HALTON HILLS HYDRO INC. RESPONSES TO INTERROGATORIES OF THE VULNERABLE ENERGY CONSUMERS' COALITION (VECC)

Tuesday, November 20, 2007

Overall Rate Impact
VECC Question #1
References: Ex1/T2/S1 and Ex10/T1/S9 Pages 1-3 (Appendix F)
Preamble: VECC wishes to more fully understand the impacts of the proposed rate increases on its specific constituency. (Note: Consult the Toronto Environmental Alliance Report prepared for the OPA for Low Income Methodology)

a) Comment on the level of impact ($ and %) of the monthly/annual rate/cost increases:
- ***i. The impact on low income families at the Stats Canada Low Income Cut Off Income (LICO) level (% of disposable income required to pay for electricity) Compare 2008to 2006 and 2007.***
- ***ii. The Impact on Senior citizens (lower average use) at the LICO. Compare 2008 to 2006 and 2007.***
- ***iii. List the opportunities for Low Income customers and Seniors to reduce their electricity bills.***
- ***iv. Discuss the need for mitigation based on your answers to i-iii above.***

b) Estimate the total impact on the cost of electricity for a Low Income family (LICO level) living in a 1000 square foot multi-family rental unit. (assume utilities are not included in rent)
c) Comment on the outlook/impact for other factors affecting electricity bills-the COP, the impact of TOU rates and discontinuation of the RPP.
d) Comment on the impact, on the cost of electricity and electricity bills, of individual metering for condominium and rental housing units. (including Social Housing)

a) Level and impact of rate changes:

i) Impact on families at LICO level – to evaluate the impact of the rate changes proposed in this application on customers in this category, an estimate of average monthly / annual consumption would be required. Please refer to Appendix F of the Application for an evaluation of the monthly impacts, both on a percentage and dollar basis outlining year-over-year impacts, for customers with various consumption levels.

ii) Impact on Senior citizens at LICO level – similar to i) above, an estimate of average monthly / annual consumption would be required for this customer class. Please refer to Appendix F of the Application for an evaluation of the monthly impacts, both on a percentage and dollar basis outlining year-over-year impacts, for customers with various consumption levels.

iii) Reducing electricity bills – there are a number of opportunities available to Low Income Customers and Seniors to reduce their electricity bills. Please find below a sample of easy strategies which will enable reduction of a consumer's electricity bill:

- Turn off lights when not in use.
- Use task lighting rather than lighting the whole room unnecessarily for close work.
- Replace incandescent bulbs, (ie. regular light bulbs) with compact fluorescent lights. While more expensive to purchase, prices continue to drop and they pay for themselves with time.
- Use incandescent bulbs with a light dimmer. When less light is needed, the lights can be dimmed and less energy is consumed.
- Use a fan rather than an air conditioner during the summer
- Setting the temperature a couple of degrees lower during the winter can save a lot of money.
- Use curtains and shades on windows to keep heat in during the winter.
- Use window shades to reduce or block sunlight and heat during the summer (especially effective for windows that receive direct sunlight).
- Turn computers and printers off when not in use.
- Thaw, or partially thaw, frozen foods in the refrigerator before cooking.
- Use a smaller appliance if possible. Small appliances use less power than larger ones. For example, use a microwave oven rather than a regular electric oven/stove.

iv) Rate mitigation – Halton Hills Hydro Inc. does not propose any rate mitigation in this application. The total bill impacts to various customer classes are relatively minimal.

b) Impact of rate proposal on low income family in 1,000 square foot multi-family rental unit – as stated above, to evaluate the impact of the rate changes proposed in this application on customers in this category, an estimate of average monthly / annual consumption would be required. Significantly varying electricity consumption patterns may be experienced in a 1,000 square foot multi-family rental unit.

Please refer to Appendix F in the Application for an evaluation of the monthly impacts, both on a percentage and dollar basis, outlining year-over-year impacts for customers with various consumption levels.

c) Outlook / impact of COP, TOU rates, discontinuation of RPP – Halton Hills Hydro Inc. does not wish to comment on these factors as these are provincially mandated programs.

d) Individual metering for condominium and rental housing units – individual consumers will have the opportunity to gain more control over the cost of their electricity consumption and electricity bills with the introduction of individual metering for condominium and rental housing units. Without individual metering, consumers in these units will pay an average cost of all consumers in the building. There is reduced incentive to reduce electricity consumption since an individual's actions will impact the average for all consumers in the building. In addition, each individually metered customer would be charged a fixed monthly service charge.

Smart Metering
VECC Question #2
Reference: Ex1/T1/S6
Preamble*: "In the rate application, Halton Hills Hydro Inc. has not included any costs related to Smart Metering. In decision EB-2007-0536 dated April 12, 2007, Halton Hills Hydro Inc. applied for $1.18 to embark on its Smart Metering Investment Plan filed with the Ontario Energy Board December 15, 2006. However, the Ontario Energy Board only approved $0.26 due to Regulation 153/07. At the present time, it is unclear how Smart Metering costs will be recovered and therefore we request to be included in any provincial mandate of Smart Metering Costs recovery."*

a) Please provide a copy of HHI SM Plan 2006-2010.
b) Provide details on RFP/bids/contracts for meter supply and information on pricing.
c) Provide an update of expenditures to the end of 2007 in the standard Board Staff Format, including unit costs.
d) Provide the forecast for 2008 test year in the same format.
e) Provide details of the SM deferral account as forecast at the end of 2007 and 2008.
f) Provide details of the 2007 and 2008 SM rate riders.

a) See Appendix A – Smart Meter Investment Plan

b) See Appendix A – Smart Meter Investment Plan

c) Halton Hills Hydro Inc. has incurred approximately $40,000 in Smart Metering Costs. The costs were expended as follows:
   i.
      1. Request For Proposal Costs - $31,850
         a. Preparation
         b. Demonstrations
         c. Evaluations
         d. Field Demonstrations
      2. Communications Study - $8,150

   ii. No Smart Meters have been installed

d) Forecast for 2008 is contained in Appendix A- Smart Metering Investment Plan.

e) Smart Meter deferral account:
   i. Estimated balance as at December 31, 2007 - $151,421
   ii. Estimated balance as at April 30, 2008 - $176,421
   iii. As of this filing, the only known rate rider expires on April 30, 2008

f) Current rate riders are $0.28/customer/month as Directed in EB-2007-0536 Decision and Order from the Ontario Energy Board for Distribution rates effective May 1, 2007 dated April 12, 2007.

Service Quality, Reliability Performance and Preventative Maintenance
VECC Question #3
No Reference-Deficiency in Filing

a) Provide 2000-2006, actuals for OEB Service Quality Indicators and estimates for Bridge year 2007 and 2008. b) Provide SAIDI, SAIFI and CAIDI reliability data for 2000-2006 and projections for 2007 and 2008. c) Provide an analysis as to whether HHI performance is at, below, or above Hydro One Distribution's performance. d) Provide an analysis as to whether HHI performance is at, below, or above industry norms.

e) Describe the level of effort applied to preventative maintenance programs for underground and overhead distribution assets, including annual FTEs and total costs for each (capital and labour) 2000-2008.

f) Position preventative maintenance costs as a percentage of overall distribution system (labour and capital) costs for 2006-2008.

a)

Table 1 – Service Quality Indicators

	% Completed within approved time							
Indicator	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007 Forecast**	**2008 Forecast**
Low Voltage Connections	100	100	100	100	100	100	100	100
High Voltage Connections	100	-	-	100	100	100	100	100
Cable Locates	100	100	100	100	-	97	100	100
Phone Calls	-	84.53	76.7	85.34	-	67	100	100
Annual Appointments	-	97.62	100	100	-	100	100	100
Annual Written Response	-	100	91.7	100	-	100	100	100
Emergency Urban Response	100	100	100	100	100	100	100	100
Emergency Rural Response	100	-	100	100	100	100	100	100

b)

Table 2 – Service Reliability Indices

	2003	**2004**	**2005**	**2006**	**2007 Forecast**	**2008 Forecast**
SAIDI	3.4253	1.1234	1.8462	1.193	1.2	1.2
SAIFI	1.8774	1.2190	1.7034	1.534	1.6	1.6
CAIDI	1.8200	0.9200	1.0838	0.780	0.8	0.8

c) HHHI performance is above Hydro One Distribution's performance in most areas.

d) HHHI performance is comparable to other LDCs in the province.

e) A level of effort sufficient to appropriately maintain the distribution assets of Halton Hills Hydro Inc. has been applied on an annual basis. The total annual costs for preventative maintenance programs, including FTE costs is as follows:

Year	$
2000	557,000
2001	573,000
2002	576,000
2003	488,000
2004	562,000
2005	594,000
2006	695,000
2007	741,000
2008	821,000

The company maintains 10 staff annually which may be allocated to operations and maintenance activities at any time. For 2008, one additional staff member will be added to this group.

f) Preventative maintenance costs as a percentage of overall distribution system costs for 2006 – 2008:

Year	%
2006	16.4
2007	13.8
2008	15.9

Business Planning/Budget Assumptions
VECC Question #4
References: Ex1/T2/S2 and Ex3/T2/S1

a) Provide a Copy of HHIs Business Planning/Budget Document.
b) Indicate the key Business Planning/Budget assumptions (inflation, housing starts, customer growth etc.) that, if incorrect, will impact on the 2008 Revenue Requirement.
c) Provide order of magnitude impacts/sensitivities of the key variables on the test year revenue requirement.

a) See Appendix B

b) Key Business Planning Assumptions
- Customer growth both number and consumptions volumes
- Reliability, aging infrastructure
- Safety

c) Key Sensitivities on test year revenue requirement
- Return on Equity
- Debt Servicing Cost

2008 Revenue Deficiency
VECC Question #5
Reference: Ex1/T1/S4 Causes of Revenue Deficiency
a) Please provide a version of the schedule including the following

- ***i. Historical 2006 (approved and actual).***
- ***ii. Bridge year 2007 Forecast and YTD.***
- ***iii. Test year as shown.***

b) Provide Variance analyses for 2006 and 2007 YTD

a)

Table 3 – Revenue Deficiency / Sufficiency

	2006 Board Approved	2006 Actual	2007 Bridge	2008 Test
Revenue Forecast				
Distribution revenue	9,023,508	9,323,876	9,672,375	9,951,365
Other operating revenue (net)	974,580	1,064,259	960,000	1,103,000
Total Revenue Forecast	9,998,088	10,388,135	10,632,375	11,054,365
Revenue Requirement				
Operation & maintenance	3,923,445	4,583,978	4,741,000	5,288,000
Depreciation & amortization	1,846,338	1,930,209	2,129,369	2,190,723
Interest	923,150	1,000,873	997,951	1,242,620
Transformer allowance	165,383	178,815	180,000	183,000
Low voltage	613,744	613,744	636,500	660,000
Return	1,329,336	1,329,336	1,354,593	1,585,346
PILs	938,649	731,486	1,181,000	1,242,593
Smart meters	136,800	136,800	75,000	--
CDM	88,690	88,690	--	--
Total Revenue Requirement	9,965,535	10,593,931	11,295,413	12,392,282
Revenue sufficiency (deficiency)	32,553	(205,796)	(663,038)	(1,337,917)

b) Variance analyses for 2006 segmented information is per the following in the Application:

i. Revenue variance – Exhibit 3 / Tab 1 / Schedule 3 / Page 1
ii. Cost variance – Appendix D of original Application

Calculation of Revenue Requirement
VECC Question #6
Reference: Ex1/T2/S4
a) Provide a version of the summary table with the following additions
i. 2006 actual.
ii. 2007 forecast.
b) Provide variance analysis for 2006 and YTD 2007.

a) Please refer to VECC Interrogatories #5.

b) Please refer to VECC Interrogatories #5.

Rate Base and Working Capital
VECC Question #7
References: Ex2/T1/S2 and Ex2/T4/S1

a) Has HHI performed a lead/lag study for working capital? If so please provide a copy.

b) Is HHI aware the Lead/lag studies performed for Hydro One and Toronto Hydro (Navigant Studies)?

c) If the average result of those studies (about 12%) was applied to HHI what would be the impact on Working Capital, Ratebase and Revenue Requirement for 2008?

d) Since COP and customer collections are the largest Cash Flow items what would be the Impact on Working Capital, Ratebase and Revenue Requirement for 2008, if the Working Capital for Account 4705-Power Purchased ($27,767,404), and the collection period for customer accounts were set at the same values as Hydro One?

a) Halton Hills Hydro Inc. has not undertaken a lead/lag study.

b) HHHI is not aware of the lead/lag studies performed for Hydro One or Toronto Hydro.

c) The results of a reduction to 12% for 2008 would be:

Working capital	$ 5,175,360 (from $6,469,200)
Rate base	$36,660,334 (from $37,954,174)
Revenue requirement	$10,349,878 (from $10,446,283)

d) If 12% was used on power purchased, the 2008 impact would be:

Working capital	$ 5,636,177 (from $6,469,200)
Rate base	$37,121,151 (from $37,954,174)
Revenue requirement	$10,384,214 (from $10,446,283)

Capital Budget
VECC Question #8
References: Ex2/T3/S1-6

a) Please provide a consolidated 2008 Capital Budget schedule using logical categories of expenditures such as Distribution System, Transformation, Metering, General Plant, Properties and IT.(refer to Hydro One and Toronto Hydro for examples)

b) Provide comparisons of 2008 to 2006 and 2007 budgets in the same format.

c) Provide any additional explanatory notes re variances.

d) Please advise whether HHHI has conducted a Distribution Asset Condition Assessment; if yes, please provide a copy.

e) Otherwise please explain in some detail how HHHI assessed the priorities to replace/rebuild/install various components of its Distribution assets?

f) Provide the Multi-year budgets for all major 2008 projects shown on Page 6 of the schedule.

g) Provide examples of Business Cases for major 2008 Projects

- ***i. F Building Upgrade (Page 6)***
- ***ii. G Transformer Station (Page 6)***

a) Please see Table 4 for a consolidated capital budget for 2008 Test.

Table 4 – Consolidated Capital Budget

	2008 Test	2007 Bridge	2006 Actual
Distribution System	1,518,170	1,699,295	1,306,750
Stations	1,313,240	1,020,396	130,415
Transformation	590,000	575,500	319,504
Information Technology	420,700	243,000	353,611
Buildings	285,000	-	29,799
Rolling Stock	280,000	230,000	52,428
Communications	152,800	27,500	97,487
Metering	139,400	592,000	270,787
Other	131,700	254,020	716,576
Construction In Progress	1,000,000	200,000	796,510
Total	5,831,010	4,841,711	4,073,867

b) Please see Table 5 for a consolidated capital budget for 2006 Actual and 2007 Bridge and variances.

Table 5 – Consolidated Capital Budget Variances

	Test year compared to Bridge	Bridge year compared to 2006 Actual
Distribution System	(181,125)	392,545
Stations	292,844	889,981
Transformation	14,500	255,996
Information Technology	177,700	(110,611)
Buildings	285,000	(29,799)
Rolling Stock	50,000	177,572
Communications	125,300	(69,987)
Metering	(452,600)	321,213
Other	(122,320)	(462,556)
Construction In Progress	800,000	(596,510)
Total	989,299	767,844

c) All variances can be explained on the project-by-project review for each year per Exhibit 2/Tab 3/Schedule 1/Pages 1 – 7, Exhibit 2/Tab 3/Schedule 2/Pages 1 – 5, and Exhibit 2/Tab 3/Schedule 3/Page 1.

d) Halton Hills Hydro Inc. has not conducted a formal Distribution Asset Condition Assessment. However, here is a summary of the Asset Inspections we perform at Halton Hills Hydro Inc..

- Thermal Scan of entire system and substations – yearly
- Visual Inspection of Urban System - complete within 3 years
- Visual Inspection of Rural System – complete within 6 years
- Visual Inspection of Underground Equipment – complete within 3 years
- Visual Inspection of Substations – completed monthly
- Tree trimming completed on a 3 year cycle

Our area is broken down into 11 sections and we inspect each of those sections according to the timelines listed above.

e) Priorities for Replacing Distribution Assets – Halton Hills Hydro Inc. prioritizes on a two year forecasting basis for replacing, installing and upgrading its distribution assets. A review is performed annually for the two-year period for all distribution assets, with a listing compiled for all potential projects. These projects are ranked based on various requirements and the outcome is the budgeted projects that are necessary to undertake for the annual period.

f) Multi-Year Budgets for major 2008 projects – the project contained in construction in progress which has a multi-year timeframe is the transformer station. Past municipal transformer station build costs have averaged from $8M to $12M for other local distribution companies. Halton Hills Hydro Inc. is not at the stage to prepare a detailed multi-year budget, but expects the aggregate cost for the transformer station to be within this historical range.

g) Examples of business cases for major 2008 projects:

i) F - Building Upgrade

The building upgrade project involves the replacement of the roof systems to the offices of Halton Hills Hydro Inc., located at 43 Alice Street, Acton, ON. Halton Hills Hydro Inc. contracted a company to perform an assessment on the current roof systems. The company determined that the existing roof systems are nearing the end of their life expectancy and need replacement. The assessment described instances of leaking, vegetation growth, compromised seals and membranes and cracked flashings among other issues. The building has already experienced leaking and water damage. This project cannot be deferred. There is a risk to the building structure and employee safety if the project is not completed. In addition, any further water damage could result in the loss of data and material assets (ie computers, furniture).

ii) G – Transformer Station

Please see The GTA West Supply Study found in Appendix C of the OEB Staff interrogatories responses. The Supply Study provides a description of projected growth and load requirement and the basis for Transformer Station. This project cannot be deferred for reasons stated in the GTA West Supply Study.

Operating Revenue/Load Forecast
VECC Question #9
References: Ex3/T2/S1-3

a. Provide working papers underlying the load growth and customer growth. Forecasts.
b. Provide more details on the Hydro One methodology underlying the weather-normalized consumption shown at E3/T2/S2.
c. Please provide a version of E3/T2/S2 include 2007 and 2008.
d. Please provide missing table- Exhibit: 3 Tab: 2 Schedule: 2 Page: 3.
e. If the missing table does not include 2006 and 2007 date please provide a version with these inclusions.
f. Delineate the impact of a shift from bulk metering to individual metering for condominiums and rental housing units including, by year, the additional meters and the associated loads and consumption.
g. Has HHI confirmed its estimates of consumption and load for the condominium and rental multi-family buildings sector? Please discuss.
h. Has HHI taken into account the impacts of OPA Conservation programs in its forecast. Please describe.

a.) The Load growth and customer growth forecasts come from a number of documents that culminate into the evidence filed in the Application. Those documents include:
   a. Municipal Subdivision information
   b. Ongoing residential subdivision occupancy
   c. Load projections by feeder
   d. New residential subdivision development
   e. New Commercial Subdivision development
   f. Residential/Commercial "in-fill" information

   In response to these questions b, c and e, please refer to OEB Staff Interrogatory responses from Halton Hills Hydro Inc. #29.

d) Exhibit 3/Tab 2/Schedule 2/Page 3 should read "Page left intentionally blank". There is no missing data. The final sentence of Exhibit 3/Tab 2/Schedule 2/Page 2 should read "Therefore, Halton Hills Hydro Inc. has used the load and customer forecasted numbers in the PRECEDING table".

f) Halton Hills Hydro Inc. does not expect an increase in loads or consumption as this is already included in our actual load statistics. Estimates show that there are approximately 750 bulk metered customers in Halton Hills. HHHI does not expect this individual metering to be retrofitted until 2009 or 2010 as a part of our Smart Metering initiative.

g) See answer to (f) above.

h) HHHI's load forecast includes the early stages of conservation as our load forecast is derived from actual historical consumption levels of the ratepayers of HHHI.

Other Revenue
VECC Question #10
Reference: Ex3/T3/S2 Page 1
Preamble: "Explanation: In our 2008 Test year we will have an additional debt of $7,200,000 earning interest".

a) Please provide details of the calculation of the interest revenue associated with the new Debt. (Timing, Rate and Basis of calculation) (SEE also questions about type of instrument, coupon, term etc under Cost of Capital –Debt)

a.) Provided Halton Hills Hydro Inc.'s rate application is approved, HHHI intends to acquire the additional debt in May 2008. There are currently no details on the specifics of the transaction as the borrowing application has not been started. It is intention the that the additional debt will be an interest only type financial instrument. The debt costs, assuming a May 31, 2008 transaction is:

$7,200,000 x 213days/365 days x 5.78% = $242,855

Operating Costs-OM&A
VECC Question #11
Reference: Ex4/T1/S2 Page 1 and Appendix D Ex4T2S1 Pages 1 and 2

a) Either provide more details/explanations for all material differences in OM&A costs by category shown in E4/T1/S2 Page 1 AND/OR provide specific cross-references to the explanations in Appendix D by annotating schedule E4/T2/S1, pages 1-2

a) OM&A cost variances – Exhibit 4/Tab 1/Schedule 2/Page 1 and Appendix D – Exhibit 4/Tab 2/Schedule 2/Pages 1-2:

Appendix D – Exhibit 4/Tab 2/Schedule 2/Pages 1-2 breaks down the operation, maintenance, billing & collecting, community relations, and general and administrative expenses by account number per the Accounting Procedures Handbook. The totals per each of these segments in Appendix D – Exhibit 4/Tab 2/Schedule 2/Pages 1-2 ties in to the OM&A costs by category as shown in Exhibit 4/Tab 1/Schedule 2/Page 1.

Materiality is determined for each annual period in Appendix D per Exhibit 4/Tab 2/Schedule 2/Page 1. The yellow highlights per Appendix D – Exhibit 4/Tab 2/Schedule 1/Pages 1-2 indicate the variances that are in excess of materiality. These material variances are subsequently discussed in Appendix D – Exhibit 4/Tab 2/Schedule 2/Pages 1-4.

Halton Hills Hydro Inc. has discussed all material variances as requested in Appendix D – Exhibit 4/Tab 2/Schedule 2/Pages 1-4.

Compensation
VECC Question #12
Reference: Ex4/T/S6 Page 1

a) Provide the rationale for increases of 24% (2006-2008) in average base salary for Management.

b) Since most recent Union contracts have ranged in the 3-3.5% for annualized increases, please explain the 13.5% (2006-2008)increase in average unionized staff base salary.

c) Reconcile the annual average base salary data with the FTEs listed for both management and unionized staff.

d) Has HHI benchmarked its base compensation to other utilities? If so provide the documentation.

a)

i) Average compensation – 2008 Test – the average for Management compensation in 2008 should be stated as $114,626.

ii) Average management compensation for 2007 / 2008 – the average management compensation level is projected to remain relatively constant over the bridge and test years due to the remuneration level of new management staff.

iii) Position step-up on wage grid – certain employees stepped up on the wage grid

b) Average unionized compensation for 2007 / 2008 – the average unionized compensation level is projected to remain relatively constant over the bridge and test years due to new employees brought in at the lowest wage grid levels.

c) Please refer to the answers in (a) and (b) above.

d) Halton Hills Hydro Inc. references other Utilities in their base compensation. In addition, Halton Hills Hydro Inc. subscribes to an MEARIE salary survey which is provided to Halton Hills Hydro Inc. on a confidential basis.

Shared Services and Corporate Costs
VECC Question #13
References: Ex4/T2/S4, OEB Affiliate Relations Code for Electricity Distributors

a) Provide the following in tabular/spreadsheet format (.xls preferred) for each of 2006(historical), 2007(bridge), and 2008 (test) years:

- ***i. List of all services (inbound and outbound) between HHI and Affiliates in the same order as set out in the SLAs. Show each affiliate and inbound outbound services separately.***
- ***ii. For each service show whether market pricing or cost of service provider was/is used (FMV or CBP).***
- ***iii. For each service show the allocator(s) (time estimate, etc).***
- ***iv. For each service show the third prong cost/benefit and whether this is based on FMV or CBP.***
- ***v. Provide complete explanatory notes.***

b) Provide complete copies of each affiliate SLA for 2007 and 2008. Ensure costs are the same as set out in the answer to part a) and reconcile any differences.

c) Provide details of the calculation of the return allowed by the OEB on capital employed to provide affiliate services

a)

Table 6 – Affiliate Costs

	2006 Actual	2007 Bridge	2008 Test	
Shared Services Expense:				
Billing Services	54,000	55,500	56,500	FMV
Collecting Services	19,000	19,500	20,100	FMV
Customer Services ** Includes Bills, Postage, Meter Reading	112,000	115,800	117,700	FMV
Distribution Poles	48,600	49,800	50,000	CBP
Office Space	22,400	23,100	20,100	FMV
Office Equipment	22.550	23,200	23,900	FMV
Administration	75,000	82,000	54,500	FMV
Warehouse Services	4,800	4,900	5,000	FMV
Total Expense	358,350	373,700	329,700	

Water Billing: The allocation of costs in for water billing includes:

Type of Cost	**Allocator**
Salaries and Benefits	Estimated time
Supplies – bills, envelopes, postage	% of water meters to total meters
Meter Reading	Actual # of reads
Occupancy	Sq footage of space
Office equipment	Estimate of usage

Salaries and Benefits:
Halton Hills Hydro Inc. performs water billing activities for the Region of Halton. The LDC allocates customer care staffing costs based on an estimate of time spent by staff to perform the water billing functions. The allocation includes a portion of our call centre staff, billing staff, payment processing staff and supervisory time.

Supplies:
Supplies include envelopes, bills, postage and printer supplies. Halton Hills Hydro Inc. divides the number of water bills by the total number of bills to determine the proper allocation.

Meter Reading:
Meter reading costs are split on a 50/50 basis for any dual read locations.

Occupancy:
HHHI allocates occupancy costs based on an estimate of square footage used to perform this service.

Office Equipment:
HHHI allocates a percentage of annual operating costs for printers, mailing machine and AS400.

Hot Water Tank Rentals: The allocation of costs for water heater rentals includes:

Type of Cost	**Allocator**
Salaries and Benefits	Estimated time
Supplies – bills, envelopes, postage	% of bills
Occupancy	Sq footage of space
Office equipment	Estimate of usage

Salaries and Benefits:
Halton Hills Hydro Inc. performs water heater activities for the affiliate SouthWestern Energy Inc. HHHI allocates operating staffing costs based on an estimate of time spent by staff to perform the water heater functions. The allocation includes a portion of stores and operations clerk plus supervisory time.

Supplies:
Supplies include envelopes, bills, postage and printer supplies. HHHI calculates the total number of bills that include water heater charges to determine the proper allocation.

Occupancy:
HHHI allocates occupancy costs based on an estimate of square footage used to perform this service.

Office Equipment:
HHHI allocates a percentage of annual operating costs for printers, mailing machine and AS400.

Fibre Optics Services: The allocation of costs for Fibre Optics Services:

Type of Cost	**Allocator**
Salaries and Benefits	Estimated time
Occupancy	Sq footage of space
Office equipment	Estimate of usage
Poles	# of poles

Salaries and Benefits:
Halton Hills Hydro Inc. performs billing activities for the affiliate Halton Hills Fibre Optics Inc.. HHHI allocates operating staffing costs based on an estimate of time spent by staff to perform the billing functions. The allocation includes a portion of accounts payable/receivable clerk and supervisory time.

Occupancy:
HHHI allocates occupancy costs based on an estimate of square footage used to perform this service.
Office Equipment:
HHHI allocates a percentage of annual operating costs for printers, mailing machine and AS400.

Poles:
HHHI charges Halton Hills Fibre Optics the same rate per pole attachments as is charged to Bell Canada.

b) See Appendix D

c) In Halton Hills Hydro Inc.'s case, no capital has been employed only for the use of an affiliate. In all cases, it is capital that Halton Hills Hydro Inc. requires to operate the business. The fact that HHHI can offset some of these costs is a benefit to the ratepayers of Halton Hills Hydro Inc.

Distribution Loss Factor
VECC Question #14
Reference: Ex4/T2/S9

a) Please provide a detailed rationale and Working Papers for HHI's proposal to increase the distribution loss factor to 4.99% from 3.68%.

a) Due to previously less accurate data gathering, the 2007 loss factor of 1.0368 and the actual 2006 loss factor of 1.0357 were incorrectly determined. In addition, an increase in the discover of un-metered power has resulted in historical loss factors being under calculated. Since the EDR 2006 application, Halton Hills Hydro Inc. has reviewed information gathering methods and determined a more accurate method. In addition, internal procedures have been improved to ensure more accurate data.

Regulatory Assets and Deferral Accounts
VECC Question #15
Reference: Ex5/T1/S3 Pages 1-2
Preamble: "Halton Hills Hydro calculated the 2006 ending balance as the actual balance at December 31, 2006 less the OEB approved Regulatory Asset recovery until May 1st 2008. We then added carrying costs to the balance and added a forecast of RSVA power variance for both the Bridge and Test years."

a) Confirm/Update the Balance proposed to be cleared as of April 30 2008.
b) Why is it appropriate to clear forecast balances rather than actual?
c) Does HHI have a smart meter deferral account? Iif so provide the balance in the Smart Meter Deferral Account as of October 1, 2007 and the projected balance as of April 30, 2008.
d) Indicate whether the April 30 SMDA balance will be carried forward into the calculation of the 2009 SM rate adder (included as part of distribution tariff). If not, please describe the regulatory treatment of the difference between the rate adder and actual SM costs in 2008.
e) Why is the three year disposition appropriate? What other rate riders and DA clearances are anticipated?

a) Deferral and variance account balance proposed to be recovered as at April 30, 2008 per Exhibit 5/Tab 1/Schedule 3/Pages 1-2 is $1,439,704.

b) Appropriateness of clearing forecast deferral and variance account balances – corresponding with the methodology of the future test year rate filing, Halton Hills Hydro Inc. has proposed to clear forecasted balances. Clearing variances in the year incurred will ensure costs are recovered in a timely manner and minimize any carrying cost burden to the ratepayer.

c) Smart Meter Deferral Account – Halton Hills Hydro Inc. maintains a smart meter deferral account. The smart meter deferral account balance at October 1, 2007 is a credit of $132,671. The approximate smart meter deferral account balance at April 30, 2008 is $170,000.

d) Clearing the Smart Meter Deferral Account – it is the intention of Halton Hills Hydro Inc. that the smart meter funds collected to date will be offset against future smart meter activities, thereby reducing any future year smart meter rate adders.

e) Appropriateness of three-year disposition – a three-year disposition has been selected by Halton Hills Hydro Inc. to minimize the ratepayer burden of deferral and variance account balances. Three years has also been the standard utilized in prior year recoveries. No further rate riders are expected for 2008 rates other than those proposed in this rate application. Also, at this time, there are minimal further deferral accounts expected to be cleared.

VECC Question #16

Reference: Ex5/T1/S3

***Preamble**:* The methodology accepted by the OEB in RP-2004-0100, proposes to allocate the Regulatory Assets to the customer classes based on the following principles:• If costs are incurred based on energy consumption, Regulatory Assets will be allocated based on energy consumption • If costs are incurred for the benefit of all customers irrespective of their energy consumption, Regulatory assets will be allocated based on number of customers• If costs have been incurred in the past from customers using distribution revenues, Regulatory Asset will be allocated based on distribution revenue.

a) Confirm whether the proposed allocation conforms to these principles ad highlight and explain any differences.

b) For customers not on the RRP how is the allocation of RSVA modified?

a) Deferral and Variance account allocation – Halton Hills Hydro Inc. confirms that it has utilized the methodology in RP-2004-0100 to allocate the recovery of deferral and variance account balances to customer classes.

b) Allocation of RSVA for customers not on the RPP – no modification of RSVA for non-RPP customers is proposed. RSVA charges are incurred based upon kWh of power utilized by all customers, for RPP and non-RPP customers.

Cost of Capital
Capital Structure
VECC Question #17
Reference: Ex6/T1/S2 Page 1

a) Provide the Actual (average) per financial statements and deemed capital structures for 2006, 2007 YTD and forecast 2008.
b) Provide explanations for differences.
c) Estimate the cost for 2007 and 2008 of the difference between deemed and actual COC.
d) The Board-Approved D/E Phase- in was 2007-2010-4 years i.e. 2.5% per year. What was 2007 D/E ratio? Please provide the calculation.

a.) Exhibit 6/Tab 1/Schedule 2 has been updated (see Table 7). This revised schedule matches the information provided in Exhibit 6/Tab 1/Schedule 3.

Table 7 – Capital Structure

2006 Board Approved

Elements		Dollars ($)	Ratio (%)	Cost Rate (%)	Return (%)
Long-term debt-Municipal		16,141,970	49.20	6.25	
Deposits		500,000	1.50	Prime-2%	
Common equity		16,161,063	49.30		9.00
Total		32,803,033			

2007 Bridge

Elements		Dollars ($)	Ratio (%)	Cost Rate (%)	Return (%)
Long-term debt-Municipal		16,141,970	42.41	6.25	
Deposits		621,888	1.63	Prime-2%	
Common equity		21,297,057	55.96		9.00
Total		38,060,915			

2008 Test

Elements		Dollars ($)	Ratio (%)	Cost Rate (%)	Return (%)
Long-term debt-Municipal		16,141,970	34.97	6.25	
Long-term debt-Financial Institution		7,200,000	15.60	5.78	
Deposits		621,888	1.35	Prime-2%	
Common equity		22,201,336	48.08		8.93
Total		46,165,194			

We have added 2006 actual as requested.

2006 Actual

Elements	Dollars ($)	Ratio (%)	Cost Rate (%)	Return (%)
Long-term debt- Municipal	16,141,970	43.44	6.25%	
Deposits	621,888	1.67	Prime-2%	
Shareholders equity	20,392,778	54.88		5.72%**
Total	37,156,636			

**Return Calculated as:
2006 Net Income after tax $1,165,491/Shareholders Equity $20,392,778 = 5.72%

We have added 2007 YTD September (Un-audited) as requested:

2007 YTD September

Elements		Dollars ($)	Ratio (%)	Cost Rate (%)	Return (%)
Long-term debt- Municipal		16,141,970	42.63	6.25	
Deposits		603,747	1.59	Prime-2%	
Equity		21,120,078	55.78		3.49
Total		37,865,795			

**Return Calculated as:
2007 YTD Net Income after tax $737,300/Shareholders Equity $21,120,078 = 3.49%

b.) The only difference is the increase in Equity which is a result of increased retained earnings.

c.)
Table 8 – Cost of Capital

	2007	***2008***
Cost of Capital	4.88%	7.45%

d.) See (b) above

Cost of Debt
VECC Question #18
Reference: Ex6/T1/S2
Preamble: The Board's guidelines on affiliated debt allow a spread over long Canadas. Non-affiliated debt is at market rates

a) Confirm that the 6.25% Rate paid to Halton Hills on the $16,141,970 affiliate debt conforms to the Boards Guidelines-Provide the details –Long Canada rate and the Spread for A/BBB etc.. If not make the appropriate changes.
b) With respect to the $7.20 million of new debt to be issued/procured, please provide details- institution(s), term, rate and other conditions such as times interest coverage, subordination of shareholder loans etc.

a) Halton Hills Hydro Inc. complies with the OEB Guidelines.

BANK OF CANADA
BANQUE DU CANADA

1.1.1.1.1 WEEKLY (WEDNESDAY) Series:

V121796: CHARTERED BANK ADMINISTERED INTEREST RATES: PRIME BUSINESS (as at Wednesday)		
14/11/2007	**6.25**	

b) Provided Halton Hills Hydro Inc.'s rate application is approved, HHHI intends to acquire the additional debt in May 2008. There have no details on the specifics of the transaction as the borrowing application has not been started. It is the intention of HHHI that the additional debt will be an interest only type financial instrument. The debt costs assuming a May 31, 2008 transaction is:

$7,200,000 x 213days/365 days x 5.78% = $242,855

Short Term Debt
VECC Question #19
References: Ex6/T1/S2 Page 1 & Ex6/T1/S3 Page 1

a) Please provide a complete explanation as to the TD Bank Deposits and Short term debt in the amount of $250,000 shown in E6/T1/S3 for each of 2006, 2007 and 2008. Nature of instrument(s), rate etc

b) Why is there no ST debt amount or cost rate shown in the capital structure E6/T1/S2 Pg1? Please explain/correct the schedule.

a) The amounts shown as "TD Bank Deposits" and "Deposits" are related to security deposits.

b) Exhibit 6/Tab 1/Schedule 2 has been updated (see Table 9). This revised schedule matches the information provided in Exhibit 6/Tab 1/Schedule 3.

Table 9 – Capital Structure

2006 Board Approved

Elements		Dollars ($)	Ratio (%)	Cost Rate (%)	Return (%)
Long-term debt- Municipal		16,141,970	49.20	6.25	
Deposits		500,000	1.50	Prime-2%	
Common equity		16,161,063	49.30		9.00
Total		32,803,033			

2007 Bridge

Elements		Dollars ($)	Ratio (%)	Cost Rate (%)	Return (%)
Long-term debt- Municipal		16,141,970	42.41	6.25	
Deposits		621,888	1.63	Prime-2%	
Common equity		21,297,057	55.96		9.00
Total		38,060,915			

2008 Test

Elements		Dollars ($)	Ratio (%)	Cost Rate (%)	Return (%)
Long-term debt- Municipal		16,141,970	34.97	6.25	
Long-term debt- Financial Institution		7,200,000	15.60	5.78	
Deposits		621,888	1.35	Prime-2%	
Common equity		22,201,336	48.08		8.93
Total		46,165,194			

Cost of Equity
VECC Question #20
Reference: Ex6/T1/S4 Pages 1-3

a) Confirm that HHI will update the ROE calculation based on the January 2008 Consensus Forecast.

a.) Halton Hills Hydro Inc. is proposing a 8.93% ROE for purposes of the application. HHHI is not seeking to depart form the Board's Cost of Capital guidelines. It is expected the rate will be updated using January 2008 Consensus Forecasts.

