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To: All Participants

**Five-Year Review of Abandonment Cost Estimates and
Set-Aside and Collection Mechanisms
Report of the Commission of the Canada Energy Regulator, and
Base Case 2021 abandonment cost estimates**

**Before: S. Luciuk, Presiding Commissioner; M. Watton, Commissioner;
M. Chartier, Commissioner**

A. Background

On 14 December 2021, the Commission of the Canada Energy Regulator issued Procedural Direction No. 1 ([C16773](#)) initiating the concurrent five-year review of abandonment cost estimates (**ACE**) and set-aside and collection mechanisms (**SAM-COM**) for all companies with pipeline systems regulated by the Canada Energy Regulator (**CER**) [**Review**].

The Commission has completed Part 1 of the Review and its final report (**Report**) is attached. **Appendix 1** to the Report provides links to each company's Base Case 2021 ACE.

B. Comments received on the draft Report

On 24 February 2023, consistent with Procedural Direction No. 7 ([C22161](#)), the Commission released its draft Report ([C23379](#)) for comments from the Participants. The following Participants provided comments:

Participant	Link
Canadian Association of Energy and Pipeline Landowner Associations, Manitoba Pipeline Landowners Association, and Ontario Pipeline Landowners Association	C23665 C24029 (oral summary)
Louis Bull Tribe	C23676
Sucker Creek First Nation	C23677
Centra Transmission Holdings Inc.	C23679
Champion Pipe Line Corporation Limited	C23674

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Enbridge ¹	C23666 C24010 (reply)
Milk River Pipeline Ltd.	C23656
NorthRiver ²	C23678
TC Energy ³	C23669 C23986 (reply)
Trans Mountain Pipeline ULC	C23671

The Commission has considered all comments received. After reviewing the comments, together with the rest of the Participants' filings in this Review, the Commission decided to make a number of changes to the Report, including adding context, clarification, and reasoning for its decisions. Not all comments resulted in changes to the Report. Where the Commission was of the view that comments were already sufficiently addressed in the draft Report, no changes were made. The Report was also updated to reflect more current public information relevant to the Commission's determinations (for example, historical and forecast inflation rates and bond yields).

C. Companies' Base Case 2021 ACEs

The Commission has calculated each company's total Base Case 2021 ACE using the 2021 ACE Calculation Method established by the Commission in this Review. Each ACE shows a breakdown of its calculation and the total ACE amount. The calculation method, cost categories, and unit costs in each company's Base Case 2021 ACE correspond to those in **Section 4** of the Report. Participants are encouraged to review the relevant subsections in **Section 4** to understand how the numbers in each company's Base Case 2021 ACE were determined.

Some companies have CER-regulated infrastructure that does not lend itself to the 2021 ACE Calculation Method. Other companies did not provide geospatial information, or they provided incomplete or inaccurate geospatial data. These issues are discussed in **Section 2.6.1.1** and **Appendix 5** of the Report.

D. Base Case 2021 ACEs are generally higher than currently approved ACEs

After the 2016 ACE review for Group 1 companies and the 2018 ACE review for Group 2 companies were completed, the total value of all companies' ACEs was over \$10 billion (in 2016 and 2018 dollars).⁴ Inflating this amount to 2023 dollars, the total value of all ACEs

¹ 2193914 Canada Limited, Enbridge Bakken Pipeline Company Inc. on behalf of Enbridge Bakken Pipeline Limited Partnership, Enbridge Gas Inc., Enbridge Pipelines Inc., Enbridge Pipelines (NW) Inc., Enbridge Southern Lights GP Inc. on behalf of Enbridge Southern Lights LP, Express Pipeline Ltd., Maritimes & Northeast Pipeline Management Ltd., Niagara Gas Transmission Limited, St. Clair Pipelines Ltd., Vector Pipeline Limited on behalf of Vector Pipeline Limited Partnership, and Westcoast Energy Inc.

² NorthRiver Midstream Canada LP, by its general partner, NorthRiver Midstream Canada Partner Limited, and NorthRiver Midstream G and P Canada Pipelines Limited Partnership, by its general partner, NorthRiver Midstream G and P Canada Pipelines Inc.

³ TransCanada PipeLines Limited, NOVA Gas Transmission Ltd., Foothills Pipe Lines Ltd., Trans Québec & Maritimes Pipeline Inc., Great Lakes Pipeline Canada Ltd., and TransCanada Keystone Pipeline GP Ltd.

⁴ Derived from Appendix G of the 2021-22 Annual Report of the Commission of the Canada Energy Regulator (<https://www.cer-rec.gc.ca/en/about/publications-reports/annual-report/2021/commission-report/appendix-g-abandonment-funding.html>)

would have been over \$12 billion. The Base Case 2021 ACEs issued with this Report total over \$17 billion (in 2023 dollars).

In most cases, companies' Base Case 2021 ACEs have increased (in real dollars) over what was approved in the 2016 ACE review. In some cases, ACEs have decreased. Some common reasons for changes to companies' ACEs are provided in **Section 2.6.1.1** of the Report.

E. Part 2 – ACE and SAM-COM

The Commission will issue a Procedural Direction in due course setting out the ACE and SAM-COM processes for Part 2 of the Review. The Commission directs companies to refrain from submitting any requests for changes to Base Case 2021 ACEs, or filings related to SAM-COM matters, until after the issuance of that Procedural Direction. All such requests and filings must follow the direction and steps set out in that correspondence.

F. Other

Participants – in particular, companies with CER-regulated pipeline systems – are advised that the CER will be making consequential amendments to the Filing Manual so that filing requirements will align with the 2021 ACE Calculation Method, filings, and forms outlined in the Report.

For any questions, please contact the Process Advisor by phone at 1-800-899-1265 or by email at ACEReview@cer-rec.gc.ca.

Yours sincerely

Signed by

Ramona Sladic
Secretary of the Commission

Attachment



Canada Energy
Regulator

Régie de l'énergie
du Canada

Five-Year Review of Abandonment Cost Estimates and Set-Aside and Collection Mechanisms 2021

Report of the Commission of the Canada Energy Regulator

Presiding Commissioner – S. Luciuk
Commissioner – M. Watton
Commissioner – M. Chartier

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1. Executive summary

In December 2021 ([C16773](#)), in accordance with an established five-year cycle,¹ the Commission of the Canada Energy Regulator set out a process to concurrently review abandonment cost estimates (**ACEs**), set-aside mechanisms (**SAM**), and collection mechanisms (**COM**) for all companies with pipeline systems regulated by the Canada Energy Regulator (**CER**) [**Review**].

This report of the Commission (**Report**), issued at the conclusion of **Part 1** of the Review, provides an updated Base Case for calculating ACEs (**Base Case 2021**) and explains the new geographic information system- (**GIS**) based method that the Commission used to calculate companies' Base Case 2021 ACEs. This Report also updates requirements for companies' SAM and COM (together, **SAM-COM**) elements.

For approximately 10 years, the CER and its predecessor, the National Energy Board (**NEB**) have required companies to calculate ACEs and to set aside funds for abandonment activities. In the past, the NEB provided companies with a Base Case (i.e., assumptions and unit costs) as a recommended basis for calculating their ACEs. However, the majority of companies generally did not use the Base Case and, instead, calculated their ACEs using their own methodologies and data that were inconsistent between companies. The CER identified the need for a common methodology for calculating all companies' Base Case 2021 ACEs (**2021 ACE Calculation Method**) which would ensure that all ACEs:

- are transparent;
- consistently apply assumptions and unit costs; and
- can be updated efficiently in the future as new information becomes available.

Section 4 provides the Commission's decisions and reasons for the established 2021 ACE Calculation Method, including the underlying assumptions used, cost categories, and unit costs. **Appendix 1**² provides a list of all companies with CER-regulated pipeline systems and a link to their respective Base Case 2021 ACE. The total of all Base Case 2021 ACEs is over \$18 billion. This represents an increase from the existing approved ACEs, which total over \$10 billion (and were set in 2016 and 2018 dollars). If inflating this amount to 2023 dollars, the total value of existing ACEs would have been over \$12 billion. The change in Base Case 2021 ACEs reflects the continued refinement of ACEs so that the future cost of abandoning CER-regulated facilities is paid for by companies with CER-regulated pipeline systems and not borne by Indigenous Peoples, landowners, or future Canadian taxpayers.

ACE refinements will continue into the future through regular five-year reviews. In **Part 2** of this Review, companies, impacted Indigenous Peoples, landowners, and other parties will have an opportunity to request deviations from certain Base Case 2021 assumptions or unit costs for a particular pipeline based on pipeline-specific circumstances.

The Review represented the first time that SAM-COM elements have been reviewed since they were established in 2014 through the NEB's MH-001-2013 decision ([A60676](#)). Since that time, the Commission has identified several SAM-COM elements that require updating to help ensure that companies have sufficient funds available at the time of abandoning their pipeline facilities.

¹ See **Section 2.5** for a description of the history of ACE and SAM-COM.

² **Appendix 1** will be updated online throughout the Review process to include both companies' Base Case 2021 ACEs calculated in Part 1 of the Review and their final ACEs approved by the Commission in Part 2.

Section 5 provides the Commission's decisions and reasons concerning SAM-COM elements, including details around abandonment funding plans, annual contribution amount calculations, terminal abandonment dates, and collection periods, each of which is fully described and defined in this Report. In **Part 2** of this Review, companies with a SAM that is a trust that will not continue to be fully funded will have to file abandonment funding plans and other information in accordance with the direction set out in this Report.

This Report sets out a standard ACE and SAM-COM framework and seeks to enhance clarity for companies, Indigenous Peoples, landowners, and other interested parties around the Commission's expectations in relation to ACE and SAM-COM. In addition, the Report provides a transparent and robust methodology that can form the basis for refinements to ACEs and SAM-COM elements in future five-year ACE and SAM-COM reviews.

By its nature, the process of establishing ACEs and SAM-COM requirements involves an exercise of judgement and discretion. The Commission made its decisions in order to balance the benefits and costs of incremental risk reduction. For example, costs and benefits arise from both excessive and insufficient ACEs and from collecting funds in abandonment trusts too quickly or too slowly. The Commission notes that over time, more abandonment activities will take place, with CER oversight and with engagement with Indigenous Peoples, landowners, and interested parties. This experience will inform future five-year reviews.



S. Luciuk
Presiding Commissioner



M. Watton
Commissioner



M. Chartier
Commissioner

2. Context

Commonly used terms and acronyms	
2021 ACE Calculation Method	The common methodology established by the Commission for calculating all companies' ACEs in Part 1 of the Review
ACE	abandonment cost estimate
ACE Review 2016	The first five-year ACE review in 2016, conducted by the NEB
AICE	ACE-implied cost estimate
Base Case	Abandonment method assumptions and unit costs used as the basis for calculating an ACE
Base Case 2010	The Base Case set out by the NEB following the RH-2-2008 decision, for use by companies as the basis for calculating their ACEs
Base Case 2021	The Base Case used by the Commission as the basis for calculating all companies' ACEs in Part 1 of the Review
CER	Canada Energy Regulator
CER Act	<i>Canadian Energy Regulator Act</i>
Collection Period	In the context of COMs for companies using trusts for their pipeline systems, the assumed number of years to fully fund future abandonment costs
COM	collection mechanism (for abandonment costs)
GIS	geographic information system
Monitoring Provision	Provision for Monitoring of Abandoned Pipeline
NEB	National Energy Board
NRCan	Natural Resources Canada
Report	The report issued by the Commission at the conclusion of Part 1 of the Review
Review	The process established by the Commission in 2021 to concurrently review ACEs and SAM-COM for all companies with CER-regulated pipeline systems
SAM	set-aside mechanism (for abandonment costs)
Staggered Retirement Activities	Material abandonment or decommissioning activities that are anticipated to occur prior to the Terminal Abandonment Date
Terminal Abandonment Date	The anticipated date when terminal system-wide abandonment occurs
UN Declaration	United Nations Declaration on the Rights of Indigenous Peoples
UN Declaration Act	<i>United Nations Declaration on the Rights of Indigenous Peoples Act</i>
Unforeseen Events Provision	Provision for Addressing Unforeseen Events Associated with Abandoned Pipeline

2.1 What an abandonment cost estimate is

An ACE is an estimate of the costs that will be incurred by a company in abandoning its pipeline system, including the monitoring of, and addressing any unforeseen events associated with, those pipelines assumed to be abandoned in place rather than removed. A company's ACE determines the amount of money the CER requires a company to set aside to help ensure that sufficient funds will be available for the abandonment of that company's pipeline system. An ACE is calculated by using assumptions to estimate each type of anticipated cost (referred to as a **line item**) and then adding all line items together. The calculation pertains to pipelines that are in operation, decommissioned, or already abandoned in place (i.e., not abandoned by removal). The line items included in the ACE calculations – such as abandonment activity costs, provisions for abandoned pipelines, project management costs, and contingency – are described in this Report.

2.2 What an abandonment cost estimate is not

As an estimate relating to activities that may take place well into the future, an ACE cannot reflect, with 100 per cent accuracy, the future abandonment cost that would actually be incurred by a company. Refinements to an ACE are expected at a minimum through each five-year review until the pipeline is abandoned. Through these refinements, the ACE should more accurately reflect the true abandonment cost as the abandonment activities approach.

An ACE does not dictate future abandonment methods or costs. Nor does it override land acquisition and crossing agreements. Prior to an abandonment, a company must file with the CER an application for abandonment. As described further in **Section 2.8.3**, in considering an abandonment application, the Commission will determine whether to grant leave to abandon and, if so, what activities are required to appropriately abandon the pipeline and what conditions are to be imposed.

The *actual* costs to conduct the abandonment activities associated with a particular ACE line item may differ from the cost *estimated* for that line item in a company's ACE. Similarly, the total actual abandonment costs of a pipeline may be higher or lower than the total ACE for that pipeline. If actual costs are higher (either for a particular ACE line item or in total), the company is responsible to pay the full costs. An ACE does not limit company liability for any costs to appropriately abandon the pipeline.

2.3 What a set-aside mechanism is

A SAM refers to how a company will set aside funds to cover its ACE so that these funds will be available at the time of pipeline abandonment. A company can use a letter of credit, surety bond, or trust. These mechanisms protect the funds from being used for purposes not associated with abandonment and from a pipeline company's creditors. Only the CER can draw down letters of credit and demand surety bonds. Funds can only be released from trust with the Commission's approval.

2.4 What a collection mechanism is

A COM refers to how the company will collect funds associated with its SAM. Letters of credit and surety bonds put the funds in place all at once and have been self-funded by the pipeline company. Trusts are generally funded over time. They are sometimes self-funded, but often the funds are collected from shippers through tolls. Accordingly, in practice, COMs have only been established for companies using trusts as their SAM for a pipeline system.

Within the context of COMs for companies using trusts for their pipeline systems, determinations have been made with respect to the assumed number of years to fully fund future abandonment

costs (**Collection Period**) and how much money will be contributed to the trust each year (referred to as the **annual contribution amount**). In general, establishing a Collection Period gives rise to tradeoffs. If funds are collected from shippers and collection occurs too slowly, there will not be sufficient funds set aside at the time of abandonment. Alternatively, if collection from shippers occurs too quickly, current shippers will overpay and future shippers will underpay their proportion of abandonment costs (this inequitable treatment of shippers across time is referred to as **intergenerational inequity** in the context of tolling matters).

2.5 History of abandonment cost estimates and set-aside and collection mechanisms

The CER's predecessor, the NEB, established the current approach to abandonment funding with the release of its RH-2-2008 decision in 2009 ([A21835](#)). In that decision, the NEB established a key principle – landowners will not be liable for the costs of abandonment. The NEB also rejected the concept of elimination of risk, as there comes a point when further action to reduce risk is disproportionately costly as compared to the incremental benefits. These remain guiding principles in this Report, with the former of these two principles extended to include Indigenous Peoples.

The RH-2-2008 decision established:

- a framework for companies to use in preparing their preliminary ACEs;
- a five-year action plan that required companies to file those ACEs; and
- a proposed mechanism to collect and set aside the abandonment funds.

The RH-2-2008 decision included a preliminary set of assumptions for companies to use in developing their ACEs. The NEB subsequently refined these assumptions on 4 March and 21 December 2010, following further consultations with companies, and issued them as Base Case Tables A-1 to A-4 (collectively, **Base Case 2010**).³ The NEB directed companies to file their preliminary ACEs using Base Case 2010, or provide a pipeline-specific ACE for their pipeline system with justification and supporting evidence for any assumptions the company used that differed from Base Case 2010.

By 2014, the NEB had completed the MH-001-2012 ACE and MH-001-2013 SAM-COM proceedings and issued the respective decisions ([A50478](#), [A60676](#)). The result was that every company with NEB-regulated pipeline systems had an approved ACE and an approved SAM.

In each of the RH-2-2008, MH-001-2012, and MH-001-2013 decisions, the NEB expressed the view that the ACE and SAM-COM, for all companies, should be regularly reviewed – at least every five years. In this way, new information and experience could be used to improve the accuracy of the ACE and to refine the SAM-COM over time.

The NEB initiated the first five-year ACE review in 2016 to determine whether any changes to ACEs were warranted (**ACE Review 2016**).⁴ As part of the ACE Review 2016, the NEB released a Discussion Paper ([A85505](#)) identifying a number of issues regarding the lack of consistency and transparency in companies' preliminary and updated ACEs. The NEB proposed a standard format for companies to file their ACEs that would replace the Base Case 2010 tables.

The Discussion Paper and NEB's proposed standard format were discussed at a November 2017 technical conference. The Refined ACE Framework included:

³ Refined tables were later included in Appendix II of the NEB's MH-001-2012 decision.

⁴ The NEB did not initiate a review of SAM-COM elements at that time because companies had only just begun to set aside funds as of 2015.

- standardized land use and crossing categories, with descriptions;
- consistent units of measurement;
- fixed abandonment method assumptions; and
- separate tables for calculating abandonment activity costs for pipelines and above-ground facilities, remediation and restoration costs, special treatment costs, and costs to monitor and address future unforeseen events for pipelines assumed to be abandoned in place.

The NEB received comments from companies and participants regarding the proposed Refined ACE Framework both prior to and during the technical conference. While some companies and a landowner group supported the proposed framework, other companies did not. Those companies' submissions included that they had put a lot of effort into using the Base Case 2010 tables, they had appropriately customized their ACEs with company-specific assumptions, and that consistency should not be the fundamental goal of an ACE framework.

The NEB issued a Final Technical Conference Report for the ACE Review 2016 ([A92857](#)) and decisions regarding Group 1 companies' updated ACEs in 2018 ([A91357](#)). The NEB and the Commission issued decisions regarding Group 2 companies' ACEs in 2018 and 2019 ([A96835](#), [A98121](#), [C00113](#), [C03053](#), [C03136](#)). In the Group 2 company decisions, the Commission stated its expectation that, during the next five-year ACE review, the *Provisions for Abandoned Pipelines* cost category would be refined and companies would be required to adjust this cost in their future ACEs based on the outcome of that review.

By the end of 2020, the combined total of the most recently approved ACEs for both Group 1 and Group 2 companies was over \$10 billion.

2.6 The Review

The current Review includes the second five-year review of ACEs and the methodology by which they are established and the first review of SAM-COM elements. The Commission launched Part 1 of the Review in December 2021 ([C16773](#)). Part 2 of the Review will be initiated following the issuance of this Report.

The current Review differs from the ACE Review 2016 in two important ways. First, in Part 1 of the Review, the Commission considered and made significant changes to the Base Case. Second, the Commission did not ask companies to submit updated ACEs for its consideration at the outset. Instead, in Part 1 of the Review, the Commission considered and, in this Report, approves a new CER-developed, GIS-based method to calculate Base Case 2021 ACEs for each company. In Part 2 of the Review, the Commission will consider any requests to approve ACEs that differ from these Base Case 2021 ACEs based on pipeline-specific circumstances.

2.6.1 Abandonment cost estimates

2.6.1.1 Part 1 of the Review

As noted above, in Part 1 of the Review, the Commission has examined a new method of producing ACEs that differs from prior NEB practice. In the past, companies calculated their own ACEs by applying Base Case 2010 or company-specific assumptions to their pipeline systems by filling out tables. Much of Part 1 of the Review was focused on a CER proposal to calculate the ACE for each pipeline system using GIS. The Commission has established the 2021 ACE Calculation Method that:

- uses the geospatial infrastructure data provided by each company;

- uses publicly available geospatial land cover datasets from Natural Resources Canada (**NRCan**); and
- applies consistent abandonment method assumptions and unit costs.

The Commission expects that standardizing and automating the calculation will reduce the time associated with assessing the varying assumptions, methodologies, and approaches used by companies.

Through Part 1 of the Review, the Commission sought input from Participants on, among other things:

- using a GIS-based approach;
- the geospatial datasets to be used; and
- the appropriateness of the 2021 ACE Calculation Method and Base Case 2021.

The Commission also sought updated unit costs from companies. Unit cost information was not requested from Indigenous Peoples or landowners because they could not be expected to have direct experience planning for or carrying out abandonment activities, or in-house expertise. As discussed in **Section 5.4.2**, companies will be required to file additional realized cost information as they complete individual decommissioning and abandonment projects, which, over time, could help improve or validate how ACEs are calculated.

The Commission considered all submissions received and applied the expertise of CER technical staff in deciding on the 2021 ACE Calculation Method set out in this Report. Concurrent with this Report, the Commission is issuing a Base Case 2021 ACE (calculated using the 2021 ACE Calculation Method) for each company (**Appendix 1**). The Commission notes that, in most cases, companies' ACEs have increased (in real dollars) over what was approved in ACE Review 2016. In some cases, ACEs have decreased. Beyond the impacts of inflation since prior ACEs were established, some common reasons for changes to companies' ACEs include the following:

- The 2021 ACE Calculation Method uses different cost categories, assumptions, and unit costs than were included in Base Case 2010.
- In the past, many companies used their own methodology, rather than Base Case 2010, to calculate their approved ACEs, which was a permitted approach if justification was provided.
- In a number of cases, a company had a change to its pipeline system (e.g., it bought, sold, or abandoned assets).

The Commission has considered the total ACE increase⁵ and individual ACE increases and decreases that will flow from the 2021 ACE Calculation Method and finds them to be appropriate as part of a shift to the 2021 ACE Calculation Method that was subject to review and comment. The consistent, transparent, and standardized approach to calculating ACEs, described above, is expected to allow the Commission, Indigenous Peoples, landowners, companies, and other parties to better evaluate the reasonableness of a particular ACE.

To use the 2021 ACE Calculation Method, the Commission requested that companies file geospatial information about their pipelines and above-ground facilities, including through:

- Procedural Direction No. 4 ([C19143](#)); and

⁵ Total Base Case 2021 ACEs are nearly \$6 billion higher than total existing approved ACEs (if inflated to 2023 dollars).

- a letter regarding overdue filings directing those who had not filed geospatial information to file it ([C20037](#)).

Several companies did not file the requested geospatial data. The Commission generated geospatial data for these companies using information from previous ACEs filed for those pipeline systems and the CER's records (e.g., orders, certificates, company filings).

Some companies filed geospatial data which required corrections before a Base Case 2021 ACE could be calculated. For these companies, the CER issued informal information requests to the companies and in most cases, the issues were resolved by companies correcting and refileing their geospatial data.

However, for some companies, issues with their geospatial data remained. To allow calculation of those companies' Base Case 2021 ACEs, the Commission used information from the previous ACEs filed for those pipeline systems and the CER's records. In these cases, the outstanding issues generally involved missing or incorrect attributes in a company's geospatial data, or infrastructure reported in the geospatial data that did not correspond with the previous ACE for the pipeline system or CER's records (e.g., above-ground facilities were missing).

Where issues were identified with pipeline operating status data for recently abandoned pipelines, the Commission revised the pipeline operating status reported, as necessary, to ensure ACEs were not prematurely reduced⁶. For the purposes of calculating Base Case 2021 ACEs, the Commission considered these pipelines to be "abandoned" once written confirmation was received from the company that the abandonment activities are complete, per the requirements of the relevant abandonment Order.

Companies for which the Commission created or corrected geospatial data are listed in **Table 1 in Appendix 5**. The table identifies the issue and includes an explanation of pipeline length, pipeline operating status and above-ground facility types and counts used to calculate each of those companies' ACEs, as applicable.

In three cases, some or all of the infrastructure held by a company was unique in nature, including pipeline systems entirely located on bridge and dam structures and underground storage caverns, and did not allow for the application of the 2021 ACE Calculation Method. In these cases, the affected companies' ACEs were manually calculated, to the extent necessary to account for the unique features. **Table 2 in Appendix 5** lists the affected companies and includes a brief summary of the unique features and the calculation method applied.

2.6.1.2 Part 2 of the Review

In Part 2 of the Review, the Commission will determine the ACE for each company's pipeline system. Specifically, the Commission will decide whether to impose the Base Case 2021 ACE or approve a revised ACE. This decision will be made on a case-by-case basis, in response to requests made by companies, Indigenous Peoples, landowners, and other impacted parties to deviate from certain Base Case 2021 assumptions or unit costs for a particular pipeline based on pipeline-specific circumstances.

⁶ In the 2021 ACE Calculation Method, the ACE is reduced once a pipeline is abandoned as costs for abandonment activities are no longer included in the ACE. If a pipeline is abandoned in-place, the Provisions for Abandoned Pipelines will apply. Refer to **Section 4.4.7** for further explanation.

2.6.2 Set-aside and collection mechanisms

2.6.2.1 Part 1 of the Review

In Part 1 of the Review, the Commission considered refinements to certain SAM-COM elements, including Collection Periods, annual contribution amounts, and the Base Case rate of return. The Commission also examined the type of information that companies should be required to provide in pipeline specific abandonment funding plans to be filed in Part 2 of the Review. In the MH-001-2013 decision, the NEB directed that abandonment funding plans must include preliminary information such as timelines for abandonment activities, plans for drawing on funds, and annual fund balances.

Through the process for Part 1 of the Review, the Commission sought input from Participants on the above matters, as well as on company engagement, reporting of actual project costs, and other related topics. The Commission considered all submissions received and applied the expertise of CER technical staff in deciding on the SAM-COM updates set out in this Report (**2021 SAM-COM Requirements**).

2.6.2.2 Part 2 of the Review

With respect to SAM-COM, Part 2 of the Review will only apply to pipeline systems with a SAM that is a trust that is not yet fully funded. For these pipeline systems, Part 2 will require each company to file the following (along with the necessary supporting information):

- an abandonment funding plan;
- the date when complete system-wide abandonment is anticipated to occur (**Terminal Abandonment Date**);
- a proposed updated Collection Period; and
- the illustrative updated annual contribution amount based on the company's proposals and a provisional updated ACE based on the Base Case 2021 ACE.

The updated Collection Period will be subject to Commission approval in Part 2. Companies will have to update annual contribution amounts following Part 2 of the Review, using the finalized ACEs. Instructions and deadlines for these filings will be issued in short order following the issuance of this Report.

Pipelines that will continue to use a SAM that is a letter of credit, a surety bond, or a fully funded trust will not be within the scope of Part 2 of the Review as it relates to SAM-COM matters. However, once the updated ACEs are finalized for these pipeline systems, their letters of credit and surety bonds will have to be updated to reflect their new ACEs (adjusted to 2028 dollars, as described in **Section 4.5.3**). Similarly, for a trust to remain fully funded, the funds within the trust will have to cover each pipeline system's new ACE. The Commission will communicate the deadlines for companies to make these SAM updates in due course (e.g., when confirming companies' finalized updated ACEs in Part 2 of the Review). The Commission will also communicate information about the future applicability of existing exemptions from the requirements to set aside funds for abandonment. The Commission is making no determinations in this regard at this time.⁷

⁷ On 12 December 2019 ([C03619](#)), following the review of Group 2 company ACEs, the Commission decided not to conduct a review of the exemptions that had been previously granted to nine companies from the requirement to provide a SAM. Accordingly, their exemptions continued to remain in force.

2.7 Future five-year reviews

The Commission expects that the 2021 ACE Calculation Method and 2021 SAM-COM Requirements will continue to be revised and improved through future five-year reviews.

2.8 Other processes related to abandonment and abandonment funding

ACE and SAM-COM reviews are not the only CER processes in which these issues are considered. Between reviews, companies with CER-regulated pipeline systems are required to submit regular filings using forms or templates provided in the MH-001-2013 decision. A number of those forms have been updated and companies should use the revised forms and templates provided in **Appendices 3 and 4** for future filings.

Additional processes include those listed in **Sections 2.8.1 to 2.8.4**.

2.8.1 Changes to collection

The CER regulates the tolls charged for service on pipelines under its jurisdiction. A company cannot charge a toll unless it is filed with the CER or approved by the Commission. Further, pursuant to the MH-001-2013 decision, a company proposing a change to its annual contribution amount is required to make a tariff application or filing.

Accordingly, if a company makes any changes to abandonment surcharges that its shippers must pay, it must file a revised tariff or application with the CER.

2.8.2 Abandonment applications

Section 241 of the *Canadian Energy Regulator Act*⁸ (**CER Act**) requires a company to obtain leave of the Commission to abandon a pipeline. Section 50 of the *Canadian Energy Regulator Onshore Pipeline Regulations*⁹ requires such an application to include the reasons for the abandonment and the procedures that are to be used.

