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December 10, 2020

Sent via email/eFile

PNG CPCN FOR SALVUS TO GALLOWAY PROJECT
EXHIBIT A-4

Gordon Doyle
Vice President, Regulatory Affairs, Legal and Gas Supply
Pacific Northern Gas Ltd.
750 – 888 Dunsmuir Street
Vancouver, BC V6C 3K4
gdoyle@png.ca

Re: Pacific Northern Gas Ltd. – PNG-West Division – Application for a Certificate of Public Convenience and Necessity for the Salvus to Galloway Gas Line Upgrade Project – Project Number 1599140 – Information Request No. 1

Dear Mr. Doyle:

Further to your October 9, 2020 filing of the above-noted application, enclosed please find British Columbia Utilities Commission Information Request No. 1. In accordance with the regulatory timetable, please file your responses on or before **Thursday, January 14, 2021**.

Sincerely,

Original signed by:

Marija Tresoglavic
Acting Commission Secretary

/dg
Enclosure

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Pacific Northern Gas Ltd.
Application for a Certificate of Public Convenience and Necessity for the
Salvus to Galloway Gas Line Upgrade Project

INFORMATION REQUEST NO. 1 TO PACIFIC NORTHERN GAS LTD.

Table of Contents **Page no.**

A. HISTORY AND CONTEXT OF APPLICATION

1.0 Reference: HISTORY AND CONTEXT OF APPLICATION
Exhibit B-1 (Application), Section 3.1, p. 14
Pipeline Inspection Report

On page 14 of the Application, Pacific Northern Gas Ltd. (PNG) states:

> The challenge and compromises made to build this pipeline segment in this difficult terrain were identified in a post-construction 1969 Pipeline Inspection Report (1) where it is noted that the section to Prince Rupert experienced the greatest construction difficulties.

Footnote (1) identifies the title of the pipeline inspection report as "Inspection of Pacific Northern Gas Pipeline from Summit Lake to Prince Rupert Report, April 21 and 22, 1969, RM Hardy and Associates Ltd."

1.1 Please provide a copy of the 1969 Pipeline Inspection Report.

2.0 Reference: HISTORY AND CONTEXT OF APPLICATION
Exhibit B-1, Section 3.3, p. 18; Appendix B – BC OGC Order 2011-03
BC OGC General Order 2011-03

On page 18 of the Application, PNG states:

> In 2011, the BC OGC issued an order (General Order 2011-03; see Appendix B) related to a failure on the Salvus to Galloway segment of PNG's Western Transmission Gas Line.

The order directed PNG to undertake a variety of actions, including: implement a vegetation clearing program in accordance with CSA Z662; perform an engineering assessment of the pipeline and develop a hazard mitigation program; assess the hazards and develop a mitigation program related to existing girth welds; amend the IMP to incorporate the actions noted above; and consider pipeline relocation alternatives.

2.1 Please explain if the order directed by the BC Oil and Gas Commission (BC OGC) applies to the entire pipeline from Terrace to Prince Rupert or to the Salvus to Galloway segment specifically.

2.2 Please provide (or provide details of) PNG's response to General Order 2011-03, including any actions taken and any correspondence with the BC OGC related to the order.

2.2.1 Please clarify whether PNG has addressed all of the directives within General Order 2011-03 to the satisfaction of the BC OGC. If any directives within General Order 2011-03 have not been addressed to date, please provide an update on the status of PNG's response.

2.3 Please explain whether any of the repairs proposed to the pipeline segment between Salvus and Galloway have been mandated by the BC OGC, either by General Order 2011-03 or any other Order issued by the BC OGC.

2.4 Please explain any circumstance in which the compliance issues identified in BC OGC Order 2011-03 would not need to be resolved or work would not be required.

BC OGC General Order 2011-03 is provided in Appendix B to the Application. Directive 1(c) of this order directs PNG to "Develop hazard assessment and mitigation methodologies to manage and further assess the hazards imposed by the quality of existing girth welds as determined by the ACUREN report entitled *8" NPS Pipe Failure Investigation Prince Rupert Mainline* and dated December 21, 2010;"

2.5 Please provide a copy of the ACUREN report entitled 8" NPS Pipe Failure Investigation Prince Rupert Mainline.

3.0 Reference: HISTORY AND CONTEXT OF APPLICATION
Exhibit B-1, Section 3.3, pp. 18–20
BC OGC Ongoing Reviews and Audits

On page 18 of the Application, PNG states:

> Recently, the BC OGC initiated a compliance review related to assets greater than 50 years of age. Given the age of the PNG Western Transmission Gas Line it is part of this review. This is inclusive of the Salvus to Galloway pipeline segment. The BC OGC intends to assess overall pipeline condition and CSA Z662 integrity-based compliance through review of historical operating records associated with ILI, subsequent direct assessment and repair, failures and associated emergency repairs, geotechnical evaluations, in-service pressure testing, cathodic protection sufficiency, fitness for service, and engineering assessments. In response to the BC OGC initiative, PNG formulated an action plan for document aggregation and transfer, resulting in the submission of over 1,000 individual files chronicling 20-plus years of historical records and data.

3.1 Please provide an update on the current status of BC OGC's review related to PNG's assets greater than 50 years of age, including the Salvus to Galloway pipeline segment.

3.1.1 Please discuss whether PNG anticipates that the outcome of this BC OGC review would have an impact on the proposed scope of repair work in this Application.

On page 19 of the Application, PNG states:

> PNG's current IMP and associated Safety and Loss Management System (SLMS) were most recently internally assessed for conformance against CSA Z662 and updated in 2020. The updated IMP and associated practices are currently subject to a BC OGC audit that is scheduled for completion before the end of 2020.

3.2 Please provide an update on the current status of BC OGC's IMP audit.

3.2.1 Please discuss whether PNG anticipates that the outcomes of the ongoing BC OGC IMP audit could have an impact on the proposed scope of repair work in this Application.

Further on pages 19 and 20 of the Application, PNG states:

> In 2019, PNG and the BC OGC resumed discussions on PNG's risk identification, assessment, mitigation, and management processes, the need for application on a pipeline segment-to-segment basis, and the previous deficiency findings of the 2014 IMP audit. PNG responded by providing a corrective action project plan that committed the utility to improving risk assessment and management processes and to developing a semi-quantitative segment based risk assessment methodology and risk model for the entire PNG system, with initial implementation in 2020 and mandatory quarterly progress reporting to the BC OGC. <u>Associated work continues to progress on this initiative with the initial implementation stage projected for December 2020</u>. [*emphasis added*]

3.3 Please elaborate on the associated work which continues to progress on this initiative, including, including the desired outcomes of this work.

3.3.1 Please discuss what is involved in the initial implementation stage projected for December 2020.

3.3.2 Please explain how implementation of the corrective action project plan relates to the scope of repair work in this Application.

3.3.2.1 Do outcomes from this action plan have an impact on the scope of repair work in this Application?

3.3.2.2 If so, is this currently accounted for in the proposed project scope, cost estimate and schedule?

4.0 Reference: HISTORY AND CONTEXT OF APPLICATION
Exhibit B-1, Section 3.5.2, p. 22
Pipeline Incidents

On page 22 of the Application, PNG states:

> Since 1991, PNG has experienced at least 35 additional pipeline incidents along the Salvus to Galloway segment, one of which, as noted previously, resulted in an order from the BC OGC (General Order 2011-03, see Appendix B).

4.1 Please clarify whether these additional pipeline incidents occurred in the period between 1991 and 2011, or between 1991 to the present.

4.2 Please provide a table which includes the following information regarding all pipeline incidents from 1991 to 2020:

- Date of incident;
- Pipeline mile post of incident;

- Identified cause;
- Pipeline failure mode (leak or rupture);
- Method of detection;
- Description of any disruption to service as a result of incident;
- Description of repair or mitigation to address incident; and
- Cost to repair or mitigate incident.

5.0 Reference: HISTORY AND CONTEXT OF APPLICATION
Exhibit B-1, Section 3.5.3, p. 23
In-line Inspections

On page 23 of the Application, PNG states:

> The first ILI [In-line Inspection] of the Salvus to Galloway segment of the Prince Rupert NPS 8 transmission mainline was conducted in 1993. Results led to a dent and corrosion-focused integrity inspection and repair campaign under which at least sixteen repair projects in independent locations along the Salvus to Galloway pipeline segment were carried out.

5.1 Please elaborate on the scope of the 1993 corrosion-focused integrity inspection and repair campaign, including what types of inspections and repairs were completed.

