

From: skip salty [skipsalty@gmail.com]
Sent: Thursday, December 29, 2011 4:41 PM
To: Commission Secretary BCUC:EX
Subject: 2012-2014 Revenue Requirements Appl BC Hydro/IR 1

BC HYDRO – REVENUE REQUIREMENTS F2012-F2014	EXHIBITC26-2
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From Vernon Ruskin
To Commission Secretary

Dear Sir/Madam

I am submitting my IR1 , and apologise for being late for the deadline. My computer was stolen with my data and I had to reconstruct using a borrowed computer,

If I am too late for IR1 to be accepted, please reconsider my IRs for IR2 if you prefer

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REQUESTOR NAME –V.W .RUSKIN,
VW.Ruskin & Associates Ltd

IR No 1

TO BC HYDRO

DATE

PROJECT 3698592

APPLICATION NAME=Application for 2012-2014 Revenue Requirements

Topic= Capital Expenditures and Additions, with special reference to Site C and others

.References

1. Review of BC Hydro, by panel of 3 deputy ministers addressed to Premier Christy Clark and initiated by request of Energy Minister Rich Coleman ,report date Aug 2011 , published by BC Government (the report will be abbreviated as” RPC” below to save time)

Executive Summary page 1-

To save space and time ,the parts of RPC referred to in my IR are extracted and given sub no. without changing meaning

i- ..Costs Savings are required to reduce the planned rates

ii Capital asset planning and management ...(requires)..utilising stronger project management

iii We observed many examples of excessive planning,..over engineering projects,..and the use of multiple layers of contingencies

iv BC Hydro needs to manage its investment in capital projects more carefully to achieve better value for ratepayers

v BC Hydro needs to better manage their projects to keep changes within acceptable benchmark of 3% ...of project cost

vi Recommendation #34... Document Change order origin...to allow for comprehensive assessment

vIII.. Cost of site C is estimated at NPV(net present value) \$7.9 Billion

ix BC Hydro is planning to increase capacity..Site C..1100mw ..5100 gwhrs..Est Service date ..2020..

x .. Section 3.4.1 Site C

Cost per mwhr is stated from \$87 (using npv nominal 7.9 Billion value)and 5.5% discount rate

\$95 ditto, using a 6% discount rate

xi/Need to improve communication between province and BC Hydro ... to improve information available for decisions

Xii longer term rate declines will be achieved through.. operational efficiencies ,in addition to examination of long term capital planning and policy decisions

2.LPAT 2008 Appendix F8

3.History of Site C-Wikipedia on internet

4 “Vancouver Sun”..Site C costs. Info from BCH . Dec 2007

**5.PressReleases by BCH on internet 2005-2011 ,
, incl Dec 2007,May 2011 and Aug – Oct 2011**

6,Ampc IR1 ,#60

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IR1

Explanation and Refs:

**RPC report Exec Summary, and Site C Section 3.4.1
BC Hydro plans to invest approximately 6 billion over the next three
years to...expand capital infrastucture..**

RPC states

i- ..Costs Savings are required to reduce the planned rates

**ii Capital asset planning and management ...(requires)..utilising
stronger project management**

At 7.9 Billion npv, Site C is historically the most expensive item ever project in any BCH Capital budget

Its npv \$87 to 95 per mwhr exceeds the BCH ave revenue in the order of \$63 per mwhr

Therefore Site C will require further future rate increase applications by BCH

Some expenditures for Site C are in F 2012-2014, either budgeted as operating expense

and/or capitalised ,

and/or deferred until service date 2020, and then to be amortised

My information requests about Site C are intended to be helpful to identify possible ways that might reduce its cost impact

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IR 1.

