

October 12, 2018

Board of Commissioners of Public Utilities  
Prince Charles Building  
120 Torbay Road, P.O. Box 21040  
St. John's, NL A1A 5B2

**Attention: Ms. Cheryl Blundon**  
**Director of Corporate Services & Board Secretary**

Dear Ms. Blundon:

**Re: An Application by Newfoundland and Labrador Hydro for Approval of Capital Expenditures to Re-Route Transmission Lines TL 226 and TL 239**

Please find enclosed the original and eight (8) copies of the above-noted Application, plus supporting affidavit, project proposal, and draft order.

The proposed project involves the re-routing of Transmission Lines TL 239 and TL 226 which is necessary to ensure Hydro can continue to provide safe, reliable electrical service to its customers. Hydro is requesting an expedited review process to enable, if approved, construction to occur during Fall 2018, with an anticipated in-service date of December 15, 2018 for the 2018-2019 winter season.

Should you have any questions, please contact the undersigned.

Yours truly,

**NEWFOUNDLAND AND LABRADOR HYDRO**



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Shirley Walsh  
Senior Legal Counsel – Regulatory  
SW/kd

cc: Gerard Hayes – Newfoundland Power  
Paul Coxworthy – Stewart McKelvey  
ecc: Larry Bartlett – Teck Resources Limited  
Dean Porter – Poole Althouse

Dennis Browne, Q.C. – Browne Fitzgerald Morgan & Avis  
Denis Fleming – Cox & Palmer  
Sheryl Nisenbaum – Praxair Canada Inc.

**IN THE MATTER OF** the *Electrical Power Control Act*, RSNL 1994, Chapter E-5.1 (the *EPCA*) and the *Public Utilities Act*, RSNL 1990, Chapter P-47 (the *Act*), and regulations thereunder;

**AND IN THE MATTER OF** an Application by Newfoundland and Labrador Hydro (Hydro) pursuant to Subsection 41(3) of the *Act*, for approval of the Re-Routing of Transmission Lines TL 239 and TL 226

**TO:** The Board of Commissioners of Public Utilities (the Board)

**THE APPLICATION OF NEWFOUNDLAND AND LABRADOR HYDRO (Hydro) STATES THAT:**

1. Hydro is a corporation continued and existing under the *Hydro Corporation Act, 2007*, is a public utility within the meaning of the *Act* and is subject to the provisions of the *Electrical Power Control Act, 1994*.
2. Transmission lines TL 239 (138 kV) and Transmission line TL 226 (69 kV) are located on the Northern Peninsula section of Hydro's Island Interconnected System. Both lines share a right-of-way ("ROW") from the Deer Lake Terminal Station, heading north through Gros Morne National Park to the Berry Hill Terminal Station, a total distance of approximately 71 km.
3. TL 226 was commissioned in 1970 and TL 239 in 1982. Neither line has experienced any major failures to date. Historically, an existing river in the area crossed the ROW at approximately structure 275 on TL 239 and structure 453 on TL 226, turned west and followed the edge of the ROW for approximately a kilometre and then turned south, entering the main Southeast Brook.

4. On August 15, 2018 a significant rainstorm occurred over Gros Morne National Park and caused flooding in the Southeast Brook river valley, north of Wiltondale. This event caused washouts and streambank erosion, resulting in several river channels changing course along a section of the ROW. The river described above enters the ROW north of structure 275 on TL 239 but has changed paths to travel within the ROW. As a result both structure 275 on TL 239 and structure 453 on TL 226 are within the river.
5. For one span further west, the river banks have also eroded and the new water channels have converged to completely flood the existing structure locations and surrounding area. Several new river channels have formed in this section. The banks of these new streams are soft and unstable. They will continue to erode with water flow, and the erosion will accelerate with future rain events.
6. In addition, a considerable amount of erosion caused the crib foundation of structure 277 on TL 239 to completely wash out. This structure was previously at the edge of the gradual river bank and was reinforced with a crib foundation and rip rap. Since the flooding in August 2018, all of the rip rap and crib material has been washed down stream and approximately 1.5 metres of soil has washed out from around the pole. The structure is now temporarily guyed to support the pole until the lines can be relocated.
7. A transmission line reroute is required to avoid potential structural failures given the high risk of additional erosion in the area and to ensure Hydro can continue to provide safe, reliable electrical service to its customers.
8. Hydro is recommending re-routing both of the parallel lines to avoid the unstable area. The overall scope of work includes the relocation of approximately one kilometer of transmission line on each of TL 239 and TL 226 to a proposed route approximately 100 meters north. To mitigate against future issues in this area, the proposed route is located on higher ground and would be outside of the flood zone. Details regarding

Hydro's proposal to reroute the two lines are contained in the attached project proposal document.

