application (GRA) or as part of an application for companies that are operating under performance based regulation²) or a facility application.
- (2) Streamlined or abbreviated need assessment processes will be permitted for certain gas utility pipeline projects that meet defined thresholds as described in sections 3.3 and 3.4. These generally include new growth and replacement projects that meet defined cost and physical attribute thresholds and are unlikely to have significant landowner or environmental impacts.
- (3) Need will be addressed in rate filings or facilities applications based on the following:
 - Need for projects where the product of the pipeline length in kilometres and the pipeline diameter in millimetres exceeds 2,700 must be assessed in the facility application to facilitate thorough consideration of landowner and environmental issues.

Need for projects where the product of the pipeline length in kilometres and the pipeline diameter in millimetres is less than 2,700 may be deferred by the Commission from a rate filing to a facilities application where there are expected landowner or environmental issues. The Commission shall advise of any such deferral as soon in the rate filing process as possible so as to minimize, to the extent practicable, any duplication of the needs assessment. Where the Commission defers the need assessment for a project from a rate filing to a facilities application, the forecast costs of the project shall remain in the applicant's revenue requirement as placeholders, pending the outcome of the facilities application.
 - Projects that were not included in a rate filing will have the need assessed in the facility application for a licence.
 - If the gas utility pipeline owner files an application for a licence for a project where the need was not previously assessed and approved in the rate decision, or before the rate decision is issued, the need aspect of that project will be dealt with in the facility application process instead of the rate filing.
- (4) Where the need is approved in a rate decision, the cost estimate will form the basis of the variance/prudence assessment that occurs at the time of the next rate filing (opening rate base).
 - In those cases where the cost estimate associated with the need is subsequently modified through the facility application process, updates to the cost estimate will be considered and referenced in the subsequent

² The filing requirements outlined in Rule 020 are applicable, whether the pipeline capital project is proposed in a facility application or a rate application. Meeting the filing requirements of Rule 020 does not remove the need for a company to meet any additional filing requirements that are prescribed for rate applications or facility applications.

prudence assessment, at the time of the next rate filing, when establishing an opening rate base amount.

- (5) In a facilities application, updated capital cost forecasts must be provided if cost estimates vary by more than +/- 30 per cent from previously provided cost forecasts, in which case the Commission may reconsider alternatives in the need assessment.
- (6) The facility owner should identify where the need has been dealt with in its facility application.

3.3 Abbreviated need

Streamlined or abbreviated need assessment processes that would include the reason for the project are acceptable for the types of gas utility pipeline projects identified in Table 3.1 where there are no unresolved interested party objections or significant environmental impacts. Thresholds in Table 3.1 indicate the maximum project cost or scope and are reflective of the differing rate base amounts between gas utility pipelines and the resultant rate sensitivity to capital additions.

Table 3.1. Abbreviated need thresholds

	ATCO Pipelines	AltaGas Utilities Inc.
New growth projects	\$1,000,000	\$500,000
Replacement, removal or relocation projects for existing facilities where the project is reimbursed under the terms of a third party contribution or where a pipeline replacement project is required to comply with class location changes.	\$2,000,000	\$1,000,000
Replacement, removal or relocation projects for existing facilities within or in close proximity to the existing right of way.	\$1,000,000	\$500,000
New growth projects for receipt or delivery connections involving less than 100 metres of pipeline, and the associated metering and regulating facilities.	100 metres	100 metres

3.4 Complete need assessment

In circumstances where an abbreviated need assessment is not applicable an application addressing the following components must be filed with the Commission:

- (a) A description of the proposed project.
- (b) An explanation of why the project is required, including:
 - (i) a description of current infrastructure and why it cannot be used to meet the need identified;
 - (ii) forecast demand information for growth projects;
 - (iii) for replacement projects, an explanation of why the current system is no longer adequate to meet current and future requirements.

- (c) An explanation of whether the proposed project is part of a larger initiative including a description of the project's various components, functions and forecast in-service dates.
- (d) A summary of the studies and analysis performed in identifying the timing and nature of the need.
- (e) The alternatives considered to address the identified need, including doing nothing.
- (f) A technical and economic comparison of all viable alternatives considered, including:
 - (i) an evaluation of operational efficiency and reliability provided by each option;
 - (ii) an estimate of the capital, operating and maintenance costs for each option;
 - (iii) an economic assessment, with documentation of assumptions, illustrating the cumulative present value of revenue requirements over a twenty year term, depicted, where possible, with a year-by-year graphical representation;
 - (iv) a description of related infrastructure that will be impacted e.g., distribution facilities that will also be required and a cost estimate for such facilities;
 - (v) an evaluation of factors respecting implementation of each alternative, including timing and risks during construction;
 - (vi) a summary of any resolved or outstanding landowner concerns if consultation has been conducted;
 - (vii) a summary of any ratepayer or industry dialogue, including any feedback; and
 - (viii) a high-level evaluation of the land-use impacts of each alternative.
- (g) The applicant's choice of preferred alternative, including:
 - (i) the rationale for selecting the alternative; and
 - (ii) the implementation schedule for the alternative.

3.5 Process flexibility

The Commission may, with or without a hearing, dispense with, vary or supplement all or any part of the rules set out in Section 3 if it is satisfied that the circumstances of any hearing or other proceeding require it.

4 Gas utility pipeline licence application process

4.1 General requirements

- (1) All applicants must request a proceeding and submit an electronic application for all gas utility pipeline licence applications. An applicant must file its application electronically using the AUC's eFiling System that is accessible via the Commission website www.auc.ab.ca. Please refer to the eFiling System User Guide for instructions on how to obtain access to the eFiling System and how to submit applications electronically.
- (2) Electronic applications are structured as an electronic form that the applicant fills out using the eFiling System, together with a set of electronic attachments that the applicant uploads and submits to the eFiling System. The required attachments may include electronic copies of the following paper forms: Gas Utility Pipeline Licence Application form in Section 7 and Pipeline Segment/Pipeline Installation Identification form in Section 8.
- (3) Category designations give an applicant the option of applying for multiple pipelines and pipeline installations together as a project submission. A project is defined as a network of pipeline installations and pipelines that connect to a common installation or gas processing plant. A project submission may consist of a single licence application or of multiple licence applications of related pipelines and pipeline installations. A project submission must be submitted under one applicant name.
- (4) Applicants must retain documentation of information relevant to the preparation of the application, as well as subsequent construction, operation and end-of-life activities.

4.2 Considerations prior to filing a licence application

Waivers for gas utility pipeline requirements (e.g., equipment spacing or measurement) are considered through the non-routine licence application process. See Section 4.8.2.

4.3 Prohibition of construction before licence issued

- (1) An applicant must obtain a Commission licence(s) prior to commencing any site preparation, construction, or operation for a gas utility pipeline.
- (2) Applicants are not permitted to initiate construction prior to acquiring a Commission licence. However, applicants may conduct survey and required engineering assessments that include environmental, geotechnical, and historical resource investigations. Engineering assessments must be completed through shovel digs or auger samples (auger size not to exceed 15 centimetres (cm) in diameter). Applicants must obtain the consent of the landowner or occupant prior to completing any engineering assessments.
- (3) The applicant is responsible for outcomes of actions conducted on its behalf by contracted personnel.

4.4 Submission of applications

All gas utility pipeline applications must be made through the eFiling System using the following application types under the gas facilities group and pipelines category:

- **Pipeline - amendment** - applications for amendments and additions to existing gas utility pipeline licences, under the [Gas Utilities Act](#) and the [Pipeline Act](#).
- **Pipeline - new** - applications for new gas utility pipeline licences, under the *Gas Utilities Act* and the *Pipeline Act*.
- **Pipeline - transfer** - applications for name changes, amalgamations and transfers of gas utility pipelines.
- **Pipeline installation - new** - applications for new installations on new gas utility pipeline licences (e.g., compressors), under the *Gas Utilities Act* and the *Pipeline Act*.
- **Pipeline installation - amendment** - applications for amendments and additions of installations (e.g., compressors) on existing gas utility pipeline licences, under the *Gas Utilities Act* and the *Pipeline Act*.
- **Pipeline test – medium** - applications for approval to test a pipeline using air or another gas medium, under Section 36 of the [Pipeline Rules](#).

4.5 Licence amendments

A licence amendment application is a change to a current licence. This includes the correction of inadvertent data errors and number transpositions. Additional details for licence amendments are listed in Section 6.6.

4.6 Incomplete licence applications

- (1) If the application has minor errors, the Commission may stop processing the application and advise the person identified as the contact to submit corrections using the eFiling System. The Commission will resume processing the application after the corrections are registered in the eFiling System. In the case of corrections to base maps, the Commission will issue the licence after the corrections are received by the Commission.
- (2) In the case of significant deficiencies, the Commission will notify the applicant in writing that the application is closed and the reason for the closure. The applicant may reapply by submitting a new, complete and accurate licence application to the Commission.
- (3) Prior to reapplying, the applicant must assess the need to update its participant involvement program if a delay in filing or potential changes to the scope of the gas utility pipeline require participant updates.
- (4) If the applicant designates a consultant to prepare and file an application on its behalf, communication by the Commission respecting the application is with the consultant during the processing of the application.

4.7 Checking the status of a licence application

An applicant may review the status of its licence application by accessing the eFiling System.

4.8 Process

- (1) After the Commission receives and registers an application, staff performs a review to determine the application's acceptability and establishes a process to deal with the application. This may include a preliminary technical screening that helps to identify issues that require further assessment.
- (2) A licence application is submitted as either routine or non-routine. An applicant chooses the type of application submission (routine or non-routine) based on its responses to questions answered on the forms in Section 7 and Section 8. The Commission will assess the categorization and determine the process to be undertaken regarding the application.

4.8.1 Routine applications

- (1) An applicant files a routine application when:
 - Supporting documentation demonstrates compliance with all technical and participant involvement requirements.
 - There are no outstanding concerns or objections.
 - The landowner agrees (in writing) to proceed to the Surface Rights Board if there is no right-of-way agreement or other surface rights agreement.
 - A waiver from requirements is not requested.
- (2) Routine applications do not require the submission of supporting documentation. However, the Commission may request supporting documentation from the applicant.

4.8.2 Non-routine applications

- (1) An application is non-routine if the applicant cannot meet a Commission requirement, chooses to apply for a waiver of a Commission requirement, or has been directed to file a non-routine application by the Commission.
- (2) All non-routine applications must include the required documentation, an explanation of why the requirement will not be met, and alternative measures proposed to warrant a waiver.
- (3) There are three types of non-routine applications:
 1. Non-routine – participant involvement.
 2. Non-routine – technical.
 3. Non-routine – Commission designated.

1. Non-routine – participant involvement

The applicant must file a non-routine licence application for reasons of participant involvement if:

- (a) consultation and notification requirements are not met;
- (b) outstanding concerns or objections, whether inside or outside the distances in tables 6.1 and 6.2 were received by the

applicant during the participant involvement program or any time prior to filing and remain unresolved; or

- (c) the applicant is unable to obtain written confirmation from the landowner that the only outstanding concern is compensation.

2. Non-routine – technical

The applicant must file a non-routine licence application for technical reasons if:

- (a) technical requirements are not met;
- (b) a variance or waiver from requirements is requested; or
- (c) the use of an unspecified method, process, or material is proposed.

3. Non-routine – Commission designated

The applicant must file a non-routine licence application if:

- (a) so directed by the Commission prior to submission; or
- (b) outstanding concerns or objections exist for a gas utility pipeline proposal that does not require a licence under this rule (see Section 6.5).

- (4) Furthermore, the Commission may designate any routine licence application non-routine if:

- the application contains inconsistent technical information
- has associated unresolved concerns or objections
- is part of a project application proceeding to a hearing
- involves sensitive geographic or environmental areas

- (5) If a routine application is designated non-routine, the applicant is advised, given the reasons for the non-routine designation and directed to address the concerns identified by the Commission.

4.8.3 Disclosure of errors

- (1) The electronic application form provides applicants the opportunity to disclose incorrect pipeline or pipeline installation licence details. This form may also be used to disclose an existing unlicensed pipeline or pipeline installation and submit an application for the required licence. These types of applications will be considered routine except where a non-routine issue as defined in Section 4.8.2 is associated with the application.
- (2) An application for a previously unlicensed pipeline or pipeline installation is considered to be an application for a new pipeline or pipeline installation construction. In this case, an applicant must submit a letter as

an attachment with the associated application. The letter must include the following:

- details regarding the background and nature of the licensing issue
 - an explanation as to why the pipeline was not licensed or licensed incorrectly
 - a statement disclosing whether the company has received concerns or objections regarding the existing operations
- (3) An application to change licence details on previously licensed pipelines or pipeline installations is considered a licence amendment application. In this case, an applicant must submit a letter as an attachment with the associated application. The letter must include the following:
- an explanation of the need for the amendment and supporting details
 - a statement disclosing whether the company has received concerns or objections regarding operations pertaining to the amendment
- (4) Applicants may submit multiple disclosure applications under a single project (or proceeding request). If circumstances are similar for all the applications, one letter of explanation is acceptable.
- (5) An application for a gas utility pipeline or a licence amendment application that does not involve a disclosure must not be submitted with one that contains a disclosure.

4.8.4 Disclosure applications and participant involvement requirements

- (1) An applicant must not use the disclosure application to identify any participant involvement oversights related to an application. Applicants that have identified a participant involvement failure after application submission must contact the Commission directly to disclose participant involvement issues and obtain direction on how to proceed.
- (2) Disclosure applications for pipeline or pipeline installations that have been in existence and operating for several years without public concerns may not be required to fulfil all participant involvement requirements. Applicants should contact the Commission for direction on how to proceed with the required application.
- (3) If there is no evidence that an initial participant involvement program was conducted prior to the construction of the pipeline installation, the applicant must indicate on the Gas Utility Pipeline Licence Application form that public and industry consultation and notification requirements have not been met. If there is evidence that participant involvement work was completed prior to construction, the gas utility pipeline or pipeline installation application may be submitted routinely. The applicant must keep the details of the participant involvement documentation on file and available.
- (4) If an application is deficient, the applicant will be contacted and required to resubmit the application, or the portion of the application that is deficient, in accordance with Section 4.6. Additional action may be taken by the Commission to ensure that the licensing issue is resolved once it has been disclosed.

5 Gas utility pipeline – general information

Instructions for completion of the electronic application can be found in the eFiling System User Guide. Questions and issues regarding use of the eFiling System should be directed to the eFiling System support staff at 403-592-4500 or by email to info@auc.ab.ca.

6 Gas utility pipeline licence applications

6.1 Applications required

- (1) An applicant must complete a gas utility pipeline application when applying to:
 - construct and operate a new pipeline that requires a new pipeline licence
 - construct and operate a new pipeline that is to be added to an existing pipeline licence
 - change the operating parameters of an existing pipeline
 - construct a pipeline installation that includes a compressor station (in continuous use for more than 21 days) associated with pipelines carrying processed (sales) natural gas located downstream of a facility
 - remove a pipeline
 - delete a previously licensed pipeline that was never installed
- (2) An application is also used to notify the Commission of a pipeline abandonment and pipeline discontinuation.
- (3) An applicant must use a separate application in a single proceeding for each pipeline licence involved in a project (including a Section 7 form and Section 8 form for each pipeline). An applicant may apply for a number of different additions and amendments to the same licence on one Section 7 form and Section 8 form as part of one application.

6.2 Project submissions

- (1) A project submission may consist of a single licence application or of multiple licence applications for related pipelines and pipeline installations.
- (2) If the applicant is filing a single application for a project submission, the project must be submitted under a proceeding request in the eFiling System.
- (3) If the applicant is filing multiple license applications for related pipelines and pipeline installations, it can submit those application within a single proceeding. The applicant must complete a separate Gas Utility Pipeline Licence Application form and corresponding Pipeline Segment/Pipeline Installation Identification form(s) for each pipeline licence in the project.

6.3 Licences

6.3.1 Licence expiry

- (1) New pipeline licences and amendments expire one year from the date of issue if right-of-way clearing, construction, or operation is not yet started. For administrative purposes, the pipeline status “to be constructed” automatically changes to an “operating” status one year from the date the licence was issued. An applicant must submit a licence amendment at least 30 days prior to the licence expiry date informing the Commission that a pipeline will not be constructed.
- (2) If an applicant intends to proceed with a proposed gas utility pipeline for which a licence has expired, the applicant must fulfil all applicable requirements, including participant involvement requirements in Section 2, before filing a new application.
- (3) Due to the complexity of some developments, it is possible the applicant may not be able to act on a licence before the expiry date. If licence expiry is imminent, the applicant must contact the Commission for direction on the most appropriate way to proceed.
- (4) Prior to initiating new construction when a licence is nearing expiry, the applicant must conduct a new resident and landowner search and determine if any new issues have arisen since the licence was granted.
- (5) If a pipeline licence has expired and construction has not commenced, the applicant must advise the Commission by submitting a self-declaration application. The applicant should contact the Commission for further direction on how to proceed.

6.4 Category type and consultation and notification requirements

- (1) The types of pipelines requiring a licence under this rule are listed in Table 6.1, along with their respective consultation and notification requirements. The category type of a gas utility pipeline is dependent on the pipe diameter and the hydrogen sulphide (H₂S) content of the transported product.
- (2) The applicant must identify the correct category type for the proposed pipeline and perform all associated consultations and notifications.
- (3) Pipeline activities requiring licence amendments under this rule are listed in Table 6.2, along with their respective notification requirements.
- (4) If an outstanding concern or objection is received during the notification process for the pipeline activities of Table 6.2, the applicant must file a non-routine application prior to commencing any of these activities.

Table 6.1 Category B pipeline type and consultation and notification requirements

Name	Type	Description	Personal consultation to be conducted with	Notification to be provided to	Confirmation of non-objection to be obtained from
Pipelines, gas \leq 0.30 kPa H ₂ S partial pressure (pp)	100	Natural gas \leq 323.9 mm OD	<ul style="list-style-type: none"> Landowners, occupants and residents on the proposed right-of-way; and recipients of notification who request consultation or otherwise convey their objections or concerns 	<ul style="list-style-type: none"> Crown disposition holders Local authorities along the right-of-way Urban authorities within 1.5 km In a rural or industrial setting, notification must be provided to landowners, occupants and residents within 0.1 km of the pipeline. In urban communities, notification must be provided to landowners, occupants and residents within the first row of development on each side of the pipeline. Notification may be conducted personally or by mail. If the applicant considers that certain landowners that should be notified of the proposed project may be missed because they do not reside at the property, additional efforts to notify them should be considered. 	Landowners, occupants and residents on the proposed right-of-way
	101	Natural gas > 323.9 mm OD	<ul style="list-style-type: none"> Landowners, occupants and residents on or directly adjacent to the proposed right-of-way; and recipients of notification who request consultation or otherwise convey their objections or concerns 	<ul style="list-style-type: none"> Crown disposition holders Local authorities along the right-of-way Urban authorities within 1.5 km Landowners, occupants and residents within 0.2 km of the pipeline. Notification may be conducted personally or by mail. If the applicant considers that certain landowners that should be notified of the proposed project may be missed because they do not reside at the property, additional efforts to notify them should be considered. 	Landowners, occupants and residents on the proposed right-of-way
Pipeline installation	132	Compressor station	<ul style="list-style-type: none"> Landowners, occupants and residents within 0.5 km 	<ul style="list-style-type: none"> Crown disposition holders Local authorities Landowners, occupants, residents and urban authorities within 1.5 km 	Landowners, occupants and residents adjacent to the compressor station site

For clarity:

- “directly adjacent” means any adjacent property that is within 100 metres of the pipeline, and would include property across the road from a right-of-way, but would exclude property that is across a major divided highway or ring road within a transportation utility corridor.

- personal consultation for “directly adjacent” properties is not required for abandonment or removal activities unless requested by the notification recipient.
- “rural or industrial setting” means any area outside the municipal boundaries of cities, towns, and villages or inside the municipal boundaries where no subdivision development exists within 800 metres of the proposed facility. Industrial areas are within 800 metres of a single large industrial/commercial complex or numerous small or medium industrial/commercial facilities where no residential development exists.
- “first row of development” means the first row of houses or other developments facing the proposed pipeline that is also within 100 metres of the pipeline and includes property that is across the road from the right-of-way.

Table 6.2 Licence amendment requirements for pipeline or pipeline installation 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 landowners and occupants of the entire pipeline right-of-way and within the associated setbacks.	Application deemed non-routine; licence must be obtained before commencing the removal operation.
Not constructed	Notification must be provided to landowners and occupants of the entire pipeline right-of-way and within the associated setbacks.	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 landowners and occupants of the entire pipeline right-of-way and within the associated setbacks.	Application is filed within 90 days of completing the abandonment operation to advise the Commission of the abandonment. Licence must be obtained before commencing removal operations.
Discontinuation	Notification is not mandatory for discontinuations.	Application is filed within 90 days of completing the discontinuation operation to advise the Commission of the discontinuation.
MOP change and line split	Notification is not mandatory for these activities. 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.	Licence must be obtained prior to commencing operations.
Resumption of discontinued pipeline	Notification is not mandatory for resumption of a discontinued pipeline.	Licence must be obtained before commencing resumption operations.
Resumption of abandoned pipeline/pipeline installations	Personal consultation with confirmation of non-objection and notification must occur prior to the filing of application and resumption of operation and must include landowners and occupants of the entire pipeline right-of-way and within the associated setbacks.	Application is filed non-routine; licence must be obtained before commencing operations (comprehensive engineering assessment required).

6.5 Exemptions

- (1) Although no application is required under this rule for the following pipelines and activities, the gas utility must provide a project-specific information package

to any landowners, occupants, and residents that may be directly and adversely affected by the activity.

- (2) If a concern or objection to the proposal is received and remains unresolved, the Commission may require that a non-routine application be submitted.
- (3) Although applications are not required under this rule, the gas utility must meet all applicable requirements. If the gas utility is unable to meet all the requirements, it must obtain a waiver from the requirement from the Commission.

