



The Corporation of Loyalist Township
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August 23, 2017

Algonquin Power Co.
354 Davis Road
Oakville ON L6J 2X1

Attention: Homer Lensink, Vice President, Development

Dear Mr. Lensink:

**Re: Review of Draft Pre-Construction – Windlectric Project
Final Comments on July 21, 2017 Submission and
Preliminary Comments on August 17, 2017 Submission**

David Thompson provided preliminary comments on your July 21, 2017 submission with his email of August 1, 2017. We have additional comments on the July 21 submission that are listed below. We are also in receipt of your August 17, 2017 submission. While our detailed review of this most recent submission is ongoing, we have noted significant deficiencies that you may wish to address now to expedite approval:

1. Legal surveys are not complete. Township staff will not recommend final approval of the construction drawings until they have been updated with approved surveys. Our review of the drawings submitted to date indicate that most recent legal surveys received by the Township are not updated on the PCS submission.
2. We have concerns regarding the proposed road improvements which require further clarification:
 - Drainage of the road base needs to be addressed. In discussions with Mr. Rowland, Mr. Fencott requested that the native soil immediately adjacent to the new granular material be removed and replaced with granular material so that the new granular roadbed could drain properly. Please update the detail: "Typical Road Rebuild" accordingly.

The single typical section provided does not illustrate all conditions expected to be encountered on Amherst Island.

- Gaps in Terrafix over collection trenches need to be addressed. If the Terrafix has to be cut or to be reinstalled to install the collector system at any location there is no detail showing how this will be achieved. We realize that some strength may be compromised but we want to ensure that there is a stable layer of Terrafix over the collector system. Please add this detail to drawings.
3. We have concerns regarding the proposed treatment of existing culverts.
 - a) Proposed steel plate protection needs to be assessed on a site by site basis. What is proposed as adequate cover over the steel plates? What are the impacts of raising the road grade?
 - b) Issues raised regarding the extension of deficient culverts have not been addressed.
 - c) Proposals to brace larger culverts need to be submitted now to allow time for review.
 - d) Cataraqui Region Conservation Authority needs to be consulted regarding their requirements for reviews and permits where any culvert work is to be initiated.
 4. Your drawings indicate numerous encroachments onto private properties which we understand are owned by participating landowners. We will need written confirmation from Algonquin Power that all encroachments have been authorized by the effected property owners.
 5. We have noted that the section of Front Road east of Stella from the point where the asphalt ends and easterly to the Marshall Forty Road is not subject to the detail for "Typical Road Rebuild". This section of road will only be subjected to the turbine components. Some of this road section may be surface treated and the balance is gravel surfaced. We would like written specific comments from P Eng. that this surface is adequate for proposed use by Windlectric.

Furthermore, we would like the detail "Gravel Road Repair" amended such that the typical depth of replacement granular material is 200mm and not 150mm as indicated.
 6. The Township has great concern with the proposed location of the Quazite PG Box as shown on Drawing # 404A, Detail C. This detail shows a minimum offset from edge of travelled road of 0.30m. This is not sufficient. A larger clear zone must be maintained. The Township requests that the minimum offset be amended to 1.0m.

In addition, these boxes will be covered in snow during winter and difficult to see. We also want Detail C to include a reflective marker with a minimum height of 1.5m above the ground to be fastened securely to the installation. This marker should be similar to commercially available water hydrant markers and the reflective material should be a "high intensity" product as manufactured by 3M or equivalent.

**Additional Comments on July 21, 2017 submission
(not previously provided to Algonquin)**

Detailed construction drawings are required for all work on municipal road allowances.

The Pre-construction study included a revised geotechnical report and updated drawings for municipal roads and widenings for private entrances. The culvert inventory was not revised from previous submissions and the Post-Construction Remedial Specification remains unchanged.

The applicant is proposing to undertake work within the municipal right of way as part of the roads use agreement. Upgrades to roads are recommended by Stantec for Stella Forty Foot Road, Second Concession Road, Third Concession Road, South Shore Road, and Lower Forty Foot Road. These upgrades are necessary based on simulations for the road performance under heavy equipment traffic. Upgrades will include road widenings along haul routes and temporary improvements to turning radii.

Acting on behalf of Pennecon, Stantec completed an investigation of the municipal cross culverts (dated May 4, 2017). Approximately 96 culverts were included in this inventory. The culvert inventory was cross-referenced to the road construction drawings and several variances were noted. The inventory is a significant reference for pre-construction conditions and will form part of the documentation that will be relied upon when reviewing the condition of the roads after work has been completed.

The following culverts appear in the drawings, but do not appear on the inventory:

Road	Station	Size	Drawing Reference
South Shore Road	0+465	550 (size is not common)	201
Conc. 3	30+416	400	263
Conc. 2	20+575	800	244
Front Road	16+112	600	241

The following culverts appear in the inventory, but do not appear on the drawings

Road	Station	Size	Drawing Reference
South Shore Road	0+490	400	201
	2+115	400	207

- Culvert 78 has a typo in the station. It is located at station 34+659.
- Several culverts vary in sizes between the inventory and the drawings (21 in total of the drawings provided).

To assist Windlectric with their PCS submission, the Township is requesting the following culvert crossing details. The information below should be considered minimum and failure to provide details will prevent the Township giving final approval to PCS drawings.

We have selected at least four potential types of culvert installation which will require individual approaches.

