ONTARIO ENERGY BOARD

IN THE MATTER OF sections 70 and 78 of the *Ontario Energy Board Act, 1998*, S.O. 1998, c. 15, (Schedule B);

AND IN THE MATTER OF a Board-initiated proceeding to designate an electricity transmitter to undertake development work for a new electricity transmission line between Northeast and Northwest Ontario: the East-West Tie Line.

EB-2011-0140

EWT LP
Responses to Ontario Energy Board Interrogatories

March 28, 2013

EWT LP Responses to Ontario Energy Board Interrogatories in EB-2011-0140

March 28, 2013

I. QUESTIONS FOR ALL APPLICANTS

Interrogatory 1

Reference

Ref: Section 4.1 of the Filing Requirements

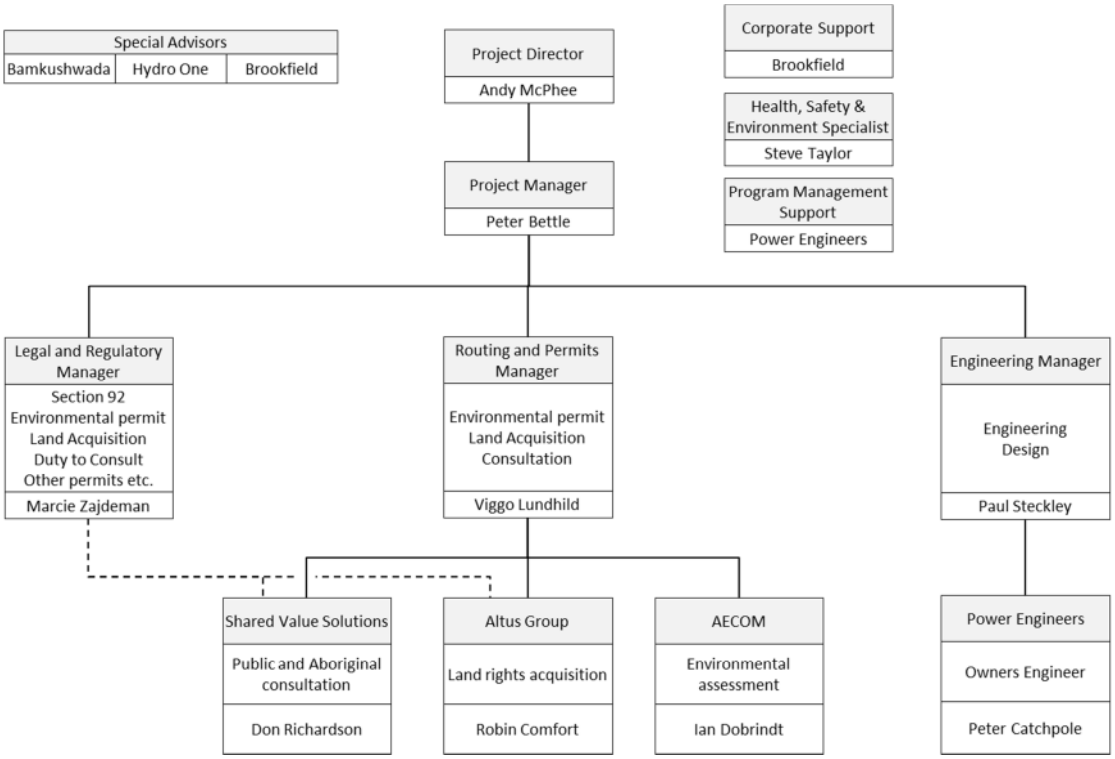
Request

Please provide your proposed organizational chart for the project development and construction phases as well as for the operation and maintenance phase, showing the various functions (including those functions listed in 4.1 of the Filing Requirements) and the reporting structure. Please include in these charts the names of members of the proposed management team (including the project manager / lead) and technical team who would be leading each function.

Response

Development Phase

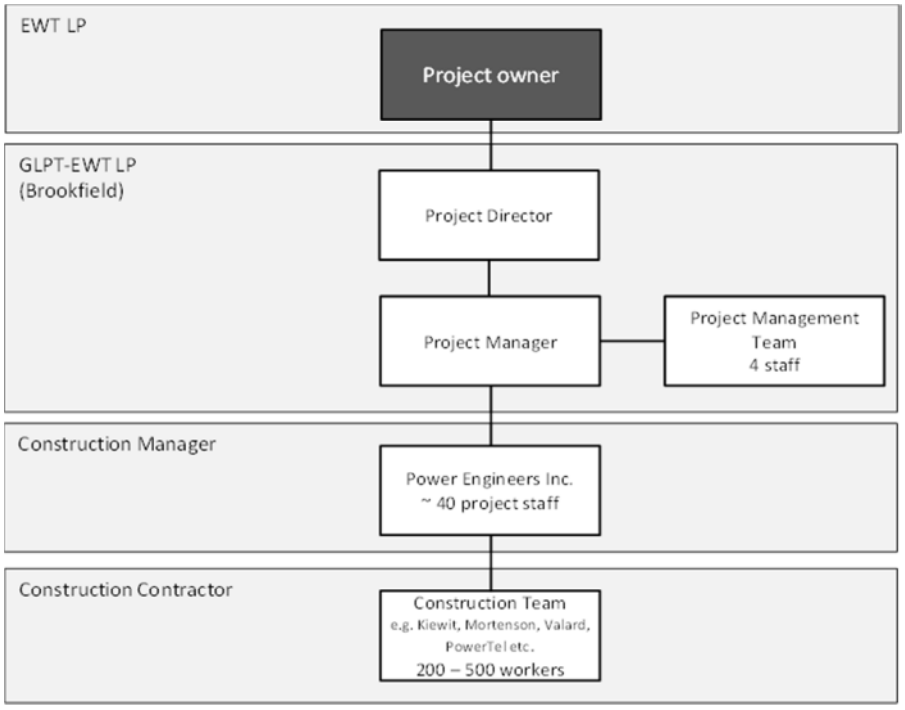
EWT LP's organization chart for the development phase was provided as Part A, Exhibit 2, Figure 2.4 and described in section 2.2. It has been reformatted to include the functions as requested and is reproduced below.



Construction Phase

EWT LP's planned organization chart for the development phase was provided in Part A, Exhibit 2, Figure 2.4 and described in section 2.2.

An overview of the organizational structure showing how EWT plans to manage the construction phase assisted by a specialist provider of construction management services is shown below.



As discussed in Part A, Exhibit 2, section 2.1.6, the construction management phase will be overseen by a dedicated EWT LP team. As discussed in section 2.2.2, the final selection of this team will occur closer to the commencement of construction and will depend in part on the nature of the construction contracting methodology ultimately selected.

While recognizing that there may be changes between designation and the start of construction (a period of approximately 42 months), EWT LP proposes to appoint a project manager for the construction phase of the Project that has experience delivering multi-million dollar energy projects. At this stage, it is anticipated that the project manager will be Mr. Berk Gursoy, whose résumé is attached in Appendix A. Mr. Gursoy is an employee of Brookfield's Power and Utility Group and was formerly Senior Transmission Engineer at Great Lakes Power, where he was the lead technical expert during the development and construction of the Transmission Reinforcement Project (a 165 km, 230 kV overhead line in the Algoma region of northern Ontario, which included the reconstruction of five substations) by Great Lakes Power Transmission LP ("GLPT").

He subsequently managed the construction of two major wind farms in Ontario, totaling 94 turbines.

The management of major infrastructure construction projects is highly specialized. As described in section 4.3.1, and consistent with Brookfield's usual business practices, EWT LP's dedicated construction management team will be assisted by a specialist construction manager, in this instance a specialist subsidiary of EWT LP's owner's engineer, Power Engineers Inc. Power Engineers will provide specialist construction management services during the construction of the Project.

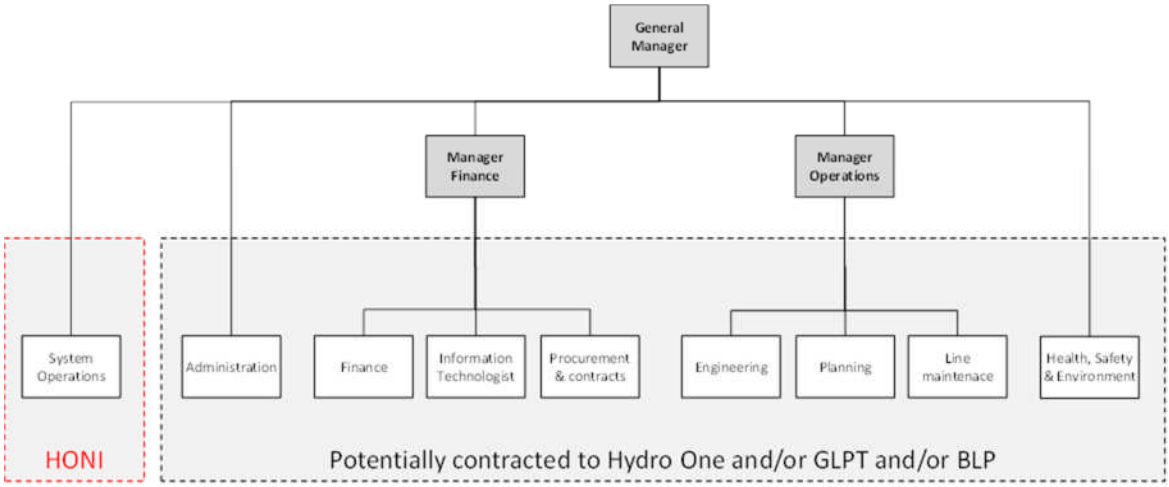
As stated in Part B, Exhibit 6, Appendix 6A, Figure 1, EWT LP has budgeted $41.7 million – approximately 10% of the construction budget – for construction management activities during the construction phase. This budget is based on a detailed estimate provided by Power Engineers Inc. in November 2012. Construction management will include the fifteen following principle activities involving 39 different specialist construction management roles:

- Contract administration
- Design control and change management
- Project scheduling
- Document control
- Construction management
- Field engineering
- Field inspection including climbing inspection
- Environmental coordination
- Material logistics and inventory control
- Health and safety
- Budget management
- Performance reporting
- Risk management
- Quality assurance
- Material quality control including factory inspection testing
- Project administration

As described in Part A, Exhibit 4, section 4.1.3.2, EWT LP plans to use a competitive process to select a construction contractor to build the new line. The construction contractor will be responsible for all aspects of construction including minor permitting, route clearing, materials procurement, civil works, electrical and mechanical erection and commissioning. The construction contractor will be responsible for providing and supervising its site labour during the construction phase.

Operations Phase

EWT LP's proposed organizational structure during the operations phase of the Project is shown below.



EWT LP will appoint a core team of three managers to manage EWT LP's business. Given the small size of EWT LP's business, these roles may be part-time, the employees being shared with other complementary Brookfield Power and Utility Group businesses. It would be premature to identify individuals at this time assuming a potential in-service date of November 2018.

As discussed in Part A, Exhibit 2, section 2.1.7, EWT LP contemplates that system operations will be outsourced to Hydro One Networks Inc. ("HONI").

For the purpose of preparing the detailed OM&A budget provided in Part B, Exhibit 8, Appendix 8A, EWT LP assumed that the other OM&A roles shown above would be filled on a standalone basis. However as noted in Part B, Exhibit 8, section 8.12, HONI and GLPT own and operate transmission facilities in the Project area and may be able to provide maintenance services more cost effectively through shared corporate services. Furthermore, Bamkushwada LP ("BLP")-related businesses may also be able to cost effectively provide support services including forestry and right-of-way maintenance. EWT LP therefore plans to investigate competitively contracting these services to suitably qualified and experienced third parties in order to reduce OM&A costs.

Interrogatory 2

Request

For the chosen project manager / lead, please confirm if this person will be dedicated to this project and describe this person's experience in managing similar projects.

Response

Development Phase

Details of EWT LP's Project management team during the development phase were provided in Part A, Exhibit 2, Figure 2.4 and described in section 2.2.

EWT LP has chosen to split the Project leadership role between two individuals – the Project Director and the Project Manager. EWT LP believes that this will ensure the Project has the leadership skills, experience and capacity to ensure its successful completion. This arrangement will also ensure continuity and allow development work to continue without interruptions. The individual roles are described in sections 2.2.1.1 and 2.2.1.2.

Mr. McPhee will be the Project Director. He is currently President of EWT LP and Vice President and General Manager of GLPT where he manages five direct reports and 45 indirect reports covering all aspects of operations including: engineering, planning, operations, system control, finance, regulatory and administrative functions. Mr. McPhee will continue to be dedicated to GLPT and EWT LP.

Mr. Bettle will be the Project Manager and will be dedicated to the Project for the duration of the development phase. Mr. Bettle is a Chartered Electrical Engineer with experience developing electricity projects in a number of countries. Since moving to Ontario as part of British Energy's team to complete due diligence on the Bruce Nuclear transaction, he has been continuously involved in Ontario's electricity industry. As a former member of the IESO Board's Technical Panel, he has extensive knowledge of the rules and regulations that shape Ontario's electricity industry. In his role as Vice President, Project Development at GLPT, Mr. Bettle participated in a number of planning activities. He has managed the preparation of EWT LP's designation plan and assembled the team of consultants who will assist with development work post-designation.

As part of an integrated approach, the Project Director and the Project Manager will be able to call on the expertise of the Brookfield Utilities Group and Hydro One Inc. through Hydro One Inc.'s subsidiary HONI.

The Project Director and Project Manager were identified in Part A, Exhibit 2.2 and their resumés provided in Appendix 2A.

Construction Phase

During the construction phase, the Project Manager will change but the Project Director will remain unchanged to provide continuity.

