

Understanding Muskrat

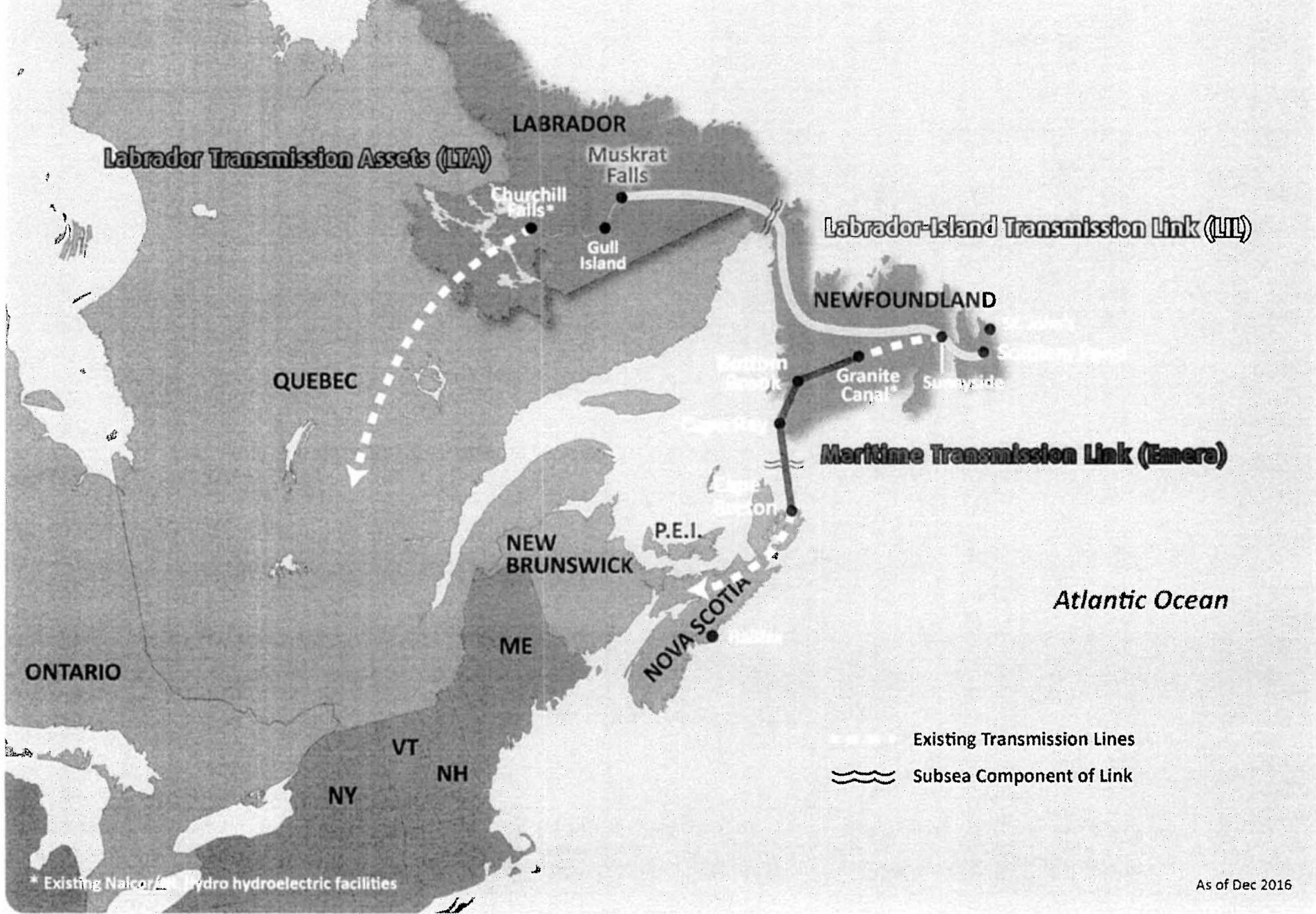
Stan Marshall, CEO Nalcor Energy

February 15, 2018

Boundless Energy



Muskrat Falls Project



2017 – A Year of Success

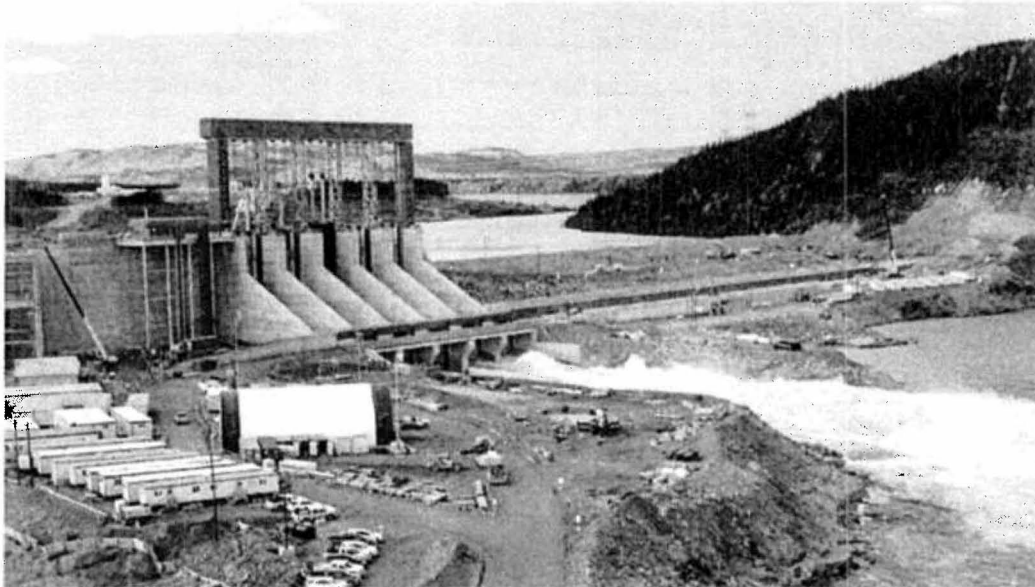
- Exceptional performance with 89% construction complete
- Settled all major claims and finalized performance-based agreements
- Raised \$2.9 billion with Federal Loan Guarantee
 - Reduces required equity from Province by \$2.7B
 - Reduces domestic electricity rates by 1.5 cents per kwh

POWER GENERATION (MUSKRAT FALLS)

Generation Site

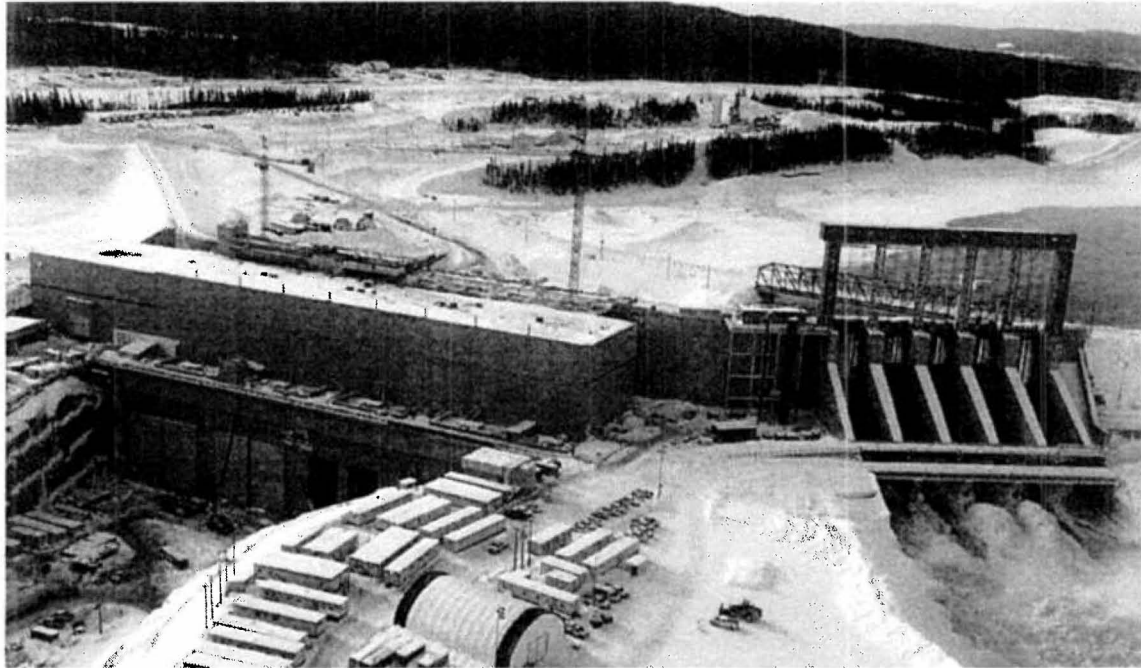


Muskrat Falls Generation



- 824 megawatts; 4.9 terawatt hours/yr (TWh)
- Projected facilities costs:
 - Sanction \$2.9B
 - June 2017 \$5.5B
- Projected in service dates:
 - Sanction: first power Q4 2017; full power Q2 2018
 - June 2017: first power Q4 2019; full power Q3 2020
- Emera to receive on average 20% of energy for 35 years at no cost and an additional 5% during first five years, delivered during off-peak.