Before filing an abandonment application, a company is required to engage with landowners, potentially affected Indigenous Peoples, and other parties in a manner commensurate with the project's scope (see Chapter 3.4 and Guide B.2 of the [Filing Manual](#)). After filing the application, the company is required to publish a notice and to serve notice of the application on landowners and potentially affected Indigenous Peoples. The Commission will consider any statements of opposition received in response to the notices and may establish a hearing process, including opportunities to raise matters related to the potential environmental and socio-economic effects of the abandonment (see section 241 of the CER Act and Guide B.2 of the Filing Manual).

The Commission will determine what activities are required to appropriately abandon the pipeline and associated above-ground facilities, based on the circumstances of the pipeline, including the environmental and socio-economic setting and land use. The Commission will also consider any relevant submissions of Indigenous Peoples, landowners, and other parties. The Commission's decision on the abandonment application will not necessarily align with the assumptions that were used to calculate the ACE. For example, the Commission could require the company to remove the pipeline, regardless of the abandonment method assumption that was used to calculate the ACE.

⁸ SC 2019, c 28, s 10.

⁹ SOR/99-294.

2.8.3 Applications to access trust funds

A company can apply for approval to withdraw funds from an abandonment trust to pay for abandonment activities (or decommissioning activities that will not need to be repeated at the time of abandonment). With respect to abandonments, Guide B.2 of the Filing Manual indicates that a company may apply to access funds from its abandonment trust as part of its abandonment application, or in a subsequent application. The Filing Manual does not set out notice requirements for applications to access trust funds.

2.8.4 Financial regulatory audits

Financial regulatory audits are one of the CER's tools to verify compliance with the CER Act, regulations, orders, and decisions, including as they relate to abandonment funding. The CER follows a risk-based approach when selecting companies to audit in a given year. In some instances, the CER may also conduct multi-company "targeted" audits, focused on a particular aspect (or aspects) of tolling, financial regulation, or compliance. The CER publishes final audit reports on its website.

3. The process for carrying out the Review

In Part 1 of the Review, the Commission considered implementing a data-driven approach to establishing Base Case 2021 ACEs. The process for Part 1 of the Review included the following steps:

- Inviting interested persons and communities to register to participate, with an offer of funding.
- Seeking Participants' comments regarding the process for the Review and the topics to be considered.
- Revising the Review process and the list of topics in response to Participants' submissions.
- Gathering updated geospatial information from companies about all CER-regulated pipeline systems.
- Issuing workshop papers prepared by CER technical staff (**Papers**) that set out the context for ACE and SAM-COM topics and asked questions of the Participants to inform the development of the 2021 ACE Calculation Method and Base Case 2021.
- Receiving Participants' written submissions regarding the Papers
- Receiving Participants' responses to information requests.
- Hearing Participants' oral submissions regarding the Papers at virtual workshops.
- Seeking Participants' comments on a draft Report.
- Releasing a final Report, taking into consideration Participants' submissions on the draft Report.
- Releasing Base Case 2021 ACEs to companies with CER-regulated pipeline systems.

In Part 2 of the Review, the Commission will decide whether to impose as the ACE for each pipeline system the Base Case 2021 ACE issued in Part 1 of the Review, or whether to approve a deviation from the Base Case 2021 ACE. Details on Part 2 of the Review will be released following the issuance this Report.

3.1 Participants

In Procedural Direction No. 1 ([C16773](#)) of 14 December 2021, the Commission indicated that all companies with CER-regulated pipeline systems are required to participate in the Review. The Commission also invited interested persons to apply to participate.

On 25 January 2022, the Commission issued Procedural Direction No. 2 ([C17370](#)) announcing the List of Participants for the Review. The Commission accepted all applications to participate. The List of Participants was updated online ([C17520-3](#)) throughout the Review to reflect new Participants and other revised Participant information.

In addition to all companies with CER-regulated pipeline systems, the Participants in the Review included Indigenous Peoples, landowner and other associations, and government departments.

Table 1 lists the Participants in the Review, other than companies with CER-regulated pipeline systems.

Table 1 – Participants in the Review (other than companies with CER-regulated pipeline systems)

Akisknuk First Nation	Louis Bull Tribe
Alberta Department of Energy	Manitoba Pipeline Landowners Association
Canadian Association of Energy and Pipeline Landowners Associations	McLeod Lake Indian Band
Canadian Association of Petroleum Producers	Ontario Pipeline Landowners Association
Centra Gas Manitoba Inc.	Province of British Columbia
Driftpile Cree Nation	Shell Canada Energy
Duncan's First Nation	Sucker Creek First Nation
Foothills First Nation	Whitefish Lake First Nation
Kapawe'no First Nation	Wolastoqey Nation in New Brunswick
Kehewin Cree Nation	Zagimē Anishinabek First Nation

3.2 Participant funding

The CER administers a Participant Funding Program, separate and apart from any hearing process, which provides financial assistance to individuals, Indigenous Peoples, landowners, and non-industry not-for-profit groups to facilitate public participation in public hearings.

On 14 December 2021, grants for the Review were announced on the CER's website and in the Commission's Procedural Direction No. 1 for the following eligible recipient types to facilitate their participation in one or more workshops and/or to provide written or oral comments on the draft Report:

- \$12,000 for Indigenous Peoples of Canada and Indigenous organizations;
- \$10,000 for non-industry not-for-profit groups or for a group of individuals, such as an unincorporated local community group; and
- \$2,500 for individuals, such as a landowner or land user.

Table 2 sets out the 12 grants paid to 12 recipients for a total of \$138,000. Indigenous communities account for 78 per cent of the funding awarded.

Table 2 – Participant funding recipients

Recipient	Grant
Canadian Association of Energy and Pipeline Landowners Associations	\$10,000
Driftpile Cree Nation	\$12,000
Duncan's First Nation	\$12,000
Foothills First Nation	\$12,000
Kapawe'no First Nations	\$12,000
Louis Bull Tribe	\$12,000
Manitoba Pipeline Landowners Association	\$10,000
Mcleod Lake Indian Band	\$12,000
Ontario Pipeline Landowners Association	\$10,000
Sucker Creek First Nation	\$12,000
Whitefish Lake #459 First Nation	\$12,000
Zagimē Anishinabek First Nation	\$12,000

The CER's Participant Funding Program has confirmed that it will provide additional funding for Part 2 of the Review.

3.3 Sufficiency of the Review process

Commission decision

The Commission finds that the process for Part 1 of the Review was sufficient. The process was procedurally fair, satisfied any duty to consult that was owed to Indigenous Peoples, met the Commission's obligations under the CER Act, and considered the United Nations Declaration on the Rights of Indigenous Peoples (**UN Declaration**). The Commission considered all Participant submissions in arriving at the 2021 ACE Calculation Method, Base Case 2021, and 2021 SAM-COM Requirements.

Reasons of the Commission

Landowner associations' concerns regarding the process for Part 1 of the Review

While acknowledging that participant funding for Part 1 of the Review was better than in past hearings addressing ACEs, the landowner associations submitted that it was not sufficient to engage expert consultants, which is required for full and meaningful participation.

The Commission notes that the landowner associations retained legal counsel and commends them for working together to present their views. The Commission is satisfied that the landowner associations had the opportunity to make their case and notes that the CER's Participant Funding Program (which is separate from the Commission's hearing processes) is not intended to cover the full cost of participating.¹⁰

Indigenous Peoples' concerns regarding the process for Part 1 of the Review

Indigenous Peoples expressed concerns regarding the highly technical content of the materials and the amount of funding granted to participate in Part 1 of the Review. On behalf of Zagimē Anishinabek

¹⁰ [Participant Funding Guide](#), Section 1.

First Nation, Councillor Acoose submitted that their participation would not have been possible without collaboration with other Indigenous Peoples.

The Commission notes that Indigenous Peoples retained legal counsel, as well as a technical advisor, and commends Indigenous Peoples for working together to present their views. The Commission also notes that it granted the request of Indigenous Peoples to extend the deadline for filing written submissions on the Papers to allow time for them to seek advice and support from third-party advisors on the technical content (Ruling No. 2, [C19656](#)). As noted above, the CER's Participant Funding Program is separate from the Commission's hearing processes and is not intended to cover the full cost of participating.

Indigenous Peoples also shared concerns regarding the Commission's failure to engage with them directly and earlier in the process, specifically before engaging with other Participants and in advance of releasing the Papers for comment. They expressed the view that the Commission's lack of engagement with Indigenous Peoples on the Papers prior to issuing them for comment "undoubtedly constrained the range of possible outcomes."

The Commission disagrees that engagement on the Papers before their release was necessary because the Papers set out the context for the Review and asked questions of Participants, rather than reflecting decisions already made. In addition, the Indigenous Peoples' Workshop Paper ([C19327-13](#)) specifically invited submissions about any additional topics relevant to the purpose and scope of the Review that Indigenous Peoples wished to further explore.

Indigenous Peoples submitted that the process for Part 1 of the Review was not in keeping with the UN Declaration. In particular, Indigenous Peoples referenced the inherent right of Indigenous Peoples to participate in decision-making processes that might affect their traditional territories and resources in a manner consistent with free, prior, and informed consent (Articles 18 and 19).¹¹ Indigenous Peoples submitted that, notwithstanding the limitations of the Review process, a "fair and responsive hearing can nonetheless be accomplished if due consideration and weight is given by the Panel to [their] submission[s]."

The Commission is of the view that the process for Part 1 of the Review was sufficient to allow for the meaningful participation of Indigenous Peoples. The process for Part 1 of the Review, described in **Section 3**, included opportunities for all Participants to provide written comments on the process and topics for the Review, written and oral comments on the Papers, and written and oral comments on the draft Report. The Commission sought to engage more deeply and directly with Indigenous Peoples participating in the process by identifying separate topics related to Indigenous Peoples ([C18392](#)) and by developing the Indigenous Peoples' Workshop Paper seeking input on both procedural and substantive issues.

In finding that the process for Part 1 of the Review was sufficient to allow for the meaningful participation of Indigenous Peoples, the Commission considered that the preamble to the CER Act references the Government of Canada's commitment to achieving Reconciliation with Indigenous Peoples, as well as implementing the UN Declaration. The Commission further considered that the CER has identified Reconciliation as a strategic priority and has recognized the UN Declaration as a framework for advancing Reconciliation.¹² In addition, the Commission considered that the *United*

¹¹ Indigenous Peoples also cited Articles 29, 39, 32, and 26 of the UN Declaration.

¹² [Strategic Plan](#), Reconciliation Strategic Priority: Transforming the way we work with the Indigenous Peoples of Canada, with a commitment to implementing the United Nations Declaration on the Rights of Indigenous Peoples, by enhancing their involvement in how we discharge our mandate recognizing their unique cultures, knowledge and histories; building renewed relationships based on the recognition of rights, respect, co-operation and partnership; improving the cultural competency of the CER and its staff; and driving meaningful change in the CER's requirements and expectations of regulated industry. See also the [CER's statement on Reconciliation](#).

*Nations Declaration on the Rights of Indigenous Peoples Act*¹³ (**UN Declaration Act**) affirms the UN Declaration as a universal international human rights instrument with application in Canadian law. Finally, the Commission considered that a duty to consult can be owed in respect of high-level decisions that have no immediate physical impacts if those decisions could lead to adverse impacts on lands and resources.¹⁴

The Commission accepts that Indigenous Peoples have the rights and interests in lands described in their written submissions. The Commission also accepts that there is potential for these rights and interests to be impacted if sufficient funds are not available for pipeline abandonment. However, the Commission's decision in Part 1 of the Review is not determinative of whether sufficient money will be available at the time of abandonment. As discussed in **Section 2**, companies are liable for the full costs of abandoning their CER-regulated pipeline systems, with the ACE and SAM-COM acting as a backstop to ensure that abandonment and monitoring activities will be fully funded. Further, Part 1 of the Review was one of many processes through which the Commission works to ensure that the amount of funds and the SAM remain appropriate for every CER-regulated pipeline system. In addition, the process is part of a five-year review cycle. The Commission remains of the view that regular reviews are important to continually improve the accuracy of ACEs and annual set-aside amounts. Given the likely timeframe for abandonment of most CER-regulated facilities, it can be expected that multiple reviews would be conducted in respect of a CER-regulated facility's ACE and SAM prior to actual abandonment.

The Commission is satisfied that the process undertaken allowed Indigenous Peoples to participate in and influence the process in a manner and at a scale that was commensurate with the underlying decision – that being a process concerning a financial backstop conducted on a regular basis in relation to all companies with CER-regulated pipeline systems.

The Commission considered the submissions of Indigenous Peoples with full contemplation of the commitments and obligations to Indigenous Peoples discussed above and its obligations to consider adverse effects pursuant to section 56 of the CER Act. Due consideration and weight were afforded to these submissions, such that a fair and responsive hearing was accomplished in this case.

4. Commission decisions regarding abandonment cost estimates, with reasons

4.1 Abandonment cost estimates overview and engagement

In the ACE Overview and Engagement Paper ([C19327-3](#)), Participants were asked questions about the CER's proposed revised method for calculating ACEs, and about engagement.

4.1.1 2021 ACE Calculation Method

Commission decision

The Commission has calculated Base Case 2021 ACEs using the GIS-based 2021 ACE Calculation Method, as outlined in this Report. Specifically, ACEs have been calculated using:

- geospatial pipeline and above-ground facility data submitted by companies with CER-regulated pipeline systems;
- geospatial land cover data from NRCan's publicly available GIS datasets for land use and crossing categories, as outlined in **Table 3**;
- the Base Case 2021 abandonment method assumptions shown in **Table 4**; and
- the cost categories and associated Base Case 2021 unit costs outlined in **Tables 5 to 23**.

¹³ S.C. 2021, c. 14.

¹⁴ *Rio Tinto Alcan Inc. v. Carrier Sekani Tribal Council*, 2010 SCC 43 at paras. 44 and 47.

Appendix 2 provides a summary of the 2021 ACE Calculation Method and Base Case 2021.

Reasons of the Commission

The Commission acknowledges the concerns raised by some companies, landowner associations, and Indigenous Peoples that, while the 2021 ACE Calculation Method will likely achieve greater consistency and transparency in ACEs, it may reduce accuracy.

ACEs, whether calculated by companies or the CER, are high-level estimates with inherent uncertainty. This uncertainty makes it difficult for a company to calculate an ACE that accurately reflects actual abandonment costs and for the Commission (and, previously, the NEB) to verify its accuracy. While the Commission agrees that the approach may result in a larger discrepancy between ACEs and actual abandonment costs in the short-term in some cases, it is of the view that this disadvantage is outweighed by the benefits of having a transparent, consistent, and efficient approach for calculating ACEs, which accords with CER Act requirements.¹⁵ The Commission believes that future ACE reviews and the resulting iterative refinement process will inherently increase the accuracy of the 2021 ACE Calculation Method and Base Case 2021 over time and, by extension, result in more accurate ACEs.

Landowner associations raised a concern that the geospatial information to be used in the CER's GIS-based 2021 ACE Calculation Method does not capture landowners' anticipated changes to land use and reflect them in the abandonment method assumptions applied in an ACE. The Commission agrees that the calculation method and NRCan's geospatial information do not capture anticipated land use changes. However, NRCan's geospatial datasets are expected to be updated every few years and, therefore, land use changes should be captured when ACEs are re-calculated during future ACE reviews. This level of accuracy is sufficient for the purposes of calculating high-level ACEs, as described in **Sections 2.1 and 2.2**.

The Commission acknowledges Indigenous Peoples' views that geospatial datasets are not appropriate for estimating abandonment costs. The Commission also acknowledges the submissions of Indigenous Peoples regarding different ways that the 2021 ACE Calculation Method could be re-developed to better consider the perspectives and rights and interests of Indigenous Peoples. The Commission considered these suggestions when establishing the 2021 ACE Calculation Method and Base Case 2021 abandonment method assumptions and unit costs, as reflected in the reasons throughout this Report.

With respect to companies' concerns about the potential duplication of effort if companies are required to review the CER's calculations, re-calculate an ACE, and apply to change the ACE, the Commission notes that requests to deviate from the Base Case 2021 ACE in Part 2 of the Review are optional. Using the 2021 ACE Calculation Method has allowed the Commission to provide Base Case 2021 ACEs with sufficient detail to allow all Participants to understand the calculations and focus any requested changes on particular line items in Part 2 of the Review, based on circumstances unique to a particular pipeline.

In its reasons in **Section 5**, the Commission considers the comments received from companies, Indigenous Peoples, and landowner associations in response to questions asked in the ACE Overview and Engagement Paper that relate to SAM-COM topics.

¹⁵ The CER Act preamble references enabling "decisions to be made in a predictable and timely manner" and "using transparent processes" that take into account "the best available scientific information and data as well as Indigenous knowledge." The purpose section of the CER Act (section 6) also references "transparent and efficient" decision-making processes.

4.1.2 Engagement related to abandonment cost estimate assumptions and costs

Commission decision

The Commission agrees with the submissions of Indigenous Peoples and landowner associations that companies should engage with them in relation to abandonment plans and activities that may affect them.¹⁶ However, the Commission will not require companies to undertake engagement with Indigenous Peoples, landowners, and interested parties specific to ACE abandonment method assumptions and costs outside of the CER-led five-year ACE reviews and companies' annual abandonment funding updates and ongoing engagement activities related to abandonment planning.

With respect to engagement on ACE assumptions and costs through future five-year reviews, this Commission panel does not have the authority to make determinations on future processes. However, the Commission values the Participants' submissions and recognizes that CER staff sought input in the discussion papers for this ACE Review to better understand how the process could be improved. This input has been summarized in this Report so it can be considered at the early planning stages of the next ACE review process.

Reasons of the Commission

Engagement on ACEs outside of ACE reviews

The Commission is of the view that the five-year ACE reviews and regular regulatory filings are sufficient to meet engagement needs with respect to ACE costs and assumptions. The Commission is also of the view that a separate proponent-led engagement process regarding ACEs would be duplicative and less efficient than the five-year ACE reviews. This could lead to an unnecessary engagement burden for all parties without providing any substantive contributions to inform ACEs. As described in **Section 2**, an ACE does not dictate future abandonment methods or costs, and companies must be granted leave to abandon prior to undertaking abandonment projects. The Commission does not propose developing further guidance regarding ACE-specific engagement activities.

Landowner associations' concerns regarding future five-year reviews

Landowner associations raised concerns regarding funding to participate in future five-year ACE reviews. As noted in **Section 3.2**, the CER administers a Participant Funding Program that is separate and apart from the Commission's hearing process. Participant funding related to future ACE reviews will be subject to CER grants and approval of financial assistance at that time.

Indigenous Peoples' concerns regarding future five-year reviews

Indigenous Peoples raised concerns regarding funding to participate in future five-year ACE reviews. As noted in **Section 3.2**, the CER administers a Participant Funding Program that is separate and apart from the Commission's hearing process. Participant funding related to future ACE reviews will be subject to CER grants and approval of financial assistance at that time.

Indigenous Peoples submitted that, in keeping with the UN Declaration and UN Declaration Act, they expect a process for engagement in future reviews that is more robust than the current process. Indigenous Peoples emphasized the need for the CER to engage early, potentially including

¹⁶ Expectations for what company-related engagement activities should include are outlined in Guide B of the Filing Manual.

workshops or direct engagement prior to commencing the process, though counsel for Indigenous Peoples acknowledged the difficulty associated with directly engaging with the significant number of Indigenous Peoples impacted by pipelines across Canada. Indigenous Peoples further submitted that the CER must consider how it might begin to give effect to their right to participate in joint decision-making processes for the setting aside of funds for reclamation and monitoring of abandoned pipelines that affect their rights and interests.

While this Commission panel cannot make binding determinations regarding future reviews, it is of the view that each five-year review – including any early engagement – should take considerably less than five years to complete. Otherwise, the review process will require constant or near-constant engagement, which imposes an undue regulatory burden on participants. The Commission fully expects that future review processes will reflect the commitments and obligations to Indigenous Peoples discussed in **Section 3.3**. The Commission also expects that the matters discussed in **Section 3.3** will be considered, including that each review is one of many processes relating to the ACE and SAM of CER-regulated pipeline systems, as well the importance of regular reviews to allow for continuous improvement. An additional consideration for future reviews may be that the current Review contemplated a complete change in approach from prior ACE calculations, whereas future reviews are anticipated to be limited to a refinement of the 2021 ACE Calculation Method.

4.2 Land use and crossing categorization

The 2021 ACE Calculation Method requires classifying companies' pipeline systems into various land use and crossing categories. The lengths of pipeline reported in each land use category and the number of crossings reported in each crossing category are used to determine the assumed amount of pipeline to be abandoned in place or removed and the assumed number of crossings for which special treatment will be applied (e.g., fill added to the pipe). This information is then used to calculate abandonment costs.

In ACE Paper 1 ([C19327-5](#)), Participants were asked questions about:

- the CER's proposed GIS-based approach to categorize companies' pipeline systems by land use and crossing type;
- the publicly available land cover geospatial datasets being considered for use;
- the land use and crossing categories that would result from implementing such an approach; and
- whether the proposed categorization captured the majority of land use considerations that would drive abandonment method assumptions.

For reference, the Base Case 2010 Table A-1, which outlines the previous land use categorizations, is found in Appendix II of the NEB's MH-001-2012 decision.

Commission decision

The Commission has decided that the land use and crossing categories and descriptions proposed in ACE Paper 1 are appropriate, subject to one change, as described in the Commission's reasons below. These categories are shown and described in **Table 3**, which also includes the NRCan geospatial dataset and attributes to be used to delineate each category in the CER's GIS.

Table 3 – Land use and crossing categories

Land use category	Description	NRCan dataset to be used	Dataset attributes to be used to delineate category ¹⁷
Agricultural Cropland	Agricultural lands used for the production of annual crops, perennial grasses for grazing, and woody crops such as orchards and vineyards	Atlas of Canada Land Cover Dataset, 2015 Edition Released in 2016 Last updated 2023	Cropland
Grasslands and Shrublands	Encompasses native prairie, agricultural pasture lands, shrublands, and barren areas with limited vegetation		<ul style="list-style-type: none"> • Temperate or sub-polar grassland • Temperate or sub-polar shrubland • Sub-polar or polar shrubland-lichen-moss • Sub-polar or polar grassland-lichen-moss • Sub-polar or polar barren-lichen-moss • Barren land
Forested Lands	Includes both publicly and privately owned forested lands and encompasses land practices such as timber harvesting and agriculture (e.g., maple stands)		<ul style="list-style-type: none"> • Temperate or sub-polar needleleaf forest • Sub-polar taiga needleleaf forest • Temperate or sub-polar broadleaf deciduous forest • Mixed forest
Existing Developed Lands	Developed areas such as cities and towns		Urban and built up
Wetlands – Water	Wetlands including marshes, swamps, and bogs, and areas covered by water		<ul style="list-style-type: none"> • Wetland • Water
Water Crossings	Crossings of watercourses and waterbodies	CanVec Series – Hydrographic Features Released in 2017 Last updated 2022	<ul style="list-style-type: none"> • Waterbody polygon and polyline features in data set • Attributes include lake, pond, reservoir, canal, ditch, diversion, side channel, tidal river, and watercourse
Road Crossings – Paved	Crossings of paved roads found both in urban and rural areas	Canada's National Highway System Released in 2016 Last updated 2021	<ul style="list-style-type: none"> • Paved feature in dataset • Attributes include freeway, expressway/highway, arterial, collector, local/street, ramp, resource/recreation, and rapid transit
Road Crossings – Unpaved	Crossings of unpaved roads found both in urban and rural areas	Canada's National Highway System Released in 2016 Last updated 2021	<ul style="list-style-type: none"> • Unpaved feature in dataset • Attributes include expressway/highway, arterial, collector, and local/street, and resource/recreation
Railway Crossings	Crossings of railway tracks	National Railway Network Released in 2017 Last updated 2021	Attributes include main, siding, spur, yard, connecting, crossover, and wye

¹⁷ Refer to the **attachment to Appendix 2** for NRCan's definitions of the chosen attributes in the dataset.

Reasons of the Commission

The Commission has established five land use categories and four crossing categories for the 2021 ACE Calculation Method, as proposed in ACE Paper 1 and as shown in **Table 3**. Those categories replace the 2010 Base Case land use and crossing categories. The Commission has chosen land use and crossing categories for the 2021 ACE Calculation Method that align with available NRCan geospatial datasets and which correspond to potential differences in abandonment method assumptions and abandonment costs. That has resulted in some categories that were previously in Base Case 2010 either not being included (e.g., *Non-Agricultural*, *Prospective Future Development*, and *Other*, *Utility Crossings*) or being combined with other categories (e.g., *Agricultural*, *Cultivated with Special Features*; *Agricultural*, *Non-Cultivated*; and *Environmentally Sensitive Areas*). These changes are described in ACE Paper 1. As well, the names of the land use and crossing categories have been changed to reflect the attributes in the relevant geospatial datasets.

The Base Case 2021 land use and crossing categories are supported by three publicly available NRCan geospatial datasets with nation-wide coverage, which will be used by the CER to categorize companies' pipeline systems by land use and crossing types using a GIS.

Descriptions of each category are provided in **Table 3** and include the NRCan dataset and dataset attributes to be used to delineate each category. The descriptions, datasets, and dataset attributes shown are as proposed in ACE Paper 1, with two changes:

- the NRCan Atlas of Canada Land Cover dataset attribute “sub-polar or polar grassland-lichen-moss” has been added to the *Grasslands and Shrublands* land use category as the Commission determined that it had been missed; and
- similarly, the “water” attribute in the NRCan Atlas of Canada Land Cover dataset was also missed and the Commission has combined that attribute with the wetland attribute to establish the new *Wetlands – Water* land use category.

The “water” attribute has been included in the *Wetlands-Water* land use category to allow abandonment method assumptions to be applied to the lengths of pipeline which traverse such areas and ensure sufficient abandonment costs are accounted for in companies' ACE for those sections of pipeline. As the methods of abandonment for pipelines traversing areas of water are expected to be similar to pipelines crossing wetlands, the Commission has established a combined land use category for wetlands and water. The “water” attribute in the NRCan Atlas of Canada Land Cover dataset will not be used to determine Special Treatment costs in an ACE, rather those costs will be calculated using the *Water Crossings* category and be established using the hydro waterbody polygon and polyline features in the CanVec Series (see **Table 3**).

The Commission acknowledges that the lack of geospatial data to support a separate land use category for non-cultivated agricultural lands is not ideal, particularly because landowner associations submitted that abandonment method assumptions are important for these lands when calculating an ACE. However, the Commission finds such lands would likely be captured by NRCan's land cover attribute “cropland,” which includes areas with perennial grasses for grazing and woody crops such as orchards and vineyards (see the full NRCan definition for the cropland attribute in the **Attachment to Appendix 2** of the Report). As well, the deficiency can be addressed by adjusting the abandonment method assumptions for the new *Grasslands and Shrublands* category, which may include some agricultural non-cultivated lands, to have a higher amount of pipeline removal than that proposed in ACE Paper 2. The abandonment method assumptions for the *Grasslands and Shrublands* category and the Commission's reasons for those assumptions are provided in **Section 4.3**. The Commission also recommends that future five-year ACE reviews consider whether publicly available geospatial datasets include data at that time to support a separate category for agricultural, non-cultivated lands and reinstate it, if feasible.

With respect to landowner associations' concerns regarding the loss of the Base Case 2010 *Non-Agricultural, Prospective Future Development* category, the Commission reviewed previous ACEs and found that there was limited use of the category. The Commission finds that it is appropriate to eliminate this category because the information supporting it is somewhat speculative and there are no publicly available geospatial datasets available to support it. Further, should developments occur, they will be reflected in changes in land cover in the updated geospatial datasets used to update ACEs during future five-year ACE reviews. Specifically, such developments would likely result in an increase in the amount of pipeline allocated to the *Existing Developed Lands* category in an ACE and a corresponding decrease in other categories. The Commission has considered the loss of the *Non-Agricultural, Prospective Future Development* category when establishing the abandonment method assumptions for the *Existing Developed Lands* category. The Commission's reasons for those abandonment method assumptions are found in **Section 4.3**.

The Commission notes that Trans Mountain Pipeline ULC, in its questions, requested that the Commission retain the Base Case 2010 *Other, Other Crossings (Utilities)* crossing category. The Commission reviewed approved ACEs and found that there was limited use of the category. Few companies reported utility crossings in their ACEs and, if they did, the abandonment method assumption applied was often 100 per cent abandonment in place with no special treatment. The Commission finds that there is little value in keeping the category if it does not result in the application of a different cost. Further, the Commission has not found a publicly available geospatial dataset with sufficient Canada-wide coverage to support delineation of the category. Should the CER observe a trend in companies applying special treatment (or other mitigation measures) at utility crossings at the time of abandonment, and appropriate publicly available data becomes available in the future, this category can be reconsidered for inclusion in the 2021 ACE Calculation Method as part of future ACE reviews. Such changes to land use and crossing categorization are not limited to utility crossings and could occur as part of future ACE reviews to address other potential cost gaps found in ACEs.

With respect to a proposed category for crossing high-voltage electric transmission lines, companies indicated that such a category is not required as the presence of high-voltage transmission lines (either parallel to or crossing a pipeline) would not require particular abandonment methods or result in the need for additional mitigation at the time of abandonment. Accordingly, the Commission did not include such a category in the 2021 ACE Calculation Method.