1.1.1 RPC in Aug 2011 estimates npv of Site C is 7.9 Billion and the npv figures for \$ per mwhr of \$87 to 95 are given depending on the interest rate discount

a/At 7.9 Billion npv nominal cost, please state the undiscounted cost "C" of Site C when completed in 2020 ,including interest during construction

b/ est cost C appears to be \$11 billion

c/If that is not correct please state the correct estimate

1.2.2 Please state if the following formula may be used to calculate the resulting \$ /mwhr cost of Site C when completed in 2020

$$C \times (\%E_r + \%B_i + \%Dep + \%Op) / \text{mwhr}$$

Where

**C= est cap(undiscounted) cost including
idc=interest during construction)**

% E =% equity, r =% return on equity

%B= % Debt , i=interest rate on Debt

% Dep =depreciation over Y =years est life

% OP =% operating and maintenance

$$\text{Mwhr} = \text{gwhr} \times 1000$$

**1.2.3If so please state the numeric values of all the above
FACTORS**

**1.2.4 If not ,please give exact formula and details how it was
calculated**

**1..3 pl state whether the \$/mwhr are(in any case) directly
proportional to the estimated (undiscounted) capital cost C, including
idc ?**

**1.4 Originally(since approx 1959 by BCElectric, and later by BCH
up to the May 2011 BCH press release), the ave gwhrs of Site C are
given as 4600 gwhrs.**

In RPC August 2011 the gwhrs of site C are stated as 5100 gwhrs

1.4.1Please explain where the extra 500 gwhrs come from

since the ave Peace River flow does not change.

1,4.2 Does that mean BCH now plan to raise the dam height to get more power? If so please compare

a.Original vs New dam height,

b.storage volume. orig and new

c Area of flooded land ,orig and new

1.4.3 If the 500 extra gwhrs were obtained some other way,such as increased turbine efficiency or other reason ,please explain details

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2. IR 2 re Factors responsible for Site C cost increase

2.1Please state if BCH believes the following historical info from Wikipedia on Internet(and partly from experience) is correct ,and if not,please provide the correct info

the HISTORY OF SITE C – 1950s to 1982

- Survey work in the mid-1950s (by Wenner-Gren and BC Electric)along the Peace River Canyon indicated the hydroelectric potential of the area. This led to the construction of the W.A.C. Bennett Dam and GM Shrum Generating Station, (By BCH and Ingeldow Kidd Consulaing Engineers) which began producing electricity in 1968.**
- Additional work in 1958 identified five other locations – Sites A, B, C, D and E – near Fort St. John as potential locations for a third dam.**

• In 1967, geographical and topographical work identified Sites C and E as the only viable options. In 1976, the current location of Site C was selected. However, development plans were shelved because there was no indication that a new resource option would be required for the foreseeable future.

1,1982

•2.1.1 In 1982, BC Hydro submitted the Site C project to the British Columbia Utilities Commission (BCUC), which carried out a comprehensive review and consultation with stakeholders. BCUC concluded the project was viable, as long as identified impacts were managed. However, it recommended the Site C not be approved- because electricity demand forecasts at the time did not warrant its development, and more analysis of alternatives was needed.

-2.1.2

Please state the estimated (undiscounted)cost of Site C (Incl idc)in 1982.,

2.1.3Please state the mw , gwhrs submitted to BCUCin 1982.

2.1.4/ Please state the est energy cost in \$ per mwhr in 1982

2.1.5 According to BCH method of calculating the effect of inflation on direct project construction cost ,(detailed in APPENDIX F8 OF BCH LPAT 2008), BCH uses The StatsCan inflation index for 7CITIES NON RESIDENTIAL CONSTRUCTION.

Please state that index for 1982.