LRAM/SSM Claim
VECC Question #21
Reference Ex9/T1/S4
Preamble: In its Decision in EB-2007-0096 the OEB provided certain clarifications with respect to the calculation of the LRAM and SSM.

a) Provide a version of Schedule 4 that shows for each program
i. Total Expenditures.
ii. Participants.
iii. Free rider estimate and source of FR Estimate.
iv. Kwh savings.
v. Net TRC.
b) Provide a schedule that supports the (revised) LRAM claim consistent with the Boards Direction on Free Ridership.
c) Provide a Schedule that supports the (revised) SSM consistent with the Board's direction on SSM calculation.
d) What is the Impact of those changes on the LRSAM/SSM claims and on the forecast 2008 revenue requirement/deficiency?
e) Please confirm how HHI proposes to recover the LRAM/SSM amounts once approved (Which is Correct-1 year or 3 years)? Please explain rationale in context of other rate riders and dispositions.

a) CDM Load Impacts by Program and Class – Net of Free Riders

Table 10

Rate Classification	Water Heater Load Control	Lighting	Capacitor Installation	Equipment Replacement
Residential	102,897 kWh			
General Service Less than 50 kW		63,179 kWh	142,600 kWh	379,749 kWh

CDM Participation Levels by Program and Class

Rate Classification	Water Heater Load Control Participation	Lighting	Capacitor Installation	Equipment Replacement
Residential	132 Customer			
General Service Less than 50 kW		1 Customer	1 Customer	1 Customer

b)

Table 11

Residential - LRAM	kWh	Rate	LRAM
2005	50,625	$.0113	$572
2006	52,272	$.0113	$591
Total	102,897		$1,163

General Service <50 kW - LRAM	kWh	Rate	LRAM
2005	142,600	$.0093	$1,326
2006	442,928	$.0124	$5,492
Total	585,528		$6,818

c)

Table 12

Residential - SSM	TRC	TRC Rate	SSM
2005	12,034	5%	$602
2006	93,993	5%	$4,700
Total			$5,302

General Service <50 kW - SSM	TRC	TRC Rate	SSM
2005	48,609	5%	$2,430
2006	274,436	5%	$13,722
Total			$16,152

d)

Table 13 – Impact of LRAM/SSM claims on Forecast 2008 revenue deficiency

Rate Class	Amounts (2005 + 2006)		Billing Units (2006)		Rate Riders		
	LRAM	SSM			LRAM	SSM	Total
	$	$			$/unit (kWh or kW)	$/unit (kWh or kW)	$/unit (kWh or kW)
Residential	$ 1,163	$ 5,302	208,116,543	kWh	0.00000	.00003	.00003
General Service less than 50 kW	$ 6,818	$ 16,152	54,412,911	kWh	0.00013	.00030	.00043
Total	**$ 7,981**	**$ 21,454**					

There will be no impact to the Forecast 2008 Revenue Requirement as these amounts are proposed to rate riders in addition to 2008 proposed rates.

e) Halton Hills Hydro Inc. is requesting a one year recovery of LRAM and SSM amounts.

Cost Allocation and Rate Design
VECC Question #22
Reference: Ex1/T1/S8 Page 1

a) Provide a version of the Schedule with the 2007 R/C ratios in the same format.
b) Explain any changes in cost allocation for 2008.
c) With respect to the fixed monthly residential charge why did HHI increase this on the basis of the OEB cost allocation study but not propose a plan to change R/C ratios. Please explain.

a)

Table 14 – 2007 Revenue to Cost Ratios

Rate Classification	Revenue to Cost Ratio - Existing
Residential	88.37%
General Service less than 50 kW	81.87%
General Service 50 to 999 kW	156.93%
General Service 1,000 to 4,999 kW	164.17%
Street Lights	15.14%
Sentinel Lights	36.74%
Un-metered Scattered Load	106.77%

Halton Hills Hydro Inc. does not have a Cost Allocation Study with 2007 rates. However, HHHI is of the opinion that it would be substantially different than what is included above and in our application as Exhibit 8/Tab 1/Schedule 1/Page 3.

b) The methodology was to obtain approximately one third to one half movement in all rate classes from existing Revenue to Cost ratios to Proposed Revenue to Cost Ratios to avoid any excessive rate issues in future years.

c) Halton Hills Hydro Inc. has changed the Revenue to Costs Ratios in our 2008 Rate Application as described in Table 15.

Table 15 – Revenue to Cost Ratios

Rate Classification	Revenue to Cost Ratio - Existing	Revenue to Cost Ratio - Proposed
Residential	88.37%	94.60%
General Service less than 50 kW	81.87%	94.44%
General Service 50 to 999 kW	156.93%	134.81%
General Service 1,000 to 4,999 kW	164.17%	131.92%
Street Lights	15.14%	24.27%
Sentinel Lights	36.74%	53.43%
Un-metered Scattered Load	106.77%	103.37%

VECC INTERROGATORIES

APPENDIX A

SMART METER INVESTMENT PLAN

HALTON HILLS HYDRO INC.
(ED-2002-0553)

SMART METER INVESTMENT PLAN
(BOARD FILE #EB-2006-0246)

DECEMBER 15, 2006

1. CONTACT INFORMATION

Arthur A Skidmore
Chief Financial Officer
519-853-3700 Ext 225
askidmore@haltonhillshydro.com

2. Did you submit a Smart Meter Investment Plan ("SMIP") as part of your 2006 EDR rate application?

In the 2006 EDR rate application from Halton Hills Hydro we stated that implementation would begin in 2007 with a target of 6,000 meters. The information is contained in Manager's Summary Chapter 3, 3.1 Tier 1 Adjustments.

3. If you have made any significant changes to your SMIP subsequent to your application, please provide details of the changes (both here in general terms and as a component of the following questions).

The timing of our implementation has changed from what was included in our EDR filing. We still intend to implement smart meters in our community in 2007. We will be issuing a RFP (copy attached as Exhibit 1) in December 2006 with responses due in 2007. We want to ensure that we are getting a smart solution for the expenditure required.

4. For the 2006 rate year, how much money has been included in the Board approved revenue requirement for the SMIP? How is this being recovered from your customers?

The Ontario Energy Board's response is included below:

"As noted in your application, you asked for 6,000 smart meters to be installed in 2006. Assuming start date for installation as May 2006 and uniform installation each month $3.50 per meter month is equivalent to a value of $1.90 per month per meter installed. (Use 12 meters, one per month with $3.50 applied to the cumulative value for one year ($273) divided by 12 meters divided by 12 months). The 6000 is multiplied by $1.90 multiplied by 12 months ($136,800) and divided by the number of metered customers you have (18,323) divided by twelve months. From this you get a rounded value of $0.62 per metered "

5. What is your SMIP in the 2006 rate year? If you do not have a SMIP in the 2006 rate year, what are your intentions for future years?

Halton Hills Hydro Inc. SMIP Timeline

Date	***Action***
December 15, 2006	File SMIP with Ontario Energy Board
December 22, 2006	Issue RFP
December 22, 2006 - January 20, 2007	Receive RFP responses
January 20, 2007 – March 31, 2007	Review and evaluate Responses
April1, 2007 – June 30, 2007	Design, build, test communication infrastructure
July 1, 2007	Review expired meters, order 2007 Smart meters – Quantity 3,500
September 1, 2007 – December 31, 2007	Installation of 3,323 meters
2008	Installation of 5,000 meters
2009	Installation of 5,000 meters
2010	Installation of 5,000 meters

6. Specifically, and in as much detail as possible, please provide the following information for your planned implementation of the SMIP:
   - The number of meters installed by class and by year, both in absolute terms and as a percentage of the class;
   - The capital expenditures and amortization by class and by year;
     (Assumed cost/meter including communication is $250/meter)
   - The operating expenses by class and by year;
     (Assumed operating costs @$1/meter/month)
     (Assumed yearly meter installation performed equally throughout the year
   - The effect of the SMIP on the level of the allowance for PILs.
     (Assumed 36.12% gross up)

RESIDENTIAL – 17,004

Year	# of Meters	Capital Expenditures	Operating Expenses	Amortization	PIL's	Total (Excluding Amortization)
2007	3,323	$830,750	$10,000	$17,300	$290,206	$1,130,956
2008	4,560	1,140,000	67,000	116,730	345,405	$1,552,405
2009	4,560	1,140,000	121,000	211,730	291,585	$1,552,585
2010	4,561	1,140,250	177,000	306,740	237,131	$1,130,956

GENERAL SERVICE – 1,319

Year	# of Meters	Capital Expenditures	Operating Expenses	Amortization	PIL's	Total (Excluding Amortization)
2007	-					
2008	440	$110,000	5,300	9,200	34,495	$149,795
2009	440	110,000	10,600	18,400	29,257	149,857
2010	439	109,750	15,900	27,600	24,020	149,670

7. If you previously submitted a plan and have made changes to it, please provide a similar set of responses to question 7 for both the original plan and the changes between plans.
The only other plan submitted was the plan included in our 2006 EDR application that was referred to in questions #2

8. With respect to funding for the SMIP, please provide comments as to whether you consider that the existing funding recovered through the 2006 rates and/or the proposed adjustment for 2007 rates is sufficient, or indicate why that funding and timing is not sufficient for your SMIP needs and what action you consider necessary to ameliorate the situation. Please ensure that these comments are as detailed and specific as possible, both with respect to the level of the funding and the timing of such a revision.
We would not consider existing funding through our 2006 rates to be sufficient for the expenditure outlined in question #6. In our opinion funding should match the investment plan as outlined in question #6. Therefore, we would expect additional 2007 funding to be ($1,130,956-$136,800(2006)-$136,800(2007) = $857,356). However, we are unclear what the statement "proposed adjustment for 2007 rates" means and therefore have assumed that our $857,356 is the proposed adjustment.

9. Please provide any additional comments that you believe would be helpful to the Board in its understanding of your SMIP and what you consider to be the requirements for the efficient and effective implementation of this government sponsored initiative.
It is Halton Hills Hydro's intention to fully support the government's Smart Metering initiative. Having the proper funding mechanism in place will enable our utility to implement a solution that will benefit all ratepayers in our community.

Respectfully Submitted:

Daniel P. Guatto,
President

Arthur A. Skidmore
Chief Financial Officer

Request for Proposal
For a
Turn-Key Electric Advanced Metering Solution

Reference # AMI-001

TABLE OF CONTENTS

1 INSTRUCTIONS TO PROPONENTS

Structure of Document and Files Provided

Structure of the Request for Proposal (RFP) document is in accordance with the Table of Contents located at the beginning of the RFP.

1.2 SCHEDULE

The proposed schedule is as follows;

Submit proposals:	January 20, 2007
Evaluate bids, interview Proponents and award contract at the sole discretion of Halton Hills Hydro and Ottawa PUC Networks Inc.	January 20 to February 1, 2007

Halton Hills Hydro and Ottawa PUC Networks Inc. reserve the right to change and or modify this schedule at any time.

1.3 FORM OF RESPONSE

In order to allow a consistent evaluation of the proposals, it is required that information be presented in accordance with the Format for Submission – Part 6 and 7 included in the Request for Proposal documents. There is no need to include standard marketing materials. All questions are to be addressed and answers are to be clear and concise. Failure to comply with all or any of the above **will** cause your proposal to be rejected without further consideration.

1.4 PROPOSAL DUE DATE

Proposals are due on January 20, 2007. At that time, please be prepared to submit your proposal as follows:

- **Electronic submission of proposal submitted to: gcameron@agsi.ca**
- **A CD and 4 Hardcopy Versions submitted in a sealed envelope to: Geoffrey Cameron, 116 Gulp St, Unit C, Georgetown, ON L7G 4A3.**

1.5 MANDATORY REQUIREMENTS

Proponent's response must satisfy the Overall Response, and business mandatory requirements for their submission to be further considered for evaluation. Section 3 of this RFP

1.6 EVALUATION CRITERIA

All proposals must meet all identified mandatory requirements including but not limited to the above and as outlined in the RFP for further evaluation consideration of the submitted proposal.

As part of the Evaluation Process, proposals will be evaluated using "best value" criteria including technical capabilities, service and support capabilities, total cost of ownership including financial incentives, commercial terms and conditions and other possible factors applied solely at Halton Hills Hydro and Ottawa PUC Network's Inc. discretion and equally to all proposals. All proposals received will be evaluated in each of the areas identified below. Any such proposal must clearly define the benefits to Ottawa PUC Networks Inc. both financially and otherwise, from its acceptance.

COMMERCIAL

- Compliance with the Commercial Terms and Conditions

FINANCIAL

- Financial viability
- Lowest cost of ownership
- Lowest Additional costs i.e.
- Terms of Payment

TECHNICAL

- Solution Capability / Functionality
- Solution Architectural Compliance
- Integration/Interface capability

SERVICE AND SUPPORT

- Proposed Solution Implementation
- Data Conversion Capability
- Proposed Service Levels
- Employee interface
- Project Plan and schedule
- Understanding of Ottawa PUC Networks Inc. requirements

1.7 CONTACT

All correspondence must be directed to Geoff Cameron at the **e-mail** address below. While we conduct the solicitation and evaluation of the proposal process, you shall not contact any individual in Ottawa PUC Networks Inc. with respect to this requirement other than Geoff Cameron. **Failure to comply with this requirement will cause your proposal to be rejected**. Thank you for your co-operation in this matter.

Inquiries with respect to this RFP must be directed only in writing by e-mail to:
Geoff Cameron – gcameron@agsi.ca

At the sole discretion of Halton Hills Hydro and Ottawa PUC Networks Inc., the question and the response may be distributed to all the respondents.

During the period prior to the submission of proposals, any alterations to the proposal documents will be issued to prospective proponents as written addenda. The proponent shall list in its proposal all addenda that were considered when its proposal was prepared.

1.8 DISCLAIMER

The proposals solicited are solely for the benefit of Halton Hills Hydro and Ottawa PUC Networks Inc. Halton Hills Hydro and Ottawa PUC Networks Inc. do not make any claims or promises whatsoever that the final award will be based on any perceived, assumed or stated criteria. Halton Hills Hydro and Oshawa PUC Networks Inc. makes no representation whatsoever that it will accept any proposal, nor will it be precluded from accepting any other proposal or other offer.

Each company responding to this RFP, invited or otherwise, shall bear all expenses incurred by the preparation and presentation of its response. Halton Hills Hydro and Oshawa PUC Networks Inc. will therefore be entitled to reject, and Halton Hills Hydro and Oshawa PUC Networks Inc. will reject, any claim made against it in this matter, regardless of the results of the RFP process.

2 STANDARD TERMS & CONDITIONS

2.2 DEFINITIONS

OPUCN - The Oshawa PUC Networks Inc., its successors and assigns.

HHH - Halton Hills Hydro Inc., its successors and assigns.

Bidder - The person, firm or corporation submitting a proposal to the OPUCN.

Company - The person, firm or corporation to whom the HHH and / or OPUCN awards a Contract, its successors and assigns.

Contract - The purchase order authorizing the Company to do the work, the proposal, the bonds or security (if any), the Company's quotation and change notices, appendices, and addenda (if any).

Subcontractor - A person, firm or corporation having a Contract with the Company for any part of the work.

Proposal Document - The documents issued by the HHH and / or OPUCN in response to which proposals are invited for the performance of Work or supply of equipment.

Work - All labour, materials, products, articles, equipment, fixtures, services, supplies, acts required, furnished or performed by the Company, which is subject of the Contract.

2.3 SUBMISSION OF PROPOSAL

Bidders must submit proposals and pricing on the forms supplied by the OPUCN and HHH.

The Bidders designated signing officer must sign the proposal form.

The signature submitted on any joint bid is on behalf of each of the Bidders.

If the Bidder is not a limited company, he must submit a copy of the most recent business or partnership registration form filed by the Bidder with the Ministry of Consumer and Commercial Relations.

Proposals must be legible, written in ink, or typewritten and the Bidder's authorized signing officer must initial erasures, over-writings or strikeouts.

Failure to return the proposal form on invitation may result in the removal of the Bidder from the OPUCN's / HHH Bidder's list.

The OPUCN / HHH will not consider any proposals received after the closing time.

Should a dispute arise from the terms and conditions of the proposal form, regarding meaning, intent or ambiguity, the decision of the OPUCN / HHH shall be final.

2.4 CONTRACT DOCUMENTS AND ORDER OF PROCEDURE

The contract documents shall consist of, the purchase order, the Proposal Document, and the Company's quotation.

The order in which the documents and portions thereof, named above, take precedence, notwithstanding their issued or executed chronological order.

Amendments to the Contract, in the form of purchase order alterations, shall take precedence over the documents or portions thereof amended thereby. Purchase order alterations, appendices and addenda to any contract document become part of that document.

The intent of the contract is that the Company supply Work that is fit and suitable for the OPUCN's and HHH's intended use and complete for a particular purpose.

None of the conditions contained in the Bidder's standard or general conditions of sale have any effect unless explicitly agreed to by the OPUCN and /or HHH and specifically referred to in the purchase order.

The laws of the Province of Ontario govern the interpretation of the contract.

2.5 CLARIFICATION OF PROPOSAL DOCUMENTS

It is a requirement of the Bidder, prior to submission of its proposal, to forward all requests for any clarification of Proposal Documents to the appropriate designate calling the proposal.

No officer, agent or employee of the OPUCN and / or HHH can orally authorize an alteration to any portion of the documents.

Every notice, advice or other communications pertaining thereto are as follows:

(a) Prior to completion closing time, in the form of a written addendum;

(b) After the OPUCN's and /or HHH's acceptance of a proposal, in writing, signed by an authorized officer of the Company, and accepted by the OPUCN.

2.6 PROOF OF ABILITY

The OPUCN and / or HHH reserves the right to request evidence of the Bidders ability, as well as any Subcontractor, in terms of experience and facilities, to perform the Work by the specified delivery date. The OPUCN and /or HHH reserves the right to approve or disapprove the use of any of the company's equipment.

2.7 DELIVERY

The Company is responsible for delivering or completing the Work specified or called for in or under the proposal as soon as possible within the period specified, unless otherwise stated, after receipt of a purchase order.

Each delivery must include a detailed delivery invoice, showing the exact quantity of goods, services, materials, articles, or equipment. The OPUCN and HHH are not bound to accept the particulars of the invoice signed by Forman's, Stockkeeper's or other receiver's receipts.

Unless otherwise stated, all work pursuant to a purchase order based on the proposal, is subject to inspection by the OPUCN and /or HHH at the point of receipt, unloading, or the site of work or service.

The Company is responsible for arranging completion of the Work as specified in the Contract.

2.8 PRICING REQUIREMENTS

Quote each item separately, in Canadian Funds, F.O.B. destination.

Prices bid must include all incidental costs and the Company deemed satisfied as to the full requirements of the quotation. The OPUCN and HHH will not accept claims for extra work and any additional work needs written authorization before commencement. Should the Company require more information or clarification, they must do so before the submission of the quotation.

Payment is full compensation for all costs related to the Work, including operating and overhead costs to provide work to the satisfaction of the OPUCN and / or HHH.

All prices quoted shall include applicable customs duty, excise tax, freight, insurance and all charges of any kind attributable to the work. Goods and Services Tax and Provincial Sales Tax are extra and not shown, unless otherwise specified herein.

If the Bidder intends to manufacture or fabricate any part of the Work outside Canada, it shall arrange its shipping procedures so that its agent or representative in Canada is the importer of record for custom purposes.

Should any additional or variation in tax or duty be imposed by the Government of Canada or the Province of Ontario that are directly applicable to the Work specified or called for in the quotation by the Bidder and before the delivery or the Work and pursuant to a purchase order issued, by the OPUCN, the appropriate increase or decrease in the price of the Work changes as of the effective date.

2.9 TERMS OF PAYMENT

The OPUCN and HHH reserve the right to hold back appropriate moneys until 45 days after the completion of Work.

Payments made thereunder, including final payment, shall not relieve the Company from its obligations or liabilities under the Contract.

Acceptance by the Company of the final payment, shall constitute a waiver of claims by the company against the OPUCN and HHH, except those previously made in writing in accordance with the Contract and still unsettled.

The OPUCN and HHH shall have the right to withhold from any sum otherwise payable to the Company such amount as may be sufficient to remedy any defect or deficiency in the Work, pending correction of it.

2.10 PATENTS AND COPYRIGHTS

The Company shall, at its expense, defend all claims, actions or proceedings against the OPUCN and / or HHH based on any allegations that the Work or any part of the Work constitutes an infringement of any patent, copyright or other proprietary right, and shall pay to the OPUCN and / or HHH all costs, damages, charges and expenses, including its lawyers' fees on a solicitor and his own client basis occasioned to the OPUCN and / or HHH by reason thereof.

The Company shall pay all royalties and patent license fees required for the Work.

If the Work or any part thereof is in any action or proceeding held to constitute an infringement, the Company shall forthwith either secure for the OPUCN and / or HHH the right to continue using the Work or shall at the Company's expense, replace the infringing Work with non-infringing Work or modify it so that the Work no longer infringes.

2.11 ALTERNATIVES AND EQUIVALENTS

The OPUCN and / or HHH may consider equivalents or alternatives where the mark or brand (if applicable) accompanies the quotation, unless otherwise stated. The OPUCN and / or HHH reserves the right to determine the equivalency of all alternatives and its decision shall be final.

2.12 ASSIGNMENT

The Company shall not assign the Contract or any portion thereof without the prior written consent of the OPUCN and HHH.

2.13 LAWS AND REGULATIONS

The Company shall comply with relevant Federal, Provincial and Municipal statutes and by-laws pertaining to the Work and its performance. The Company shall be responsible for ensuring similar compliance by its suppliers and Subcontractors.

The laws of the Province of Ontario govern the interpretation of the contract.

2.14 CORRECTION OF DEFICITS

If at any time prior to one year after the actual delivery date or completion of the Work, (or specified warranty or guarantee period if longer than one year) any part of the Work becomes defective or is deficient or fails to meet the requirements of the Contract, the Company, upon request, shall make good

every such defect, deficiency or failure without cost to the OPUCN and / or HHH. The Company shall pay all transportation costs for Work both ways between the Company's factory and repair depot and the point of use.

2.15 BID ACCEPTANCE

The OPUCN and HHH reserves the right to award by item, or part thereof, groups of items, or parts thereof, or all items of the proposals, and to award contracts to one or more Bidders submitting identical quotations as to price; to accept or reject any quotations in whole or in part; to waive irregularities and omissions, if in so doing, it serves the best interests of the OPUCN and HHH. No liability shall accrue to the OPUCN or HHH for any decision in this regard.

Proposals shall be irrevocable for 120 days after the official closing time.

The placing in mail or delivery to the Bidder's shown address, given in the notice of award to a Bidder, by the OPUCN and / or HHH, shall constitute notice of acceptance of the Contract, by the OPUCN and / or HHH, to the extent described in the notice of award.

2.16 DEFAULT BY COMPANY

(a) If the Company commits any act of bankruptcy or if a receiver is appointed on account of its insolvency or in respect of any of its property, or if the Company makes a general assignment for the benefit of its creditors; then, in any such case, the OPUCN and / or HHH may, without notice, terminate the Contract.

(b) The OPUCN and / or HHH reserves the right to terminate the contract upon expiration of ten days from the date of written notice to the Company if the Company:

i) Fails to comply with any request, instruction or order of the OPUCN and / or HHH;

ii) fails to pay its accounts;

iii) fails to comply with or persistently disregards statues, regulations, by-laws or directives of relevant authorities relating to the Work;

iv) fails to prosecute the Work with skill and diligence, or assigns or sublets the Contract or any portion thereof; without the OPUCN's and / or HHH's prior written consent;

v) refuses to correct defective work; or is otherwise in default in carrying out its part of any of the terms, conditions and obligations of the Contract.

(c) Any termination of the Contract by the OPUCN and / or HHH, as per section 2.16 (b), shall be without prejudice to any other rights or remedies the OPUCN and / or HHH may have and without incurring any liability whatsoever in respect thereto.

(d) If the OPUCN and / or HHH terminates the Contract, it is entitled to:

i) take possession of all Work in progress, data, materials and software then at the project site (at no additional charge for retention or use of the software equipment), and finish the Work by whatever means the OPUCN and / or HHH may deem appropriate under the circumstances;

ii) withhold any further payments to the Company until completion of the work and the expiry of all obligations under the Correction of Defects section;

iii) recover from the Company loss, damage and expense incurred by the OPUCN and / or HHH by reason of the Company's default (which may be deducted from any moneys due or becoming due to the Company, any balance to be paid by the Company to the OPUCN and / or HHH).

2.17 CONTRACT CANCELLATION

If the OPUCN and / or HHH deems it necessary, it reserves the right to immediately cancel any uncompleted or unperformed portion of the Work or part thereof. In the event of such a cancellation the OPUCN and / or HHH and the Company may negotiate a settlement.

The OPUCN and / or HHH shall not be liable to the Company for loss of anticipated profit on the cancelled portion or portions of the Work.

2.18 QUANTITIES

Where approximate quantities exist, no guarantee of accuracy exists and the numbers given are without any liability on behalf of the OPUCN and / or HHH. Quantities given are for comparison purposes only.

The OPUCN and HHH accepts only payment by the unit, complete at the quoted rate, on actual acceptable quantities.

2.19 SAMPLES

Upon request, samples submitted are strictly in accordance with instructions. The request for samples, subsequent to the opening of proposals, requires that delivery must follow within (5) working days after the request, unless the OPUCN and / or HHH grants additional time. Samples submitted are free of charge and returned at the Bidder's expense, if so requested, provided tests do not destroy the product, or providing they are not a requirement for comparison purposes.

The acceptance of the samples by the OPUCN and / or HHH shall be at its sole discretion and any such acceptance in no way implies relief of the Company from its obligations under the Contract.

2.20 SURETY

The Company shall, if the OPUCN and / or HHH in its absolute discretion so desires, satisfy surety requirements by providing a deposit in the form of a certified cheque, bank draft or money order or other form of surety, in an amount determined by the OPUCN and / or HHH. The OPUCN and / or HHH may hold this surety until 60 days after the day on which all Work covered by the Contract is complete and accepted. The OPUCN and / or HHH may return the surety before the 60 days provided satisfactory

evidence indicating that all liabilities incurred by the Company in carrying out the Work have expired or satisfied discharged or provided for and the receipt of a clearance certificate from the Workers' Compensation Board issued.

Failure to furnish the surety within two weeks from date of request thereof by the OPUCNand / or HHH shall make the award of the contract by the OPUCN and / or HHH subject to withdrawal.

2.21 WORKPLACE SAFETY AND INSURANCE BOARD

All of the Company's personnel must be covered by the insurance plan under the Workplace Safety and Insurance Act, 1997. Upon request by the Group, an original Letter of Good Standing from the Workplace Safety and Insurance Board shall be provided prior to the commencement of Work indicating all payments by the Company to the Board have been made. Prior to final payment, a Certificate of Clearance must be issued indicating all payments by the Company to the Board in conjunction with the subject Contract have been made and that the Group will not be liable to the Board for future payments in connection with the Company's fulfillment of the contract. Further Certificates of Clearance or other types of certificates shall be provided upon request.

2.22 INSURANCE

Upon request by the OPUCN and / or HHH , the Company shall take out and keep in force a policy of liability insurance in the amount of $5,000,000 inclusive per occurrence (or such larger amount as may be required) naming the OPUCN and HHH as additional named insured, and a certified copy of such policy or certificate provided prior to commencement of the Work. Further certified copies shall be provided upon request.

2.23 LIABILITY

The Company agrees to defend, at all times, fully indemnify and save harmless the OPUCN and HHH from all actions, suits, claims and demands, losses, costs, charges and expenses arising by reason of injury or death to any person(s) or any property or charges brought or made against or incurred by the OPUCN or HHH from or relating to the Work performed or not yet performed herein.

2.24 PROJECT SITE WORKING CONDITIONS

The onus shall be upon the Bidder to investigate the project site and inform itself, before bidding, of all the physical and working conditions and administrative practices.

2.25 SAFETY

The Company shall be responsible for being aware of all governing regulations including any established by the OPUCN and HHH related to employee health and safety. The Company shall keep its employees and Subcontractors informed of such regulations.

2.26 UNPAID ACCOUNTS

The Company shall indemnify the OPUCN and HHH from all claims arising out of the unpaid accounts relating to the Work. The OPUCN and / or HHH shall have the right at any time to require satisfactory evidence that the Work in respect of which any payment made or not yet made by the OPUCN and / or HHH is free and clear of liens, attachments, claims, demands, charges or other encumbrances.

2.27 SUSPENSION OF WORK

The OPUCN and / or HHH may without invalidating the Contract, suspend Work by the Company, from time to time, in part or in whole for such reasonable period of time as the OPUCN and / or HHH may determine.

The resumption and completion of Work after the suspension shall be governed by the schedule established by the OPUCN and / or HHH.

2.28 CHANGES IN THE WORK

The OPUCN and / or HHH may, without invalidating the Contract, direct the Company to make changes to the Work. When a change causes an increase or decrease in the Work, the Contract price increases or decreases by the application of unit prices as per the quantum of such increases or decreases, or in absence of applicable unit prices, by an amount to be agreed upon between the OPUCN and /or HHH and the Company. All such changes shall be in writing and approved by the OPUCN and / or HHH.

3 TERMS OF REFERENCE

3.2 BACKGROUND – ADVANCED METERING INFRASTRUCTURE SOLUTION

Oshawa PUC Networks Inc. (OPUCN) is an electric distribution company serving the City of Oshawa Ontario, Canada. OPUCN serves approximately 50,000 customers across a geographical territory of 160 square kilometers. OPUCN has a significant base of industrial, institutional and commercial customers in addition to their residential customers. The City of Oshawa is one of the fastest growing municipalities in Canada. This growth is projected to accelerate into the foreseeable.

Halton Hills Hydro Inc. (HHH) is an electric distribution company servicing the Town of Halton Hills Ontario, Canada. HHH serves approximately 20,000 customers across a geographical territory of 245.7 square kilometers. HHH customer base is a mix of urban and rural customers situated on and around the Niagara escarpment.

OPUCN and HHH have partnered on this Request for Proposal (RFP) in order to collaborate on identifying possible solutions with regards to the Ontario Ministry of Energy Legislative Initiative for replacing traditional electric metering infrastructure with a new Advanced Metering Infrastructure (AMI). The OPUCN and HHH collaboration effort on this RFP is in the hope of being able to maximize the business and technical value to both utilities for the entire AMI implementation.

3.3 ADVANCED METERING INFRASTRUCTURE DEFINITIONS

"**AMCC**" is an advanced metering control computer that is used to retrieve or receive and temporarily store Meter Reads before or as they are being transmitted to the MDM/R. The information stored in the AMCC is available to log maintenance and transmission faults and issue reports on the overall health of the AMI to the distributor.

"AMCD" is an advanced metering communication device that is housed either under the meter's glass or outside the meter. It transmits Meter Reads from the meter directly or indirectly to the AMCC.

"AMI" means an advanced metering infrastructure. It includes the meter, AMCD, LAN, AMRC, AMCC, WAN and related hardware, software and connectivity required for a fully functioning system that complies with this Specification. With some technologies, an AMI does not include AMRCs. An AMI does not include the MDM/R.

"AMRC" is an advanced metering regional collector that collects Meter Reads over the LAN from the AMCD and transmits these Meter Reads to the AMCC.

"Daily Read Period" means the 24-hour period for collecting Meter Reads, subject to the two periods annually during which changes to and from daylight savings time take place. The Daily Read Period ends at 12:00 midnight of each day.

"LAN" means a local area network, the communication network that transmits Meter Reads from the AMCD to the AMRC.

"meter multiplier" is the factor by which the register reading must be multiplied to obtain the registration in the stated units.

"Meter Read" is a number generated by a meter that reflects cumulative electricity consumption at a specific point in time.

"MDM/R" means the meter data management and meter data repository functions within which Meter Reads are processed to produce rate-ready data and are stored for future use.

"WAN" means a wide area network, the communication network that transmits Meter Reads from the AMRC to the AMCC or, in some systems from the AMCD directly to the AMCC, and from the AMCC to the MDM/R.

3.4 OVERALL VISION

OPUCN and HHH are required to implement an Advanced Metering Infrastructure that will adhere to new legislative requirements and support the culture of conservation initiative in the Province of Ontario Canada. Both OPUCN and HHH have a similar philosophy of investing in the solution that provides the best value for their customers and shareholders. Value is considered a blend of a reliable and robust AMI investment with advanced functionality at a reasonable price.

OPUCN and HHH believe that it is critical to select an AMI solution that is based on open technologies and standards that will provide a future proofed investment over the lifespan of the AMI infrastructure. It is OPUCN and HHH intention to select a vendor solution that will provide a robust and scalable solution while at the same time meeting budgetary requirements.

OPUCN and HHH also believe it is critical that they become self sufficient in managing the entire infrastructure. This will include all aspects of AMI management, maintenance, planning, expansion, data management, data integration to other corporate systems and system integration / scalability for load control and other customer service solutions.

3.5 BUSINESS PROBLEM DESCRIPTION

OPUCN and HHH requests proposals from vendors to provide a turn key solution that can provide a complete end-to-end AMI implementation for their respective utilities. The focus of this RFP is to provide all infrastructure and related services in order to meet all Ontario Ministry of Energy regulatory requirements while at the same time providing an open, robust and scalable solution to leverage this infrastructure for future opportunities. This solution must include:

- Hardware;
  - AMCD's;
  - AMRC's;
  - AMCC;
- Software;
- Communications infrastructure;
  - Lan;
  - Wan;
- System Integration Services;
  - AMCD readings to AMRC's;
  - AMRC readings to AMCC (leveraging utility Fiber and / or wireless where applicable);

  - AMCC to MDM/R; and
  - MDM/R to Customer Information System (CIS);
- System Diagnostics; and
- Services;
  - Installation and Testing;
  - Training; and
  - Support.

This proposed turn-key solution must be founded on open architecture and integrate with OPUCN's and HHH's enterprise computing and telecommunication environments. The AMI solution must be compatible and work with or enhance other applications to leverage the value of this investment in such areas as:

- CDM / DR;
- Load limiting;
- Outage management;
- System optimization;
- SCADA;
- CIS; and
- More ….

The AMCC database must be in Oracle and be accessible via web services for corporate system integration. Openness, redundancy, robustness and scalability of the system will be key decision factors, as well as cost, by OPUCN and HHH to ensure a low risk implementation and a high value solution for their rate payers.

3.6 PROJECT SCOPE

The proposed solution must provide at a very minimum all the functionality and reliability requirements of the Ontario Ministry of Energy as legislated under "The Functional Specification for an Advanced Metering Infrastructure" dated July 14, 2006. The major thrust of the proposal is to provide a turn-key implementation of an AMI solution including all aspects of hardware, software, communications, system integration, training and support. The solution at all times must leverage OPUCN and HHH infrastructure including affiliate fiber and wireless as possible.

As the scope and size of an turn-key AMI implementation is significant, OPUCN and HHH will take a re-iterative approach for their utility wide roll-outs.

It is planned, based upon the expected responses, that HHH will begin its first stage of the AMI roll-out in 2007. Upon satisfactory results of the vendor's initial turn-key AMI implementation roll-out stage, HHH will then complete its roll-out over a 3 year period ending in 2010. OPUCN will commence its roll-out in 2008 with completion in 2010. Exact roll-out requirements of the OPUCN will be confirmed based upon the evaluation of the RFP responses.

3.7 ACCEPTANCE CRITERIA

OPUCN and HHH plan to subject the implemented turn-key AMI solution to appropriate Quality Control processes to verify that all components of all features are functioning and in good working order. The Vendor will be notified of, and is expected to replace or correct all components fail. These corrections will be done within 1 business day of notification.

4 Form of Response Table - Schedule A

The following questions are mandatory for the vendors to respond about their turn-key solution. Vendor's response format must follow the format of questions below and answer each question.

Schedule A – Functional Specifications Worksheet

Vendor Instructions: Please fill in this table and return with your proposal. Details about each function must be detailed in the main proposal and identified by the appropriate section number.

(Vendor Name goes here)

Advanced Metering Infrastructure - General

Question	Required Function	Details	Compliant Yes/No
A1	The AMI must be meter (AMCD) agnostic.	Please specify that the AMI is meter agnostic and has not been designed for a specific "Smart Meter (AMCD)" hardware manufacturer.	
A1.1	a) List the smart meter hardware manufacturers that will integrate with the proposed AMI solution. b) Describe the system architecture in regards to its ability to communicate with the different AMCD hardware vendors.		
A2	What is your proposed AMI primary communication infrastructure solution		
A2.1	Is your network self-healing?		
A2.2	Is your network self-configuring?		
A2.3	Do you require to undertake a propagation study?		
A2.4	If short listed, would you be willing to undertake a propagation study at your own expense?		
A3	Does your proposed AMI solution guarantee the legislative minimum reliability requirement to successfully collect and transmit to the AMCC and MDM/R at least 98.0% of the Meter Reads from all AMCD's deployed by a distributor in any daily read period?		
A3.1	Explain how your proposed AMI solution will ensure and guarantee that all legislative requirements are met and adhered to for the successful collection and transmission to the AMCC and MDM/R for at least 98.0% of the Meter Reads from all AMCD's deployed by a distributor in any daily read period. Above and beyond the minimum legislative requirements please specify your guaranteed reliability.		

A4	System must be capable of leveraging the client's fibre-back haul and / or wireless communication infrastructure.	Please specify that your system is capable of integrating with the client's fibre-back haul and / or wireless communication infrastructure.
A4.1		Does your AMI communications network support TCP/IP?
A4.2	Describe your proposed solutions integration to the client's fibre-back haul and / or wireless communication infrastructure. List any assumptions you have considered for this integration.	
A5	Environmental weather operating requirements.	Does your proposed AMI solution operate effectively during extreme weather events including: • Sustained cold weather of -45 Celsius; Sustained hot weather of +65 Celsius; • Sustained high winds in excess of 100 km/h; • Sustained Heavy Precipitation including: Rain, Hail, Ice Pellets / Sleet, and Snow Fall; • Severe Lightning; and • Build up of snow and / or ice on AMI infrastructure?
A5.1	Specify in detail below the environmental operating specifications of the entire AMI solution, including individual components (AMCD's, AMRC's, LAN, WAN etc.) and the overall proposed deployed integrated solution as it relates to the environmental weather operating requirements specified above in question 5.0.	
A6	Geographic and related topographical operating requirements.	Does your proposed AMI solution operate effectively in diverse geographic and topographic environment that includes: • High density customer locations; • Rural low density customer locations; • Large bodies of water; • High density treed vegetation (coniferous and deciduous); • Niagara escarpment; and • Significant topographic elevation changes?
A6.1	Specify in detail below the geographic and topographical operating specifications of the entire AMI solution, including individual components (AMCD's, AMRC's, LAN, WAN etc.) and the overall proposed deployed	

integrated solution as it relates to the operating requirements specified above in question 6.0.

Advanced Metering Communication Device (AMCD)

Smart Meter Preference

A7.0	Requirement for new digital meters.	Will you be supplying new digital meters?
A7.1		Does the meter allow for either Time of Use or Interval reading capability?
A7.2	Please specify the suggested meter manufacturer(s) you plan to deploy as part of the turn-key implementation.	
A7.3	Manufacturer meter sealed	Is the Meter Communication installed and sealed at the manufacturer?
A8.0	Requirement for Multiple meter base support.	Does your proposed solution support multiple meter types?
A8.1	Document **all** meter types your proposed turn-key solution will support e.g. a-base, s-base, CMS, 600V Delta, poly phase meters etc.	
A9.0	Requirement for net metering support.	Does your proposed solution support net metering?
A9.1	Requirement for Standard Offer Contract (SOC) Metering	Does your proposed solution support SOC metering?
A10.0	Measurement Canada Approval	Is your proposed meter Measurement Canada Approved or Pending?
A10.1		What is the seal period of your meter?
A10.2		Will your meter qualify for meter extension?
A11.0	Meter Data Storage	In the event of a communications failure, will the meter store the metered data until communication has been re-established?
A11.1	Please describe details of metered data stored by meters including amount of data that the proposed individual meters can store. Please indicate what happens to the data if meter storage capacity is exceeded.	

AMI Preferred Advanced Functionality

A12.0	Load Control	Does your proposed solution allow for remote load control by the utility?
A12.1	Specify the remote load control features and options of your proposed turn-key solution.	
A13.0	Load Limiting	Does your proposed solution allow for load limiting of service?
A13.1	Specify the Load Limiting features and options your proposed turn-key solution offers. Specify if the load limiting device is built into the meter or if it is an add-on (separate module / device).	