Some companies submitted that some of the revised land use categories could be combined because the abandonment method assumptions for those categories are the same and do not provide any benefit to the calculation of an ACE. While the Commission agrees that the abandonment method is the same for some land use categories, it finds that there is merit in keeping the proposed breakdowns because the associated abandonment method assumptions may change in the future as more abandonments are conducted and better information becomes available. As well, the Commission finds that more precise delineation of land use allows interested parties to better understand how an ACE reflects their interests.

The Commission acknowledges Indigenous Peoples' views that the 2021 ACE Calculation Method must include categories for, or sufficiently accommodate, considerations related to Indigenous Peoples' land use (including traditional activities) and land title (such as reserve, Aboriginal title, and Indigenous fee simple lands), which may be subject to future development. Indigenous Peoples submitted that these categories would help to ensure that costs in an ACE account for removing pipeline on those lands to allow Indigenous Peoples to exercise their rights and interests. The Commission notes that Indigenous Peoples did not support adding a land use category for Indian reserves or land claim areas using NRCan's *Aboriginal Lands of Canada Legislative Boundaries* geospatial dataset. Due to the lack of support for such a land use category by Indigenous Peoples and other Participants, the Commission has not included the proposed category in the 2021 ACE Calculation Method. The CER is not aware of any other alternative publicly available datasets

(with consistent, Canada-wide coverage) that could support the land use categories suggested by Indigenous Peoples in their responses.

The Commission has decided not to include the Base Case 2010 *Other, Environmentally Sensitive Areas* crossing category as a separate category in the 2021 ACE Calculation Method because environmentally sensitive areas form part of several of the newly established land use and crossing categories (i.e., *Grasslands and Shrublands, Forested Lands, Wetlands, and Water Crossings*).

The Commission acknowledges Indigenous Peoples' concerns that the land use categories fail to differentiate between environmentally sensitive and non-environmentally sensitive grasslands, wetlands, and forested lands. Environmentally sensitive areas are designations that are open to interpretation and there is no credible, publicly available geospatial dataset with Canada-wide coverage that would allow delineation of such lands. In the absence of such information, for the purposes of calculating ACEs, the abandonment method assumptions applied to land use categories which may include environmentally sensitive areas have been assigned by the Commission in consideration of the abandonment methods that would be implemented in such areas. As a result, separate land use categories for environmentally sensitive areas are not required.

In its decisions and reasons in **Sections 5.1 and 5.3**, the Commission considers the other concerns raised by Indigenous Peoples in their submissions regarding ACE Paper 1.

The Commission has considered the submission from companies that there is potential for double counting of special treatment costs in an ACE due to the greater number of crossing categories proposed in the 2021 ACE Calculation Method and the potential for a pipeline to cross two or more crossing types at the same location. The Commission addresses this submission in **Section 5.4.7**.

4.3 Abandonment method assumptions

The 2021 ACE Calculation Method applies abandonment method assumptions to the lengths of pipeline and number of crossings in different categories in order to calculate:

- the total length of pipeline that will be assumed to be abandoned in place;
- the total length of pipeline that will be assumed to be removed; and
- the total number of crossings that will be assumed to be abandoned in place with special treatment (e.g., fill added to pipe).

In ACE Paper 2 ([C19327-7](#)), Participants were asked questions about the CER's proposed abandonment method assumptions for the revised land use and crossing categories presented in ACE Paper 1. For reference, the Base Case 2010 Table A-2, which outlines the previous abandonment assumption methods, is found in Appendix II of the NEB's MH-001-2012 decision.

Commission decision

The Commission has decided to adopt most of the abandonment method assumptions proposed in ACE Paper 2 for Base Case 2021, with certain exceptions as described in the Commission's reasons below. These abandonment method assumptions are shown in **Table 4**.

Table 4 – Abandonment method assumptions

Land use and crossing categories	Pipeline diameters			
	Very small < 4" (114.3 mm)	Small 4" to 12" (114.3 to 304.8 mm)	Medium 12" to 26" (304.8 to 660 mm)	Large > 26" (660 mm)
Agricultural Cropland	95% A – 5% R	95% A – 5% R	80% A – 20% R	80% A – 20% R
Grasslands and Shrublands	95% A – 5% R	95% A – 5% R	90% A – 10% R	90% A – 10% R
Forested Lands	95% A – 5% R	95% A – 5% R	95% A – 5% R	95% A – 5% R
Wetlands – Water	95% A – 5% R	95% A – 5% R	95% A – 5% R	95% A – 5% R
Existing Developed Lands	80% A – 20% R	80% A – 20% R	80% A – 20% R	80% A – 20% R
Water Crossings	100% A	95% A – 5% A+	95% A – 5% A+	95% A – 5% A+
Road Crossings – Paved	100% A	100% A	100% A+	100% A+
Road Crossings – Unpaved	100% A	100% A	50% A – 50% A+	50% A – 50% A+
Railway Crossings	100% A	100% A+	100% A+	100% A+

Legend: A = abandoned in place; R = removed; A+ = abandoned in place with special treatment

Reasons of the Commission

Certain companies submitted that the assumptions include too much pipeline removal. Some companies suggested that the NEB's views that an assumption of 100 per cent abandonment in place for small diameter pipelines for the following Base Case 2010 land use categories remained applicable: *Agricultural, Cultivated; Agricultural, Non-Cultivated; Non-Agricultural, No Future Development Anticipated; Other – Paved Road; and Other – Gravel Road Crossings.*

Landowner associations also maintained their position from previous ACE-related proceedings that an abandonment method assumption of 100 per cent removal on agricultural lands is appropriate.

Indigenous Peoples submitted that an abandonment method assumption of 100 per cent removal should apply to lands that are under the current control of Indigenous Peoples and lands that may be subject to Indigenous Peoples' control and development in future. They submitted that assuming less than 100 per cent removal results in a risk of underfunding abandonment activities, thereby jeopardizing Indigenous Peoples' rights and interests.

The Commission considered the comments and suggestions received from Participants in response to ACE Paper 2 regarding land acquisition and crossing agreements. Companies generally indicated that the terms of such agreements are accommodated within the abandonment method assumptions. As noted in the reasons presented below, the Base Case 2021 abandonment method assumptions for each land use category now account for the possibility that pipeline removal could be required at the time of abandonment for reasons other than land use, including because of the terms of private agreements. Although the ACE for a particular pipeline may not fully reflect the terms of a land acquisition or crossing agreement, the parties to the agreement remain liable to each other according to the terms of the agreement.

In making its decision regarding each Base Case 2021 abandonment method assumption, the Commission weighed Participants' views with the following considerations:

- Companies are fully liable for the costs of abandonment activities at the time of abandonment, and the ACE and SAM-COM act as safeguards.
- Base Case 2021 abandonment method assumptions applied to calculate an ACE do not determine the methods that will be used to abandon a specific pipeline. Rather, they should broadly reflect the probability of the different abandonment methods (e.g., abandonment in place, pipeline removal, special treatment) being applied within different land uses or at specific crossing types for all CER-regulated pipelines across Canada.
- The abandonment methods authorized by the Commission (and, previously, the NEB) for the abandonment of CER-regulated pipelines to-date may inform ACE abandonment method assumptions by providing an understanding of what abandonment methods have been applied in the past.¹⁸
- Research¹⁹ regarding abandonment and abandonment technologies can inform abandonment method assumptions.
- As set out in ACE Paper 2, there may be project- and site-specific circumstances, apart from land use and regardless of pipeline diameter, that would result in the need to remove all or part of a pipeline at the time of abandonment, including, for example:
 - results of risk assessments (e.g., unstable slopes, erosion at water crossings);
 - results of consultation with Indigenous Peoples, landowners, and other interested parties;
 - accommodation of concerns raised by Indigenous Peoples regarding their rights and interests; and
 - the terms of applicable land acquisition and crossing agreements.

Considering the above, the Commission did not apply an abandonment method assumption of 100 per cent pipeline removal to any land use category (e.g., the *Agricultural Cropland*, *Grasslands and Shrublands*, and *Existing Developed Lands* land use categories, as asserted by landowner associations and more broadly by Indigenous Peoples). However, the Commission agrees that all Base Case 2021 abandonment method assumptions should explicitly include a certain percentage of pipeline removal for all land use categories which accounts for circumstances at the time of abandonment that would necessitate removal of all or part of a pipeline and which are not necessarily the result of land use. As suggested in ACE Paper 2, the Commission has applied a minimum of 5 per cent removal to the Base Case 2021 abandonment method assumptions for all land use categories for this reason.

The Commission's reasons for the Base Case 2021 abandonment method assumptions for each land use and crossing category are provided below. The abandonment method assumptions will likely be refined in future ACE reviews as more information becomes available.

Agricultural Cropland category

In ACE Paper 2, an abandonment method assumption of 80 per cent abandonment in place and 20 per cent removal was suggested for all pipeline diameters in the *Agricultural Cropland* category. ACE Paper 2 included a note stating that there had previously been varying views regarding these

¹⁸ Any noted historical trends regarding abandonment methods are not indicative of what might be proposed by companies and authorized by the Commission for specific pipeline abandonments in the future. Abandonment methods applied to a pipeline at the time of abandonment will reflect current regulatory requirements, best practices, and site-specific circumstances, and may change over time.

¹⁹ See Petroleum Technology Alliance of Canada research studies listed in Appendix A of ACE Paper 2; *Pipeline Decommissioning Research Program – Final Report*, prepared by University of Calgary for Enbridge Pipelines Inc., 30 December 2018 ([C16017-3](#)); and third-party evidence referred to by landowner groups in Workshop Transcript Volume 1, dated 17 October 2022 ([C21440-1](#)).

assumptions in the ACE Review 2016 and suggested those assumptions be a starting point for discussions in ACE Review 2021.

For medium and large diameter pipelines in the *Agricultural Cropland* category, the Commission has decided to use the same abandonment method assumptions that were applied to the Base Case 2010 *Agricultural, Cultivated* land use category as there was not sufficient evidence filed in this Review to support a change to those assumptions. This results in an abandonment method assumption of 80 per cent abandonment in place and 20 per cent pipeline removal. As noted above, an abandonment method assumption of 95 per cent abandonment in place and 5 per cent removal will be applied to very small and small diameter pipelines in the *Agricultural Cropland* category, rather than the 100 per cent abandonment in place that was previously applied to the Base Case 2010 *Agricultural, Cultivated* land use category. Although actual abandonments to-date for CER-regulated pipelines indicate that less than 20 per cent removal has occurred for medium and large diameter pipelines in cropland, the Commission finds that the abandonment method assumption appropriately reflects the possibility that more may be removed in future. The Commission can revisit these assumptions in future ACE reviews, if warranted, based on new information at that time, including any changes in actual abandonment practices.

Grasslands and Shrublands category

In response to evidence submitted by landowner associations regarding the loss of the Base Case 2010 *Agricultural, Non-Cultivated* land use category, the Commission has decided to change the abandonment method assumption for the *Grasslands and Shrublands* land use category for medium and large diameter pipelines from 95 per cent abandonment in place and 5 per cent removal, as proposed in ACE Paper 2, to 90 per cent abandonment in place and 10 per cent removal. Because this category also includes a variety of non-agricultural land cover types (e.g., native prairie) which may be sensitive to disturbance, the Commission has decided to apply a lower pipeline removal percentage than the 20 per cent applied to other agricultural lands (cropland). For very small and small diameter pipelines, the Commission has applied an abandonment method assumption of 95 per cent abandonment in place and 5 per cent removal for the *Grasslands and Shrublands* category, as explained in its reasons above. These assumptions are generally reflected in the actual abandonment methods applied to CER-regulated pipelines to-date.

Forested Lands category

The Commission has applied an abandonment method assumption of 95 per cent abandonment in place and 5 per cent pipeline removal for all pipeline diameters in the *Forested Lands* category. As noted in ACE Paper 2, the *Forested Lands* land use category replaced Base Case 2010 *Non-Agricultural, No Future Development Anticipated* category that had an abandonment method assumption of 100 per cent abandonment in place. Five per cent pipeline removal is reflected in the assumption in consideration of the Commission's above-noted decision that all Base Case 2021 abandonment method assumptions will include a minimum of five per cent pipeline removal. The abandonment method assumption reflects the expectation that abandonment in place will be the preferred abandonment method in forested areas to minimize re-disturbance of the landscape and is reflected in the actual abandonment methods applied to CER-regulated pipelines to-date.

Wetlands-Water category

Regarding the wetlands, most companies that responded to Question 2 in ACE Paper 2 agreed with having wetlands as a land use category rather than a crossing category. Some companies indicated their preference for wetlands to be a crossing category, noting that any concerns regarding water conduit effects would be addressed using special treatment. Indigenous Peoples raised concerns regarding the protection of wetlands.

As per Guide B of the Filing Manual, companies are required to assess the environmental effects of any pipelines being abandoned in place in order to identify environmental and socio-economic risks (e.g., water conduit effects) and apply appropriate mitigation measures to avoid or minimize those risks. There are various measures that can be applied that would offer a similar level of environmental protection, including abandonment in place with segmentation (cutting and capping) on either side of a wetland, abandonment in place with special treatment (cutting and capping on either side of a wetland and filling the pipeline segment beneath a wetland), or removing the pipeline within a wetland. Nonetheless, there cannot be multiple sets of abandonment method assumptions for one category in the 2021 ACE Calculation Method.

The Commission has decided that wetlands will be accounted for as a land use category, rather than a crossing category, based on companies' preference and because abandonment in place with segmentation at wetlands is what, in the CER's experience, has been typically proposed by companies for actual abandonments to-date, when such mitigation has been deemed necessary. Further, as noted in **Section 4.2**, the Commission combined wetlands with areas of water shown in NRCan Atlas of Canada Land Cover dataset and established a combined *Wetlands-Water* land use category as it is expected that the abandonment method assumptions (abandonment in place, pipeline removal) for pipelines traversing wetlands would be similar to areas of water.

As proposed in ACE Paper 2 for wetlands, the Commission has applied an abandonment method assumption of 95 per cent abandonment in place and 5 per cent removal for all pipeline diameters to the *Wetlands-Water* land use category. This means that most of the pipeline accounted for in this category will be applied to the *Abandonment in Place* cost category, which includes costs for segmentation of the pipeline at locations such as wetlands. Further information about the *Abandonment in Place* cost category is found in **Section 4.4.3**.

Existing Developed Lands category

For the *Existing Developed Lands* land use category, the Commission finds the abandonment method assumption of 80 per cent abandonment in place and 20 per cent removal, as proposed in ACE Paper 2, to be appropriate. The abandonment method assumption for all pipeline diameters in this category in Base Case 2010 was 100 per cent abandonment in place. The new abandonment method assumption reflects the potential need for companies to remove pipelines, irrespective of pipeline diameter, in urban areas at the time of abandonment to allow for redevelopment. Further, the abandonment method assumption for the *Existing Developed Lands* category also accounts for some of the pipeline removal that was previously included in the Base Case 2010 *Non-Agricultural, Prospective Future Development* land use category and which had an abandonment method assumption of 100 per cent pipeline removal for all pipeline diameters. Refer to **Section 4.2** for the reasons why the Base Case 2010 *Non-Agricultural Prospective Future Development* category has not been included in the 2021 ACE Calculation Method.

Water Crossings category

The Commission considered Participants' submissions on special treatment covered in ACE Paper 3 ([C19327-9](#)). Some companies submitted that special treatment was not required or appropriate at water crossings.

As proposed in ACE Paper 2, the Commission has applied an abandonment method assumption of 5 per cent special treatment at water crossings (i.e., special treatment will be applied to 5 per cent of water crossings) for small, medium, and large diameter pipelines and an assumption of 100 per cent abandonment in place with no special treatment at water crossings for very small diameter pipeline. The assumption for small, medium, and large diameter pipelines reflects the possibility that some of those water crossings will require special treatment at the time of abandonment and aligns with some companies' approved ACEs that included such costs. For very small diameter pipelines, an

assumption of 100 per cent abandonment in place has been applied as it is assumed that it may be impractical or unwarranted to add special treatment to pipelines of that size at the time of abandonment.

Road Crossings and Railway Crossings categories

The Commission has applied an abandonment method assumption of 100 per cent abandonment in place with special treatment for medium and large diameter pipelines for the *Road Crossings – Paved* category. This abandonment method assumption aligns with that shown previously in the Base Case 2010 Other, *Roads & Railways* category.

In ACE Paper 2, an abandonment method assumption of 100 per cent abandonment in place with no special treatment was proposed for very small diameter pipelines and an assumption of 100 per cent abandonment in place with special treatment was proposed for small diameter pipelines at paved road crossings. In consideration of some companies' assertion that the NEB's views in its MH-001-2012 decision for small diameter pipelines remain current and applicable, the Commission has not adopted the assumption for the small diameter category proposed in ACE Paper 2. Rather, the Commission applied an abandonment method assumption of abandonment in place with no special treatment for small diameter pipelines. The Commission agrees that ground subsidence is not likely to result from the degradation of very small and small diameter pipelines abandoned in place at paved road crossings.

For unpaved road crossings, the Commission has adopted the abandonment method assumption of 50 per cent abandonment in place with special treatment for medium and large diameter pipelines, as proposed in ACE Paper 2. This category did not exist in Base Case 2010 and the abandonment method assumption applied reflects the varied views that Participants shared during discussions at the ACE Review 2016 technical conference. Similar to paved road crossings, the Commission finds that an abandonment method assumption of 100 per cent abandonment in place with no special treatment is appropriate for very small and small diameter pipelines at unpaved road crossings.

The Commission finds the abandonment method assumptions proposed in ACE Paper 2 for railway crossings to be appropriate. No specific comments from Participants were received regarding this crossing category. An abandonment method assumption of 100 per cent abandonment in place with special treatment will be applied to small, medium, and large diameter pipelines, and an assumption of 100 per cent abandonment in place with no special treatment will be applied to very small diameter pipelines. The Commission has not applied an abandonment method assumption of 100 per cent abandonment in place with no special treatment for small diameter pipelines at railway crossings, as that was not requested by Participants in their submissions and is not reflected in the NEB's MH-001-2012 decision.

Cumulative effects

With respect to Indigenous Peoples' concerns raised in response to ACE Paper 2 regarding potential cumulative effects of abandonment activities and pipelines abandoned in place, **Section 2.8.2** describes the requirement for companies to obtain leave to abandon their pipelines. Guide B of the Filling Manual requires companies, as part of any such application, to complete an environmental and socio-economic assessment for abandonment activities (including reclamation), the scope of which must include assessing the cumulative effects of the proposed abandonment activities and explaining the effects of the proposed method of abandonment on the rights and interests of Indigenous Peoples.

4.4 Cost categories and associated unit costs

A pipeline's ACE is calculated using cost categories that reflect the expected costs for the company to abandon that pipeline (including any associated above-ground facilities), and includes project management and engineering costs, provisions for monitoring and addressing any unforeseen events that may arise for pipelines abandoned in place, and contingency. To derive costs for each cost category, various unit costs are applied to the pipeline lengths assumed to be abandoned in place and removed and to any associated above-ground facilities that will be removed as per Canadian Standards Association requirements.

In ACE Paper 3, several changes were proposed to the Base Case 2010 cost categories. ACE Paper 3 asked questions about the various proposed cost categories, the associated category descriptions, and the methods proposed to calculate each cost. ACE Paper 3 also asked about the proposed split of the small pipeline diameter category into various subcategories, and about splitting some cost categories by commodity type and abandonment methods.

As well, companies were asked to file unit costs for each proposed cost category for the Commission's consideration in establishing Base Case 2021 unit costs. For reference, the Base Case 2010 Table A-3, which outlines the previous cost categories and unit costs, is found in Appendix II of the NEB's MH-001-2012 decision.

The unit costs filed by companies were varied and reflect each individual company's experience with its specific pipelines and above-ground facilities. The Commission considered all of the filed unit costs and Participants' comments, and applied the expertise of CER technical staff to arrive at the Base Case 2021 unit costs provided in the tables below. All Base Case 2021 unit costs have been established in 2023 dollars, to be as current as practical given the timing of this Report and high recent inflation.²⁰

The Commission generally selected unit costs in the mid-range of those submitted by companies. In addition, as described in **Section 4.4.10**, the Commission selected a contingency cost at the top end of the contingency percentages submitted by companies.

Indigenous Peoples and landowner associations expressed concerns with the Commission's unit cost selection. Both advocated for the use of high-end unit costs to mitigate the risk of abandonment underfunding.

There are costs associated with setting aside funds for abandonment. Companies using a surety bond or letter of credit as their SAMs pay annual costs for these instruments and these costs generally rise as the size of the surety bond or letter of credit rises to meet a higher ACE. Companies using a trust are required to contribute funds each year, with these funds often collected from shippers. These annual contributions similarly rise as the related ACE rises. Amounts set aside in trust also carry opportunity costs, as they are unavailable for other company investments. As noted in **Section 2.5**, the NEB rejected the concept of elimination of risk, and the Commission agrees that there comes a point when further action to reduce risk is disproportionately costly as compared to the incremental benefits from that further action. Accordingly, the Commission made its unit cost and contingency decisions to balance the benefits of risk reduction that come from building in greater cushions in ACEs with the increased costs associated with doing so. This Review, and regular reviews in general, help ensure that this balance continues to be appropriately struck.

Landowner associations also raised concerns that some Base Case 2021 unit costs (e.g., Remediation, Unforeseen Event Provision) had decreased when compared to those required

²⁰ Inflation has been above 3 per cent since April 2021. While it has been generally declining since it peaked at 8.1 per cent in June 2022, inflation remains above the Bank of Canada's target range of 1 to 3 per cent.

by Base Case 2010. The Commission did not rely on Base Case 2010 unit costs to establish Base Case 2021 unit costs. Rather, it used the new unit costs provided by companies. This is similar to the manner in which the unit costs in Base Case 2010 Table A-3 were originally established by the NEB through a consultative process with companies and other interested parties (including landowner associations) in 2009-2010 as part of the Land Matters Consultation Initiative.²¹ In the years since Base Case 2010 unit costs were determined, there has been substantive examination of abandonment costs through the establishment of companies' preliminary ACEs and during the subsequent 2016 ACE Review. As well, the Commission notes that very few companies applied Base Case 2010 unit costs when calculating their ACEs (which received regulatory approval). As a result, the Commission finds it appropriate not to rely on Base Case 2010 to establish Base Case 2021 unit costs.

The Commission's decisions and reasons for each cost category are discussed separately in **Sections 4.4.1 to 4.4.10**.

4.4.1 Pipeline Diameter

Commission decision

The Commission has decided to use the pipeline diameter categories shown in **Table 5** in the 2021 ACE Calculation Method.

Table 5 – Pipeline diameter categories

	Pipe category				
	Very small diameter pipe (not steel) [i.e., composite, polyethylene (PE) polyvinyl chloride (PVC), or fiberglass]	Very small diameter pipe (steel)	Small diameter pipe (all materials)	Medium diameter pipe (all materials)	Large diameter pipe (all materials)
Pipeline diameter	< 4" (114.3 mm)	< 4" (114.3 mm)	4" to 12" (114.3 to 304.8 mm)	>12" to 26" (304.8 to 660 mm)	> 26" (660 mm)

Reasons of the Commission

ACE Paper 3 proposed splitting the Base Case 2021 small diameter pipe category into two subcategories, very small diameter pipe (less than 4") and small diameter pipe (4" to 12"), based on the comments of some companies during the ACE Review 2016 that the Base Case 2010 unit costs for the small diameter pipeline category are too high and do not appropriately reflect the abandonment costs of very small diameter pipelines. Splitting the very small diameter pipe category further by material type (steel versus not steel) was also proposed.

The unit costs that companies submitted support separating costs for small diameter pipes from those for very small diameter pipes for use in the 2021 ACE Calculation Method. While most unit costs provided by companies for very small diameter pipes show only minor differences for various abandonment activities between steel and non-steel pipelines, the Commission has decided to use two separate categories to provide transparency and allow for further examination of such costs in future ACE reviews.

²¹ [A27778](#), Land Matters Consultation Initiative Stream 3, Pipeline Abandonment – Financial Issues, letter dated 21 December 2010 (Unit Costs and Process for Consideration of Group 1 May 2011 Cost Estimate Filings).

4.4.2 Land Access, and Pipeline Purging and Cleaning

Commission decision

The Commission has decided to establish separate cost categories for land access and for pipeline purging and cleaning. The Base Case 2021 unit cost for *Land Access* is the same for all pipeline diameters, whereas Base Case 2021 unit costs for *Pipeline Purging and Cleaning* will vary based on both pipeline diameter and the type of commodity carried by the pipeline.

The Commission has decided to use the cost category descriptions proposed in ACE Paper 3, with one change for the *Pipeline Purging and Cleaning* cost category, as described in the Commission’s reasons below. The cost category descriptions and calculation methods are provided in **Table 6**. The Base Case 2021 unit costs established for the cost categories are shown in **Table 7**.

Table 6 – Land Access, and Pipeline Purging and Cleaning (description and method)

Cost category	Description of costs	Calculation method
Land Access	<ul style="list-style-type: none"> • Access rights and permits • Establishing temporary workspaces • Surveying activities • GIS updates • Discharge rights 	Calculated by multiplying the total length of the pipeline system by the applicable Base Case 2021 unit cost shown in Table 7 .
Pipeline Purging and Cleaning	<ul style="list-style-type: none"> • Mobilization and demobilization of equipment and personnel • Emptying pipeline of service fluids • Pipeline pigging, cleaning and purging in a manner that leaves no mobile materials remaining in the pipelines • Pipeline cleanliness verification via laboratory testing and analysis • Storage and disposal of wastes 	Calculated by multiplying the total length of the pipeline system, by pipeline diameter and commodity type, by the applicable Base Case 2021 unit costs shown in Table 7 . These costs are then added up to obtain the total estimated cost for the cost category.

Table 7 – Land Access, and Pipeline Purging and Cleaning (unit costs)

		Very small diameter pipe (not steel)	Very small diameter pipe (steel)	Small diameter pipe (all materials)	Medium diameter pipe (all materials)	Large diameter pipe (all materials)
Land Access (\$/km)		\$4,000				
Pipeline Purging and Cleaning (\$/km)	Oil	\$3,000	\$3,000	\$5,000	\$8,000	\$12,000
	Gas	\$2,500	\$2,500	\$4,000	\$7,000	\$10,000
	Other commodity	\$2,500	\$2,500	\$4,000	\$7,000	\$10,000

*See **Table 5** for pipe diameter measurements

Reasons of the Commission

The Commission has decided to establish separate cost categories for land access and for pipeline purging and cleaning to increase the transparency of ACEs. This decision aligns with responses

received from Participants to questions asked in ACE Paper 3 that indicated general support for separating these categories.

Land Access cost category

The Base Case 2021 unit cost for *Land Access* is the same for all pipeline diameters. This approach differs from Base Case 2010, in which unit costs for the cost category varied depending on pipeline diameter. The revised approach reflects the fact that land access costs are generally administrative in nature and not a function of diameter, as noted in ACE Paper 3 and supported by companies' submissions. The Commission acknowledges the comments received from some Participants, that abandonment method (in particular, removal of large diameter pipelines) may influence land access costs. The Commission can consider subdividing this cost category in the future after more abandonments of large diameter pipelines have taken place and actual costs are available.

More generally, in establishing the unit costs for *Land Access*, the Commission has taken into consideration the range of unit costs provided by companies. The chosen unit cost is in the mid-range of the total unit costs provided for the cost category.

The Commission has decided to use the *Land Access* cost category description proposed in ACE Paper 3 because Participants' submissions indicated that it was reasonable. The cost category description is provided in **Table 6**.

Pipeline Purging and Cleaning cost category

Base Case 2021 unit costs for *Pipeline Purging and Cleaning* vary based on both pipeline diameter and the type of commodity carried by the pipeline, as proposed in ACE Paper 3. This approach differs from Base Case 2010, in which unit costs varied based on different types of terrain. Companies' submissions indicated support for the revised approach. While the Commission agrees with Indigenous Peoples' submissions that different terrain types may influence abandonment costs, the Commission has decided not to consider terrain for pipeline purging and cleaning costs because these costs are unlikely to change significantly based on different types of terrain. Further, applying geospatial terrain datasets to the GIS is complex. This cost category can be refined in future ACE reviews, if warranted, based on information from actual abandonments.

The Commission has decided to use the *Pipeline Purging and Cleaning* cost category description proposed in ACE Paper 3, with the addition of "mobilization and demobilization of equipment and personnel," as suggested by Trans Mountain Pipeline ULC. The updated cost category description is found in **Table 6**. While the Commission acknowledges some companies' views that including the mobilization and demobilization of equipment and personnel costs in the descriptions of multiple ACE cost categories (e.g., Pipeline Purging and Cleaning, Abandonment in Place, Pipeline Removal) may result in a duplication of such costs in an ACE, the Commission is of the view that there are circumstances where such costs would be incurred separately.

In response to submissions from Trans Mountain Pipeline ULC that "Pipeline cleanliness verification via laboratory testing and analysis" should be deleted from the description because a properly cleaned pipe should have no product remaining from which to take a sample for testing, the Commission has decided not to make that change because the water used to clean a pipeline can be tested to verify cleanliness.

