Elizabeth Caruso Testimony

February 28, 2019

(Supplemental Evidence – Redacted Version in Record, Unredacted Version Not In Existing Record)

THE STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPLICATION FOR SITE LOCATION OF DEVELOPMENT ACT PERMIT

AND NATURAL RESOURCES PROTECTION ACT PERMIT

FOR THE NEW ENGLAND CLEAN ENERGY CONNECT

FROM QUÉBEC-MAINE BORDER TO LEWISTON

AND RELATED NETWORK UPGRADES

PRE-FILED DIRECT TESTIMONY OF

ELIZABETH CARUSO

TOWN OF CARATUNK

FEBRUARY 28, 2019

TESTIMONY OF ELIZABETH CARUSO

Q. Please state your name and address

A. Elizabeth Caruso, 81 West Shore Rd, Caratunk, Maine 04925

Q. What is the name of your organization and business address?

A. Town of Caratunk, PO Box 180, Caratunk, Maine 04925

Q. What is your current position?

A. First Selectman, Overseer, Assessor

Q. What other occupations have you had in the Caratunk area?

I have worked as a Maine Registered Whitewater Guide since 1992. In 1994, I left a lucrative Industrial Engineering career in Connecticut to live and recreate in this amazingly beautiful and peaceful area. Utilizing my Masters in Business Administration, from 1995 to 2008, I co-owned and operated North American Whitewater Expeditions, Inc. (dba North American Outdoor Adventure), a licensed whitewater rafting outfitter operating on 7 rivers in Maine, Massachusetts, Vermont and Connecticut. I also founded and operated The Outpost Bed and Breakfast and River House (bed and breakfast) in the West Forks. In addition, I founded and operated the Dead River Outfitter Shop, selling outdoor gear, equipment and clothing for year-round recreationists. In addition to the summer rafting season, we had a fleet of snowmobile rentals and ATV rentals and offered guided tours during both seasons. My company was instrumental in maintaining snowmobile trails, building snowmobile bridges and first opening up Coburn Mountain as a groomed trail.

In addition, I helped start The Forks Area Chamber of Commerce and worked as its first Executive Director, where one of my tasks was creating and marketing the Forks Area Snowmobile Trail map.

I also participated in the settlement negotiations over the FERC relicensing of Harris Station where Florida Power and Light coordinated a large dialogue with the whitewater industry, communities, organizations and agencies (circa 2000). A far cry from CMP's backroom, secretive dealings with a few business stakeholders to create an MOU in lieu of open community mitigation talks.

In addition to working in the greater Forks Area as a guide and business owner, I am an avid outdoor enthusiast. I have spent countless hours navigating the Kennebec, Dead and Penobscot rivers, boating on the area's lakes and ponds, cross country skiing, snowshoeing, hiking the area's mountains and trails, snowmobiling, ATV-ing and fishing. My husband and sons provide our family's organic, grass-fed meat every year by hunting the area's deer and moose.

As a full-time homeschool mother, my husband is the primary source of income for our family. His livelihood is comprised entirely of outdoor, tourism-based activities during Maine's four seasons. He is a Maine Master Guide, and it is critical to our family that he have a secure flow of guests during the hunting, fishing, snowmobiling and summer seasons.

Q. Why did the Town of Caratunk intervene in these proceedings?

The Town of Caratunk has grave concerns with regards to many facets of the NECEC proposal. As a democratic government, our voters (residents) expect the town to defend and represent their welfare. Most year-round residents derive their income in the tourism industry as independent guides or by working for the recreational outfitters, lodges, cabins and restaurants, area gas stations, etc. A few of these residents are intervenors in this proceeding, and many have submitted sworn testimonies and public comments against the project.

Other residents work as carpenters, roofers, woodsmen, and handymen catering to the needs of the area's landowners, both year-round and seasonal. However, most of Caratunk's landowners are from out-of-state and own vacation homes and camps along Pleasant Pond and the Kennebec River. Caratunk residents will not only be impacted financially through their livelihoods from which they derive income to support families, but also in their ways-of-life. All residents chose homes and vacation homes or camps in Caratunk for the area's peace and beauty in surroundings and also for the recreational opportunities provided by the local mountains, ponds, lakes, rivers, streams, etc. NECEC will invade the beautiful and valuable view shed which they enjoy but which also provides financial worth. NECEC will assault the nature's silence and the nighttime darkness from their decks and during year-round recreation activities.

There are obviously impacts to public health and safety, and scenic, historic and recreational values related to any major energy project. Those impacts are the reasons behind the public outcry as seen in the PUC public witness hearings, on the PUC website, in news stories, letters to the editor and guest editorials, and at numerous grassroots events. Those impacts are exactly why the Town of Caratunk intervened in this docket and why ***every*** **town, township, and plantation in the immediate vicinity** that will be impacted by the new corridor **has formally voted against NECEC**.[1] Additionally, several road associations, including Mile 10 Road Owners Association, Spencer Road, Grace Pond Subdivision

[1] The Town of Caratunk, West Forks Plantation, The Forks Plantation, Town of Jackman, Dennistown Plantation, and Town of Moose River and Alna have all voted to oppose the project and Caratunk has a moratorium in place pursuant to a special town meeting vote.

Road Owners Association, and Moxie Pond East Homeowners Association, representing landowners in unorganized territories have submitted letters of opposition to this corridor[2]. Obviously, these impacts are critical enough to have two agencies analyze them from their respective views as an important part of evaluating NECEC compared with any benefits to Maine and any potential alternatives.

It is self-evident that installing 100-foot-tall transmission towers along a new corridor as wide as the New Jersey Turnpike through relatively undeveloped western Maine will have numerous, significant, and permanent impacts. The Department doesn't have to quantify the impacts because CMP bears the burden of proof to demonstrate that there won't be impacts. Those impacts are part of the total cost of the project. Unfortunately, CMP hasn't done the studies[3] or provided evidence to quantify the impacts or prove there won't be any.

Due to the grave concerns of this corporate-profit-only project, an Elective Transmission Upgrade, the Town of Caratunk recently enacted the Electrical Transmission Corridor Moratorium Ordinance in order to protect the public health, safety and welfare of the residents of Caratunk. The Planning Board is working on an appropriate ordinance and determining the most appropriate methods to regulate such activities because there exists the potential for serious public harm including visual and financial impact, fire, noise, taxpayer-incurred costs as well as environmental and health degradation.

Buffering for Visual Impacts: Overview

CMP has NOT shown that THE USE CAN BE BUFFERED enough to not impact our wild and scenic landscape that characterizes our 4-season outdoor recreation area.

The transmission lines and corridor as designated through our area would not be buffered sufficiently to maintain our community's economic vitality, our residents' ways of life and our residents' livelihoods. Our year-round and seasonal residents chose purposefully to live in Caratunk for the remote, wilderness, pristine and recreational attributes of the greater Forks area. This corridor represents a wide strip ripped out of our landscape and significantly impacting, in fact negating, our scenic and wild setting. Tourists and seasonal landowners come from all over the country and the world to partake of our wilderness landscape and our guided wilderness trips, leaving their urban lifestyle to experience our unique pristine wilderness.[4]

[2] CRTK-13, Homeowners' Association Letters
[3] CRTK-1, January 9, 2019 Transcript of PUC hearings, cross-examination by Elizabeth Caruso
[4] CRTK – 2, Kennebec Valley 2017 Regional Tourism Impacts

Our year-round residents who have a commercial guiding business or who are employed as guides, waitstaff, housekeepers, office staff, cooks, cashiers, gas attendants, etc. in this area depend on the characteristics of this wild and scenic landscape to remain wild and scenic and not be industrialized by a 150'-300' corridor of transmission lines and 100' poles. In addition, these wilderness guide businesses and their families rely on the viability of the fishing, hunting, snowmobiling, hiking, ATV-ing, and whitewater activities as well as the strength and health of the fishery and wildlife population and habitat. Our community would be dramatically and negatively impacted by this transmission line/corridor through the West Forks/Moxie areas, Johnson and Coburn Mountains and Parlin Pond, Bald Mountain and Appalachian Trail. So much of our residents' revenue depends on the scenic and aesthetic uses of our area.

We concur with the Department's statement that the photo-simulation of the corridor in leaf-stage was Inadequate at best. During fall, winter and spring, the lines and poles would be visually, obtrusively industrial against the natural wilderness. One of the many scenic areas impacted in the sub-districts is the Coburn and Johnson mountain area. The corridor will tear a strip along the Coburn Connector Trail and ITS 89, which are one the most popular destinations for snowmobilers. On a busy day, hundreds of tourists snowmobiling to Coburn Mountain's 3800' observatory would be staring 360 degrees down at the vastness of this destructive corridor.

Winter Survey

Because the applicant failed to conduct any survey of this critical season in the greater Forks area, a Winter Recreation Impact Survey[5] was conducted by Sandra Howard, PhD. This online survey was distributed electronically, and participants responded during a 4-week period between January 18 and February 18, 2019. Of the 163 participants, 70% thought "Riding along a powerline trail" was "Least Important", 70% thought "Groomed trail riding in forested areas" were "Very Important", 71.2% thought "Scenic beauty along snowmobile trails" was "Very Important", and 90% thought "Riding along mountain view trails with overlooks" was "Very Important".

We are sure that, had the applicant conducted an analysis of the snowmobile recreation users of the area of the new corridor, the data would show an overwhelming opposition to industrialized infrastructure in this scenic area. As guides and guests have attested, 100' poles, red blinking lights and 150-300' scars

[5] CRTK – 3, Winter Recreation Impact Survey

across the mountains, valleys, streams and ponds are simply horrific to recreationists and tourists traveling to encounter a natural setting.

ALTERNATIVES ANALYSIS

CMP has failed to show that there is NO ALTERNATIVE. In fact, there are alternatives. First of all, there already exists a corridor from the Quebec border on the other side of Route 201. CMP could easily have used this corridor. It's quite simple and is even listed in the MOU with Western Mountains and Rivers Corporation.

Secondly, CMP could have buried the line alongside Route 201 in a preexisting corridor and where the land is already disturbed. Thirdly, CMP could have buried the line under pre-existing dirt roads. During the Town's cross examination on January 9th of the PUC hearings, Mr. Dickinson explained that he had proposed burying a transmission line in the Hudson Valley of New York due to aesthetic purposes. [6]

> MR. TANNENBAUM: Can I just follow up quickly? Did -- I wasn't sure I heard this right. Did CMP conduct an analysis of what it would cost to bury the line in the new corridor?
>
> MR. DICKINSON: No.
>
> MR. TANNENBAUM: Okay, thank you.
>
> MS. CARUSO: So you mentioned earlier this morning that on a project in the Hudson Valley you buried the line for aesthetic reasons. And it didn't occur to you to bury the line here through this high tourism area and with all these camp owners having their property abutting a huge DC transmission line?
>
> MR. DICKINSON: So the project you're talking about, Connect New York, is a project that is -- I would put in the dream category of project development portfolio that we have. It's -- so far has not got momentum within New York state. Maybe part of that is the cost related to it, but, again, what the strategy there is we knew we were submitting into a request for information in New York a number of years ago. We knew that there were existing AC overhead projects that already were in place, and our idea was to find a corridor that already was predisturbed. So a predisturbed corridor and putting a buried line along the thruway means that you're not disrupting, you know, a new area, an area that currently wasn't dug up. You're doing one that was just previously disturbed. So again, there was a specific rationale and reason.

Route 201 would certainly be considered a "predisturbed" area, and yet, CMP chose not to use this rationale or reason in this case. Additionally, CMP has given no evidence that it had realistically tried to find an alternate route. They have stated that they chose this route because they already own the land, thereby making the project less expensive. **CMP's shortsightedness and desire to cut costs should**

[6] CRTK – 1, January 9 transcript, p. 90

NEVER be the reason that our towns and landscapes are devastated and our residents' abilities to enjoy life and sustain livelihoods should suffer.

Furthermore, the applicant should have used the same foresight and precautions in our spectacular forest and tourism area that they offered in New York. In response to a New York RFI, Thorn Dickinson, Vice-President of Business Development for Iberdrola USA, proposed an underground line for a similar 1,000 MW DC line utilizing existing public and private right-of-way. As clearly stated in their own "Connect New York" document[7], the underground routing was utilized in order to 1) mitigate environmental and right-of-way concerns, 2) avoid eminent domain, and 3) eliminate aesthetic and health-based concerns.

The "Connect New York" Option

Simply stated, "Connect New York" is our vision of how to best advance the major supply-side energy objectives delineated in "Power NY". It would include a 1,000 MW DC bulk transmission line running from the Utica area to New York City. There is also the option to add a second 1,000 MW line. The **routing would be underground utilizing existing public and private right-of-way**. **In doing so we can mitigate environmental and right-of-way concerns that derail most bulk transmission projects and avoid eminent domain and NIMBY issues. By burying an efficient, underground DC bulk transmission line, line losses will be reduced and aesthetic and health-based concerns eliminated**. In fact, the energy industry knows all too well that burying transmission lines is common practice to alleviate aesthetic and environmental issues. NextEra has brought this very issue to the Department's and Commission's attention. Where but in this spectacular area, would it have been more appropriate to bury this corridor, eliminate 100' monstrosities, huge and humming DC transmission lines, and drastically reduce the amount of herbicides polluting our streams, renowned fisheries and wildlife – which many of us rely on to feed our families.

As a competitor in the 83D RFP process, TDI-VT has a fully permitted, ready-and-waiting, **underground and underwater** corridor of 145 miles to deliver the same power from Hydro Quebec into Massachusetts. There is no excuse for CMP to not have buried NECEC underground for the entire length of the 53 new miles of corridor through our last contiguous forest and spectacular tourism area. Additionally, the line should have been buried in all areas where residential homes would abut the line or view shed.

[7] CRTK – 4, Connect New York, p.7 (emphasis added)

Aside from already owning and arranging lease agreements for the land of the new corridor, CMP didn't research existing uses of the new area to minimize scenic, recreational, visual impacts (as their competitor TDI had done in Vermont). During the January 9 cross examination, CMP admitted the following.

> MS. CARUSO: Okay. So **have you studied winter snowmobiling** in the affected area of the proposed new corridor?
>
> MR. STINNEFORD: **We have not conducted a study**, although we have had numerous conversations with the Maine Snowmobile Association and they are very supportive of the Project.
>
> MS. CARUSO: Okay. **Have you completed any studies as to why people come to the region of the new portion of the line to hunt, fish, raft, hike, or snowmobile?**
>
> MR. DICKINSON: **No**, as I said, I think my understandings from the -- why I believe there's opportunities for new expanded tourism in the region come from conversations that I had had with people in the region.[8]

In other words, they had *some* conversations with *some* people and that's all they offer to support their contention that NECEC not only won't harm our tourist economy but will actually be good for it. In reality, the communities along the new corridor – who obviously know more about our local tourist economy than CMP does – have all come out strongly in opposition to NECEC. As mentioned above, the registered voters, landowners and/or boards of selectmen along the new corridor have overwhelmingly opposed NECEC. In contrast, CMP has very little support. The contractors who would build NECEC obviously like the idea, the relatively few business owners who would directly benefit from the WM&RC MOU are required to support it (discussed below).

CMP also tries to suggest that a "working forest" is somehow an already-spoiled landscape and that our local concerns should be dismissed. Western Maine is a wonderful, scenic, special area, and the landowners that manage the "working forest" are excellent stewards of the land. The overall value and beauty of our natural heritage is exactly why people come to our region to take advantage of a largely unspoiled wilderness experience. CMP's implication that this is more or less just a wasteland is untrue, disrespectful, and doesn't support any finding that NECEC will cause little, if any, impacts in our region. (Roger Merchant's GROUP 2 testimony will go into greater detail on this issue).

Aside from the last-minute resort to bury the 1000' of line under the Kennebec River, **<u>CMP didn't conduct *any* kind of analysis to find out if it might be possible to install the line underground</u>** – like

[8] CRTK -1, January 9 Transcript p. 85 (emphasis added)

TDI and significant parts of Northern Pass – to see if some of the visual and environmental impact could be avoided:

> MR. TANNENBAUM: Can I just follow up quickly? Did-- I wasn't sure I heard this right. **Did CMP conduct an analysis of what it would cost to bury the line in the new corridor?**
>
> MR. DICKINSON: **No**.[9]

The fact that they only did relatively superficial analyses related to project impacts is extremely disturbing to the local communities and to those whose livelihoods and families are at stake. It should be disturbing to the Department and Commission, as well.

What they did do was insufficient. James Palmer, the DEP's peer reviewer responsible for evaluating CMP's Visual Impact Assessment, found it sorely lacking and sent them back to the drawing board to do it better. The peer reviewer said, "The question remains—why is there not a full accounting of potential scenic resources and a documented evaluation of all those with potential visibility? There does not even appear to be a process to attempt a full accounting."

CMP has provided <u>no evidence related to the potential impact on property values</u>, <u>no evidence addressing whether the local communities have</u> <u>sufficient emergency response capabilities</u>, and <u>no evidence that NECEC will not harm our tourism and recreation economy</u>. Without supporting evidence, it is difficult to see how CMP can claim there won't be any impacts. For reasons such as these, it is difficult for intervenors and members of the public to see how the DEP/LUPC could possibly allow NECEC to occur.

CMP has gone to great lengths to downplay the impacts and disparage the views of its critics. For example, on September 4, 2018, DEP issued a formal letter response[10] to CMP regarding information that CMP provided on July 26, 2018. DEP's letter includes some enlightening quotes from the CMP July 26 filing. According to CMP:

> "At the Preferred Alternative location, the river is generally flat water, and is **not particularly valued by recreational users** . . . This commercial [rafting] and **recreational use of this section of the river arguably has more impact on any bucolic nature of the river than does the proposed overhead crossing** . . . **This existing human-caused visual impact at the Harris Dam put-in is significantly greater than the Preferred Alternative would be … and affects rafters' and other boaters'**

[9] CRTK – 1, January 9 Transcript p. 90 (emphasis added)
[10] https://www.maine.gov/dep/ftp/projects/necec/2018-09-04-Mirabile-follow-up-questions-7-27-to-8-14-submissions%20.pdf, emphasis added

> **aesthetic expectations on the river downstream** . . . **Due to the position, buffering, and limited duration of viewing, the overhead crossing in the proposed location will not diminish the recreational use or scenic character of the outstanding river segment** located between the Forks and Indian Pond Dam. Accordingly, the two conductors and two shield wires that would cross the river at **the Preferred Alternative location**, which as described above **is not particularly unique or wild**, **would not adversely affect existing uses of the Kennebec River**."

DEP asked, "…did CMP draw these conclusions based on user survey data? Can you provide the basis for these statements?" Of course, there was no survey data or analytical basis for CMP's conclusions. Most of the "analysis" they did was after-the-fact – after the application was filed and only after DEP asked them to do it.

However, a Kennebec River Visitor Impact Study was conducted in 2018, and 98.6%[11] respondents stated that a pictured transmission line crossing with 12-18 FAA orange balls[12] would have "a negative impact on your wilderness river experience" (275 out of 279 participants). This information was presented as sworn testimony by Carol Howard at the Hallowell PUC Public Witness Hearing; the following day, CMP amended the application to bury the line under the gorge.

Instead of actually studying recreational impacts, CMP just dismisses them. Rafting guides and recreational boaters strongly disagree with the idea that where NECEC would cross the Kennebec River gorge "is not particularly valued by recreation users." As a matter of fact – and as any study or survey of actual users would have shown – it's one of the most peaceful and serene parts of the adventure where boaters have a chance to look around and catch their breath after the excitement of the whitewater. Instead of a constructive approach with stakeholders and any data-driven analysis, they offer unsupported, inaccurate, and frankly offensive opinions like, "recreational use of this section of the river arguably has more impact on any bucolic nature of the river than does the proposed overhead crossing." Somebody at CMP just made that up. What's even scarier is they apparently thought saying things like that would help them get a permit.

For additional intervening comments on this topic, please refer to:

06-096 Ch. 375, § 9. Buffer Strips.
06-096 Ch. 375, § 14. No Unreasonable Effect on Scenic Character.
06-096 Ch. 375, § 12. Preservation of Unusual Natural Areas.
38 M.R.S. § 480-D(8). Outstanding river segments.
6-96 . 315.

[11] CRTK – 5, KRV Impact Circle Chart
[12] CRTK – 5, KRV Impact Photograph

<u>Site Location of Development Law – 30 M.R.S. § 484. Applicable Licensing Criteria</u>

30 M.R.S. § 484(3). No adverse effect on the natural environment.

The Town of Caratunk believes that CMP has not "made adequate provision for fitting the development harmoniously into the existing natural environment and that the development will not adversely affect existing uses, scenic character, air quality, water quality or other natural resources in the municipalities along the transmission line or in neighboring municipalities." CMP's proposed project will likely have significant negative impacts on existing whitewater rafting, hiking, hunting and fishing activities on rivers remote ponds, lakes and on land, as well as on the scenic character of the Old Canada Scenic Byway and the Appalachian Trail. These significant negative impacts on our natural environment correlate to our residents' way of life, livelihoods and the community's economic viability which is dependent on the lure of tourists to visit the very attributes which will be taken away.

30 M.R.S. § 484(3)(H).

The Town of Caratunk believes that CMP's proposed project may adversely impact significant vernal pool habitat. CMP's application indicates that there are at least 42 significant vernal pools and 23 potentially significant vernal pools wholly or partially located within the proposed action area.

<u>Chapter 375: NO ADVERSE ENVIRONMENTAL EFFECT STANDARDS OF THE SITE LOCATION OF DEVELOPMENT ACT</u>

The Town of Caratunk – as well as all the towns north to the border – have grave concerns over the lack of fire and emergency infrastructure that is necessary to support the construction and operation of such a high-power transmission line. The absolutely horrific fires in California are reason enough to insist on adequate fire protection around any such lines. None, however, exists.

In addition, these tourist dependent towns are just as concerned about where the construction workers would even stay. The tourist lodges, hotels, cabins and motels do not want to fill their occupancy on temporary construction workers leaving no room for returning tourism clients. In Caratunk's cross-examination of CMP executives on January 9th, when asked about this issue as well as the **<u>absence of</u>**

fire and emergency medical care, CMP had not even considered these requirements when choosing to place this high-power line in our woods.

> MS. CARUSO: -- did you ask the affected communities whether or not they could accommodate such a large construction workforce or if they had the fire and emergency response resources to handle it?
>
> MR. DICKINSON: So the -- I don't think -- I think the simple answer is no.[13]

To answer the question, the Town of Caratunk has no local fire or emergency response. (*Both are contracted out from Bingham). The Forks, West Forks, Parlin Pond, Jackman, Dennistown and Moose River all rely on Bingham's ambulance, the Skowhegan Redington Fairview Hospital, and they have a small fire department in Jackman and a few volunteers at the West Forks Volunteer Fire Department.

Furthermore, the Maine State Federation of Firefighters just released a letter of concern "for fire and other emergency response capabilities within the areas located along and adjacent to the NECEC corridor." The president warned:

> "Please also note that these fire departments also lack sufficient off-road fire support capacity. While several do have smaller 4WD apparatus, sufficient large-scale wildland suppression and emergency mitigation equipment is not available in the rural areas of the proposed NECEC Corridor area." [14]
>
> "The most current available Somerset County Emergency Management Agency Mitigation Plan states the following: C3 Goals Wildfires: Reduce damage, injury and possible loss of life in Somerset County caused by wildfires. Somerset County is subject to wild land fires. The most likely damages caused by a wildfire are the loss of life, loss of prime timberland, and the destruction of personal and real property, especially homes. The loss of electricity is also possible, since many high voltage transmission lines pass through heavily wooded areas. Major wildfires may close commerce, resulting in major losses of income to local businesses and individuals. *There were at least 261 wild land fires in Somerset Country in from 2005 to 2010. Information to date indicates that consideration of the many emergency hazards associated with the construction and future management of the NECEC Corridor have not been addressed. Due to this oversight, we conclude that the preparedness and safety of our fire fighters, and other first responders

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[13] CRTK – 1, January 9, p. 124

[14] CRTK – 6, Maine State Federation of Fire Fighters letter, 2/12/19

> who will respond to NECEC Corridor incidents, has been severely overlooked and their security and safety significantly compromised."

With the California fires still fresh in our eyes and memories, we see this concern alone as sufficient reason for the Department and Commission to deny permits for NECEC.

06-096 375, § 14. No Unreasonable Effect on Scenic Character.

The Town of Caratunk believes that CMP's proposed project will have a devastating effect on the scenic character along the proposed transmission line. For example, the line will cross the Appalachian Trail, the Old Canada Scenic Byway, the Kennebec Gorge, the Spencer Road, Cold Stream, and many other important scenic sites not the least of which is The Forks Area - Jackman Snowmobile Trail system.

CMP has been propagating that the area of the new 53 miles is nothing but a working forest. We all know that clear cuts grow back, but CMP's destructive herbicides and cutting will create a permanent wasteland of the forest.
Notably, CMP's visual rendering showed uninhabited, bland and undesirable roads, ponds and mountains. In order to illuminate the outlandish misrepresentation of these impressive destinations, the Town has attached a file[15] of pictures of the tourist destinations, vacation lands, beautiful mountains, pond and natural landscapes that NECEC will fragment and industrialize, forever destroying God's creation.

As the Department and Commission review these pictures, we ask you to keep in mind, not only the beauty of the land, but also the joy and peace of the recreationists. If we could ask you to stretch your imagination even further, think about how many Maine employees are involved in meeting the needs of each one of these visitors (housekeeping, cook and wait staff, office administration, reservationists, gas stations, grocery stores, guides, machine rentals, snowmobile groomers, cabins and lodge owners, etc.). Next, think about the families they are supporting. A permit awarded to NECEC would not only permanently affect these landscapes, wildlife and fisheries, but would permanently affect the livelihoods of these Maine citizens and their families.

It is important to note that only after Coburn Mountain was opened as a trail destination, the snowmobiling season became as strong and vibrant as it is now. Personally speaking as one local example, my family would not be able to live in Caratunk year-round if we didn't have the income of

[15] CRTK – 8, Visual Rendering, Elizabeth Caruso

the snowmobiling season during the winter months.

Visitors from Maine and all over the globe are drawn to this last contiguous forest, remote ponds, and incredible landscapes during the summer, fall hunting and hiking, spring fishing and winter snowmobiling seasons. People leave their industrialized and urban settings to come to this area to catch a glimpse of raw nature in its beauty and allow the inherent peace of their surroundings to settle their souls. <u>Once industrial powerlines flood these views, wrap around our mountains and ponds, these visitors won't have a reason to return.</u>

Attached is a rendering of The Forks Area snowmobile trail system around Coburn and Johnson mountains with the proposed NECEC corridor superimposed.[16] It is plainly evident that NECEC is **maliciously invasive in its placement within this highly visible tourism destination area**. NECEC will forever <u>degrade this scenic area</u>, <u>significantly undermine the natural beauty</u> of this area and <u>destabilize the tourism economy which Somerset County residents rely so heavily on</u>.

The John Muir Trust study of 2017 found that 55% of the tourists would not return to a wilderness area if it has transmission infrastructure.[17]

If CMP chose to bury the line for 1000 ft under the Kennebec River to avoid impact to tourism, CMP should have avoided the snowmobiling recreational area as well. Snowmobiling, or winter, tourism is equally as critical to the Forks area as rafting is during the summer. Coburn Mountain, with its 360-degree spectacular view, is the major lure of snowmobile riders from Eustis, Jackman, Greenville and Bingham. Wrapping industrial infrastructure all around Johnson and Coburn mountains will turn away these riders. Without the volume of riders, restaurants, cabins, lodges, rentals, guides, gas stations, retail shops – and all their support staff – will greatly suffer and some will likely have to move out of the area for work.

06-096. 375, § 15. Protection of Wildlife and Fisheries.

The Town of Caratunk believes that CMP's proposed project does not adequately protect wildlife and fisheries. The Town of Caratunk believes that CMP's proposed project does not contain buffer strips of sufficient area to provide wildlife with travel corridors between areas of available habitat, will adversely

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[16] CRTK – 9, Coburn Mountain snowmobile trails
[17] CRTK – 10, John Muir Study, 2017

affect wildlife and fisheries lifecycles, and will result in unreasonable disturbance of deer wintering areas, significant vernal pools, waterfowl and wading bird habitat, and species declared threatened or endangered.

As the above report explains, it is obvious that the consistent application of herbicides polluting the Maine native brook trout fisheries and the natural deer and moose habitats would not be considered as "management and conservation efforts aimed at maintaining populations of native species." Similarly, unnecessarily ruining deer wintering habitats by ripping an industrial corridor through these natural areas would also not be considered proper management and conservation efforts.

Natural Resources Protection Act – 38 M.R.S. § 480-D. Applicable Licensing Criteria.

38 M.R.S. § 480-D(1). Existing uses.

The Town of Caratunk believes that CMP's proposed project may unreasonably interfere with existing scenic, aesthetic, and recreational uses as indicated above.

Rural vs. Industrial Maine Towns

When addressing the effects of the project location, it is critical that the Department and Commission differentiate between the varied locations which NECEC would affect. There are two completely dissimilar demographic and geographic cultures of Maine.

On the most northern section, NECEC consists of 53 miles of new corridor prior to the subsequent sections along scenic ponds/lakes and continuing into forested or farm lands in rural towns. These towns and plantations located in Somerset and Franklin counties are among the most heavily opposed to the transmission project. In fact, the towns along the new corridor through the last unfragmented green field are unanimously opposed. Being so remote geographically, these residents specifically chose to acquire their lands for the scenic, peaceful and healthy attributes of a non-industrialized environment. Their livelihoods and ways of life and healthy eating (hunting for organic, grass-fed game) require this preserved, wild landscape. The very livelihoods of the residents in Somerset County, for example, are dependent on their natural landscapes to lure tourists traveling from industrialized settings to recreate in Somerset County.

In contrast, cities in and around the southern terminus of the line, in Lewiston, Maine, are accustomed to industrial infrastructure. Just as the rural, northern areas depend on a preserved, wild landscape, these cities and residents are dependent on mechanical industries for revenue and jobs. Likewise, these southern areas seek to remedy economic depressions due to loss of industrial jobs with similarly natured jobs.

The State of Maine is very diverse. Maine icons include lobster, lighthouses, coastlines, logging and paper mills as well as big game, boating and fishing in pristine inland waters and rugged wilderness. LL Bean, another Maine icon, would never publish fishing, kayaking or hunting pictures with industrialized transmission lines in a pristine, wild setting. That is not Maine's iconic image. It is not "the way life should be". Although certain proponents, such as the Maine Chamber, Lewiston/Auburn Chamber, City of Lewiston and IBEW, may have louder voices, the rural citizens of Maine are equally as important though fewer in number. The Department and Commission should consider Somerset and Franklin counties equally with Androscoggin County.

It is also enlightening to find that the public outcry, as revealed through media polls, social media, and especially through the PUC public comments, is not limited to Somerset and Franklin county residents. Citizens from all regions of Maine are crying out to stop this project from devastating Maine's wilderness, wild nature, Maine's tourism and brand. A reoccurring message is that we, this generation, must preserve our wild landscape for the future generations – especially because urbanization and industrialized infrastructure will only keep increasing in other areas of the state, region and country. Americans will need Maine's wild and scenic areas even more in the future!

38 M.R.S. § 480-D(3). Harm to habitats; fisheries.

The Town of Caratunk believes that CMP's proposed project may unreasonably harm significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, and aquatic life. The Town of Caratunk also believes that CMP's proposed mitigation may diminish the overall value of significant wildlife habitat and species utilization of the habitat in the vicinity of the proposed transmission line.

38 M.R.S. § 480-D(4). Interfere with natural water flow.

The Town of Caratunk believes that CMP's proposed project may unreasonably interfere with the natural flow of surface or subsurface waters as discussed above.

38 M.R.S. § 480-D(5). Lower Water Quality.

The Town of Caratunk believes that CMP's proposed project may cause violations of state water quality laws, including those governing the classification of the State's waters as discussed above.

38 M.R.S. § 480-D(8). Outstanding river segments.

The Town of Caratunk believes that CMP has not demonstrated that no reasonable alternative to crossing outstanding river segments, such as the Kennebec Gorge, exists which would have less adverse effect upon the natural and recreational features of the river segment. Although CMP doesn't consider this section of the crossing as "particularly unique or wild", citing "... the Preferred Alternative location, which as described above is not particularly unique or wild, would not adversely affect existing uses of the Kennebec River."

Practically speaking, this is a section of river where guests are sitting in the boats looking around because it is too shallow to swim. Bald eagles are commonly seen, and the impact of pristine wilderness is readily noticed and appreciated by guides and guests alike.

In actuality, the **Kennebec River is a Class A River** according to the 1982 Maine Rivers Study.[18] CMP failed to include that, according to the 1982 Maine River Study, the **Kennebec, Dead and Sheepscot Rivers have been identified as "Class A" Rivers** and identified as:[19]

1. River or river segments possessing six resource values with regional, statewide or greater than statewide significance in a specific resource category.

2. Rivers or river segments possessing two or more resource values which are recognized to be some of the State's most significant in a given resource category. Included within this category are rivers providing important habitat (defined as self-sustaining viable runs or significant restoration efforts producing fishable populations) for the nationally significant Atlantic sea run salmon".

RESOURCE VALUES[20]:

- Geologic / Hydrologic Features
- River Related Critical / Ecologic Resources
- Undeveloped River Areas
- Scenic River Resources
- Historical River Resources

[18] CRTK – 12, https://www.maine.gov/dep/gis/datamaps/lawb_maine_river_survey/pdf/1982MaineRiversStudy_FinalReport2011.pdf?sfns=mo
[19] CRTK – 12, Maine Rivers Study, p.9
[20] CRTK – 12, Maine River Study, p. 8

- Recreational River Resources

Furthermore, in Section I, Item 5 of the Findings, **the Study stated that impacts of development around these river resources should be avoided or minimized.** Obviously crossing the Kennebec River, whether under or over, and its tributaries should be avoided whenever possible.

> **There is a significant base of citizen and public agency support for the conservation and sound management of the river resources of Maine.**
>
> River conservation interests in the state vary widely. Such interests include recreational boating and fishing, commercial boating and fishing, education and scientific research, wildlife preservation, water quality maintenance, and miscellaneous recreational interests. While these interests vary and sometimes conflict, an underlying consensus exists that **rivers in their natural condition constitute a valuable resource to the State of Maine.** There also appears to be a consensus among river interests regarding which rivers are most important and warrant conservation action.
>
> In addition, there appears to be a public recognition of the need to balance the goals of hydroelectric development and river conservation, and a desire for the use of hydropower where compatible with the resource values of a river and **where impacts of development are avoided or minimized.**

The department and Commission should carefully weigh the findings of this study as it was intended for state agencies' deliberations. As can be seen below, the Kennebec and Dead Rivers were ranked at the highest classification of river resource value, and the state must ensure that these qualities are protected.

> INTRODUCTION[21]
>
> On June 22, 1981, Governor Brennan released the Energy Policy for the State of Maine. The hydropower section of the policy directed that:
>
> "The Department of Conservation, working with environmental, economic, energy and other appropriate interests, should identify river stretches in the State that provide unique recreational opportunities or natural values and develop a strategy for the protection of these areas for submission to the Governor."
>
> In response to this directive, and as a continuation of the State's ongoing efforts to conserve Maine's significant rivers, the Department of Conservation initiated the Maine Rivers Study. The U.S. Department of the Interior, National Park Service's Mid-Atlantic Office, as part of their ongoing river conservation technical assistance to the State, has provided staff to conduct this study.
>
> The purpose of the study is two-fold. The first is to define a list of unique natural and recreation rivers, identifying and documenting important river related resource values as

[21]CRTK – 12, Maine River Study, p. 13 (emphasis added)

well as **ranking the State's rivers into categories of significance based on composite river resource value**. The second purpose of the study is to **identify a variety of actions that the State can initiate to manage, conserve, and where necessary, enhance the State's river resources in order to protect those qualities which have been identified as important**.

Chapter 310: WETLANDS AND WATER BODIES PROTECTION

06-096. 310, § 5. General Standards

The Town of Caratunk believes that CMP has not adequately minimized the amount of wetland to be altered. The Town of Caratunk believes that CMP's proposal may result in an unreasonable impact because the project will cause a loss in wetland area, functions, and values, and CMP has not demonstrated that there is not a practicable alternative to the proposed project that would be less damaging to the environment.

Chapter 315: ASSESSING AND MITIGATING IMPACTS TO EXISTING SCENIC AND AESTHETIC USES

06-096. 315.

The Town of Caratunk believes that CMP's proposed project is likely to unreasonably interfere with existing scenic and aesthetic uses, and thereby diminish the public enjoyment and appreciation of the qualities of a scenic resource, and that any potential impacts have not been adequately minimized.

In Caratunk's cross-examination of CMP executives on January 9th, **CMP admitted that they did not even assess the area of the new 53 miles for existing uses.**

> MS. CARUSO: "in the visual rendering presentation of August 17th you presented -- or your company presented to the PUC some pictures of Parlin Pond, Enchanted, Coburn Mountain, Rock Pond, Spencer Road, the Kennebec River, and they appear to be uninhabited without visible recreational usage or unusual scenery. And then it was stated at that meeting that you were trying to minimize the impact of a national scenic byway by putting the line to the east and to the west. Did you analyze the usages of areas you chose to place the line beyond it being a working forest?
>
> MR. DICKINSON: "You know, I'm not aware of that." [22]

In Caratunk's cross-examination of CMP executives on January 9th, **CMP admitted that they did not conduct any studies on the impacts of tourism in the area of the new 53 miles.**

[22] CRTK -1, January 9 Transcript p. 81

> MR. TANNENBAUM: Okay, so maybe the question should be, have you done a study of the impacts on tourism?
>
> MR. DICKINSON: Yeah, there's no specific study that we did.[23]

In Caratunk's cross-examination of CMP executives on January 9th, **<u>CMP admitted that they did not conduct any studies on winter snowmobiling in the area of the new 53 miles.</u>**

> MS. CARUSO: Okay. So have you studied winter snowmobiling in the affected area of the proposed new corridor?
>
> MR. STINNEFORD: We have not conducted a study[24]

In Caratunk's cross-examination of CMP executives on January 9th, **<u>CMP admitted that they did not consider the scenic and economic impacts from the corridor in the scenic and/or residential areas of the new 53 miles</u>**.

> MS. CARUSO: So because of the scenic and economic impacts from this corridor, especially in the new corridor area but also in the existing corridor area with all the camp owners and the people who are impacted, did you ever consider burying the line for the entire length of the new construction?
> MR. DICKINSON: No, we didn't.
> MS. CARUSO: Did you ever study the potential difference on the economy of the region between burying the line and not burying the line?
> MR. DICKINSON: No, we did not.
> MS. CARUSO: Did you ever evaluate the scenic or visual impact of burying the line versus not burying the line?
> MR. DICKINSON: No, we did not.[25]

Simply stated, CMP did not care where or how this corridor is placed. CMP did not consider the citizens or residents of Maine. Their lack of foresight and attention to details reveals the rushed planning of this project and the lack of stewardship in the great State of Maine.

<u>Chapter 335: SIGNIFICANT WILDLIFE HABITAT</u>

06-096. 335, § 3(A). Avoidance.

The Town of Caratunk believes that CMP's proposed project is likely to have an unreasonable impact because it is likely to degrade significant wildlife habitat, disturb wildlife, and affect the continued use of significant wildlife habitat by wildlife and CMP has not demonstrated that there is not a practicable

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[23] CRTK -1, January 9 Transcript p. 83
[24] CRTK -1, January 9 Transcript p. 85
[25] CRTK -1, January 9 Transcript p. 89

alternative to the project that would be less damaging to the environment. CMP has indicated that the placement of the corridor is based on land CMP owns. This is not avoidance.

06-096. 335, § 3(B). Minimal alteration.

The Town of Caratunk believes that CMP has not minimized the alteration of habitat and disturbance of wildlife.

06-096. 335, § 3(C). No Unreasonable impact.

The Town of Caratunk believes that one or more of the standards of the NRPA at 38 M.R.S. § 480-D will not be met and that therefore CMP's project will have an unreasonable impact on protected natural resources and wildlife.

06-096. 335, § 3(D). Compensation.

The Town of Caratunk believes that CMP's compensation is inadequate to off-set lost habitat function.

The Department and Commission must differentiate NECEC as opposed to a reliability transmission project. As an Elective Transmission Upgrade, NECEC must be held to a higher standard than a reliability transmission project, especially when the ETU is just a for-profit project that would be built to serve an entirely different state. This ETU is no different than any other corporation, like Walmart or McDonalds, that is applying for a permit to do business. That clearly shifts the balance when comparing impacts versus benefits. CMP would need to prove there would be numerous, significant, permanent, and quantifiable benefits in Maine that would be enough to justify the numerous, significant, permanent and quantifiable impacts of the project. The evidence in the record doesn't even come close to supporting a permit.

CMP argues that "no costs will accrue to Maine consumers." That is not the question. In fact, the Town and its residents contend that there will be significant costs related to our livelihoods and ways of life, property values, and risks to public safety and health – and we are all Maine consumers, too.

The real cost of the project is what it will do to our natural resources and local economy. Therefore, the question for the Commission is whether there will be any benefits – such as enhancing reliability, improving the tourist and recreation economy, improving trout fisheries, enhancing deer and moose habitats– that sufficiently justify the unavoidable costs of building a brand-new transmission corridor through an area that so strongly disagrees with CMP's contention it will be a good thing for us.

The Department and Commission can only approve NECEC if there is unequivocal and overwhelming evidence that the NECEC ETU will provide significant and long-lasting benefits to Maine without adverse impacts.–The applicant must demonstrate that the proposed activity will not unreasonably interfere with the scenic character, existing scenic, aesthetic, recreational or navigational uses and that the development fits harmoniously into the natural environment. <u>CMP has not provided that evidence.</u> This Elective Transmission Upgrade does not fit harmoniously with the fisheries, wildlife, scenery, or the landowners who abut the line or see the line from their homes. As is obvious from the public outcry, town votes, the nearly 1000 PUC comments, ever-increasing grass roots uprising, countless editorials, etc., this foreign corporate profit venture seeks to destroy the local economy, Maine's brand and lure, and the livelihoods and ways of life of the Maine people. That's why CMP didn't provide sufficient evidence to support their case.

30 M.R.S. § 484(5). Ground Water.

The Town of Caratunk believes that CMP's proposed project will "pose an unreasonable risk that a discharge to a significant ground water aquifer will occur." CMP's application indicates that "potential sources of groundwater contamination will include fuel and hydraulic and lubrication oils used in the operation and maintenance of vehicles, but most importantly, the application of herbicides to control vegetation." NECEC Site Location of Development Application at 15-1. <u>It should be unacceptable to the DEP that the drinking water of Jackman and Moose River should be polluted with chemicals.</u>

06-096 Ch. 375, § 2. No Unreasonable Alteration of Climate.

The Town of Caratunk believes that CMP's proposed project may result in "unreasonable alteration of climate." CMP claims that the project is expected to reduce regional greenhouse gas emissions in Massachusetts but has not produced evidence that this proposed transmission line will not result in an overall increase in greenhouse gas emissions. Expert consultants from CMP, Generator Intervenors and NextEra in the PUC proceedings could not confirm that Hydro-Quebec had the necessary capacity of hydro power to provide for NECEC's requirement to Massachusetts without shifting supply from their other customers' and buying fossil sourced power.

The Department can only consider whether this project will benefit the climate here in the state. If NECEC is allowed to transpire, renewable energy projects (such as solar) in the state will be suppressed, and therefore, harm Maine in reducing the state's greenhouse gas emissions.

06-096 Ch. 375, § 3. No Unreasonable Alteration of Natural Drainage Ways.

The Town of Caratunk believes that CMP's proposed project "will cause an unreasonable alteration of natural drainage ways" through improper drainage right-of way and drainage that may result in adverse impact to adjacent parcels of land. CMP's application indicates that their project will cross 115 streams, 263 wetlands, and impact 76.3 acres of mapped wetlands.

06-096 Ch. 375, §5. Erosion and Sedimentation Control.

The Town of Caratunk believes that CMP's proposed project will not adequately control erosion and sedimentation to protect water quality and wildlife and fisheries habitat. CMP's application indicates that their project will cross 115 streams, 263 wetlands, and impact 76.3 acres of mapped wetlands.

06-096 Ch. 375, § 6. No Unreasonable Adverse Effect on Surface Water Quality.

The Town of Caratunk believes that CMP's proposed project could cause the pollution of surface waters through both point and non-point sources of pollution. CMP's application indicates that their project will cross 115 streams, 263 wetlands, and impact 76.3 acres of mapped wetlands.

06-096 Ch. 375, § 9. Buffer Strips.

The Town of Caratunk believes that CMP's proposed project will not adequately utilize natural buffer strips to protect water quality, wildlife habitat, and visual impacts from the proposed transmission line. At this time, it does not appear that CMP's proposed buffers are sufficient to avoid these impacts.

All indication is that these 90-100' structures would devastate the view shed of tourists in our area. However, from the standpoint of landowners and taxpayers, this industrial invasion of their view shed from their properties will significantly devalue their land. Not only is this robbing individuals of their possessions, valuables and net worth, but this degradation will translate to a reduction in property tax value for the towns and plantations.

CMP has bragged about lowering tower heights. For abutting landowners, the overwhelming concern is not only view shed and property devaluation, but deep concern for sickness and disease from Corona hum and electromagnetic frequencies. Testimonies from powerline victims (180' from AC MRPR line) include that they were 1) unable to sleep in the house, 2) radios work laying on the grass, 3) dairy cows stopped producing milk, 4) their animals became sterile, 5) animals died, 6) adults and children get shocked[26]. When an intervenor asked a CMP executive about particular cases, the executive smugly responded that they were litigating the situation. We ask the DEP to stand up for the citizens of Maine and to deny a permit for any structure that will cause cancers, sleep degradation and disruption of daily health or life to any citizen.

COMMENTS ON NON-HEARING TOPICS

06-096 Ch. 375, § 10. Control of Noise.

The Town of Caratunk believes that CMP's proposed project will not adequately control excessive environmental noise from construction, operation, and maintenance of the proposed transmission line which could degrade the health and welfare of nearby neighbors, line abutters, Appalachian Trail and other hikers, campers such as on Rock Pond, and camp owners on Moxie Pond. This is especially true for noise from the transmission lines themselves, especially during inclement weather. The Corona hum, inherent in the line's operation is a life altering, property devaluing concern.

The Town of Caratunk currently enacted the Electrical Transmission Line Moratorium Ordinance. One of the major concerns for the townspeople is the corridor's noise and electromagnetic frequencies as well as their associated health defects and/or disruption of normal lifestyles. Residents choose to live in Caratunk and the greater Forks areas is the environment's serenity, the silence that nature brings and the darkness from the absence of urban lights. NECEC would invade the silence with its inherent, constant noise. This very noise has prevented sleep from residents in the Farmington area whose homes abut an AC line - and NECEC is a much more powerful DC line.

06-096 Ch. 375, § 12. Preservation of Unusual Natural Areas.

The Town of Caratunk believes that CMP's proposed project will harm numerous land and water areas that contain natural features of unusual geological, botanical, zoological, ecological, hydrological, other scientific, educational, scenic, or recreational significance. CMP's proposed project will impact at least 8 deer wintering areas (44.3 acres) and 12 inland waterfowl and wading bird habitats (22.7 acres). The project will cross and degrade the scenically and recreationally significant Kennebec Gorge. Application material indicates that the project area includes the following rare plants: wild leek, red-stemmed gentian, long-leaved bluet, and dry land sedge, and numerous natural and distinguished natural communities.

[26] CRTK – 7, Diane Zagwijn-Coston's official PUC testimony, 10/17/18

According to the Recreational Hunter and Angler Market Report: Maine, prepared for the Maine Office of Tourism and Department of Inland Fisheries & Wildlife (*See* Attachment A, pages 116-117 (emphasis added), ***Insights from the Maine licensed and Traveling sportsmen surveys*** revealed that:

- "The state of Maine is well positioned as one of the "Best" destinations among Maine licensed hunters and anglers across a majority of attributes that are important to them -ranging from climate, safety, pricing, and amenities. Maine's particular strengths among Traveling sportsmen are its attractive natural setting and its sense of safety."
- "The state's natural amenities, beauty and sense of security or safety are also identified to be among the most important characteristics of a site that hunters and anglers say are important when making the decision to hunt or fish. "
- "The abundance of game species and the ability to target native populations are critical factors that influence destination choices. Maine Department of Inland Fisheries & Wildlife supports management and conservation efforts aimed at maintaining healthy populations of native species. "
- "Interestingly, one of the key destination factors for hunters and anglers is the remoteness of the location. However, travel distance also factors into their decision. The geographical size and travel distance to the more remote areas can be a challenge to bring sportsmen to the state. Among traveling sportsmen, it may be important to highlight other services in the area for nonsportsmen to influence the travel decision."

38 M.R.S. § 480-D(2). Soil erosion.

The Town of Caratunk believes that CMP's proposed project may cause unreasonable erosion of soil or sediment and may unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

Impacts to Maine Renewable Energy

Should CMP be granted the NECEC, Maine's energy grid will be locked up, and future renewable energy projects such as Caratunk's solar farm would be prevented. With the approval of NECEC, new sources would be hindered and current viable energy contracts would be retired with Maine jobs lost. The only entities benefiting from NECEC is CMP, Massachusetts and Hydro-Quebec.

Title, Right or Interest

The Town of Caratunk believes that CMP does not have full right, title, and interest in the entire proposed corridor. The streams, rivers and the VIEWS belong to the people. CMP might own much of the land - arguably paid for by Maine ratepayers – but they do not have the right to steal the character of the lands or the scenic views.

Greenhouse Gas and Climate Benefit

The key point is that NECEC will not reduce greenhouse gas. The Department must find a valid environmental benefit before authorizing the destruction of a healthy fishery, wetland, wildlife and tourism area. However, NECEC provides no climate benefit as expert witnesses and intervenors have revealed.

The Massachusetts Attorney General submitted testimony from expert Dean M. Murphy to the Massachusetts Department of Public Utilities stating that NECEC does not meet the clean energy standards for their Section 83D RFP because it would not be "new".

> *"The proposed contracts, as written, do not ensure that the Qualified Clean Energy acquired via the contracts will comprise fully incremental energy deliveries into New England, as the RFP specified. The RFP required that the Qualified Clean Energy under the contract should be incremental to (i.e., in addition to) the hydroelectric energy that HQ has delivered to New England historically, or that would otherwise be expected to be delivered. The proposed contracts implement much weaker requirements for incrementality and would allow most (and potentially all) of the contract energy delivered to substitute for historical deliveries (See* Attachment B, page 5).

Mr. Murphy further testifies that just because there are new transmission lines available, there is no requirement for <u>new</u> <u>clean</u> energy.

However, merely adding transmission does not ensure that clean energy deliveries will be incremental relative to historical deliveries, unless the contracts explicitly require this. As the proposed contracts are written, that will not necessarily be the case; clean energy deliveries could be far less than fully incremental and still satisfy the requirements of the 10 proposed contracts (See Attachment B, page 16).

With regards to greenhouse gas benefit, Mr. Murphy clearly explains that HQ would implement "resource shuffling" or greenwashing, resulting in NO greenhouse gas reduction as a result of NECEC.

> Q. Must the contracts require full incrementality for the 83D clean energy to create the desired offset to greenhouse gas emissions?
>
> A. Even if the proposed contracts required energy deliveries to be fully incremental, this would not necessarily guarantee that GHG emissions would decrease by an amount corresponding to the Qualified Clean Energy of the contract. Incrementality is defined in the RFP only with respect to deliveries into New England, while GHG emissions must be measured at a global level. It would be possible, at least in principle, to satisfy the requirements of full incrementality

(i.e. , the Qualified Clean Energy is incremental to the full historical average deliveries into New England), and still not offset a corresponding amount of global GHG emissions. This could happen through resource shuffling— reassignment of a fixed amount of clean energy so as to increase the clean energy delivered to a particular destination without increasing the total amount of clean energy overall.

For instance, with the new NECEC transmission link, if HQ increased deliveries into New England by the contracts' 9.55 TWh relative to historical New England deliveries, this would achieve full incrementality as defined in the RFP. But if HQ accomplished this by reducing its exports to other neighboring regions rather than by increasing clean energy generation overall, then global GHG emissions would not necessarily be reduced. Diverting clean energy from other regions to New England would enable a reduction in fossil generation and emissions within New England, but the reduced deliveries to other regions may need to be replaced by additional fossil generation in those regions. This would effectively substitute fossil generation in other regions for fossil generation in New England, shifting emissions from one region to another, without causing a material decrease (the actual impact would depend on the relative emissions intensities of each region.) (See Attachment B, , page 16-17)

Q. What would be required to ensure a reduction in GHG emissions?

A. ………Importantly, it must involve overall global emissions reductions, not reductions in one region or sector that might be offset by a corresponding increase that is triggered elsewhere, or reductions that would have occurred regardless of the proposed action (See Attachment B, page 17).

Hydro-Quebec has not confirmed or proven in any of Maine's proceedings that the company actually has the additional capacity to provide this hydropower. In fact, HQ has committed to utilizing existing facilities to supply NECEC contracted energy.

Q. Do the proposed contracts require the energy to be additional in this sense of offsetting GHGs globally?

A. No, not necessarily. HQ has committed to using existing HQPR facilities to supply the contracted energy. If these facilities were spilling significant amounts of water due to transmission constraints that would be relieved by the NECEC transmission, or if Hydro-Québec undertook investments to expand its system—to increase output from existing facilities or add *new generation or storage capability—then a portion of the generation may be considered additional. But the contracts do not require this, nor has HQ indicated that it is the case (See* Attachment B, page 18).

In the Executive Summary of the Energyzt Advisors report: GREENWASHING AND CARBON EMISSIONS: UNDERSTANDING THE TRUE IMPACTS OF NEW ENGLAND CLEAN ENERGY CONNECT, experts further confirm that the contracts allow Hydro-Quebec to shift existing exports into New England to supply NECEC at a higher price.

Hydro-Québec has a financial incentive to sell as much excess energy that it can, subject to water and generation constraints, and divert exports from other markets into NECEC to achieve a higher price. Given its system characteristics and profit goals, Hydro-Québec could even purchase energy from other markets during low-priced hours in order to retain energy in the form of water waiting in its reservoirs for subsequent sale at higher prices to New England through NECEC. Furthermore, the significant inflow via a 1,200 MW transmission line into Maine could adversely affect the economic prospects for Maine renewables, which are likely to be deferred or delayed as a result of the project's impacts on the local transmission network. The net result would be a minimal impact on efforts to reduce total carbon emissions.

NECEC could divert energy sales from another market into New England; shifting flows between markets may not reduce total greenhouse gas emissions and could even increase total carbon injections into the atmosphere. (See Attachment C, pages 4-5)

Hydro-Québec's proposal in response to the Massachusetts Clean Energy RFP explicitly states that it would supply energy to NECEC from existing generation resources, and not from new sources of renewable energy developed to serve the line. Given that HydroQuébec would maximize its exports without NECEC and sell whatever excess energy that it had into external markets, Hydro-Québec would supply NECEC by simply shifting those exports into New England via NECEC at a higher contracted price. This shift in energy flows could create an offsetting impact in the other markets which would have to produce replacement energy, potentially resulting in offsetting carbon emissions. While Maine power plants would be forced to shut-down to accommodate energy flowing into NECEC, fossil fuel plants in other markets (including oil, natural gas and coal units), would fire-up in response to Hydro-Québec's shifting its energy sales, negating any potential climate benefits.

> *Hydro-Quebec can and does buy energy from low-priced markets and then sells its "clean energy" at a higher price into other markets, potentially creating a similar impact on carbon emissions in the atmosphere as if Hydro-Québec were generating power from fossil fuels directly. (See* Attachment C, page 14)

The Department should be most concerned with Maine's greenhouse gas reduction, and in fact, NECEC will be preventing Maine own renewable energy entities from making the necessary strides in this area. According to the Energzt report, and as many of the intervenors have been stating, NECEC will flood and lock up the Maine energy grid. Not only does this inflict much harm on Maine's ability to reduce greenhouse gas and provide climate change benefit, but it also sets back the State for years to come.

> *NECEC would suppress the development of new renewable energy generation in Maine which, in contrast to Hydro-Québec's market-switching strategy, actually could lower greenhouse gas emissions and provide more local jobs and economic benefits than NECEC.*

The Town of Caratunk offers a prime example of this suppression of new renewable energy generation. In July of 2017, Caratunk was approached by NextEra for a solar farm (located in Caratunk and the Town of Moscow) in response to the Massachusetts 83D RFP. The Town supported this project as it would make good use of existing land, formerly known as the US AF Radar Station; it would create fulltime jobs and tax revenue with no adverse impact. However, with the presence of NECEC's DC line, this NEW renewable energy project would be prevented, barred from connecting to the Maine energy grid.

It is critical that the Department and state agencies permit an environment that supports Maine-based renewable energy projects as these are the endeavors which will result in greenhouse gas reductions for our state and region as well as employee Maine citizens and provide greater environmental benefit.

Respectfully submitted,

Date: 2/21/19

Elizabeth Caruso Elizabeth M Caruso
(type or print witness name here
& sign on above line)

State of Maine
County of Somerset

Date: 2/21/2019

Personally appeared before me the above-named Elizabeth Caruso, who, being duly sworn, did testify that the foregoing testimony was true and correct to the best of his/her knowledge and belief.

Before me,

LAURA JEAN SEAVEY
Notary Public - Maine
My Commission Expires
June 29, 2022

Notary ~~Public / Attorney~~ at Law
My Commission Expires: 6/29/22

Exhibit 1

MAINE PUBLIC UTILITIES COMMISSION
AUGUSTA, MAINE

IN RE:)
) Docket No. 2017-232
CENTRAL MAINE POWER COMPANY) January 9, 2019
)

Request for Approval of CPCN for the New England Clean Energy Connect Construction of 1,200 MW HVDC Transmission Line from Québec-Maine Border to Lewiston (NECEC)

APPEARANCES:

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CHRISTOPHER SIMPSON, Hearing Examiner
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BRUCE WILLIAMSON, Maine Public Utilities Commission
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JOHN SHOPE, Foley Hoag, Calpine Corp., Vistra Energy, Bucksport
STEVE BARTLETT, Foley Hoag, Calpine, Vistra Energy, Bucksport
JOHN FLUMERFELT, Calpine Corporation
TANYA BODELL, Energyzt, Calpine Corp., Vistra Energy, Bucksport
ANDREW LANDRY, Preti Flaherty, Industrial Energy Consumer Group
SUE ELY, Natural Resources Council of Maine
PHELPS TURNER, Conservation Law Foundation
AMY OLFENE, Drummond Woodsum, NextEra Energy Resources
BRIAN MURPHY, NextEra Energy Resources
BEN SMITH, Soltan Bass Smith, Western Maine Mountains & Rivers
ELIZABETH CARUSO, Town of Caratunk
DOT KELLY

CONFERENCE COMMENCED (January 9, 2019, 9:05 a.m.)

MR. TANNENBAUM: Good morning. This is a hearing in PUC docket 2017-00232 which is Central Maine Power Company's request for approval of a CPCN for the New England Clean Energy Connect. Let's start with appearances from the parties with the Public Advocate, please.

MS. WYMAN: Liz Wyman, Office of the Public Advocate.

MR. BRYANT: Eric Bryant with the Office of the Public Advocate.

MR. HOBBINS: Barry Hobbins, Public Advocate.

MR. LANDRY: Andrew Landry from Preti Flaherty on behalf of the Industrial Energy Consumer Group.

B. SMITH: Ben Smith on behalf of Western Mountains & Rivers Corporation.

MR. TURNER: Phelps Turner, Conservation Law Foundation.

MR. DICKINSON: Thorn Dickinson, Avangrid Networks.

MR. STINNEFORD: Eric Stinneford, Central Maine Power.

MR. ESCUDERO: Bernardo Escudero, Avangrid Networks.

MR. PEACO: Dan Peaco, Daymark Energy Advisors on behalf of Central Maine Power.

MR. BOWER: Jeff Bower with Daymark Energy Advisors on behalf of Central Maine Power.

D. SMITH: Doug Smith with Daymark Energy Advisors on behalf of Central Maine Power Company.

MS. TRACY: Sarah Tracy with Pierce Atwood on behalf of Central Maine Power.

MR. DES ROSIERS: Jared des Rosiers from Pierce Atwood on behalf of Central Maine Power.

MR. MURPHY: Brian Murphy on behalf of NextEra Energy Resources.

MS. OLFENE: Amy Olfene of Drummond Woodsum on behalf of NextEra Energy Resources.

MS. ELY: Sue Ely, Natural Resources Council of Maine.

MS. KELLY: Dot Kelly, Phippsburg, Maine.

MS. BODELL: Tanya Bodell from Energyzt on behalf of the generator interveners.

MR. SHOPE: John Shope, Foley Hoag on behalf of the generator interveners which are Calpine Corporation, Vistra Energy Corporation, and Bucksport Generation, LLC.

MR. BARTLETT: Steve Bartlett, Foley Hoag on behalf of the generator interveners.

MR. FLUMERFELT: John Flumerfelt, Calpine Corporation.

MR. TANNENBAUM: Okay, witnesses on the panel have been sworn in. Oh, I'm sorry, appearances from the phone, parties in the case?

MS. CARUSO: Elizabeth Caruso the town of Caratunk.

MR. TANNENBAUM: Okay. Any other party in the case on the phone? Okay, let's proceed then. As I mentioned, this panel has been sworn in in this proceeding so we'll proceed with the questioning from NextEra.

MR. MURPHY: Thank you, and good morning, panel. Similar to when we had the technical conference, I put together a booklet with tabs on it that I'll go through. Hopefully it'll make it easier for you all and for me. And in the first tab is part of your application. I'm going to ask you some foundational questions on that first tab. And NEC (sic) is a high-voltage direct current or HVDC transmission line, correct?

MR. DICKINSON: That's correct.

MR. MURPHY: And NECEC is a high-voltage direct current line designed to deliver 1,200 megawatts of energy. Is that correct?

MR. DICKINSON: That's correct.

MR. MURPHY: And it's also using the voltage source converter or VSC technology?

MR. DICKINSON: That's correct.

MR. MURPHY: And it's approximately, in the Maine portion of the line, 145 miles?

MR. DICKINSON: That's correct.

MR. MURPHY: In your September 2017 petition filed with the Commission, CMP explained that the transmission line was to be constructed and operated as an overhead transmission line.

MR. DICKINSON: That's correct.

MR. MURPHY: And since then, on October 22nd, 2018, CMP filed documents indicating that it was amending its Maine Department of Environmental Protection application to include an underground crossing of the upper Kennebec River.

MR. DICKINSON: That's correct.

MR. MURPHY: The underground crossing of the Kennebec River will bury the transmission line for approximately one mile?

MR. DICKINSON: That's correct.

MR. MURPHY: At the November 28, 2018 technical conference, I asked if CMP had considered routing the underground -- excuse me, considered routing the transmission underground for the 53 miles of green field corridor and whether they had considered that in the same way they considered routing under the Kennebec River. And the answer I received from Mr. Dickinson was that you did not consider in the same manner. Do you recall providing that answer?

MR. DICKINSON: Yes, I do.

MR. MURPHY: And therefore, just to make sure we're all on the same page, it's currently the company's proposal that the HVDC line will be approximately one mile underground and 144 miles overhead.

MR. DICKINSON: That's correct.

MR. MURPHY: Now moving to tab four, this is NextEra Hearing Exhibit 19 which is CMP's competitive intelligence presentation on the TDD -- excuse me, the TDI HVDC line. On page one of the presentation, you'll see that the TDI HVDC line proposes to deliver a thousand megawatts of Hydro-Quebec energy into Vermont. Do you see that?

MR. DICKINSON: Yes.

MR. MURPHY: And also on that first page of the CMP presentation, the TDI Vermont line is approximately 154 miles long. Is that correct?

MR. DICKINSON: Yes.

MR. MURPHY: And of the 154 miles, approximately a hundred miles of that line is to be routed under water and 54 miles of that line is to be buried underground which is also in this presentation.

MR. DICKINSON: Correct.

MR. MURPHY: And the TDI line is also using the same technology that you all are using which is the VSC HVDC technology. It's not on that page, but if you recall.

MR. DICKINSON: I do remember that, yes.

MR. MURPHY: Okay. And do you also recall that the line that is the subject of this competitive intelligence is fully permitted? Or they represent that they're fully permitted.

MR. DICKINSON: They represent that they're fully permitted.

MR. MURPHY: Thank you. And then on tab six, this is information about Northern Pass, and it's fair to say that the panel is aware of the Northern Pass transmission line.

MR. DICKINSON: Yes.

MR. MURPHY: And that is another HVDC line that is proposed to deliver 190 megawatts of Hydro-Quebec energy into New Hampshire. Correct?

MR. DICKINSON: Correct.

MR. DES ROSIERS: I believe you meant 1,090 not 190. You said 190.

MR. MURPHY: Oh, thank you. 1,090 just to make the record clear. I appreciate that. Is that correct, 1,090?

MR. DICKINSON: Yes, that's correct.

MR. MURPHY: Thank you. And of that -- I'm sorry. And then next question is are you also aware that the Northern Pass line on the U.S. side is approximately 192 miles in length?

MR. DICKINSON: Yes.

MR. MURPHY: And of that 192 miles, Northern Pass proposes to bury approximately 60 miles of that line.

MR. DICKINSON: Yes.

MR. MURPHY: And are you also aware that the New Hampshire siting evaluation committee denied Northern Pass's application for a siting and facility certificate last year?

MR. DICKINSON: Yes, I am.

MR. MURPHY: Now tab seven is the New York Connect project, and, Mr. Dickinson, you worked on that project, correct?

MR. DICKINSON: Yes.

MR. MURPHY: And am I correct to say that was a 244-mile HVDC line that was proposed to be buried?

MR. DICKINSON: Yes.

MR. MURPHY: Now in your application, is it also correct to say that you proposed to bury the HVDC line so that line losses would be reduced and aesthetics and health-based concerns eliminated?

MR. DICKINSON: I'm sorry, could you repeat the second part of that?

MR. MURPHY: Sure. In your application, is it correct to say that you stated one of the purposes to bury the HVDC line was to reduce line losses and eliminate the concerns regarding aesthetics and health?

MR. DES ROSIERS: I'll object to the question to the extent it refers to an application. I don't believe there's been a foundation laid that any application was filed with respect to that project, Connect New York.

MR. MURPHY: Okay. We're talking about tab seven. Do you recognize the application that you worked on?

MR. DICKINSON: Well, if I -- it would be helpful for me to remember exactly what the date of this is, but I believe this is from an RFI response from New York, you know, I think a number of years ago, but it was a response for ideas from New York about the different risks and challenges they saw associated with the development of a more vibrant energy infrastructure and --

MR. MURPHY: That's my understanding as well. So if you go three pages in on tab seven, and under the title The Connect New York Option, and if you go to the first paragraph, the last sentence, and that's what I was paraphrasing. "By burying an efficient underground DC volt transmission line, line losses will be reduced, aesthetics and health-based concerns eliminated."

MR. DICKINSON: Yeah, I think the line losses refer specifically to a DC project. The burying portion relates to concerns that we knew existed in the Hudson Valley region associated with aesthetic and health-based concerns. And there were already proposed above-ground AC transmission projects to alleviate -- this is essentially a project that's fundamental purpose was to alleviate the central east constraint in New York where there's a significant amount of congestion. We were -- we had this specific idea as a competitor to other ideas that we saw as being out there. Those other ideas were overhead projects. And by utilizing the thruway, we had a corridor that was pre-disturbed. Obviously that corridor would not have allowed for an overhead line to go right along the -- back and forth across the thruway, but a buried line through a portion of land that had already been disturbed by the thruway we believed was another alternative that the state would consider. Of course, as you probably know from looking at this, that in the end, the state decided not to consider this project within that context.

MR. MURPHY: Go to tab eight, and throughout my questioning --

MR. TANNENBAUM: Brian, I just want to follow up on that. So is your testimony that burying the underground DC line does not, in and of itself, reduce losses?

MR. DICKINSON: Yeah, I'd have to go to my -- the -- my engineering folks to tell me a little bit more about it, but the prime benefit of the losses comes, I believe, from the actual difference between DC and AC and the reduction in line losses.

MR. TANNENBAUM: Okay, thank you. Sorry.

MR. MURPHY: No problem. Go to tab eight, and throughout my questioning, again to make it easier on myself and you all, I've taken parts of your testimony. And if you need to refer to more than the parts that I've taken, you know, feel free to, but the first part are pages 15 through 17 of the panel's rebuttal testimony. And on page 15 at lines (sic) 18, you state that CMP has executed a finding memorandum of understanding, or MOU, with Western Mountains & Rivers Corporation. Do you see that?

MR. DICKINSON: Yes, I do.

MR. MURPHY: Okay. Turning to the next page, which is 16, on lines three through seven, you state the MOU commits CMP to an initial donation of $250,000. Is that correct?

MR. DICKINSON: Yes.

MR. MURPHY: And for your own purposes, on tab nine, I have attached the MOU. So if you need to reference the MOU, feel free to do that. You also state that there is an additional 250,000 -- or 50,000 over five years should be paid pursuant to the MOU. Isn't that correct?

MR. DICKINSON: That's correct.

MR. MURPHY: Now turning to page 17, lines one through three, you state that if the high-voltage DC line crosses the Kennebec Gorge underground, CMP agrees to contribute five to $10 million. Am I reading that correctly?

MR. DICKINSON: That's correct.

MR. MURPHY: And as we've already discussed, you've agreed to route the high-voltage DC line under Kennebec Gorge, right?

MR. DICKINSON: Correct.

MR. MURPHY: Now doing some math, given that you have agreed to route the transmission line under the Kennebec Gorge, in the event -- this is the words from the MOU if you need to check it -- in the event you attain all your permits, license, and approvals, then, under the MOU, you are committed to provide Western Mountains a total of, my read is, 5.5 to $10.5 million in payments. Does that sound correct?

MR. DICKINSON: That's correct. Obviously it doesn't include the other commitments that are in the MOU, but that's correct from a dollar perspective.

MR. MURPHY: Is it also correct that CMP has not executed any other similar MOUs or agreements like the one it executed with Western Mountains & Rivers?

MR. DICKINSON: That's correct.

MR. MURPHY: Now going back to tab four, which is the TDI presentation, we'll go to page four. And here there are a bunch of bullets, and part of my questions are about the bullets and also clarifications about the bullets, and I want to just make sure that the record's clear about what the presentation says and doesn't say. Now if we go to the presentation, the third bullet from the top indicates that the TDI line agreed to pay a minimum of $280 million over 40 years. Do you see that bullet? It's under community funding, second bullet, third bullet starts with "The agreement was filed."

MR. DICKINSON: I see that.

MR. MURPHY: Okay. And this is where I want to make sure the record's clear. I think we'll be on the same page but want to make sure. The next three bullets are not additive to the 283 million. Actually they describe what's in the 283 million. And I have the CLF agreements and other information, but is that your recollection as well? And take your time. I do think those are not in addition to, but -- or subcategories of the 283. And if you want to take it subject to check, I'm happy with that.

MR. DICKINSON: That's probably the better way to do it. I'll take that subject to check.

MR. MURPHY: So if, subject to check, you agree with me those are subcategories, one example is the bullet that's right underneath the third bullet, the fourth bullet. It starts 109 million. And one of these subcategories is the 109 million that would be contributed to a fund to provide renewable energy generation in Vermont. That's what your presentation says, correct?

MR. DICKINSON: Correct.

MR. MURPHY: Okay. Also on this page, the very last bullet, it explains that TDI agreed to $136 million payment to be used to reduce electric rates. That's what your presentation says, correct?

MR. DICKINSON: Correct.

MR. MURPHY: Just simple math, adding the 283 to the 136 million, I come up with total commitments for TDI in these agreements of $419 million. Does that math sound correct?

MR. DICKINSON: That sounds correct.

MR. MURPHY: Now going to tab 14, this is the Northern Pass bid, an excerpt from that. And you'll see under number three, need for New Hampshire to receive unique benefits for hosting the project, I'm just going to focus on two bullets. And the first bullet that I'll focus on is the second one entitled Forward New Hampshire Fund. Do you see that bullet?

MR. DICKINSON: Yes.

MR. MURPHY: And according to this bid, Northern Pass, through the Forward New Hampshire Fund, commits $200 million to fund New Hampshire priorities in the areas of community betterment, clean energy innovation, economic development, tourism, etc. Is that correct?

MR. DICKINSON: That's correct.

MR. MURPHY: Okay. And if you go two more bullets, Northern Pass also committed to a northern county job creation fund for $7.5 million.

MR. DICKINSON: Correct.

MR. MURPHY: That's what they're representing. So taking those two numbers together, I come up with approximate $207 million that Northern Pass has stated it's committed to New Hampshire.

MR. DICKINSON: Correct.

MR. MURPHY: Now I'd like to go to tab 15. And in tab 15, I have excerpts from three bids into 83D, the NECEC bid, the TDI bid, and the Northern Pass bid. And I'm just going to walk through. If you go three pages in, this is a CMP bid which commits $50 million to be paid over 40 years to Massachusetts low-income program if you're selected and awarded and receive all your approvals?

MR. DICKINSON: Correct.

MR. MURPHY: And if we continue two more pages, see that TDI, under what they're calling Section 13.3.2, commits to $20 million over 20 years.

MR. DICKINSON: Correct.

MR. MURPHY: And then if we go another two pages, Northern Pass -- I read this to state that Northern Pass is committing only to $10 million over 20 years for the low -- Massachusetts low-income program.

MR. DICKINSON: That's correct.

MR. MURPHY: Go to tab 16. Again, this is an excerpt from the panel's rebuttal testimony. On page nine at line 18 of the rebuttal testimony, you state that the Massachusetts EDC transmission service rates are fixed. Is that correct? Do you see that on line 18?

MR. DICKINSON: That's correct.

MR. MURPHY: Okay. And then later on page nine, you state at lines 19 through 20, that because the transmission service rates are fixed, that CMP bears the cost risk if ISO New England determines that additional system upgrades are required. Do you see that statement?

MR. STINNEFORD: Yes, that's correct.

MR. MURPHY: Thank you. Now turning to tab 17 which is CMP's response to NextEra data or information request 002-012. In this response, the second sentence, you repeat again that the transmission service agreement rates are fixed. Do you see that statement?

MR. STINNEFORD: Yes.

MR. MURPHY: Okay. Then in the next sentence, you state that in developing the TSA fixed rates, CMP made certain assumptions regarding required system upgrades and the CCIS upgrades and their associated cost based on your studies. Do you see that statement?

MR. STINNEFORD: Yes.

MR. MURPHY: The next sentence indicates that you included a level of contingency in the TSA fixed rate to account for the potential that the final cost associated with the system and CCIS system upgrades are greater than that estimate. Do you see that statement?

MR. STINNEFORD: Yes, I do.

MR. MURPHY: Okay. Now let's go back to tab 16 and the last page on tab 16. This is, again, an excerpt from your rebuttal testimony. Now this is page 14 and I would direct you to lines 15 through 17 where it states that ISO New England is expected to complete additional -- the additional system impact study by August 2019 and the Section I.3.9 approval process by October of 2019. Do you see those statements?

MR. STINNEFORD: Yes.

MR. MURPHY: Now does it follow then that CMP will not know the certainty of whether the contingency we discussed with the TSA fixed rate will be sufficient for the additional ISO system upgrades until the October -- August -- I'm sorry, the August or October timeframe? Let me restate that. It was a little choppy. Does it follow that CMP will not know the certainty of whether the contingency you set aside for the additional ISO system upgrades, or the potential for those upgrades, in your fixed transmission service agreement will be meeted or exceeded until you have the results of the ISO's studies in the August or October timeframe of this year?

MR. STINNEFORD: I would agree with that, yes.

MR. MURPHY: Okay. So given that, is it fair to state that the current uncertainty associated with the contingency and whether it will be meeted or exceeded is one of the reasons, not all the reasons but one of the reasons, that CMP has not committed to additional agreements over and above that of the Maine Western Mountains MOU and similar to the agreements that we previously discussed for TDI and Northern Pass?

MR. DICKINSON: No, I wouldn't agree to that.

MR. MURPHY: Let's go to tab 19. This is page 18 from the panel's rebuttal testimony. At lines one through ten -- or, I'm sorry, at lines 10 through 11, the panel states, "It is not clear who will purchase any of the hydroelectric generation that is transported under this TSA." Am I correct that the TSA referred to here is the 110-megawatt TSA between CMP and HQUS?

MR. STINNEFORD: Yes.

MR. MURPHY: Okay. Now turning to tab 20, this is an excerpt from the HQUS bid into the Connecticut Zero Carbon RFP. It's the title page. And then if you turn to the second page, you see that in the bullets this is a bid between Hydro-Quebec U.S. and Green -- Vermont Green Mountain and not NEC. Am I reading this correctly?

MR. DICKINSON: That's correct.

MR. MURPHY: Now are you familiar that HQUS did not put any bid into the Connecticut Zero Carbon RFP that included the 110 megawatts TSA and NECEC?

MR. DICKINSON: That's my understanding.

MR. MURPHY: Is it also your understanding that Hydro-Quebec didn't place any bid, whether it was the Vermont Green Mountain line or the NECEC line, into the 2018 Rhode Island RFP for long-term renewable energy contracts?

MR. DICKINSON: Yeah, to my understanding, I agree.

MR. MURPHY: Okay. Thank you. Those are all my questions.

MR. TANNENBAUM: I'm a little shocked. Okay, let's move to the generator interveners.

MR. SHOPE: Good morning. Mr. Dickinson, I understand that you gave some rebuttal testimony in this case relating to the subject of diversion. Do you recall that?

MR. DICKINSON: I just had a little hard time hearing you.

MR. SHOPE: Oh, sure. Okay. Obviously you are one of the CMP executives who gave rebuttal testimony, correct?

MR. DICKINSON: Yes.

MR. SHOPE: Okay. And part of the rebuttal that was sort of under your domain of the three of you was the issue of addressing Mr. Speyer's testimony about Hydro-Quebec's possibly diverting exports from other adjoining control areas from New England. Do you recall that?

MR. DICKINSON: I would describe my testimony as demonstrating that, compared to an historical baseline, the energy that would be delivered on this NECEC would be incremental to the northeast.

MR. SHOPE: Okay, and -- but the -- was the reason it was rebuttal testimony was that it was rebutting the arguments that had been made with regard to diversion?

MR. DICKINSON: Yeah, I guess I don't -- the word diversion, I mean, there was the subject about whether this was incremental or not, and that was the focus of the testimony.

MR. SHOPE: Okay. Now, and with regard to the way you came about the incremental analysis, just sort of round numbers, you had -- you based -- your conclusion was that by 2023, Hydro-Quebec would have approximately 40 terawatt hours available for export and you compared that to a historical baseline that you had derived of 30.5 and you added the 9.54 (sic) terawatt hours for NECEC, and that essentially indicated that, in your view, everything under -- that was going to be supplied across NECEC to the Massachusetts utilities would be, in your way of viewing things, incremental?

MR. DICKINSON: I would describe basically what I did was to look at a historical five-year baseline which worked out to be 30.5 terawatt hours and assume that they would continue to commit to delivering that 30.5 and then looked at whether an incremental 9.45 terawatt hours could then be delivered and still, over the 20-year period, result in no impacts and have that availability.

MR. SHOPE: Okay, and you concluded that Hydro-Quebec, in fact, did have 40 terawatt hours available for export. And so if you added the 30.5 to the roughly 9.5 for NECEC, that equaled the 40?

MR. DICKINSON: So, yeah, I concluded that if you take the storage that was demonstrated in capacity at the end of 2017, the existing capability they had in 2017, added the Romaine 4 unit that was in 2020 coming online, and 500 megawatts of additional capacity in 2025 and you assume all those pieces, that you -- by delivering 40 terawatt hours, they had that capability to still serve the energy that they had.

MR. SHOPE: Okay. And when you said you included the storage, that was based, in part, on your measuring the storage as of the end of the year, correct?

MR. DICKINSON: Correct, at the end of 2017.

MR. SHOPE: Yeah, okay. And have you made any adjustment for the -- well, and is it your view that it's proper to measure the available storage as of the end of the year as opposed to when it's still winter in -- up in Quebec?

MR. DICKINSON: Well, it's the -- I had to rely on just publicly-available data. That was the only piece of data that I had associated with storage, and my view was, by comparing year over year each year's storage at the same point in time, it gave you a general sense of the increasing storage of water that was building up in the HQ system.

MR. SHOPE: Okay. But so you're saying you looked for data that would show what the available storage was -- well, let me put it this way. The storage that's available on December 31 is not the maximum date of storage in the Hydro-Quebec system, right?

MR. DICKINSON: Yeah. I didn't have any other information to demonstrate whether it was high or low.

MR. SHOPE: Okay. Well, just based on your general knowledge of being in the industry, it's the case that with hydroelectric systems, or at least in the case of Quebec given its climate, that it has peak load in the winter, it has to supply a lot of electricity to heat people's houses, but at the same time, the snow and the ice are not melting to fill the reservoir, right?

MR. DICKINSON: No, that makes sense.

MR. SHOPE: Yeah. So during the winter months, in fact, Hydro-Quebec is drawing down on its reservoirs in order to supply electricity for heating.

MR. DICKINSON: I'm not a hydro expert, but that makes sense.

MR. SHOPE: Okay. So - and the fresh water doesn't come in to refill the reservoir until the late spring and summer, right?

MR. DICKINSON: That would make sense.

MR. SHOPE: Okay. So that would suggest, therefore, that the low point in the reservoir typically would be at the end of the winter, beginning of the summer.

MR. DICKINSON: Yeah, I can see how that would be the case.

MR. SHOPE: And so for purposes of reserves and calculating reserves and how much was available, you would want to look at that low point, right?

MR. STINNEFORD: I would just comment that, based on my own experience with reservoir management at CMP, it's a cyclical process. You would expect reservoirs to be relatively full, as you say, going into the winter period, but then when the spring melt hits those reservoirs, they do refill and you get another high in storage following the spring melt.

MR. SHOPE: Sure. But for purposes of the utility maintaining its reserves, it has to figure out how much it's going to have at the low point, right?

MR. DICKINSON: Yeah, again, my understanding from everything I've learned on Hydro-Quebec by researching the publicly-available information, that 98 terawatt hours was their guideline for that minimum level of storage.

MR. SHOPE: Okay. And you just weren't able to -- did you look for data at what the storage was at the -- you know, in late spring, beginning of summer?

MR. DICKINSON: That's correct.

MR. SHOPE: You looked for it, but you weren't able to find it?

MR. DICKINSON: Yeah, I looked for it and wasn't able to find it.

MR. SHOPE: Okay. But if you had found it and it showed lower numbers, that would then mean you would have to adjust the amount that was in storage, right?

MR. DICKINSON: Yeah, I mean, I think if I had perfect information and saw the shape overall here, that might be something you'd look at for a specific purpose. Here, what I'm trying to demonstrate is what is the general amount of storage that's available in capacity. And by measuring it on the same day every year, you -- you know, looking back over the last five years, you can clearly see that the level of water in storage is increasing.

MR. SHOPE: Okay. But in any event, if we were to actually look at the storage on -- at the low point year to year to year, that would mean there would be a reduction in the amount that would be available.

MR. DICKINSON: Yeah, I mean, I don't know what that information is so I don't have it.

MR. SHOPE: Now, as part of your calculations, you also had to factor in the amount of electricity that Quebec was going to consume for its own native load, right?

MR. DICKINSON: That's correct.

MR. SHOPE: Okay. And so maybe if we could distribute what's already been previously marked as NRCM 002-21. So I've marked -- and actually -- so -- and so the -- what's already -- what's just been distributed and is marked already as NRCM 002-021, this is the backup for your modeling of the domestic load growth up in Quebec, right?

MR. DICKINSON: That's correct.

MR. SHOPE: Okay. So if we look at the model here, it looks like you -- your input is you're assuming Hydro-Quebec domestic load of 182.8 terawatts in 2018, and if we just take -- go to 2026, that grows to 189 in your modeling assumptions. Is that correct?

MR. DICKINSON: Could you just repeat those numbers and years again?

MR. SHOPE: Sure. So it's -- in 2018, which is the first of the years in your backup, it's 182.8 terawatts, and that's to the right of the column roughly in the middle there called HQ Domestic Load.

MR. DICKINSON: Correct.

MR. SHOPE: Okay. And then that grows in 2026 up to 289.

MR. DICKINSON: Correct.

MR. SHOPE: Okay. And you drew these figures, as I understand it, from the 2017/2026 Electric Supply Plan that was issued by Hydro-Quebec on November 1st of 2016. Is that correct?

MR. DICKINSON: That's correct.

MR. SHOPE: Okay, and that's -- so we've circulated that. And then if you look on the second page, that -- we see those very same numbers on the -- in the column Needs Identified by the Plan.

MR. DICKINSON: Correct.

MR. SHOPE: Okay. Yeah, and the document, the 2017 to 2026 Electric Supply Plan we'd like to have marked as GINT

26. Okay, now -- and how did you find out about the 2017 to 2026 Electricity Supply Plan?

MR. DICKINSON: I think in my conversations with Hydro-Quebec and me searching for documents that were publicly available that related to load growth, they pointed this out to me.

MR. SHOPE: Okay. Now did you make any inquiry as to whether or not the plan that had been issued on November 1st of 2016 had been updated as of the time that you were preparing your rebuttal testimony?

MR. DICKINSON: I don't remember.

MR. SHOPE: You don't remember whether you did that or not?

MR. DICKINSON: I believe that my conclusion was this was a good source of information for the basis of the model.

MR. SHOPE: Okay. But you don't know whether you inquired as to whether it was the most current information?

MR. DICKINSON: It would make sense to me that that conversation happened. I just don't remember it specifically.

MR. SHOPE: And presumably, if you had more current information from Hydro-Quebec available, you would have wanted to use it, right?

MR. DICKINSON: I think I would have considered -- I considered every piece of information that I looked at in putting together this model.

MR. SHOPE: Well, I mean, if Hydro-Quebec had issued an update of the information and that was available, you would presumably wanted to have used it for your analysis, right?

MR. DICKINSON: I think if I had a different report, I would read the report, I'd understand what that report was telling me and make sure it made sense within the context of the analysis I was doing.

MR. SHOPE: All right. I'd like to distribute the next document, please.

MR. TANNENBAUM: John, was the prior document generator interveners six?

MR. SHOPE: Twenty-six.

MR. TANNENBAUM: Oh, 26.

MR. SHOPE: And I'll just note for the record, these are certified translations of excerpts from documents that were originally published in French. And actually, with respect to GINT 16, which was the plan on November 1, 2016, did you read it in the French, Mr. Dickinson?

MR. DICKINSON: I do not speak French.

MR. SHOPE: Did you have somebody translate it for you?

MR. DICKINSON: I think for the relevant pieces where I needed to understand what was being said, my memory is I did make sure that I was understanding things correctly.

MR. SHOPE: Is that Google translate?

MR. DICKINSON: I think I was also was speaking to a number of people that were bilingual.

MR. SHOPE: Okay. All right. So you now have before you the 2017 progress report of the 2017 to 2026 Electricity Supply Plan issued on October 31, 2017. Do you see that?

MR. DICKINSON: Yes.

MR. SHOPE: Okay. So this is a progress report on the plan that you actually had used, right?

MR. DICKINSON: That's what it appears to be, yes.

MR. SHOPE: Yeah. And it was issued I guess about nine months before your testimony -- before your rebuttal testimony.

MR. DICKINSON: That looks correct.

MR. SHOPE: Yeah, okay. Now if we look at the page which is a few pages in but it's marked on the bottom -- because it's an excerpt, it says in the lower right corner page 8 of 47. Do you see that?

MR. DICKINSON: Yes.

MR. SHOPE: Okay. And this also has load growth being illustrated, and if you see about three-quarters of the way down there's a -- that Needs Per Plan column that we talked about.

MR. DICKINSON: Yes, I see that.

MR. SHOPE: Okay. And this one shows that the needs per plan grow from -- in 2018 from 182.1 terawatt hours in 2018 to, in 2026, 191.6. Do you see that?

MR. DICKINSON: I see that, yes.

MR. SHOPE: Okay. So that's a load growth of 9.5 terawatt hours in that period, correct?

MR. DICKINSON: Between 2018 and 2026?

MR. SHOPE: Yes.

MR. DICKINSON: Yes.

MR. SHOPE: Okay. But the load growth that you had assumed using the plan from the prior year, November 1 of 2016, that was projecting a load growth for the same period of only 6.2 terawatt hours, correct?

MR. DICKINSON: That's correct, the difference between the 0.4 percent load growth that I assumed and the 0.5 percent load growth that was in this analysis.

MR. SHOPE: So that's a -- so the difference between those two as of 2026 would be 3.2 terawatt hours of additional consumption being projected by Hydro-Quebec domestically.

MR. DICKINSON: Could you repeat that again?

MR. SHOPE: Sure. In other words, the difference in the load growth projection as of 2026 is 3.3 terawatt hours, right?

MR. DICKINSON: So in 2026, the delta between my analysis and what would be here would be the difference between 191.6 and 189. So essentially 2.6 terawatt hours, but if you accumulate that over that period of time, I think that number sounds right.

MR. SHOPE: So -- well, just so I'm clear -- but the updated plan had a slightly lower starting point, right?

MR. DICKINSON: That's right, yeah. The 2018 number was 182.1 versus 182.8.

MR. SHOPE: So the -- but we're talking about at least two or three -- depending on which way you slice it, it's -- we're talking about two or three or more terawatt hours of difference of load growth being projected as between the 2017 plan and the 2016 plan.

MR. DICKINSON: That's correct.

MR. SHOPE: Yeah, okay. And so in relation to NECEC, that would wipe out about a third of the NECEC terawatt hours, right?

MR. DICKINSON: Explain that to me?

MR. SHOPE: So in the NECEC terawatt hours are 9.5 terawatt hours per year over a number of years, right?

MR. DICKINSON: 9.4 terawatt hours per year, yeah.

MR. SHOPE: Yeah. And your analysis, based on, among other things, the domestic load growth projections in Quebec found that all 9.45 terawatt hours for NECEC would be, in your words, incremental.

MR. DICKINSON: Correct.

MR. SHOPE: Yeah, okay. But if we say that Quebec needs somewhere, you know, two and a half, three and a half more terawatt hours domestically than you projected because you used the older projection, that means that there's that much less available for NECEC, right?

MR. DICKINSON: Well, so if we put into the model a higher level of load forecast, what would happen -- if you go to the HQ Energy Available in Storage, the graph that shows the minimum level of storage and then the maximum level of storage, what I show is that by 2020, you hit the maximum level of storage where actually spilling of energy is going to be required. We obviously know now that that spilling is occurring earlier than I had projected. So by increasing the load, you're going to reduce the amount of spilling, but I -- my guess would be that if you actually solved this for that higher level, you would end up with a very similar case.

MR. SHOPE: I see. So basically, using the more current load growth projection actually reduces what you perceive as a spillage problem.

MR. DICKINSON: It would -- from the forecast I have here, which was based at my understanding of the potential of spilling at that point in time, then the amount of spilling that I'm showing here would be reduced as a result of a higher load forecast, yes.

MR. SHOPE: Now -- and you're assuming -- part of -- or one of the drivers of your assumption of spilling is that you're using as the baseline the 30.5 terawatt hours which was the average of the five prior years of exports. Is that correct?

MR. DICKINSON: My assumption was that prior to NECEC and the purpose for my calculation of the baseline, again, going back to the dialogue that was happening at the time and some of the questions that we'd received from environmental NGOs, was that Hydro-Quebec was not going to be able to deliver on their historical level of exports. They were going to have to reduce those historical level of exports in order to meet NECEC's demands. So we wanted to, in good faith, demonstrate that -- whether that was true or not. And by holding those historical level of exports, we were able to demonstrate that Hydro-Quebec could keep their historical level of exports without -- and add NECEC without having to withdraw energy from other markets. They had enough incremental generation coming online and they had enough water in storage.

MR. SHOPE: We went through, at the technical conference, a lot of the storage issues, and so I don't want to revisit all of that since that's, you know, in the record and obviously the Commissioners will be able to consider the correctness or not of your analysis at that time. But you have raised spillage, and -- well, actually, let me back up. So as I understand your previous testimony, the NECEC project is going to be served entirely by existing facilities. Is that correct?

MR. DICKINSON: I think that's the --

MR. STINNEFORD: Yeah, it's existing generation or additions to that existing generation is, I believe, how it's worded.

MR. SHOPE: Okay, but I'm looking at -- so my understanding is that the power -- that no new facilities are being built in order to serve the Massachusetts utilities across NECEC. Is that your understanding?

MR. STINNEFORD: Yeah, the PPAs with the Massachusetts EDCs include a list of eligible specific resources which can provide energy under the PPAs, and deliveries -- production and deliveries will have to be tracked through a GIS-like mechanism to verify that. But that doesn't mean that other capacity additions that are made on the HQ system won't occur or won't increase their capability to produce exports.

MR. SHOPE: So, well, let's just break that down. The power purchase agreements that the Massachusetts utilities have made with Hydro-Quebec specify that the power that will be provided across NECEC to the Massachusetts utilities will come from a specified group of plants, all of which are now existing. Is that true or isn't it?

MR. STINNEFORD: I believe that's true, but, you know, that would also include upgrades to the capacities of those existing resources as well.

MR. SHOPE: Okay, so Hydro-Quebec may have to spend additional funds to upgrade its facilities in order to serve the Massachusetts contracts.

MR. STINNEFORD: That's not what I said.

MR. SHOPE: Okay, so explain to me what the difference is between saying it's going to be served by an upgrade facility or it isn't going to be served by an upgraded facility.

MR. STINNEFORD: Hydro-Quebec has a portfolio of generating resources. They have identified in the PPAs a set of those resources that are eligible to provide deliveries under the PPAs. That includes both the existing capacity of those resources as well as any expansions to those resources' capacity in the future. In addition to that, Hydro-Quebec may add additional resources to its portfolio of generating resources that would expand its ability to produce energy and produce exports.

MR. SHOPE: Okay. Now, so as I understand your -- well, let me ask you this, Mr. Dickinson, since you raised the point of spillage. Is it your position that Hydro-Quebec is going to be building additional upgrades?

MR. DICKINSON: Yeah, there's Romaine 4 that'll be added in 2020, 245 megawatts, and then a variety of efficiency improvements that increase generation capacity without increasing reservoir sizes that they've estimated at about 500 megawatts for 2025.

MR. SHOPE: So these efficiency upgrades, can you just briefly, for the record, just explain what kind --

MR. DICKINSON: My understanding is it's --

MR. SHOPE: -- practical matter what kind of stuff is that, you know, and --

MR. DICKINSON: My understanding is that the reservoir sizes won't change, but they're improving the turbine technologies to be able to extract more power from the water that's flowing through the dam.

MR. SHOPE: Okay. And are those upgrades the kind -- do they have the lead times that the big dams have?

MR. DICKINSON: I would -- I don't have knowledge of it, but it makes sense to me that that lead time would be less because the -- one of the challenges in siting, I would assume, would be the reservoir impact. And if you're not impacting the reservoirs, I would assume the siting would be simpler.

MR. SHOPE: Okay. In other words, they have an existing dam, they're just going to have to shut down one of the turbines, either remove it and replace it or in some way gussy it up, if you will, and then set it spinning again?

MR. DICKINSON: Yeah, I mean, I don't know all the steps that go into planning, certifying, approvals, construction, and engineering, but in a general sense, yes.

MR. STINNEFORD: I would say, you know, typically those types of upgrades are trying to coordinate during regularly-scheduled maintenance periods so there'd be no lost generation.

MR. SHOPE: Okay, so now as I understand it, your understanding is that right now, Hydro-Quebec is spilling water because it has insufficient export transmission capability. Is that correct?

MR. DICKINSON: Well, I would describe it a little bit different. They clearly have stated that, with this transmission line, they would be able to avoid, in 2018, an amount of spilled energy equivalent to the NECEC line. But the inability for them to deliver energy has -- is a combination in certain markets to transmission capability, as it is in New England, but then to the larger market, it's also their inability to make sales at a margin above zero. Otherwise, they would be -- putting water through the turbines that would result in a sale that's a loss. And so instead of doing that, they're spilling water.

MR. SHOPE: Okay. But in other words, at least, in part in your view, Hydro-Quebec is spilling water even though it has enough generation capacity, but it can't get the electricity that it could generate to market in the United States.

MR. DICKINSON: Well, it can't get it to market in a profitable sale throughout the northeast.

MR. SHOPE: Yeah, okay. Now if Hydro-Quebec can't get the power to market because it has insufficient export transmission capability and, as a result, it's spilling water, why would it build more generation?

MR. DICKINSON: Well, again, the -- your question -- I just want to make sure that the question is stated correct so I'm not confusing the record. The -- my point is not that it doesn't -- there isn't transmission capability to certain markets. I think yesterday we talked about we do think there is transmission capability to certain markets, not to New England. But the challenge is that the cost for them to get that power to other markets and make an energy sale would result in a loss. So, again, just to make sure your question is right, it's not there isn't transmission capability. It's that they can't make those sales at a loss. So they're faced with a decision: do we run this water through the turbine and sell it at a loss or let the water spill over and have that. So the --

MR. SHOPE: Okay, let me just back up and focus on my question which is, okay, if right now their two choices are, in your hypothesis, either sell the water at what you call a loss -- sell the energy at what you call a loss through some export transmission arrangement or spill the water, and those are the choices that they have, why would they build more generation? More generation doesn't solve the problem of getting the energy to market in the United States, does it?

MR. STINNEFORD: I think the decisions to add capacity, generating capacity, are long lead time decisions. Hydro-Quebec obviously made some of these decisions years ago, and they have been attempting for over a decade to build a new interconnection to accommodate additional exports. So the delays that have been -- have resulted in getting those additional transmission facilities built have resulted, to some extent, in the spillage.

MR. SHOPE: So as I understand it, your view is that Hydro-Quebec began building Romaine 3 and planned for Romaine 4 in the expectation that at least some of the energy was going to be used for export to the United States.

MR. DICKINSON: Yeah, I think -- that's correct.

MR. SHOPE: Okay. And -- but -- and when they did that, they had to hope that the necessary transmission was going to be built on the U.S. side of the border.

MR. STINNEFORD: Yeah, I wouldn't --

MR. SHOPE: Could you -- do you agree with that?

MR. STINNEFORD: I'm not sure I would agree with Thorn's agreement earlier. It's not necessarily exports to the U.S. but exports in aggregate to cost-effective markets. Clearly they would like that to be the U.S. That is the highest-priced market to which they can export, but --

MR. SHOPE: Okay, so your view is --

MR. TANNENBAUM: John, excuse me, Commissioner Williamson has a follow up.

MR. SHOPE: Sure.

MR. WILLIAMSON: Excuse me, I'd like to ask a question of the panel. To what extent could Hydro-Quebec be adding reservoir capacity and upgrading turbines in anticipation of expiration of the arrangement with Churchill Falls? I think that's 4,600 megawatts or something at Churchill Falls that expires in 2042.

MR. STINNEFORD: Yeah, I'm sure that's a consideration in their long-term planning.

MR. WILLIAMSON: Okay, the second thing is on spillage, to what extent might the addition of renewables, particularly wind and solar in Quebec -- I noticed in one of these reports it's mentioned that they're uncertain about the contribution, but it could be -- I think I saw one terawatt hour or a little bit more. To what extent could that spillage -- because there is -- be occurring because there is policy initiatives that are encouraging the development of wind and solar instead? In other words, they have to buy it as a prevential statement.

MR. DICKINSON: That's right.

MR. WILLIAMSON: -- they don't need the water.

MR. DICKINSON: That's right, that's right. The -- any generation added or any existing generation within the control area of Quebec, whether it's some that's been added over the last few years or new generation that would be added, would only make the situation of additional spilling a larger challenge.

MR. WILLIAMSON: Thank you.

MR. SHOPE: So -- oh.

MR. WILLIAMSON: Go ahead.

MR. SHOPE: Oh, sure.

MR. WILLIAMSON: Thank you.

MR. SHOPE: Thank you. So -- but just getting back to my question -- and this is speaking to you, Mr. Dickinson, because you are the one who prepared the rebuttal testimony on this point. My recollection of your rebuttal testimony is that you testified that Hydro-Quebec had been building in anticipation of export to the northeastern United States, at least in part. Are you withdrawing that testimony?

MR. DICKINSON: Yeah, I do. I think Eric's refinement of my answer is a better one, which is obviously they're looking at every market, and the northeast is obviously one of the important ones that's there.

MR. SHOPE: Okay, so your view is that Hydro-Quebec began planning for, permitting, and building Romaine 3 and 4 in anticipation of export to northeastern United States, New Brunswick, Ontario, potential PJM even, Midwest ISO, all of these markets.

MR. DICKINSON: So, yeah, I mean, if you look at the historical data around their construction and look at their public statements that they've made as far back as 2003, they've added 5,000 megawatts. One of the key aspects of that they discussed in doing that was building a new clean energy for a future that valued that clean energy.

MR. SHOPE: Okay, so --

MR. DICKINSON: And then if you move forward, even since 2014 when Romaine 2, Romaine 1, Romaine 3 came -- or -- came online, they've, since 2014, added 1,304 megawatts of capacity.

MR. SHOPE: Now in planning these dams, they have to determine how big the dams will be, right?

MR. DICKINSON: Yes.

MR. SHOPE: Okay. And the size of the reservoir is actually -- can be controversial. Is that -- up in Canada as far as --

MR. DICKINSON: Yeah, my understanding that the reservoir and the impacts of that are an important part of their permitting.

MR. SHOPE: Yeah. And so in determining the sizing of these dams to the extent Hydro-Quebec was considering export markets, it would size the dam bigger to the extent that it was hoping to export as opposed to simply sizing it for Quebec native load.

MR. DICKINSON: Yeah, I think their decisions on the size of the generation will be based on a forward-looking strategic view of all the different reasons why they might build hydro.

MR. SHOPE: Okay. Now -- and so just to be clear, it's your understanding that they sized the dams bigger in order to serve the export market as well as the native load based on the hope or the expectation or the speculation that sufficient transmission would be built to get that power to the external markets.

MR. DICKINSON: I think the export sales has been a consistent, important strategic initiative for them and would have been considered in the size of the generation.

MR. SHOPE: Yeah. And for them to -- but in light of the fact that export transmission would be needed, they had, to some degree, speculate that that export transmission would be built. Is that true?

MR. DICKINSON: That's right. So they -- as an example, I think Northern Pass was originally being discussed in 2008. And they had to make a decision, if we're going to serve that, what kind of generation might we want to build in order to make sure, going back even further before that. And so when you consider the -- as Eric said, the expectation that some of that transmission might get built and when it would be built, they wanted to make sure there was generation available to serve it.

MR. SHOPE: Now, with regard to spilling, I think you said earlier that Hydro-Quebec right now is spilling the amount of energy that would be -- it's spilling the amount of energy at least that would be provided across NECEC due to the fact that it doesn't have insufficient -- it doesn't have sufficient export transmission. Did I hear that right?

MR. DICKINSON: Well, just to be clear, what -- I never said what their total amount of energy they're spilling. I understand that on a normal operation of a hydro portfolio, you're always going to have spilling of water for operational, local agreements, water levels. So what I'm talking -- so imagine that as a base level that exists over the last 20 years of normal spilling from an operations perspective. What I'm talking about is the spilling that began in 2017 and accelerated in 2018 related to -- not to operational issues, but specifically to their inability to get the power out of Quebec on an economic basis to make export sales.

MR. SHOPE: Okay, and is your information on that the letter of December 14, 2018 from Simon Bergervin at Hydro-Quebec to you?

MR. DICKINSON: Well, so there's that piece of information. There's conversations that we had with the Portland Press Herald, with members of Hydro-Quebec. Hydro-Quebec also met with the Boston Globe. They also -- based on the CEO's comments that he's made related to his public announcements associated with the spilling of this economic -- the water that can't get out of Quebec as a result of economic ability. But yes, the 10.4 terawatt hours of water that was spilled year to date is about equivalent to water that could have been run through the turbines and delivered on this project if that project was in service now.

MR. SHOPE: Okay, so if we -- you mentioned the 10.4 terawatt hours. That's a reference to -- that's a figure that's referred in Mr. -- letter -- if we look at what's been marked as Kelly 004-001, Attachment 1, which was the letter of December 14, 2018 which was discussed yesterday as an exhibit -- do you have that?

MR. DICKINSON: Yes.

MR. SHOPE: Okay. And so if we go down under the -- towards the bottom of the page, it's the paragraph that's one up from the last paragraph, and it says, "In this category to date, in 2018 Hydro-Quebec has spilled approximately 10.4 terawatt hours' worth of energy," right?

MR. DICKINSON: That's correct.

MR. SHOPE: Okay. And that would include the -- as far as we know from this letter, that would include the ordinary spillage that you were describing earlier, right?

MR. DICKINSON: No, no, absolutely not.

MR. SHOPE: Well, it doesn't say that, does it?

MR. DICKINSON: Well, it says Hydro-Quebec spilled, due to a lack of economic transmission, 10.4 terawatt hours.

MR. SHOPE: No, I'm reading a sentence there and it says, "In this category to date," which is the previous category is water spilled, it says Hydro-Quebec has spilled approximately 10.4 hour -- terawatt hours' worth of energy. And then it says "Without additional transmission export capability, the quantity of spilled water in future years is expected to be comparable to the quantity of spilled water in 2018 under comparable market and operational conditions," right?

MR. DICKINSON: So "in this category" is referring to the category of water that was spilled due to economic transmission.

MR. SHOPE: But it doesn't say that, sir, does it? Where does it say that?

MR. STINNEFORD: That was the question that was posed and to which they are responding was how much was spilled due to a lack of economic transmission.

MR. SHOPE: So that's your -- but that's your inference.

MR. STINNEFORD: No, that was the question.

MR. SHOPE: No, the question -- okay, so the question is regarding the existing hydro facilities that will provide electricity for NEC (sic), have those dams spilled water instead of generating electricity due to a lack of economic transmission. If so, please provide the volume and then please provide the reasons for that spillage. So the question itself presumes that there will be multiple reasons other than economic transmission deficiency, right?

MR. DICKINSON: Well, the way Hydro-Quebec answered the question was interpreting that the volumes that we're looking for are for economic transmission. If they were to put in what the total amount of spillage is, I would guess that was probably closer to 15 terawatt hours of energy that actually was spilled.

MR. STINNEFORD: In fact, they have confirmed that in conversations that we've had with them.

MR. SHOPE: Okay, now these -- when you -- you said you brought people from Hydro-Quebec down to meet with the Portland Press Herald?

MR. DICKINSON: Well, I don't know if I brought them. We went together, yes.

MR. SHOPE: Okay. And did you ask any of those Hydro-Quebec representatives whether they would be willing to come and testify in these proceedings so we could ask these questions?

MR. DICKINSON: I did not ask that question.

MR. SHOPE: Nothing further.

MR. TANNENBAUM: John, the second document -- I'm sorry, the progress report document, is that --

MR. SHOPE: G 7, yes.

MR. TANNENBAUM: Okay. Next up is CLF.

MR. TURNER: Thanks, Mitch. At this time we don't have any questions.

MR. TANNENBAUM: Public Advocate?

MR. BRYANT: Good morning. So while -- I have some questions about an exhibit that's being distributed, but first, while Liz is doing that, can you tell us what the status is of ISO New England's system impact study for this project?

MR. WILLIAMSON: Can you speak into the mic?

MR. BRYANT: My question was what's the status of the ISO New England system impact study for this project?

MR. STINNEFORD: It is underway. It has begun.

MR. BRYANT: Is it still CMP's expectation that that project -- that that study will be completed next summer or early next fall?

MR. STINNEFORD: Yes, I would say this coming fall, yeah.

MR. BRYANT: Okay, thank you. So I distributed what has been marked as OPA Exhibit 4. It has been filed in CMS, and it's a letter from Mr. des Rosiers to Mr. Lanphear, and I've copied the first two pages. The remaining pages of this letter are not subject to my question and aren't pertinent to what I want to know. And the reason that I identified Mr.

Stinneford for questioning is that he's referenced in this letter beginning at the bottom of the first page and it's to the top of the second. So, Mr. Stinneford, are you familiar with this letter?

MR. STINNEFORD: Yes, I am.

MR. BRYANT: Did you review it before it was filed in CMS?

MR. STINNEFORD: I did.

MR. BRYANT: Did you help to draft it?

MR. STINNEFORD: I may have helped to edit it, yes.

MR. BRYANT: So in this letter, Mr. des Rosiers says --

MR. DES ROSIERS: The typos are mine.

MR. BRYANT: The typos belong to counsel, thank you. In the letter, counsel says that, quote, "CMP commits that the NECEC will be owned by an affiliated special-purpose entity rather than CMP should the Commission prefer this structure." And I would just ask you, Mr. Stinneford, if CMP commits to what its counsel has put forth in this letter.

MR. STINNEFORD: Yes, we do.

MR. BRYANT: On the second page of the letter in the large paragraph towards the top, it references that this change, this creation of the affiliate and the transfer of the project to the affiliate, will occur, quote, "before construction." Can you help me understand what CMP means by "before construction"?

MR. STINNEFORD: Well, it was our understanding that some of the concerns that had been expressed by the Public Advocate's office and by Commission staff related to the risks that this project would impose on CMP and its ratepayers were risks related to construction. So -- whether that's cost overruns, permitting, whatever. So we felt that to address those concerns, it would make sense to actually make the transfer occur prior to the commencement of construction.

MR. BRYANT: How would you identify the commencement of construction? The taking down of trees, the putting up of poles, or something in between?

MR. STINNEFORD: It would certainly be a point in time after all permits had been received. There is some procurement activity that's already underway so you can't tie it to procurement, but certainly clearing of corridors would constitute an early stage of construction, yes.

MR. BRYANT: The CPCN that's been filed here includes the HVDC line that's generated most of the questioning but also includes some upgrades to existing transmission -- CMP's existing transmission system. Does CMP propose to put all of the projects that are within this CPCN into an affiliate or only the HVDC line?

MR. STINNEFORD: Our thought on that would be it would be most efficient to put the HVDC line and converter station into the SPE, but the AC upgrades on CMP's existing system we would propose to keep within CMP. The SPE would still be financially responsible for all the costs associated with those upgrades, but ownership, I think if we started to parse ownership on a reconductored line, for example, gets very complex.

MR. BRYANT: Do you agree that in order to accomplish the transfer of the project to an affiliate that CMP would need to initiate a separate docket and to have the affiliate issues examined in that docket under pertinent statute and rule?

MR. STINNEFORD: Well, they certainly would need to be addressed in accordance with pertinent statute and rule. Whether that's done within this docket or a separate docket I think is to be determined.

MR. BRYANT: But either way, the affiliate would need to receive an approval from this Commission as an affiliate and potentially even as a T&D utility under Maine law. Is that correct?

MR. STINNEFORD: That's correct. As we've identified, there'd be a number of transfers and affiliate transactions that would need to occur, and those would require Commission approval.

MR. BRYANT: Thank you, that's all I have.

MR. TANNENBAUM: I think this might be a good time to take a break. So we'll come back in 15 minutes.

CONFERENCE RECESSED (January 9, 2019, 10:27 a.m.)

CONFERENCE RESUMED (January 9, 2019, 10:45 a.m.)

MR. TANNENBAUM: Okay, let's go back on the record. So the generator interveners have passed out a document, an ISO New England document, titled Interim Compensation Treatment.

MR. SHOPE: Yes.

MR. TANNENBAUM: And you would like to put that into the record as an exhibit?

MR. SHOPE: Yes, which I guess would be GINT 28 if so accepted.

MR. TANNENBAUM: Okay, any objection? Or do you want to think about it and -- I realize this is --

MR. DES ROSIERS: If I may respond after the lunch break because we -- I haven't looked at it at all. I mean, I assume it's -- because it's an ISO report, we'll have no objection, but since I haven't looked at it, I don't want to say that blindly.

MR. TANNENBAUM: Okay, fair enough.

MR. SHOPE: And in particular, just if it helps anybody, we're going to be focusing -- or the reason that we'd be introducing it would be slide 20 where ISO indicates that imports would not be eligible for compensation under the -- a fuel security program.

MR. TANNENBAUM: All right. We have -- we'll go back to the questioning of the witnesses. I think we do have some follow-up questions from the OPA so we'll do that now. So CMP's initial proposal in this case was to house the NECEC project within CMP?

MR. STINNEFORD: That's correct.

MR. TANNENBAUM: And in making that proposal or making that decision, can you -- and maybe this is a question for Thorn. Can you tell me who was involved at CMP in the discussions regarding this issue?

MR. DICKINSON: In my memory, I was involved. There was counsel, internal counsel, involved. Pierce Atwood was involved and other executives, including at the head of Avangrid Networks, I believe the president of CMP.

