STATE OF VERMONT
PUBLIC SERVICE BOARD

Petition of Champlain VT, LLC d/b/a TDI New England for a Certificate of Public Good, pursuant to 30 V.S.A. §248, authorizing the installation and operation of a high voltage direct current (HVDC) underwater and underground electric transmission line with a capacity of 1,000 MW, a converter station, and other associated facilities, to be located in Lake Champlain and in the Counties of Grand Isle, Chittenden, Addison, Rutland, and Windsor, Vermont, and to be known as the New England Clean Power Link Project ("NECPL")	)	Docket No. 8400

SUPPLEMENTAL PREFILED DIRECT TESTIMONY OF SETH G. PARKER

ON BEHALF OF CHAMPLAIN VT, LLC

August 26, 2015

Summary:

Mr. Parker's Supplemental Testimony provides an update on three issues discussed in his earlier testimony. *First*, he makes a mathematical correction to his estimate of the reduction in wholesale energy and capacity prices in Vermont due to the NECPL. *Second*, he supplements his outlook on New England's need for, and the availability of, Canadian renewable resources that could be imported via the NECPL over the foreseeable future. *Third,* he addresses the different hedge value estimate presented in DPS Regional Policy Director Edward McNamara's Direct Testimony.

Q. Please state your name, occupation and business address.

Response: I am Seth G. Parker, a Vice President and Principal of Levitan & Associates, Inc. ("LAI"), a management consulting firm specializing in power market design, pipeline infrastructure, and competitive energy economics. I joined LAI in 1998. LAI is located at 100 Summer Street, Suite 3200, Boston, MA 02110.

Q. Have you previously filed testimony in this proceeding?

Response: Yes, I submitted prefiled Direct Testimony on behalf of Champlain VT, LLC d/b/a TDI New England concerning the New England Clean Power Link ("NECPL") Project on December 8, 2014.

Q. What is the purpose of your Supplemental Testimony?

Response: The purpose is to provide an update on three issues discussed in my earlier testimony. *First*, I am making a mathematical correction to my estimate of the reduction in wholesale energy and capacity prices in Vermont due to the NECPL. I discovered the need for this correction in answering the Department of Public Service's ("DPS") Second Set Discovery Request 10.c. *Second*, I was asked to supplement my outlook on New England's need for, and the availability of Canadian renewable resources, that could be imported via the NECPL over the foreseeable future. *Third,* I address the different hedge value estimate presented by DPS Regional Policy Director Edward McNamara in his Direct Testimony.

Correction to Prior Testimony

Q. What is the mathematical correction you are making to the energy market impacts of the NECPL?

Response: In my Direct Testimony I estimated the reduction in wholesale energy and capacity prices in Vermont and New England. Central to this analysis was my use of a dispatch simulation model, AURORAxmp, to forecast the operation of the New England bulk power market with and without the NECPL. The model results indicated how the wholesale hourly energy prices over the Study Period would be affected by the NECPL.

Independent System Operator - New England ("ISO-NE") administers the regional wholesale energy market and sets hourly wholesale energy prices, as I explained in my Direct Testimony. In order to accurately reflect the ISO-NE transmission limitations between zones ("interface limits") within New England and the subsequent congestion that gives rise to zonal energy price differentials, I utilized the ISO-NE load forecast defined by Regional System Plan ("RSP") Sub-Areas to be consistent with those interface limits. I also used the Vermont RSP Sub-Area load to calculate the resulting savings for Vermont residents, but the Vermont RSP Sub-Area includes more than just the state of Vermont and thus overstates the State's energy savings. These two forecasts of Vermont's load, taken from ISO-NE's 2013 Regional System Plan, previously provided as ***Exhibit TDI-SGP-2***, are shown in the table below:

Table 1. ISO-NE Load Forecast for Vermont

Load Definition	2013	2022
Vermont RSP Sub-Area	7,425 GWh	7,995 GWh
Vermont State	6,695 GWh	7,110 GWh

Although my calculation of the wholesale energy price reduction due to the NECPL correctly utilized the Vermont RSP Sub-Area load, I should have utilized the Vermont State load to calculate savings for Vermont consumers. My original estimate of energy savings for Vermont consumers as reported in my Direct Testimony, specifically in A13, A46, A48, and A76, and my corrected estimate are provided below.