6.5.1 Pipeline installations

The licensing of the following pipeline installations does not occur under this rule:

- loading racks
- meter stations
- regulator stations
- a temporary pipeline installation that will be in continuous use for less than 21 consecutive days (consent for temporary pipeline installations is obtained from the local Alberta Energy Regulator (AER) field centre)
- line heaters associated with category B pipelines

6.5.2 Pipeline activities

The licensing of the following pipelines and activities is not required under this rule:

- Rural gas utilities or low pressure distribution pipelines operated at a maximum operating pressure (MOP) of 700 kPa or less ([Pipeline Act](#) and [Gas Distribution Act](#)).
- A pipeline replacement if each individual section is less than 100 metres (m) long and
 - The replaced pipe is removed.
 - The work is carried out within the existing right-of-way.
 - The replacement sections are identical, of the same material, or evaluated as being equal or superior to the existing material.
- The pipeline or tie-in is wholly within a single surface lease boundary or is wholly within adjacent or abutting facility surface leases, per Section 1(4) of the [Pipeline Rules](#).

6.6 Licence amendments

The licensee must submit a pipeline licence amendment application for:

- MOP changes
- resumption
- discontinuation
- abandonment or partial removals
- removal
- line split
- a pipeline that is not constructed

6.7 Participant involvement requirements

- (1) The applicant must ensure that the requirements set out in Section 2, Participant involvement, are met for the radius set out in tables 6.1 and 6.2.
- (2) The applicant must indicate any outstanding concerns or objections by checking the appropriate bold response on the Gas Utility Pipeline Licence Application form to indicate a non-routine application. The applicant must also include a written summary of the outstanding concerns or objections), including a discussion as to how the applicant intends to mitigate the issues raised.
- (3) The Commission does not prescribe the geographical area the applicant must investigate for industry notification. However, the applicant is expected to discuss the proposal with licensees of similar pipelines that may be directly and adversely affected by the application.
- (4) The applicant is expected to provide oil and gas reserve owners and licensees that may be directly and adversely affected with a written overview of the proposed pipeline. The onus is then on these parties to raise any concerns or objections to the proposal. The Commission does not require applicants to acquire crossing agreements prior to submitting an application. However, crossing agreements must be in place prior to construction.
- (5) In cases of pipeline abandonment applicants must inform the Commission, if any unresolved concerns or objections to the abandonment procedure are received, prior to commencing with the abandonment. The Commission will then review the unresolved concerns or objections and advise the applicant of any further process, A licence amendment application to notify the Commission of the abandonment must be filed within 90 days of completion of the abandonment.

6.8 Technical requirements

6.8.1 Checklist for Minimum Technical Requirements

- (1) The [*Checklist for Minimum Technical Requirements for Pipeline Applications*](#) is a reference document and must only be submitted with a non-routine application.
- (2) Additional technical information should be considered for:
 - a pipeline resumption
 - MOP increase
 - composite pipeline installation
- (3) The following subsections discuss various fields on the Gas Utility Pipeline Licence Application form.

6.8.2 Emergency response planning

All licensees must have a corporate-level emergency response plan (ERP) that addresses the fundamentals for handling an emergency situation arising from the construction or operation of a gas utility pipeline or pipeline installation.

6.8.3 Pipeline discontinuation

- (1) Pipeline discontinuation is defined as the temporary deactivation of a pipeline or part of a pipeline.
- (2) An application is not required for pipeline discontinuation; however, for the purpose of updating Commission records, the applicant must notify the Commission by submitting a licence amendment application within 90 days of completion of the pipeline discontinuation.
- (3) Industry and public notification is not mandatory for discontinuations. See Table 6.2.
- (4) When discontinuing a pipeline, the licensee must ensure that:
 - (a) proper discontinuation procedures are in place. See Section 82 of the [Pipeline Rules](#);
 - (b) cathodic protection is maintained; and
 - (c) setback distances are retained (right-of-way boundaries).

6.8.4 Pipeline abandonment

- (1) Pipeline abandonment is defined as the permanent deactivation of a pipeline in accordance with the [Pipeline Rules](#). A licensee must:
 - (a) take the measures required to ensure that the pipeline is left in a permanently safe and secure condition; and
 - (b) remove related surface equipment no longer in use, including pig traps, risers, block valves, and line heaters, unless they are located within the boundaries of a facility that will continue to have other licensed equipment operating after the gas utility pipeline abandonment.
- (2) When abandoning a pipeline, the licensee must:
 - (a) conduct notification with parties that may be directly and adversely affected along the entire pipeline right-of-way and those affected by setbacks prior to any abandonment procedures (see Table 6.2);
 - (b) ensure that proper abandonment procedures are in place; and
 - (c) submit a licence amendment application notifying the Commission of the abandonment within 90 days of the pipeline abandonment.

6.8.5 Partial pipeline removals

- (1) The physical removal of a pipeline where crossings are not being removed is considered a partial removal.

- (2) When applying for a partial pipeline removal and prior to undertaking any activity, the licensee must:
 - (a) conduct notification with persons that may be directly and adversely affected along the pipeline right-of-way and associated setbacks (see Table 6.2);
 - (b) submit a routine licence amendment application to the Commission to remove the pipeline; and
 - (c) obtain licence prior to commencing removal operations.

6.8.6 Pipeline resumption

- (1) Pipeline resumption is defined as resuming operations on a discontinued pipeline or on a pipeline that has not been in active flowing service within the last 12 months to its original licensed parameters. In rare and exceptional circumstances, a licence may be granted to resume operation of an abandoned pipeline if the licensee has supported the application with a comprehensive engineering assessment.
- (2) When resuming operation of a discontinued pipeline, the licensee must ensure that cathodic protection was maintained in accordance with Canadian Standards Association (CSA) Z662 and there is suitable external coating integrity.
- (3) To resume operation of an abandoned pipeline, a licensee must file a non-routine application and demonstrate:
 - (a) compliance with personal consultation, confirmation of non-objection, and notification requirements for all persons that may be directly and adversely affected parties along the entire pipeline right-of-way and those affected by setbacks (see Table 6.2);
 - (b) the integrity of the external coating and that cathodic protection was maintained; and
 - (c) that a comprehensive engineering assessment supports the resumption.

6.8.7 Pipeline removal

- (1) Pipeline removal is defined as the removal of the entire pipeline, including crossings of roads, railways, and watercourses. The physical removal of a portion of a pipeline is also addressed by filing a pipeline removal application.
- (2) When applying to remove a pipeline and prior to undertaking any activity, the licensee must:
 - (a) conduct notification with persons that may be directly and adversely affected along the pipeline right-of-way and associated setbacks (see Table 6.2); and
 - (b) submit a licence amendment application to the Commission as a routine licence application

6.8.8 Pipeline replacement

Pipeline replacement is defined as the replacement of an existing pipeline or a pipeline segment. An application is not required for a pipeline replacement if each individual section is less than 100 metres long and:

- (a) the replaced pipe is removed;
- (b) the work is carried out within the existing right-of-way; and
- (c) the replacement sections are identical, of the same material, or evaluated as being equal or superior to the existing material for both strength and compatibility with natural gas service.

6.8.9 Calgary and Edmonton transportation/utility corridors

An applicant must obtain ministerial consent, or a letter of non-objection, from Alberta Infrastructure prior to submitting an application to the Commission if the proposed gas utility pipeline or an activity related to a gas utility pipeline will result in a surface disturbance in the transportation/utility corridors.

6.8.10 Line splits

A line split occurs when one line segment is split into multiple line segments that are each assigned an individual line number. The licensee must file a licence amendment application prior to splitting a line.

6.8.11 Base plan maps

- (1) Base map(s) must be submitted electronically with applications for new construction of a gas utility pipeline, and for abandonment, discontinuation, removal, resumption of an existing gas utility pipeline, for gas utility pipeline(s) not constructed, and pipeline installations.
- (2) An applicant must obtain the most recent pipeline base map from AER Information Services.
- (3) Pipeline base maps must be used to identify other pipeline licensees that must be contacted for pipeline crossing agreements.
- (4) All markings on a base map indicating pipelines should appear no thicker than 0.7 millimetres on an 11 inch by 17 inch copy.
- (5) The applicant must complete the following tasks and submit the applicable base map electronically with each application.
 1. Indicate the new pipeline(s) or resumption of operation in red.
 2. Indicate a pipeline installation by drawing a red box on the base map at the appropriate location.
 3. Indicate pipelines to be abandoned, discontinued, not constructed or removed in green.
 4. Indicate installation to be abandoned or removed in green.
 5. Determine the appropriate licence and line number from Commission records and identify them on the base map(s).

6. If the application is for new construction and a new licence is required, label the base map(s) with the substance to be transported. The Commission will assign a new licence number.
 7. Indicate the existing pipeline for a line split in red. Put a line in blue or in black across the existing pipeline where the line split is located.
- (6) All base maps must be submitted to the Commission in electronic form. Electronically scanned, hand-drawn copies of base maps are not acceptable.
 - (7) When an application is approved, the Commission transfers, via the AER, the base map information to the master graphics file, which is available to all users.
 - (8) The Commission uses pipeline base maps to show the approximate location of licensed pipelines under its jurisdiction. The maps are produced on an individual township basis. If a township is very congested, a larger scale is used, e.g., quarter section. The base plan maps submitted to the Commission show the best pipeline location data available and identify the licence number of each pipeline. Under no circumstances should these maps be used for physically locating pipelines, as they only provide a general representation of the pipeline route.

6.8.12 Right-of-way plans

- (1) Applicants are required to submit a right-of-way plan along with base plan maps for pipeline applications that involve new construction or an amendment to change or correct the pipeline route/right-of-way.

The AER will use the right-of-way plans to digitize the location of the pipeline. The right-of-way for the line(s) being applied for has to be distinguishable from other pipeline rights-of-way on the right-of-way plans. Rights-of-way that are adjacent to, or being crossed by, the proposed pipeline should indicate the licence numbers of any pipelines within the right-of-way.

These plans can be represented as either individual ownership plans or as a plan of the entire route. For lengthy pipeline routes, a series of pages is preferred to a single small-scale map that shows the entire route. Use of a scale smaller than 1:25 000 might not adequately represent topographic or watercourse crossing details in certain circumstances.

6.8.13 Maximum operating pressure (MOP) increase

- (1) The applicant or licensee must determine if any of the following is affected by an increase in MOP and take the necessary mitigation measures to ensure continued compliance:
 - (a) testing requirements to confirm capability for the increased pressure,

- (b) overpressure protection on upstream and downstream pipelines,
 - (c) pipeline class re-designation,
 - (d) pipeline level reclassification,
 - (e) potential setbacks,
 - (f) material and standard suitability, and
 - (g) partial pressure of H₂S does not exceed 0.30 kPa.
- (2) If the applicant determines that the pipeline operation will change the personal consultation and confirmation of non-objection or the notification requirements, the applicant must initiate consultation and notification (see Table 6.2).

6.8.14 Maximum operating pressure (MOP) decrease

The applicant or licensee must determine if either of the following is affected by a decrease in MOP and take the necessary mitigation measures to ensure continued compliance:

- (a) pipeline integrity under the new MOP; and
- (b) pressure compatibility with upstream and downstream pipelines (i.e., any necessary adjustments in overpressure protection).

6.8.15 Partial pressure of H₂S in the gas phase

- (1) The partial pressure of H₂S in the gas phase determines:
- if sour service materials are required; and
 - the pipeline category type.
- (2) The partial pressure is determined by multiplying the mole fraction of H₂S in the gas phase by the MOP.
- (3) The applicant must use the results of the calculation to determine the need for sour service materials as required by CSA Z662.
- (4) Under this rule, an increase in H₂S partial pressure to a level greater than 0.30 kPa is not permitted.

6.8.16 Substance change

Under this rule, substance changes are not permitted.

6.8.17 Canadian Standards Association (CSA) standards

- (1) Steel pipe, fittings, flanges, and valves must meet the applicable requirements of a standard or specification given in Table 5.3 of CSA Z662, with the acceptable materials and limitations indicated.
- (2) For pipeline installations:
- (a) piping upstream and downstream of a line heater must meet CSA Z662 standards;

- (b) piping within the line heater must be designed to American Society of Mechanical Engineers (ASME) B31.3;
- (c) compressor stations must meet CSA Z662; and
- (d) as indicated in the preface of CSA Z662, ASME B31.3 is only permissible for internal piping for compressor stations.

6.8.18 Stress level

(1) Stress level is defined as the stress in the wall of a pipe that is produced by the pressure of the fluids in the pipeline. This section describes the stress level calculation for steel, aluminum, and polyethylene pipeline materials.

(2) Stress level is calculated as a percentage using the following formulas:

- for steel or aluminum pipe material:

$$\frac{(\text{MOP kPa}) (\text{outside diameter mm})}{(20 \times \text{pipe specified minimum yield strength MPa}) (\text{wall thickness mm})}$$

- for polyethylene pipe material:

$$\frac{(\text{MOP kPa}) (\text{outside diameter mm} - \text{wall thickness mm})}{(20 \times \text{pipe long-term hydrostatic strength MPa}) (\text{wall thickness mm})}$$

(3) The applicant must meet all applicable CSA Z662 design requirements:

- (a) For steel pipes in a gas utility application, the stress level must not exceed 72 per cent unless otherwise approved by the Commission. In this case, the applicant must file a non-routine application.
- (b) For aluminum pipe in a gas utility application, the stress level must not exceed 72 per cent unless otherwise approved by the Commission. In this case, the applicant must file a non-routine application.
- (c) For type 3408, 3608, or 3708 polyethylene pipe with a design temperature less than 23 degrees Celsius, the stress level must not exceed 50 per cent for dry gas transmission.

(4) These limitations are not applicable for type PE80, PE100, 3710, or 4710 polyethylene pipe.

(5) For all other pipeline materials and new technologies, the applicant must file a non-routine pipeline licence application.

6.8.19 Pipeline installation

(1) A pipeline installation includes any equipment, apparatus, mechanism, machinery, or instrument incidental to the operation of a pipeline. Under this rule, only compressor stations are listed on the licence as pipeline installations.

(2) When applying for a pipeline installation, the applicant must fulfil personal consultation, confirmation of non-objection, and notification

requirements for persons that may be directly and adversely affected in accordance with Table 6.1.

- (3) Where applicable, the applicant must meet storage requirements set out in Part 3 of this rule.

6.8.19.1 Process flow diagrams

The applicant must attach a process flow diagram (PFD) for all pipeline installation applications.

The PFD must identify all existing and proposed equipment at the pipeline installation.

New equipment must be identified in the legend and annotated on the diagram.

Typical diagrams are acceptable providing that they accurately represent the actual operations of the installation and contain the correct location and applicant name.

The applicant must clearly identify the following on the PFD:

- a) process equipment
- b) measurement points
- c) source(s) of all inlet or receipts and deliveries, including all fuel lines, flare lines, and vent points, and
- d) safety equipment.

6.8.19.2 NO_x emissions

If NO_x emissions are present, an applicant must ensure that the pipeline installation meets the [Alberta Ambient Air Quality Objectives](#) (AAAQO) for NO₂. A pipeline installation exempt from registration with Alberta Environment and Parks (AEP) may exceed the AAAQO. It is in the company's interest to conduct modelling to ensure that its pipeline installation meets the AAAQO. In order to demonstrate that the pipeline installation meets the AAAQO, the Commission may require that the applicant provide NO_x modelling.

In designing its needs, the applicant must design the pipeline installation to meet the requirements set out in AEP's *Code of Practice for Compressor and Pumping Stations and Sweet Gas Processing Plants*.

The applicant must register all compressor stations with AEP before commencing operation if the total NO_x emissions are greater than 16 kg/h.

New and additional natural gas-driven reciprocating engines greater than 600 kW at full load must not emit more than six grams of NO_x per kilowatt-hour (g/kWh).

The applicant must meet the following requirements when NO_x emissions are present at pipeline installations that require registration or approval with the Alberta Energy Regulator (AER):

- a) dispersion modelling must be conducted in accordance with AEP's [Air Quality Model Guideline](#);
- b) based on dispersion modelling, predicted NO₂ concentrations must meet the AAAQO using guidance from the Air Quality Model Guideline;
- c) standby equipment used only for emergency purposes can be excluded from dispersion modelling;
- d) the engine exhaust stack height must be set in accordance with the direction given in AEP's *Code of Practice for Compressor and Pumping Stations and Sweet Gas Processing Plants*; and
- e) NO_x emissions from steam generating units, heaters, and boilers can be excluded from dispersion modelling if their combined contribution is less than three per cent of the total NO_x emissions.

6.8.19.3 Plot plans

A plot plan must be submitted with each pipeline installation application that clearly indicates the on-lease location of all the equipment (with the exception of valves) as indicated on the PFD.

6.8.19.4 Noise

All pipeline installations under the Commission's jurisdiction must meet the requirements of Rule 012: [Noise Control](#).

A noise impact assessment summary form (Appendix 3 of Rule 012), or a detailed noise impact assessment must be completed prior to the submission of a pipeline installation application for any new permanent pipeline installation or for modifications to existing permanent pipeline installations if there is a reasonable expectation of a continuous or intermittent noise source. A copy of the noise impact assessment, or summary form (if applicable), must be submitted with the application.

For the purpose of a noise impact assessment, a permanent pipeline installation is a pipeline installation in operation for more than two months.

6.8.20 Proliferation

Pipeline development is to be carried out in a manner that minimizes the overall impacts on the environment and public. Proliferation of pipelines occurs when new development results in greater surface disturbances and impact on the public than would be the case if existing infrastructure were used or if significant excess capacity or redundancy of capacity would result.

6.8.21 Setback requirements

For all gas utility pipelines, no permanent dwellings may exist within the pipeline right-of-way boundaries.

6.8.22 Environmental requirements

Environmental information is required for pipeline and pipeline installation applications. In addition to the Environmental Requirements section of the Gas Utility Licence Application form, the following information should be submitted with the application.

6.8.22.1 General requirements

All pipeline and pipeline installation applications must include an environmental evaluation report that:

- describes the present (pre-project) environmental and land use conditions in the local study area
- describes the project activities and infrastructure that may adversely affect the environment
- identifies what ecosystem components (i.e., terrain and soils, surface water bodies and hydrology, wetlands, vegetation species and communities, wildlife species and habitat, aquatic species and habitat, and environmentally sensitive areas) within the local study area may be adversely affected by the project
- describes the potential adverse effects of the project on the ecosystem components during the life of the project
- describes the mitigation measures the applicant proposes to implement during the life of the project to reduce the potential adverse effects
- describes any monitoring activities the applicant proposes to implement during the life of the project to verify the effectiveness of the proposed mitigation

6.8.22.2 Regional land-use plans

If the project site occurs within the plan boundaries of a regional land use plan (e.g. South Saskatchewan Regional Plan), applicants must include information addressing compliance with the environmental management frameworks developed for the regional plan as follows:

- (i) Confirm that the proposed project is compliant with the regional plan.
- (ii) Confirm if the proposed project is in a conservation area or provincial recreation area established in the regional plan.
- (iii) Provide submissions describing how the activity may be considered incidental to a previously approved activity.

- (iv) If the project will release air or waste water emissions into the environment, use groundwater or surface water, or cause new surface or subsurface disturbance, summarize discussions held with the AER regarding the project and its potential to exceed the triggers and limits of the air quality management framework, the surface water quality management framework, and the groundwater management framework of the regional plan. Discuss any actions or mitigation recommended by the AER as a result of these discussions and describe how you plan to incorporate this mitigation into the project.
- (v) If the project will clear vegetation, summarize discussions held with the AER regarding the project and its potential to exceed the biodiversity targets detailed in the biophysical management framework for the regional plan (once this framework is adopted). Discuss any actions or mitigation measures recommended by the AER and describe how these actions or mitigation measures will be incorporated into the project.

6.8.22.3 Conservation and reclamation requirements

The [*Environmental Protection and Enhancement Act*](#) requires that pipelines located in the white area of the province with an index of 2690 or greater (Class 1) must have an *Environmental Protection and Enhancement Act* Conservation and Reclamation approval, that can be obtained from the AER.³ Pipelines with an index value lower than 2690 (Class 2) do not require the approval.

The index is determined by multiplying the outside diameter of the pipe (in mm) times the length of the pipe (in km).

For Class 2 pipelines, notification to the AER is not required; however, AEP conservation and reclamation requirements under the *Environmental Protection and Enhancement Act* must be met.

For Class 1 pipelines, the applicant may file a routine application once the 30-day AEP notification period has expired.

Non-routine applications for which concerns or objections remain unresolved may be submitted before the 30-day expiry.

³ In March of 2014, the AER assumed responsibility for reclamation and remediation activities for all oil, gas, and coal operations in the Alberta. These activities were formerly the responsibility of Alberta Environment and Parks (AEP), previously known as Alberta Environment and Sustainable Resource Development.

7 Gas Utility Pipeline Licence Application form

- (1) The application for a gas utility pipeline must be made on the following Gas Utility Pipeline Licence Application form and submitted to the Commission. This form is available on the [AUC website](#) in Microsoft Word and Adobe PDF formats.
- (2) An example of the form is followed by step-by-step information on how to complete the licence application.
- (3) All associated plans and maps must be submitted in electronic form.