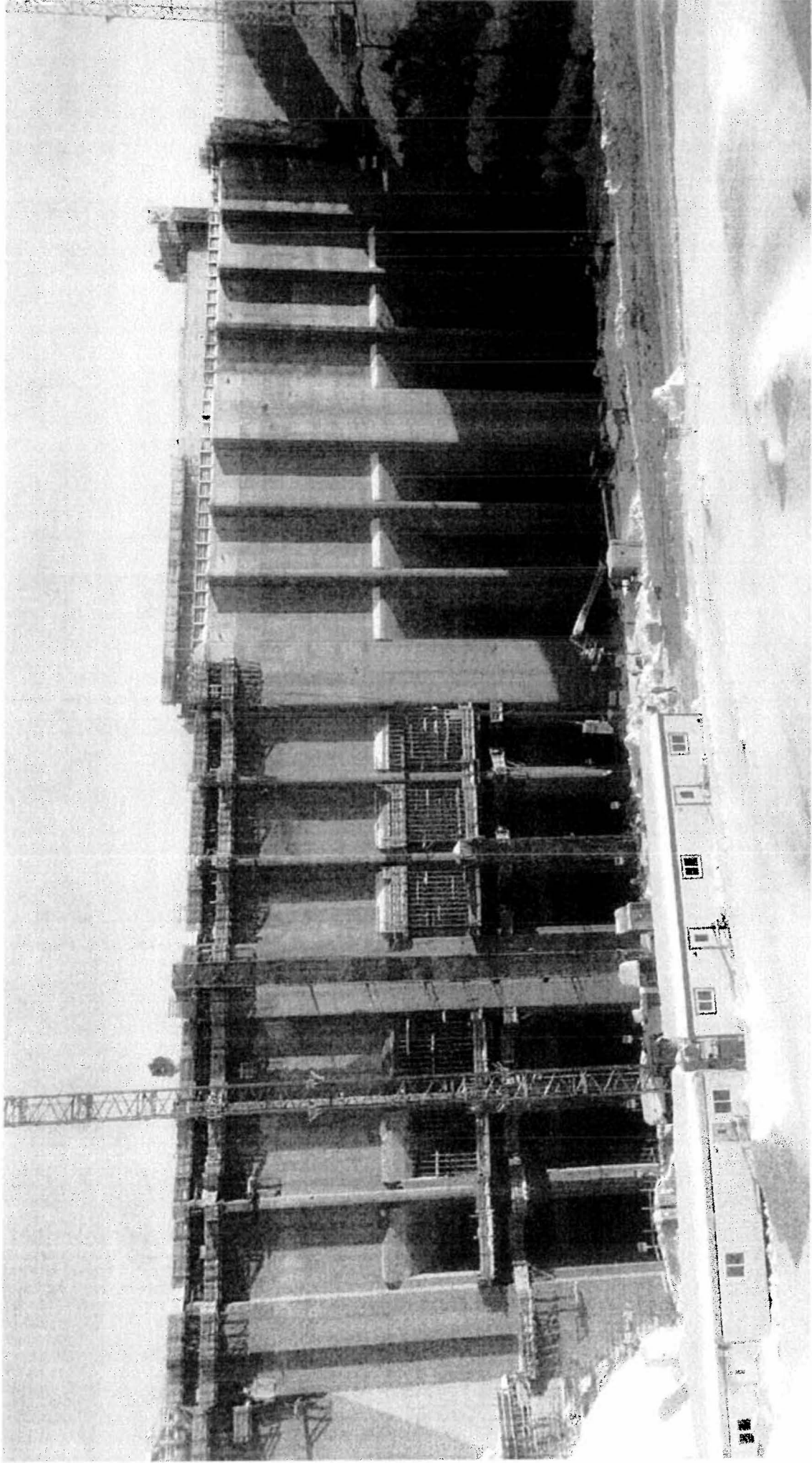
Muskrat Falls Generation



- Major work completed:
 - North Spur stabilization
 - South dam
 - Powerhouse enclosed
 - Ice/safety boom installed
- North Dam – 40% completed

