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FROM	Fax no. (204) 360-6147	TO	Fax no. 204-943-0461
Originator Marla Boyd Lawyer		Recipient Gavin Wood Gavin Wood Law Office	
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MESSAGE:

As requested, attached is a copy of the November 14, 2010 letter omitted from KM's direct evidence regarding communication from Manitoba Hydro.

Regards,
Marla Boyd

EX. KM-5



PO Box 815 • Winnipeg Manitoba Canada • R3C 2P4
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November 14, 2010

Mr. Gavin Wood
Gavin Wood Law Office
3 - 430 River Avenue
WINNIPEG, Manitoba R3L 0C6

Dear Sir:

RE: Report of Drs. Kubursi and Magee - Draft Chapter 5

Thank you for the efforts expended to provide Manitoba Hydro with a draft copy of Chapter 5. Manitoba Hydro appreciates the opportunity to review the draft chapter provided by the PUB independent consultants on Saturday, November 13, 2010, and has attempted to correlate its comments to the version provided on Sunday November 14, 2010. Manitoba Hydro appreciates the significant efforts evidence by the report, and wishes to suggest some areas where Manitoba Hydro wishes to provide comments and clarifications which may assist in a fuller understanding of Manitoba Hydro's business, or items which must be redacted in order to preserve confidential or commercially sensitive information, as detailed in the attachments to this letter.

As noted in our earlier correspondence, these matters of understanding, or impressions created by the report are of concern to Manitoba Hydro as in the context of Manitoba Hydro's operations, a slight misunderstanding may result in significant time expended in the regulatory framework, and may lead to less than desirable outcomes for all participants. In many cases, it would be helpful for the technical suggestions to be provided in the proper context in order that Manitoba Hydro's major risks are adequately addressed. Given the time constraints associated with providing these comments, Manitoba Hydro's comments may be somewhat abbreviated. Manitoba Hydro is not in a position to comment on all specific areas in the time permitted, and as such, silence should not be interpreted as acceptance or agreement with the matters contained in the report for which comments were not provided.

We appreciate your consideration of Manitoba Hydro's comments, and welcome the opportunity to review further any matters which require clarification. We acknowledge receipt of Chapters 6 and 7 on Sunday, November 14, 2010 and will provide you with our comments and any proposed redactions as soon as possible on Monday.

Yours truly,
MANITOBA HYDRO LAW DEPARTMENT

Per: *M Boyd*

MARLA D. BOYD
Barrister & Solicitor

ATTACHMENT

Manitoba Hydro Comments on Chapter 5 of the Report of Drs. Kubursi and Magee

Please note that Manitoba Hydro has adopted the convention of Drs. Kubursi and Magee and have in some cases referred to Drs. Kubursi and Magee as "KM".

The issues and comments provided on Friday, November 12, 2010 also apply to some of the matters addressed in Chapter 5 and accordingly, Chapter 5 should be reviewed in light of the comments made with respect to Chapters 1 - 4. These include, for example, comments regarding the stage of development of PRISM, the outputs of HERMES (as discussed on page 21 of Chapter 5), MH's risk governance issues and preparedness plans as outlined in Section 5.2.3.

It is noted that Chapter 5 quotes extensively from the NYC, however, at times in the KM report it is unclear whether the statements are those of the NYC, or the finding of KM. We would appreciate your clarification as you review the report prior to final submission to the PUB.

Section 5.2.1.1

Page 11, first paragraph (Page 195, second paragraph) - we note the statement that "MH maintains that the major source of uncertainty it faces is volumetric, and that changes in prices result in minor variations in demand and revenue." This is factually incorrect, and would be more correctly stated as "MH maintains that the major source of uncertainty it faces is volumetric, and that changes in prices result in minor variations in demand, *planned import and export activity, and planned generation operations.*"

In the same paragraph, KM state, "Lake levels must be maintained at targeted levels by licensing agreements while the transmission capacity constraints on US transmission impose binding quantitative restrictions on MH's choices." This statement is factually incorrect and is more correctly stated that "Lake levels must be maintained *within level ranges allowed by its licences and agreements* while the transmission capacity constraints *on tielines connecting Manitoba Hydro to neighbouring markets* impose binding quantitative restrictions on MH's choices."

