

1 Q. Please provide a detailed project update and schedule for the Muskrat Falls and
2 interconnecting transmission project.

3

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5 A. Project information, including a discussion on the project status, major
6 procurement decisions, and the integrated project schedule is available in the
7 report of the Independent Engineer, released in April 2014, a copy of which can be
8 found in Hydro's response to PUB-NLH-210 Attachment 1. The report is also
9 available at the following link:

10 <http://muskratfalls.nalcorenergy.com/newsroom/reports/>

11

12 The Integrated Project Schedule is included in Appendix K of the report.

13

14 Further context and details are available in CA-NLH-025 Attachment 1, and monthly
15 project reports are also available at the above link.

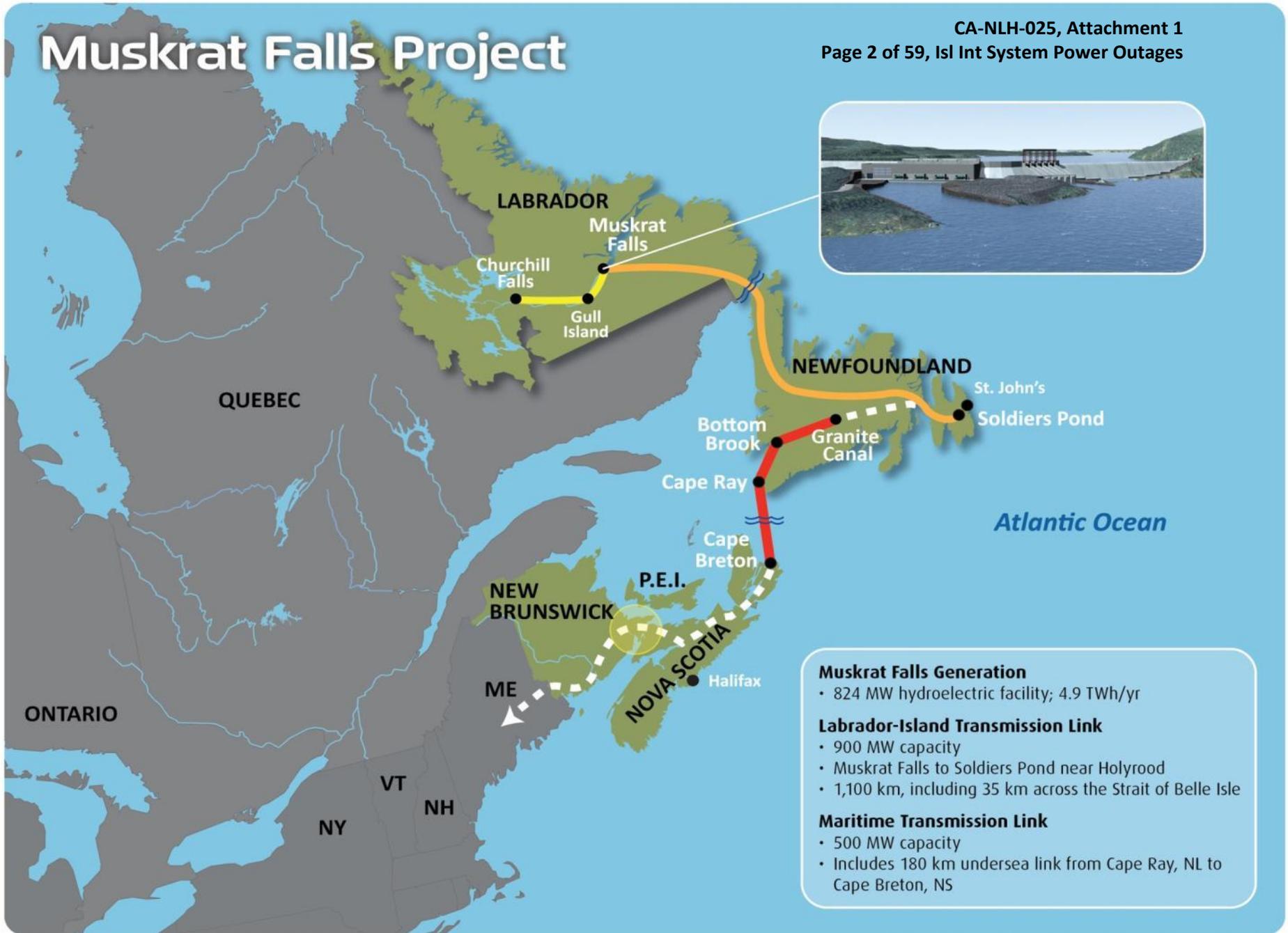
Muskrat Falls Project Update

June 2014

Boundless Energy



Muskrat Falls Project



- Muskrat Falls Generation**
 - 824 MW hydroelectric facility; 4.9 TWh/yr
- Labrador-Island Transmission Link**
 - 900 MW capacity
 - Muskrat Falls to Soldiers Pond near Holyrood
 - 1,100 km, including 35 km across the Strait of Belle Isle
- Maritime Transmission Link**
 - 500 MW capacity
 - Includes 180 km undersea link from Cape Ray, NL to Cape Breton, NS