The Commission has established Base Case 2021 unit costs for the *Pipeline Purging and Cleaning* cost category based on the range of unit costs provided in companies' submissions. The Base Case 2021 unit costs were generally chosen to be close to or slightly less than the mid-range of the unit costs provided for each pipeline diameter, and reflect a steady increase of cost with increase in pipeline diameter. As well, the Base Case 2021 unit costs for oil pipelines are higher than gas

pipelines, and Base Case 2021 unit costs for gas and oil pipelines are higher than for pipelines transporting other commodities. The unit costs for very small diameter pipelines are the same for both steel and non-steel pipelines, as it is not expected that pipeline material would result in a significant difference in purging and cleaning costs and not enough unit costs were provided by companies for very small diameter, non-steel pipeline to establish separate unit costs for that pipeline diameter category.

Some companies submitted that both low and high unit costs should be assigned for the *Pipeline Purging and Cleaning* cost category. This suggestion is not practical because there is no way for the Commission to know which unit cost (low or high) to apply to a particular pipeline based on the geospatial information provided by a company.

4.4.3 Abandonment in Place

Commission decision

The Commission has decided to continue to use the *Abandonment in Place* cost category established in Base Case 2010 for the 2021 ACE Calculation Method. Base Case 2021 unit costs for *Abandonment in Place* vary based on pipeline diameter.

The Commission has decided to use the cost category description proposed in ACE Paper 3. The cost category description and calculation method are provided in **Table 8**. The Base Case 2021 unit costs established for the cost category are shown in **Table 9**.

Table 8 – Abandonment in Place (description and method)

Cost category	Description of costs	Calculation method
Abandonment in Place	<ul style="list-style-type: none"> • Mobilization and demobilization of equipment and personnel • Excavation of pipelines and appurtenances where necessary to conduct abandonment activities (includes topsoil stripping) • Cutting, capping, and effectively sealing the pipelines • Segmentation to prevent water movement and mitigate water conduit effects • Removal of underground appurtenances (e.g., cathodic protection) • Backfill and compaction of disturbed soils 	Calculated by multiplying the length of the pipeline system assumed to be abandoned in place, by pipeline diameter, by the applicable Base Case 2021 unit costs shown in Table 9 . These costs are then added up to obtain the total estimated cost for the cost category.

Table 9 – Abandonment in Place (unit costs)

	Very small diameter pipe (not steel)	Very small diameter pipe (steel)	Small diameter pipe (all materials)	Medium diameter pipe (all materials)	Large diameter pipe (all materials)
Abandonment in Place (\$/km)	\$5,000	\$10,000	\$12,000	\$17,000	\$20,000

*See **Table 5** for pipe diameter measurements

Reasons of the Commission

Base Case 2021 unit costs for *Abandonment in Place* vary based on pipeline diameter, which is the same approach used for Base Case 2010. Companies' submissions indicated continued support for this approach.

The Commission has decided to use the *Abandonment in Place* cost category description proposed in ACE Paper 3 because Participants' submissions indicated that it accurately describes the costs associated with abandoning a pipeline in place. The cost category description is provided in **Table 8**. The *Abandonment in Place* cost category description includes some revisions when compared to the *Basic Abandonment in Place* cost category from Base Case 2010. First, the cost category no longer includes costs related to remediation, reclamation, and restoration for pipelines assumed to be abandoned in place. Base Case 2021 includes new cost categories related to remediation, reclamation, and restoration (see **Section 4.4.5**). Second, the *Abandonment in Place* cost category does not consider terrain as a factor for estimating costs to abandon in place. Companies' submissions indicated support for removing terrain as a factor, with some companies submitting that abandonment in place costs are not as impacted by terrain conditions as are pipeline removal costs.

ACE Paper 3 asked questions regarding the appropriate segmentation interval (i.e., the distance between plugs) to be used when establishing unit costs for the *Abandonment in Place* cost category, and how companies considered these intervals in their unit costs submissions. Alliance Pipeline Ltd. indicated that it applied a segmentation interval of 10,000 metres to its costs. Other companies said that they did not apply specific segmentation intervals when developing their unit costs because they assumed that abandonment activities at above-ground facilities and crossings would result in reasonable segmentation. Landowner associations suggested that segmentation should occur at all property boundaries.

The Commission has decided not to assign a specific segmentation interval to this cost category. The Commission agrees with companies that actual segmentation locations will vary greatly for each pipeline depending on terrain; environmental and socio-economic considerations; and consultation with landowners, Indigenous Peoples, and other stakeholders at the time of abandonment. Recent abandonments of CER-regulated pipelines demonstrate that segmentation is rarely used and is usually only proposed for longer pipelines. The unit costs associated with the *Abandonment in Place* cost category can be adjusted in future ACE reviews, if warranted, based on new information from actual abandonments.

More generally, in establishing unit costs for the *Abandonment in Place* cost category, the Commission has taken into consideration the range of unit costs provided by companies. The chosen Base Case 2021 unit costs generally are close to or slightly less than the mid-range of the total costs provided by companies for each pipeline diameter category and reflect a steady increase of cost with increase in pipeline diameter. The unit cost for very small diameter, non-steel pipelines is half of the unit cost for very small diameter, steel pipelines as the expected difference in such abandonment in place costs was reflected in the unit costs provided by companies for the very small diameter pipeline categories.

4.4.4 Pipeline Removal

Commission decision

The Commission has decided that the *Pipeline Removal* cost category to be used in the 2021 ACE Calculation Method will be limited to activities associated with pipeline removal and no longer include costs related to land reclamation. Unit costs for *Pipeline Removal* vary by pipeline diameter.

The Commission has decided to use the cost category description proposed in ACE Paper 3. The description and calculation method for the cost category are provided in **Table 10**. The Base Case 2021 unit costs established for the cost category are shown in **Table 11**.

Table 10 – Pipeline Removal (description and method)

Cost category	Description of costs	Calculation method
Pipeline Removal	<ul style="list-style-type: none"> • Mobilization and demobilization of equipment and personnel • Removal of buildings and equipment • Right-of-way clearing • Topsoil stripping • Excavation of pipelines and appurtenances (including cathodic protection) • Cutting and capping of pipelines • Stockpiling, loading, hauling, and disposal of removed pipelines, buildings, and equipment • Backfill and compaction of disturbed soils 	Calculated by multiplying the length of the pipeline system assumed to be removed, by pipeline diameter, by the applicable Base Case 2021 unit costs shown in Table 11 . These costs are then added up to obtain the total estimated cost for the cost category.

Table 11 – Pipeline Removal (unit costs)

	Very small diameter pipe (not steel)	Very small diameter pipe (steel)	Small diameter pipe (all materials)	Medium diameter pipe (all materials)	Large diameter pipe (all materials)
Pipeline Removal (\$/km)	\$12,000	\$30,000	\$80,000	\$200,000	\$350,000

*See **Table 5** for pipe diameter measurements

Reasons of the Commission

As was proposed in ACE Paper 3, the Commission has decided to establish a single cost category for pipeline removal in the 2021 ACE Calculation Method for pipeline removal activities at the time of abandonment, with different unit costs for each pipeline diameter category.

To increase transparency of the pipeline removal land restoration costs in an ACE that were previously accounted for in Base Case 2010 Cost Category 5b, the Commission has created separate cost categories in the 2021 ACE Calculation Method for remediation and for reclamation and restoration costs. Participants’ submissions generally indicated agreement with this approach, although some submitted that there were no benefits to splitting such costs. The Commission’s reasons for the new *Remediation*, and *Reclamation and Restoration* cost categories are found in **Section 4.4.5**, and those reasons include consideration of the comments received in response to questions asked in the *Pipeline Removal* section of ACE Paper 3.

The Commission has also decided not to use terrain as a factor for estimating pipeline removal costs in the 2021 ACE Calculation Method, as was done in Base Case 2010 for Cost Category 5b. The Commission agrees with Participants’ submissions that pipeline removal in difficult terrain could result in higher pipeline removal costs. However, it is a complex task to determine how geospatial terrain datasets can best be applied to the GIS to categorize terrain along pipeline systems and meaningfully determine what terrain characteristics would result in differences in pipeline removal costs. The Commission is of the view that further exploration of this topic would be required to incorporate terrain as a factor and this may be considered as part of future ACE reviews.

The Commission notes that Cost Category 5a in Base Case 2010 also included factors to be applied to reduce pipeline removal costs if companies have more than one pipeline in the same ditch. In ACE Paper 3, the possibility of abandonment cost reductions was considered, including for pipeline removal costs, where multiple pipelines are in the same corridor. The Commission has decided not

to apply such cost reductions in the 2021 ACE Calculation Method. The Commission’s reasons for this decision are found in **Section 4.5.2**.

The Commission has decided to use the *Pipeline Removal* cost category description proposed in ACE Paper 3 because Participants’ submissions indicated that it accurately describes the costs associated with removing pipeline. The cost category description is provided in **Table 10**.

In establishing the *Pipeline Removal* costs, the Commission has taken into consideration the range of unit costs provided by companies. The chosen Base Case 2021 unit costs are generally close to or slightly less than the mid-range of the total costs provided by companies for each pipeline diameter category and reflect a steady increase of cost with increase in pipeline diameter. The unit cost for very small diameter, non-steel pipelines is less than half of the unit cost for very small diameter, steel pipelines as the expected difference in such pipeline removal costs was reflected in the unit costs provided by companies for the very small diameter pipeline categories.

4.4.5 Remediation, and Reclamation and Restoration

Commission decision

The Commission has decided to establish separate cost categories for *Remediation* and for *Reclamation and Restoration* in the 2021 ACE Calculation Method. Unit costs for *Remediation* vary by the type of commodity carried by the pipeline. Unit costs for *Reclamation and Restoration* vary according to whether the pipeline is assumed to be abandoned in place or removed. Further, the unit costs for the *Reclamation and Restoration (Pipeline Removal)* subcategory also vary by pipeline diameter.

The Commission has decided to revise the cost category descriptions proposed in ACE Paper 3 as described in the reasons below. The descriptions are provided in **Table 12** with the calculation methods. The Base Case 2021 unit costs established for the cost category are shown in **Table 13**.

Table 12 – Remediation, and Reclamation and Restoration (description and method)

Cost category	Description of costs	Calculation method
Remediation	<ul style="list-style-type: none"> Remediation of contaminated soil, sediment and/or groundwater, where necessary, including monitoring and testing. Includes, but is not limited to: excavation, hauling, and disposal of contaminated soil; backfilling; field sampling and analytical testing; and follow-up monitoring 	Calculated by multiplying the total length of the pipeline system, by commodity type, by the applicable Base Case 2021 unit costs shown in Table 13 . These costs are then added up to obtain the total estimated cost for the cost category.
Reclamation and Restoration	<ul style="list-style-type: none"> Assess, reclaim and restore the ground surface (e.g., soil, vegetation) for the length of the pipeline right-of-way (not just at areas disturbed during abandonment activities) to equivalent land use of adjacent lands (or other relevant reclamation objective such as critical habitat for specified wildlife species at risk, landowner requests, Indigenous cultural values, etc.) Alleviate any noted soil and/or vegetation issues (e.g., sub-soil compaction, subsidence) Seeding As relevant, planting of trees and shrubs to restore critical habitat for wildlife species at risk and implementing access control measures 	<p>Abandonment in Place: Calculated by multiplying the total length of the pipeline system assumed to be abandoned in place by the applicable Base Case 2021 unit cost shown in Table 13.</p> <p>Pipeline Removal: Calculated by multiplying the length of the pipeline system assumed to be removed, by pipeline diameter, by the applicable Base Case 2021 unit costs shown in Table 13. These costs are then added up to obtain the total estimated cost for the cost category.</p>

Cost category	Description of costs	Calculation method
	<ul style="list-style-type: none"> Erosion control measures Weed control Monitoring (e.g., up to five years) to confirm reclamation objectives are met 	

Table 13 – Remediation, and Reclamation and Restoration (unit costs)

		Very small diameter pipe (not steel)	Very small diameter pipe (steel)	Small diameter pipe (all materials)	Medium diameter pipe (all materials)	Large diameter pipe (all materials)
Remediation (\$/km)	Oil	\$10,000				
	Gas	\$5,000				
	Other commodity	\$5,000				
Reclamation and Restoration (\$/km)	Abandonment in Place	\$10,000				
	Pipeline Removal	\$30,000	\$30,000	\$40,000	\$55,000	\$70,000

*See **Table 5** for pipe diameter measurements

Reasons of the Commission

The Commission has decided to establish separate cost categories for *Remediation* and for *Reclamation and Restoration* to increase transparency of these costs in ACEs. Participants had mixed views regarding the addition of these cost categories to the 2021 ACE Calculation Method. While some Participants indicated support for the approach, others suggested that pipeline remediation, reclamation, and restoration should be grouped into a single cost category because the activities may occur simultaneously and the distinction between what constitutes one activity versus another may not be discernible or increase the accuracy of an ACE.

When making its decision, the Commission considered the importance of remediation, reclamation, and restoration activities to landowners, Indigenous Peoples, land users, and the general public. In particular, the Commission considered the potentially high costs that could be incurred if contamination is discovered at the time of abandonment and remediation activities are required, or if restoration above standard reclamation objectives is deemed necessary. While it is not appropriate for Base Case 2021 to account for the highest potential costs (because actual costs will be pipeline-specific and may be quite limited for some pipelines), unit costs should transparently and reasonably account for remediation, reclamation, and restoration costs, in the event these activities are required at the time of abandonment.

Companies and landowner associations expressed support for the Commission’s proposed approach of determining *Remediation* unit costs based on commodity type. While ACE Paper 3 also proposed that *Remediation* unit costs be split by pipeline diameter, the Commission has not chosen to do so for the 2021 ACE Calculation Method as the unit costs provided by companies for the cost category indicate that, for the most part, remediation costs are not influenced by pipeline diameter. As a result, Base Case 2021 *Remediation* unit costs are split by commodity type, but not pipeline diameter. If pipeline removal is required to mitigate any identified contamination, the Commission is of the view that those costs would be accounted for in the *Pipeline Removal* cost category and not the *Remediation* cost category.

Landowner associations submitted that the type of pipe coating may also affect remediation costs at the time of abandonment. The Commission did not include pipe coating as a factor to determine *Remediation* unit costs because this is a new cost category with a wide range of costs filed by companies, and adding further granularity may not improve the estimates.

For the *Reclamation and Restoration* cost category, unit costs are based on the assumed abandonment method (i.e., abandonment in place or pipeline removal). Several companies and landowner associations supported this approach. The Commission acknowledges submissions from landowner associations and Trans Mountain Pipeline ULC that land use can also affect *Reclamation and Restoration* costs. The Commission has decided not to consider land use because this is a new cost category with a wide range of costs filed by companies and adding further granularity may not improve the estimates.

The *Reclamation and Restoration* unit costs provided by companies for pipelines assumed to be abandoned in place did not show significant differences in cost by pipeline diameter. As a result, the Commission has decided to calculate such costs using a single Base Case 2021 unit cost. The *Reclamation and Restoration* unit costs provided by companies for pipelines assumed to be removed did show differences in cost by pipeline diameter, so the Commission has established different Base Case unit costs for each pipeline diameter category for these costs.

The Commission has revised the *Remediation*, and *Reclamation and Restoration* cost category descriptions proposed in ACE Paper 3 based on the Commission's further review of the descriptions and Indigenous Peoples' submissions. Specifically, the *Remediation* cost category description has been revised to remove costs related to delineation of historical contamination as those costs are already captured as part of *Engineering and Project Management* costs (e.g., Phase I and Phase II Environmental Site Assessments). As well, the description has been broadened to capture all forms of remediation (previously it was focused on in-situ remediation) and minor edits have been made to better describe the associated activities. Indigenous Peoples submitted that the *Reclamation and Restoration* cost category description failed to incorporate or consider Indigenous Peoples' perspectives and cultural values. In response, the Commission revised the description to indicate that reclamation objectives will be informed by, among other things, meaningful engagement with Indigenous Peoples and landowners. The Commission is of the view that reclamation objectives can be refined at the time of abandonment through engagement to include appropriate Indigenous perspectives and cultural values. The revised descriptions for the *Remediation*, and *Reclamation and Restoration* cost categories are provided in **Table 12**.

For the *Remediation*, and *Reclamation and Restoration* cost categories, the Commission considered the appropriate unit to be used for these costs. ACE Paper 3 asked if dollars-per-kilometre was an appropriate unit for calculating these costs. Several companies and landowner associations agreed with the proposed unit, but Trans Mountain Pipeline ULC stated that it may not be appropriate for the *Remediation* cost category because historical contamination is generally localized. Instead, the company suggested that a dollar-per-*instance* approach be applied. The Commission has applied dollars-per-kilometre as the unit for both cost categories because that approach aligns with other pipeline unit costs. While the Commission agrees that contamination is generally localized, the dollars-per-kilometre approach reflects the possibility that a number of locations along the length of the pipeline may require remediation, ranging from less than one location to several locations per kilometre. Landowner associations also proposed adding a multiplier factor to remediation unit costs where the operating history of a particular company or pipeline indicated an increased risk. The Commission did not add a multiplier because it does not have the appropriate data available at this time.

Companies provided a wide range of low and high unit costs for the *Remediation*, and *Reclamation and Restoration* cost categories, which was not unexpected considering the nature of the costs. Several companies suggested that the CER determine a "typical" or "average" Base Case 2021

unit cost, based on the low and high unit costs they provided. Landowner associations and Indigenous Peoples were of the view that the high-end unit costs should be applied. The Commission has decided to use unit costs for the *Remediation*, and *Reclamation and Restoration* cost categories that are in the lower- to mid-range of those provided because not all pipeline abandonments are expected to incur such costs. Regarding some companies' expectation that the CER will incorporate company-specific information as needed, the Commission re-iterates that, in Part 1 of the Review, ACEs will be calculated using Base Case 2021 unit costs, not company-specific unit costs.

For the *Remediation* cost category, the Commission has chosen Base Case 2021 unit costs for oil pipelines that are double those for gas and other commodity pipelines. Further, the Base Case 2021 unit costs for gas pipelines and other commodity pipelines are the same. The Commission has chosen these values in consideration of submissions from Trans Mountain Pipeline ULC that oil contamination remediation is likely to cost more than gas or other commodity contamination, and that companies' filed unit costs indicate that remediation costs for oil pipelines are generally higher than remediation costs for gas and other commodity pipelines. As well, the chosen values reflect the CER's experience that there are more incidents of contamination associated with oil pipelines than gas and other commodity pipelines.

For the *Reclamation and Restoration (Pipeline Removal)* subcategory, the Commission established the Base Case 2021 unit cost by pipeline diameter. The unit costs increase with pipeline diameter, as reflected in the unit costs provided by companies for the subcategory. The unit cost information submitted by companies for very small diameter pipelines did not show a clear differentiation of costs based on whether the pipe material was steel or not steel. As a result, the Commission has applied the same unit costs for the *Reclamation and Restoration (Pipeline Removal)* subcategory to very small diameter (steel) pipelines and very small diameter (not steel) pipelines

The Base Case 2021 unit costs for the *Remediation*, and *Reclamation and Restoration* cost categories are considered by the Commission to be a starting point to estimate such costs. These unit costs may be examined in future ACE reviews as more information becomes available from actual abandonments to see if they should be adjusted.

With respect to Indigenous monitoring, companies submitted that they recognize the importance of Indigenous monitoring opportunities. They also submitted that specific costs would be difficult to separate from overall remediation monitoring costs and reclamation and restoration monitoring costs because Indigenous monitoring costs generally reflect the scope and scale of the abandonment and the scope and scale of Indigenous Peoples' participation. The Commission heard the following from Indigenous Peoples:

- The Commission should consider Indigenous knowledge and land uses by Indigenous Peoples when assessing remediation, reclamation, and restoration activities and their costs.
- To the extent that Indigenous Peoples' rights or interests are impacted, the costs estimated for Indigenous monitoring should not depend on the scope and scale of the project and abandonment methods required.
- Indigenous monitoring should receive separate treatment in the unit cost table, similar to the separate treatment of Indigenous engagement in *Engineering and Project Management* costs.
- The potential costs of Indigenous monitoring could vary the overall costs of an ACE depending on the scale and nature of the pipeline and commitments made by a company to Indigenous Peoples.

The Commission also heard from landowner associations that Indigenous monitoring should be a discrete cost category, rather than including these costs in the overall estimates for reclamation

monitoring. This would ensure that full funding for other land reclamation and restoration activities is preserved.

The Commission agrees with Participants about the importance of Indigenous monitoring in planning an abandonment and any corresponding monitoring activities. As outlined in Guide B of the Filing Manual, the Commission expects companies to provide opportunities for Indigenous Peoples to share their knowledge and participate at the time of abandonment, as appropriate. The Commission agrees with Indigenous Peoples that the costs of these activities, where required, will be the responsibility of companies at the time of abandonment. With respect to the implications of Indigenous monitoring costs on ACE refinements, the Commission agrees with companies that estimating these costs separately from overall monitoring costs would be challenging and would likely not lead to a more accurate estimate. Therefore, the Commission has not included a separate line item for Indigenous monitoring under the *Remediation*, or *Reclamation and Restoration* cost categories. However, the Commission has accounted for Indigenous monitoring as a component of the unit costs in ACEs.

4.4.6 Special Treatment

Commission decision

The Commission has decided to continue to use the *Special Treatment* cost category established in Base Case 2010 for the 2021 ACE Calculation Method, but has revised the approach so that unit costs vary based on crossing type and not just pipeline diameter category.

The Commission has decided on a description for the cost category, which is provided with the calculation method in **Table 14**. The Base Case 2021 unit costs established for the cost category are shown in **Table 15**.

Table 14 – Special Treatment (description and method)

Cost category	Description of costs	Calculation method
Special Treatment	Cutting, capping, and filling pipelines with appropriate material (e.g., concrete), where needed, at water, road, and railway crossings	Calculated by multiplying the number of crossings in a pipeline system assumed to have special treatment applied, by crossing type and pipeline diameter, by the applicable Base Case 2021 unit costs shown in Table 15 . These costs are then added up to obtain the total estimated cost for the cost category.

Table 15 – Special Treatment (unit costs)

	Very small diameter pipe (not steel)	Very small diameter pipe (steel)	Small diameter pipe (all materials)	Medium diameter pipe (all materials)	Large diameter pipe (all materials)
Special Treatment – Water (\$/crossing)	\$20,000 / crossing	\$20,000 / crossing	\$40,000 / crossing	\$80,000 / crossing	\$120,000 / crossing
Special Treatment – Road (\$/crossing)	\$10,000 / crossing	\$10,000 / crossing	\$35,000 / crossing	\$50,000 / crossing	\$75,000 / crossing
Special Treatment – Railway (\$/crossing)	\$10,000 / crossing	\$10,000 / crossing	\$35,000 / crossing	\$50,000 / crossing	\$75,000 / crossing

*See **Table 5** for pipe diameter measurements

Reasons of the Commission

For unit costs for special treatment at crossings, the Commission has decided to use the approach proposed in ACE Paper 3, which was revised from Base Case 2010. Unit costs vary based on the type of crossing – water, road, or railway – and pipeline diameter. The Commission’s reasons for using these crossing categories are provided in **Section 4.2**. Unit costs for both paved and unpaved roads are included in a single category for all roads because the costs to apply special treatment are expected to be similar.

Special treatment unit costs will be applied based on the number of each type of crossing, as determined by the CER’s GIS using the NRCAN datasets (as shown in **Section 4.2**), rather than based on the length of each crossing. The Commission acknowledges Indigenous Peoples’ preference to calculate special treatment costs by the length of each crossing. As well, the Commission notes that, while companies did not object to using the number of crossings rather than pipeline lengths to calculate the costs category, as was proposed in ACE Paper 3, several companies submitted that both the length and number of crossings are considerations for special treatment costs because fill costs will increase with longer crossing lengths (e.g., at water crossings). The NRCAN geospatial datasets used to delineate the crossings do not allow for the tabulation of crossings by length in the CER’s GIS. As a result, the unit costs for *Special Treatment* at crossings reflect the range of potential costs for crossings of varying lengths.

A proposed description for the cost category was not included in ACE Paper 3, so the Commission has created a description for the cost category in **Table 14**. The description aligns with the low-end and high-end unit cost examples provided in the unit cost table²² that companies were requested to use to provide their unit costs as part of this Review.

Regarding the unit costs themselves, the Commission has chosen values that are close to or slightly less than the mid-range of the unit costs submitted by companies for this cost category. For water crossings, the Commission has established the unit costs in consideration of the potential for some crossings to be longer than road or railway crossings and to therefore require higher rates of fill.

The Commission has decided to use the same unit costs for road and railway crossings because the costs to apply fill are expected to be similar. Companies provided few unit cost submissions for very small diameter, non-steel pipes, so the Commission used the same Base Case 2021 unit costs for these pipes as for very small diameter, steel pipes.

The Commission has also considered a comment received from some companies in response to both the ACE Overview and Engagement Paper and ACE Paper 3 regarding the potential for double counting of special treatment costs in an ACE due to the greater number of crossing categories proposed for the 2021 ACE Calculation Method and the potential for a pipeline to cross two or more crossing types at the same location. The Commission has decided not to implement such cost savings as it is a complex task that requires further consultation with companies regarding the assumptions to be used and the cost savings methodology to be applied. The Commission is of the view that this topic could be considered as part of future ACE reviews.

4.4.7 Provisions for Abandoned Pipelines

Commission decision

The Commission has decided to continue to include a cost category in ACEs for financial provisions for activities related to pipelines that are assumed to be abandoned in place, as established in Base

²² [C18897](#) provided to companies on 29 April 2022.

Case 2010 (Cost Category 3b – Provision for Post-Abandonment Activities). These provisions will be split into two cost subcategories:

- Provision for Monitoring of Abandoned Pipeline (**Monitoring Provision**); and
- Provision for Addressing Unforeseen Events Associated with Abandoned Pipeline (**Unforeseen Events Provision**).

The Commission has decided to use the cost category descriptions proposed in ACE Paper 3. The descriptions and calculation methods for the cost categories are provided in **Table 16**. The Base Case 2021 unit costs, frequency assumptions, and annuity factor established by the Commission to calculate the Monitoring Provision and Unforeseen Event Provision are shown in **Table 17**.

Table 16 – Provisions for Abandoned Pipelines (description and method)

Cost category	Description of costs	Calculation method
Monitoring	<ul style="list-style-type: none"> • Monitoring patrols of abandoned pipeline • Maintaining signage on right-of-way • Administration, including: <ul style="list-style-type: none"> ○ Maintaining and updating database of abandoned pipelines ○ Third-party crossing administration (e.g., one-call services, costs to administer third-party inquiries and requests) ○ Management fees paid to external parties to manage monitoring obligations for abandoned pipelines 	<p>The length of pipeline used to calculate this provision is determined using the sum of the total length of operating and decommissioned pipelines assumed to be abandoned in place and the total length of currently abandoned pipeline.</p> <p>The annual cost for monitoring is calculated in two parts:</p> <ul style="list-style-type: none"> • The annual cost for administration and signage maintenance is calculated by multiplying the determined length of pipeline by the applicable Base Case 2021 unit cost shown in Table 17. • The annual cost for monitoring patrols is calculated by multiplying the determined length of pipeline by the applicable Base Case 2021 unit cost shown in Table 17 and then dividing that value by the assumed number of years between monitoring patrols shown in Table 17. No costs for monitoring patrols will be applied to very small and small diameter pipelines. <p>The derived annual costs for administration and signage maintenance and monitoring patrols are then added together and multiplied by the Base Case 2021 annuity factor.</p>
Unforeseen Events	<ul style="list-style-type: none"> • Provisions necessary to address any unforeseen events regarding the abandoned pipeline • Events could include (but not be limited to): ground subsidence; soil erosion; pipe displacement at slopes or water crossings; discovery of contamination; loss of depth of cover; tile drainage issues; formation of water conduits; and other problems caused by the presence of an abandoned pipe 	<p>The length of pipeline used to calculate this provision is determined using the sum of the total length of operating and decommissioned pipelines assumed to be abandoned in place and the total length of currently abandoned pipeline.</p> <p>The annual cost for unforeseen events is calculated by multiplying the following together:</p> <ul style="list-style-type: none"> • the determined length of pipeline • the applicable Base Case 2021 unit cost shown in Table 17 • the assumed number of events per year per 100 kilometres shown in Table 17, divided by 100 so that the resulting unit applied is events per-year per-kilometre <p>The derived annual cost for unforeseen events is then multiplied by the Base Case 2021 annuity factor.</p>

Table 17 – Provisions for Abandoned Pipelines (unit costs)

		Very small diameter pipe (not steel)	Very small diameter pipe (steel)	Small diameter pipe (all materials)	Medium diameter pipe (all materials)	Large diameter pipe (all materials)
Monitoring Provision	Annual cost of administrative activities and signage maintenance (\$/km)	\$400				
	Cost of a single instance of monitoring patrols (\$/km)				\$150	
	Assumed number of years between monitoring patrols (frequency, in years)				5	
	Annuity factor	80:1 ²³				
Unforeseen Event Provision	Cost to address an unforeseen event (\$/event)	\$1,500	\$6,000	\$50,000	\$75,000	\$125,000
	Assumed number of unforeseen events per year per 100 km (frequency in years/100 km)	0.1	0.1	0.1	0.5	0.7
	Annuity factor	80:1				

*See **Table 5** for pipe diameter measurements

Reasons of the Commission

The Commission has decided to continue to include a cost category in ACEs for financial provisions for activities related to pipelines that are assumed to be abandoned in place (Provisions for Abandoned Pipelines). In Base Case 2010, this cost category was titled “Provision for Post Abandonment Activities.” For the 2021 ACE Calculation Method, the Commission has revised the title of the cost category to align with the term “abandoned pipeline” in the CER Act.²⁴

The Commission has decided to split the cost category into two separate provisions:

- The Monitoring Provision includes funds for periodic monitoring of the length of pipeline actually and assumed to be abandoned in place.
- The Unforeseen Event Provision is a contingency for addressing future unforeseen events relating to pipeline actually and assumed to be abandoned in place.