A14.0	Remote Disconnect	Does your proposed solution allow for remote disconnect?
A14.1	Specify the remote disconnect features and options your proposed turn-key solution offers. If disconnect is available but is not remote, please state as such, indicate if disconnect module is built into the meter or is it an add-on (separate module / device).	
A16.0	Tamper proofing requirement.	Does your proposed AMCD solution include tamper proofing features and alarms?
A16.1	Specify the AMCD tamper proof features and alarms of the AMI ad your proposed AMCD devices.	
A17.0	Data Security	Is your data transmission secure between all aspects of your turn-key AMI solution including all devices and network connections?
A17.1	Explain in detail your data security features across the entire AMI infrastructure. Additionally provide your AMI infrastructure security upgrade policies and procedures.	
A18.0	Real time AMCD failure alerts.	Does your proposed AMI solution provide for real-time AMCD failure alerts to the AMCC?
A18.1	Please describe the details of your proposed turn-key solution power outage restoration, recording, and notification system.	
A19.0	Real time AMCD restoration notification.	Does your proposed AMI solution provide for real-time AMCD restoration of service?
A19.1	Please describe the details of your proposed turn-key solutions power restoration, recording, and notification system.	
A20.0	Infrastructure Upgrades	Does the proposed solution allow for remote upgrades to firmware?
A20.1		Does the proposed solution allow for remote upgrades to software?
A21.0	Diagnostics	Does the proposed solution include diagnostic tools”
A21.1	Please indicate what system diagnostic tools are available.	
A22.0	Signal Hopping	If your proposed solution is wireless at the meter level, does it allow for self-adjusting signal hopping about the spectrum so as not interfere with other frequencies?
A22.1	If your system allows for self adjusting signal hopping, explain the ability for the solution to detect interference from another source frequency and self adjust so as not to interfere.	

System Integration

A23.0	AMCC ownership of the LDC	Will the AMCC be physically resident at the LDC?
A24.0	Oracle Database Platform Preference	Will the AMCC database be stored within an Oracle 10g RDBMS?
A25.0	Open Database Standard Adherence	Is the data accessible by the LDC for other application needs as required?
A25.1	Open Standards Architecture	Is the proposed solution built upon open standards?
A25.2	Please indicate what standards the proposed solution conforms to (including in-house load control)	
A25.3	Two-way Communication	Does the proposed solution allow for two-way communication to in realtime?
A26.0	Services Oriented Architecture (SOA) Adherence via XML / SOAP protocols.	Is the AMI solution including the AMCC database founded solution on a Services Oriented Architecture for LDC system integration purposes?
A26.1	Provide a logical architecture description and diagram that addresses SOA interfaces of the AMI to support various LDC applications including: • SCADA (Survellant); • OMS (Future Oracle based); • CIS (Harris / HTE); • GIS (Oracle / SPATIALinfo); and • Engineering Analysis (Dromey Design (D.E.S.S.) / CYME).	
A27.0	AMCC Data Export	Does the AMCC allow for easy export of data, including incremental changes, to support non SOA LDC utility applications (e.g. CableCad, Load Shifting etc.)
A28.0	Advanced Data Analysis Functionality	Does the proposed AMI solution provide advanced data analysis / reading capability?
A28.1	Power Quality Readings	Does the proposed AMI solution provide Power Quality analysis readings and writing to the AMCC?
A28.2	Current Draw	Does the proposed AMI solution provide Current Draw analysis readings and writing to the AMCC?
A28.3	Voltage Monitoring	Does the proposed AMI solution provide Voltage Monitoring readings and writing to the AMCC?
A28.4	Please specify if your proposed solution provide	• Voltage (Line-to-line, Line-to-Neutral, Line-to-Line-to-

	power quality data for (Yes/No foreach)	Line) • Current (Amps) • kW Consumed • kW Delivered • Outage Management / Restoration • Sag/ Swell • Can Max./ Min. points be set for voltage monitoring? • Harmonics
A28.5	Indicate how power quality is stored and retrieved.	
A28.6	Specify other data analyzed and recorded to the AMCC by the proposed AMI infrastructure.	
A29.0	Customer Load Limiting Ability	Does the proposed AMI solution include the functionality for Customer Load Limiting ability?
A29.1	Explain the proposed AMI solution can assist in the ability to provide Customer Load Limiting Functionality.	
A30.0	Distribution Automation?	Does the AMI communication infrastructure have support for distribution automation e.g. SCADA?
A30.1	Explain how the proposed AMI solution can support distribution automation.	
A31.0	Scalability	Is your proposed solution scalable to allow for future LDC customer growth? Is there a limit to scalability?

Schedule B – Functional Specifications Worksheet

AMI Legislative Functionality Requirement Compliance

Confirm that the proposed turn-key AMI solution will meet all minimum Legislation as per the " **FUNCTIONAL SPECIFICATION FOR AN ADVANCED METERING INFRASTRUCTURE**" as mandated by the Ontario Ministry of Energy and legislated by the Ontario Government

Confirm the turn-key AMI solution addresses and meets the following functional specifications of the advanced metering infrastructure as defined in the "**FUNCTIONAL SPECIFICATION FOR AN ADVANCED METERING INFRASTRUCTURE"** legislation:

Minimum Functionality

B1.0	AMI shall collect Meter Reads on an hourly basis from all AMCDs deployed by a distributor and transmit these same Meter Reads to the AMCC and MDM/R, as required, in accordance with the Specifications.
B1.1	A Meter Read shall be collected, dated and time stamped at the end of each hour (i.e. midnight

		as represented by 24:00).
B1.2		The date and time stamping of Meter Reads shall be recorded as year, month, day, hour, minute (i.e. YYYY-MM-DD hh:mm).
B1.3		All meters shall have a meter multiplier of one (1).
Performance Requirements		
B2.0	Collection and Transmission of Meter Reads	AMI shall successfully collect and transmit to the AMCC and MDM/R at least 98.0% of the Meter Reads from all AMCDs deployed by a distributor in any Daily Read Period.
B2.1		Meter Reads unsuccessfully collected or transmitted shall not be due to the same AMI component (including, without limitation, any AMCD) during any three (3) month consecutive time period.
B2.2		AMI shall be able to collect and transmit Meter Reads during its operating life without requiring a field visit.
B2.3	Transmission Accuracy	Over the Daily Read Period, 99.9% of the Meter Reads received by the AMCC shall contain the same information as that collected by all AMCDs deployed by the distributor.
B2.4		AMI shall be capable of providing Meter Reads with a precision of at least 10 Watt-hours (0.01 kWh).
Technical Requirements		
B3.0		When an AMI includes AMRCs, the AMRCs shall have the ability to store meter data to accommodate the performance requirements as per section B2.0, B2.1, B2.2, B2.3 and B2.4.
B3.1	Time Synchronization	AMI shall be operated and synchronized to Official Time, as set by the National Research Council of Canada.
B3.2		AMI shall have the capability of adjusting for changes due to local daylight savings time.
B3.3		AMI installed within a distributor's service area shall have the capability of accommodating more than one (1) time zone.
B3.4		Time synchronization shall be maintained in the AMI to the

		specified accuracy parameters set out in section B2.0 following a loss of power.
B3.5		All Meter Reads shall adhere to accurate time synchronization processes to ensure an accurate accounting of electricity consumption at each meter.
B4.0	Time Accuracy	At all times, time accuracy in the AMI shall not exceed a ±1.5 minute variance from the time established in section B3.1.
B4.1		AMI shall be able to prove that time accuracy does not exceed the permitted time variance identified in section B3.1.
B5.0	Loss and Restoration of Power	AMI shall detect and identify the interval in which a loss of power occurred during a Daily Read Period.
B5.1		AMI shall detect and identify the interval in which power was restored following a loss of power.
B6.0	Environmental Tolerances	All AMI components (except the AMCC) shall operate and meet the requirements in these Specifications within a temperature range of minus thirty degrees Celsius (–30° C) to positive sixty-five degrees Celsius (+65° C), and within a humidity range of zero percent (0%) to ninety-five percent (95%) non-condensing.
Advanced Metering Communication Device (AMCD)		
B7.0	Installation Within the Meter	The AMCD shall not impair the ability of the meter to be visually read.
B7.1		Meters in which an AMCD is installed shall be able to be installed in existing meter sockets or enclosures.
B7.2		AMCD shall meet or exceed ANSI standards to withstand electrical surges and transients.
B8.0	Labelling	The AMCD shall be permanently labelled with: (1) Legally required labelling; (2) Manufacturer's name; (3) Model number; (4) AMCD identification number; (5) Input/output connections; (6) Date of manufacture; and (7) Bar code for tracking and inventory management.

B9.0		When installed at a consumer's location, the meter shall visibly display, as a minimum, the AMCD identification number, meter serial number and LDC badge number for the meter.
B10.0		The AMCD shall be able to be initialized or programmed during, or prior to, field installation.
Transmission of Meter Reads		
B11.0		All Meter Reads collected during the Daily Read Period shall be received by the AMCC and transferred to the MDM/R no later than 5:00 a.m. local time following the Daily Read Period.
B12.0		Meter Reads are not required to be transmitted in a single transmission and may be transmitted as frequently as necessary in order to meet the requirements in section B11.0.
B13.0		AMCC shall transfer the information identified in section B11.0 using an approved protocol and file structure.
Advanced Metering Regional Collectors (AMRC)		
B14.0	LAN Communication Infrastructure	The spectrum allocation and wattage of the radio signal used by an AMI shall not impede neighbouring frequencies.
B15.0	When an AMI includes AMRCs	The AMI shall provide for the continuous powering of AMRCs regardless of their location and placement.
B15.1		All AMCDs shall be able to collect and transmit Meter Reads when one or more AMRC has a loss of power.
B15.2		Memory and software parameters shall be maintained at all AMRC during a loss of power, whether by the provision of backup/alternate power or other solution.
Advanced Metering Control Computer (AMCC)		
B16.0		Each AMCC shall have the ability to store a rolling sixty (60) days of Meter Reads.
B16.1		A distributor shall not aggregate Meter Reads into rate periods or calculate consumption data from the Meter Reads collected through its AMI either in its AMCC or any other component.
B16.2		The AMCC shall be able to

		perform basic operational verification of Meter Reads received before transmitting these Meter Reads to the MDM/R.
Customer Account Information		
B17.0		The proposed solution will support the distributors requirement to provide initial information associated with customer accounts to the MDM/R on a date to be determined.
B17.1		The proposed solution will support on an ongoing basis, the distributors requirement to provide information associated with any change to the initial information identified in section B17.0 to the MDM/R at a frequency to be determined.
Monitoring & Reporting Capability		
B18.0		The AMI shall have non-critical reporting functionality and critical reporting functionality as required in this section B18.0. Information generated from this reporting functionality shall be available to the MDM/R.
B19.0	Non-critical reporting	At the completion of every Daily Read Period and following a transmission of Meter Reads, the AMCC shall generate a status report that includes information regarding anomalies and issues affecting the integrity of the AMI or any component of the AMI including information related to any foreseeable impact that such anomalies or issues might have on the AMI's ability to collect and transmit Meter Reads.
B19.1		In addition to section B19.0, the AMCC shall generate reports: (1) Confirming successful initialization of the AMCD's installed in the field; (2) Confirming data linkages among an AMCD identification number, LDC badge number, serial number and customer account; (3) Confirming that the MDM/R has successfully received notification of any changes to customer account information;

(4) Confirming that the AMCC has successfully made changes to customer account information following receipt of same from the MDM/R;
(5) Confirming the successful collection and transmission of Meter Reads or logging all unsuccessful attempts to collect and transmit Meter Reads, identifying the cause, and indicating the status of the unsuccessful attempt(s) pursuant to section B2.0, B2.1, and B2.2;
(6) Confirming the accuracy of the Meter Reads received by the AMCC pursuant to section B2.3;
(7) Confirming that all Meter Reads have a precision of at least 10 Watthours (0.01 kWh) pursuant to section B2.4;
(8) Confirming whether the Meter Reads acquired within the Daily Read Period are in compliance with the time accuracy levels identified in section B4.0 and B4.1;
(9) Confirming whether time synchronization within the AMI or any components of the AMI has been reset within the Daily Read Period;
(10) Identifying the intervals in which a loss of power occurred and at which power was restored, following a loss of power;
(11) Addressing the functionality of the AMCD communication link, including status indicators related to the AMCD and AMRC;
(12) Identifying suspected instances of tampering, interference and theft;
Flagging potential network, meter and AMCD issues; and
(14) Identifying any other instances that impact or could potentially impact the AMI's ability to collect and transmit Meter Reads to the AMCC and/or MDM/R on a daily basis.

B19.2 Following a transmission of Meter Reads or at the completion of every Daily Read Period, the information in section B19.1 (5) shall be stored

		and used by the AMCC to assess compliance with the requirement specified in section B2.1.
B19.3		The reports generated in sections B19.0 and B19.1 shall be made available to the MDM/R with a frequency to be determined.
B20.0	Critical reporting: Critical events are defined to include any AMI operational issue that could adversely impact the collection and transmission of Meter Reads during any Daily Read Period.	The AMI shall identify and report the following to the distributor: (1) AMCD failures; (2) AMRC failures; (3) Issues related to the storage capacity of any component of the AMI; (4) Communication links failures; (5) Network failures; and (6) Loss of power and restoration of power.
B20.1		The reports generated in section B20.0 shall be made available to the MDM/R.
Security and Authentication		
B21.0		The AMI shall have security features to prevent unauthorized access to the AMI and meter data and to ensure authentication to all AMI elements.
Proven Technology		
B22.0		The proposed AMI solution electricity AMCD device has a minimum of 5000 units of the same electricity AMCD device functioning in the field as part of one or more functioning AMI.
Regulatory Requirements		
B23.0		The AMI shall meet all applicable federal, provincial and municipal laws, codes, rules, directions, guidelines, regulations and statutes (including any requirements of any applicable regulatory authority, agency, board, or department including Industry Canada, the Canadian Standards Association, the Ontario Energy Board and the Electrical Safety Authority) (collectively, “Laws”). For greater certainty, the AMI shall meet all applicable Laws that are necessary for the measurement of data and/or the transmission of data to and from

	the consumers within the Province of Ontario, including Laws applicable to metering, safety and telecommunications.
Water or Natural Gas Meter Reads B24.0	The AMI should be capable of supporting an increased number of Meter Reads associated with the reading and transmission of water and/or natural gas meters through additional ports on the AMCD, through optionally available multi-port AMCDs, or through additional AMCD/AMRC devices that are compatible with operating on the AMI. When procuring AMI, distributors shall obtain an indication of the capabilities of the proposed AMI to read water and natural gas meters, indicating the makes and models of such meters that can be read, and any requirements for retrofitting them.

5 Form of Response Schedule C – Solution Overview and Mandatory Responses Written Format

5.2 MANDATORY VENDOR RESPONSE - VENDOR'S LOGICAL ARCHITECTURE SOLUTION OVERVIEW

1. Provide your proposed AMI solution end-to-end integrated architecture, including all hardware, communications, and system integration.

2. Provide your proposed turn-key AMI solution's end-to-end implementation workflow.

3. The turn-key AMI solution must be founded on "open" standards and be robust and scalable to provide as yet unknown / undefined applications as documented in this RFP document. The clients wish to invest in a system that will have the ability to provide on-going new benefits to both the utility and their customers. Please provide an overview of your proposed solution and how it can provide a "future proofed" infrastructure allowing the clients to provide enhanced services and benefits over time. Please describe the type of future solution you see your proposed AMI turn-key solution supporting over time.

4. Provide a sample data model of the information stored within the AMCC.

5. Provide an overview of AMI interface to the LDC and a sample of the AMI data presentment to the LDC.

5.3 MANDATORY VENDOR RESPONSE – VENDOR LICENSING, SUPPORT AND TRAINING

1. The clients wish to be self sufficient in moving forward with the AMI system maintenance, planning and expansion. Describe in detail the following information in regards to your turn-key AMI solution including:

2. Knowledge transfer and training for LDC AMI infrastructure management and planning;
3. Knowledge transfer for LDC AMI infrastructure maintenance;
4. Knowledge transfer for AMCC management, development and system integration;
5. Turn-key AMI solution warranty;
6. Turn-key AMI solution licensing requirements;
7. All initial 3rd party costs and on-going yearly maintenance; and
8. Turn-key AMI solution support capability and levels.

5.4 MANDATORY RESPONSE – PROJECT MANAGEMENT APPROACH

Project Control

The Vendor must describe the methodology for creating and maintaining various project control mechanisms for all phases throughout the project.

Specific project management/control software, hardware or manual products used for project control should be listed and samples included.

Project Status

The Vendor must describe in detail, the methodology for monitoring the status of the turn-key project. Minimum project management requirements are:
• Work status (in-progress, completed or future) based on structured subdivisions of the work scope into tasks and sub-tasks, typically a Work Breakdown Structure (WBS).
• Status of the project schedule which is based on the same work subdivisions (WBS) and including forecasts of early and/or late completions.
• Problem areas and issues with potential impact to project progress and completion.

The above requirements must be included in a bi-weekly project status report to OPUCN and / or HHH by the second working day following the end of the report period. The contents of these reports should be included in the Vendor's proposal as samples.

Communications

The Vendor must outline and describe the most efficient and cost-effective method for handling client-communications which will insure OPUCN and HHH has sufficient information to monitor, report and evaluate the project status. The Vendor must also describe optimum methods for problem-resolution regarding data conversion and solution configuration. These methods must be approved by OPUCN and / or HHH, in writing, prior to the start of conversion.

Change Control

The Vendor must describe the criteria to evaluate proposed changes and the method for processing changes. Any changes must be approved in writing by OPUCN and / or HHH prior to implementation. Changes may include, but are not limited to the following:

- Technical specifications
- Method or manner of performance of the work
- Scope of work

5.5 MANDATORY RESPONSE – SOLUTION SUPPORT

2. Describe your solution support plan including maintenance, updates and technical help.

3. What is your support framework (in-house, partners) – response time, time available, number of staff and physical location?

4. What is your certification and training availability?

5.6 MANDATORY RESPONSE – VENDOR REFERENCES

Oshawa PUC Networks and /or Halton Hills Hydro will contact references as part of the evaluation process. Three references must be included with RFP submission. The following must be included and as outlined in Part 4 Form of Response:

- Contact name, title, company name, telephone information,
- Description of services provided. Include duration and timing of engagement.
- Details of specific challenges faced.
- Details of specific service level arrangements.
- References should highlight any contracts with diverse challenges.

5.7 PRICING

Appendix A includes a pricing schedule for vendor proposal cost response. The vendor must complete submit this schedule in a separate envelope from the main response.

6 VENDOR SIGNATURE

1.0 Exceptions

We have reviewed the Vendor Instructions, Commercial Terms & Conditions and Terms of Reference. We understand that failure to explicitly express any exception in this space will deem acceptance.

2.0 Signature

The undersigned is duly authorized to bind the Proponent and hereby warrants and represents the following:

- The data provided pursuant to this document is accurate in all respects,
- All RFP documents have been thoroughly reviewed,
- The Proponent has the current capability to provide the proposed solution,
- Offers shall be open for acceptance for 120 days

SIGNATURE _____
NAME _____
TITLE _____
DATE _____

VECC INTERROGATORIES

APPENDIX B

2007 Business Plan Summary and Overview

2007 Business Plan Summary and Overview

November 10, 2006

Strategic Focus
Growth will be an integral part of our strategic focus. Internally (within Halton Hills) this will occur through new development like 410/407/Steeles, and residential subdivisions. Externally, the Transfer Tax exemption may create opportunities to acquire additional distribution assets.
Two major government initiatives will again be key drivers to the business in 2006, specifically, Conservation and Demand Management (new OPA program) and Smart Metering.
Management will continue efforts to increase Shareholder value.

Threats, Risks & Uncertainty
Affiliate Relationships Code compliance is a risk because of the OEB's unsettled position on acceptable operating situations for LDC affiliates.
Cost of capital study impact on utility performance measures.
Attempts to purchase our corporation

Operational Focus
Capital Budgets.
Staffing – complement increase: smart metering and underground locate requirements.
Safety
Reliability and Customer Service
Improvement in developer relations

Implementation Strategies.

Safety:

- Will continue to promote and educate the ”Seriously Fun Safety” program.
- Will work toward EUSA silver award.
- Regular safety training, meetings and tailboards.
- No lost-time injuries.

Staffing:

- Two additional complements required. Additional settlement analyst to accommodate smart metering and service layouts/locates person - Q3 of 2007.

Smart Metering:

- RFP results available in early 2007.
- Pilot project implementation in Q1 2007.
- Use of affiliate infrastructure to facilitate communications.
- Funding expected to be $4M to $6M by 2010. Recoverable through rates.

Conservation and Demand Management:

- Continue to deliver programs initiated in 2005 , specifically customer information/residential programs (coupon program, water heater load control).
- Expand effort with projects supported by new OPA CDM fund.

Capital Budgets:

- Funding for 2007 will continue to be derived internally through and combination of amortization and net income after tax.
- Borrowing may become a consideration for capital budget requirements in 2008.

Reliability:

- Continued investment in load monitoring equipment.
- Replacement of aging rear-lot plant.

Shareholder Value:

- Growth in customer base.
- Contributions to community.
- Payments to Shareholder.
- Increasing equity.

VECC INTERROGATORIES

APPENDIX C

GTA West Supply Study

GTA West Supply Study

Adequacy of Transmission Facilities

And

Transmission Supply Plan 2005 – 2015

February 16, 2006

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Foreword

This report is the result of a joint study by Enersource Hydro Mississauga, Halton Hills Hydro Inc., Hydro One Brampton, Hydro One Networks Inc. Distribution, Milton Hydro and Hydro One Networks Inc. Transmission. The study team members were:

Paul Cook, Hydro One Networks
Gary Ebersberger, Halton Hills Hydro Inc.
Dave Haddock, Hydro One Brampton
Charlie Lee, Hydro One Networks Distribution
Richard Murray, Milton Hydro Distribution Inc.
Eva Ping, Hydro One Networks
Vaffi Poonja, Enersource Hydro Mississauga
Christine Spears, Hydro One Networks

The load forecast is based on information available to Enersource Hydro Mississauga, Hydro One Brampton, Toronto Hydro Electric System, Halton Hills Hydro, Milton Hydro and Hydro One-Distribution.

The preferred plans have been selected and endorsed based primarily on technical considerations. Where applicable, these plans will be subject to Environmental Assessment approval and / or Ontario Energy Board (OEB) approval. The issue of cost allocation between utilities was not addressed.

Signatures

We have reviewed this report and concur with its recommendations. This endorsement shall not operate as a waiver of any participant's rights due to material changes in load forecasts or economic considerations.

Utility	Signature	Title
Enersource Hydro Mississauga		Roland Herman Executive VP & Chief Operating Officer
Halton Hills Hydro Inc.		Dan Guatto President
Hydro One Brampton		Roger Albert President
Hydro One Networks Inc. - Distribution		Ron Salt Manager, Distribution Development
Hydro One Networks Inc. – Transmission		John Sabiston Team Leader/ Senior Advisor
Milton Hydro Distribution Inc.		Don Thorne President & CEO

Date: February 16, 2006

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Date: February 16, 2006

TABLE OF CONTENTS

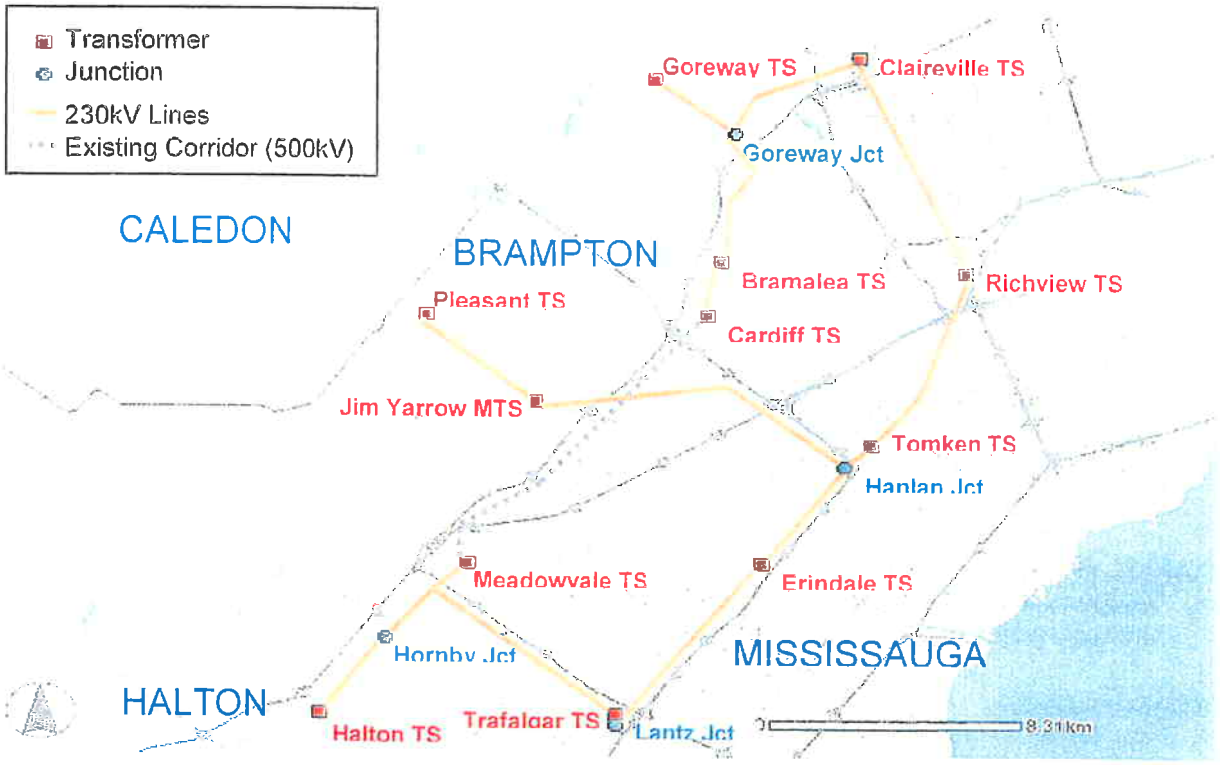
Executive Summary

Background

For the purpose of this study, Greater Toronto Area (GTA) West includes the area roughly bordered geographically by Highway 27 to the east, King Street to the north, Regional Road 25 to the west and Highway 403/407 to the south. Much of the study area is Peel Region, with a small section of both Halton Region and Toronto.

The electrical supply in this area is provided through 500 kV and 230 kV transmission lines and step down transformation facilities as shown in Map 1. The distribution system within this area is at two different voltage levels, 44 kV and 27.6 kV. Load forecasts provided by the Local Distribution Companies (LDCs) in GTA West indicate that electrical load growth is expected to continue at a summer average rate of 2.6% per year at the 27.6 kV sub-transmission level and 1.5% per year at the 44 kV sub-transmission level, for the next ten years.

Map 1: Existing Transmission Facilities in GTA West.



In June of 2004, a joint utility planning study was initiated between five of the six LDCs in GTA West and Hydro One Networks Inc. - Transmission. The LDC participants in this joint study were:

- Enersource Hydro Mississauga (EHM)
- Halton Hills Hydro Inc. (HHH)
- Hydro One Brampton (HOB)
- Hydro One Networks Inc. – Distribution (HONI – Dx)
- Milton Hydro Distribution Inc. (MHD)

This study identified the need for transmission capacity and voltage stability in GTA West, and assessed the capability of the transmission system to meet the load requirements for the 10 year study period (from 2005 to 2015). An additional assessment for expected 2024 conditions was also undertaken to evaluate the proposed plans with respect to the long-term system requirements and identify potential gaps. Several transmission alternatives were investigated to address the needs and deficiencies as soon as practical.

Need

The needs assessed in this study were evaluated and identified based on the occurrence of a single contingency.

Station Overloads (230/27.6 kV)

- Transformers T1/T2 at Bramalea Transmission Station (TS) are currently exceeding their summer capacity limit[1] (2005)
- Transformers T1/T2 at Erindale TS are currently exceeding their summer capacity limit (2005)
- Transformers T5/T6 at Pleasant TS are currently loaded to their summer capacity limit (2005)
- Transformers T1/T2 at Jim Yarrow Municipal Transmission Station (MTS) are expected to exceed their summer capacity limit by summer 2009[2]
- Transformers T5/T6 at Goreway TS are expected to reach their summer capacity limit by summer 2011[3]
- Transformers T3/T4 at Halton TS are expected to reach their summer capacity limit by summer 2011

Station Overloads (230/44 kV)

- Transformers T1/T2 at Meadowvale TS are currently exceeding their summer capacity limits (2005)
- Transformers T3/T4 and T5/T6 at Erindale TS are expected to exceed their summer capacity limit by summer 2006[4]
- Transformers T1/T2 at Pleasant TS are expected to exceed their summer capacity limits by summer 2011

Voltage Deficiencies

- Meadowvale TS is currently experiencing voltage deficiencies during periods of high summer loading and is below Operating and Planning Standards[5]

Circuit Overloads

- Segments of circuits R19T/R21T are expected to reach thermal capacity limits as per Operating and Planning Standards by summer 2009
- Segments of circuits T38B/T39B are expected to be nearing thermal capacity limits as per Operating and Planning Standards by summer 2015

[1] "summer capacity limit" is discussed in Section 2.
[2] Jim Yarrow MTS forecast includes load transfers from Bramalea TS (transformers T1/T2) and Pleasant TS (transformers T5/T6).
[3] Goreway TS (transformers T5/T6) forecast includes load transfers from Bramalea TS (transformers T1/T2).
[4] Erindale TS (T3/T4, 230/44 kV) will experience unacceptable voltage decline before transformers reach capacity, while transformers T5/T6 will be at the transformer capacity limit.
[5] Please refer to Section 5 for details on Operating and Planning Standards.

Forced Load Transfers

Due to the rapid load growth in this area, and the lack of local transmission resources, several stations have been and/or will be forced to designate cascading load transfers to other stations in order to mitigate operating risks until further capacity can be supplied.

This study was conducted under the assumption that by 2005 additional station capacity would be provided by a new TS (Cardiff TS coming into service in May 2005). Some immediate load relief is possible via load transfers between stations operating at the same sub-transmission voltage levels, however the load growth in this area is such that new step down facilities will be required before 2007. Load transfers between different sub-transmission voltage levels are either not technically possible or economically prohibitive.

Recommended Transmission Reinforcements

A number of options were considered to address the needs as indicated above, and after a thorough technical analysis and review, the following recommendations were made:

- Install by summer 2007 Low Voltage (LV) capacitors at Meadowvale TS (2 capacitor banks, 32.4 MVAR at 46 kV)
- For short-term relief and as they become necessary, perform load transfers:
  - From Bramalea TS (T1/T2, 230/27.6 kV) to Goreway TS (T5/T6, 230/27.6 kV) and Jim Yarrow MTS (T1/T2, 230/27.6 kV)
  - From Pleasant TS (T5/T6, 230/27.6 kV) to Jim Yarrow MTS (T1/T2, 230/27.6 kV)
  - From Erindale TS (T1/T2, 230/27.6 kV) to Cardiff TS (T1/T2, 230/27.6 kV)
  - From Meadowvale TS (T1/T2, 230/44 kV) to Erindale TS (T3/T4, 230/44 kV)
- Construct by summer 2008 Winston TS with two 230/44 kV, 75/125 MVA transformers in the vicinity of Winston Churchill Blvd. and Highway 403
- Extend by summer 2009 circuits V72R and V73R from Cardiff TS to the Pleasant TS tap and construct Hurontario Switching Station (SS). Radially re-supply Jim Yarrow MTS from this SS
- Construct by summer 2009 Pleasant TS #3 with two 230/27.6 kV, 75/125 MVA transformers on the existing Pleasant TS site
- Construct by summer 2011 Goreway TS #2 with two 230/27.6 kV, 75/125 MVA transformers on the existing Goreway TS site
- Install by summer 2011 a second 230/44 kV, 50/83 MVA transformer at Goreway TS
- Construct by summer 2011 either Steeles TS or James Snow TS with two 230/27.6 kV, 50/83 MVA transformers. The Steeles TS location would be in the vicinity of Steeles Avenue and Trafalgar Road while the James Snow TS location would be in the vicinity of Steeles Avenue and James Snow Parkway

Recommendations

Several recommendations can be drawn from this study to address the current system deficiencies and provide system capacity to meet forecasted load growth. These recommendations are:

1. Subject to the Ontario Power Authority's integrative review (Integrated Power System Plan) Hydro One Networks Inc. to initiate the approval processes required for the extension of circuits V72R and V73R and the construction of Hurontario SS.

2. Hydro One Networks Inc. to commence the detailed specification and engineering of the LV capacitors at Meadowvale TS.

3. Hydro One Networks Inc. to commence the preliminary engineering and consultation with the LDCs, and to initiate the approval processes on the construction of a new TS , Winston TS, in the vicinity of Winston Churchill Blvd. and Highway 403 in Mississauga.

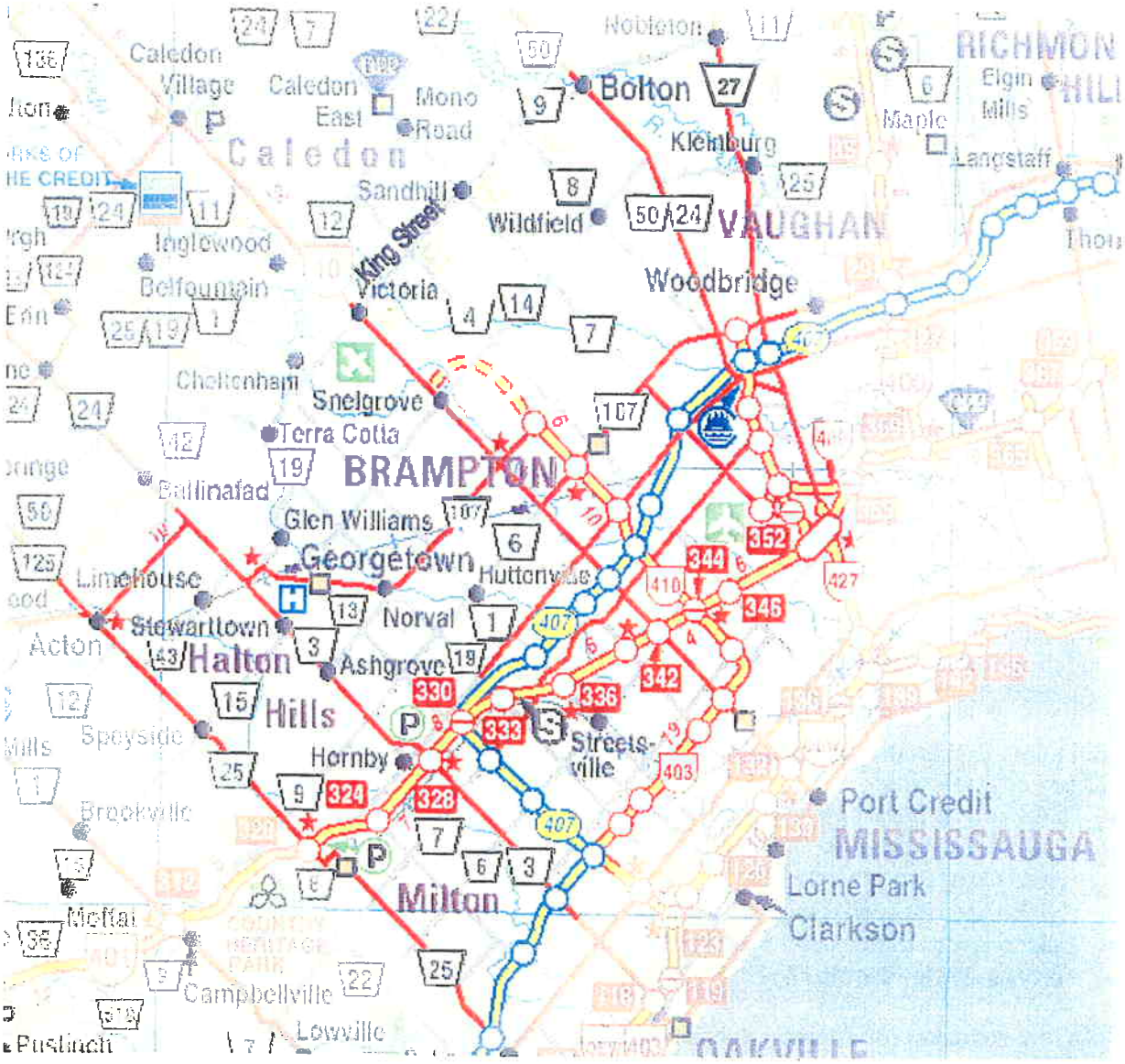
4. The LDCs to continue to transfer loads as necessary to mitigate potential operating risks until transmission capacity is established.

5. The LDCs to continue to monitor load growth in the GTA West area and to review options for long-term growth based on the location of new developments and load forecasts.

1. INTRODUCTION

For the purpose of this study, Greater Toronto Area (GTA) West includes the area roughly bordered by Highway 27 to the east, King Street to the north, Regional Road 25 to the west and Highways 403/407 to the south (refer to Map 2). Much of the study area is Peel Region, with a small section of both Halton Region and Toronto.

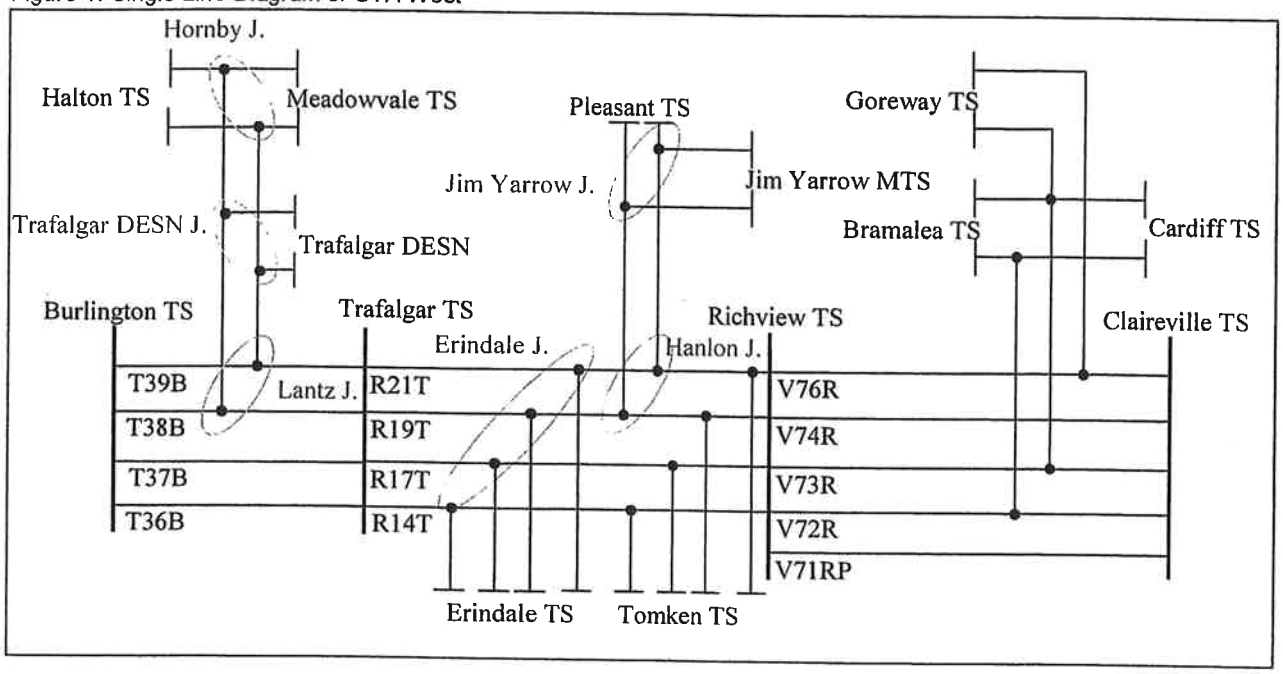
Map 2: Study Geographical Area[6]



Electrical supply in this area is provided through 500 kV and 230 kV transmission lines and step down transformation facilities (Transmission Station, TS; Municipal Transmission Station, MTS) as shown in Map 1 and Figure 1.