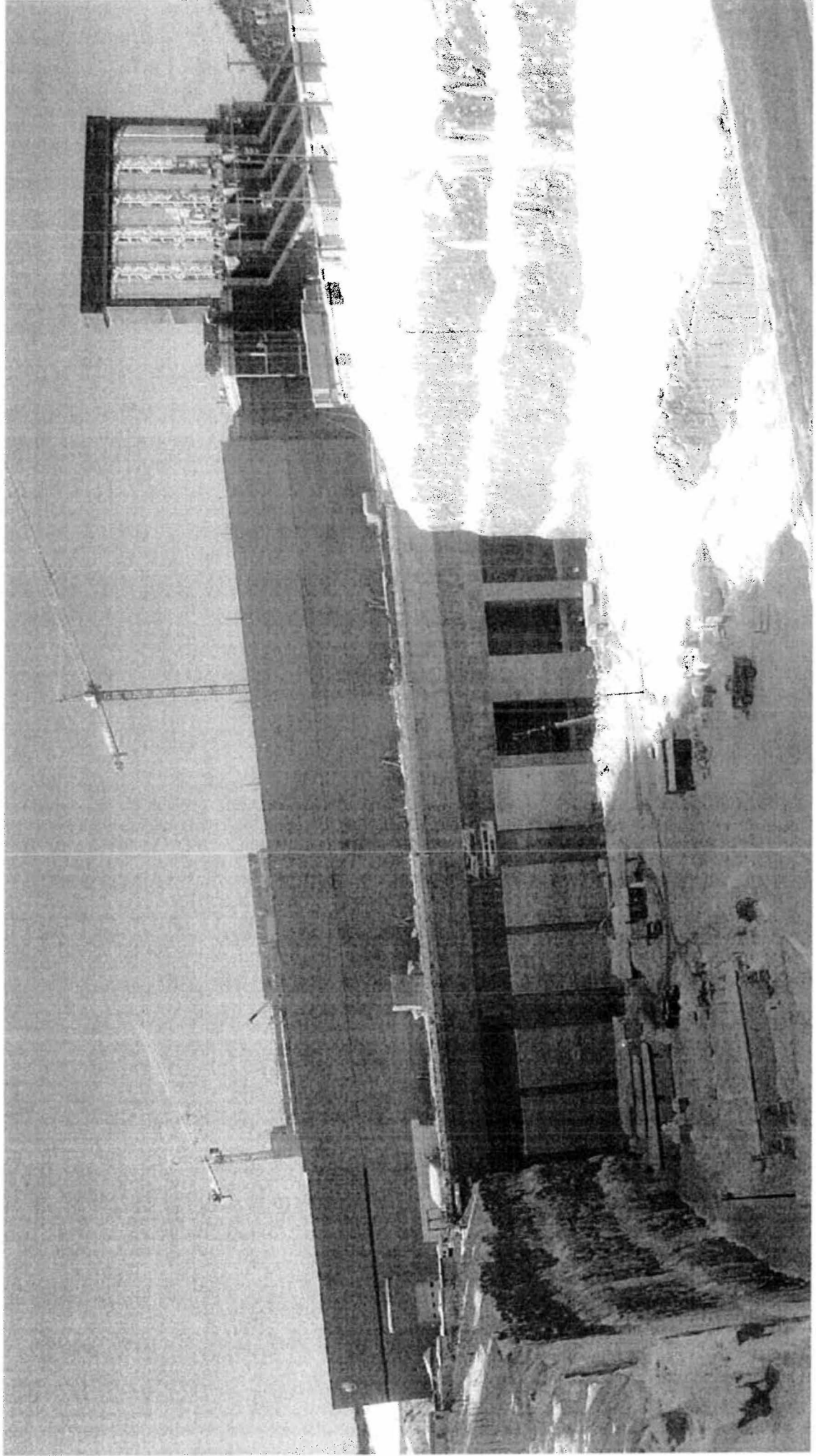
78% construction completed

Intake





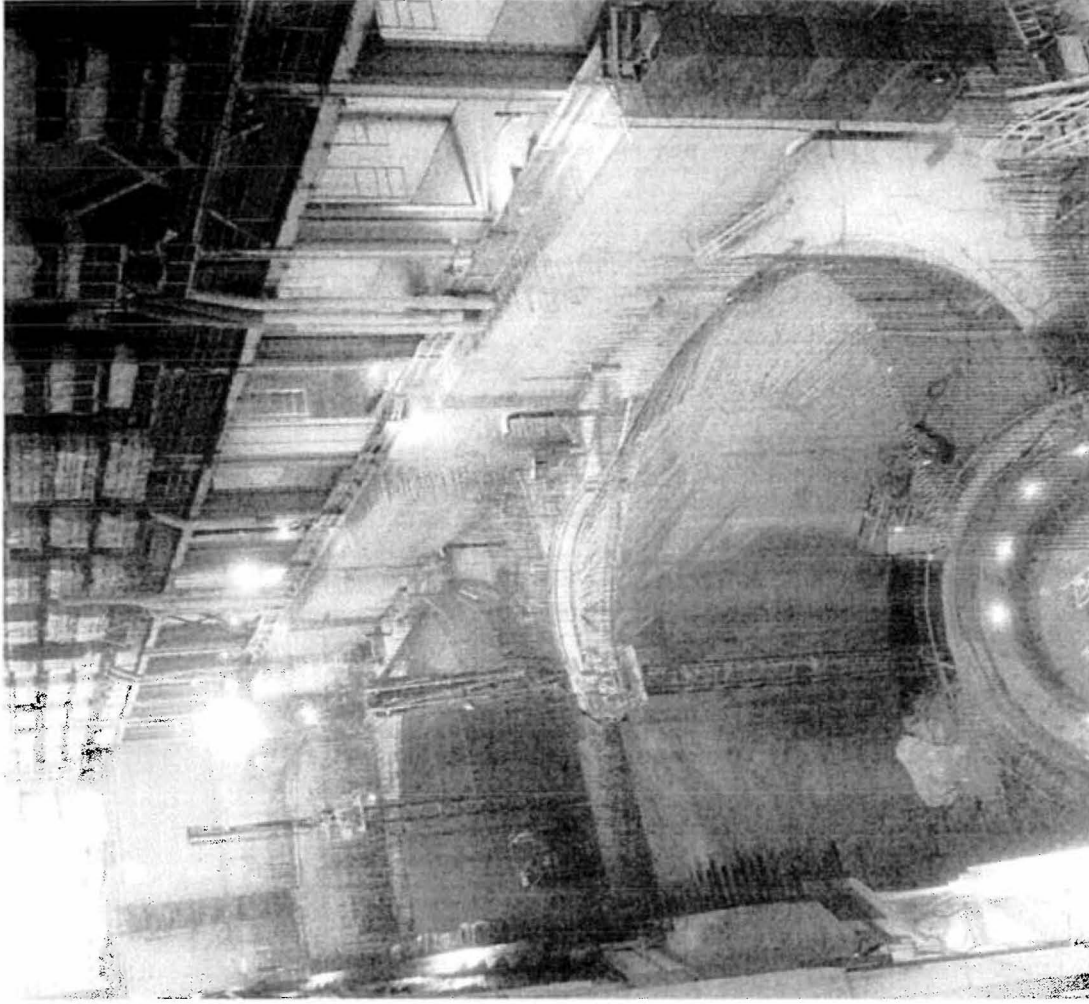
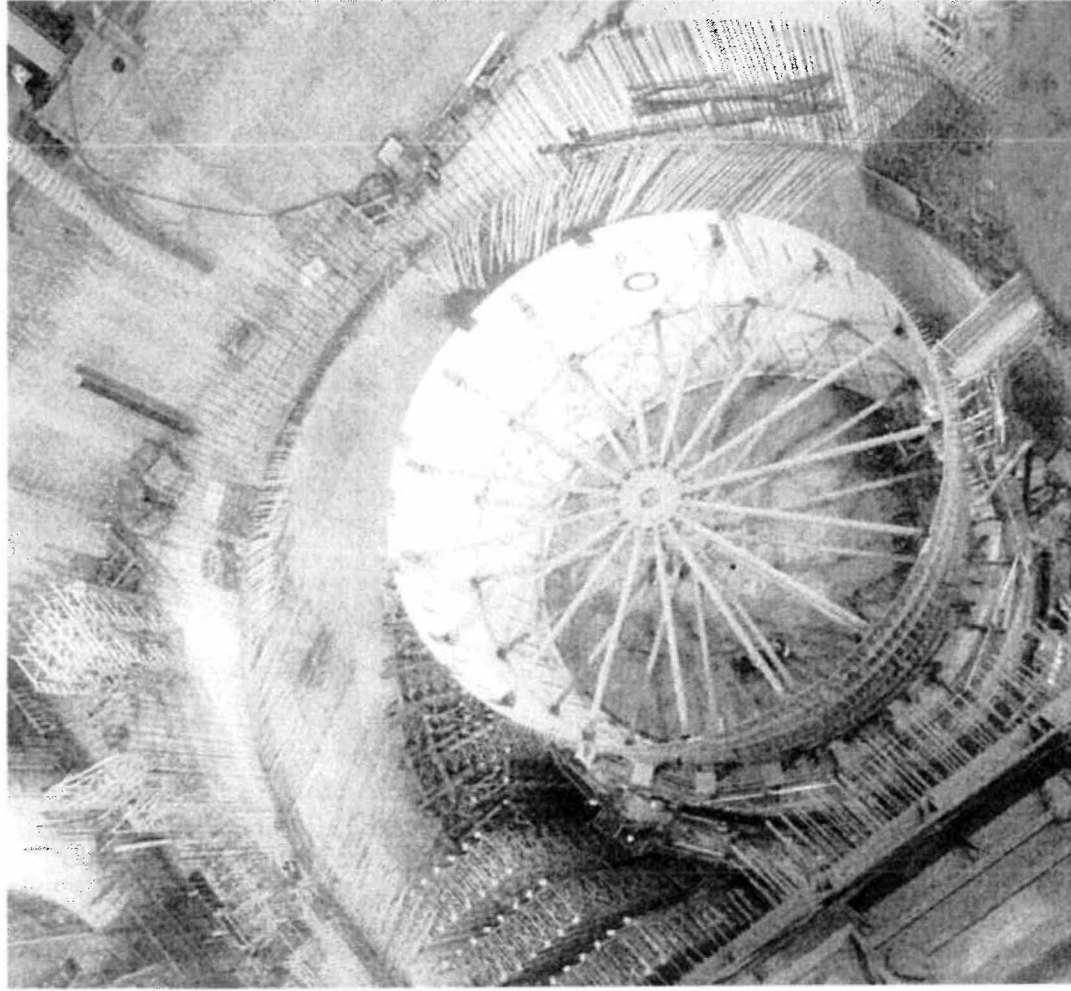
Tailrace