²³ An annuity factor of 80:1 is applied to both the Monitoring Provision and Unforeseen Event Provision annual costs to derive the financial provisions required at the time of abandonment to fund each dollar needed annually over the subsequent years, in perpetuity, accounting for the effects of inflation. The 80:1 factor is calculated based on the inverse of the Base Case 2021 real rate of return, as described in **Section 5.2** (i.e., $[1 \div 0.0125]$).

²⁴ “abandoned pipeline” means a pipeline the operation of which has been abandoned in accordance with an order under subsection 214(1) and that remains in place.

In response to some companies' concerns about splitting the cost category into too many subcategories, the Commission notes that the calculation method for the provisions was shown in Base Case 2010 Table A-3 as two separate costs which then were summed together to establish the unit costs shown for the cost category. As a result, the Commission finds that the new approach is not substantively different than what was used in Base Case 2010. Rather, the explicit division of the provisions in the 2021 ACE Calculation Method provides increased transparency.

The Commission has decided to use the descriptions of the *Provisions for Abandoned Pipelines*, as described in ACE Paper 3. The descriptions are provided in **Table 16**.

The Commission has decided not to include cathodic protection in the *Provisions for Abandoned Pipelines* descriptions, as suggested by landowner associations and Indigenous Peoples. Landowner associations submitted that costs for continued cathodic protection should be included in the Monitoring Provision and, if not included, then the abandonment method assumption should be 100 per cent pipeline removal. Indigenous Peoples also indicated support for including cathodic protection in the description. Some companies outlined commitments they made to maintain cathodic protection for liquids pipelines that will be abandoned in place on privately owned lands, and the expected annual costs of providing continued cathodic protection.

The Commission based its decision on several factors. First, applying continued cathodic protection to abandoned pipelines is not a regulatory requirement. Second, companies (other than those referred to above) indicated that they do not support the inclusion of continued cathodic protection, and that abandonments of CER-regulated pipelines to-date have not included continued cathodic protection. Third, the costs that companies provided to maintain cathodic protection indicate that those costs are relatively minor when compared to a total ACE. The Commission's decision to exclude these costs from the 2021 ACE Calculation Method does not affect the ability of companies and other parties to address continued cathodic protection in the terms of a land acquisition or crossing agreement. As noted previously in this Report, an ACE does not determine the methods that will be applied at the time of abandonment, and the company remains liable for the full cost.

The Commission has decided that the annual cost for the Monitoring Provision will be calculated by adding together two annual costs: administrative activities and signage maintenance, and monitoring patrols. Some companies submitted that there is no need to distinguish administrative and signage maintenance costs in an ACE because the Base Case 2010 approach already reasonably accounts for such costs. The Commission has decided to include separate line items for these costs to increase the transparency of ACEs.

The Base Case 2021 annual cost for monitoring patrols will be calculated using the Base Case 2021 assumed patrol frequency. Consistent with Base Case 2010, the Commission has decided that the Base Case 2021 cost for the Monitoring Provision should be calculated such that the annual Monitoring Provision cost (adjusted for inflation) will be available forever – that is, in perpetuity. The way that this is achieved is by multiplying the annual cost by an annuity factor.²⁵ The Commission's reasons for the chosen annuity factor are provided separately below.

In response to submissions received from several companies and landowner associations that pipeline diameter does not generally influence monitoring costs, the Commission has decided that the Monitoring Provision unit costs will not vary based on pipeline diameter. However, the Commission has decided that the monitoring patrol costs will only apply to medium and large diameter pipelines in an ACE. This change was not suggested by companies or other Participants in response to the discussion papers, but rather resulted from CER technical staff's examination of

²⁵ The annuity factor is calculated in such a way that, when it is multiplied by the annual cost, the resulting total amount will produce enough annual investment returns to pay for the annual cost (inflation adjusted) in perpetuity, based on assumed rates of return.

the Monitoring Provision. The Commission acknowledges Indigenous Peoples' concerns regarding its determination that monitoring patrol costs are not applicable to very small and small diameter pipe. The Commission finds, however, that the risks and severity of potential impacts of an abandoned pipeline remaining in-place (e.g., subsidence, pipe exposure, water conduit effect) are expected to be less for smaller diameter pipelines than for larger diameter pipelines. Including such costs in an ACE for very small and small diameter pipelines is considered unnecessary at this time due to the lower associated risk with such pipelines. The Provisions for Abandoned Pipelines for small and very small diameter pipelines in an ACE will continue to include funds for administrative activities and signage maintenance, as part of the Monitoring Provision, and to address any issues that may arise while abandoned, as part of the Unforeseen Event Provision. Monitoring Provision costs for very small and small diameter pipelines can be refined in future ACE reviews as more information regarding abandoned pipelines becomes available.

As was proposed in ACE Paper 3, the Commission has decided that the Unforeseen Event Provision will be calculated by multiplying the unit cost to address a single unforeseen event by the assumed number of unforeseen events each year for every 100 kilometres of pipe, as determined by pipeline diameter. Similar to the Monitoring Provision, an annuity factor will then be multiplied by the resulting annual costs so that the annual amounts (adjusted for inflation) are available in perpetuity. Companies and landowner associations indicated mixed views about whether pipeline diameter would influence costs for the Unforeseen Event Provision. For example, landowner associations stated that the costs of removing small diameter pipe or remediating historical contamination associated with a small diameter pipe would be less expensive than for a larger diameter pipe. The Commission agrees that pipeline diameter could influence costs for unforeseen events, as proposed in ACE Paper 3.

Having considered Participants' submissions and the unit costs submitted by companies, the Commission has decided on the Base Case 2021 annual unit costs and associated assumed annual frequencies for the Monitoring Provision and Unforeseen Event Provision shown in **Table 17**. Some companies submitted that "typical" unit costs and assumed annual frequencies should be derived from the low and high unit costs provided by companies in their unit cost submissions. Several companies noted that annual administrative activities and signage maintenance may vary greatly depending on the pipeline system and economies of scale. Indigenous Peoples stated that it was not appropriate to ask companies to determine the frequency of monitoring patrols. They indicated that the frequency should be pipeline specific and risk based and be informed by consultation with potentially affected Indigenous Peoples. Landowner associations submitted that the Unforeseen Event Provision should be based on worst-case scenario projections and expressed concern that the provision will be underfunded and, if used, will deplete funds available for other abandonment activities. They further suggested that the Base Case 2010 value of approximately \$84,000 per-kilometre for such contingency was inadequate when considering that a single instance of historical contamination may cost hundreds of thousands of dollars or more.

The Commission has chosen values for the Base Case 2021 unit costs for the Monitoring Provision (e.g., annual cost of administrative activities and signage maintenance, single instance of monitoring patrols) that are close to the mid-range of the unit costs submitted by companies. Taking into consideration the revised unit costs submitted by TC Energy,²⁶ the mid-ranges of the monitoring patrol unit costs submitted by all companies for medium and large diameter pipelines are materially lower than those reflected in the draft Report.

Most companies proposed a monitoring patrol frequency of once per year. While it is reasonable for a company to patrol their medium and large diameter abandoned pipelines annually when they have operating pipeline nearby, the Commission finds that such a frequency may not be reasonable for

²⁶ TransCanada PipeLines Limited, NOVA Gas Transmission Ltd., Foothills Pipe Lines Ltd., Trans Québec & Maritimes Pipeline Inc., Great Lakes Pipeline Canada Ltd., and TransCanada Keystone Pipeline GP Ltd.

monitoring abandoned pipelines once a company ceases to exist and another entity is conducting the required patrols. As a result, the Commission has chosen to apply a monitoring patrol frequency of five years for medium and large diameter pipelines in the Monitoring Provision.

With regard to the Unforeseen Event Provision, the Commission has established the Base Case 2021 values for the number of unforeseen events per-year per-100 kilometres to be generally close to the mid-range of values provided by companies. Landowner associations raised concerns that the Base Case 2021 unforeseen event unit costs in the draft Report were too low. As a result, the Commission re-examined the unforeseen event unit costs provided by companies – which were wide ranging – and has increased the Base Case 2021 unforeseen event unit costs for small, medium and large diameter to better reflect the mid-range of unit costs provided by companies.

In consideration of some companies' submissions that the provisions do not consider efficiencies and cost savings where multiple pipelines are in the same right-of-way, the Commission has considered that comment as part of its reasons in **Section 4.5.2**.

Annuity factor

The Commission has decided that an annuity factor of 80:1 will be applied to derive the Monitoring Provision and Unforeseen Event Provision in Base Case 2021, calculated using the Base Case 2021 real rate of return [$1 \div 0.0125$].

In coming to this determination, the Commission considered Participants' submissions on whether income taxes should be accounted for in a revised annuity factor. Indigenous Peoples and several companies submitted that the annuity factor should account for the effects of income taxes, with several submissions indicating that income taxes would only need to be accounted for in the case of pipeline companies that use a trust as their SAM, because trusts generate taxable income. Several companies suggested the following formula to calculate a revised annuity factor that accounts for income taxes:

$$1 \div [(\text{Pre-tax Nominal Rate of Return}) \times (1 - \text{Income Tax Rate}) - \text{Inflation Rate}]$$

While the Commission is persuaded that, after completing terminal abandonment activities, income taxes will continue to reduce the net rate of return that trusts realize, the Commission has decided not to account for income taxes in the Base Case annuity factor at this time. The Commission is of the view that other potentially important factors require further consideration prior to making this substantial change in the methodology used to calculate the Base Case annuity factor. In particular, the Commission is of the view that trustee fees and management expenses, as well as other expenses (e.g., audit, administrative, etc.), should be considered. These fees and expenses could – like income taxes – reduce the net return available to retain within trusts. Further, the Commission is of the view that additional consideration should be given to whether the Base Case annuity factor should continue to be premised on a rate of return reflective of yields on Government of Canada marketable bonds (as described in **Section 5.2**).²⁷

Considering the importance of the annuity factor in determining ACEs, the significant impact that could result from modest changes to the real rate of return assumed after terminal abandonment, and that Participants have not had the opportunity in this Review to provide submissions on these other factors, the Commission has determined that further consideration of these topics is warranted

²⁷ Once terminal abandonment activities are complete, annual contributions are likely to have ceased and the trusts will only be holding funds for subsequent costs that are presumed to continue in perpetuity (rather than also for large terminal abandonment costs). These changes may warrant the Base Case rate of return being premised on a different investment profile after terminal abandonment occurs.

in the next review, prior to implementing a revised approach to calculating the annuity factor in the Base Case.²⁸

Lastly, some companies suggested that where a company has employed an investment approach that yields a real return different than the Base Case 2021 rate of 1.25 per cent, the annuity factor should be based on the company’s individual rate of return. It is not clear how this suggestion relates to the Base Case, given the company-specific nature of this suggested approach. Further, as discussed above, there are several potentially important factors pertaining to the Base Case annuity factor methodology that warrant further consideration in the future. Accordingly, the Commission is not prepared to adjust the Base Case annuity factor based on this suggestion or to accept that companies with real rates of return that differ from the Base Case 2021 rate of 1.25 per cent should have their ACE based on an annuity factor reflective of the company-specific rate of return.

4.4.8 Above-Ground Facilities

Commission decision

The Commission has decided to continue to use the *Above-Ground Facilities* cost category, as established in Base Case 2010, but has revised the above-ground facility types and subdivided the costs in the category into three subcategories: *Removal, Remediation, and Reclamation and Restoration*. Unit costs vary for each subcategory based on the type of above-ground facility.

The Commission has established cost category descriptions for each subcategory. The descriptions and calculation methods for the subcategories are provided in **Table 18**. The Base Case 2021 unit costs established for the subcategories are shown in **Table 19**.

Table 18 – Above-Ground Facilities (description and method)

Cost category	Description of costs	Calculation method
Removal	<ul style="list-style-type: none"> • Mobilization and demobilization of equipment and personnel • Removal of buildings and equipment • Excavation of pipelines and appurtenances to allow for removal of underground appurtenances (includes topsoil stripping) • Removal of underground appurtenances • Stockpiling, loading, hauling, and disposal of removed pipelines, appurtenances, buildings, and equipment • Backfill and compaction of disturbed soils 	Calculated by multiplying the number of facilities, by type, by the applicable Base Case 2021 unit costs shown in Table 19 . These costs are then added up to obtain the total estimated cost for the cost category.
Remediation	<ul style="list-style-type: none"> • Remediation of contaminated soil, sediment and/or groundwater, where necessary, including monitoring and testing. Includes, but is not limited to: excavation; hauling, and disposal of contaminated soil; backfilling; field sampling and analytical testing; and, follow-up monitoring 	Calculated by multiplying the number of facilities, by type, by the applicable Base Case 2021 unit costs shown in Table 19 . These costs are then added up to obtain the total estimated cost for the cost category.
Reclamation and Restoration	<ul style="list-style-type: none"> • Assess, reclaim and restore the ground surface (e.g., soil, vegetation) at above-ground facility sites to equivalent land use of adjacent lands (or other relevant reclamation objective such as critical habitat 	Calculated by multiplying the number of facilities, by type, by the applicable Base Case 2021 unit costs shown in Table 19 . These costs are then added up to obtain

²⁸ In addition, as the CER gains experience with processes related to orphaned pipelines, in a future five-year review the Commission may revisit the appropriate treatment of factors such as income taxes for calculating the annuity factor applied to pipelines that use letters of credit and surety bonds as their SAM.

Cost category	Description of costs	Calculation method
	for specified wildlife species at risk, landowner requests, Indigenous cultural values, etc.) <ul style="list-style-type: none"> • Alleviate any noted soil and/or vegetation issues (e.g., sub-soil compaction, subsidence) • Seeding • As relevant, planting of trees and shrubs to restore critical habitat for wildlife species at risk and implementing access control measures • Erosion control measures • Weed control • Monitoring (e.g., up to five years) to confirm reclamation objectives are met 	the total estimated cost for the cost category.

Table 19 – Above-Ground Facilities (unit costs)

	Valve with above-ground appurtenances	Meter station	Compressor station	Pump station	Oil terminal and storage facilities	Processing plant	Other riser
Removal (\$/above-ground facility type)	\$50,000	\$200,000	\$3,000,000	\$250,000	\$1,000,000	\$1,000,000	\$25,000
Remediation (\$/above-ground facility site)	\$12,000	\$60,000	\$480,000	\$100,000	\$500,000	\$500,000	\$6,000
Reclamation and Restoration (\$/above-ground facility site)	\$15,000	\$35,000	\$300,000	\$75,000	\$500,000	\$500,000	\$10,000

Reasons of the Commission

For the *Above-Ground Facilities* cost category, the Commission has decided to use the approach proposed in ACE Paper 3, which was revised from that described in Base Case 2010. The cost category is split into three subcategories:

- removal costs;
- remediation costs; and
- reclamation and restoration costs.

Unit costs for these three subcategories vary according to seven different types of above-ground facilities:

- valves with above-ground appurtenances;
- meter stations;
- compressor stations;
- pump stations;
- oil terminal and storage facilities;

- processing plants; and
- other risers.

When deciding on this approach, the Commission considered submissions provided in response to questions in both the *Above-ground facilities* and *Remediation, reclamation, and restoration costs* sections of ACE Paper 3. The Commission has established the separate cost subcategories for *Remediation*, and *Reclamation and Restoration* to increase transparency of these costs in ACEs. The Commission acknowledges that Participants had mixed views in their submissions regarding the addition of these cost subcategories to the ACE calculation method both for pipelines and above-ground facilities. Consistent with its reasons in **Section 4.4.5**, the Commission considered the importance to landowners, Indigenous Peoples, land users, and the general public of returning lands to an appropriate condition during and after abandonment activities. In particular, the Commission considered the potentially high costs that could be incurred if contamination is discovered at the time of abandonment and remediation activities are required. As the Commission stated in **Section 4.4.5**, while it is not appropriate for Base Case 2021 to account for the highest potential costs – because actual costs will be pipeline-specific and may be quite limited for some pipelines – unit costs should transparently and reasonably account for remediation, reclamation, and restoration costs in the event that these activities are required at the time of abandonment.

Some Participants submitted that commodity type influences above-ground facility remediation costs, and that pipeline diameter is an important consideration for removal of block valve assemblies and other above-ground facilities. The Commission examined this issue and determined that such categorizations of the *Remediation* and *Removal* cost subcategories cannot be accommodated at this time because the geospatial above-ground facility data submitted by companies does not include attributes that allow the Commission to distinguish above-ground facility types by commodity type or pipeline diameter.

Because descriptions were not included in ACE Paper 3 for the *Above-Ground Facilities* cost category, the Commission adapted the descriptions for the *Remediation*, and *Reclamation and Restoration* subcategories from the descriptions proposed in the *Remediation, reclamation, and restoration costs* section of ACE Paper 3, as the activities are similar.

With respect to the unit cost to be used for the *Above-Ground Facilities* cost category, the Commission has decided to use a dollars-per-site unit. Some companies suggested that the size of the site and commodity type should be considered. Another company suggested using dollars-per-acre, and that dollars-per-site would only be appropriate if low- and high-end costs could be applied to capture costs of larger facility sites. Landowner associations suggested adding a multiplier factor to *Remediation* unit costs where the operating history of a particular company or pipeline system indicated an increased risk of historical contamination. The unit cost used for this cost category does not reflect these suggestions because the geospatial data submitted by companies is point data and does not include attributes identifying the size of a site, commodity type, pipeline diameter, complexity of the facility, or information regarding historical contamination. Future ACE reviews may further examine this issue to determine if such refinements to the 2021 ACE Calculation Method can be accommodated, including whether additional attributes should be included in companies' updated geospatial data submissions to support further categorization.

Regarding the Base Case 2021 unit costs, the Commission has chosen values that are close to or slightly less than the mid-range of the unit costs submitted by companies. The Commission acknowledges submissions by Indigenous Peoples and landowner associations that high-end unit costs should be applied. However, the Commission finds that it is not appropriate for Base Case 2021 unit costs to account for the highest potential costs because circumstances requiring the highest costs would not apply to all above-ground facility sites.

The Commission is of the view that additional clarity in respect of the types of facilities to be included in each of the above-ground facility categories in Base Case 2021 would be beneficial to ensure that companies are classifying their respective above-ground facilities in a consistent manner. In the next ACE review, the Commission may develop such descriptions and re-examine the above-ground facility unit costs to ensure they accurately reflect the descriptions established.

4.4.9 Engineering and Project Management

Commission decision

Similar to Base Case 2010, the Commission has decided to continue calculating *Engineering and Project Management* costs in the 2021 ACE Calculation Method by applying different percentages depending on the length of a company’s pipeline system.

The *Engineering and Project Management* cost category will be applied to all cost categories, except *Provisions for Abandoned Pipelines* (i.e., in **Section 4.4.7**) and *Contingency* (i.e., in **Section 4.4.10**).

The Commission has established a description for the cost category which, along with the calculation method for the category, is provided in **Table 20**. The Base Case 2021 unit cost percentages are shown in **Table 21**.

Table 20 – Engineering and Project Management (description and method)

Cost category	Description of costs	Calculation method
Engineering and Project Management	<ul style="list-style-type: none"> • Costs related to regulatory, legal and finance support, external relations and land support, environment, health and safety support, operations support, stakeholder consultation • Includes detailed cost estimates, planning, applications, detailed engineering and environmental studies, engineering and project management, construction management, and project and cost control • Engagement activities with Indigenous Peoples (approximately 1/6 of total percentage for this cost category) • Engagement activities with landowners and other stakeholders (approximately 1/6 of the total percentage for this cost category) 	<p>Calculated by multiplying the sum of the total costs for all cost categories, except the Provisions for Abandoned Pipelines and Contingency, by the applicable percentage shown in Table 21. The lengths shown in Table 21 refer to a company’s total pipeline length, not the lengths of its individual pipelines.</p>

Table 21 – Engineering and Project Management (unit costs)

Percentages to be applied to all cost categories, except Provisions for Abandoned Pipelines and Contingency			Percentage of unit costs
Engineering and Project Management	Total percentage to be applied for Engineering and Project Management	For pipeline systems < 50 km in length	15%
		For pipeline systems 50 – 500 km in length	10%
		For pipeline systems > 500 km in length	5%
	Proportion (approximate) of total Engineering and Project Management costs to be used for engagement activities with Indigenous Peoples		1/6
	Proportion (approximate) of total Engineering and Project Management costs to be used for engagement with landowners and other stakeholders		1/6

Reasons of the Commission

The Commission has decided to continue to use the *Engineering and Project Management* cost category for the 2021 ACE Calculation Method, as established in Base Case 2010, with some modifications.

The Commission notes that the proposed approach for this cost category in ACE Paper 3 did not consider the length of a pipeline system, as Base Case 2010 does. The Commission has decided to determine *Engineering and Project Management* costs using different percentages of total unit costs (except for *Provisions for Abandoned Pipelines* and *Contingency*) based on three subcategories of pipeline length. The Commission did not apply the same percentage to all lengths of pipeline because it is likely that cost efficiencies will be realized for longer lengths of pipe. The Commission also did not apply the approach suggested by Indigenous Peoples to vary the percentages in relation to the characteristics of the pipeline, because of the complexity involved in determining which pipeline characteristics would affect *Engineering and Project Management* costs and how to apply them in an appropriate manner. The Commission determined the Base Case 2021 percentages to use for each pipeline length subcategory based on the percentages companies provided in their unit cost submissions for the *Engineering and Project Management* cost category as a whole and in consideration of the percentages, by pipeline length, shown in Base Case 2010 for the category.

In response to questions in ACE Paper 3, landowner associations and Indigenous Peoples supported separate categories for engagement activities to ensure that these costs are transparently accounted for in an ACE and appropriate funds for engagement activities are available at the time of abandonment. Companies recognized the importance of accounting for engagement costs, but submitted that splitting *Engineering and Project Management Costs* into subcategories may not improve ACEs because different abandonment projects will warrant different costs.

Regarding how to account for engagement activity costs, some companies suggested assigning an overall percentage of activity costs. Landowner associations suggested that it should be a per-kilometre cost. Indigenous Peoples preferred an overall percentage based on the characteristics of the pipeline, including the potential impacts on Indigenous Peoples' rights and interests and the company's commitments made to Indigenous Peoples.

The Commission has decided to account for engagement with Indigenous Peoples and engagement with landowners and other stakeholders as separate line items within the overall *Engineering and Project Management* costs. The Commission has assigned a proportion of the overall *Engineering and Project Management* costs to be used for engagement activities, as shown in **Table 21**:

- 1/6 of overall costs for engagement activities with Indigenous Peoples; and
- 1/6 of overall costs for engagement activities with landowners and stakeholders.

The Commission has decided to assign a proportion to demonstrate the importance of engagement activities, while recognizing that the drivers of engagement costs are difficult to determine. The Commission expects that actual engagement costs will vary for each abandonment. As previously mentioned in this Report, the company will be liable for the full costs at the time of abandonment.

Some companies expressed concern regarding double counting for *Engineering and Project Management* costs on the basis that these costs are already factored into the other cost categories. While current ACEs calculated using Base Case 2010 may include costs for engineering and project management in other cost categories, the revised 2021 ACE Calculation Method cost categories do not include such costs. Engineering and project management costs are solely accounted for in the *Engineering and Project Management* cost category to improve the transparency of ACEs.

4.4.10 Contingency

Commission decision

For the 2021 ACE Calculation Method, the Commission has decided to apply *Contingency* costs of 25 per cent to all cost categories except *Provisions for Abandoned Pipelines* and *Engineering and Project Management*.

The Commission has established a description for the cost category. The description and the calculation method for the category is provided in **Table 22**. The Base Case 2021 unit cost percentage is shown in **Table 23**.

Table 22 – Contingency (description and method)

Cost category	Description of costs	Calculation method
Contingency	Addition to specified cost categories to compensate for the inherent uncertainty in the estimates	Calculated by multiplying the sum of the total costs for all cost categories, except the provisions for abandoned pipelines and engineering and project management, by the applicable percentage shown in Table 23 .

Table 23 – Contingency (unit costs)

Contingency	25%
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Reasons of the Commission

Participants' submissions related to contingency costs were varied. Landowner associations recommended that Base Case 2021 *Contingency* costs remain at 25 per cent of a total ACE, inclusive of any other built-in contingency amounts. Indigenous Peoples submitted that contingency should be individually assessed for each pipeline based on each potentially applicable abandonment task to accommodate the variability of tasks and environmental and social settings for each pipeline, to reduce the risk of underfunding.

Companies applied contingencies that ranged from 2 to 25 per cent in their unit cost table submissions, with approximately 15 per cent reflecting the mean and 13.7 per cent reflecting the median. Several companies indicated a preference to develop their own ACE *Contingency* costs in a manner consistent with the Association for the Advancement of Cost Engineering International (**AACEI**) guidelines. These companies did not articulate whether or how the Commission should

use the AACEI guidelines to inform its determination of Base Case 2021 *Contingency* costs. Several companies indicated that the contingency needed for abandonment projects is lower relative to pipeline installation projects due to known factors that increase the level of scope definition for abandonment projects, including data pertaining to a pipeline's physical and operating characteristics, access routes to rights-of-way, and location-specific construction and operating costs.

The Commission has decided that *Contingency* costs of 25 per cent remain appropriate. It may be appropriate in a future ACE review to reconsider whether such contingency costs should start to apply to the *Provisions for Abandoned Pipelines* cost category and the *Engineering and Project Management* cost category, given the uncertainty related to the accuracy of these categories. However, no persuasive submissions for or against such a change were received, and the Commission finds no reason to change this approach at this time. The Commission did not use the *Contingency* cost approach proposed by Indigenous Peoples because the Base Case 2021 approach to estimating abandonment costs does not use enough pipeline-specific detail for this approach to result in improved accuracy for *Contingency* costs for each pipeline.

With respect to the AACEI guidelines, as discussed throughout this Report, the Base Case generates high-level estimates of abandonment costs based on common datasets and generalized Base Case assumptions. The Commission finds that this is distinct from the circumstances in which contingency costs are generally developed using the AACEI guidelines, where they are based on levels of definition and associated accuracy ranges for individual projects. Notwithstanding this finding, the Commission considers contingency estimates developed using the AACEI guidelines to be useful to help gauge the reasonableness of the Base Case 2021 *Contingency* costs. Similarly, the AACEI guidelines may also prove useful in assessing any proposed pipeline-specific *Contingency* costs that deviate from Base Case 2021. The Commission considers that Base Case 2021 ACEs should include a contingency factor that is generally higher than the contingency factor for a pipeline-specific ACE which is reflective of more detailed, case-specific information.

With respect to companies' submissions that there is less uncertainty in the accuracy of costs associated with abandonment projects than pipeline installation projects, the Commission similarly finds that, even if this is true for individual projects, it may not be true when considering the contingency factor to be applied to Base Case ACEs. Further, the Commission notes that some companies stated that this rationale was based on their experience with executing projects generally, and that they were generally unable to provide empirical information to support this position. As companies gain more experience with abandonment and decommissioning projects, the Commission expects companies to provide empirical support for contingency factors that they propose.

The Commission was also not persuaded that taxes or insurance should be explicitly reflected in Base Case 2021 *Contingency* costs. The Commission agrees with the suggestion from some companies that taxes are best considered as components of the individual abandonment activities to which they relate. The Commission has decided not to explicitly account for insurance in *Contingency* costs based on companies' submissions that insurance is accounted for in *Engineering and Project Management* costs or via existing company umbrella policies. While Indigenous Peoples indicated that taxes and insurance costs should be reflected transparently, the Commission is not explicitly accounting for them in *Contingency* costs because doing so would add unnecessary complexity by necessitating removal of tax- or insurance-related costs from other categories to avoid double counting.

Indigenous Peoples submitted that ACEs should address what they describe as a perennial issue of underfunding Indigenous engagement and monitoring and ACEs should account for and reflect contributions to an Indigenous engagement and monitoring contingency fund (in addition to costs for Indigenous engagement and monitoring included in an ACE). The Commission is of the view that

Base Case 2021 costs for Indigenous engagement and Indigenous monitoring, in combination with the overall 25 per cent *Contingency* cost, sufficiently accounts for unforeseen costs related to Indigenous engagement and Indigenous monitoring, and a separate contingency cost is unnecessary.

Finally, the Commission expects that, going forward, any company that proposes to use contingency costs in Part 2 of the Review that differ from Base Case 2021 will provide the following information in support of their proposal:

- a detailed description of how the proposed contingency costs were developed;
- a detailed explanation of whether the methodology used to develop the proposed contingency costs aligns with the AACEI guidelines and, if so, how;
- empirical data on project cost estimates and actuals for each CER-regulated pipeline abandonment or decommissioning project completed within the preceding five calendar years, using the table in **Appendix 4(f)** as a template; and
- a discussion on the extent to which the empirical data provided in the **Appendix 4(f)** table supports the proposed contingency costs.