[6] Map clip from http://www.mto.gov.on.ca/english/traveller/map/images/pdf/southont/sheets/Map3.pdf

Figure 1: Single Line Diagram of GTA West



The northern Mississauga and Brampton area is expected to have a large rate of load growth for the upcoming years as a result of population growth and development projects taking place in this area. Load growth trends in this area indicate that recent transmission upgrades and newly built or planned stations, including the construction of Jim Yarrow MTS and Cardiff TS, will not be able to provide the required transformation capacity. For this reason, in June 2004, five of the six Local Distribution Companies (LDCs) in GTA West and Hydro One initiated a joint study.

The purpose of this joint study was to assess the load growth in GTA West and ensure that adequate transmission and connection facilities will be available to meet the electrical demand requirements over the upcoming decade, 2005 to 2015.

Six Local Distribution Companies (LDCs) own and operate assets in the specified study area. These companies are:

- Enersource Hydro Mississauga (EHM)
- Halton Hills Hydro Inc. (HHH)
- Hydro One Brampton (HOB)
- Hydro One Networks Inc. – Distribution (HONI – Dx)
- Milton Hydro Distribution Inc. (MHD)
- Toronto Hydro Electric System (THES)

With the exclusion of Toronto Hydro Electric System[7], the above listed LDCs participated in this joint study.

[7] Toronto Hydro Electric System did not participate in this study beyond providing load forecasts, as their asset locations and circumstances are such that they are able to resolve capacity issues via load transfers between various transmission facilities within their jurisdiction.

2. EXISTING TRANSMISSION SYSTEM AND NEEDS

GTA West is supported by two main 500/230 kV TSs (Claireville TS and Trafalgar TS) transforming electricity from 500 kV to 230 kV, and one 230 kV electrical system hub (Richview TS).

There are ten step-down transmission facilities that were analyzed in this study. These stations step the transmission voltage of 230 kV down to a sub-transmission level, either 27.6 kV or 44 kV, for distribution of electricity to the end-use customer. Table 1 lists the stations and their associated step-down transformer voltage capability. Four of the ten existing TSs (Bramalea TS, Erindale TS, Goreway TS and Pleasant TS) in the study area have the ability to step-down to both sub-transmission voltages. The remaining stations are only able to step-down to one sub-transmission voltage.

Table 1: Transmission Step-down Facilities Within GTA West

Station	230 / 27.6 kV	230 / 44 kV
Bramalea TS	Transformers T1/T2	Transformers T3/T4 and T5/T6
Cardiff TS	Transformers T1/T2	
Erindale TS	Transformers T1/T2	Transformers T3/T4 and T5/T6
Goreway TS	Transformers T5/T6	Transformer T4
Halton TS	Transformers T1/T2	
Jim Yarrow MTS	Transformers T1/T2	
Meadowvale TS		Transformers T1/T2
Pleasant TS	Transformers T5/T6	Transformers T1/T2
Richview TS	Transformers T1/T2, T5/T6 and T7/T8	
Tomken TS		Transformers T1/T2 and T3/T4

The above mentioned TSs are connected as follows (refer to Figure 1 and Map 1):

1. Trafalgar TS and Richview TS are connected via four 230 kV circuits (R14T, R17T, R19T and R21T). Erindale TS and Tomken TS are tapped off of these circuits. Two radial extensions from R19T and R21T at Hanlon Junction supply Pleasant TS and Jim Yarrow MTS.

2. Richview TS and Claireville TS are connected via five 230 kV circuits (V71RP, V72R, V73R, V74R, V76R). Goreway TS, Bramalea TS and Cardiff TS are tapped off of these circuits.

3. Meadowvale TS and Halton TS are supplied via two radial extensions from two 230 kV circuits (T38B and T39B) connecting Trafalgar TS and Burlington TS.

The study area was identified as summer critical[8]. Load forecasts provided by the LDCs indicate that electrical load growth is expected to continue at a summer average rate of 2.6% per year at the 27.6 kV sub-transmission level and 1.5 % per year at the 44 kV sub-transmission level, for the next ten years.

[8] Summer critical means less available margin between loading and applicable equipment ratings during this particular season.

Some stations in the study area are already peaking above their summer capacity limit (Limited Time Rating, LTR)[9], as well as experiencing voltage deficiencies related to high loading. The particular needs of this system were identified using a single contingency analysis. Those needs and the associated need dates are detailed below. Refer to Table 2 for a summary.

Station Overloads (230/27.6 kV)

- Transformers T1/T2 at Bramalea TS are currently exceeding their summer 10-day LTR (2005)
- Transformers T1/T2 at Erindale TS are currently exceeding their summer 10-day LTR (2005)
- Transformers T5/T6 at Pleasant TS are currently loaded to their summer 10-day LTR (2005)
- Transformers T1/T2 at Jim Yarrow MTS are expected to exceed their station summer 10-day LTR by summer 2009[10]
- Transformers T5/T6 at Goreway TS are expected to reach their summer 10-day LTR by summer 2011[11]
- Transformers T3/T4 at Halton TS are expected to reach their summer 10-day LTR by summer 2011

Station Overloads (230/44 kV)

- Transformers T1/T2 at Meadowvale TS are currently exceeding their summer 10-day LTR (2005)
- Transformers T3/T4 and T5/T6 at Erindale TS are expected to exceed their summer 10-day LTR by summer 2006
- Transformers T1/T2 at Pleasant TS are expected to exceed their summer 10-day LTR by summer 2011

Voltage Deficiencies

- Meadowvale TS is currently experiencing voltage deficiencies during periods of high summer loading and is below Operating and Planning Standards (refer to Section 5 for definition of Operating and Planning Standards)

Circuit Overloads[12]

- Segments of circuits R19T/R21T are expected to reach summer thermal capacity limits as per Operating and Planning Standards (refer to section 5) by 2009
- Segments of circuits T38B/T39B are expected to be nearing summer thermal capacity limits as per Operating and Planning Standards by 2015

[9] For planning purposes, the LTRs, or thermal capacity limits, referred to in this study are emergency ratings for electrical equipment to acknowledge that equipment ratings can be exceeded for a certain length of time without causing undue stress on the equipment. For transformers, this is a 10-day LTR and for circuits or lines this is a 15-minute LTR immediate post fault, and continuous rating for steady state post fault.

[10] Jim Yarrow MTS load growth forecast includes load transfers from Bramalea TS (T1/T2, 230/27.6 kV) and Pleasant TS (T5/T6, 230/27.6 kV).

[11] Goreway TS (T5/T6) load growth forecast includes load transfers from Bramalea TS (T1/T2).

[12] These circuit overloads were observed in a basecase loadflow with a Flow East Towards Toronto (FETT) transfer of approximately 3600 MW.

Table 2: Summary of Transmission Needs and Need Dates

Year	27.6 kV Stations	44 kV Stations	Circuits
2005 (Present)	Bramalea TS (T1/T2) Erindale TS (T1/T2) Pleasant TS (T5/T6)	Meadowvale TS (T1/T2)	
2006		Erindale TS (T3/T4 and T5/T6)	
2009	Jim Yarrow MTS (T1/T2)		R19T/R21T
2011	Goreway TS (T5/T6) Halton TS (T3/T4)	Pleasant TS (T1/T2)	

3. LOAD GROWTH

Load forecasts provided by LDCs in GTA West indicate that electrical load growth is expected to continue at a summer average rate of 2.6% per year for the next ten years at the 27.6 kV level and at 1.5% per year at the 44 kV level (refer to Table 3). More detailed load forecasts, including station capacity data, can be found in Appendix A.

Table 3: Forecast – Summer Peak Load (MW)

	Forecast Load in MW											
230/27.6 kV Stations	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	
1. Bramalea TS[1,2,3]	193	174	175	177	179	181	183	183	184	184	184	
2. Cardiff TS[1]	0	101	103	105	107	110	112	112	112	113	113	
3. Erindale TS[1,4]	233	167	170	174	177	181	185	185	186	187	187	
4. Goreway TS[3]	148	155	163	170	177	184	192	200	208	216	224	
5. Halton TS	97	114	131	149	162	166	170	175	179	183	188	
6. Jim Yarrow MTS[2]	95	100	113	125	138	152	166	180	196	211	225	
7. Pleasant TS[2]	198	198	198	198	198	198	198	198	198	198	198	
8. Richview TS	354	362	364	368	371	374	377	380	385	388	392	
Total:	1318	1371	1418	1466	1509	1546	1582	1614	1647	1680	1710	Avg.
Growth Rate:		4.0%	3.4%	3.4%	3.0%	2.4%	2.4%	2.0%	2.1%	2.0%	1.8%	2.6%
230/44 kV Stations	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	
1. Bramalea TS[1,2,3]	179	184	188	192	196	201	205	210	215	220	224	
2. Goreway TS[3]	28	29	30	31	32	34	35	36	37	39	40	
3. Erindale TS[1,4]	360	374	384	394	405	415	425	427	429	431	433	
4. Meadowvale TS[4]	181	181	181	181	181	181	181	181	181	181	181	
5. Pleasant TS[2]	131	136	140	144	148	152	156	161	164	170	174	
6. Tomken TS	312	314	316	317	319	321	322	323	324	325	326	
Total:	1191	1217	1239	1260	1281	1303	1324	1337	1350	1364	1377	Avg.
Growth Rate:		2.3%	1.8%	1.7%	1.7%	1.7%	1.7%	1.0%	0.9%	1.1%	0.9%	1.5%

1 Net load; includes load transfers from Bramalea TS and Erindale TS to Cardiff TS.
2 Net load; includes load transfers from Pleasant TS and Bramalea TS.
3 Net load; Includes load transfers from Bramalea TS.
4 Net load; Includes load transfers from Meadowvale TS to Erindale TS

The major load centres during the ten-year study period exist in the north and westerly parts of the city of Mississauga at the 44 kV sub-transmission level. As well, major load centres exist in the west and northeasterly parts of Brampton at both 44 and 27.6 kV sub-transmission levels. The study area is considered summer critical.

4. System Assumptions

Certain assumptions were made in order to assess the effects of different contingencies to verify the system capacity. The assumptions used in the study were:

1. If a coincident peak load forecast was not provided by the LDC, the coincident peaks were calculated using the factors in Table 4.

Table 4: Coincidence Factors

LDC	Coincidence Factor
Enersource Hydro Mississauga	Coincident peak forecast provided
Halton Hills Hydro Inc.	Coincident peak forecast provided
Hydro One Brampton	Coincident peak forecast provided
HONI Dx	Coincident peak forecast provided
Milton Hydro Distribution Inc.	0.95
Toronto Hydro Electric System	0.95

2. Power factors were provided by each LDC and used in this study as listed in Table 5.

Table 5: Power Factors

LDC	Power Factor	
Enersource Hydro Mississauga	0.9	
Halton Hills Hydro Inc.	0.9	
Hydro One Brampton	Bramalea TS (27.6 kV) – 0.88[13] Goreway TS (27.6 kV) – 0.92 Jim Yarrow MTS (27.6 kV) – 0.92 Pleasant TS (27.6 kV) – 0.93	Bramalea TS (44 kV) – 0.88[14] Goreway TS (44 kV) – 0.85 Pleasant TS (44 kV) – 0.88[15]
Hydro One Networks Inc. – Distribution	0.88	
Milton Hydro Distribution Inc.	0.9	
Toronto Hydro Electric System	0.9	

3. A study period of 10 years, from 2005 to 2015, was used to assess the transmission requirements.

4. Equipment summer continuous ratings and LTRs were based on a daytime ambient temperature of 30°C with a wind speed of 4 km/hour.

5. Hydro One Brampton shifts 60% of Bramalea TS (T1/T2, 27.6 kV) load growth to Jim Yarrow MTS (T1/T2, 27.6 kV) and 40% of Bramalea TS (T1/T2, 27.6 kV) load growth to Goreway TS (T5/T6, 27.6 kV).

6. Hydro One Brampton shifts all future load growth at Pleasant TS (T5/T6, 27.6 kV) to Jim Yarrow MTS (T1/T2, 27.6 kV)

[13] Low voltage (LV) capacitors have been installed at Bramalea TS to compensate for the power factor.
[14] LV capacitors have been installed at Bramalea TS to compensate for the power factor.
[15] LV capacitors have been installed at Pleasant TS to compensate for the power factor.

7. Toronto Hydro Electric System transfers load amongst the Richview TS step-down facilities (27.6 kV) so that they remain under the station capacity limit (10-day LTR).

8. Enersource Hydro Mississauga is unable to create more 44 kV ties between Tomken TS and Erindale TS due to the geography of the region and the lack of sub-transmission corridors. Thus, extra load from Erindale TS (T5/T6, 44 kV) and Meadowvale TS (T1/T2, 44 kV) are to be shifted to Erindale TS (T3/T4, 44 kV).

9. Powerflow simulation analysis was based on the July 2004 load flow basecase with loads increased to represent the year under study. LDCs provided load forecasts from 2004 to 2024.

5. Operating and Planning Standards

The following Operating and Planning Standards were followed throughout this assessment.

The Independent Electricity System Operator's (IESO) Planning and Operating Standards indicate that[16]:

- The minimum voltage on the 230 kV transmission system under normal conditions is 220 kV, with a maximum allowable decline of 10% for a single element contingency;
- A maximum allowable voltage decline of 10% at all buses before tap changer action takes place;
- A maximum allowable voltage decline of 10% at high voltage and a maximum decline of 5% at low voltage (sub-transmission level) buses after tap changer action takes place; and,
- Voltage rises to be within 4% upon capacitor switching.

All transmission circuits and stations must be loaded to within their applicable ratings. When assessing thermal constraints at TSs, loading must not exceed the 10-day LTR in the event of a single contingency, both immediate post fault (before tap changer action takes place) and steady state post fault (after tap changer action takes place). Thermal constraints on transmission circuits are such that they must not exceed the 15-minute LTR for immediate post fault and must not exceed the continuous rating for steady state post fault for a single contingency.

For area supply planning purposes, the IESO stipulates the following guideline for loads greater than 500 MW in the IESO Supply Deliverability Guidelines:

> *"With all transmission elements in service, any single element or double circuit contingency should not result in an interruption of supply to a load level of 500MW or more."*[17]

[16] IESO Transmission Assessment Criteria, IMO_REQ_0041
http://www.ieso.ca/imoweb/pubs/marketAdmin/IMO_REQ_0041_TransmissionAssessmentCriteria.pdf
[17] IESO Supply Deliverability Guidelines, IMO_GDL_0021
www.ieso.ca/imoweb/pubs/marketAdmin/IMO_GDL_0021_IMOSupplyAvailabilityGuidelines.pdf

6. ADEQUACY OF EXISTING FACILITIES

This section reviews the adequacy of the existing 500 kV and 230 kV transmission facilities to supply the load in GTA West to step-down transformation facilities Bramalea TS, Cardiff TS, Erindale TS, Goreway TS, Halton TS, Jim Yarrow MTS, Meadowvale TS, Pleasant TS, Richview TS, and Tomken TS. The transformation capacity at these load stations is also reviewed.

6.1 230 kV Transmission System

Four circuits (R14T, R17T, R19T and R21T) extend between Richiview TS and Trafalgar TS to supply electricity to Erindale TS, Tomken TS, Pleasant TS and Jim Yarrow MTS as well as carry power to Richview and transmission facilities further east. Circuits R14T and R17T have the capability to supply the forecasted load growth for the study period without any observable thermal or voltage limitations. Circuits R19T and R21T reach thermal limits by 2009. Circuits R19T and R21T supply electricity to more than 500 MW of load and are thus operating beyond the adequate system reliability and security guidelines as outlined in the IESO Supply Deliverability Guidelines.

Four circuits (T36B, T37B, T38B and T39B) extend between Trafalgar TS and Burlington TS. Step-down transformation facilities tapped off of circuits T38B and T39B within the defined GTA West geographic area were included in this study. Circuits T36B and T37B were only assessed in those situations where a contingency redistributed significant amounts of electricity along those lines. Step-down facilities tapped off of these lines were not included in this study. Under all contingencies, circuits T36B and T37B did not display any thermal loading or voltage deficiency limitations during the study period. The loss of either circuits T38B or T39B caused voltage deficiencies starting in 2005 at Meadowvale TS and in 2012 at Halton TS LV buses. By 2015, the segment of circuits T38B and T39B between Lantz Junction and Trafalgar TS DESN[19] (approximately the distance of one tower span) is loaded to approximately 80% of its continuous rating, steady state post contingency.[20]

Five circuits (V71RP, V72R, V73R, V74R and V76R) extend from Claireville TS to Richview TS. Bramalea TS and Cardiff TS are tapped off of a radial extension of V72R and V73R. Goreway TS is tapped off of a radial extension of V73R and V76R. By 2008, circuits V72R, V73R and V76R will be loaded up to 50% of their continuous rating pre-contingency on the segments between Claireville TS and Richview TS. In the same year, under steady state post contingency, these three circuits are not loaded beyond 60% of their continuous rating. On the radial tap extending from circuit V72R, the loading does not exceed 21% of its continuous rating and likewise for V73R. For circuit V76R, the loading does not exceed 14%. At the end of the study period, 2015, the loading on the three radial segments of circuits V72R, V73R and V76R does not exceed 32% of their continuous rating.

[18] IESO Supply Deliverability Guidelines, IMO_GDL_0021
www.ieso.ca/imoweb/pubs/marketAdmin/IMO_GDL_0021_IMOSupplyAvailabilityGuidelines.pdf

[19] DESN – Dual Element Spot Network; a step down facility who has the same name as a Transformer Station (TS) whose purpose is to transform electricity from one high voltage to another. The term DESN is used to identify the load connection TS.

[20] Where the contingency is the loss of the parallel circuit.

6.2 Step Down Transformation Facilities

Of imminent concern in this assessment is the step-down transformer capacity in GTA West. Several stations were found, at the very early stages of the study period, to be operating beyond Operating and Planning Standards (please refer to Section 5). A total of seven TSs require either additional capacity or voltage correction by the end of the study period; some of these at two separate sub-transmission levels. Further load forecast information can be found in Appendix A.

- Bramalea TS has step-down transformation capability to both 44 kV and 27.6 kV. Transformers T1 and T2 step-down voltage from 230 kV to 27.6 kV, and are already exceeding capacity. At this time, additional load growth in the Bramalea TS area at voltage level 27.6 kV is being transferred to Jim Yarrow MTS (60%) and Goreway TS (40%). This station has no additional capacity to supply the increasing load in the area. Due to the influx of local generation[21] in the Bramalea TS area connected to the 44 kV sub-transmission system, the transformation facilities connected to the 44 kV system were not found to be near thermal limits, nor were any voltage deficiencies identified during the study period.

- Erindale TS has step-down transformation capability to both 44 kV and 27.6 kV. Transformers T1 and T2 step-down voltage from 230 kV to the 27.6 kV level. These transformers are currently loaded beyond their summer 10-day LTR. Load is being transferred to Cardiff TS and will continue to be transferred until transformers T1 and T2 at Erindale TS are within their summer 10-day LTR. Transformers T5 and T6 (44 kV) are also currently loaded beyond their summer 10-day LTR. However, there is some available capacity on transformers T3 and T4 (44 kV) to which load is being transferred from transformers T5 and T6. With these and other 44 kV load transfers from Meadowvale TS, transformers T5 and T6 at Erindale TS are expected to be loaded to capacity by 2005, and transformers T3 and T4 at Erindale TS (44 kV) are expected to be loaded beyond capacity by 2006. There is additional capacity at Tomken TS (44 kV) for load transfers, however, there are insufficient sub-transmission right-of-ways on which to build distribution lines between these two stations. Thus 44 kV Erindale TS load cannot be transferred to Tomken TS.

- Pleasant TS has step-down transformation capability to both 44 kV and 27.6 kV. Transformers T5 and T6 transform electricity from 230 kV to the 27.6 kV level. These transformers are currently loaded to their summer 10-day LTR and all additional load is being transferred to Jim Yarrow MTS. Transformers T1 and T2 transform electricity from 230 kV to the 44 kV level. These transformers are expected to reach their summer 10-day LTR by summer 2011.

- Meadowvale TS has step-down transformation capability to 44 kV. This station is currently loaded to its summer 10-day LTR and all additional load is being transferred to Erindale TS.

- Halton TS has step-down transformation capability to 27.6 kV. This station is expected to be loaded to its summer 10-day LTR by 2011.

[21] Local generation on the Bramalea TS 44 kV system: Greater Toronto Airport Authority, McDonell Douglas CGS and Algonquin Power Energy from Waste.

- Jim Yarrow MTS has step-down transformation capability to 27.6 kV. Jim Yarrow MTS is currently receiving load transfers from Pleasant TS and Bramalea TS. The load at this station is expected to exceed its summer 10-day LTR by 2009.

- Goreway TS has step-down transformation capability to both 44 kV and 27.6 kV. Load forecasts suggest that transformers T5 and T6 at Goreway TS, which transform from 230 kV to 27.6 kV, will be loaded to their summer 10-day LTR by 2011. This is assuming that the low voltage buses have balanced loads and taking into consideration the load transfers from Bramalea TS. Transformer T4 (44 kV) at Goreway TS, does not display any problems during the study period.

- Cardiff TS was placed in-service in 2005. This station transforms from 230 kV to 27.6 kV. Load forecasts suggest that this station will be exceeding its summer 10-day LTR by the end of the study period, 2015.

6.3 Load Transfer Capability

Load transfer capability within the sub-transmission systems has enabled some of the immediate concerns at several stations to be temporarily addressed. Due to the rapid load growth in several areas of GTA West, and the lack of local transmission resources, several stations have been and/or will be forced to designate cascading load transfers to other stations in order to mitigate operating risks until further capacity can be supplied. These load transfers are from:

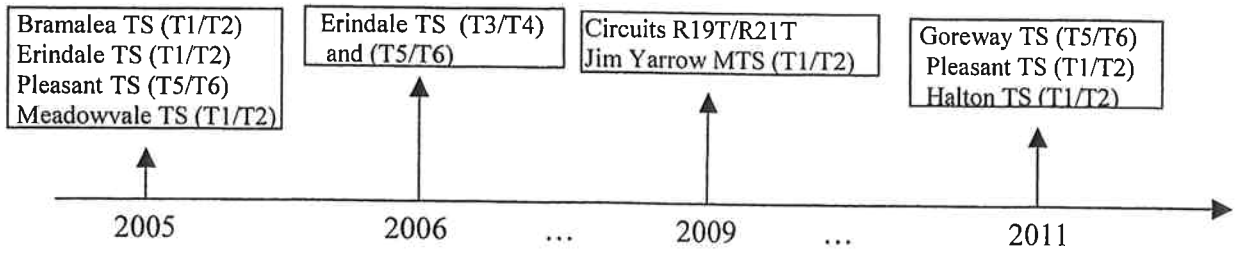
- Transformers T1/T2 at Bramalea TS (27.6 kV) to transformers T5/T6 at Goreway TS (27.6 kV), transformers T1/T2 at Jim Yarrow MTS (27.6 kV) and transformers T1/T2 at Cardiff TS (27.6 kV);
- Transformers T1/T2 at Erindale TS (27.6 kV) to transformers T1/T2 at Cardiff TS (27.6 kV);
- Transformers T5/T6 at Pleasant TS (27.6 kV) to transformers T1/T2 at Jim Yarrow MTS (27.6 kV); and,
- Transformers T1/T2 at Meadowvale TS (44 kV) to transformers T3/T4 at Erindale TS (44 kV).

These load transfers have already been or are in the process of being initiated by the LDCs. However, the load transfers do not address the overall load growth requirements, transmission capacity and voltage deficiencies, and in fact will accelerate transmission capacity needs at other stations.

6.4 Summary of Needs

A summary of the needs to be addressed via transmission, step-down transformation, and voltage correction facilities as proposed in this study are shown in Figure 2. The need dates for the study area indicate that several new TSs are required immediately.

Figure 2: Summary of Needs, 2005 – 2015



In order to identify potential solutions that would address more than one need, the needs identified in this study were combined into different groups taking into account the load transfer activities outlined in Section 6.3, the voltage transformation capabilities at the stations and the geographic load growth. These groups of needs, shown in Table 6, may have slightly different need dates than the dates shown in Figure 2.

Table 6: Geographic / Voltage Level Grouping of Needs

Group	Voltage Level	Need Date
Erindale TS / Meadowvale TS	44 kV	2006
Pleasant TS / Jim Yarrow MTS	27.6 kV	2009
Circuits R19T / R21T	230 kV	2009
Bramalea TS / Goreway TS	27.6 kV	2011
Pleasant TS	44 kV	2011
Halton TS	27.6 kV	2012

7. Possible Options to Address Supply Capacity & Voltage Stability

This section outlines all possible options considered in the study in order to address the identified needs in GTA West. Table 7 itemizes the options that are rejected and those that are further analyzed. These options address the overall transmission concerns that arise, despite the load transfers that are in progress. In some cases, options were proposed to address issues at two voltage levels. For this reason, some options may occur twice in the following table under different needs.

Table 7: Summary of Options

Option	Description	Status
"Do Nothing"	"Do Nothing"	Rejected
Meadowvale TS Voltage Decline		
LVC	Install Low Voltage (LV) Capacitors – 2, 32.4 MVAr at 46 kV	Further Analyzed
Relief for Erindale TS and Meadowvale TS (44 kV)		
EM1	New DESN at Meadowvale TS (Meadowvale TS #2); two 230/44/27.6 kV, 75/125 MVA transformers	Rejected
EM2	New DESN at Meadowvale TS (Meadowvale TS #2); two 230/44 kV, 75/125 MVA transformers	Further Analyzed
EM3	New DESN, Winston TS, in the vicinity of Winston Churchill Blvd and Highway 403; two 230/44 kV, 75/125 MVA transformers	Further Analyzed
Relief for Goreway TS and Bramalea TS (27.6 kV)		
GB1	New DESN, North Central Brampton TS, in the vicinity of Bovaird Drive and Heart Lake Road; two 230/27.6 kV, 75/125 MVA transformers	Rejected
GB2	New DESN at Cardiff TS (Cardiff TS #2); two 230/27.6 kV, 75/125 MVA transformers	Rejected
GB3	New DESN at Goreway TS (Goreway TS #2); two 230/27.6 kV, 75/125 MVA transformers	Further Analyzed
Relief for Pleasant TS (44 kV)		
EM2	New DESN at Meadowvale TS (Meadowvale TS #2); two 230/44 kV, 75/125 MVA transformers and cascading load transfers from Pleasant TS	Rejected
EM3	New DESN, Winston TS, in the vicinity of Winston Churchill Blvd and Highway 403; two 230/44 kV, 75/125 MVA transformers and cascading load transfers from Pleasant TS (44 kV).	Rejected
P1	New DESN at Pleasant TS (Pleasant TS #3); two 230/44/27.6 kV, 75/125 MVA transformers	Rejected
P2	2nd 230/44 kV, 50/83 MVA transformer at Goreway TS; cascading load transfers from Pleasant TS	Further Analyzed
Relief for Pleasant TS and Jim Yarrow MTS (27.6 kV)		
EM1	New DESN at Meadowvale TS (Meadowvale TS #2); two 230/44/27.6 kV, 75/125 MVA transformers	Rejected

GB1	New DESN, North Central Brampton TS, in the vicinity of Bovaird Drive and Heart Lake Road; two 230/27.6 kV, 75/125 MVA transformers	Rejected
P1	New DESN at Pleasant TS (Pleasant TS #3); two 230/44/27.6 kV, 75/125 MVA transformers	Rejected
PJ1	New DESN at Pleasant TS (Pleasant TS #3); two 230/27.6 kV, 75/125 MVA transformers	Further Analyzed
PJ2	New DESN, Orlando TS, in the vicinity of Mississauga Rd and Highway 407; two 230/27.6 kV, 75/125 MVA transformers	Rejected
Relief for Halton TS (27.6 kV)		
EM1	New DESN at Meadowvale TS (Meadowvale TS #2); two 230/44/27.6 kV, 75/125 MVA transformers	Rejected
H1	New DESN at Halton TS (Halton TS #2); two 230/27.6 kV, 50/83 MVA transformers	Rejected
H2	New DESN, Steeles TS, in the vicinity of Steeles Ave. and Trafalgar Rd; two 230/27.6 kV, 50/83 MVA transformers	Further Analyzed
H3	New DESN, James Snow TS, in the vicinity of Steeles Ave. and James Snow Parkway; two 230/27.6 kV, 50/83 MVA transformers	Further Analyzed
Relief for circuits R19T/R21T and 500 MW IESO Guideline Restriction (230 kV)		
T1	Extend circuits V72R/V73R from Cardiff TS to the Pleasant TS tap and construct a new Switching Station (SS), Hurontario SS, west of Hurontario Street	Further Analyzed
T2	Extend circuits V72R/V73R from Cardiff TS to Jim Yarrow MTS and re-supply Jim Yarrow MTS	Rejected
T3	Extend circuits T38B/T39B from Meadowvale TS to the Pleasant TS tap and construct a new SS, Hurontario SS, west of Hurontario Street	Further Analyzed
T4	Extend circuits T38B/T39B from Meadowvale TS to Jim Yarrow MTS and re-supply Jim Yarrow MTS	Rejected
T5	Reconductor circuits R19T/R21T from Trafalgar TS to Erindale Junction and from Hanlon Junction to Jim Yarrow Junction	Rejected
T6	Extend circuits V73R/V76R from Goreway TS to the Pleasant TS tap and construct a new SS, Pleasant SS	Rejected

7.1 "Do Nothing"

The "Do Nothing" approach will aggravate the existing load supply and transmission capacity problems and accelerate capacity problems with circuits R19T/R21T.

For circuits R19T/R21T, this approach does not satisfy the IESO requirements stipulated in the guideline for loads greater than 500 MW.

This alternative is not an acceptable approach and is not considered further.

7.2 Meadowvale TS Voltage Decline

LVC: ***Install Low Voltage Capacitors***
Installation of LV capacitors at Meadowvale TS will allow the station to meet minimum voltage requirements in the event of a single contingency.

7.3 Relief of Erindale TS and Meadowvale TS (44 kV)

EM1: ***Meadowvale TS #2***
A new 230/44/27.6 kV, 75/125 MVA DESN at Meadowvale TS would provide capacity for the Erindale TS and Meadowvale TS areas. The use of a three winding transformer to transform voltages to two sub-transmission levels (44 kV and 27.6 kV) would mean that Jim Yarrow MTS and Pleasant TS and/or Halton TS may also take advantage of the capacity offered by this proposed new DESN. This option was considered and rejected on the basis that a single DESN would not be able to supply the necessary capacity for both the 44 kV and 27.6 kV needs in the surrounding area over the next ten years.

EM2: ***Meadowvale TS #2***
A new 230/44 kV, 75/125 MVA DESN at Meadowvale TS would provide capacity for Erindale TS and Meadowvale TS at the 44 kV sub-transmission level. This option was further evaluated.

EM3: ***Winston TS***
A new 230/44 kV, 75/125 MVA DESN in the vicinity of Winston Churchill Boulevard (or Erin Mills Parkway) and Highway 403 would provide additional capacity off-loading Erindale TS and Meadowvale TS. This option was further evaluated.

7.4 Relief for Goreway TS and Bramalea TS (27.6 kV)

GB1: ***North Central Brampton TS***
A new 230/27.6 kV, 75/125 MVA DESN in North Central Brampton in the vicinity of Bovaird Drive and Heart Lake Road would provide transmission capacity to relieve Goreway TS and Bramalea TS. This option does not completely satisfy the needs of the LDC and therefore was considered and rejected.

GB2: ***Cardiff TS #2***
A new 230/27.6 kV, 75/125 MVA DESN at Cardiff TS would provide additional transmission capacity relieving Goreway TS and Bramalea TS. There is insufficient room for the required facilities on the existing site and this option does not completely satisfy the needs of the LDC and therefore was considered and rejected.

GB3: ***Goreway TS #2***
A new 230/27.6 kV, 75/125 MVA DESN at Goreway TS would provide transmission capacity to relieve both Goreway TS and Bramalea TS. The location of this DESN is closer to the load centre and would be in an overall more ideal location than the other two proposals (GB1 and GB2). Thus, this option was considered further.

7.5 Relief for Pleasant TS (44 kV)

EM2: ***Meadowvale TS #2***
Same as above (EM2, Section 7.3), with the addition of cascading load transfers from Pleasant TS to the new DESN at Meadowvale TS. However, cascading load transfers from Pleasant TS to Meadowvale TS would be complex and costly for the LDC, thus this option was considered and rejected.

EM3: ***Winston TS***
Same as above (EM3, Section 7.3), with the addition of cascading load transfers from Pleasant TS to the new DESN at Winston TS. However, cascading load transfers from Pleasant TS to the proposed station in the vicinity of Winston Churchill Blvd and Highway 403 would be complex and costly for the LDC, thus this option was considered and rejected.

P1: ***Pleasant TS #3***
A new 230/44/27.6 kV, 75/125 MVA DESN at Pleasant TS would provide additional transmission capacity to Pleasant TS at the 44 kV sub-transmission level, as well as address needed capacity at the 27.6 kV sub-transmission level for Pleasant TS and Jim Yarrow MTS. However, the capacity requirements for 27.6 kV are large enough to require a whole DESN while the capacity requirements at the 44 kV level are small enough to make this transformer size uneconomic. Thus, this option was considered and rejected.

P2: ***Goreway TS 44 kV DESN***
Install a second 230/44 kV, 50/83 MVA transformer at Goreway TS. This would provide the required transmission capacity for Pleasant TS at the 44 kV sub-transmission level, as well as complete the DESN at Goreway TS, providing redundancy and thereby reducing operating risks to the load already established there. This option was considered further.

7.6 Relief for Pleasant TS and Jim Yarrow MTS (27.6 kV)

EM1: ***Meadowvale TS #2***
Same as above (EM1, Section 7.3) with the addition of cascading load transfers at the 27.6 kV level from Pleasant TS and Jim Yarrow MTS to the new DESN at Meadowvale TS. The load requirements for Pleasant TS and Jim Yarrow MTS are such that they would require an entire 75/125 MVA DESN. Thus, this option of sharing between the two sub-transmission levels was considered and rejected.

GB1: ***North Central Brampton TS***
Same as above (GB1, Section 7.4) with the addition of cascading load transfers from Pleasant TS and Jim Yarrow MTS (27.6 kV) to this new DESN. However, the load requirements at the 27.6 kV sub-transmission level do not permit the sharing of a single DESN as it would not provide enough capacity to the 27.6 kV level. Thus, this option was considered and rejected.

PJ1: ***Pleasant TS #3***
A new 230/27.6 kV, 75/125 MVA DESN at Pleasant TS would provide the needed capacity at the 27.6 kV sub-transmission level. This option was considered further.

PJ2: ***Orlando TS***
A new 230/27.6 kV, 75/125 MVA DESN in the vicinity of Mississauga Road and Highway 407 would provide the needed transmission capacity. However, the location of this proposed DESN is too far away from the load centre. Thus, this option was considered and rejected.

7.7 Relief for Halton TS (27.6 kV)

EM1: Meadowvale TS #2
Same as above (EM1, Section 7.3), with the addition of load transfers from Halton TS to Meadowvale TS #2. This option would not provide enough capacity at the 44 kV level for the requirements of Meadowvale TS and Erindale TS. This option was therefore considered and rejected.

H1: ***Halton TS #2***
A new 230/27.6 kV, 50/83 MVA DESN at Halton TS would provide transmission capacity for the load growth near Halton TS at the 27.6 kV level. However, this option does not completely satisfy the needs of the LDC. Thus, this option was considered and rejected.

H2: ***Steeles TS***
A new 230/27.6 kV, 50/83 MVA DESN in the vicinity of Steeles Avenue and Trafalgar Road would provide transmission capacity for the load growth near Halton TS at the 27.6 kV level. This option was preferred by the LDCs and was considered further.

H3: ***James Snow TS***
A new 230/27.6 kV, 50/83 MVA DESN in the vicinity of James Snow Parkway and Steeles Avenue would provide transmission capacity for the load growth near Halton TS at the 27.6 kV level. This option was preferred by the LDCs and was considered further.

7.8 Relief for Circuits R19T/R21T and IESO 500 MW Guideline Restriction (230 kV)

T1: ***Circuits V72R/V73R Extension and Hurontario SS***
Circuits V72R and V73R are extended from Cardiff TS west to the Pleasant TS tap (approximately 4 km in length). A new SS is constructed at this junction, Hurontario SS. Jim Yarrow MTS is radially re-supplied from the new SS. This effectively provides a second source of power for the Pleasant TS tap, off-loading circuits R19T and R21T from Erindale Junction to Hanlon Junction and from Hanlon Junction to Jim Yarrow Junction. The new SS satisfies the IESO requirements stipulated in the guideline for loads greater than 500 MW by creating an isolation point on circuits R19T and R21T.

T2: ***Circuits V72R/V73R Extension and Re-supply Jim Yarrow MTS***
Circuits V72R and V73R are extended from Cardiff TS west to Jim Yarrow MTS. Jim Yarrow MTS is re-supplied from this extension. This option would place too much load on circuits V72R/V73R and was thus considered and rejected.

T3: Circuits T38B/T39B Extension and Hurontario SS
Circuits T38B and T39B are extended from Meadowvale TS east to the Pleasant tap (approximately 9 km). A new SS is constructed at this junction, Hurontario SS, and Jim Yarrow MTS is radially re-supplied from the new SS.

T4: ***Circuits T38B/T39B Extension and Re-supply Jim Yarrow MTS***
Circuits T38B and T39B are extended from Meadowvale TS east to Jim Yarrow MTS. Jim Yarrow MTS is re-supplied from this extension. This option would place too much load on circuits T38B/T39B and was thus considered and rejected.

T5: ***Reconductor Circuits R19T/R21T***
Circuits R19T and R21T are reconductored between Erindale Junction and Hanlon Junction (5.1 km in length) and between Hanlon Junction and Jim Yarrow Junction (11.6 km in length). For circuits R19T and R21T, this option does not satisfy the IESO requirements stipulated in the guideline for loads greater than 500 MW and was therefore considered and rejected.

