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October 31, 2012

*via RESS e-filing – signed original to follow by courier*

Ms. Kirsten Walli  
Board Secretary  
Ontario Energy Board  
PO Box 2319  
2300 Yonge Street, 27<sup>th</sup> floor  
Toronto, ON M4P 1E4

Dear Ms. Walli:

**Re: Toronto Hydro-Electric System Limited (“THESL”)  
OEB File No. EB-2012-0064 (the “Application”)  
Evidentiary update and deferred interrogatory responses**

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THESL writes in respect of the above-noted matter. Further to the letter of Aird & Berlis LLP circulated earlier today (attached here), please find enclosed THESL's evidence update. Also enclosed are THESL's responses to all interrogatories that were initially deferred, either in whole or in part, in anticipation of this update to THESL's evidence.

THESL will make available on its website a courtesy copy of the current version of its application and evidence, incorporating the updated materials.<sup>1</sup>

Please do not hesitate to contact me if you have any questions.

Yours truly,

*[original signed by]*

**Amanda Klein**  
Director, Regulatory Affairs  
Toronto Hydro-Electric System Limited  
[regulatoryaffairs@torontohydro.com](mailto:regulatoryaffairs@torontohydro.com)

cc: Fred Cass of Aird & Berlis LLP, Counsel for THESL, by electronic mail only  
Intervenor of Record for EB-2012-0064 by electronic mail only

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<sup>1</sup> <http://www.torontohydro.com/sites/electricsystem/Pages/2012IRM.aspx>

# AIRD & BERLIS LLP

Barristers and Solicitors

Fred D. Cass  
Direct: 416-865-7742  
E-mail: fcass@airdberlis.com

October 31, 2012

Kirsten Walli  
Board Secretary  
Ontario Energy Board  
PO Box 2319  
2300 Yonge Street  
Toronto, Ontario  
M4P 1E4

Dear Ms. Walli:

**Re: Application by Toronto Hydro-Electric System Limited; EB-2012-0064**

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We are writing to confirm that, today, Toronto Hydro-Electric System Limited (THESL) is filing with the OEB an update to its evidence in EB-2012-0064 (the "Update"). As stated in THESL's letters to the OEB dated September 13, 2012 and October 22, 2012, this Update reflects the results of THESL's review of the ICM jobs described in the application, to determine the extent to which the work plan must be updated to take account of the passage of time since the application was originally filed.

The Update represents a detailed, job-level review of the proposed capital expenditure program. THESL has applied this level of granularity to the Update for two reasons. First, the nature and circumstances of this incremental capital module ("ICM") application calls for an increased level of detail in the evidence. Second, the OEB has generally expressed a desire for more transparency and detail respecting THESL's evidence.

THESL sees the ICM as a regulatory instrument which allows for the funding of necessary capital expenditures in a context where there is no other mechanism available for funding those expenditures. These are the precise circumstances in which the utility finds itself – THESL presently has no other option to fund essential work. THESL believes that the work plan described in this update meets the requirements and intent of the incremental capital module as it has evolved over time, including the relevant ICM factors, such as need and prudence.

## Content and Organization of the Update

The Update will provide the OEB and intervenors with new forecasts of job scheduling and cost estimates that THESL has developed over the past five months.<sup>1</sup> The updated evidence primarily addresses a shifting of jobs between ICM years, due to both the passage of time, and THESL's operational experience, since the application was filed in May of 2012.

To this end, the Update is effectively a "snapshot in time" which provides a more refined and fine-grained picture of THESL's work plan for 2012 and 2013. Since the filing of the application, time has passed and THESL has needed to complete certain essential work and plan for near-term execution of other essential work. As a result, THESL has been able to further refine the information in the application on the timing and sequencing of certain jobs, as well as the cost estimates associated with that work. This new information is reflected throughout the updated evidence.

All of the activity funded as a result of the OEB's decision in this case will be subject to a true-up process. THESL is committed to developing a true-up mechanism satisfactory to the OEB and is open to working with Board staff and intervenors to that end. In this way, ratepayers can have the full benefit of needed capital works, while being protected against under-spend or imprudent over-spend.

THESL has also taken the opportunity that the updating of the evidence presents to include in the Update:

- (a) Removal of the Grid Solutions project;<sup>2</sup> and
- (b) Corrections to original evidence.<sup>3</sup>

Finally, THESL has included with the Update responses to the interrogatories it deferred on October 5, 2012. For convenience, THESL's responses in this regard include an index of deferred interrogatories.

THESL will file its update through RESS, deliver hard copies to the OEB and provide an electronic copy to intervenors. As soon as is possible, THESL also intends to provide to parties an electronic convenience copy, including the updated pages, of the sections of its evidence affected by the Update.

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<sup>1</sup> In some cases, THESL has been able to replace estimates with actuals.

<sup>2</sup> Pursuant to THESL's letter dated October 5, 2012.

<sup>3</sup> Discovered in the course of preparing interrogatory responses and the evidence update.

In order to assist readers of the evidence, THESL's presentation of the Update is as follows:

- (a) an Addendum to the Manager's Summary explains the evidence update;
- (b) a Segment Update Narrative is placed at the beginning of each updated segment business case, which in a separate text box summarizes the key elements of the evidence update for that segment;
- (c) marginal notations appear within each business case at the locations where changes have been made; and
- (d) Appendix "A" to the Addendum includes a Revision Summary which documents each substantive change to THESL's pre-filed evidence, and provides the fundamental reason for each change (this includes a key for the marginal notations in the business cases).

THESL's evidence, as updated, demonstrates the critical need for its work plan. The Update has been developed by knowledgeable operation-level employees who have the responsibility for identifying and implementing the work described in the evidence. In due course, these employees will be presented as the witnesses who will testify in support of THESL's evidence.

### **Phasing Request and Proposal**

THESL respectfully requests that the Board proceed to hear the application in two phases. THESL proposes that its work program for 2012 and 2013 be considered in the current phase of the proceeding and, with the exception of the Bremner Station project and associated capital contributions<sup>4</sup>, it proposes that consideration of 2014 projects be deferred to a second phase.

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<sup>4</sup> With respect to the Bremner Station project, and the associated capital contributions from THESL to HONI, THESL believes that it is necessary to treat that project as an integrated, three-year undertaking. Furthermore, THESL believes that its updated evidence supports both the updated timelines for the project and the associated expenditures through to the end of 2014, at which time Bremner is forecasted to be complete, subject to OEB approval. OEB approval for the whole of the first phase of the Bremner Station project is required at this time to enable THESL to enter into the construction and equipment supply commitments that are necessary to achieve completion by the end of 2014.

THESL makes this phasing proposal to facilitate an efficient and expeditious review of the ICM application for 2012/2013. There are a number of reasons why an expeditious hearing of THESL's application in respect of 2012 and 2013 is critical – these include the following.

For one, the capital work proposed in this application is essential to maintain the reliability of the distribution system for customers and the safety of employees and the public. For this reason, THESL has undertaken certain capital work in 2012 without the certainty of rates funding for that work. THESL forecasts that it will have spent a considerable amount of money beyond depreciation<sup>5</sup> on projects in 2012 – for a total of \$275 million by year-end – money that has been spent without any assurance of recovery. This is not a sustainable course for THESL.

Further, in order to provide ratepayers with certainty concerning rates to be effective in 2013, and to address critically needed capital work, THESL respectfully submits that there is an urgent need for OEB guidance regarding THESL's capital projects in 2012 and 2013.

As stated, THESL anticipates that the proposed phasing of its application will facilitate an expeditious consideration of 2012/2013 projects. THESL requests that a procedure be established to allow for a hearing of the current phase of the case before the end of 2012.

This procedure could include a Technical Conference, held as soon as possible after parties have reviewed the evidence update, where parties would be able to ask questions about, and seek clarification of, the updated evidence.

A phased approach to this proceeding would mean that evidence regarding 2014 could effectively be put "on hold" until the second phase of the proceeding. THESL has marked the evidence that is specific to 2014 using a "strikethrough" format, so that the Board and parties will be able to identify evidence that need not be addressed in the current phase of the proceeding. While this evidence is not being withdrawn, THESL would update it prior to the second phase of the proceeding. The update of the 2014 evidence would reflect the Board's decision in the current phase, the then most current forecast of the 2014 work plan, and THESL's progress on 2012 and 2013 projects at the time of the 2014 evidence update.

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<sup>5</sup> THESL estimates depreciation funding to be between \$140 and \$145 million, depending on the approach taken.

October 31, 2012

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If the OEB would like any additional information with respect to the contents of this letter or the Update, please do not hesitate to contact us in that regard.

Yours truly,

AIRD & BERLIS LLP



Fred D. Cass

FDC/

c.c. All EB-2012-0064 Intervenors  
Amanda Klein, THESL

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## 1 **Addendum to Manager's Summary – Summary of Updated Evidence**

### 3 **1. Introduction**

4 This evidence update is filed pursuant to section 11.02 of the OEB's Rules of Practice and  
5 Procedure.

6  
7 On September 13 and October 22, 2012, THESL advised the OEB and parties by letter that  
8 since much of 2012 has passed, THESL had undertaken a process to update its evidence to  
9 reflect the necessary rescheduling of the jobs constituting its proposed capital program,  
10 together with other consequential changes.

11  
12 This summary describes the nature and underlying rationale for THESL's evidentiary update  
13 in respect of 2012 and 2013. THESL's proposal for 2014 is described in further detail  
14 below.

15  
16 As described in its October 22, 2012 letter, THESL's update is fundamentally administrative  
17 in nature, representing a shifting of certain jobs between ICM years in order to reflect the  
18 reality of the passage of time in 2012 and THESL's operational experience since this  
19 application was filed in May. The movement of jobs from 2012 to 2013 is also partially a  
20 result of the limited funds available for 2012 capital expenditures as well as other factors  
21 discussed in greater detail later in this summary. THESL has also taken the opportunity to  
22 update certain forecast information that has recently become available. THESL provides  
23 this update to assist in providing the OEB and intervenors a more precise picture of its  
24 capital needs, and where possible for 2012, THESL has replaced forecasts with actuals.

25  
26 THESL sees the Incremental Capital Module as a regulatory instrument which allows for the  
27 funding of necessary capital expenditures in a context where there is no other mechanism  
28 available for funding those expenditures. These are the precise circumstances in which  
29 THESL finds itself – THESL presently has no other option to fund this essential work.

1 THESL believes that the workplan described in this update conforms to the requirements  
2 and intent of the incremental capital module as it has evolved over time, including the  
3 relevant ICM factors, such as need and prudence.

4  
5 All of THESL's work under an approved ICM will be subject to a true-up mechanism to be  
6 applied at the time of rebasing. THESL is committed to developing a true-up protocol  
7 which meets all of the Board's requirements. As discussed below, if the Board considers it  
8 advisable, THESL will work with Board Staff and Intervenors to develop such a protocol.

## 9 10 **2. Phasing Request, Urgency and Proceeding Timelines**

11 As requested through its counsel in the covering letter accompanying this update, while  
12 THESL maintains its three year request for ICM funding, it is proposing, with one  
13 exception, that 2014 be bifurcated from the 2012 and 2013 portions of the application and  
14 considered by the OEB in a second phase to be heard after a decision for 2012 and 2013.

15  
16 The sole exception to THESL's bifurcation request is the Bremner project together with the  
17 Bremner-related capital contributions to Hydro One.

18  
19 In order to provide THESL ratepayers with certainty concerning rates to be effective in  
20 2013, and to address critically needed capital work on its distribution system, THESL  
21 believes that phase 1 of the application must be heard as expeditiously as possible and in  
22 2012. THESL proposes that bifurcating and phasing this application will assist the OEB and  
23 all parties in addressing the 2012 and 2013 issues more effectively and expeditiously.

24  
25 THESL believes that the suite of capital work proposed is essential for maintaining the  
26 reliability of the distribution system for customers and the safety of employees and the  
27 public. To this end, THESL has undertaken the difficult task of balancing the need to  
28 undertake certain capital work in 2012 with the present lack of rates funding to do that work.  
29 THESL forecasts that it will have spent a considerable amount of money beyond

1 depreciation<sup>1</sup> on projects in 2012 – for a total of \$275 million by year-end - money which has  
2 been spent without certainty respecting recovery. This is not a sustainable course for  
3 THESL.

4  
5 As the Board will see, there are a number of factors which impact the scheduling of work  
6 with competing priorities.

7  
8 All of these factors emphasize the need for an expeditious decision on THESL's application.

9  
10 To the extent that the OEB grants THESL's phasing request, THESL anticipates that the  
11 OEB and intervenors will find it convenient to be readily able to distinguish evidence that  
12 would be effectively on hold until the second phase of this proceeding. To this end, THESL  
13 has presented the 2014-specific evidence in the application in "strikethrough format" to  
14 indicate that the 2014 evidence is subject to a future update. It is important to highlight that  
15 this approach should not be construed in any way as a withdrawal of the 2014-specific  
16 evidence or any diminution of THESL's commitment to it. Experience has shown that the  
17 2014 work will be much more effectively dealt with after THESL's overall work program has  
18 progressed. The same factors that justify and drive the update itself suggest that an  
19 examination of the 2014 work is most effectively conducted closer to the implementation  
20 date, and with the accumulated experience of the totality of the ICM work available. Subject  
21 to OEB approval, THESL proposes to file updated evidence to support 2014 expenditures  
22 in advance of phase two of this proceeding. Accordingly, THESL has not provided an  
23 update to the originally filed 2014 figures at this time.<sup>2</sup>

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<sup>1</sup> THESL estimates depreciation funding to be between \$140 and \$145 million, depending on the approach taken.

<sup>2</sup> THESL estimates that based on its updated forecast for 2012 and 2013, its total capital program for 2014 would be approximately \$500 million (excluding Bremner Station). However, this estimate has not yet been validated by factors including the necessary executability analysis as described throughout this document.

1 **3. Forecasts and True-Up**

2 THESL's update is effectively a "snapshot in time" which provides a more refined and fine-  
3 grained picture of THESL's work plan for 2012 and 2013, in particular. Since filing this  
4 application, time has passed and THESL has needed to execute certain essential work and  
5 plan for near-term execution of other essential work. As a result, THESL has been able to  
6 further refine the picture it presents in this application in respect of the timing and  
7 sequencing of carrying out certain jobs, as well as the cost estimates associated with that  
8 work, and this new information is reflected here and throughout the updated evidence.

9  
10 THESL's update does not represent a correction to its previously-filed job sequencing and  
11 cost estimates. Rather, this update reflects the reality of project planning for a utility that  
12 operates in a mature, congested urban environment. In undertaking jobs, THESL must  
13 contend with complexities including the intensification of development (like condominium  
14 complexes, the Pan-Am Games, and waterfront redevelopment), limited space for utility  
15 equipment installation, over a century of previous construction by various agencies often  
16 with missing or inaccurate historical records, and coordination with other City and utility  
17 reconstruction programs. These complexities lead to a continual evolution of job scope, and  
18 hence anticipated job costs throughout a job's lifecycle, from planning through design to  
19 execution.

20  
21 By necessity, the closer the utility gets to job execution, the more refined its forecasts will be.  
22 It is not until very close to the execution point of a job (and even sometimes well into  
23 project construction) that it is possible, or prudent, for a utility such as THESL to produce a  
24 detailed and fine-grained workplan in respect of job timing and cost estimates.

25  
26 These factors have become especially salient for THESL in 2012 given the passage of time,  
27 and the uncertainty with respect to rates funding for 2012 capital work. THESL has had to  
28 postpone certain jobs originally forecasted in its 2012 workplan. Accordingly, while THESL  
29 believes that the information in this update constitutes an appropriate snapshot in time, the  
30 forecasts provided are still directional in nature, and actuals may differ from those forecasts.

1

2 In short, given THESL's present circumstances - needing to execute certain essential work  
3 and plan for near-term execution of other essential work – the utility has found itself in the  
4 position of being able to further refine the picture for its 2012 and 2013 workplan. In an  
5 effort to provide the OEB and intervenors visibility into this refined picture, THESL is  
6 updating its application on this basis.

7 THESL believes that the OEB's true-up process offers valuable protection to ratepayers in  
8 this regard. Any ICM rate adders that THESL is granted will, at the time of THESL's  
9 rebasing, be reconciled to reflect actual, prudent spending – ratepayers are fully protected  
10 against any under-spending or imprudent over-spending. To this end, THESL is committed  
11 to implementing the true-up mechanism the OEB approves in an efficient and cooperative  
12 manner, and is receptive to working with OEB staff and intervenors to develop a detailed  
13 proposal in this regard.

14

15 Further details of THESL's updated workplan are provided below.

16

#### 17 **4. THESL's Updated Workplan in General**

18 THESL's updated evidence provides a detailed representation of the refined workplan  
19 forming the basis of this ICM application. All of the work represented by this plan is  
20 necessary to ensure an appropriate level of service and reliability for ratepayers, and safety  
21 for employees and the public. Every job identified in this update plays an important role in  
22 delivering those outcomes.

23

24 The job-shifting presented in this update has been occasioned by the passage of time since  
25 THESL filed its application in May of 2012 and the real-world experience that the utility has  
26 gained since that time. By the very nature of THESL's circumstances, it must implement a  
27 complex series of capital jobs in a dense, diverse and multi-party urban environment.  
28 Prioritization and planning often must recognize real-time obstacles and opportunities.  
29 While a given job may be assigned a high priority, THESL may have to wait for the best



1 opportunity to execute it. That opportunity may depend on a wide variety of factors, many  
2 of which are beyond THESL's control and involve numerous parties.

3

4 This kind of contingency also drives an important element of THESL's workplan, which is  
5 to maximize the effect of work at a given job site in light of the fact that THESL may not be  
6 able to return to that site whenever it chooses. In some instances this means that the most  
7 economical way of performing work which must be performed in due course may be to  
8 advance a portion of it.

9

10 Accordingly and as described in further detail below, the update documents movement of  
11 jobs between ICM years, and primarily from 2012 to 2013, with certain work being moved  
12 to 2014. Certain jobs necessarily span multiple years. Sometimes this is occasioned because  
13 execution of a complex capital work program such as THESL's necessitates sequencing  
14 execution of jobs throughout the year (i.e. not all jobs are begun on January 1 and completed  
15 on December 31 of a given year). In other instances, THESL must complete certain pre-  
16 construction design work late in one calendar year in order to execute the job in the  
17 following calendar year.

18

19 THESL is confident that the jobs identified for the 2012 and 2013 workplan are directionally  
20 accurate and can be effectively and substantially implemented in the manner described,  
21 subject to the constraints and needs for ongoing adjustments detailed in THESL's evidence.  
22 With the exception of the Bremner project and associated capital contributions, THESL  
23 believes that its request for funding for projects in 2014 should await a further update of the  
24 application at a time when its progress with the work can be properly incorporated.

25

26 With respect to the Bremner Station project, and the associated capital contributions from  
27 THESL to HONI, THESL believes that it is necessary to treat that project as an integrated,  
28 three-year undertaking. Furthermore, THESL believes that its updated evidence supports  
29 both the updated timelines for the project and the associated expenditures through to the  
30 end of 2014, at which time Bremner is forecasted to be complete, subject to OEB approval.

1 OEB approval for the whole of the first phase of the Bremner Station project is required at  
2 this time to enable THESL to enter into the construction and equipment supply  
3 commitments that are necessary to achieve completion by the end of 2014. As a result, the  
4 Bremner Station project, together with the associated capital contributions to Hydro One for  
5 that project, form the only exceptions to THESL's request that the OEB determine matters  
6 related to 2014 in Phase 2 of this application, after a further evidence update from THESL.  
7

## 8 **5. Specific Details of THESL's Updated Workplan**

9 THESL's evidentiary update effectively takes the form of an administrative shifting of  
10 certain portions of its three year workplan between the ICM years, and presents refined cost  
11 estimates that are now available given the passage of time.  
12

### 13 **Updates to Timing – Postponement of Jobs**

14 The primary driver for THESL's update to its evidence is the need to postpone some jobs  
15 from their original scheduling in 2012, and to move those jobs to 2013. This is a result of  
16 the passage of time since filing this application in May 2012. As described above, THESL  
17 undertook the difficult task of balancing the need to undertake certain capital work in 2012  
18 with the prevailing contingencies which are outlined below, which include the present lack of  
19 rates funding to do that work. THESL's revised 2012 workplan represents an effort to put  
20 that limited funding, comprised of depreciation and a further commitment by THESL - for a  
21 total of \$275 million<sup>3</sup> - to the best use.  
22

23 THESL has established sophisticated techniques to determine which needs of the  
24 distribution system have the highest priority from an electricity distribution perspective.  
25 Generally, these techniques identify which assets or conditions on the distribution system  
26 present the greatest risks to reliability and/or safety. In theory, THESL would execute the  
27 identified jobs starting from the highest electrical distribution priority and proceeding  
28 through each successive job on the priority list until it had exhausted its available resources.

---

<sup>3</sup> THESL estimates depreciation funding to be between \$140 and \$145 million, depending on the approach taken.

1  
2 However, in practice there are a number of factors that restrict THESL's ability to execute  
3 jobs in strict priority sequence. As THESL noted in its original evidence (for example, at  
4 page 7 of the Manager's Summary) the fact is that in the execution of a large scale  
5 construction program, events occur which cause the actual cost and timing of certain jobs to  
6 vary from what was initially forecast. These variances can be caused by a number of external  
7 factors which are uncertain or unforeseeable at the time the forecast was prepared. THESL  
8 further noted that in order to maintain the efficiency of its overall program, as described  
9 above, it would be necessary to adjust job timing to accommodate unforeseen delays in some  
10 jobs and to advance others so as to maintain efficient resource utilization.

11

12 Specific factors in this regard include:

- 13 • ***Specialized resource availability.*** For certain types of specialized skilled labour, there  
14 is a limited resource pool to draw from. For example, Paper Insulated Lead Covered  
15 cable jointing, network installation or replacement, and overhead box-construction are  
16 specialized skills that are largely unique to THESL, and few workers are trained or  
17 experienced in this type of work. THESL can only undertake a limited number of jobs  
18 in these categories, even if further work of high priority is called for. In addition, the  
19 availability of contractor electrical construction resources is limited, compared to those  
20 for civil work.
- 21 • ***Feeder loading restrictions.*** High system loading, especially during hotter weather,  
22 can prevent the transfer of load from a given feeder to an adjacent heavily-loaded  
23 feeder. These transfers are necessary to de-energize and isolate a feeder or portions of a  
24 feeder to allow a capital job to proceed. Feeder loading restrictions can thus impact the  
25 timing of specific jobs.
- 26 • ***Material lead-times.*** For some of the major assets like switchgear and breakers, the  
27 manufacturing lead-time can be up to a year. Even for relatively smaller assets, lead-  
28 times can be significant. THESL's work is subject to the variability of the supply chain,  
29 and supplier's inventories of parts.

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When THESL prepares medium and long-term workplans for rate filings and other business purposes, it considers the above-noted factors. As noted above, the reality of project planning, especially for a large urban utility that operates in a dynamic environment, is that it is not until very close to the execution point of a job (and even sometimes well into project construction) that it is possible, or prudent, for THESL to produce a detailed and fine-grained workplan in respect of job timing and cost estimates. By necessity, the closer the utility gets to job execution, the more refined its forecasts will be.

Given THESL's present circumstances - needing to execute certain essential work in 2012 and plan for near-term execution of other essential work in 2013 – the utility has found itself in the position of being able to further refine the picture for its 2012 and 2013 workplan. However, the required postponement of certain jobs occasioned by the passage of time and a more refined executability analysis, does not detract from the necessity of executing these jobs as soon as possible. The high priority ranking of this work persists and THESL still has no other choice but to do the work as soon as it can.

**Updates to Timing – Advancement of Jobs**

In a limited number of cases, THESL's updated evidence reflects the advancement of some jobs from their original scheduling in 2013 to their updated scheduling in 2012. This is a result of the factors noted above as well as labour and design considerations.

First, in order to maximize the efficient utilization of THESL's labour force, it is necessary to have work execution flowing continuously throughout the year. To achieve this, it is THESL's standard practice to advance some of the civil construction (of duct banks, pole installations, etc.) for jobs in a planned year into the prior year. This ensures that there is work available in the early months of the planned year for the electrical labour force to undertake. It also avoids constructing civil structures in those months when the ground is frozen and frost premiums apply to civil work.

1 Also, given the long timeframes associated with capital construction jobs, it is necessary to  
2 design these jobs months in advance of their actual construction. This allows time not only  
3 for the design itself, but also for material procurement (especially for long lead-time  
4 equipment like breakers, switches, and underground cable), circulation of designs drawings  
5 for review by other utilities, applying for and obtaining City permits, and utility plant locates.  
6 This often results in designs being advanced into the year prior to the planned construction  
7 year.

### 9 **Updates to Costs of Jobs, Segments, and Projects**

10 THESL's evidence update reflects the latest available information regarding job costs (and  
11 consequently, Segment and Project costs). Where actual information has become available  
12 through the course of executing jobs in 2012, it is reflected, and is accompanied by updated  
13 information on projected job costs.

14  
15 In addition, some cost estimates have been revised to reflect the transition from high level  
16 estimates used for planning purposes to detailed estimates used for execution purposes. For  
17 purposes of planning and budgeting, THESL follows a two-stage process for cost  
18 estimation. The first stage is the production of a high level estimate that is usually prepared  
19 using a cost per unit of work approach. For example, when producing the initial estimate  
20 for an underground direct buried job, THESL uses a cost per unit length parameter that  
21 reflects the cost of installing civil and electrical infrastructure based on a selected standard of  
22 construction. This approach is used for initial screening of jobs and avoids the significant  
23 cost involved to produce a detailed estimate for a job that may not go forward.

24  
25 As accepted jobs proceed toward the construction phase, THESL produces a detailed  
26 estimate based on the particular features of a specific job. A number of factors may cause  
27 the cost of a specific job to change from the average used for the initial estimate, and these  
28 factors are accounted for in the detailed estimate. (Additional factors, such as season, use of  
29 overtime labour, system loading, and real-time switching options may also affect actual costs  
30 versus detailed estimate costs.)

1

2 Over a large number of jobs, and through the rigorous application of structured project  
3 management techniques, the pluses and minuses of individual jobs may cancel out such that  
4 in aggregate the initial estimates form a reliable indication of the total cost of the jobs in the  
5 category. However, in the natural course of job progression, more specific information  
6 about individual jobs becomes available and this has been reflected in THESL's evidence  
7 update.

8

9 The updated cost information is reflected throughout the updated evidence for each  
10 Business Case and is summarized further below in Table 2. Please note that while THESL  
11 has confined the narrative Business Case evidence updates to cost changes greater than  
12 \$100,000, THESL has included all cost changes in its calculation of the revised costs for  
13 2012 and 2013. Due to time constraints, THESL has not updated its Feeder Investment  
14 Model calculations to reflect the revised costs and timing. However, THESL has no reason  
15 to believe that the FIM calculations contained within its application do not continue to be  
16 directionally accurate, and is not aware at this time of any case in which the conclusion for a  
17 particular job is affected.

18

### 19 **Additions of Jobs**

20 Through the course of executing jobs in 2012 and through ongoing evaluation, THESL has  
21 identified 10 jobs in 3 project segments (Underground Infrastructure, Feeder Automation,  
22 and HONI Contributions) which it proposes to add to those segments. The total cost of  
23 the additional jobs is \$5.5 million in 2012 and \$2.8 million in 2013. Explanations for the  
24 added jobs are provided in the corresponding business cases.

25

### 26 **Corrections to Original Evidence**

27 Through the course of preparing interrogatory responses and the evidence update, THESL  
28 has become aware of various errors contained in the evidence originally filed. In certain  
29 cases these errors are minor and relate only to presentation, rather than underlying

1 calculations; in other cases, underlying calculations were affected. Several corrections were  
2 noted in interrogatory responses. These corrections are shown in the updated evidence.

3

4 **Summary Report on Year-to-Date Spending**

5 THESL has prepared a summary report on spending to August 31, 2012, the latest date for  
6 which information is available. In addition, THESL has prepared an estimate of spending to  
7 year end, 2012. In Table 1 below, THESL presents this information by project segment.

1 **Table 1: Summary Report of Total 2012 Actual and Estimated Capital Spending**  
 2 **\$Millions**

Schedule Number	Projects	Segments	2012 Actuals (Aug/12)	2012 Forecast
B1	Underground Infrastructure and Cable	Underground Infrastructure	14.63	28.75
B2		Paper Insulated Lead Covered Cable - Piece Outs and Leakers	-	0.08
B3		Handwell Replacement	6.37	13.65
B4	Overhead Infrastructure and Equipment	Overhead Infrastructure	1.63	9.07
B5		Box Construction	0.02	0.58
B6		Rear Lot Construction	9.36	16.36
B7		Polymer SMD-20 Switches		
B8		SCADA-Mate R1 Switches		
B9	Network Infrastructure and Equipment	Network Vault & Roofs	0.65	2.84
B10		Fibertop Network Units	0.00	1.48
B11		Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)		
B12	Station Infrastructure and Equipment	Stations Power Transformers	-	0.38
B13.1 & 13.2		Stations Switchgear - Municipal and Transformer Stations	1.05	1.73
B14		Stations Circuit Breakers	0.11	0.76
B15		Stations Control & Communication Systems	0.03	0.14
B16		Downtown Station Load Transfers	0.03	0.68
B17	Bremner TS	Bremner Transformer Station	3.38	8.50
B18	Hydro One Capital Contributions	Hydro One Capital Contributions	18.21	22.98
B19	Feeder Automation	Feeder Automation	-	2.30
B20	Metering	Metering	2.41	4.74
B21	Plant Relocations	Externally-Initiated Plant Relocations and Expansions	2.23	10.16
C1	Operations Portfolio Capital		71.92	120.51
C2	Information Technology Capital		13.53	22.00
C3	Fleet Capital		0.73	0.80
C4	Buildings and Facilities Capital		3.01	5.00
	Allowance for Funds Used During Construction			1.20
<b>Total</b>			<b>149.30</b>	<b>274.68</b>

Note: Updated amount for 2012 Hydro One Capital Contributions reflects a credit amount from a prior period, unrelated to proposed ICM projects.

3 **Overall Cost Impacts**

4 The overall cost impacts of ICM job cost changes, job additions, and job timing changes is  
 5 summarized below in Table 2, by segment. With the exception of the Bremner project and  
 6 Bremner-related HONI contributions, the variances below are computed with respect to  
 7 2012 and 2013 only.



1 **Table 2: Overall Cost Impacts by ICM Segment**  
 2 **\$Millions**

Projects	Segments	2012 Original Cost	2012 Update Cost	Update - Original Variance	2013 Original Cost	2013 Update Cost	Update - Original Variance	2014 Original Cost	2014 Update Cost	Update - Original Variance	Total Original Cost	Total Update Cost	Update - Original Variance
Underground Infrastructure and Cable	Underground Infrastructure	46.9	28.8	(18.2)	53.0	58.9	5.9			-	100.0	87.7	(12.3)
	Paper Insulated Lead Covered Cable - Piece Outs and Leakers	17.3	0.1	(17.2)	5.2	5.4	0.2			-	22.5	5.5	(17.0)
	Handwell Replacement	12.0	13.7	1.6	14.5	16.7	2.2			-	26.5	30.3	3.8
Overhead Infrastructure and Equipment	Overhead Infrastructure	29.4	9.1	(20.4)	53.0	55.9	2.9			-	82.4	64.9	(17.5)
	Box Construction	10.2	0.6	(9.6)	20.5	23.0	2.5			-	30.7	23.6	(7.1)
	Rear Lot Construction	34.4	16.4	(18.0)	20.7	29.4	8.7			-	55.1	45.8	(9.3)
	Polymer SMD-20 Switches	3.1	-	(3.1)	2.9	1.5	(1.4)			-	6.0	1.5	(4.5)
	Scadamate R1 Switches	2.9	-	(2.9)	2.8	1.4	(1.4)			-	5.7	1.4	(4.2)
Network Infrastructure and Equipment	Network Vault and Roofs	13.6	2.8	(10.7)	12.3	18.8	6.5			-	25.9	21.6	(4.3)
	Fibertop Network Units	8.6	1.5	(7.1)	8.8	7.7	(1.1)			-	17.4	9.2	(8.2)
	Automatic Transfer Switches and Reverse Power Breakers	3.3	-	(3.3)	3.3	3.3	(0.0)			-	6.6	3.3	(3.3)
Station Infrastructure and Equipment	Stations Power Transformers	1.3	0.4	(0.9)	2.6	3.5	0.9			-	3.9	3.9	-
	Stations Switchgear - Municipal and Transformer Stations	19.3	1.7	(17.6)	18.8	21.8	3.1			-	38.1	23.5	(14.6)
	Stations Circuit Breakers	1.4	0.8	(0.6)	1.1	0.6	(0.5)			-	2.4	1.3	(1.1)
	Stations Control and Communication Systems	1.1	0.1	(1.0)	2.2	1.0	(1.2)			-	3.3	1.1	(2.2)
	Downtown Station Load Transfers	1.8	0.7	(1.1)	1.6	2.1	0.6			-	3.3	2.8	(0.5)
	Bremner Transformer Station	31.7	8.5	(23.2)	69.4	81.0	11.6	23.0	34.6	11.6	124.1	124.1	(0.0)
Hydro One Capital Contributions	25.3	23.0	(2.3)	52.1	48.1	(4.0)	27.0	37.0	10.0	104.4	108.1	3.7	
Feeder Automation	7.8	2.3	(5.5)	16.3	20.7	4.4			-	24.1	23.0	(1.2)	
Metering	Wholesale and Smart Metering	5.6	4.7	(0.9)	7.2	8.4	1.2			-	12.8	13.1	0.3
Plant Relocations	Externally-Initiated Plant Relocations and Expansions	24.3	10.2	(14.1)	17.7	24.8	7.2			-	41.9	35.0	(6.9)
Grid Solutions	Grid Solutions	2.4	-	(2.4)	3.6	-	(3.6)			-	6.0	-	(6.0)
<b>Total ICM</b>		<b>303.6</b>	<b>125.2</b>	<b>(178.5)</b>	<b>389.5</b>	<b>434.1</b>	<b>44.6</b>	<b>50.0</b>	<b>71.6</b>	<b>21.6</b>	<b>743.1</b>	<b>630.8</b>	<b>(112.3)</b>

Note: Hydro One Capital Contribution figures for 2014 reflect Bremner-related amounts only. Updated amount for 2012 Hydro One Capital Contributions reflects a credit amount from a prior period, unrelated to proposed ICM projects.

3 For clarity regarding the total costs of jobs, segments, and projects, THESL has classified  
 4 jobs according to the year of their commencement, recognizing that in many cases 2012 jobs  
 5 will now be carried over into 2013. Costs stated in the business cases follow this protocol.

1 However, for purposes of computing the ICM rate adders, THESL has entered the calendar  
 2 expenditure for each year. This is illustrated in Figure 1 below.

	2012	2013	2014	Project Cost
2012				
Job 1	20	4		Job 1 24
Job 2	13			Job 2 13
Job 3	19	13		Job 3 32
Job 4	51	17	11	Job 4 79
Job 5	4		19	Job 5 23
				2012 Job subtotal 171
2013				
Job 6		27	9	Job 6 36
Job 7		33	5	Job 7 38
Job 8		16		Job 8 16
Job 9		49	21	Job 9 70
Job 10			17	Job 10 25
				2013 Job subtotal 185
<b>Total Spend by Year</b>	<b>107</b>	<b>176</b>	<b>73</b>	<b>Total Project Cost 356</b>
			<b>Total Spend 356</b>	

**Figure 1: Illustrative Schematic of Cost Categorization**

3 In Figure 1, five hypothetical jobs are categorized as 2012 jobs because they commence in  
 4 that year. The total cost of those jobs is \$171. However, the capital spend in 2012 in this  
 5 illustrative example is \$107, which figure would be input to the ICM model in order to  
 6 derive the ICM rate adders. For 2013, the total of jobs 6 through 10 is \$185, but 2013  
 7 capital spending is \$176, consisting of spending on three 2012 jobs plus five 2013 jobs. In  
 8 this generalized example, some spending for both 2012 and 2013 jobs occurs in 2014,  
 9 although no 2014 jobs are depicted. Overall, total cumulative expenditures equal total  
 10 project costs.

11

12 **Presentation of Updated Evidence**

13 To assist the OEB and parties, THESL presents its updated evidence by the following  
 14 means:

- 1 A. Segment Update Narratives. A separate text box at the beginning of each updated  
2 segment business case summarizes the key elements of the evidence update for that  
3 segment.
- 4 B. Marginal Notations. Marginal notations (/c for corrections, /u for updates, etc.)  
5 appear within each business case at locations where changes have been made.
- 6 C. Summary Table of Revisions. A summary table of revisions is presented as  
7 Appendix A to this Addendum to the Manager's Summary.
- 8

## 9 **6. Rate Implementation**

10 As was discussed in Board Staff IR Tab 6B 1-11, VECC IR Tab 6L 11-120, and VECC IR  
11 Tab 6L 11-121, the timing of the hearing of this application will affect the implementation of  
12 rates. Based on the current expected timelines, THESL requests that proposed Rate Adders  
13 and Rate Riders be implemented beginning May 1, 2013. Accordingly, the Adders and  
14 Riders have been recalculated assuming that implementation date, as discussed below. The  
15 new proposed and updated rate adders and riders are reflected in the updated 2013 Tariff  
16 Sheets (Tab 3, Schedule B2), and 2013 Bill Impact schedules (Tab 3, Schedule C2.2).

17

18 As THESL has noted in VECC IR Tab 6L 11-121, THESL expects to update both the 2013  
19 IRM rates and 2013 ICM rate adders using the Board's updated PCI index and associated  
20 change in the ICM threshold calculation, for implementation of 2013 rates once these values  
21 become available.

22

### 23 2012 ICM Rate Adders

24 As a result of the current timing of this proceeding, THESL proposes that the revenue  
25 requirement associated with approved 2012 ICM capital projects be collected over the two  
26 year, May 1 2013 to April 30 2015 period. The annual revenue requirement associated with  
27 the updated 2012 capital projects is shown in updated Exhibit E1.1, page 12 (or Tab E4.1 of  
28 the Excel model) and would normally be recoverable in each year of the three year IRM

1 period, 2012-14. The calculation of the rate adder is shown in the updated and corrected  
2 Exhibit E1.3.

3

4 2012 IRM Foregone Revenue Rate Riders

5 THESL proposes a new rate rider to collect the 2012 IRM component of rates which would  
6 have taken effect June 1, 2012, the date the Board has previously declared distribution rates  
7 interim. THESL has calculated the foregone revenue for the 11-month period June 1, 2012  
8 through April 30, 2013, using the difference between 2011 Board Approved distribution  
9 rates and a 0.68% increase in both the 2011 Board Approved fixed and variable components  
10 of distribution rates, applied to the 2011 Board Approved loads and customers.

11 THESL proposes to clear this amount over the remaining two rate years (2013-14) of the  
12 ICM period. The calculation of the 2012 IRM Foregone Revenue and proposed rate riders  
13 is shown in Tab 3, Exhibit F1. Any variance between the amount collected through this rate  
14 rider and the approved amount would be cleared in the next rebasing filing.

15

16 2011 Year-End Rate Base Foregone Revenue Rate Riders

17 As described on pages 4-6 of the Managers Summary, and calculated in Appendix 1 to the  
18 Manager's Summary, the unrecognized 2011 Rate Base results in a foregone revenue  
19 requirement over the 2012-14 period of \$38 million.

20

21 As a result of the timing of this proceeding, THESL now proposes to clear this amount  
22 through a two-year rate rider to be implemented May 1, 2013. The calculation of the revised  
23 rate rider is included as an update to Appendix 1 of the Managers summary.

1 **Appendix A – Revision Summary**

2

3 The Revision Summary provided in this appendix documents each substantive change to  
4 THESL’s prefiled evidence, and provides the fundamental reason for each change. The  
5 reasons behind these are briefly summarized below:

6

7 • Corrections (/C)

- 8 ○ Corrections to errors in the prefiled evidence (e.g. numbers transposed,  
9 typographical errors, incorrect references, etc)

10

11 • Cost Estimate Updates (/UF)

- 12 ○ Costs were updated based on the availability of more accurate estimates, as well  
13 as partial actual data for 2012.

14

15 • Additions of Jobs (/UF)

- 16 ○ In a few instances, a more refined project assessment identified the need for new  
17 jobs not included in the original scope.

18

19 • Data Updates (/UF)

- 20 ○ More accurate and updated data was provided where available (e.g. rates  
21 information, load forecasts, etc)

22

23 • Schedule Updates (/US)

- 24 ○ Jobs were shifted from 2012 to 2013 or 2014 due to the amount of work that  
25 could be undertaken in 2012, which was limited by one or more of the following:  
26 i. Labour: availability of specialized labour and the need to use available  
27 civil and electrical contractors efficiently  
28 ii. Availability of materials

- 1                   iii. Seasonal operational constraints – including weather (construction
- 2                                   limitations during winter) and system loading (difficulty in shifting load
- 3                                   during summer peak periods and limits on the number of scheduled
- 4                                   outages that can be imposed on an area)
- 5                   iv. Permitting delays
- 6                   v. Uncertainty of funding
- 7                   ○ Jobs were advanced from 2013 to 2012 due to:
- 8                                   i. The need to complete civil work before electrical work can commence
- 9                                   and the greater availability of external civil resources
- 10                                  ii. “Executability” of certain jobs because they could be designed/permited
- 11                                  in the near-term

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 93, 95	E10112	E10112 Purple Sageway 51M3 UG replacement NY51M3 electrical	Schedule Update (job deferred to 2014)	Civil work proposed to proceed in 2013
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 104	E11087	E11087 Grand Marshall Cable Repl SCNT47M1	Cost Estimate Update	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 89	E11301	E11301 FESI-12 Hupfield UG rebuild Phase 1 (SC47M3)	Cost Estimate Update	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 81	E11421	E11421 Glamorgan/Dundak UG Rebuild (SC51M29) Electrical	Cost Estimate and Schedule Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 89	E11438	E11438 Old Finch UG Rebuild Phase 1 - Civil (47M3)	Cost Estimate Update	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 89	E11439	E11439 Old Finch UG Rebuild Phase 1 - Electrical (47M3)	Cost Estimate and Schedule Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 74	E11483	E11483 Rebuild Ingleton 63M12 - Ph 1 - Civil	Cost Estimate Update	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 72	E11484	E11484 Rebuild Ingleton SCNT63M12 Ph 2 (Civil)	Schedule Update (job deferred to 2014)	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 27	E11592	E11592 FESI-12 NY51M6 Leslie/Nymark UG Cable Rehab Prt2	Cost Estimate and Schedule Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 27	E11593	E11593 FESI-12 NY51M6 Leslie/Nymark UG Cable Rehab Ph1	Cost Estimate Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 98	E11616	E11616 Meadowvale/Heatherbank 47M17 Cabling Civil	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 74	E12081	E12081 Rebuild Ingleton Main Ph A - Elect	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 74	E12094	E12094 Rebuild Ingleton Ph 1 Elect	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 74	E12096	E12096 Rebuild Ingleton Ph 3 Elect	Cost Estimate and Schedule Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 88-90	E12126	E12126 Morningview UG Rebuild Phase 1 - Civil (47M3) & Elec (47M3)	Cost Estimate and Schedule Update	Civil work and electrical design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 88-90	E12127	E12127 Morningview UG Rebuild Phase 2 - Civil (47M3)	Cost Estimate and Schedule Update	Civil work and electrical design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 89	E12157	E12157 Morningside/OldFinch UG Rehab - Civil (26M23 / 47M3)	Cost Estimate Update	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 43	E12188	E12188 H9M30 435 Markam Rd TH UG Rehab	Cost Estimate and Schedule Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 69	E12202	E12202 Rehab of Feeder NAE5-2M3 in McCowan and Kingston area (Electrical)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 47-48	E12209	E12209 Dalmatian/Choiceland 47M13 UG Rebuild-Civil SCNA47M13	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 104	E12212	E12212 Venture Drive UG Rebuild Civil SCNT47M1	Cost Estimate and Schedule Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 9-12	E12226	E12226 NY80M27/29 Yorkminster UG Tie Elec	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 9-12	E12227	E12227 NY80M29 Fenn/Foursome UG DB Rebuild Elect	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 48	E12228	E12228 Dalmatian/Choiceland 47M13 Rebuild -Electrical SCNA47M13	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 69	E12230	E12230 Rehab of Feeder NAE5-2M3 in McCowan and Kingston area (Civil)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 90	E12234	E12234 Neilson Industrial Ph3 UGDB Rebuild Civil (47M3)	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 90	E12235	E12235 Neilson Industrial Ph3 UGDB Rebuild Elec (47M3)	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 82-83	E12237	E12237 Cassandra NY53M25 UG Cable Rebuild (Electrical)	Schedule Update (job deferred to 2014)	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 98	E12239	E12239 Royal Rouge Trail UG Rebuild 47M17-Civil SCNA47M17	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 98	E12240	E12240 Durnford/Rylander/Tideswell 47M17 3-Ph Loop-Civil SCNA47M17	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 98	E12241	E12241 Rebuild Tallpine Subd and Durnford TH 47M17- Civil SCNA47M17	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 98	E12242	E12242 Royal Rouge Trail UG Rebuild 47M17-Electrical SCNA47M17	Cost Estimate and Schedule Update	Design work advanced to 2012

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 98	E12243	E12243 Durnford/Rylander/Tideswell 47M17 3-Ph Loop-Electrical SCNA47M17	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 98	E12244	E12244 Rebuild Talpine Subd and Durnford TH 47M17- Electrical SCNA47M17	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 40	E12256	E12256 Bridletowne Cable Replacement SCNA502M22 - Electrical	Cost Estimate and Schedule Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 40	E12259	E12259 Bridletowne Cable Replacement SCNA502M22 - Civil	Cost Estimate and Schedule Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 48	E12275	E12275 Muirbank 47M13 UG Rebuild - Ph 2 - Civil	Cost Estimate Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 98	E12281	E12281 Meadowvale/Heatherbank 47M17 Cabling Elec	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 104	E12288	E12288 NT47M1 - UG Rebuild in the Hutcherson Sq area Electrical Work SCNT47M1	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 104	E12300	E12300 NT47M1 - UG Rebuild in the Hutcherson Sq area Civil Work SCNT47M1	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 74	E12317	E12317 Rebuild Ingleton Main Ph B - Elect	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 89	E12319	E12319 26M23 New Feeder to Morningside - Old Finch (Electrical) SCNT47M3	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 98	E12335	E12335 47M17 Blue Anchor UG Rebuild Electrical SCNA47M17	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 98	E12336	E12336 47M17 Blue Anchor UG Rebuild Civil SCNA47M17	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 43	E12348	E12348 H9M30 UG Rebuild Muir Dr - Golf Club - Civil SCNAH9M30	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 89	E12357	E12357 Morningview UG Extension (26M23)	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 95	E12393	E12393 James Gray Drive UG Rebuild Elec NY51M3	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 95	E12394	E12394 James Gray Drive UG Rebuild Civil NY51M3	Cost Estimate and Schedule Update	Design work advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 78	E12493	E12493 FESI UG Rebuild NT63M8 Revis Sub Part 1- Civil SCNT63M8	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 78	E12494	E12494 FESI UG Rebuild NT63M8 Revis Sub Part 2-Civil SCNT63M8	Cost Estimate Update	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 78	E12495	E12495 FESI UG Rebuild NT63M8 Revis Sub Part 3-Civil SCNT63M8	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 104	E12520	E12520 FESI Conlins Milner NT47M1 - Civil	Cost Estimate Update	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 48	E13014	E13014 Holmcrest 47M13 UG Rebuild - Civil SCNA47M13	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 40	E13037	E13037 2501-61 Bridletowne UG 502M22 Rebuild Electrical SCNA502M22	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 52	E13074	E13074 UG Rehab of NY51M7 - Electrical	Schedule Update (job deferred to 2014)	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 56-58	E13098	E13098 NY51M24 UG Rebuild in Subdivision by Don Mills & Sheppard Part 1 - Electrical NY51M24	Schedule Update (job deferred to 2014)	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 56-58	E13101	E13101 NY51M24 UG Rebuild in Subdivision by Don Mills & Sheppard Part 2 - Electrical NY51M24	Schedule Update (job deferred to 2014)	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 53, 55	E13103	E13103 UG rebuild of NY51M24 Buchan Crt by Sheppard Ave E. - Electrical NY51M24	Schedule Update (job deferred to 2014)	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 15	E13289	E13289 UG Rebuild R26M34 Melford Customer Vaults	Schedule Update (job deferred to 2014)	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 101	E14026	E14026 Rebuild UG Trunk 502M21-28 Warden -Electrical	Schedule Update (job deferred to 2014)	



Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B01 - Underground Infrastructure	Tab 4, Schedule B1, Figures 1, 43A; Pages 4, 114-116-A	N/A	N/A	Correction	Figure and related narrative corrected to include only sustained interruptions attributed to direct buried cable failures. Original figure included both momentary and sustained interruptions.
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 130, Table 1	N/A	N/A	Correction	Some of the information previously listed in this table was included in error; the revised table reflects the corrected information.
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 134-136	N/A	N/A	Correction	Table and related narrative revised to more accurately reflect cost of options for correcting problems with direct buried cables.
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 140, 197	N/A	N/A	Correction	Revised estimated avoided risk cost to reflect correct application of annual discount rate
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 2-3	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 4, 110	N/A	N/A	Correction	"Circuit kilometers" corrected to "conductor kilometers"
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 17	W11385	W11385 FESI-12 Northwoods Subd UG Rebuild (55M8)	Cost Estimate and Schedule Update	Job deferred to 2013
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 60	W12077	W12077 Hoggs Hollow Electric and Civil	Cost Estimate Update	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 50-51	W12449	FESI - Lateral Cable & Tx Rehab Bathurst & Rockford	Cost Estimate and Schedule Update	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 51	W12451	FESI - UG Lat cable and transformer Rehab Cedarcroft, Patricia, etc.	Schedule Update (job deferred to 2014)	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 109	W12490	FESI-UG DB Cable Rehab Bombardier Supply	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 104A-104C	W13193	Arrow Rd. - Lateral UG Loop Replacement	Addition of Job	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 44-46	W13239	Northview Heights Electrical Rebuild	Schedule Update (job deferred to 2014)	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Pages 98A-98C	W13474, W13475	UG Cable Replacement on 85M31 at Lodestar Road, Toronto (Electrical) NY85M31	Addition of Job	
B01 - Underground Infrastructure	Tab 4, Schedule B1, Page 19	X11444	Tichester and surrounding civil electrical enhancement 35M10/35M9	Cost Estimate Update	
B02 - PILC	Tab 4, Schedule B2, Page 31	N/A		Correction	Error with intermediate calculation (does not affect end result).
B02 - PILC	Tab 4, Schedule B2, Page 15	X11532	Terauley Station Piece Out and Leakers	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B02 - PILC	Tab 4, Schedule B2, Page 15	X12512	Carlaw Station Piece Out and Leakers	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B02 - PILC	Tab 4, Schedule B2, Page 15	X12513	Leaside Station Piece Out and Leakers	Cost Estimate and Schedule Update	Job deferred to 2013
B02 - PILC	Tab 4, Schedule B2, Page 15	X12514	Esplanade Station Piece Out and Leakers	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B02 - PILC	Tab 4, Schedule B2, Page 2; Page 9, 10, 11, 12, 13, 14	X12779	Bridgeman to High Level PILC Feeder Replacement	Cost Estimate and Schedule Update	Job divided into phases, with necessary civil work proposed to proceed in 2013.
B02 - PILC	Tab 4, Schedule B2, Page 15	X13396	Windsor Station Piece Out and Leakers	Schedule Update (job deferred to 2014)	
B02 - PILC	Tab 4, Schedule B2, Page 15	X13397	Strachan Station Piece Out and Leakers	Schedule Update (job deferred to 2014)	
B02 - PILC	Tab 4, Schedule B2, Page 15	X13399	Dufferin Station Piece Out and Leakers	Schedule Update (job deferred to 2014)	
B03 - Handwell Replacements	Tab 4, Schedule B3, Page 2, Table 1; Page 14, Table 3	A12236	A12236 Handwell Standardization Remediation Continue	Cost Estimate Update	

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B03 - Handwell Replacements	Tab 4, Schedule B3, Pages 2, 13, 14	N/A	N/A	Cost Estimate Update	Project Segment Cost Estimate Update
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 161	E11088	E11088 North York SCADA (East) NY53M10 - Area A & D	Cost Estimate Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 108	E11243	E11243 Repl of Failing OH Assets on Feeder NY80M6 - Ph 2A	Cost Estimate Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 161	E11374	E11374 Scada Installations (8 switches) (NY34M6 )	Cost Estimate Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 172	E11805	Fibreglass Secondary Insulation Replacement	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 158	E12104	E12104 Chipping Crossburn 53M10 OH Rebuild	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 112	E12358	51M21 Rebuild OH Sections Part 1	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 112	E12361	51M21 Rebuild OH Sections Part 2	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 113	E12433	E12433 Voltage Conversion KHF2	Cost Estimate and Schedule Update	Job advanced to 2012
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 108	E12436	NY80M6 Feeder OH Enhancement Phase 3 NY80M6	Cost Estimate Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 174	E12457	E12457 CSP Transformer and Pole replacement NY80M5	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 112	E12459	Banbury/Post Rd OH Rehab: NY34M6, NY53M24, NY51M21	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 101	E12884	E12884 Rebuild Broadlands MS NYSS59 VC - Ph 2	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 101	E12892	E12892 Rebuild Broadlands MS NYSS59 VC - Ph 2	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 101	E12893	E12893 Rebuild Broadlands MS NYSS59 VC - Ph 2	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 172	E13110	NYSS68-F9 OH Rebuild Pleasant View	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 16 Table 1, Page 83, Page 180 Table 1	N/A	N/A	Correction	FIM Values
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 94	N/A	N/A	Correction	Transposition Error
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 4, 42	N/A	N/A	Correction	Transposition Error
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 37-39	N/A	N/A	Correction	Table 3 and Figures 24, 25, 26 Corrected
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Pages 2, 5, 8, 9, 11, 13, 30, 31, 42, 55, 77, 82, 83, 86, 91	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 103	W10275	Manby TS_load Transfer to Horner TS_Ele_2010	Cost Estimate Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 163	W11289	W11289 FESI 55M22 ROWNTREE CONTINGENCY (PH-6)	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 161	W12089	W12089 Remote Switch Install - Finch 85M31 & M2	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 161	W12253	W12253 11M7 Switch Replacement Jane/Woolner	Schedule Update (job deferred to 2014)	

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 158	W12284	CSP and Conductor Replacement	Cost Estimate and Schedule Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 98	W12292	W12292 FESI - Lomar OH Rebuild 55M25	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 97	W12309	W12309 FESI Spenvally Rebuild	Schedule Update (job shifted between 2012/2013)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 158	W12339	W12339 FESI CSP and Conductor Replacement 11M1 and 11M4	Schedule Update (job shifted between 2012/2013)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 158	W12351	W12351 FESI CSP and Conductor Replacement NY35M24	Schedule Update (job shifted between 2012/2013)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 118	W12491	FESI Rebuild and CSP replacement Ph#3	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 110	W12669	FESI 5 - Martin Ross & Flint Rebuild	Cost Estimate and Schedule Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 119	W13054	FESI Refurbish OH feeder ph#1	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 119	W13055	FESI Refurbish OH feeder ph#2	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 119	W13056	FESI Refurbish OH feeder ph#3	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 119	W13057	FESI Refurbish OH feeder ph#4	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 122	W13130	Refurbish OH Feeder - Epsom Downs	Cost Estimate Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 167	W13169	Weston Railway - OH Rebuild	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 124	W13206	Refurbish Feeder Laterals - Phase 2 of 2	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 95	WXXXXX	Danger and Caution pole replacement	Cost Estimate and Schedule Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 161	X12156	Replacement of manual switch with SCADA NY53-M8	Cost Estimate and Schedule Update	Job deferred to 2013
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 161	X12163	Replacement of manual switch with SCADA switch NY53-M6	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 159	X12179	Replacement of CSP transformers	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 116	X12204	Replacement of CSP transformer	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 95	X12461	X12461 35M12 O/H Rebuild Flamborough Dr	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 158	X12501	35M12 - O/H Rebuild - Keele St and Milford Ave NY35M12	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 147	X13004	Convert Dupont B71DU to 13.8 kV and remove B51DU	Schedule Update (job deferred to 2014)	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 161	E10387	E10387 Bermondsey SCADA	Cost Estimate Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 101	E12133	E12133 Rebuild Broadlands MS NYSS59 VC - Ph 2	Cost Estimate and Schedule Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 106	E13111	Overhead Rebuild R43M28	Cost Estimate Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 161	X12158	Replacement of manual switch with SCADA switch on Feeder NY53-M7	Cost Estimate Update	

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 109	X12175	Replacement of CSP transformer, YK35M1	Cost Estimate Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 161	X12176	Replacement of manual switch with SCADA switch on Feeder NY53M5	Cost Estimate Update	
B04 - Overhead Infrastructure	Tab 4, Schedule B4, Page 84-91, 161	X12182	Replacement of manual switch with SCADA switch on Feeder NY34-M5,NY34-M6,NY34-M7	Cost Estimate Update	
B05 - Box Construction	Tab 4, Schedule B5, Pages 1, 3, 7, 9, 10, 15, 18, 19	N/A	N/A	Cost Estimate and Schedule Update	
B05 - Box Construction	Tab 4, Schedule B5 Appendix J, Page 9, Table 2	N/A	N/A	Correction	FIM correction
B05 - Box Construction	Tab 4, Schedule B5, Page 4, Table 1; Page 153, Table 2	N/A	N/A	Correction	FIM correction
B05 - Box Construction	Tab 4, Schedule B5, Page 6, Table 2; Page 20, Table 5; Page 22, Table 6; Page 54, Table 31	X11452	Millwood MS: B2MD, Merton MS:B1MR, Partial Voltage Conversion	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B05 - Box Construction	Tab 4, Schedule B5, Page 6, Table 2; Page 20, Table 5; Page 23, Table 6; Page 57, Table 35	X12054	Voltage Conversion from 4kV to 13.8kV System TOB5DN	Cost Estimate Update	
B05 - Box Construction	Tab 4, Schedule B5, Page 6, Table 2; Page 21, Table 5; Page 23, Table 6; Page 59, Table 39	X12055	Voltage Conversion from 4kV to 13.8kV System TOB2DU	Cost Estimate and Schedule Update	Job advanced to 2012
B05 - Box Construction	Tab 4, Schedule B5, Page 6, Table 2; Page 20, Table 5; Page 22, Table 6, Page 34, Table 12	X12352	4.16kV B-7-CD OH Feeder Voltage Conversion to 13.kV System	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B05 - Box Construction	Tab 4, Schedule B5, Page 6, Table 2; Page 20, Table 5; Page 22, Table 6; Page 43, Table 17	X12445	B5HW and B3HW conversion/transfer to A200E	Cost Estimate and Schedule Update	Job deferred to 2013
B05 - Box Construction	Tab 4, Schedule B5, Page 7, Table 2; Page 22, Table 5; Page 23, Table 6; Page 59, Table 39	X13003	X13003 Convert 4KV Dupont B6DU to 13.8kV	Cost Estimate and Schedule Update	
B06 - Rear Lot	Tab 4, Schedule B6, Page 6	N/A	N/A	Correction	Figure should have compared "Real Lot" Overhead Outages
B06 - Rear Lot	Tab 4, Schedule B6, Page 14, Figure 3	N/A	N/A	Correction	As indicated in response to EP IR#41, Figure 3 is being withdrawn because of errors uncovered in the data underlying it
B06 - Rear Lot	Tab 4, Schedule B6, Page 4, 30-31, 39-42, 50	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B06 - Rear Lot	Tab 4, Schedule B6, Page 10, Table 1; Page 37; Page 38, Table 7; Page 71-72, Tables A1-A4; Page 73, Figure A4	N/A	N/A	Correction	FIM Values
B06 - Rear Lot	Tab 4, Schedule B6, Pages 43, 51, 59	N/A	N/A	Correction	Unit Counts

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 55	W11168	W11168-Albion F1 Silverstone - Elec	Cost Estimate Update	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 53	W11219	W11219 RATHBURN SAFI CONVERSION (Part-3) U/G (2011 CARRYOVER)	Cost Estimate Update	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41 Table titled "Listing of All Jobs" and page 47 Table in section 3.5 titled "Required Capital Costs"	W12561	Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 1	Cost Estimate Update	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41 Table titled "Listing of All Jobs" and page 47 Table in section 3.5 titled "Required Capital Costs"	W12562	Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 2	Cost Estimate Update	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 47	W12563	Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 3	Cost Estimate Update	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 47	W12564	Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 4	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 47	W12565	Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 5	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 47	W12566	Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 6	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 47	W12567	Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 7	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 60	W13017	Rear Lot #011 Ph#1 Electrical VC	Schedule Update (job deferred to 2014)	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 60	W13019	Rear Lot #011 Ph#2 Electrical VC	Schedule Update (job deferred to 2014)	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 60	W13020	Thorncrest (#011) RL VC Ph#5 Electrical	Schedule Update (job deferred to 2014)	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 60	W13142	Thorncrest (#011) RL VC Ph#5 Civil	Cost Estimate Update	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 47	W13195	Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 8	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 43	X11293	Forest Hill Rear Lot Civil PH#5	Cost Estimate Update	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 43	X12113	Forest Hill Electrical PH#4 HL UG ELECTRICAL	Cost Estimate Update	
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 43	X12114	Forest Hill Electrical PH#5	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41 Table titled "Listing of All Jobs" and page 57 Table in section 8.4 titled "Required Capital Costs"	X12184	Rear lot VC S/E Lawrence/Leslie P1 Electrical NYSS37F2	Cost Estimate and Schedule Update	Job deferred to 2013
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 57	X12185	Rear lot VC S/E Lawrence/Leslie P 2 Electrical NYSS37F2	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B06 - Rear Lot	Tab 4, Schedule B6, Pages 39-41, 57		Rear lot VC S/E Lawrence/Leslie P 3 Electrical NYSS37F2	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B07 - Polymer SMD-20 Switches	Tab 4, Schedule B7, Page 3, Table 1; Page 12, Table 3; Page 14, Table 4	N/A	N/A	Cost Estimate Update	Project Segment Cost Estimate and Schedule Update
B07 - Polymer SMD-20 Switches	Tab 4, Schedule B7, Page 2, Table 1; Page 13, Table 4	X12827	SMD-20 Replacement 2012	Cost Estimate and Schedule Update	
B07 - Polymer SMD-20 Switches	Tab 4, Schedule B7, Page 2, Table 1; Page 13, Table 4	X13419	SMD-20 Replacement 2013	Schedule Update (job deferred to 2014)	
B08 - SCADAMATE R1	Tab 4, Schedule B8, Pages 2, 16, 17, 18 Table 2	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B08 - SCADAMATE R1	Tab 4, Schedule B8, Page 18, Page 30 Table 1	N/A	N/A	Correction	Corrected FIM estimates
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 11-12, Table 3	X11362	X11362 -Loc# 4111 -Augusta and College	Cost Estimate Update	
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 11-12, Table 3	X11441	X11441 -Loc# 4512 -Eglinton Ave E./Holly St	Cost Estimate Update	
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 11-12, Table 3	X11529	X11529 Loc# 4790 Easy + West Vault Wellington St. W/ Emily St	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 8, Table 2	X12208	X12208 Loc#4485, 105 Adelaide St. West - Rebuild Vault Roof	Cost Estimate Update	
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 11-12, Table 3	X12289	X12289 Vault Loc#4412, Build a new Vault Adelaide St. West/Grand Opera Lane	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 8, Table 2	X12321	X12321 Loc#4931, Rebuild Vault Roof Front St. East and Jarvis St. A40GD	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 11-12, Table 3	X12371	X12371 -Loc# 4431 -Blue Jays Way and King St. West	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 11-12, Table 3	X12830	X12830 Loc# 4432 vault rebuild project	Cost Estimate and Schedule Update	Job deferred to 2013
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 11-12, Table 3	X12834	X12834 Vault Rebuild Project	Cost Estimate Update	
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 11-12, Table 3	X12835	X12835 Vault Rebuild Project	Schedule Update (job deferred to 2014)	
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 6, Table 1	X12844	X12844 Abandon Network Vaults	Schedule Update (job deferred to 2014)	
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 6, Table 1	X12858	X12858 Abandon 2 Network Vaults	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Page 8, Table 2	X12438	X12438 Vault Roof Rebuild Project	Schedule Update (job deferred to 2014)	
B09 - Network Vaults & Roofs	Tab 4, Schedule B9, Pages 2, 5, 6, 7, 8, 9, 13, 25	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B10 - Fibertop Network Units	Tab 4, Schedule B10, Page 19	N/A	N/A	Correction	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Page 33, Table 1	N/A	N/A	Correction	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X11840	4540_A66DX	Cost Estimate and Schedule Update	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12685	4517_A91A	Schedule Update (job shifted between 2012/2013)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12686	4517_A92A	Cost Estimate and Schedule Update	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12733	4794_A48CE	Cost Estimate and Schedule Update	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12736	4286_A53WR	Schedule Update (job shifted between 2012/2013)	