On page 196, first paragraph, the statement is made that "This is not a small amount of money and serves to indicate that accurate price forecasts are a key determinant of net revenues". In order to be factually correct, the word "forecast" should be inserted before "net revenues". It must also be noted that, as explained in the KPMG report, the \$45 million amount is the result of a pessimistic set of assumptions and even in that circumstance, as a percentage of the total revenues and costs being optimized is relatively small (in the order of less than 5%).



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In the second paragraph (p. 196), it should be noted that MH does translate its monthly price forecast at MINN hub into hourly prices for each month of the forecast period at the MHEB node. This monthly price forecast is obtained from a single forecast vendor.

Page 12, first full paragraph (p. 196, third paragraph) - we note that the concluding paragraph of this sentence is unclear. It would be appreciated if it could be clarified which assertion KM has identified as correct, MH expects that this was intended to reference KPMG's assertion.

Page 197 Finding #1 – KM states, "Prices in HERMES are not stale; they are based on adjusted forecasts from five reputable consulting groups." This statement is factually incorrect as it confuses the price forecast processes used in the operating horizon (HERMES) with that of the long-term planning horizon (SPLASH). The forecast based on five vendor provided forecasts is used in SPLASH. The price forecast used in HERMES is based on a single purchased forecast that is updated monthly. Manitoba Hydro suggests replacing this sentence with, "Prices in HERMES are not stale; they are based on adjusted forecasts *from a reputable price forecast provider.*"

MH also disagrees that the NYC has raised a valid point about using the forward price curve alternative. Broker quotes are not appropriate for obtaining a cash price which is necessary for MH to optimize its marginal production. Further, there is no sufficiently developed long term market-based (broker quotes) price forecast that could be used in SPLASH.

Section 5.2.1.2

p. 198, fourth paragraph – KM state, "It is still an issue of accuracy of inputs to the extent that HERMES is only based on this average flow calculated from this single historical series to calculate revenues and other financial parameters." This statement is factually incorrect. Manitoba Hydro notes that HERMES is based on an expected flow case in the current operating year, which is projected from observed antecedent flows using a regression model fit to historical flow data, and for the purposes of the IFF, a median inflow case is used in the subsequent budget.

Finding 2 (p. 199) states that "The accuracy of the historical water flow data before 1942 is not high...". This is not substantiated. The NYC has made this assertion, which KM appears to accept. However, there are no studies to support this assertion. The same conclusion is found at page 13, fourth paragraph, where KM state "This is an interesting point of view but does not detract from the seriousness of the claim that the specific constructed series upon which MH bases much of its planning of dependable energy has to be verified statistically." MH has a nearly complete gauge flow record back to 1928, which includes the critical flow period from 1937 - 1941. Prior to 1928, some statistical modeling was necessary to fill in the record for the Churchill River. MH has spent significant time and effort in studying and verifying the quality of its flow records, and has high confidence in them. We would therefore request that this be corrected, or

alternatively that KM cite the sources of their investigations which support KM's conclusion.

Section 5.2.1.3

Finding 3 - MH does not agree with the Finding 3 that "Different production coefficients in HERMES and SPLASH are a problem." MH does not view this as a problem as these models are run for different purposes and in the context of the use of these two models, different production coefficients do not affect the reliability of the results. This is a negative statement, and if it is to be left in, should be accompanied by an explanation of what "problem" this creates, given MH's use of these models for different functions.

Section 5.2.1.4

Finding 4 - As part of MH's climate change studies, there is significant work being undertaken in the area of hydrological modeling for the entire Nelson-Churchill watershed. This work, at some point, may be applied in the operations and generation planning processes.