While recognizing that there may be changes between designation and the commencement of construction (a period of approximately 42 months), EWT LP proposes to appoint a Project Manager for the construction phase of the Project that has experience delivering multi-million dollar energy projects. At this stage, the Project Manager would likely be Mr. Berk Gursoy whose résumé is attached in Appendix A. As described in EWT LP's response to Interrogatory #1, Mr. Gursoy is an employee of Brookfield's Power and Utility Group and was formerly Senior Transmission Engineer at Great Lakes Power where he was the lead technical expert during the development and construction of GLPT's Transmission Reinforcement Project (a 165 km, 230 kV overhead line in the Algoma region of northern Ontario, including the reconstruction of five substations). He subsequently managed the construction of two major wind farms in Ontario (totaling 94 turbines).

The Project Manager will be dedicated to this Project.

Interrogatory 3

Reference

Ref: Section 4.2 of the Filing Requirements

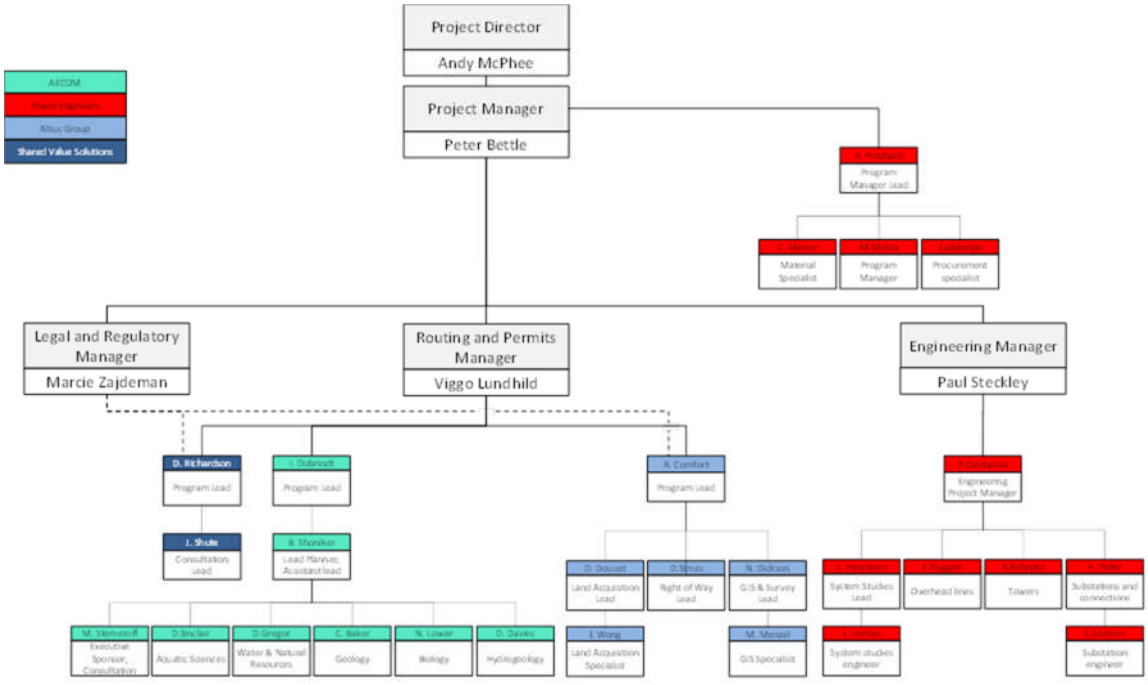
Request

For the list of "key technical team personnel" provided in response to section 4.2 of the Filing Requirements, please provide the specific proposed project / O&M role for each member.

Response

In Part A, Exhibit 4, section 4.2 EWT LP identified 27 key technical team personnel who will support EWT LP's development and construction activities. Their Project roles were identified in the table included in section 4.2.

The functional organizational structure showing the relationships between the key technical team personnel is provided graphically below.



Interrogatory 4

Request

On a national and international basis, identify any and all transmission projects where the applicant, its partner(s), shareholder(s), affiliate(s) or other related entities (collectively referred to as the "Applicant") have commenced the construction of a new transmission line but which the Applicant has been unable to complete and/or bring into service. Please describe the reasons why the Applicant has been unable to complete the transmission line and/or bring it into service.

Response

EWT LP is not aware of any transmission projects where the applicant, its partners or other related entities commenced construction of a new transmission line but were unable to complete and/or bring into service other than HONI's Niagara Reinforcement Project.

In the OEB decision for HONI's 2007/2008 rate application EB-2006-0501, page 63, the Board allowed special regulatory treatment for the Niagara Reinforcement Project, concluding that the occupation of a portion of the lands necessary for completion of the last two kilometers of the project in association with an Aboriginal land claim was a recognizable and materialized risk, the resolution of which was beyond the control of HONI.

Interrogatory 5

Requests

Please list the individuals that you plan to allocate to each of a) negotiating First Nation and Métis participation and b) conducting consultation with First Nation and Métis communities as delegated by the Crown. For each individual, please describe the individual's responsibilities on the team, relationship to the affected communities (if any), and relevant experience.

Response

EWT LP provided a comprehensive communications and consultation plan in Part B, Exhibit 10, Appendix 10A of its designation application. The individual roles and responsibilities are explained in more detail below.

(a) Aboriginal Economic Participation (including jobs, training, provision of goods and services)

Viggo Lundhild will be responsible for managing the negotiating of First Nation and Métis participation. As can be seen from his resumé,[1] Mr. Lundhild has extensive experience managing complex processes, procuring services, and in hiring and training staff. Mr. Lundhild will work closely with Marcie Zajdeman on this task. Mr. Lundhild is originally from Sault Ste. Marie and is familiar with the issues and opportunities in northern Ontario.

Mr. Lundhild will be assisted by Pierre Pelletier, Donald Richardson, Marvin Stemeroff, Ms. Zajdeman, and the six Aboriginal Liaison Officers.[2]

- Mr. Pelletier is President of BLP, former chief of the Red Rock Indian Band (in the Project area), and a successful local business owner. Mr. Pelletier was instrumental in the formation of BLP and has extensive experience developing new Aboriginal business opportunities in the Project area. Mr. Pelletier will be responsible for working with the Aboriginal communities to identify opportunities.
- Dr. Richardson is a principal at Shared Value Solutions Ltd. with extensive experience working with Aboriginal communities. Dr. Richardson will be responsible for providing oversight and strategic guidance for the First Nation and Métis consultation program and guidance on Aboriginal economic participation. His resumé is provided in Part A, Exhibit 4, Appendix 4B.
- Ms. Zajdeman, whose experience is described below, will be responsible for providing legal and regulatory advice.

[1] See Part A, Exhibit 2, Appendix 2A.

[2] See Part B, Exhibit 10, Appendix 10A, page 24.

(b) Crown Consultation

Marcie Zajdeman will be responsible for managing the delegated aspects of the Crown's duty to consult with Aboriginal peoples. Ms. Zajdeman will work closely with Mr. Lundhild on this task. Ms. Zajdeman, whose resumé is included in Part A, Exhibit 2, Appendix 2A, joined Brookfield in 2008 and is Vice President Legal and Regulatory. Previously, Ms. Zajdeman was Senior Legal Counsel at HONI and was instrumental in the Memorandum of Understanding (MOU) between the Crown and HONI relating to the delegated aspects of the duty to consult for the Bruce to Milton Transmission Reinforcement Project. Ms. Zajdeman was a member of the HONI working and steering committees interfacing with provincial and federal governments on Aboriginal permits and consultation, and has presented on the duty to consult to international audiences.

Ms. Zajdeman will be assisted by Jeremy Shute, Mr. Stemeroff, Byron LeClair, and the six Aboriginal Liaison Officers[3].

- Mr. Shute is a principal at Shared Value Solutions Ltd with extensive experience working both with and for Aboriginal communities. His project responsibilities will include participation in community notifications, in community and small group meetings, in the management of Traditional Knowledge and Land Use and Occupancy collection and integration (training community participants, identifying interviewees, collecting data, analyzing, collating and presenting data, integrating data in project planning), in preparing community information packages, and in the training of archaeological and environmental monitors. His resume is included in Part A, Exhibit 4, Appendix 4B.
- Mr. Stemeroff is an Associate Vice President with AECOM's Canadian environmental practice. Mr. Stemeroff has extensive experience consulting with Aboriginal communities. His resumé is also provided in Appendix 4B. Mr. Stemeroff will be responsible for ensuring that EWT LP's consultation with Aboriginal communities is coordinated with and satisfies the requirements under the *Environmental Assessment Act.*
- Mr. LeClair is Director of Energy Projects for the Pic River First Nation, President of Kagiano Power Corporation (a wholly owned community energy company) and Vice President of Business Development for the Begetekong Power Corporation (a partnership between Pic River and Innergex Renewable Energy). Mr. LeClair has spoken at many conferences on topics related to Aboriginal people, resource development projects and the benefits of First Nations business partnerships. He is a member of the Pic River First Nation and served eight years as a councillor for the community. Mr. LeClair has previously undertaken the procedural aspects of the Crown's duty to consult with respect to Pic River's hydroelectric projects in the Project area. Mr. LeClair's primary responsibility will be the scheduling and coordination of the process.

[3] See Part B, Exhibit 10, Appendix 10A, page 24.

Interrogatory 6

Questions

If you are selected as the designated transmitter, will the First Nation and Métis communities identified by the Ministry of Energy in its letter to the Ontario Power Authority ("OPA") dated May 31, 2011, and possibly other affected and interested First Nation and Métis communities, be given an equal opportunity to participate in the project? Will all affected (or interested) First Nation and Métis communities be given equal opportunity for all forms of participation in the project (e.g. employment opportunities, equity participation)?

Response

If EWT LP is selected as the designated transmitter, the identified First Nation and Métis communities and possibly other affected and interested First Nation and Métis communities will not only be accommodated, as appropriate, but may benefit from economic participation in the development and construction of the Project. Where all applicable technical and professional standards are met, the costs are commercially reasonable and the BLP Participating First Nations are not selected to provide the goods or services (due to lack of ability to provide or higher cost option), then EWT LP will give priority with respect to employment, training and commercial opportunities to other Aboriginal community members and to the businesses which they own or control. Moreover, EWT LP's competitive procurement processes will pair community resources and assets with Project needs in order to maximize the efficiency of the Project and enhance Aboriginal participation in it. For more detail in this regard, see pages 7 and 8 of Part A, Exhibit 3 of EWT LP's designation application.

EWT LP is not contemplating changes to its ownership structure at this time. The decision of the Participating First Nations to do business with each other, to form BLP, and to become equal partners in EWT LP with companies of their own choice was an act of self-determination. It has taken almost three years to develop the underlying relationship. Their decision was based on a desire for participation in development, construction and operations activities; for equity ownership; and for equal participation in the corporate governance of the transmitter designated to own transmission facilities crossing their traditional territories. This is congruent with the Participating First Nations each having traditional territories directly impacted by the Project, since their communities are all located within 40 km of the existing East-West Tie line and are the closest to the proposed Project. Such proximity gives the Participating First Nations unique routing, cultural and traditional knowledge regarding the Project area, and existing relationships with the majority of landowners, municipalities and agencies in the area.

First Nation and Métis participation from an equity perspective is not just a 'tick-the-box exercise' for the purpose of satisfying criteria for the current process. For BLP and EWT

LP, it is also fundamental to the advancement of the Project and to the communities that are directly affected.

Interrogatory 7

Question

Does a First Nation or Métis community need to be "affected" by the project, in order to participate, or can it participate if it is not affected but still interested?

Response

Please see response to Interrogatory #6 for All Applicants.

Interrogatory 8

Question/Request

Have you (or an affiliate) assisted, or will you (or an affiliate) assist, a prospective First Nation and Métis equity participant by providing a loan, by arranging financing through an independent financial institution, or otherwise? If yes, please explain how.

Response

No loans have been provided to the six Participating First Nation to assist with their equity participation. It is EWT LP's expectation that all of its partners will be able to provide their equity without the assistance of the other partners. As highlighted in EWT LP's application at Part A, Exhibit 5, section 5.0.1, in the event that BLP cannot obtain appropriate funding, Brookfield Infrastructure Holdings (Canada) Inc. and Hydro One Inc. will provide financing to BLP on commercial terms and conditions.

Interrogatory 9

Question

Have you undertaken, or will you undertake, an assessment to quantify the potential impacts on the affected First Nation and Métis communities, the amount of which could be counted toward the participating community's equity contribution?

Response

There is a distinction between equity participation and appropriate "economic accommodation" that might arise through consultation.

If EWT LP is selected as the designated transmitter, it will consult with the affected First Nation and Métis communities and appropriately accommodate them. The appropriate accommodation will be based on the strength of any Aboriginal claim in the Project area, and the effect the Project may have on any such claim. Potential impacts on the affected First Nation and Métis communities will be evaluated in this context. With regard to the equity contribution of Participating First Nations, please see the response to Interrogatory # 8 for All Applicants.

Interrogatory 10

Question

For those who propose to have or have equity participation with First Nation or Métis partners, how do you anticipate this participation will affect your credit rating, if at all?

Response

EWT LP believes that BLP's participation may have a positive impact on its credit rating but the impact is not likely to be material.

Specifically, and as described in Part C of EWT LP's designation application, BLP through the Participating First Nations possesses intimate knowledge of the local geography and climate and the traditional land use activities in the Project area because the Project area is located entirely within the traditional territories of the Participating First Nations. This traditional and local knowledge is critical in the development of the Project. It will enable EWT LP to plan routing, construction, operations and maintenance activities in a manner that is efficient and mindful of any potential impacts. Possessing this knowledge at the very outset of development makes the development process more efficient and will result in savings to ratepayers. This knowledge reduces Project risk and this should be reflected in slightly lower financing costs.

As described in Part B, Exhibit 5, given the utility-level financing experience, the financial strength and operating experience of both Hydro One and Brookfield Infrastructure, and the indicative credit rating of GLPT under similar financing conditions, EWT LP expects to achieve a credit rating which in turn will facilitate financing at rates, terms and conditions that are beneficial to EWT LP and the ratepayer. Given the utility-level financing proposed for the Project, EWT LP believes that third party lenders will provide the necessary financing for the BLP share.