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12738	4499WV_A66H	Schedule Update (job shifted between 2012/2013)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12739	4219EV_A54WR	Schedule Update (job shifted between 2012/2013)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12741	N1034_A65H	Schedule Update (job shifted between 2012/2013)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12743	N1107_A53CS	Schedule Update (job shifted between 2012/2013)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12751	4219WV_A51WR	Schedule Update (job shifted between 2012/2013)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12780	4099_A66H	Schedule Update (job shifted between 2012/2013)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12781	4131_A67WR	Schedule Update (job shifted between 2012/2013)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12782	4131_A68WR	Cost Estimate and Schedule Update	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12783	4160_A69WR	Cost Estimate and Schedule Update	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12784	4336_A44GD	Cost Estimate and Schedule Update	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12785	4336_A48GD	Cost Estimate and Schedule Update	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12786	4523_A20T	Cost Estimate and Schedule Update	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12787	4553_A56H	Cost Estimate and Schedule Update	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12788	4625_A50DX	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12789	4651_A53H	Cost Estimate and Schedule Update	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12790	4651_A54H	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12791	4745_A55H	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12792	4897NV_A43CE	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12793	N1010_A41CE	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12794	N1102_A71CE	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12795	N1102_A72CE	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4003_A68H	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4068SV_A62H	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4106_A91A	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4123_A70H	Schedule Update (job deferred to 2014)	

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4164_A84A	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4176_A5K	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4177_A65WR	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4198_A64H	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4210_A34A	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4210_A36A	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4243_A12K	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4254WV_A75CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4274_A25W	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4274_A38W	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4317_A91A	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4325_A50CE	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4339WV_A92CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4394_A52CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4394_A53CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4412EV_A40GD	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4426_A72CE	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4438_A65WR	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4499EV_A65H	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4509_A62A	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4518_A70A	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4518_A71A	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4518_A72A	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4543EV_A7GL	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4555_A70CE	Schedule Update (job deferred to 2014)	



Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4562_A54WR	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4614_A42CE	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4619_A94B	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4627_A60CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4627_A61CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4630_A31DN	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4657_A43GD	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4667_A30DN	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4710SV_A60CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4726_A23T	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4736_A64H	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4752_A75CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4753_A48H	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4753_A49H	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4760_A10MN	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4769_A92B	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4777_A44CE	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4789_A91B	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4851_A5GL	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4883_A78CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	4940_A41GD	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	N1005_A77CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	N1033_A62H	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	N1051_A13K	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	N1051_A15K	Schedule Update (job deferred to 2014)	

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	N1053_A71CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	N1071_A78E	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	N1072_A92A	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	N1083_A43GD	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	N1083_A49GD	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	N1115_A94CS	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12825	V4476_A16L	Schedule Update (job deferred to 2014)	
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4205_A41GD	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4340_A49GD	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4376_A63H	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4378_A43CE	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4478_A66WR	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4521_A54WR	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4529WV_A49GD	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4653SV_A65CS	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4709_A39DN	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4710NV_A62CS	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4768NV_A12DX	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	4776SV_A44CE	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	N1011_A63WR	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	N1011_A66WR	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	N1029_A43GD	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	N1045_A77CS	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	N1087_A67WR	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	N1090_A37X	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	V4511_A16L	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	V4511_A17L	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Appendix A, Page 21 - 27	X12843	V4733_A16L	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B10 - Fibertop Network Units	Tab 4, Schedule B10, Page 1, 3, 4	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate Update
B11 - ATS & RPB	Tab 4, Schedule B11, Page 22	N/A	N/A	Correction	Incorrect units were used for the presented outage cost values
B11 - ATS & RPB	Tab 4, Schedule B11, Page 1, 5	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X11505	D9012 - Near 654 Castlefield, Toronto	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X12658	D3031 - 2108 Queen St East, Toronto	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X12798	4862 - 77 Ryerson Ave, Toronto	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X12799	4023 - Near 142 Pears Ave, Toronto	Cost Estimate and Schedule Update	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X12800	D9010 - 205 Richmond St W, Toronto	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X12801	D3022 - 75 Dowling Ave, Toronto	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X12802	4064 - 295 College St, Toronto	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X12822	4368 - 300 Dufferin St, Toronto	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X12822	4063 - 645 Adelaide St W, Toronto	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X00000	D3039 - 186 Cowan, Toronto	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 3	X12829	4515 - 25 Lascelles Blvd, Toronto;	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X13420	4086 - 499 St Clair Ave W, Toronto	Schedule Update (job deferred to 2014)	
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X13420	4081 - 700 St Clair Ave W, Toronto	Schedule Update (job deferred to 2014)	
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X13420	4321 - 245 Eglinton Ave W, Toronto	Schedule Update (job deferred to 2014)	
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X13420	4694 - 1669 Bloor St W, Toronto	Schedule Update (job deferred to 2014)	
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X13420	D3012 - 439 Sherbourne Ave, Toronto	Schedule Update (job deferred to 2014)	
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X13420	4109 - 100 Shaftesbury Ave, Toronto	Schedule Update (job deferred to 2014)	
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X13420	N1164 - 35 Jackes Ave, Toronto	Schedule Update (job deferred to 2014)	
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X13420	N1173 - 130 Merton St, Toronto	Schedule Update (job deferred to 2014)	

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B11 - ATS & RPB	Tab 4, Schedule B11, Page 6-7, Table 2	X13420	D9008 – 40 Scollard Rd, Toronto	Schedule Update (Job deferred to 2014)	
B12 - Station Power Transformers	Tab 4, Schedule B12, Page 1, Table 1	20675	S12389 Scarborough Golf Club Replace Transformer TR1 - 3/4 MVA	Schedule Update (Job shifted between 2012/2013)	Job deferred to 2013
B12 - Station Power Transformers	Tab 4, Schedule B12, Page 1, Table 1	20685	S12391 Thistletown MS replace transformer TR2 - 3/4 MVA. N/A	Schedule Update (Job shifted between 2012/2013)	Job deferred to 2013
B12 - Station Power Transformers	Tab 4, Schedule B12, Page 4; Page 34; Page 53, Table 1	N/A	N/A	Correction	
B12 - Station Power Transformers	Tab 4, Schedule B12, Pages 1,2	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B13.1 - Municipal Substation Switchgear Replacement	Tab 4, Schedule B13.1, Page 1; Page 7	N/A	N/A	Correction	
B13.1 - Municipal Substation Switchgear Replacement	Tab 4, Schedule B13.1, Page 2, Table 1	20427	S12320 Leslie MS Switchgear Replacement	Schedule Update (Job shifted between 2012/2013)	Job deferred to 2013
B13.1 - Municipal Substation Switchgear Replacement	Tab 4, Schedule B13.1, Page 2, Table 1	20750	S12416 Porterfield MS Replace Switchgear	Schedule Update (Job shifted between 2012/2013)	Job deferred to 2013
B13.1 - Municipal Substation Switchgear Replacement	Tab 4, Schedule B13.1, Page 2, Table 1	21338	S13090 Greencedar Lawrence MS Replace Switchgear	Cost Estimate Update	
B13.1 - Municipal Substation Switchgear Replacement	Tab 4, Schedule B13.1, Page 2, Table 1	21581	S13126 Neilson Dr MS Replace Switchgear	Cost Estimate Update	
B13.1 - Municipal Substation Switchgear Replacement	Tab 4, Schedule B13.1, Page 3, Table 1	22805	S14070 Thornton MS Replace Switchgear (pre-work)	Schedule Update (Job shifted between 2012/2013)	Job deferred to 2013
B13.1 - Municipal Substation Switchgear Replacement	Tab 4, Schedule B13.1, Page 5; Page 16; Page 22, Table 1	N/A	N/A	Correction	
B13.1 - Municipal Substation Switchgear Replacement	Tab 4, Schedule B13.1, Pages 1,3	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B13.2 - Transformer Stations Switchgear	Tab 4, Schedule B13.2, Page 1, Table 1, Page 8	25425	Strachan TS A7-8 switchgear replacement	Cost Estimate Update	
B13.2 - Transformer Stations Switchgear	Tab 4, Schedule B13.2, Page 1, Table 1, Page 10	22025	Carlaw TS A6-7E switchgear replacement	Cost Estimate and Schedule Update	
B13.2 - Transformer Stations Switchgear	Tab 4, Schedule B13.2, Page 1, Table 1, Page 13	20877	Wiltshire TS A3-4W switchgear replacement	Cost Estimate and Schedule Update	
B13.2 - Transformer Stations Switchgear	Tab 4, Schedule B13.2, Page 1, Table 1, Page 16	20492	Duplex TS A5-6DX switchgear replacement	Cost Estimate Update	
B13.2 - Transformer Stations Switchgear	Tab 4, Schedule B13.2, Page 20	N/A	N/A	Correction	Classification of HI for Carlaw A6-7E was incorrect
B13.2 - Transformer Stations Switchgear	Tab 4, Schedule B13.2, Page 34, Table 1	N/A	N/A	Correction	
B13.2 - Transformer Stations Switchgear	Tab 4, Schedule B13.2, Page 6; Page 28; Page 34, Table 1	N/A	N/A	Correction	
B13.2 - Transformer Stations Switchgear	Tab 4, Schedule B13.2, Pages 1, 2	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B14 - Stations Circuit Breakers	Tab 4, Schedule B14, Page 1, Table 1; Page 7	S13125	S13125 Leslie TS: Replace 51M7 and 51M8 KSO Oil CB	Schedule Update (Job deferred to 2014)	
B14 - Stations Circuit Breakers	Tab 4, Schedule B14, Page 1, Table 1; Page 7	S13146	S13146 Bermondsey TS: Repl. KSO OCB's (53M1, 53M9 & 53M11)	Schedule Update (Job deferred to 2014)	
B14 - Stations Circuit Breakers	Tab 4, Schedule B14, Page 3	N/A	N/A	Correction	Number of outdoor-mounted oil breakers was inaccurate
B14 - Stations Circuit Breakers	Tab 4, Schedule B14, Page 5	N/A	N/A	Correction	Graph was reflecting incorrect data

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B14 - Stations Circuit Breakers	Tab 4, Schedule B14, Page 5; Page 36; Page 43	N/A	N/A	Correction	
B14 - Stations Circuit Breakers	Tab 4, Schedule B14, Page 7	N/A	N/A	Correction	
B14 - Stations Circuit Breakers	Tab 4, Schedule B14, Page 2	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B15 - Station Control and Communication Systems	Tab 4, Schedule B15, Page 1, Table 1; Page 7	S12033	S12033 Improve SONET Redundancy: Split Toronto SONET Ring N/A	Schedule Update (Job shifted between 2012/2013)	Job deferred to 2013
B15 - Station Control and Communication Systems	Tab 4, Schedule B15, Page 1, Table 1	S13095	S13095 Improve SONET Redundancy: Sheppard TS to Ellesmere TS	Schedule Update (Job deferred to 2014)	
B15 - Station Control and Communication Systems	Tab 4, Schedule B15, Page 1, Table 1	S13096	S13096 SONET: Upgrade OC3 to OC12	Schedule Update (Job deferred to 2014)	
B15 - Station Control and Communication Systems	Tab 4, Schedule B15, Page 1, Table 1 cascaded throughout the document	S13292	S13292 Replacements of 14 MOSCAD RTUs in Etobicoke	Schedule Update (Job deferred to 2014)	
B15 - Station Control and Communication Systems	Tab 4, Schedule B15, Page 19	N/A	N/A	Correction	kW should be kVA
B15 - Station Control and Communication Systems	Tab 4, Schedule B15, Page 2, Table 2; Page 13+B786	S12554	S12554 Etobicoke replace 15 MOSCAD RTUs (Est 21881)	Cost Estimate Update	Project Segment Cost Estimate Update
B15 - Station Control and Communication Systems	Tab 4, Schedule B15, Page 2	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B16 - Downtown Contingency	Tab 4, Schedule B16 Pages 11, 21	N/A		Correction	Incorrect units were used for the presented outage cost values
B16 - Downtown Contingency	Tab 4, Schedule B16, Pages 1, 3, 6-8, 13-14, 18, 19, 20-21	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B16 - Downtown Contingency	Tab 4, Schedule B16, Page 1, Table 1; Page 7, Table 3	X11424	Feeder Tie A203BN to A240GD	Schedule Update (job shifted between 2012/2013)	
B16 - Downtown Contingency	Tab 4, Schedule B16, Page 1, Table 1; Page 6, Table 2	X11620	X11620 Dufferin - Bridgman Feeder Ties (4) - Electrical Dufferin(13.8	Cost Estimate Update	
B16 - Downtown Contingency	Tab 4, Schedule B16, Page 1, Table 1; Page 7, Table 3	X12131	Feeder Tie A34W to A256DN	Schedule Update (job deferred to 2014)	
B16 - Downtown Contingency	Tab 4, Schedule B16, Page 1, Table 1; Page 7, Table 3	X12132	Feeder Tie A57W to A273DN	Schedule Update (job deferred to 2014)	
B17 - Bremner TS	Tab 4, Schedule B17: Page 4; Page 5; Page 6; Page 6, Table 1; Page 30; Page 31; Figure 10; Page 32; Page 35; Page 35, Table 11; Page 36, Table 12; Page 41; Page 42; Page 42, Table 15; Appendix 5, Table 2, Page 12	N/A	N/A	Cost Estimate Update	
B17 - Bremner TS	Tab 4, Schedule B17: Page 2 footnote 2; Page 9; Page 10; Page 10 Table 2; Page 10, footnote 6; page 11, Figure 5; Appendix 2, Table 1, Page 3	N/A	N/A	Data Update	Updated based on 2012 load forecast
B18 - HONI Contributions	Tab 4, Schedule B18, Page 17	S12807	Strachan TS A7-8 switchgear replacement HONI Engineering Study	Correction	

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B18 - HONI Contributions	Tab 4, Schedule B18, Page 1			Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B18 - HONI Contributions	Tab 4, Schedule B18, Pages 1, 2, 8, 30, 34	S12812	Bremner TS Capital Contribution	Schedule Update (job shifted between 2012/2013)	Job shifted to 2013 and 2014
B18 - HONI Contributions	Tab 4, Schedule B18, Pages 2, 16, 17, 31, 39	S12981	Strachan TS A3-4 capital contribution	Addition of Job	
B18 - HONI Contributions	Tab 4, Schedule B18, Pages 2, 4, 5, 6, 19-A, 19-B, 31, 33, 41-A, 41-B	S12982	Glengrove TS A5-6 capital contribution	Addition of Job	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 33	E12595	E12595 - PPEast 2012 FA Project - Radio Coordination Study & Repeater Radio Installation	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Page 33	E12596	E12596 - PPEast 2012 Feeder Automation Project - Site Acceptance Tests	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Page 60	E12679	E12679 - East 2014 Repeater Radio Installation for Scarborough East	Addition of Job	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13314	E13314 PPEast 2013 Feeder Automation Project on SCNT63M3	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13315	E13315 PPEast 2013 Feeder Automation Project on SCNA502M28	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13318	E13318 PPEast 2013 Feeder Automation Project on SCNA502M21	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13331	E13331 Feeder Automation of SCNAH9M25	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13341	E13341 PPEast 2013 Feeder Automation Site Acceptance Test	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13348	E13348 Feeder Automation of SCNAR26M22	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13349	E13349 Feeder Automation of SCNAR26M21	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13350	E13350 Feeder Automation of SCNAR26M36	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13352	E13352 Feeder Automation of SCNAR26M34	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13353	E13353 Feeder Automation of SCNAR26M31	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13354	E13354 Feeder Automation of SCNAR26M32	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13355	E13355 Feeder Automation of SCNAH9M31	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13356	E13356 Feeder Automation of SCNAH9M32	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13357	E13357 Feeder Automation of SCNAH9M26	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 45	E13358	E13358 Feeder Automation of SCNAH9M23	Schedule Update (job deferred to 2014)	
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 56, 60	E14387	E14387-P03 PPEast Feeder Automation SCNAE5M2	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 56, 60	E14388	E14388-P03 PPEast Feeder Automation SCNAE5M4	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 56, 60	E14389	E14389-P03 PPEast Feeder Automation SCNAE5M6	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 57, 60	E14390	E14390-P03 PPEast Feeder Automation SCNAE5M8	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 57, 60	E14391	E14391-P03 PPEast Feeder Automation SCNAE5M10	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 57, 60	E14392	E14392-P03 PPEast Feeder Automation SCNAE5M21	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 57, 60	E14393	E14393-P03 PPEast Feeder Automation SCNAE5M22	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 58, 60	E14394	E14394-P03 PPEast Feeder Automation SCNAE5M23	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 58, 60	E14395	E14395-P03 PPEast Feeder Automation SCNAE5M24	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 58, 60	E14396	E14396-P03 PPEast Feeder Automation SCNAE5M25	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 58, 60	E14397	E14397-P03 PPEast Feeder Automation SCNAE5M26	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 59, 60	E14398	E14398-P03 PPEast Feeder Automation SCNAE5M27	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 59, 60	E14399	E14399-P03 PPEast Feeder Automation SCNAE5M29	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 59, 60	E14400	E14400-P03 PPEast Feeder Automation SCNAE5M30	Schedule Update (job shifted between 2012/2013)	Job advanced to 2013
B19 - Feeder Automation	Tab 4, Schedule B19, Page 60	E12679	E12679-East 2013 FA Repeater Radio Installation for Scarborough TS	Addition of Job	
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 2, 25-26, 33, 39, 43-44, 61, 123-124	N/A	General	Correction	Corrected non-asset risk and updated number of switching points in FIM analyses
B19 - Feeder Automation	Tab 4, Schedule B19, Page 24	N/A	General	Schedule Update (job shifted between 2012/2013)	Project Segment Scheduling Update
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 42-43	W13366	W13366 - 2013 FA - North York - Fairchild TS (80M1)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 42-43	W13367	W13367 - 2013 FA - North York - Fairchild TS (80M2)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 42-43	W13368	W13368 - 2013 FA - North York - Fairchild TS (80M4)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 42-43	W13369	W13369 - 2013 FA - North York - Fairchild TS (80M6)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 42-43	W13370	W13370 - 2013 FA - North York - Fairchild TS (80M8)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 37-38	W13371	W13371 - 2013 FA - Etobicoke - Horner TS (30M1)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 42-A, 43	W13372	W13372 - 2013 FA - North York - Fairchild TS (80M10)	Cost Estimate and Schedule Update	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 42, 43	W13373	W13373 - 2013 FA - North York - Fairchild TS (80M21)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 42-A, 43	W13374	W13374 - 2013 FA - North York - Fairchild TS (80M29)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 37, 38	W13375	W13375 - 2013 FA - Etobicoke - Horner TS (30M2)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 37, 38	W13377	W13377 - 2013 FA - Etobicoke - Horner TS (30M4)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 37, 38	W13378	W13378 - 2013 FA - Etobicoke - Horner TS (30M8)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 37, 38	W13379	W13379 - 2013 FA - Etobicoke - Horner TS (30M9)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 37, 38	W13380	W13380 - 2013 FA - Etobicoke - 38M12	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 37-A, 38	W13381	W13381 - 2013 FA - Etobicoke - 38M8	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 37-A, 38	W13383	W13383 - 2013 FA - Etobicoke - Manby TS (38M5)	Cost Estimate and Schedule Update	Job advanced to 2012

Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
B19 - Feeder Automation	Tab 4, Schedule B19, Pages 37-A, 38	W13384	W13384 - 2013 FA - Etobicoke - Manby TS (38M4)	Schedule Update (job shifted between 2012/2013)	Job advanced to 2012
B19 - Feeder Automation	Tab 4, Schedule B19, Page 38	W13483	W13483 - FA 2013 - P3 - Etobicoke Repeater Radio Survey/Install	Addition of Job	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 43	W13484	W13484 - FA 2013 - P3 - Fairchild Survey/Repeater Radio Installation	Addition of Job	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 38	W13485	W13485 - FA 2013 - P3 - Etobicoke SAT	Addition of Job	
B19 - Feeder Automation	Tab 4, Schedule B19, Page 43	W13486	W13486 - FA 2013 - P3 - Fairchild SAT	Addition of Job	
B20 - Metering	Tab 4, Schedule B20, Pages 3, 11, 18, 20		Wholesale Metering Market Settlement Compliance	Cost Estimate Update	
B20 - Metering	Tab 4, Schedule B20, Pages 3, 18, 38		Seal Expiring Meters	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 5-7 Table 1, Page 17-20, 22-24, Page 29 Table 5, Page 31-32 Table 6, Page 33-34	N/A	N/A	Cost Estimate and Schedule Update	Project Segment Cost Estimate and Schedule Update
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 5, Table 1, Page 24, Table 4	W10498	Weston Tunnel	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 6, Table 1; Page 29, Table 5	W12545	Keele St & hwy 401-PH2- Tunnelling under Hwy 401	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 7, Table 1; Page 32, Table 6	W12663	W12663 OH Reconfiguration- Beecroft Rd Extension Area NY80M22	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 5, Table 1; Page 24, Table 4	W12828	W12828 Metrolinx pole relocation at MartinGrove	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 7, Table 1; Page 32, Table 6	W12909	Lawrence and Allen Pole Relocation	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 6, Table 1; Page 24, Table 4	X11602	Strachan Electrical Relocation Part 1	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 6, Table 1; Page 24, Table 4	X11603	Strachan Electrical Relocation Part 1	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 6, Table 1; Page 24, Table 4	X11604	Strachan Electrical Relocation Part 1	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 6, Table 1; Page 24, Table 4	X11605	Strachan Electrical Relocation Part 1	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 6, Table 1; Page 31, Table 6	X11763	Dunn Ave Directional Drilling	Cost Estimate and Schedule Update	Job deferred to 2013
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 5, Table 1, Page 19, Table 2	X12635	Queens Quay Rebuild Phase 1	Cost Estimate Update	
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 5, Table 1, Page 19, Table 2	X12636	Queens Quay Rebuild Phase 2	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 5, Table 1, Page 19, Table 2	X12637	Queens Quay Rebuild Phase 3	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 7, Table 1; Page 32, Table 6	X12873	NW PATH Addition Ph1	Cost Estimate and Schedule Update	Job deferred to 2013
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 7, Table 1; Page 32, Table 6	X	North West PATH Addition Phase 2	Schedule Update (job shifted between 2012/2013)	Job deferred to 2013
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 7, Table 1; Page 32, Table 6	X	Dundas Street Overhead to Underground Phase 1	Cost Estimate and Schedule Update	Job deferred to 2013
B21 - Externally Initiated Relocation and Expansion	Tab 4, Schedule B21, Page 7, Table 1; Page 32, Table 6	X	Dundas Street Overhead to Underground Phase 2	Cost Estimate Update	



Project Segment / Category	Reference	Job/Scope #	Job Title	Type of Change	Comments
Manager's Summary	Manager's Summary, Page 11	N/A	N/A	Correction	Correction of typographical error; missing "not"
Manager's Summary	Manager's Summary, Page 6	N/A	N/A	Correction	Updates to half-year rule calculation
Manager's Summary	Manager's Summary, Page 13	N/A	N/A	Data Update	Updates to alternative revenue requirement calculation
Manager's Summary	Manager's Summary, Page 14, 21	N/A	N/A	Data Update	Updates to rates recovery proposal
Manager's Summary	Manager's Summary, Page 23-24	N/A	N/A	Data Update	Total capital request updated
C1- Building and Facilities Capital	Tab 4, Schedule C4, Page 2, Table 1	N/A	N/A	Schedule Update (job shifted between 2012/2013)	
C2 - Information Technology Capital	Tab 4, Schedule C2, Page 1, Table 1	N/A	N/A	Cost Estimate Update	
C3 - Fleet Capital	Tab 4, Schedule C3, Page 1-2	N/A	N/A	Cost Estimate Update	
C4 - Operations Portfolio Capital	Tab 4, Schedule C1, Page 1, 6, 7, 10	N/A	N/A	Cost Estimate and Schedule Update	
Rates	Tab 2, Appendix 1, Page 2	N/A	N/A	Data Update	Revised 2011 Unfunded Capex Rate Rider
Rates	Tab 3, Schedule B2	N/A	N/A	Data Update	Revised 2013 Rate schedules
Rates	Tab 3, Schedule C2.1	N/A	N/A	Data Update	Updated 2013 IRM Model
Rates	Tab 3, Schedule C2.2	N/A	N/A	Data Update	Updated 2013 Bill Impacts
Rates	Tab 3, Schedule D	N/A	N/A	Correction	Corrected RTSR rates
Rates	Tab 3, Schedule F	N/A	N/A	Data Update	Calculation of Lost 2012 IRM revenue rate riders
Rates	Tab 4, Schedule E1.1	N/A	N/A	Correction	Updated and corrected 2012 ICM workbook
Rates	Tab 4, Schedule E1.2	N/A	N/A	Data Update	Updated Threshold Spreadsheet
Rates	Tab 4, Schedule E1.3	N/A	N/A	Data Update	Updated 2012 ICM Rate Rider with Days of Service
Rates	Tab 4, Schedule E1.4	N/A	N/A	Data Update	Updated and corrected 2012 ICM workbook DOS rates
Rates	Tab 4, Schedule E2.1	N/A	N/A	Data Update	Updated and corrected 2013 ICM workbook
Rates	Tab 4, Schedule E2.2	N/A	N/A	Data Update	Updated and corrected 2013 ICM workbook input
Rates	Tab 4, Schedule E2.3	N/A	N/A	Data Update	Updated 2012 ICM Rate Rider with Days of Service
Rates	Tab 4, Schedules F1.1 and F1.2 through F22.1 and F22.2	N/A	N/A	Data Update	Updated 2012 and 2013 ICM worksheets
Incremental Capital Module	Tab 4, Schedule A, Page 1	N/A	N/A	Data Update	Updated revenue requirement and rate impact
Summary of Capital Program	Tab 4, Schedule A, Appendix 1	N/A	N/A	Data Update	Updated the amounts and schedules for capital requirements

1 By the operation of the half-year rule, this produces approved and actual, but unrecognized,  
2 ratebase in the amount of \$120 million. Because this amount is unrecognized in ratebase and  
3 rates for 2012 through to the time of rebasing, THESL experiences an effective disallowance of  
4 \$120 million of *approved* ratebase in rates for 2012, 2013 and 2014 under IRM (less  
5 corresponding depreciation over that period), even though those assets were installed and are  
6 being used to provide distribution services to customers at the end of 2011 (the “Approved-But-  
7 Forgone Ratebase”).

8  
9 THESL’s foregone capital-related revenue requirement corresponding to this amount of  
10 Approved-But-Forgone Ratebase is approximately \$12.7 million annually or \$38.0 million over /c  
11 the IRM period. Upon rebasing and subject to acceptance by the Board, the depreciated  
12 amount corresponding to the Approved-But-Forgone ratebase would enter ratebase, but under  
13 that rebasing there would be no recovery of the foregone capital-related revenue requirement  
14 incurred during the interim PCI years.

15  
16 In summary, the operation of the half-year rule in THESL’s circumstances would result in a  
17 permanent loss of approximately \$38.0 million dollars over the balance of the IRM term, unless /c  
18 remedied by the Board.

19  
20 **Three-Year Period**

21  
22 **THESL’s Proposal<sup>3</sup>** /u

23 The projects and annual amount of ICM funding sought in THESL’s Application represent the  
24 level of capital funding that THESL requires in order to conduct a capital program that is  
25 expected to maintain the current levels of safety and reliability of its distribution system in a  
26 predictable and cost-effective manner. Predictability of THESL’s capital program over a  
27 reasonable multi-year horizon is strongly conducive to the cost-effectiveness of that program.

28  
29 In this application THESL proposes a period of three years overall, with each distinct year (2012  
30 through 2014) being severable, and with each year having distinct distribution rates. THESL

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<sup>3</sup> Please also refer to THESL’s correspondence accompanying its filing of updated evidence on October 31, 2012

1 To demonstrate the significant differences in the ICM rate adders that would result from the  
 2 modified approach relative to the standard approach, THESL has filed the standard ICM models  
 3 at Tab 4, Schedules E1 to E3, together with the calculated adders from the alternative approach.  
 4 A summary of the comparative single year ICM revenue requirements and corresponding rate  
 5 adders for the Residential and General Service <50kW classes appears below in Table 1. In total /u  
 6 across 2012 and 2013, the proposed revenue requirement is lower by \$22.32 million, under the /u  
 7 alternate approach. THESL considers this to be significant from the perspective of rate /u  
 8 mitigation.

10 **Table 1: Comparative Revenue Requirements and Rate Adders** /u

Revenue Requirements \$ Millions		2012	2013	Total
Standard Methodology		\$ 10.08	\$ 39.87	\$ 49.95
Alternative Methodology		\$ 6.35	\$ 21.28	\$ 27.63
Difference		\$ 3.73	\$ 18.59	\$ 22.32
<b>Residential Rate Adders</b>				
<b>Standard Methodolgy</b>				
	Fixed Portion (\$/30days)	\$ 0.34	\$ 1.36	
	Variable Portion (\$/kWh)	\$ 0.00029	\$ 0.00114	
<b>Alternative Methodology</b>				
	Fixed Portion (\$/30days)	\$ 0.22	\$ 0.73	
	Variable Portion (\$/kWh)	\$ 0.00018	\$ 0.00061	
<b>Difference</b>				
	Fixed Portion (\$/30days)	\$ 0.12	\$ 0.63	
	Variable Portion (\$/kWh)	\$ 0.00011	\$ 0.00053	
<b>GS &lt; 50 kW Rate Adders</b>				
<b>Standard Methodolgy</b>				
	Fixed Portion (\$/30days)	\$ 0.46	\$ 1.81	
	Variable Portion (\$/kWh)	\$ 0.00043	\$ 0.00170	
<b>Alternative Methodology</b>				
	Fixed Portion (\$/30days)	\$ 0.29	\$ 0.97	
	Variable Portion (\$/kWh)	\$ 0.00027	\$ 0.00091	
<b>Difference</b>				
	Fixed Portion (\$/30days)	\$ 0.17	\$ 0.84	
	Variable Portion (\$/kWh)	\$ 0.00016	\$ 0.00079	

11 There are two further issues that relate to the multi-year features of THESL's ICM application.  
 12 First, THESL is aware that most of 2012 may have elapsed by the time that the Board issues its

1 Decision in this proceeding. The earliest date for rate implementation is unknown at this time. /u  
2 In these circumstances, THESL proposes that the OEB permit THESL to recover the approved /u  
3 2012 ICM adder amounts over the period from May 1, 2013 until April 30, 2015. THESL remains /u  
4 prepared to report to the Board on the progress of its capital program as of the end of 2012  
5 when that information becomes available in 2013.

6  
7 Second, the Board's Renewed Regulatory Framework for Electricity ("RRFE") is underway and  
8 may produce a revised framework early enough to be available for 2014 applications. While the  
9 implementation of the new framework remains to be determined, it is THESL's view that  
10 nothing in this application would constrain the adoption of a new framework for THESL, even  
11 prior to 2015. The Board's requirements for reporting and true-up reconciliation would remain  
12 applicable to THESL's ICM capital programs, and these ensure that no undue variances are borne  
13 by ratepayers or THESL.

#### 14 15 **Application of ICM Criteria**

16 As noted by the Board in the January 5, 2012 Decision with Reasons and Order on the  
17 Preliminary Issue in EB-2011-0144, the Board's thinking in respect of the ICM eligibility criteria  
18 has evolved. THESL has carefully reviewed the ICM Material and has sought to address and  
19 meet the Board's criteria for consideration and acceptability of ICM projects. THESL addresses  
20 each of these criteria below, beginning with those cited specifically by the Board in reference to  
21 a potential ICM application by THESL.

#### 22 23 **Discrete**

24 THESL's ICM portfolio consists of ten discrete programs, some of which are divided into  
25 segments and each of which is composed of numerous jobs to be completed across the three  
26 year period. For purposes of severability the programs, segments, and jobs are grouped into  
27 yearly categories. The ICM portfolio structure for each year is illustrated in Table 2 below.

1 **Table 2: ICM Portfolio Structure**

/u

<b>Projects</b>	<b>Segments</b>
<b>Underground Infrastructure and Cable</b>	<b>Underground Infrastructure</b>
	<b>Paper Insulated Lead Covered Cable - Piece Outs and Leakers</b>
	<b>Handwell Replacement</b>
<b>Overhead Infrastructure and Equipment</b>	<b>Overhead Infrastructure</b>
	<b>Box Construction</b>
	<b>Rear Lot Construction</b>
	<b>Polymer SMD-20 Switches</b>
	<b>Scadamate R1 Switches</b>
	<b>Network Vault and Roofs</b>
<b>Network Infrastructure and Equipment</b>	<b>Fibertop Network Units</b>
	<b>Automatic Transfer Switches and Reverse Power Breakers</b>
	<b>Stations Power Transformers</b>
<b>Station Infrastructure and Equipment</b>	<b>Stations Switchgear - Municipal and Transformer Stations</b>
	<b>Stations Circuit Breakers</b>
	<b>Stations Control and Communication Systems</b>
	<b>Downtown Station Load Transfers</b>
	<b>Bremner Transformer Station</b>
<b>Bremner Transformer Station</b>	<b>Bremner Transformer Station</b>
<b>Hydro One Capital Contributions</b>	<b>Hydro One Capital Contributions</b>
<b>Feeder Automation</b>	<b>Feeder Automation</b>
<b>Metering</b>	<b>Wholesale and Smart Metering</b>
<b>Plant Relocations</b>	<b>Externally-initiated Plant Relocations and Expansions</b>

2 Each project may contain jobs that are geographically dispersed across Toronto, but the projects  
 3 are nevertheless unified by one or more defining characteristics pertaining to the nature of the  
 4 work to be done. For example, the Overhead Infrastructure and Equipment Project addresses  
 5 the need to restore overhead distribution, and the jobs constituting this project are unified by  
 6 the fact that all of them address various forms of overhead plant in need of remediation.

7

8 Detailed descriptions of the scope and nature of the jobs contained within each project are  
 9 provided at Tab 4, Schedules B1 to B21. Each project is clearly identifiable, coherent, and  
 10 distinguishable from other projects, and THESL's evidence contains detailed descriptions of the  
 11 work to be undertaken within each project (i.e., the jobs).

/u

1 global perspective, the 'baby boom' phenomenon is unusual and is analogous to the  
2 demographic features of THESL's infrastructure.

3

4 **Interim Rates, Implementation of Rates, And True-Up Upon Rebasing<sup>6</sup>**

5 As a result of the events leading to THESL's IRM/ICM application for 2012 rates, the timing of  
6 the Application does not permit rates to be implemented for May 1, 2012 or for existing rates to  
7 be declared interim as of that date. Therefore THESL requests that the Board issue an Order  
8 making rates in effect as of May 31, 2012 interim as of June 1, 2012.

9

10 Such an order would not presuppose in any way the outcome of this proceeding, nor would it in  
11 any way bind the Board. Rather, it would provide the Board with additional flexibility with  
12 respect to the implementation of rates resulting from the Board's ultimate decision with respect  
13 to THESL's application, and it would afford THESL a reasonable opportunity to recover the costs  
14 approved by the Board for the 2012 rate year.

15

16 Given the uncertainty about when the proceeding will conclude, THESL proposes that the Board  
17 continue with the practice it followed in 2011 for THESL's rates, under which rates were  
18 implemented upon the conclusion of the proceeding but were effective as of an earlier date  
19 when rates became interim. In that case, the Board approved 'foregone revenue' rate riders  
20 which were designed to permit THESL an opportunity to recover the incremental revenue  
21 approved by the Board for the period between when rates became interim and when new rates  
22 were implemented.

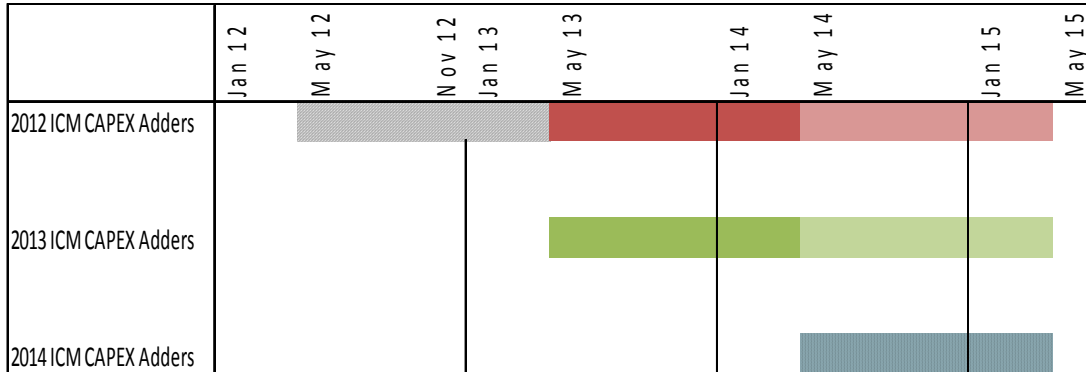
23

24 For the purpose of avoiding a large terminal revenue variance with respect to the 2012 ICM rate  
25 adder, and for the purpose of rate smoothing, THESL proposes that the OEB permit THESL to /u  
26 recover the allowed 2012 ICM revenue requirement through ICM rate adders effective from /u  
27 May 1, 2013 to April 30, 2015. /u

---

<sup>6</sup> Please also see the Addendum to the Manager's Summary

- 1 Under this approach, the duration of the respective rate adders over the ICM period is
- 2 illustrated below in Figure 1.



3 **Figure 1: Duration of Rate Adders**

/u

4

5 THESL makes these proposals on the basis of its understanding that upon rebasing, a final

6 determination of the allowed revenue requirement attracted by the actual ICM expenditures

7 will be made by the Board, and that actual revenue received under the ICM rate adders will be

8 reconciled to the ultimately approved amount, with any variance refunded to or collected from

9 customers in the 2015 rate year. The reconciliation between allowed and actual revenue would

10 be conducted regardless of the amount of the variance (unless it is immaterial) and regardless of

11 the date and manner in which rates were implemented throughout the period. THESL also

12 understands that the true-up process will account for the actual timing of jobs, and that a

13 variance in job timing would not, by itself, cause any job to become ineligible for inclusion in the

14 calculation of the actual revenue requirements associated with the ICM. On this basis both

15 ratepayers and THESL would be kept whole with respect to the approved ICM expenditures

16 actually made by THESL, and THESL would not be subject to a revenue deficit as a result of the

17 ICM rate adders being implemented later than May 1, 2012.

1 THESL cannot undertake the obligation to make the corresponding capital expenditures without  
 2 the opportunity to recover the associated costs through approved ICM rate adders.

3

4 **Comparison Between THESL’s Cost Of Service And IRM/ICM Applications**

5

6 **Capital Projects Not Included in This Application**

7 THESL’s former long-term capital plan, which was directed to stable and programmatic renewal  
 8 of distribution and general assets, and which was substantially approved by the Board in THESL’s  
 9 last three rate cases over the previous four years, cannot be conducted within the IRM/ICM  
 10 framework due to the restriction on capital spending that exists within that framework given the  
 11 non-discretionary criterion.

12

13 The capital plan outlined in this ICM application has been significantly curtailed relative to the  
 14 early rebasing application that THESL presented to the Board under file EB-2011-0144. The total  
 15 capital requested by year under each application framework is shown in Table 3 below.

16

17 **Table 3: Total Capital Requests – Rebasing vs ICM (\$ millions)**

/u

	2012	2013	2014	Total
REBASING	\$ 590.0	\$ 615.0	<del>\$ 640.0</del>	<del>\$ 1,845.0</del>
ICM	\$ 274.7	\$ 579.1	<del>\$ 439.5</del>	<del>\$ 1,422.7</del>
Difference	(\$315.3)	(\$35.9)	<del>(\$200.5)</del>	<del>\$ (422.3)</del>

18 THESL does not plan to execute projects such as Paper Insulated Lead Covered Cable  
 19 Replacement, Asbestos Insulated Lead Covered Cable Replacement, Stations Infrastructure,  
 20 Nomenclature, Grounding Compliance, Electric Vehicles and Modernization Initiatives in the  
 21 next three years. In addition, for continuing project areas such as underground infrastructure,  
 22 THESL now proposes further reductions in capital spending for the purposes of the submitted  
 23 ICM projects relative to previous proposals.



1 **Table 4: Distribution Plant Percentages of CAPEX – Rebasing vs ICM**

/u

REBASING	2012	2013	2014
Total Capital	\$ 590.0	\$ 615.0	\$ 640.0
Less Fleet, Facilities, Other	\$ (38.6)	\$ (37.8)	\$ (39.4)
Less IT	\$ (42.1)	\$ (48.2)	\$ (53.1)
Distribution Plant	\$ 509.3	\$ 529.0	\$ 547.5
Distribution Plant % of Total	86.3%	86.0%	85.5%
<b>ICM</b>			
Total Capital	\$ 274.7	\$ 579.1	<del>\$ 439.5</del>
Less Fleet, Facilities, Other	\$ (7.0)	\$ (8.4)	<del>\$ (8.0)</del>
Less IT	\$ (22.0)	\$ (15.0)	<del>\$ (15.0)</del>
Distribution Plant	\$ 245.7	\$ 555.7	<del>\$ 416.5</del>
Distribution Plant % of Total	89.4%	96.0%	<del>94.8%</del>

2 **Implementation of New Suite Meter Rate**

3 In its Corrected Decision and Order on Suite Metering Issues dated March 9, 2012 in EB-2010-  
 4 0142, the Board determined that a separate rate class should be created for multi-residential  
 5 customers that at the present time are served utilizing Quadlogic technology. In its Decision,  
 6 the Board directed THESL “to implement the new rate in conjunction with its rate setting  
 7 process for 2012” and “file a revised cost allocation model and related rates and other material,  
 8 reflecting the Board’s findings in this Decision”.

9  
 10 In its Final Order Regarding Suite Metering Issues dated April 26, 2012, the Board directed THESL  
 11 to:

- 12 (a) incorporate the rates of \$17.00 for the Quadlogic class fixed charge and \$0.02565 for  
 13 the Quadlogic class variable charge, and \$18.25 for the remaining Residential class fixed  
 14 charge and \$0.01507 for the remaining Residential class variable charge into its 2012  
 15 rate application in conformity with the Corrected Suite Metering Decision and  
 16 subsequent Board directives arising from this application;

<b>APPENDIX 1 TO MANAGER'S SUMMARY</b>				
(\$ millions)				
CapEx Approved 2011		378.8		
Funded through Depreciation		-138.8		
Fixed Assets Impact		240.0		
Closing Rate Base in 2011		120.0		
Opening Rate Base in 2012		120.0		
<b>Rate Base</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>Total</b>
Opening Rate Base	120.0	116.3	112.5	
Depreciation for the year	-3.8	-3.8	-3.8	
Closing Balance	116.3	112.5	108.8	
Average Balance	118.1	114.4	110.6	
<b>Revenue Requirement</b>				
Depreciation	3.8	3.8	3.8	11.3
Cost of capital (6.94%)				
Interest (	3.7	3.6	3.4	10.7
Return on	4.5	4.4	4.2	13.1
PILs	1.0	1.0	0.9	3.0
Total Revenue Requirement	<b>13.0</b>	<b>12.7</b>	<b>12.4</b>	<b>38.0</b>
<b>PILs Calculation</b>				
Target Net Inc	4.5	4.4	4.2	13.1
Add: Deprecia	3.8	3.8	3.8	11.3
Less: CCA	-5.4	-5.4	-5.4	-16.1
Income for PIL	2.9	2.8	2.6	8.3
PILs	0.8	0.7	0.7	2.2
Gross-up PILs	1.0	1.0	0.9	3.0
<b>Assumptions</b>				
Depreciation v	1.43	1.43	1.43	
Average life of	32 years	32 years	32 years	
Tax rate	26.40%	26.40%	26.40%	

## 2011 Unfunded Capex Rate Rider

Rate Class	Service Charge % Revenue A	Distribution Volumetric Rate % Revenue kWh B	Distribution Volumetric Rate % Revenue kW C	Service Charge Revenue D = \$N * A	Distribution Volumetric Rate Revenue kWh E = \$N * B	Distribution Volumetric Rate Revenue kVA F = \$N * C	Total Revenue by Rate Class G = D + E + F	Billed Customers or Connections H	Billed kWh I	Billed KVA J	Service Charge Rate Adder K = D / H / 12	Distribution Volumetric Rate kWh Adder L = E / I	Distribution Volumetric Rate kVA Adder M = F / J	Service Charge Rate Adder (DOS)	Distribution Volumetric Rate kWh Adder Rider	Distribution Volumetric Rate kVA Adder (DOS)
Residential	24.8%	13.9%	0.0%	\$ 4,721,947.34	\$ 2,653,142.98	\$ -	\$ 7,375,090.32	598,508	4,886,977,489	0	\$0.657461	\$0.000543		\$0.65	\$0.00054	
Residential Urban	1.0%	0.5%	0.0%	\$ 182,979.19	\$ 92,211.82	\$ -	\$ 275,191.01	24,898	99,791,184	0	\$0.612429	\$0.000924		\$0.60	\$0.00092	
General Service Less Than 50 kW	3.6%	9.1%	0.0%	\$ 691,144.25	\$ 1,731,751.20	\$ -	\$ 2,422,895.45	65,792	2,139,318,076	0	\$0.875414	\$0.000809		\$0.86	\$0.00081	
General Service 50 to 999 kW	1.1%	0.0%	28.5%	\$ 200,868.10	\$ -	\$ 5,429,674.43	\$ 5,630,542.53	13,067	10,116,374,153	26,935,191	\$1.281058		\$0.201583	\$1.26		\$0.1988
General Service 1,000 to 4,999 kW	0.8%	0.0%	8.9%	\$ 152,534.00	\$ -	\$ 1,697,131.92	\$ 1,849,665.92	514	4,626,928,262	10,587,119	\$24.729897		\$0.160302	\$24.39		\$0.1581
Large Use	0.3%	0.0%	4.5%	\$ 61,139.83	\$ -	\$ 852,836.39	\$ 913,976.22	47	2,376,778,323	4,993,733	\$108.403955		\$0.170781	\$106.92		\$0.1684
Street Lighting	0.5%	0.0%	1.8%	\$ 91,479.71	\$ -	\$ 333,235.13	\$ 424,714.84	162,777	110,165,016	322,023	\$0.046833		\$1.034818	\$0.05		\$1.0206
Unmetered Scattered Load	0.0%	0.6%	0.0%	\$ 2,363.65	\$ 122,963.46	\$ -	\$ 125,327.11	1,130	56,231,585	0	\$0.174362	\$0.002187		\$0.17	\$0.00219	
Unmetered Scattered Load	0.0%	0.0%	0.0%	\$ 4,602.84	\$ -	\$ -	\$ 4,602.84	21,729	0	0	\$0.017652			\$0.02		
				<b>\$ 6,109,058.91</b>	<b>\$ 4,600,069.47</b>	<b>\$ 8,312,877.87</b>	<b>\$ 19,022,006.25</b>									

Incremental Revenue Requirement for 2012

\$ 12,993,132.07

Incremental Revenue Requirement for 2013

\$ 12,681,337.50

Incremental Revenue Requirement for 2014

\$ 12,369,542.93

Total Revenue Requirement 2012-2014

A \$ 38,044,012.50

Annual Recovery over 2013-2014

B = A / 2 \$ 19,022,006.25

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

This schedule supersedes and replaces all previously approved schedules of Rates, Charges and Loss Factors

EB-2012-0064

## RESIDENTIAL SERVICE CLASSIFICATION

This classification is applicable to accounts where electricity is used exclusively for residential purposes in separately metered living accommodations, where the Competitive Sector Multi-Unit Residential classification is not applicable. Eligibility is restricted to dwelling units that consist of a detached house or one unit of a semi-detached, duplex, triplex or quadruplex building, with a residential zoning; separately metered dwellings within a town house complex or apartment building; and bulk metered residential buildings with six or fewer units. Further details concerning the terms of service are available in the distributor's Conditions of Service.

### APPLICATION

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

No rates and charges for the distribution of electricity and charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule, unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein

Unless specifically noted, this schedule does not contain any charges for the electricity commodity, be it under the Regulated Price Plan, a contract with a retailer or the wholesale market price, as applicable

It should be noted that this schedule does not list any charges, assessments, or credits that are required by law to be invoiced by a distributor and that are not subject to Board approval, such as the Debt Retirement Charge, charges for the Ministry of Energy Conservation and Renewable Energy Program, the Global Adjustment, the Ontario Clean Energy Benefit and the HST

### MONTHLY RATES AND CHARGES - Delivery Component

Service Charge	\$	18.50 (per 30 days)
Smart Meter Funding Adder	\$	0.68 (per 30 days)
2011 Unfunded Capex Rate Rider - MFC - Effective Until April 30, 2015	\$	0.65 (per 30 days)
2012 IRM Rate Rider - MFC - Effective Until April 30, 2015	\$	0.06 (per 30 days)
2012 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	0.52 (per 30 days)
2013 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	1.36 (per 30 days)
Distribution Volumetric Rate	\$/kWh	0.01527
2011 Unfunded Capex Rate Rider - DVR - Effective Until April 30, 2015	\$/kWh	0.00054
2012 IRM Rate Rider - DVR - Effective Until April 30, 2015	\$/kWh	0.00005
2012 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kWh	0.00043
2013 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kWh	0.00114
Rate Rider for Deferral/Variance Account Disposition (2012)	\$/kWh	-0.00043
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00807
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00561

### MONTHLY RATES AND CHARGES – Regulatory Component

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

This schedule supersedes and replaces all previously approved schedules of Rates, Charges and Loss Factors

EB-2012-0064

## COMPETITIVE SECTOR MULTI-UNIT RESIDENTIAL

This classification is applicable to accounts where electricity is used exclusively for residential purposes in a multi-unit residential building, where unit metering is provided using technology that is substantially similar to that employed by competitive sector sub-metering providers. Use of electricity in non-residential units of multi-unit buildings does not qualify for this classification and will instead be subject to the applicable commercial classification. Further details concerning the terms of service are available in the distributor's Conditions of Service.

### APPLICATION

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

No rates and charges for the distribution of electricity and charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule, unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein

Unless specifically noted, this schedule does not contain any charges for the electricity commodity, be it under the Regulated Price Plan, a contract with a retailer or the wholesale market price, as applicable

It should be noted that this schedule does not list any charges, assessments, or credits that are required by law to be invoiced by a distributor and that are not subject to Board approval, such as the Debt Retirement Charge, charges for the Ministry of Energy Conservation and Renewable Energy Program, the Global Adjustment, the Ontario Clean Energy Benefit and the HST

### MONTHLY RATES AND CHARGES - Delivery Component

Service Charge	\$	17.23 (per 30 days)
Smart Meter Funding Adder	\$	0.68 (per 30 days)
2011 Unfunded Capex Rate Rider - MFC - Effective Until April 30, 2015	\$	0.60 (per 30 days)
2012 IRM Rate Rider - MFC - Effective Until April 30, 2015	\$	0.05 (per 30 days)
2012 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	0.48 (per 30 days)
2013 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	1.27 (per 30 days)
Distribution Volumetric Rate	\$/kWh	0.02600
2011 Unfunded Capex Rate Rider - DVR - Effective Until April 30, 2015	\$/kWh	0.00092
2012 IRM Rate Rider - DVR - Effective Until April 30, 2015	\$/kWh	0.00008
2012 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kWh	0.00073
2013 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kWh	0.00194
Rate Rider for Deferral/Variance Account Disposition (2012)	\$/kWh	-0.00047
Shared Tax Savings Rate Riders - DVR - Effective Until April 30 2014	\$/kWh	-0.00010
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00807
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00561

### MONTHLY RATES AND CHARGES – Regulatory Component

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

This schedule supersedes and replaces all previously approved schedules of Rates, Charges and Loss Factors

EB-2012-0064

## GENERAL SERVICE LESS THAN 50 KW SERVICE CLASSIFICATION

This classification refers to a non-residential account whose monthly average peak demand is less than, or is forecast to be less than 50 kW. Further servicing details are available in the distributor's Conditions of Service.

### APPLICATION

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

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### MONTHLY RATES AND CHARGES - Delivery Component

Service Charge	\$	24.63 (per 30 days)
Smart Meter Funding Adder	\$	0.68 (per 30 days)
2011 Unfunded Capex Rate Rider - MFC - Effective Until April 30, 2015	\$	0.86 (per 30 days)
2012 IRM Rate Rider - MFC - Effective Until April 30, 2015	\$	0.07 (per 30 days)
2012 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	0.69 (per 30 days)
2013 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	1.81 (per 30 days)
Distribution Volumetric Rate	\$/kWh	0.02277
2011 Unfunded Capex Rate Rider - DVR - Effective Until April 30, 2015	\$/kWh	0.00081
2012 IRM Rate Rider - DVR - Effective Until April 30, 2015	\$/kWh	0.00007
2012 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kWh	0.00064
2013 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kWh	0.00170
Rate Rider for Deferral/Variance Account Disposition (2012)	\$/kWh	-0.00032
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00780
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00506

### MONTHLY RATES AND CHARGES – Regulatory Component

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

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EB-2012-0064

## GENERAL SERVICE 50 TO 999 KW SERVICE CLASSIFICATION

This classification refers to a non-residential account whose monthly average peak demand is equal to or greater than 50 kW but less than 1,000 kW, or is forecast to be equal to or greater than 50 kW but less than 1,000 kW. This rate also applies to bulk metered residential apartment buildings or the house service of a residential apartment building with more than 6 units. Further servicing details are available in the distributor's Conditions of Service.

### APPLICATION

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

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### MONTHLY RATES AND CHARGES - Delivery Component

Service Charge	\$	36.05 (per 30 days)
Smart Meter Funding Adder	\$	0.68 (per 30 days)
2011 Unfunded Capex Rate Rider - MFC - Effective Until April 30, 2015	\$	1.26 (per 30 days)
2012 IRM Rate Rider - MFC - Effective Until April 30, 2015	\$	0.11 (per 30 days)
2012 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	1.00 (per 30 days)
2013 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	2.65 (per 30 days)
Distribution Volumetric Rate	\$/kVA	5.6720 (per 30 days)
2011 Unfunded Capex Rate Rider - DVR - Effective Until April 30, 2015	\$/kVA	0.1988 (per 30 days)
2012 IRM Rate Rider - DVR - Effective Until April 30, 2015	\$/kVA	0.0172 (per 30 days)
2012 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kVA	0.1580 (per 30 days)
2013 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kVA	0.4168 (per 30 days)
Rate Rider for Deferral/Variance Account Disposition (2012)	\$/kVA	-0.0539 (per 30 days)
Shared Tax Savings Rate Riders - DVR - Effective Until April 30 2014	\$/kVA	-0.0067 (per 30 days)
Retail Transmission Rate – Network Service Rate	\$/kW	2.7947 (per 30 days)
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	1.9286 (per 30 days)

### MONTHLY RATES AND CHARGES – Regulatory Component

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

This schedule supersedes and replaces all previously approved schedules of Rates, Charges and Loss Factors

EB-2012-0064

## GENERAL SERVICE 1,000 TO 4,999 KW SERVICE CLASSIFICATION

This classification refers to a non-residential account whose monthly average peak demand is equal to or greater than 1,000 kW but less than 5,000 kW, or is forecast to be equal to or greater than 1,000 kW but less than 5,000 kW. This rate also applies to bulk metered residential apartment buildings or the house service of a residential apartment building with more than 6 units. Further servicing details are available in the distributor's Conditions of Service.

### APPLICATION

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

No rates and charges for the distribution of electricity and charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule, unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein

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### MONTHLY RATES AND CHARGES - Delivery Component

Service Charge	\$	695.83 (per 30 days)
Smart Meter Funding Adder	\$	0.68 (per 30 days)
2011 Unfunded Capex Rate Rider - MFC - Effective Until April 30, 2015	\$	24.39 (per 30 days)
2012 IRM Rate Rider - MFC - Effective Until April 30, 2015	\$	2.11 (per 30 days)
2012 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	19.38 (per 30 days)
2013 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	51.13 (per 30 days)
Distribution Volumetric Rate	\$/kVA	4.5105 (per 30 days)
2011 Unfunded Capex Rate Rider - DVR - Effective Until April 30, 2015	\$/kVA	0.1581 (per 30 days)
2012 IRM Rate Rider - DVR - Effective Until April 30, 2015	\$/kVA	0.0137 (per 30 days)
2012 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kVA	0.1256 (per 30 days)
2013 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kVA	0.3314 (per 30 days)
Rate Rider for Deferral/Variance Account Disposition (2012)	\$/kVA	-0.0421 (per 30 days)
Shared Tax Savings Rate Riders - DVR - Effective Until April 30 2014	\$/kVA	-0.0056 (per 30 days)
Retail Transmission Rate – Network Service Rate	\$/kW	2.7002 (per 30 days)
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	1.9268 (per 30 days)

### MONTHLY RATES AND CHARGES – Regulatory Component

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)



**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

This schedule supersedes and replaces all previously approved schedules of Rates, Charges and Loss Factors

EB-2012-0064

## LARGE USE > 5000 KW SERVICE CLASSIFICATION

This classification applies to an account whose average monthly maximum demand used for billing purposes is equal to or greater than, or is forecast to be equal to or greater than, 5,000 kW. Further servicing details are available in the distributor's Conditions of Service.

### APPLICATION

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

No rates and charges for the distribution of electricity and charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule, unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein

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It should be noted that this schedule does not list any charges, assessments, or credits that are required by law to be invoiced by a distributor and that are not subject to Board approval, such as the Debt Retirement Charge, charges for the Ministry of Energy Conservation and Renewable Energy Program, the Global Adjustment, the Ontario Clean Energy Benefit and the HST

### MONTHLY RATES AND CHARGES - Delivery Component

Service Charge	\$	3050.17 (per 30 days)
Smart Meter Funding Adder	\$	0.68 (per 30 days)
2011 Unfunded Capex Rate Rider - MFC - Effective Until April 30, 2015	\$	106.92 (per 30 days)
2012 IRM Rate Rider - MFC - Effective Until April 30, 2015	\$	9.25 (per 30 days)
2012 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	84.96 (per 30 days)
2013 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	224.12 (per 30 days)
Distribution Volumetric Rate	\$/kVA	4.8053 (per 30 days)
2011 Unfunded Capex Rate Rider - DVR - Effective Until April 30, 2015	\$/kVA	0.1684 (per 30 days)
2012 IRM Rate Rider - DVR - Effective Until April 30, 2015	\$/kVA	0.0146 (per 30 days)
2012 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kVA	0.1338 (per 30 days)
2013 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kVA	0.3531 (per 30 days)
Rate Rider for Deferral/Variance Account Disposition (2012)	\$/kVA	-0.0437 (per 30 days)
Shared Tax Savings Rate Riders - DVR - Effective Until April 30 2014	\$/kVA	-0.0059 (per 30 days)
Retail Transmission Rate – Network Service Rate	\$/kW	3.0781 (per 30 days)
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	2.1405 (per 30 days)

### MONTHLY RATES AND CHARGES – Regulatory Component

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

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EB-2012-0064

**STANDBY - GENERAL SERVICE 50 - 1,000 KW SERVICE CLASSIFICATION**

These classifications refer to an account that has Load Displacement Generation and requires THESL to provide back-up service. Further servicing details are available in the distributor's Conditions of Service.

**APPLICATION**

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

No rates and charges for the distribution of electricity and charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule, unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein

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It should be noted that this schedule does not list any charges, assessments, or credits that are required by law to be invoiced by a distributor and that are not subject to Board approval, such as the Debt Retirement Charge, charges for the Ministry of Energy Conservation and Renewable Energy Program, the Global Adjustment, the Ontario Clean Energy Benefit and the HST

**MONTHLY RATES AND CHARGES - Delivery Component**

Service Charge	\$	200.61 (per 30 days)
Distribution Volumetric Rate	\$/kVA	5.672 (per 30 days)

**MONTHLY RATES AND CHARGES – Regulatory Component**

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

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EB-2012-0064

**STANDBY - GENERAL SERVICE 1,000 - 5,000 KW SERVICE CLASSIFICATION**

These classifications refer to an account that has Load Displacement Generation and requires THESL to provide back-up service. Further servicing details are available in the distributor's Conditions of Service.

**APPLICATION**

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

No rates and charges for the distribution of electricity and charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule, unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein

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**MONTHLY RATES AND CHARGES - Delivery Component**

Service Charge	\$	200.61 (per 30 days)
Distribution Volumetric Rate	\$/kVA	4.5105 (per 30 days)

**MONTHLY RATES AND CHARGES – Regulatory Component**

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

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**STANDBY - LARGE USE SERVICE CLASSIFICATION**

These classifications refer to an account that has Load Displacement Generation and requires THESL to provide back-up service. Further servicing details are available in the distributor's Conditions of Service.

**APPLICATION**

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

No rates and charges for the distribution of electricity and charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule, unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein

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**MONTHLY RATES AND CHARGES - Delivery Component**

Service Charge	\$	200.61 (per 30 days)
Distribution Volumetric Rate	\$/kVA	4.8053 (per 30 days)

**MONTHLY RATES AND CHARGES – Regulatory Component**

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

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EB-2012-0064

## UNMETERED SCATTERED LOAD SERVICE CLASSIFICATION

This classification applies to an account taking electricity at 750 volts or less whose average monthly maximum demand at each location is less than, or is forecast to be less than, 50 kW and the consumption is unmetered. Such connections include cable TV power packs, bus shelters, telephone booths, traffic lights, railway crossings, etc. The level of the consumption will be agreed to by THESL and the customer, based on detailed manufacturer information/ documentation with regard to electrical consumption of the unmetered load or periodic monitoring of actual consumption. Further servicing details are available in the distributor's Conditions of Service.

### APPLICATION

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

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### MONTHLY RATES AND CHARGES - Delivery Component

Service Charge	\$	4.91 (per 30 days)
Service Charge (per connection)	\$	0.50 (per 30 days)
2011 Unfunded Capex Rate Rider - MFC - Effective Until April 30, 2015	\$	0.17 (per 30 days)
2011 Unfunded Capex Rate Rider (per connection) - MFC - Effective Until April 30, 2015	\$	0.02 (per 30 days)
2012 IRM Rate Rider - MFC - Effective Until April 30, 2015	\$	0.01 (per 30 days)
2012 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	0.14 (per 30 days)
2012 ICM Rate Adder (per connection) - MFC - Effective Until April 30, 2015	\$	0.01 (per 30 days)
2013 ICM Rate Adder - MFC - Effective Until April 30, 2015	\$	0.36 (per 30 days)
2013 ICM Rate Adder (per connection) - MFC - Effective Until April 30, 2015	\$	0.04 (per 30 days)
Distribution Volumetric Rate	\$/kWh	0.06152
2011 Unfunded Capex Rate Rider - DVR - Effective Until April 30, 2015	\$/kWh	0.00219
2012 IRM Rate Rider - DVR - Effective Until April 30, 2015	\$/kWh	0.00019
2012 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kWh	0.00174
2013 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kWh	0.00458
Rate Rider for Deferral/Variance Account Disposition (2012)	\$/kWh	-0.00088
Shared Tax Savings Rate Riders - DVR - Effective Until April 30 2014	\$/kWh	-0.00010
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00491
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00354

### MONTHLY RATES AND CHARGES – Regulatory Component

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
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EB-2012-0064

## STREET LIGHTING SERVICE CLASSIFICATION

This classification applies to an account for roadway lighting with a Municipality, Regional Municipality, Ministry of Transportation and private roadway lighting, controlled by photo cells. The consumption for these customers will be based on the calculated connected load times the required lighting times established in the approved OEB street lighting load shape template. Further servicing details are available in the distributor's Conditions of Service.