MR. TANNENBAUM: Okay, and their names? The names?

MR. DICKINSON: Sarah Burns, Bob Kump, Scott Mahoney, myself --

MR. TANNENBAUM: Eric, were you involved?

MR. STINNEFORD: No, not directly in those discussions. I was on temporary leave at that point in time.

MR. TANNENBAUM: Okay. Bernardo, were you involved in those discussions?

MR. ESCUDERO: I do not recall. I mean -- no, I do not recall.

MR. TANNENBAUM: Okay. You want to clarify (indiscernible)?

MS. HUNTINGTON: Well, I'm going to ask some questions about documents that were provided as an attachment to an October 9th, 2018 filing by CMP. And it -- I'm not sure that the witnesses need to have the documents in front of them, but I'll look to Jared and Sarah to see whether you would like them to. It's the -- just so you know what I'm referring to, it's the redacted versions of the emails and the privileged document.

MR. TANNENBAUM: I think it's just -- what you want to do is confirm from those documents who were involved the discussions. So just --

MS. HUNTINGTON: Okay, so I'm looking at the emails and the persons that were included on the emails, and I see consistently that Mr. Dickinson and Mr. Escudero were on the emails. Does that refresh your recollection?

MR. ESCUDERO: Yeah, I'm sure I was -- well, I'm not sure, but I believe it's possible that I was copied in emails and probably copied on those meeting invites. What I don't recall is attending those meeting invites -- I mean those meetings, sorry.

MS. HUNTINGTON: Do you recall, Thorn, being involved in the emails and attending meetings on this topic?

MR. DICKINSON: Yeah, definitely. I mean -- and this is something we've talked about in prior testimony. We had, at this period of time, a great deal of things going on at the same time. So my memory is similar to Bernardo's. I do not remember him being in those discussions so --

MS. HUNTINGTON: There's a Mr. Coon referenced on some of the emails. Could you tell us who he is and what his responsibility is at either CMP or Avangrid?

MR. STINNEFORD: He is treasurer for Avangrid Networks.

MS. HUNTINGTON: Okay. And there's a Cathy McCarthy, Urban Blake (sic), and Anne O'Hanlon included on several of the emails. Could you tell us who those folks are?

MR. STINNEFORD: Ms. McCarthy and Mr. Blake are attorneys at Bracewell, our Washington FERC counsel. Anne O'Hanlon is the administrative assistant to Mr. des Rosiers.

MS. HUNTINGTON: And there's Paul Dumais referenced on several of the emails and apparently involved in drafting or providing comment on the document. Who was Mr. Dumais and what was his position and his area of expertise?

MR. STINNEFORD: Mr. Dumais was director of regulatory with an emphasis on transmission-related issues at the time that this was drafted. He's since retired.

MS. HUNTINGTON: Was his -- was it transmission ratemaking issues or transmission development issues or both?

MR. STINNEFORD: Primarily ratemaking issues.

MS. HUNTINGTON: Okay. And who was -- who is Jeffrey Seabrick (phonetic)?

MR. STINNEFORD: Jeffrey Seabrick is an analyst who works for Paul Dumais -- or did work for Paul Dumais at the time.

MR. TANNENBAUM: So Thorn, we -- well, we'll take a step back. Eric did answer questions during a tech conference and in a data request regarding the reasons why CMP chose to propose to put the project in CMP as opposed to an affiliate. Can you tell me what your understanding of the reasons why that decision was made?

MR. DICKINSON: Yeah, I think they were similar to Eric's perspective. You know, I think that in our view the project could be managed within CMP. We could manage it within a place that didn't provide adverse risks. The costs of the project would be separated out and made separate. So, you know, we didn't see -- at least my own perspective, I didn't see any benefits associated with creating a separate SPE.

MR. TANNENBAUM: Were there any other criteria or issues discussed other than the ones raised by Mr. Stinneford?

MR. DICKINSON: I mean, I think --

MR. DES ROSIERS: If I may, just positing that the content of the discussions that occurred in the presence of counsel, both from Pierce Atwood and from Bracewell, you can identify the topics, but at this point, don't disclose any of the discussion because, as we have previously objected and as has been found, the contents of the communication, there is a privilege here, and I'm -- but I just want to walk the fine line through the discussion.

MR. TANNENBAUM: I'm not asking about what -- questions about the document. I'm asking Thorn what CMP's reasons were for proposing that it be put into a -- or stay into CMP. And so far, the response from Eric is that you had expertise within CMP --

MS. HUNTINGTON: And they own the land.

MR. TANNENBAUM: And that you own the land. Is there anything else?

MR. DICKINSON: So the -- I think the other filter that I was always looking at throughout this whole bid was preventing -- presenting a project that was as competitive as it could be, and that includes not only price and cost and our ability to manage the project, to own the right-of-way, but also our ability to execute and follow through. And I think the -- another factor would be that having it at CMP was a simpler approval process. We wouldn't have to have this other step associated with creating an SPE. So I think that's the -- that topic would be an additional one that would have played --

MR. TANNENBAUM: In the approval process here or in Massachusetts?

MR. DICKINSON: Well, I think just even structurally within our own organization. You know, the approval process here. I think we're always concerned, you know, that we knew that there were projects that had been ongoing for eight, nine years that were well staffed and ready to pick up anything that we did in our bid. So we tried to minimize any uncertainty and risk that was in our project that somebody could pick apart.

MR. TANNENBAUM: Was there a consideration that Massachusetts may look at the bid more favorably if it was housed in CMP as opposed to an affiliate?

MR. DICKINSON: I don't think from a -- you know, if they were comparing two bids, one that had it as a separate SPE and one at CMP and those existed, I don't think they would see any difference associated with that. But I think that any additional approval, requirement, regulatory process that might have to exist, I could imagine might be looked at as another risk.

MR. TANNENBAUM: Were there any ratemaking considerations?

MR. DICKINSON: I don't believe that we saw any differences between ratemaking between the two structures. They would have -- my memory is they would have been identical.

MR. TANNENBAUM: Bernardo, are you aware of any of the reasons why CMP chose to house this in CMP?

MR. ESCUDERO: No, I am not.

MR. STINNEFORD: If I could, Mitch, I mean, my testimony will speak for itself, but I believe I did raise a number of other issues, other than the two that you've noted, in my testimony.

MR. TANNENBAUM: Okay. Now --

MS. HUNTINGTON: Can I follow up with a ratemaking question? Were there -- was there consideration of the treatment of the property that was acquired for this project with respect to the period of time between when the property was purchased and when it was transferred to what we're referring to as the NECEC tariff within CMP or the ratemaking treatment of the property if the project didn't succeed in the Massachusetts RFP? Was that a consideration?

MR. DICKINSON: You know, I don't think that was a consideration associated with the decision. You know, I think that, you know, obviously we've had a lot of discussions around this up until this point. My view, from the guidance I got from external counsel, was that those right-of-ways did -- were applicable to be recovered in rate base and -- or to return on. So at that point when I made that decision, I wouldn't -- I would have thought that if there was an SPE, that they would have been transferred or some mechanism would have been in place at that point to pull them out of rate base. So it wouldn't have played into the decision in my mind.

MS. HUNTINGTON: But what -- I was focusing on the period between when the property was purchased and the point in time it was transferred to an SPE. Was that -- or in the event the project didn't go forward. Was that not a consideration, that in those periods of time and under those circumstances, the land would remain in CMP rate base and be recovered by -- through CMP ratepayers or through the regional tariff?

MR. DICKINSON: My understanding based on the guidance I had from legal counsel was that we would be able to continue to earn a return on those right-of-ways up until the time that it would be -- become part of a project later on. And maybe just a little bit more on that. My understanding of the FERC guidelines on that was if there was some opportunity for a useful opportunity related to that right-of-way to the future, then that's something that has that opportunity to return, and that's what my understanding was based on.

MR. TANNENBAUM: So would it be correct that ratepayers will continue to pay for that land until it's transferred to a special-purpose entity?

MR. DICKINSON: Well, that was my understanding at that time. That's what I'm referencing in the decision. So as a -- because that was my understanding, in my mind it didn't matter. The property wouldn't matter as it related to transferring it to an SPE because you would transfer it from a period of time when you're earning a return to a period of time when it has a cash flow associated with a transmission service agreement. Again, that was my understanding at that time.

MR. STINNEFORD: And I would just say, prospectively, if the project does not go forward, that land will only stay in Account 105 and be considered part of rate base as long as we have a definitive plan for its use. If we no longer have a plan for its use, it comes out.

MR. TANNENBAUM: So if you transfer it to an SPE and then the project does not go forward, what happens then?

MR. STINNEFORD: Well, it would sit on the books of the SPE as long as the SPE continues to exist, but it would not be in rate base.

MR. TANNENBAUM: It would not be in rate base.

MR. STINNEFORD: That's right.

MR. TANNENBAUM: And it would not go back into rate base unless the SPE has a specific project.

MR. STINNEFORD: Well, the SPE would have to have a tariff in which to recover the costs. If it has no project, it has no tariff.

MR. TANNENBAUM: Is there a reason to wait until construction begins to transfer the property?

MR. STINNEFORD: Our -- as we've expressed perhaps in confidential settlement discussions, but in terms of timing of a transfer, we think it would make sense to wait until permits are secured and then make the transfer because it's much easier to transfer permits once issued than to disrupt the middle of a permitting process by changing the entity. But we think it could be done between that window of time once permits are received but prior to the commencement of construction.

MR. TANNENBAUM: So there is a time period between --

obviously between the -- getting all the permits and starting construction, and what you're saying is you would put it into the SPE after all the permits are --

MR. STINNEFORD: That would be our suggestion. As quickly as possible because we obviously don't want to delay construction, but that would be the window in which we think it makes sense to do it.

MR. TANNENBAUM: And meanwhile, this land for future use has been in CMP's rate base and it has been paid for by ratepayers?

MR. STINNEFORD: Yes, it is in rate base and we are earning a return on it currently.

MR. TANNENBAUM: And that's throughout New England, that's a socialized --

MR. STINNEFORD: Land is allocated in rate base based on the so-called PTF/non-PTF allocator. So it's roughly 80/20.

MR. TANNENBAUM: Eighty PTF?

MR. STINNEFORD: Yes.

MR. TANNENBAUM: So if this project goes through, then the ratepayers will have paid a certain amount of money on this land that is now going into CMP's NECEC project.

MR. STINNEFORD: Yes.

MR. TANNENBAUM: Does CMP have any plans to reimburse customers for that amount of money?

MR. STINNEFORD: I'll take my advice from counsel when we're infringing on confidential settlement discussions. That is certainly an issue that has been discussed in settlement.

MR. TANNENBAUM: When CMP was -- and maybe this is for Thorn. When CMP was deciding to propose that the project remain with CMP, did the issue of a goodwill payment come up?

MR. DICKINSON: No, it didn't, my memory.

MR. TANNENBAUM: Eric?

MR. STINNEFORD: No, not that I'm aware of.

MR. TANNENBAUM: Bernardo?

MR. ESCUDERO: I am not aware.

MR. TANNENBAUM: I realize this is -- well, I'll ask the question. In making your proposal today or when you filed the letter to house this in an SPE, did CMP consider a goodwill payment under Chapter 820 of the Commission rules or something like a goodwill payment in effect?

MR. STINNEFORD: No. This is -- as we've discussed in the context of Chapter 820, we don't view this as a non-core activity which would invoke that requirement.

MR. TANNENBAUM: So assuming this doesn't settle and it goes to the Commission, what we have before us is a proposal that -- what I would assume is an amended proposal to house the project in an SPE along with the conditions you indicated in that letter regarding approval of affiliate transactions, participating in money pool arrangements, credit facilities, and that sort of thing. That's -- what's in this letter is essentially an amended proposal?

MR. STINNEFORD: It's expressing our willingness to adopt this type of structure with these types of conditions if the Commission determines that that's in the best interest of customers.

MR. TANNENBAUM: And if the Commission determines it's in the best interest of customers, the Commission would then rule on whether a goodwill payment is required under the rule?

MR. STINNEFORD: I guess that's a question for counsel, but, again, we would dispute that this is a non-core activity that would invoke a Chapter 820 requirement and the payment of a goodwill payment.

MS. HUNTINGTON: I think we may have addressed this at one of the technical conferences, but I just wanted to get clarity on the ratemaking treatment or the accounting treatment of the ongoing expenses such as participating in this proceeding or the Massachusetts RFP, as well as engineering and permitting types of activities. How are those being accounted for?

MR. STINNEFORD: All of those costs are accumulated, have been accumulated for -- since we initiated the project in accounts that are booked to a preliminary survey and engineering account under FERC accounting rules which means that they are effectively deferred. They're not recovered under our tariff. And once a project is permitted and proceeds to construction, then they are transferred out of that preliminary survey account and actually into the specific FERC plant accounts and expense accounts that would then become part of the capitalized project. So that would include internal labor costs, including our time here today, engineering expenses, study expenses, consultant fees. All of that is being booked into these preliminary survey accounts.

MS. COOK: Eric, those accounts, you said the expenses are essentially deferred. Are they deferred with carrying costs in any form?

MR. STINNEFORD: No. No.

MS. HUNTINGTON: I wanted to go back to the -- to follow up on Mitch's questions again just to make sure we're clear on the witnesses' testimony with respect to the issues that were considered with respect to the decision to house the project in CMP. And I'll articulate what I've heard from the witnesses so far, and if you want to supplement it, please do. So the way you've -- previously Eric has noted that for -- in support of this, that the property is owned by CMP. CMP has a proven track record in developing transmission projects. The employees are within CMP and the arrangements related to sharing employees in affiliate transactions would create an administrative step. And I think Mr. Dickinson referred to the advantage of -- in terms of the process of competing in the RFP as well as with respect to permitting that keeping it in CMP would simplify those processes or make you more competitive. Is that --

MR. DICKINSON: Yeah, again, I just think it's a -- any time you add an additional requirement in an RFP, you take a risk that that additional requirement is viewed by somebody as a negative aspect to your bid.

MS. HUNTINGTON: Okay.

MR. STINNEFORD: If I could, Faith, the other issue, and it's related to how you summarized my concerns, but the other concern we expressed was by having to comply with affiliate requirements between the SPE and CMP, we didn't want to see barriers that would create inefficiencies in the execution of the project or that would be detrimental to CMP's core interests by restricting information, systems, employees' time, and things like that.

MS. HUNTINGTON: Okay. And again, I understand that I'm not allowed to ask about the content of the privileged document, but I'm puzzled by the disconnect between your testimony that you didn't -- that the fact that there'd be perhaps more favorable ratemaking treatment with respect to things like the property that could ride on CMP ratepayers was not a factor, given the involvement of Mr. Dumais whose -- you know, whose expertise was in FERC ratemaking issues. There weren't any FERC ratemaking issues that were relevant to the decision?

MR. DICKINSON: You know, I do remember conversations around allocation of administrative and general costs, but in the end, we determined that those allocations would be the same if it was within CMP or at an SPE. So I think that was a conversation I remember having with Paul. So that would be an example of -- you know, and Paul was also involved in the discussion with the external counsel previously, this was prior to this, around the acquisition of the land and its ability to be recovered under rates. So those are the two things I remember talking to Paul about about this project and specifically within that decision.

MS. HUNTINGTON: Thank you.

MR. TANNENBAUM: Okay, so we are now going to move on to the IECG. Drew?

MR. LANDRY: Thank you. I'm passing out an excerpt from the transmission services agreement which has previously been marked Exhibit -- well, it's NECEC 17 which was included in the prefiling (indiscernible) rebuttal testimony by CMP. This version is marked confidential, but I conferred with Sarah Tracy and others, and I'm confident that these portions are not confidential, so I can refer to these publicly. My name is Andrew Landry. I'm counsel for the Industrial Energy Consumer Group. I don't have that much this morning, but first question

I had was I just wanted to confirm -- I know this is in the record elsewhere, but you have stated on a few occasions that are in the earlier part of the record that CMP agrees to hold harmless Maine ratepayers from the cost of this project for the first 40 years of that project. Is that correct?

MR. STINNEFORD: Yes.

MR. LANDRY: And you just answered a few questions from the Public Advocate and the staff about moving the project into a special-purpose entity, and my understanding is you've expressed a willingness to do so if the Commission orders it but you haven't committed to do that yet. Is that correct?

MR. STINNEFORD: That's correct.

MR. LANDRY: And in terms of holding customers harmless, Maine ratepayers harmless, from any increases in transmission costs, if the project were to suffer -- it was within CMP and it were to suffer cost overruns or that sort of thing, would having the project in a special purpose entity serve to help insulate Maine customers from those cost overruns?

MR. STINNEFORD: I think Maine customers could be insulated in either structure, but --

MR. LANDRY: I think we previously talked in a prior technical conference and in some data requests about whether or not Hydro-Quebec failing to deliver any power would constitute an event of default under the transmission service agreement, and I think we concluded that it did not. In other words, the Massachusetts EDCs are on the hook to pay CMP regardless of whether Hydro-Quebec is actually able to deliver any power.

MR. STINNEFORD: There are circumstances under the PPAs in which, if Hydro-Quebec fails to deliver for reasons other than a TSA default or TSA non-delivery, that the EDCs can terminate. And if that happens, then there's a termination of not only the PPAs but potentially the TSAs, and Hydro-Quebec, under those circumstances, is liable not only to the EDCs but to CMP.

MR. LANDRY: Thank you. Now I circulated, before my questioning, a -- what was attached I believe to your rebuttal testimony, but it's marked NECEC 17. This is a portion of the transmission services agreement between Central Maine Power and NSTAR Electric d/b/a Eversource, and I assume the provisions of this are essentially identical to those agreements that you have with Western Mass. Electric and National Grid subsidies. Is that --

MR. STINNEFORD: I believe with respect to these particular provisions, that's correct.

MR. LANDRY: Now, the provisions that I've copied and circulated relate to owner defaults and I believe is defined under the agreement that Central Maine Power is the owner.

MR. STINNEFORD: That's correct.

MR. LANDRY: And if we look at 14.2(c), one of the events of default is the failure of the transmission line to be capable of operating at or above 1,040 megawatts as of the commercial operation date unless it's excused. A little paraphrasing, but --

MR. STINNEFORD: Yeah, there clearly are other provisions in that section but yes.

MR. LANDRY: And looking at 14.2(e), and I'll let you read it but I'll just paraphrase, essentially if there's a lack of availability, failure to meet the minimum average availability for some period of time, there being some opportunity to cure, but if that's not resolved, then that will be a default and -- is that a fair paraphrasing of 14.2(e)?

MR. STINNEFORD: Yeah, there are clearly many other subprovisions within that, but that's a fair summary.

MR. LANDRY: And looking at the remedies upon default, if you look at 14.4(a), I understand that upon a default, which would include any under 14.2, that the distribution companies may terminate the agreement?

MR. STINNEFORD: Yes.

MR. LANDRY: Would you agree that moving -- that if the EDCs were to declare an event of default because of a failure to -- of the project to be able to operate as it was agreed to, that the loss of that revenue stream would be a significant adverse impact on CMP or whoever owns the line?

MR. STINNEFORD: Well, there are several things that could happen in that circumstance. I guess the first order is that Hydro-Quebec would have rights to step into the agreement and assume those obligations, in which case there potentially could be no impact. But certainly if all revenue was lost, and, you know, Hydro-Quebec is not interested in stepping in and no other third party is, then, yes, the potential loss of revenue would have a major impact.

MR. LANDRY: Would you agree that moving the ownership of the line into a special purpose entity would insulate Maine ratepayers from that risk more effectively than having it within CMP?

MR. STINNEFORD: It potentially could be more beneficial in that circumstance. As we've said, I mean, we're -- if the project were to stay within CMP, from a ratemaking perspective, we have committed to a full segregation of costs at FERC, and FERC has accepted those provisions. So as I said, I think there are means of insulating CMP even if it is -- the project stays there rather than an SPE. But it, perhaps, could be cleaner if it were separated.

MR. LANDRY: Thank you. That's all I have.

MR. TANNENBAUM: Okay. Dot?

MS. KELLY: No questions.

MR. TANNENBAUM: Elizabeth, you still on the line?

MS. ELY: I do have questions, NRCM.

MS. CARUSO: Yes, I am.

MS. ELY: If you want to go (indiscernible) or not (indiscernible).

MR. TANNENBAUM: Okay, we'll go with Elizabeth and then you can finish.

MS. CARUSO: Can you hear me -- oh. Can you hear me --

MR. TANNENBAUM: Yes, I'm sorry, Elizabeth. Could you speak into the phone?

MS. CARUSO: Sure. Is this better?

MR. TANNENBAUM: Much better.

MS. CARUSO: Okay. I have a handout which, due to the weather, I was unable to attend today, but I have someone who's helping me out by distributing a packet of information for your review. And I believe Chris kindly printed off three more pages that can be added to that. I can't tell when you are ready. My feed got stuck. Oh, I see now. Thank you so much for your help, ladies. (Indiscernible) didn't accommodate my drive down there today. Are you all set?

MR. TANNENBAUM: I think we are.

MS. CARUSO: Okay.

MR. TANNENBAUM: Please proceed.

MS. CARUSO: So I'd like to start off with tab one in the handout. Of course, you're familiar with it. It's the memorandum of understanding between CMP and the Western Mountains & Rivers Corporation. On page four, Roman numerals three and four discuss the combined lump sum payment of 22 million which was initially the plan. My question is is this the only mitigation payment that you have offered to do or do you have any other agreements in place?

MR. DICKINSON: No, there are no other agreements.

MS. CARUSO: So you're not having any discussions with anyone else related to additional mitigation or compensation payments?

MR. DICKINSON: No, there are -- there have been confidential negotiations that have happened here, and also there are bilateral conversations that happened in discussions that we're having.

MS. CARUSO: So do you expect to enter into any new or additional mitigation or compensation agreements?

MR. DICKINSON: I would say that's uncertain at this point.

MS. CARUSO: So you include that there -- it is possible that you could have additional compensation --

MR. DICKINSON: Yes.

MS. CARUSO: -- your project budget. Okay. Now with regards to the decision to go under the river, that has now dropped the mitigation payment to somewhere between five and ten million. Is that correct?

MR. DICKINSON: Yeah, for that portion of the MOU.

MS. CARUSO: Okay. Can you explain why you included a provision to allow you to reduce the payment?

MR. DICKINSON: Well, it really was part of a two-year dialogue that we had with the people that we had been discussing with over that period of time. And you know, when we started the dialogue, I think there was a general feeling of just say no to the project. We spent a lot of time listening to concerns, hearing what the concerns were of the people in the community, and ultimately -- and part of it is in our -- the way we laid out this project of trying to minimize the impacts by utilizing existing corridors and utilizing the new corridor through an area that's already heavily logged, we recognized that there were a few areas that we believed were of the biggest importance, and one of them was the Kennebec River crossing. So when we were approached to begin a dialogue, we did. And in the process of that dialogue, there -- and part of that was exploring what our belief was the cost of an underground piece underneath the Kennebec River, which at that time was in the 30 million range. We started having a dialogue about, well, if there was an overhead, what might a mitigation package look like there. If there is an underground, what might the mitigation package look (sic). So it was a natural dialogue over a couple-year period that eventually lead to that point.

MS. CARUSO: So is it safe to assume that you thought the aerial crossing of the Kennebec was the largest single impact worthy of mitigation?

MR. DICKINSON: Yeah, I think that's fair to say.

MS. CARUSO: Okay. And do you -- so basically, relative to the entire project which involves a significant amount of newly-constructed corridor and numerous other environmental and other types of impacts, you felt that that, you know, thousand feet of visibility or so of the entire project was worthy of mitigation.

MR. DICKINSON: We believe that that -- going back to your prior question, we believe that that was the single biggest piece of impact. Obviously within the DEP process that is going on now, we've had a lot of discussions around mitigation, and we've had a lot of discussions about mitigations that will be within that process. But to answer your question, we recognize that there are impacts from a transmission line like this along the path, but we worked extremely hard to try to minimize those impacts in the design. We recognize that in the DEP process, those mitigations will happen, but we recognize that the overhead river crossing was the -- as you said, the single biggest area of concern.

MS. CARUSO: Right. Well, I'm not saying that. I'm just asking you if you say that.

MR. DICKINSON: Yeah, yeah, no, I agree with that.

MS. CARUSO: Okay. And so when you took the 12 to $17 million off the table, what impacts do you think that five to ten million dollar payment -- what impacts would they address?

MR. DICKINSON: You know, I think our perspective was there -- this area around the Kennebec River crossing. Still, there are impacts around that general area, and I think it still was meant to be a representation of that. But I think more that it was an organic process that happened in the negotiation which was I think there was some perspective originally that the agreement would only have some -- you know, only an underground approach could -- would ever be accepted. And then as I said, eventually there was an approach for an overhead. So I don't think there was any algorithm or rubric around what that five to ten meant to represent, but it was, again, the outcome of a dialogue over a two-year period.

MS. CARUSO: So, you know, we hear five and we hear ten. Is it five? Is it ten? Is it something in between? What is the amount?

MR. DICKINSON: Well, the firm obligation is five, but, you know, the -- at the time, the range -- at that specific time there were discussions around, in some of the unorganized territories, ways in which the community could benefit incrementally by doing tax incentive financing and finding a way to make sure that those incremental taxes find a way into the community. So I think some of that range was around that area, but, you know, obviously I think we -- I know me particularly who was at I think every individual meeting up at The Forks and spent a lot of time up talking to people in the community, I was very proud about this agreement, to the opportunity to bring value to the community. And obviously we continue to be open minded about how we can work with the community going forward, including what that range might mean.

MS. CARUSO: So you mentioned that you were meeting with the public and the community and talking to the public. Wasn't that after you had already signed the MOU?

MR. DICKINSON: No, I mean, I made -- the -- part of our negotiations with Western Mountains & Rivers was - from our perspective, had a couple of concerns and things that were on our mind when we communicated to them. One was we wanted to have the goal of having this represent the community as a whole, and as you can -- as you probably know from the makeup of the board, we also wanted the board to be representative of a large perspective of the community. And, you know, my experience is that I was up there a lot talking with people that had questions, people that wanted to learn more about what was happening before or after, and we definitely encouraged all the people we were talking about to continue to have conversations, to let the community know that these discussions were going on, although I'm sure that there were components of the negotiation that -- as it relates to specific aspects that were held back and confidential.

MS. CARUSO: I will follow up with this more a little bit later, but would it be fair to say that the MOU and the mitigation payment were designed to buy the local support of the few companies and entities that were -- you were meeting with initially for two years and then afterwards broke out and discussed it with the public?

MR. DICKINSON: No, I think the way I would characterize it is how I characterized it before. I thought this line provided an opportunity to bring value to the community through expanded nature-based tourism, economic development, new trail systems, certain rights that people in the community would have that they wouldn't have before, access to certain recreational assets. I saw this personally as a real opportunity to have a partnership between the project and the community.

MS. CARUSO: So on page six, Section 7, subsection A, it requires that WMRC, at CMP's request, would provide oral and written testimony to any jurisdictional permitting agency and require WMRC to testify that the MOU represents an appropriate offset to various impacts of the project. Am I interpreting that correctly?

MR. DICKINSON: Yes, I think you are.

MS. CARUSO: Okay. Is it typical practice for an agreement like this to include a quid pro quo that requires the entity that will receive compensation funds to proactively support the project at the funder's request?

MR. DICKINSON: So this is a representation of the common feeling that we arrived to at the signature of the MOU. The dialogue, the numerous meetings that we had, the conversations that we had all led to a point where the signature -- signatories of Western Mountains & Rivers were agreeing to this was consistent with their expectations. So I wouldn't characterize it the way that you have.

MS. CARUSO: Do you consider the need to provide mitigation for impacts related to things like our tourism industry or potential negative impacts to local property values?

MR. DICKINSON: Well, the -- you know, we're obviously talking about within this proceeding the benefits and the need for the project. In the DEP process, we'll be looking at all the pieces within that, and I think those are all considerations that happen within that context.

MS. CARUSO: Well, it appears that you did mitigate for the crossing of the Kennebec, but I'm wondering if you considered the need to provide mitigation for non-Kennebec River related tourism impact.

MR. DICKINSON: Well, you know, I -- my own expectation based on what I've learned is that there are going to be significant opportunities for expanded tourism in this region that -- you know, new access for ATVs, new access for snowmobile accesses, new trail systems, along with funds that we've designated to go towards encouragement of new tourism in that area.

MS. CARUSO: Did you direct Daymark or the University of Maine to account for economic impacts in all four seasons?

MR. DICKINSON: No.

MS. CARUSO: Okay. Have you completed any studies as to why people come to the region of the new portion of the line to hunt, fish, raft, hike, or snowmobile?

MR. DICKINSON: No, as I said, I think my understandings from the -- why I believe there's opportunities for new expanded tourism in the region come from conversations that I had had with people in the region.

MS. CARUSO: Right, and I understand that. You -- I understand the few companies that you spoke with that are on the board at the time that you came up with this agreement. I'm just asking if you did any studies, that's all.

MR. STINNEFORD: There are use surveys that are done as part of the DEP permitting process but not associated with this proceeding.

MS. CARUSO: That was done this fall but not prior to coming up with the agreement. And that was for the Kennebec River.

MR. DICKINSON: Yeah, I guess the only thing I'll just say, I don't want it to be represented that the only conversations I've had with people in the community are the people that were -- we were working together on the agreement over time. You know, I've talked to snowmobilers, ATVs, hunters, other people that all see some of the opportunities that come from a new corridor that exists.

MS. CARUSO: Right, but those conversations were had after the MOU became public, correct?

MR. DICKINSON: No, I think the -- you know, we have done, from the beginning of this project, an effort to reach out to people along the corridor.

MS. CARUSO: Okay. We'll just move on and we'll come back to that later. Did you -- in the visual rendering presentation of August 17th you presented -- or your company presented to the PUC some pictures of Parlin Pond, Enchanted, Coburn Mountain, Rock Pond, Spencer Road, the Kennebec River, and they appear to be uninhabited without visible recreational usage or unusual scenery. And then it was stated at that meeting that you were trying to minimize the impact of a national scenic byway by putting the line to the east and to the west. Did you analyze the usages of areas you chose to place the line beyond it being a working forest?

MR. STINNEFORD: Well, I think as we have presented in technical conferences here in this proceeding, you know, a great deal of thought was put into the choice of the new corridor location, siting it, to the maximum extent possible, avoiding conserved and preserved lands. And, again, I think we've provided maps that demonstrate that as well.

MR. DICKINSON: And I think I would just --

MS. CARUSO: -- but did you analyze the usages of the areas?

MR. DICKINSON: You know, I'm not aware of that. You know, I was just going to also point out that, I think as we've also presented at that time, there -- these lands are owned by two private companies. And, you know, they have made it very clear publicly and particularly in a letter that was addressed to the Commission in the middle of December that they have -- you know, their primary utilage (sic) of that land is as a working forest and that --

MS. CARUSO: Right, I said beyond it being a working forest was my question.

MR. DICKINSON: Well, no. So I was just making the point that they have made it very clear that they, as a secondary and on their own goodwill, have made those lands available for other utilizations. But that utilization shouldn't interfere with their ability as a private landowner to utilize those lands how they see fit.

MS. CARUSO: Of course. So now there were three pages that were distributed separately from my packet, and it's a state of Maine report, recreational hunter and angler market report. It's prepared by Southwick Associates, fish and wildlife economics and (indiscernible) in April of 2015. And this was prepared for the Maine Office of Tourism and the Department of IF&W. On the second page, it's sort of a summary of the report, and it says key insights. (Indiscernible) from the Maine license and traveling sportsmen surveys. It says, "The state of Maine is well positioned as one of the, quote, best destinations among Maine licensed hunters and anglers across a majority of attributes that are important to them, ranging from climate, safety, pricing, and amenities. Maine's particular strengths among traveling sportsmen are its attractive natural setting and its sense of safety. The state's natural amenities, beauty, and sense of security or safety are also identified to be among the most important characteristics of a site that hunters and anglers say are important when making the decision to hunt or fish." On the third bullet it says, "Interestingly, one of the key destination factors for hunters and anglers is the remoteness of the location." So are you aware in tourism surveys that they show the primary reason people come to Maine to hunt and fish is the remoteness and scenic quality of it?

MR. DICKINSON: That would -- I mean, that would make sense to me.

MS. CARUSO: Okay. And have you studied how a transmission line would affect these people's experiences?

MR. DICKINSON: I mean, we have, as we've already talked about, done a significant amount of work demonstrating the impacts both on the natural environment and on the visual resources that are there. And, again, you know, my conversations have led me to the belief that the -- that there's a real opportunity for an increase in tourism, not a decrease.

MS. CARUSO: But beyond discussing it with the people in the agreement, you haven't done a study.

MR. DES ROSIERS: Objection to form, assumes facts not in evidence. And compound question.

MS. CARUSO: I didn't hear that.

MR. TANNENBAUM: Okay, so maybe the question should be have you done a study of the impacts on tourism?

MR. DICKINSON: Yeah, there's no specific study that we did.

MR. TANNENBAUM: Okay.

MS. CARUSO: Okay. So there is no study on the effects of the variety of the lodging, the restaurants, all the associated -- the trickle-down effect of tourism --

MR. DICKINSON: Well, no, actually --

MS. CARUSO: -- this area?

MR. DICKINSON: Well, but that was a different question I guess from my perspective. You know, the project has substantial benefits associated with both a drop in energy prices that have an overall effect on GDP that trickle down throughout the Maine economy. Also, the property taxes that the region will experience. And then specifically to what you're talking about is a significant amount of both direct and indirect jobs around the project, something we saw very clearly with MPRP that had positive effects on, you know, restaurants and hotels and other businesses indirectly related to the project.

MS. CARUSO: Right. But there are studies that show, and you're familiar with them in other proceedings, that people -- tourists don't come to the remote areas -- or there was one study, I'm not sure if you recall it, the John (Indiscernible) Trust of 2017 where 55 percent of the tourists would not return to an area of wilderness with a transmission line in it.

MR. DES ROSIERS: Objection to form, assumes facts not in evidence.

MS. CARUSO: -- were just --

MR. TANNENBAUM: Thorn, are you familiar with that study?

MR. DICKINSON: No, I'm not.

MR. TANNENBAUM: Okay.

MS. CARUSO: Okay. Oh, I thought it was. I thought that was -- had been part of the proceedings. I apologize. Moving on. So there were, in the visual rendering, some of the additions that you submitted, pictures of snow on the ground, but did you actually do a study in leaf-off conditions?

MR. STINNEFORD: I'm not sure what you mean by a study. We did, in response to requests in the DEP permitting process, provide additional renderings under winter snow cover conditions.

MS. CARUSO: Okay. So have you studied winter snowmobiling in the affected area of the proposed new corridor?

MR. STINNEFORD: We have not conducted a study, although we have had numerous conversations with the Maine Snowmobile Association and they are very supportive of the project.

MR. DICKINSON: You know, I mentioned some of the comments and conversations we had, and actually at the Somerset County, the head of the MSA spoke. And I thought it was very interesting and what he said he receives on a daily basis complaints from all their members on a numerous amounts of things. You know, he said you'd be amazed at how much people complain about various things about their experience, but never once in his whole period did he ever get a complaint that somebody said they saw a transmission structure.

MS. CARUSO: Right. But have you studied how -- have you done any studies in -- it seems like you -- there's a lot about the Kennebec River that you're familiar with, but have you studied how winter snowmobiling season affects the local businesses, the year-round residents such as outfitters, lodges, restaurants, the associated staff members, the snowmobile guides, the grooming operations, and the -- as travelers come up north, they -- they're spending in the gas stations and the grocery stores, it all is affected by the snowmobiling season. And have you studied what would happen to the economy of the region during the construction period of the new corridor --

MR. DICKINSON: We have not --

MS. CARUSO: -- there, you know -- okay.

MR. DICKINSON: We have not studied that, but again, my belief in conversations with people in the snowmobile communities, this actually will be a net positive effect. So I would see that as a net benefit of addition, but we did not do a study for that.

MS. CARUSO: Do you -- have you snowmobiled in the area?

MR. DICKINSON: I snowmobiled when I was in -- up to when I was in fourth grade but not since.

MS. CARUSO: Okay. So do you know the difference between snowmobiling in trails and woods versus under power lines?

MR. DICKINSON: I believe I've snowmobiled in both conditions, but I wouldn't consider myself an expert.

MR. STINNEFORD: And I certainly have.

MS. CARUSO: Okay. So do you know what happens when there's not enough snow on the trails? For example, when spring starts to set in and the snow pack is melting, dirt starts to be uncovered, the grooming operations cease. And you know, when grooming operations cease, so does the flow of riders, of course, both in state and out of state on the trails.

MR. STINNEFORD: It's a sad time of --

MS. CARUSO: Does that make sense?

MR. STINNEFORD: Yeah, it's a sad time of year for snowmobilers, I'll grant you that.

MS. CARUSO: Yeah. And when -- you know, if -- because when grooming operations stop, people don't want to snowmobile on the trail. It's not as smooth. And when the snowmobilers don't come, and the restaurants and lodges, of course, they're losing their customer base. So did you know that the snowmobile trails under transmission lines historically are the first to be rutted and bare due to the absence of the forest canopy and the resulting exposure of the sun?

MR. STINNEFORD: That would not surprise me, no.

MS. CARUSO: Right. So you have -- so in terms of -- you know, you mentioned that you're adding new -- you're excited about the possibility of new trails for snowmobiling because of the transmission line. Did you account for that -- the differentiation between the snow cover in your economic studies and economic impact?

MR. DICKINSON: No.
MS. CARUSO: What about -- if this -- if this -- if you get the permits and this corridor is being constructed -- the area around Johnson and Coburn Mountains, which are so heavily traveled by snowmobilers coming from Rangeley, Jackman, Greenville, The Forks area, it's a destination spot. Are you aware that the Coburn Mountain would be shut down during that proposed construction?
MR. DICKINSON: I mean, our perspective would be when we get to the period of staging our construction, to do it in a way that has the least impact on whatever operations are going on in the region.
MS. CARUSO: Okay. Well, regarding the line under the Kennebec, have you started your test soils?
MR. STINNEFORD: Test --
MS. CARUSO: -- burying the line.
MR. STINNEFORD: The test boring, is that what you're referring to?
MS. CARUSO: Yes.
MR. ESCUDERO: Yes, we have. We conducted that end of last year.
MS. CARUSO: Okay. And did you need a permit to do that?
MR. ESCUDERO: I believe we needed some sort of permit and we got it, but I would need to confirm that.

MS. CARUSO: So because of the scenic and economic impacts from this corridor, especially in the new corridor area but also in the existing corridor area with all the camp owners and the people who are impacted, did you ever consider burying the line for the entire length of the new construction?

MR. DICKINSON: No, we didn't.

MS. CARUSO: Did you ever study the potential difference on the economy of the region between burying the line and not burying the line?

MR. DICKINSON: No, we did not.

MS. CARUSO: Did you ever evaluate the scenic or visual impact of burying the line versus not burying the line?

MR. DICKINSON: No, we did not. And we also didn't evaluate the various impacts of a buried DC line through a new corridor.

MS. CARUSO: So you chose to bury the line under the Kennebec but not for the entire 53 miles?

MR. DICKINSON: Well, our original --

MS. CARUSO: Was cost the primary --

MR. DICKINSON: I'm sorry.

MS. CARUSO: Sorry?

MR. DICKINSON: Sorry, go ahead.

MS. CARUSO: Was cost the primary reason for not burying the line?

MR. DICKINSON: We believed it was the simplest, and obviously cost was a component of that. But we also believed it was the one that made the most sense.

MR. TANNENBAUM: Can I just follow up quickly? Did -- I wasn't sure I heard this right. Did CMP conduct an analysis of what it would cost to bury the line in the new corridor?

MR. DICKINSON: No.

MR. TANNENBAUM: Okay, thank you.

MS. CARUSO: So you mentioned earlier this morning that on a project in the Hudson Valley you buried the line for aesthetic reasons. And it didn't occur to you to bury the line here through this high tourism area and with all these camp owners having their property abutting a huge DC transmission line?

MR. DICKINSON: So the project you're talking about, Connect New York, is a project that is -- I would put in the dream category of project development portfolio that we have. It's -- so far has not got momentum within New York state. Maybe part of that is the cost related to it, but, again, what the strategy there is we knew we were submitting into a request for information in New York a number of years ago. We knew that there were existing AC overhead projects that already were in place, and our idea was to find a corridor that already was predisturbed. So a predisturbed corridor and putting a buried line along the thruway means that you're not disrupting, you know, a new area, an area that currently wasn't dug up. You're doing one that was just previously disturbed. So again, there was a specific rationale and reason. But again, that -- the RFI was not selected or moved forward with.

MR. TANNENBAUM: Thorn, a follow up. Excuse me. What do you mean by predisturbed?

MR. DICKINSON: Yeah, so the -- there -- you know, I actually don't know what was there before the New York State Thruway, but you know, let's assume that that was a green field area at least for some of the --

MR. TANNENBAUM: I thought -- excuse me, I thought when you were talking about predisturbed, you were talking about the corridor at issue here.

MR. STINNEFORD: No.

MR. DICKINSON: No, no. No, I was talking about the corridor along the New York Thruway.

MR. TANNENBAUM: Okay, sorry.

MR. DICKINSON: Okay.

MS. CARUSO: So just to summarize, you didn't evaluate the cost of burying the line, and likewise, you didn't evaluate the cost to the region for the impact of property values and viewshed and scenic issues and the health issues of herbicides and other sorts of things by having an above line -- above-ground line.

MR. DICKINSON: Yeah, that's right. I also would say that there were a lot of other things that we didn't evaluate. Another example would be what happens if, for a 20 or maybe even a 40-year period, we're not able to pull three million metric tons of carbon out of the atmosphere and what happens to the region, to the tourism, to the people that go and count on that land to visit if, you know, these kind of steps aren't made in order to abate climate change.

MS. CARUSO: Do you -- in comparing -- in addition to -- if you had buried the line, in addition to fewer visual impacts, would burying the line lessen the amount of herbicides required to be sprayed along the route?

MR. STINNEFORD: Well, the corridor would still need to be cleared of vegetation even if the line were buried. You know, it may be a less cleared area, but it would still need to be cleared and maintained.

MS. CARUSO: So how wide an area would you need to clear?

MR. STINNEFORD: We haven't evaluated that.

MS. CARUSO: So if TDI in Vermont is willing to bury their line and they're still delivering a significant mitigation package, how can CMP refuse the cost to bury the line?

MR. STINNEFORD: I guess first I would point out that TDI has not found a customer that's willing to pay the cost to do that. They have a proposed project, but no one's agreed to pay for it.

MS. CARUSO: Is it a fair statement that burying the line would have significantly fewer visual impacts and fewer impacts on human health?

MR. STINNEFORD: It certainly would be less visible. I can't speak to the health impacts. I don't think anyone on this panel is an expert in this area.

MS. CARUSO: Okay. Moving on to tab two, please. This is an article from the November 18th edition of the Portland Press Herald. If you could turn to page five as noted in the bottom right-hand corner. It starts with the headline Merchant Versus Reliability, quote/unquote. Let me know --

MR. DICKINSON: Oh, I'm sorry, yeah, yeah, I'm there.

MS. CARUSO: Okay. Do you know Mr. Don Jessome who is described here as a chief executive of the TDI project in Vermont and who is a competitor under the 83D RFP?

MR. DICKINSON: No, I do not.

MS. CARUSO: In the first paragraph under that headline, he was reported as saying that, quote, "all three projects," end quote, which I assume related to the three Hydro-Quebec proposals, including TDI, Northern Pass, and NECEC, are so-called merchant lines. Would you agree with that characterization that NECEC is a merchant project?

MR. DICKINSON: Yeah, I see that that is -- oh, would I agree that NECEC is a merchant project?

MS. CARUSO: Uh-huh.

MR. DICKINSON: No, I'd never consider it a merchant project.

MS. CARUSO: So would -- do you agree that the three projects are not, quote, "reliability projects"?

MR. DICKINSON: So maybe just to clarify what I mean by merchant. You know, we have a tariff. If this project is built and constructed, it will have a tariff that's FERC regulated and will result in revenues as long as we operate the line that we're supposed to be in a tariff that dictates how those revenues are provided from a counterparty of a utility. So from a transmission perspective, I would say it was consistent with other types of transmission except for the fact that it's a fixed price and we take more risk associated with that.

When I think of a merchant project, I think of a project that might be built between two ISOs and takes an arbitrage risk between those. Those revenues are uncertain. They're taking the merchant power risk in order to generate their profits. But I would put it in a different category than reliability as you're saying. I just wouldn't put it in a merchant category. I would put them into competitive solicitations. Now I do think that there are reliability benefits associated with the project, but clearly the prime focus is on delivering clean energy to New England.

MS. CARUSO: Well, my understanding is that what are generally referred to as, quote, "Reliability projects are designated by ISO New England as pool transmission facilities or PTFs. They're built to address a reliability need" --

MR. STINNEFORD: Yeah, I think you --

MS. CARUSO: -- "as identified by ISO New England."

MR. STINNEFORD: I think you've conflated several things there. I mean, reliability projects are not necessarily PTF projects, but they are built to address an identified reliability need through a planning process, whether that's ISO New England's process or our local transmission planning process.

MR. TANNENBAUM: Let me follow up on this. Does the term merchant transmission have a meaning within the industry? Is there a --

MR. STINNEFORD: I'm not sure there's a standard definition, but I think most people would agree with how Thorn has represented this. If the project is fully secured through long-term contracts with a secure counterpart, that would generally not be considered merchant, just as it would with a power plant. If a power plant is built on spec to sell into spot markets without firm contracts, it would be considered a merchant plant. But if it's secured with long-term power purchase agreements, it generally wouldn't.

MS. CARUSO: Let me rephrase the question.

MR. VANNOY: Just a follow up. Sorry, one follow up here. So how would you put Order 1000 and merchant in that, just real briefly?

MR. DICKINSON: Yeah, at least from my perspective, if there's a competitive solicitation around an opportunity, for example, to take advantage of a congestion or a constraint that exists across an interface like central east or one that might exist between, you know, some PJM and MISO or something like that, if the -- in my mind what determines a merchant from a non-merchant is what is the buyer, where is the revenue source that's from that. I think both of those could be in competitive solicitations through an Order 1000, but if the revenues are based on some market mechanism that involves energy and/or capacity prices and the project developer is taking that risk, that's what I would put into the merchant category.

MR. TANNENBAUM: Thank you. Elizabeth, please proceed.

MS. CARUSO: Okay, thank you. So I guess do you agree that it's a for-profit project rather than a project that's designated to meet a reliability need?

MR. STINNEFORD: I think those are two very different things. Even reliability projects --

MS. CARUSO: Is it a for-profit project?

MR. STINNEFORD: Yes, as are most reliability projects.

MS. CARUSO: So the article states that these three projects -- again, we're referring to TDI, Northern Pass, and NECEC -- are, quote, "being developed for clean energy goals and to make money for Hydro-Quebec and the builders," end quote. And by builders we assume he means investors. Do you agree that these three projects, including NECEC, were proposed to address public policy goals and make money for Hydro-Quebec and the transmission line investors?

MR. DICKINSON: Yeah, I would say that I wouldn't limit it to the three -- these three projects, though. There were 53 proposals that were bid, some by solar developers, some by wind developers, some by battery technology. All of those individual developers all had a similar motivation to provide a competitive project and earn a return.

MS. CARUSO: Right, but this article is about these three right now. So is it true that these three 83D projects that Mr. Jessome talks about are designed to meet a public policy goal rather than an identified reliability need and these are electric transmission upgrades?

MR. STINNEFORD: Yes, I mean, -- well, I can't speak for the other two projects. I can only speak for CMP's NECEC project. It was definitely proposed to -- in response to a public policy initiative launched by the Massachusetts utilities and the DOE. So, yes, I would agree with you that it's a creature of public policy.

MS. CARUSO: Okay.

MR. DICKINSON: But I would just add one additional piece is that there was a major focus in the RFP on firmness. And what firmness implies is that when that energy is needed, it will be able to be delivered. And we had some testimony yesterday around the benefits of having a firm amount of energy available when you're running out of oil on that day when -- within the ISO. So from that perspective, the fact that the RFP didn't include firmness as a key component, I think there is a component of the bid related to reliability.

MR. STINNEFORD: In fact, if you read, you know, both Section 83D as well as the RFP itself, one of the stated criteria is specifically that -- to ensure greater reliability through, you know, reduced reliance on natural gas, particularly during winter delivery periods.

MS. CARUSO: Okay. But as far as ISO is concerned, is it an ETU?

MR. STINNEFORD: It will be an elective transmission upgrade.

MS. CARUSO: Okay. And given that it's intended to, you know, meet this public policy goal as you discussed, is it fair to characterize NECEC as a for-profit project for Avangrid and Hydro-Quebec?

MR. STINNEFORD: As I said, any transmission project is going to earn a profit or return for the investors in that project, including this project.

MS. CARUSO: Okay. Now, does it -- it looks to me like in the statute it talks about, quote, "public need" but doesn't specify whether or not it has to be a Maine need. Is that correct?

MR. STINNEFORD: Could you specify what statute you're referring to?

MS. CARUSO: The statute for the PUC that says petition for approval of proposed transmission lines, Title 35-A.

MR. STINNEFORD: I believe that's 3132 that you're referring to, in which case I would agree it's -- the statute, when it defines public need, is not specific in stating whether that is a Maine need.

MS. CARUSO: So, you know, just help me out here because I'm not a lawyer, but just hypothetically, could someone in Maine apply for an ETU project in a different state because of a public need in Maine?

MR. STINNEFORD: I'm not sure I followed that question.

MS. CARUSO: Well, is it correct to assume that you believe the Commission can grant a certificate for an out-of-state need just because the statute doesn't specifically prohibit that?

MR. STINNEFORD: I thought your question was to build something out of state, in which case permitting under 3132 wouldn't be required.

MS. CARUSO: No, but could -- but it seems the understanding of the company that they believe the Commission can grant a certificate for an out-of-state need like Massachusetts just because the statute doesn't specifically prohibit -- that it doesn't specifically say it has to be a Maine public need (sic).

MR. STINNEFORD: That's not --

MR. DES ROSIERS: Objection, assumes facts not in evidence.

MR. STINNEFORD: Yeah, I was going to say --

MR. DES ROSIERS: Misstates the position of the company.

MR. STINNEFORD: That is not the company's argument.

MR. TANNENBAUM: That's also a legal question too that might not really be appropriate for the panel.

MS. CARUSO: Okay. Okay, thank you so much. Moving on to tab three, I have a number of questions about CMP's community outreach effort, mainly related to the pre-application phase. There is a public outreach section in your CPCN application which states that, quote, "CMP recognizes the importance of public involvement and is committed to transparent and responsive stakeholder agreements," end quote.

Will you accept that that's a direct quote from your application, the statement represents CMP's corporate policy?

MR. STINNEFORD: I'm sorry, we're not finding the language you're quoting.

MS. CARUSO: I don't -- hold on, I'm pulling up on my screen. Let me find that, and I'll -- let me just move on right here.

MR. TANNENBAUM: Elizabeth, we do need to take a lunch break pretty soon. So I don't know if this is a good time --

MS. CARUSO: Sure. You want to do it right now? Because I'm --

MR. TANNENBAUM: We could. About how much more time do you anticipate?

MS. CARUSO: I'm not sure. It's taking longer than I expected so I think lunch right now would be fine. I have --

MR. TANNENBAUM: Okay, let me ask --

MS. CARUSO: -- four more tabs to get through.

MR. TANNENBAUM: Okay, let me ask NRCM. Do you have an estimate?

MS. ELY: I have a very small number of questions. I would expect no more than ten minutes.

MR. TANNENBAUM: Okay. All right, so we'll take a lunch break for an hour now. What I'm wondering, if people could think about and maybe we'll talk after, is if we do finish early, which it looks like we will, should we proceed with the Daymark panel today? Again, people might not be prepared for that and maybe that doesn't make sense, but I'm just asking a question and we could talk about it after.

MR. DES ROSIERS: Another suggestion I might have is I think we were down to not that many questions left for a few witnesses for Ms. Bodell that may fit better. You know, to -- instead of have the portion of her examination fall on Friday because Friday will be a busier day I think than Thursday.

MR. TANNENBAUM: Okay, well, let's think about that over lunch.

MR. FLUMERFELT: Excuse me, Mitch. John Flumerfelt here. Could we wait until Mr. Shope's back in the room to have that decision?

MR. TANNENBAUM: I assume he'll be back after lunch.

MR. FLUMERFELT: No, he -- I think he just took a quick (indiscernible) break. In terms of your question.

MR. TANNENBAUM: Okay, but we'll break for lunch, and then we'll talk about it after lunch. Okay? Thank you.

CONFERENCE RECESSED (January 9, 2019, 12:13 p.m.)

CONFERENCE RESUMED (January 9, 2019, 1:16 p.m.)

MR. TANNENBAUM: Okay, Elizabeth, please --

MS. CARUSO: I can't see the video, but --

MR. TANNENBAUM: You should in a second.

MR. DES ROSIERS: Mitch, before -- there was one question of Mr. Escudero that he was going to check on. He can give a confirmatory answer right at the beginning.

MR. TANNENBAUM: Okay. Bernardo?

MR. ESCUDERO: Yeah, thank you. You asked me if we needed a permit for doing the borings at the Kennebec River, and I confirmed with the (indiscernible) that we actually -- we didn't need it. We checked with the land use planning commission, and they confirmed that it wasn't needed. So I wanted to make that (indiscernible).

MR. TANNENBAUM: Great, thank you. Okay. Elizabeth, please proceed with your questions.

MS. CARUSO: Okay, thank you. So we are in tab three, and the statement that I made was on page 88 of your CPCN application. It states what it states in there, that CMP recognizes the importance of public involvement and is committed to transparent and responsive stakeholder engagement. So my question is do you feel that statement represents CMP's policy well enough?

MR. STINNEFORD: Yeah, we stand by the words in our petition. We still feel that's true.

MS. CARUSO: Okay. Is it fair to assume you included a discussion related to public outreach because you feel it is important -- an important issue for the Commission?

MR. STINNEFORD: Yes.

MS. CARUSO: Okay. So the application describes the first phase of NECEC communication plan as, quote, "prefiling communications to ensure key stakeholders are well-informed and not surprised by CMP's proposal," end quote, and it refers to a more comprehensive discussion later on in the plan presented as Exhibit NECEC-9. Going to this exhibit, on page one, the language in the second paragraph reads, quote, "The NECEC team began its outreach campaign to introduce and advance the project on July 17th, 2017 with a series of conversations with targeted stakeholders," end quote. Are you with me?

MR. DICKINSON: Yes.

MS. CARUSO: Okay. So who were the stakeholders that were targeted during this phase?

MR. DICKINSON: I'm looking at our response to data request NRCM-02-01 where we list a number of the meetings that we've had throughout the process. And starting at July 17th, we have city of Lewiston, Franklin County, Greater Franklin Development Council, town of Farmington, Somerset County Commissioners, Somerset Economic Development Corp., town of Bingham, town of Moscow, town of Farmington, Jay, Androscoggin County Commissioners. And then -- well, that's into August at that point. I don't know if -- were you interested in further meetings?

MS. CARUSO: No, I was just curious who the stakeholders -- who you consider the stakeholders. Are these the same stakeholders that were part of the board on the MOU?

MR. DICKINSON: No. No, these would be the city of Lewiston -- obviously --

MS. CARUSO: Right, I heard -- yeah.

MR. DICKINSON: Yeah.

MS. CARUSO: Okay. Was there any public notice to residents of the affected communities about any pre-application meetings with community leaders or any other broader outreach to invite public comment?

MR. DICKINSON: Yeah, was there any at any time during the project, is that your question?

MS. CARUSO: Well, before the -- was there any public notice about any pre-application meetings, like, before you applied?

MR. DICKINSON: I mean, the challenge here is in a competitive process letting your competition know what your project looks like creates a challenge. You know, we had a number of different bids, both wind, solar, battery technology along with the two different Hydro-Quebec bids. We weren't sure how much of our competition even knew that we were going to be bidding or what we were going to be bidding, and providing them any details around that is dangerous. And why we end up having these meetings so close to our bid for these kind of key meetings would be one way to mitigate that.

MS. CARUSO: Right. Well, you mentioned earlier that you had met for two years with some stakeholders. So I'm wondering why you chose not to meet with others, aside from your competitive concerns. I mean, you didn't have to put it in the newspaper.

MR. DICKINSON: Yeah, so the -- so, well, maybe one comment is that the original conversations with the group that then became Western Mountains & Rivers emanated out of our earlier bids in the tristate RFP. So really the bids that we had submitted into that solicitation also included wind and solar opportunities. Again, they weren't selected in that RFP process, but the dialogue really began well before that and continued through on. As far as communications to the towns along the corridor, you know, we've had multiple meetings with every town along the corridor. We've -- all of those meetings were publicly noticed and put onto the agenda for public comment.

MS. CARUSO: Right, but I was referring to after the bid but before the application. So on page two of the NECEC-9, do you see under phase one of the plan where it says, quote, "Prior to the filing and a broad public announcement, the project team made contact with key stakeholders to provide an overview of the project, including the route map, the economic benefits, and plans to avoid sensitive areas," end quote?

MR. DICKINSON: I see that, yes.

MS. CARUSO: Okay. And do you also see on page three under, quote, "phase one prefiling communication," end quote, the second sentence that says, quote, "Even before the project was announced publicly or drew media attention, elected officials, business and community leaders, and economic development officials were provided with the project details, answers to their questions, and an understanding of the project benefits and impact," end quote?

MR. DICKINSON: Yes, I see that.

MS. CARUSO: Do you happen to recall when the project first drew media attention?

MR. DICKINSON: There was Hydro-Quebec -- when we're talking about this project specifically, not necessarily the wind ones which obviously go back multiple years, but the -- Hydro-Quebec first announced that they were going to have a project through wind -- through -- originally Hydro-Quebec only had announced one bidding partner which was Northern Pass. And I think it was in the spring of 2018 that they announced that they were actually going to have multiple bids, one through New Hampshire and one through Maine. At that point they didn't specifically designated us as the provider of the transmission services. And then as I noted in my earlier communication, we began to brief people on the project really kind of closer to the bid at the end of July.

MR. DES ROSIERS: Mr. Dickinson, in your answer you said 2018. Did you mean 2017?

MR. DICKINSON: Oh, yeah, thank you. 2017, thank you.

MS. CARUSO: So in that quote that we just read, I'm assuming that when it says elected officials, you refer to including people like mayors and selectmen and town managers. Is that correct?

MR. DICKINSON: Yeah, so again, the city of Lewiston would be an example. The Somerset County Commissioners, you know, the other towns that I mentioned all would be examples.

MS. CARUSO: Okay. And did you meet with these elected officials in each town along the route before you filed your application?

MR. DICKINSON: The towns that are listed -- so this is a complete list, I believe, of the formal meetings that we had, and the -- you know, you can see the meetings that -- between the end of 2000 -- you know, summer of 2016 through 2017.

MS. CARUSO: I can't see it but --

MR. DICKINSON: Oh, okay, all right.

MS. CARUSO: -- that's okay.

MR. DICKINSON: Yeah, and I think one -- go ahead, sorry.

MS. CARUSO: So those are the towns that you met with before, but why didn't you meet with all the towns?

MR. DICKINSON: I think our -- again, I think there's a balance of a number of factors. As I already mentioned, we have to be very careful to not tip our hand associated to the competitive nature of the bids that we're going into with -- you know, we had an idea there were going to be a lot of bids. Fifty-three was a pretty big number, and that it -- the more information you provide even an hour before a bid is due could change somebody's strategy associated with how they bid, balanced against a desire to get out there, as we laid out in phase one, and then we identified those key areas to have those contacts before the bid was submitted.

MS. CARUSO: So you chose to tell some towns beforehand, but you -- it was kind of a secret to other towns beforehand?

MR. DICKINSON: Yeah, there was no purposeful --

MR. DES ROSIERS: Objection. Can you define beforehand? What time period are you referring to?

MS. CARUSO: Before the application.

MR. DES ROSIERS: And by the application, you mean the application to the PUC?

MS. CARUSO: Right. So would you be surprised to learn that the very first time any CMP representative discussed NECEC with our selectboard in Caratunk was around on March 21st of 2018, around five months after you filed the CPCN application?

MR. DICKINSON: So I'm sorry, I thought there was a follow up to your earlier question. Could you repeat that again, please?

MS. CARUSO: Sure. Would you be surprised to learn that the very first time that any CMP representative discussed NECEC with the Caratunk selectboard was on March 21st of 2018 which was about five months after you filed the application?

MR. DICKINSON: I see that date on the data request. That's correct, March 21st.

MS. CARUSO: And would you accept my representation as the chair of the Caratunk selectboard that CMP's March 21st meeting or presentation was not much more than a relatively short pitch to request that Caratunk file a letter in support of the project?

MR. DICKINSON: I mean, I would -- I'm pretty familiar with the presentations that were used to provide information to the communities along the border where we were going. I wouldn't represent it the way you did, but I'm pretty -- I think I'm somewhat familiar with what that presentation looked like.

MR. STINNEFORD: But it's my understanding that each of the towns, including Caratunk, was offered to have additional presentations with additional information and we would follow up if that was desired. And in fact, I think in almost every town, we did follow up and had multiple meetings with town officials.

MS. CARUSO: With regards to Caratunk, do you recall that -- I believe that our first -- by the way, our first meeting was pretty short. It wasn't a special meeting. It was just part of our monthly selectmen meeting. So it wasn't like we had a separate meeting open to the public to discuss this project. I think you didn't expect to need much of our time if I recall correctly so --

MR. DES ROSIERS: I'm going to state an objection.

MS. CARUSO: -- that's why I asked that question.

MR. DES ROSIERS: This appears to be testimony as opposed to questioning of the witnesses.

MS. CARUSO: Well, I was just responding to what you said.

MR. TANNENBAUM: Okay, just proceed.

MS. CARUSO: Do you recall that while Caratunk filed a support letter after the March 21st meeting, we subsequently retracted our support once we became more educated about the project and that was submitted into the docket as a public comment at that time?

MR. DICKINSON: You know, subject to check, I will accept that.

MS. CARUSO: Okay. Would you also accept my representation that Mr. Carroll told the selectmen at the March 21st meeting that Caratunk would be included as a party in local mitigation discussions that were apparently underway?

MR. DICKINSON: I mean, my tendency is not to accept that as a precept. I would want to talk to Mr. Carroll myself and understand the nature of the dialogue that he had. I mean, again, our approach was to make ourself (sic) available, and every town along the corridor, as I understand it, every organized town we met with multiple times so -- and we're open to any request for any meeting anywhere. Something I think our whole outreach team was incredibly about is our ability to make ourselves available for people in the community to talk about the project.

MS. CARUSO: So as you have earlier testified that there was a lot of promise for community benefits with this mitigation package and that it was supposed to go towards the greater community and specifically it was stated from Caratunk to Parlin Pond. Is that correct?

MR. DICKINSON: Yeah, that's correct.

MS. CARUSO: Okay. And so would you accept that, as far as I'm saying it, the first time we heard about the MOU with Western Mountains & Rivers Corporation was after it had been executed, CMP did not request any input whatsoever from Caratunk, and Caratunk was not, in fact, included in the discussions leading up to the MOU?

MR. DICKINSON: Again, my perspective as I had answered earlier was that there was a great deal of outreach from the folks that were representing the community and Western Mountains & Rivers to the community about what was -- that there were discussions going on with CMP.

MS. CARUSO: So were there any elected officials from Caratunk that were a part of those discussions?

MR. DICKINSON: There were none that were directly in the meetings that I had, but my understanding were those conversations were -- not specifically necessarily that one but other ones were happening throughout the community.

MS. CARUSO: I'm not following.

MR. DICKINSON: So what I'm saying is that we encouraged, and my understanding are the people that we were in dialogue with, on numerous occasions, spent time outreaching into the community to discuss the nature of the discussions and the project that we were doing.

MS. CARUSO: So would it -- would you accept my representation again that the first time any elected official from the town of Caratunk, from selectmen to planning board members to any officer, we had never heard about the MOU until after Mr. Carroll told us that we would be a part of the process and Caratunk would be represented in the mitigation?

MR. DES ROSIERS: Objection to form, assumes facts not in evidence.

MS. CARUSO: I'm just asking if you would trust me that that's my understanding of it.

MR. STINNEFORD: We have no way of knowing your understanding. I'm sorry.

MR. TANNENBAUM: Eric or Thorn, are you --

MS. CARUSO: So if you --

MR. TANNENBAUM: Excuse me. So I think the question is are you aware or can you -- do you know whether any officer or elected official from Caratunk was informed of the MOU before it was finalized?

MR. DICKINSON: Well, I think what -- to answer your question is I don't have a way of knowing. I don't actually --

MS. CARUSO: Okay. Well, I'm not under oath, but I'm not -- I'm telling the truth about it.

MR. TANNENBAUM: Okay.

MS. CARUSO: And it's my understanding that The Forks -- the West Forks, the areas of this new part of the corridor, were not knowledgeable or a part of the representation on that board before it was signed.

MR. DES ROSIERS: I'll object to that --

MR. TANNENBAUM: And then --

MS. CARUSO: Is that your understanding as well?

MR. TANNENBAUM: Was that your understanding as well?

MR. DICKINSON: No, I -- you know, my belief was there was a significant understanding around the community that there was a dialogue going around about an MOU encouraged by our discussions and our goals of representing a mitigation package and an agreement that would provide benefits throughout the community.

MS. CARUSO: So you're saying it was up to other people? The other people on the MOU had to communicate that with the members of the community?

MR. DICKINSON: Well, I think there's -- I can think about all the trips I've made up to The Forks and sat around picnic tables and showed maps of people (sic) and talked about the project. Throughout this process, the outreach team has proactively reached out to every town. Throughout this process we've -- every time there's been a request for a meeting, we've made ourselves available, and it's something I'm incredibly proud of, the way we have managed the project. In addition to all that, we encouraged the members of the Western Mountains to reach out to the community to make sure that this represented a broad sense of what was happening. So not alone, but in addition to.

MS. CARUSO: I think it was maybe early to mid-March when several entities like the generators and the Renewable Energy Association intervened in opposition. Was it around then? Do you know?

MR. STINNEFORD: I don't know exactly when interventions were filed.

MS. CARUSO: At that time, were you more concerned that the docket might become more complicated or controversial because the interveners were participating in it?

MR. DICKINSON: I mean, we believe in this project.

We think this project provides significant benefits for Maine. And we put together a team, a project, and a filing that we're proud of, and I don't think we would have done it any different if there had been just two or three interveners or 30 or 40.

MS. CARUSO: Okay. I just didn't know if it was a coincidence that we were -- that the town of Caratunk was approached by Mr. Carroll after that or -- I don't know when CMP started to meet with officials in other towns to get letters of support in the local area of the new corridor.

MR. DICKINSON: Well, again, we -- an NRCM data request that I said, we listed all the formal meetings. So if you refer to that, you can see the, you know, two long pages of very small font set of meetings that we had over that period of time.

MS. CARUSO: Okay. The last bullet on page three of NECEC-9, it discusses that one of the objectives of prefiling a communications plan was to, quote, "build and maintain valuable relationships along the route." Then continuing on on the top of page four it says your additional objectives were to, quote, "identify and address issues of importance to key stakeholders and to use early input to develop the project worthy of expedited permitting." Do you see that?

MR. DICKINSON: Yes, I do.

MS. CARUSO: Okay. Since we didn't -- we weren't met with prior to the filing, and I suspect Caratunk wasn't the only town, do you think it was an effective execution of phase one of your communications plan?

MR. DICKINSON: Yes, I do.

MS. CARUSO: Okay. On the bottom of page four, it says -- there's a second bullet regarding the project brochure and some one pagers, and included in the pre-application communications it says, quote, "outline the NECEC in a clear and concise fashion and include a map as well highlights of the project benefits," end quote. And then on page five, the first bullet says, quote, "project maps." Is it fair to say that the property taxes were one of the primary benefits you were promoting in order to encourage support of local -- of elected officials?

MR. DICKINSON: Yeah, I think it was one of a key of -- a group of them, yes.

MS. CARUSO: Okay. And then on the first bullet on page five, you refer to an overview map which delineates the route and location of existing transmission-related infrastructure, and you refer to the route maps that depict the corridor on a town-by-town basis and include, quote, "geographical features such as water bodies," end quote. And the final sentence says that between the overview map and the route map you provide a full understanding of the project elements. Is that correct?

MR. DICKINSON: Yes, I see that.

MS. CARUSO: Okay. So does this imply that the map showing the general route, the existing transmission infrastructure, and water bodies provide a, quote, "full understanding of the project elements of NECEC"?

MR. DICKINSON: Yeah, I mean, we've developed numerous maps for numerous purposes throughout the process.

MS. CARUSO: Okay. So would you agree that things like the height of the proposed towers, the width of the corridor, the need to manage vegetation with herbicides, the crossing of streams and wetlands, and the need to address local fire control or emergency response requirements or the temporary -- potential temporary interruption of the use of snowmobile trails and other impacts to recreational resources, would they be project elements? None of which were discussed in our first meeting -- presentation at the town office.

MR. DICKINSON: I mean, the purpose of that --

MS. CARUSO: -- they were --

MR. DICKINSON: I'm sorry, go ahead. The purpose for the town meetings were to provide a comprehensive understanding of the project and then be available to questions. And, you know, to the degree that people had a specific question, we would do our best to get back and provide that information, but, you know, I can't imagine the size of a presentation. It would be at least a two-day long presentation if we went to every element that you described in the project. So the idea is we make ourself available, we listen to what people's concerns are, and we do our best to respond to those.

MS. CARUSO: Right. So do you think that the -- so you say that one of the goals of the pre-application communications was to, quote, "identify and address issues of importance to key stakeholders."

MR. DICKINSON: Yes.

MS. CARUSO: Since they weren't part of your initial target audience, is it fair to say you felt that the landowners, the guides who are using the area, and other residents of the affected communities were not the, quote, "key stakeholders"?

MR. DICKINSON: No, and I think, you know, again, there is a balance here before submitting a project on how much you can disclose about the project. What we did, and I think what we're very proud about in the way that we built this project, is to utilize most of it through an existing corridor and then to -- largely through two private landowners that currently log the land, utilize, site, the project at that location. Now in our conversations and in our own analysis we identified some areas that we knew would be a specific concern, Moxie Lake, Appalachian Trail crossing, the Kennebec River. And we actually modified some of our plans in order to mitigate those impacts after speaking with people in the community about those areas.

MS. CARUSO: So it was my understanding that one of the groups opposing this is the landowners on Moxie Lake. Did you meet with the -- those camp owners, the associations that are along Moxie Lake?

MR. DICKINSON: Yes, I met with them.

MS. CARUSO: Before this and before the mitigation?

MR. DICKINSON: Well, we modified -- based on our own analysis, we reduced the pole size along the -- there's a transmission corridor that parallels Moxie Lake with an existing 115 structure in it, and when we first designed the line, we imagined having 95-foot poles, monopoles, in that structure. And both of our own understanding, our own outreach team, and conversations with the public, we believe that by reducing the pole size to 75 feet, even though it costs more money for us, it meant more structures, more pieces in there, we actually brought the pole size down to the -- similar as the topography in the area so those camp owners on the opposite side of the lake would not see the structures. So that would be, you know, an example where we -- you know, both our own knowledge of our outreach team which involved people that know Maine very well, our conversations with people in the public, and then we made a modification to our project to incur additional cost in order to mitigate the visual impacts of the -- of that project.

MS. CARUSO: So -- but you didn't meet with the Moxie landowners before you filed and, given the fact that they sent a letter of opposition, apparently the lower tower height didn't get them to support the project. Did you offer to bury the line there?

MR. DICKINSON: No.

MS. CARUSO: Would you agree that a broader public outreach -- you know, just given the fact of all the public comments that have been posted on the PUC site, that perhaps a broader public outreach at the beginning of the process might have allowed CMP to develop a better understanding about the issues of concern in the various communities before you finalized the application or --

MR. DICKINSON: I -- you know, my own feeling is I'm incredibly proud of the outreach team that we brought to bear here. It's not one or two people. We have a, you know, large group of people, both internal and external, some with years of experience in siting projects and understanding the issues that get raised. I can't point to a specific thing that we would do differently. I mean, obviously we believe the project is a good one. We believe that the benefits are real, and obviously we've gone through that in extensive detail in this proceeding. And unfortunately there are people that are -- for whatever purpose and reason, don't see it the same way. Obviously that's up to everyone to weigh the benefits here. But, no, I'm incredibly proud of the outreach team and the efforts that they've done on this project.

MS. CARUSO: Well, that's good. So do you think that anything could have been done different to eliminate the huge public backlash of the six or 700 comments of opposition, the different organizations, and the towns that are rescinding their support?

MR. STINNEFORD: I would say, you know, that just has to be kept in perspective. I think it's still in excess of 90, 95 percent of the communities along the corridor are still supporting the project. It's a small minority of communities that are not. And, yes, there are several hundred individuals who have filed comments and organizations that have filed comments against the project, but I think a project of this scale and this magnitude, you have to anticipate that there's going to be some level of opposition.

MS. CARUSO: Okay. Did CMP at that time think it might have been harder to show NECEC was worthy of expedited permitting if they started having more broader public outreach? You know, information sessions instead of talking to just a targeted audience?

MR. DICKINSON: I'm sorry, I'm not sure I --

MS. CARUSO: What is expedited permitting in your opinion?

MR. STINNEFORD: Well, I think it's been our experience that the permitting process, for example, this process that we're in today, although it has the possibility as we've seen in the past, to run on for years on some projects, I think to the extent that we hold this project to its current schedule, we would consider that to be expedited relative to history.

MS. CARUSO: But the PUC regulations say that there's -- that is has to be decided within a certain amount of time. So you're kind of limited on that, correct?

MR. STINNEFORD: That time is routinely extended.

MR. DES ROSIERS: Someday I'm going to get one done in that time.

MR. TANNENBAUM: Don't count on it.

MS. CARUSO: Have you ever asked the affected communities whether the very rural areas like in Somerset County, like the area of the new corridor, if they logistically can provide accommodations for such a large construction work force or whether they have adequate fire and other emergency response resources to deal with, you know, potential project-related hazards during the construction and the operation?

MR. DICKINSON: I mean, the -- our -- I mean, we have a great deal of experience in managing these types of projects and understanding the communities that we host them within. And those are conversations that, yeah, there were times where that came up in our dialogue, and I would expect that if this project continues to go forward, there will be continued coordination and efforts along that front.

MS. CARUSO: But just I guess (indiscernible) answer, did you ask the affected communities whether or not they could accommodate such a large construction workforce or if they had the fire and emergency response resources to handle it?

MR. DICKINSON: So the -- I don't think -- I think the simple answer is no. Obviously we've done an analysis over the employment that will be required in order to get the project done through the work at the University of Southern Maine.

MR. STINNEFORD: And I would just say that, you know, setting aside the issues you raised around public safety which I acknowledge, one community's challenge is another's opportunity. I mean, to the extent that this construction process is going to inject a great deal of economic value into the community, I think many view that as a positive.

MS. CARUSO: So have you spoken with, for example, you know, the towns of Jackman or West Forks, The Forks, or Caratunk to see if they had accommodations to -- that were available, aside from their tourist accommodations, like the hotels that are hosting the tourists that come to the area, do they have an excessive amount of rooms available? Do they have fire departments? Do they have emergency resources to support this kind of construction project?

MR. DICKINSON: Yeah, I mean, we continue to be in dialogue in the specific example of Jackman. I was just up there a few weeks ago, and we were talking about some of the topics that you mentioned. So, yeah, I think it's -- in our view it's an ongoing dialogue that will continue to happen in the towns to make sure that we provide the most value we can related to the project with having the least impact.

MS. CARUSO: Right. But have you ever built such a large project in Somerset County? An area like this that is not really inhabited? Do you really know if there's enough resources or not to support this construction? Or the operation of the line once it's up in terms of fire and emergency? You don't really know right now, right?

MR. STINNEFORD: You asked about four questions there, and I haven't had a chance to answer any of them yet. Yes, we have built projects in Somerset County, not in this specific area. We have built projects in areas that are equally remote and have not encountered problems with the housing and lodging, feeding of construction crews. We've managed to work those issues out in areas that are equally remote. But in terms of, you know, have we had conversations with those municipalities around the public safety issues that you've raised, I think Thorn has addressed that question.

MR. DICKINSON: And then from an operations perspective, you know, we have thousands of miles of distribution and transmission system throughout Maine. So, you know, the --

MS. CARUSO: Well, I'm only asking this because I hear the communities themselves are expressing real concerns that they don't have the housing or the fire should there be fires like what happened in California. So what the question is is have you addressed these concerns beforehand? And do you know that, should there be fires like that, that there is a response crew in the location that's there? Do you know if there's -- for example, do you know if they have five departments? Are they volunteer fire departments? Is there an ambulance service? Is there a hospital there?

MR. STINNEFORD: We have transmission lines that traverse areas of Maine that have -- are equally remote, if not more remote, than what we're talking about in this corridor through many unorganized townships that have no fire departments, no public safety resources. So it's not a new issue. It's an issue that we're accustomed to.

MS. CARUSO: Okay, moving on to tab four, you'll see that the first page from the printout -- is a printout from a January 2nd post on Facebook that invites people to visit a specific portion of the website, the NECEC website, if they want to find out more information about how the project affects their community. Do you see that?

MR. DICKINSON: Yeah.

MS. CARUSO: And then there's a link that takes visitors to the map on the website where people can click on individual towns, and here you'll see a relevant page for Caratunk. At the bottom of the second page on tab four, there's an estimate of the new tax revenue Caratunk will receive in one year -- in year one. And there's an asterisk that refers to a sort of disclaimer on the following page that says it's an estimate based on the 2017 preliminary design and it is subject to change. Do you see that?

MR. STINNEFORD: Yes.

MS. CARUSO: So your tax estimates were performed by the Maine Center for Business & Economic Research. Is that correct?

MR. STINNEFORD: That's correct.

MS. CARUSO: And as I understand it, the total estimated property taxes are approximately 18 million per year. Is that correct?

MR. STINNEFORD: Yes.

MS. CARUSO: And the process that they developed -- they used to develop the $18 million estimate was the same that Daymark used as an assumption in how they modeled the overall economic impacts. Is that true?

MR. STINNEFORD: Well, I think both Daymark and Mr. Wallace will be testifying later in this proceeding. I'd probably ask them directly.

MS. CARUSO: So if the numbers -- but this was to say if the numbers are lower -- if the actual number is lower than their estimate, would that mean that Daymark had over estimated the economic benefits?

MR. STINNEFORD: Or if the taxes end up being higher, then they have under estimated the benefits. That's correct.

MS. CARUSO: Okay. Are you familiar with the sworn testimony during the public witness hearings from the tax assessor for the town of Caratunk and other towns, Mr. Garnett Robinson?

MR. STINNEFORD: I'm generally aware of the testimony, not the details.

MS. CARUSO: Okay. Are you aware that, you know, in his professional experience, he works as an assessor for various other towns throughout the state and towns also in which CMP has recently built large transmission projects?

MR. STINNEFORD: Was there a question there?

MS. CARUSO: Are you aware of that?

MR. STINNEFORD: Yes.

MS. CARUSO: Okay. Do you recall that he provided specific examples of how CMP had tax declarations and lower tax payments -- under-reported tax declarations and lower tax payments than the initial revenue projections which had been provided to those towns during the development or permitting stage of the projects?

MR. STINNEFORD: Yeah, I think one of the things that happened, particularly -- and I think most of these issues have arisen as -- around the Maine Power Reliability Program, the MPRP project. And I think what happened in those instances was the property tax projections were calculated based on the specific investment to be made in each community and assumed that that value would be assessed at its installed cost effectively, at least in the initial year. What it didn't take into account is the way that Maine Revenue Service handles the assessment of transmission line. It's unique. It's somewhat complex. But in general terms, transmission lines are assessed on an average unitized basis by voltage class. So, for example, all of CMP's 345,000 volt transmission facilities are all assessed at the same average value per mile based on an initial investment, less 30 percent depreciation, and then that value is fixed. And then all transmission across our -- across the state is assessed on that same average value basis. So the result of that was that some communities that had significant transmission line investment from MPRP did not see the full benefit of that property tax assessment in their community, but conversely, there were many other town who did not host any of the project that saw an increase in the assessed value. Now, in the case of the NECEC project, we'll see a significantly diminished impact of that methodology because NECEC's costs will have to be fully segregated from CMP's other transmission costs. The DC corridor will be separately assessed, separately costed and assessed. So the full assessed -- assessment impact of those facilities will be realized in the host communities where it's located. It still will be subject to this fixed 70 percent depreciated value calculation, but it will not be, in effect, socialized across other communities.

MR. TANNENBAUM: Okay. We have a follow up.

MR. WILLIAMSON: Eric, I have a question. To what extent does CMP face payments in lieu of taxes in towns as opposed to assessed valuations and so forth? I mean, it is used in some states and some other jurisdictions.

MR. STINNEFORD: Yeah, I'm not aware of any of the host communities for this project where that will be the case.

MR. WILLIAMSON: Okay.

MR. TANNENBAUM: Hold on, Elizabeth.

MS. CARUSO: So --

MR. TANNENBAUM: Yeah, Elizabeth, hold on. We -- the bench has another follow up. Go ahead, Chris.

MS. COOK: So just so I understand what you just said, Eric, does that mean that the $18 million of property tax value is actually only going to be 70 percent of that?

MR. STINNEFORD: It's not as simple as that, unfortunately. The initial property tax assessments that had been done that I believe fed into both Ryan Wallace's work and Daymark's I believe assumed that they -- that property would be depreciated over time and its assessed value would depreciate over time. So that analysis probably overstated the assessed value on the front end but understated it on the back end because the 70 percent is fixed through time. You know, the decision under this Maine Revenue Service bulletin that we subscribe to was done as a simplification. You know, rather than tracking actual depreciation on every asset through time, this was a simplified way to establish a fair assessed value, but it is fixed.

MS. COOK: So do you have a view right now as to whether what Daymark and Mr. Wallace have done is an over estimate or an under estimate?

MR. STINNEFORD: I think there are many assumptions in that analysis. You know, we assumed it was based on current mil rates, for example. There was no escalation of mil rates so -- there are other assumptions that would probably push that in the other direction if we were to adjust for this methodology.

MS. COOK: Okay, thank you.

MR. TANNENBAUM: Okay. Elizabeth, please continue.

MS. CARUSO: Okay. So, for example, what you're saying is that 100,487 for Caratunk is really split to some extent between the town and the state?

MR. STINNEFORD: No. The --

MS. CARUSO: So -- go ahead.

MR. STINNEFORD: No, I mean, the process I described is the process by which CMP comes up with an assessed value for transmission lines. So we will calculate the assessed value using that methodology, report that to the town of Caratunk, and that will be the basis for Caratunk's issuance of a property tax bill to CMP.

MS. CARUSO: So do you see the concern, though, that towns have when CMP comes in order to get a permit and they have a wonderful revenue projection for the town who issues the permit, and then when it comes down to it, the permit actually is about, you know, 17 or 30 percent or something far less than what they expected? Do you see that concern for town assessors and selectmen?

MR. STINNEFORD: Well, I can understand the concern, yes.

MS. CARUSO: And do you think that there's a difference between the tax treatment for an ETU versus a rate-based utility asset?

MR. STINNEFORD: They're all rate-based assets. I mean, the purpose of this assessment methodology is to recognize that fact that, unlike many other classes of property, transmission line assets, their ability to earn is based on their depreciated book value. And that's no different whether it is a rate-based reliability transmission line or an ETU that is recovering its revenue through some other tariff.

MS. CARUSO: So if this -- you know, as a for-profit project, if the actual revenue performance is less than projected once it's in operation, wouldn't we expect the property value of the line to drop?

MR. STINNEFORD: We might argue for that, but that's not the methodology that Maine Revenue Service prescribes.

MS. CARUSO: Well, are you familiar with the wind farm in Bingham and the unorganized territory where, just within two years ago, they put it up, they -- and then within two years, their performance dropped significantly, they were filing for abatements, and want to sue the town for their tax bill?

MR. STINNEFORD: You're talking about the assessment of a generation project, not a transmission line who recovers its revenues through a completely different mechanism.

MS. CARUSO: But it's still a for-profit project, and if it doesn't -- part of the assessing -- part of the components for assessing is based on the performance of that business component of that line. And at some point, CMP could say, well, we're not really producing what we expected to be producing, we're not entering the market, it's really not -- it's not as valuable as we thought it would be and we don't want to pay these taxes.

MR. STINNEFORD: Yeah, again, transmission lines are not assessed based on their market value. Unlike generation projects, paper mills, other types of property, transmission lines are uniquely assessed based on the methodology that I've described. It's not based on value. Market value I should say.

MS. CARUSO: But your earnings are locked in by the PPA, is that right, and -- per the 20-year contract?

MR. STINNEFORD: Forty-year contracts, yes.

MS. CARUSO: Okay. And you recover your revenue as well?

MR. STINNEFORD: Yes, independent --

MS. CARUSO: -- that?

MR. STINNEFORD: Yes, we do.

MS. CARUSO: Okay. So are you aware that when selectboards and town assessors review the tax impact of any new development, we also consider the potential offsetting impacts to existing property values?

MR. STINNEFORD: I'm not aware of that, no.

MS. CARUSO: Okay, so we need to look at -- so you don't know if the value from MCBER included any offsetting impacts that the towns have to assess?

MR. DES ROSIERS: I'm going to object and indicate that Mr. Wallace of the Maine Center will be testifying on Friday and can be a much better witness to answer that question.

MR. TANNENBAUM: Eric, do you an opinion one way --

MR. STINNEFORD: I do not. I mean, I don't believe he factored that into his analysis, but that's something he should confirm.

MR. TANNENBAUM: Okay. Sustained.

MS. CARUSO: At the bottom of the first page of the website printout provides information that Caratunk is in Somerset County, provides the distance that the corridor will travel through Caratunk, and provides the estimated new tax revenue. Do you see that?

MR. STINNEFORD: Yes.

MS. CARUSO: And then the next page has four bullets of additional benefits. Is that right?

MR. STINNEFORD: Yes.

MS. CARUSO: So -- and then are there any other information on the Caratunk page?

MR. STINNEFORD: Again, I don't know. This -- we did not produce this so I'm not sure whether there was other information that was not included or not.

MS. CARUSO: No, that's it. So when someone follows the link for more information about NECEC in their community, this is what they get, assuming we didn't leave any pages out, correct?

MR. STINNEFORD: Yeah, I'm not sure whether there is additional information for other communities or if they're all the same. I don't know.

MS. CARUSO: Well, at least for Caratunk. So will --

on this issue, will CMP -- so CMP can't make a firm commitment that they'll actually pay the estimated amount that is being published as part of the company's efforts to solicit local support. You're saying you can't make a firm commitment that you will definitely be paying this?

MR. STINNEFORD: No.

MR. DES ROSIERS: In paying the "this," is "this" referring to the tax amount?

MS. CARUSO: Yes.

MR. STINNEFORD: As the footnote says, we will not know the actual assessed value until we know the actual cost of the project. This is all based on estimated project cost.

MS. CARUSO: Uh-huh. Okay, the next document, tab four, is a filing that was made at FERC on August 20th, 2018. I assume you're familiar with this.

MR. STINNEFORD: Yes.

MS. CARUSO: The pages are from Exhibit 3-1, Schedule 1. I understand it -- the way I understand it, this is analysis CMP provided to FERC as part of a proceeding where FERC would approve the rate of return under your transmission contracts for NECEC.

MR. STINNEFORD: No.

MS. CARUSO: Is that right?

MR. STINNEFORD: No, that's not correct.

MS. CARUSO: It's not?

MR. STINNEFORD: We were filing approval of the transmission service agreements, not specifically a rate of return but the terms and conditions of the entire agreements.

MS. CARUSO: Okay. On line 18 of each page you provide a number for property tax expense under the category Revenue Requirements. And in year one of the project it says you expect to incur 20.533 million in property tax expense. And it looks like that stays relatively consistent over the first 20 years of the project. Is that true?

MR. STINNEFORD: That is what this indicates, yes.

MS. CARUSO: Okay.

MR. STINNEFORD: I believe it is --

MS. CARUSO: Was this estimate also provided by MCBER?

MR. STINNEFORD: No, it was not. This is based on assumptions that were in a different financial model, and, again, it's -- it was based on an estimate of the initial cost and assessed value. I don't even know if the assumed mil rates in that analysis were -- equivalent to the analysis that was used by Mr. Wallace.

MS. CARUSO: Okay, so I guess you can understand my confusion because on one hand we -- there's 18 million that has been touted as one of the major economic benefits of the project, and then we have our professional tax assessor who testified under oath that CMP often pays much less than the initial estimate and then we have this estimate to FERC which is more than 20 million. So it's hard to know which it is, you understand?

MR. STINNEFORD: I think that just points to the challenges of estimating future property taxes.

MS. CARUSO: Okay.

MR. STINNEFORD: I'm assuming that the communities would not be upset if we -- turned out our estimate of 20 million was correct.

MS. CARUSO: Just a minute, please. Okay. Well, thank you for your interpretation. This is something that, you know, the public needs to know because it's the outreach that we are receiving that we want to be able to understand it and be confident in it. Okay, moving on to tab five, this is an article published on December 12th in the Times Record which reports on a public information meeting that was held in the town of Durham. Do you see that?

MR. DICKINSON: Yes.

MR. STINNEFORD: Yes.

MS. CARUSO: Okay. So I just want to point out that this was a meeting organized and hosted by NRCM, and I was in attendance and also spokesperson for Avangrid, John Carroll, attended. On the seventh paragraph on the second page of the article toward the bottom, I'll read a quote. It says, that CMP representative John Carroll called the opposition, quote, "bizarre and shameful, lamenting that instead of seeing Hydro-Quebec as a leader in the clean energy movement," he said we -- quote, "we are immediately suspicious," end quote. And I assume by "we" he means project opponents. Do you see that statement?

MR. STINNEFORD: I see the statement, yes.

MS. CARUSO: Okay. So do you think it's helpful for the project spokesman to accuse or insult stakeholders like that?

MR. DES ROSIERS: I'm going to object to the use of a newspaper article for this purpose. I believe we've excluded a whole bunch of other press articles, and to ascribe -- to use it in this purpose is inappropriate and calls for hearsay and assumes facts not in evidence.

MR. TANNENBAUM: Well, I think the -- go ahead and allow the question on the assumption or hypothetical that Mr. Carroll did say those things, but I will restrict lengthy questions regarding a newspaper article. So you can respond.

MS. CARUSO: Okay.

MR. STINNEFORD: Yeah, I don't think any of us here were present at that meeting so I have no understanding of the context in which these partial quotes were made. So I can't offer an opinion on whether Mr. Carroll's intent here was to be insulting or whether he was expressing his view on an issue that's critical to the project. I think it's very difficult to make any kind of assessment with this very limited context.

MS. CARUSO: Okay. Do you know if CMP has any kind of code of conduct with -- or other employee communications policies governing whether or not -- you know, how CMP representatives comment?

MR. STINNEFORD: We have general codes of conduct. I don't know whether the -- our corporate communications group has a specific code of conduct as you've described it. I don't know.

MS. CARUSO: Okay. There was also a radio interview on December 12th on WVOM with Mr. Carroll, and there -- did you know that -- did you listen to it?

MR. STINNEFORD: I have not, no.

MS. CARUSO: He referred to people who disagree with CMP's projected benefits as being --

MR. DES ROSIERS: I really object to this one because we don't even have a document with a transcript for this radio. So there's no basis for the question in the record.

MR. TANNENBAUM: Okay, that objection's sustained.

MS. CARUSO: Okay. So my concern is and the concern of other residents --

MR. DES ROSIERS: I'm going to that too, assumes facts not in evidence.

MR. TANNENBAUM: Go ahead and proceed.

MS. CARUSO: We're wondering if, because towns have come out in opposition to the project, if CMP will be kind of -- with regards to delivering our electricity, with regards to outages, if they would be retaliating against the towns who are in opposition.

MR. STINNEFORD: I'm sorry, was that a question?

MS. CARUSO: Yes.

MR. STINNEFORD: No, CMP does -- will not retaliate against any community for any reason.

MS. CARUSO: So we shouldn't have a problem with the electricity being delivered, the outages, the workings of the distribution of electricity in our towns because towns have come out against the project?

MR. STINNEFORD: No, we have statutory and regulatory obligations to provide service to all communities, and, you know, a community's position with respect to this project is not going to affect that.

MS. CARUSO: So assuming Mr. Carroll's comments are correct, this does not represent CMP's corporate view towards its stakeholders?

MR. STINNEFORD: Again, I'm not sure what comments you're referring to.

MS. CARUSO: Well, the ones that were already objected to.

MR. DES ROSIERS: I'll repeat my objection.

MR. TANNENBAUM: Yes, as far as the radio goes, we don't know what Mr. Carroll said. And as far as the newspaper goes, there is a lot of question regarding exactly what somebody might have meant in a quote in a newspaper which is why we don't allow newspapers into the record.

MS. CARUSO: Okay, very good. Thank you. Moving on to tab six, this includes pages 26 and 27 from the CPCN application where we discuss municipal permitting requirements. Do you see that?

MR. STINNEFORD: Yes.

MS. CARUSO: On line five of page 26, you cite the requirements of the statute which require the project developer to provide municipal offices with maps of the project. Is that correct?

MR. STINNEFORD: Yes.

MS. CARUSO: And I believe the application says that you distributed maps via certified mail prior to submitting the application. Is that correct?

MR. STINNEFORD: Yes.

MS. CARUSO: Are there any other statutory or regulatory compliance requirements or Commission policies related to public outreach that is applicable to NECEC or is it pretty much entirely your discretion?

MR. STINNEFORD: No, there are other requirements, to notify abutting landowners, for example,

MS. CARUSO: Okay. On page 26, line nine, there's a discussion that continues to page 27, and it talks about the need for NECEC to address municipal jurisdictional issues and local land use ordinances. And on line three of page 27, there's a statement that says, quote, "CMP anticipates all required local approvals will be obtained by mid-2019," end quote. Is that still what you anticipate given project delays and such?

MR. ESCUDERO: The current expectation is that we will initiate the local approvals early this year and that the (indiscernible) will go through early '22, 2022 is the current plan.

MS. CARUSO: Okay. Do you plan to initiate local permitting before or after the Commission issues its decision?

MR. ESCUDERO: Well, I haven't seen the detailed plans yet. We just got it developed at the end of 2018 so I cannot provide an answer to that.

MR. STINNEFORD: I think, you know, each municipal permitting requirements are different in terms -- you know, some may have more substantial permitting requirements that have longer lead times. Others are fairly perfunctory. And there are other considerations, such as the time that is allowed between the issuance of a permit and the time that construction must begin. So all of that feeds into the scheduling of local permitting, and it will be different for different communities and will be driven, in large part, by the construction schedule for the project.

MS. CARUSO: Okay. On page 27, line nine, it says that, quote, "In the unlikely event a municipal ordinance severely restricts or prohibits construction of the project, CMP will pursue an amendment of the applicable ordinance," end quote. Then it goes on to say that if that doesn't work -- and this is a quote from the CPCN application -- quote, "CMP will petition the Commission under applicable Maine law for appropriate redress to permit approval and construction of the project." And then there's a footnote that states the relevant statutory language. Do you agree?

MR. STINNEFORD: I agree that's what it says, yes.

MS. CARUSO: Okay. At this point, do you expect you'll have to submit any petitions for a municipal permit exemption?

MR. STINNEFORD: It's -- at this stage, we don't know yet.

MS. CARUSO: Okay. Is it a fair summary to say that the way the process works is that CMP has to make best efforts to obtain any and all local permits, but if it fails to obtain one or more, they can and will ask the Commission to give them an exemption?

MR. STINNEFORD: I -- that's a very broad summarization, but I think it's a fair one.

MS. CARUSO: Okay. Is it fair to use the word pre-emption to describe a situation where a state agency exempts a project developer from an otherwise applicable local land use requirement?

MR. DES ROSIERS: Objection, calls for a legal conclusion.

MR. TANNENBAUM: Sustained.

MS. CARUSO: So for an elective transmission upgrade or a for-profit project as this is that's not being developed but was -- is for a for-profit investment for a company, would an exemption be a -- something that would be pursued if there were -- if it was missing a permit to continue?

MR. STINNEFORD: I guess I still struggle with your characterization of -- distinguishing this as a for-profit investment. Any investment that the utility makes will earn a profit hopefully. There really is nothing that distinguishes this project with respect to profitability from any other investment the company would make. I think what you're asking is an ETU. That is distinguishable. And as far as we're concerned, its status as an ETU as opposed to some other form of transmission upgrade under the ISO New England tariff would not make a difference in terms of whether or not it would require or result in us seeking an exemption from the Commission over a local permitting issue.

MS. CARUSO: Okay. Has the Commission ever been asked to approve an elective transmission upgrade over is NECEC the first one?

MR. STINNEFORD: To my knowledge, there has not been one in Maine.

MS. CARUSO: So are non-utility energy developers who may want to invest in things like solar or wind farms, are they eligible for any exemptions from municipal land use requirements?

MR. STINNEFORD: You're asking for my legal opinion?

MR. DES ROSIERS: I'm going to object on legal --

MS. CARUSO: What is your understanding, yes.

MR. DES ROSIERS: I'm going to object on legal grounds. But I will state that to the extent such a developer were building a transmission line, they would be entitled to seek an exemption.

MS. CARUSO: Okay. If you are unable to obtain any of the local permits, when would the Commission -- or when should the Commission expect you to file a pre-emption petition that seeks appropriate redress?

MR. DES ROSIERS: Objection --

MR. TANNENBAUM: Objection sustained on the question using the term pre-emption. Otherwise, Eric, you can answer if you heard the question.

MR. STINNEFORD: Well, I think I did. I think, you know, as you summarized before, we have to make good-faith efforts to achieve local permitting through the normal means.

If we are unsuccessful either in achieving a required amendment to a local ordinance or achieving a local permit, it would be at that time that we would petition the Commission for an exemption.

MS. CARUSO: So, you know, you're aware that Caratunk has rescinded initial support, and are you also aware that other communities have held town-wide votes and some formally oppose the approval of NECEC?

MR. STINNEFORD: I'm generally aware of that, yes.

MS. CARUSO: Okay. Is it your view that the Commission has the authority to grant an exemption from local permitting requirements in communities that have voted against, formally, the project?

MR. DES ROSIERS: Calls for a legal conclusion. Objection.

MR. TANNENBAUM: Sustained.

MS. CARUSO: Are you aware that the town of Caratunk currently has an electric transmission line moratorium in place?

MR. STINNEFORD: I am.

MS. CARUSO: Do you believe that the Commission could give an exemption for a town that has a moratorium in place?

MR. DES ROSIERS: Objection, calls for a legal conclusion.

MR. TANNENBAUM: Sustained.

MS. CARUSO: Would CMP ask for an exemption from the Commission for towns that are not -- for towns that, for example, have a moratorium or an ordinance that would not issue CMP the permit for this?

MR. STINNEFORD: I think those circumstances will have to be addressed on a case-by-case basis. I can't answer that in the abstract. We have to assess, you know, what our alternatives are in each one of those municipalities where we encounter those circumstances.

MS. CARUSO: But you wouldn't agree not to.

MR. STINNEFORD: I'm sorting out the double negatives there. I think that's correct, we would not agree not to.

MR. TANNENBAUM: Elizabeth, can I ask how much more time you have? You're going to significantly --

MS. CARUSO: Yes. Just a couple more and then I'm done.

MR. TANNENBAUM: Okay, proceed.

MS. CARUSO: I understand that CMP has all the land rights it needs to build the project as currently proposed. Am I correct that the issuance of the CPCN would let CMP use the power of eminent domain for NECEC?

MR. DES ROSIERS: Calls for a legal conclusion.

MR. TANNENBAUM: Sustained.

MS. CARUSO: Well, would CMP need to come to the Commission if it wanted to use eminent domain?

MR. DES ROSIERS: Objection, calls for a legal conclusion as a matter of --

MS. CARUSO: Would you agree not to use eminent domain?

MR. STINNEFORD: We can't do that sitting here today not knowing what circumstances we might encounter in the future, but as we said, for this project as it stands now, we have all of the land rights that we require to build the project. So it would not be necessary under the current circumstances.

MS. CARUSO: So you wouldn't seek the PUC -- you wouldn't -- so you wouldn't use eminent domain if you had to or you wouldn't seek the PUC exemption if you had to, as of right now?

MR. TANNENBAUM: I don't think that's -- that was the answer. The answer was they have land rights so they don't anticipate needing to use eminent domain, but if eminent domain was required, I think Eric's answer was he can't commit to not doing it.

MR. STINNEFORD: That's correct.

MS. CARUSO: Okay. I think we're all set. Thank you very much for your time. I have no further questions.

MR. TANNENBAUM: Okay. Sue?

MS. ELY: Thank you. Sue Ely, Natural Resources Council of Maine. I have just a couple of questions, and apologies to Eric and Mr. Escudero, I think they're mostly for Thorn. But if anyone else on the panel has an answer, by all means, feel free to answer. But, Mr. Dickinson, earlier when you were answering questions from Attorney Shope, you -- I think it was Mr. Shope's questions -- you were talking about speaking to a bunch of people who are bilingual to help translate Hydro-Quebec documents. Do you recall that conversation? It was --

MR. DICKINSON: Yes.

MS. ELY: Okay. Do you recall who those people where?

MR. DICKINSON: Yeah, I -- essentially Hydro-Quebec employees that could speak English.

MS. ELY: Okay. You also -- during --

MR. DES ROSIERS: Most of them do that very well.

MS. ELY: I know, if only it were a different province that didn't have quite a strong leaning towards French, this wouldn't be such a complicated proceeding maybe. There -- you also mentioned that you had to rely on publicly-available data when compiling your rebuttal testimony about the greenhouse gas implications and reservoir levels. Is that correct?

MR. DICKINSON: Correct.

MS. ELY: And I was wondering if you could elaborate on why you had to rely on publicly-available data.

MR. DICKINSON: Well, probably a better way to say it is that was the methodology that I did for putting together the rebuttal testimony. So the plan was for me to address the issues that were prior -- in prior testimony, and I pursued publicly-available information to put that information together.

MS. ELY: You relied on publicly-available data, yet you had access to Hydro-Quebec employees. Is that correct?

MR. DICKINSON: Yeah, I would -- so Hydro-Quebec employees both, you know, made sure I wasn't making fatal flaws associated with how I were to look at it and, if I was struggling to find a specific reference to publicly-available information, they would point me in the right direction.

MS. ELY: What was the purpose in -- if you had access to Hydro-Quebec employees, what was the purpose of only relying on information that was publicly available?

MR. DICKINSON: I mean, I guess in my perspective, that made it much easier in providing the information in the testimony. So by that means, I could put the information out there and show -- I mean, the -- and stepping back just maybe a little on the purpose for the analysis, the --

MS. ELY: I'm sorry, I just want to know if you had access to an employee who could give you information, why, if they could give you sort of the potential to have real-time information about Hydro-Quebec's system, would you rely only on public information?

MR. DICKINSON: For purposes of this specific representation, the goal was to provide a representation of the perspective of their ability to me and define this as incremental energy as an issue that was brought up by a number of environmental NGOs in my discussions with them and to do it in a way that allowed us to share that with everybody. So I never pursued confidential information. I mean, I never asked a question for confidential information. The goal was always to develop a model based on publicly-available data.

MS. ELY: Okay. So then I want to ask you, the document that you provided, well, CMP provided in response to a data request by Ms. Kelly was an email from Hydro-Quebec, and I guess it's a different approach is to get Hydro-Quebec to write an email responding to a data request. Was there no publicly-available information that would make that point --

MR. DES ROSIERS: Objection to --

MS. ELY: -- in the data request?

MR. DES ROSIERS: Objection to form. I'm not sure what you're referring to by an email.

MS. ELY: Sorry, thank you. The email that was the response to Dot Kelly's data request 004-001 that we have been discussing earlier today.

MR. STINNEFORD: So I believe that was a letter, not an email.

MR. SHOPE: I think it's the letter of December 14 from Bergervin to which I was referring earlier.

MS. ELY: I'm sorry. Yes, it is a letter, sorry.

MR. DICKINSON: So again, I'm sorry, I lost the question in there.

MS. ELY: That's fine. I'm sure that my muddled delivery did not help. The -- I'll try it one more time. So why, for responding to Dot Kelly's data request marked 004-001, did you -- did CMP include a letter drafted by Hydro-Quebec as opposed to publicly-available information?

MR. DICKINSON: So the method that we -- when we received the data request, we forwarded it on to Hydro-Quebec and Hydro-Quebec responded with the letter that they provided. So that was the method by which we responded to Dot Kelly's data request.

MS. ELY: Okay.

MR. STINNEFORD: I would just say specifically there is no public source for this specific information that was requested which is why we addressed it directly to them.

MS. ELY: Okay. When you responded, did Hydro-Quebec -- when you asked this question of Hydro-Quebec, did they respond with any additional information besides the letter?

MR. DICKINSON: I mean, as I had said earlier in my testimony, not only did this data response get responded to, but we also had meetings with the Portland Press, we had meetings with the Boston Globe. The outreach team also met with a number of other papers and had discussions, and I think in those context of discussions that, you know, other conversations happened, other information, videos on -- showing the water actually spilling, other things like that were exchanged.

MS. ELY: Were those conversations in an attempt to answer Ms. Kelly's data request?

MR. DICKINSON: Oh, no, I'm sorry, no.

MS. ELY: Okay.

MR. STINNEFORD: We did have other telephonic conversations with the author of this letter and other HQ employees to get further clarity round this.

MS. ELY: But they didn't provide you any underlying data to support the letter? I'll phrase it as a question. Did they provide you underlying data to support the letter?

MR. STINNEFORD: I wouldn't say they provided us data. They did provide us with clarifying explanation and information. For example, earlier today we talked about the ordinary spillage that would occur in the Hydro-Quebec system to address environmental permitting restrictions, hydrologic conditions, the normal seasonal spillage that occurs on their system. In those conversations, they clarified that that is in the range of four to five terawatt hours a year pretty consistently through history and that the numbers that are reflected in this letter are incremental above that four to five terawatt hours that would ordinarily be spilled. So, you know, we did have those types of clarifying conversations with them, but they did not provide us, you know, supporting reports or documents for that data.

MS. ELY: Okay. Switching gears. Earlier, Mr. Dickinson, you were asked a -- and I don't -- I think you'll remember this generally. I don't have the data request off the top of my head. You had been asked to identify which employees -- well, actually, it's in response to an NRCM request that we were just talking about. It's the meetings that you attended to talk to individuals about the project. And I'm curious have these stakeholder meetings continued after the data request that you responded to? Have you continued to go to those meetings with community members?

MR. DICKINSON: Maybe you could -- if you could just restate that? I want to make sure I understand what date you're referring to. Dot Kelly's --

MS. ELY: No, the NRCM request for the list of stakeholder meetings.

MR. DICKINSON: Oh, yeah. Yeah, I mean, we have continued to offer every town along the corridor and adjacent towns for meetings. They've told us -- I think every town now has told us, no, we're good. We've had multiple meetings in all those towns. We're willing to go anywhere and have a meeting anytime with people that are interested in the project, and, you know, we -- you know, between myself, Eric, Doug Herling, members of the outreach team, we've been all over the state. And, you know, my mantra to the team was always there's only 1.4 million people in Maine, let's talk to them all.

MS. ELY: So your testimony is that you have continued to have these meetings throughout this -- throughout the process, they didn't stop when you submitted the data request to the Natural Resources Council of Maine.

MR. DICKINSON: No, that's right.

MS. ELY: Okay. And you mentioned that Doug Herling has participated in these meetings, that you have participated. Who else is continuing to participate in these stakeholder meetings?

MR. DICKINSON: I mean, the short and long of it -- and you could -- I mean, depending on how you call these stakeholder meetings, you know, we're trying to come up with -- we have meetings right now where we're trying to figure out how to utilize our commitment to bring fiber optic to Somerset, Franklin County and to -- like, for example, we were just in Whitefield the other day. So Whitefield is an area where the 345 line goes, and we've now made a commitment to put fiber optic up on that AC transmission line. And we met with the people in Whitefield about the idea of connecting in their existing fiber optic along that place, and in that meeting, it included -- actually Heather Johnson at the point was Connect Maine who is, you know, kind of the fiber optic leader for the state at that point in time. It was Bill Sawyer, an engineer for CMP, and Justin Tribbet who also is an engineer. We were meeting with them to figure out how we can bring value to that community by bringing fiber optic, and those kind of discussions are going on in Somerset and Franklin County. But that's just a specific example. Eric would be in some meetings. Bernardo would be in some meetings. Other management people that are involved. Really the way I see it is everybody that's on the project, not just the core group of outreach teams, should be available to interact with the community on a regular basis.

MS. ELY: Does that include going to selectboard meetings?

MR. DICKINSON: Yeah.

MS. ELY: Does that include going to county commissioner meetings?

MR. DICKINSON: Yes.

MS. ELY: Okay. You mentioned that you'd made a recent commitment to put fiber optic in the 345 line. Is that writing -- is that agreement in writing?

MR. DICKINSON: No, I'd describe it as a handshake agreement, but the engineers and the people that are managing the dollars related to the project understand that it's a commitment.

MS. ELY: Okay. Who is the commitment with?

MR. DICKINSON: We sat around a table at the Skowhegan Cafe or -- I can't remember the name of the place, and a number of folks from Whitefield and us talked about it. And, you know, I made the commitment there at that point.

MS. ELY: Are these members of the community that you made the agreement with?

MR. DICKINSON: Yeah, I think they're some of the people that are community members that care, that want to see about value being brought to their community. Some of the people that I believe were on the selectboard of --

MS. ELY: Can you be more -- like, so I understand that people who want to see value in their community is a subset of people, but can you be more specific about who you made your agreement with and -- or who they represent?

MR. DICKINSON: Again, the -- what -- I think the better understanding of how we have approached this project is every time we get a phone call for an opportunity in a community to have a dialogue about the project, we take it. In that conversation with Whitefield, in that meeting that we had, they asked about fiber optic because they had heard about it related to the DC line. We had -- I think I had one conversation early on with one selectman, who is also on the economic development selectmen for Whitefield. And then that led to a larger group where we sat around and had blueberry pie and coffee around a little plastic picnic table, and at that meeting, we heard what their interests were. I contacted our engineering group, understood the incremental cost that we'd incur, and, for me, I believe that extra cost was worth the value of delivering it. We asked for nothing in return. We asked for nothing from any of the people in Whitefield. I believe this is the kind of thing that we've demonstrated throughout this project.

MS. ELY: Will you be signing a memorandum of agreement or any more-formalized documentation?

MR. DICKINSON: If the town of Whitefield would like to have a formal commitment from us committing to that, we're happy to do it.

MS. ELY: Are there other communities that you've made these types of handshake agreements with?

MR. DICKINSON: So the representation of a handshake as a negative thing is interesting to me. To me --

MS. ELY: It was not a -- it was --

MR. DICKINSON: Okay.

MS. ELY: My deadpan delivery might give me away, but I am really just asking are there other communities that you made a handshake agreement with?

MR. DICKINSON: Yeah, I think where there's conversations we're having throughout the project to find ways to help deliver value in ways that, to my, are synergistic with the project, and fiber optic is a perfect example. And there's a lot of things going on in the project, a lot of irons in the fire, but, you know, those kind of conversations are happening all along the -- on the project, and we are open to any additional calls from any towns that want to have these conversations.

MS. ELY: I'm trying to understand if there are other side agreements that are being made through the -- through this process.

MR. DICKINSON: So the -- there's no -- the agreement with Whitefield is -- there's no agreement. There's no negotiation. There's not a document that is looked at to be an MOU. It was me listening to people in the community about what they cared about and me making a commitment to them. And as I said, if they want me to firm that up in a letter or an MOU, we're happy to do that. So there's no side agreements that are currently engaged, but we have conversations with both Somerset and Franklin County around fiber optic, as an example, to try to figure out how to -- we've already committed as part of the project to provide significant amount of splice points along a high-bandwidth fiber optic cable at the edge of our right-of-way, and we're going to provide that at no cost, no -- to people that would be able to connect into that as a way to encourage fiber optic. What we're also interested in are there other opportunities that we could do beyond that, and those are the kind of discussions would be an example in the specific area of fiber optic that we're doing.

MS. ELY: I understand you testified earlier that there are no new MOUs that you have signed besides the one with the Western Mountains & Rivers Corporation. Is that a correct understanding?

MR. DICKINSON: That's correct.

MS. ELY: Are there -- aside from the MOU structure, are there any other agreements that Central Maine Power or Avangrid has made with any other interested parties?

MR. DICKINSON: There's no other MOUs that we've signed or executed related to any other interested parties.

