

## Schedule 2

### Scope of Work

#### Hydroelectric Dam Construction

##### **For the Keeyask project:**

1. Review, assess, and determine the reasons for project cost overruns with respect to:
  - i. Design or project scope changes;
  - ii. Deviations from estimated quantities;
  - iii. Labour productivity;
  - iv. Labour costs;
  - v. Labour hiring constraints with respect to:
    - Competition with other large civil projects in Canada;
    - Remote location; and
    - Northern and First Nations jobs.
2. Determine whether Manitoba Hydro followed best practices for its pre-construction design and engineering work including whether sufficient geotechnical analysis was undertaken.
3. Review and assess Manitoba Hydro's cost estimating methodologies, identifying best practices and short-comings. Explain why the cost estimating methodologies resulted in an overly optimistic cost estimate.
4. Review and assess Manitoba Hydro's scheduling methodologies, identifying best practices and short-comings.
5. Review and assess Manitoba Hydro's tendering and contracting methodologies, including choices of contract types, decisions to tender versus directly negotiate contracts, and identifying best practices and short-comings. The scope is to include the following contracts: general civil works; turbines and generators;

spillway gates, guides, and hoists; intake gates, guides, and hoists; main camp; camp operations and maintenance services; design engineering; site development; South Access Road; and reservoir clearing. Other material contracts identified by the Independent Consultant should be reported to the Board.

6. Review and assess Manitoba Hydro's and the Keeyask Cree Nations' project governance structure and processes comparing to best practices and short-comings. Provide an opinion how the governance has affected – both positively and negatively – project management, contractor management, and scheduling.
7. Assess Manitoba Hydro's updated Keeyask cost estimate for reasonableness, including whether appropriate contingencies and reserves have been provisioned.
8. Identify aspects of the updated cost estimate and schedule that are at heightened levels of risk and recommend risk mitigation strategies that Manitoba Hydro should use.
9. Identify changes to project governance or project management that would beneficially improve the execution of the remaining work and minimize risks.

#### HVDC System Design and Construction

##### **For the Bipole III HVDC converter stations (Keewatinohk and Riel):**

10. Review and explain the reasons for the increases in the converter stations cost estimate from \$1.09 billion (2010) to \$2.68 billion (2014).
11. Review and assess Manitoba Hydro's cost estimating methodologies, identifying best practices and short-comings, with specific attention to the short-comings that resulted in the converter station estimates increasing by 150%.

12. Review the design specifications and tender documents to determine whether the performance specifications for HVDC equipment established by Manitoba Hydro were appropriate.
13. Review and assess the tendering and contracting methodologies for the converter stations, identifying best practices and short-comings.
14. Identify reasons why HVDC converter equipment bidders proposed LCC technology and not VSC. Quantify and explain the impact of this on the converter station costs.
15. Review and assess the reasons for the capital cost increases from the 2014 control budget of \$2.68 billion to the current forecast at completion amount of \$2.78 billion.

#### Transmission Line Construction

##### **For Bipole III:**

16. Determine whether Manitoba Hydro followed best practices for its pre-construction design and engineering work.
17. Review and assess Manitoba Hydro's cost estimating methodologies, identifying best practices and short-comings.
18. Review and assess Manitoba Hydro's tendering and contracting methodologies, including choices of contract types for the major contracts, identifying best practices and short-comings.
19. Review and assess Manitoba Hydro's proposed project management, contractor management, construction risk management, and scheduling methodologies, identifying best practices and short-comings.
20. Review, assess, and determine the reasons for project cost overruns since the final pre-construction control budget.

21. Assess Manitoba Hydro's updated forecast at completion capital cost for reasonableness, including whether appropriate contingencies and reserves have been provisioned.
22. Identify aspects of the updated cost estimate and schedule that are at heightened levels of risk and recommend risk mitigation strategies that Manitoba Hydro should use.

**For the Manitoba-Minnesota Transmission Project and the Manitoba-Saskatchewan Transmission Project:**

23. Determine whether Manitoba Hydro followed best practices for its pre-construction design and engineering work.
24. Review and assess Manitoba Hydro's cost estimating methodologies, identifying best practices and short-comings.
25. Review and assess Manitoba Hydro's proposed tendering and contracting methodologies, including choices of contract types for the major contracts.
26. Review and assess Manitoba Hydro's proposed construction management, contractor management, construction risk management, and scheduling methodologies.
27. Assess Manitoba Hydro's updated capital cost estimates for reasonableness, including whether appropriate contingencies and reserves have been provisioned.

**For the Great Northern Transmission Line:**

28. Compare the GNTL estimated capital costs with estimates for similar projects and assess whether the estimated cost is reasonable.
29. Review and assess the Facilities Construction Agreement and the Project Development Agreement between Minnesota Power and Manitoba Hydro's

subsidiary for reasonableness, identifying whether the agreements follow best practices or have short-comings.

30. Review, assess, and explain the reasons for cost estimate increases since 2014.
31. Compare and contrast Minnesota Power's cost estimating methodology with Manitoba Hydro's.