Interrogatory 11

Request

With respect to First Nation and Métis participation issues, please identify any First Nation and Métis communities you have initiated contact with, those you have met with, and those you have existing arrangements to meet with.

Response

EWT LP has met with each of the six Participating First Nations communities forming BLP only for the purpose of sharing information about the Project and economic participation, and not as consultation. See response to Interrogatory #6 for All Applicants.

BLP's partners are themselves First Nations and have relations with a large number of Aboriginal groups.

EWT LP has not directly initiated contact with First Nation and Métis communities outside the Participating First Nations for a number of reasons:

(a) EWT LP has not at this time been delegated the procedural aspects of the Crown's duty to consult;

(b) approaching communities in advance of the Board's decision would be premature;

(c) EWT LP's view is that to have had six transmitters attempting to arrange discussions with the 18 Aboriginal communities identified by the Ministry of Energy would have caused confusion and not have been of assistance to the OEB designation process; and

(d) consistency with the approach taken by the Alberta Electric System Operator (AESO) recently approved by the Alberta Utilities Commission (AUC).

Interrogatory 12

Question/Request

Does your Consultation Plan treat engagement with First Nations and Métis communities, whose traditional territories will be crossed by the proposed East-West Tie route, on an equivalent basis? Where there are differences in the proposed engagement between First Nations and Métis communities please explain and provide justification for the difference.

Response

Yes, EWT LP's Consultation Plan treats engagement with First Nations and Métis communities whose traditional territories will be crossed by the proposed East-West Tie route on an equivalent basis. Among the guiding principles which inform EWT LP's First Nation and Métis Consultation Plan, found at Part B, Exhibit 10 of its designation application, are (i) bringing value to Ontario ratepayers, and (ii) ensuring that First Nation and Métis communities with existing or asserted Aboriginal or treaty rights that could be adversely affected by the Project are meaningfully consulted on reasonable approaches to avoiding or mitigating adverse impacts. Task # 5 of the First Nation and Métis Consultation Plan requires understanding how First Nation and Métis communities want consultation and communication activities to proceed. The consultation plan and activities will need to be grounded in the consultation expectations of the First Nation and Métis communities. EWT LP will coordinate meetings with interested communities to discuss the consultation activities and approach proposed for the Project. Where appropriate, MOUs on consultation approaches and programs will be developed with individual communities. The expected outcome is a consultation program that is accepted by these Aboriginal communities.

Interrogatory 13

Request

Please outline and provide examples of relevant experience the applicant has in undertaking procedural aspects of consultation with Métis communities in the context of the development, construction or operation of a transmission line or other large scale construction projects.

Response

Please see pages 10-15 of Part B-Exhibit 10 of EWT LP's designation application, which sets out the significant and extensive experience of EWT LP's partners and consultants in undertaking the procedural aspects of Aboriginal consultation, including consultation with Métis communities, in the context of the development, construction or operation of transmission lines and other large scale construction projects.

Interrogatory 14

Question/Request

Is the applicant or any of its affiliates/partners aware of any outstanding claims, applications, reviews or other proceeding brought against it (them), as transmitter or otherwise, by a First Nation or Métis community who disputes the use or proposed use of land, including disputes related to consultation or accommodation, compensation, mitigation, remedial measures, or other similar claims? If so, please identify and describe.

Response

EWT LP has been advised by its partners (including by Hydro One Inc. through its independent director, Michael Mueller) that the partners are not aware of any outstanding disputes as against them or EWT LP of the type described in the question. EWT LP notes Hydro One Inc.'s affiliate, HONI, owns and operates transmission facilities in the area in which the proposed facilities are to be located. In light of the Board's Phase 1 Decision and Order dated July 12, 2012, EWT LP has not taken any steps to communicate with HONI regarding whether First Nations or Métis communities in the vicinity of the Project have made claims or raised disputes related to consultation or accommodation, compensation, mitigation, remedial measures or other similar claims in respect of HONI's existing transmission operations. EWT LP understands that HONI is participating in this process in an *amicus* role and would likely be in the best position to answer this type of inquiry directly.

Interrogatory 15

Question/Request

Has your proposed design has been utilized successfully in terrain and weather conditions similar to that of Northern Ontario? If not, please comment on the potential risks of your proposed design with respect to its use in Northern Ontario.

Response

As described in Part B, Exhibit 6, section 6.1, EWT LP has based its Reference-Based Design on the existing X10 tower family employed by HONI and the 'Grackle' ACSR conductor. Both are widely used in Ontario and present no new risks.

As described in Part B, Exhibit 6, section 6.4, EWT LP proposes to consider alternative designs to determine whether an alternative design would provide a better trade-off for ratepayers in terms of cost, technical performance and public acceptability. These are as follows:

(i) A conventional double circuit steel lattice tower modified to provide longer, more cost effective spans while still meeting the appropriate galloping criteria. The behaviour and performance of trussed steel lattice structures is well understood in a wide variety of terrain and weather conditions including Northern Ontario. The use of a modified or new steel lattice tower design therefore does not present any new risks provided the tower is properly designed and tested.

(ii) A conventional single circuit steel lattice tower, in this instance assumed to be the W1 tower family employed by HONI. This is an existing technology and therefore does not present any new risks.

(iii) A cross-rope suspension ("CRS") line. This technology, although new to northern Ontario, has a long service history in other jurisdictions, including the third, fourth and fifth James Bay transmission lines totaling approximately 2,000 km in northern Quebec. These lines, installed in the 1970's, operate under similar conditions in terms of terrain and climate but are, if anything, more remote. In a contemporary article in the Montreal Gazette newspaper,[4] the head of Hydro Quebec's transmission research and development department described how the "installation crew can raise at least nine chainette [CRS] towers a day compared to about three guyed V or one rigid tower."

Furthermore, guyed structures such as CRS have been successfully used in northern Ontario since the early 1960's. EWT LP understands that Hydro One has approximately 1,100 route-km of guyed-tower transmission lines currently in operation. The lines are principally in northern Ontario operating in the same terrain and similar climatic conditions as the East-West Tie Project area.

[4] Montreal Gazette, July 7, 1977, page 11.

> Specifically, HONI's guyed lines include one 470 km, 500 kV single circuit between Sudbury and Pinard, north of Timmins, and two approximately 330 km, single circuit 500 kV guyed lines between Sudbury and Toronto (which together comprise Ontario's main north-south tie). The lines were constructed between January 1962 and August 1967. Parts of these lines are now therefore more than 50 years old.

EWT LP provided a comprehensive 76 page report titled "Assessment of the Use of CRS Structures on HV/EHV Transmission Lines" (Part B, Exhibit 6, Appendix 6D) which evaluated the application of this tower design to the East-West Tie. The report concluded that the tower design was well suited for the Project, given its inherent robustness, simplicity and low cost, provided that a single circuit alternative met the IESO's and the OPA's requirements.

The selection of cross rope suspension towers in EWT LP's opinion does not present any new risks but would provide a number of potential benefits.

Interrogatory 16

Request

To the extent that your application includes a tower design not typically used in Ontario, please indicate whether the construction schedule in your application includes time for testing of new tower designs.

Response

EWT LP has identified the potential need for tower testing – please see Part B, Exhibit 6, Appendix 6A, "Engineer's Report on the EWT Transmission Line OEB Reference Option", page 9.

EWT LP confirms it has allowed for the testing of new tower designs, if necessary, in its development schedule. Please see the Project workflows provided in Part B, Exhibit 7, Appendix 7A (Regular) and Appendix 7B (Accelerated).

The proposed CRS tower design, if this is ultimately identified as the preferred alternative, provides a schedule and cost opportunity savings that is much improved over the testing program required for any other types of new tower design. Rather than needing to test a full tower at an off-shore testing facility, the CRS tower can be tested at the fabricator's or any more accessible site easily and quickly. This is because only the mast itself requires testing, and this testing can be done horizontally on a shop floor.

Interrogatory 17

Reference

Ref: Paragraph 3.6.4 of the Board's Minimum Technical Requirements

Request

The necessity for the requirement at paragraph 3.6.4 of the Board's Minimum Technical Requirements has been questioned. Please comment on the risk of single loop galloping and the cost of meeting the Board's requirement.

Response

On November 27, 2012, EWT LP posted a question on the OEB's portal questioning whether any outages or conductor damage on the existing East-West Tie were attributable to conductor galloping over the past 40 years. HONI replied that "*Our records dating back to January 1990 show no forced outages relating to conductor galloping with respect to the existing East-West Tie lines. Data prior to January 1990 is not readily available. We are also not aware of any conductor damage due to galloping.*" This response suggests that galloping is not an issue in the Project area in spite of the existing East-West Tie not meeting the proposed galloping standard.

In Part B, Exhibit 6, section 6.4.2.3 of its designation application, EWT LP stated that it had identified one negative driver on cost in particular: the single loop galloping criteria. EWT LP identified this criteria is potentially overly conservative and recommended that it be reviewed as part of its development work. EWT LP proposed a Modified Reference-Based Design in its application, "REF B", which it estimates may reduce construction costs by approximately $47 million if EWT LP is not required to meet the galloping criteria (see Part B, Exhibit 6, Table 6.1 and Figures 1 and 2 of Appendix 6A (Engineer's Report on the EWT Transmission Line OEB Reference Option)). In contrast, requiring the Project to meet the galloping criteria will cost an additional $47 million relative to EWT LP's "REF B" Modified Reference-Based Design.

EWT LP provided a commentary on single loop galloping and the cost of meeting the Board's requirement in its designation application, Part B, Exhibit 6, section 6.4 and Appendix 6A, page 5 (Engineer's Report on the EWT Transmission Line OEB Reference Option).

Conductor galloping has been historically addressed around the world by a range of empirical rules and formulas with varied success. CIGRE published a document, Technical Brochure 322, dated June 2007 that provided another approach and formulation for mitigating galloping-induced faults. The study depends heavily on data gathered by Ontario Hydro some years ago and is promoted heavily by the Technical Brochure's Canadian committee member, David Havard, retired from Ontario Hydro. One of the features of the work is the suggestion that single loop galloping should be considered for all span lengths. This is a departure from other common approaches and the effect is to

increase the spacing needed between conductors comparatively, and particularly in the vertical direction.

The contents of the CIGRE/Havard report constitute the technical requirements for the East-West Tie Project with respect to galloping management. While the document's suggested methodology is based on certain data collected with inherent inaccuracies and provides greater conductor separations than many other methodologies, it is a new and unproven method. It must be understood that the method may reduce the frequency of galloping-induced faults when compared to some other methods but it offers no guarantees that it will eliminate the problem both due to the nature of galloping and because the method is untested.

Galloping of transmission line conductors is well understood to be a largely vertical motion. The size of the oval-shaped envelope within which the conductor gallops is almost universally considered to be 2.5 times higher than it is wide. Thus, fault mitigation requires much more vertical space between conductors than horizontal space. When the circuit count and structural configuration allows for it, it is much more cost-effective to avoid galloping-induced faults by putting conductors beside each other rather than above and below each other. One of the attractions of a single circuit design is that the horizontal placement of the conductors is easily and economically achieved compared to a double circuit. Thus, the single circuit CRS design is comparatively immune to galloping faults.

As described in Part B, Exhibit 6, section 6.4.2.1 of its designation application, EWT LP has included as an integral part of its development work the testing and, if necessary, revision of certain assumptions underlying the design of the line, including the galloping criteria. This development work will ensure the final design and route for the line will provide the best value for ratepayers while meeting all technical requirements and, as a result of extensive consultation, have broad-based public support.

Interrogatory 18

Question

In your proposed design for the line, are there any space limitations that would restrict the ability of workers to maintain the new line?

Response

There are no space limitations in EWT LP's proposed designs that would restrict the ability of workers to maintain the new line safely and cost effectively.

Live line maintenance practices require particular separation of phase conductors from each other and from grounded objects such as the supporting structures. They also require particular hardware choices and orientations to allow the use of live line tools.

As described in its application, EWT LP will determine the most cost effective design for the new East-West Tie after completing the necessary technical and economic studies, consulting with stakeholders including land owners, and undertaking the environmental studies identified in its approved terms of reference for the environmental assessment. The final detailed design for the new line, whether using traditional double circuit steel lattice towers (the Reference Option) or single circuit cross rope suspension towers (CRS alternative design), will incorporate the appropriate design features (clearances, hardware choices etc.) to allow the line to be safely and cost effectively maintained in full compliance with the limits of approach set out in the Electrical Utility Safety Rules[5] and in accordance with good industry practice[6].

[5] Electrical Utility Safety Rules, Revised 2009, Infrastructure Health & Safety Association – personnel restricted zone for voltages in the range 150 kV to 250 kV is 2.1 m to 1.2 m.

[6] e.g. The US Occupational Safety and Health Administration (OSHA) requirement for "Working Clearances/Limits of Approach 1910.269 Table R-6 at 230-242 kV" is 1.60 m phase to ground and 2.29 m phase to phase.

Interrogatory 19

Questions

Different tower structures, foundations, tower spacing, etc. were proposed in the various applications. What were the applicant's design assumptions (e.g. right-of-way spacing from Hydro One Networks Inc. ("HONI")'s assets, tower height, span length, foundation, etc.) to avoid any adverse impact to HONI's transmission system, including: (i) in the event of a catastrophic failure of the proposed new line; and (ii) access by HONI to the existing transmission line for routine maintenance and service restoration?

Response

As EWT LP discussed in its application, the designated transmitter will only be able to finalize the route of the new line when it has properly consulted with all stakeholders, including HONI, and has completed an individual environmental assessment. EWT LP has provided a detailed consultation plan describing how it proposes to solicit this input as part of its application.

EWT LP agrees that it is important for the new East-West Tie to be designed to provide sufficient separation between the new and existing transmission lines to allow both HONI and the designated transmitter to access their facilities for routine maintenance and service restoration, and to prevent the catastrophic failure of one line from damaging another line.