Muskrat Falls Site Layout



Project Components

- 824 megawatt (MW) hydroelectric development at Muskrat Falls (outside HVGB)
- two 315 kilovolt (kV) High Voltage alternating current (HVac) transmission lines between Muskrat Falls & Churchill Falls (Labrador Transmission Assets)
- 1,100 km long High Voltage direct current (HVdc) transmission line between Muskrat Falls & Soldiers Pond (Labrador-Island Transmission Link)

Project Evolution

2012

Project Sanction



- Environmental Assessment – Generation
- Aboriginal Impacts and Benefits Agreement
- Environmental Assessment – Transmission
- Water Management Agreement
- Commercial Negotiations & Agreements with Emera
- Decision Gate 2 (Announce Muskrat Falls Project/Partnership with Emera)
- Decision Gate 3

- Federal Loan Guarantee Agreement
- Project Sanction
- Start Construction
- Provincial Regulations
- Company Structure in Place
- Financing/Commercial Agreements
- Labour Agreements
- SPO Issued
- Project Execution
- First Power

Key Milestones & Activities

Key Milestones Achieved in 2013

- Federal Loan Guarantee and project financing completed
- EA approval for transmission
- Engineering >98% completed
- RCC cofferdam completed
- Bulk excavation completed
- Started horizontal directional drilling in Straits
- Starter camp opened; permanent camp under construction