Table 2. Vermont Ratepayer Energy Savings (2014 $ millions over Study Period)

	Direct Testimony	Supplemental Testimony
Load Definition	Vermont RSP Sub-Area	Vermont State
Energy Savings w/o Hedge	$ 201.0	$ 178.5
Energy Savings w/ Hedge	$ 150.8	$ 133.9

Q. Does your correction to the Vermont load zone alter your estimate of wholesale energy savings for New England as a whole?

Response: No, the total New England savings I reported in my Direct Testimony of $1,590.7 million (2014 $ over the Study Period ignoring Vermont's hedges) did not change.

Q. What is the mathematical correction you are making to the capacity market impact of the NECPL?

Response: In my Direct Testimony I estimated the impact of the NECPL on future Forward Capacity Auctions ("FCAs") assuming the NECPL would provide 500 MW of capacity and sloped FCA demand curves were utilized for FCAs #4 - #7. I then applied the average reduction in wholesale capacity prices for those FCAs to Vermont's portion of ISO-NE's peak load. As with my calculation of wholesale energy price savings, I used the Vermont RSP Sub-Area peak load to calculate the capacity savings for Vermont ratepayers

when I should have used the Vermont State peak load. Those values, taken from ISO-NE's 2013 Regional System Plan, are shown below.

Table 3. ISO-NE Peak Load Forecast for Vermont

Load	2013	2022
Vermont RSP Sub-Area	1,280 MW	1,405 MW
Vermont State	1,090 MW	1,175 MW

The Vermont Sub-Area peak load is greater than the Vermont State load over the Study Period; thus my original estimate of Vermont's wholesale capacity savings was overstated. My original estimate of capacity savings for Vermont consumers as reported in my Direct Testimony, specifically in A13, and my corrected estimate are provided below.

Table 4. Vermont Ratepayer Capacity Savings (2014 $ millions over Study Period)

	Direct Testimony	Supplemental Testimony
Load Definition	Vermont Sub-Area	Vermont State
Capacity Savings w/o Hedge	$ 121.1	$ 101.2
Capacity Savings w/ Hedge	$ 90.8	$ 75.9

Q. What will be the combined wholesale energy and capacity price savings for Vermont residents?

Response: In my Direct Testimony, I estimated that Vermont ratepayers would save $150.8 million in energy costs plus $90.8 million in capacity costs for a total of $241.6 million (all 2014 $) over the ten year Study Period. With the corrections I am presenting in this Supplemental Testimony, I estimate that Vermont ratepayers would save $133.9 million in energy costs plus $75.9 million on capacity costs for a total of $209.7 million (all 2014 $) over the Study Period. These values include the impact of my estimated 25% long-term

contract hedges that partially insulates Vermont ratepayers from swings in wholesale energy and capacity prices.

Testimony Concerning the Transmission of Renewable Energy on the NECPL

Q. What was your outlook on renewable energy from Canada in your Direct Testimony?

Response: In A25 of my Direct Testimony I touched upon the availability of renewable energy for the NECPL shippers when I stated, "[t]here are significant hydroelectric and wind resources in Quebec and the Maritime Provinces that have been and continue to be developed.[3]" In my footnote 3 I identified the following renewable resources under development: (i) Hydro Quebec recently completed the Eastmain-1-A and Sarcelle hydroelectric projects with a combined installed capacity of 918 MW, (ii) Hydro Quebec is currently constructing the Romaine Complex to be comprised of four hydropower generating stations with a total installed capacity of 1,550 MW, (iii) Hydro Quebec has purchase rights to 5,428 MW of Churchill Falls (Labrador) hydroelectric capacity and 2,399 MW of wind farm capacity, and (iv) Hydro Quebec issued a tender call for an additional 450 MW of wind capacity in December, 2013. Hydro Quebec is the provincial public utility responsible for generation, transmission, and distribution of electricity for the province of Quebec. I also indicated that Nalcor, the provincial energy corporation of Newfoundland and Labrador, is developing an additional 3,000 MW of hydroelectric capacity on the lower Churchill River at Muskrat Falls and Gull Island in Labrador.