For the purpose of preparing its designation application,[7] EWT LP has assumed that the new line would generally run within 0.5 km of the existing line. This alignment facilitates the reuse of existing access tracks to construct and maintain the line, so benefitting ratepayers through reduced cost and smaller environmental footprint, while providing the necessary separation described above. It also reduces the need for the new line to repeatedly pass over or under the existing line: each crossing increases the risk that the failure of one line damages the other line resulting in the loss of both lines.

[7] Part B, Exhibit 6, Appendix 6A, Engineers Report on the EWT Transmission Line OEB Reference Option, page 6.

Interrogatory 20

Questions

With respect to the construction, operation and maintenance of the new transmission line, what were the applicant's assumptions to avoid any adverse impact to HONI's transmission system, including: (i) in the event of a catastrophic failure of the proposed new line; and (ii) access by HONI to the existing transmission line for routine maintenance and service restoration?

Response

As noted in the response to Interrogatory #19 for All Transmitters, EWT LP is not intending to locate the new line in such proximity to the existing line that it would be within falling distance of the existing line or hinder maintenance. It may be attractive to share access roads in a general way and this suggests proximity in the range of a few hundred meters to several kilometers separation. EWT LP will consult with HONI following designation to ensure that the new line will not cause any adverse impacts to existing transmission infrastructure.

Interrogatory 21

Questions

The Independent Electricity System Operator ("IESO") indicates that the double-circuit line described as the Reference Option has several benefits over the single-circuit option. These include:

- **a higher thermal rating (up to about 800 MW) that can be exploited for future expansion by adding more voltage control or compensation equipment;**
- **a higher level of reliability because of its inherent redundancy (2 circuits to one, a lower exposer to common-mode failures, more flexibility to perform line and terminal maintenance);**
- **less reliance on voltage control and compensation equipment, and special protection systems;**
- **less electrical equipment involved and less risk of equipment failure; and**
- **a higher level of operating security as described in section 16 of the IESO's August 2011 Feasibility Study.**

Are there any beneficial attributes of the single-circuit option, other than reduced cost? Are there other benefits of the double circuit line that are not listed above?

Response

The useful capacity of any new line will ultimately depend on the robustness of the existing transmission system, the reliability standards in force, and the availability of control actions including generation and demand side management. If the underlying transmission system is weak and the availability of control actions is the limiting factor, then under the existing NERC planning standards a new double circuit line should theoretically always have a greater useful capacity than a new single circuit line of the same equivalent conductor cross section. If the availability of control actions is not the limiting factor, then for a given useful capacity a single circuit line may require more control actions in the event of a first contingency than the equivalent double circuit line. Assuming that both alternatives meet all relevant reliability standards, the designated transmitter will have to determine whether the electrical performance of a double circuit line justifies its additional costs over a single circuit. This is a core development activity and one that many transmitters overlook.

Cost and electrical performance are not, however, the only criteria when considering the design of a new electricity transmission line in the 21st century. The new line also has to receive approval under the *Environmental Assessment Act* (Ontario) and, where applicable, the *Canadian Environmental Assessment Act.* This approval requires consideration of a number of factors over and above the electrical performance and cost

of the line. As EWT LP noted in Part B, Exhibit 7, section 7.5.2.1, a number of recent unsuccessful energy projects failed not because they were technically deficient or not cost effective, but due to public opposition on environmental grounds.

Many of the benefits of a single-circuit option, in addition to its lower capital and operating costs, lie in its superior environmental attributes and how these affect public support.

EWT LP discussed the advantages and disadvantages of single circuit alternatives in its designation application – see the report *East West Tie Expansion, Assessment of the Use of CRS Structures on HV/EHV Transmission Lines* filed as Part B, Exhibit 6, Appendix 6D.

EWT LP noted the following:

- Single circuit towers are less visually intrusive than double circuit towers because they are typically shorter and less of the tower projects above the tree line. Guyed single circuit structures have an even lower visual footprint due to the absence of large steel members in the trussed structures. Visual impact is a significant cause of public opposition when permitting new infrastructure.
- Single circuit towers require a narrower right-of-way for a given span length. This further reduces the visual and environmental impact of the new line. Images Render 1 and Render 2, which are attached in Appendix B, and the movie file provided to the Board (and to any parties upon request) on the enclosed CD-ROM illustrate the visual impact of the CRS design. Notably, the limited clearing that EWT LP proposes for the right-of-way, compared to the standard notions of clearing an entire right-of-way, and the notion that guyed towers require a wider right-of-way are illustrated. These images reflect the discussions provided in the "Use of CRS Structures" report included as part of the EWT LP application.
- Single circuits allow for the use of a horizontal conductor formation. In addition to reducing the height and visual intrusiveness of the tower, this also reduces incidental bird strike. The effect of the new line on species at risk and migratory birds is an important consideration in the environmental assessment.
- Single circuits allow for the use of guyed structures. In addition to the cost saving, guyed towers are lighter and require simpler foundations. Both reduce the environmental impact during construction. Single circuit guyed structures also provide inherent anti-cascade failure at every tower. This is critical where the climate is harsh and access for repairs difficult.
- CRS structures can also be modified to provide greater reliability by adding structural and insulation strength for incremental costs which are much less than for conventional lattice structures. Relatively small increases in insulation strength (insulator length and electrical clearances to the tower) will provide marked reductions in momentary outages. Relatively small increases in structural strength will provide significantly greater margins of security against low probability but high impact events, such as structural failures during extreme weather events. While not

changing regulatory reliability requirements, increased reliability of a single circuit line option would positively impact actual system performance.

- CRS single circuit lines have a number of additional benefits compared to other guyed structures. CRS lines need less reactive compensation as a result of the smaller GMD (closer physical arrangement of the conductors - see CRS report, Table 2, Electrical Characteristics of a Single Circuit 230 kV Line Using Conventional Lattice and CRS Structures). CRS towers are also lighter than conventional guyed structures, thus further reducing the environmental impact during construction.

As EWT LP noted in Part B, Exhibit 6, page 15, of its designation application, the OPA concluded that the installation of a double circuit line to reinforce the East-West Tie would be preferable to a single circuit given the conclusions of the IESO Study on the single circuit performance in a contingency event.[8] However, this assessment was based on the relative costs of the two options with the OPA finding that the cost savings of the single line option were not sufficient to justify the performance difference. EWT LP notes that this cost-benefit analysis would change significantly if a single line option were considered in combination with CRS structures – see also the response to EWT LP Interrogatory #5. As noted in the CRS Report, CRS structures have a significantly lower construction cost when compared, for example, to the Reference-Based Design. Power Engineers also indicates that CRS has a long, proven track record and would be expected to perform well in northern Ontario based on its performance in northern Quebec and elsewhere. Finally, EWT LP notes that the fully guyed CRS structures provide natural resistance to cascade failures. Therefore, EWT LP believes that there is value to ratepayers in further studying a single circuit alternative. In particular, there is value in revisiting the cost-benefit analysis to determine whether the cost savings and enhanced 'permit-ability'[9] of a single circuit CRS design justify the difference in performance in a contingency event.

[8] OPA, Long Term Electricity Outlook for the Northwest and Context for the East-West Tie Expansion, June 30, 2011.

[9] A technical design that has a smaller or less disruptive environmental impact should in principle require a simpler and cheaper, though no less thorough environmental assessment, and is more likely to be found consistent with the purposes of the *Environmental Assessment Act* and thus approved by the Minister. Such a design would therefore benefit ratepayers through reduced risk, cost and schedule in addition to lower capital and operating costs.

Interrogatory 22

Question

The IESO suggests that to assess whether a proposal will satisfy IESO reliability criteria at the required transfer level, some characteristics for proposals must be available. What is the a.c. resistance (at 20°C), reactance and susceptance (i.e. R, X, B) for each circuit of the Wawa to Marathon and Marathon to Lakehead sections of the new line(s)?

Clarification from Board: The 20ºC temperature reference refers to both the conductor temperature and the ambient temperature. The 20ºC is meant to reflect 'normal room temperature' and the conductor is assumed to have reached that temperature when the test is conducted to determine its dc resistance.

Since the test would not involve any significant current, the heating effect would be negligible, so the conductor temperature would not change.

The 20ºC reference temperature was actually established in 1913 for the International Annealed Copper Standard for determining the conductivity of commercially pure annealed copper.

CSA Standards C49.1, C49.2, C49.3, C49.5 & C49.7 (there are probably others) all make reference to the 20ºC temperature at which the resistivity is to be determined.

Clause 4.2.2.2 of CSA Standard C49.7 states:

> **All measurements necessary for the determination of volume resistivity, as covered by Clause 3.5.2, shall be carried out at a temperature of 20°C or close enough thereto to permit accurate correction of all measured quantities to their values at 20°C, by the application of the standard linear correction formulae as follows:**
>
> **$R_{20} = R_t / [1 + a_R (t-20)]$**
>
> **where**
>
> - **R_t = resistance in ohms at a temperature of t°C**
> - **r_{20} = resistance in ohms at a temperature of 20°C**
> - **a_R = constant mass temperature coefficient of resistance per degree Celsius at 20°C**
> - **t = temperature of wire in degree Celsius at which resistance is measured**

Response

Structure Type	Conductors	R_1 (Ω/km)	X_1 (Ω/km)	B_1 (µS/km)
Reference Case – Lattice Double Circuit	1 x 1292 Grackle	.049	.495	3.34
Lattice Tower – Single Circuit	2 x 795 Drake	.036	.375	4.41
Cross Rope Tower – Single Circuit	2 x 795 Drake	.036	.349	4.72

The table above provides the positive sequence R, X and B values expressed in the usual units per km. The values are given per km to facilitate developing power flow models, assuming that given the line lengths involved each line would be broken into two or more sections for modeling at the discretion of the modeler.

The Wawa to Marathon line section is estimated to be between 175 km and 200 km in length and the Marathon to Lakehead section is estimated to be between 225 km and 240 km in length.

As described in Part B, Exhibit 6, section 6.4.2, EWT intends to perform a methodical study to establish final conductor selection so these conductors should not be treated as final selections.

Interrogatory 23

Request

In the IESO Feasibility study of August 2011, the IESO indicates that it assumed a route length of approximately 400 km, and used electrical circuit parameters representative of that length of route. For transmitters proposing alternative paths that vary 40 km or more in length from the reference 400 km, please comment as to whether the change in length will materially alter the electrical parameters of the line and whether the targeted transfer capability can still be achieved.

Response

The route alternatives EWT LP identified in Part B, Exhibit 9, section 9.4 vary between approximately 400 km and 440 km in length. The change in length is not expected to materially alter the electrical parameters of the line or whether the targeted transfer capability will be achieved.

Interrogatory 24

Request

For transmitters proposing to use 230 kV class equipment, please indicate whether the design you propose will be capable of continuous operation up to 250 kV as required by the IESO's Market Rules.

Response

Consistent with its affidavit (Part B, Exhibit 6, Appendix 6B) and section 4 of its licence (ET-2011-0350), EWT LP confirms that its final design for the new East-West Tie will comply with all applicable standards including Chapter 4 of the IESO Market Rules. The line will be designed for a maximum continuous operating voltage of 250 kV.

Interrogatory 25

Request

Please describe any differences between the inputs that went into the Feasibility Study on record and your proposed design.

Response

EWT LP's Reference Based design (double circuit steel lattice towers) as described in Part B, Exhibit 6, section 6.1 of its designation application is based on the Board's reference option and is therefore consistent with the inputs of the IESO's Feasibility Study on record.

As discussed on page 16 of its report "East West Tie – Assessment of the Use of CRS Structures on HV/EHV Transmission Lines" (Part B, Exhibit 6, Appendix 6D), EWT LP considers its single circuit CRS option using twin "Drake" 795 kcmil conductors to be equivalent to the single circuit line considered by the IESO in its August 18, 2011 Feasibility Study, which also assumed the use of twin "Drake" conductors. Please also see the response to EWT LP Interrogatory #4.

Interrogatory 26

Question

Please complete the following three tables to enhance cost comparability between applications. Applicants should provide the cost estimates based on their preferred option for the line. Where the preferred option is not the reference option, the tables should also be provided for the reference option.

In completing the tables, please assume the following:

- **All figures should be stated in 2012 dollars, without escalation in labour, materials or other costs.**
- **The development phase ends with the filing of a leave to construct application with the Board.**
- **Taxes and duties should be excluded.**

Response

Development Costs

Development Activity	**Estimated Cost**	**Reference in filed application**
Engineering, design, and procurement activity	$4.68m	Part B, Exh 8, App.8A
Materials and equipment	Zero	N/A
Permitting and licensing (excluding environmental and regulatory approvals)	$0.56m	Part B, Exh 8, App.8A
Environmental and regulatory approvals	$5.15m	Part B, Exh 8, App.8A
Land rights (acquisition or options), including consultation and negotiation with landowners	$3.31m	Part B, Exh 8, App.8A
First Nation and Métis participation (direct and indirect costs, including impact mitigation if applicable)	Zero	Included as cost in relevant activity
First Nation and Métis consultation	$1.71m	Part B, Exh 8, App.8A
Other consultation (community, stakeholder)	$2.43m	Part B, Exh 8, App.8A
IDC or AFUDC (if included in estimates)	$1.6m	Part B, Exh 8, §8.2.1 p5, l11
Contingency	Zero	See note below
Other (explain in detail) Project Management including health, safety and environment; cost control, project administration	$4.28m	Part B, Exh 8, App.8A
Total	$23.72m	

Notes:

- The detailed breakdown of the costs tabled above is provided in detail in Part B, Exhibit 8, section 8.2.1 and Appendix 8A.
- Stakeholder costs relating to meetings with agency staff with respect to the environmental assessment e.g. Environmental Assessments Approval Branch, Department of Fisheries and Oceans etc. are included under the category 'Environmental and Regulatory Approvals'
- Stakeholder costs relating to meetings with agency staff from the IESO, the OPA, etc. are included under 'Engineering, Design and Procurement Activities' and 'EWT Project Management'
- All EWT LP internal costs including GLPT staff costs are included in 'Other – Project Management'
- The treatment of contingency is described in response to Interrogatory #28 for All Applicants.

