Scott A. Stoll
Direct: 416.865.4703
E-mail: sstoll@airdberlis.com

BY COURIER, EMAIL AND RESS

Ms. Kirsten Walli
Board Secretary
Ontairo Energy Board
2300 Yonge Street
27th Floor, Box 2319
Toronto, ON M4P 1E4

Dear Ms. Walli:

Re: Haldimand County Hydro Inc. ("HCHI")
Notice of Motion/Affidavit of the Intervenor
Board File No.: EB-2011-0027
Board File No.: EB-2011-0063

Please find attached the Notice of Motion of the Intervenor, Haldimand County Hydro Inc. The materials have been filed on the Board's RESS and two (2) hardcopies are being couriered to the Board.

Yours truly,

AIRD & BERLIS LLP

Scott A. Stoll

SAS/hm
Encl.

cc: Nabih Mikhail
Kristi Sebalj
Intervenors from EB-2011-0027

EB-2011-0027
EB-2011-0063

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

AND IN THE MATTER OF an Application by Summerhaven Wind LP for an Order granting leave to construct a new transmission line and associated facilities for the Summerhaven Wind Energy Centre.

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.

NOTICE OF MOTION OF THE INTERVENOR

HALDIMAND COUNTY HYDRO INC.

Aird & Berlis LLP
Suite 1800, Box 754
BCE Place
181 Bay Street
Toronto, Ontario M5J 2T9

Attention: Scott Stoll
Tel: (416) 865-4703
Fax: (416) 863-1515
Email: sstoll@airdberlis.com

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

AND IN THE MATTER OF an Application by Summerhaven Wind LP for an Order granting leave to construct a new transmission line and associated facilities for the Summerhaven Wind Energy Centre.

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.

NOTICE OF MOTION OF THE INTERVENOR

HALDIMAND COUNTY HYDRO INC.

Pursuant to the Ontario Energy Board's Rules of Practice and Procedure (the "**Rules**"), Haldimand County Hydro Inc. ("**HCHI**") will make a motion to the Board for the matter described herein on a date to be determined by the Board at the Board's office located at 2300 Yonge Street, Toronto, Ontario. HCHI does not have a preference for an oral or written consideration of this motion.

THIS MOTION IS FOR:

1) An order or orders of the Board to:
   a) Defer any final decision in EB-2011-0027 and EB-2011-0063 until the Board has conducted a generic proceeding to decide issues of general applicability to the development of transmission lines in municipal rights-of-way ("**ROW**") and to establish principles for distributors, generators and transmitters to guide the methods and

expectations for connections to and expansion of the grid and the efficient delivery of electricity;

b) To establish procedures for the publication, notice, participation and scheduling such proceeding; and

c) Provide such other relief as the Board deems just and reasonable.

THE GROUNDS FOR THIS MOTION

2) Haldimand County Hydro Inc. ("**HCHI**") has been granted intervenor status in EB-2011-0027 and has applied for intervenor status of EB-2011-0063. The Applicants in each proceeding are proponents of wind power projects and have applied for leave to construct 230kV transmission lines in Haldimand County to connect their wind power facilities to the Hydro One Networks Inc. ("**HONI**") transmission network.

3) Each Applicant has proposed to construct significant segments of the proposed transmission line within municipal road allowances. Further, each Applicant has asserted a right to locate the proposed transmission line within the municipal right-of-way pursuant to section 41 of the *Electricity Act, 1998,* S.O.1998, c.15, (Schedule A) (the "**Electricity Act**").

4) HCHI acknowledges that other stakeholders may have an interest in the expansion of the transmission system but HCHI has restricted its comments to issues of interest to HCHI and electricity distributors.

Issues of General Concern

5) Each of the Applications will not connect to the HCHI distribution system but, if approved as currently proposed to use the municipal ROW, will have an impact upon HCHI and potentially, HCHI's ratepayers. The Applications are of importance to the electricity industry and include the following distributor utility related generic issues:

a) Can the OEB order the transmission line to be located underground? And if so, under what circumstances would the OEB make such an order?

b) Are transmitters and distributors permitted to locate poles on both sides of municipal ROWs?

c) If the answer to (b) is "no", are transmitters and distributors required to enter into joint use pole agreements? If so, is what space requirements are to be provided for future users and what form of agreements or rights are to included in such an arrangement?

d) In EB-2011-0063, a form of easement agreement for the municipality is provided. The access to municipal ROWs through the use of an easement agreement may impact the existing rights of electricity distributors and potentially other utilities. Other utilities have rights of access to municipal ROWs but do not have easements. What is the appropriate form and content of land rights that should be granted by a municipality to transmitters in these situations?

e) If the proposed transmission line has the potential to impact the distributor in respect of operating and maintenance costs, how does the distributor properly recover such costs?

f) If the proposed transmission line requires or has the potential to require the distributor to purchase additional capital assets, such as a vehicle, is such an expenditure to be recovered from the generator/transmitter?

g) What quality of service and reliability impacts may result from overhead transmission lines, such as induction and stray voltage;

h) How does the Board's exclusive authority granted by section 19(6) of the OEB Act, see below, reconcile with the Ministry of the Environment's authority to issue a Renewable Energy Approval pursuant to section 47.3 of the *Environmental Protection Ac*t ("**EPA**")?

> *19(6) The Board has exclusive jurisdiction in all cases and in respect of all matters in which jurisdiction is conferred on it by this or any other Act*.

6) HCHI has provided the preliminary list of issues but is not suggesting these are the only issues and that a proper issues list should be developed during the generic proceeding.

7) HCHI feels that these issues, if not considered in a generic forum, will be revisited on multiple occasions in the future due to the potential for additional generation projects connecting to the transmission grid given the applications and contracts for such projects.

Additional Leave Applications are Likely

8) HCHI is of the view that addition leave to construct proceedings for transmission lines to be located in municipal ROW will arise in the future.

9) HCHI would note that in EB-2011-0063, the Applicant has confirmed its intention to construct several similar facilities at Exhibit A, Tab 1, Schedule 1, page 3, item 11 where it stated:

> "In particular, the Project will contribute a total of 253.1 MW of clean, renewable energy to the provincial electricity grid, and forms part of the Applicant's commitment, in conjunction with its affiliates, to develop 2500 MW of renewable energy in Ontario over the next five years."

10) On April 8, 2010 the Ontario Power Authority ("**OPA**") announced the awarding of 184 Feed-In Tariff Contracts ("**FIT Contracts**"). A copy of the List of Contracts may be found at Exhibit "**A**" to the Affidavit of Mr. Lloyd Payne. The OPA's list of launch projects includes 11 wind power projects that each have a contract capacity of 30MW or more (in some cases more than 100MW) and will likely require a transmission connection. In addition, there are several other wind and solar projects with contract capacities larger than 10MWs which appear to be located in close proximity to several other projects and there may be clusters of projects that require connection to the transmission grid.

11) On April 8, 2010, the OPA issued a second list of projects which were not awarded FIT Contracts but are awaiting the results of the Economic Connection Test ("**FIT Applications ECT**"). This list of projects included 47 wind projects - each with contract capacities in

excess of 30MWs. Again, there are several other wind and solar projects with contract capacities larger than 10MWs which appear to be located in close proximity to other projects and may require connection to the transmission grid. A copy of the list of projects awaiting economic connection test results may be found at Exhibit "**B**" to the Affidavit of Mr. Lloyd Payne. Several of these projects also required an "Enabler Line".

12) On February 24, 2011 the OPA announced the second round of large scale projects to receive FIT Contracts ("**FIT Contracts Second Round**"). This announcement included 3 wind projects with a contract capacity in excess of 30MW. A copy of the list of projects for FIT Contracts – Second Round may be found at Exhibit "**C**" to the Affidavit of Mr. Lloyd Payne.

13) Further, the OPA has other generation procurement processes underway which have and may continue to result in new connections to the transmission system.

Other Jurisdictions, Proper Planning and Expansion of the Grid

14) HCHI is aware that certain jurisdictions, such as British Columbia and Virginia, have taken steps to review the issue of locating transmission lines in ROW. Attached as Exhibit "**D**" to the Affidavit of L. Payne is a copy of the report prepared for the British Columbia Ministry of Transportation titled "*Effects of High Voltage Transmission Line in Proximity of Highways*". This report provides a survey and recommendations regarding the practice of locating transmission lines near highways. This report is available on the Ministry of Transportation website at:
http://www.th.gov.bc.ca/publications/eng_publications/electrical/transmission_line_study.pdf

15) Virginia has also considered the issue of above-ground and underground transmission lines through the Virginia Joint Commission on Technology and Science.

16) However, HCHI is not aware of such guidance for Ontario's more than 80 distributors and 6 regulated transmitters.

17) HCHI is of the view that the request for a generic proceeding is consistent with and would further the Board's agenda for rational, efficient regional planning. A wind power proponent is concerned primarily with obtaining the lowest cost effective manner of connecting the wind project, not the most cost effective long-range evolution of the electricity grid. As such, the incorporation of these types of projects into a regional planning framework would be of benefit to distributors and ratepayers.

18) HCHI would note that on April 1, 2011, the Board announced a consultative proceeding, EB-2011-0043 to provide a framework for regional planning. The purpose of the proceeding is:

> This consultation is intended to develop a regulatory framework for regional planning, having regard to the principles articulated in earlier TSC consultations as well as the following:
>
> - that an optimized solution is desirable as being the lowest cost in the long term;
> - that a coordinated solution is desirable as allowing for a consideration of broader needs and for involvement by a larger set of stakeholders; and
> - that cost responsibility for optimized solutions is attributed in an appropriate manner.

19) The Summerhaven Wind Energy Centre is located in close proximity to the Port Dover and Nanticoke Wind Farm and the IESO recommended that a joint connection facility be utilized. Certainly, a coordinated regional plan would have benefits to ratepayers, utilities and generators.

20) Historically transmission lines have been located in dedicated utility ROW. However, HCHI is of the view that locating transmission facilities in municipal ROW will increasingly be a preferred option and quite possibly the default option for generators as:

a) The *Electricity Act* section 41 provides:

> ***41.*** *(1) A transmitter or distributor may, over, under or on any public street or highway, construct or install such structures, equipment and other facilities as it*

considers necessary for the purpose of its transmission or distribution system, including poles and lines.

b) The generator has fewer landowners with whom to negotiate;

c) There is no ability to tax such facilities where locating such lines on private property would require payment to the landowner thus lowering costs for the generator; and

d) It is expected that constructing in a previously disturbed ROW will raise fewer environmental issues.

21) HCHI is of the view that the policy and circumstances of the current market have evolved as the transmission lines associated with generation do not serve the ratepayers in the same manner as that of the traditional rate regulated transmission companies. When the market first opened in 2002 there were fewer than 6 licensed electricity transmitters. New transmitters were licensed to serve remote communities, a furtherance of the general public interest.

22) Traditional rate regulated transmission companies have obligations to provide access to load and generator customers which differ from those of the single purpose transmission asset for a wind power facility. The influx of transmitters may also raise issues regarding the further expansion of the electricity grid and issues of open access to transmission.

23) As such, the analysis and balancing of interests under section 41 may differ today given the different circumstances and policy objectives of the Province and mandate of the Ontario Energy Board.

Scope of Authority for Leave to Construct

24) The Board's scope of authority for leave to construct is limited by section 96(2) of the OEB Act, which is reproduced below:

96. (1) If, after considering an application under section 90, 91 or 92 the Board is of the opinion that the construction, expansion or reinforcement of the proposed work is in the public interest, it shall make an order granting leave to carry out the work.

(2) In an application under section 92, the Board shall only consider the following when, under subsection (1), it considers whether the construction, expansion or reinforcement of the electricity transmission line or electricity distribution line, or the making of the interconnection, is in the public interest:

1. The interests of consumers with respect to prices and the reliability and quality of electricity service.

2. Where applicable and in a manner consistent with the policies of the Government of Ontario, the promotion of the use of renewable energy sources.

25) HCHI is of the view the Board must consider the impacts upon HCHI and HCHI's ratepayers even though the transmission system is not connecting to HCHI electricity distribution system.

26) The Board is to consider the quality of service in its review of a leave to construct application. Also, HCHI would suggest that standard incident response capabilities imposed by the Board would lead to a consistent known standard which all such generators, transmitters and distributors would need to meet.

27) In HCHI's limited review of renewable energy approvals much of the information pertains to the wind turbines and very little appears to be related to the transmission lines. HCHI is concerned that without sufficient standards and guidance from the Board issues may arise to the potential detriment of ratepayers.

28) HCHI is concerned that a potential conflict between the Board's power and the Minister of the Environment's power under section 47.3 of the EPA may arise and that the development of guiding principles would reduce or avoid the likelihood of such a conflict.

Other

29) Locating transmission facilities within municipal ROW may impact other utilities and could lead to additional congestion in ROW as well as issues of grounding related to induced or stray voltage.

30) The municipal ROW is a public asset and the use of it by private generators raises different policy considerations in determining the appropriate course of action. For example, how are the rights balanced against the rights of other users of the ROW and those of ratepayers?

31) HCHI has retained Kinectrics, a consulting firm with considerable expertise in the area, to provide technical assistance to its participation in the Applications, and if appropriate, the generic proceeding.

32) HCHI has brought this motion for an orderly consideration of the issues that may arise for the connection of generation projects and the use of municipal ROW. It is felt that a considered approach to the general issues will result in a more efficient review of future specific projects rather than having a specific situation create rules of general application which are given precedential significance with the considered approach of establishing industry standards.

MATERIALS TO BE RELIED UPON

33) HCHI will rely upon the following materials:

a) The Affidavit of Mr. Lloyd Payne sworn April 28th, 2011;

b) The evidentiary record to date in the proceedings EB-2011-0027 and EB-2011-063;

c) The *Ontario Energy Board Rules of Practice and Procedure*;

d) The Board's decisions in other such similar matters; and

e) Such other materials as counsel may advise and this Board will permit.

ALL OF WHICH IS RESPECTFULLY SUBMITTED.

HALDIMAND COUNTY HYDRO INC.

By its Counsel
Scott Stoll

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TO:

THE ONTARIO ENERGY BOARD

Kirsten Walli
Board Secretary
Ontario Energy Board
27th Floor, P.O. Box 2319
2300 Yonge Street
Toronto Ontario
M4P 1E4

Tel: 416-481-1967
Fax: 416-440-7656
E-mail:

AND TO: **The Applicant**
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c/o Grand Renewable Wind GP Inc.
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Mississauga, ON L5R
Attention: Mr. Jeong Tack Lee
Tel: 905-285-1851
Fax: 905-285-1852
Email: leejt@samsung.com

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9151401.1

IN THE MATTER OF the *Ontario Energy Board Act, 1998,* S.O. 1998, c. 15 (Schedule B)

AND IN THE MATTER OF an Application by Summerhaven Wind LP for an Order granting leave to construct a new transmission line and associated facilities for the Summerhaven Wind Energy Centre

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

AFFIDAVIT OF LLOYD PAYNE
(Sworn the 28TH day of April, 2011)

I, LLOYD PAYNE, of the Town of Caledonia, Ontario, **MAKE OATH AND SAY AS FOLLOWS:**

1. I am the President and Chief Executive Officer of the Moving Party, Haldimand County Hydro Inc. ("HCHI"), and as such have knowledge of the matters hereinafter deposed to. Where my knowledge is based on information and belief, I have indicated the source of the information and my belief as to its truth.

2. Attached hereto and marked as Exhibit "A" hereto is the list of projects, as announced by the Ontario Power Authority on April 8, 2010, to receive FIT Contracts.

3. Attached hereto and marked as Exhibit "B" hereto is the list of projects, as announced by the Ontario Power Authority on April 8, 2010, awaiting Economic Connection Test.

4. Attached hereto and marked as Exhibit "C" hereto is the list of projects, as announced by the Ontario Power Authority on February 24, 2011, to receive FIT Contracts.

5. Attached hereto and marked as Exhibit "D" hereto is a copy of the report prepared for the British Columbia Ministry of Transportation titled "*Effects of High Voltage Transmission Line in Proximity of Highways*".

SWORN before me at)
)
Ontario, this 28th day of)
)
April, 2011.)

A Commissioner for Taking Affidavits

LLOYD PAYNE

9151169.1

LEEANNE BETTY VREUGDENHIL, a Commissioner etc., Province of Ontario for McCarthy & Fowler, Barrister & Solictors. Expires April 14, 2013

The attached is Exhibit "A" to the

Affidavit of Lloyd Payne, sworn before

me this 28th day of April, 2011.

Leeanne Vreugdenhil

A Commissioner, etc.

LEEANNE BETTY VREUGDENHIL, a
Commissioner etc., Province of Ontario
for McCarthy & Fowler, Barrister & Solictors.
Expires April 14, 2013

LEEANNE BETTY VREUGDENHIL, a
Commissioner etc., Province of Ontario
for McCarthy & Fowler, Barrister & Solictors.
Expires April 14, 2013

FIT Contracts April 8 10 - Applicant Legal Name Order

Applicant Legal Name	Project Name	Project City	Project Source	Nameplate Capacity (kW)	Region	Current State
2176047 Ontario Inc.	2176047	Brockville	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
2176050 Ontario Inc.	2176050	Brockville	Solar PV Groundmount	9,000	East	CONTRACT OFFERED
2225045 Ontario Inc.	Welland Ridge Road	Welland	Solar PV Groundmount	10,000	Niagara	CONTRACT OFFERED
2225049 Ontario Inc.	Longueil TS Malbouef	Alfred	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
2225050 Ontario Inc	Norfolk Bloomburg TS	Simcoe	Solar PV Groundmount	10,000	Niagara	CONTRACT OFFERED
2225051 Ontario Inc.	Belleville TS Demorestville	Demorestville	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
2225053 Ontario Inc.	Napanee TS Taylor Kidd	Odessa (Millhaven)	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
2225054 Ontario Inc.	Kingston Gardiner TS Odessa	Odessa	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
2225055 Ontario Inc.	Kingston Gardiner Hwy2 North	Odessa	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
2225056 Ontario Inc.	Kingston Gardiner Hwy2 South	Odessa	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
2225128 Ontario Inc	Kingston Gardiner TS Unity Road	Elginburg (Glenburnie)	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
2225213 Ontario Inc.	Mississippi Mills Solar Park	Mississippi Mills	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
2225228 Ontario Inc.	Alfred	Alfred	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
2225249 Ontario Inc	Burritts Rapids	Ottawa	Solar PV Groundmount	7,000	East	CONTRACT OFFERED
2225256 Ontario Inc.	Liskeard 1	Temiskaming Shores	Solar PV Groundmount	10,000	Northeast	CONTRACT OFFERED
2225342 Ontario Inc.	Liskeard 3	Timiskiming Shores	Solar PV Groundmount	10,000	Northeast	CONTRACT OFFERED
2225345 Ontario Inc.	Liskeard 4	Temiskaming Shores	Solar PV Groundmount	10,000	Northeast	CONTRACT OFFERED
6324827 Canada Inc.	Birch Creek Hydro	Webbwood	Water	1,000	Northeast	CONTRACT OFFERED
6718710 Canada Corporation	Latchford Dam	Latchford	Water	838	Northeast	CONTRACT OFFERED
6718710 Canada Corporation	Latchford Dam 2	latchford	Water	419	Northeast	CONTRACT OFFERED
Alderville First Nation	Alderville 3	Alnwick Township	Solar PV Groundmount	5,000	East	CONTRACT OFFERED
Amik-BBF HydroKap L.P.	Big Beaver Falls Hydroelectric Project	Kapuskasing	Water	5,500	Northeast	CONTRACT OFFERED
Amik-CTR HydroKap L.P.	Camp Three Rapids Hydroelectric Project	Kapuskasing	Water	5,500	Northeast	CONTRACT OFFERED
Big Thunder Wind Park LP	Big Thunder Beta Windpark	Municipality of Neebing	Wind On-Shore	16,500	Northwest	CONTRACT OFFERED
Bow Lake Phase 1 Wind Farm Ltd.	Bow Lake Phase 1	Montreal River Harbour	Wind On-Shore	20,000	Northeast	CONTRACT OFFERED
Bow Lake Phase 2 Wind Farm Ltd.	Bow Lake Phase 2a	Montreal River Harbour	Wind On-Shore	20,000	Northeast	CONTRACT OFFERED
Bow Lake Phase 2 Wind Farm Ltd.	Bow Lake Phase 2b	Montreal River Harbour	Wind On-Shore	20,000	Northeast	CONTRACT OFFERED
Bracebridge Generation Ltd.	Wilson Falls Generating Station	Bracebridge	Water	2,300	Central	CONTRACT OFFERED
Bracebridge Generation Ltd.	Bracebridge Falls Generating Station	Bracebridge	Water	2,000	Central	CONTRACT OFFERED
BWP Wind Limited Partnership	Merlin Wind Farm	Merlin	Wind On-Shore	10,000	West of London	CONTRACT OFFERED
Canadian Shield Wind Power Inc.	Little Brit Power	Sudbury	Wind On-Shore	1,500	Northeast	CONTRACT OFFERED
Capital Power GP Holdings Inc.	Port Dover and Nanticoke Wind Project	Walpole	Wind On-Shore	105,000	Niagara	CONTRACT OFFERED
CLEAN BREEZE WIND PARK GRAFTON LP	CLEAN BREEZE WIND PARK GRAFTON	GRAFTON	Wind On-Shore	10,000	East	CONTRACT OFFERED
CLEAN BREEZE WIND PARK LP	CLEAN BREEZE WIND PARK	BALTIMORE	Wind On-Shore	12,500	East	CONTRACT OFFERED
Clearydale Farms	Clearydale Farms	Spencerville	Bio-Gas	498	East	CONTRACT OFFERED
CLOUDY RIDGE WIND PARK LP	SKYWAY 126 WIND ENERGY	SINGHAMPTON	Wind On-Shore	10,000	Niagara	CONTRACT OFFERED
Comber Wind Limited Partnership	Comber East - C24Z Wind Project	Town of Lakeshore	Wind On-Shore	82,800	West of London	CONTRACT OFFERED
Comber Wind Limited Partnership	Comber West - C23Z Wind Project	Town of Lakeshore	Wind On-Shore	82,800	West of London	CONTRACT OFFERED
Conestogo Wind, LP	Conestogo Wind Energy Centre	Alma	Wind On-Shore	23,000	Niagara	CONTRACT OFFERED
Confederation Power Inc.	Goulais Wind Farm	Sault Ste. Marie	Wind On-Shore	25,000	Northeast	CONTRACT OFFERED
Coughlin Controls Inc	Driftwood Power	Monteith	Water	400	Northeast	CONTRACT OFFERED
Cyntech Corporation	Black Bay Solar Project Phase 2	Dorion Township	Solar PV Groundmount	750	Northwest	CONTRACT OFFERED
De Bruin Farms Ltd.	DeBruin Farms Biogas	Wolfe Island	Bio-Gas	360	East	CONTRACT OFFERED
EFFISOLAR ENERGY CORPORATION	EffiSolar Brockville Solar Farm (10MW)	ELIZABETHTOWN-KITLEY	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
EFFISOLAR ENERGY CORPORATION	EffiSolar Beckwith Solar Farm (10MW)	Township of Beckwith	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
EFFISOLAR ENERGY CORPORATION	EffiSolar Cornwall Solar Farm A (10MW)	Township of South Glengarry	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Ernestown Windpark LP	Ernestown Wind Park	Ernestown	Wind On-Shore	10,000	East	CONTRACT OFFERED
Farm Owned Power (Melancthon) Ltd.	Farm Owned Power (Melancthon) Ltd.	Shelburne	Wind On-Shore	100,000	Niagara	CONTRACT OFFERED
Ferme Geranik Inc.	Ferme Geranik Biogas	St. Albert	Bio-Gas	499	East	CONTRACT OFFERED
Gilead Power Corporation	Ostrander Point Wind Energy Park	Prince Edward County	Wind On-Shore	24,000	East	CONTRACT OFFERED
Gillette Farms Inc.	Powerbase / Gillette Farms Inc	Embrun	Bio-Gas	498	East	CONTRACT OFFERED
GLEN MANOR WIND FARM LP	SUNNY SHORES SOLAR FARM	WELLINGTON	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Grand Valley Wind Farms Inc. on behalf of Grand Va	Grand Valley Wind Farms (Phase 2)	Dundalk	Wind On-Shore	10,800	Niagara	CONTRACT OFFERED
GREY HIGHLANDS CLEAN ENERGY LP	GREY HIGHLANDS CLEAN ENERGY	SINGHAMPTON	Wind On-Shore	20,000	Niagara	CONTRACT OFFERED
GREY HIGHLANDS ZERO EMISSION PEOPLE LP	GREY HIGHLANDS ZERO EMISSION PEOPLE	SINGHAMPTON	Wind On-Shore	10,000	Niagara	CONTRACT OFFERED
Grimsby Energy Inc	Grimsby Bioreactor Project	Grimsby	Bio-Gas	1,000	Niagara	CONTRACT OFFERED
Haliburton Forest & Wild Life Reserve Ltd	Haliburton Forest Biopower 1	Haliburton	Biomass	775	Central	CONTRACT OFFERED
High Falls Development Partnership	High Falls Hydropower Development	District of Rainy River	Water	6,400	Northwest	CONTRACT OFFERED
Horizon Hydro LP	Trout Lake River Hydroelectric Project	Ear Falls	Water	4,000	Northwest	CONTRACT OFFERED
Hybridyne Power Generation Site A Inc.	HPG Site A	Brownsville	Solar PV Groundmount	2,000	East	CONTRACT OFFERED
Index Energy Mills Road Corporation	Index Energy Mills Road Corporation	Ajax	Biomass	17,812	Central	CONTRACT OFFERED
Integrated Gas Recovery Services Inc.	Lafleche Landfill Gas Utilization	Moose Creek	Landfill	4,500	East	CONTRACT OFFERED
International Power Canada, inc.	Pointe Aux Roches Wind	Lakeshore	Wind On-Shore	48,600	West of London	CONTRACT OFFERED
International Power Canada, inc.	Plateau III Wind	Melancthon	Wind On-Shore	9,000	Niagara	CONTRACT OFFERED
International Power Canada, inc.	Plateau I & II Wind	Dundalk	Wind On-Shore	18,000	Niagara	CONTRACT OFFERED
Invenergy Solar Canada ULC	Simcoe Solar Energy Centre I	Woodville	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
Invenergy Solar Canada ULC	Simcoe Solar Energy Centre III	Woodville	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
Invenergy Wind Canada ULC	Conestogo Wind Energy Centre 2	Wallensetin	Wind On-Shore	19,500	Niagara	CONTRACT OFFERED
Invenergy Wind Canada ULC	Conestogo Wind Energy Centre 1	Drayton	Wind On-Shore	69,000	Niagara	CONTRACT OFFERED
Kagawong Power Incorporated	Charlton Dam GS Expansion	Charlton	Water	850	Northeast	CONTRACT OFFERED
Leader Energy.ca Corp.	Clarington Wind Farm	Clarington	Wind On-Shore	10,000	East	CONTRACT OFFERED
LFL Properties Inc.	Elora Hydro Electric Generating Station	Elora	Water	1,000	Niagara	CONTRACT OFFERED
Lizard Creek Power Inc.	Lizard Creek Small Hydro Project	Township of The North Shore	Water	1,040	Northeast	CONTRACT OFFERED
Magnum WInd Energy Corp.	Zurich	Zurich	Wind On-Shore	800	Bruce	CONTRACT OFFERED
M'Chigeeng First Nation	Mother Earth Renewable Energy Project - Phase I	M'Chigeeng	Wind On-Shore	4,000	Northeast	CONTRACT OFFERED
McLean's Mountain Wind L.P.	McLean's Mountain WInd Farm 1	Little Current	Wind On-Shore	50,000	Northeast	CONTRACT OFFERED
McLean's Mountain Wind L.P.	McLeans Mountain Wind Farm 3	Little Current	Wind On-Shore	10,000	Northeast	CONTRACT OFFERED
Namewaminikan Hydro Inc.	Namewaminikan Waterpower Project	Beardmore	Water	10,000	Northwest	CONTRACT OFFERED
Neeskah Energy Limited Partnership	Neeskah Project	Calstock	Water	6,500	Northeast	CONTRACT OFFERED
Nipiy-OWF HydroKap L.P.	Old Woman Falls Hydroelectric Project	Kapuskasing	Water	5,500	Northeast	CONTRACT OFFERED
Nipiy-WOF HydroKap L.P.	White Otter Falls Hydroelectric Project	Kapuskasing	Water	5,500	Northeast	CONTRACT OFFERED