Gas Utility Pipeline

DAY _____ MONTH _____ YEAR _____ Applicant's Reference _____

1. IDENTIFICATION	
Company Name _____	Applicant BA Code _____
2. PARTICIPANT INVOLVEMENT REQUIREMENTS	
1. Consultation and notification requirements have been met: Public _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
Industry _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
2. There are outstanding objections/concerns related to this application _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
3a. Distance to nearest residence _____ km	
3b. Distance to nearest surface development (pipeline installations only) _____ km	
3. EMERGENCY RESPONSE PLANNING	
1. The applicant will meet AUC requirements for emergency response planning _____	YES <input type="checkbox"/>
2a. The pipeline requires a new emergency response plan _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
2b. The pipeline requires an amendment to an existing emergency response plan _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
4. TYPE OF APPLICATION	
Category Type _____	
<input type="checkbox"/> New construction	<input type="checkbox"/> New pipeline installation
<input type="checkbox"/> Self disclosure	<input type="checkbox"/> Licence amendment
	Licence number P _____
5. NEW CONSTRUCTION/ADDITION ONLY	
<input type="checkbox"/> New pipeline licence	<input type="checkbox"/> Addition to existing licence
	Licence number P _____
6. LICENCE AMENDMENT ONLY	
<input type="checkbox"/> MOP increase	<input type="checkbox"/> Discontinuation
<input type="checkbox"/> MOP decrease	<input type="checkbox"/> Resumption
<input type="checkbox"/> Other _____	<input type="checkbox"/> Abandonment
(specify) _____	<input type="checkbox"/> Not constructed
	<input type="checkbox"/> Partial Removal
	<input type="checkbox"/> Removal
7. TECHNICAL CONSIDERATIONS	
1. The H ₂ S content in the gas phase is _____ mol/kmol.	
2. The partial pressure of H ₂ S in the gas phase is _____ kPa. (must be ≤0.30 kPa)	
3. The pipeline meets all current applicable CSA Z662 standards _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
4. Prior to operation, procedures for corrosion mitigation, monitoring, evaluation, and record keeping will be implemented _____	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>
5. The pipeline installation meets all applicable standards _____	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>
8. MOP INCREASE	
1. The MOP has increased _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
1a. If Yes, the pipe, valves, flanges, and fittings are suitable for the new MOP or will be prior to operations _____	YES <input type="checkbox"/>
9. RESUMPTION, DISCONTINUATION, AND ABANDONMENT ONLY	
1a. The pipeline you are applying to resume operation of was discontinued in accordance with AUC requirements _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
1b. The integrity of the discontinued pipeline has been verified _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
2. The pipeline was discontinued in accordance with AUC requirements _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
3. The pipeline was abandoned in accordance with AUC requirements _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
4. In case of abandonment, all associated surface facilities will be removed and the surface site reclaimed within one year _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
10. ENVIRONMENTAL REQUIREMENTS	
1. The ground disturbance ⁴ activities associated with the pipeline application in accordance with AEP's <i>Environmental Protection Guidelines</i> _____	YES <input type="checkbox"/> N/A <input type="checkbox"/>
2. The applicant will comply with the <i>Code of Practice</i> in accordance with the <i>Water Act</i> _____	YES <input type="checkbox"/> N/A <input type="checkbox"/>
3. Application has been made to the AER for Conservation and Reclamation Approval (white area only) _____	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>
If application has been advertised, provide the Notice Expiry Date _____ (Day-Month-Year)	
4. The proposed pipeline/pipeline installation is located within the Calgary or Edmonton Transportation/Utility Corridor _____	YES <input type="checkbox"/> NO <input type="checkbox"/>
4a. If YES, the pipeline/pipeline installation has ministerial consent or a letter of non-objection from Alberta Infrastructure _____	YES <input type="checkbox"/> NO <input type="checkbox"/> NA <input type="checkbox"/>
5. The proposed pipeline/pipeline installation is compliant with the regional plan(s) created under the <i>Alberta Land Stewardship Act</i> , and meets Commission environmental and noise requirements _____	YES <input type="checkbox"/> NO <input type="checkbox"/>

⁴ As defined in the *Pipeline Act*.

7.1 How to complete the Gas Utility Pipeline Licence Application form

Date	Enter the date on which you will submit this schedule to the Commission in the upper left corner (e.g., 15 Jan 2009).
Applicant's reference	Enter your own file reference in the designated area (optional).
Step 1: Identification	
Company name	Enter the full corporate name of the applicant.
Applicant BA code	Enter the four-digit business associate (BA) code issued to your company.
Step 2: Participant involvement requirements	
<i>If you check a BOLD response, you must attach supporting information.</i>	
1. Consultation and notification requirements have been met: public	<p>YES means all applicable requirements as outlined in tables 6.1 and 6.2 and in the participant involvement requirements of Section 2, Participant involvement, and Section 6.7, Participant involvement requirements, have been met prior to application submission.</p> <p>NO means that due to exceptional circumstances, all applicable requirements as cited above have not been met. This includes being unable to contact a party or receive confirmation of non-objection, as required. If NO, you must attach:</p> <ul style="list-style-type: none"> • the participant involvement summary of all personal consultation and notification that has been completed, • the name, address, telephone number, and legal land description of participants for which personal consultation and notification requirements have not been completed, • a detailed explanation of why all personal consultation and non-objection requirements cannot be completed, • a detailed explanation of why all notification requirements cannot be completed, and • an explanation of how you would like the Commission to proceed with this application. <p>The Commission will review the circumstances and decide if an exemption is warranted.</p>
1. Consultation and notification requirements have been met: industry	<p>YES means all operators of similar pipelines or pipeline installations within your area of investigation have been notified in accordance with the participant involvement requirements of Section 2 and Section 6.7 and the proliferation requirements of Section 6.8.20 prior to application submission.</p> <p>NO means that due to exceptional circumstances, all applicable requirements as cited above have not been met. If NO, you must attach:</p> <ul style="list-style-type: none"> • a record of contact with industry parties conducted, • copies of correspondence between parties, • minutes of meetings held, • copies of information distributed, • a summary of parties for which industry notification have not occurred • a detailed explanation of why all industry notification requirements were not completed, and • an explanation of how you would like the Commission to proceed with this application. <p>The Commission will review the circumstances and determine if an exemption is warranted.</p>

2. There are outstanding concerns/objections related to this application.	<p>YES means members of the public or industry have outstanding concerns/objections.</p> <p>If YES, you must attach:</p> <ul style="list-style-type: none"> • name, address, telephone number, and legal land description of the party with outstanding concerns or objections, • a copy of written concerns or objections received, if available, • a chronology of the participant involvement program conducted with the party, • a discussion of how you would like the Commission to proceed with your application, • steps taken to mitigate the outstanding concerns or objections, • a copy of the project-specific information package provided, and • a list of other documents distributed. <p>The Commission will review the concerns or objections identified and determine if an exemption is warranted.</p> <p>NO means there are no outstanding public or industry objections or concerns.</p>
3a. Distance to nearest residence.	Enter the distance to the nearest residence in kilometres (km) to two decimal places.
3b. Distance to nearest surface development (pipeline installations only).	Enter the distance to the nearest surface development in kilometres (km) to two decimal places.
Step 3: Emergency response planning	
1. The applicant will meet AUC requirements for emergency response planning.	YES means the corporate emergency response plan (ERP) will meet the requirements of Section 8 of the Pipeline Rules .
2a. The pipeline requires a new emergency response plan.	YES means a new ERP is required. NO means a new ERP is not required.
2b. The pipeline requires an amendment to an existing emergency response plan.	YES means an existing ERP will be amended to include this pipeline. NO means the existing ERP will not be amended.
Step 4: Type of application	
<i>Choose the appropriate box. You may choose more than one, provided the activities are for the same licence.</i>	
Category type	Enter the applicable category type from Table 6.1.
New construction	Check this box if you are applying for new pipeline construction.
New pipeline installation	Check this box if you are applying for a new pipeline installation.
Licence amendment	Check this box if you are applying to change the operating parameters of an existing pipeline (e.g. removal).
Licence number	If you are adding to or amending an existing licence, enter the Commission licence number.
Self-disclosure	Check this box if this is a self-disclosure application for a pipeline or pipeline installation. If selected, you must attach a letter of explanation describing the background and nature of the licensing issue.
Step 5: New construction/addition only	
<i>Complete this section only if you are constructing a new system or adding a pipeline to an existing licence.</i>	
New pipeline licence	Check this box if you are applying for a new licence and you have determined that there is no appropriate licence to which your pipeline can be added.
Addition to existing licence	Check this box if you are adding a new pipeline to an existing licence. The proposed pipeline must transport the same substance as the existing pipeline and be part of the same system.
Licence number	If you are adding to an existing licence, enter the Commission licence number.

Step 6: Licence amendment only	
<i>Complete this step only if you are amending an existing pipeline. Choose all that apply to your amendment. If you check a BOLD response, you must attach supporting information.</i>	
MOP increase (Section 6.8.13)	Check this box if you are applying to increase the maximum operating pressure.
MOP decrease (Section 6.8.14)	Check this box if you are applying to decrease the maximum operating pressure.
Resumption (Section 6.8.6)	Check this box if you are applying to resume operation of a pipeline or part of a pipeline that has been discontinued or abandoned.
Discontinuation (Section 6.8.3)	Check this box if you are advising the Commission that operation of an existing pipeline has been discontinued.
Abandonment (Section 6.8.4)	Check this box if you are advising the Commission that an existing pipeline has been abandoned.
Partial removal (Section 6.8.5)	Check this box if you are removing portion(s) of an existing pipeline (this must be accompanied by a line split in order to indicate the sections to be removed on the Pipeline Segment/Pipeline Installation Identification Form).
Removal (Section 6.8.7)	Check this if you are applying to remove an entire pipeline, including crossings of roads, railways, and water courses. You must attach an explanation of the circumstances, documentation detailing that the entire pipeline, including water, rail, and road crossings, is being removed, and confirmation that notification requirements have been met. The Commission will review the circumstances and decide if an exemption is warranted.
Not constructed	Check this box if you are advising the Commission that the pipeline will not be constructed.
Other (specify)	Check this box for all licence amendments other than those listed. Specify the type of amendment in the space provided.
Step 7: Technical considerations	
<i>If you check a BOLD response, you must attach supporting information.</i>	
1. H ₂ S content in the gas phase.	Enter the maximum H ₂ S content (mol/kmol) in the gas phase to two decimal places under the pipeline MOP conditions. Enter zero if no H ₂ S is present.
2. Partial pressure of the H ₂ S in the gas phase. (This must not exceed 0.30 kPa.) (Section 6.8.15)	Enter the partial pressure (kPa) in the gas phase at the MOP to two decimal places. Enter zero if no H ₂ S is present. Partial pressure is used in CSA Z662 to determine need for sour service.
3. The pipeline meets all current applicable CSA Z662 standards. (Sections 6.8.17)	YES means that the pipelines in this application are covered by the current CSA Z662 standards and meet all applicable requirements. NO means that due to exceptional circumstances, all applicable requirements as cited above have not been met. If NO , you must attach: <ul style="list-style-type: none"> a detailed explanation of what CSA Z662 standards are not being met and why, a detailed technical assessment that demonstrates how design, construction, and operational considerations have addressed public safety and environmental concerns. The Commission will review the circumstances and decide if an exemption is warranted.

<p>4. Prior to operation, procedures for corrosion mitigation, monitoring, evaluation, and record keeping will be implemented.</p>	<p>YES means you have established and will be implementing suitable internal and external corrosion mitigation, monitoring, evaluation, and record-keeping procedures in accordance with the requirements of the current CSA Z662 Standard, Section 9, and the Pipeline Rules, Section 53.</p> <p>NO means that due to exceptional circumstances, all applicable requirements as cited above have not been met. If you select NO, you must attach:</p> <ul style="list-style-type: none"> • a detailed explanation of why a corrosion program is not being implemented, • a detailed technical assessment that demonstrates why the requirements of the current CSA Z662 Standard and the Pipeline Rules are not being met. <p>The Commission will review the circumstances and decide if an exemption is warranted.</p> <p>N/A means that the corrosion control procedures required by the current CSA Z662 Standard and the Pipeline Rules do not apply, as the pipeline is non-corrosive (e.g., fibreglass, composite, or polymer pipe).</p>
<p>5. The pipeline installation meets all applicable standards.</p>	<p>YES means the pipeline installation, including those that do not appear separately on the licence, will meet all applicable requirements in accordance with Section 6.8.17 Canadian Standards Association (CSA) Standards and Section 6.8.19 Pipeline Installation.</p> <p>NO means that due to exceptional circumstances, all applicable requirements as cited above have not been met. If NO, you must attach:</p> <ul style="list-style-type: none"> • a detailed explanation of what requirements are not being met and why; • a detailed technical assessment that demonstrates how design, construction, and operational considerations have addressed public safety and environmental concerns. <p>The Commission will review the circumstances and decide if an exemption is warranted.</p> <p>N/A means that there are no pipeline installations attached to the proposed pipeline(s).</p>
<p>Step 8: MOP increase</p>	
<p><i>Complete this step only if you are applying for a pipeline licence amendment. If you check a BOLD response, you must attach supporting information.</i></p>	
<p>1. The MOP has increased. (Section 6.8.13)</p>	<p>YES means that there is an increase in the MOP. If NO there is no increase in the MOP.</p>
<p>1a. If Yes, the pipe, valves, flanges, and fittings are suitable for the new MOP or will be prior to operation</p>	<p>YES means the pipes, valves, and fittings are suitable for the new MOP.</p>
<p>Step 9: Resumption, discontinuation and abandonment only</p>	
<p><i>Complete this step only if you are applying to resume operation of a pipeline or advising the Commission of discontinuation or abandonment operations that have been completed. If you check a BOLD response, you must attach supporting information.</i></p>	
<p>1a. The pipeline you are applying to resume operation of was discontinued in accordance with AUC requirements.</p>	<p>YES means the pipeline was discontinued in accordance with the requirements of the Pipeline Rules.</p> <p>NO means that due to exceptional circumstances, all applicable requirements as cited above have not been met or that the pipeline was abandoned.</p> <p>If NO, you must attach:</p> <ul style="list-style-type: none"> • detailed information confirming the pipeline’s integrity (internal and external),

	<ul style="list-style-type: none"> • a comprehensive engineering assessment that supports the resumption, and • documentation as specified in Section 6.8.1, Checklist for Minimum Technical Requirements. <p>If the pipeline is abandoned, you must attach documentation that demonstrates personal consultation, confirmation of non-objection, and that notification requirements have been met for all directly affected parties along the entire right-of-way and those affected by the setbacks. The Commission will review the circumstances and decide if an exemption is warranted.</p> <p>Abandoned pipelines are not normally candidates for resumption-of-operation licensing. A licence may be granted, but only in rare and exceptional circumstances if the applicant has supported the request with a comprehensive engineering assessment.</p>
<p>1b. The integrity of the discontinued pipeline has been verified.</p>	<p>YES means you have verified the integrity of the discontinued pipeline. NO means you have not undertaken all necessary work to verify the integrity of the discontinued pipeline due to exceptional circumstances. If NO, you must attach</p> <ul style="list-style-type: none"> • an explanation of why the necessary work to verify the integrity of the pipeline has not been undertaken; and • documentation as specified in Section 6.8.1, Checklist for Minimum Technical Requirements. <p>The Commission will review the circumstances and decide if an exemption is warranted.</p>
<p>2. The pipeline was discontinued in accordance with AUC requirements.</p>	<p>YES means the pipeline was discontinued in accordance with the requirements of the Pipeline Rules. NO means that due to exceptional circumstances, all applicable requirements as cited above have not been met. If NO, you must attach an explanation of why the pipeline was not discontinued in accordance with the applicable Commission requirements. The Commission will review the circumstances and decide if an exemption is warranted.</p>
<p>3. The pipeline was abandoned in accordance with AUC requirements.</p>	<p>YES means the pipeline was abandoned in accordance with the requirements of the Pipeline Rules, including the removal of all surface equipment related to the pipeline that will no longer be in use. NO means that due to exceptional circumstances, all applicable requirements as cited above have not been met. If NO, you must attach an explanation of why the pipeline was not abandoned in accordance with the applicable Commission requirements. The Commission will review the circumstances and decide if an exemption is warranted.</p>
<p>4. In case of abandonment, all associated pipeline installations will be removed and the surface site reclaimed within one year.</p>	<p>YES means all pipeline installations that will no longer be in service associated with the abandoned pipeline will be removed, the surface site reclaimed within one year, and a reclamation certificate application submitted to the AER within three years. NO means the associated pipeline installation will not be removed and the site will not be reclaimed because the pipeline installation is still in use. You must describe any exceptional circumstances if the pipeline installation will not be reclaimed within one year and provide an alternative proposed deadline for completion of the reclamation.</p>

Step 10: Environmental requirements	
<i>If you check a BOLD response, you must attach supporting information.</i>	
1. The pipeline will be constructed in accordance with AEP's <i>Environmental Protection Guidelines</i> .	<p>YES means all requirements of the Environmental Protection Guidelines issued by AEP have been met.</p> <p>N/A means new construction is not taking place.</p>
2. The applicant will comply with the <i>Code of Practice</i> in accordance with the <i>Water Act</i> .	<p>YES means you will notify the AER as required by the Water Act. The Code of Practice applies to both mapped and unmapped water bodies. Due to the large scale of the maps, there are many water bodies that are not shown on the maps. The <i>Code of Practice</i> outlines how the class of an unmapped water body is determined.</p> <p>N/A means there is no water crossing involved.</p>
3. Application has been made to the AER for conservation and reclamation approval (white area only).	<p>YES means you have determined that conservation and reclamation (C&R) approval is required under the Environmental Protection and Enhancement Act and have applied to the AER (white area only). If the application has been advertised, enter the notice expiry date. Routine applications submitted prior to this expiry date will be closed.</p> <p>NO means you have determined that a C&R approval is required but have not applied for it. If NO, you must attach a detailed explanation of why the required C&R approval has not been applied for. The Commission will review the circumstances but will not approve the application until the C&R approval is granted.</p> <p>N/A means the pipelines are AEP Class II and a C&R approval is not required.</p>
4. The proposed pipeline/installation is located within the Calgary or Edmonton transportation/utility corridor. (Section 7.8.9)	<p>YES means the proposed pipeline/pipeline installation is located within the Calgary or Edmonton transportation/utility corridor.</p> <p>NO means the proposed pipeline/pipeline installation is not located within the Calgary or Edmonton transportation/utility corridor.</p>
4a. If YES, the pipeline/installation has ministerial consent from Alberta Infrastructure.	<p>YES means the pipeline/pipeline installation has received ministerial consent from Alberta Infrastructure.</p> <p>NO means the pipeline/pipeline installation has not received ministerial consent from Alberta Infrastructure. If NO, you must attach a detailed explanation of why ministerial consent has not been received. The Commission will review the circumstances and decide if an exemption is warranted.</p> <p>N/A means new construction is not taking place.</p>
5. The proposed pipeline/pipeline installation meets Commission environmental requirements	<p>YES means the proposed pipeline/pipeline installation meets all applicable Commission environmental and noise requirements.</p> <p>NO means the pipeline/pipeline installation does not meet all applicable Commission environmental and noise requirements.</p> <p>If NO, you must attach a detailed explanation of why the pipeline/pipeline installation does not meet Commission environmental and noise requirements and what measures will be in place to ensure that the pipeline/pipeline installation will not create an adverse environmental and noise impact.</p>
The proposed pipeline/pipeline installation is compliant with the Lower Athabasca Regional Plan (LARP), or other applicable regional land-use plan.	<p>YES means the proposed pipeline/pipeline installation meets all policies and limits set out in the Lower Athabasca Regional Plan (LARP), or other applicable regional land-use plan.</p>

<p>For pipeline installations with major sources of noise identified, a noise impact assessment, or noise impact assessment summary form has been submitted and the proposed installation is compliant with Rule 012</p>	<p>NO means the proposed pipeline/pipeline installation does not meet all policies and limits set out in the Lower Athabasca Regional Plan (LARP), or other applicable regional land-use plan.</p> <p>If NO, you must attach a list of what policies and limits the pipeline/pipeline installation does not meet and an explanation of why not.</p> <p>N/A means the proposed pipeline/pipeline installation does not occur within the boundaries of any adopted regional land-use plan.</p> <p>YES means for the proposed pipeline/pipeline installation where there is a reasonable expectation of continuous noise, a noise impact assessment, or noise impact assessment summary form has to be submitted and the proposed installation is compliant with Rule 012.</p> <p>NO means for the proposed pipeline/pipeline installation, where there is a reasonable expectation of continuous noise, a noise impact assessment, or noise impact assessment summary form has NOT been submitted and/or the proposed installation is non-compliant with Rule 012.</p> <p>If NO, you must submit a noise impact assessment, or noise impact assessment summary form and if the proposed installation is non-compliant with Rule 012, you must identify the noise attenuation measures you are committing to implement.</p> <p>N/A means for the proposed pipeline/pipeline installation there is not a reasonable expectation of continuous noise.</p>
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8 Pipeline Segment/Pipeline Installation Identification form

- (1) Pipeline segment and installation identification required for a gas utility pipeline licence application must be entered on the Pipeline Segment/Pipeline Installation Identification form. This form is available on the AUC website in Microsoft Word and Adobe PDF formats.
- (2) An example of the form is followed by step-by-step information on how to complete the segment and installation information.
- (3) All associated plans and maps must currently be submitted in electronic form.