5.2 Please discuss any relevant lessons learned from the 1993 integrity inspection and repair campaign (e.g. access to ROW, execution strategies, repair methodology, etc.).

5.2.1 Please explain how any lessons learned have been incorporated into the current scope of repair work in this Application.

B. PROJECT NEED AND JUSTIFICATION

6.0 Reference: PROJECT NEED AND JUSTIFICATION
Exhibit B-1, Section 4.3, p. 29
Reactivated Capacity (RECAP) Project

On page 29 of the Application, PNG states the following:

> PNG anticipates seeking BCUC approval of a planned CPCN application for additional interconnection infrastructure and related capital costs, as well as approval of the underlying contracts associated with the incremental RECAP load.

6.1 Please describe the additional interconnection infrastructure, including when such a project is planned to be undertaken, and the scope and anticipated cost of the project.

6.1.1 Please explain why additional interconnection infrastructure and related capital costs described in the above preamble are planned to be addressed through a separate project.

PNG further states on page 29 of the Application:

> While meeting incremental load from RECAP customers is not the driver of the Project, without the work described in Section 6 of this Application, PNG would be unable to reliably meet the demand related to the RECAP loads. Consequently, the Project will also allow PNG to operate the Western Transmission Gas Line at pressures required to serve RECAP customers in a safe and reliable manner. PNG must consider rate impacts on customers and the ability of customers to pay for capacity additions necessary to

meet the objective of safe, reliable service, compared to the price of alternate energy sources.

6.2 Please explain in detail how PNG's proposed Salvus to Galloway Upgrade Project ties in, overlaps, or is otherwise correlated with its goal to operate the Western Transmission Gas Line at pressures required to serve RECAP customers.

6.3 Please discuss how the RECAP project and PNG's overall vision for attaching new customer load to its Western Transmission Gas Line factored in PNG's decision-making when determining which alternative should be proposed for the Salvus to Galloway Upgrade Project.

6.4 Given PNG's planned filing of the RECAP project Certificate of Public Convenience and Necessity (CPCN) and the size and scope of both projects, please discuss any potential challenges which PNG may face regarding: (i) resources; (ii) project timeline; (iii) financing; or (iv) any other challenges.

6.5 If the Application were not approved as applied for, what would the implications be, if any, on the RECAP project? Please discuss.

7.0 Reference: PROJECT NEED AND JUSTIFICATION
Exhibit B-1, Section 4.6, p. 49
Pipeline Capacity

On page 49 of the Application, PNG states the following:

> PNG's ability to safely and reliably operate its Western Transmission Gas Line, including the Salvus to Galloway pipeline segment, are critical to PNG being able to continue to meet the needs of existing customers, and equally critical to the attachment of new industrial customers in the Prince Rupert and Port Edward areas, including meeting the capacity and timing requirements of RECAP customers as described in Section 4.3.

7.1 Please provide PNG's 20-year demand forecast for the Prince Rupert and Port Edwards areas.

7.1.1 Please explain PNG's methodology for developing its 20-year demand forecast, detailing all assumptions made.

7.1.2 Please describe the anticipated capacity and timing requirements of RECAP customers.

7.2 Please provide Load Duration Curves for the pipeline supplying the Prince Rupert and Port Edwards areas now and at the end of the 20-year planning period, which shows the peak demand for each day of a design year.

7.3 Please provide the pipeline capacity and associated operating pressure required to meet the demand needs of: (i) existing firm customers; (ii) interruptible customers; and (iii) new industrial customers, including and excluding RECAP customers, in the Prince Rupert and Port Edward areas.

7.3.1 Please describe the methodology and assumptions that PNG uses to calculate the required capacity and associated operating pressure for the pipeline.

7.4 Please provide the pipeline capacity at the licensed maximum operating pressure (MOP).

7.4.1 Please describe how the MOP of the pipeline is determined.

7.5 Please provide a graph of pipeline capacity (at current operating pressure and MOP) and the current year and the 20-year forecasted peak demand of: (i) firm customers; (ii) interruptible customers; and (iii) new customers.

8.0 Reference: PROJECT NEED AND JUSTIFICATION
Exhibit B-1, Section 5.3.1.1, pp. 57–58
Prevention of Leaks and Ruptures

On pages 57 and 58 of the Application, PNG states that it considered, for each alternative, Prevention of Leaks and Prevention of Ruptures, among other factors, within the category of Pipeline Integrity and Asset Management. PNG explains that a leak could be repaired without incurring natural gas service loss to downstream customers while a rupture would result in a loss of service to all downstream customers for an extended period.

8.1 Please describe further the ability of the Terrace to Prince Rupert pipeline to sustain gas supply to customers in the event of an incident resulting in a failure (leak and/or rupture).

8.2 Please describe how PNG repairs a pipeline leak without incurring a loss of gas service to downstream customers.

8.3 Please describe PNG's emergency response plan in the event of a rupture on the Terrace to Prince Rupert pipeline.

9.0 Reference: PROJECT NEED AND JUSTIFICATION
Exhibit B-1, Section 3.5.2, p. 22
Pipeline Review

On page 22 of the Application, PNG states:

> In 1991, an internal PNG technical report (1991 Report) identified risks that were related to the original design, construction, and commissioning, operating and maintenance history, pipeline physical characteristics, and geohazards. Particular matters of note included the facts that the pipeline segment traversed extremely difficult terrain, that there was limited-to-no access for heavy equipment for repair and risk mitigation work purposes, and that historically there were limited funds available for upgrading the pipeline in risky areas.

9.1 Please explain if the risks identified in the internal PNG technical report relate to the Salvus to Galloway segment or to the entire pipeline from Terrace to Prince Rupert.

9.2 Please provide a copy of the internal PNG technical report.

PNG further states on page 22 of the Application:

> The 1991 Report also noted that to mitigate the impacts of these challenges PNG had historically operated the line at a reduced operating pressure equating to an effective design factor of 50% rather than the normal practice of operating at an 80% design factor. On one hand, this operational decision, which continues to be followed, may have mitigated some of the potential adverse impacts associated with the condition of the pipeline. Conversely, if PNG could have operated as originally intended, at the higher design factor, PNG would not have had to absorb losses to operational flexibility, line pack, and resiliency.

9.3 Please explain why reducing the operating pressure may have mitigated potential adverse impacts associated with the condition of the pipeline.

9.3.1 Please describe the aforementioned adverse impacts.

9.4 Please explain why increasing the operating pressure would improve operational flexibility, line pack and resiliency.

9.5 Please explain in detail how PNG's goal to operate the pipeline at pressures required to serve RECAP customers may affect the aforementioned adverse impacts.

10.0 Reference: PROJECT NEED AND JUSTIFICATION
Exhibit B-1, Section 4.3, p. 28
Infrastructure Criticality

PNG states on page 28 of the Application that the region also has a number of Indigenous communities that have long-term economic development opportunities tied to having a secure and reliable natural gas pipeline to serve the area.

10.1 Please provide additional details regarding any specific Indigenous community economic development opportunities which are contingent on the presence of a natural gas pipeline, or the availability of natural gas.

C. DESCRIPTION AND EVALUATION OF ALTERNATIVES

11.0 Reference: UPGRADE PIPELINE ALTERNATIVES
Exhibit B-1, Section 5.2.3, pp. 53-54, Section 5.3.2, p. 59
Evaluation Method

On pages 53 and 54 of the Application, PNG states that the Upgrade Pipeline alternative would address compliance with the applicable codes and standards. However, PNG expects "some continued residual pipeline integrity risk, as only the highest priority corrosion features, dents or geohazards would be addressed."

On page 59 of the Application, PNG states that it scored each alternative on an overall basis on a range from 0 to 5 based on their consistency with the definitions for each of the Evaluation Criteria, including Pipeline Integrity Management.

11.1 Please confirm, or otherwise explain, that all four Upgrade Pipeline sub-options would ensure long-term compliance with the applicable codes and standards, including BC OGC General Order 2011-03.

11.2 Please elaborate on PNG's rationale for scoring the four Upgrade Pipeline sub-options on a range from 0 to 5 for the Pipeline Integrity Management criteria.

11.3 Please qualify and quantify the residual pipeline integrity risk that would exist with each of the four Upgrade Pipeline sub-options.

11.4 Please explain any circumstance in which the work to address residual pipeline integrity risk would be undertaken in a subsequent project, and not in the current Application.