MS. ELY: It doesn't have to be an MOU. Any type of agreement.

MR. DICKINSON: No, I don't believe so.

MS. ELY: Okay. That's all I've got for questions.

MR. TANNENBAUM: I know Barry's got just an issue. Jared, how much redirect?

MR. DES ROSIERS: Not much, five or ten minutes at the most.

MR. TANNENBAUM: We've been going for a while. I think we should -- why don't we just take a break now, come back in 15.

CONFERENCE RECESSED (January 9, 2019, 2:56 p.m.)

CONFERENCE RESUMED (January 9, 2019, 3:16 p.m.)

MR. TANNENBAUM: Okay, let's go back on the record. Barry, I know you had some -- a line of questions. Let's --

MR. HOBBINS: Yes, I do, if you don't mind. Well, good afternoon. It's good to see you. Been a long day so far. I just had a couple questions, and I don't know whether to address them to you, Thorn, or to all of you but collectively why don't we talk about them. We've heard so far from Elizabeth Caruso from Caratunk and also Ms. Eli who was -- Ms. Ely, rather, who represents the Natural Resources Council of Maine, and they talked a little about community benefits and the like. And when you were putting your project together for Massachusetts, you had certain criteria you had to follow under their statute, is that correct, as far as community benefits or that part of your submission to --

MR. DICKINSON: The response to the RFP included an RFP document that required specific criteria that needed to be filed.

MR. HOBBINS: Right. So did -- in your process of having, you know, been selected, did you look to the New Hampshire documents or the Vermont documents or the two proposals that were a competing proposal to look at those documents at all and, in particular, the community benefit elements of those two projects with respect to their submission?

MR. DICKINSON: So just so -- just to make sure I understand, the Massachusetts RFP had specific requirements in it for their own state.

MR. HOBBINS: Yes.

MR. DICKINSON: So when you're referencing the community benefits, are you talking about the community benefits --

MR. HOBBINS: For the state -- for example, looking at the state of Vermont and looking at the benefits that would have gone to the state of Vermont if they would have been successful in their project. The same is true of New Hampshire. I'm more interested in New Hampshire if that could be the case. So did you have an opportunity to look at their applications, their full applications, both -- more so in New Hampshire than Vermont?

MR. DICKINSON: Sure. So we did a great deal of market intelligence before we submitted our bid, and because that's a project that's been going on for nine or ten years, there was information out there and available. And part of that was the various agreements that they had made along the route.

MR. HOBBINS: And did you happen to look at the proposal that was rejected by the site evaluation committee of the state of New Hampshire?

MR. DICKINSON: I'm aware that the Northern Pass project was denied by the site evaluation committee.

MR. HOBBINS: Did any of you -- anyone else, Bernardo or Eric, look at those particular submissions and then look at their -- and look what -- the final rejection or why they were not approved by their respective commissions?

MR. STINNEFORD: Yeah, I'm generally familiar with the filings and the decisions. I probably can't quote the details.

MR. ESCUDERO: I am aware of the decision, but I didn't review the application.

MR. HOBBINS: You didn't review the application?

MR. ESCUDERO: I did not.

MR. HOBBINS: You did not. So as far as the state of New Hampshire's proposal, are you familiar with the community benefit package that was submitted fairly --

MR. DICKINSON: Yeah, in a broad, yes.

MR. HOBBINS: Yes. Did you also know that there was an attempt by Public Service Company of New Hampshire d/b/a Eversource -- and who filed a motion for rehearing on the decision an order denying the application? Did you know that there was an extensive submission made? I believe submitted in March of 2018?

MR. DICKINSON: Yes, I'm aware of that.

MR. HOBBINS: And are you of the document itself?

MR. DICKINSON: I think I may have read a summary related to it, but I didn't pick it up and read the whole --

MR. HOBBINS: So you are familiar with the document and --

MR. DICKINSON: Yes.

MR. HOBBINS: I'd like to, if I may, if you -- it sounds like you would -- that I could refresh your recollection, possibly. And how about you, Eric or Bernardo? Did you have an opportunity to look at the final -- because that was the final nail in the coffin. And so obviously I'm sure -- I know that your attorney did and I know that the battery of attorneys and I'm sure your president did. But Eric, I'm sure you must have looked at that particular document.

MR. STINNEFORD: I did look at it. I skimmed it briefly. I -- again, I didn't spend a lot of time reading it.

MR. HOBBINS: And, Bernardo, you probably didn't.

MR. ESCUDERO: I remember reading about it in the media, but I don't remember looking at that specific document.

MR. TANNENBAUM: Are you familiar with the community benefit aspect of that motion?

MR. DICKINSON: Yeah, I believe in a very general sense, yes, yeah.

MR. HOBBINS: The reason I'm asking you that is that during the process of your successful submission and obviously your petition to this -- to the Public Utilities Commission allowing for permission to go forward with the project here in Maine and before the Department of Environmental Protection and the Land Use Planning Board, you obviously must have thought about what was offered in the state -- Commonwealth of Massachusetts, what they required obviously or what was offered by Eversource and what by -- in New Hampshire -- in Mass. -- in Vermont. Were you --

MS. BODELL: So again, I'm confused when -- only when you reference Massachusetts. So --

MR. HOBBINS: Well, no, the reason I say that is because obviously you were successful with Massachusetts, but then you had to come to Maine. And I'm talking about the idea of permission, just like when they were looking at the project, they couldn't get approval. Eversource couldn't get approval in the state of New Hampshire because they didn't meet the requisite requirements apparently of their site evaluation committee which is different than how we operate here. So the reason I'm asking you that question --

MR. TANNENBAUM: I'm sorry, Barry, what exactly is the question that you're asking?

MR. HOBBINS: Well, what I'm asking for a question is what considerations did you give in putting together some type of community benefit package in Maine? Maybe give us some idea of what you went through, what process.

MR. DICKINSON: Yeah, sure. It was very similar to some of the testimony that I've already discussed earlier today where we started off by trying to design a project that had the smallest amount of impact that we could. And I think always the first goal there is to build a transmission line across the existing corridor, and I think just about 70 percent of that is along the existing corridor. Then the second goal would be, can you build a transmission line in an area where the impact is minimized because that area has similar utilization than it does now. And so by having two private landowners where there's a heavily-wooded section, a working forest, putting that line there and avoiding many of the other sensitive areas was the beginning of the project. I also talked about some of the things we did in areas where we thought there would be some concerns and some larger impacts: the Appalachian Trail, Moxie Lake, the Kennebec River. And then ultimately when we put together a price, we have to balance the overall price to Massachusetts, what we think is fair for Massachusetts for what they pay and the benefits they get, versus the benefits that Maine and the impacts in Maine. And that is the balance that we took. And we took in tons of information. We did market intelligence on where our other projects were, our own experience in developing projects, and as I said, our confidence in the way our project was designed.

MR. HOBBINS: It sounded like, from your testimony of Ms. Caruso, that the only commitment that's present is the commitment that is binding upon your project.

MR. DICKINSON: That's right. I mean, specifically to that narrow question, obviously as part of the DEP process, we are currently in discussions about a ton of different types of mitigation associated with the project, and those are things that are still ongoing.

MR. HOBBINS: And obviously there are some confidential discussions that have occurred in the past and obviously I don't want you to testify to any of those, of course. But I wanted you to take a look, if you could, if all three of you could take a look at community benefits. And I know that earlier I think Mr. Murphy led you through some exhibits of the community benefits for the state of New Hampshire. And it was interesting because I was kind of puzzled with the figure that was used in the state of New Hampshire for the proposal because I think that that was the original amount that was proposed by the developer at the time and that was the amount of money on the table when the site evaluation committee turned down the proposal. But the reason I'm giving you this other document to look at is because the Public Service Company of New Hampshire d/b/a Eversource, in their motion to rehear the case, not only made arguments based upon the original discussion but they also discussed why they wanted to reopen the case and what other possible potential benefits could be put on the table for reconsideration in order to have the proposal decided. So if you could do me a favor and take a look at Attachment C which is in the back of this very big document. And if you could look at -- if you haven't -- I'm just going to give you a couple minutes to look at it because it's really interesting, section Additional Conditions, which they proposed now in this. So essentially what they're attempting to do, to give you a backdrop of why I'm interested in this, they --

MR. WILLIAMSON: Barry, is this on page four of Attachment C?

MR. HOBBINS: No, it's Attachment C.

MR. WILLIAMSON: C. And then I find --

MR. HOBBINS: And then on page four would be the -- no, it's page 15. It's number 74, page 15, Additional Benefits.

MR. TANNENBAUM: Okay. And Barry, what's the question that you're asking?

MR. HOBBINS: What I'm asking -- first of all, I want them to take a look and if they could just review that.

MR. TANNENBAUM: Okay, so you're reviewing Additional Conditions on page 15.

MR. HOBBINS: Were you aware, after knowing the backdrop of this, that there was an additional relief benefit that was requested -- that was offered as an offer to the evaluation committee?

MR. DICKINSON: At a very high level, yes, but, you know, my focus here would have been more on -- you know, my curiosity would have been on the likelihood that they're going to --

MR. HOBBINS: What was your understanding of -- at a high level of --

MR. DICKINSON: My simple memory of it was that there was an extra amount of benefits that were provided as part of that.

MR. HOBBINS: And what do you -- what did you know about, for example, the energy cost relief benefits? That's number 74. What do -- does that look familiar to you? That's number 74, page 15. Does that figure of a value up to $300 million over a 20-year period -- are you --

MR. TANNENBAUM: Maybe we can cut this a little short. Were you aware, before you saw this document, of what the additional benefits that were proposed?

MR. DICKINSON: Not to this detail. I mean, I knew that they -- my understanding was Eversource was making a last-pitch effort to try to throw everything they could in order to overturn the appeal and that they threw a bunch of stuff to see what would stick. But I didn't go through these in detail to review them and understand them.

MR. HOBBINS: So you -- the $300 million figure doesn't stand out to you over a 20-year period?

MR. STINNEFORD: Well, I --

MR. HOBBINS: How about you, Eric?

MR. STINNEFORD: I guess I would correct the characterization. They're not paying 300 million in cash.

MR. HOBBINS: No, no.

MR. STINNEFORD: They're providing 400,000 megawatt hours in --

MR. HOBBINS: That's right. I'm asking --

MR. TANNENBAUM: Barry, allow him to answer.

MR. HOBBINS: I apologize.

MR. STINNEFORD: They're offering to provide 400,000 megawatt hours of environmental attributes whose value may be as much as 300 million based on their representation of the market value.

MR. HOBBINS: But you would define that as a benefit, wouldn't you?

MR. STINNEFORD: Yes, I think that's the intent.

MR. HOBBINS: Okay. And as far as what the applicants -- what it says here, if I may just read it to you, "The applicants shall monetize such environmental attributes for the purpose of providing a reduction in energy cost to low-income and business customers in addition to the projected wholesale market price benefits of the project." So in your review of your project, was there ever any consideration to utilizing the same type of benefit structure as a community benefit for the state of Maine?

MR. DICKINSON: Again, I think our existing proposal provides a significant amount of benefits to Maine that we've already described. And then as I described, in developing our price, we obviously had to consider contingencies around the project, and we tried to balance, in that process, our understanding of the impacts of our project, the real impacts of our project, not some other project that's different than ours, and then balance the price that we were then asking for Massachusetts to pay versus the benefits and the impacts that Maine would have. In the end, that's how we made the decision. So we did consider those types of things went in the development of the price.

MR. HOBBINS: So in your opinion then what London Economics found or what your company found through your consultants will say -- which we're going to hear about later on is what you feel to be enough community benefits to satisfy the state of Maine as far as having a benefit consistent with our law.

MR. DICKINSON: And so we -- just to be clear, we have the incremental jobs for the period of time of the construction. We have the reduction in energy prices, the potential reduction in capacity prices, property taxes, fiber optic, and what we believe is an added benefit for tourism.

MR. STINNEFORD: And to your question, you know, that

-- those benefits, we've estimated, you know, they're roughly $100 million over the first ten years of the project. And that is, in our view, more than sufficient to meet the statutory requirement of a public benefit, particularly since the cost to Maine customers for this project is zero.

MR. HOBBINS: What was the cost of the project in New Hampshire to New Hampshire ratepayers? Was it zero?

MR. STINNEFORD: Again, it depends on which -- how you're defining this project. The Northern Pass has been through multiple iterations.

MR. HOBBINS: No, this last proposal.

MR. STINNEFORD: In this last instance in which it was bid into 83D, it would have been supported fully by the Massachusetts customers just as our --

MR. HOBBINS: Thank you very much, that's the answer, right? Thank you. I have no further questions. Thank you.

MR. TANNENBAUM: Jared, redirect?

MR. DES ROSIERS: Mr. Dickinson and Mr. Stinneford, you were just asked questions about the benefits packages in Vermont and the benefits packages in New Hampshire. And why didn't CMP promise hundreds of millions of dollars on top of the benefits you described, Mr. Dickinson?

MR. DICKINSON: Yeah, I think first of all, I would reference these two specific projects had been developed for multiple years prior to any awareness of any kind of competitive solicitations for transmission, and they made an election how they approached that project, the way they built that out, how they did that, and made their decisions along with that. For us, we started from the point of designing this project in a way to mitigate the impacts as much as we could as we described and then defined that right balance between Massachusetts, what they're going to pay and the benefits they're going to get, versus the benefits that Maine would get and the impacts to Maine.

MR. DES ROSIERS: And, Mr. Stinneford, in striking the balance that Mr. Dickinson described, what is the significance with respect to competitive transmission under current FERC policy and the applicable tariffs in New England?

MR. STINNEFORD: Yeah, I --

MR. SHOPE: Objection, calls for a legal conclusion.

MR. STINNEFORD: I'll address it at a policy level rather than with respect to law.

MR. TANNENBAUM: Proceed.

MR. STINNEFORD: We have significant concerns that if the world proceeds as it appears to be where more and more of our transmission network is going to be built through competitive bidding solicitations, whether that's through Order 1000 or through state-specific procurement programs such as we've seen here with 83D, that if projects are continually required to inflate their bids with community benefit packages on the order of hundreds of millions of dollars, the end result of that is going to be pricing for transmission projects that is not going to fulfill the expectations of policymakers, our state regulators, here in New England in particular where we have seen, you know, a strongly expressed desire for lower transmission costs through competitive processes. If those competitive processes continue to be distorted by these types of benefit packages, those benefits will never be realized.

MR. DES ROSIERS: In the approach that CMP used in formulating its bid for the NECEC, did the company apply a similar approach with respect to its other bid in 83D or in any other prior solicitation?

MR. DICKINSON: Yeah, that would be a consistent approach for the other projects that we bid into this solicitation, including the wind, the solar, and the battery projects in addition to the tristate RFP that we had issued before and similarly to other projects that we've tried to move forward within a development portfolio.

MR. DES ROSIERS: What would be the significance -- what would be the impact, in your view, of requiring transmission projects built as elective transmission upgrades to deliver renewable resources from Maine, what would the impact be if, in order to build transmission, it were necessary to include significant community benefits along the lines of the TDI or Northern Pass projects?

MR. DICKINSON: Yeah, I mean, I think there are two impacts. Obviously one of them is going to be that the resources in Maine, the wind resources, the solar resources, other sources that are also going to require transmission are going to become more pricey, and that has impacts on whoever the end customer is, whether it's Maine customers or other New England customers. And it's also going to disadvantage those projects against other alternative sources that may not be providing that same tax to the price.

MR. DES ROSIERS: Shifting gears. Now shifting back to some of the questioning that Mr. Shope did with respect to -- and that's to you, Mr. Dickinson, with respect to your modeling that you did as part of your rebuttal testimony. Since you submitted the rebuttal testimony in July, are -- have you become aware of other information that supports, in your view, the conclusions and opinions you provided in that testimony?

MR. SHOPE: Objection, scope.

MR. TANNENBAUM: Overruled.

MR. DICKINSON: So as I mentioned earlier today, I had a conversation with Hydro-Quebec around the issue where they disclosed to me the spilling of water in '17 and '18. That was coincident with the CEO from Hydro-Quebec publicly committing to that in Quebec, as we mentioned, on an interview publicly. I also already mentioned the conversations we've had with a number of newspaper resources to discuss that same information. I think the other thing that was interesting is that during the discovery process, I became aware of an email that I hadn't read before that, although it's confidential, the -- what -- the subject of it had to do with Hydro-Quebec showing that there was a firm amount of energy that they could get out of Quebec without a new transmission line. And, you know, I can't get into the specifics of the number in the public session, but that number that was in there and that discussion about the fact that, without NECEC, they're going to reach a cap where they're not going to be able to export additional energy because of economics that we talked about earlier is reinforced in that email from May of 2017.

MR. DES ROSIERS: Now, Mr. Stinneford, there was questions from the Office of the Public Advocate and the IECG with respect to the potential impacts of having CMP be the owner of the project as opposed to a special-purpose entity. Do you see benefits to CMP and its existing customers if the project were to be owned by CMP?

MR. STINNEFORD: There are potential benefits, and I've addressed some of this in earlier testimony that, in financing the project, there will have to be new debt issued. And currently, at rates that are available in the market, that debt could be achieved at a lower cost than CMP's current embedded cost of debt. The result of that would be that our average cost of debt for CMP would go down. If this is separately financed outside of CMP, CMP ratepayers would lose the benefit of that.

MR. DES ROSIERS: There was also questions with respect to whether the company believed it was appropriate or -- to -- that the special-purpose entity would pay a -- some kind of a goodwill payment to -- or, excuse me, that the SPE would pay some sort of a goodwill payment as part of a transfer, and I believe your testimony was you did not believe that to be appropriate. And just explain why you don't believe it would be necessary or appropriate in this instance.

MR. STINNEFORD: Sure. The basis that we have heard argued for a goodwill payment is that the project would constitute a non-core service under Chapter 820 and that -- and I've heard various reasons or explanations for why it should be considered non-core. Our concerns or my concerns are that those reasons that I have heard expressed would mean that much of CMP's future transmission activity, if not all of it, could potentially be considered non-core. You know, whether that's due to the fact that this was competitively bid or that it was for the benefit of a third party and not CMP's native customers, those kind of criteria are behind much of the transmission that we build today and are likely going to be an increasing amount that we build in the future. And if that's the criteria for determining whether something is core or non-core, you know, much of CMP's activities would be then considered non-core and have to be spun off into an affiliate. And I -- it leads to what I think is an untenable result, and we would have great concerns with that.

MR. DES ROSIERS: Now there was also questions, though, with respect to the treatment of the planet held for future use that is currently owned by CMP and that has been put into rates under the -- both the regional tariff and the local tariff and that transmission customers have paid and that what will happen with that plant when the NECEC moves forward. And I guess what is the company's position today with respect to how that plant should be treated both on a prospective basis and then retrospectively with respect to -- retrospectively?

MR. STINNEFORD: Prospectively, I don't think there's any disagreement that when the project goes forward, that land would be transferred out of CMP rate base in Account 105 and would be booked to the project. We have promised in confidential settlement discussions that in the context of a CPCN being issued by the Commission here and the project going forward to construction that we would refund to Maine customers the amount that has been previously been collected in rates associated with that land held for future use. That's an amount that is, in rough terms, a hundred million --

MR. TANNENBAUM: Hundred million?

MR. STINNEFORD: -- a million dollars plus carrying costs.

MR. DES ROSIERS: Hold on.

MR. STINNEFORD: And I -- you know, I can say today that that is a commitment that we would make even outside of settlement. If that were the desire of the Commission, that that money be returned to customers through a revenue requirement credit upon the issuance of a CPCN and transfer of that property into operating property, we would pledge to make that commitment.

MR. DES ROSIERS: There was some questioning with respect to the public outreach and the notice that was provided prior to the submission of the petition in this CPCN proceeding, and at that time, there was some mention of giving notice to abutting landowners. Could you describe that and when that happened?

MR. DICKINSON: Sure. So that we were required to make a public information meeting as a result of our DEP application. We -- the requirement was really only one of those information meetings for -- to happen. We actually held three. In prep for those meetings, you need to provide written notice to all abutters, and we made that notice to those parties. We had held those three public hearings in a way to try to provide coverage for the overall project. Again, even though we were only required to do one. One was in Bingham, one was in Lewiston, and one was in Windsor.

MR. DES ROSIERS: Were they well attended?

MR. DICKINSON: Yeah, they were extremely well attended. There was a lot of dialogue. We had a well -- staff, number of outreach people and experts, at a number of stations showing visuals of the project, the route of the project. We had computers manned so that people could see specifically where the line was located. We had follow up with people that had questions and addressed misconceptions that were out there related to the project.

MR. DES ROSIERS: There was also some questioning with respect to the outreach to the town of Caratunk. And did CMP -- what was CMP's outreach to Caratunk and the town officials?

MR. DICKINSON: Well, we -- you know, we discussed the meeting that was held. My expectation is there was an outreach ahead of that, but since the -- since that meeting, we've continued to, a number of occasions, ask for additional meetings and we've been -- to the town officials, and the town officials have communicated back that they're not interested in us for coming back.

MR. DES ROSIERS: That's all I have, thank you.

MR. VANNOY: Can I ask a follow up?

MR. TANNENBAUM: Yes, you may.

MR. VANNOY: Could you flesh out a little bit more for me, Eric, the -- you commented a future where TOs can't own as core business those transmission projects. You called that untenable. Could you flesh out what you mean by that in a little bit more detail?

MR. STINNEFORD: Yeah, if you believe that we're on a trend, as I do, that, whether it's reliability projects or public policy projects or state-initiated RFP processes, a significant piece of our future transmission is going to be procured through competitive processes -- and that's going to be reliability upgrades, it's going to be ETUs, it's going to be all sorts of transmission. If, you know, CMP is required to separate its activities around those types of construction projects from its other transmission and distribution activities, it's going to create additional costs, inefficiencies, operational constraints that, in our mind, just don't make sense.

MR. TANNENBAUM: The way I see your core business is to provide reliable transmission and distribution service. It doesn't really, in my view, matter whether that -- if it's a reliability project, whether it's procured through a competitive process or through the judicial process. So I don't think that the issue is whether it's a competitive process or not. I think it may go more towards whether it's a core function of CMP to provide reliable transmission service. So, for example, if CMP were to own a generator lead to bring a wind project into the grid, would that generate a lead, be a core business of CMP?

MR. STINNEFORD: I'd have to think about the legal definitions behind that, Mitch.

MR. TANNENBAUM: I know, it -- well --

MR. STINNEFORD: It's -- I mean, to some extent, we infringe on that today when we build generator interconnections under an interconnection request. Although staff may not have raised the competitive bidding issue, other parties have as a criteria for consideration in core versus non-core. But they've also raised the issue of building transmission for somebody other than our native load requirements as being outside of core activities. You know, under that definition, then us building a generator interconnection, whether we own it or it's being built and turned over for the benefit of the generator or system upgrades that we're building on our system to accommodate an independent generator, that would fall under the category of non-core. And I think, you know, that doesn't make sense to us either.

MR. WILLIAMSON: This is going back to Eric, to your comments about the benefits, community benefit packages, becoming a part or perhaps a usual part or a commonplace part of transmission projects, that tends to increase transmission costs, project costs overall. How do you regard CMP's -- or as you stated, a policy view, a high-level policy view, how do you regard that view as compared with your peers in the region? Do you find, for example, that Eversource is perhaps excessively generous in what they offer? I mean, do others share that kind of perspective on, while it may need to be done, there is a cost on projects? Because, back to your original point, we are all concerned about transmission costs in New England. That's well known. So let me know your thoughts regards -- CMP as related to the peers --

MR. STINNEFORD: Yeah, I mean, I hesitate to speak on behalf of other transmission developers, but, I mean, clearly some are willing to make those commitments and include those costs in the cost of their project. You know, they're not doing it out of their own goodwill and out of their own financial backers. They're asking customers to pay for those mitigation packages. Not all projects, I suspect, are doing that, and I'll admit each state is going to view the requirement for those kind of mitigation packages differently. Our concern is that if we reinforce that requirement by demanding similar mitigation packages here in Maine, we're just contributing to that snowball effect that is going to make this very difficult to reverse in the future.

MR. WILLIAMSON: And just do you get the impression that nationally this is a problem? This may be beyond what you're familiar with, but on the other hand, you may have come across --

MR. DICKINSON: I mean, we just competed in a project in the MISO region, and it is very clear that the winning bidder, NextEra, did not include a benefits package in that transmission line. So that would be a very recent example of that. But the one difference I think to point out here with Northern Pass as being kind of the prime example -- obviously the Vermont project was not selected -- that was a project that moved for ten years and continued to try to find a way to make that project move forward and had a different strategy on how they approached it.

MR. WILLIAMSON: Thank you.

MR. TANNENBAUM: I'm kind of caught up in this core/non-core. If CMP participated or constructed a transmission project in another state, would that be core because it's transmission?

MR. STINNEFORD: I think if you -- based on my reading of the definitions, you know, right now the definition of core versus non-core does have a hook to franchise service territory. So activities that are outside of that could be considered non-core. So we don't dispute the fact that if we were bidding on a competitive solicitation to build transmission elsewhere in New England or outside of New England that that could be considered non-core.

MR. TANNENBAUM: Okay. Anything else for this panel? Okay. You're excused. Thank you very much for your testimony. We have a couple of exhibit issues I want to discuss. So the generator interveners, I believe, asked questions regarding Exhibits 26 and 27.

MR. DES ROSIERS: No objection to those and no objection as well to Exhibit 28.

MR. TANNENBAUM: No objection --

MR. DES ROSIERS: To 26 or 27 or the additional presentation that they passed around today. We have no objection to that as well.

MR. TANNENBAUM: And was that marked?

MR. DES ROSIERS: I believe it was marked as 28. Yeah, so they --

MR. TANNENBAUM: Twenty-eight? Okay. Now, let's see.

MR. TURNER: Mitch, sorry, I just -- over here. I just want to -- on number 28, it's clearly a typo, but just for the record it says January 8, 2018. I believe they meant January 8, 2019.

MR. SHOPE: Yes, that's the markets committee error, but it's a common error at the beginning of the year.

MR. TURNER: Understood.

MR. SHOPE: We'll talk to Mr. Fowler about it when he comes on Friday. And by the way, just as a housekeeping matter, should we -- with regard to the exhibits that we've passed around today, should we file them on the website?

MR. TANNENBAUM: You mean in the docket?

MR. SHOPE: Yeah, in the docket. Because I know some -- CMP has circulated some additional exhibits, and I don't know whether they've yet been filed on the docket.

MR. TANNENBAUM: They should be. If they're not data requests, they should be on CMS -- or data responses.

MR. DES ROSIERS: And in that regard, because we haven't finished with Ms. Bodell's testimony, I haven't made -- checked to make sure all of ours are addressed, but we certainly intend to do that when Ms. Bodell's testimony is complete.

MR. TANNENBAUM: Okay. Brian, regarding NextEra's exhibits, we deferred ruling on many of your proposals. I believe what you referred to today were marked in your pre-hearing memo as Exhibits -- well, sorry, I'll get back to that. I'm assuming now at this hour we're not going to move to Ms. Bodell or do parties think we should?

MR. SHOPE: Oh, so we're ready to go, and as far as I'm concerned, anything that makes Friday shorter is a good thing, but --

MR. TANNENBAUM: Want to go for an hour --

MR. SHOPE: But it's -- okay.

MR. TANNENBAUM: Why don't we --

MR. SHOPE: I'm assuming that we would finish it up. Is that --

MR. TANNENBAUM: Okay, so quickly, Brian, I believe you referred to as -- you referred to Exhibit 17, 25, 22, and 24. Can I assume -- and then -- so we deferred on those. I assume there's no objection for those exhibits going in the record.

MR. DES ROSIERS: It's my understanding, subject to discussion with Mr. Murphy, that for some of them, he intends to only offer the portions that are included in his handout. We have no objection to the inclusion of those portions of the documents, not the complete files that he originally filed. So with that, we have no objection.

MR. TANNENBAUM: So maybe that would be worth filing in CMS, just the excerpts. And then the other ones that we deferred ruling on during a case conference, would those be considered withdrawn?

MR. MURPHY: I don't think I'm going to use them tomorrow, but if we could wait till tomorrow.

MR. TANNENBAUM: All right, let's wait until tomorrow. Okay, Ms. Bodell. Drew, would you like to lead us off?

MR. LANDRY: Sure, why not. Good afternoon, Ms. Bodell. I'm Andrew Landry. I'm counsel for Industrial Energy Consumer Group in this proceeding. And I wanted to start with a couple of follow ups from yesterday's hearing. I think you mentioned at some point you discussed the fact that Hydro-Quebec has some flexibility with respect to either delivering power or making a financial make-whole payment in lieu of delivering power. Do you recall making those comments?

MS. BODELL: I do.

MR. LANDRY: Would you agree that that's not an unlimited right, that there is a certain minimum physical deliverability that has to be done under the contract?

MR. SHOPE: I'm going to object to the form because I think you're talking about deliverability versus delivered. I mean, I think since you --

MR. LANDRY: Delivery --

MR. SHOPE: Delivery. Yeah, you said deliverability, yeah.

MR. LANDRY: Thank you. Would you agree that there is a minimum requirement for physical delivery under the contract?

MS. BODELL: I would agree that there is a minimum requirement for physical delivery. I think a lot of our discussion yesterday was about the definition of what's incremental to New England, and that definition allows for a significant amount of reduction in what they're currently sending into New England without any penalty whatsoever. And, for example, in 2017 they delivered 18.2 terawatt hours into New England. Under the Eversource and Unitil contracts, they're only required to deliver three terawatt hours. And under the other contract, it has a maximum of 9.45 with adjustments that would take it down. So I think the conversation yesterday did not speak to -- what's in the contract with respect to total deliverable energy was focused on the incremental aspects of delivering into New England which all of the -- well, I'll speak for ourselves -- which the economic benefits analyses was focused on.

MR. LANDRY: Okay. I don't want to dive too deep into the PPA because I'm sure we'll bore everybody at this late hour, but would you agree that the contract calls for a hundred percent capacity factor but allows some flexibility to substitute either financial payments or delivery in other hours?

MS. BODELL: I would agree that the contract allows for that flexibility. In both of those cases, either a financial payment, which is why I referred to this more as a put, and the second is with respect to the ability to do makeup deliveries at other points during the period designated, whether it's within the year, whether it's in the specific type of hour, or whether it's a longer period.

MR. LANDRY: And again, I don't want to get into the details, but is it your understanding that there's a limit to the amount of substitution they can do?

MS. BODELL: I would agree with you that there is language that attempts to limit that substitution at which point the make-whole payments -- I think they're called cover damages -- come into play. But I also indicated in my surrebuttal report that the Hydro-Quebec guarantee, parental guarantee, backing the support for these contracts is limited. And therefore, if there is a benefit that Hydro-Quebec could obtain by simply walking away from the contract because there's a higher benefit than that parental guarantee, they would have an economic incentive to do so. So at the end of the day, it's going to be an economic decision, but the contract speaks for itself.

MR. LANDRY: Thank you, I agree with that. And one further question about the PPA and then we'll move along. Which is would you agree that the contract requires the power to -- or the contract to satisfy ISO New England's capacity capability interconnection standard?

MS. BODELL: I agree that there is language in there and a process by which that's to be obtained. And obviously if there is a deliverability issue with respect to the contract, there are repercussions with respect to whether or not the contract and the project can proceed.

MR. LANDRY: Okay, thank you. And would you -- and moving past the PPA, would you agree that the capacity capability interconnection standard of ISO New England is intended to ensure that energy is -- from particular units seeking to interconnect is capable of qualifying for the capacity market, at least physically capable of delivering the power that -- for which capacity is proposed, it doesn't say anything as to the MOPR or anything we'll talk about on Friday?

MR. SHOPE: I'm going to object to the form of the question because --

MR. LANDRY: Sorry.

MR. SHOPE: -- it -- there -- it's a very complicated clause that you're asking about and there were, like, three different --

MR. LANDRY: Okay --

MR. SHOPE: -- concepts getting mashed up there.

MR. LANDRY: I'll maybe ask an open-ended question which is could you describe your understanding of the capacity capability interconnection standard of ISO?

MS. BODELL: I'd actually want to review that before I gave you a description of that, but on a high level I can say, in general, any ISO is going to want to ensure that a connection is not going to adversely impact the reliability of their system.

MR. LANDRY: Okay, thank you. Now, there's a lot of discussion -- I'm sure we're going to have a lot of discussion on Friday about the minimum offer price rule, and I really don't want to talk about that today at all except to note that in terms of whether Hydro-Quebec is able to qualify this energy in the capacity market, one possibility is that it could have -- or could qualify by having a low enough price under the minimum offer price rule to be able to participate in an auction. Is that fair?

MS. BODELL: So you're talking about a minimum offer price which would be calculated as part of the minimum offer price rule?

MR. LANDRY: Right, I'm saying if Hydro-Quebec seeks to qualify this power in the capacity market, one possibility is it would actually -- would satisfy the minimum offer price rule and would be able to bid in the market?

MS. BODELL: I think that we'll talk more about this on Friday. I would call it a theoretical possibility because I think there's very strong evidence, including the spirit of the minimum offer price rule as well as specific information that we've provided about what we know publicly about Quebec's system, that makes that theoretical.

MR. LANDRY: And another possibility is that it doesn't qualify, but it does participate in a substitution auction and replaces some existing units.

MS. BODELL: That most certainly is a possibility.

MR. LANDRY: And you discuss in your testimony, I believe -- your initial testimony, I believe, at page 27 the fact that Wyman might be one of the units that might seek to retire. Is that -- or -- is that your recollection or is that fair?

MS. BODELL: That is fair. In my original testimony, I identified Wyman as a plant potentially at risk of being an obvious choice for the substitution given its size but also the fact that it is -- has been identified already as a plant at risk of retirement by ISO New England. And so given that, plus given the general characteristics of Wyman which I described, I would see Wyman as being a candidate for potential substitution. But then again, Wyman provides fuel diversity and that has allowed for an RMR contract in other cases in this market.

MR. LANDRY: And you also identified, I think on page 28, a number of gas units that you thought might be candidates for substitution?

MS. BODELL: That's right. Again, my analysis did not look at the details of their financials because I don't have access to a critical component of that which is their fixed costs. But just basically assuming that if they're not operating to provide energy, they're not generating as much revenue, and if they're large, they have larger fixed costs. That would imply that the larger plants that are not operating are potential candidates for substitution.

MR. LANDRY: Now, let's assume in your hypothetical that ISO New England stepped in to support Wyman and, in fact, some gas units retired in the substitution auction. In that case, would a Hydro-Quebec contract with a capacity supply obligation enhance the fuel security of Maine and New England?

MS. BODELL: Not necessarily, and let me tell you why. And this goes to your first question about the contract and the flexibility in the contract. Because there is this minimum level that theoretically could be required to be delivered under this contract and there is this contract in place, it would make sense for Hydro-Quebec to deliver the energy that it has available through NECEC and also potentially bid capacity through NECEC but take that capacity away from what they're currently bidding into New England through New Brunswick and through New York. And the reason is because they have to pay wheeling costs for selling that capacity and the energy associated with it through New Brunswick and through New York. And so, therefore, it would be less costly if -- under our conclusion that they have very limited capacity to be able to sell anyway, it would make economic sense for them to simply shift their capacity supply obligations from the other interties into NECEC, which would cause no net benefit whatsoever, no net impact on capacity prices. As far as the fuel diversification is concerned, the reality is Maine is the most diversified fuel part of ISO New England, and some of the gas that's supplied to those plants comes through a separate line that is unrelated to the Algonquin city gate TETCO 3 congestion that has occurred during peak periods. So I'm not -- I haven't done a thorough analysis, but there are just general aspects of the way the gas plants in Maine are connected that would make me believe it's not going to have a benefit for the rest of New England from a fuel diversification point of view even if those gas plants did retire.

MR. LANDRY: With respect to imports or delivery of capacity through New York or Hydro-Quebec, does Hydro-Quebec have a capacity supply obligation through those points?

MS. BODELL: Yes. So Hydro-Quebec has -- I mean, this is in one of my workpapers. Hydro-Quebec has a capacity supply obligation -- or qualified -- I'd have to look, but I think they also did win their capacity supply obligation. They both qualified and won the capacity supply obligation for I think it's 300 megawatts through New York and -- I would have to look up the number, again, it's in my workpapers -- but for a certain amount through New Brunswick as well.

MR. LANDRY: Would they have to surrender those capacity supply obligations?

MS. BODELL: If they, as we conclude, have a limited amount of capacity and, therefore, they're trying to optimize the capacity that they have, they would not have to surrender that. It would just make an economic -- it would make economic sense that if they have no more capacity to bid, that they redirect the capacity they're currently bidding through New York and New Brunswick into NECEC. Again, because they have the lower cost of delivery since they're not paying the wheeling charges.

MR. LANDRY: I understand that, but they have an existing capacity supply obligation, yet they transfer to a different delivery point?

MS. BODELL: They only do one year-to-year capacity supply bid, and I think that's in part because it -- well, I suspect it's because of the volatility of the water supply and the capacity that they could have available on any year.

MR. LANDRY: So theoretically, it might not be available at any particular time.

MS. BODELL: That's right. And in fact, as I showed in the supplemental report, there were two years, FCA 9 and FCA 10 I believe, where Hydro-Quebec only qualified for 200 megawatts into the market. And they've recently been able to qualify for more, but that just shows it was following a dry year in 2013, and come 2014/'15 I think they bid conservatively into the FCA. But I think it's important to see the variation in what their historical qualification and clearing has been.

MR. LANDRY: Now if they didn't qualify, or didn't seek to qualify, in the capacity -- forward capacity market, would they still be eligible to receive payments from generators who are penalized under the pay for performance rules?

MS. BODELL: The pay for performance is tied to the capacity supply obligation, and so if Hydro-Quebec does not have a capacity supply obligation, they would not be subject to those penalties or rewards.

MR. LANDRY: But if another unit, let's say a gas unit in Maine, was unable to satisfy its obligation during a peak period and had to pay a penalty, if Hydro-Quebec were delivering during those hours, would they be eligible to receive a portion of the payments?

MS. BODELL: The pay for performance which is part of a capacity supply agreement, the answer -- I believe it's part of the capacity supply agreement obligation, and so the answer would be no. And that's part of the reason why some of these plants are putting delist bids out, because there's a pay for performance penalty that goes into their calculation.

MR. LANDRY: Let's say when they pay the penalty, the money goes into a pool that's used to fund -- to pay folks who do show up and provide capacity or are available during those hours, is that right?

MS. BODELL: That's right. But I think, again, subject to check, and we can look at this on Friday, but I believe the pay for performance is a capacity supply obligation payment. I know the penalties are only tied to whether or not they had a capacity obligation and did not pay. I'd want to check to make sure that the payment only goes to those that did. But if it does go to all of the plants, then your theory would be correct.

MR. LANDRY: All right, thank you.

MR. VANNOY: Just a follow up. If you take the hypothetical that it goes to anybody who's supplying energy during that scarcity period --

MS. BODELL: Correct.

MR. VANNOY: -- that they receive a payment in that pay for performance incentive piece, how would you view that with respect to some of the other economic incentives they have to move their capacity around. I mean, does that change in any way what you're saying with respect to their incentives?

MS. BODELL: It still would change what I'm saying with respect -- it would not -- I don't think it would change what I'm saying with respect to the incentives because there's energy that would be flowing through NECEC. They'd be getting a high price under the contract for that. And so under most conditions, they're going to want to flow the energy under that contract, especially because of some of these contractual provisions, even though they have flexibility not to. So if they're going to get paid no matter what, does it matter where they're shifting their energy? No, but they still want to be able to get the capacity supply payment. And, again, I'd want to go back to the pay for performance to refresh myself on the details of how the payout goes before I make a conclusion, but I think generally, they still save on the New Brunswick wheeling charge which is why they would put it through NECEC irregardless -- if the pay for performance -- so let me step back. If the pay for performance payment occurs just because they're delivering energy, that in and of itself would not impact whether they sell it through New Brunswick or through NECEC. It's the fact that there's a wheeling charge through New Brunswick that they have to pay that would have to be compared to a fixed payment that they already have to make under the TSA. So they can avoid the New Brunswick transmission fee if they sell it through NECEC. I hope that makes sense.

MR. VANNOY: No, I followed. Thanks.

MR. LANDRY: We talked a little bit about delisting here and the possibility of some units in Maine seeking to delist. Am I correct there's two types of delist bids that plants can pursue? One is a dynamic delist bid and another is a static, is that the right term?

MS. BODELL: That is correct.

MR. LANDRY: And one of those is -- contemplates the full retirement of the unit and the other one contemplates that the unit would remain operational and simply participate in the energy market or whatever else it wants to do?

MS. BODELL: Yes.

MR. LANDRY: If the unit selected the option of remaining open, would those -- are those units eligible to receive payments from the pay for performance penalties? Maybe it's the same question I asked before.

MR. SHOPE: I'm sorry, you said remaining open, and I'm not sure what -- I guess formally it's an objection to the form of the question, but I -- maybe you could rephrase it.

MR. LANDRY: Yeah. Would those units be eligible to receive any payments in the event that there was units paying a pay for performance penalty?

MR. SHOPE: Drew, again, objection because I'm not sure what unit -- you said units that are open which I don't think is a term.

MR. LANDRY: Right. I'm referring to the units that have delisted but have remained operational. If they remain operational and they are able to operate during peak hours when pay for performance penalties are incurred by some units, would they be eligible to receive payments as a portion of the penalties?

MS. BODELL: Again, I'd really like -- you know, sometimes these rules are very complex and they have clauses and subtle aspects. I'd like to refresh myself on the pay for performance rules and get back to you on that.

MR. LANDRY: Sure.

MS. BODELL: My original thought is that the pay for performance penalties and rewards are only paid to companies and plants that have a CSO, that have qualified and cleared the capacity market. But there may be some exceptions or clauses or under -- you know, they're just -- or state of emergency.

So I just -- I really would like to review those rules before I make a definitive statement to say that somebody who no longer has a CSO and is operating as an energy-only resource, whether or not they would be eligible for the upside of a penalty -- of a performance pays program but not the downside. They most certainly would not be part of the downside. I just need to review the rules to see if they'd be part of the upside.

MR. LANDRY: All right, thank you.

MR. SHOPE: And it's not within the scope of his testimony, but if you'd like to ask that question of Mr. Fowler on Friday, then certainly by all means.

MR. LANDRY: Thank you. Now those units -- a unit that does choose to remain open if it's a -- after they delist, presumably it might be -- a lot of these units in Maine have been running as peaking units. Is that fair?

MS. BODELL: That is true.

MR. LANDRY: And if they did have available fuel supply and were able to run during peak hours, whether that's a winter unit that has oil available or a unit in the summer, a gas unit, any -- during the summer, they would be -- have the opportunity to receive some of those high prices during those extreme peak hours.

MS. BODELL: That is true. However, a lot of those plants are receiving revenues under the capacity market, and the question is, from an economic decision point, they now have less flexibility with respect to the source of their revenues. They're permanently out of -- if they substitute out through CASPR, they're permanently out of the capacity market, and, therefore, changes in energy prices -- they'd be more sensitive to changes in energy prices.

MR. LANDRY: Sure, okay, thank you. Now, with respect to these -- the low-capacity factor units that you had identified, again, I think at pages 27 and 28 of your testimony, I believe a number of them were operating in the, you know, 15 percent capacity factor plus or minus. Is that your recollection?

MS. BODELL: I'll say that the chart speaks for itself because we did calculate what the capacity factors are, but most certainly they are not operating very often. They are not even peak operators, they're super-peak operators that operate during the most extreme pricing situations.

MR. LANDRY: And when do those most extreme pricing situations occur?

MS. BODELL: Those extreme pricing situations generally occur during the summer peak hours when load is highest. They also can occur in the winter because of the higher gas prices that happen not just in New England, but most of the markets, just because of the winter cold, results in a higher demand for gas from residential and industrial and commercial consumers, mainly for the heating. So generally the peak prices in New England occur in the summer and the winter. However, as we discussed yesterday, there are some anomalies that can occur during the shoulder months tied to the fact that that's when a lot of the generators are scheduled for maintenance. And so, therefore, often that tight supply can create some anomalous price spikes. Generally, the higher prices are going to occur -- the super peaks are going to occur in the winter and the summer.

MR. LANDRY: Now, with respect to the gas units that you'd identified in your chart on page 28, if the price spike is being caused by a shortage of gas, those units probably were not running during the gas period -- the peak winter period?

MS. BODELL: I would say no. I think if the gas plants are not operating during the winter peak period, it's generally because they're not economic and the oil is a lower-priced option. And so the oil plants will be coming online, the dual-fuel units will be coming online, and oil will start to set the price instead of natural gas. So I don't think that you can't look at a gas plant as being unable to get the supply and that's why they're not operating. I think the market prices send a very good price signal which say, look, you can operate, you can get the gas, but it's going to be very expensive, but there's a cheaper alternative, which is this oil plant over here, so we're going to operate the oil plant instead. And that's the nature of the New England system with the dual-fuel capability and the oil units. New York has a similar type of situation.

MR. LANDRY: Do you think that a fair number of the hours that the gas units are running are summer afternoons?

MS. BODELL: I would expect that to be the case, yes. Again, summer and winter, but summer afternoon I would expect, if it's a very hot summer, that there'd be a summer day they'd be operating.

MR. LANDRY: You agree that the development of additional solar facilities in Maine and New England may tend to cause the capacity factor of these units to reduce as well?

MS. BODELL: So the answer -- the question is simple. The answer is more complicated because I think what you're talking about now is what's called the duck curve and that's where there's actually a dip in the load in the middle of the day in the summer because the solar is providing energy and offsetting the need for energy to be delivered to residential consumers who would otherwise have air conditioning load because the solar panels on the roof are offsetting that. And in that case, what you would expect is that an inefficient gas unit might not operate but, in fact, those inefficient gas units happen to have the fastest ramp up speeds. And so they happen to be needed often to be able to make up the difference when the solar gets covered by a cloud. If a cloud comes over all of a sudden, the load gets up. And so there's a lot more volatility that requires ramping capability, and that can be paid for through ancillary services and that can be a valuable revenue source for these inefficient but fast ramp up/ramp down plants.

MR. LANDRY: The capacity factor only reflects the hours generation, it doesn't reflect ancillary services.

MS. BODELL: Well, the ancillary services are a non-spinning reserve or spinning reserve. But to the extent they're required to inject into the system to cover when the cloud comes over, then there's energy being injected into the system to do that. And so you would see that would go into the capacity factor calculation. But again, I said it's a complicated answer to what seems like a simple question. You really have to run the analysis to see what the solar load is, how these plants are needed, and how increased solar is going to impact their capacity factor. But, in general, I would expect with lower super peaks, there could be a lower capacity factor for those units.

MR. LANDRY: Thank you. One more area. Would you agree in general that the cost of energy has a direct impact on whether businesses are -- can be profitable if energy's an important part of their cost structure?

MS. BODELL: Yes, to the extent that energy is an important input to a manufacturing process or any business, then the price of that energy impacts their profitability.

MR. LANDRY: So to the extent that you see a reduction in the price of energy, businesses would have -- potentially have available funds to hire new workers or to expand their property, their -- expand their business locations.

MS. BODELL: I think it depends on how big that price reduction is and how much of the cost that energy component is of the total cost structure as well as what the investment requirements are and even if there is an opportunity to expand to produce more. So it's not a simple relationship. There's a lot of threshold numbers that would need to be analyzed.

MR. LANDRY: But the tendency would be, if you have more available money, you -- I mean, you may just decide to keep it as a business owner, but you also may decide that, given the lower cost structure, it's an opportunity to expand.

MS. BODELL: Again, I will agree with you that lower costs are beneficial to businesses. What they do with that is very unique to those businesses.

MR. LANDRY: Do you have a sense of how significant energy costs are to the operation of paper mills and similar manufacturers?

MS. BODELL: My understanding is that it's a large portion of their costs, but I don't know the relative portion or how that compares to the fixed costs.

MR. LANDRY: Are you aware that a number of paper mills have permanently closed in Maine over the last four or five years?

MS. BODELL: I am aware of that, but I don't know what the cause is, whether it's tied to energy prices, whether it's tied to a change in the market, or if there are other costs that have increased like gas or any of the other costs that go into producing and delivering.

MR. LANDRY: Fair enough. Thank you very much.

MS. BODELL: Sure. You're welcome.

MR. TANNENBAUM: Dot?

MS. KELLY: Thank you. Thank you, Ms. Bodell. My questions are all going to be about the same kind of topic to better understand how if, let's say, the TDI transmission line was built or the Northern Pass line was built or if the CMP line was built, how it impacts things like the indirect savings to energy costs, CASPR, LMP in Maine, and zonal separation in Maine. So I'm going to start from the beginning, but I was just giving you a flavor.

MS. BODELL: Thank you.

MS. KELLY: So referring back to Mr. des Rosiers' questions on the TDI proposal, are you familiar with that 83D project to kind of use that or would it be better to use the Northern Pass or can you do both?

MS. BODELL: Why don't we use a generic project? Because I think whatever your questions are, I don't have enough detail about any of the projects, and if I did, I wouldn't be able to share it. So let's talk about a general transmission project.

MS. KELLY: Okay, located in different areas.

MS. BODELL: And coming from Quebec into New England is, I assume, your condition.

MS. KELLY: Correct.

MS. BODELL: Okay.

MS. KELLY: Is it fair to say that you're going to do that response in a way that's an evaluation as done as a but-for analysis? So it's -- you're going to try to just have that be the one thing that's changing in the answers that you're going to give to me?

MS. BODELL: That's exactly right. And when you do a benefits analysis for transmission, you look at what are the -- what would happen without the project, what would happen with the project. And the only thing you change is the addition of the project when you run the models. There may be some ancillary things that have to be adjusted because of the project, but generally you would just change that one thing. I haven't seen a benefits analysis that does a comparison where you take an historical number even though you know the future is going to be different and put it in. Generally, you do your projection forward, what is it going to be, and then put in the new project.

MS. KELLY: And so I recognize it's difficult because, from your testimony of yesterday, there's that additional question of is this incremental power that's coming in or how much from Hydro-Quebec will impact it. So I'm hoping in your answers you'll address what your basis is. So I'd like to start from where Mr. Landry was questioning you. Assuming the transmission line through Maine and then a transmission line leading into Massachusetts from New Hampshire or Vermont, would that have any significant impact on the price of energy in Maine due to the indirect savings?

MS. BODELL: So in general, as our analysis showed, an injection of energy into market is going to have an impact on prices. I think what is critical in this case is if there's a contract that's going to determine how much energy is going to be injected into the system, you would -- and you have access to that contract, you would want to take those details into account. So given that the supplier is the same in the three examples that you provided, I think it would be important to get the details of that contract and analyze what the economic incentives are and how that impacts the benefits in New England. We assumed, as I've already said, that this is an injection that comes in. There's not a redirection from New England even though we did look at the economics and assume a diversion from New York. Again, you'd want to look at the details of ow much is going to be delivered and under what conditions given the contract. If you don't have the contract, you try to make an educated guess about what the injections of energy are going to be.

MS. KELLY: So yesterday some of the questions were just assuming what you assumed in your original modeling which showed a pretty significant indirect benefit. Can you speak to how that would be the same or different with a line that was not going through Maine but an adjacent location into Massachusetts?

MR. SHOPE: I guess I'm going to object to the form of the question. I'm not sure what is meant by significant or what is meant by indirect. I think the modeling related to the effect on the wholesale energy market prices. And I think indirect has been a discussion at least in the expert reports with regard to jobs or perhaps a multiplier effect, that sort of thing.

MS. KELLY: Okay, please ignore the indirect part.

MS. BODELL: So, Dot, could you please repeat the question?

MS. KELLY: Sure. Using your model that you did for the original testimony, could you describe whether there would be a difference between a line in Maine, like CMP, and a similar line in an adjacent state?

MS. BODELL: Okay.

MR. TANNENBAUM: So I think the question is if you had a similar line in New Hampshire or Vermont, would there be similar benefits in terms of energy and capacity reductions.

MS. BODELL: Right, and I think also she's asking us to use our original assumption that doesn't get into the details of the economics of the contract and when energy would be injected but simply looks at -- assume it all comes into New England and anything else that would have been sold into New England continues to be sold into New England. So under that -- under those conditions, there would be differences between the impacts of a line that's coming directly into Maine and a line that's coming into, say, Vermont or New Hampshire. You'd have to run the model to know how that impacts the locational marginal prices because it is about transmission constraints, and I don't think anybody can do that in their head. It's very complicated. But I think the key difference that we did emphasize is the impact on the capacity market, the fact that Maine, with NEC (sic) coming into Maine, it would bind. We talked about this yesterday, that that would not be the case if it was going into another marketplace. And so our conclusion is that there is a higher likelihood you would have the retirements in Maine with NECEC and, although there's still a risk, it's a lower risk with respect to a transmission line that would go into another part of the region.

MS. KELLY: And could you address the zonal separation that has been described? Would that still be the same? Would Maine be considered a separate zone at this point?

MS. BODELL: So again, it depends where that other transmission line would be coming in. If that other transmission line is coming into New Hampshire or Vermont, it would still be part of the northern zone which is already a separate capacity zone. If it were going into Massachusetts, for example, then it wouldn't -- it'd have a different impact. But, again, we're getting into some of the details of the way that the capacity markets work, and Mr. Fowler is, frankly, an incredible expert on that because he has sat in those meetings multiple days and hours across the year.

MS. KELLY: As always, thank you very much for your responses.

MS. BODELL: Thank you, Ms. Kelly.

MR. TANNENBAUM: Sue?

MS. ELY: Actually, my question was the zonal question, and that was just covered. So no questions.

MR. TANNENBAUM: Okay. John, redirect?

MR. SHOPE: Yes, Ms. Bodell, when you were being questioned by Mr. des Rosiers, you -- he asked you about, you know, your observation that in light of what you now know about Hydro-Quebec's exports to New England last year -- and I think you had mentioned the 18 terawatt hours -- in relation to the thresholds for incremental under the Massachusetts contracts and you had mentioned three terawatt hours for Eversource and

Unitil and around nine and a half terawatt hours for National Grid, at the end of that -- and you had mentioned in connection with all of that that you believe that potentially all of the power that was currently being -- or that would be sold on NECEC could be redirected from power that was already being sold to New England. You remember that generally?

MS. BODELL: I do remember that, yes.

MR. SHOPE: And you had mentioned that this would very significantly affect the determination of whether there was any price benefit in Maine.

MS. BODELL: That's correct.

MR. SHOPE: Okay. And I believe Mr. des Rosiers asked you a question just in general, well, if there's not going to be price suppression or at least to the same extent, why do the generators care about that. So I guess the question would be why would generators in Maine care about the proposed NECEC project or be concerned about it in light of the information that you now have about the historical Hydro-Quebec sales in relation to the thresholds under the contracts?

MS. BODELL: Yes, so if what Hydro-Quebec ends up doing is, without NECEC, it would have sold into Maine through New Brunswick but instead decides to sell that energy through NECEC, there would be no difference in the energy price for the most part. There might be some minor changes, but generally it's going to be about the same. So that would mean no energy market benefits or impacts in Maine. On the other hand, if it came out of, say, western Massachusetts and was injected into Maine, all else equal, you would have the higher congestion, the higher losses. And, therefore, since the LMP that the generators receive is composed of the energy price plus the losses, plus the congestion, there would still be an impact on the energy market price in Maine, that LMP price in Maine, but it would be less than what I calculated. That said, there could still be an adverse impact on the energy market price for the generators. So I would think they would be impacted -- adversely impacted by that.

MR. SHOPE: Now, Mr. des Rosiers asked you about a cold snap that had occurred just about a year ago in late December of 2017, the very beginning of January of 2018.

MS. BODELL: Yes.

MR. SHOPE: You recall that? Okay. And I believe you had testified that you had some familiarity with that situation.

MS. BODELL: I did. For a client that I can't disclose, they asked us to do a detailed analysis of what happened during that cold snap, what caused it, why did it happen, what happened with prices in New England, is this a capacity constraint on the gas pipelines coming into New England, is it something else. So we did that analysis. And part of what we looked at as part of that analysis was where was the energy coming from in New England, who was supplying the energy during that cold snap, that period of time.

MR. SHOPE: And did you -- well, actually maybe we can just circulate the next document and you can tell us what that is.

MS. BODELL: Yeah, so one of the things we looked at was the imports, how were the imports impacted during the cold snap, did they stay the same, did they go up, did they go down. And this, what's being passed around, is one of the slides from the presentation that we made to our client. It was slide six -- I don't know off the top of my head, maybe it was around 25 pages, 30 pages, the entire deck -- analyzing what had occurred. We also did some memos and we did some commentary on some of the public statements that were issued by ISO New England as part of our analysis. But this particular page, and this was -- could I get a copy, Steve? Thank you. So this particular page, I was trying to pull it up yesterday -- and when you're on the stand, you can't do things as quickly as you think -- because I vaguely remembered that we had found that the imports have gone down. And, in fact, what this shows -- it comes from the ISO New England morning reports, and the gray box in this chart is during the cold snap, December 26th, 2017 to January 8th, 2018. It looks at, on these colored bars, whether something's coming in from New York ISO across each of the three interties, whether it's coming into New England through New Brunswick, or whether it's coming in through Phase II which, as you know, is directly connected to Quebec, or whether it's coming in from High Gate which is also directly connected to Quebec but tends to be a pretty standard contract. And what you see is during that cold snap -- and again, this was just a statement that we made in April at the bottom in the brown box -- Canadian imports from Quebec fell by around one-third and that's specifically the Phase II line. It was predominantly the Phase II line, although, as you can see from some of the blue bars, High Gate also went down. And interestingly, if you look at the orange bars, those are imports coming in from New Brunswick, and you see that those also had some variation as well. And the conclusion is, from this, that during that very cold peak period in the winter of 2017 and '18 the Quebec imports into New England fell by around one-third.

MR. SHOPE: But what was happening to prices in New England at the time of the cold snap?

MS. BODELL: Prices -- as we discussed yesterday, prices were very, very high. They weren't necessarily being set by the gas price, although some of the hours were. There was also prices being set by the oil price, but it was still a very high-priced period in New England. It would be a time when you would have the most incentive to sell every single megawatt of energy that you could into New England. And yet, during that time, it was also cold in New York, it was also cold in Quebec, and there were other competing needs. We don't know exactly what was going on with those systems. All we know is that the total imports coming into New England from Quebec during that period was one-third lower than the surrounding days.

MR. SHOPE: Okay, and I think Mr. des Rosiers had asked you about what potential benefit the NECEC line would have if there -- a similar cold snap were to occur if the project goes forward. And so could the same thing happen?

MS. BODELL: So assuming they haven't shifted their capacity supply obligation into NECEC, there's enough flexibility in the contract that during the super peak cold days Quebec does not have to deliver. As long as they were to make it up during other hours, they would be fine and wouldn't suffer any penalty. And then, of course, the incremental calculation is on a year-by-year basis. But with respect to fuel security or deliverability during the time when New England needs it most, there's so much flexibility in that contract that I wouldn't count on it.

MR. SHOPE: That's it for the generator interveners.

MR. TANNENBAUM: Okay. Anything else for this witness?

MR. SHOPE: Oh, yes. I'm sorry, yes. Just to clarify, we would like to have what's just been passed around as Generator Intervener 29.

MR. WILLIAMSON: Do you have an extra copies of that?

MR. BARTLETT: Yes, we do actually. Sorry.

MS. BODELL: Steve, there are three important people in addition to all the other important people in this room.

MR. TANNENBAUM: So --

MR. SHOPE: I'm sorry, did you folks not have copies of that when we were going over it?

MR. WILLIAMSON: I have it.

MR. TANNENBAUM: Okay, so any objections?

MR. DES ROSIERS: Since we've just been provided this and this is an Energyzt report as opposed to an ISO New England report, I would want to do -- have a better understanding. The source is listed as analysis of ISO New England morning reports. It's not necessarily identifying the source of the data, and this is ISO data. So we have some foundational issues as to --

MR. SHOPE: Well, it is ISO data, and so we -- I'm happy to -- then we can have that emailed to Mr. Simpson and then we can circulate that as well if you'd like or we can have -- or if you'd like to cross examine Ms. Bodell as to what the source of the data is, that's fine too. But I --

MR. DES ROSIERS: If I may suggest, if counsel for the generator interveners can share the source data, we can look at it and then -- and reserve on an objection or reserve on asking any questions of Ms. Bodell with respect to her analysis that's just been provided to us.

MR. TANNENBAUM: Okay, so we'll defer ruling. Anything else for today? Thank you, Tammy.

MS. BODELL: Thank you.

MR. TANNENBAUM: See you Friday. We'll probably see --

MS. BODELL: All right, we'll see you Friday.

MR. SHOPE: And tomorrow is nine o'clock if my memory --

MR. TANNENBAUM: Yes, it is.

CONFERENCE ADJOURNED (January 9, 2019, 4:51 p.m.)

CERTIFICATE

I hereby certify that this is a true and accurate transcript of the proceedings which have been electronically recorded in this matter on the aforementioned hearing date.

D. Noelle Forrest

D. Noelle Forrest, Transcriber

Exhibit 2

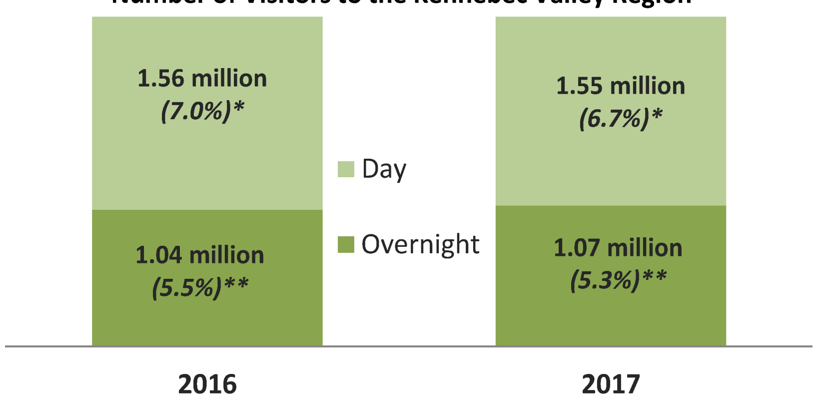
Kennebec Valley

2017 Regional Tourism Impact Estimates

An estimated 2.6 million visitors came to the Kennebec Valley region in 2017, a 0.7% increase over 2016.

2016 Total	**2017 Total**
2.60 million	**2.62 million**
(6.3% of All Maine Visitors)	***(6.0% of All Maine Visitors)***

Number of Visitors to the Kennebec Valley Region



***** Percent of estimated total Maine day visitors***

***** Percent of estimated total Maine overnight visitors***

Year-over-year changes in visitation estimates fall within standard statistical margins of error and, therefore, should not be interpreted as absolute, significant fluctuations in visitation. Valid indicators of change include ongoing trends over multiple years, as well as noted statistically significant changes.

- *For the purposes of visitation and visitor expenditure estimates, only visitors on tourism-related trips are included. Tourism-related trips include: All leisure trips, trips that are a general visit to see friends or relatives, a wedding, a holiday visit, and business trips that are for a convention/conference/trade show or training/professional development.*

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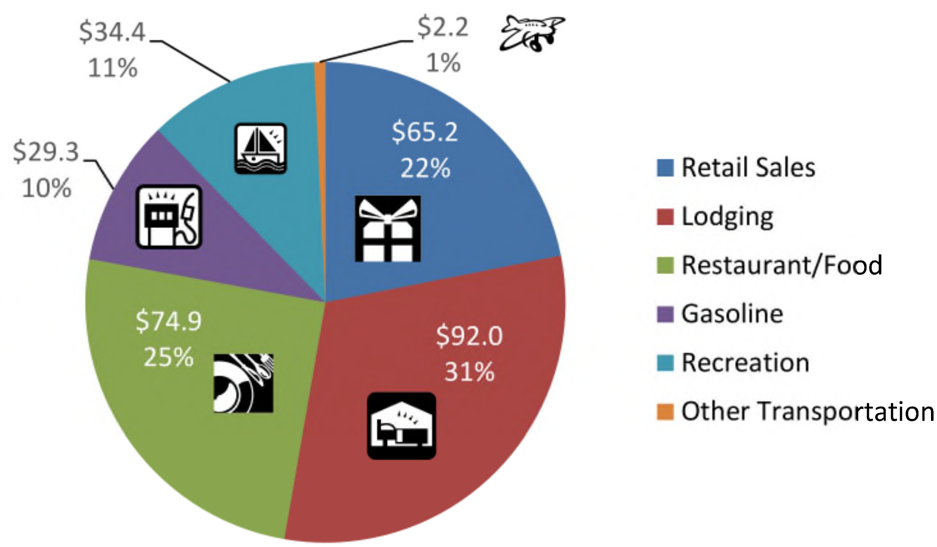
Kennebec Valley

2017 Regional Tourism Impact Estimates

In 2017, Kennebec Valley visitors spent nearly $298 million, down 1.9% from 2016.

2017 Total

$298 million



The $298 million spent by visitors in the region supported…

Economic Impact begins when a visitor spends money in an area. The benefits to the local economy go beyond the basic impact of these dollars spent – these dollars create a chain effect. The effects of these expenditures are evident as the direct recipients of these expenditures in turn pay wages, earn income, and pay taxes. Further these secondary recipients spend *their* income and thereby create more impact.

4,901 jobs

$95.7 million in total earnings

$27.6 million in total taxes

- *For the purposes of visitation and visitor expenditure estimates, only visitors on tourism-related trips are included. Tourism-related trips include: All leisure trips, trips that are a general visit to see friends or relatives, a wedding, a holiday visit, and business trips that are for a convention/conference/trade show or training/professional development.*
- *For the purposes of expenditure estimates, visitors are defined as all overnight visitors and all out-of-state day visitors on tourism-related trips.*
- *Economic Impact is estimated using DPA visitor expenditure estimates, and the RIMS II Economic Impact model.*

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Winter Recreation Impact Survey
February 2019
Conducted by Sandra Howard, PhD

Summary:

This online survey was distributed electronically and participants responded during a 4-week period between January 18-February 18, 2019. The prompt to participants read as follows: "We are collecting data about the winter recreation experience in western Maine. These data will be used in response to a proposed 145-mile transmission line through Maine, which would include crossing many mountains, wetlands, and waterways in an undeveloped region of western Maine."

- 163 Participants

- State of Residence
  - Connecticut (8.0%)
  - Maine (65.6%)
  - Massachusetts (17.8%)
  - New Hampshire (4.3%)
  - Other – Maryland, New York, Virginia, Pennsylvania (4.3%)

- Year of most recent trip to Maine
  - 2019 (84.6%)
  - 2018 (13.5%)
  - 2017 (1.9%)

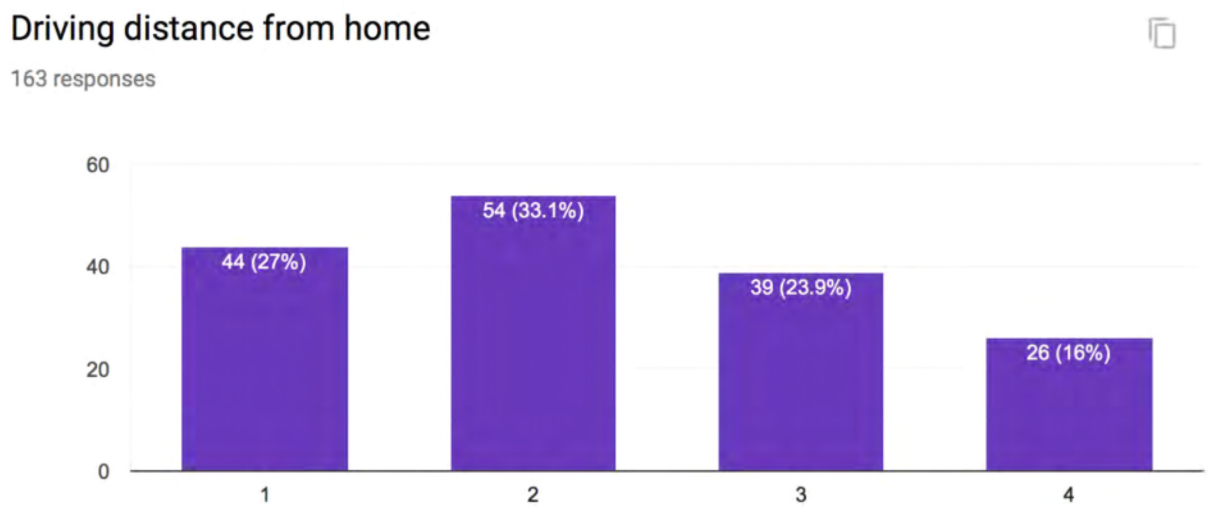
- Duration of most recent trip to western Maine
  - 1-2 days (14.1%)
  - 3-4 days (40.4%)
  - 5 or more days (30%)
  - Seasonal Resident (3.9%)
  - Year-Round Resident (11.6%)

- Number of times traveled to area to participate in winter rec. activities
  - 1-5 times (8.6%)
  - 6-10 times (11.6%)
  - 11-15 times (7.4%)
  - 16-20 times (7.4%)
  - 20+ times (65%)

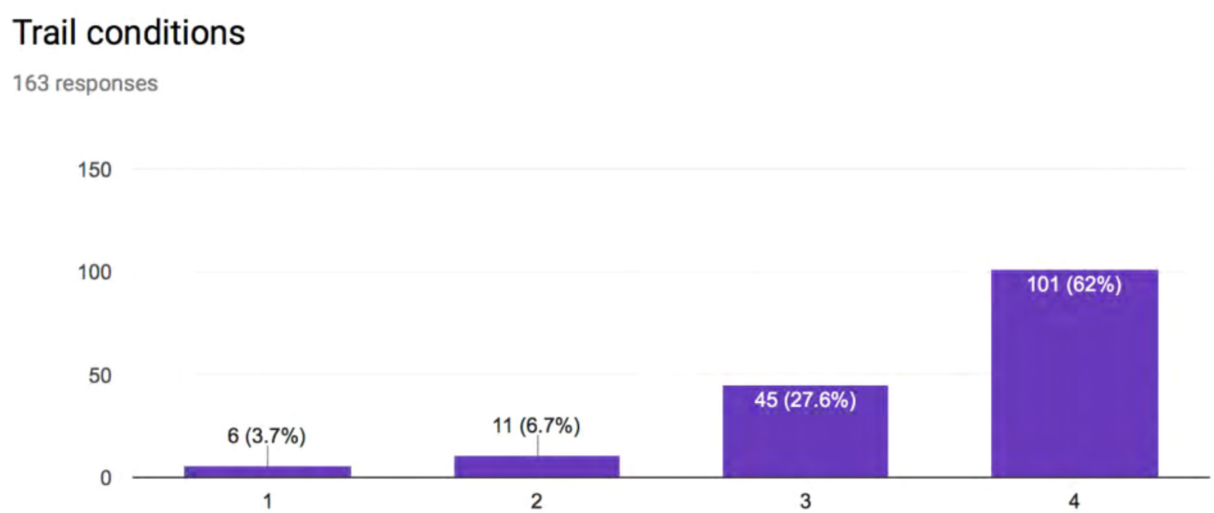
- Activities engaged in on most recent trip to area (*select one or more)
  - Purchased Fuel (91.4%)
  - Purchased Meals/Drinks at Local Restaurant (90.8%)
  - Snowmobiling (86.5%)
  - Purchased Grocery Items (81.6%)
  - Viewed scenery (75.5%)
  - Purchased Retail Items (68.1%)
  - Stayed at Area-Owned Home (55.2%)

- Stayed at Area-Lodging Accommodations (50.3%)
- Snowshoeing/Winter hiking (39.9%)
- Ice Fishing (39.3%)
- Cross-country skiing (19%)
- Rented Snowmobile (6.7%)
- Other (6.6%)
- Hired Snowmobile Guide (1.8%)

- RATE EACH FACTOR FOR SELECTING A SNOWMOBILE DESTINATION:



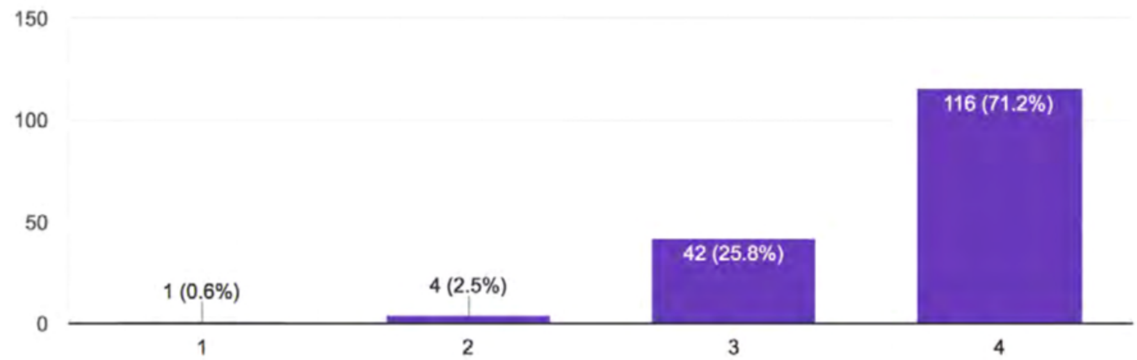
SCALE (1 = Less Important; 4 = Very Important)



SCALE (1 = Less Important; 4 = Very Important)

Scenic beauty along snowmobile trails

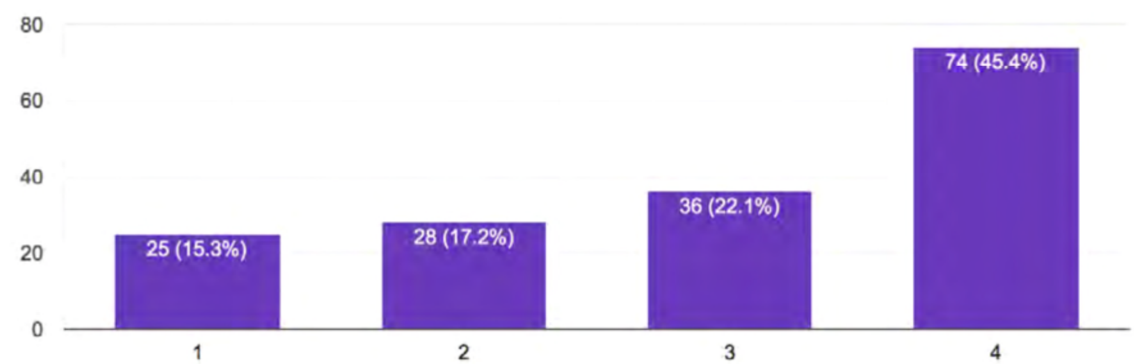
163 responses



SCALE (1 = Less Important; 4 = Very Important)

Ability to participate in other recreation activities (i.e. ice fishing, snowshoeing, x-country skiing, etc.)

163 responses



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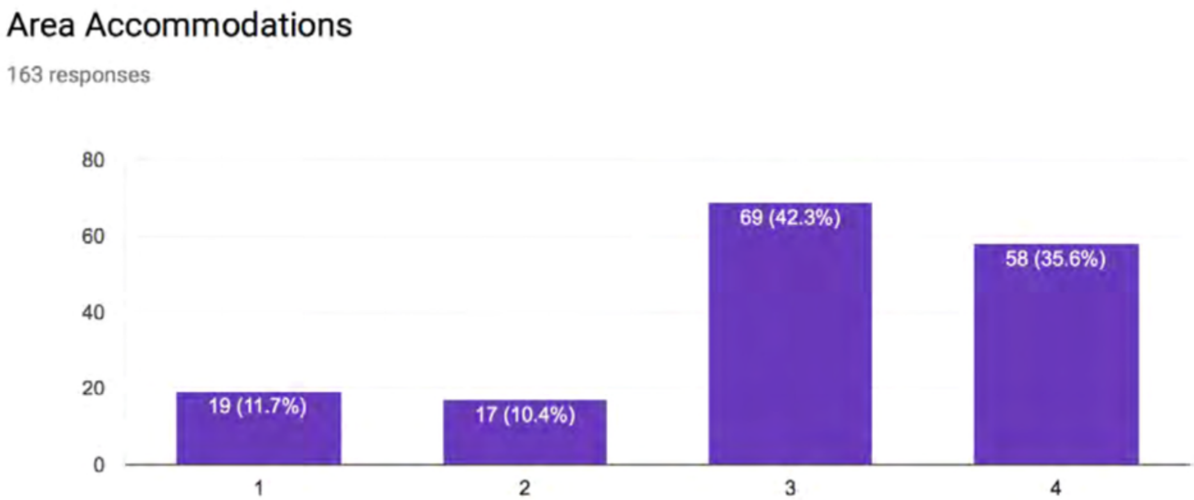

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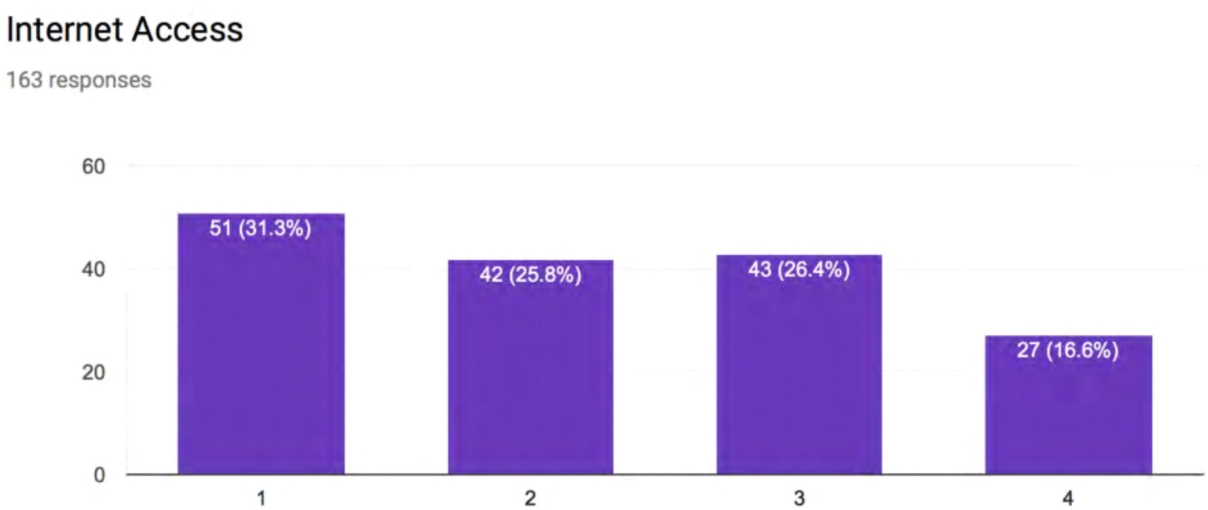
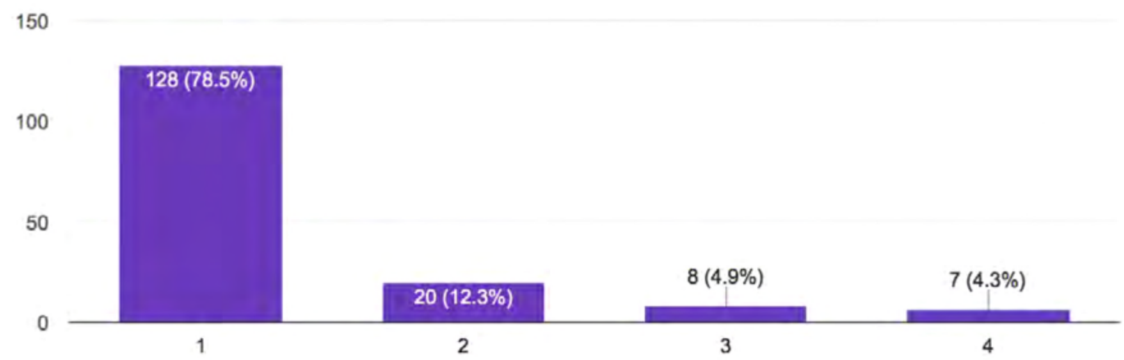


SCALE (1 = Less Important; 4 = Very Important)

Opportunity to view large-scale utility infrastructure in the area

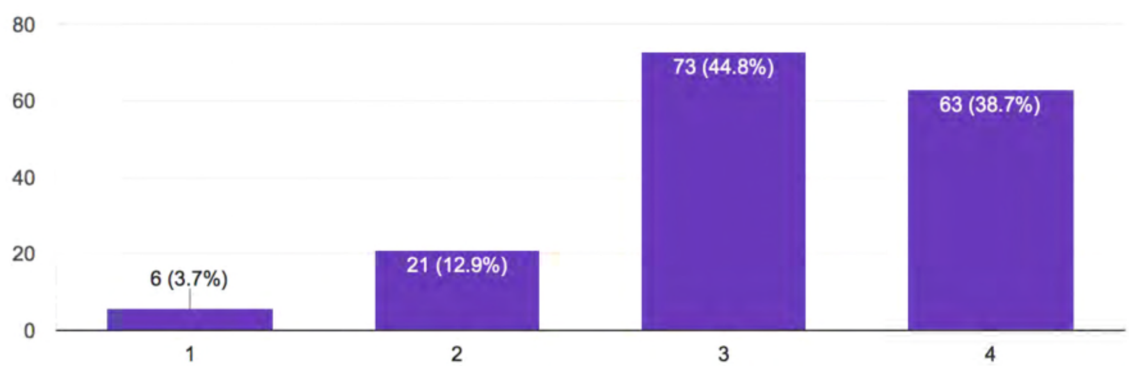
163 responses



SCALE (1 = Less Important; 4 = Very Important)

Area Restaurants

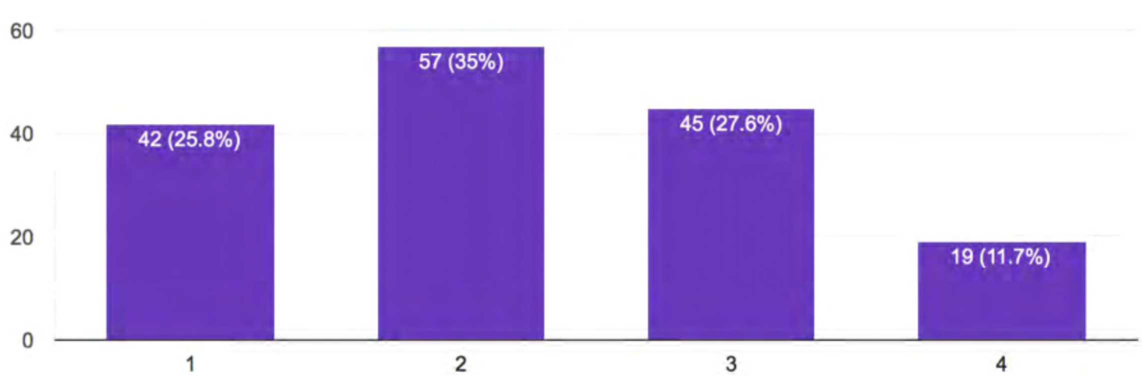
163 responses



SCALE (1 = Less Important; 4 = Very Important)

Area Shopping

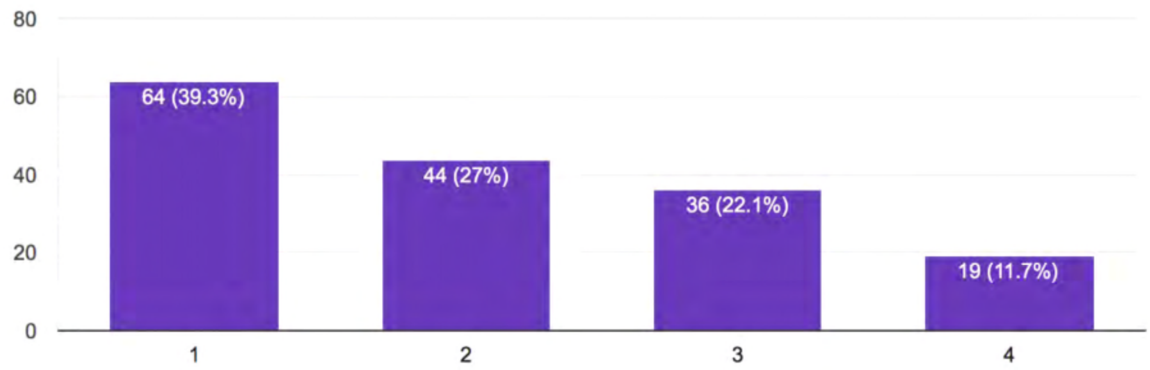
163 responses



SCALE (1 = Less Important; 4 = Very Important)

Area Rentals

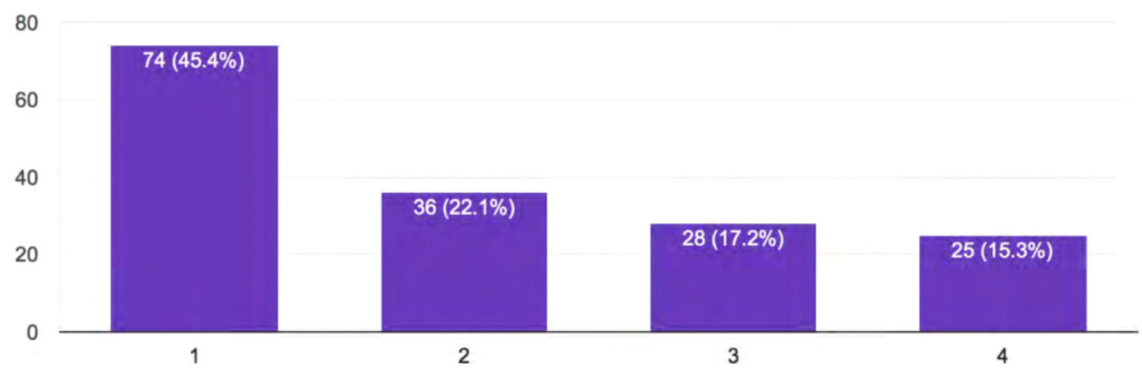
163 responses



SCALE (1 = Less Important; 4 = Very Important)

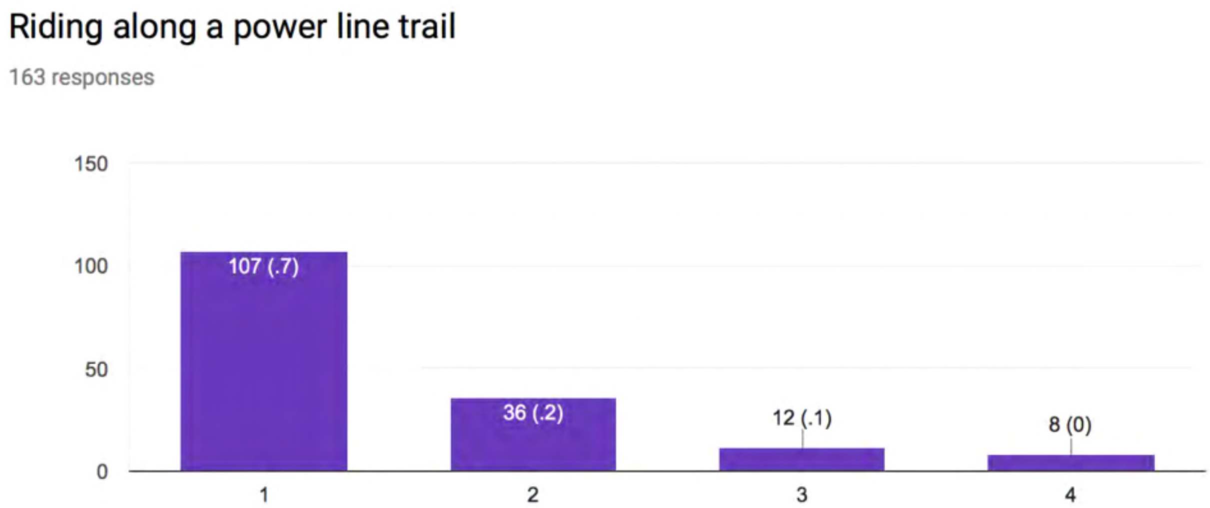
Area Guides

163 responses

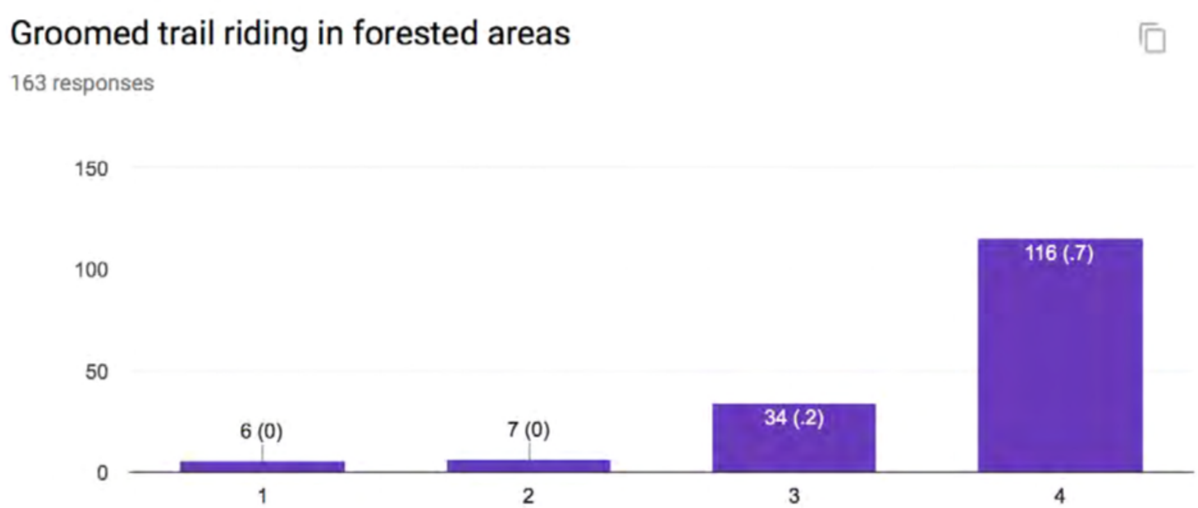


SCALE (1 = Less Important; 4 = Very Important)

- RATE YOUR PREFERENCE FOR EACH TYPE OF SNOWMOBILING EXPERIENCE BELOW:



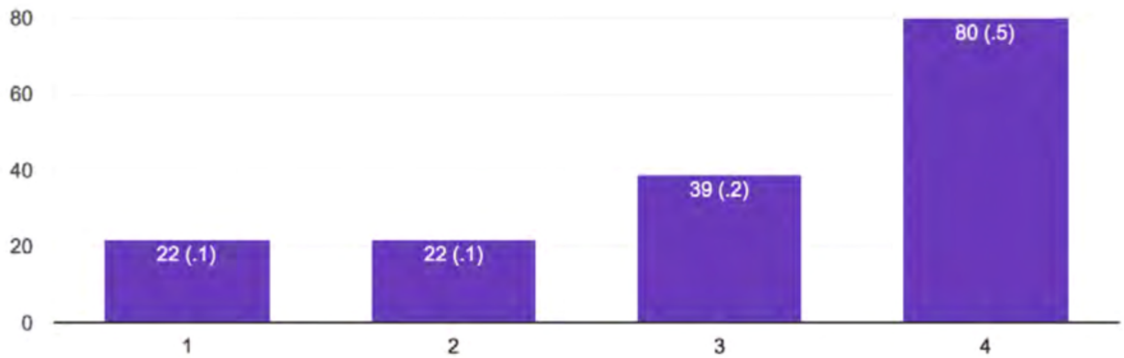
SCALE (1 = Least Preferred; 4 = Most Preferred)



SCALE (1 = Least Preferred; 4 = Most Preferred)

Riding with few road or power line crossings

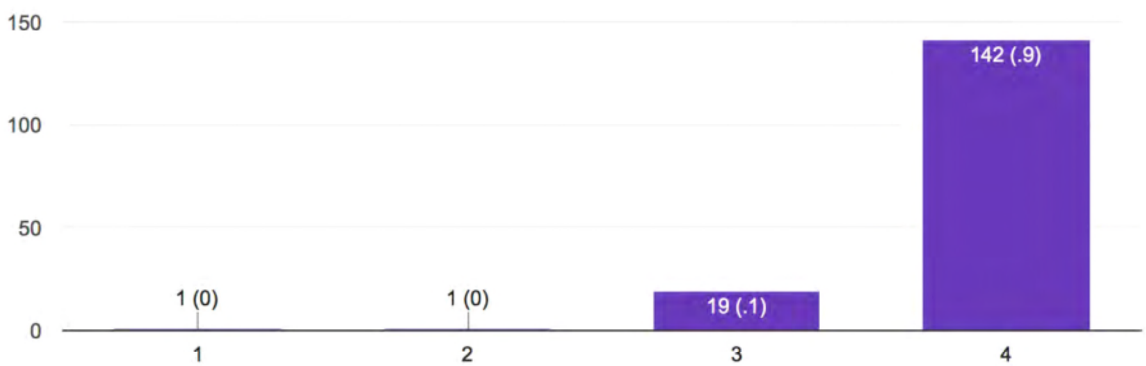
163 responses



SCALE (1 = Least Preferred; 4 = Most Preferred)

Riding along mountain view trails with overlooks

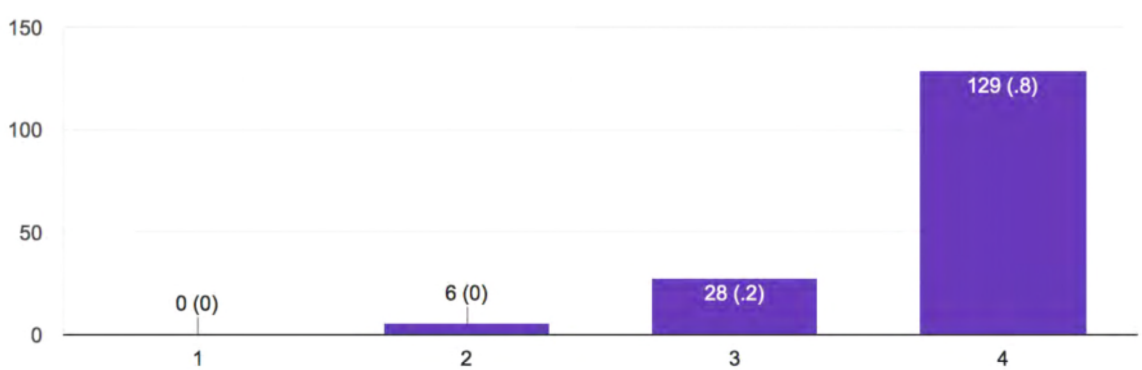
163 responses



SCALE (1 = Least Preferred; 4 = Most Preferred)

Seeing wildlife in their natural setting

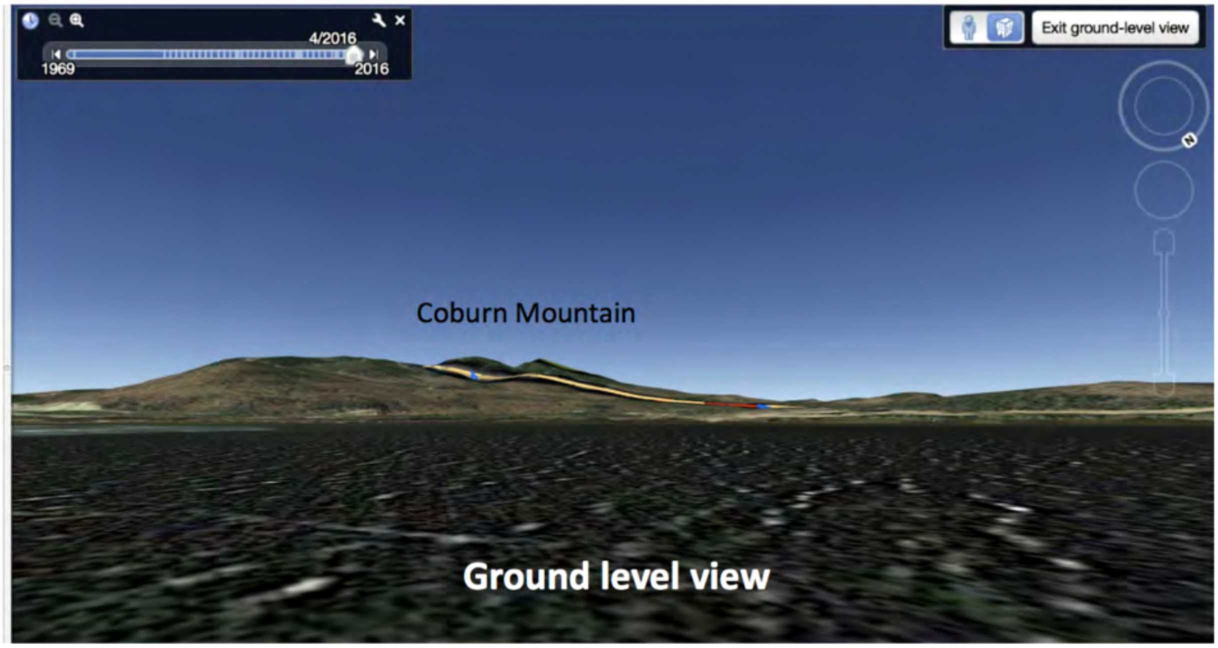
163 responses



SCALE (1 = Least Preferred; 4 = Most Preferred)

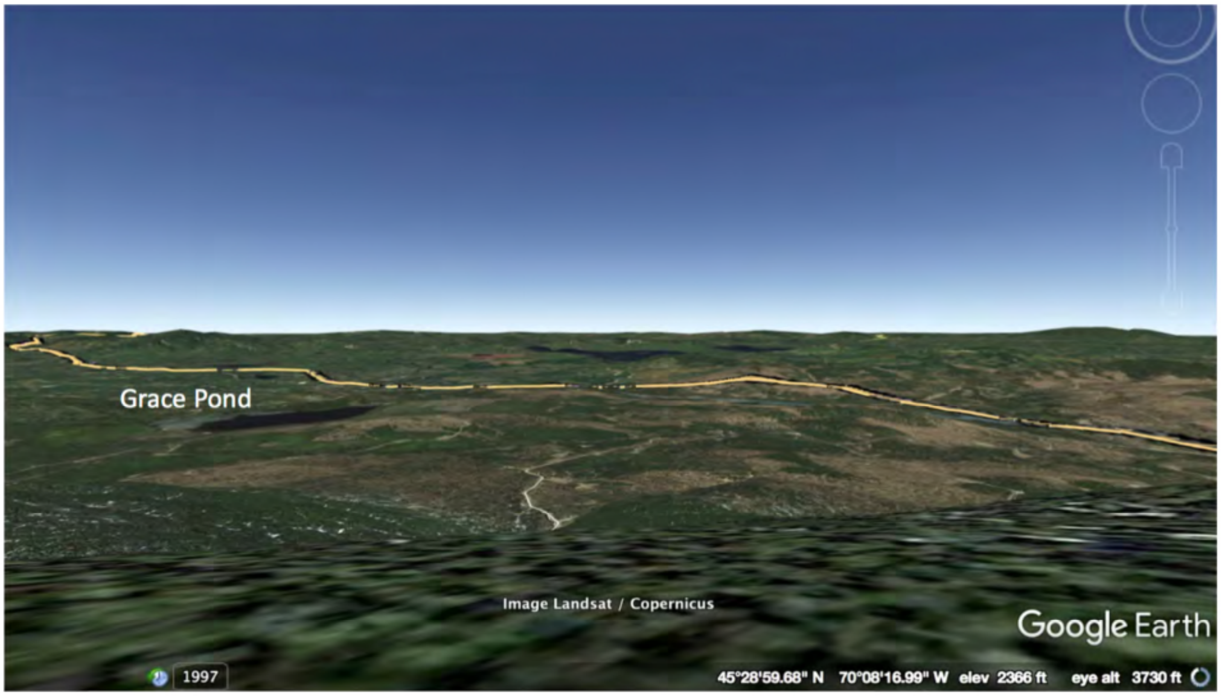
- Participants were asked to "look at the scenic photos and GIS simulation photos that show a 150-foot wide cleared corridor with 100-foot transmission towers."

GIS simulation of proposed transmission corridor at Coburn Mountain

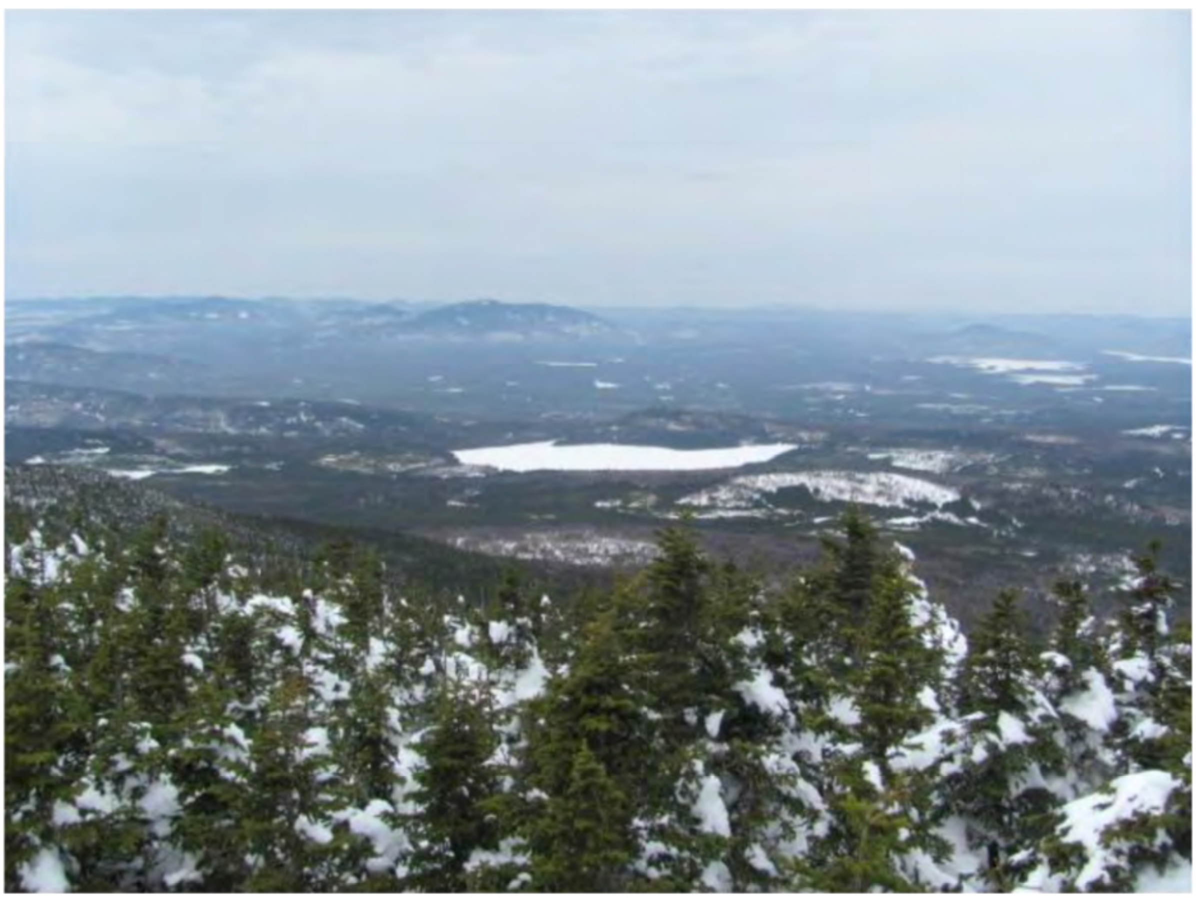


Snowmobilers at the top of Coburn Mountain

View of Grace Pond from the top of Coburn Mountain - GIS simulation of transmission corridor

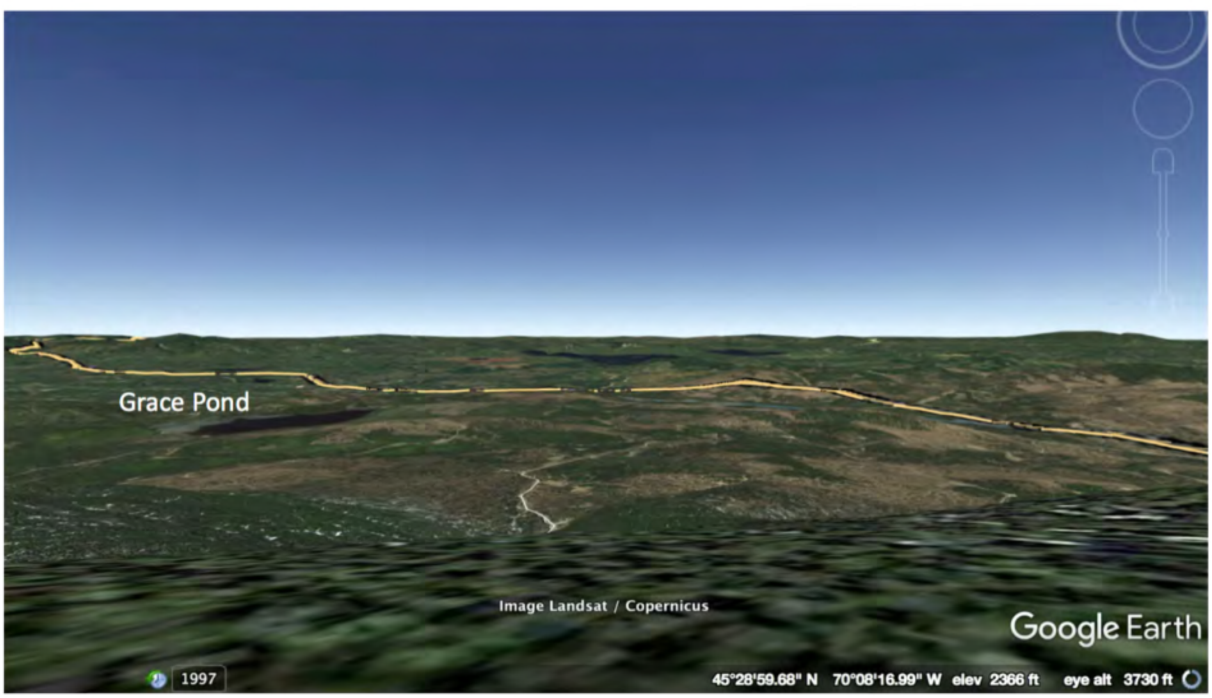


View of Grace Pond from the top of Coburn Mountain



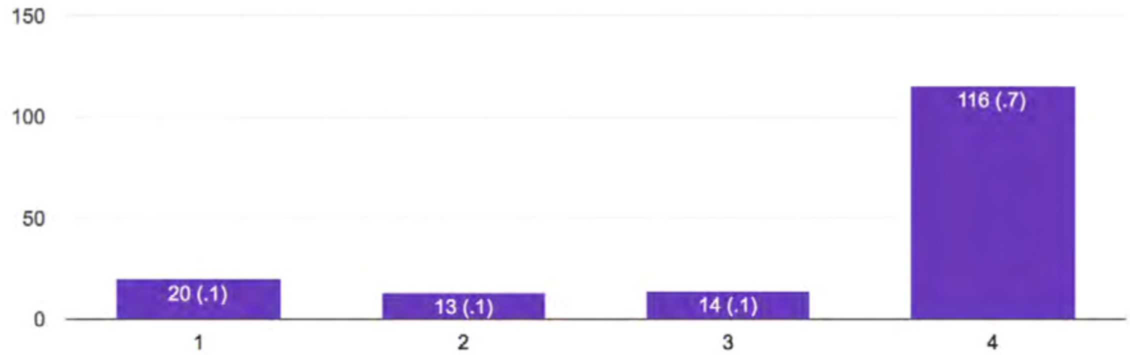
View of Johnson Mountain from the top of Coburn Mountain - GIS simulation of transmission corridor

View of Grace Pond from the top of Coburn Mountain - GIS simulation of transmission corridor



What visual impact would a 150-foot wide cleared corridor with 90-foot transmission towers have on your wilderness snowmobiling experience?

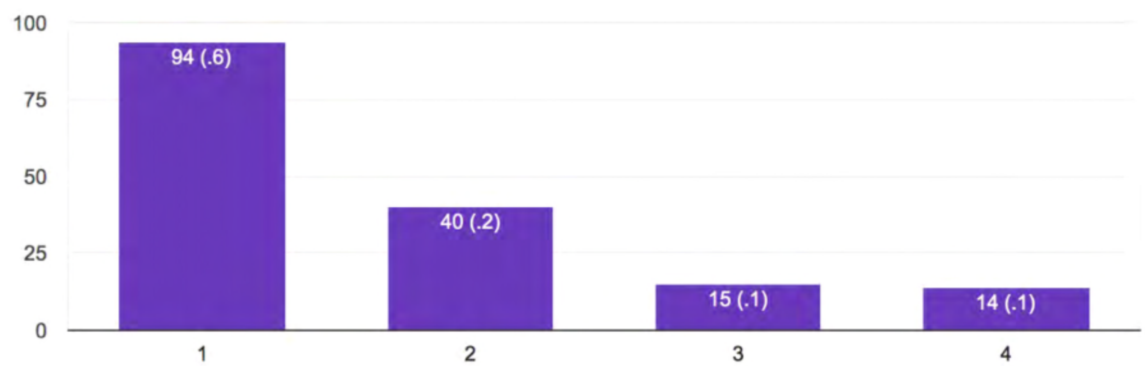
163 responses



SCALE (1 = Little Negative Impact; 4 = Strong Negative Impact)

Would you be more or less likely to visit a scenic area which contains large-scale developments for a snowmobiling destination?

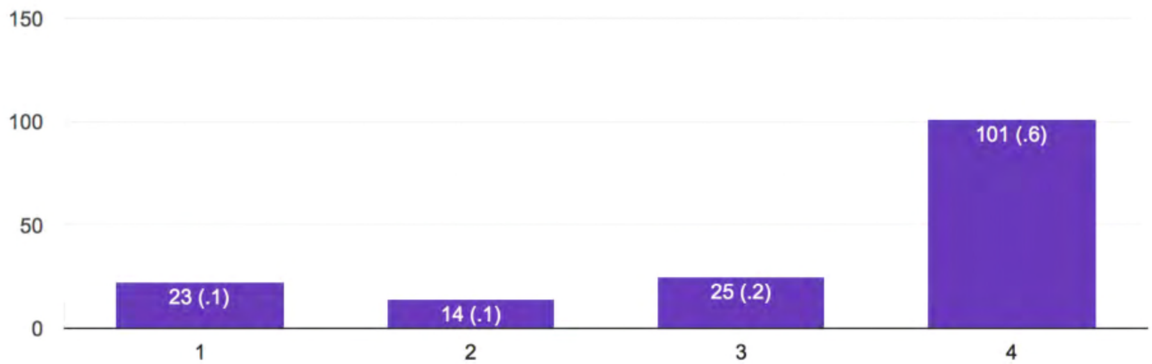
163 responses



SCALE (1 = Little Negative Impact; 4 = Strong Negative Impact)

What impact would the presence of a 150-foot wide cleared corridor with 90-foot transmission towers have on your decision for a return visit the area in the future?

163 responses



SCALE (1 = Little Negative Impact; 4 = Strong Negative Impact)

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"Connect New York"

Introduction

The respondent group detailed below is proud to provide the following submission to the New York Energy Highway Request for Information (RFI). The information contained within this response addresses the requirements of the RFI and includes additional information regarding property, interconnection, operational, socio-economic, and environmental issues among others. An Index is also included to map the projects benefits to the Energy Highway's objectives.

Simply stated, the Connect New York proposal:

- Provides for the construction of a 1,000 MW DC underground transmission line, with the option of an additional 1,000 MW's, utilizing existing public and private rights-of-way which become a main route on the "New York Energy Highway" and will satisfy many of the Cuomo Administration's energy goals;

- Satisfies "New York's energy policy goals of providing affordable and reliable energy, while improving the environment, creating and retaining jobs, and promoting economic growth, as New York transitions to a more efficient, lower carbon and cleaner, greener energy economy; and

- Reduces transmission system congestion that prevents the delivery of power from northern and western generating stations to southern load centers, reducing a significant financial burden on ratepayers.

Section I – Respondent Information

Iberdrola USA, 52 Farm View Drive, New Gloucester, ME 04260
Thorn Dickinson, Vice President – Business Development
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Iberdrola USA, a subsidiary of global energy leader Iberdrola S.A., is an energy services and delivery company serving about 2.7 million customers in upstate New York and New England. Its primary subsidiaries are New York State Electric & Gas, Rochester Gas and Electric and Central Maine Power.

Iberdrola USA, and its parent, bring tremendous experience and investment capabilities to New York. Iberdrola USA is in the midst of a $1.4 billion upgrade of its transmission system in the state of Maine. The project, called MPRP, includes over 400 miles of new transmission lines, five new substations, and upgrades to numerous existing lines and substations. The company is about 1/3 of the way into the 5 year project and the project is on time and on budget. This project has created over 3,300 direct and indirect jobs for the state of Maine. Importantly, the project's DART rate (a measure of safety incidents) is .09 through March 2012 vs. a national average of 2.1. The completion of this project in early 2015 fits well with the likely construction schedule for this proposal.