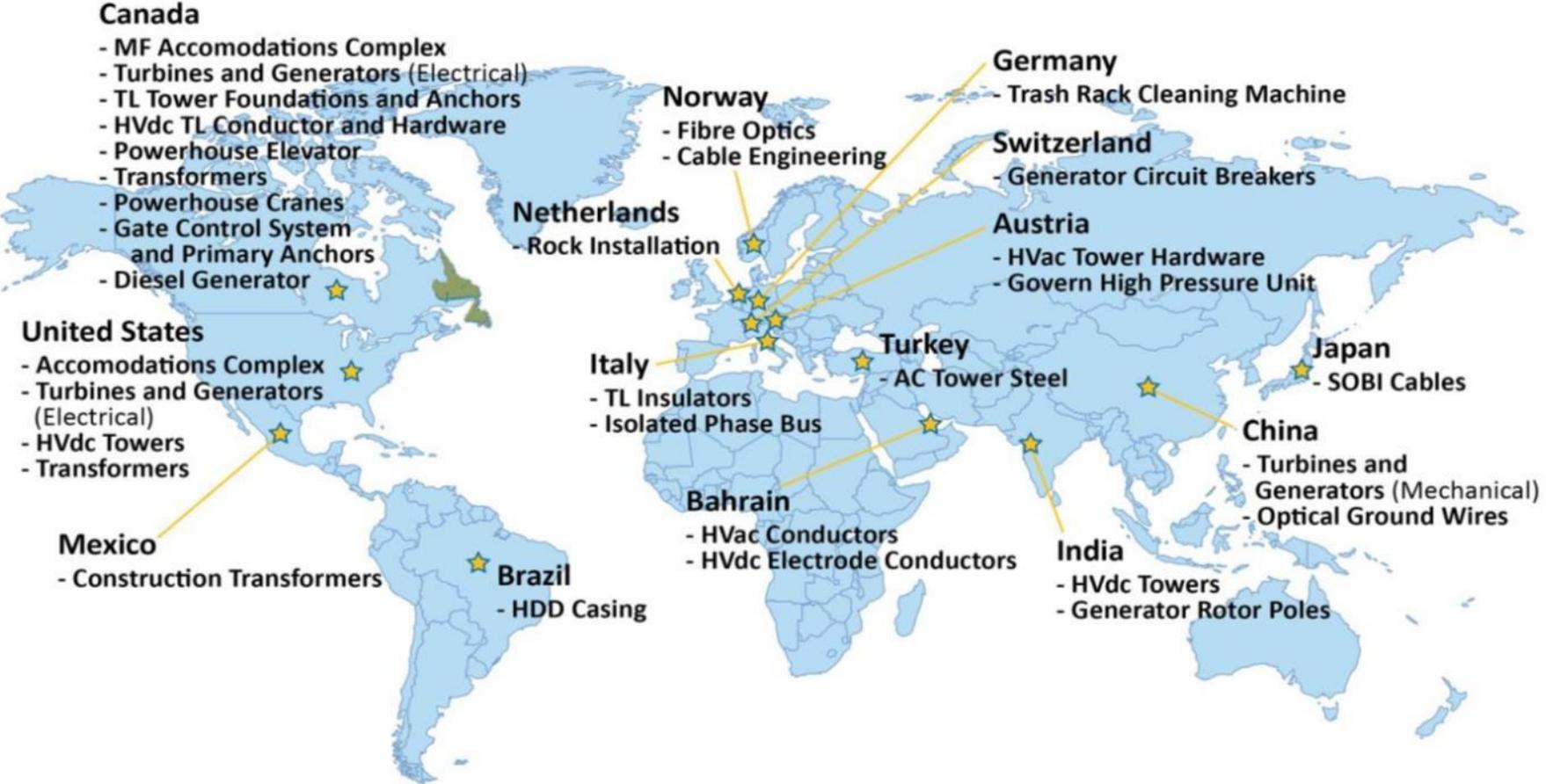


Key Milestones Achieved in 2013

- HVac transmission clearing started
- Marshalling yard constructed
- Structural testing on Hvac towers
- Civil work in Forteau & Churchill Falls started
- Astaldi started mobilization
- Historic Resources Recovery program



Global Reach



2014 Major Activities

- Activity will ramp up in all project areas:
 - Concrete placement at Muskrat Falls
 - Transmission line construction between Muskrat Falls & Churchill Falls
 - Award final major contracts
 - Complete drilling program in Straits
 - Continue site preparation and development at Soldiers Pond
 - Complete site work at Churchill Falls
 - Construction work on Labrador-Island Link



2014 Highlights & Activities

- Work has started on all major sites as per construction plan, including Muskrat Falls, Soldiers Pond, Churchill Falls, SOBI and the transmission routes.
- Employment is expected to reach 2,500 by the end of the year
 - Approx. 85% of total workforce from NL
- Expenditures for 2014 are estimated upwards of \$1B
- Maintaining 2017 target for commissioning and startup of first power.