### APPLICATION

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

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### MONTHLY RATES AND CHARGES - Delivery Component

Service Charge (per connection)	\$	1.32 (per 30 days)
2011 Unfunded Capex Rate Rider (per connection) - MFC - Effective Until April 30, 2015	\$	0.05 (per 30 days)
2012 ICM Rate Adder (per connection) - MFC - Effective Until April 30, 2015	\$	0.04 (per 30 days)
2013 ICM Rate Adder (per connection) - MFC - Effective Until April 30, 2015	\$	0.10 (per 30 days)
Distribution Volumetric Rate	\$/kVA	29.1168 (per 30 days)
2011 Unfunded Capex Rate Rider - DVR - Effective Until April 30, 2015	\$/kVA	1.0206 (per 30 days)
2012 IRM Rate Rider - DVR - Effective Until April 30, 2015	\$/kVA	0.0883 (per 30 days)
2012 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kVA	0.8110 (per 30 days)
2013 ICM Rate Adder - DVR - Effective Until April 30, 2015	\$/kVA	2.1395 (per 30 days)
Rate Rider for Deferral/Variance Account Disposition (2012)	\$/kVA	-0.3877 (per 30 days)
Shared Tax Savings Rate Riders - DVR - Effective Until April 30 2014	\$/kVA	-0.0425 (per 30 days)
Retail Transmission Rate – Network Service Rate	\$/kW	2.4857 (per 30 days)
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	2.2997 (per 30 days)

### MONTHLY RATES AND CHARGES – Regulatory Component

Wholesale Market Service Rate	\$/kWh	0.0052
Rural Rate Protection Charge	\$/kWh	0.0011
Standard Supply Service – Administrative Charge (if applicable)	\$	0.25 (per 30 days)

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
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EB-2012-0064

**microFIT GENERATOR SERVICE CLASSIFICATION**

This classification applies to an electricity generation facility contracted under the Ontario Power Authority's microFIT program and connected to the distributor's distribution system. Further servicing details are available in the distributor's Condition of Service.

**APPLICATION**

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule.

No rates and charges for the distribution of electricity and charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein.

Unless specifically noted, this schedule does not contain any charges for the electricity commodity, be it under the Regulated Price Plan, a contract with a retailer or the wholesale market price, as applicable.

It should be noted that this schedule does not list any charges, assessments, or credits that are required by law to be invoiced by a distributor and that are not subject to Board approval, such as the Debt Retirement Charge, charges for the Ministry of Energy Conservation and Renewable Energy Programs, the Global Adjustment, the Ontario Clean Energy Benefit and the HST.

**MONTHLY RATES AND CHARGES - Delivery Component**

Service Charge	\$	5.33 (per 30 days)
----------------	----	--------------------

**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

This schedule supersedes and replaces all previously approved schedules of Rates, Charges and Loss Factors

EB-2012-0064

**ALLOWANCES**

Transformer Allowance for Ownership - per kVA of billing demand	\$/kVA	(0.62) (per 30 days)
Primary Metering Allowance for transformer losses – applied to measured demand and energy	%	(1.00)

**SPECIFIC SERVICE CHARGES**

**APPLICATION**

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule

No charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule, unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein.

It should be noted that this schedule does not list any charges, assessments, or credits that are required by law to be invoiced by a distributor and that are not subject to Board approval, such as the Debt Retirement Charge, charges for the Ministry of Energy Conservation and Renewable Energy Program, the Global Adjustment, the Ontario Clean Energy Benefit and the HST.

**Customer Administration**

Duplicate invoices for previous billing	\$	15.00
Easement letter	\$	15.00
Income tax letter	\$	15.00
Request for other billing information	\$	15.00
Account set up charge/change of occupancy charge (plus credit agency costs if applicable)	\$	30.00
Returned cheque charge (plus bank charges)	\$	15.00
Special meter reads	\$	30.00
Meter dispute charge plus Measurement Canada fees (if meter found correct)	\$	30.00

**Non-Payment of Account**

Late Payment - per month	%	1.50
Late Payment - per annum	%	19.56
Collection of account charge - no disconnection	\$	30.00
Disconnect/Reconnect at meter - during regular hours	\$	65.00
Disconnect/Reconnect at meter - after regular hours	\$	185.00
Disconnect/Reconnect at pole - during regular hours	\$	185.00
Disconnect/Reconnect at pole - after regular hours	\$	415.00

Install/Remove load control device - during regular hours	\$	65.00
Install/Remove load control device - after regular hours	\$	185.00
Specific Charge for Access to the Power Poles \$/pole/year	\$	22.35
Specific Charge for Access to the Power Poles \$/pole/year	\$	18.55
Specific Charge for Access to the Power Poles \$/pole/year (Hydro Attachments on Third Party Poles)	\$	(22.75)



**Toronto Hydro-Electric System Limited**  
**TARIFF OF RATES AND CHARGES**  
**Effective Date May 1, 2013**  
**Implementation Date May 1, 2013**

This schedule supersedes and replaces all previously approved schedules of Rates, Charges and Loss Factors

EB-2012-0064

## RETAIL SERVICE CHARGES (if applicable)

### APPLICATION

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule.

No rates and charges for the distribution of electricity and charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule, unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein.

Unless specifically noted, this schedule does not contain any charges for the electricity commodity, be it under the Regulated Price Plan, a contract with a retailer or the wholesale market price, as applicable

It should be noted that this schedule does not list any charges, assessments, or credits that are required by law to be invoiced by a distributor and that are not subject to Board approval, such as the Debt Retirement Charge, charges for the Ministry of Energy Conservation and Renewable Energy Program, the Global Adjustment, the Ontario Clean Energy Benefit and the HST.

Retail Service Charges refer to services provided by a distributor to retailers or customers related to the supply of competitive electricity

One-time charge, per retailer, to establish the service agreement between the distributor and the retailer	\$	100.00
Monthly Fixed Charge, per retailer	\$	20.00
Monthly Variable Charge, per customer, per retailer	\$/cust.	0.50
Distributor-consolidated billing charge, per customer, per retailer	\$/cust.	0.30
Retailer-consolidated billing credit, per customer, per retailer	\$/cust.	(0.30)
Service Transaction Requests (STR)		
Request fee, per request, applied to the requesting party	\$	0.25
Processing fee, per request, applied to the requesting party	\$	0.50
Request for customer information as outlined in Section 10.6.3 and Chapter 11 of the Retail Settlement Code directly to retailers and customers, if not delivered electronically through the Electronic Business Transaction (EBT) system, applied to the requesting party		
Up to twice a year	\$	no charge
More than twice a year, per request (plus incremental delivery costs)	\$	2.00

### LOSS FACTORS

If the distributor is not capable of prorating changed loss factors jointly with distribution rates, the revised loss factor will be implemented upon the first subsequent billing for each billing cycle.

Total Loss Factor – Secondary Metered Customer < 5,000 kW	1.0376
Total Loss Factor – Secondary Metered Customer > 5,000 kW	1.1087
Distribution Loss Factor - Primary Metered Customer < 5,000 kW	1.0272
Distribution Loss Factor - Primary Metered Customer > 5,000 kW	1.0085

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



Ontario Energy Board

**3<sup>RD</sup> Generation Incentive  
Regulation Model**

**Choose Your Utility:**

Toronto Hydro-Electric System Limited  
Wasaga Distribution Inc.

Application Type: IRM3

OEB Application #: EB-2011-0144

LDC Licence #: ED-2002-0497

**Application Contact Information**

Name: Anthony Lam

Title: Economist

Phone Number: 416 542 2876

Email Address: alam@torontohydro.com

We are applying for rates effective: May 1, 2013

Please indicate the version of Microsoft Excel that you are currently using: Excel 2007

**Legend**

DROP-DOWN MENU

INPUT FIELD

CALCULATION FIELD

**Copyright**

*This Workbook Model is protected by copyright and is being made available to you solely for the purpose of filing your IRM application. You may use and copy this model for that purpose, and provide a copy of this model to any person that is advising or assisting you in that regard. Except as indicated above, any copying, reproduction, publication, sale, adaptation, translation, modification, reverse engineering or other use or dissemination of this model without the express written consent of the Ontario Energy Board is prohibited. If you provide a copy of this model to a person that is advising or assisting you in preparing the application or reviewing your draft rate order, you must ensure that the person understands and agrees to the restrictions noted above.*

*While this model has been provided in Excel format and is required to be filed with the applications, the onus remains on the applicant to ensure the accuracy of the data and the results.*



Ontario Energy Board

**3<sup>RD</sup> Generation Incentive  
Regulation Model**

Toronto Hydro-Electric System Limited - EB-2011-0144

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Ontario Energy Board  
**3<sup>RD</sup> Generation Incentive  
Regulation Model**

Toronto Hydro-Electric System Limited - EB-2011-0144

Select the appropriate rate classes as they appear on your most recent Board-Approved Tariff of Rates and Charges.

**Note: The microFIT class does not exist in the drop-down menu below as it will automatically be inserted into your proposed Tariff Schedule.**

**Rate Class**

- Residential
- Residential Urban
- General Service Less Than 50 kW
- General Service 50 to 999 kW
- General Service 1,000 to 4,999 kW
- Large Use > 5000 kW
- Standby - General Service 50 - 1,000 kW
- Standby - General Service 1,000 - 5,000 kW
- Standby - Large Use
- Unmetered Scattered Load
- Street Lighting
- Sentinel Lighting
- Choose Rate Class
- Choose Rate Class
- Choose Rate Class
- Choose Rate Class
- Choose Rate Class
- Choose Rate Class
- Choose Rate Class
- Choose Rate Class
- Choose Rate Class
- Choose Rate Class
- Choose Rate Class



**Toronto Hydro-Electric System Limited - EB-2011-0144**

Please note that unlike the Distribution Volumetric Rates, which will be entered in the following two tabs, all current Monthly Fixed Charges, including the base charges, must be entered on this tab. Please enter the descriptions of the current Monthly Fix Charges exactly as they appear on your most recent Board-Approved Tariff of Rates and Charges by using the drop-down menus under the column labeled "Rate Description". If the description is not found in the drop-down menu, please enter the description in the green cells under the correct class exactly as it appears on the tariff. Once a description is selected or entered into the green cells, the input cells for the "Unit", "Amount", and "Effective Date" will appear. Please note that the base Monthly Fixed Charge is identified in the drop-down list as a "Service Charge" to coincide with the description on the tariff. Please do not enter more than one "Service Charge" for each class for which a base monthly fixed charge applies. \*\*Note: Do not enter Standard Supply Service Rate. The rate will appear automatically on the final Tariff of Rates and Charges.

Rate Description	Unit	Amount	Effective Until Date
<b>Residential</b>			
Service Charge (Based on 30 day month)	\$	18.37	April 30, 2015
Smart Meter Funding Adder	\$	0.68	April 30, 2014
Rate Rider for Recovery of Late Payment Penalty Litigation Costs (per customer)	\$	0.24	April 30, 2013
<b>Residential Urban</b>			
Service Charge (Based on 30 day month)	\$	17.12	April 30, 2015
Smart Meter Funding Adder	\$	0.68	April 30, 2014
Rate Rider for Recovery of Late Payment Penalty Litigation Costs (per customer)	\$	0.24	April 30, 2013
<b>General Service Less Than 50 kW</b>			
Service Charge (Based on 30 day month)	\$	24.47	April 30, 2015
Smart Meter Funding Adder	\$	0.68	April 30, 2014
Rate Rider for Recovery of Late Payment Penalty Litigation Costs	\$	0.69	April 30, 2013
<b>General Service 50 to 999 kW</b>			
Service Charge (Based on 30 day month)	\$	35.80	April 30, 2015
Smart Meter Funding Adder	\$	0.68	April 30, 2014
Rate Rider for Recovery of Late Payment Penalty Litigation Costs	\$	8.37	April 30, 2013
<b>General Service 1,000 to 4,999 kW</b>			
Service Charge (Based on 30 day month)	\$	691.13	April 30, 2015
Smart Meter Funding Adder	\$	0.68	April 30, 2014
Rate Rider for Recovery of Late Payment Penalty Litigation Costs	\$	69.81	April 30, 2013
<b>Large Use &gt; 5000 kW</b>			
Service Charge (Based on 30 day month)	\$	3029.57	April 30, 2015
Smart Meter Funding Adder	\$	0.68	April 30, 2014
Rate Rider for Recovery of Late Payment Penalty Litigation Costs	\$	304.62	April 30, 2013

<b>Unmetered Scattered Load</b>		
Service Charge (Based on 30 day month)	\$ 4.87	April 30, 2015
Rate Rider for Recovery of Late Payment Penalty Litigation Costs (per customer)	\$ 0.09	April 30, 2013
<b>Sentinel Lighting</b>		
Service Charge (per connection)	\$ 0.49	April 30, 2015
<b>Street Lighting</b>		
Service Charge (Based on 30 day month)	\$ 1.31	April 30, 2015
Rate Rider for Recovery of Late Payment Penalty Litigation Costs	\$ 0.04	April 30, 2013
<b>Standby - General Service 50 - 1,000 kW</b>		
Service Charge (Based on 30 day month)	\$ 199.26	April 30, 2015
<b>Standby - General Service 1,000 - 5,000 kW</b>		
Service Charge (Based on 30 day month)	\$ 199.26	April 30, 2015
<b>Standby - Large Use</b>		
Service Charge (Based on 30 day month)	\$ 199.26	April 30, 2015



Ontario Energy Board

**3<sup>RD</sup> Generation Incentive  
 Regulation Model**

Toronto Hydro-Electric System Limited - EB-2011-0144

For each class, please enter the base Distribution Volumetric Rates ("DVR") from your most recent Board-Approved Tariff of Rates and Charges by using the drop-down menus and input cells in columns labeled "Unit" and "Amount".

Rate Description	Unit	Amount
Residential	\$/kWh	0.01517
Residential Urban	\$/kWh	0.02582
General Service Less Than 50 kW	\$/kWh	0.02262
General Service 50 to 999 kW	\$/kVA	5.63370
General Service 1,000 to 4,999 kW	\$/kVA	4.48000
Large Use > 5000 kW	\$/kVA	4.77280
Unmetered Scattered Load	\$/kWh	0.06110
Sentinel Lighting		
Street Lighting	\$/kVA	28.92010
Standby - General Service 50 - 1,000 kW	\$/kVA	5.63370
Standby - General Service 1,000 - 5,000 kW	\$/kVA	4.48000
Standby - Large Use	\$/kVA	4.77280











Toronto Hydro-Electric System Limited - EB-2011-0144

Please enter your RTS-Network Rates from your most recent Board-Approved Tariff of Rates and Charges by using the drop-down menus under the column labeled "Rate Description". If the description is not found in the drop-down menu, please enter the description in the green cells under the correct classes exactly as it appears on the tariff.

Rate Description	Unit	Amount
<b>Residential</b>		
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00703
<b>Residential Urban</b>		
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00703
<b>General Service Less Than 50 kW</b>		
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00680
<b>General Service 50 to 999 kW</b>		
Retail Transmission Rate – Network Service Rate	\$/kW	2.43510
<b>General Service 1,000 to 4,999 kW</b>		
Retail Transmission Rate – Network Service Rate	\$/kW	2.35270
<b>Large Use &gt; 5000 kW</b>		
Retail Transmission Rate – Network Service Rate	\$/kW	2.68200
<b>Unmetered Scattered Load</b>		
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00428
<b>Sentinel Lighting</b>		
<b>Street Lighting</b>		
Retail Transmission Rate – Network Service Rate	\$/kW	2.16580
<b>Standby - General Service 50 - 1,000 kW</b>		
<b>Standby - General Service 1,000 - 5,000 kW</b>		
<b>Standby - Large Use</b>		



Toronto Hydro-Electric System Limited - EB-2011-0144

Please enter your RTS-Connection Rates from your most recent Board-Approved Tariff of Rates and Charges by using the drop-down menus under the column labeled "Rate Description". If the description is not found in the drop-down menu, please enter the description in the green cells under the correct classes exactly as it appears on the tariff.

Rate Description	Unit	Amount
<b>Residential</b>		
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00513
<b>Residential Urban</b>		
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00513
<b>General Service Less Than 50 kW</b>		
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00463
<b>General Service 50 to 999 kW</b>		
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	1.76300
<b>General Service 1,000 to 4,999 kW</b>		
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	1.76130
<b>Large Use &gt; 5000 kW</b>		
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	1.95670
<b>Unmetered Scattered Load</b>		
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00324
<b>Sentinel Lighting</b>		
<b>Street Lighting</b>		
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	2.10220
<b>Standby - General Service 50 - 1,000 kW</b>		
<b>Standby - General Service 1,000 - 5,000 kW</b>		
<b>Standby - Large Use</b>		



Toronto Hydro-Electric System Limited - EB-2011-0144

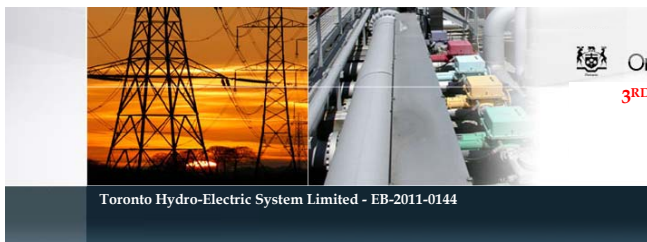
Please complete the following continuity schedule for your Group 1 Deferral / Variance Accounts, Account 1521 and Account 1562. Enter information into green cells only. Lines 51-61 contain footnotes and further instructions.

If you have received approval to dispose of balances from prior years, the starting point for entries in the 2012 DVA schedule below will be the balance sheet date as per your G/L for which you received approval. For example, if in the 2011 EDR process (CoS or IRM) you received approval for the December 31, 2009 balances, the starting point for your entries below should be the adjustment column AV for principal and column BA for interest. This will allow for the correct starting point for the 2010 opening balance columns (for both principal and interest) without requiring entries dating back to the beginning of the continuity schedule ie: Jan 1, 2005.

		2005										
Account Descriptions	Account Number	Opening Principal Amounts as of Jan-1-05	Transactions Debit/ (Credit) during 2005 excluding interest and adjustments <sup>5</sup>	Board-Approved Disposition during 2005	Adjustments during 2005 - other <sup>3</sup>	Closing Principal Balance as of Dec-31-05	Opening Interest Amounts as of Jan-1-05	Interest Jan-1 to Dec-31-05	Board-Approved Disposition during 2005	Adjustments during 2005 - other <sup>3</sup>	Closing Interest Amounts as of Dec-31-05	
<b>Group 1 Accounts</b>												
LV Variance Account	1550					\$ -					\$ -	
RSVA - Wholesale Market Service Charge	1580					\$ -					\$ -	
RSVA - Retail Transmission Network Charge	1584					\$ -					\$ -	
RSVA - Retail Transmission Connection Charge	1586					\$ -					\$ -	
RSVA - Power (excluding Global Adjustment)	1588					\$ -					\$ -	
RSVA - Power - Sub-Account - Global Adjustment	1588					\$ -					\$ -	
Recovery of Regulatory Asset Balances	1590					\$ -					\$ -	
Disposition and Recovery of Regulatory Balances (2008) <sup>7</sup>	1595					\$ -					\$ -	
Disposition and Recovery of Regulatory Balances (2009) <sup>7</sup>	1595					\$ -					\$ -	
<b>Group 1 Sub-Total (including Account 1588 - Global Adjustment)</b>		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Group 1 Sub-Total (excluding Account 1588 - Global Adjustment)</b>		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>RSVA - Power - Sub-Account - Global Adjustment</b>	<b>1588</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Special Purpose Charge Assessment Variance Account</b>												
	<b>1521</b>											
<b>Deferred Payments in Lieu of Taxes</b>												
	<b>1562</b>											
<b>Group 1 Total + 1521 + 1562</b>		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>The following is not included in the total claim but are included on a memo basis:</b>												
Board-Approved CDM Variance Account	1567											
PILs and Tax Variance for 2006 and Subsequent Years (excludes sub-account and contra account below)	1592											
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Input Tax Credits (ITCs)	1592											
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Contra Account	1592					\$ -					\$ -	
Disposition and Recovery of Regulatory Balances <sup>7</sup>	1595					\$ -					\$ -	

**For all Board-Approved dispositions, please ensure that the disposition amount has the same sign (e.g: debit balances are to have a positive figure and credit balance are to have a negative figure) as per the related Board decision.**

<sup>1</sup> Applicants may wish to propose kWh as the allocator for account 1521 pending a final decision of the Board  
<sup>2</sup> Provide supporting statement indicating whether due to denial of costs in 2006 EDR by the Board, 10% transition costs write-off, etc.  
<sup>2A</sup> Adjustments Instructed by the Board include deferral/variance account balances moved to Account 1590 as a result of the 2006 EDR and account 1595 during the 2008 EDR and subsequent years as ordered by the Board.  
<sup>3</sup> Please provide explanations for the nature of the adjustments. If the adjustment relates to previously Board Approved disposed balances, please provide amounts for adjustments and include supporting documentations.  
<sup>4</sup> Although the Global Adjustment Account is not reported separately under 2.1.7, please provide a breakdown in rows 28 and 29.  
<sup>5</sup> For RSVA accounts only, report the net variance to the account during the year. For all other accounts, record the transactions during the year.  
<sup>6</sup> If the LDC's 2011 rate year started January 1, the projected interest is recorded from January 1, 2011 to December 31, 2011 on the December 31, 2010 balance adjusted for the disposed balances approved by the Board in the 2011 rate decision. If the LDC's 2011 rate year started May 1, the projected interest is recorded from January 1, 2011 to April 30, 11 on the December 31, 2010 balance. The projected interest is recorded from May 1, 2011 to April 30, 2012 on the December 31, 2010 balance adjusted for the disposed balances approved by the Board in the 2011 rate decision.  
<sup>7</sup> Include Account 1595 as part of Group 1 accounts (line 31) for review and disposition if the recovery (or refund) period has been completed, and the audited financial statements support the underlying residual balance in account 1595. If the recovery (or refund) period has not been completed, include the balances in Account 1595 on a memo basis only (line 49).



Toronto Hydro-Electric System Limited - EB-2011-0144

Please complete the following continuity schedule for your Group 1 Deferral / Variance Accounts, Account 1521 and Account 1562, and provide supporting notes and further instructions.

If you have received approval to dispose of balances from prior years, the starting point for entries in the 2012 DV/Continuity schedule is the date of the Board's decision. For example, if in the 2011 EDR process (CoS or IRM) you received approval for the December 2010 Board decision, the starting point for principal and column BA for interest. This will allow for the correct starting point for the 2010 opening balance to the beginning of the continuity schedule i.e. Jan 1, 2005.

		2006										
Account Descriptions	Account Number	Opening Principal Amounts as of Jan-1-06	Transactions Debit / (Credit) during 2006 excluding interest and adjustments <sup>5</sup>	Board-Approved Disposition during 2006 <sup>2,2A</sup>	Adjustments during 2006 - other <sup>3</sup>	Closing Principal Balance as of Dec-31-06	Opening Interest Amounts as of Jan-1-06	Interest Jan-1 to Dec-31-06	Board-Approved Disposition during 2006 <sup>2,2A</sup>	Adjustments during 2006 - other <sup>3</sup>	Closing Interest Amounts as of Dec-31-06	
<b>Group 1 Accounts</b>												
LV Variance Account	1550	\$ -				\$ -	\$ -				\$ -	
RSVA - Wholesale Market Service Charge	1580	\$ -				\$ -	\$ -				\$ -	
RSVA - Retail Transmission Network Charge	1584	\$ -				\$ -	\$ -				\$ -	
RSVA - Retail Transmission Connection Charge	1586	\$ -				\$ -	\$ -				\$ -	
RSVA - Power (excluding Global Adjustment)	1588	\$ -				\$ -	\$ -				\$ -	
RSVA - Power - Sub-Account - Global Adjustment	1588	\$ -				\$ -	\$ -				\$ -	
Recovery of Regulatory Asset Balances	1590	\$ -				\$ -	\$ -				\$ -	
Disposition and Recovery of Regulatory Balances (2008) <sup>7</sup>	1595	\$ -				\$ -	\$ -				\$ -	
Disposition and Recovery of Regulatory Balances (2009) <sup>7</sup>	1595	\$ -				\$ -	\$ -				\$ -	
<b>Group 1 Sub-Total (including Account 1588 - Global Adjustment)</b>		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Group 1 Sub-Total (excluding Account 1588 - Global Adjustment)</b>		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>RSVA - Power - Sub-Account - Global Adjustment</b>	<b>1588</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Special Purpose Charge Assessment Variance Account</b>												
	<b>1521</b>											
<b>Deferred Payments in Lieu of Taxes</b>												
	<b>1562</b>					\$ 5,998,665	\$ 1,354,812	\$ 287,268			\$ 1,067,544	
<b>Group 1 Total + 1521 + 1562</b>		\$ -	\$ -	\$ -	\$ -	\$ 5,998,665	\$ 1,354,812	\$ 287,268	\$ -	\$ -	\$ 1,067,544	
<b>The following is not included in the total claim but are included on a memo basis:</b>												
Board-Approved CDM Variance Account	1567											
PILs and Tax Variance for 2006 and Subsequent Years (excludes sub-account and contra account below)	1592											
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Input Tax Credits (ITCs)	1592											
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Contra Account	1592	\$ -				\$ -	\$ -				\$ -	
Disposition and Recovery of Regulatory Balances <sup>7</sup>	1595	\$ -				\$ -	\$ -				\$ -	

**For all Board-Approved dispositions, please ensure that the disposition amount has the same sign (e.g. negative figure) as per the related Board decision.**

Applicants may wish to propose kWh as the allocator for account 1521 pending a final decision of the Board. Provide supporting statement indicating whether due to denial of costs in 2006 EDR by the Board, 10% transition costs Adjustments Instructed by the Board include deferral/variance account balances moved to Account 1590 as a result of 1. Please provide explanations for the nature of the adjustments. If the adjustment relates to previously Board Approved (Although the Global Adjustment Account is not reported separately under 2.1.7, please provide a breakdown in rows 28 For RSVA accounts only, report the net variance to the account during the year. For all other accounts, record the transaction in the LDC's 2011 rate year started January 1, the projected interest is recorded from January 1, 2011 to December 31, 2011. If the LDC's 2011 rate year started May 1, the projected interest is recorded from January 1, 2011 to April 30, 2012 on the December 31, 2010 balance adjusted for the disposed balances as per the Board's decision. Include Account 1595 as part of Group 1 accounts (line 31) for review and disposition if the recovery (or refund) period support the underlying residual balance in account 1595. If the recovery (or refund) period has not been completed, include



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Please complete the following continuity schedule for your Group 1 Deferral / Variance Accounts, Account 1521 and Account 1562, and provide supporting notes and further instructions.

If you have received approval to dispose of balances from prior years, the starting point for entries in the 2012 DV/Continuity schedule is the date of the Board's approval. For example, if in the 2011 EDR process (CoS or IRM) you received approval for the December 2010 Board decision, the starting point for principal and column BA for interest. This will allow for the correct starting point for the 2010 opening balance to the beginning of the continuity schedule i.e. Jan 1, 2005.

		2007										
Account Descriptions	Account Number	Opening Principal Amounts as of Jan-1-07	Transactions Debit / (Credit) during 2007 excluding interest and adjustments <sup>5</sup>	Board-Approved Disposition during 2007	Adjustments during 2007 - other <sup>3</sup>	Closing Principal Balance as of Dec-31-07	Opening Interest Amounts as of Jan-1-07	Interest Jan-1 to Dec-31-07	Board-Approved Disposition during 2007	Adjustments during 2007 - other <sup>3</sup>	Closing Interest Amounts as of Dec-31-07	
<b>Group 1 Accounts</b>												
LV Variance Account	1550	\$ -				\$ -	\$ -				\$ -	
RSVA - Wholesale Market Service Charge	1580	\$ -				\$ -	\$ -				\$ -	
RSVA - Retail Transmission Network Charge	1584	\$ -				\$ -	\$ -				\$ -	
RSVA - Retail Transmission Connection Charge	1586	\$ -				\$ -	\$ -				\$ -	
RSVA - Power (excluding Global Adjustment)	1588	\$ -				\$ -	\$ -				\$ -	
RSVA - Power - Sub-Account - Global Adjustment	1588	\$ -				\$ -	\$ -				\$ -	
Recovery of Regulatory Asset Balances	1590	\$ -				\$ -	\$ -				\$ -	
Disposition and Recovery of Regulatory Balances (2008) <sup>7</sup>	1595	\$ -				\$ -	\$ -				\$ -	
Disposition and Recovery of Regulatory Balances (2009) <sup>7</sup>	1595	\$ -				\$ -	\$ -				\$ -	
<b>Group 1 Sub-Total (including Account 1588 - Global Adjustment)</b>		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Group 1 Sub-Total (excluding Account 1588 - Global Adjustment)</b>		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>RSVA - Power - Sub-Account - Global Adjustment</b>	<b>1588</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Special Purpose Charge Assessment Variance Account</b>												
	<b>1521</b>											
<b>Deferred Payments in Lieu of Taxes</b>	<b>1562</b>	\$ 5,998,665				\$ 5,998,665	\$ 1,067,544	\$ 283,587			\$ 783,957	
<b>Group 1 Total + 1521 + 1562</b>		\$ 5,998,665	\$ -	\$ -	\$ -	\$ 5,998,665	\$ 1,067,544	\$ 283,587	\$ -	\$ -	\$ 783,957	
<b>The following is not included in the total claim but are included on a memo basis:</b>												
Board-Approved CDM Variance Account	1567											
PILs and Tax Variance for 2006 and Subsequent Years (excludes sub-account and contra account below)	1592											
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Input Tax Credits (ITCs)	1592											
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Contra Account	1592	\$ -				\$ -	\$ -				\$ -	
Disposition and Recovery of Regulatory Balances <sup>7</sup>	1595	\$ -				\$ -	\$ -				\$ -	

**For all Board-Approved dispositions, please ensure that the disposition amount has the same sign (e.g. negative figure) as per the related Board decision.**

Applicants may wish to propose kWh as the allocator for account 1521 pending a final decision of the Board. Provide supporting statement indicating whether due to denial of costs in 2006 EDR by the Board, 10% transition costs Adjustments Instructed by the Board include deferral/variance account balances moved to Account 1590 as a result of 1. Please provide explanations for the nature of the adjustments. If the adjustment relates to previously Board Approved (Although the Global Adjustment Account is not reported separately under 2.1.7, please provide a breakdown in rows 28 For RSVA accounts only, report the net variance to the account during the year. For all other accounts, record the transaction If the LDC's 2011 rate year started January 1, the projected interest is recorded from January 1, 2011 to December 31, Board in the 2011 rate decision. If the LDC's 2011 rate year started May 1, the projected interest is recorded from Jan recorded from May 1, 2011 to April 30, 2012 on the December 31, 2010 balance adjusted for the disposed balances ap Include Account 1595 as part of Group 1 accounts (line 31) for review and disposition if the recovery (or refund) period support the underlying residual balance in account 1595. If the recovery (or refund) period has not been completed, inc





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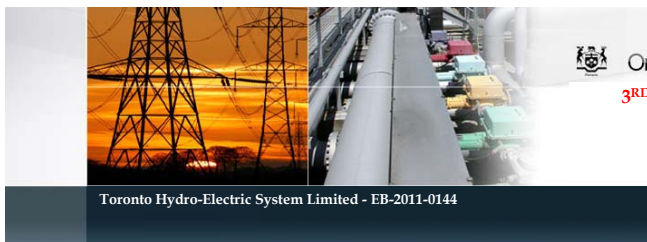
Please complete the following continuity schedule for your Group 1 Deferral / Variance Accounts, Account 1521 and Account 1562, and provide supporting notes and further instructions.

If you have received approval to dispose of balances from prior years, the starting point for entries in the 2012 DV/Continuity schedule is the date of the Board's approval. For example, if in the 2011 EDR process (CoS or IRM) you received approval for the December 31, 2010 disposition of balances, the starting point for the 2010 opening balance in the continuity schedule is: Jan 1, 2005.

		2008										
Account Descriptions	Account Number	Opening Principal Amounts as of Jan-1-08	Transactions Debit / (Credit) during 2008 excluding interest and adjustments <sup>5</sup>	Board-Approved Disposition during 2008	Adjustments during 2008 - other <sup>3</sup>	Closing Principal Balance as of Dec-31-08	Opening Interest Amounts as of Jan-1-08	Interest Jan-1 to Dec-31-08	Board-Approved Disposition during 2008	Adjustments during 2008 - other <sup>3</sup>	Closing Interest Amounts as of Dec-31-08	
<b>Group 1 Accounts</b>												
LV Variance Account	1550	\$ -				\$ -	\$ -				\$ -	
RSVA - Wholesale Market Service Charge	1580	\$ -				\$ -	\$ -				\$ -	
RSVA - Retail Transmission Network Charge	1584	\$ -				\$ -	\$ -				\$ -	
RSVA - Retail Transmission Connection Charge	1586	\$ -				\$ -	\$ -				\$ -	
RSVA - Power (excluding Global Adjustment)	1588	\$ -				\$ -	\$ -				\$ -	
RSVA - Power - Sub-Account - Global Adjustment	1588	\$ -				\$ -	\$ -				\$ -	
Recovery of Regulatory Asset Balances	1590	\$ -				\$ -	\$ -				\$ -	
Disposition and Recovery of Regulatory Balances (2008) <sup>7</sup>	1595	\$ -				\$ -	\$ -				\$ -	
Disposition and Recovery of Regulatory Balances (2009) <sup>7</sup>	1595	\$ -				\$ -	\$ -				\$ -	
<b>Group 1 Sub-Total (including Account 1588 - Global Adjustment)</b>		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Group 1 Sub-Total (excluding Account 1588 - Global Adjustment)</b>		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>RSVA - Power - Sub-Account - Global Adjustment</b>	<b>1588</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Special Purpose Charge Assessment Variance Account</b>												
	<b>1521</b>											
<b>Deferred Payments in Lieu of Taxes</b>	<b>1562</b>	\$ 5,998,665				\$ 5,998,665	\$ 783,957	\$ 238,747			\$ 545,210	
<b>Group 1 Total + 1521 + 1562</b>		\$ 5,998,665	\$ -	\$ -	\$ -	\$ 5,998,665	\$ 783,957	\$ 238,747	\$ -	\$ -	\$ 545,210	
<b>The following is not included in the total claim but are included on a memo basis:</b>												
Board-Approved CDM Variance Account	1567											
PILs and Tax Variance for 2006 and Subsequent Years (excludes sub-account and contra account below)	1592											
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Input Tax Credits (ITCs)	1592											
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Contra Account	1592	\$ -				\$ -	\$ -				\$ -	
Disposition and Recovery of Regulatory Balances <sup>7</sup>	1595	\$ -				\$ -	\$ -				\$ -	

**For all Board-Approved dispositions, please ensure that the disposition amount has the same sign (e.g. negative figure) as per the related Board decision.**

Applicants may wish to propose kWh as the allocator for account 1521 pending a final decision of the Board. Provide supporting statement indicating whether due to denial of costs in 2006 EDR by the Board, 10% transition costs Adjustments Instructed by the Board include deferral/variance account balances moved to Account 1590 as a result of 1. Please provide explanations for the nature of the adjustments. If the adjustment relates to previously Board Approved (Although the Global Adjustment Account is not reported separately under 2.1.7, please provide a breakdown in rows 28 For RSVA accounts only, report the net variance to the account during the year. For all other accounts, record the transaction in the LDC's 2011 rate year started January 1, the projected interest is recorded from January 1, 2011 to December 31, 2011 on the 2011 rate decision. If the LDC's 2011 rate year started May 1, the projected interest is recorded from January 1, 2011 to April 30, 2012 on the December 31, 2010 balance adjusted for the disposed balances as per the Board's decision. Include Account 1595 as part of Group 1 accounts (line 31) for review and disposition if the recovery (or refund) period support the underlying residual balance in account 1595. If the recovery (or refund) period has not been completed, include



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Please complete the following continuity schedule for your Group 1 Deferral / Variance Accounts, Account 1521 and Account 1562, and provide supporting notes and further instructions.

If you have received approval to dispose of balances from prior years, the starting point for entries in the 2012 DV/AV schedule is the date of the Board's approval. For example, if in the 2011 EDR process (CoS or IRM) you received approval for the December 2010 Board AV for principal and column BA for interest. This will allow for the correct starting point for the 2010 opening balance to the beginning of the continuity schedule i.e. Jan 1, 2005.

		2009									
Account Descriptions	Account Number	Opening Principal Amounts as of Jan-1-09	Transactions Debit / (Credit) during 2009 excluding interest and adjustments <sup>5</sup>	Board-Approved Disposition during 2009	Adjustments during 2009 - other <sup>3</sup>	Closing Principal Balance as of Dec-31-09	Opening Interest Amounts as of Jan-1-09	Interest Jan-1 to Dec-31-09	Board-Approved Disposition during 2009	Adjustments during 2009 - other <sup>3</sup>	Closing Interest Amounts as of Dec-31-09
<b>Group 1 Accounts</b>											
LV Variance Account	1550	\$ -			\$ 910,834	\$ 910,834	\$ -			\$ 43,562	\$ 43,562
RSVA - Wholesale Market Service Charge	1580	\$ -			\$ 54,927,284	\$ 54,927,284	\$ -			\$ 2,852,619	\$ 2,852,619
RSVA - Retail Transmission Network Charge	1584	\$ -			\$ 15,203,484	\$ 15,203,484	\$ -			\$ 738,236	\$ 738,236
RSVA - Retail Transmission Connection Charge	1586	\$ -			\$ 10,736,969	\$ 10,736,969	\$ -			\$ 1,364,052	\$ 1,364,052
RSVA - Power (excluding Global Adjustment)	1588	\$ -			\$ 259,129	\$ 259,129	\$ -			\$ -	\$ -
RSVA - Power - Sub-Account - Global Adjustment	1588	\$ -			\$ 44,599,726	\$ 44,599,726	\$ -			\$ 15,819	\$ 15,819
Recovery of Regulatory Asset Balances	1590	\$ -			\$ 2	\$ 2	\$ -			\$ -	\$ -
Disposition and Recovery of Regulatory Balances (2008) <sup>7</sup>	1595	\$ -			\$ 491,772	\$ 491,772	\$ -			\$ 276,556	\$ 276,556
Disposition and Recovery of Regulatory Balances (2009) <sup>7</sup>	1595	\$ -			\$ 2,787,938	\$ 2,787,938	\$ -			\$ 42,064	\$ 42,064
<b>Group 1 Sub-Total (including Account 1588 - Global Adjustment)</b>		\$ -	\$ -	\$ -	\$ 38,896,013	\$ 38,896,013	\$ -	\$ -	\$ -	\$ 5,245,783	\$ 5,245,783
<b>Group 1 Sub-Total (excluding Account 1588 - Global Adjustment)</b>		\$ -	\$ -	\$ -	\$ 83,495,739	\$ 83,495,739	\$ -	\$ -	\$ -	\$ 5,229,964	\$ 5,229,964
<b>RSVA - Power - Sub-Account - Global Adjustment</b>	<b>1588</b>	\$ -	\$ -	\$ -	\$ 44,599,726	\$ 44,599,726	\$ -	\$ -	\$ -	\$ 15,819	\$ 15,819
<b>Special Purpose Charge Assessment Variance Account</b>											
	<b>1521</b>										
<b>Deferred Payments in Lieu of Taxes</b>	<b>1562</b>	\$ 5,998,665				\$ 5,998,665	\$ 545,210	\$ 68,235			\$ 476,975
<b>Group 1 Total + 1521 + 1562</b>		\$ 5,998,665	\$ -	\$ -	\$ 38,896,013	\$ 44,894,678	\$ 545,210	\$ 68,235	\$ -	\$ 5,245,783	\$ 4,768,808
<b>The following is not included in the total claim but are included on a memo basis:</b>											
Board-Approved CDM Variance Account	1567										
PLTs and Tax Variance for 2006 and Subsequent Years (excludes sub-account and contra account below)	1592										
PLTs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Input Tax Credits (ITCs)	1592										
PLTs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Contra Account	1592	\$ -				\$ -	\$ -				\$ -
Disposition and Recovery of Regulatory Balances <sup>7</sup>	1595	\$ -				\$ -	\$ -				\$ -

**For all Board-Approved dispositions, please ensure that the disposition amount has the same sign (e.g. negative figure) as per the related Board decision.**

Applicants may wish to propose kWh as the allocator for account 1521 pending a final decision of the Board. Provide supporting statement indicating whether due to denial of costs in 2006 EDR by the Board, 10% transition costs Adjustments Instructed by the Board include deferral/variance account balances moved to Account 1590 as a result of 1. Please provide explanations for the nature of the adjustments. If the adjustment relates to previously Board Approved c Although the Global Adjustment Account is not reported separately under 2.1.7, please provide a breakdown in rows 28 For RSVA accounts only, report the net variance to the account during the year. For all other accounts, record the tran If the LDC's 2011 rate year started January 1, the projected interest is recorded from January 1, 2011 to December 31, Board in the 2011 rate decision. If the LDC's 2011 rate year started May 1, the projected interest is recorded from Janu recorded from May 1, 2011 to April 30, 2012 on the December 31, 2010 balance adjusted for the disposed balances ap Include Account 1595 as part of Group 1 accounts (line 31) for review and disposition if the recovery (or refund) period support the underlying residual balance in account 1595. If the recovery (or refund) period has not been completed, inc



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Please complete the following continuity schedule for your Group 1 Deferral / Variance Accounts, Account 1521 and other accounts and further instructions.

If you have received approval to dispose of balances from prior years, the starting point for entries in the 2012 DV/AV should be the 2011 received approval. For example, if in the 2011 EDR process (CoS or IRM) you received approval for the December 31, 2011 column AV for principal and column BA for interest. This will allow for the correct starting point for the 2010 opening balance to the beginning of the continuity schedule is: Jan 1, 2005.

		2010											
Account Descriptions	Account Number	Opening Principal Amounts as of Jan-1-10	Transactions Debit/ (Credit) during 2010 excluding interest and adjustments <sup>5</sup>	Board-Approved Disposition during 2010	Other <sup>3</sup> Adjustments during Q1 2010	Other <sup>3</sup> Adjustments during Q2 2010	Other <sup>3</sup> Adjustments during Q3 2010	Other <sup>3</sup> Adjustments during Q4 2010	Closing Principal Balance as of Dec-31-10	Opening Interest Amounts as of Jan-1-10	Interest Jan-1 to Dec-31-10	Board-Approved Disposition during 2010	Adjustments during 2010 - other <sup>3</sup>
<b>Group 1 Accounts</b>													
LV Variance Account	1550	\$ 910,834	\$ 186,439	\$ 713,449					\$ 383,824	\$ 43,562	\$ 3,654	\$ 44,084	
RSVA - Wholesale Market Service Charge	1580	\$ 54,927,284	\$ 26,238,240	\$ 47,563,346					\$ 33,602,178	\$ 2,852,619	\$ 249,451	\$ 2,924,115	
RSVA - Retail Transmission Network Charge	1584	\$ 15,203,484	\$ 7,764,568	\$ 18,324,237					\$ 10,885,321	\$ 738,236	\$ 38,920	\$ 792,643	
RSVA - Retail Transmission Connection Charge	1586	\$ 10,736,969	\$ 3,097,923	\$ 7,432,471					\$ 206,576	\$ 1,364,052	\$ 17,950	\$ 1,383,545	
RSVA - Power (excluding Global Adjustment)	1588	\$ 259,129	\$ -	\$ 264,726					\$ 5,597	\$ -	\$ -	\$ -	
RSVA - Power - Sub-Account - Global Adjustment	1588	\$ 44,599,726	\$ 8,632,018	\$ 15,859,509					\$ 20,108,199	\$ 15,819	\$ 152,866	\$ 91,679	
Recovery of Regulatory Asset Balances	1590	\$ 2	\$ -	\$ -					\$ 2	\$ -	\$ -	\$ -	
Disposition and Recovery of Regulatory Balances (2008) <sup>7</sup>	1595	\$ 491,772	\$ -	\$ -					\$ 491,772	\$ 276,556	\$ 9,743	\$ -	
Disposition and Recovery of Regulatory Balances (2009) <sup>7</sup>	1595	\$ 2,787,938	\$ 2,424,338	\$ -					\$ 363,600	\$ 42,064	\$ 35,321	\$ -	
<b>Group 1 Sub-Total (including Account 1588 - Global Adjustment)</b>		<b>\$ 38,896,013</b>	<b>\$ 21,396,991</b>	<b>\$ 57,011,821</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 3,281,183</b>	<b>\$ 5,245,783</b>	<b>\$ 117,027</b>	<b>\$ 5,147,897</b>	<b>\$ -</b>
<b>Group 1 Sub-Total (excluding Account 1588 - Global Adjustment)</b>		<b>\$ 83,495,739</b>	<b>\$ 12,764,973</b>	<b>\$ 72,871,331</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 23,389,381</b>	<b>\$ 5,229,964</b>	<b>\$ 269,892</b>	<b>\$ 5,056,218</b>	<b>\$ -</b>
<b>RSVA - Power - Sub-Account - Global Adjustment</b>	<b>1588</b>	<b>\$ 44,599,726</b>	<b>\$ 8,632,018</b>	<b>\$ 15,859,509</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 20,108,199</b>	<b>\$ 15,819</b>	<b>\$ 152,866</b>	<b>\$ 91,679</b>	<b>\$ -</b>
<b>Special Purpose Charge Assessment Variance Account</b>	<b>1521</b>		<b>\$ 6,123,220</b>	<b>\$ 9,697,579</b>				<b>\$ 3,050,473</b>	<b>\$ 523,886</b>		<b>\$ 19,401</b>		
<b>Deferred Payments in Lieu of Taxes</b>	<b>1562</b>	<b>\$ 5,998,665</b>							<b>\$ 5,998,665</b>	<b>\$ 476,975</b>	<b>\$ 47,839</b>		
<b>Group 1 Total + 1521 + 1562</b>		<b>\$ 44,894,678</b>	<b>\$ 27,520,211</b>	<b>\$ 66,709,400</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 3,050,473</b>	<b>\$ 8,755,962</b>	<b>\$ 4,768,808</b>	<b>\$ 184,266</b>	<b>\$ 5,147,897</b>	<b>\$ -</b>
<b>The following is not included in the total claim but are included on a memo basis:</b>													
Board-Approved CDM Variance Account	1567								\$ -	\$ -			
PILs and Tax Variance for 2006 and Subsequent Years (excludes sub-account and contra account below)	1592	\$ 14,427,499	\$ 2,314,616	\$ 11,109,564					\$ 5,632,551	\$ -	\$ 62,633		
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Input Tax Credits (ITCs)	1592		\$ 733,340					\$ 366,600	\$ 1,099,940	\$ -	\$ 2,932		
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Contra Account	1592	\$ -	\$ 733,340	\$ -				\$ 366,600	\$ 1,099,940	\$ -	\$ 2,932		
Disposition and Recovery of Regulatory Balances <sup>7</sup>	1595	\$ -	\$ 33,680,187						\$ 33,680,187	\$ -	\$ 5,375,322		

**For all Board-Approved dispositions, please ensure that the disposition amount has the same sign (e.g. negative figure) as per the related Board decision.**

Applicants may wish to propose kWh as the allocator for account 1521 pending a final decision of the Board. Provide supporting statement indicating whether due to denial of costs in 2006 EDR by the Board, 10% transition costs Adjustments Instructed by the Board include deferral/variance account balances moved to Account 1590 as a result of 1. Please provide explanations for the nature of the adjustments. If the adjustment relates to previously Board Approved (Although the Global Adjustment Account is not reported separately under 2.1.7, please provide a breakdown in rows 28-29). For RSVA accounts only, report the net variance to the account during the year. For all other accounts, record the transfer of the LDC's 2011 rate year started January 1, the projected interest is recorded from January 1, 2011 to December 31, 2011 on the 2011 rate decision. If the LDC's 2011 rate year started May 1, the projected interest is recorded from January 1, 2011 to April 30, 2012 on the December 31, 2010 balance adjusted for the disposed balances as per the LDC's 2011 rate decision. Include Account 1595 as part of Group 1 accounts (line 31) for review and disposition if the recovery (or refund) period support the underlying residual balance in account 1595. If the recovery (or refund) period has not been completed, include the amount in account 1595.



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Please complete the following continuity schedule for your Group 1 Deferral / Variance Accounts, Account 1521 and Account 1595 and follow the instructions.

You have received approval to dispose of balances from prior years, the starting point for entries in the 2012 DW is the 2011 EDR process (CoS or IRM) you received approval for the December 31, 2011 balance. For example, if in the 2011 EDR process (CoS or IRM) you received approval for the December 31, 2011 balance, record the 2011 balance in column AV for principal and column BA for interest. This will allow for the correct starting point for the 2010 opening balance to the beginning of the continuity schedule is: Jan 1, 2005.

Account Descriptions	Account Number	2011					Projected Interest on Dec-31-10 Balances			2.1.7 RRR	Variance RRR vs. 2010 Balance (Principal + Interest)
		Closing Interest Amounts as of Dec-31-10	Principal Disposition during 2011 - instructed by Board	Interest Disposition during 2011 - instructed by Board	Closing Principal Balances as of Dec 31-10 Adjusted for Dispositions during 2011	Closing Interest Balances as of Dec 31-10 Adjusted during 2011 Disposition	Projected Interest from Jan 1, 2011 to December 31, 2011 on Dec 31 -10 balance adjusted for disposition during 2011 <sup>5</sup>	Projected Interest from January 1, 2012 to April 30, 2012 on Dec 31 -10 balance adjusted for disposition during 2011 <sup>6,7</sup>	Total Claim	As of Dec 31-10 <sup>4</sup>	
<b>Group 1 Accounts</b>											
LV Variance Account	1550	\$ 3,133	\$ 197,386	\$ 4,053	\$ 186,438	\$ 920	\$ 2,754	\$ 914	\$ 189,185	\$ 386,957	\$ 0
RSVA - Wholesale Market Service Charge	1580	\$ 177,956	\$ 7,363,938	\$ 137,577	\$ 26,238,240	\$ 40,378	\$ 367,991	\$ 128,567	\$ 26,775,177	\$ 33,780,134	\$ 0
RSVA - Retail Transmission Network Charge	1584	\$ 93,327	\$ 3,120,753	\$ 72,499	\$ 7,764,568	\$ 20,828	\$ 114,139	\$ 38,046	\$ 7,937,581	\$ 10,978,648	\$ 0
RSVA - Retail Transmission Connection Charge	1586	\$ 1,543	\$ 3,304,499	\$ 48,830	\$ 3,097,923	\$ 50,373	\$ 45,532	\$ 15,180	\$ 3,209,008	\$ 205,033	\$ 0
RSVA - Power (excluding Global Adjustment)	1588	\$ -	\$ -	\$ -	\$ 5,597	\$ -	\$ -	\$ -	\$ 5,597	\$ 5,597	\$ 0
RSVA - Power - Sub-Account - Global Adjustment	1588	\$ 228,725	\$ -	\$ 228,725	\$ 20,108,199	\$ 457,450	\$ 66,966	\$ 98,558	\$ 20,731,172	\$ 20,336,924	\$ 0
Recovery of Regulatory Asset Balances	1590	\$ -	\$ -	\$ -	\$ 2	\$ -	\$ -	\$ -	\$ 2	\$ 2	\$ -
Disposition and Recovery of Regulatory Balances (2008) <sup>7</sup>	1595	\$ 286,299	\$ 491,772	\$ 296,776	\$ -	\$ 10,477	\$ 10,477	\$ -	\$ 0	\$ 778,072	\$ 0
Disposition and Recovery of Regulatory Balances (2009) <sup>7</sup>	1595	\$ 77,385	\$ -	\$ -	\$ 363,600	\$ 77,385	\$ 80,251	\$ -	\$ 521,235	\$ 440,985	\$ 0
<b>Group 1 Sub-Total (including Account 1588 - Global Adjustment)</b>		-\$ 214,913	-\$ 7,842,070	-\$ 635,356	\$ 4,560,887	\$ 420,443	\$ 229,327	\$ 24,130	\$ 4,776,133	-\$ 3,496,096	\$ 0
<b>Group 1 Sub-Total (excluding Account 1588 - Global Adjustment)</b>		-\$ 443,638	-\$ 7,842,070	-\$ 406,631	\$ 15,547,312	\$ 37,007	\$ 296,293	\$ 74,428	\$ 15,955,039	-\$ 23,833,019	\$ 0
<b>RSVA - Power - Sub-Account - Global Adjustment</b>	<b>1588</b>	\$ 228,725	\$ -	\$ 228,725	\$ 20,108,199	\$ 457,450	\$ 66,966	\$ 98,558	\$ 20,731,172	\$ 20,336,924	\$ 0
<b>Special Purpose Charge Assessment Variance Account</b>	<b>1521</b>	-\$ 19,401					\$ 67,502	\$ 2,590	\$ 574,577	\$ 3,554,958	\$ 3,050,473
<b>Deferred Payments in Lieu of Taxes</b>	<b>1562</b>	\$ 429,136		-\$ 5,998,665	\$ 429,136	-\$ 88,180	-\$ 29,393	-\$ 5,687,102	\$ 1,103,311	\$ 6,672,840	
<b>Group 1 Total + 1521 + 1562</b>		\$ 194,823	-\$ 7,842,070	-\$ 635,356	-\$ 1,437,778	\$ 849,579	-\$ 250,005	-\$ 2,673	\$ 336,392	\$ 1,162,173	\$ 9,723,313
<b>The following is not included in the total claim but are included on a memo basis:</b>											
Board-Approved CDM Variance Account	1567	\$ -							\$ -		\$ -
PILs and Tax Variance for 2006 and Subsequent Years (excludes sub-account and contra account below)	1592	-\$ 62,633	-\$ 3,317,935	-\$ 55,042	-\$ 2,314,616	\$ 12,643	-\$ 34,025	-\$ 10,665	\$ 2,366,898	-\$ 5,674,950	\$ 20,234
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Input Tax Credits (ITCs)	1592	\$ 2,932					-\$ 15,046	\$ 5,390	\$ 1,093,216	\$ 736,332	-\$ 366,540
PILs and Tax Variance for 2006 and Subsequent Years - Sub-Account HST/OVAT Contra Account	1592	-\$ 2,932					\$ 15,046	-\$ 5,390	\$ 1,093,216	-\$ 736,332	\$ 366,540
Disposition and Recovery of Regulatory Balances <sup>7</sup>	1595	-\$ 5,375,322		-\$ 33,680,187	-\$ 5,375,322				-\$ 39,055,509	-\$ 39,055,509	\$ -

For all Board-Approved dispositions, please ensure that the disposition amount has the same sign (e.g. negative figure) as per the related Board decision.

Applicants may wish to propose kWh as the allocator for account 1521 pending a final decision of the Board. Provide supporting statement indicating whether due to denial of costs in 2006 EDR by the Board, 10% transition costs Adjustments Instructed by the Board include deferral/variance account balances moved to Account 1590 as a result of 1. Please provide explanations for the nature of the adjustments. If the adjustment relates to previously Board Approved c Although the Global Adjustment Account is not reported separately under 2.1.7, please provide a breakdown in rows 28 For RSVA accounts only, report the net variance to the account during the year. For all other accounts, record the tran: If the LDC's 2011 rate year started January 1, the projected interest is recorded from January 1, 2011 to December 31, Board in the 2011 rate decision. If the LDC's 2011 rate year started May 1, the projected interest is recorded from Janu recorded from May 1, 2011 to April 30, 2012 on the December 31, 2010 balance adjusted for the disposed balances ap Include Account 1595 as part of Group 1 accounts (line 31) for review and disposition if the recovery (or refund) period support the underlying residual balance in account 1595. If the recovery (or refund) period has not been completed, inc



Ontario Energy Board

**3<sup>RD</sup> Generation Incentive  
 Regulation Model**

Toronto Hydro-Electric System Limited - EB-2011-0144

In the green shaded cells, enter the most recent Board Approved volumetric forecast. If there is a material difference between the latest Board-approved volumetric forecast and the

Rate Class	Unit	Metered kWh	Metered kW	Billed kWh for Non-RPP Customers	Estimated kW for Non-RPP Customers	Distribution Revenue <sup>1</sup>	1590 Recovery Share Proportion*	1595 Recovery Share Proportion (2008) <sup>2</sup>
Residential	\$/kWh	4,886,977,489		559,659,628	-	204,720,003		
Residential Urban	\$/kWh	99,791,184		11,421,625	-	4,600,284		
General Service Less Than 50 kW	\$/kWh	2,139,318,076		437,628,634	-	67,255,470		
General Service 50 to 999 kW	\$/kVA	10,116,374,153	26,935,191	6,900,756,638	-	156,294,314		
General Service 1,000 to 4,999 kW	\$/kVA	4,626,928,262	10,587,119	4,177,096,302	-	51,343,590		
Large Use > 5000 kW	\$/kVA	2,376,778,323	4,993,733	2,272,251,249	-	25,370,430		
Unmetered Scattered Load	\$/kWh	56,231,585			-	4,681,925		
Sentinel Lighting					-			
Street Lighting	\$/kVA	110,165,016	322,023	110,128,567	-	11,789,364		
Standby - General Service 50 - 1,000 kW					-			
Standby - General Service 1,000 - 5,000 kW					-			
Standby - Large Use					-			
<b>Total</b>		<b>24,412,564,088</b>	<b>42,838,067</b>	<b>14,468,942,643</b>	<b>-</b>	<b>526,055,380</b>	<b>0%</b>	<b>0%</b>

**Total Claim (including Accounts 1521 and 1562)**      -\$      336,392

**Total Claim for Threshold Test (All Group 1 Accounts)**      \$      4,776,133

**Threshold Test <sup>3</sup> (Total Claim per kWh)**      0.00020      Claim does not meet the threshold test. If data has been entered on Sheet 9 for Accounts 1521 and 1562, the model will only dispose of Accounts 1521 and 1562.

<sup>1</sup> For Account 1562, the allocation to customer classes should be performed on the basis of the test year distribution revenue allocation to customer classes found in the Applicant's Cost of Service application that was most recently approved at the time of disposition of the 1562 account balance.

<sup>2</sup> Residual Account balance to be allocated to rate classes in proportion to the recovery share as established when rate riders were implemented.

<sup>3</sup> The Threshold Test does not include the amount in 1521 nor 1562.





Toronto Hydro-Electric System Limited - EB-2011-0144

No input required. This worksheet allocates the deferral/variance account balances (Group 1, 1521, 1588 GA and 1562) to the appropriate classes.

**Allocation of Group 1 Accounts (Excluding Account 1588 - Global Adjustment)**

Rate Class	Units	Billed kWh	% kWh	1550	1580	1584	1586
Residential	\$/kWh	4,886,977,489	20.02%	0	0	0	0
Residential Urban	\$/kWh	99,791,184	0.41%	0	0	0	0
General Service Less Than 50 kW	\$/kWh	2,139,318,076	8.76%	0	0	0	0
General Service 50 to 999 kW	\$/kVA	10,116,374,153	41.44%	0	0	0	0
General Service 1,000 to 4,999 kW	\$/kVA	4,626,928,262	18.95%	0	0	0	0
Large Use > 5000 kW	\$/kVA	2,376,778,323	9.74%	0	0	0	0
Unmetered Scattered Load	\$/kWh	56,231,585	0.23%	0	0	0	0
Sentinel Lighting	-	-	0.00%	0	0	0	0
Street Lighting	\$/kVA	110,165,016	0.45%	0	0	0	0
Standby - General Service 50 - 1,000 kW	-	-	0.00%	0	0	0	0
Standby - General Service 1,000 - 5,000 kW	-	-	0.00%	0	0	0	0
Standby - Large Use	-	-	0.00%	0	0	0	0
<b>Total</b>		<b>24,412,564,088</b>	<b>100.00%</b>	<b>189,185</b>	<b>(26,775,177)</b>	<b>7,937,581</b>	<b>3,209,008</b>

\* RSVA - Power (Excluding Global Adjustment)

**1588 RSVA - Power (Global Adjustment Sub-Account)**

Rate Class	non-RPP kWh	% kWh	1588
Residential	559,659,628	3.87%	-
Residential Urban	11,421,625	0.08%	-
General Service Less Than 50 kW	437,628,634	3.02%	-
General Service 50 to 999 kW	6,900,756,638	47.69%	-
General Service 1,000 to 4,999 kW	4,177,096,302	28.87%	-
Large Use > 5000 kW	2,272,251,249	15.70%	-
Unmetered Scattered Load	-	0.00%	-
Sentinel Lighting	-	0.00%	-
Street Lighting	110,128,567	0.76%	-
Standby - General Service 50 - 1,000 kW	-	0.00%	-
Standby - General Service 1,000 - 5,000 kW	-	0.00%	-
Standby - Large Use	-	0.00%	-
<b>Total</b>	<b>14,468,942,643</b>	<b>100.00%</b>	<b>20,731,172</b>

**Allocation of Account 1562**

	% of Distribution Revenue	Allocation of Balance in Account 1562
Residential	38.9%	2,213,196
Residential Urban	0.9%	49,733
General Service Less Than 50 kW	12.8%	727,088

General Service 50 to 999 kW	29.7%	-	1,689,673
General Service 1,000 to 4,999 kW	9.8%	-	555,067
Large Use > 5000 kW	4.8%	-	274,276
Unmetered Scattered Load	0.9%	-	50,616
Sentinel Lighting	0.0%	-	-
Street Lighting	2.2%	-	127,453
Standby - General Service 50 - 1,000 kW	0.0%	-	-
Standby - General Service 1,000 - 5,000 kW	0.0%	-	-
Standby - Large Use	0.0%	-	-
<b>Total</b>	<b>100.0%</b>	<b>-</b>	<b>5,687,102</b>



1588*	1590	1595 (2008)	1595 (2009)	1521	Total
0	0	0	0	115,021	115,021
0	0	0	0	2,349	2,349
0	0	0	0	50,351	50,351
0	0	0	0	238,100	238,100
0	0	0	0	108,900	108,900
0	0	0	0	55,940	55,940
0	0	0	0	1,323	1,323
0	0	0	0	0	0
0	0	0	0	2,593	2,593
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
<b>5,597</b>	<b>2</b>	<b>0</b>	<b>(521,235)</b>	<b>574,577</b>	<b>574,577</b>





Ontario Energy Board

**Deferral / Variance Account  
 Work Form**

Toronto Hydro-Electric System Limited - EB-2011-0144

No input required. This worksheet calculates rate riders related to the Deferral/Variance Account Disposition (if applicable) and associated rate riders for the global adjustment sub-account.

Please indicate the Rate Rider Recovery Period (in years)

Rate Class	Unit	Billed kWh	Billed kW	Accounts Allocated by kWh/kW (RPP) or Distribution Revenue	Deferral/Variance Account Rate Rider	Account 1588 Global Adjustment
Residential	\$/kWh	4,886,977,489	-	-\$ 2,098,175	(\$0.00043)	\$/kWh \$ -
Residential Urban	\$/kWh	99,791,184	-	-\$ 47,384	(\$0.00047)	\$/kWh \$ -
General Service Less Than 50 kW	\$/kWh	2,139,318,076	-	-\$ 676,737	(\$0.00032)	\$/kWh \$ -
General Service 50 to 999 kW	\$/kVA	10,116,374,153	26,935,191	-\$ 1,451,573	(\$0.05389)	\$/kVA \$ -
General Service 1,000 to 4,999 kW	\$/kVA	4,626,928,262	10,587,119	-\$ 446,167	(\$0.04214)	\$/kVA \$ -
Large Use > 5000 kW	\$/kVA	2,376,778,323	4,993,733	-\$ 218,336	(\$0.04372)	\$/kVA \$ -
Unmetered Scattered Load	\$/kWh	56,231,585	-	-\$ 49,292	(\$0.00088)	\$/kWh \$ -
Sentinel Lighting	-	-	-	\$ -	\$0.00000	\$ -
Street Lighting	\$/kVA	110,165,016	322,023	-\$ 124,860	(\$0.38774)	\$/kVA \$ -
Standby - General Service 50 - 1,000 kW	-	-	-	\$ -	\$0.00000	\$ -
Standby - General Service 1,000 - 5,000 kW	-	-	-	\$ -	\$0.00000	\$ -
Standby - Large Use	-	-	-	\$ -	\$0.00000	\$ -
<b>Total</b>		<b>24,412,564,088</b>	<b>42,838,067</b>	<b>-\$ 5,112,525</b>		<b>\$ -</b>





**Ontario Energy Board**  
**3<sup>RD</sup> Generation Incentive Regulation Model**

Toronto Hydro-Electric System Limited - EB-2011-0144

Below is a listing of the current Monthly Fixed Charges. All rates with expired effective dates have been removed. In columns "B", "K", and "M" (green cells), please enter all additional Monthly Fixed Charges you are proposing (eg: Smart Meter Funding Adder, etc). Please ensure that the word "Rider" or "Adder" is included in the description (as applicable).