North Bay Hydro Distribution Ltd	Merrick Landfill Project	North Bay	Landfill	1,600	Northeast	CONTRACT OFFERED
Northland Power Solar Abitibi L.P.	Northland Power Solar Abitibi	Cochrane	Solar PV Groundmount	10,000	Northeast	CONTRACT OFFERED
Northland Power Solar Belleville North L.P.	Northland Power Solar Belleville North	Ameliasburg	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Northland Power Solar Belleville South L.P.	Northland Power Solar Belleville South	Ameliasburg	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Northland Power Solar Burks Falls East L.P.	Northland Power Solar Burks Falls East	Burks Falls	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
Northland Power Solar Burks Falls West L.P.	Northland Power Burks Falls West	Ryerson, ON	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
Northland Power Solar Crosby L.P.	Northland Power Solar Crosby	Portland	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Northland Power Solar Empire L.P.	Northland Power Solar Empire	Cochrane	Solar PV Groundmount	10,000	Northeast	CONTRACT OFFERED
Northland Power Solar Glendale L.P.	Northland Power Solar Glendale	Cornwall	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Northland Power Solar Long Lake L.P.	Northland Power Solar Long Lake	Hunta	Solar PV Groundmount	10,000	Northeast	CONTRACT OFFERED
Northland Power Solar Martin's Meadows L.P.	Northland Power Solar Martin's Meadows	Cochrane	Solar PV Groundmount	10,000	Northeast	CONTRACT OFFERED
Northland Power Solar McCann L.P.	Northland Power Solar McCann L.P.	Portland	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Northland Power Solar North Burgess L.P.	Northland Power Solar North Burgess	North Burgess	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Northland Power Solar Rideau Lakes L.P.	Northland Power Solar Rideau Lakes	Rideau Lakes	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Okikendawt Hydro L.P.	Okikendawt Hydroelectric Project	Dokis Bay	Water	10,000	Northeast	CONTRACT OFFERED
Ontario Solar PV Fields 1 Limited Partnership	Wainwright Solar Park	Oxdrift	Solar PV Groundmount	10,000	Northwest	CONTRACT OFFERED
Ontario Solar PV Fields 10 Limited Partnership	Mattawishkwia Solar Park	Hearst	Solar PV Groundmount	10,000	Northeast	CONTRACT OFFERED
Ontario Solar PV Fields 11 Limited Partnership	Ramore Solar Park	Ramore	Solar PV Groundmount	8,000	Northeast	CONTRACT OFFERED
Ontario Solar PV Fields 2 Limited Partnership	Morley Solar Park	Stratton, in the Township of Morley	Solar PV Groundmount	10,000	Northwest	CONTRACT OFFERED
Ontario Solar PV Fields 3 Limited Partnership	Vanzwolf Solar Park	Township of Dawson	Solar PV Groundmount	10,000	Northwest	CONTRACT OFFERED
Ontario Solar PV Fields 4 Limited Partnership	Dave Rampel Solar Park	Township of Dawson	Solar PV Groundmount	10,000	Northwest	CONTRACT OFFERED
Ontario Solar PV Fields 7 Limited Partnership	Kap Solar Park	Kapuskasing	Solar PV Groundmount	6,000	Northeast	CONTRACT OFFERED
Pecors Power o/a Cantech Construction Ltd.	Pecors Power Small Hydro Project	Elliot Lake	Water	2,000	Northeast	CONTRACT OFFERED
Peeshoo Energy Limited Partnership	Peeshoo Project	Calstock	Water	6,500	Northeast	CONTRACT OFFERED
Penn Energy Renewables, Ltd.	Penn Energy - S. Glengarry_St. Lawrence-1	South Glengarry	Solar PV Groundmount	9,333	East	CONTRACT OFFERED
Penn Energy Renewables, Ltd.	Penn Energy - Edwardsburgh_Morrisburg-1	Edwardsburgh/Cardinal	Solar PV Groundmount	9,333	East	CONTRACT OFFERED
Penn Energy Renewables, Ltd.	Penn Energy - Hamilton_Port Hope-4	Baltimore	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Peterborough Utilities Inc.	Bensfort Road LFG Generation Project	Peterborough	Landfill	2,000	East	CONTRACT OFFERED
Pic Mobert Hydro Power Joint Venture	Gitchi Animki Niizh Generating Station	Brothers Township	Water	10,000	Northwest	CONTRACT OFFERED
Pic Mobert Hydro Power Joint Venture	Gitchi Animki Bezhig Generating Station	Brothers Township	Water	8,900	Northwest	CONTRACT OFFERED
Pukwis Wind Partner I Inc.and Pukwis Energy Co-ope	Pukwis Community Wind Park	Sutton West	Wind On-Shore	20,000	Central	CONTRACT OFFERED
purEnergy	Kawartha Biogas Inc.	Havelock	Bio-Gas	9,800	East	CONTRACT OFFERED
RE Adelaide 1 ULC	RE Adelaide 1c	Strathroy	Solar PV Groundmount	1,000	West of London	CONTRACT OFFERED
RE Adelaide 1 ULC	RE Adelaide 1d	Strathroy	Solar PV Groundmount	500	West of London	CONTRACT OFFERED
RE Breen 2 ULC	RE Breen 2	Putnam	Solar PV Groundmount	10,000	Niagara	CONTRACT OFFERED
RE Highbury 1 ULC	RE Highbury 1	Dorchester	Solar PV Groundmount	5,000	West of London	CONTRACT OFFERED
RE Ingersoll 1 ULC	RE Ingersoll 1	Ingersoll	Solar PV Groundmount	8,000	Niagara	CONTRACT OFFERED
RE Ingersoll 1 ULC	RE Ingersoll 1b	Ingersoll	Solar PV Groundmount	500	Niagara	CONTRACT OFFERED
RE Ingersoll 1 ULC	RE Ingersoll 1a	Ingersoll	Solar PV Groundmount	1,000	Niagara	CONTRACT OFFERED
RE Midhurst 2 ULC	RE Midhurst 2	Springwater	Solar PV Groundmount	3,500	Central	CONTRACT OFFERED
RE Midhurst 3 ULC	RE Midhurst 3	Oro Station	Solar PV Groundmount	3,500	Central	CONTRACT OFFERED
RE Midhurst 4 ULC	RE Midhurst 4	Oro-Medonte	Solar PV Groundmount	6,500	Central	CONTRACT OFFERED
RE Midhurst 6 ULC	RE Midhurst 6	Midhurst	Solar PV Groundmount	9,000	Central	CONTRACT OFFERED
RE Orillia 1 ULC	RE Orillia 1	Hawkestone	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
RE Orillia 2 ULC	RE Orillia 2	Hawkestone, Oro Medonte	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
RE Orillia 3 ULC	RE Orillia 3	Hawkestone	Solar PV Groundmount	6,500	Central	CONTRACT OFFERED
RE Smiths Falls 1 ULC	RE Smiths Falls 1	Smiths Falls	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
RE Smiths Falls 2 ULC	RE Smiths Falls 2	Perth	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
RE Smiths Falls 3 ULC	RE Smiths Falls 3	Smiths Falls	Solar PV Groundmount	8,000	East	CONTRACT OFFERED
RE Smiths Falls 4 ULC	RE Smiths Falls 4	Perth	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
RE Smiths Falls 5 ULC	RE Smiths Falls 5	Smiths Falls	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
RE Smiths Falls 6 ULC	RE Smiths Falls 6	Rideau Lakes	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
RE Waubaushene 3 ULC	RE Waubaushene 3	Wyebridge	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
RE Waubaushene 4 ULC	RE Waubaushene 4	Coldwater	Solar PV Groundmount	8,000	Central	CONTRACT OFFERED
RE Waubaushene 5 ULC	RE Waubaushene 5	Coldwater	Solar PV Groundmount	3,500	Central	CONTRACT OFFERED
SETTLERS LANDING WIND PARK LP	SETTLERS LANDING WIND PARK	PONTYPOOL	Wind On-Shore	10,000	East	CONTRACT OFFERED
SkyPower Glenarm LP	Glenarm	Kawartha Lakes	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
SkyPower Val Caron LP	Val Caron	Greater Sudbury	Solar PV Groundmount	10,000	Northeast	CONTRACT OFFERED
Skyway 125 Wind Energy Inc	skyway 125	singhampton	Wind On-Shore	10,000	Niagara	CONTRACT OFFERED
SNOWY RIDGE WIND PARK LP	SNOWY RIDGE WIND PARK	BETHANY	Wind On-Shore	10,000	East	CONTRACT OFFERED
South Branch Windfarm Inc.	South Branch Wind Farm	Brinston	Wind On-Shore	30,000	East	CONTRACT OFFERED
Summerhaven Wind, LP	Summerhaven Wind Energy Centre	Nanticoke	Wind On-Shore	125,000	Niagara	CONTRACT OFFERED
SunE Rutley LP	SunE Rutley	Ingleside	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Swift River Energy LP	North Bala Small Hydro Project	Bala	Water	5,000	Central	CONTRACT OFFERED
Tempest Power Corp.	William Rutley Solar Park	Ingleside	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
THE CORPORATION OF THE CITY OF KITCHENER	Consolidated Maintenance facility Solar Roof	Kitchener	Solar PV Rooftop	500	Niagara	CONTRACT OFFERED
Trout Creek Wind Power Inc.	Trout Creek	Township of Laurier, District of Parry Sound	Wind On-Shore	10,000	Northeast	CONTRACT OFFERED
Vineland Wind Power Inc.	HAF Energy	Caistors Centre	Wind On-Shore	10,000	Niagara	CONTRACT OFFERED
Wahpeestan Energy Limited Partnership	Wahpeestan Project	Calstock	Water	6,500	Northeast	CONTRACT OFFERED
Wainfleet Wind Energy Inc.	Wainfleet Wind Farm	Wainfleet	Wind On-Shore	10,000	Niagara	CONTRACT OFFERED
Wapoose Energy Limited Partnership	Wapoose Project	Calstock	Water	6,500	Northeast	CONTRACT OFFERED
Wasdell Falls Power Corporation	Wasdell Falls Waterpower Project	Washago	Water	1,900	Central	CONTRACT OFFERED
Waste Management of Canada Corporation	WM Ottawa Landfill Gas to Energy	Ottawa	Landfill	6,400	East	CONTRACT OFFERED
Wendigo Power Partnership Inc.	Wendigo Waterpower Project	Marter Township, Temiskaming	Water	3,000	Northeast	CONTRACT OFFERED
WHISPERING WOODS WIND FARM LP	WHISPERING WOODS WIND FARM	MILLBROOK	Wind On-Shore	10,000	East	CONTRACT OFFERED
White Pines Wind Farm Inc.	White Pines Wind Farm	Milford	Wind On-Shore	60,000	East	CONTRACT OFFERED

WIND FARM COLLIE HILL LP	WIND FARM COLLIE HILL	HASTINGS	Wind On-Shore	5,600	East	CONTRACT OFFERED
Windstream Wolfe Island Shoals Inc.	Wolfe Island Shoals Wind Farm	Marysville	Wind Off-Shore	300,000	East	CONTRACT OFFERED
WOOLWICH BIO-EN INC.	Woolwich Bio-En Inc.	Elmira	Bio-Gas	2,852	Niagara	CONTRACT OFFERED
wpd Canada Corp.	Ballyduff Wind Farm	Pontypool	Wind On-Shore	11,500	East	CONTRACT OFFERED
wpd Canada Corp.	Fairview Wind Farm	Stayner	Wind On-Shore	18,400	Niagara	CONTRACT OFFERED
wpd WF1 Inc.	Belwood Wind Farm	Fergus	Wind On-Shore	9,200	Niagara	CONTRACT OFFERED
wpd WF2 Inc.	Whittington Wind Farm	Orangeville	Wind On-Shore	6,900	Niagara	CONTRACT OFFERED
Xeneca Limited Partnership	McGraw Falls 2089284	Thunder Bay District	Water	2,400	Northwest	CONTRACT OFFERED
Xeneca Limited Partnership	Lapinigam Rapids 6712517	Hearst District	Water	8,200	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	At Soo Crossing 2154061	Sudbury District	Water	4,300	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Cascade Fall 1723378	Sudbury District	Water	2,100	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Ivanhoe River, Third Falls - 2118964	Cochrane District	Water	5,100	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	McPherson Fall 2154065	Sudbury District	Water	2,000	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Wanatango Falls 2124716	Cochrane District	Water	4,670	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Four Slide Falls Ltd 1713400	Elliot Lake City Limits - Sault Ste Marie Region	Water	7,300	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Wabageshik Rapid at Outlet Lake 1723377	Sudbury District	Water	3,400	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Middle Twp Buchan 6712541	Hearst District	Water	5,000	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Allen and Struthers 2130769	Alban Municipality, Sudbury District	Water	2,800	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Big Eddy at CPR Bridge	Petawawa	Water	5,300	East	CONTRACT OFFERED
Xeneca Limited Partnership	Ivanhoe River, The Chute - 2124750	Chapleau District	Water	3,600	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Marter Twp, Blanche River - 2154070	Kirkland Lake District	Water	2,100	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	McCarthy Chute 1713399 Ltd.	Elliot Lake City Limits - Sault Ste Marie Region	Water	2,000	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Near North Boundary Twp Buchan 6712568	Hearst District	Water	3,750	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Outlet Kapuskasing Lake 6773770	Chapleau District	Water	2,500	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Larder Lake & Raven Falls 2118966	Kirkland Lake District	Water	1,250	Northeast	CONTRACT OFFERED
Xeneca Limited Partnership	Half Mile Rapids PGED	Petawawa	Water	4,800	East	CONTRACT OFFERED
ZEP WIND FARM GANARASKA LP	ZEP WIND FARM GANARASKA	ORONO	Wind On-Shore	20,000	East	CONTRACT OFFERED

The attached is Exhibit "B" to the

Affidavit of Lloyd Payne, sworn before

me this 28th day of April, 2011.

Leeanne Vreugdenhil

A Commissioner, etc.

LEEANNE BETTY VREUGDENHIL, a
Commissioner etc., Province of Ontario
for McCarthy & Fowler, Barrister & Solictors.
Expires April 14, 2013

FIT Awaiting ECT April 8 10 - Applicant Legal Name Order

Applicant Legal Name	Project Name	Project City	Project Source	Nameplate Capacity (kW)	Region	Current State	Enabler Requested
1037193 Ontario Ltd.	SouthPoint Wind Offshore Wind Project - Leamington	Leamintgon	Wind Off-Shore	10,000	West of London	AWAITING ECT	
1037193 Ontario Ltd.	SouthPoint Wind Offshore Wind Project - Kingsville	Leamintgon	Wind Off-Shore	10,000	West of London	AWAITING ECT	
1037193 Ontario Ltd.	SouthPoint Wind Offshore Wind Project - Union	Leamintgon	Wind Off-Shore	10,000	West of London	AWAITING ECT	
1795205 Ontario Inc.	A&T ENERGY Solar Farm (Harty)	Harty	Solar PV Groundmount	8,250	Northeast	AWAITING ECT	
2131403 Ontario Corp.	Seaforth WInd Farm	Seaforth	Wind On-Shore	10,000	Bruce	AWAITING ECT	
2176052 Ontario Inc.	2176052	Elizabethtown-Kitley	Solar PV Groundmount	10,000	East	AWAITING ECT	
2176089 Ontario Inc.	2176089	Brockville	Solar PV Groundmount	10,000	East	AWAITING ECT	
2186632 Ontario Inc.	Arthur Wind Farm	Arthur	Wind On-Shore	6,000	Niagara	AWAITING ECT	
2224614 Ontario Inc.	Lakeport	Cobourg	Solar PV Groundmount	9,900	East	AWAITING ECT	
2224772 Ontario Inc.	Meyer Wind Farm	Paisley	Wind On-Shore	4,000	Bruce	AWAITING ECT	
2225046 Ontario Inc.	Welland Moyer Road	Welland	Solar PV Groundmount	10,000	Niagara	AWAITING ECT	
2225047 Ontario Inc.	Axio CNP Stevensville West	Fort Erie	Solar PV Groundmount	10,000	Niagara	AWAITING ECT	
2225048 Ontario Inc.	CNP Stevensville East	Fort Erie	Solar PV Groundmount	10,000	Niagara	AWAITING ECT	
2225057 Ontario Inc.	Greely DS West	Osgoode (Greely)	Solar PV Groundmount	10,000	East	AWAITING ECT	
2225059 Ontario Inc.	Wilhaven DS	Cumberland (Ottawa)	Solar PV Groundmount	10,000	East	AWAITING ECT	
2225211 Ontario Inc.	Laurentian Valley Solar Park	Pembroke	Solar PV Rooftop	5,000	East	AWAITING ECT	
2225212 Ontario Inc.	Renfrew Valley Solar Park	Renfrew	Solar PV Groundmount	10,000	East	AWAITING ECT	
2225238 Ontario Inc	Greely	Ottawa	Solar PV Groundmount	10,000	East	AWAITING ECT	
2225253 Ontario Inc.	Tillsonburg 2	Tillsonburg	Solar PV Groundmount	5,000	West of London	AWAITING ECT	
2225338 Ontario Inc.	Liskeard 2	Timiskaming Shores	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
2225348 Ontario Inc.	Liskeard 5	Temiskaming Shores	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
2225350 Ontario Inc.	Liskeard 6	Temiskaming Shores	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
2225352 Ontario Inc.	Perth Solar Power Park	Perth	Solar PV Groundmount	10,000	East	AWAITING ECT	
2225355 Ontario Inc.	True Grid Solar 1	Marter	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
2225357 Ontario Inc.	True Grid Solar 2	Marter Township	Solar PV Groundmount	8,000	Northeast	AWAITING ECT	
2225544 Ontario Inc.	Bio-Carbon Plant Development	Kenora	Biomass	2,000	Northwest	AWAITING ECT	
2225614 Ontario Inc.	GS-02 - Preston Farm	Edwards	Solar PV Groundmount	10,000	East	AWAITING ECT	
2225615 Ontario Inc.	GS-03 - Willem Farm	Edwards	Solar PV Groundmount	10,000	East	AWAITING ECT	
2225616 Ontario Inc.	GS-04 - Barbers Farm	Ottawa	Solar PV Groundmount	10,000	East	AWAITING ECT	
2225617 Ontario Inc.	GS-05 - River Farm	Burritts Rapids	Solar PV Groundmount	10,000	East	AWAITING ECT	
2225618 Ontario Inc.	Willow Hawk Solar Park	Tillsonburg	Solar PV Groundmount	10,000	West of London	AWAITING ECT	
2225619 Ontario Inc.	Tillsonburg 1	Tillsonburg	Solar PV Groundmount	3,000	West of London	AWAITING ECT	
2225712 Ontario Inc.	Schlegel Wind Farm 1	Huron Kinloss	Wind On-Shore	21,000	Bruce	AWAITING ECT	
Ameresco Canada Wind Power, Inc	Ameresco Colchester 1	Harrow	Wind On-Shore	10,000	West of London	AWAITING ECT	
Ameresco Canada Wind Power, Inc	Ameresco Colchester 2	Harrow	Wind On-Shore	10,000	West of London	AWAITING ECT	
Armow Wind Power LP	Armow Wind Farm	Municipality of Kincardine	Wind On-Shore	80,000	Bruce	AWAITING ECT	
Arran Wind Project ULC	Arran Wind Energy	Burgoyne	Wind On-Shore	115,000	Bruce	AWAITING ECT	
BEACONSFIELD BREEZES WIND PARK LP	BEACONSFIELD BREEZES WIND PARK	BURGESSVILLE	Wind On-Shore	10,000	West of London	AWAITING ECT	
Big Thunder Wind Park LP	Big Thunder Alpha Windpark	Municipality of Neebing	Wind On-Shore	16,500	Northwest	AWAITING ECT	
Big Thunder Wind Park LP	Big Thunder Gamma Windpark	Municipality of Neebing	Wind On-Shore	15,000	Northwest	AWAITING ECT	
Big Thunder Wind Park LP	Big Thunder Delta Windpark	Municipality of Neebing	Wind On-Shore	16,000	Northwest	AWAITING ECT	
Big Thunder Wind Park LP	Big Thunder Epsilon Windpark	Municipality of Neebing	Wind On-Shore	15,000	Northwest	AWAITING ECT	
Bornish Wind, LP	Bornish Wind Energy Centre	Keyser	Wind On-Shore	73,500	West of London	AWAITING ECT	
Boulevard Associates Canada, Inc.	Goshen Wind Energy Centre	Dashwood	Wind On-Shore	102,000	Bruce	AWAITING ECT	
Boulevard Associates Canada, Inc.	East Durham Wind Energy Centre	Priceville	Wind On-Shore	23,000	Bruce	AWAITING ECT	
Boulevard Associates Canada, Inc.	Jericho Wind Energy Centre	Thedford	Wind On-Shore	150,000	West of London	AWAITING ECT	ENABLER REQUESTED
Boulevard Associates Canada, Inc.	Bluewater Wind Energy Centre	Zurich	Wind On-Shore	60,000	West of London	AWAITING ECT	ENABLER REQUESTED
Brampton Brick Limited	Brampton Brick Welland Solar Rooftop Project	Welland	Solar PV Rooftop	2,500	Niagara	AWAITING ECT	
BWP Wind Limited Partnership	Harwich Wind Farm	Blenheim	Wind On-Shore	10,000	West of London	AWAITING ECT	
BWP Wind Limited Partnership	Flat Creek II Wind Farm	Blenheim	Wind On-Shore	10,000	West of London	AWAITING ECT	
BWP Wind Limited Partnership	Flat Creek I Wind Farm	Blenheim	Wind On-Shore	8,000	West of London	AWAITING ECT	
BWP Wind Limited Partnership	Walker Marsh Wind Farm	Cottam	Wind On-Shore	10,000	West of London	AWAITING ECT	
BWP Wind Limited Partnership	Arner Green Wind Farm	Kingsville	Wind On-Shore	10,000	West of London	AWAITING ECT	
BWP Wind Limited Partnership	Laurel Wind Farm	Laurel	Wind On-Shore	12,000	Niagara	AWAITING ECT	
BWP Wind Limited Partnership	St. Joachim Wind Farm	St. Joachim	Wind On-Shore	10,000	West of London	AWAITING ECT	
BWP Wind Limited Partnership	Oakland Wind Farm	Staples	Wind On-Shore	8,000	West of London	AWAITING ECT	
Canadian Shield Wind Power Inc.	North Channel Winds	Gore Bay	Wind On-Shore	3,000	Northeast	AWAITING ECT	
Capital Power GP Holdings Inc.	Kingsbridge II Wind Power Project	Goderich	Wind On-Shore	270,000	Bruce	AWAITING ECT	
Castor River Windfarm Inc.	Miller's Creek Wind Farm	Rainy River	Wind On-Shore	20,000	Northwest	AWAITING ECT	
Ches Counsell Homes Ltd.	Cargill G.S.	Cargill	Water	500	Bruce	AWAITING ECT	
Clinton Energy Ltd	Clinton Energy FD 6.0MW Site	East Huron	Wind On-Shore	6,000	Bruce	AWAITING ECT	
Coldwell Wind Limited Partnership	Coldwell Wind Project	Marathon	Wind On-Shore	100,000	Northwest	AWAITING ECT	ENABLER REQUESTED
Comber Wind Limited Partnership	Comber East - C23Z Wind Project	Town of Lakeshore	Wind On-Shore	82,800	West of London	AWAITING ECT	
Comber Wind Limited Partnership	Comber East - C21J Wind Project	Town of Lakeshore	Wind On-Shore	82,800	West of London	AWAITING ECT	
Comber Wind Limited Partnership	Comber East - C22J Wind Project	Town of Lakeshore	Wind On-Shore	82,800	West of London	AWAITING ECT	
Comber Wind Limited Partnership	Comber West - C22J Wind Project	Town of Lakeshore	Wind On-Shore	82,800	West of London	AWAITING ECT	
Comber Wind Limited Partnership	Comber West - C24Z Wind Project	Town of Lakeshore	Wind On-Shore	82,800	West of London	AWAITING ECT	
Comber Wind Limited Partnership	Comber West - C21J Wind Project	Town of Lakeshore	Wind On-Shore	82,800	West of London	AWAITING ECT	
Comber Wind Limited Partnership	Comber West - Phase II	Town of Lakeshore	Wind On-Shore	18,400	West of London	AWAITING ECT	
Comber Wind Limited Partnership	Comber East - Phase II	Town of Lakeshore	Wind On-Shore	18,400	West of London	AWAITING ECT	
Dairy Lane Systems Ltd	Walker Digester	Malahide township	Bio-Gas	1,000	Niagara	AWAITING ECT	
Domtar Inc	Chaudière (Ottawa) Hydro Project No 2	Ottawa	Water	5,600	East	AWAITING ECT	
Domtar Inc	Chaudière (Ottawa) Hydro Project No 5	Ottawa	Water	5,600	East	AWAITING ECT	
Domtar Inc	Chaudière (Ottawa) Hydro Project No 3	Ottawa	Water	5,600	East	AWAITING ECT	
Domtar Inc	Chaudière (Ottawa) Hydro Project No1	Ottawa	Water	5,600	East	AWAITING ECT	
Domtar Inc	Chaudière (Ottawa) Hydro Project No 4	Ottawa	Water	5,600	East	AWAITING ECT	
Domtar Pulp and Paper Products Inc.	Topping Turbogenerator Project	Dryden	Biomass	15,000	Northwest	AWAITING ECT	
Dover Wind Power Partnership	Dover Wind Energy Centre I	Chatham	Wind On-Shore	39,000	West of London	AWAITING ECT	
Dover Wind Power Partnership	Dover Wind Energy Centre II	Chatham	Wind On-Shore	40,500	West of London	AWAITING ECT	
Dryden Renewable Energy Corp	Dryden Solar Park 1	Dryden	Solar PV Groundmount	5,000	Northwest	AWAITING ECT	
Dymond Solar Power Inc.	Dymond	New Liskeard	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
EFFISOLAR ENERGY CORPORATION	EffiSolar Cornwall B Solar Farm B (7MW)	Township of South Glengarry	Solar PV Groundmount	7,000	East	AWAITING ECT	
EFFISOLAR ENERGY CORPORATION	EffiSolar Wolford Solar Farm (10MW)	Township of Merrickville-Wolford	Solar PV Groundmount	10,000	East	AWAITING ECT	
Environmental Electric Company Inc.	Heron Bay	Heron Bay	Wind On-Shore	3,300	Northwest	AWAITING ECT	
Erie Shores West Wind Farm LP & 2181967 Ontario Co	Erie Shores West Wind Farm	Vienna	Wind On-Shore	22,500	West of London	AWAITING ECT	
FESTIVAL WIND FARM LP	FESTIVAL ZORRA WIND FARM	STRATFORD	Wind On-Shore	10,000	Bruce	AWAITING ECT	
Forest Wind Power Inc.	Forest Wind Farm	Forest	Wind On-Shore	10,000	West of London	AWAITING ECT	
Grand Bend Wind L.P.	Grand Bend Wind Farm	Zurich	Wind On-Shore	100,000	Bruce	AWAITING ECT	
Grand Valley Wind Farms Inc. on behalf of Grand Va	Grand Valley Wind Farms (Phase 3)	Grand Valley	Wind On-Shore	40,000	Bruce	AWAITING ECT	
Gunn's Hill Windfarm Inc.	Gunn's Hill Wind Farm	Woodstock	Wind On-Shore	25,000	West of London	AWAITING ECT	
Hearst Biomass Energy LP	Hearst Biomass Energy LP	Hearst	Biomass	9,999	Northeast	AWAITING ECT	