Construction Schedule to First Power

| Year | 2013 | | | | 2014 | | | | 2015 | | | | 2016 | | | | 2017 | | | |
|--|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
| Quarter | Q1 | Q2 | Q3 | Q4 |
| Muskrat Falls Generation Facility | | | | | | | | | | | | | | | | | | | | |
| Site infrastructure (access roads, camp, construction power) | █ | █ | █ | █ | █ | █ | █ | █ | | | | | | | | | | | | |
| Reservoir preparation | | | | | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| Spillway, Powerhouse, Dams construction | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| North Spur stabilization | | | | | | | | | █ | █ | █ | █ | █ | █ | █ | █ | | | | |
| Labrador Transmission Asset | | | | | | | | | | | | | | | | | | | | |
| Churchill Falls camp set-up and Labrador marshalling yard | █ | █ | █ | █ | | | | | | | | | | | | | | | | |
| Muskrat Falls and Churchill Falls switchyards | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| Right-of-way clearing | | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | | | | |
| Muskrat Falls to Churchill Falls HVac transmission line construction | | | | | | | | | █ | █ | █ | █ | █ | █ | █ | █ | | | | |
| Labrador-Island Transmission Link | | | | | | | | | | | | | | | | | | | | |
| Soldiers Pond switchyard, converter station, synchronous condensers | | | | | | | | | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| Forteau and Shoal Cove transition compounds | | | | | | | | | █ | █ | █ | █ | █ | █ | █ | █ | | | | |
| Labrador HVdc and electrode transmission lines | | | | | | | | | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| Newfoundland HVdc and electrode transmission lines | | | | | | | | | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| Dowden’s Point and L’Anse au Diable electrode sites | | | | | | | | | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ |
| Strait of Belle Isle Marine Cable Crossing | | | | | | | | | | | | | | | | | | | | |
| Civil work | | | █ | █ | █ | █ | █ | █ | | | | | | | | | | | | |
| HDD Shoal Cove - Boreholes 1,2,3 | | | █ | █ | █ | █ | █ | █ | | | | | | | | | | | | |
| HDD Forteau - Boreholes 1,2,3 | | | | | █ | █ | █ | █ | | | | | | | | | | | | |
| Rock quarrying and delivery | | | | | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | █ | | | | |
| Liner Install and vessel campaign | | | | | | | | | █ | █ | █ | █ | | | | | | | | |
| Land cable installation | | | | | | | | | █ | █ | █ | █ | | | | | | | | |
| Subsea cable installation - Cables 1,2,3 | | | | | | | | | | | | | | | | | █ | █ | █ | █ |
| Subsea rock berm construction | | | | | | | | | | | | | | | | | █ | █ | █ | █ |

Following first power, commissioning activities related to generation and transmission components of the project will continue into 2018. Subject to change without notice according to project requirements. Effective June 2014.

Our Project, Our Benefits

Investing in Muskrat Falls

- Focus is on providing the greatest long-term value to the province
- Meeting our growing electricity needs
- Long-term rate stability
- Enhanced system reliability
- Eliminating our reliance on foreign oil for electricity
- Practically eliminating greenhouse gas emissions from electricity sector
- Employment & economic benefits
- Significant, long-term revenue for NL
- Controlling our energy future



Realizing Benefits Today

- Successfully meeting commitments made in the project's Benefits Strategy.
- NL workers and businesses are realizing significant benefits from employment and procurement opportunities with the project.

Realizing Benefits Today

- Employment Benefits (as of April 2014)
 - Total project workforce is 1,785
 - 1,527 of project workforce are NL residents
 - 548 of Labrador workforce are Labrador residents
 - 321 females working on the project (91% from NL)
 - 164 Innu working on site
 - 52% of Labrador workforce are Aboriginal workers
- Employment expected to reach 2,500 by end of 2014

WOMEN ARE PART OF SOMETHING BIG

AT MUSKRAT FALLS





Learn more about employment opportunities with the Muskrat Falls Project at muskratfallsjobs.com



LOWER CHURCHILL PROJECT

Realizing Benefits Today

- Economic & Income Benefits (Jan'13 to April'14):
 - >\$457 million invested in NL businesses
 - >\$105 million in salaries paid to NL residents
 - Total direct benefits to NLers and NL-based businesses >\$562 million
 - IBA procurement commitments exceeded - ~\$450 million in contracts awarded to Innu businesses
- Total incurred costs to April'14 - >\$1.2 billion