11.4.1 If a separate project would be required, please describe the anticipated scope, cost and timeline for the work.

12.0 Reference: UPGRADE PIPELINE ALTERNATIVES
Exhibit B-1, Section 5.5.5.1, p. 65
Metal Loss and Dents

On page 65 of the Application, PNG provides the following explanation for Finite Element Analysis (FEA):

> Metal loss features can be easily assessed for safe maximum operating pressure given anomaly size and degree of pipe wall thinning. Dents, however, cannot be similarly assessed and per CSA Z662 must be repaired unless deemed acceptable by an

engineering assessment, typically consisting of FEA. FEA of dents typically assess dent depth, length to depth ratio, strain, corrosion features, and other stress concentrators that may be present. FEA can also use operational history to assess historic pressure cycling and estimate remaining life. A dent proven acceptable by engineering assessment could provide an opportunity for cost savings to the project by avoiding potentially unnecessary repair costs.

12.1 Please provide a detailed quantitative and qualitative explanation for how metal loss features are assessed for safe maximum operating pressure, including:

- how safe maximum operating pressure relates to the current operating pressure and the licensed maximum operating pressure of the pipeline; and
- how other hazards (discontinuous pipe support, slope stability, seismic) were factored into the assessment of metal loss features.

12.2 Please further explain how FEA is used to estimate remaining life. As part of this response, please explain all assumptions and calculations.

12.3 Please discuss the impact of increased or decreased operating pressure on the capital costs for repairs due to metal loss and / or dents. In your response, please address the impact of a lower maximum operating pressure within the pipeline capacity required to serve existing customers and any potential cost saving to the project.

13.0 Reference: ALTERNATIVES CONSIDERED
Exhibit B-1, Section 5.2.4, pp. 54–55; Appendix H
Alternative 4 – Deactivate Pipeline and Supply with Liquefied Natural Gas (LNG)

On page 54 of the Application, PNG states that "for the purpose of this analysis, PNG determined that it would require a secure source of supply, over which it had control, in the region."

13.1 Please discuss PNG's rationale for requiring control over its LNG supply.

13.2 Please discuss whether PNG considered other potential sources of LNG supply in the region such as LNG Canada in Kitimat.

13.2.1 If yes, please explain the supply arrangements considered and why PNG determined that it would not be feasible to pursue.

On page 55 of the Application, PNG states:

> PNG engaged Solaris Management Consultants Inc. to develop a high level cost estimate of this alternative for screening purposes (see Appendix H). Indications are that capital expenditure for infrastructure required to supply the area with LNG would cost between $235 million and $364 million (as-spent dollars).

13.3 Please explain in detail how PNG developed the operational requirements (LNG production capability and storage volume) for the LNG alternative.

13.4 Please explain in detail how Solaris developed the cost estimates for the LNG alternative, including all assumptions made.

13.5 Please provide examples of other LNG facilities in Canada which are similar in size to the LNG alternative. For each identified facility, please describe the operation and provide the LNG production capability and capital cost of the facility, where available.

14.0 Reference: ALTERNATIVES EVALUATION
Exhibit B-1, Section 5.3.2, p. 61; Section 4.1, p. 25
Weighting of Scoring Criteria

On page 61 of the Application, PNG provided the following table showing the overall weighting of evaluation criteria:

Evaluation Criteria	Weight
Pipeline Integrity and Asset Management	40%
Project Delivery, Operational Assurance and Stakeholder Impact	20%
Financial and Customer Impacts	40%

14.1 Please further explain how PNG determined the specific percentage weightings for the three evaluation criteria and the rationale for each of the weightings.

Further on page 61, PNG provided the following tables showing the weightings for each category within the three evaluation criteria:

Pipeline Integrity and Asset Management	Weight
Prevention of Leaks (small release, no loss of service)	25%
Prevention of Ruptures (major release, loss of service)	45%
Proactive Asset Management and Lifecycle Optimization	15%
Foundational Technical Solution	15%

Project Delivery, Operational Assurance and Stakeholder Impact	Weight
Project Delivery	20%
Environmental	15%
Lands and Right of Way	10%
Consultation and Engagement	15%
Operational	10%
System Capacity & Reliability	25%
Socio-economic Benefit	5%

Financial and Customer Impact	Weight
NPV of Incremental Annual Revenue Requirement (65 years)	80%
Rate Impact	20%

14.2 For each of the three evaluation criteria, please explain how PNG developed the categories within each criterion and how it determined the appropriate weighting for each category.

14.3 Please explain how the costs associated with each of the categories in the Project Delivery, Operational Assurance and Stakeholder Impact criterion were considered when evaluating each alternative, including whether these costs were included in the Project Delivery, Operational Assurance and Stakeholder Impact criterion itself or in the Financial and Customer Impact criterion (or both) and why.

On page 25 of the Application, PNG states:

> The objective of the proposed Project is to remediate the Salvus to Galloway pipeline segment as a necessary and cost-effective solution to address existing compliance deficiencies relating to applicable pipeline standards and to ensure the continued provision of safe, reliable natural gas service to PNG's customers in the Prince Rupert and Port Edward areas.

14.4 Please explain in detail the rationale for the System Capacity and Reliability overall weighting of 5 percent (25 percent of the evaluation criteria weighted at 20 percent), given that a primary objective of the Project is to ensure the continued provision of safe, reliable natural gas service to customers.

15.0 Reference: ALTERNATIVES EVALUATION
Exhibit B-1, Section 5.3.1.3, pp. 59, 62, 64
Financial Scoring of Alternatives

On page 59 of the Application, PNG states:

> PNG undertook a financial evaluation of long-term rate impacts through an analysis of the present value of the incremental revenue requirement, as well as the delivery rate impact the year after construction is completed and the assets are placed into service based on the estimated capital cost and operating cost for each alternative. For a fair net present value comparison, future incremental sustainment capital and operating expenditures over the 65-year operational period for each alternative was included.

PNG states on page 62 of the Application that the Upgrade Pipeline solution identified four variations for capital repairs of the 80 kilometer section of pipeline to address the extensive corrosion, dents, geohazards and related necessary pipeline repairs. These sub-alternatives or Upgrade Alternatives (UA) are referred to as UA 1, UA 2, UA 3, and UA 4, and are summarized in Table 5-6.

PNG further states on page 64 that: "Following the initial screening and selection of the Upgrade Pipeline alternative, all of UA 1, UA 2, UA 3 and UA 4 were deemed feasible; however, the final project definition required further evaluation of these sub-alternatives to produce a practical and appropriate project scope while still meeting all project objectives."

15.1 Please describe the sustainment capital projects for each alternative.

15.2 Please confirm, otherwise explain, if sustainment capital includes pipeline upgrades.

15.3 Please explain if each of the 4 Pipeline Upgrade sup-options will require additional upgrades during the 65-year operational period, and if the cost of future upgrades has been included in the financial analysis for each of the options.

15.3.1 If not, please explain why not, including why future upgrades will not be necessary.

15.4 If the future upgrade cost to the pipeline was factored into the financial analysis, would option UA 2 still be the preferred alternative? Please explain and provide all supporting calculations and assumptions.

D. PROJECT DESCRIPTION

16.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 6.1, p. 75
Pipeline Specification and Design Criteria

On page 75 of the Application, PNG states "The Project proposed in this Application involves repairing sections of the NPS 8 pipeline between Salvus to Galloway on PNG's Western Transmission Gas Line, following the scope of Alternative UA 2 as described in Section 5."

16.1 Please provide a table which includes the following information for each identified dent or metal loss feature and each identified geohazard along the NPS 8 pipeline between Salvus to Galloway which have been included as part of the scope of repairs in this Application:

- Project segment (e.g. Salvus to Razorback, etc.);
- Pipeline MP of the dent or metal loss feature or geotechnical mitigation;
- Distance (km) west of Salvus Station;
- Brief description of the dent or metal loss feature or geohazard;
- Brief description of proposed remediation technique;
- Confirmation repair required based on CSA Z662 Clause 10.10 criteria; and
- Repair or mitigation priority level.

17.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 6.2.2, p. 77; Appendix J, p. 16
Pipeline Specification and Design Criteria

On page 77 of the Application, PNG states:

> Taking a conservative approach, PNG will select and design materials and pressure testing specifications for a CSA Z662 Class 2 location, which allows for consistent materials to be used through the Project and capacity for future development near the right of way. This is a design decision that results in negligible difference in cost relative to Class 1 location requirements.