Iberdrola is also a leader in the utilization of technology. For example, the MPRP project will be fully compliant with IEC 61850, an international best practice standard for substation automation and communications. Iberdrola USA subsidiary, Central Maine Power, recently completed the full installation of automated or "smart" meters that will provide tremendous environmental and customer benefits. Consumers are able to better manage their energy usage. CMP eliminated over 2 million vehicle miles per year.

Our parent, Iberdrola S.A., is a global investor-owned company with experience forged over more than 150 years of history that provides service to 31 million customers in 38 countries and four continents.

After a significant process of growth and internationalization, which involved an investment of over $100 billion in the last eleven years, Iberdrola is today one of the five largest global utilities, the world leader in the wind sector, and the leading Spanish energy group.

Our 33,000 employees manage assets worth $130 billion that in 2011 produced revenues worth $42 billion and a net profit over $3.5 billion.

Iberdrola will continue to grow its core businesses: power generation through clean technologies and the build up and management of transmission and distribution networks. In addition, the continuous improvement of operational efficiency will remain one of the basic foundations of the Group's activities.

The path to sustainable growth in size, efficiency and profitability has brought Iberdrola a number of international awards, such as the nomination as leading electric utility on the "Global 100 Most Sustainable Corporations in the World". In addition, Iberdrola has been member of the "Dow Jones Sustainability Index" for the last eleven years.

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Throughout its 63-year history, Cianbro has safely and efficiently planned, managed, and constructed many technically complex, historic, and environmentally sensitive projects for a wide variety of public and private clients. A total commitment to safety combined with the enthusiasm of an innovative team of construction professionals, has enabled Cianbro to build a durable reputation for completing projects safely, on schedule, and within budget. Founded in 1949 by the Cianchette brothers, Cianbro is now one of the largest, most diverse, successful, 100% employee-owned, construction and construction services companies based on the East Coast. Presently operating in more than forty (40) states, in twelve markets, and employing over 4,000 team members, Cianbro self-performs civil, structural, mechanical, electrical, transmission, fabrication, and coating work.

Cianbro is also the managing member of Atlantic Energy Partners, LLC; the developer of the Neptune Regional Electrical Transmission System (Neptune). The Neptune Transmission System provides up to 660 MW of electric power from the PJM system to the LIPA grid on Long Island via a 500-kilovolt (kV), high voltage direct current (HVDC) cable. The HVDC cable extends between two converter stations, one in Sayreville, New Jersey, and one on Duffy Avenue in the community of New Cassel in the Town of North Hempstead. The Sayreville converter station takes alternating current (AC) power from the PJM system and converts it to DC power, while the Duffy Avenue station converts DC power back to AC for use on the LIPA system. The DC cable runs approximately 50 miles under the Raritan River in New Jersey and the Atlantic Ocean, and an additional 15 miles buried alongside the Wantagh Parkway. The Neptune Transmission System interconnects to PJM in Sayreville at a nearby First Energy substation, and interconnects to the LIPA system at the Newbridge Road substation in Levittown.

Since starting operation in mid-2007, Neptune has provided, on average, nearly 25 percent of the electric power used on Long Island, and runs at its full capacity of 660 MW most of the time. In addition, Neptune has performed as well or better than expectations, averaging nearly 98 percent availability. The Neptune HVDC cable allows LIPA to tap into a diverse range of power generation from PJM, including renewables such as wind and hydro, as well as oil, coal, nuclear, and natural gas. This diversity of generation sources is not available on Long Island. Because wholesale energy prices in PJM are generally much lower than on Long Island, power brought over the Neptune cable is less expensive than most of what can be generated on the island.

For LIPA, the Neptune HVDC cable was seen as an environmentally friendly, cost-effective solution to future power needs. According to LIPA, an economic assessment conducted prior to construction projected that the Neptune cable would provide about $1.4 billion in net benefits to LIPA, which was significantly more than any other project proposed to meet Long Island's long-term energy needs. As former LIPA Chairman Kevin Law has said, *"The Neptune cable provides LIPA with the opportunity to acquire lower-cost energy to meet customer needs while providing more flexibility in selecting the markets from which we acquire that energy. It is a significant win-win for Long Island."*

Gilberti Stinziano Heintz & Smith, P.C., 555 East Genesee St., Syracuse, NY 13202
William Gilberti, CEO and Managing Partner
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For more than twenty-five years, Gilberti Stinziano Heintz & Smith, PC (GSH&S) has served the needs of clients in the energy field, including large, multi-plant power producers, natural gas pipeline operators, and electric transmission line developers, as well as the developers, installers and operators of various renewable energy systems and other smaller generating facilities. We have been counsel on power generation projects that total more than 5,000 megawatts of generating capacity and have counseled both gas pipeline and electric transmission companies on projects involving more than 450 miles of transmission line.

Together with the firm's CEO and Managing Partner, William J. Gilberti, Jr., the lawyers in the GSH&S energy group combine decades of in-depth industry knowledge and experience and include leading practitioners in the industry, such as a former executive vice president and general counsel of the New York Power Authority, the largest state-owned power organization in the nation, and a former counsel to the U.S. Nuclear Regulatory Commission.

The firm's understanding of, and experience with, the applicable financing structures, regulatory requirements and governmental approvals needed for large infrastructure and commercial development projects in New York, including large scale energy generation and transmission projects, is unparalleled. From the initial planning and feasibility phases of a project through environmental review and permitting to completion of construction and beyond, GSH&S provides counsel and strategic advice to clients on every aspect of energy development.

GSH&S has successfully completed the permitting and environmental review for various power plants firing a wide variety of fuels and for hundreds of miles of transmission line in the State. The firm has served as lead counsel in several landmark cases under the State's Environmental Quality Review Act (SEQRA), including litigation establishing that certain previously approved industrial operations were "grandfathered" and not subject to review. GSH&S has also provided strategic legal counsel on the approvals needed for various major generation and transmission projects in New York, including, among others, a 130-mile underground electric transmission line, an aboveground 190-mile electric transmission line and a 50-mile overhead electric transmission line.

GSH&S often engages in complex litigation involving State and federal agencies regarding permitting and environmental issues. The firm served as lead counsel in such a case for the second largest independently owned cogeneration plant in North America. As a result of the firm's strategy and effort, the U.S. Court of Appeals for the 4th Circuit vacated and remanded the Federal Energy Regulatory Commission (FERC) interpretation of the Energy Policy Act of 2005 in a case of national first impression, knocking out federal licensing regulations that would displace state regulation of electric transmission lines; and the U.S. Court of Appeals for the 9th Circuit vacated and remanded to the federal Department of Energy, its determination to create the Mid-Atlantic National Interest Electric Transmission Corridor, the designation of which is a prerequisite for any shift of transmission line licensing from the states to FERC.

GSH&S regularly assists in the drafting and negotiation of various energy contracts, most recently having negotiated power purchase and interconnection agreements for the developer of a utility-scale solar photovoltaic project.

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Spectra was formed in 1993 and is a self-certified, federal Small Business Enterprise (SBE). Spectra maintains its corporate office in Latham, New York, just minutes away from the New York State capital office buildings in Albany, and has branch offices in Syracuse and Poughkeepsie, NY. Spectra has 47 employees that specialize in areas of infrastructure engineering, environmental analysis, planning, permitting, and compliance.

Spectra's engineers and scientists are leaders in integrated engineering solutions for a sustainable energy future. In the energy service market, Spectra provides environmental management, permitting, conceptual design, site/civil engineering, project management, surveying, and construction management.

Spectra is owned and operated by Robert C. LaFleur and John H. Shafer, PE. Mr. Shafer has over 40 years in the field of transportation and infrastructure systems. Prior to joining Spectra, Mr. Shafer served as Executive Director of the New York State Thruway Authority (NYSTA) and Chief Engineer for the New York State Department of Transportation (NYSDOT). Mr. Shafer currently serves on several State advisory committees, including the committee overseeing the replacement of the Tappan Zee Bridge. Mr. LaFleur has 39 years of experience as an expert in environmental planning and permitting projects. He has been called upon to provide expert testimony in a number of legal proceedings concerning environmental and planning matters. Mr. LaFleur has acted as Project Manager on an extensive power transmission project under Article VII of the Public Service Law.

Spectra has experience working with a variety of federal and state regulatory agencies. Among these include the New York State Power Authority (NYPA), the New York State Office for Technology, the New York State Department of Environmental Conservation, the United States Environmental Protection Agency, as well as the NYSTA and NYSDOT. These are all agencies with an interest in this energy highway project being proposed by the Power Authority.

Section II – Project Description

"Connect New York" is a 1,000 MW DC bulk transmission line running from the Utica area to New York City (Zone E - Mohawk Valley to Zone J - New York City). This underground transmission initiative would utilize existing public and private right-of-way to build a new bulk transmission line that would enable the fulfillment of the "New York Energy Highway" and many of the Cuomo Administration's energy imperatives. It would include 244 miles of high voltage DC cable, two AC/DC converter stations and a small amount of high voltage AC cable. There is also the option to add a second 1,000 MW line. This is a technology that is in use in the United States and oversees. The permitting process is expected to be completed within two years, and the project is expected to be completed within four years, unless those timeframes are shortened as discussed in Section V below.

Section III – Project Justification

"Connect New York" is a bulk transmission initiative that would utilize existing right-of-way to build a new bulk transmission line that would enable the fulfillment of many of the Cuomo Administration's supply side energy imperatives. "Connect New York" is a practical, feasible and necessary prerequisite to the successful realization of many of the important energy precepts outlined in "Power NY" and the "New York Energy Highway".

"Power NY"

"Power NY states that… "New York's energy policy must meet the interrelated goals of providing affordable and reliable energy, improving our environment and creating jobs and economic growth through energy policy as we transition to a more efficient, lower carbon and cleaner, greener energy economy. ("Power NY" Page 1) "Power NY" delineates its guiding principles as follows:

- **Affordability**… take steps to reduce energy costs
- **Energy Efficiency**
- **Smart Transmission and Distribution**
- **Economic Development –** job creation
- **Environmental Quality –** cleaner fuels and renewables
- **Reliability –** dependable and emergency prepared
- **Equity** – demands that one region or neighborhood not bear most of the costs of a certain policy while another receives the benefits
- **Good Execution and Government's Role –** facilitate and encourage private sector investments that supports our energy goals and these guiding principles
- **Transparency and Accountability**

"Power NY" delineates several supply side energy imperatives that form the foundation of the Cuomo Administration's energy policy. These ambitious energy goals include:

1. Upgrade and Expand the Transmission Grid

   "Improve Reliability and Reduce Costs by Upgrading our Transmission Infrastructure and Bringing Reliable, Low Cost Clean Energy to Areas Where it is Needed Most While Maintaining Regional Equity"

2. Improve the Environment Through Renewables and Clean Energy

   "Expand Wind and Solar Power and Repower Old Plants to Make them Cleaner and More Efficient"

   "Make New York the Nation's Leader in Wind Power"

   "Enact a New Power Plant Generation Siting Law"

   "Close Indian Point… We must find and implement alternative sources of energy generation and transmission to replace the electricity now supplied by the Indian Point Power facility.

3. Improve Energy Independence

   "By… supporting in-state energy resource development, New York will reduce outflow of dollars to pay for energy imports" (2009 State Energy Plan).

4. Renewable Portfolio Standard

   Renewable increased to 30% by 2015

5. Greenhouse Gas Emissions Reductions

   Executive Order #24: Decreased by 80% by 2050

While these energy precepts are logical, sensible and progressive there are many significant challenges confronting their realization. Some of these challenges are administrative, including permitting and siting. Some involve the limitations of older fundamental infrastructure, including in particular, the bulk transmission grid that constricts the flow of energy from existing and prospective generation sites to the marketplaces.

Transmission: The Foundation of a Progressive Energy Policy

Irrespective of what generation options are utilized, adequate bulk transmission is a necessary prerequisite to bring new age power to market and to realize the supply side energy imperative outlined in "Power NY" and in the "New York Energy Highway". This view is supported from almost every authoritative vantage point.

- NYISO Wind Generation Study (2010)

  "Although the addition of wind to the resource mix resulted in significant reduction in production costs, the reduction would have been even greater if transmission constraints between upstate and downstate were eliminated."

- 2009 State Energy Plan

  "(Transmission) investments are also necessary to support the state's transition to a clean energy economy, and will be driven by longer-term strategic needs, including the need to reduce GHG emissions."

- NYISO 2010 Comprehensive Reliability Plan

  "The Indian Point Plant retirement scenarios… show that loss of ISOs expectations would exceed criteria… thermal violations… and voltage performance on the system would be degraded."

The "Connect New York" Option

Simply stated, "Connect New York" is our vision of how to best advance the major supply-side energy objectives delineated in "Power NY". It would include a 1,000 MW DC bulk transmission line running from the Utica area to New York City. There is also the option to add a second 1,000 MW line. The routing would be underground utilizing existing public and private right-of-way. In doing so we can mitigate environmental and right-of-way concerns that derail most bulk transmission projects and avoid eminent domain and NIMBY issues. By burying an efficient, underground DC bulk transmission line, line losses will be reduced and aesthetic and health based concerns eliminated.

This bulk transmission path will significantly mitigate two of the three major transmission bottlenecks at the Central East interface costing Southeast New York over a billion dollars per year. In addition, the project will bring much needed new capacity to some of New York's most active wind development sites and existing cleaner gas fired plants in Upstate NY. Because the project will use public right of ways, it will provide a new source of revenue to the state. Additionally, this project will be a life-line to older upstate generating facilities that may currently be less environmental friendly by allowing them to repower with new technologies and to continue to support their local economies.

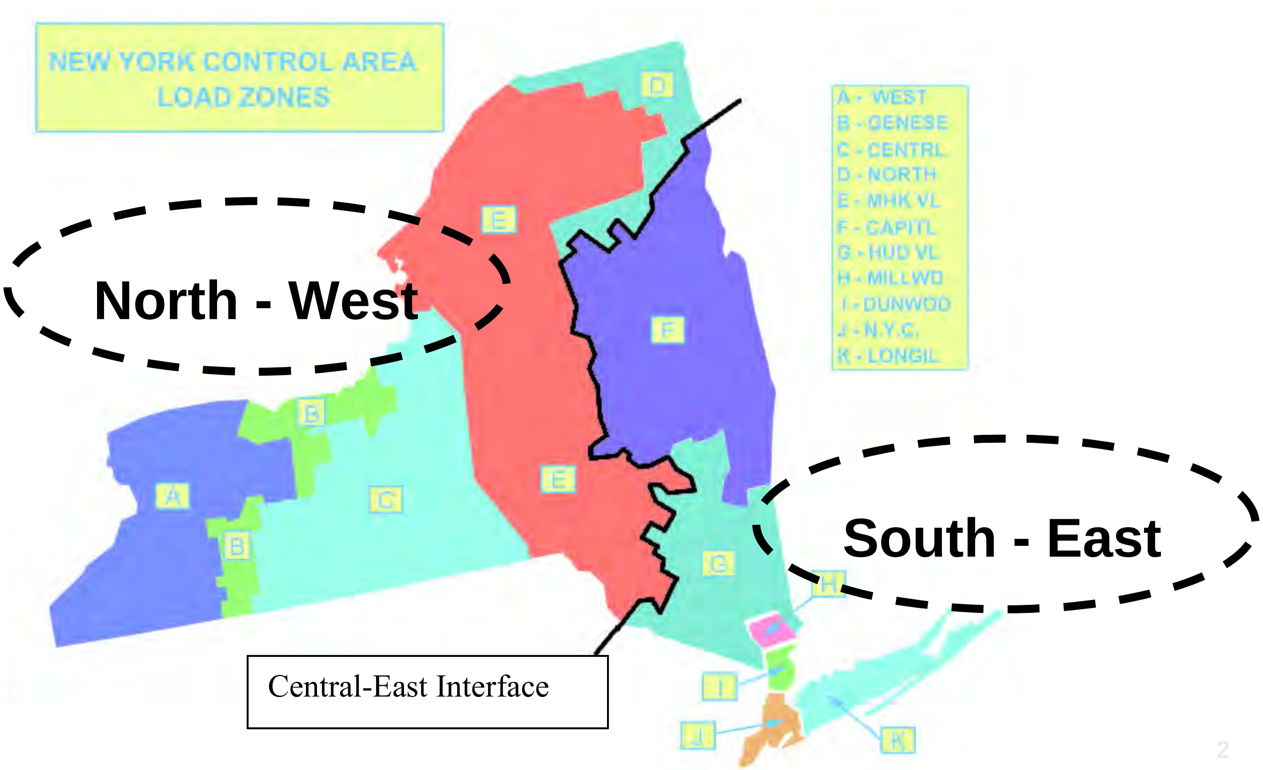
The Central-East Interface – Transmission Congestion

The Central-East Interface is the name given to a conceptual transmission boundary that separates the bulk transmission capabilities located in the North and West regions of New York from the load (demand) centers located in the South and East. Essentially it is the choke point where the ample generating capacity located in the North and Western regions are constricted from supplying the markets in the South and East regions. Figure 1, below, illustrates the Central-East Interface.

Figure 1

Central – East Interface

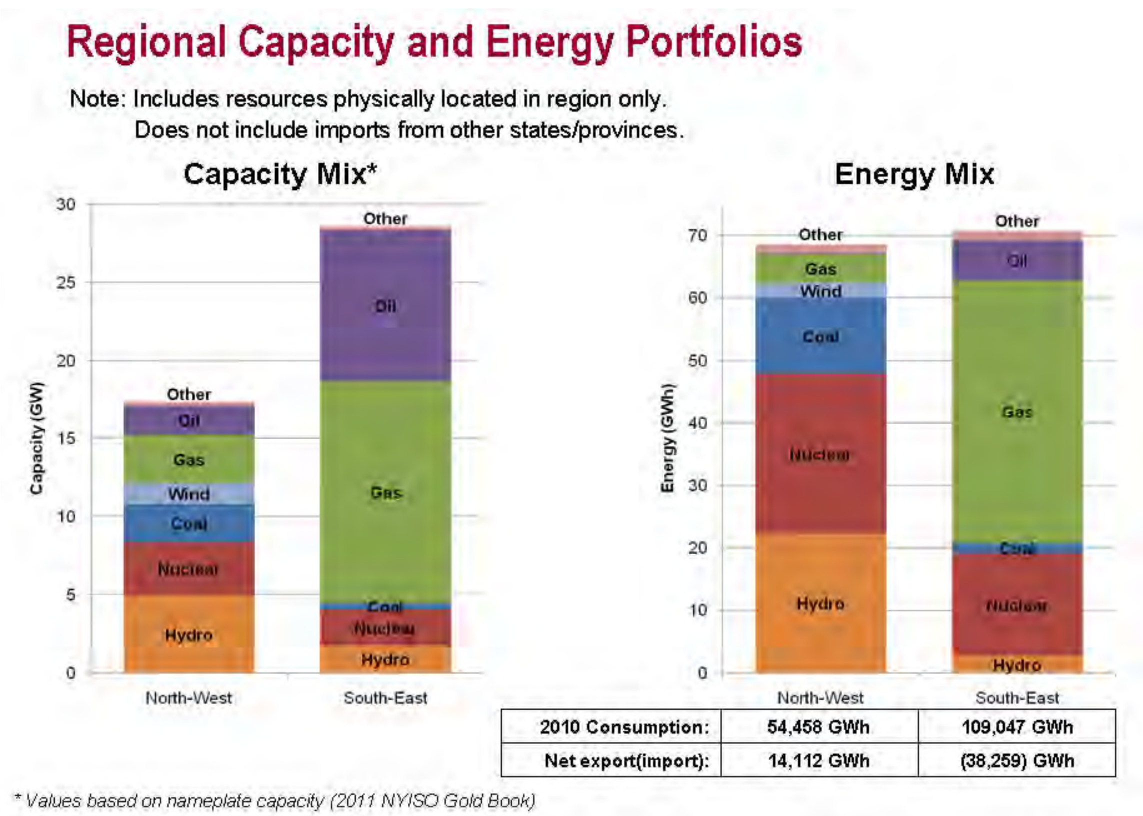
Divides New York into 2 distinct zones: North-West and South-East.



This interface creates two very distinct energy markets. These markets have different energy generation portfolios and demand profiles and accordingly different prices and different greenhouse emissions.

The bar graph below, Figure 2, illustrates the capacity mix of the generators in the North-West and the South-East. It also discloses the energy generated from these facilities.

Figure 2



Several observations can be made from this chart.

- The South-East is much more dependent on gas/oil base load capacity.
- As shown below, much of this gas/oil fixed capacity is older, less efficient steam units that rely on fuel with higher green house gas emissions
- Without Indian Point, the South-East generating facilities would be almost entirely gas/oil.
- The North-West regions produce more energy than they consume (net exporters).
- The North-West region's production is less than it would be if the bulk transmission transfer capability across the Central-East Interface were greater than it is.
- The South-East region is a net importer (38,259 GWh) with 14,112 GWh or 36% of these imports coming from the North-West. The remainder comes from out of state, i.e., representing a missed opportunity for in-state generators.

Figure 3

Pre-1970 downstate peaking generators

Owner/Operator	Generator & Unit	Town	Year in Service	Primary Fuel	Nameplate (MW)	2010 net GWh	Capacity Factor
Consolidated Edison Co. of NY, Inc.	East River 6	Manhattan	1951	Oil	156.2	480.6	35%
Long Island Power Authority	Glenwood ST 04	Glenwood	1952	Gas	114.0	95.3	10%
Long Island Power Authority	Far Rockaway ST 04	Far Rockaway	1953	Gas	100.0	189.9	22%
Consolidated Edison Co. of NY, Inc.	East River 7	Manhattan	1955	Oil	200.0	471.0	27%
Long Island Power Authority	Barrett ST 01	Island Park	1956	Gas	188.0	518.4	31%
Astoria Generating Company L.P.	Astoria 3	Queens	1958	Oil	376.0	728.3	22%
Long Island Power Authority	Port Jefferson 3	Port Jefferson	1958	Oil	188.0	238.2	14%
NRG Power Marketing LLC	Arthur Kill ST 2	Staten Island	1959	Gas	376.2	530.3	16%
Long Island Power Authority	Port Jefferson 4	Port Jefferson	1960	Oil	188.0	192.0	12%
Astoria Generating Company L.P.	Astoria 4	Queens	1961	Oil	387.0	636.9	19%
Astoria Generating Company L.P.	Astoria 5	Queens	1962	Oil	387.0	411.7	12%
TC Ravenswood, LLC	Ravenswood ST 01	Queens	1963	Oil	400.0	633.2	18%
TC Ravenswood, LLC	Ravenswood ST 02	Queens	1963	Oil	400.0	502.9	14%
Long Island Power Authority	Barrett ST 02	Island Park	1963	Gas	188.0	562.9	34%
TC Ravenswood, LLC	Ravenswood ST 03	Queens	1965	Oil	1,027.0	1,143.3	13%
Long Island Power Authority	Northport 1	Northport	1967	Gas	387.0	1,153.4	34%
Long Island Power Authority	Northport 2	Northport	1968	Gas	387.0	854.9	25%

Source: 2011 NYISO Gold Book

1

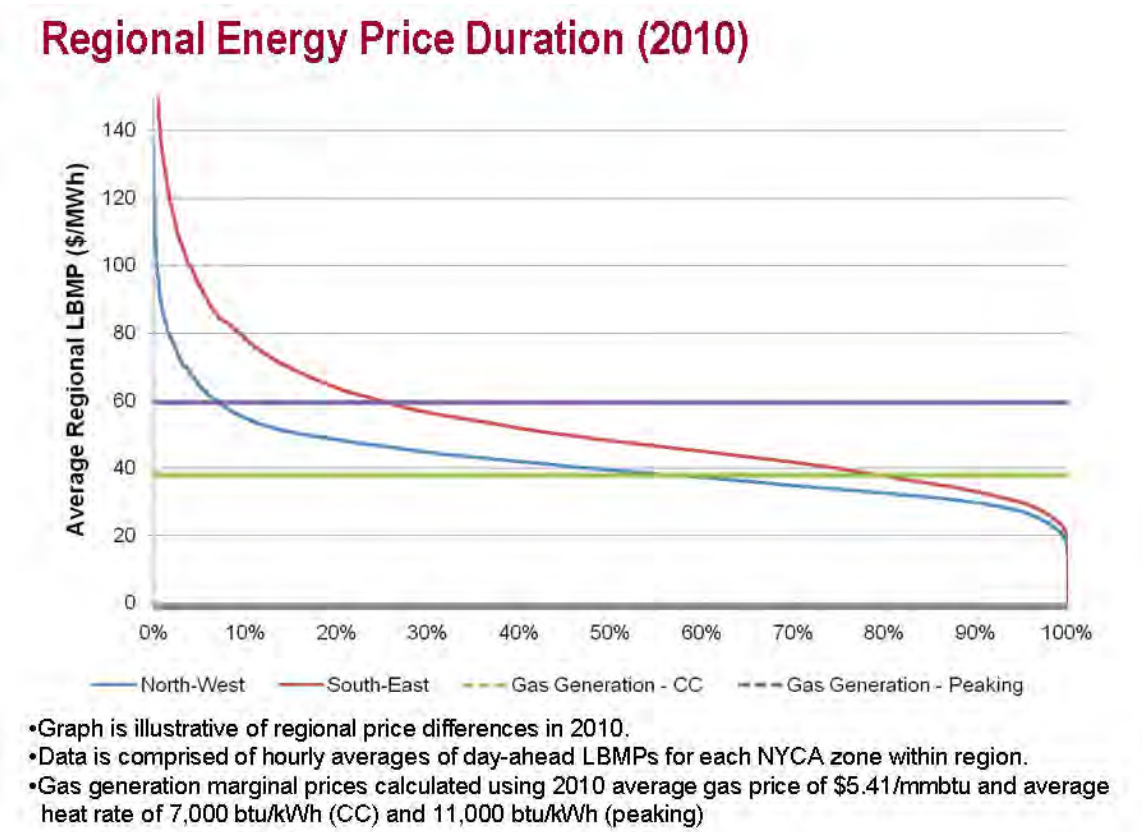
Price Impacts in North-West after Relieving Congestion

Some have suggested that new bulk transmission designed to relieve the bottlenecks at the Central-East Interface would materially increase the price of energy in the North-West. Comprehensive modeling would need to be completed to accurately forecast the various effects on prices throughout the state if new bulk transmission were built. This would be done as part of our proposal. Nevertheless, one can deduce that there is ample excess generating capacity in the North-West, capable of creating power that would flow into the South-East and not significantly increase the marginal cost of power in the North-West.

Specifically, the North-West had a nameplate capacity for gas of 3,100 MW and in 2010 had net generation of 4,630 GWhs representing a low 17% capacity factor. Of the 3,100 MWs of gas generating capacity, 2,292 MWs or 74% was combined cycle gas and ran at a low capacity factor of 19.8%. Again while comprehensive modeling would spell out the specifics, one can infer that given the low capacity for the combined cycle fleet, these units were setting the market price in the North-West market. More interestingly, the North-West combined cycle fleet has the capacity to export an additional 8,100 GWhs, assuming that they operated at a 60% capacity factor and that the bulk transmission's transfer capability at the Central-East Interface could accommodate it. Currently, the bulk transmission system cannot accommodate any additional exports from the North-West into the South-East. That is why the combined cycle gas fleet in the

North-West region operated at a 19.8% capacity factor and why the less efficient, more expensive, less reliable and dirtier gas/oil steam units listed in Figure 3 filled the void. The regional energy price duration below, Figure 4, graphically makes these points demonstrating the regional price difference.

Figure 4



The Cost of Transmission Congestion

The practical consequences of the Central-East Interface transmission congestion increased the state-wide annual cost of power by an average of 12% over the period from 2004 through 2010. This represented an average annual cost of $1.4 billion included in the average state-wide cost of energy of $11.7 billion. Although 2011 numbers are still being finalized, it is estimated that total congestion for last year will be $1 billion. See Figure 5.

Figure 5

Historical New York Congestion Costs by Zone

Zone Name	Load Zone	Congestion Costs to NY Electric Consumers*							Average
Zone Name	Zone	2004	2005	2006	2007	2008	2009	2010	($ M)
West	A	-1	-5	1	-14	-25	-14	-1	-8
Genesee	B	1	-1	2	-14	-9	4	6	-2
Central	C	1	-1	4	9	18	8	11	7
North	D	0	-1	0	0	-2	-3	-1	-1
Mohk. Valley	E	0	0	2	5	10	4	5	4
Capital	F	8	19	27	74	143	53	62	55
Hud. Valley	G	5	20	54	87	176	57	73	67
Milwood	H	3	12	27	31	78	16	23	27
Dunwoodie	I	4	24	44	56	124	41	49	49
NY City	J	582	809	673	700	1,403	503	560	747
Long Island	K	230	508	708	518	624	274	350	459
Total		833	1,384	1,542	1,452	2,540	943	1,136	1,404
Total Energy Cost to Load		10,059	15,314	11,969	12,831	15,485	7,397	9,005	11,723
Congestion % - original		8%	9%	13%	11%	16%	13%	13%	12%

Cost to New York consumers averaging $1.4B per year

86% of that cost borne by New York City and Long Island

Congestion has averaged 12% of consumer energy costs

*Source: Congestion costs results from NYISO's PROBE analysis, a model designed to reproduce market prices as closely as possible.

2008 results are high due, in large part, to very high natural gas prices which can occur periodically in a commodity's life cycle.

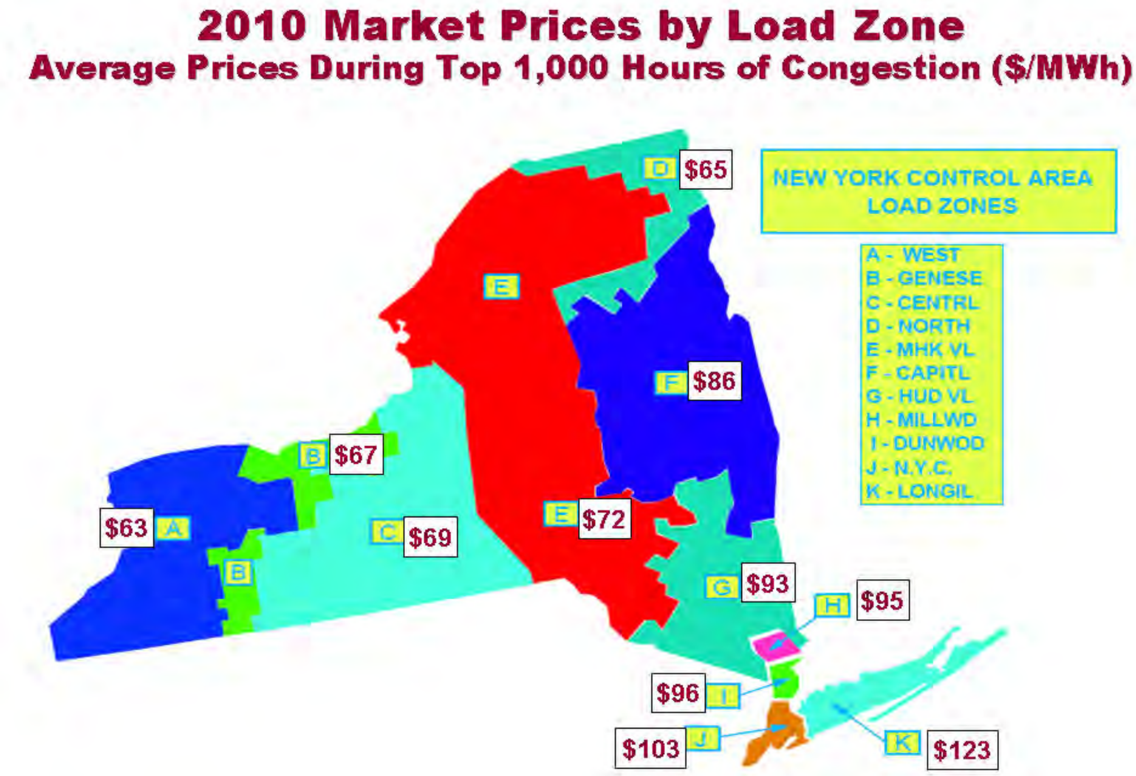
Highlighted areas represent load zones that will benefit from the transmission project.

Several observations can be made including:

- New York City and Long Island have paid nearly 86% of this annual congestion cost averaging $1.4 billion.
- The congestion peaked in 2008 at 16% due to very high natural gas prices which can and will occur periodically in a commodity's life cycle.
- Even during the historical economic downturn in 2009 and 2010 the congestion cost was $1.0 billion each year.
- This additional cost of energy for New York and Long Island consumers could have been avoided if new bulk transmission across the Central-East interface had been in place.

The map below, Figure 6, illustrates the 2010 average market prices by Load Zone during the highest 1,000 hours of congestion.

Figure 6



It is the reduction of these congestion costs that represents the primary commercial justification for building "Connect New York". Nevertheless, other important strategic benefits are associated with this proposal and will, in time, bring commercial returns.

Reinvigorating Renewable Development

If New York State is committed to meeting its RPS goal, several initiatives could be introduced that would reverse the downward momentum for wind development. Principal among these is relieving the congestion that prevents export of low cost North-West wind power to high cost South-East load centers. This commitment could also be backstopped by requiring utilities and state agencies to enter long-term fixed-price bundled contracts with credible wind developers with proven track records. Utilities have traditionally been hesitant to sign long-term contracts due to rating agency implications, but there are regulatory means to address these concerns.

To realize the potential of the State's renewable resources, bulk transmission must be expanded to reach north and west into the most promising wind development zones. This bulk transmission must be supplemented with a plan to develop new secondary transmission lines to gather the newly developed wind energy and deliver it to the newly developed bulk transmission system.

Second, the reauthorized Public Service Law Article X process, with its 25 megawatt threshold and application to renewable generation projects, needs to be implemented in a way that maximizes the potential benefits of single entity (Public Service Commission) approval within one year from complete application (or 6 months for certain modifications of existing facilities). Further consolidating and/or streamlining the State Environmental Quality Review Act process for smaller renewable generation sources is necessary and might be accomplished by establishing time limits for completion of hearings, decisions and appeals for renewable projects of certain dimensions/features, regardless of whether they are reviewed under SEQRA or under the Public Service Law.

Finally it is conventional wisdom that off-shore wind is significantly more expensive than on-shore wind. The state's agencies should focus on the most realistic renewable options to meet the RPS mandate that is only four years away. Now is not the time to experiment with the exotic alternatives.

Environmental Compatibility

"Connect New York" will utilize a combination of existing public and private right-of-ways, which have been previously disturbed and will significantly minimize, if not entirely eliminate, impacts to visual, historic, archaeological and other important environmental resources. By proposing efficient, buried transmission lines, the proposal will also address many of the concerns associated with aerial transmission lines and towers, such as their visual impacts and aesthetics, electromagnetic radiation effects and impacts on property value. Connect New York will also allow for the transmission of energy from wind farms and other clean upstate generating facilities that produce less greenhouse gas emissions than the older generating facilities downstate.

The Indian Point Question

The Fukushima nuclear accident refocused attention on the Indian Point nuclear plant and the effort to renew the plant's two operating licenses when they expire in 2013 and 2015. The practical reality is that the plant's 2,000 MW capacity is currently a vital piece of the energy portfolio for southern and eastern New York. Its power is "clean" and low priced. Nevertheless it represents a recognized potential safety risk to the greater New York City metropolitan area.

There cannot be a serious discussion about closing Indian Point without simultaneously proposing an alternative energy supply that meets the reliability requirements of the region. New bulk transmission is a necessary prerequisite to filling this potential energy void.

"Connect New York" is not the exclusive answer to replacing the potential loss of Indian Point energy but it could be an important piece of the puzzle that could, with the right support delivered in an urgent manner, come to the market in a reasonably timely fashion.

Summary of Benefits
How Connect New York Could Advance
Governor Cuomo's Supply-side Energy Imperatives and Satisfy the Goals of the New York Energy Highway

There are many compelling benefits associated with the "Connect New York" initiative but perhaps the most important one is that it is achievable. Many of the mine fields threatening the approval of customary transmission proposals are avoided with the "Connect New York's" approach. Environmental and NIMBY challenges are largely circumvented by utilizing the existing right-of-way. Eminent domain is similarly not an issue.

Equally important "Connect New York" is all about New York. It will foster New York's desire for energy independence by building an energy highway that will change the financial dynamics of repowering upstate plants while encouraging new investment in on-shore wind development east of Lake Ontario. It will reduce the state's annual energy bill by reducing congestion and allowing lower cost, cleaner energy upstate to flow into New York City and Long Island. This will finally reduce downstate energy bills at a time when consumers need some relief.

The energy most likely to be transmitted on "Connect New York" (gas and renewables) will displace more expensive and higher green house gas energy produced by the older vintage fossil fuel plants in the metropolitan New York/Long Island regions thereby reducing greenhouse emissions as well as energy costs.

Finally, "Connect New York" will create thousands of New York jobs not only during the construction period but subsequently by enhancing prospects for older upstate coal plants to invest in repowering as a new downstate energy market is opened up. The same holds true for renewable development east of Lake Ontario, assuming that long-term power purchase contracts can be put in place to support the 2015 RPS mandate.

In summary, the time has come for this transmission infrastructure proposal to be implemented as the foundation for Governor Cuomo's "Power NY" vision and the "New York Energy Highway".

Section IV – Financial

As a privately funded capital project, the business case for developing "Connect New York" is predicated on securing long-term capacity purchase contracts with New York State's load serving entities. The high level business case for "Connect New York" is commercially attractive:

1. Build a 1,000 MW DC line with two converter stations, with the option to add a second 1,000 MW line;
2. Underwrite the investment with a fixed price transmission contract; and
3. New York electric consumers realize a significant annual reduction in energy costs attributable to reduction in congestion costs.

Alternative approaches could be used to determine how the project costs would be allocated among the load serving entities. Some regions in the country utilize an allocation methodology based on which customers benefit from the project. Although this may be the most fair approach, the process of determining beneficiaries is complicated and can become contentious. Other regions in the country use a postage stamp allocation. Under this approach, the project is determined to have benefits for the state or region as a whole and the costs are allocated on a prorated usage basis. This is by far the simplest approach, but it could be argued that those customers that are not receiving the large majority of the projects benefits should not pay an equal share. It may be determined that some combination of the two approaches, one that recognizes the allocation of project benefits but that does not get bogged down into detailed and potentially contentious modeling discussions is the correct middle path.

Section V – Permit/Approval Process

The current administrative and regulatory construct would require the following approvals, each of which will be sought concurrently, with the associated time frames running in parallel. The list below includes an approximation of the time required to secure those approvals based on historical precedents and assuming conventional approach to gaining these approvals. Vigorous support and follow through by the Administration could reduce these timeframes.

A. Public Service Commission Article VII Application – 2 years

An Article VII proceeding before the Public Service Commission (PSC) typically requires approximately two years to complete. The Respondents control the rights to certain application materials and intellectual property that have been maintained on the active docket before the PSC. If utilized as part of the current conceptualized proposal, this position on the active docket could potentially shorten the time frame for permitting, as well as the overall construction date, by approximately six months or more.

B. NYISO System Reliability Impact Study
   - Preparation of system impact study – 6 months
   - NYISO review and approval – 6 months
     (A similar project was previously evaluated and a system reliability impact study was performed and approved)

C. FERC authorizations to sell transmission rights at negotiated rates – 6 months

D. Acquisition of right-of-ways
   - Various public entities

Index

As a final reference, the table below indicates that all four of the Energy Highway objectives, detailed on Page 11 of the New York Energy Highway RFI, are satisfied by "Connect New York". The following table provides the appropriate Energy Highway RFI page references.

Energy Highway Objectives		Page Reference
Reduce constraints on the flow of electricity	√	4, 7-13
Assure long-term reliability	√	7-10, 13-14
Encourage development of renewable generation	√	13-14
Increase efficiency of power generation	√	4, 7-14

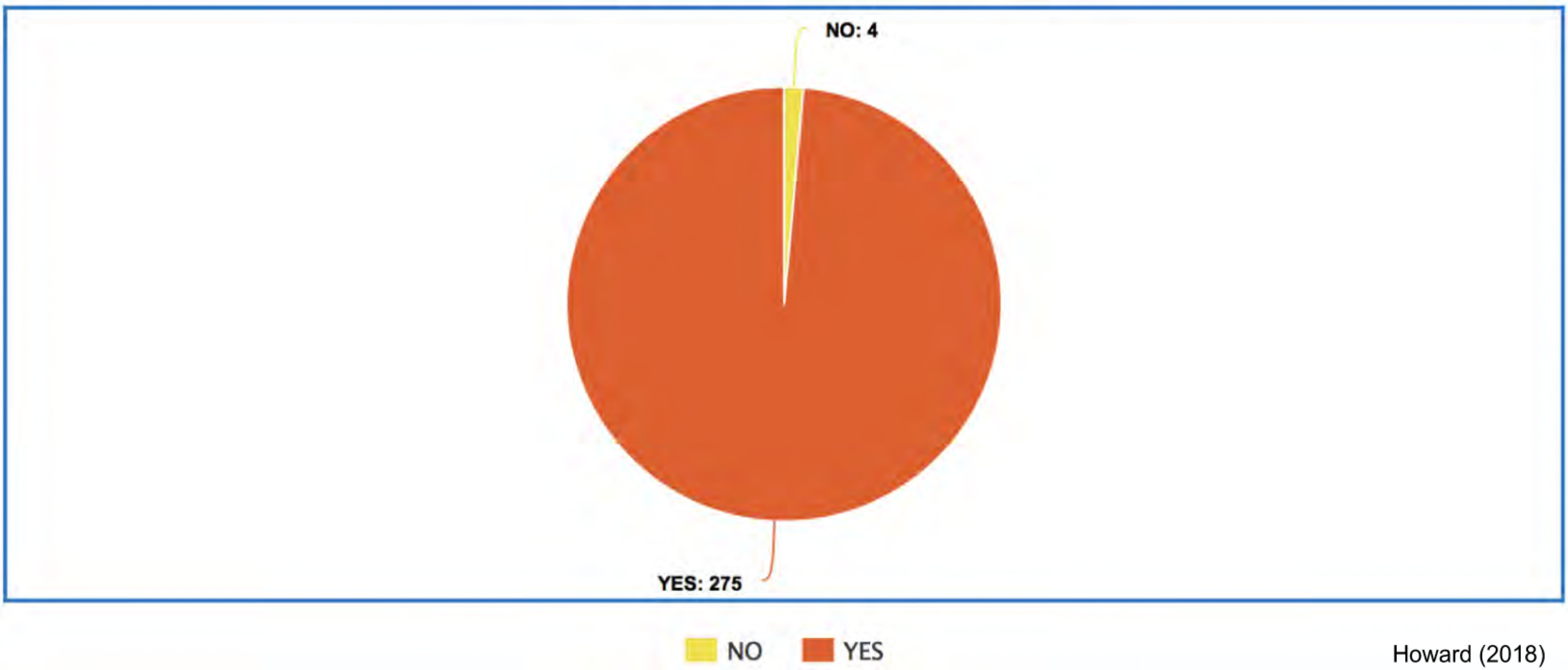
Page 13 of the New York Energy Highway RFI listed additional benefits that should be addressed in the submission. The table below demonstrates that these have been met by this submission and provides the appropriate page references.

Additional Project Benefits		Page Reference
Create Jobs	√	15
Environmentally Sustainable	√	4, 9-14
System Performance and Operation	√	4, 7-14
Rate Payer Value	√	7-13
Demonstrate ability to go through NYISO SRIS/SIS Process	√	16

Exhibit 5

Kennebec River Visitor Impact Study

Response to Visual Impact of Kennebec River Crossing on Wilderness Experience
279 Recreational and Commercial River Users



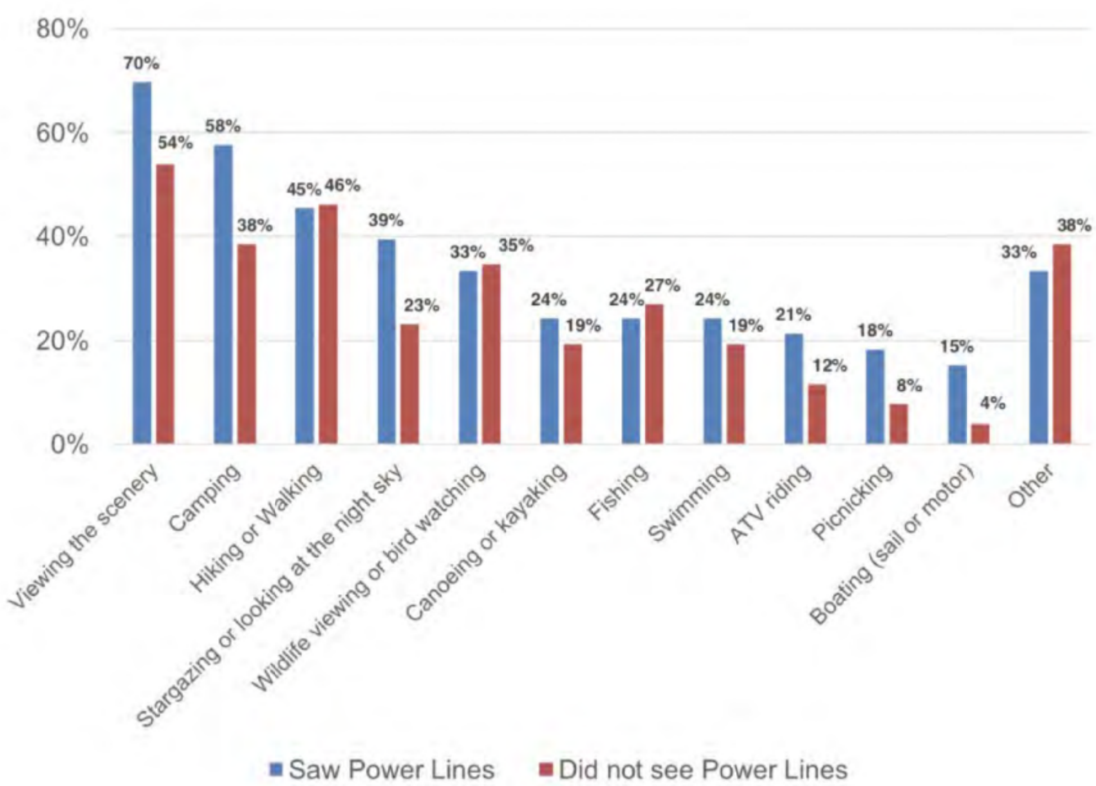
Howard (2018)

Updates on River Crossing

- While CMP has decided to drill under the river, that minimizes scenic impact in only that ONE area. There will *still* be sign of infrastructure on shoreline and huge visual impacts throughout the remainder of the corridor.
- Will those access roads to the river provide additional access to river enthusiasts? Will it result in overcrowding like on the Deerfield River?
- What are the impacts on river ecology, water quality & fish habitat?
- If it takes months to complete, how would that impact the rafting season and river flows during construction?
- What about the larger environmental issues of the entire construction and concerns about the source of hydropower?
- The Kennebec River is important, but it’s not the only area to be concerned about in Somerset County and remaining corridor.

Visits to Area and Activities

Q4. Thinking about your visit to the upper Kennebec River area, what are your plans other than rafting?



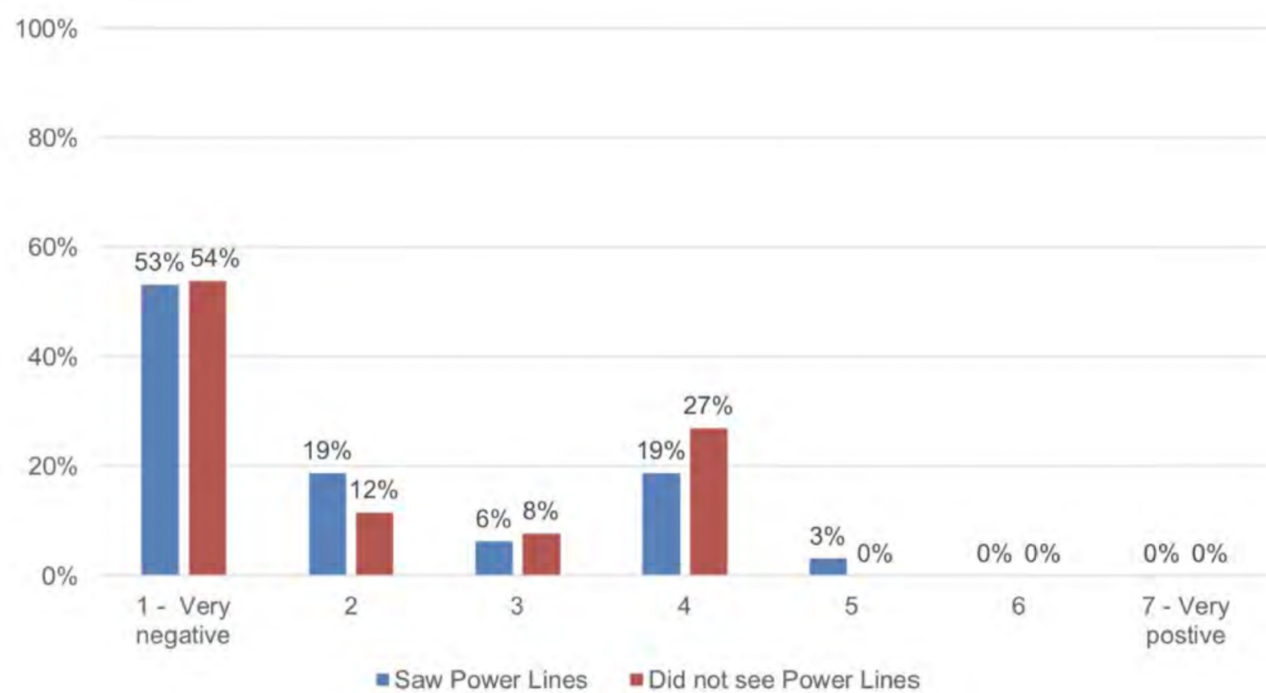
Summary
Beside rafting, viewing the scenery, camping, hiking or walking were the most common activities for rafters visiting the upper Kennebec River area.

MARKET DECISIONS RESEARCH

Even CMP's river user survey submitted to PUC-DEP-LUPC revealed that tourists prioritized viewing the scenery in Somerset County.

Impact of Human Activity

Q10. Please rate the impact this sign of activity may have on the quality of your experience today. - Views of powerlines on hillsides.



Rate on a scale 1 to 7 scale where 7 means a very positive impact on your experience and 1 means the factor would have a very negative impact on your experience.

MARKET DECISIONS RESEARCH

The majority of respondents said that power lines on hillsides would be negative. How will this impact their decision to return to this area for a wilderness experience in the future?

Maine State Federation of Firefighters

Feb 12th, 2019

Governor Janet T. Mills, Augusta ME
Maine PUC: chris.simpson@maine.gov
DEP attn Jim Beyer: NECEC.DEP@maine.gov
LUPC attn Bill Hinkel: Bill.Hinkel@Maine.gov
Mass DPU: alan.topalian@state.ma.us & dpu.efiling@mass.gov

Dear Recipients:

This letter is to express concerns for fire and other emergency response capacities within the areas located along and adjacent to the proposed NECEC Corridor. (RE: DPU 18-64; DPU 18-65; DPU 18-66)

The Maine State Federation of Firefighters (MSFFF) has a membership of over 6000 firefighters. Many of our members are volunteers within small departments in rural communities. Several of our volunteer members, who serve areas within the proposed NECEC Corridor, contacted us to express their concerns for fire and safety response. These concerns focus not only on the major construction phases of the project, but also on significant risks that will be established and which will continue to exist long after construction crews have left the area and wide areas of high voltage power lines cross their jurisdictions. Further conversations and investigation indicate that to date, no evaluation, assessment, or documentation of the fire, emergency medical, terrorism and other risks, or the services and equipment needed to mitigate those risks, have been formally identified, discussed, studied, and/or reported on.

While Maine is not a "fire regime" it does not mean that catastrophic fires cannot occur here. Rural fire response has improved in the seventy years since "The Year Maine Burned" in 1947, but we must remember October 1947 followed one of Maine's rainiest seasons on record. *"From October 13 to October 27, firefighters tried to fight 200 Maine fires, consuming a quarter of a million acres of forest, taking the lives of 16 people, and wiping out nine entire towns. The Maine fires destroyed 851 homes and 397 seasonal cottages, leaving 2,500 people homeless".*

As we've seen over the last few years in other parts of our country and around the world, fires of magnitude that quickly overwhelm state and local resources are becoming annual events. Additionally, as was demonstrated in 2018 with the Paridise (CA) Campfire; PG&E, the power company whose transmission power lines were responsible for the fire, quickly declared bankruptcy. The convenience of PG&E and its ability to declare bankruptcy leaves Paradise, its victims, and the American taxpayer, to clean up the 150,000 acres of toxic wasteland before any attempt is made to rebuild from the destruction.

Regarding fire suppression and emergency support within the proposed NECEC Corridor, please see the enclose map and note the following:

Approximately 70 miles, from the Quebec border to Bingham, has no organized fire or emergency response capacity. These areas are covered by the Maine Forest Service (MFS). During a typical fire season, approximately March-October, the MFS has Rangers living the area who provide initial size-up once they arrived on scene. Weather permitting, air support from Augusta is dispatched; if air support is not already assigned to another fire in another part of the state. Ground crew members from around Maine may also be called to fight fires. Organizing and staging MFS wildland firefighters for a significant fire takes an hour or more. Fires on a windy day gain a significant headway before crews can arrive to remote areas. Volunteers from rural Maine towns are also trained in wildland firefighting and may respond to assist with MFS and Rangers when available.

The first 100 miles of the proposed Corridor, including the 70 miles covered by the MFS and Rangers, has only three (3) volunteer departments within a one-mile (1-mile) buffer of the proposed Corridor. These are the Bingham, Anson, and Solon Volunteer Fire Departments. This area has no staffed fire services and daytime coverage is extremely limited.

South of Bingham, and still within Somerset County, there are three (3) additional fire departments with a two-mile (2-mile) buffer of the proposed NECEC transmission line. These are the volunteer departments of Starks, Madison, and Industry. Once again, these three additional departments have no staffed fire and daytime coverage is extremely limited.

Please also note that these fire departments also lack sufficient off-road fire support capacity. While several do have smaller 4WD apparatus, sufficient large scale wildland suppression and emergency mitigation equipment is not available in the rural areas of the proposed NECEC Corridor area.

Non-fire emergency medical services (EMS) paramedic response is provided by Upper Kennebec Valley Ambulance out of Bingham. Emergency transports are taken to Redington-Fariview Hospital, 35-miles away. Redington-Fariview hospital has a Lifeflight landing pad, with helicopter transport dispatched from Bangor, Lewiston, or Sanford, if available.

Initial response for terrorist or other types of emergency incidents would come from either the Franklin or Somerset County Emergency Agencies depending on the location of the incident. We have been unable to locate any reference or notice from NECEC on how risk and incidents of this nature would be mitigated.

An example of a known risk that supports the need to evaluate, assess, document and sufficiently mitigate comprehensive fire and emergency risks associated with the proposed NECEC Corridor is shown by the 2017 (draft) Somerset County ME Hazard Mitigation Plan.

The most current available Somerset County Emergency Management Agency Mitigation Plan states the following:
C3 Goals
Wildfires: Reduce damage, injury and possible loss of life in Somerset County caused by wildfires.
*Somerset County is subject to wild land fires. The most likely damages caused by a wildfire are the loss of life, loss of prime timberland, and the destruction of personal and real property, especially homes. The loss of electricity is also possible, since many high voltage transmission lines pass through heavily wooded areas. Major wildfires may close commerce, resulting in major losses of income to local businesses and individuals. *There were at least 261 wild land fires in Somerset Country in from 2005 to 2010.*

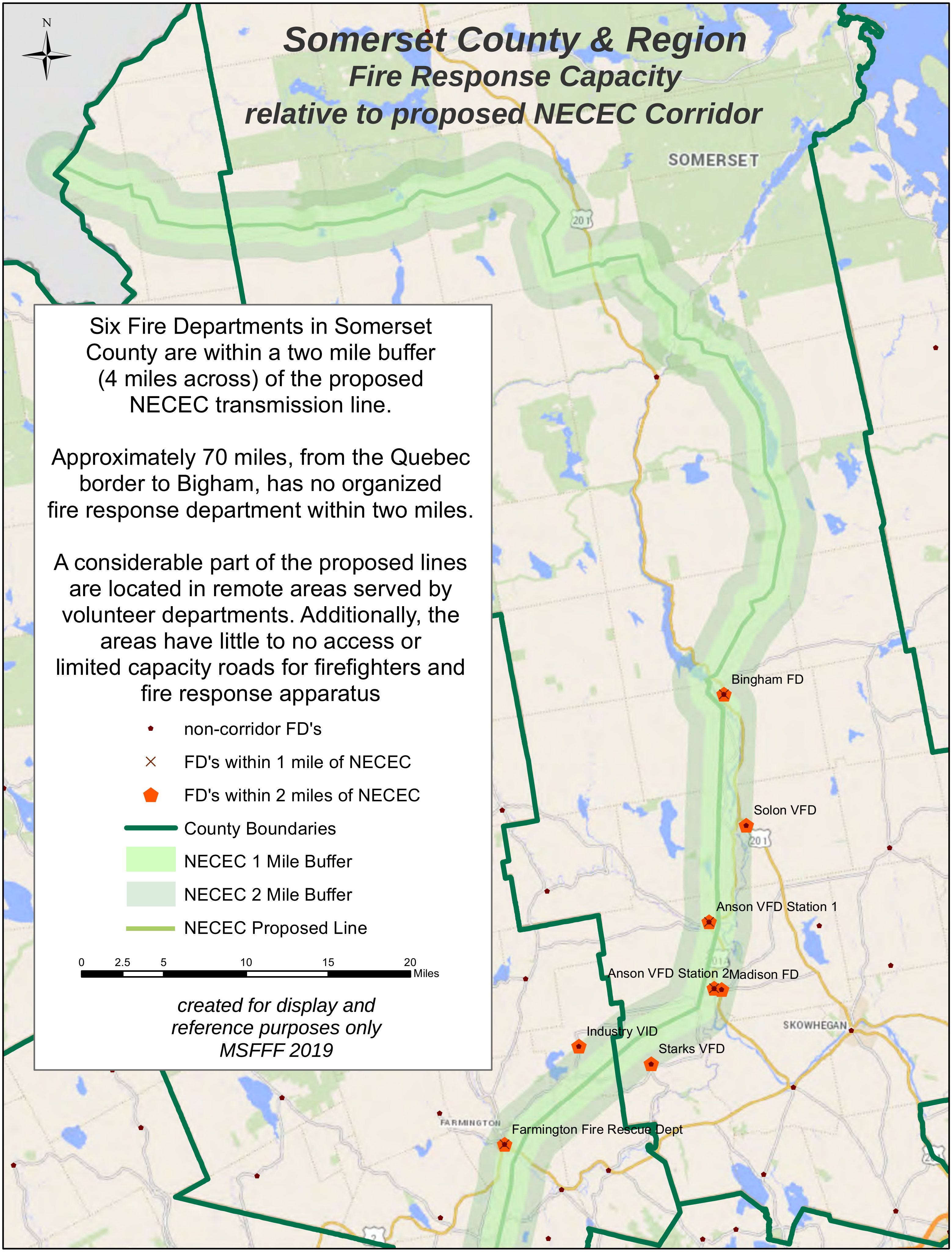
Information to date indicates that consideration of the many emergency hazards associated with the construction and future management of the NECEC Corridor have not been addressed. Due to this oversight, we conclude that the preparedness and safety of our fire fighters, and other first responders who will respond to NECEC Corridor incidents, has been severely overlooked and their security and safety significantly compromised.

The Officers and members of the MSFFF appreciate the opportunity to present these comments and look forward to having the fire, EMS, and other emergency response issues regarding the proposed NECEC Corridor fully evaluated, assessed, and documented. We also encourage the development of and look forward to reviewing mitigation and implementation plans to address associated Corridor risks, and fully support these risks being formally discussed, studied, disclosed, and reported.

Respectfully submitted,

Kenneth Desmond
President, MSFFF
PO Box 911
Sabattus, ME 04280

enc: map of Somerset Cnty Region



Somerset County & Region
Fire Response Capacity
relative to proposed NECEC Corridor
N
SOMERSET
201
Six Fire Departments in Somerset County are within a two mile buffer (4 miles across) of the proposed NECEC transmission line.
Approximately 70 miles, from the Quebec border to Bigham, has no organized fire response department within two miles.
A considerable part of the proposed lines are located in remote areas served by volunteer departments. Additionally, the areas have little to no access or limited capacity roads for firefighters and fire response apparatus
non-corridor FD's
FD's within 1 mile of NECEC
FD's within 2 miles of NECEC
County Boundaries
NECEC 1 Mile Buffer
NECEC 2 Mile Buffer
NECEC Proposed Line
0 2.5 5 10 15 20 Miles
created for display and reference purposes only
MSFFF 2019
Bingham FD
Solon VFD
Anson VFD Station 1
Anson VFD Station 2
Madison FD
Industry VID
Starks VFD
SKOWHEGAN
FARMINGTON
Farmington Fire Rescue Dept

Maine public utility commistion public testimony hearing on October 17, 2018(2018-00232)

My name is Diane Zagwijn-Coston. Jim and I reside at 482 togus Road in Chelsea along with our grand-daughters Lilli age 4 and Autumn age 9.

Our property directly abuts CMP's transmission corridor in witch section 3025 of the high voltage MPRP has now been constructed. This was one of the last sections of the MPRP high voltage transmission line sine 2014 when blasting began. New pole 82 of the 345 Kilovolt AC line is 182.5 from my bedroom and that is to close. I know the CMP considers this project to have been a true success, on time and on budget. But as an abutter, I feel that we where not given accurate and full information and are now suffering with stray and induced voltage that impacts our animals, ourselves and has resulted in very significant shocks to my nephew, my husband, my 9 year old granddaughter, and two of our animals. The shocks are sever enough to knock my husband to the ground and cause our adult horse to rear up and scream out in pain.

In April 2017 when Jim received his first shock I contacted CMP to report the shock and that our radio would play by just stretching the cord out on the ground in our backyard. CMP gave this phone report work order #10300381598. no one form CMP responded.

In May of 2017, after contacting several people, two CMP representatives finally came to our home. They tested a lot of places using a hand held voltage meter one probe on the ground and the other in different locations. I witnessed the testing. My own notes show that the voltmeter read 89 volts by just placing the lead in the gr4ound and the other in the air. This testing was done with the circuit breaker to my property off.

Things happened on our property since the moment they began preparing to build the line. Among other things many trees on my property, not in the right of way, where cut down; Blasting occurred and 23 animals large and small died within weeks of the blasting., fencing was destroyed and herbicide spraying was done with out notice and our horse was sprayed in the face with it. However, what I really want you to hear is what has happened to us since the line was energized in April, 2015.

Right off and still continuing we have stray current(voltage) on fencing that was not turned on. Everyone in our house hold has had health issues we have never had before the line was energized, including sever headaches, body aches with burning pain, and large epidermal cysts. All our animals are now sterile where before, every year for four consecutive years many animals where born yearly on our property.

I am testifying here today, to urge the commission to be sure there is an LDRT (LAND DISPUTE RESOLUTION TEAM) and an Ombudsman be appointed for the NECEC. I suggest that the Ombudsman have more authority to address problems and cause relief to be provided than it had in the MPRP. I don't know if the voltage and magnetic field that is leaking from the transmission line located next to my home is going to be repeated with the new high voltage lines that are to be installed with the NECEC project, but problems like ours should be prevented- and if not prevented, addressed, right away, when they do occur.

I have five documents that I would like entered into evidence. They are all on the PUC online computer system under the invention that the PUC Commissioners, thank you, Commissioners, required PUC staff to undertake after our PUC appeal of the LDRT recommendation was referred to the Commissioner, 2018-00034. The investigation Docket is 2018-00170.

The five documents I wish to include as part of this Testimony are all available in Docket 2018-00170. I have a hard copy here, or they could be digitally included. Four are from item 7, 1. Pre-filed testimony of Diane Zagwijn-Coston; 2. Exceptions to Recommended Decision on Coston's Appeal of LDRT decision (2018-00034); 3. Attachments to exceptions to Recommended Decision; 4. factual issues #4 on stray voltage; in the fifth is item 14 Dot Kelly inclusion of filling in 2018-00034 -Dkelly comment to Revise the Recommend Decision on the Coston Farm. LDRT Appeal final version.

I hope no one else has to go through what my family has endured.

Sincerely, Diane Zagwijn Coston

Diane Zagwijn-Coston

Testimony for 2017-00232 Attachment 1
2018-00170 Attachments to Exceptions to Recommended Decision from Filing # 7.

STATE OF MAINE
PUBLIC UTILITIES COMMISSION

May 24, 2018

EXCEPTIONS & COMMENTS
OF DIANE ZAGWIJN-COSTON
AND JAMES COSTON TO
RECOMMENDED DECISION

PETITION FOR FINDING OF PUBLIC CONVENIENCE & NECESSITY FOR THE MAINE POWER RELIABILITY PROGRAM CONSISTING OF THE CONSTRUCTION OF APPROXIMATELY 350 MILES OF 345 KV AND 115 KV TRANSMISSION LINES (MPRP) PERTAINING TO CENTRAL MAINE POWER CO.

DOCKET NO. 2008-00255

CENTRAL MAINE POWER COMPANY APPEAL OF LDRT DECISION REGARDING DIANE AND JAMES COSTON

DOCKET NO. 2018-00034

TO THE PUBLIC UTILITIES COMMISSION: This submission is made on behalf of Diane Zagwijn-Coston and James Coston [hereinafter, "Costons"] to provide the Commission with their exceptions and comments on the "Recommended Decision" dated May 18, 2018.

RE I. SUMMARY. The Costons respectfully take exception in part and agree in part with the recommended finding that the Ombudsman's referral to the Landowner Dispute Resolution Team (LDRT) from the Maine Power Reliability Program (MPRP) is outside the jurisdiction of the Landowner Dispute Resolution Process (LDRP). They expressly take exception to the part that finds the Ombudsman's referral regards alleged impacts "caused by Central Maine Power Company's operation" of the MPRP.

The Coston's complaint involves *design errors* and *construction issues* in the MPRP—not operation. They seek a Commission order that CMP mitigate the MPRP design flaw by moving the tower that is positioned too close for safety to their home,

ATTACHMENT 1
to Costons' exceptions

EMF Site Measurements

Customer Name: Diana Coston **Witnessed:** Y / N

Service Address: 482 Togus Road

Account Number: 211-0009538-019

Date of Measurement: May 19, 2017 1:30 PM

Field Star S/N: F.W. Bell S/N 1642006

Energy Service Specialist: D M Begin

Additional Personnel Present: Chris Marshall-BMMcd

The measurements recorded herein are instantaneous measurements.

Transmission structure; section #: 3025, **pole #:** 82.
(If applicable)

Center Line of existing transmission corridor: 50.2 **mGauss**
Edge of transmission right of way: 37.2 **mGauss**

Nearest adjacent point of residence /business: 7.4 **mGauss**
Service Entrance: 7.2 **mGauss**
Nearest CMP Distribution Structure: Pole 39 5.6 **mGauss**
(pole/padmount transformer #: 39 **)**

Internal measurements for residence/business:

Location	Comment	Measurement mGauss
Porch	adjacent driveway	5.8
Trough-right barn		8.8
Leach field		16.6
Plow Truck		5.6
Microwave		577 mg on contact
In House Kitchen	breaker off	6.2
Kitchen Table	breaker off	6.7

ATTACHMENT 2
to Coston's Exceptions

From: Thompson, Gregory J. [mailto:gregory.thompson@avangrid.com]
Sent: Friday, August 25, 2017 1:46 PM
To:
Subject: FW: Coston Farm, Chelsea

Chris and Bill,

Below is a summary of the meeting between the Coston's, Ray Boucher and Greg Snow. It should be noted that there is no official report regarding the visit. This site visit was meant to rule out the possibility of the distribution circuit causing a safety concern for the Coston's. Ray and Greg do not have the expertise nor the equipment to test for EMF. Further, they would not be the appropriate representatives to discuss safety as it relates to the transmission line and the proximity to the Coston's property. Ben Shepard's group or a contractor through Ben's group should be able to address those issues.

Greg Thompson

Manager of Regional Operations

Augusta Service Building

From: Boucher, Raymond A.
Sent: Friday, August 25, 2017 11:03 AM
To: Thompson, Gregory J.
Cc: Snow, Gregory
Subject: Coston Farm, Chelsea

Greg, below are my recollections related to our preliminary investigation of the voltage potential concern raised by Mr. and Mrs. Coston at their farm in Chelsea. Greg Snow may have additional information or comments. Please review this and let me know if you have any questions.

On May 3, 2017, Greg Snow, who was filling in for Tim Robbins, called me to discuss Mrs. Coston's concerns about potential shocks at their farm in Chelsea. Greg indicated that Mr.

Coston had recently been doing some maintenance work on an electric fence at their farm when he became aware of the voltage potential on the metal fencing. The Costons believe the presence of voltage on their fence may be related to the 345 KV transmission line (MPRP) which runs adjacent their property.

Before assuming it was related to EMF from the transmission lines, I suggested to Greg that we should do some preliminary checks to ensure that the unwanted voltage was not related to faulty wiring or equipment connected to the electric service we were providing from the local distribution circuit.

Subsequently, Greg Snow and I met with Mrs. Coston at her farm that morning. Using his standard multi-meter, Greg took voltage measurements by placing one probe in the earth and the other on the fence conductor (with the fence off) in the area Mrs. Coston said her husband had noticed the voltage potential. Greg confirmed that he was measuring voltage that fluctuated around 84 volts.

At our request, Mrs. Coston then opened her electric service main breaker. With the electric service to the farm now completely off, Greg rechecked the earth to fence potential at the same location and indicated that the readings had not noticeably changed. Additionally, he noted that he was getting similar fluctuating voltage to earth readings simply by holding the probe to his body or even in mid-air.

Greg related this to his experiences with EMF induced voltage that he often experienced while doing line-work in transmission corridors. He indicated that it was common practice for linemen to ground metal objects such as vehicles etc. to mitigate the induction while they worked in transmission corridors. He suggested to Mrs. Coston that this might be a good practice for them as well since much of the fencing appeared to be located well within the transmission corridor.

I indicated to Mrs. Coston that we would refer this to Company personnel that had information regarding the 345 KV transmission corridor boundaries and expertise in transmission EMF induced voltage for further investigation and follow-up.

Later that day I sent an email (attached) to you with our findings so this could be directed to the appropriate people for further investigation.

Greg Snow and I met with a customer this morning who is getting shocks at her home. They thought the voltage was being induced by the 345 KV transmission line (MPRP) adjacent to their property. We did some voltage checks and did confirm that there was voltage present (varied to over 84 + volts to earth) on their fence line which runs parallel to the transmission line. It is not faulty electrical equipment as we also confirmed the voltage readings even with the service main breaker open. It does appear to be related to the transmission line and Greg Snow can fill you in with the customer name, phone number and explain the voltage readings in more detail.

This is beyond anything I can address. Could you follow-up with someone more familiar with the MPRP project and right-of-way and resulting voltage induction issue. Please let me know if you have any questions for me.

From: Pierce, Tamra L.
Sent: Tuesday, May 02, 2017 3:48 PM
To: Boucher, Raymond A.
Subject: Voltage Induction

Ray,

Steve said that this should be given to Greg Thompson to decide how it should be handled. He also suggested the safety person for Augusta but I am not sure they handle these types of issues. I would talk with Greg.

Attachment 3 to Exceptions and Comments

of Diane Zagwijn and James Coston

AFFIDAVIT OF DIANE ZAGWIJN-COSTON

I am Diane Zagwijn-Coston of 482 Togus Road in Chelsea, Maine. Under oath, I make the following statement in support of the Exceptions and comments being filed on behalf of myself and my husband James Coston ["Jim"] with the Public Utilities Commission today.

1. The factual statements made in our referenced "Exceptions" being filed today are true to the best of my knowledge, information and belief, including, but not limited to:

a. Jim and I are raising two grandchildren, ages 3 and 9, in the house we own at 482 Togus Road, which is located nearest to Pole 82 of Section 3025 of the CMP transmission line.

b. we were not notified that Pole 82 was going to be on our side of the corridor until after it was built. We had understood from Al Godfrey that that pole was going to on the further side of the corridor, but somehow, it got moved closer to us.

c. I have become very concerned about my own and my family's health since the line became operational . This is because I have had chronic headaches which I had never had before, growths have appeared on my face, my legs frequently have pains like I've never had before, my blood pressure has gone way up and I suffer a lot of insomnia that I never used to consider a problem. I have seen a growth appear on my husband's hip and hear complaints of headaches and other pains from the girls.

d. We have had 24 animals die since the blasting and after the line became active. That is a lot for a small farm. It's hard on everyone.

e. We have had several different animals that we always used to be able to breed in the spring, become completely infertile. We have had some newborn animals die shortly after birth. That was not at all our experience as a farm prior to the blasting, construction and operation of this line.

f. After seeing what has been happening with so many of our animals, I am increasingly concerned about the long-term impact on our granddaughters healthy development, including but not limited to their ability to someday have children.

g. We have moved the girls' bedrooms to the point in the house furthest from Tower 82, but that hasn't helped their symptoms.

h. In 2014 our well water was tested and found to be contaminated after several of our farm animals suddenly died (soon after the blasting took place in the transmission line corridor). From that time until August, 2017, we hauled 28 one-gallon jugs of water every three days from a spring 6 miles away until that spring was no longer available to us. Now we buy almost that much water every three days.

i. We have a house with 2 baths and 3 bedrooms, with a 2 car garage, a storage shed and a barn and we have 10 acres for agricultural use. We do have a small balance on our mortgage on it still.

j. We have been looking for a place to move to that is similar. So we have looked for places with between 5 and 15 acres and 3 bedrooms within a 10-30 mile radius of where we live and where I and my husband work (Chelsea and Vassalboro). But the places we have found are all over $200,000 some over $300,000. We found four that we could see moving to, but all have now been sold.

k. We will not be able to purchase such a place and relocate without help.

l. This process has been already very time consuming and extremely discouraging for us. It is especially depressing to think we have to start over or bringing in a different process.

2. I am not a lawyer and I know I have been focusing mostly on incidents and factual matters, not the legal questions like jurisdiction as they said in the proposed decision. This is the reality of my life; I can't help it. That's why we looked for a lawyer to help with the legal issues.

But I still want the Commission to know the details of what we've been through and the specific ways we disagree with what CMP is saying. So attached with this is what I have prepared for a new submission to Harry Lanphear (the same as I did earlier this year) to be ready for hearing in the LDRP process either by the LDRT or by the PUC. I ask that you please consider this affidavit and my attachment in reaching a decision on the PUC's jurisdiction to hear the referral made by the Ombudsman.

May 25, 2018

Diane Zagwijn Coston

Diane Zagwijn-Coston

NOTICE

STATE OF MAINE
KENNEBEC, ss.

Personally appeared Diane Zagwijn-Coston and, under oath, stated to me that the foregoing statements by her are true to the best of her knowledge, information and belief, this 25th day of May, 2015, before me,

Susan Farnsworth

My commission expires 12/3/2019. Notary Public: Susan R. Farnsworth

ATTACHMENT TO AFFIDAVIT OF DIANE ZAGWIJN-COSTON

NOTE: CMP submitted a lengthy comment to this docket on February 21, 2018. This attachment to my affidavit addresses certain points and attachments in the CMP February 21, 2018 to show how we disagree with CMP's version of events and why. Diane Zagwijn-Coston

1. ANIMAL DEATHS STARTED AFTER BLASTING.

On page 5, the CMP comment states:

> **On 05.15.14** – Jim Coston contacted MPRP Real Estate agent Al Godfrey concerning farm animals that had died. Mr. Coston reported that animals started dying in fall 2013. Mr. Coston believed blasting may have tainted the ground water. Chris Marshall (Burns & McDonnell) asked Stephanie Cote (Ciambro) to contact Coston on behalf of Irby, the general contractor responsible for constructing the MPRP in the area.

My husband and I specifically remember that the animals died in the spring of 2014 and it was after April, not February.

I remember contacting Mr. Godfrey and then CMP, within a few days of the deaths, which occurred over a few weeks. The deaths were the newborn calves and the newborn goats, and a couple adult goats, as well as some smaller animals. After this incident, the cows could not be bred back because they were sterile. Calves on the farm are born in May to June. The last calf born, and the only calf to live more than a short period, was born in June and named June. She is still on the farm.

CMP's Exhibit 5 page 1 of 2, is an internal email from Stephanie Cote dated Tuesday, May 20, 2014 sent to Chris McKenney and four other men. It was not sent to the Costons. The email purports to document the conversation she had with Diane Coston the day before. It states (directly conflicting with the information quoted above from page 5 of CMP's exhibit).

> I'm following up my voicemail with this email regarding abutter James Coston and his dead farm animals in Chelsea (Togus West). I spoke with Diane Coston over the phone yesterday afternoon. As communicated by the Diane their farm animals (cows, chickens & rabbits) began dying in mid February 2014. Our internal review yesterday confirmed that blasting at structures 83-87 on S. 3025 did not take place until mid April 2014. We confirmed this morning that our matting crews were not in the area until staging began February 27, 2014.

Not only is this information about the calves dying in February wrong, as we are sure about when calving happens, but it conflicts with the statement reported by CMP on page 5 (quoted above) which states Mr. Coston reported the animals started dying in fall 2013. They did not and he would not have said that.

The email in Exhibit 5 ends with the information that Al Godfrey was at the Coston farm because I called him about the dying animals. That is true and that is why we want Al Godfrey to testify about his recollections. We were always impressed with Mr. Godfrey with his quick responsiveness and thoroughness. Al Godfrey initially came to see us

DC

when he was representing CMP in the negotiations we had with CMP about its purchase of our land in the corridor. I request that Al Godfrey be asked about his recollections on this because we are confident that he will confirm our version of the facts.

It is still not clear why our animals died after the blasting occurred.

2. STRAY VOLTAGE.

A. With power off Costons report shocks from fence.

On page 6, CMP accurately notes that Jim was shocked by the electric fence while the fence was turned off for the first time (04.09.17). The CMP report insinuates that this delay from the energizing of the lines in 2015 means something. In fact, according to Jim it was just the unusual occurrence that the power was off because Jim was setting up the fence for the season. Jim's nephew was by, and because the fence was not energized, being a young man, he grabbed onto it and the handle, and was shocked. Jim couldn't believe it; he confirmed that the fence was unplugged, and tested the fence for himself. He was shocked to the ground. They then walked the whole fence to see if some unknown electrical connection existed, which it didn't. Thus the fact that it wasn't noticed until 2017 that the un-energized fence was conducting significant stray electricity, is not surprising. If, as I understand they do in Wisconsin, the utility did stray voltage testing before and after the installation of high voltage lines on close abutters, the fact would have been known sooner. It was a risk that was unknown to us during the design and construction phase, as a result.

Stray voltage is an issue of significant safety and health for our family. There appears to be a downplaying of the importance of stray voltage by CMP on the Coston property, with important emails missing and erroneous facts included.

The CMP timeline describes the actions that they took after we reported being shocked by the electric fence while the fence was turned off. On Sunday, April 9, 2017, Jim was severely shocked by the un-energized electric fence (See description above).
On April 12, 2017 I called to report that Jim had been severely shocked on April 9th.
(The timeline however, inaccurately states he was shocked on April 12.)
That shock was significant and very upsetting to him and me. We were then and are still very afraid of the stray voltage hazards that are on our property. We all avoid the fence.

Stray Voltage Shock and Testing. I have a note that I spoke to Rhonda in the Department of High Tension Line Service Center and Rhonda gave me a work order

JC

#10300381598. The fact that a work order of that number was issued could be checked, but I never got anything in writing and no one ever came.

After I had reported to CMP on April 12, 2017, I waited until the end of the month and when there was no follow up, I contacted Al Godfrey who made a few phone calls. Al Godfrey called back and requested Diane call Tim Robinson. His answering machine said to contact Sam W. Diane spoke to Sam, who was just filling in, and Sam suggested Diane talk to Greg Snow. Diane talked to Greg Snow who agreed to come over and investigate. Greg and Ray came the next day, on May 3, 2017. That's when Greg got his reading of 84 volts as described in Attachment 2.

It was only through extreme perseverance that I got someone to acknowledge the significant shock that Jim had suffered.

On September 13, 2017, the timeline explains that both Jim and our grand-daughter were shocked while operating a gate on a de-energized fence, but that CMP got a message from the PUC that didn't say that both Autumn and Jim got shocked. I conclude from that, that the message did say that Autumn got shocked. The timeline note makes it seem that CMP was unaware that anyone was shocked. But reading it closely, I believe they did learn at least that Autumn was shocked.

I recall that my first call to Merica (since Leah was still out with her medical condition) I only knew and only reported to her that Autumn was shocked. I was not aware at that point that Jim had grabbed the fence from Autumn since she was not letting go, and that is when he got badly shocked. I did tell Merica soon after that however that both of them were shocked. I also told her where that fence was.

The fence that has since had the filters put on it is the one closest to the transmission lines by the leachfield. The gate handle that shocked Autumn is on a different fence, further away from the corridor and south of our home on the south side of the Coston driveway.

This is CMP's timeline entry, which seems to downplay the seriousness of the incident and shows their lack of follow through.

> **09.13.17** – Coston's granddaughter, as well as Jim Coston, allegedly shocked while opening gate on de-energized fence. Coston called PUC. PUC forwarded to CMP, in that correspondence, no mention of Jim Coston also being shocked.

Over a month later, the timeline states that Jim Wright and Tom Ward checked fence and filters, finding the filters worked perfectly. They didn't want to talk to me, they just

DC

wanted to check the filters. They didn't comment on the fact that the fence that shocked Autumn was on the other side of the property from the corridor edge.

In section C., of the CMP comment (page 15) CMP describes their efforts on stray voltage at the Coston property. I feel the stray voltage issue that exists throughout the property has not been fully investigated and is clearly related to the design and location of the Transmission Line.

The report continues:

> Second, CMP has in any case already addressed the Costons' stray voltage concern by adding filters to the Costons' electric fence. As CMP has reported to the Costons and Ombudsman Sprague, the installation of electric fences below transmission lines, particularly when the fences run parallel to the lines, often causes stray voltage issues in the fence when the fence is turned off. To mitigate this issue, CMP has installed voltage filters on the Costons' fence. CMP repeatedly tested these filters during Summer and Fall 2017, and each time found them to be working properly.

As described in this Exhibit, CMP ignores the stray voltage that has been evident on the property even after the installation of the two filters.

Summary. Jim and I ask the PUC, no matter what is decided about jurisdiction, to require CMP to do a full investigation and report on alternatives or to provide a different location for us similar to their relocation of the Morrisseys.

Although CMP maintains they have addressed our stray voltage concern, we ask that the PUC specifically find that CMP has not sufficiently addressed our stray voltage concerns.

Diane Zajonc Coston

Testimony for 2017-00232 Attachment 2
2018-00170 Coston stray voltage filing 7 factual issue #4.
(Stray - Induced Voltage)

	ISSUES & EVIDENCE RE COSTON'S PROPERTY SAFETY CLAIMS			
	FACTUAL ISSUE # (4) STRAY VOLTAGE ENERGIZING ELECTRIC FENCING			
#	**EXHIBITS**	**DATE**	**PGS**	**NOTES/COMMENTS**
1	Definition of "Agrivolt"	7/19/2018	1	
2	Email from regarding S3025 flows	12/21/2017	2	
3	S3025 Flow charts - 12/18/15-11/14/17		16	
4	Letter to Harry Lanphear rebuttal comments	5/25/2018	6	
5	Readings done by Dot Kelly	5/25/2018	4	
6	Email from Susan Cottle to Leah Sprague	5/18/2017	1	
7	Email from Leah Sprague to Costons	2/1/2018	1	
8	Email from Chris Marshall to Leah Sprague and forwarded to Diane	8/25/2017	4	
9	Email between Greg Thompson and Roy Boucher	5/25/2017	3	
10	Eamil between Costons and Leah Sprague forwarding emails	8/8/2017	2	
11	Copy of notice of Precautionary Recommendation from Performed Line Products Co.	?	2	
12	Wisconsin Public Service information regarding farm voltage/measuring	?	3	

7-19-18

WWW. agrivolt. com.

Agrivolt.

" The presence of electric current in the animal Environment, regardless of the Source, generates Stress. over time, This stress can affect the immune system. a weakened immune System makes the animal more prone to diseases and consequently affects its well being and performance. "

Subject: Fwd: Chelsea: S3025 Flows

From: lwsprague@aol.com

To: costonsfarm@yahoo.com

Date: Saturday, July 14, 2018 11:34:22 AM

Their response.

Sent from my I phone

Begin forwarded message:

> **From: "Marshall, Christopher" <cmarshall@burnsmcd.com>**
> **Date: December 21, 2017 at 10:08:19 AM EST**
> **To: Leah Sprague <lwsprague@aol.com>**
> **Cc: "Kayser, John" <jkayser@burnsmcd.com>**
> **Subject: Chelsea: S3025 Flows**
>
> Leah,
>
> The attached graphs reflect the flow on Section 3025 on the days requested. There does not appear to be any correlation between the flow on the line and the known dates where there was induced voltage on the fence.
>
> On several days the graphing appears to show zero flow. This is inaccurate and is due to the device used to collect the data. CMP has indicated that they can provide more accurate data for those dates using a different device, however the technician who can do so is not available until early January.
>
> As we discussed the other day, we can arrange a time for CMP to test the fence so that it can be moved, however in the future the Costons should use their own voltage meter to confirm there is no voltage on the line if they would like to continue using it in the current configuration running parallel to the transmission line.
>
> I'll be spotty over the next week, but call me if you have any questions.
>
> **Chris Marshall,** PMP \ Burns & McDonnell
>
> Senior Public Involvement Specialist \ Stakeholder Management Solutions
>
> O 207-517-8494 \ M 207-272-5975 \ F 207-517-8463

cmarshall@burnsmcd.com \ burnsmcd.com

27 Pearl Street \ Portland ME 04101

image001.jpg 870B

image002.jpg 866B

image003.jpg 861B

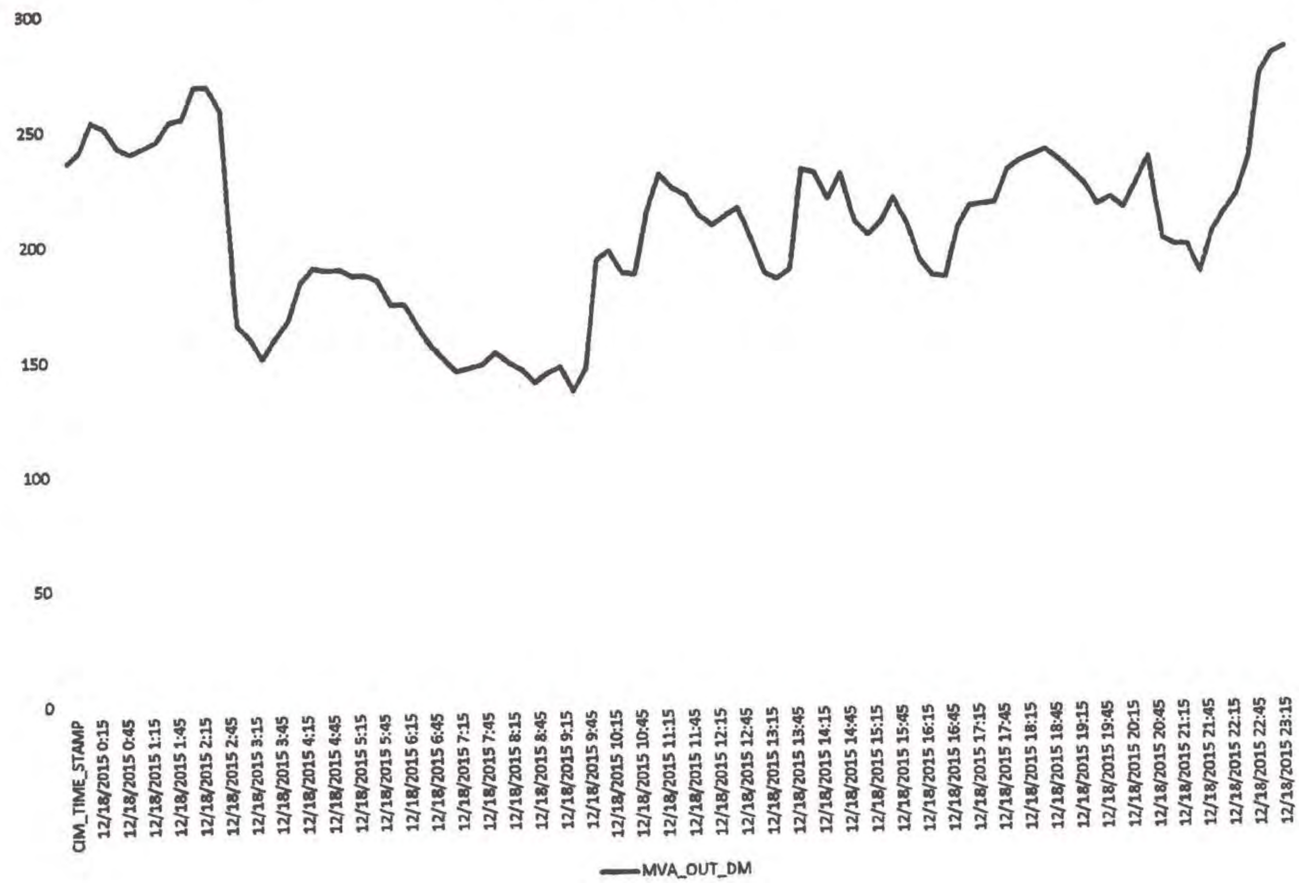
image004.jpg 874B

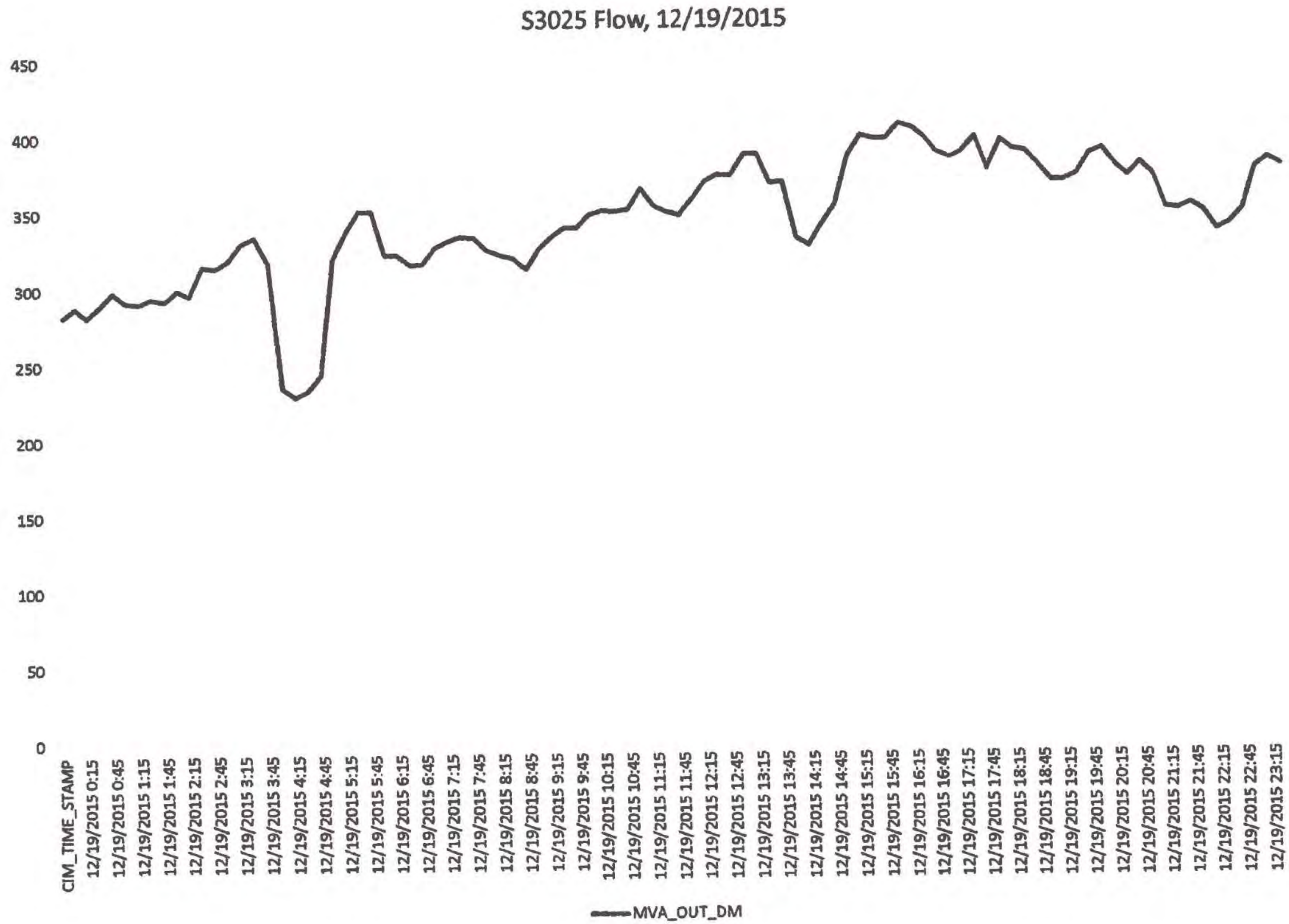
image005.png 529B

image006.png 1.1kB

S3025 Flows.pdf 136.9kB

S3025 Flow, 12/18/2015

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150
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50
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MVA_OUT_DM

00020

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300
250
200
150
100
50
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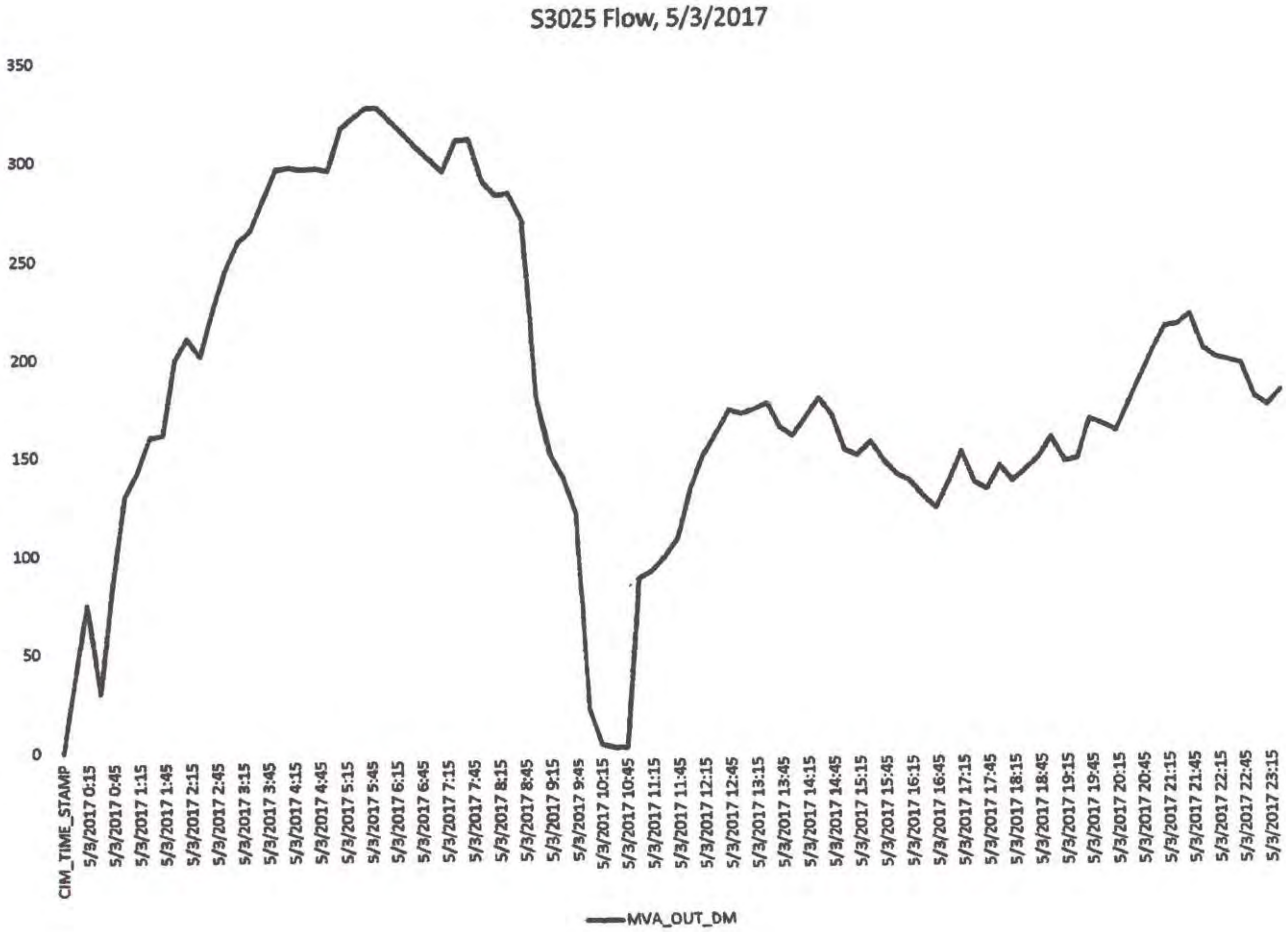

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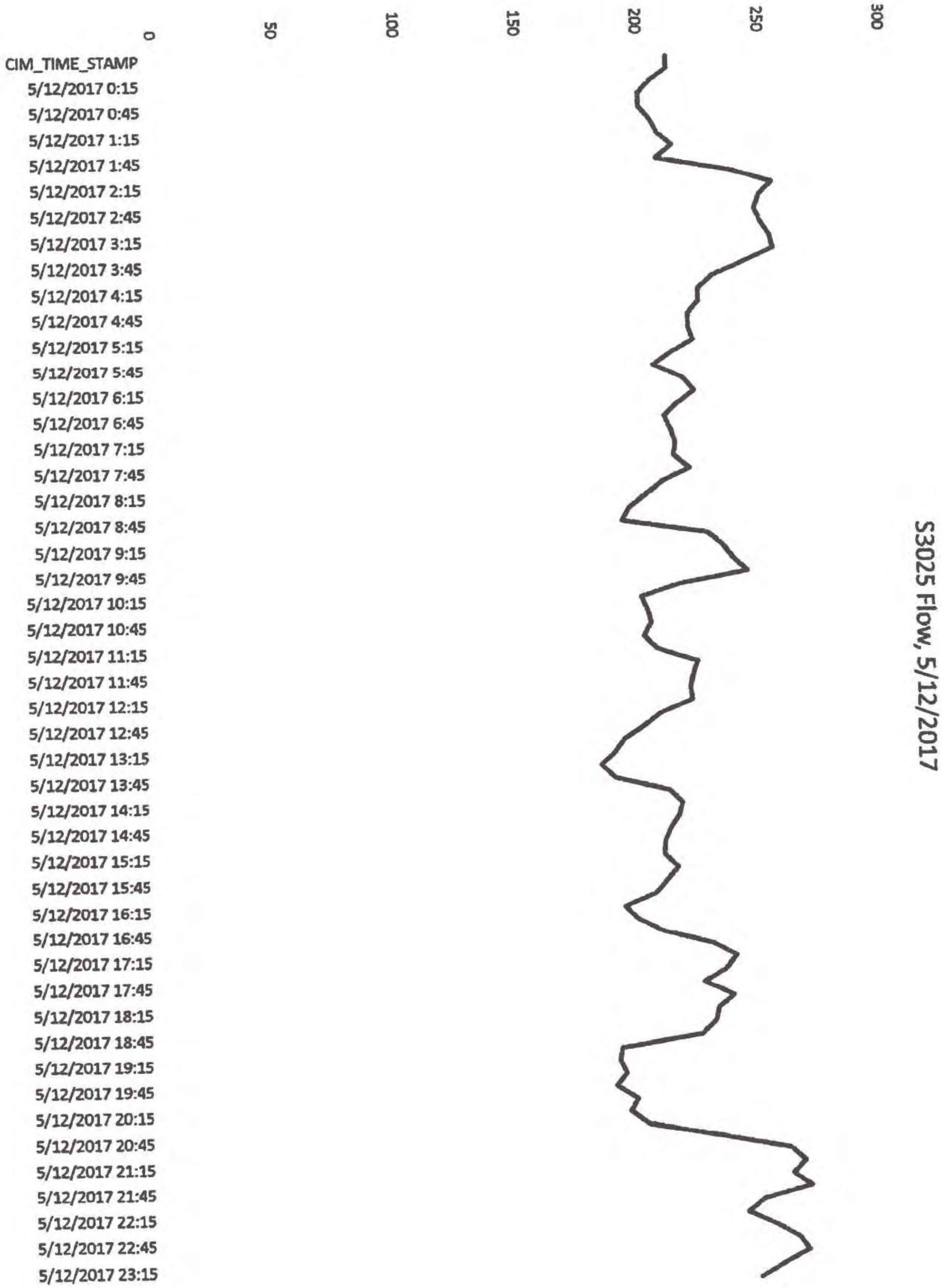
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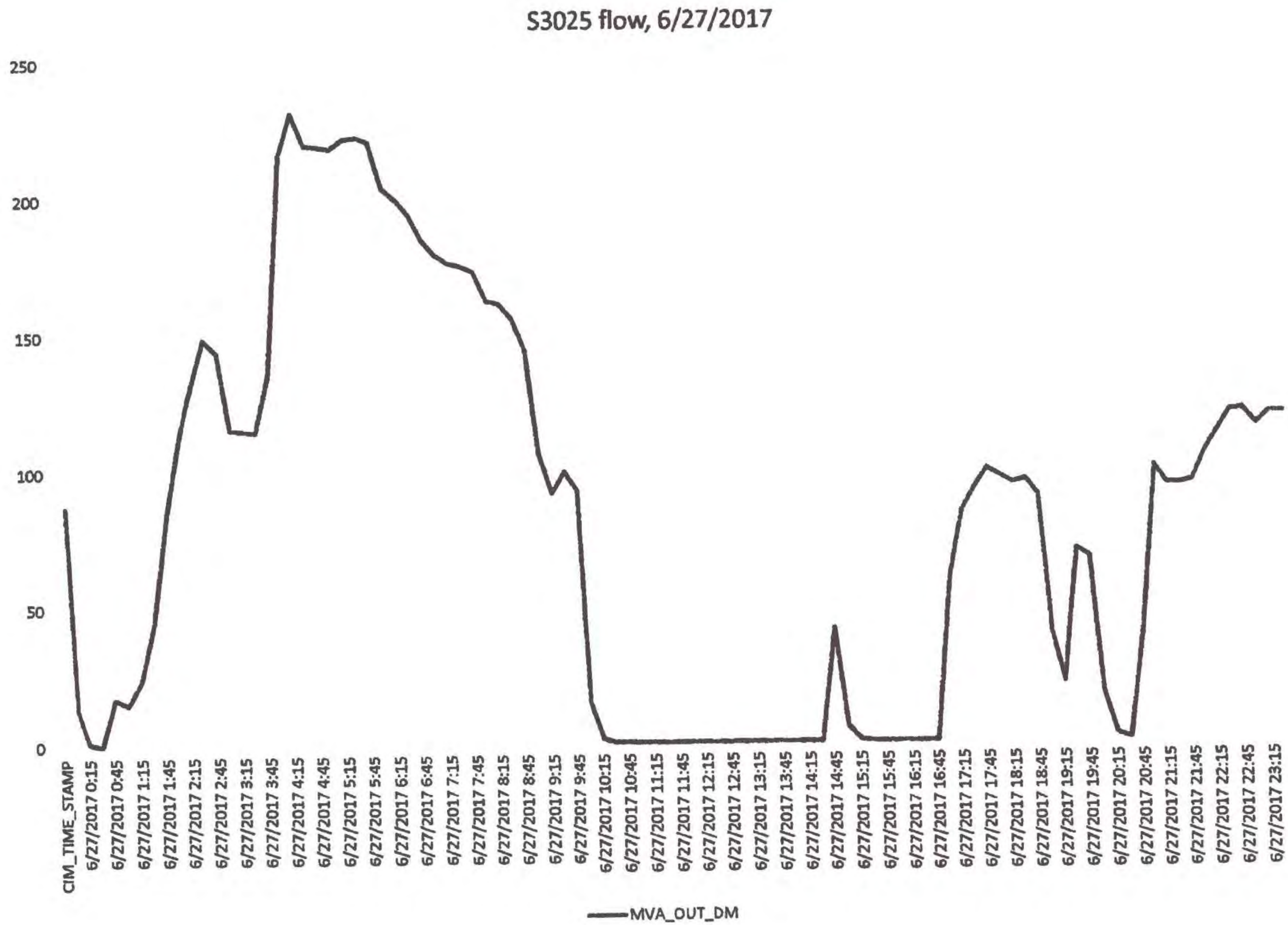
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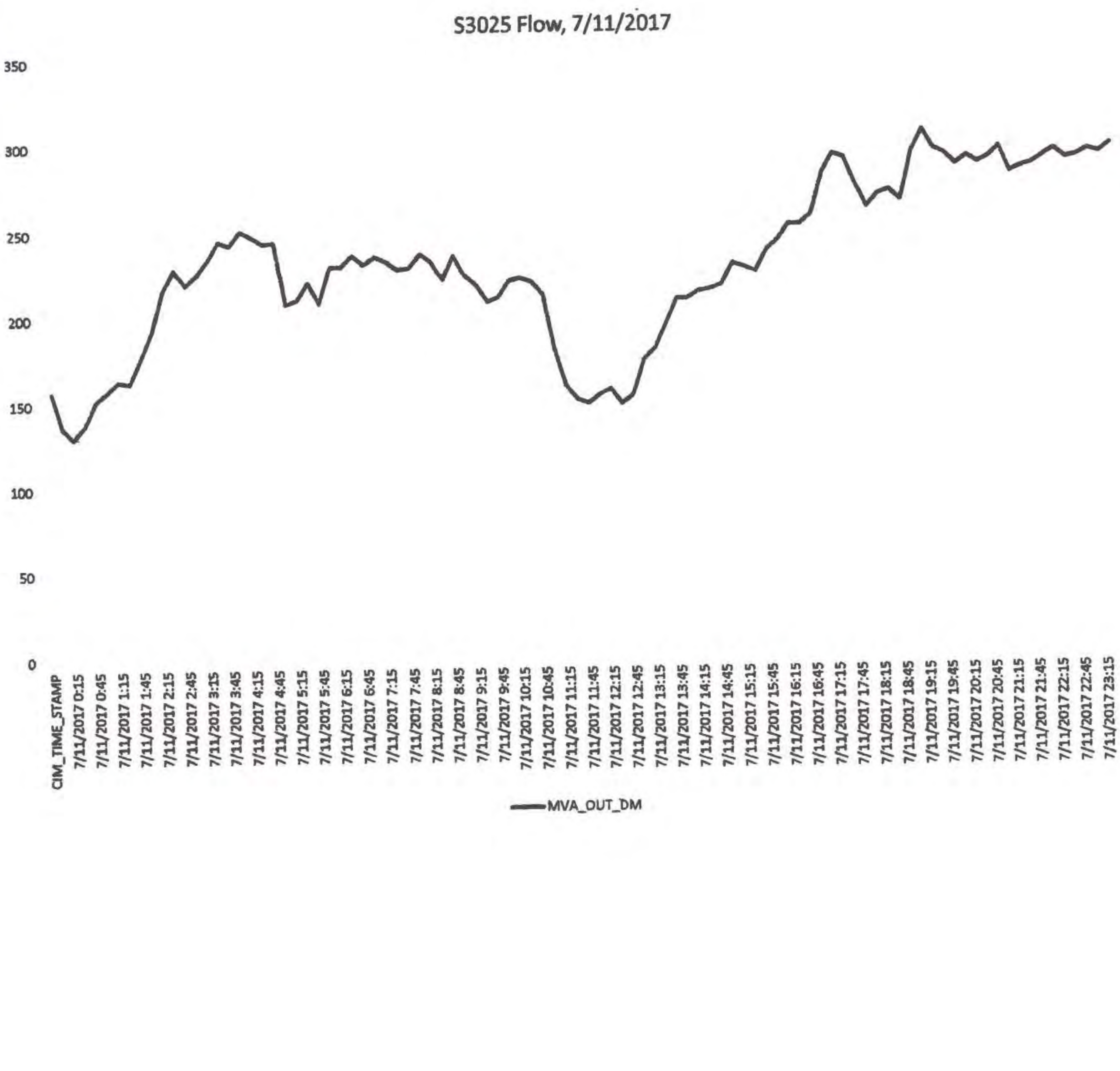
C00204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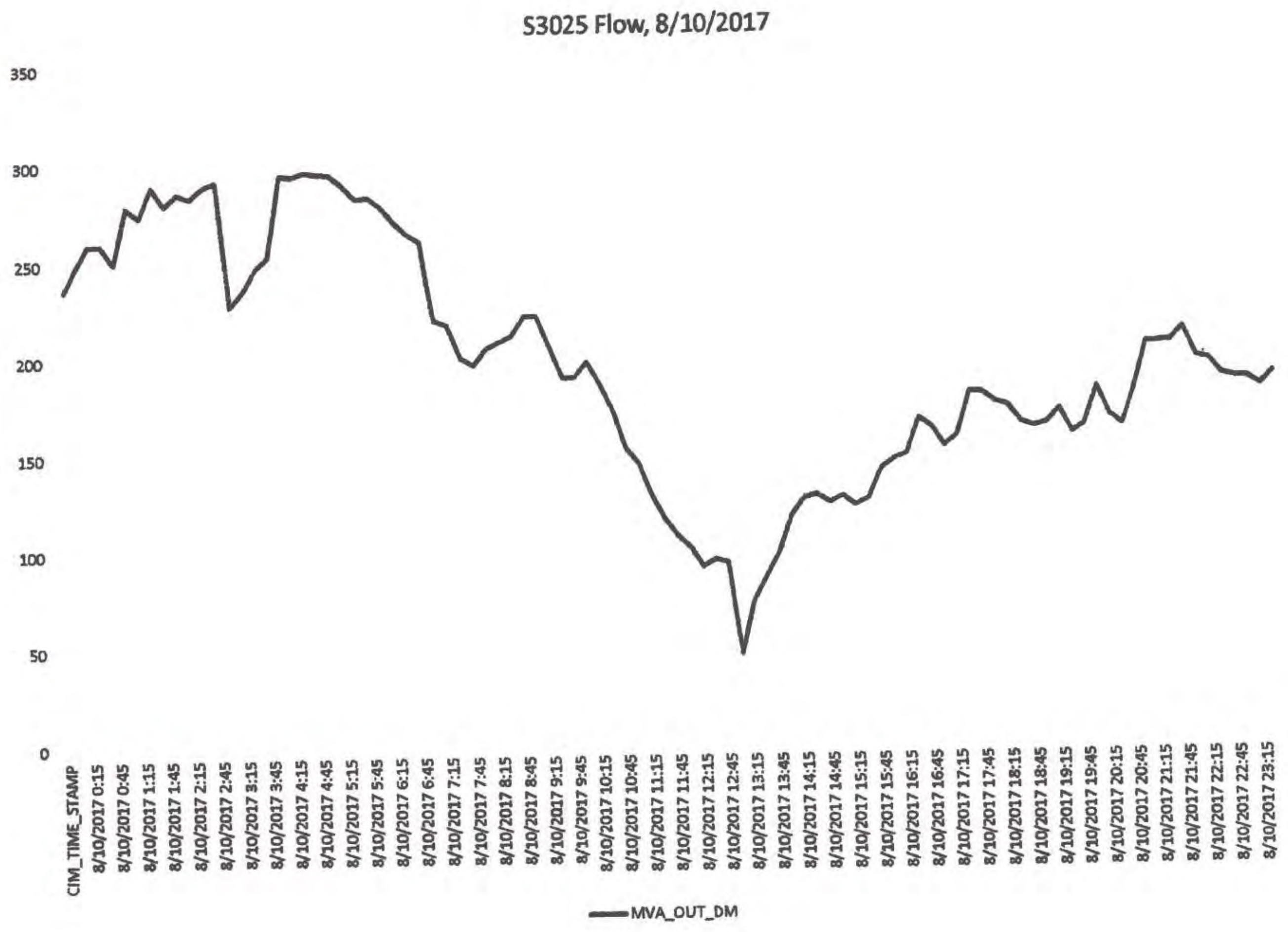
S3025 Flow, 7/19/2017



