

1 Q. On pg. 3 of Exhibit 30 it is stated that the results of the studies outlined for Muskrat  
2 Falls were incorporated in the capital cost estimate in the fall of 2010. When will  
3 the results of the additional studies and analyses undertaken since the fall of 2010  
4 to the present be incorporated in the capital cost estimates for the Muskrat Falls  
5 facilities, the HVac Transmission System in Labrador and the Labrador-Island  
6 Transmission Link including the Strait of Belle Isle Cable Crossing. If such updated  
7 project costs are available now, provide the most recent revised capital cost  
8 estimate for each major component described in Exhibit 30.

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11 A. The results of Phase III engineering activities and the responses to requests for  
12 proposals for major equipment deliverables, such as subsea cables and turbine –  
13 generator sets, will be incorporated in the DG3 capital cost estimates for Muskrat  
14 Falls, Labrador HVac transmission, and the Labrador Island Transmission Link during  
15 Q2 of 2012 in anticipation of a DG3 decision in mid 2012.

1 Q. Pg. 6 of Exhibit 31 states that the current capital cost estimates for the Muskrat  
2 Falls Project and the Labrador-Island Transmission Link were prepared for the  
3 purposes of Decision Gate 2 and on pg. 7 it is stated that this cost estimate is  
4 *“commensurate with a AACE International Class 4 estimate”*. What degree of  
5 accuracy is usually attached to Class 4 estimates?  
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8 A. According to AACE International Recommended Practice No. 18R-97, typical  
9 accuracy ranges for a Class 4 estimate can be -15% to -30% on the low side to +20  
10 to +50% on the high side, depending on the technical complexity of the project,  
11 degree of project definition (i.e. percentage of design complete), appropriate  
12 reference information, and the inclusion of an appropriate contingency  
13 determination.

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15 However these ranges are not absolute and are not industry or project specific.  
16 AACE International Recommended Practice No. 18R-97 “Cost Estimate Classification  
17 System” states:

18 “In summary, estimate accuracy will generally be correlated with  
19 estimate classification (and therefore the level of project definition),  
20 all else being equal. However, specific accuracy ranges will typically  
21 vary by industry. Also, the accuracy of any given estimate is not fixed  
22 or determined by its classification category. Significant variations in  
23 accuracy from estimate to estimate are possible if any of the  
24 determinants of accuracy such as technology, quality of reference  
25 cost data, quality of the estimating process, and skill and knowledge  
26 of the estimator vary. Accuracy is also not necessarily determined by

1           the methodology used or the effort expended. Estimate accuracy  
2           must be evaluated on an estimate-by-estimate basis (emphasis  
3           added), usually in conjunction with some form of risk analysis  
4           process.”

1 Q. What is the degree or range of accuracy used by Nalcor Energy with respect to the  
2 Decision Gate 2 estimates for the Muskrat Falls Project and the Labrador-Island  
3 Transmission Link that have been provided to the Board?  
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6 A. With reference to Nalcor's response to PUB-Nalcor-42, Nalcor has followed the  
7 AACE International practices and has carried out a risk analysis and in consideration  
8 of the mature technology, high quality of reference cost data and best practice  
9 estimating process followed has determined that a contingency of 15 percent to the  
10 base estimate provided a P50 Capital Cost Estimate is appropriate.

1 Q. What public policy directives were used in the analysis to derive the power  
2 purchase price to be paid by Hydro to Nalcor for Muskrat Falls power and energy?

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5 A. In deriving a power purchase price to be paid by Hydro to Nalcor Muskrat Falls  
6 power and energy, Nalcor has maintained general consistency with the public policy  
7 directive that Newfoundland and Labrador Hydro's return on equity be in line with  
8 that of Newfoundland Power and other Canadian regulated utilities.

1 Q. What are the key policy objectives referred to in the first paragraph of Exhibit 36?

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4 A. Nalcor believes that the rate payer benefits outlined in Exhibit 36 facilitate the key  
5 policy objective of developing the Lower Churchill resource.

1 Q. If “cost of service” (“COS”) pricing were applied in determining the power purchase  
2 price, what would be the power purchase price paid by Hydro to Nalcor for Muskrat  
3 Falls power and energy in the first full calendar year of supply?  
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6 A. Nalcor has prepared an annual cost of service model in response to the question  
7 posed. The financial parameters in this model were set to provide an internal rate  
8 of return of 8.4% for the Muskrat Falls investment. On this basis, the cost of service  
9 in year 1 would be \$214 /MWh declining with each year thereafter as the Island  
10 sales base grows and the return on rate base declines.  
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12 Nalcor notes that a cost of service pricing model will not be applied to determine  
13 the power purchase price to be paid by Hydro and therefore the price provided  
14 above is unrelated to the price of energy to be charged by Nalcor. As indicated in  
15 Exhibit 36, a cost of service model has the following disadvantages:  
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- 17 a) the revenue paid by ratepayers for Muskrat Falls is highest in the first year  
18 (that is, when the undepreciated cost of the asset is at its maximum), and  
19 declines thereafter, and
- 20 b) equity investors earn their regulated return each year; this return (in dollars)  
21 is also highest in the first year.  
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23 While the Island’s energy requirements increase over time in line with economic  
24 growth, the early-year COS rate for MF power would be a significant burden for  
25 ratepayers in those years, as the required COS revenue for MF would be at its  
26 maximum and the power required by ratepayers would be at a minimum.