Pipeline Segment

DAY	MONTH	YEAR

APPLICANT'S REFERENCE

1. PIPE SPECIFICATION/SUBSTANCE

Substance _____ Code _____ H₂S (mol/kmol) _____ Licence Number P _____

ID No.	Outside Diameter (mm)	Wall Thickness (mm)	Material	Type	Grade	MOP (kPa)	Stress Level	Joints	IP
01									
02									
03									
04									
05									

2. PIPE LOCATION AND STATUS

Action	Line No.	From Location						FC	To Location					FC	Length (km)	Status	Environment	ID No.
		LSD	SEC	TWP	RGE	M	LSD		SEC	TWP	RGE	M						

3 INSTALLATION SPECIFICATION

Action	Installation No.	Location					Installation Type	Compressor Rating (kW)	Driver Power Source	Status
		LSD	SEC	TWP	RGE	M				

8.1 How to complete Pipeline Segment/Pipeline Installation Identification form

Date	Enter the date on which you will submit this schedule to the Commission in the upper left corner (e.g., 15 Jan 2009).
Applicant's Reference	Enter your own file reference in the designated area (optional).
Step 1: Pipe Specification/Substance	
Substance	Enter the category name of the substance from Table 8.1.
Code	Enter the substance code from Table 8.1.
Licence Number	Enter the licence number of the pipeline or pipeline installation.
Outside Diameter	Enter the outside diameter of the pipeline in millimetres (mm) to one decimal place.
Wall Thickness	Enter the pipe nominal wall thickness in mm to two decimal places.
Material	Enter the code for the pipe material from Table 8.2.
Type and Grade	Enter the codes for the type and grade of material for the pipeline from tables 8.3, 8.4, 8.5, and 8.6.
Maximum Operating Pressure (MOP)	Enter the MOP of the pipeline rounded to the nearest 10 kilopascals (kPa).
Stress Level (Section 6.8.18)	Enter the calculated stress level of the pipeline.
Joints	Enter the code for the type of joint from Table 8.7.
Internal Protection (IP)	Enter the internal protection code from Table 8.8.
Step 2: Pipe Location and Status	
Action	Enter the applicable code: A – when adding a new line number to a new or existing licence C – when making changes to an existing pipeline where pipe specifications are changing and all pipelines where the line location and/or status are changing
Line Number	Enter the line number of the pipeline. If you are adding pipelines to an existing licence, use the next available line number on the licence. Note: When reinstating a pipeline (for which a previous removal or partial removal application was filed), the original line number must be used.
From Location	Enter the legal description of the starting point of the pipeline according to the direction of flow.
Facility Code (FC)	Enter the facility code for the starting point of the pipeline from Table 8.9.
To Location	Enter the legal description of the terminating point of the pipeline.
Facility Code (FC)	Enter the facility code for the end point of the pipeline from Table 8.9.
Length	Enter the length of the pipeline in kilometres (km) to two decimal places.
Status	Enter the appropriate status code from Table 8.10.
Environment	Enter the environment code from Table 8.11, if applicable. A creek, lake, or river designation code must be entered if it appears on the current Provincial Base Map 1:1 000 000. The <i>Code of Practice</i> applies to both mapped and unmapped water bodies. Due to the large scale of the maps, there are many water bodies that are not shown on the maps. The <i>Code of Practice</i> outlines how the class of an unmapped water body is determined.
Identity Number (ID)	This is used as a cross-reference for Step 1: Pipeline Specification/Substance.
<i>If replacing a portion of pipeline 100 m or greater, a pipeline licence application is required.</i>	

Step 3: Installation Specification	
Action	Enter the applicable code: A – when adding a new installation to a new or existing licence C – when making changes to an existing installation where specifications are changing
Installation Number	Enter the pipeline installation number. If you are adding a pipeline installation to an existing pipeline licence, use the next available installation number on the licence.
Location	Enter the legal description of the pipeline installation.
Installation Type	Enter the type of installation from Table 8.12. Note: An increase in H ₂ S partial pressure to a level greater than 0.30 kPa is not permitted.
Compressor Rating (kW)	If you are constructing a compressor station, enter the kilowatt (kW) rating.
Driver Power Source	Enter the compressor driver power source from Table 8.13.
Status	Enter the appropriate status code from Table 8.14.

Table 8.1 Substance categories

Substance	Substance category	Code	Priority code
Methane, natural gas with H ₂ S partial pressure ≤ 0.30 kPa.	Natural gas	NG	6

Table 8.2 Pipe material codes

Pipe material	Code
Aluminum	A
Composite	G
Fibreglass	F
Polyethylene	P
Polyvinyl chloride	V
Steel	S

Table 8.3 Steel pipe codes (examples only)

Pipe specification	Code	
	Type	Grade
API 5L Grade A	5L	A
API 5L Grade B	5L	B
API 5L Grade X42	5L	X42
API 5L Grade X60	5L	X60
ASTM A53 Grade B	A53	B
ASTM A106 Grade B	A106	B
ASTM A333 Grade 6	A333	6
CSA Z245.1 Grade 241 Category I	Z245.1	241 1
CSA Z245.1 Grade 290 Category II	Z245.1	290 2
CSA Z245.1 Grade 359 Category III	Z245.1	359 3
ASTM A539	A539	N/A *

*Not applicable for ASTM A539.

Table 8.4 Aluminum pipe codes (examples only)

Pipe specification Aluminum Association Alloy No.	Code	
	Type	Grade*
6063 T1A	6063	T1A
6063 T1B	6063	T1B

If clad aluminum, add C at the end of Grad Code (e.g.) T1AC).

Table 8.5 Fibreglass and fibre-reinforced composite pipe codes (examples only)

Pipe specification	Code	
	Type	Grade*
Ameron Bondstrand 3000	AMERON	3000
Star Fibreglass 500	STAR	500
Centron 800	CEN	800
Fibrespar 1500 E	FSLP	1500
Hydril ANSI 300	HDLP	300
Flexpipe (ANSI 300)	FPLP	750

Table 8.6 Polyethylene pipe codes (examples only)

Pipe specification Aluminum Association Alloy No.	Code	
	Type	Grade*
PE 2406 SDR 11	2406	11
PE 3408 SDR 9	3408	9

Table 8.7 Joint codes

Joint	Code
Thru-Kote Welded	A
Butt Fusion	B
Bonded	C
Flanged	F
Solvent Welded	G
High Energy Welded	H
Crimp Kote	K
Sure Lok	L
Mechanical Coupling	M
Pronto Lock	P
Socket Fusion	S
Threaded	T
Welded	W
Zap-Lok	Z
Twin Lock	E
Triple Seal	R

Table 8.8 Internal protection codes

Protection type	Code
Uncoated	U
Thin Film	T
Cement	C
Expanded Polyethylene	E
Grouted	G
Free Standing	L

Table 8.9 Facility codes*

Facility	Code
Compressor Station	CS
Meter/Regulation Station	MR
Meter Station	MS
Pipeline	PL
Regulator Station	RS
Line Heater	LH
Gas Processing Plant	GP
Blind End	BE
Petrochemical Plant	PP
Refinery	RF
Storage Cavern	SC
* If facility code is not set out above, use AER facility code.	

Table 8.10 Status codes

Status	Code
Abandoned	A
Discontinued	D
Operating	O
Removed	R
To Be Constructed	P
Delete from Licence	X
Not Constructed	N

Table 8.11 Environment codes

Crossing	Code
Creek	CC
Lake	LC
Overhead	OC
River	RC
Surface (surface line)	SC

Table 8.12 Pipeline installation codes

Facility	Code
Compressor Station	CS

Table 8.13 Driver power source codes

Facility	Code
Natural Gas	N
Electric	E

Table 8.14 Status codes for pipeline installations

Status	Code
Operating	O
Removed	R
To Be Constructed	P
Delete from Licence	X
Not Constructed	N

Part 2: Flaring, incinerating and venting of gas utility pipelines

9 Flaring, incinerating and venting requirements

- (1) This part replaces Directive 060, *Upstream Petroleum Industry Flaring Directive* and applies to disposal of gases from gas utility pipelines and pipeline installations by flaring, incinerating, and venting including:
 - (a) low-pressure flash-gas and other gas streams at pipeline installations such as system compressor stations; and
 - (b) pipeline depressuring for maintenance, process upsets, or emergency depressuring for safety reasons.
- (2) A licensee must evaluate all new and existing sources of gas flaring, incinerating, or venting from gas utility pipelines and pipeline installations except for intermittent small sources of less than 100 cubic metres per month, such as pig trap depressuring.
- (3) A licensee must update an evaluation prepared under Section 10(2) prior to any planned flaring, incinerating or venting.
- (4) A licensee must:
 - (a) document alternatives considered to eliminate or reduce flaring, incinerating, or venting, how they were evaluated, and the outcome of the evaluation.
 - (b) assess opportunities to eliminate or reduce flaring, incinerating, and venting of gas due to frequent maintenance or outages.
 - (c) investigate and correct repeat occurrences of flaring or venting at gas utility pipelines and pipeline installations.
 - (d) address public complaints and concerns related to gas utility pipelines and pipeline installation flaring, incinerating, or venting.
 - (e) investigate and implement feasible measures to conserve gas from depressuring of gas utility pipelines and pipeline installations.
 - (f) ensure that flares, incinerators, and vents are designed and operated in compliance with good engineering practices, and all relevant safety codes and regulations.
- (5) A licensee must minimize venting, flaring, and incinerating volumes from its gas utility pipelines and pipeline installations.
- (6) A licensee must evaluate conservation of gas from planned pipeline depressuring:
 - (a) having regard for the value of gas, costs of conserving the gas, and economic impacts of extending outages on downstream customers and upstream producers; and
 - (b) whether it is practical when impacts on customers and producers are considered.
- (7) A licensee must give notice to the Commission by way of the local AER field centre in the area with a minimum 24 hours' advance notice of planned outages that will result in flaring, incinerating, or venting and discuss with that AER field centre the measures to be taken to minimize emissions.

10 Performance requirements

- (1) A licensee must ensure that a professional engineer, certified technician, certified engineering technologist or registered engineering technologist⁵ is responsible for the design or review of flare and incinerator systems, including separation, related piping, and controls, and for the specification of safe operating procedures.
- (2) The following apply to the design of gas combustion systems for flaring and incinerating at gas utility pipelines and pipeline installations:
 - *Pressure Equipment Safety Regulation*;
 - API-RP-521: Guide for Pressure-Relieving and Depressuring Systems, Section 4: Selection of Disposal Systems; and
 - applicable fire safety codes, electrical codes, CSA standards, and mechanical engineering standards.
- (3) A licensee must document and implement operating procedures that define the operational limits of flare or incinerator systems and that these procedures meet the design requirements.
- (4) A licensee must operate flare and incinerator systems within operational ranges and type of service specified by the designing or reviewing engineer, technician, or technologist. If this equipment is used for emergency shutdowns, this must be considered in the design.
- (5) If a licensee is using a flare or incinerator in a field service that has not previously been field tested, the licensee must be able to provide actual monitoring data to show that performance specifications can be met.
- (6) Field testing of newly designed equipment is not allowed, unless there are acceptable and redundant combustion systems to ensure that gas can be properly combusted if the new equipment fails to perform as predicted or the ability exists for the gas utility pipeline or pipeline installation to be shut in if problems arise.

10.1 Conversion efficiency

- (1) Flares and incinerators, and other gas combustion systems must be designed, maintained, and operated so that emissions do not exceed the *Alberta Ambient Air Quality Objectives*.
- (2) A licensee must modify or replace existing flares or incinerators if operations result in off-lease odours, odour complaints, or visible emissions such as black smoke.

10.2 Heating value and exit velocity for flares in the event of upstream process upsets

- (1) If a flare is also subject to an Alberta [*Environmental Protection and Enhancement Act*](#) approval, the more stringent requirement on minimum heating value applies.

⁵ The titles Professional Engineer, Certified Technician, Certified Engineering Technologist, and Registered Engineering Technologist refer to designations as granted by APEGGA or ASET or the equivalent.

- (2) For purposes of this rule, the combined net or lower heating value of gas, including make-up fuel gas, directed to a flare must not be less than 20 megajoules per cubic metre (MJ/m³), except as noted below:
 - (a) If existing stacks have an established history of stable operation and compliance with the *Alberta Ambient Air Quality Objectives* (licensees are expected to support claims that existing stacks have operated satisfactorily over time), licensees are allowed to maintain the current heating value provided that it is not less than 12 MJ/m³.
 - (b) If flare stacks have a history of flame failure, odour complaints, or exceedances of the *Alberta Ambient Air Quality Objectives*, licensees must operate with a combined flare gas heating value of not less than 20 MJ/m³.
- (3) If fuel make-up is required, it must be specified for flare stacks by a qualified technical professional⁶ and
 - (a) equipment controls must be installed and operating procedures must be documented to ensure minimum fuel gas make-up during operating conditions; and
 - (b) gas utility pipelines and pipeline installations must be operated in compliance with specified minimum fuel gas make-up requirements.
- (4) The flare tip diameter must be properly sized for the anticipated flaring rates. The flare spreadsheet associated with AER's [Directive 060](#) provides a range of recommended values.

10.3 Minimum residence time and exit temperature for incinerators in the event of upstream process upsets

- (1) If an incinerator is subject to an [Environmental Protection and Enhancement Act](#) approval, any requirements regarding minimum residence time or exit temperature contained in that approval take precedence over these requirements.
- (2) Incinerators must provide a minimum residence time⁷ of 0.5 seconds at maximum flow rate or greater as required for complete combustion of heavier gases.
- (3) Incinerators must be operated without an exposed flame.
- (4) If the gas contains less than 10 mol/kmol (one per cent) H₂S and the unsupplemented heating value of the gas is 20 MJ/m³ or greater, no minimum residence time is required.
- (5) Incinerators must operate with a minimum exit temperature⁸ of 600 degrees Celsius.

⁶ Professional Engineer, Certified Technician, Certified Engineering Technologist, or Registered Engineering Technologist, as recognized by APEGGA or ASET, or the equivalent.

⁷ Residence time is calculated between the top of the final burner and the stack exit.

⁸ Exit temperature must be measured within 1 stack diameter of the exit. A shielded thermocouple must be used if the burner flame is visible to the temperature monitor. For further information, consult the Alberta Stack Sampling Code or contact Alberta Environment and Parks.

- (6) For combustion of gases with less than 10 mol/kmol (one per cent) H₂S and an unsupplemented heating value of 20 MJ/m³ or greater, no minimum exit temperature or temperature monitoring is required.
- (7) For any enclosed combustion technology not meeting the requirements relating to minimum exit temperature and minimum residence time a licensee must submit third-party verified conversion efficiency test results or approval, unless the gas utility pipeline or pipeline installation is subject to an [Environmental Protection and Enhancement Act](#) approval.
- (8) Test programs and submissions must be provided by a qualified technical professional⁹ and must include:
 - (a) inlet gas parameters, including flow rates and composition;
 - (b) stack gas exit parameters, including temperature and composition;
 - (c) material and energy balance calculations;
 - (d) a mass-weighted conversion efficiency value representative of the exit conditions;
 - (e) discussion of the variation of measured and calculated results, depending on sampling location across the stack; and
 - (f) discussion of extending test results to other inlet conditions, including discussion of inlet limitations for H₂S concentration and inlet gas flow rate.
- (9) All testing must meet the *Alberta Stack Sampling Code*.
- (10) Temperature monitoring and reporting requirements still apply.
- (11) A licensee using an incinerator must be able to provide details about the conversion efficiency of the equipment. Any of the following are considered to be acceptable evidence of compliance with this requirement:
 - (a) the design at the maximum specified capacity meets the residence time, temperature, and conversion efficiency requirements set out in (b), as calculated using the incineration spreadsheet associated with AER's [Directive 060](#); or
 - (b) conversion efficiency for incinerators is 99 per cent or greater, based on one of the following:
 - (i) the manufacturer's third-party-verified conversion efficiency test results, provided that the tests were conducted under conditions representative of the facility design; or
 - (ii) actual field measurements of conversion efficiency from the operating facilities following start-up; or
 - (c) if conversion efficiency is less than 99 per cent, the incinerator is considered to operate as a flare and must meet all requirements for flares, including stack height.

⁹ Professional Engineer, Certified Technician, Certified Engineering Technologist, or Registered Engineering Technologist, as recognized by APEGGA or ASET, or the equivalent.

10.4 Smoke emissions

- (1) Gas combustion must not result in continuous or repeat black smoke emissions.
- (2) Black smoke from pipeline depressuring for maintenance, process upsets, or emergency depressuring for safety reasons or emergency flaring must not exceed an average of 40 per cent opacity over six consecutive minutes or the requirements in the *Substance Release Regulations* made under the [*Environmental Protection and Enhancement Act*](#).
- (3) Any smoke emissions that may result in public concern must immediately be reported to the local AER field centre in the area.

10.5 Ignition

- (1) Incinerators must have reliable systems to ensure continuous ignition of any gas that may discharge to the device.
- (2) If repeat failures have occurred or off-lease odours or other impacts have resulted from failure to ensure ignition of sour gas, regardless of H₂S content, the Commission may require installation of:
 - (a) both pilots and automatic ignition; or
 - (b) flame failure detection and alarms.
- (3) Manual flare and incinerator ignition subject to good fire safety practices are acceptable for pipeline depressuring for maintenance, process upsets, or emergency depressuring for safety reasons where:
 - (a) no continuous gas flow exists; and
 - (b) no automatic relieving systems are connected to the stack.

10.6 Stack design

- (1) Flares and incinerators must meet or exceed all of the following applicable stack design requirements:
 - (a) flare and incinerator stacks must be designed so that the maximum radiant heat intensity at ground level will not exceed 4.73 kilowatts per square metre (kW/m²),
 - (b) ground-level radiant heat determinations for flares must be based on calculation procedures outlined in the flare spreadsheet associated with AER's [*Directive 060*](#), API-RP-521 Section 4.4.2.3, or *GPSA Engineering Data Book 12th Edition*, Section 5,
 - (c) incinerators must be operated without exposed flame.
- (2) A licensee may request from the Commission an exception to the requirements for stack design, if the licensee shows that the proposed stack design provides an equivalent level of safety and
 - (a) the licensee restricts access to the area where the radiant heat intensity guideline could be exceeded and ensures that this area is free of combustible materials and vegetation;

- (b) access restrictions must include appropriate warning signs and the area must be clearly marked; and
 - (c) necessary procedures such as safe-work permit system must be in place when it is necessary to work within the area where the radiant heat intensity guideline could be exceeded.
- (3) Flares and incinerators located within a distance of five times the height of any neighbouring buildings must have a height of at least 2.5 times the height of the highest building, except for devices for destruction of trace vent gases, such as those emitted from gas dehydrators.
 - (4) Flares and incinerators must have sufficient height to provide adequate plume dispersion to comply with the *Alberta Ambient Air Quality Objectives* for SO₂.
 - (5) Proper stack heights must be used in order to minimize fuel consumption. If the use of supplemental fuel gas is proposed, all other options must be investigated first. Fuel gas usage and amounts must be justified.
 - (6) Interconnecting lines to the flare or incinerator must be secured to prevent whipping or flailing.

10.7 Liquid separation

This section applies in cases where liquids may be present in the pipeline:

- (1) A licensee must use proper gas-liquid separation facilities adequate to protect the gas utility pipeline system or gas combustion system.
- (2) These requirements respecting liquid separation apply to knockout, knockout drum, scrubber, and separator.
- (3) Liquid separation equipment must be provided in both temporary and permanent flare and incinerator systems to prevent the carryover of liquid hydrocarbons, water, or other liquids.
- (4) Flare and incinerator separators must be designed in accordance with good engineering practice to remove droplets of 300- to 600-micron diameter and larger as set out in *API-RP-521*.
- (5) Designs must be based on the lowest density hydrocarbon liquids that could be released to the flare or incinerator system.
- (6) The flare and incinerator separators or knockout drums must be designed to have sufficient holding capacity for liquid that may accumulate as a result of upstream operations, such as hydrocarbon carryover, liquid slugs, and line condensation.
- (7) Flare and incinerator separators in gas utility pipelines or pipeline installations must be equipped with high-level alarms that can be responded to by the operator prior to liquid carryover, in addition to liquid level indication.
- (8) All flare and incinerator separators must be provided with visual level indicators, plus high-level facility shutdowns or high-level alarms that can be responded to by the operator prior to liquid carryover, as well as operating procedures to ensure that the liquid retention in the vessel will not exceed the maximum design liquid level during all operating conditions. If impacts such as liquid carryover or unacceptable smoke emissions have occurred as a result of failure to control

liquid level, both high-level facility shutdowns and high-level alarms must be provided.

- (9) High-level alarms and facility shutdowns must be installed on all flare and incinerator separators where liquid streams are directed to the separator for storage or where free liquids are contained in continuously combusted streams.
- (10) Flare and incinerator separator high-level alarms must be connected to pipeline installation alarm panels or semi-attended facility alarm call-out systems if the pipeline installations are so equipped.
- (11) Flare and incinerator separators or knockout drums used for liquid storage must be designed in accordance with Part 3 of this rule.
- (12) Notwithstanding the requirements in this section, the Commission does not require independent flare or incinerator separators in situations where the only vessels connected to the flare or incinerator are separators equipped with a high level shut down (HLSD) or equivalent device, or a system that prevents liquids from entering the flare or incinerator and where the HLSD is configured to shut down and block in, but not depressure the pipeline installation and the HLSD trip level is set so that adequate vapour-liquid separation is not impaired at maximum liquid level and vapour flow rates.

10.8 Backflash control

- (1) A licensee must take precautions to prevent backflash using appropriate engineering and operating practices, such as:
 - (a) installation of flame arresters between the point of combustion and the flare or incinerator separator; or
 - (b) provision of sufficient flare header sweep gas velocities (i.e., purge or blanket gas) to prevent oxygen intrusion into the flare or incinerator system.
- (2) Check valves are not an acceptable form of backflash control.
- (3) Safe work procedures must be in place to ensure complete purging of oxygen from flare or incinerator systems prior to ignition.

10.9 Flare and incinerator spacing requirements

- (1) A licensee must follow good engineering and safety practices in the layout of gas utility pipelines or pipeline installations.
- (2) A licensee must consult fire protection codes and guidelines when designing a pipeline installation.
- (3) For permanent flaring systems and incinerators on pipeline installations, flares and incinerators must be:
 - (a) located, as measured from the base of the stack, at least 50 m away from storage tanks containing flammable liquids or flammable vapours; and
 - (b) located, designed, and operated so that no hazard to public property is created. They must be at least 100 m away from surface improvements with the exception of surveyed roadways or road allowances, which must

be 40 m from flares and incinerators¹⁰ and 100 m away from an occupied residence.

- (4) Flare and incinerator spacing must comply with the requirements defined in the current *Forest and Prairie Protection Regulations*.
- (5) A licensee must maintain areas surrounding permanent flares and incinerators to minimize fire hazards.

10.10 Noise

Flares and incinerators must be designed to operate in compliance with Rule 012.