Q. Since filing your prefiled Direct Testimony have you conducted additional research on the NECPL's long-term energy sources?

Response: Yes, I contacted Hydro Quebec and the Quebec Ministry of Energy and Natural Resources. I also conducted a web search for publicly available documents. In conducting this research and presenting my conclusions, I note that (i) Hydro Quebec is responsible for virtually all of the energy production in the province of Quebec; and (ii) some data is provided in terms of capacity, e.g. MW, and other data is provided in terms of energy, e.g. GWh.

Q. What is the current mix of Hydro Quebec's energy?

Response: According to page 2 of its 2014 Annual Report, which can be found at http://www.hydroquebec.com/publications/en/corporate-documents/annual-report.html**,** Hydro Quebec has increased its percentage of renewable energy generation and purchases, predominantly from hydroelectric resources, from 94% in 2010 to 99% in 2013 and in 2014. I should add that page 12 of the 2014 Annual Report also conveyed the interest in Canadian hydropower expressed by potential purchasers in the Northeastern U.S. and in Hydro Quebec's desire to pursue such exports.

Q. Did Hydro Quebec forecast its percentage of renewable resources over the next few years?

Response: Yes, Hydro Quebec prepared the NPCC 2014 Québec Balancing Authority Area Comprehensive Review of Resource Adequacy ("NPCC 2014 Review") to comply with resource adequacy requirements established by the Northeast Power Coordinating Council ("NPCC"). The NPCC is the entity responsible for promoting and improving the reliability of the interconnected bulk power system in Northeastern North America. The NPCC 2014

Review can be found at https://www.npcc.org/Library/Resource%20Adequacy/Forms/Public%20List.aspx. It was published on December 2, 2014 and forecasted provincial supply and demand from winter 2014-15 through winter 2018-19.

Q. In the NPCC 2014 Review, did Hydro Quebec anticipate renewable resource additions over the near term?

Response: Yes, the NPCC 2014 Review concluded on page i "About 2,900 MW of new generation capacity have been added in Quebec since the filing of the last Comprehensive Review [in October 2011]. An additional 3,200 MW is expected to be commissioned by 2018-2019."

In particular, the NPCC 2014 Review identified the following resource additions on pages 8-9, the first three of which are consistent with footnote 3 of my Direct Testimony.

- Eastmain 1A and La Sarcelle were commissioned in 2012 and 2013, a total of 927 MW.
- Three other hydroelectric stations are expected to enter service by 2018-19: La Romaine-2 of 640 MW, La Romaine-1 of 270 MW, and La Romaine-3 of 395 MW.
- Hydro Quebec issued a tender call to acquire 450 MW of wind power capacity by 2015-16.
- Hydro Quebec launched a program to acquire 300 MW of biomass capacity by the end of 2016 and expects to purchase electricity from 100 MW of small hydroelectric plants by 2018-19.

Q. According to the NPCC 2014 Review, how will Quebec's resource mix change over the near term?

Response: Quebec's resource mix (in terms of capacity) was projected to change slightly, based upon information as of September 2014, as shown in the table below (based on Table 6.1 of the NPCC 2014 Review). About 99% of Quebec's resource mix was still projected to be renewable in winter 2018-19.