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IR3 Increase In Site C Costs

-3.1.1 2007

**,According to The “Vancouver Sun” December 5, 2007 ,
“The construction cost for the controversial Site C dam project on the
Peace River has increased by \$3 billion since 2005 and could reach
\$6.6 billion, BC Hydro reported on Tuesday.”**

3.1.2 That was a 100% increase in cost in 2005-7.

**a/Please refer to the BCH 2005 estimate of Site C at 3.3 Billion ,
b/ Please state the StatsCan inflation index for 2007 and 2005
referred to above**

**3.1.3 / The TOTAL (loaded) cost of Site C went up 100% from 3.3
Billion in 2005 to 6,6 Billion in Dec 2007**

**3.2.4/ the TOTAL (loaded, but undiscounted) cost of Site C went up
67% from 6.6 million in Dec 7 to approx 11 Billion in Aug 2011 per
RPC.**

If not please state the correct figures

**3.3 The npv 7.9 Billion cost of Site C given by RPC in August 2011 is
equivalent to app \$11 Billion (undiscounted) in 2020 . which is 39%
higher than the npv figure of 7.9 billion**

If not please state the correct figure

**3.4 It appears that the npv figures of \$ 87 -95 per mwhr are based
on npv 7.9 Billion in Aug 2011**

**When Site C goes into service 2020, that will increase by 11/7.9
=39% the \$ per mwhr figures to app \$121 to \$132 per mwhr in 2020.**

If this is not correct, pl state the correct figures

3.5 Since the \$ per mwhr are proportional to the TOTAL cost C,the following Table shows the approximate rounded prorated \$/Per mwhr with different Capital costs of Site C

TOTAL Site C Cost est	2005	2007	2011
Billions (undiscounted)	3.3	6.6	11
\$/mwhr Low	36	72	121
High	40	80	132

If this is not correct, please state the correct figures

3.6 It follows that

a/ in 2005 the site C costs were \$36 to \$40 per mwhr which is lower than the ave BCH revenue of app \$60 per mwhr

b/ and BCH would not require a rate increase for Site C at 3.3 Billion. which would tend to reduce the ave rates

c/Therefore Peace Site C at \$3.3 Billion was a very good decision for BCH

3.7/From 2007 onwards, as a result of Site C cost increases. the Site C costs\$ per mwhr range from approx \$72 to \$132 per mwhr

That exceeds the ave BCH revenue of app \$63per mwhr.

3.8 Therefore with Site C BCH thereupon have to apply --for a future rate increase to BCUC

3.9 RPC excutive summary states

iv BC Hydro needs to manage its investment in capital projects more carefully to achieve better value for ratepayers

If that is correct ,it would seem logical for BCH to consider alternatives to Site C, starting 2007 when Site C would obviously require rate increases

3.10 In fact BCH produced LPAT 2008 Appendix F8 with potential alternatives, The latter included cheaper untapped hydro on the Columbia according to BCH own cost estimates

3.11

a/ Please state why BCH did not switch to cheaper alternatives to Site C .which would not require rate increases?

b. Please state if there some valid reasons(or momentum) for continuing with Site C

regardless of cost and rate

**increases ,
when LPAT 2008 clearly shows cheaper alternatives on the Columbia
that could avoid rate increases?**

**b/ Did BCH in fact discuss this alternative ,”in the light of changing
circumstances” with BC govt officials?**

c/If so ,what was the outcome?

**3.12 Was BCH unable to communicate that” light of changing
circumstances “ to the provincial govt and politicians ?**

Is that one reason why RPC stated

“xi/Need to improve communication between province and BC Hydro ... to improve information available for decisions”?

Energy Minister Coleman is obviously extremely concerned about reducing rate increases, when he asked to appoint RPC

3.13

a/ Recently ,On Nov 1 2011 I was told by a Sr BCH engineer “Wer’e looking into the Columbia projects you mention ”

b/But on Nov 8 2011 I was told by Sr BC govt official” The provincial govt was opposed to any untapped hydro developments on the Columbia “

c/Please state what is the present status on the Columbia alternatives?