1 For these reasons, an alternative approach to MF power pricing was developed  
2 which affords a number of advantages for ratepayers.

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4 An “escalating supply price” (that is, the price per MWh of power actually used by  
5 ratepayers, expressed in real dollars subject to escalation at CPI) has been  
6 established to recover all costs – operating costs over time, debt service costs for  
7 the debt portion (as applicable) of the capital investment, and an equity return on  
8 the equity portion of the capital investment at a defined Internal rate of Return  
9 (“IRR”) over the life of the project.

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11 This escalating supply price is lower than would be indicated initially by the COS  
12 framework. It escalates evenly over time, and is applied only to power actually used  
13 by ratepayers – the early-year burden placed on ratepayers at that time is  
14 minimized.

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16 Given the advantages of the escalating approach, Nalcor has selected it as the  
17 pricing model to be used for the supply of Muskrat Falls energy to the Island.



1 Q. In its letter of July 12, 2011 the Board requested a copy of the report supporting the  
2 purchase price of Muskrat Falls power and energy by Hydro. No report was  
3 provided in response to this request. Exhibit 36 does not refer to a report or a  
4 study but does say Nalcor had undertaken "*a supply pricing analysis for Muskrat*  
5 *Falls power*". Was a report or study completed to determine the purchase price? If  
6 so, provide it.

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9 A. No report or study was completed to determine the purchase price for Muskrat  
10 Falls power. As provided in PUB-Nalcor-48, a supply pricing analysis in the form of  
11 an excel worksheet model was undertaken for the Muskrat Falls project in order to  
12 estimate its economic cost of production given the capital and operating cost  
13 estimates, financial hurdles, and output levels. This initial supply price was  
14 subsequently applied to the Island sales to derive a project return of 8.4%.

1 Q. Provide a copy of the entire supply pricing analysis undertaken by Nalcor referred  
2 to in Exhibit 36.

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5 A. Confidential Exhibit CE-61 provides an excel worksheet model framework prepared  
6 by PWC for Nalcor. This model was used to originally estimate the economic cost of  
7 production for the Muskrat Falls project. This supply price was a function of capital  
8 and operating costs, firm energy output of 4.5 TWh, and an 11 percent return to  
9 capital. The escalating supply price was calculated to be \$76/MWh in 2010\$, with  
10 an annual 2% general inflation escalator applied to it thereafter.

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12 Once the escalating supply price of \$76 /MWh had been estimated, the next step  
13 was to use this price to derive project revenue, cash flows and shareholder returns  
14 for Muskrat Falls assuming that the Island was the only firm market and that the  
15 remainder of the production potential for the plant would be spilled. The return to  
16 capital generated by the Island sales profile, coupled with the escalating supply  
17 price, was calculated to be 8.4%. (The excel workbook analysis for this step has  
18 been previously provided in Exhibit 15 with additional detail provided in MHI-  
19 Nalcor-58 (including Confidential Exhibit CE-53) and MHI-Nalcor-117.) Nalcor  
20 deemed this return to be acceptable for the Muskrat Falls investment. While the  
21 8.4% return is currently below the long run forecast of return on equity for utilities,  
22 it was recognized that Muskrat Falls would have opportunities to realize additional  
23 revenues for the operational period before Island requirements fully utilized  
24 Muskrat Falls' production potential.

1 Q. Provide a copy of the report and analysis completed by PWC on the Muskrat Falls  
2 power purchase price referred to in Exhibit 15.

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5 A. Please refer to the response to PUB-Nalcor-48.

1 Q. Has a term sheet been developed detailing how the Power Purchase Agreement  
2 (PPA) between Nalcor and Hydro will be structured? If so, please provide a copy of  
3 the term sheet. If not, please describe in detail the methodology for the  
4 determination of the selling price and how the PPA will be structured and its impact  
5 on ratepayers.

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8 A. A term sheet that details how the Power Purchase Agreement (PPA) between  
9 Nalcor and Hydro has not been developed.

10 Nalcor has determined through analysis (for example, PUB- Nalcor- 48 and Exhibit  
11 15) that the Muskrat Falls project would be financially viable if Muskrat Falls  
12 recovered its full costs on the Island block over a 50-year supply agreement.

13 Based on DG2 cost estimates, the \$76 per MWh supply price (expressed in 2010\$,  
14 escalating at 2 percent and applied to projected island market volume) is the supply  
15 price that results in an 8.4 percent Internal Rate of Return, assuming no other sales  
16 are made.

17 While the structure of the PPA has not been determined, Nalcor envisages that this  
18 will be treated as a power purchase expense in NLH's overall regulated revenue  
19 requirement.