Table 5. Quebec Installed Capacity by Fuel Type (MW)

	Winter 2014-15		Winter 2018-19	
Hydro	39,431	96%	40,355	95%
Thermal	436	1%	436	1%
Biomass	324	1%	437	1%
Wind *	2,881	2%	3,950	3%
Total	41,024	100%	42,382	100%

* Wind values correspond to installed capacity; NPCC's total utilizes 30% of installed wind capacity.

Q. Did the NPCC 2014 Review provide any indication as to the availability of Quebec resources for exports?

Response: Yes, the Major Findings on page i stated "…in 2018-2019, winter peak period planned resources (45,268 MW) are above forecasted demand (39,489 MW) by 5,779 MW. This is explained by new resources that are planned to be added to the system." This resource surplus is more than adequate to meet Quebec's needs and could support exports via the NECPL.

Q. Did any other document provide resource projections beyond winter 2018-19?

Response: Yes, Hydro Quebec's Sustainability Report 2014, which can be found at http://www.hydroquebec.com/publications/en/docs/sustainability-

report/rdd_2014_en.pdf, provides resource projections from 2014 to 2023. According to the data on page 32 of the Sustainability Report 2014, Hydro Quebec's provincial resource mix is projected to change only slightly through 2023, as shown in Table 6 in which I converted Hydro Quebec's energy quantities into percentages. Total supplies, which grow from 194.1 TWh in 2014 to 201.9 TWh in 2023, always exceed Quebec's needs and leaves a surplus for exports.

Table 6. Hydro Quebec Energy Balance

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Heritage Pool	92.2%	92.8%	91.6%	91.0%	90.4%	90.1%	89.7%	89.2%	88.9%	88.6%
Baseload and Cycling	2.2%	1.7%	1.8%	1.8%	1.8%	2.1%	2.3%	2.3%	2.3%	2.1%
Biomass and Small Hydro	0.8%	1.0%	1.4%	1.7%	1.8%	1.8%	1.8%	1.7%	1.7%	1.7%
Wind	3.5%	4.3%	5.0%	5.3%	5.8%	5.8%	5.8%	6.0%	6.0%	6.0%
Winter Purchases	1.3%	0.2%	0.2%	0.3%	0.2%	0.3%	0.5%	0.7%	1.0%	1.6%
Total supplies	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Hydro Quebec's resource categories and significant changes over the forecast period are as follows:

- The Heritage Pool is Hydro Quebec's annual delivery obligation for its distribution customers. It stays constant at 178.9 TWh/year and is 100% hydroelectric.
- Baseload and Cycling resources are also 100% hydroelectric. Hydropower can be cycled by storing water behind dams and releasing it when needed.
- Biomass and Small Hydro more than doubles from 1.5 TWh to 3.5 TWh.
- Wind grows from 6.8 TWh to 12.1 TWh.

- Winter Purchases are made by Hydro Quebec to meet its system peaks and are forecasted to drop and then gradually increase to 3.2 TWh in 2023.

Q. Does the Energy Balance in Hydro Quebec's Sustainability Report 2014 give you any insight into the likelihood of renewable energy imports via the NECPL?

Response: Yes, the report's forecast of growing wind and other renewable energy strongly indicates that Hydro Quebec's level of renewable energy available for export should remain close to 99% over the foreseeable future.

Q. Has the Provincial Government of Quebec established policies concerning renewable resources?

Response: Yes, in 2006 the Quebec government adopted Energy Strategy 2006-2015: Using Energy to Build the Québec of Tomorrow, which articulated the province's energy goals and strategies to achieve those goals. Chief among those goals were the development of Québec's hydroelectric resources, wind power, and greater energy efficiency. In preparation for the next version of that report, Energy Strategy 2016-2025, the Quebec Ministry of Energy and Natural Resources published 2016-2025 Energy Policy, Document 4 – Renewable Energies ("Energy Policy – Renewable Energies"), a background policy document that identifies key energy issues, renewable energy sources, future energy demand, and the province's energy infrastructure. The document can be found here: http://www.politiqueenergetique.gouv.qc.ca/wp-content/uploads/Document4-Renewable_energy.pdf.

