

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998, S.O. 1998, c. 15, Sch. B*, as amended (the “**OEB Act**”);

AND IN THE MATTER of an application by Grand Renewable Wind LP for an Order or Orders granting Leave to Construct new Transmission Facilities within Haldimand County, Ontario.

APPLICANT RESPONSE TO
ONTARIO ENERGY BOARD STAFF INTERROGATORIES

Interrogatory # 1 - General

Questions/Requests:

- (i) What is GRW's (or that of its limited partners) experience in constructing and operating a transmission interconnection facility in Ontario, and/or another jurisdiction in Canada? If applicable, please provide examples of similar projects undertaken in the above-mentioned jurisdictions, discussing project management, construction, operation and maintenance of these transmission facilities.

The Applicant is owned by two limited partners each holding 49.99% interest, respectively, being Samsung Renewable Energy Inc. ("**SRE**") and Pattern Grand LP Holdings LP ("**Pattern LP**"). Patten LP has experience constructing and operating a transmission interconnection facility in Manitoba. The transmission facility connects the St. Joseph Project, a 138 MW wind farm that was commissioned in March 2011.

For the construction, we will be selecting a reputable and experienced construction company following a due bid process.

We could approach the local distribution company to provide maintenance and distribution repair services for a fee. If no agreement is reached, we will contract with a reputable Operations & Management company for operations, distribution maintenance, repair and restoration.

We will contract with a transmission maintenance company with the experience and equipment to operate, repair and maintain the transmission overhead and underground facilities.

The project will have local employees that can respond to an outage in 30 minutes. The employees will be able to operate and tag equipment like breakers and switches and inspect for the cause of the outage. Contract crews will initiate repair and restoration.

- (ii) If question (i) is not applicable please discuss by enlarging the discussion to other projects in North America that display similar requirements as the transmission facilities that are the subject of this Application.

Pattern LP's parent company, Pattern Energy Group, developed and financed the Trans Bay Cable Project in northern California in partnership with Pittsburgh Power Company. The project will provide critical grid reliability services to the San Francisco Area.

For the construction, we will be selecting a reputable and experienced construction company following a due bid process.

In respect of Pattern Energy Group's experience designing and constructing North American Electric Reliability Corporation (NERC) compliant network transmission connections, below is a listing of the Pattern transmission connection projects listed

in CKT's response to HONI #4, with additional voltage and physical connection information included. In each case; i) administrative arrangements were set out in long-term interconnection agreements between Pattern and the transmitter; and ii) the facilities were constructed and connected based on utility grade, local utility and NERC standards and are operated pursuant to a generator-operator compliance manual.

Project	Location	In-Service Date	Line Length	Line Type	Line Voltage	Physical Connection Description
Cedar Creek*	Colorado	Dec 2007	76 miles	Radial	230 kV	Switching Station
Aragonne Mesa*	New Mexico	Dec 2006	22 miles	Radial	138 kV	Switching Station
Sweetwater 4a*	Texas	Mar 2007	20 miles	Radial	345 kV	Substation with Transformer
Caprock*	New Mexico	Dec 2004	15 miles	Radial	115 kv	Switching Station
Hatchet Ridge	California	Oct 2010	3 miles	Radial	230 kV	Switching Station

- (iii) Please indicate whether GRW intends to make use of contractors. Please identify what the capabilities of any contractors are or would be and provide a summary of the experience of each contractor.

The Applicant will be making use of contractors for civil (balance of plant), electrical (transmission facilities, collector lines, etc.) and erection (turbines), as well as project management (general contractor) (collectively, the "**Work**"). The Applicant, through an experienced and reputable general contractor, will likely be using separate sub-contractors for each of the above areas. The Applicant has already conducted an open bid for the pre-feasibility related to the Work.

The Applicant is still in the process of selecting a qualified general and/or sub-contractors to construct and operate its transmission facilities in Ontario, including the Facility. All qualified contractors will have substantial experience in building transmission facilities. At this time, due to confidentiality of bid process, the Applicant is not able to disclose the names of the contractors that have qualified for

the RFP. The Applicant will update the Board once the electrical contractor has been chosen.

Construction contractors have not yet been selected. The Applicant is in the process of bid preparation.

Interrogatory # 2: Permits, Reports and Other Applications

Questions/Requests:

- (i) Please indicate when a final SIA and CIA are expected to be completed? Please file them as soon as they are issued.

The final SIA and CIA were filed with the Board on August 2, 2011.

- (ii) Please update Reference (c) the "Construction and In-Service Schedule". What is the expected in-service date for the transmission facilities?

Please see HCHI IRR #5 (f).

- (iii) Please discuss the Applicant's strategy to deal with delays for either the GREP or the proposed Facility construction. Indicate how this kind of contingency is incorporated into the construction schedule that has been submitted. Does the Applicant foresee any cost consequences for delays? How does the Applicant intend to address such cost consequences?

In line with the practices of the Applicant's parent and its affiliates, the submitted construction schedule does not contain contingencies for delays. Should there be delays on the part of the Applicant during construction, such cost consequences would be borne by the Applicant.

- (iv) Please update the list of required permits and approvals and include the current status and the timeline for obtaining each permit and approval.

<i>Permit</i>	<i>Status</i>
Transport Canada	Applied for and in progress
Land Use Clearance	Applied for and in progress
Navigational Clearance	Consultation completed
SIA	Complete
CIA	Complete
Connection Cost Estimate Agreement	Expected Sept 2011
CCRA	After CCEA
Water Crossing (Conservation Authority)	Will be applied for

Permit	Status
Electrical Safety Authority Inspection Permit	To be obtained at COD of Facility
Generator's Licence	Will be applied for shortly
Leave to Construct	In progress
Notice of Project (Ministry of Labour)	To be submitted at construction
Special Vehicle Configuration	County permit – negotiations in progress
Transportation Plan	County permit – negotiations in progress
Highway Entrance Permit	Will be applied for prior to construction
Change of Access and Heavy/Oversize Load Transportation Permit	Will be applied for prior to construction
Wide load permit	Will be applied for prior to construction
Right of way agreement	County jurisdiction – negotiations in progress
Severance	Not required
Road Cut Permit	Will be applied for prior to construction
Pre-Condition Survey	Condition of road use agreement
Building Permit	County permit – negotiations in progress
Entrance Permit	County permit – negotiations in progress
Transportation Plan	In progress – being developed by Siemens
Renewable Energy Approval	Draft documents posted for public comment. Comments will be applied to REA documents.

- (v) Please update the Board on the GRW's request to obtain an OEB generator licence.

The Applicant is aiming to submit a request for a generator license as well as a notice of proposal to own transmission facilities pursuant to section 81 of the OEB Act within the next 8 weeks and in any event no later than the day that is at least 7 months prior to the anticipated connection date of the GREP to the IESO-controlled grid (via the Facility), as per the timelines recommended by the IESO.

- (vi) Please update the Board on GRW's intent to register with the IESO as a market participant.

The Applicant intends to comply with the IESO's market registration timeline procedures, as outlined in **Schedule A** (IESO Market Entry Timeline) attached hereto, and will seek to apply to be a market participant on or prior to the Application Date.

Interrogatory # 3: Option Agreement and Ground Leases

Questions/Requests:

- (i) Please provide the status of the “option agreements” described in Reference (a), and also provide an update on the negotiation with the Ontario Realty Board Corporation (“ORC”) in order to acquire rights to lands held by the Ministry of Infrastructure (to which ORC acts as land manager) to build the Collector Substation and a portion (about 5%) of the Transmission Line.

SRE has nearly completed the Option and Lease contract negotiations with Ontario Realty Corporation. Commercial terms of the Option and Lease have been agreed upon. The last remaining items are limited to specific real estate issues that apply to ORC and not necessarily to private land owners.

The ORC Option and Lease agreement specifically discusses allowing SRE to build a collector substation and related transmission line.

Once the Option and Lease agreement contract has been agreed upon by both the ORC and the project company, it will need to proceed through the provincial process for approval.

- (ii) Please provide an update on the negotiations to obtain the three Ground Leases described in paragraph 41 of Reference (b), and indicate whether any of these Ground Leases are in place.

Landowner C - negotiations are nearly completed. Commercial terms for the Option and Lease have been agreed upon by both parties. Landowner C's legal counsel is reviewing both agreements and should have comments back to SRE legal by August 15th, 2011. SRE anticipates concluding negotiations by the end of August 2011.