9. The estimated cost of this project is \$932,400.
10. Hydro submits that the rerouting of TL 239 and TL 226 is necessary to ensure that Hydro can continue to provide service which is safe and adequate and just and reasonable as required by Section 37 of the *Act*.
11. Hydro therefore makes Application for an Order pursuant to section 41(3) of the *Act* approving the rerouting a one kilometer section of each of TL 239 and TL 226 at an estimated total capital cost of \$932,400 as set out in this Application and in the attached project proposal document.

**DATED** at St. John's, in the Province of Newfoundland and Labrador, this 12 day of October, 2018.



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Electrical
Mechanical
Civil
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Transmission & Distribution
Telecontrol
System Planning

## Transmission Line Re-Routing

TL 226 and TL 239

October 2018

*A Report to the Board of Commissioners of Public Utilities*

## **Summary**

On August 15, 2018 a significant rainstorm occurred over Gros Morne National Park and caused flooding in the Southeast Brook river valley, north of Wiltondale. This event caused washouts and streambank erosion, resulting in several river channels changing course along a section of right-of-way (“ROW”) containing both a 138 kV transmission line (TL 239) and a 69 kV transmission line (TL 226). Although there has always been a small river in this area, the river flow path has changed and water levels and erosion increased due to the rainstorm event.

The resulting damage has created a significant risk to the transmission lines due to erosion of the soil holding the wood poles in place. To avoid structural failure, Hydro is proposing to re-route approximately one kilometer of each of the parallel lines to an area with stable ground conditions. The estimated project cost is approximately \$932,400 with a planned completion by December 14, 2018.

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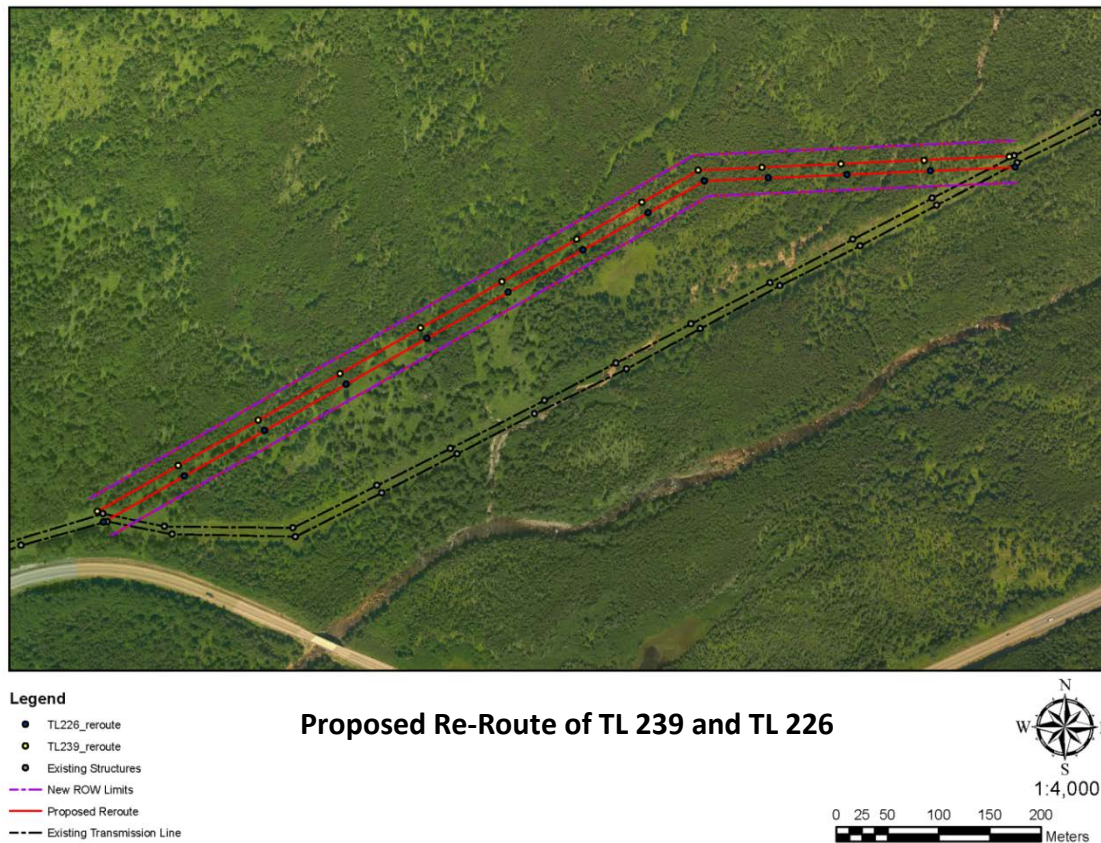
## **1.0 Introduction**