Helios Project III Limited Partnership	Ottawa Solar Project	Ottawa	Solar PV Groundmount	10,000	East	AWAITING ECT	
Innergex renewable energy inc.	Rock Hill	Greater Madawaska	Wind On-Shore	100,000	East	AWAITING ECT	ENABLER REQUESTED
Innergex renewable energy inc.	Masinabik	Greenstone	Wind On-Shore	150,000	Northwest	AWAITING ECT	ENABLER REQUESTED
Innergex renewable energy inc.	Chii Noden	Greenstone	Wind On-Shore	90,000	Northwest	AWAITING ECT	ENABLER REQUESTED
Innergex renewable energy inc.	Laurier	Powassan	Wind On-Shore	100,000	Northeast	AWAITING ECT	ENABLER REQUESTED
Innerkip Windfarm Inc.	Innerkip Wind Farm	Innerkip	Wind On-Shore	19,000	Niagara	AWAITING ECT	
Integrated Gas Recovery Services Inc.	Essex Regional Landfill Gas Utilization	Essex	Landfill	4,500	West of London	AWAITING ECT	
International Power Canada, inc.	Silcote Corners Wind	Annan	Wind On-Shore	46,800	Bruce	AWAITING ECT	
International Power Canada, inc.	Erieau Wind	Chatham-Kent	Wind On-Shore	99,000	West of London	AWAITING ECT	
International Power Canada, inc.	Byng Wind	Dunnville	Wind On-Shore	9,000	Niagara	AWAITING ECT	
International Power Canada, inc.	Blue Sky Wind II	Essex	Wind On-Shore	19,800	West of London	AWAITING ECT	
International Power Canada, inc.	Blue Sky Wind I	Essex	Wind On-Shore	19,800	West of London	AWAITING ECT	
International Power Canada, inc.	Blue Sky Wind III	Essex	Wind On-Shore	9,000	West of London	AWAITING ECT	
International Power Canada, inc.	Belle River Wind	Lakeshore	Wind On-Shore	95,000	West of London	AWAITING ECT	
International Power Canada, inc.	Blue Water Wind	Ripley	Wind On-Shore	125,000	Bruce	AWAITING ECT	
International Power Canada, inc.	East Lake St. Clair Wind	Wallaceburg	Wind On-Shore	99,000	West of London	AWAITING ECT	
Kenogami Industries Inc.	Longlac Biomass Cogeneration Project	Longlac	Biomass	25,000	Northwest	AWAITING ECT	
Kent Centre Wind Farm Inc.	Kent Centre Wind Farm	Blenheim	Wind On-Shore	100,000	West of London	AWAITING ECT	
Kerr's Ridge Windfarm Inc.	Kerr's Ridge Wind Farm	Mountain	Wind On-Shore	20,000	East	AWAITING ECT	
Kruger Energy Chatham II L.P.	Chatham Extension Wind Project	Merlin (municipality of Chatham-Kent)	Wind On-Shore	7,500	West of London	AWAITING ECT	
Lac Seul First Nation	Bluffy Lake Hydro WSR-2007-49	unorganized area	Water	4,200	Northwest	AWAITING ECT	
LAKESIDE BREEZES LP	LAKESIDE BREEZES I	IONA STATION	Wind On-Shore	10,000	West of London	AWAITING ECT	
LAKESIDE BREEZES LP	LAKESIDE BREEZES II	IONA STATION	Wind On-Shore	10,000	West of London	AWAITING ECT	
Lakewind Power Cooperative Inc.	Lakewind/Bervie	Kincardine	Wind On-Shore	20,000	Bruce	AWAITING ECT	
Liberty Energy Inc.	Liberty Energy Centre Phase 1	Hamilton	Biomass	6,500	Niagara	AWAITING ECT	
Loch Lomond Hydro LP	Loch Lomond Hydro	Thunder Bay	Water	2,100	Northwest	AWAITING ECT	
Loch Lomond Wind Energy LP	Loch Lomond	Thunder Bay	Wind On-Shore	48,300	Northwest	AWAITING ECT	
LongLake 58 First Nation	LongLake 1	Longlac	Solar PV Groundmount	4,000	Northwest	AWAITING ECT	
LongLake 58 First Nation	Long Lake 2	Longlac	Solar PV Groundmount	5,000	Northwest	AWAITING ECT	
Lower Lake Hydro Limited Partnership	Lower Lake Hydroelectric Project	Terrace Bay	Water	10,000	Northwest	AWAITING ECT	
Loyalist Wind Project LP	Prince Edward County Wind Project - Phase II	Milford	Wind On-Shore	32,000	East	AWAITING ECT	
Loyalist Wind Project LP	Prince Edward County Wind Project - Phase I	Milford	Wind On-Shore	10,000	East	AWAITING ECT	
Mahekun Energy Limited Partnership	Mahekun Project	Calstock	Water	5,000	Northeast	AWAITING ECT	
Mainstream Sydenham Renewable Power Inc.	Sydenham Wind Energy Centre	RR5 Bothwell	Wind On-Shore	66,700	West of London	AWAITING ECT	
Majestic Energy Inc. (6736785 Canada Inc.)	Majestic Wind Farm	Paisley	Wind On-Shore	2,000	Bruce	AWAITING ECT	
Manitoulin Greenhead Windpark LP	Greenhead Wind Park	Town of Northeastern Manitoulin and the Islands	Wind On-Shore	8,000	Northeast	AWAITING ECT	
Marlborough Windfarm Inc.	Marlborough Wind Farm	Richmond	Wind On-Shore	20,000	East	AWAITING ECT	
Maximum Breeze Energy Co-operative	Maximum Breeze	Lucan	Wind On-Shore	10,000	Bruce	AWAITING ECT	
McLean's Mountain Wind L.P.	McLeans Mountain Wind Farm 4	Little Current	Wind On-Shore	10,000	Northeast	AWAITING ECT	
McLean's Mountain Wind L.P.	McLeans Mountain Wind Farm 5	Little Current	Wind On-Shore	10,000	Northeast	AWAITING ECT	
McLean's Mountain Wind L.P.	McLeans Mountain Wind Farm 6	Little Current	Wind On-Shore	10,000	Northeast	AWAITING ECT	
McLean's Mountain Wind L.P.	McLeans Mountain Wind Farm 2	Little Current	Wind On-Shore	10,000	Northeast	AWAITING ECT	
Merlin Quinn Wind Power LP	Merlin Quinn Wind Farm	TILBURY	Wind On-Shore	54,000	West of London	AWAITING ECT	
Michipicoten First Nation	Dore Falls Hydropower Development	Wawa	Water	2,000	Northeast	AWAITING ECT	
Morphy's Falls Windfarm Inc.	Beckwith Wind Farm	Carleton Place	Wind On-Shore	12,500	East	AWAITING ECT	
Multistream Power Corporation	Fourth Chute GS	Township of Bonnechere Valley	Water	1,800	East	AWAITING ECT	
Muskoo Energy Limited Partnership	Muskoo Project	Calstock	Water	9,999	Northeast	AWAITING ECT	
Neekik Energy Limited Partnership	Neekik Project	Calstock	Water	12,000	Northeast	AWAITING ECT	
Neguaquon Lake Hydro Development Projects LP	Myrtle Falls Hydropower Development	District of Rainy River	Water	2,000	Northwest	AWAITING ECT	
New Liskeard Solar Power Inc.	New Liskeard	New Liskeard	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
Nimaasing Wind Limited Partnership	Nimaasing Wind Project	Sault Ste Marie	Wind On-Shore	200,000	Northeast	AWAITING ECT	ENABLER REQUESTED
North Shore Power Group Inc.	Blind River Solar Generating Facility	Blind River	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
NORTHERN LIGHTS WIND PARK LP	NORTHERN LIGHTS WIND PARK	MARKDALE	Wind On-Shore	10,000	Bruce	AWAITING ECT	
Northland Power Solar Brockville L.P.	Northland Power Solar Brockville	Brockville	Solar PV Groundmount	10,000	East	AWAITING ECT	
Northland Power Solar Gold L.P.	Northland Power Solar Gold	Cochrane	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
Northland Power Solar Hunta L.P.	Northland Power Solar Hunta	Hunta	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
Northland Power Solar Ramore L.P.	Northland Power Solar Ramore	Ramore	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
Northland Power Solar Smith Falls L.P.	Northland Power Solar Smith Falls L.P.	Jasper	Solar PV Groundmount	10,000	East	AWAITING ECT	
Northland Power Solar Theriault L.P.	Northland Power Solar Theriault	Matheson	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
Ojibways of the Pic River First Nation	High Falls Hydropower Development	Heron Bay	Water	3,200	Northwest	AWAITING ECT	
Ojibways of the Pic River First Nation	Manitou Falls Hydropower Development	Heron Bay	Water	2,800	Northwest	AWAITING ECT	
Ontario Clean Power Bonfield Inc. JV with Windstream Energy	Matachewan Wind Farm	Matachewan	Wind On-Shore	100,000	Northeast	AWAITING ECT	
Ontario Clean Power South River Inc. JV with Windstream Ene	South River Wind Farm Phase 2	Powassan	Wind On-Shore	10,000	Northeast	AWAITING ECT	
Ontario Clean Power South River JV with Windstream Energy	South River Wind Farm Phase 1	Powassan	Wind On-Shore	10,000	Northeast	AWAITING ECT	
Ontario Solar PV Fields 5 Limited Partnership	Mountjoy North Solar Park	Timmins	Solar PV Groundmount	6,000	Northeast	AWAITING ECT	
Ontario Solar PV Fields 6 Limited Partnership	Dalton Road South Solar Park	Timmins	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
Ontario Solar PV Fields 8 Limited Partnership	Photon Solar Park	Kapuskasing	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
Penn Energy Renewables, Ltd.	Penn Energy - Eliza-Kitley_Brockville 1	Brockville	Solar PV Groundmount	10,000	East	AWAITING ECT	
Penn Energy Renewables, Ltd.	Penn Energy - Edwardsburgh_Brockville-2	Edwardsburgh/Cardinal	Solar PV Groundmount	7,460	East	AWAITING ECT	
Penn Energy Renewables, Ltd.	Penn Energy - Edwardsburgh_Brockville-1	Edwardsburgh/Cardinal	Solar PV Groundmount	9,333	East	AWAITING ECT	
Penn Energy Renewables, Ltd.	Penn Energy - Thunder Bay_Ft. William	Thunder Bay	Solar PV Groundmount	7,700	Northwest	AWAITING ECT	
PIONEER WIND PARK LP	PIONEER WIND PARK	Shedden	Wind On-Shore	10,000	West of London	AWAITING ECT	
POLAR BEAR WIND PARK LP	POLAR BEAR WIND PARK	WELLINGTON	Wind On-Shore	20,000	East	AWAITING ECT	
Preneal Canada Inc.	Northern Bruce Penisula 150 MW	Lion's Head, Northern Bruce Peninsula	Wind On-Shore	150,000	Bruce	AWAITING ECT	ENABLER REQUESTED
Quixote One Wind Energy Corp	Q1WEC	Tiverton	Wind On-Shore	2,500	Bruce	AWAITING ECT	
Quixote Three Wind Energy Corp.	Q3WEC	Clinton	Wind On-Shore	2,500	Bruce	AWAITING ECT	
Quixote Two Wind Energy Corp.	Q2WEC	Kincardine	Wind On-Shore	2,500	Bruce	AWAITING ECT	
RE Adelaide 1 ULC	RE Adelaide 1	Strathroy	Solar PV Groundmount	4,000	West of London	AWAITING ECT	
RE Adelaide 1 ULC	RE Adelaide 1a	Strathroy	Solar PV Groundmount	2,500	West of London	AWAITING ECT	
RE Adelaide 1 ULC	RE Adelaide 1b	Strathroy	Solar PV Groundmount	2,000	West of London	AWAITING ECT	
RE Smiths Falls 3 ULC	RE Smiths Falls 3a	Smiths Falls	Solar PV Groundmount	1,000	East	AWAITING ECT	
RE Smiths Falls 3 ULC	RE Smiths Falls 3b	Smiths Falls	Solar PV Groundmount	500	East	AWAITING ECT	
RE Smiths Falls 3 ULC	RE Smiths Falls 3c	Smiths Falls	Solar PV Groundmount	500	East	AWAITING ECT	
RE Sunningdale 1 ULC	RE Sunningdale 1	Thorndale	Solar PV Groundmount	7,000	West of London	AWAITING ECT	
RE Waubaushene 5 ULC	RE Waubaushene 5a	Coldwater	Solar PV Groundmount	1,000	Central	AWAITING ECT	
RE Waubaushene 5 ULC	RE Waubaushene 5b	Coldwater	Solar PV Groundmount	500	Central	AWAITING ECT	
RE Wonderland 1 ULC	RE Wonderland 1	London	Solar PV Groundmount	6,500	West of London	AWAITING ECT	
Redbird Energy	Redbird Energy SEGP Wind Farm	Billings	Wind On-Shore	10,000	Northeast	AWAITING ECT	
Renfrew Power Generation Inc.	First Chute	Horton	Water	1,700	East	AWAITING ECT	
Renfrew Power Generation Inc.	Clear Point	Renfrew	Water	4,000	East	AWAITING ECT	
Ronald Dagg	Eirin Wind Farm	Forest	Wind On-Shore	10,000	West of London	AWAITING ECT	
Roubos Wind Energy Ltd.	Teviotdale 2	Moorefield/Township of Wellington North	Wind On-Shore	1,200	Bruce	AWAITING ECT	
Saturn Power Inc.	Forest Lea Solar Farm	Pembroke	Solar PV Groundmount	6,500	Central	AWAITING ECT	
Saturn Power Inc.	Goshen Solar Farm	Renfrew	Solar PV Groundmount	5,000	East	AWAITING ECT	

Schneider Power Spring Bay Inc.	Spring Bay	Township of Central Manitoulin	Wind On-Shore	4,000	Northeast	AWAITING ECT	
Schouten Corner View Farms Ltd.	Schouten Corner View Farms Ltd.	Richmond	Bio-Gas	498	East	AWAITING ECT	
Schouten Dairy Farms Inc.	Schouten Dairy Farms Inc.	Richmond	Bio-Gas	498	East	AWAITING ECT	
Sequoia Loch Lomond Solar Energy LP	Giizis Power	Thunder Bay	Solar PV Groundmount	10,000	Northwest	AWAITING ECT	
Silvercreek Solar Park Inc.	Silvercreek Solar Park	Aylmer	Solar PV Groundmount	10,000	West of London	AWAITING ECT	
Sky Generation Inc.	Proof Line II	Forest	Wind On-Shore	3,600	West of London	AWAITING ECT	
SkyPower CL 1 LP	Crown Solar 1	Grant/Charlton	Solar PV Groundmount	10,000	Northeast	AWAITING ECT	
SkyPower Napanee Roads LP	Napanee Roads	Napanee	Solar PV Groundmount	10,000	East	AWAITING ECT	
SkyPower Otonabee LP	Otonabee	Peterborough	Solar PV Groundmount	10,000	East	AWAITING ECT	
Skyway 127 Wind Energy Inc.	Skyway 127	Port Elgin	Wind On-Shore	100,000	Bruce	AWAITING ECT	
Solar Semiconductor Inc.	Great Lakes One	Newburgh	Solar PV Groundmount	9,500	East	AWAITING ECT	
St. Catharines Hydro Generation Inc.	Shickluna Hydro Electric Generating Station	St. Catharines	Water	4,000	Niagara	AWAITING ECT	
St. Columban Energy LP	St. Columban 2 Wind Energy Project	Seaforth	Wind On-Shore	15,000	Bruce	AWAITING ECT	
St. Columban Energy LP	St. Columban 1 Wind Energy Project	Seaforth	Wind On-Shore	18,000	Bruce	AWAITING ECT	
Summerhaven Wind, LP	Adelaide Wind Energy Centre	Kerwood	Wind On-Shore	60,000	West of London	AWAITING ECT	
Suncor Energy Products Inc.	Camlachie Wind Power Project	Camlachie	Wind On-Shore	20,000	West of London	AWAITING ECT	
Suncor Energy Products Inc.	Cedar Point Wind Power Project Phase II	Forest	Wind On-Shore	100,000	West of London	AWAITING ECT	
Suncor Energy Products Inc.	Cedar Point Wind Power Project Phase I	Forest	Wind On-Shore	50,000	West of London	AWAITING ECT	
Suncor Energy Products Inc.	Adelaide Wind Power Project	Strathroy	Wind On-Shore	40,000	West of London	AWAITING ECT	
SunE James LP	SunE James	Township of Drummond	Solar PV Groundmount	10,000	East	AWAITING ECT	
SunE McGale LP	SunE McGale	Jasper	Solar PV Groundmount	10,000	East	AWAITING ECT	
SunE McWilliams LP	SunE McWilliams	Ottawa	Solar PV Groundmount	10,000	East	AWAITING ECT	
SunE Paddock LP	SunE Paddock	Jasper	Solar PV Groundmount	10,000	East	AWAITING ECT	
SunE Ray LP	SunE Ray	Township of North Elmsley	Solar PV Groundmount	10,000	East	AWAITING ECT	
SunE Saar LP	SunE Saar	Pembroke	Solar PV Groundmount	10,000	East	AWAITING ECT	
SunE South Stormont LP	SunE South Stormont	Newington	Solar PV Groundmount	10,000	East	AWAITING ECT	
SunE Steepe LP	SunE Steepe	Perth	Solar PV Groundmount	10,000	East	AWAITING ECT	
Superior Shores Wind Farm L.P.	Superior Shores Wind Farm	Heron Bay	Wind On-Shore	25,300	Northwest	AWAITING ECT	
Superior Windfarm LP	Superior Windfarm	Dorion	Wind On-Shore	13,800	Northwest	AWAITING ECT	
Teviotdale Wind Power Inc.	Teviotdale 1	Moorefield/Township of Wellington North	Wind On-Shore	10,000	Bruce	AWAITING ECT	
Toronto Hydro Energy Services Inc.	ABTP Biogas Cogen Plant	Toronto	Bio-Gas	9,912	Central	AWAITING ECT	
Toronto Hydro Energy Services Inc., OPPL	Green Lane	St. Thomas	Landfill	9,912	West of London	AWAITING ECT	
TTD Wind Project ULC	Twenty Two Degree Energy	Holmesville	Wind On-Shore	150,000	Bruce	AWAITING ECT	
UDI Renewables Corporation	UDI Nanticoke Wind Farm	Nanticoke	Wind On-Shore	10,000	Niagara	AWAITING ECT	
Upper Canada Windfarm Inc.	Upper Canada Wind Farm	Lansdowne	Wind On-Shore	12,500	East	AWAITING ECT	
Vortex Wind Power Limited	Kefkatikgwam Mountain Phase 3	Nipigon	Wind On-Shore	20,000	Northwest	AWAITING ECT	ENABLER REQUESTED
Vortex Wind Power Limited	Kefkatikgwam Mountain Phase 1	Nipigon	Wind On-Shore	20,000	Northwest	AWAITING ECT	ENABLER REQUESTED
Vortex Wind Power Limited	Kefkatikgwam Mountain Phase 2	Nipigon	Wind On-Shore	20,000	Northwest	AWAITING ECT	ENABLER REQUESTED
Walpole Island First Nation	Wind Bkejer	Wallaceburg	Wind On-Shore	10,000	West of London	AWAITING ECT	
Weber Wind Farm Inc.	Weber Wind Farm	Mapleton	Wind On-Shore	10,000	Niagara	AWAITING ECT	
Westhills Power Corp.	Horton Solar Park	Renfrew	Solar PV Groundmount	10,000	East	AWAITING ECT	
Wikwemikong-Preneal Wind 100 LP	Wikwemikong 100 MW	Wikwemikong	Wind On-Shore	100,000	Northeast	AWAITING ECT	ENABLER REQUESTED
Wikwemikong-Preneal Wind 26 LP	Wikwemikong 26 MW	Wikwemikong	Wind On-Shore	26,000	Northeast	AWAITING ECT	
Wind Energy Niagara LTD.	Wainfleet Wind Power Development	Wainfleet	Wind On-Shore	10,000	Niagara	AWAITING ECT	
WIND FARM STONETOWN LP	WIND FARM STONETOWN	ST. MARYS	Wind On-Shore	10,000	West of London	AWAITING ECT	
Windstream Bruce Inc.	Bruce Peninsula Wind Farm	Municipality of South Bruce	Wind On-Shore	125,000	Bruce	AWAITING ECT	
Windstream Elk Lake Inc. JV with Windstream Energy Inc & O	Elk Lake Wind Farm	Elk Lake	Wind On-Shore	200,000	Northeast	AWAITING ECT	
Windstream North Inc.	Ranger Lake Wind Farm A Phase 2	Searchmont	Wind On-Shore	50,000	Northeast	AWAITING ECT	
Windstream North Inc.	Ranger Lake Wind Farm B Phase 2	Searchmont	Wind On-Shore	50,000	Northeast	AWAITING ECT	
Windstream North Inc.	Ranger Lake Wind Farm A Phase 1	Searchmont	Wind On-Shore	50,000	Northeast	AWAITING ECT	
Windstream North Inc.	Ranger Lake Wind Farm B Phase 1	Searchmont	Wind On-Shore	50,000	Northeast	AWAITING ECT	
Windstream Temagami Inc. JV with Windstream Energy Inc. &	Friday Lake Wind Farm	Best & Gillies Limit TWP/ Latchford	Wind On-Shore	100,000	Northeast	AWAITING ECT	
wpd Canada Corp.	Shiloh Wind Farm	Alvinston	Wind On-Shore	46,000	West of London	AWAITING ECT	
wpd Canada Corp.	Napier Wind Farm	Kerwood	Wind On-Shore	5,400	West of London	AWAITING ECT	
wpd Canada Corp.	Petrolia Wind Farm	Petrolia	Wind On-Shore	18,400	West of London	AWAITING ECT	
wpd Canada Corp.	Wilkesview Wind Farm	Sombra	Wind On-Shore	13,800	West of London	AWAITING ECT	
Xeneca Limited Partnership	Quibell: Lots 2 & 6 Con III-V Wabigoon - 2127613	Dryden District	Water	4,500	Northwest	AWAITING ECT	
Xeneca Limited Partnership	Island Falls 2130760	Fort Frances District	Water	3,000	Northwest	AWAITING ECT	
Xeneca Limited Partnership	Long Rapids 2130752	Fort Frances District	Water	3,600	Northwest	AWAITING ECT	
Xeneca Limited Partnership	Wabigoon Falls - 6774008	Kenora District	Water	3,900	Northwest	AWAITING ECT	
Xeneca Limited Partnership	Above Ball Lake 2127580	Kenora District	Water	4,100	Northwest	AWAITING ECT	
Xeneca Limited Partnership	Jocko River - 2089282	North Bay District	Water	4,400	Northeast	AWAITING ECT	
Xeneca Limited Partnership	Flower Falls - 2125852	Sioux Lookout District	Water	9,900	Northwest	AWAITING ECT	
Xeneca Limited Partnership	7th - 5th Falls	Sioux Lookout District	Water	6,400	Northwest	AWAITING ECT	
Xeneca Limited Partnership	12th Falls - 8th Falls - 2125855	Sioux Lookout District	Water	5,800	Northwest	AWAITING ECT	
Xeneca Limited Partnership	13th Fall McDougall Mills 2188163	Sioux Lookout District	Water	3,000	Northwest	AWAITING ECT	
Xeneca Limited Partnership	Shabaqua Corner 2124726	Thunder Bay District	Water	2,400	Northwest	AWAITING ECT	
Xeneca Limited Partnership	Roaring Rapids 3.2km from Mouth 2118969	Thunder Bay District	Water	5,100	Northwest	AWAITING ECT	ENABLER REQUESTED
Xeneca Limited Partnership	Kamiskotia Falls 2130765	Timmins District	Water	3,800	Northeast	AWAITING ECT	
ZERO EMISSION PEOPLE PLEASANT BAY LP	ZERO EMISSION PEOPLE PLEASANT BAY	WELLINGTON	Wind On-Shore	20,000	East	AWAITING ECT	
Zurich Wind Power LP	Zurich Wind Farm	Municipality of Bluewater	Wind On-Shore	37,500	Bruce	AWAITING ECT	

