



THE HOLM TEAM *Agriculture Economics Journalism Trade Int'l Cooperation*

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August 30, 2017

B.C. Utilities Commission
Site C Submissions
via email to siteCsubmission@bcuc.com

Dear Commissioners;

RE: Expert Opinion Submission to the British Columbia Utilities Commission Inquiry
Concerning the BC Hydro Site C Dam

I am writing to provide data and analysis to be considered by the Commission in its evaluation of energy economics of Site C Dam. Specifically, I am writing to provide expert opinion on *potential mechanisms to recover costs to ratepayers associated with terminating the Site C project* (Terms of Reference 3 (b)(iii)).

First of all, I will qualify myself: I am a resource economist and Professional Agrologist (Retired) with over 40 years experience in Canadian agriculture. I hold an M.Sc. in Agricultural Economics from UBC (1974) and a Master of Management, Cooperatives and Credit Unions from Saint Mary's University (2014). Together with Agrologist Eveline Wolterson, I provided expert testimony on the agricultural impact of the Site C dam to the Joint Review Panel on behalf of the Peace Valley Environment Association and the BC Women's Institute. A past President of the BC Institute of Agrologists and BC Agrologist of the year 2000, I am also a Distinguished Alumni of UBC (2008) and received the Queen's Medal twice for "contribution to community". My published columns on farm policy have won ten national journalism awards since 2002.

Under a "terminate the dam" scenario, offsetting the costs of terminating of the dam will of course be the *benefits of not flooding the project area*, one of the most important of which is the agricultural benefit arising from *retaining this fertile farmland in a Class 1 climate for agriculture*.

The problem facing the Commission is that when BC Hydro modeled the agricultural value of the farmland to be flooded by the dam, they dramatically undervalued – for reasons described below - the economic loss that will be incurred over the next 100 years if the dam is built.

BC Hydro calculated that the economic value of the farmland to be flooded by the dam is equivalent to the sum, over 100 years, of the annual market value of the crops harvested, less direct expenses, interest on investment, management fees and depreciation, expressed in current value dollars. BC Hydro refers to this as "return to the land."

BC Hydro pegged the 100-year “return to the land”(value) of farmland loss to be \$22.3 million CAD¹ in discounted, *net present value* dollars. For the reasons noted below, this dramatically understates the agricultural value of this land.

And here is the problem: if the Commission relies on BC Hydro’s undervalued assessment of the economic value of farmland loss in its benefit/cost analysis of the “terminate the dam” scenario, it will substantively undervalue the benefits derived by retaining that farmland. This in turn skews the analysis, overstating the cost of termination.

As can be seen in Table 1, when even the inadequate (1,666 hectare) BC Hydro model is tweaked to reflect moderate horticulture development and an appropriate social discount rate,² the value to agriculture increases dramatically to \$111.6 million in *net present value* dollars. And when the land base of the model is adjusted to include the 2,150 hectares of high capability horticulture land excluded by BC Hydro, this figure rises to \$255.6 million in *net present value* dollars, ten times (order of magnitude) higher costs than claimed by BC Hydro.

TABLE 1: Increases in BC Hydro's EIS Estimate of Farmland Lost to Site C Dam when Appropriate Cropping Scenarios and Social Discount Rate Used , NET PRESENT VALUE \$

	BCH Baseline 1,666 hectares <small>million \$ CAD, Yr 15</small>	Using 1.4 SRD <small>million \$ CAD, Yr 15</small>	Moderately Robust Horticulture Scenario <small>million \$ CAD, Yr 15</small>	Moderately Robust Horticulture Scenario including +2,150 hectares of prime land dismissed by BCH <small>million \$ CAD, Yr 15</small>
Farm Gate Sales	30.9	60.5	197.7	452.8
Direct Farm Expenses	10.4	19.6	54.2	124.1
Return to the Land after deducting direct expenses and other farm costs such as interest, management and depreciation	22.3	33.3	111.6	255.6
Secondary Economic Activity (Based on direct farm expenses) \$	19	35.40	116.70	267.3
Multiplier = 1.8				
Multiplier = 2.2 in yr 25				
RETURN TO NATURAL CAPITAL \$	41.0	68.7	228.3	522.9

TABLE 2: Increases in BC Hydro's EIS Estimate of Farmland Lost to Site C Dam when Appropriate Cropping Scenarios and Social Discount Rate Used, CUMULATIVE DOLLARS

	BC Hydro Baseline <small>million \$ CAD, cumulative (undiscounted, non-discounted \$)</small>	Moderately Robust Horticulture Scenario <small>million \$ CAD, cumulative (undiscounted, non-discounted \$)</small>	Moderately Robust Horticulture Scenario including +2,150 hectares of prime land dismissed by BCH <small>million \$ CAD, cumulative (undiscounted, non-discounted \$)</small>
Total Farm Gate Sales (100 years) \$	139.2	474.1	1,085.9
Multiplier = 1.8 * direct farm expenses \$	76.7		
Multiplier =direct farm expenses* 1.8in years 1-25, 2.2 in years 25-100		270.1	618.7
TOTAL ECONOMIC ACTIVITY \$	215.9	744.2	1,704.6

(For interest, the *cumulative* non-discounted values over this same 100 year period are also presented in Table 2 above.)