11 Venting and fugitive emissions management requirements

11.1 General requirements

- (1) All continuous and temporary venting must be evaluated for purposes of conservation of the gas.
- (2) A licensee must burn all non-conserved volumes of gas if volumes and flow rates are sufficient to support stable combustion.
- (3) The Commission may investigate vented volumes of 500 m³/day, or even lower, if it appears that stable combustion of the gas may be feasible. Upon request, a licensee must provide justification for volumes not combusted.
- (4) Pressure-relieving devices may be connected to open tanks provided that all other requirements in this part are met.
- (5) Hydrocarbon products stored in atmospheric storage tanks at compression stations must not exceed a true vapour pressure of 83 kPa at 21.1 degrees Celsius if such tanks are vented to the atmosphere.
- (6) Temporary, short-term venting is allowed at gas utility pipelines and pipeline installations on the following conditions:
 - (a) gas must be sweet;
 - (b) gas must not contain any free hydrocarbon liquid (if free hydrocarbon liquids are present in the produced gas, a flare [or other gas combustion device] and liquid separation must be used);
 - (c) all liquids must be separated and contained in accordance with the storage requirements of Part 3 of this rule; and
 - (d) total gas volume must not exceed 2 10³ m³ and the duration must not exceed 24 hours.
- (7) The local AER field centre may consider alternatives to the requirements under this section should special circumstances warrant and a licensee must contact the AER field centre in the area for approval of alternatives.
- (8) Temporary venting is permitted within 500 m of a residence if the volume vented does not exceed 500 m³. Venting volumes in excess of 500 m³ requires the

¹⁰ The 40-metre spacing requirement applies to public road allowances and roads where the public has open access. There is no spacing requirement for private operator access roadways or private roadways on operating sites.

approval of the local AER field centre and the consent of the resident whose residence is within 500 m of the venting.

- (9) Vented gas must not constitute an unacceptable fire or explosion hazard. Any venting must not occur within a distance less than 25 m from any flame type equipment and spacing requirements must be met.
- (10) An appropriate flame arrester, equivalent safety device, or proper engineering and operating precautions such as sufficient sweep gas velocity must be used on all vent lines from hydrocarbon storage tanks connected to flare or incinerator stacks.

11.2 Limitations of venting gas containing H₂S or other odorous compounds in the event of an upstream process upset

- (1) Gas containing more than 10 mol/kmol H₂S must not be vented to the atmosphere.
- (2) Venting must not result in H₂S odours outside the boundary of the site of the pipeline installation.
- (3) Venting must not result in off-site exceedances of the *Alberta Ambient Air Quality Objectives*.

12 Records

- (1) A licensee must keep all equipment and controls design information and submit it to the Commission upon request, if the Commission determines that there is a concern with the equipment or controls.
- (2) A licensee must keep copies of operating limits and procedures and submit them to the Commission upon request.
- (3) A licensee must keep design information on flare and incinerator system liquid separation equipment and submit it to the Commission upon request.
- (4) A licensee must keep information on backflash controls and submit it to the Commission upon request if the Commission determines that there is a concern with the equipment or controls.
- (5) A licensee must maintain a log of flaring, incinerating, and venting occurrences and respond to public complaints and to comply with release reporting requirements set out in the [Pipeline Rules](#).
- (6) Logs must:
 - (a) include information on complaints related to flaring, incinerating, and venting events and how these complaints were investigated and addressed;
 - (b) describe each flaring, incinerating, and venting incident and any changes implemented to prevent future events of a similar nature from occurring;
 - (c) include the date, time, duration, gas source or type (e.g., gas containing sulphur compounds such as mercaptans), and volumes for each incident; and
 - (d) be kept for a minimum of 12 months.

- (7) Flaring, incinerating, and venting records must be made available to the Commission upon request for each pipeline or pipeline installation, where flaring, incinerating, and venting occur.
- (8) A licensee may retain logs for remote or semi-attended facilities at a central location where public complaints related to the pipeline installation in question would normally be received.

Part 3: Storage requirements for gas utility pipelines and pipeline installations

13 Definitions

- (1) In this part:
 - (a) “aboveground storage tank” means a tank that sits on or above the ground surface and whose top and complete external sides can be visually inspected;
 - (b) “adverse effect” means an impairment of or damage to the environment, human health or safety, or property;
 - (c) “bulk pads” means a ground surface area designated for the segregated storage of materials without the use of a container or tank;
 - (d) “container” means a portable aboveground storage device that does not exceed one cubic metre in capacity;
 - (e) “device” includes an aboveground tank, an underground tank, a container, and a bulk pad;
 - (f) “impervious” means a natural material that demonstrates a hydraulic conductivity of 10^{-6} cm/s or less as determined in situ or of 10^{-7} cm/s or less as determined in a laboratory from a representative disturbed sample, or a synthetic membrane liner or barrier appropriately selected to control the migration of specific fluids;
 - (g) “leak detection system” means a system designed for the early detection of any leakage from a primary containment device; may include visual, electronic, or statistical inventory methodologies;
 - (h) “permanent storage” means the storage of materials produced, generated, or used by a gas utility pipeline or pipeline installation in a device that is a permanent, fixed part of the gas utility pipeline or pipeline installation;
 - (i) “temporary storage” means the storage of materials produced, generated, or used in specific operations, such as plant turnarounds, construction operations, containment and cleanup of a spill, or emergency conditions, of a gas utility pipeline or pipeline installation that does not exceed three months;
 - (j) “tank” means a device designed to contain liquid materials that has an internal capacity of more than 1 m^3 and is constructed of impervious materials that provide structural support and may include such materials as plastic, fibreglass-reinforced plastic, or steel but does not include piping; and
 - (k) “underground storage tank” means a tank, of any volume, that is partially or completely buried and does not allow for the visual inspection of the top, complete sides, and bottom of the tank without excavation.

- (2) Subject to Subsection (4), this part applies to storage systems for gas utility pipelines and pipeline installations constructed and commissioned after January 1, 2002.
- (3) For storage systems for gas utility pipelines and pipeline installations constructed and commissioned before January 1, 2002, the requirements in Appendix 3 apply. However, if these storage systems are modified or added to, the requirements in Appendix 3 no longer apply and the requirements set out in this part must be met.
- (4) This part does not apply to:
 - (a) aboveground and underground pressurized vessels that are part of an active production process that have been designed to a working pressure greater than 103.4 kilopascals (kPa) (15 pounds per square inch [psi]) and are registered with the Alberta Boilers Safety Association; and
 - (b) flare knockout tanks and pipeline drip vessels.

14 General storage requirements

- (1) A licensee must store materials, such as condensates (C5+, non-pressurized storage), chemicals, solvents, lubricants (other than for motor vehicle use), oily waste, that may adversely affect the environment and that is produced, generated, or used on a pipeline installation site.
- (2) A licensee may use alternative storage systems to those set out in this part, if the licensee demonstrates that the materials, systems, equipment, procedures, or new technologies meet the objectives of the requirements in this part.
- (3) Prior to implementing an alternative storage system, a licensee must apply to the Commission and include the design details of the pipeline installations and provide sufficient information to substantiate that an equivalent level of environmental protection and safety will be achieved by the proposed storage system.
- (4) A licensee must:
 - (a) select a storage site that minimizes the potential for environmental concerns;
 - (b) implement operating procedures, maintenance practices, and inspection programs to maintain the integrity of the primary containment device and any associated equipment such as valves, fittings, piping, or pumps;
 - (c) implement operating practices to prevent the buildup of static electricity during the transfer of flammable liquids;
 - (d) store the materials in a manner such that incompatible materials are segregated to prevent contact even in the event of a possible release so that materials do not:
 - (i) generate extreme heat or pressure or cause a fire or explosion;
 - (ii) produce uncontrolled fumes or gases that pose a risk of fire or explosion; and
 - (iii) damage the structural integrity of a storage facility.

14.1 Release or spill prevention

- (1) A licensee must ensure that materials stored at a pipeline installation are adequately contained to prevent soil, surface water, and groundwater contamination through effective primary containment, secondary containment, and leak detection.
- (2) While often small in nature, releases or spills may occur for a variety of reasons, such as load line connection spills, tank overflows, truck overfilling, and flange, valve, and fitting leaks. The occurrences of these types of releases or spills are an indication of opportunities for improvements in operations.
- (3) A licensee must include within their operating procedures proactive measures to prevent the occurrence of these releases, such as plans and policies to prevent releases, as well as documentation of their frequency and the cause of occurrence in order to determine the overall program effectiveness. These measures must include contracted services, as contractors are often responsible for the loading operations that may result in intermittent releases.
- (4) Some of the measures that a licensee must implement to reduce release volumes and frequency include:
 - gas utility inspection and maintenance programs
 - gas utility operations handbooks or environmental bulletins
 - licensee and contractor training on gas utility expectations and reporting
 - contract or pre-job orientations
 - detailed records of internal spill or incident reports
 - a database of incidents to allow for analysis of spill cause and frequency
- (5) Measures that prevent spills and releases are the most effective in terms of both cost and environmental protection.
- (6) A licensee must immediately contain, clean up, and report all spills and releases to the appropriate agency.

14.2 Storage duration

- (1) A licensee must not store materials indefinitely.
- (2) Materials stored must be consumed within a period of two years.
- (3) Wastes and empty barrels must not be stored for longer than one year.

14.3 Permanent or temporary storage

- (1) The following storage devices do not require secondary containment requirements:
 - (a) an aboveground or underground tank used to store fresh water, provided that the water meets the following criteria: chloride \leq 500 milligrams per litre (mg/L), pH 6.0 to 9.0, no visible hydrocarbon sheen (roughly equates to less than 10 mg/L, and no other chemicals in concentrations that would be harmful to the environment;

- (b) a small tank or a group of small tanks with a total combined volume not exceeding five cubic metres on a site, see Section 16.1;
 - (c) an aboveground or underground storage device such as a pop tank and other emergency containment tank, a compressor oil drain tank, used to infrequently store fluids for very short durations, provided they are emptied immediately after use and are regularly inspected to verify their integrity; or
 - (d) pigging fluid catchment devices.
- (2) If the characteristics of the site (e.g., topography, hydrogeology and geology) are such that the risks associated with surface water contamination, subsurface contaminant migration, and impacts to groundwater are high, leak detection and secondary containment are required for any storage device regardless of its usage frequency.
 - (3) The temporary storage of sludges or solids such as contaminated soil, spill debris, oily waste in steel-fabricated, solids-storage bins such as lugger bins, does not require secondary containment.
 - (4) Even in temporary storage situations, a licensee must not store contaminated materials or materials possessing the potential to leach directly on the ground.
 - (5) At the end of the specific operation, a licensee must transfer the temporarily stored materials to a permanent storage device or appropriately treat or dispose of the stored materials.

14.4 Siting

- (1) A licensee must locate a storage device or area so that it is:
 - (a) readily accessible for firefighting and other emergency procedures;
 - (b) not located in a floodplain, unless appropriate alternative secondary containment measures are incorporated into the design and installation;
 - (c) chosen so as to minimize the risk of environmental damage, including any threats to the integrity of the storage area, the quality of soils, surface water, and groundwater, and the health of humans, animals, and plants during the construction, operation, and closure of the storage area; and
 - (d) not located within 100 m of the normal high-water mark of a body of water, permanent stream, or water well used for domestic purposes.
- (2) When temporary storage is associated with emergency situations, a licence may be exempt from fully implementing the criteria in this section.

14.5 Equipment spacing

- (1) No person shall smoke within 25 m of a separator or other unprotected source of ignitable vapour.
- (2) No flame-type equipment shall be placed or operated within 25 m of any process vessel unless, where such is applicable, the flame-type equipment is fitted with an adequate flame arrester. Flame-type equipment shall not be located in the same building as any process vessel or other source of ignitable vapour, unless:
 - (a) the air intakes and flues or all burners are located outside the building;
 - (b) relief valves, safety heads, and other sources of ignitable vapours are vented outside the building and discharged above roof level; and
 - (c) the building is adequately cross ventilated.

All storage devices or areas must comply with the equipment spacing requirements identified in Figure 1.

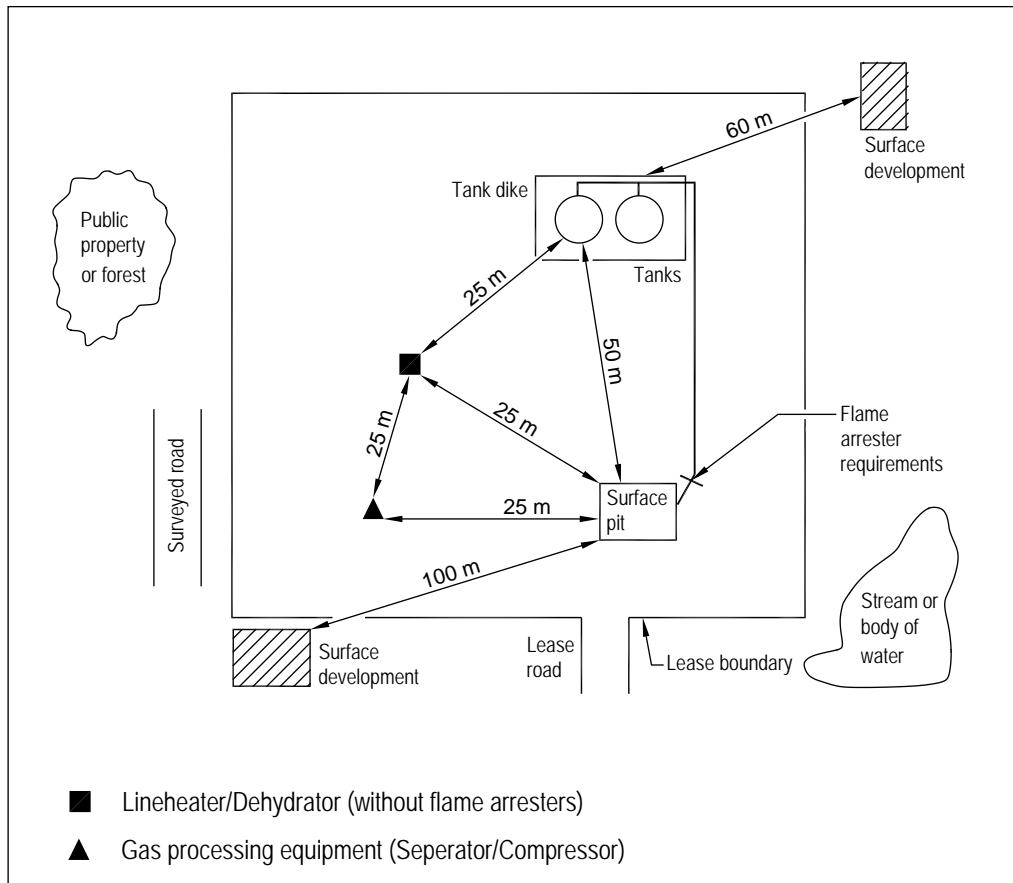


Figure 1. Equipment Spacing Diagram

14.6 Identification of storage facilities

- (1) A licensee must place signs on all stand-alone storage of a gas utility pipeline and pipeline installation at the entrance to the gas utility pipeline and pipeline installation indicating the licensee name, emergency phone number, and legal description, as set out in Figure 2.
- (2) Within a storage area of a gas utility pipeline and pipeline installation and at storage areas that form part of an operating of a gas utility pipeline and pipeline installation, signs must indicate the materials that are stored, warnings, and any general housekeeping practices that should be followed in the storage area (e.g., segregation).

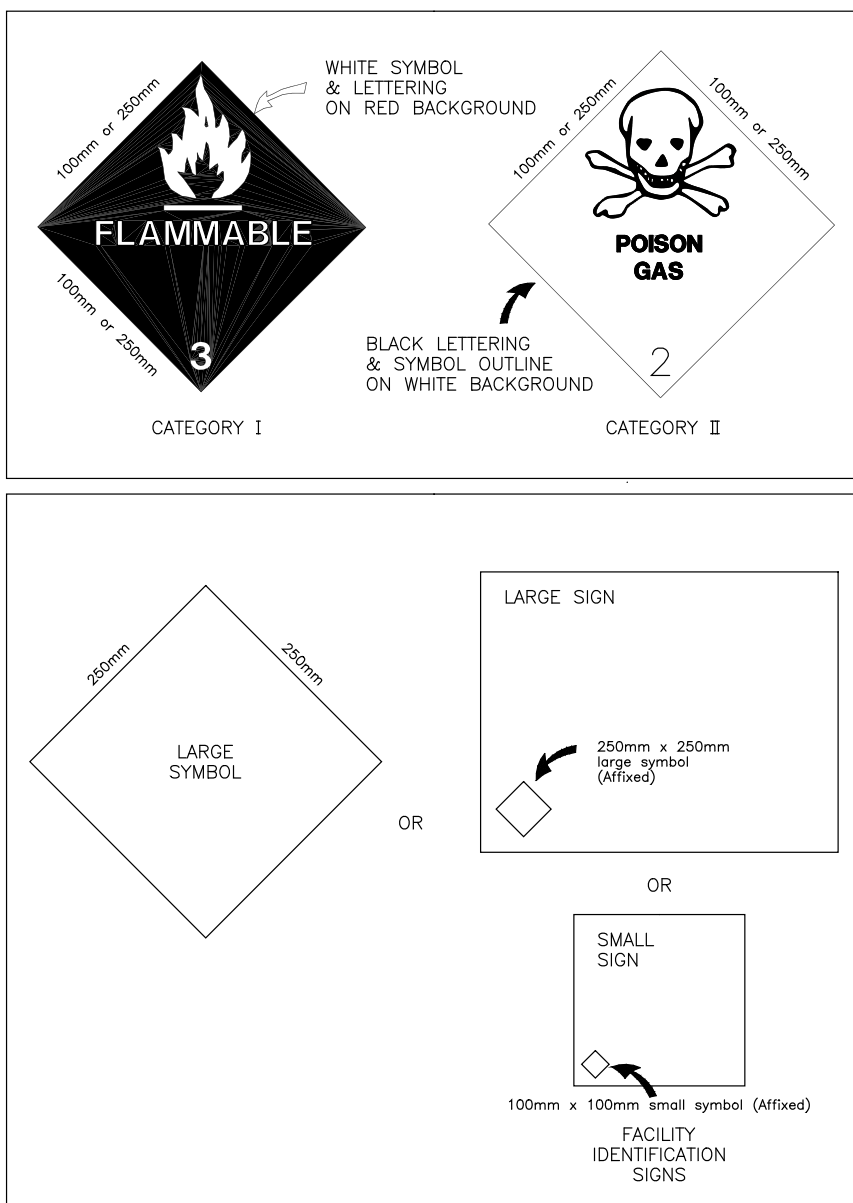


Figure 2. Facility Identification and Warning Signs

14.7 Release of collected surface run-on/runoff waters

- (1) A licensee must test collected waters at a pipeline installation storage site to determine whether the waters contain:
 - (a) a chloride content of 500 mg/L maximum (e.g., test strips);
 - (b) a pH 6.0 to 9.0 (e.g., test strips or meter readings);
 - (c) no visible hydrocarbon sheen (roughly equates to less than 10 mg/L); and
 - (d) no other chemical contamination (e.g., clean operating conditions such that collected waters are not impacted by spills or releases).
- (2) If the tests show that the waters have not been contaminated, surface run-on or runoff waters collected on a pipeline installation site, for example, within a diked area of a tank farm or within the surface water collection system, the licensee may release the water back into the environment provided that it is done in a controlled manner on adjacent lands, if the licensee has obtained landowner or occupant consent and records each release, including the pre-release test data and the estimated volume of water released.
- (3) The discharge of collected surface waters into a watercourse is not permitted unless otherwise specified in an [*Environmental Protection and Enhancement Act*](#) approval.
- (4) Unless a licensee can treat contaminated waters on site, the licensee must send contaminated water to an approved facility for treatment or disposal.
- (5) The minimal parameters listed in this section are intended as screening parameters for sites exhibiting good practices. On sites where spills or releases have occurred, the collected surface water must be tested for parameters that would demonstrate that the water has not been affected.

15 Requirements for aboveground storage tanks

- (1) A licensee must ensure that an aboveground storage tank is constructed from suitable metallic or non-metallic materials such as steel-welded or skid-mounted tank, plastic tote or slip, or fibreglass-reinforced plastic tank, capable of containing the stored materials.
- (2) An aboveground storage tank with an internal volume less than one cubic metre is a container, see Section 17.
- (3) Tornado systems or other positive pressure systems used as product stabilizers or accumulators are process vessels and not storage tanks and no secondary containment is required.

15.1 Aboveground storage tanks with an internal volume less than five m³

- (1) For an aboveground storage tank with an internal volume greater than one m³ but less than five m³ such as a mounted methanol, glycol, or chemical tank, a licensee must:
 - (a) visually inspect the tank on a monthly basis to verify the integrity of the tank;

- (b) ensure that a tank has operable and non-leaking fittings, nozzles, and hoses;
 - (c) implement preventive measures to avoid spills and leaks at fluid transfer points such as piping, flanges, valves; and
 - (d) either externally coat the tank with materials such as paint or galvanized steel or use a tank made from a weather- and corrosion-resistant material such as plastic or fiberglass.
- (2) A licensee may store on a pipeline installation site a total combined internal volume of five m³ in small tanks without secondary containment. For a site with five 2.5 m³ tanks, two of these tanks do not require secondary containment, while three of these tanks require secondary containment.

15.2 Aboveground storage tanks with an internal volume equal to or greater than five m³

- (1) For an aboveground storage tank with an internal volume equal to or greater than five m³ or if small tanks have a combined internal volume equal to or are greater than five m³, a licensee must:
- (a) design, manufacture, test, and install a tank to applicable engineering, manufacturing, and regulatory standards;
 - (b) install a tank made either from weather-resistant material or externally coated with a weather-resistant material;
 - (c) externally coat a steel tank with a material such as paint, or have it galvanized;
 - (d) if storing corrosive liquids in steel tanks, internally coat or line a tank to minimize corrosion;
 - (e) install transfer lines and hoses compatible with the material being transferred and with leak-proof connections;
 - (f) use a spill control device, around hose connections at fluid transfer points to help prevent the contamination of soil, surface runoff water, and groundwater, which
 - (i) keeps precipitation or other materials out of the spill control device,
 - (ii) prevents rusting and allows for easy inspection of the integrity, and
 - (iii) recovers any spilled or leaked fluids from the device,
 - (g) design a tank loading and unloading area to contain any spills or leaks;
 - (h) contour a site to prevent the collection of surface water on the ground immediately surrounding the secondary containment system, such as a tank farms; and
 - (i) incorporate in a tank measures to prevent the overfilling of a tank such as automatic sensing devices for interconnection with shutoff equipment at the supply point, automatic overflow shutoff devices of a float valve or other mechanical type, vent restriction devices, and overflow alarm devices

of the audible or visual type (single-stage or two-stage activation), inventory control, and any other appropriate measure that will prevent overflowing.