The attached is Exhibit "C" to the

Affidavit of Lloyd Payne, sworn before

me this 28th day of April, 2011.

Leeanne Vreugdenhil

A Commissioner, etc.

LEEANNE BETTY VREUGDENHIL, a
Commissioner etc., Province of Ontario
for McCarthy & Fo[illegible] Barrister & Solicitors.
Expires April 14, 2013

FIT Contracts Offered February 24 - Applicant Legal Name Order

Applicant Legal Name	Project Name	Project City	Project Source	Nameplate Capacity (kW)	Region	Current State
Aria LP	Aria	Elmvale	Solar PV Groundmount	9,000	Central	CONTRACT OFFERED
Atlantic Packaging Products Ltd.	Atlantic Packaging - 5711 Atlantic Dr	Mississauga	Solar PV Rooftop	500	Central	CONTRACT OFFERED
Atlantic Packaging Products Ltd.	Atlantic Packaging - 1900 Thickson Rd	Whitby	Solar PV Rooftop	500	East	CONTRACT OFFERED
Balsam Lake Green Energy	Balsam Lake Green Energy Solar Farm	Kawartha Lakes	Solar PV Groundmount	3,000	Central	CONTRACT OFFERED
BeamLight LP	BeamLight	Georgina	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
Canadian Solar Developers Ltd.	Canadian Solar Developers Ltd. L.P. #15	Barrie	Solar PV Groundmount	250	Central	CONTRACT OFFERED
Canadian Solar Developers Ltd.	Canadian Solar Developers Ltd. L.P. #16	Barrie	Solar PV Groundmount	250	Central	CONTRACT OFFERED
Canadian Solar Developers Ltd.	Canadian Solar Developers Ltd. L.P. #17	Barrie	Solar PV Groundmount	250	Central	CONTRACT OFFERED
CityLights LP	CityLights	Chesterville	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
DiscoveryLight LP	DiscoveryLight	Thorah	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
EarthLight LP	EarthLight	Pefferlaw	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
FotoLight LP	FotoLight	Prince Edward County	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
GoldLight LP	GoldLight	Georgina	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
GoodLight LP	GoodLight	Eldon	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
Illumination LP	Illumination	Scugog	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
LunarLight LP	LunarLight	Belleville	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
MightySolar LP	MightySolar	Chesterville	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Nigig Power Corporation	Nigig Power Corporation	Pickerel	Wind On-Shore	300,000	Central	CONTRACT OFFERED
Penn Energy Renewables, Ltd.	Penn Energy - Ridgefield	Kawartha Lakes	Solar PV Groundmount	8,000	Central	CONTRACT OFFERED
Penn Energy Renewables, Ltd.	Penn Energy - Brantgate	Burford Township	Solar PV Groundmount	5,000	Niagara	CONTRACT OFFERED
Penn Energy Renewables, Ltd.	Penn Energy - Brantgate (i-1)	Burford Township	Solar PV Groundmount	2,000	Niagara	CONTRACT OFFERED
Penn Energy Renewables, Ltd.	Penn Energy - Brantgate (i-2)	Burford Township	Solar PV Groundmount	1,000	Niagara	CONTRACT OFFERED
Penn Energy Renewables, Ltd.	Penn Energy - VanDorp	Port Hope	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Penn Energy Renewables, Ltd.	Penn Energy - Roseplain	Uxbridge	Solar PV Groundmount	6,500	Central	CONTRACT OFFERED
Perpetual Energy Systems, LLC	Perpetual Cleanpower Lindsay	Lindsay	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
Perpetual Energy Systems, LLC	Perpetual Cleanpower Oro 4 Line	Oro-Medonte	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
RayLight LP	RayLight	Wyebridge	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
Renewable Energy Business (R.E.B.) Limited	Niagara Region Wind Farm	Smithville	Wind On-Shore	230,000	Niagara	CONTRACT OFFERED
Saturn Power Inc.	David Brown Solar Park	Ingleside	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
SOLAR SPIRIT LP	SOLAR SPIRIT 4	Belleville	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Solray Energy Corporation	Solray Energy Forfar 3	Forfar	Solar PV Groundmount	500	East	CONTRACT OFFERED
Solray Energy Corporation	Solray Energy Epsom	Port Perry	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Solray Energy Corporation	Solray Energy Sunderland	Beaverton	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
SparkleLight LP	SparkleLight	Kawartha Lakes	Solar PV Groundmount	10,000	Central	CONTRACT OFFERED
SunE Ray LP	SunE Newboro 1	Drummond	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
SunE Ray LP	SunE Newboro 4	Rideau Lakes	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
SunE South Stormont LP	SunE Bruining 1	Ingleside	Solar PV Groundmount	10,000	East	CONTRACT OFFERED
Timber Run Hydropower Corporation	Norland Dam Hydropower Development	Kawartha Lakes	Water	500	Central	CONTRACT OFFERED
UDI Renewables Corporation	UDI Port Ryerse Wind Farm	Simcoe	Wind On-Shore	10,000	Niagara	CONTRACT OFFERED
Windlectric Inc.	Amherst Island Wind Project	Stella	Wind On-Shore	75,000	East	CONTRACT OFFERED

The attached is Exhibit "D" to the

Affidavit of Lloyd Payne, sworn before

me this 28th day of April, 2011.

A Commissioner, etc.

LEEANNE BETTY VREUGDENHIL, a
Commissioner etc., Province of Ontario
for McCarthy & Fowler, Barrister & Solicitors.
Expires April 14, 2013

STUDY

Effects of High Voltage Transmission Line In Proximity of Highways

Submitted to

Ministry of Transportation

Submitted By

DMD & Associates Ltd.
Surrey, BC

1369-05
September 30, 2005

STUDY

Effects of High Voltage Transmission Line In Proximity of Highways

BC Ministry of Transportation

Executive Summary

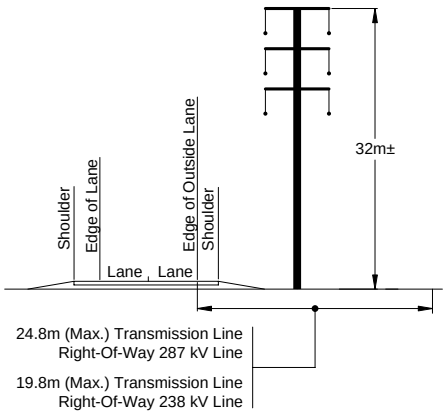
This study is a follow-up to the 2001 *Review of Overhead Transmission Lines in Highway Right-of-Ways* report undertaken by DMD and Associates Ltd. The original report reviewed issues and impacts of locating 138kV (and smaller) transmission lines within Ministry right-of-way's. The purpose of this follow-up report is to define impacts and required clearances from 230 kV and 287 kV transmission lines to Ministry roadways and buildings.

This study is a joint effort between DMD and Associates Ltd and Lex Engineering Ltd with design calculations undertaken by Detmold Consulting Ltd. Calculations were undertaken to verify corona inception, radio interference, audio noise, magnetic field and electric field so clearance from transmission lines to the traveled roadway can be defined. Results calculated were within industry standards and practice.

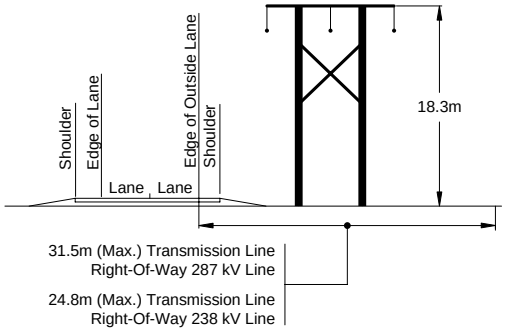
Relaxing MoT's policy to allow transmission lines rated at 230kV and 287kV within a highway right-of-way should have little effect on normal highway operations and the general public. However, the existence of a transmission line within the highway right-of-way will effect the placement of parallel utilities, mainly communications systems. Future building placement will also be impacted.

Based on calculations for single circuit transmission, for a transmission line with the conductors arranged horizontally on an 18m high structure, the right-of-way requirements would be approximately 24.8m for a 238kV line and 31.5m for a 287kV line assuming a tangent road cross-section. If the conductors are arranged vertically, on a 32m high mono-tube structure the requirements would be 19.8m for a 238kV Line and 24.8m for a 287kV line. These right-of-way distances would be measured from the edge of travel lanes. Additional right-of-way will be required for curved road sections.

A formal submittal shall be made where there is a request for placement of a transmission line within a MoT right-of-way or in proximity to a highway. Calculations and designs should be undertaken based on established design criteria (copy in appendix) and submitted for review. The design criteria would serve as a basis for acceptance.



Monotube Structure
(Vertical Conductor Arrangement)



H Frame Structure
(Horizontal Conductor Arrangement)

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BC Ministry of Transportation

1. Introduction

This study is a follow-up to the 2001 *Review of Overhead Transmission Lines in Highway Right-of-Ways* report undertaken by DMD and Associates Ltd. The original report reviewed issues and impacts of locating 138kV (and smaller) transmission lines within Ministry right-of-way's. The purpose of this follow-up report is to define impacts and required clearances from 230 kV and 287 kV transmission lines to Ministry roadways and buildings. We have undertaken calculations to verify required horizontal clearance between transmission lines and the traveled roadway.

The information in this report is a joint effort between DMD and Associates Ltd. and Lex Engineering Ltd. Calculations were undertaken by Detmold Consulting Ltd.

2. Define pole/structure and line configurations

Various pole configurations exist for supporting transmission lines of 138 kV or greater. Some example configurations are lattice towers, steel mono-tube structures and wood H-frame structures as shown in the photos below.

Overhead transmission lines require a separation between the overhead conductors which transmit the power in separate three phase circuits. Each of these three phase circuits will typically require a minimum of 6.7m separation for voltages of 230 kV and above. This separation can be achieved by stacking the conductors vertically or horizontally. The photographs on page 2 show various scenarios. The arrangement of the conductors typically defines the type of structure.

There is no simple method for determining what configuration is used in any given area, without going through a detailed design. Each pole line is designed for the specifics of the area, voltage and number of conductors and circuits. Some factors which impact the type of structure are soils, grades, right-of-way width, wind pressures, ambient temperature range, seismic zone, etc.

Steel mono-tube structures are typically used in an urban setting where development is located on one side of the pole line and the road is on the other side. These structures have three groups of conductors stacked vertically above each other. This requires a very tall pole to provide the required vertical clearances. The main advantage of mono-tube structures is that they can be set at greater distance apart requiring fewer poles. As well, the horizontal foot-print of the structure is relatively small and as such can be used in narrow urban right-of-ways. The disadvantages are the relatively high cost and tall poles which are typically more visible. Steel mono-tube Y type structures will allow conductors to be arrayed horizontally and as such may reduce structure height.

Wood H-frame structures are typically used in rural areas where lower mounting heights and shorter spans between poles can be applied. Wood H-frame structures are far cheaper than steel mono-tube or lattice type structures and as such are typically the most cost effective option. Conductors are only arrayed horizontally thus reducing the required mounting heights.

Lattice type structures are typically used in both mono-tube and wood H-frame structure applications. They will typically have a much larger foot print than mono-tube or H frame structures. Conductors can be arrayed vertically or horizontally with a lattice structure.

An order of magnitude installation cost per kilometer with wood H-structures would be approximately $200K to $400K per kilometer. In comparison, an installation with steel mono-tube or lattice poles would be approximately $300K to $600K per kilometer. We would caution that the above costs may vary drastically depending on the type of soils, grades, right-of-way width, wind pressures, seismic zone, etc and should not be used for cost estimation. These costs are for the installation of the poles and conductors only and don't include right-of-way costs, cost for clearing, etc.

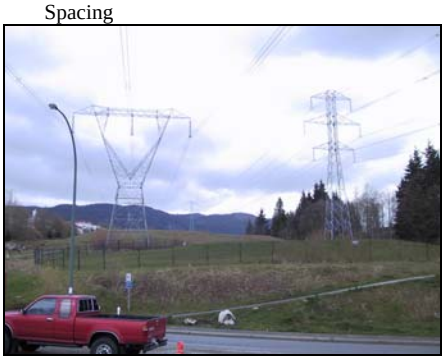
Poles with a vertical conductor arrangement will require higher mounting heights than those with horizontal conductor arrangement.

A line constructed with mono-tube structures will typically be more expensive to construct, however, this type of structure has advantages in urban areas with limited right-of-way, or where longer spans between poles are required, or where additional vertical clearances are required for highway crossings.

In terms of maintaining the required clear zone, a Y or Mono-tube structure will be much better suited to narrow urban right-of-ways. The clear zone should apply not only to the transmission structures, but also to the associated guys and anchors. The selection of a particular structure design should be the responsibility of the transmission line designer.

230kV Double Cct Mono-tube Steel Pole (Right Side of Photo) – Vertical Conductor Spacing

230kV Single Circuit Wood Pole H-Frame – Horizontal Conductor Spacing



500kV Single Circuit Steel Lattice Tower (Left Structure) – Horizontal Conductor Spacing
230kV Double Circuit Steel Lattice Tower (Right Structure) – Vertical Conductor Spacing

500kV Single Circuit Steel 'Y' Structure – Horizontal Conductor Spacing

3. Electrical and Magnetic Effects

To verify the required offsets and clearances, we have undertaken transmission line calculations using transmission line design software. Calculations undertaken include corona inception, radio interference, audible noise, electric field and magnetic fields. In all cases, the results for both 238kV and 287kV transmission lines are within recommended guidelines based on offsets shown on sketches 1A, 1B, 2A and 2b which are in the Appendix.

Commentary on the calculations is as follows:

- **Corona Inception**: Corona is the ionization of the air close to an energized conductor caused when the voltage gradient of the conductor is high enough to pull the electrons of the air molecules out of their orbits (producing ions). The voltage gradient at which this happens is the corona inception gradient. This is why the maximum voltage gradient of the conductor should be below the corona inception gradient. This is to avoid radio interference. Based on our calculations, the maximum voltage gradients are below the positive corona inception.
- **Radio Interference**: Values were calculated at 15m outside the outer conductor (closest to the road) and meet CSA maximum allowable radio interference levels in fair weather (CSA doesn't define requirement in foul weather). Any MoT Guidelines should include a statement that the transmission line is to be designed to comply with CSA standards for Maximum Allowable Radio Interference (Fair Weather).
- **Audible Noise**: This would not be an issue on a typical highway. However, it could be of concern in residential areas where local noise bylaws are present. The calculations undertaken do include noise levels. However, the audible noise from the transmission lines would be far less impacting than the sound from the traffic itself.
- **Electric Field**: This is the most critical element. The electric field strength within the right-of-way has been calculated and is shown on each of the sketches attached. The calculated levels at the edge of the driving lanes are:

    i. Sketch 1A- 1.2kV/m

    ii. Sketch 2A- 1.1kV/m

    iii. Sketch 1B- 1.4kV/m

    iv. Sketch 2B- 1.7kV/m

    In our report, we will define maximum levels that would apply to the traveled portion of the roadway and pull-outs, parking areas, etc. It appears that a common standard in the US is a maximum 10kV/m at the edge of the roadway. The ***BC Hydro Transmission Engineering, Technical Procedures Manual*** recommends the electric field at the edge of the right-of-way shall not exceed 10kV/m. We recommend the electrical field not exceed 5kV/m at edge of roadway and / or right-of-way which in this case would be met.

Vehicle fueling could be an issue only for large vehicles parked parallel to the transmission line. The induced voltage between a large transport truck and a fuel truck could conceivably be large enough to cause a spark. This problem can easily be eliminated by attaching a ground wire between the two vehicles during refueling. In general, we would not recommend locating vehicle fueling facilities under or immediately adjacent to power lines.

- **Magnetic Field**: This is another key element to consider. The magnetic field strength within the right-of-way has been calculated and is shown on sketches 1A, 1B, 2A and 2b. The calculated levels at the edge of the driving lanes are:

  v. Sketch 1A- 95 milliGauss

  vi. Sketch 2A- 65 milliGauss

  vii. Sketch 1B- 125 milliGauss

  viii. Sketch 2B- 85 milliGauss

  US Standards appear to be a maximum of 150 or 200 milliGauss at the edge of the highway right-of-way. To put this in perspective, 1000 milliGauss is the maximum general public exposure where interference with human heart pacemakers can occur.

  The magnetic field is another safety issue, and as such the maximum field level that would apply to the traveled portion of the roadway and pull-outs, parking areas, etc should not exceed 200 milliGauss which in this case would be met.

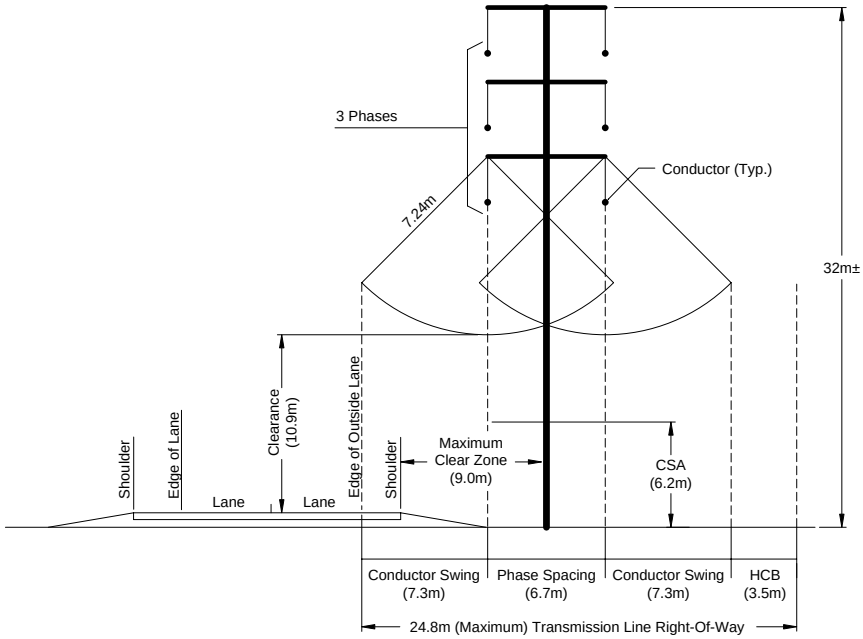
As with all these effects, it is critical that calculations be undertaken on a per project basis to verify impacts.

4. Right of Way Requirements

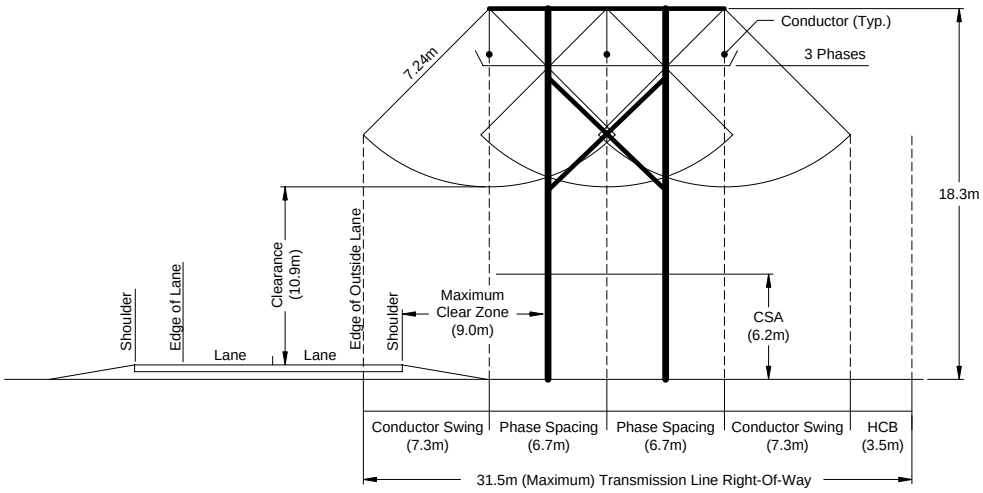
The main issues in determining the right-of-way is determining the horizontal and vertical clearances from the traveled portion of the roadway, including allowance for conductor swings out over the roadway. To determine this clearance, we have retained the services of a transmission line designer to undertaken calculations using transmission design software. Based on calculations for single circuit transmission, for a transmission line with the conductors arranged horizontally, the right-of-way requirements would be approximately 24.8m for a 238kV line and 31.5m for a 287kV line assuming a tangent road cross-section. If they conductors are arranged vertically, on a mono-tube structure the requirements would be 19.8m for a 238kV Line and 24.8m for a 287kV line.