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IR 4 Change Order for Site C, called “upgrade”

Ref RPC

iii We observed many examples of excessive planning,..over engineering projects,..and the use of multiple layers of contingencies

iv BC Hydro needs to manage its investment in capital projects more carefully to achieve better value for ratepayers

Recommendation#34 BC Hydro needs to better manage their projects to keep changes within acceptable benchmark of 3% ...of project

4.1 The BCH May 2011 Press Release and information sheets regarding Site C showed an artist pr picture of Site C and included the following

**“Site C Video Shot List May 2011,
Animated Project Design Upgrades,
Rendering of historic design for Site C**

- **Rendering of upgraded design for Site C**

Animated Project Design

Upgrades

Rendering of historic design for Site C

- **Rendering of upgraded design for Site C**

- **Animation:**

- **Repositioned generation station and spillway**
- **Concrete buttress**
- **Overflow auxiliary spillway**
- **Centre dividing wall in spillway**

4.1.1 The forgoing makes it clear that there was a change order authorised and issued ,so that Site C was completely redesigned (from the previous old conventional straight dam design)

To an unconventional right angled design by BCH engineers and /or their consultants and called an “upgrade”

4.1.2The old conventional straight dam design was used on all other BCH heritage plants since 1950’s , and presumably when BCH submitted Site C for consideration to BCUC in 1982 .

If not,please describe the dam design used in 1982

4.1.3The old conventional “heritage” dam designs have succeeded in producing our low electric rates in BC for 50 years /(The same Kind of conventional design is used in 1 million other dams worldwide)

4.1.4 A right angle configuration is much longer than a straight line .You don’t have to be an engineer to see that commonsense shows

the right angled design requires a much longer dam extent, and therefore far greater volumes of earthfill., Rocks or concrete,

4.1.5 You don't have to be an engineer to understand that the cost of any dam depends on the cost of moving earth and other materials, from their origin to their final place in a dam, And if contractors have to move and place greater quantities of earth,concrete and rock, they are justified to charge more to recover their costs(and earn more profit.

Please state if that is one reason why the cost of Site C shot up?, (It obviously wasn't all inflation, which certainly didn't shoot up 233% between 2005 at \$ 3.3 Billion and to August 2011)

4.2 Please state

a/ the quantities of earth, and concrete or rock, in cu yds or tons , to be moved in the original dam design submitted to BCUC in 1982

,That quantity is available from due diligence work of earlier engineers,surveyors, geologists, drillers that have worked on Site C, and has been known for over 50 years, The earlier engineers as due diligence determined quantities so the contractors could be asked to bid for construction

b/ Ditto, due diligence would require engineers to estimate the quantities with any changes and the new "upgraded" design

c/ Please state and detail the difference in quantities a-b=DQ

4.3 There is an app 5.4 Billion estimated Site C costs increase ,68%, ,between 2007 and 2011. A significant portion is probably due to the change by BCH to the new "upgraded" dam design

**a/Please if possible ask at least two contractors to estimate very roughly and state (without obligation or commitment) how many \$ extra are caused by the change and” upgrade”
Please state the very rough cost increase due to the change order and upgrade of Site C**

b/For Comparison please also use the BCH method of estimating inflation given in LPAT2008 Appendix F8 , Taking the old 1982 Site C costs, and Statscan Inflation index for” 7 Cities” for Non Residential construction,. Which includes ,schools, hospitals ,shopping centers etc , but there are probably no dams in 7 Cities)

c/Since BCH has not built any major dams for 30 years or more ,in order to double check costs, / Knowing the difference in quantities DQ and associated \$ cost is vital to BCH and ratepayers, because \$millions or even \$ Billions might possibly be involved.

**4.4/ Please also state total \$ cash costs each year from 2005 to 2011,
for ME=“ management , BCH engineering, information and public relations , outside engineers , contractors, any new surveys. new drilling, new geologic reports ,travel and expenses charged to BCH financial accounts relating toSite C , to effect this “upgrade” starting from 2007 to 2011 ,
which were charged to BCH financial accounts for ,operating ,capitalised or deferred,**

4.5Please state the total of all \$ costs due to the change , including future contractor costs and payments, ME’s already incurred ,plus any future anticipated or planned costs for supervision of construction and future engineering etc.