T6: ***Circuits V73R/V76R Extension and Pleasant SS***
Circuits V73R and V76R are extended from Goreway TS to the Pleasant TS tap and a new SS (Pleasant SS) is constructed at this junction. However, there is insufficient space at Pleasant

TS to economically incorporate both a third DESN as well as a new SS. Moreover, this option would require at least 13 km of double circuit underground cable at a cost of $5-10 Million/km as there is no available transmission right-of-way. This option was considered cost prohibitive. It was therefore considered and rejected.

7.9 Consideration of Local Generation

Several local power generating stations (GS) in the Brampton area are currently in-service and/or are expected to be in-service within the next 12-24 months. Despite rapid load growth, the 44 kV DESN at Bramalea TS was not a concern throughout the study period as the local generation is connected to the system at the 44 kV sub-transmission level. This local generation has sufficiently off-loaded the transformers of the 44 kV DESN at Bramalea TS such that new transmission capacity was not an identified requirement throughout the study period. However, this local generation does not affect the loading of the 27.6 kV DESN at Bramalea TS. As such, this DESN still poses a problem, requiring immediate load transfers to various other TSs in the Brampton area, in addition to future planned transmission capacity.

A large GS in the vicinity of Goreway TS area is also proposed. A qualitative analysis shows that this GS, even at a 900 MW capacity, will not resolve any of the needs identified in this study. The transmission capacity needed in the Bramalea TS, Goreway TS and Cardiff TS areas would be unresolved by connecting a GS at the 230 kV high voltage level. However, this proposed GS could potentially increase the usability of an extension of circuits V72R/V73R to the Pleasant TS tap, with the establishment of Hurontario SS as outlined in option T1.

8. PLANS: OPTION COMBINATIONS

The options listed in the previous section that were considered worth further analysis were combined into several combinations and evolved into four plans as shown in Table 8. These plans effectively resolve all transmission capacity problems throughout the study period from 2005 to 2015.

Table 8: Plans: Option Combinations

Need	Year	Plan			
		A	B	C	D
Pleasant TS/Jim Yarrow MTS (27.6 kV)	2009	PJ1	PJ1	PJ1	PJ1
Bramalea TS/Goreway TS (27.6 kV)	2011	GB3	GB3	GB3	GB3
Erindale TS/Meadowvale TS (44 kV)	2006	EM3	EM3	EM2	EM2
Pleasant TS (44 kV)	2011	P2	P2	P2	P2
Halton TS (27.6 kV)*	2012	H2	H2	H2	H2
R19T/R21T and IESO 500 MW Guideline	2009	T1	T3	T1	T3

* Option H3 would be supplied from the same tap as H2, thus results from H2 were considered to satisfactorily represent option H3 for the purposes of this study.

Please refer to Figures 3, 4, 5 and 6 for schematic diagrams of the above plans.

Figure 3: Plan A

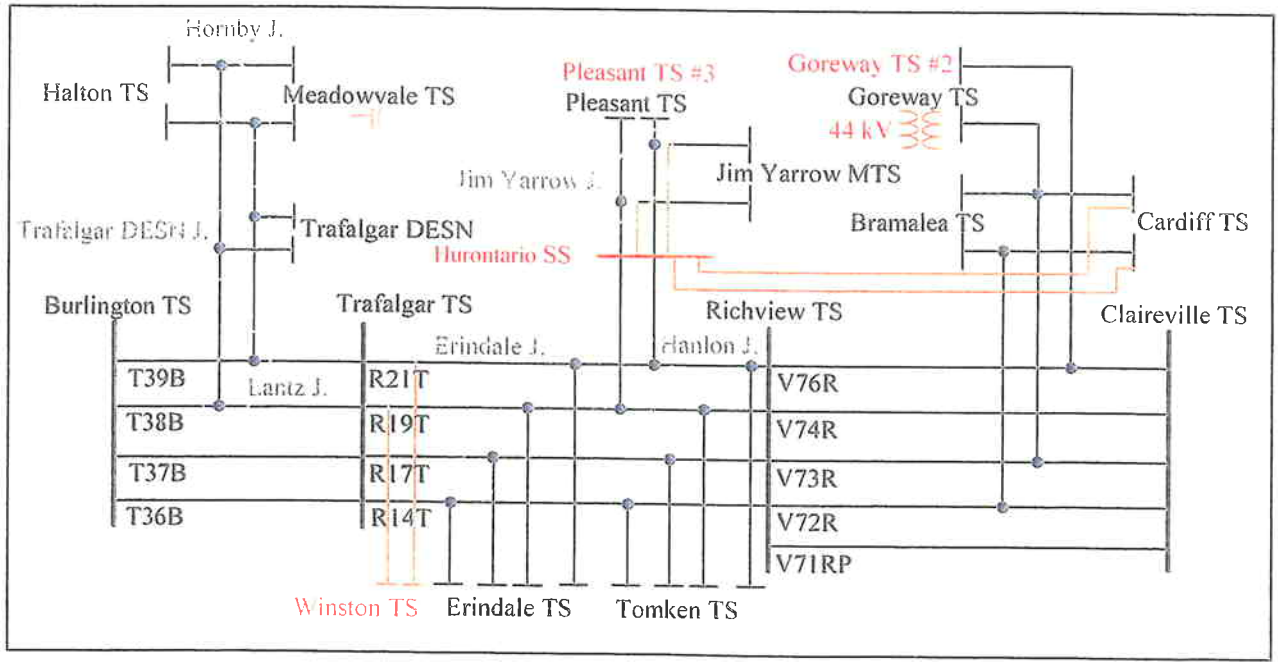


Figure 4:Plan B

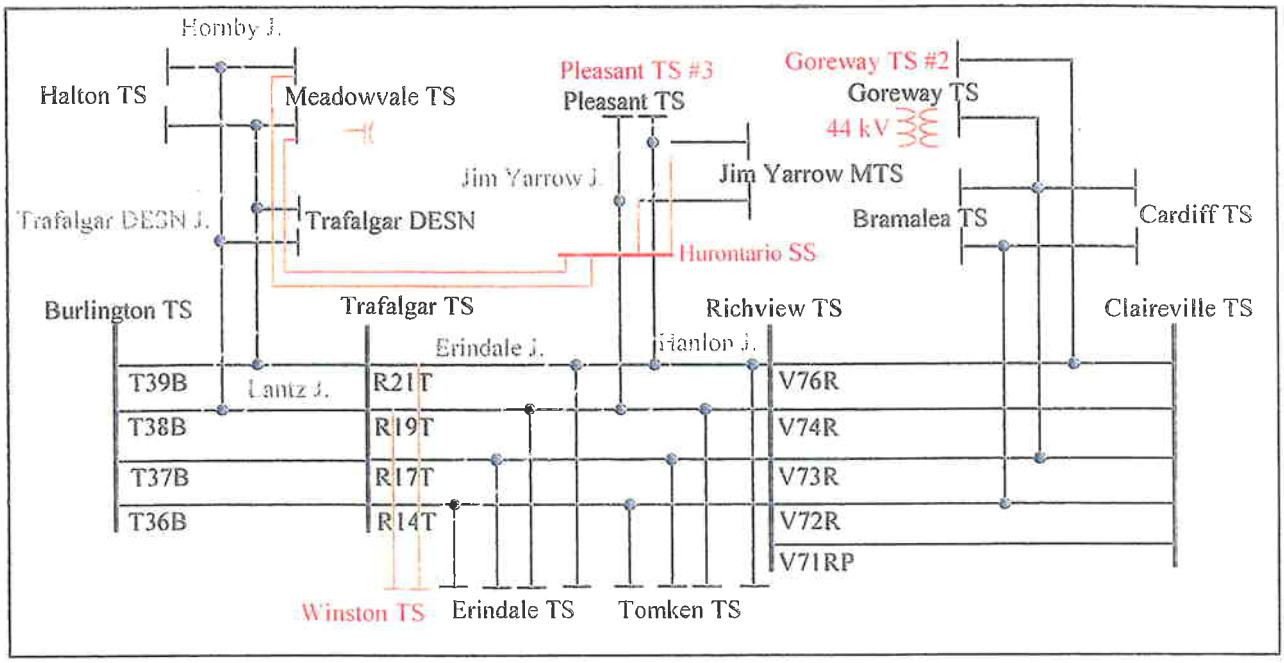


Figure 5: Plan C

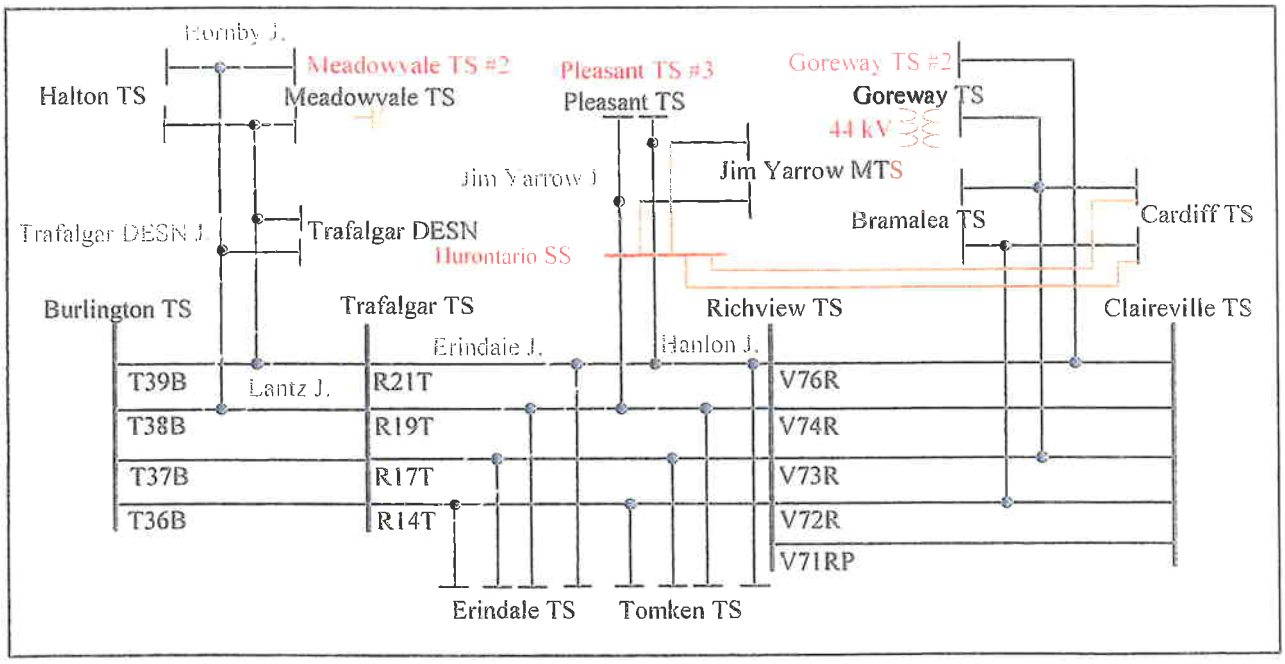
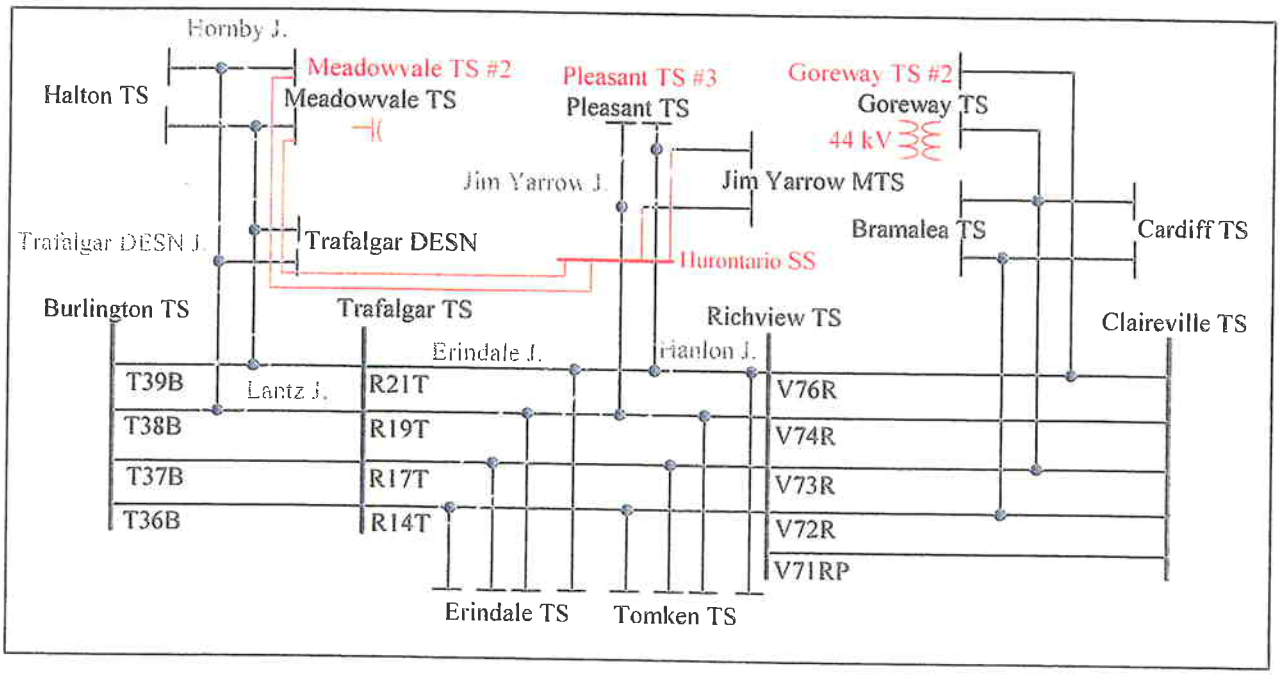


Figure 6: Plan D



9. SELECTION OF PREFERRED PLAN

The Shaw Power Technologies Inc. PSS/E software[22] was used to assess the transmission capacity for the existing facilities and for the proposed plans in GTA West. All plans address the needs identified during the 10-year study period. Specific loadflow results can be found in Appendix C.

9.1 2015 Technical Evaluation

9.1.1 Plan A: Extension of Circuits V72R/V73R, Winston TS

Plan A addresses all of the identified needs in this study. This Plan includes the extension of circuits V72R and V73R from Cardiff TS across to the proposed new SS, Hurontario SS, located on the Pleasant TS tap. Jim Yarrow MTS is radially re-supplied from Hurontario SS. The proposed new TS, Winston TS, tapped from circuits R19T and R21T will support the growing 44 kV load, off-loading Meadowvale TS and Erindale TS. New 230/27.6 kV transformation capacity is provided at Pleasant TS and Goreway TS and new 230/44 kV transformation capacity is provided at Goreway TS.

Technically, Plan A performed well. The majority of the high voltage buses were within an acceptable voltage range of between 240 and 243 kV pre-contingency. The following contingencies were observed: loss of circuit V72R, loss of circuit T38B, loss of circuit R19T Upper[23], loss of circuit R19T Lower[24], and loss of circuit R14T. Since the ratings on the double circuits[25] were consistent, it is a good assumption that the loss of the other circuit in the double circuit pair would warrant the same technical results. These contingencies revealed that Erindale TS and Meadowvale TS may need to transfer further load to the new TS, Winston TS, in order to maintain transformer operation below the summer 10-day LTR. The load at Cardiff TS exceeds the station capacity, steady state post fault (107%). The voltage at Hurontario SS was 240.5 kV and the voltage at Cardiff TS was 240.7 kV. The loading on the extension of circuits V72R and V73R was approximately 280 MW total and each line was loaded to 18% of its continuous rating, under pre-fault conditions. Winston TS placed additional load on circuits R19T and R21T, however this load is tapped off prior to the line sections of concern (Erindale Junction to Hanlon Junction and Hanlon Junction to Hurontario SS).

9.1.2 Plan B: Extension of Circuits T38B/T39B, Winston TS

Plan B involved the extension of circuits T38B and T39B from Meadowvale TS across to the proposed new SS, Hurontario SS, located along the Pleasant TS tap. The new proposed TS, Winston TS, is tapped from circuits R19T and R21T. New 230/27.6 kV transformation capacity is provided at Pleasant TS and Goreway TS and new 230/44 kV transformation capacity is provided at Goreway TS. Plan B performed adequately, though the voltages were not quite as high as for Plan A. Again, Cardiff TS exceeded capacity, steady state post fault (107%). The voltage at Hurontario SS was 239.2 kV and the voltage at Meadowvale TS was 239.3 kV. Meadowvale TS, Halton TS and Erindale TS exceeded capacity steady state post fault. The voltages on the Pleasant TS tap were low, and Pleasant TS 230/44 kV transformers were nearly loaded to capacity steady state post fault (~96%). The loading on the extension of circuits T38B and T39B was approximately 250 MW total and each line was loaded to 20% of its continuous rating under pre-fault conditions.

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[22] Copyright © 1976 – 2004 Siemens Power

[23] R19T Upper is the portion of circuit R19T north of Hurontario SS.

[24] R19T Lower is the portion of circuit R19T between Richview TS and Trafalgar TS and from Hanlon Junction to Hurontario SS.

[25] A line of supporting structures that carries two power circuits.

9.1.3 *Plan C: Extension of Circuits V72R/V73R, Meadowvale TS #2*

Plan C performed similarly to Plan A. The only difference between these two plans is the addition of Meadowvale TS #2 in place of the new TS, Winston TS. New 230/27.6 kV transformation capacity is provided at Pleasant TS and Goreway TS and new 230/44 kV transformation capacity is provided at Goreway TS. These similarities were reflected in the results of the technical analysis. Again, Cardiff TS exceeded capacity, steady state post fault (107%). Meadowvale TS may need to transfer additional load onto Meadowvale TS #2. The voltage at Hurontario SS was 240.4 kV pre-fault. The voltage at Cardiff TS is 240.6 and the voltage at Meadowvale TS was 239.9 kV. The loading on the extension of circuits V72R and V73R was approximately 290 MW total and each line was loaded to 19% of its continuous rating, under pre-fault conditions.

9.1.4 *Plan D: Extension of Circuits T38B/T39B, Meadowvale TS #2*

Plan D performed similarly to Plan B. Again the only difference between these two plans is the addition of Meadowvale TS #2 in place of the new TS, Winston TS. New 230/27.6 kV transformation capacity is provided at Pleasant TS and Goreway TS and new 230/44 kV transformation capacity is provided at Goreway TS. The overall system voltages were slightly lower especially on the Meadowvale TS tap. Again, Cardiff TS exceeded capacity, steady state post fault (107%). Erindale TS may need to transfer more load onto Meadowvale TS #2. The voltage at Hurontario SS was 238.5 kV. The voltage at Meadowvale TS was 238.6 kV. The total load on the extension of circuits T38B and T39B was approximately 240 MW, with each line loaded to approximately 19% of its continuous rating, under pre-fault conditions. On the loss of circuit R19T, the line section between Erindale Junction and Hanlon Junction on circuit R21T is loaded to 43% of continuous, steady state post fault. On the loss of circuit T38B, the line section between Lantz Junction and Trafalgar DESN Junction on T39B is loaded to 86% and the line section between Trafalgar DESN Junction and Hornby Junction on the same line is loaded to 78%.

9.1.5 *Plans A and C Versus Plans B and D: Circuit Extension V72R/V73R Versus T38B/T39B*

The intent of extending either circuits V72R/V73R or T38B/T39B is to off-load circuits R19T/R21T between Hanlon Junction and the proposed new Hurontario SS. Table 9 shows that the extension of circuits V72R/V73R (Plans A and C) allows circuits R19T/R21T to be off-loaded more than the extension of circuits T38B/T39B (Plans B and D). In Plans A and C, circuit R21T is loaded to 37% and 35% respectively, of its continuous current loading capacity. While for Plans B and D, circuit R21T is loaded to 41% and 43% respectively. Approximately 60% of the reactive support for the Pleasant tap comes from the Richview/Claireville area and 40% from the Trafalgar area. The extension of T38B/T39B causes all of the reactive support from Richview/Claireville to flow along R21T. This increases the flow along the line segment between Hanlon Junction and Hurontario SS, causing it to be loaded higher in Plans B and D than in Plans A and C.

Table 9: Impact on Circuit R21T, With Loss of Circuit R19T Lower

Loss of R19T Lower, 2015 Steady State Post Contingency	**Plan**			
	V72R/ V73R	T38B/ T39B	V72R/ V73R	T38B/ T39B
	A	**B**	**C**	**D**
From Hanlon J. to Hurontario SS	37%	41%	35%	43%
From Erindale J. to Hanlon J.	62%	48%	55%	43%
Note: All % values are a percentage of current loading, continuous rating				

Another line segment of concern on circuits R19T/R21T was between Erindale Junction and Hanlon Junction. Table 9 shows that Plans B and D (48% and 43%) actually allow this section of the circuits to be off-loaded more than Plans A and C (62% and 55%). The extension of circuits T38B/T39B changes the flow on circuit R21T such that Tomken TS is mainly supplied from Richview TS whereas the extension of circuits V72R/V73R causes Tomken TS to be mainly supplied from Trafalgar TS. Supplying Tomken from the Trafalgar side of R21T increases the loading on the line segment between Erindale Junction and Hanlon Junction, causing it to be loaded higher in Plans A and C than in Plans B and D.

9.1.6 Plans A and B Versus Plans C and D: Winston TS Versus Meadowvale TS #2

Circuits T38B/T39B are affected by the options of whether to construct the new TS, Winston TS or add Meadowvale TS #2. Increased load on circuits T38B/T39B could precipitate the need for reconductoring sections of these lines sooner than anticipated. Table 10 shows the impact.

Table 10: Impact on Circuit T39B With Loss of Circuit T38B

Loss of T38B, 2015 Steady State Post Contingency	**Plan**			
	Winston TS		Meadowvale TS #2	
	A	**B**	**C**	**D**
Lantz J. to Trafalgar DESN J.	71%	77%	86%	86%
Trafalgar DESN J. to Hornby J.	63%	69%	78%	78%
Note: All % values are a percentage of current loading, continuous rating				

Plans A and B represent the Winston TS option while Plans C and D represent the Meadowvale TS #2 option. Line segments Lantz Junction to Trafalgar DESN Junction and Trafalgar DESN Junction to Hornby Junction were identified as being most susceptible to over-loading on circuits T38B/T39B. As shown in Table 10, the current loading on circuit T39B, between Lantz Junction and Trafalgar DESN Junction, is considerably less for Winston TS (71% and 77%) than for Meadowvale TS #2 (86% and 86%). Similarly, on the line segment between Trafalgar DESN Junction and Hornby Junction the current loading is less for Winston TS (63% and 69%) versus Meadowvale TS #2 (78% and 78%).

9.1.7 Plan A Versus Plans B, C and D: Trafalgar TS and Claireville TS Autotransformers

The loads flowing on the Trafalgar TS and Claireville TS autotransformers were observed and compared amongst the four plans to determine their impact. The Trafalgar TS autotransformers were within their capacity limits for the duration of the study period. The Claireville TS autotransformers were at their capacity limits by the end of the study period. Resolving issues with the loading on the autotransformers at Claireville TS requires further investigation beyond the GTA West study, and is therefore considered outside of the scope of this study. It is assumed that measures, independent of this study, are being taken to resolve this issue[26]. However, none of the options being considered will change the recommendations of this study.

The basecase conditions relevant to the loading on the Trafalgar TS and Claireville TS autotransformers were:

- Summer peak load of 26,000 MW
- Flow East Towards Toronto (FETT) transfers of approximately 3600 MW
- Queenston Flow West (QFW) transfers of approximately 500 MW
- 6 Pickering GS units, 4 Darlington GS units, 6 Bruce GS units and 0 Lakeview GS units modelled

[26] Some of the options being considered include Goreway GS and other generation in GTA West as well as additional autotransformers at Parkway TS.

- Local 44 kV generation connected to Bramalea TS in-service
- Proposed Goreway GS not in-service

Table 11 shows the impact each plan had on the autotransformers,. Plan A was used as a base for the comparison, and Plans B, C and D were compared to Plan A to show the difference in the megawatt (MW) flow. The flows were normalized by the number of autotransformers at each of the stations (2 at Trafalgar TS, 4 at Claireville TS).

Table 11: Autotransformer Impact

	Plan Comparison			
Stations / Plans	**A**	**B**	**C**	**D**
Trafalgar TS	--	22	-7	22
Claireville TS	--	-20	4	-17
Note: Numbers are in Δ MW/Autotransformer				

There is no material effect on the flows on the autotransformers at either Trafalgar TS or Claireville TS when comparing the construction of Winston TS (Plans A and B) to the construction of Meadowvale TS #2 (Plans C and D). The following conclusions can be drawn when comparing the extension of circuits V72R/V73R (Plans A and C) to the extension of circuits T38B/T39B (Plans B and D):

- the extension of V72R/V73R will increase the flow on the Claireville TS autotransformers.
- the extension of T38B/T39B will increase the flow on the Trafalgar TS autotransformers.

Overall, the flow differential between the four plans is minimal and not considered material.

9.1.8 Preferred Plan

HV Voltages in Plan A were within a very acceptable range, and slightly higher than in Plans B, C or D. Winston TS (Plans A and B) is a better technical choice than Meadowvale TS #2 (Plans C and D) as there are indications that the addition of Meadowvale TS #2 could lead to transmission problems well into the future. When comparing the extension of circuits V72R/V73R (Plan A) to the extension of circuits T38B/T39B (Plan B), Table 10 clearly shows that the current loading percentages for Plan A are less than for Plan B. Specifically, the extension of circuits T38B/T39B places additional stress on certain line segments which may advance the need for reconductoring these line sections on circuits T38B/T39B. The flows on the autotransformers at Trafalgar TS and Claireville TS were marginally different between the four plans, with the new 44 kV TS (Winston TS/Meadowvale TS #2) having no material effect whatsoever. In consideration of the technical analysis for the year 2015, the best choice is Plan A, which includes the extension of circuits V72R/V73R and the construction of a new TS, Winston TS.

9.1.9 2024 Technical Assessment

All plans met the needs identified in the 10-year study period. These plans were further technically evaluated with respect to the long-term system planning requirements by assessing them for the expected 2024 conditions. This method provides a snapshot of the long-term viability of each of the plans, and how each would perform under the increasing load growth that is expected in the GTA West. The study participants provided load forecasts up to the year 2024. Overall, with respect to long-term system planning requirements in GTA West, Plan A performed technically better than the other plans. Refer to Appendix B for results of the 2024 Technical Assessment.

9.2 Cost Comparison

Table 12 shows representative costs comparing potential total cost for each of the proposed options. These estimated costs are preliminary and are used for comparison only. The most economic plan is Plan C and the second most economic is Plan A. Both of these plans encompass the extension of circuits V72R/V73R, and differ only in regards to the construction of Winston TS (Plan A, $15M) versus Meadowvale TS #2 (Plan C, $10M). However, considering the degree of accuracy of the preliminary costs, the differential between the plans is nominal.

Table 12: Cost Comparison of Option Combinations

Plan	A	B	C	D
LVC	1	1	1	1
PJ1	10	10	10	10
GB3	10	10	10	10
EM2	--	--	10	10
EM3	15	15	--	--
P2	3	3	3	3
H2	15	15	15	15
T1	32	--	32	--
T3	--	42	--	42
Total:	**86**	**96**	**81**	**91**

Note: all numbers are listed as $ Million

10. Discussion

Overall, Plan A performed technically better than Plans B, C or D. Generally, the HV system voltages were slightly higher for Plan A. The specific sections of circuits R19T/R21T were off-loaded sufficiently to eliminate the need for reconductoring. The four plans displayed relatively minimal change to the flow distribution on the Trafalgar TS and Claireville TS autotransformers.

In the long-term, Plan A did not advance further transmission problems along circuits T38B/T39B or cause problems along any other circuits. Placing additional reactive power on the HV system for voltage support could enhance Plan A. All of the new deficiencies observed in the 2024 outlook (refer to Appendix B) could be resolved via load transfers between stations and/or addition of LV capacitors and HV reactive support.

Discussion with the LDCs determined that Winston TS is the preferred option to Meadowvale TS #2 as there are indications that the addition of Meadowvale TS #2 could lead to transmission problems well into the future. This eliminates Plans C and D. Between the remaining two plans (Plans A and B), Plan A is more economic as shown in Table 12. The reason for this is that the extension of circuits V72R and V73R is 5 km shorter than the extension of circuits T38B and T39B. Thus, Plan A is the preferred alternative.

11. CONCLUSIONS

The following conclusions can be reached from the analysis performed for this study:

- Bramalea TS (27.6 kV), Pleasant TS (27.6 kV) and Erindale TS (27.6 kV) are currently loaded to or beyond their capability and are being forced to transfer load to other stations to mitigate operating risks.

- Meadowvale TS (44 kV) and Erindale TS (44 kV) are expected to be at capacity by 2006. The earliest possible option to relieve the loading at Meadowvale TS and Erindale TS (44 kV) is 2008 with the addition of the proposed TS, Winston TS.

- Meadowvale TS will currently suffer voltage declines greater than 10% under immediate post fault conditions. This voltage stability problem can be rectified with a LV capacitor. The earliest that a LV capacitor could be installed at Meadowvale TS is summer 2007.

- Circuits R19T/R21T are currently (2005) beyond the IESO requirements stipulated in the guideline for loads greater than 500 MW. Segments of these lines are expected to be at capacity by 2009. The earliest possible option to address this problem can be implemented by 2009.

- Pleasant TS T1/T2 (44 kV) is expected to be at capacity by 2011. Option P2 (Goreway TS 44 kV DESN) can address this issue as early as 2011.

- Pleasant TS and Jim Yarrow MTS (27.6 kV) are expected to exceed capacity by 2009. Option PJ1 (Pleasant TS #3) can address this issue as early as 2009.

- Bramalea TS and Goreway TS (27.6 kV) are expected to be at capacity by 2011. Option GB3 (Goreway TS #2) can address these issues as early as 2011.

- Halton TS (27.6 kV) is expected to be at capacity by 2011. Options H2 (Steeles TS) or H3 (James Snow TS) can address this issue as early as 2011.

- The preferred Plan to meet all of these needs is Plan A, consisting of the following:
    1. Install LV capacitors at Meadowvale TS;
    2. Build Winston TS;
    3. Extend circuits V72R/V73R from Cardiff TS to the Pleasant TS tap, build Hurontario SS, and radially re-supply Jim Yarrow MTS;
    4. Add a 2nd 230/44 kV transformer at Goreway TS (44 kV DESN);
    5. Build Pleasant TS #3; and,
    6. Build Goreway TS #2.

12. RECOMMENDATIONS

Several recommendations can be drawn from this study to address the current system deficiencies and provide system capacity to meet forecasted load growth. These recommendations are:

1. Subject to the Ontario Power Authority's integrative review (Integrated Power System Plan) Hydro One Networks Inc. to initiate the approval processes required for the extension of circuits V72R and V73R and the construction of Hurontario SS.

2. Hydro One Networks Inc. to commence the detailed specification and engineering of the LV capacitors for Meadowvale TS.

3. Hydro One Networks Inc. to commence the preliminary engineering and consultation with the LDCs, and to initiate the approval processes on the construction of a new TS, Winston TS, in the vicinity of Winston Churchill Blvd. and Highway 403.

4. The LDCs to continue to transfer loads as necessary to mitigate potential operating risks until additional transmission capacity becomes available.

5. The LDCs and Hydro One to continue to monitor load growth in the GTA West area and to review options for long-term growth based on the location of new developments and load forecasts.

APPENDIX A:

LOAD FORECASTING DATA

Table A1 below shows the coincident load forecast from 2005 to 2015 for all stations in MVA. It includes the station or DESN LTR (limited time rating). The data in this table does not include load transfers to new stations proposed in this study, however it does include load transfers to existing stations as proposed by the LDCs. Please note, Richview DESN load was neglected as it was assumed that Toronto Hydro Electric System would manage their load between DESNs to reduce operating risks when necessary.

Table A1: Coincident Load Forecast in MVA

		Forecast Load in MVA												
	Station - 27.6 kV	**LTR (MVA)**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	
1.	Bramalea T1/T2	172.6	**217**	**195**	**197**	**199**	**201**	**203**	**205**	**206**	**206**	**206**	**207**	
2.	Cardiff TS	126.1	0	112	115	117	119	122	124	125	125	125	**126**	
3.	Erindale T1/T2	190.8	**259**	186	189	**193**	**197**	**201**	**205**	**206**	**207**	**207**	**208**	
4.	Goreway T5/T6	191.8	161	169	177	184	**192**	**200**	**209**	**217**	**226**	**235**	**243**	
5.	Halton TS	206.6	108	127	146	165	180	184	189	194	199	204	**208**	
6.	Jim Yarrow MTS	174.0	104	109	122	136	150	165	**180**	**196**	**213**	**229**	**244**	
7.	Pleasant T5/T6	198.6	**213**	**213**	**213**	**213**	**213**	**213**	**213**	**213**	**213**	**213**	**213**	
8.	*Richview T1/T2*	*172.6*	*152*	*154*	*155*	*157*	*158*	*160*	*161*	*163*	*165*	*167*	*168*	
9.	*Richview T5/T6*	*198.4*	*116*	*119*	*121*	*122*	*123*	*124*	*125*	*126*	*127*	*128*	*129*	
10.	*Richview T7/T8*	*88.1*	***137***	***141***	***142***	***143***	***144***	***145***	***146***	***147***	***149***	***150***	***151***	
	Total:		1466	1524	1576	1629	1677	1717	1758	1792	1829	1865	1898	Avg.
	Growth Rate			4.0%	3.4%	3.3%	2.9%	2.4%	2.3%	2.0%	2.0%	2.0%	1.8%	2.6%
	Station - 44 kV	**LTR (MVA)**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	
1.	Bramalea T3/T4[1]	117.4	**118**	**118**	**118**	**118**	**118**	**118**	**118**	**118**	**118**	**118**	**118**	
2.	Bramalea T5/T6	176.8	83	89	94	98	103	108	112	118	123	129	134	
3.	Goreway T4	95.4	33	34	36	37	38	40	41	42	44	45	47	
4.	Erindale T5/T6	171.9	**184**	**184**	**184**	**184**	**184**	**184**	**184**	**184**	**184**	**184**	**184**	
5.	Erindale T3/T4[2]	209.1	**216**	**231**	**243**	**254**	**266**	**277**	**289**	**291**	**293**	**295**	**297**	
6.	Meadowvale TS	200.7	**201**	**201**	**201**	**201**	**201**	**201**	**201**	**201**	**201**	**201**	**201**	
7.	Pleasant T1/T2	164.5	148	153	157	162	**166**	**171**	**176**	**181**	**185**	**191**	**196**	
8.	Tomken T1/T2	183.0	166	168	169	170	171	172	173	173	174	175	175	
9.	Tomken T3/T4	202.9	180	181	182	183	183	184	185	185	186	187	187	
	Total:		1329	1359	1383	1407	1431	1455	1479	1494	1508	1525	1539	Avg.
	Growth Rate			2.3%	1.8%	1.7%	1.7%	1.7%	1.7%	1.0%	0.9%	1.1%	0.9%	1.5%

The numbers in bold indicate those that are at or above the station LTR. In some cases, there are LV capacitors at the stations which indirectly provide additional capacity at the station and effectively raises the LTR at the station. The numbers in bolded red indicate where the loading at the station has

[1] Bramalea T3/T4 (44 kV) appears to be loaded beyond its summer 10-day LTR, however, this problem is addressed by local generation.

[2] Includes load transfers from Meadowvale TS and from Erindale T5/T6.

become larger than this inflated LTR value provided by the LV capacitors. In other cases, a voltage decline issue arose while the study was being conducted which indicated that the voltage decline at a particular station reached an unacceptable level prior to the station load being at capacity. These numbers were indicated in red, non-bolded font. All of the red numbers (bolded and non-bolded) indicate where load must be transferred to another station (new or existing) to mitigate operating risks.

For some stations where there was a single customer, it was necessary to review the non-coincident load forecast information in order to determine when the station peak would surpass the station LTR and further capacity or LV capacitors would be required to mitigate operating risks. These stations and/or DESNS are shown in Table A2. At stations where there were multiple customers reporting load forecasting information, coincident data was utilized to provide the need dates for additional transformation capacity.

Table A2: Non-Coincident Load Forecast

	Forecast Load in MVA											
	LTR	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Jim Yarrow MTS	174.0	120.6	138.2	154.6	169.5	**184.9**	**200.8**	**217.4**	**234.5**	**252.1**	**270.5**	**286.7**

APPENDIX B:

2024 Technical Assessment

All plans address the needs identified during the 10-year study period. These plans were further technically evaluated with respect to the long-term system planning requirements by assessing them for the expected year 2024 conditions. This method provides a snapshot of the long-term viability of each of the plans, and how each would perform under the increasing load growth that is expected in GTA West. The study participants provided load forecasts up to the year 2024. Specific loadflow results can be found in Appendix D.

All plans met the needs identified in the 10 year study period.

Plan A: V72R/V73R Extension, "Winston TS"

The assessment of Plan A through the years 2015 to 2024 identified the development of several future deficiencies in GTA West.

The overall system voltages in the study area were quite low, ranging from 232 kV at Pleasant TS. The loading at Pleasant TS is very high, and LV capacitors on the proposed Pleasant TS #3 LV buses would assist in supporting the voltage at this station. Additional reactive support may also be of benefit on the high voltage (HV) system at the proposed Hurontario SS.

Upon the loss of circuits R19T between Hurontario SS and Pleasant TS, the low voltages decline nearly 10% at Pleasant TS and decline more than 10% on the Pleasant TS #3 LV bus, under immediate post fault conditions. The loading at Pleasant TS #3 (27.6 kV) is beyond capacity (103% of the summer 10-day LTR) using the voltage varying load method. Under steady state post fault conditions, a voltage collapse occurs at Pleasant TS #3 by 2024, due to the high loading combined with the depressed voltage at both the transmission and sub-transmission levels. This problem could be addressed with the addition of LV capacitors at Pleasant TS #3, or by transferring load from Pleasant TS #3 to another station. Of additional note is the overloading of circuit R21T between Hurontario SS and Pleasant TS. This was noticeable under steady state post fault conditions with the use of a pair of LV capacitors at Pleasant TS #3. Under this scenario, this circuit was loaded to 110% of its continuous rating, steady state post fault.

For the loss of the lower portion of circuit R19T, the low transmission system voltages contribute to the overload of Erindale T5 (106%) under steady state post fault conditions. There is plenty of capacity at Winston TS to transfer any excess load from Erindale TS (T5/T6). However, it is advisable that if the transmission system voltages can be well supported with reactive power, then the load will not have to be transferred.

The loss of circuit V73R identified that the 44 kV DESN at Goreway TS was loaded beyond its summer 10-day LTR. This significantly depresses the voltage levels at Goreway TS during a single contingency. The 44 kV DESN at Goreway TS is loaded to 131% under immediate post fault conditions (using the voltage varying load method) and to 167% under steady state post fault conditions. The 27.6 kV load at Goreway TS is also over the summer 10-day LTR (101%). However, there is spare capacity at Goreway TS #2 to transfer any excess load from Goreway TS.