On August 15, 2018 a significant rainstorm occurred over Gros Morne National Park and caused flooding in the Southeast Brook river valley, north of Wiltondale. This event caused washouts and streambank erosion, resulting in several river channels changing course along a section of ROW containing both a 138 kV transmission line (TL 239) and a 69 kV transmission line (TL 226). Although there has always been a small river in this area, the river flow path has changed and water levels and erosion increased due to the rainstorm event. The resulting damage has created a significant risk to the transmission lines due to increased soil erosion and a heightened risk should another rainstorm event occur.

## **2.0 Project Description**

Hydro is proposing to re-route both of the parallel lines, TL 239 and TL 226 (refer to Figure 1), to avoid the unstable area. The overall scope of work shall include the relocation of approximately one kilometer of transmission line on each of TL 239 and TL 226 to a proposed route approximately 100 meters north. The length of the re-route realigns the two transmission lines with nearby angle structures to the west, and extends the eastern interconnection location away from the river, crossing over in a more perpendicular orientation. To mitigate against future issues in this area, the proposed route is located on higher ground and is outside of the flood zone.





**Figure 1: Proposed Re-Route of TL 239 and TL 226**

In addition to the requirement for approval by the Board of Commissioners of Public Utilities (the “Board”), the overall scope of work will be subject to an Environmental Assessment by Parks Canada (the “Park”) and cannot proceed until released by the Park. The proposed route and scope of work has been reviewed with the Park and the Environmental Assessment is currently underway. Hydro anticipates that this process will be completed and approved by October 31, 2018.

### 3.0 Justification

Structural failures due to further erosion in the area will impact service. A transmission line re-route is necessary for Hydro to provide reliable electrical service to customers on the entire Great Northern Peninsula (“GNP”), as these two lines are the interconnection of the GNP to the remainder of the Island Interconnected System (“IIS”).

### 3.1 Existing System

TL 226 is a 69 kV line commissioned in 1970 and has a total of 791 wood pole transmission structures. The majority of the line is located within the Gros Morne National Park Reserve. To date, this line has experienced no major failures.

TL 239 is a 138 kV line commissioned in 1982 and has a total of 610 wood pole transmission structures. The majority of the line is located within the Gros Morne National Park Reserve. To date, this line has experienced no major failures.

Both transmission lines are located on the Northern Peninsula section of the IIS (refer to Figure 2). Both lines share a ROW from the Deer Lake Terminal Station, heading north through Gros Morne National Park, to the Berry Hill Terminal Station, a total distance of approximately 71 km.