<u>Construction Costs - Reference Design Option using double circuit steel lattice towers and 1192 Grackle conductor on the assumed reference route</u>

Construction Activity	**Estimated Cost**	**Reference in filed application**
Engineering, design, and procurement activity	$5m	Part B, Exhibit 8, Table 8.2, page 22
Materials and equipment	$53m	Part B, Exhibit 6, Appendix 6A, Figure 1
Permitting and licensing	$1m	Note 2
Environmental and regulatory approvals	$6m	Part B, Exhibit 8, Table 8.2, page 22
Land rights (acquisition or options), including consultation and negotiation with landowners	$4m	Note 3
First Nation and Métis participation (direct and indirect costs, including impact mitigation if applicable)	$0m	
First Nation and Métis consultation	$1m	Note 2
Other consultation (community, stakeholder)	$1m	Note 2
Site clearing and preparation	$7m	Part B, Exhibit 6, Appendix 6A, Figure 1
Construction	$282m	Part B, Exhibit 6, Appendix 6A, Figure 1
Site remediation	N/A	Note 1
IDC or AFUDC (if included in estimates)	$28m	Part B, Exhibit 8, Table 8.2, page 22
Contingency	$56m	Note 2
Other (explain in detail) - EWT Project Management including financing and legal	$4m	Part B, Exhibit 8, Table 8.2, page 22
Other - Construction Management	$42m	Part B, Exhibit 8, Table 8.2, page 22
Total	$490m	

Notes:

1. Site remediation is included in Construction
2. Contingency is apportioned in the table above as follows: Permitting and Licensing ($1m); Land Rights Acquisition ($4m); First Nation& Métis Consultation ($1m); Other Consultation ($1m); Other Contingency ($56m)
3. Land costs were estimated as follows. Note they should be similar for all transmitters because the cost of easements and land purchases, whether for private or Crown land, are all market based,.
   - In October 2012, Altus Group Inc. ("Altus") reviewed the land use along the reference route for EWT LP and identified 156 separate land parcels.
   - Altus identified the FARES land use code for each land parcel e.g. #100 for residential land, to generate a land use profile
   - Altus also reviewed recent land transactions in each of the municipalities between Thunder Bay and Nipigon to determine the typical transaction price for private land
   - Based on the recent transactions, EWT LP assigned typical land prices for unimproved and improved lands ($250 and $1,000 per acre respectively)
   - Easements across private land were assumed at 75% of the market value with a further 5% for injurious affection. A review of aerial photography suggested that four properties may require buyout.
   - Land use rights across Crown land and Indian Reserves were appraised in accordance with the appropriate formula.
   - As a result, EWT LP provisionally estimates the cost of land rights to be a single lump-sum payment of $850,000 plus an annual fee of approximately $50,000. These costs exclude transaction costs.
   - Transaction costs (land agents, title searches and registrations, valuation, third party appraisal, negotiations with owners, EWT and landowner legal fees, surveys, drawings, administration, etc.) after the application for leave to construct is submitted are estimated at $3.2 million.
4. All values subject to rounding

<u>Construction Costs – ALT-B Single circuit cross-rope suspension ("CRS") towers and twin 795 Drake conductor on the assumed reference route</u>

Construction Activity	**Estimated Cost**	**Reference in filed application**
Engineering, design, and procurement activity	$5m	Part B, Exhibit 8, Table 8.2, page 22
Materials and equipment	$34m	Part B, Exhibit 6, Appendix 6A, Figure 2
Permitting and licensing	$1m	Note 2
Environmental and regulatory approvals	$7m	Part B, Exhibit 8, Table 8.2, page 22
Land rights (acquisition or options), including consultation and negotiation with landowners	$4m	Note 2

Construction Activity	**Estimated Cost**	**Reference in filed application**
First Nation and Métis participation (direct and indirect costs, including impact mitigation if applicable)	$0m	
First Nation and Métis consultation	$1m	Note 2
Other consultation (community, stakeholder)	$1m	Note 2
Site clearing and preparation	$10m	Part B, Exhibit 6, Appendix 6A, Figure 2
Construction	$184m	Part B, Exhibit 6, Appendix 6A, Figure 2
Site remediation	N/A	Note 1
IDC or AFUDC (if included in estimates)	$18m	Part B, Exhibit 8, Table 8.2, page 22
Contingency	$40m	Note 2
Other (explain in detail) - EWT Project Management including financing and legal	$4m	Part B, Exhibit 8, Table 8.2, page 22
Other - Construction Management	$42m	Part B, Exhibit 8, Table 8.2, page 22
Total	$350m	

Notes:

1. Site remediation is included in 'Construction'
2. Contingency has been apportioned in the table above as follows: Permitting and Licensing ($1m); Land Rights Acquisition ($4m); First Nation& Métis Consultation ($1m); Other Consultation ($1m); Other Contingency ($40m)
3. All values subject to rounding

<u>O&M Costs</u>

Operations and Maintenance Activity	**Estimated Cost (per annum)**	**Reference in filed application**
Major activities (please list, but cost estimate may be bundled) - Operations - Maintenance	$4.06m	Part B, Exhibit 8, section 8.12
Administration and general costs related to O&M	$1.63m	Part B, Exhibit 8, section 8.12
Regulatory costs	$0.25m	Part B, Exhibit 8, section 8.12
Contingency	$1.19m	Part B, Exhibit 8, section 8.12
Total	$7.12m	

See Part B, Exhibit 8, section 8.12 for a detailed estimate.

Interrogatory 27

Requests

(a) Please confirm that while costs may be reaggregated into the specified categories, the amounts in the tables are consistent with the overall estimates filed in your application.

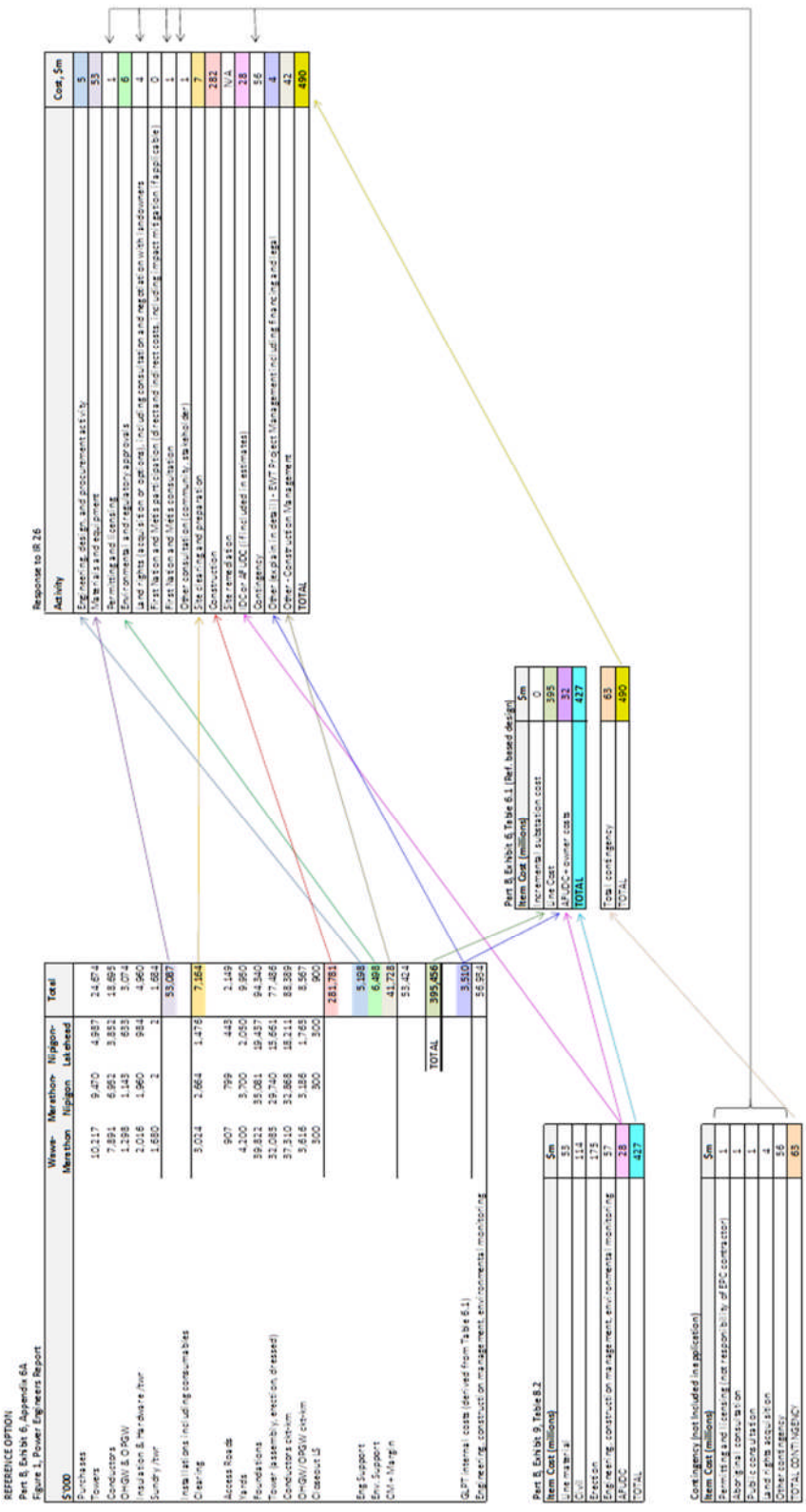
(b) Please reconcile each of the development, construction and operation phase totals produced in the tables with the total costs for each of these phases put forward in your application. The reconciliation should describe and quantify each reconciling element.

Response

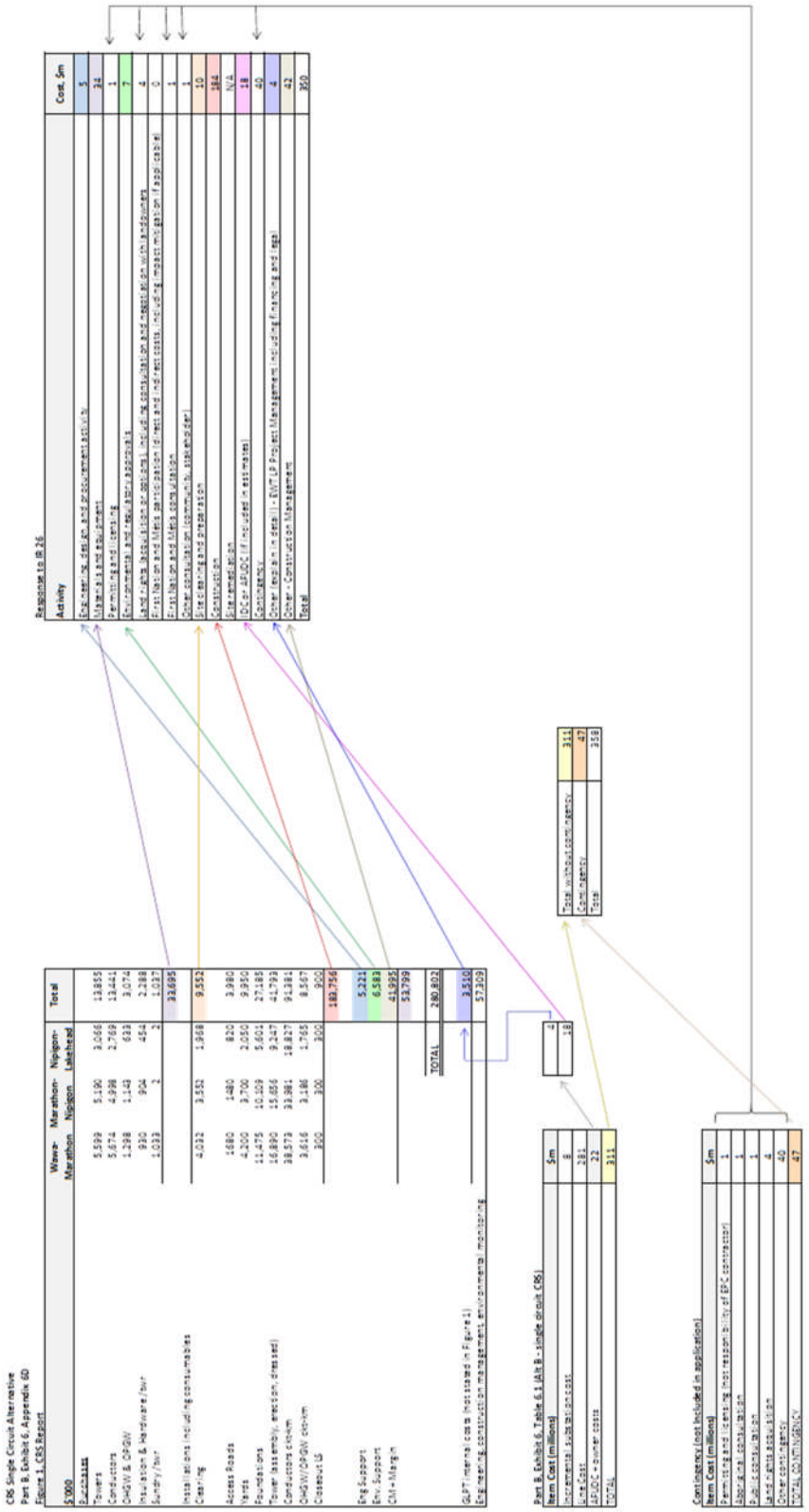
(a) The development costs identified in response to Interrogatory #26 for All Applicants above are consistent with the overall estimates filed in EWT LP's application.

The construction costs identified in response to Interrogatory #26 for All Applicants above are consistent with the overall estimates filed in EWT LP's application with one exception. EWT LP has included an amount for contingency (which includes minor permitting, consultation and land rights acquisition) in its response to Interrogatory #26 for All Applicants.

(b) The reconciliations for each of the development, construction and operation phase totals are shown diagrammatically below.