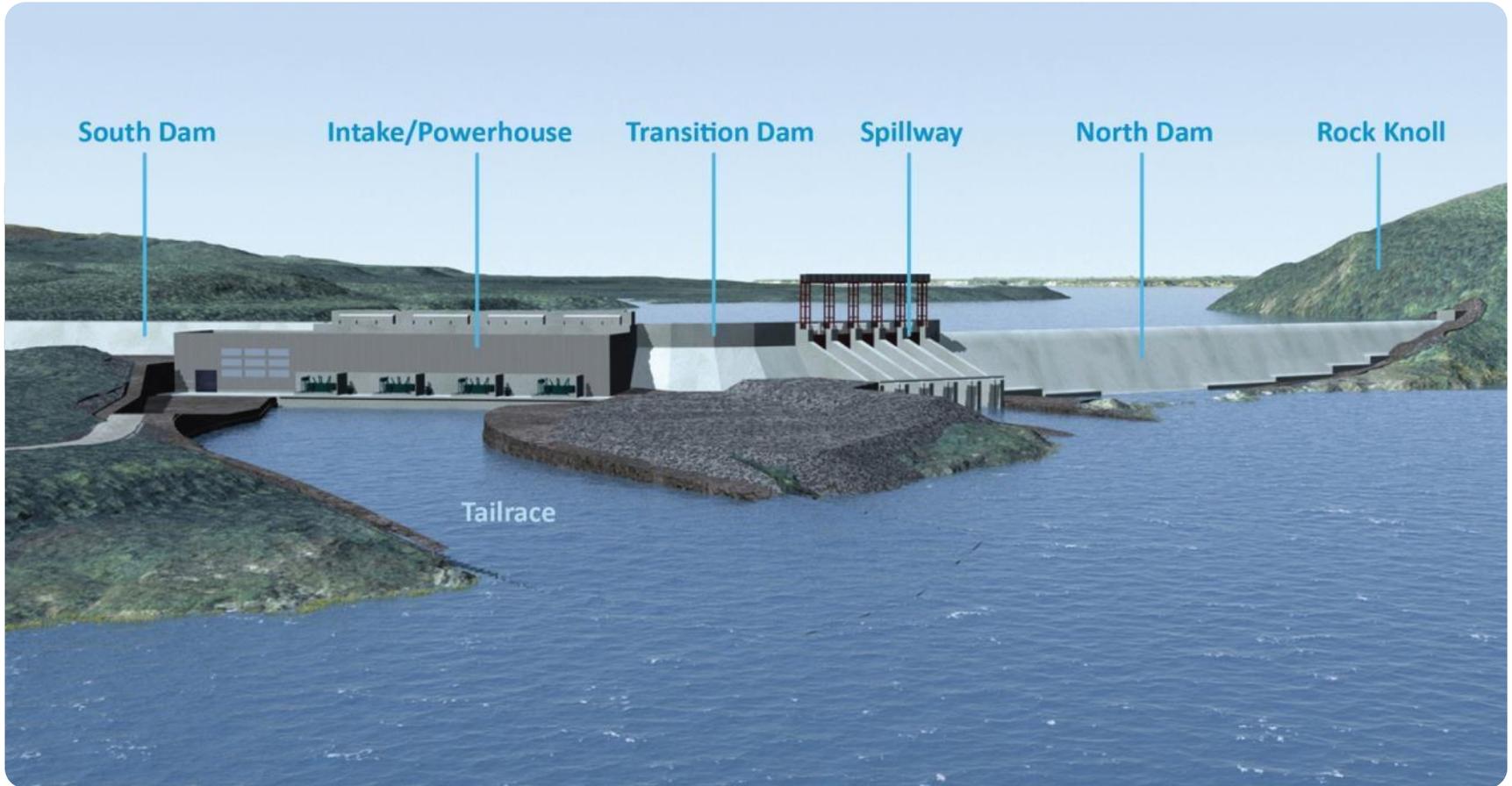


Muskrat Falls Site

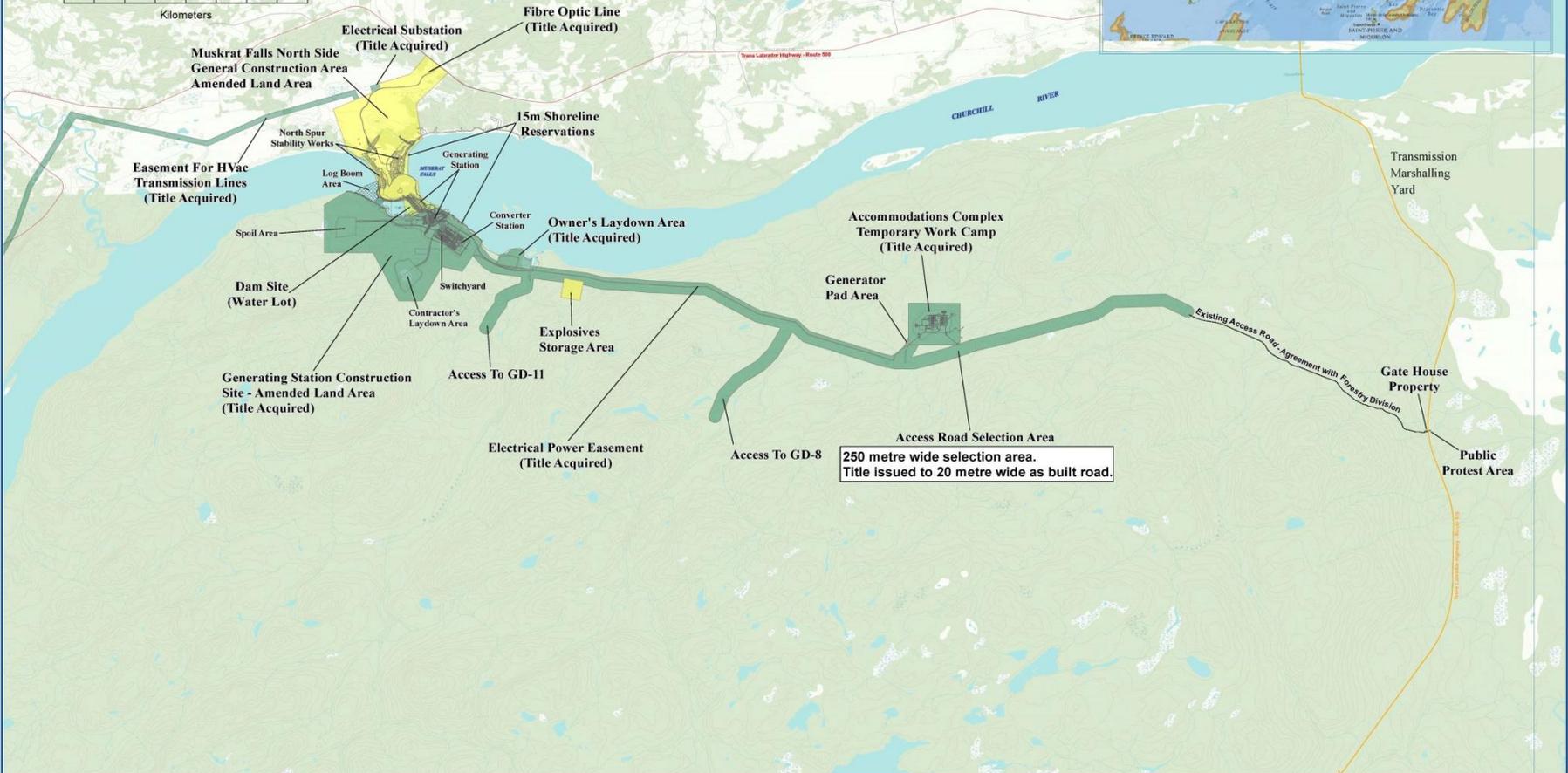
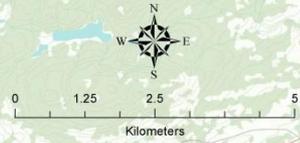
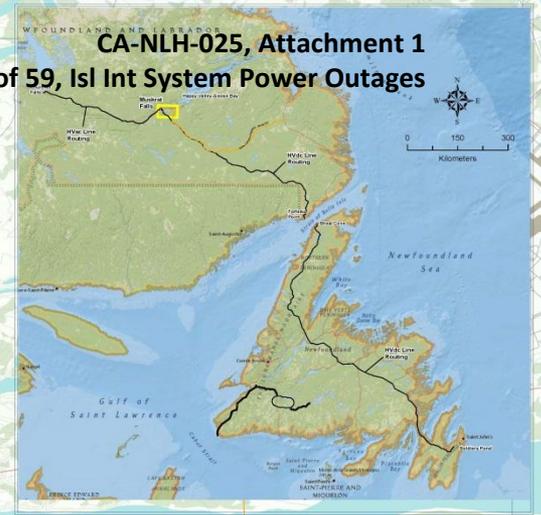
Muskrat Falls Generating Facility

- 824 MW hydroelectric generation facility on lower Churchill River
- Approx. 30 km west of Happy Valley-Goose Bay
- Two dams and a powerhouse
- Second-largest hydroelectric facility in Atlantic Canada and the province when complete
- 560,000 m³ of concrete is required to build the structures at Muskrat Falls – equivalent to 3 Hebron gravity-based structures (GBS)
- Powerhouse structure will be as tall as the Peace Tower on Parliament Hill
- Turbine efficiency at Muskrat Falls will be one of the highest ever obtained in North America