Landowner A - The Applicant is no longer negotiating with Landowner A for the use of Landowner A's land. Landowner A has been replaced with a new landowner (“Landowner D”), which individual is the owner of property legally described as: PT LT 1-2 CON 9 Rainham as in HC295170; Haldimand County, P.I.N. 38208-0053. Landowner D is reviewing the contract for the placement of the Transition Station with legal counsel. All commercial terms have been agreed up and it is anticipated that Landowner D will sign the contract by the end of August 2011.

As a landowner that may have been indirectly affected by the Application, Landowner D was originally notified of the Notice of Application.

Landowner B – Similar to Landowner D, the commercial aspects of the contract to house the Transition Station have been agreed upon and the contract is under legal review by Landowner B. It is anticipated that Landowner B will sign the contract by the end of August 2011.

- (iii) For the Ground Leases that are executed, please locate them by referring to Paragraph 43 of the noted Reference (a), to identify them by Landowner and Parcel.

The Applicant submitted to the Board a revised application dated April 28, 2011. The revised application states that the Ground Leases have not been executed and the Ground Leases have not been executed as of the date of these submissions. The Applicant will update the Board once the Ground Leases have been executed.

Interrogatory # 4: Land Matters – Haldimand County ROW Agreement

Questions:

- (i) Please indicate whether or not an Easement Agreement (the “ROW Agreement”) as indicated in Reference (b), using the form shown in Reference (c), has been executed between the Applicant and Haldimand County in regard to the Haldimand ROW.

Please see HCHI IRR# 3(b). The Applicant is negotiating a comprehensive Community Vibrancy Fund with Haldimand County that will cover a number of key issues, including a road use agreement, community benefits, and principles of cooperation between the County and the Applicant.

Interrogatory # 5: Land Matters- List of Crossings

Questions:

- (i) As four months had already passed since the noted evidence in Reference (a) was provided, please provide a list of crossings, preferably on a map showing the location of the proposed transmission poles on County Road 20. If a list is not available, please give the reasons for the delay.

Please refer to the Transmission Line Layout, attached hereto as **Schedule B**. The Applicant will submit a detailed list of crossings as soon as it becomes available. The Applicant has not reached the point in the detailed design in which all of the crossings are known, however the preliminary utility locate has been carried out and the Applicant has identified the majority of the third parties that will be affected.

- (ii) Please clarify whether the Line Crossings identified in Reference (b), paragraph 58 constitute all the expected Transmission Line crossings referred to in Reference (a), paragraph 37.

No, the water crossings identified in paragraph 58 are the complete list of water crossings by the Transmission Line. Please see the map identifying water bodies within the Project Site, attached hereto as **Schedule C**.

- (iii) Please update whether Temporary crossings would be required as indicated in Reference (b), paragraph 59.

All crossings would be permanent.

- (iv) Please identify any other existing facilities, non electrical facilities, such as water pipes, railway lines etc. in the proposed right-of-way which might affect or be affected by construction of the proposed Transmission Line. Please identify proposed approaches to avoid possible disruption for such facilities.

Other crossings by the Transmission Line generally include the crossing of Haldimand Road 20 (4 times to satisfy environmental setbacks from wetlands and woodlots) and Highway 3 at Nelles Corners (1 time underground), Haldimand County Hydro distribution lines (approximately 5 times) and other communications cables and underground pipelines have been identified but not detailed. The detailed design of the Transmission Line has not been completed. Once the route is finalized, the crossing of other infrastructure will be identified and appropriate measures taken to ensure safe crossing.

Interrogatory # 6: Land Matters – MOI Lands

Questions:

- (i) Please indicate whether the wind Option Agreement has been executed? If not please provide a detailed status as to what issues are not resolved and are perhaps the reasons for the delay.

The terms of the ORC Option Agreements are currently being negotiated between ORC and SRE with respect to the ORC Land. All commercial terms have been agreed to but a few real estate specific clauses are being worked on to satisfy the uniqueness of leasing land from the government. Furthermore, a number of people have recently been let go at ORC and MOI, including the lead negotiator for ORC. ORC is working to replace the lead negotiator.

- (ii) Please verify that the wind Option Agreement includes the Portion of the Transmission Line and the Collector Substation that is built on the MOI Lands. If this is not the case, please provide a description and a map showing the location of the Transmission Line portion and the Collector Substation that is within the wind Option Agreement vis-à-vis the solar Option Agreement.

The wind ORC Option Agreement will cover the portion of the Transmission Line that is located on MOI Lands. The solar ORC Option Agreement will cover the land required for the Collector Substation. The Applicant will enter into a partial assignment of the solar ORC Option Agreement, insofar as it affects the lands upon which the Wind Project substation is located, from Grand Renewable Solar LP to the Applicant. As the Applicant and Grand Renewable Solar LP are affiliates, there are no concerns relating to this partial assignment.

Interrogatory # 7: Draft Reports – REA Process

Questions/Requests:

- (i) Please provide an update on developments in regard to the Renewable Energy Approval process since the May 26, 2011 update noted in Reference(c), and also upon completion please file a copy of the REA approval with the Board.

Please see HCHI IRR #5(d).

- (ii) Please confirm that, should the REA decision result in a material alteration to the route of the transmission line as proposed in the Application to the Board, the Applicant will amend its application and file additional evidence on the revised route before commencing construction.

Confirmed.

Interrogatory # 8: General – Status of Power Purchase Agreement

Question/Request:

- (i) Please indicate whether or not the Applicant executed a Power Purchase Agreement (“PPA”) with the Ontario Power Authority. If the PPA has not been executed, please provide a description of the reasons for the delay, and a timeline when the PPA is expected to be concluded.

As of August 2, 2011, the Applicant has executed a PPA with the Ontario Power Authority.

Interrogatory # 9: Application for Generation Licence and Sec. 81 of OEB Act

Question/Request:

- (i) Please indicate when the Applicant intends to apply for a generation licence and a notice of proposal to own transmission facilities pursuant to section 81 of the OEB Act.

Please see Board Staff IRR# 2(v).

Interrogatory # 10: Transmission Licence Requirement

Question/Request/Clarifications:

Please indicate whether the Applicant intends to apply for a transmission licence. If the answer is negative i.e., that the Applicant intends to apply for an exemption from obtaining a transmitter licence, please provide responses to the following:

- (i) On what basis can the Board ensure that the TSC provisions and obligations are binding on the Solar Project?

The Applicant is relying on section 4.0.2 of Reg. 161/99 of the TSC to be exempt from obtaining a transmitter licence. This exemption is consistent with both the terms of Reg. 161/99 and past practice at the Board.

Based on such exemption, the Applicant would not be subject to section 3.0.5 of the TSC and therefore the TSC would not be applicable as between the relationship between the Applicant and Grand Renewable Solar LP since the Applicant would not be a licensed transmitter.

As a private party connecting to the Facility, which is essentially a gen-tie or line tap, Grand Renewable Solar LP would not be subject to the TSC. Specifically, under the TSC, and subject to exceptions that are not applicable here, generators are required to construct their own connection facilities (see. s. 6.3.3). This is what the Applicant is doing here.

However, pursuant to section 4.1.1 of the TSC, the Applicant and Grand Renewable Solar LP would enter into a connection agreement, similar to the form of connection agreement set out in Appendix 1 – Version B of the TSC.

From a reliability perspective, the Board can rely on the requirements of the SIA and CIA to ensure that all reliability standards will be met, as well as the numerous codes and standards applicable to transmitters. As owner and operator of the Facility, the Applicant will be required to meet the criteria set out in the SIA and CIA, respectively. The SIA in particular references the relevant sections of the TSC that must be complied with in order for the Applicant to commission the Facility.

Furthermore, pursuant to the SIA, the registration of the generation facilities (i.e. the Solar Project and the Wind Project) will need to be completed through the IESO's Market Entry process before IESO final approval for connection is granted and any part of the generation facility can be placed in-service. During the IESO's Market Entry process, the connection applicant (i.e. in this case, the Applicant) will be required to demonstrate to the IESO that all requirements identified in this SIA report have been satisfied.¹

¹ Final System Impact Assessment, dated May 5, 2011, at p. .

- (ii) Please provide an explanation as to the reasons the Applicant would be disadvantaged if it were obligated to obtain a transmitter's licence.

In terms of this particular project, the Applicant would be severely disadvantaged if it were required to obtain a transmitter licence from the Board, especially at this point in the leave to construct process and the development process of the Grand Renewable Energy Park. From a timing perspective, the Applicant would need time to prepare and submit an application and then seek approval from the Board, which could take longer than 210 days, as per the OEB's performance measures. If the transmitter licence were approved, the Applicant would have to re-apply to the Board for a leave to construct, since there are increased filing requirements for a licensed transmitter.