17.1 Please clarify whether PNG is assuming a Class 2 location when determining all design and operation requirements necessitated by CSA Z662 (e.g. valve spacing, depth of cover, evaluation and repair of imperfections, etc.).

17.2 Please discuss the likelihood of future development in the Class location assessment area for the Salvus to Galloway pipeline.

On page 16 of Appendix J to the Application, PNG states:

> It is expected sectionalizing valves will be installed between Salvus and Galloway stations to assist with operational and maintenance flexibility. Their locations and specifications will be determined at a later phase of the project but will be based on ease of access and benefits to operational flexibility.

17.3 Please discuss whether the current project scope and project cost estimate includes the addition of any new or replacement sectionalizing valves.

17.4 Please explain whether the current or proposed valve spacing on the Salvus to Galloway mainline assumes a CSA Z662 Class 2 location designation.

18.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Appendix J, p. 24
Assessment of Existing Girth Welds

On page 24 of Appendix J to the Application, PNG states:

> Due to a historical order from the BC OGC, any original construction welds that are exposed will be evaluated to current standards and repaired as needed using pressure containing sleeves or using cut-out (pipe replacement) method.

18.1 Please clarify how many girth weld repairs or replacements PNG has currently incorporated in the Project scope.

18.2 Please discuss the potential cost and schedule impact to the Project if all exposed girth welds require repair or replacement.

19.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 6.2.2.7, p. 80
Finite Element Analysis (FEA)

On page 80 of the Application, PNG states:

> Engineering critical assessment incorporating FEA shall be used to verify potential repair avoidance opportunities for high-priority dents identified by the most recent ILI data analysis but not meeting the definition of a defect under CSA Z662. Any opportunities realized through completion of FEA will reduce both cost and resource expense on the Project.

19.1 Please confirm how many dents have been identified by PNG as candidates for FEA.

19.2 Please explain whether PNG is able to complete the FEA using currently available information from ILI runs or whether field-collected dent dimensional information is required.

19.3 Please clarify what repair methodology is included within the project scope for all dent locations identified as FEA candidates.

19.4 Please provide the anticipated impact to the Project scope, cost and schedule if all FEA candidate dent locations require repair.

20.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 6.4.5, p. 89; Section 6.4.7, p. 90; Appendix G, p. 8; Section 9.3.8, p. 134
Project Repair Sites

On page 89 of the Application, PNG states, "Site mobilization is expected to start immediately following CPCN approval and to continue through 2023 as required per the Project schedule."

20.1 Please explain how many individual repair sites are currently contemplated in the Project (i.e. some sites can address multiple dent or metal loss features or geohazards).

On page 90 of the Application, PNG states:

> The duration of construction at each of the repair or installation sites will vary depending upon a number of factors including access limitations for crews, equipment and materials, weather, effective daily work hours available, and, in the case of repairs, the extent of damage found.

On page 8 of Appendix G to the Application, PNG states that "2 Camps for workforce accommodation have been included in the pipeline portions between Salvus and Galloway Rapids."

20.2 Please discuss whether remote camps are required for ease of access to site by construction crews.

20.2.1 If so, have remote camps been included within the current scope of the Project and the current Project cost estimate.

20.2.2 If not, please explain whether PNG investigated the pros and cons of establishing remote camps and the outcomes of this investigations.

PNG states on page 134 of the Application that it received an offer from a landowner for PNG to use their private land on Prudhomme Lake as a staging area or a workcamp.

20.3 Please clarify if PNG has accepted this offer, and if it is one of the remote camps mentioned on page 8 of Appendix G.

21.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 6.6.1, p. 89
Project impacts: Environmental

On page 92 of the Application, PNG states, "Project work will be performed in the identified least-risk timing windows as much as possible or with additional prescriptive mitigative measures as required."

21.1 Please elaborate on the scheduling constraints imposed by the least-risk timing windows.

21.1.1 Please discuss how the least-risk timing windows have been accounted for in the construction schedule.

21.1.2 Please discuss which least-risk timing windows have the greatest impact or potential impact on the construction schedule.

22.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 6.6.2, p. 93; Section 8.3, p.120
Project impacts: Cultural

On page 93 of the Application, PNG states, "Potential archaeological impacts identified will be further assessed by PNG during the Archaeological Impact Assessment (AIA) process."

On page 120 of the Application, PNG states:

> The desktop review and PFR [Preliminary Field Reconnaissance] report indicated that areas of archaeological potential exist within the Project footprint and an AIA is recommended to be completed before any clearing or other land remediation activities are undertaken in the identified areas. Work on the AIA commenced in August 2020.

22.1 Please provide an update on the AIA process.

22.2 Please discuss any anticipated impacts to the Project scope, cost and schedule that may result from the outcomes of the AIA process.

23.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 6.8.1, p. 97
Risk Identification and Qualitative Analysis

On page 96 of the Application, PNG identifies the following Project Risks (left column), Risk Descriptions (centre column) and Mitigation Strategies (right column) in Table 6-7:

4	Unable to achieve required depth of cover	Unknown as to whether rock blasting for the ditch can be managed, and obtaining desired design depth may not be possible or require rework.	▪ Terrain mapping performed in FEED. ▪ Perform as much field reconnaissance as possible in high risk areas prior to construction to determine if any indications of bedrock. ▪ Follow company blasting specifications. ▪ Rock hammering may be used as last resort in short sections. ▪ Assume high percentage of rock in planning and estimating. ▪ Plan for other mitigations other than deeper cover or accept higher risk.

23.1 Please explain whether field reconnaissance has been completed on all high risk areas to determine if there are any indications of bedrock.

23.2 Please elaborate on other mitigation options available to PNG if the required depth of cover cannot be achieved.

23.2.1 Please discuss the cost impact to pursue the other mitigation options available should the necessary depth of cover not be achievable.

23.3 Please discuss what is meant by "accept higher risk."

23.4 Please explain, with reference to applicable codes, standards and PNG internal integrity management planning, how PNG determines whether a higher risk is acceptable.

16	Park Use Permit (PUP) not defined or received	PUP in Khyex Conservancy does not cover area needed for Project and PUP amendment not received in time for planned construction.	▪ Engage BC Parks and BC OGC early in 2020 and perform permitting as early as possible.

23.5 Please clarify whether PNG has determined that an amended Park Use Permit is required.

23.5.1 If an amended Park Use Permit is required, please explain the impact of this requirement on both Project cost and Project schedule.

23.6 Please provide an update on PNG's engagement efforts to date with BC Parks, the BC OGC and any First Nations regarding work to be performed within the Khyex Conservancy.

24.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Appendix G, pp. 15–16
Identified Risks

On pages 15 and 16 of Appendix G to the Application, PNG lists the following high level project risks:

- Management of sediment run-off during construction, when constructing in close proximity to the Skeena, the Kasiks and the Khyex rivers in particular, and in the vicinity of many other fish bearing streams;
- Heavy rain and wet snow conditions could have a significant adverse effect on schedule;
- Constructing through some very challenging terrain conditions (tight valleys either side of the Razorback and over the Razorback) and in close proximity to pristine fish bearing streams;
- Geo hazards in the tight valley conditions between Salvus and the mouth of Khyex River;
- Managing environmental sensitivities based on project commitments, and escalated regulatory expectations being experienced on other current pipeline projects in BC;
- Management of sediment controls and right of way erosion incidents between construction seasons, and post construction, could be very expensive;
- Availability of skilled workforce in a heated market place; and
- Potential cost increase to most facets of construction during a heated market.

24.1 Please discuss what mitigations PNG has included within the current Application to address these identified project risks.

25.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 1.2.3, p. 3; Section 4.3, p. 29; Section 6.3, pp. 83, 85–86
Project Cost Estimate

On page 83 of the Application, PNG provides the following table showing a summary of the Project capital budget:

Table 6-4: Project Cost Summary

Cost Element *($ millions)*	**As-spent $**	**2020 $**
Indirect Costs:		
Engineering and Project Development	$ 1.25	$ 1.19
Permitting (Lands, Environmental, Archaeological)	2.02	1.92
S2G Project and Construction Management	8.55	8.13
	11.82	11.24
Direct Costs:		
Procurement	0.90	0.86
Construction (Equipment and Labor)	54.55	51.90
	55.45	52.75
Subtotal	67.27	63.99
Contingency (20%)	13.45	12.80
Subtotal including Contingency	80.73	76.79
Management Reserve (5%)	4.04	3.84
Total Capital Cost	**$ 84.76**	**$ 80.63**

25.1 Please discuss the accuracy of the Project cost estimate.

On page 3 of the Application, PNG states:

> Following the screening analysis PNG determined that the Upgrade Pipeline alternative was the only option that had an acceptable balance of cost, the ability to comply with applicable codes and regulations in a timely manner, and could also meet the capacity and timing needs for future RECAP customers.