Muskrat Falls Generating Facility



MUSKRAT FALLS PROJECT AREA



Muskrat Falls – Current Status

- Astaldi continues to mobilize resources and equipment to site
- Accommodations Complex - significantly complete. Kitchen, Dining Room and Recreation buildings opened - sports complex underway
- Reservoir clearing progressing well ahead of schedule
- Fabrication and manufacturing of the turbines and generators is progressing ahead of planned schedule.
- The roller compacted concrete (RCC) dam and rock fill cofferdams were successfully completed on schedule in 2013. This work was essential to be complete in time last fall to provide protection of the excavated powerhouse/spillway from the elevated river levels caused by ice in the Churchill River during the winter.
- North Spur progressing well and contract for stabilization work will proceed as planned

Powerhouse Excavation – Sept 2013



Riverside Cofferdam



Spillway Excavation



Intake for Powerhouse



Powerhouse/Spillway Area



Powerhouse Area – June 2014



Spillway – June 2014



Aggregate Preparations & Crushing



Turbines/Generator Manufacturing



Accommodations Complex (Starter and Permanent)



Transmission Key Activities

LTA

Labrador Transmission Assets

- Two 345kVac transmission lines from Muskrat Falls to Churchill Falls each line ~ 250kms
- New switchyard at Churchill Falls and connecting to an extension to the existing 735kVac switchyard
- New switchyard at Muskrat Falls

LTA Status Update

- Right-of-way clearing continues in advance of transmission construction
- First towers to be erected in the coming months
- Commenced transmission construction contract
- All materials for HVac construction delivered to laydown area
- Completed necessary infrastructure in Churchill Falls
- Completed earthworks and started construction on transmission infrastructure. Work progressing as planned.

HVac Towers

Self supporting structures



Guyed Structures



HVac ROW Clearing



Tower Assembly



Hvac Tower Foundation Installation



Churchill Falls Switchyard Area



Churchill Falls Accommodations



Labrador Marshalling Yard



Transmission Key Activities

LIL

Labrador-Island Transmission Link

- High Voltage direct current (HVdc) transmission system
- 1,100 km long, 60 m wide right-of-way running from central Labrador, crossing the Strait of Belle Isle (subsea cable), and extending to Newfoundland's Avalon Peninsula.
- Once constructed, it will be one of the most robust transmission systems in the province, engineered to withstand the harsh environmental and weather conditions experienced in Newfoundland and Labrador.
- Labrador-Island Link will include ~4500 towers, ~460,000 insulators and ~6,000,000 m of conductor
- Weight of steel required for towers and grillage will be twice the weight of the Hibernia topsides

Labrador-Island Transmission Link

- Work includes:
 - Right-of-way (ROW) clearing
 - Installing foundations and assembling and installing transmission towers
 - Converter station at Muskrat Falls and Soldiers Pond, a switchyard and synchronous condenser facility at Soldiers Pond, and electrodes at L'Anse au Diable and Dowden's Point.
 - Building the Strait of Belle Isle transition compounds on each side of the Strait, which act as the transition point between the subsea cable and overhead transmission line.

Labrador-Island Transmission Link



LIL – Status Update

- Preparing to start construction in Labrador
- SOBI horizontal directional drilling program – Newfoundland side drilling to ~ 2.1km is complete, moved to Labrador side and commenced drilling
- Cable work on schedule
- Soldiers Pond work commenced as planned. Today 70-80 people are working on site
- HVdc transmission line work progressing as planned