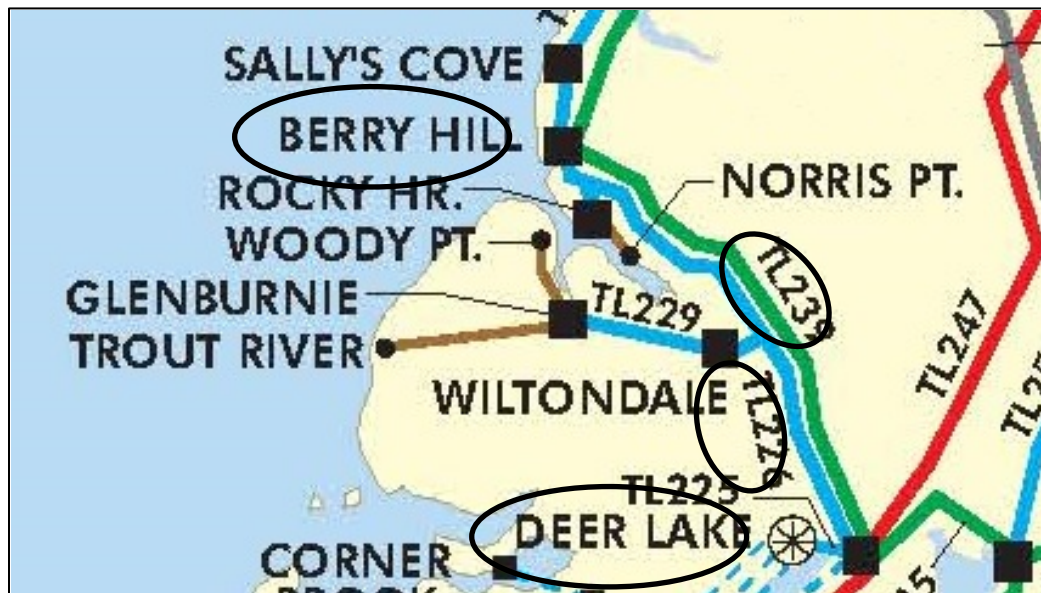


Figure 2: Route of TL 239 and TL 226

In general, the construction of both lines consists of a variety of wood pole structure types, with the section through the Park consisting of single pole tangent, dead-end, and angle structures to minimize the ROW width.

- 1 Figure 3 shows the one kilometer ROW section affected by the flooding. The top three photos
- 2 in Figure 3 were taken from a helicopter patrol shortly after the incident, while the bottom
- 3 photo in Figure 3 shows the overall section of line on October 1, 2018.



**Figure 3: Section of ROW affected in August**



1 The original river course crossed the ROW at approximately structure 275 on TL 239 and  
2 structure 453 on TL 226 turned west and followed the edge of the ROW for approximately 500  
3 m, turned south and entered the main Southeast Brook.

4

5 Figure 4 shows the river entering the ROW north of structure 275 on TL 239. Although it  
6 previously crossed the ROW at this location, it has changed course and now travels within the  
7 existing ROW, placing both structures in the river. A washout has occurred north of the ROW  
8 resulting in several new water channels. The current condition of this area is shown in Figures 4  
9 and 5.



**Figure 4: Washout at Structures 453 – TL 226 (left) and 275 – TL 239 (right)**



**Figure 5: Stream Erosion North of ROW at Structures 275 – TL 239 and 453 – TL 226**

- 1 For one span further west, the river banks have also eroded and the new water channels have
- 2 converged to completely flood the existing structure locations and surrounding area. Several
- 3 new river channels have formed in this section, as illustrated in Figure 6. The banks of these
- 4 new streams are soft and unstable and will continue to erode with water flow and will
- 5 experience further acceleration with future rain events.



**Figure 6: New Water Channels at Structures 276 – TL 239 and 454 – TL 226**



1 The current course of the river continues for the next two spans between structures, with a  
2 considerable amount of erosion causing the crib foundation of structure 277 – TL 239 to  
3 completely wash out as shown in Figure 7. This structure was previously at the edge of the  
4 gradual river bank and was reinforced with a crib foundation and rip rap. Since the flooding in  
5 August 2018, all of the rip rap and crib material has been washed down stream and  
6 approximately 1.5 metres of soil has washed out from around the pole. The structure is now  
7 temporarily guyed to support the pole until the lines can be relocated.



**Figure 7: Erosion of Rip Rap at Structure 277 – TL 239  
(Circa 2003 on left and September 2018 on right)**

8 Just west of structure 277 – TL 239, the river turns south and joins the larger Southeast Brook.  
9 Figure 8 shows the river bank east of structures 278 – TL 239 and 456 – TL 226, where the river  
10 turns and leaves the ROW. The river banks show considerable erosion and Hydro anticipates  
11 future events will compromise these structures as well.