¹ BC Hydro Site C Clean Energy Project Environmental Impact Statement, Volume 3 Economic and Land and Resource Use Effects Assessment, Section 20 Agriculture. p. 20-59. Table 20.33

² Moderate Horticulture Scenario: Assumes a food crisis year 15, resulting in 84 hectares of horticulture crops being planted that year, and thereafter 20 hectares of horticulture crops added per year until a total of 883 hectares are planted to horticulture crops by year 50. Economic multiplier rises in year 25 to 2.2 (Carleton University Centre for Trade and Policy Law).

Below is a summary of economic miscalculations made by BC Hydro in its evaluation of farmland value that contributed to this discrepancy:

FIRST, BC Hydro based their economic evaluation of farmland loss on too few acres - only 1,666 hectares of Class 1-5 prime valley bottom horticulture land were considered – a mere 13% of total land impacted by the dam.

Excluded from consideration (without any legitimacy; simply dubbed “unlikely to be farmed”) were an additional 2,150 hectares of equally high capacity bottomland. A further 2,653 hectares of Class 6 and 7 bottomlands were also uncounted and unvalued despite the fact that the Class 6 lands have important grazing value in this Class 1 climate for agriculture zone.

SECOND, BC Hydro based their economic evaluation of farmland loss on an impoverished cropping scenario - what was planted in 2011 is not at all reflective of the productivity of this prime farmland in a Class One climate.

Only 541 hectares of land was under cultivation in the Project area in 2011, planted to canola, grain, forage and pasture. In part, this is due to the “shadow of the dam” effect – all of this land has been under a flood reserve since the late 1950’s. In larger part, it reflects the fact that the overwhelming majority (over 90%) of project land at the time was owned by BC Hydro or the Crown – neither known for their farming activities. As a result, the “baseline” for BC Hydro’s model undervalues the productivity of the land (and, in fact, includes zero hectares of high valued horticulture crops).

THIRD, BC Hydro based their economic evaluation of farmland loss on an inadequate modeling process that fails to reflect market conditions of supply and demand.

The BC Hydro model does not appropriately consider realistic development scenarios for this land based on provincial market conditions of supply and demand for horticulture crops. Instead, it models only 1 hectare a year increase (100 hectares after 100 years) for high valued horticulture crops.

The land to be flooded by the dam is the only area for new horticulture production in the province. BC imports close to 60 per cent of the vegetable crops we could grow here, mostly from California. Climate change, the impact of fossil fuels on transportation costs, the effect of population growth and increasing water scarcities - all of which stand to impact significantly the landed cost of vegetables in BC - make PLAN B a critical option for food security. Site C is BC’s Plan B.

FOURTH, BC Hydro based their economic evaluation of farmland loss on an inappropriately high social discount rate (used to value future production of this land) that undervalues the economic contribution of future agricultural production.³

FIFTH, BC Hydro based their economic evaluation of farmland loss on farm gate value after all expenses including interest, return to capital, return to labour and depreciation. They wrote off the value of secondary economic activity as insignificant.

³ “...ethical SDR’s are needed to account for irreversible impacts that the current generation may create for future generations and to apply intergenerational equity ...a rate of 1.4% is required to avoid global economic disaster.” Stern: Review on the Economics of Carbon Credits

The economic importance of this prime horticulture land in a Class One climate – the only area for large-scale horticulture expansion in the province - is of course considerably greater than the above numbers would suggest.

The quick analysis above - built upon and hence constrained by BC Hydro's inadequate evaluation model - does not reflect the benefits accruing to human nutrition, community resilience and food security if these lands remain available to contribute to the economic and social well-being of the province. (And such benefits certainly should be taken into consideration as part of the any "terminate the dam" benefit/cost analysis...)

But what this quick analysis *does* do is give an indication of why the decision to NOT FLOOD these lands has tangible benefits beyond those estimated by BC Hydro, and that such economic benefits, if properly valued, will serve to offset/ameliorate costs associated with a terminate the dam option.

If you have any further questions, please don't hesitate to contact me...

Yours sincerely,

A handwritten signature in black ink, appearing to read "Wendy Holm P.Ag. (Ret'd)". The signature is fluid and cursive.

Wendy Holm, P.Ag.(Ret'd),
M.M.C.C.U.