The loss of circuit T38B identified that Meadowvale TS and Halton TS were above their summer 10-day LTRs (loaded to 102% and 100% respectively, under steady state post fault conditions). This is due to the overall depressed transmission system voltage. There is spare capacity at Winston TS and Steeles TS to transfer load from Meadowvale TS and Halton TS, respectively.

However, if the transmission system voltages can be improved with reactive support, load would not have to be transferred.

Plan B: T38B/T39B Extension, "Winston TS"
Plan B also meets all of the needs identified in the study period. The same deficiencies arose at Pleasant TS #3 and Goreway TS as well as on circuits R19T and R21T between Hurontario SS and Pleasant TS. The problems at Erindale TS and Meadowvale TS were also present as well.

With the extension of circuits T38B and T39B (Plan B), circuits R19T/R21T was offloaded more in Plan B in comparison to Plan A, as previously identified in section 8.1. The HV system voltages are approximately 2 to 3 kV lower for Plan B than for Plan A.

Plan C: V72R/V73R Extension, Meadowvale TS #2
Plan C performed slightly worse than Plan A. Meadowvale TS #2 had lower voltages than Winston TS (234.9 kV versus 237.8 kV). Overall, the voltages on the Meadowvale TS/Halton TS tap are lower for Plan C compared to Plan A.

The contingency where circuit T38B or T39B was forced from service is of concern for Plan C. Under immediate post fault conditions, the LV buses at Halton TS declined nearly 10% using the voltage varying load method. Under steady state post fault conditions, the system voltages for Plan C were generally lower than for Plan A. As well, the following segments of the in-service circuit (T39B) was loaded over 95% of its continuous rating (the same results would be expected on T38B with T39B removed from service). Hornby Junction by Trafalgar DESN Junction was 95.5% of its continuous rating, and Lantz Junction by Trafalgar DESN Junction was 103.4% of its continuous rating. Under the implementation of Plan C, these line sections would require reconductoring sometime between 2015 and 2024. Halton TS and Meadowvale TS are overloaded sometime before 2024 under steady state post fault conditions.

Overall, Plan C did not perform, technically, as well as Plan A. There are indications that the addition of Meadowvale TS #2 could lead to transmission problems on circuits T38B/T39B as well as voltage problems on the Meadowvale TS/Halton TS tap well into the future.

Plan D: T38B/T39B Extension, Meadowvale TS #2
Due to the fact that the LDCs preferred the option of Winston TS over Meadowvale TS #2, and the extension of circuits V72R/V73R was more cost effective than the extension of circuits T38B/T39B, this option was not reviewed further.

VECC INTERROGATORIES

APPENDIX D

Shared Services Agreements
Halton Hills Fibre Optics
SouthWestern Energy

SERVICES AGREEMENT

(Hydro –Fibre Optics)

THIS AGREEMENT made effective the 1st day of January, 2001,

B E T W E E N:

HALTON HILLS HYDRO INC., an Ontario corporation having offices within the Town of Halton Hills, in the Province of Ontario (hereinafter referred to as "Hydro")

– and –

HALTON HILLS FIBRE OPTICS INC., an Ontario corporation having offices within the Town of Halton Hills, in the Province of Ontario (hereinafter referred to as "Fibre")

WHEREAS Fibre is engaged in the business of providing varied and sundry telecommunications services and for such purposes has need of personnel, office premises and equipment; and

WHEREAS Hydro is engaged in the business of the local distribution of electricity and for such purposes has personnel, office premises and equipment that it could make available to Fibre; and

WHEREAS Hydro and Fibre have agreed as to the basis upon which the personnel, office premises and equipment of Hydro may be made available to Fibre and Hydro and Fibre wish to enter into this agreement to record their agreements.

NOW THEREFORE, in consideration of the premises hereto and the covenants and agreements herein and other good and valuable consideration, the receipt and sufficiency of such consideration being hereby acknowledged by each party hereto to the other party hereto, the parties hereto covenant and agree as follows:

2 ARTICLE 1 – DEFINITIONS

1.1 Words and Phrases Defined

In this Agreement, unless the subject matter or context is inconsistent therewith, the words and phrases set forth below shall have the meanings attributed below:

"Affiliate" has the meaning attributable thereto pursuant to the Ontario *Business Corporations Act*.

"Agreement" means this Agreement and includes all schedules to this Agreement and, further, includes all amendments and supplements as may be made from time to time.

"Available Hours" means the hours in a calendar year that an employee of Hydro is available to provide services to Hydro.

"**Business Day**" means a day that is not a Saturday, Sunday or a public or bank holiday in the Province of Ontario.

"Codes" means the Affiliate Relationships Code and all other codes, legislation, regulation and rules applicable to Hydro and Fibre from time to time.

"Default" shall have the meaning provided therefor in Section 17.1.

"Dispute Resolution Provisions" means the provisions of Article 20.

"Force Majeure" means in relation to the performance of any obligation under this Agreement, any cause, condition or event of any nature whatsoever which is beyond the reasonable control of the party responsible for such obligation which prevents in whole or in part the performance by either party of its respective obligations including without limitation, acts of war, revolution, riot, sabotage, vandalism, earthquakes, storms, flooding, lightning and other acts of God, local or national emergencies, strikes, lockouts, work slowdowns and all other labour disputes, whether lawful or unlawful.

"Hydro Equipment" shall have the meaning provided therefor in Section 6.1 and includes tools, machinery and vehicles but does not include materials expected to be consumed in the course of operations and not returned to Hydro.

"Lowest Competitive Price" means a price for a particular service and/or provision of equipment which is no more than the price charged by Hydro to anyone other than Fibre for a similar service and/or provision of similar equipment under similar circumstances.

"Management and Office Personnel" means the President, Vice President, Controller, Accounting Supervisor, Administrative Assistant, Cashiers, Billing Clerks, Billing and Customer Service Supervisor, Customer Service Clerks, Accounts Payable Clerk of Hydro, from time to time.

"Notice" shall have the meaning provided therefor in Section 23.1.

"Person" means an individual, partnership, limited partnership, joint venture, syndicate, sole proprietorship, company or corporation with or without share capital, unincorporated association, trust, trustee, executor, administrator or other legal personal representative, regulatory body or agency, government or governmental agency, authority or entity however designated or constituted.

"Prescribed Rate" means the rate of interest allowed, from time to time, to Hydro on its debt for the purposes of calculating the electricity distribution rates for Hydro pursuant to Performance Based Regulation of Hydro by the Ontario Energy Board.

"Service Personnel" means engineering and operations staff of Hydro excepting those thereof that are Management and Office Personnel.

"Support Structures" means the supporting structures, including poles, conduits, support strands, anchors and manholes, which Hydro owns or which Hydro does not own but has the right to permit others to use.

"Term" means the period of time that this Agreement is in effect pursuant to the provisions of Article 14.

1.2 Derivations

Where a word or phrase is defined for the purposes of this Agreement, a derivative of that word or phrase shall have a corresponding meaning.

1.3 Extended Meanings

In this Agreement words importing the singular number only include the plural and *vice versa*, words importing any gender include all genders and words importing persons include all Persons.

1.4 Accounting Terms

All accounting terms not otherwise defined in this Agreement shall have the meanings assigned to them in accordance with Canadian generally accepted accounting principles, except where inappropriate in the context in which such accounting term is used in this Agreement.

1.5 Industry Terms

Unless expressly defined herein, words having well known technical or trade meanings within the electricity distribution and related industries shall be so construed.

ARTICLE 2: INTERPRETATION

2.1 Interpretation of Agreement and Schedules

The body of this Agreement and all the Schedules to this Agreement constitute one and the entire agreement between the parties hereto and, accordingly, the body of this Agreement and all such Schedules hereto shall be interpreted and enforced as though the provisions of such Schedules were set forth in the body of this Agreement prior to the execution page hereof and without giving paramountcy to the provisions of the body of this Agreement or any of the Schedules to this Agreement over the provisions of the other.

2.2 Governing Law

This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable in the Province of Ontario and shall be treated in all respects as an Ontario contract.

2.3 Legislation, Regulations and Rules

Any reference in this Agreement to all or any part of any statute, regulation or rule shall, unless otherwise expressly stated herein, be a reference to the statute, regulation or rule, or part thereof, as amended from time to time.

2.4 Article, Section, Subsection and Item References

The division of this Agreement into Articles, Sections and Subsections are for convenience of reference only and shall not affect or be considered to affect the construction or interpretation of the provisions of this Agreement. References in this Agreement or in an Schedule to this Agreement to an Article, Section or Subsection shall mean a reference to an Article , Section or Subsection within the body of this Agreement. References herein to an Item without identifying the Section in which the Item is contained shall mean a reference to the Item in the same Section where the reference is made.

2.5 Headings

The headings of Articles, Sections and Subsections herein and in the Schedules to this Agreement and the Table of Contents are inserted for convenience of reference only and shall not affect or be considered to affect the construction or interpretation of the provisions of this Agreement.

2.6 "Hereof" Etc.

The terms "hereof", "hereunder", "herein", "hereto" and similar expressions refer to this Agreement in its entirety and not to any particular Article, Section, Subsection or other portion of this Agreement.

2.7 Currency of Contract

All references in this Agreement to money shall denote the lawful currency of Canada, except as may be otherwise expressly stated.

2.8 Accounting Principles

Wherever in this Agreement reference is made to a calculation to be made or an action to be taken in accordance with generally accepted accounting principles, such reference will be deemed to be to the generally accepted accounting principles from time to time approved by the Canadian Institute of Chartered Accountants, or any successor institute, applicable as at the date on which such calculation or action is made or taken or required to be made or taken in accordance with generally accepted accounting principles.

2.9 Waiver of Contra-Proferentem Rule

Each party to this Agreement acknowledges and agrees that it has participated in the drafting of this Agreement and, accordingly, this Agreement shall not be interpreted either more or less favorably in favor of any party to this Agreement by virtue of the fact that one party or its counsel has been principally responsible for the drafting of all or a portion of this Agreement.

2.1.1 ARTICLE 3 –MANAGEMENT AND OFFICE PERSONNEL

3.1 Supply

Hydro shall, throughout the Term of this Agreement, supply the services of the Management and Office Personnel to provide to Fibre the same services as the Management and Office Personnel provide to Hydro and, in addition, to provide such other services as may be requested of them by the Management and Office Personnel to whom they are responsible.

3.2 Responsibilities of Management and Office Personnel

The Management and Office Personnel shall fulfill the same responsibilities with respect, to Fibre that the Management and Office Personnel fulfill with respect to Hydro and, in addition, shall fulfil such other responsibilities as may be requested of them by the Management and Office Personnel to whom they are responsible.

3.3 Conflicts of Interest and Release

Fibre acknowledges that the Management and Office Personnel are officers and employees of Hydro and, as such, they will have a conflict of interest with respect to any matter which would involve business or other relations between Hydro and Fibre inasmuch as Hydro is the sole shareholder of Fibre. Fibre agrees that, insofar as this Agreement is concerned, the obligations that each of the Management and Office Personnel has to Hydro is paramount to the obligations that the Management and Office Personnel has to Fibre. Accordingly, in each event of a such a conflict of interest in the obligations that any Management and Office Personnel owes to Hydro and Fibre, the Management and Office Personnel is excused from performing such obligation and the particular event shall be referred to officers or employees of Fibre that do not have such a conflict or, failing that, to the Board of Directors for resolution. Further, Fibre hereby releases the Management and Office Personnel, and each of them, and Hydro from all liability that may arise or be associated with any conflict of interest that any of the Management and Office Personnel may have as a result of being an officer of both Fibre and Hydro, performing any of the responsibilities associated with being an officer of Fibre or providing services to Fibre pursuant to this Agreement.

3.4 Indemnity and Release

Fibre shall indemnify and hold harmless Hydro and each of the Management and Office Personnel from and against all loss, claims and liability whatsoever that arises howsoever from or is associated with the performance of the Management and Office Personnel of their responsibilities to Fibre except such

thereof as results from the negligence or wilful misconduct of the Management and Office Personnel, or any of them.

3.5 Not Employees

The Management and Office Personnel are not, and shall in no event become, employees of Fibre. In no event shall Fibre become obligated howsoever to pay, or make any contribution to Hydro in respect of, the salaries, wages, benefits or other compensation payable by Hydro to the Management and Office Personnel except to pay to Hydro any amount payable by Fibre to Hydro pursuant to Section 3.6. In no event shall the use by Fibre of the services of the Management and Office Personnel become the basis for any right of any labour union or similar organization to become the bargaining agent for the employees of Fibre.

3.6 Charge for Management and Office Personnel Services

Based upon the estimates agreed to by the parties hereto of the amount of time of the Management and Office Personnel that will be required in order for the Management and Office Personnel to provide the services and to fulfil their obligations pursuant to this Agreement, Fibre shall pay Hydro the amount of Two Thousand Dollars ($2,700.00) monthly for the services of the Management and Office Personnel. The amount payable by Fibre to Hydro pursuant to this Section for the services of the Management and Office Personnel includes;

(i) compensation to Hydro for indeterminable costs of the equipment and supplies used by the Management and Office Personnel for the equipment used by them to provide their services and fulfil their responsibilities to Fibre pursuant to this Agreement;

(ii) a fair and reasonable allocation of gross payroll and benefits costs of Hydro attributable to the Management and Office Personnel in respect of the time that the Management and Office Personnel spend to provide their services and fulfil their responsibilities to Fibre pursuant to this Agreement, such allocation being based upon Available Hours; and

(iii) a mark-up consistent with market circumstances on the actual cost to Hydro of the Management and Office Personnel and provided by Hydro to Fibre.

Hydro shall, from time to time, calculate the amounts to be charged to Fibre for the Management and Office Personnel provided by Hydro to Fibre pursuant to this Agreement and shall give Fibre Notice thereof and of each change thereto. In the event that Fibre disputes that any charge for the Management and Office Personnel is calculated in accordance with the provisions of this Agreement, then Fibre shall give Notice of its dispute to Hydro whereupon Hydro and Fibre shall endeavor in good faith to resolve the dispute provided, however, that either Hydro or Fibre may at any time refer the dispute for resolution pursuant to the Dispute Resolution Provisions.

In consideration of the payments by Fibre to Hydro pursuant to this Section, Fibre shall not be required or expected to make any contribution to the provision of the offices, equipment, support staff or other requirements that the Management and Office Personnel may require to provide their services and fulfil their responsibilities to Fibre under this Agreement.

2.1.2 ARTICLE 4 – SERVICE PERSONNEL

4.1 Supply

Fibre may, at any time and from time to time, request Hydro to provide the Service Personnel, or any of them, to provide services to Fibre. Each such request by Fibre to Hydro for Service Personnel shall be in writing, and may be in the form of a purchase order, and shall specify:

(i) the number and type of Service Personnel required;

(ii) the equipment which is to accompany the Service Personnel;

(iii) the period of time for which the Service Personnel are required, including a contingency period which shall be separately specified;

(iv) the purpose for which the Service Personnel are required, including the specific tasks that the various Service Personnel will be performing; and

(v) the location or area in which the Service Personnel will be providing their services,

unless Hydro and Fibre shall otherwise agree.

4.2 Obligation to Supply and Conditions

Upon receipt by Hydro of a request from Fibre for Service Personnel satisfying the requirements of Section 4.1, Hydro shall supply the requested Service Personnel to Fibre for the purposes requested subject to the following conditions:

(i) Hydro determines, in its sole unfettered judgement, that it has the requested Service Personnel available that are capable of performing the specified tasks, during the period of time and in the location or area indicated in the request made by Fibre;

(ii) the supply of Service Personnel is subject to interruption due to emergency requirements of Hydro, as determined by Hydro in its sole and unfettered judgement, for the purposes of its own business, but not otherwise;

(iii) Hydro determines, in its sole unfettered judgement, that it has the equipment available which will allow the requested Service Personnel to perform the tasks for which they have been requested by Fibre, provided, however, that Hydro shall provide the requested Service Personnel notwithstanding that Hydro may have determined that it does not have the equipment available which will allow the requested Service Personnel to perform the tasks for which they have been requested by Fibre in the event that Fibre undertakes to provide the necessary equipment;

(iv) Fibre will provide and/or otherwise reimburse Hydro for all fuel, lubricants and other consumables consumed in the operation of the equipment used by the Service Personnel;

(v) Fibre will reimburse Hydro for the cost of all materials provided by Hydro to Fibre for the purposes of completing the assignment of the Service Personnel;

(vi) Hydro shall not be required to supply or continue the supply of Service Personnel if, in the sole and unfettered judgement of Hydro, the work environment in which the

Service Personnel are or will be providing their services does not satisfy applicable safety laws and/or regulations;

(vii) Hydro shall not be required to supply or continue the supply of Service Personnel if, in the sole and unfettered judgement of Hydro, the services being or to be provided by the Service Personnel do not satisfy the requirements of Section 13.1; and

(viii) Fibre shall indemnify and hold harmless Hydro and each of the Service Personnel from and against all loss, claims and liability whatsoever that arises howsoever from or is associated with the performance of the Service Personnel of their responsibilities to Fibre except such thereof as results from the negligence or willful misconduct of the Service Personnel, or any of them.

4.3 Equipment

The Service Personnel provided by Hydro to Fibre pursuant to this Agreement shall, subject to the provisions of Section 4.2(iii), be accompanied by the equipment required by the Service Personnel in order to perform the tasks in respect of which the Service Personnel were requested.

4.4 Time Sheets/Work Orders

Hydro shall cause each of the Service Personnel to make a written record, which may be in the form of time sheets or work orders, of the time spent by such Service Personnel providing services to Fibre pursuant to this Agreement and the charges of Hydro to Fibre for the services of the Service Personnel shall be calculated on the basis of such written records.

4.5 Charges for Service Personnel

Fibre shall pay Hydro for the services of the Service Personnel charges which represent the fair market value thereof and, otherwise, which:

(i) do not exceed the Lowest Competitive Price;

(ii) includes in the calculation of such charges a fair and reasonable allocation of gross payroll and benefits costs of Hydro attributable to the Service Personnel in respect of the time that the Service Personnel spend to provide their services and fulfil their responsibilities to Fibre pursuant to this Agreement, such allocation being based upon Available Hours, being based only on actual charges paid to third parties and not including any notional calculations;

(iii) include with respect to equipment provided with Service Personnel only charges consistent with the provisions of Article 5; and

(iv) include a mark-up consistent with market circumstances on the actual cost to Hydro of the Service Personnel and equipment provided by Hydro to Fibre.

Hydro shall, from time to time, calculate the amounts to be charged to Fibre for the Service Personnel provided by Hydro to Fibre pursuant to this Agreement and shall give Fibre Notice thereof and of each change thereto. In the event that Fibre disputes that any charge for the Service Personnel is calculated in accordance with the provisions of this Agreement, then Fibre shall give Notice of its dispute to Hydro whereupon Hydro and Fibre shall endeavor in good faith to resolve the dispute provided, however, that either Hydro or Fibre may at any time refer the dispute for resolution pursuant to the Dispute Resolution Provisions.

In consideration of the payments by Fibre to Hydro pursuant to this Section, Fibre shall not be required or expected to make any contribution to the provision of the offices, equipment, support staff or other requirements that the Service Personnel may require to provide their services and fulfil their responsibilities to Fibre under this Agreement.

4.6 Not Employees

The Service Personnel are not, and shall in no event become, employees of Fibre. In no event shall Fibre become obligated howsoever to pay, or make any contribution to Hydro in respect of, the salaries, wages, benefits or other compensation payable by Hydro to the Service Personnel except to pay to Hydro any amount payable by Fibre to Hydro pursuant to Section 4.4. In no event shall the use by Fibre of the services of the Service Personnel become the basis for any right of any labour union or similar organization to become the bargaining agent for the employees of Fibre.

4.7 Limited Warranty

Fibre acknowledges that, except as set forth in this Agreement Hydro makes no warranty, representation or indemnity, express or implied, with respect to any of the Service Personnel and equipment provided by Hydro to Fibre pursuant to this Article or for any work performed by the Service Personnel and

equipment provided by Hydro to Fibre pursuant to this Article, including any and all warranties of design, merchantability or fitness for particular purpose or arising from a course of dealing, usage or trade, and each party hereto hereby expressly waives and disclaims all such warranties, representations and indemnities except that the Service Personnel are properly trained and fully qualified to perform the services that they are intended to perform for Fibre pursuant to this Article and the equipment provided by Hydro to the Service Personnel are adequate and safe for use by the Service Personnel to perform the services to be performed by the Service Personnel for Fibre pursuant to this Article. The warranties set forth in this Agreement constitute the only warranties made by a party hereto to the other party hereto with respect to this Agreement and are made in lieu of all other warranties or conditions, written or oral, statutory, express or implied.

ARTICLE 5 - CONTRACTORS

5.1 Reimbursement

Fibre shall reimburse Hydro for a percentage of the actual cost to Hydro of each provider of services to Hydro under contract with Hydro equal to the percentage of the services of such service provider used by Fibre is of the total services provided by such service provider to both Hydro and Fibre. In the event that Fibre might make available to Hydro the services of a service provider under contract with Fibre, Hydro shall reimburse Fibre for a percentage of the actual cost to Fibre of such service provider equal to

the percentage of the services of such service provider used by Hydro is of the total services provided by such service provider to both Hydro and Fibre.

2.1.3 ARTICLE 6 – EQUIPMENT

6.1 Supply

Fibre may, at any time and from time to time, request equipment from Hydro for use by Fibre without Service Personnel (such equipment being referred to as "Hydro Equipment"). Each request by Fibre to Hydro for Hydro Equipment shall be in writing, and may be in the form of a purchase order, and shall specify:

(i) the type and number or quantity of Hydro Equipment required;

(iii) the period of time for which the Hydro Equipment is required, including a contingency period which shall be separately specified;

(iv) the purpose for which the Hydro Equipment is required, including the specific tasks for which the various Hydro Equipment will be used; and

(v) the location or area in which the Hydro Equipment will be used.

6.2 Obligation and Conditions of Supply

Upon receipt by Hydro of a request from Fibre for Hydro Equipment satisfying the requirements of Section 6.1, Hydro shall supply the requested Hydro Equipment to Fibre for the purposes requested subject to the following conditions:

(i) Hydro determines, in its sole unfettered judgement, that it has the requested Hydro Equipment available that is capable of performing the specified tasks, during the period of time and in the location or area indicated in the request made by Fibre;

(ii) the supply of Hydro Equipment is subject to interruption due to emergency requirements of Hydro for the purposes of its own business, but not otherwise, determined by Hydro in its sole and unfettered judgement;

(iii) Hydro determines, in its sole and unfettered judgement, that the persons that will be operating and maintaining the Hydro Equipment are properly qualified and that the Hydro Equipment will be operated safely;

(iv) Hydro determines, in its sole and unfettered judgement, that the persons that adequate insurance is being carried by Fibre with respect to loss or damage to the Hydro Equipment and with respect to the persons who will be operating the Hydro Equipment;

(v) Fibre will provide and/or otherwise reimburse Hydro for all fuel, lubricants and other consumables consumed in the operation of the Hydro Equipment;

(vi) all Hydro Equipment is provided pursuant and subject to Hydro's conditions, from time to time, for the supply of equipment;

(vii) Fibre shall reimburse Hydro for any damage to the Hydro Equipment, reasonable wear and tear excepted; and

(viii) Fibre shall indemnify and hold harmless Hydro from and against all loss, claims and liability whatsoever that arises howsoever from or is associated with the use by Fibre of the Hydro Equipment except such thereof as is attributable to the Hydro Equipment itself and not to the manner of use thereof.

6.3 Charges for Hydro Equipment

Fibre shall pay Hydro for the use of Hydro Equipment charges which represent the fair market value thereof and, otherwise, which:

(i) do not exceed the Lowest Competitive Price;

(ii) include with respect to equipment provided with Service Personnel only charges consistent with the provisions of Article 4; and

(iii) include a mark-up consistent with market circumstances on the actual cost to Hydro of the Hydro Equipment provided by Hydro to Fibre.

Hydro shall, from time to time, calculate the amounts to be charged to Fibre for the Hydro Equipment provided by Hydro to Fibre pursuant to this Agreement and shall give Fibre Notice thereof and of each change thereto. In the event that Fibre disputes that any charge for the Hydro Equipment is calculated in accordance with the provisions of this Agreement, then Fibre shall give Notice of its dispute to Hydro whereupon Hydro and Fibre shall endeavor in good faith to resolve the dispute provided, however, that either Hydro or Fibre may at any time refer the dispute for resolution pursuant to the Dispute Resolution Provisions.

6.4 No liability

Fibre shall have no liability to Hydro related to the use of the Hydro Equipment associated with ordinary wear and tear associated or with usage of the Hydro Equipment not involving negligence or wilful misuse. It is the intent of the parties hereto that the amounts payable by Fibre to Hydro for use of the Hydro Equipment includes an amount to compensate Hydro for the ordinary wear and tear that would result from the customary useage of the Hydro Equipment.

6.5 No Warranty

Fibre acknowledges that, except as expressly set forth in this Agreement Hydro makes no warranty, representation or indemnity, express or implied, with respect to the design, merchantability or fitness for particular purpose of any of the Hydro Equipment or arising from a course of dealing, usage or trade, and Fibre hereby expressly waives and disclaims all such warranties, representations and indemnities except that the Hydro Equipment is in industry standard condition for useage at the time that it is delivered to Fibre for useage. The warranties set forth in this Agreement constitute the only warranties made by a party hereto to the other party hereto with respect to this Agreement and are made in lieu of all other warranties or conditions, written or oral, statutory, express or implied.

2.1.3.1.1.1.1.1 ARTICLE 7 - SYSTEMS

7.1 No Charge

The parties hereto agree that the various charges by Hydro to Fibre pursuant to this Agreement include a component compensating Hydro for the use made by the Management, Office and Service Personnel of the computer hardware and software used by such Personnel in order to provide services to Fibre pursuant to this Agreement and, accordingly there shall not be any separate charge by Hydro to Fibre in relation to such use of computer hardware and software.

7.2 Reimbursement for Consumables

Notwithstanding the provisions of Section 7.1, Fibre shall reimburse Hydro for the cost to Hydro of any materials consumed through the use of Hydro's computer systems (for example, invoice formats acquired by Hydro for use in invoicing Fibre's customers) in the course of Hydro performing its obligations to Fibre hereunder.

2.1.3.1.1.1.1.2 ARTICLE 8 - BILLING, COLLECTION, CUSTOMER SERVICES & TAXES

8.1 Allowed Functions

Hydro agrees that the Management, Office and Service Personnel may be used by Fibre to bill and collect bills issued by Fibre to its customers and to provide customer service to the customers of Fibre and that the charges for the Management, Office and Service Personnel so doing are included in the monthly charge payable by Fibre to Hydro pursuant to Section 3.6.

8.2 Taxes

The amounts stated in this Agreement to be payable by Fibre to Hydro pursuant to this Agreement do not include any taxes. Fibre shall be responsible for the payment of, and shall pay or reimburse Hydro if paid by Hydro, all Goods and Services Tax, Provincial Sales Tax and other taxes of a similar nature applicable to, or arising from the price or value, purchase or sale or the provision or use of any of the personnel, services and equipment provided by Hydro to Fibre pursuant to this Agreement, regardless of the period or entity actually taxed.

2.1.3.1.1.1.1.3 ARTICLE 9 – SUPPORT STRUCTURES ATTACHMENTS

9.1 Authorization

Hydro hereby grants Fibre the right to place and maintain attachments upon or within the Support Structures of Hydro, subject to the conditions and prices imposed generally by Hydro upon those authorized by Hydro to make attachments upon or within the Support Structures of Hydro or, if there are no others so authorized by Hydro, subject to the conditions and prices agreed by Hydro and Fibre or, failing such agreement, settled pursuant to the Dispute Resolution Provisions having regard to the Codes.

2.1.4 ARTICLE 10 – PREMISES

10.1 Provision

Hydro shall, upon receipt of Notice from Fibre so requesting, make available to Fibre premises within the offices of Hydro located in the main offices, from time to time, of Hydro in Acton, Ontario for the conduct by Fibre of its business, subject to Hydro determining, in its sole and unfettered judgement, that it has space that could be made available to Fibre for such purposes. At Fibre's request and expense, any offices provided by Hydro to Fibre pursuant to this Section shall be separate, and shall have separate access, from the offices of Hydro.

10.2 Codes Compliance

Hydro and Fibre shall co-operate and take all reasonable measures to insure that any premises made available by Hydro to Fibre pursuant to this Article are so made available in compliance with the requirements of the Codes.

10.3 Vacating Premises

In the event that:

(i) Hydro at any time determines that it needs the premises made available to Fibre pursuant to this Article in order for Hydro to conduct its own business; or

(ii) the Codes no longer allow Hydro to make available to Fibre premises within the offices of Hydro located in the of Hydro,

then Fibre shall vacate the premises made available by Hydro to Fibre pursuant to this Article within six (6) months of receipt of Notice to vacate from Hydro.

10.4 Office Equipment

Fibre shall be allowed the use of office equipment and supplies as part of the premises made available by Hydro to Fibre pursuant to this Article.

10.5 Payment

Fibre shall pay Hydro Three hundred and Twelve Dollars and Fifty Cents ($312.50) monthly for the premises and the use of office equipment and supplies made available by Hydro to Fibre pursuant to this Article. It is intended that the amount payable by Fibre to Hydro for the premises, equipment and supplies made available by Hydro to Fibre pursuant to this Article represents the fair market value thereof and either party hereto may at any time, but not more frequently than every six months, require the other party hereto to enter into discussions and agree to a new amount to be paid by Fibre to Hydro pursuant to this Article as representing the fair market value at the time of the premises, equipment and supplies made available by Hydro to Fibre pursuant to this Article and, failing such agreement, the matter may be resolved pursuant to the Dispute Resolution Provisions.

ARTICLE 11 – PAYMENTS, INTEREST AND ADJUSTMENTS

11.1 Payments

All amounts payable by a party hereto pursuant to this Agreement shall be paid within thirty (30) days of the receipt of the invoice therefor.

11.2 Interest

All amounts not paid by a party hereto within the time herein provided for the payment thereof shall bear interest until paid at the Prescribed Rate and all such interest payable by a party hereto shall be paid at the same time as the amount to which such interest relates is paid.

11.3 Adjustments

Upon the request of either party hereto, the parties hereto shall negotiate in good faith any change to this Agreement reasonably sought by a party hereto, without any obligation upon the parties hereto to agree to any change to this Agreement and, subject to express provision otherwise made elsewhere in this Agreement, the Dispute Resolution Provisions shall not apply to such negotiations.

11.4 Set-Off

A party hereto obliged to make a payment to the other party hereto may set off against the amount otherwise payable any amount to which the first party is then entitled to receive from the other party and to remit the other party the amount by which the amount owed by the first party to the other party exceeds the amount owed to it by the other party, if any, provided the first party informs the other party of it having so done prior to the date upon which the other party is obliged to remit to the first party the amount which the first party has set off against the amount other wise payable by the first party to the other party.

2.1.5 ARTICLE 12 – INDUSTRY CODES

12.1 Compliance is Objective

It is the expressed intent of both of the parties hereto that the arrangements provided for herein shall at all times be in compliance with the Codes as they apply to the parties hereto from time to time.

12.3 Best Efforts

Each party hereto shall use all reasonable efforts to comply with the Codes insofar as the Codes apply to the particular party. Each party hereto shall use all reasonable efforts (excepting such as would have an adverse economic consequence to the party) to adapt its conduct so as to allow the other party hereto to comply with the Codes insofar as the Codes apply to that other party.

12.2 Amendment

In the event that the parties hereto cannot voluntarily adapt their conduct so as to comply to the requirements of the Codes or if to so do would have adverse economic consequences to either party hereto, then either party may require the other party hereto to amend this Agreement such that both parties hereto would be in compliance with the requirements of the Codes and to adjust the economic provisions of this Agreement such that the burden of such compliance is properly borne by the party which had the obligation to change this Agreement in order for it to comply with the Codes and, failing such agreement, the parties may have recourse to the Dispute Resolution Provisions to resolve the matter.

12.4 Code Session

Forthwith upon complete execution of this Agreement the parties hereto shall jointly host a meeting of all Administrative and Service Personnel that might be expected to provide services pursuant to this Agreement for the purposes of explaining the requirements of the Codes with respect to their provision of services and equipment to Fibre on behalf of Hydro pursuant to this Agreement.

2.1.5.1.1.1.1.1 ARTICLE 13 - STANDARDS

13.1 Standards of Performance

Except as specifically set forth herein, for the purpose of this Agreement the standards and practices of performance within the telecommunication and the electricity transmission, distribution and generation industries in the Province of Ontario shall be the measure of the performance of a party hereto.

ARTICLE 14 - TERM

14.1 Original Term

Subject to Sections 14.2 and 14.3, the term of this Agreement shall begin on the date of this Agreement and will terminate at the end of the day preceding the first anniversary of the date hereof, such period being referred to as the "Original Term".

14.2 Extension of Original Term

Unless either party hereto gives the other party hereto written notice of termination of this Agreement at least ninety (90) days prior to the end of the Original Term or of any extension thereof pursuant to this Section, as the case may be, this Agreement shall automatically be renewed at the end of the Original Term and of any such extension thereof, as the case may be, for a one (1) year period upon the same terms and conditions in effect under this Agreement at the end of the Original Term or the end of the preceding extension thereof, as the case may be.

14.3 Termination by Agreement

This Agreement may be terminated at any time by the agreement of both parties hereto, a matter not to be determined pursuant to the Dispute Resolution Provisions.

3 ARTICLE 15 – TERMINATION

15.1 Expiry of Term

Upon expiration or termination of this Agreement the rights granted by each party hereto to the other party hereto shall immediately terminate and neither party hereto shall have any further obligations to the other party hereto except:

(i) to finally settle accounts between the parties hereto as regards the activities of the parties hereto during the Term of this Agreement;

(ii) as regards those matters that this Agreement provides will be done upon termination of this Agreement; and

(iii) as expressly otherwise provided in this Agreement.

15.2 Removal

Promptly upon termination of this Agreement for any reason, each party hereto shall, at its sole cost and expense, remove all of its equipment, facilities and other associated property from the property and facilities of the other party hereto under the supervision of such other party should such other party desire. Should a party fail to effect such removal within thirty (30) days following termination of this Agreement, the equipment, facilities and other associated property of the party shall be deemed abandoned and may be removed by the other party at the expense of the party whose property is removed.

15.3 Effect of Termination

Notwithstanding the foregoing or any other provision of this Agreement, no termination or expiration of this Agreement shall effect the rights or obligations of any party hereto:

(i) with respect to any prior breach or any then existing defaults or the obligation to make any payment hereunder attributable to the period prior to the date of termination or expiration; or

(ii) with respect to those provisions of this Agreement which survive the expiry of the Term of the Agreement by virtue of the express provisions of this Agreement or necessary implication based upon the terms of this Agreement or the course of dealing between the parties to the Agreement.

3.1.1.1.1.1.1.1 ARTICLE 16 – FORCE MAJEURE

16.1 Generally

No party hereto shall be liable to the other party hereto for any default in performance or compliance with provisions of this Agreement if such default is due to any circumstance beyond the reasonable control of the affected party including, without limitation of the foregoing, any act of God, fire, flood, lack of or delay in transportation, the adoption or amendment of government codes, ordinances, laws, rules, regulations or restrictions that materially impair the affected parties performance hereunder, war or civil disorder, strikes, law, codes or other labour disputes. Notwithstanding anything in the preceding sentence of this Section, none of the foregoing shall excuse any default in payment of any amount payable pursuant to this Agreement.

4 ARTICLE 17 – DEFAULT

17.1 Events of Default

A party hereto shall be in default under this Agreement (a "Default") if:

(i) it fails to pay any amount which is due and unpaid within thirty (30) days of receipt from the party hereto to which the amount is due of a written notice (a "Payment Notice") that the amount is due and unpaid; or

(ii) the other party hereto gives it written notice that it has given it three (3) or more Payment Notices in any given twelve (12) month period;

(iii) in the case of any other material breach of this Agreement, it fails to cure such breach within thirty (30) days after notice specifying such breach, provided that if the breach is of a nature that cannot be cured within thirty (30) days, a default shall not have occurred so long as the breaching party has commenced to cure the breach within said time period and thereafter diligently pursues such cure to completion;

(iv) it becomes insolvent or bankrupt or any bankruptcy, reorganization, debt arrangement or other proceeding under any bankruptcy or insolvency law or any dissolution or liquidation proceeding being instituted by or against it; or

(v) the private or court appointment of a receiver or receiver and manager or officer with similar powers over any part of its property.

17.2 Remedies

In the event of a Default by a party hereto, the non-defaulting party may avail itself of one or more of the following remedies:

(i) take such actions as it determines, in its sole discretion, to correct the default; or

(ii) pursue any legal remedies it may have under applicable law or principles of equity, including specific performance; or

(iii) terminate this Agreement upon thirty (30) days prior written notice to the defaulting party.

Except as set forth to the contrary herein, any right or remedy of a party hereto shall be cumulative and without prejudice to any other right or remedy, whether contained herein or not.

ARTICLE 18 – TRANSFER

18.1 Prohibition

This Agreement may be not assigned in whole or in part by either party hereto without the prior written consent of the other party hereto. Each party hereto shall have the right to arbitrarily withhold, delay or condition such consent.

18.2 Exception re: Security

Notwithstanding any other provision of this Agreement, a party hereto may assign this Agreement as collateral security to a lender.

18.3 Exception re: Affiliate

Notwithstanding any other provision of this Agreement, either party hereto may assign this Agreement to an Affiliate or delegate the performance of its obligations under this Agreement to an Affiliate provided that the party hereto making any such assignment or

delegation shall remain jointly liable with its assignee or delegate to the other party hereto with respect to the performance of this Agreement or of the obligations under this Agreement delegated.

18.4 Change in Control

In the event of a change in control of a party hereto, the other party hereto shall have the right to terminate this Agreement by giving Notice of termination to the party hereto who has had a change in Control. For the purposes of this Section, "Control" shall have the meaning given thereto for the purposes of the Ontario *Business Corporations Act*.

4.1.1.1.1.1.1.1 ARTICLE 19 - INSURANCE

19.1 Maintenance

During the term of this Agreement and at its sole expense, each party hereto shall maintain commercial general liability insurance which shall have a minimum limit of liability of five million dollars ($5,000,000.00) per occurrence and shall include premises and operations liability, contractor's contingency liability with respect to the operations of subcontractors, completed operations liability and contractual liability.

19.2 Added Insured

Upon request by Fibre to Hydro, and subject to Hydro being reasonably able to do so and conditional upon Fibre paying any incremental cost to Hydro for so doing, Hydro shall add Fibre as an insured under the insurance policies of Hydro so as to make Fibre insured under such insurance policies.