More fundamentally, the effect of being licenced is that the Applicant would become a regulated utility, which is a different business than being a generator. As a regulated utility, its rates, terms of access and general business terms would be regulated by the Board. This includes having connection procedures approved by the Board, establishing a rate base, operating revenues, cost of capital and capital structure, carrying out cost allocation study requirements, establishing a rate design and deferral and variance accounts. The Applicant does not have the resources or the business model to enter into and be subject to the Board's regulatory regime.

The Applicant would also be subject to the requirement under the transmission system code to provide access to any party seeking to connect to the Transmission Line. This in turn, would bring about further regulatory requirements and significantly alter rates applications and subject the Applicant to the Board's current incentive rate mechanism procedure.

The Applicant would also be disadvantaged since the Affiliates Relationship Code would now be applicable, including provisions relating to confidentiality, contracting with affiliates etc. As Board Staff is aware, Grand Renewable Solar LP and the Applicant are affiliated via the ownership interest held by SRE. Substantially all of the development of the Wind Project has been carried out by the Applicant's general partner acting on behalf of the Applicant, while prior to the formation of Grand Renewable Solar LP, SRE carried out development of the Solar Project (which development will continue to be carried out by the new general partner of Grand Renewable Solar LP). Regarding the future development and operation of the Solar Project and Wind Project, it is likely that both may depend on the same subcontractor, or that one of the companies may provide services to the other company. The applicability of the Affiliates Relationship Code would be extremely problematic from an ownership perspective and force unnecessary corporate re-organizations of the Applicant and Grand Renewable Solar LP.

The Applicant does not believe that the purpose of the transmitter regulatory regime is meant to be applied in the present circumstances. The Applicant is not in the business of transmitting electricity and is merely seeking to connect its project to the IESO-controlled grid via a gen-tie. For financing and other reasons, the Solar Project and Wind Project will have different owners, although the Applicant's parent will have

a controlling interest in each. The Applicant believes that it would be inefficient for the Board to order an applicant in a leave to construct process to obtain a transmitter licence because of the existence of another generator on the gen-tie line.

As long as the exemption requirements are met, the Applicant should not be subject to a burdensome regulatory regime that is meant to protect consumers from pricing impacts. Indeed, in the present scenario the costs of the Facility are being *entirely* absorbed by the Applicant. Were the Board to force a generator applicant to apply for a transmitter licence because it is transmitting the power of a third party at cost, it would deter generators from sharing transmission resources to deliver their power to the IESO-controlled grid based on the above-mentioned disadvantages. The result would be separate gen-tie lines impacting more landowners and municipalities and demanding further Board, applicant and intervenor resources.

- (iii) As a privately owned line, does GRW see the possibility that there may be requests for additional connections?

The Applicant does not anticipate that there will be requests for additional connections based on the fact that the geographic area surrounding the Facility will be substantially used by the Solar Project and the Wind Project. In particular, due to cumulative noise impacts, it would not be possible to build another wind farm under current regulations. A typical 10 MW solar farm only requires on average 100 acres to be developed, however any such farm would have to meet the current regulatory requirements for agricultural land.

Furthermore, the Transmission Line is 230 kV, which is only large enough to support the power derived from the Solar Project and the Wind Project.

In the event that requests were made in the future, the Applicant would consider such requests in the context of the regulatory environment at that time and the commercial terms being offered by the third party (for example, an agreement to cover the costs related to transmission infrastructure upgrades).

- (iv) On what basis would GRW expect to address such requests and, where appropriate, facilitate such connections?

Please see Board Staff IRR 10(iii).

Interrogatory # 11: Collector Substation - Power Transformer Sizes

Questions/Requests:

- (i) Did the Applicant initiate a dialogue with the Independent Electricity System Operator (the "IESO") to understand and quantify the extent of the limitation of evacuating the full output of the wind and solar generation with the currently proposed step up transformers? If such an exchange took place with the IESO or if the Applicant carried out such evaluation on its own, please provide a summary of the exchanges with the IESO along with the Applicant's evaluation and conclusions

Yes, the Applicant continues to have a dialogue with the IESO regarding the interconnection of the facility.

In an email to the IESO dated April 1, 2011, the Applicant, via its consultant, Stantec, provided a brief evaluation on the IESO Comment in the following response to the IESO Draft SIA, an excerpt of which is provided at **Schedule 'D'**. The comment provided to Samsung based on the draft SIA in regard of the transformer sizing is as follows.

"A conclusion is indicated that the main step up transformers (166 MVA and 108 MVA) may limit the full output for the wind and solar farms. The solar farm operation at 100% output with the full 48 MVAR results in an overall 110 MVA rating which slightly exceeds the maximum transformer rating. For the wind farm confirmation of the final number and rating of the wind turbines is required. (69 turbines rated at 2.221MW each and 50 MVAR compensation results in an overall rating of 161 MVA.). We appreciate IESO comment who are likely looking at the loading at full power output and full absorbing of Vars at 0.90 PF. This is a condition that will likely never happen. This is not a Baseload thermal plant that operates at 100 % all of the time. Most wind projects will operate at 100%, less than 3-5% of the time. Under normal operations, one or more turbines are either down for maintenance or not operating at 100%. It is unlikely that all 69 WTG's will be at 100% at the same time. Even if they are, the chance that all units are also being required to absorb reactive power above a 0.95 PF is even more unlikely. We would not recommend increasing the sizing of the transformers - it would be hard to justify the additional cost."

It was confirmed in the final SIA report issued under recommendation #1 the "The proponent acknowledges the concerns and accepts to the transformers at higher ratings or reduce the output of the facility if required." The Applicant will ensure that it meets all of the recommendations put forth by the IESO in the Final SIA.

Subsequent to the Final SIA report, in order to meet REA requirements, two WTGs have been deleted resulting in a reduction of the overall output of the Wind System to ~149MW. This will further reduce any impact of the Project on the grid.

- (ii) In the event that the Applicant considered increasing the capacity of the two noted transformers, please provide the revised sizes of the two transformers that were contemplated?

The Applicant is not considering increasing the capacity of the two noted transformers.

- (iii) In the event of a possible revision in the sizing of the noted transformers, would the manufacturer be able to meet the original delivery date?

The Applicant does not anticipate revising the size of the transformers.

Interrogatory # 12: Transmission System Specification

Questions/Requests:

- (i) At Reference (a), the SIA report indicated that the 230 kV over-head line, underground cable and 230 kV breakers don't have required maximum continuous voltage rating of at least 250 kV. At Reference (b), the SIA report outlines the link between the noted requirement at Reference (a) and Appendix 4.1, reference 2 of the Market Rules which set out that requirement. Please acknowledge that you are accepting the noted requirement, and outline your proposed timeline and steps to comply with the SIA report finding.

Confirmed. The Applicant will ensure that, as per the requirements of the Market Rules and the SIA, the Transmission Line and breakers will have a maximum continuous voltage of at least 250 kV. Responsibility of final design and equipment procurement is to specify all equipment will be rated for the maximum continuous voltage rating of 250kV.

Interrogatory # 13: Interconnection Station and Cost Responsibility

Questions/Requests:

- (i) Please confirm that the Applicant is responsible for the total cost of the Interconnection Station [referenced in Exh. A/ Tab 2/ Sch. 1/ p. 2/Paragraph 5 (d)].

Confirmed. The Applicant will bear the entire cost of the Interconnection Station. The Applicant will also be contributing to upgrades required for Hydro One Networks Inc.'s infrastructure to allow the connection of the Interconnection Station to the N5M circuit. This payment will be incorporated and form part of the Connection Cost Agreement.

- (ii) Please clarify who will own that Interconnection Station, regardless of the cost responsibility for that Interconnection Station.

The Applicant will own the Interconnection Station.