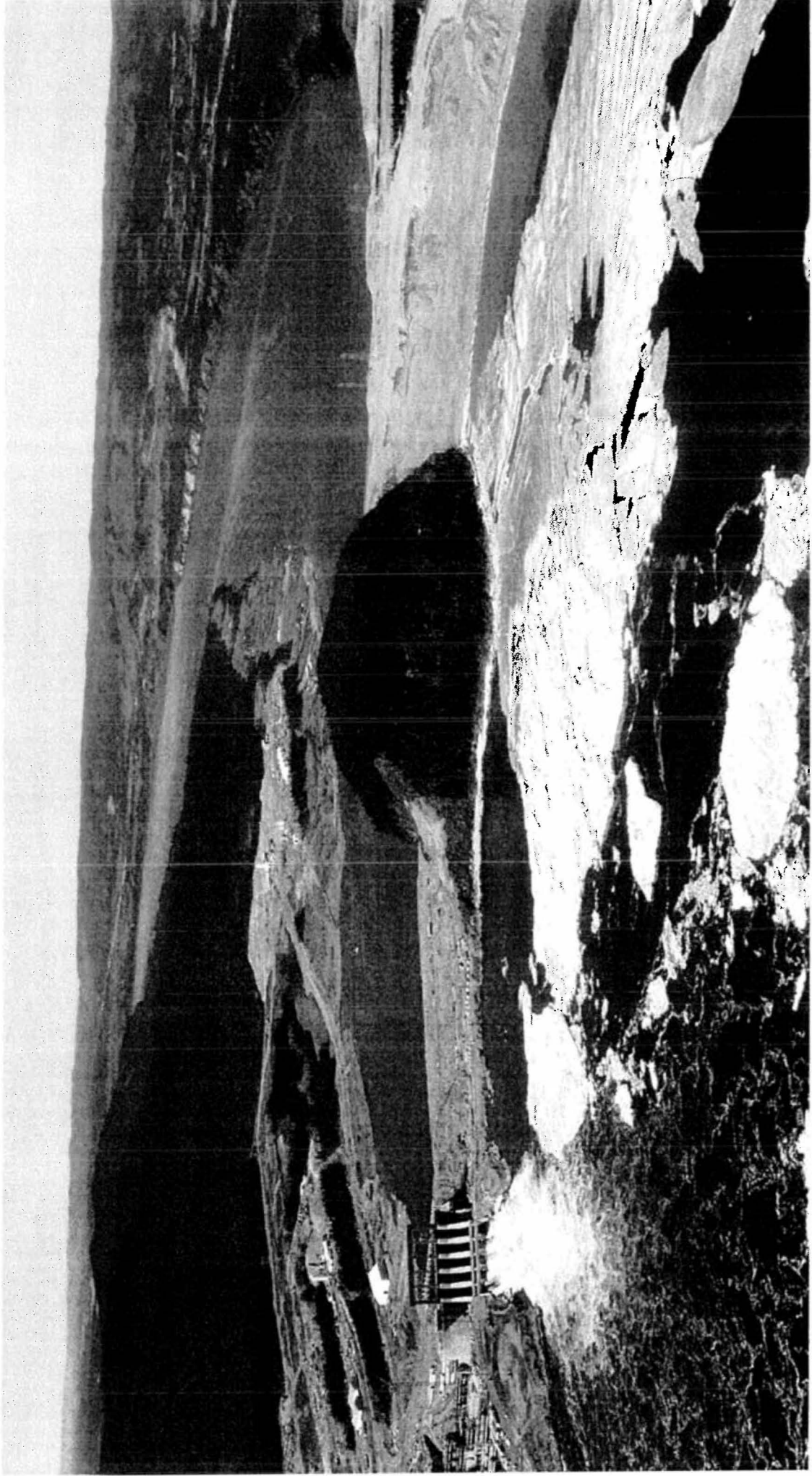
North Dam



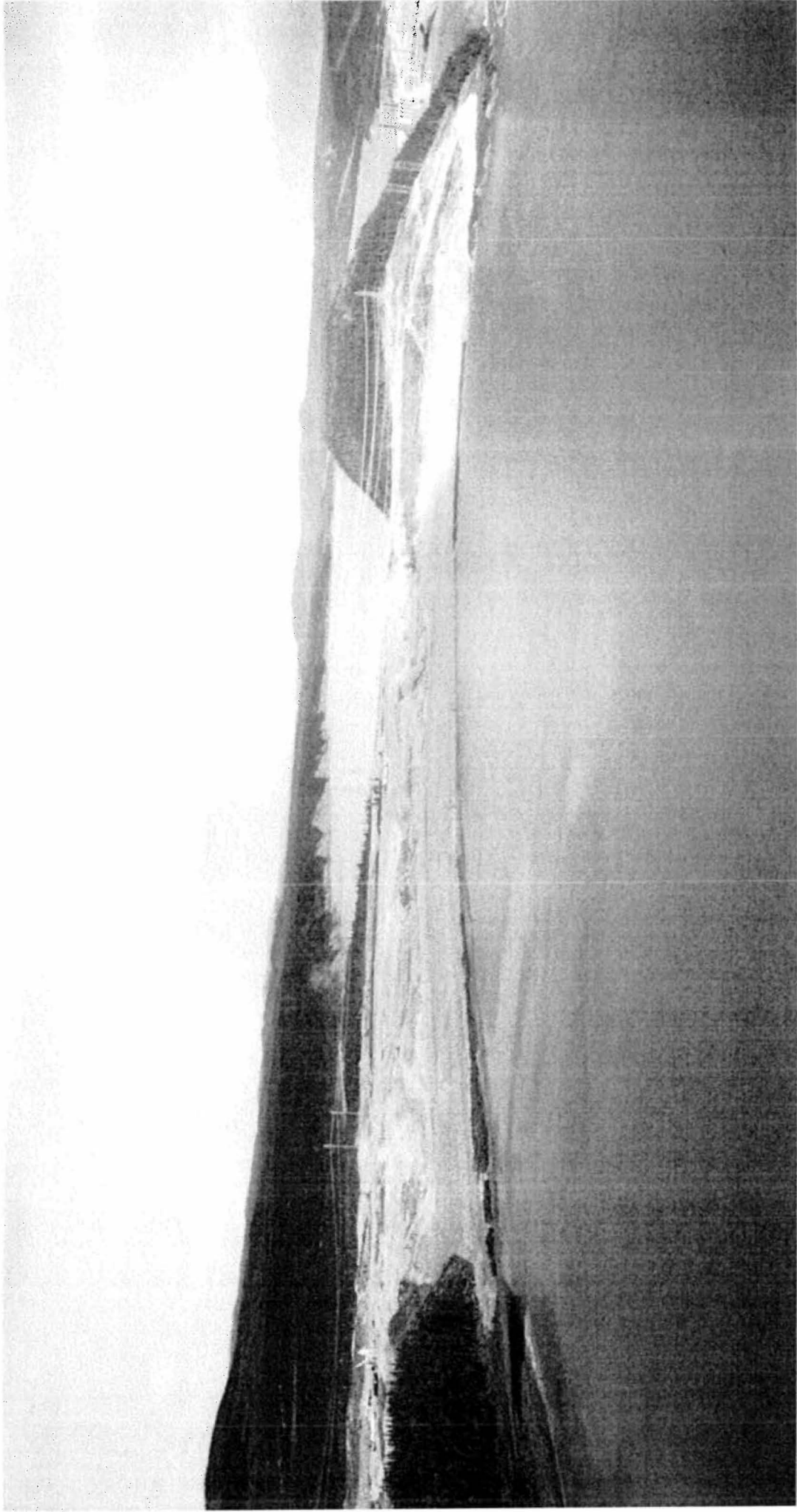
Powerhouse Units 1-4



North Spur (Downstream View)



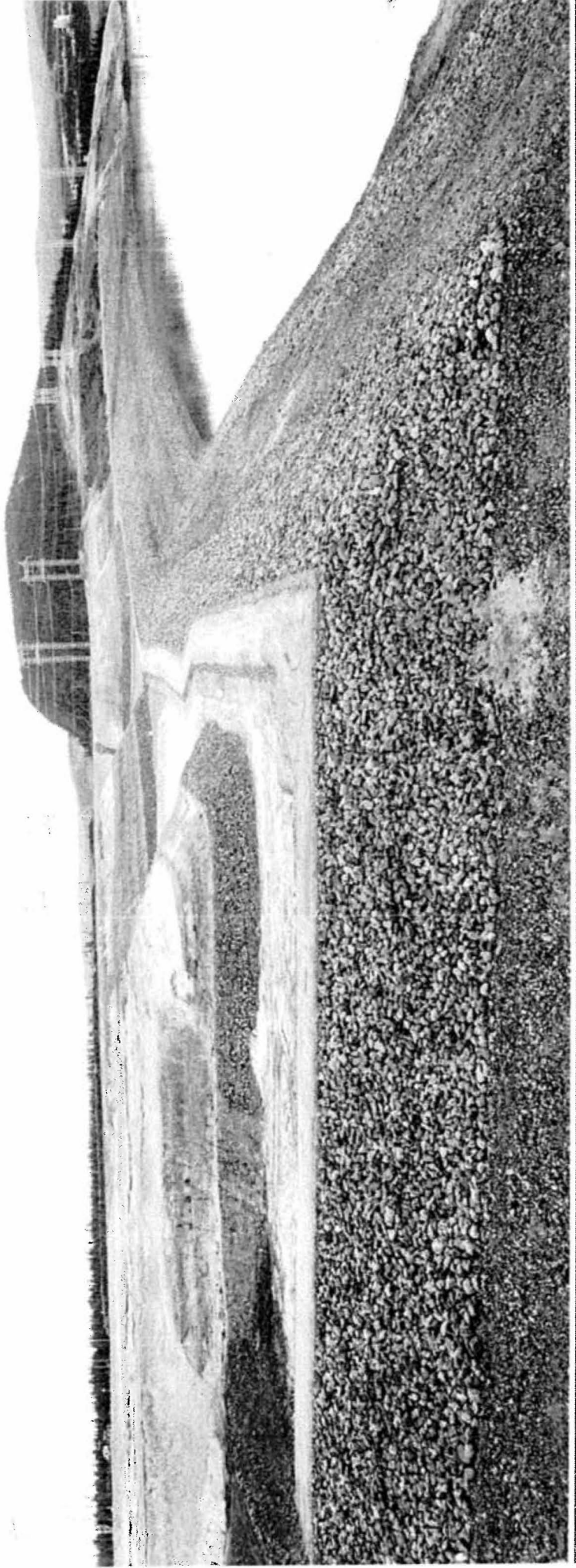
North Spur (Upstream View)



North Spur (Upstream View)

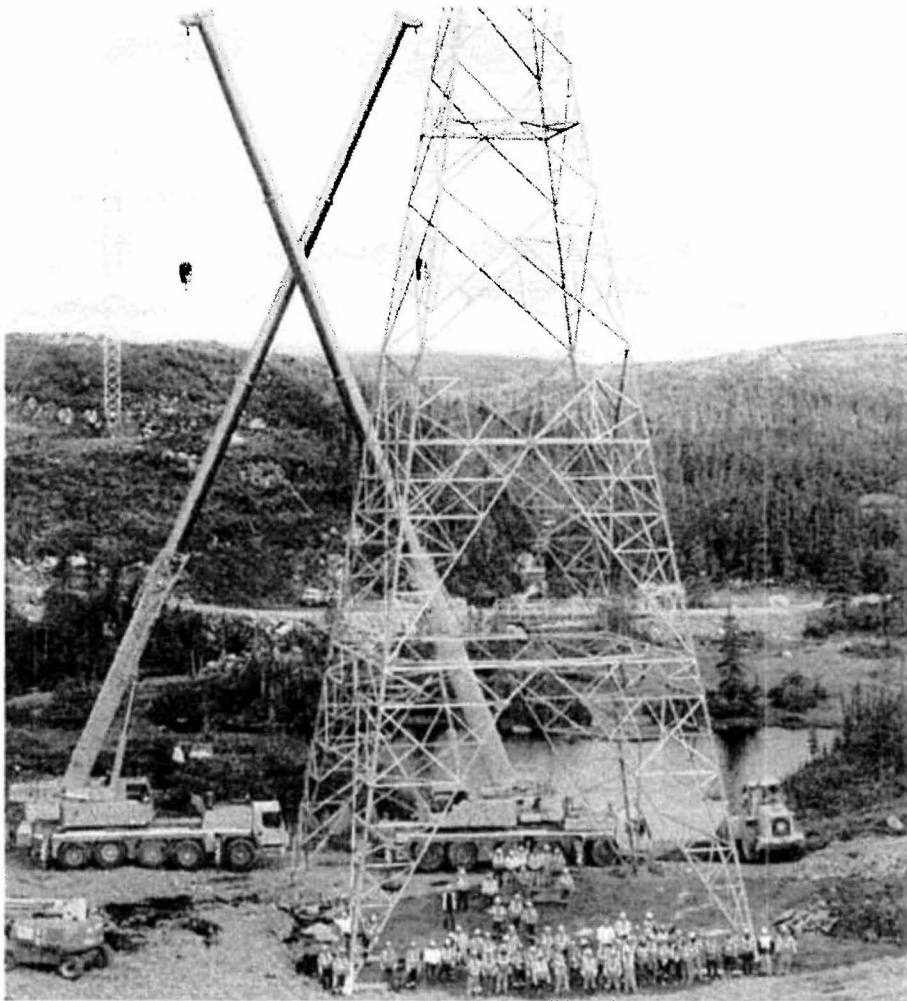


North Spur (Upstream)



POWER SUPPLY (TRANSMISSION)