Muskrat Falls Converter/Switchyard Area



Soldiers Pond Site Access Location



Soldiers Pond Mobilization



LIL - SOBI Cable Crossing

Strait of Belle Isle Cable Crossing

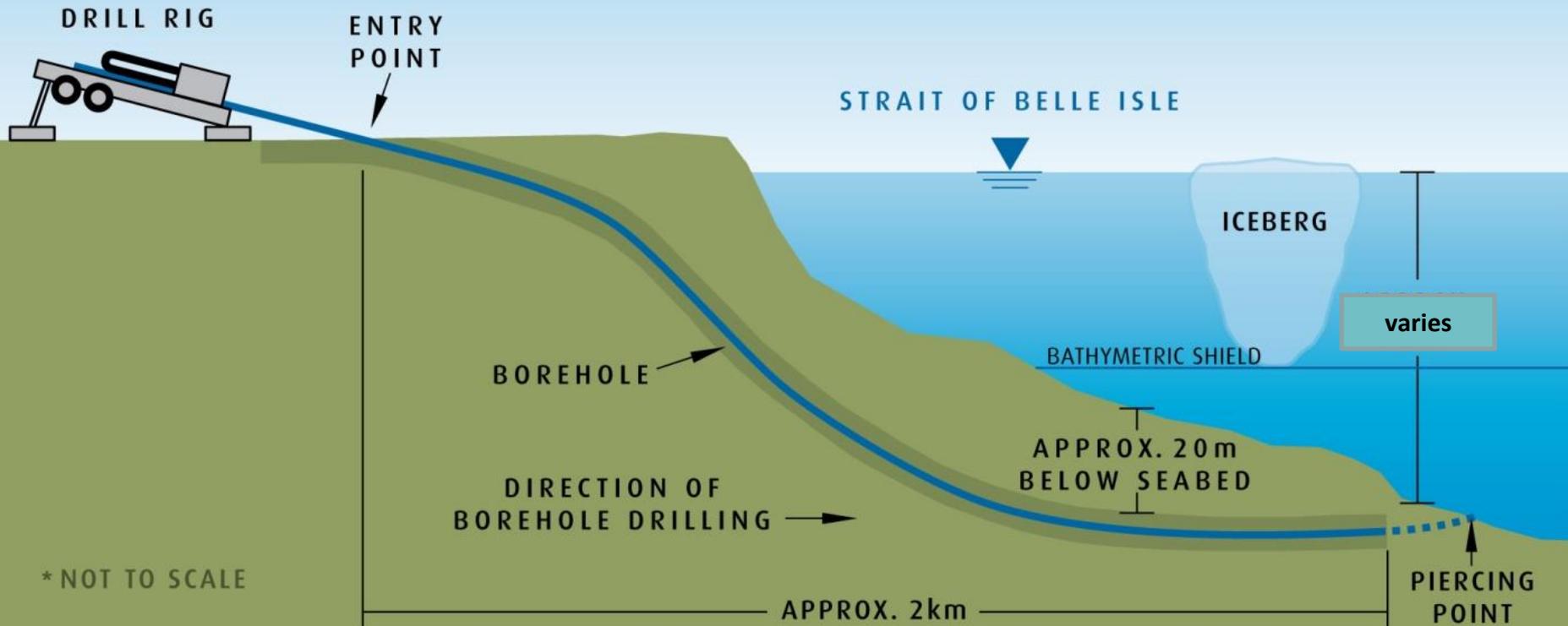
- 35km marine cable crossing connecting transmission line from Forteau, Labrador to Shoal Cove, Newfoundland
- 3 marine power cables along the seabed
- Horizontal directional drilling technology, drill rigs will bore three holes from the shoreline and out under the seabed on both sides of the Straits
- Cables placed along the sea floor and covered by rock berms to protect against marine traffic and fishing activity
- Cables follow natural bathymetric lines, below depth of icebergs in the area

Strait of Belle Isle Cable Crossing



Horizontal Directional Drilling

ILLUSTRATION OF HORIZONTAL DIRECTIONAL DRILLING



2014 Activities – SOBI

- Continue SOBI horizontal directional drilling program
 - Completed HDD program in Shoal Cove
 - Started HDD work in Forteau, one of three boreholes completed
- Continue subsea and land cable manufacturing for installation in 2016
- Construction of rock quarry in Forteau
- Construction of a quay in Forteau

SOBI Marine Cable Crossing



HDD Drill Rig - Strait of Belle Isle



SOBI – Forteau Site Preparations



Access to Information

- Project website: muskratfalls.nalcorenergy.com
 - Monthly reports on: costs, jobs, procurement, expenditures, etc.
- Employment: www.muskratfallsjobs.com
- Project office: Happy Valley-Goose Bay
- Community Liaison Committee:
 - Active committee in HVGB with community members