Similarly, the Commission expects that Indigenous Peoples, landowners, or other parties proposing contingency costs for a particular pipeline system in Part 2 of the Review that differ from Base Case 2021 will provide an explanation in support of their proposal.

4.5 Other matters related to abandonment cost estimate calculations

4.5.1 Minimum abandonment cost estimate

Commission decision

The Commission has decided that it will not establish a minimum ACE at this time.

Table 24 – Minimum ACE

	Minimum ACE	Applicability	Amount
Minimum ACE	None	n/a	n/a

Reasons of the Commission

In the past, ACEs for CER-regulated pipeline systems were calculated individually and no minimum ACE was established. In ACE Paper 3, the CER indicated that it was considering the efficacy of imposing a minimum amount of funds to be set aside by a company, regardless of the calculated ACE for its pipeline system, to ensure that adequate funds are available at the time of abandonment.

Participants generally submitted that imposing a minimum ACE was not appropriate and that ACEs should be calculated specific to each company. Indigenous Peoples indicated that imposing an arbitrary requirement on a company that may or may not be sufficient to account for its abandonment costs might not be preferable. The Commission agrees with these submissions. Assigning an arbitrary minimum ACE is also not in line with the Commission’s goal of using a consistent and transparent method for calculating ACEs. In addition, having further developed the 2021 ACE Calculation Method during this Review, and having applied it to a number of companies’ CER-regulated pipeline systems, the Commission finds that the Base Case 2021 ACEs are appropriate and a minimum ACE amount is not required.

4.5.2 Shared corridor

ACE Paper 3 asked questions about whether ACEs should account for cost savings where multiple pipelines will be abandoned within a shared corridor. ACE Paper 3 did not propose such cost savings. Rather, the purpose of the questions was to better understand the issue and evaluate whether they should be accounted for in Base Case 2021.

Commission decision

The Commission has decided that it will not include cost savings for the abandonment of multiple pipelines in a shared corridor in the 2021 ACE Calculation Method.

Reasons of the Commission

Companies generally favoured accounting for cost savings in ACEs where multiple pipelines share the same corridor. Specifically, some companies indicated that synergies may be realized for mobilization/demobilization; right-of-way clearing; access; remediation, reclamation, and restoration; and the monitoring provision for pipelines abandoned in place. They suggested a synergy factor of up to 85 per cent for pipelines in a common ditch and 25 per cent for pipelines in a shared corridor but not in a common ditch. One company suggested that efficiencies would only be realized if the pipelines were less than three metres apart, and if only one bell hole (of similar size to that required for a single pipeline) was required to expose the pipelines. The same company also submitted that cost savings would result from monitoring abandoned pipelines in a shared corridor if they were less than 10 metres apart. Other companies submitted that the pipelines co-located within a common right-of-way would typically be abandoned once the last pipeline ceases operation. They expected economies of scale due to lower pipeline removal and other costs associated with abandoning the pipelines at the same time, rather than sequentially, but suggested that such cost efficiencies could be addressed as part of final refinement and derivation of ACEs.

Some companies submitted that not accounting for shared corridors in ACEs as part of this Review would result in a surplus of abandonment funding and intergenerational inequity. They suggested that companies could either file information related to shared corridors as part of their geospatial data or the costs savings could be reflected in the unit costs. Another company suggested that the geospatial data provided by companies already identifies where a company has multiple pipelines in a single right-of-way and proposed that another category be added to the abandonment method assumptions for shared corridors. Those assumptions could then be applied to certain costs with obvious synergies in shared corridors (e.g., Land Access, Monitoring).

Landowner associations suggested that abandonment costs should be calculated separately for all pipelines without any consideration of the location of a pipeline within a shared corridor because it is not possible to know whether adjacent pipelines will be abandoned at or around the same time. It is therefore not possible to know if cost savings may be achieved at the time of abandonment.

While the Commission has not included cost savings for pipelines in a shared corridor at this time, further consideration could be given to this topic in a future review. To determine whether cost savings are appropriate, information would be needed about the anticipated timing of abandonment of CER-regulated pipelines within shared corridors and the factors that may influence the timing of abandonment of specific pipelines within a corridor.

If such costs savings were to be implemented, an understanding would be required as to what cost savings should be applied at what locations and under what circumstances, including, for example:

- Does there need to be a minimum length of corridor for cost savings to be applied?
- Should cost savings be applied incrementally based on the number of pipelines owned by a company in a shared corridor?
- If yes, what should those incremental cost savings be and what methodology should be used to apply such savings?
- What further attributes, if any, would be required in companies' geospatial data to support the calculation of such savings?

4.5.3 Inflation rate

ACE Paper 3 asked questions about determining the Base Case inflation rate and how the rate should be used for ACE and SAM-COM purposes.

Commission decision

The Commission has decided to use the following rates of inflation for Base Case 2021:

- Inflating prior ACEs – Actual inflation as measured by the Consumer Price Index.
- Future-proofing – letters of credit and surety bonds will be required to cover an amount equal to 1.104 times the 2023-dollar ACE.
- Annual contribution amount – 2.0 per cent inflation rate.

Reasons of the Commission

Inflating prior ACEs

At times, inflation may be used to inflate prior ACE amounts to current dollars, and Participants were asked to comment on how this should be done. Submissions were only received from companies, which supported the use of actual Consumer Price Index for this purpose instead of using an alternative measure such as a Base Case inflation rate. The Commission agrees with this approach because it should provide a more accurate way of updating past costs, and there are no material barriers or added complexity in applying actual inflation instead of a Base Case inflation rate (since actual inflation is readily available). As such, the Commission instructs that, to the extent companies use inflation to update their prior ACEs to current dollars, they should generally do so using actual total Consumer Price Index inflation over the relevant intervening period.²⁹

Future-proofing

Companies and landowners made submissions that supported future-proofing ACE amounts. These submissions varied somewhat, suggesting that ACE amounts be inflated forward to the anticipated mid-point between ACE reviews, the next ACE review, or further into the future. For example, landowners submitted that letters of credit and surety bonds should be future-proofed such that the ACE amount would be inflated forward to 2030.

The Commission is of the view that the past practice of requiring letters of credit and surety bonds to cover ACE amounts from the last ACE review (in prior-year dollars) may contribute to a shortfall in the funding for abandonment activities that may need to be paid for from a letter of credit or a surety bond. This shortfall could arise because of the expected impact of inflation on ACEs. As such,

²⁹ For example, see Statistics Canada, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1810000413>. Table 18-10-0004-13 – Consumer Price Index by product group, monthly, percentage change, not seasonally adjusted, Canada, provinces, Whitehorse, Yellowknife and Iqaluit.

the Commission is of the view that future-proofing of letters of credit and surety bonds is an important safeguard against having insufficient funds available at the time of abandonment.

The Commission finds that it is appropriate to future-proof letters of credit and surety bonds against the impacts of inflation out to the likely timing for completion of the next ACE review (when letters of credit and surety bonds will presumably again be updated to new ACE amounts). The Commission is of the view that future-proofing only to the mid-point between ACE reviews would be insufficient because there is likely to be a lag between when the CER would call upon a letter of credit or a surety bond and the time that abandonment would be executed and paid for. Further, the Commission is of the view that future-proofing to 2030 would be overly costly for companies, considering that the potential need for the CER to call upon a letter of credit or a surety bond extends across time (i.e., it does not only arise towards the time of the next ACE review).

Specifically, for the purpose of this Review, letters of credit and surety bonds will be required to cover ACE amounts adjusted for inflation to 2028 dollars. Several companies pointed towards the Bank of Canada’s inflation forecast. The Commission finds that it is appropriate for future-proofing to be done based upon the most current Bank of Canada forecast, in which inflation falls to 3 per cent in mid-2023, then returns to 2 per cent at the end of 2024.³⁰ Accordingly, for companies using a letter of credit or surety bond as their SAM, their letter of credit or surety bond will have to account for their ACEs (measured in 2023 dollars) being inflated by 10.4 per cent. **Table 25** illustrates how the Commission calculated this amount. The Commission notes that, because ACEs will be in 2023 dollars, they will already reflect the impacts of recent inflation, which has been as high as 8.1 per cent (as described in **Section 4.4**).

Table 25 – Inflation forecast for future-proofing ACEs for letters of credit and surety bonds

Inflating to	Inflation rate forecast
2024 dollars	2.0 %
2025 dollars	2.0%
2026 dollars	2.0%
2027 dollars	2.0%
2028 dollars	2.0%
Total growth (compounded)	10.4%

Annual contribution amount calculation

In setting the Base Case inflation rate to be used in the annual contribution amount calculation, the Commission is of the view that an equivalent methodology as that used to future-proof ACE amounts is appropriate, with the calculation of the annual contribution amount inflation rate using inflation of 2.0 per cent for all years after 2028 (i.e., the Bank of Canada’s target). Based on this methodology, the Commission finds that a 2.0 per cent rate remains the appropriate Base Case rate for annual contribution amount calculations. As noted by companies – which generally supported the continued use of 2.0 per cent for Base Case 2021 – regular ACE reviews provide an opportunity to adjust for variations between realized and assumed inflation.

4.5.4 Salvage value

ACE Paper 3 asked questions about whether assumptions on zero salvage value remained appropriate.

³⁰ Bank of Canada, Monetary Policy Report – April 2023, <https://www.bankofcanada.ca/wp-content/uploads/2023/04/mpr-2023-04-12.pdf>, PDF pages 26-27 of 32.

Commission decision

The Commission has decided that Base Case 2021 will continue to assume zero salvage value.

Reasons of the Commission

Base Case 2010 set salvage value at zero, consistent with the NEB's RH-2-2008 decision. With only a few exceptions from Group 1 companies, this Base Case 2010 assumption has been used by companies when calculating ACEs.

Most Participants expressed support for continuing the practice of assuming zero salvage value in Base Case 2021. Some companies submitted that, while zero salvage value in the Base Case is a conservative assumption that may be reasonable in most cases, it may also be appropriate to apply a positive salvage value to some categories of above-ground pipeline components and equipment. They suggested that a company could provide the number or weight of material to validate and support the non-zero salvage value for a pipeline-specific ACE. While Indigenous Peoples did not support any positive salvage value, they submitted that companies should validate claims of salvage value with supporting market studies, purchase agreements, or supply and demand forecasts.

The Commission has decided that retaining a salvage value of zero for Base Case 2021 continues to be a reasonable and conservative assumption. While the Commission accepts that there may be cases where positive salvage value is realized by companies during abandonment, no Participant suggested that this warrants a non-zero Base Case 2021 assumption. Further, the Commission observes that including positive salvage values increases the risk of underfunding, because the salvage value may not be fully realized.

4.5.5 Acquiring land rights

ACE Paper 3 asked questions about costs associated with the acquisition of land rights at the time of abandonment.

Commission decision

The Commission has decided not to include in ACEs a separate line item for the acquisition of land rights at the time of abandonment.

Reasons of the Commission

The Commission decided not to include in ACEs costs associated with the acquisition of land rights at the time of abandonment. This was based on companies' submissions that negotiated land agreements, which are in place during the operating life of a pipeline, remain in effect at the time of abandonment unless they are renegotiated, and that any additional cost for acquiring temporary workspace to accommodate a change in abandonment method would be small and cannot be foreseen.

The Commission does not agree with the landowner associations' proposal to add 25 per cent to ACEs to cover costs to acquire additional land rights related to abandonment and to address possible damage to land at the time of abandonment. Should additional land rights, damages, or other compensation matters arise at the time of abandonment, the Commission is of the view that the contingency fund described in **Section 4.4.10** would likely account for these unforeseen costs in the ACE calculations. Companies are liable and responsible for all costs of abandonment, whether those costs could be planned and accounted for in the ACE calculation, or not. In addition, should unforeseen damages or other compensation matters arise at the time of abandonment, the CER has

mechanisms in place to address them (e.g., compensation applications may be filed by landowners at that time).

5. Commission decisions regarding set-aside and collection mechanisms, with reasons

The Commission has considered all submissions received, including responses to information requests, related to the content and questions in the SAM-COM Paper ([C19327-11](#)).³¹ The Commission's decisions and reasons on SAM-COM topics are provided in this section.

Most of the decisions in this section apply only to pipelines for which abandonment funds are being set aside in a trust that is not yet fully funded. For these pipelines, incremental funds need to be set aside each year so that the trust will be fully funded by the time the pipeline system needs to be abandoned. Accordingly, trusts that are not yet fully funded give rise to special considerations related to how quickly and the duration over which funds should be set aside. These considerations do not arise in the case of pipelines for which the SAM is a letter of credit, surety bond, or fully funded trust.

To provide clarity and context for its decisions in **Section 5**, the Commission determines in **Section 5.3.3** that, for pipelines where material abandonment or decommissioning activities are anticipated prior to their terminal system-wide abandonment date, the Collection Period will need to be adjusted to account for these earlier activities. The Commission refers to these earlier activities as **Staggered Retirement Activities**, and the anticipated date when terminal system-wide abandonment occurs as the **Terminal Abandonment Date**.

This new approach means that, where a pipeline has Staggered Retirement Activities, its Collection Period will end sooner than its Terminal Abandonment Date. Only where a pipeline has no Staggered Retirement Activities will the pipeline's Collection Period and Terminal Abandonment Date match. Accordingly, in the SAM-COM sections of this Report, the Commission's focus is sometimes on the Terminal Abandonment Date while, at other times, it is on the Collection Period. For example, whereas in the past the NEB established a maximum Collection Period, the Commission is instead now establishing a maximum Terminal Abandonment Date. The Commission is not setting a maximum Collection Period, though the maximum Terminal Abandonment Date will act as a maximum Collection Period for pipelines with no Staggered Retirement Activities. For pipelines with Staggered Retirement Activities, the need to adjust the Collection Period to account for such activities means that the longest possible Collection Period will end sooner than the maximum Terminal Abandonment Date.

5.1 Terminal Abandonment Dates

5.1.1 Maximum Terminal Abandonment Date

Commission decision

The maximum Terminal Abandonment Date will be 31 December 2054, which is approximately 32 years from now, compared to the former maximum Collection Period of 40 years.

Reasons of the Commission

Prior to this Review, the maximum Collection Period was set at 40 years. Several companies submitted that they were in favour of continuing with a 40-year maximum Collection Period. In support of this position, companies advocated for matching the Collection Period with a pipeline's

³¹ Context and the basis for the submissions on SAM-COM topics are found in the SAM-COM Paper. The full context is not repeated in this Report.

useful life, as determined by factors such as market dynamics, supply and demand for oil and gas in North America, competition, technological progress, and regulatory and policy risk. Companies suggested that, absent these and other factors suggesting otherwise, a 40-year Collection Period remains appropriate. Some companies further submitted that the fundamental factor in establishing a Collection Period is the overall outlook for energy supply and demand. Companies also suggested that a renewed global recognition of the importance of energy security and growing investments and commitments related to carbon capture, utilization, and storage have the potential to extend the reliance on conventional energy sources. The Commission is not convinced that a maximum 40-year Terminal Abandonment Date is appropriate at this time. The Commission finds that, in the current circumstances, there is a compelling case for a shorter maximum. The Commission is of the view that a 40-year maximum would produce elevated risk that more drastic shortening of the maximum Terminal Abandonment Date could be necessary in the future.

The Commission does not consider it prudent to wait to shorten the maximum Terminal Abandonment Date until there is overwhelming evidence (e.g., definitive forecasts) that major abandonments will occur by a particular date, because such evidence might only be available when such a date is relatively near at hand. Rather, the Commission finds that uncertainty in forecasting is a key consideration in determining the appropriate maximum Terminal Abandonment Date today. This aligns with the NEB's decision to reject a longer proposed Collection Period in its MH-001-2013 decision, where the NEB pointed to the upper limit on the ability of a company to forecast demand for transportation services on a pipeline.

The Commission agrees with Indigenous Peoples' submissions' that the Government of Canada's goals and steps toward net-zero emissions could potentially impact the useful life of pipeline systems, and finds it prudent to ensure that funds will be available for their abandonment earlier than 40 years from now. The Commission does not accept, however, their submissions that the maximum Collection Period or Terminal Abandonment Date should be reduced to 25 years, which corresponds to the year 2047, or that the baseline Collection Period or Terminal Abandonment Date should be even sooner than that. While, directionally, the energy transition suggests that abandonments could happen sooner than 40 years from now, there is significant uncertainty as to the ultimate impacts on the demand for pipeline transportation services. The Commission also agrees with submissions that the energy transition may present opportunities for existing pipelines (e.g., to move other products), though the Commission finds that such opportunities are uncertain and tied to the broader long-term energy uncertainty.³²

Overall, the Commission concludes that a maximum Terminal Abandonment Date of approximately 32 years from now – or, more precisely, 31 December 2054 – strikes an appropriate balance between the benefits associated with the security of having funds collected and set aside in a trust, and the potential intergenerational inequity that would arise from collecting funds over too short of a period. While this timing generally aligns with the 40-year maximum established when the NEB's

³² The International Energy Agency's *World Energy Outlook 2022*, released on 27 October 2022 (<https://iea.blob.core.windows.net/assets/c282400e-00b0-4edf-9a8e-6f2ca6536ec8/WorldEnergyOutlook2022.pdf>), is a notable illustration of the current degree of uncertainty and the magnitude of potential change from the energy transition. In the Stated Policies Scenario (premised on policies that are in place or under development), the International Energy Agency projects that Canada would be producing 2 per cent more oil and 6 per cent more natural gas in 2050 than in 2021. In contrast, in the Announced Pledges Scenario (premised on governments meeting their announced climate-related commitments, including longer term net-zero emissions targets), Canada's 2050 oil and natural gas production volumes are 43 per cent and 54 per cent below 2021 levels, respectively. Lastly, while the International Energy Agency does not provide Canadian-specific results for the Net-Zero Emissions scenario (which maps out a way to limit the rise in global average temperatures to 1.5°C), 2050 global oil and natural gas demand in this scenario are more than 50 per cent lower than in the Announced Pledges Scenario. Of note, the CER's 2023 Canada's Energy Future report is planned to include long-term energy projections for full scenarios that, for the first time, are premised on Canada achieving net-zero emissions by 2050.

MH-001-2013 decision was released in 2014 (and where collection and set aside in trusts had to commence by 1 January 2015), the Commission expects that, as more information becomes known about the energy transition, this maximum period may warrant further revisions – whether to correspond to a pre-2050 date, an even later date, or somewhere in between.

For clarity, the Commission confirms that, for pipelines with Staggered Retirement Activities, the effective maximum Collection Period will be shorter than 32 years. That is, even where such a pipeline uses the maximum Terminal Abandonment Date, its Collection Period will have to be reduced to end sooner than that date to account for the Staggered Retirement Activities. This is discussed further in **Section 5.3.3**.

5.1.2 Justifying pipeline-specific Terminal Abandonment Dates

Commission decision

To justify a pipeline's proposed Terminal Abandonment Date in Part 2 of this Review, the Commission requires companies to provide information on supply, markets, and transportation, and include an explanation of how the following were considered:

- the energy transition;
- climate change laws, regulations, and policies; and
- any other foreseeable economic risks.

In addition, where an economic life is used in setting a pipeline system's depreciation rates – often described as an **economic planning horizon** – the economic planning horizon must be provided along with the proposed Terminal Abandonment Date. In instances where the economic planning horizon differs materially from the proposed Terminal Abandonment Date, a clear rationale must be provided to explain why the difference is appropriate.

Reasons of the Commission

The Commission agrees with Participants that supply, markets, and transportation matters represent fundamental factors that should be considered on a pipeline-specific basis to determine the appropriateness of proposed Terminal Abandonment Dates. The Commission further agrees with companies' and landowner associations' submissions that climate change laws, regulations, and policies (and the changing energy landscape more broadly) are factors that should be accounted for in market, supply, and transportation evidence to justify proposed Terminal Abandonment Dates. Therefore, the Commission has decided that, to justify proposed Terminal Abandonment Dates, all companies using trusts that are not fully funded must file pipeline-specific information on supply, markets, and transportation matters. In doing so, companies should explain how the following factors influence the pipeline-specific supply, markets, and transportation matters: the energy transition; climate change laws, regulations, and policies (both in existence and reasonably likely to be tabled); and any other foreseeable economic risks. To the extent there is other supplementary information that is material to the determination of a particular pipeline's Terminal Abandonment Date, that information should also be provided.

The Commission expects the information filed in support of proposed Terminal Abandonment Dates to be commensurate with the size of the pipeline, and that the aforementioned information on supply, markets, and transportation matters should generally accord with the type of information expected as part of applications for new facilities. That is, consistent with several companies' submissions, the information set out in Section A.3 of the Filing Manual should be used as a guide for the specific supply, markets, and transportation information that companies should file to support their proposed Terminal Abandonment Dates.

As part of company justifications for proposed Terminal Abandonment Dates, the Commission has also decided to require that companies provide the economic planning horizons used in their pipeline system's most recent depreciation study. Companies generally indicated that economic planning horizons used in setting depreciation rates could be used to assess the reasonableness of proposed Collection Periods, but the two concepts should not be considered equivalent. Some companies submitted that the Collection Period does not represent an estimate of economic or physical life and that evidence should not be required to support a Collection Period that deviates from the economic planning horizon. Indigenous Peoples suggested that the appropriate consideration of economic planning horizons depends on how the depreciation studies are conducted (e.g., using publicly available corporate strategies, corporate risk registers and disclosures, federal and provincial targets and commitments). The Commission is of the view that, where there is a material difference between the proposed Terminal Abandonment Date and economic planning horizon, companies should provide a detailed rationale to explain why the proposed Terminal Abandonment Date remains appropriate. While economic planning horizons are not equivalent to Terminal Abandonment Dates, the Commission has not heard reasons to suggest that there should typically be a material misalignment between the two. Accordingly, economic planning horizons could provide a helpful metric for assessing the reasonableness of proposed Terminal Abandonment Dates.

Some Participants suggested that there be informational requirements in addition to those specified above – for example, commitments made to Indigenous Peoples, corporate strategies, corporate risk registers and disclosures. While such information may be relevant to assessing the reasonableness of proposed Terminal Abandonment Dates in certain cases, the Commission has decided not to impose additional informational requirements in this regard at this time. However, companies should provide such information where it is material to a pipeline's Terminal Abandonment Date, along with any other supplementary information that is material.

5.2 Rate of return

Commission decision

The Base Case 2021 real rate of return will be 1.25 per cent.

Reasons of the Commission

On 4 March 2010 ([A24600](#)), the NEB updated the pre-tax Base Case 2010 rate of return to 3.5 per cent, reflecting a 1.5 per cent real rate of return, given the Base Case 2010 inflation assumption of 2 per cent.

The assumed real rate of return has a significant impact on the annual contribution amount and ACE. Specifically, the ACE is generally inversely proportional to the assumed real rate of return because of the impact on the annuity factor (i.e., *Provisions for Abandoned Pipelines* rise as the real rate of return falls, and vice versa). The annual contribution amount is likewise generally inversely proportional, not only because of its relationship to the ACE, but also because funds in trust benefit from compound growth through the pre-abandonment years.

The Commission continues to support the concept of capital preservation of funds in a trust and, with no Participant suggesting otherwise, accepts that Government of Canada marketable bonds remain an appropriate benchmark because they reflect a low-risk rate of return. No Participant suggested a fundamental shift in the methodology used to calculate the rate of return for these bonds, although some companies suggested Government of Canada bond yield forecasts could provide some insight into whether historical or current trends are expected to continue or fundamental shifts are expected.

The NEB set the Base Case 2010 rate of return based on the previous 10 years' bond yields and inflation. The Commission observes that the past 10 years have been characterized by abnormally low bond yields net of inflation. Specifically, average long-term Government of Canada bond yields have been approximately equal to average inflation over the last decade. **Figure 1** illustrates the degree to which yields for long-term Government of Canada bonds, net of inflation, have experienced a steady decrease over the past 30 years. The dashed line is the rolling 10-year average bond yield net of the rolling 10-year average inflation rate and shows the gradual change over time that results in the different averages for each decade of data, represented by the grey horizontal lines.

Figure 2 – 30-year history shows decline in Long-Term Bond Yields, Net of Inflation³³



In considering the Base Case 2021 rate of return, the Commission takes a long-term view given the anticipated timing of abandonment activities. The Commission is therefore particularly reluctant to update the rate of return based on recent yields that are at odds with yields from prior decades, as recent yields may not accurately represent investment opportunities in the future. This conservative approach to making changes based on recent yields is supported by the opportunity to make further adjustments in future periodic reviews, if warranted. For example, during the next review, the Commission will have the benefit of more years of data when considering the degree to which low real yields from the last decade (that is, until early 2023) might be indicative of likely future yields.

As suggested by some companies, the Commission has examined the forecasts from major Canadian banks, which are available through 2024. Currently, the average of their forecasts for 10-year and 30-year bond yields net of inflation recover to positive returns of 0.74 to 0.97 per cent,

³³ **Figure 1** shows data for May 1993 through April 2023. Sources: Bond yields are from the Bank of Canada for “Government of Canada marketable bonds, average yield: over 10 years.” Inflation is based on Bank of Canada data for Consumer Price Index Total.

respectively, by the end of 2024.³⁴ The latest Department of Finance Survey of Private Sector Economic Forecasters (from February 2023) shows similar forecasted values and trends, with the forecast 10-year Benchmark Government Bond Rate being above forecast inflation by 0.8 per cent in 2024, and rising to 1.0 per cent in 2026 and 2027.³⁵ Although all of these forecasts are relatively short-term, the Commission considers them to provide some support for a coming change in trend from the past several years where bond yields net of inflation were near-zero or negative.

Weighing all of the above considerations, the Commission finds that a decrease in the Base Case real rate of return to 1.25 per cent is appropriate at this time.³⁶ As has been the case previously, the Commission expects that the Base Case rate will not be appropriate for all companies for their annual contribution amount calculations. Instead, the Commission expects companies to use alternative rate of return assumptions in their annual contribution amount calculations, where warranted by their trust investment strategies.

Finally, the SAM-COM Paper also contemplated whether it might be more appropriate to use multiple Base Case 2021 rates of return to account for a lower rate of return during the trust de-risking phase (for ensuring capital preservation towards the end of a pipeline system's service life). The Commission agrees with companies that factors impacting a trust's rate of return are, to some extent, company-specific, and, therefore, rates of return can also be company-specific. Adding additional rates of return for Base Case 2021 may not result in a material improvement of ACE and SAM-COM calculations, provided that the single Base Case 2021 rate is premised on a sufficiently low-risk investment profile. Accordingly, the Commission has decided to continue to use a single real rate of return for Base Case 2021.

5.3 Abandonment funding plans, Collection Periods, and annual contribution amounts

5.3.1 Timespan of abandonment funding plans

Commission decision

The Commission requires companies using trusts as their SAM to file an abandonment funding plan if the trust is not fully funded, which must cover a pipeline's full abandonment horizon.

Reasons of the Commission

In its MH-001-2013 decision, the NEB directed companies to file preliminary abandonment funding plans in time for the next SAM-COM review. In the SAM-COM Paper, the Commission indicated that, in follow-up to that direction, companies will be required to file preliminary abandonment funding plans after the release of this Report. The Commission also proposed that this direction would only apply to companies using trusts, where the trusts are not yet fully funded (i.e., it would not apply to companies using letters of credit or surety bonds, or with fully funded trusts).

³⁴ Sources of data (accessed on 16 May 2023):

- Bank of Montreal, from the Canadian data in its Forecasts & Recent Releases section from <https://economics.bmo.com/en/>
- Canadian Imperial Bank of Commerce, from its "View All GDP" and "View All Rates & FX" links in its Forecast Snapshots for GDP, available at <https://economics.cibccm.com/>
- Royal Bank of Canada, from its "Economic Forecast Detail – Canada" and "Canada-U.S. Interest Rates and Key FX rates" reports available at <https://thoughtleadership.rbc.com/economics/>
- Scotiabank, from its Forecast Tables available at <https://www.scotiabank.com/ca/en/about/economics.html>
- Toronto-Dominion Bank, from its "Long-Term Canadian Economic Outlook" and "Interest Rate Outlook" tables available at <https://economics.td.com/ca-forecast-tables>

³⁵ See <https://www.canada.ca/en/department-finance/services/publications/private-sector-survey.html>.

³⁶ While this continues to be a pre-tax rate, the Commission has decided not to account for income taxes in the Base Case annuity factor at this time, as described in **Section 4.4.7**.

Companies submitted that five years is an appropriate length for abandonment funding plans because there is sufficient certainty to forecast system component retirement and associated cashflows. They indicated that limited availability of information limits the ability to create long-term abandonment funding plans because specific project scope and timing become well defined only as the timing for abandonment nears. To the extent that intergenerational inequity concerns could arise from a trust's cashflow timing, companies indicated that the appropriate mechanism to mitigate these risks is through setting an appropriate Collection Period, rather than increasing the specificity of abandonment funding plans. The Commission acknowledges that the inherent uncertainty in the longer term poses a challenge to accurately forecasting specific abandonment and decommissioning activities. However, the Commission finds that there remains important value in extending the abandonment funding plan beyond five years. Even if a forecast is incorrect, it is likely a better indication of the future than not having a forecast; not having a forecast is akin to forecasting zero annual abandonment and decommissioning activities after year five until the Terminal Abandonment Date. Requiring abandonment funding plans to cover a pipeline's full abandonment horizon is consistent with the NEB's statement in its MH-001-2013 decision (at PDF page 121 of 176) that it "recognizes the inherent uncertainty in determining abandonment timelines for different components of a system. However, this uncertainty does not absolve companies of their responsibility to identify and manage risk."