Rate Description	Unit	Amount	Effective Until Date	Proposed Amount	Effective Until Date
<b>Residential</b>					
Service Charge (Based on 30 day month)	\$	18.37	April 30, 2015		
Smart Meter Funding Adder	\$	0.68	April 30, 2014		
2011 Unfunded Capex Rate Rider - MFC (per 30 days)	\$			0.65	April 30, 2015
2012 IRM Rate Rider - MFC (per 30 days)	\$			0.06	April 30, 2015
2012 and 2013 - ICM Rate Adder - MFC (per 30 days)	\$			1.88	April 30, 2015
<b>Residential Urban</b>					
Service Charge (Based on 30 day month)	\$	17.12	April 30, 2015		
Smart Meter Funding Adder	\$	0.68	April 30, 2014		
2011 Unfunded Capex Rate Rider - MFC (per 30 days)	\$			0.60	April 30, 2015
2012 IRM Rate Rider - MFC (per 30 days)	\$			0.05	April 30, 2015
2012 and 2013 - ICM Rate Adder - MFC (per 30 days)	\$			1.75	April 30, 2015
<b>General Service Less Than 50 kW</b>					
Service Charge (Based on 30 day month)	\$	24.47	April 30, 2015		
Smart Meter Funding Adder	\$	0.68	April 30, 2014		
2011 Unfunded Capex Rate Rider - MFC (per 30 days)	\$			0.86	April 30, 2015
2012 IRM Rate Rider - MFC (per 30 days)	\$			0.07	April 30, 2015
2012 and 2013 - ICM Rate Adder - MFC (per 30 days)	\$			2.50	April 30, 2015
<b>General Service 50 to 999 kW</b>					
Service Charge (Based on 30 day month)	\$	35.80	April 30, 2015		
Smart Meter Funding Adder	\$	0.68	April 30, 2014		
2011 Unfunded Capex Rate Rider - MFC (per 30 days)	\$			1.26	April 30, 2015
2012 IRM Rate Rider - MFC (per 30 days)	\$			0.11	April 30, 2015
2012 and 2013 - ICM Rate Adder - MFC (per 30 days)	\$			3.65	April 30, 2015
<b>General Service 1,000 to 4,999 kW</b>					
Service Charge (Based on 30 day month)	\$	691.13	April 30, 2015		
Smart Meter Funding Adder	\$	0.68	April 30, 2014		
2011 Unfunded Capex Rate Rider - MFC (per 30 days)	\$			24.39	April 30, 2015
2012 IRM Rate Rider - MFC (per 30 days)	\$			2.11	April 30, 2015
2012 and 2013 - ICM Rate Adder - MFC (per 30 days)	\$			70.51	April 30, 2015
<b>Large Use &gt; 5000 kW</b>					
Service Charge (Based on 30 day month)	\$	3029.57	April 30, 2015		
Smart Meter Funding Adder	\$	0.68	April 30, 2014		
2011 Unfunded Capex Rate Rider - MFC (per 30 days)	\$			106.92	April 30, 2015
2012 IRM Rate Rider - MFC (per 30 days)	\$			9.25	April 30, 2015
2012 and 2013 - ICM Rate Adder - MFC (per 30 days)	\$			309.08	April 30, 2015
<b>Unmetered Scattered Load</b>					
Service Charge (Based on 30 day month)	\$	4.87	April 30, 2015		
2011 Unfunded Capex Rate Rider - MFC (per 30 days)	\$			0.17	April 30, 2015
2012 IRM Rate Rider - MFC (per 30 days)	\$			0.01	April 30, 2015
2012 and 2013 - ICM Rate Adder - MFC (per 30 days)	\$			0.50	April 30, 2015
<b>Sentinel Lighting</b>					
Service Charge (per connection)	\$	0.49	April 30, 2015		
2011 Unfunded Capex Rate Rider - MFC (per connection/ 30 days)	\$			0.02	April 30, 2015
2012 IRM Rate Rider - MFC (per connection/30 days)	\$			0.00	April 30, 2015
2012 and 2013 - ICM Rate Adder - MFC (per connection/30 days)	\$			0.05	April 30, 2015
<b>Street Lighting</b>					
Service Charge (Based on 30 day month)	\$	1.31	April 30, 2015		
2011 Unfunded Capex Rate Rider - MFC (per connection/ 30 days)	\$			0.05	April 30, 2015
2012 IRM Rate Rider - MFC (per connection/30 days)	\$			0.00	April 30, 2015
2012 and 2013 - ICM Rate Adder - MFC (per connection/30 days)	\$			0.14	April 30, 2015
<b>Standby - General Service 50 - 1,000 kW</b>					
Service Charge (Based on 30 day month)	\$	199.26	April 30, 2015		
	\$				
	\$				
	\$				
	\$				
<b>Standby - General Service 1,000 - 5,000 kW</b>					
Service Charge (Based on 30 day month)	\$	199.26	April 30, 2015		
	\$				
	\$				
	\$				
	\$				
<b>Standby - Large Use</b>					
Service Charge (Based on 30 day month)	\$	199.26	April 30, 2015		

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Current RTSR-Network Rates are listed below. In column "K", please enter your proposed RTSR-Network Rates as per Sheet 13 of the Board's RTSR Workform.

Rate Description	Unit	Current Amount	% Adjustment	Proposed Amount
<b>Residential</b>				
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00703	14.794%	0.00807
<b>Residential Urban</b>				
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00703	14.794%	0.00807
<b>General Service Less Than 50 kW</b>				
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00680	14.706%	0.00780
<b>General Service 50 to 999 kW</b>				
Retail Transmission Rate – Network Service Rate	\$/kW	2.43510	14.767%	2.79470
<b>General Service 1,000 to 4,999 kW</b>				
Retail Transmission Rate – Network Service Rate	\$/kW	2.35270	14.770%	2.70020
<b>Large Use &gt; 5000 kW</b>				
Retail Transmission Rate – Network Service Rate	\$/kW	2.68200	14.769%	3.07810
<b>Unmetered Scattered Load</b>				
Retail Transmission Rate – Network Service Rate	\$/kWh	0.00428	14.720%	0.00491
<b>Sentinel Lighting</b>				
<b>Street Lighting</b>				
Retail Transmission Rate – Network Service Rate	\$/kW	2.16580	14.771%	2.48570
<b>Standby - General Service 50 - 1,000 kW</b>				
<b>Standby - General Service 1,000 - 5,000 kW</b>				
<b>Standby - Large Use</b>				













Current RTSR-Connection Rates are listed below. In column "K", please enter your proposed RTSR-Connection Rates as per Sheet 13 of the Board's RTSR Workform.

Rate Description	Unit	Current Amount	% Adjustment	Proposed Amount
<b>Residential</b>				
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00513	9.395%	0.00561
<b>Residential Urban</b>				
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00513	9.395%	0.00561
<b>General Service Less Than 50 kW</b>				
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00463	9.395%	0.00506
<b>General Service 50 to 999 kW</b>				
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	1.76300	9.395%	1.92864
<b>General Service 1,000 to 4,999 kW</b>				
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	1.76130	9.395%	1.92678
<b>Large Use &gt; 5000 kW</b>				
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	1.95670	9.395%	2.14053
<b>Unmetered Scattered Load</b>				
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kWh	0.00324	9.395%	0.00354
<b>Sentinel Lighting</b>				
<b>Street Lighting</b>				
Retail Transmission Rate – Line and Transformation Connection Service Rate	\$/kW	2.10220	9.395%	2.29970
<b>Standby - General Service 50 - 1,000 kW</b>				
<b>Standby - General Service 1,000 - 5,000 kW</b>				
<b>Standby - Large Use</b>				



## Ontario Energy Board

### 3<sup>RD</sup> Generation Incentive Regulation Model

Toronto Hydro-Electric System Limited - EB-2011-0144

If applicable, please enter any adjustments related to the revenue to cost ratio model into columns H and K.  
 The Price Escalator has been set at the 2011 values and will be updated by Board staff. The Stretch Factor Value will also be updated by Board staff.

Price Escalator 2.00%    Productivity Factor 0.72%    Price Cap Index **0.68%**

Choose Stretch Factor Group III    Associated Stretch Factor Value 0.6%

Rate Description	Unit	Current MFC	MFC Adjustment from R/C Model	Current Volumetric Charge	Unit	DVR Adjustment from R/C Model	Price Cap Index	Proposed MFC
<b>Residential</b>								
Residential Urban	\$	18.37		0.01517	\$/kWh		0.680%	18.50
General Service Less Than 50 kW	\$	17.12		0.02582	\$/kWh		0.680%	17.23
General Service 50 to 999 kW	\$	24.47		0.02262	\$/kWh		0.680%	24.63
General Service 1,000 to 4,999 kW	\$	35.80		5.63370	\$/kVA		0.680%	36.05
Large Use > 5000 kW	\$	691.13		4.48000	\$/kVA		0.680%	695.83
Unmetered Scattered Load	\$	3,029.57		4.77280	\$/kVA		0.680%	3,050.17
Sentinel Lighting	\$	4.87		0.06110	\$/kWh		0.680%	4.91
Street Lighting	\$	0.49					0.680%	0.50
Standby - General Service 50 - 1,000 kW	\$	1.31		28.92010	\$/kVA		0.680%	1.32
Standby - General Service 1,000 - 5,000 kW	\$	199.26		5.63370	\$/kVA		0.680%	200.61
Standby - Large Use	\$	199.26		4.48000	\$/kVA		0.680%	200.61
	\$	199.26		4.77280	\$/kVA		0.680%	200.61

**Proposed  
Volumetric  
Charge**

0.01527

0.02600

0.02277

5.67201

4.51046

4.80526

0.06152

29.11676

5.67201

4.51046

4.80526



Please enter the descriptions of the current Loss Factors from your most recent Board-Approved Tariff of Rates and Charges by using the drop-down menu in the column labeled "Loss Factors". If the description is not found in the drop-down menu, please enter the description in the green cells under the correct classes.

**Loss Factors**

**Current**

Total Loss Factor – Secondary Metered Customer < 5,000 kW	1.0376
Total Loss Factor – Secondary Metered Customer > 5,000 kW	1.1087
Distribution Loss Factor - Primary Metered Customer < 5,000 kW	1.0272
Distribution Loss Factor - Primary Metered Customer > 5,000 kW	1.0085





**RETAIL SERVICE CHARGES (if applicable)**

The application of these rates and charges shall be in accordance with the Licence of the Distributor and any Code or Order of the Board, and amendments thereto as approved by the Board, which may be applicable to the administration of this schedule.

No rates and charges for the distribution of electricity and charges to meet the costs of any work or service done or furnished for the purpose of the distribution of electricity shall be made except as permitted by this schedule, unless required by the Distributor's Licence or a Code or Order of the Board, and amendments thereto as approved by the Board, or as specified herein.

Unless specifically noted, this schedule does not contain any charges for the electricity commodity, be it under the Regulated Price Plan, a contract with a retailer or the wholesale market price, as applicable

It should be noted that this schedule does not list any charges, assessments, or credits that are required by law to be invoiced by a distributor and that are not subject to Board approval, such as the Debt Retirement Charge, charges for the Ministry of Energy Conservation and Renewable Energy Program, the Global Adjustment, the Ontario Clean Energy Benefit and the HST.

Retail Service Charges refer to services provided by a distributor to retailers or customers related to the supply of competitive electricity

One-time charge, per retailer, to establish the service agreement between the distributor and the retailer	\$	100.00
Monthly Fixed Charge, per retailer	\$	20.00
Monthly Variable Charge, per customer, per retailer	\$/cust.	0.50
Distributor-consolidated billing charge, per customer, per retailer	\$/cust.	0.30
Retailer-consolidated billing credit, per customer, per retailer	\$/cust.	(0.30)
Service Transaction Requests (STR)		
Request fee, per request, applied to the requesting party	\$	0.25
Processing fee, per request, applied to the requesting party	\$	0.50
Request for customer information as outlined in Section 10.6.3 and Chapter 11 of the Retail Settlement Code directly to retailers and customers, if not delivered electronically through the Electronic Business Transaction (EBT) system, applied to the requesting party		
Up to twice a year	\$	no charge
More than twice a year, per request (plus incremental delivery costs)	\$	2.00



Residential	2012 Interim			2013			Impact	
	Volume	Rate \$	Charge \$	Volume	Rate \$	Charge \$	Change \$	Change %
Service Charge (per 30 days)	1	18.25	18.25	1	18.50	18.50	0.25	1.4%
Distribution	800	0.01520	12.16	800	0.01527	12.22	0.06	0.5%
Smart Meter Rider (per 30 days)	1	0.68	0.68	1	0.68	0.68	-	0.0%
LRAM Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011/12 Rate Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - Global Adjustment - RPP	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011 Rate Rider	-	-	-	-	-	-	-	n/a
Contact Voltage	-	-	-	-	-	-	-	n/a
Late Payment Penalty	1	0.24	0.24	-	-	-	(0.24)	-100.0%
Foregone Revenue Rate Rider - fixed rate	-	-	-	-	-	-	-	n/a
Foregone Revenue Rate Rider - variable rate	-	-	-	-	-	-	-	n/a
<b>2011 Unfunded Capex Rate Rider - MFC</b>	-	-	-	1	0.65	0.65	0.65	n/a
<b>2011 Unfunded Capex Rate Rider - DVR</b>	-	-	-	800	0.00054	0.43	0.43	n/a
<b>Shared Tax Savings Rate Rider - DVR</b>	-	-	-	800	-	-	-	n/a
<b>2012 Foregone IRM Rate Rider - MFC</b>	-	-	-	1	0.06	0.06	0.06	n/a
<b>2012 Foregone IRM Rate Rider - DVR</b>	-	-	-	800	0.00005	0.04	0.04	n/a
<b>2012 ICM Rate Adder - MFC</b>	-	-	-	1	0.52	0.52	0.52	n/a
<b>2012 ICM Rate Adder - DVR</b>	-	-	-	800	0.00043	0.34	0.34	n/a
<b>2013 ICM Rate Adder - MFC</b>	-	-	-	1	1.36	1.36	1.36	n/a
<b>2013 ICM Rate Adder - DVR</b>	-	-	-	800	0.00114	0.91	0.91	n/a
<b>Deferral/Variance Account Rate Rider</b>	-	-	-	800	(0.00043)	(0.34)	(0.34)	n/a
Sub Total A - Distribution			31.33			35.37	4.04	12.9%
RTST - Network	830	0.00703	5.84	830	0.00807	6.70	0.86	14.8%
RTSR - Connection	830	0.00513	4.26	830	0.00561	4.66	0.40	9.4%
Sub Total B (including Sub-Total A) - Distribution			41.42			46.73	5.30	12.8%
Wholesale Market Rate	830	0.0052	4.32	830	0.0052	4.32	-	0.0%
RRRP	830	0.0011	0.91	830	0.0011	0.91	-	0.0%
DRC	800	0.0070	5.60	800	0.0070	5.60	-	0.0%
Standard Supply Service Charge	1	0.25	0.25	1	0.25	0.25	-	0.0%
SPC	830	-	-	830	-	-	-	n/a
Cost of Power Commodity - 1st Tier (May 1st 2010)	600	0.075	45.00	600	0.075	45.00	-	0.0%
Cost of Power Commodity - 2nd Tier (May 1st 2010)	230	0.088	20.25	230	0.088	20.25	-	0.0%
Total Bill (including Sub-Total B)			117.75			123.05	5.30	4.5%

kWh

Consumption Details	800
Total Loss Factor	1.0376

Competitive Sector Multi-Unit Residential	2012 Interim			2013			Impact	
	Volume	Rate \$	Charge \$	Volume	Rate \$	Charge \$	Change \$	Change %
Service Charge (per 30 days)	1	18.25	18.25	1	17.23	17.23	(1.02)	-5.6%
Distribution	334	0.01520	5.08	334	0.02600	8.68	3.61	71.1%
Smart Meter Rider (per 30 days)	1	0.68	0.68	1	0.68	0.68	-	0.0%
LRAM Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011/12 Rate Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - Global Adjustment - RPP	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011 Rate Rider	-	-	-	-	-	-	-	n/a
Contact Voltage	-	-	-	-	-	-	-	n/a
Late Payment Penalty	1	0.24	0.24	-	-	-	(0.24)	-100.0%
Foregone Revenue Rate Rider - fixed rate	-	-	-	-	-	-	-	n/a
Foregone Revenue Rate Rider - variable rate	-	-	-	-	-	-	-	n/a
<b>2011 Unfunded Capex Rate Rider - MFC</b>	-	-	-	1	0.60	0.60	0.60	n/a
<b>2011 Unfunded Capex Rate Rider - DVR</b>	-	-	-	334	0.00092	0.31	0.31	n/a
<b>Shared Tax Savings Rate Rider - DVR</b>	-	-	-	334	(0.00010)	(0.03)	(0.03)	n/a
<b>2012 Foregone IRM Rate Rider - MFC</b>	-	-	-	1	0.05	0.05	0.05	n/a
<b>2012 Foregone IRM Rate Rider - DVR</b>	-	-	-	334	0.00008	0.03	0.03	n/a
<b>2012 ICM Rate Adder - MFC</b>	-	-	-	1	0.48	0.48	0.48	n/a
<b>2012 ICM Rate Adder - DVR</b>	-	-	-	334	0.00073	0.24	0.24	n/a
<b>2013 ICM Rate Adder - MFC</b>	-	-	-	1	1.27	1.27	1.27	n/a
<b>2013 ICM Rate Adder - DVR</b>	-	-	-	334	0.00194	0.65	0.65	n/a
<b>Deferral/Variance Account Rate Rider</b>	-	-	-	334	(0.00047)	(0.16)	(0.16)	n/a
Sub Total A - Distribution			24.25			30.03	5.78	23.8%
RTST - Network	347	0.00703	2.44	347	0.00807	2.80	0.36	14.8%
RTSR - Connection	347	0.00513	1.78	347	0.00561	1.94	0.17	9.4%
Sub Total B (including Sub-Total A) - Distribution			28.46			34.77	6.31	22.2%
Wholesale Market Rate	347	0.0052	1.80	347	0.0052	1.80	-	0.0%
RRRP	347	0.0011	0.38	347	0.0011	0.38	-	0.0%
DRC	334	0.0070	2.34	334	0.0070	2.34	-	0.0%
Standard Supply Service Charge	1	0.25	0.25	1	0.25	0.25	-	0.0%
SPC	347	-	-	347	-	-	-	n/a
Cost of Power Commodity - 1st Tier (May 1st 2010)	347	0.075	25.99	347	0.075	25.99	-	0.0%
Cost of Power Commodity - 2nd Tier (May 1st 2010)	-	0.088	-	-	0.088	-	-	n/a
Total Bill (including Sub-Total B)			59.22			65.53	6.31	10.7%

kWh

Consumption Details	334
Total Loss Factor	1.0376

GS < 50 kW	2012 Interim			2013			Impact	
	Volume	Rate \$	Charge \$	Volume	Rate \$	Charge \$	Change \$	Change %
Service Charge (per 30 days)	1	24.30	24.30	1	24.63	24.63	0.33	1.4%
Distribution	2,000	0.02247	44.94	2,000	0.02277	45.54	0.60	1.3%
Smart Meter Rider (per 30 days)	1	0.68	0.68	1	0.68	0.68	-	0.0%
LRAM Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011/12 Rate Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - Global Adjustment - RPP	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011 Rate Rider	-	-	-	-	-	-	-	n/a
Contact Voltage	-	-	-	-	-	-	-	n/a
Late Payment Penalty	1	\$0.69	0.69	-	-	-	(0.69)	-100.0%
Foregone Revenue Rate Rider - fixed rate	-	-	-	-	-	-	-	n/a
Foregone Revenue Rate Rider - variable rate	-	-	-	-	-	-	-	n/a
<b>2011 Unfunded Capex Rate Rider - MFC</b>	-	-	-	1	0.86	0.86	0.86	n/a
<b>2011 Unfunded Capex Rate Rider - DVR</b>	-	-	-	2,000	0.00081	1.62	1.62	n/a
<b>Shared Tax Savings Rate Rider - DVR</b>	-	-	-	-	-	-	-	n/a
<b>2012 Foregone IRM Rate Rider - MFC</b>	-	-	-	1	0.07	0.07	0.07	n/a
<b>2012 Foregone IRM Rate Rider - DVR</b>	-	-	-	2,000	0.00007	0.14	0.14	n/a
<b>2012 ICM Rate Adder - MFC</b>	-	-	-	1	0.69	0.69	0.69	n/a
<b>2012 ICM Rate Adder - DVR</b>	-	-	-	2,000	0.00064	1.28	1.28	n/a
<b>2013 ICM Rate Adder - MFC</b>	-	-	-	1	1.81	1.81	1.81	n/a
<b>2013 ICM Rate Adder - DVR</b>	-	-	-	2,000	0.00170	3.40	3.40	n/a
<b>Deferral/Variance Account Rate Rider</b>	-	-	-	2,000	(0.00032)	(0.64)	(0.64)	n/a
Sub Total A - Distribution			70.61			80.08	9.47	13.4%
RTST - Network	2,075	0.00680	14.11	2,075	0.00780	16.19	2.08	14.7%
RTSR - Connection	2,075	0.00463	9.61	2,075	0.00506	10.50	0.89	9.3%
Sub Total B (including Sub-Total A) - Distribution			94.33			106.77	12.44	13.2%
Wholesale Market Rate	2,075	0.0052	10.79	2,075	0.0052	10.79	-	0.0%
RRRP	2,075	0.0011	2.28	2,075	0.0011	2.28	-	0.0%
DRC	2,000	0.0070	14.00	2,000	0.0070	14.00	-	0.0%
Standard Supply Service Charge	1	0.25	0.25	1	0.25	0.25	-	0.0%
Special Purpose Charge	2,075	-	-	2,075	-	-	-	n/a
Cost of Power Commodity - 1st Tier (May 1st 2010)	750	0.075	56.25	750	0.075	56.25	-	0.0%
Cost of Power Commodity - 2nd Tier (May 1st 2010)	1,325	0.088	116.62	1,325	0.088	116.62	-	0.0%
Total Bill (including Sub-Total B)			294.52			306.96	12.44	4.2%

kWh

Consumption Details	2,000
Total Loss Factor	1.0376

GS > 50 < 1000	2012 Interim			2013			Impact	
	Volume	Rate \$	Charge \$	Volume	Rate \$	Charge \$	Change \$	Change %
Service Charge (per 30 days)	1	35.56	35.56	1	36.05	36.05	0.49	1.4%
Distribution	388	5.5956	2,171.09	388	5.6720	2,200.74	29.64	1.4%
Smart Meter Rider (per 30 days)	1	0.68	0.68	1	0.68	0.68	-	0.0%
LRAM Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011/12 Rate Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - Global Adjustment - Non RPP	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011 Rate Rider	-	-	-	-	-	-	-	n/a
Contact Voltage	-	-	-	-	-	-	-	n/a
Late Payment Penalty	1	\$8.37	8.37	-	-	-	(8.37)	-100.0%
Foregone Revenue Rate Rider - fixed rate	-	-	-	-	-	-	-	n/a
Foregone Revenue Rate Rider - variable rate	-	-	-	-	-	-	-	n/a
<b>2011 Unfunded Capex Rate Rider - MFC</b>	-	-	-	1	1.26	1.26	1.26	n/a
<b>2011 Unfunded Capex Rate Rider - DVR</b>	-	-	-	388	0.1988	77.13	77.13	n/a
<b>Shared Tax Savings Rate Rider - DVR</b>	-	-	-	388	(0.0067)	(2.60)	(2.60)	n/a
<b>2012 Foregone IRM Rate Rider - MFC</b>	-	-	-	1	0.11	0.11	0.11	n/a
<b>2012 Foregone IRM Rate Rider - DVR</b>	-	-	-	388	0.0172	6.67	6.67	n/a
<b>2012 ICM Rate Adder - MFC</b>	-	-	-	1	1.00	1.00	1.00	n/a
<b>2012 ICM Rate Adder - DVR</b>	-	-	-	388	0.1580	61.30	61.30	n/a
<b>2013 ICM Rate Adder - MFC</b>	-	-	-	1	2.65	2.65	2.65	n/a
<b>2013 ICM Rate Adder - DVR</b>	-	-	-	388	0.4168	161.72	161.72	n/a
<b>Deferral/Variance Account Rate Rider</b>	-	-	-	388	(0.0539)	(20.91)	(20.91)	n/a
Sub Total A - Distribution			2,215.70			2,525.80	310.10	14.0%
RTST - Network	349	2.4351	849.85	349	2.7947	975.35	125.50	14.8%
RTSR - Connection	349	1.7630	615.29	349	1.9286	673.08	57.79	9.4%
Sub Total B (including Sub-Total A) - Distribution			3,680.84			4,174.24	493.40	13.4%
Wholesale Market Rate	155,640	0.0052	809.33	155,640	0.0052	809.33	-	0.0%
RRRP	155,640	0.0011	171.20	155,640	0.0011	171.20	-	0.0%
DRC	150,000	0.0070	1,050.00	150,000	0.0070	1,050.00	-	0.0%
Standard Supply Service Charge	1	0.25	0.25	1	0.25	0.25	-	0.0%
Special Purpose Charge	155,640	-	-	155,640	-	-	-	n/a
Cost of Power Commodity - 1st Tier (May 1st 2010)	750	0.075	56.25	750	0.075	56.25	-	0.0%
Cost of Power Commodity - 2nd Tier (May 1st 2010)	154,890	0.088	13,630.32	154,890	0.088	13,630.32	-	0.0%
Total Bill (including Sub-Total B)			19,398.19			19,891.59	493.40	2.5%
	<b>kWh</b>	<b>kW</b>	<b>kVA</b>	<b>Hours Use</b>	<b>PF</b>	<b>Net/Conn</b>		
Consumption Details	150,000	349	388	430	90%	100%		
Total Loss Factor	1.0376							

GS > 1000 < 5000	2012 Interim			2013			Impact	
	Volume	Rate \$	Charge \$	Volume	Rate \$	Charge \$	Change \$	Change %
Service Charge (per 30 days)	1	686.46	686.46	1	695.83	695.83	9.37	1.4%
Distribution	1,778	4.4497	7,911.57	1,778	4.5105	8,019.67	108.10	1.4%
Smart Meter Rider (per 30 days)	1	0.68	0.68	1	0.68	0.68	-	0.0%
LRAM Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011/12 Rate Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - Global Adjustment - Non RPP	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011 Rate Rider	-	-	-	-	-	-	-	n/a
Contact Voltage	-	-	-	-	-	-	-	n/a
Late Payment Penalty	1.00	\$69.81	69.81	-	-	-	(69.81)	-100.0%
Foregone Revenue Rate Rider - fixed rate	-	-	-	-	-	-	-	n/a
Foregone Revenue Rate Rider - variable rate	-	-	-	-	-	-	-	n/a
<b>2011 Unfunded Capex Rate Rider - MFC</b>	-	-	-	1	24.39	24.39	24.39	n/a
<b>2011 Unfunded Capex Rate Rider - DVR</b>	-	-	-	1,778	0.1581	281.10	281.10	n/a
<b>Shared Tax Savings Rate Rider - DVR</b>	-	-	-	1,778	(0.0056)	(9.96)	(9.96)	n/a
<b>2012 Foregone IRM Rate Rider - MFC</b>	-	-	-	1	2.11	2.11	2.11	n/a
<b>2012 Foregone IRM Rate Rider - DVR</b>	-	-	-	1,778	0.0137	24.36	24.36	n/a
<b>2012 ICM Rate Adder - MFC</b>	-	-	-	1	19.38	19.38	19.38	n/a
<b>2012 ICM Rate Adder - DVR</b>	-	-	-	1,778	0.1256	223.32	223.32	n/a
<b>2013 ICM Rate Adder - MFC</b>	-	-	-	1	51.13	51.13	51.13	n/a
<b>2013 ICM Rate Adder - DVR</b>	-	-	-	1,778	0.3314	589.23	589.23	n/a
<b>Deferral/Variance Account Rate Rider</b>	-	-	-	1,778	(0.0421)	(74.85)	(74.85)	n/a
Sub Total A - Distribution			8,668.52			9,846.38	1,177.87	13.6%
RTST - Network	1,600	2.3527	3,764.32	1,600	2.7002	4,320.32	556.00	14.8%
RTSR - Connection	1,600	1.7613	2,818.08	1,600	1.9268	3,082.88	264.80	9.4%
Sub Total B (including Sub-Total A) - Distribution			15,250.92			17,249.58	1,998.67	13.1%
Wholesale Market Rate	830,080	0.0052	4,316.42	830,080	0.0052	4,316.42	-	0.0%
RRRP	830,080	0.0011	913.09	830,080	0.0011	913.09	-	0.0%
DRC	800,000	0.0070	5,600.00	800,000	0.0070	5,600.00	-	0.0%
Standard Supply Service Charge	1	0.25	0.25	1	0.25	0.25	-	0.0%
Special Purpose Charge	830,080	-	-	830,080	-	-	-	n/a
Cost of Power Commodity - 1st Tier (May 1st 2010)	750	0.075	56.25	750	0.075	56.25	-	0.0%
Cost of Power Commodity - 2nd Tier (May 1st 2010)	829,330	0.088	72,981.04	829,330	0.088	72,981.04	-	0.0%
Total Bill (including Sub-Total B)			99,117.96			101,116.63	1,998.67	2.0%
	<b>kWh</b>	<b>kW</b>	<b>kVA</b>	<b>Hours Use</b>	<b>PF</b>	<b>Net/Conn</b>		
Consumption Details	800,000	1,600	1,778	500	90%	100%		
Total Loss Factor	1.0376							

LU	2012 Interim			2013			Impact	
	Volume	Rate \$	Charge \$	Volume	Rate \$	Charge \$	Change \$	Change %
Service Charge (per 30 days)	1	3,009.11	3,009.11	1	3,050.17	3,050.17	41.06	1.4%
Distribution	9,434	4.7406	44,722.82	9,434	4.8053	45,333.20	610.38	1.4%
Smart Meter Rider (per 30 days)	1	0.68	0.68	1	0.68	0.68	-	0.0%
LRAM Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011/12 Rate Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - Global Adjustment - Non RPP	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011 Rate Rider	-	-	-	-	-	-	-	n/a
Contact Voltage	-	-	-	-	-	-	-	n/a
Late Payment Penalty	1	\$304.62	304.62	1	-	-	(304.62)	-100.0%
Foregone Revenue Rate Rider - fixed rate	-	-	-	-	-	-	-	n/a
Foregone Revenue Rate Rider - variable rate	-	-	-	-	-	-	-	n/a
<b>2011 Unfunded Capex Rate Rider - MFC</b>	-	-	-	1	106.92	106.92	106.92	n/a
<b>2011 Unfunded Capex Rate Rider - DVR</b>	-	-	-	9,434	0.1684	1,588.69	1,588.69	n/a
<b>Shared Tax Savings Rate Rider - DVR</b>	-	-	-	9,434	(0.0059)	(55.66)	(55.66)	n/a
<b>2012 Foregone IRM Rate Rider - MFC</b>	-	-	-	1	9.25	9.25	9.25	n/a
<b>2012 Foregone IRM Rate Rider - DVR</b>	-	-	-	9,434	0.0146	137.74	137.74	n/a
<b>2012 ICM Rate Adder - MFC</b>	-	-	-	1	84.96	84.96	84.96	n/a
<b>2012 ICM Rate Adder - DVR</b>	-	-	-	9,434	0.1338	1,262.27	1,262.27	n/a
<b>2013 ICM Rate Adder - MFC</b>	-	-	-	1	224.12	224.12	224.12	n/a
<b>2013 ICM Rate Adder - DVR</b>	-	-	-	9,434	0.3531	3,331.15	3,331.15	n/a
<b>Deferral/Variance Account Rate Rider</b>	-	-	-	9,434	(0.0437)	(412.27)	(412.27)	n/a
<b>Sub Total A - Distribution</b>			<b>48,037.23</b>			<b>54,661.21</b>	<b>6,623.98</b>	<b>13.8%</b>
RTST - Network	8,491	2.6820	22,772.86	8,491	3.0781	26,136.15	3,363.29	14.8%
RTSR - Connection	8,491	1.9567	16,614.34	8,491	2.1405	18,174.99	1,560.65	9.4%
<b>Sub Total B (including Sub-Total A) - Distribution</b>			<b>87,424.43</b>			<b>98,972.34</b>	<b>11,547.91</b>	<b>13.2%</b>
Wholesale Market Rate	4,584,150	0.0052	23,837.58	4,584,150	0.0052	23,837.58	-	0.0%
RRRP	4,584,150	0.0011	5,042.57	4,584,150	0.0011	5,042.57	-	0.0%
DRC	4,500,000	0.0070	31,500.00	4,500,000	0.0070	31,500.00	-	0.0%
Standard Supply Service Charge	1	0.25	0.25	1	0.25	0.25	-	0.0%
Special Purpose Charge	4,584,150	-	-	4,584,150	-	-	-	n/a
Cost of Power Commodity - 1st Tier (May 1st 2010)	750	0.075	56.25	750	0.075	56.25	-	0.0%
Cost of Power Commodity - 2nd Tier (May 1st 2010)	4,583,400	0.088	403,339.20	4,583,400	0.088	403,339.20	-	0.0%
<b>Total Bill (including Sub-Total B)</b>			<b>551,200.28</b>			<b>562,748.19</b>	<b>11,547.91</b>	<b>2.1%</b>
	<b>kWh</b>	<b>kW</b>	<b>kVA</b>	<b>Hours Use</b>	<b>PF</b>	<b>Net/Conn</b>		
Consumption Details	4,500,000	8,491	9,434	530	90%	100%		
Total Loss Factor	1.0187							

Street Lights	2012 Interim			2013			Impact	
	Volume	Rate \$	Charge \$	Volume	Rate \$	Charge \$	Change \$	Change %
Connection Charge	162,353	1.30	211,059.44	162,353	1.32	214,306.51	3,247.07	1.5%
Distribution	25,755	28.7248	739,807.22	25,755	29.1168	749,903.18	10,095.96	1.4%
Regulatory Assets - 2011/12 Rate Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - Global Adjustment - RPP	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011 Rate Rider	-	-	-	-	-	-	-	n/a
Contact Voltage	-	-	-	-	-	-	-	n/a
Late Payment Penalty	162,353	\$0.04	6,494.14	-	-	-	(6,494.14)	-100.0%
Foregone Revenue Rate Rider - fixed rate	-	-	-	-	-	-	-	n/a
Foregone Revenue Rate Rider - variable rate	-	-	-	-	-	-	-	n/a
<b>2011 Unfunded Capex Rate Rider - MFC</b>	-	-	-	162,353	0.05	8,117.67	8,117.67	n/a
<b>2011 Unfunded Capex Rate Rider - DVR</b>	-	-	-	25,755	1.0206	26,285.55	26,285.55	n/a
<b>Shared Tax Savings Rate Rider - DVR</b>	-	-	-	25,755	(0.0425)	(1,094.59)	(1,094.59)	n/a
<b>2012 Foregone IRM Rate Rider - MFC</b>	-	-	-	162,353	-	-	-	n/a
<b>2012 Foregone IRM Rate Rider - DVR</b>	-	-	-	25,755	0.0883	2,274.17	2,274.17	n/a
<b>2012 ICM Rate Adder - MFC</b>	-	-	-	162,353	0.04	6,494.14	6,494.14	n/a
<b>2012 ICM Rate Adder - DVR</b>	-	-	-	25,755	0.8110	20,887.31	20,887.31	n/a
<b>2013 ICM Rate Adder - MFC</b>	-	-	-	162,353	0.10	16,235.34	16,235.34	n/a
<b>2013 ICM Rate Adder - DVR</b>	-	-	-	25,755	2.1395	55,102.82	55,102.82	n/a
<b>Deferral/Variance Account Rate Rider</b>	-	-	-	25,755	(0.3877)	(9,985.21)	(9,985.21)	n/a
Sub Total A - Distribution			957,360.80			1,088,526.89	131,166.09	13.7%
RTST - Network	25,755	2.1658	55,780.18	25,755	2.4857	64,019.20	8,239.02	14.8%
RTSR - Connection	25,755	2.1022	54,142.16	25,755	2.2997	59,228.77	5,086.61	9.4%
Sub Total B (including Sub-Total A) - Distribution			1,067,283.14			1,211,774.87	144,491.72	13.5%
Wholesale Market Rate	9,620,365	0.0052	50,025.90	9,620,365	0.0052	50,025.90	-	0.0%
RRRP	9,620,365	0.0011	10,582.40	9,620,365	0.0011	10,582.40	-	0.0%
DRC	9,271,748	0.0070	64,902.23	9,271,748	0.0070	64,902.23	-	0.0%
Standard Supply Service Charge	1	0.25	0.25	1	0.25	0.25	-	0.0%
Special Purpose Charge	9,620,365	-	-	9,620,365	-	-	-	n/a
Cost of Power Commodity - 1st Tier (May 1st 2010)	750	0.075	56.25	750	0.075	56.25	-	0.0%
Cost of Power Commodity - 2nd Tier (May 1st 2010)	9,619,615	0.088	846,526.14	9,619,615	0.088	846,526.14	-	0.0%
Total Bill (including Sub-Total B)			2,039,376.31			2,183,868.04	144,491.72	7.1%
	kWh	Connections	kW	KVA	Hours Use	PF	Net/Conn	
Consumption Details	9,271,747.50	162,353	25,755	25,755.00	360	100%	100%	
Total Loss Factor	1.0376							

USL	2012 Interim			2013			Impact	
	Volume	Rate \$	Charge \$	Volume	Rate \$	Charge \$	Change \$	Change %
Service Charge (per 30 days)	1	4.84	4.84	1	4.91	4.91	0.07	1.4%
Connection Charge	1	0.49	0.49	1	0.50	0.50	0.01	2.0%
Distribution	365	0.06070	22.16	365	0.06152	22.45	0.30	1.4%
LRAM Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011/12 Rate Rider	-	-	-	-	-	-	-	n/a
Regulatory Assets - Global Adjustment - RPP	-	-	-	-	-	-	-	n/a
Regulatory Assets - 2011 Rate Rider	-	-	-	-	-	-	-	n/a
Contact Voltage	-	-	-	-	-	-	-	n/a
Late Payment Penalty	1	0.09	0.09	-	-	-	(0.09)	-100.0%
Foregone Revenue Rate Rider - fixed rate - customer	-	-	-	-	-	-	-	n/a
Foregone Revenue Rate Rider - variable rate - connection	-	-	-	-	-	-	-	n/a
Foregone Revenue Rate Rider - variable rate	-	-	-	-	-	-	-	n/a
<b>2011 Unfunded Capex Rate Rider - MFC</b>	-	-	-	1	0.17	0.17	0.17	n/a
<b>2011 Unfunded Capex Rate Rider - MFC (Connection)</b>	-	-	-	1	0.02	0.02	0.02	n/a
<b>2011 Unfunded Capex Rate Rider - DVR</b>	-	-	-	365	0.00219	0.80	0.80	n/a
<b>Shared Tax Savings Rate Rider - DVR</b>	-	-	-	365	(0.00010)	(0.04)	(0.04)	n/a
<b>2012 Foregone IRM Rate Rider - MFC</b>	-	-	-	1	0.01	0.01	0.01	n/a
<b>2012 Foregone IRM Rate Rider - MFC (Connection)</b>	-	-	-	1	-	-	-	n/a
<b>2012 Foregone IRM Rate Rider - DVR</b>	-	-	-	365	0.00019	0.07	0.07	n/a
<b>2012 ICM Rate Adder - MFC</b>	-	-	-	1	0.14	0.14	0.14	n/a
<b>2012 ICM Rate Adder - MFC (Connection)</b>	-	-	-	1	0.01	0.01	0.01	n/a
<b>2012 ICM Rate Adder - DVR</b>	-	-	-	365	0.00174	0.64	0.64	n/a
<b>2013 ICM Rate Adder - MFC</b>	-	-	-	1	0.36	0.36	0.36	n/a
<b>2013 ICM Rate Adder - MFC (Connection)</b>	-	-	-	1	0.04	0.04	0.04	n/a
<b>2013 ICM Rate Adder - DVR</b>	-	-	-	365	0.00458	1.67	1.67	n/a
<b>Deferral/Variance Account Rate Rider</b>	-	-	-	365	(0.00088)	(0.32)	(0.32)	n/a
Sub Total A - Distribution			27.58			31.43	3.86	14.0%
RTST - Network	379	0.00428	1.62	379	0.00491	1.86	0.24	14.7%
RTSR - Connection	379	0.00324	1.23	379	0.00354	1.34	0.11	9.3%
Sub Total B (including Sub-Total A) - Distribution			30.42			34.63	4.21	13.8%
Wholesale Market Rate	379	0.0052	1.97	379	0.0052	1.97	-	0.0%
RRRP	379	0.0011	0.42	379	0.0011	0.42	-	0.0%
DRC	365	0.0070	2.56	365	0.0070	2.56	-	0.0%
Standard Supply Service Charge	1	0.25	0.25	1	0.2500	0.25	-	0.0%
Special Purpose Charge	-	-	-	-	-	-	-	n/a
Cost of Power Commodity - 1st Tier (May 1st 2010)	379	0.075	28.40	379	0.075	28.40	-	0.0%
Cost of Power Commodity - 2nd Tier (May 1st 2010)	-	0.088	-	-	0.088	-	-	n/a
Total Bill (including Sub-Total B)			64.02			68.23	4.21	6.6%
	Kwh	Customer	Connection					
Consumption Details	365	1	1					
Total Loss Factor	1.0376							



1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.

1    **CONCERNING 2014 INFORMATION**

2

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8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.

**2012 IRM - LOST REVENUE RATE RIDER**

Rate Class	Re-based Billed Customers or Connections	Re-based Billed kWh	Re-based Billed kVa	Service Charge	Distribu tion Volume Rate kWh	Distribu tion Volume Rate kVa	Service Charge Revenue G = A * D * 11	Distribution Volumetric Rate Revenue kWh H = B * E	Distribution Volumetric Rate Revenue kVa I = C * F	Revenue Requirement Rates J = G + H + I	Service Charge	Distribution Volumetric Rate kWh	Distribution Volumetric Rate kVa
	A	B	C	D	E	F	11	H = B * E	I = C * F	I			

2011 Approved Load Forecast - 11 Months		2011 Approved Rates		11 Months Revenue at 2011 Rates									
Residential	598,508	4,525,698,913		18.25	0.01507		120,150,481	68,202,283	0	188,352,764			
Residential Urban	24,898	91,475,252		17.00	0.02565		4,655,926	2,346,340	0	7,002,266			
General Service Less Than 50 kW	65,792	1,973,588,444		24.30	0.02247		17,586,243	44,346,532	0	61,932,776			
General Service 50 to 999 kW	13,067		24,760,210	35.56		5.5956	5,111,111	0	138,548,230	143,659,342			
General Service 1,000 to 4,999 kW	514		9,712,360	686.46		4.4497	3,881,245	0	43,217,088	47,098,333			
Large Use - Regular	47		4,583,464	3,009.11		4.7406	1,555,710	0	21,728,369	23,284,079			
Street Lighting	162,777		295,192	1.30		28.7248	2,327,712	0	8,479,335	10,807,047			
Unmetered Scattered Load	1,130	51,545,620		4.84	0.06070		60,143	3,128,819	0	3,188,962			
Unmetered Scattered Load	21,729			0.49			117,120	0	0	117,120			
							155,445,691	118,023,974	211,973,023	485,442,688			

2011 Approved Load Forecast - 11 Months		2012 IRM Rates (2011 Rates * IRM Price Cap Index)		11 Months Revenue at 2012 IRM Rates									
Residential	598,508	4,525,698,913		18.37	0.01517		120,967,504	68,666,058	0	189,633,562			
Residential Urban	24,898	91,475,252		17.12	0.02582		4,687,586	2,362,295	0	7,049,882			
General Service Less Than 50 kW	65,792	1,973,588,444		24.47	0.02262		17,705,830	44,648,089	0	62,353,918			
General Service 50 to 999 kW	13,067		24,760,210	35.80		5.6337	5,145,867	0	139,490,358	144,636,225			
General Service 1,000 to 4,999 kW	514		9,712,360	691.13		4.4800	3,907,637	0	43,510,965	47,418,602			
Large Use - Regular	47		4,583,464	3,029.57		4.7728	1,566,289	0	21,876,122	23,442,411			
Street Lighting	162,777		295,192	1.31		28.9201	2,343,540	0	8,536,995	10,880,535			
Unmetered Scattered Load	1,130	51,545,620		4.87	0.06111		60,552	3,150,095	0	3,210,647			
Unmetered Scattered Load	21,729			0.49			117,916	0	0	117,916			
							156,502,722	118,826,537	213,414,440	488,743,699			

**2012 IRM Price Cap Index 0.680%**

2011 Approved Load Forecast - 12 Months		Revenue at 2012 IRM rates less Revenue at 2011 rates			
Residential	598,508	4,886,977,489			\$ 817,023 \$ 463,776 \$ - \$ 1,280,799
Residential Urban	24,898	99,791,184			\$ 31,660 \$ 15,955 \$ - \$ 47,615
General Service Less Than 50 kW	65,792	2,139,318,076			\$ 119,586 \$ 301,556 \$ - \$ 421,143
General Service 50 to 999 kW	13,067		26,935,191		\$ 34,756 \$ - \$ 942,128 \$ 976,884
General Service 1,000 to 4,999 kW	514		10,587,119		\$ 26,392 \$ - \$ 293,876 \$ 320,269
Large Use - Regular	47		4,993,733		\$ 10,579 \$ - \$ 147,753 \$ 158,332
Street Lighting	162,777		322,023		\$ 15,828 \$ - \$ 57,659 \$ 73,488
Unmetered Scattered Load	1,130	56,231,585			\$ 409 \$ 21,276 \$ - \$ 21,685
Unmetered Scattered Load	21,729				\$ 796 \$ - \$ - \$ 796
					\$ 1,057,031 \$ 802,563 \$ 1,441,417 \$ 3,301,010

Rate Rider - 24 months Recovery (DOS)	
\$ 0.06	\$ 0.00005
\$ 0.05	\$ 0.00008
\$ 0.07	\$ 0.00007
\$ 0.11	\$ 0.0172
\$ 2.11	\$ 0.0137
\$ 9.25	\$ 0.0146
\$ 0.00	\$ 0.0883
\$ 0.01	\$ 0.00019
\$ 0.00	

1     **INCREMENTAL CAPITAL MODULE**

2

3     THESL seeks the Board's approval for incremental revenue requirements of \$10.1 million, \$39.9     /UF, US  
4     million and ~~\$13.5 million~~ for the years 2012, 2013 and ~~2014~~, respectively, to be recovered from  
5     customers through fixed and variable rate class specific rate adders over the applicable calendar  
6     years commencing May 1 of 2013 and ~~2014~~, respectively, related to non-discretionary,  
7     incremental capital investments. To the greatest extent possible, THESL request is in  
8     accordance with the Board's requirements for the Incremental Capital Module ("ICM") under its  
9     IRM plan. The proposed rate adders would result in an increase of approximately \$3.13, and     /UF, US  
10    ~~\$0.77~~, per month in an average residential customer's bill for 2013 and ~~2014~~, respectively.

11

12    **THESL's Proposed Capital Expenditures**

13

14    A summary of THESL's proposed capital expenditures is provided in Appendix 1 to this schedule.  
15    This table shows the total level of proposed capital expenditures, including amounts below the  
16    materiality threshold, by Project and Project Segment for each year 2012-13.

17

18    Detailed Business Case descriptions of the proposed capital expenditures for each Segment are  
19    provided in Schedules B and C. Reviews by third party consultants of the Business Cases and  
20    THESL's approach to Asset Management are provided in Schedule D.

21

22    To determine the rate riders resulting from the proposed ICM capital expenditures, THESL has  
23    populated the ICM Workforms (E Schedules) using the details from the individual ICM  
24    Worksheets for each Segment (F Schedules), for each year.

### Summary of Capital Program

Schedule Number	Projects	Segments	Cost Estimates (\$M)				
			2012 Forecast *	2013 Budget	2014	Total for 2012 and 2013 **	
B1	Underground Infrastructure and Cable	Underground Infrastructure	28.75	58.94	<del>74.92</del>	87.70	/UF, US
B2		Paper Insulated Lead Covered Cable - Piece Outs and Leakers	0.08	5.42	<del>1.47</del>	5.50	/UF, US
B3		Handwell Replacement	13.65	16.65	<del>7.17</del>	30.30	/UF, US
B4	Overhead Infrastructure and Equipment	Overhead Infrastructure	9.07	55.88	<del>20.11</del>	64.95	/UF, US
B5		Box Construction	0.58	23.04	<del>27.76</del>	23.62	/UF, US
B6		Rear Lot Construction	16.36	29.43	<del>11.03</del>	45.78	/UF, US
B7		Polymer SMD-20 Switches	-	1.53	<del>2.94</del>	1.53	/UF, US
B8		SCADA-Mate R1 Switches	-	1.43	<del>2.69</del>	1.43	/UF, US
B9	Network Infrastructure and Equipment	Network Vault & Roofs	2.84	18.76	<del>15.57</del>	21.60	/UF, US
B10		Fibertop Network Units	1.48	7.71	<del>9.36</del>	9.19	/UF, US
B11		Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)	-	3.26	<del>3.23</del>	3.26	/UF, US
B12	Station Infrastructure and Equipment	Stations Power Transformers	0.38	3.48	<del>0.87</del>	3.86	/UF, US
B13.1 & 13.2		Stations Switchgear - Muncipal and Transformer Stations	1.73	21.81	<del>20.31</del>	23.54	/UF, US
B14		Stations Circuit Breakers	0.76	0.55	<del>1.38</del>	1.31	/UF, US
B15		Stations Control & Communicaton Systems	0.14	1.00	<del>1.34</del>	1.14	/UF, US
B16		Downtown Station Load Transfers	0.68	2.14	<del>3.59</del>	2.82	/UF, US
B17	Bremner TS	Bremner Transformer Station	8.50	81.00	<del>23.02</del>	89.50	/UF, US
B18	Hydro One Capital Contributions	Hydro One Capital Contributions	22.98	48.12	<del>36.00</del>	71.10	/UF, US
B19	Feeder Automation	Feeder Automation	2.30	20.66	<del>7.38</del>	22.97	/UF, US
B20	Metering	Metering	4.74	8.40	<del>10.03</del>	13.14	/UF, US
B21	Plant Relocations	Externally-Initiated Plant Relocations and Expansions	10.16	24.84	<del>13.34</del>	35.00	/UF, US
B22	Grid Solutions	Grid Solutions	-	-	<del>0.96</del>	-	/UF, US
C1	Operations Portfolio Capital		120.51	121.63	<del>121.60</del>	242.14	/UF, US
C2	Information Technology Capital		22.00	15.00	<del>15.00</del>	37.00	/UF, US
C3	Fleet Capital		0.80	2.00	<del>2.00</del>	2.80	/UF, US
C4	Buildings and Facilities Capital		5.00	5.00	<del>5.00</del>	10.00	/UF, US
	Allowance for Funds Used During Construction		1.20	1.40	<del>1.40</del>	2.60	/UF, US
<b>Total</b>			<b>274.68</b>	<b>579.09</b>	<del><b>439.47</b></del>	<b>853.78</b>	/UF, US

\* The sum of actual spending to August 31, 2012 and estimated spending to year end.

\*\* THESL has asked the OEB to consider the work programs identified for 2012 and 2013 together, and to defer consideration of the work program for 2014 to a later date.

1 **II INFORMATION TECHNOLOGY CAPITAL**

2  
 3 The Information Technology (IT) Capital Portfolio for 2012-2014 consists of required hardware  
 4 asset replacements, application upgrades and 2011 carryover projects that need to be  
 5 completed. The IT Capital Portfolio provides enabling technology to support critical business  
 6 processes; Meter-to-Cash, Legal and Regulatory compliance, stakeholder reporting, as well as  
 7 power delivery and restoration. A hardware asset failure due to end of life or a critical  
 8 application failure due to lack of vendor support would result in substantial and prolonged  
 9 disruption to THESL's operations and adversely impact customers. The IT Capital Portfolio is  
 10 required to mitigate the risk to THESL's ability to reliably deliver power, restore outages, bill  
 11 customers, and comply with Legal and Regulatory requirements including reporting.

12  
 13 Table 1 below summarizes THESL's planned spending by project for 2012-2014.

14  
 15 **Table 1: Projects for 2012-2014 (\$ M)**

Project Name	2012	2013	2014
Corporate Applications Upgrade	1.09	1.12	0.45
Billing and Regulatory Compliance Systems Upgrade	3.62	2.75	2.14
Geospatial Information System & Outage Management System Upgrade	0.40	2.63	3.57
Information Technology Hardware Asset Replacement	5.74	8.51	8.85
2011 Carryover Projects	11.15	-	-
<b>TOTAL</b>	<b>22.00</b>	<b>15.00</b>	<b>15.00</b>

16 **1. Corporate Applications Upgrade**

17 THESL must upgrade its Financial Forecasting and Records Management systems to the most  
 18 recent versions. The Financial Forecasting system is critical to THESL's financial processes such  
 19 as capital/operational budgeting, financial consolidation and regulatory reporting. As part of  
 20 THESL's legal and governance framework, the Records Management system is the official core  
 21 repository of capital project artifacts including electrical drawings, standards, and Ontario

1 **III FLEET CAPITAL**

2

3 THESL's Fleet is currently composed of 693 units, including motorized vehicles (such as cars,  
 4 pickups, and bucket trucks), and equipment (such as sweepers, backhoes and forklifts). The  
 5 fleet capital spending proposed for 2012 to 2014 is to acquire new vehicles and equipment to  
 6 replace those existing units that have reached the end of their service lives and where further  
 7 repairs and maintenance would not be appropriate or cost effective. It is also intended to  
 8 include the purchase of on-vehicle equipment, such as rubber power line covers. /UF  
 /UF

9

10 Table 1 below outlines THESL's forecast of units requiring replacement, the type of replacement  
 11 vehicle to be acquired and the pre-tax cost of replacement in 2012 and 2013, as well as the /UF  
 12 forecasted cost of rubber power line covers required in the same years. The projected fleet /UF  
 13 costs for 2012 are less than 10% of THESL's historic total fleet budget in recent years and those /UF  
 14 for 2013 are roughly 20% of the said budget.

15

16 **Table 1: Fleet Costs for 2012-2014**

Vehicle Description	2012		2013		2014	
	Number	Cost	Number	Cost	Number	Cost
Car/Light Truck	5	0.14	-	-	-	-
Derrick	2	0.35	-	-	-	-
Forklift	1	0.11	-	-	-	-
Bucket Truck (Various Designs)	-	-	-	-	6	1.69
Cube Van	-	-	18	1.90	3	0.31
Vehicle Sub-Total	8	0.60	18	1.90	9	2.00
<b>On-Vehicle Equipment</b>						
Rubber Power Line Covers		0.20		0.10		
<b>Total</b>		<b>0.80</b>		<b>2.00</b>		<b>2.00</b>

} /UF

17 End-of-life vehicle replacement is non-discretionary and must occur during the test year period  
 18 if THESL is to have the adequate number and quality of vehicles required to accomplish its  
 19 distribution function. THESL's vehicle fleet must be safe, reliable and operate at reasonable  
 20 cost. As a result, THESL must replace vehicles that exhibit one or more of the following  
 21 conditions:

- 22 • are not consistently reliable and directly adversely impact THESL's ability to provide an  
 23 acceptable level of reliable customer service;

1 work being performed on these assets. The consultant’s report is provided in Tab 4, Schedule  
 2 D6. In planning its Facilities capital plan, THESL relies on the recommendations and findings of  
 3 these reports. THESL’s planned spending on Facilities capital projects for 2012-2014 is less than  
 4 half of actual historical spending in recent years, given that proposed expenditures are limited  
 5 to the highest-priority, non-discretionary items only.

6

7 Table 1 below summarizes THESL planned spending by project. The details of each project are  
 8 further summarized below.

9

10 **Table 1: Buildings and Facilities Budget 2012-2014 (\$ M)**

<b>Project Name</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
14 Carlton Street	2.20	2.01	<del>1.62</del>
500 Commissioners Street	0.70	1.60	<del>0.97</del>
6 Monogram Place	0.13	0.13	<del>0.11</del>
60 Eglinton Ave W	0.13	0.02	<del>0.00</del>
601 Milner Avenue	0.13	0.12	<del>0.40</del>
Card Access Security System	1.70	1.02	<del>1.90</del>
Installation of Backflow Preventer	0.01	0.08	<del>0.00</del>
<b>TOTAL</b>	<b>5.00</b>	<b>5.00</b>	<b><del>5.00</del></b>

/us

11 **1. 14 Carlton Street**

12 Work at THESL’s Head Office at 14 Carlton involves a number of priority maintenance initiatives,  
 13 as well as several larger initiatives where THESL believes that further postponement and delay is  
 14 not a viable option. Notably, THESL plans to refurbish the existing sixth floor to retrofit the  
 15 cooling/heating fan coil units which are well past their life cycle and have started to fail. THESL  
 16 cannot risk allowing multiple failures of these coils since accessing them would involve  
 17 disturbing asbestos wrapping. The sixth floor also has a number of Asbestos Containing  
 18 Materials which were an integral part of the building construction. In accordance with the OHSA  
 19 and regulations, the Asbestos Containing Materials must be removed prior to any work being  
 20 performed on these assets. THESL also plans to install a new drainage pipe in the building, to



# ICM Project – Underground Infrastructure and Cable

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## Underground Infrastructure Segment

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | Underground Infrastructure Segment

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### **SUMMARY OF CHANGES IN THE UPDATE**

- 1
- 2 • Reduced 2012-2013 budget from \$99.96 M to \$87.7 M, a reduction of \$12.26 M
- 3 • Revised number of jobs proposed for 2012/2013 to 27, with jobs for 2014 to be addressed in
- 4 Phase Two, as proposed
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system
- 8 • Clarified the trend in outages due to direct buried cable by presenting the information in
- 9 terms of outages per kilometre of direct buried cable remaining in the system. See Figure 1
- 10 • Corrected numerical and typographical errors

## ICM Project | Underground Infrastructure Segment

### I EXECUTIVE SUMMARY

#### 1. Project Description

This segment includes 27 discrete jobs to replace approximately \$87.7 million of direct buried cable with cable in concrete-encased ducts, and air-insulated pad-mounted switchgear units with SF<sub>6</sub>-insulated pad-mounted switchgear units in 2012, and 2013, and 2014. The cost breakdown by year is \$61.1 million in 2012, and \$26.6 million in 2013, and ~~\$74.92 million in 2014~~. The jobs address both direct buried cable and air-insulated pad-mounted switchgear units collectively, as this is the most efficient and cost-effective approach. Table 1 below lists the proposed jobs, in order of the number of unplanned sustained outages<sup>1</sup> experienced by the feeder in 2011 (with the exception of the last job in the table because it addresses a number of feeders). Each job is described in section II.

**Table 1: List of jobs to be executed in 2012, and 2013 and 2014**

Job Title	Year	Estimated Cost (\$M)	
Underground Rehabilitation of Feeder NY80M29	2012, 2013	\$2.90	
Underground Rehabilitation of Feeder SCNAR26M34	2012, 2013, <del>2014</del>	\$2.33	/US
Underground Rehabilitation of Feeder NY55M8	2013	\$2.50	/UF, US
Underground Rehabilitation of Feeder YK35M10	2012	\$2.32	/US
<del>Underground Rehabilitation of Feeder SCNT63M4</del>	<del>2014</del>	<del>-\$3.16</del>	
Underground Rehabilitation of Feeder SCNA47M14	2012, 2013	\$4.43	
Underground Rehabilitation of Feeder NY51M6	2012	\$2.91	/UF, US
<del>Underground Rehabilitation of Feeder NY80M8</del>	<del>2014</del>	<del>-\$9.51</del>	
<del>Underground Rehabilitation of Feeder NY85M6</del>	<del>2014</del>	<del>-\$2.01</del>	
Underground Rehabilitation of Feeder NY51M8	2013, <del>2014</del>	\$1.26	/US
Underground Rehabilitation of Feeder SCNA502M22	2012, 2013, <del>2014</del>	\$2.78	/UF, US

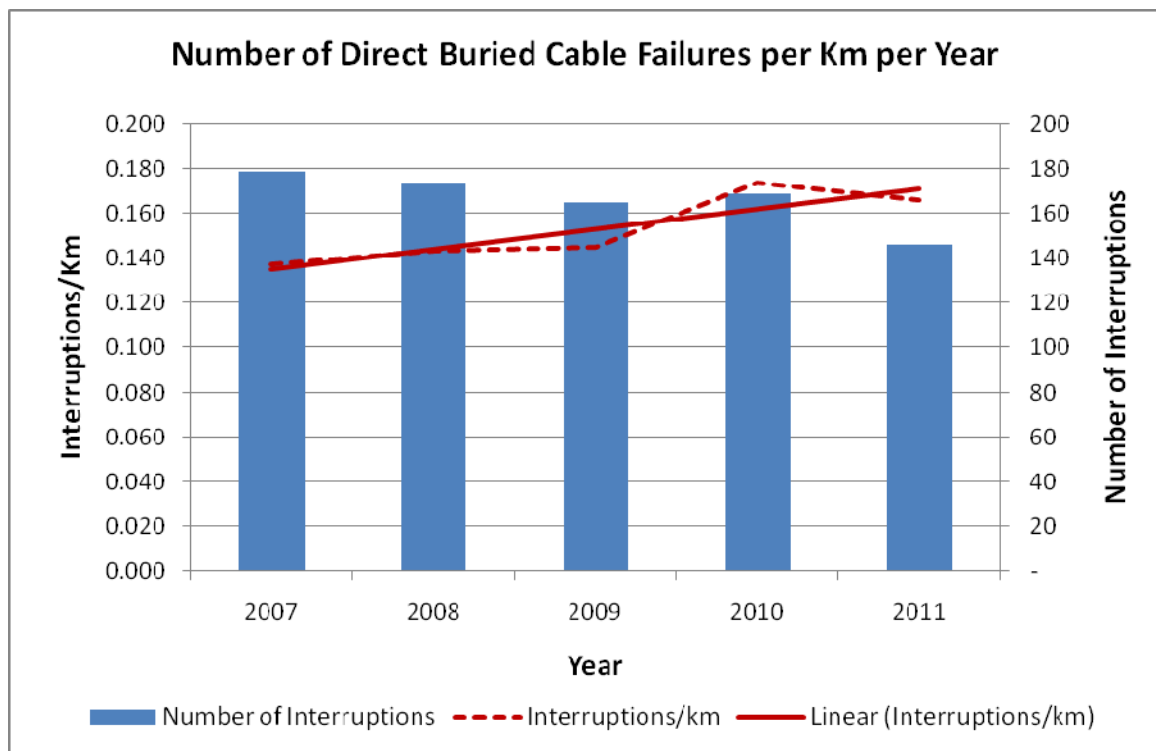
<sup>1</sup> A sustained outage is an outage lasting more than one minute.