Further, on page 29 of the Application, PNG states:

> While meeting incremental load from RECAP customers is not the driver of the Project, without the work described in Section 6 of this Application [Project Description], PNG would be unable to reliably meet the demand related to the RECAP loads. Consequently, the Project will also allow PNG to operate the Western Transmission Gas Line at pressures required to serve RECAP customers in a safe and reliable manner.

25.2 Please explain whether the Project scope and capital cost estimate include any activities that are needed solely to serve future RECAP customers.

25.2.1 If confirmed, please provide a breakdown of these RECAP costs included in the cost estimate by year and cost category and please provide reference(s) to where these costs have been included in the project cost estimate.

25.2.2 If confirmed, and if possible, please provide the estimated project cost to upgrade the pipeline for safety, reliability and compliance with codes and standards only (i.e. excluding costs driven by RECAP). If not possible, please explain why not.

25.3 Please discuss in detail the impacts on the Project, both quantitative and qualitative, if RECAP does not proceed due to unforeseen circumstances.

On page 85 of the Application, PNG states that "contingency is exclusive of necessary management reserve which has been set at 5%."

In addition, on page 86, PNG states. "Further, the management reserve will address unknown project-related risks that may materialize during project implementation that have high consequence but a low likelihood of occurring."

25.4 Please explain how five percent was determined to be an appropriate management reserve for the Salvus to Galloway Project CPCN.

26.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 2.5, p. 11; Section 5.7, p. 73; Section 6.3, p. 87
Project Cost Estimate

On page 73 of the Application, PNG states that it "has completed rigorous analysis over a two-year period that has been validated and supplemented by the work of third-party experts" and provides the following related footnote:

> Dynamic Risk Assessment Systems Inc., BGC Engineering Inc., Skystone International LP, Lauren Services, Solaris Management Consultants Inc., Innovative Pipeline Projects Ltd., Khtada Environmental Services Ltd., Chartwell Consulting Services Ltd., Roy Northern Land and Environmental Ltd., Revay and Associates, and Strait Projects Ltd.

Further, on page 87 of the Application, PNG states:

> The cost estimate was developed with the support of Lauren Services and a purpose-built project cost estimating team comprised of the following applicable subject matter experts in their respective disciplines identified in Table 6-5.

Table 6-5: Subject Matter Experts Used in Development of Cost Estimate

Company	Subject Matter
BGC Engineering Inc.	Geohazard inventory, hazard identification, risk assessment, alternatives cost/benefit analysis, and risk mitigation conceptual design
Chartwell Consultants Ltd.	Access management and improvement development
Dynamic Risk Assessment Systems Inc.	Pipeline integrity and ILI response
Khtada Environmental Services Limited	Aquatic and terrestrial habitat assessments, environmental constraints analysis, stream identification and classification, and environmental related permitting
Lauren Services	Pipeline engineering
McElhanney Consulting Services Ltd.	Survey
Revay and Associates Ltd.	Quantitative risk analysis
Roy Northern Land and Environmental Ltd.	Archeological reviews and permitting
Strait Projects Ltd.	Construction execution

26.1 Please confirm or explain otherwise, whether these costs have been included in the project cost estimate.

26.1.1 If confirmed, please provide the costs, by year and cost category, associated with the services provided by each third-party and subject matter expert outlined in the preamble and please indicate where these costs have been included in the project cost estimate.

On page 11 of the Application, PNG provides contact details for "Farris LLP," the legal counsel engaged by PNG for the Application.

26.2 Please confirm or explain otherwise, that these costs have been included in the project cost estimate.

26.2.1 If confirmed, please provide the expected costs by year associated with the legal services provided by Farris LLP on the Application and please indicate where these costs have been included in the project cost estimate.

27.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 3.1, p. 16
Project Cost Estimate

On page 16 of the Application, PNG states:

> Upon obtaining the required regulatory approvals from the BCUC and the BC OGC, PNG will undertake work to address the highest priority integrity issues as required by the applicable codes and standards, improving reliability of service, and reducing overall pipeline risk.

27.1 Please confirm or explain otherwise, that these costs have been included in the project cost estimate.

27.1.1 If confirmed, please provide the expected costs by year associated with the required regulatory approvals from the BCUC and the BC OGC and please indicate where these costs have been included in the project cost estimate.

28.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Section 1.2.6, pp. 5–6
Project Cost Estimate

On page 5 of the Application, PNG states:

> Key components of PNG's project development process include early consultation and engagement with Indigenous communities, identified stakeholders, and the general public and maintaining two-way communication with affected and interested parties.

Further, on page 6 of the Application, PNG states:

> As the Project develops and moves throughout the various project stages, PNG will continue to work with Indigenous communities to ensure they are consulted, engaged and kept informed of Project developments and that they have an opportunity to comment on updated environmental and archaeological management plans as they are developed.

28.1 Please confirm, or explain otherwise, whether the cost to date and future expected cost associated with the consultation and engagement with Indigenous communities, identified stakeholders and the general public for the Project have been included in the project cost estimate.

28.1.1 If confirmed, please provide a breakdown of these costs by year and please indicate where these costs have been included in the project cost estimate.

29.0 Reference: PROJECT DESCRIPTION
Exhibit B-1, Appendix G, p. 14
Project Cost Estimate

On page 14 of Appendix G to the Application, PNG states: "The current Statistics Canada Infrastructure Escalation Index rate of 2.68% per annum has been applied to construction costs occurring after the first year of construction activity."

29.1 Please confirm or explain otherwise, that the escalation factor of 2.68 % per annum has been applied to all construction costs, occurring after the first year of construction activity, in the project estimate and why PNG considers this appropriate.

29.1.1 If confirmed, please explain whether there are any non-recurring construction costs included in the project cost estimate which have been escalated.

30.0 Reference: PROJECT DESCRIPTION
PNG-West 2020-2021 Revenue Requirements Application (RRA) proceeding, Exhibit B-7, BCUC (Information Request) IR 117.1; Exhibit B-9, BCUC Panel IR 2.2
Project Cost Estimate

In response to BCUC IR 117.1 in the PNG-West 2020-2021 RRA proceeding, PNG provided the following breakdown of 2018 and 2019 actual costs and Test Year 2020 and 2021 forecast costs for the Salvus to Galloway remediation project:

	Actuals		Forecast	
Cost Element	**2018**	**2019**	**2020**	**2021**
PNG Labour	$ 600	$ -	$ 76,000	$ 150,000
Engineering and Design	200,699	345,375	791,400	497,800
Survey	100,200	-	-	-
Lands, Permitting, C&N	-	76,514	30,000	-
Environmental	-	103,590	50,000	-
Material Procurement	5,700	30,336	25,680	613,020
Construction	-	-	753,000	756,000
Contingency	-	-	172,610	201,680
Total Costs	$307,199	$555,815	$1,898,690	$2,218,500

In response to BCUC Panel IR 2.2 for the PNG-West 2020-2021 RRA, PNG stated:

> While costs incurred to date and into 2021 were initially envisioned and required for developing and supporting activities justified within the 2018-2019 and 2020-2021 RRAs, PNG confirms that portions of the 2018 to 2021 capital expenditures specified in response to BCUC IR 117.1 will support the forthcoming CPCN (or Section 44.2) application and for pipeline condition remediation and risk reduction activities beyond the test period. [*Emphasis Added*]

30.1 Please confirm, or explain otherwise, that the project cost estimate in the CPCN application excludes the 2018 to 2021 costs outlined in response to BCUC IR 117.1.

30.1.1 If not confirmed, please provide the amount, by year and cost category, that has been included in the project cost estimate in the CPCN, including references to where these costs have been included in the project estimate and please provide an explanation for why PNG considers this appropriate.

E. PROJECT COSTS, ACCOUNTING TREATMENT AND RATE IMPACTS

31.0 Reference: PROJECT COSTS, ACCOUNTING TREATMENT AND RATE IMPACTS
Exhibit B-1, Section 7.1, pp. 102–103; Section 7.3, p. 106; Cover Letter of Exhibit B-1, p. 3; PNG-West 2020-2021 Revenue Requirements Application (RRA) proceeding, Exhibit B-2, p. 18
Financial Analysis

On pages 102 and 103 of the Application, PNG states:

> PNG has undertaken a financial analysis of the Project over a 65-year period. Table 7-2 that follows provides a summary of the initial 7 years of the analysis. The full details of the financial analysis are presented in Appendix N, submitted on a confidential basis.