REFERENCE OPTION
Part B, Exhibit 6, Appendix 6A
Figure 1, Power Engineers Report
$'000
Purchases
Towers
Conductors
OHGW & OPGW
Insulators & hardware /set
Sundry /set
Installations including consumables
Clearing
Access Roads
Pads
Foundations
Tower assembly, erection, dressed
Conductors stringing
OHGW/OPGW stringing
Obstacles
Eng Support
Env. Support
OH + Margin
TOTAL
QUP internal costs (derived from Table 6.1)
Engineering, construction management, environmental monitoring
Waver-Marathon
Marathon-Nipigon
Nipigon-Lakehead
Total
Response to IR 26
Activity
Cost, $m
Engineering, design and procurement activity
Stakeholder engagement
Permitting and Licensing
Environmental and regulatory approvals
Land rights acquisition or options, including consultation and negotiation with landowners
First Nation and Metis participation (directand indirect costs, including impact mitigation if applicable)
First Nation and Metis consultation
Other consultation (community, stakeholder)
Site clearing and preparation
Construction
Site remediation
ICD or AFUDC (if included in estimates)
Contingency
Other (explain in detail) - EWP Project Management including financing and legal
Other - Construction Management
TOTAL
Part B, Exhibit 9, Table 9.2
Item Cost (million)
$m
Line material
Civil
Erection
Engineering, construction management, environmental monitoring
AFUDC
TOTAL
Part B, Exhibit 6, Table 6.1 (Part based design)
Item Cost (million)
$m
Incremental substation cost
Line Cost
AFUDC - owner costs
TOTAL
Total contingency
TOTAL
Contingency (not included in application)
Item Cost (million)
$m
Permitting and licensing (not responsibility of EPC contractor)
Aboriginal consultation
Public consultation
Land rights acquisition
Other contingency
TOTAL CONTINGENCY

1



1

Part B, Exh B, App.8A
Development Budget

Response to IR 26

ACTIVITY	TOTAL million
Licensing and Permitting	
Environmental Assessment	
EA program management and agency consultation	$ 0.97
EA Terms of Reference	$ 0.95
EA Field Studies	$ 1.36
Environmental Assessment	$ 1.88
Sub-total (environmental assessment)	$ 5.15
Leave to Construct	
Application	$ 0.56
Hearing	$ -
Sub-total (leave to construct)	$ 0.56
Total (licensing and permitting)	$ 5.71
Engineering	
Program management, QA/QC	$ 0.77
Engineering and design	$ 2.57
Interconnection	$ 0.38
System studies	$ 0.82
Total (engineering)	$ 4.54
Routing	
Land use studies & land owner engagement	$ 0.55
Route selection	$ 0.72
PPM	$ 1.04
Total (routing)	$ 2.32
Consultation	
Public engagement	$ 2.43
First Nation and Metis consultation	$ 1.71
Total (consultation)	$ 4.14
Land Acquisition	
Land appraisal	$ 0.12
Title searches	$ 0.40
Land acquisition	$ 0.48
Total (land acquisition)	$ 0.99
Procurement	
Construction RFQ/RFP process	$ 0.14
Total (procurement)	$ 0.14
Project Management	
GLPT management team	$ 3.68
Health and safety	$ 0.16
Program administration and cost control	$ 0.44
Total (procurement)	$ 4.28
TOTAL	$ 22.12

Development Activity	Estimated Cost
Engineering, design, and procurement activity	$4.68m
Materials and equipment	Zero
Permitting and licensing [NTD other than environmental and regulatory approvals]	$0.56m
Environmental and regulatory approvals	$5.15m
Land rights (acquisition or options), including consultation and negotiation with landowners	$3.31m
First Nation and Métis participation (direct and indirect costs, including impact mitigation if applicable)	Zero
First Nation and Métis consultation	$1.71m
Other consultation (community, stakeholder)	$2.43m
IDC or AFUDC (if included in estimates)	$1.60m
Contingency	Zero
Other (explain in detail) Project Management including health, safety and environment; cost control, project administration	$4.28m
Total	$23.72m

Note - the cost of AFUDC was provided in Part B, Exh B, §B2.1 p5, lines 11

1

EWT LP
Estimated Operations & Maintenance Costs
Part B, Exhibit B, section B.12

OM&A Budget for EWT LP	OEB standard account code	Estimated Annual Expense
Transmission Expenses - Operation		
Operation Supervision & Engineering	4805	$ 345.000
System Supervision & Control (Load Dispatching)	4810	750.000
Buildings & Fixtures Expenses	4815	50.000
Overhead Line Expenses	4830	600.000
Rents	4850	60.000
Transmission Expenses - Maintenance		
Maintenance of Overhead Conductors & Devices	4935	300.000
Maintenance of Overhead Lines - ROW	4940	1,800.000
Maintenance of Overhead Lines - Roads & Trails	4945	150.000
Administrative and General Expenses		
Management Salaries & Expenses	5605	405.000
General Administrative Salaries & Expenses	5615	728.000
Office Supplies & Expenses	5620	113.300
Outside Services Employed	5630	300.000
Insurance	5635	50.000
Regulatory Expenses	5655	250.000
Electrical Safety Authority Fees	5680	30.000
Total Operations		1,805.000
Total Maintenance		2,250.000
Total Administrative & General		1,876.300
Total OM&A		$5,931.300
Add: Contingency of 20%		1,186.260
Total Estimated OM&A		$7,117.560

Response to IR 26

Operations and Maintenance Activity	Estimated Cost
Major activities (please list, but cost estimate may be bundled) Operations Maintenance	$4.06m
Administration and general costs related to O&M	$1.63m
Regulatory costs	$0.25m
Contingency	$1.19m
Total	$7.12m

Interrogatory 28

Request

For each phase, please describe how the contingency amounts were determined.

Response

Contingency - Development Budget

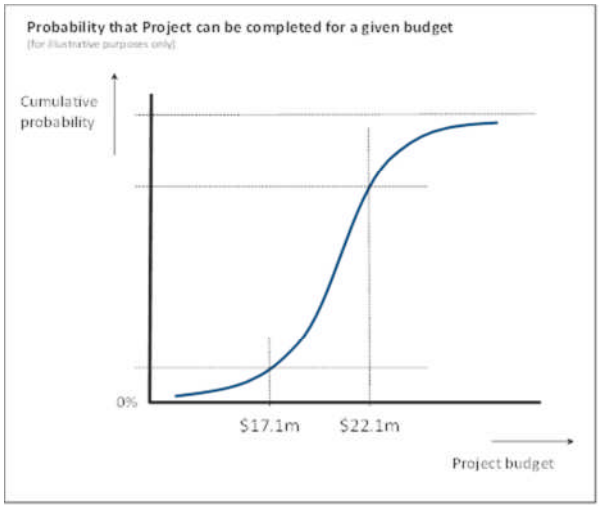
AACE International defines contingency as *"An amount added to an estimate to allow for items, conditions, or events for which the state, occurrence, or effect is uncertain and that experience shows will likely result, in aggregate, in additional costs."*[10] It includes major scope changes, extraordinary events, amounts outside the defined scope of the Project, escalation and currency effects.

As described in Part B, Exhibit 8, section 8.2.2, EWT LP has identified a reasonable range of development outcomes and the associated costs, i.e. $18.9m - $22.1m, net of AFUDC.

Rather than identify the minimum Project development cost ($18.9m) and characterize the incremental Project scope and associated expenditure ($3.2m) as contingency, EWT LP has instead identified the higher Project development cost ($22.1m) in its application. EWT LP believes that this is consistent with the nature of the designation process, i.e. a regulatory hearing rather than a commercial procurement. EWT LP has also calculated the accuracy of the total budget estimate (±$1.8m) through a detailed line-by-line risk assessment of the development budget. This number reflects the uncertainty in EWT LP's budget estimate.

The presentation of EWT LP's development budget is best illustrated in Figure 8.2, reproduced below (noting that $17.1m = $18.9m less $1.8m).

[10] AACE International (formerly American Association of Cost Engineers), "Cost Engineering Terminology", Recommended Practice 10S-90, rev. 2012.



Contingency - Construction Budget

In the absence of a completed environmental assessment and the type of consultation necessary for a project of this nature, it is not possible to finalize the design, location or construction methodology for the new line.

EWT LP considers its construction cost estimate to be at the low end of 'class 4' as defined by AACE,[11] or a 'Class D' indicative estimate on the scale used by PWGSC.[12]

Based on the limited pre-development work EWT LP has already completed, its recent experience constructing transmission lines in Ontario, the advice of its owner's engineer, Power Engineers Inc., and the input from two major North American construction companies, EWT LP has assumed construction contingency of $63 million (which includes $1 million permitting and licensing, $4 million for land rights acquisition, $1 million for Aboriginal consultation, $1 million for consultation and $56 million for other contingencies).

[11] AACE International, Recommended Practice No. 17R-97 COST ESTIMATE CLASSIFICATION SYSTEM TCM Framework: 7.3 – Cost Estimating and Budgeting, 2003.

[12] Public Works and Government Services Canada – see http://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/bi-rp/conn-know/couts-cost/definition-eng.html.

Contingency – Operations Budget

Given that the final design and route of the line has not been determined and that the operations phase will not commence for at least five years, EWT LP has assumed a nominal 20% contingency in its operations budget estimate.

Interrogatory 29

Request

With respect to operation, maintenance and administration costs, please indicate whether the applicant's stated OM&A costs are estimated on a standalone basis (i.e. the full OM&A costs of the line) or on a net basis (i.e. excluding costs incurred by affiliates or other regulated utilities providing services to the applicant). If on a net basis, please provide in detail the applicant's estimated OM&A costs on a standalone basis.

Response

The OM&A budget included in EWT LP's designation application (Part B, Exhibit 8, section 8.12) was prepared on a standalone basis and assumes that EWT LP does not contract for any services from either HONI or GLPT.

EWT LP has provided below a comparison of its OM&A budget assuming certain services are contracted to HONI and GLPT and the budget filed in its application.

Both budgets include all the OM&A costs for which EWT LP would seek recovery.

Item	Standalone – no contracting of services from GLPT or HONI	Standalone – services contracted from GLPT and HONI	Explanation for cost reduction
Operations	$1.80m	$0.51m	New control room eliminated. Economies of scale through sharing existing staff and resources. Reduced staff numbers.
Maintenance	$2.25m	$1.8m	Economies of scale, particularly in RoW maintenance planning
Regulatory Expenses	$0.25m	$0.25m	No change
Administrative & General	$1.62m	$1.23m	Shared back office allows for reduced staff numbers
Contingency	$1.19m	$0.38m	Fixed price contracting with GLPT/HONI reduces price uncertainty – contingency reduced from 20% to 10%
Total	**$7.12m**	**$4.17m**	

Interrogatory 30

Questions

With respect to the provision of services by HONI:

(a) What specific services were assumed in the application?

(b) What were the assumed associated costs?

(c) In the absence of any input from HONI, on what basis were these assumptions made?

(d) What is the impact on the application if the assumed services are not provided by HONI as envisioned by the applicant?

Response

The specific HONI services assumed by EWT LP in its application include

(i) Operating services;

(ii) Potential to provide OM&A services; and

(iii) Advice and assistance to EWT LP's partner, Hydro One Inc.

Each is discussed in turn below.

(i) As stated in Part A, Exhibit 4, section 4.1.3.7, Post designation, EWT LP plans to enter into an agreement with HONI for the provision of operating services. These services would be provided by HONI to EWT LP on a fully allocated cost basis and relate only to the use of HONI's Ontario Grid Control Centre.

Consistent with the Board's Phase 1 decision, EWT LP was unable to discuss with HONI its costs for providing EWT LP with operating services. EWT LP has therefore prepared an estimate of $750,000 annually on a fully costed basis as given in Part B, Exhibit 8, section 8.12, System Supervision & Control (Load Dispatching).

This is an internal estimate and a conservative one. On a net basis, EWT LP estimates it may be possible to provide this service for as little as $210,000 annually. EWT LP also notes that because the protection, control and SCADA equipment will be in a HONI-controlled switchyard, HONI is likely to provide these services regardless of which transmitter is designated. The cost of System Supervision & Control should therefore be the same for all transmitters.

(ii) EWT LP has prepared its OM&A budget provided in Exhibit 8, section 8.1.2, on a fully-costed standalone basis assuming that no maintenance services were provided by HONI.

As stated in Part A, Exhibit 4, section 4.1.3.7, EWT LP will consider outsourcing maintenance services to suitably qualified and experienced suppliers in order to reduce transmission costs for ratepayers. EWT LP believes there are likely to be economies of scale in contracting some services to HONI, as HONI already owns and operates transmission facilities in the Project area. EWT LP believes that this would enable it to significantly reduce its OM&A costs compared to operating as a fully independent standalone utility as has currently been assumed. (Please also see Interrogatory #29 for All Applicants.)

Consistent with the Board's Phase 1 decision, EWT LP has not discussed with HONI the cost of it providing these services.

(iii) As described throughout EWT LP's application, Hydro One Inc. through its subsidiary HONI has extensive experience developing, constructing and operating electricity transmission facilities in Ontario including the recently completed Bruce to Milton Transmission Reinforcement Project. This was the most significant recent transmission project to have been completed in Ontario and required an individual environmental assessment, the acquisition of land rights and the Board's leave to construct.

Post-designation, EWT LP, through Hydro One Inc., will draw as necessary on this direct knowledge and experience. EWT LP notes that HONI has applied to the Board for the approval of a revenue deferral account for this purpose.[13]

Consistent with the Board's Phase 1 decision, EWT LP has not been able to discuss with HONI when or how it will draw on this direct knowledge and experience. HONI's direct knowledge and experience post-designation will further strengthen EWT LP's capabilities.

To the extent that EWT LP draws on HONI's direct knowledge and experience, EWT LP expects it will be required to recompense HONI's fully-allocated costs for services provided by HONI in connection with the Project.

[13] EB-2012-0031, Exhibit A, Tab 2, Schedule 1, paragraph 8.