**ICM Project | Underground Infrastructure Segment**

Job Title	Year	Estimated Cost (\$M)	
Underground Rehabilitation of Feeder SCNAH9M30	2012, 2014	\$0.84	/UF, US
Underground Rehabilitation of Feeder NY85M4	2013, 2014	\$2.48	
Underground Rehabilitation of Feeder SCNA47M13	2012, 2013, 2014	\$3.47	/UF
Underground Rehabilitation of Feeder NY80M2	2012	\$0.80	
Underground Rehabilitation of Feeder NY51M7	2013	\$1.13	/US
Underground Rehabilitation of Feeder NY51M24	2013, 2014	\$3.21	
Underground Rehabilitation of Feeder NY80M30	2012	\$4.07	/UF
<del>Underground Rehabilitation of Feeder NY55M23</del>	2014	<del>-\$2.24</del>	
<del>Underground Rehabilitation of Feeder NY85M24</del>	2014	<del>-\$2.03</del>	/US
Underground Rehabilitation of Feeder SCNAE5-2M3	2012	\$1.51	
<del>Underground Rehabilitation of Feeder NY85M7</del>	2014	<del>-\$13.83</del>	
Underground Rehabilitation of Feeder SCNT63M12	2012, 2013, 2014	\$7.68	/UF, /US
Underground Rehabilitation of Feeder SCNT63M8	2012, 2013, 2014	\$5.05	
Underground Rehabilitation of Feeder SCNAE5-1M29	2012	\$3.97	/US
Underground Rehabilitation of Feeder NY53M25	2013	\$2.40	
<del>Underground Rehabilitation of Feeder NY80M9</del>	2014	<del>-\$2.21</del>	
Underground Rehabilitation of Feeder SCNT47M3	2012, 2013, 2014	\$16.98	/UF, /US
<del>Underground Rehabilitation of Feeder SCNAH9M23</del>	2014	<del>-\$2.71</del>	
Underground Rehabilitation of Feeder NY51M3	2012, 2013, 2014	\$0.37	/UF, /US
Underground Rehabilitation of Feeder SCNA47M17	2012	\$1.10	
Underground Rehabilitation of Feeder NY85M31	2013	\$0.34	/UF
<del>Underground Rehabilitation of Feeder SCNA502M21</del>	2014	<del>-\$2.56</del>	
Underground Rehabilitation of Feeder SCNT47M1	2012, 2013, 2014	\$6.63	/UF, /US
Underground Rehabilitation of Feeder NY55M21	2013	\$1.51	/UF
Underground Rehabilitation of Feeders NY85M1, NY85M9 and NYSS58F1	2012, 2013	\$2.66	/US
	<b>Jobs Total</b>	<b>\$87.63</b>	
	<b>Reconciliation for job cost changes &lt; \$100,000 and rounding</b>	<b>\$ 0.07</b>	
	<b>Reconciled Total</b>	<b>\$87.70</b>	

## ICM Project | Underground Infrastructure Segment

1 The number of sustained interruptions due to direct buried cable failures has exhibited a slightly  
 2 decreasing trend since 2000, mainly due to the direct buried replacement projects that have  
 3 been completed since 2007. However, the number of sustained interruptions (due to direct  
 4 buried cable) per kilometer of direct buried cable remaining in the system has been increasing  
 5 since 2007. This is illustrated in Figure 1, and highlights the need to continue to replace direct  
 6 buried cable. Approximately 887 conductor kilometres of direct buried cable remain in THESL's  
 7 system, representing approximately 7% of all underground primary cable in THESL's distribution  
 8 grid. Of the 887 conductor kilometres, approximately 580 conductor kilometres require  
 9 immediate attention.



10 **Figure 1: Number of sustained interruptions, attributed to direct buried cable failures, per**  
 11 **kilometer of direct buried cable remaining in the system.**

12  
 13 In 2011, Customers Interrupted (CI) and Customer Hours Interrupted (CHI) values for direct  
 14 buried cables accounted for 57% and 43% respectively of the CI and CHI for the entire  
 15 underground distribution system.

## ICM Project | Underground Infrastructure Segment

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1     **II       DESCRIPTION OF WORK**

2

3     Direct buried (DB) cross-linked polyethylene (XLPE) cables and air-insulated pad-mounted  
4     switches both represent critical assets within the underground distribution system. Both of  
5     these assets have been identified as carrying significant reliability and safety risks, inherent to  
6     past installation practices as well as overall design. Based on factors such as specific failure  
7     modes, safety incidents, reliability, and asset performance, it has been determined that  
8     approximately \$87.7 million of underground infrastructure rehabilitation is required in 2012 and  
9     2013 to 2014 to address direct buried cable and air-insulated pad-mounted switchgear.

} /UF, US

10

11     As will be further discussed in later sections, direct buried XLPE cables are not only past their  
12     useful service life, but due to the specific method of installation (i.e., directly buried in the  
13     ground) these cables are experiencing hydrothermal aging and failing at a higher than  
14     anticipated rate. As detailed in section III below, direct buried cable failures have a significant  
15     impact on the reliability of THESL's grid.

16

17     Air-insulated pad-mounted switchgear units have also been failing at an accelerated rate. The  
18     design of these switchgear units allows for contamination and moisture to easily accumulate in  
19     the switching compartment, resulting in premature failure. These switchgear units present  
20     potential safety risks due to their live-front design and failure mode. The failure of an air-  
21     insulated pad-mounted switch can have a significant impact on reliability as these switches are  
22     often used to tie together multiple circuits. The most prudent solution, detailed below, is to  
23     replace air-insulated pad-mounted switchgear with SF<sub>6</sub>-insulated pad-mounted switchgear.

24

25     The underground infrastructure rehabilitation jobs to replace direct buried cable and air-  
26     insulated distribution switchgear with cable in concrete-encased ducts and SF<sub>6</sub>-insulated  
27     distribution switchgear, respectively, have been selected based on feeders experiencing the  
28     worst reliability. Each job, with the exception of one, targets the assets of one feeder (as  
29     indicated in the title of each job), thereby focusing on improving the condition and reliability of  
30     that feeder.

**ICM Project | Underground Infrastructure Segment**

1 **Table 4: Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
20043	E12206 NY80M29 Fenn/Foursome UG DB Rebuild Civil	2012	\$1.28
19464	E12226 NY80M27/29 Yorkminster UG Tie Elec	2013	\$0.54
20044	E12227 NY80M29 Fenn/Foursome UG DB Rebuild Elect	2012	\$0.43
23241	E12656 UG Cable Replacement NY80M29 Harrison Garden West	2012	\$0.49
23556	E12666 Phase 1 Reconfigure FESI 80M29 -Harrison Garden	2012	\$0.16
<b>Total:</b>			<b>\$2.90</b>

} /UF

2 **2. Underground Rehabilitation of Feeder SCNAR26M34 (E11544, E12121, and E12153)**

/us

3  
4 **2.1. Objective**

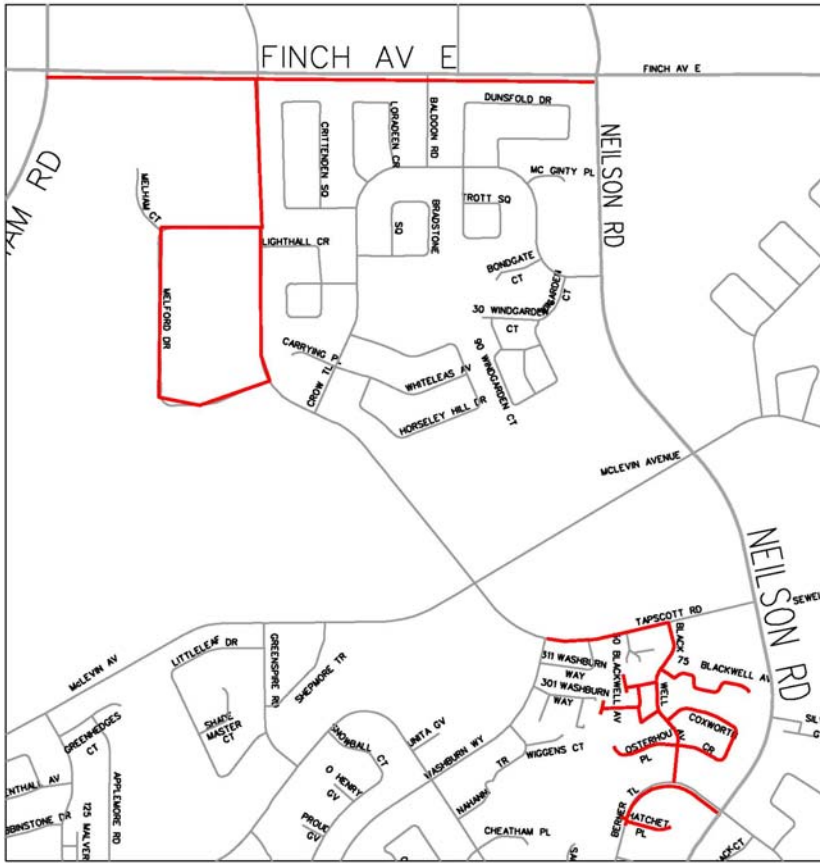
5 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
6 SCNAR26M34 in order to improve reliability of service and mitigate potential safety risks.

7  
8 **2.2. Historical Reliability Performance**

9 Number of Unplanned Sustained Outages in 2011: 12

10  
11 As evident from Table 5, this feeder has been experiencing increasingly poor reliability over the  
12 past three years. This poor reliability is partially due to failures of underground assets, including  
13 direct buried cable. This job rebuilds areas that have experienced underground asset failures.

## ICM Project | Underground Infrastructure Segment



1 **Figure 4: Map of Underground Rehabilitation of Feeder SCNAR26M34**

2

### 3 **2.5. Required Capital Costs**

4 There are six phases to this job in 2012-2013 with a total estimated cost of \$2.33M.

/US



## ICM Project | Underground Infrastructure Segment

1 **Table 5: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – SCNAR26M34			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	1,183	9,101	7,560
Feeder CHI ( <i>Cumulative</i> )	7,221	5,567	14,616

2 **2.3. Scope of Work**

3 This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR-XLPE  
 4 cable in new concrete-encased ducts, and new submersible transformers. Assets to be replaced  
 5 include direct-buried cable and submersible transformers.

} /US

7 **Table 6: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	8,250 m	Primary Cable	8,250 m
Submersible Transformers	18	Submersible Transformers	18
Air-insulated Pad-mounted Switchgear	4	SF <sub>6</sub> -insulated Pad-mounted Switchgear	4

/US

8 **2.4. Map and Locations**

9 The assets being replaced by this job are located in the area bordered by Neilson Road to the  
 10 east, Markham Road to the west, Finch Avenue East to the north, and Sheppard Avenue to the  
 11 south. A map of the job area appears in Figure 4 below.

## ICM Project | Underground Infrastructure Segment

1 **Table 7: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
24850	E11544 Rebuild Blackwell Coxworth UG (Civil)	2012	\$1.38
24852	E12121 Rebuild Blackwell Coxworth UG (Electrical)	2013	\$0.48
24500	E12153 Melford Distribution Feeder Transfer from R26M34	2012	\$0.47
<del>24149</del>	<del>E14321 Establish Neilson Tapscott R26M34 Main -Civil</del>	2014	\$1.06
24150	E14322 Establish Neilson Tapscott R26M34 Main -Electrical	2014	\$0.54
		<b>Total:</b>	<b>\$2.33</b>

/ us

2 **3. Underground Rehabilitation of Feeder NY55M8 (W11385)**

3

4 **3.1. Objective**

5 The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY55M8  
 6 in order to improve reliability of service and mitigate potential safety risks.

7

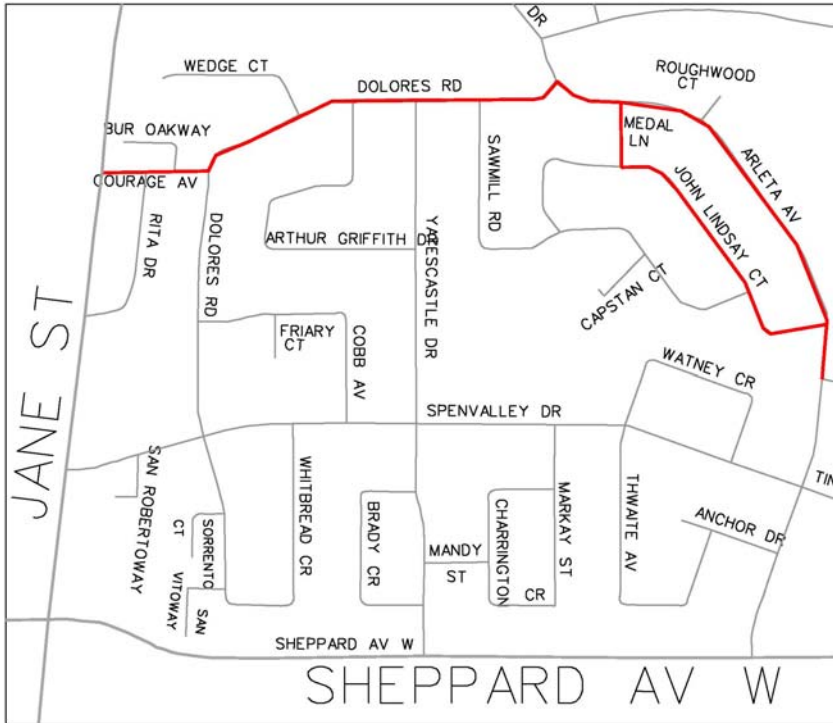
8 **3.2. Historical Reliability Performance**

9 Number of Unplanned Sustained Outages in 2011: 12

10

11 As is evident from Table 8, the reliability of this feeder is poor. The majority of outages on this  
 12 feeder are related to asset failures, and the majority of asset failures are underground asset  
 13 failures.

**ICM Project | Underground Infrastructure Segment**



1 **Figure 5: Map of Underground Rehabilitation of Feeder NY55M8**

2

3 **3.5. Required Capital Costs**

4

5 **Table 10: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
18585	W11385 FESI 55M8 Northwoods Sub UG Cable and Rebuild	2013	\$2.50
<b>Total:</b>			<b>\$2.50</b>

} /UF, US

6 **4. Underground Rehabilitation of Feeder YK35M10 (X11444)**

7

8 **4.1. Objective**

9 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 10 YK35M10 in order to improve reliability of service and mitigate potential safety risks.

**ICM Project | Underground Infrastructure Segment**



1 **Figure 6: Map of Underground Rehabilitation of Feeder YK35M10**

2

3 **4.5. Required Capital Cost**

4

5 **Table 13: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
18675	Ticchester and surrounding civil electrical enhancement 35M10/35M9	2012	\$2.32
<b>Total:</b>			<b>\$2.32</b>

} /UF

6 **5. ~~Underground Rehabilitation of Feeder SCNT63M4 (E14327, E14330)~~**

7

8 **5.1. ~~Objective~~**

9 ~~The objective of this job is to proactively replace underground assets on the 27.6 kV feeder~~

10 ~~SCNT63M4 to improve reliability of service and mitigate potential safety risks.~~

## ICM Project | Underground Infrastructure Segment

### 5.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2011: 10

Historically, the majority of asset related sustained outages on this feeder have been due to the failure of underground assets. Underground asset failures accounted for approximately 50% of the CI and CHI in 2011. Table 14 provides reliability data for this feeder for 2009, 2010 and 2011.

**Table 14: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE – SCNT63M4</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI <i>(Cumulative)</i>	397	230	28,124
Feeder CHI <i>(Cumulative)</i>	131	649	22,102

### 5.3. Scope of Work

This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR XLPE cable in new concrete encased ducts, new SF<sub>6</sub> insulated switchgear, and new submersible transformers. Assets to be replaced include direct buried cable, air insulated switchgear and submersible transformers.

**Table 15: Asset Replacement**

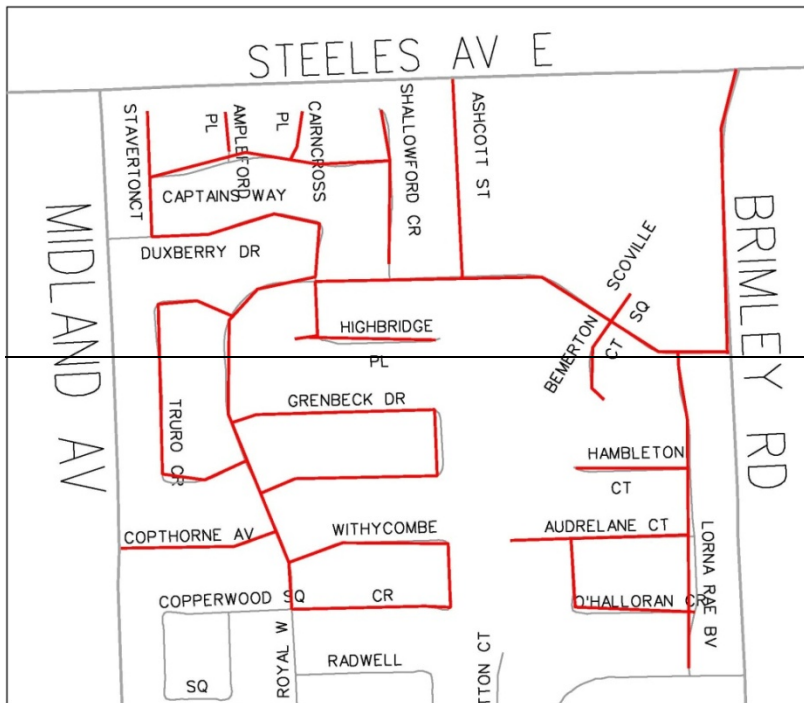
<b>Assets to be Replaced</b>		<b>New Assets to be Installed</b>	
Primary Cable	13,750m	Primary Cable	13,750m
Submersible Transformers	1	Submersible Transformers	1
Air-insulated Pad-mounted Switchgear	7	SF <sub>6</sub> -insulated Pad-mounted Switchgear	7
Air-insulated Vault-installed	4	SF <sub>6</sub> -insulated Vault-installed	4

**ICM Project | Underground Infrastructure Segment**

Switchgear		Switchgear	
------------	--	------------	--

1 **5.4. Map and Locations**

2 The assets being replaced by this job are located in the area bordered by Brimley Road to the  
 3 east, Midland Avenue to the west, Steeles Avenue East to the north, and McNicoll Avenue to the  
 4 south. A map of the job area appears in Figure 7 below.  
 5



6 **Figure 7: Map of Underground Rehabilitation of Feeder SCNT63M4**

7

8 **5.5. Required Capital Costs**

9 There are two phases to this job for a total estimated cost of \$3.16M.

## ICM Project | Underground Infrastructure Segment

1 **Table 16: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
24224	E14327-P01 Port Royal N UG Reconfigure Main Civ Agincourt TS SCNT63M4	2014	\$2.20
24225	E14330-P01 Port Royal N UG Reconfigure Main Elec Agincourt TS SCNT63M4	2014	\$0.96
		<b>Total:</b>	<b>\$3.16</b>

2 **6. Underground Rehabilitation of Feeder SCNA47M14 (E12529, E12530, E13060, E13061,**  
 3 **E13063 and E13064)**

4  
 5 **6.1. Objective**

6 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 7 SCNA47M14 in order to improve reliability of service and mitigate potential safety risks.

8  
 9 **6.2. Historical Reliability Performance**

10 Number of Unplanned Sustained Outages in 2011: 10

11  
 12 This feeder has been experiencing increasingly poor reliability, with the majority of asset related  
 13 sustained outages due to the failure of underground assets. Table 17 provides historical  
 14 reliability data for this feeder.

15  
 16 **Table 17: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – SCNA47M14			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	4,076	14,227	11,491
Feeder CHI ( <i>Cumulative</i> )	3,365	7,658	7,586

## ICM Project | Underground Infrastructure Segment

1 **Table 21: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	13,300 m	Primary Cable	13,300 m
Air-insulated Pad-mounted Switchgear	6	SF <sub>6</sub> -insulated Pad-mounted Switchgear	6
Air-insulated Vault-installed Switchgear	12	SF <sub>6</sub> -insulated Vault-installed Switchgear	12

2 **7.4. Maps and Locations**

3 The assets being replaced by this job are located along Leslie Street from Sheppard Avenue East  
 4 to just north of Finch Avenue East. A map of the job area appears in Figure 9 below.

6 **7.5. Required Capital Costs**

7 There are two phases to this job for a total estimated cost of \$2.91M.

/UF

9 **Table 22: Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
21551	E11593 FESI-12 NY51M6 Leslie/Nymark UG Cable Rehab Ph1	2012	\$1.41
22424	E11592 FESI-12 NY51M6 Leslie/Nymark UG Cable Rehab Prt2	2012	\$1.50
<b>Total:</b>			<b>\$2.91</b>

/UF

/UF, US

/UF



## ICM Project | Underground Infrastructure Segment

### ~~8. — Underground Rehabilitation of Feeder NY80M8 (W12464, W14229, W14248)~~

#### ~~8.1. — Objective~~

~~The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY80M8 in order to improve reliability of service and mitigate potential safety risks.~~

#### ~~8.2. — Historical Reliability Performance~~

~~Number of Unplanned Sustained Outages in 2011: 8~~

~~Table 23 provides historical reliability data for this feeder. While the table seems to indicate slightly improving reliability over the past three years, this feeder experienced a large number of unplanned sustained outages in 2011 — eight. Half of these unplanned sustained outages were due to failures related to underground primary cable.~~

~~Table 23: Historical Reliability Performance~~

<del>HISTORICAL RELIABILITY PERFORMANCE — NY80M8</del>			
<del>Reliability Metric</del>	<del>2009</del>	<del>2010</del>	<del>2011</del>
<del>Feeder CI (Cumulative)</del>	<del>4,622</del>	<del>4,616</del>	<del>3,004</del>
<del>Feeder CHI (Cumulative)</del>	<del>5,144</del>	<del>3,768</del>	<del>2,975</del>

~~This job rebuilds an area that has experienced multiple direct buried cable failures.~~

#### ~~8.3. — Scope of Work~~

~~This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR XLPE cable in new concrete encased ducts, new SF<sub>6</sub> insulated switchgear, and new submersible transformers. Assets to be replaced include direct buried cable, air insulated switchgear and submersible transformers.~~

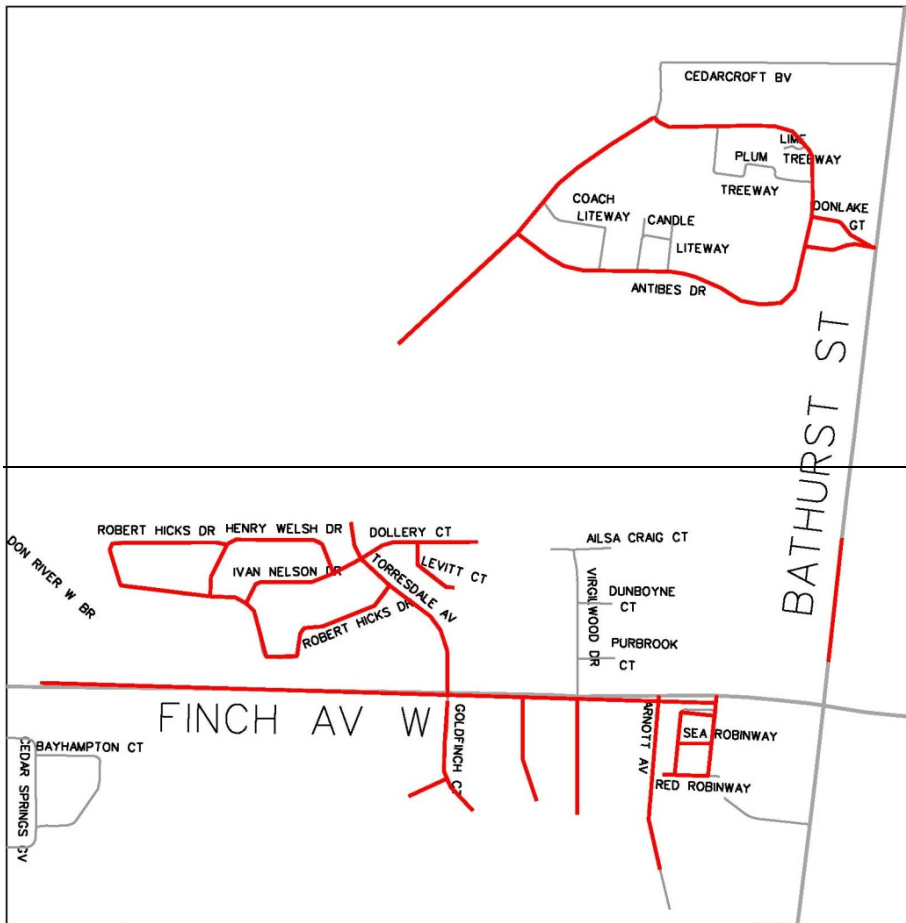
## ICM Project | Underground Infrastructure Segment

1 **Table 24: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	11,000 m	Primary Cable	11,000 m
Submersible Transformers	18	Submersible Transformers	18
Air-insulated Pad-mounted Switchgear	1	SF <sub>6</sub> -insulated Pad-mounted Switchgear	1

2 **8.4. Maps and Locations**

3 The assets being replaced by this job are located in the area northwest of the intersection of  
 4 Bathurst Street and Finch Avenue West. A map of the job area appears in Figure 10 below.



5 **Figure 10: Map of Underground Rehabilitation of Feeder NY80M8**

## ICM Project | Underground Infrastructure Segment

### 1 ~~8.5. Required Capital Costs~~

2 There are three phases to this job for a total estimated cost of \$9.51M.

3

### 4 ~~Table 25: Capital Costs~~

<del>Job Estimate Number</del>	<del>Job Phase</del>	<del>Job Year</del>	<del>Estimated Cost (\$M)</del>
<del>21262</del>	<del>W12464 FESI – UG Cable Rehab Antibes 80M2 and 80M8</del>	<del>2014</del>	<del>\$1.27</del>
<del>23543</del>	<del>W14229 Finch/Torresdale and Robert Hicks Subdivision Civil</del>	<del>2014</del>	<del>\$6.55</del>
<del>23446</del>	<del>W14248 Finch/Torresdale and Robert Hicks Subdivision Electrical</del>	<del>2014</del>	<del>\$1.69</del>
<del>Total:</del>			<del>\$9.51</del>

### 5 ~~9. Underground Rehabilitation of Feeder NY85M6 (W14078, W14096)~~

6

#### 7 ~~9.1. Objective~~

8 The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY85M6  
 9 in order to improve reliability of service.

10

#### 11 ~~9.2. Historical Reliability Performance~~

12 ~~Number of Unplanned Sustained Outages in 2011: 8~~

13

14 As is evident from Table 26, this feeder has been experiencing increasingly poor reliability.

## ICM Project | Underground Infrastructure Segment

1 **Table 26: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE – NY85M6</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI <i>(Cumulative)</i>	576	1,831	5,833
Feeder CHI <i>(Cumulative)</i>	38	782	12,279

2 **9.3. Scope of Work**

3 This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR XLPE  
 4 cable in new concrete-encased ducts and new submersible transformers. Assets to be replaced  
 5 include direct buried cable and submersible transformers.

6  
 7 **Table 27: Asset Replacement**

<b>Assets to be Replaced</b>		<b>New Assets to be Installed</b>	
Primary Cable	7,400 m	Primary Cable	7,400 m
Submersible Transformers	4	Submersible Transformers	4

8 **9.4. Maps and Locations**

9 The assets being replaced by this job are located in the area bordered by Bathurst Street to the  
 10 east, Dufferin Street to the west, Steeles Avenue West to the north, and Sheppard Avenue West  
 11 to the south. A map of the job area appears in Figure 11 below.

12  
 13 **9.5. Required Capital Costs**

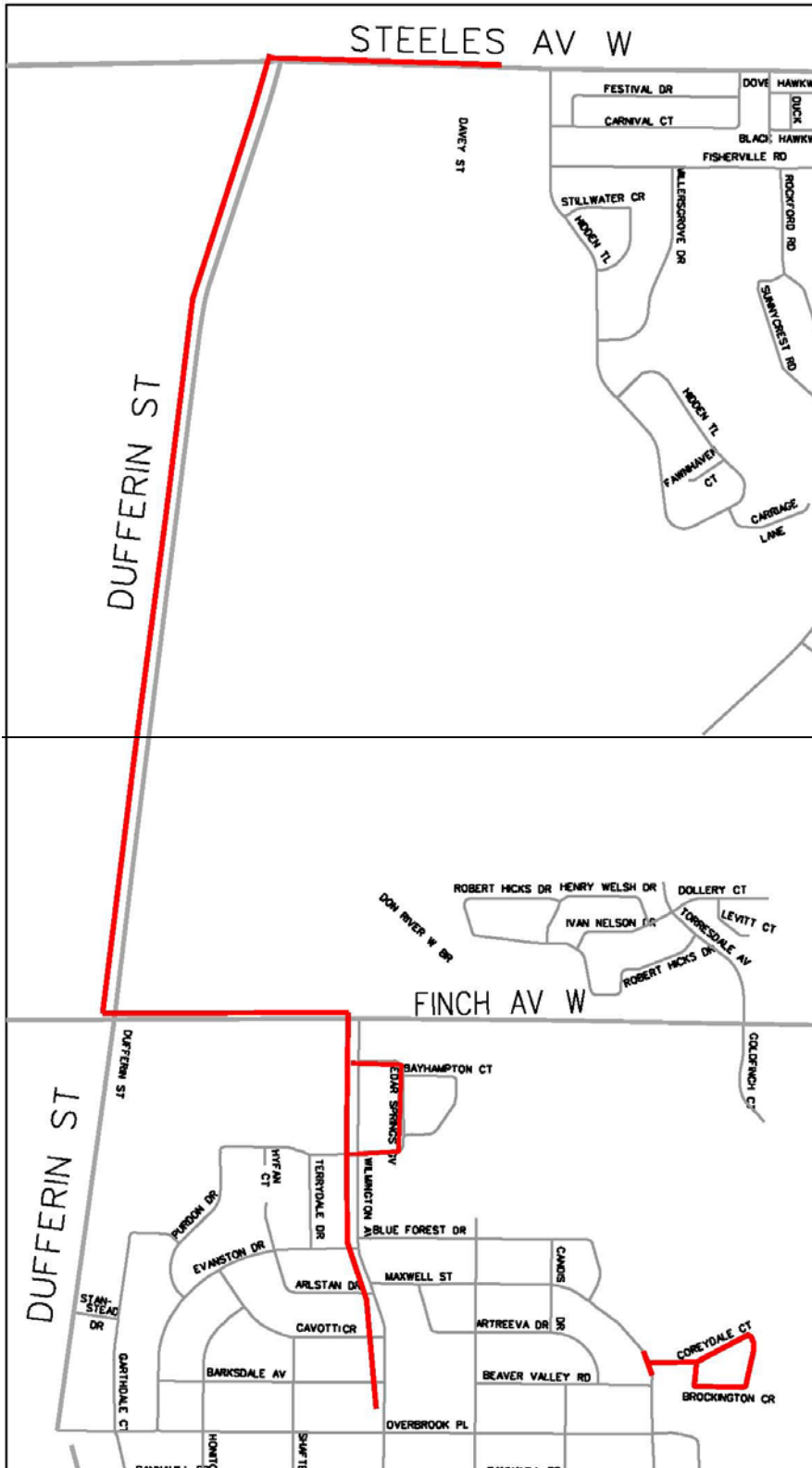
14 There are two phases to this job for a total of \$2.01M.

## ICM Project | Underground Infrastructure Segment

1 **Table 28: Capital Costs**

<b>Job Estimate Number</b>	<b>Job Phase</b>	<b>Job Year</b>	<b>Estimated Cost (\$M)</b>
22865	W14078 UG lateral Cable Rehab Dufferin/Finch/Wilmington	2014	\$0.83
22902	W14096 Coreydale/Brockington UG Residential Rebuild	2014	\$1.18
<b>Total:</b>			<b>\$2.01</b>

ICM Project | **Underground Infrastructure Segment**



1 **Figure 11: Map of Underground Rehabilitation of Feeder NY85M6**

## ICM Project | Underground Infrastructure Segment

1 **10. Underground Rehabilitation of Feeder NY51M8 (E13078, ~~E13077~~)** /US

2

3 **10.1. Objective**

4 The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY51M8  
 5 in order to improve reliability of service and mitigate potential safety risks.

6

7 **10.2. Historical Reliability Performance**

8 Number of Unplanned Sustained Outages in 2011: 8

9

10 Table 29 provides reliability data for this feeder. While total CI and CHI for the feeder have been  
 11 decreasing since 2009, the number of sustained outages due to underground asset failures has  
 12 been on the rise. Underground asset failures represented the majority of CI in 2009 and 2011.

13

14 **Table 29: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – NY51M8			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	6,124	2,277	2,480
Feeder CHI ( <i>Cumulative</i> )	2,787	2,634	461

15 **10.3. Scope of Work**

16 This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR-XLPE  
 17 cable in new concrete-encased ducts to replace old direct-buried cable.

18

19 **Table 30: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	4,000 m	Primary Cable	4,000 m

**ICM Project | Underground Infrastructure Segment**

1 **10.5. Required Capital Costs**

2 There is a single phase of this job in 2013 for a total estimated cost of \$1.26M. /US

3  
 4 **Table 31: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
21298	E13078 UG DB cable replacement between Leslie and Bayview - Civil NY51M8, NY51M6	2013	\$1.26
21297	<del>E13077 UG DB cable replacement between Leslie and Bayview - Electrical NY51M8, NY51M6</del>	2014	<del>\$0.32</del>
		<b>Total</b>	<b>\$1.26</b>

/US

5 **11. Underground Rehabilitation of Feeder SCNA502M22 (E11072, E12256, E12259,**  
 6 **E13037, E13124, ~~E14009~~)**

/US

7  
 8 **11.1. Objective**

9 The objective of this job is to proactively replace underground assets on the 27.6 kV feeder  
 10 SCNA502M22 to improve reliability of service and mitigate potential safety risks.

11  
 12 **11.2. Historical Reliability Performance**

13 Number of Unplanned Sustained Outages in 2011: 7

14  
 15 As is evident from Table 32, this feeder has been experiencing very poor reliability. This job  
 16 addresses previous direct buried cable failures that have contributed to the poor reliability of  
 17 this feeder.



## ICM Project | Underground Infrastructure Segment

1 **11.5. Required Capital Costs**

2 There are five phases to this job in 2012-2013 for a total estimated cost of \$2.78M. /UF, US

3  
 4 **Table 34: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)	
20948	Bridletowne NA502M22 UG Replacement SCNA502M22 (Elec)	2012	\$0.18	
20261	E12256 Bridletowne Cable Replacement SCNA502M22 - Electrical	2012	\$0.34	} /UF, US
20263	E12259 Bridletowne Cable Replacement SCNA502M22 – Civil	2012	\$1.09	
24683	E13037 2501-61 Bridletowne UG 502M22 Rebuild Electrical SCNA502M22	2013	\$0.16	
21589	E13124 Rebuild Orange File SD 502M22 UG-Civil	2013	\$1.01	
<del>21591</del>	<del>E14009 Rebuild Orange File SD 502M22 UG- Electrical</del>	<del>2014</del>	<del>\$0.25</del>	
<b>Total:</b>			<b>\$2.78</b>	/UF, US

5 **12. Underground Rehabilitation of Feeder SCNAH9M30 (E12188, E12348, ~~E13011, E14190,~~** /US

6 **~~E14191~~)**

7  
 8 **12.1. Objective**

9 The objective of this job is to proactively replace underground assets on the 27.6 kV feeder  
 10 SCNAH9M30 to improve reliability of service and mitigate potential safety risks.

11  
 12 **12.2. Historical Reliability Performance**

13 Number of Unplanned Sustained Outages in 2011: 7

**ICM Project | Underground Infrastructure Segment**

1 **12.5. Required Capital Costs**

2 There are two phases to this job in 2012 for a total estimated cost of \$0.84M. /UF, US

3  
 4 **Table 37: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)	
20001	E12188 H9M30 435 Markam Rd TH UG Rehab	2012	\$0.36	/UF, US
20520	E12348 H9M30 UG Rebuild Muir Dr - Golf Club - Civil SCNAH9M30	2012	\$0.48	/US
20525	E13011 H9M30 UG Rebuild Muir Dr - Golf Club - Electrical SCNAH9M30	2014	\$0.36	
23297	E14190 UG Rebuild H9M30 Kingston Mason - Civil	2014	\$1.72	
23300	E14191 UG Rebuild H9M30 Kingston Mason - Electrical	2014	\$0.67	
<b>Total:</b>			<b>\$0.84</b>	/UF, US

5 **13. Underground Rehabilitation of Feeder NY85M4 (~~W13239, W13278, W14153, W14154,~~**  
 6 **~~W14155~~)** /US

7  
 8 **13.1. Objective**

9 The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY85M4  
 10 in order to improve reliability of service and mitigate potential safety risks.

**ICM Project | Underground Infrastructure Segment**

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**13.2. Historical Reliability Performance**

Number of Unplanned Sustained Outages in 2011: 7

Table 38 presents historical reliability data for this feeder. While there is a drop in CI and CHI in 2010, the overall trend is worsening reliability.

**Table 38: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – NY85M4			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	524	26	2,862
Feeder CHI ( <i>Cumulative</i> )	129	84	6,235

This job addresses direct buried cable failures that have occurred on this feeder.

**13.3. Scope of Work**

This job replaces both civil and electrical assets. It installs 10,800 m of new 28 kV Aluminum TR-XLPE cable in new concrete-encased ducts to replace direct-buried cable. Of the assets shown in Table 39, 3,700 m of primary cable as well as all of the submersible transformers and SF<sub>6</sub>-insulated switchgear will be installed in future years, however, the civil work for the installation of these electrical assets is part of this job.

} /us

**Table 39: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	14,500 m	Primary Cable	14,500 m
Submersible Transformers	30	Submersible Transformers	30
Air-insulated Vault-installed Switchgear	3	SF <sub>6</sub> -insulated Vault-installed Switchgear	3

## ICM Project | Underground Infrastructure Segment

1 **Table 40: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
22715	W13278 Northview Heights Civil Rebuild	2013	\$2.48
<del>23258</del>	<del>W14153 UG Rebuild and Cable Replacement</del> <del>Whitehorse/Kodiak</del>	<del>2014</del>	<del>\$0.51</del>
<del>23313</del>	<del>W14154 Lateral Cable Replacement</del> <del>Dufferin/Finch/Toro</del>	<del>2014</del>	<del>\$1.30</del>
<del>23330</del>	<del>W14155 Lateral Cable Replacement</del> <del>Chesswood/Champagne</del>	<del>2014</del>	<del>\$1.50</del>
		<b>Total:</b>	<b>\$2.48</b>

/US

/US

2 **14. Underground Rehabilitation of Feeder SCNA47M13 (E12209, E12228, E12275, ~~E12276,~~**  
 3 **~~E13014 and E13015~~)**

/US

5 **14.1. Objectives**

6 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 7 SCNA47M13 in order to improve reliability of service and mitigate potential safety risks.

9 **14.2. Historical Reliability Performance**

10 Number of Unplanned Sustained Outages in 2011: 6

12 As is clear from Table 41, this feeder has been experiencing increasingly worsening reliability.

13 This is partially due to failures of underground assets, including direct buried cable.

## ICM Project | Underground Infrastructure Segment

1 **Table 41: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE – SCNA47M13</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI ( <i>Cumulative</i> )	4,889	10,328	17,600
Feeder CHI ( <i>Cumulative</i> )	2,653	11,821	12,499

2 **14.3. Scope of Work**

3 This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR-XLPE  
 4 cable in new concrete-encased ducts and new submersible transformers. Assets to be replaced  
 5 include direct-buried cable and submersible transformers.

6  
 7 **Table 42: Asset Replacement**

<b>Assets to be Replaced</b>		<b>New Assets to be Installed</b>	
Primary Cable	11,600 m	Primary Cable	11,600 m
Submersible Transformers	63	Submersible Transformers	63

8 **14.4. Maps and Locations**

9 The assets being replaced by this job are located in the vicinity of the intersection of  
 10 Meadowvale Road and Ellesmere Road. A map of the job area appears in Figure 16.

11  
 12 **14.5. Required Capital Costs**

13 There are four phases to this job in 2012 for a total of \$3.47M.

/US

**ICM Project | Underground Infrastructure Segment**

1 **Table 43: Required Capital Costs**

<b>Job Estimate Number</b>	<b>Job Phase</b>	<b>Job Year</b>	<b>Estimated Cost (\$M)</b>	
24843	E12275 Muirbank 47M13 UG Rebuild - Civil	2012	\$0.84	/UF, US
20637	E13014 Holmcrest 47M13 UG Rebuild - Civil	2012	\$1.41	/US
20066	E12209 Dalmatian/Choiceland 47M13 UG Rebuild-Civil	2012	\$1.20	
20067	E12228 Dalmatian/Choiceland 47M13 Rebuild – Electrical (DESIGN ONLY)	2012	\$0.02	/UF, US
<del>24636, 24844</del>	<del>E12276 Muirbank 47M13 UG Rebuild – Electrical</del>	<del>2014</del>	<del>\$0.52</del>	
<del>20638</del>	<del>E13015 Holmcrest 47M13 UG Rebuild – Electrical</del>	<del>2014</del>	<del>\$0.44</del>	
<b>Total:</b>			<b>\$3.47</b>	/UF, US

## ICM Project | Underground Infrastructure Segment

1 **15. Underground Rehabilitation of Feeder NY80M2 (W12449)** /US

2

3 **15.1. Objective**

4 The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY80M2  
 5 in order to improve reliability of service and mitigate potential safety risks.

6

7 **15.2. Historical Reliability Performance**

8 Number of Unplanned Sustained Outages in 2011: 6

9

10 Table 44 provides historical reliability data for this feeder. Overall, this feeder has been  
 11 exhibiting a worsening reliability trend. The spike in CI and CHI in 2010 is due to asset failures.  
 12 In 2010, 4,191 of CHI were due to underground asset failures. Over the past two years, 63% of  
 13 asset related sustained outages have been due to underground asset failures.

14

15 **Table 44: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – NY80M2			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	2,050	7,966	2,809
Feeder CHI ( <i>Cumulative</i> )	395	5,441	1,354

16 **15.3. Scope of Work**

17 This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR-XLPE  
 18 cable in new concrete-encased ducts to replace old direct-buried cable.

19

20 **Table 45: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	3,000 m	Primary Cable	3,000 m

/US

**ICM Project | Underground Infrastructure Segment**

1 **15.4. Maps and Locations**

2 The assets being replaced by this job are located in the vicinity of Bathurst Street, south of  
 3 Steeles Avenue West. A map of the job area appears in Figure 17.

4  
 5 **15.5. Required Capital Costs**

6 There is one phase of this job for a total estimated cost of \$0.80M.

/UF, US

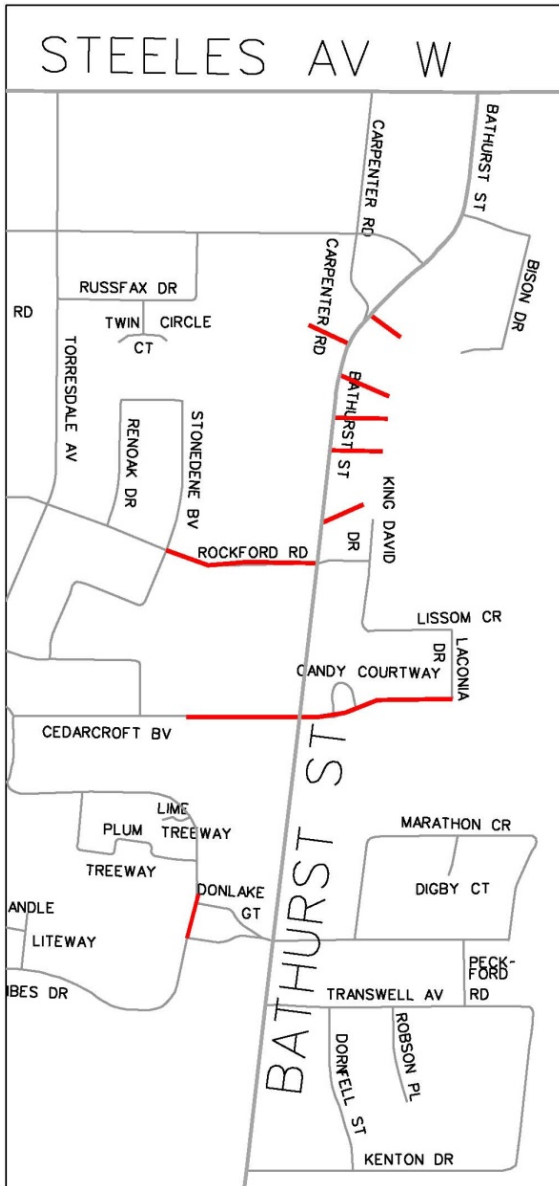
7  
 8 **Table 46: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
20902	W12449 FESI - Lateral Cable and Tx Rehab Bathurst and Rockford	2012	\$0.80
		<b>Total:</b>	<b>\$0.80</b>

} /UF, US



## ICM Project | Underground Infrastructure Segment



1 **Figure 17: Map of Underground Rehabilitation of Feeder NY80M2**

2

3

4 **16. Underground Rehabilitation of Feeder NY51M7 (E13074, E13075)**

/US

5

6 **16.1. Objective**

7 The objective of this job is to proactively replace underground assets on 27.6kV feeder NY51M7  
8 in order to improve reliability of service and mitigate potential safety risks.

## ICM Project | Underground Infrastructure Segment

### 16.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2011: 6

Historical reliability data for this feeder is presented in Table 47. This significant rise in CI and CHI in 2010 is due to an increase in overhead and underground asset failures. Nearly half of the CI in 2010 is due to primary cable failure. This job aims to address the increase in primary cable failures in 2010.

**Table 47: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – NY51M7			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	5,466	9,764	3,126
Feeder CHI ( <i>Cumulative</i> )	1,783	3,676	1,728

### 16.3. Scope of Work

This job installs civil assets for the electrical assets listed in Table 48 below. The electrical assets will be installed in future years.

} /us

**Table 48: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	4,000 m	Primary Cable	4,000 m
Submersible transformer	1	Submersible transformer	1

### 16.4. Maps and Locations

The assets being replaced by this job are located in the area bordered by Leslie Street to the east, Bayview Avenue to the west, Hawsbury Drive to the north, and York Mills Road to the south. A map of the job area appears in Figure 18.

## ICM Project | Underground Infrastructure Segment

1 **16.5. Required Capital Costs**

2 There is one phase of this job for a total estimated cost of \$1.13M in 2013. /us

3  
 4 **Table 49: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
21291	NY51M7 Replacement of DB Cables btn Leslie & Bayview - Civil	2013	\$1.13
<b>Total</b>			<b>\$1.13</b>

/us

5 **17. Underground Rehabilitation of Feeder NY51M24 (E13102, ~~E13103, E13107, E13108,~~** /us  
 6 **~~E13099, E13098, E13101, E13104, E13106, E13058, E13069~~)**

7  
 8 **17.1. Objective**

9 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 10 NY51M24 in order to improve reliability of service and mitigate potential safety risks.

11  
 12 **17.2. Historical Reliability Performance**

13 Number of Unplanned Sustained Outages in 2011: 6

14  
 15 This feeder has been regularly experiencing underground asset failures over the past ten years.  
 16 These failures have been contributing significantly to the number of unplanned sustained  
 17 outages, as well as CI and CHI. This job provides a long-term solution to address previous direct  
 18 buried cable failures on this feeder and reduce the likelihood of future underground asset  
 19 failures.

20  
 21 Table 50 provides historical reliability data for this feeder.

**ICM Project | Underground Infrastructure Segment**

1 **Table 50: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE – NY51M24</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI ( <i>Cumulative</i> )	4,337	6,265	270
Feeder CHI ( <i>Cumulative</i> )	3,518	5,410	942

2 **17.3. Scope of Work**

3 This job installs 5,540 m of new 28 kV Aluminum TR-XLPE cable in new concrete-encased ducts  
 4 to replace direct-buried cable. Of the assets shown in Table 51, 14,500 m of primary cable as  
 5 well as all of the submersible transformers and SF<sub>6</sub>-insulated switchgear will be installed in  
 6 future years, however, the civil work for the installation of these electrical assets is part of this  
 7 job.

} /us

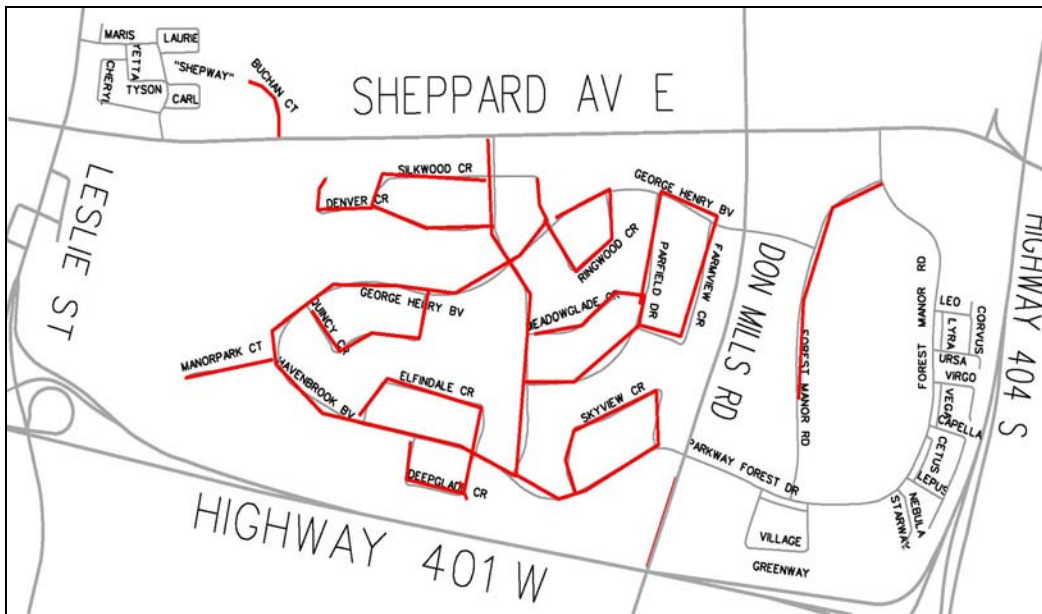
9 **Table 51: Asset Replacement**

<b>Assets to be Replaced</b>		<b>New Assets to be Installed</b>	
Primary Cable	20,040 m	Primary Cable	20,040 m
Submersible Transformers	22	Submersible Transformers	22
Air-insulated Vault-installed Switchgear	6	SF <sub>6</sub> -insulated Vault-installed Switchgear	6

10 **17.4. Maps and Locations**

11 The assets being replaced by this job are located in the area bordered by Highway 404 to the  
 12 east, Leslie Street to the west, Finch Avenue East to the north, and Highway 401 to the south.  
 13 Maps of the job areas appear in Figure 19 and Figure 20.

**ICM Project | Underground Infrastructure Segment**



1 **Figure 19: Map of Underground Rehabilitation of Feeder NY51M24**



2 **Figure 20: Map of Underground Rehabilitation of Feeder NY51M24**

3

4 **17.5. Required Capital Costs**

5 There are six phases to this job in 2013 for a total estimated cost of \$3.21M.

/us

**ICM Project | Underground Infrastructure Segment**

1 **Table 52: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
21449	E13102 UG rebuild of NY51M24 Forest Manor Rd East of Don Mills - Electrical NY51M24	2013	\$0.08
21450	E13102 UG rebuild of NY51M24 Forest Manor Rd East of Don Mills - Civil NY51M24	2013	\$0.23
21447	E13108 UG rebuild of NY51M24 Buchan Crt by Sheppard Ave E. - Civil NY51M24	2013	\$0.24
21500	E13099 UG Rebuild on Don Mills between Sheppard and Graydon - Electrical NY51M24	2013	\$0.19
21433	E13104 NY51M24 UG Rebuild in Subdivision by Don Mills & Sheppard Part 1 - Civill NY51M24	2013	\$1.12
21434	E13106 NY51M24 UG Rebuild in Subdivision by Don Mills & Sheppard Part 2 - Civill NY51M24	2013	\$1.35
<del>21110</del>	<del>E13058 NY51M24, NY51M25 UG Rebuild Finch &amp; Don Mills - Electrical NY51M24, NY51M25</del>	2014	\$0.16
<del>21202</del>	<del>E13069 NY51M24, NY51M25 UG Rebuild Finch &amp; Don Mills - Civil NY51M24, NY51M25</del>	2014	\$0.51
<b>Total</b>			<b>\$3.21</b>

/US

/US

/US

2

## ICM Project | Underground Infrastructure Segment

1 **Table 54: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	40,300 m	Primary Cable	40,300 m
Submersible Transformers	30	Pad-mounted Transformers	30
Air-insulated Pad-mounted Switchgear	1	SF <sub>6</sub> -insulated Pad-mounted Switchgear	1
Air-insulated Vault-installed Switchgear	1	SF <sub>6</sub> -insulated Vault-installed Switchgear	1

2 **18.4. Maps and Location**

3 The assets being replaced by this job are located along Yonge Street between Lawrence Avenue  
 4 and Sheppard Avenue. A map of the job area appears in Figure 21.

6 **18.5. Required Capital Costs**

7 There are four phases to this job for a total estimated cost of \$4.07M in 2012.

/UF

9 **Table 55: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
18845	W11455 FESI-12 Yonge St UG Fdr Cable rehab (NY80M30/M27)	2012	\$0.39
19032	W11456 FESI-12 Hwy 401 UG Fdr Cable rehab NY80M30	2012	\$1.56
19399	W11460 FESI-12 NY80M30 Johnston/Yonge UG Fdr Cable rehab	2012	\$0.02
19522	W12077 Hoggs Hollow UG Rebuild (NY80M30)	2012	\$2.10
	<b>Total:</b>		<b>\$4.07</b>

} /UF

## ICM Project | Underground Infrastructure Segment

### 19. ~~Underground Rehabilitation of Feeder NY55M23 (W14284, W14350)~~

#### 19.1. ~~Objective~~

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY55M23 to improve reliability of service and mitigate potential safety risks.

#### 19.2. ~~Historical Reliability Performance~~

Number of Unplanned Sustained Outages in 2011: 6

Table 56 presents reliability data for this feeder for 2009, 2010 and 2011. The high CI and CHI in 2010 as compared with 2009 and 2011 is primarily due to primary cable failures.

**Table 56: ~~Historical Reliability Performance~~**

<b>HISTORICAL RELIABILITY PERFORMANCE – NY55M23</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI ( <i>Cumulative</i> )	115	6,533	3,170
Feeder CHI ( <i>Cumulative</i> )	455	1,367	915

#### 19.3. ~~Scope of Work~~

This job replaces both civil and electrical assets. This job installs new 27.6 kV Aluminum TR-XLPE cable in new concrete encased ducts and new submersible transformers. Assets to be replaced include direct-buried cable and submersible transformers.

**Table 57: ~~Asset Replacement~~**

<b>Assets to be Replaced</b>		<b>New Assets to be Installed</b>	
Primary Cable	1,575 m	Primary Cable	1,575 m
Submersible Transformers	3	Submersible Transformers	3

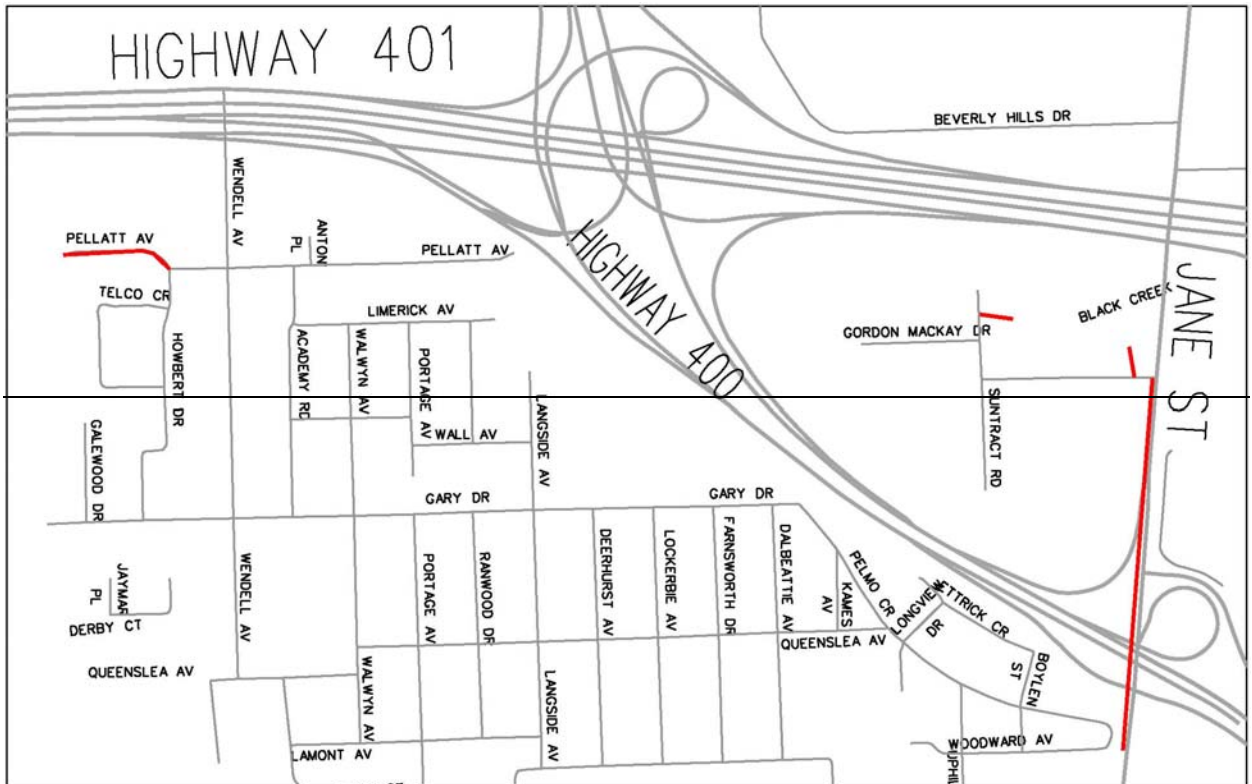


## ICM Project | Underground Infrastructure Segment

### 1 **19.4. Maps and Locations**

2 The assets being replaced by this job are located in the Highway 401 and Jane Street area. A  
3 map of the job area appears in Figure 22.

4



5 **Figure 22: Map of Underground Rehabilitation of Feeder NY55M23**

6

### 7 **19.5. Required Capital Costs**

8 There are two phases to this job for a total estimated cost of \$2.24M in 2014.

## ICM Project | Underground Infrastructure Segment

1 **Table 58: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
23947	W14284 Pellatt Ave. UG DB Rebuild NY55M23	2014	\$1.07
24386	W14350 P01 Gordon Mackay Underground Rebuild	2014	\$1.17
		<b>Total:</b>	<b>\$2.24</b>

2 **20. — Underground Rehabilitation of Feeder NY85M24 (W14268, W14269, W14270)**

3

4 **20.1. — Objective**

5 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 6 NY85M24 in order to improve reliability of service and mitigate potential safety risks.

7

8 **20.2. — Historical Reliability Performance**

9 Number of Unplanned Sustained Outages in 2011: 6

10

11 Historical reliability data for this feeder is presented in Table 59. As can be seen, there is an  
 12 overall trend of worsening reliability.

13

14 **Table 59: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – NY85M24			
Reliability Metric	2009	2010	2011
Feeder CI (Cumulative)	2,726	62	4,793
Feeder CHI (Cumulative)	1,322	52	3,024

15 This job rebuilds areas that have experienced direct buried cable failures.

## ICM Project | Underground Infrastructure Segment

1 **20.3. Scope of Work**

2 This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR XLPE  
 3 cable in new concrete encased ducts and new SF<sub>6</sub> insulated switchgear. Assets to be replaced  
 4 include direct buried cable and air insulated switchgear.

5  
 6 **Table 60: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	14,100 m	Primary Cable	14,100 m
Air insulated Vault- installed Switchgear	1	SF <sub>6</sub> insulated Vault installed Switchgear	1

7 **20.4. Maps and Locations**

8 The assets being replaced by this job are located in the area bordered by Dufferin Street to the  
 9 east, Keele Street to the west, Finch Avenue West to the north, and Sheppard Avenue West to  
 10 the south. A map of the job area appears in Figure 23.

ICM Project | **Underground Infrastructure Segment**



1 **Figure 23: Map of Underground Rehabilitation of Feeder NY85M24**

2

3 **20.5. Required Capital Costs**

4 There are three phases to this job for a total of \$2.03M.

## ICM Project | Underground Infrastructure Segment

1 **Table 61: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
23818	Chesswood and Steepprock Dr. Lateral Replacement NY85M24	2014	\$0.56
23819	St. Regis, Bakersfield & Ashwarren Lateral Replacement NY85M24	2014	\$0.86
23820	Lepage and Keele St. Lateral Replacement	2014	\$0.61
<b>Total:</b>			<b>\$2.03</b>

2 **21. Underground Rehabilitation of Feeder SCNAE5-2M3 (E12202, E12230)**

3

4 **21.1. Objective**

5 The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNAE5-  
 6 2M3 to improve reliability of service and mitigate potential safety risks.

7

8 **21.2. Historical Reliability Performance**

9 Number of Unplanned Sustained Outages in 2011: 6

10

11 This feeder has exhibited worsening reliability, as is evident from Table 62. Moreover, failures  
 12 of underground assets have represented the majority of asset related sustained outages on this  
 13 feeder. This job rebuilds an area that experienced a direct buried cable failure in 2010.

14

15 **Table 62: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – SCNAE5-2M3			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	174	297	2,374
Feeder CHI ( <i>Cumulative</i> )	448	1,376	758

**ICM Project | Underground Infrastructure Segment**

1 **21.5. Required Capital Costs**

2 There are two phases to this job for a total of \$1.51M.

3

4 **Table 64: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
20106	E12202 Rehab of Feeder NAE5-2M3 in McCowan and Kingston area (Electrical)	2012	\$0.42
20136	E12230 Rehab of Feeder NAE5-2M3 in McCowan and Kingston area (Civil)	2012	\$1.09
<b>Total:</b>			<b>\$1.51</b>

} /us

5 ~~**22. Underground Rehabilitation of Feeder NY85M7 (W14129, W14130, W14131, W14132,**~~  
 6 ~~**W14133, W14134, W14135)**~~

7

8 ~~**22.1. Objectives**~~

9 The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY85M7  
 10 in order to improve reliability of service and mitigate potential safety risks.

11

12 ~~**22.2. Historical Reliability Performance**~~

13 Number of Unplanned Sustained Outages in 2011: 6

14

15 Table 65 provides historical reliability data for this feeder. Over the past ten years, underground  
 16 asset failures have represented the 82% of asset failures and have contributed significantly to CI  
 17 and CHI.

## ICM Project | Underground Infrastructure Segment

1 **Table 65: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE – NY85M7</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI ( <i>Cumulative</i> )	1,228	3,414	85
Feeder CHI ( <i>Cumulative</i> )	1,415	773	36

2 This job rebuilds areas that have experienced direct buried cable failures.

3

4 **22.3. Scope Work**

5 This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR XLPE  
 6 cable in new concrete encased ducts and new submersible transformers. Assets to be replaced  
 7 include direct buried cables and submersible transformers.

8

9 **Table 66: Asset Replacement**

<b>Assets to be Replaced</b>		<b>New Assets to be Installed</b>	
Primary Cable	8,580 m	Primary Cable	8,580 m
Submersible Transformers	41	Submersible Transformers	41

10 **22.4. Maps and Locations**

11 The assets being replaced by this job are located in the area bordered by Bathurst Street to the  
 12 east, Keele Street to the west, Steeles Avenue West to the north, and Finch Avenue West to the  
 13 south. A map of the job area appears in Figure 25.