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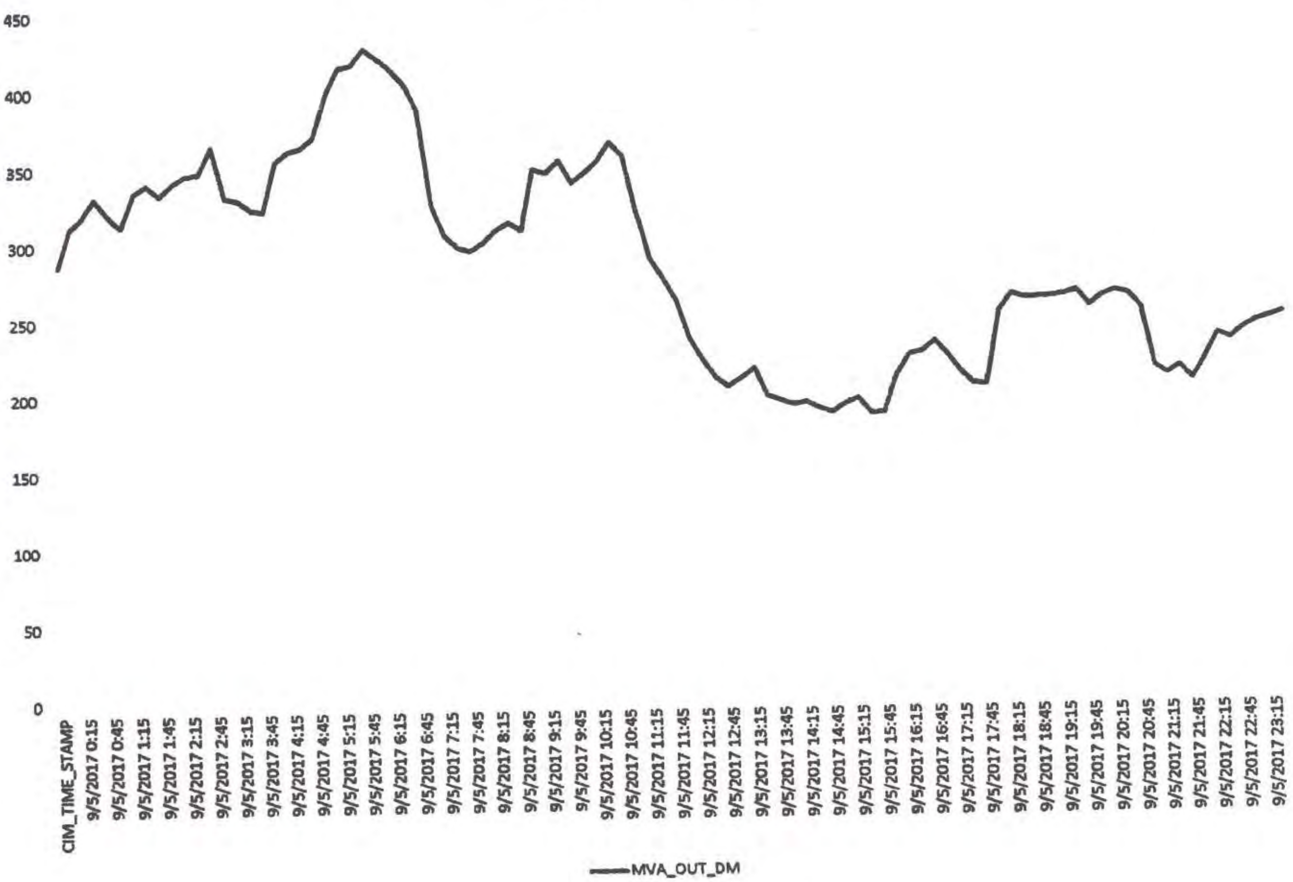
000208

S3025 Flow, 9/5/2017



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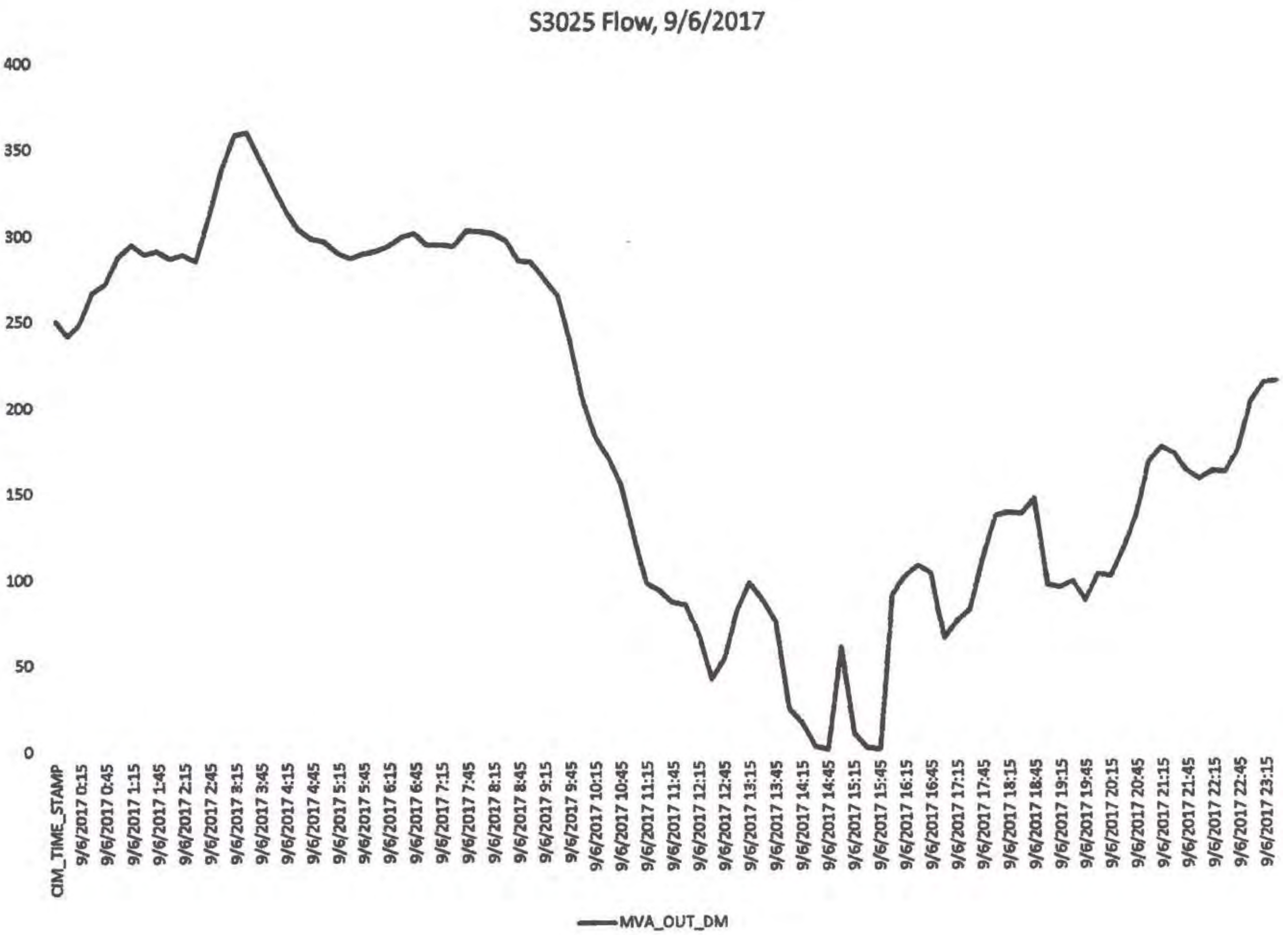
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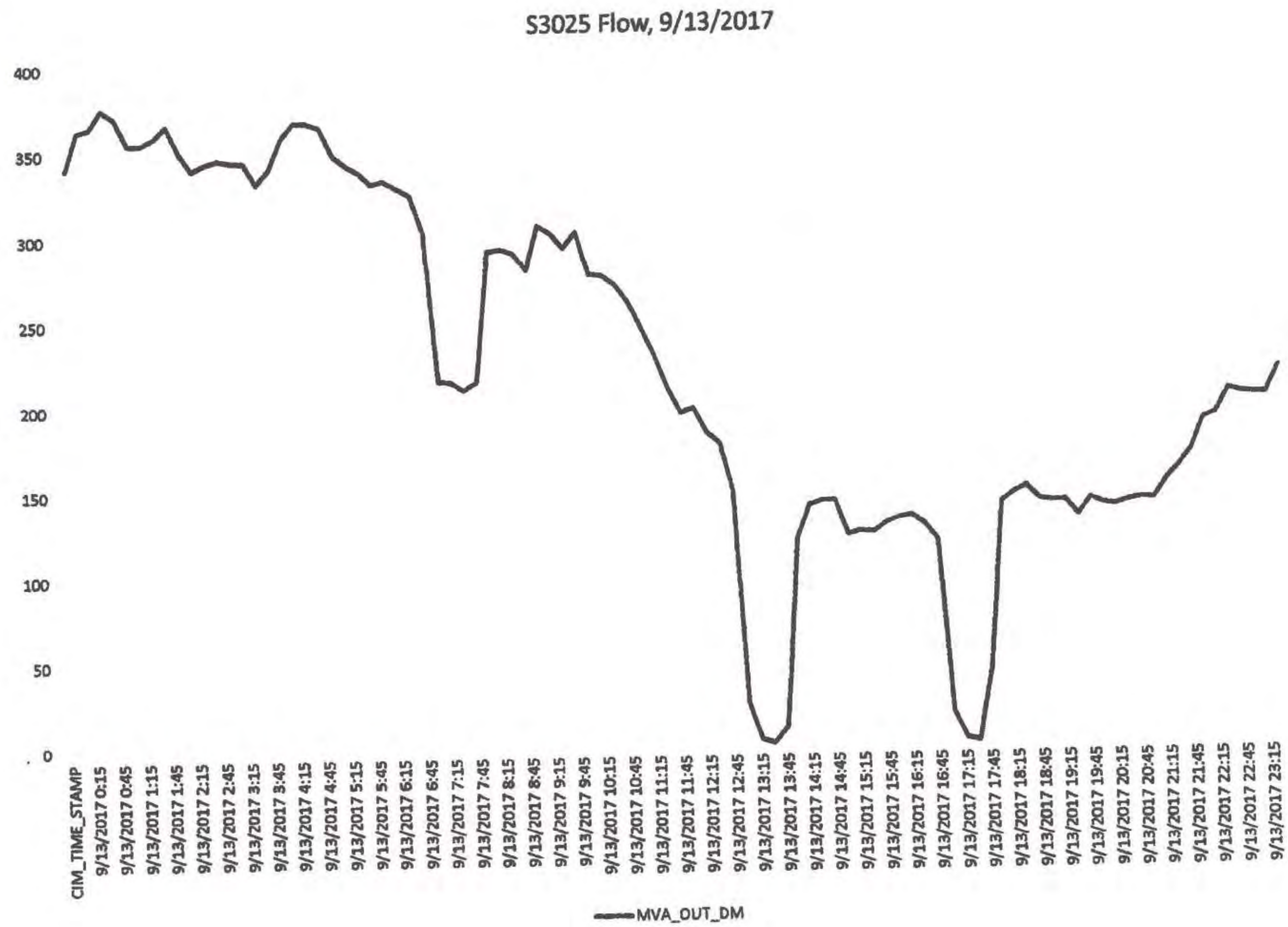
9/6/2017 18:45
9/6/2017 19:15
9/6/2017 19:45
9/6/2017 20:15
9/6/2017 20:45
9/6/2017 21:15
9/6/2017 21:45
9/6/2017 22:15
9/6/2017 22:45
9/6/2017 23:15
MVA_OUT_DM

000210



S3025 Flow, 9/13/2017
400
350
300
250
200
150
100
50
0
CIM_TIME_STAMP
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9/13/2017 0:45
9/13/2017 1:15
9/13/2017 1:45
9/13/2017 2:15
9/13/2017 2:45
9/13/2017 3:15
9/13/2017 3:45
9/13/2017 4:15
9/13/2017 4:45
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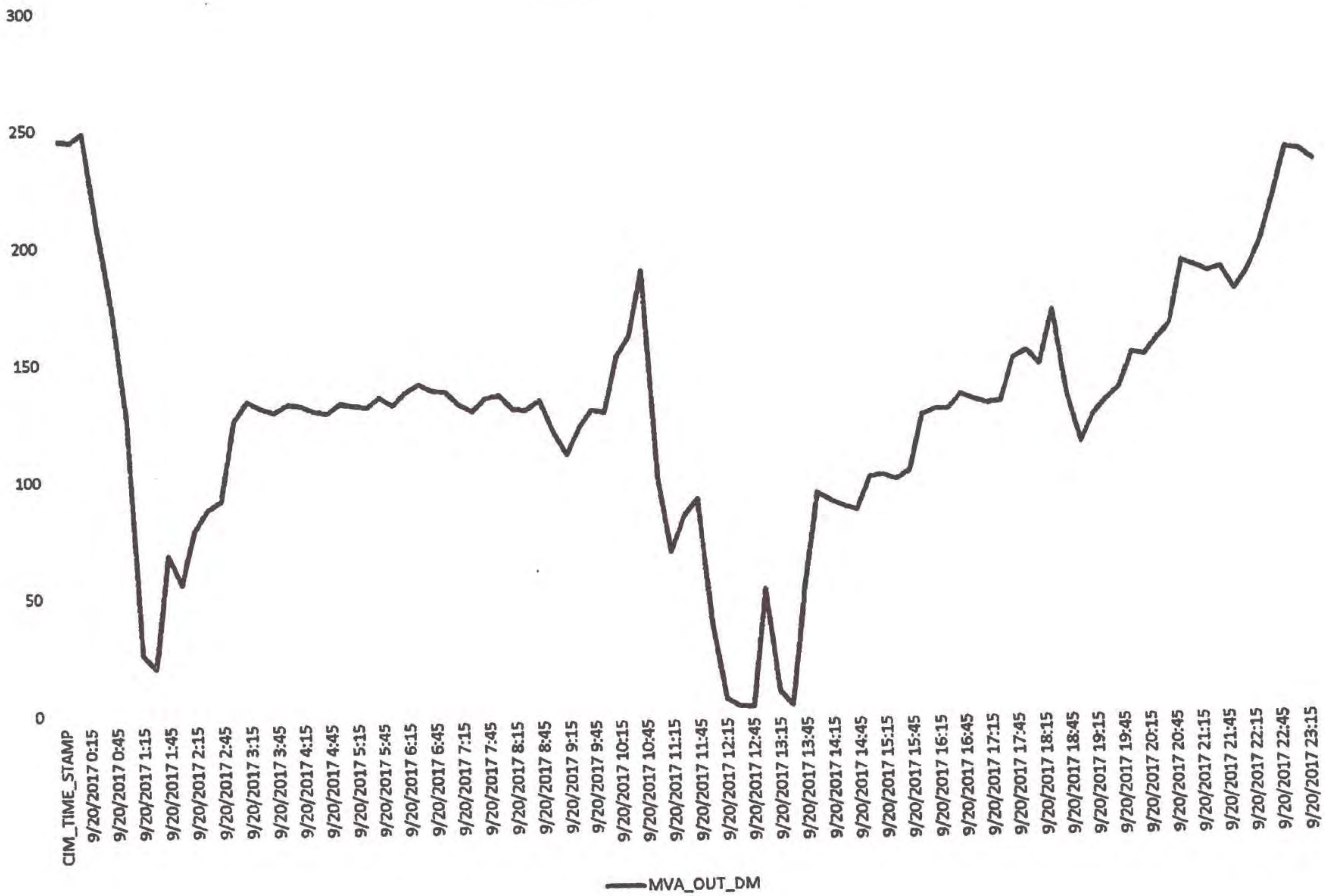
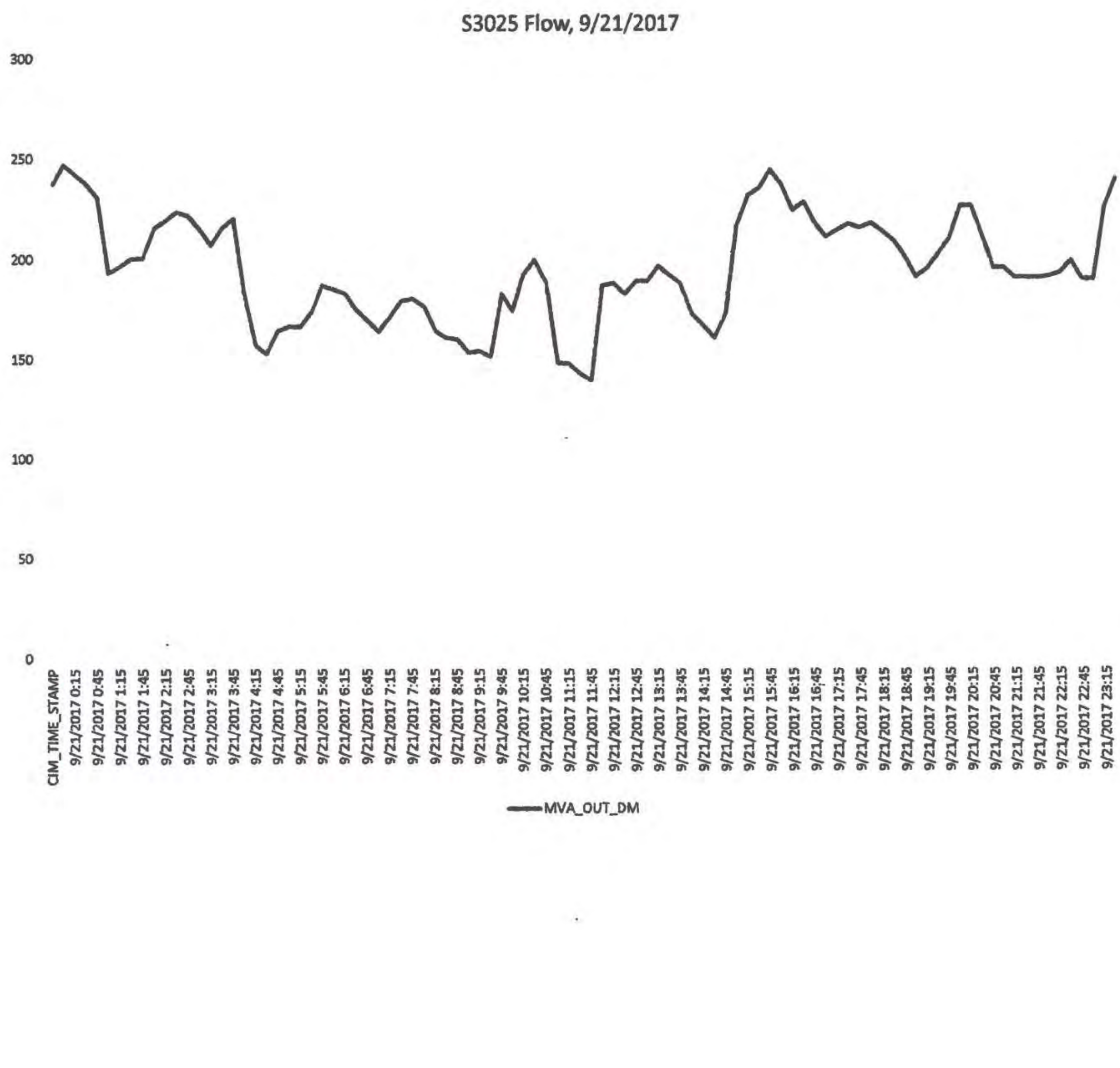
MVA_OUT_DM

S3025 Flow, 9/20/2017





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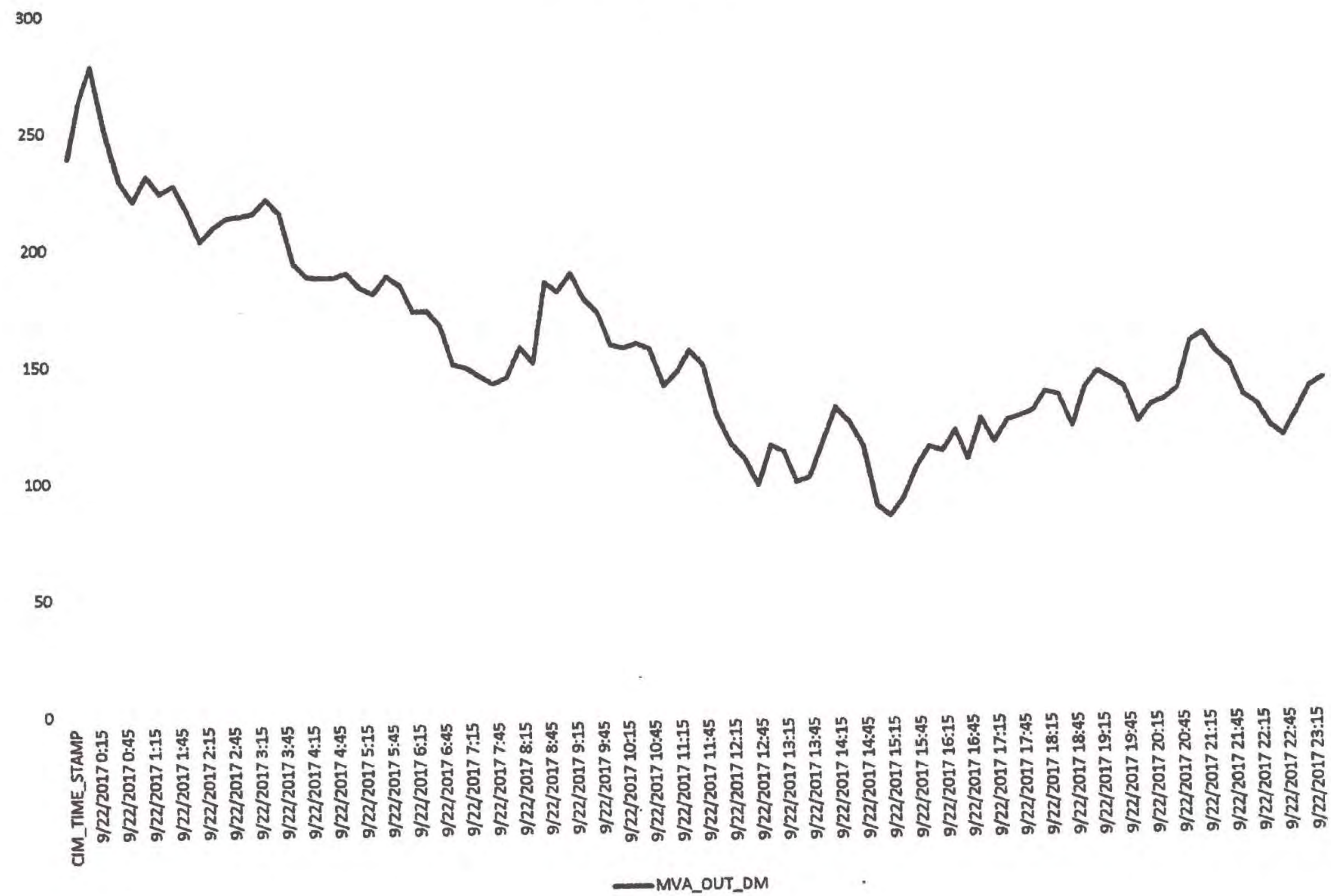
9/21/2017 22:45
9/21/2017 23:15
MVA_OUT_DM

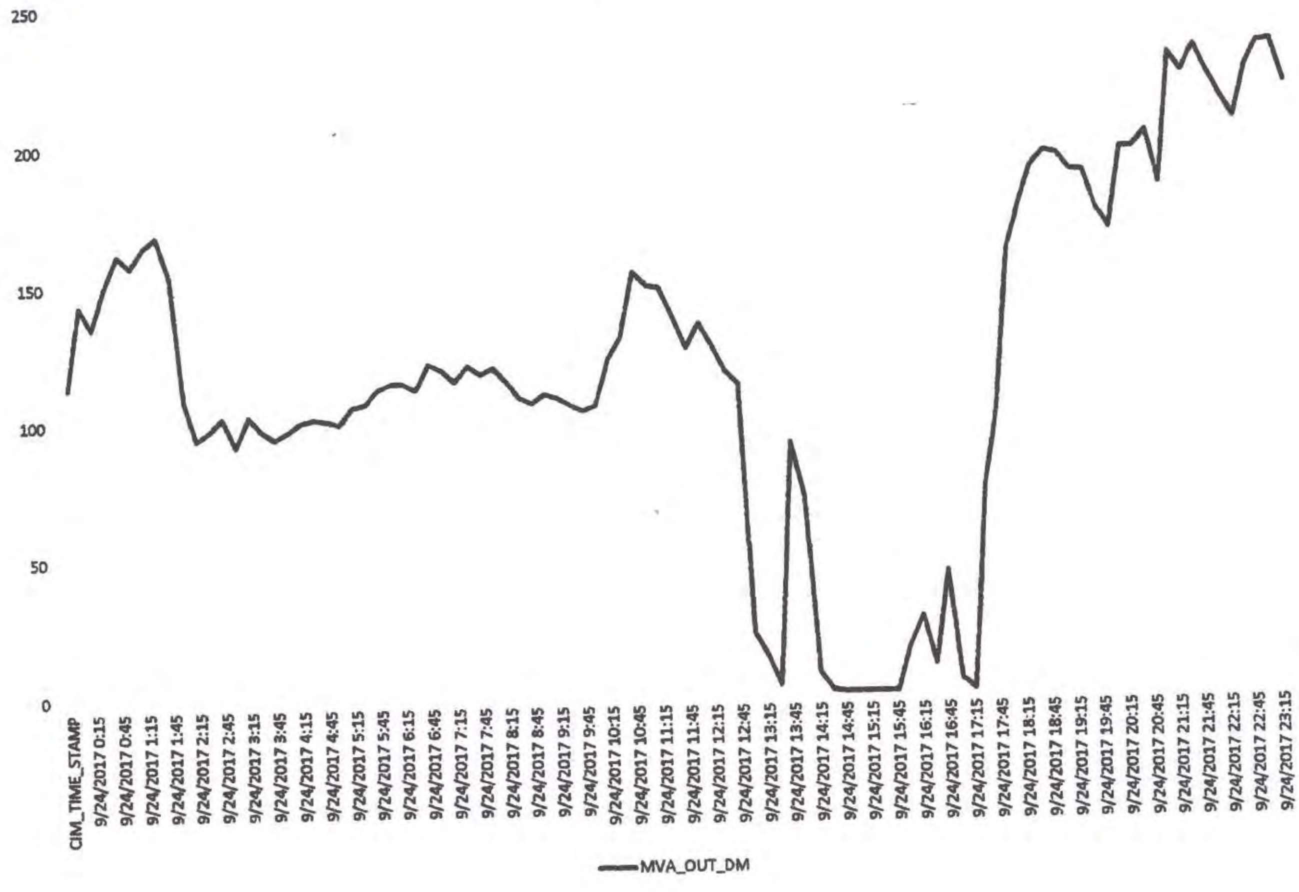
000212

S3025 Flow, 9/22/2017

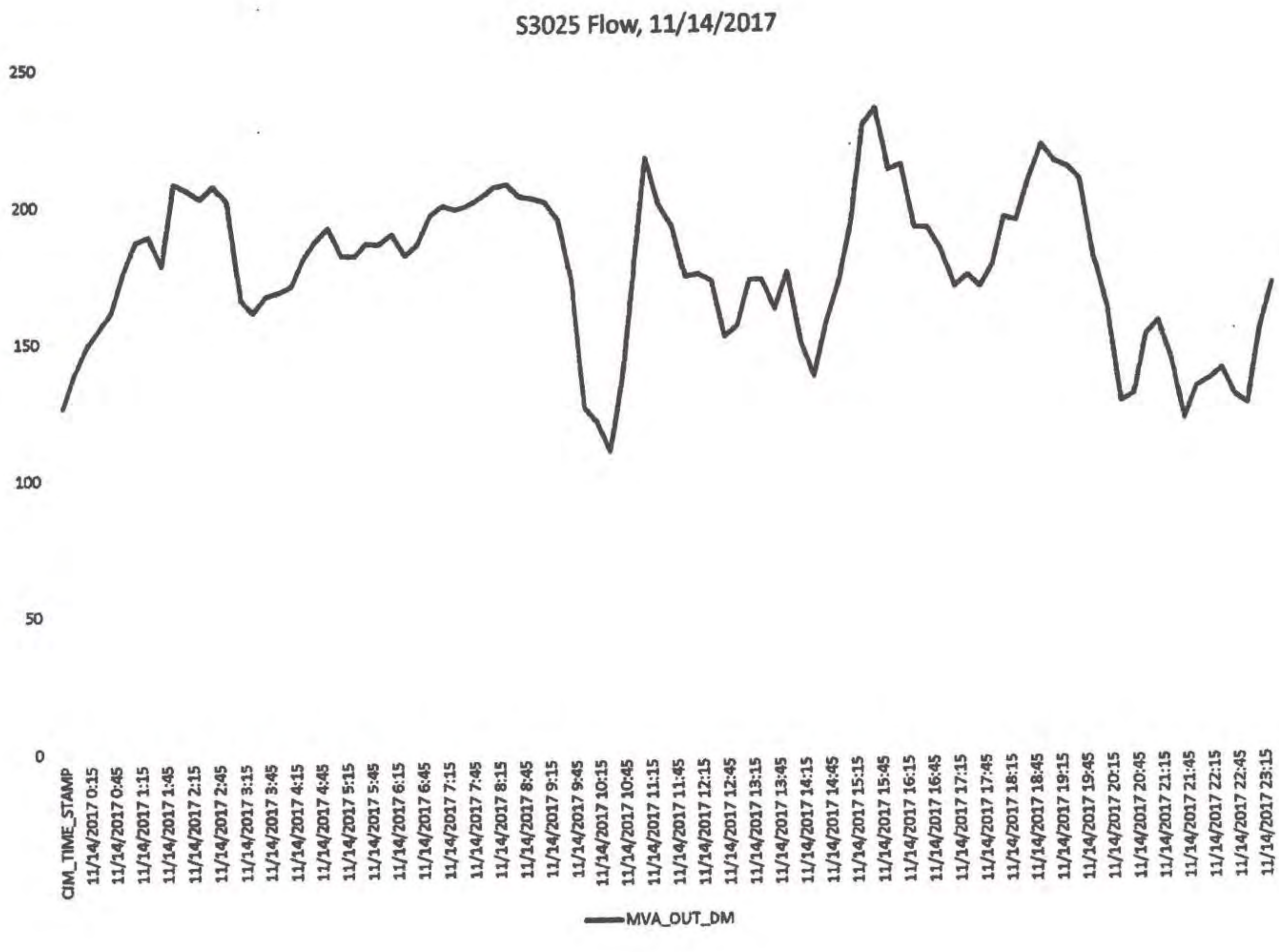


000213

S3025 Flow, 9/24/2017



000214


S3025 Flow, 11/14/2017
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CIM_TIME_STAMP
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MVA_OUT_DM

000215

Email 5/25/18 @ 6^29 pm (#3 Email Dot Kelly) Diane + DOT'S Work for 5/25/18

May 25, 2018

Harry Lanphear, Administrative Director
Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

Re: 2018-00034: Rebuttal Comments on Staff Recommended Decision Regarding Proposed LDRT Referral, Diane and James Coston, 482 Togus Road, Chelsea

Mr. Lanphear,

As I stated in my February 21, 2018 comment to this docket, Jim and I are here before the PUC with two serious and dangerous situations which we ask for your help with CMP to document and develop recommendation.

(1) Unpredictable stray voltage. (2) Excessive levels of EMF.

We request the Draft decision be modified to specify that CMP perform a stray voltage test similar to the free tests offered in Wisconsin utility areas and produce a report with recommendations. We would appreciate the PUC opening an investigation so that the stray voltage report comes under the PUC process, as the LDRT process is not being allowed as a vehicle for our legitimate issue to be addressed.

CMP submitted a lengthy comment to this docket on February 21, 2018. This rebuttal addresses the points and attachments in the CMP February 21, 2018 comment.

DESIGN AND CONSTRUCTION: On page 1 of CMP's comments CMP maintains that the LDRT process is no longer available because construction is over. The recommended draft decision codifies CMPs contention. We maintain that without a different vehicle to address concerns of design and construction from the MPRP, the LDRT process should be utilized to see that abutters are not facing health impacts to themselves and their livestock from the new transmission line. The EMF readings done at our property by CMP showed levels 37% higher than the maximum CMP predicted and higher than the level in the Curtis decision and lawsuit (Docket 2011-00504 and upheld by the Maine Law Court on February 26, 2013).

With respect to the very important issue of stray voltage, CMP has declined to do the testing that they originally said they would do, on the grounds that they do not typically test along transmission corridors. Meanwhile Jim and I still have a problem that was not resolved by the installation of filters on our electric fencing. CMP had maintained that the filters would solve the problem.

We agree with CMP that our construction concerns were resolved by a settlement agreement entered into in February 2012. That issue is not what is being requested regarding stray voltage and EMF levels.

EMF and Stray Voltage Impacts. On page 2, CMP states "The Costons' remaining claims concerning stray voltage and electromagnetic fields were asserted after the completion of construction and involve the operation of CNMP's transmission system in the vicinity of the Coston property." We think this is a false conclusion. It is specifically the design of the transmission lines and there close proximity to our home and farm combined with the lack of warning that we would have any impact from the transmission line on our activities, that makes this issue one directly related to the issuance of the Certificate of Public Convenience and Necessity and the Design and Construction of the line.

We had lived with the 115 kV transmission line in the location where the 345 kV line is now. We did not have stray voltage or the animal behavior that we now experience with the 345 kV line. We do not think CMP wanted to have our life impacted, but it is.

Again, we request the Commission open an Investigation into Stray Voltage and EMF levels on our property as an alternative to the LDRT process.

Rebuttal of CMP's Statement of Facts that it was known that the HVAC line was going to be located to the south.

On page 3 CMP uses a draft document to infer that we should have been aware that the high voltage line was going to be located on the southern side. In fact, we were informed by Al Godfrey that the high voltage line would be on the north side and that our north neighbors were going to be affected by line and need to move, not us. As documentation we have the October 21, 2008 option to purchase which does not show where the transmission lines will be and which shows we have more land around our home toward the corridor than the similar graphic in CMP's attachment in this filing. The option to purchase and land swap graphic is attached.

We would like the investigation to get testimony from Al Godfrey as he was the CMP consultant directly involved in the land swap and our dead animals discussed below. We disagree with CMP's version of the facts.

Dying animals. Disagree with internal document revealed in this comment.

On page 5, the CMP comment states, "**On 05.15.14** – Jim Coston contacted MPRP Real Estate agent Al Godfrey concerning farm animals that had died. Mr. Coston reported that animals started dying in fall 2013. Mr. Coston believed blasting may have tainted the ground water. Chris Marshall (Burns & McDonnell) asked Stephanie Cote (Ciambro) to contact Coston on behalf of Irby, the general contractor responsible for constructing the MPRP in the area.

Jim Coston specifically remembers that the animals died in the spring of 2014, and Diane Coston remembers contacting Mr. Godfrey and then CMP within a few days of the deaths, which occurred over a few weeks. The deaths were the newborn calves, and the newborn goats, and a couple adult goats, and then the cows could be bred back because they were sterile. Calves on the farm are born in May to June. The last calf born, was born in June and named June. She was the only calf that survived. She is still on the farm.

CMP's Exhibit 5 page 1 of 2, is an internal email from Stephanie Cote dated Tuesday, May 20, 2014 sent to Chris McKenney and four other men. It was not sent to the Costons. The email purports to document the conversation she had with Diane Coston the day before. It states (directly conflicting with the information quoted above from page 5).

> I'm following up my voicemail with this email regarding abutter James Coston and his dead farm animals in Chelsea (Togus West). I spoke with Diane Coston over the phone yesterday afternoon. As communicated by **the** Diane [the extra the before Diane is in the email, which otherwise seems well crafted, emphasis added] their farm animals (cows, chickens & rabbits) began dying in mid February 2014. Our internal review yesterday confirmed that blasting at structures 83-87 on S. 3025 did not take place until mid April 2014. We confirmed this morning that our matting crews were not in the area until staging began February 27, 2014.

Not only is this information about the calves dying in February wrong, as Jim is sure about when calving happens, but it conflicts with the statement on page 5 (quoted above) which states the animals started dying in fall 2013.

The email in Exhibit 5 ends with the information that Al Godfrey was at the Coston farm because of the dying animals. That is why we want Al Godfrey to testify about his recollections. We were always impressed with Mr. Godfrey with his quick responsiveness and thoroughness. According to LinkedIn, https://www.linkedin.com/in/al-godfrey-bb5a6b2b, Al Godfrey is President at TMSI Engineers in Gardiner, Maine specializing in Civil Engineering.

> Diane made mention that Al Godfrey and a Chris (?) stopped by in response to their concern. We want to understand what information you gathered from this meeting as Diane was looking for a comprehensive well water test.

Diane would like to confirm that Al Godfrey did come the day after she called him reporting the multiple deaths. When Al Godfrey arrived, the water testing person, Steven McCoy with AERUS, that Diane had hired was just leaving and Mr. Godfrey and Steven talked for a bit. Again, we request that Al Godfrey be asked about his recollections because we are confident that he will confirm our version of the facts.

It is still not clear why our animals died after the blasting occurred.

With power off Costons report shocks from fence. On page 6, CMP accurately notes that Jim Coston was shocked by the electric fence while the fence was turned off for the first time (04.09.17). The CMP report insinuates that this delay from the energizing of the lines in 2015 means something. In fact, according to Jim Coston it was just the unusual occurrence that the power was off because Jim was setting up the fence for the season. Jim's nephew was by and because the fence was not energized, being a young man, he grabbed onto it and the handle, and was shocked. Jim couldn't believe it, confirmed that the fence was unplugged, and tested the fence for himself. He was shocked to the ground. They then walked the whole fence to see if some unknown electrical connection existed, which it didn't. Thus the fact that it wasn't noticed until 2017 that the un-energized fence was conducting significant stray electricity, is not surprising. If, as in Wisconsin, the utility did stray voltage testing before and after the installation of high voltage lines on close abutters, the fact would have been known sooner. It was a risk that was unknown.

Stray Voltage.

This is an issue of significant safety and health for the Coston family. There appears to be a downplaying of the importance of stray voltage on the Coston property, with important emails missing and erroneous facts included.

The CMP timeline describes the actions that they took after the Costons reported being shocked by the electric fence while the fence was turned off. On Sunday April 9, 2017, Jim was severely shocked by the un-energized electric fence (See description above).

Erroneous fact. The timeline then states that Mr. Coston was shocked again on April 12, 2017. This is not true. The shock was significant. The Costons were then and are still very afraid of the stray voltage hazards that are on their property. They avoid the fence.

The entry in the timeline for April 12, 2017 doesn't reveal who thought Jim Coston was shocked again, but certainly no one has directly asked the Costons. Diane has a hand written record that shows she called CMP on April 12, 2017 to report the April 9, 2017 event.

Stray Voltage Shock and Testing. Diane has a note that she spoke to Rhonda in the Department of High Tension Line Service Center and Rhonda gave her a work order #10300381598. This work order could be checked but was never given to Mrs. Coston.

On May 3, 2017, after Diane had reported to CMP on April 12 she waited until the end of the month and then contacted Al Godfrey who made a few phone calls. Al Godfrey called back and requested Diane call Tim Robinson. His answering machine said to contact Sam W. "I verbally talked to Sam, who was just filling in, and he suggested I talk to Greg Snow". I talked to Greg Snow who agreed to come over and investigate. They came on May 3, 2017. As you can read in this description, it is only through Diane's extreme perseverance that she got someone to acknowledge her.

The May 3 testing with Ray Boucher and Greg Snow, which Diane witnessed, showed very high levels of stray voltage – 84 V. Ray Boucher sent an email to Gregory Thompson of Avangrid that day which summarized his findings. This email was not described or disclosed by CMP, but was provided to Diane in October 2017. See three page e-mail thread dated August 25, 2017 from Gregory Thompson regarding the testing by Greg Snow.

On May 3, 2017, Ray Boucher wrote:

> **Greg Snow and I met with a customer this morning who is getting shocks at her home. They thought the voltage was being induced by the 345 KV transmission line (MPRP) adjacent to their property. We did some voltage checks and did confirm that there was voltage present (varied to over 84+ volts to earth) on their fence line which runs parallel to the transmission line. It is not faulty electrical equipment as we also confirmed the voltage readings even with the service main breaker off. It does appear to be related to the transmission line and Greg Snow can fill you in with the customer name, phone number and explain the voltage readings in more detail.**
>
> **This is beyond anything I can address. Could you follow-up with someone more familiar with the MPRP project and right-of-way and resulting voltage induction issue. Please let me know if you have any questions for me.**

Clearly Ray and Greg thought this was a big issue. The email on August 25, 2017 from Mr. Thompson to "Chris and Bill" takes a different view of the hazard without describing why.

Mr. Thompson writes:

Below is a summary of the meeting between the Coston's, Ray Boucher and Greg Snow. It should be noted that there is no official report regarding the visit. This site visit was meant to rule out the possibility of the distribution circuit causing a safety concern for the Coston's. Ray and Greg do not have the expertise nor the equipment to test for EMF. Further, they would not be the appropriate representatives to discuss safety as it relates to the transmission line and the proximity to the Coston's property. Ben Shepard's group or a contractor through Ben's group should be able to address those issues.

Downplaying the ongoing issue of stray voltage and pressuring Mrs. Coston to say she is satisfied is mis-represented.

On June 27, 2017 CMP sent two men to the site. They had a box of filters, didn't do any measurements, used only two filters and then pressured Diane to say that she was satisfied, by repeatedly asking her, "Are you satisfied?" Diane responded, Yes, I am happy you came to put the filters on, but only time will tell if they are going to work." Diane did not state that Leah ever said she had to move out of her home due to EMF. Diane believes Leah said "that the levels are unsafe."

The timeline states:
06.27.17 – Ben Shepard and Jim Wright (CMP) installed filters on the electric fence to address induced voltage. Diane Coston informed Shepard that Ombudsman Sprague advised her to move out of her home due to EMF.

The CASD letter sent on July 6, 2017, (see Exhibit 8) corroborates that Diane was uncomfortable with the conclusion that the installation of the filters was sufficient. The last paragraph shows that her satisfaction was conditional, by including the word "currently", when Merica Tripp related the phone call just two days after the filters were installed.

> I spoke with Ms. Coston on June 29, 2017. She indicated that she is **currently** satisfied with the installation of the filters... (emphasis added, note how it differs from the timeline quotation).

Thus the timeline entry overstates the case when it doesn't include the word "currently".

07.06.17 – CASD sent letter to James Coston confirming that Diane Coston was "satisfied with the installation of the filters in order to mitigate the safety concern regarding the electric fence" and closing the Costons' complaint.

It is clear that Mrs. Coston would have preferred to have the case remain open to monitor that the filters were successfully addressing the stray voltage issue and that they were no longer going to be shocked.

On September 13, 2017, the timeline explains that both Mr. Coston and his grand-daughter were shocked while operating a gate on a de-energized fence, but that CMP got a message from the PUC that didn't say that both Autumn and Jim got shocked. We can only conclude that the message did say that Autumn got shocked. The timeline note, makes one think that CMP was unaware that anyone was shocked, but reading it closely makes one realized they did learn that Autumn was shocked. Diane recalls that her first call to Merica (since Leah was still out with her medical condition) only reported that Autumn was shocked. She was not aware that Jim grabbed the fence from Autumn

Readings
on
May 25th
2018
Done by Dot Kelly
at 482 Togus Rd Chelsea
ME

Finch 10" from filter 1-7-16

N Side

8" out Air 38.0 40.5

Finch [illegible] .2 3.9

10" off Air 50.7 [illegible]

finch 7.25 26.67 7.8

10" - 18" Air 39.33 38.09

Finch By Filter 5.04 5.47

S. W Corner 10" off Air 36 .0296

finch 10 off 0.18 0.57

S Side 25' off Barn

10' x 5' off Air 4.60 4.58

Finch 33.21 30.83

3.72 3.51

C0022

[redacted]

At 12:54 All Testing has leeds on

Top Stairs
Deck .003 bottom of stairs .003
with one Black leed in .241
Between two Garage doors & Corner of barn
black lead in ground .373 V. AC.

South side
25 ft from Corner of Barn 1.57 - 1.63 V. AC
25 ft from South of west Corner of barn
2.45 to 2.57 V AC
25 ft west of barn 2 feet East of elec fence
3.9 V. AC to 4.86 V ac, 5 inches from fence
line 3.7 V. AC touching fence ~~39.0 V ac~~ 39.05 V.ac

South East corner of barn fence line 2 ft
away 1.064 V.ac - 1.086 . 5 inch from fence
1.105 V. AC to 1.111 V. ac touching the fence
is 39.03 V. AC to 39.07 V. ac

direct under distribution line edge of driveway 1.555 V. ac
to 1.533
pole # 39. Standing open air .015 black lead in
ground under distribution wire .250 to .263

27 feet Nort of 45 mile Side under the
345 KV line. Adestent to road bed-(1 foot)
16.9 to 16.85 V. AC.

triaxial Magnetic Field Meter T-192

Homeowner

Gauss meter : 10:12 am 5/25/18

on Kitchen table : 2.33 mG
2.45

On Diane's work desk in room closest to power lines 2.44-2.59

VM Southwire 21030T True RMS AC Clamp meter CAT III 600V 400A

Kitchen table no leads
0.003 - 0.004 V

With leads in it shows 0.167-
0.170
V

Diane's desk

Leads in separated by 2'
0.131 Volts

When black lead is touched to metal file cabinet the reading went to 0.392 V.

1-800-452-4699

Subject: Fwd: MPRP--James and Diane Coston

From: lwsprague@aol.com

To: costonsfarm@yahoo.com

Date: Sunday, February 18, 2018 01:56:26 PM

Ann Brooks is with CMP.

Sent from my I phone

Begin forwarded message:

> **From:** "Cottle, Susan" <susan.cottle@maine.gov>
> **Date:** May 18, 2017 at 9:26:52 AM EDT
> **To:** "lwsprague@aol.com" <lwsprague@aol.com>, "Brooks, Ann M. (Ann.Brooks@cmpco.com)" <Ann.Brooks@cmpco.com>
> **Cc:** "Tripp, Merica A" <Merica.A.Tripp@maine.gov>
> **Subject:** MPRP--James and Diane Coston
>
> Leah—I am writing to you as the ombudsman for the MPRP to let you know that we are advising James and Diane Coston to contact you with their concerns resulting from the project; they are being provided with your contact information today. We have a complaint open here for them having to do with stray voltage, which may arise near any transmission line. And we will be continuing to address that complaint accordingly. However, the Costons have additional concerns beyond the voltage issue that they believe are specifically related to the project that have affected their water and, from what we understand from the Costons, have not yet been addressed as needed. The ombudsman process is, of course, the most appropriate venue for the resolution of any MPRP concerns.
>
> Ann—I am including you on this email as our CASD contact so that you/CMP is aware of this. As we discussed yesterday, I had indicated that if the consumer indicated to us that there were matters related to the MPRP that had not previously been satisfactorily addressed, we would need to refer them to the ombudsman. As noted above, the stray voltage issue is something that we in CSAD will continue to look into (Merica will be handling it) and be expecting CMP to address promptly so as to ensure safety in both the immediate- and long-term.
>
> If either of you have any questions, please do not hesitate to contact me directly.
>
> -S
>
> **Susan E. Cottle, Deputy Director**
>
> **Consumer Assistance and Safety Division**
>
> **Maine Public Utilities Commission**
>
> **18 State House Station**
>
> **Augusta, ME 04333-0018**

Subject: **Notes**

From: lwsprague@aol.com
To: costonsfarm@yahoo.com
Date: Thursday, February 1, 2018, 10:35:25 AM EST

1. CMP did not notify the Costons that the line would be constricted adjacent to their property. The Costons learned of this only as construction progressed and as finally confirmed by Al Godfrey in 2014. They never received any notice of the change in the location of the transmission structures from the north to the south side of the corridor.

2. Blasting occurred before the Costons' animals began to die. (NOTE: Diane will confirm his again through her notes.) July 2011.

3. Obviously the two voltage filters installed by CMP on the Costons' electric fence have not addressed the stay voltage problem because shocks have been received from the non-energized fence after the filters were installed.

4. The Costons never told PUC staff that they were satisfied with this attempt to resolve the stray voltage problem. In fact, it was PUC staff who recommended that the Costons contact the Ombudsman and gave them the Ombudman's contact information.

5. The issues of excessive EMF and stray voltage are designated and constriction issues that have never been resolved and could only have ben known after the transmission line was energized.

It appears from page four of Amy Mills' letter that while the LDRT is not making factual findings at this time, the LDRT has already decided these factual issues and would "deny the referral" but for the question of jurisdiction. Thus, as laymen, the Costons should probably appeal this decision to the full Public Utilities Commission in order to be sure their rights are preserved.

Leah W. Sprague
P.O. Box 1228
Damariscotta, ME 04543-1228
207.586.6080

•

•

Fwd: Coston Farm, Chelsea (3)

People
Leah Sprague <lwsprague@aol.com>
To
Diane Zagwijn-coston
Oct 14 at 1:40 PM

This message contains blocked images.

Duane,

I'm not sure whether I forwarded this to you before.

Leah

Sent from my I phone

Begin forwarded message:

From: "Marshall, Christopher" <cmarshall@burnsmcd.com>
Date: August 25, 2017 at 2:47:17 PM EDT
To: Leah Sprague <lwsprague@aol.com>
Subject: FW: Coston Farm, Chelsea

Please see below and attached. This is confirmation that there was no official report of the service center visit.

Since this is an internal email from CMP including contact information, I ask that you treat it as information for review only.

As we have previously discussed, the Service Center asked the transmission group to respond following this visit, which we did.

Chris

Chris Marshall, PMP \ Burns & McDonnell

Senior Public Involvement Specialist \ Stakeholder Management Solutions

O 207-517-8494 \ M 207-272-5975 \ F 207-517-8463

cmarshall@burnsmcd.com \ burnsmcd.com

27 Pearl Street \ Portland ME 04101

Tammy

Tammy Pierce

Key Account Manager

Kennebec Valley Region

Central Maine Power Company

57 Old Winthrop Road, Augusta, ME 04330

Office # - 207-621-6658

Fax # - 207-629-4887

- Download

mime-attachment

Reply Reply to All Forward More
Diane Zagwijn-coston Wow!! new email from leah
Oct 15 at 10:04 AM
Diane Zagwijn-coston Duane, I'm not sure whether I forwarded this to you before. Leah Sent from my I phone Begin forwarded message: From: "Marshall, Christopher" <cmarshall@burnsmcd.com> Date: August 25, 2017 at 2:47:17 PM EDT To: Leah Sprague <lwsprague@aol.com> Subject: FW: Coston Farm, Chelsea Please see below and attached. This is confirmation that there was no official report of the service center visit. Since this is an internal email from CMP including contact information, I ask that you treat it as information for revie

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From: Thompson, Gregory J. [mailto:gregory.thompson@avangrid.com]
Sent: Friday, August 25, 2017 1:46 PM
To:
Subject: FW: Coston Farm, Chelsea

Chris and Bill,

Below is a summary of the meeting between the Coston's, Ray Boucher and Greg Snow. It should be noted that there is no official report regarding the visit. This site visit was meant to rule out the possibility of the distribution circuit causing a safety concern for the Coston's. Ray and Greg do not have the expertise nor the equipment to test for EMF. Further, they would not be the appropriate representatives to discuss safety as it relates to the transmission line and the proximity to the Coston's property. Ben Shepard's group or a contractor through Ben's group should be able to address those issues.

Greg Thompson

Manager of Regional Operations

Augusta Service Building

From: Boucher, Raymond A.
Sent: Friday, August 25, 2017 11:03 AM
To: Thompson, Gregory J.
Cc: Snow, Gregory
Subject: Coston Farm, Chelsea

Greg, below are my recollections related to our preliminary investigation of the voltage potential concern raised by Mr. and Mrs. Coston at their farm in Chelsea. Greg Snow may have additional information or comments. Please review this and let me know if you have any questions.

On May 3, 2017, Greg Snow, who was filling in for Tim Robbins, called me to discuss Mrs. Coston's concerns about potential shocks at their farm in Chelsea. Greg indicated that Mr.

Coston had recently been doing some maintenance work on an electric fence at their farm when he became aware of the voltage potential on the metal fencing. The Costons believe the presence of voltage on their fence may be related to the 345 KV transmission line (MPRP) which runs adjacent their property.

Before assuming it was related to EMF from the transmission lines, I suggested to Greg that we should do some preliminary checks to ensure that the unwanted voltage was not related to faulty wiring or equipment connected to the electric service we were providing from the local distribution circuit.

Subsequently, Greg Snow and I met with Mrs. Coston at her farm that morning. Using his standard multi-meter, Greg took voltage measurements by placing one probe in the earth and the other on the fence conductor (with the fence off) in the area Mrs. Coston said her husband had noticed the voltage potential. Greg confirmed that he was measuring voltage that fluctuated around 84 volts.

At our request, Mrs. Coston then opened her electric service main breaker. With the electric service to the farm now completely off, Greg rechecked the earth to fence potential at the same location and indicated that the readings had not noticeably changed. Additionally, he noted that he was getting similar fluctuating voltage to earth readings simply by holding the probe to his body or even in mid-air.

Greg related this to his experiences with EMF induced voltage that he often experienced while doing line-work in transmission corridors. He indicated that it was common practice for linemen to ground metal objects such as vehicles etc. to mitigate the induction while they worked in transmission corridors. He suggested to Mrs. Coston that this might be a good practice for them as well since much of the fencing appeared to be located well within the transmission corridor.

I indicated to Mrs. Coston that we would refer this to Company personnel that had information regarding the 345 KV transmission corridor boundaries and expertise in transmission EMF induced voltage for further investigation and follow-up.

Later that day I sent an email (attached) to you with our findings so this could be directed to the appropriate people for further investigation.

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Greg Snow and I met with a customer this morning who is getting shocks at her home. They thought the voltage was being induced by the 345 KV transmission line (MPRP) adjacent to their property. We did some voltage checks and did confirm that there was voltage present (varied to over 84 + volts to earth) on their fence line which runs parallel to the transmission line. It is not faulty electrical equipment as we also confirmed the voltage readings even with the service main breaker open. It does appear to be related to the transmission line and Greg Snow can fill you in with the customer name, phone number and explain the voltage readings in more detail.

This is beyond anything I can address. Could you follow-up with someone more familiar with the MPRP project and right-of-way and resulting voltage induction issue. Please let me know if you have any questions for me.

From: Pierce, Tamra L.
Sent: Tuesday, May 02, 2017 3:48 PM
To: Boucher, Raymond A.
Subject: Voltage Induction

Ray,

Steve said that this should be given to Greg Thompson to decide how it should be handled. He also suggested the safety person for Augusta but I am not sure they handle these types of issues. I would talk with Greg.

YAHOO! MAIL

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Fw: Fwd: 10300381598 CHELSEA 2

Yahoo/Susan Fa

Leah Sprague Diane, They communicate Leah Sent f Aug 8, 2017 at 10:04 AM

Diane Zagwijn-coston <costonsfarm@yahoo.com> Aug 8 2017 at 2:55 PM
To: farns@gwi.net

This message contains blocked images. Show images or Always show images

Hide original message

On Tuesday, August 8, 2017 10:04 AM, Leah Sprague <lwsprague@aol.com> wrote:

Diane,

They communicate.

Leah

Sent from my I phone

Begin forwarded message:

From: "Marshall, Christopher" <cmarshall@burnsmcd.com>
Date: August 8, 2017 at 9:57:22 AM EDT
To: Leah Sprague <lwsprague@aol.com>
Subject: Fwd: 10300381598 CHELSEA

Fyi.

Chris Marshall
Burns & McDonnell
207 272 5975

-------- Original message --------
From: "Kohler, Susan B." <Susan.Kohler@cmpco.com>
Date: 8/8/17 8:11 AM (GMT-06:00)
To: "Shepard, Benjamin N" <Benjamin.Shepard@cmpco.com>, "Marshall, Christopher" <cmarshall@burnsmcd.com>
Subject: FW: 10300381598 CHELSEA

Good Morning,
More requests from Costons.

From: Couturier, Daniel
Sent: Tuesday, August 08, 2017 9:07 AM
To: Kohler, Susan B.
Subject: FW: 10300381598 CHELSEA

From: Yorks, Rhonda
Sent: Tuesday, August 08, 2017 8:39 AM
To: LineClericalNewService
Cc: Wright, James (CMP); Couturier, Daniel
Subject: 10300381598 CHELSEA

CONTACT DIANE COSTON
CONTACT PHONE # 588-6113

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Fw: Fwd: 10300381598 CHELSEA 2

Yahoo/Susan Fa...

Leah Sprague <lwsprague@aol.com>
To: Diane Zagwijn-coston

Aug 8, 2017 at 10:04 AM

This message contains blocked images. Show images or Always show images

Diane,

They communicate

Leah

Sent from my I phone

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Date: August 8, 2017 at 9:57:22 AM EDT
To: Leah Sprague <lwsprague@aol.com>
Subject: **Fwd: 10300381598 CHELSEA**

Fyi.

Chris Marshall
Burns & McDonnell
207.272.5975

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Subject: 10300381598 CHELSEA

CONTACT DIANE COSTON

CONTACT PHONE # 588-6113

1 SHE WANTS RADIATION TESTING ON GROUND FROM HIGH TENSION LILNES

2 SHE WANTS A STEP VOLTAGE TEST DONE

3. SHE WANTS TO KNOW IF HER HUSBAND IS WORKING ON THEIR ELECTRIC FENCING AND THERE IS A SURGE THRU THE HIGH TENSION LINES WILL HER HUSBAND GET FRIED?

Unsupported brows...

PRECAUTIONARY RECOMMENDATIONS
FOR
EXTRA HIGH VOLTAGE PRODUCTS

(ARMOR-GRIP® SUSPENSION, ARMOR RODS, OR SPACERS)

1 Extra care should be exercised in the handling and installation of extra high voltage products including conductors. Nicks, scratches, dirt, identification tags, grease, or other foreign materials can cause corona. Properly remove these materials before installation.

2 In applying ARMOR-GRIP® Suspension or Armor Rods, the alignment of the ends of the rods should be maintained within 3/4 inch.

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PRECAUTIONARY RECOMMENDATIONS

FOR

EXTRA HIGH VOLTAGE PRODUCTS

(ARMOR-GRIP® SUSPENSION, ARMOR RODS, OR SPACERS)

1 Extra care should be exercised in the handling and installation of extra high voltage products including conductors. Nicks, scratches, dirt, identification tags, grease, or other foreign materials can cause corona. Properly remove these materials before installation.

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Measuring stray voltage on the farm

Stray voltage, a common phenomenon, most likely will be found if you look for it. In other words, all farms with electrical service have some level of stray voltage. WPS can help you determine if the levels on your farm are affecting your livestock.

A stray voltage test using protocol developed by the Public Service Commission of Wisconsin is the only way to give you the answers that you need. WPS knows where and what to measure, knows what types of sources to look for, and has the equipment and expertise to conduct ~~the most~~ comprehensive stray voltage test available to you.

- How WPS measures stray voltage
- Cow contact measurements
- Determining the source
- Testing timeframe
- Schedule a free stray voltage test

How WPS measures stray voltage

WPS tests for stray voltage for a period of 24 to 48 hours to measure all levels of electric load during a typical day.

Voltmeters are positioned where livestock touch two contact points simultaneously. By doing this, WPS measures the actual voltage levels that livestock encounter, in addition to voltage at other points on the electrical system.

- The handheld Fluke 87 meter allows us to locate cow contact points with the highest voltage. WPS then uses these spots - certain stalls, for example - to conduct the tests. By testing in areas with the highest readings, we know that the "worst-case scenario" is being recorded.
- WPS places its main digital voltmeter (Metrosonics MSRV4) near an area where readings can be observed. This meter reads both steady-state and impulse (motor start) voltages. The Metrosonics records measurements on four channels:
  1. Primary neutral to a remote ground rod
  2. Main service panel neutral to a remote ground rod
  3. Voltage drop in the neutral wire between the primary transformer and the main service panel. (The higher the voltage drop, the stronger the chance for stray voltage problems.)
  4. Cow contact voltage
- A handheld, clamp-on ampmeter is used to measure currents on neutral conductors.

0002339

- A handheld oscilloscope displays instant readings of voltage impulses that may be caused by fencers, trainers or motors.

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Cow contact measurements

WPS takes measurements where livestock may encounter stray voltage as they simultaneously touch two points, such as:

- Water bowl to floor
- Water bowl to stall
- Stall or parlor steel to floor
- Heated waterer to floor
- Feed bunk to floor

When the floor is a contact point, a wire from the meter is connected to a copper plate pressed down onto a clean spot on the concrete floor. Salt and water may be used to increase conductivity of the floor.

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Determining the source

WPS diagnoses the source of stray voltage by measuring the voltage at the primary and secondary neutral, and also by measuring the voltage drop between these two points. A remote ground rod is used as a reference. The reference rod is driven into the ground at least 100 feet from a primary or secondary panel or an electrical ground. By taking these readings, we can determine the source of any excessive voltage and work with you on corrective actions that may need to be taken.

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Testing timeframe

By testing for 24 to 48 hours straight, WPS is sure to record the highest levels of stray voltage, such as when the milk pump motor is started during milking. The Public Service Commission of Wisconsin requires electric utilities to test for a minimum period of 24 hours.

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Schedule a free stray voltage test

Our comprehensive stray voltage test is free. Schedule an appointment to have your WPS agricultural consultant and a WPS electrical engineer visit your farm and conduct the test. Once testing is complete, WPS will provide you with a printout of the actual voltmeter readings and discuss the findings with you. If the utility is found to be the source of any excessive stray voltage, WPS will fix the problem. If the on-farm electrical system is found to be the cause, we will work with you to reduce the level of stray voltage.

To make an appointment, contact us.

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WEC Energy Group

00024

Testimony for 2017-00232 Attachment 3
2018-00170 pre-filed testimony of Diane Coston
filing 7

Q. Please statement your name and address, and list others currently living with you at that address.

A. My name is Diane Zagwijn-Coston. I live at 482 Togus Road, Chelsea, Maine. with my husband, James Coston ("Jim") and my two granddaughters, ages 3 and 9.

Q. What is your connection to and interest in the investigation recently ordered by the Maine Public Utilities Commission in this case?

A. My family's lives have changed horrendously since Central Maine Power's ("CMP") representative first contacted us on October 21, 2008—nearly ten years ago—asking to discuss buying some of our land for the high voltage (345kV) powerline to be built in the Central Maine Power right of way that ran across and beside our property.

We first contacted the PUC's Ombudsman in June, 2011—over 7 years ago—about some of the issues included in this investigation. Some of the initial problems we complained about were resolved back then. But some things we raised--like having the new boundary line surveyed—were not.

I am grateful for the Commission's willingness to investigate the issues referred to it by Ombudsman Leah Sprague. I hope this investigation will provide us a resolution that will leave us able to live, raise our grandchildren and farm in a *safe* environment. As a result of CMP's high voltage power line being operated too close to our home, and from other things that happened during the construction phase, our home is no longer a safe place for us to live in, much less raise little children in, and it is no longer a safe place for breeding livestock as we had been doing before the line was built. I also hope this investigation will expose and address issues in certain parts of their land purchase process, expose and address certain kinds of conduct that occurred during construction, and expose and address the way complaints were handled in our case, so that other people won't have to suffer the way we have.

Q. What can you tell the Commission about the factual basis for each of the five issues related to your property that Commission identified from the Ombudsman's referral?

I will explain the factual basis with reference to each of the five issues, issue by issue, laid out by the PUC Commissioners for this "investigation", but first I want to give the factual background common to all of the issues. I feel I can best do this by first saying how things were <u>before</u> CMP bought property from us on November 29, 2010 and then explaining how it's been <u>after</u> that date.

Q. How did CMP come to acquire land from you in 2010?

A. On October 21, 2008, we were contacted by a representative from CMP, named Al Godfrey I believe, about CMP's purchasing a triangular piece (1.46 acres) of our land located next to where our home is, that it wanted to own before proceeding with construction of a new high voltage transmission line to be placed in CMP's existing right of way. On November 29, 2010, closing was held on that sale as we had agreed that CMP could acquire that property from us by swapping for another triangular piece of land adjacent to both our land and CMP's Right of Way, plus some cash payment.

At the time of the closing in 2010, we were using the property CMP wanted to buy for grazing area for a variety of animals on our farm. The land we got in exchange was further from our house and barn, and less convenient, but still suitable for our grazing purposes.

<u>BEFORE CMP BOUGHT LAND FROM US ON 11/29/10</u>.

Q. What is your history of ownership of the property where you live on Togus Road?

A. Jim (my husband) and I first acquired acreage and began living at 482 Togus Road in June of 2004At the time of our purchase in 2004, the property was crossed in part by and otherwise adjacent to a CMP Right of Way, with a 115v transmission line on the far side away from us. . In 2010, the land we owned there was reshaped as a result of CMP's purchase of land from us and a purchase by us of land from CMP. After those two purchases, all of our land was only adjacent to the right of way, but it longer went across or under CMP right of way at any point.

Q. Who has occupied the property besides you since 2004?

When we first moved in there in 2004, our household was Jim, me, my ten year old daughter and our two dogs. By 2010, I had one granddaughter living with us, and we had acquired a substantial number of farm animals.

Q. How do you and your husband support your household and animals?

For the past several years, I have worked as a teaching assistant in the Chelsea Elementary School (3/4 mile down the road), the same school my daughter went to and now my grandchildren attend. My husband is employed in construction by an employer based in Vassalboro. Because of our jobs, this property was and is a very convenient location for us.

Over the six years (2004-2010), we acquired several kinds of animals and operated a small farm which helped feed our family and sometimes provided some additional income.

Q. What animals did you acquire between 2004 and 2010?

A. HORSES: On February 14, 2005, we acquired our first horse, a thoroughbred named "Cheyenne." In April of 2006 we got a second horse, a quarterhorse named "Ginger". In 2007, our third horse "Frankie", a paint stallion, was born. He was born there on the property to Ginger.

CATTLE: In August of 2006, we got ten (10) head of cattle, including one Holstein, one Black Angus and eight Herefords. That herd consisted of one bull and nine females.

From that herd, two calves were born were born in each of the next four years, through and including 2010. We would usually sell two calves a year, keep half the meat for our family and sell the other half of the meat.

CHICKENS: In August of 2006 we acquired 20 chickens and a couple of roosters. From those chickens, we were able to collect about two dozen eggs a day, year-round. We kept what we needed for our family and sold eggs to people who knew we had them at $2.50 a dozen.

PIGS: In 2006, we began seasonal raising of two pigs a year, (from April or May through October or November) after which we sold them for slaughter. Again, we usually kept some of the meat, sold the rest.

GEESE: In 2008, we got two geese. Four geese were born from them and sold by us that year and at least two geese were born and two sold in each of the next two years through and including 2010.

GOATS: In 2006, we also acquired six goats because I am lactose intolerant and so is my granddaughter, Autumn, who has lived with us from her birth in 2008.

RABBITS: Between 2006 and 2010, we also acquired six rabbits.

GUINEA PIGS: Between 2006 and 2010, we also acquired two guinea pigs.

Q. How would you summarize what it was like, living at 482 Togus Road, in the six years between 2004 and 2010?

A/ Taking care of my young daughter, then beginning in 2008, also my newborn granddaughter, plus all the animals we had, kept us very, very busy. But we really enjoyed living on this property through 2010.

Periodically, we would have friends and family come over for day-time get togethers, during which a lot of the time we would be outside on our property: riding horses, walking, talking, barbequeing meals, etc. We felt it was a beautiful surrounding and a great place for children to be able to play and be active outside.

We had no health issues in those days. Overall, we were happy there.

Q. Prior to November 29, 2010, what concerns, if any, had you expressed about the new high power line to be built in the right of way next to you?

A. We had understood from Al Godfrey in our discussions with him between October 21, 2008 and the closing on November 29, 2010, that CMP wanted to buy the piece of land from us so they could construct a new high power (345kV) transmission line in the right of way, in addition to the 115 kV already there on the far side of the ROW, away from our property. During our discussions and negotiations with CMP, primarily through Al Godfrey, we were told by him, and understood, that the new line would be built near the existing 115kV line and also located on the far side of the right of way – away from our house. We asked questions about that location and also asked about the scope of the electromagnetic field (EMF) of the new line.

In response to our questions, Al Godfrey provided us with a drawing of the proposed right of way and line location, as well as printed information for a resource material about EMF. Given the proposed location of the new line on the far side (away from us) of the CMP right of way, we felt comfortable that we wouldn't be significantly impacted by EMF or otherwise by the new power line. See attached pages 1-87 of our Exhibits related to Issue # 1.

Other than our questions about impact from the EMF, we were not aware of any cause for concern to our health or well-being. We saw no reason to expect significant disruption or change in our lives, or any negative impact on our health or our farm animals, from construction of the new 345kV power line on the farther side of the right of way.

Sadly, we were wrong not to worry more—in many respects. See attached pages 88 – 401 of our Exhibits related to Issues # 2- 5.

AFTER CMP BOUGHT LAND FROM US ON NOVEMBER 29, 2010

Q. What was it like after CMP bought the land in the right of way from you on November 29, 2010?

A. Soon after CMP's purchase of the piece of our property on November 29, 2010, things changed—and got quite difficult within the first six months during the time CMP sub-contractors were preparing the right of way for construction. They destroyed a considerable stretch of our fencing, cut a whole stand of trees on *our* property (as well as one tree in back field that was of great sentimental value to myself and my mother and that was nowhere near CMP's right of way), plus they destroyed and/or cut off access to a major grazing area for our animals. CMP sub-contractors also sprayed weed control liquid, without prior notice to us, and hit one of our horses directly in the face at very close range, completely spooking her so she bolted and ran off the property over to the neighbors. The neighbor saw them spray her. When I got to her, her face was dripping wet with a brown substance that I washed off. I also had to irrigate her eyes—not an easy task.

I called Lucas Tree and was told the spray was not harmful to animals and was environmentally friendly. I was surprised by that as the sprayers were decked out head to toe in plastic. I was upset that we got no notice and that they ended up going so close to our animals. In August of this year, I saw the spraying equipment out front again. I asked them if they were going to spray by our property. I was told that we are in a "no-spray" zone.

In June of 2011, we filed a complaint with Ombudsman MacGowan. He met with us on July 22, 2011. His notes are attached at page 95 of our Exhibits re Issue #2. As a result of his investigation, we got a gift card to a tractor supply store for us to purchase fencing and payment was to a farmer for us to get hay to get through that season. See page 99 of our Exhibits in re Issue #2. We did not get the other things the Ombudsman had mentioned in his July 22, 2011 notes.

In 2011, the CMP sub-contractors were cutting a large stand of trees on our property, many of which were not within the ROW. In the process of doing that cutting, they dropped a tree into the geese's fenced-in area (on our property and not within the ROW), completely scaring the geese. Then they went into the geese's fenced in nesting area to remove the two geese and the nest. To accomplish that, they had to hold the gander by the neck so he wouldn't bite them. After that, none of the 7 goose eggs that had been laid hatched, because the geese would not return to sit on the nests.

The stand of trees they cut down in 2011 on our side of the ROW line had offered important shade protection to our animals. The pigs blistered and suffered very bad sunburn from the resulting lack of shade. We had to build a temporary shelter for the animals until we could relocate and refence their grazing area. Jim was constantly moving fences at the request of the sub-contractors.

Things got much, much worse in April of 2014 after CMP sub-contractors had blasted within the ROW in preparation for erecting the towers for the new line. Not long after the blasting, our horses stopped using the watering hole nearest to the ROW (which they had been using) and would only drink from a watering hole on the far side of our property, beyond the barn and well away from the ROW.

Also, in April and May of 2014, twenty-one (21) of our animals died or were stillborn. Nine calves (all 6 months old and younger) died, and one calf was born dead. [The mother of the newborn born dead had given birth in prior years to 6 other calves without any issues.] Six rabbits (four, 3 to 4 years old, and two, only 6 months old) also died. Three goats died or were born dead in April (one 3-year old nanny gave birth to a stillborn female goat; and the nanny died 3 hours later. Also a 1-year old goat died.) A couple of smaller animals (rabbits) also died.

We believe our water was contaminated as a result of the blasting and we think that affected these animals and caused them to die. This was a year before the line was activated.

With all these things, the year 2014 was a nightmarish time for us due to the deaths but also what it did to our workload to continue living there with our animals. After the horses refused to drink the water and a number of our other animals had died, we called Steven McCoy of Aerus to test our water. We had had him test it in 2008, and he found some arsenic at that time. He had told us we shouldn't drink it nor should any of our animals under 200 pounds. So, from that time on, in 2008, we hauled water for ourselves and the small animals from a well spring on the Vigue Road in Whitefield.

After we got the 2014 water test results from Steve McCoy, we had to hauling more than twice as much water from the well because Steve told us this time, that from what he found in the water, which now included MbTE, he would advise that we not even use the water to shower, let alone let us or any of our animals drink it, including the larger animals. Then, beginning in August, 2017, the well supply was no longer available as a source for the water we were hauling every week and since then, we have had to buy our water (bottled) from a store. Attached, for example, are some copies of receipts for our water purchases from part of June, July and August, 2018. <u>See</u> page 182 of our Exhibits re Issue #3. I do not have a copy of either the 2008 or the 2014 Aerus test results done for us by Steve McCoy, but we would like to ask that he be able to testify as an expert on our behalf and that his test results and related documents would be included as part of his report and opinions. See exhibits related to Aerus at pages 123 and 124 of our Exhibits re Issue #3.

In April 2014, I also called Al Godfrey. I called him because we had been so impressed before with how responsive and thorough he had been for us during the land negotiations. He was very quick to respond this time again.

When Al Godfrey arrived, it was 6 p.m. He spoke briefly to Steve McCoy, as Steve was just leaving after doing our water test. Then, Al talked with us briefly on the porch, and after that, Al walked with us out beyond the garage. On looking around outside, as soon as he saw the new poles, Al looked shocked and immediately said "Jim and Diane, I am so sorry. Wow, they did move the corridor and I don't know how." He bowed his head, and again said "I am so sorry".

And then, after the line was *activated* in March of 2015, things went from bad to worse.

Q. What happened after the March, 2015 activation of the new 345kV high power line?

A. I described a lot of what happened in my affidavit and other attachments we included with our "Exceptions and Comments of Diane Zagwijn-Coston and James Coston to the Recommended Decision" that we filed with the Commission in Docket No. 2008-00255 on or about May 24, 2018. See attached that entire response we filed along with all its attachments.

(1) SHOCKS FROM STRAY VOLTAGE AND/OR INDUCED VOLTAGE. See our attached Exhibits re Issue #4 starting at page 195 – 241. Our May filing described severe shocks that Jim's nephew and Jim received from our electric fence when it was not connected in April, 2017, after the 345kV line was activated. Also, since then, both Jim and my granddaughter received similar shocks from a de-energized fence in 2017. In

June of 2018, our bull got a thick scar across his nose from touching a line with way more than normal 'juice' in it. Also, later this summer, one of our two horses reared and screamed also after getting a severe shock from a fence line that was totally deenergized. We have called those shocks instances of "stray voltage". We realize at least one or two of those may have been instances of induced voltage in places where our electric fence runs parallel to the power line. CMP has assumed that our fence is the problem, but have not helpful in explaining exactly we are to deal it and we still have the problem. They installed two filters on our fence in 2017 but did not ground them but only to a painted fence post. I have since understood that a painted fence post is not a proper ground. Jim has been advised not to touch the fence without first testing and testing periodically while working with it.

(2) HEALTH ISSUES. I also want to elaborate on the physical symptoms that I, my family and some of our animals have had.

(a) HIGH BLOOD BLOOD PRESSURE. In December, of 2015, I was sent to the hospital by our school nurse, when she got a reading of 240 over 180 for my blood pressure. I got higher readings in the hospital. I had never before had a problem with my blood pressure. I now have to take medication every day for to keep my blood pressure in check.

(b) CYSTS. I have had two instances of large really ugly swelling and bumps appearing on my face, that I was told were epidermal cysts. They disfigured my face so much that I did not go to work at the school for four weeks in April and May of 2014 and also two weeks in 2017. In 2017, my cyst absessed and had to be dug out. See my attached exhibit labeled "8-29-18 medical records of Diane Coston." My horse, Ginger, had very similar bumps on her body, which also got infected and had to be dug out. See page 398-401 of our "Exhibits re Factual Issue #5. Jim also had a similar sizeable bump appear on his hip.

(c) HEADACHES. Since the line was activated in 2015 all of us have had frequent long-lasting headaches, when none of us had them before. We get them more often and more intensely the more time we spend there.

(d) ENDLESS INSOMNIA; INTERRUPTED SLEEP. We rarely have been able to sleep through the night since the lines were activated. We sit bolt upright from a sound sleep several times a night, for no apparent reason. On occasion, humming of the lines will wake us up. We moved the children to the far end of the house, and they sleep better and seem to have fewer complaints. We, however, are exhausted. Jim never used to have a problem sleeping right through the night; I used to only wake up maybe once a night. Now we each wake up 4 to 5 times a night.

(e) ACHES; PAINS; SENSATIONS. We all experience periodic unexplained physical aches, pains and odd sensations that we never had before. When the children complain of such things and are otherwise home for the day, I try to send them to a friend or relative's for the day. That seems to help.

(f) SPARKING; TINGLING. I have had to stop wearing metal rimmed glasses as I was seeing sparks in front of my eyes when I wore them and got bad headaches with them on. I have to wear glasses when I drive, but don't put them on until I am out of the driveway. Visiting friends even comment on odd physical sensations and sparks or tingling when at our house. This is only since the line was activated.

(g) LIVER ISSUES. I don't know the cause, but I recently was found to have fatty deposits on my liver and more testing is going to be done. I have never had anything like that before. I do not drink alcohol. Neither of us do.

(h) Financial stress has increased for us due to all added costs of mitigating the contaminated water, time lost by me for work, my added medication expenses, etc.

(i) Other more generalized stress has steadily increased for all of us, perhaps from the unceasing EMF. For Jim and I, it's also from worrying about how we can get ourselves into a safe living situation, especially for the children. Since so many of our animals, both large and small, have died or become sterile, we can't help but worry about health consequences of prolonged exposure for our grandchildren, as well as ourselves.

Q. What result, what relief, would you like to get as a result of this PUC investigation?

A. We do not know what other steps we could take to make our home safe, and we can not afford to move to anything reasonably comparable. See our attached Exhibit named "8-29-18 real estate search related documents." Except for Al Godfrey's responsiveness, we have not felt CMP as a company, or as the employer of various sub-contractors, has taken our complaints seriously or responded to them effectively. That makes it all the worse.

What I would like is for CMP to agree to, or if not, to be ordered to, relocate us to a reasonably comparable property in size, geographic location and suitability for residence and farming, but which is safely removed from high power lines.

I ask that the Commission review our pre-filed testimony, allow us opportunity to make data requests of CMP before they ask more of us; and also allow us time to designate expert witnesses related to the 5 issues, especially but not only for the contaminated water, EMF and on stray or induced voltage, and to amend our exhibit list at the time we do so.

If we can not get all our exhibits uploaded tonight by midnight, I ask that we be given an extension of time to complete the process. I also am very concerned about my own, and my family's health. We do not have health insurance and so I would ask for some reimbursement for medical expenses we have and will continue to incur since the line was activated. I also

Q. Is that all your testimony?

A. Yes, it is the essence of what I have to say at least until we can get some more information, through data requests we want to make from CMP as we mentioned at the Case Conference held in this Investigation on July 26, 2018.

Testimony for 2017-00232 Attachment 4
2018-00170 Exceptions to Recommended Decision
filing 7.

STATE OF MAINE
PUBLIC UTILITIES COMMISSION

May 24, 2018

EXCEPTIONS & COMMENTS
OF DIANE ZAGWIJN-COSTON
AND JAMES COSTON TO
RECOMMENDED DECISION

PETITION FOR FINDING OF PUBLIC CONVENIENCE & NECESSITY FOR THE MAINE POWER RELIABILITY PROGRAM CONSISTING OF THE CONSTRUCTION OF APPROXIMATELY 350 MILES OF 345 KV AND 115 KV TRANSMISSION LINES (MPRP) PERTAINING TO CENTRAL MAINE POWER CO.

DOCKET NO. 2008-00255

CENTRAL MAINE POWER COMPANY APPEAL OF LDRT DECISION REGARDING DIANE AND JAMES COSTON

DOCKET NO. 2018-00034

TO THE PUBLIC UTILITIES COMMISSION: This submission is made on behalf of Diane Zagwijn-Coston and James Coston [hereinafter, "Costons"] to provide the Commission with their exceptions and comments on the "Recommended Decision" dated May 18, 2018.

RE I. SUMMARY. The Costons respectfully take exception in part and agree in part with the recommended finding that the Ombudsman's referral to the Landowner Dispute Resolution Team (LDRT) from the Maine Power Reliability Program (MPRP) is outside the jurisdiction of the Landowner Dispute Resolution Process (LDRP). They expressly take exception to the part that finds the Ombudsman's referral regards alleged impacts "caused by Central Maine Power Company's operation" of the MPRP.

The Coston's complaint involves *design errors* and *construction issues* in the MPRP—not operation. They seek a Commission order that CMP mitigate the MPRP design flaw by moving the tower that is positioned too close for safety to their home, unless CMP is willing to purchase their home and help them relocate to a safe and reasonably comparable replacement home and compensate them for damage to their land and property caused by CMP and its subcontractors in the course of construction.

Only because the cost of moving a tower (or, alternatively, the cost of their being relocated into a comparable home) will likely exceed $200,000 do the Costons agree with the conclusion that the LDRT does not have jurisdiction to address their complaint.

Finally, the Costons respectfully take the position that the LDRP could and should remain functional for the purpose of dealing with design and construction problems, even after the MPRP became operation, where, as here, the primary way to mitigate continuing safety concerns would be to relocate or redesign structures and the alternate ways for landowners to seek redress are cost prohibitive and beyond the capacity of the Costons, as they would be for the average landowner.

RE II. BACKGROUND.

Section A of the background part of the recommended decision addresses the creation and purpose of the LDRP. Determining that there is jurisdiction in the LDRP now to review the Costons' claims is consistent with the overall purposes cited in this section. Even though it is too late to provide the "expedited" kind of review during design and construction that was hoped for when the process was set up, it is actually not too late to avoid a situation where part of the transmission line would need to be relocated and "reconstructed at considerable expense" should the reviewers find for the Costons on their complaint about the fundamental lack of adequate safety in section 3025 of the MPRP transmission line as designed and constructed so close to their home. Cf. reference at page 12 of the Recommended Decision to the LDRT's explanation in its

Mendola[1] decision of the purpose of the LDRP.

The fact the Coston's complaints include significant safety concerns, rather than, for example, mere aesthetics and related diminution of value, warrants taking advantage of the opportunity to mitigate this situation through the LDRP because allowing this situation to continue without mitigation would directly contravene the Commission's statutory mission "to ensure *safe*, reasonable and adequate service"[2] [Emphasis added.]

With no notice to the Costons, CMP changed the design of the transmission line from the north side to the south side of the corridor (thereby relocating a pole in section 3025 to within 182.5 feet of their home). If they had had proper notice of the change, it would be a lot fairer to say that it's too late for them to complain now because the issue could have been addressed during the design and construction phase. In their response to the LDRT Referral, by letter dated January 23, 2018 to Harry Lanphear, the Costons requested opportunity to provide evidence that this change was made and made without notice to them. They have requested opportunity to call Al Godfrey as a witness because what he said then in 2014 (on seeing the actual location of the tower near them) and what he had told them prior to that would support their version of these facts.

CMP should not be able to change the design with no notice to the affected landowner and then later say in effect, 'Sorry, because the construction (according to the changed design) is now complete, you can't use the LDRT to try to resolve your issues with the design.' The problem that this flawed design creates for the Costons is amplified and illustrated by the fact that the electromagnetic field ("EMF") readings at the corridor's edge (nearest pole to them in section 3025) turned out to be 62% higher[3]

[1] See Landowner Dispute Resolution Team, Consideration of Referral by Ombudsman Regarding Michael and Rachel Mendola, LDRT Docket No. 2013-00002, Dec. 26, 2013 referenced on page 12 of Proposed Decision dated 5/18, 2018.

[2] 35-A M.R.S.A. §101.

[3] The proposed decision acknowledges this change is part of the Coston's concern, but rely on CMP's claim that

than had been projected by CMP's experts, and this is a level they believe is demonstrably unsafe.

The fact that the design and construction phase is over is a relevant factor in deciding if the LDRT should still have a functional role to resolve controversies like the Costons, but it should not be the only one. Factors to be considered should include what sort of relief is requested and whether relocation or reconstruction of the line is what would best resolve the issues raised as is the case here. If the answer to that inquiry is yes, then the fact that construction is over, should not preclude LDRT review. Otherwise, making design changes without notice and then finishing construction before there is opportunity for landowner input or complaint is encouraged, not avoided and mitigation is made avoidable.

B. The Coston Property Dispute

In addition to concerns about the high EMF readings, the Costons have stray voltage issues that also appear to directly result from the design change that relocated the pole so close to their home. As noted in the proposed decision, the Costons are raising two grandchildren, now aged 3 and 9, in their home. They regard the EMF levels as a threat to the children's physical safety and healthy development from just continuing to live in that home. Al Godfrey provided the Costons (when they asked about EMF) an NIH booklet dated June 2002 of questions and answers called "EMF electric and magnetic fields associated with the use of Electric Power." In a section on the World Health Organization International Agency for Research on Cancer, it states the following about a report by an international scientific panel of 21 experts from 10 countries who met in June 2001 to review the scientific evidence regarding the potential carcinogenicity of static and ELF (extremely low frequency or power-frequency) EMF:

> The panel classified power-frequency EMF as "possibly carcinogenic to humans" based on a fairly consistent statistical association between a doubling of risk of childhood leukemia and magnetic field exposure above 0.4 microtesla (0.4 μT, 4 milligauss or 4 mG)." Referenced NIH report at page 54.

By comparison, the May 19, 2017 reading in the Coston's kitchen (with the breaker **off**) was **6.7 mGauss.** <u>**See**</u> report of EMF Site Measurements by D M Begin on May 19, 2017, incorporated herein by reference and included herewith as **ATTACHMENT 1** to these Exceptions.

Stray voltage is also an important safety concern for this family, especially but not only for the children, one of whom has already been significantly shocked by touching the fence in the Costons' yard. A reading for stray voltage done by Greg Snow in May, 2017 at the Costons' showed 84 volts. <u>See</u> **ATTACHMENT 2** correspondence from Greg Thompson including correspondence from Raymond Boucher, incorporated herein by reference.

CMP has declined to do more stray voltage testing, as they had originally said they would do, on the grounds that they do not typically test along transmission corridors. But the Costons still have a problem that was not resolved by the installation of filters on their fencing. The Costons understand the proposed decision to suggest they could file a new complaint about that with the CASD or bring ten-person civil complaint. Neither option is very satisfying at this point, and filing a ten-person civil complaint with the Commission may not be feasible for a number of reasons nor would it likely provide timely relief, even if successful.

Diane Coston's letter dated January 23, 2015 (commenting on the LDRT referral) to Harry Lanphear, lists the numerous health issues they have experienced since 2015 (that they did not have before) including chronic head aches, leg pain, insomnia, masses forming on face and hip, as well as high blood pressure and chronic fatigue. It is their experience and belief that these things come from the stray voltage and the high EMF levels since the line was activated. [4] That may seem operational, but it would not have been the issue it is but for the design change that located a pole too close to their home. [5] There is no coal mine with a canary in it here, but the dying and infertile animals they have complained about, support their concerns for their own health and should raise real concern in any observer that they are simply now living too close to a 345 kV line as result of that design change. See **ATTACHMENT 3**, Affidavit of Diane Zagwijn-Coston, incorporated herein by reference. That this impact of a change in project design was not fully knowable until after line operation began, should not bar resolution by the LDRT.

The Costons also allege that their well water was contaminated as a result of the blasting. Whether the blasting had such a damaging impact due to the design change, and whether or not the blasting was done in a negligent manner, the fact is that a number of the Coston's farm animals died mysteriously in 2014 within a short period of time after the blasting that year. Contrary to CMP claims, this was before the lines were activated, so that is not an operational issue either. The damage to the value and usefulness of their property from contamination of their well water source and the loss of several farm animals, is all damage and loss that the Costons incurred during the construction of the line. This damage has not been resolved or compensated either.[6]

---

[5] It is consistent that such health impacts could come from high levels of exposure to EMF based on guidelines and related materials published by the International Commission on Non-Ionizing Radiation Protection.

[6] The Costons do agree that a prior complaint they had made about temporary interference with grazing rights was resolved through the Ombudsman and LDRP. They do not agree that the cutting of trees on their land without notice or permission has been compensated or resolved, but they do understand that that is something they would need to deal with through the courts.

As the proposed decision notes, the total impact and effect of the design that placed the pole so close to the Coston's home has been to make that home unsafe and thus unlivable for them and their grandchildren. If they are not able to get the line relocated, or alternatively themselves relocated, the value and usefulness of their property will have been taken from them without compensation. That would be, in our view, tragic. It would also be a taking in violation of the fifth amendment to the US constitution.

RE: V. DECISION AND ORDER

As noted above in Section II A of these exceptions, there is still need for LDRP-style rapid response now to the safety concerns raised and, with all due respect, the Costons argue that process should not be foreclosed to them simply because the line is now built and operational, when their primary concerns relate to unsafe conditions from design changes made without notice to them and to other construction issues.

The proposed decision suggests that the Costons' case does not involve significant enough EMF levels to warrant the relief requested and cites the Curtis case[7] in support of this conclusion. However, that case is factually distinguishable from the Coston case because CMO projected EMF levels at the Curtis residence would be 3.4 mG on average and 5.0 mG at peak. In the Coston's case, EMF testing (actual not, projected) found EMF levels to be 6.7 mG[8] at their kitchen table with the breaker off. See attached Exhibit A, the results of the 5-19-2017 EMF Site Measurements. The Costons' actual EMF levels are considerably higher than those projected for the Curtis' residence.

Also, the PUC stated in Curtis:

> We do not direct CMP to purchase the Curtis residence. In general, we

[7] Central Maine Power Company Appeal of LDRT Decision Regarding Wanda and Mark Curtis, Docket No. 2011-00504, Order (April 18, 2012).
[8] See ATTACHMENT 1.

> do not favor the purchase of abutting landowner property as a reasonable EMF mitigation technique. We do not rule out the possibility that such a home purchase may be reasonable in a particular circumstance. However, we cannot conclude that house purchase is warranted here where CMP does not need the property to build the line, the modeled EMF exposure is relatively low and there is a significant expense associated with the purchase.[9] Id.

CONCLUSION

In conclusion, the Costons respectfully request that the Commission modify the Recommended Decision to:

a) find that in this situation the LDRP should be allowed to function because the Costons safety concerns are from design and construction issues, even though construction is complete;

b) agree that the Costons' case is a case of significant safety concerns, distinguishable in that regard from the Curtis case, and thus is a case warranting house purchase (unless the line is relocated); and

c) because of the expense involved, is a case jurisdictionally appropriate for resolution by the Commission itself, rather than the LDRT.

Dated: May 25, 2018

Respectfully submitted,

Susan Farnsworth

Susan Farnsworth. Bar #348
Counsel for Diane and James Coston
P.O. Box 29, Hallowell, ME 04347
(207) 626-3312

[9] In the Curtis case, the Commission was asked by the Office of Public Advocate, through its counsel, to adopt a standard of 3mG exposure and the Commission declined to do so.

Testimony for 2017-00232 Attachment 5
2018-00170 OKelly Comment to Revise the Recommended Decision on the Coston Farm LDRT Appeal · w/ affidavit, dated 10/17/2018

May 25, 2018

Harry Lanphear, Administrative Director
Maine Public Utilities Commission
18 State House Station
Augusta, ME 04333-0018

Re: 2018-00034: Comments on the Recommended Decision Denying the Referral of the Coston Stray Voltage Health and Safety Issues to the LDRT.

Mr. Lanphear,

I have been following the Coston attempt to get someone to keep their property, their grandchildren, their animals and themselves safe from the impacts of stray voltage on their property. I met Diane Coston soon after I read her request for an appeal submitted to the PUC.

I have spoken with Mrs. Coston on numerous occasions since February and have been at their home for many hours both yesterday and today.

I am concerned that a hazardous situation is being ignored which is caused by the design of the MPRP 345 KV high voltage power line in close proximity to the Coston farm and house.

At the Coston farm and home, they have had ongoing instances of serious shocks from un-energized electric fences on their property.

The important test information that CMP has not explained is the high levels of stray voltage on the Coston property. CMP engineers tested the property on May 3, 2017 (more than a year ago) and found readings of up to 84 volts by having the ground of the voltmeter touching the earth and the other lead held in the air.

I have talked with a few electrical engineers, with the Wisconsin Public Service Utility and have read the information in this docket. All the engineers, including the two CMP employees that conducted the stray voltage test and the Wisconsin Public Utility manager for their stray voltage program feel that a reading of 84 volts is a serious situation. I have attached a document on stray voltage from the Wisconsin Public Service Utility.

In Wisconsin, I spoke with Cory Kauchta, 920-433-2913, and he described their free stray voltage testing program, which is available from all the Wisconsin Public Utilities. He told me that for cattle farms, 0.5 volts AC is the screening level in Wisconsin, with 1 volt AC an action level. At 2-3 volts, cattle are affected. Today I brought a volt meter to the Costons and tested many areas around their yard and fence. Although I just had a unit from Lowe's, I was able to replicate high voltage readings in the 30 – 40 Volt AC range by placing the black lead in the ground and red lead in the air. By the fence with the filters, closest to the transmission line, the readings on the electrified fence were vaciliating but generally low, so the filters there are working. However, the unenergized fence, further away from the transmission line, at the back of barn showed readings of 39 Volts AC.

We can see that the Costons have had serious incidents where they have been badly shocked by unenergized gates and fences. They are taking many precautions to not be hurt by this dangerous situation.

I firmly believe that the Commission should not make a decision in this case that allows this level of stray voltage to be swept under the rug. Please reconsider the recommended decision and modify it to require that CMP to fully investigate the stray voltage at the Coston residence, submit documentation of the findings and take appropriate action.

Thank you for considering these comments. If you have any questions or wish further information please contact me.

Sincerely,

Dot Kelly
Dot Kelly
Date: 10/17/2018
I attest that the foregoing testimony is correct to the best of my knowledge and belief.
Dot Kelly

Exhibit 8

NECEC's Negative Impacts to Scenic View Shed and Year-Round Recreational Tourism

View from Sally Mtn,
looking south to
Coburn Mtn. (left),
Attean Mtn. (right)

Appendix D: Photosimulations

PHOTOSIMULATION 7A: PARLIN POND, Parlin Pond Twp

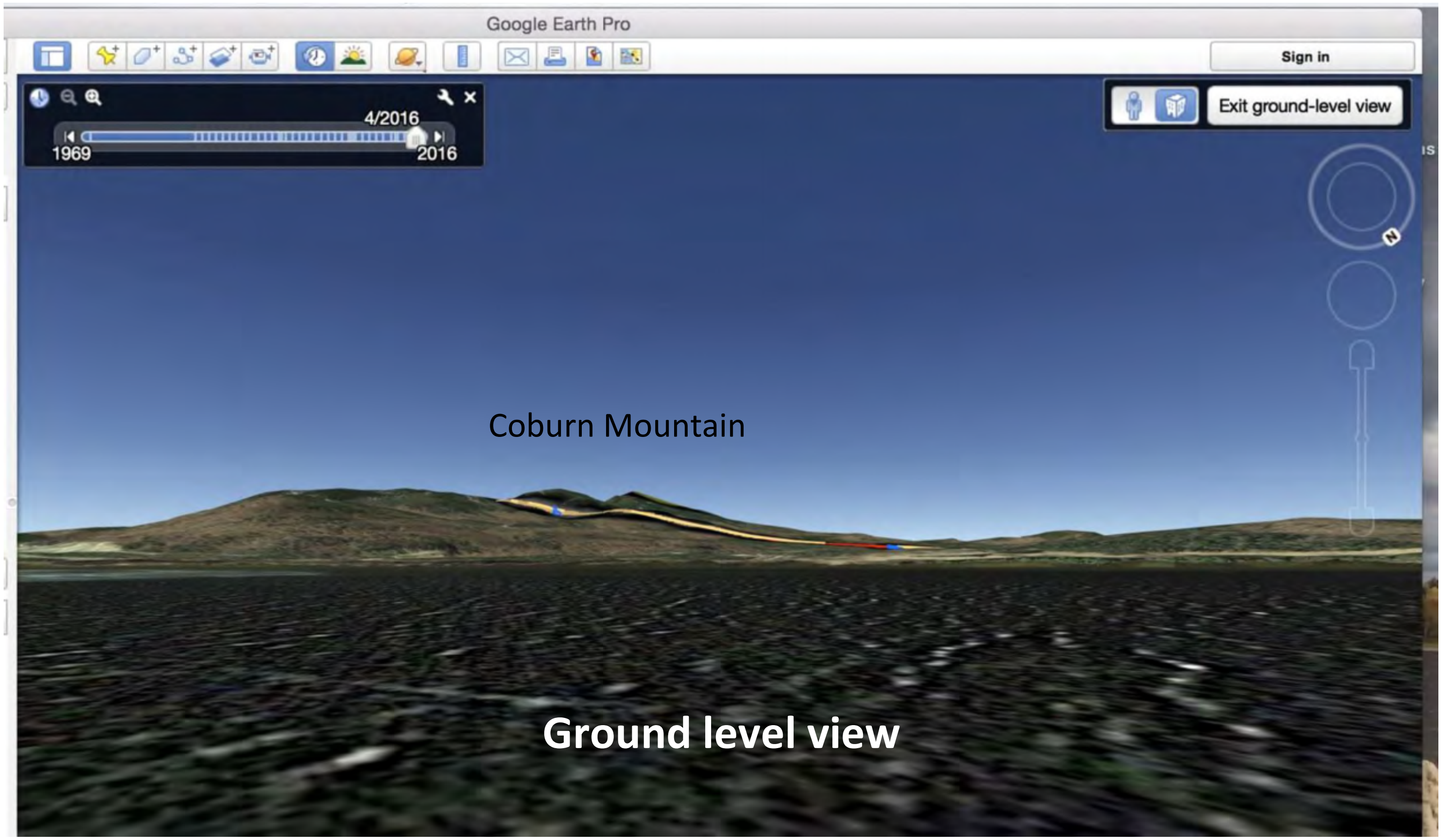
Existing Conditions: Normal view looking south from the northern end of Parlin Pond. Coburn Mountain is on the left in image.

September 27, 2017

Google Earth’s Parlin Pond: Corridor is indeed VISIBLE

From northern end of PP looking southwest.

60-80 ft Average Tree Height vs. 100’ Towers



*see Forest Trees of Maine: https://www.maine.gov/dacf/mfs/publications/handbooks_guides/forest_trees/individual_spp_index.html

Parlin Pond: Corridor to Impact Business

Who would want an industrial transmission line as a backdrop of their wedding venue?

Joe Kruze

Lake Parlin Lodge: Winter Recreational Usage

Joe Kruze

- Hundreds of meals served daily during the snowmobile season.
- Tourists ride in from Eustis, Jackman, Forks, Greenville, Bingham

Parlin Pond: Heavy Winter Recreational Usage

Joe Kruze

Parlin Pond Tourism Economy

Where are the **winter user studies**?

Joe Kruze

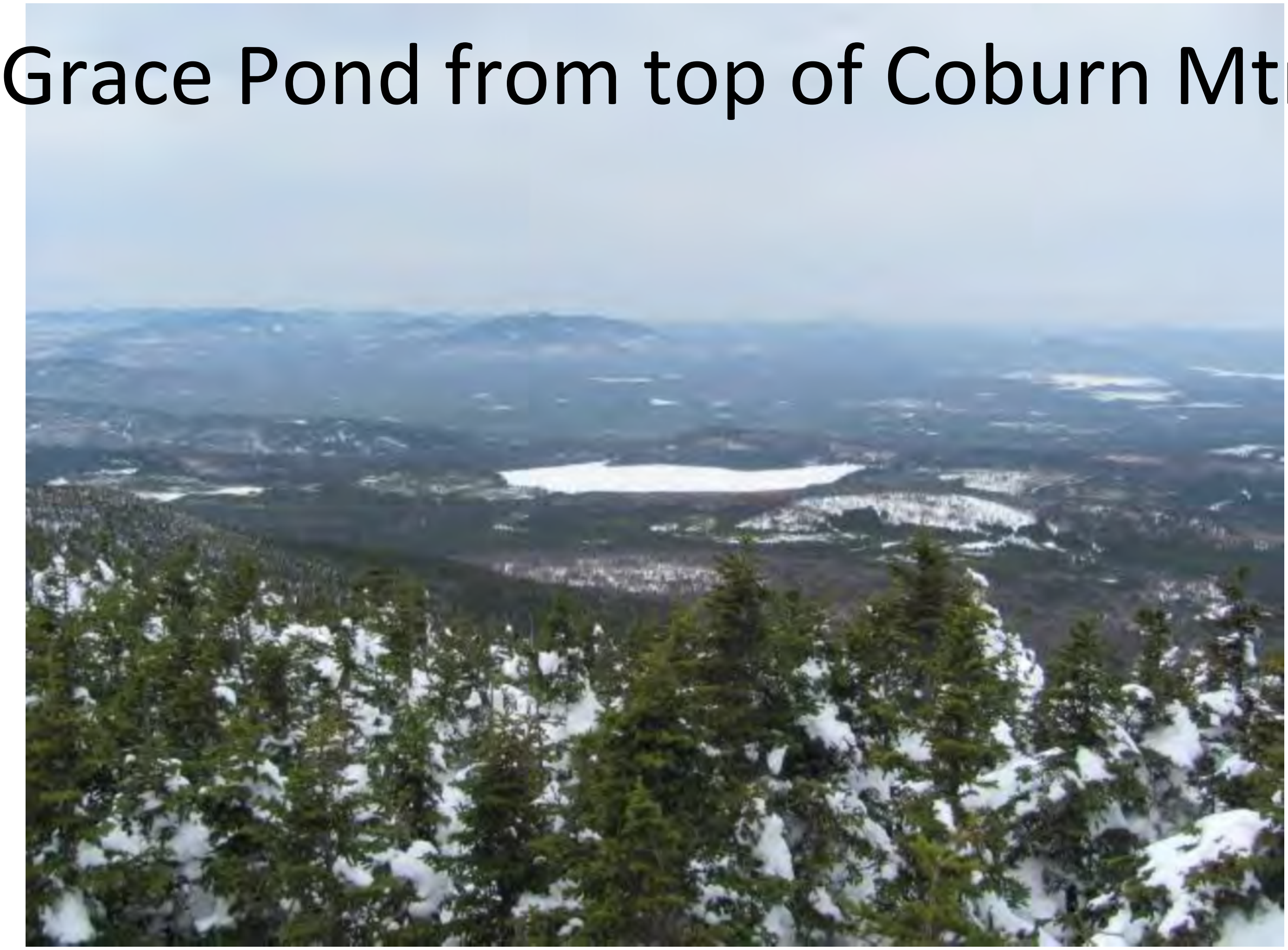
**The Forks Area to
Jackman
is a
Maine Tourism
Winter Destination.**

Where's the user data for scenic and economic impact?

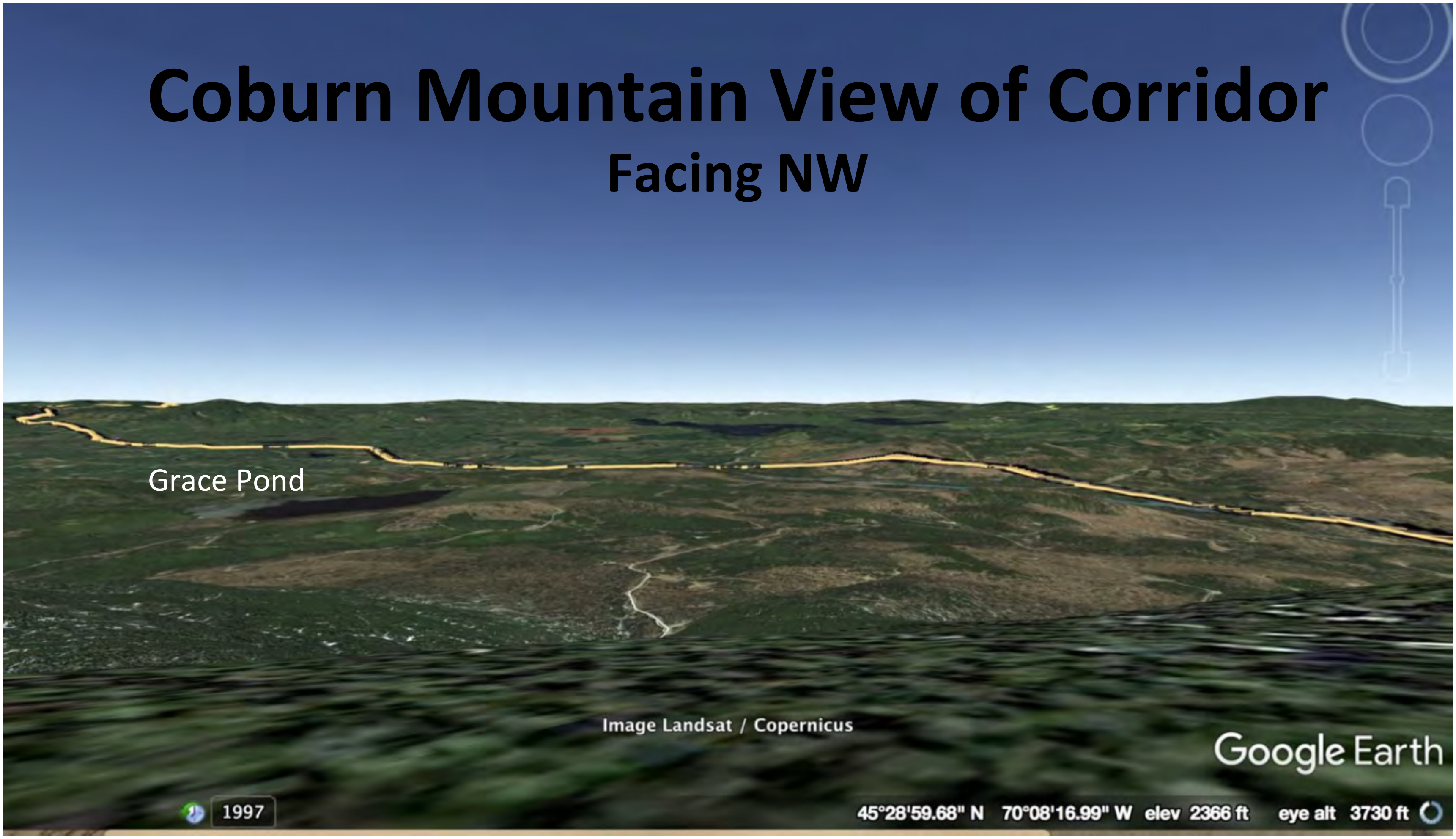
How deeply are the employees and families going to be impacted?