4.6 Please state which costs are , or will be based on fixed tender bids, which are cost plus, and which are based on a % of actual construction costs ,

4.6 Please compare the total \$ costs/.benefits ratio of this “upgrade” change order per above . Please state what” upgrade’ benefits ,estimated \$ or other benefits or savings would come to the ratepayers , and/or the Prov Govt and/or BCH

4,7 Please identify the groups ,inside and outside BCH, who have or may potentially benefit from this “upgrade “financially, for another 9 years to the 2020 in service date of Site C

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IR5 Approval of Change orders

Ref RPC

Recommendation #34 BC Hydro needs to better manage their projects to keep changes within acceptable benchmark of 3% ...of project

vi Recommendation #38... Document Change order origin...to allow for comprehensive assessment

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a/ Please state date and the origin of the change order to an “upgraded design”of Site C.

b/Please state the scope and terms of reference,and estimated costs, and benefits claimed for this change, as originally proposed , and any subsequent additions or amendment s between 2005 and 2007.

c/Please state to whom the propoals for change are addressed , and what officials in BCH and/or BC govt are involved in evaluating and/or authorising this

**and similar proposals and change orders,
and what officials in BCH and /or the provincial govt
are involved in authorising such a major change order**

**d/Was there a cost/benefit analysis summary
made before it was authorised?**

If so please provide details.

**e/Did BCH obtain an independent opinion whether the new right
angled type dam structure**

a/is not more liable to earthquake damage

b/is not more liable to silting

**as compared to the conventional heritage type dam
used by BCH for 50 or more years?**

If so, please provide details

d/ I want to be clear

**I am very much for,
and not against .**

**suggestions and ,change orders ,
provided they “upgrade” the ratepayers and BCH and govt coffers,
along with” Upgrading” people inside and/or outside BCH**

I agree with RPC complaint about BCH being risk averse

**.
So obviously every suggestions for changes , no matter from whom
,that may materially reduces costs ,
and may benefits both ratepayers and BCH ,
should be very much encouraged
and highly rewarded in BCH.**

**Otherwise you get the top-down Prussian Army atmosphere
situation, where hand-cuffed BCH engineers are forced to say**

**“we first need a green light
from our current political masters”**

**Please explain what are the relevant BCH arrangements for
encouraging suggestions,
no matter from whom,
and rewarding good ones
in BCH today**

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”IR 7 Additions to Direct Construction Costs of Site C

Ref

1.RPC

**iii We observed many examples of excessive planning,..over
engineering projects,..and the use of multiple layers of contingencies**

**iv BC Hydro needs to manage its investment in capital projects more
carefully to achieve better value for ratepayers**

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- **2.BCH [News Release: BC Hydro Welcomes Joint Review Panel Process \(September 2011\)](#) [PDF, 66 Kb]**
- **3.BCH [Site C Project Update \(October 2011\)](#) [PDF, 63 Kb]**

4.LPAT 2008 Appendix

F8

**IR 7.1 is to flag increases of Site C Cost estimates
by BCH over a number of years
,with due regard RPC summary ,recommendations**

7.2 Using the same clear method of adjusting direct construction costs given in LPAT2008 Appendix F8 (as shown below) please compare the TOTAL (ADJUSTED)''LOADED'' costs of Site C, at

- 1 .1982, submission to BCUC ,**
- 2.2005,**
- 3. 2007**
- 4.AUG 2011 (RPC date)**

generally as indicated below or similar.
Please also give the physical factors shown

1/Year	1982	2005	2007	Aug 2011
		?		
	1	2	3	4
2Direct Constr Cost				
2aContingencies				
2b Management and Engineering				
2c Hearing Costs				
2dMitigation and Compensation				
2c Const Ins and Bonds				
2d Indirect Construction cost				
2e Inflation Costs				
2f Inflation index =StatsCan				
7 CITIES Non Residential Projects				
2g Definition Phase Allowances				
2h Mitigation and compensation				
(addl to 2d)				
2i Engineering Reqd Prior Regulatory schedule				
2j Interest during construction				
2h Any Other Added cost				
Pl state details				
2i= TOTAL'' LOADED'' COST		?	3.3B	6.6B
				11B