Interrogatory 14: Transmission Corridor – Environmental Consideration

Questions/Clarifications:

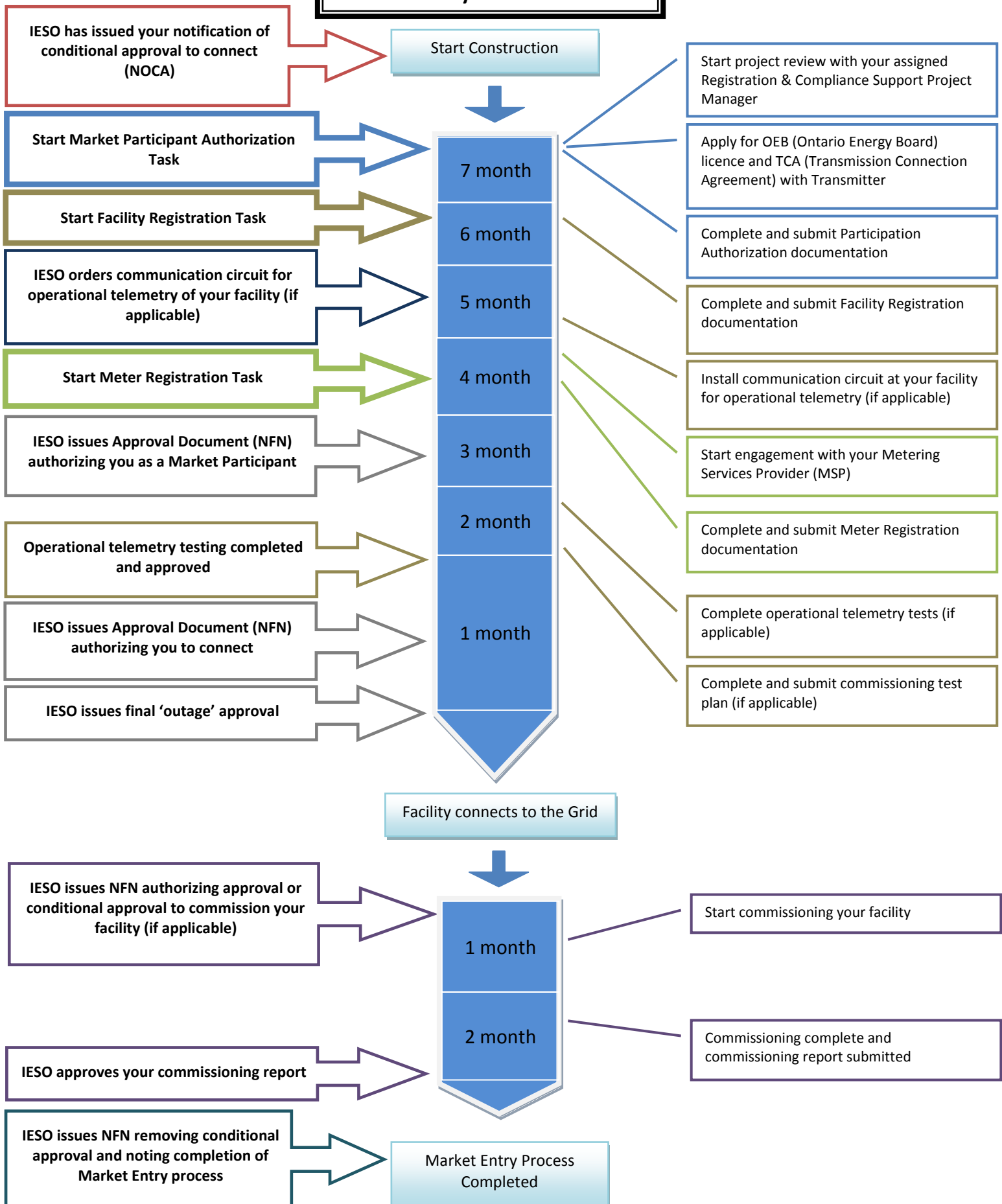
- (i) Please confirm that the effects of the items listed above [referencing Exh. B/ Tab 3/ Sch. 1/pp. 5-6/ Paragraph 60] would be considered as environmental-related only to the extent that these aspects do not cause reliability or quality deterioration to the existing or near-future planned distribution system or to its distribution customers, where such deteriorations are linked to the impact of the proposed transmission system co-locating in the same ROW as the existing or near future planned distribution system.

Confirmed.

SCHEDULE A

IESO MARKET ENTRY TIMELINE

Market Entry Process Timeline



SCHEDULE B

TRANSMISSION LINE PLAN LAYOUT



REVISED TL ROUTE AFTER POLE RELOCATED
2/25/2011
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Station	Offset	Angle	Notes
274.32			1.pole terminal sta=-0.89 h=26.90 ele=200.75 Terminal
259.06			2 pole angle 10-30 sta=31.05 ht=28.41 ele=200.75 Angle
243.84			3 pole suspension 1.pole sta=152.06 ht=28.38 ele=200.75 Tangent
228.60			4 pole angle 90.pole sta=274.79 ht=26.90 ele=200.75 Angle
213.36			5 pole angle 90.pole sta=343.08 ht=26.90 ele=200.75 Angle
198.12			6 pole suspension 1.pole sta=501.25 ht=28.38 ele=200.75 Tangent
			7 pole angle 10-30 sta=664.96 ht=28.41 ele=200.75 Angle
			8 pole angle 10-30 sta=707.37 ht=26.41 ele=200.75 Angle
			9 pole suspension 1.pole sta=821.83 ht=28.38 ele=200.21 Tangent
			10 pole angle 10-30 sta=957.44 ht=26.41 ele=199.57 Angle
			11 pole angle 90.pole sta=1004.76 ht=26.90 ele=199.05 offset adjust=3.00 Angle
			12.pole.suspension 1.pole sta=1135.38 ht=28.38 ele=198.98 Tangent
			13 pole suspension 1.pole sta=1256.47 ht=28.38 ele=199.25 Tangent
			14 pole angle 10-30 sta=1381.42 ht=28.41 ele=200.13 Angle 10-30



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TRANSMISSION LINE STRUCTURE

STRUCTURE NUMBER
1

No

1. FINAL CONDUCTOR SIZING TO BE COMPLETED DURING DETAIL DESIGN
2. CRITICAL OF OVERHEAD AND UNDERGROUND CONDUCTORS TO BE COMPLETED DURING DETAIL DESIGN

CONFIRMED DURING DETAIL DESIGN

7	Strand 1A, Module with Pages 100-102	1B	5P	11.02.2	
1	Strand 1B, Module / Page 100-102	1B	5P	11.02.2	
Reaction		By	Apd		

PRELIMINARY
NOT FOR CONSTRUCTION

Client/Project
SAMSUNG C&T CORPORATION
C-31300 Renewable Project
GRAND RENEWABLE ENERGY PARK
Mississauga, Ontario
Title
**TRANSMISSION LINE
PLAN AND PROFILE**

Project No. 161010624	Scale NONE
Drawing No. E401	Sheet 1 of 15
	Revision 2



REUSED TL ROUTE AFTER POLE RELOCATED
2/23/2010
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274.32	54 pole angle 90.00 sta=8268.78 ht=26.90 ele=207.56 offset adjust=-2.13	274.32
259.08	55 pole angle 10.30 ht=28.41 ele=208.51 orient angle=180.00	259.08
243.84	56 pole suspension 1, pol sta=8496.20 ht=28.38 ele=208.07 orient angle=180.00 Tangent	243.84
228.60	57 pole suspension 1, pol sta=8665.16 ht=28.38 ele=208.64 orient angle=180.00 Tangent	228.60
213.36	58 pole suspension 1, pol sta=8878.86 ht=28.38 ele=210.17 orient angle=180.00 Tangent	213.36
198.12	59 pole suspension 1, pol sta=9060.41 ht=28.38 ele=210.52 orient angle=180.00 Tangent	198.12
8229.60	60 pole suspension 1, pol sta=9208.97 ht=28.38 ele=208.67 orient angle=180.00 Tangent	8229.60
8305.80	61 pole suspension 1, pol sta=9435.16 ht=28.38 ele=208.31 orient angle=180.00 Tangent	8305.80
8382	62 pole suspension 1, pol sta=9622.33 ht=28.38 ele=210.20 orient angle=180.00 Tangent	8382
8458.20		8458.20
8534.40		8534.40
8610.60		8610.60
8686.80		8686.80
8763		8763
8839.20		8839.20
8915.40		8915.40
8991.60		8991.60
9067.80		9067.80
9144		9144
9220.20		9220.20
9296.40		9296.40
9372.60		9372.60
9448.80		9448.80
9525		9525
9601.20		9601.20
198.12		198.12

HDD Drawing



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● TRANSMISSION LINE PROPOSED
1 STRUCTURE NUMBER

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2. E-MAIL: PROJECTS AND INFORMATION CONSULTING TO BE
3. E-MAIL: PROJECTS AND INFORMATION CONSULTING TO BE