These right-of-way distances would be measured from the outside edge of travel lanes. Additional right-of-way will be required for curved road sections.

Typical road cross sections with mono-tube and H-frame structures are defined below.



Monotube Structure (Vertical Conductor Arrangement)
HCB - Horizontal Building Clearance



H Frame Structure (Horizontal Conductor Arrangement)
HCB - Horizontal Building Clearance

1. Power lines crossing highways must meet highway vertical clearance over driving lanes under worst sag conditions.
2. Power lines paralleling highways must meet highway vertical clearances over driving lanes under all conductor conditions.
3. Power lines paralleling highways must provide CSA horizontal clearance to buildings (HCB) from swung conductors to edge of driving lanes.
4. Power lines paralleling highways must meet CSA vertical clearances over highway rights of way.
5. Clearance over roadway is based on BC Hydro Power line Design Manual 5.2 Table K, Minimum Clearance for New Construction on AC Power lines.

Typical Cross Sections (287kV)

All poles, guys, anchors and other power line components subject to physical damage should be installed beyond the MoT designated clear zone for the roadway in question.

Design AADT	Minimum Clear Zone Width (m) Design Speed (km/h)				
	60	70 to 80	90	100	110 to 120
Under 750	2.0	3.0	4.0	5.0	6.0
750-1500	3.0	4.0	5.0	6.0	7.0
1501-6000	4.0	5.0	6.0	8.0	9.0
over 6000	5.0	6.0	7.0	9.0	9.0

MoT Clear Zone (from Tech Bulletin DS96001)

5. Vertical Transmission Clearances

Overhead transmission can run parallel with the road or highway and cross the road or highway provided the required vertical clearances listed below are achieved and poles are located outside of the MoT clear zone. Note that running transmission lines over buildings will require special permission from the ***British Columbia Safety Authority*** which is not typically granted.

Vertical clearances of overhead lines from ground surface or pavement crown shall conform to **BC Hydro Transmission Engineering, Technical Procedures Manual – *5.2 Table K Minimum Clearances for New Construction on AC Power Lines***. The clearances specified in ***CAN/CSA-C22.3 No. 1-01*** are minimum requirements and in certain situations these standards are considered too low and have therefore been modified by BC Hydro to suit conditions in BC. Vertical clearances should be increased accordingly if there is any possibility of future under building with another power line or a communications line. A copy of the ***BC Hydro Transmission Design Manual – 5.2 Table K*** is located in the appendix.

	Voltage Class (Phase to Phase)	
Crossing Over	230kV	287kV
Land Accessible to:		
Vehicles and Equipment -	7.1m	7.5m
Pedestrians Only -	6.0m	6.4m
Roads – where no provision is made for future power lines along:		
Minor Roads	7.9m	8.3m
Highways	10.5m	10.9m
Roads – where provision is made for future power lines up to 25kV along:		
Minor Roads and Highways	13.6	14.1m
Logging and Mining Roads (L = load height)	L + 3.5m	L + 3.9

Minimum Vertical Clearance of Transmission Lines (From BCH 5.2 Table K)

Minimum distances between electrical power lines and any highway structure shall conform to WCB regulations; the distances are summarized below. Special

precautions and proper work procedure must still be followed even if minimum clearance distances are maintained. WCB clearances would also be an issue where transmission lines run over buildings or MoT signal, lighting and sign poles.

Voltage (Phase to Phase)	Minimum Distance (Meters)
0 to 750	1.0
Over 750 to 75,000	3.0
Over 75,000 to 250,000	4.5
Over 250,000 to 550,000	6.0

Minimum WCB Clearances from Overhead Lines

When defining vertical clearances future development as well as other utilities will impact clearances and must be considered.

6. Impacts on Other Utilities

BC Hydro policy would not permit placing a distribution circuit (25kV or less) on the same structures as 138kV and higher voltage lines. The distribution line would have to be on the opposite side of the highway.

Communications lines along the power line would have to be ADSS (all dielectric).

The purpose of the two requirements above is to avoid unsafe induction voltages on the distribution or communications systems.

Pipelines would have to be separated from any transmission line 66kV and up by 10m minimum horizontally as per ***CAN/CSA22.3 No.6***. This is to provide adequate working space for pipeline maintenance.

7. Impacts on Highways Maintenance

In very heavy snow areas, snow removed from the road should not be piled directly under the transmission line to a depth which would reduce clearances below code clearances for a person standing on the snow bank.

Over height equipment moved along the highway could be a problem for the line designs relying on vertical separation. The problems that normally relate to line crossings would now also be a concern continuously along one side of the highway.

We had contacted various MoT District Highway Operations staff and the Road and Bridge Maintenance Contractor, Yellowhead Road and Bridge in Fort St John, where recent 138kV transmission lines have been installed to discuss concerns / issues. No maintenance issues or concerns where registered.

Power line maintenance should have little impact on highway operations and maintenance as any work to the line would be done off the highway.

8. Review of all Applicable Codes and Regulations

The Provincial and National standards that regulate and/or recommended minimum standards for the design, construction, operation and maintenance of transmission lines and other utilities and structures in the vicinity of transmission lines are as follow:

- ***CAN/CSA-C22.3 No. 1-01 Overhead Systems*** which covers the requirements for construction of overhead systems. The ***BC Hydro Transmission Engineering: Technical Procedures*** would normally be used for design purposes because it has more stringent requirements than *CAN/CSA 22.3*. The BC Hydro standards are also more detailed than the *CAN/CSA 22.3* and as such are an excellent guideline for those designing a transmission line.
- ***BC Hydro Transmission Engineering: Technical Procedures - Vertical Clearances for Overhead Lines on BC Hydro Transmission Systems*** covers the minimum vertical clearance of AC transmission lines crossing over land, roads, railways, pipelines and other wires. Since BC Hydro's standards for vertical clearance are more stringent than ***CAN/CSA-C22.3 No. 1-01***, BC Hydro Technical Procedures are recommended.
- ***Industrial Health and Safety Regulations, Workers Compensation Board (WCB)*** covers minimum distances between exposed, energized high voltage electrical equipment and conductors and any worker, work, tool, machine, equipment or material. This will typically apply to signal and lighting poles.
- ***CAN/CSA-C22.3 No. 3-98 Electrical Coordination*** which covers the principles and practices applicable for the purpose of effecting electrical coordination between organizations that operate electrical supply or communication systems. It addresses power system influences due to electrical, magnetic and conductive coupling between the two systems during normal power system operation as well as abnormal or fault conditions. This Standard also provides guidelines to mitigate these power system influences thereby reducing shock hazards and equipment failures. When dealing with transmission lines 230kV and above it is likely only fibre optic cables can be installed in the right-of-way as they will not be impacted by the transmission lines
- ***CAN/CSA-C22.3 No. 5.1-93 Recommended Practices for Electrical Protection - Electric Contact Between Overhead Supply and Communication Lines*** covers the principles and general practices of electrical protection applicable to overhead supply systems operating at more than 750V but less than 50kV phase to phase and communication systems. When these principal are applied it is intended to minimize the risk associated with electrical contact. However, if contact does occur it ensures that the contact voltage does not exceed a predetermined limit therefore providing a degree of protection to people, property and equipment. When dealing with transmission lines 230kV and above it is likely only fibre optic cables can be installed in the right-of-way as they will not be impacted by the transmission lines.

- ***CAN/CSA-C22.3 No. 6-M91 Principles and Practices of Electrical Coordination Between Pipelines and Electric Supply Lines*** which covers methods of electrical coordination between pipelines and power lines having line-to-ground voltages greater than 35kV (60kV phase to phase). This Standard describes mutual interference effects and specifies methods that will reduce these effects.

9. Survey of the Practice of Other Jurisdictions in North America

Numerous surveys and information collection was undertaken as part of the 2001 DMD Transmission Line Study. In the 2001 study, we determined that the only jurisdictions in Canada which regulate voltages of transmission lines in right-of-ways were Quebec and British Columbia. In the United States, each state has different policies regarding locating transmission lines in their right-of-ways. Most states review applications on an individual basis.

Based on a brief internet search and some basic research, listed below are some specific requirement from other jurisdictions:

Electric Field

- Several US states guidelines - 10kV/m
- ESB (Ireland) Guidelines - 5kV/m general public exposure
- BC Hydro Transmission Design Standards – 5kV/m at edge of the right-of-way

Magnetic Fields

- Transmission Line Guideline (Florida) - 150mG at edge of ROW
- Transmission Line Guideline (New York) - 200mG at edge of ROW
- ESB (Ireland) Guidelines - 1000mG general public exposure

Radio Interference

- CSA Maximum allowable RI (Fair Weather) - 50.0 dB

10. Impacts on Other Utilities & Crossings

Copper conductors for telephone, cable TV or other similar services would not be placed on the same poles or structures as the transmission conductors. Copper communication cables have serious restrictions when placed on or near transmission lines. Sufficient horizontal separation does allow installation on the same right of way. ADSS cables are the preferred communication cable for placement on transmission lines. All communications conductors in the same right-of-way as a transmission line should be ADSS (all dielectric) fibre cables.

Metallic pipelines should be adequately separated from the transmission line, preferably by locating the pipeline on the opposite side of the roadway. The recommendations of Standard CAN/CSA-22.3 No.6-M91 are that any pipeline be located a minimum of 10m from power line footings and other below-ground fault current discharge facilities.

Access roads to a highway will require a vertical clearance to a transmission line consistent with BC Hydro standards, WCB and CSA codes. This could limit locations of access roads to the highway if the transmission line is not designed

with adequate vertical clearance. It is important to note that transmission lines will have to be installed high enough to permit the installation of new access roads wherever they may be required or planned.

11. 500kV Transmission Lines

The electrical and magnetic fields associated with transmission lines increase with the operating voltage of the line. It is recommended that 500kV transmission lines be avoided in common right-of-ways with highways however if it can't be avoided they must be reviewed on a per project basis.

12. Highway 37 Corridor

As requested we have contacted the Stikine District regarding installing a transmission line on Highway 37. We have had some discussions with Fred Saychuck of the Stikine District Office. However, he advised that we should talk to Sheri Applegate as she has been the most involved with transmission lines. Fred did advise that the right-of-way on Highway 37 varies from as narrow as up to the edges of the road shoulder to as wide as 100m. Additional right-of way would therefore be required to construct a transmission adjacent to Highway 37. Sheri offered the following comments:

- Consideration should be given to the impacts on the aesthetics of the highway corridor with the installation of a transmission line. Designated view points should be maintained.
- Avalanche zones should be considered and may be an issue.
- Archeological as well first nations concerns were issues with the construction of the 138kV Coast Mountain Transmission Line and should be investigated.
- A full environmental impact study (EIS) should be undertaken prior to approving the transmission line adjacent to any highway.
- Transmission lines may have impacts on roads used for aviation landing. Areas where aircraft are allowed to land on roads should be reviewed taking into account potential hazard to aircraft.

13. Conclusions

The use of 230kV or 287kV transmission lines would require greater vertical clearances specified in the standards than for lower voltages as noted in this study. Otherwise, there are no special requirements for 230kV or 287kV lines. Issues to be considered are:

- Building transmission lines will ultimately open the door to development. However, the line itself will limit development adjacent to the highway. Provisions would have to be made to accommodate access and future access roads.
- Advance planning should take into account other potential utilities which may be installed in the right-of-way.
- Transmission line clearances should be increased for those lines that cross the highway at cross roads to accommodate signals and roadway lighting which has specific clearance requirements.

- Electric and magnetic fields at the edge of the traveled portion of the roadway, including pull-outs, shoulders and other areas likely to be used for parking of vehicles should not exceed the following at a height of one metre above finished grade:

    1. Electric Field — Not to exceed 5kV rms/ meter
    2. Magnetic Field — Not to exceed 200 milliGauss

- Radio interference at the edge of the traveled portion of the roadway, including pull-outs, shoulders and other areas likely to be used for parking of vehicles should not exceed CSA Maximum Allowable RI (fair weather) of 50dB.
- For Corona inception the maximum voltage gradients (kV/cm) for each conductor shall be below the corona inception gradient (kV/cm). This is to avoid radio interference.

STUDY

Effects of High Voltage Transmission Line In Proximity of Highways

BC Ministry of Transportation

APPENDIX

Design Criteria

BC Hydro Standards

Utility Policies Survey

Calculations

Sketches 1A, 1B, 2A & 2B

DMD

STUDY

Effects of High Voltage Transmission Line In Proximity of Highways

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APPENDIX

Design Criteria

Design Criteria for 230kV and 287kV Transmission Lines Adjacent to Highways

1. Agency requesting transmission lines in MoT right-of-way shall obtain the appropriate permit from MoT prior to proceeding. As part of the approval process the agency requesting the transmission lines shall retain an APEGBC registered electrical engineer qualified in transmission line design to undertake calculations and verify that all of the pertinent criteria listed below have been addressed.

2. The transmission line design shall comply with the requirements of :

    - BC Hydro Transmission Engineering: Technical Procedures - Vertical Clearances for Overhead Lines on BC Hydro Transmission Systems
    - CAN/CSA-C22.3 No. 3-98 Electrical Coordination
    - CAN/CSA-C22.3 No. 1-M87 Overhead Systems
    - Industrial Health and Safety Regulations, Workers Compensation Board (WCB)
    - CAN/CSA-C22.3 No. 5.1-93 Recommended Practices for Electrical Protection - Electric Contact Between Overhead Supply and Communication Lines
    - CAN/CSA-C22.3 No. 6-M91 Principles and Practices of Electrical Coordination Between Pipelines and Electric Supply Lines

3. Clearances shall meet BC Hydro required vertical clearances over the traveled portion of the roadway, including pull-outs, shoulders and other areas likely to be used for parking of vehicles. Vertical clearances should also be maintained where access roads enter the highway or where MoT envisions access roads could enter the highway in the future.

4. All poles, guys, anchors and other power line components should be installed beyond the MoT designated clear zone for the roadway in question.

5. In very heavy snow areas, snow removed from the road should not be piled directly under the line to a depth which would reduce clearances below code clearances for a person standing on the snow bank. Increase vertical clearance or move the line further out to compensate.

6. Electrical and magnetic fields at the edge of the traveled portion of the roadway, including pull-outs, shoulders, future access roads and other areas likely to be used for parking of vehicles should not exceed the following using a sensor height 1 metre above finished grade:

    Electric Field 5kV rms per meter
    Magnetic Field 200milliGauss

7. Radio interference at the edge of the traveled portion of the roadway, including pull-outs, shoulders and other areas likely to be used for parking of vehicles should not exceed CSA Maximum Allowable RI (fair weather) of 50dbu.

8. For Corona inception the maximum voltage gradients (kV/cm) for each conductor shall be below the corona inception gradient (kV/cm). This is to avoid radio interference.

STUDY

Effects of High Voltage Transmission Line In Proximity of Highways

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APPENDIX

BC Hydro Standards

DMD

(a) The existence of an angle greater than zero between the centre lines of the power line and the parked vehicle.

(b) The fact that the vehicle may be restricted to locations where the electric field is less than the maximum value for the subject span.

(c) In some cases, the maximum sag condition and the associated maximum electric field occur only under an emergency loading condition which can exist only for a few hours per year. Care should be exercised in exploiting such a feature, however, because loading conditions may change over the life of the plant.

Table 1 shows the effect of vehicle size on the maximum permissible electric field.

3.0 ELECTRIC FIELDS AT THE EDGE OF RIGHTS-OF-WAY

The maximum electric field at the edge of the right-of-way shall be limited to 5 kV rms/m.

4.0 CALCULATING THE ELECTRIC FIELD

(a) When calculating the electric fields, the conductor voltages shall be taken as the maximum continuous values, e.g. $550/\sqrt{3}$ kV in case of 500 kV class lines.

(b) The electric fields may be calculated using a computer program based on the method given by Deno et al (1982), or by using the graphical method given by Mousa (1982, 1985).

TABLE 1

The Electric Field Limits Imposed by the

5 mA Induced Current Rule

Item	Transport Truck	Farm Machinery	Farm Tractor	Pickup With Camper	Full Size Sedan	School Bus
Size(m)	20.0 x 2.4	7.6 x 2.4	3.7 x 1.5	6.4x2.3	5.3x2	10.7x2.4
Height(m)	4.15	4.15	2.1	2.9	1.4	2.7
Electric Field (kV/m)	6.2	11.4	38.5	15.6	45.5	12.8

TABLE H

HIGHWAY CLEARANCES

(When no allowance is made for underbuilding of future powerlines)

Nominal Voltage	69 kV	138 kV	230 kV	287 kV	345 kV	500 kV
Basic Clearance (m)	9.0	9.0	9.0	9.0	9.0	
Electrical Clearance (m)	0.6	0.9	1.5	1.9	2.2	
Total (m)	9.6	9.9	10.5	10.9	11.2	14.2*1

*1 This clearance is due to induction from a tractor trailer assuming a 525 kV normal operating voltage and a 5 mA "let go" current.

(c) Other Crossings

For all other crossings, the MOC is considered sufficient for new construction.

5.1 - TABLE J

MINIMUM OPERATING CLEARANCES FOR UPRATING
OF AC TRANSMISSION LINES
(m)

Crossing Over*1 *10	Nominal Line to Line Voltage 69 kV	138 kV	230 kV	287 kV	345 kV	500 kV
GROUND*6 Accessible to:						
Vehicles & Equipment*11	5.2	5.5	6.1	6.5	6.8	9.6*8
Pedestrians Only*2 *9	5.0	5.4	6.0	6.4	6.7	7.7
ROADS						
Minor Roads & Highways	6.9	7.3	7.9	8.3	9.4*8	14.2*8
Logging & Mining Roads*3	L+2.5	L+2.9	L+3.5	L+3.9	L+4.2	L+5.2
RAILWAYS*7	8.4	8.7	9.3	9.7	10.0	11.0
PIPELINES	8.6	9.0	9.6	10.0	10.3	11.3
WIRES*4 (STRUCTURES)*5						
0 - 25 kV	1.4(1.4)	2.0(2.0)	2.6(2.6)	3.1(3.1)	3.5(3.5)	4.2(4.2)
69 kV	1.4(1.4)	2.0(2.0)	2.6(2.6)	3.1(3.1)	3.5(3.5)	4.2(4.2)
138 kV		1.5(2.3)	2.1(2.9)	2.7(3.4)	3.0(3.8)	4.2(4.5)
230 kV			2.4(2.8)	3.0(3.3)	3.4(3.7)	4.5(4.4)
287 kV				3.1(3.3)	3.6(3.7)	4.7(4.4)
345 kV					3.7(3.3)	4.9(4.0)
500 kV						5.4(3.7)

*1 The crossing conductors are considered to be in their maximum final sag position. Additional clearance must be provided for survey and construction tolerances.

*2 This is generally ground where the slope is greater than 30° to the horizontal.

TABLE J - (cont'd)

*3 Some judgement must be exercised when determining the value of L (load height). The travelling load height must be obtained from the companies involved. If it is not possible to determine the height, use a value of 7.6 m for L. Regardless of the value used for L, the clearance over main haul roads cannot be less than the value required for minor roads crossed by lines of that voltage class.

*4 Upper conductors at final sag shall be above the straight line between the support points of the lower wire. Where the sag of the lower wire exceeds 6 m, the clearance may be reduced by one half the difference between this sag and 6 m.

*5 These clearances apply if the upper conductor in the swung position, as determined in Note 6, is within 3 m horizontally of a structure.

*6 To determine clearances to sidehills, horizontal deviation shall be calculated using the non-sheltered span curve from Table 1 of CAN/CSA-C22.3 No. 1-M87 and applying the design clearance requirements for ground normally accessible to pedestrians only (Table 2).

*7 These clearances also apply where the conductors are along roads or railway tracks, if the conductors in the swung position as calculated in Note 6 are closer than the horizontal distances shown below, to the vertical projection of edge of travelled way or closest rail. Reference CAN/CSA-C22.3 No. 1-M87 Clauses 4.4 (Table 6), 4.7.3.2 and 4.7.3.3 (Table 9).

	Voltage					
Location	69 kV	138 kV	230 kV	287 kV	345 kV	500 kV
Roads	1.8	2.2	2.8	3.2	3.5	4.5*
Main Rail	4.0	4.3	4.9	5.3	5.6	6.6
Sidings	3.4	3.7	4.3	4.7	5.0	6.0

* Or 12 m from the rest position, whichever is the greater.

*8 Values apply only to the structure configurations shown in Fig. 1.

*9 Where snow depths are known to be greater than 1 m, the clearance shall be increased accordingly.

*10 For elevations over 1000 m, increase the electrical component of the clearances (see Table A) by 1 percent for each additional 100 m.

*11 When it is determined that higher objects will be present, the clearances shall be increased by the amount that the object height exceeds 4.15 m. In the case of high pressure irrigation systems, the object height to be used is 6 m. For 345 kV and 500 kV, a study of electrostatic induction effects may be required.

5.2 - TABLE K

MINIMUM CLEARANCES FOR NEW CONSTRUCTION ON AC TRANSMISSION LINES (m)

Crossing Over*1 *10	Nominal Line to Line Voltage 69 kV	138 kV	230 kV	287 kV	345 kV	500 kV
LAND*6 Accessible to:						
Vehicles & Equipment*11	6.2	6.5	7.1	7.5	7.8	9.6*8
Pedestrians Only*2 *9	5.0	5.4	6.0	6.4	6.7	7.7
ROADS						
Where no provision is made for future powerlines along:						
• Minor Roads	6.9	7.3	7.9	8.3	9.4*8	14.2*8
• Highways	9.5	9.9	10.5	10.9	11.2	14.2*8
Where provision is made for future powerlines up to 25 kV along minor roads and highways:	12.4	13.0	13.6	14.1	14.6	15.2
• Logging & Mining Roads*3	L+2.5	L+2.9	L+3.5	L+3.9	L+4.2	L+5.2
RAILWAYS*7	8.4	8.7	9.3	9.7	10.0	11.0
PIPELINES	8.6	9.0	9.6	10.0	10.3	11.3

WIRES*4 (STRUCTURES)*5						
0 - 25 kV	1.4(1.4)	2.0(2.0)	2.6(2.6)	3.1(3.1)	3.5(3.5)	4.2(4.2)
69 kV	1.4(1.4)	2.0(2.0)	2.6(2.6)	3.1(3.1)	3.5(3.5)	4.2(4.2)
138 kV		1.5(2.3)	2.1(2.9)	2.7(3.4)	3.0(3.8)	4.2(4.5)
230 kV			2.4(2.8)	3.0(3.3)	3.4(3.7)	4.5(4.4)
287 kV				3.1(3.3)	3.6(3.7)	4.7(4.4)
345 kV					3.7(3.3)	4.9(4.0)
500 kV						5.4(3.7)

Refer to Table J for notes.

STUDY

Effects of High Voltage Transmission Line In Proximity of Highways

BC Ministry of Transportation

APPENDIX

Utility Policies Survey

DMD

UTILITY POLICIES FROM OTHER PROVINCES AND STATES

The survey of jurisdictions listed below was undertaken in 2001. From discussions with the Transportation Departments of other Provinces and review of available documents, it was determined that very little information was available and minimal guidance is given for the installation of power lines within highway right-of-ways. For example, in Alberta's Utility Guidance Manual it allows single poles to parallel the highway and to be located within the ROW. The Provinces of PEI and Newfoundland didn't even have a utility policy in place. Only Quebec mentioned that 50kV and above is considered a transmission and is therefore not allowed in the ROW. Many of the Provinces just deals with the installation of utility poles within the ROW on an individual and first come first served basis and are not concerned with voltage. A summary of these finding are detailed below.

Province	Voltage Limit	Location Within Right-Of-Way	Other Restrictions
Alberta	None	- Within 1m of edge of ROW	- Single wood poles - Based on a first come first served basis - Double pole transmission lines and tower mounted transmission lines paralleling highway should normally be positioned outside and beyond 30m of the ROW
Manitoba		- Within 0.6m of ROW	- No policy in place - Generally only allow single pole lines
New Brunswick			- NB Power transmission lines not normally located on highway ROW - Transmission lines defined as lines above 25kV phase to phase
Newfoundland			- No policy in place
Nova Scotia	None	- 20m ROW: within 1.5m of boundary line with min. 4.5m from shoulder line - 30m ROW: min. 4.5m from shoulder line, min. 12m from centre line preferred	- Not allowed on controlled access highways - Permit required for utility lines within 60m of boundary of controlled access highway - Permit not normally approved for utility lines within 15m of outside limit of boundary of controlled access highway
PEI			- No policy in place
Quebec	50kV		- If above voltage limit not allowed in ROW
Saskatchewan	None		- If there is sufficient room within ROW

Yukon			- Policy does ”not address transmission lines, which will be dealt with on an individual basis”

Summary of Utility Polices from Other Provinces as it Relates to Transmission Lines

The Federal Highway Administration (FHWA) has a document which deals with utility use of freeway right-of-ways. It stipulates that “each State must decide, as part of its utility accommodation plan, whether or not to allow longitudinal utility installation within the access control line of freeways and under what circumstances”. This utility accommodation plan applies to Federal-aid projects, however each State Transportation Department found it difficult to adopt two policies, one for Federally funded highway projects and the other for State funded highway projects. As a result each State Transportation Department have generally adopted only one policy to cover all highway projects whether federally funded or State funded.