Section 5.2.1.6

Page 204, second paragraph. - Discussion of the "Hotelling principle" is misleading as it incorrectly implies Manitoba Hydro has infinite storage capability. In reality, choosing to store water adds risk of future spill which can be viewed as a storage cost. The text should reflect how this physical reality limits the applicability of the Hotelling principle.

Page 204 - last paragraph states "The Consultant has correctly noted that in a few instances HERMES solutions called for lower levels of water balances in the lakes than is warranted by future prices and prudent management." MH disagrees with this statement. The decision to draw water down was made either by MH management or by upstream reservoir managers outside of Manitoba and was not a result of the performance or output of HERMES.

Finding 6 - A better description of the importance of dynamic programming to MH's operations would be of assistance. It would be useful for KM to identify those similar utilities in North America, with multi-reservoir systems, which are successfully using dynamic programming.

5.2.1.6 Model Output: Predictive Accuracy

Page 21 - with respect to the finding that "Where it failed, however, was in the crucial period of the critical year of low flow." The commentary implies that the forecast was static. In fact, MH updated its forecasts regularly throughout 2003/04 based on actual water conditions. The fact that the deviation was 11% based on September 2003 information was not unexpected and falls within the range of possible outcomes given the variation in water, weather and market conditions.

The statements that "HERMES under-predicts total revenues" and "simple forecasting errors of total cost are large" does not appear to consider offsetting domestic load/revenue variations, and the fact that MH may take advantage of additional merchant

opportunities to purchase energy on the export market for resale in real time. This would largely account for the variation which KM refer to in stating "forecasting errors are quite large in several years".

Page 21, second last sentence (page 207, fourth paragraph) - the statement that "the improvement in the second forecast over the first forecast could be an indication of a deficiency of HERMES lag structure" mostly reflects the fact that the second forecast incorporates four months or more of actual information and has little to do with MH's antecedent forecasting technique.

Section 5.2.4, page 218 - We note there is a lettering issue with the list in that it commences at "K".

Section 5.2.4.1.1

P.222, last para. - The statement, "ICF argues that without additional investment in hydroelectric power plants, MH will have surplus power for sale, and the only feasible market is the export market" appears to include a typographical error. The word "without" should be replace by "with."

Page 223, paragraph commencing "Fifth" - the sentence ends "...or if there are changes in MISO rules". It appears that KM is confusing the role and jurisdiction of MISO with that of NERC and MRO (and possibly FERC). MH suggests adding "or in reliability requirements under NERC" at the end of the sentence.

Section 5.2.4.1.3

This section contains information which requires redaction. We are attaching the relevant pages with MH's required redactions (pages 232, 233, 234) MH would have no objection to the average percentage of all three contracts being provided based on a price of at least \$84 as demonstrated on page 149 of the KPMG report.

Finding 12 - the statement that "This suggests that export revenues can be relied upon to subsidize domestic rates when they are higher than import prices" is unclear.

5.2.4.1.4.

Finding 13 (page 236) - Manitoba Hydro disagrees with the statement that "The inclusion of wind and out of money thermal energy in dependable energy is a stretch..." These resources are integral to MH's system under low flow conditions and are appropriately relied upon in planning and resourcing MH's firm load commitments. When thermal resources will be relied on a small percentage of the time, lower capital cost and higher operating cost based resources are appropriate. It is not correct to assert that these resources represent a small portion of generation in low water flow conditions.

We also note that the correct spelling is "Conawapa".

We note that there is another Finding 13 at page 240, which should be Finding 14.

Section 5.2.4.1.5

This section contains information which requires redaction. We are attaching the relevant pages with MH's required redactions. [p. 237-240 inclusive]

Section 5.2.4.1.6

Finding 14 (should be 15) MH is not clear why the need for adequate risk capital to mitigate against MH's LTC risk exposures is a "serious concern". If this is to be addressed in Chapter 6, perhaps a reference would be of assistance.

Section 5.4 Conclusions

To the extent that MH has made comments in the body of the report, they should be reflected in the conclusions reiterated here. We are also attaching a copy of page 246 which requires redaction.