1	Project Name	Stantec Inc.
2	Project Number	1000 10th Avenue
3	Project Location	Edmonton, Alberta
4	Project Date	2010/02/23
5	Project Status	Completed
6	Project Manager	John Doe
7	Project Engineer	Jane Smith
8	Project Designer	John Doe
9	Project Checker	Jane Smith
10	Project Approver	John Doe

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Project: Stantec Inc.
Location: 1000 10th Avenue
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Canada
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Fax: 311.379.8000
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TRANSMISSION LINE
PLAN AND PROFILE
Scale: NONE
Drawing No: 407
7 of 15
2



REVISED TL ROUTE - AFTER POLE RELOCATED
 2/28/2015
 Page 8/15

274.32	62 pole suspension1.pol sta=9622.33 ht=28.38 ele=210.20 orient angle=180.00 Tangent	274.32
259.08	63 pole suspension1.pol sta=9787.42 ht=28.38 ele=209.91 orient angle=180.00 Tangent	259.08
243.84	64 pole suspension1.pol sta=9981.61 ht=28.38 ele=211.32 orient angle=180.00 Tangent	243.84
228.80	65 pole suspension1.pol sta=10166.41 ht=28.38 ele=212.28 orient angle=180.00 Tangent	228.80
213.36	66 pole suspension1.pol sta=10351.63 ht=28.38 ele=209.98 orient angle=180.00 Tangent	213.36
198.12	67 pole suspension1.pol sta=10521.67 ht=28.38 ele=208.46 orient angle=180.00 Tangent	198.12
198.12	68 pole suspension1.pol sta=10685.23 ht=28.38 ele=207.63 orient angle=180.00 Tangent	198.12
198.12	69 pole suspension1.pol sta=10901.03 ht=28.38 ele=208.44 orient angle=180.00 Tangent	198.12

ADD Drawing



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Legend
 1 TRANSMISSION LINE STRUCTURE
 2 STRUCTURE NUMBER

Notes
 1. DESIGN CONSTRUCTION 11/10/15 BY KE. CON. (P. 1) 2. 11/10/15
 2. DESIGN CONSTRUCTION 11/10/15 BY KE. CON. (P. 1) 2. 11/10/15
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Client: Starlec
 Project: SAUSUNG CAT CORPORATION
 Ontario Renewable Project
 GRAND RENEWABLE ENERGY PARK
 Mississauga, Ontario

The TRANSMISSION LINE
 PLAN AND PROFILE

Project No. 161010024
 Scale NONE
 Drawing No. E408
 Sheet 8 of 15
 Revision 2



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● TRANSMISSION LINE STRUCTURE
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Notes
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2. EXTENT OF OVERHEAD AND UNDERGROUND CONDUCTORS TO BE CONFIRMED DURING DETAIL DESIGN

Revised I/A Route with Pole Relocated	IB	SP	11.02.23
Revised I/A Route / Pole Locates	IB	SP	11.02.16
Revision	Ry	Aspl	11.02.05
A. PRELIMINARY REVIEW			
Issued	JH	SPD	10.10.07
	Ry	Aspl	11.02.05
File Name: 10024-E409	JH	SPD	10.03.08
Drawn	Chad	Diya	11.02.05
Permit-Set			

PRELIMINARY
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Client/Project
SAMSUNG C&T CORPORATION
Ontario Renewable Project
GRAND RENEWABLE ENERGY PARK

Mississauga, Ontario

Title
TRANSMISSION LINE
PLAN AND PROFILE

Project No.	Scale
161010524	NONE
Drawing No.	Sheet
	Revision

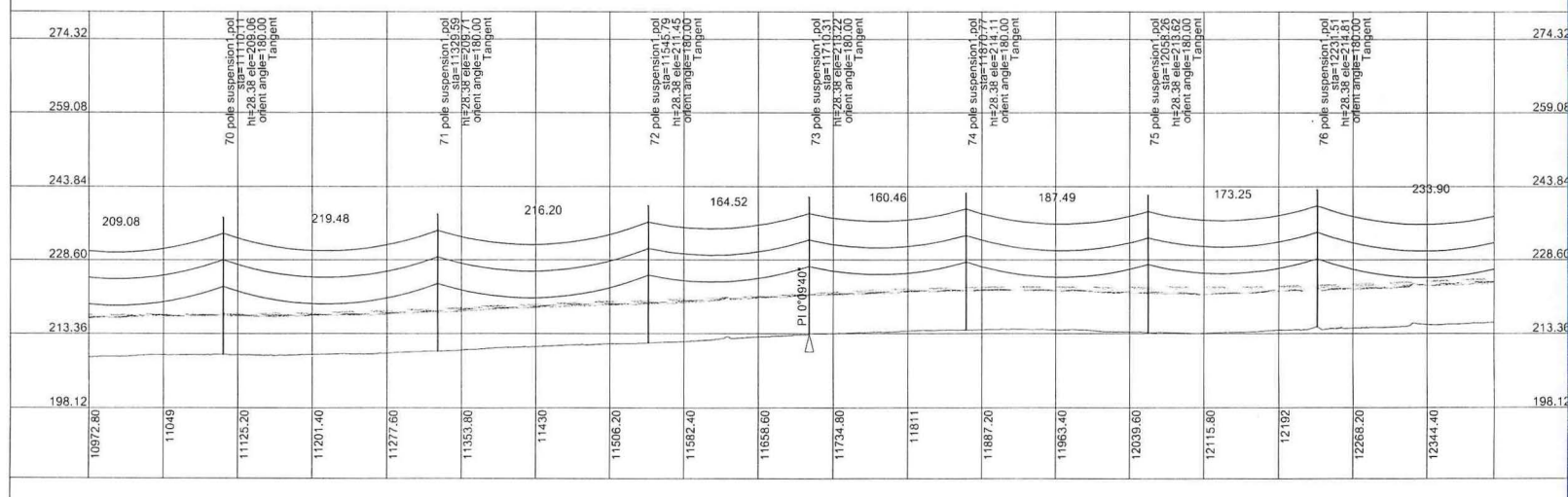
E409 9 of 15 2

ADD Drawing



60.0 m
Horiz. Scale
12.0 m
Vert. Scale

REVISED TL ROUTE_AFTER POLE RELOCATED
2/25/2011
Page 9/15





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1 STRUCTURE NUMBER

Notes
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2. EXTENT OF OVERHEAD AND UNDERGROUND CONDUCTORS TO BE CONFIRMED DURING DETAILED DESIGN

Revised 1/3 Route with Poles Relocated	JB	SP	11.02.21
Revised 1/3 Route / Pole Locations	JB	SP	11.02.10
By:	App'd		11.04.00
APPROVAL REVIEW	JH	SP	10.10.07
Issued	By	App'd	11.04.00
For Name: 10524-EX10	JH	SP	10.10.07
Drawn	CNA	Eng.	11.04.00

Pemb-Seal

PRELIMINARY
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Client/Project
SAMSUNG C&T CORPORATION
Ontario Renewable Project
GRAND RENEWABLE ENERGY PARK
Mississauga, Ontario

Title
TRANSMISSION LINE
PLAN AND PROFILE

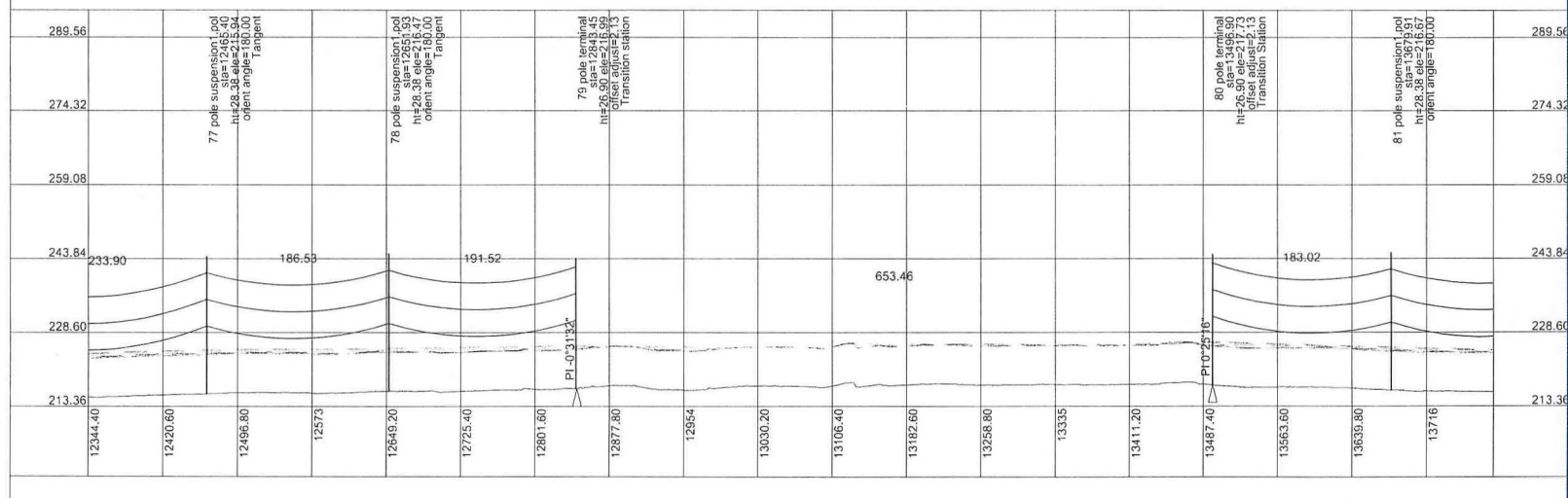
Project No: 161010524
Drawing No: Sheet
Scale: NONE
Revision