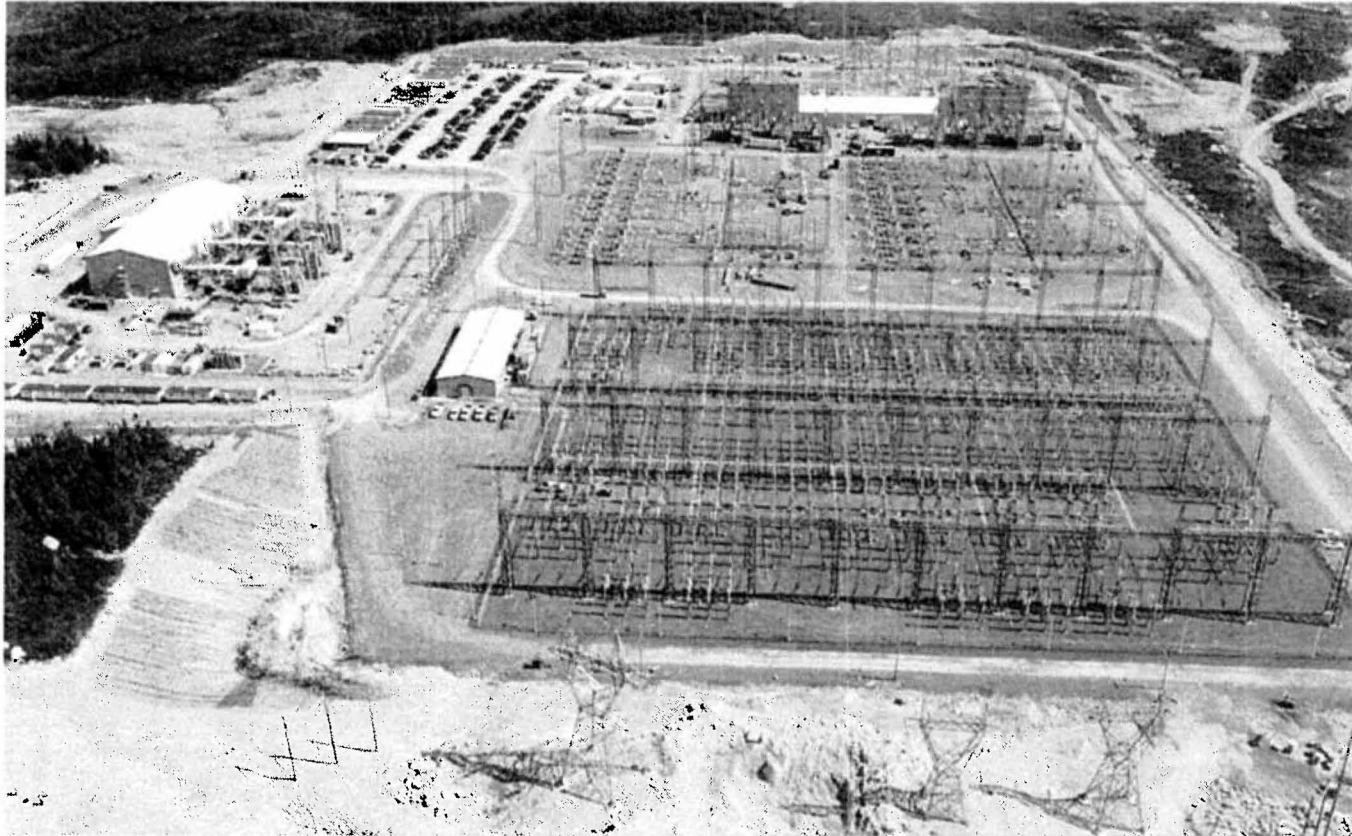
Labrador-Island Link (LIL)



99% construction completed

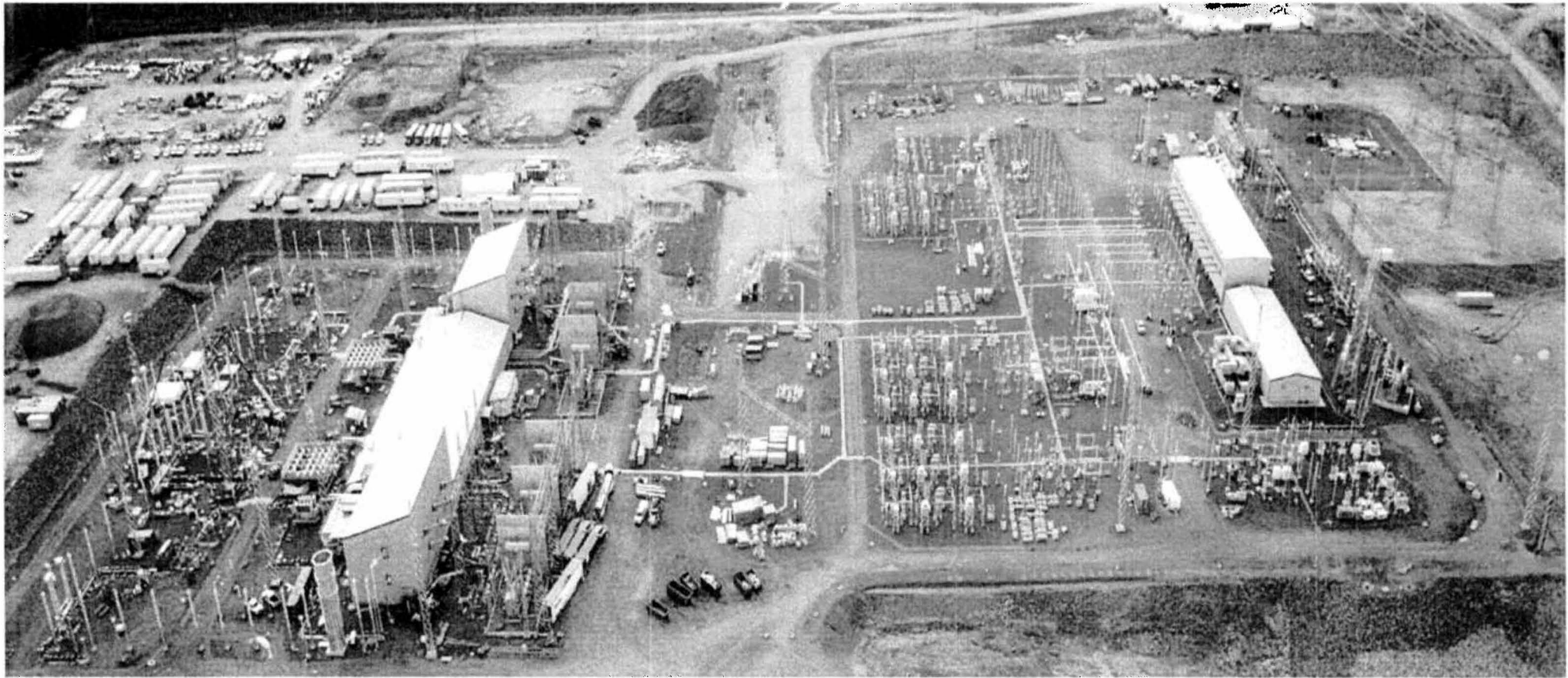
- 1,100 km line from Muskrat Falls to Soldiers Pond
- 30 km across the Strait of Belle Isle (SOBI)
- SOBI completion by end of 2016
- Projected facilities costs:
 - Sanction \$2.6B
 - June 2017 \$3.7B
- Projected in service dates:
 - Sanction: Q2 2017
 - June 2017: Q2 2018
- Emera provides equity contribution plus interest of \$0.8B based on current estimates to receive regulated utility rate of return

Soldiers Pond



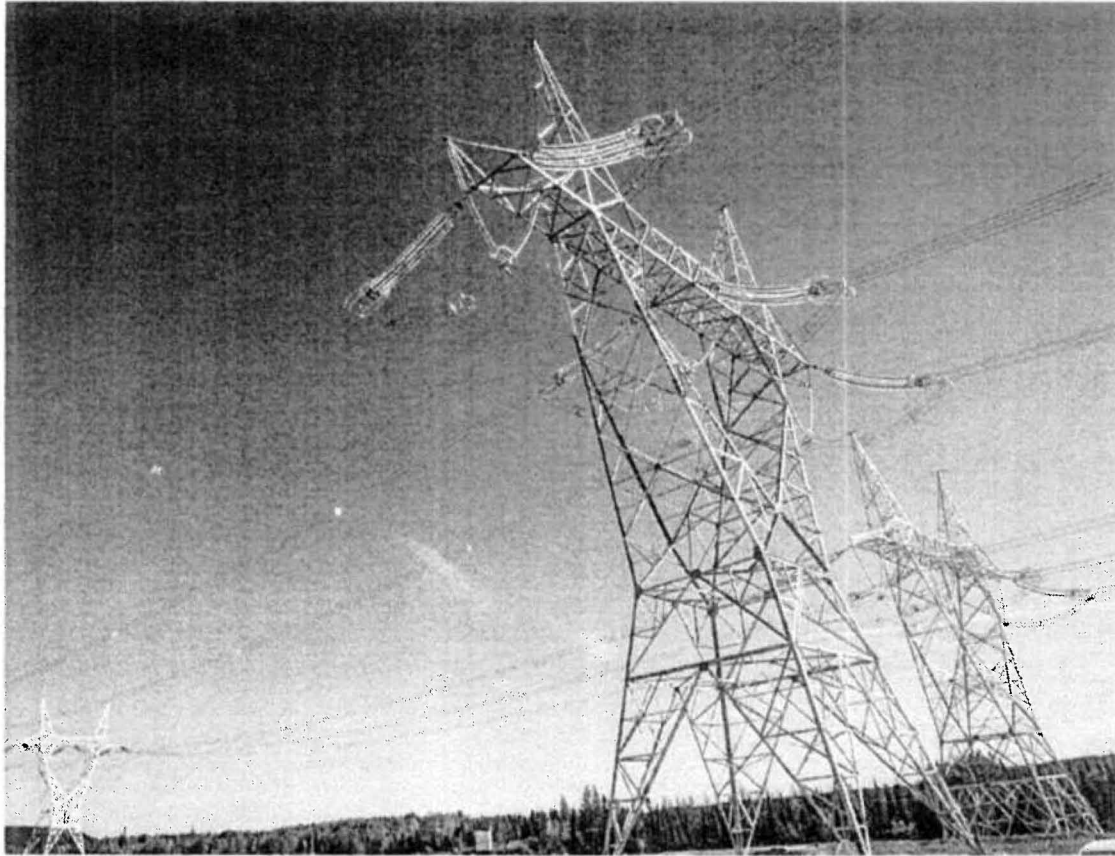
- AC switchyard constructed, energized and fully integrated into NL Hydro system
- Synchronous condensers and converter stations nearing completion