Table 7-2: Summary Financial Analysis

Salvus to Galloway - Alternative 1 - Base Case for 65 years	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Cost of Service							
Depreciation of utility plant	-	382,194	1,061,870	1,304,009	1,304,009	1,304,009	1,304,009
Tax on depreciation	-	141,359	392,747	482,305	482,305	482,305	482,305
Amortization of Net Salvage	-	76,434	212,360	260,785	260,785	260,785	260,785
Tax on Amortization of Net Salvage	-	28,270	78,544	96,455	96,455	96,455	96,455
Interest on utility plant	192,135	797,103	1,399,432	1,518,520	1,489,629	1,460,738	1,431,847
Return on equity on utility plant	548,717	2,063,117	3,348,294	3,633,226	3,564,102	3,494,977	3,425,852
Tax on return on equity	202,950	763,070	1,238,410	1,343,796	1,318,229	1,292,663	1,267,096
CCA Tax Reduction	(1,102,584)	(2,607,633)	(2,443,973)	(2,015,612)	(1,854,366)	(1,706,020)	(1,569,541)
Property Tax	-	-	-	-	-	-	-
Total Ratebase Items	(158,783)	1,643,914	5,287,684	6,623,483	6,661,147	6,685,911	6,698,807
Operating Costs		-	-	-	-	-	-
TOTAL COST OF SERVICE	**(158,783)**	**1,643,914**	**5,287,684**	**6,623,483**	**6,661,147**	**6,685,911**	**6,698,807**
Utility Plant - Total							
Balance (bop)	**0**	**24,842,865**	**69,022,283**	**84,761,468**	**84,761,468**	**84,761,468**	**84,761,468**
Utility Additions							
461 - Land rights	1,839	3,451	1,203	-	-	-	-
465 - Transmission mains	24,841,027	44,175,967	15,737,981	-	-	-	-
Balance (eop)	**24,842,865**	**69,022,283**	**84,761,468**	**84,761,468**	**84,761,468**	**84,761,468**	**84,761,468**
Add: Acc. Depreciation	-	(382,194)	(1,444,065)	(2,748,074)	(4,052,083)	(5,356,092)	(6,660,102)
Add: Acc. Amortization of Net Salvage Value	-	(76,434)	(288,794)	(549,578)	(810,363)	(1,071,148)	(1,331,932)
Less: Reduction of Net Salvage Value	-	-	-	-	-	-	-
Average Rate Base	12,421,433	46,703,260	75,796,132	82,246,213	80,681,419	79,116,625	77,551,831
Ending Net Rate Base	19,874,660	68,563,655	83,028,610	81,463,816	79,899,022	78,334,228	76,769,434
465 - Transmission Mains - rate							
Acc. Amortization of Net Salvage Value - bop	-	-	76,434	288,794	549,578	810,363	1,071,148
Amortization of Net Salvage	-	76,434	212,360	260,785	260,785	260,785	260,785
Acc. Amortization of Net Salvage Value - eop	-	76,434	288,794	549,578	810,363	1,071,148	1,331,932
Assumptions:							
Annual Inflation	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Annual Infrastructure Construction Price Escalation	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Infrastructure Construction Price Escalation (2020 = base year)	102.7%	105.4%	108.3%	111.2%	114.1%	117.2%	120.4%
2021 Application - Cost of Service	42,248,182	42,248,182	42,248,182	42,248,182	42,248,182	42,248,182	42,248,182
Year-over-year Change		4.3%	8.6%	3.2%	0.1%	0.1%	0.0%

31.1 Please confirm, or explain otherwise, that the financial analysis excludes any costs associated with future RECAP customers.

31.1.1 If not confirmed, please provide a breakdown of these RECAP costs included in the analysis by year and please provide reference(s) to where these costs have been included in the analysis.

31.2 Please discuss why PNG selected a 65-year period for its financial analysis of the project and why PNG considers this appropriate.

31.3 Please discuss the likelihood of the Salvus to Galloway pipeline having a useful life of 65 years as a result of the upgrades in the Application.

31.4 Please explain why there are no operating or maintenance costs included in the total cost of service for the analysis in Table 7-2.

31.5 Please explain whether PNG expects any significant change(s) in operating or maintenance costs as a result of the Project compared to 2019 and 2020 costs.

31.5.1 If yes, please provide details of the amount and timing of the operating and/or maintenance cost changes anticipated.

On page 106 of the Application, PNG provides the following table showing the rate impacts associated with the Project alone (i.e. excluding RECAP costs and revenues):

Table 7-5: Rate Impact of the Project

	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Cost of Service ($)							
2021 Revenue Requirements Application	42,248,182	42,248,182	42,248,182	42,248,182	42,248,182	42,248,182	42,248,182
Salvus to Galloway	(158,783)	1,643,914	5,287,684	6,623,484	6,661,147	6,685,911	6,698,807
Total	42,089,399	43,892,096	47,535,866	48,871,666	48,909,329	48,934,093	48,946,989
Revenue Deficiency/(Sufficiency) ($)							
Salvus to Galloway Project	(158,783)	1,643,914	5,287,684	6,623,484	6,661,147	6,685,911	6,698,807
CAGR Relative to 2021 Rates		4.3%	6.3%	5.1%	3.8%	3.1%	2.5%
Year over Year Rate Increase	**-0.4%**	**4.3%**	**8.3%**	**2.8%**	**0.1%**	**0.1%**	**0.0%**
Residential delivery rates ($/GJ)	12.68	13.23	14.32	14.73	14.74	14.74	14.75

The following is a BCUC staff extract from Table 6 on page 18 of the PNG-West 2020-2021 RRA, showing the cost of service for 2021 compared to 2020:

Table 6: Amended Cost of Service Comparison – Test Year 2021 vs Test Year 2020

EXPENSES ($000's)	Test Year 2021	Test Year 2020	Difference Total	Difference Subtotal
Total Cost of Service Excluding Company Use Gas Cost	**42,009**	**39,678**	**2,332**	**2,332**
Company Use Gas Cost	568	500		
Total Cost of Service Including Company Use Gas Cost	**42,578**	**40,177**		

31.6 Please reconcile the "2021 Revenue Requirements Application" cost of service" of $42,248,182, as outlined in red in Table 7-5, to the PNG-West 2020-2021 RRA cost of service for 2021 of $42,578,000, including references to the differences, if appropriate.

On page 3 of the cover letter to the Application, PNG states:

> Appendix N includes cost estimates, containing capital cost estimates for the Project. Again, PNG submits that this appendix should be kept confidential on the basis that should the Application be approved, PNG expects to seek competitive bids for the materials and construction work required to execute the Project, and disclosure of the estimated costs for the material and construction work would prejudice PNG's negotiating position and competitive tendering processes.

31.7 Please elaborate on the reasons for treating Appendix N to the Application as confidential, given that the capital cost estimates for the project appear to be provided on an overall basis in this financial analysis.

31.8 Please confirm whether PNG continues to consider Appendix N to be confidential in its entirety.

31.8.1 If not, please provide a public redacted version of Appendix N. If yes, please explain further why the entire Appendix N should be considered confidential.

32.0 Reference: PROJECT COSTS, ACCOUNTING TREATMENT AND RATE IMPACTS
Exhibit B-1, Section 7.3, pp. 106–108
Rate Impacts

On page 106 of the Application, PNG provides the following table showing the anticipated average rate impact for residential customers of the project on a standalone basis:

Table 7-6: Summary of Cost and Rate Impact

Cost Impacts	
Capital Cost ($2020)	$80,633,475
Average Annual Impact on Cost of Service[1]	$6,442,899
Average Rate Impacts	
Incremental cost of service (per GJ)[1]	$2.23
Residential usage/year (GJ)[2]	68.3
Impact to annual residential bill	$152
Average change to 2021[2] residential bill	11.2%

[1] Over first 20 years of service

[2] Based on 2021 as per 2020-2021 Revenue Requirements Application

32.1 Please confirm, or explain otherwise, that the average annual impact on cost of service of $6,442,899 is based on the 20-year period from 2024 to 2043.

32.1.1 If confirmed, please explain why PNG considers this appropriate.

32.1.2 If confirmed, please explain why the 20-year period beginning in 2021 was not used as the basis for the average annual impact on cost of service.