Q. Does Energy Policy - Renewable Energies offer any insights into the availability of long-term renewable resources in Quebec?

Response: Yes, page 22 states, "[t]here is still significant potential for hydroelectric development in Québec: it is generally assessed at 45,000 MW, of which nearly 20,000 MW offers potential economic interest in the current climate. This availability offers leverage for the development of northern Québec. These estimates do not include the potential offered by developing technologies, such as marine turbines that use the speed of a current to generate energy."

Page 22 also addresses Quebec's wind development potential. "By the end of 2017, when all the wind farms that were contracted are in service, Québec's wind energy capacity will have attained nearly 4,000 MW, which is 10% of the total installed capacity. Québec enjoys impressive wind energy potential…"

Q. Does Energy Policy - Renewable Energies offer any insights into the likelihood of renewable energy exports from Quebec to New England?

Response: Yes, as evidenced by the following excerpts. *First,* on page 53, "[i]n economic terms, hydroelectricity exports represent a major source of income for Québec." The economic importance of hydroelectric development is emphasized on page 55: "The energy sector is responsible for thousands of direct and indirect jobs in Québec and constitutes an important economic development lever for many stakeholders, including businesses, municipalities and Aboriginal communities." In remote parts of Quebec, according to page 57, "…wind power development has led to a noteworthy improvement in the job market,

with a drop in the unemployment rate and major gains in the labour force participation rate."

Second, as explained on page 55, "[e]nvironmentally, by providing Québec's neighbours with renewable, competitive and reliable energy, Québec is helping fight climate change and pollution. Hydroelectricity from Québec often replaces power generation that is dominated by classic thermal channels in the neighbouring grids, channels which emit a lot of greenhouse gases and other atmospheric pollutants."

Third, page 55 goes on to explain, "…projects between Quebec and the United States could help increase Quebec's power exports." An example cited is, "[t]he New England Clean Power Link project, by Transmission Developers Inc., a 1,000-MW direct-current line, buried under Lake Champlain, which would connect Québec to Vermont."

Q. How would you summarize the Provincial policy of renewable energy exports to New England in Energy Policy - Renewable Energies?

Response: The Quebec government believes there is vast potential for additional renewable resource development, such development is important to the provincial economy, and exporting renewable energy into New England is economically and environmentally sound.

Q. Can the Eastern Provinces also provide power for the NECPL?

Response: The Eastern Provinces consist of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. There are transmission links between New Brunswick and Quebec that would allow New Brunswick to wheel power from the Eastern

Provinces to Quebec so that it could then be delivered to the NECPL. Together, these Provinces have close to one-third of Quebec's installed generating capacity.

In footnote 3 of my Direct Testimony, I touched upon this issue of the Eastern Provinces providing power for the NECPL: "Renewable energy resources have been, and continue to be developed in the Canadian Maritimes as well. Nalcor, a provincial energy corporation, generates significant amounts of hydroelectric energy and is developing an additional 3,000 MW of hydroelectric capacity on the Lower Churchill River at Muskrat Falls and Gull Island in Labrador." Nalcor develops and manages the energy resources in Newfoundland and Labrador. The Muskrat Falls facilities (824 MW and 4.9 TWh/year) should be completed in 2017-2018 and the Gull Island facilities (2,250 MW and 11.7 TWh/year) are expected to take another three or more years to complete. Some portion of the output from these two projects could be available to be imported via the NECPL. To put these projects into perspective, their combined output would be about double the expected imports via the NECPL.

Q. Have you investigated the availability of renewable resources in the other Eastern Canadian provinces for the NECPL?

Response: Yes, there are other projects that may be able to provide surplus energy for the NECPL either directly or by freeing up other renewable energy.