Muskrat Falls



- Converter station and AC switchyard nearing completion
- Commissioning work underway
- Energization planned for Q1 2018

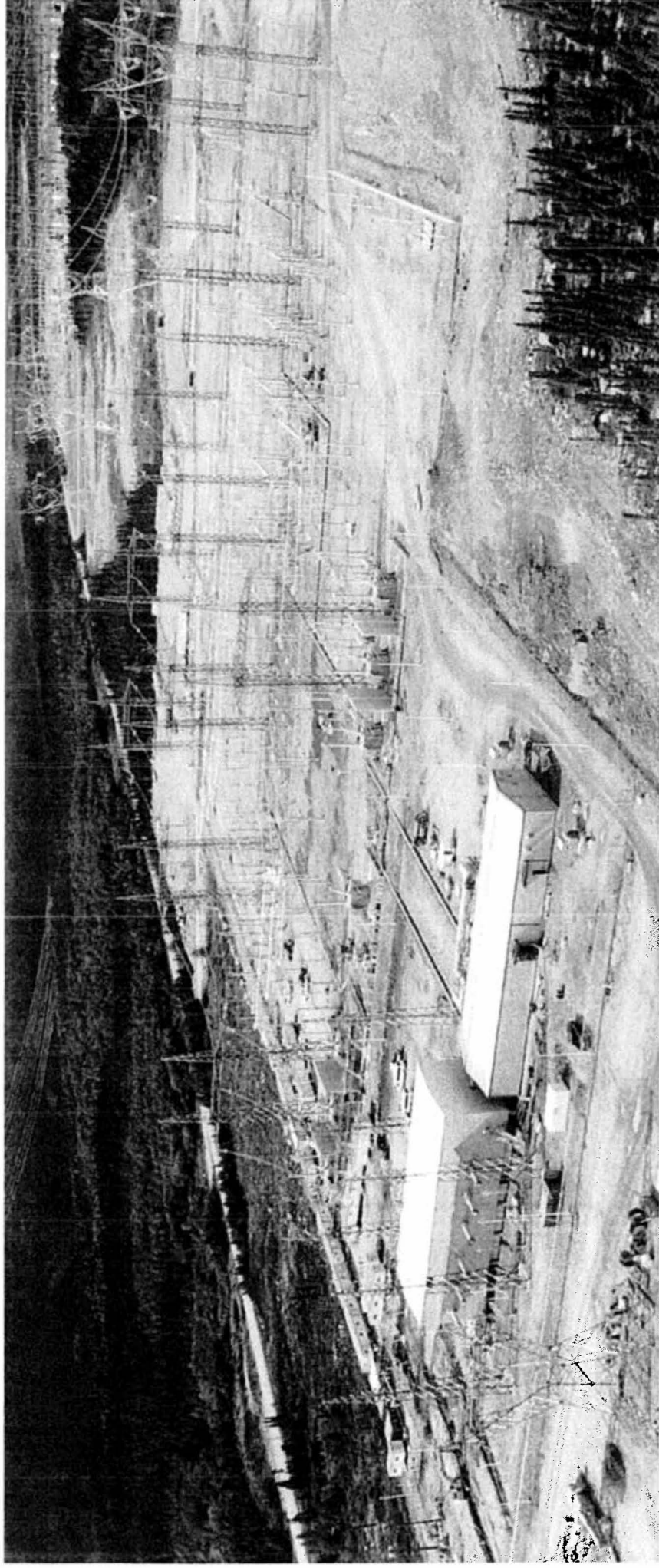
Labrador Transmission Assets (LTA)



- Churchill Falls to Muskrat Falls
- Two, 250 km 315 kilovolt lines
- Projected facilities costs:
 - Sanction \$692M
 - June 2017 \$894M
- Projected in service dates:
 - Sanction: Q2 2017
 - June 2017: Q2 2018

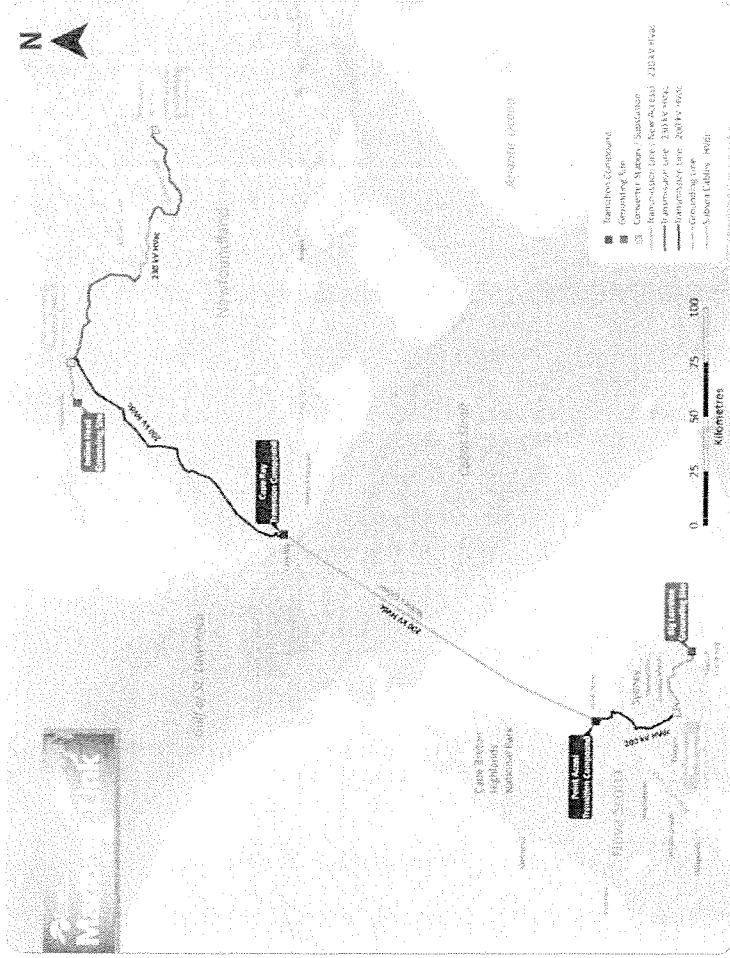
99% construction completed

Churchill Falls



- Switchyard construction 99% complete
- Commissioning work underway
- Energization planned for Q1 2018

Maritime Link (Emera)

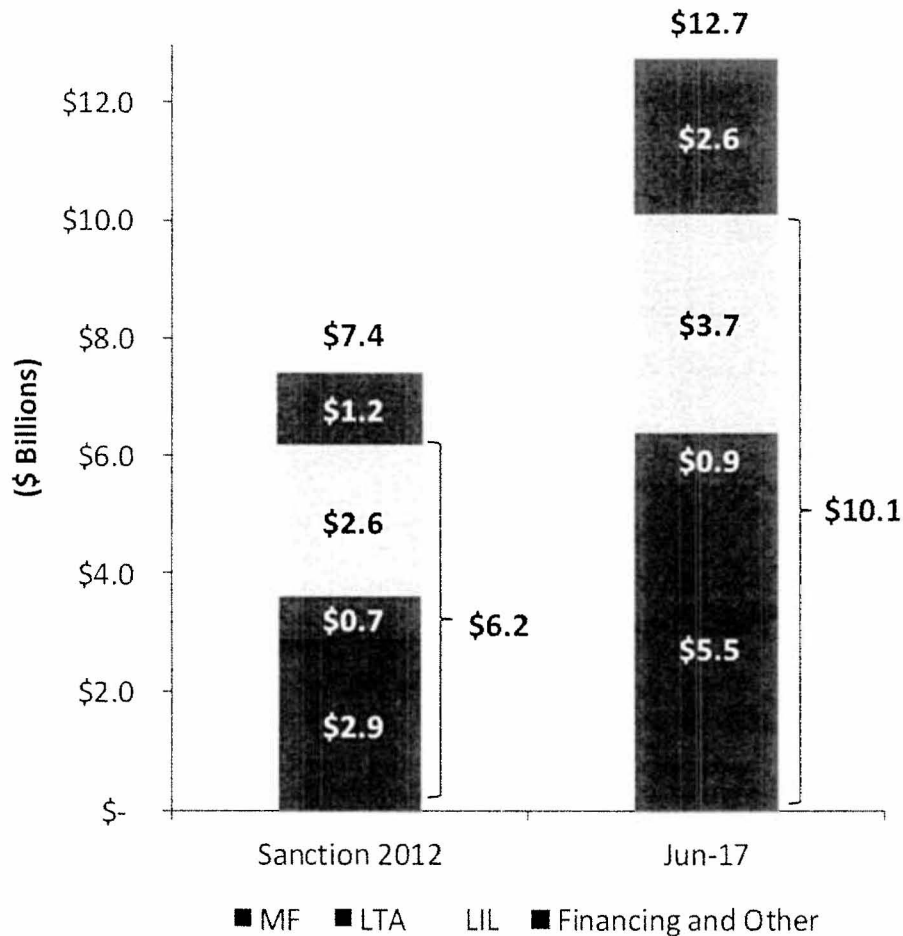


- Constructed, owned and operated by Emera for 35 years
- 500 MW capacity
- 170 km undersea link from Cape Ray, NL to Cape Breton, NS
- Projected facilities cost \$1.58B
- Testing commenced Q4 2017; commissioning in progress
- Nalcor has transmission rights to import/export power