- a) Either culvert capacity is acceptable for loads – definitive statement from P.Eng as to which culverts meet this criteria
- b) Typical small/medium culvert detail by P.Eng that doesn't meet criteria in part 'a'
 - Including maximum span/diameter of culvert
 - Minimum cover to plate over culvert
 - Cover of plate to road surface
 - Thickness of plate
 - Minimum grade of steel
 - Minimum width and length of plate required
 - Type of granular cover over and under plate
- c) Culvert span exceeds typical requirements in b) and does not meet conditions in part 'a'
 - Need full individual engineered solution with full details suitable for trades to complete, protective measures and for inspection purposes
- d) Where two culverts are less than 3 pipe diameters away from each other an individual or typical design as in part 'c' will be required

Where a concrete headwall is required at the end of a culvert, the structure will be designed, inspected and approved by a P.Eng prior to backfill. (Example Section A-A, Drawing MR 252.)

Stantec recommended replacement of 11 CSP culverts and 1 concrete box culverts due to either their deteriorated condition or lack of sufficient cover. A further 10 were of concern. Pennecon is proposing to span the deteriorated culverts with temporary steel plates in lieu of replacing the culverts. This can be an acceptable approach, but will have an impact on snow clearing if the plates are to remain into winter. How will Pennecon assure the Township their work will not impact municipal snow removal?

Turning improvements are being reviewed as part of the fill permit applications since most of the fill to be placed is on private property. To avoid reviewing these twice, it is recommended each widening application be reviewed taking into consideration drainage and sedimentation and erosion controls for the complete works in association with the fill permit process.

Geotechnical Comments

1. Pg 12 – Stella 40 Foot Road – construction traffic estimate was 25,500 ESALs in the May 9, 2017 Report while this report indicates 15,000 ESALs and 13,000 ESALs on the south end.
2. Pg 13 – 2nd Concession Road - construction traffic estimate was 15,300 ESALs in the previous report while this report indicates 9,000 ESALs.
3. Pg 13 – 3rd Concession Road – construction traffic estimate was 5,100 ESALs in the previous report vs. 3,500 ESALs in this report.
4. Pg 13 – South Shore Road – construction traffic estimate was previously 15,300 ESALs and now decreased to 8,000 ESALs.
5. Pg 14 – Lower 40ft Road – construction traffic estimate decreased from 5,100 ESALs from the previous report to 3,500 ESALs in the current report.
6. Pg 14 – New section added to describe the proposed upgrades to the existing roads. For gravel roads, a single blanket solution provided for all roads: sub-excavate upper 200mm of existing road base, place Combigrid 30/30 or equivalent and place and compact 300mm Granular A to 100% SPMDD. What is the design ESAL?
7. Pg 15 - Recommendation for Asphalt surface road includes continual monitoring, maintenance, repairs and upgrade as necessary throughout the construction. Upgrade includes removing asphalt and granular material, placing Combigrid 30/30 or equivalent and placing and compacting 300mm Granular A to 100% SPMDD. What is the design ESAL? Also, the recommendation does not include asphalt surfacing, Pg 16 – Recommendation for the base course for the Dump Road has changed from 300mm Granular B Type II to 300mm Granular A, which is an improvement.

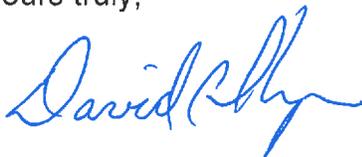
In general, from the perspective of the Township, two main items are of concern:

1. How the traffic loads were decreased since the May 2017 report?
2. Are the single blanket recommendations for gravel surface and asphalt surface roads adequate for all cases? What is the design ESAL?

Electrical Comments

1. There are discrepancies between drawing description on coversheet G001 and description under project drawing titles (E400A, E401A, E402A, E404A, E406A, E407A & E408A). It is recommended to have identical descriptions under both coversheet and the project drawings.
2. Coordination of existing underground utilities/services are not identified/shown on E402A drawings. It is recommended to include note referring impact of proposed design on E402A drawings if conflict arises on interference of existing underground utilities/services.
3. Pull box requirements for 34.5kV circuit and fiber optic cables are not clearly identified on the E402A drawings. It is recommended to clearly indicate and identify pull box requirements on the plan layouts0 E402A drawings.
4. Notes and Legends on E402A drawings are repeated on sheet 1/10 to 10/10. Notes and legends that are applicable to the layout / drawing to be shown on the layout.
5. Note#1 for identifying culvert crossing on private access roads on E402A drawings is a general note. Consulting engineer shall review the constructability of cables and coordination of construction activities.
6. Fire optic specifications were not provided, Consultant to submit for review.
7. Note#4 on drawing E407A & E408A is related to requirements for cable markers. Identification of municipal right of way is not shown on the drawing E402A. Consultant to review the constructability of cable marking in private property in coordination with municipal requirements.
8. Note#7 on drawing E407A & E408A is related to project boundaries and municipal right of ways. Identification of project boundaries and municipal right of ways is not shown on the drawing E402A. Consultant to review the constructability of cable marking in private property in coordination with municipal requirements.

Yours truly,



Robert J Maddocks

Chief Administrative Officer

DT/fpss

CC: Ariel Bautista, Algonquin Power
Jeff Norman, Algonquin Power
Tony Fleming, Cunningham Swan
Dan Fencott, G.D. Jewell Engineering
Guy Laporte, AECOM (Retired)
Murray Beckel, Loyalist Township
Dave Thompson, Loyalist Township
Jim Stewart, Algonquin Power