On page 107 of the Application, PNG provides the following table showing the rate impacts of the project including all costs and revenues related to the 65 MMSCFD RECAP volumes:

Table 7-7: Rate Impact of the Project plus RECAP Volumes of 65 MMSCFD

	2021E	2022E	2023E	2024E	2025E	2026E	2027E
RECAP Revenue	-	**852,506**	**12,343,726**	**24,370,404**	**30,056,127**	**29,838,886**	**29,939,060**
Cost of Service							
2021 Revenue Requirements Application	42,248,182	42,248,182	42,248,182	42,248,182	42,248,182	42,248,182	42,248,182
Salvus to Galloway	(158,783)	1,643,914	5,287,684	6,623,484	6,661,147	6,685,911	6,698,807
RECAP	-	33,766	1,084,999	946,820	4,664,359	4,056,342	4,312,079
Total	42,089,399	43,925,863	48,620,865	49,818,486	53,573,688	52,990,435	53,259,068
Revenue Deficiency/(Sufficiency)							
Salvus to Galloway Project	(158,783)	1,643,914	5,287,684	6,623,484	6,661,147	6,685,911	6,698,807
RECAP Margin	-	(818,740)	(11,258,727)	(23,423,584)	(25,391,768)	(25,782,544)	(25,626,981)
Total	(158,783)	825,174	(5,971,043)	(16,800,100)	(18,730,621)	(19,096,633)	(18,928,174)
CAGR Relative to 2021 Rates		2.0%	-7.3%	-15.5%	-13.6%	-11.3%	-9.4%
Year over Year Rate Increase		**2.0%**	**-15.8%**	**-29.9%**	**-7.6%**	**-1.6%**	**0.7%**
Residential delivery rates ($/GJ)	12.68	12.93	10.89	7.64	7.06	6.95	7.00

32.2 Please confirm, or explain otherwise, that the RECAP revenue forecasts in Table 7-7 are based on the executed Transportation Service Agreements (TSAs).

32.3 Please explain why the RECAP revenue is expected to commence in 2022.

32.4 Please explain why the RECAP revenue is expected to increase significantly from 2022 to 2023 and continue to grow significantly until 2025.

32.5 Please provide a breakdown of the RECAP cost of service each year in Table 7-7 by cost category.

32.6 Please discuss the basis for the RECAP cost of service provided in Table 7-7.

32.7 Please confirm, or explain otherwise, that the Salvus to Galloway project costs will not be recovered through rates in Pacific Northern Gas (N.E.) Ltd.

32.8 Please confirm, or explain otherwise, that the Salvus to Galloway project costs will be recovered through all rate classes in PNG-West.

32.9 Please clarify whether the Salvus to Galloway project costs will be recovered through rates for new industrial customers.

On page 108 of the Application, PNG provides the following table showing the rate impacts of the project including costs and revenues "associated with the smaller of the two RECAP proponents' load of 30 MMSCFD:"[1]

Table 7-8: Rate Impact of the Project plus RECAP Volumes of 30 MMSCFD

	2021E	2022E	2023E	2024E	2025E	2026E	2027E
RECAP Revenue	-	-	2,113,652	10,568,258	12,681,910	12,983,074	13,167,848
Cost of Service							
2021 Revenue Requirements Application	42,248,182	42,355,682	42,031,611	42,358,967	42,248,182	42,248,182	42,248,182
Salvus to Galloway	(158,783)	1,643,914	5,287,684	6,623,484	6,661,147	6,685,911	6,698,807
RECAP	-	-	(181,957)	664,826	888,763	905,331	929,570
Total	42,089,399	43,999,596	47,137,338	49,647,276	49,798,092	49,839,424	49,876,560
Revenue Deficiency/(Sufficiency)							
Salvus to Galloway Project	(158,783)	1,643,914	5,287,684	6,623,484	6,661,147	6,685,911	6,698,807
RECAP Margin	-	-	(2,295,609)	(9,903,433)	(11,793,147)	(12,077,743)	(12,238,277)
Total	(158,783)	1,643,914	2,992,075	(3,279,949)	(5,132,000)	(5,391,832)	(5,539,470)
CAGR Relative to 2021 Rates		3.9%	3.5%	-2.7%	-3.2%	-2.7%	-2.3%
Year over Year Rate Increase		**3.9%**	**3.1%**	**-13.9%**	**-4.8%**	**-0.7%**	**-0.4%**
Residential delivery rates ($/GJ)	12.68	13.18	13.58	11.70	11.14	11.06	11.02

32.10 Please discuss how the 30 MMSCFD would be allocated between the interconnection locations (i.e. Prince Rupert and Terrace).

32.11 Please explain the basis for the RECAP revenue forecasts provided in Table 7-8.

32.12 Please explain why the RECAP revenue is expected to commence in 2023, if the RECAP volume is 30 MMSCFD, instead of 2022 if the RECAP volume is 65 MMSCFD.

32.13 Please explain why the RECAP revenue is expected to increase significantly from 2023 to 2024 and additionally increase by approximately 20 percent from 2024 to 2025.

32.14 Please provide a breakdown of the RECAP cost of service each year in Table 7-8 by cost category.

32.15 Please discuss the basis for the RECAP cost of service provided in Table 7-8.

32.16 Please explain why the expected RECAP cost of service is approximately 78 percent lower in 2027 if the RECAP volume is 30 MMSCFD rather than 65 MMSCFD ($4,312,079 in Table 7-7 compared to $929,570 in Table 7-8).

33.0 Reference: PROJECT COSTS, ACCOUNTING TREATMENT AND RATE IMPACTS
Exhibit B-1, Section 7.3.4, pp. 106, 108, 111
Rate Impact Mitigation

On page 106 of the Application, PNG states that on a standalone basis, it anticipates that the project would have the following rate impact:

> As shown, PNG's residential customers would see a delivery rate increase of approximately $2.23/GJ relative to rates proposed for 2021 in PNG's 2020-2021 Revenue Requirements Application, which is equivalent to an annual bill increase of $152 or 11.2%.

On page 108 of the Application, PNG states:

> PNG is mindful of the rate impacts of project costs in the development period and may

[1] Exhibit B-1, Section 7.3, p. 106.

apply to the BCUC for approval of a new deferral account, if considered necessary, to defer some or all of the incremental cost of service associated with the Project in its initial years to mitigate rate volatility. PNG would seek amortization of this new deferral account in future revenue requirements applications following the realization of RECAP volumes and the associated revenues.

33.1 Please explain whether PNG have considered any rate impact mitigation proposals which are not associated with the RECAP project.

33.1.1 If yes, please discuss the alternative rate impact mitigation proposals considered by PNG, including the advantages and disadvantages of each and please explain why each alternative was rejected.

33.1.2 If not, please explain why not.

33.1.3 If not, please discuss how PNG will mitigate rate shock for its customers if the RECAP project does not proceed.

33.2 Please confirm, or explain otherwise, that the new deferral account referred to in the preamble is the "project-specific deferral" account, as shown in Tables 7-9 and 7-10.

On page 111 of the Application, PNG states:

> In this scenario, PNG illustrates the use of the rate smoothing mechanism to mitigate rate impacts during the three-year period that project costs are incurred and RECAP demand ramps up. This example also illustrates that excess RECAP revenue above the RECAP cost of service will be captured in the LVIDA for future amortization, to provide flexibility in avoiding rate shock if and when the RECAP contracts expire, and to mitigate rate impacts of unforeseen circumstances in the future. In addition, this scenario also illustrates the use of a new project specific deferral account during the development period. PNG notes that the use of all three mechanisms may not be necessary to manage rate changes over time. [*Emphasis Added*]

33.3 Please discuss how PNG will decide which mechanism to use in order to manage rate stability, including any factors PNG will consider in determining the appropriate mechanism.

33.4 Please explain the purpose of the new project specific deferral account.

33.5 Please explain how PNG will determine the amount to be captured in the new project specific deferral account.

33.5.1 Please explain whether these costs could be captured in the existing rate smoothing deferral account, and the implications of doing so.

F. ENVIRONMENT AND ARCHEOLOGY

34.0 Reference: ENVIRONMENT AND ARCHEOLOGY
Exhibit B-1, Section 8.2.4.2, p. 119
Provincial Regulatory Requirements

PNG states on page 113 of the Application that Khtada selected several environmental components for review in the Environmental Constraints Report based on their regional experience, the spatial and temporal scope of the Project and anticipated project environment interactions.