MUSKRAT FALLS PROJECT COSTS

(DATA AS PER JUNE 2017 UPDATE)

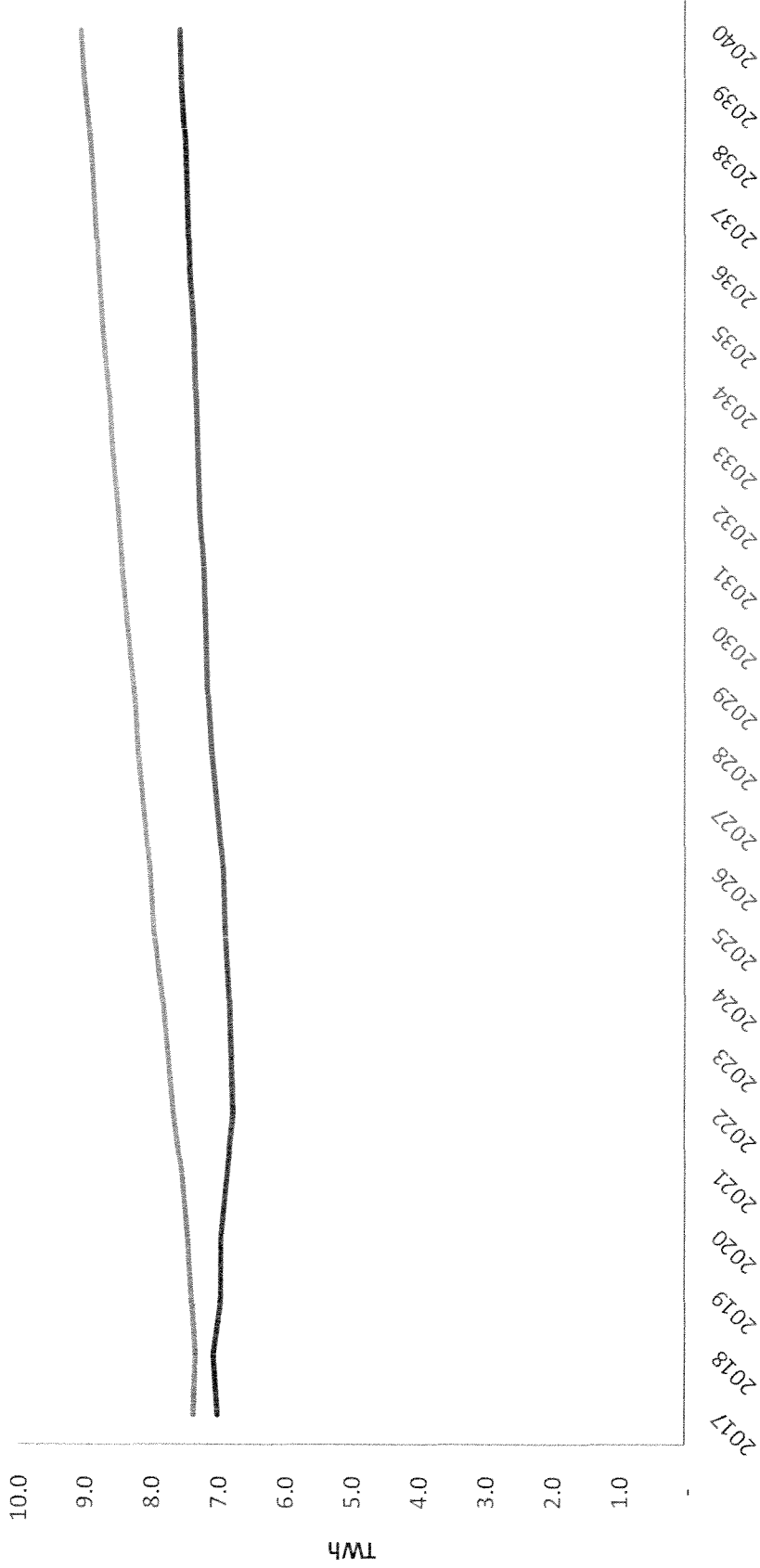
Muskrat Falls Projected In-service Capital Cost



Overall Project Cost Increase – Contributing Factors

- Original cost estimates were optimistic/overly aggressive
- Risks of the project were underestimated at the beginning
- Lack of experience of some contractors working in our harsh environment
- Early execution by some major contractors was poor

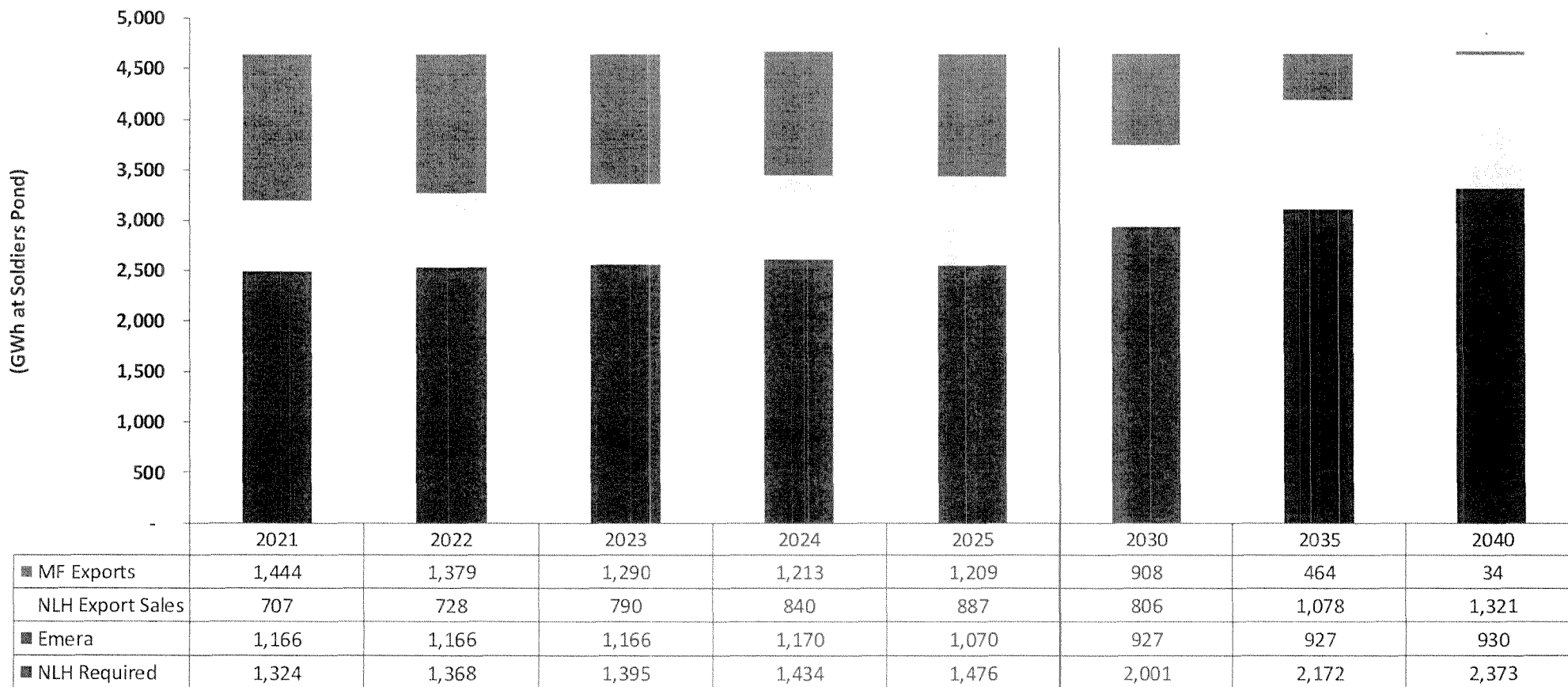
NL Hydro Island Interconnected Sales



Note: May 2017 load forecast is based on a targeted rate of 18 cents/kWh in 2020 escalating at 2.2% thereafter.