4.1.1.1.1.1.1.2 ARTICLE 20 – DISPUTE RESOLUTION PROVISIONS

5 20.1 Generally

Should any dispute or disagreement of any kind arise at any time with respect to the interpretation or application of this Agreement or the carrying out by a party of its obligations hereunder, the parties hereto agree that good faith negotiations shall take place between the parties hereto with the objective of resolving such dispute or disagreement, and the dispute or disagreement shall thereafter be referred to the Chief Executive Officers of the parties hereto who shall attempt in good faith to resolve such dispute or disagreement. If within the next following thirty (30) day period, the dispute or disagreement has not been resolved to the satisfaction of the parties hereto, the parties hereto to whose satisfaction such

dispute or disagreement has not been resolved (the "Aggrieved Party") may refer the dispute or disagreement to binding arbitration pursuant to the *Arbitration Act*, 1991 (Ontario) in accordance with this Section by notice in writing to the other party hereto. Within ten (10) days of giving of such notice of arbitration, the parties hereto shall jointly select a single arbitrator who shall be independent of and acceptable to the parties. In the event that the parties hereto are unable to agree upon a suitable arbitrator within such ten (10) day period, the arbitrator shall be selected by a Justice of the Ontario Superior Court of Justice upon application by any party hereto.

20.2 Fees and Expenses

The fees and expenses of the arbitrator shall be split equally between the parties to the dispute.

20.3 Procedures

The arbitrator shall fix the appropriate procedures which may include an oral hearing. Unless the parties wish to mutually set the points at issue, the arbitrator shall order the parties to file statements pursuant to Section 25 of the Ontario *Arbitration Act, 1991*. The arbitrator may order interest on any award and the arbitrator may award costs to either party. In the absence of any such award of costs, each of the parties shall bear its own costs of any arbitration pursuant to this Section. The arbitrator shall be strictly bound by legal principles and the nature of this Agreement in rendering his decision.

20.4 Private Arbitration

The arbitration shall be completely private (subject to the regulatory requirements of any party or its Affiliates as a public company or regulated company) and shall take place in Toronto, Ontario unless the parties agree otherwise.

20.5 Arbitration Binding

The Parties agree that good faith negotiations and arbitration shall all be without recourse to the Courts and that the award of the arbitrator or arbitrators shall be final and binding, except that:

(i) either party may appeal an arbitration award to the Courts of the Province of Ontario on a question of law; and

(ii) either party may apply to a court of competent jurisdiction for an interim measure of protection.

6 ARTICLE 21 – INTELLECTUAL PROPERTY

21.1 No transfer of Rights

Except as otherwise expressly provided herein, this Agreement does not convey to a party hereto any right, title, estate or interest whatsoever in or to any of the copyrights, patent rights and other intellectual property rights of the other party hereto.

21.2 Jointly Developed Rights

6.1.1.1.1 The parties hereto shall own jointly and equally any copyrights, patent rights and other intellectual property rights that are developed by the parties pursuant to this Agreement. Should a party hereto wish to sell any or all of its interest in any jointly owned copyrights, patent rights and other intellectual property rights then the other party hereto shall have a Right of First Offer with respect to the interests wished to be sold, the terms of which shall be settled by arbitration pursuant to the Dispute Resolution Provisions in the event that such terms cannot be agreed by the parties hereto.

21.3 Logos

Fibre shall not use Hydro's name, logo or other distinguishing characteristics: (i) without the prior written consent of Hydro; and (ii) in the event use thereof by Fibre is consented to by Hydro, in a manner which would mislead consumers as to the distinction between Hydro and Fibre.

ARTICLE 22 - NON-DISCLOSURE

22.1 Definitions

For the purposes of this Agreement:

"**Information**" means: (i) all business, financial and technical information and data, whether oral or written, in whatever media or form, which is disclosed, directly or indirectly, by either party hereto to the other party hereto whether before, on or after the date hereof including, without limiting the generality of the foregoing, any other information or data relating to, comprising, describing or incorporating a party's current or proposed products, services, prices, suppliers, customers, dealers, agents, employees, businesses, business opportunities, addresses, locations, systems, specifications, drawings, sketches, designs, ideas, creations, inventions, formulas, improvements, models, samples, processes, codes, equipment, methods, techniques, experiments, demonstrations, prototypes, procedures, design methodology, evaluation methodology and criteria, trade secrets, business operations,

reports, plans, forecasts, costs, salaries, sales, income, profit, profitability, pricing, business information, financial information and situation, business or marketing plans, distribution and other business strategies, current or historical data, test data, research, technology, computer systems, computer programs, source, object and any other codes, routines and other software and documentation, scientific, computer or technical information and network architecture maps, specifications and service; (ii) any information marked "private", "restricted", "confidential", "proprietary" (or otherwise marked or described so as to indicate confidentiality) or which, by the nature of the circumstances surrounding the disclosure thereof, ought in good faith be treated as confidential, in all cases in its original form or whether it is converted to different forms or combined with additional information, and including any information relating to third parties contained therein; and (iii) any notes, memoranda, summaries, analyses, compilations or any other writings relating howsoever to any of the foregoing prepared relative thereto by the receiving party or on its behalf.

22.2 **Obligations Arising From Disclosure**

During the course of the relationship established between the parties pursuant ot this Agreement, each party may disclose to the other party or permit the other party access to certain Information, either directly or indirectly. Each disclosure of Information will be made or permitted upon the basis of the confidential relationship established between the parties by this Agreement and upon each party's agreement that, unless otherwise specifically authorized in writing by the other, it will:

(i) *use the Information solely for the purpose for which it was disclosed;*

(ii) *take all reasonable care and precautions, at least as great as the care and precautions that it takes to protect its own confidential or proprietary information, to keep the Information confidential;*

(iii) *not disclose, or allow the disclosure of, any Information before or after the termination of this Agreement, except as permitted by this Agreement;*

(iv) *restrict disclosure of the Information only to its employees or other personnel, advisors, consultants and agents (collectively, "Representatives") with a need to know the Information and who are bound to maintain the Information confidential;*

(v) *notify each Representative that receives any Information of the requirements of this Agreement and of the restrictions on use and disclosure of Information imposed by this Agreement;*

(vi) *insure that no Representative breaches or causes or allows to be breached any of the receiving party's obligations hereunder and direct each Representative to abide by the terms of this Agreement;*

(vii) *not use, or allow to be used, howsoever any Information to compete with or in a manner detrimental or adverse to the commercial interests of the disclosing party;*

(viii) *except in connection with the purpose for which Information is disclosed, not copy or duplicate such Information or knowingly allow anyone else to copy or duplicate such Information; and*

(ix) promptly return to the disclosing party, upon its request made before or after termination of this Agreement, or certify as destroyed, the Information in whatever form and regardless of whether such Information was made or compiled by the

receiving party or furnished by the disclosing party, together with all copies thereof, howsoever made.

22.3 Exceptions

The obligations under this Agreement shall not apply to any Information that the receiving party can demonstrate to the disclosing party's reasonable satisfaction:

(i) *became public and generally known through no act or omission of the receiving party or its Representatives;*

(ii) *was disclosed on a non-confidential basis in good faith to the receiving party by a third party which the receiving party had reasonable grounds to believe had legitimate possession thereof and the right to make such disclosure;*

(iii) *was in legitimate possession of the receiving party prior to its disclosure by the disclosing party to the receiving party;*

(iv) *that the receiving party is required by law, judicial or arbitration process to disclose, provided that, prior to disclosing any Information, the receiving party shall promptly notify the disclosing party of such requirement to disclose and take such steps as are reasonably necessary, and cooperate with the disclosing party, to lawfully limit such disclosure and to maintain the confidentiality of the Information in the hands of the receiving party, including obtaining appropriate protective orders; or*

(v) *is approved in writing by the disclosing party for release or other use by the receiving party according to the terms set out in such written approval.*

The burden of demonstrating the applicability of any exception in this Section shall be upon the party seeking to rely upon any such exception.

22.4 Discretionary Disclosure

Each party acknowledges that, notwithstanding the execution of this Agreement, each party maintains the sole and absolute discretion to determine what, if any, Information it will release to the other party. The receiving party acknowledges that the Information disclosed in any manner whatsoever is proprietary to the disclosing party.

22.5 No Warranty

Each party warrants that it has all requisite authorization to enter into this Agreement and that it has the right to disclose any Information disclosed to the other party. Each party acknowledges and understands that the other party makes no other representation or warranty in relation to any Information disclosed including, without limiting the generality of the foregoing, as to its adequacy, accuracy, or suitability for any purpose and, except as expressly agreed in writing, shall not be liable for any loss or damage arising from the use of the Information howsoever caused.

22.6 Intellectual Property

Each party acknowledges and agrees that all Information shall be owned solely by the disclosing party. Each party further agrees that nothing contained in this Agreement

shall be construed as granting any rights, by licence or otherwise, under any intellectual property rights in, or concerning any of, the disclosing party's Information.

22.7 Indemnity

The receiving party shall indemnify and save harmless the disclosing party from and against all losses, liabilities, damages, costs and expenses (including reasonable legal fees and disbursements) suffered or incurred by the disclosing party as a result of a breach of a term of this Agreement by the receiving party or its Representatives.

22.8 Equitable Remedies

In the event of a breach or threatened breach of any term of this Agreement, the receiving party agrees that the harm suffered or that may be suffered by the disclosing party would not be compensable by monetary damages alone and, accordingly, that the disclosing party shall, in addition to other available legal or equitable remedies, be entitled to the issuance of immediate injunctive relief, specific performance and any other remedies in law or equity for such breach or threatened breach of the receiving party's obligations hereunder. The receiving party shall reimburse the disclosing party for all reasonable costs and expenses, including reasonable legal fees and disbursements, incurred by the disclosing party in attempting to enforce the obligations under this Agreement of the receiving party or its Representatives.

22.9 Independent Activities

Each party, as a disclosing party, understands that the receiving party may currently or in the future be developing information internally, or receiving information from a third party that may be similar to the disclosing party's Information. Accordingly, nothing in this Agreement shall be construed as a representation or warranty that the receiving party will not develop products or services, or have products or services developed for it, or enter into any arrangement that, without violation of any of the provisions of this Agreement, compete with the products or services which are contemplated by, or which are the subject of, the disclosing party's Information or the purpose for which Information was disclosed.

22.10 No Implied Obligations

Neither this Agreement, nor the disclosure or receipt of any Information, shall imply or confirm any intention to enter into any contract or other business relationship, or to purchase any product or service, by either of the parties or any commitment by either of the parties with respect to the present or future development, production or distribution of any product or service.

22.11 Termination and Survival

Either party may terminate this Agreement at any time upon prior written notice to the other party. In the event that this Agreement is terminated, this Agreement shall not apply to any Information disclosed after such termination but, notwithstanding the termination of this Agreement, shall continue to apply to any and all Information disclosed prior to the termination of this Agreement.

7 ARTICLE 23 – NOTICES

23.01 Addresses

All notices and other communications from one party hereto to another (a "Notice") that are required or permitted under this Agreement shall be in writing and shall be delivered by hand or by courier, transmitted by facsimile, sent by mail or sent by e-mail to the party hereto to whom it is to be given at the address for such party below:

(i) to Hydro:

Postal Address: Halton Hills Hydro Inc.

7.1.1.1.1.1 **43 Alice Street**
Halton Hills (Acton), Ontario
L7J 2A9

Attention: The President

Telefacsimile Number: (519) 853-4148

7.1.1.1.1.1.1.1.1 Attention: The President

E-mail Address: guatto@hhhydro.on.ca

(ii) to Fibre:

Postal Address: Halton Hills Fibre Optics Inc.

7.1.1.1.1.2 **43 Alice Street**
Halton Hills (Acton), Ontario
L7J 2A9

Attention: The Chief Financial Officer

Telefacsimile Number: (519) 853-4148

7.1.1.1.1.2.1.1.1 Attention: The Chief Financial Officer

E-mail Address: askidmore@hhhydro.on.ca

23.02 Time of Receipt

A Notice will be received for the purposes of this Agreement when actually received by intended recipient thereof. Notices shall be deemed to have been received in the following circumstances:

(i) when transmitted by facsimile or e-mail transmission, at 10:00 in the forenoon (local time of the recipient) on the next Business Day following the day upon which the Notice is transmitted, provided that another copy of the Notice is received or deemed received by the recipient by delivery, courier or post within ten days of the date of deemed receipt of the Notice by facsimile or e-mail transmission; and

(ii) by mail, on the tenth day (days upon which there is an interruption of postal service in Canada or the United States of America excepted) following the day on which the Notice was mailed.

23.03 Change of Address

A party hereto may change its address for the purposes of Section 23.01 by giving notice to the other party hereto and in such event all notices thereafter given to that party shall be to such changed address.

8 ARTICLE 24 – GENERAL

9

10

24.1 Prior Agreements

This Agreement supersedes and terminates all prior agreements, understandings or writings between the parties hereto and their predecessors, whether written or oral and whether legally enforceable or not, in connection with the matters dealt with in this Agreement.

24.2 Inurement

This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors, assigns as provided for herein, receivers, receiver-managers and trustees.

24.3 Relationship of Parties

The relationship between the parties hereto shall not be that of partners, agents, or joint venturers for one another, and nothing contained in this Agreement shall be deemed to constitute a partnership or agency agreement between them for any purposes, including, but not limited, to federal or provincial income tax purposes. The parties hereto, in performing any of their obligations hereunder, shall be independent contractors or independent parties and shall discharge their contractual obligations at their own risk subject, however, to the terms and conditions of this Agreement.

24.4 Waiver in Writing

No waiver by a party hereto of any provision, or the breach of any provision, of this Agreement shall be effective unless it is contained in a written instrument signed by authorized officers or representatives of

the party hereto. Such written waiver shall affect only the matter specifically identified in the instrument granting the waiver and shall not extend to any other matter, provision or breach.

24.5 Delay Not Waiver

The failure of a party hereto to give notice to any other party hereto or to take any other steps in exercising any right, or in respect of the breach or nonfulfillment of any provision of this Agreement, shall not operate as a waiver of that right, breach or provision nor shall any single or partial exercise of any right preclude any other or future exercise of that right or the exercise of any other right, whether in law or in equity or otherwise.

24.6 Acceptance of Payment Not Waiver

Acceptance of payment by a party hereto after the breach or nonfulfillment of any provision of this Agreement by another party shall not constitute a waiver of the provisions of this Agreement, other than any breach cured by such payment.

24.7 Amendments

This Agreement may only be amended by a written agreement executed on behalf of both parties hereto by their duly authorized representatives in such regards.

24.8 Time of the Essence

Time shall be of the essence of this Agreement.

24.9 Further Assurances

Each of the parties hereto shall at its own cost and expense, from time to time and without further consideration, execute or cause to be executed all documents and shall take or refrain from taking all actions which are reasonably necessary or reasonably desirable to give effect to the provisions of this Agreement.

24.10 Severability

In the event that any provision of this Agreement shall be adjudged to be invalid for any reason whatsoever, such invalidity shall not affect the operation of any other provision of this Agreement and such invalid provision shall be deemed to have been deleted from this Agreement.

24.11 Use of Name

Each party hereto agrees that it will not use, suffer or permit to be used, directly or indirectly, the name of any other party hereto for any purpose whatsoever without, in each instance, first obtaining the written consent of such other party.

24.12 Waiver of Relief

The parties acknowledge that any default, forfeiture or assignment provisions contained in this Agreement are, in view of the risks inherent in the business to be conducted by parties hereto, reasonable and equitable. Each party hereto waives any and all rights which it may have at law or in equity against default, forfeiture or penalty if such provisions herein are invoked.

24.13 No Third Party Beneficiaries

Nothing in this Agreement shall entitle any Person other than the parties hereto and their respective successors to any claim, cause of action, remedy or right of any kind in respect of this Agreement or the subject matter of this Agreement.

24.14 Attornment

Each party hereto irrevocably submits to and accepts the jurisdiction of the courts of the Province of Ontario, Canada and all courts of appeal therefrom as regards any legal proceedings relative to this Agreement. Each party hereto irrevocably waives, to the fullest extent that it may effectively do so, the defense of an inconvenient forum to the maintenance in the courts of the Province of Ontario and all

courts of appeal therefrom as regards any legal proceedings relative to this Agreement. Each of the parties hereto agrees that a final judgement of the courts of the Province of Ontario, Canada or any court of appeal therefrom and in respect of which all appeal periods have expired without appeal shall be conclusive and may be enforced in other jurisdictions by legal proceedings on the judgement or in any other manner provided by law.

24.15 Good Faith

Each of the parties hereto shall have a duty to act in good faith in the performance and enforcement of this Agreement. All actions, activities, consents, approvals and other undertakings of the parties hereto shall be performed in a reasonable and timely manner.

24.16 Language of Agreement

The parties to this Agreement have expressly agreed that this Agreement be drawn in the English language. Les parties aux presentes ont expressement convenu que le present contrat soit redige en anglais.

24.17 Entire Agreement

This instrument (including all Schedules hereto, if any) states and comprises the entire agreement between the parties hereto relative to the subject matter hereof. There is no representation, warranty or collateral agreement relating to this transaction except as expressly set forth herein.

24.18 Counterpart and Facsimile Execution

This Agreement and any amendment, supplement, restatement or termination of any provision of this Agreement may be executed and delivered in any number of counterparts, each of which when executed and delivered is an original but all of which taken together constitute one and the same instrument. This Agreement may be executed by facsimile and the facsimile execution pages will be binding upon the executing Party to the

same extent as the original executed pages. The executing Party covenants to provide originals of the facsimile execution pages for insertion into the original Agreement in place of the facsimile pages.

IN WITNESS WHEREOF the parties hereto have executed and delivered this Agreement effective as of the date first above written.

HALTON HILLS FIBRE OPTICS INC.

By: _____

10.1.1.1 Daniel F. Guatto,
President

By: _____
Adrian A. Phillips,
Secretary

10.1.1.2

HALTON HILLS HYDRO INC.

By: _____

10.1.1.2.1 Bryan D. Boyce,

10.1.1.2.2 Chairman

By: _____
Adrian A. Phillips,
Secretary

AMENDING AGREEMENT

(HHHI – HHFOI Services Agreement)

THIS AGREEMENT made this 1st day of January, 2007,

BETWEEN:

HALTON HILLS HYDRO INC.

- and -

HALTON HILLS FIBRE OPTICS INC.

WHEREAS the parties hereto are parties to a Services Agreement made effective the 1st day of January, 2001 and such agreement, as previously amended, is herein referred to as the "Services Agreement"; and

WHEREAS the parties hereto wish to amend the Services Agreement in the manner hereinafter provided.

NOW THEREFORE, for good and valuable consideration, the receipt and adequacy whereof being hereby acknowledged by each party hereto to the other party hereto, the parties hereto covenant and agree as follows:

1. CONTINUATION OF CHARGE FOR MANAGEMENT AND OFFICE PERSONNEL SERVICES

It is agreed that the charges presently provided in Section 3.6 of the Services Agreement shall continue to be Two Thousand Seven Hundred Dollars ($2,700.00) monthly throughout 2007.

2. CONTINUATION OF CHARGE FOR PREMISES AND OFFICE EQUIPMENT AND SUPPLIES

It is agreed that the charges presently provided in Section 10.5 of the Services Agreement shall continue to be Three Hundred Dollars ($300.00) monthly throughout 2007.

3. ADDITION OF CHARGE FOR GEORGETOWN POP SITE

The Services Agreement is hereby amended by adding thereto the following Article 10A:

10.1.2 **"**ARTICLE 10A – GEORGETOWN POP SITE

10A.1 Provision

Hydro shall make available to Fibre a mutually agreed area within the boundaries of the property upon which Hydro's Georgetown Substation is located upon which Fibre may construct and occupy a building for use by Fibre as a POP location. Upon Fibre's request and at Fibre's expense, any building constructed by Fibre on Hydro's Georgetown Substation site pursuant to this Section shall have access secure and separate from Hydro's access to such site.

10A.2 Codes Compliance

Hydro and Fibre shall co-operate and take all reasonable measures to insure that any building constructed and occupied by Fibre on Hydro's Georgetown Substation site pursuant to this Article and the use thereof by Fibre are in compliance with the requirements of the Codes.

10A.3 Vacating Property

In the event that:

(i) Hydro at any time determines that it needs the site upon which any building constructed by Fibre on Hydro's Georgetown Substation site pursuant to this Article is located in order for Hydro to conduct its own business; or

(ii) the Codes no longer allow Hydro to make available to Fibre property within the boundaries of Hydro's Georgetown Substation for use by Fibre to locate and use a building for the purposes for which Fibre is then using such building,

then Fibre shall, within six (6) months of receipt of Notice to vacate from Hydro, vacate such building, join with Hydro in executing all documents necessary to terminate Fibre's rights under this Article and to transfer title to such building to Hydro and, upon such transfer,

Hydro shall pay Fibre the fair market value of such building determined by agreement between Hydro and Fibre or, failing such agreement, pursuant to the Dispute Resolution Provisions.

10A.4 Payment

Fibre shall pay Hydro Six Hundred Dollars ($600.00) monthly throughout 2007 for the property made available by Hydro to Fibre pursuant to this Article. It is intended that the amount payable by Fibre to Hydro for the property made available by Hydro to Fibre pursuant to this Article represents the fair market value thereof and either party hereto may at any time, but not more frequently than every six months, require the other party hereto to enter into discussions and agree to a new amount to be paid by Fibre to Hydro pursuant to this Article as representing the fair market value at the time of the property made available by Hydro to Fibre pursuant to this Article and, failing such agreement, the matter may be resolved pursuant to the Dispute Resolution Provisions."

4. RATIFICATION

Except as in this Agreement expressly otherwise provided, the Services Agreement is hereby ratified and confirmed and declared to continue and be in effect and binding upon the parties hereto in accordance with its terms as amended by the provisions of this Agreement.

5. FURTHER ASSURANCES

Each of the parties hereto shall, from time to time and at all times hereafter, at the request of the other party hereto and without further consideration, execute and deliver all documents, take or refrain from taking all actions and deliver all further assurances as may be reasonably required to give effect to the terms and intent of this Agreement.

IN WITNESS WHEREOF the parties hereto have executed and delivered this Agreement on the date first above written.

HALTON HILLS FIBRE OPTICS INC.

By: _____

Arthur A. Skidmore,

Chief Financial Officer

HALTON HILLS HYDRO INC.

By: _____

Daniel F. Guatto,

President

SERVICES AGREEMENT

(Hydro – Services)

THIS AGREEMENT made effective the 1st day of January, 2001,

B E T W E E N:

HALTON HILLS HYDRO INC., an Ontario corporation having offices within the Town of Halton Hills, in the Province of Ontario (hereinafter referred to as "Hydro")

– and –

HALTON HILLS ENERGY SERVICES INC., an Ontario corporation having offices within the Town of Halton Hills, in the Province of Ontario (hereinafter referred to as "Services")

WHEREAS Services is engaged in the business of providing varied and sundry services related to the electrical industry and for such purposes has need of personnel, office premises and equipment; and

WHEREAS Hydro is engaged in the business of the local distribution of electricity and for such purposes has personnel, office premises and equipment that it could make available to Services; and

WHEREAS Hydro and Services have agreed as to the basis upon which the personnel, office premises and equipment of Hydro may be made available to Services and Hydro and Services wish to enter into this agreement to record their agreements.

NOW THEREFORE, in consideration of the premises hereto and the covenants and agreements herein and other good and valuable consideration, the receipt and sufficiency of such consideration being hereby acknowledged by each party hereto to the other party hereto, the parties hereto covenant and agree as follows:

11 ARTICLE 1 – DEFINITIONS

1.1 Words and Phrases Defined

In this Agreement, unless the subject matter or context is inconsistent therewith, the words and phrases

set forth below shall have the meanings attributed below:

"Affiliate" has the meaning attributable thereto pursuant to the Ontario *Business Corporations Act*.

"Agreement" means this Agreement and includes all schedules to this Agreement and, further, includes all amendments and supplements as may be made from time to time.

"Available Hours" means the hours in a calendar year that an employee of Hydro is available to provide services to Hydro.

"**Business Day**" means a day that is not a Saturday, Sunday or a public or bank holiday in the Province of Ontario.

"Codes" means the Affiliate Relationships Code and all other codes, legislation, regulation and rules applicable to Hydro and Services from time to time.

"Default" shall have the meaning provided therefor in Section 17.1.

"Dispute Resolution Provisions" means the provisions of Article 20.

"Force Majeure" means in relation to the performance of any obligation under this Agreement, any cause, condition or event of any nature whatsoever which is beyond the reasonable control of the party responsible for such obligation which prevents in whole or in part the performance by either party of its respective obligations including without limitation, acts of war, revolution, riot, sabotage, vandalism, earthquakes, storms, flooding, lightning and other acts of God, local or national emergencies, strikes, lockouts, work slowdowns and all other labour disputes, whether lawful or unlawful.

"Hydro Equipment" shall have the meaning provided therefor in Section 6.1 and includes tools, machinery and vehicles but does not include materials expected to be consumed in the course of operations and not returned to Hydro.

"Lowest Competitive Price" means a price for a particular service and/or provision of equipment which is no more than the price charged by Hydro to anyone other than Services for a similar service and/or provision of similar equipment under similar circumstances.

"Management and Office Personnel" means the President, Vice President, Controller, Accounting Supervisor, Administrative Assistant, Cashiers, Billing Clerks, Billing and Customer Service Supervisor, Customer Service Clerks, Accounts Payable Clerk of Hydro, from time to time.

"Notice" shall have the meaning provided therefor in Section 23.1.

"Person" means an individual, partnership, limited partnership, joint venture, syndicate, sole proprietorship, company or corporation with or without share capital, unincorporated association, trust, trustee, executor, administrator or other legal personal representative, regulatory body or agency, government or governmental agency, authority or entity however designated or constituted.

"Prescribed Rate" means the rate of interest allowed, from time to time, to Hydro on its debt for the purposes of calculating the electricity distribution rates for Hydro pursuant to Performance Based Regulation of Hydro by the Ontario Energy Board.

"Service Personnel" means engineering and operations staff of Hydro excepting those thereof that are Management and Office Personnel.

"Term" means the period of time that this Agreement is in effect pursuant to the provisions of Article 14.

1.2 Derivations

Where a word or phrase is defined for the purposes of this Agreement, a derivative of that word or phrase shall have a corresponding meaning.

1.3 Extended Meanings

In this Agreement words importing the singular number only include the plural and *vice versa*, words importing any gender include all genders and words importing persons include all Persons.

1.4 Accounting Terms

All accounting terms not otherwise defined in this Agreement shall have the meanings assigned to them in accordance with Canadian generally accepted accounting principles, except where inappropriate in the context in which such accounting term is used in this Agreement.

1.5 Industry Terms

Unless expressly defined herein, words having well known technical or trade meanings within the electricity distribution and related industries shall be so construed.

ARTICLE 2: INTERPRETATION

2.1 Interpretation of Agreement and Schedules

The body of this Agreement and all the Schedules to this Agreement constitute one and the entire agreement between the parties hereto and, accordingly, the body of this Agreement and all such Schedules hereto shall be interpreted and enforced as though the provisions of such Schedules were set forth in the body of this Agreement prior to the execution page hereof and without giving paramountcy to the provisions of the body of this Agreement or any of the Schedules to this Agreement over the provisions of the other.

2.2 Governing Law

This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable in the Province of Ontario and shall be treated in all respects as an Ontario contract.

2.3 Legislation, Regulations and Rules

Any reference in this Agreement to all or any part of any statute, regulation or rule shall, unless otherwise expressly stated herein, be a reference to the statute, regulation or rule, or part thereof, as amended from time to time.

2.4 Article, Section, Subsection and Item References

The division of this Agreement into Articles, Sections and Subsections are for convenience of reference only and shall not affect or be considered to affect the construction or interpretation of the provisions of this Agreement. References in this Agreement or in an Schedule to this Agreement to an Article, Section or Subsection shall mean a reference to an Article , Section or Subsection within the body of this Agreement. References herein to an Item without identifying the Section in which the Item is contained shall mean a reference to the Item in the same Section where the reference is made.

2.5 Headings

The headings of Articles, Sections and Subsections herein and in the Schedules to this Agreement and the Table of Contents are inserted for convenience of reference only and shall not affect or be considered to affect the construction or interpretation of the provisions of this Agreement.

2.6 **"Hereof" Etc.**

The terms "hereof", "hereunder", "herein", "hereto" and similar expressions refer to this Agreement in its entirety and not to any particular Article, Section, Subsection or other portion of this Agreement.

2.7 **Currency of Contract**

All references in this Agreement to money shall denote the lawful currency of Canada, except as may be otherwise expressly stated.

2.8 Accounting Principles

Wherever in this Agreement reference is made to a calculation to be made or an action to be taken in accordance with generally accepted accounting principles, such reference will be deemed to be to the generally accepted accounting principles from time to time approved by the Canadian Institute of Chartered Accountants, or any successor institute, applicable as at the date on which such calculation or action is made or taken or required to be made or taken in accordance with generally accepted accounting principles.

2.9 **Waiver of Contra-Proferentem Rule**

Each party to this Agreement acknowledges and agrees that it has participated in the drafting of this Agreement and, accordingly, this Agreement shall not be interpreted either more or less favorably in favor of any party to this Agreement by virtue of the fact that one party or its counsel has been principally responsible for the drafting of all or a portion of this Agreement.

11.1.1 ARTICLE 3 –MANAGEMENT AND OFFICE PERSONNEL

3.1 Supply

Hydro shall, throughout the Term of this Agreement, supply the services of the Management and Office Personnel to provide to Services the same services as the Management and Office Personnel provide to Hydro and, in addition, to provide such other services as may be requested of them by the Management and Office Personnel to whom they are responsible.

3.2 Responsibilities of Management and Office Personnel

The Management and Office Personnel shall fulfill the same responsibilities with respect, to Services that the Management and Office Personnel fulfill with respect to Hydro and, in addition, shall fulfil such other responsibilities as may be requested of them by the Management and Office Personnel to whom they are responsible.

3.3 Conflicts of Interest and Release

Services acknowledges that the Management and Office Personnel are officers and employees of Hydro and, as such, they will have a conflict of interest with respect to any matter which would involve business or other relations between Hydro and Services inasmuch as Hydro is the sole shareholder of Services. Services agrees that, insofar as this Agreement is concerned, the obligations that each of the Management and Office Personnel has to Hydro is paramount to the obligations that the Management and Office Personnel has to Services. Accordingly, in each event of a such a conflict of interest in the obligations that any Management and Office Personnel owes to Hydro and Services, the Management and Office Personnel is excused from performing such obligation and the particular event shall be referred to officers or employees of Services that do not have such a conflict or, failing that, to the Board of Directors for resolution. Further, Services hereby releases the Management and Office Personnel, and each of them, and Hydro from all liability that may arise or be associated with any conflict of interest that any of the Management and Office Personnel may have as a result of being an officer of both Services and Hydro, performing any of the responsibilities associated with being an officer of Services or providing services to Services pursuant to this Agreement.

3.4 Indemnity and Release

Services shall indemnify and hold harmless Hydro and each of the Management and Office Personnel from and against all loss, claims and liability whatsoever that arises howsoever from or is associated with the performance of the Management and Office Personnel of their responsibilities to Services except such thereof as results from the negligence or wilful misconduct of the Management and Office Personnel, or any of them.

3.5 Not Employees

The Management and Office Personnel are not, and shall in no event become, employees of Services. In no event shall Services become obligated howsoever to pay, or make any contribution to Hydro in respect of, the salaries, wages, benefits or other compensation payable by Hydro to the Management and Office Personnel except to pay to Hydro any amount payable by Services to Hydro pursuant to Section 3.6. In no event shall the use by Services of the services of the Management and Office Personnel

become the basis for any right of any labour union or similar organization to become the bargaining agent for the employees of Services.

3.6 Charge for Management and Office Personnel Services

Based upon the estimates agreed to by the parties hereto of the amount of time of the Management and Office Personnel that will be required in order for the Management and Office Personnel to provide the services and to fulfil their obligations pursuant to this Agreement, Services shall pay Hydro the amount of Twelve Thousand Five Hundred Fifty-Nine Dollars ($12,559.00) monthly for the services of the Management and Office Personnel. The amount payable by Services to Hydro pursuant to this Section for the services of the Management and Office Personnel includes;

(i) compensation to Hydro for indeterminable costs of the equipment and supplies used by the Management and Office Personnel for the equipment used by them to provide their services and fulfil their responsibilities to Services pursuant to this Agreement;

(ii) a fair and reasonable allocation of gross payroll and benefits costs of Hydro attributable to the Management and Office Personnel in respect of the time that the Management and Office Personnel spend to provide their services and fulfil their responsibilities to Services pursuant to this Agreement, such allocation being based upon Available Hours; and

(iii) a mark-up consistent with market circumstances on the actual cost to Hydro of the Management and Office Personnel and provided by Hydro to Services.

Hydro shall, from time to time, calculate the amounts to be charged to Services for the Management and Office Personnel provided by Hydro to Services pursuant to this Agreement and shall give Services Notice thereof and of each change thereto. In the event that Services disputes that any charge for the Management and Office Personnel is calculated in accordance with the provisions of this Agreement, then Services shall give Notice of its dispute to Hydro whereupon Hydro and Services shall endeavor in good faith to resolve the dispute provided, however, that either Hydro or Services may at any time refer the dispute for resolution pursuant to the Dispute Resolution Provisions.

In consideration of the payments by Services to Hydro pursuant to this Section, Services shall not be required or expected to make any contribution to the provision of the offices, equipment, support staff or other requirements that the Management and Office Personnel may require to provide their services and fulfil their responsibilities to Services under this Agreement.

11.1.2 ARTICLE 4 – SERVICE PERSONNEL

4.1 Supply

Services may, at any time and from time to time, request Hydro to provide the Service Personnel, or any of them, to provide services to Services. Each such request by Services to Hydro for Service Personnel shall be in writing, and may be in the form of a purchase order, and shall specify:

(i) the number and type of Service Personnel required;

(ii) the equipment which is to accompany the Service Personnel;

(iii) the period of time for which the Service Personnel are required, including a contingency period which shall be separately specified;

(iv) the purpose for which the Service Personnel are required, including the specific tasks that the various Service Personnel will be performing; and

(v) the location or area in which the Service Personnel will be providing their services,

unless Hydro and Services shall otherwise agree.

4.2 Obligation to Supply and Conditions

Upon receipt by Hydro of a request from Services for Service Personnel satisfying the requirements of Section 4.1, Hydro shall supply the requested Service Personnel to Services for the purposes requested subject to the following conditions:

(i) Hydro determines, in its sole unfettered judgement, that it has the requested Service Personnel available that are capable of performing the specified tasks, during the period of time and in the location or area indicated in the request made by Services;

(ii) the supply of Service Personnel is subject to interruption due to emergency requirements of Hydro, as determined by Hydro in its sole and unfettered judgement, for the purposes of its own business, but not otherwise;

(iii) Hydro determines, in its sole unfettered judgement, that it has the equipment available which will allow the requested Service Personnel to perform the tasks for which they have been requested by Services, provided, however, that Hydro shall provide the requested Service Personnel notwithstanding that Hydro may have determined that it does not have the equipment available which will allow the requested Service Personnel to perform the tasks for which they have been requested by Services in the event that Services undertakes to provide the necessary equipment;

(iv) Services will provide and/or otherwise reimburse Hydro for all fuel, lubricants and other consumables consumed in the operation of the equipment used by the Service Personnel;

(v) Services will reimburse Hydro for the cost of all materials provided by Hydro to Services for the purposes of completing the assignment of the Service Personnel;

(vi) Hydro shall not be required to supply or continue the supply of Service Personnel if, in the sole and unfettered judgement of Hydro, the work environment in which the Service Personnel are or will be providing their services does not satisfy applicable safety laws and/or regulations;

(vii) Hydro shall not be required to supply or continue the supply of Service Personnel if, in the sole and unfettered judgement of Hydro, the services being or to be provided by the Service Personnel do not satisfy the requirements of Section 13.1; and

(viii) Services shall indemnify and hold harmless Hydro and each of the Service Personnel from and against all loss, claims and liability whatsoever that arises howsoever from or is associated with the performance of the Service Personnel of their responsibilities to Services except such thereof as results from the negligence or willful misconduct of the Service Personnel, or any of them.

4.3 Equipment

The Service Personnel provided by Hydro to Services pursuant to this Agreement shall, subject to the provisions of Section 4.2(iii), be accompanied by the equipment required by the Service Personnel in order to perform the tasks in respect of which the Service Personnel were requested.

4.4 Time Sheets/Work Orders

Hydro shall cause each of the Service Personnel to make a written record, which may be in the form of time sheets or work orders, of the time spent by such Service Personnel providing services to Services pursuant to this Agreement and the charges of Hydro to Services for the services of the Service Personnel shall be calculated on the basis of such written records.

4.5 Charges for Service Personnel

Services shall pay Hydro for the services of the Services Personnel charges which represent the fair market value thereof and, otherwise, which:

(i) do not exceed the Lowest Competitive Price;

(ii) includes in the calculation of such charges a fair and reasonable allocation of gross payroll and benefits costs of Hydro attributable to the Service Personnel in respect of the time that the Service Personnel spend to provide their services and fulfil their responsibilities to Services pursuant to this Agreement, such allocation being based upon Available Hours, being based only on actual charges paid to third parties and not including any notional calculations;

(iii) include with respect to equipment provided with Service Personnel only charges consistent with the provisions of Article 5; and

(iv) include a mark-up consistent with market circumstances on the actual cost to Hydro of the Service Personnel and equipment provided by Hydro to Services.

Hydro shall, from time to time, calculate the amounts to be charged to Services for the Service Personnel provided by Hydro to Services pursuant to this Agreement and shall give Services Notice thereof and of each change thereto. In the event that Services disputes that any charge for the Service Personnel is calculated in accordance with the provisions of this Agreement, then Services shall give Notice of its dispute to Hydro whereupon Hydro and Services shall endeavor in good faith to resolve the dispute provided, however, that either Hydro or Services may at any time refer the dispute for resolution pursuant to the Dispute Resolution Provisions.

In consideration of the payments by Services to Hydro pursuant to this Section, Services shall not be required or expected to make any contribution to the provision of the offices, equipment, support staff or

other requirements that the Service Personnel may require to provide their services and fulfil their responsibilities to Services under this Agreement.

4.6 Not Employees

The Service Personnel are not, and shall in no event become, employees of Services. In no event shall Services become obligated howsoever to pay, or make any contribution to Hydro in respect of, the salaries, wages, benefits or other compensation payable by Hydro to the Service Personnel except to pay to Hydro any amount payable by Services to Hydro pursuant to Section 4.4. In no event shall the use by Services of the services of the Service Personnel become the basis for any right of any labour union or similar organization to become the bargaining agent for the employees of Services.

4.7 Limited Warranty

Services acknowledges that, except as set forth in this Agreement Hydro makes no warranty, representation or indemnity, express or implied, with respect to any of the Service Personnel and equipment provided by Hydro to Services pursuant to this Article or for any work performed by the Service Personnel and equipment provided by Hydro to Services pursuant to this Article, including any and all warranties of design, merchantability or fitness for particular purpose or arising from a course of dealing, usage or trade, and each party hereto hereby expressly waives and disclaims all such warranties, representations and indemnities except that the Service Personnel are properly trained and fully qualified to perform the services that they are intended to perform for Services pursuant to this Article and the equipment provided by Hydro to the Service Personnel are adequate and safe for use by the Service Personnel to perform the services to be performed by the Service Personnel for Services pursuant to this Article. The warranties set forth in this Agreement constitute the only warranties made

by a party hereto to the other party hereto with respect to this Agreement and are made in lieu of all other warranties or conditions, written or oral, statutory, express or implied.