Finding 11

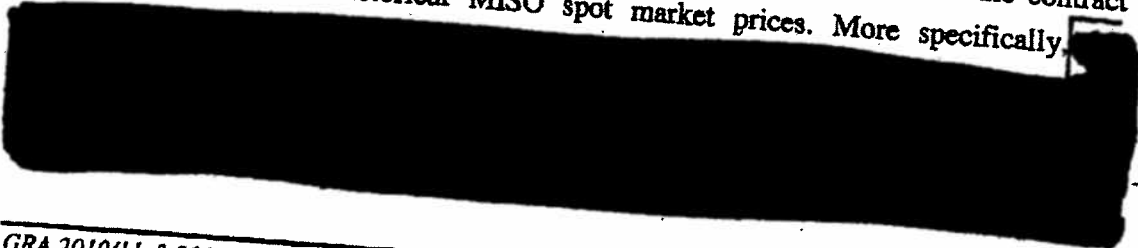
There are many benefits for MH to be in the export market and specifically, the the long term fixed price firm exports market. The long list advanced by KPMG and ICF outlined these benefits which include: diversification of the export portfolio, matching fixed costs to fixed revenues, guaranteeing secure investment in transmission infrastructure by counterparties and qualifying for priority transmission rights, pre-empting excess capacity by competitors, guaranteeing access to long term finance on favourable terms, raising export revenues in US dollars to defray import and debt costs in the same currency (providing MH a hedge against exchange rate fluctuations), greater access to firm imports when needed, and a host of other advantages. Even the Consultant admits that the issue is not selling in forward markets; the benefits from this would outweigh costs.

5.2.4.1.3 Are Export Revenues Subsidizing Local Rates?

The main contentions of the Consultant revolve around adequate contract prices. She has advanced a number of propositions suggesting that these prices are formulated and structured in a way which is not consistent with deregulated prices, that they are below what MH could achieve, that they fall below existing market prices (RA or DA prices), that they are not high enough to match import prices and that this discount is forcing rate payers to subsidize US consumers.

Most of these contentions can be settled easily by evaluating facts.

KPMG presents Exhibit 4.12 (KPMG Report, 149) that compares contract prices with MAPP and MISO on peak prices between 1997 and 2009. ICF has done the same but only for 1997 and 2008 (ICF, Exhibit 6-8, 86). Both have concluded that the contract prices are higher than historical MISO spot market prices. More specifically,



[REDACTED]

Below is a summary of MH's Pricing of electricity as determined in Long-Term Export Contracts (Source: Pricing of Long-Term Export Contracts, provided by Manitoba Hydro).

"Long-term electricity price forecasts and market analyses are usually purchased annually from a group of industry consultants (for the 2008 forecast 5 expert consultants were used). The forecasts are adjusted to a common Canada-US border pricing point and are aggregated on a weighted basis following a detailed analysis."

In addition, a [REDACTED] to the 'on peak' price forecast for dependable energy to reflect the expectation that a [REDACTED] will be willing to [REDACTED] over the long-term. This [REDACTED] reflects MH's historical experience in selling a high value, long-term product, backed by MH's dependable energy resources.

MH's Electricity Export Price Forecast is used as a benchmark for the setting of the minimum offer prices for long-term export sales. MH's actual offer prices may be higher reflecting the customer's alternative cost of supply and perceived demand for MH product. Final contract prices may reflect additional value provided to the customer or MH following negotiation. These may include, for example, more favourable escalation terms, ownership of environmental attributes or an appropriate sharing of transmission costs.

Furthermore, in conjunction with the price forecasts as inputs into the process of contract price determination, MH uses avoided cost analysis to benchmark the long term price against the counterparty's long term marginal costs. KPMG reports that although there is some evidence that this is done at MH (excel files), it is not done thoroughly enough or documented sufficiently to be a satisfactory procedure.