**Figure 8: River Erosion East of Structures 278 – TL 239 and 456 – TL 266**

- 1 The top left photo of Figure 3, also shows a new river channel that has been created since the
- 2 event in August 2018. Figure 9 shows the current condition of the area with the river bed and
- 3 surrounding damage. During rain events and spring melt, when further erosion occurs, this
- 4 channel will pose a significant risk to the lines in their current location.



**Figure 9: New River Channel and Damage North of ROW**

- 1 After on-site inspections and consultation with the Park, Hydro proposes to re-route the
- 2 transmission structures currently within the washout (see Figure 10) to an area 100 metres
- 3 north (see Figure 1), out of the flood zone of the rivers.





**Figure 10: Section of TL 239 and TL 226 ROW (September 2018)**

### **3.2 Operating Experience**

Hydro has observed progressing erosion along streambanks in the area of concern over the last twenty years during ground and semi-annual helicopter patrols. In the early 2000s, structure 456 – TL 226 was relocated along the line to increase its distance from the eroding streambank. At that time, rip rap and cribbing were also installed at structure 277 – TL 239 to protect against erosion along the adjacent stream. Figure 7 depicts the rip rap in 2003, as well as after the rainstorm of August 15, 2018, when the rip rap and crib material was washed away.

Erosion along the lines has reached a point where measures such as crib or rip rap installation is no longer sufficient to ensure the reliability of TL 239 and TL 226.

#### **3.2.1 Reliability Performance**

The lines in this area have performed reliably to date, with no forced outages due to erosion from the river in the area.

**3.2.2 Anticipated Useful Life**

The expected life span of the re-routed section is approximately 40 years.

**3.3 Development of Alternatives**

Two alternatives were considered to address this issue;

- 1) Re-routing the transmission lines approximately 100 meters north of the existing ROW to an area of higher elevation away from the path of the river; and,
- 2) Completing extensive civil earthwork, which would include the construction of small dams to divert water the water flow, and the installation of cribs and rip rap to reinforce the structure foundations in case of another major event.

Alternative 2 is not viable due to the continual erosion of the ROW and the extent of the erosion in the ROW as result of the latest rainstorm event. The amount of erosion currently in the area would require a major civil undertaking that would have significant impact to the local environment within the national park. In consideration of the environmental impact, the requirement for ongoing maintenance, and the lack of guarantee that it would be a permanent solution, the Park was not in favour of this alternative.

**3.3.1 Economic Analysis**

A net present value calculation was not performed in this instance as there are no viable alternatives to re-routing TL 239 and TL 226.

**4.0 Conclusion**

The existing lines are located in a high risk area. The re-routing of TL 239 and TL 226 will result in the avoidance of the lines being located in unstable ground conditions, which would have high potential for future transmission line structure failures and outages to customers. These lines are currently exposed to a risk of failure. The risk is increased in the event of another rainstorm. Therefore, expedited re-routing of the lines is necessary.

## 1 4.1 Project Estimate

2 The project estimate is shown in Table 1.

**Table 1: Project Estimate**

<b>Project Cost:(\$ x1,000)</b>	<b>2018</b>	<b>2019</b>	<b>Beyond</b>	<b>Total</b>
Material Supply	225.0	0.0	0.0	225.0
Labour	111.2	40.0	0.0	151.2
Consultant	0.0	0.0	0.0	0.0
Contract Work	350.0	0.0	0.0	350.0
Other Direct Costs	24.4	18.0	0.0	42.4
Interest and Escalation	1.7	8.4	0.0	10.1
Contingency	0.0	153.7	0.0	153.7
<b>TOTAL</b>	<b>712.3</b>	<b>220.1</b>	<b>0.0</b>	<b>932.4</b>

## 3 4.2 Project Schedule

4 The anticipated project schedule is shown in Table 2.

**Table 2: Project Schedule**

<b>Activity</b>		<b>Start Date</b>	<b>End Date</b>
Planning	Engineering Design and Planning	November 1, 2018	November 12, 2018
Procurement	Material Procurement	November 8, 2018	November 12, 2018
Construction	Brush Clearing and ROW Preparation	November 5, 2018	November 16, 2018
	Pole Installations	November 19, 2018	November 30, 2018
	Conductor Stringing and Tie-In	December 3, 2018	December 14, 2018
	Clean-up and Demobilization	January 7, 2019	January 14, 2019
Closeout	Project Closeout	January 14, 2019	January 31, 2019

**IN THE MATTER OF** the *Electrical Power Control Act*, RSNL 1994, Chapter E-5.1 (the *EPCA*) and the *Public Utilities Act*, RSNL 1990, Chapter P-47 (the *Act*), and regulations thereunder;

**AND IN THE MATTER OF** an Application by Newfoundland and Labrador Hydro (Hydro) pursuant to Subsection 41(3) of the *Act*, for approval of the Re-Routing of Transmission Lines TL 239 and TL 226.