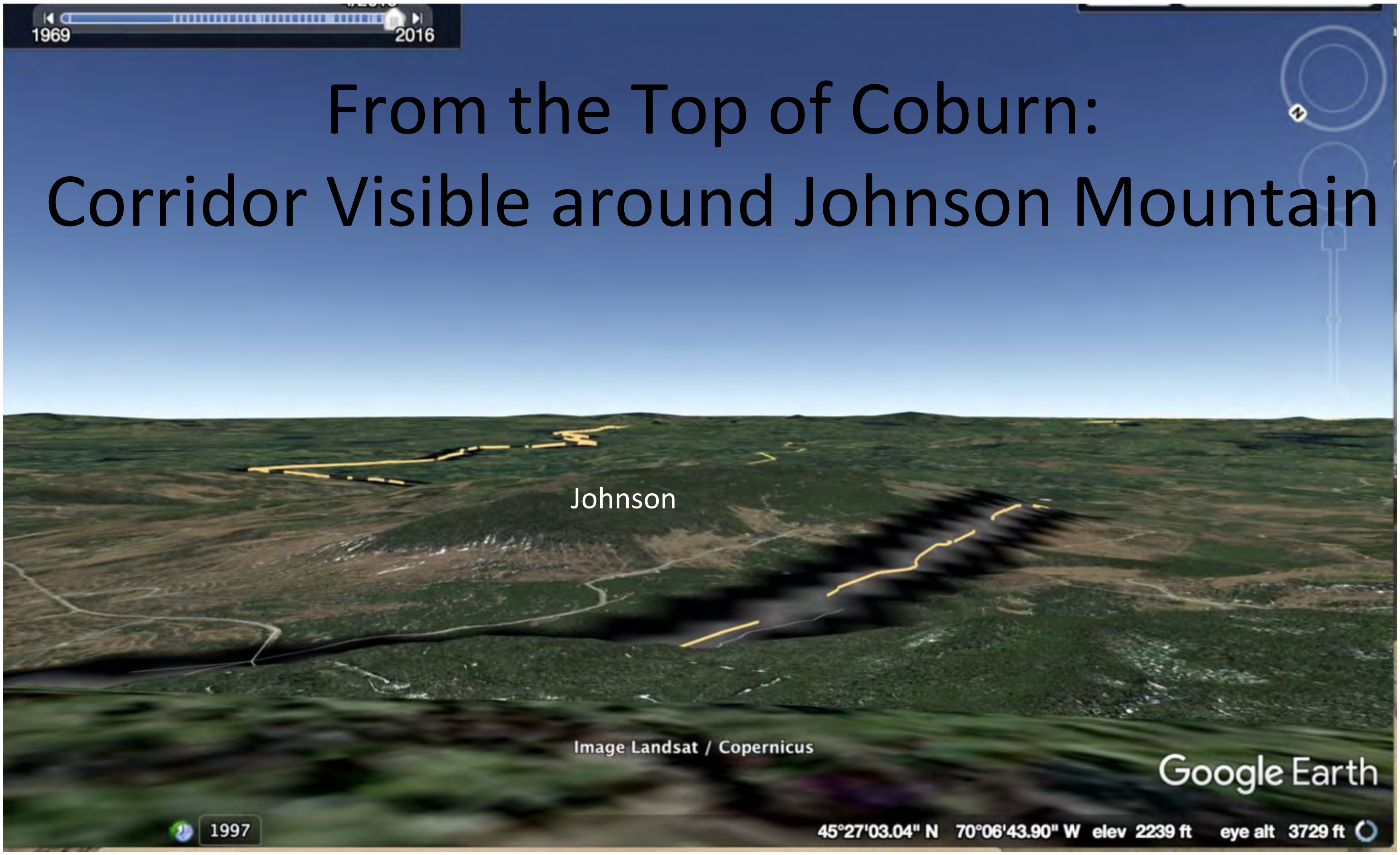

Coburn Mountain, 360 view of NECEC
Tallest ITS peak in New England
Host to hundreds of snowmobilers a day
Joe Kruze

Grace Pond from top of Coburn Mtn

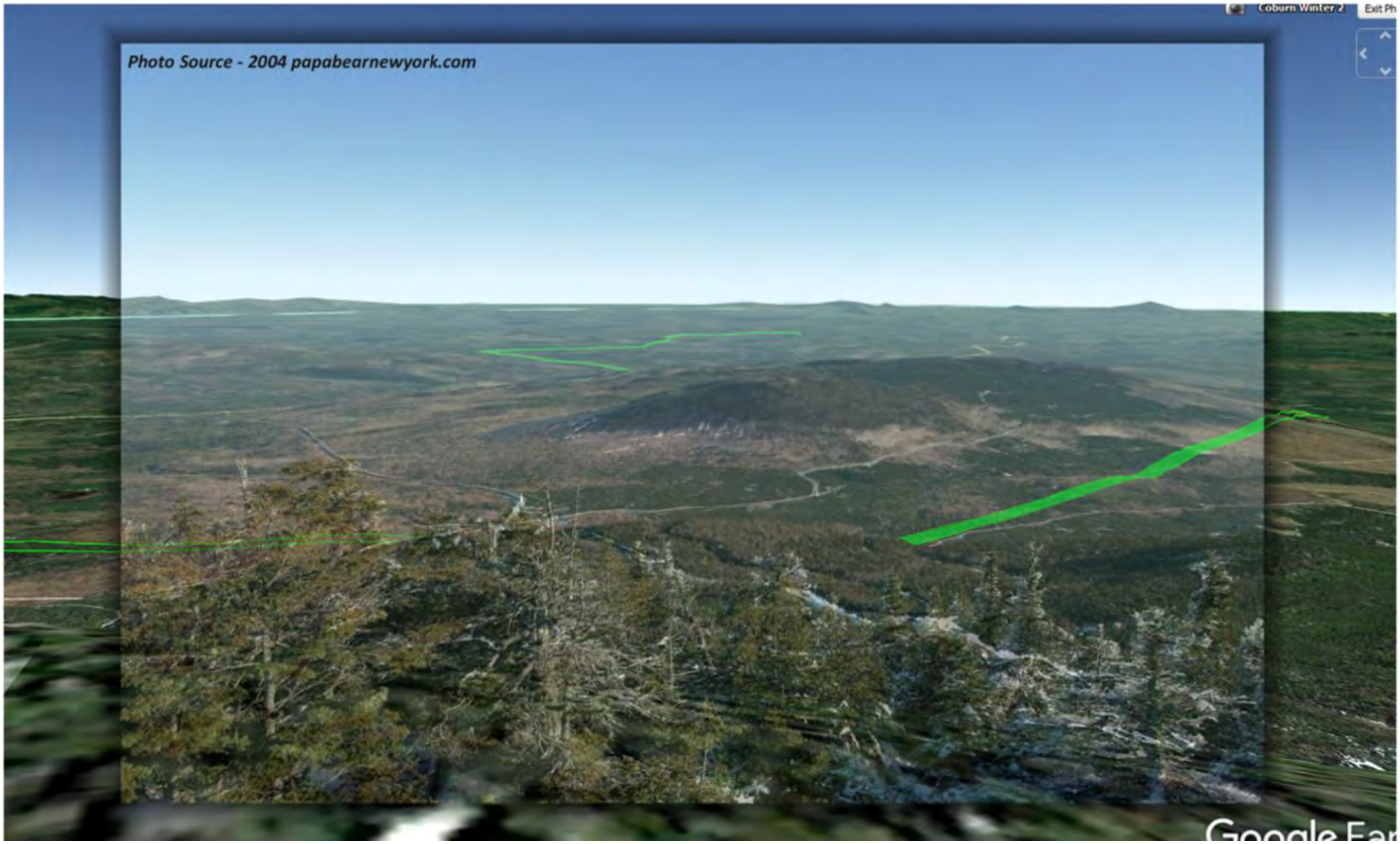


Ed Buzzell


Coburn Mountain View of Corridor
Facing NW
Grace Pond
Image Landsat / Copernicus
Google Earth
1997
45°28'59.68" N 70°08'16.99" W elev 2366 ft eye alt 3730 ft

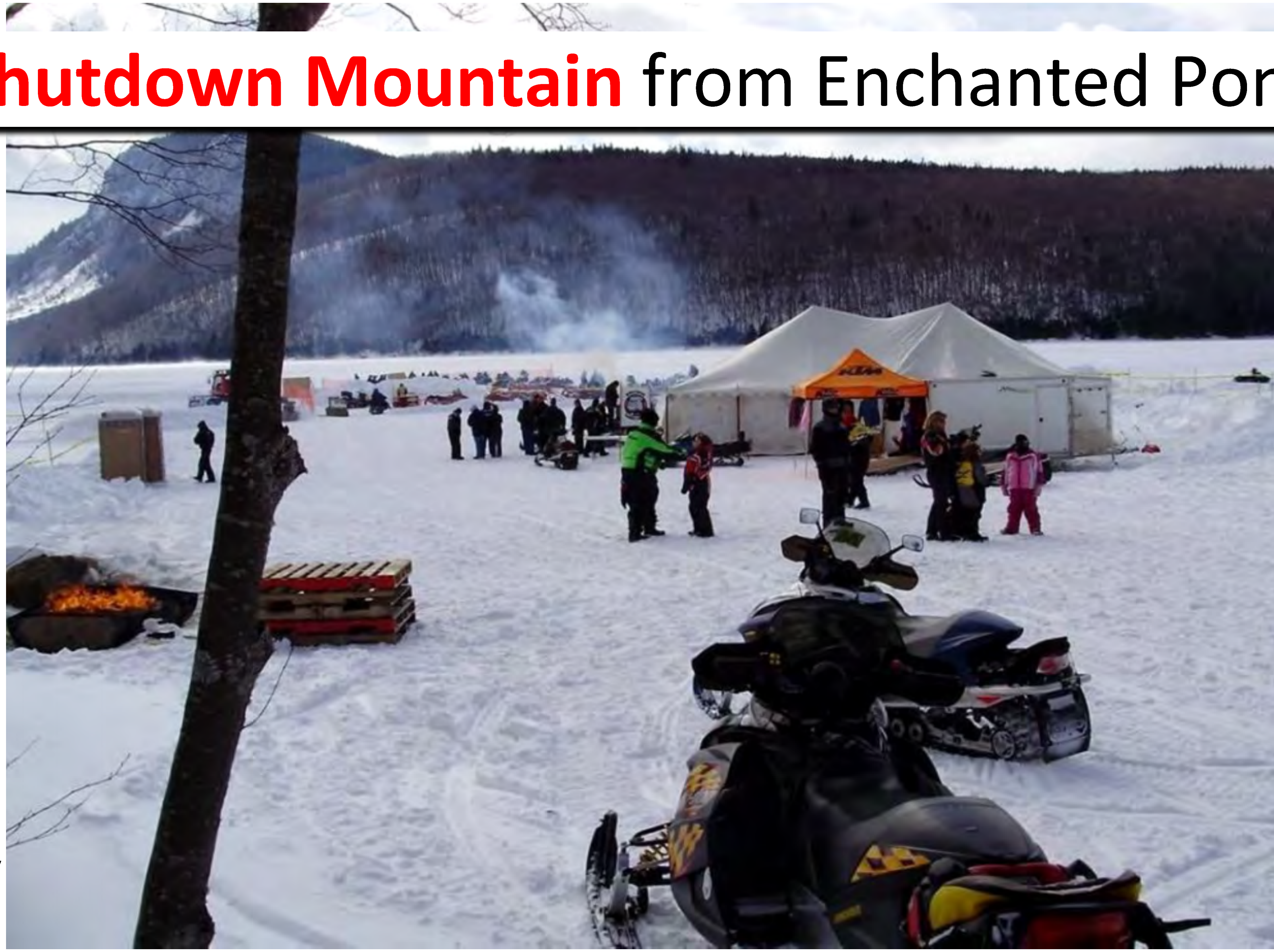

From the Top of Coburn:
Corridor Visible around Johnson Mountain
1969
2016
Johnson
Image Landsat / Copernicus
Google Earth
1997
45°27'03.04" N 70°06'43.90" W elev 2239 ft eye alt 3729 ft

Coburn Mountain Google Earth Overlay 2



Mike/Shirley
Johnson

Shutdown Mountain from Enchanted Pond



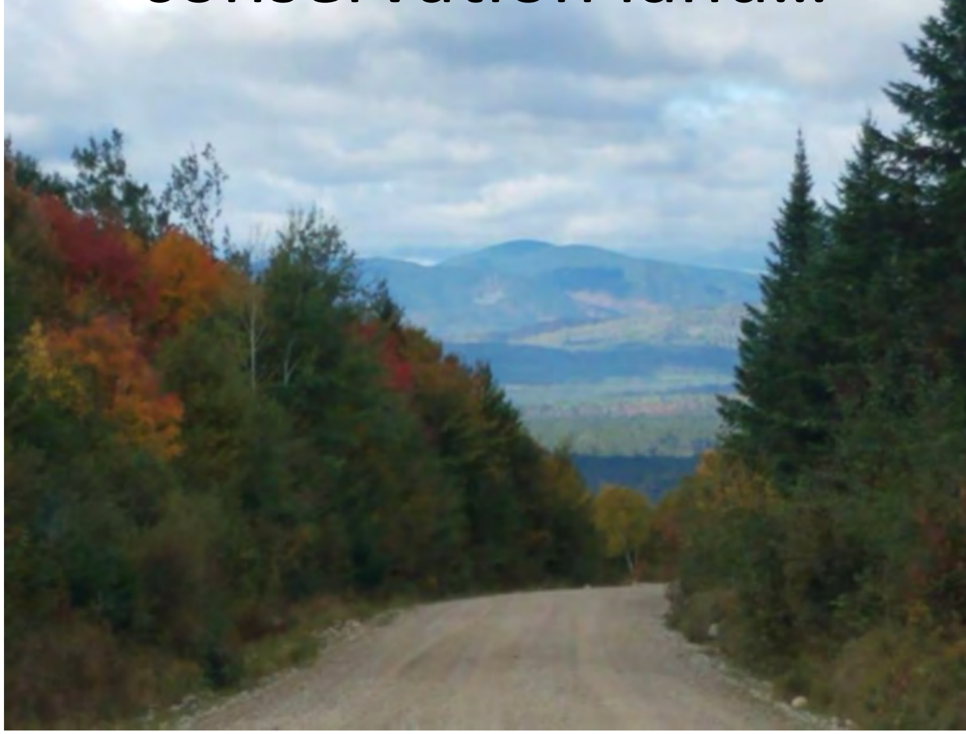
Mike/Shirley
Johnson


Corridor from Shutdown Mtn Trail
Enchanted Pond
4/2016
1969
2016
Exit ground-level view
Image Landsat / Copernicus
Google Earth
Preview
1997
Imagery Date: 4/23/2016
70°10'03.56" W elev 1788 ft eye alt 2083 ft

Spencer Access Road
Not just a “logging road”

Jennifer Pelotte Poirier – Spencer Road

Spencer Road is a highly used, beautiful and scenic access road to Enchanted, Grace, Rock ponds, #5 Mtn., access to 16,000+ acres of conservation land…

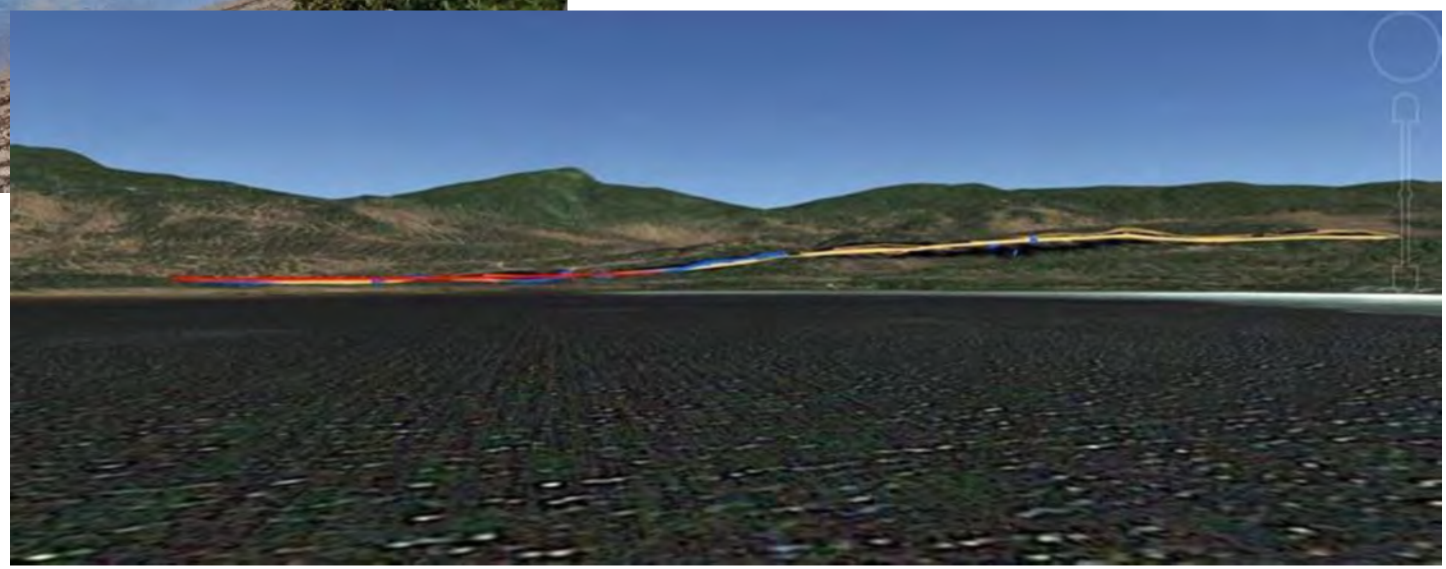


Spencer Access Road

Spencer Road Recreational Usage

Kimberly Nadeau– Spencer Road

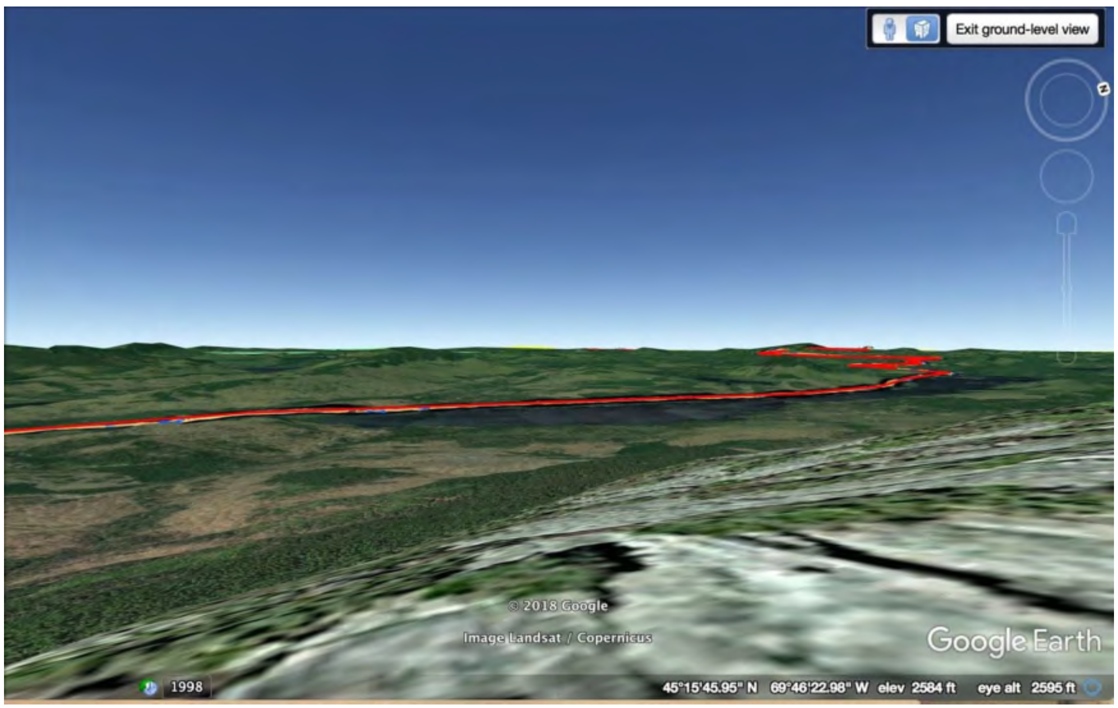
Rock Pond after



Three Slide Mountain from Rock Pond

Corridor View From Three Slide Mtn
4/2016
1969
2016
Exit ground-level view
Rock
Pond
Image Landsat / Copernicus
Google Earth
1997
45°29'28.17" N 70°23'27.05" W elev 2559 ft eye alt 3009 ft

Summit of
Moxie Bald Mountain
Appalachian Trail



Moxie Pond
as seen from
summit of
Mosquito Mtn.

From Top of
Mosquito

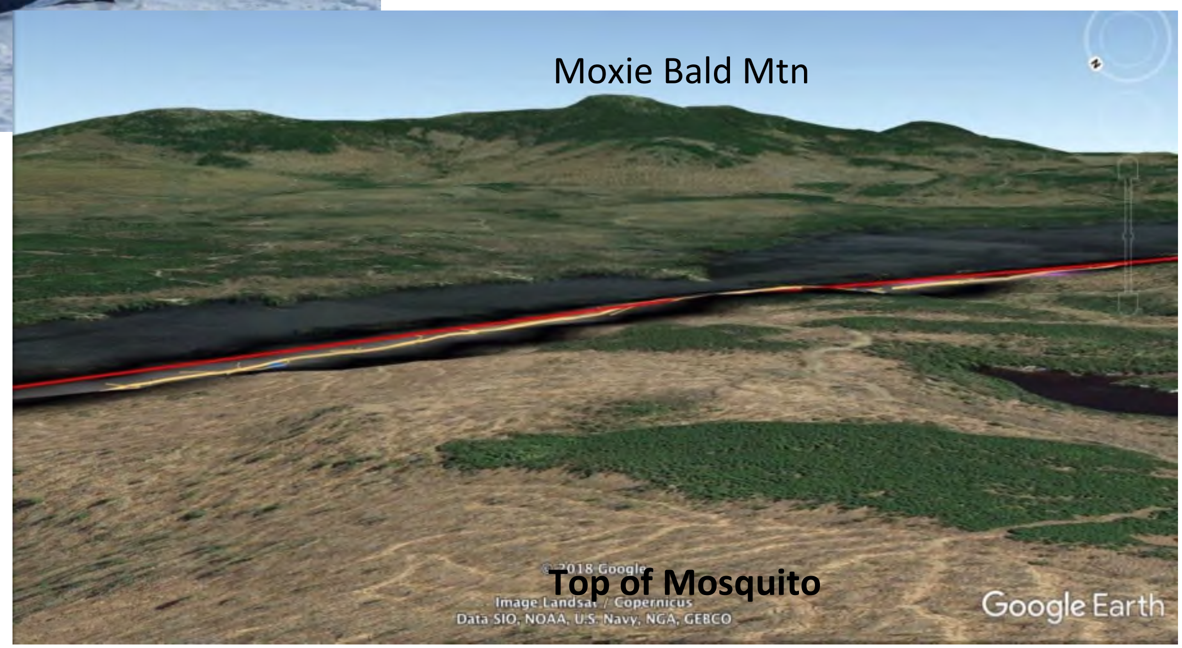
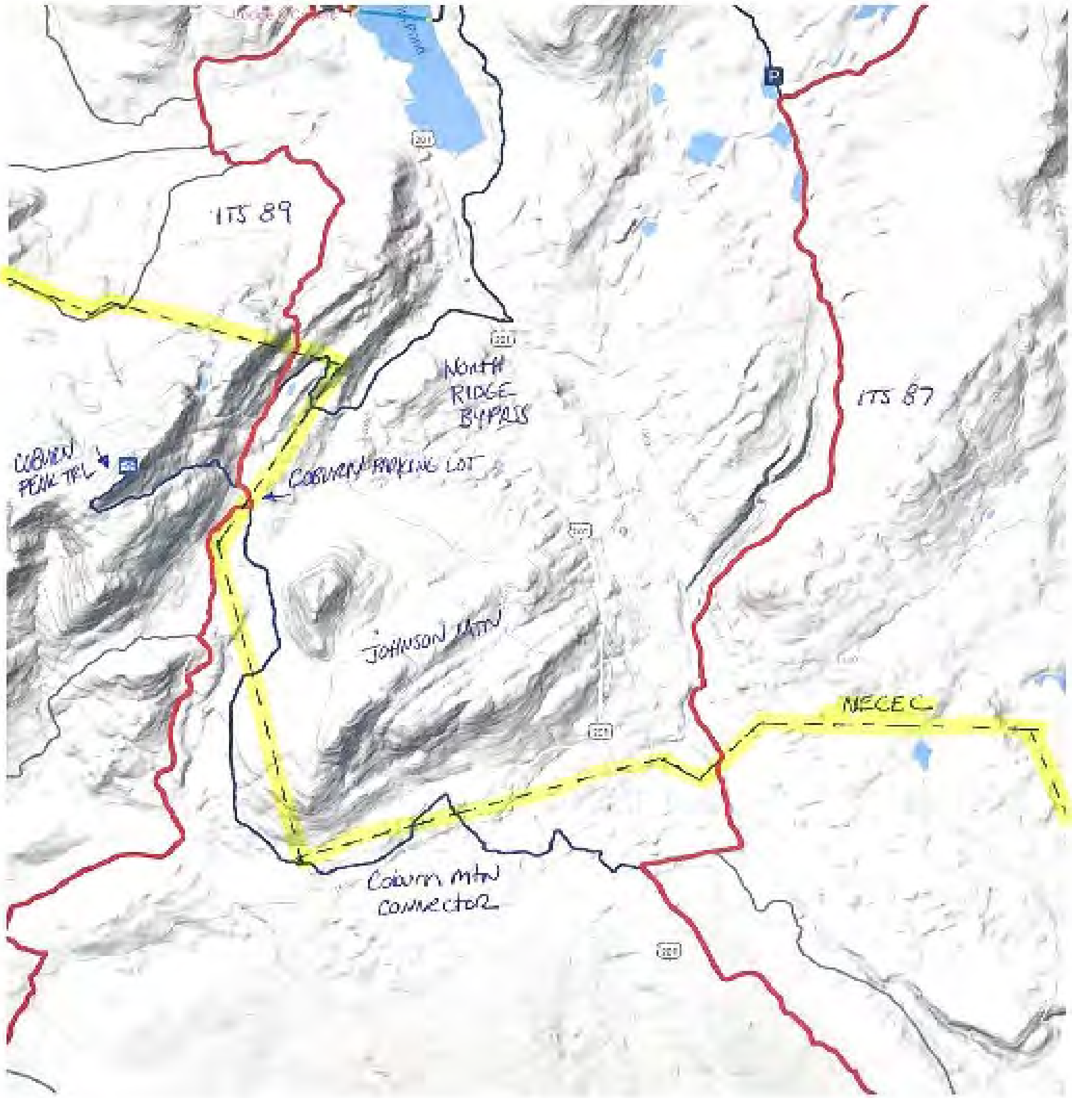
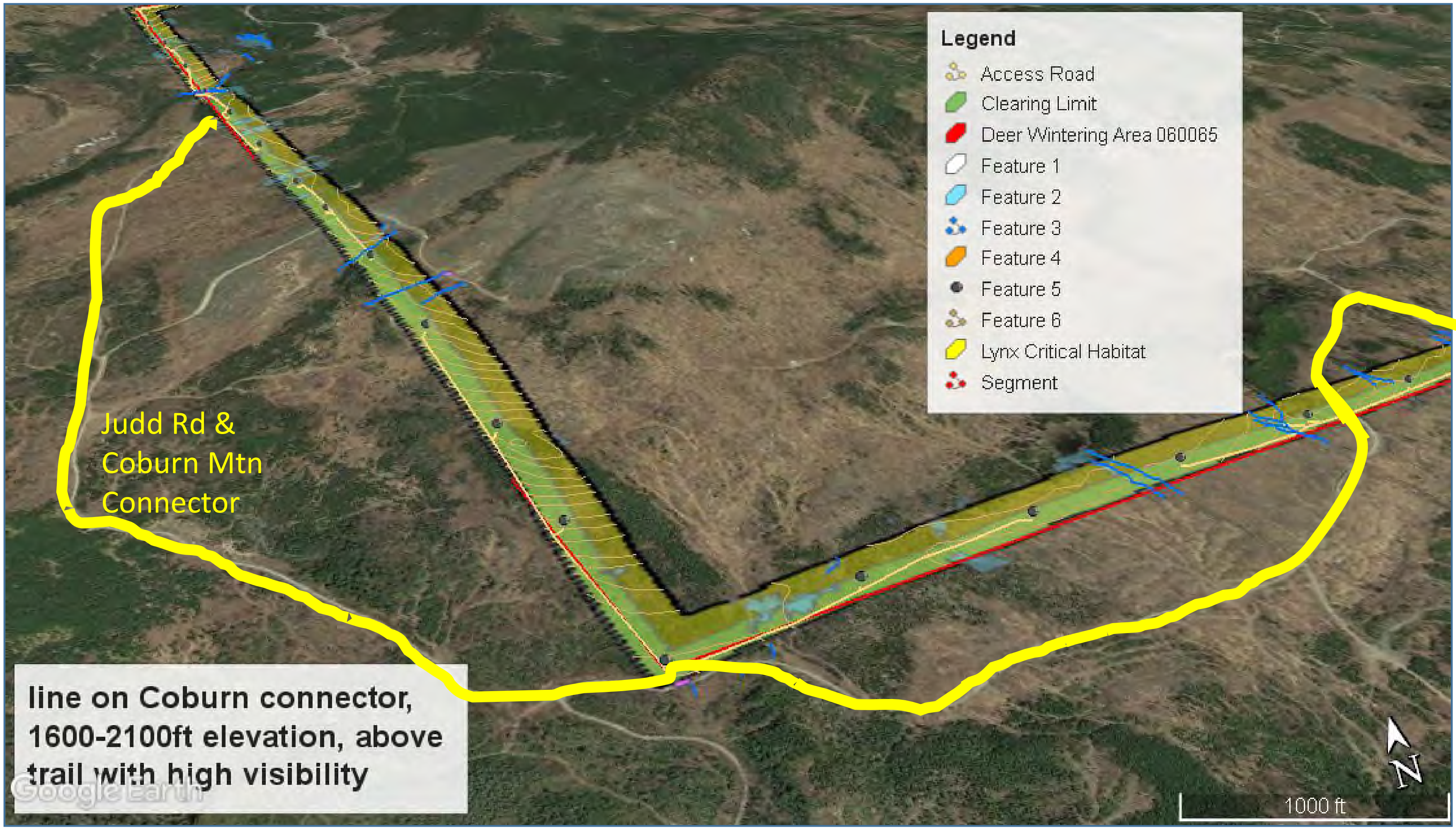
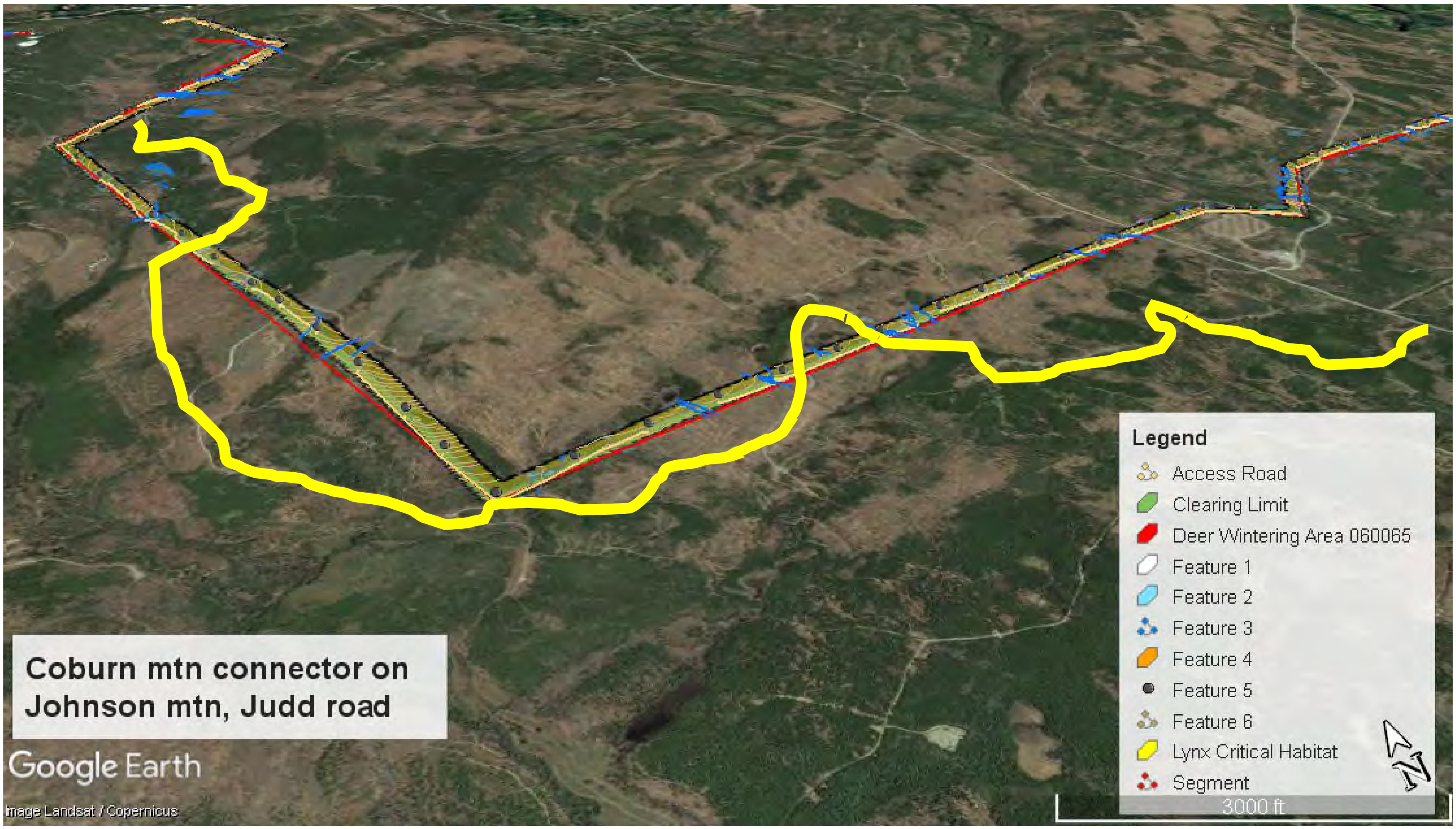


Exhibit 9


2019
The Forks Area
SNOWMOBILE MAP
Ride ITS 86, 87 & 89
Bingham • Caratunk • The Forks • West Forks
TWP Parlin • Jackman • Eustis • Rangeley
Rockwood • Greenville • Kokadjo • Abbot
like us
Coburn Mt. Maine's Highest Groomed
Snowmobile Trail at 3750ft
The Forks Area Chamber of Commerce
Route 201, PO Box 1 | West Forks, Maine 04985
Visit forksarea.com


ITS 89
NORTH RIDGE BYPASS
ITS 87
COBURN PEAK TRL
COBURN PARKING LOT
JOHNSON MTN
NECEC
Coburn Mtn Connector


Legend
Access Road
Clearing Limit
Deer Wintering Area 060065
Feature 1
Feature 2
Feature 3
Feature 4
Feature 5
Feature 6
Lynx Critical Habitat
Segment
Judd Rd &
Coburn Mtn
Connector
line on Coburn connector,
1600-2100ft elevation, above
trail with high visibility
1000 ft
N
Google Earth


Coburn mtn connector on
Johnson mtn, Judd road
Google Earth
Image Landsat / Copernicus
Legend
Access Road
Clearing Limit
Deer Wintering Area 060065
Feature 1
Feature 2
Feature 3
Feature 4
Feature 5
Feature 6
Lynx Critical Habitat
Segment
3000 ft
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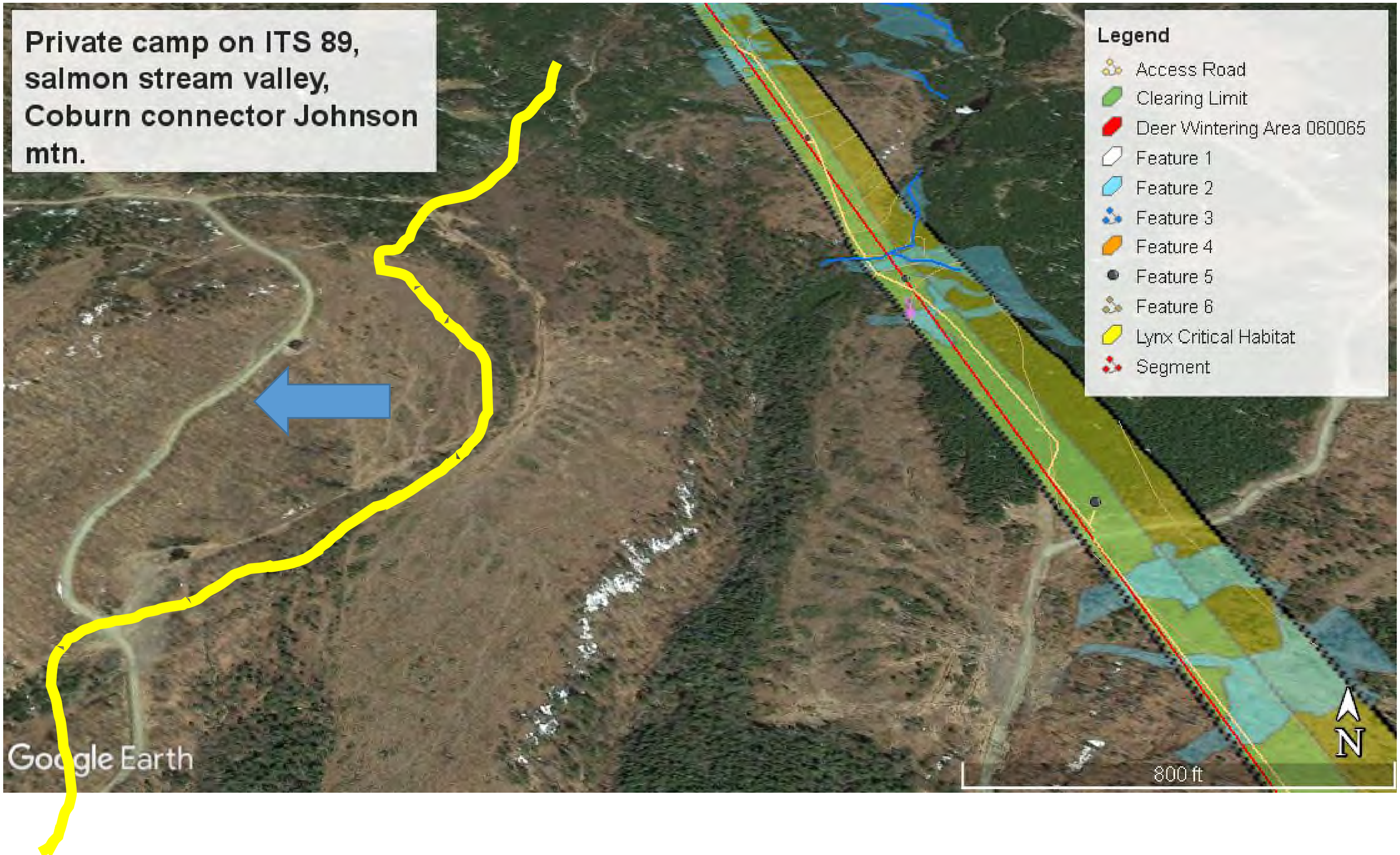
Private camp on ITS 89, salmon stream valley, Coburn connector Johnson mtn.
Legend
Access Road
Clearing Limit
Deer Wintering Area 060065
Feature 1
Feature 2
Feature 3
Feature 4
Feature 5
Feature 6
Lynx Critical Habitat
Segment
N
800 ft
Google Earth


ITS 89, Coburn mtn parking lot, Coburn mtn connector Johnson mtn.
Mountain Ponds
Legend
Access Road
Clearing Limit
Deer Wintering Area 060065
Feature 1
Feature 2
Feature 3
Feature 4
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Feature 6
Lynx Critical Habitat
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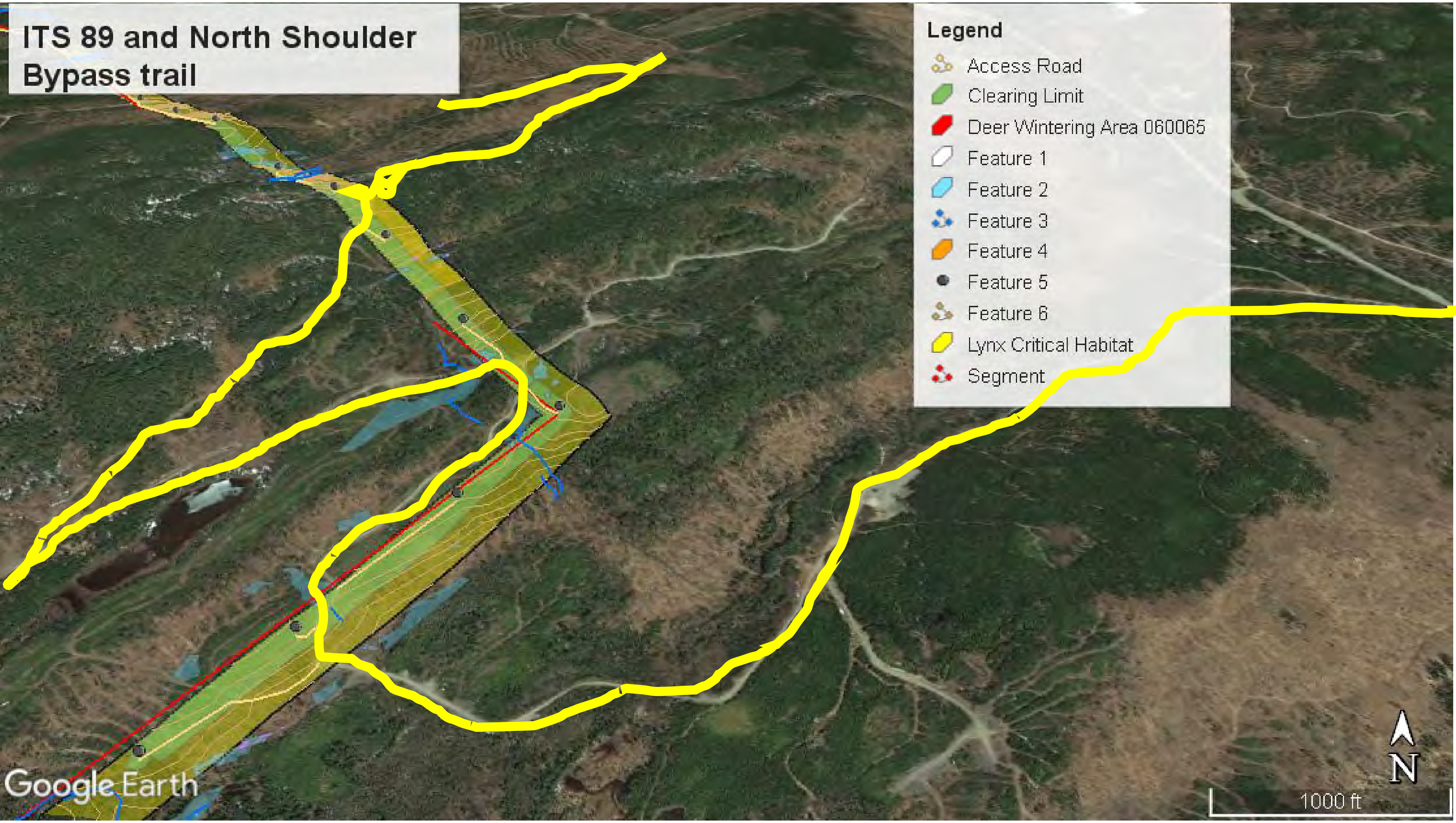
ITS 89 and North Shoulder Bypass trail
Legend
Access Road
Clearing Limit
Deer Wintering Area 060065
Feature 1
Feature 2
Feature 3
Feature 4
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Feature 6
Lynx Critical Habitat
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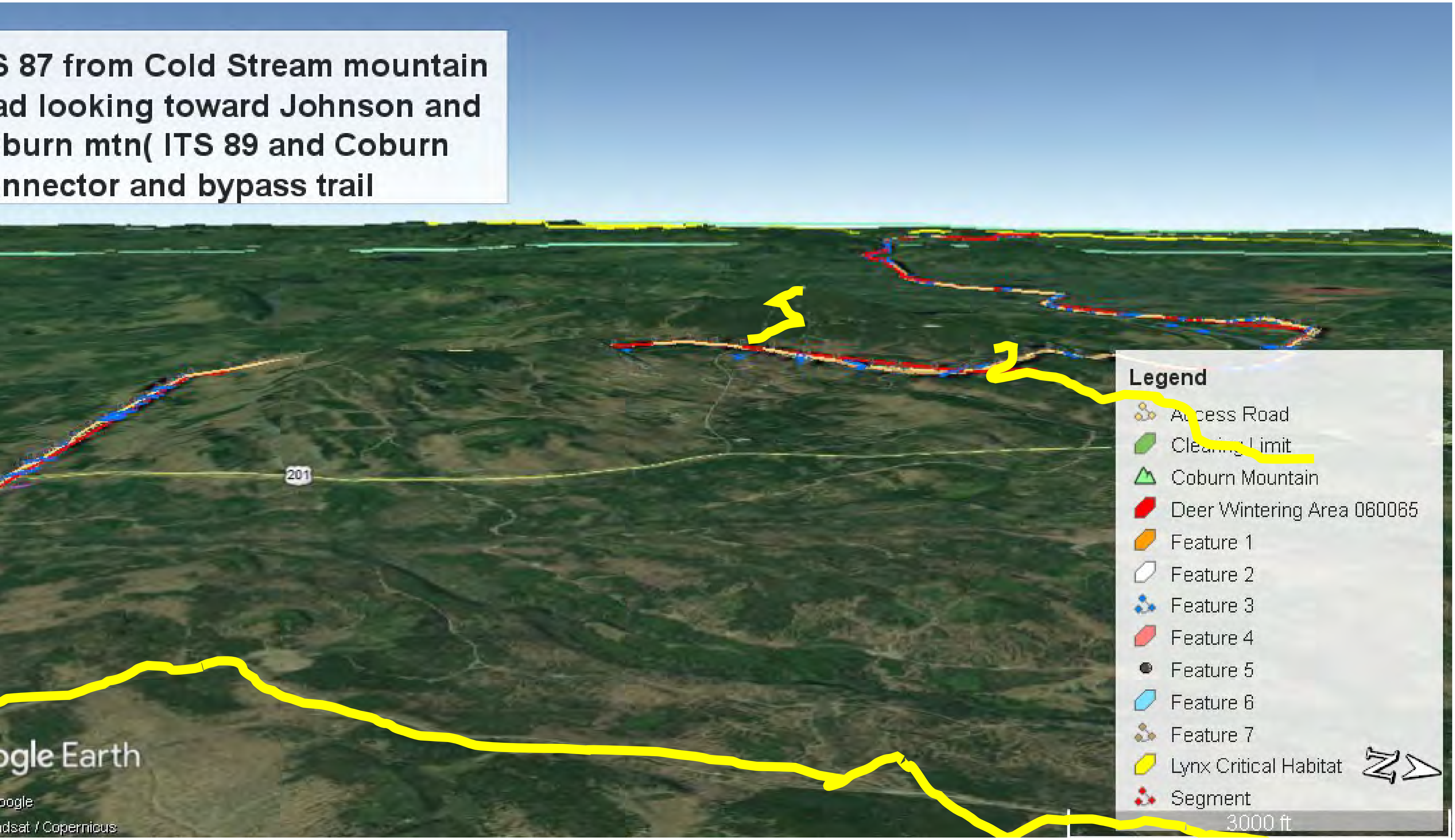
1000 ft
Google Earth



S 87 from Cold Stream mountain
ad looking toward Johnson and
burn mtn(ITS 89 and Coburn
nnector and bypass trail
Legend
Access Road
Clearing Limit
Coburn Mountain
Deer Wintering Area 060065
Feature 1
Feature 2
Feature 3
Feature 4
Feature 5
Feature 6
Feature 7
Lynx Critical Habitat
Segment
3000 ft
N
201
Google Earth
Google
Landsat / Copernicus


'S 89 line crossing North Shoulder Coburn Mtn 2700ft
Legend
Access Road
Clearing Limit
Deer Wintering Area 060065
Feature 1
Feature 2
Feature 3
Feature 4
Feature 5
Feature 6
Lynx Critical Habitat
Segment
N
700 ft
oogle Earth

Wild Land

Conducted by YouGov on behalf of John Muir Trust

Fieldwork Dates: 18th - 22nd May 2017

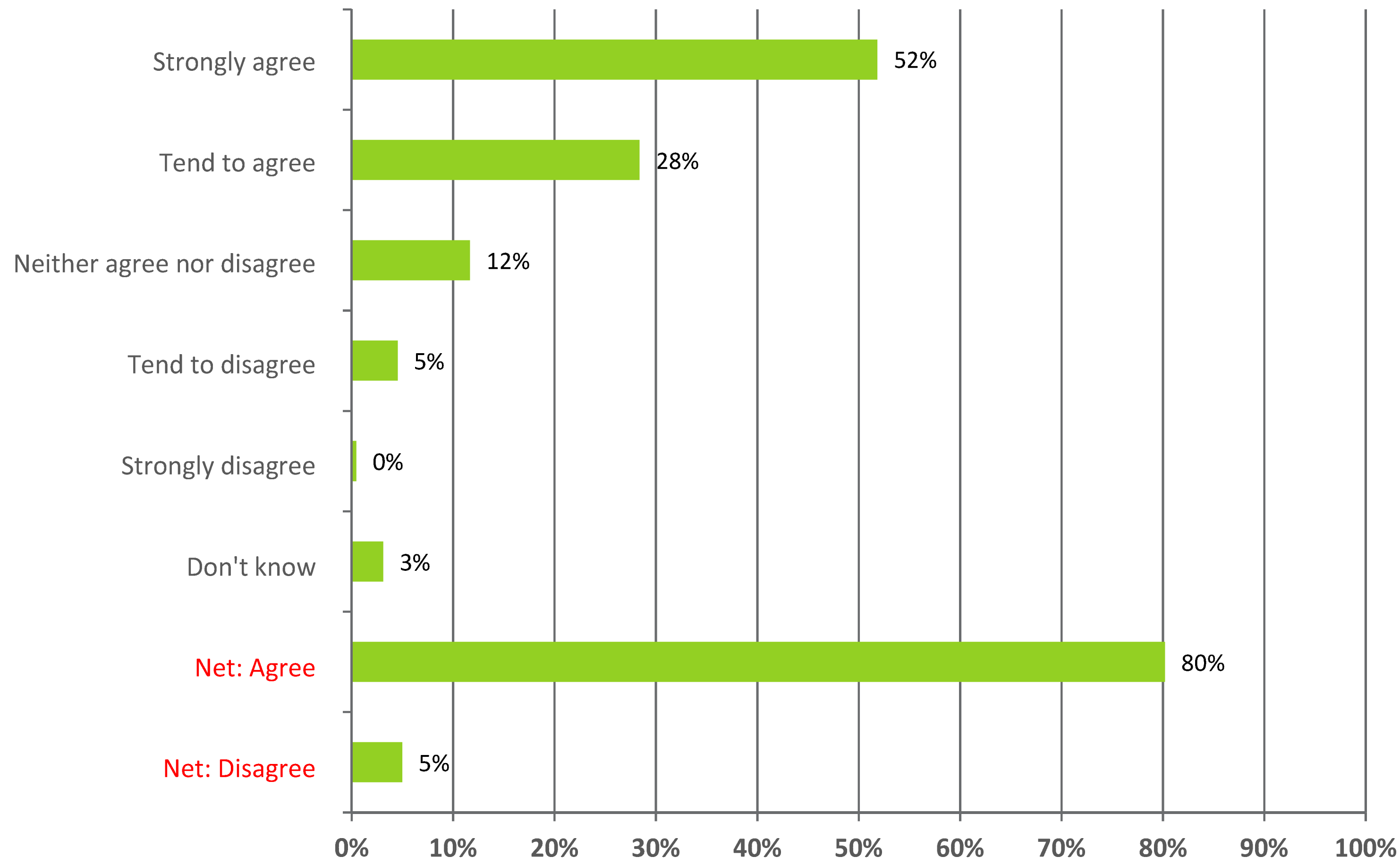
JOHN MUIR TRUST
FOR *wild* LAND & *wild* PLACES

YouGov

Exhibit 10

Wild Land

SJW_q1. For the following question, by "Wild Land Areas", we mean places that are rugged, remote and free from major human structures. To what extent, if at all, do you agree or disagree with the following statement?
"Wild Land Areas should continue to be protected in the future from large scale infrastructure, such as industrial-scale wind farms, major electricity transmission and super-quarries"

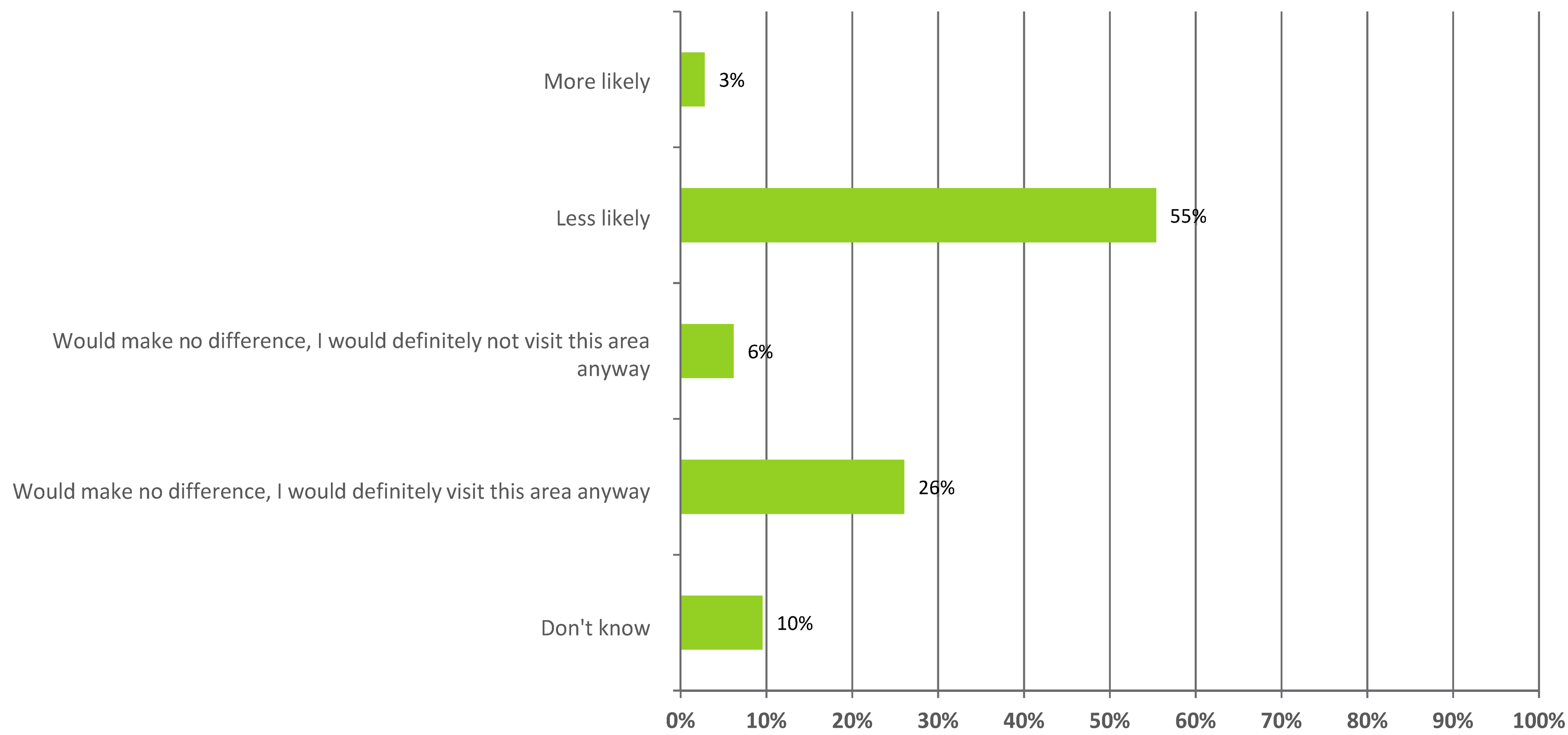


Unweighted base: All Scottish adults (1028)

YouGov

Wild Land

SJW_q2. Would you be more or less likely to visit a scenic area which contains large scale developments (e.g. commercial wind farms, quarries, pylons etc.), or would it make no difference?



Unweighted base: All Scottish adults (1028)

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Exhibit 12

MAINE RIVERS STUDY

Final Report

State of Maine
Department of Conservation

U.S. Department of the Interior

National Park Service
Mid-Atlantic Regional Office

May 1982
Electronic Edition August 2011
DEPLW-1214

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Section I. Major Findings

1. <u>The State of Maine is unique in the Northeastern United States in the number and diversity of significant natural and recreational river resources that it possesses.</u>

The Maine Department of Inland Fisheries and Wildlife estimates that there are 31,806 miles of permanently flowing rivers and streams in the state, a figure equivalent to one linear miles of stream for every square mile of land surface. Rivers vary in size from the long and wide Penobscot River which drains 8570 square miles to the short and narrow Rapid River and Grand Lake Stream. Over sixty rivers enter the ocean along the Maine coast and three rivers form the U.S. / Canadian International Boundary. Among these water resources are select quantity of rivers which are widely recognized for their outstanding values.

Important river resources include:

a. 17 river gorges, 61 waterfalls, and 38 white water rapids identified as being outstanding geological or hydrological features with state-wide significance.
b. More miles of undeveloped free-flowing rivers than any other state in the Northeast United States
c. River corridor segments which provide habitat for diverse populations of rare and endangered plant species of state and national importance.
d. Coastal rivers which provide significant habitat for northern bald eagle and shortnosed sturgeon, on the Federal Threatened and Endangered Species List.
e. 192 miles of high quality river habitat for an internationally known landlocked salmon fishery and 22,000 miles of primary brook trout habitat known for its excellence throughout New England
f. The only rivers in the eastern United States containing significant self-sustaining Atlantic Salmon runs, and, due to federal and state restoration efforts, the East coast's most heavily fished Atlantic sea run salmon river.
g. Three rivers which together account for over 60% of the state's commercial alewife catch and a number of other coastal rivers which have the potential to become profitable commercial fisheries
h. The only two stretches of Class V white water and the longest single stretch of Class II-IV rapids in the entire New England region.
i. The longest and most popular extended back country canoe trips in the Northeast and over 4000 miles of other rivers suitable to boaters of all ability levels.

2. <u>The Maine River Study has identified 4264 miles of rivers and river segments which possess significant natural and recreational resource values.</u>

Maine rivers have been inventoried and analyzed to identify important river areas and to rank these areas according to their overall significance as unique and/or multiple value natural and recreational resources. The final ranking represents a synthesis of objective resource analysis and a consensus of opinion among resource experts and state river conservation interests.

Rivers, river segments and related tributaries identified as possessing significant natural and recreation resource values were placed in one of four significance categories, identified as rating A, B, C, and D. These categories represent a hierarchy of cumulative resource values, and are defined in the following manner.
River Rating Hierarchy:

A Rivers and related corridors on the "A" list possess a composite natural and recreational resource value with greater than state significance.

B Rivers and related corridors on the "B" list possess a composite natural and recreational resource value with outstanding statewide significance.

C Rivers and river-related corridors or specific areas on the "C" list possess a composite natural and recreational resource value with state-wide significance.

D Rivers and river-related corridors or specific areas on the "D" list possess natural and recreational values with regional significance.

The total mileage of rivers and streams in each of the categories is summarized in the following table:

Significance Category Rating	Number of Rivers	Total Miles of Main Segments	% of the State's Total River/Stream Resource	Total Miles including Significant Tributaries	% of State's Total River/Stream Resource
A	20	867.0	2.7	1663.5	5.2
B	18	698.0	2.2	1176.0	3.7
C	41	843.5	2.6	1152.5	3.6
D	23	262.0	0.8	272.0	0.9
Total	102	2670.5	8.4	4264.0	13.4

A number of rivers included on the study's B list have been identified as possessing specific resource values of highest importance to Maine river constituents. These rivers are therefore deserving of special efforts to maintain the identified outstanding resource values. These rivers and their corresponding values are as follows;

Inland Fisheries Values:

Crooked River
Grand Lake Stream
Kennebago River

Commercial Anadromous Fisheries Values:

Damariscotta River
St. George River

Whitewater Boating Values:

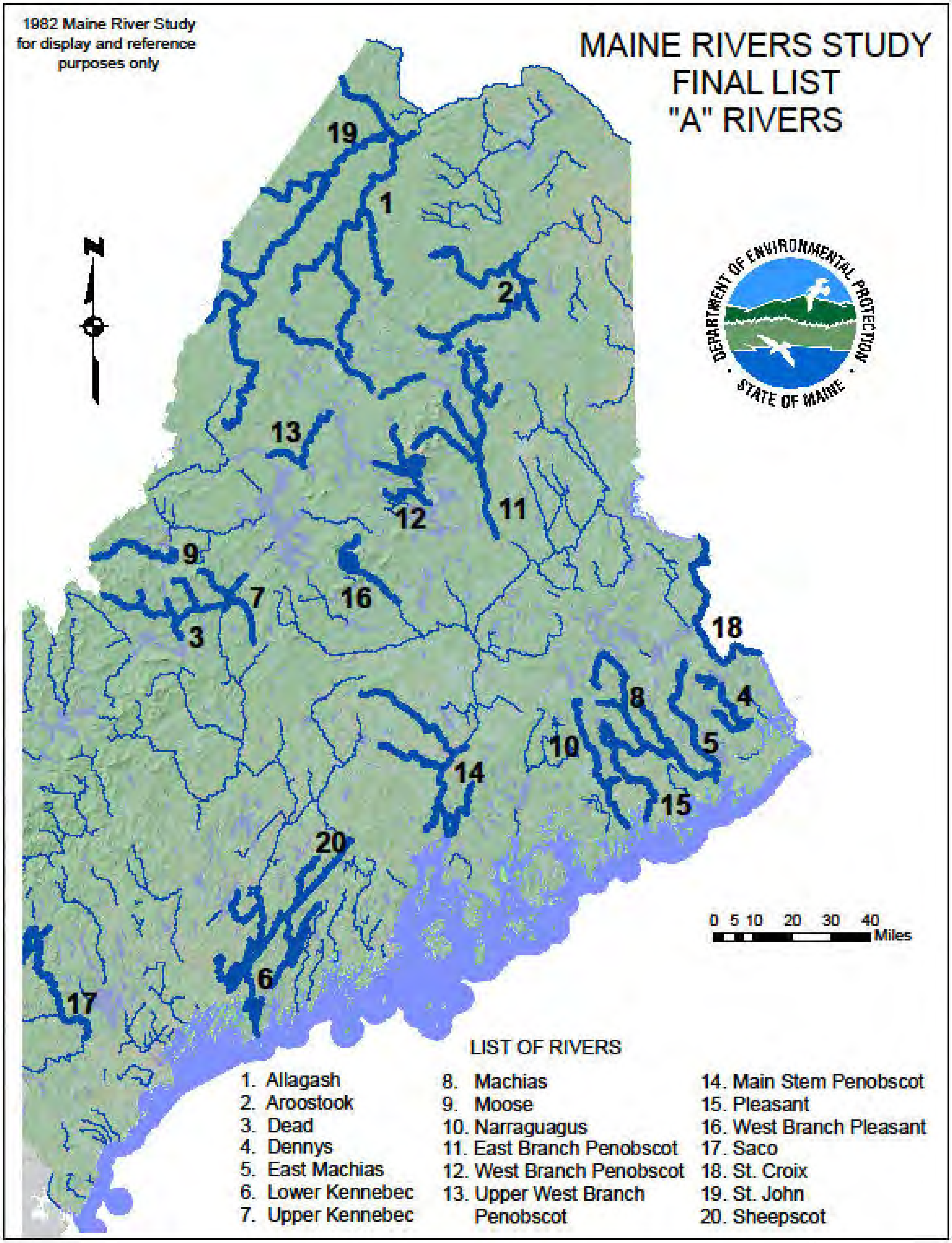
Carrabassett River
Rapid River

Critical Botanic Values

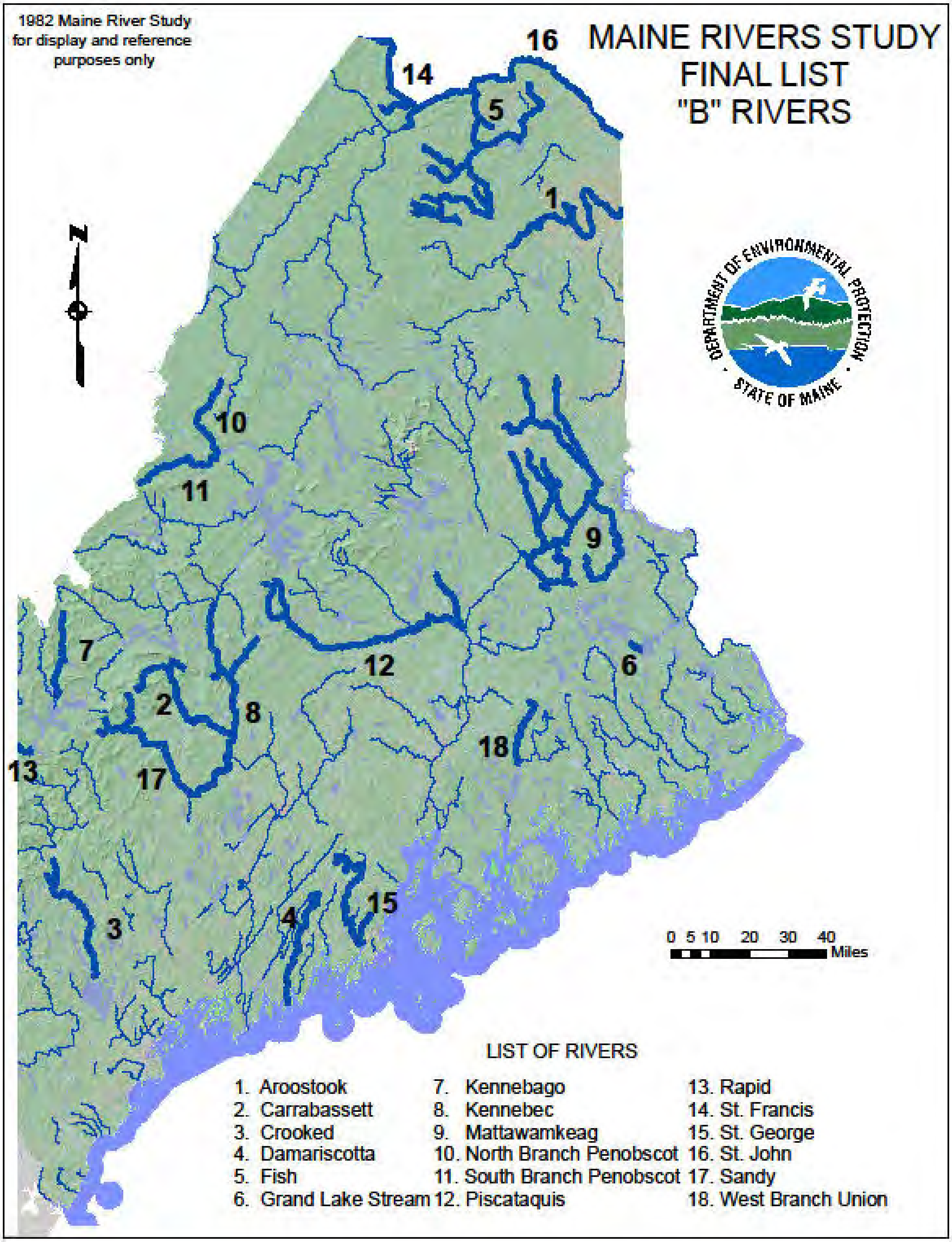
St. John river
Aroostook River

Maps identifying rivers and river segments included in the study's "A" and "B" significance categories follow.

"A" Rivers Map and River segments



“B” Rivers Map and River segments



3. <u>The potential exists in Maine for the conservation of complete watersheds or river ecosystems, an opportunity unparalleled by few, if any, states in the Northeast.</u>

A specific river segment does not function independently but instead, both affects and is affected by adjacent land areas, connecting segments, lakes and tributaries. This physical and biological interdependence of rivers and tributaries within a watershed provides the basis for the principle that a systems approach to water resources planning and management is both prudent and necessary. This is particularly so in riverine systems which are in a natural state.

The Maine River Study has identified a number of relatively large watersheds within the state which are of high significance as undeveloped and interdependent hydrologic units. These sub-basins are characterized by a general lack of major artificial river impoundments, minimal river corridor development, a high degree of hydrologic and ecologic interdependence, and a consistency of resource quality among all segments. These include:

a. The upper St. John watershed including the Northwest, Southwest, and Baker Branches, and the Little and Big Black Rivers.

b. The East Branch of the Penobscot watershed, including the Seboeis River and Wassataquoik Stream.

c. The Aroostook and Big Machias watershed above Sheridan.

d. The Allagash watershed.

e. The Mattawamkeag watershed.

f. The Fish River watershed, including the Fish Lakes Chain.

g. The Machias River watershed in Washington County

4. <u>Potential conflicts between hydroelectric development projects and significant natural and recreation rivers exist in the State of Maine.</u>

Estimates of the total hydropower potential in the state (including both undeveloped sites and existing dam sites capable of being retrofitted) vary between 600,000 kilowatts and 1,200,000 kilowatts. Preliminary assessment s of feasible hydroelectric sites on the study's A, B, and C rivers by Maine's Office of Energy Resources have identified 72 sites capable of producing 400,000 kilowatts of power.

Of the river segments identified on the Maine River Study's A list, Federal Energy Regulatory Commission preliminary permits are pending for 5 sites with a total generation potential of over 125 megawatts. These projects are located on the West Branch of the Penobscot, the Kennebec, the Aroostook, and the East Machias. A 500 kilowatt project is currently being constructed on the Pleasant River in Washington County. Twenty additional potential sites are located on "A" list rivers. "B" list preliminary permit applications include projects on the St. George, Rapid, Kennebago, Mattawamkeag, Piscataquis, and Aroostook rivers with a total generation potential of over 60,000 kilowatts.

The extent of the conflict between significant river resource areas and hydropower development vary according to the specific resource characteristics associated with a particular site. In many instances, resource impact will be minimal or can be mitigated or avoided through proper facility sizing and placement, fishway design, and/or water release scheduling. However, while the impact on river related resources will be minor for many potential projects, a select number of developments could significantly alter a river's character and destroy irreplaceable resources, some with multi-state or national significance.

Corridor land development and resources use may also impact river resource values with adverse effects occurring on water quality, wildlife habitat, user access, and scenic values. Again, conflict can often be minimized through proper planning which recognizes the resource values associated with the particular river area.

5. <u>There is a significant base of citizen and public agency support for the conservation and sound management of the river resources of Maine.</u>

River conservation interests in the state vary widely. Such interests include recreational boating and fishing, commercial boating and fishing, education and scientific research, wildlife preservation, water quality maintenance, and miscellaneous recreational interests. While these interests vary and sometimes conflict, an underlying consensus exists that rivers in their natural condition constitute a valuable resource to the State of Maine. There also appears to be a consensus among river interests regarding which rivers are most important and warrant conservation action.

In addition, there appears to be a public recognition of the need to balance the goals of hydroelectric development and river conservation, and a desire for the use of hydropower where compatible with the resource values of a river and where impacts of development are avoided or minimized.

6. <u>A variety of alternatives are available within the local, State and federal government and the private sector to conserve and manage Maine's significant natural and recreational rivers.</u>

The natural and recreational resources of Maine's rivers are extremely significant, diverse and complex. These river areas contain a mix of public and private land ownership in the form of existing parks, recreation areas, agricultural lands, historic sites, natural areas, forests and villages. Natural resources in some areas are interwoven with the fabric of existing communities. These "living or working river areas" contribute to the uniqueness, quality, and resource value of the areas from a State and National perspective.

In addition to the importance of the river corridor resources, there appears to be a base of public agency and citizen support for improved management and enhancement of these resources. The State and local jurisdictions as well as private groups and citizens have committed themselves to conserve and enhance river areas throughout Maine. As strong as the support is for improved management of Maine's rivers, so are the feelings of a need for local control and private stewardship. Indications are that proposals for the conservation of Maine's rivers should be initiated and developed at the State and local level.

In this regard, no single level of government of existing system of parks, regulations, recreation areas, programs or preserves can be expected to conserve and manage Maine's rivers. Only through the shared responsibility of the several levels of governments and the private sector, can the significant natural and recreational values of the State's rivers be conserved or enhanced.

A coordinated application of existing government programs, consistent with varying river area goals, could result in significant economic benefits and will support federal, State and local conservation and enhancement efforts.

II. INTRODUCTION

On June 22, 1981, Governor Brennan released the Energy Policy for the State of Maine. The hydropower section of the policy directed that:

> **"The Department of Conservation, working with environmental, economic, energy and other appropriate interests, should identify river stretches in the State that provide unique recreational opportunities or natural values and develop a strategy for the protection of these areas for submission to the Governor."**

In response to this directive, and as a continuation of the State's ongoing efforts to conserve Maine's significant rivers, the Department of Conservation initiated the Maine Rivers Study. The U.S. Department of the Interior, National Park Service's Mid-Atlantic Office, as part of their ongoing river conservation technical assistance to the State, has provided staff to conduct this study.

The purpose of the study is two-fold. The first is to define a list of unique natural and recreation rivers, identifying and documenting important river related resource values as well as ranking the State's rivers into categories of significance based on composite river resource value. The second purpose of the study is to identify a variety of actions that the State can initiate to manage, conserve, and where necessary, enhance the State's river resources in order to protect those qualities which have been identified as important.

III STUDY METHOD AND PROCESS

Introduction – Each of Maine's rivers and major streams were assessed during the course of this study to identify the State's unique natural and recreation rivers. The method used to identify and rank Maine's rivers, prepared in cooperation with the River Basin Subcommittee of the State's Land and Water Resource Council, was designed to:

a. Rely on existing quantitative and qualitative research information.
b. Rely on information from recognized river resource experts
c. Use a "systems" or river-ecosystem approach of analysis which recognized the relationships and interrelationships of rivers, their tributaries and watersheds.
d. Incorporate public and expert input into the evaluation process

The study process was intended to not only develop an objective and factual base of information on Maine's rivers, but also a consensus among river experts regarding the most important rivers in the State.

The method used is based on the following five step process.

Step 1 – Identification and Definition of Unique River Values

The first step in the study identified unique recreation and natural river categories. These categories, selected by the study team and the River Basin Subcommittee, were used to serve as a framework for the collection and analysis of river information. The unique natural river categories selected for analysis included:

1) geologic and hydrologic features (gorges, waterfalls, etc)
2) critical and rare species of plants and wildlife (bald eagle wintering areas, etc)
3) undeveloped river corridors
4) scenic river corridors (river areas with outstanding views, visual diversity, etc)

The categories selected for unique recreational river areas included:

1) anadromous fisheries (salmon runs, etc
2) inland fisheries (trout streams, etc)
3) whitewater boating (areas with rapids)
4) canoe touring (areas for canoe boat trips)
5) backcountry excursion boating (areas for extended wilderness trips)
6) river related historic sites with national significance

Once these categories or "types" of unique rivers and river segments were identified each category was described and defined in detail.

To help determine which rivers or river segments possessed resource values of regional or greater significance, a set of standards were established for each category. These standards serve as minimum "threshold" criteria to determine which rivers should be considered for further evaluation.

The specific criteria for each natural and recreational river category and the evaluation method used to identify qualifying river areas is described in Section IV of this report.

Step 2 – Identification of Significant River Resource Values

The second step of the study process involved the identification of those rivers and river segments which met the natural and recreation river category criteria. River areas were identified through a review of existing sources of information (canoe guidebooks, natural area studies, previous river inventories, etc) and through discussions with various government and private sector river experts. Rivers which met or exceeded the category criteria were identified on the <u>Preliminary Draft List of Rivers Under Evaluation</u> released in November 1981. This list of more than 120 rivers and river segments was distributed to public and private interests for review and comment.

Each of the rivers and river segments on the Preliminary Draft List was researched by natural and recreation river category, and river values were systematically identified. The Preliminary List and documentation of river values served as a basis for subsequent analysis.

Step 3 – River Category Evaluation
The next step of the study process focused on the evaluation and detailed documentation of river values by specific category. With assistance from resource experts all rivers and river segments identified as unique or significant in a given category were further inventoried and analyzed in detail to substantiate river values. The results of this analysis were recorded on lists by river category. These lists of rivers represent a culmination of the river evaluation, documentation and expert review process and are judged to possess resource values of regional, statewide, and greater than statewide significance.

Step 4 – River Category Synthesis
River information collected, evaluated and documented in earlier steps was combined in an effort to summarize all of the natural and recreation values associated with particular river segments and to connect adjoining river segments which possess similar values.

To help simplify the recording and display of river values a matrix was used. The matrix identified the total number of resource values associated with each river segment and highlighted those areas of statewide or greater than statewide significance. New river segment descriptions were defined using the following general guidelines.

1. Where a river possesses a combination of overlapping natural and recreation values, a composite river segment is identified with the outer boundaries of the overlapping segments determining the boundary of the entire river area.

2. A tributary stream which flows into, and is connected to a larger river area is included in the larger river segment description if the tributary stream: a) possesses natural or recreation values consistent with those of the main river area, and/or b) significantly enhances the overall value of the larger river segment's resources.

3. A tributary stream with natural or recreation values greater than those of a connecting main river area is listed separately from that area.

4. Larger connecting rivers have been listed as tributaries to a river system in certain unique situations (i.e. Big Machias River in the Aroostook River watershed), where: a) the rivers are free-flowing and within an undeveloped watershed; b) the rivers in the watershed exhibit a high degree of hydrological and ecological interdependence.

Following the combination of rivers and associated tributaries, river segment descriptions and resource values were revised and displayed on a matrix.

Rivers or river segments with related resource values which have been determined to be the state's most significant in a specific resource category were identified on a matrix with an asterisk. These resources possess greater than state or national significance, related to the distribution and rarity of the resource value.

Step 5 – Comparative River Evaluation
The combined unique and significant natural and recreational resource values of all river segments were evaluated on a comparative basis to determine their relative importance within the State of Maine. Each of the rivers from the Preliminary Draft List were ranked and placed into one of four categories of river resource significance ranking. These categories, identified as A, B, C, and D, represent a range of river values, from areas which are greater than that of State significance to those of regional importance.

Rivers and river segments were placed within particular categories based on the number and significance of various river values. The final river ranking scheme recognizes rivers which have a variety of significant values as well as importance due to specific unique resource qualities.

River Ranking Criteria – The criteria used to place rivers within the four categories are as follows:

"A" Rivers

1. River or river segments possessing six resource values with regional, statewide or greater than statewide significance in a specific resource category.

2. Rivers or river segments possessing two or more resource values which are recognized to be some of the State's most significant in a given resource category. Included within this category are rivers providing important habitat (defined as self-sustaining viable runs or significant restoration efforts producing fishable populations) for the nationally significant Atlantic sea run salmon.

"B" Rivers

1. Rivers or river segments possessing four or five resource values with regional, statewide or greater than statewide significance in a specific resource category.
2. Rivers or river segments possessing one resource value which is recognized to be one of the State's most significant in a given resource category.

"C" Rivers

1. Rivers or river segments possessing one to three resource values with regional, statewide or greater than statewide significance in a specific resource category.

"D" Rivers

1. Rivers or river segments possessing one or more resource values of regional significance

Using the aforementioned criteria, rivers and river segments were identified in the Draft Final List of Rivers Under Evaluation released in February 1982. This list of rivers was distributed to public and private interests for review and comment, and copies of the list were made available through a statewide news release.

In addition, a series of public meetings in Bangor, Presque Isle, Machias, and Lewiston were held to solicit input. Public comments, and additional information where appropriate, were incorporated in final revision of the Draft Final List.

Thus, the Final List of Rivers released in April 1982 reflects the results of a comparative and cooperative river evaluation process which incorporates factual, objective information and the consensus opinion of numerous diverse river interests.

IV. RIVER RESOURCE CATEGORIES

Unique Natural Rivers – Overview

This section of the final report will outline the process of identification, documentation, and evaluation of Maine's "unique and natural rivers". The focus here is on these natural resources that make a river important:

- an absence of development within the land corridor adjacent to the river
- the presence of a variety of habitats for the fauna and flora
- uncommon and unique features like bedrock formations
- rare and threatened plant and animal species
- critical ecologic areas
- scenic waterfalls and vistas
- National Historic Sites and National Natural Landmarks

The combination of the wide scope of this study and the limited time allocated did not allow for the collection of new information or field work on a river by river basis. Rather, the emphasis was on the gathering and organizing of existing information from a variety of sources and experts. State and Federal resource management agencies were of help in this section of the study, and will be cited in discussion on the appropriate resources.

Much of the river-related resource information was taken from statewide assessments of natural resources by the Maine Critical Areas Program, a part of the State Planning Office. The groundwork for this program was laid in 1972 with the Maine Natural Areas Inventory, a report which attempted to identify the most significant natural areas around the state. After this study was issued, it became clear that additional work was needed for the systematic evaluation of the relative values of natural resources of the state, in order to identify which areas were the most unique or significant.

In 1974, the State Legislature passed an act establishing a state Register of Critical Areas, and charged the State Planning Office with initiating a Critical Areas Program designed to identify, document, and conserve statewide critical natural areas through management agreements and donation or acquisition of property. Primary emphasis in the program at this time is on identification and registration of critical areas.

The kinds of critical areas evaluated by the program primarily correspond to the definition of "historic and fragile lands," from U.S. Senate Act 268, 93rd Congress.

> *" . . . lands where uncontrolled or incompatible development could result in irreversible damage to important historic, cultural, scientific, or esthetic values, or natural systems which are of more than local significance, such lands to include shorelands of rivers, lakes and streams, rare or valuable ecosystems and geological formations, significant wildlife habitats, and unique scenic or historic areas. . . ."*

Other natural resource experts with important contributions to the study included wildlife resource experts from the University of Maine at Orono, Maine Department of Inland Fisheries and Wildlife, and U.S. Fish and Wildlife Service, who were helpful in the identification and documentation of significant river related wildlife resources. The prior assessment of the state's rivers by the National Park Service for the Nationwide Rivers Inventory was the primary source of information for the evaluation of corridor development and scenic resources of the rivers in Maine.

A. GEOLOGIC/HYDROLOGIC FEATURES

Introduction

The majority of bedrock formations of the State were originally deposited as sediments on the bottom of the ocean during the Lower Paleozoic era (hundreds of millions of years before the present), as well as being formed from molten rock material from deep within the earth. Later in the Paleozoic period during the building of the Appalachian Mountains, these sediments were subjected to intense pressures and temperatures causing them to become folded, faulted, and uplifted, accompanied by intense volcanic activity. Today these durable igneous and metamorphic rocks are exposed in the Mountains of New England upland section of the state, as well as along parts of Maine's rocky coast. The finest examples of bedrock features – such as waterfalls, gorges, and fossils – are distributed in these areas of Maine.

Many of the bedrock materials outcropping along the banks of streams and rivers in northern Maine contain traces of organisms and plants called fossils, which once lived in the early marine environments hundreds of millions of years ago. The majority of these river related fossil localities lie within a band of non-to-partially metamorphosed rocks which sweeps across the central part of the state, ending in the northeastern corner of Aroostook County. Most of these fossils are marine vascular plants and invertebrates from the Lower to Middle Paleozoic era.

During the Quaternary glaciation, the state was covered with a mile thick accumulation of snow and ice, a much larger version of the glaciers which survive today in the European Alps and Canadian Rockies.

As the glaciers from Laurentide Ice Sheet moved southward from eastern Canada they scoured the bedrock formed millions of years earlier, shearing off the tops of many hills, ridges, and mountains. Approximately 10,000 years ago this ice began to melt, leaving behind a watery landscape of lakes, ponds, streams, rivers, and wetlands.

A veneer of boulders, sand, gravel, and clay also remained to blanket the landscape, testimony to the tremendous erosive power of the slowly moving glaciers. These deposits of glacial sediments formed many of the state's lakes by damming valleys widened and deepened by the glaciers. The hydraulic action of glacial meltwater initiated the process of erosion on underlying bedrock material, occasionally encountering cliffs or abrupt jumps in the landscape, and forming waterfalls. Normally, these hydraulic features degenerated into whitewater rapids as the bedrock eroded. For a waterfall to remain in a landscape, one of two conditions must have been present. Either the flow of the stream was insufficient to significantly erode the bedrock, or the rock contained a particular feature (such as cracks or joints) which allowed the waterfall to maintain itself as erosion proceeded. In this situation, the falls would migrate upstream with time, excavating a downstream gorge. Waterfalls also resulted from streams selectively eroding areas of weakness in the bedrock.

Many interesting surficial geologic formations were formed at the margins of the melting glaciers in the central and southern areas of the State; many of these glacial deposits are the finest examples in the northeast region. Surficial formations related to rivers include linear ridges called eskers or horsebacks, intricately braided streams with complexes of river islands, rivers with sinuous meander complexes, glacial outwash plains, glaciofluvial marine deltas, and washboard moraines.

1. Definition

There are river-related physical features in the state whose location and distribution are controlled by the structure and composition of the bedrock, by the surficial geology and by natural geologic processes including weathering and erosion.

Towering waterfalls, steep-walled granite gorges, systems of lakes, ponds, and wetlands, and surficial glacial formations are among these unique physical features. The distribution of these resources is a function of the geologic events occurring hundreds of millions of years ago, as well as resulting from events occurring after the melting of more than one mile of ice which covered Maine until approximately 10,000 years ago.

2. Significance

a. Scientific – Many of the geologic features associated with rivers have unique importance for scientific research. These features (such as glacial eskers, fossils, or gorges) are useful in the research of past geologic processes which affected the distribution and composition of rocks and minerals on the earth, as well as understanding present-day geologic processes changing the world.

Gorges and waterfalls contain large areas of steam washed and exposed bedrock, important in a state where most bedrock areas are obscured by glacial drift making scientific study difficult if not impossible. Waterfalls are also important geologic sites for study because they are not accidental features in a landscape; their location is a function of the bedrock geology and / or glacial history of an area.

The scientific study of the fossils found in the rocks of the state has greatly affected the understanding of the State's paleogeographic history and the knowledge of the types of ancient forms of life which once lived in what is now Maine. Some of the state's fossil sites are widely known and well-documented localities and have yielded specimens of museum quality; many are the finest found in the world. Still other sites have been discovered only recently and deserve more detailed study.

One river-related geologic locality which is reportedly crucial to the understanding of central Maine geology is Ripogenus Gorge. The Gorge, which contains a wide variety of sedimentary, igneous, and metamorphic rock types; displays significant geologic structures in addition to being an important Silurian fossil locality; was recently recognized by the National Park Service as a potential National Natural Landmark.

b. Scenic / Recreational – Because of their scenic and esthetic qualities, waterfalls and gorges are often linked to local and regional tourist economies serving as camping or fishing sites or scenic roadside vistas. Some gorges have large rapids run by commercial whitewater rafting interests which bring dollars into local areas.

c. Historic – The rivers of Maine are intimately tied to the State's history because of their importance as traditional transportation routes. Many gorges and waterfalls presented obstructions to former log running and have legendary significance. Others have since been modified by channel improvements for log running, or obliterated by downstream dams for hydroelectric generation. Occasionally, waterfalls and gorges were the sites for mills or small towns and have associated historic buildings with state and national significance.

d. Ecologic – Gorges and waterfalls often contain a great diversity of hydrologic and ecologic environments, and a variety of habitat for flora and fauna. These environments may include flatwater above the hydrologic feature, ledges, rapids, and shooting flow through the gorge or waterfall, with gravel floodplains and rapid water downstream. Ravines, gorges, and streamside cliffs are often more shaded, with higher humidity than most environments, and many species of rare plants are known to grow in such areas. Sandy glacial outwash plains are another river-related geologic feature which have a unique association of plants. The droughty infertile soils are often maintained as blueberry barrens, supporting the cultivation of wild blueberries.

3. Standards for Inclusion

Unique and significant geologic and hydrologic features in Maine are studied on a continuing basis by the Critical Areas Program. The physical resources studied to date include bedrock fossil localities, eskers, waterfalls, and gorges. Significant white water rapids in the state have also been identified by this program, and their findings were incorporated into the assessment of recreational boating by the Maine Rivers Study.

Geologic and hydrologic features meeting the significance criteria defined by the Critical Areas Program are recommended for inclusion on the Register for Critical Areas; at this time, 61 waterfalls and 19 gorges have been recommended. Significant eskers and fossil locations have also been added to the Register.

River-related geologic features recognized by the National Park Service in the Nationwide Rivers Inventory as important because of their uniqueness, rarity, or scarcity (one-or-two-of-a-kind nature, or having significance for a particular region of the state) were also included in this study. These features included reversible falls, glacial outwash plains, river-linked lake systems, and river meander complexes.

4. Evaluation Method and Criteria

During the assessment of the State's geologic and hydrologic features, general criteria were used to identify significant river-related physical features. These criteria were developed in order to identify areas of geologic and hydrologic importance associated with rivers which deserved recognition by this study, but had not been comprehensively studied on a statewide basis. These criteria included the following:

a. Scarcity: a resource with extremely limited distribution in the State, New England region, or United States; distinctly unusual, rare, one-or two of a kind features.

b. Diversity of values: significant physical features occurring in association with other values (i.e., a gorge which is a classic geologic type locality with habitat for endangered bald eagles and high recreational value).

c. Susceptibility to human activities; features which could be degraded or destroyed by human presence or activities.

d. Ecologic significance: resource sites which contain a variety of habitats and ecological values.

e. Historic value: features that were involved in the settlement, transportation, or early industrial activities of the State. A site was considered significant historically if: a) it had interesting military history; b) it was an important industrial or economic site; c) it was important in 19th century log driving activities.

f. Scenic / Esthetic value: resource features which were important to the local and regional recreation and tourist economies. A feature was considered to have outstanding scenic attributes if: a) it was of large magnitude in some way (length, depth, overall size); b) had good potential or existing vistas, and c) it had a diversity of hydrologic elements including rapids, chutes, flumes or falls.

g. Scientific attributes: a site was considered geologically outstanding if any one of the following criteria existed: a) it was a type locality or best exposure of a geologic formation; b) it had an exceptional display of bedrock structures; c) it displayed exceptional hydrologic features.

The fossil sites were considered scientifically significant if meeting on or more of the following criteria:

1) Areas which are the type of locality of a particular fossil (i.e. The area where there first specimens known to science were collected).

2) Areas containing a unique fossil assemblage, index fossils, and/or fossils useful for scientific age determination and correlation work.

3) Areas with educational value and frequently visited by school groups.

The following rivers were recognized by experts as having outstanding river related geologic resources and highlighted on the Final List of Rivers with an asterisk:

Upper Kennebec River
West Branch Penobscot River
West Branch Pleasant River

5. Information Sources and Expert Review

The following references were used by the study team to identify and document resource values.

Waterfalls in Maine and Their relevance to the Critical Areas Program of the State Planning Office; Brewer, Thomas, 1978

Gorges in Maine and Their relevance to the Critical Areas Program of the State Planning Office; Brewer, Thomas, 1978

A Preliminary Listing of Noteworthy Natural Features in Maine; Center for Natural Areas, June 1976.

Significant Bedrock Fossil Localities in Maine and Their Relevance to the Critical Areas Program; Forbes, William H., 1977

Nationwide Rivers Inventory; U.S. Department of the Interior, National Park Service, Mid-Atlantic Regional Office, Philadelphia, PA, 1981

Dr. Thomas Brewer of Boston College, Boston Massachusetts, and Janet McMahon and Harry Tyler of the Critical Areas Program within the State Planning Office provided information and expert opinion to the study team.

B. RIVER RELATED CRITICAL/ECOLOGICAL RESOURCES

Introduction

The State of Maine possesses an unusual abundance of water and related land resources, having more miles of river and more lakes per square mile than any other state in New England, as well as the highest percentage of land covered by forest of any state in the United States. Of the 19.8 million acres of land in Maine, 17.4 million acres (approx 88% of the state) is in forest, and 1.5 million acres (7% of the state) is covered by inland fresh water. This figure does not reflect areas of bogs and wetlands which are perennially wet or flooded for certain seasons of the year.

The topographic relief in Maine has produced a complexity of terrestrial ecosystems, which for the purpose of this discussion can be grouped into basic vegetative types: Alpine tundra, Northern hardwood spruce-fir, Northeast spruce-fir, transition hardwood-conifer, and transition hardwood. With the exception of Alpine tundra, any of these major vegetative associations may be found along a river corridor, depending on the altitude of the area, as well as other influencing factors such as soil type, steepness and aspect of slopes, and amount of moisture present.

Just below the alpine areas and on the tops of many of the lesser peaks in the White Mountains is the Northeast spruce-fir association, usually consisting of pure fir forest just below timberline, with red spruce increasing at lower elevations. These conifer forests grade into Northern hardwood spruce-fir forests downward, the transition occurring at about 2500 feet in the White Mountains. These forests contain a variety of hardwood and conifer species. Some of the conifers such as red spruce and fir drop out at lower elevations and in the more southern portions of Maine. Transition hardwood-conifer forests, found in extreme southwest Maine and along lower valleys in other parts of the state, have a greater number of southern species like white ash, black birch, black cherry, and increasing concentrations of red oak, white oak and hickory.

Soils throughout the state are largely developed from glacial tills and stratified drift, tending to be podsols (soils with upper horizons depleted of plant essential nutrients) at higher elevations under spruce-fir forests, and brown podsolics at lower elevations. Most of the soils are acidic, although limestone areas throughout the state often have unique calciphile (or calcium loving) vegetation, occasionally with associations of rare and endangered plant species.
These are other special types of river-related vegetation in Maine found with certain types and conditions of soils. Areas of coarse sandy glacial outwash along many rivers support pitch pine barrens. In some cases these areas are maintained in a lower successional stage as blueberry barrens by controlled burning and other management practices.

White pine is another species that grows well in glacial outwash areas, where it can reproduce without competition from other species of trees. This tree also grows well on steep-sided riparian areas (along rivers, steams, lakes, and ponds) in a variety of soil conditions. The vast majority of the immense pines which once grew along the rivers of Maine have been cut, although a few stands of old growth white pine exist in the state. The most notable example of these is The Hermitage stand along the West Branch of the Pleasant River.

Low, cool, poorly drained sites in Maine often support classic bog ecosystems, with typical acid peats resulting from the accumulation of sphagnum moss. These bogs are important natural areas, supporting many endemic, unique, or peripheral species of plants (especially orchids) which are found only in these unusual biotic systems. A special type of bog forest characterized by Eastern Atlantic or coastal white cedar is found in some parts of mid-coastal and southeastern Maine. Another unique type of bog sometimes within river corridor areas is the raised bog, formed in depressions on drier ridges surrounding bogs. A mound several feet high is formed by the accumulation of sphagnum moss, while water is retained by the sponge-like consistency of the moss.

Of all the various ecosystems associated with rivers, perhaps the most significant are the wetlands, the transition zones between the terrestrial and the aquatic environments. Wetlands have outstanding natural value (for the production of photosynthetic oxygen, as catchments for flood waters, pollution filters, and aquifer recharge areas and for species habitat) as well as significant economic value, supporting the important statewide hunting, fishing, and trapping recreational community. Inland wetlands have primary importance as feeding, nesting, and rearing areas for waterfowl.

Although generally associated with waterfowl, wetlands provide habitat for many furbearing animals as well. Otter, beaver, muskrat, mink, and others are directly dependent on these areas for their food and shelter. Other species such as deer, woodcock, and hare often inhabit areas bordering these wetlands. In addition to the previously mentioned furbearers and game animals, numerous non-game species depend on wetlands to supply some or all of their life requirements. Tidal rivers and salt marshes have plants which are adapted to changes in water level, salinity, temperatures, and nutrients. These coastal rivers and wetlands serve as resting areas for spring and fall migrations of waterfowl, as well as wintering areas for waterfowl and raptors, including the endangered bald eagle.

There are other areas associated with rivers that support unusual assemblages of plants, including certain relict and endemic species. These are highly specialized species, influenced by subtle changes in sunlight, humidity, temperature, and soil moisture, texture and composition. These areas include cliffs, where plants are subjected to fluctuations and extremes of light, temperature, climate, and erosion, as well as ravines and gorges which have shaded, humid conditions preferred by certain species.

BOTANIC CRITICAL / ECOLOGIC RESOURCES

1. Definition

There are over 2,100 species of vascular plants known to occur in the State of Maine. Of these, 318 species are considered scarce or rare. The Critical Areas Program has identified 97 species known to inhabit riverine areas. Significant habitats for vascular plants include cliffs, gorges, river and stream banks, pond and lake margins, bogs, and wetlands.

The causes of the rarity of these plants can be difficult to define at times, although the majority of the rare plants can be identified in one or more of the following categories, according to the Critical Areas Program:

a. Species with scarce habitat within the State (although more common elsewhere)
b. Species at the northern or southern limit of their range.
c. Species with a very restricted natural range (endemics).
d. Species with seriously declining populations.
e. Species which, for a variety of reasons, are rare throughout their entire range.

The definition of rarity can be complex, since it is a function of the actual limited distribution of the plant in its habitat, as well as its perceived value to our society. The Critical Areas Program has defined rarity primarily by its biological distribution. A plant species is considered to be rare if its has been found in ten (or fewer) towns in the state; a species may be found in more than 10 towns and still be considered rare if it is at the limit of its range, is declining or vulnerable, or is restricted in distribution throughout its range.

2. Significance

The values of plants to our society and to other animals of the land and waters of this world are infinite. Plants regulate temperature near the earth, maintain the atmospheric balance of carbon dioxide to oxygen, convert solar energy into stored chemical energy needed by animals, have educational and aesthetic value, and supply an endless variety of medical and chemical products for humans. Communities of plants are important for soil development, prevention of erosion, storage of water, and providing food and shelter to many species of animals.

The many varieties of rare and unusual plant species are found in habitats which are unstable and changing, and subject to climatic extremes. The gene pool of these plants is a storehouse for traits necessary for breeding new species, as well as representing unknown potential as a source of new chemicals and drugs to serve mankind.

3. Standards for Inclusion

Using data on the distribution of rare plant species, as well as the previously mentioned rarity criteria, a group of botanists has assigned levels of importance to rare plants in the New England region. The Critical Areas Program has adopted this system for its own work in the state, assigning each listed plant species to one of three levels of importance; National, New England, or State.

National level rare species are of two types;
1) Presently listed as a Federal Endangered or Threatened Species, or proposed for review or under review for listing by the Office of Endangered Species of the U.S. Fish and Wildlife Service, or
2) found in few areas outside of New England, although not having official recognition as nationally threatened.

Species considered rare within New England are vascular plants listed through a joint effort by the U.S. Fish and Wildlife Service and New England Botanical Club. Some of these species may be rare throughout New England, but are common in Maine, and are obviously not included on this list.

Species rare at the state level are those species not considered rare through most of their range, but are rare within this state. The majority of species in this level are species reaching their northern limit in Maine.

In addition to identifying rare vascular plants, the Critical Areas Program has also assessed unusual stands of old growth white pine around the state. Significant river-related stands on the Presumpscot River, West Branch Pleasant River, and Vaughan Brook have been included in this study.

4. Evaluation Method and Criteria

The known or suspected locations of critical botanic species along the rivers in Maine were mapped, and segments containing the range of distribution of the plant species were defined using the following criteria;

a. Plant species were considered to be river-related if found within the one-quarter mile land corridor adjacent to either bank of the river.

b. A one-mile buffer zone in both directions of a species locality was included within the segment description, in order to account for possible disjunct populations of rare vascular plant species.

Once all localities of plant species were mapped, the river segments were analyzed to determine their overall significance for critical and rare plants, based on the diversity of species at the various levels of importance (National, New England, State).

A system of points was assigned to each of the particular levels of significance, as follows.

	Points
a. Species on the Federal Endangered and Threatened List. Pedicularis furbishiae (Furbish lousewort) is the only riverine plant species on the list at the present time.	5
b. Species under review for inclusion on the Federal Endangered and Threatened List. These species are: Listeria auriculata; Oxytropis campestris var. johannenis; Viola novae-angliae; Cardamine longii	4
c. Other species with National level significance	3
d. Species with New England level significance	2
e. Species with state level significance	1

One half (0.5) points were deleted from the score for each species if a particular plant location of a species was based on historical records of botanists, and the location is only suspected and has not been verified in recent years by Critical Areas Program or other approved botanists. Thus, based on this scoring system, a river segment with a known location of Oxytropis campestris var. johannensis (National level significance), and suspected location of Gentiana amarella (New England level of significance) would be awarded a score of 5.5 points (4+ 1.5 points).

Based on this system of scoring, the following rivers were judged to be clearly outstanding on the basis of critical/rare vascular plant species, and identified with an asterisk on the Final List of Rivers;
St John River, between Hamlin and Hafford Brook
Aroostook River, between the Canadian Border and Pudding Rock

Information was also gathered on ecologic plant areas which have been recognized as having national significance by the Department of the Interior under the National Natural Landmarks Program. The following rivers with related National Natural Landmarks have been highlighted on the Final List of Rivers with an asterisk:

Dennys River – Meddybemps Heath, in the headwaters of Meddybemps Lake
Mattawamkeag River - Thousand Acre (Crystal) Bog, along Fish Stream & East Branch Molunkus Stream
Passadumkeag River – Passadumkeag Marsh, along Cold Stream
West Branch Pleasant River – The Hermitage Old Growth White Pine Stand

5. Information Sources and Expert Review

The following references were used by the study team to identify and document resource values.

Rare Vascular Plants in Maine, Critical Areas Program Report, June, 1981
A Preliminary Listing of Noteworthy Natural Features in Maine, Maine Critical Areas Program, June 1976

Mr. Harry Tyler and Ms. Susan Gawler of the Critical Areas Program within the State Planning Office provided information and review to the study team.

ZOOLOGIC CRITICAL / ECOLOGICAL RESOURCES

1. Definition

The reduction and deterioration in habitat of many species of river related wildlife is of major concern to the scientific community in the perpetuation and continued viability of these resources. When a type of habitat or significant ecologic area having certain necessary and indispensible qualities is destroyed or degraded, certain zoologic species suffer a reduction in abundance and may ultimately be threatened with extinction. For the purposes of this report, the following definition of critical or endangered zoologic species is offered.

a. Endangered – A species whose prospects of survival and reproduction are in immediate jeopardy. Its peril may be the result of a single cause or variety of causes, including the following:

1. Habitat: loss or change of habitat, high specialization of habitat, and restricted distribution.
2. Reproduction: small size of litters, long period of gestation, slow maturation of young
3. Behavior Patterns: poor adaptability to changing conditions.
4. Competition and predation
5. Over exploitation
6 Disease

b. Rare or Critical – A species, not presently threatened with extinction, but having such a small population or area of habitat throughout its range that it could face endangered conditions in the future if its environment worsens.

2. Significance

Critical zoological resources are of importance to the environment in the State of Maine by insuring the preservation of natural diversity in an ecosystem. The maintenance of a heterogeneous species pool allows a particular species to more readily adapt to changing environmental conditions. The preservation of critical and endangered species has a cultural significance as well, which comes from a deep-seated psychological and philosophic evaluation of the environment, including a refined reverence for life. This view holds that all plants and animals have value as intrinsic components of the living part of our planet and should not be destroyed through man's intentional or inadvertent activities upon the environment. In this view, species extinction brought about by man's activities is considered a cultural disaster.

3. Evaluation Method and Criteria

Due to the absence of a well developed data base a comprehensive assessment of river related wildlife and ecologic areas was not possible in the time allocated for this study. Where information was available on the statewide distribution and significance of certain species (such as bald eagles), then this data was incorporated into the study. Some wildlife resource experts did contribute information on regionally significant river related ecologic areas, which was noted in the documentation section of this report for the study's "A" and "B" rivers.

a. Federal Endangered Wildlife Species

The State of Maine has the only significant population of bald eagles in the northeast United States. The northern subspecies of bald eagles was officially listed as endangered in the state in February 1978. Coastal areas and river estuaries provide important habitat for the majority of Maine's wintering and breeding populations of eagles; Inland rivers, ponds, and lakes also have seasonal importance to nesting and summering eagles, although the use of these areas undergoes a marked decline during the winter months when ice cover limits their opportunities for foraging.

Wildlife biologists from the University of Maine at Orono have assessed river-related areas in the state for the presence of important habitat for bald eagles.

Important rivers are those with a significant concentration of birds for a particular region of the state, including:

a. Areas with active nesting sites
b. Areas with historic nesting sites
c. Areas which are used by significant concentrations of wintering eagles

Based on these criteria, the following rivers have been rated as outstanding for the presence of very significant concentrations of nesting and/or wintering populations of bald eagles and have been identified with an asterisk on the matrix with the Final List of Rivers:

Lower Kennebec River: including Merrymeeting Bay
Main Stem Penobscot River: Bucksport to Old Town
Dennys River: Hinkley Point to headwaters of Meddybemps Lake

b. Critical Zoologic Species with Statewide Significance

The Critical Areas Program is involved in an ongoing process of assessment of critical zoological species in the state. At the present time heron rookeries, horseshoe crabs, and American oysters are the only river-related critical species that it has evaluated on a statewide basis. Significant habitat areas for these species (such as nesting areas and breeding grounds), have been listed on the Maine Register of Critical Areas.

When assessing the significance of a particular zoologic species, the Critical Areas Program uses the following criteria:

1) Peripherality: the degree to which a species is at the edge of its typical geographic breeding range.

2) Endemicity: the range of distribution to which species is restricted (i.e. Found only in Maine out of the entire Northeast, out of the entire U.S., out of North America, out of the entire world).

3) Relative Scarcity: the number of sites where a particular species is know to be found

4) Probable Status Change: a measure of a species trend in population and sites of location over a specified period of time.

5) Relative Specialization of Habitat: the environmental requirements of a particular species and its degree of specialization to certain habitats; including its vulnerability to loss of habitat.

6) Scarcity of Habitat: the relative scarcity of potential or actual suitable habitat of a species.

7) Susceptibility to Disturbances: the relative degree of tolerance of a species to immoderate human presence.

8) Relative Knowledge: the amount of information available on the distribution and scarcity of a particular species.

9) Relative Use: the general level of public interest in a species.

10) Spatial Distribution: a measure of the pattern of distribution of a species over its geographic range.

11) Probable Site Persistence: the relative probability of species presence at a certain location for a majority of years over a given span of time (usually 20-25 years).

12) Seasonal Mobility: the conditions of seasonal movements of a species

13) Area Size Needs: the area required by a species for all life needs (breeding sites, feeding grounds, territory) during its breeding season.

c. Critical Ecological Areas

The Maine Department of Inland Fisheries and Wildlife has identified and inventoried eight inland and six coastal types of wetlands located around the state. The Land Use Regulation Commission has also zoned fish and wildlife protection sub-districts for deer wintering yards and wetlands in the unorganized territories. Regional biologists associated with the Department of Inland Fisheries and Wildlife were able to document the more important ecologic areas for many of Maine's rivers. These areas included critical coastal salt marshes important for shorebirds and migratory and wintering waterfowl, significant acreages of inland wetlands and their associated fauna, and large deer wintering areas.

4. Information and Expert Review

The following references were used as sources of information for this study:

A Preliminary Listing of Noteworthy Natural Areas in Maine:
Center for Natural Areas; South Gardiner, Maine 1976

Register of Critical Areas,
Maine Critical Areas Program, Maine State Planning Office

An Ecological Characterization of Coastal Maine,
U.S. Department of the Interior, Fish & Wildlife Service; Newton Corner, Mass., 1980

Bald Eagle Management Plan, Ray Owen and Charlie Todd,
University of Maine at Orono, School of Forest Resources
Expert opinion and review was provided by Ray Owen and Charlie Todd from the University of Maine at Orono, resource biologists from the Maine Department of Inland Fisheries and Wildlife, and the U.S. Fish and Wildlife Service.

C. UNDEVELOPED RIVER AREAS

1. Definition

Any physical alteration of the land surface will influence the natural processes along the river corridor. Construction activities can cause increased soil erosion and runoff to enter a stream; septic tank effluent from seasonal homes along river banks can cause changes in water quality. Development in the river corridor may have a negative or positive impact on the resources of a river depending upon how it alters the essential elements which compromise it.

2. Significance

Undeveloped lands contiguous to the rivers of Maine represent some of the more significant natural resource areas in the State. The interface between the adjacent land and the flowing water of a river is an important area, providing food, cover, and habitat for a variety of fauna and flora. Wetlands associated with rivers have special importance in the hydrologic and biological systems, serving as areas for aquifer recharge, acting as catch basins for flood waters, filtering out pollution, producing oxygen by photosynthesis, and providing species habitat. Forests and ground cover lining the river banks cool the waters by providing shade, and prevent soil erosion. River corridors in the natural state often have high quality scenery for recreational users of the river. It is clear for all these reasons that undeveloped corridor lands warrant the conservation and protection of their special qualities.

3. Standards for Inclusion

Rivers and river segments in Maine which were evaluated for the amount of existing corridor development must have met the following qualifying criteria.

a. The main stem of a segment must be greater than 10 miles in length (tributaries to the main segment could be less than 10 miles in length) .

b. The river or river segment must be free from significant hydrologic impoundments, modifications, and diversions.

Once the river evaluations were conducted, a cutoff value of 30 development points per mile was used to define the more significant undeveloped rivers in Maine. An explanation of the development point system of evaluation follows in the next section.

4. Evaluation Method and Criteria

The National Park Service of the Department of the Interior developed a process for evaluating the undeveloped character of a river corridor in its work on the Nationwide Rivers Inventory. The method used for the Inventory was adapted for use in this study. The assessment of land use development in river corridor areas was made using the most recent USGS 7.5' or 15' quadrangle maps available. This information was supplemented in some cases with aerial photos and local road maps and atlases.

Each river and river segment was measured on the map and divided into one mile intervals beginning with the downstream segment boundary. The study river corridor (defined as contiguous lands within one quarter mile of each river bank) was also defined on the map.

Using data sheets, all land use development was recorded for each mile interval, and numerical values were assigned to the various land uses. Development having a greater impact on natural values, (i.e. bridge crossings, parallel railroads and power lines, and small towns) were given more points than lower impact development (i.e. footpaths and unpaved roads).

The following is a list of land use features typically found within river corridors and their corresponding development points.

Land Use Development Features	Points
Primitive road ending	1
Footbridge	2
Gaging station	
Primitive road parallel (trail)	3
Small dock	4
Unpaved road ending (plain)	
Orchards, farms, dwellings, cemetery	5
Abandoned rail line ROW	6
Outfalls	
Railroad ending	8
Powerline ending	
Fire tower	
Outbuildings, schools	
Unpaved road	
Light duty bridge (plain)	
Paved road ending (red)	10
Paved boat ramp	
Campground	
Picnic area	
Unpaved road parallel (plain)	
Pipeline and powerline crossing	15
Railroad bridge	18
Paved road bridge (red)	

Land Use Development Features	Points
Railroad parallel	20
Paved road parallel (red)	
Pipeline parallel	25
Powerline parallel	
Water storage tank	
Bulkhead	
Rip rap	
Small Tributary reservoir	
Gravel pits	
Developed recreation area	30
Marina (site check)	
Country club	
Swimming pool	
Radio tower	35
Power substation	
Pumping station	
Paved road bridge (4 lanes)	40
Sewage plant	
Apartment building	
Hospital (site check)	
Village (up to 499 pop / site check)	
Dam (small)	

After the land use development features for the river segment were identified, the numerical scores for each one mile interval were tabulated. By totaling all interval scores, and dividing through by the number of intervals (river miles), an average mile by mile index of the river's corridor development was calculated.

Outstanding River Segments

Examination of previous National Park Service work for the Nationwide Rivers Inventory has shown that rivers with an average of less than 15 point per mile are
equivalent to the least developed rivers in the northeast United States. Outstanding undeveloped rivers in the State with a corridor development index of 15 points or less and a length greater than 25 miles were identified with an asterisk on the matrix accompanying the Final List of Rivers: and are as follows:

Allagash River Aroostook - Machias System
East Machias River
Machias River (Washington County)
East Branch Penobscot – Seboeis River System
Upper West Branch Penobscot River
Pleasant River (Washington County)
St Croix River
St Francis River
St John River (including the Big Black, Little Black, and Baker Branch)

5. Information Sources and Expert Review

The following references were used as sources of information for this study:

Wild and Scenic Rivers System Study – Northeast Region, US Department of the Interior, Heritage Conservation and Recreation Service, Northeast Region, Philadelphia, Pennsylvania.

Wild and Scenic Rivers System Study – Northeast Region, Guidelines for Evaluating Wild, Scenic and Recreational Rivers.

Nationwide Rivers Inventory, Criteria for River Evaluation; US Department of the Interior, Heritage Conservation and Recreation Service, Northeast Regional Office, J. Glenn Eugster, October, 1979

Nationwide Rivers Inventory – Final List of Rivers, State of Maine, US Department of the Interior, Heritage Conservation and Recreation Service, Northeast Regional Office, January 1981

Nationwide Rivers Inventory, Criteria for Establishing River Priorities: US Department of the Interior, Heritage Conservation and Recreation Service, Northeast Regional Office, J. Glenn Eugster, April, 1980

J. Glenn Eugster from the National Park Service in Philadelphia provided information and expert review for this portion of the study.

D. SCENIC RIVER RESOURCES

1. Definition

Different river areas in Maine possess different types of scenery. Traditionally, scenic river resources have been identified by user preference studies and professional evaluations. To determine user preferences, groups of people are usually shown a series of river area photos, and asked to rate them according to preference or quality. Results are then analyzed to determine which river and landscape corridor elements or mix of elements correlate highly with preferred areas.

In professional evaluations, river areas are analyzed by trained planners according to a set of fixed criteria using either design principles, ecological and cultural criteria, or a quantitative scale.

In both instances the objective is to focus on specific variable river and river corridor characteristics which have been determined to be major influences on perceived scenic or landscape quality.

2. Significance

For many years there has been a growing recognition of the concept that certain landscape elements such as scenery are unique resources worth identifying and protecting. In fact, there are many federal and state laws and regulations which address the growing need for management of visual resources. Until the 1960's the area of public environmental management and policy related to scenic resources developed mostly in the context of outdoor recreation. The focus was predominantly on the management and preservation of specific areas with unique or outstanding scenic attributes. Concern with scenic values in the context of a larger landscape area or the relationship of scenic values to a wider range of resource issues are a side effect of environmental legislation within the last 15 years. For example, at the federal level, scenic and aesthetic considerations were addressed in the National Environmental Policy Act of 1969, the Coastal Zone Management Act of 1972, and the Wild and Scenic Rivers Act of 1968. The State of Maine followed the approach of these laws when it formulated the Mandatory Shoreland Zoning Act and Site Location of Development Act.

Scenic values and qualities have been recognized for years in the real estate field, which has assigned higher market values based on public demand to certain scenic features, such as properties with mountain views, or locations on river or lake waterfront areas. The Maine tourism industry also recognizes the scenic qualities of the State's river environment in many of its programs.

3. Minimum Standards for Inclusion

Initially rivers, river segments and other landscape areas were identified using recognized sources of scenic or visual information such as the Nationwide Rivers Inventory, various Critical Areas Program reports, canoe guides, travel information and other documents. To be placed on the <u>Preliminary Draft List of Rivers Under Evaluation,</u> rivers had to be recognized or documented as being scenic or possessing a high degree of visual quality due to a specific feature, characteristic or element. All sources of information, whether subjective or objective, were treated equally.

4. Evaluation Method and Criteria

The two basic components of the scenic river resource assessment are land form and pattern. The quality of any scenic river experience is dependent on the synthesis of land pattern into the overall land topography.

Land forms are the natural forms of the surface of the earth, the mountains, rolling hills and valleys which form the overall context of a natural landscape. The study of land forms constitutes an important part of a scenic river resource assessment, through the visual impact of dominant landscape forms, as well as affecting the patterns and distribution of other components of scenic river areas.

Land use pattern is the interlocking texture of fabric of the landscape including man and the by-products of his technology and culture. Patterns of land uses are a function of combinations of the parts of the natural and built environment and their overall composition. The composition of these parts is an important determinant of the visual quality of a landscape. For example, a small New England river hamlet against a steeply forested mountain range, or a sandy floodplain area next to a large rock outcrop are examples of contrasting combinations of texture which create patterns that are visually interesting. The nature of our perceptions depends upon the combination of natural and built pattern within the existing landform. The scenic quality of the river environment will depend on the quality of both the natural pattern and built pattern, and on the extent to which the two patterns are meshed or harmonized with one another.

The perceived scenic quality of a river and its corridor will also be a function of the frequency and diversity of the various natural and man-made components which combine to form a landscape (such as geomorphic and hydrologic features, vegetation, and cultural values), as well as the interrelationships among these components. Scenic resource values can be defined based on general relationships among components of a landscape. These relationships, which become the basic principles upon which assessment of river-related scenic resources is based, include the following:

- As the relief increases, the scenic quality of the river corridor increases
- As the landscape becomes more rugged, the scenic quality of the river corridor increases
- As the amount of enclosure by vegetation increases, the scenic quality of the river corridor increases
- As the diversity of land uses increases, the scenic quality of the river corridor increases
- As the naturalness of a landscape increases, the scenic quality of the river corridor increases.