34.1 Please confirm if Khtada or PNG solicited the input of Indigenous groups prior to commencing the report.

PNG states on page 119 of the Application: "The BC OGC requires demonstrated consultation with potentially impacted Indigenous nations, as well as engagement with landowner and/or rights holders."

34.2 Please clarify what, in the view of PNG, would constitute "demonstrated consultation."

35.0 Reference: ENVIRONMENT AND ARCHEOLOGY
Exhibit B-1, Section 8.2.5, pp. 119-120
Land Use

On pages 119 and 120 of the Application, PNG states:

> Several federal First Nations Reserve lands intersect with or are situated in close proximity to the pipeline right of way or access routes in the Project area. These include Kasika No. 72, Kasiks River No. 29, Ksagwisgwas No. 63, Khyex No. 64, and Khyex No. 8. PNG notes that the pipeline is routed through Kasika No. 72 and Khyex No. 8. Cabins are located along the Kasiks River and are believed to belong to recreational users, suggesting that the valley has important recreational value. The pipeline does not interfere with these potential users.

35.1 Please discuss what steps PNG has taken to contact the affected groups to confirm that the pipeline does not interfere with these potential users, in particular Kasika No. 72 and Khyex No. 8.

35.2 Please provide a map showing the pipeline right of way, and the First Nations Reserve lands described above.

On page 120 of the Application, PNG states:

> Government-sanctioned documents may also impose environmental constraints on a project, depending on the scope. These can include Ministerial Orders (i.e. Ungulate Winter Range, Species at Risk identified through the Identified Wildlife Management Strategy) or land use planning and management guidelines and objectives (i.e. North Coast Land Use Management Plan, Great Bear Rainforest Land Use Objectives). PNG will adhere to all applicable directives as outlined in government sanctioned documents, as required.

35.3 Please clarify if PNG has established if there are any existing directives which affect the Project. If yes, please discuss the impacts for the Project, if applicable. If no, please discuss what steps PNG plans to take to identify all applicable directives.

G. CONSULTATION AND ENGAGEMENT

36.0 Reference: CONSULTATION AND ENGAGEMENT
Exhibit B-1, Section 9.3.1, p. 126
Potentially Affected Stakeholders

PNG states on page 126 of the Application that in the development of the Communication and Engagement Plan for the Project, it identified key stakeholders and assessed the potential impact of the Project on each stakeholder.

36.1 Please outline the methodology used by PNG to identify key stakeholders, and to assess the potential impact of the project on each stakeholder.

On page 126 or the Application PNG states:

> The following public stakeholders have either already been engaged by PNG or will be engaged as the Project advances though its various phases:
>
> - General Public – residents, businesses, industrial customers, RECAP customers as well as landowners that will be directly impacted by the Project;
> - British Columbia Provincial Government Agencies – BC OGC; BC Parks; Ministry of Forests, Lands, Natural Resource Operations and Rural Development; Ministry of Environment; Ministry of Transportation & Infrastructure; and Ministry of Energy, Mines and Petroleum Resources.
> - Federal Agencies – Transport Canada and Department of Fisheries and Oceans.
> - Municipal and Regional Governments – City of Prince Rupert and District of Port Edward.

36.2 In table format, please clarify which of these stakeholders have or have not yet been engaged by PNG. If not yet engaged by PDG, please specify plans and timelines for contacting these stakeholders.

37.0 Reference: CONSULTATION AND ENGAGEMENT
Exhibit B-1, Section 9.3.6, p. 130
Communications Materials to Support Engagement

PNG states on page 130 of the Application that a "Project Fact Sheet was sent to all identified stakeholders in Table 9-2, above, as well as the Indigenous communities identified in Section 9.4.1."

37.1 Please confirm on which page Table 9-2 is located, or provide the missing table if applicable.

38.0 Reference: CONSULTATION AND ENGAGEMENT
Exhibit B-1, Section 9.3.2, p. 126; Table 9-1, p. 127
Engagement Approach

PNG states on page 126 of the Application that it "proactively engaged those stakeholders anticipated to be most impacted by the Project and notified/informed those who may have an interest in it."

38.1 Please describe the approach used by PNG to determine who would be most impacted by the Project.

Table 9-1 on page 127 of the Application outlines the International Public Participation (IAP2) Spectrum of Engagement.

On page 127 of the Application, PNG states:

> As context for the planned engagement, the proposed Project is a required safety and reliability upgrade taking place on an existing gas line in a designated right of way in a remote area. Therefore, no new landowners will be impacted. The Project's location in a remote area minimizes concerns for traffic impacts. Although impacts on rates could be a point of interest for customers, PNG is looking to mitigate this challenge by adding further industrial loads to significantly offset the cost of the upgrade. Given this situational analysis, PNG engaged stakeholders and the public at the Inform / Consult / Involve levels on the IAP2 spectrum, specific to the perceived impact on each stakeholder.

38.2 Please provide a table identifying which engagement tier on the IAP2 spectrum each stakeholder group has been assigned to.

39.0 Reference: CONSULTATION AND ENGAGEMENT
Exhibit B-1, Section 9.3.8, p. 134
Issues and Concerns Raised

On page 134 of the Application, PNG states: "The BC Ministry of Environment requested a meeting with PNG. This meeting will be held via video-conference on September 23, 2020."

39.1 Please provide an update of the meeting with the BC Ministry of Environment.

40.0 Reference: CONSULTATION AND ENGAGEMENT WITH INDIGENOUS COMMUNITIES
Exhibit B-1, Section 9.4.1, p. 135
Potentially Affected Indigenous Communities

PNG states on page 135 of the Application that it considered all Indigenous communities whose traditional territories overlap the Project footprint to be potentially impacted by the proposed Project. PNG's review and evaluation identified six Indigenous communities, all of Tsimshian ancestry.

40.1 Please discuss the information PNG considered to identify these First Nations.

40.2 Please provide a map of the Indigenous community territories and the Project footprint.

41.0 Reference: CONSULTATION AND ENGAGEMENT WITH INDIGENOUS COMMUNITIES
Exhibit B-1, Section 9.4.4, Table 9-2, pp. 138-140; CPCN Guidelines, Appendix A to Order G-20-15, pp. 6-7
CPCN Guideline Information Requirements for Consultation

Table 9-2 provides a summary of PNG's engagement efforts with Indigenous communities prior to submitting the Application.

The CPCN Guidelines include the following points:

> For each potentially affected First Nation, summarize the consultation to date, including:
> (ii) Identification of any group, body, specific band or specific person(s) that have been consulting on behalf of the First Nation in connection with the application. Identify the specific member bands represented by any group or body.
> …
> (iv) Any relevant, non-confidential written documentation regarding consultation, such as notes or minutes of meetings or phone calls, or letters received from or sent to the First Nation.
> …
> (vii) Copies of any documents which confirm that the First Nation is satisfied with the consultation to date.

On page 140 of the Application, PNG states:

> PNG considers that there are no substantive outstanding issues or concerns related to engagement with Indigenous communities at the time of application. The Indigenous communities engaged to date all recognize the importance of the proposed Project in ensuring a reliable supply of gas to local communities. PNG committed to continuing engagement on environmental impacts of the Project ahead of permit applications when more detailed information is available. PNG will work with the individual communities to accommodate and mitigate any concerns, where possible.

41.1 Please provide an updated Table 9-2, including any the names of specific persons that have been consulting on behalf of each Indigenous Community, and any significant developments which

have occurred since the Application was submitted.

41.2 Please provide any supporting documentation such as emails or letter to substantiate the lack of outstanding substantive concerns.

41.3 Please provide a copy of any relevant, non-confidential documents received from each indigenous community regarding consultation, or confirming that the relevant community is satisfied with the consultation to date.

42.0 Reference: CONSULTATION AND ENGAGEMENT WITH INDIGENOUS COMMUNITIES
Exhibit B-1, Section 9.4.4, Table 9-2, p. 138
Issues and concerns raised

According to Table 9-2 on page 138 of the Application, the Gitga'at Community is at the notification stage only, and PNG will continue to reach out to the community for engagement.

42.1 Please discuss what attempts have been made to contact the Gitga'at, the date of these efforts and if the community has responded to these efforts since the Application was submitted.

PNG states in Table 9-2 that the Gitxaala Community has expressed concern over the BC OGC handling of permits that should be dealt with by DFO.

42.2 Please expand on this concern, and PNG's response, including the relevance of these concerns to the Project, such as possible schedule delays related to the processing of permits.