## ICM Project | Underground Infrastructure Segment

1 **Table 67: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
23006	W14129 Torresdale UG DB Rebuild	2014	\$0.64
23009	W14130 Rebuild Russfax and Twin Circle Crt	2014	\$0.46
22992	W14131 UG DB Rebuild Ingles Gate & Shenstone Rd	2014	\$0.77
23004	W14132 Black Hawkway DB Rebuild	2014	\$2.05
23043	W14133 UG DB Rebuild on Festival and Carnival	2014	\$2.55
22984	W14134 UG DB PH#1 Rebuild Hidden Trail and Surrounding Area	2014	\$3.75
22987	W14135 UG DB PH#2 Rebuild Hidden Trail and Surrounding Area	2014	\$3.61
<b>Total:</b>			<b>\$13.83</b>

2 **23. Underground Rehabilitation of Feeder SCNT63M12 (E11472, E11483, ~~E11484~~, E11618,** /US  
 3 **E12081, E12094, E12095, E12096, E12317, ~~E13152, E14011~~)**

4  
 5 **23.1. Objective**

6 The objective of this job is to proactively replace underground assets on the 27.6 kV feeder  
 7 SCNT63M12 to improve reliability of service and mitigate potential safety risks.

8  
 9 **23.2. Historical Reliability Performance**

10 Number of Unplanned Sustained Outages in 2011: 5

## ICM Project | Underground Infrastructure Segment

### 1 23.4. Maps and Locations

2 The assets being replaced by this job are located in the area bordered by Middlefield Road to  
 3 the east, Brimley Road to the west, Steeles Avenue East to the north, and Finch Avenue East to  
 4 the south. A map of the job area appears in Figure 26.

### 6 23.5. Required Capital Costs

7 There are eight phases to this job in 2012-2013 for a total of \$7.68M.

/UF, US

9 **Table 70: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)	
22215	E11618 Rebuild Ingleton UG SCNT63M12 Main (Civil) - Ph B	2012	\$0.06	
20438	E11472 Rebuild Ingleton UG SCNT63M12 Main (Civil) - Ph A	2012	\$0.06	
19001	E11483 Rebuild Ingleton 63M12 - Ph 1 - Civil	2012	\$2.67	/UF
19437	E12081 Rebuild Ingleton Main Ph A - Elect	2013	\$1.26	/US
19448	E12095 Rebuild Ingleton Ph 2 Elect	2012	\$0.67	
24717	E12317 Rebuild Ingleton Main Ph B - Elect	2013	\$0.56	} /US
19442	E12094 Rebuild Ingleton Ph 1 Elect	2012	\$1.22	
24658	E12096 Rebuild Ingleton Ph 3 Elect	2012	\$1.18	/UF, US
21868	E13152 Rebuild UG Trunk NT63M12 M8 Brimley - Civil	2014	\$1.69	
21869	E14011 Rebuild UG Trunk NT63M12 M8 Brimley - Electrical	2014	\$0.93	
<b>Total:</b>			<b>\$7.68</b>	/UF, US

## ICM Project | Underground Infrastructure Segment

1 **24. Underground Rehabilitation of Feeder SCNT63M8 (E12493, E12494, E12495, ~~E13042,~~**  
 2 **~~E13043, E13044, E13129, E13267, E14010, E14047)~~** /US

3  
 4 **24.1. Objective**

5 The objective of this job is to proactively replace underground assets on the 27.6 kV feeder  
 6 SCNT63M8 to improve reliability of service and mitigate potential safety risks.

7  
 8 **24.2. Historical Reliability Performance**

9 Number of Unplanned Sustained Outages in 2011: 5

10  
 11 Reliability information pertaining to this feeder indicates that historically the majority of asset  
 12 related sustained outages on this feeder are due to the failure of underground assets. These  
 13 failures have contributed significantly to CI and CHI.

14  
 15 In 2009, 28.2% of CI and 2.8% of CHI were due to air-insulated switchgear failures. These figures  
 16 jumped to 99.7% in 2011.

17  
 18 Table 71 provides historical reliability data for this feeder. This feeder has both overhead and  
 19 underground assets. Overhead asset failures did not cause sustained outages in 2010 and 2011,  
 20 but overhead asset failures did account for most of CI and CHI in 2009. Without the impact of  
 21 overhead asset failures in Table 71, the table would show a worsening reliability trend for this  
 22 feeder from 2009 to 2011. In other words, it is the underground asset failures that are causing  
 23 worsening reliability for this feeder.

24  
 25 **Table 71: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE – SCNT63M8</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI ( <i>Cumulative</i> )	11,495	227	5,313
Feeder CHI ( <i>Cumulative</i> )	5,276	658	5,879

## ICM Project | Underground Infrastructure Segment

1 **24.5. Required Capital Costs**

2 There are five phases to this job in 2012-2013 for a total of \$5.05M.

/UF, US

3

4 **Table 73: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
20973	E12493 FESI UG Rebuild NT63M8 Revlis Sub Part 1- Civil SCNT63M8	2012	\$0.62
20978	E12494 FESI UG Rebuild NT63M8 Revlis Sub Part 2-Civil SCNT63M8	2013	\$1.58
20979	E12495 FESI UG Rebuild NT63M8 Revlis Sub Part 3-Civil SCNT63M8	2012	\$1.77
21864	E13129 Rebuild UG Trunk NT63M8 M11 McCowan-Civil	2013	\$0.65
22591	E13267 UG Rebuild 63M8 Silver star Midland- Civil	2013	\$0.43
<del>21356</del>	<del>E13042 FESI UG Rebuild NT63M8 Revlis Sub Part 1 Elec SCNT63M8</del>	<del>2014</del>	<del>\$0.53</del>
<del>21357</del>	<del>E13043 FESI UG Rebuild NT63M8 Revlis Sub Part 2 Elec SCNT63M8</del>	<del>2014</del>	<del>\$0.41</del>
<del>21358</del>	<del>E13044 FESI UG Rebuild NT63M8 Revlis Sub Part 3 Elec SCNT63M8</del>	<del>2014</del>	<del>\$0.67</del>
<del>21865</del>	<del>E14010 Rebuild UG Trunk NT63M8 M11 McCowan-Electrical</del>	<del>2014</del>	<del>\$0.34</del>
<del>22592</del>	<del>E14047 UG Rebuild 63M8 Silver star Midland Electrical</del>	<del>2014</del>	<del>\$0.30</del>
		<b>Total:</b>	<b>\$5.05</b>

/US

/UF

/US

/UF, US

**ICM Project | Underground Infrastructure Segment**

1 **25.5. Required Capital Costs**

2 There are two phases to this job for a total of \$3.97M.

/UF

3  
 4 **Table 76: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
18653	E11421 Antrim Glamorgan Dundalk UG Rebuild SCNAE5-1M29 (Elec)	2012	\$1.69
18652	E11421 Antrim Glamorgan Dundalk UG Rebuild SCNAE5-1M29 (Civil)	2012	\$2.28
		<b>Total:</b>	<b>\$3.97</b>

/UF, US

/UF, US

5 **26. Underground Rehabilitation of Feeder NY53M25 (E11139, E12237)**

/US

6  
 7 **26.1. Objective**

8 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 9 NY53M25 in order to improve reliability of service and mitigate potential safety risks.

10  
 11 **26.2. Historical Reliability Performance**

12 Number of Unplanned Sustained Outages in 2011: 5

13  
 14 Table 77 presents the historical reliability performance of this feeder. The very high CI and CHI  
 15 figures in 2009, as compared to 2010 and 2011, are primarily due to underground primary cable  
 16 failures.

**ICM Project | Underground Infrastructure Segment**

1 **Table 77: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE – NY53M25</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI ( <i>Cumulative</i> )	19,054	563	1,393
Feeder CHI ( <i>Cumulative</i> )	10,648	1,167	920

2 This job rebuilds an area that has experienced direct buried cable failures.

3

4 **26.3. Scope of Work**

5 This job installs civil assets to accommodate the electrical assets listed in Table 78. These  
 6 electrical assets will be installed in future years.

} /us

7

8 **Table78: Asset Replacement**

<b>Assets to be Replaced</b>		<b>New Assets to be Installed</b>	
Primary Cable	13,600 m	Primary Cable	13,600 m

9 **26.4. Maps and Locations**

10 The assets being replaced by this job are located in the area bordered by Victoria Park Avenue  
 11 to the east, the Don Valley Parkway to the west, York Mills Road to the north, and Lawrence  
 12 Avenue East to the south. A map of the job area appears in Figure 29.

13

14 **26.5. Required Capital Costs**

15 There is a single phase of this job with a total cost of \$2.40M.

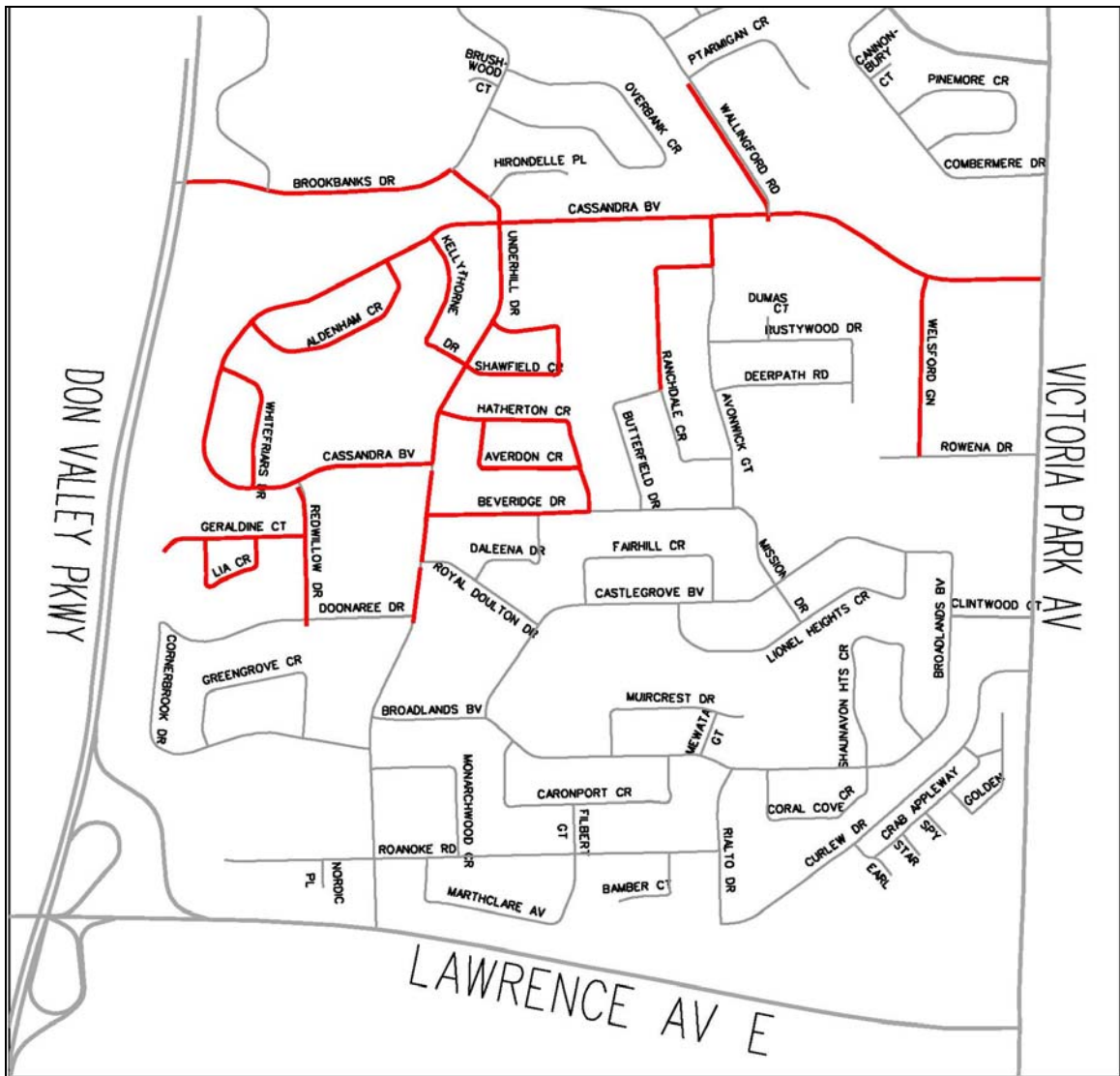
/us

**ICM Project | Underground Infrastructure Segment**

1 **Table 81: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
25279	E11139 Cassandra UG Rebuild - Civil	2013	\$2.40
<b>Total:</b>			<b>\$2.40</b>

} /us



2 **Figure 29: Map of Underground Rehabilitation of Feeder NY53M25**

## ICM Project | Underground Infrastructure Segment

### ~~27. Underground Rehabilitation of Feeder NY80M9 (W12642)~~

#### ~~27.1. Objective~~

~~The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY80M9 in order to improve reliability of service and mitigate potential safety risks.~~

#### ~~27.2. Historical Reliability Performance~~

~~Number of Unplanned Sustained Outages in 2011: 5~~

~~Table 80 presents the historical reliability performance of this feeder. The high CI and CHI figures in 2009, as compared to 2010 and 2011, are due significantly to underground primary cable failures.~~

~~Table 80: Historical Reliability Performance~~

<b>HISTORICAL RELIABILITY PERFORMANCE – NY80M9</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Feeder CI <i>(Cumulative)</i></b>	3,666	141	927
<b>Feeder CHI <i>(Cumulative)</i></b>	1,662	423	817

~~This job rebuilds an area that has experienced underground asset failures, including direct buried cable failures.~~

#### ~~27.3. Scope of Work~~

~~This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR-XLPE cable in new concrete-encased ducts, new SF<sub>6</sub>-insulated switchgear, and new submersible transformers. Assets to be replaced include direct-buried cable, air-insulated switchgear and submersible transformers.~~



## ICM Project | Underground Infrastructure Segment

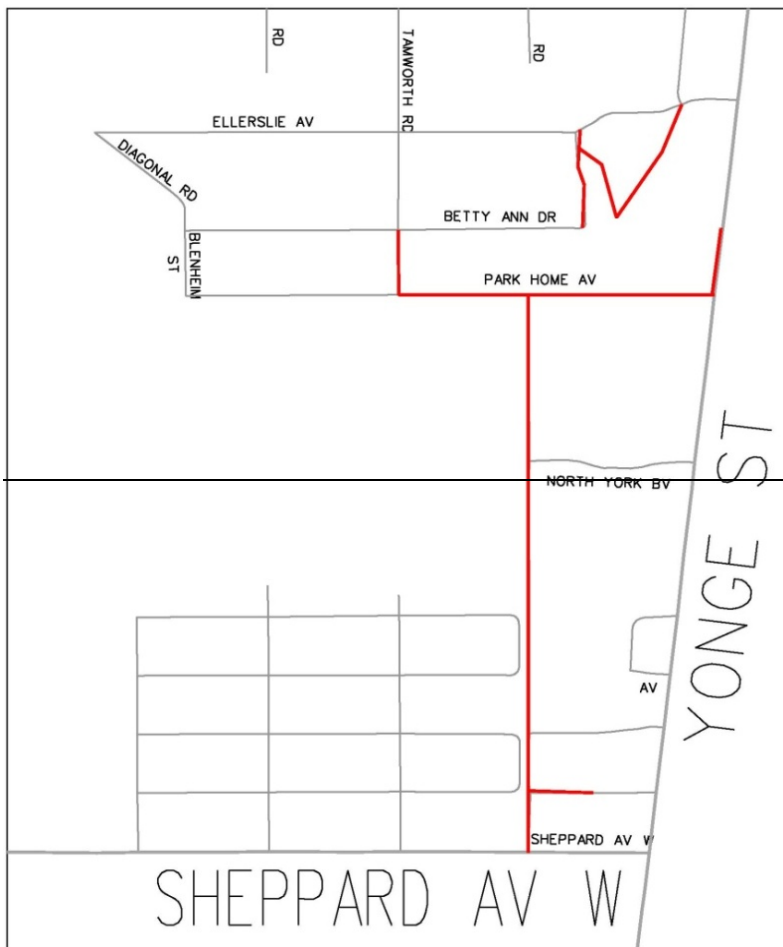
1 **Table 81: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	16,250 m	Primary Cable	16,250 m
Submersible Transformers	3	Submersible Transformers	3
Air-insulated Pad-mounted Switchgear	2	SF <sub>6</sub> -insulated Pad-mounted Switchgear	2

2 **27.4. Maps and Locations**

3 The assets being replaced by this job are located in the northwest area of the intersection of  
 4 Yonge Street and Sheppard Avenue. A map of the job area appears in Figure 30.

5



6 **Figure 30: Map of Underground Rehabilitation of Feeder NY80M9**

## ICM Project | Underground Infrastructure Segment

1 **27.5. Required Capital Costs**

2

3 **Table 84: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
23023	W12642 UG Trunk and Lat Cable Rehab Beecroft	2014	\$2.21
		<b>Total:</b>	<b>\$2.21</b>

4 **28. Underground Rehabilitation of Feeder SCNT47M3 (E11191, E11301, E11356, E11372,**  
 5 **E11380, E12157, E11438, E12357, E12319, E11439, E12126, E12127, ~~E12128~~, E12234**  
 6 **and E12235)**

/C, /US

7

8 **28.1. Objective**

9 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 10 SCNT47M3 in order to improve reliability of service and mitigate potential safety risks.

11

12 **28.2. Historical Reliability Performance**

13 Number of Unplanned Sustained Outages in 2011: 4

14

15 This feeder has held the rank of worst performing feeder on THESL's system for a few years.

16 Table 83 presents historical reliability data for this feeder.

17

18 **Table 83: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – SCNT47M3			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	47,262	102,883	12,750
Feeder CHI ( <i>Cumulative</i> )	21,607	45,729	8,963



**ICM Project | Underground Infrastructure Segment**

1 **Table 85: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)	
21506	E11191 FESI-12 McLevin/Alford UG rebuild NT4747M3	2012	\$0.88	
21853	E11301 FESI-12 Hupfield UG rebuild Phase 1 NT47M3	2012	\$1.67	/UF
22356	E11356 FESI-12 Pennyhill UG rebuild NT47M3	2012	\$1.00	
21854	E11372 FESI-12 Hupfield UG rebuild Phase 2 NT47M3	2012	\$1.33	
22928	E11380 FESI-12 Empringham/McLevin UG rebuild NT47M3	2012	\$1.84	
20430	E12157 26M23 New Feeder to Morningside- Old Finch –Civil	2012	\$1.15	/UF
18719	E11438 Old Finch UG Rebuild Phase 1 - Civil (47M3)	2012	\$1.95	
19623	E12126 Morningview SCNT47M3 UG Rebuild Phase 1 (Electrical) (DESIGN ONLY)	2012	\$0.03	/UF, US
19627	E12127 Morningview SCNT47M3 UG Rebuild Phase 2 (Electrical) (DESIGN ONLY)	2012	\$0.04	
<del>19629</del>	<del>E12128 Morningview SCNT47M3 UG Rebuild Phase 3 (Electrical)</del>	2014	<del>\$0.79</del>	
20558	E12357 Extend UG R26M23 to Morningview 47M3 (DESIGN ONLY)	2012	\$0.02	/UF, US
20432	E12319 26M23 New Feeder to Morningside- Old Finch –Electric	2012	\$0.42	/US
18720	E11439 Old Finch UG Rebuild Phase 1 - Electrical (47M3)	2012	\$1.25	/UF, US

**ICM Project | Underground Infrastructure Segment**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)	
19622	E12126 Morningview SCNT47M3 UG Rebuild Phase 1 (Civil)	2012	\$1.81	/UF, US
19626	E12127 Morningview SCNT47M3 UG Rebuild Phase 2 (Civil)	2012	\$1.59	
19628	E12128 Morningview SCNT47M3 UG Rebuild Phase 3 (Civil)	2013	\$1.96	
20169	E12234 Rebuild 3-Phase Neilson Industrial NT47M3 – Civil (DESIGN ONLY)	2012	\$0.03	/UF, US
20170	E12235 Rebuild 3-Ph Neilson Industrial NT47M3- Electrical (DESIGN ONLY)	2012	\$0.01	
<b>Total:</b>			<b>\$16.98</b>	

1 ~~29. Underground Rehabilitation of Feeder SCNAH9M23 (E13121, E13147 and E13148)~~

2

3 ~~29.1. Objective~~

4 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 5 SCNAH9M23 in order to improve reliability of service and eliminate safety

6

7 ~~29.2. Historical Reliability Performance~~

8 Number of Unplanned Sustained Outages in 2011: 4

9

10 Table 86 presents historical reliability data for this feeder. In 2011, there were a number of  
 11 primary cable failures that contributed significantly to the increase in CI and CHI from 2010.

## ICM Project | Underground Infrastructure Segment

1 **Table 86: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE — SCNAH9M23</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI ( <i>Cumulative</i> )	1,963	1,163	10,042
Feeder CHI ( <i>Cumulative</i> )	433	135	7,207

2 This job rebuilds an area that has experienced a direct buried cable failure.

3

4 **29.3. Scope of Work**

5 This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR XLPE  
 6 cable in new concrete encased ducts and new SF<sub>6</sub> insulated switchgear. Assets to be replaced  
 7 include direct buried cables and air insulated switchgear.

8

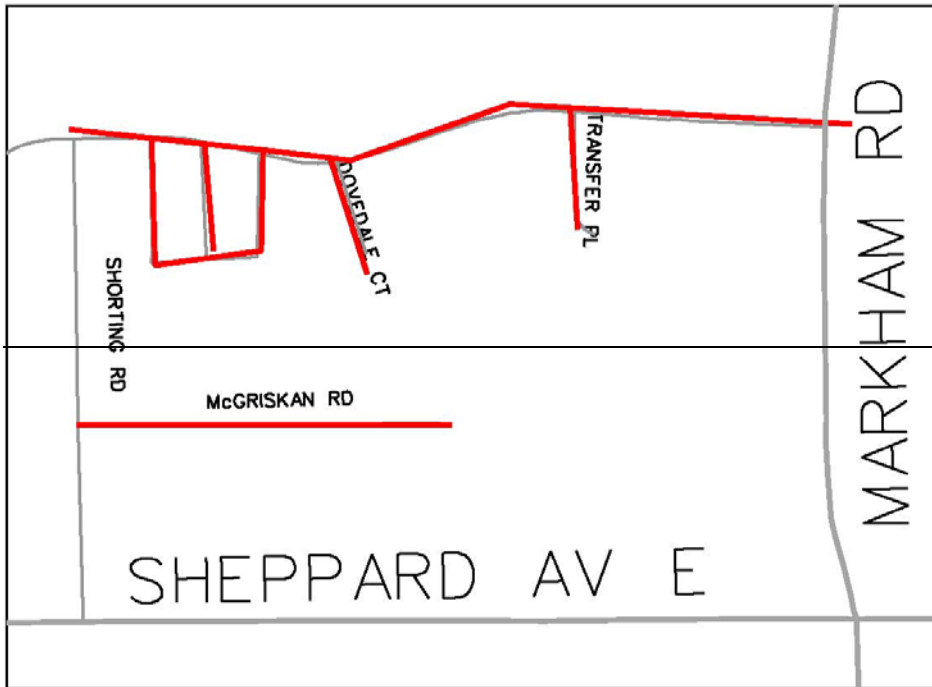
9 **Table 87: Asset Replacement**

<b>Assets to be Replaced</b>		<b>New Assets to be Installed</b>	
Primary Cable	12,300m	Primary Cable	12,300m
Air insulated Pad-mounted Switchgear	1	SF <sub>6</sub> insulated Pad-mounted Switchgear	1
Air insulated Vault-installed Switchgear	26	SF <sub>6</sub> insulated Vault installed Switchgear	26

10 **29.4. Maps and Locations**

11 The assets being replaced by this job are located in the vicinity of the intersection of Markham  
 12 Road and Sheppard Avenue East. A map of the job area appears in Figure 32.

ICM Project | **Underground Infrastructure Segment**



1 **Figure 32: Map of Underground Rehabilitation of Feeder SCNAH9M23**

2

3 **29.5. Required Capital Costs**

4 There are four phases to this job for a total of \$2.71M.

5

6 **Table 88: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
21565	E13121 McGriskin Road UG Rebuild Civil SCNAH9M23	2014	\$0.28
21561	E13121 McGriskin Road UG Rebuild Civil SCNAH9M23	2014	\$0.19
21663	E13147 Nugget Avenue UG Rebuild Civil SCNAH9M23	2014	\$0.91
21664	E13148 Nugget Avenue UG Rebuild Electrical SCNAH9M23	2014	\$1.33
<b>Total:</b>			<b>\$2.71</b>

**ICM Project | Underground Infrastructure Segment**

1 **30. Underground Rehabilitation of Feeder NY51M3 (~~E12341, E12346, E12377, E12379,~~ /us  
 2 ~~E12393, E12394, E12408, E12409,~~ and E10112)**

3  
 4 **30.1. Objective**

5 The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY51M3  
 6 in order to improve reliability of service and mitigate potential safety risks.

7  
 8 **30.2. Historical Reliability Performance**

9 Number of Unplanned Sustained Outages in 2011: 4

10  
 11 Table 91 presents historical reliability data for this feeder. There was an increase in  
 12 underground asset failures in 2010 that contributed significantly to the high CI (compared to  
 13 2009 and 2011). Overall, there is a worsening reliability trend for this feeder.

14  
 15 **Table 90: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – NY51M3			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	150	4,500	1,638
Feeder CHI ( <i>Cumulative</i> )	454	1,420	3,013

16 **30.3. Scope of Work**

17 This job involves design work to replace both civil and electrical assets, as well as installation of  
 18 civil assets. In future years, direct buried cable will be replaced with new 28 kV Aluminum TR-  
 19 XLPE cable in new concrete-encased ducts, and new submersible transformers will be installed  
 20 as shown in Table 91. /us

21  
 22 **Table 91: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	8,500 m	Primary Cable	8,500 m
Submersible transformer	51	Submersible transformer	51



## ICM Project | Underground Infrastructure Segment

1 **Table 91: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
24578	<del>E12341 Bluffwood Saddletree Civil NY51M3</del>	2014	<del>\$1.35</del>
24846	E10112 Purple Sageway 51M3 UG replacement (Civil)	2013	\$0.34
20645	<del>E12377 Goldenwood Road UG Rehab Electrical</del>	2014	<del>\$0.32</del>
20648	<del>E12379 Pineway Craigmont Bruce Farm UG Rehab</del>	2014	<del>\$0.13</del>
20519	<del>E12346 Bluffwood Saddletree Electrical NY51M3</del>	2014	<del>\$0.14</del>
20672	E12393 James Gray Drive UG Rebuild Elec NY51M3 (DESIGN ONLY)	2012	\$0.01
20674	E12394 James Gray Drive UG Rebuild Civil NY51M3 (DESIGN ONLY)	2012	\$0.02
20697	<del>E12408 Thimble Berryway Aspenwood UG Rebuild Civil NY51M3</del>	2014	<del>\$0.45</del>
0693	<del>E12409 Thimble Berryway Aspenwood UG Rebuild Electrical NY51M3</del>	2014	<del>\$0.17</del>
		<b>Total</b>	<b>\$0.37</b>

/UF

/UF, US

/UF, US

2 **31. Underground Rehabilitation of Feeder SCNA47M17 (E11616, E12239, E12240, E12241,**  
 3 **E12242, E12243, E12244, E12281, E12335 and E12336)**

4  
 5 **31.1. Objectives**

6 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 7 SCNA47M17 in order to improve reliability of service and mitigate potential safety risks.

## ICM Project | Underground Infrastructure Segment

### 31.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2011: 3

Table 92 provides historical reliability data for this feeder. The decrease of CI and CHI in 2011 can be attributed to some underground rehabilitation work that was performed on this feeder in 2010 and 2011. This work carried a cost of nearly \$8 million. This job will address remaining underground assets on this feeder that require replacement, and is expected to result in long-term reliability improvement of the feeder.

**Table 92: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – SCNA47M17			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	7,260	7,740	3,303
Feeder CHI ( <i>Cumulative</i> )	1,916	3,305	665

### 31.3. Scope of Work

This job involves design work as well as the replacement of both civil and electrical assets. New 28 kV Aluminum TR-XLPE cable in new concrete-encased ducts and new submersible transformers will replace existing direct-buried cable and submersible transformers.

} /US

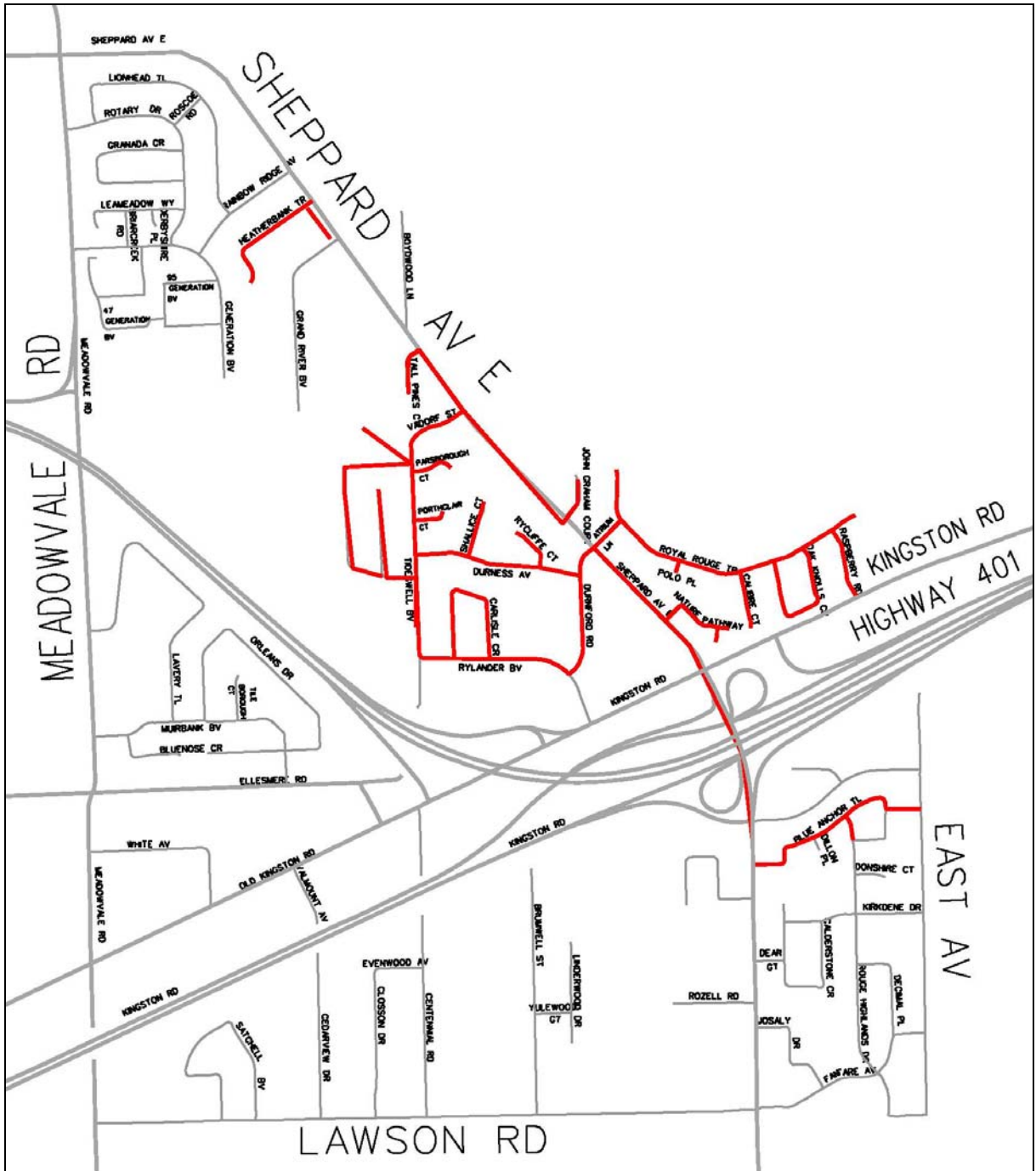
**Table 93: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	16,600 m	Primary Cable	16,600 m
Submersible Transformers	1	Submersible Transformers	1

### 31.4. Maps and Locations

The assets being replaced are located in the vicinity of the intersection of Sheppard Avenue East and Kingston Road. A map of the job area appears in Figure 34.

ICM Project | **Underground Infrastructure Segment**



1 **Figure 34: Map of Underground Rehabilitation of Feeder SCNA47M17**

2

3 **31.5. Required Capital Costs**

4 There are ten phases in this job for a total estimated cost of \$1.10M.

/UF, US

## ICM Project | Underground Infrastructure Segment

1 **Table 94: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
20207	E12239 Royal Rouge Trail UG Rebuild 47M17-Civil (DESIGN ONLY)	2012	\$0.05
20200	E12240 Durnford/Rylander/Tideswell 47M17 3-Ph Loop-Civil	2012	\$0.89
20209	E12241 Rebuild Tallpine Subd and Durnford TH 47M17- Civil (DESIGN ONLY)	2012	\$0.05
20208	E12242 Royal Rouge Trail UG Rebuild 47M17-Electrical (DESIGN ONLY)	2012	\$0.01
20206	E12243 Durnford/Rylander/Tideswell 47M17 3-Ph Loop-Electric (DESIGN ONLY)	2012	\$0.01
20210	E12244 Rebuild Talpine Sub and Durnford TH 47M17- Electrical (DESIGN ONLY)	2012	\$0.01
20345	E11616 Meadowvale/Heatherbank 47M17 Cabling Civil (DESIGN ONLY)	2012	\$0.02
20313	E12281 Meadowvale/Heatherbank 47M17 Cabling Elec (DESIGN ONLY)	2012	\$0.02
20477	E12335 47M17 Blue Anchor UG Rebuild Electrical (DESIGN ONLY)	2012	\$0.01
20478	E12336 47M17 Blue Anchor UG Rebuild Civil (DESIGN ONLY)	2012	\$0.03
<b>Total:</b>			<b>\$1.10</b>

/UF, US

/US

/UF, US

## ICM Project | Underground Infrastructure Segment

### 1 **32. Underground Rehabilitation of Feeder NY85M31 (W13474, W13475)**

2

#### 3 **32.1. Objective**

4 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
5 NY85M31 in order to improve reliability of service and mitigate potential safety risks.

6

#### 7 **32.2. Historical Reliability Performance**

8 Number of Unplanned Sustained Outages in 2011: 3

9 Number of Unplanned Sustained Outages in 2012: 2

10

11 Since January of 2011, all 4 of the unplanned momentary outages and 4 of the 5 unplanned  
12 sustained outages on this feeder have been due to the failure of the cable segment being  
13 replaced through this job. The severe deterioration of this specific cable segment and increasing  
14 reactive repair costs to address these failures supports the need for this job. The pertinent loop  
15 on Lodestar Road also supplies a critical customer, the Toronto Ambulance Dispatch Centre.

16

17 Table 94a provides historical reliability data for this feeder.

18

19 **Table 94a: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE – NY80M29</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI ( <i>Cumulative</i> )	1	12	571
Feeder CHI ( <i>Cumulative</i> )	3	23	58

#### 20 **32.3. Scope of Work**

21 This job will install new 28 kV Aluminum TR-XLPE cable in new concrete-encased ducts. Assets  
22 to be replaced include direct-buried cable that was installed in 1977.

/UF, US

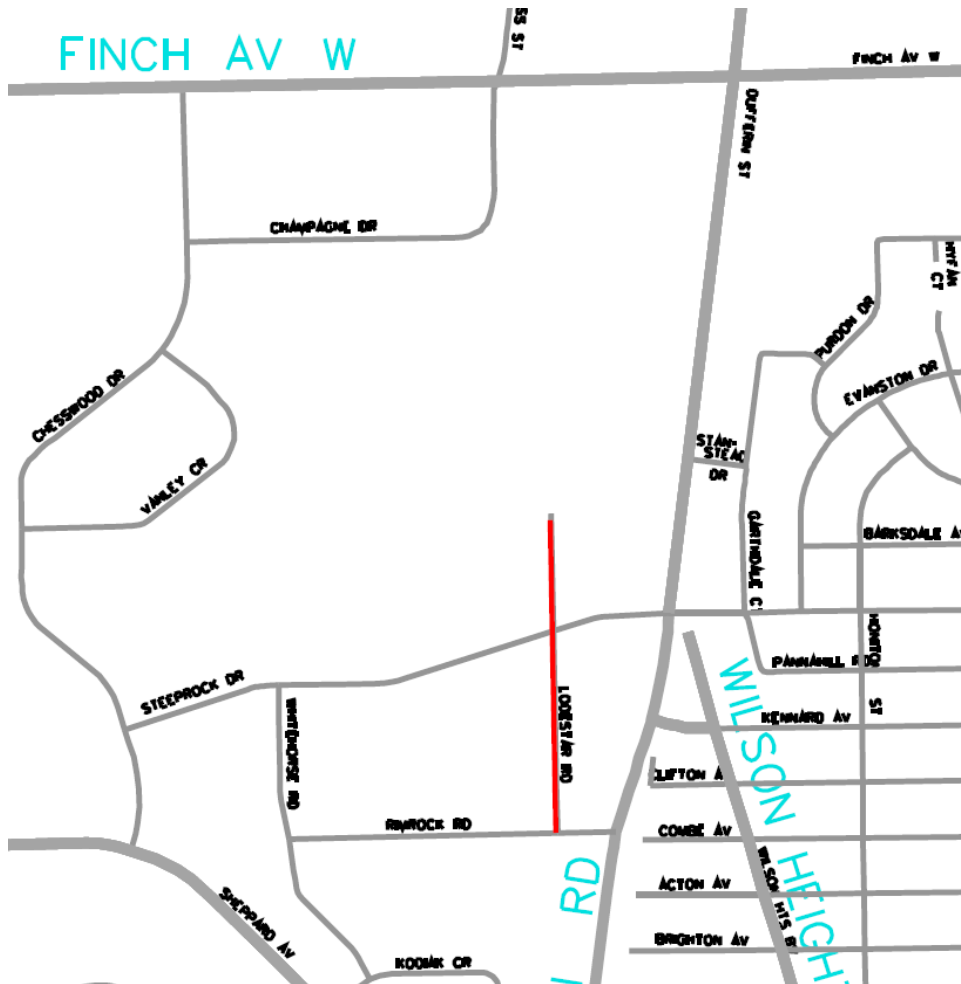
**ICM Project | Underground Infrastructure Segment**

1 **Table 94b: Asset Replacement**

Assets to be Replaced	
Primary Cable	3,900 m

2 **32.4. Map and Locations**

3 The assets being replaced by this job are located on Lodestar Road. A map of the area appears  
 4 in Figure 34a below.



5 **Figure 34a: Map of Underground Rehabilitation of Feeder NY85M31**

/UF, US

**ICM Project | Underground Infrastructure Segment**

1 **32.5. Required Capital Costs**

2 There are two phases to this job with a total estimated cost of \$0.34 M.

3

4 **Table 94c: Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
26034	W13475 UG Cable Replacement on 85M31 at Lodestar Road, Toronto (Civil)	2013	\$ 0.14
26035	W13474 UG Cable Replacement on 85M31 at Lodestar Road, Toronto (Electrical)	2013	\$ 0.20
<b>Total:</b>			<b>\$ 0.34</b>

/UF, US

## ICM Project | Underground Infrastructure Segment

### ~~33. Underground Rehabilitation of Feeder SCNA502M21 (E13123, E13184, E14008)~~

#### ~~33.1. Objective~~

The objective of this job is to proactively replace underground assets on the 27.6 kV feeder SCNA502M21 to improve reliability of service and mitigate potential safety risks.

#### ~~33.2. Historical Reliability Performance~~

Number of Unplanned Sustained Outages in 2011: 2

This feeder has been experiencing worsening reliability, as is evident from Table 95. The majority of CI and CHI in 2009, 2010, and 2011 were due to underground primary cable failures.

**Table 95: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE – SCNA502M21</b>			
<b>Reliability Metric</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Feeder CI ( <i>Cumulative</i> )	7,099	4,814	8,992
Feeder CHI ( <i>Cumulative</i> )	941	1,534	6,298

#### ~~33.3. Scope of Work~~

This job replaces both civil and electrical assets. This job installs new 28 kV Aluminum TR-XLPE cable in new concrete encased ducts and new SF<sub>6</sub> insulated switchgear. Assets to be replaced include direct-buried cable and air-insulated switchgear.

**Table 96: Asset Replacement**

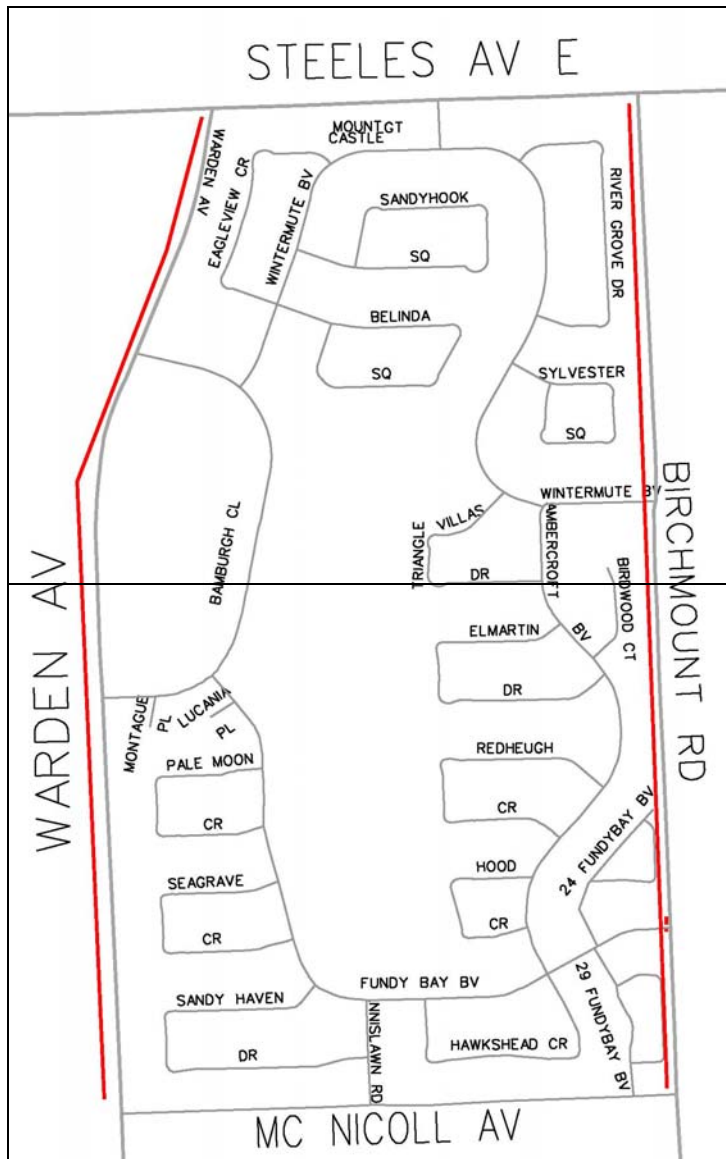
<b>Assets to be Replaced</b>		<b>New Assets to be Installed</b>	
Primary Cable	16,742m	Primary Cable	16,742m
Air-insulated Pad-mounted Switchgear	4	SF <sub>6</sub> -insulated Pad-mounted Switchgear	4



## ICM Project | Underground Infrastructure Segment

### 1 **33.4. Maps and Locations**

- 2 The assets being replaced by this job are located along Birchmount Avenue and Warden Avenue,  
3 south of Steeles Avenue East. A map of the job area appears in Figure 35.



4 **Figure 35: Map of Underground Rehabilitation of Feeder SCNA502M21**

5

### 6 **33.5. Required Capital Costs**

- 7 There are four phases to this job for a total estimated cost of \$2.56M.

## ICM Project | Underground Infrastructure Segment

1 **Table 97: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
21585	E13123 Rebuild Trunk 502M1-M22 Birchmount-Civil	2014	\$0.88
21933	E13184 Rebuild UG Trunk 502M21-28 Warden-Civil	2014	\$1.28
21586	E14008 Rebuild Trunk 502M1-M22 Birchmount-Electrical	2014	\$0.40
		<b>Total:</b>	<b>\$2.56</b>

2 **34. Underground Rehabilitation of Feeder SCNT47M1 (E11087, E12195, ~~E12210, E12212,~~**  
 3 **~~E12213, E12225, E12288, E12299, E12300, E12316, E12520 and E13079)~~**

/us

4  
 5 **34.1. Objective**

6 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 7 SCNT47M1 in order to improve reliability of service and mitigate potential safety risks.

8  
 9 **34.2. Historical Reliability Performance**

10 Number of Unplanned Sustained Outages in 2011: 2

11  
 12 Table 98 presents the historical reliability of this feeder. The higher CI and CHI figures in 2010  
 13 are primarily due to a spike in overhead asset failures in 2010. The improvement in reliability in  
 14 2011 (and in 2010 if the overhead asset failures are removed from the data) are due to  
 15 approximately \$7 million in underground rehabilitation work completed in 2009. Prior to 2009,  
 16 the feeder was experiencing an increasing number of underground asset failures. This job will  
 17 address the remaining aged underground assets on this feeder, including direct buried cable

## ICM Project | Underground Infrastructure Segment

1 sections that have experienced multiple failures, in order to provide long-term reliability  
 2 improvement for the feeder.

3

4 **Table 98: Historical Reliability Performance**

HISTORICAL RELIABILITY PERFORMANCE – SCNT47M1			
Reliability Metric	2009	2010	2011
Feeder CI ( <i>Cumulative</i> )	6,436	11,039	2,151
Feeder CHI ( <i>Cumulative</i> )	3,493	7,163	143

5 **34.3. Scope of Work**

6 This job involves design work as well as installation of civil and electrical assets. This job installs  
 7 new 28 kV Aluminum TR-XLPE cable in new concrete-encased ducts, new SF<sub>6</sub>-insulated  
 8 switchgear, and new submersible transformers. Assets to be replaced include direct-buried  
 9 cable, air-insulated switchgear and submersible transformers.

/us

10

11 **Table 99: Asset Replacement**

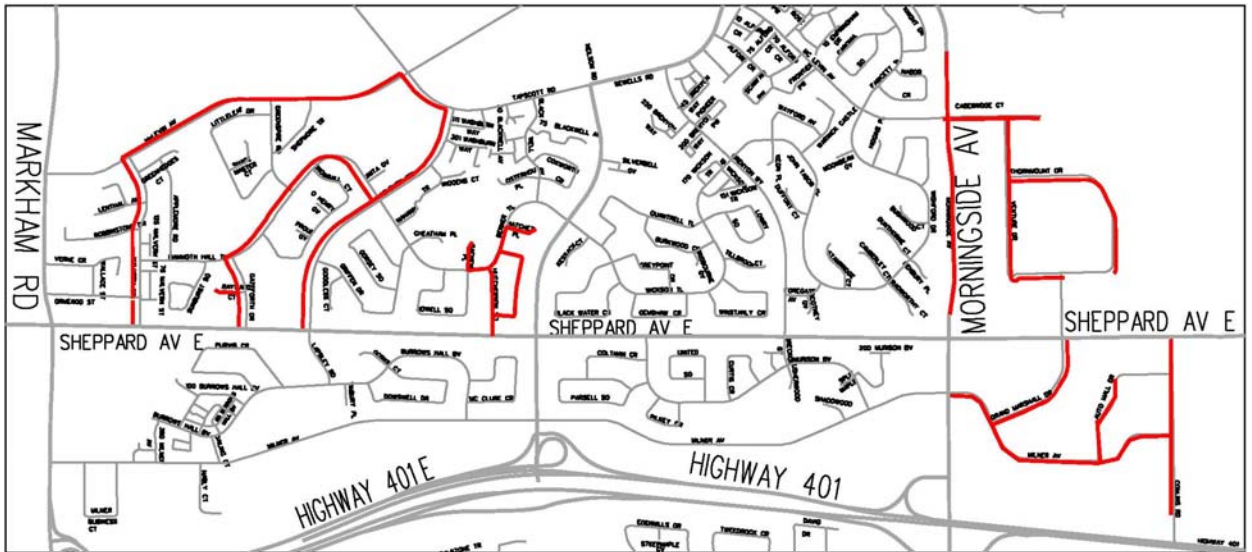
Assets to be Replaced		New Assets to be Installed	
Primary Cable	58,680 m	Primary Cable	58,680 m
Submersible Transformers	16	Submersible Transformers	16
Air-insulated Pad-mounted Switchgear	4	SF <sub>6</sub> -insulated Pad-mounted Switchgear	4
Air-insulated Vault-installed Switchgear	5	SF <sub>6</sub> -insulated Vault-installed Switchgear	5

## ICM Project | Underground Infrastructure Segment

### 1 34.4. Maps and Locations

2 The assets being replaced by this job are located in the area bordered by Neilson Road to the  
3 east, Markham Road to the west, Finch Avenue to the north, and Highway 401 to the south. A  
4 map of the job area appears in Figure 36.

5



6 **Figure 36: Map of Underground Rehabilitation of Feeder SCNT47M1**

7

### 8 34.5. Required Capital Costs

9 There are six phases to this job in 2012 and 2013 for a total estimated cost of \$6.63M.

/UF, US

## ICM Project | Underground Infrastructure Segment

1 Table 100: Required Capital Costs

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)	
24664	E11087 Grand Marshall Cable Repl SCNT47M1 – Civil and Electrical	2012	\$0.57	} /UF
21287	E12520 UG Rebuild NT47M1 Conlins Milner- Civil	2012	\$1.30	
19999	E12195 Mammoth Hall UG Rebuild Civil NT47M1	2013	\$3.42	
20051	<del>E12213 Morningside Avenue UG Rebuild Electrical NT47M1</del>	2014	<del>\$2.05</del>	
20417	<del>E12299 Gateforth Drive SCNT47M1 UG Rebuild (Civil)</del>	2014	<del>\$0.27</del>	
21288	<del>E13079 UG Rebuild NT47M1 Conlins Milner – Electrical</del>	2014	<del>\$0.99</del>	
20383	E12288 NT47M1 - UG Rebuild in the Hutcherson Sq area Electrical (DESIGN ONLY)	2012	\$0.01	} /UF, US
20388	E12300 NT47M1 - UG Rebuild in the Hutcherson Sq area Civil (DESIGN ONLY)	2012	\$0.01	
20059	<del>E12210 Venture Drive UG SCNT47M1 – Civ / Elec</del>	2014	<del>\$1.92</del>	
20058	E12212 Venture Drive UG Rebuild Civil SCNT47M1	2012	\$1.32	} /UF, US
20013	<del>E12225 Mammoth Hall UG Rebuild Electrical NT47M1</del>	2014	<del>\$1.21</del>	
20424	<del>E12316 Gateforth Drive SCNT47M1 UG Rebuild (Electrical)</del>	2014	<del>\$0.14</del>	
		<b>Total:</b>	<b>\$6.63</b>	} /UF, US

**ICM Project | Underground Infrastructure Segment**

1 **35. Underground Rehabilitation of Feeder NY55M21 (W13193)**

2

3 **35.1. Objective**

4 The objective of this job is to proactively replace underground assets on 27.6 kV feeder  
 5 NY55M21 in order to improve reliability of service and mitigate potential safety risks.

6

7 **35.2. Historical Reliability Performance**

8 Number of Unplanned Sustained Outages in 2011: 2

9 Number of Unplanned Sustained Outages in 2012: 7

10

11 Table 98 presents the historical reliability of this feeder. Although the yearly cumulative number  
 12 of interruptions per customer appears to be improving, the cumulative outage duration per year  
 13 has increased in the last three years. 16% of the outages in the last three years and all 7  
 14 unplanned sustained outages this year (2012) on the feeder have been due to underground  
 15 cable failures. Prior to 2009, the feeder was experiencing an increasing number of underground  
 16 asset failures.

/UF, US

17

18 **Table 100a: Historical Reliability Performance**

<b>HISTORICAL RELIABILITY PERFORMANCE – NY55M21</b>			
<b>Reliability Metric</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Feeder CI ( <i>Cumulative</i> )	1,254	189	170
Feeder CHI ( <i>Cumulative</i> )	716	381	836

19 This job rebuilds the area supplied by the feeder that has experienced multiple direct buried  
 20 cable failures.

**ICM Project | Underground Infrastructure Segment**

1 **35.3. Scope of Work**

2 This job installs both civil and electrical assets. The job installs new 28kV Aluminum TR-XLPE  
 3 cable in new concrete-encased ducts and new submersible transformers to replace the aged and  
 4 poorly performing direct buried cables and end-of-life submersible transformers.

5  
 6 **Table 100b: Asset Replacement**

Assets to be Replaced		New Assets to be Installed	
Primary Cable	7,500m	Primary Cable	7,500m
Submersible Transformers	3	Submersible Transformers	3

/UF, US

7 **35.4. Maps and Locations**

8 The assets being replaced by this job are located in the primary cable loop along Deerhide  
 9 Crescent, Arrow Road and Pemmican Court. A map of the job area appears in Figure 36a below.

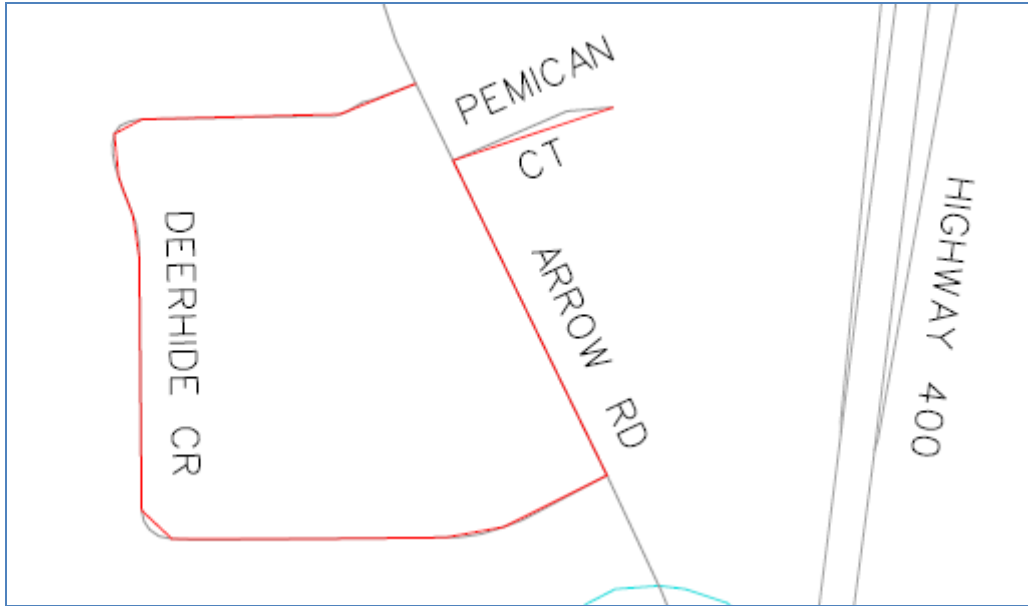
10  
 11 **35.5. Required Capital Costs**

12 The job is estimated at \$1.51M and is planned for execution in 2013.

13  
 14 **Table 100c: Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimate Cost (\$M)
22319	W13193 Arrow Rd - Lateral UG Loop Replacement	2013	\$1.51
<b>Total:</b>			<b>\$1.51</b>

ICM Project | **Underground Infrastructure Segment**



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1 **Figure 36a: Map of Underground Rehabilitation of Feeder NY55M21**



## ICM Project | Underground Infrastructure Segment

1 **Table 103: Required Capital Costs**

Job Estimate Number	Job Phase	Job Year	Estimated Cost (\$M)
20380	W11614 FESI LadyShot-Eldorado DB Cable Replace	2013	\$0.69
22073	W11615 FESI Keegen Cr. DB Cable Replace	2012	\$0.45
20812	W12435 Faul David and Astral UG DB Res'l Rebuild	2012	\$0.55
20989	W12490 FESI-UG DB Cable Rehab Bombardier Supply	2012	\$0.97
<b>Total:</b>			<b>\$2.66</b>

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## ICM Project | Underground Infrastructure Segment

### III NEED

#### 1. Underground Direct Buried Cable

##### 1.1. Overview

The installation of primary voltage XLPE cables directly into the ground – hence the term *direct buried* – dates as far back as the 1950s in the districts of North York, East York, York, Scarborough and Etobicoke within of the City of Toronto. These cables total approximately 877 conductor kilometers, representing approximately 7% of the underground primary cable in THESL’s distribution grid. Sixty-six percent of these direct buried XLPE cables (580 conductor kilometers) are in need of immediate attention.

} /c

The most significant degradation process for XLPE cables is water treeing [Ref 1 – App A]. Water treeing and electrical treeing (the final stage of water treeing) are pre-breakdown phenomena associated with dielectric cable failure. Water treeing starts with the penetration of moisture into the cable insulation; these trees are microscopic tears within the dielectric. In the early stages of water treeing, the path between the conductor and the neutral still remains intact. However, over time, continuous seepage of moisture into the insulation and electrical stress allows ions from the conductor to start migrating into the microscopic tears. These voids then become carbonized and form electrical trees. Once this final stage of treeing is reached, the cable starts to fail rapidly due to internal short circuits that occur between the primary conductor and the neutral conductor on the outside of the cable insulation as shown in Figure 40.



Figure 40: Fault due to premature insulation failure (taken on January 14, 2009)

## ICM Project | Underground Infrastructure Segment

1 and 2006 there were a total of 337 reported contact incidents on underground cables due to  
2 dig-ins in Ontario. Sixteen serious incidents in Ontario due to dig-ins were reported to the ESA  
3 between January 2006 and April 2007 [Ref 15 – App A].  
4

5 From 2001 to 2009, the ESA reported a total of 662 contact incidents with respect to  
6 underground cable assets [Ref 16 – App A]. Despite administrative controls in place to identify  
7 underground cables before excavation begins, 4% and 7% of all underground cable outages  
8 which occurred in 2010 and 2011, respectively, were attributed to dig-ins. Therefore, direct  
9 buried cables continue to present a potentially serious safety risk to field crews and the general  
10 public.  
11

### 12 **1.4. Environmental Impact**

13 In some cases, when direct buried cables are decommissioned, it is not feasible to remove them  
14 from the earth due to factors such as municipal road moratoriums. Although there is no  
15 particular study indicating the long-term effects of these cables in the ground, due diligence and  
16 environmental responsibility dictates that when possible, the cables should be removed and  
17 disposed of. Installing cables in conduit would allow THESL to always remove failed and/or  
18 decommissioned cables.  
19

### 20 **1.5 Reliability**

21 The effects of accelerated hydrothermal aging (which include water and electrical-treeing) on  
22 THESL's direct buried cables have started to become more and more apparent and have resulted  
23 in a decline in system reliability. Customer Interruptions (CI) have shown an overall increasing  
24 trend since 2001. This is illustrated in Figure 42. The total number of sustained interruptions or  
25 outages has exhibited a slightly decreasing trend over the past ten-year period, as seen in Figure  
26 43. The slightly decreasing trend can be attributed to the direct buried cable replacement  
27 projects that started in 2007 and continued through to 2011. Over the same period, the  
28 number of sustained interruptions (due to direct buried cable) per kilometer of direct buried  
29 cable remaining in the system has been increasing. This is illustrated in Figure 43a, which also  
30 contains a trend line showing that direct buried cables are failing at an increasing rate.

/C

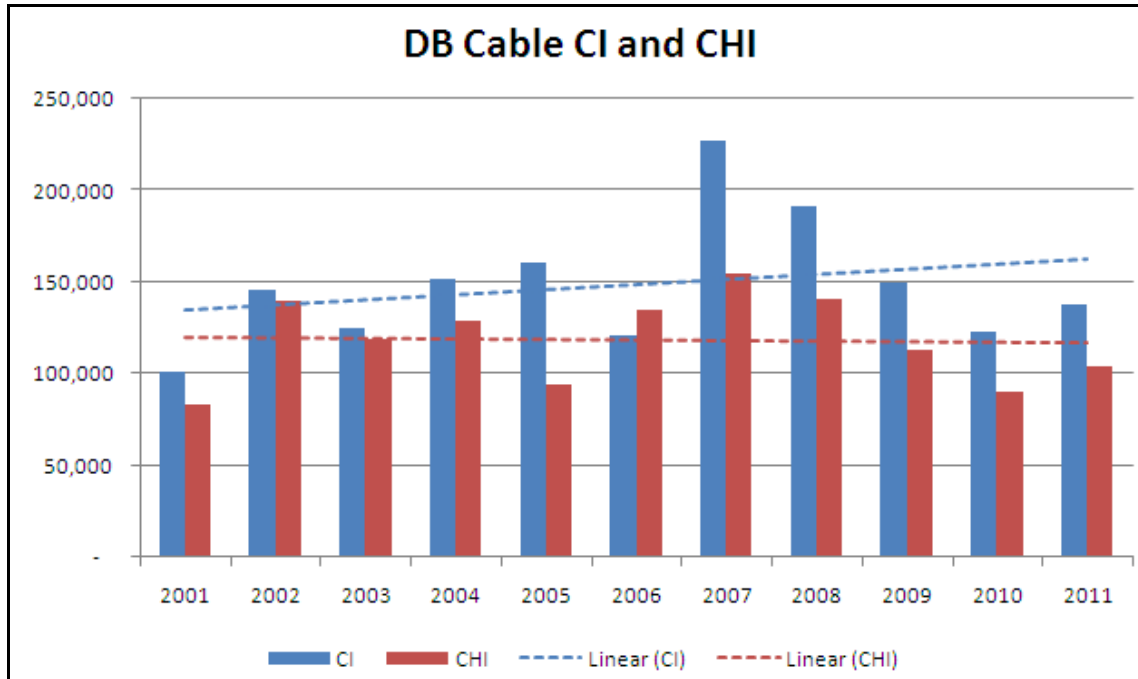
## ICM Project | Underground Infrastructure Segment

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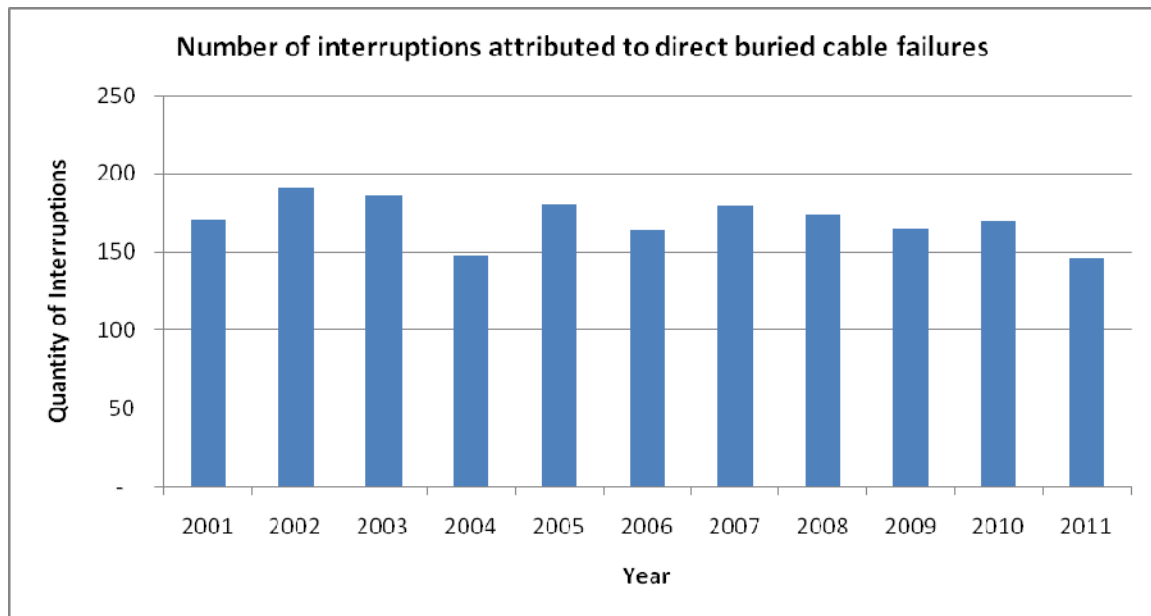
/c

- 1 Figures 44 and 45 compare the CI and CHI impacts due to direct buried cables against the entire
- 2 underground distribution system (including all primary cables). These figures both illustrate that
- 3 the majority of interruptions attributed to underground system infrastructure have been
- 4 attributed specifically to direct buried cable.