After reviewing many different State utility accommodation policies, the information from State to State varied. Some States do not allow longitudinal installation of utilities at all, some States only disallow longitudinal installation of utilities along interstates, freeways and expressways and some States had no restrictions. What was fairly consistent was that when longitudinal installations were allowed on highway right-of-ways they were limited to single pole construction and that they encouraged the joint use of poles. The only constant from policy to policy was there was no maximum voltage applied to power lines located within the highway right-of-way. A summary of these finding are detailed in Table 3.

State	Location Within Right-Of-Way	Restrictions
California (Caltrans)	- Generally located as close as possible to ROW line and outside slope limits or behind curbs - Minimum desirable setback from clear zone is 6.09m - Not closer than 0.45m behind a curb face or less than 0.60m from edge of a slope catch point or a driveway, or within a drainage ditch	- Not permitted within access control line of any freeway or expressway - Prohibit installation in scenic highway corridors

Kansas (KDOT)	- Locate on uniform alignment and preferably within 2.1m of ROW line - Rural areas: outer limits of ROW, preferably within 0.6m or less of ROW line and as a minimum not closer than the clear zone - Suburban areas with rural type highways and speeds 70km/h or lower: at least 4.5m from edge of travelled lane with preferred location near ROW line - Curbed sections: at least 1.8m back of curb, 2.4m is desirable and near the ROW line preferred	- Along interstates and fully controlled access highways only if determined that denial would result in severe hardship or is contrary to the public interest - Use durable materials designed for long service life expectancy and relatively free from routine servicing and maintenance - Location in scenic areas reviewed on an individual basis - Locate to minimize need for later adjustment to accommodate future highway improvements, to permit servicing with minimal interference to highway traffic and without increasing the difficulty or cost to highway maintenance - Only single pole type construction allowed with vertical configuration of conductors - Joint use of poles encouraged
Montana (MDT)	- Rural areas: preferably along outer portion of ROW but in no case within the clear recovery area without prior approval - Urban areas: outer edge or ROW, behind sidewalk, or a minimum of 0.61m behind face of curb - Clear recovery area defined as min. of 12.8m from centreline on unpaved roads, and 9.2m from outer edge of outside-travelled lane on paved roads, or the clear zone, whichever is greater.	- Not permitted on interstates - Not permitted in scenic areas, historic sites, public parks, archaeological sites, wet lands or any other environmentally sensitive area
Nebraska (NDOR)	- Rural areas: beyond the clear zone, if insufficient ROW use breakaway design or regrade the ROW - Suburban areas with rural-type roadways and and speed limits of 72km/h and lower: at least 4.5m from edge of paved travel way with preferred location near ROW line - Urban areas with curb sections: back of sidewalk or a minimum 1.8m back of curb	- Joint use of poles encouraged - Within Interstate or Freeway may be considered as a last resort - Avoid scenic byways, scenic strips, overlooks, rest areas, recreation areas, wildlife and waterfowl refuges, public parks and historic sites

Nevada (NDOT)	- Outside the clear recovery area and at or as near to the ROW as possible - In areas with curbs, gutters and sidewalks, locate behind or at back edge of sidewalk if possible and not closer than 0.6m behind face of curb	- Allow longitudinal encroachment only if utility provides service to the general public or a significant segment thereof - Not permitted on controlled access freeways - Only self-supporting armless, single-pole construction allowed with vertical configurations of conductors and cables - Not within ROW adjacent to areas of scenic or natural beauty, including public parks and recreation lands, wildlife and waterfowl refuges, historic sites, scenic strips, overlooks, rest areas or landscaped areas
Oregon (ODOT)		- May impose joint use occupancy
Utah (UDOT)	- Locate on a uniform alignment within 0.9m to the ROW line and as a minimum outside the recovery and clear zone area - If installed behind curb and gutter shall be minimum 0.46m behind front face of curb when no sidewalk exists or preferably 0.46m behind the sidewalk when both barrier curb and gutter and sidewalk exist when ROW is available	- Locate to minimize need for later adjustment to accommodate future highway improvements - Use durable materials designed for long service life expectancy and relatively free from routine servicing and maintenance - Only single pole type construction allowed - Joint use of poles encouraged - Avoid scenic strips, overlooks, rest areas, recreation areas, public parks and historic sites
Washington (WSDOT)	- Outside control zone	- Reduce number of poles through joint use of poles and increasing span lengths - Avoid placing poles on outside of horizontal curves - Consider alternate pole designs to allow construction at/or close to ROW line
Wyoming (WYDOT)	- As close as possible to the highway ROW line - Outside clear recovery area unless using an approved breakaway design	- Only single pole type construction allowed - Joint use of poles encouraged - No poles located within inslopes or back slopes of 2:1 and steeper

Summary of Utility Accommodation Polices from Other States as it Relates to Transmission Lines

In general each State Transportation Department has variances to their guidelines because they recognize that conditions may arise which make it impractical, infeasible or unreasonably costly to comply with the guidelines. In these situations variances must be adequately supported and justified while also considering traffic safety.

Examples of conditions that make it impractical to comply with utility offset guidelines include:

- Right-of-way that is not adequate to accommodate utilities outside of the clear zone. In these situations the safety of the motorist is provided by the breakaway design of the utility structure or the installation of guard rails or other protective devices or structures;
- Terrain or other features that do not warrant full compliance with clear zone, such as the top of cut slopes;
- In timbered areas, adherence to the principles of occupying the outer portion of the ROW or adherence to the clear recovery area distance may result in unwarranted cutting of trees along the highway or cutting of a new path along the ROW line.

Variances to the avoidance of scenic areas are considered only where:

- Other locations are unusually difficult and unreasonably costly, or more desirable from the standpoint of visual quality;
- Underground installation is not technically feasible or is unreasonably costly or is more detrimental to the scenic appearance of the area;
- The proposed installation can be made at a location and will employ suitable designs and materials, which give it adequate attention to the visual qualities of the area being traversed; and
- Utility installation is needed for highway purposes, such as for continuous highway lighting or to serve a weigh station, rest or recreational area.

STUDY

Effects of High Voltage Transmission Line In Proximity of Highways

BC Ministry of Transportation

APPENDIX

Calculations

==========
ELECTRICAL EFFECTS PROGRAM
==========

Rogers Engineering Inc.
(403) 282-4750

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Input Data File Information

Date: 2005-07-12
Name: M2TH230.DAT
Desc: MoTH Study - Bluebell - 230 (2)

	Dist. from Tower C-L (metre)	Height to Bdl Mid Pt (metre)	Subcon Diam. (cm.)	Subcon Spacing (cm.)	Voltage L-G (kV)	Current (Amps)	Phase Angle (degrees)
PHA	-5.50	14.15	2.971	.00	132.80	665.0	.00
PHB	.00	14.15	2.971	.00	132.80	665.0	120.00
PHC	5.50	14.15	2.971	.00	132.80	665.0	240.00

==========
CORONA INCEPTION CALCULATION

Altitude	:	500.0 (m)
Temperature	:	65.0 (deg C)
Relative air density (RAD)	:	.830
Conductor Surface Factor	:	.8
Radius of Conductor	:	1.485 (cm)

Conductor Surface Gradient for
Positive Corona Inception : 17.895 (kV/cm)

MAXIMUM VOLTAGE GRADIENTS
(kV/cm)

PHA	14.4062
PHB	15.4354
PHC	14.4062

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

RADIO INTERFERENCE SPECIFICATIONS

Antenna Height = 1.000 m
RI Frequency = 1.00 MHz
Altitude = 500.0 m
Ground Conductivity = 20.00 mmho/m
Lateral Dist From Outside Phase = 15.0 m

Values at Standard Distance (15 m) from Outer Phase

Foul Weather Radio Interference (L50) = 54.3 dbu
Fair Weather Radio Interference (L50) = 37.3 dbu

CSA Maximum Allowable RI (Fair Weather) = 50.0 dbu

Maximum Radio Interference (dbu)

Lateral Dist. (m)	Phase	Rain L50	Fair L50
.0	PHB	64.4	47.4
2.0	PHB	64.2	47.2
4.0	PHB	63.6	46.6
6.0	PHB	62.8	45.8
8.0	PHB	61.7	44.7
10.0	PHB	60.6	43.6
12.0	PHB	59.3	42.3
14.0	PHB	58.1	41.1
16.0	PHB	56.9	39.9
18.0	PHB	55.7	38.7
20.0	PHB	54.6	37.6
22.0	PHB	53.6	36.6
24.0	PHB	52.5	35.5
26.0	PHB	51.6	34.6
28.0	PHB	50.7	33.7
30.0	PHB	49.9	32.9
32.0	PHB	49.1	32.1
34.0	PHB	48.3	31.3
36.0	PHB	47.6	30.6
38.0	PHB	47.0	30.0
40.0	PHB	46.3	29.3
42.0	PHB	45.7	28.7
44.0	PHB	45.2	28.2
46.0	PHB	44.6	27.6
48.0	PHB	44.1	27.1
50.0	PHB	43.6	26.6
52.0	PHB	43.2	26.2
54.0	PHB	42.7	25.7
56.0	PHB	42.3	25.3
58.0	PHB	41.9	24.9
60.0	PHB	41.5	24.5

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

AUDIBLE NOISE SPECIFICATIONS

Antenna Height = 1.524 m
Altitude = 500.0 m
Lateral Distance From Center of Tower = 30.5 m

Values at Standard Distance (30.5 m) from Centerline

Audible Noise (Rain L50) = 40.4 DBA
Audible Noise (Fair Weather L50) = 15.4 DBA

Audible Noise (Rain L5) = 49.3 DBA
Audible Noise (Fair Weather L5) = 24.3 DBA

AUDIBLE NOISE (Values DBA)

Lateral Dist. (m)	L50 Rain	L50 Fair	L5 Rain	L5 Fair
.0	44.9	19.9	53.6	28.6
2.0	44.8	19.8	53.6	28.6
4.0	44.7	19.7	53.4	28.4
6.0	44.5	19.5	53.2	28.2
8.0	44.2	19.2	53.0	28.0
10.0	43.9	18.9	52.7	27.7
12.0	43.5	18.5	52.3	27.3
14.0	43.2	18.2	52.0	27.0
16.0	42.8	17.8	51.6	26.6
18.0	42.4	17.4	51.3	26.3
20.0	42.0	17.0	50.9	25.9
22.0	41.7	16.7	50.6	25.6
24.0	41.4	16.4	50.3	25.3
26.0	41.0	16.0	49.9	24.9
28.0	40.7	15.7	49.6	24.6
30.0	40.4	15.4	49.3	24.3
32.0	40.2	15.2	49.1	24.1
34.0	39.9	14.9	48.8	23.8
36.0	39.6	14.6	48.5	23.5
38.0	39.4	14.4	48.3	23.3
40.0	39.2	14.2	48.0	23.0
42.0	38.9	13.9	47.8	22.8
44.0	38.7	13.7	47.6	22.6
46.0	38.5	13.5	47.4	22.4
48.0	38.3	13.3	47.1	22.1
50.0	38.1	13.1	46.9	21.9
52.0	37.9	12.9	46.7	21.7
54.0	37.8	12.8	46.5	21.5
56.0	37.6	12.6	46.4	21.4
58.0	37.4	12.4	46.2	21.2
60.0	37.3	12.3	46.0	21.0

File: M2TH230.DAT 2005-07-12

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

ELECTRIC FIELD (E-FIELD) CALCULATIONS

Sensor Height = 1 metre

	E-FIELD RESULTANTS		E-FIELD XY VECTOR COMPONENTS			
X (m)	E-FIELD (kV/m)	THETA	E-FIELD X (kV/m)	THETA X	E-FIELD Y (kV/m)	THETA Y
.0	.26	90.0	.21	30.0	.26	-60.0
2.0	.49	70.8	.20	41.1	.46	2.0
4.0	.78	79.6	.16	51.8	.77	21.5
6.0	1.01	84.7	.11	63.3	1.00	30.7
8.0	1.13	88.1	.06	83.7	1.13	36.1
10.0	1.15	90.5	.03	148.2	1.15	39.5
12.0	1.10	92.1	.04	-160.5	1.10	41.6
14.0	1.00	93.2	.06	-146.6	1.00	43.0
16.0	.88	93.9	.06	-141.2	.88	43.8
18.0	.76	94.4	.06	-138.5	.76	44.4
20.0	.65	94.6	.05	-137.0	.65	44.7
22.0	.55	94.7	.04	-136.2	.55	44.9
24.0	.47	-85.3	.04	-135.7	.47	45.1
26.0	.40	-85.4	.03	-135.4	.40	45.2
28.0	.34	-85.5	.03	-135.3	.34	45.3
30.0	.29	-85.6	.02	-135.2	.29	45.3
32.0	.25	-85.8	.02	-135.2	.25	45.4
34.0	.22	-85.9	.02	-135.2	.22	45.5
36.0	.19	-86.0	.01	-135.2	.19	45.6
38.0	.16	-86.2	.01	-135.2	.16	45.7
40.0	.14	-86.3	.01	-135.2	.14	45.8
42.0	.13	-86.4	.01	-135.2	.13	46.0
44.0	.11	-86.6	.01	-135.2	.11	46.1
46.0	.10	-86.7	.01	-135.2	.10	46.3
48.0	.09	-86.8	.00	-135.2	.09	46.5
50.0	.08	-86.9	.00	-135.1	.08	46.7
52.0	.07	-87.0	.00	-135.1	.07	46.9
54.0	.06	-87.1	.00	-135.0	.06	47.1
56.0	.06	-87.2	.00	-135.0	.06	47.3
58.0	.05	-87.3	.00	-134.9	.05	47.5
60.0	.05	-87.4	.00	-134.8	.05	47.8

File: M2TH230.DAT 2005-07-12

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

MAGNETIC FIELD (B-FIELD) CALCULATIONS

Sensor Height = 1 metre

	B-FIELD RESULTANTS		B-FIELD XY VECTOR COMPONENTS			
X (m)	B-FIELD (mGauss)	THETA	B-FIELD X (mGauss)	THETA X	B-FIELD Y (mGauss)	THETA Y
.0	62.36	90.0	15.06	120.0	62.36	30.0
2.0	61.55	104.3	20.69	169.4	59.75	35.6
4.0	59.15	118.4	30.41	191.9	52.38	40.8
6.0	55.35	132.3	38.11	203.1	41.62	45.6
8.0	50.52	145.4	41.89	209.4	29.58	50.5
10.0	45.16	157.5	41.82	213.2	18.36	56.8
12.0	39.75	168.5	38.96	215.4	9.42	69.4
14.0	34.66	178.1	34.64	216.7	4.03	110.4
16.0	30.09	-173.5	29.89	217.4	4.45	176.7
18.0	26.10	-166.2	25.36	217.7	6.56	197.9
20.0	22.70	-159.9	21.33	217.8	7.93	205.2
22.0	19.81	-154.5	17.89	217.8	8.60	208.6
24.0	17.37	-149.7	15.02	217.6	8.79	210.4
26.0	15.31	-145.6	12.64	217.5	8.67	211.5
28.0	13.57	-141.9	10.69	217.2	8.37	212.1
30.0	12.08	-138.7	9.09	217.0	7.98	212.5
32.0	10.82	-135.9	7.77	216.8	7.53	212.8
34.0	9.73	-133.3	6.68	216.5	7.08	212.9
36.0	8.79	-131.0	5.77	216.3	6.63	213.0
38.0	7.97	-128.9	5.02	216.1	6.20	213.1
40.0	7.26	-127.1	4.38	215.8	5.80	213.1
42.0	6.64	-125.4	3.85	215.6	5.42	213.0
44.0	6.09	-123.8	3.39	215.5	5.06	213.0
46.0	5.61	-122.4	3.01	215.3	4.74	213.0
48.0	5.18	-121.0	2.67	215.1	4.44	212.9
50.0	4.80	-119.8	2.39	214.9	4.16	212.9
52.0	4.45	-118.7	2.14	214.8	3.90	212.8
54.0	4.14	-117.7	1.93	214.6	3.67	212.7
56.0	3.87	-116.7	1.74	214.5	3.45	212.7
58.0	3.61	-115.8	1.57	214.4	3.25	212.6
60.0	3.39	-114.9	1.43	214.2	3.07	212.6

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ELECTRICAL EFFECTS PROGRAM
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Rogers Engineering Inc.
(403) 282-4750

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Input Data File Information

Date: 2005-07-11
Name: MOTH230.DAT
Desc: MoTH Study - Bluebell - 230

	Dist. from Tower C-L (metre)	Height to Bdl Mid Pt (metre)	Subcon Diam. (cm.)	Subcon Spacing (cm.)	Voltage L-G (kV)	Current (Amps)	Phase Angle (degrees)
PHA	-5.50	11.25	2.971	.00	132.80	665.0	.00
PHB	.00	11.25	2.971	.00	132.80	665.0	120.00
PHC	5.50	11.25	2.971	.00	132.80	665.0	240.00

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CORONA INCEPTION CALCULATION

Altitude	:	500.0 (m)
Temperature	:	65.0 (deg C)
Relative air density (RAD)	:	.830
Conductor Surface Factor	:	.8
Radius of Conductor	:	1.485 (cm)

Conductor Surface Gradient for
Positive Corona Inception : 17.895 (kV/cm)

MAXIMUM VOLTAGE GRADIENTS
(kV/cm)

PHA	14.4668
PHB	15.4323
PHC	14.4668

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

RADIO INTERFERENCE SPECIFICATIONS

Antenna Height	=	1.000 m
RI Frequency	=	1.00 MHz
Altitude	=	500.0 m
Ground Conductivity	=	20.00 mmho/m
Lateral Dist From Outside Phase	=	15.0 m

Values at Standard Distance (15 m) from Outer Phase

Foul Weather Radio Interference (L50)	=	53.6 dbu
Fair Weather Radio Interference (L50)	=	36.6 dbu
CSA Maximum Allowable RI (Fair Weather)	=	50.0 dbu

Maximum Radio Interference (dbu)

Lateral Dist. (m)	Phase	Rain L50	Fair L50
.0	PHB	66.6	49.6
2.0	PHB	66.3	49.3
4.0	PHB	65.4	48.4
6.0	PHB	64.1	47.1
8.0	PHC	62.7	45.7
10.0	PHC	61.7	44.7
12.0	PHC	60.3	43.3
14.0	PHC	58.8	41.8
16.0	PHC	57.2	40.2
18.0	PHC	55.6	38.6
20.0	PHC	54.0	37.0
22.0	PHC	52.6	35.6
24.0	PHB	51.3	34.3
26.0	PHB	50.2	33.2
28.0	PHB	49.3	32.3
30.0	PHB	48.3	31.3
32.0	PHB	47.5	30.5
34.0	PHB	46.7	29.7
36.0	PHB	45.9	28.9
38.0	PHB	45.2	28.2
40.0	PHB	44.6	27.6
42.0	PHB	44.0	27.0
44.0	PHB	43.4	26.4
46.0	PHB	42.8	25.8
48.0	PHB	42.3	25.3
50.0	PHB	41.8	24.8
52.0	PHB	41.3	24.3
54.0	PHB	40.9	23.9
56.0	PHB	40.4	23.4
58.0	PHB	40.0	23.0
60.0	PHB	39.6	22.6

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

AUDIBLE NOISE SPECIFICATIONS

Antenna Height = 1.524 m
Altitude = 500.0 m
Lateral Distance From Center of Tower = 30.5 m

Values at Standard Distance (30.5 m) from Centerline

Audible Noise (Rain L50) = 40.6 DBA
Audible Noise (Fair Weather L50) = 15.6 DBA

Audible Noise (Rain L5) = 49.5 DBA
Audible Noise (Fair Weather L5) = 24.5 DBA

AUDIBLE NOISE (Values DBA)

Lateral Dist. (m)	L50 Rain	L50 Fair	L5 Rain	L5 Fair
.0	46.1	21.1	54.8	29.8
2.0	46.1	21.1	54.7	29.7
4.0	45.9	20.9	54.5	29.5
6.0	45.6	20.6	54.3	29.3
8.0	45.2	20.2	53.9	28.9
10.0	44.8	19.8	53.5	28.5
12.0	44.3	19.3	53.1	28.1
14.0	43.8	18.8	52.6	27.6
16.0	43.3	18.3	52.2	27.2
18.0	42.9	17.9	51.8	26.8
20.0	42.5	17.5	51.4	26.4
22.0	42.1	17.1	51.0	26.0
24.0	41.7	16.7	50.6	25.6
26.0	41.4	16.4	50.3	25.3
28.0	41.0	16.0	49.9	24.9
30.0	40.7	15.7	49.6	24.6
32.0	40.4	15.4	49.3	24.3
34.0	40.1	15.1	49.0	24.0
36.0	39.9	14.9	48.8	23.8
38.0	39.6	14.6	48.5	23.5
40.0	39.4	14.4	48.2	23.2
42.0	39.1	14.1	48.0	23.0
44.0	38.9	13.9	47.8	22.8
46.0	38.7	13.7	47.5	22.5
48.0	38.5	13.5	47.3	22.3
50.0	38.3	13.3	47.1	22.1
52.0	38.1	13.1	46.9	21.9
54.0	37.9	12.9	46.7	21.7
56.0	37.7	12.7	46.5	21.5
58.0	37.6	12.6	46.3	21.3
60.0	37.4	12.4	46.1	21.1

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

ELECTRIC FIELD (E-FIELD) CALCULATIONS

Sensor Height = 1 metre

	E-FIELD RESULTANTS		E-FIELD XY VECTOR COMPONENTS			
X (m)	E-FIELD (kV/m)	THETA	E-FIELD X (kV/m)	THETA X	E-FIELD Y (kV/m)	THETA Y
.0	.60	90.0	.36	30.0	.60	-60.0
2.0	.89	75.0	.34	47.1	.86	-4.8
4.0	1.32	80.8	.28	61.7	1.30	20.1
6.0	1.64	85.9	.17	78.1	1.63	32.2
8.0	1.75	89.7	.07	121.5	1.75	38.6
10.0	1.68	92.4	.08	-166.3	1.68	42.1
12.0	1.49	94.1	.11	-145.7	1.49	44.0
14.0	1.26	95.1	.11	-139.2	1.26	45.0
16.0	1.04	-84.4	.10	-136.4	1.04	45.5
18.0	.85	-84.2	.09	-135.1	.85	45.7
20.0	.70	-84.2	.07	-134.4	.69	45.7
22.0	.57	-84.3	.06	-134.2	.57	45.7
24.0	.47	-84.5	.05	-134.1	.46	45.7
26.0	.39	-84.7	.04	-134.2	.38	45.7
28.0	.32	-84.9	.03	-134.2	.32	45.7
30.0	.27	-85.1	.02	-134.4	.27	45.7
32.0	.23	-85.3	.02	-134.5	.23	45.7
34.0	.20	-85.5	.02	-134.6	.19	45.7
36.0	.17	-85.7	.01	-134.7	.17	45.8
38.0	.14	-85.9	.01	-134.8	.14	45.8
40.0	.13	-86.1	.01	-134.9	.13	45.9
42.0	.11	-86.2	.01	-134.9	.11	46.1
44.0	.10	-86.4	.01	-135.0	.10	46.2
46.0	.09	-86.5	.01	-135.0	.09	46.4
48.0	.08	-86.6	.00	-135.0	.08	46.5
50.0	.07	-86.8	.00	-135.0	.07	46.7
52.0	.06	-86.9	.00	-135.0	.06	46.9
54.0	.05	-87.0	.00	-134.9	.05	47.1
56.0	.05	-87.1	.00	-134.9	.05	47.4
58.0	.04	-87.2	.00	-134.8	.04	47.6
60.0	.04	-87.3	.00	-134.7	.04	47.8

MAGNETIC FIELD (B-FIELD) CALCULATIONS

Sensor Height = 1 metre

X (m)	B-FIELD RESULTANTS B-FIELD (mGauss)	THETA	B-FIELD XY VECTOR COMPONENTS B-FIELD X (mGauss)	THETA X	B-FIELD Y (mGauss)	THETA Y
.0	93.63	90.0	29.01	120.0	93.63	30.0
2.0	92.27	106.2	36.89	168.1	88.92	38.6
4.0	88.03	122.8	51.56	194.0	75.09	46.2
6.0	80.91	139.2	62.44	207.0	54.62	52.8
8.0	71.67	154.8	65.11	213.8	32.85	60.7
10.0	61.65	168.8	60.51	217.2	15.19	77.1
12.0	52.08	-179.1	52.07	218.9	6.70	135.7
14.0	43.66	-168.9	42.87	219.7	9.51	190.0
16.0	36.61	-160.5	34.53	219.8	12.59	204.0
18.0	30.84	-153.5	27.62	219.7	13.92	209.1
20.0	26.17	-147.6	22.12	219.5	14.09	211.5
22.0	22.38	-142.6	17.81	219.1	13.61	212.7
24.0	19.30	-138.4	14.46	218.8	12.82	213.3
26.0	16.78	-134.8	11.84	218.4	11.91	213.7
28.0	14.70	-131.7	9.79	218.0	10.98	213.8
30.0	12.97	-129.0	8.17	217.7	10.08	213.9
32.0	11.52	-126.6	6.87	217.3	9.25	213.9
34.0	10.29	-124.4	5.82	217.0	8.49	213.9
36.0	9.24	-122.5	4.98	216.7	7.79	213.8
38.0	8.34	-120.8	4.28	216.4	7.16	213.7
40.0	7.57	-119.3	3.71	216.2	6.60	213.6
42.0	6.89	-117.9	3.23	215.9	6.09	213.5
44.0	6.31	-116.7	2.83	215.7	5.64	213.4
46.0	5.79	-115.5	2.49	215.5	5.22	213.3
48.0	5.33	-114.4	2.21	215.3	4.85	213.2
50.0	4.93	-113.5	1.96	215.1	4.52	213.2
52.0	4.56	-112.6	1.75	214.9	4.21	213.1
54.0	4.24	-111.7	1.57	214.8	3.94	213.0
56.0	3.95	-111.0	1.41	214.6	3.69	212.9
58.0	3.69	-110.2	1.28	214.5	3.46	212.8
60.0	3.45	-109.6	1.16	214.3	3.25	212.7