15.3 Secondary containment for single-walled aboveground tanks with an internal volume of five m³ or greater

- (1) For a single-walled aboveground storage tank with an internal volume of equal to or greater than five m³, a licensee must install a secondary containment system consisting of an impervious liner and a dike and designed to contain leakage and prevent it from impacting the surrounding environment.
- (2) The area within the secondary containment system must be graded to a sump or low-lying area within the diked area to allow for the collection of rainwater, snow-melt water, and any possible leakage from the tanks.
- (3) No uncontrolled discharge of collected fluids or discharge of untested fluids is permitted, see Section 15.7.
- (4) Despite this section, a licensee may use a single-walled aboveground tank for temporary storage of fluids without an impervious liner or a dike where:
 - (a) the site is manned for the duration that fluids are being produced into the tank;
 - (b) the tank is fitted with a high-level shutdown device to prevent fluids from overflowing; or
 - (c) the fluids are not being produced to the tank, but are simply being stored.
- (5) A licensee exercising the option to not dike a tank under Section 16.3(4) must empty the tank or remove it from the site within 72 hours of completing the operation.

15.4 Dikes

- (1) A licensee must construct a dike with soil, steel, concrete, solid masonry, or synthetic material and design it to contain liquids within the diked area, to be able to withstand the hydrostatic head associated with it being full of liquid, and so that it will not deteriorate or develop leaks during the projected life of the structure.
- (2) A dike must:
 - (a) be sized to have a volumetric capacity of not less than 110 per cent of the capacity of the tank when the diked area contains one tank or when the diked area contains more than one tank of not less than the sum of:
 - (i) the capacity of the largest tank located in the diked area, and
 - (ii) 10 per cent of the greater of:
 - (A) the capacity specified in (a), or
 - (B) the aggregate capacity of all other tanks located in the diked area;
 - (b) have no openings in it (e.g., dike drains to the surrounding area); and

- (c) be maintained in good condition including keeping the area encompassed by the dike free from weeds, debris, and extraneous combustible material.

15.5 Leak detection

- (1) A licensee must be able to demonstrate the integrity of its aboveground storage tank by using leak detection methods and verify whether any material has escaped.
- (2) Leak detection methods for aboveground storage tanks include:
 - (a) incorporation of a layer of porous material, such as sand, over the liner and underneath a tank to provide protection to the liner and to allow any leakage to move preferentially through the porous material to a collection area within the diked area;
 - (b) monthly visual inspections of tanks and the surface of the diked area for evidence of problems, damage, or leakage; and
 - (c) the incorporation of subliner leakage detection devices such as weeping tile system.
- (3) When a leak is identified, the tank or storage system must be shut down, inspected, and repaired.

15.6 Secondary containment for indoor single-walled aboveground storage tanks

A licensee must surround an indoor aboveground storage tank by a containment device such as an impervious containment base and wall or curbing, or drain and collection tank that has a capacity as described in Section 16.4(2).

15.7 Double-walled tanks (internal volume $\geq 5 \text{ m}^3$)

- (1) A licensee may use a double-walled aboveground tank as an alternative to a single-walled aboveground tank using a secondary containment system consisting of a liner and a dike.
- (2) An aboveground storage tank with double walls must:
 - (a) have the primary tank separated from the secondary containment so as to provide a continuous interstitial space below and around the primary tank;
 - (b) be equipped with a method of overfill protection that incorporates an audible or visual alarm that alerts the licensee of a potential overfill condition or an automatic shutoff mechanism to prevent the overflow of the primary tank;
 - (c) be equipped with an effective spill control device at the fill/delivery connection;
 - (d) have a system to monitor the interstitial space between the tank walls (e.g., pressure, vacuum, electronic, or vapour monitoring or manual sampling);
 - (e) be protected against damage from vehicular traffic such as controlled access to the site, bollards, guard rails, or concrete barricades;

- (f) be equipped with a valve as close as practical to the tank to prevent draining of the tank should a leak or break occur in the piping; and
 - (g) for systems designed with delivery connections at grade level, have a bottom load equipped with provisions to allow the delivery hose to be emptied and with a drip catchment device for the hose.
- (3) Unless the interstitial-space monitoring device in an aboveground storage tank with double walls is equipped with a continuous monitoring system that will indicate when the primary or secondary tank is leaking, a licensee must check the interstitial-space monitoring device at least monthly, to ensure that the tank system is not leaking and must document any abnormal circumstances, as well as any corrective actions taken.
 - (4) A licensee must check an automatic shutdown system monthly and maintain it to ensure continuous functionality, and documentation pertaining to this and any abnormal circumstances from the monitoring or sampling of the interstitial-space must be retained.

16 Requirements for underground storage tanks

- (1) A licensee may install an underground storage tank of any volume which must:
 - (a) be double-walled, designed, manufactured, tested, and installed to applicable engineering, manufacturing, and regulatory standards;
 - (b) be tested for integrity along with the associated piping when newly installed, as a complete system prior to placing in service;
 - (c) have cathodic protection and an external coating to minimize corrosion if it is of steel;
 - (d) have transfer lines and hoses that are compatible with the material being transferred and have leak-proof connections;
 - (e) have spill control devices around hose connections at fluid transfer points to help prevent the contamination of soil, surface runoff water, and groundwater which include devices to:
 - (i) keep precipitation or other materials out of the spill control device,
 - (ii) prevent rusting and to allow for easy inspection of their integrity such as elevation above ground level, and
 - (iii) recover any spilled or leaked fluids from the device; and
 - (f) incorporate measures to prevent the overfilling of tanks such as automatic shutoff devices, high-level alarms, two-stage alarms, visual indicators, or any other measure that will prevent overfilling.
- (2) For an underground storage tank, a licensee must design:
 - (a) a tank loading and unloading areas to contain any spills and leaks; and
 - (b) breathing vents must be designed to prevent the overflowing of fluids onto the ground.

- (3) A licensee may install an internal lining in an underground storage tank to prevent internal corrosion, but by itself such a measure is not considered to be an acceptable corrosion protection measure.

16.1 Secondary containment and leak detection

- (1) For an underground storage tank, a licensee must provide a secondary containment system through the use of double-walled tanks that allow monitoring of the interstitial space between the two walls.
- (2) A licensee must monitor the interstitial space of the double-walled storage tank monthly using pressure monitoring, vacuum monitoring, electronic monitoring, vapour detection, manual sampling, or an equivalent method. Any abnormal circumstances must be documented, as well as any corrective actions taken.

17 Storage requirements for containers

- (1) The total combined volume of containers without secondary containment cannot exceed one m³, approximately five barrels or five 45-gallon drums on any gas utility pipeline or pipeline installation site.
- (2) Despite Section 18(1), secondary containment is required:
 - (a) if a release or spill could not be contained on site or if a spill or release could reasonably be expected to present a risk to a stream, water body, groundwater or cause other environmental concerns; or
 - (b) for all containers that exceed the total combined volume of one m³, that is for a site with more than five barrels, the number of barrels exceeding five require secondary containment.
- (3) The type of secondary containment and weather protection for a container depends on the nature of the contained material, the type of container, and the design of the storage compound.

17.1 Secondary containment

- (1) A licensee must construct a secondary containment system for containers such as a dike, curb, or collection trays of materials that:
 - (a) are impervious to the materials being stored; and
 - (b) will not react with or absorb any material being stored.
- (2) A secondary containment system for a container must:
 - (a) have a net capacity greater than that of the largest container within the storage area or 10 per cent of the total volume of all containers in the storage area, whichever is greater;
 - (b) be achieved through the proper use of at least one of the following devices:
 - (i) storage compound that meets the secondary containment criteria for aboveground storage tanks such as impervious liner and dike,

- (ii) storage building with curbing,
 - (iii) storage trailer,
 - (iv) metal and plastic bins,
 - (v) overpacks, or
 - (vi) drip trays or spill pallets, and
- (c) not have any opening that may provide a direct connection to the ground underneath or surrounding the primary container.
- (3) A licensee must include in storage trailers and buildings for containers:
 - (a) clad structures with concrete floors and curbing that is a minimum height of 15 cm and is placed on the perimeter of the floor in such a manner that the contained material cannot escape between the floor and curb;
 - (b) clad structures with a containment floor;
 - (c) sealed shipping containers with a containment floor; and
 - (d) loading dock buildings with a containment floor.
- (4) A licensee must include in the design considerations for trailers and buildings for containers:
 - (a) compatibility of the construction materials with the materials being stored;
 - (b) proper ventilation of vapour emissions from the materials being stored;
 - (c) compliance with fire and electrical codes;
 - (d) security measures or procedures to prevent unauthorized entry; and
 - (e) absence of floor drains directly connected to the outside.

17.2 Leak detection and weather protection

- (1) A leak detection system, other than visual leak detection, is not required for the storage of containers, provided that a licensee can demonstrate that a container storage area is protected from the elements or has a secondary containment system.
- (2) Weather protection for containers is a physical cover or coating over containers.

18 Requirements for bulk pads

- (1) A licensee may construct a permanent bulk pad on a gas utility pipeline or pipeline installation site for the storage of solid materials, such as contaminated soils, spent desiccant, catalyst, or activated carbon.
- (2) A bulk pad storage area must incorporate:
 - (a) a compacted clay or synthetic liner, concrete, or asphalt base pad with a slope directed to a catchment device to allow for the collection of precipitation and any generated leachate; and
 - (b) a continuous curb with a minimum height of 15 cm on at least three sides of the bulk pad.

- (3) Material must be stockpiled in a manner that will not exceed the capacity of the bulk pad, for example piled at a suitable distance from the curbs and with a slope to prevent the material from tumbling over the curbs surrounding the bulk pad.
- (4) In situations where the stored material may potentially generate a leachate, concrete or asphalt may be used as a durable working surface but are not considered adequate as primary containment. The design of the pad must incorporate a compacted clay or synthetic liner under the working surface. In these situations the incorporation of a leachate collection system above the primary containment device and a leak detection system under the primary containment device is also required.
- (5) For bulk pads, the liner or pad is the primary containment device and must have a hydraulic conductivity of 10^{-7} cm/s or less. Compacted clay liners must also meet the criteria specified in Section 22.1.
- (6) Synthetic liners must be able to serve as the primary containment device and meet the requirements outlined in Section 22.3.

19 Inspection, monitoring, and record-keeping requirements

- (1) A licensee must maintain records to demonstrate compliance with this part.
- (2) With respect to the storage requirements outlined in this part, a licensee of pipeline installation site must:
 - (a) Maintain inventory records and retain the records on site or at the local field office for two years. Where applicable, this includes copies of dockets for material received and shipped;
 - (b) Maintain inspection and corrosion monitoring programs to provide an indication of the integrity of tanks and piping for a minimum of five years, but preferably for the lifetime of the tank or pipeline installation site;
 - (c) Maintain records of test or maintenance checks must be retained for a minimum of five years, but preferably for the lifetime of the tank or pipeline installation site;
 - (d) Document and retain for a minimum of five years, but preferably for the lifetime of the tank, any abnormal circumstances identified from the monthly visual inspections of aboveground storage tanks, the monthly interstitial space monitoring of double-walled aboveground tanks, or the monthly interstitial space monitoring of double-walled underground storage tanks, as well as any corrective actions taken to remedy the situation and prevent it from reoccurring;
 - (e) Document that monthly visual inspections and interstitial space monitoring are being conducted;
 - (f) Document and retain for a minimum of five years, but preferably for the lifetime of the storage device, the monitoring results from the leak detection system for bulk pads, as well as any investigative work or corrective actions taken to remedy a breach of the storage devices;
 - (g) Clean up immediately any spills or leaks and report leaks and spills to the Commission by way of the local AER field centre, and take corrective action; and
 - (h) Document abnormal circumstances and corrective actions.

- (3) In the event that a storage device has overflowed or its leak detection system indicates that it may be leaking, a licensee must investigate the situation, verify the integrity of the storage device, report the release to the Commission by way of the local AER field centre and implement corrective actions which must be documented and may include:
 - (a) repairing and testing the storage device;
 - (b) replacing the storage device; or
 - (c) implementing cleanup activities as required, including assessing the soil for contamination.
- (4) Where applicable, a licensee must retain groundwater monitoring records for a minimum of five years, but preferably for the lifetime of the pipeline installation site.
- (5) A licensee must maintain records from alternative leak detection systems such as electromagnetic surveys, soil vapour surveys, weeping tile monitoring wells, and inventory reconciliation, for a minimum of five years, but preferably for the lifetime of the pipeline installation site.
- (6) A licensee must keep all required licences and permits on site or at the field or plant offices.
- (7) A licensee must maintain:
 - (a) records on excavation or nearby construction that could affect the integrity of the storage system; and
 - (b) the names of all person who conducted the inspection and monitoring programs.
- (8) A licensee must notify the Commission by way of the local AER field centre if any of the monitoring results from a storage device indicate a concern and describe:
 - (a) the parameters that changed;
 - (b) the investigative work conducted; and
 - (c) any remedial or corrective work that has occurred or is proposed.
- (9) A licensee must provide a record kept under this part to the Commission if the record is requested by the Commission.

20 Withdrawal of storage tanks from service

- (1) This section sets out the procedures to be followed when aboveground or underground storage tanks used for fluids are taken out of service.
- (2) When an aboveground or underground storage tank is taken out of service for a period not exceeding 180 days, a licensee must:
 - (a) isolate the tank;
 - (b) empty the tank or measure and record the fluid level in the tank and then repeat this procedure on a monthly basis, making records available to the Commission upon request;
 - (c) maintain the impressed current cathodic corrosion protection system, if applicable; and
 - (d) maintain monthly leak detection monitoring.

- (3) When an aboveground or underground storage tank is taken out of service for a period exceeding 180 days, a licensee must:
 - (a) remove all liquids and vapours from the storage tank and its connecting piping;
 - (b) isolate the tank and mark it to clearly indicate that it is empty;
 - (c) maintain the impressed current cathodic corrosion protection system, if applicable; and
 - (d) verify the integrity of the tank prior to reactivation if the tank has been out of service for longer than one year (refer to Appendix 3 for integrity verification requirements) and re-label the tank.
- (4) If a licensee wants to change the service of a tank, prior to reactivation, the tank must be cleaned and refurbished if necessary and then verified for compatibility with the new service.

20.1 Permanent withdrawal from service

- (1) A licensee taking an aboveground or underground tank permanently out of service must:
 - (a) remove all fluids and sludges and purge the tank of all combustible vapours;
 - (b) remove the aboveground tank from the active part of the pipeline installation storage site and either dispose of it or relocated it in an appropriate storage area on the site; and
 - (c) remove underground tank from the active part of a pipeline installation; if the activity compromises the operation of the pipeline installation site, the underground tank must be isolated and then removed when the site is decommissioned.
- (2) Upon removal of a tank, a licensee must assess the soil surrounding the tank and, if the soil is contaminated, decontaminated it according to the applicable standards.
- (3) A licensee must document all decontamination work, including verification (through confirmatory soil samples) that remediation objectives were achieved and made available to the Commission or AEP, upon request.

21 Impervious liners

- (1) A liner which is part of a secondary containment system must:
 - (a) consist of a material that is inert to or compatible, chemically resistant, with the material being stored in a tank;
 - (b) be impervious such as a compacted clay liner, a natural liner or a synthetic liner;
 - (c) be durable and suitable for the operating and ambient conditions;
 - (d) cover the area within the dike, including the area beneath the tanks; and
 - (e) be keyed into the dike walls.

- (2) The purpose of a secondary containment liner is not to function as a tank or other primary containment.
- (3) There are two modes of mass transfer through a barrier such as a liner: liquid transfer (through hydraulic conductivity) and vapour transfer (through molecular diffusion). Hydraulic conductivity is applicable to natural materials, where mass transfer depends on the movement of liquid through pore structure of a soil and the driving force is hydraulic pressure or head. Vapour transfer is applicable to polymer barriers, where the driving force is the concentration gradient of the permeating substance across the barrier. Although no material is completely impermeable, the type, design, and installation of a liner is extremely important in achieving the desired level of impermeability for both primary and secondary containment liners.

21.1 Compacted clay liners

- (1) For the purpose of secondary containment, a licensee must compact clayey soil to achieve a hydraulic conductivity of 1×10^{-6} cm/s or less determined in situ or 1×10^{-7} cm/s or less determined in a laboratory from a representative disturbed sample (material must meet hydraulic conductivity requirements under full hydrostatic head).
- (2) For use as primary containment, a licensee must compact clay liners to achieve a hydraulic conductivity that is at least one order of magnitude less than that required for secondary containment.
- (3) A hydraulic conductivity of $\leq 1 \times 10^{-7}$ cm/s is achievable if clayey soil is excavated, reworked, or homogenized and laid down in lifts following applicable construction protocol on a properly prepared sub-base. Key properties in achieving low hydraulic conductivity are the plasticity index and clay content of the soil. There are reasons to prefer a soil of low plasticity over highly plastic clay, as soils with low plasticity are often easier to mix, hydrate, and homogenize in the field and tend to be less susceptible to desiccation cracking.
- (4) Factors in achieving low hydraulic conductivity in compacted clay liners include:
 - (a) using suitable clayey soils that meet the following specifications:
 - (i) greater than 30 per cent fines (defined as dry weight percentage passing the No. 200 sieve),
 - (ii) greater than 20 per cent clay (0.002 mm or smaller as determined by hydrometer method),
 - (iii) well graded (no excess of particles in any size range and no intermediate sizes lacking),
 - (iv) Liquid limit (LL) equal to or greater than 30,
 - (v) Plasticity index (PI) equal to or greater than 10;
 - (b) laying the clayey soil down in lifts a minimum of four lifts, with each being 15 cm to 20 cm thick (loose thickness);
 - (c) properly preparing the surface to receive a lift of soil:
 - (i) if placing the soil on sub-grade, the sub-grade must be adequately compacted,

- (ii) if placing the soil on a previously compacted lift, the surface should be scarified to a nominal depth of 2.5 cm prior to placing the next lift of soil;
- (d) using the clayey soil at the correct water content, each lift must be placed at approximately two per cent to three per cent wet of optimum moisture;
- (e) compacting each lift to a minimum of 95 per cent of the standard Proctor maximum dry density using the proper type of compactor with an appropriate number of passes and:
 - (i) the best type of compactor in most instances is a heavy, footed roller with feet that fully penetrate the loose lift of soil;
 - (ii) the compactor must be heavy enough to ensure that adequate compactive energy is delivered to the soil and that the feet fully penetrate the full depth of the lift to kneed it and bond it to the previous lift;
 - (iii) the number of compactor passes over a given area varies between soil and compactor type, but sufficient passes must be conducted to achieve the desired density;
- (f) placing down sufficient lifts to achieve a final compacted thickness of 0.6 m or greater;
- (g) protecting each compacted lift from damage
 - (i) a smooth-drum roller is often used to compact the surface of a completed lift, as this forms a hard skin, which helps to minimize desiccation and sheds water,
 - (ii) the smooth surface should be roughened with a disc prior to placing the next lift,
 - (iii) upon completion of the liner, an appropriate overlying material must be used to protect the liner from mechanical damage and weathering.
- (5) The construction of a compacted clay liner requires application by qualified personnel overseen by a professional geotechnical engineer. The specifications of the clayey material used for the liner and the details of the liner construction (quality assurance/quality control [QA/QC] data) must be documented and made available to the Commission upon request.

21.2 Natural liners

- (1) Natural liners involve scarification and re-compaction of in situ clay, without excavating the underlying clay, and placing it in lifts as for a compacted clay liner and is used in storage and treatment areas to impede the movement of materials that could adversely impact soil or groundwater.
- (2) A licensee may only be use natural liners at sites that have a deposit of appropriate clayey soils with a minimum thickness of 0.9 m and where the seasonal high groundwater table is greater than one metre below the expected bottom of the liner.

- (3) A licensee may investigate the potential for in situ clayey deposits to serve as natural liners only when sites are located in relatively low-permeability clay or till. A variety of geochemical, geophysical, and engineering tools are available for investigating the hydraulic integrity of natural liners.
- (4) Delineation of the in situ clayey deposit requires a site investigation by a qualified person.
- (5) A licensee must focus attention on looking for hydraulic defects, such as sand seams, cracks, and fissures.
- (6) A minimum of three boreholes, arranged in an approximate equilateral triangle, is required to establish orientation of any significant geologic plane.
- (7) Depth of sampling from the surface to characterize underlying soil materials must be at least three metres. One sampling must be extended to establish depth to groundwater.
- (8) A licensee must have analyzed the clayey soil in a lab to determine liquid limit, plasticity index, clay content, and fines content.
- (9) Factors in achieving suitable natural liners include:
 - (a) preparing the site for the construction
 - (i) remove the topsoil from the site and appropriately salvage and store it,
 - (ii) remove rocks or clumps greater than 50 mm in size,
 - (b) scarifying and re-compacting the in situ clayey deposit to 95 per cent of the standard Proctor maximum dry density and
 - (i) only scarify the in situ clayey deposit to a depth that can be re-compacted using select equipment,
 - (ii) the in situ clay must be at two per cent to three per cent wet of optimum,
 - (c) smoothing out the completed liner with a smooth barrel compactor and applying overlying material to protect the liner from mechanical damage and weathering.
- (10) The completed liner must achieve a hydraulic conductivity as specified in Section 22.1. A variety of geochemical, geophysical, and engineering tools are available for investigating the hydraulic integrity of natural liners.
- (11) For natural liners, in situ hydraulic conductivity tests may be more accurate than laboratory tests.
- (12) The construction of a natural liner requires application by qualified personnel overseen by a professional geotechnical engineer. The specifications of the clayey deposit, including the site delineation information, and the details of the liner construction (QA/QC data) must be documented and made available to the Commission upon request.