ARTICLE 5 - CONTRACTORS

5.1 Meter Readers

Services shall reimburse Hydro for a percentage of the actual cost to Hydro of persons who read meters for Hydro under contract with Hydro equal to the percentage that the total number of water meters read by such persons is of the total number of electricity and water meters read by such persons.

5.2 Other Contractors

Services shall reimburse Hydro for a percentage of the actual cost to Hydro of each provider of services to Hydro under contract with Hydro equal to the percentage of the services of such service provider used by Services is of the total services provided by such service provider to both Hydro and Services. In the event that Services might make available to Hydro the services of a service provider under contract with Services, Hydro shall reimburse Services for a percentage of the actual cost to Services of such service provider equal to the percentage of the services of such service provider used by Hydro is of the total services provided by such service provider to both Hydro and Services.

11.1.3 ARTICLE 6 - EQUIPMENT

6.1 Supply

Services may, at any time and from time to time, request equipment from Hydro for use by Services without Service Personnel (such equipment being referred to as "Hydro Equipment"). Each request by Services to Hydro for Hydro Equipment shall be in writing, and may be in the form of a purchase order, and shall specify:

(i) the type and number or quantity of Hydro Equipment required;

(iii) the period of time for which the Hydro Equipment is required, including a contingency period which shall be separately specified;

(iv) the purpose for which the Hydro Equipment is required, including the specific tasks for which the various Hydro Equipment will be used; and

(v) the location or area in which the Hydro Equipment will be used.

6.2 Obligation and Conditions of Supply

Upon receipt by Hydro of a request from Services for Hydro Equipment satisfying the requirements of Section 6.1, Hydro shall supply the requested Hydro Equipment to Services for the purposes requested subject to the following conditions:

(i) Hydro determines, in its sole unfettered judgement, that it has the requested Hydro Equipment available that is capable of performing the specified tasks, during the period of time and in the location or area indicated in the request made by Services;

(ii) the supply of Hydro Equipment is subject to interruption due to emergency requirements of Hydro for the purposes of its own business, but not otherwise, determined by Hydro in its sole and unfettered judgement;

(iii) Hydro determines, in its sole and unfettered judgement, that the persons that will be operating and maintaining the Hydro Equipment are properly qualified and that the Hydro Equipment will be safely operated;

(iv) Hydro determines, in its sole and unfettered judgement, that the persons that adequate insurance is being carried by Services with respect to loss or damage to the Hydro Equipment and with respect to the persons who will be operating the Hydro Equipment;

(v) Services will provide and/or otherwise reimburse Hydro for all fuel, lubricants and other consumables consumed in the operation of the Hydro Equipment;

(vi) all Hydro Equipment is provided pursuant and subject to Hydro's conditions, from time to time, for the supply of equipment;

(vii) Services shall reimburse Hydro for any damage to the Hydro Equipment, reasonable wear and tear excepted; and

(viii) Services shall indemnify and hold harmless Hydro from and against all loss, claims and liability whatsoever that arises howsoever from or is associated with the use by Fibre of the Hydro Equipment except such thereof as is attributable to the Hydro Equipment itself and not to the manner of use thereof.

6.3 Charges for Hydro Equipment

Services shall pay Hydro for the use of Hydro Equipment charges which represent the fair market value thereof and, otherwise, which:

(i) do not exceed the Lowest Competitive Price;

(ii) include with respect to equipment provided with Service Personnel only charges consistent with the provisions of Article 4; and

(iii) include a mark-up consistent with market circumstances on the actual cost to Hydro of the Hydro Equipment provided by Hydro to Services.

Hydro shall, from time to time, calculate the amounts to be charged to Services for the Hydro Equipment provided by Hydro to Services pursuant to this Agreement and shall give Services Notice thereof and of each change thereto. In the event that Services disputes that any charge for the Hydro Equipment is calculated in accordance with the provisions of this Agreement, then Services shall give Notice of its dispute to Hydro whereupon Hydro and Services shall endeavor in good faith to resolve the dispute provided, however, that either Hydro or Services may at any time refer the dispute for resolution pursuant to the Dispute Resolution Provisions.

6.4 No liability

Services shall have no liability to Hydro related to the use of the Hydro Equipment associated with

ordinary wear and tear associated or with usage of the Hydro Equipment not involving negligence or

wilful misuse. It is the intent of the parties hereto that the amounts payable by Services to Hydro for use of the Hydro Equipment includes an amount to compensate Hydro for the ordinary wear and tear that would result from the customary useage of the Hydro Equipment.

6.5 No Warranty

Services acknowledges that, except as expressly set forth in this Agreement Hydro makes no warranty, representation or indemnity, express or implied, with respect to the design, merchantability or fitness for particular purpose of any of the Hydro Equipment or arising from a course of dealing, usage or trade, and Services hereby expressly waives and disclaims all such warranties, representations and indemnities except that the Hydro Equipment is in industry standard condition for useage at the time that it is delivered to Services for useage. The warranties set forth in this Agreement constitute the only warranties made by a party hereto to the other party hereto with respect to this Agreement and are made in lieu of all other warranties or conditions, written or oral, statutory, express or implied.

11.1.3.1.1.1.1.1 ARTICLE 7 - SYSTEMS

7.1 No Charge

The parties hereto agree that the various charges by Hydro to Services pursuant to this Agreement include a component compensating Hydro for the use made by the Management, Office and Service Personnel of the computer hardware and software used by such Personnel in order to provide services to Services pursuant to this Agreement and, accordingly there shall not be any separate charge by Hydro to Services in relation to such use of computer hardware and software.

7.2 Reimbursement for Consumables

Notwithstanding the provisions of Section 7.1, Services shall reimburse Hydro for the cost to Hydro of any materials consumed through the use of Hydro's computer systems (for example, invoice

formats acquired by Hydro for use in invoicing Services' customers) in the course of Hydro performing its obligations to Services hereunder.

7.3 Meter Readers

Notwithstanding the provisions of Section 7.1, Services shall reimburse Hydro for a percentage of the amortization of the cost of Itron Meter Readers used to read water meter and electricity meters equal to the percentage that the total number of water meters read by such devices is of the total number of electricity and water meters read by such devices.

11.1.3.1.1.1.1.2 ARTICLE 8 - BILLING, COLLECTION, CUSTOMER SERVICES & TAXES

8.1 Allowed Functions

Hydro agrees that the Management, Office and Service Personnel may be used by Services to bill and collect bills issued by Services to its customers and to provide customer service to the customers of Services and that the charges for the Management, Office and Service Personnel so doing are included in the monthly charge payable by Services to Hydro pursuant to Section 3.6.

8.2 Services' Charges on Hydro's Invoices

Hydro agrees that, as part of the services provided by Hydro to Services pursuant hereto and paid for by Services by the payments made by Services to Hydro pursuant to Section 3.6, Hydro shall include reasonable space on the invoices sent by Hydro to its customers who are also customers of Services for the charges of Services to that customer. Hydro shall, promptly after receipt, remit to Services any amount received by Hydro on account of payment by a customer of charges by Services to the customer included on an invoice of Hydro.

8.3 Postage

Notwithstanding the provisions of Section 7.1, Services shall reimburse Hydro for the cost to Hydro to mail invoices to the water customers of The Regional Municipality of Halton by paying to hydro a percentage of the cost to Hydro to mail water and electricity invoices equal to the percentage that the total number of water invoices mailed is of the total number of electricity and water invoices mailed.

8.4 Taxes

The amounts stated in this Agreement to be payable by Services to Hydro pursuant to this Agreement do not include any taxes. Services shall be responsible for the payment of, and shall pay or reimburse Hydro if paid by Hydro, all Goods and Services Tax, Provincial Sales Tax and other taxes of a similar nature applicable to, or arising from the price or value, purchase or sale or the provision or use of any of the personnel, services and equipment provided by Hydro to Services pursuant to this Agreement, regardless of the period or entity actually taxed.

ARTICLE 9 – PROVISION OF INSURANCE COVERAGE

9.1 Coverage upon Request

Upon request by Services to Hydro, and subject to Hydro being reasonably able to do so and conditional upon Services paying any incremental cost to Hydro for so doing, Hydro shall add Services as an insured under the insurance policies of Hydro so as to make Services insured under such insurance policies.

11.1.4 ARTICLE 10 – PREMISES

10.1 Provision

Hydro shall, upon receipt of Notice from Services so requesting, make available to Services premises within the offices of Hydro located in the main offices, from time to time, of Hydro in Acton, Ontario for the conduct by Services of its business, subject to Hydro determining, in its sole and unfettered judgement, that it has space that could be made available to Services for such purposes. Any offices provided by Hydro to Services pursuant to this Section shall be separate, and shall have separate access from the offices of Hydro.

10.2 Codes Compliance

Hydro and Services shall co-operate and take all reasonable measures to insure that any premises made available by Hydro to Services pursuant to this Article are so made available in compliance with the requirements of the Codes.

10.3 Vacating Premises

In the event that:

(i) Hydro at any time determines that it needs the premises made available to Services pursuant to this Article in order for Hydro to conduct its own business; or

(ii) the Codes no longer allow Hydro to make available to Services premises within the offices of Hydro located in the of Hydro,

then Services shall vacate the premises made available by Hydro to Services pursuant to this Article within six (6) months of receipt of Notice to vacate from Hydro.

10.4 Office Equipment

Services shall be allowed the use of office equipment and supplies as part of the premises made available by Hydro to Services pursuant to this Article.

10.5 Payment

Services shall pay Hydro One Thousand Eight Hundred Thirty-Six Dollars and Forty-One Cents ($1,836.41) monthly for the premises and the use of office equipment and supplies made available by Hydro to Services pursuant to this Article. It is intended that the amount payable by Services to Hydro for the premises, equipment and supplies made available by Hydro to Services pursuant to this Article represents the fair market value thereof and either party hereto may at any time, but not more frequently than every six months, require the other party hereto to enter into discussions and agree to a new amount to be paid by Services to Hydro pursuant to this Article as representing the fair market value at the time of the premises, equipment and supplies made available by Hydro to Services pursuant to this Article and, failing such agreement, the matter may be resolved pursuant to the Dispute Resolution Provisions.

11.1.4.1.1.1.1.1 *ARTICLE 11 – PAYMENTS, INTEREST AND ADJUSTMENTS*

11.1 Payments

All amounts payable by a party hereto pursuant to this Agreement shall be paid within thirty (30) days of the receipt of the invoice therefor.

11.2 Interest

All amounts not paid by a party hereto within the time herein provided for the payment thereof shall bear interest until paid at the Prescribed Rate and all such interest payable by a party hereto shall be paid at the same time as the amount to which such interest relates is paid.

11.3 Adjustments

Upon the request of either party hereto, the parties hereto shall negotiate in good faith any change to this Agreement reasonably sought by a party hereto, without any obligation upon the parties hereto to agree to any change to this Agreement and, subject to express provision otherwise made elsewhere in this Agreement, the Dispute Resolution Provisions shall not apply to such negotiations.

11.4 Set-Off

A party hereto obliged to make a payment to the other party hereto may set off against the amount otherwise payable any amount to which the first party is then entitled to receive from the other party and to remit the other party the amount by which the amount owed by the first party to the other party exceeds the amount owed to it by the other party, if any, provided the first party informs the other party of it having so done prior to the date upon which the other party is obliged to remit to the first party the amount which the first party has set off against the amount other wise payable by the first party to the other party.

11.1.5 ARTICLE 12 – INDUSTRY CODES

12.1 Compliance is Objective

It is the expressed intent of both of the parties hereto that the arrangements provided for herein shall at all times be in compliance with the Codes as they apply to the parties hereto from time to time.

12.3 Best Efforts

Each party hereto shall use all reasonable efforts to comply with the Codes insofar as the Codes apply to the particular party. Each party hereto shall use all reasonable efforts (excepting such as would have an adverse economic consequence to the party) to adapt its conduct so as to allow the other party hereto to comply with the Codes insofar as the Codes apply to that other party.

12.2 Amendment

In the event that the parties hereto cannot voluntarily adapt their conduct so as to comply to the requirements of the Codes or if to so do would have adverse economic consequences to either party hereto, then either party may require the other party hereto to amend this Agreement such that both parties hereto would be in compliance with the requirements of the Codes and to adjust the economic provisions of this Agreement such that the burden of such compliance is properly borne by the party

which had the obligation to change this Agreement in order for it to comply with the Codes and, failing such agreement, the parties may have recourse to the Dispute Resolution Provisions to resolve the matter.

12.4 Code Session

Forthwith upon complete execution of this Agreement the parties hereto shall jointly host a meeting of all Administrative and Service Personnel that might be expected to provide services pursuant to this Agreement for the purposes of explaining the requirements of the Codes with respect to their provision of services and equipment to Services on behalf of Hydro pursuant to this Agreement.

11.1.5.1.1.1.1.1 ARTICLE 13 - STANDARDS

13.1 Standards of Performance

Except as specifically set forth herein, for the purpose of this Agreement the standards and practices of performance within the electricity transmission, distribution and generation industry in the Province of Ontario shall be the measure of the performance of a party hereto.

ARTICLE 14 - TERM

14.1 Original Term

Subject to Sections 14.2 and 14.3, the term of this Agreement shall begin on the date of this Agreement and will terminate at the end of the day preceding the first anniversary of the date hereof, such period being referred to as the "Original Term".

14.2 Extension of Original Term

Unless either party hereto gives the other party hereto written notice of termination of this Agreement at least ninety (90) days prior to the end of the Original Term or of any extension thereof pursuant to this Section, as the case may be, this Agreement shall automatically be renewed at the end of the Original Term or of any such extension thereof, as the case may be, for a one (1) year period upon the same terms and conditions in effect under this Agreement at the end of the Original Term or the end of the preceding extension thereof, as the case may be.

14.3 Termination by Agreement

This Agreement may be terminated at any time by the agreement of both parties hereto, a matter not to be determined pursuant to the Dispute Resolution Provisions.

12 ARTICLE 15 – TERMINATION

15.1 Expiry of Term

Upon expiration or termination of this Agreement the rights granted by each party hereto to the other party hereto shall immediately terminate and neither party hereto shall have any further obligations to the other party hereto except:

(i) to finally settle accounts between the parties hereto as regards the activities of the parties hereto during the Term of this Agreement;

(ii) as regards those matters that this Agreement provides will be done upon termination of this Agreement; and

(iii) as expressly otherwise provided in this Agreement.

15.2 Removal

Promptly upon termination of this Agreement for any reason, each party hereto shall, at its sole cost and expense, remove all of its equipment, facilities and other associated property from the property and facilities of the other party hereto under the supervision of such other party should such other party

desire. Should a party fail to effect such removal within thirty (30) days following termination of this Agreement, the equipment, facilities and other associated property of the party shall be deemed abandoned and may be removed by the other party at the expense of the party whose property is removed.

15.3 Effect of Termination

Notwithstanding the foregoing or any other provision of this Agreement, no termination or expiration of this Agreement shall effect the rights or obligations of any party hereto:

(i) with respect to any prior breach or any then existing defaults or the obligation to make any payment hereunder attributable to the period prior to the date of termination or expiration; or

(ii) with respect to those provisions of this Agreement which survive the expiry of the Term of the Agreement by virtue of the express provisions of this Agreement or necessary implication based upon the terms of this Agreement or the course of dealing between the parties to the Agreement.

12.1.1.1.1.1.1.1 ARTICLE 16 – FORCE MAJEURE

16.1 Generally

No party hereto shall be liable to the other party hereto for any default in performance or compliance with provisions of this Agreement if such default is due to any circumstance beyond the reasonable control of the affected party including, without limitation of the foregoing, any act of God, fire, flood, lack of or delay in transportation, the adoption or amendment of government codes, ordinances, laws, rules, regulations or restrictions that materially impair the affected parties performance hereunder, war or civil disorder, strikes, law, codes or other labour disputes. Notwithstanding anything in the preceding sentence of this Section, none of the foregoing shall excuse any default in payment of any amount payable pursuant to this Agreement.

13 ARTICLE 17 – DEFAULT

17.1 Events of Default

A party hereto shall be in default under this Agreement (a "Default") if:

(i) it fails to pay any amount which is due and unpaid within thirty (30) days of receipt from the party hereto to which the amount is due of a written notice (a "Payment Notice") that the amount is due and unpaid; or

(ii) the other party hereto gives it written notice that it has given it three (3) or more Payment Notices in any given twelve (12) month period;

(iii) in the case of any other material breach of this Agreement, it fails to cure such breach within thirty (30) days after notice specifying such breach, provided that if the breach is of a nature that cannot be cured within thirty (30) days, a default shall not have occurred so long as the breaching party has commenced to cure the breach within said time period and thereafter diligently pursues such cure to completion;

(iv) it becomes insolvent or bankrupt or any bankruptcy, reorganization, debt arrangement or other proceeding under any bankruptcy or insolvency law or any dissolution or liquidation proceeding being instituted by or against it; or

(v) the private or court appointment of a receiver or receiver and manager or officer with similar powers over any part of its property.

17.2 Remedies

In the event of a Default by a party hereto, the non-defaulting party may avail itself of one or more of the following remedies:

(i) take such actions as it determines, in its sole discretion, to correct the default; or

(ii) pursue any legal remedies it may have under applicable law or principles of equity, including specific performance; or

(iii) terminate this Agreement upon thirty (30) days prior written notice to the defaulting party.

Except as set forth to the contrary herein, any right or remedy of a party hereto shall be cumulative and without prejudice to any other right or remedy, whether contained herein or not.

ARTICLE 18 – TRANSFER

18.1 Prohibition

This Agreement may be not assigned in whole or in part by either party hereto without the prior written consent of the other party hereto. Each party hereto shall have the right to arbitrarily withhold, delay or condition such consent.

18.2 Exception re: Security

Notwithstanding any other provision of this Agreement, a party hereto may assign this Agreement as collateral security to a lender.

18.3 Exception re: Affiliate

Notwithstanding any other provision of this Agreement, either party hereto may assign this Agreement to an Affiliate or delegate the performance of its obligations under this Agreement to an Affiliate provided that the party hereto making any such assignment or delegation shall remain jointly liable with its assignee or delegate to the other party hereto with respect to the performance of this Agreement or of the obligations under this Agreement delegated.

18.4 Change in Control

In the event of a change in control of a party hereto, the other party hereto shall have the right to terminate this Agreement by giving Notice of termination to the party hereto who has had a change in Control. For the purposes of this Section, "Control" shall have the meaning given thereto for the purposes of the Ontario *Business Corporations Act*.

13.1.1.1.1.1.1.1 ARTICLE 19 - INSURANCE

19.1 Maintenance

During the term of this Agreement and at its sole expense, each party hereto shall maintain commercial general liability insurance which shall have a minimum limit of liability of five million dollars ($5,000,000.00) per occurrence and shall include premises and operations liability, contractor's contingency liability with respect to the operations of subcontractors, completed operations liability and contractual liability.

13.1.1.1.1.1.1.2 ARTICLE 20 – DISPUTE RESOLUTION PROVISIONS

14 20.1 Generally

Should any dispute or disagreement of any kind arise at any time with respect to the interpretation or application of this Agreement or the carrying out by a party of its obligations hereunder, the parties hereto agree that good faith negotiations shall take place between the parties hereto with the objective of resolving such dispute or disagreement, and the dispute or disagreement shall thereafter be referred to the Chief Executive Officers of the parties hereto who shall attempt in good faith to resolve such dispute or disagreement. If within the next following thirty (30) day period, the dispute or disagreement has not been resolved to the satisfaction of the parties hereto, the parties hereto to whose satisfaction such dispute or disagreement has not been resolved (the "Aggrieved Party") may refer the dispute or disagreement to binding arbitration pursuant to the *Arbitration Act*, 1991 (Ontario) in accordance with this Section by notice in writing to the other party hereto. Within ten (10) days of giving of such notice of arbitration, the parties hereto shall jointly select a single arbitrator who shall be independent of and acceptable to the parties. In the event that the parties hereto are unable to agree upon a suitable arbitrator within such ten (10) day period, the arbitrator shall be selected by a Justice of the Ontario Superior Court of Justice upon application by any party hereto.

20.2 Fees and Expenses

The fees and expenses of the arbitrator shall be split equally between the parties to the dispute.

20.3 Procedures

The arbitrator shall fix the appropriate procedures which may include an oral hearing. Unless the parties wish to mutually set the points at issue, the arbitrator shall order the parties to file statements pursuant to S. 25 of the Arbitration Act, 1991. The arbitrator may order interest on any award and the arbitrator may award costs to either party. In the absence of any such award of costs, each of the parties shall bear its own costs of any arbitration pursuant to this Section. The arbitrator shall be strictly bound by legal principles and the nature of this Agreement in rendering his decision.

20.4 Private Arbitration

The arbitration shall be completely private (subject to the regulatory requirements of any party or its Affiliates as a public company or regulated company) and shall take place in Toronto, Ontario unless the parties agree otherwise.

20.5 Arbitration Binding

The Parties agree that good faith negotiations and arbitration shall all be without recourse to the Courts and that the award of the arbitrator or arbitrators shall be final and binding, except that:

(i) either party may appeal an arbitration award to the Courts of the Province of Ontario on a question of law; and

(ii) either party may apply to a court of competent jurisdiction for an interim measure of protection.

15 ARTICLE 21 – INTELLECTUAL PROPERTY

21.1 No transfer of Rights

Except as otherwise expressly provided herein, this Agreement does not convey to a party hereto any right, title, estate or interest whatsoever in or to any of the copyrights, patent rights and other intellectual property rights of the other party hereto.

21.2 Jointly Developed Rights

15.1.1.1.1 The parties hereto shall own jointly and equally any copyrights, patent rights and other intellectual property rights that are developed by the parties pursuant to this Agreement. Should a party hereto wish to sell any or all of its interest in any jointly owned copyrights, patent rights and other intellectual property rights then the other party hereto shall have a Right of First Offer with respect to the interests wished to be sold, the terms of which shall be settled by arbitration pursuant to the Dispute Resolution Provisions in the event that such terms cannot be agreed by the parties hereto.

21.4 Logos

Services shall not use Hydro's name, logo or other distinguishing characteristics: (i) without the prior written consent of Hydro; and (ii) in the event use thereof by Services is consented to by Hydro, in a manner which would mislead consumers as to the distinction between Hydro and Services.

ARTICLE 22 - NON-DISCLOSURE

22.1 Definitions

For the purposes of this Agreement:

"**Information**" means: (i) all business, financial and technical information and data, whether oral or written, in whatever media or form, which is disclosed, directly or indirectly, by either party hereto to the other party hereto whether before, on or after the date hereof including, without limiting the generality of the foregoing, any other information or data relating to, comprising, describing or incorporating a party's current or proposed products, services, prices, suppliers, customers, dealers, agents, employees, businesses, business opportunities, addresses, locations, systems, specifications, drawings, sketches, designs, ideas, creations, inventions, formulas, improvements, models, samples, processes, codes, equipment, methods, techniques, experiments, demonstrations, prototypes, procedures, design methodology, evaluation methodology and criteria, trade secrets, business operations, reports, plans, forecasts, costs, salaries, sales, income, profit, profitability, pricing, business information, financial information and situation, business or marketing plans, distribution and other business strategies, current or historical data, test data, research, technology, computer systems, computer programs, source, object and any other codes, routines and other software and documentation, scientific, computer or technical information and network architecture maps, specifications and service; (ii) any information marked "private", "restricted", "confidential", "proprietary" (or otherwise marked or described so as to indicate confidentiality) or which, by the nature of the circumstances surrounding the disclosure thereof, ought in good faith be treated as confidential, in all cases in its original form or whether it is converted to different forms or combined with additional information, and including any information relating to third parties contained therein; and (iii) any notes, memoranda, summaries, analyses, compilations or any other writings relating howsoever to any of the foregoing prepared relative thereto by the receiving party or on its behalf.

22.2 Obligations Arising From Disclosure

During the course of the relationship established between the parties pursuant ot this Agreement, each party may disclose to the other party or permit the other party access to certain Information, either directly or indirectly. Each disclosure of Information will be made or permitted upon the basis of the confidential relationship established between the parties by this Agreement and upon each party's agreement that, unless otherwise specifically authorized in writing by the other, it will:

(i) *use the Information solely for the purpose for which it was disclosed;*

(ii) *take all reasonable care and precautions, at least as great as the care and precautions that it takes to protect its own confidential or proprietary information, to keep the Information confidential;*

(iii) *not disclose, or allow the disclosure of, any Information before or after the termination of this Agreement, except as permitted by this Agreement;*

(iv) *restrict disclosure of the Information only to its employees or other personnel, advisors, consultants and agents (collectively, "Representatives") with a need to know the Information and who are bound to maintain the Information confidential;*

(v) *notify each Representative that receives any Information of the requirements of this Agreement and of the restrictions on use and disclosure of Information imposed by this Agreement;*

(vi) *insure that no Representative breaches or causes or allows to be breached any of the receiving party's obligations hereunder and direct each Representative to abide by the terms of this Agreement;*

(vii) *not use, or allow to be used, howsoever any Information to compete with or in a manner detrimental or adverse to the commercial interests of the disclosing party;*

(viii) *except in connection with the purpose for which Information is disclosed, not copy or duplicate such Information or knowingly allow anyone else to copy or duplicate such Information; and*

(ix) promptly return to the disclosing party, upon its request made before or after termination of this Agreement, or certify as destroyed, the Information in whatever form and regardless of whether such Information was made or compiled by the receiving party or furnished by the disclosing party, together with all copies thereof, howsoever made.

22.3 **Exceptions**

The obligations under this Agreement shall not apply to any Information that the receiving party can demonstrate to the disclosing party's reasonable satisfaction:

(i) *became public and generally known through no act or omission of the receiving party or its Representatives;*

(ii) *was disclosed on a non-confidential basis in good faith to the receiving party by a third party which the receiving party had reasonable grounds to believe had legitimate possession thereof and the right to make such disclosure;*

(iii) *was in legitimate possession of the receiving party prior to its disclosure by the disclosing party to the receiving party;*

(iv) *that the receiving party is required by law, judicial or arbitration process to disclose, provided that, prior to disclosing any Information, the receiving party shall promptly notify the disclosing party of such requirement to disclose and take such steps as are reasonably necessary, and cooperate with the disclosing party, to lawfully limit such disclosure and to maintain the confidentiality of the Information in the hands of the receiving party, including obtaining appropriate protective orders; or*

(v) *is approved in writing by the disclosing party for release or other use by the receiving party according to the terms set out in such written approval.*

The burden of demonstrating the applicability of any exception in this Section shall be upon the party seeking to rely upon any such exception.

22.4 Discretionary Disclosure

Each party acknowledges that, notwithstanding the execution of this Agreement, each party maintains the sole and absolute discretion to determine what, if any, Information it will release to the other party. The receiving party acknowledges that the Information disclosed in any manner whatsoever is proprietary to the disclosing party.

22.5 No Warranty

Each party warrants that it has all requisite authorization to enter into this Agreement and that it has the right to disclose any Information disclosed to the other party. Each party acknowledges and understands that the other party makes no other representation or warranty in relation to any Information disclosed including, without limiting the generality of the foregoing, as to its adequacy, accuracy, or suitability for any purpose and, except as expressly agreed in writing, shall not be liable for any loss or damage arising from the use of the Information howsoever caused.

22.6 Intellectual Property

Each party acknowledges and agrees that all Information shall be owned solely by the disclosing party. Each party further agrees that nothing contained in this Agreement shall be construed as granting any rights, by licence or otherwise, under any intellectual property rights in, or concerning any of, the disclosing party's Information.

22.7 Indemnity

The receiving party shall indemnify and save harmless the disclosing party from and against all losses, liabilities, damages, costs and expenses (including reasonable legal fees and disbursements) suffered or incurred by the disclosing party as a result of a breach of a term of this Agreement by the receiving party or its Representatives.

22.8 Equitable Remedies

In the event of a breach or threatened breach of any term of this Agreement, the receiving party agrees that the harm suffered or that may be suffered by the disclosing party would not be compensable by monetary damages alone and, accordingly, that the disclosing party shall, in addition to other available legal or equitable remedies, be entitled to the issuance of immediate injunctive relief, specific performance and any other remedies in law or equity for such breach or threatened breach of the receiving party's obligations hereunder. The receiving party shall reimburse the disclosing party for all reasonable costs and expenses,

including reasonable legal fees and disbursements, incurred by the disclosing party in attempting to enforce the obligations under this Agreement of the receiving party or its Representatives.

22.9 Independent Activities

Each party, as a disclosing party, understands that the receiving party may currently or in the future be developing information internally, or receiving information from a third party that may be similar to the disclosing party's Information. Accordingly, nothing in this Agreement shall be construed as a representation or warranty that the receiving party will not develop products or services, or have products or services developed for it, or enter into any arrangement that, without violation of any of the provisions of this Agreement, compete with the products or services which are contemplated by, or which are the subject of, the disclosing party's Information or the purpose for which Information was disclosed.

22.10 No Implied Obligations

Neither this Agreement, nor the disclosure or receipt of any Information, shall imply or confirm any intention to enter into any contract or other business relationship, or to purchase any product or service, by either of the parties or any commitment by either of the parties with respect to the present or future development, production or distribution of any product or service.

22.11 Termination and Survival

Either party may terminate this Agreement at any time upon prior written notice to the other party. In the event that this Agreement is terminated, this Agreement shall not apply to any Information disclosed after such termination but, notwithstanding the termination of this Agreement, shall continue to apply to any and all Information disclosed prior to the termination of this Agreement.

16 ARTICLE 23 – NOTICES

23.1 Addresses

All notices and other communications from one party hereto to another (a “Notice”) that are required or permitted under this Agreement shall be in writing and shall be delivered by hand or by courier,

transmitted by facsimile, sent by mail or sent by e-mail to the party hereto to whom it is to be given at the address for such party below:

(i) to Hydro:

Postal Address: Halton Hills Hydro Inc.

16.1.1.1.1.1 **43 Alice Street**
Halton Hills (Acton), Ontario
L7J 2A9

Attention: The President

Telefacsimile Number: (519) 853-4148

16.1.1.1.1.1.1.1.1 Attention: The President

E-mail Address: guatto@hhhydro.on.ca

(ii) to Services:

Postal Address: Halton Hills Energy Services Inc.

16.1.1.1.1.2 **43 Alice Street**
Halton Hills (Acton), Ontario
L7J 2A9

Attention: The Vice President

Telefacsimile Number: (519) 853-4148

16.1.1.1.1.2.1.1.1 Attention: The Vice President

E-mail Address: gebersberger@hhhydro.on.ca

23.2 Time of Receipt

A Notice will be received for the purposes of this Agreement when actually received by intended recipient thereof. Notices shall be deemed to have been received in the following circumstances:

(i) when transmitted by facsimile or e-mail transmission, at 10:00 in the forenoon (local time of the recipient) on the next Business Day following the day upon which the Notice is transmitted, provided that another copy of the Notice is received or deemed received by the recipient by delivery, courier or post within ten days of the date of deemed receipt of the Notice by facsimile or e-mail transmission; and

(ii) by mail, on the tenth day (days upon which there is an interruption of postal service in Canada or the United States of America excepted) following the day on which the Notice was mailed.

23.3 Change of Address

A party hereto may change its address for the purposes of Section 23.1 by giving notice to the other party hereto and in such event all notices thereafter given to that party shall be to such changed address.

17 ARTICLE 24 – GENERAL

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24.1 Prior Agreements

This Agreement supersedes and terminates all prior agreements, understandings or writings between the parties hereto and their predecessors, whether written or oral and whether legally enforceable or not, in connection with the matters dealt with in this Agreement.

24.2 Inurement

This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors, assigns as provided for herein, receivers, receiver-managers and trustees.

24.3 Relationship of Parties

The relationship between the parties hereto shall not be that of partners, agents, or joint venturers for one another, and nothing contained in this Agreement shall be deemed to constitute a partnership or agency agreement between them for any purposes, including, but not limited, to federal or provincial income tax purposes. The parties hereto, in performing any of their obligations hereunder, shall be independent contractors or independent parties and shall discharge their contractual obligations at their own risk subject, however, to the terms and conditions of this Agreement.

24.4 Waiver in Writing

No waiver by a party hereto of any provision, or the breach of any provision, of this Agreement shall be effective unless it is contained in a written instrument signed by authorized officers or representatives of the party hereto. Such written waiver shall affect only the matter specifically identified in the instrument granting the waiver and shall not extend to any other matter, provision or breach.

24.5 Delay Not Waiver

The failure of a party hereto to give notice to any other party hereto or to take any other steps in exercising any right, or in respect of the breach or nonfulfillment of any provision of this Agreement, shall not operate as a waiver of that right, breach or provision nor shall any single or partial exercise of any right preclude any other or future exercise of that right or the exercise of any other right, whether in law or in equity or otherwise.

24.6 Acceptance of Payment Not Waiver

Acceptance of payment by a party hereto after the breach or nonfulfillment of any provision of this Agreement by another party shall not constitute a waiver of the provisions of this Agreement, other than any breach cured by such payment.

24.8 Amendments

This Agreement may only be amended by a written agreement executed on behalf of both parties hereto by their duly authorized representatives in such regards.

24.8 Time of the Essence

Time shall be of the essence of this Agreement.

24.9 Further Assurances

Each of the parties hereto shall at its own cost and expense, from time to time and without further consideration, execute or cause to be executed all documents and shall take or refrain from taking all actions which are reasonably necessary or reasonably desirable to give effect to the provisions of this Agreement.

24.10 Severability

In the event that any provision of this Agreement shall be adjudged to be invalid for any reason whatsoever, such invalidity shall not affect the operation of any other provision of this Agreement and such invalid provision shall be deemed to have been deleted from this Agreement.

24.11 Use of Name

Each party hereto agrees that it will not use, suffer or permit to be used, directly or indirectly, the name of any other party hereto for any purpose whatsoever without, in each instance, first obtaining the written consent of such other party.

24.12 Waiver of Relief

The parties acknowledge that any default, forfeiture or assignment provisions contained in this Agreement are, in view of the risks inherent in the business to be conducted by parties hereto, reasonable and equitable. Each party hereto waives any and all rights which it may have at law or in equity against default, forfeiture or penalty if such provisions herein are invoked.

24.13 No Third Party Beneficiaries

Nothing in this Agreement shall entitle any Person other than the parties hereto and their respective successors to any claim, cause of action, remedy or right of any kind in respect of this Agreement or the subject matter of this Agreement.

24.43 Attornment

Each party hereto irrevocably submits to and accepts the jurisdiction of the courts of the Province of Ontario, Canada and all courts of appeal therefrom as regards any legal proceedings relative to this Agreement. Each party hereto irrevocably waives, to the fullest extent that it may effectively do so, the defense of an inconvenient forum to the maintenance in the courts of the Province of Ontario and all courts of appeal therefrom as regards any legal proceedings relative to this Agreement. Each of the parties hereto agrees that a final judgement of the courts of the Province of Ontario, Canada or any court of appeal therefrom and in respect of which all appeal periods have expired without appeal shall be conclusive and may be enforced in other jurisdictions by legal proceedings on the judgement or in any other manner provided by law.

24.54 Good Faith

Each of the parties hereto shall have a duty to act in good faith in the performance and enforcement of this Agreement. All actions, activities, consents, approvals and other undertakings of the parties hereto shall be performed in a reasonable and timely manner.

24.16 Language of Agreement

The parties to this Agreement have expressly agreed that this Agreement be drawn in the English language. Les parties aux presentes ont expressement convenu que le present contrat soit redige en anglais.

24.17 Entire Agreement

This instrument (including all Schedules hereto, if any) states and comprises the entire agreement between the parties hereto relative to the subject matter hereof. There is no representation, warranty or collateral agreement relating to this transaction except as expressly set forth herein.

24.17 Counterpart and Facsimile Execution

This Agreement and any amendment, supplement, restatement or termination of any provision of this Agreement may be executed and delivered in any number of counterparts, each of which when executed and delivered is an original but all of which taken together constitute one and the same instrument. This Agreement may be executed by facsimile and the facsimile execution pages will be binding upon the executing Party to the same extent as the original executed pages. The executing Party covenants to provide originals of the facsimile execution pages for insertion into the original Agreement in place of the facsimile pages.

IN WITNESS WHEREOF the parties hereto have executed and delivered this Agreement effective as of the date first above written.

HALTON HILLS ENERGY SERVICES INC.

By: _____

19.1.1.1 Name:

_____

19.1.1.2 Title:

_____

HALTON HILLS HYDRO INC.

By: _____

19.1.1.3.1 Name: _____

19.1.1.3.2 Title: _____

By: _____

19.1.1.3 Name:
_____

Title: _____

By: _____

19.1.1.3.3 Name: **_____**

19.1.1.3.4 Title: **_____**

AMENDING AGREEMENT

(HHHI – SWE Services Agreement)

THIS AGREEMENT made this 1st day of January, 2007,

BETWEEN:

HALTON HILLS HYDRO INC.

- and -

SOUTHWESTERN ENERGY INC.
(Previously named Halton Hills Energy Services Inc.)

WHEREAS the parties hereto are parties to a Services Agreement made effective the 1st day of January, 2001 and such agreement, as heretofore amended, is herein referred to as the "Services Agreement"; and

WHEREAS the parties hereto wish to amend the Services Agreement in the manner hereinafter provided.

NOW THEREFORE, for good and valuable consideration, the receipt and adequacy whereof being hereby acknowledged by each party hereto to the other party hereto, the parties hereto covenant and agree as follows:

1. AMENDMENT TO CHARGE FOR MANAGEMENT AND OFFICE PERSONNEL SERVICES FOR 2007

The Services Agreement is hereby amended with respect to 2007 by deleting the words and numbers "Nine Thousand Six Hundred Fifty-One Dollars ($9,651.00)" from Section 3.6 of the Services Agreement and by substituting therefor the words and numbers "Nine Thousand Eight Hundred Thirty-Two Dollars and Fifty Cents ($9,832.50)".

2. CONTINUATION OF CHARGE FOR PREMISES AND OFFICE EQUIPMENT AND SUPPLIES THROUGHOUT 2007

It is agreed that the charges presently provided in Section 10.5 of the Services Agreement shall continue to be Five Thousand Dollars ($5,000.00) monthly throughout 2007.

3. EFFECTIVE DATE OF AMENDMENTS

The amendments of the Services Agreement made in this Agreement shall be effective on the date of this Agreement and shall apply only to the calendar year following the date of this Agreement.

4. RATIFICATION

Except as in this Agreement expressly otherwise provided, the Services Agreement is hereby ratified and confirmed and declared to continue and be in effect and binding upon the parties hereto in accordance with its terms as amended by the provisions of this Agreement.

5. FURTHER ASSURANCES

Each of the parties hereto shall, from time to time and at all times hereafter, at the request of the other party hereto and without further consideration, execute and deliver all documents, take or refrain from taking all actions and deliver all further assurances as may be reasonably required to give effect to the terms and intent of this Agreement.

IN WITNESS WHEREOF the parties hereto have executed and delivered this Agreement on the date first above written.

SOUTHWESTERN ENERGY INC.

By: _____

Arthur A. Skidmore,

Chief financial Officer

HALTON HILLS HYDRO INC.

By: _____

Daniel F. Guatto,

President