The price forecast and the avoided cost procedure are coupled in benchmarking the minimum offer price for long term exports. There are also other factors that influence the outcome of the contract negotiations. These include [REDACTED] It would be wrong to see the price

in isolation of these additional values that a lower price may have been necessary to acquire these attributes.

It is also to be noted that the contracted price is a real price (nominal price adjusted for inflation). Real price increases over the term of the contract are stipulated in order to capture real increases in electricity prices. Typical escalators include the [REDACTED]

Whatever the value of the final price embedded in the long term contracts, it appears to be higher than the past average in the spot market. This is a comforting result but needs to be considered against marginal cost, average total cost and import prices before generalizations can be made about which party is subsidizing the other, or that the risk exposures in long term contracts is sufficiently mitigated. We will deal here with the first issue.

According to MH's recent Cost of Service study, costs attributable to export sales constituted approximately 13% of total costs, whereas export sales contributed 32% to total revenue. This shows that if the allocation of costs to domestic sales and exports is credible and believable, exports are contributing more to revenues than to cost and therefore it is quite likely they are contributing to the sustainability of low domestic rates. This question is contingent on a proper allocation of total costs.

MH has only four choices. It can sell its energy surplus in long term contracts or it can sell the surplus in the opportunity market either in real time (RT) or in the day ahead market (DA). Of course it can store the water for another period and refrain from generating in the current period. But in order to store there should be enough storage capacity. This we will assume it is there.

The optimal generation is determined by equating the prices to marginal costs and refraining from current production whenever expected price increases minus storage costs are higher than the interest rate. If prices in the long term market are higher than long term marginal cost, more should be sold in the long term or vice versa.

We have calculated the long term marginal cost of generation for MH; it is quite low and could be declining over the relevant range given the large fixed costs involved in generation. There is no question the prices negotiated are significantly higher than

5.2.4.1.5 Will the Prices, Curtailment Provisions and the Import Upset Price in the New Contracts Prove Sufficient to Prevent Seller and Buyer Regret?

The new contracts are structured differently than the old ones in several respects, but primarily by the inclusion of [REDACTED]

Contract prices are set at the expected long-term nominal price with escalators to account for inflation and other factors that affect expected prices. MH uses the [REDACTED] The latter only reflects the changes in prices in a basket of consumer goods, whereas the implicit GDP deflator reflects price changes in the entire basket of final goods and services produced over a year. The escalators are not linked to market prices of electricity because that would change the fixed price contract into a variable one which contradicts the logic of fixed price contracts.

The specifics of these escalations are clear and can be summarized as follows:

The contract with [REDACTED] allows the escalation of [REDACTED] If, however, the [REDACTED] capacity and energy prices from [REDACTED] then [REDACTED] calculated using the [REDACTED]

In the [REDACTED] contract, the [REDACTED] until April 2022; no escalation after 2022 but the capacity price is not allowed in any year to fall below [REDACTED] in 2008 dollars. The [REDACTED] The fixed energy price in any year is not allowed to fall below [REDACTED] in 2008 dollars.

In the [REDACTED] contract, the [REDACTED] in 2008 dollars. The guaranteed energy price is [REDACTED]

[REDACTED] in 2008 dollars.

These prices are [REDACTED] The reasons why counterparties will pay these relatively prices are based on four factors:

- A) Guaranteed access to a large pool of reliable energy.
- B) Access to clean (carbon free) energy with environmental attributes transferred to them.
- C) Avoided risks of price changes. They are guaranteed a firm price with certainty.
- D) The major part of the volumetric risk is assumed by MH.

The new curtailment clauses are far better than those in the old contract and should prove their worth in the event that they are needed. It may be argued that better terms could have been negotiated but that is pure speculation. If that is the case, one would wonder why MH would refrain from wrestling better terms from the counterparty. The issue with this thinking is the treatment of each component of the contract separately from the rest of the components. The contract has to be seen in its entirety as it is outcome of protracted and difficult negotiations: the agreement is a set of compromises acceptable to both parties.