First, NB Power supplies New Brunswick with electricity and has transmission links to Maine and Quebec. According to page 16 of its 2014 Integrated Resource Plan, https://www.nbpower.com/media/102794/irpjuly2014-english.pdf, it owns 3,513 MW of thermal, hydroelectric, and other generating capacity and has PPAs for another 731 MW of

wind and other resources. NB Power aims to increase its renewable energy sources and discusses future hydroelectric expansion opportunities on pages 52-55 of the 2014 Integrated Resource Plan. The Grand Falls Additional Power project, which would be 100 MW and generate 300 GWh/year, has the lowest lifecycle cost of all the resource options according to the data provided on page 157 of that document.

Second, Nova Scotia Power, the largest electricity supplier in that province, is constructing the Maritime Link transmission project to replace coal-fired generation with imported hydroelectric power from the Lower Churchill Falls project. Nova Scotia also plans to develop its wind resources, which would be facilitated by Lower Churchill Falls' hydroelectric energy to balance the wind's intermittent generation.

Third, Prince Edward Island imports most of its energy requirements from New Brunswick, and generates the rest from wind and thermal units. There is considerable wind potential that will also require hydroelectric or other resources to balance the wind's intermittent generation.

Q. What is your overall outlook on the availability of renewable resources in the Eastern Canadian Provinces to be imported via the NECPL?

Response: I would not be surprised if the Eastern Canadian Provinces have surplus renewable energy for the NECPL in the future that could be wheeled through New Brunswick and Quebec, particularly if those Provinces complete on-going renewable energy projects and continue to pursue renewable energy projects as planned.

Q. Can you address the issue raised by DPS Witness McNamara in A9 of his Direct Testimony of whether non-renewable energy could be imported over the NECPL?

Response: Yes. The location of the NECPL's interconnection point with the Hydro Quebec system near the US-Canadian border provides geographic and transmission cost advantages to source renewable energy from Hydro Quebec compared to other provinces. As I pointed out in A25 and in footnote 3 of my Direct Testimony, "[t]here are significant hydroelectric and wind resources in Quebec and the Maritime Provinces that have been and continue to be developed." I am not aware of any non-renewable projects being constructed or planned in those provinces. Therefore, I anticipate that virtually all Canadian energy supplies for the NECPL will be renewable.

This supply of renewable energy is well-positioned to satisfy New England's need for renewable energy. In A23 and A24 of my Direct Testimony, I explained that each of the New England states has some form of a Renewable Portfolio Standard ("RPS") or an equivalent and that the New England Governors have expressed their collective desire to invest in transmission to import renewable energy.

In addition, legislation was passed in Connecticut and Rhode Island, and is currently being revised in Massachusetts, for electric distribution companies to collaborate with their respective state commissions on a coordinated competitive bidding process for hydropower and other clean energy resources. The Massachusetts bill, filed on July 9, 2015, calls for up to 18.9 million MWh/year of energy from hydroelectric and other RPS-eligible resources, which is more than twice NECPL's anticipated annual energy deliveries. Lastly, the Obama administration released its final proposed Clean Power Plan to establish national carbon dioxide standards on August 3, 2015. If enacted, the Clean Power Plan would further

increase the demand for low-carbon and zero-carbon renewable resources to meet increasingly stringent emission targets in 2020 and in 2025.

Q. Please summarize your conclusions regarding the supply of and demand for Canadian renewable resources that could be imported via the NECPL over the foreseeable future.

Response: New England states need renewable energy to meet their RPS (or equivalent) targets and may need even more to meet the proposed Clean Power Plan targets. The New England Governors have expressed their desire for renewable energy and are planning a coordinated multi-state competitive bidding process for hydropower and clean energy resources.

On the supply side, I expect that renewable resources from Canada will provide virtually all of the energy to be imported via the NECPL over the foreseeable future based on the current resource mix, the expected addition of renewable resources over the next ten years, the provincial interest in developing additional hydroelectric and wind resources, and the provincial government's explicit support of renewable energy development and exports.