Interrogatory 31

Questions

With respect to the use, modification or expansion of HONI's stations:

(a) What specific uses, modifications or expansions were assumed in the application?

(b) What were the assumed associated costs?

(c) In the absence of any input from HONI, on what basis were these assumptions made?

(d) What is the impact on the application if the assumed uses, modifications or expansions do not proceed as envisioned by the applicant?

Response

(a)

Reference-Based Design (double circuit lattice towers)

Wawa Substation	**Marathon Substation**	**Lakehead Substation**
Add one rung of breaker and a half	Add two rungs of breaker and a half	Add one rung of breaker and a half
Expand yard	Expand yard	Expand yard
Add One Line Relay Panel	Add Two Line Relay Panels	Add One Line Relay Panel
No Expansion of Relay House	No Expansion of Relay House	No Expansion of Relay House
Line Relaying communications is Fiber Optic – no carrier equipment required	Line Relaying communications is Fiber Optic – no carrier equipment required	Line Relaying communications is Fiber Optic – no carrier equipment required

REF B (double circuit lattice towers with revised galloping criteria etc.)

Wawa Substation	**Marathon Substation**	**Lakehead Substation**
Add one rung of breaker and a half	Add two rungs of breaker and a half	Add one rung of breaker and a half

Expand yard	Expand yard	Expand yard
Add One Line Relay Panel	Add Two Line Relay Panels	Add One Line Relay Panel
No Expansion of Relay House	No Expansion of Relay House	No Expansion of Relay House
Line Relaying communications is Fiber Optic – no carrier equipment required	Line Relaying communications is Fiber Optic – no carrier equipment required	Line Relaying communications is Fiber Optic – no carrier equipment required

1

2 ALT A (single circuit lattice towers)

Wawa Substation	**Marathon Substation**	**Lakehead Substation**
Refurbish one rung of breaker and a half for higher ampacity	Refurbish one rung of breaker and a half for higher ampacity	Refurbish one rung of breaker and a half for higher ampacity
Replace existing rung structures	Replace existing rung structures	Replace existing rung structures
Replace One Line Relay Panel	Replace Two Line Relay Panels	Replace One Line Relay Panel
No Expansion of Relay House	No Expansion of Relay House	No Expansion of Relay House
Line Relaying communications is Fiber Optic – no carrier equipment required	Line Relaying communications is Fiber Optic – no carrier equipment required	Line Relaying communications is Fiber Optic – no carrier equipment required

3

4 ALT B (single circuit with CRS towers)

Wawa Substation	**Marathon Substation**	**Lakehead Substation**
Refurbish one rung of breaker and a half for higher ampacity	Refurbish one rung of breaker and a half for higher ampacity	Refurbish one rung of breaker and a half for higher ampacity
Reuse existing station structures	Reuse existing station structures	Reuse existing station structures

Replace One Line Relay Panel	Replace Two Line Relay Panels	Replace One Line Relay Panel
No Expansion of Relay House	No Expansion of Relay House	No Expansion of Relay House
Line Relaying communications is Fiber Optic – no carrier equipment required	Line Relaying communications is Fiber Optic – no carrier equipment required	Line Relaying communications is Fiber Optic – no carrier equipment required

(b) The incremental costs of the incremental substation work for options ALT A and ALT B, as shown in Part B, Exhibit 6, table 6.1, and including incremental reactive compensation, were estimated at $8 million. Because of the tighter conductor spacing, the series capacitor costs for the CRS single circuit option would be marginally lower (around 10% to 20%); but, this has been ignored given the overall accuracy of the construction cost estimates.

(c) The cost estimate was based on information provided by Power Engineers taken from its internal substation estimating system. This system utilizes continuously updated equipment costs (from vendors and project execution) from voltages ranging from 34.5kV up to 500 kV.

(d) The cost of any substation changes resulting from these alternatives is small compared to the overall Project cost.

Interrogatory 32

Request

Please complete the following tables, detailing all transmission projects greater than 100 km in length, undertaken by the applicant, its partners, shareholders, affiliates, or any other entities which the applicant is relying on for the purposes of its application, in the past 10 years in all jurisdictions. Please provide the reasons for the budget and schedule variances for each project.

(a) Budget Variance Table

Name of project	Details of project	Budgeted cost	Stage of process at which budget created	Actual cost	Variance	Reason for variance

(b) Schedule Variance Table

Name of project	Details of project	Estimated development and construction time	Stage of process at which time estimate made	Actual development and construction time	Variance	Reason for variance

Response

(a) Budget Variance Table
(This information was provided in Part B, Exhibit 7, section 7.4)

Name of project	Details of project	Location	Budgeted cost	Stage of process at which budget created	Actual cost	Variance	Reason for variance
TRP	164km 230kV overhead line	Northern Ontario	$80.89m	Leave to construct[14]	$83.709[15]	$2.82 m (3.5%)	Additional structures required replacement on P21G ($2.54m) as a subsidiary part of the main project
B2M	180km double cct 500kV overhead line	Ontario	$635m	Leave to construct[16]	$734m[17]	$99m (15%)	Permitting delayed; commodity costs increased; program accelerated to meet OPA's early in-service date.
WETT / CREZ	606 km 345kV overhead line + 5 substations	Texas	$625m	Designation	$757m[18]	N/A	Change of scope – see discussion below

WETT/CREZ

In January 2009, the Public Utility Commission of Texas (PUCT) awarded WETT, a 50:50 partnership between Brookfield and Spanish engineering firm Isolux Corsán Concesiones SA, the right to develop, construct, own and operate approximately 376 miles of 345 kV electricity transmission lines and five associated substations needed to deliver energy from wind farms in northwest Texas to load centers in the southeast. WETT was the only non-US consortium to be awarded a contract under the Competitive Renewable Energy Zone (CREZ[19]) competitive transmission procurement process run by the PUCT. The WETT facilities are currently scheduled to be in service in 2013 and are expected to total over $800 million US in greenfield construction. WETT has successfully obtained all necessary siting and permitting applications from the PUCT (in particular, all Certificates of Convenience and Necessity - 'CCN') and at this time all right of ways have been cleared, tower erection and stringing is underway and the commissioning of its first line segment and substation will be complete the first week of April.

[14] EB-2003-0162.

[15] EB-2009-0408, Exhibit 2, Tab 1, Schedule 1, Table 2-1-1 B.

[16] EB-2007-0050.

[17] EB-2012-0031, D1-3-3, App A, Table 2.

[18] Docket 40606, WETT's rate case filing in August 2012. Project costs are anticipated to be higher than this estimate.

[19] In January 2009, PUCT designated transmitters to undertake the CREZ program comprising 109 separate projects and 2,963 miles of transmission at an estimated cost of $4.97 billion. It has since grown to 186 projects totaling 3,593 miles (5,800 km) at an estimated cost of $6.87 billion. The program is to be completed by December 2013 with all transmitters having their new facilities in service by this date.

WETT anticipates the completion of the entire project in July 2013, well before the December 2013 requirement for CREZ facilities.

In August 2012, WETT applied to the Commission for authority to establish initial rates and tariffs[20]. The application included the approval of $183 million of capital costs incurred as of June 30, 2012 (subsequently updated to $283 million through October 31, 2012[21]). The application was approved in January 2013 with the costs having been found prudent with no disallowance. In its application, WETT informed the Commission that its forecast project costs had increased to $757 million as a result of an additional substation and increased use of monopoles (at a greater expense) as ordered by the Commission.

(b) Schedule Variance Table

(This information was provided in Part B, Exhibit 7, section 7.4)

Name of project	Details of project	Location	Estimated development and construction time	Stage of process at which schedule created	Actual development and construction time	Variance	Reason for variance
TRP	164km 230kV overhead line	Northern Ontario	26 months[22]	Leave to construct	25 months[23]	1 month (early)	Within accuracy of original plan
B2M	180km double circuit 500kV overhead line	Ontario	4 years & 6 months[24]	Leave to construct	5 years & 2 months	8 months	Protracted permitting process; Niagara Escarpment Commission decision appealed; route changes; land rights expropriation
WETT	606 km 345kV overhead line + 5 substations	Texas	30 months[25]	Certificate of convenience and necessity	33 months	3 months	See notes below

WETT's projects form part of the overall CREZ program which is due to be completed December 2013. WETT originally anticipated the project completion in April 2013; however , as noted above, this timeline has been rescheduled with the Commission to July 2013 to better

[20] Docket 40606.

[21] Agreement for the Procedural Processing of the Application approved on October 12, 2012.

[22] From filing application for leave to construct in September 2003 to completion November 2005.

[23] As per TRP Monitoring Report (Final) sent to the Board.

[24] Application for leave to construct filed March 2007; planned in-service date September 30 2011; actual in-service date May 14, 2012.

[25] Applications for certificate of convenience and necessity made June 2010, August 2010 and November 2010; planned in-service December 2012, February 2013, April 2013; actual in-service dates are currently scheduled for March 2013, April 2013 and May 2013 (see Commission Quarterly Report for Q1 2013).

align with the in-service dates of neighbouring projects and to support the objective of completing CREZ projects prior to the end of 2013.

II. QUESTIONS FOR EWT LP

Interrogatory 1

Request

Regarding Bamkushwada LP, please outline the governance structure.

Response

Bamkushwada LP ("BLP") is composed of one general partner, being Bamkushwada General Partner Inc., and six limited partners, each having an equal partnership interest, being Fort William First Nation, Michipicoten First Nation, Pays Plat First Nation, Pic Mobert First Nation, Pic River First Nation, and Red Rock Indian Band (the "Participating First Nations").

Bamkushwada General Partner Inc. holds the authority to administer, manage, control, and operate the day-to-day business of BLP, and is governed by a board of directors comprised of six individuals (the "Board"). The Participating First Nations are the sole shareholders of Bamkushwada General Partner Inc., and each shareholder Participating First Nation, through its chief and council, is permitted to nominate one individual to be elected by the shareholders and to serve as a director on the Board.

Interrogatory 2

Questions

EWT LP has secured a 1/3rd equity partnership with Bamkushwada LP ("BLP"). BLP consists of six directly affected First Nations communities. Are the participating First Nations in BLP bound by an exclusivity clause that restricts the ability of other applicants from developing similar participation relationships, either before or after designation? In the event that EWT LP is not designated by the Board, can you advise whether or not the entity that is designated will be able to consult with the participating First Nations in BLP immediately after the Board issues its designation decision?

Response

The partners of EWT LP have mutually agreed to deal with each other on an exclusive basis with respect to the Project before and after the date of designation. The Participating First Nations did so voluntarily, and with the advice of independent legal counsel. Because each of the partners of EWT LP play a role in the partnership's governance and its designation plan, the exclusivity period before the Board's designation decision provided stability to the partnership's structure. From BLP's perspective, it enables BLP to manage Aboriginal involvement and (being a First Nations-owned entity) to speak as one voice in respect of First Nations interests. The extension of the exclusivity period after designation is only for a brief time and is to allow for sufficient time to wind up or otherwise address issues arising from the commercial relationship between the partners post-designation. Exclusivity only relates to economic participation in EWT LP and the Project.

However, the Participating First Nations are not contractually prohibited in any way from participating in consultation and accommodation with the Crown in respect of the Project; providing information about their communities, history , people and asserted and actual rights; or, participating in any consultation or negotiating any form of accommodation with a designated transmitter who is not EWT LP. Accordingly, if EWT LP is not designated by the Board, the entity that is designated will be able to consult with the Participating First Nations in BLP immediately after the Board issues its designation decision.

Interrogatory 3

Question

At what stage in the development process will EWT determine whether a single circuit line using CRS structures is the preferred alternative?

Response

EWT LP expects to have completed the studies to determine if a single circuit line should be studied further as early as November 2013, assuming that designation happens on or about August 1st 2013. EWT LP plans to have completed the environmental studies and public engagement necessary to confirm the preferred tower design, which could be a CRS design given its technical suitability and low cost, by February 2015. These activities in the context of EWT LP's overall development plan are shown in Part B, Exhibit 7, Appendices 7A and 7B.

Interrogatory 4

Questions

Does EWT LP consider its CRS option to be identical to any of the single circuit options considered by the IESO in its August 18, 2011 Feasibility Report? If so, which one?

Response

As discussed on page 16 of its report *East West Tie – Assessment of the Use of CRS Structures on HV/EHV Transmission Lines* (Part B, Exhibit 6, Appendix 6D), EWT LP considers its single circuit CRS option using twin "Drake" 795 kcmil conductors to be equivalent to the single circuit line considered by the IESO in its August 18, 2011 Feasibility Study, which study also used twin "Drake" conductors.

EWT LP's owner's engineers, Power Engineers Inc., concluded in its report that:

> "*From an electrical performance perspective the CRS tower design will perform as well or better than a conventional lattice tower design. Consequently the single circuit analyses in the IESO study will be applicable, although likely to somewhat understate the electrical performance of a CRS tower design.*"

Both the single circuit option studied by the IESO and the CRS option proposed by EWT LP use the same conductor. The principle difference between the two alternatives is the choice of supporting structure i.e. conventional trussed steel lattice towers versus guyed cross-rope suspension structures. As discussed in EWT LP's designation application (Appendix 6D), the CRS towers will not have a material effect on the electrical performance of the new line. Therefore, the IESO's feasibility study can be relied upon for the purpose of assessing the performance of the CRS option. This view is validated by the IESO's private response to a query from AOLP:

> *"…we [IESO] have reviewed your [Altalink's] request below and we agree with your interpretation that the use of alternative structures does not trigger the need for an IESO feasibility study….. provided the…. structures can satisfy the other technical requirements and design criteria…"*[26]

[26] Email from Mike Falvo, Manager – Market Facilitation, Independent Electricity System Operator, to Steve Hodgkingson, VP Corporate Development & Business Partnerships, Altalink dated November 5th, 2012. See Appendix 6A of Altalink Ontario LP's designation application.