ICM Project | **Underground Infrastructure Segment**

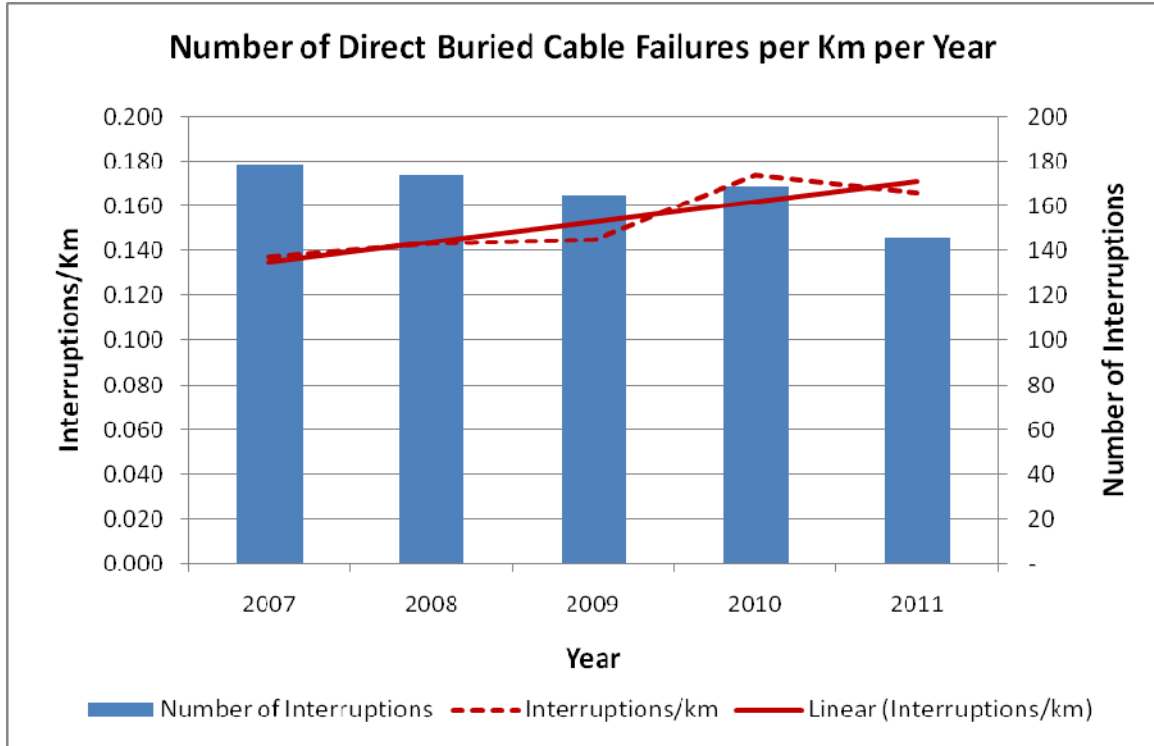


1 **Figure 42: Customer Interruptions (CI) and Customer Hours Interrupted (CHI) due to outages**  
 2 **attributed to direct buried cable failures.**



3 **Figure 43: Number of interruptions attributed to direct buried cable failures. Each**  
 4 **interruption increases the Feeders Experiencing Sustained Interruptions (FESI) count.**

ICM Project | **Underground Infrastructure Segment**



1 **Figure 43a: Number of sustained interruptions, attributed to direct buried cable failures, per**  
 2 **kilometer of direct buried cable remaining in the system.**

## ICM Project | Underground Infrastructure Segment

1 The process for locating and repairing a failed segment of direct buried cable, described at the  
 2 beginning of this section, can be quite lengthy. Table 1 lists significant outages over the past ten  
 3 years that were caused by direct buried cable failures. The table includes the system average  
 4 interruption duration index (SAIDI) contributions of each of these failures. In one case,  
 5 customers were out of power for more than a day.

6  
 7 **Table 1: Examples of direct buried cable failures that caused significant outages**

Year	Feeder	District	Outage Duration (Hours)	SAIDI Contribution (Hours)
2002	NY51M3	North York	6.42	0.0162
2007	NYSS68-F7	North York	6.68	0.0001
2008	NYSS68-F9	North York	7.37	0.0001
2010	ETLFF1	Etobicoke	27.68	0.0080
2010	NY51M6	North York	19.18	0.0006
2010	NY55M25	North York	13.55	0.0005

8

9 Figure 5 provides a closer look at the typical environment in which direct buried cables are  
 10 exposed over the duration of their service. More images of the difficulties and disruptions  
 11 associated with direct buried cables are provided in Appendix B.

## ICM Project | Underground Infrastructure Segment

1 **Table 3: Installation/rejuvenation costs of new 1/0 Al TR-XLPE cable and repair costs due to**  
 2 **an unplanned outage for a single-phase circuit**

Option	Installation / Rejuvenation Costs				Repair Due to Outage			
	Material / Injection Cost (per meter)	Electrical Labour Cost (per segment)	Civil Cost (per metre)	Total Installation/ Rejuvenation Cost (1)	Electrical Material and Labour Cost	Civil Cost	Total Costs	Total Costs per metre
1. Performing reactive work on the feeder (i.e. replace XLPE with strand-filled TR-XLPE)	\$13.41	\$1,822.24	\$240.18	\$27,181.33 (3)	\$4,922.37 (2)	\$1,244 (per splice-pit) (3)	\$6,166.04	\$6,166.04
2. Rejuvenate existing XLPE direct buried cables via cable injection	20.01	\$3,352.08	\$522.50	\$57,603.08	\$4,922.37 (2)	\$1,244 (per splice-pit) (3)	\$6,166.04	\$6,166.04
3. Replace existing XLPE direct buried cables with new strand-filled TR-XLPE direct buried cables	\$13.41	\$1,822.24	\$240.18	\$27,181.33	\$4,922.37 (2)	\$1,244 (per splice-pit) (3)	\$6,166.04	\$6,166.04
4. Replace existing XLPE direct buried cables with new strand-filled TR-XLPE cables in concrete-encased ducts (5)	\$13.41	\$2,162.90	\$380.40	\$41,544.32	\$6,171.12 (4)	N/A	\$6,171.12	\$61.71

**Table Notes**

- 1) The total installation assumes 100m segment and cable length.
- 2) Each faulted cable will require two splices; this price reflects the cost of two splices plus labour.
- 3) This is assuming that the fault is located on the first try and only one splice pit is required, otherwise multiple pits may be needed and accounted for in the repair calculations.
- 4) This price assumes a 100m length of cable between two cable chambers is being replaced since the entire cable run of a ducted cable needs to be replaced after a fault.
- 5) 2x3 duct configuration



## ICM Project | Underground Infrastructure Segment

---

1 From Table 3 it can be seen that the initial capital cost associated with Option 4 is higher than  
2 that of Options 1, 2 and 3. Although it appears that the repair costs of Option 4 are slightly /c  
3 higher than those of Option 3, it should be noted that these costs only account for the repair of  
4 a single faulted section. Typically, when an aged direct buried cable fails once, other failures will  
5 begin to occur on the same segment. Based on field experience, if three or more insulation  
6 failures occur on a single cable segment that feeder is flagged as unreliable and a  
7 recommendation is made to rebuild the entire area associated with that cable segment.

8  
9 Here, two recent examples of repeated failures on the same segment of direct buried cable are  
10 presented; in both cases the entire cable segment now needs to be replaced. The first example  
11 is that of a direct buried segment of feeder NYSS53M7. The 35 meter segment has failed nine  
12 times since 2008, with four of the failures occurring in January and February of 2012. Field  
13 crews have also reported that the insulation of this cable segment is severely damaged to the  
14 point that it is visually noticeable. Thus this feeder has been flagged as one which needs  
15 immediate attention.

16  
17 The second example is the case of feeder SCNAE5-M29. In 2009 a segment of this feeder  
18 between two transformer stations was flagged due to poor reliability. Some remediation was  
19 performed and the feeder trend started to show signs of improvement therefore the jobs and  
20 sub-jobs originally assigned to this feeder were deferred. However, the feeder started to fail  
21 again in the fall of 2011 and further remediation actions were taken. This did not improve the  
22 reliability of this segment of the feeder. The repeated failures deteriorated the dielectric  
23 insulation to the point that recently, when field crews attempted to transfer load in order to  
24 upgrade pad-mounted switchgear, the cable segment failed.

25  
26 Unfortunately this is a common scenario experienced by various utilities in the industry as  
27 reported by Jack H. Lawson in his paper, *Utility URD Cable Experience* [Ref 12 – App A]

28  
29 Using the data in Table 3 it can be seen that the cost of repairing the direct buried cable  
30 segment along feeder NYSS53M7 – four times in January and February – carried a cost  
31 \$24,662.40. Additional costs were incurred to address the previous failures, and further costs

## ICM Project | Underground Infrastructure Segment

---

1 will be incurred to reactively replace the entire 35-metre segment. Had this cable segment been  
2 concrete encased, after the first fault the entire segment would have been replaced with a new  
3 segment for a cost of \$ 6,171.12. /c

4  
5 It is therefore fair to conclude that the repair costs associated with direct buried cable failures  
6 could be as high as four times those which are indicated in Table 3. Furthermore, the cables in /c  
7 concrete-encased ducts will have their asset life renewed (when they are replaced) and will be  
8 able to last longer and provide more reliable service compared to the direct buried cables that  
9 are not only weakened due to age, but also due to the added splices during repairs. Hence,  
10 among the options discussed, Option 4, proactive replacement of direct buried cable with cable  
11 in concrete-encased ducts, is the most prudent option.

### 14 **2) Air Insulated Pad-mounted Switchgear**

15 THESL considered five options to mitigate the reliability and safety risks associated with this  
16 equipment:

- 17 a) Accelerated maintenance frequency
- 18 b) Reactively replace a failed unit with a similar unit
- 19 c) Install a moisture barrier at the base of each switch
- 20 d) Reactively replace a failed unit with a Pad-Mounted Enclosed (PME) unit
- 21 e) Proactively replace with non air insulated pad-mounted switchgear

### 23 **Option 1: Accelerated Maintenance Frequency**

24 Air-insulated pad-mounted switches are maintained on an annual basis. Maintenance involves  
25 visual inspection and infrared and ultrasonic scanning of the live switchgear unit to determine  
26 the presence of excess contamination buildup, hot spots and corona discharge (partial electrical  
27 discharge in the air). Corrective work resulting from maintenance activities involves carbon  
28 dioxide (CO<sub>2</sub>) washing of the energized unit to remove dirt and other contaminants while  
29 maintaining power supply to customers. Carbon dioxide (CO<sub>2</sub>) washing is a process whereby dry  
30 ice pellets are propelled at a high velocity by a compressed air gun. Upon impact, the dry ice  
31 creates a micro-thermal shock (caused by the extreme cold temperature of -79° C) that breaks

## ICM Project | Underground Infrastructure Segment

---

1 the only one of these options that addresses the failure mode associated with air-insulated pad-  
2 mounted switches.

3

4

### 5 **3) Avoided Risk Cost**

6 The effectiveness of the Underground Infrastructure segment can be further highlighted by  
7 determining how much cost is avoided by executing this work immediately as opposed to  
8 executing it in 2015. These avoided costs include quantified risks, taking into account the assets'  
9 probability of failure, and multiplying this with various direct and indirect costs associated with  
10 in-service asset failures, including the costs of customer interruptions, emergency repairs and  
11 replacement.

12

13 Carrying out work on this asset class immediately instead of deferring to 2015 will result in an  
14 estimated avoided risk cost of \$209 million. This figure shows that there are substantial /c  
15 economic benefits from executing this work immediately. In addition to the avoided risk cost,  
16 approximately 67,500 CI and 60,000 CHI are expected to be mitigated by the time the  
17 Underground Infrastructure segment is completed in (compared to a “do-nothing” or “run-to-  
18 fail” approach). Further explanation is provided in Appendix F.

## ICM Project | Underground Infrastructure Segment

1 Estimated Risk Cost. The final results are provided in Table 1. Note that a negative Project Net  
 2 Cost in the avoided risk calculation indicates project benefit.

} /c

3

4 **Table 1: Avoided Estimated Risk Cost for Underground Infrastructure Segment**

Business Case Element	Cost (in Millions)
Present Value of Project Net Cost in 2015 (PV(PROJECT <sub>NET_COST</sub> (2015)))	-\$147
Project Net Cost in 2012 (PROJECT <sub>NET_COST</sub> (2012))	-\$356
<b>Avoided Estimated Risk Cost =</b> <b>(PV(PROJECT<sub>NET_COST</sub>(2015))) – PROJECT<sub>NET_COST</sub>(2012)</b>	<b>\$209</b>

} /c

# ICM Project – Underground Infrastructure and Cable

---

## Paper Insulated Lead Covered (PILC) Cable – Piece Outs and Leakers Segment

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | PILC Piece-Outs and Leakers Segment

---

1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$22.5 M to \$9.4 M, a reduction of \$13.1 M
- 3 • Revised number of Piece Out and Leaker Repairs proposed for 2012/2013 to 10, with jobs
- 4 for 2014 to be addressed in Phase Two
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system
- 8 • Bridgman to High Level PILC Feeder Replacement job divided into separate civil and
- 9 electrical work phases, with civil work to proceed in 2013
- 10 • Corrected numerical and typographical errors

## ICM Project | PILC Piece-Outs and Leakers Segment



1 **Figure 1: Leaking PILC Cable (January 18, 2012)**

2

3 This segment includes ten discrete jobs to repair and replace Paper Insulated Lead Covered /UF, US  
4 (PILC) cable in 2012 and 2013, and 2014 at an estimated cost of \$9.4M. /UF, US

5

6 Each cable chamber in each job must be inspected to determine if any deficiencies, other than  
7 the known leaking cables and cables requiring piecing out, have occurred since the last  
8 inspection.<sup>1</sup> Leaks can occur along the cable itself or on the lead sleeves encapsulating cable  
9 splices. As part of the work, cables will be placed and racked in a way such that the center of  
10 the cable chamber remains clear of cable for safe access and egress. In some limited cases, a  
11 leaking PILC cable can be repaired with the replacement of the lead sleeve over the splice.

---

<sup>1</sup> As discussed more fully below in Section III, “piecing out” refers to the process of extending a cable in a chamber, usually by adding an additional piece of cable, such that it has the correct length to allow placement on cable racks, thereby permitting ample clearance for personnel entering a cable chamber, and also providing proper support to prevent damage to the cable.

## ICM Project | PILC Piece-Outs and Leakers Segment

---

1    **II       DESCRIPTION OF WORK**

2    **1.   Bridgman to High Level PILC Feeder Replacement**

3

4    **1.1.   Objectives**

5    After the near miss incident that occurred on a feeder connecting Bridgman to High Level  
6    stations on December 15, 2011, and explained in detail in Section III-1.1, all the PILC cables  
7    connecting these two stations and housed in the same civil infrastructure were inspected by  
8    THESL personnel. The results of these inspections show that many of the cables are leaking  
9    beyond the point of repair. Faults in these cables have taken a HONI transformer out of service  
10   six times in the past one and a half years which is not a sustainable approach for continuity of  
11   service, and it is also putting HONI assets at risk at the station.

12

13   The objective of this job is to address THESL's safety and operational issues, as well as concerns  
14   about HONI's equipment.

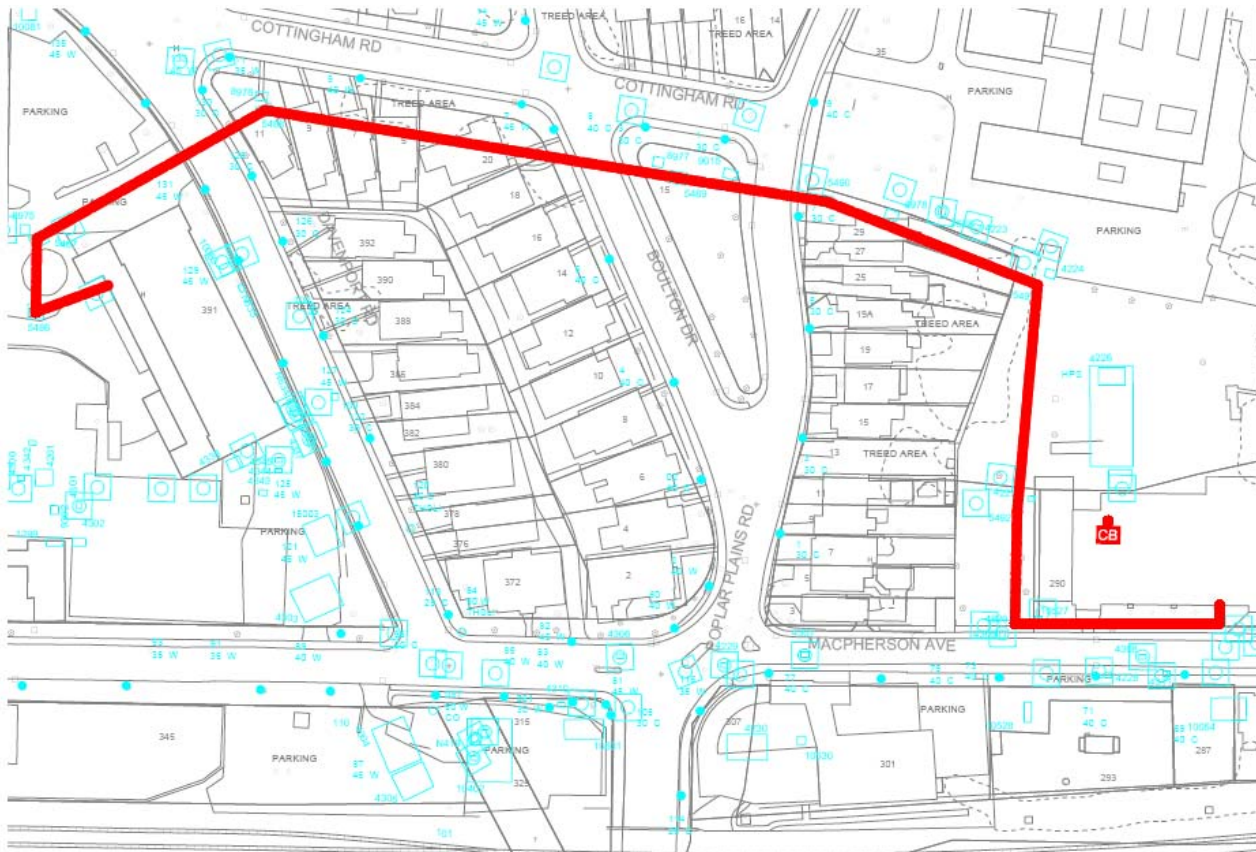
15

16   **1.2.   Scope of Work**

17   The total work required by the Bridgman to High Level PILC feeder replacement includes  
18   replacement of eight feeders that run between Bridgman and High Level Station. The scope of  
19   work identified for 2013 consists of necessary civil work. The feeders are A31BH, A32BH,        /US  
20   A37BH, A38BH, A43BH, A44BH, A45BH and A46BH. Since all these cables are single phase,  
21   1500kcmil, a total of 24-1500kcmil cables, over a distance of 455m is needed. This equates to a  
22   total distance of 10.9 kilometres of new 1500kcmil cable. Because of the lack of suppliers of  
23   lead-based PILC cable today, along with the hazards associated with leaking PILC cable, the  
24   1500kcmil PILC cable will be replaced with 1500kcmil TRXLPE cable. This cable is a larger        /US  
25   diameter and to accommodate this cable, the civil infrastructure needs to be rebuilt. The  
26   modern standard 1,500kcmil TRXLPE cables will not fit in the existing three-inch ducts, so the  
27   duct banks and cable chambers must be rebuilt. This required civil work is the proposed phase  
28   of work for 2013, with an estimated cost of \$3.9M.        /UF, US



**ICM Project | PILC Piece-Outs and Leakers Segment**



1 **Figure 2: Project Map and Locations**

2

3

4 **Table 2: Required Capital Costs**

Job Estimate Number	Job Title	Job Year	Total Estimated Cost (\$M)
27177	Bridgman to High Level PILC Feeder Replacement—Phase 1—Civil	2013	3.9

/UF, US

## ICM Project | PILC Piece-Outs and Leakers Segment



1 **Figure 5: Leaking Oil from PILC Cables Connecting Bridgman to High Level Stations**  
2 **(January 18, 2012)**

3

4

### 5 **2. Piece Out and Leaker Repairs**

6

#### 7 **2.1 Objectives**

8 There are nine jobs in this segment to piece out rebuilt cable chambers and repair leaking PILC /us  
9 cable in 2012 and 2013, and 2014 at an estimated cost of \$5.5M. The discrete jobs are listed, /UF, us  
10 and locations depicted, in Table 3 and Figure 6, below, respectively.

**ICM Project | PILC Piece-Outs and Leakers Segment**

1 **Table 3: Piece Out and Leaker Jobs**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Units</b>	<b>Job Year</b>	<b>Total Estimated Cost (\$M)</b>	
21216	Carlaw Station Piece Out and Leakers	24	2013	0.51	/US
21217	Leaside Station Piece Out and Leakers	21	2013	0.18	/UF, US
21218	Esplanade Station Piece Out and Leakers	12	2013	0.11	/US
21219	Glengrove Station Piece Out and Leakers	15	2012	0.29	
21220	Cecil Station Piece Out and Leakers	17	2012	0.20	
21221	Duplex Station Piece Out and Leakers	41	2012	0.61	
21222	Main Station Piece Out and Leakers	31	2012	0.58	
19798	Windsor Station Piece Out and Leakers II	8	2013	2.24	
19554	Terauley Station Piece Out and Leakers	49	2012	0.76	/US
24688	Bridgman Station Piece Out and Leakers	17	2014	0.17	
24703	Gerrard Station Piece Out and Leakers	12	2014	0.10	
24706	Basin Station Piece Out and Leakers	3	2014	0.05	
24711	4kV Stations Piece Out and Leakers	103	2014	1.15	
<b>2012 – 2013 Total</b>				<b>5.5M</b>	/UF

ICM Project | PILC Piece-Outs and Leakers Segment



1 **Figure 8: Before — Cable Chamber Requiring Piece Outs at Yonge and Merton**  
2 **(January 16, 2012)**

/c



3 **Figure 9: After — Cable Chamber showing properly supported cables and splices in a cable**  
4 **rack within the cable chamber (January 18, 2012)**

## ICM Project | PILC Piece-Outs and Leakers Segment

1 **Table 4: Present Value of Options**

<b>Business Case Element</b>	<b>PV (in Millions)</b>
<b>Option 1 — Deferral of Repair and Replacement Activities</b>	<b>\$36.16</b>
Cost of Ownership [CO1]	
➤ Environmental Cost	\$5.06
➤ Emergency Repairs—Additional Tool Time	\$31.10
<b>Option 2 – De-energize Feeders within Cable Chamber during work activities—Cost of Ownership [CO2]</b>	<b>\$3,005</b>
➤ Cost of Customer Interruptions	\$3,000
➤ Environmental Cost	\$5.06
<b>Option 3— Repair Leakers and Cables Requiring Piece Outs When Performing Emergency Work –Preset Value [CO3]</b>	<b>\$30.38</b>
➤ 2012 Project Cost	\$19.9
➤ 2013 Project Cost	\$10.4
➤—2014 Project Cost	\$2.9
<b>Option 4— – Proactively Repair or Replace the Affected Cables – Present Value [CO4]</b>	<b>\$22.2</b>
➤ 2012 Project Cost	\$17.3
➤ 2013 Project Cost	\$5.2
➤—2014 Project Cost	\$1.5
<b>Option 1 versus Option 2 PV [CO1-CO2]</b>	<b>-\$2,969</b>
<b>Option 1 versus Option 3 PV [CO1-CO3]</b>	<b>\$5.8</b>
<b>Option 1 versus Option 4 PV [CO1-CO4]</b>	<b>\$14.0</b>

## ICM Project | PILC Piece-Outs and Leakers Segment

---

- 1 • Assume life cycle (and PV calculation) ends at age 100.
- 2 • Assume there is no change in total number of piece out/leakers from year-to-year
- 3 • Assume average cable chamber load is 3200kVA (6 feeders, 9MVA, operating at 60%
- 4 load)
- 5 • The time the feeders require to be de-energized is 1 hour

6

7 Given

- 8 • Total Cable Chambers with piece-out and leakers = 484
- 9 • Average PILC Cable Segment = 0.157km
- 10 • Total Cable Chamber Population = 10,854
- 11 • Total Chambers visited = 28,576
- 12 • Total Chambers with Piece-out and Leakers visited in 2011 = 1,301
- 13 • Average age of PILC cable = 28 years
- 14 • Useful Life of PILC Cable = 75 years
- 15 • Event Impact = \$30/kVA
- 16 • Duration Impact = \$15/kVA\*h

17

18 An outage impact is calculated using 3200 kVA for 1 hour.

19

20 Outage impact=  $(\$30/\text{kVA})(3,200\text{kVA}) + (\$15/\text{kVA}\cdot\text{h})(3,200\text{kVA}\cdot 1\text{h}) = \$144,000$

/c

21

22 The risk only remains if the cable with the piece-out or leaker does not fail, and is not replaced  
23 with a new cable. Therefore, taking the average age of the population of PILC cables, and  
24 multiplying the (probability of having a piece-out leaker) x (impact), a risk cost is calculated. This  
25 risk is taken from the average age until the population is 100 years old, and done for each cable  
26 chamber visited containing a piece out leaker. Finally, the present value in 2012 dollars is taken.

27

28 The present value of de-energizing until the cable is 100 years old is \$2.3M per chamber. It is  
29 assumed that a given load cannot be transferred to another feeder because the standby feeder  
30 would also run in the cable chamber where work is happening, and be de-energized. Given

/c

## ICM Project | PILC Piece-Outs and Leakers Segment

---

1 1,301 chambers are visited a year, this number is **\$3 Billion** if all feeders are de-energized each  
2 time a worker is required to enter a chamber.

3  
4

### 5 **Option 3 – Repair or Replace Leakers and Cables Requiring Piece Outs when performing** 6 **Emergency Work**

- 7 • Assume all 1,301 leakers/piece outs are addressed within a three-year time period.
- 8 • Even with staggering of work over a three-year period, do not account for existing risks  
9 (environmental/de-energization) from year-to-year.

10

11 Because of space constraints in the cable chamber, the emergency work will be completed first  
12 and then the repairs of the piece-out and leakers completed second, stretching half the job into  
13 premium priced, over-time. Given that the Bridgeman to Highlevel station ties job cannot be  
14 completed in this manner, only the piece-out and leakers jobs can be completed on over-time.

15

16 Considering the premium over time, and the fact that the dollars of this job are spent over a  
17 three-year period, the job costs each year are:

18 2012 = \$ 19,850,950

19 2013 = \$ 10,358,037

20 ~~2014 = \$ 2,933,222~~

21

22 The present value in 2012 dollars, equates to **\$30.4 Million** using 6.06% discount rate.

23

24

### 25 **Option 4 – Proactively Repair or Replace the Affected Cables**

- 26 • Assume all 1,301 leakers/piece outs are addressed within a three-year time period.
- 27 • Even with staggering of work over a three-year period, do not account for existing risks  
28 (environmental/de-energization) from year-to-year.

## ICM Project | PILC Piece-Outs and Leakers Segment

---

1 All the dollars of this job are spent over a three-year period. Given the job costs each year:

2           2012 = \$ 17,323,056

3           2013 = \$ 5,179,018

4           2014 = \$ 1,466,610

5

6 The present value in 2012 dollars, equates to \$22.2 million using a 6.06% discount rate.



# ICM Project – Underground Infrastructure and Cable

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## Handwell Replacement Segment

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | Handwell Replacement Segment

---

1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Increased 2012-2013 budget from \$26.5 M to \$30.3 M, an increase of \$3.8 M
- 3 • 2014 jobs and spending shown in strike-through
- 4 • Corrected numerical and typographical errors

## ICM Project | Handwell Replacement Segment

1 **Table 1: Summary of Segment Costs**

Project Estimate Number	Project Title	Year	Cost Estimate (\$M)
20178	Handwell Standardization and Remediation	2012	\$15.84
25009	Handwell Standardization and Remediation	2013	\$14.45
<del>25011</del>	<del>Handwell Standardization and Remediation</del>	<del>2014</del>	<del>\$ 7.17</del>
<b>Total:</b>			<b>\$30.3</b>

/UF

/UF, US

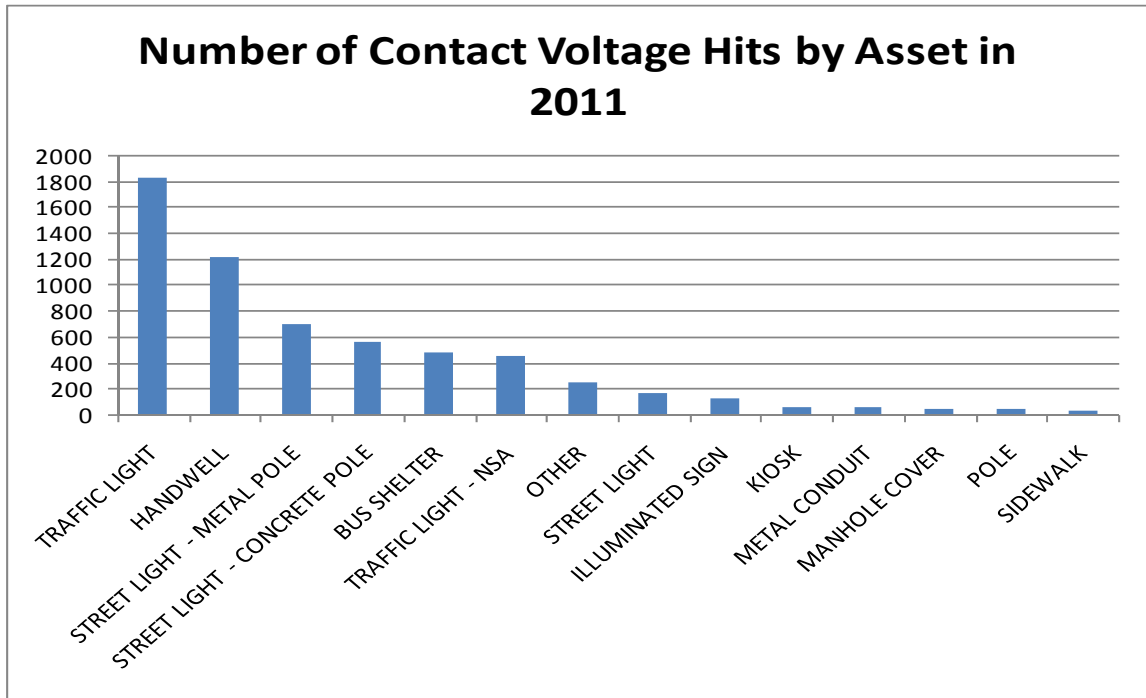
2 **2. Why the Project is Needed Now**

3

4 Handwells are among the top three structures with the highest number of contact voltage hits  
 5 as assessed by mobile scanning inspections (See Section III). Common causes include damage  
 6 from the elements, as handwells are exposed to harsh environmental conditions, third party  
 7 damage whenever the sidewalk is rebuilt or repaired, degradation of cable insulation, and  
 8 substandard installation of connections. If left untreated, the public may be exposed to the  
 9 potential safety risk posed by electric shock through contact voltage from the following sources:

- 10 • Contact of exposed conductor with metallic plates and covers;
- 11 • Direct contact with exposed conductor; or
- 12 • Indirect contact through another medium
  - 13 ○ Concrete structures (including sidewalks)
  - 14 ○ Conductive salt water saturates concrete and a voltage gradient forms
  - 15 ○ Metallic poles

ICM Project | Handwell Replacement Segment



1 **Figure 8 – 2011 Results by Asset Class**

2

3 Additionally, Table 2 shows the number of energized (greater than 1 volt) handwells detected in /c  
 4 THESL’s service territory.

5

6 **Table 2 – Number of Energized Handwells**

Year	Number of Energized Handwells Detected (>1 Volt)
2009	777 (Note: scanning commenced partway through 2009)
2010	1,219
2011	1,226
2012	524 (Note: includes results up to the end of March 2012)

/c

/c

/c

7 Any contact voltage occurrences that are not proactively detected through mobile scanning  
 8 have the potential to harm members of the public. In 2011, there were eight recorded handwell

## ICM Project | Handwell Replacement Segment

---

1 contact voltage incidents which resulted in claims against THESL. These incidents are listed in  
2 Table 3. /c

3

4 **Table 3 – Contact Voltage Incidents on Handwells (2011)** /c

Date	Location	Description of Incident
January 4	Wellesley/Bay	Dog shocked
January 6	Bay/Elm	Dog shocked
January 15	Yonge/St. Clair	Dog shocked
January 21	York/King/Wellington	Person shocked
February 11	644 Danforth Avenue	Dog shocked
March 8	Eglinton/Scarlett	Dog and person shocked
March 26	638 Danforth Avenue	Dog shocked
August 3	56 McGill	Dog shocked

## ICM Project | Handwell Replacement Segment

---

1 **IV      PREFERRED ALTERNATIVE**

2

3 **1.      Project Description**

4

5 The Handwell Replacement program will replace the above components which were installed  
6 based on previous standards with new components meeting the current standards. This work is  
7 intended to enhance public-safety by mitigating the potential risk of contact voltage through  
8 ongoing handwell replacements. This approach is preferred, as opposed to deferring the  
9 required work to some later date and not mitigating potential safety risks.

10

11 This work begins by addressing the highest risk areas in the downtown core due to higher  
12 pedestrian traffic and a greater number of handwells with a resulting concentration of contact  
13 voltage occurrences. THESL will then begin replacement in other areas of the City with  
14 handwells that are identified as not being constructed to current standards. The cost of this  
15 approach is an estimated \$30.3 million to remediate about 4,665 handwells. This is expected to  
16 result in replacement of the vast majority of metal handwells, thereby reducing the potential  
17 safety risk of contact voltage to the public.

/UF

18

19 The alternative to the proposed replacement program would be to replace handwells reactively  
20 when specific instances of contact voltage are identified, or if they fall within the scope of a  
21 related distribution project. While this option would defer capital expenditures, it will also  
22 result in a higher potential public safety risk. As the existing handwells continue to age and the  
23 condition of the cables within them continues to deteriorate, an increase in contact voltage  
24 occurrences is expected, further compounding the risk.

25

26 Moreover, even if this work is deferred in the short term, the existing handwells eventually will  
27 require replacement due to their deteriorated condition. Reactive replacement costs may also  
28 be higher for locations identified during contact voltage scans due to the costs of after-hours  
29 work and delays in permitting. THESL believes that it is prudent to complete this work in the  
30 near term in order to address the potential safety risk.

## ICM Project | Handwell Replacement Segment

1     **2.     Project Scope and Cost**

2

3     Handwell replacement typically involves the following tasks:

- 4         •   Excavation and removal of legacy handwells
- 5         •   Replacement of active handwells with non-conductive units
- 6         •   Replacement of underground secondary mains cable with a superior, dual-insulation
- 7             cable
- 8         •   Remaking all connections in handwells to the current standard

9

10     Forecast costs are based on an average a handwell replacement cost of approximately \$6,900

11     per unit and do not include unforeseen locations requiring remediation.

12

13     **Table 4: Handwells - Summary of Project Costs**

/C

Project Estimate Number	Project Title	Project Year	Cost Estimate (\$M)
20178	Handwell Standardization and Remediation	2012	\$15.84
25009	Handwell Standardization and Remediation	2013	\$14.45
25011	Handwell Standardization and Remediation	2014	\$7.17
<b>Total:</b>			<b>\$30.3</b>

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# ICM Project – Overhead Infrastructure and Equipment

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## Overhead Infrastructure Segment

Toronto Hydro-Electric System Limited (THESL)





## ICM Project | Overhead Infrastructure Segment

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### **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced budget for 2012-2013 to \$64.95 M as compared to \$82.45 M, a reduction of
- 3 \$17.50 M
- 4 • Reduced number of jobs proposed for 2012-2013 to 76 as compared to 90 as originally filed,
- 5 with jobs for 2014 to be addressed in Phase Two, as proposed
- 6 • 2014 jobs and spending shown in strike-through
- 7 • Replaced Figures 16-18 and 24-26 and Table 3 to include only forced outages
- 8 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 9 the continuing priority needs of the system
- 10 • Corrected numerical and typographical errors

## ICM Project | Overhead Infrastructure Segment

---

1     **I       EXECUTIVE SUMMARY**

2

3     **1.   Project Description**

4

5     **1.1.   Overview**

6     Overall, the overhead plant of Toronto Hydro Electric System Limited (THESL) covers  
7     approximately 53 percent of the total distribution system within the City of Toronto. This  
8     document discusses the immediate need to address system-wide issues associated with  
9     overhead infrastructure and proposes jobs to replace aged, deteriorated and non-standard  
10    equipment. The main body of the document begins by describing the issues associated with  
11    THESL's existing overhead plant and the options for addressing them (Section II). This is  
12    followed by summary of the work that THESL must perform on poles, transformers, conductors,  
13    switches and porcelain hardware in 2012 and 2013 ~~and 2014~~ to improve safety and reliability  
14    (Section III).

15

16    **1.2.   Equipment Categories**

17

18    **1.2.1.   Wood Poles**

19    Currently, THESL has a total of 106,860 wood poles, of which 11.4 percent are either in poor or  
20    very poor condition. This figure breaks down to approximately 2,650 poles in very poor  
21    condition, requiring immediate replacement, and about 9,530 poles in poor condition, requiring  
22    replacement in the near future (within three years). The Health Index used to assess the  
23    condition of wood poles accounts for a variety of degradation factors. These can lead to  
24    irreversible damage and include loss of pole strength, cross-arm rot, woodpecker or carpenter  
25    ant damage, surface rot at various levels of the pole, pole top feathering, wood loss and  
26    mechanical fire damage. Figures 5 through 13 in Section II below illustrate the causes and  
27    effects of pole degradation. In an extreme case pole degradation can lead to collapse as shown  
28    in Figure A.

## ICM Project | Overhead Infrastructure Segment

---



1 **Figure A: Fallen Pole on Acacia Road with Rotten Base**

2

3 Maintaining wood poles in a satisfactory condition is essential for the delivery of reliable service  
4 to utility customers; pole failures lead to service disruptions to customers, while weakened  
5 poles present risks to THESL crew workers and potential safety risks. As part of the jobs  
6 described below, THESL will replace approximately 4,124 poles during 2012-2013.

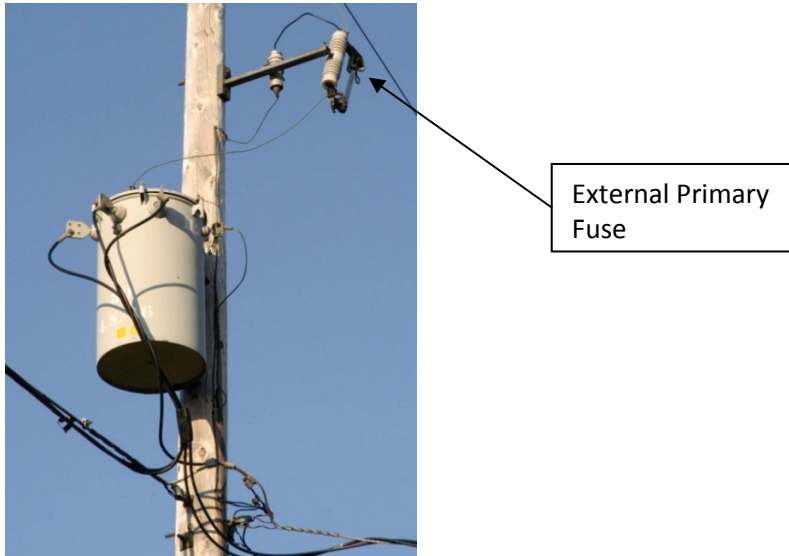
/ US

7

### 8 **1.2.2. Completely Self-Protected (CSP) Transformers**

9 Completely self-protected (“CSP”) internally fused transformers (“CSP transformers”) are legacy  
10 installations that were put into service prior to amalgamation of the Toronto area’s six municipal  
11 electric utilities to form Toronto Hydro. CSP transformers contain fusing inside the transformer  
12 tank and are typically mounted on 35-foot poles, as shown in Figure B. Once a CSP transformer  
13 has failed in the field or the primary fuse has been activated, it must be replaced. In contrast,  
14 the current standard for overhead, pole-mounted transformers (non-CSP transformers) requires

## ICM Project | Overhead Infrastructure Segment



1 **Figure C: Standard Non-CSP Transformer**

2

3 CSP transformers have been failing at an increased rate resulting in poor reliability. In addition,  
4 the average repair time for CSP transformers is higher than for standard non-CSP transformers  
5 because when the internal fuse operates on a CSP transformer, the entire transformer must be  
6 replaced. For standard non-CSP transformers, in about half the outages, transformer  
7 replacement is not required because THESL can address the outage by replacing the external  
8 fuse while leaving the transformer in place. As a result, standard non-CSP transformer outages  
9 have a significantly lower impact on Customer Hours of Interruption than CSP transformer  
10 outages (See Section II).

11

12 THESL plans to proactively replace 985 CSP transformers with standard non-CSP transformers in /C  
13 conjunction with other overhead capital work conducted the 2012 to 2014 period. The drive to  
14 improve the reliability and safety of THESL's distribution system has necessitated voltage  
15 conversion and rehabilitation of deteriorated assets throughout the city. CSP transformers  
16 encountered within the areas designated this work will be replaced with standard non-CSP  
17 transformers.

## ICM Project | Overhead Infrastructure Segment

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1 **1.2.3. Overhead Conductors**

2 Overhead conductors play a vital role in delivering power from sources of supply to points of  
3 consumption. THESL faces two key issues with respect to overhead conductors: insufficient  
4 ampacity from undersized conductors, resulting in inefficient feeder utilization and operational  
5 constraints; and bare conductor that is susceptible to outages from tree contact.

6  
7 Load growth in the system necessitates upgrades to undersized conductor to avoid  
8 complications during the restoration of feeders. Furthermore, the overhead conductor asset  
9 class is also the most susceptible to tree contact interruptions due to the lack of conductor  
10 insulation and proximity to mature trees. Sustained interruptions caused by tree contacts on  
11 the trunk portion of the feeder have risen by 60 percent from 2010 to 2011.

12  
13 The replacement of undersized conductors with the current standard will allow for greater  
14 amounts of load to be transferred during outages. Implementing this option would improve  
15 operational flexibility by permitting system controllers to more effectively restore power  
16 through sectionalizing or feeder load transfers. This will lead to more efficient restoration of  
17 power to customers.

18  
19 THESL plans to upgrade of undersized conductor as part of other overhead capital work by  
20 integrating this initiative into jobs identified under as part of the Overhead Infrastructure Capital } /us  
21 Segment (See Section II).

22  
23 Upgrading bare conductors with tree-proof conductors will improve reliability and mitigate the } /c  
24 risk of further outages as result of tree contact on feeder trunks. Investment in tree-proof  
25 conductors also will help control future tree trimming costs. Runnymede TS and Leaside TS have  
26 had the largest number of outages related to tree contacts and these outages have had the  
27 highest impacts at the station level. Feeders from Runnymede TS and Leaside TS require the  
28 upgrade of a total of 61 kilometres from bare insulated overhead conductor to 556.5

## ICM Project | Overhead Infrastructure Segment



1 **Figure E: Broken Porcelain Insulator**

2

3

4 THESL intends to replace 400 porcelain insulators yearly with the approved polymer standard in  
5 each of 2012 and 2013 ~~and 2014~~. Typically, porcelain insulators would be replaced on feeders in  
6 locations with deteriorated pole framing hardware including highly contaminated areas such as  
7 those close to major highways as well as congested, heavily treed areas, and other areas where  
8 the potential for failure is high and where there may be associated safety risks. Replacements  
9 would occur as part of other overhead rebuild work identified under the overhead infrastructure  
10 jobs below. The cost of this effort is over two years totals \$1.04 million. /UF

11

12 Porcelain pothead terminations also have the potential to fail in a catastrophic manner,  
13 releasing porcelain shards and dispersing oil. This can damage other nearby electrical  
14 equipment and public property. In addition, the dispersion of oil from the damaged  
15 terminations may result in a fire or an environmental hazard. Figure F shows the results of a  
16 porcelain pothead failure sending shards of porcelain onto the balcony of a nearby home,

## ICM Project | Overhead Infrastructure Segment

1 shattering the window of the family room and causing damage to the windshield of a nearby  
2 police car.

3



4 **Figure F: Failure Effects of the Porcelain Pothead Terminators**

5

6 There are approximately 565 porcelain pothead locations. The majority of porcelain potheads  
7 are located in the downtown core, with the remaining locations dispersed across the former  
8 distribution service areas of Etobicoke and Scarborough. Starting in 2012 and continuing  
9 through 2013, THESL plans to replace 50 locations annually, for a two-year total of 100 locations  
10 (approximately 18 percent of the total population), by first targeting public thoroughfare areas  
11 such as sidewalks, bus stops and school zones. The estimated cost of this effort over two years  
12 totals \$2.23 million.

} /UF, US

13

### 14 **1.3. Job Structure**

15 In Section III below, THESL discusses the specific jobs that it is proposing under this segment in  
16 2012 and 2013 and 2014. The main approach used to structure these jobs is to identify

**ICM Project | Overhead Infrastructure Segment**

1 **Table 1 – Project Cost**

	<b>Project Year</b>	<b>Cost Estimate (\$ M)</b>
Overhead Infrastructure	2012	\$25.40
Overhead Infrastructure	2013	\$39.12
Overhead Infrastructure	2014	\$20.11
<b>Job Total</b>		<b>\$64.52</b>
<b>Reconciliation for job cost changes &lt; \$100,000 and rounding</b>		<b>\$ 0.43</b>
<b>Reconciled Total</b>		<b>\$64.95</b>

} /UF

2 **2. Why the Project is Needed Now**

3

4 This segment is intended to address safety and reliability issues associated with aged,  
 5 deteriorated and non-standard equipment types described above. With respect to safety, the  
 6 failure modes associated with the equipment types described above create potential risks for  
 7 THESL crews and public at large. Only by beginning to eliminate these equipment types can  
 8 THESL begin to reduce these potential risks.

9

10 In terms of reliability, the general trend shows that overhead system reliability has deteriorated  
 11 over the five-year period from 2007 to 2011. More specifically, overhead switches, insulators,  
 12 and lighting arrestor failures have increasingly contributed to system outage levels. These  
 13 causes account for 69 percent of the Customer Interruptions (CI) and 58 percent Customer  
 14 Hours Interrupted (CHI) of the total Overhead Equipment failures in 2011. The impacts of  
 15 overhead equipment on Defective Equipment CI and CHI Contributions are shown in Figures G  
 16 and H.



## ICM Project | Overhead Infrastructure Segment

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1 Average Interruption Duration Index (SAIDI). From a SAIFI perspective, overhead outages  
2 account for 46 percent, 56 percent and 39 percent of the Defective Equipment-related outages  
3 in 2009, 2010 and 2011, respectively. In terms of SAIDI, overhead outages account for 41  
4 percent, 44 percent and 34 percent of the Defective Equipment-related outages for 2008, 2009  
5 and 2010 respectively.

6  
7 There are many critical issues regarding the condition of overhead assets which should be  
8 addressed immediately. These issues have implications both for reliability and safety as  
9 discussed in the following paragraphs.

### 10 11 **3. Why the Proposed Project Is the Preferred Alternative**

12  
13 For each equipment category discussed in Section II below, THESL presents the range of options  
14 considered as alternatives to the proposed project. Where viable alternative replacement  
15 options exist, they are explored. For example, wood poles can be replaced with concrete poles.  
16 THESL considers this option, but concludes that, except in very limited circumstances, using  
17 concrete poles would be inferior to using wood pole owing to the cost and characteristics of  
18 concrete poles as explained below in Section II.

19  
20 For most equipment categories, however, the available options reduce to two: replacing the /c  
21 equipment over 2012 and 2013 as proposed or deferring replacement to a future date. In /us  
22 circumstances where the equipment being replaced is no longer standard owing to safety and  
23 reliability issues (e.g., CSP transformers or porcelain insulators), THESL has adopted a new  
24 standard equipment type that addresses these issues. Thus, in these circumstances, the  
25 preferred replacement technology is already determined, only the timing of replacement  
26 remains to be decided. To consider the benefits of the proposed replacement timing versus  
27 deferral, THESL performed the Business Case Evaluation attached as Appendix 1.

28  
29 In the Business Case Evaluation, the Overhead Infrastructure Segment represents an “in-kind”  
30 replacement project in which the existing overhead assets are being replaced with new

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1 in 2015 were brought back to a present value and the difference between this value and the  
 2 Project Net Cost quantified for 2012 was taken as the Avoided Estimated Risk Cost. The final  
 3 results are provided in Table 1.

4

5 **Table 1: Avoided Estimated Risk Cost for Overhead Infrastructure Project**

Business Case Element	Estimated Cost (\$ M)
Present Value of Project Net Cost in 2015 (PV(PROJECT <sub>NET_COST</sub> (2015)))	\$ 222
Project Net Cost in 2012 (PROJECT <sub>NET_COST</sub> (2012))	\$ 111
<b>Avoided Estimated Risk Cost =</b> <b>(PV(PROJECT<sub>NET_COST</sub>(2015)) – PROJECT<sub>NET_COST</sub>(2012))</b>	<b>\$ 111</b>

/c

/c

6 Based on the safety and reliability benefits from completing this segment and the  
 7 demonstration in the Business Case Evaluation that undertaking this segment now as opposed  
 8 to 2015 has a lower net costs, the proposed segment is the preferred alternative. It is the least  
 9 cost alternative to customers.

## ICM Project | Overhead Infrastructure Segment

For these reasons, the preferred option, in most cases, is to replace aging wooden poles, which have reached the end of their useful lives, with new wooden poles.

### 2.1.3. Wood Poles Selected for Replacement

The pole replacement program is an initiative aimed at replacing poles that are in very poor and in poor condition. Pole replacements are also included in project areas targeted for overhead work due to poor reliability performance and other ongoing issues with equipment condition.<sup>1</sup>

Currently about 2.5 percent of THESL poles are in very poor condition, which represents about 2,650 poles. Of these, 14.8 percent, or about 393 poles, are located on the trunk portion of feeders. In addition, 8.9 percent of poles are in poor condition, which represents 9,530 poles.

Of these, about 17.7 percent are located on the trunk portion of feeders, which represents

1,683 poles. Figure 18 illustrates the increasing number of poles in poor and very poor

condition from 2010 to 2013. If these poles are not replaced now, they will continue to deteriorate and pose safety and reliability risks. Deferral of replacement to future years will only increase the number of poles in poor and very poor condition requiring replacement.

/us

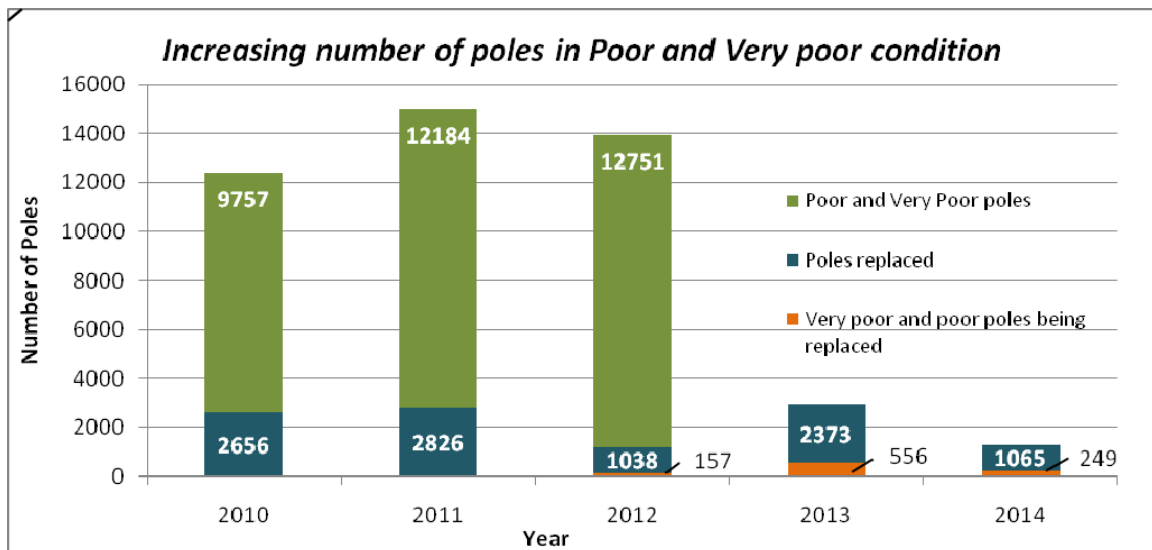


Figure 18: Increasing Number of Poles in Poor and Very poor Condition

<sup>1</sup> If THESL is replacing all of the wood poles in an area, it may also replace some poles in fair condition, to avoid having to return to the area and do spot replacements in the next few years. Poles in fair condition, however, are not targeted by the replacement program.

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1  
 2 As mentioned previously, outages due to pole failures take a long time to restore (Refer to  
 3 Figure 16). If the pole causing the outage is located on the trunk portion of a feeder, the outage  
 4 can impact also as many as 3,000 customers. For these reasons, a wood pole replacement  
 5 program is necessary to address pole failures before they occur and expose customers to  
 6 lengthy outages.

7  
 8 Poles replacement priority is determined by pole Health Index information obtained as part of  
 9 the ACA, by a pole testing program and by field assessments conducted by experienced field  
 10 crew members and engineers. The poles that are identified for replacement are typically  
 11 located on the Worst Performing Feeders, except for poles that are identified as Danger and  
 12 Caution poles through an external contractor, which can be located anywhere.

13  
 14 THESL plans to replace approximately 4,124 poles during 2012-2013 (Refer to Table 2) at an /us  
 15 average cost of about \$11,854. The total cost of the pole replacement program is \$48.89  
 16 million. This cost covers all of the costs normally associated with replacing a pole, but does not /UF  
 17 include the cost of replacing additional equipment located on the pole.

18  
 19 **Table 2: Pole replacement Program**

POLE REPLACEMENT PROGRAM			
Year	2012	2013	2014
Poles	1,195	2,929	1,314

20 The replacement of poles is the most practical way to ensure the continued integrity of the  
 21 distribution system. This would enhance the safety of the public and THESL workforce and avoid  
 22 pole failures, as well as related customer claims. A reduction in pole replacement expenditures  
 23 to address end-of-life equipment will ultimately result in a continued rise in poor overhead  
 24 reliability.

25  
 26 Maintaining poles in satisfactory condition and replacing them when required is essential for the  
 27 delivery of reliable service to utility customers. Should this work be further deferred, the

## ICM Project | Overhead Infrastructure Segment

1 the standard non-CSP transformer procedure. The longer stick allows for a greater working  
 2 distance for the crew worker from the transformer and the potential risk of the lid blowing off  
 3 during re-energization. Furthermore, the standard non-CSP also has the external fuse in  
 4 conjunction with the current-limiting fuse to provide additional protection.

5  
 6 On CSP transformers, the internal fuse is designed to coordinate with the current limiting fuse  
 7 (CLF), but the effectiveness of this coordination depends on the nature of the internal fault and  
 8 whether the fuse has cleared properly. For example, a CLF was burning at CSP Transformer  
 9 T13102 on feeder 85M23 on July 05, 2004 and became a potential safety risk for crews at the  
 10 scene. As another example, on March 18, 2010, a crew arrived to find a lid blown off at CSP  
 11 Transformer T8040 on feeder SS58-F1. The concern for this crew was operating on such a CSP  
 12 with an 8-foot grip all stick. Incidents such as these create potential safety risks which can be  
 13 avoided with standard non-CSP transformers.

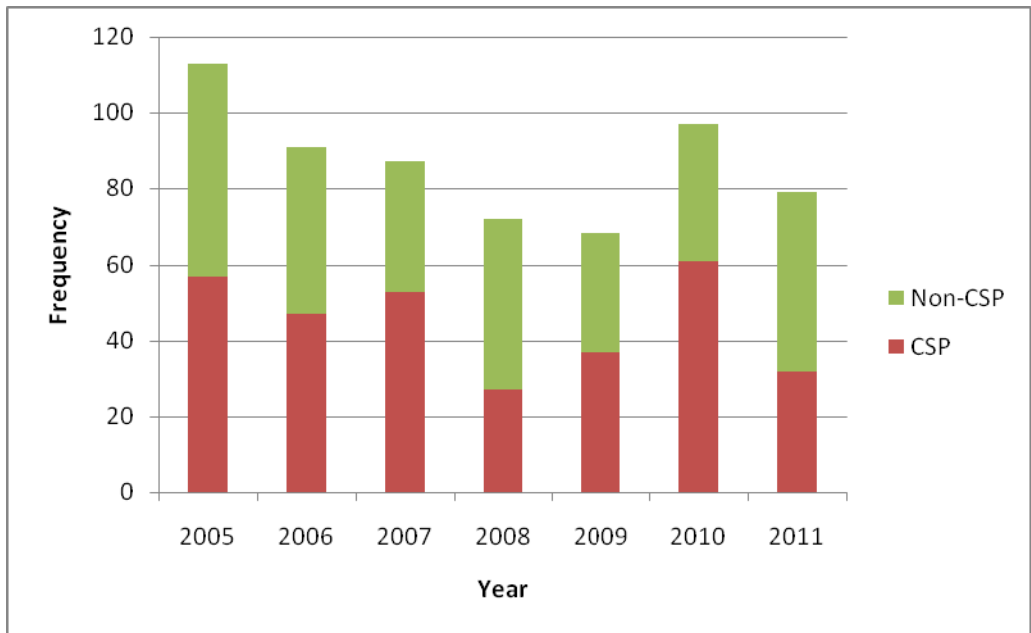
14  
 15 THESL estimates that CSP transformers comprise only 9.2 percent of all overhead transformers.  
 16 As shown in Table 3 and Figures 24 - 26, however, CSP transformers contribute  
 17 disproportionately to both the frequency and the duration of outages.

18  
 19 **Table 3: 2005-2011 Transformer Forced Outages**

Year	Frequency		CI		CHI	
	CSP	Non-CSP	CSP	Non-CSP	CSP	Non-CSP
2005	57	56	2209	3630	4923	4925
2006	47	44	11937	2042	8197	3727
2007	53	34	2929	1914	5872	3229
2008	27	45	1998	3513	1843	4872
2009	37	31	6820	4490	4062	2709
2010	61	36	9126	701	8777	2354
2011	32	47	3226	6477	2774	4900

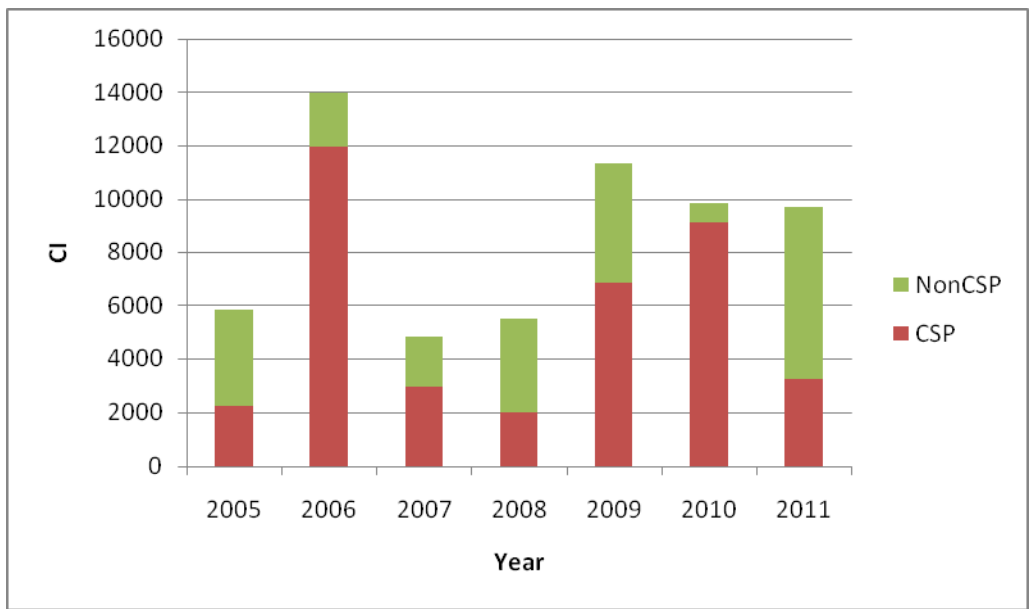
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**ICM Project | Overhead Infrastructure Segment**



1 **Figure 24: Summary of Forced Outages Due to Transformers**

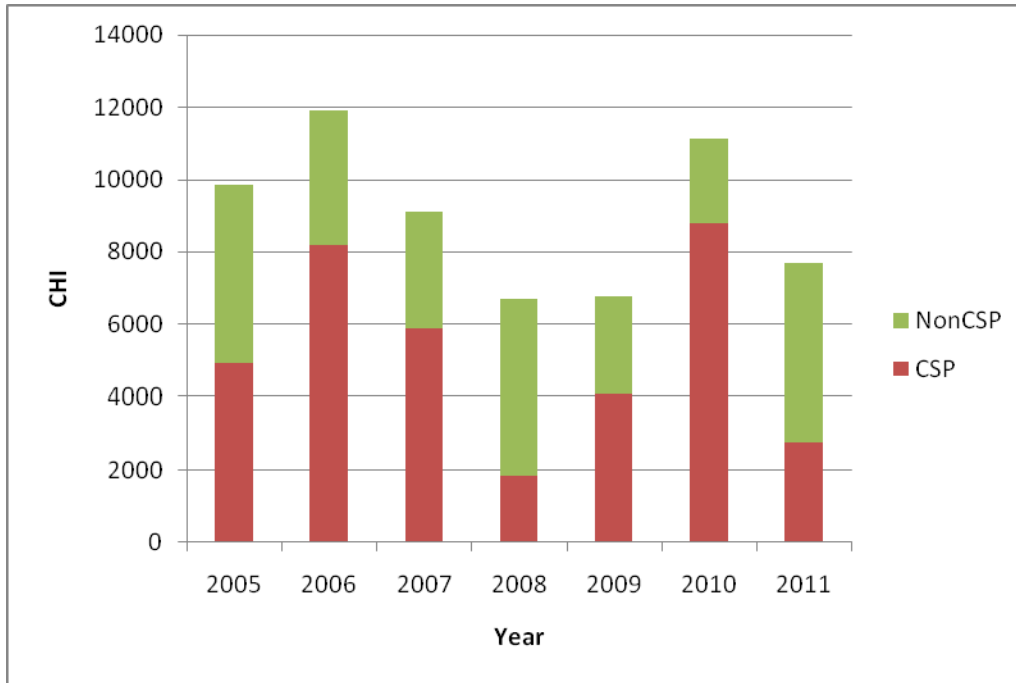
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2 **Figure 25: Summary of Forced CI Due to Transformers**

/c

**ICM Project | Overhead Infrastructure Segment**



1 **Figure 26: Summary of Forced CHI Due to Transformers**

/c

2

3 Standard non-CSP transformers take approximately 195 minutes to replace. This is slightly  
 4 longer than the 180 minutes to replace CSP transformers, because the standard non-CSP  
 5 transformers require an additional 15 minutes to install the external fuse. However, because  
 6 the standard non-CSP transformers are replaced approximately half as many times as CSP  
 7 transformers, standard non-CSP transformer outages have a significantly lower impact on  
 8 Customer Hours of Interruption. Table 4 shows this decrease in outage duration. As this table  
 9 clearly demonstrates, the standard transformer provides increased reliability compared to its  
 10 CSP counterpart, due to its lower average restoration time.

11

12 **Table 4: CSP vs Standard Non-CSP Transformer Outage Duration Comparison**

	Standard Installation	CSP Installation	Standardization Improvement
Minutes Out Due to Blown Fuse (Typical)	$15(0.5) + 195(0.5) = 105^1$	180	42%

Note: <sup>1</sup>The value of 105 minutes is based on a typical replacement time of 15 minutes for the external fuse and 195 minutes for the replacement of both the transformer unit and fuse.

## ICM Project | Overhead Infrastructure Segment

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1 standard non-CSP transformers. THESL plans to replace 985 CSP transformers with standard /c  
2 non-CSP transformers as part of other conversion and rehabilitation work from 2012 to 2013.  
3 This replacement is expected to reduce the number of CSP transformers operating past their /us  
4 useful lives and reduce the number of CSP transformers remaining to be replaced.

5  
6 Each proposed CSP replacement with a standard non-CSP transformer includes replacement of  
7 the existing pole with a taller pole and installation of all associated external fusing hardware as  
8 shown in Figure 20.