The Commission finds that annual contribution amounts should be informed by abandonment funding plans that estimate and anticipate cashflows throughout the pipeline's entire abandonment horizon (that is, for all years until the Terminal Abandonment Date). The Commission is of the view that using abandonment funding plans to inform annual contribution amounts will mitigate risk by helping to ensure that abandonment funds are available when required prior to the abandonment of the entire pipeline. Using abandonment funding plans to inform annual contribution amounts can also help to reduce intergenerational inequity among toll payers. Despite the uncertainty of long-term forecasts, for both of these reasons, the Commission finds that there is material benefit to extending the abandonment funding plan to cover the entire abandonment horizon.

The Commission has decided not to require abandonment funding plans for pipelines that use a trust that is fully funded, letters of credit, or surety bonds as their SAM. The Commission is of the view that the effort involved with preparing abandonment funding plans will be substantial enough that abandonment funding plans should only be required where they are likely to yield material value, as described above for trusts that are not fully funded. Indigenous Peoples submitted that there could be information contained in abandonment funding plans for companies using letters of credit, surety bonds, or fully funded trusts as their SAM that may be materially valuable to Indigenous Peoples. However, Indigenous Peoples did not provide additional information in support of this submission. Accordingly, the Commission finds that there is an absence of clear value at this time to support requiring abandonment funding plans for pipelines with fully funded trusts, letters of credit, or surety bonds as their SAM.

5.3.2 Required contents of abandonment funding plans

Commission decision

The Commission has decided that the following information is required in abandonment funding plans:

- **Most recent historical five years** – Annual summary of actual abandonment and decommissioning costs.
- **Years one to five of abandonment horizon** – Detailed annual abandonment and decommissioning plans, along with expected annual cost requirements, sources of funds, and a forecast of cashflows of the trust.

- **After year five until the Terminal Abandonment Date** – A high-level annual cost estimate for abandonment and decommissioning activities, and cashflow forecast to be generated through a reasonable methodology, along with supporting documentation describing the methodology.

Reasons of the Commission

The CER currently provides high-level guidance on abandonment funding plans in Section B.3 of the Filing Manual, which aligns with what the NEB set out in its MH-001-2013 decision. This Review provides an opportunity to further clarify what information is required in abandonment funding plans. As described in **Section 5.3.1**, the Commission agrees that, as the length of a projection increases, the availability and accuracy of information decreases, which naturally limits the benefits and ability of companies to provide an abandonment funding plan with the same level of annual detail throughout its duration.

Companies submitted that requiring the same level of detail for long-term forecasts as is required for shorter five-year forecasts is impractical and speculative. They submitted that, in the short term, added specificity may reduce potential underfunding of large abandonment projects through highlighting the required adjustment of a company's annual contribution amount. Indigenous Peoples submitted that increased specificity could lead to decreased risk of underfunding and intergenerational inequity, and that more detailed assessment may be appropriate in the first five years than in the longer term.

The Commission agrees that the level of information in abandonment funding plans should decrease in specificity during the abandonment horizon covered in the abandonment funding plan. The intention of requiring more specific information in the short term is to help protect against cashflow issues impacting the availability of funds for near-term abandonment or decommissioning work and to provide a solid information base upon which to generate longer-term cost and funding expectations in the abandonment funding plan.

Some companies indicated that certain abandonment and decommissioning activities are part of ongoing maintenance work and not associated with end of life or cessation of service. For example, facility upgrades may involve decommissioning older assets to replace them with new assets. Where this is the case, and funds from a trust are not accessed, the companies submitted that these costs have no impact on abandonment funding and could be excluded from abandonment funding plans. The Commission accepts that when the decommissioning work is driven by the need to upgrade or replace an asset, and the work will not be funded by funds set aside in a trust, then companies may exclude these activities in their abandonment funding plans (in both their historical and forecast costs).

Having decided that the level of information in abandonment funding plans should decrease in specificity during the abandonment horizon covered in the abandonment funding plan, the Commission requires that abandonment funding plans include the items listed below. With respect to Requirements 1 to 3, as was suggested by some companies, the Commission formed the requirements with reference to the level of information contained in the five-year abandonment/decommissioning outlooks submitted by Group 1 companies in ACE Review 2016. With respect to all costs submitted pursuant to the abandonment funding plan requirements below, companies should specify the dollar-year(s) associated with the submitted costs.

Abandonment funding plan requirements

For the most recent past five years:

- 1) An overview of abandonment and decommissioning activities (because historical actual cost information could provide important contextual information necessary for assessing the abandonment funding plan). Provide a table outlining actual expenses and the source of funds used for abandonment and decommissioning activities (**Table 1 in Appendix 4(d)**).

For the first five years of the abandonment horizon:

- 2) A report outlining abandonment and decommissioning plans. Where possible, provide project specifics. For example, detail by year the type of facilities being abandoned or decommissioned, including information such as the number, length, diameter, and use of pipeline segments; the number of compressor/pumping units or stations; and the number of meter stations.
- 3) A separate table for each source of funds anticipated to be used for abandonment and decommissioning activities (e.g., funds from trust, or funded through cashflow from operations) outlining the annual costs associated with each type of facility, split between abandonment and decommissioning (**Table 2 in Appendix 4(d)**).
- 4) A table showing anticipated cashflows and annual balances of the trust (**Table 3 in Appendix 4(d)**).

After year five until the Terminal Abandonment Date:

- 5) A table outlining the annual costs of abandonment and decommissioning activities for all years beyond year five of the abandonment funding plan (**Table 4 in Appendix 4(d)**). To reflect the increasing uncertainty following the first five years, these costs need not necessarily be tied to specific facilities. Accordingly, no details are required about the facilities being impacted. Instead, these annual costs are to be viewed as an indication of when abandonment and decommissioning work is reasonably expected to occur for a pipeline system and be consistent with the information and analysis used to determine the pipeline-specific Terminal Abandonment Date (e.g., related to supply, markets, and transportation matters).
- 6) A table showing anticipated annual cashflows and balances of the trust (**Table 5 in Appendix 4(d)**).

With respect to Requirement 5, companies should select the methodology used for this longer-term forecast. For example, for a pipeline with abandonment or decommissioning projects in the prior five years or in the first five years of its abandonment funding plan, it may be possible to forecast future costs using some methodology to extrapolate when future abandonment and decommissioning work would reasonably be expected to occur.

Within their abandonment funding plans, companies should include a description of the methodology used to project annual costs and cashflows and explain why it is appropriate. Companies should specify and justify how they account for the costs captured by the *Provisions for Abandoned Pipelines* cost category, within both their cost and cashflow projections.

The Commission expects that some companies may not have completed material abandonment or decommissioning activities in the preceding five-year period and may not anticipate completing any in the first five years covered by the abandonment funding plan. These companies are not excused from Requirement 5. They must substantiate their forecasted abandonment and decommissioning costs beyond year five of the abandonment funding plan. If no activities are anticipated until the

Terminal Abandonment Date, this must likewise be supported by a substantial level of detail, as described in **Section 5.3.4**.

In addition to filing an initial abandonment funding plan in Part 2 of this Review, the Commission expects that companies will provide updated abandonment funding plans in future SAM-COM reviews. Further, the Commission expects companies to file updated abandonment funding plans if there are material changes between reviews that would significantly impact the outcome of the previous abandonment funding plan.

5.3.3 Setting pipeline-specific Collection Periods and annual contribution amounts based on Staggered Retirement Activities

Commission decision

As a default, individual pipeline Collection Periods should be based on the aggregation of weighted averages of the future abandonment and decommissioning dates specified in the pipeline's abandonment funding plan. Consequently, the Commission has decided that a straight-line methodology to calculating annual contribution amounts can continue to be used for pipelines with Staggered Retirement Activities. The following assumptions apply to calculate annual contribution amounts:

- 1) inflation rate of 2.0 per cent;
- 2) the pipeline-specific Collection Period;
- 3) the pipeline-specific rate of return on funds collected;
- 4) the pipeline-specific tax rate; and
- 5) the pipeline-specific estimate of trustee's fees and expenses incurred by the trustee.

Going forward, the Commission directs companies to use the updated annual contribution amount form set out in **Appendix 4(a)** for establishing annual contribution amounts.

Reasons of the Commission

Using appropriate pipeline-specific Collection Periods is of crucial importance, given their role in setting annual contribution amounts. Historically, pipeline-specific Collection Periods (and resulting annual contribution amounts) have been premised on terminal system-wide abandonment occurring as a one-time event at the end of the system's life. The Commission expects that for most companies at least some portions of their pipeline systems will be abandoned or decommissioned prior to the terminal system-wide abandonment. Consequently, if pipeline-specific Collection Periods (and resulting annual contribution amounts) were to continue to assume terminal abandonment will occur as a one-time event, this would heighten the risk of trusts being underfunded at the time of terminal system-wide abandonment.

Landowner associations submitted that full funding for abandonment activities should be collected for a pipeline before the commencing of abandonment activities on that pipeline. They also submitted that early withdrawal of funds for decommissioning activities unduly increases the risk that insufficient funds will be in place to cover the costs of pipeline abandonment at the time of abandonment. While the Commission does not agree that full funding must be collected prior to commencing Staggered Retirement Activities, the Commission finds that individual company Collection Periods should be set in a manner that accounts for the anticipated timing of cash requirements and withdrawals from trusts that are associated with Staggered Retirement Activities.

In terms of how to adjust annual contribution amounts to account for anticipated Staggered Retirement Activities, Indigenous Peoples submitted that, where companies anticipate staggered

abandonment activities, multiple Collection Periods should be applied to facilitate a more detailed and, ideally, accurate ACE. However, Indigenous Peoples did not provide additional information in support of this submission. Companies generally submitted that there should be no requirement to employ multiple Collection Periods to account for or reflect material planned abandonment or decommissioning activities, with some companies stating that this approach could result in significant year-over-year variations in abandonment surcharges that would raise concerns over intergenerational inequities. While there is theoretical appeal in using multiple Collection Periods that match the timing of each material planned retirement (and associated withdrawal), the Commission finds that the merits of such an approach are significantly undermined by the considerable uncertainty that presently exists in relation to the timing of planned retirements and associated trust withdrawals.

Instead, the Commission agrees with companies' suggestion that, to the extent that meaningful retirements are anticipated in advance of a total cessation of operation, it would be appropriate to establish a single Collection Period for the entire pipeline system, recognizing that some retirements will occur before, and some after, the designated Collection Period. However, the Commission does not agree that this approach should continue to be premised on system-wide abandonment occurring as a one-time event. The Commission has therefore decided that a single Collection Period can continue to be used for pipelines that anticipate Staggered Retirement Activities and that the Collection Period in such cases should, as a default, be based on the aggregation of weighted averages of expected Staggered Retirement Activities that are set out in pipeline abandonment funding plans (weighted according to timing and cost). As part of this decision, the Commission also finds that it is acceptable for such pipelines to continue the existing straight-line approach to calculating annual contribution amounts.

Specifically, as a default, the weighted-average methodology for calculating individual pipeline Collection Periods can be as follows:

$$\text{Collection Period} = \frac{\sum [(\text{Retirement Cost}) \times (\text{Retirement Date})]}{\sum (\text{Retirement Cost})}$$

where: Σ denotes summation across all years in the abandonment horizon;

Retirement Cost represents the anticipated cost of abandonment and decommissioning that is forecast in a company's abandonment funding plan in each particular year, measured in consistent base year dollars (e.g., \$2023); and

Retirement Date represents the year (measured as years into the future) of each abandonment and decommissioning cost that is forecast in a company's abandonment funding plan.³⁷

The Commission recognizes that the weighted-average approach to setting Collection Periods and the corresponding straight-line annual contribution amounts result in a degree of systematic mismatch between the exact timing of when funds are expected to be needed and the timing of when they will be set aside. For example, under this approach, abandonment activities occurring at the Terminal Abandonment Date are anticipated to be fully funded at an earlier date (since the trust would become fully funded at an earlier date). The Commission also recognizes that when the weighted-average Collection Period is used along with the updated annual contribution amount form

³⁷ For example, for a company with a 32-year Terminal Abandonment Date and Staggered Retirement Activities for two components of its pipeline system in year 5 (abandonment cost of \$20MM in \$2023) and year 20 (\$15MM in \$2023), with the rest of the system forecast to be abandoned in year 32 (\$100 MM in \$2023), the Collection Period would be calculated as follows:

$$[(\$20\text{MM} \times 5) + (\$15\text{MM} \times 20) + (\$100\text{MM} \times 32)] \div (\$20\text{MM} + \$15\text{MM} + \$100\text{MM}) = 26.67 \text{ years}$$

set out in **Appendix 4(a)**, full funding of trusts would be anticipated to require annual contributions to continue for a period beyond the Collection Period date whenever Staggered Retirement Activities are forecasted.³⁸

However, the Commission is of the view that the weighted-average approach to setting Collection Periods, combined with the calculation of straight-line annual contribution amounts using the form set out in **Appendix 4(a)**, strikes an appropriate balance between various considerations, such as the simplicity and stability of annual contribution amounts, the risk of trusts being underfunded at the time of terminal system-wide abandonment, and intergenerational equity. Nevertheless, the determination of Collection Periods and annual contribution amounts may warrant further consideration and refinement in a future review.

The Commission agrees with companies that suggested that they should be allowed some flexibility to set Collection Periods in relation to their unique circumstances. However, alternative approaches to setting Collection Periods must result in annual contribution amounts that are at least as closely aligned with the timing of material staggered retirements as would be the case using the above approach. The Commission expects companies to substantiate any deviation from the weighted-average approach to setting Collection Periods and the corresponding straight-line annual contribution amounts by providing detailed information on how their proposed approach more closely aligns with the timing of anticipated retirements and withdrawals from trusts, as compared to the default approach outlined above.

5.3.4 Information required to justify a Collection Period based on no Staggered Retirement Activities

Commission decision

The Commission expects a substantial level of detail to be provided to support proposals to base a Collection Period on no Staggered Retirement Activities. The Commission is providing guidance regarding suitable information, but is not establishing standard information requirements.

Reasons of the Commission

As previously articulated by the NEB, the Commission is of the view that, for most pipelines, not all abandonment and decommissioning activities will take place at the same time. The Commission expects that most companies will require some portions of their systems to be abandoned or decommissioned prior to the Terminal Abandonment Date. Considering that failure to appropriately account for the anticipated timing of material interim retirements in setting pipeline-specific Collection Periods has the potential to exacerbate under-collection risk (via their role in deriving annual contribution amounts) and intergenerational inequity, the Commission expects a substantial level of detail to be provided to support proposals to base a Collection Period on no Staggered Retirement Activities.

There is limited information available in connection with this topic due to limited experience to-date. Further, a company's reasons for proposing a Collection Period based on no Staggered Retirement

³⁸ If all assumptions and estimates were to be perfectly realized, full funding would not be anticipated until slightly after the Collection Period date. This arises because of how certain parameters are accounted for. For example, the calculation of straight-line ACAs using the form in **Appendix 4(a)**, using weighted-average Collection Periods, does not account for the fact that amounts withdrawn to pay for Staggered Retirement Activities will not thereafter accrue investment earnings within a trust. In the future, the Commission may look at modifying the Collection Period and/or ACA calculation so that full funding would be anticipated at exactly the Collection Period date. In the meantime, using consistent base year dollars to calculate the weighted-average Collection Period should reduce the contributions needed after the Collection Period date.

Activities may vary. As a result, the Commission is not establishing specific information requirements at this time. However, the Commission expects that, whatever the specific information provided, companies will explain in detail how the information supports the premise that all abandonment and decommissioning activities will occur at a single future point in time. As suggested by several companies, the Commission anticipates that it may sometimes be appropriate to include information about the pipeline system's physical and operational characteristics. Depending on the pipeline's circumstances, companies may also (or instead) need to include the information outlined above in **Section 5.1.2**.

5.3.5 Margin of safety on Collection Periods

Commission decision

The Commission has decided not to require that a margin of safety be imposed on individual pipeline Collection Periods at this time.

Reasons of the Commission

For the following reasons, the Commission disagrees with landowner associations' submissions that abandonment trusts should be fully funded at least five years in advance of abandonment activities:

- As described in **Section 5.1.1**, uncertainty related to long-term forecasting is a key consideration in the Commission's decision on an updated maximum Terminal Abandonment Date. Accordingly, an explicit margin of safety would be somewhat duplicative given that it too would relate to the underlying issue of uncertainty around Terminal Abandonment Dates.
- In **Section 5.3.3**, the Commission finds that pipeline-specific Collection Periods should reflect the Staggered Retirement Activities that are anticipated. As a result, companies with Staggered Retirement Activities will have Collection Periods that end earlier than their Terminal Abandonment Date.
- Large abandonments are still generally expected to be many years away, and the Commission's five-year reviews provide another means to address uncertainty through regular opportunities to reconsider Collection Periods.

The Commission also agrees with some company submissions that an additional margin of safety could give rise to additional intergenerational inequity among shippers.

5.4 Access to funds from trusts

5.4.1 Applications for withdrawals from trusts: filing requirements and potential limits on the amounts released prior to the Terminal Abandonment Date

Commission decision

The Commission has decided not to impose general limits on the amount of funds that can be withdrawn from abandonment trusts prior to a pipeline's Terminal Abandonment Date. However, the Commission has developed updated guidance on the information that it expects companies to provide in applications for withdrawals from trusts.

Reasons of the Commission

Indigenous Peoples submitted that early decommissioning and abandonment should be encouraged and that a general presumptive limit for withdrawals is not appropriate. Instead, they suggested that a company's application to withdraw funds from their trusts prior to the system's end of life should trigger a review of their ACE to determine, to the greatest extent possible, the level of risk that the withdrawal poses on future abandonment funding, cultural inequity, and intergenerational inequity. Landowners submitted that there is an inherent problem with permitting the use of abandonment funds for decommissioning activities in advance of terminal abandonment because it could result in insufficient funds being available at the time of abandonment. They also suggested that, if the use of abandonment funds in advance for decommissioning means that the overall fund becomes underfunded in relation to the ultimate required funding amount, companies should have to make up the shortfall (or provide additional security for the shortfall amount) as a condition of the early withdrawal and use of the funds. The Commission is of the view that applications to access funds from trusts should continue to be assessed on a case-by-case basis, rather than applying general restrictions, and that, along with the additional guidance set out in this section about what information to provide, case-by-case assessments will adequately address the potential for withdrawals to create a shortfall of funds at the Terminal Abandonment Date.

A material misalignment between the anticipated timing or size of trust disbursements to fund interim retirements (as outlined in a pipeline's abandonment funding plan) and the actual timing or size for decommissioning or abandonment activities could contribute to a material change in the risk that a trust would be underfunded at the Terminal Abandonment Date. In particular, where actual interim retirements occur sooner or are more costly than what was anticipated and factored into a pipeline's annual contribution amount, disbursing funds would, all else equal, heighten the risk of underfunding at the end of the system's life. These impacts may be cumulative, such that frequent immaterial unanticipated retirements could eventually materially impact the underfunding risk. To mitigate these concerns, the Commission expects the following:

- In any application to access funds, a company should outline how the timing of the applied-for withdrawal compares with what was anticipated in the pipeline's abandonment funding plan and annual contribution amount derivation. This information is in addition to the information listed in Guide B, Section B.3 (Applications to Access Funds from the Trust to Fund Abandonment) of the Filing Manual.
- Where there is material misalignment between the anticipated and actual timing or size of trust withdrawals (either as a result of a single application or cumulative impacts of multiple applications), companies should substantiate why the applied-for withdrawal remains appropriate considering the potential underfunding risk at the Terminal Abandonment Date. The amount of information and level of detail provided should correspond to the degree to which withdrawals deviate from the pipeline's abandonment funding plan (and hence, from the withdrawals factored into the pipeline's annual contribution amount). There could be instances where a company seeking a withdrawal should address whether and how it intends to ensure that its underfunding risk does not materially increase as a result of the withdrawal (for example, by outlining how the company plans to adjust the pipeline's annual contribution amount to reflect updated information).

In response to landowner associations' concerns about funds being withdrawn from abandonment trusts to pay for decommissioning activities³⁹, the Commission finds that the existing Filing Manual

³⁹ Decommissioning is when a company permanently shuts down the operation of a pipeline, but service is still provided through other pipelines owned by the operator. For example, the same service (i.e. product transportation) still continues through other methods, such as newly built pipelines through the same or a similar

guidance is sufficient and aligned with the Commission's expectation that funds set aside in trusts are only to be withdrawn to pay for decommissioning activities that will not be repeated at the time of abandonment and that reduce future abandonment costs.

5.4.2 Reporting actual cost information in relation to release of funds from trusts

Commission decision

When a company applies to access funds from trust *after* completing abandonment or decommissioning activities, its application should include the following:

- Actual cost information in the format of **Appendix 4(e)**, including an estimated breakdown of actual costs consistent with **Part D of Appendix 4(e)**, except in the case of the smallest projects for which actual costs do not need to be in this format (e.g., those undertaken pursuant to Exemption Order XO/XG-100-2008 related to decommissionings).
- The ACE-implied cost estimate (**AICE**), including a breakdown consistent with **Part E of Appendix 4(e)**, and a variance analysis when actual costs are at least 15 per cent above or below the AICE.

When a company applies to access funds from trust *before* completing abandonment or decommissioning activities, its application should include the following:

- The project cost estimate in the format of **Appendix 4(e)**, including an estimated breakdown of the project cost estimate consistent with **Part D of Appendix 4(e)**.
- The AICE, including a breakdown consistent with **Part E of Appendix 4(e)**, and a variance analysis when the project cost estimate is at least 15 per cent above or below the AICE.

Reasons of the Commission

Section B.3 of the Filing Manual indicates that applications to access funds from trusts should include actual project cost information. These costs are to be broken down by cost category and abandonment activity, as reflected in Base Case 2010 Tables A-3 and A-4 from MH-001-2012, or using a reasonable alternative, explaining how the alternative reflects the cost categories of Tables A-3 and A-4. The Commission finds that additional guidance is warranted with respect to the information that companies should include when applying to access funds from trust. Among other reasons, this additional guidance is warranted because:

- For the first time, companies with trusts that are not fully funded will be filing abandonment funding plans covering their full abandonment horizons, and their annual contribution amounts will be reflective of these abandonment funding plans. These new circumstances interplay with some of the current Filing Manual guidance (quoted below).⁴⁰
- Base Case 2010 Tables A-3 and A-4 from MH-001-2012 (currently referenced in the Filing Manual) will no longer be current upon the issuance of this Report.

route or different pipelines within the same system. When a pipeline is abandoned, its operation permanently shuts down and all service ceases. There are no new pipelines built to provide the same service and service does not continue through other pipelines within a system (CER [Land Matters Guide](#)).

⁴⁰ In particular, in Section B.3 of the Filing Manual, Filing Requirement 1.b requires that companies provide the impacts on ACEs and ACAs from the withdrawal from trust. Filing Requirement 5 requires that companies provide an updated abandonment funding plan if there has been a change to the abandonment funding plan.

- The Commission has heard from companies that, as was the case with Base Case 2010 Tables A-3 and A-4 from MH-001-2012, it would be costly and difficult to provide actual cost information broken down by ACE cost category.
- The Filing Manual does not provide guidance for what cost information should be submitted if the company's application to access funds from trust is filed before completing the abandonment activities.

Using updated tables to file actual cost information

Companies submitted that it would be difficult and costly to transpose decommissioning and abandonment project cost data into the cost categories used in Base Case 2021. Some companies indicated that reporting actual or estimated project costs in this format would require significant changes in company processes and computer systems and that, even after such changes, reporting would still rely on the subjective allocation of some costs.

The Commission finds that reporting project costs in a standardized format will help the CER monitor and understand withdrawals from abandonment trusts and help provide consistent visibility into abandonment and decommissioning activity costs (which, over time, could help to improve or validate how ACEs are calculated). However, the manner of reporting should mitigate the effort and cost required by companies to provide actual cost data, while still allowing the benefits of the data to be realized. Specifically, when companies submit applications for access to funds from trust after project completion, they should submit actual cost information in the format of **Appendix 4(e)**. In addition to the total actual cost, companies are to provide, if available, a breakdown of the actual total cost by the cost categories in the 2021 ACE Calculation Method or, if not available, the estimated percentages of the actual total cost by cost category (see **Part D of Appendix 4(e)**). The Commission expects companies to use reasonable efforts to provide these breakdowns (whether actual or estimated), but does not expect companies to make significant changes to their processes and computer systems to track actual costs using these cost categories. While the breakdowns may not always be accurate, the Commission is of the view that they will nonetheless provide valuable data over time.

For the smallest projects (e.g., those undertaken pursuant to Exemption Order XO/XG-100-2008 related to decommissionings), given that the effort of reporting in the format of **Appendix 4(e)** may not be warranted, actual costs may be reasonably provided in an alternative format. Beyond the smallest projects, however, the Commission is of the view that the difficulty or cost of producing information in this format should typically not excuse companies from providing it.

Providing AICEs

The AICE is a cost estimate for a piece of a pipeline system, generated by applying the methodology used to derive the overall ACE for the entire pipeline system to the piece of the system in question (e.g., a particular decommissioning or abandonment project). The AICE should be net of (i.e., excluding) the *Provisions for Abandoned Pipelines* because those costs are anticipated to be incurred after abandonment. For clarity, the AICE is distinct from a company's actual project cost estimate, which would be based on a project-specific cost estimation process.

While the Commission acknowledges companies' submissions about the potential drawbacks of comparing AICEs with actual (or project estimated) costs, the Commission is of the view that AICEs could nonetheless provide the CER with important information. While every abandonment and decommissioning project within a system would not be expected to have costs that closely approximate the AICE for that project, consistent material discrepancies across projects on a particular pipeline system (or even a material discrepancy on a single sizeable project) may warrant additional scrutiny. Accordingly, the Commission is of the view that AICEs may be helpful in

considering the impacts of a withdrawal on abandonment funding risk. Specifically, AICEs could be used along with (and in assessing) the information submitted in accordance with the following existing guidance in Section B.3 of the Filing Manual:

- Include any impacts on the ACE and annual contribution amount from removing funds for end-of-life work.
- If there have been changes to a previously filed abandonment funding plan, provide a revised abandonment funding plan.

The Commission also anticipates that, as AICE information is collected over time and across companies, this information (including how the AICEs compare with actual costs) could further help improve or validate ACE methodologies and results.

Accordingly, when a company applies to access funds from a trust after completing a decommissioning or an abandonment activity, it should provide the AICE, including a breakdown of the AICE that is consistent with **Part E of Appendix 4(e)**. Further, companies should provide a variance analysis when actual costs are at least 15 per cent above or below the AICE, analyzing the likely reasons for, and the lessons from, the variance.

Further, where the application relates to decommissioning activities, the company should adjust the actual costs and the AICE as follows:

- If any of the decommissioning activities will need to be repeated at the time of abandonment, their actual costs should be reported separately from actual costs for non-repeatable activities.
- Any activities that will still be needed at the time of abandonment should be removed from the AICE.

The company should identify and explain these adjustments, and base the variance analysis on the actual costs and AICE resulting from these adjustments.

Providing cost information when applying to access funds from trust before completing decommissioning or abandonment activities

Currently, the guidance in Section B.3 of the Filing Manual relates to actual costs. In the event that a company applies to access funds from trust before completing the abandonment or decommissioning activity, the company will not yet know the actual costs. In this situation, the company should instead include the following information in its application:

- i) In lieu of actual costs, provide the project cost estimate in the format of **Appendix 4(e)**, including an estimated breakdown of the project cost estimate by the unit cost categories used in Base Case 2021 (see **Part D of Appendix 4(e)**).
- ii) Provide the AICE in the format of **Part E of Appendix 4(e)** and provide a variance analysis whenever the project cost estimate is at least 15 per cent above or below the AICE (using the above AICE guidance).

The Commission considers it likely that, in approving any such application in the future, a condition of approval would be that the applicant must provide actual cost information after project completion. Such a condition could require a company to complete and file the template in **Appendix 4(e)**, both as it pertains to the provision of actual costs and the provision of variance analysis when actual costs are sufficiently different from the AICE. In addition, because any such approval would consider the project cost estimate, a further explanation of variances may also be warranted if actual costs materially diverge from the previously submitted project cost estimate (e.g., by at least 15 per cent).

Considerations for applications for abandonment or decommissioning activities

While the above guidance only applies to applications to access funds from trusts, the Commission is of the view that some of this guidance may also have value in the case of abandonment and decommissioning applications more broadly – that is, applications for the physical activities even where the company does not also apply to access funds from trust. In approving applications for decommissioning and abandonment activities, the NEB and Commission have often required companies to file actual cost information after project completion, and the Commission notes that consistent cost information across time and companies could prove useful for improving or validating ACE methodologies and results in future. Accordingly, the above guidance may warrant the attention of companies preparing abandonment and decommissioning applications.