21.3 Synthetic liners

- (1) The installations of synthetic liners must follow the manufacturer's specifications and be conducted by a qualified personnel.
- (2) Synthetic liners must be a minimum 30 mils to be suitable for secondary containment.
- (3) Liners must be physically and chemically resistant to the material stored.
- (4) The specification of liner material and the details of installations (QC/QA data) must be documented and made available to the Commission upon request.

Appendix 1 – Definitions

Carbon conversion efficiency (CCE)

The CCE quantifies the effectiveness of a device to oxidize hydrocarbons and is the relative conversion of carbon compounds in the reactants to products of complete and incomplete combustion. Incomplete combustion products include unburnt hydrocarbons (hydrocarbon [HC] measured as methane [CH₄]) and other partially oxidized carbon compounds, such as carbon monoxide (CO) in the exhaust. For the purposes of this directive, CCE is reported as the percentage of carbon in the fuel that is converted to CO₂ and is obtained from:

$$CCE = \frac{\text{Mass Rate of Carbon in the Fuel Converted to CO}_2}{\text{Mass Rate of Carbon in the Fuel}}$$

With this definition, the mass and molar efficiency are the same. An adjustment must be made if there is CO₂ in the inlet stream, as it does not react. The adjustment depends on the fraction of CO_{2, fuel} and hydrocarbons C_xH_{y, fuel} in the gas stream entering the device and the number of carbon moles (X) per molecule of hydrocarbon. CCE can be determined from exhaust and fuel concentration measurements using

$$CCE = \frac{CO_{2, stack} - (CO_{2, fuel} / (X C_x H_{y, fuel})) (CO_{stack} + HC_{stack})}{(CO_{2, stack} + CO_{stack} + HC_{stack})}$$

This equation reduces to the following familiar expression if the inlet does not contain CO₂ (CO_{2, inlet} = 0):

$$CCE = \frac{CO_{2, stack}}{(CO_{2, stack} + CO_{stack} + HC_{stack})}$$

Cathodic protection

A method of preventing corrosion to a metal surface by introducing another metal (anode) into the ground to create a corrosion cell in which the surface to be protected becomes a cathode. If deterioration or corrosion occurs at the anode (introduced metal), the cathodic protection may be of a sacrificial type or impressed current design.

Combustion efficiency (CE)

The CE quantifies the effectiveness of a device to fully oxidize a fuel. Products of complete combustion (i.e., CO₂, H₂O, and sulphur dioxide [SO₂]) result in all of the chemical energy released as heat. Products of incomplete combustion (e.g., CO, unburnt hydrocarbons, other partially oxidized carbon compounds, H₂S, and other reduced and partially oxidized sulphur compounds) reduce the amount of energy released. For the purposes of this rule, CE is reported as the percentage of the net heating value that is released as heat through combustion.

Compressor station/site	A pipeline installation which is listed on the associated pipeline licence. This includes service equipment intended to maintain or increase the flowing pressure of the gas that it receives from a pipeline or gas plant prior to delivery to market or other disposition.
Condensate	A mixture mainly of pentanes and heavier hydrocarbons that may be contaminated with sulphur compounds, that is recovered or is recoverable at a well from an underground reservoir, and that may be gaseous in its virgin reservoir state but is liquid at the conditions under which its volume is measured or estimated.
Confirmation of non-objection	A statement made by a person that confirms there is no objection to the Commission granting a licence for the proposed pipeline or pipeline installation.
Conservation	The recovery of solution gas for use as fuel for useful purposes or sale.
Conservation efficiency	Conservation efficiency (per cent) = $(\text{Solution gas production} - \text{Flared} - \text{Vented}) / (\text{Solution gas production}) \times 100$
Crown disposition	The administrative and operating conditions assigned for use of public lands in the form of a lease, licence, permit, or letter of authority; administered by Sustainable Resource Development (SRD).
Emergency response plan	A comprehensive plan to protect the public, including criteria for assessing an emergency situation and procedures for mobilizing response personnel and agencies and establishing communications and coordination.
Environment	All components of the earth including air, land, and water; all layers of the atmosphere; all organic and inorganic matter and living organisms; and interacting natural systems.
Freeboard	The unused upper portion of a primary containment device.
Hydrogen sulphide (H ₂ S)	A naturally occurring gas found in a variety of geological formations and also formed by the natural decomposition of organic matter in the absence of oxygen. H ₂ S is colourless, heavier than air, and extremely toxic. In small concentrations it has a rotten egg smell and causes eye and throat irritation.
Landowner	The person in whose name a certificate of title has been issued pursuant to the Land Titles Act , or if no certificate of title has been issued, the Crown or other body administering the land. In the case of Métis land, the person registered in the Métis Settlements Land Registry as owner of the Métis title pursuant to the Métis Settlements Land Registry Regulation .
Leachate	Interstitial fluids separated from materials or fluids generated by the percolation of liquids (e.g., water) through materials.

Leachate collection system	A seepage pathway and collection system constructed on the surface of the primary containment device to allow for the drainage, collection, and removal of any generated leachate.
Licensee	The holder of a licence for a pipeline according to the records of the Commission (Alberta Utilities Commission Act).
Line heater	Equipment installed at a pipeline installation to control gas temperature.
Liquid	A substance that contains free liquids as determined by the US EPA Method 9095 Paint Filter Liquids Test, Test Methods for Evaluating Solid Wastes Physical/Chemical Methods (EPA Publication No. SW 846).
Monitoring well	A well used to detect liquid or vapour leakage from a primary or secondary containment device or to sample a groundwater aquifer or unsaturated zone to detect the presence of any contaminants.
Non-objection	The party that may be directly and adversely affected has been personally consulted or notified of the project, has fully understood the details, has no outstanding concerns or objections, and does not oppose the Commission issuing a licence for the proposed pipeline development.
Occupant	A person other than the owner who is in actual possession of land; a person who is shown on a certificate of title or by contracts as having an interest in the land; in the case of Métis land, a person having a right or interest in land recorded on the Métis title register pursuant to the Métis Settlements Land Registry Regulation ; the holder of a permit for a coal mine; the owner of a private access road.
Oily waste	An unwanted substance or mixture of substances that results from the construction, operation, abandonment, or reclamation of a gas utilities pipeline and pipeline installation but does not include an unwanted substance or mixture of substances from such a source that is received for storage, treatment, disposal, and/or recycling at a facility regulated by AEP.
Oily waste	A specific type of waste that contains discarded oil from equipment incidental to pipeline operations such as used lubricating oil from compressor stations.
Partial pressure	The pressure exerted by one component of a natural gas mixture when isolated in a container.
Participant involvement	Participant involvement encompasses all aspects of public and industry interactions and communications.
Personal consultation	Consultation through face-to-face visits or telephone conversations with identified parties and providing the required information packages.

Pipeline abandonment	The permanent deactivation of a pipeline in accordance with the <i>Pipeline Rules</i> .
Pipeline base map	The plan produced by the AER on a township or smaller geographic area basis that shows pipelines currently licensed under the <i>Pipeline Act</i> .
Pipeline discontinuation	The temporary deactivation of a pipeline or part of a pipeline.
Pipeline installation	Has the same meaning as in Section 1(1)(l) of the <i>Pipeline Act</i> . Compressor stations are the only pipeline installations under Rule 020 that must be listed on the application.
Pipeline removal	The removal of the entire pipeline, including crossings of roads, railways, and watercourses.
Primary containment device	A device used to physically contain materials produced, generated, or used in processes regulated by this Rule. Primary containment devices include, but are not limited to, single-walled tanks, the internal wall of double-walled tanks, containers, and the liners of bulk pads.
Project	A network of pipelines, and/or pipeline installations that connects to a common facility.
Residence	Full-time or part-time dwelling.
Resident	A person occupying a residence on a temporary or permanent basis.
Right-of-way	The land upon which a legal right-of-way is granted over another person's property. This right can be acquired by means of an easement or by a right-of-entry order.
Secondary containment system	An impervious barrier or liner used for the purpose of containing and preventing any leakage from the primary containment device from impacting the environment.
Separation or setback distance	The minimum required distance between a pipeline or pipeline installation and land-use development, such as a surface improvement, permanent dwelling, unrestricted country development, urban centre, or public facility.
Solid	A substance that does not contain free liquids as determined by the U.S. EPA Method 9095 Paint Filter Liquids Test and is not gaseous at standard conditions.
Source	All gas flared, incinerated, or vented from a single operating pipeline installation.

Spill control device A device (e.g., load box) used to physically collect and recover spills and leaks of materials from process equipment, piping valves, flanges, and other equipment, especially at material transfer points. Spill control devices must be maintained to ensure their integrity and that they are of sufficient capacity to be functional (e.g., free of precipitation).

Storage The holding of materials produced, generated, and used by a gas utility pipeline for a period of time until the products or wastes are transported, treated, or disposed.

Stress level The stress in the wall of a pipe that is produced by the pressure of the fluids in the pipeline.

Sulphur conversion efficiency (SCE) The SCE quantifies the effectiveness of a device to oxidize sulphur and is the relative conversion of sulphur compounds in the reactants to products of complete and incomplete combustion. Incomplete combustion products include unburnt H₂S, other reduced sulphur compounds (measured as H₂S), such as carbonyl sulphide and carbon disulphide (especially if present in the fuel), and other partially oxidized sulphur compounds, such as sulphur trioxide (SO₃) in the exhaust (measured as SO₃). For the purposes of this directive, SCE is reported as the percentage of sulphur in the fuel that is converted to SO₂ and is obtained from

$$SCE = \frac{\text{Mass Rate of Sulphur in the Fuel Converted to } SO_2}{\text{Mass Rate of Sulphur in the Fuel}}$$

With this definition, the mass and molar efficiency are the same. SCE can be determined from stack gas concentration measurements using

$$SCE = \frac{SO_{2,stack}}{(SO_{2,stack} + SO_{3,stack} + H_2S_{stack})}$$

Sulphur emissions For the purposes of this rule, this includes all air emissions of sulphur-containing compounds, including SO₂, H₂S, and total reduced sulphur compounds (e.g., mercaptans). Sulphur emissions from flare stacks are expected to be primarily in the form of SO₂, with minor amounts of other compounds.

Sulphur recovery efficiency Sulphur recovery efficiency = (sulphur produced + injected)/(sulphur produced + injected + sulphur emissions), where the sulphur emission is normally SO₂ expressed in sulphur equivalence. All values are units of mass.

Surface development A railway, pipeline, canal or other right-of-way, road allowance, surveyed roadway, dwelling, industrial plant, aircraft runway or taxiway, buildings used for military purposes, permanent farm buildings, school, or church.

Venting The intentional controlled release of uncombusted gas.

Water body Natural or man-made; contains or conveys water continuously, intermittently, or seasonally.

A natural water body is any location where water flows or is present, whether the flow or the presence of water is continuous, seasonal, intermittent, or occurs only during a flood. This includes the bed and shore of a river, stream, lake, creek, lagoon, swamp, marsh, slough, muskeg, or other natural drainage, such as ephemeral draws, wetlands, riparian areas, floodplains, fens, bogs, coulees, and rills.

Man-made water body includes a canal, drainage ditch, reservoir, dugout, or other man-made surface feature.

Watercourse The bed and shore of a river, stream, lake, creek, lagoon, swamp, marsh, or other natural body of water or a canal, ditch, reservoir, or other man-made surface feature, whether it contains or conveys water continuously or intermittently.

Weather protection A structure, protective coating, or cover that ensures that the integrity of the primary containment device and its labelling are not compromised by the elements of nature.

Appendix 2 – Sample participant involvement summary form

Compressor Site @ 13-4-51-16W6M

(Enter type of application here)

Land location (Qtr-Sec-Twp-Rge-Mer)	Land interest (e.g. landowner, occupant, local authority)	Name/ address/ phone no.	Date of personal consultation	Date of confirmation of non-objection (as described in Table 6.1)	Consultation by phone or meeting	Notification by fax, registered or regular mail	Documents distributed and date of distribution	Date additional material distributed	Comments
NW 1/4-4-51-16W6M	Landowner (SRD)	Crown Edmonton, AB 780-888-8888	Jan. 1, 2005	Jan. 17, 2005 MSL #0000000	Meeting	Hand delivered	Commission letter; project description Jan. 1, 2005	None requested	Declined copies of Commission brochures
NW 1/4-4-51-16W6M	Crown Disposition Holder TPA #0000	Trapper 1234 St. City, AB 780-999-9999	Jan. 1, 2005		Phone	Regular mail	Commission letter; project description; Commission brochures	None requested	Wait a min. of 14 days prior to submitting application

Appendix 3 – Storage requirements for existing pipelines installations

1 Aboveground storage tanks (internal volume $\geq 5 \text{ m}^3$)

1.1 Retrofitting

Licensees that have retrofitted their pipeline installation sites to meet the secondary containment requirements for aboveground tanks (i.e., installed double-walled tanks or secondary containment consisting of a dike and liner system meeting the requirements outlined in Section 16) are not required to integrity test these tanks, but must meet the monthly monitoring requirements for leak detection.

1.2 Integrity testing

- (1) The schedule for the next integrity test must be based on the previous integrity test such that the time interval between integrity tests must not exceed five years. For information on the methodologies available for integrity testing aboveground storage tanks, see Table A1; for further explanatory notes, see Table A3. A licensee must be able to verify that the test method used was appropriate for the specific situation and that the results were reliable.
- (2) If the initial integrity test identified a problem with the aboveground storage tank, the licensee has the option to replace the tank with one that was integrity verified and appropriate for the type of service or to repair the tank and then retest it. If the results of the retest did not confirm the integrity of the tank, the tank was to be replaced with one that was integrity verified and appropriate for the type of service. These requirements are also applicable when the tanks are being reverified.
- (3) Licensee must conduct monthly visual inspections of all aboveground tanks and the diked area for evidence of problems, damage, or leakage. Any spills or leaks must be cleaned up and, as required, corrective action initiated. Any abnormal circumstances must be documented.

1.3 Replacement of an existing aboveground storage tank or addition of a new tank to an existing tank farm

- (1) When replacing an existing tank, it is not mandatory to upgrade the tank farm to meet full secondary containment and leak detection requirements as outlined in Section 16. As these sites were constructed prior to January 1, 1996, the capacity of the dike must as a minimum be 100 per cent the volume of the largest tank within the tank farm. Upon removal of the old tank, any contamination must be managed, and then the ground must be compacted and appropriately prepared for placement of the new tank.

- (2) Should an existing multi-tank farm have sufficient capacity to accommodate an additional tank, it may be added. However, if the addition of a new tank results in reconstruction of the tank farm area, it is expected that the reconstruction will meet the secondary containment and leak detection requirements outlined in Section 16.3.
- (3) Licensee replacing a tank or adding a new one to an existing tank farm must meet the requirements outlined in Section 16. These tanks must be integrity verified every five years, unless the tank farm area has been reconstructed to meet the secondary containment and leak detection requirements outlined in Section 16 or an option to replace the integrity verification requirement (next section) has been implemented.

1.4 Options to replace the requirement to verify the integrity of aboveground tanks

- (1) The replacement of an existing tank or the addition of a new tank to an existing tank farm presents the licensee with the opportunity to install a liner or weeping tile system under the tank (see leak detection method in Table A1). Although not mandatory, the installation of a weeping tile system or liner, combined with monthly monitoring, may be used to replace the requirement to reverify the integrity of the tanks every five years. Any liquids collected in the weeping tile system must be field tested for pH (e.g., using test strips or meter), chlorides (e.g., using test strips), hydrocarbon odour, and a visible oil sheen. The results from the monthly field tests must be recorded, and if there is indication of a problem, investigative work must be conducted, followed by any necessary corrective measures.
- (2) Integrity verified, single-walled aboveground tanks within a diked area (on sites constructed prior to 1996) may be retrofitted with a second bottom and a system to monitor the interstitial space between the two bottoms. Provided the interstitial space is monitored monthly, this option may be used to replace the requirement to reverify the tank every five years.
- (3) Any abnormal circumstances from the monthly monitoring must be documented, as well as any corrective actions implemented to remedy the abnormal circumstance.

2 Underground storage tanks

2.1 Retrofitting

- (1) A licensee that has replaced single-walled underground storage tanks with double-walled tanks meeting the requirements in Section 17 or that has retrofitted their single-walled underground tanks with secondary containment (i.e., synthetic liner or natural soil conditions exhibiting a hydraulic conductivity of 10⁻⁶ cm/s or less) and leak detection was not required to integrity verify these underground storage tanks. The leak detection systems for these tanks must be monitored monthly.

- (2) The option to retrofit single-walled underground storage tanks is no longer been available. For those tanks that have been retrofitted, the following requirements are expected to be met.

For synthetic liners surrounding the underground tank with a monitoring well positioned between the tank and liner:

- The bottom of the liner should be sloped to encourage any leakage from the tank to collect at the low point, which should be down gradient of the directional flow of groundwater.
- At least one monitoring well must be completed in the low point and positioned between the secondary containment liner and the tank for the purpose of monitoring any leakage from the tank.

For weeping tile systems installed with single-walled underground storage tanks:

- Such a system is only permitted where there are low-permeable soil conditions (i.e., the hydraulic conductivity of the soil is 10⁻⁶ cm/s or less) and the seasonal high groundwater table is not within one metre of the bottom of the tank.
- A continuous loop of weeping tile should be placed around the tank at a depth approximating the deepest portion of the tank and in such a fashion as to encourage the movement of groundwaters that may occur under the tank towards the weeping tile.
- The weeping tile should be sloped to encourage the collection of fluids at the lowest point, which should be down gradient of the directional flow of groundwater.
- At least one monitoring well must be completed at the collection point for the purpose of monitoring any leakage from the tank.
- Criteria for the installation of weeping tile may be found in the *Safety Codes Act*.

- (3) The leak detection systems for the above options must be monitored monthly. Any liquids collected in the monitoring well(s) must be field tested for pH (e.g., using test strips or meter), chlorides (e.g., using test strips), hydrocarbon odour, and a visible oil sheen. The results from the monthly field tests must be recorded, and if there is indication of a problem, investigative work must be conducted, followed by any necessary corrective measures. The results from the monthly monitoring must be retained for a minimum of five years, but preferably for the lifetime of the facility.

2.2 Integrity testing

- (1) The schedule for the next integrity test must be based on the previous integrity test such that the time interval between integrity test must not exceed three years. For information on the methodologies available for integrity testing underground storage tanks, see Table A2; for further explanatory notes, see Table A3. A licensee must be able to verify that the test method used was appropriate for the specific situation and that its results were reliable.

- (2) If the integrity test identified a problem with the underground storage tank, the licensee has the option to replace the tank with a double-walled one as per the requirements outlined in Section 17 or to repair the tank and then retest it. If the results of the retest did not confirm the integrity of the tank, the tank was to be replaced as per the requirements outlined in Section 17.

2.3 Small aboveground tanks, containers, and bulk pads

A licensee of pre-1996 facilities with small aboveground tank where the total combined volume per site exceeds five m³ is required to provide secondary containment, as outlined in Section 16.3. A licensee is allowed to continue the use of concrete as primary containment for bulk pads constructed prior to 2002 where there is potential for the stored materials to generate a leachate provided that the associated leak detection systems do not indicate a breach of containment. The leak detection systems for bulk pads described above must be monitored and the results recorded and reported as per the requirements detailed in sections 19 and 20.

2.4 Existing monitoring programs

Results from existing monitoring programs can also be used to help determine whether or not storage devices are leaking. Methods used to detect contaminants such as salts and hydrocarbons in the soil or groundwater within the immediate vicinity of a storage device are considered indirect methods, as opposed to direct methods that actually verify or test the integrity of the storage device. Examples of existing monitoring programs include:

- groundwater or soil vapour monitoring wells installed in the immediate vicinity (e.g., down gradient of the groundwater flow) of the storage device
- electromagnetic surveys (for tanks containing brine or brine-equivalent liquids)
- soil vapour surveys for hydrocarbons (for tanks containing hydrocarbons)

Table A1. Integrity tests for aboveground storage tanks¹

Method	Description	Pros	Cons	Applications
Ultrasonic test	<p>Ultrasonic testing checks components and structures to detect internal and surface breaking defects and measures wall thickness. Ultrasonics operates on the principle of infecting a very short pulse of ultrasound into a component or structure and then receiving and analyzing any reflected sound pulses.</p> <p>There are different kinds of ultrasonic tests. The A-Scan point-to-point technique, used for decades, involves taking a thickness reading at one point on a section of the tank and repeating this process several times on the same tank to generate a sample.</p> <p>The B-Scan technique can take ultrasonic thickness readings over every 0.04 inch of the surface, which results in almost 100 per cent coverage of the tank surface. This eliminates the problems associated with the A-Scan technique missing problem areas. The B-Scan can also scan through coatings, unlike the A-Scan technique.</p>	<ul style="list-style-type: none"> • Only one side of the surface needs to be assessed. • It can locate areas of both leaks and potential leaks. When these areas of potential leaks are identified, they can be revisited on subsequent inspections. 	<ul style="list-style-type: none"> • Requires specialized equipment that needs an experienced licensee to interpret the results. • The tank may need to be cleaned before the inspection can take place. 	Works on most aboveground storage tanks.
Internal visual inspection	An internal visual inspection can be performed by emptying and cleaning the inside of the tank and then visually inspecting it for signs of weakness or holes. These inspections should be performed in conformance with API Standard 653 and may be combined with an ultrasonic test.	<ul style="list-style-type: none"> • Inexpensive. • Easy to perform. • The whole inside of the tank can be inspected. 	<ul style="list-style-type: none"> • The tank needs to be emptied and cleaned before inspection. • There is the possibility of overlooking smaller leaks. 	Works on most aboveground storage tanks.
External visual inspection	An external visual inspection can be performed on all aboveground storage tanks that are visible on all sides. These inspections should be performed in conformance with API Standard 653 and may be combined with an ultrasonic test.	<ul style="list-style-type: none"> • Inexpensive. • Easy to perform. • The whole outside of the tank can be inspected. 	<ul style="list-style-type: none"> • There is the possibility of overlooking smaller leaks. • It is only possible to inspect the part of the tank not resting on the ground • If bottom of tank cannot be inspected, the inspection must be combined with some other method. 	Works on most aboveground storage tanks.