Interrogatory 5

Questions

The IESO in its Feasibility Study IESO_REP_0748 compares the relative merits of a new high-capacity single-circuit line versus a new double-circuit line with respect to a one-plus-one contingency. The Study describes control actions (e.g. generation dispatch, load rejection, increased transfers), which would be necessary in the event of a second single-element contingency after experiencing an initial single-element contingency or outage if the new line is a single circuit line.

(a) Can EWT LP provide any evidence that the IESO, the OPA or EWT LP determined the availability of the control actions noted in IESO_REP_0748?

(b) Can EWT LP provide any evidence that the IESO, the OPA or EWT LP determined the annual cost of the control actions noted in IESO_REP_0748 (up to 300 MW additional generation or import, or some lesser amount of generation/import for armed load rejection up to 150 MW)? If yes, and assuming that the economic analysis is conducted over a 50 year period, what is the total cost?

Response

(a) In its report IESO_REP_0748, the IESO describes on page 31 the control actions that could be required following the loss of a single circuit new East-West Tie including the dispatch of at least 300 MW of generation in Ontario, the arming of up to 150 MW of load rejection, an increase in transfers via interconnections with Manitoba and Minnesota or a combination thereof. The IESO notes that these control actions would comply with the IESO's criteria.

In its June 30, 2011 report "Long Term Electricity Outlook for the Northwest and Context for the East-West Tie Expansion", the OPA noted that there was approximately 1,410 MW of installed generation capacity in the northwest area in 2010. This is expected to increase to 1,560 MW as a result of the changes to the generation mix documented in the report. The generation will be a mix of predominantly hydro, biomass and other renewables. The OPA also notes that the Manitoba Interconnection has a capacity of 330 MW (to ON) / 262 MW (to MB), and the Minnesota Interconnection a capacity of 90 MW (to ON) / 140 MW (to MN). The OPA expects 90 MW of demand response to also be available in the northwest, an increase of 40 MW over 2010 (50 MW).

The determination of the availability of control actions is complex and would require access to certain IESO-confidential data that is not publicly available. The availability of particular control actions will further vary in real-time: ensuring the availability of sufficient resources in real-time is an integral part of the IESO's day-to-day operation of Ontario's integrated electricity system.

The mix of resources indicated by the OPA in its report does however provide some assurance that the appropriate control actions could, in principle, be available, and this is further reinforced by the absence in the IESO's report of any suggestion that these control actions would not be available or may be limited

(b) The calculation of the cost of control actions requires access to certain IESO-confidential information, including generator bidding data, which is not publicly available. As described in Part B, Exhibit 6, section 6.4.2.3, EWT LP plans to work with the IESO to evaluate the cost of control actions to determine whether the incremental costs of control actions in the event of a contingency event on a single circuit new East-West Tie, calculated on a probabilistic basis, is justified by the lower capital and operating costs of a single circuit option compared to those of the equivalent double circuit alternative. This study forms part of EWT LP's planned approach for methodically evaluating alternative designs and routes for the new East-West Tie in consultation with stakeholders, including the IESO and the OPA. These studies will include the incremental cost of increasing reliability on the single circuit line by increasing the structural and insulation strength to determine if increasing reliability of the single circuit line is desirable.

EWT LP has provided, below, an initial estimate of the annual cost of control actions. This analysis demonstrates that there is value in further investigating a CRS-based single circuit line post-designation.

High level evaluation of economics of CRS line

Performance of existing East-West Tie (from public Hydro One Networks Inc. data*)		
Average number of sustained unplanned outages per circuit per year	1.8	
Average duration of sustained unplanned outage	7.6	hours per outage
Average number of sustained planned outages per circuit per year	1.4	
Average duration of sustained planned outage of existing circuit	44.4	hours per outage
Assumed performance of new East-West Tie (based on performance of existing line)		
Outage outage rate of new circuits compared to old circuits	75%	
Average number of sustained unplanned outages per circuit per year	1.3	
Average duration of sustained unplanned outage	7.6	hours per outage
Average number of sustained planned outages per circuit per year	1.0	
Average duration of sustained planned outage of existing circuit	44.4	hours per outage
Assumed performance of reinforced East-West Tie Path		
Assumed number of sustained unplanned outages of any circuit per year	9.6	
Average duration of sustained unplanned outage	7.6	hours per outage
Assumed number of sustained planned outages of any circuit per year	7.5	
Average duration of sustained planned outage	44.4	hours per outage
Number of hours per year when any circuit is expected to be on sustained outage and control action will be necessary	405	hours per year
Marginal cost of constraining on generation to provide control action	58	$/MWh
Amount of control action required per activation (as per IESO report)	300	MW
Annual cost of providing control actions	7.0	$m
Discount rate	7%	
50-year discounted cost of control actions	104	m$

Conventional single cct v. double circuit		
Cost of conventional single circuit line meeting galloping criteria	399	m$
plus Discounted value of control actions	104	m$
less Cost of double circuit line meeting galloping criteria	(490)	m$
Incremental cost of conventional single circuit line over double circuit line	13	m$
Comment - double circuit line would likely be the preferred option		

CRS single cct v. double circuit		
Cost of single circuit CRS line meeting galloping criteria	358	m$
plus Discounted value of control actions	104	m$
less Cost of double circuit line meeting galloping criteria	(490)	m$
Incremental cost of CRS single circuit line over double circuit line	(28)	m$
Comment - single circuit CRS option should be further studied		

Assumptions

- New line has 25% fewer outages than the existing 40 year old line
- All outages are independent - no simultaneous outages
- Outage durations for old and new line are the same
- Any sustained outage of any circuit requires IESO control action for full duration of outage
- Full 300 MW of control action always required and provided exclusively by generation ; note the OPA identified a maximum transfer requirement across the East-West Tie of approximately 400MW during the initial period of operation following its reinforcement so this assumption favours double cct alternative
- Generation is 10% biomass at $130/MWh, 20% gas at $85/MWh plus 70% hydro at $40 /MWh
- Constrained down generator was bidding zero
- Ignores transient outages because will not be long enough for IESO to take control actions i.e. no incremental cost of control actions
- Ignores incremental losses
- Cost of CRS line = $350m (see IR #26) + HONI s/s costs $8m (see IR #31)

* For years 2002-2011 excluding 2009 (ice storm)

1

Interrogatory 6

Questions

EWT LP references the reconfiguration or retirement of existing circuits between Thunder Bay and Nipigon. In regards to the proposed reconfiguration or retirement:

(a) What impact will the reconfiguration or retirement of these existing circuits have on the IESO controlled grid?

(b) Did EWT LP consult the IESO and/or HONI with respect to the reconfiguration or retirement of these existing circuits? If so, what did the IESO and/or HONI advise EWT LP about the option?

(c) Is the option of reconfiguring or retiring these existing circuits available to any proponent the Board designates?

Response

(a) Although a detailed evaluation of the reconfiguration or retirement of the existing circuits between Thunder Bay and Nipigon requires access to IESO-confidential system data that is not publicly available, EWT LP's owner's engineers, Power Engineers Inc., have qualitatively considered this option and believe it is worthy of further study as part of EWT LP's planned development work. Conceptually as discussed in Part B, Exhibit 9, section 9.4.1.2, the reconfiguration and rationalization of the existing circuits should have no adverse effect on system reliability while facilitating the acquisition of right-of-way for the new line; reducing the overall environmental impact of electricity transmission between Thunder Bay and Nipigon; and potentially reducing the long-term cost of electricity transmission.

(b) Consultation with the IESO and HONI as to the potential reconfiguration or retirement of these existing circuits forms part of EWT LP's planned development work and in particular the planned preliminary studies referred to in task 2.4.4.1 shown in the Gantt chart provided as Part B, Exhibit 7, Appendix 7C. It forms part of EWT LP's planned approach for methodically evaluating alternative designs and routes for the new East-West Tie in consultation with stakeholders including the IESO and HONI.

(c) EWT LP's innovative proposal to consider reconfiguration of the transmission circuits north of Thunder Bay is an example of EWT LP directly employing its local knowledge and experience to identify ways of overcoming challenges in a cost-effective and efficient manner.

EWT LP is not aware of any restrictions on other licensed transmitters that could prevent them identifying and pursuing this and other innovative ideas to reduce costs to ratepayers.

Interrogatory 7

Question

Are the costs associated with the conversion of EWT LP's single circuit design to a 500kV circuit included in the cost estimates set out in the application?

Response

In Part B, Exhibit 6, section 6.5.3, and also in Appendix 6D (The CRS Report), EWT LP identified the benefits of the 230 kV single circuit cross-rope suspension ("CRS") design, including the ability to design and construct the line for future 500 kV operation at minimal incremental cost.

EWT LP plans to work with the OPA during the development phase to evaluate the incremental benefits to ratepayers, if any, of designing the line for future conversion to 500 kV operation. This development work is described in Part B, Exhibit 6, section 6.4 and is part of EWT LP's planned approach to methodically evaluate alternative designs and routes for the new East-West Tie.

The incremental costs of constructing the EWT facility for possible future 500 kV use are due to strengthening of structures to accommodate future 3-bundle or 4-bundle conductors in place of the planned 2-bundle conductors; increasing the heights of structures to accommodate the replacement of 230 kV insulator strings with 500 kV strings and to accommodate the higher ground clearance requirements; and the purchase of added right-of-way width for 500 kV clearances. Our calculation of these incremental cost increases are in the range of 10%-15% of construction costs at 230 kV. It is important to understand that the CRS design choice does permit such a possibility at this range of cost increase, whereas all other structure choices accommodate no such possibility at any reasonable cost increase.

The costs identified with EWT LP's CRS alternative design described in Part B, Exhibit 6, section 6.4 are for the construction of a 650 MW line designed to operate at a nominal 230 kV. They do not include any of the incremental costs of converting the line to 500 kV discussed above.

Interrogatory 8

Question

What limitations does a compact design of 6m between phases pose on the ability of workers to complete maintenance on live lines?

Response

Please see the response to Interrogatory #18 for All Transmitters.

Interrogatory 9

Request

Please confirm if EWT LP's project schedule, land acquisition plan, environmental assessment plan and permitting plan, as these are set out in its application, apply equally to the three alternative route options.

Response

The schedules, plans and associated costs will be the same and include the evaluation of all three alternative routes, as well as any other alternatives identified as a result of consultation with stakeholders.

As described in Part B, Exhibit 9, section 9.4, EWT LP plans to undertake a thorough and systematic analysis of potential alternative routes using the routing methodology described in Appendix 9D of its application. Consultation with stakeholders including agencies, municipalities, First Nations and Métis communities is important not only in evaluating these alternatives, but also in the selection of the criteria that will be used in the evaluation. EWT LP's plans are based around and include the costs and time required to properly complete this consultation, and to implement a systematic development process to identify the preferred design and route for the new line.

Interrogatory 10

Questions

To what extent will existing land rights that are currently held by one of the entities in the Hydro One group of companies be utilized or shared by EWT LP? If land rights that are held by these companies are utilized or shared by EWT LP, will the existing agreements that govern the existing rights (for example, land use permits issued by the Crown), need to be renegotiated or changed? If yes, will EWT LP reimburse the relevant utility or company in respect of any associated incremental costs? Is this cost included in EWT LP's application and, if so, where?

Response

For the purpose of preparing its application, EWT LP has assumed that it will require land rights for the full length of the new land, and that all land rights will be acquired at fair market value regardless of ownership. This has been factored into EWT LP's cost estimates. Please see the response to Interrogatory #26 for All Applicants.

EWT LP's understanding from the materials filed by HONI[27] and from the comments made by HONI staff at the transmitters' meeting January 23, 2011 is that the designated transmitter will be required to obtain new land rights for the new line.

[27] See http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/351484/view/.

Appendix A

Résumé of Berk Gursoy

- Berk Gursoy is Vice-President, Wind Operations and Project Development in Brookfield's Power and Utilities Group. In this role, he is responsible for the company's 405 MW wind facilities currently in operation in Ontario as well as wind and hydro project development activities across Canada.

- Mr. Gursoy is a registered Professional Engineer in Ontario and holds a Master of Science degree in electrical power systems with 17 years of experience in the design, permitting, construction and operation of power transmission & distribution and wind energy facilities. His work experience spans across utility, independent power producer and consulting platforms in North America and abroad.

- Since 2006, Mr. Gursoy has been responsible for Brookfield's wind development activities in Canada ranging from site selection and land assembly to permitting and construction. During this period:

    - Directed the assembly of over 150,000 acres of private and Crown lands primarily in Northern Ontario

    - Managed the public consultation, municipal permitting and environmental assessment process to completion for two wind projects in Southern Ontario

    - Directed the detailed design, optimization, EPC contract assembly & negotiation, construction and commissioning of the above projects; establishing the largest wind energy facility (216 MW) currently in operation in Canada

    - In the meantime Mr. Gursoy also led project development (public and First Nations consultation, land assembly, environmental risk assessment, wind measurement campaigns, conceptual design) of four large scale wind projects (650 MW in total) along the eastern and northern shores of Lake Superior

- Prior to his role in Brookfield's wind business, Mr. Gursoy was the senior transmission engineer for Great Lakes Power in Ontario, Canada. In this role, he successfully developed an $85M transmission project (165 km x 230 kV transmission line and five substation refurbishments) as lead technical expert:

    - Identified and evaluated technical options via extensive power flow and stability analyses, prepared conceptual designs and directed the assembly of EPC contract documents. As key technical witness, he also participated in the Section 92 and the subsequent rate order processes and responded to technical interrogatories.

- In parallel to this project, he prepared the company's 20-yr capital plan and executed $35M of capital projects in three years consisting of several brownfield 115 kV and 230 kV line and substation projects - all on schedule and on budget

- Developed a new maintenance program, directed unplanned maintenance and troubleshooting on a daily basis, prepared a suite of operating procedures and participated in system restoration activities following the August 2003 blackout

- Prior to his role at GLP, Mr. Gursoy worked on several transmission and distribution projects in Canada and abroad in consulting and R&D environments

Appendix B

Render 1 and Render 2 Images of CRS Design

See attached.