5.5 Communication, engagement, and notice regarding SAM-COM

5.5.1 Communication and engagement regarding SAM-COM

Commission decision

The Commission has decided not to require companies to develop new, specific communication tools related to SAM-COM, or to undertake SAM-COM-specific engagement activities.

Reasons of the Commission

The Commission agrees with companies that their existing communication tools, practices, and protocols regarding abandonment matters, including the use of existing websites and reporting mechanisms related to abandonment activities and abandonment funding, are adequate for sharing SAM-COM information with Indigenous Peoples and other interested parties. As a result, companies are not required to develop new, specific communication tools related to SAM-COM.

The Commission has also decided that companies are not required to undertake SAM-COM-specific engagement activities. Indigenous Peoples submitted that notice of activities or applications affecting their asserted rights or interests should be provided reasonably in advance of any prospective work or response deadlines, and as soon as reasonably possible, given the nature of the engagement. The Commission is of the view that ongoing and annual engagement activities related to abandonment matters, including financial matters and abandonment funding plans, provide Indigenous Peoples and other interested parties with sufficient opportunities to engage on various abandonment-related topics, including financial matters and SAM-COM. The Commission also notes that Guide B of the Filing Manual sets out engagement expectations for companies related to abandonment planning and abandonment applications.

5.5.2 Notice regarding access to funds from trusts

Commission decision

The Commission has decided that companies are not required to provide notice regarding access to funds from trusts.

Reasons of the Commission

The Commission finds that notice of abandonment applications, as required by subsection 241(2) of the CER Act, provides sufficient notice to potentially affected Indigenous Peoples and landowners of any planned abandonment activities. As outlined in Guide B.2.2 of the Filing Manual, a company is required to provide details of the estimated costs associated with a proposed abandonment in their abandonment application and to confirm how the proposed abandonment activities will be funded. If the company intends to fund the activities with its abandonment trust, then the company can indicate in its application whether it is also applying to access the trust at that time or if it will submit a subsequent application to access trust funds.

Appendix 1 ACEs for all companies with CER-regulated pipeline systems

The table below includes all companies' Base Case 2021 ACEs calculated in Part 1. As Part 2 of the Review progresses and concludes, this table will be updated to include all companies' approved ACEs.

Company (ACE Holder)	Base Case 2021 ACE calculated in Part 1 of the Review		ACE approved in Part 2 of the Review	
	Link	Amount	Link	Amount
1057533 Alberta Ltd.	C24833	\$12,446,590		
2193914 Canada Limited	C24834	\$13,273,075		
2670568 Ontario Ltd.	C24835	\$420,153		
6720471 Canada Ltd.	C24836	\$983,805		
Alliance Pipeline Ltd., as general partner for and on behalf of Alliance Pipeline Limited Partnership	C24837	\$618,505,926		
AltaGas Holdings Inc. for and on behalf of AltaGas Pipeline Partnership	C24838	\$5,047,719		
ARC Resources Ltd.	C24839	\$4,702,652		
Astara Energy Corp.	C24840	\$367,799		
Aurora Pipe Line Company Ltd.	C24841	\$437,588		
Bonavista Energy Corporation	C24842	\$132,435		
Campus Energy Partners Operations Inc.	C24843	\$38,104,259		
Canada Border Services Agency	C24844	\$231,307		
Canadian Natural Resources Limited	C24845	\$19,376,595		
Canadian-Montana Pipe Line Company	C24846	\$503,051		
Canlin Energy Corporation	C24847	\$1,661,771		
Genovus Energy Inc.	C24848	\$13,992,347		
Centra Transmission Holdings Inc.	C24849	\$46,713,637		
Champion Pipe Line Corporation Limited	C24850	\$21,300,872		
Chief Mountain Gas Co-op Ltd.	C24851	\$105,915		
County of Vermilion River No. 24 Gas Utility	C24852	\$153,743		
Crescent Point Energy Corp.	C24853	\$1,377,035		
Emera Brunswick Pipeline Company Ltd.	C24855	\$37,186,394		
Enbridge Bakken Pipeline Company Inc., on behalf of Enbridge Bakken Pipeline Limited Partnership	C24856	\$36,072,478		
Enbridge Gas Inc.	C24857	\$343,599		
Enbridge Pipelines (NW) Inc.	C24858	\$159,951,322		
Enbridge Pipelines Inc.	C24859	\$2,924,807,920		

Company (ACE Holder)	Base Case 2021 ACE calculated in Part 1 of the Review		ACE approved in Part 2 of the Review	
	Link	Amount	Link	Amount
Enbridge Southern Lights GP Inc. on behalf of Enbridge Southern Lights LP	C24860	\$276,210,974		
Enercapita Energy Ltd.	C24861	\$1,604,276		
Express Pipeline Ltd.	C24862	\$107,681,525		
ExxonMobil Canada Properties	C24863	\$12,876,056		
Foothills Pipe Lines Ltd. (includes Foothills Pipe Lines (South B.C.) Ltd.)	C24864	\$424,953,661		
FortisBC Huntingdon Inc.	C24866	\$140,321		
Gear Energy Ltd.	C24867	\$416,262		
Genesis Pipeline Canada Ltd.	C24868	\$11,543,770		
Great Lakes Pipeline Canada Ltd.	C24869	\$19,010,136		
ISH Energy Ltd.	C24870	\$10,980,612		
Kinder Morgan Utopia Ltd.	C24871	\$1,518,431		
Kingston Midstream Virden Limited	C24872	\$30,269,349		
Kingston Midstream Westspur Limited	C24873	\$154,908,407		
Kiwetinohk Energy Corp.	C24874	\$559,876		
LBX Pipeline Ltd.	C24875	\$3,478,042		
Leucrotta Exploration Inc.	C24878	\$551,811		
Lignite Pipeline Canada Corp.	C24879	\$632,046		
Many Islands Pipe Lines (Canada) Limited	C24880	\$101,194,689		
Maritimes & Northeast Pipeline Management Ltd.	C24882	\$197,302,480		
Milk River Pipeline Ltd.	C24883	\$12,304,352		
Minell Pipeline Limited	C24884	\$7,070,983		
Montreal Pipe Line Limited	C24885	\$67,590,658		
Niagara Gas Transmission Limited	C24886	\$9,881,182		
NorthRiver Midstream Canada Partner Limited, as general partner and on behalf of NorthRiver Midstream Canada LP	C24888	\$2,593,319		
NorthRiver Midstream G and P Canada Pipelines Inc., as general partner and on behalf of NorthRiver Midstream G and P Canada Pipelines Limited Partnership	C24889	\$4,925,731		
NOVA Gas Transmission Ltd.	C24890	\$5,638,704,250		
Obsidian Energy Ltd.	C24891	\$2,634,101		
Omimex Canada, Ltd.	C24892	\$120,274		
Ovintiv Canada ULC	C24893	\$19,482,354		
Pembina Energy Services Inc.	C24894	\$9,264,651		

Company (ACE Holder)	Base Case 2021 ACE calculated in Part 1 of the Review		ACE approved in Part 2 of the Review	
	Link	Amount	Link	Amount
Pembina Prairie Facilities Ltd.	C24895	\$62,504,287		
Pieridae Alberta Production Ltd.	C24896	\$565,257		
Pine Cliff Border Pipelines Limited	C24897	\$5,591,726		
Pine Cliff Energy Ltd.	C24898	\$410,312		
Pipestone Energy Corp.	C24899	\$20,840		
PKM Cochin ULC	C24900	\$194,798,151		
Plains Midstream Canada ULC	C24901	\$247,520,781		
Portal Municipal Gas Company Canada Inc.	C24903	\$333		
Pouce Coupé Pipe Line Ltd.	C24904	\$30,775,293		
Prospera Energy Inc.	C24905	\$196,209		
SCL Pipeline Inc.	C24906	\$753,730		
Shiha Energy Transmission Ltd.	C24907	\$3,745,852		
Souris Valley Pipeline Limited	C24908	\$12,013,222		
Spartan Delta Corp.	C24909	\$221,543		
St. Clair Pipelines Ltd.	C24910	\$1,202,043		
Steel Reef Infrastructure Corp.	C24911	\$7,525,318		
Strathcona Resources Ltd.	C24912	\$732,028		
Sunoco Logistics Partners Operations GP LLC on behalf of Sunoco Pipeline LP	C24913	\$1,227,668		
Surge Energy Inc.	C24914	\$1,603,781		
Tamarack Acquisition Corp.	C24915	\$374,008		
TAQA NORTH by its managing partner TAQA NORTH Ltd.	C24916	\$1,515,511		
Tidewater Midstream and Infrastructure Ltd.	C24917	\$5,217,621		
Trans Mountain Pipeline ULC	C24918	\$912,696,666		
Trans Québec and Maritimes Pipeline Inc.	C24919	\$172,227,840		
TransCanada Keystone Pipeline GP Ltd.	C24920	\$423,004,118		
TransCanada PipeLines Limited	C24921	\$4,293,599,744		
Trans-Northern Pipelines Inc.	C24922	\$183,027,567		
Tundra Oil & Gas Limited for and on behalf of Tundra Oil & Gas Partnership	C24923	\$290,790		
Twin Rivers Paper Company Inc.	C24924	\$2,875,261		
Vector Pipeline Limited on behalf of Vector Pipeline Limited Partnership	C24925	\$8,241,872		
Veresen Energy Pipeline Inc.	C24926	\$4,937,088		
Veresen NGL Pipeline Inc.	C24927	\$2,662,203		

Company (ACE Holder)	Base Case 2021 ACE calculated in Part 1 of the Review		ACE approved in Part 2 of the Review	
	Link	Amount	Link	Amount
Westcoast Energy Inc.	C24929	\$882,663,888		
Westover Express Pipeline Limited	C24930	\$51,384,542		
Whitecap Resources Inc.	C24931	\$1,951,439		
Yoho Resources Inc.	C24932	\$205,026		
Zibi Community Utility	C24933	\$214,200		
Total		\$18,607,102,324		

Appendix 2 2021 ACE Calculation Method and Base Case 2021

Note: This summary is provided as Appendix 2 to the Report of the Commission of the Canada Energy Regulator related to the Five-Year Review of Abandonment Cost Estimates and Set-Aside and Collection Mechanisms 2021 (**Report**)

Purpose

The full Report describes in detail the geographic information system- (**GIS-**) based method (**2021 ACE Calculation Method**) that was used by the Canada Energy Regulator (**CER**) to calculate all 2021 abandonment cost estimates (**ACEs**) for companies with CER-regulated pipeline systems in 2021. The purpose of this appendix is to provide an overview, or summary of, the 2021 ACE Calculation Method and to serve as a roadmap to calculations based on data and information in tables and sections of the Report (**Report Tables** and **Report Sections** respectively).

2021 ACE Calculation Method

- 1) The geospatial data provided by companies, as was requested by the Commission ([C19143](#)),¹ was used to classify companies' pipeline systems in the following ways:
 - The lengths of the operating and decommissioned pipelines were categorized by land use using the land categories described in **Report Table 3**, the pipeline diameter categories described in **Report Table 5**, and commodity type. This categorization used the CER's GIS with the publicly available Natural Resources Canada (**NRCan**) land cover geospatial dataset and attributes shown in **Report Table 3** and which is further described in the attachment to this appendix.
 - The total number of crossings by crossing type (water, paved road, unpaved road, and railway) and by pipeline diameter category for operating and decommissioned pipelines were determined by the CER's GIS using the NRCan geospatial datasets and attributes listed in **Report Table 3** and which are described further in this appendix.
 - Above-ground facilities were classified by above-ground facility type.
 - The lengths of already abandoned pipelines were classified by pipeline diameter category.
- 2) The Base Case 2021 abandonment method assumptions in **Report Table 4** were then applied to the total lengths of pipelines, number of crossings, and number of above-ground facilities for those different categories to calculate:
 - the total lengths of pipeline in each pipeline diameter category assumed to be abandoned in place;
 - the total lengths of pipeline in each pipeline diameter category assumed to be removed;
 - the total number of crossings in each pipeline diameter category assumed to be abandoned in place with special treatment (e.g., fill added to pipe); and
 - the total number of above-ground facilities, by type, assumed to be removed.

¹ Appendix 1 of the Commission of the CER's 16 May 2022 letter to the Participants regarding updated Initial geospatial information requirements.

This step only applied to operating and decommissioned pipelines; not already abandoned pipelines.

- 3) Costs for each cost category, listed in the following table and described in **Report Section 4.4**, were then calculated using the assumed values determined in Step 2 above. The calculation methods for each cost category are described in **Report Section 4.4** and use Base Case 2021 unit costs, percentages, and factors for each cost category that are also described in **Report Section 4.4**. All cost categories applied to operating and decommissioned pipelines, whereas only the *Provisions for Abandoned Pipelines* cost category applied to abandoned pipelines.

Cost category	Report section
Land Access, Pipeline Purge and Clean	4.4.2
Abandonment in Place	4.4.3
Pipeline Removal	4.4.4
Remediation, and Reclamation and Restoration	4.4.5
Special Treatment	4.4.6
Provisions for Abandoned Pipelines	4.4.7
Above-Ground Facilities	4.4.8
Engineering and Project Management	4.4.9
Contingency	4.4.10

- 4) The resulting costs for each cost category was summed to determine the value of a company's ACE.

Attachment to Appendix 2 – NRCan geospatial data set attribute definitions

Atlas of Canada Land Cover Dataset definitions²

- **Cropland:** Areas dominated by intensively managed crops. These areas typically require human activities for their maintenance. This includes areas used for the production of annual crops, such as corn, soybeans, wheat, vegetables, and tobacco; perennial grasses for grazing; and woody crops such as orchards and vineyards. Crop vegetation accounts for more than 20% of total vegetation. This class does not represent natural grasslands used for light to moderate grazing.
- **Temperate or sub-polar grassland:** Areas dominated by graminoid or herbaceous vegetation, generally accounting for more than 80% of total vegetation cover. These areas are not subject to intensive management such as tilling, but can be used for grazing.
- **Temperate or sub-polar shrubland:** Areas dominated by woody perennial plants with persistent woody stems, less than 3 metres tall and typically accounting for more than 20% of total vegetation cover.
- **Sub-polar or polar shrubland-lichen-moss:** Areas dominated by dwarf shrubs with lichen and moss, typically accounting for at least 20% of total vegetation cover. This class occurs across northern Canada.
- **Sub-polar or polar grassland-lichen-moss:** Areas dominated by grassland with lichen and moss, typically accounting for at least 20% of total vegetation cover. This class occurs across northern Canada.
- **Sub-polar or polar barren-lichen-moss:** Areas dominated by a mixture of bare areas with lichen and moss, typically accounting for at least 20% of total vegetation cover. This class occurs across northern Canada.
- **Barren land:** Areas characterized by bare rock, gravel, sand, silt, clay, or other mineral material, with little or no “green” vegetation present regardless of its inherent ability to support life. Generally, vegetation accounts for less than 10% of total cover.
- **Temperate or sub-polar needleleaf forest:** Forests generally taller than 3 metres and accounting for more than 20% of total vegetation cover. The tree crown cover consists of at least 75% needle-leaved species.
- **Sub-polar taiga needleleaf forest:** Forests and woodlands with trees generally taller than 3 metres, accounting for more than 5% of total vegetation cover, with shrubs and lichens commonly present in the understory. The tree crown cover consists of at least 75% needle-leaved species. This type occurs across northern Canada and may consist of treed muskeg or wetlands. Forest canopies are variable and often sparse, with generally greater tree cover in the southern parts of the zone than in the north.
- **Temperate or sub-polar broadleaf deciduous forest:** Forests generally taller than 3 metres and accounting for more than 20% of total vegetation cover. These forests have more than 75% of tree crown cover represented by deciduous species.
- **Mixed forest:** Forests generally taller than 3 metres and accounting for more than 20% of total vegetation cover. Neither needleleaf nor broadleaf tree species make up more than 75% of total tree cover, but they are codominant.

² <https://atlas.gc.ca/lcct/en/index.html>

- **Urban and built up:** Areas that contain at least 30% urban constructed materials for human activities (cities, towns, transportation, etc.).
- **Water:** Areas of open water, generally with less than 25% of non-water cover types. This class refers to areas that are consistently covered by water.
- **Wetlands:** Areas dominated by perennial herbaceous and woody wetland vegetation which is influenced by the water table at or near surface over extensive periods of time. This includes marshes, swamps, bogs, etc., either coastal or inland, where water is present for a substantial period annually.

CanVec Series – Hydrographic Features Dataset definitions³

- **Waterbody:** Polygon feature describing a body of water.
- **Watercourse:** Polyline feature which describes a natural body of water through which water may flow, and includes the following attributes:
 - **Canal:** An artificial body of water serving as a navigable waterway or to channel water
 - **Ditch:** Small, open man-made channel constructed through earth or rock for the purpose of conveying water
 - **Diversion:** Diverted water drainage
 - **Lake:** Inland natural flat body of water
 - **Pond:** A body of standing water, usually smaller than a lake
 - **Reservoir:** A wholly or partially man-made body of water for storing or regulating and controlling water
 - **Side Channel:** A channel providing an alternative water way within a flowing body of water
 - **Tidal River:** A natural body of water in which flow and water surface elevation are affected by the tide
 - **Watercourse:** A natural body of water through which water may flow

Canada's National Highway System Dataset definitions⁴

- Pavement Status feature includes attributes indicating improvement to a road surface:
 - **Paved:** A road with a surface made of hardened material such as concrete, asphalt, tar gravel, or steel decks
 - **Unpaved:** A road with a surface made of loose material such as gravel and dirt
- Functional Road Class feature includes attributes indicating the type of roads:
 - **Freeway:** An unimpeded, high-speed controlled access thoroughfare for through traffic with typically no at-grade intersections, usually with no property access or direct access, and which is accessed by a ramp
 - **Expressway / Highway:** A high-speed thoroughfare with a combination of controlled access intersections at any grade
 - **Arterial:** A major thoroughfare with medium to large traffic capacity

³ https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/canvec/doc/info.html

⁴ https://nrm-rnn.readthedocs.io/en/latest/source/en/product_documentation/feature_catalogue.html#road-segment

- **Collector:** A minor thoroughfare mainly used to access properties and to feed traffic with right of way
- **Local / Street:** A low-speed thoroughfare dedicated to provide full access to the front of properties
- **Rapid Transit:** A thoroughfare restricted to public transit buses
- **Resource / Recreation:** A narrow passage whose primary function is to provide access for resource extraction and may also serve in providing public access to the backcountry

National Railway Network Dataset definitions⁵

- Track Classification feature provides functional classification of a track feature and includes the following attributes:
 - **Main:** Main track of the network
 - **Siding:** Track of lower rank that comes off of the main track and is double-ended to rejoin the main track
 - **Spur:** Track of lower rank that comes off of the main track, is single-ended and does not rejoin the main track
 - **Yard:** Complex series of railroad tracks for storing, sorting, or loading/unloading, rolling stock and/or locomotives
 - **Connecting:** Track which branches off a subdivision that establishes a connection to another subdivision
 - **Crossover:** Short connecting track between two or more other tracks
 - **Wye:** Track arranged to form the letter “Y”

⁵ https://ftp.maps.canada.ca/pub/nrcan_rncan/vector/geobase_nrwn_rfn/doc/GeoBase_nrwn_en_Catalogue.pdf

Appendix 4 Reporting forms and templates

Note: Each form or template is listed below and can be accessed via the CER's [website](#), under Abandonment Funding Documents. The CER will update these forms and templates as needed. Their respective links will direct the reader to the most current version of each form or template.

Number	Title
Appendix 4(a)	Annual contribution amount calculation form
Appendix 4(b)	Reporting form – Trusts
Appendix 4(c)	Reporting form – Other than trusts
Appendix 4(d)	Tables – Details required in abandonment funding plans
Appendix 4(e)	Tables – Reporting actual costs
Appendix 4(f)	Table – Information to justify proposed contingency costs in abandonment cost estimates

Appendix 5 Exceptions to strict use of the ACE 2021 Calculation Method

Table 1 – Companies for which geospatial data was created or corrected based on CER records

Company	Outstanding issue(s)	Explanation of how the identified issues were resolved by the Commission
Canada Border Services Agency	<ul style="list-style-type: none"> Information provided by the Agency did not include above-ground facilities, but above-ground facilities were included in the Agency's 2018 ACE. 	<ul style="list-style-type: none"> Four risers were included in the calculation of the Agency's Base Case 2021 ACE.
Chief Mountain Gas Co-op Ltd.	<ul style="list-style-type: none"> Pipeline length information provided by the company did not match the pipeline length confirmed to be regulated by the NEB (now, the CER) during the 2018 ACE review. 	<ul style="list-style-type: none"> Used a pipeline length of 0.7 km, rather than 3 km, to calculate the company's Base Case 2021 ACE.
Crescent Point Energy Corp.	<ul style="list-style-type: none"> An Abandonment Order was recently issued by the Commission for two of the company's pipelines. The operational status attributes for those pipelines in the company's geospatial data were reported as "abandoned." The company has not yet provided confirmation, as per the requirements of the Abandonment Order, that abandonment activities are complete. 	<ul style="list-style-type: none"> The operational status for the pipelines was changed from "abandoned" to "operating" to ensure that abandonment activity costs are included in the Base Case 2021 ACE until abandonment activities are confirmed to be complete.
ISH Energy Ltd.	<ul style="list-style-type: none"> The submitted geospatial data had numerous issues as filed and could not be used to calculate the company's Base Case 2021 ACE. The company did not respond to informal information requests. 	<ul style="list-style-type: none"> Used CER records and the company's 2018 ACE filing to fix the geospatial data provided. This resulted in a pipeline length of 99 km and 4 valves, 2 risers, and 1 pump station being used to calculate the company's Base Case 2021 ACE.
Kiwetinohk Energy Corp.	<ul style="list-style-type: none"> No geospatial data was submitted by the company. 	<ul style="list-style-type: none"> Used CER records and the 2018 ACE filing for the pipeline system to establish geospatial data for the company. This resulted in 15.6 km of abandoned pipeline being used to calculate the company's Base Case 2021 ACE.
Many Islands Pipe Lines (Canada) Limited	<ul style="list-style-type: none"> The company submitted revised geospatial data, which included null (0) counts for some of its above-ground facilities. 	<ul style="list-style-type: none"> Above-ground facilities with a null count were removed from the company's geospatial data.
NorthRiver Midstream Canada Partner Limited	<ul style="list-style-type: none"> Geospatial data provided by the company did not include any above-ground facilities, but above-ground facilities were included in the 2018 ACE for the pipeline system. The company did not respond to informal information requests. 	<ul style="list-style-type: none"> Three valves were included in the calculation of the company's Base Case 2021 ACE.

Company	Outstanding issue(s)	Explanation of how the identified issues were resolved by the Commission
Obsidian Energy Ltd.	<ul style="list-style-type: none"> • None of the requested attributes for above-ground facilities were included in the company's geospatial data so that data could not be used to calculate the company's Base Case 2021 ACE. • The company did not respond to informal information requests. 	<ul style="list-style-type: none"> • Used the company's 2018 ACE filing to fix the geospatial data provided. • Twelve valves were included in the calculation of the company's Base Case 2021 ACE.
Omimex Canada, Ltd.	<ul style="list-style-type: none"> • No geospatial data was submitted by the company. • An Abandonment Order was issued by the Commission for the pipeline system in 2021, but the company has not yet confirmed that abandonment activities have been completed as per the requirements of the Order. 	<ul style="list-style-type: none"> • Used CER records and the company's 2018 ACE to establish geospatial data. • Used a pipeline length of 1.3 km to calculate the company's Base Case 2021 ACE. • To ensure abandonment activity costs are included in the Base Case 2021 ACE until abandonment activities are confirmed to have been completed, the operational status of the pipeline was set as "operating" and not "abandoned."
Ovintiv Canada ULC	<ul style="list-style-type: none"> • No geospatial data was submitted by the company for the already abandoned Deep Panuke pipeline. 	<ul style="list-style-type: none"> • Used CER records and the company's 2020 ACE to establish geospatial data for the Deep Panuke pipeline. • Used a length of 178 km for the Deep Panuke pipeline to calculate the company's Base Case 2021 ACE.
Pipestone Energy Corp.	<ul style="list-style-type: none"> • The operational status attribute for the pipeline was shown as "susp" in the information provided by the company, which is not one of the listed operational status types for use by companies when providing their geospatial data. 	<ul style="list-style-type: none"> • The operational status for the pipeline was changed to "abandoned," in alignment with CER records and the 2018 ACE for the pipeline.
Prospera Energy Inc.	<ul style="list-style-type: none"> • An Abandonment Order was recently issued by the Commission for the company's pipelines. • The operational status attributes for those pipelines in the company's geospatial data were reported as "abandoned." • The company has not yet confirmed, as per the requirements of the Abandonment Order, that abandonment activities are complete. 	<ul style="list-style-type: none"> • The operational status for the pipelines reported were changed from "abandoned" to "operating" to ensure that abandonment activity costs are included in the Base Case 2021 ACE until abandonment activities are confirmed to be complete.
Tamarack Acquisition Corp.	<ul style="list-style-type: none"> • No geospatial data was submitted by the company. • An Abandonment Order was issued by the Commission for the pipeline system in 2020, but the company has not yet confirmed that abandonment activities have been completed as per the requirements of the Order. 	<ul style="list-style-type: none"> • Used CER records and the 2018 ACE filing to establish geospatial data for the company. • Used a pipeline length of 3.3 km to calculate the company's Base Case 2021 ACE. • To ensure abandonment activity costs are included in the Base Case 2021 ACE until abandonment activities are confirmed to have been completed, the operational status of the pipeline was set as "operating" and not "abandoned."

Company	Outstanding issue(s)	Explanation of how the identified issues were resolved by the Commission
TAQA North Ltd.	<ul style="list-style-type: none"> A meter station with a null (0) count was included in the company's geospatial data. An Abandonment Order was issued by the Commission in 2022 for the pipelines, which included removal of the meter station. The company confirmed in 2023 that the abandonment activities have been completed, including removal of the reported meter station. 	<ul style="list-style-type: none"> The meter station has been removed from the company's geospatial data as the facility has been removed.
Twin Rivers Paper Company Inc.	<ul style="list-style-type: none"> The company indicated that the material types of these pipelines are comprised of metal and cement, which are not included as material types in the 2021 ACE Calculation Method. 	<ul style="list-style-type: none"> For the purposes of calculating an ACE, the pipeline material types for the two cement pipelines were changed to "steel" in the company's geospatial data.
Yoho Resources Inc.	<ul style="list-style-type: none"> Geospatial data submitted by the company indicates that the pipeline is "decommissioned." An Abandonment Order was recently issued by the Commission and, as per the requirements of that Order, the company has confirmed that the abandonment activities have been completed. 	<ul style="list-style-type: none"> The operational status of the pipeline was changed from "decommissioned" to "abandoned" in the company's geospatial data.

Table 2 – Companies for which all or portions of their Base Case 2021 ACEs were manually calculated

Company	Identified issue(s)	Explanation of how the ACE was calculated
2670568 Ontario Limited	<ul style="list-style-type: none"> No geospatial data was submitted by the company. The pipeline system is entirely located on bridge and dam structures. NRCan geospatial datasets do not include a land use category for such structures and such a category was not contemplated as part of the 2021 ACE Calculation Method. 	<ul style="list-style-type: none"> An abandonment method assumption of 100 per cent removal was applied to the pipeline lengths shown in CER records as it would be expected that the pipelines would be removed from the bridge and dam structures at the time of abandonment. There are no associated above-ground facilities. Applicable <i>Land Access, Pipeline Purging and Cleaning, Pipeline Removal, Engineering and Project Management, and Contingency</i> unit costs were applied to those pipeline lengths to calculate the ACE.

Company	Identified issue(s)	Explanation of how the ACE was calculated
Plains Midstream Canada ULC	<ul style="list-style-type: none"> • The company provided geospatial data for its pipeline system. • However, the company's 2018 ACE included abandonment costs related to four underground storage caverns and associated brine ponds and above-ground facilities. • Such infrastructure was not contemplated as part of the 2021 ACE Calculation Method. 	<ul style="list-style-type: none"> • The company's 2018 ACE for the underground storage caverns, brine ponds, and above-ground facilities was inflated to \$2023 using an inflation factor of 17 per cent.¹ This amount was then added to the ACE generated by the 2021 ACE Calculation Method for the company's pipeline system to derive an overall ACE.
Zibi Community Utility	<ul style="list-style-type: none"> • The pipeline system is entirely located on a bridge. • NRCan geospatial datasets do not include a land use category for such structures and such a category was not contemplated as part of the 2021 ACE Calculation Method. 	<ul style="list-style-type: none"> • An abandonment method assumption of 100 per cent removal was applied to the pipeline lengths provided by the company in its geospatial data as it would be expected that the pipelines would be removed from the bridge at the time of abandonment. There are no associated above-ground facilities. • Applicable <i>Land Access, Pipeline Purging and Cleaning, Pipeline Removal, Engineering and Project Management, and Contingency</i> unit costs were applied to those pipeline lengths to calculate the ACE.

¹ To arrive at 2023 dollars, the Commission inflated 2018 dollars by 17 per cent, based on total Consumer Price Index inflation between early 2018 and early 2023 (Statistics Canada, Table 18-10-0004-01).