**AFFIDAVIT**

I, Kyle Tucker, Professional Engineer, of St. John's in the Province of Newfoundland and Labrador, make oath and say as follows:

1. I am the Manager – Regulatory Engineering, of Newfoundland and Labrador Hydro, the Applicant named in the attached Application.
2. I have read and understand the foregoing Application.
3. I have personal knowledge of the facts contained therein, except where otherwise indicated, and they are true to the best of my knowledge, information and belief.

**SWORN** at St. John's in the )  
Province of Newfoundland and )  
Labrador this 12 day of October )  
2018, before me: )

  
\_\_\_\_\_  
Barrister – Newfoundland and Labrador

  
\_\_\_\_\_  
Kyle B. Tucker, P. Eng.

1 (DRAFT ORDER)  
2 NEWFOUNDLAND AND LABRADOR  
3 BOARD OF COMMISSIONERS OF PUBLIC UTILITIES  
4

5 AN ORDER OF THE BOARD  
6

7 NO. P.U. \_\_ (2018)  
8

9 **IN THE MATTER OF** the *Electrical Power*  
10 *Control Act*, RSNL 1994, Chapter E-5.1 (the  
11 *EPCA*) and the *Public Utilities Act*, RSNL 1990,  
12 Chapter P-47 (the *Act*), and regulations  
13 thereunder;  
14

15 **AND IN THE MATTER OF** an Application  
16 by Newfoundland and Labrador Hydro  
17 (Hydro) pursuant to Subsection 41(3) of the  
18 *Act*, for approval of the Re-Routing of  
19 Transmission lines TL 239 and TL 226.  
20

21 **WHEREAS** the Applicant is a corporation continued and existing under the *Hydro Corporation*  
22 *Act, 2007*, is a public utility within the meaning of the *Act* and is subject to the provisions of the  
23 *Electrical Power Control Act, 1994*; and  
24

25 **WHEREAS** Section 41(3) of the *Act* requires that a public utility not proceed with the  
26 construction, purchase or lease of improvements or additions to its property where:

- 27 a) the cost of construction or purchase is in excess of \$50,000; or  
28 b) the cost of the lease is in excess of \$5,000 in a year of the lease,  
29

30 without prior approval of the Board; and  
31

32 **WHEREAS** on August 15, 2018 a significant rainstorm occurred over Gros Morne National  
33 Park and caused flooding in the Southeast Brook river valley, north of Wiltondale. This event  
34 caused washouts and streambank erosion, resulting in several river channels changing course  
35 along a section of the Right of Way ("ROW"); and  
36

37 **WHEREAS** the river described above enters the ROW north of structure 275 on TL 239 but has  
38 changed paths to travel within the ROW. As a result both structure 275 on TL 239 and structure  
39 453 on TL 226 are within the river; and  
40

41 **WHEREAS** a considerable amount of erosion caused the crib foundation of structure 277 on  
42 TL 239 to completely wash out and erosion of the river banks present a substantial risk to other  
43 structures in the area; and

**WHEREAS** on October 12, 2018 Hydro applied to the Board for approval to reroute a one kilometer section of Transmission lines TL 239 and TL 226 to avoid potential structural failures given the high risk of additional erosion in the area; and

**WHEREAS** the capital cost of the project is anticipated to be \$932,400; and

**WHEREAS** the Board is satisfied that rerouting of Transmission lines TL 239 and TL 226 is necessary to ensure Hydro can continue to provide service which is safe and adequate and just and reasonable.

**IT IS THEREFORE ORDERED THAT:**

1. The proposed capital expenditure of \$932,400 to reroute Trans Transmission lines TL 239 and TL 226 is approved.
2. Hydro shall pay all expenses of the Board arising from this Application.

**DATED** at St. John's, Newfoundland and Labrador, this      day of      , 2018.

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