(continued)

¹ The integrity tests are listed in random order without regard for the accuracy or cost of the test.

See Table A3 for explanatory notes.

Underground storage tank (UST) integrity tests are not directly transferable for use on aboveground storage tanks (AST). ASTs are subject to larger temperature fluctuations, influenced more by atmospheric pressure changes and wind, and usually larger than USTs.

Table A1. Integrity tests for aboveground storage tanks¹ (continued)

Method	Description	Pros	Cons	Applications
Vacutect system	<p>All openings to the tank are sealed off and a mild vacuum (less than half of one psi) is applied to the tank using a vacuum pump. The vacuum level is constantly monitored and maintained by the computer in the testing unit. While under vacuum, Vacutect monitors for three things: water level, noise (via a hydrophone), and the pressure in the tank.</p> <p>This test has been modified from the test performed on USTs for use on ASTs.</p>	<ul style="list-style-type: none"> • Allows the technician to perform trouble shooting to determine whether the system is leaking and the nature and location of the leak. • Same-day results. • Product may remain in the tank. • Not affected by temperature. 	<ul style="list-style-type: none"> • The expertise of the licensee is crucial for this test to effectively determine the location of the leak. • Vibrations from nearby equipment or vehicles may interfere with the test, making testing difficult on active sites. • May be ineffective in clay soils because it may plug up holes in the tank bottom (see under Vacuum Test and Pressure Test for additional problems). • May be influenced by tank sludge and sedimentary accumulations. 	<p>Works on tanks up to 500 barrels (16 feet in diameter). Larger tanks may prove difficult for obtaining a vacuum.</p>
Mass-based systems	<p>The test is designed to measure any changes in the buoyancy force acting on a probe inserted into the tank. Uses mass measurement technology to determine if product is entering or leaving the tank. The technology is based on the fact that buoyancy force only varies as a direct result of a change in the mass of the liquid. Buoyancy force is not affected by changes in product temperature, since the change in volume due to temperature change is offset by a corresponding change in liquid density.</p>	<ul style="list-style-type: none"> • Same-day results. • The tank doesn't have to be completely empty. • The test is not affected by temperature. 	<ul style="list-style-type: none"> • Testing at low product levels could allow a leak to remain undetected. • Tests only the portion of the tank containing product. • There are several mass-based systems being used in the industry today. However, they are not designed to handle the large temperature fluctuations or the changing atmospheric pressures associated with ASTs. These systems were designed for USTs, where different types of forces are present. • Results are affected by wind, vibration, and tank shell dynamics. 	<p>Works on most ASTs.</p>
Vigilant test	<p>The method is based on sensing the vacuum changes that occur in the interstitial space between an outer rigid tank and an inner wall formed by installing a flexible membrane liner in the tank. Vacuum changes are analyzed continuously with a microprocessor to determine the rate of change. Very slow changes occur on tight tanks due to molecular permeation through the membrane into the interstitial space. This baseline behaviour is determined experimentally for each tank after installation of the membrane is complete. The vacuum behaviour will vary significantly if a leak is present. Both liquid and air leaks may be detected using this method.</p>	<ul style="list-style-type: none"> • There are no fill or underfill requirements. • Will work on all products. • The tank needs very little time after product is added before the tank is stable enough for testing. 	<ul style="list-style-type: none"> • The tank liner must be carefully fitted to the tank. Liners that are too small will produce larger interstitial spaces, decreasing the sensitivity of the leak detection system. • A baseline behaviour must be established for each tank. An error in establishing the baseline could result in either missed detections or masked leaks. 	<p>May be used on tanks that have liners and are under 400 barrel capacity.</p>

(continued)

Table A1. Integrity tests for above ground storage tanks¹ (continued)

Method	Description	• Pros	• Cons	Applications
Pressure test	This test involves the introduction of slight pressure (nitrogen gas) to the tank. A decrease in pressure is measured over a time interval. If the pressure decreases, the tank may have a leak. This test requires the pneumatic isolation of the tank and/or lines being tested. The tank must also be empty of fluids.	<ul style="list-style-type: none"> • Inexpensive. • Easy to perform. 	<ul style="list-style-type: none"> • Potential to damage the tank if too much pressure is applied. Many of the tank manufacturers warn against pressure testing. • The tank may be difficult to isolate if there are a number of lines connecting to it. • If there is sludge in the tank that can't be removed, this method may be ineffective, as the sludge could act as a plug when pressure is applied, concealing any leaks the tank might have underneath the sludge. • Only reveals that there is a leak, not the size or location of the leak. 	Only works on smaller tanks.
Vacuum test	A vacuum test involves the introduction of a slight vacuum to the tank. A decrease in vacuum is measured over a time interval. If the vacuum decreases, the tank may have leak. This test requires the pneumatic isolation of the tank and/or lines being tested. The fluid level in the tank should be noted.	<ul style="list-style-type: none"> • Inexpensive. • Easy to perform. 	<ul style="list-style-type: none"> • Potential to collapse the tank. Many of the tank manufacturers warn against vacuum testing. • The tank may be difficult to isolate if there are a number of lines connecting to it. • If there is sludge in the tank that can't be removed, this method may be ineffective, as the sludge could act as a plug when pressure is applied, concealing any leaks the tank might have underneath the sludge. • Soil beneath the tank may plug holes and mask a leak. • Only reveals that there is a leak, not the size or location of the leak. 	Only works on smaller tanks.
In-fill test	This test involves the overflowing of a tank (preferably with water) and the subsequent recording of liquid levels over time. This requires the hydraulic isolation of the tank.	<ul style="list-style-type: none"> • Least expensive. • Easy to perform. • Stored product does not always have to be removed. 	<ul style="list-style-type: none"> • Does not account for varying temperatures. • The tank has to be full and all vapour pockets need to be identified and removed. • There is the potential for product being leaked into the surrounding soils. • Only identifies there is a leak, not the size or location of the leak. 	Works on most aboveground storage tanks, but is impractical for larger tanks.

(continued)

Table A1. Integrity tests for aboveground storage tanks¹ (continued)

Method	Description	• Pros	• Cons	Applications
Hydrostatic test	The tank is completely filled and stabilized. Tank pressure is raised by five to seven psi by a pump or by adding a similar hydrocarbon. If pressure is maintained for one hour, tank is leak free.	<ul style="list-style-type: none"> • Inexpensive • Easy to perform test. • Stored product does not always have to be removed. 	<ul style="list-style-type: none"> • Does not account for varying temperatures. • It could cause a tank rupture. This method is not recommended by tank manufacturers. • The tank has to be full and all vapour pockets need to be identified and removed. • There is the potential for product being leaked into the environment. • Only identifies there is a leak, not the size or location of the leak. • The presence of sludge in a tank may mask any leaks underneath the sludge. 	Only works on smaller tanks.
Tracer test	A tracer gas (or liquid) is injected into the tank. Soil gas samples are taken from probes installed into the ground around the tank. A leak is declared if tracer is detected outside the tank.	<ul style="list-style-type: none"> • The production system can remain in service through the entire procedure. • There are no fill or underfill requirements. • The system is designed for easy retesting, since the probes are permanent. • Can test any size of tank without a loss in test sensitivity. • Not affected by hydrocarbons from previous leaks or spills. 	<ul style="list-style-type: none"> • Lab results are generally not available until 10 to 14 days after the start of the test. • The test can be strongly affected by the type of soil (i.e., the test will not work well in low-porosity soils). • Only able to test for leaks on the tank bottom. • Underground piping could be damaged during probe installations. 	Works for most tanks placed on the ground.
Mass Integrity test	A small trickle of nitrogen is forced into the bottom portion of the tank (in the product) and the pressure required to maintain a continuous flow of bubbles is measured (measuring for head pressure). The test procedure measures the change in the product mass during an overnight data collection. The rate of mass change is determined and described in a leak rate.	<ul style="list-style-type: none"> • Corrects for thermal expansion and temperature stratification. • Will work on any size of tank. • Compensates for tank shell dynamics. • Third-party performance rated. 	<ul style="list-style-type: none"> • It only tests for leaks below the product line. • Affected by large fluctuations in barometric pressure. 	Works on most aboveground storage tanks.

(continued)

Table A1. Integrity tests for aboveground storage tanks¹ (concluded)

Method	Description	• Pros	• Cons	Applications
Inventory reconciliation	The licensee maintains records on all of the product that enters and leaves the tank. By examining these records, the licensee should be able to tell if there is a leak in the tank. There are a number of companies that offer software programs that use leak detection algorithms for analyzing inventory, sales, and delivery data to conduct leak-detection testing.	<ul style="list-style-type: none"> • Easy to implement. • Can be done while the tank is in operation. 	<ul style="list-style-type: none"> • May not be accurate due to the inaccuracy of measuring the volumes entering and leaving the tank. Also, the volume of product entering and leaving the tank isn't usually corrected for temperature. • Does not take into account evaporation from the tank. • Location of the leak can't be identified. • Will overlook smaller leaks. • Results are open to interpretation and additional investigations. 	Works on most tanks, but the most practical application is on manifolded tanks and large tanks.
Robotic inspection	A visual inspection can be performed internally on an aboveground storage tank while it is in operation. The robot is lowered into the tank and performs ultrasonic testing on the floor of the tank, providing video footage of the tank bottom for analysis. The robot also has the capability of cleaning the tank.	<ul style="list-style-type: none"> • Can be performed while the tank is in operation. • Can be used on very large tanks. • Will inspect the entire tank bottom for areas of weakness and holes. 	<ul style="list-style-type: none"> • A very expensive piece of equipment, requiring specialized people to operate the robot and interpret the results. • Expensive. 	Works on larger tanks.
Permanent leak-detection devices	<p>There are ways of installing a tank so that when there is a leak it will be noticed by the licensees.</p> <p>One is setting the tanks on liners in the shape of coasters. When the tank is leaking, product will appear on the edges of the coaster, alerting the licensee to the leaking.</p> <p>Another is the weeping tile system. A system is installed under the tank with the capability of collecting fluids leaked out of the tank and directing them to a collection device. The licensee can check the collection device regularly for product, which would indicate a leak.</p>	<ul style="list-style-type: none"> • Cost effective. • Continuous monitoring by licensees. • Early leak-detection capabilities. 	<ul style="list-style-type: none"> • Relies on the release of product (this is the same for all of the other tests except for ultrasonic testing, which is capable of finding signs of weakness). • Must lift the tank for installation or be installed prior to placement of the tank within tank farm area. 	Works on most aboveground storage tanks.

Table A2. Integrity tests for underground storage tanks¹¹

Method	Description	Pros	Cons	Applications
Pressure decline test procedure	Involves the introduction of slight pressure (nitrogen gas) to the tank (approximately five psi or less). A decrease in pressure is measured over a time interval. If the pressure decreases over time, the tank may have a leak. The test requires the pneumatic isolation of the tank and lines being tested. The fluid level in the tank should be noted.	<ul style="list-style-type: none"> • Inexpensive (see Table A3). • Easy to perform (see Table A3). • Same-day results. 	<ul style="list-style-type: none"> • Potential to damage the tank if too much pressure is applied. Many tank manufacturers recommend against applying pressure to a tank. • The tank may be difficult to isolate if it has a number of lines coming into it. • If there is sludge in the tank that can't be removed, this method may be ineffective, as the sludge could act as a plug when pressure is applied, concealing any leaks the tank might have underneath the sludge. • Only reveals that there is a leak, not the size or location of the leak. 	Most underground tanks (see Table A3).
Vacuum decline test procedure	Involves the introduction of a slight vacuum to the tank. A decrease in vacuum is measured over a time interval. If the vacuum decreases, the tank may have a leak. This test requires the pneumatic isolation of the tank and lines being tested. The tank must also be empty of fluids.	<ul style="list-style-type: none"> • Inexpensive. • Easy to perform. • Same-day results. 	<ul style="list-style-type: none"> • Potential to collapse the tank. Many tank manufacturers recommend against applying vacuum to a tank. • The tank may be difficult to isolate if it has a number of lines coming into it. • If there is sludge in the tank that can't be removed, this method may be ineffective, as the sludge could act as a plug when pressure is applied, concealing any leaks the tank might have underneath the sludge. • Soil on the outside of the tank may plug holes and mask a leak. • Only reveals that there is a leak, not the size or location of the leak. 	Most underground tanks.

(continued)

¹¹ The integrity tests are listed in random order without regard for the accuracy or cost of the test.

Table A2. Integrity tests for underground storage tanks¹ (continued)

Method	Description	Pros	Cons	Applications
Fill test	Involves the overflowing of a tank (preferably with water) and the subsequent recording of liquid levels over time. This requires the hydraulic isolation of the tank and/or lines being tested.	<ul style="list-style-type: none"> • Least expensive. • Easy to perform. 	<ul style="list-style-type: none"> • Does not account for varying temperatures. • The tank has to be full and all vapour pockets need to be identified and removed. • Trapped air pockets, line swags, and other difficulties impact the evaluation of the connected underground piping. • If there is high groundwater or if the tank is surrounded by thick clays, a leak could be disguised. • There is the potential for product being leaked into the surrounding soils. • Only reveals that there is a leak, not the size or location of the leak. 	Most underground tanks.
Out-fill test	Involves the emptying of the tank and the subsequent recording of liquid levels over time. This requires the hydraulic isolation of the tank and/or lines being tested.	<ul style="list-style-type: none"> • Least expensive. • Easy to perform. • Useful for areas where there is a high groundwater table. 	<ul style="list-style-type: none"> • Only reveals that there is a leak, not the size or location of the leak. • Only works in high groundwater situations. • If the leak is small, it may take a long time for a measurable amount of groundwater to infiltrate the tank. • May not evaluate risers, connections, and connected underground piping. 	Will work for most tanks situated in soils with a high groundwater table.
Hydrostatic test	The tank is completely filled and stabilized. Tank pressure is raised by five to seven psi by a pump or by adding a similar hydrocarbon. If pressure is maintained for one hour, tank is leak free.	<ul style="list-style-type: none"> • Inexpensive. • Easy to perform. • Stored product does not always have to be removed. • Same-day results. 	<ul style="list-style-type: none"> • Does not account for varying temperatures. • Could cause tank or piping to rupture. Many tank manufacturers recommend against applying pressure to a tank. • Tank has to be full and all vapour pockets need to be identified and removed. • Trapped air pockets, line swags, and other difficulties impact the evaluation of the connected underground piping. • Difficult to interpret the result. • Potential for product being leaked into the environment. • Only reveals that there is a leak, not the size or location of the leak. 	Most underground tanks.

(continued)

Table A2. Integrity tests for underground storage tanks¹ (continued)

Method	Description	Pros	Cons	Applications
Suretest volumetric leak detection procedure	A probe is inserted into the tank (product). The probe is sensitive to the outflow or inflow of any liquids within the tank and can detect product loss or gain to an accuracy of .001 litres per hour. Temperature sensors are spaced to take the temperature at each level of product. The probe's microprocessor corrects for volume changes that are due to thermal expansion or contraction of the product.	<ul style="list-style-type: none"> • The test is not affected by temperature. • Same-day results. • Third-party performance rated. • Can detect the presence and rate of a leak. 	<ul style="list-style-type: none"> • Important that technician is trained. • Product volume level restrictions. • Product type and temperature change limitations. • Evaluates the lower tank portion, which contains product. An alternative test procedure is required to test above the product level, risers, connections, and underground product piping. • Groundwater level must known to ensure that equilibrium does not occur within the tank product level. Product does not leave or enter the tank during the test procedure and groundwater does not infiltrate the tank. 	Most underground tanks.
Tracer test	A tracer gas (or liquid) is injected into the tank. Soil gas samples are taken from probes installed into the ground around the tank. A leak is declared if tracer is detected outside the tank.	<ul style="list-style-type: none"> • The production system can remain in service through the entire procedure. • There are no fill or underfill requirements. • The leak location can be determined. • The system is designed for easy retesting, since the probes are permanent. 	<ul style="list-style-type: none"> • Lab results are not generally available until 10 to 14 days after the start of the test. • The test can be strongly affected by the type of soil (i.e., the test will not work well in low-porosity soils) and the groundwater level around the tank. • Tank and piping system may have to be sealed and pressurized with tracer gas in order to evaluate risers and connected underground piping. 	Most underground tanks.

(continued)

Table A2. Integrity tests for underground storage tanks¹ (continued)

Method	Description	Pros	Cons	Applications
Ullage acoustics leak detection test procedure	The fluid is removed from the tank and a microphone is placed into the tank. The storage tank and connected openings are sealed off. A computer connected to the microphone measures the amount of background noise present in the tank. Two to three psi nitrogen pressure is placed in the sealed tank system. The computer determines a leak by measuring a change in the background noise (caused by the vibrations created by escaping nitrogen). A pressure decline procedure is performed simultaneously to evaluate the connected piping.	<ul style="list-style-type: none"> • Same-day results. • Can identify the location of leaks. • Allows for trouble shooting while the test is being performed. • Nonvolumetric, and not affected by temperature or vapour pockets. • Third-party performance evaluated. 	<ul style="list-style-type: none"> • The expertise of the licensee is crucial for this test to effectively determine the location of the leak. • Vibrations from nearby equipment or vehicles may interfere with the test, making testing difficult in some situations. • High groundwater levels may affect results. 	Most underground tanks.
Underfill leak detection procedure (e.g., PetroTite II, Alert 1000)	The underfill test is designed to measure any changes in buoyancy force acting on a probe inserted into the tank. It uses mass measurement technology to determine if product is entering or leaving the tank. The technology is based on the fact that buoyancy force only varies as a direct result of a change in the mass of the liquid. It is not affected by changes in product temperature, since the change in volume due to temperature change is offset by a corresponding change in liquid density.	<ul style="list-style-type: none"> • Same-day results. • Not affected by temperature. • Third-party performance rated. 	<ul style="list-style-type: none"> • Minimum 40 per cent and maximum 95 per cent product levels required. • Tank's product must be a consistent type, otherwise stratification will affect results. • If the groundwater is above the bottom of the tank, it increases the product level that will be required to perform the test. 	Most underground tanks.

(continued)

Table A2. Integrity tests for underground storage tanks¹ (concluded)

Method	Description	Pros	Cons	Applications
Vacutect leak detection system	All openings to the tank are sealed off and a mild vacuum is applied to the tank using a vacuum pump. The vacuum level is constantly monitored and maintained by the computer in the testing unit. While under vacuum, vacutect monitors for three things: water level, noise (via a hydrophone), and pressure in the tank.	<ul style="list-style-type: none"> • Can perform trouble shooting to determine not only if the system is leaking, but the nature and location of the leak. • Same-day results. • Product can remain in the tank. • The test is not affected by temperature. • Third-party performance rated. 	<ul style="list-style-type: none"> • Expertise of the licensee is crucial for this test to effectively determine the location of the leak. • Vibrations from nearby equipment or vehicles may interfere with the test. This makes testing difficult in some situations. • Using the vacuum or the pressure may be ineffective in clay soils because it may plug up holes in the tank. 	Most underground tanks.
Visual inspection	In some of the tanks with large manways it may be possible to inspect the tanks visually for leaks.	<ul style="list-style-type: none"> • Inexpensive. • Easier to locate the leak than other methods. • The whole inside of the tank can be inspected. 	<ul style="list-style-type: none"> • Tank must be completely emptied and cleaned before a thorough visual inspection can be performed. • Might overlook smaller leaks. • An alternative procedure is required to evaluate the connected underground piping. • Tank must be completely isolated for safety reasons. • Outside of the tank can't be visually inspected unless the tank is unearthed. 	Will only work on tanks with large enough manways for someone to enter through.

Table A3. Explanatory notes

Item	Explanation/discussion
Costs	<p>The terms “inexpensive” and “expensive” are used in relative terms in this report. Some examples of costs are that</p> <ul style="list-style-type: none"> • ultrasonic testing can cost thousands of dollars; • a precision leak test can cost approximately \$500 and up; • an external visual inspection performed by an licensee working at the facility has no real cost associated with it. <p>So in relative terms the external visual inspection is inexpensive compared to the relatively expensive ultrasonic test.</p> <p>Note that costs can vary within each test method depending on the availability of equipment, how difficult the tank is to isolate, whether product needs to be added or removed from the tank, what type of product is stored in the tank, the size of the tank, and the amount of time required to perform the test.</p> <p>Additional costs that occasionally need to be factored in are the potential costs associated with taking the tank out of service while performing the test. This is especially true for larger tanks, where it is more economical to consider using a testing method that allows the tank to stay in service even if that test is more expensive.</p>
Difficulty of performing the test	<p>In this report, the statements on the difficulty of implementing a test are used in relative terms. For example, a pressure test is listed as easy to perform. This means that a pressure test is easier to perform relative to performing something like a tracer test. This designation is only in regard to the general case. There will be many cases where it is impossible to isolate a tank from the lines connected to it. Then it would be easier to perform the tracer test (which does not require the complete isolation of a tank), rather than the pressure test. However, the tester will not be able to identify a test failure as a tank problem or line problem.</p>
Certification	<p>The United States EPA has issued protocols that test methodologies must meet in order to be classified as a precision test. With respect to the downstream petroleum industry, most Canadian jurisdictions have adopted those parameters, which include the ability to identify a leak as small as 0.38 L/hour, 95 per cent accuracy, and false positive outcomes of five per cent or less. This certification applies to test methodologies for underground tanks only. Some aboveground tank testing methodologies have had third-party performance evaluations, but the parameters for sensitivity and accuracy have not been established by any government body.</p> <p>For various reasons, the use of only certified, precision tests is not required for the upstream petroleum industry. However, owners of tanks should consult with the tester to determine if an evaluation has been completed by a third party to ensure that the test is appropriate.</p>
Applications	<p>The application section of the table is vague due to the diversity of tanks used in the industry. A test may be applicable/inapplicable to a tank based on factors such as size, shape, positioning, environment (e.g., climate), product stored, material the tank is made out of, how many lines are connected to the tank, and if the tanks are manifolded.</p>