- As the amount of tree cover increases, the scenic quality of the river corridor increases.
- As the density of land use edges increases, the scenic quality of the river corridor increases.
- As the diversity of land use edges increases, the scenic quality of the river corridor increases.
- As the compatibility of land use increases, the scenic quality of the river corridor increases.
- As the water surface and water edge increases, the scenic quality of the river corridor increases.
- As the size and length of the view increases, the scenic quality of the river corridor increases.

In general, spatial variety and three-dimensional contrast are positive values within a given river corridor's landscape composition. The greater the contrast and variety in spatial landforms and patterns, the higher the perceived scenic value. Spatial variety is judged on the shape of spaces, the degree of enclosure by landform or vegetation, and the diversity of shape, pattern, and enclosure which exist in a landscape.

Once relationships among compatible parts of a landscape have been defined, it is possible to proceed with the analysis by identifying the presence of specific landscape components or combinations of components which have scenic value. The following are river and landscape features and components which were identified in this analysis:

1) Landscape Physiography

This qualitative evaluation of physiographic relief will give an index of three dimensional contrast in a river-related landscape. The topography surrounding a river corridor is classified into one of the seven categories of form, representing a continuum of physiography from flatland to mountains. The underlying assumption is the greater the amount of relief in a river corridor, the greater the scenic quality.

2) Landscape Diversity

The amount of spatial variety is another measure of scenic value in a landscape. The scenic value of a river corridor will be enhanced when there is a diversity of hydrologic, geomorphic, and vegetative elements present. A general rule is the greater the diversity of landscape elements (land, water, vegetation) the higher the scenic quality.

a) Hydrologic features inventoried included channel shape, the presence of waterfalls, cascades, and whitewater rapids, tributary confluences, ponds and lakes, river islands, and complexity of water edges. The presence of hydrologic features (such as waterfalls and rapids) that have universal public appeal will enhance the scenic qualities of a river corridor. Scenic quality will also increase as the complexity of hydrologic elements increases. The greater the sinuosity of a river channel, the greater the visual carrying capacity of recreational users at the river's surface. In a similar manner, the more irregular or complex a river's shoreline or corridor (from the presence of river island complexes or tributary confluences for example), the higher its visual quality.

b) Vegetative features inventoried on the rivers included the percentage of tree cover, diversity of vegetative types, presence of forest edges, and forest wetland contacts. The underlying assumption was that scenic quality increases with the increased amount of tree cover, density of forest edges, and diversity of vegetation.

c) Outstanding geomorphic landforms and landscape features were identified for each of the three physiographic sections in Maine (Seaboard Lowland, New England Upland, and White Mountains) and then inventoried for each of the evaluated rivers. These representative and unique scenic features, by physiographic section, included:

- Seaboard Lowland

Landforms: undulating topography, worm clam flats, tidal marshes, beaches, and dunes

- New England Upland

Landforms: rolling topography, bold dome-like hills, soft round hilltops, steep side slopes and V-shaped gullies.

Drainage: curved dendritic, right-angle tributaries, glacial ponds and swamps, oxbow lakes

Landscape Features: eskers, kames, moraines, monadnocks, glacial erratics fields

- White Mountains

Landforms: V-shaped valleys, conical peaks in rows, eroded cliff and bench topography.

Drainage: radial, dendritic, deranged,

Landscape Features: ravines, escarpments, monadnocks, eskers, drumlins, kames, lake deltas, other glacial features.

In addition to inventorying these specific features which are thought to increase a river corridor's scenic quality, other geomorphic elements were identified which by their complexity of form or shape, add to river scenery. These elements of form are defined as relief enclosure.

- Relative Relief: the scenic quality of the river corridor will increase with greater relative relief. To calculate, elevation points were selected at quarter-mile intervals on a topographic map for a river area, and the lowest elevation point was subtracted from the average high elevation.

- Enclosure: as the amount of enclosure increases, scenic quality increases. Enclosures were measured by calculating the percentage of area enclosed by (lying below) the median of relative relief.

3) Land Use Diversity and Compatibility

Land use diversity relates to the number of different land use types, their areas, and the length of their edges. Compatibility of land use is a measure of the visual congruence (the visual fit) of adjacent land uses. Land use includes visually distinctive types of surface cover such as agricultural fields or forest, which may support more than one use.

b. Evaluation Methodology

The National Park Service of the Department of the Interior developed this process of scenic assessment outlined in the previous section for its work on the Nationwide Rivers Inventory. Evaluation of scenic river landscapes was conducted for the Inventory using the most recent USGS 7.5’ of 15’ quadrangle maps available, supplemented by field work, videotapes and slides from low-altitude helicopter flights over many of these rivers. Substantial use was made of this existing data base which was modified and expanded where appropriate for the Maine Rivers Study.

For this study’s scenic river assessment, each river or river segment was measured on a topographic map and divided into one mile intervals beginning with the downstream segment boundary.

Using data sheets, all significant scenic landscape components were recorded for each mile interval. Greater value was assigned to segments with an outstanding diversity of components, or those riverscapes with a highly compatible combination of vegetative, hydrologic, geomorphic, and cultural values.

5. Information Sources and Experts

The following references were used as sources of information for this study;

Nationwide Rivers Inventory – Criteria for River Evaluations: US Department of the Interior, Heritage Conservation and Recreation Service, Northeast Regional Office, Philadelphia, Pa. 1979

Study of Visual and Cultural Environment for North Atlantic Region: Research Planning and Design Associates, Amherst, MA, published as Appendix N, North Atlantic Water Resources Study, November 1970

Guidelines for Identifying and Evaluating Scenic Resources; Hudson River Basin; Water and Related Land Resources Study, Technical Paper 4, October 1978

A Preliminary Listing of Noteworthy Natural Features in Maine: Center for Natural Areas, South Gardiner, Maine, June 1976

J. Glenn Eugster from the Mid-Atlantic Regional Office of the National Park Service provided information and review for this section of the study.

E. HISTORICAL RIVER RESOURCES

1. Definition

The rivers of Maine have long served a vital role in the colonization, development, and industrial growth of the state. This part of the Maine Rivers Study focused on the identification of river related historic places and sites which have achieved recognition as national Historic Landmarks or are listed on the National Register of Historic Places. It is realized that many of the rivers of Maine have historical and cultural value other than these recognized on the national level, such as the historic use for logging runs, the presence of archaeological sites, building with state or local importance, or settlements which represent unique cultural values. However, a lack of expertise and state agency assistance did not permit a more comprehensive survey by the study team. Thus, this discussion will focus on National Historic Landmark and National Register sites associated with rivers in the state.

2. Significance

River-related national historic landmarks and places in Maine are visible reminders of the events, places, and objects which have affected broad patterns of American history and reflect the evolution of industry and culture in this state and the US. They contain prehistoric and historic villages of the American Indian and early colonists, fortifications for the protection of access to waterways, sites of industry and resource extraction activities, and bridges with unique architectural styles. All historic areas designated as National Historic Landmarks are of national significance; other properties which are nominated by the State of Maine and placed on the National Register of Historic Landmarks after approval by the Secretary of the Interior are of national, state, or local significance. In recent years, building districts which possess a composite quality and evoke a special feeling and association have been added to the National Register. Such districts may contain individual buildings which of themselves may not be outstandingly significant but which, as an assemblage representing a special character of an urban or rural waterfront or port, possess national, state, or local significance.

3. Standards for Inclusion

There are many National Historic Sites which are found along rivers in Maine. However, only those sites which have a direct connection to the river, in terms of industrial, economic, or cultural importance (such as former significant winter ports or fortifications at the mouths of rivers for the defense of upstream settlements) were noted as significant by this study.

4. Evaluation Methods and Criteria

To attain the designation of National Historic Landmark, a property must be studied by National Park Service historians, architects, or archaeologists, usually as a part of a major theme in American history such as Social and Humanitarian Movements or Agriculture. The property should meet three general criteria:

1) significance in a given field
2) association with individuals and events
3) integrity, the latter meaning that original and intangible elements which contribute to national significance must remain intact

Potential landmarks are brought semi-annually before two advisory boards of scholars and national leaders – the Consulting Committee for the National Survey of Historic Sites and Buildings, and the Advisory Board on National Parks, Historic Sites, Buildings, and Monuments. These boards review the presentations of National Park Service professionals. Those properties which meet the approval of the Secretary's Advisory Board are recommended for landmark status. The actual designation is effected when the Secretary of the Interior, acting upon the counsel of his Advisory Board, approves landmark designation. The National Historic Landmarks Program is the only honorary historic preservation program of its kind in the Nation.

Because of their recognized national significance, National Historic Landmarks associated with particular rivers in Maine have been noted on the matrix accompanying the Final List of Rivers with an asterisk, to highlight their outstanding historic value.

A variety of criteria have been defined to guide the State, Federal agencies, and the Secretary of the Interior in evaluating potential entries in Maine for addition to the National Register of Historic Places, and include the following:

The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

a. That are associated with events that have made a significant contribution to the broad patterns of the state's history; or

b. That are associated with the lives of persons significant in the state's past; or

c. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d. That have yielded, or may be likely to yield, information important in prehistory or history.

Before submission to the National Register, all nominations must be approved by a State review board whose membership includes professionals in the fields of architecture (or architectural history), history, and archeology. If the property meets the National Register criteria, the board recommends it for nomination. The nomination form is then signed by the State Historic Preservation Officer and forwarded to the National Register, which reviews the potential entry and decides whether to accept or reject it.

5. Information Sources and Expert Review

The following references were used by the study team to identify and document resource values:

National Register of Historic Places, US Department of the Interior, Heritage Conservation and Recreation Service, Washington, DC, 1976

Annual Listing of Historic Properties, National Register of Historic Places; US Department of the Interior, Heritage Conservation and Recreation Service, Federal Register; Tuesday, February 6, 1979
_______________________; Federal Register, Tuesday, March 18, 1980
_______________________; Federal Register, Tuesday, February 3, 1981

The State Historic Preservation Office was requested to participate in the identification, documentation, and review of significant historic and cultural rivers but declined.

Unique Recreational Rivers – Overview

Both the economically important tourist industry and the life style of Maine residents rely heavily on the recreation use of the state's natural resources. Rivers are important components of this recreational use, providing diverse recreational experiences to a variety of interests. Recreational activities associated with rivers include camping, picnicking, fishing, boating, hiking, sightseeing, swimming, hunting, skating, and sailing.

While each of these activities is important to varying degrees, the Maine River Study has restricted its recreational analysis to activities which are:

1) directly dependent on free-flowing river resources
2) highly popular throughout the state, and
3) engaged in by large and readily identifiable user groups.

The recreational categories chosen for analysis include recreational boating (canoe touring, white water boating, and extended back country boating), inland fishing, and anadromous fishing.

For each recreational category, rivers were evaluated according to resource significance, economic importance, and user priority. This evaluation process recognized that user preference ultimately plays a dominate role in the determination of a river's value as a recreational resource. Input from concerned user groups was therefore sought throughout the process, with a strong attempt made to arrive at a consensus of opinion among users regarding the recreational significance of specific rivers.

This user input, coupled with objective analysis by resource experts, resulted in the category findings detailed in this report. The specific method used for each recreational category follows.

A. ANADROMOUS FISHERIES

a. Definition

Fresh water and tidal rivers which empty into the ocean or salt water estuaries provide vital habitat for anadromous fish. An anadromous fish species is characterized by its migratory nature, spending much of the life cycle in salt water but returning to fresh water to spawn. Catadromous fish species (e.g. the American eel) reverse this pattern by migrating to the ocean to spawn. For the purpose of this study, catadromous fish are considered to be included in the anadromous category.

The Maine River Study has identified important anadromous fishery rivers and isolated those that are of highest value to the state and its residents.

b. Significance

Historically, anadromous fish were of high importance to Maine's commercial fishing industry and were a dependable food source for coastal river inhabitants. While extensive commercial fishing depleted this resource, it was the increase in industrial pollution and the construction of impassable dams which most seriously depleted anadromous fish populations. The creation of the Atlantic Sea Run Salmon Commission in 1947, as well as the state Department of Marine Resources' strong commitment to anadromous fish restoration beginning in the mid-1960's, provide evidence that Maine recognizes the tremendous ecological and recreational significance as well as the commercial value of the state's anadromous fish.

a. Ecological Importance – Many of Maine's coastal rivers are characterized by their exceptional potential to support anadromous fish, both in numbers and species diversity. Of special note are the rivers which provide habitat for the more sensitive species. The shortnosed sturgeon found in a limited number of rivers is listed as an endangered species by the federal government. The American shad and Atlantic sea run salmon have also had their numbers severely reduced and depend on Maine rivers for their survival.

Maine's six rivers with fishable self-sustaining Atlantic salmon runs are unique, as no other state can claim even one. At least three additional rivers in the state are recognized as having high potential for restoration of historic Atlantic salmon fisheries.

b. Recreational Importance – The Atlantic sea run salmon fishery is recognized as a statewide high priority resource of value to Maine's recreational fishing interests as well as to the state's tourist industry. The Penobscot River is the most heavily fished Atlantic salmon river in the country; the value of this one river to the tourist industry is estimated to be a half million dollars per year. The American shad and rainbow smelt also are potentially of high recreational importance. Smelt are currently popular as a winter fishing resource. Overall, more user-days are expended fishing smelt that any other of the state's anadromous fish species.

c. Commercial Importance – Salmon, smelt, shad, and alewife were historically of high value to the commercial fishing industry. While the depletion of salmon, shad, and smelt have lessened their commercial importance, the alewife, which is an essential lobster and trawling bait, continues to be an important commercial fishery. According to the Maine Department of Marine Resources, landing of alewife doubled between 1970 and 1977, with total catch tripling during this time. with successful restoration, shad and smelt could also contribute significantly to Maine's commercial fishery industry.

Restoration efforts by the State Department of Marine Resources and the Salmon commission, assisted by federal funding, are beginning to produce results. Restoration, coupled with improvements in water quality and proper planning for future impoundments, will ensure that the ecologic, recreation, and commercial potential of Maine's rivers as anadromous fish resources will be realized.

3. Standards for Inclusion

Rivers were included in the Preliminary Draft List of Rivers Under Evaluation if they met the following standards:

a. The river must be a viable anadromous fishery resource. It therefore must either currently support a substantial anadromous fish population or have realistic potential for restoration as evidenced by:
  a) current restoration efforts, or
  b) management plans which call for timely restoration.

b. The river must drain a minimum of 25 square miles before discharging into tidal waters. (Thirty of Maine's sixty coastal rivers meet both of these standards).

4. Evaluation Method and Criteria

The criteria used to evaluate anadromous fishery river significance include:

a. Habitat quality and quantity
b. Presence of threatened, endangered, or sensitive species
c. Species diversity
d. Recreational importance
e. Commercial importance
f. Evidenced restoration efforts
g. Unique characteristics (i.e. self-sustaining Atlantic sea run salmon runs)

Note: The migratory nature of the resource makes specific anadromous fish segment identification difficult. Both the major thoroughfares and the spawning areas are essential to species survival. Therefore, when labeling segments for rivers in the anadromous category, the entire length of the river migration cycle was identified.

Rivers meeting the minimum standards were evaluated with the assistance of the Maine Department of Marine Resources' anadromous fish experts. The Preliminary Draft List was reviewed by private fishing interests and Atlantic Sea Run Salmon Commission staff. Because of the unique value of the Atlantic salmon, all rivers which support self-sustaining salmon runs were given high priority. All of these salmon rivers are, however, of importance to other species and to the state's overall anadromous fish program.

The rivers in Maine which were judged to be of highest significance include the following. Each river is identified by an asterisk in the Final List of Rivers section of this report.

Damariscotta River: high commercial alewife importance
Dennys River: self-sustaining Atlantic salmon run
East Machias River: self-sustaining Atlantic salmon run
Kennebec River: high habitat quality and quantity, species diversity and abundance, presence of endangered species, high recreational importance.
Machias River: (Washington County): the state's largest self-sustaining Atlantic salmon run, recreational importance
Narraguagus River: self-sustaining Atlantic salmon run
Penobscot River: high recreational importance, high restoration expenditure, habitat quality and quantity
Pleasant River (Washington County): self-sustaining Atlantic salmon run
Sheepscot River: self-sustaining Atlantic salmon run, endangered species
St George River: high commercial alewife importance

5. Information Sources and Expert Review

Information and expert opinion was provided to the study team by the following agencies and organizations.

Maine Department of Marine Resources
(fisheries biologists' input and review, species management plans)

Maine Department of Inland Fisheries and Wildlife
(Atlantic Sea Run Salmon Commission staff biologist review, miscellaneous publications)

Trout Unlimited

Maine Sportsman Magazine

B. RIVER-RELATED INLAND FISHERIES

1. Definition

Inland fish include all fish species which inhabit a fresh waters environment throughout their life cycle, in contrast to the migratory anadromous fish which require both fresh and salt water habitats. Included in the general category of inland fisheries are both cold water and warm water species. This analysis is restricted to river fisheries and does not consider lake fisheries. However, rivers which derive their major importance from their support of lake fisheries are given recognition.
While factors such as ecological importance (i.e., critical habitat) are given strong consideration, the focus of the study is the identification of inland fishery rivers and streams which are judged to be of high recreational importance.

2. Significance

The State of Maine has approximately 32,000 miles of flowing water, all of which support sport fisheries. Major cold water species include the native brook trout (the most abundant and certainly one of the most important cold water species), and native landlocked salmon (a highly prized fish found in a limited number of rivers), and the introduced brown trout (an adaptable species capable of providing a sport fishing resource where other cold water species will not thrive). Rivers which provide principal habitat for cold water species total 23,000 linear miles with an average of 153 legal sized fish per mile. Landlocked salmon are found in 64 rivers covering 635 miles. Nearly 200 miles of Maine's rivers provide exceptionally high quality habitat for this species.

Major stream-related warm water species include the native white perch and the introduced smallmouth and largemouth bass. All have self-sustaining populations. Warm water species predominate in 6400 miles of Maine's rivers and streams.

Sport fishing for inland species has witnessed a large increase in popularity over the past few years among Maine's residents, and approximately 190,000 resident fishing licenses are sold annually. When non-resident licenses and youth (who are not required to obtain a license) are taken into account, the Department of Inland Fisheries and Wildlife projects that 385,000 people fish Maine waters. Studies using creel census expansion techniques estimate 460,000 angler-days are spent annually on Maine's rivers and streams, accounting for one-third of the total inland fishing use. Cold water fish harvest in rivers and streams totals 532,000 fish annually, and the Department of Inland Fisheries and Wildlife estimates that there is potential for doubling both the use and take figures. The Department currently stocks 316,000 cold water fish annually in 105 streams totaling 826 linear miles.

Inland fisheries have economic as well as recreational value. Seventy to eighty thousand out-of-staters annually purchase fishing licenses and a number of in-state fishing guides and outfitter businesses depend on Maine inland fisheries. The overall dollar value of inland river and stream fishing has not been established, but it is definitely an important component of Maine's natural resource-related tourist industry.

3. Standards for Inclusion

Preliminary inland fish resource data was obtained with the assistance of the Maine Department of Inland Fisheries and Wildlife. Using a questionnaire accompanied by guidelines for evaluation, fisheries biologists in each of Maine's seven wildlife management regions were asked to identify approximately ten river and/or stream segments which they determined to be of high importance to that region's recreational fisheries program. A total of 81 river segments totaling 1487 miles was identified through this process. These results were reviewed by state level fisheries biologists from the Department of Inland Fisheries and Wildlife, and four additional segments were added due to their statewide significance. These 85 rivers and river segments comprise the Preliminary Draft List of Rivers Under Evaluation.

The list of rivers developed should not be construed to represent all rivers of significance for inland fisheries in each region. A limitation was placed on the number to be listed per region, and the emphasis was on importance for recreational fisheries. It should be clearly stated that all other rivers, brooks, and streams not on the list have at least some significance to the overall inland fisheries resources of Maine. Also, recreational demands upon these resources can be expected to change over time, with consequent shifts in significance for recreational fisheries uses and relative importance.

4. Evaluation Method and Criteria

The Department of Inland Fisheries and Wildlife's regional biologists evaluated the rivers which they selected according to the following criteria:

a. **Species Composition** – The existence of fish species of major importance by virtue of being:
   1) rare in the region
   2) highly preferred by anglers
   3) of major ecological importance

b. **Water Quality** – The extent to which overall water quality is capable of sustaining preferred fish resources.

c. **Aquatic Habitat Quality** – The existence of natural features favorable to fish production and sustenance of preferred fish species (adequate flow, cover, etc)

d. **Fishing Quality** – An evaluation of recreational fishing results (success rate, size of take, desirability of species taken, etc.)

e. **Quality of Recreational Use** – The ability of a river segment to provide a satisfying recreational fishing experience (scenery, solitude, challenge, variety, etc)

f. **Existing Recreation Use** – The popularity of a river segment as a recreational fishery resource.

g. **Economic Importance** – The importance of recreational fishing on the river segment to the regional economy (use of local guides, retail sales, etc)

Using comparative analysis, rivers which were preliminary judged to be of highest statewide significance were identified. The regional lists were then distributed to Maine fishing interests for review and comment. Each of Maine's local Trout Unlimited chapters evaluated rivers on the Preliminary Draft List according to the criteria of fishing quality, recreational quality, and current use. Again using comparative analysis, rivers were ranked by region and the highest priority rivers were noted. Trout Unlimited's Maine Council combined local chapter findings and produced a comprehensive list of that organization's statewide fishery priorities.

The study's final determination of the state's outstanding inland fishing rivers incorporated the Department of Inland Fisheries and Wildlife's preliminary findings, Trout Unlimited's review and evaluation, and comments from other recognized resource experts and interested individuals who reviewed the study's Preliminary Draft List.

Rivers which were identified as being the States' most significant recreational inland fishery rivers follow. Each is identified with an asterisk in the Final List of Rivers section of this report.

Crooked River
Fish River Lake Thoroughfares
Grand Lake Stream
Kennebago River
Penobscot River, Upper West Branch
Penobscot River, West Branch (Ripogenus Gorge Section)
Penobscot River, East Branch

Other highly significant recreational fisheries include the:
Moose River
Narraguagus River
Rapid River
Roach River
Saco River
St John River
Sheepscot River
Nahmakanta Stream
Presque Isle Stream
Wassataquoik Stream

Trout Unlimited efforts and expenditures on the Little Ossippee River and the Pleasant River (Cumberland County), and the Maine Department of Inland Fisheries and Wildlife's stocking and management efforts on a number of additional rivers throughout the state attest to these rivers' significance. Those rivers identified by this study as being of high importance are, however, the result of a consensus of expert and public opinion and are representative of high quality resources of a type not found in this abundance in other states in the eastern United States.

5. Information Sources and Expert Review

Information and expert opinion were provided to the study team by the following agencies and organizations:

Maine Department of Inland Fisheries and Wildlife (state fisheries biologists, regional fisheries biologists, species management plans)

Trout Unlimited (local chapters and Maine Council)

Maine Sportsmen Magazine

Sportsman's Alliance of Maine

Regional and state biologists from the Maine Department of Inland Fisheries and Wildlife performed the preliminary identification and assessment of inland fisheries, and provided comment and review throughout the study. Species management plans were the source of information on habitat and significance of particular species. The Maine Council and local chapters of Trout Unlimited, as well as Maine Sportsmen Magazine and Sportsman's Alliance of Maine provided review and comment on the study.

C. RIVER-RELATED RECREATIONAL BOATING

1. Definition

The present study focuses on river-related recreational boating which is dependant on flowing waters and the use of a "waterway trail". Consequently, river resources were identified which were of importance mainly to recreational activities using open and closed canoes, kayaks, and inflatable rafts. In order to represent a broad range of recreational boating interests, the general recreational boating category has been subdivided into three more specific categories, which identify distinct recreational boating activities and river users. These three categories are as follows:

a. Canoe Touring – Rivers and river segments which are navigable in an open canoe by novice to intermediate paddlers and which contain predominantly flat water, quickwater, and Class I rapids.

b. Whitewater Boating – Rivers and river segments which are navigable in canoes, kayaks, or rafts by intermediate to expert boaters and which contain a significant number of Class II to Class V rapids.

c. Backcountry Excursion Rivers – Rivers located in natural environments which are of adequate length to provide an extended river camping experience. These rivers may contain any combination of white water and/or canoe tour boating.

2. Significance

Maine's natural amenities have long been the source of recreational opportunities for the people of the state as well as the principal generator of tourist industry revenue. While historically the coast has been the focus of tourist recreation attention, the 1970's saw a strong diversification in recreation use patterns, with river use in particular increasing at an unparalleled rate. Though comprehensive user statistics do not exist for most state rivers, those that do exist verify this marked increase in river recreation popularity. The Allagash Wilderness Waterway witnessed a 60% increase in use between 1966 and 1980, while use on the St John has more than doubled since 1975. Use on the Saco River increased 300% between 1971 and 1976, and recent analysis suggests that recreational boater use on the Saco has since increased by 25% annually. The most significant change in boating use has occurred in commercial rafting. In 1976 approximately 600 commercial passengers rafted the Kennebec Gorge and the West Branch's Ripogenus Gorge. In 1981 this figure approached 14,000, a 200-fold increase.

Even without future growth, commercial rafting will annually add approximately $2,000,000 to Maine's tourist industry revenues. River recreation popularity has also made canoe outfitting a viable component of the tourist industry with significant use on the Allagash, St John, Penobscot, and coastal rivers in eastern Maine.

Maine's recreational river resources are extensive. For example, the Appalachian Mountain Club's canoe guide identifies 4,474 miles of boatable rivers and streams within the state. The Maine Rivers Study has determined that 1,750 of these miles represent significant boating areas of high resource quality and high use priority. 650 of these miles are predominantly associated with white water boating, 500 with flat water canoe touring, and 600 with back country excursion boating.

Included in these 1,750 miles of river are a number of river segments which possess unique features. Maine can boast New England's only two stretches of Class V white water as well as the region's longest stretch of continuous canoeable white water. It can also boast the Northeast's premier back country canoe trips and one of three federally designated wild and scenic rivers.

These river resources, combined with a number of lesser known rivers with significant recreation potential, provide the State of Maine with a recreational resource of extremely high value. Though 98% of the state's river corridors are privately owned, the prevalent multiple use concept at work in the state ensures that these resources will remain accessible to boating enthusiasts.

3. Standards for Inclusion

To be included in the Preliminary Draft List of Rivers Under Evaluation, a river had to:

a. Be listed as a prominent river trip in one or more of the recognized river guide books
b. Be recommended by one of the state's recognized statewide recreational boating interests or organizations, or
c. Show evidence of use by commercial outfitters

4. Evaluation Method and Criteria

A list of rivers meeting the minimum standards for inclusion in the recreational boating category was distributed to representatives of recreational boating interest groups, commercial outfitters, and other knowledgeable sources. Experts were asked to review the list and to evaluate each river segment's statewide significance in relation to others on the list. They were then asked to group rivers in priority categories from high to low. The following criteria were offered as guidelines in making these determinations.

General criteria with relevance to all the boating categories included:

1. Existing use
2. Access
3. Navigability
4. Length of season and flow regularity
5. Scenery and aesthetic experience
6. Economic importance

Specific criteria for each of the recreational boating categories included:

Canoe Touring – safety, use by organizations
Whitewater Boating – presence of significant rapids
Backcountry Excursion – length of trip, lack of corridor development, availability of camp sites

Concurrent with this expert review process, study team members assembled available river use statistics, identified commercially significant rivers, and researched each river segment in an attempt to identify unique recreational features. Individual expert evaluations were then combined, and a list which represented a consensus of opinion was developed. This list was cross checked with the study team's independent evaluation, and the final list of outstanding recreational rivers was produced.

The following rivers were identified as outstanding (the state's most significant) in each category, and identified with an asterisk on the Final List of Rivers.

Backcountry Excursion:
- Allagash River
- Machias River (Washington County)
- East Branch Penobscot River
- Upper West Branch Penobscot River
- St Croix River
- St John River

Whitewater Boating
- Carrabassett River
- Dead River
- East Branch Penobscot River
- Upper Kennebec River
- Machias River (Washington County)
- West Branch Penobscot River
- Rapid River
- Seboeis River
- Wassataquoik River

Canoe Touring
- Moose River
- Saco River

Many other canoe touring rivers have importance to regional recreational boaters, including the following rivers:
- Royal River
- St George River
- Kennebec River
- Aroostook River
- Upper Androscoggin River

5. Information Sources and Expert Review

Information and expert opinion was provided to the study team by the following agencies and organizations.
- Appalachian Mountain Club, Maine Chapter
- High Adventure BSA
- Maine Audubon Society
- Maine Professional Guide's Association
- Maine State Planning Office
- Natural Resource Council of Maine River Committee
- Penobscot Paddle and Chowder Society
- White Water Outfitters Association of Maine

The following references were used by the study team to identify and document resource values.

AMC River Guide, Appalachian Mountain Club, Volumes 1 and 2, Boston: AMC, 1980

New England White Water River Guide, Gabler, Ray, New Canaan, Conn: Tobey Publishing Co., Inc., 1975

Canoe Trails Directory, Makens, James C., New York: Doubleday and Company, Inc., 1979

Maine Rivers, Thorndike, Maine: The Thorndike Press.

Maine's Whitewater Rapids, McMahon, Janet, Augusta, Maine: Maine State Planning Office, 1981

Pole, Paddle, and Portage, Riviere, William A., Boston: Little, Brown, and Company, 1969

Canoeing Maine (#1 and #2), Thomas, Eben, Thorndike, Maine: The Thorndike Press, 1979

Canoeing Racing: Hot Blood and Wet Paddles, Thomas, Eben, Hallowell, Maine: Hallowell Printing Company, 1974.

The Maine Atlas and Gazetter, Yarmouth, Maine: Delorme Publishing Company, 1981.

V. Final List of Rivers

The following is the list of all rivers and streams in the state of Maine which have been determined through the study process to have significant and/or unique natural and recreational resource values. This list represents the product of the river evaluation, documentation, and expert and public review process and are judged to possess resource values of regional, statewide, and greater than statewide significance.

The list defines for each river the segment of the river with one or more resource values. The matrix accompanying the list identifies the total number of resource values associated with each river segment. Resource values which are the state's most outstanding in a particular resource category or greater than statewide significance are highlighted on the matrix with an asterisk.

The following guidelines were used to define the limits to the segment of river containing a significant resource value. The river segment for each specific resource value for a particular river is defined in the appendices following this report. River segments were defined by the following criteria:

1. Segments were described using readily identifiable physical locations.

2. Distinct river segments were identified for each natural and recreation value by determining the length of river required to preserve a given natural value or to support a given recreational activity.

3. Segments were identified such that each exhibits a relatively consistent level of resource quality throughout the segment.

4. A river segment could extend through a natural or man-made lake if the upstream and downstream portions of the river segment were of consistent resource quality and type, and if the lake did not significantly disrupt the river's natural values or recreational use. Rivers which flow through urban or other developed areas were handled in a similar manner

5. In recognition of the importance of upstream tributaries to the resource value of a river segment, the designation "to headwaters" was used to describe segment boundaries whenever the segment location and resource values justify such a description.

6. Segment boundaries were determined by associated resource values alone and did not take into account jurisdictional boundaries or the location of potential development.

Chapter 10 Key Insights

Insights from the Maine licensed and Traveling sportsmen surveys

- The state of Maine is well positioned as one of the "Best" destinations among Maine licensed hunters and anglers across a majority of attributes that are important to them - ranging from climate, safety, pricing, and amenities. Maine's particular strengths among Traveling sportsmen are its attractive natural setting and its sense of safety.
    - The state's natural amenities, beauty and sense of security or safety are also identified to be among the most important characteristics of a site that hunters and anglers say are important when making the decision to hunt or fish.

- The abundance of game species and the ability to target native populations are critical factors that influence destination choices. Maine Department of Inland Fisheries & Wildlife supports management and conservation efforts aimed at maintaining healthy populations of native species.

- Interestingly, one of the key destination factors for hunters and anglers is the remoteness of the location. However, travel distance also factors into their decision. The geographical size and travel distance to the more remote areas can be a challenge to bring sportsmen to the state. Among traveling sportsmen, it may be important to highlight other services in the area for non-sportsmen to influence the travel decision.

- Maine's primary market from which to recruit visiting hunters and anglers is the Northeast, North Atlantic, and mid-Atlantic regions. Findings indicate that, given the size of the traveling sportsmen market in those areas, there remains growth potential to increase the state's level of penetration within that market.

- Word-of-mouth is an important marketing tool among Maine's sportsmen. Both hunters and anglers rely on recommendations from friends or family about hunting and fishing destinations. Maine sportsmen report a high degree of satisfaction with their hunting and fishing trips in Maine and are likely to recommend the experience to friends and family

- Traditional media outlets such as television, magazine, and online are also effective means to reach sportsmen. Top media titles consumed by sportsmen in Maine's market area include The Bassmasters (TV), Field & Stream (magazine), and North American Hunting Club (online), among others.

- When not hunting or fishing, sportsmen and their travel companions are typically enjoying the opportunity to relax and unwind and to see the local sights.

Insights gained from other research about hunter and angler recruitment and retention

- Nationally, only 15% of anglers typically purchase a license five out of five years.[11] Among hunters, 35% of resident hunters and 7% of nonresident hunters typically purchase a licensed five out of five years.[12] And, the number of hunters and anglers had been on the decline since the early 1990's.[13]

- Sportsmen cite a variety of reasons for not hunting or fishing. The most commonly cited reasons are: not enough time, takes time away from family, and other obligations such as work or family.[14] The argument of "not enough time" can actually be reflective of shifting preferences and other activities providing the same or more benefits than hunting or fishing had in the past.

- When hunters and anglers take a hiatus from the sport, the largest percent of sportsmen (41% for hunters and 38% for anglers) return within 3 years.[15] A recent effort, spearheaded by the Recreational Boating and Fishing Foundation, focused on lowering the rate of lapsing anglers or shortening the time away from the sport through used communication and outreach to encourage anglers to renew their license. Findings show that that these efforts have not been effective at reducing the rate of lapsing by a significant degree.

- What competes for free time among sportsmen? Among anglers, the most commonly cited preferred indoor recreational activity is relaxing or watching TV. The most commonly preferred outdoor activities included hiking, camping, hunting, and gardening.[16] A similar study has not been completed for hunters but it is possible the same preferences exist, particularly given the number of sportsmen who both hunt and fish.

[11] Southwick Associates and Responsive Management. 2011. Understanding Activities that Compete with Recreational Fishing. Prepared for the American Sport Fishing Association under a U.S. Fish and Wildlife Service Grant VA M-24-R.
[12] Southwick Associates. 2010. *A Portrait of Hunters and Hunting License Trends: National Report*. Prepared for the National Shooting Sports Foundation.
[13] U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.
[14] American Sportfishing Association, Responsive Management, Oregon Department of Fish and Wildlife, and Southwick Associates. 2013. Exploring Recent Increases in Hunting and Fishing Participation. U.S. Fish & Wildlife Service Multi-state Conservation Grant F12AP00142.
[15] Ibid.
[16] Southwick Associates and Responsive Management. 2011. Understanding Activities that Compete with Recreational Fishing. Prepared for the American Sport Fishing Association under a U.S. Fish and Wildlife Service Grant VA M-24-R.

REDACTED

D.P.U. 18-64/18-65/18-66
Exh. AG-DM
December 21, 2018
Hearing Officer: Alan Topalian

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

Petition of NSTAR Electric Company d/b/a Eversource Energy for approval by the Department of Public Utilities of a long-term contract for procurement of Clean Energy Generation, pursuant to Section 83D of An Act Relative to Green Communities, St. 2008, c. 169, as amended by St. 2016, c. 188, § 12	)	**D.P.U. 18-64**
Petition of Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid for approval by the Department of Public Utilities of a long-term contract for procurement of Clean Energy Generation, pursuant to Section 83D of An Act Relative to Green Communities, St. 2008, c. 169, as amended by St. 2016, c. 188, § 12	)	**D.P.U. 18-65**
Petition of Fitchburg Gas and Electric Light Company d/b/a Unitil for approval by the Department of Public Utilities of a long-term contract for the procurement of Clean Energy Generation, pursuant to Section 83D of An Act Relative to Green Communities, St. 2008, c. 169, as amended by St. 2016, c. 188, § 12	)	**D.P.U. 18-66**

TESTIMONY
OF
DEAN M. MURPHY

Dated: **December 21, 2018**

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I. STATEMENT OF QUALIFICATIONS

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

A. My name is Dean M. Murphy. I am a Principal with The Brattle Group in the Boston office, located at One Beacon Street, Boston, Massachusetts 02108.

Q. Please describe your professional experience and educational background.

A. I have over twenty-five years of experience in economic consulting, with the majority of my work focusing on the electricity sector. My work has encompassed topics such as resource and investment planning (including power and fuel price forecasting), valuation for contract disputes and asset transactions, climate change policy and analysis, competitive industry structure and market behavior, and market rules and mechanics. I have experience examining these and other electric-sector matters from the perspectives of investor-owned and public electric utilities, independent producers and investors, industry groups, consumers, regulators, and system operators. I hold a Ph.D. in Industrial Engineering and Engineering Management and an M.S. in Engineering-Economic Systems, both from Stanford University, and a B.E.S. in Materials Science and Engineering from the Johns Hopkins University.

Q. Have you previously testified before any regulatory body?

A. Yes. I have testified before the New Hampshire Public Utilities Commissions, the Connecticut Department of Public Utility Control, the New Jersey Department of Public Utilities, and the Public Utilities Board of Manitoba, and have presented to advisory committees to the Pennsylvania Department of Environmental Protection. I have testified before committees of the state legislatures in New Jersey, New York, and Pennsylvania. I have also testified before the United States Court of Federal Claims, the U.S. Bankruptcy Court (both New Jersey and Southern District of New York), and the United States District Court (Vermont). I have submitted written testimony on behalf of the Massachusetts Attorney General's Office addressing the procurement of offshore wind in the Section 83C proceedings. My CV is attached as Attachment 1.

II. PURPOSE OF TESTIMONY

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the Massachusetts Attorney General's Office.

Q. What is the purpose of your testimony?

A. Pursuant to Section 83D of the Green Communities Act, ("Act," or "Section 83D"), Eversource, National Grid, and Unitil (collectively, the "Distribution Companies" or "EDCs") jointly sponsored a competitive solicitation for Clean Energy Generation for an annual amount of electricity equal to approximately 9,450,000 MWh (9.45 TWh), to be procured by the Distribution Companies entering into cost-effective long-term contracts by 2022.[1] In accordance with Section 83D, the Distribution Companies issued a Request for Proposals ("RFP") for Long-Term Contracts for Clean Energy Projects. Thereafter, the Evaluation Team received and evaluated the proposals.[2]

The New England Clean Energy Connect Hydro bid ("NECEC Hydro") was ultimately selected for contract negotiations, following the siting denial of the Northern Pass Transmission Hydro bid ("NPT Hydro"), which had initially been selected. The NECEC Hydro bid consists of energy supplied by Hydro Renewable Energy, Inc. ("HRE") and a new HVDC transmission line constructed by Central Maine Power ("CMP") that interconnects Québec with the New England power grid in Maine.[3] The contract

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[1] Section 83D of Chapter 169 of the Acts of 2008 (the "Green Communities Act"), as amended by chapter 188 of the Acts of 2016, *An Act to Promote Energy Diversity* (the "Energy Diversity Act").

[2] The Evaluation Team was comprised of the Distribution Companies and the Department of Energy Resources ("DOER").

[3] HRE is a wholly-owned indirect unit of Hydro-Québec.

Continued on next page

negotiations resulted in power purchase agreements ("PPAs") for energy and Environmental Attributes ("EAs") between the EDCs and H.Q. Energy Services (U.S.) Inc. ("HQ"), and Transmission Service Agreements ("TSAs") between the EDCs and CMP. The PPAs specify the obligation of HQ to supply Qualified Clean Energy and Environmental Attributes from Hydro-Québec Power Resources ("HQPR").[4]

The purpose of my testimony is to discuss the reasonableness of the Section 83D solicitation process and the resulting PPAs and TSAs.

Q. What are the major findings from your analyses?

A. The proposed contracts, as written, do not ensure that the Qualified Clean Energy acquired via the contracts will comprise fully incremental energy deliveries into New England, as the RFP specified. The RFP required that the Qualified Clean Energy under the contract should be incremental to (*i.e.*, in addition to) the hydroelectric energy that HQ has delivered to New England historically, or that would otherwise be expected to be delivered. The proposed contracts implement much weaker requirements for incrementality and would allow most (and potentially all) of the contract energy delivered to substitute for historical deliveries. This aspect of the contracts must be corrected in order to conform with the RFP requirements, and the overall purpose of the Act. This could be done by modifying the requirements of the proposed contracts, assuming HQ is able and willing to provide fully incremental Qualified Clean Energy into New England. If HQ is unable or unwilling to provide fully incremental Qualified Clean Energy, other sources of clean energy could supplement or substitute to satisfy this requirement. For example, the HQ deliveries of hydroelectric energy could be supplemented with some renewable energy that does meet the RFP's incrementality

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[4] The PPAs define HQPR as "those existing hydroelectric generating stations, located in the Province of Québec and owned and operated as a system by Hydro-Québec or its subsidiaries from time to time, that produce electric energy, which consists predominantly of low-carbon and renewable hydro-electric energy services during the Services Term." Exh. JU-3-B, at 14.

requirement, or the HQ energy could be replaced in its entirety with energy from other renewable bids (which might have different transmission requirements). There were several alternative bids comprised of new renewable generation (and transmission) that would provide fully incremental clean energy, and some of these alternative bids scored well in the evaluation.

In addition, I have concerns about the selection process. Neither of the two top-scoring bids, [redacted], nor a potential portfolio comprised of just those two bids, were carried forward from the second stage of the evaluation into the third and final stage.[5] These alternatives that were dropped from consideration may have performed better than the NECEC Hydro project that was selected. This selection issue may be related to the previous question of whether the proposed contracts provide fully incremental clean energy, because the [redacted] projects would have fully satisfied the incrementality requirements of the RFP.

I am also concerned about the inclusion of bidders' affiliates in the Evaluation Team. This is generally considered inappropriate because it can bias the evaluation and selection process. Such concerns arose in multiple instances in the 83D evaluation process and were noted by the Independent Evaluator.[6]

My final concerns regard the potential for the scaling approach used in bid scoring to inadvertently and improperly affect the bid scores and ranking, and the metric used to calculate the Global Warming Solutions Act ("GWSA") benefits. Although these appear to be less important issues in this solicitation than the concerns noted above, they should be addressed in any future solicitations.

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[5] Revised Independent Evaluator Final 83D Report Confidential, at 68, 70 (August 7, 2018). These two high-scoring bids were included as components of portfolios that scored relatively poorly in the evaluation; the lower scores for these portfolios may have been due to the inclusion of still other, lower-scoring bids in those portfolios.

[6] *See, e.g., id.,* at 27-28, 32, 36, 48-49.

III. REVIEW OF KEY DOCUMENTS IN THE PROCEEDING

Q. What documents have you reviewed in this proceeding?

A. I have reviewed the RFP, the Independent Evaluator's report submitted by Peregrine Energy Group, responses to Information Requests, and the direct Joint Testimony and accompanying exhibits submitted by the Distribution Companies, including the Tabors Caramanis Rudkevich ("TCR") evaluation report, the bid selection letters, the scoring protocols, the qualitative scoring, portions of the bids, and the proposed contracts.

IV. THE PROPOSED CONTRACTS DO NOT PROVIDE INCREMENTAL HYDROELECTRIC GENERATION AS CONTEMPLATED BY THE RFP

Q. What is your concern regarding whether these proposed contracts will provide incremental hydroelectric generation?

A. The proposed contracts do not require that HQ provide incremental hydroelectric generation as specified in the RFP. The stated goal of the Act is to "facilitate the financing of clean energy generation resources."[7] That is, the legislature intended to bring additional clean energy into the Commonwealth. This goal is reflected in the RFP, the stated intent of which, in the context of a hydroelectric bid, was to acquire "Incremental Hydroelectric Generation"[8] that would be incremental to historical hydroelectric energy deliveries into New England.[9] My understanding of the purpose of this RFP requirement is to ensure that the hydroelectric or renewable energy resources procured under the long-term contracts would not substitute for historical clean energy deliveries, but rather would provide a long-term net increase in the amount of clean energy delivered into New England. As written, the proposed contracts include much

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[7] Section 83D(a).

[8] Exh. JU-2, at 18.

[9] Bids for renewable resources were required to be provided from new generation, which would necessarily be incremental to historical energy. Hydro suppliers were permitted to offer "Incremental Hydroelectric Generation" from existing resources but were required to show that the generation would be incremental.

weaker requirements. Although each EDC's contract has its own incrementality provisions, even the most stringent contract requires that less than half of the newly contracted clean energy provided be incremental to historical average generation.

Q. What did the RFP require in terms of incrementality?

A. The RFP defines incremental hydroelectric generation:

> "Incremental Hydroelectric Generation" means Firm Service Hydroelectric Generation that represents a net increase in MWh per year of hydroelectric generation from the bidder and/or affiliate as compared to the 3 year historical average and/or otherwise expected delivery of hydroelectric generation from the bidder and/or affiliate within or into the New England Control Area.[10]

That is, to be considered "incremental," the RFP requires the bidder to provide energy in addition to the bidder's 3-year historical average of deliveries into New England (or more than the bidder would have otherwise delivered). The 2014-2016, 3-year imports from HQ into New England is 14.8 TWh.[11] Thus, for the 9.55 TWh of Qualified Clean Energy from the contracts to be fully incremental energy delivery, total deliveries would need to be 24.35 TWh annually.

Q. Do the proposed contracts adopt the RFP definition of incrementality?

A. Although the preamble that appears in each of the proposed contracts asserts "WHEREAS, the output of the Hydro-Québec Power Resources, delivered through the New Transmission Facilities (as defined herein), shall constitute incremental hydroelectric generation during the Services Term,"[12] the contracts themselves do not define the term "incremental hydroelectric generation." Rather than repeating or referring to the definition in the RFP, or implementing equivalent requirements, each of the proposed contracts establishes considerably less stringent requirements.

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[10] Exh. JU-2, at 5.

[11] Exh. NEER-1-8.

[12] *See, e.g.*, Exh. JU-3-A, at 7.

Continued on next page

The contracts require two types of energy to be delivered: 1) "Guaranteed Qualified Clean Energy," which is the contracted total of 9.55 TWh across the three contracts, to be delivered through the NECEC,[13] and 2) "Baseline Hydroelectric Generation Imports" ("Baseline Hydro"), which consists of all other power deliveries from Hydro-Québec to New England.[14] Exhibit H to the proposed contracts establishes Minimum Required Baseline Hydroelectric Generation Imports ("Minimum Baseline") quantities.[15] Conceptually, to provide incremental generation, the Minimum Baseline should equal historical energy deliveries. But the values established for the Minimum Baseline quantities are substantially below the historical average, and so the contracts do not actually require the clean energy deliveries to be incremental.

The three EDCs' proposed contracts establish different requirements for the Minimum Baseline quantity. The National Grid contract establishes a Minimum Baseline of 9.45 TWh, which is substantially below the 14.8 TWh of historical deliveries.[16] This implies that HQ must deliver a total of 19.0 TWh annually to New England (9.45 TWh of Minimum Baseline plus 9.55 TWh from the contract). Even though the contracts

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13 Exhibit B to the proposed contracts provides the Schedule of Guaranteed Qualified Clean Energy for each hour. For Eversource, this number is 579.335 MWh/hour (Exh. JU-3-A, at 72); for National Grid it is 498.348 MWh/hour (Exh. JU-3-B, at 80); and for Unitil it is 12.317 MWh/hour (Exh. JU-3-C, at 72). Summing across EDCs and multiplying by 8,760 hours/year yields total Guaranteed Qualified Clean Energy of 9.548 TWh/year.

14 See, *e.g.*, Exh. JU-3-A, at 86. The Baseline Hydro amount refers to all other deliveries to New England, not the amounts that are specific to each EDC or their contracts.

15 Exh. JU-3-B, at 92. While the Eversource and Unitil contracts do not use the phrase "Minimum Required Baseline Hydroelectric Generation Imports," the contracts do require a minimum level of "Baseline Hydroelectric Generation," against which damages are measured. Exh. JU-3-A, at 86.

16 According to National Grid's response to Exhibit NEER-1-8, due to "the difficulties of predicting what differences from HQ's 3-year historical average annual delivery of approximately 14.8 TWh from HQ to New England from 2014-2016 could reasonably be expected over the twenty years following the targeted commercial operation date for this project, it is reasonable and acceptable to move forward with the contract based on HQ's agreement to the 9.45 TWh Minimum Required Baseline Hydroelectric Generation Imports."

Continued on next page

nominally represent incremental hydro of 9.55 TWh annually, HQ will be required to deliver to New England only 4.2 TWh more than it has delivered historically. In other words, less than half the contract energy is required to be incremental; for the remainder, HQ can simply substitute contract energy at the contract price for energy that it has historically sold into New England. In fact, the Minimum Baseline for National Grid may be reduced further (though not increased) by several potential adjustments.

The incrementality requirements of the Eversource and Unitil contracts are even less stringent They are based on a Minimum Baseline quantity of 3.0 TWh,[17] so that the total clean energy deliveries into New England, including deliveries under the new contract, can be below historical average deliveries. Thus, HQ could satisfy its long-term contract obligations by delivering only 12.55 TWh annually (9.55 contract + 3.0 Baseline), which would be 15% less clean energy than it has delivered historically. The difference could then, for example, be sold into the market to another buyer offering a higher price, which might include a premium for the fact that the hydro energy is clean.

Figure 1 below illustrates the contract quantity requirements, contrasting what would be required for full incrementality as described in the RFP, shown by the first column, with what is required by each of the proposed contracts. The figure shows that the Eversource and Unitil contracts require HQ to deliver just 3.0 TWh of Baseline Hydro to New England, 80% (11.80 TWh) below the historical average. The National Grid contract requires somewhat greater Baseline deliveries of 9.45 TWh, but still 36% (5.35 TWh) below the historical average. The Deficit indicated relative to each contract is the amount by which total hydro deliveries to New England (Qualified Clean Energy plus Baseline Hydro) can fall short of full incrementality without penalty.

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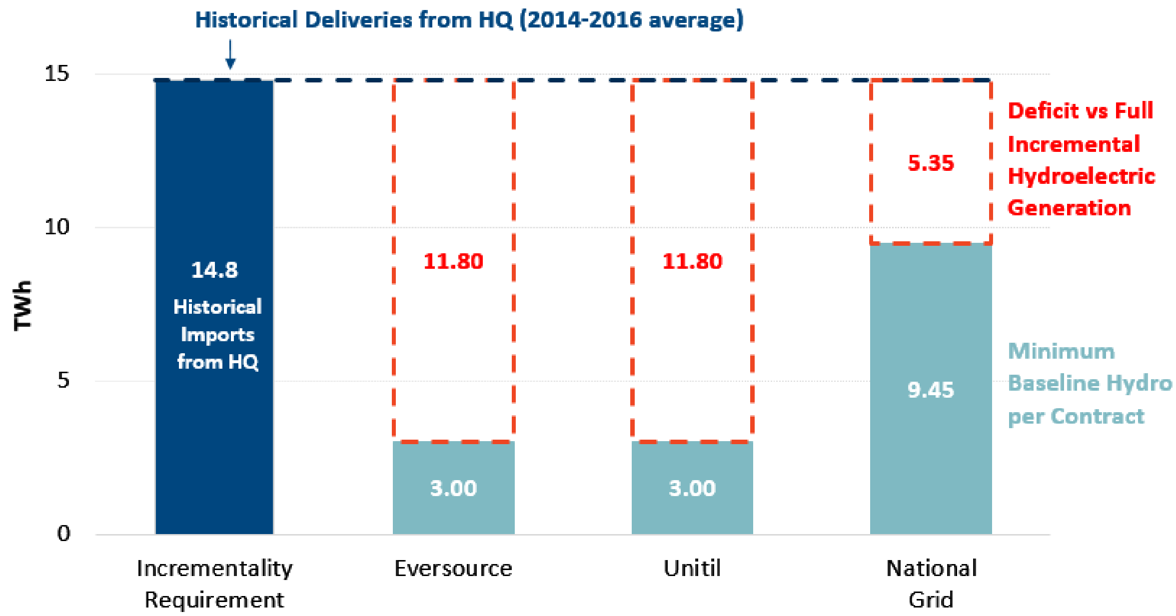
[17] According to Exhibit NEER-1-9, Eversource and Unitil found that the requirement to deliver incremental generation was met in the bid response, and the 3 TWh Minimum Baseline that was negotiated would not make “the administration of such a provision problematic.”

Figure 1: Baseline Hydro Deliveries into New England Required by Proposed Contracts



Sources and Notes: Minimum Baseline Hydro per Contract is from contracts (Exhs. JU-3-A, JU-3-B, JU-3-C).

Q. Do the Minimum Baseline hydro generation levels established in the proposed contracts provide a reasonable assurance to Massachusetts ratepayers that the total clean energy delivered to the Commonwealth will increase if the proposed contracts are enacted?

A. No. As discussed above, the contract provisions do not ensure that energy deliveries under the contracts will be fully incremental relative to historical imports from HQ. In the case of Eversource and Unitil, total clean energy deliveries could fall <u>below</u> historical levels without penalty. Furthermore, the stated goal of the Act is to "facilitate the financing of clean energy generation" through "cost-effective long-term contracts."[18] If the proposed long-term contracts allow HQ to provide less clean energy to New England than it has historically, then it is not apparent that the contracts would be financing clean energy generation. It is also not clear that the contracts would be cost-effective, as ratepayers could be paying for energy and EAs as if they would be incremental to

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[18] Section 83D(a).

historical deliveries, but the deliveries would not necessarily be fully incremental because the contracts do not require it.

Q. How do the contracts enforce the Minimum Baseline requirements that they do include?

A. The Minimum Baseline requirements are enforced by a damages calculation that penalizes any Shortfall, the amount by which Baseline Hydro is below the Minimum Baseline. The damages, which would be applied to the energy payment to HQ, are calculated as a share of the TSA payments proportional to the Shortfall. For National Grid, the damages share is the Shortfall divided by the Minimum Baseline (9.45 TWh); whereas for Eversource and Unitil, the damages share is the Shortfall divided by the Minimum Baseline (3.0 TWh) plus the contract energy, totaling 12.55 TWh. In both cases, the damage amount is the relevant share multiplied by the annual TSA payments, with some time averaging and rolling average adjustments. Several factors may reduce the damages amount and/or reduce the Minimum Baseline deliveries that are required to avoid damages.[19]

Figure 2 below illustrates the contract incentives facing HQ to provide incremental energy, showing how the aggregate contract payments for energy and EAs change as the level of Baseline Hydro delivered changes. If HQ delivers fully incremental Baseline Hydro (equal to the historical average of 14.8 TWh), there are no damages and no

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[19] Damages are only calculated if the Shortfall is positive (*i.e.*, HQPR delivers less than the Minimum Baseline). The Eversource and Unitil contracts provide a reduction in the Minimum Baseline subject to a *Force Majeure* provision, and a provision related to negative pricing in New England. Exhs. JU-3-A, at 86-87; JU-3-C, at 84-85. The National Grid contract provides for several factors that can reduce (but not increase) the Minimum Baseline, including on-peak prices relative to a floor, total transfer capabilities for deliveries into New England, total net electricity exports from Hydro-Québec, and changes in Hydro-Québec's firm transmission rights. The National Grid damages for Shortfall are also scaled down by 20% after each five years of the contract, starting at 100% of the Shortfall share times the TSA payment in the first 5 years, and falling to 40% in the last 5 years. Exh. JU-3-B, at 94.

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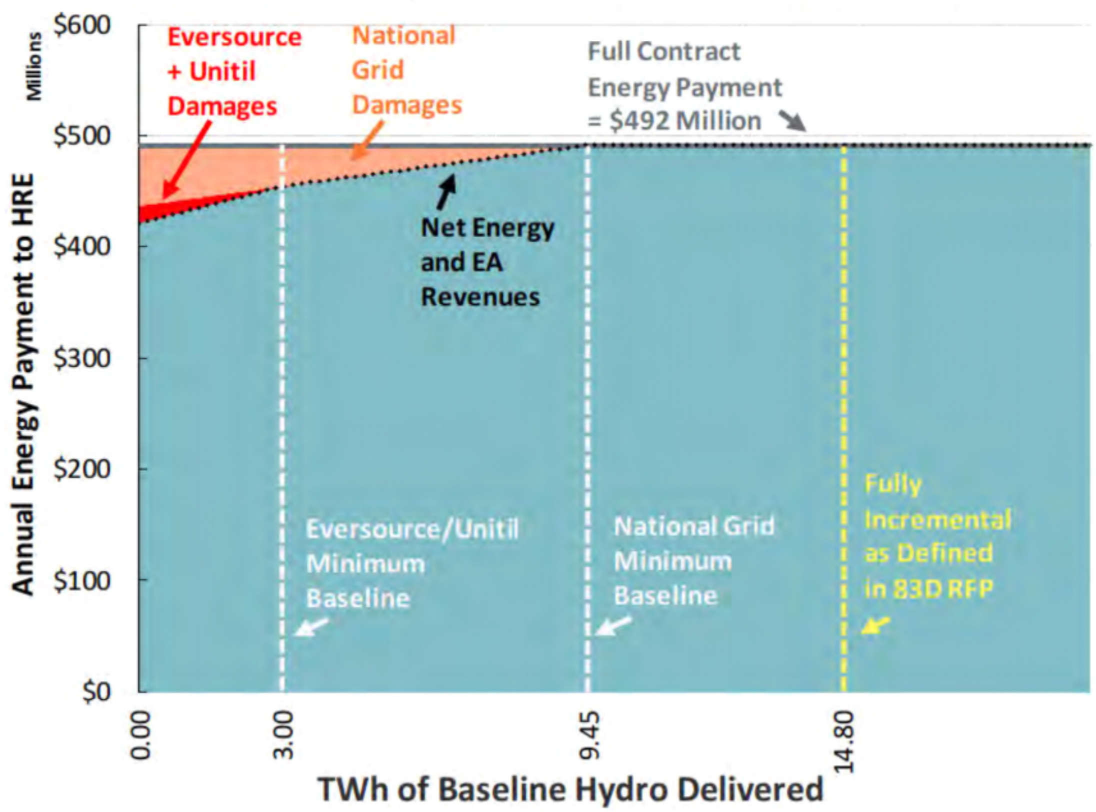
reduction to the net revenues earned under any of the EDCs' contracts. Damages are incurred when Baseline Hydro deliveries drop below the Minimum Baseline of the National Grid contract, 36% below the level that would be fully incremental. As Baseline Hydro falls below this level, net energy and EA revenues from National Grid are reduced according to the Shortfall relative to the National Grid Minimum Baseline, at a rate of \$5.80/MWh of Shortfall. Below the 3.0 TWh Minimum Baseline of the Eversource and Unitil contracts, which is 80% below full incrementality, Eversource and Unitil damages begin to be incurred as well; total damages across all three contracts in this range are \$10.98/MWh of Shortfall. Even at zero Baseline Hydro, total energy and EA payments across the three contracts are reduced by only 14.3%. These measures do not account for any of the other adjustments noted above, which could reduce (but not increase) the damage amounts.

Figure 2: EDC Energy Payment vs. Baseline Hydro Generation



Source and Notes: Contracted energy prices, contracted clean energy delivery, and contract details in relation to Baseline Hydro are from Exhibits JU-3-A, JU-3-B, JU-3-C. Transmission unit price and contract capacity are from Exhibits JU-

4-A, JU-4-B, JU-5-C. For the purposes of this chart, it is assumed that all contracted clean energy (Guaranteed Qualified Clean Energy) is delivered. The chart reflects prices from contract year 1 (Nominal 2017 $).

Q. Do the damage mechanisms in the contracts give HQ sufficient incentive to provide fully incremental hydro deliveries?

A. No, the damage mechanisms do not give HQ the proper incentives to provide fully incremental deliveries of clean energy. There is no disincentive for HQ to under-provide Baseline Hydro until it falls well below the historical average, and even then, the disincentives for further Shortfall are modest.

Q. Has this potential for Massachusetts ratepayers to receive the same total clean energy generation but pay for it at an above market rate been raised previously?

A. Yes. The Department of Public Utilities ("Department") explicitly acknowledged this risk in response to HQ's comments,[20] in which HQ proposed amending the incrementality requirements in the RFP by changing the definition of incremental hydro generation to require only the capability to deliver incremental power, rather than the actual delivery of incremental power:

> The Department agrees that there would be a risk to ratepayers if an electric distribution company entered into a contract with a bidder based on the

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[20] HQ proposed that Incremental Hydroelectric Generation be defined as: "Firm Service Hydroelectric Generation that is capable of providing a net increase in MWh per year of hydroelectric generation from the bidder and/or affiliate as compared to the 3 year historical average delivery of hydroelectric generation from the bidder and/or affiliate within or into the New England Control Area." *Fitchburg Gas and Electric Light Company d/b/a Unitil, Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid, and NSTAR Electric Company and Western Massachusetts Electric Company, each d/b/a Eversource Energy*, D.P.U. 17-32, Comments of H.Q. Energy Services (U.S.) Inc., at 8 (February 21, 2017). This proposed definition is aligned with HRE's response to how it provides incrementality in its bid for this solicitation: "[redacted]." *Section 83D Request for Proposal Application Form,* NECEC RFP Response (HRE) Confidential, Section 4.2, at 20 (emphasis added).

Continued on next page

> bidder's capability to provide a net increase in MWh/year of hydroelectric generation. If the bidder subsequently failed to provide a net increase in generation, ratepayers would have paid for a service (*i.e.*, Incremental Hydroelectric Generation) that the bidder did not deliver.[21]

In its 2016 background document on regulations to limit greenhouse gases ("GHG"), including the Clean Energy Standard ("CES"), the Massachusetts Department of Environmental Protection ("DEP") explicitly expressed a concern that "resource shuffling" of Canadian hydro (*i.e.*, the contractual or transactional reassignment of clean energy without increasing the total amount of clean energy overall) could result in the CES delivering no additional clean energy to the Commonwealth:

> Excluding existing resources from the CES would not be sufficient to prevent resource shuffling with respect to transmission of electricity from Canada. Currently, electricity imported from Canada is an important source of clean electricity for Massachusetts, but the ability to import additional electricity from Canada is limited by the amount of transmission capacity. Resource shuffling could occur if new hydroelectric generation resources were to displace existing hydroelectric resources as the source of the electricity traveling through existing transmission lines. In this case, CES compliance could occur without any change in the amount of clean energy available for use in Massachusetts.[22]

Although the DEP's comments were focused on the role of transmission, the issue of incrementality is not limited to transmission. Adding new transmission without requiring that deliveries be incremental would fail to address the issue, as illustrated in this proceeding and the development of the RFP.

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[21] D.P.U. 17-32, at 33 (2017).

[22] Massachusetts Department of Environmental Protection, *Background Document on Proposed New and Amended Regulations*, at 30 (December 16, 2016).

Continued on next page

Q. Does the fact that the contracts add significant transmission capacity to enable greater deliveries to New England alleviate the concern about whether the contract energy would be incremental?

A. Energy deliveries from Québec are often constrained by the limits of the transmission interface between Québec and New England.[23] Thus transmission must be expanded to enable the delivery of incremental clean energy into New England. However, merely adding transmission does not ensure that clean energy deliveries will be incremental relative to historical deliveries, unless the contracts explicitly require this. As the proposed contracts are written, that will not necessarily be the case; clean energy deliveries could be far less than fully incremental and still satisfy the requirements of the proposed contracts.

V. ADDITIONALITY AND OFFSETTING GREENHOUSE GAS EMISSIONS

Q. Must the contracts require full incrementality for the 83D clean energy to create the desired offset to greenhouse gas emissions?

A. Even if the proposed contracts required energy deliveries to be fully incremental, this would not necessarily guarantee that GHG emissions would decrease by an amount corresponding to the Qualified Clean Energy of the contract. Incrementality is defined in the RFP only with respect to deliveries <u>into New England</u>, while GHG emissions must be measured at a <u>global</u> level.[24] It would be possible, at least in principle, to satisfy the requirements of full incrementality (*i.e.*, the Qualified Clean Energy is incremental to the full historical average deliveries into New England), and still not offset a corresponding amount of global GHG emissions. This could happen through resource shuffling—reassignment of a fixed amount of clean energy so as to increase the clean energy

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[23] *Section 83D Request for Proposal Application Form,* NECEC RFP Response (HRE) Confidential, Section 4.2, at 20.

[24] Exh. JU-2, at 5-6.

delivered to a particular destination without increasing the total amount of clean energy overall.

For instance, with the new NECEC transmission link, if HQ increased deliveries into New England by the contracts' 9.55 TWh relative to historical New England deliveries, this would achieve full incrementality as defined in the RFP. But if HQ accomplished this by reducing its exports to other neighboring regions rather than by increasing clean energy generation overall, then global GHG emissions would not necessarily be reduced. Diverting clean energy from other regions to New England would enable a reduction in fossil generation and emissions within New England, but the reduced deliveries to other regions may need to be replaced by additional fossil generation in those regions. This would effectively substitute fossil generation in other regions for fossil generation in New England, shifting emissions from one region to another, without causing a material decrease (the actual impact would depend on the relative emissions intensities of each region).[25]

Q. What would be required to ensure a reduction in GHG emissions?

A. For the 83D contracts, or any project, to reliably reduce GHG emissions, they would need to provide clean energy that is "additional." Additionality is a commonly-used concept in the climate change discussions; it refers to emissions reductions that occur <u>because of</u> a proposed action, reductions that would not have occurred otherwise under "business as usual." Importantly, it must involve overall global emissions reductions, not reductions in one region or sector that might be offset by a corresponding increase that is triggered elsewhere, or reductions that would have occurred regardless of the proposed action. For example, a PPA that supports the development of a new wind farm will generally be additional. The new wind farm produces clean energy that would not otherwise be

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[25] This shifting of emissions from one region to another through resource shuffling is analogous to "leakage," defined as "the offset of a reduction in emissions of greenhouse gases within the commonwealth by an increase in emissions of greenhouse gases outside of the commonwealth." G.L. c. 21N, § 1.

produced, displacing fossil energy and reducing emissions, so the clean energy and the emissions reductions are additional to what would have occurred without the PPA. Clean energy, however, is not always additional in this sense. If an existing wind farm with an expiring PPA signed a renewed PPA with a different buyer, the renewed PPA does not result in additional clean energy. The existing wind farm would have continued to produce clean energy even without the renewed PPA; the output may have been sold to a different buyer or in the spot market. The renewed PPA does not increase the total clean energy produced and consumed or reduce emissions; it just reallocates clean energy that would be produced in any case. It can sometimes be challenging to define and determine additionality in practice, primarily because doing so can require a very precise specification of the alternative "business as usual" circumstance—*i.e.*, additional to what? But for the purposes of the 83D procurement, the important point is that a global perspective is necessary. The RFP requirement that the contract energy be incremental to New England (even if the proposed contracts required full incrementality) does not ensure that it would be additional or necessarily result in corresponding GHG reductions.

Q. Do the proposed contracts require the energy to be additional in this sense of offsetting GHGs globally?

A. No, not necessarily. HQ has committed to using existing HQPR facilities to supply the contracted energy.[26] If these facilities were spilling significant amounts of water due to transmission constraints that would be relieved by the NECEC transmission, or if Hydro-Québec undertook investments to expand its system—to increase output from existing facilities or add new generation or storage capability—then a portion of the generation may be considered additional. But the contracts do not require this, nor has HQ indicated that it is the case.

[26] *See, e.g.,* Exhibit JU-3-A, at 70-71 for a list of existing facilities that will be used to provide the contracted energy.

VI. POTENTIAL CHANGES TO THE PROPOSED CONTRACTS TO ENSURE INCREMENTALITY

Q. How could the proposed contracts be modified to ensure the energy provided is fully incremental relative to historical deliveries?

A. Increasing the Minimum Required Baseline Hydroelectric Generation Imports quantity in Exhibit H to the proposed contracts will increase the amount of energy that is required to be incremental. Unfortunately, it may not be as simple as increasing this value to equal the 14.8 TWh historical average of deliveries into New England (and removing the provisions that can reduce the Minimum Baseline). This simplistic approach could create difficulties because the amount of hydroelectric energy that HQPR is able to produce can vary from year to year based largely on hydrologic conditions. Dry years will have less total energy available, and it may not be possible to export the historical average amount; similarly, the appropriate Baseline Hydro amount could exceed the historical average in years with above-average energy. Some further adjustment mechanisms may be necessary; these might include indexing the Minimum Baseline to water conditions or to total exports from Hydro-Québec, and/or making the Minimum Baseline a multi-year or rolling requirement (the National Grid contract contains some such adjustments). A desirable principle for defining the Baseline Hydro energy (as well as the 83D contract energy) is that it should take priority over HQ exports to other regions to ensure that the contract energy is incremental to what would have been delivered to New England absent the contracts. But the existing low minimum thresholds for Baseline Hydro delivery in the proposed contracts, and the modest incentives to meet even those minimum thresholds, are insufficient to ensure that Massachusetts ratepayers will receive the fully incremental clean energy that was solicited in the RFP.

Q. Would HQ be able to provide fully incremental energy to meet such a contract requirement with its existing system?

A. In Section 4.2 of its bid materials, HRE [redacted]

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[redacted]

Q. If HQ is unable or unwilling to provide hydro production that is fully incremental, are there other options that could improve the performance of the contracts on this dimension?

A. If HQ is unable or unwilling to provide fully incremental hydro, as that might be reasonably defined, then another option could be to include other energy sources that can provide incremental energy. For example, if some new renewable energy was used to supplement the HQ hydro supply, the demands on HQPR's existing hydro system could be reduced while maintaining the total amount of incremental energy provided to New England under the contract. An alternative bid included both wind and hydro generation with the NECEC transmission, the "NECEC Wind/Hydro" bid [redacted]. In this bid, SBx (a joint venture of Gaz Metro and Boralex) would develop the wind generation as a complement to the existing hydro power. [redacted]

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27 *Section 83D Request for Proposal Application Form,* NECEC RFP Response (HRE) Confidential, Section 4.2, at 20.

28 [redacted].

29 [redacted] he difference between [redacted] and the [redacted] provided in the wind portion of the bid, leaves [redacted] TWh of the contract to be fulfilled by hydro generation.

Continued on next page

Q. Would this amount of supplemental wind energy enable HQPR's existing hydro system to provide the balance of the energy requirements for fully incremental energy?

A. It may, though it is possible that even with the [redacted], HQ might not be able or willing to provide the lower [redacted] of hydro required for incremental generation. In that case, it may be necessary to turn to other suppliers for the required amount of incremental energy. [redacted].[30] If the NECEC Hydro bid cannot provide fully incremental energy, these other bids would be unable to do so. Fortunately, there were other bids that could supply the desired fully incremental clean energy requirements. In fact, because many of these other bids were based on new renewable generation, they would be additional, and thus would ensure that the clean energy delivered to New England would offset GHG emissions, which even fully incremental energy from existing hydro resources might not necessarily do, as discussed above. The Evaluation Team created and evaluated several portfolios of renewable energy projects in Stage 3 that could be candidates if the NECEC Hydro bid [redacted] could not provide incremental clean energy. In addition, the two highest-scoring bids in the Stage 2 evaluation were [redacted] bids; although they were not evaluated on a standalone basis in Stage 3, they could be potential candidates.

VII. PROJECT SELECTION

Q. What is your concern regarding project selection?

A. There appear to be some issues regarding which projects and portfolios were selected to carry forward into Stage 3 of the evaluation. Specifically, the two highest-scoring projects in Stage 2, [redacted], were not carried forward into the

30 [redacted]

Stage 3 evaluation individually. This may have been because each bid offers less clean energy than the 9.45 TWh desired in the solicitation, though that would not necessarily disqualify these projects as standalone bids, since there was no requirement that the full amount be acquired in a single solicitation, and multiple solicitations were contemplated. Further, a portfolio consisting of just these two projects would have provided about [redacted] of the energy targeted by the procurement and may have performed very well. These two projects were included as components in several larger portfolios, though these larger portfolios included other, lower-scoring bids that may have diluted their value.

Q. Do your concerns regarding project selection relate to the question of whether the NECEC Hydro bid offers fully incremental clean energy?

A. Yes. The [redacted] bids both [redacted], and so there is no concern about whether they would offer incremental energy to New England. In fact, they would be additional as well, in the sense discussed above, and are not subject to concerns over resource shuffling, so they would offer confidence regarding global GHG reductions.

Q. Please briefly describe the evaluation of bids and bid selection process.

A. The bids were evaluated in three stages, which was followed by bid selection. In Stage 1, bids were evaluated against the RFP threshold requirements. Bids that met the threshold requirements were carried to Stage 2, where they were evaluated on both quantitative and qualitative dimensions. The Evaluation Team then selected several large proposals from Stage 2, plus several portfolios made up of multiple projects, for further evaluation in Stage 3, and ultimately project selection.

Q. Were all the bids that were evaluated in Stage 2 also evaluated in Stage 3?

A. No. As stated in the RFP, it was not expected that all bids from Stage 2 would be evaluated in Stage 3. The RFP provides three metrics for including bids in Stage 3: 1) the rank order of the proposals at the end of the Stage 2 evaluation; 2) the cost

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effectiveness of the proposals based on the Stage 2 quantitative evaluation; and 3) the total annual generation of the proposals relative to the procurement target.[31]

Q. Were the proposals with the highest rank order and highest cost-effectiveness from Stage 2 brought forward into Stage 3?

A. As standalone projects, no. [redacted] were the two most highly ranked large proposals in Stage 2. They received the highest Net Total Benefit scores and highest Net Direct Benefits scores.[32] Both the [redacted], and thus would provide energy to New England that would be both incremental to New England and additional globally. [redacted] was the top ranked bid in Stage 2, receiving a total score of 85.94; [redacted] was the second highest ranked bid in Stage 2, with a total score of 80.24. The NECEC Hydro bid was ranked third with a score of 79.95, more than 5 points below the top-ranked [redacted] Each of these portfolios included between [redacted] other smaller projects that had lower net direct benefits and higher costs,[33] which may have depressed the portfolio scores. The Evaluation Team did not evaluate [redacted] bids individually or in a portfolio composed solely of these two projects.

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31 Exh. JU-2, at 41.

32 [redacted]

33 As previously discussed, the [redacted] is an exception. *See supra* note 32.

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Q. Is it likely that the [redacted] bids would have scored well in Stage 3, either individually or combined in a portfolio consisting of just these two bids?

A. Yes. [redacted] bids were ranked first and second in the Stage 2 evaluation. The Stage 3 scoring used the same quantitative and qualitative evaluation approaches as Stage 2, so these bids would have ranked first and second in Stage 3 as well, above the NECEC Hydro bid.[34] I believe that these two bids should have been considered on a standalone basis, so that an explicit tradeoff could be made [redacted] and their better performance.

Further, a portfolio consisting of just these two bids would likely have scored quite well, and would have provided most of the energy targeted in the procurement. The Stage 3 portfolios that included [redacted] along with other projects likely scored lower due to the inclusion of these other lower-scoring projects, and so do not offer good guidance regarding the value of a portfolio consisting solely of these two bids. To calculate the total benefits of this new portfolio would require a full evaluation, including a new simulation with TCR's Enelytix model, as requested in Information Request AG 3-2.[35] I believe that a portfolio consisting of just the [redacted] projects would have been attractive and might have been preferred to the NECEC Hydro bid, and thus should have been evaluated. Further, these bids, either individually or in a portfolio, would provide greater confidence regarding the delivery of fully incremental clean energy to New England, and GHG emissions offsets.

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[34] The scaling of quantitative scores was performed independently in Stage 3, so the scoring would differ slightly from the Stage 2 scoring (*see* Section IX on the impact of scaling). The Stage 3 scaling slightly increases the advantage of the [redacted] bids over the NECEC Hydro bid.

[35] While the direct benefit portion of the total quantitative benefits should be additive and thus not require another simulation, and the qualitative benefits are not affected by inclusion in a portfolio, the indirect benefits may not be additive and would require a separate simulation to evaluate.

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Q. In combination, would the [redacted] bids satisfy the full clean energy procurement requirement under section 83D?

A. [redacted] the Act allows the EDCs to carry out multiple procurements to acquire the full 9.45 TWh of desired clean energy.[36] Had the EDCs selected a bid or a portfolio that did not satisfy the full 9.45 TWh goal, a second procurement could have been held to acquire the remaining clean energy. In fact, several other portfolios evaluated in Stage 3 offered less than the 9.45 TWh desired, though none fell short by as much as [redacted]

VIII. EVALUATION TEAM COMPOSITION

Q. In your opinion, is it appropriate that the utilities participated in bid evaluation, given that their affiliates had submitted bids in this solicitation?

A. In general, I do not find it appropriate that the Evaluation Team included the utilities whose affiliates had submitted bids. This apparent conflict of interest raises serious concerns, for several reasons.

Q. Is this just a perceived conflict of interest, or are there reasons that this could influence the outcome of the procurement process?

A. The perception of a possible conflict of interest is rooted in real reasons for concern. One concern is the possibility of information sharing that could offer the affiliate a bidding advantage. This is particularly relevant in this procurement, where bidders were not generally aware of the precise scoring mechanism that would be used to evaluate bids. The risk that bid evaluators might share information with some bidders and not others is increased if members of the bid Evaluation Team are affiliated with some bidders.

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[36] Section 83D(b).

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Q. Does walling off the Evaluation Team from direct or indirect communications with the bidding team alleviate the concerns regarding bidder affiliates on the Evaluation Team?

A. An ethical wall can be established between members of the Evaluation Team and the bidding teams, with the intent of minimizing the possibility of inappropriate information sharing. I understand that Standards of Conduct were established to create such ethical walls in this instance, though I cannot attest to their efficacy.

But in addition to concerns about inappropriate information sharing, incentive problems can arise. If the EDC stands to benefit if its affiliate prevails in the procurement process, then the EDC members on the Evaluation Team may—consciously or subconsciously—be influenced by those incentives, and favor bids from the affiliate. An apparent bias in evaluation toward an EDC affiliate's bid, either intentional or unintentional, occurred at several points in this 83D solicitation, and was explicitly identified and documented by the Independent Evaluator:

> Based on our observations, Eversource favored, or had the appearance of favoring, NPT in various stages of the evaluation and selection process, especially toward the end. This included the deliberations with respect to the interest rate assumption in the quantitative evaluation and the qualitative evaluation with respect to several criteria, [redacted]. This was also the case with respect to the Stage 3 and bid selection process, where Eversource focused on aspects of the evaluation, evaluation metrics and assumptions that supported selection of Northern Pass. It was perhaps even more apparent when Eversource sought to keep NPT in play for contract negotiations even after the required New Hampshire siting approval was denied, with a remote possibility for a prompt reversal in order for Northern Pass to be able to build the project anywhere near the timeframe proposed.[37]

The issue of favoritism toward an affiliate's bid is clearly problematic both in theory, and in practice in this solicitation. Here, if it had not been for the removal of the NPT Hydro bid from consideration due to the siting denial, there might have been good reason to contest the final winner on these grounds.

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[37] Revised Independent Evaluator Final 83D Report Confidential, at 48–49 (August 7, 2018).

Q. Did having affiliates on the Evaluation Team cause a problematic outcome?

A. The possibility that affiliate favoritism may have influenced the evaluation and selection process in some subtle way cannot be ruled out, even after NPT Hydro was removed from consideration. Project selection was ultimately made by the DOER, as the EDCs did not agree on the selection. Eversource and Unitil favored NPT Hydro, a bid affiliated with Eversource. National Grid favored NECEC Hydro. After the DOER selected NPT Hydro, this bid was removed from consideration and the non-affiliated NECEC Hydro bid was selected. But this does not eliminate all concern, because the DOER only discussed the NPT Hydro and NECEC Hydro bids in its selection letter.[38] It did not, for example, consider the high-scoring [redacted] discussed above for potential final selection. In the end, I do not have enough evidence to either exclude the possibility that affiliate favoritism may have affected bid scoring or selection, nor to conclude that the outcome was tainted by having affiliates on the Evaluation Team. Nonetheless, I would not recommend this for any future solicitations.

IX. SCALING OF QUANTITATIVE NET BENEFIT

Q. Please summarize your analysis and findings regarding the scaling of quantitative net benefit in Stage 2 and Stage 3.

A. The quantitative net benefit calculated for the proposals in the evaluation process is scaled onto a 75 point scale, with qualitative scoring accounting for up to another 25 points.[39] The scaling approach implies that the dollar value of each point depends on the particular values of the Net Total Benefit of the proposals, and the dollar value of a point affects the relative importance of quantitative vs. qualitative dimensions. The value of Net Total Benefit depends in turn on other analytic assumptions used in the evaluation. Thus using this scaling approach means that the choice of analytic assumptions could alter the relative importance of the qualitative vs. quantitative dimensions in the

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[38] Exh. JU-10, at 1.

[39] Revised Independent Evaluator Final 83D Report, at 11 (August 7, 2018).

evaluation, potentially influencing the ranking of proposals in ways the Evaluation Team may not intend or even understand.

In this solicitation, quantitative and qualitative scores are <u>negatively</u> related among several of the higher-scoring proposals, with bids that scored high on quantitative measures scoring low qualitatively, and vice versa. For example, [redacted] had a Stage 3 quantitative score of 65.69 and a qualitative score of 19.13. Conversely, the NECEC Hydro bid had a higher Stage 3 quantitative score of 75, and a lower qualitative score of 15.63.[40] These are conditions under which the scaling approach, with its potential to influence the relative weighting of quantitative and qualitative factors, could influence the ranking of portfolios, and potentially the outcome of the solicitation. While the weighting would have had to change significantly in this case to influence the ranking of these two bids, this potential impact illustrates why this scaling approach should be reconsidered for future energy solicitations.

X. EVALUATION OF GWSA BENEFITS

Q. Please describe the metric used to evaluate the GWSA impact of the proposals.

A. The GWSA metric is designed to measure "the value of the Proposal's contribution toward meeting the Global Warming Solutions Act (GWSA) over and above compliance with the RPS and CES."[41] It was calculated in the 83D bid evaluations as the dollar value of the difference between the emissions decrease (relative to the Base Case) and the amount of RECs or CECs created by the project and used for compliance with the RPS or CES. According to the Evaluation Team (excluding National Grid), the RECs and CECs are subtracted off in an attempt to avoid double-counting the REC and CEC value of the projects.[42]

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[40] Exh. JU-6, at 25.

[41] *Id.*, at 31.

[42] Revised Independent Evaluator Final 83D Report Confidential, at 17–18 (August 7, 2018).

Q. Does the GWSA metric accurately reflect a proposal's contribution toward meeting GWSA requirements?

No. The GWSA requires an economy-wide reduction in GHG emissions. The appropriate metric regarding GWSA benefits involves the GHG reduction attributable to the project relative to the Base Case, without deducting the REC/CEC quantity.[43] This is the same position that National Grid has expressed.[44] Ultimately, the GWSA calculation error did not impact the ranking of NECEC Hydro as the highest ranked bid.[45]

Q. Does this conclude your current testimony?

A. Yes.

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[43] D.P.U. 18-76/18-76/18-78, Exh. AG-DM-1, at 17 (November 5, 2018).

[44] Revised Independent Evaluator Final 83D Report Confidential*,* at 18; D.P.U. 18-77, Exh. NG-TJB-1, at 6 (November 30, 2018).

[45] Exh. AG-2-2-C, Attachment.

DEAN M. MURPHY
Principal

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Dr. Dean Murphy is an economist with a background in engineering. He has expertise in energy economics, competitive and regulatory economics and finance, as well as quantitative modeling and risk analysis. His work centers on the electric industry, encompassing issues such as resource and investment planning (including power and fuel price forecasting), valuation for contract disputes and asset transactions, climate change policy and analysis, competitive industry structure and market behavior, and market rules and mechanics. He has addressed these issues in the context of business planning and strategy, regulatory hearings and compliance filings, litigation and arbitration. Dr. Murphy has examined these matters from the perspectives of investor-owned and public electric utilities, independent producers and investors, industry groups, regulators, system operators, and consumers.

Dr. Murphy holds a Ph.D. in Industrial Engineering and Engineering Management and an M.S. in Engineering-Economic Systems, both from Stanford University, and a B.E.S. in Materials Science and Engineering from the Johns Hopkins University. Prior to joining The Brattle Group in 1995, Dr. Murphy worked as an associate with Applied Decision Analysis, Inc.

AREAS OF EXPERTISE

- Resource Planning, Investment, and Forecasting
- Valuation for Energy Contract Disputes and Energy Asset Transactions
- Climate Policy Analysis
- Market Structure and Competitiveness
- Electricity Markets: Energy, Capacity, and Ancillary Services
- Procurement and Restructuring

EXPERIENCE

Resource Planning, Investment, and Forecasting

- For Manitoba Hydro, which is evaluating large investments in hydroelectric capacity and transmission expansion that would facilitate significant off-system sales, Dr. Murphy testified in a public hearing regarding the potential evolution of long-term power prices in the export market. He also developed a set of future scenarios based on the possible future evolution of several key market drivers, and forecast long-term market prices of power for each scenario. The scenario drivers included fuel prices, climate policy, coal plant retirements, renewable energy portfolio standards, and load levels, which are affected by price feedback and active demand management programs. This assignment has been repeated in subsequent years to understand how changing market drivers have influenced the potential range future of power prices.

- Dr. Murphy assisted the investor-owned utilities and regulators in Connecticut in complying with a legislative mandate to develop annual resource and procurement plans for the state, over several annual cycles. He focused particularly on the development of a set of scenarios against which alternative resource plans were evaluated, in order to illuminate the risks that might be associated with such plans. Key issues were potential federal climate legislation, natural gas prices, electricity demand, and demand side management strategies, and the complex interplay between these factors. He also evaluated energy security issues, including interactions between natural gas availability and electric reliability, as well as the potential role of nuclear power and emerging technologies, and their impacts on energy security.

- For a consortium in the initial stages of developing a major long-distance offshore DC transmission link designed to integrate multiple thousands of megawatts of new wind generation into several electric markets, Dr. Murphy performed a preliminary evaluation of the potential energy and capacity value of the project, and the approximate customer cost impact. These analyses were designed to assist in securing FERC approval for incentive rate treatment and abandoned cost recovery.

- For a merchant electric generator contemplating renewing or replacing an expiring output contract for a gas-fired generator, Dr. Murphy used a power market simulation model to forecast potential long-term power price trends under several scenarios involving fuel costs, generator retirements and renewable additions. Using the forecasts of potential long-term trends, he simulated the plant's short-term operations and its resulting financial performance. A key factor that had a significant effect on the plant's value in this analysis was characterizing the short-term volatility of power prices and the plant's ability to respond to capture short periods of attractive prices.

- Dr. Murphy developed a long-term forecast of Renewable Energy Credit (REC) prices across multiple states and interconnected electricity markets for a renewable generation developer. He considered state-level Renewable Portfolio Standard (RPS) requirements over time, as well as potential federal renewable requirements, looking at the cost and geographic availability of several potential renewable resource types and incorporating the effect of in-state requirements and alternative compliance payments.

- Dr. Murphy worked with a manufacturer of an energy storage technology to estimate its value on several dimensions across a range of potential applications. He used simulated charge-discharge cycles with historical prices in several markets to demonstrate not only the technology's energy and capacity value, but also its potential ancillary service and reliability benefits.

- For the Tennessee Valley Authority (TVA), Dr. Murphy assisted in the development of TVA's long-range Strategic Plan to deal with the development of competitive markets and a changing regulatory environment. He organized and performed numerous operational and financial analyses to understand TVA's performance under a wide variety of scenarios, and integrated the results into a strategic framework, considering numerous potential outside influences (e.g., fuel price scenarios) and TVA responses (e.g., product unbundling or changes to TVA's pricing structure).

- For a utility client interested in building a merchant transmission line, Dr. Murphy evaluated the benefits of the line, designed and implemented an auction for the rights to use the line once constructed, and evaluated the bids received in the auction.
- For an entrepreneurial client investigating the opportunities for an electric storage technology in the deregulated electric market, Dr. Murphy developed a model that optimizes facility operations with respect to a set of forecasted electric commodity price profiles. The model was used to evaluate the technology's potential profitability on several different electricity systems. Commodity price profiles for each system were projected by integrating historical real-time system marginal cost data with the projected cost of additional capacity.

Valuation for Energy Contract Disputes and Energy Asset Transactions

- In a bankruptcy hearing, Dr. Murphy testified regarding the fair market value of the post-petition energy services (electricity, chilled and hot water) provided under contract by a creditor, in order to determine the debtor's responsibility for these costs.
- Dr. Murphy assisted the Staff of the New Hampshire Public Utility Commission in understanding the customer cost savings associated with a proposed utility divestiture of generating assets, as assessed by the utility. Key issues were whether the utility's analysis had correctly represented the operational benefits of the assets to customers in reducing their energy costs, and whether the capacity value of the assets had been accurately captured.
- Dr. Murphy assisted an Asian energy company in deepening their understanding of U.S. electricity and natural gas markets, as part of their plan to acquire assets in the region. Brattle helped to characterize market rules, including recent and proposed changes, in several regional ISOs, and how these rules may affect the financial opportunities of generators located in these ISOs.
- In a major arbitration dispute, Dr. Murphy assisted a merchant generating company in determining the value lost when the government agency with whom it had contracted to develop a gas-fired power plant decided to terminate the contract before the plant was completed. A key contributor to the value lost was the potential riskiness of the contract revenues. The contract's unusual structure insulated the merchant generating company from many of the risks normally associated with electricity markets, transferring these risks to the government agency over the contract's twenty-year term. This transfer of risk had a major effect on the value of the contract and thus on the magnitude of the arbitration claim.
- Dr. Murphy calculated the damages that resulted from several partial derates of a nuclear plant. The plant's owner had a unit-contingent output contract with a regional utility, and during the derate events, the plant delivered less power than it would have if it had operated normally. The utility had to replace the missing power (or equivalently, in some hours lost

the opportunity to resell the power) at higher market prices, and also lost some of the capacity value of the plant in the regional capacity market.

- For an investor exploring the acquisition of several gas-fired generators in markets without retail deregulation, Dr. Murphy helped to analyze the potential profitability of the assets under a range of assumptions about future natural gas and CO_2 allowance prices. Building on simulation results developed by another consultant, Dr. Murphy and the Brattle team were able to investigate several factors specific to the individual assets in question but not captured by a broad market simulation model.
- Dr. Murphy advised a committee of bondholders of a foreign subsidiary of a U.S. merchant power company that was undergoing restructuring. He advised regarding the value of several power contracts and assets in which the subsidiary had an interest, including a potential damage claim for a terminated long-term contract.
- In a dispute related to a terminated long-term power contract for an electric generating facility, the original contract contained clauses that may be triggered in the event of a default, based on the value of available replacement opportunities. For a group of bondholders of the facility, Dr. Murphy prepared an affidavit regarding the market value of the available replacement opportunities, and how they related to the facility's debt and operating costs.
- For an independent power producer, Dr. Murphy supported expert testimony to value damages due to termination of a long-term electric generator tolling contract, requiring power market forecasting and finance valuation techniques. Key to this case was the increase in risk caused by the loss of the contract, in an environment (following the collapse of the power sector in 2001) in which it was not possible to obtain a long-term replacement contract.
- For a bondholder of a power marketing company, Dr. Murphy evaluated the likely outcome of an arbitration hearing regarding damages due as a result of the termination of a long-term generation contract.
- For an independent power producer forced into bankruptcy by the rejection of a long-term power contract by its counterparty, Dr. Murphy assessed the economic damages due to the loss of the contract.
- In the context of a dispute over damages in a terminated gas supply contract, Dr. Murphy analyzed and provided written testimony regarding the potential to resell contracted natural gas that could not be utilized by the purchaser.
- For a utility client attempting to acquire a partially completed generating station to be held as a utility affiliate, Dr. Murphy analyzed the acquisition and affiliate transaction to determine whether there would be any violation of market power regulations.

Climate Policy Analysis

- With a Brattle co-author, Dr. Murphy evaluated the contributions of nuclear plants to the U.S. economy, as well as their environmental effects in reducing carbon and other emissions. This study used a power sector simulation model in combination with a dynamic input-output model of the U.S. economy, and found that the primary economic effect was that nuclear plants hold down power prices, reducing what all consumers pay for electricity. This savings, because it is significant and widespread, gives a substantial boost to the economy overall.
- Similar to the study described above, Dr. Murphy and his co-author have performed more detailed evaluations at the level of several individual states where nuclear is an important generation source. They have examined specific nuclear plants that are facing financial challenges to determine how these plants affect electricity prices, economic activity, and emissions of CO_2 and other pollutants within their state.
- Dr. Murphy helped the senior executives of a major coal producer to assess the long-term implications of U.S. climate policy on the electricity generating infrastructure. He characterized the effects of different potential policy structures and stringency on CO_2 prices, the economics of existing and future electric generating technologies, and likely generation expansion and retirement decisions over several decades, in order to forecast power sector costs and CO_2 emissions under these policy approaches. The project also involved estimating the long-term effects on CO_2 emissions in the transportation and other sectors.
- In seeking regulatory approval for a generation expansion plan, an investor-owned utility engaged Dr. Murphy to help understand the interrelationship between potential climate policy, the cost of natural gas, and the cost of generation technologies. He helped the client to incorporate these interacting factors into the client's existing planning models.
- Dr. Murphy assisted the executives of a major U.S. electric company in developing a proposed policy structure to mitigate greenhouse gas emissions (carbon dioxide) that would be economically efficient, effective, and manageable for industries and the economy. The research evaluated the impact on the electric industry, addressing overall, regional, and company-level effects of alternative policies and stringency of legislation. It also addressed the effects on consumers and other industries.

Market Structure and Competitiveness

- Dr. Murphy leads the Brattle team as the Independent Auction Monitor for the Southern Companies' Energy Auction, which has been in operation since April 2009. The auction is governed by FERC tariff, which is designed to mitigate potential market power. The tariff requires Southern to administer auctions for standard day-ahead and hour-ahead energy products for delivery "Into SoCo," and to offer its available capacity at a cost-based rate into these auctions. The Brattle team has developed data structures, monitoring protocols and automated tools to track Southern Companies' load forecasting, purchases and sales, outage declarations, and unit capabilities and costs. On this basis, Brattle monitors Southern's offers into each auction to ensure in compliance with the FERC cost-based tariff. Brattle also ensures that the auction functions and clears properly, and monitors the behavior of third party participants in the Auction. Monitoring is done on a daily basis, with reports annually on auction performance and tariff compliance to the FERC.

- Dr. Murphy participated in a market power analysis in the context of a major electric utility merger, focusing on the analysis of how transmission availability and constraints affect the potential for the exercise of market power. He coordinated the collection and interpretation of transmission data from numerous utilities. To correct for the inherent data weaknesses, he designed and oversaw a separate, integrated transmission modeling effort to determine the ability of the grid to support short-term power transactions.
- Dr. Murphy evaluated the potential anti-competitive effects of a merger between a major regional natural gas company and an electric utility in a region where electric generation is highly dependent on natural gas as a fuel. He examined the potential for the merged company to exercise vertical market power by manipulating the price of natural gas to influence the competitive price of electricity, and what effect that would have on the competitiveness of the electric market.
- In several other cases, Dr. Murphy analyzed whether proposed energy company mergers or acquisitions would create the potential for the exercise of horizontal and/or vertical market power, developing mitigation strategies where appropriate.
- In a proposed merger involving an East Coast electric utility, Dr. Murphy assisted senior management in evaluating the effects of retail access on the financial health of both the client company and the potential merger partner, taking into account projected operating costs, the timing of open access, market prices for power, customer loss, and stranded cost recovery.

Electricity Markets: Energy, Capacity, and Ancillary Services

- For a competitive energy supplier and generation owner, Dr. Murphy analyzed the role of demand-side resources, such as interruptible load, in an ISO-sponsored capacity market. He examined the extent to which demand-side resources could supply capacity needs, and the risk that frequent utilization of such resources might dissuade their participation in the market.
- Dr. Murphy assisted a U.S. electric ISO with understanding the implications of expanding ISO membership on the ancillary service requirements of both existing and proposed new ISO members.
- For a major hydroelectric generator, Dr. Murphy assessed the planning and decision system used to determine when and how to allocate energy (e.g., in spot or forward markets). Both value and risk implications are important, and both are affected by large uncertainties and correlations in forward and spot prices, weather, energy (water) availability, and non-electric restrictions, among other factors. Dr. Murphy developed a number of recommendations for improving the accuracy of the utility's forecasts and models, thus improving the decisions based on them.

- Dr. Murphy assisted a major Northwest hydroelectric generator in understanding the role of electric ancillary services, including voltage control and reserve generating capacity, in a restructured electric market. Issues included the interaction between the energy market and the ancillary services market, and the implications of embedded cost pricing as compared to competitive market-based pricing of ancillary services. This engagement involved coordinating work across the generation and transmission groups within the client organization to determine appropriate tariff rates for these ancillary services.
- In a series of projects for the Electric Power Research Institute (EPRI), Dr. Murphy examined the potential for hydroelectric generators to provide reserve generating capacity in a restructured electricity market. Dr. Murphy developed an economic framework for understanding how the markets for electric energy and reserve capacity interact, and whether hydro's technical advantages in providing reserve capacity are likely to make reserves a natural niche market for hydro. Dr. Murphy also evaluated the probable effect of industry restructuring on the value of hydroelectric power assets, taking account of their technical capabilities to store and release energy according to market conditions, and provide ancillary services.
- For a utility client, Dr. Murphy evaluated the effects of pricing structure on demand for electricity, load shape, and revenues. Changes in pricing structure can stimulate electric demand, increasing revenue without increasing the per unit electricity price. This may be a useful mechanism for mitigating a utility's stranded costs as the industry is restructured.

Procurement and Restructuring

- Dr. Murphy assisted the Staff of the New Hampshire Public Utility Commission in an analysis of customer savings that would result from the divestiture of a New Hampshire utility's remaining generation assets. Concerns and disagreements about an earlier analysis had led to disputes over whether to move ahead with the divestiture, including a split within the PUC Staff. Dr. Murphy's analysis and his testimony before the NHPUC helped to unite the parties in support of moving ahead with the divestiture.
- Dr. Murphy assisted an electric utility client with regulatory strategy regarding a state proposal to allow utilities to earn a "premium" on long-term power purchases, in order to account for the risks involved in committing to purchased power contracts.
- Dr. Murphy assisted a California utility in hearings before the California Public Utilities Commission regarding the establishment of a process for the California utilities to resume power procurement in the wake of the western power crisis of 2000-2001.
- In several engagements, Dr. Murphy assisted utility clients facing potential customer loss through municipalization. As part of these analyses, he determined the stranded costs (unrecovered investment) that municipalization would involve.
- Dr. Murphy assisted an electric utility client in planning for industry restructuring by characterizing alternative paths that restructuring could take, and developing potential strategies that respond to a competitive market and regulatory changes. He developed a

detailed spreadsheet-based system and financial model to evaluate the effects of various strategies and scenarios on the magnitude of stranded costs and the client's financial performance. This modeling effort required analysis and forecasting of the changes in the structure of the market for electricity, as well as probable regulatory changes and their implications. The model served as the basis for several follow-up studies addressing more specific decisions and issues, performed by the client and by The Brattle Group.

Other Engagements

- In eight different litigation cases involving 14 nuclear reactors at 11 plants, Dr. Murphy has evaluated the Department of Energy's (DOE) failure to honor its commitment to remove spent nuclear fuel from U.S. nuclear plants. He led the analytical effort in all of these cases, and provided expert witness testimony in one of them, to characterize how the government should and would have carried out its contractual obligation. Dr. Murphy simulated a nationwide market for the exchange of spent fuel removal rights, as was enabled by the contract, which made it possible to determine the timing of spent fuel removal from each individual plant in the non-breach world. The results of these analyses were used to support the damage claims of the client nuclear owners for ongoing spent fuel storage costs that would have been unnecessary if the DOE had performed its contract obligations.
- Dr. Murphy assisted in a review of the auction of an ownership share in a nuclear generating plant, in order to determine whether the sale was performed using commercially reasonable means to ensure mitigation of the regulated seller's stranded costs.

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The Future of the U.S. Coal Generation Fleet., by Metin Celebi, Marc Chupka, Dean M. Murphy, Samuel A. Newell and Ira H. Shavel, Excerpt from the Fall 2017 newsletter for the ABA Antitrust Section, Transportation and Energy Industries Committee, November 30, 2017. The article analyzes the decline in coal-generated electricity in North America and discusses the implication of a recently proposed U.S. Department of Energy (DOE) rule that could shield certain coal and nuclear plants from competitive market forces.

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Amory Lovins, " Do Coal and Nuclear Generation Deserve Above-Market Prices?," The Electric Journal July 2017, Vol. 30, Issues 6, Pages 23-30

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GREENWASHING AND CARBON EMISSIONS: UNDERSTANDING THE TRUE IMPACTS OF NEW ENGLAND CLEAN ENERGY CONNECT

Prepared by: Energyzt Advisors, LLC

Prepared for: Maine Renewable Energy Association
Natural Resources Council of Maine
Sierra Club

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EXECUTIVE SUMMARY

GREENWASHING AND CARBON EMISSIONS: UNDERSTANDING THE TRUE IMPACTS OF NECEC

This report was commissioned by the Maine Renewable Energy Association, Natural Resources Council of Maine, and Sierra Club to understand the potential impacts of the New England Clean Energy Connect ("NECEC") on carbon emissions.

NECEC is a proposed transmission line with a capacity of 1,200 MW that would import around 9.5 TWh of energy from Québec into New England for purchase by Massachusetts utilities under Section 83D of the *Climate Protection and Green Economy Act*.[1] Although Central Maine Power ("CMP") and Hydro-Québec[2] claim that the electrical energy delivered via NECEC would be "clean energy" from Québec's existing hydroelectric system, there are a number of reasons why the energy flowing through NECEC may not be "clean," may not be hydroelectricity, and may not even be sourced from Québec. Furthermore, the NECEC project – a high voltage direct current ("HVDC") transmission line crossing 145 miles in Maine, including 53.5 miles of pristine areas -- also could hinder Maine's efforts to develop its own renewable energy resources which otherwise could reduce carbon emissions and create local jobs and economic opportunities. This report examines the impacts of NECEC on carbon emissions and concludes that NECEC will not result in a significant reduction in greenhouse gas emissions, and may even increase them.

Hydro-Québec has a financial incentive to sell as much excess energy that it can, subject to water and generation constraints, and divert exports from other markets into NECEC to achieve a higher price. Given its system characteristics and profit goals, Hydro-Québec could even purchase energy from other markets during low-priced hours in order to retain energy in the form of water waiting in its reservoirs for subsequent sale at higher prices to New England through NECEC. Furthermore, the significant inflow via a 1,200 MW transmission line into Maine could adversely affect the economic prospects for Maine renewables, which are likely to be deferred or delayed as a result of the project's impacts

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[1] Mass. Gen. Laws Ch. 21N, Section 3 (a – d).

[2] Hydro-Québec refers to the parent company of Hydro Renewable Energy, Inc. ("HRE") which submitted a bid in response to the Massachusetts Section 83D request for proposal and Hydro-Québec US, the entity that is the counterparty to the Massachusetts contracts. Hydro-Québec is a provincially-owned company that manages the Québec power system via Hydro-Québec Power (generation), Hydro-Québec TransEnergíe (Transmission) and Hydro-Québec Distribution (distribution system delivery and retail services).

on the local transmission network. The net result would be a minimal impact on efforts to reduce total carbon emissions.

NECEC could divert energy sales from another market into New England; shifting flows between markets may not reduce total greenhouse gas emissions and could even increase total carbon injections into the atmosphere.

It is important to note that intertie capacity from Québec into other markets is not a constraining factor for Hydro-Québec exports. Even during 2017 when Hydro-Québec exports reached a record high, there was a significant amount of unused transmission capacity throughout the year, indicating that the constraint on increasing exports from Québec into other markets is due to limited availability of water to produce energy or other production constraints, not the amount of transmission capacity. Therefore, a new intertie merely allows Hydro-Québec to access a higher-priced, long-term contract with Massachusetts instead of selling into competitive spot markets at lower, more uncertain prices. The NECEC transmission line is not necessary to export additional clean energy from Québec into external markets.

Hydro-Québec's proposal in response to the Massachusetts Clean Energy RFP explicitly states that it would supply energy to NECEC from existing generation resources, and not from new sources of renewable energy developed to serve the line. Given that Hydro-Québec would maximize its exports without NECEC and sell whatever excess energy that it had into external markets,[3] Hydro-Québec would supply NECEC by simply shifting those exports into New England via NECEC at a higher contracted price. This shift in energy flows could create an offsetting impact in the other markets which would have to produce replacement energy, potentially resulting in offsetting carbon emissions. While Maine power plants would be forced to shut-down to accommodate energy flowing into NECEC, fossil fuel plants in other markets (including oil, natural gas and coal units), would fire-up in response to Hydro-Québec's shifting its energy sales, negating any potential climate benefits.[4]

Hydro-Quebec can and does buy energy from low-priced markets and then sells its "clean energy" at a higher price into other markets, potentially creating a similar impact

[3] External markets into which Hydro-Québec sells energy includes Ontario, New Brunswick, New York, Mid-Continent ISO, PJM, and New England.

[4] The relative carbon emissions impact of displacing New England generation with new generation in other markets depends on the carbon intensity of power plants on the margin in each market.

on carbon emissions in the atmosphere as if Hydro-Québec were generating power from fossil fuels directly.

As a result of its reservoir storage capability, Hydro-Québec can buy lower cost energy from markets where fossil fuel generators are operating, retain water in its reservoirs and then sell that water as hydropower at higher priced periods back into the same or other markets. This strategy was described publicly by the government of Québec back in 2004:

> . . . Hydro-Québec is able to purchase electrical energy from neighbouring markets at lower prices during certain periods, and then resell it later to neighbouring networks at higher prices.[5]

Hydro-Québec continues to declare its ability to engage in the buy-low/sell-high arbitrage opportunities in its Annual Reports.[6] At the Maine Public Utilities Commission (Maine PUC), CMP admitted on the record that the proposed power purchase agreements for energy via NECEC allow Hydro-Québec to use its existing resources and import/export interties to optimize profits.[7] In this way, Hydro-Quebec can claim that the electricity it sells is "clean" hydropower even if it is buying fossil fuel electricity to enable those energy sales. There is no way for anyone in New England to know when this happens, even though Hydro-Quebec has publicly acknowledged that this is their business model. So long as NECEC can assign energy from its dams to New England, the Massachusetts contracts ignore how Hydro-Québec is managing its system to meet its energy sales obligations.

NECEC would suppress the development of new renewable energy generation in Maine which, in contrast to Hydro-Québec's market-switching strategy, actually could lower greenhouse gas emissions and provide more local jobs and economic benefits than NECEC.

[5] Minestere des Ressource natuelles, dela Faune et des parcs, Gouvernement du Quebec. 2004. "The Energy Sector in Québec, Context, Issues and Questions," p. 41.

[6] Hydro-Québec Annual Report 2017, p. 48, "Hydro-Québec supplies the Québec market with electricity and also sells power on wholesale markets in Canada and the United States. In addition, it is active in arbitrage transactions."

[7] *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Technical Conference Transcript (Aug. 1, 2018), pp. 21-25.

The proposed transmission project is a direct line from Québec into New England via Maine that does not allow other renewables in Western Maine to interconnect. NECEC is anticipated to consume the existing transmission availability and could make the cost of interconnection by in-state renewable resources to the ISO-NE system at a different point in Maine more expensive. This means that new renewable energy projects, such as solar arrays and wind projects, would not be able connect to the grid as easily and could be unable to compete with renewables in other states. In contrast to Hydro-Québec's energy flows through NECEC, potential Maine-based renewable energy projects would result in greenhouse gas reductions, would employ people in Maine and New England, and provide greater environmental benefit.

The Massachusetts contracts pay a higher price for energy than Hydro-Québec otherwise would earn by selling into other markets under current conditions. Although there are certain penalties if threshold levels of hydroelectric energy are not delivered, the contracts do not require the energy to be incremental to historical levels or to what Hydro-Québec currently can produce. Hydro-Québec is allowed to replace its "clean energy" with substitutes, even if it results in higher emissions.

Adjusting CMP's model to reflect lower runoff conditions while maintaining Hydro-Québec's exports at historical levels illustrates how and why Hydro-Québec would have to resort to diverting exports and greenwashing.

CMP's model assumes that heavy water conditions would continue throughout the term of the contract. Changing one simple assumption in CMP's model of Hydro-Québec's system while maintaining exports at levels experienced during the past five years indicates that energy supplied via NECEC could be required to divert exports into other markets and even engage in greenwashing to meet its obligations.

The reality, however, is that Hydro-Québec is not confined to a single strategy or objective over the course of the contract. Hydro-Québec will manage its system, sales, exports and opportunities according to water conditions, market prices and production constraints. Such optimization will include diverting sales into other markets and greenwashing, as required to optimize profits.

The Massachusetts contracts do not preclude Hydro-Québec from engaging in purchasing energy from other markets to supply NECEC. The net result could be higher emissions.

ENERGYZT

GREENWASHING AND CARBON EMISSIONS: UNDERSTANDING THE TRUE IMPACT OF NECEC

This report examines the environmental impact of the proposed New England Clean Energy Connect ("NECEC") project on carbon emissions.[1]

NECEC is a 1,200 MW high voltage direct current ("HVDC") transmission line that would cross 145 miles of Maine natural resources from Bettie Township on the Québec border to Lewiston, Maine – of which 53.5 miles in Somerset Country would require construction of a new clearing along a previously undeveloped right of way. While this transmission project would have significant impacts on Maine's natural resources and ecosystems, the focus of this report is on whether the project would have a net impact on carbon emissions globally.

Greenwashing

The term greenwashing was created in 1986 in response to an increase in marketing and advertising that created the perception that a company's products, aims or policies were sustainable, clean and/or green, regardless of reality. The term greenwashing subsequently was applied to the electricity sector with respect to concerns that renewable energy claims did not reflect the true nature of the underlying energy source.

Hydro-Québec claims that NECEC will deliver 100% clean energy 100% of the time via NECEC.[2] This claim, however, is unsupported by the terms of the contracts with the Massachusetts utilities. Given Québec's interconnections with other markets, NECEC effectively allows Hydro-Québec to divert its energy sales from other markets into New England for a higher contractual price. In addition, under the terms of the contracts with

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[1] This report was commissioned by the Maine Renewable Energy Association ("MREA"), Natural Resources Council of Maine ("NRCM"), and Sierra Club.

- MREA: According to its website, "MREA leads the local and statewide policy debate on renewable energy generation in Maine, and works to ensure its efforts are united with those of its member companies." https://www.renewablemaine.org/
- NRCM: NRCM is a "nonprofit membership organization protecting, restoring, and conserving Maine's environment," https://www.nrcm.org/
- Sierra Club: With over 3.5 million members and supporters focused on "defending everyone's right to a healthy world," the Sierra Club is "the most enduring and influential grassroots environmental organization in the United States." https://www.sierraclub.org/home

[2] Commonwealth Magazine, John Carroll and Lynn St. Laurent, "Hydro-Quebec, Central Maine Power respond to critics," September 8, 2018,

https://commonwealthmagazine.org/opinion/hydro-quebec-central-maine-power-respond-to-critics/

Massachusetts utilities, Hydro-Québec would not be precluded from purchasing energy from other markets to sell directly into NECEC or for purposes of conserving water in its reservoirs for future supply to NECEC at a later time.

The practice of purchasing energy from one market in order to sell it into another market as hydroelectric energy at a later time can be referred to as "greenwashing." In effect, Hydro-Québec can procure supply from other markets in order to meet its clean energy obligations delivered via NECEC even though the environmental impact in those other markets could be the same as if the energy were supplied directly from fossil fuel generating resources. Massachusetts ratepayers effectively could be paying above-market prices for energy from existing resources outside of Québec that provide no incremental environmental benefit and could even increase carbon emissions.

There are many indicators that this project would not reduce carbon emissions and could even increase them. Hydro-Québec's interconnected system with significant reservoir storage, makes the origin of the energy being sold through NECEC into Massachusetts difficult to confirm, and thus the true impact on carbon dioxide emissions impossible to measure. The following factors make it likely that this proposed transmission line will have adverse environmental consequences despite being marketed as a "clean" energy project:

- **Incentive and Opportunity to Buy Low and Sell High:** Hydro-Québec's highly interconnected system configuration, especially with respect to other markets, creates opportunities for Hydro-Quebec to source the energy sold to Massachusetts via NECEC from other markets, where nuclear energy and fossil fuel generation is operating and effectively would supply Hydro-Québec's purchases.