E410 10 of 15 2

ADD Drawing



REVISED TL ROUTE_AFTER POLE RELOCATED
2/25/2011
Page 10/15





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● TRANSMISSION LINE STRUCTURE
1 STRUCTURE NUMBER

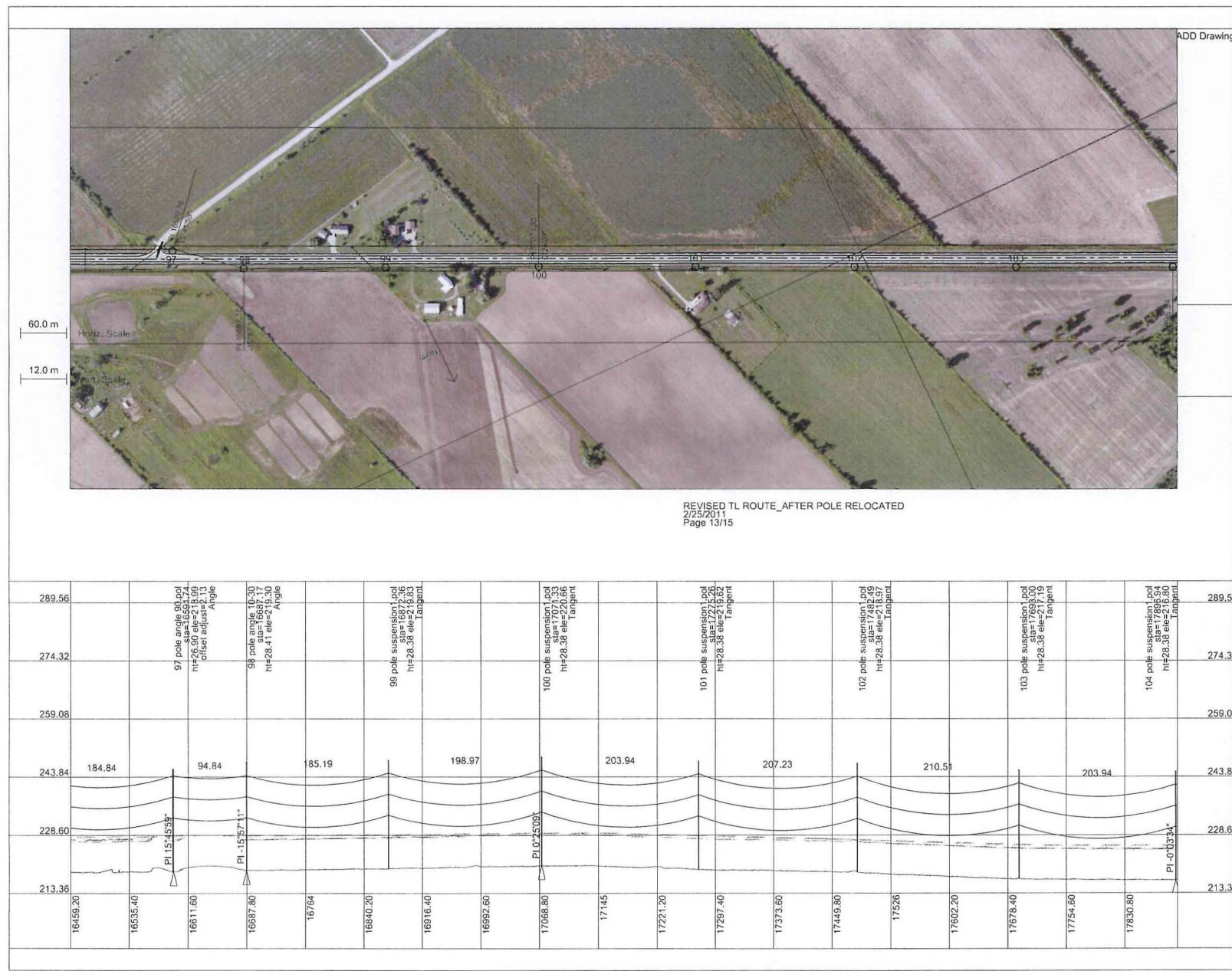
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DESIGN
2. EXTENT OF OVERHEAD AND UNDERGROUND CONDUCTORS TO BE
CONFIRMED DURING DETAILED DESIGN

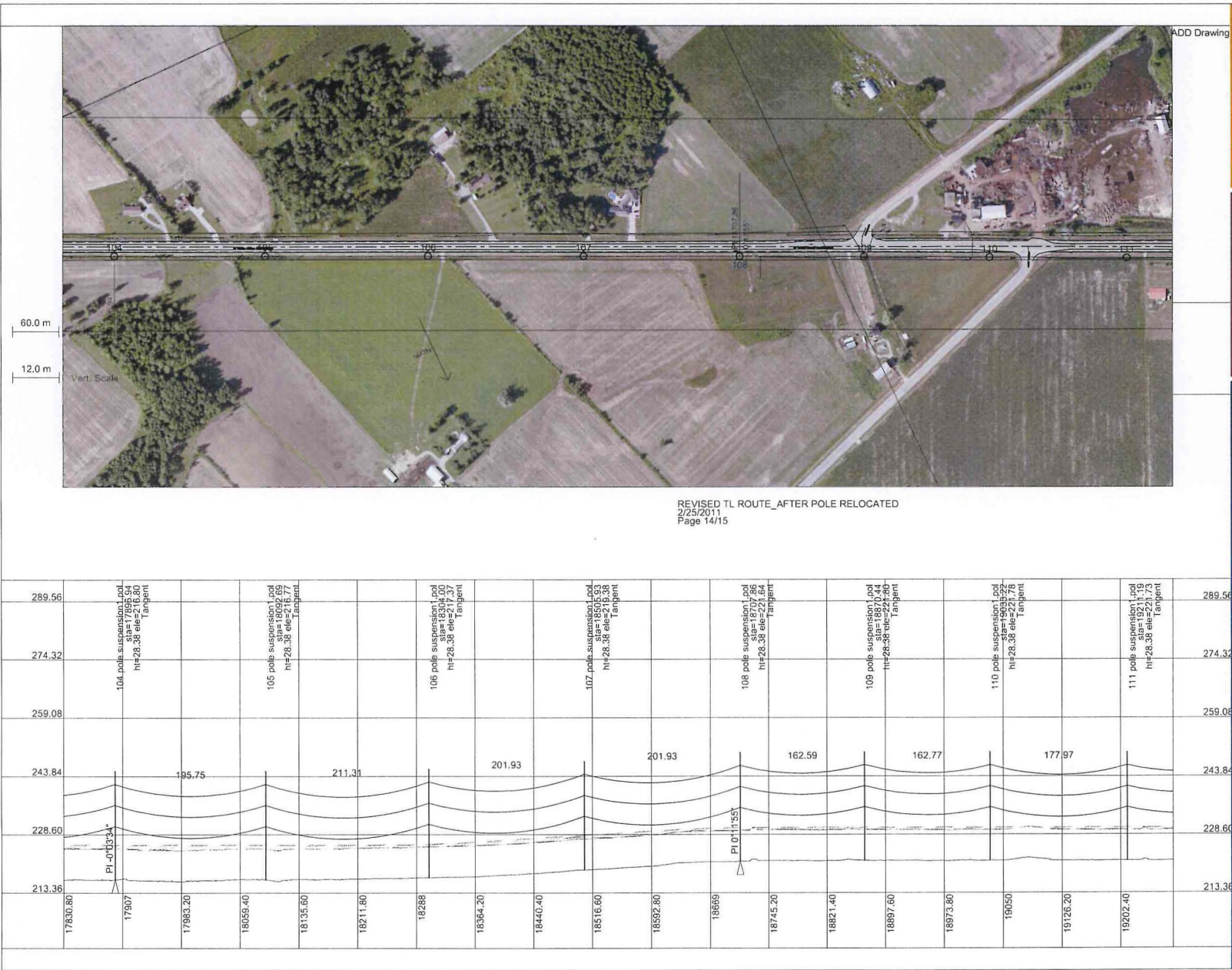
Revised T/L Route with Poles Relocated	TH	SP	11.02.22
Revised T/L Route / Pole Locations	TH	SP	11.02.18
Revised	By	Appd	11.02.00
A. PRELIMINARY REVIEW			
Issued	JH	SPP	10.10.07
For Name: 10624-E413	JH	SPP	10.05.06
Permit-Seal	Des	Chgs	Shgs