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ELECTRICAL EFFECTS PROGRAM
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Rogers Engineering Inc.
(403) 282-4750

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Input Data File Information

Date: 2005-07-11
Name: MOTH287.DAT
Desc: MoTH Study - Columbine - 287

	Dist. from Tower C-L (metre)	Height to Bdl Mid Pt (metre)	Subcon Diam. (cm.)	Subcon Spacing (cm.)	Voltage L-G (kV)	Current (Amps)	Phase Angle (degrees)
PHA	-6.70	11.20	3.402	.00	165.70	780.0	.00
PHB	.00	11.20	3.402	.00	165.70	780.0	120.00
PHC	6.70	11.20	3.402	.00	165.70	780.0	240.00

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CORONA INCEPTION CALCULATION

Altitude	:	500.0 (m)
Temperature	:	65.0 (deg C)
Relative air density (RAD)	:	.830
Conductor Surface Factor	:	.8
Radius of Conductor	:	1.701 (cm)

Conductor Surface Gradient for
Positive Corona Inception : 17.645 (kV/cm)

MAXIMUM VOLTAGE GRADIENTS
(kV/cm)

PHA	15.6849
PHB	16.6429
PHC	15.6849

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

RADIO INTERFERENCE SPECIFICATIONS

Antenna Height	=	1.000 m
RI Frequency	=	1.00 MHz
Altitude	=	500.0 m
Ground Conductivity	=	20.00 mmho/m
Lateral Dist From Outside Phase	=	15.0 m

Values at Standard Distance (15 m) from Outer Phase

Foul Weather Radio Interference (L50)	=	60.2 dbu
Fair Weather Radio Interference (L50)	=	43.2 dbu
CSA Maximum Allowable RI (Fair Weather)	=	50.0 dbu

Maximum Radio Interference (dbu)

Lateral Dist. (m)	Phase	Rain L50	Fair L50
.0	PHB	72.9	55.9
2.0	PHB	72.6	55.6
4.0	PHB	71.7	54.7
6.0	PHB	70.4	53.4
8.0	PHC	69.7	52.7
10.0	PHC	69.0	52.0
12.0	PHC	67.8	50.8
14.0	PHC	66.3	49.3
16.0	PHC	64.7	47.7
18.0	PHC	63.1	46.1
20.0	PHC	61.5	44.5
22.0	PHC	60.0	43.0
24.0	PHC	58.6	41.6
26.0	PHC	57.2	40.2
28.0	PHC	56.0	39.0
30.0	PHC	54.8	37.8
32.0	PHC	53.8	36.8
34.0	PHB	53.0	36.0
36.0	PHB	52.2	35.2
38.0	PHB	51.5	34.5
40.0	PHB	50.8	33.8
42.0	PHB	50.2	33.2
44.0	PHB	49.6	32.6
46.0	PHB	49.1	32.1
48.0	PHB	48.5	31.5
50.0	PHB	48.0	31.0
52.0	PHB	47.6	30.6
54.0	PHB	47.1	30.1
56.0	PHB	46.7	29.7
58.0	PHB	46.3	29.3

60.0 PHB 45.9 28.9

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

AUDIBLE NOISE SPECIFICATIONS

Antenna Height = 1.524 m
Altitude = 500.0 m
Lateral Distance From Center of Tower = 30.5 m

Values at Standard Distance (30.5 m) from Centerline

Audible Noise (Rain L50) = 48.0 DBA
Audible Noise (Fair Weather L50) = 23.0 DBA

Audible Noise (Rain L5) = 55.5 DBA
Audible Noise (Fair Weather L5) = 30.5 DBA

AUDIBLE NOISE (Values DBA)

Lateral Dist. (m)	L50 Rain	L50 Fair	L5 Rain	L5 Fair
.0	53.3	28.3	60.6	35.6
2.0	53.3	28.3	60.6	35.6
4.0	53.1	28.1	60.4	35.4
6.0	52.9	27.9	60.2	35.2
8.0	52.5	27.5	59.9	34.9
10.0	52.1	27.1	59.5	34.5
12.0	51.7	26.7	59.1	34.1
14.0	51.2	26.2	58.6	33.6
16.0	50.7	25.7	58.2	33.2
18.0	50.3	25.3	57.8	32.8
20.0	49.9	24.9	57.4	32.4
22.0	49.4	24.4	57.0	32.0
24.0	49.1	24.1	56.6	31.6
26.0	48.7	23.7	56.3	31.3
28.0	48.4	23.4	55.9	30.9
30.0	48.1	23.1	55.6	30.6
32.0	47.7	22.7	55.3	30.3
34.0	47.5	22.5	55.0	30.0
36.0	47.2	22.2	54.7	29.7
38.0	46.9	21.9	54.5	29.5
40.0	46.7	21.7	54.2	29.2
42.0	46.5	21.5	54.0	29.0
44.0	46.2	21.2	53.7	28.7
46.0	46.0	21.0	53.5	28.5
48.0	45.8	20.8	53.3	28.3
50.0	45.6	20.6	53.1	28.1
52.0	45.4	20.4	52.9	27.9
54.0	45.2	20.2	52.7	27.7
56.0	45.1	20.1	52.5	27.5
58.0	44.9	19.9	52.3	27.3
60.0	44.7	19.7	52.1	27.1

File: MOTH287.DAT 2005-07-11

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

ELECTRIC FIELD (E-FIELD) CALCULATIONS

Sensor Height = 1 metre

	E-FIELD RESULTANTS		E-FIELD XY VECTOR COMPONENTS			
X (m)	E-FIELD (kV/m)	THETA	E-FIELD X (kV/m)	THETA X	E-FIELD Y (kV/m)	THETA Y
.0	1.14	90.0	.46	30.0	1.14	-60.0
2.0	1.34	81.5	.46	49.9	1.32	-16.8
4.0	1.79	81.8	.41	65.0	1.78	12.2
6.0	2.24	85.1	.30	78.2	2.24	28.5
8.0	2.49	88.6	.15	103.1	2.49	37.3
10.0	2.48	91.5	.10	172.1	2.48	42.0
12.0	2.26	93.5	.14	-150.3	2.26	44.5
14.0	1.95	-85.2	.16	-139.8	1.94	45.8
16.0	1.63	-84.5	.15	-135.8	1.62	46.4
18.0	1.33	-84.2	.13	-134.0	1.33	46.6
20.0	1.09	-84.2	.11	-133.2	1.08	46.6
22.0	.89	-84.2	.09	-132.9	.88	46.6
24.0	.73	-84.4	.07	-132.8	.73	46.4
26.0	.60	-84.6	.06	-132.9	.60	46.3
28.0	.50	-84.8	.05	-133.1	.50	46.1
30.0	.42	-85.0	.04	-133.3	.42	46.0
32.0	.35	-85.3	.03	-133.5	.35	45.9
34.0	.30	-85.5	.02	-133.7	.30	45.8
36.0	.26	-85.7	.02	-133.9	.26	45.7
38.0	.22	-85.8	.02	-134.1	.22	45.7
40.0	.19	-86.0	.01	-134.3	.19	45.7
42.0	.17	-86.2	.01	-134.4	.17	45.7
44.0	.15	-86.3	.01	-134.6	.15	45.7
46.0	.13	-86.5	.01	-134.7	.13	45.7
48.0	.12	-86.6	.01	-134.8	.12	45.8
50.0	.10	-86.7	.01	-134.9	.10	45.9
52.0	.09	-86.8	.01	-134.9	.09	46.0
54.0	.08	-87.0	.00	-135.0	.08	46.1
56.0	.07	-87.1	.00	-135.0	.07	46.2
58.0	.07	-87.2	.00	-135.1	.07	46.3
60.0	.06	-87.2	.00	-135.1	.06	46.5

File: MOTH287.DAT 2005-07-11

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

MAGNETIC FIELD (B-FIELD) CALCULATIONS

Sensor Height = 1 metre

	B-FIELD RESULTANTS		B-FIELD XY VECTOR COMPONENTS			
X (m)	B-FIELD (mGauss)	THETA	B-FIELD X (mGauss)	THETA X	B-FIELD Y (mGauss)	THETA Y
.0	121.56	90.0	46.10	120.0	121.56	30.0
2.0	120.59	104.0	51.54	159.2	117.49	39.9
4.0	117.14	118.9	65.55	187.9	104.18	48.3
6.0	110.31	134.5	80.25	204.6	81.48	55.2
8.0	100.15	150.0	87.46	213.5	53.82	62.4
10.0	87.89	164.4	84.77	218.1	28.40	74.9
12.0	75.25	177.1	75.16	220.4	12.13	112.9
14.0	63.57	-172.0	62.96	221.4	11.95	178.3
16.0	53.48	-162.9	51.15	221.7	16.64	200.8
18.0	45.09	-155.3	41.02	221.6	19.16	208.2
20.0	38.23	-149.1	32.83	221.4	19.81	211.5
22.0	32.66	-143.8	26.39	221.0	19.37	213.1
24.0	28.12	-139.3	21.36	220.6	18.36	214.0
26.0	24.41	-135.5	17.45	220.1	17.12	214.4
28.0	21.35	-132.3	14.38	219.7	15.81	214.7
30.0	18.81	-129.4	11.96	219.3	14.54	214.8
32.0	16.68	-126.9	10.04	218.9	13.34	214.8
34.0	14.89	-124.7	8.49	218.5	12.23	214.7
36.0	13.36	-122.8	7.24	218.1	11.23	214.6
38.0	12.05	-121.0	6.22	217.8	10.32	214.5
40.0	10.92	-119.5	5.38	217.5	9.51	214.4
42.0	9.94	-118.0	4.68	217.2	8.77	214.3
44.0	9.08	-116.7	4.09	216.9	8.11	214.2
46.0	8.33	-115.6	3.60	216.7	7.52	214.1
48.0	7.67	-114.5	3.18	216.4	6.98	214.0
50.0	7.08	-113.5	2.83	216.2	6.50	213.8
52.0	6.56	-112.6	2.52	216.0	6.06	213.7
54.0	6.09	-111.7	2.26	215.8	5.66	213.6
56.0	5.67	-111.0	2.03	215.6	5.30	213.5
58.0	5.30	-110.2	1.83	215.4	4.97	213.4
60.0	4.95	-109.6	1.66	215.3	4.67	213.3

==========
ELECTRICAL EFFECTS PROGRAM
==========

Rogers Engineering Inc.
(403) 282-4750

==========

Input Data File Information

Date: 2005-07-12
Name: M2TH287.DAT
Desc: MoTH Study - Columbine - 287 (2)

	Dist. from Tower C-L (metre)	Height to Bdl Mid Pt (metre)	Subcon Diam. (cm.)	Subcon Spacing (cm.)	Voltage L-G (kV)	Current (Amps)	Phase Angle (degrees)
PHA	-6.70	14.10	3.402	.00	165.70	780.0	.00
PHB	.00	14.10	3.402	.00	165.70	780.0	120.00
PHC	6.70	14.10	3.402	.00	165.70	780.0	240.00

==========

CORONA INCEPTION CALCULATION

Altitude	:	500.0 (m)
Temperature	:	65.0 (deg C)
Relative air density (RAD)	:	.830
Conductor Surface Factor	:	.8
Radius of Conductor	:	1.701 (cm)
Conductor Surface Gradient for Positive Corona Inception	:	17.645 (kV/cm)

MAXIMUM VOLTAGE GRADIENTS
(kV/cm)

PHA	15.5977
PHB	16.6365
PHC	15.5977

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

RADIO INTERFERENCE SPECIFICATIONS

Antenna Height = 1.000 m
RI Frequency = 1.00 MHz
Altitude = 500.0 m
Ground Conductivity = 20.00 mmho/m
Lateral Dist From Outside Phase = 15.0 m

Values at Standard Distance (15 m) from Outer Phase

Foul Weather Radio Interference (L50) = 60.4 dbu
Fair Weather Radio Interference (L50) = 43.4 dbu

CSA Maximum Allowable RI (Fair Weather) = 50.0 dbu

Maximum Radio Interference (dbu)

Lateral Dist. (m)	Phase	Rain L50	Fair L50
.0	PHB	70.7	53.7
2.0	PHB	70.5	53.5
4.0	PHB	69.9	52.9
6.0	PHB	69.1	52.1
8.0	PHB	68.0	51.0
10.0	PHB	66.8	49.8
12.0	PHC	66.0	49.0
14.0	PHC	65.0	48.0
16.0	PHC	63.9	46.9
18.0	PHC	62.7	45.7
20.0	PHC	61.4	44.4
22.0	PHC	60.2	43.2
24.0	PHC	59.0	42.0
26.0	PHC	57.9	40.9
28.0	PHB	56.9	39.9
30.0	PHB	56.1	39.1
32.0	PHB	55.3	38.3
34.0	PHB	54.6	37.6
36.0	PHB	53.9	36.9
38.0	PHB	53.2	36.2
40.0	PHB	52.6	35.6
42.0	PHB	52.0	35.0
44.0	PHB	51.4	34.4
46.0	PHB	50.9	33.9
48.0	PHB	50.3	33.3
50.0	PHB	49.9	32.9
52.0	PHB	49.4	32.4
54.0	PHB	48.9	31.9
56.0	PHB	48.5	31.5
58.0	PHB	48.1	31.1
60.0	PHB	47.7	30.7

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

AUDIBLE NOISE SPECIFICATIONS

Antenna Height = 1.524 m
Altitude = 500.0 m
Lateral Distance From Center of Tower = 30.5 m

Values at Standard Distance (30.5 m) from Centerline

Audible Noise (Rain L50) = 47.7 DBA
Audible Noise (Fair Weather L50) = 22.7 DBA

Audible Noise (Rain L5) = 55.2 DBA
Audible Noise (Fair Weather L5) = 30.2 DBA

AUDIBLE NOISE (Values DBA)

Lateral Dist. (m)	L50 Rain	L50 Fair	L5 Rain	L5 Fair
.0	52.1	27.1	59.4	34.4
2.0	52.0	27.0	59.4	34.4
4.0	51.9	26.9	59.3	34.3
6.0	51.7	26.7	59.1	34.1
8.0	51.4	26.4	58.9	33.9
10.0	51.1	26.1	58.6	33.6
12.0	50.8	25.8	58.3	33.3
14.0	50.4	25.4	57.9	32.9
16.0	50.1	25.1	57.6	32.6
18.0	49.7	24.7	57.2	32.2
20.0	49.3	24.3	56.9	31.9
22.0	49.0	24.0	56.5	31.5
24.0	48.6	23.6	56.2	31.2
26.0	48.3	23.3	55.9	30.9
28.0	48.0	23.0	55.6	30.6
30.0	47.7	22.7	55.3	30.3
32.0	47.4	22.4	55.0	30.0
34.0	47.2	22.2	54.7	29.7
36.0	46.9	21.9	54.5	29.5
38.0	46.7	21.7	54.2	29.2
40.0	46.4	21.4	54.0	29.0
42.0	46.2	21.2	53.7	28.7
44.0	46.0	21.0	53.5	28.5
46.0	45.8	20.8	53.3	28.3
48.0	45.6	20.6	53.1	28.1
50.0	45.4	20.4	52.9	27.9
52.0	45.2	20.2	52.7	27.7
54.0	45.0	20.0	52.5	27.5
56.0	44.9	19.9	52.3	27.3
58.0	44.7	19.7	52.1	27.1
60.0	44.5	19.5	51.9	26.9

File: M2TH287.DAT 2005-07-12

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

ELECTRIC FIELD (E-FIELD) CALCULATIONS

Sensor Height = 1 metre

	E-FIELD RESULTANTS		E-FIELD XY VECTOR COMPONENTS			
X (m)	E-FIELD (kV/m)	THETA	E-FIELD X (kV/m)	THETA X	E-FIELD Y (kV/m)	THETA Y
.0	.55	90.0	.28	30.0	.55	-60.0
2.0	.75	76.8	.27	43.4	.73	-11.0
4.0	1.10	80.6	.24	55.4	1.08	13.5
6.0	1.41	84.4	.18	66.8	1.40	26.4
8.0	1.61	87.5	.11	82.7	1.61	33.9
10.0	1.68	89.8	.05	123.4	1.68	38.5
12.0	1.63	91.6	.06	-173.7	1.63	41.4
14.0	1.51	92.9	.08	-150.6	1.51	43.2
16.0	1.34	93.7	.09	-142.4	1.34	44.2
18.0	1.17	94.2	.09	-138.5	1.16	44.9
20.0	1.00	-85.5	.08	-136.6	1.00	45.3
22.0	.85	-85.4	.07	-135.5	.85	45.5
24.0	.72	-85.3	.06	-134.8	.72	45.6
26.0	.62	-85.4	.05	-134.5	.61	45.6
28.0	.52	-85.5	.04	-134.4	.52	45.6
30.0	.45	-85.6	.03	-134.3	.45	45.6
32.0	.39	-85.7	.03	-134.3	.38	45.6
34.0	.33	-85.9	.02	-134.4	.33	45.6
36.0	.29	-86.0	.02	-134.5	.29	45.6
38.0	.25	-86.1	.02	-134.6	.25	45.6
40.0	.22	-86.3	.01	-134.7	.22	45.6
42.0	.19	-86.4	.01	-134.7	.19	45.6
44.0	.17	-86.5	.01	-134.8	.17	45.7
46.0	.15	-86.6	.01	-134.9	.15	45.8
48.0	.14	-86.8	.01	-134.9	.14	45.8
50.0	.12	-86.9	.01	-135.0	.12	45.9
52.0	.11	-87.0	.01	-135.0	.11	46.0
54.0	.10	-87.1	.01	-135.0	.10	46.2
56.0	.09	-87.2	.00	-135.1	.09	46.3
58.0	.08	-87.2	.00	-135.1	.08	46.4
60.0	.07	-87.3	.00	-135.1	.07	46.6

File: M2TH287.DAT 2005-07-12

==========[EEFFECTS (V2.2C) – Detmold Consulting] ==========

MAGNETIC FIELD (B-FIELD) CALCULATIONS

Sensor Height = 1 metre

X (m)	B-FIELD RESULTANTS B-FIELD (mGauss)	THETA	B-FIELD XY VECTOR COMPONENTS B-FIELD X (mGauss)	THETA X	B-FIELD Y (mGauss)	THETA Y
.0	83.62	90.0	24.69	120.0	83.62	30.0
2.0	82.80	103.0	29.83	161.6	80.84	36.6
4.0	80.31	116.2	40.41	186.5	72.67	42.6
6.0	76.13	129.4	50.37	200.4	59.96	48.0
8.0	70.47	142.3	56.49	208.5	44.68	53.1
10.0	63.80	154.5	57.79	213.4	29.43	59.3
12.0	56.73	165.6	55.00	216.3	16.49	70.1
14.0	49.82	175.6	49.68	217.9	7.70	99.1
16.0	43.45	-175.6	43.32	218.8	6.03	161.9
18.0	37.80	-168.0	36.98	219.3	8.70	192.9
20.0	32.91	-161.4	31.20	219.4	10.85	203.3
22.0	28.73	-155.7	26.19	219.4	12.00	207.9
24.0	25.19	-150.7	21.98	219.2	12.41	210.3
26.0	22.19	-146.4	18.49	219.0	12.33	211.7
28.0	19.64	-142.6	15.62	218.7	11.95	212.5
30.0	17.48	-139.3	13.26	218.5	11.42	213.1
32.0	15.64	-136.3	11.32	218.2	10.81	213.4
34.0	14.05	-133.7	9.71	217.9	10.17	213.6
36.0	12.69	-131.3	8.38	217.6	9.53	213.7
38.0	11.50	-129.2	7.28	217.4	8.92	213.7
40.0	10.47	-127.3	6.35	217.1	8.33	213.7
42.0	9.57	-125.5	5.57	216.9	7.79	213.7
44.0	8.77	-123.9	4.90	216.6	7.28	213.7
46.0	8.07	-122.5	4.34	216.4	6.81	213.6
48.0	7.45	-121.1	3.86	216.2	6.38	213.6
50.0	6.89	-119.9	3.44	216.0	5.98	213.5
52.0	6.40	-118.8	3.08	215.8	5.61	213.4
54.0	5.95	-117.7	2.77	215.6	5.27	213.4
56.0	5.55	-116.7	2.50	215.5	4.96	213.3
58.0	5.19	-115.8	2.26	215.3	4.67	213.2
60.0	4.86	-115.0	2.05	215.1	4.41	213.1

STUDY

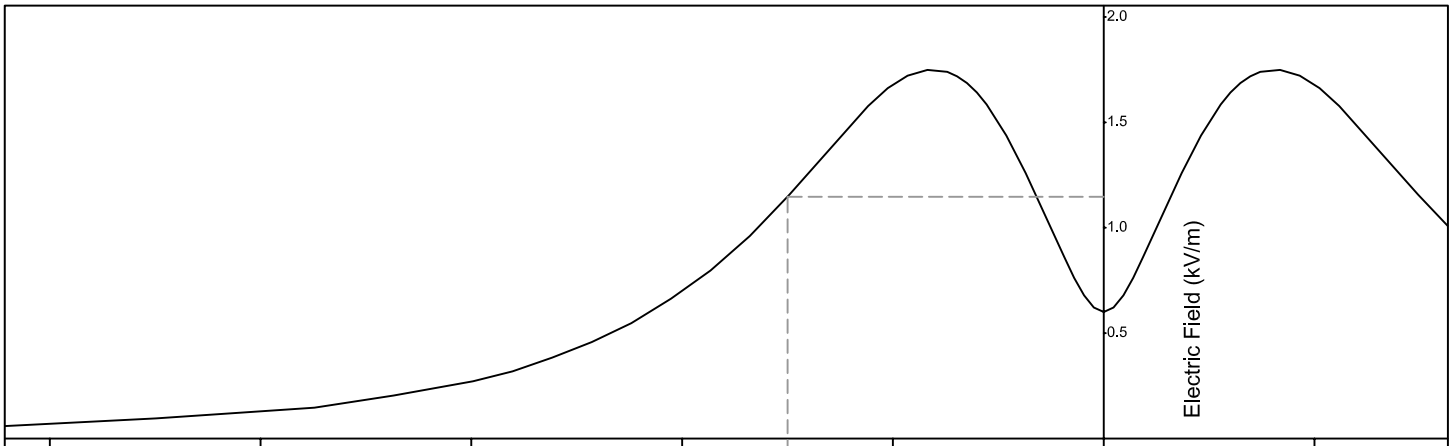
Effects of High Voltage Transmission Line In Proximity of Highways

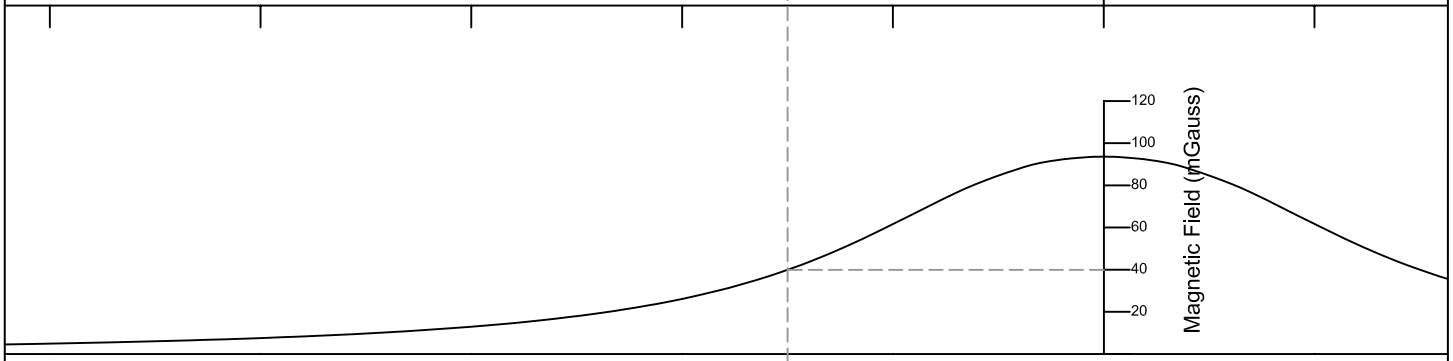
BC Ministry of Transportation

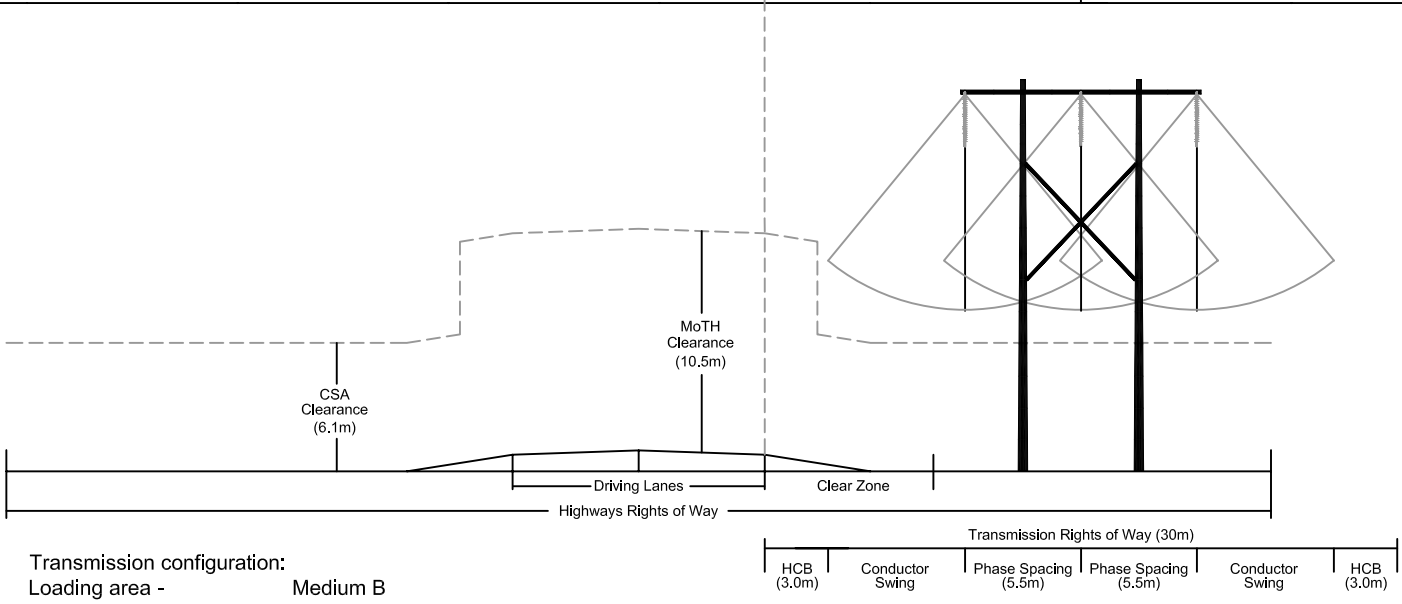
APPENDIX

Sketches 1A, 1B, 2A & 2B

DMD







Transmission configuration:

Loading area -	Medium B
Ruling span -	203m
Ruling sag (max) -	7.8m
Horizontal clearance to buildings -	3.0m
Required transmission RW -	30m

Notes:

1) Powerlines crossing highways must meet highway vertical clearances over driving lanes under worst sag conditions.
2) Powerlines paralleling highways must meet highway vertical clearances over driving lanes under all conductor conditions.
3) Powerlines paralleling highways must provide CSA horizontal clearance to buildings (HCB) from swung conductors to edge of driving lanes.
4) Powerlines paralleling highways must meet CSA vertical clearances over highway rights of way.