The exact structures of the curtailment provisions negotiated differ by contract. In the [REDACTED] contract the curtailment causes include:

In the event of adverse water conditions (MH unable to meet firm load), MH has the right to reduce guaranteed energy [REDACTED]

[REDACTED]

Curtailment can be exercised under the following circumstances:

[REDACTED]

MH would follow a curtailment priority criteria in which firm power delivery takes precedence over system participation power sales.

In the [redacted] (Term Sheets) these curtailment conditions are specified to include:

[redacted]

[redacted]

[redacted]

Also, MH would follow a curtailment priority criteria in which firm power delivery takes precedence over system participation power sales.

The general conditions for curtailment in the contract with [redacted]

[redacted]

[redacted]

MH would also follow a curtailment priority criteria in which firm power delivery takes precedence over system participation power sales.

Under adverse water conditions (MH is unable to meet firm energy commitments), MH has the right to curtail [REDACTED]

[REDACTED]

[REDACTED]

The curtailment clauses negotiated with [REDACTED] (contract), and binding term sheets that allow MH to curtail up to 29% (2/7 days) of its firm export commitments but would leave 71% of these commitments to be met. Total system firm commitments represent 68% (ICF, 123) of decrease by 19% given that the firm export commitments represent 68% (ICF, 123) of 2020-2025 volume (0.29×0.68). The latter is more consistent with dependable supplies coincident with the worst drought. In Chapter 4 we have estimated that the likelihood (probability) of a minimum below the one MH has chosen to define its dependable energy is quite low (about 1 in 392 years at the 95% confidence level). In other words, the actual minimum chosen by MH would define a level that is consistent with the average of all minima simulated from 100 drawings using a statistical process of 94 water flow possibilities.

Finding 13

The negotiated contract prices in the new contracts or binding term sheets with [REDACTED] and the escalation clauses are firmly structured to protect the contracts' real prices in the future. At this point in time, the contracted prices are sufficient to raise significant revenues for MH over its costs. The upset price on importing energy in the [REDACTED] contract will play a modest role in protecting MH from paying congestion prices in the event of a shortage. But the major achievements in these contracts are the curtailment provisions in the new contracts that could effectively decrease MH's firm export commitments by 29% and 19% of the total volume in times of adverse water conditions.

that the issue is not selling in forward markets; the benefits from this would outweigh costs.

Eleventh, contract prices embedded in long term contracts are sufficiently higher than historical average spot MISO prices. These prices are carefully constructed using weighted long term forecasts and hopefully estimates of the long run marginal cost of counterparties. The export prices are higher than long run marginal cost of MH and average total cost. This suggests that export revenues when they are higher than import prices can be relied upon to subsidize domestic rates. We are not in a position to verify the claim in the Cost of Service that exports account for only 13% of total cost but we can verify they contribute 32% of total revenue.

Twelfth, the expanded capacity when Keeyask and Canawapa are completed will increase dependable energy and selling in the long term at higher prices than spot MISO prices will increase revenues. Expected declines in spot prices beyond 2011 will make these contacts more valuable. High import prices will remain a threat to contend with in time of shortages but new contract limit prices on these imports will define an upset price for MH. The inclusion of wind and out of money thermal energy in dependable energy is a stretch but they represent such a small portion of total generation that their inclusion or exclusion is not a material concern.

Thirteenth, the negotiated contract prices in the new contracts or binding term sheets with NPS, WPS and MP are [REDACTED] and the escalation clauses are firmly structured to protect the contracts' real prices in the future. At this point of time, the contracted prices are sufficient to raise significant revenues for MH over its costs. The upset price on importing energy in the NPS contract will play a modest role in protecting MH from paying congestion prices in the event of a shortage. But the major achievements in these contracts are the curtailment provisions in the new contracts that could effectively decrease MH's firm export commitments by 29% and 19% of the total system in times of adverse water conditions.

Fourteenth, The Consultant's calculations of the probability of a severe drought and the magnitude of drought losses are glaringly low and those of that may result from LTC commitments considerably higher than those that a reasonable calculation would result