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Client/Project
SAMSUNG C&T CORPORATION
Ontario Renewable Project
GRAND RENEWABLE ENERGY PARK
Mississauga, Ontario
Title
TRANSMISSION LINE
PLAN AND PROFILE

Project No.	Scale
161010624	NONE
Drawing No.	Sheet
E413	13 of 15
	Revision
	2





REVISED TL ROUTE_AFTER POLE RELOCATED
2/25/2011
Page 14/15

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● TRANSMISSION LINE STRUCTURE

1 STRUCTURE NUMBER

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2. EXTENT OF OVERHEAD AND UNDERGROUND CONDUCTORS TO BE CONFIRMED DURING DETAILED DESIGN

Revision	By	Appr	Date
1	Revised T/L Route with Poles Relocated	TR	SP
2	Revised T/L Route / Pole Locations	TR	SP

PRELIMINARY REVIEW

Issued

For Name: 10024-EX14

Permit Seal

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GRAND RENEWABLE ENERGY PARK
Mississauga, Ontario

Title
TRANSMISSION LINE
PLAN AND PROFILE

Project No.
161010524

Scale
NONE

Drawing No.
Sheet

Revision

E414 14 of 15 2



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- TRANSMISSION LINE STRUCTURE
- 1 STRUCTURE NUMBER

Notes

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2. EXTENT OF OVERHEAD AND UNDERGROUND CONDUCTORS TO BE CONFIRMED DURING DETAIL DESIGN

Revised 1/3 Route with Poles Relocated	JB	SP	11.02.23
Revised 1/3 Route / Pole Locations	JB	SP	11.02.18
Revised	By	Appd	11.02.00
PRELIMINARY REVIEW	JH	SPD	10.10.07
Issued	By	Appd	11.02.00
File Name: 10624-E415	JH	SPD	10.11.11
Drawn	CH4	Disg	11.02.00

Perth-Seal

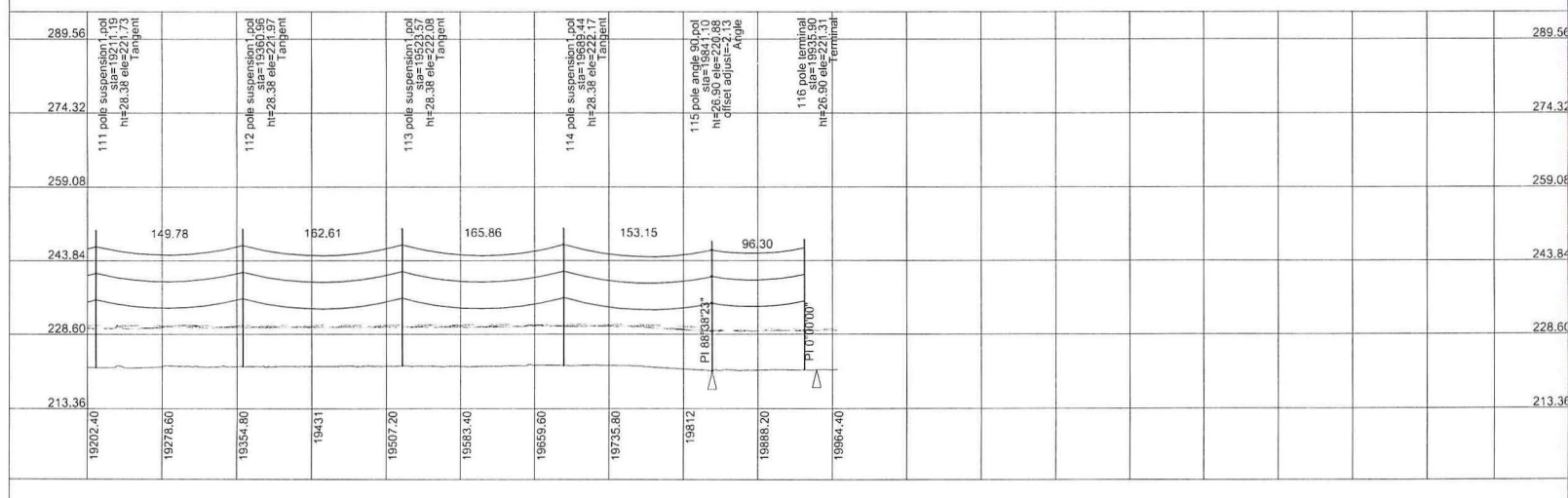
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Client/Project
SAMSUNG C&T CORPORATION
Ontario Renewable Project
GRAND RENEWABLE ENERGY PARK
Mississauga, Ontario
Title
TRANSMISSION LINE
PLAN AND PROFILE

Project No.	Scale
161010624	NONE
Drawing No.	Sheet
E415	15 of 15
	Revision
	2



REVISED TL ROUTE_AFTER POLE RELOCATED
2/25/2011
Page 15/15



SCHEDULE C

WATER CROSSING



July 2011
160960577



Legend

- Study Area
- Zone of Investigation
- Constructable Area
- Wind Project Location**
- Proposed Turbine Location
- Access Road
- Overhead Collector Line
- Underground Collector Line
- Solar Project Location**
- Solar Lands

- Transmission Line**
- Overhead Transmission Line
- Underground Transmission Line
- Electrical Transmission Component
- Existing Features**
- Road
- Railway
- Abandoned Railway
- Transmission Line (MNR)
- Watercourse (OBM, as modified by Stantec)
- Waterbody (OBM, as modified by Stantec)

- Water Body Status**
- REA Water Body
- Non-REA Watercourse



Notes

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GRAND RENEWABLE ENERGY PARK

Figure No.

2.2

DRAFT

Title

WATER BODY LOCATIONS
Tile 2 of 20



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July 2011
160960577



Legend

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> Study Area Zone of Investigation Constructable Area Wind Project Location Proposed Turbine Location Access Road Overhead Collector Line Underground Collector Line Solar Project Location Solar Lands | <ul style="list-style-type: none"> Transmission Line Overhead Transmission Line Underground Transmission Line Electrical Transmission Component Existing Features Road Railway Abandoned Railway Transmission Line (MNR) Watercourse (OBM, as modified by Stantec) Waterbody (OBM, as modified by Stantec) | <ul style="list-style-type: none"> Water Body Status REA Water Body Non-REA Watercourse |
|--|--|---|



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Client/Project

SAMSUNG, PATTERN & KEPCO (SPK)
GRAND RENEWABLE ENERGY PARK

Figure No.