- **Potential for Increased Carbon Emissions in other markets**: The diversion of existing sales of hydroelectricity from other markets, for example in New York, New Brunswick or Ontario, could increase carbon emissions in those markets, offsetting or even exceeding claimed carbon benefits of NECEC in New England.[3]

[3] The ultimate impact on total carbon emissions will depend on the relative carbon emissions intensity of the last plant required to generate energy or shut-down in response to Hydro-Québec's activities. If the states in the Northeast pursue their stated carbon reduction goals, the relative impact should go to zero as relative carbon emissions across markets converge.

- **Displacement of Existing and New Maine Renewable Resources:** Maine's potential for new renewable resources will be adversely impacted, delayed and deferred as a result of NECEC.

The outcomes described in this report are not theoretical. Under realistic assumptions about water conditions, Hydro-Québec would not be able to maintain exports at 2017 levels with NECEC unless it diverted sales from other markets and engaged in greenwashing during the first half of the contract. Hydro-Québec has engaged in the described behavior in the past and has every incentive to engage in this behavior to optimize its profits going forward.

1. OVERVIEW OF NECEC

Central Maine Power is proposing to build a new transmission line to bring existing Canadian hydroelectric energy into New England via Maine. NECEC was developed in response to the Massachusetts solicitation for clean energy under Section 83D of the *Climate Protection and Green Economy Act*.[4]

Of the forty-six submissions to the Massachusetts Section 83D Request for Proposal ("RFP"), NECEC is one of three projects that proposed to supply existing hydroelectricity from Hydro-Quebec via new transmission lines into New England. Northern Pass Transmission (NPT) was selected initially and offered 1,200 MW; NECEC was the next choice after New Hampshire refused to site Northern Pass, also offering 1,200 MW; and TDI's New England Clean Power Link (NECPL) would have transmitted up to 1,000 MW of energy from Québec's existing hydroelectric power system.[5] Aside from one other transmission project proposed by Emera, the forty-two (42) other projects included wind, solar, hydroelectricity or some combination, and includes renewable energy projects being developed in Maine.[6]

The assertion that NECEC supply would come from existing resources appears multiple times in Hydro-Québec's proposal in response to the Massachusetts clean energy request for proposal, as illustrated by the following excerpt.[7]

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[4] Mass. Gen. Laws Ch. 21N, Section 3(a – d).

[5] See the public versions of the bid submitted for each project located on the Massachusetts Clean Energy website: https://macleanenergy.com/83d/83d-bids/.

[6] Ibid.

[7] See for example, pages 4, 6 and 56.

> All of the hydroelectric generation units that comprise the HQ Hydropower Resources are in operation and, therefore, have already been constructed. Although new hydroelectric generation units may be added to the HQ Hydropower Resources portfolio in the future, **no new facilities or capital investments for hydroelectric generation units are required as part of this Proposal**.[8]

(emphasis added).

The RFP initially required bidders proposing to supply from existing projects to explain how the delivered energy would be incremental to historical levels. The requirement that the delivered energy be incremental also was incorporated into the template for the Power Purchase Agreement which defined "Qualified Clean Energy" to include "Incremental Hydroelectric Generation," defined as:

> "Incremental Hydroelectric Generation" means hydroelectric generation that represents a net increase in MWh per year of hydroelectric generation from the Seller as of the Effective Date as compared to the three-year historical average for the period January 1, 2014 through December 31, 2016 and/or otherwise expected delivery of hydroelectric generation from the Seller within or into the New England Control Area.[9]

Following negotiations between Hydro-Québec and the Massachusetts utilities, however, the signed version of the contract dropped the definition of "Incremental Hydroelectric Generation" and changed the definition of "Qualified Clean Energy" to exclude any reference to incremental hydroelectric generation.[10] Furthermore, there is no requirement that total deliveries into New England versus the historical averages be incremental, only

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[8] HRE Section 83D Application Form, submitted July 27, 2017, p. 63 (emphasis added).

[9] DRAFT* POWER PURCHASE AGREEMENT FOR FIRM QUALIFED CLEAN ENERGY FROM HYDROELECTRIC GENERATION BETWEEN [______________________________] [Buyer] AND [__________________] [Seller] As of [____________], 201_ , p. 7.

[10] See for example, *Central Maine Power Co., Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232*, Exhibit No. NECEC-16, POWER PURCHASE AGREEMENT FOR FIRM QUALIFIED CLEAN ENERGY FROM HYDROELECTRIC GENERATION BETWEEN MASSACHUSETTS ELECTRIC COMPANY AND NANTUCKET ELECTRIC COMPANY d/b/a NATIONAL GRID AND H.Q. ENERGY SERVICES (U.S.) INC., as of June 13, 2018, [REDACTED].

penalties if Hydro-Québec fails to meet the new set of requirements, which is described in Exhibit H to the power purchase agreement. Although Exhibit H is redacted, CMP witnesses testified before the Maine PUC in public session that Hydro-Québec does not have to make incremental delivery of power into New England, but can pay penalties instead.[11]

The Maine PUC Technical expert, London Economics, testified that this ability to trade between markets and obtain a higher price is a "key motivator" for NECEC.[12]

Key Insight

The signed contracts do not require Hydro-Québec to deliver incremental energy from its existing hydroelectric projects. Instead, if it is economic or strategic to do so, Hydro-Québec can choose to not deliver incremental energy and pay penalties instead. The contracts do not monitor or preclude Hydro-Québec from engaging in purchases from other markets for its own domestic use to allow for sales of its hydroelectricity at a premium to Massachusetts utilities under the contracts.

The NECEC project, as submitted to the Section 83D RFP, is a collaboration between CMP and two wholly-owned subsidiaries of Hydro-Québec -- Hydro-Québec TransEnergíe (HQT) and Hydro Renewable Energy (HRE). HRE subsequently was replaced by Hydro-Québec US in the signed power purchase agreements, placing the obligation on a US-based affiliate of Hydro-Québec that has limited assets in the event of default.

Under publicly available contracts and proposals, the NECEC transmission line would have a capacity of 1,200 MW. HQT would build and operate the transmission line on the Québec side and CMP would build and operate the portion of the transmission line located in Maine. Hydro-Québec would make available to Massachusetts a minimum of 8.5 TWh up to 9.5 TWh of electricity per year at the discretion of the Massachusetts distribution utilities engaged in the procurement.[13]

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[11] *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Technical Conference Transcript (Aug. 1, 2018), pp. 28 – 35.

[12] *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Technical Conference Transcript (Sep. 19, 2018), pp. 21-25.

[13] Section 83D, Request for Proposal Application Form, submitted by Hydro Renewable Energy Inc., p. 3, https://macleanenergy.com/83d/83d-bids/

Figure 1 illustrates the proposed path of the NECEC project and interconnection between Québec and Lewiston, Maine.

Figure 1: Proposed NECEC Project[14]

The injection point at Lewiston, Maine, is not ideal. Maine is connected to the ISO-NE system through a long high voltage AC line and energy must pass through at least four interfaces before arriving in Massachusetts. The Maine generation system produced only 11.5 TWh of energy in 2017 compared to 17 TWh in 2010. According to the U.S. EIA,

[14] NECEC, https://www.necleanenergyconnect.org/map

electricity imports from Québec that already have occurred are one of the reasons for the reduction in Maine generation:

> Maine's Renewable Portfolio Standards (RPS) require electricity providers to fuel 30% of their electricity generation with renewable resources. In addition to policy initiatives, electricity imports from Canada—notably from Quebec—have been contributing an increasingly larger share to Maine's total generation, displacing natural gas-fired generation as the primary source. Since 2012, electricity imports from Canada have more than tripled . . .[15]

Imports into Maine from Québec already have displaced a significant portion of Maine's natural gas plants. NECEC would continue the trend of displacement by nearly matching the total amount of energy generated by Maine power plants in 2017. If NECEC were to proceed injection of such a significant amount of energy into Maine, Maine's existing generators, including biomass plants, will be displaced. NECEC also will have an adverse impact on transmission availability, congestion and losses. As a result, new renewable energy generation would find it more costly to connect to the system in Maine for delivery into the rest of New England. These higher interconnection costs would make it more difficult for Maine renewable resources to compete with the rest of New England.

Under the agreement with Hydro-Québec, CMP would build the transmission line on the Maine portion of the line. CMP anticipates the need to invest in a number of transmission upgrades to incorporate NECEC into the system; a critical part of the existing ISO-NE transmission system, Surowiec-South, currently has only 200 MW of availability for incremental energy flows without upgrades.[16] CMP's proposed upgrades, however, would simply move congestion down to the Maine-New Hampshire Interface which has an interface limit of around 1,900 MW and does not have enough capacity to flow NECEC out of Maine in all hours without the additional cost of congestion and incremental line losses.[17]

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[15] EIA Form 923 data, https://www.eia.gov/naturalgas/weekly/archivenew_ngwu/2018/09_27/

[16] ISO-NE, Final Maine Resource Integration Study ("MRIS"), March 2018, Available at https://www.iso-ne.com/staticassets/documents/2018/03/final_maine_resource_integration_study_report_non_ceii.pdf

[17] *Central Maine Power Co., Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232,* Exhibit No. TLB-1, "Testimony of Tanya L. Bodell," April 30. 2018.

The total cost for CMP's transmission line build-out and upgrades is estimated to be $950 million. Under the proposed structure, Maine ratepayers would not be responsible for any payments to build the transmission line. However, Maine ratepayers also would not obtain any direct rights to capacity on the transmission line or energy being delivered across NECEC. Therefore, any benefit to Maine that could result from the proposed transmission line would be indirect impacts.

Given the global nature of carbon emissions, the impact on Maine's carbon emissions alone or even New England's carbon emissions across the broader region cannot be examined without consideration of the impact on surrounding areas. In assessing the net impacts of NECEC on carbon dioxide emissions, therefore, it is necessary to consider the total impact of NECEC across multiple markets.

Key Insight

NECEC does not offer any direct benefits to Maine residents. Whereas Massachusetts is estimated to receive hundreds of millions of dollars in direct benefits, Maine would not receive any direct benefits associated with energy deliveries dedicated to Maine ratepayers. Instead, the potential impact of NECEC to Maine includes the net impact of NECEC on global emissions and should be examined across multiple markets.

2. SOURCE OF QUÉBEC HYDROELECTRIC SUPPLY

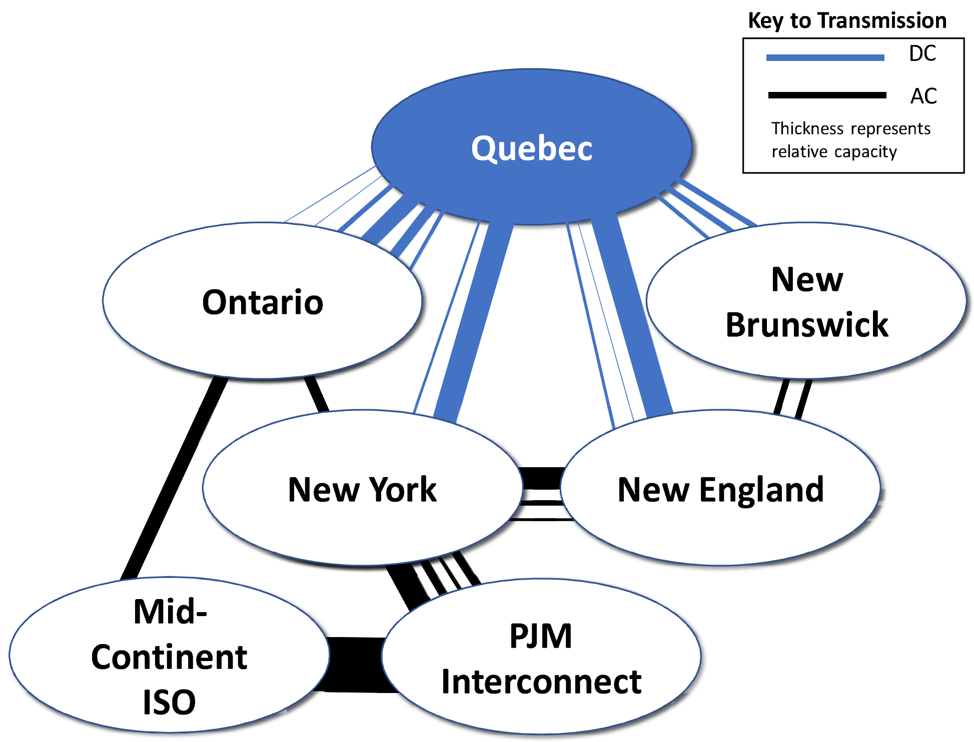
Hydro-Québec owns and operates a large system of hydroelectric generation and other power generating capabilities along with an extensive transmission network. In order to understand how Hydro-Québec is likely to supply energy via NECEC, it is important to understand the current and anticipated state of its system, the amount of excess energy it could produce with or without NECEC and what Hydro-Québec otherwise would do with that energy in the absence of NECEC.

This section provides a high-level summary of the Hydro-Québec system; Appendix B provides a more detailed overview.

2.1 Québec is interconnected with multiple markets

Québec is physically interconnected to four other markets via DC tielines – New England, Ontario, New York and New Brunswick (**Figure 2**).

Figure 2: Interties and transmission lines between Québec and major markets



In addition, by wheeling through other markets, Hydro-Québec can sell into PJM and the Mid-Continent ISO -- two markets that are explicitly listed in Hydro-Québec's application for a blanket export license.[18] Both New York and New Brunswick connect with New England via an AC transmission interconnection, allowing Hydro-Québec to sell energy into New England via New York and New Brunswick. In addition, Hydro-Québec can and does sell into New York via Ontario.[19]

The ability to purchase from other markets and store an equivalent amount of energy by

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[18] National Energy Board, Application by Hydro-Québec, "Application for a Blanket Electricity Export Permit Pursuant to s.119.03 of the National Energy Board Act and s.9 of the National Energy Board Electricity Regulations," Application Submission Date 19/02/2010, p. 4.

"(3) Provide a brief description of the export markets (e.g. geographic area, NERC region, etc.) to be served. Les marchés visés sont les marchés nord-américains desservis par le New York Independent System Operator, Inc., l'ISO New England Inc., le Midwest Independent Transmission System Operator, Inc. et la PJM Interconnection, LLC."

[19] National Energy Board, Analysis of Commodity Tracking System Data,

https://apps.neb-one.gc.ca/CommodityStatistics/Statistics.aspx?language=english reducing flow through its turbines provides valuable flexibility to Hydro-Québec. This flexibility is particularly profitable during low water conditions when Hydro-Québec would have less energy to sell into external markets or high-priced years when the difference between peak and off-peak energy prices is greater.

The higher-priced, long-term NECEC contract is an example of the way Hydro-Québec can arbitrage between markets – buying low in one market and then reselling that energy at a higher price elsewhere. The above-market price of the contracts with Massachusetts utilities also would allow Hydro-Québec to maximize profits through optimization of its imports and exports while selling under a lucrative long-term contract.

2.2 The National Energy Board issues energy export licenses

In order to sell any energy commodity products into the US, Hydro-Québec must obtain a license from the National Energy Board (NEB). The NEB considers a number of factors before issuing a license, including:

- **Other Provinces:** Whether or not there could be adverse consequences to other provinces in Canada; and
- **Environment:** Impact on the environment.

As explained below, these requirements, combined with the characteristics of Hydro-Québec's system, makes it very clear that Hydro-Québec would have to divert sales from other markets in order to deliver electricity products via NECEC (thereby negating any impact on carbon emissions) and/or purchase electricity products from other markets in order to meet its firm commitments under the Massachusetts contracts (i.e., greenwashing).

2.2.1 Other Provinces

Specific export licenses for Hydro-Québec indicate that the NEB also looks at whether or not there would be an adverse impact on other provinces. The license issued to Hydro-Québec for contractual sales to Vermont specifically notes in the preamble:

> AND WHEREAS the Board is satisfied that the parties interested in buying electricity for consumption in Canada have been given fair market access to any electricity proposed for export under this permit;

> AND WHEREAS the Board is satisfied that the proposed exports will not cause any unacceptable effects on provinces other than those from which exports will occur;[20]

The focus on potential impacts on other Canadian provinces could make it difficult for Hydro-Québec to reduce sales into Ontario or New Brunswick or engage in behaviors that could adversely impact those provinces. Therefore, the bulk of the export reductions could come from New York.

2.2.2 Environment

The NEB also is tasked with considering the environment and would be required to perform a detailed review of potential environmental impacts if the proposed source of energy sales is to come from new generation facilities. In the case of the 10-year blanket export license issued to Hydro-Québec in 2010 for up to 30 TWh of firm and interruptible energy for export, the NEB specifically noted:

> Regarding the impact of the proposed exportation on the environment, the Board is of the view that there is no nexus between the proposed export and new facilities, changes to existing facilities, or modifications to the operation of existing facilities and environmental effects. As a result, the Board is satisfied that further consideration of the environmental effects of the proposed export is not required.
>
> To ensure that a potential nexus would not arise in the future, the Board has incorporated a condition into the permit, which in relation to any single export contract, limits the ability of the Applicant to rely on the permit to a maximum period of five years. The Board is of the view that a sales contract of five years or less is not sufficient to support the construction of new facilities or modifications to existing facilities, to serve the demands of an export contract.[21]

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[20] National Energy Board, Permit EPE-370, IN THE MATTER OF section 119.03 of the National Energy Board Act (the Act) and the regulations made thereunder; and IN THE MATTER OF an application by Hydro-Québec for authorization to export electricity to H.Q. Energy Services (U.S.) Inc. dated 4 March 2010 by Hydro-Québec for authorization to export electricity to H.Q. Energy Services (U.S.) Inc., pursuant to section 119.03 of the National Energy Board Act (the Act), Issued August 18, 2011.

[21] National Energy Board, "Letter accompanying the issuance of a licence in response to Application dated 19 February 2010 for authorization to export electricity pursuant to Section 119.03 of the National Energy Board Act (Act)1 by Hydro-Québec," October 29, 2010, p. 3.

In this context, it is understandable why Hydro-Québec so clearly indicated that it would only supply energy from its existing portfolio of hydroelectric projects that already are built for purposes of the Clean Energy RFP – to say otherwise may run afoul of the NEB licensing requirements. If supply were to be from new construction, the NEB could require an extensive environmental review.

2.3 Québec's energy versus capacity

In order to understand the source of Hydro-Québec's energy into New England via NECEC, an examination of Hydro-Québec's system – both energy and capacity -- is in order. Capacity is provided by existing or planned generating plants that could be available to generate electrical energy when needed. Energy is the electricity that flows when those generating plants are operating. The distinction is important because the contracts with Massachusetts are for energy only – not capacity.[22]

Furthermore, the contracts are for firm energy; firm energy that is not backed by specified resource capacity needs to be firmed with another resource. In this case, Hydro-Québec's system and the ability to optimize energy purchases and sales across its four system interties could provide the firming without the need to dedicate specific hydroelectric units to the contract. This section explains further why the contracts with the Massachusetts utilities are for firm energy only and the implications for greenwashing and carbon emissions.

Québec's system is a winter-peaking system and, as such, Hydro-Québec is required to maintain generation capability above its peak demand in the winter. However, water flow is at its lowest during the winter months, requiring Québec to rely on stored water in its reservoirs to produce energy. Therefore, Hydro-Québec's energy production capacity is limited by its already-built generation capacity and reservoir levels.[23]

[22] Although the contracts require Hydro-Québec to attempt to qualify to provide capacity into the ISO-NE market, there is no penalty if such capacity is not available or does not clear the market, "For the avoidance of doubt, but without limiting the condition set forth in Section 3.4(b)(ii), **Seller shall have no obligation during the Services Term** to pay for such Network Upgrades or **to complete the Forward Capacity Auction qualification process**" (emphasis added).

[23] As with any large hydroelectric system operator, Hydro-Québec manages its reservoir levels to be able to meet its energy needs over the course of the year and under adverse run-off conditions over multiple years as well as during peak periods.

The North American Electric Reliability Council (NERC) projects that Québec could be short of its required reserve margins by 2024 unless another 1,100 MW of prospective resources are obtained.

> Under the Prospective Scenario, a total of 1,100 MW of expected capacity imports are planned by the Québec area. These purchases have not yet been backed by firm long-term contracts. However, on a yearly basis, the Québec area proceeds with short-term capacity purchases (UCAP) in order to meet its capacity requirements if needed.[24]

In other words, Québec is projected to require nearly the equivalent of NECEC's potential capacity by 2023 according to NERC. If Hydro-Québec must purchase capacity to meet its own provincial needs, it would not be able to sell capacity into another market such as ISO-NE unless it is purchasing sufficient capacity from other markets.[25] In fact, Hydro-Québec already appears to be engaging in capacity arbitrage – purchasing short-term capacity from New York's UCAP market and Ontario (500 MW), and selling 462 MW into the higher-priced ISO-NE Forward Capacity Market ("FCM") for FCA9 (June 2018 –May 2019).[26]

ISO-NE explicitly requires that a resource bidding into the capacity market as a New Import Capacity Resource backed by an external control area such as the Québec system to show that its load and capacity projections for the external Control Area has sufficient excess capacity to back the bid.[27] If Hydro-Québec intends to rely on specific generating

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[24] NERC, 2017 Long-term Reliability Assessment, pp. 55-56, Under the prospective scenario, a total of 1,100 MW of expected capacity imports are planned by the Québec area, although these purchases have not yet been backed by firm long-term contracts.
https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_12132017_Final.pdf

[25] Ibid., pp. 53-54. Ontario also will not be in a position to renew the current sale of 500 MW of capacity to Québec.

[26] ISO-NE, "Forward Capacity Auction Capacity Obligations," https://www.iso-ne.com/markets-operations/markets/forward-capacity-market/

[27] See ISO-NE Market Rules (Effective Date, 9/28/2018 - Docket # ER18-2078-000), Market Rule 1, Section 13, paragraph III.13.1.3.5.3:

> III.13.1.3.5.3. Imports Backed by an External Control Area. . .
>
> If the New Import Capacity Resource will be backed by an external Control Area and the capacity will be imported over an Elective Transmission Upgrade and the capacity will be imported over an interface that has not achieved Commercial Operation as defined in

resources to bid power, those resources must be identified and shown to be unencumbered from other capacity supply obligations.[28]

The shortfall in capacity does not correspond to a shortfall in energy because Québec has reservoirs and can store water to generate excess energy across the year whereas capacity requirements are an instantaneous need at the point of peak demand on the system. Given the natural flows of precipitation and snow melt in Québec, the province is flush with water in the late spring and early summer months. That water is used to produce energy as well as to replenish the reservoirs for the winter. Water is converted into energy and sold into other markets in order to maximize profits.

In addition to energy sales, Hydro-Québec also engages in arbitrage opportunities where it purchases from one market at a lower price and either sells directly into another market or stores the purchased energy in the reservoir in order to sell energy at a later time.

Figure 3 illustrates how Hydro-Québec has used purchased energy imported into Québec historically to support its export sales into other markets. For example, in 2010, imports supported nearly half of its exports (10.7 TWh imported versus 23.3 TWh exported). Without those purchases, Hydro-Québec either would have had to reduce exports or fall below minimum reservoir levels.[29]

> Schedule 25 of Section II of the Transmission, Markets and Services Tariff, the provisions regarding site control (Section III.13.1.1.2.2.1) and critical path schedule (Section III.13.1.1.2.2.2) shall apply in addition to the requirement that the Project Sponsor **submit system load and capacity projections for the external Control Area showing sufficient excess capacity during the Capacity Commitment Period to back the New Import Capacity Resource for the length of the multi-year contract** (emphasis added).

[28] Ibid, Section III.13.1.3.5.2.

[29] *Central Maine Power Co.,* Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Response to NRCM-002-021, Attachment 1.

Figure 3: Hydro-Québec total exports and imports[30]

Year	[1] Exports (TWh)	[2] Imports (TWh)	[3] Net Exports (TWh)
2008	21.3	6.1	15.2
2009	23.4	4.9	18.5
2010	23.3	10.7	12.6
2011	26.8	6.0	20.8
2012	31.8	1.7	30.1
2013	32.2	1.4	30.8
2014	26.6	1.2	25.4
2015	29.9	0.6	29.3
2016	32.7	0.1	32.6
2017	34.9	0.5	34.4

NOTES:
[1] See "Hydro-Québec at a Glance, p. 2 across the Annual Reports for a consistent set of data on electricity sales outside of Québec. For 2012 and earlier, there is conflicting information in other areas of the report, which is ignored for purposes of developing this table.
[2] Derived as the difference between reported Exports and Net Exports.
[3] Net Electricity Exports, p. 12 (2016 Annual Report), p. 12 (2014 Annual Report).

As a general proposition, Québec has excess energy over the course of the year that it can sell into other markets at a profit and already is doing so. Revenue from sales to external markets has exceeded $1.5 billion over the past few years.[31] In 2017, Hydro-Québec earned $1.575 billion from electricity exports and issued more than $2 billion back to the Québec government as a dividend for the fifth consecutive year.[32] Selling exports has become a necessity for Hydro-Quebec, as indicated by Hydro-Québec CEO Éric Martel's recent comment, "Without exports, our profits are in trouble."[33]

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[30] Compiled using Hydro-Québec Annual Reports 2012 – 2017.

www.hydroquebec.com/about/financial-results/annual-report.html

[31] Hydro-Québec Annual Reports.

[32] 2017 Hydro-Québec Annual Report, p. 3,

http://www.hydroquebec.com/data/documents-donnees/pdf/annual-report.pdf

[33] Financial Post, "Without exports our profits are in trouble: Hydro-Quebec plugs into U.S. markets for growth," April 20, 2018, https://business.financialpost.com/commodities/energy/without-exports-our-profits-are-in-trouble-hydro-quebec-plugs-into-u-s-markets-for-growth.

The Massachusetts contracts represent a higher value opportunity for Hydro-Québec than their existing exports because it is an above-market, fixed price contract. It is an arbitrage opportunity across markets that Hydro-Québec describes in its Annual Reports as an activity in which it engages. As the Maine PUC Technical Expert noted,

> With a new outlet for its energy, such as NECEC, HQP will have an increased ability to capture higher energy prices in ISO-NE's energy markets, forfeiting sales to other lower-priced markets . . . This arbitrage opportunity is the core of HQP's exporting strategy and the key motivator for HQP in contracting with NECEC.[34]

2.4 Economic Incentives to Buy, Divert or Build

There are multiple ways that Hydro-Québec could meet its firm energy commitment to NECEC:

1) **Buy:** Purchase energy directly from other markets.

2) **Divert:** Reduce energy sales into other markets.[35]

3) **Upgrade:** Invest in existing hydroelectric facilities to obtain higher maximum output levels.

4) **Build:** Invest in new impoundments and associated hydroelectric facilities to increase system output.

Hydro-Québec's response to the RFP indicated that Hydro-Québec would use only existing facilities; there would be no upgrades or new facilities required to meet the requirements in the contracts.[36] A new license with the NEB also would have to use existing facilities or be subject to an extensive environmental impact review. According to

[34] *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Technical Conference Transcript (Sep. 19, 2018), pp. 21-25.

[35] Rob Ferguson, The Star, "Ontario signs deal for electricity from Quebec in bid to defuse anger over hydro bills," October 21, 2016, https://www.thestar.com/news/queenspark/2016/10/21/ontario-signs-deal-for-electricity-from-quebec-in-bid-to-defuse-anger-over-hydro-bills.html.

[36] HRE Section 83D Application Form, submitted July 27, 2017, pp. 4, 6, 56, and 63.

Hydro-Québec's own study, a new facility would cost more than the contract price for at least the first half of the contract, making it an uneconomic solution at least initially (see Appendix B, **Figure B - 10**). Furthermore, a new hydroelectric facility in Québec would take around 10 years to build, well into the NECEC contract period even if it could be economically justified.

Hydro-Québec would not be able to use the upgrades for NECEC. The response to the RFP explicitly noted that no new upgrades would be required.[37] Furthermore, Hydro-Québec's own load projections indicate that it would need around 6.2 TWh of upgrades to meet incremental load by 2023; additional load growth through 2034 would require the entirety of potential upgrades to keep sales into other markets constant during the 20-year NECEC contract period.[38]

CMP has argued that Hydro-Québec has sufficient water in storage to supply NECEC without diverting sales into other markets.[39] This conclusion, however, is based on the assumption that recent high water conditions will continue; under an assumption of lower runoff conditions, Hydro-Québec would need to divert sales to meet its obligations to supply NECEC (see Appendix B, section B.5). Furthermore, there is no reason why Hydro-Québec would not sell any available energy that it had in the absence of NECEC, subject to economic prices and transmission availability, which is plentiful and has not been fully utilized in the past (see Appendix B, section 8.3).

Therefore, in order to supply NECEC, Hydro-Québec would either have to divert sales that otherwise would occur and/or purchase energy from other markets.

[37] Ibid., p. 63.

[38] Hydro Québec, Deep Decarbonization in the Northeastern United States and Expanded Coordination with Hydro-Québec, April 2018, pp. 27-28 ("Load in Québec was assumed in all scenarios to grow by 0.42% per year for a total increase of 28.7 TWh between 2015 and 2050."). If, as reported in footnote 5, 144 TWh of hydroelectricity is available, there would be only 13 TWh of additional energy available through upgrades. This amount would be consumed by Québec load growth by around 2034 given the 0.42% load growth assumed by the study.

[39] *Central Maine Power Co.,* Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Rebuttal Report of Dickinson, et. al., July 13, 2018, pp. 30 – 35.

Key Insight

It would be uneconomic for Hydro-Québec to build new hydroelectric facilities to meet the need of NECEC energy supply under current conditions. This buttresses the case that Hydro-Quebec would not provide new renewable energy and therefore NECEC would not lower greenhouse gas emissions.

Under the Massachusetts contracts, Hydro-Québec receives an energy price that starts at $51.50 / MWh in 2023 and rises to around $82.40 / MWh in 2042. The starting price is lower than the cost of building new facilities which Hydro-Québec assumes to be $70/MWh.[40] Instead, Hydro-Québec would simply divert energy from other markets which have been trading at between $20 and $40/MWh, consistent with futures prices for energy to be delivered into New York (see Appendix B, **Figure B - 12** and **Figure B - 13**). Although upgrades could cost less, those reported upgrades already are required to meet Québec's domestic load growth. Therefore, it would be more economic for Hydro-Québec to divert lower-priced energy sales from other markets into NECEC or greenwash low-priced purchases.[41]

Key Insight

Given the stated source of this energy and economic incentives, the natural source of supply would be a diversion of energy away from other markets.

3. GREENWASHING: SOURCING PURCHASES FROM OTHER MARKETS

Hydro-Québec also could purchase energy from markets with low or even negative prices to meet its energy commitments. The ability to purchase imports in order to conserve water in its reservoirs for use during higher-priced periods creates a profit-maximizing opportunity that Hydro-Québec is uniquely positioned to pursue. The impact on the environment could be the same as if Hydro-Quebec were generating energy in those

[40] Energyzt confirmed that all dollar figures in the Deep Decarbonization study are in US dollars via conversation with Evolved Energy Research, one of the authors of the report.

[41] Hydro-Québec notes in its Section 83D application form that it may upgrade or build new facilities in the future, but that these are not required to supply NECEC. Given Hydro-Québec's need for new capacity, if any upgrades or capacity additions could occur regardless of NECEC, then they should be incorporated into the scenarios with and without NECEC when estimating the impact of NECEC on carbon emissions.

markets from fossil fuels directly. This section describes how Hydro-Québec has engaged in greenwashing in the past and is incentivized to continue to do so in the future.

3.1 Hydro-Québec's strategic plays across markets

The ability to buy-low and sell high is an arbitrage opportunity, and is cited in Hydro-Québec's annual reports as an activity that it engages in along with selling energy into other markets.[42] Hydro-Québec has engaged extensively in such arbitrage opportunities in the past, purchasing nearly 50 percent of its exports in 2010 (Appendix B, **Figure B - 6**). Such purchased energy is likely to include carbon-emitting resources.[43]

This strategy has been a long-standing approach for Hydro-Québec, referenced in 2004 by the Government of Québec:

> Hydro-Québec is able to purchase electrical energy from neighbouring markets at lower prices during certain periods, and then resell it later to neighbouring networks at higher prices. If rainfall conditions permit, and once Québec's own energy security has been guaranteed, Hydro-Québec Production's unused supplies can be exported (net export sales) to neighbouring markets.[44]

While this type of arrangement can help Hydro-Quebec to maximize its profits, it also creates a "greenwashing" situation where Hydro-Quebec can create the perception that its energy is clean and renewable when it is not. Specifically, Hydro-Quebec's interconnectedness would allow the NECEC energy to appear to come from Hydro-Québec's hydroelectric plants when, in reality, such excess energy was only enabled through purchases from fossil fuel plants.

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[42] For example, see 2017 Hydro-Québec Annual Report, Notes to Consolidated Statements, p. 50 of 94.

[43] Many of the surrounding markets have stated objectives to decarbonize the grid in order to achieve lower carbon emissions from the power sector. This decarbonization would make the impact of import/export optimization converge over time.

[44] Minestere des Ressource natuelles, dela Faune et des parcs, Gouvernement du Quebec. 2004. The Energy Sector in Québec, Context, Issues and Questions. p. 41.

3.2 Greenwashing is possible under the contracts

The Massachusetts contracts have no way to monitor, prevent, or penalize Hydro-Québec for engaging in purchases from other markets in order to conserve water in its reservoirs for sale though NECEC. Although the Massachusetts contracts do require Hydro-Québec to "tag" its electrons through the ISO-NE Generation Information System (GIS), the tracking system simply tags imports from Hydro-Québec as coming from a specific hydroelectric facility. However, the GIS does not track Hydro-Québec's total system dispatch or decisions.

Under the contracts with Massachusetts utilities, Hydro-Québec is not required and therefore is unlikely to provide the details for its entire system operations, energy imports and energy sales. Without an understanding of Hydro-Quebec's entire system, it will look as if the Massachusetts utilities are purchasing hydroelectricity when, in fact, those purchases may be enabled by purchases from other markets that allowed Hydro-Quebec to conserve the water in its dams for production when NECEC supply was required.

The inability to track energy flows into and out of Hydro-Quebec's system allows Hydro-Québec to effectively "greenwash" any energy it purchases from other markets and convert it into "clean energy" for purposes of its contracts. At best, Hydro-Québec would be receiving the system mix which would include whatever was operating at the time of the purchases. In reality, Hydro-Québec's purchases from other markets could be enabling carbon-emitting resources to operate when they otherwise would be turned off. For example, low cost coal from New Brunswick or natural gas from New York could be the incremental plant's fuel source that effectively allows Hydro-Québec to purchase from another markets in order to conserve water to service NECEC. Under such conditions, NECEC actually would be increasing fossil fuel use in other markets outside of ISO-NE that would not have occurred in the absence of NECEC.

There is no reason to assume that Hydro-Québec would not engage in the same strategy that it described in 2004, and clearly executed upon from 2008 through 2012, referenced in its annual reports as recently as 2017 and could pursue without penalty under the Massachusetts contracts. As a result, Massachusetts ratepayers would be paying multiples on the market price for something that is not truly Québec hydroelectricity. Hydro-Québec effectively would be an expensive broker purchasing energy that Massachusetts ratepayers otherwise could obtain through competitive markets.

Key Insight

The higher price in the NECEC contract and the inability to accurately account for the Hydro-Quebec system creates perverse incentives for Hydro-Québec to engage in arbitrage opportunities by purchasing cheaper and, potentially, higher emitting energy from other markets to meet the NECEC firm energy supply obligations.

3.3 NECEC energy may not come from Québec

The risk of Hydro-Québec engaging in buy-low/sell-high opportunities is not theoretical. Futures prices in New York for peak hours are trading at around $41/MWh for 2023; off-peak prices would be even lower.[45] It therefore would be economic for Hydro-Québec to divert energy away from New York to sell via NECEC.

The estimated energy price discrepancy between market prices and energy prices in the NECEC contract undoubtedly will incentivize Hydro-Québec to ensure that there is enough water in its reservoirs to meet the requirements of the GIS tracking system and contract requirements to be able to claim that its energy supply via NECEC is "clean energy."[46] Although it would appear that the energy was coming from Québec, it actually would have been sourced from another market either via diversion of exports or purchases from lower-priced markets.

Key Insight

Hydro-Québec has every incentive to arbitrage between markets, and already does so. The lucrative arrangements under the NECEC contract create an even greater incentive for Hydro-Québec to greenwash energy by buying from other markets to supply NECEC.

[45] CME Group, NYISO Zone A Day-Ahead Peak Calendar-Month 5 MW Futures Quotes, October 11, 2018, https://www.cmegroup.com/trading/energy/electricity/nyiso-zone-a-5-mw-peak-calendar-month-day-ahead-lbmp-swap-futures.html.

[46] The actual price for energy under the NECEC contract has been disclosed to the public as part of the filings to the Massachusetts Department of Public Utilities. The energy price starts at around $51 / MWh in 2023, rising to around $82 in 2043. Adding in transmission charges over NECEC, the delivered energy price in Lewiston starts at $66/MWh, rising to around $103/MWh in 2042. In addition, Massachusetts ratepayers would have to pay for the cost of transmission, including congestion and losses, required to bring the energy from Lewiston, Maine into Massachusetts.

3.4 No guarantee that NECEC would be incremental to New England

The Massachusetts contracts do not guarantee that energy flowing through NECEC would be incremental.

The Massachusetts RFP originally required hydroelectric imports to be "incremental to New England" and required a showing of what Québec's imports into New England has been over the prior three years.[47] The template for the contract included as part of the RFP also included a definition for incremental energy to be delivered:

> "Incremental Hydroelectric Generation" means Firm Service Hydroelectric Generation that represents a net increase in MWh per year of hydroelectric generation from the bidder and/or affiliate as compared to the 3-year historical average and/or otherwise expected delivery of hydroelectric generation from the bidder and/or affiliate within or into the New England Control Area.

However, the final contracts excluded the entire definition of "Incremental Hydroelectric Generation." Although the contract does include penalties for Hydro-Québec's failure to deliver adequate amounts of "clean energy" under the Attachment H to the contract, the penalties are limited, allowing Hydro-Québec to make an economic decision as to how to manage its system to optimize profits taking into account the opportunity costs of sales into other markets versus NECEC.

Key Insight

Hydro-Québec's system characteristics plus the AC transmission connections between those interconnected markets and a contract that does not even have a definition for "Incremental Hydroelectric Generation" makes it difficult to track and ascertain the true source of Hydro-Québec's energy that would flow via NECEC. There is no guarantee that the energy would be incremental. There is no guarantee that it would come from Québec. There is no guarantee that it would be "clean" and there is no guarantee that total carbon emissions would be reduced.

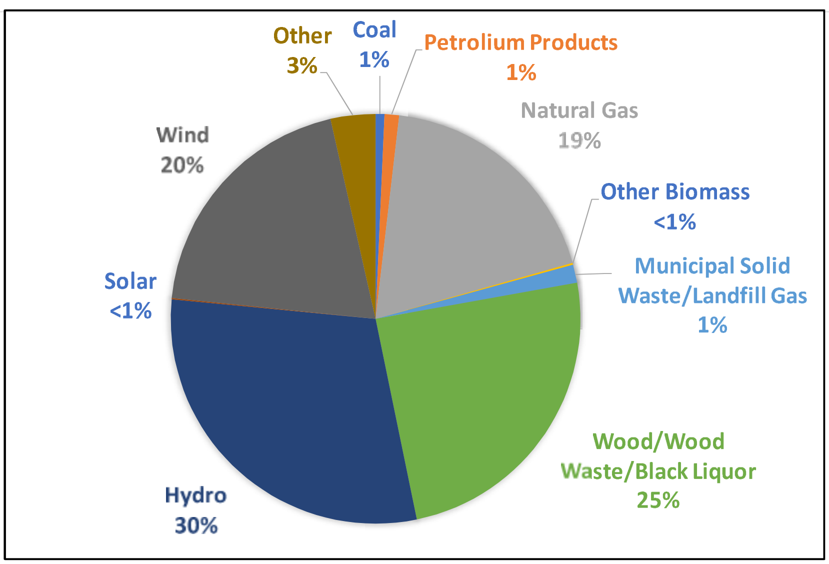
[47] NECEC Section 83D Application Form, p. B (redacted).

4. ADVERSE IMPACT ON MAINE RENEWABLES

Another adverse environmental impact of NECEC relates to its consequences on the development of renewable resources in Maine. According to the U.S. Energy Information Administration, Maine's in-state retail customers consumed around 11.5 TWh of energy in 2016.[48] ISO-NE's load forecasts underlying the 2018 CELT report project that Maine load will total around 13.5 TWh in 2023.[49] Regardless, adding 9.5 TWh to a system with nearly equivalent amount of supply and demand could be extremely disruptive to existing and new resources.

In 2017, approximately 75 percent of the electrical energy produced was from renewable resources (**Figure 4**).[50]

Figure 4: Maine generation mix by fuel type[51]



[48] U.S. EIA, State Profiles, Maine, https://www.eia.gov/electricity/state/maine/

[49] ISO-NE, 2018-2027 Forecast Report of Capacity, Energy, Loads, and Transmission *(CELT)*, http://isonewswire.com/updates/2018/5/8/2018-forecast-of-capacity-energy-loads-and-transmission-is-p.html

[50] U.S. EIA, State Profiles, Maine, https://www.eia.gov/state/?sid=ME

[51] Energyzt analysis of https://www.eia.gov/electricity/data/eia923/ and https://www.eia.gov/state/print.php?sid=ME

Maine frequently exports energy from its diverse system mix to the rest of New England across long transmission lines, especially when natural gas supply is constrained during extreme winter conditions.

According to the US EIA, the amount of Maine-based generation output declined over the past decade partially due to increasing imports from Québec.

> Maine's Renewable Portfolio Standards (RPS) require electricity providers to fuel 30% of their electricity generation with renewable resources. In addition to policy initiatives, electricity imports from Canada—notably from **Quebec—have been contributing an increasingly larger share to Maine's total generation, displacing natural gas-fired generation as the primary source. Since 2012, electricity imports from Canada have more than tripled**, increasing from 0.8 GWh in 2012 to 2.7 GWh in 2017.[52]

(emphasis added).

NECEC would bring even more Québec imports directly into Maine and would have adverse impacts on existing and future renewable developments in Maine. Existing renewable resources – primarily biomass and hydroelectric dams in Maine – could face reductions to energy margins as a result of NECEC. New renewable developments would face higher costs to connect and higher price premiums, making them less competitive than potential similar renewable developments in other New England locations outside of Maine.

4.1 Reduced operating margins

Adding around 9.5 TWh into Maine's system would have adverse consequences for Maine's existing renewable resources, particularly biomass and hydroelectric generators. NECEC would decrease energy prices that those plants receive from ISO-NE for energy they generate and reduce the energy margins required to keep the plants operational.[53]

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[52] US EIA, Natural Gas Weekly Update, "Renewables surpass natural gas as the primary electricity-generating source in Maine," https://www.eia.gov/naturalgas/weekly/archivenew_ngwu/2018/09_27/.

[53] *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Exhibit No. TLB-1, Prepared Surrebuttal Testimony of Tanya L. Bodell, August 17, 2018, p. 8.

The total impact of potentially lower prices would be less than 0.6 percent of an average Maine residential ratepayer bills.[54] Most of the decrease in energy prices to Maine ratepayers would be due to increased congestion and losses tied to transporting so much more energy out of Maine into the rest of New England.[55] In effect, the majority of any potential energy price reduction resulting from NECEC is due to inefficiencies tied to the higher waste of energy through increased losses.[56]

Key Insight

NECEC would adversely impact existing renewable resources in Maine for very little economic and carbon emissions benefit.

4.2 Higher costs for Maine renewables to connect to ISO-NE

A recent study performed by ISO-NE estimated that there is currently around 200 MW of capacity available for new renewables to connect in Western Maine and an additional 600 MW of estimated transmission capacity that can be accessed with upgrades.[57] NECEC's Section 83D Application Form claims that it can increase the capacity at the Surowiec-South line with upgrades by 1,000 MW. Regardless, the fact that NECEC would use the 200 MW of existing headroom and add only the incremental amount it requires leaves little excess transmission capability for Maine renewables under development.[58]

[54] This calculation assumes a delivered retail rate of around $130/MWh.

[55] *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Exhibit No. TLB-1, Prepared Direct Testimony of Tanya L. Bodell, April 30, 2018, Figure 8, p. 23.

[56] *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Technical Conference, September 7, 2018, pp. 37, 50, 53, 68. See also EXM-004-006_Uplan Results.xlsx.

[57] ISO-NE, Maine Renewable Integration Study,

Central Maine Power Co., Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Exhibit No. NECEC-36 originally submitted as Attachment 1 to CMP-014-001.

[58] This argument was posed by Francis Pullaro from RENEW in his submission on April 30, 2018, to the *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232.

Furthermore, congestion would simply shift from the Surowiec-South Interface to the Maine-New Hampshire Interface, where no new upgrades are planned.[59] The Maine-New Hampshire Interface currently allows for up to around 1,900 MW of energy flows at any point in time. The addition of NECEC pushes those flows to the maximum level more often, increasing losses and congestion charges.

In addition, NECEC increases losses that would be incurred by all generators in Maine. Losses represent wasted energy that is lost because of transmission line inefficiencies. As current increases, losses increase by the square of the energy flows. The exponential relationship ensures that losses increase as flows increase. Higher losses mean that more energy has to be produced to deliver the same amount to demand.

In ISO-NE, this translates into a lower price for energy produced at the generator site in Maine. Lower prices are a market signal that discourages new generation plants from being built. Therefore, NECEC's adverse impact on losses and congestion effectively will send the signal to renewable resource developers that they should not build in Maine, all else equal.

Currently, several western Maine renewable developments are in front of NECEC. Some of the renewable resource developments slated for northern Maine already have fallen behind NECEC in the queue as of May 22, 2018. Although the renewable developments in front of NECEC would not face higher upgrade costs, CMP in its Section 83D Application Form noted that it expects to supersede most of the Maine renewable resources in the ISO-NE queue:[60]

> These other generation projects are instead being evaluated as part of the ISO-NE MRIS in a "clustered" basis. As discussed in Section 6.9, CMP believes that these projects will fall below the NECEC Transmission Project in the queue through the cluster study process that ISO-NE is seeking to implement, thereby leaving the NECEC Transmission Project only behind

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[59] *Central Maine Power Co.,* Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Exhibit No. TLB_1, Testimony of Tanya L. Bodell, April 30, 2018.

[60] Both the northern and western clusters were ahead of NECEC in the queue when it issued its proposal in response to the Massachusetts Clean Energy RFP. Since then, the northern cluster did not fund a cluster study and fell behind NECEC in the queue.

> the three queue projects included in the NECEC system impact study performed by the Avangrid transmission planning group.[61]
>
> . . .
>
> Should each of these projects decline to commit to fund the necessary transmission upgrades in order to participate in the cluster study, they will drop down in the queue (or drop out entirely), thereby significantly reducing the number of projects holding queue positions before the NECEC Transmission Project and expediting the timeline for ISO-NE to complete the required system impact studies for the NECEC Transmission Project.[62]

For those renewable resources that are behind NECEC in the queue, the net impact would be increased costs for Maine renewable resources to upgrade transmission as part of their interconnection requirements if NECEC were to proceed. Such renewable resources would be deferred or delayed – potentially indefinitely – with a lost opportunity to create a net reduction in carbon emissions.

Key Insight

Because of the increased cost of upgrading transmission due to the NECEC, development of renewable resources in Maine could be deferred or indefinitely delayed.

5. IMPLICATIONS FOR CARBON EMISSIONS

Given the interconnectivity of Québec and New England, the analysis of NECEC's impact on carbon dioxide emissions must extend beyond the boundaries of New England to other interrelated markets. Such an analysis requires a detailed production cost model that can run a projection of what the markets would do with and without NECEC and the associated diversion of Québec excess energy exports.

Two studies are in the public domain that apply two different production cost models to analyze the impact of carbon dioxide emissions under the assumption that total excess

[61] NECEC Section 83D Application Form, p. 83, footnote, 21.

[62] Ibid., p. 85.

energy available for export into other markets by Hydro-Québec is held constant:[63]

- **Energyzt Analysis:** Assessment of the impact of NECEC on carbon emissions, presented in the testimony of James M. Speyer before the Maine PUC Docket No. 2017-00232, April 30, 2018; and

- **ESAI Study:** "Analysis of Greenhouse Gas Emissions Impacts: New Class I Resources vs. Existing Large Hydro," Prepared for GridAmerica Holdings, Inc., September 2017, focused on the impact of Northern Pass Transmission.

Even though the ESAI study examines the impact of Northern Pass Transmission, the findings are relevant to NECEC which is a similar type of project that includes a new 1,200 MW transmission line between Québec and New England, as well as around 9.5 TWh of baseload energy flows from Hydro-Québec under contract with the Massachusetts utilities.

These studies make four significant conclusions that are consistent with the discussion above:

1) **Excess energy is the same with or without a new Intertie (e.g., NECEC or Northern Pass):** Hydro-Québec exports into other markets are limited by water availability, not transmission delivery capability. Therefore, the total amount of excess energy that Hydro-Québec has available to sell into external markets will remain the same with or without NECEC.

2) **Hydro-Québec would divert external sales to meet new energy requirements:** In order to meet new firm energy requirements associated with a long-term power purchase agreement to be delivered over a new tieline such as NECEC or Northern Pass, Hydro-Québec would reduce energy sales into other markets.[64]

3) **Higher carbon emissions elsewhere offset the impact in New England:** As a

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[63] Interestingly, both CMP's expert (Daymark) or the Maine PUC Expert (London Economics) calculated the impact on carbon emissions for New England only, and did not present an estimate of how NECEC would impact total carbon emissions across other markets that would be impacted by NECEC.
[64] The Maine PUC Technical Expert, London Economics Incorporated, makes the same assumption for purposes of its analysis of the NECEC Minimum Offer Price Rule. *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Transcript (Sep. 19, 2018).

result of Hydro-Québec's diversion of energy sales from other markets into New England via a new transmission line from Québec, carbon dioxide emissions would be higher in other markets from which energy sales are diverted.

4) **The offset in other markets could result in higher total emissions in some years:** The amount by which carbon emissions would exceed the savings in New England depends on where Québec sources its energy. However, it is NECEC could result in higher total carbon emissions than otherwise would occur if the transmission line were not to proceed.

Each of these points is elaborated upon below with respect to the impact on total carbon dioxide emissions from importing Québec hydroelectricity across a 1,200 MW HVDC transmission line into New England.

5.1 Excess energy is the same with or without a new intertie

Both the Energyzt Analysis and the ESAI Study conclude that Hydro-Québec has a limited pool of excess energy that already is and would continue to be optimized subject to constraints such as water conditions, reservoir management decisions, and firm commitments.

Intertie capacity into other markets is not a constraining factor. Both studies conclude that it is economical for Hydro-Québec to export all of its surplus energy and that Hydro-Quebec has a low marginal cost of production and sufficient transmission capacity into external markets to continue to do so going forward. Therefore, a new intertie merely allows Hydro-Québec to access a higher-priced, long-term contract market in Massachusetts and is not necessary to transport clean energy that otherwise would be wasted.

The total amount of excess energy available to Hydro-Québec to sell into other markets varies between the studies, but would be somewhere between 33 to 38 TWh per year, of which between 20 and 25 TWh would be exported to the United States in the base case.[65] Hydro-Québec's own study assumes that exports to the U.S. would remain constant at

[65] ESAI provides a projection for 2017 to 2026 that ranges from 36.2 to 38.2 (ESAI, p. 5). The Energyzt Analysis projects that there would be 33.5 TWh in 2023 if purchases were reduced to reflect Romaine-3 coming online.

22.4 TWh without a build-out of new hydroelectric facilities.[66]

The Technical Expert of the Maine PUC estimates that the amount of firm energy that would be available to flow into the US would total 21.5 TWh in 2021 based on a supply and demand comparison.[67] Existing transmission lines would allow for the entirety of this amount of excess energy to be sold into US markets. Therefore, there appears to be consensus about the amount of excess energy that Hydro-Québec would have available for sale into the United States. Regardless of the estimate, the NECEC energy supply obligation of up to 9.4 TWh would be a sizable portion of any available excess energy that Hydro-Québec would sell.

Key Insight:

A new transmission line from Québec into New England such as NECEC would not create an incremental increase in total exports of hydroelectric power from Quebec into other markets.

5.2 Hydro-Québec would divert exports to meet new energy requirements

Accepting that Hydro-Québec's excess energy is the same with or without a new intertie, each study applies a different methodology to divert energy from other markets into the new intertie.

The Energyzt Analysis used historical averages for the base case flows from Québec into the U.S.. Assuming that exports to the U.S. would remain the same, the Energyzt analysis then removed the equivalent of the NECEC flows from New York into NECEC, starting with the lowest-priced hours first.

ESAI created a base case that: 1) held contractual flows fixed; and 2) applied the remaining excess energy into the highest priced markets during the highest-priced hours first, followed by the next highest priced hours/markets until the surplus energy was allocated. For the case with a new transmission line and flows from Québec, ESAI then reallocated energy from the base case starting with the lowest-priced hours in the lowest-priced markets first. The result is that energy tends to be diverted predominantly from

[66] Deep Decarbonization Study, p. 30.

[67] See *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, London Economics response to GINT-001-049.

New York and Ontario into Northern Pass.[68]

The models were then rerun with the reallocated energy to calculate total carbon dioxide emissions generated by each power plant in the model.

5.3 Higher carbon emissions incurred elsewhere offset emissions in ISO-NE

In both analyses, higher emissions in other markets resulting from Québec's diversion of exports into those markets offset the impacts from the proposed transmission line and Québec energy supply in New England. A comparison of the results of the two analyses for 2023 under projected low gas price and low carbon price conditions is presented in **Figure 5**.

Figure 5: Impact on carbon emissions in 2023 under low gas and low carbon prices

	Change in Carbon Emissions by Market (Million MT)	
Market	**ESAI Analysis[69]**	**Energyzt Analysis[70]**
New England	(2.4)	(3.3)
NYISO	1.0	2.3
PJM	0.1	0.5
MISO	0.2	0.5
Ontario	1.0	0.1
TOTAL Across Markets	**(0.1)**	**0.1**

[68] ESAI, Table 5, p. 15.

[69] ESAI Study, Table 5, p. 15. For comparative purposes, the signs have been switched. ESAI denotes decreases in carbon emissions as a positive number whereas Energyzt denotes it as a negative value. In addition, the ESAI results were presented in short tons and converted to metric tons for comparison with the Energyzt Analysis results using a conversion rate of 0.9072 metric tons per one short ton.

[70] *Central Maine Power Co., Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232,* Exhibit No. JMS-4.

Key Insight:

Under low natural gas and low carbon price conditions, an increase in carbon emissions from the diversion of Québec exports from other markets into a transmission line into New England offsets the impact from the proposed transmission line and Québec energy supply into New England, resulting in no net impact, and in the case of the Energyzt Analysis, results in an increase in total carbon emissions.

The impact that NECEC has on total carbon emissions will depend on market conditions. The Energyzt analysis also examined an alternative case of high natural gas prices and high carbon prices that were assumed by the NECEC expert in its application to the Maine PUC. Under those conditions, carbon dioxide emissions in New England would be lower than the low natural gas-price case due to the fact that less efficient units would be more expensive and therefore displaced by operating the more efficient units more often. Under this scenario, diverting exports from Québec from New York into Massachusetts tends to have a much greater impact on carbon emissions, resulting in an increase in total carbon emissions of 0.4 million metric tons in 2023 (**Figure 6**).

Figure 6: Carbon emissions impact in 2023 under high gas and high carbon prices

State/Region	Carbon Emissions (Million MT)		Net Carbon Emissions Impact (Million MT)
	No NECEC	With NECEC	
ISO-NE	26.8	23.8	(3.0)
NYISO	25.8	28.1	2.3
PJM	396.8	397.8	1.1
MISO	351.0	350.9	(0.1)
Ontario	3.6	3.7	0.1
Total	**804.0**	**804.4**	**0.4**

As noted in the Energyzt testimony summarizing the results of the analysis, the increase in total emissions is the equivalent of building "a new 250 MW combined cycle gas power plant running at a 40 percent capacity factor or average emissions from around 80,000 automobiles averaging 4.75 metric tons of carbon emissions over the course of a year."[71]

[71] *Central Maine Power Co.,* Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Exhibit No. JMS-1.

Key Insight:

Under conditions of higher natural gas prices and higher carbon prices, carbon emissions could increase.

In summary, NECEC would have a negligible impact on total carbon emissions and could even increase them when the effect on other markets is considered. Hydro-Québec's diversion of energy exports from other power markets to service NECEC results in incremental carbon emissions as power plants in those markets fire-up generators to make up the missing energy flows. In effect, there is no net impact to carbon emissions, and possible adverse consequences, when Hydro-Québec diverts its surplus energy resources into NECEC.

6. ANALYSIS OF GREENWASHING POTENTIAL USING CMP's MODEL

As part of the Maine PUC hearing, CMP offered a model to assess the ability of Hydro-Québec to meet its NECEC obligations while maintaining exports at historical levels. The model purports to determine whether or not Hydro-Québec's sales via NECEC can be incremental.[72]

The simplistic model suffers from three fundamental flaws (described in more detail in Appendix B):

1) **The CMP Model Answers the Wrong Question:** The real question is whether NECEC reduces global emissions, and the CMP model does not address this question at all. To do so would require an analysis of what carbon emissions would be with and without NECEC, which the model does not do.

2) **CMP Assumes a Sudden Availability of Incremental Exports:** CMP assumes that Hydro-Québec does not sell its excess energy into other markets unless NECEC is built. In fact, there is plenty of excess transmission capacity servicing the interconnected markets that Hydro-Québec could use to sell its excess energy that currently is stored in its reservoirs and the incentive to do so prior to NECEC coming online.

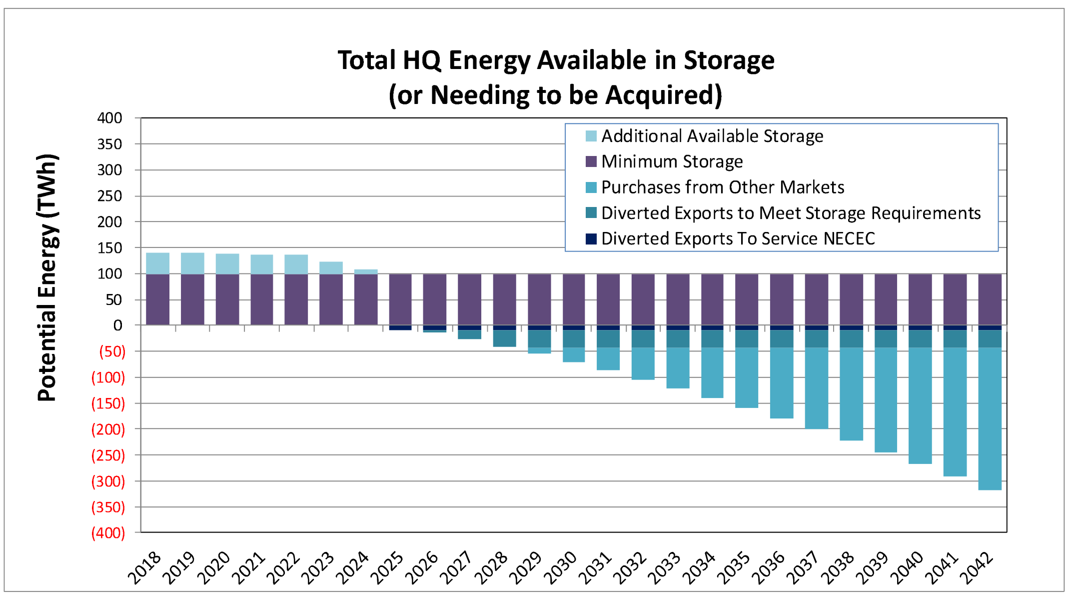
3) **Sensitivity to Key Assumptions:** The model is incredibly sensitive to key

[72] *Central Maine Power Co.,* Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, CMP Response to NRMC-032-021, Attachment 1.

assumptions, including how much runoff would Hydro-Québec receive. CMP implicitly assumes high water conditions that have been experienced in 2017 and the years before will continue for the entirety of the contract, allowing for high levels of energy availability that allows incremental exports compared to historical levels. Making a small adjustment to this assumption has a significant impact.

Adjusting a single assumption -- the assumed availability of water and potential generation output by only six percent to reflect lower runoff than the high water conditions experienced in 2017, it is clear that Hydro-Québec would not be able to service NECEC without diverting energy from other markets and engaging in greenwashing through purchases from other markets (**Figure 7**).

Figure 7: Hydro-Québec operations per the CMP Model with lower runoff



In reality, Hydro-Québec is not confined to a single strategy over the course of the contract. Hydro-Québec will manage its system, sales, exports and opportunities according to water conditions and market prices. NECEC simply imposes another fixed obligation onto the system against which Hydro-Québec will optimize its operations. Such optimization will include diverting sales into other markets and greenwashing, as required to optimize profits.

This activity is allowed under the "clean energy" contracts with Massachusetts utilities.

7. CONCLUSION

Under the terms of the contracts with Massachusetts utilities, Hydro-Québec would not be precluded from purchasing energy from other markets to sell directly into NECEC or for purposes of conserving water in its reservoirs for future supply to NECEC at a later time. Massachusetts utilities would have no ability to monitor or prevent this possibility from occurring. Massachusetts ratepayers effectively could be paying above-market prices for power from existing resources outside of Québec that provide no incremental environmental benefit and could even increase carbon emissions.

CMP's own model of the Hydro-Québec system does not include realistic assumptions. Adjusting the model to reflect lower runoff conditions and an objective of maintaining exports at historical levels illustrates a realistic scenario under which Hydro-Québec would have to divert energy and engage in greenwashing behavior. Under these conditions, Hydro-Québec would have to do both in order to maintain exports at 2017 levels.

Hydro-Québec's sales via NECEC do not have to be incremental to Québec's historical hydroelectric generation sales into New England. The energy does not have to be incremental to what Hydro-Québec otherwise would sell into other markets. There is no guarantee that Massachusetts ratepayers would receive 100% "clean energy" given the greenwashing game that Hydro-Québec is able to play. There is no guarantee that the environment would receive a net reduction in carbon emissions; total carbon emissions in other markets could increase to a level that any reduction in New England carbon emissions would be negated or even exceeded. If NECEC were allowed to proceed, the only guarantee is that Québec would receive billions of dollars in future dividends and Maine's renewables industry will be adversely impacted.

It is unlikely that NECEC will benefit the climate. At best, the NECEC could have negligible impact on global greenhouse gas emissions. However, there are a number of conditions under which NECEC actually could increase global carbon emissions as Hydro-Québec engages in profit-maximizing behavior around its firm rights to capacity on the NECEC transmission line and contracts with Massachusetts utilities.

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APPENDIX B: OVERVIEW OF QUEBEC'S ELECTRICITY SYSTEM AND EXPORTS

Hydro-Québec owns and operates a large system of hydroelectric generation and other power generating capabilities along with an extensive transmission network. Hydro-Québec's generating capacity in 2017 was 37,309 MW from 87 generating stations. Additional sources, such as wind, solar and purchases from third parties create total nameplate capacity of 47,857 MW.[1]

In understanding what electricity products are likely to be sold via NECEC, it is important to distinguish between energy and capacity. Capacity is provided by existing or planned generating plants that could be available to generate electrical energy when needed. Energy is the electricity that flows when those generating plants are operating. The distinction is important because the contracts with Massachusetts are for energy – not capacity.[2]

Furthermore, the contracts are for firm energy; firm energy that is not backed by capacity needs to be firmed with another resource – in this case, Hydro-Québec's ability to optimize energy purchases and sales across its four system interties. This section explains further why the contracts with the Massachusetts utilities are for firm energy only and the implications for greenwashing and carbon emissions.

[1] Hydro-Québec - TransÉnergie, Plan Directeur, 2020, http://www.hydroquebec.com/data/transenergie/pdf/hqt-plan-directeur-2020.pdf

[2] Although the contracts require Hydro-Québec to attempt to qualify to provide capacity into the ISO-NE market, there is no penalty if such capacity is not available or does not clear the market (see NECEC-16, section 7.5., "For the avoidance of doubt, but without limiting the condition set forth in Section 3.4(b)(ii), **Seller shall have no obligation during the Services Term** to pay for such Network Upgrades or **to complete the Forward Capacity Auction qualification process**" (emphasis added).

B.1 QUÉBEC'S CAPACITY

In order to meet reliability standards, each region is required to maintain an amount of generating resources above its maximum demand for power. In Québec, where the system peaks in winter, Hydro-Québec strives to maintain a level of installed and purchased capacity above its winter peaking load. Targeted reserve requirements are 12.9 percent above peak demand.[3] However, waterflow is at its lowest during the winter months, requiring Québec to rely on stored water in its reservoirs to produce energy in addition to its normal flows. Its energy production capacity is limited by its available generation capacity and reservoir levels.

The North American Electric Reliability Council (NERC) projects that Québec will be short of its required reserve margins by 2024 unless another 1,100 MW of prospective resources are obtained.[4] Québec is not in a position to sell 1,200 MW of capacity into New England or any other market during the winter months. If anything, Québec will need to purchase that level of capacity resources from other markets to meet its required reserve margins. Assuming that NECEC will provide 1,090 MW of capacity into New England results in an immediate shortfall for Québec against its targeted reserve margins, as shown in **Figure B-1**.[5]

This is particularly problematic for New England which requires capacity to be sold year-round. In other words, Québec will not be in a position to commit capacity into New England via NECEC– which is why the contracts with Massachusetts are for firm energy only. Therefore, Québec either would have to withdraw its current capacity sales into New England and New York to meet its own reserve requirement

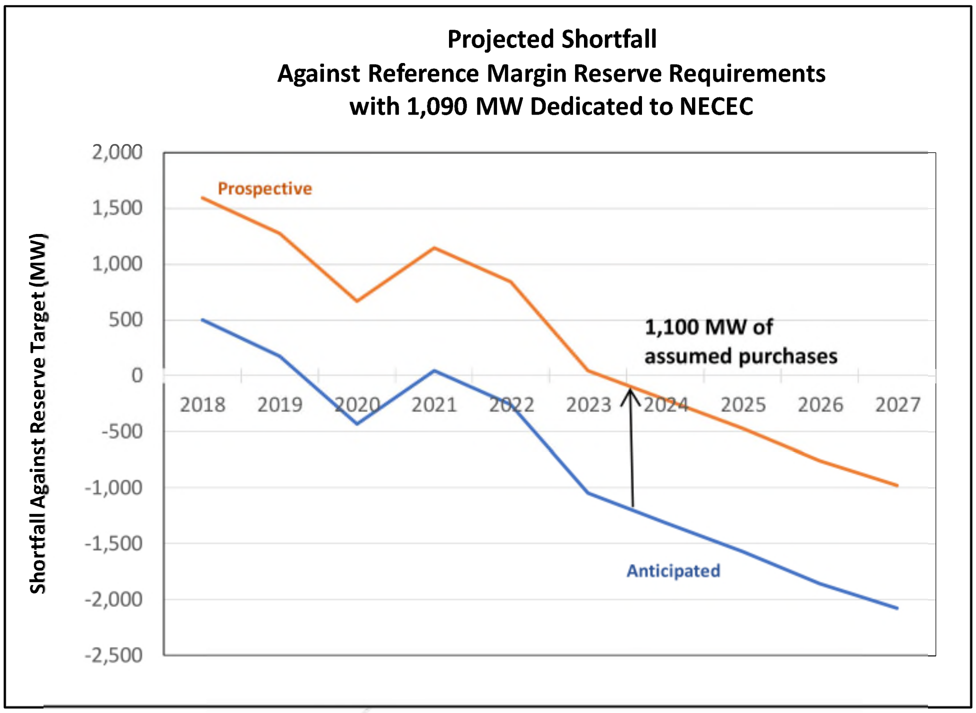
[3] NERC, 2017 Long-term Reliability Assessment, pp. 55.

[4] NERC, 2017 Long-term Reliability Assessment, pp. 55-56, Under the prospective scenario, a total of 1,100 MW of expected capacity imports are planned by the Québec area, although these purchases have not yet been backed by firm long-term contracts.
https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_12132017_Final.pdf

[5] NERC, 2017 Long-term Reliability Assessment, pp. 53-54. Ontario will not be in a position to renew the current sale of 500 MW of capacity to Québec. However, the Maritimes, New York and New England are projected to have excess capacity that could be sold to Québec.

levels or optimize its purchases and sales of capacity across the interconnected markets. NECEC could be used to meet Québec's shortfall in capacity, not the other way around.

Figure B - 1: Hydro-Québec shortfall against reserve margins with NECEC[6]



NOTE: Anticipated resources reflect what already exists or is being built; prospective resources include potential purchases that could be used to meet the targeted levels.
Reference Margin Level = Installed Reserve Margin Requirement

Therefore, if Québec is going to build any new upgrades or new impoundment structures, it would be because of its own need for new capacity, not to service other markets. Those additional capacity investments would occur regardless of NECEC.

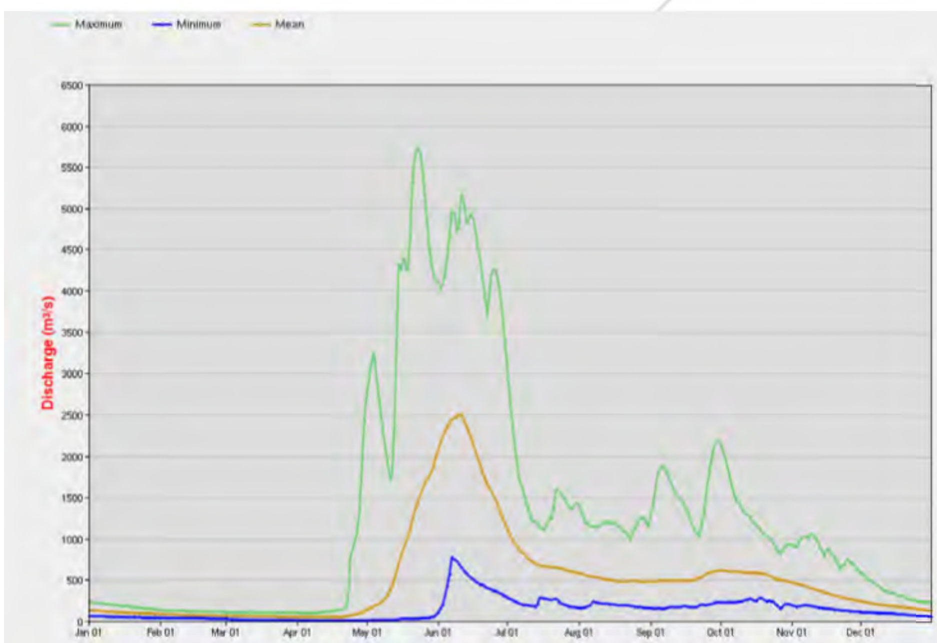
[6] NERC, 2017 Long-Term Reliability Assessment, p. 55 adjusted for 1,090 MW reduction for potential NECEC commitments.

B.2 HYDRO-QUÉBEC'S ENERGY

The shortfall in capacity does not correspond to a shortfall in energy because Québec can store water to generate excess energy across the year whereas capacity requirements are an instantaneous need at the point of peak demand on the system. Québec's generation capacity is dominated by large hydroelectric generation, some renewable resources predominantly purchased from third parties, and small percentage of thermal plants located in remote regions.

Given the natural flows of precipitation and snow melt in Québec, the province is flush with water in the late spring and summer months (**Figure B - 2**). That water is used to produce energy as well as to replenish the reservoirs for the winter.

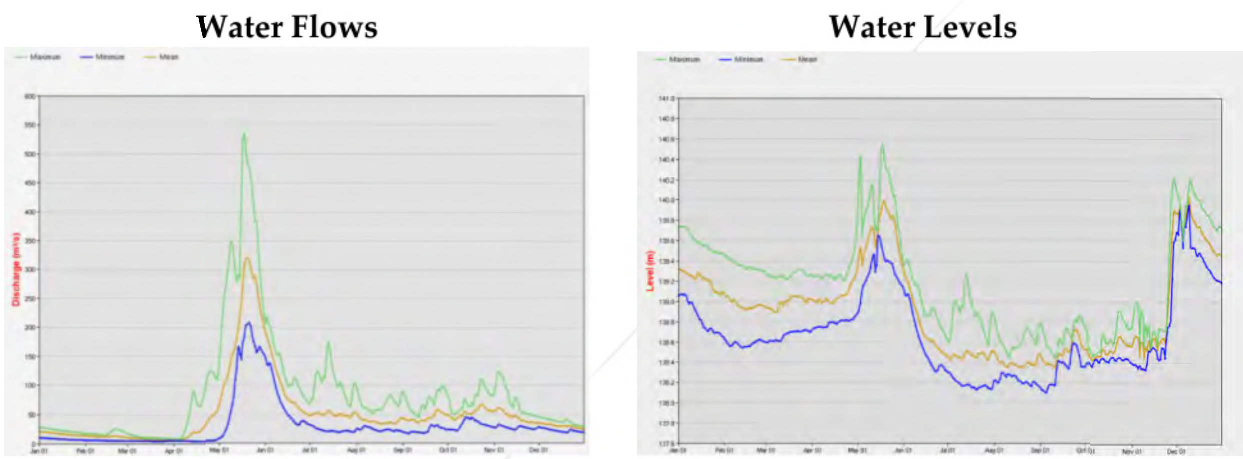
Figure B - 2: **Daily flow for Baleine River (1956 – 2013)**[7]



[7] Government of Canada, Hydrometric Flow Data, Daily Discharge Graph for BALEINE (RIVIERE A LA) À 40,2 KM DE L'EMBOUCHURE (03MB002) [QC], https://wateroffice.ec.gc.ca/mainmenu/historical_data_index_e.html

Reservoir management is a critical function of Hydro-Québec, which must meet its firm commitments while balancing between ensuring that reservoir levels do not drop below optimal levels for production in the winter and early spring while ensuring that snow melt does not exceed reservoir capacity and spill in the summer months. **Figure B - 3** illustrates the management of reservoir levels versus average snowmelt for Churchill Falls, the largest single resource that Hydro-Québec Power has access to (5,428 MW under contract). Although waterflows are negligible November through March and peak in May and June, reservoir management allows Hydro-Québec to draw down on its reservoirs during the winter periods and maximize generation during peak periods as require.

Figure B - 3: Daily discharge for Churchill Falls (2009 – 2014)[8]



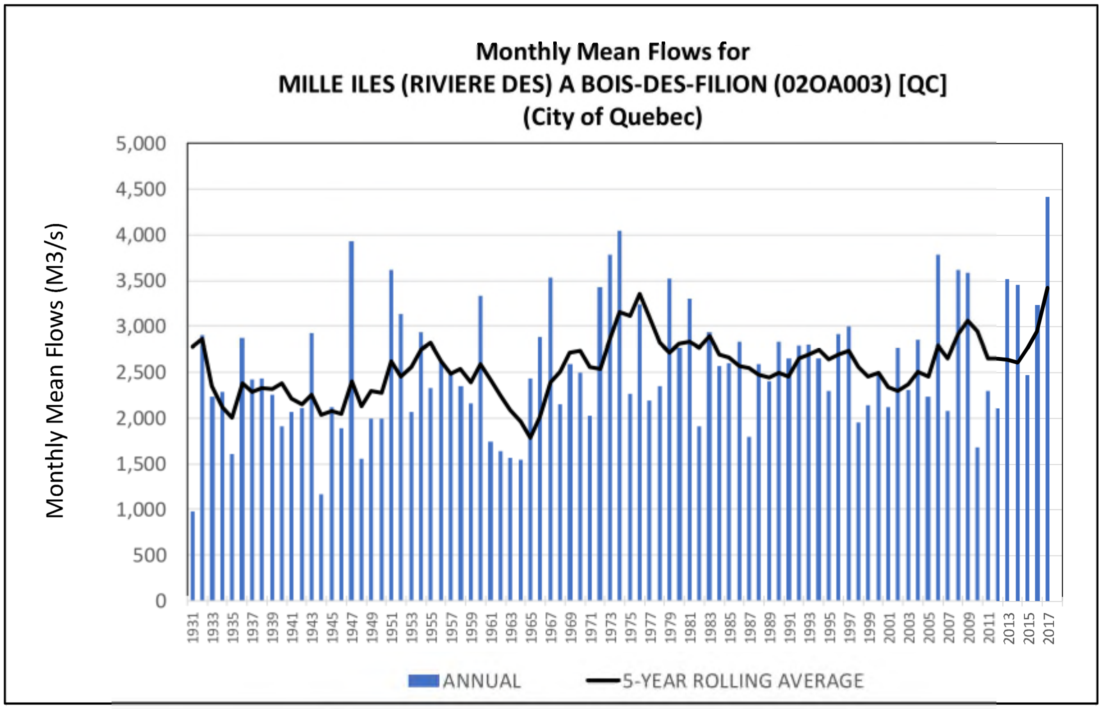
Hydro-Québec also manages its reservoirs to ensure that potential energy is optimized. If reservoirs cannot be too low or the water will fall below the generator intake tunnels, preventing the production of electricity. If too high, water may have to be spilled – released through upstream chutes without producing electricity. Reservoir management allows Hydro-Québec to manage the energy available in its system over multiple years.

The ability to manage across multiple years is important as the average precipitation varies on a year-by-year basis, as illustrated above with the range of water flows at Baleine

[8] Government of Canada, Hydrometric Flow Data, Daily Discharge Graph for CHURCHILL RIVER ABOVE CHURCHILL FALLS TAILRACE (03OD008) [NL], https://wateroffice.ec.gc.ca/mainmenu/historical_data_index_e.html

and Churchill Falls. **Figure B - 4** shows variation in monthly flows at Québec City, the location with the most consistent records of monthly water flows. The bars are annual water flows; the line represents a 5-year rolling average for the past 90 years. As can be seen, 2017 was a record water flow year and the five-year average flows ending 2017 exceed the previous high set in 1976.

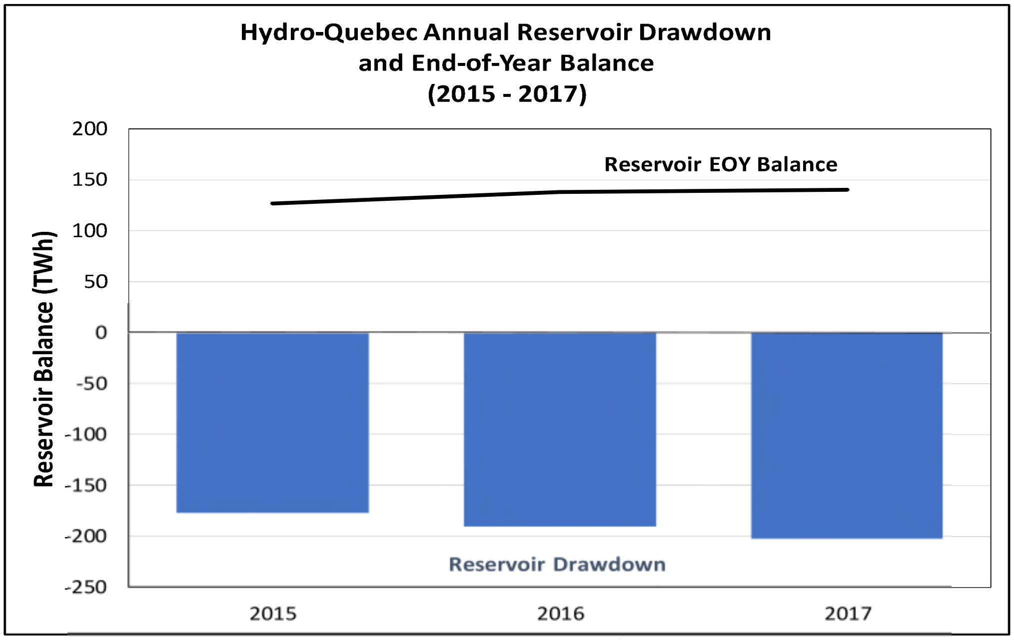
Figure B - 4: Daily flows for Québec City (1931-2017)[9]



The high precipitation and flow levels required significant drawdown on its reservoirs to maintain levels below maximum. Despite the increasing draw-down, year-end levels remained higher in 2017 than at the end of the previous three years (**Figure B - 5**). This is indicative of heavy water conditions through precipitation and snow melt.

[9] Government of Canada, Hydrometric Flow Data, Daily Discharge Graph for Monthly Discharge Statistics Data for MILLE ILES (RIVIERE DES) A BOIS-DES-FILION (02OA003) [QC], https://wateroffice.ec.gc.ca/mainmenu/historical_data_index_e.html

Figure B - 5: Hydro-Québec reservoir draw-down (2015-2017)[10]



Hydro-Québec's annual reports support the fact that 2017 and the prior years experienced high runoff conditions.

Per the 2017 HQ Annual Report:

> In 2017, net electricity exports reached a historic volume of 34.4 TWh and contributed $780 million to net income. As a result of an effective sales strategy, smooth operation of generating and transmission facilities **and high runoff**, net exports increased by 1.8 TWh over the previous record, set in 2016.[11]

(emphasis added).

[10] Calculated based on Hydro-Québec Annual Reports.

[11] Hydro-Québec Annual Report 2017, p. 22.

Per the 2016 HQ Annual Report:

> EXPORTS REACH A HISTORIC HIGH Net electricity exports rose by 3.3 TWh compared to 2015, reaching a historic high of 32.6 TWh and contributing $803 million to net income. This is a 1.8-TWh increase over the previous record, set in 2013, made possible by the smooth operation of generating and transmission facilities, in particular, **as well as high runoff and favorable weather conditions**. These factors, combined with the skillful development and deployment of the sales strategy, enabled the company to take advantage of business opportunities on external markets. The record volume of exports is all the more remarkable given the unavailability of a major power transmission link between Québec and New England in April and May 2016 due to scheduled maintenance. Finally, **because of the high runoff in 2016**, Hydro-Québec ended the year with record reservoir storage of 138.2 TWh.[12]

(emphasis added).

These annual reports also make it clear that variability in runoff is one of the key uncertainties and one which Hydro-Québec manages in various ways:

> **One of the principal uncertainties that Hydro-Québec faces relates to natural water inflows . . . It therefore manages its reservoir storage on a multiyear basis and maintains an adequate margin between its generating capacity and its commitments.** This allows the division to compensate for variations in runoff, replenish its reserves or take advantage of business opportunities.[13]

(emphasis added).

[12] Hydro-Québec Annual Report 2016, p. 25.

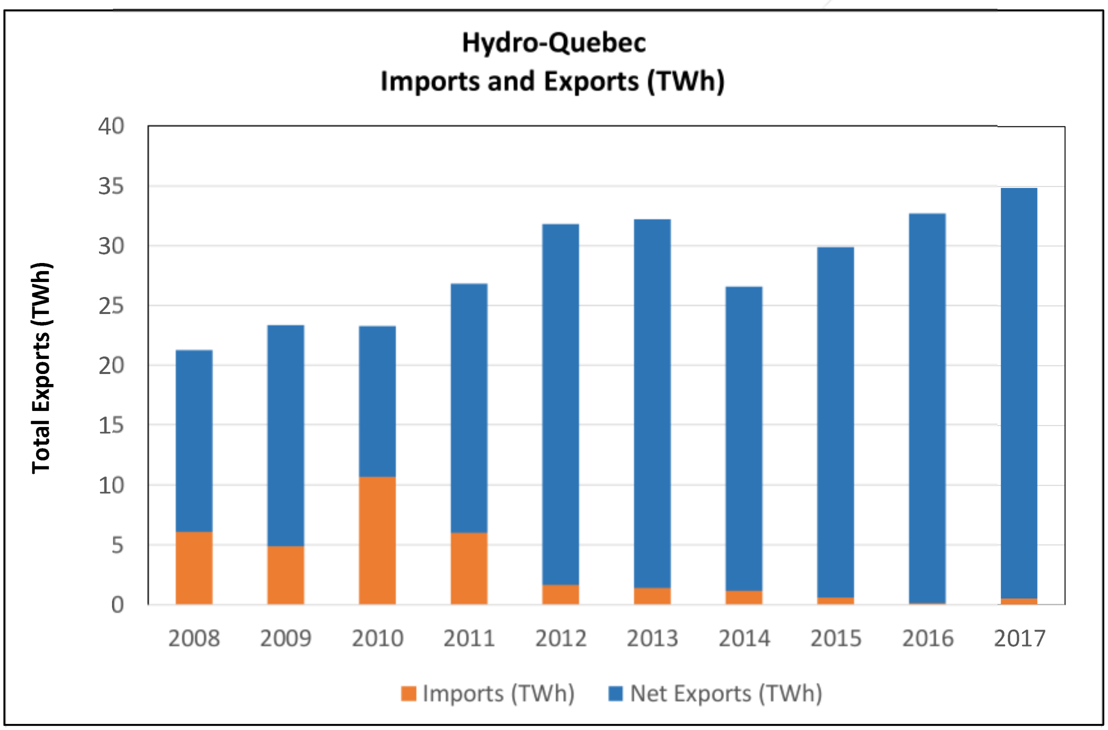
[13] Ibid., pp. 42, 44.

B.3 HYDRO-QUÉBEC'S EXPORTS

Given the extensive water flows that had occurred in 2017 and the previous five years, it is not surprising that Hydro-Québec exported a record amount of energy at around 34. 4 TWh for 2017. This record amount included annual snowmelt as well as significant draw-down of its reservoirs to maintain appropriate reservoir levels. In addition, Hydro-Québec imported less energy than it had in the past.

Hydro-Québec's annual reports show the historical amount of excess energy it has sold into external markets, net of imports (**Figure B - 6**).

Figure B - 6: Hydro-Québec total exports and imports (2008-2017)[14]



In general, Québec has excess energy over the course of the year that it can sell into other markets at a profit. This was especially true during the past five years when water flows

[14] Calculated based on Hydro-Québec Annual Reports.

were particularly heavy. During the mid- to late-2000s, when water flows were not as heavy, Hydro-Québec exported less and purchased from other markets. Between 2008 and 2012, imports were approximately one-third of Hydro-Québec's total exports; in 2010, Hydro-Québec purchased nearly half of the energy that it exported.

The percentage of imports as a portion of exports has declined over the past few years, as a combination of heavier water conditions and increased capacity build-out has allowed Hydro-Québec to engage in greater export transactions without purchases. However, history shows that Hydro-Québec is in a position to arbitrage between markets – buying low-priced energy from one market and selling stored reservoir water converted into energy into higher-priced markets.

Figure B - 7: Sales Outside of Québec in 2017[15]

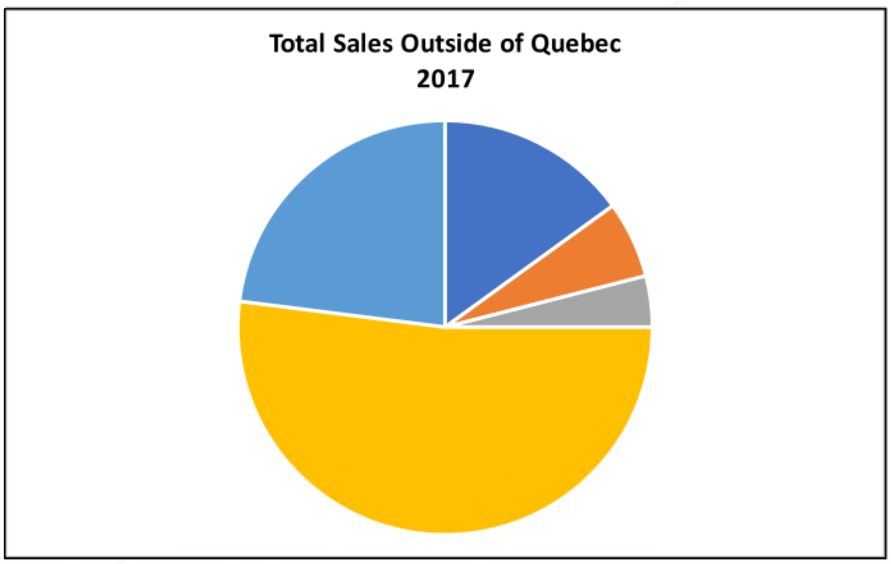


Figure B - 8 illustrates the level of exports from Québec over the past five years into the US. Total electricity exports into New York, New England and other markets ranged from 23.5 TWh to 27.7 TWh between 2013 and 2017. This is consistent with Hydro-Québec's website which claims, "Every year, Hydro-Québec has approximately 25–30 TWh

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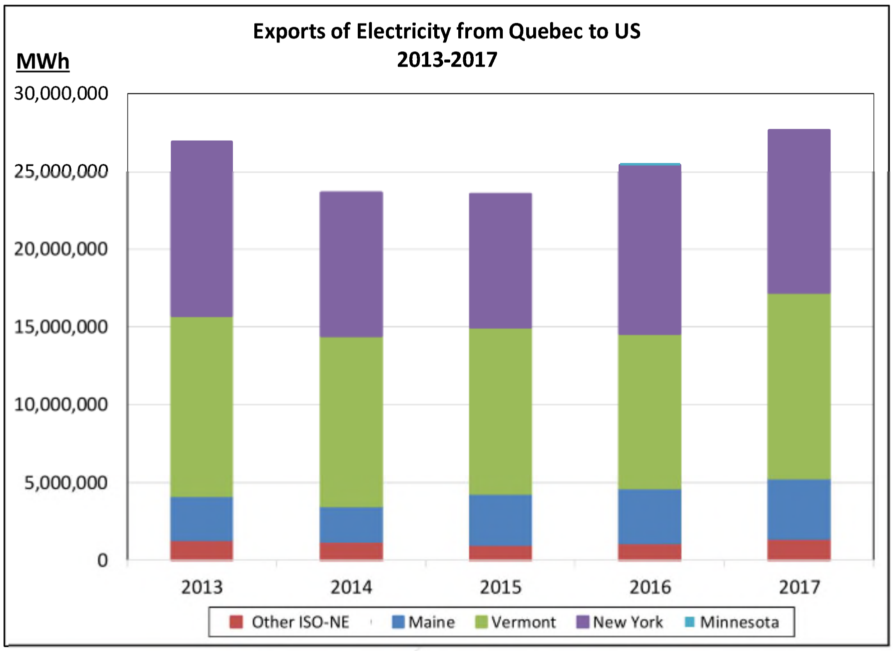
[15] Hydro-Québec 2017 Annual Report.

available for sale to markets outside Québec."[16] Approximately 90 percent of all exports into the United States from Québec are sold by Hydro-Québec or one of its affiliates.[17]

Figure B - 8: Electricity exports from Québec to the US on an annual basis[18]



Revenue from sales to external markets – which has ranged from $750 million to $1.5 billion over the past few years[19] -- is paid as a dividend to the Québec government. This level of profitability relies on exports, as indicated by Hydro-Québec's CEO Éric Martel.[20] The vast majority of Hydro-Québec's energy exports are sold to the United States.

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[16] Hydro-Québec website: FAQs about exports, www.hydroquebec.com/international/en/faq.html

[17] Energyzt analysis of National Energy Board, Monthly Electricity Export Reports for Canada to the US.
[18] National Energy Board, Monthly Electricity Export Reports for Canada to the US; New England ISO represents sales into ISO-NE outside of flows into Maine and Vermont.

[19] Hydro-Québec Annual Reports.

[20] Financial Post, "Without exports our profits are in trouble: Hydro-Quebec plugs into U.S. markets for growth," April 20, 2018, https://business.financialpost.com/commodities/energy/without-exports-our-profits-are-in-trouble-hydro-quebec-plugs-into-u-s-markets-for-growth

Figure B - 9: Electricity exports from Québec to the US on a monthly basis[21]

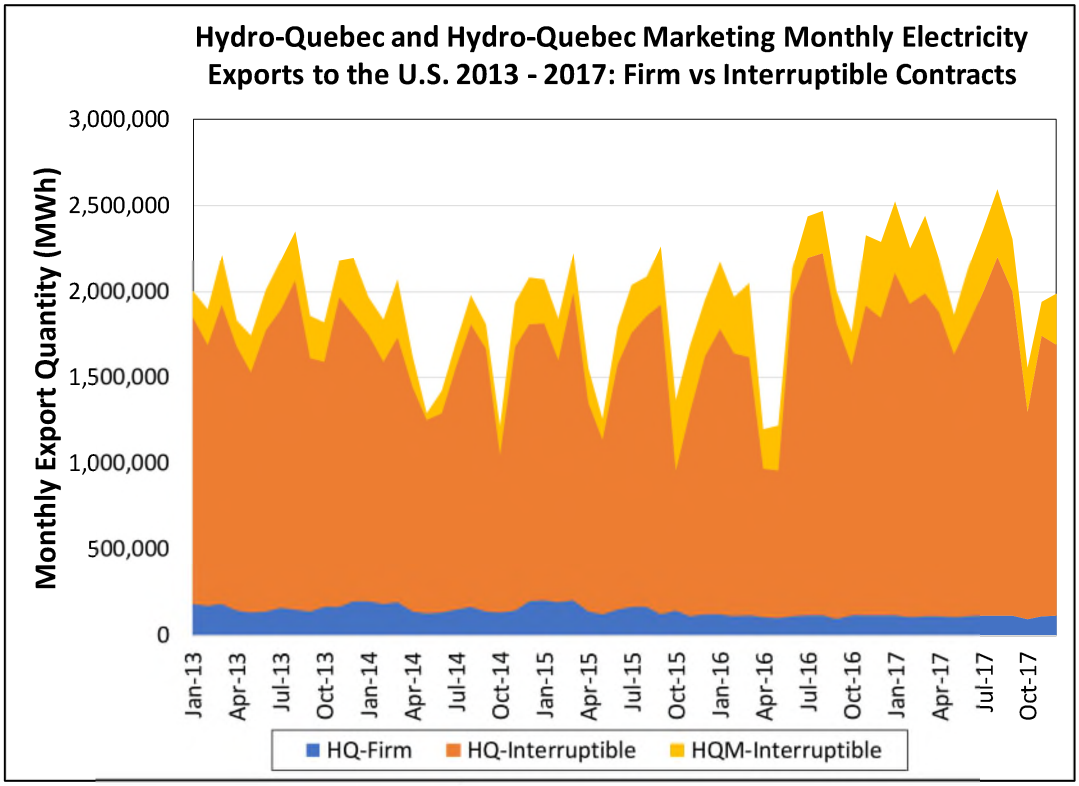


Figure B - 9 graphs sales from Hydro-Québec into U.S. markets on a monthly basis. Most of Hydro-Québec's sales are interruptible, which means that they are non-firm energy sales into non-firm spot markets. This chart also illustrates seasonal increases in sales during higher priced seasons (i.e., summer and winter). This pattern is consistent with opportunistic sales into other markets in the summer and winter peaks. Hourly flows from Québec into external markets (not shown) tell the same story -- exports generally increase during peak hours and fall during off-peak hours, illustrating Hydro-Quebec's profit motive to maximize sales during higher-priced periods.

Although total energy sales vary from year to year and month to month based on weather conditions, new capacity, reservoir management decisions and market conditions, Hydro-

[21] Energyzt analysis of National Energy Board, Monthly Electricity Export Reports for Canada to the US.

Québec has an incentive to maximize its available energy sales to the highest-priced markets during the highest-priced periods. Such sales are subject to Hydro-Québec's own firm commitments, water management decisions, generation capacity limits, and transmission constraints.

B.4 PROJECTED LOAD GROWTH IN QUÉBEC

There are multiple ways that Hydro-Québec could meet its firm capacity commitments going forward: Buy, divert, upgrade and build. **Figure B - 10** presents Hydro-Québec's own estimates of potential expansion opportunities and estimated costs (reported in US Dollars) to compare the cost of these alternatives.

Figure B - 10: Cost comparison of meeting NECEC obligations[22]

Hydro Bin	Potential (TWh)	Levelized Fixed Cost ($/kW-yr)	Levelized Cost of Electricity ($/kWh)
1	157	Current: 106 Post-2030: 133	Current: 0.02 Post 2030: 0.025
2	10	372	0.07
3	10	531	0.10
4	15+	690	0.13

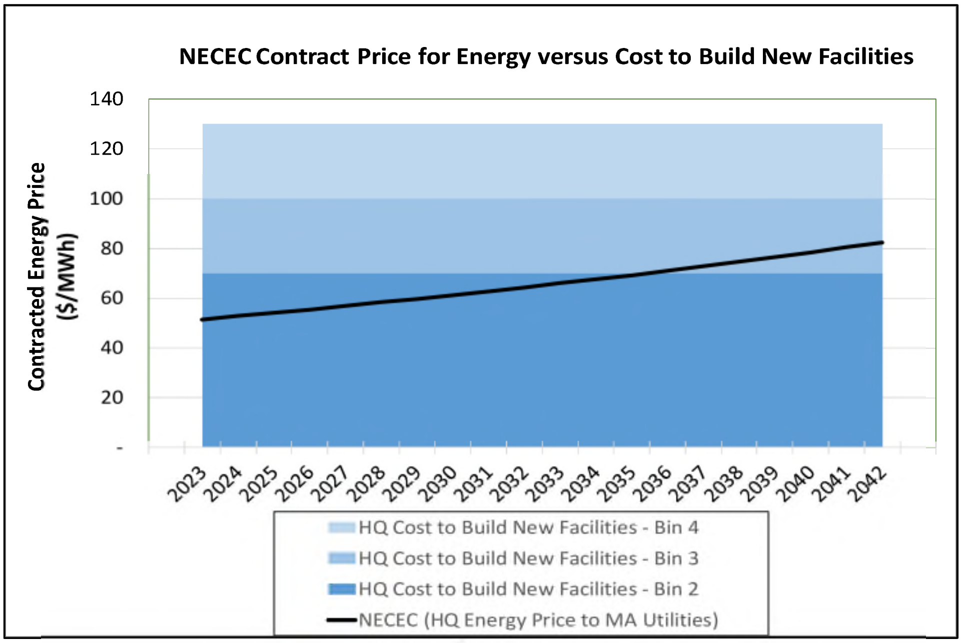
Although upgrades are the least costly option, this option is not available to Hydro-Québec for purposes of exports. Upgrades only offer 13 TWh of additional energy all of which is required to meet Hydro-Québec's growing load through 2034 (half of that amount is required through 2023, when the NECEC contract takes effect).[23] Furthermore, some of

[22] Ibid., p. 28. All dollar values are reported in US Dollars per Energyzt conversation with Evolved Energy Research, one of the authors of the report.

[23] Hydro Québec, Deep Decarbonization in the Northeastern United States and Expanded Coordination with Hydro-Québec, April 2018, pp. 27-28. Per Footnote 5 which indicates 144 TWh already is available, there would be only 13 TWh of additional energy available through upgrades. This would be consumed by Québec load growth by around 2034 given the load growth assumed by the study:

the potential for increased storage depends on wetter conditions than historically has been the case.[24]

Figure B - 11: Comparison of NECEC contract price to a new hydro facility[25]



The cost of building new impoundments is significantly higher – around $70 to $130 / MWh. The energy price in the contracts with Massachusetts utilities starts at $51/MWh and rises to around $82/MWh. As the contracted energy price is higher than the NECEC contract price for energy, it would be uneconomic for Hydro-Québec to build new facilities to meet its obligations under the contracts with Massachusetts utilities (**Figure B - 11**).

In contrast, Hydro-Québec has only been making between $20 to $40 / MWh on its exports

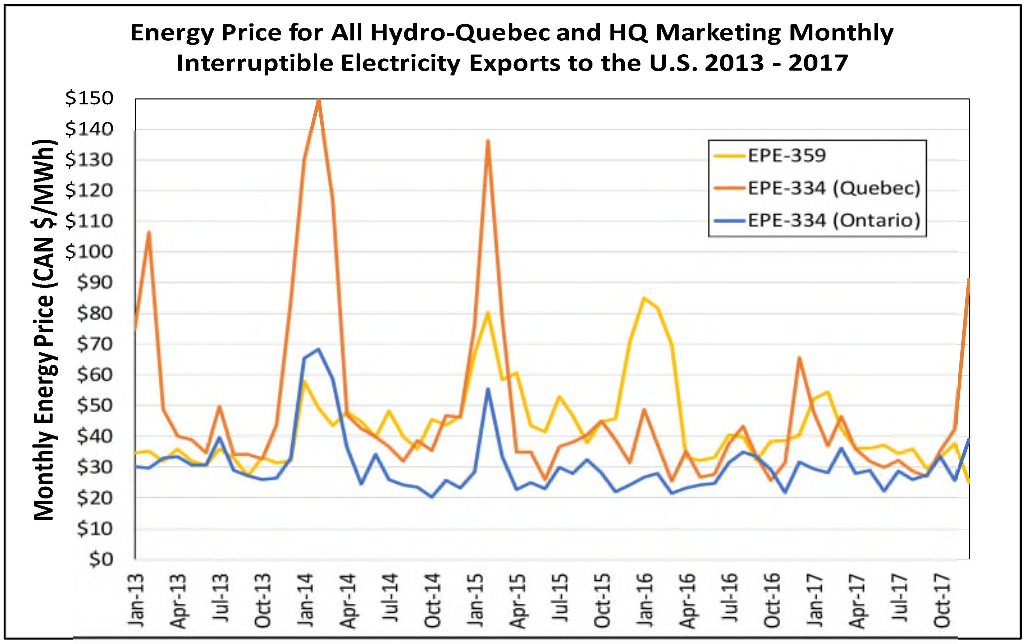
"Load in Québec was assumed in all scenarios to grow by 0.42% per year for a total increase of 28.7 TWh between 2015 and 2050."

[24] Hydro-Québec et. al., "Deep Decarbonization in the Northeastern United States and Expanded Coordination with Hydro-Québec," April 2018, p. 28.

[25] Contract prices derived from publicly-available information concerning the price under the Massachusetts contracts presented to the Massachusetts Department of Public Utilities. Cost to build new facilities is based on the Deep Decabonization Study

(peak and off-peak) except during winter price spikes (**Figure B - 12**). Off-peak hours, the periods when Hydro-Québec would be most likely to divert energy for sales to NECEC, is likely to be on the lower end of this range.

Figure B - 12: Hydro-Québec average price for interruptible energy by license[26]



The futures market indicates a projection of electrical energy prices in New York that is consistent with historical prices, and would be significantly below the contract price. Futures for New York peak prices for zone A, which tend to be higher than the North Zone where Hydro-Québec interconnects into New York, are averaging around $41/MWh for 2023. If off-peak hours are considered, Hydro-Québec could make money by simply diverting the entirety of its exports into New York into NECEC, or buying from other markets during off-peak hours to conserve its water for sale via NECEC.

[26] Energyzt analysis of National Energy Board, Monthly Electricity Export Reports for Canada to the US.

Figure B - 13: CME Group, NYISO Zone A – Peak Hour Futures Contract Price[27]

Trading Clearing Regulation Data Technology Edu

DEC 2022	OPT		-	-	37.30	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
JAN 2023	OPT		-	-	50.60	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
FEB 2023	OPT		-	-	48.25	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
MAR 2023	OPT		-	-	37.55	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
APR 2023	OPT		-	-	34.20	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
MAY 2023	OPT		-	-	35.60	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
JUN 2023	OPT		-	-	38.70	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
JUL 2023	OPT		-	-	54.60	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
AUG 2023	OPT		-	-	50.50	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
SEP 2023	OPT		-	-	38.80	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
OCT 2023	OPT		-	-	34.50	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
NOV 2023	OPT		-	-	34.20	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018
DEC 2023	OPT		-	-	38.75	-	-	-	0	No Limit / No Limit	16:45:00 CT 11 Oct 2018

Legend: OPT Options Price Chart ? About This Report

Given where market prices are trading, it generally would be more economic for Hydro-Québec to simply divert sales away from markets with prices below that level in order to service NECEC or, if it is more economic to do so, purchase energy from lower priced markets to generate energy to sell to Massachusetts under a long-term contract.

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[27] CME Group, NYISO Zone A On-peak Price as of October 11, 2018, https://www.cmegroup.com/trading/energy/electricity/nyiso-zone-a-5-mw-peak-calendar-month-day-ahead-lbmp-swap-futures.html

Hydro-Québec notes in its Section 83D application form that it may upgrade or build new facilities in the future. Given Hydro-Québec's need for new capacity, any upgrades or capacity additions that do occur would happen regardless of NECEC, and should be incorporated into the scenarios with and without NECEC when estimating the impact of NECEC on carbon emissions.

B.5 RECALCULATION OF CMP'S PROJECTIONS

In response to claims that Hydro-Québec would supply NECEC by diverting sales from other markets, CMP presented a calculation of energy available from Hydro-Québec's system going forward.[28] The calculation purports to show that Hydro-Québec would have a sufficient amount of incremental energy as a result of higher storage levels and therefore would not have to decrease exports into other markets below historical levels.

The simplistic model suffers from three fundamental flaws:

1) **The CMP Model Answers the Wrong Question:** The real question is whether NECEC reduces global emissions, and the CMP model does not address this question. To do so would require an analysis of what carbon emissions would be with and without NECEC. Given the recent set of high water conditions, Hydro-Québec has stored energy that it could use to generate energy going forward. This does not mean that sales via NECEC would be incremental over the entire term of the contract or that the stored water would not otherwise be sold as exports into other markets in the absence of NECEC. Therefore, the model cannot address what the net effect on emissions would be.

2) **CMP Assumes a Sudden Availability of Incremental Exports:** According to the CMP model, Hydro-Québec does not sell its excess energy into other markets unless NECEC is built. This results in reservoir levels remaining high up to the point where NECEC comes online. In fact, there is plenty of excess transmission

[28] *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Rebuttal Testimony of Thorn Dickinson, Eric Stinneford, and Bernardo Escudero on Behalf of Central Maine Power Company, July 13, 2018; CMP Response to NRMC-032-021, Attachment 1.

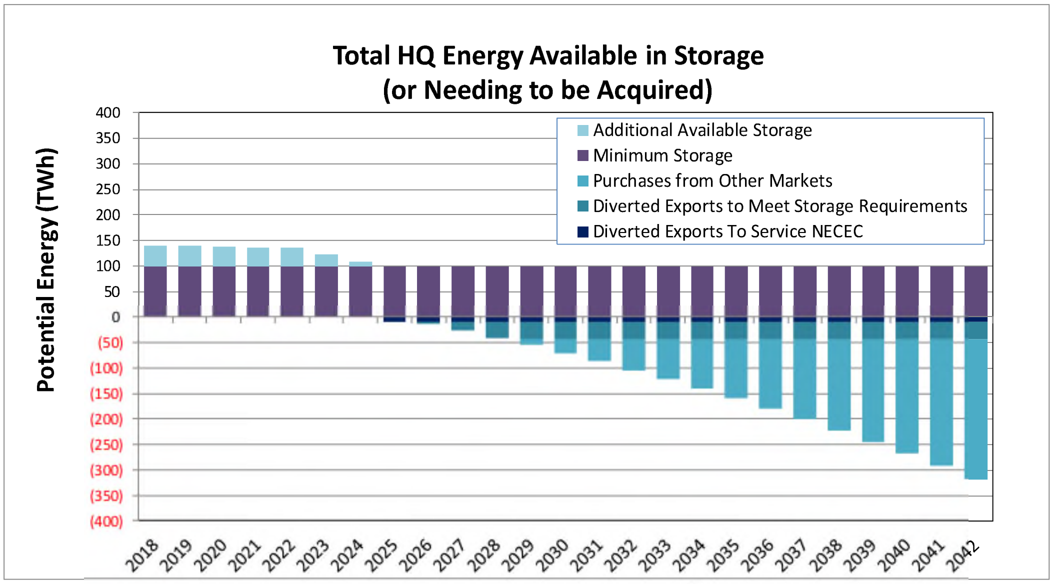
capacity servicing the interconnected markets that Hydro-Québec could use to sell its excess energy that currently is stored in its reservoirs. Historically, there has been around 16 to 18 TWh of unused transfer capacity across the tielines that Hydro-Québec could have used to sell its energy.[29] Intertie capacity is not the constraint for Hydro-Québec exports. Furthermore, by conserving water in storage to service NECEC, there would be an adverse impact on environmental emissions in other markets that otherwise could be mitigated if Hydro-Québec were to sell that energy prior to the NECEC contract.

3) **Water Conditions:** The model is incredibly sensitive to one key assumption – how much runoff would Hydro-Québec receive implicitly assumes high water conditions that have been experienced in 2017 and the years before will continue for the entirety of the contract, allowing for high levels of energy availability that allows incremental exports compared to historical levels. Assuming that Hydro-Québec will enjoy lower run-off levels – even a small reduction in the CMP assumption of 6 percent – dramatically changes the result. With this one change, Hydro-Québec would be unable to meet NECEC obligations while maintaining historical export levels without having to reduce exports and purchasing energy from other markets to meet its obligations.

Addressing only the assumed water conditions to reflect lower runoff conditions going forward compared to the recent high water years confirms that there are conditions under which: 1) Hydro-Québec would not have the excess energy required to maintain exports at recent levels; and 2) if Hydro-Québec did not divert energy from other markets into NECEC or reduce its exports to below historical levels, it would have to make other adjustments. Specifically, Hydro-Québec would have to divert exports into NECEC for sale into New England almost immediately under the contract and would have to begin greenwashing sometime during the first half of the contracts (**Figure B - 14**).

[29] *Central Maine Power Co.*, Request for approval of CPCN for the New England Clean Energy Connect, Maine P.U.C. No. 2017-000232, Exhibit No. JMS-3, Technical Report: Hydro-Québec Exports, April 2018, Figure 6, pp. 7-8.

Figure B - 14: Hydro-Québec operations with lower runoff conditions



In other words, doing nothing more to the CMP model other than reducing the assumed starting point for generation to reflect reasonable runoff conditions shows that Hydro-Québec will need to add new capacity to the system which is counter to what Hydro-Québec has stated NECEC would require and would be uneconomic given the NECEC contract prices for energy. Therefore, Hydro-Québec would have to manage its total export levels to meet its NECEC obligations and/or greenwash purchases from other markets.

In reality, Hydro-Québec is not confined to a single strategy over the course of the contract. Hydro-Québec will manage its system, sales, exports and opportunities according to water conditions and market prices. NECEC simply imposes another fixed obligation onto the system against which Hydro-Québec will optimize its operations. Such optimization will include diverting sales into other markets and greenwashing, as required to optimize profits.

B.6 CONCLUSIONS ON QUÉBEC'S SYSTEM AND SALES

According to NERC's long-term reliability assessment projections, Québec's system currently is projected to be short on capacity – without another acquisition of 1,100 MW of potential capacity resources, the province will be short of its targeted reserve requirements by 2023. Therefore, it would be unlikely that Hydro-Québec would be able to sell additional capacity into the ISO-NE market via NECEC unless it increases purchased capacity from other markets beyond what is required to maintain its own targeted reserve margins.

In contrast to its projected shortfall in capacity, Hydro-Québec has excess energy. Hydro-Québec maximizes its profits by selling that excess energy into other markets. Historically, there has been a significant amount of unused capacity on the transmission interties between Québec and other markets indicating that the constraint is not transmission, but Hydro-Québec's availability of energy (i.e., water). Therefore, if NECEC were built, the energy would be supplied by diverting energy sales from other markets.

Hydro-Québec has issued public statements that it could meet NECEC requirements with existing reservoir storage and upgrades. Any energy available through reservoir storage could be, and most likely would be, sold into other markets. The entirety of the upgrades are required to meet projected domestic load growth through 2034. Therefore, NECEC would be supplied by diverted energy.

CMP has testified that Hydro-Québec has enough water in its reservoirs to meet its obligations to NECEC while maintaining exports into other markets at historical levels. Their conclusions, and the underlying model supporting those conclusions, assumes that the high water conditions of 2017 and the previous years would continue indefinitely. This is unrealistic. Simply changing the assumed level of potential energy to reflect alternative conditions indicates that Hydro-Québec would be unable to maintain its sales into other markets plus its energy obligations into NECEC without diverting exports and greenwashing energy purchased from other markets.

Understanding Québec's system is key to understanding potential environmental impacts of NECEC. Hydro-Québec is not likely to upgrade its system to meet incremental sales into other markets as those upgrades are needed to meet its own projected load growth. Hydro-Québec is not likely to sell capacity via NECEC as it requires an incremental 1,100 MW of capacity in order to meet its projected requirements in 2023. Lastly, Hydro-Québec is not likely to sell incremental energy into NECEC as it has the incentive to maximize sales of its excess energy into other markets and divert the lowest-priced hours into NECEC.

NECEC reflects an alternative way for Hydro-Québec to sell energy into an existing market in which it already trades. The large size of NECEC and associated energy supply commitment would enable Hydro-Québec to convert roughly one-third of its existing sales into low-priced spot markets into a higher-priced contract. In order to meet this commitment, Hydro-Québec will be able to manage its system, reservoirs, exports and imports given water conditions and market prices. The net impact on carbon emissions in the environment could be negligible and may even have adverse consequences if NECEC diverts energy from markets with higher emissions on the margin compared to New England.