REVISIONS

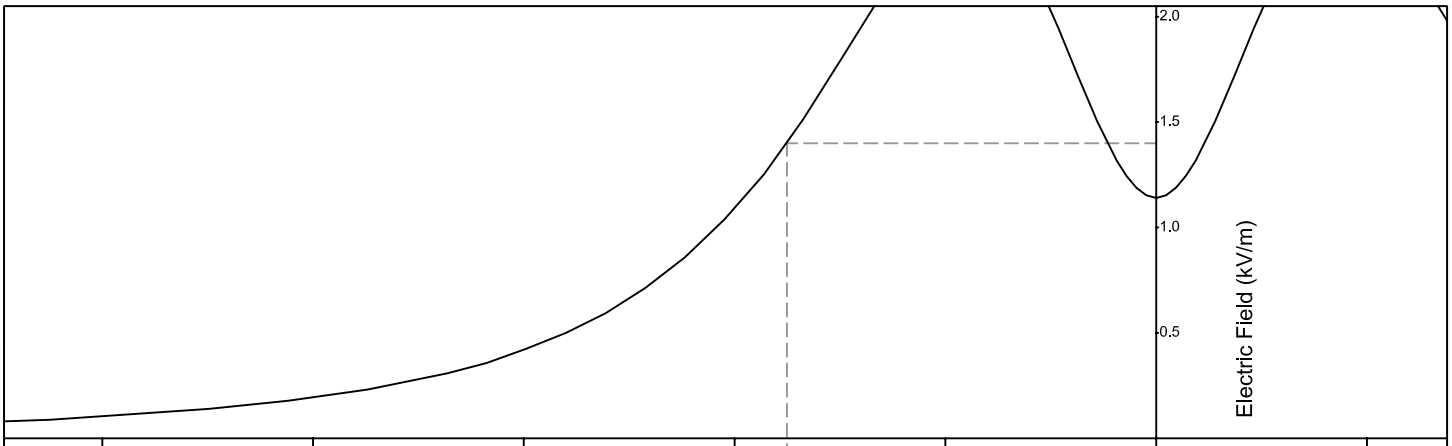
No.	BY	DATE	DESRIPTION	APP.
1	JMD	05/08/11	ADDED CLEARANCE DIMENSIONS	
0	JMD	05/07/12	NEW DRAWING	

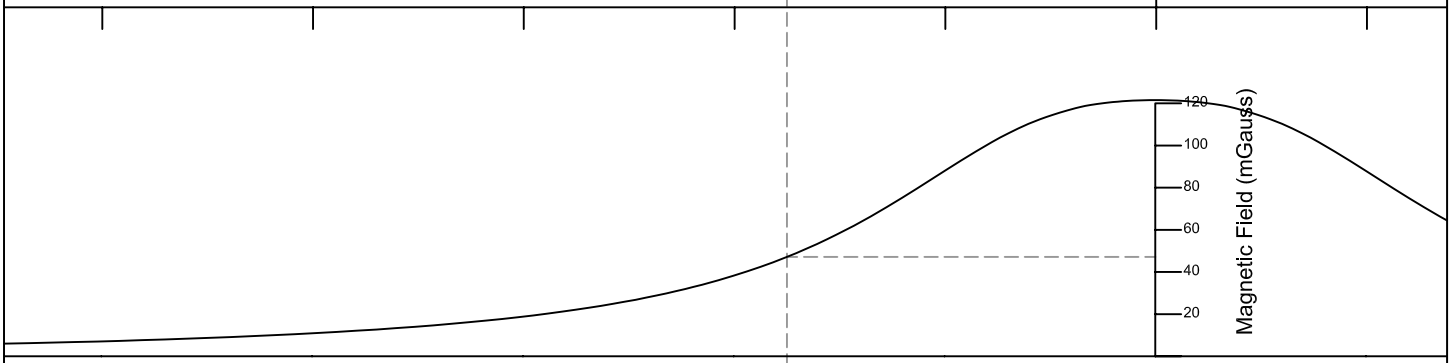
Proposed Sharing of Rights of Way

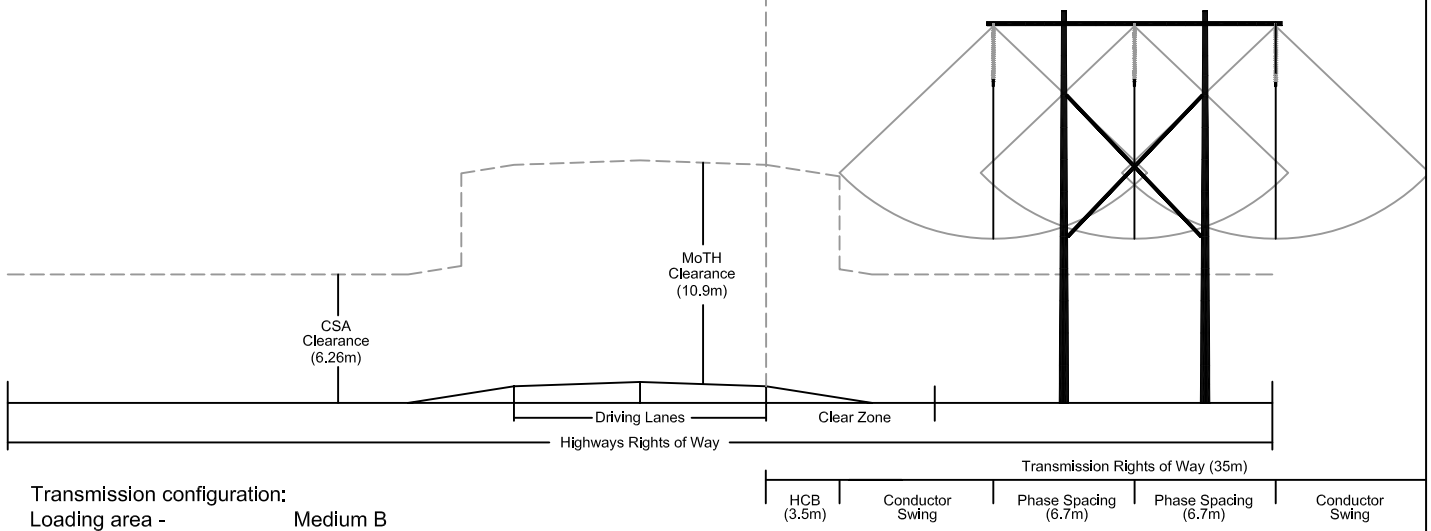
(230 kV beside Highway)

Detmold Consulting Ltd.

DRAWING No.	REV.
Sketch 1A	1







Transmission configuration:

Loading area -	Medium B
Ruling span -	195m
Ruling sag (max) -	7.24m
Horizontal clearance to buildings -	3.5m
Required transmission RW -	35m

Notes:

1) Powerlines crossing highways must meet highway vertical clearances over driving lanes under worst sag conditions.
2) Powerlines paralleling highways must meet highway vertical clearances over driving lanes under all conductor conditions.
3) Powerlines paralleling highways must provide CSA horizontal clearance to buildings (HCB) from swung conductors to edge of driving lanes.
4) Powerlines paralleling highways must meet CSA vertical clearances over highway rights of way.

REVISIONS

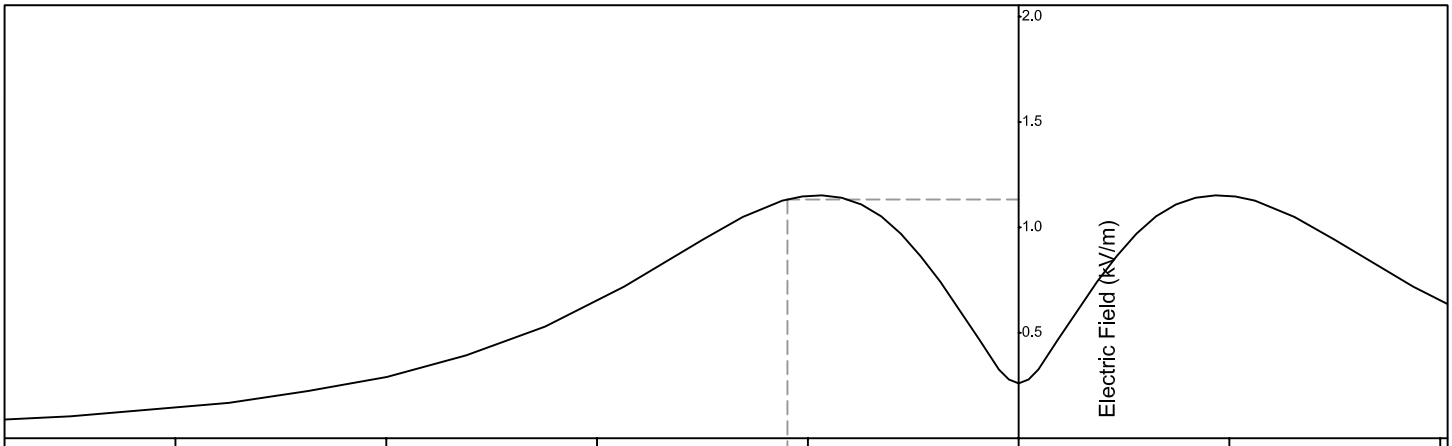
No.	BY	DATE	DESRIPTION	APP.
1	JMD	05/08/11	ADDED CLEARANCE DIMENSIONS	
0	JMD	05/07/15	NEW DRAWING	

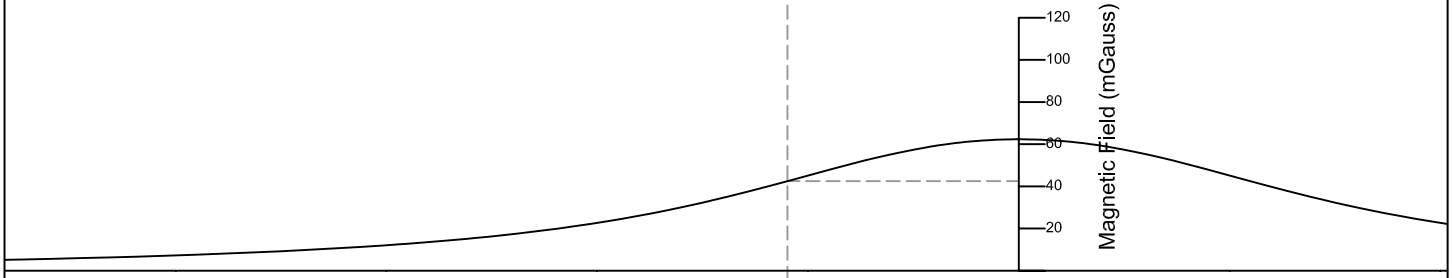
Proposed Sharing of Rights of Way

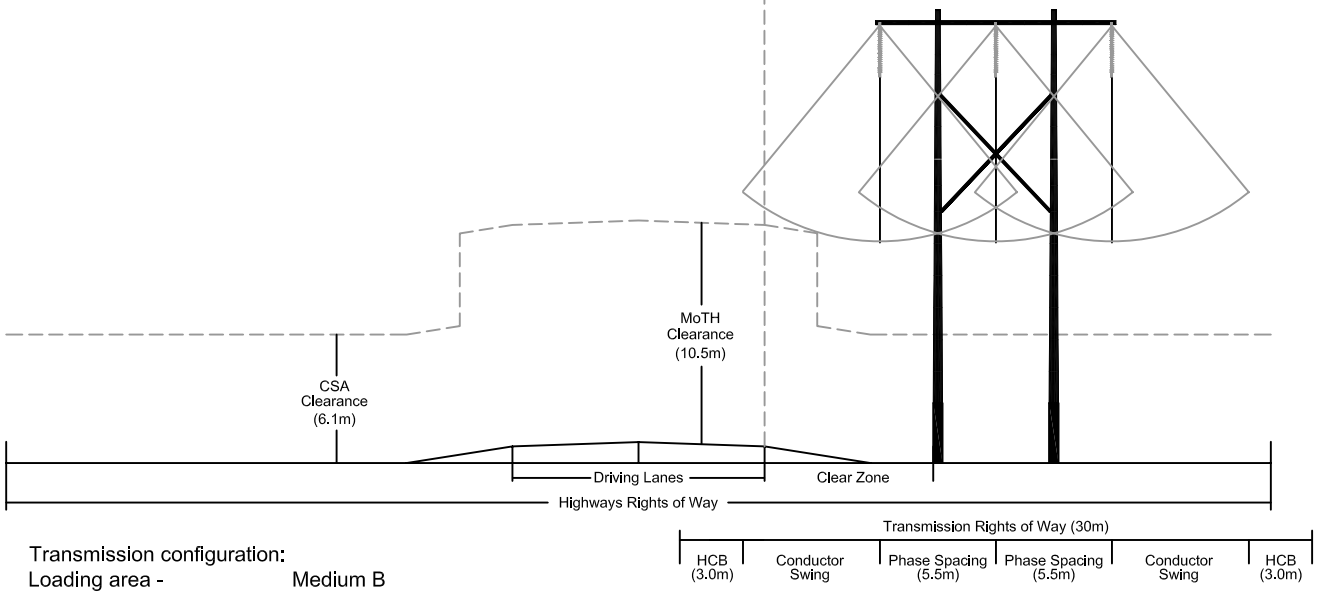
(287 kV beside Highway)

Detmold Consulting Ltd.

DRAWING No.	REV.
Sketch 1B	1







Transmission configuration:

Loading area -	Medium B
Ruling span -	203m
Ruling sag (max) -	7.8m
Horizontal clearance to buildings -	3.0m
Required transmission RW -	30m

Notes:

1) Powerlines crossing highways must meet highway vertical clearances over driving lanes under worst sag conditions.
2) Powerlines paralleling highways must meet highway vertical clearances over driving lanes under all conductor conditions.
3) Powerlines paralleling highways must provide CSA horizontal clearance to buildings (HCB) from swung conductors to edge of driving lanes.
4) Powerlines paralleling highways must meet CSA vertical clearances over highway rights of way.

REVISIONS

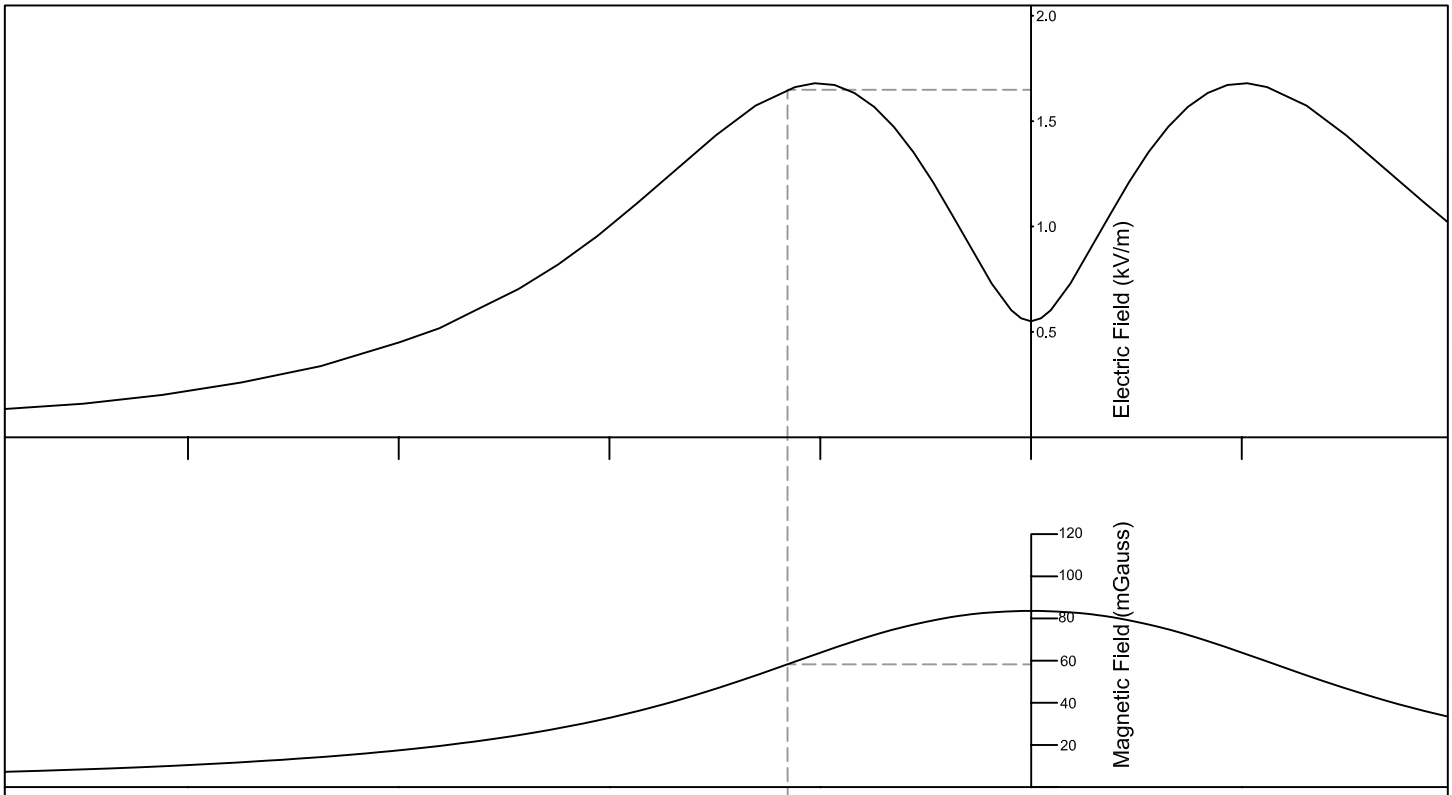
No.	BY	DATE	DESRIPTION	APP.
1	JMD	05/08/11	ADDED CLEARANCE DIMENSIONS	
0	JMD	05/07/15	NEW DRAWING	

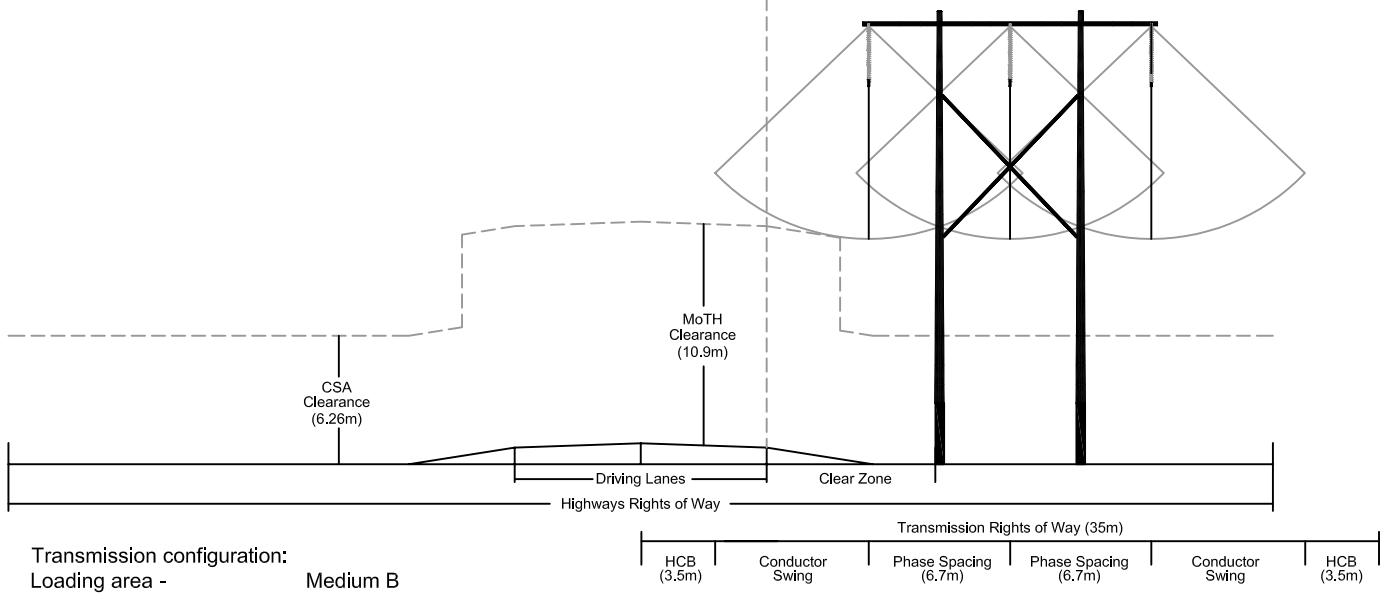
Proposed Sharing of Rights of Way

(230 kV swung over Highway)

Detmold Consulting Ltd.

DRAWING No.	REV.
Sketch 2A	1





Transmission configuration:

Loading area -	Medium B
Ruling span -	195m
Ruling sag (max) -	7.24m
Horizontal clearance to buildings -	3.5m
Required transmission RW -	35m

Notes:

1) Powerlines crossing highways must meet highway vertical clearances over driving lanes under worst sag conditions.
2) Powerlines paralleling highways must meet highway vertical clearances over driving lanes under all conductor conditions.
3) Powerlines paralleling highways must provide CSA horizontal clearance to buildings (HCB) from swung conductors to edge of driving lanes.
4) Powerlines paralleling highways must meet CSA vertical clearances over highway rights of way.

REVISIONS

No.	BY	DATE	DESRIPTION	APP.
1	JMD	05/08/11	ADDED CLEARANCE DIMENSIONS	
0	JMD	05/07/15	NEW DRAWING	

Proposed Sharing of Rights of Way

(287 kV swung over Highway)

Detmold Consulting Ltd.

DRAWING No.	REV.
Sketch 2B	1