2.3

DRAFT

Title

WATER BODY LOCATIONS
Tile 3 of 20



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Legend

- | | | |
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| <ul style="list-style-type: none"> Study Area Zone of Investigation Constructable Area Wind Project Location <ul style="list-style-type: none"> Proposed Turbine Location Access Road Overhead Collector Line Underground Collector Line Solar Project Location <ul style="list-style-type: none"> Solar Lands | <ul style="list-style-type: none"> Transmission Line <ul style="list-style-type: none"> Overhead Transmission Line Underground Transmission Line Electrical Transmission Component Existing Features <ul style="list-style-type: none"> Road Railway Abandoned Railway Transmission Line (MNR) Watercourse (OBM, as modified by Stantec) Waterbody (OBM, as modified by Stantec) | <ul style="list-style-type: none"> Water Body Status <ul style="list-style-type: none"> REA Water Body Non-REA Watercourse |
|--|--|---|



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Client/Project

SAMSUNG, PATTERN & KEPKO (SPK)
GRAND RENEWABLE ENERGY PARK

Figure No.
2.4

DRAFT

Title

WATER BODY LOCATIONS
Tile 4 of 20

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July 2011
160960577



Stantec

Legend

- | | | |
|-------------------------------|---|---------------------|
| Study Area | Overhead Transmission Line | REA Water Body |
| Zone of Investigation | Underground Transmission Line | Non-REA Watercourse |
| Constructable Area | Electrical Transmission Component | |
| Wind Project Location | Existing Features | |
| Proposed Turbine Location | Road | |
| Access Road | Railway | |
| Overhead Collector Line | Abandoned Railway | |
| Underground Collector Line | Transmission Line (MNR) | |
| Solar Project Location | Watercourse (OBM, as modified by Stantec) | |
| Solar Lands | Waterbody (OBM, as modified by Stantec) | |



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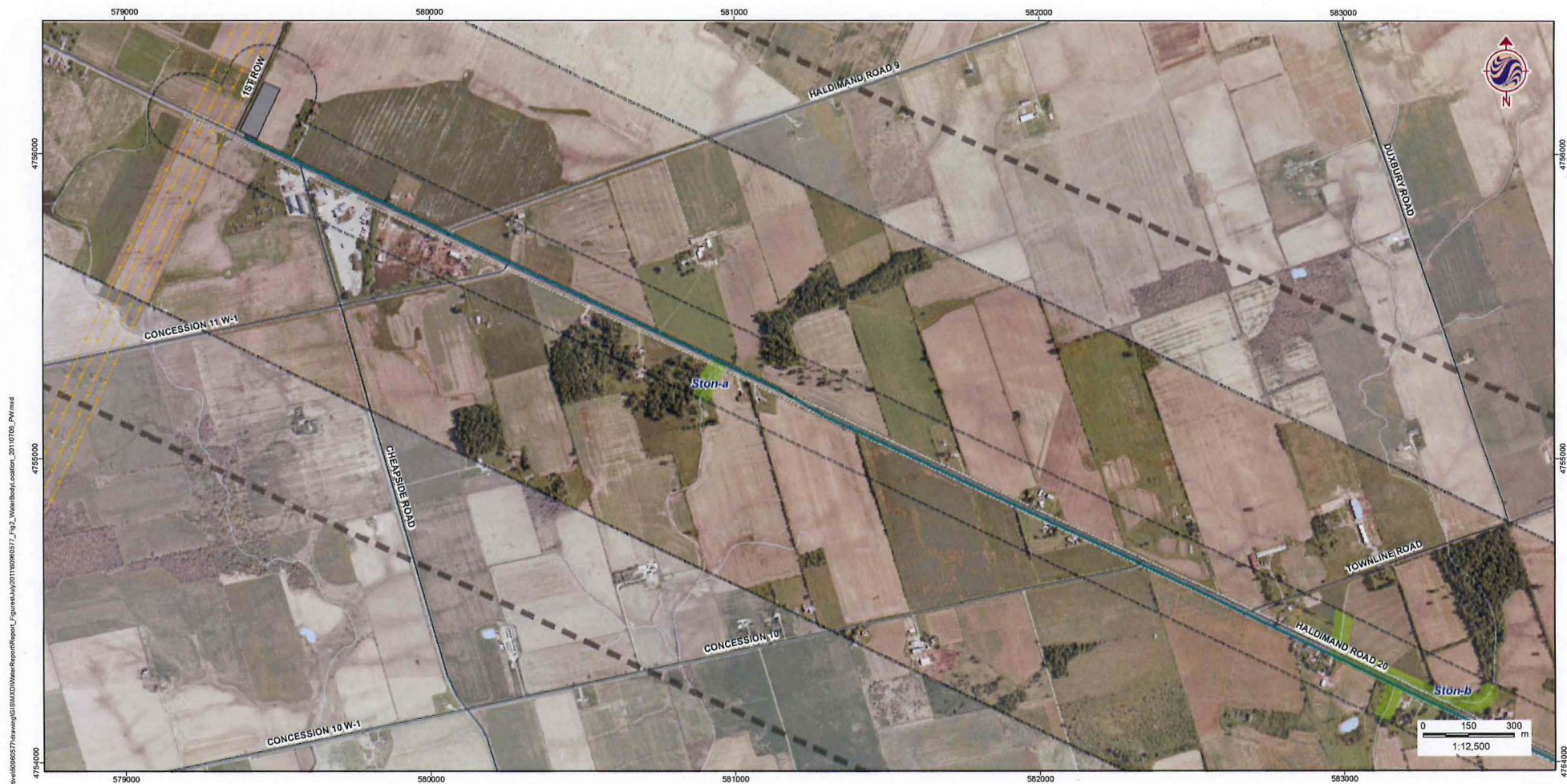
SAMSUNG, PATTERN & KEPKO (SPK)
GRAND RENEWABLE ENERGY PARK

Figure No.
2.6

Title

WATER BODY LOCATIONS
Tile 6 of 20

DRAFT



July 2011
160980577



Stantec

Legend

- Study Area
- Zone of Investigation
- Constructable Area

Wind Project Location

- Proposed Turbine Location
- Access Road
- Overhead Collector Line
- Underground Collector Line

Solar Project Location

- Solar Lands

Transmission Line

- Overhead Transmission Line
- Underground Transmission Line
- Electrical Transmission Component

Existing Features

- Road
- Railway
- Abandoned Railway
- Transmission Line (MNR)
- Watercourse (OBM, as modified by Stantec)
- Waterbody (OBM, as modified by Stantec)

Water Body Status

- REA Water Body
- Non-REA Watercourse



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SAMSUNG, PATTERN & KEPKO (SPK)
GRAND RENEWABLE ENERGY PARK

Figure No.

2.20

Title

WATER BODY LOCATIONS
Tile 20 of 20

DRAFT

EB-2011-0063
Grand Renewable Wind, LP
Board Staff IRR
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Schedule D, Pages:1

SCHEDULE D

COMMENTS ON SIA REPORT

Comments On The Draft SIA Report For GREP Project

We have reviewed the IESO SIA Report and offer our commentary as follows:

- 1) Under Part 2 General Requirements, Protection Systems, item 1 (page 13) indicates “and any additional requirements identified by the transmitter.” These additional requirements by the transmitter need to be defined.
- 2) IESO indicated the several places throughout the report that all equipment to be rated for maximum system voltage of 250 kV. Final equipment selections will be made to ensure compliance to the maximum 250 kV voltage level for the main breaker and 230 kV underground cable. This may require significant voltage upsizing as ratings above 245 kV may push us into the next class of 345 kV.
- 3) A conclusion is indicated that the main step up transformers (166 MVA and 108 MVA) may limit the full output for the wind and solar farms. The solar farm operation at 100% output with the full 48MVAR results in an overall 110MVA rating which slightly exceeds the maximum transformer rating. For the wind farm confirmation of the final number and rating of the wind turbines is required. (69 turbines rated at 2.221MW each and 50MVAR compensation results in an overall rating of 161 MVA.). We appreciate IESO comment who are likely looking at the loading at full power output and full absorbing of Vars at 0.90 PF. This is a condition that will likely never happen. This is not a Baseload thermal plant that operates at 100 % all of the time. Most wind projects will operate at 100%, less than 3-5% of the time. Under normal operations, one or more turbines are either down for maintenance or not operating at 100%. It is unlikely that all 69 WTG's will be at 100% at the same time. Even if they are, the chance that all units are also being required to absorb reactive power above a 0.95 PF is even more unlikely. So we can accept overheating and minor loss at 100% output over the life of the project. We would not like to consider increasing the sizing of the transformers because of the additional cost.
- 4) Transformer rating on page 11 in the fifth paragraph is not correct (it should be 166 MVA top rating, not 150 as shown).
- 5) The IESO has indicates a value of 2.3 MW per WTG as the rating in section 4.2. this should be corrected to the 2.221 MW value. This discrepancy may be due to the PSS/E Software model that was provided and the MW value provided in the software model. Turbine MW value in section 4.1 is to be corrected. It appears that the information presented in section 1 uses the value of 2.22 MW.
- 6) On page 28, in the third paragraph under 6.4, you state in the last sentence that the WTG technology has no capability to supply dynamic. I think you were referring to the solar inverters – not WTG's.