Sanction 2012 Jun-17

Muskrat Falls Energy Deliveries

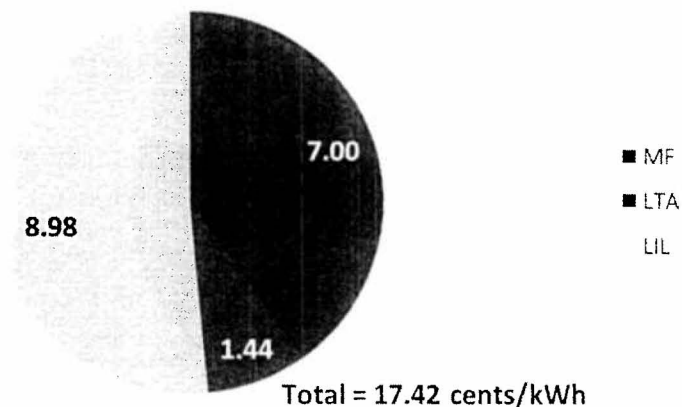


Unit Cost Projections

(For energy delivered at Soldiers Pond)

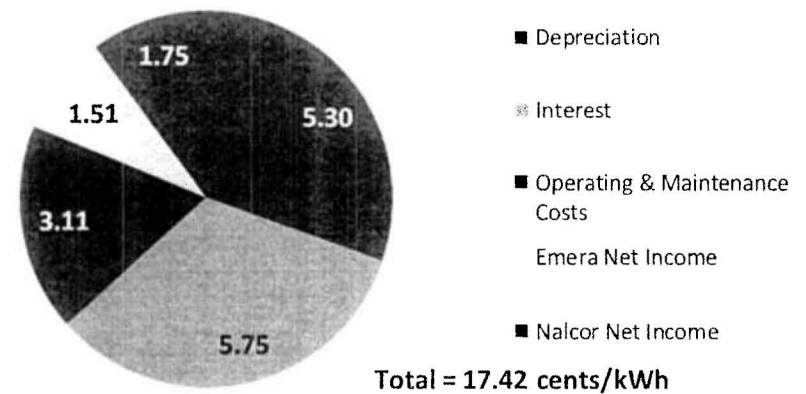
Muskrat Falls Unit Cost Projection by Project Component

(2021 - cents/kWh)

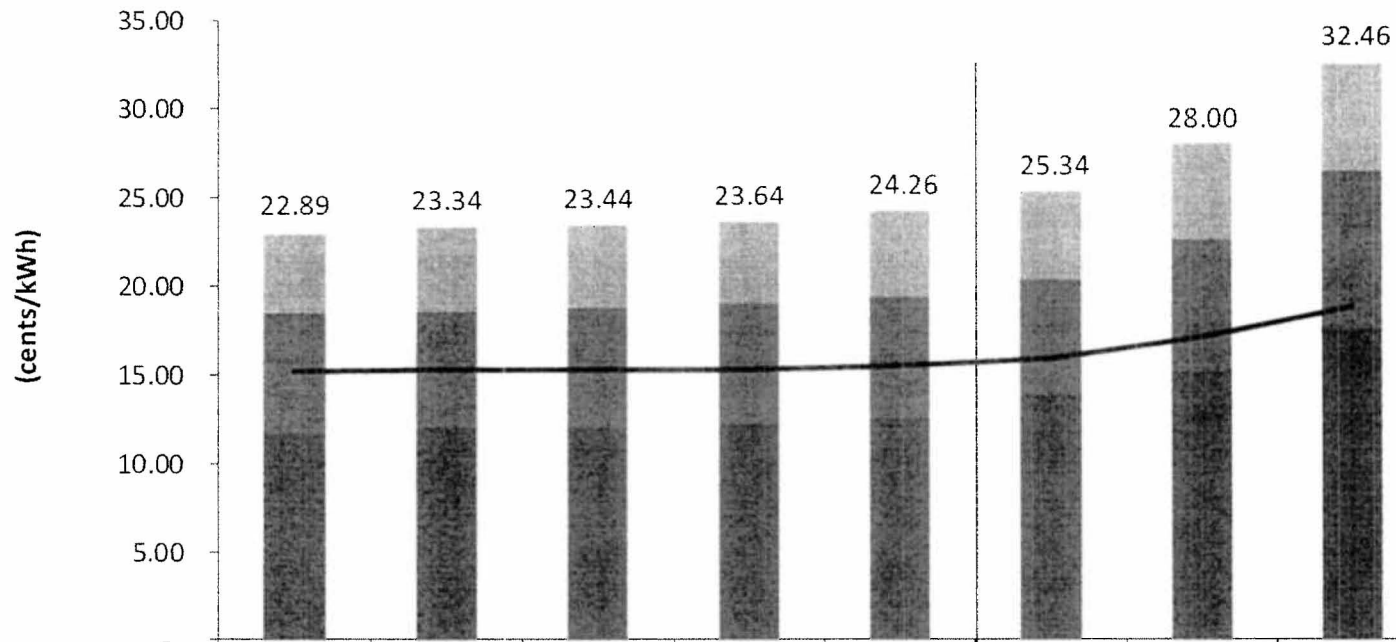


Muskrat Falls Unit Cost Projection by Cost Category

(2021 - cents/kWh)



Island Interconnected Domestic Rate Projections



	2021	2022	2023	2024	2025	2030	2035	2040
NP Costs	4.43	4.77	4.74	4.71	4.96	5.02	5.50	6.03
NLH Other	6.80	6.54	6.68	6.76	6.80	6.50	7.39	8.87
MF purchased power cost	11.66	12.02	12.02	12.17	12.49	13.82	15.11	17.56
Jun-17	22.89	23.34	23.44	23.64	24.26	25.34	28.00	32.46
Sanction 2012	15.12	15.30	15.26	15.25	15.46	15.84	17.09	18.78

Current wholesale and domestic rates are 7.5 cents/kWh and 11.7 cents/kWh (excluding HST), respectively.

Mitigation Measures

- Extend Federal Loan Guarantee (complete)
- Transmission infeed in advance of Muskrat generation
- Targeted purchases and sales of energy through Quebec and Maritimes interties

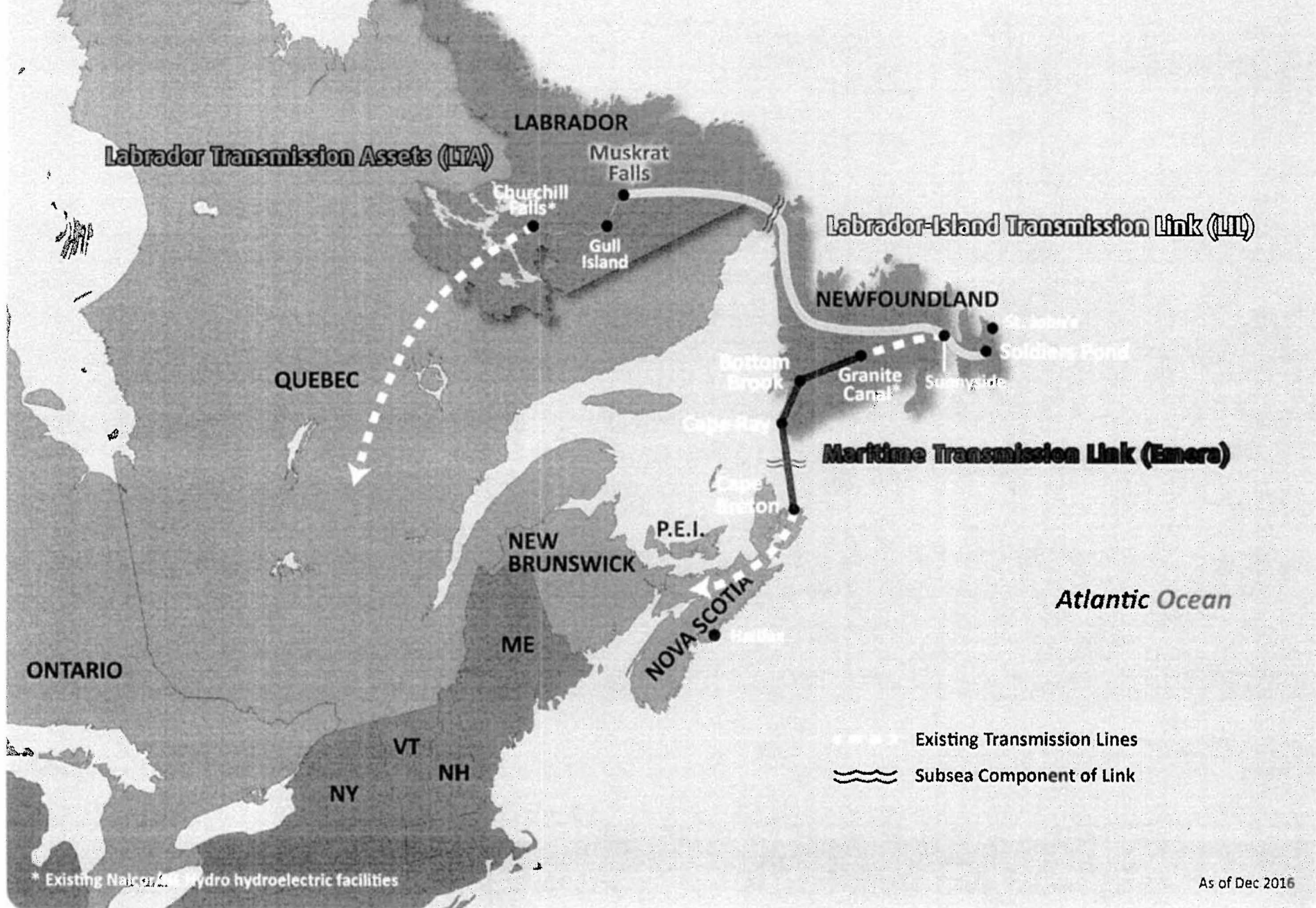
2018 Focus - Transmission

- Maintain safety focus
- Completing construction and commissioning work required to energize the transmission lines for power delivery to the island from Churchill Falls in mid-2018

2018 Focus - Generation

- Maintain safety focus
- Continue with installation of turbine and generator components
- Complete the North Dam
- Prepare for first power in 2019

Muskrat Falls Project



6 Stages of a Mega Project

1. Wild Enthusiasm
2. Disillusionment
3. Confusion, Panic and Hysteria
4. Search for the Guilty
5. Punishment of the Innocent
6. Reward the Uninvolved