Hedge Value Estimate

Q. Please review the hedge value concept that you provided in your Direct Testimony.

Response: Vermont utilities have three ways to either lock in energy and/or capacity prices that fully protect ratepayers from long-term swings in wholesale prices or have contract pricing formulae that partially protect ratepayers from these swings: long-term power supply contracts, owned generation resources, and entitlements to other generation resources. Such

price hedges can be valuable tools to manage utility supply portfolios. In the context of my forecast of the long-term reductions in wholesale energy and capacity prices due to the NECPL, any long-term hedges would limit the ability of Vermont ratepayers to realize the full benefit of such price reductions. Such hedges must be taken into consideration in any ratepayer analysis.

Q. Please review the hedge value that you calculated in your Direct Testimony and how you arrived at it.

Response: The details of my calculation of a 25% hedge value were provided as a Workpaper to TDI-NE's Responses to the DPS's Second Round Discovery Requests. As explained in my Workpaper, I relied primarily on data contained in Green Mountain Power ("GMP's") FERC Form No. 1 to estimate the long-term hedge contribution from the three energy supply categories. I focused on publically-available GMP documents because it serves approximately three-quarters of the state; as a result, I did not research data for other Vermont utilities. I ignored short-term contracts that reflect near-term market realities and thus do not provide a hedge against long-term price swings. I also took into account load growth and likely power plant retirements over the Study Period.

Q. What hedge value did DPS witness McNamara estimate in his Direct Testimony, and how did he calculate that value?

Response: Mr. McNamara concluded that "[g]enerally, the Vermont utilities are more than 50% hedged against wholesale market prices over the next 10 years, with closer to 56% hedged in 2019, the earliest year that the NECPL would likely be commissioned." Mr.

McNamara calculated these values based on a spreadsheet with data on owned generation, contracts, generation entitlements, and open purchases at market prices for all of the Vermont utilities. The Department recently provided Mr. McNamara's workpaper with his spreadsheet to TDI-NE who then forwarded it to me.

Q. Do you have any relevant observations on Mr. McNamara's spreadsheet and his conclusions?

Response: We agreed on the treatment of many energy sources and disagreed on others, principally because Mr. McNamara had access to more comprehensive and more detailed information than I had. The fact that he considered all of the Vermont utilities while I focused solely on GMP is not problematic because his data indicates the hedge value for GMP was very similar to the hedge value for all of Vermont. In any event, both of our analyses necessarily made assumptions about the future which may prove to be different over time.

Q. What would be the power market savings based on Mr. McNamara's hedge estimate?

Response: In order to calculate ratepayer savings based on Mr. McNamara's hedge estimate I applied an average hedge value of 50% for the ten year Study Period of April 2019 through March 2029. The time period for Mr. McNamara's estimate of "…more than 50% hedged against wholesale market prices over the next 10 years…" was for an earlier period of time and his estimate of "…closer to 56% hedged in 2019…" only covers the first year of the Study Period. The table below includes the resulting range of corrected for energy, capacity,

and total Vermont ratepayer savings with no hedge, my 25% hedge estimate, and a 50% hedge estimate.

Table 7. Corrected Range of Vermont Ratepayer Savings (2014 $ millions over Study Period)

Hedge Values	Energy Savings	Capacity Savings	Total Savings
No Hedge	$ 178.5	$ 101.2	$ 279.6
25% Hedge	$ 133.9	$ 75.9	$ 209.7
50% Hedge	$ 89.2	$ 50.6	$ 139.8

The savings to Vermont ratepayers are significant regardless of hedge value. Moreover, the NECPL is expected to be commercially operational for many decades, well beyond my ten year Study Period. During this time, some of Vermont's long-term contracts will expire, some owned resources will retire, and some resource entitlements will end. Any of these eventualities would reduce Vermont's long-term hedges and enable Vermont ratepayers to benefit more from the wholesale energy and capacity price reductions due to the NECPL.

Q. Does this conclude your testimony at this time?

Response: Yes.