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PHYSICAL

3a ave Gwhrs/year.	4600	4600	4600	5100
3b MW	?	900	900	1100
3c height dam	?			?
3d Flooded area	?			?
3e est volume of earth fill if possible				
Cu yds or tons				

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IR 8 Information To Achieve Longer Term Rate Declines

Ref

1 RPC

xi/Need to improve communication between province and BC Hydro ... to improve information available for decisions

Xii longer term rate declines will be achieved through.. operational efficiencies ,in addition to .. examination of long term capital planning and policy decisions

2. LPAT 2008 Appendix F8

3.Keenleyside SFU 1974 lectures on Columbia River Treaty (CRT)

4,Dr Shrum ditto

5 , BC ADM Mc Nabb ditto

6 Columbia River Treaty terms

8.1 a// In 1974 BCH chairman Keenleyside stated “5 different engineering companies provided over 100 different Columbia plant alternatives.

He chose 4 with the least power, because there was then a power glut . That included presently existing Duncan and Arrow(Keenleyside)dams, lacking any or enough generators , even today.

b/Obviously it costs far less to add provisions for generators to an existing dam

than to build a complete new dam and powerhouse like Site C.

c/please state if BCH agrees

8.2 In addition, as planned in 1960, BCH could operate to use the 25% extra “non Treaty” storage Which BC built and paid for as planned in 1960 , Using Peace/Columbia diversity and cyclical carryover storage multi year to provide more power

It could provide more gwhrs than Site C (in the order of 6800 gwhrs) .

It does not require building any new dams and would be very low cost.

To determine exact added gwhrs and costs would require

A detail engineering investigation

8.3 These three small Columbia projects alone could provide more power at far less cost than Site C

Well before 2020 they could make BC Hydro completely self sufficient in a critical water year

Please state if you agree they should be studied in detail. If not, please explain your reasons

8.4 if you don't agree with me about the Columbia above please Compare

BCH own estimates for Murphy Creek on the Columbia in LPAT 2008

.

Murphy Creek is actually specifically listed right in CRT but was never built because of power glut

8.5*IF WE PRORATE UNDISCOUNTED Site C figures of 11 billion and \$121-132 per mwhr in RPC report, you CAN SEE**

	MURPHY	SITE C	
Gwhrs=	1794=35%	5100 =100%	mw
ORIGINAL (275 mw at 74% LF)			
	380 mw =35%	1100 mw = 100%	
	At 54% lf	at 54% lf	
Original est =943 million=		?	
Inflated cost w overheads and BCH est additions undiscounted			
	1.54 billion = 14%	11B=100%	
PRORATED \$/Mwhr UNDISCOUNTED			
	\$ 48- 53/mwhr =	\$=121-132/MWHR	
	=40%	=100%	

Note If you prefer to compare npv that Site C is 87-95 /mwhr, \Murphy Creek is also reduced but stays at 40% \$/mwhr of Site C

8.6 CONCLUSION

According to BCH own figures in LPAT 2008 Appendix F8 Murphy Creek on Columbia can deliver power at \$48 to 53 per mwhr ,far less than Site C, and less that the\$ 63/ mwhr BCH ave revenue

8.7 So Murphy on Columbia needs no rate increase and could lead to a rate decline

8.8 Nov 1 2011, i presented this info and figures to a BCH sr engineer who Told me “Wer’e looking into it’. Please tell me what BCH is planning to do about it

8.9 Nov 8 2011 I presented this same info and figures to a sr BC govt official in Victoria .He told me the “ BC govt policy is against any new Columbia projects”

8.10 Obviously that does not agree with RPCsummary and reccomendations

i- ..Costs Savings are required to reduce the planned rates

xi/Need to improve communication between province and BCHydro ... to improve information available for decisions

Xii longer term rate declines will be achieved through.. operational effieencies ,in addition to examination of long term capital planning and policy decisions

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