9  
10 THESL proposes to replace CSP transformers as part of other overhead capital work by  
11 integrating this initiative into regular work for rebuild jobs identified as part of the Overhead  
12 Infrastructure segment. Replacing this asset as part of an overhead rebuild is the most efficient  
13 approach because it allows THESL to undertake this work when crews are already in the area  
14 replacing other overhead infrastructure. All CSP transformers in the areas identified for  
15 overhead infrastructure rebuild will be replaced.

### 16 17 **Option (b): Proactive Replacement of all CSP transformers with Standard Transformers**

18 Proactive replacement of all CSP transformers with standard transformers would require that  
19 this work be carried out independently of other proposed overhead distribution conversion and  
20 rehabilitation activities. This would not be the lowest cost option as it would forego the savings  
21 associated with replacing CSP transformers and other distribution equipment at the same time  
22 as is proposed in Option (a). Not only does the approach presented in Option (a) result in lower  
23 cost, it also concentrates CSP replacements in areas where distribution rehabilitation is most  
24 needed because these are the areas where other overhead work is already planned.

### 25 26 **Option (c): Reactively Replace Failed CSP Transformers with New CSP Transformers**

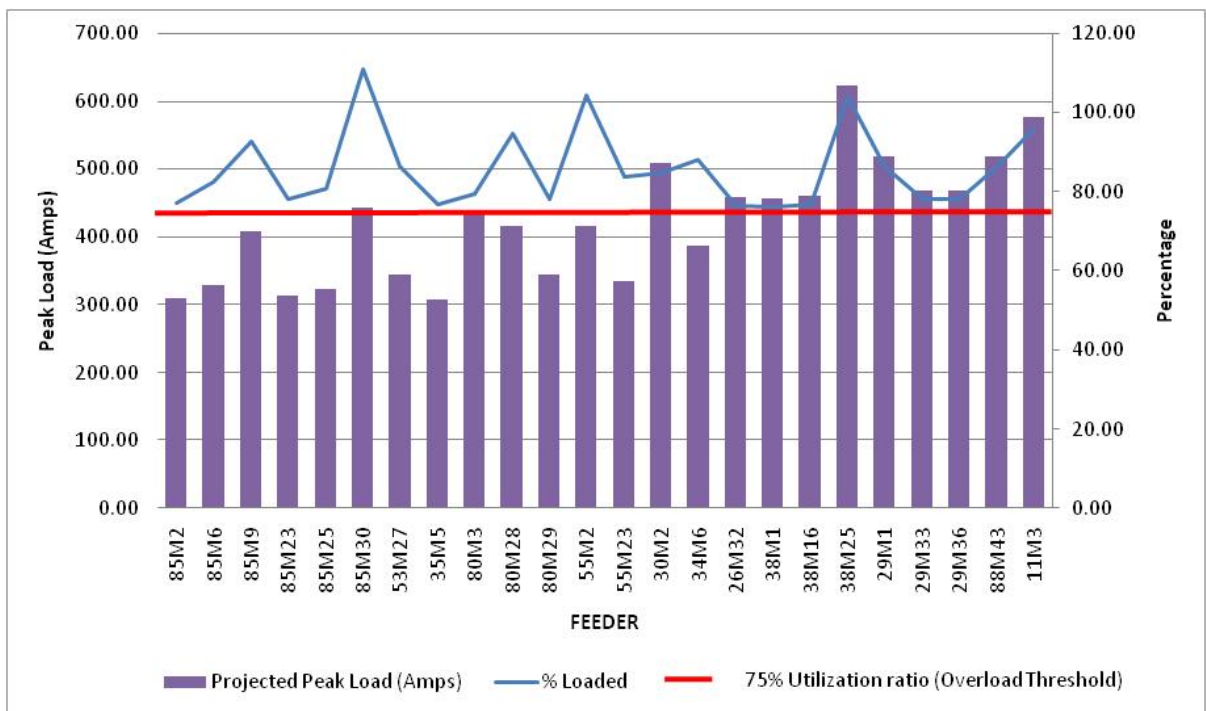
27 Maintaining the status quo and reactively replacing CSP transformers as they fail would mean  
28 that CSP transformers will continue to fail at an increasing rate. As shown in Figures 24 to 26,  
29 CSP transformer failures had a disproportionate impact on transformer outages from 2005 to  
30 2011. The failure rate for CSP transformers decreased from 2010 to 2011 because of an



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/C

1 maximum capacity is overloaded. This is the minimum criteria established to undertake  
 2 sectionalizing during feeder restoration in the event of an outage. Based on a bus load growth  
 3 factor of one percent annually, THESL projects 24 feeders in the 27.6kV overhead distribution  
 4 system will be overloaded in 2012 and expects this number to continue to rise beyond 2013 and  
 5 2014. Figure 30 shows the projected peak loads and percentage utilization for these 24 feeders  
 6 in 2012, based on one percent bus load growth.

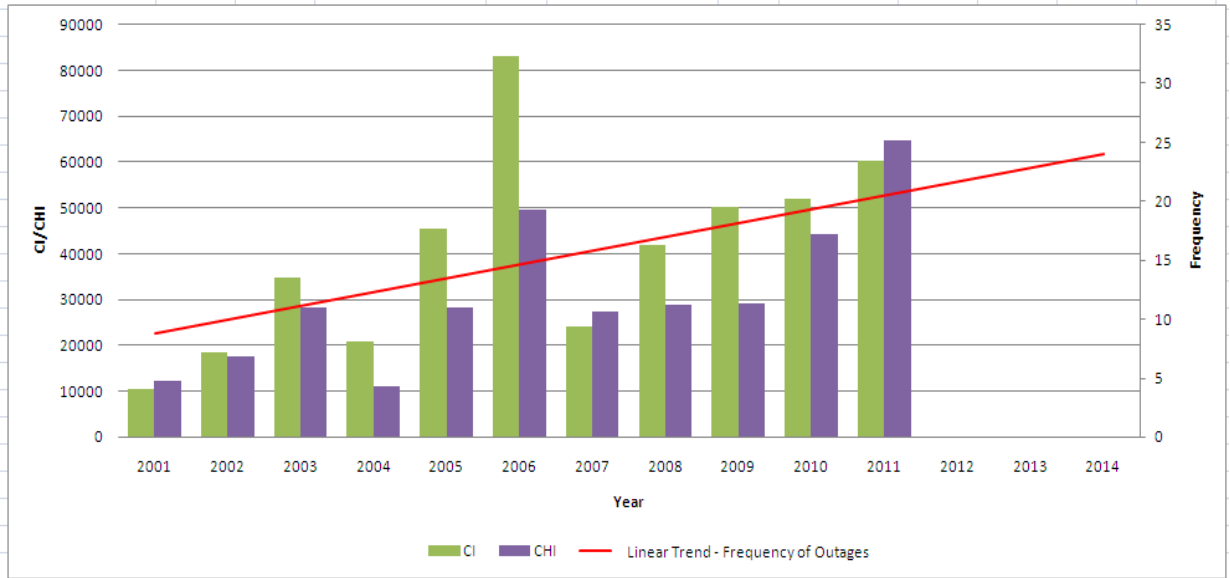


7 **Figure 30: Projected Overloaded Feeders**

8  
 9 Undersized conductors impede efficient service restoration. During a fault condition, load is  
 10 typically transferred from one feeder to another, in order to restore as many customers as  
 11 possible, as quickly as possible. When a fault occurs on a feeder, the feeder receiving the  
 12 transferred load will be required to carry a higher load than under normal conditions.

13  
 14 Feeder utilization is defined as the actual loading of the feeder in relation to its maximum rated  
 15 capacity. The greater the utilization value for a given feeder, the less flexibility there is for  
 16 power system controllers to shift a desired amount of load to a feeder. Feeder load transfers

ICM Project | Overhead Infrastructure Segment



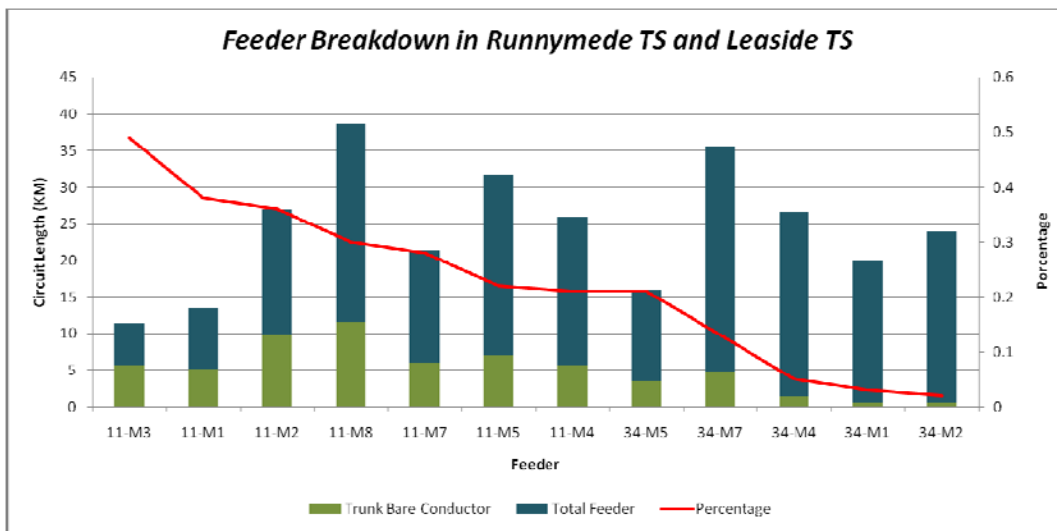
1 **Figure 34: 2001-2011 Forced tree outages on trunk portions of feeder**

2

3 Figure 35 and Table 9 (below) present a breakdown of the 12 feeders in Runnymede TS and  
 4 Leaside TS that were affected by tree-related outages on the feeder trunk circuit. There is  
 5 approximately 61 kilometres of bare conductor on these 12 feeders. The proportion of such  
 6 bare conductor on the trunk varies between two to 50 percent.

/c

7



8 **Figure 35: Runnymede TS and Leaside TS feeder breakdown**

## ICM Project | Overhead Infrastructure Segment

1 **Table 9: Runnymede TS and Leaside TS feeder breakdown**

Feeder	Trunk Bare Conductor (kilometres)	Total Feeder (kilometres)	Percentage (%)
11-M1	5.1136	13.48179	38
11-M2	9.7512	26.9035	36
11-M3	5.5771	11.32926	49
11-M4	5.5373	25.95147	21
11-M5	6.9671	31.56462	22
11-M7	5.898	21.34093	28
11-M8	11.4738	38.69671	30
34-M1	0.5	19.91791	3
34-M2	0.5555	23.86875	2
34-M4	1.417	26.64363	5
34-M5	3.3918	15.91608	21
34-M7	4.7133	35.59178	13
<b>TOTAL</b>	<b>60.9</b>	<b>291.21</b>	<b>21</b>

2

3 Tree contacts on a feeder trunk circuit will result in an outage that impacts all customers  
 4 connected to the feeder, and cause the station circuit breaker to lock out. Figure 36 shows the  
 5 total number of customers on each of the 12 identified feeders from Runnymede TS and Leaside  
 6 TS. Thus, on each of these feeders, approximately 2,800 customers on average would  
 7 experience a forced outage should there be tree contact with the feeder trunk. Tree contacts  
 8 on certain feeders such as 11-M8 and 11-M5 would have the greatest impact because of the  
 9 number of customers they serve and the amount of bare conductors on their trunks.

/c

## ICM Project | Overhead Infrastructure Segment

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1  
2 As previously stated, there are 96 feeders on which a portion of the conductor is undersized  
3 (less than 556.5 kcmil). These undersized portions total 82 kilometres of undersized conductor  
4 located on the trunk portions of THESL's 27.6 kV distribution system. Anticipated load growth  
5 on feeders with undersized conductor will exacerbate load transfer challenges during feeder  
6 restoration. Of the 96 feeders with undersized conductor, nine of them will be overloaded in  
7 2012 (utilization ratio of greater than of 75 percent). The nine feeders that are both overloaded  
8 and have undersized conductor are shown on Figure 33. These nine feeders have approximately  
9 seven kilometres of undersized conductor that inhibits effective load restoration. These nine  
10 feeders need to be upgraded to THESL's standard size of 556.5 kcmil immediately.

11  
12 THESL plans to upgrade undersized conductor as part of other overhead capital work by  
13 integrating this initiative into jobs identified below in Section III.

} /us

14  
15 **Option (b) Feeder reconfiguration, as part of other capital work, to balance overloaded circuits**  
16 **and relieve strain due to undersized conductor**

17 Feeder reconfiguration capital projects allow for permanent load shifting and phase balancing to  
18 reduce the existing overall state of feeder operating loads. It includes permanent switching  
19 operations, switch relocations and installations, and other asset installations or upgrades such  
20 that operating loads are manageable and suitable points for load transfer exist to improve  
21 operating flexibility. This approach can alleviate excess loads on feeders with undersized  
22 conductor. However, depending on the specific feeder analysis, the options for reconfiguration  
23 on any given overloaded feeder may require intensive capital work to install, upgrade, or  
24 relocate assets. The cost of reconfiguration would likely be significantly greater than the  
25 \$220,000 cost to replace the seven kilometres of undersized conductor on overloaded feeders in  
26 Option (a).

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1 In 2012 and 2013, THESL plans to replace a total of 683 porcelain in-line disconnect and air- /us  
2 break gang-operated switches. The yearly breakdown is as follows: 210 locations in 2012 and  
3 473 in 2013. The replacements will be targeted at 4kV and 27.6kV locations across the system /us  
4 (4kV switches will be replaced with 27.6kV units in voltage conversion projects). The proposed  
5 replacements represent approximately five percent of THESL's installed overhead switch  
6 population.

7

8 **Option (b): Replace All In-Line Disconnect and Manual Air-Break Gang-Operated switches on**  
9 **the overhead distribution system with SCADA-Mate R2 switches**

10 The functions of these switch types cannot be eliminated as they are required for the operability  
11 of the distribution grid. SCADA-Mate R2 switches can be used instead of these switch types to  
12 perform the necessary functions. The SCADA-Mate switches are faster and remotely operable,  
13 which will reduce restoration times, improve SAIDI and allow THESL to better manage service  
14 interruptions during outages. While this option could address the safety and reliability issues  
15 associated with these switches, it is not feasible because of the number of units involved. The  
16 cost and outage time required for this option would be prohibitive.

17

18 **Option (c): Allow the In-Line Disconnect and Manual Air-Break Gang-Operated switches to fail**  
19 **and replace them on a reactive basis**

20 Though this option slowly reduces the number of In-Line Disconnect and Manual Air-Break  
21 Gang-Operated switches on the system by attrition, it does nothing to address the potential  
22 safety risk associated with the switches and their failure. Deferring the replacements of the  
23 end-of-life switches is also not an option as the health of the switches will only get worse over  
24 time and lead to longer restoration times. This is not a feasible option because it does not  
25 address the problems posed by these switches.

26

27 **2.5. Porcelain Hardware**

28

29 **2.5.1. Issues with Porcelain Hardware**

30 Porcelain insulators are a potential safety concern because their failures can result in shards of  
31 jagged debris falling from the overhead distribution system. They are also a reliability concern

## ICM Project | Overhead Infrastructure Segment

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1 With regard to arresters and terminators, many utilities in North America are switching over  
2 from porcelain to polymer due to reasons enumerated earlier in this document. Porcelain post  
3 insulators mounted on steel, concrete and wood structures have experienced cascading  
4 mechanical failures due to impact loads because of the rigidity of the structures. In THESL's  
5 experience, probably due to pressure-fitted mountings, the failure mode of arresters and  
6 terminators is typically explosive, which leads to safety concerns for both crews and the public.

7  
8 Deferral of porcelain insulator replacement would increase the potential risk to public and  
9 worker safety as the equipment continues to age and failure rates climb. Porcelain potheads  
10 are legacy standards associated with PILC cables. Current work practices require the use of XLPE  
11 cables with polymer terminations for most applications since they are lighter, have improved  
12 electrical and thermal properties and require less specialization for termination and splicing.  
13 Deferral of this work would prolong the use of PILC, which is increasingly difficult to source and  
14 requires worker specialization that is difficult to maintain.

15  
16 The current practice would be to reactively replace failed porcelain insulators, and porcelain  
17 potheads with the current approved polymer standard. Waiting for failures to occur before  
18 replacing these items will continue to expose the public and THESL workers to potential safety  
19 risks.

### 20 21 **2.5.2. Options for Addressing Porcelain Hardware**

22 The following options were considered in mitigating the risks associated with these assets:

- 23 (a) Proactively replace porcelain equipment with the approved polymer standard
- 24 (b) Reactively replace porcelain equipment with the approved polymer standard

#### 25 26 **Option (a): Proactively replace porcelain equipment with the approved polymer standard**

27 Under this option, THESL proposes to replace 400 porcelain insulators yearly with the approved  
28 polymer standard in each of 2012 and 2013 ~~and 2014~~. Typically, porcelain insulators will be  
29 replaced as part of other overhead rebuild work identified overhead infrastructure jobs shown  
30 below in Section III. The estimated cost of this effort over two years totals \$1.04 million.

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## ICM Project | Overhead Infrastructure Segment

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1 Currently there are approximately 54,100 porcelain insulators in the overhead distribution  
2 system located across all of the THESL distribution service area.

3  
4 THESL will be replacing porcelain insulators on feeders in locations with deteriorated pole  
5 framing hardware including highly contaminated areas such as those close to major highways as  
6 well as congested, heavily treed areas and other locations where the potential for failure is high  
7 and where there may be associated safety risks.

8  
9 There are approximately 565 porcelain pothead locations. The majority of porcelain potheads  
10 are located in the downtown core, with the remaining locations dispersed across the former  
11 distribution service areas of Etobicoke and Scarborough. Starting in 2012 and continuing to  
12 2013, THESL plans to replace 50 locations annually, for a two-year total of 100 locations /UF, US  
13 (approximately 18 percent of the total population), by first targeting public thoroughfare areas  
14 such as sidewalks, bus stops and school zones. The estimated cost of this effort over three years  
15 totals \$2.23 million. /UF

### 16 17 **Option (b): Reactively replace porcelain equipment with the approved polymer standard**

18 In Option (b), THESL would reactively replace porcelain insulators and potheads with the current  
19 approved polymer standard for each asset when they fail.

20  
21 Option (a) is preferred because it better addresses the associated safety and reliability issues.  
22 As this equipment poses reliability and potential safety concerns, the sooner it is removed from  
23 the system the less likely it is to cause outages, injuries and property damage. Option (b),  
24 reactive replacement, also would result in a higher unit cost for replacement. Unit costs would  
25 be higher because crew members will be required to make replacements on an incident by  
26 incident basis.

### 27 28 **2.6. Avoided Risk Costs from the Overhead Infrastructure Segment**

29 The effectiveness of the Overhead Infrastructure segment can be further highlighted by  
30 determining how much cost is avoided by executing this work immediately as opposed to  
31 executing it in 2015. These avoided costs include quantified risks, taking into account the assets'

## ICM Project | Overhead Infrastructure Segment

---

1 probability of failure, and multiplying this by the various direct and indirect costs associated with  
2 in-service asset failures, including the costs of customer interruptions, emergency repairs and  
3 replacement.

4

5 Carrying out immediate work on this asset class will result in an avoided estimated risk cost of  
6 \$111 million, which represents the avoided cost of executing the work immediately as opposed /UF  
7 to deferring until 2015. This figure shows that there are substantial economic benefits from  
8 executing this work immediately. These results are further explained within the Appendix  
9 section. In addition to the avoided risk cost, by the time the Overhead Infrastructure segment is  
10 completed in 2014, approximately 30,000 CI and 18,500 CHI can be mitigated when compared  
11 to a run-to-fail approach.



**ICM Project | Overhead Infrastructure Segment**

1 **IV DESCRIPTION OF WORK**

2

3 **1. LISTING OF ALL JOBS**

4

5 **1.1. 2012 Jobs**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Cost Estimate (\$, millions)</b>	<b>Section Reference</b>
20572	Magellan / Giltspur OH Rebuild	2012	\$1.62	3
20892	Arrowsmith Overhead Rebuild	2012	\$0.76	4
20873	Riverside Dr VC Part #2	2012	\$1.34	5
23677	Chipping Crossburn 53M10 OH Rebuild	2012	\$0.28	40
20875	George Andersen and Culford Rd. Overhead Rebuild	2012	\$1.63	40
24668	Rebuild Broadlands MS Area with VC	2012	\$1.34	6
16616	Manby TS Load Transfer to Horner TS	2012	\$0.95	8

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**ICM Project | Overhead Infrastructure Segment**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Cost Estimate (\$, millions)</b>	<b>Section Reference</b>
19581	Replacement of non-standard and overloaded transformer	2012	\$0.53	41
19454	X11524 Replacement manual switch with SCADA, EYA11L	2012	\$0.07	42
19453	X11525 Replacement manual switch with SCADA, EYA12L	2012	\$0.07	42
19455	X11526 Replacement manual switch with SCADA, EYA14L	2012	\$0.08	42
19792	X12158 Replacement of manual tie switches with SCADA 53-M7	2012	\$0.53	42
19892	X12176 Replacement of manual tie switches with SCADA 53-M5	2012	\$0.38	42
19894	X12182 Replacement of manual tie switches with SCADA 34M5, 34M6 34M7	2012	\$0.20	42
19452	X10449 Replacement of manual switch with SCADA EYA13L	2012	\$0.07	42
18456	E11374 SCADA Installation 34M6	2012	\$0.79	42
17801	E10387 Bermondsey SCADA	2012	\$0.29	42

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**ICM Project | Overhead Infrastructure Segment**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Cost Estimate (\$, millions)</b>	<b>Section Reference</b>
20391, 19965	E11088 North York SCADA 53M10 Area A	2012	\$0.31	42
24060	E12744 - Bell Line Conversion	2012	\$0.08	42
21531	Overhead Rebuild R43M28	2012	\$0.80	9
24666	80M6 Feeder OH Enhancement	2012	\$0.99	10
24598,	E12436 – NY80M6 Feeder OH	2012	\$1.14	10
19871	Replacement of CSP Transformer	2012	\$1.42	11
20946	W12462 – 3 Phase Extension along Rockford	2012	\$0.27	45
20684	W12397 - Safety Alert SMD-20 Switch Replacement	2012	\$0.50	7
20565	FESI CSP and Conductor Replacement	2012	\$4.41	40
20578	E12358 OH Rebuild of sections of the Overhead Distribution on NY51M21, Part 1	2012	\$1.58	13
20595	E12361 OH Rebuild of sections of the Overhead Distribution on NY51M21, Part 2	2012	\$0.83	13
20848	E12459 Banbury/Post Rd OH Rehab: NY34M6, NY53M24, NY51M21	2012	\$0.26	13
20774	E12433 Conversion feeder SCKHF2 to 27.6kV	2012	\$0.90	14
21457	E13110 NYSS68-F9 OH Rebuild at Pleasant View	2012	\$0.54	48
20881	E12457 - CSP Transformer and Pole Replacement	2012	\$0.44	50
<b>2012 Overhead ICM TOTAL</b>			<b>\$25.40</b>	

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**ICM Project** | **Overhead Infrastructure Segment**

1 **1.2. 2013 Jobs**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Cost Estimate</b>	<b>Section Reference</b>	
20416	X12318 34M1 SCADAmates Installation	2013	\$0.17	42	/UF
20659	W12383-OH Switch Replacements to SCADA Controlled Switches	2012	\$0.21	42	
22598	W13271 3 Feeder Riser SCADA Switch Installations Hydro RoW	2013	\$0.29	42	/UF
21190	E12508 OH Rebuild of the Overhead Distribution on NY80M4 Phase 1	2013	\$1.79	15	

**ICM Project | Overhead Infrastructure Segment**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Cost Estimate</b>	<b>Section Reference</b>
21193	E12509 OH Rebuild of the Overhead Distribution on NY80M4 Phase 2	2013	\$1.08	15
21785	E13153 Rebuild of the Overhead Distribution on NY51M8	2013	\$1.69	16
19775	X13109- 34M6 -Replacement of non –standard CSP transformers and conductor	2013	\$0.97	17
20939	W12442 - FESI Rebuild and CSP Replacement Ph#1 NY85M1	2013	\$1.39	18
21517	W13113 - FESI Feeder Rehab and CSP replacement Ph#1	2013	\$0.71	20

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**ICM Project | Overhead Infrastructure Segment**

Job Estimate Number	Job Title	Year	Cost Estimate	Section Reference
21518	W13115 - FESI Feeder Rehab and CSP replacement PH#2	2013	\$0.50	20
21639	W13130 - Refurbish OH Feeder - Epsom Downs	2013	\$1.35	21
21690	W13131 - Refurbish OH Feeder Falstaff Area Ph#2	2013	\$1.40	21
22184	W13198 – Refurbishment of trunk feeder – Regent Road and Wilson Avenue	2013	\$1.24	22
22208	W13205 – Refurbish Feeder Laterals Phase 1 of 2	2013	\$1.21	22
22180	W13204 - Elynhill_Ellerslie_Betty Ann_Park Home Ph#2 Overhead Rehab NY80M1	2013	\$0.80	25
21920	W13185 - 80M1 Carney Rd Distribution Rehab	2013	\$0.70	25
22037	W13188 - 80M1 Finchhurst Dr and Fleetwell Crt OH Rebuild	2013	\$0.15	25
22041	W13189 - 80M1 Stafford Rd and Cloebury Crt	2013	\$0.19	25
21876	W13182 - Rehab Eldora_Kensington_Elmview 80M1	2013	\$0.13	25
21998	Clarkhill Glenborough Park Ancona Overhead Rebuild	2013	\$0.64	25

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**ICM Project | Overhead Infrastructure Segment**

Job Estimate Number	Job Title	Year	Cost Estimate	Section Reference
22173	80M1 Ellerslie_Betty Ann_ Park Home Ph#1 OH rehab	2013	\$0.58	25
23567	W13351 FESI Rebuild and CSP Replacement Ph#2 (NY85M1)	2013	\$2.01	18
24161	W13376 Voltage Conversion Rennie Park (TOB1RK)	2013	\$1.59	26
20296	OH Rebuild Spenvally Dr and Surrounding Area	2013	\$0.69	43
22203	E12570 - NY53M25 Rehabilitation of the OH Distribution on	2013	\$1.20	27
21578	E11742 - Rehabilitation of the OH Distribution on SCNA47M13	2013	\$0.42	27
20773	W12123 - Churchill/Wynn OH Rehab and VC (SS60-F2 to 80M1)	2013	\$1.02	28
20412	W12306 - FESI NY55M25 OH Feeder Equipment Rehab	2013	\$0.91	45
21999	W13167 – Clayson/Bartor Trunk Feeder Reconfiguration and Refurbishment	2013	\$1.10	46
22229	E12574 Overhead Rehabilitation of SCREF3	2013	\$0.83	48
21569	W13122 – FESI Refurbish OH Feeder (30M10)	2013	\$0.50	23
23430	P03 Evans Avenue and Royal York Rd, Reconfiguration of Feeders	2013	\$0.80	49

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**ICM Project | Overhead Infrastructure Segment**

Job Estimate Number	Job Title	Year	Cost Estimate	Section Reference
22245	W13211 - Goulding MS F1 and F2 VC Ph#1	2013	\$1.20	31
22248	W13216 - Goulding MS F1 and F4 VC Ph#2	2013	\$0.99	31
24951	Danger and Caution pole replacement	2013	\$1.86	2
20456	Spenny Valley OH Rebuild	2013	\$1.12	3
20499	W12339/P03 FESI CSP and Conductor Replacement on YK11M1 off Weston Road and Jane Street	2013	\$0.85	40
20379	CSP and Conductor Replacement	2013	\$1.02	40
24669, 24851, 24881	Rebuild Broadlands MS Area with VC	2013	\$2.13	6
19785	X12156 Replacement of the manual tie switches with SCADA 53-M8	2013	\$0.30	42
19837	X12163 Replacement of manual tie switches with SCADA 53-M6	2013	\$0.52	42
19806	W12089-Remote SCADA Switch Install Bathurst TS	2013	\$0.09	42
22850	E12890 - NY80M6 Feeder OH Enhancement Phase 3	2013	\$0.37	10
23696	W12669 – Martin Ross and Flint Rebuild NY85M7	2013	\$0.41	12
<b>2013 Overhead ICM Total</b>			<b>\$39.12</b>	

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## ICM Project | Overhead Infrastructure Segment

### 1 1.3. 2014 Jobs

Job Estimate Number	Job Title	Year	Cost Estimate	Section Reference
24169	E14319 New SCADA Switch on 43M24	2014	\$0.20	4.43
24139	E14318 New SCADA Switches on NY51M3	2014	\$0.19	4.43
22994, 22995	E14136 OH Upgrade SCNAR43M24 Hollis Milne Birchmount	2014	\$0.88	4.30
22958	E14117 OH Rebuild R43M28 Aylesworth Kennedy	2014	\$0.75	4.30
23978	E14286 OH Rebuild and Voltage Conversion of NYSS64F2 from Ruddington MS	2014	\$0.94	4.31
22859	W14073 55M31 OH Rebuild at intersection Steels Ave W and Weston RD.	2014	\$0.80	4.44
22960	38M27 North Queen conductor Upgrade	2014	\$0.21	4.33
23089	W14150 OH Feeder Rehab Milvan / Penn	2014	\$1.02	4.34
23093	OH Feeder Rehab Finch / Weston / TorYork	2014	\$0.64	4.34
23873	W14278 Overhead Rebuild Duplex/Church/Parkview	2014	\$0.72	4.25
23364	OH Feeder Rehab Alexdon, Chesswood, Champagne	2014	\$0.54	4.45
24129	W14320 Ardwick Overhead Spot Replacement	2014	\$0.49	4.35

**ICM Project | Overhead Infrastructure Segment**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Cost Estimate</b>	<b>Section Reference</b>
24166	W14326—Nabesby Overhead Rebuild	2014	\$0.93	4.35
24218	W14329—P03 Gracedale Blvd. Overhead Rebuild Finch TS NY55M27	2014	\$0.62	4.35
24257	W14333—Aviemore Dr. Overhead Rebuild Finch TS	2014	\$0.60	4.35
24269	W14334—Duncanwoods Dr. Overhead Rebuild Finch TS	2014	\$0.58	4.35
24295	W14340—Lindylou Overhead Rebuild	2014	\$1.12	4.35
23878	W14276 OH Feeder Rehab—Signet, Weston, Fenmar (NY55M1)	2014	\$1.97	4.36
24320	W14343—Voltage Conversion RB-F3 Phase 1	2014	\$0.45	4.37
24321	W14344—Voltage Conversion— Westmount MS RB-F1	2014	\$0.60	4.37
24333	W14345—Voltage Conversion— Westmount MS Phase 1	2014	\$0.48	4.37
24052	W14306—85M5—McAllister Rd. Overhead Rebuild	2014	\$0.30	4.39
24089	W14315—85M5—Carmichael Ave. OH rebuild and conductor upgrade	2014	\$0.71	4.39
23979	W14285—Pellatt OH and UG lateral Rebuild	2014	\$0.24	4.39
24007	W14289—OH Rebuild off Gary Avenue	2014	\$0.80	4.39
23361	30M7 OH Upgrade and ETRF2 OH VC	2014	\$2.04	4.40
23312	E14170 Rouge Park OH Rebuild Phase and VC of 3 SCXGF3	2014	\$0.62	4.49

## ICM Project | Overhead Infrastructure Segment

Job Estimate Number	Job Title	Year	Cost Estimate	Section Reference
23323	W14181 Kingsway MS OH Voltage Conversion (ETEF1)	2014	\$0.66	4.48
<b>2014 Overhead ICM Total</b>			<b>\$20.11</b>	

### 2. Pole Replacement of Level 4 and 5 Poles (Danger and Caution poles)

#### 2.1. Objectives

The purpose of this job is to replace poles that have been identified as level 4 and 5 poles (Danger and Caution poles) by an external contractor "Ontario Pole Inspection Services". This contractor uses different method of inspection to determine the pole condition such as sound and bore inspection and software engineered to determine remaining pole strength. The poles are tested at different points to identify pole-top feathering, cross-arm rot, cracks, surface rot at ground level, above ground level and below ground level. Poles tested receive a score from 0 to 5. A score of 0 means that there is no evidence of pole damage and a score of 5 indicates that the pole is in very bad condition. A level 4 pole is one that should be replaced in a short period of time to avoid failures. A level 5 pole is a pole that should be replaced as soon as possible.

#### 2.2. Scope of Work

The scope of work for this job is to replace 275 poles that have been identified in level 4 and 5 (Danger and Caution poles). The replacement of the poles will occur across the City of Toronto. There is a back-log of poles in level 4 and 5 condition that require replacement. In 2010, testing of 83 poles with an average pole Health Index (HI) score of 28, indicating that the poles are in very poor condition. For 2011 there are 192 poles with an average HI score of 15, falling under the category of poles in very poor conditions. The poles require immediate replacement in order to prevent pole failures.

/c

/c

## ICM Project | Overhead Infrastructure Segment

### 1 2.3. Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
24951	Danger and Caution pole replacement	2013	\$1.86
<b>Total:</b>			<b>\$1.86</b>

/UF, US

### 2 3. Magellan / Giltspur / Lomar / Spenny Valley Overhead Rebuild

#### 3 3.1. Objectives

4 The purpose of this job is to rebuild sections of the distribution feeder 55M25 in the Magellan /  
 5 Giltspur / Lomar area. The primary overhead distribution plant on 55M25 requires short-term  
 6 targeted rehabilitation in order to address reliability concerns (Refer to Figures 58 and 59).  
 7 55M25 has experienced seven sustained interruptions in the past year.  
 8

#### 9 3.2. Scope of Work

10 The scope of work for this job is to rebuild the existing overhead distribution to THESL standards  
 11 in the area along Magellan/Giltspur / Lomar. This job will address aging and non-standard  
 12 assets such as poles, switches, CSP transformers, insulators and undersized conductor in areas  
 13 that have failed or have a high probability of failing in the near future. The number of sustained  
 14 outages has increased with a high proportion due to faults on the overhead plant. These  
 15 sustained outages have significantly impacted the number of customers affected at over 20,000  
 16 customers interrupted in 2011. An immediate rebuild targeting end of life and non-standard  
 17 equipment will likely reduce the probability of future outages and improve the reliability to the  
 18 customers in this neighbourhood. Deferral will increase the risk of future outages on these  
 19 aging assets that have a high probability of failure.  
 20

## ICM Project | Overhead Infrastructure Segment

### 1 3.3. Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
20572	Magellan / Giltspur OH Rebuil	2012	\$1.62
20456	Spennyvalley OH Rebuild	2013	\$1.12
<b>Total:</b>			<b>\$2.74</b>

/us

### 2 4. Arrowsmith Overhead Rebuild

/us

3

#### 4 4.1. Objectives

5 The purpose of this job is to rebuild the existing overhead distribution system in the Arrowsmith  
 6 area with standardized equipment. Outages on this portion of the distribution system are  
 7 attributable to overhead equipment failures and contacts by animals. The primary overhead  
 8 distribution plant requires immediate targeted rehabilitation in order to address reliability  
 9 concerns

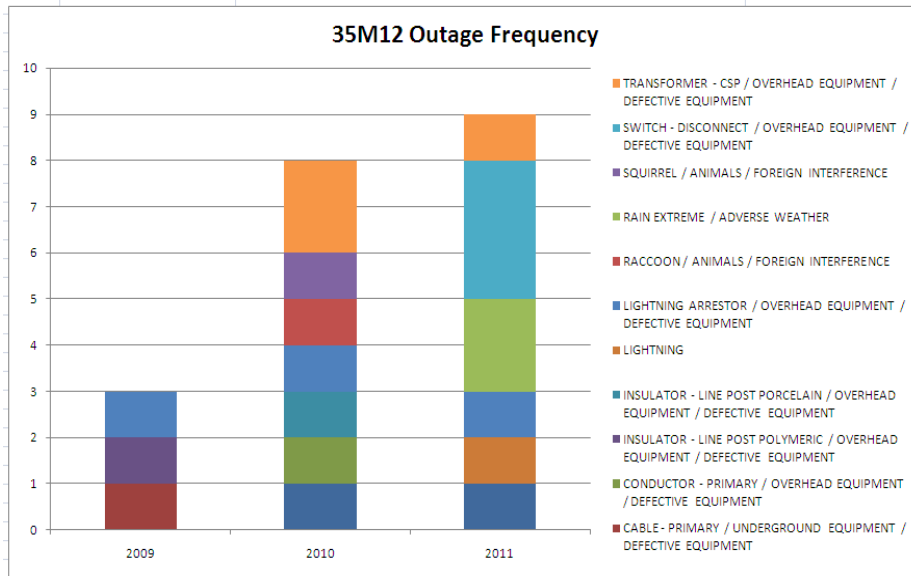
/us

10

#### 11 4.2. Scope of Work

12 Figure 60 shows the increasing trend of outages on 35M12, particularly due to overhead  
 13 equipment such as defective transformers; disconnect switches, lightning arrestors, and  
 14 conductor.

ICM Project | Overhead Infrastructure Segment



1 **Figure 60: 35M12 Outage Frequency**

2

3 The overhead plant surrounding Arrowsmith Avenue Drive consists of deteriorating equipment.  
 4 The scope of work for this job is to rebuild the overhead infrastructure on feeder 35M12  
 5 specifically in the area of Arrowsmith Avenue Drive. The job will include the replacement of  
 6 poles porcelain equipment, overhead transformers to adjust to current THESL standards.

} /c

7

8 **4.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
20892	X12460 - Arrowsmith Overhead Rebuild	2012	\$0.76
		<b>Total:</b>	<b>\$0.76</b>

/US

/UF

## ICM Project | Overhead Infrastructure Segment

### 1 6.3. Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
24668	Rebuild Broadlands MS Area with VC	2012	\$1.34
24669	Rebuild Broadlands MS Area with VC	2013	\$0.16
24851	Rebuild Broadlands MS NYSS59 Area with VC-Ph2	2013	\$1.75
24881	Rebuild Broadlands MS SS59 Area with VC-Ph2 -Install Poles	2013	\$0.22
<b>Total:</b>			<b>\$3.47</b>

/UF

/UF, US

### 3 7. Safety Alert SMD-20 Switch Replacement

4

#### 5 7.1. Objectives

6 The purpose of this job is to replace SMD-20 Switches whose pin assembly had been modified  
 7 from the original design at various locations around Etobicoke.

8

#### 9 7.2. Scope of Work

10 The scope of work is to remove 81 porcelain switches that were identified to have their pin  
 11 assembly modified and replace with new polymer type SMD-20 units at different locations in the  
 12 South end of Etobicoke.

13

14 Switches containing this modification have been primarily found in the South end of Etobicoke.

15 The modification was to limit the travel of the fuse when the switch was in an opened position  
 16 so that the fuse would not swing open fully (approximately 180 degrees) and potentially contact  
 17 other apparatus that may be below it. The problem is that the pin may limit the travel of the  
 18 fuse such that there will be inadequate air clearance between the top of the fuse and the top of  
 19 the switch needed to prevent arcing. The primary concern is that the modification may cause  
 20 arcing that could compromise the safety of people in the vicinity as well as THESL field crews.

21 Limiting the fuse travel may also further interfere with other activities such as using the  
 22 loadbreak tool or fuse replacement. A further concern with these switches is the porcelain  
 23 construction which has been identified as a safety issue as well as reliability problem considering  
 24 the high failure rate observed with porcelain insulated switches.

## ICM Project | Overhead Infrastructure Segment

MANBY (230KV/27.6KV) TS	Firm Capacity (MVA)				YEAR										
	Present		Future		2010*	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	100%	95%	100%	95%											
B&Y	63	60	63	60	68	68	69	70	71	71	72	73	73	74	74
Q&Z (Bus load includes load supplied to Hydro One)	63	60	63	60	61	61	61	62	63	63	64	65	65	66	67
V&F	112	106	112	106	94	97	99	100	101	102	103	104	105	107	108
Total of all Buses	238	226	238	226	223	226	228	231	234	236	238	241	243	246	249
Surplus MVA					15	12	10	7	4	2	0	-3	-5	-8	-11
% Loading (Load/2010 firm Cap)					94	95	96	97	98	99	100	101	102	103	105

**Manby TS:**  
B-Y Bus requires load relief in 2011

**Manby TS:**  
Q-Z Bus requires load relief in 2014

1 **Figure 61: Loading Capacity**

2

3 In order to transfer the proposed load, THESL must run two feeders north from Horner TS to  
 4 pick up the Manby TS loading. This requires civil construction at Horner TS egress and along the  
 5 east side of Kipling Avenue. The scope of work for this job involves three new poles including  
 6 two feeder risers, eight cable chambers, two kilometres of underground cable, and eight  
 7 switches.

8

9 **8.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
16616	Manby TS Load Transfer to Horner TS	2012	\$0.95
	<b>Total:</b>		<b>\$0.95</b>

/UF

10 **9. Overhead Rebuild on feeder SCNAR43M28**

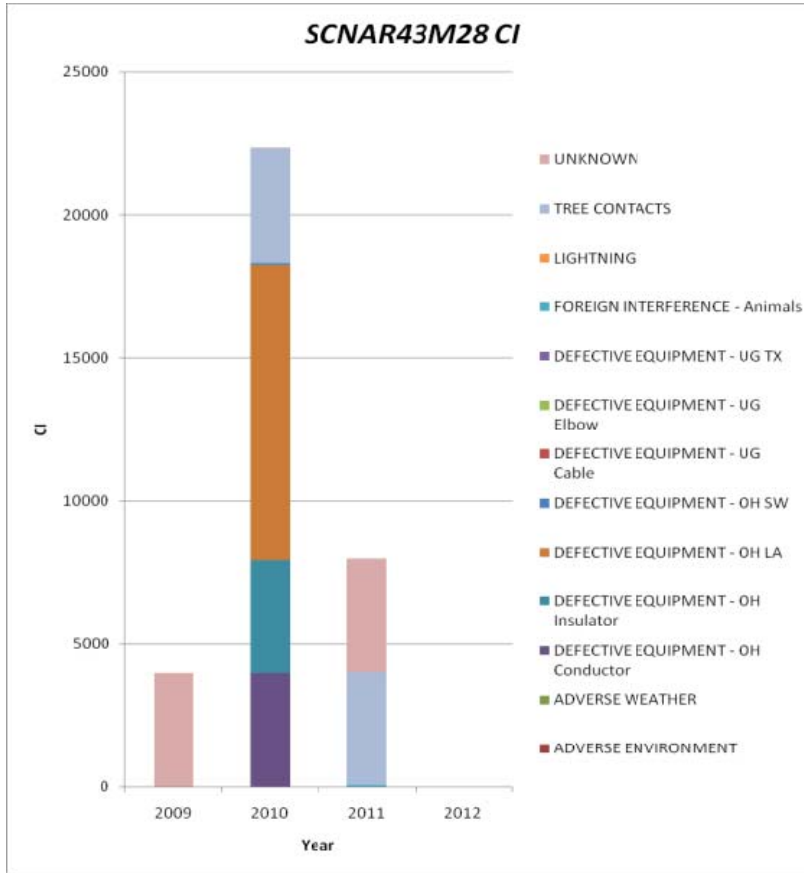
11

12 **9.1. Objectives**

13 The objective of this job is to rebuild the overhead infrastructure on feeder SCNAR43M28 with  
 14 the replacement of deteriorated poles, porcelain infrastructure (insulators and switches), CSP



ICM Project | Overhead Infrastructure Segment



1 **Figure 64: SCNAR43M28 CI**

2

3 Figures 63 and 64 show the impact of Customers Hours Interrupted and Customers Interrupted  
 4 (CI) (CHI) for tree contact and porcelain switches.

5

6 This job will take place in the area bounded by Midland Avenue, Warden Avenue, St. Clair  
 7 Avenue and Lake Ontario.

8

9 **9.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
21531	E13111Overhead Rebuild SCNAR43M28	2012	\$0.80
<b>Total:</b>			<b>\$0.80</b>

/UF

## ICM Project | Overhead Infrastructure Segment

1 this heavily-treed area in order to prevent further outages due to tree contact. The area for job  
 2 2466 is bounded by Kenneth Avenue, Bishop Avenue, Estelle Avenue and Sheppard Avenue East.  
 3 The area for job 24598, 22850 is bounded by Bayview Avenue, Empress Avenue, Dudley Avenue  
 4 and Sheppard Avenue East.

### 6 **10.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
24666	E11243 – 80M6 Feeder OH Enhancement	2012	\$0.99
24598,	E12436 – NY80M6 Feeder OH Enhancement Phase 3 NY80M6	2012	\$1.14
22850	E12890 - NY80M6 Feeder OH Enhancement Phase 3	2013	\$0.37
<b>Total</b>			<b>\$2.50</b>

} /UF

### 7 **11. Overhead Rebuild on feeder 35M1**

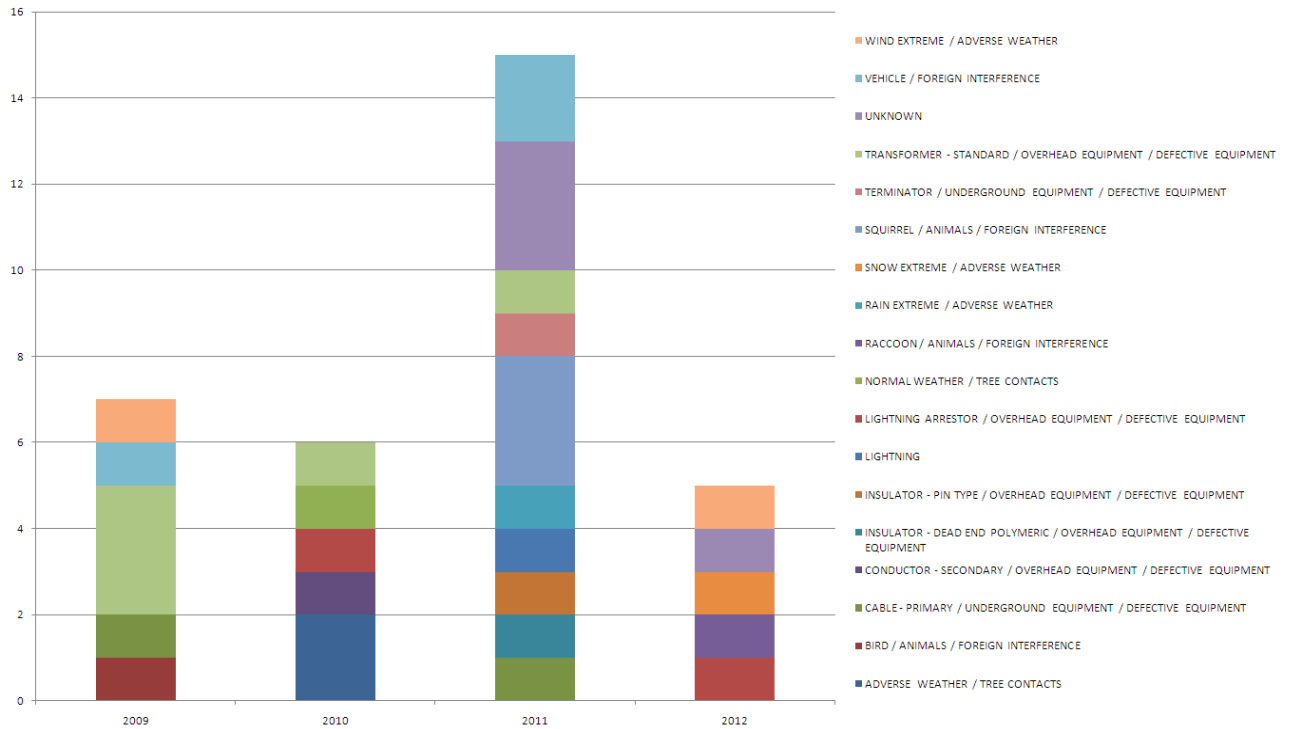
#### 9 **11.1. Objectives**

10 The objective of this job is to reduce the probability of outages due to the failure of CSP  
 11 transformers and non-standard equipment on feeder 35M1. The non standard equipment had  
 12 been the major contributor to the rise in the number of sustained outages on this feeder from  
 13 seven outages in 2009 to nine outages in 2010 and then to 15 outages in 2011. The significant  
 14 decline in the reliability of this feeder indicates the need to address it in 2012 to improve service  
 15 to the 1,854 customers that it serves.

#### 17 **11.2. Scope of Work**

18 As shown in Figure 66, there were 15 sustained interruptions in 2011. In the first three months  
 19 of 2012, the feeder has already experienced five outages. There is an urgent need to upgrade  
 20 deteriorating assets on this feeder, which have contributed the increase in CHI from 420 in 2009  
 21 to 74,383 in 2010 and 13,997 in 2011.

ICM Project | Overhead Infrastructure Segment



1 **Figure 66: 35M1 Outage Frequency**

2

3 The scope of this job is to replace the non-standard equipment on the feeder. This job will  
 4 target CSP transformers, aging poles, porcelain switches and lightning arrestors, and will install  
 5 tree proof conductor in areas of the feeder that are heavily treed. Animal guards will be  
 6 installed to reduce any faults that may occur from animal interference.

7

8 **11.3. Required Capital Costs**

Job Estimate Number	Project Phase	Year	Estimated Cost (\$M)
19871	X12175 Replacement of CSP Transformer	2012	\$1.42
<b>Total:</b>			<b>\$1.42</b>

/UF

**ICM Project | Overhead Infrastructure Segment**

1 **12. Martin Ross and Flint Road Overhead Rebuild**

2

3 **12.1. Objectives**

4 The objective of this job is to rebuild the overhead distribution system in the area of Martin Ross  
 5 Avenue and Flint Road due to the deteriorating condition of the assets that are past their useful  
 6 lives. This job will replace non-standard and deteriorating equipment that pose a potential  
 7 safety risk to the public and THESL personnel.

8

9 **12.2. Scope of Work**

10 Feeder NY85M7 has experienced eight outages in the past year. There is an urgent need to  
 11 upgrade deteriorating assets on this feeder to avoid further outages.

12

13 The scope of this job is to replace the non-standard equipment on the feeder. This job will  
 14 target CSP transformers, aging poles, porcelain switches and will install tree proof conductor in  
 15 areas of the feeder that are heavily-treed. Animal guards will be installed to reduce any faults  
 16 that may occur from animal interference.

17

18 **12.3. Required Capital Costs**

Job Estimate Number	Project Phase	Year	Estimated Cost (\$M)
23696	W12669 – Martin Ross and Flint Rebuild NY85M7	2013	\$0.41
<b>Total:</b>			<b>\$0.41</b>

/UF, US

19 **13. Overhead Rebuild of Sections of Feeders NY34M6, NY53M24, NY51M21**

20

21 **13.1. Objectives**

22 The purpose of this job is to replace old and deteriorating overhead assets and undersized  
 23 conductors on sections of the feeders with newer and more reliable lines and equipment that

**ICM Project | Overhead Infrastructure Segment**

1 metres from Berkindale Drive to OH Harrison, 455 metres along Harrison Road and 508 metres  
 2 along Heathcote Avenue E-W and South (ends 27F3 NOP).

3  
 4 **13.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
20578	E12358 OH Rebuild of sections of the Overhead Distribution on NY51M21, Part 1	2012	\$1.58
20595	E12361 OH Rebuild of sections of the Overhead Distribution on NY51M21, Part 2	2012	\$0.83
20848	E12459 Banbury/Post Rd OH Rehab: NY34M6, NY53M24, NY51M21	2012	\$0.26
<b>Total:</b>			<b>\$2.67</b>

} /us

5 **14. Voltage conversion on feeder SCKHF2**

/c

6  
 7 **14.1. Objectives**

8 The purpose of this job is to transfer the load supplied by 13.8kV overhead distribution feeder  
 9 SCKHF2 to the 27.6kV feeder. This will allow THESL to dismantle and remove all 13.8kV  
 10 overhead lines in the area and enable the decommissioning of the Brimley Sheppard Municipal  
 11 Station built in 1965.

12  
 13 **14.2. Scope of Work**

14 The scope of work is to convert the overhead load supplied by SCKHF2 on Brimley Road to  
 15 SCNAH9M23. Brimley Sheppard (KH) MS station was built in 1965. Both transformer and  
 16 13.8kV breakers are very old. To enable decommissioning of the station and distribution  
 17 equipment and to modernize the electrical distribution equipment in the area, THESL proposes  
 18 to convert the distribution fed from this Municipal Station with the modern 27.6kV equipment  
 19 built to current standards.

**ICM Project | Overhead Infrastructure Segment**

1 **14.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
20774	E12433 Conversion feeder SCKHF2 to 27.6kV	2012	\$0.90
<b>Total:</b>			<b>\$0.90</b>

/UF, US

2 **15. OH Rebuild of the Overhead Distribution on NY80M4**

3

4 **15.1. Objectives**

5 The purpose of this work is to rebuild the overhead distribution on this feeder, in the area of  
 6 Yonge Street and Cummer Avenue, with the replacement of porcelain insulators, lightning  
 7 arresters, non-standard CSP transformers and other end-of-life assets.

8

9 **15.2. Scope of Work**

10 As seen in Figure 68, this feeder has experienced nine outages in 2011 and there have already  
 11 been 2 sustained outages in the first three months of 2012. The number of outages along the  
 12 feeder indicates the poor performance of the assets associated with it. The frequent outages  
 13 underscore the urgency for this remedial job.

14

15 Proactive replacement of these assets is expected to cost less than reactive replacement when  
 16 they fail. The deferral of this work would likely lead to deteriorating reliability with a high risk of  
 17 increased outage frequency and duration. Potential safety risk to THESL crews and the public  
 18 also would increase if the job is deferred.

/c

**ICM Project | Overhead Infrastructure Segment**

1 **17.2. Scope of Work**

2 The scope of work includes the replacement of poles, overhead conductors, non-standard CSP  
 3 transformers, switches, porcelain insulators and arresters in the areas primarily between Mount  
 4 Pleasant Road, York Mills Road, Eglinton Avenue East and The Donway West.

} /US

6 **17.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
19775	X13109- 34M6 -Replacement of non – standard CSP transformers and conductor	2013	\$0.97
<b>Total</b>			<b>\$0.97</b>

/UF

7 **18. Rebuild and CSP transformer replacement**

8

9 **18.1. Objectives**

10 The objective of this job is to replace the aging and non-standard primary overhead distribution  
 11 equipment on feeder 85M1, which has a high probability of future outages, in order to improve  
 12 reliability. Feeder NY85M1 had sustained eight interruptions during the past year (FESI-8)  
 13 predominately caused by failing equipment and foreign interference on the overhead plant. The  
 14 area is primarily comprised of non-standard poor performing assets such as CSP transformers,  
 15 undersized conductor, deteriorating poles, porcelain insulators, arrestors and switches. These  
 16 two jobs are expected to address the issues that are contributing to the poor reliability of the  
 17 feeder, and improve the safety and reliability of this feeder.

**ICM Project** | **Overhead Infrastructure Segment**

1 **18.3. Required Capital Costs**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Estimated Cost (\$M)</b>
20939	W12442 - FESI Rebuild and CSP Replacement Ph#1 NY85M1	2013	\$1.39
23567	W13351 FESI Rebuild and CSP Replacement Ph#2 (NY85M1)	2013	\$2.01
<b>Total</b>			<b>\$3.40</b>

/UF



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**ICM Project** | **Overhead Infrastructure Segment**

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/us

## ICM Project | Overhead Infrastructure Segment

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/us

1    **20.    WPF Feeder Rehabilitation on NY80M8**

2

3    **20.1.   Objectives**

4    The purpose of this job is to rehabilitate feeder NY80M8 by replacing poles that were identified  
5    in poor conditions, non-standard CSP transformers, conductors and porcelain insulators.

6

7    **20.2.   Scope of Work**

8    The scope of work for these jobs involves the replacement of bare overhead conductor with  
9    tree-proof conductor along the feeder's overhead line. In addition to this, the job will replace  
10   CSP transformers and poles. New telcon drop wire with a cone installed over the primary  
11   bushing will be installed on the new transformers. Non-standard or deteriorated hardware at  
12   the pole and transformer locations including porcelain insulators and porcelain arrestors will be  
13   replaced by new units that conform to current THESL standards. The streets where these  
14   replacements will take place are on Bathurst Street, Finch Avenue West, Wilmington Avenue,  
15   Virgilwood Drive, Dubbyne Court, Purbrook Court, Transwell Avenue, Peckford Road, Robson  
16   Place, Kenton Drive, Dallas Road, Lister Drive, Pinnard Court and Dornfell Street.

## ICM Project | Overhead Infrastructure Segment

### 21. Overhead Feeder Refurbishment on NY55M28

#### 21.1. Objectives

The objective of these jobs is to rebuild the plant on NY55M28. It will replace the aging and non-standard primary overhead distribution equipment and the XLPE lateral services with tree retardant cable to improve reliability.

#### 21.2. Scope of Work

The scope of work for these jobs is to replace poles, overhead primary conductor and non-standard CSP transformers. Also, poor performing assets such as porcelain insulators and arrestors will be replaced as well. In addition, undersized primary overhead conductor will be replaced to standard size. In areas where underground laterals are serviced with early vintage XLPE cable, it will be replaced with standard tree retardant cable.

#### 21.3. Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
21639	W13130 - Refurbish OH Feeder - Epsom Downs	2013	\$1.35
21690	W13131 - Refurbish OH Feeder Falstaff Area Ph#2	2013	\$1.40
<b>Total</b>			<b>\$2.75</b>

/UF

### 22. Refurbishment of trunk feeder and laterals on NY85M10

#### 22.1. Objectives

The objective of this job is to rebuild and replace the aging and non-standard primary overhead distribution equipment on feeder NY85M10 in order to improve reliability. These jobs also will replace XLPE lateral services with tree retardant cable to improve reliability.

**ICM Project | Overhead Infrastructure Segment**

1 **22.3. Required Capital Costs**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Estimated Cost (\$M)</b>
22184	W13198 – Refurbishment of trunk feeder – Regent Road and Wilson Avenue	2013	\$1.24
22208	W13205 – Refurbish Feeder Laterals Phase 1 of 2	2013	\$1.21
<b>Total</b>			<b>\$2.45</b>

/UF

2 **23. Overhead Feeder Refurbishment on ETR30M10**

3

4 **23.1. Objective**

5 The objective of this job is to replace the non-standard and aging equipment that pose a high  
 6 risk of failure on feeder ETR30M10 from Horner TS. The feeder has experienced poor reliability  
 7 due to failing equipment since 2009 and refurbishment work will target high risk equipment to  
 8 mitigate the risk of future outages.

9

10 **23.2. Scope of Work**

11 The scope of work is to replace all non-standard and aged poles, porcelain insulators and  
 12 switches, and steel brackets in the job area between Royal York Road, Kipling Avenue, Dundas  
 13 Street and Evans Avenue. Animal guards and insulated drop wires will be installed at strategic  
 14 locations to reduce the probability of a fault due to animal interference. Fuse coordination work  
 15 is included where necessary to reduce outage impacts.

**ICM Project | Overhead Infrastructure Segment**

1 **23.3. Required Capital Costs**

Job Estimate Number	Job Phase	Year	Estimated Cost (\$M)
21569	W13122 – FESI Refurbish OH Feeder (30M10)	2013	\$0.50
<b>Total:</b>			<b>\$0.50</b>

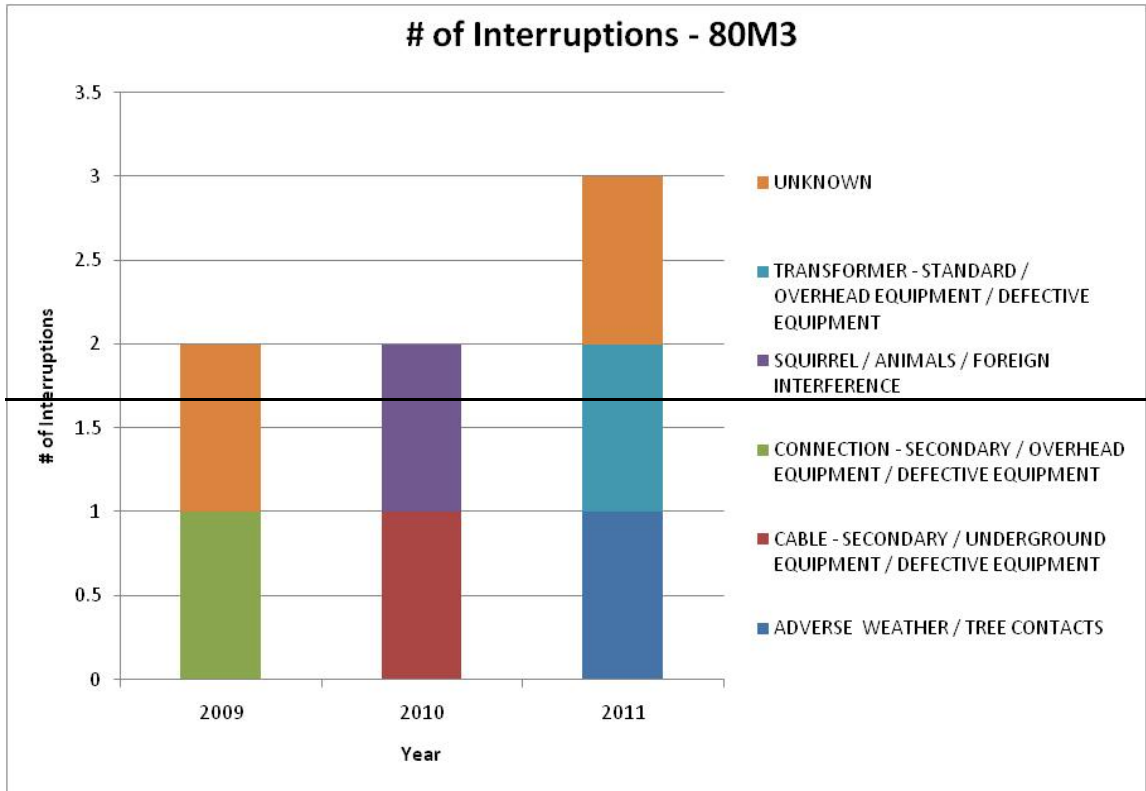
2 ~~**24. OH Rebuild Duplex, Church, Parkview NY80M3 (W14278)**~~

3

4 ~~**24.1. Objectives**~~

5 The objective of this job is to rebuild a portion of NY80M3 in order to improve the service  
 6 reliability to customers connected on this feeder in the vicinity of Yonge Street and Finch  
 7 Avenue (Refer to Figure 73 for number of interruptions). The overhead equipment on feeder  
 8 NY80M3 is reaching end of life and in many areas the assets are non-standard. Over the last few  
 9 years the most prevalent cause of outages on this feeder was component failure. In addition,  
 10 fusing the unfused lateral connections to the trunk will mitigate the impact of an outage to the  
 11 entire feeder that would otherwise affect all 614 residential and commercial customers on it.

ICM Project | Overhead Infrastructure Segment



1 **Figure 73: Number of Interruptions on NY80M3**

2

3 **24.2. Scope of Work**

4 The scope of work consists of replacing non-standard and aging equipment on feeder NY80M3  
 5 that have a high probability of future failure. The equipment slated for replacement will be  
 6 aging poles and CSP transformers. THESL will also install tree proof conductor in heavily treed  
 7 areas and improve the feeder's configuration by installing additional fusing on lateral portions  
 8 that are currently connected to the trunk without protection.

**ICM Project | Overhead Infrastructure Segment**

1 **24.3. Required Capital Costs**

<b>Job Estimate Number</b>	<b>Project Phase</b>	<b>Year</b>	<b>Cost (\$, millions)</b>
23873	W14278-Overhead Rebuild Duplex/Church/Parkview	2014	\$0.72
		<b>Total:</b>	<b>\$0.72</b>

2 **25. Overhead Rebuild and Feeder Rehabilitation on NY80M1**

/c

3

4 **25.1. Objectives**

5 The purpose of these jobs is to improve operational reliability and refurbish power supply by  
 6 rehabilitating aging distribution infrastructure on feeder NY80M1.

7

8 **25.2. Scope of Work**

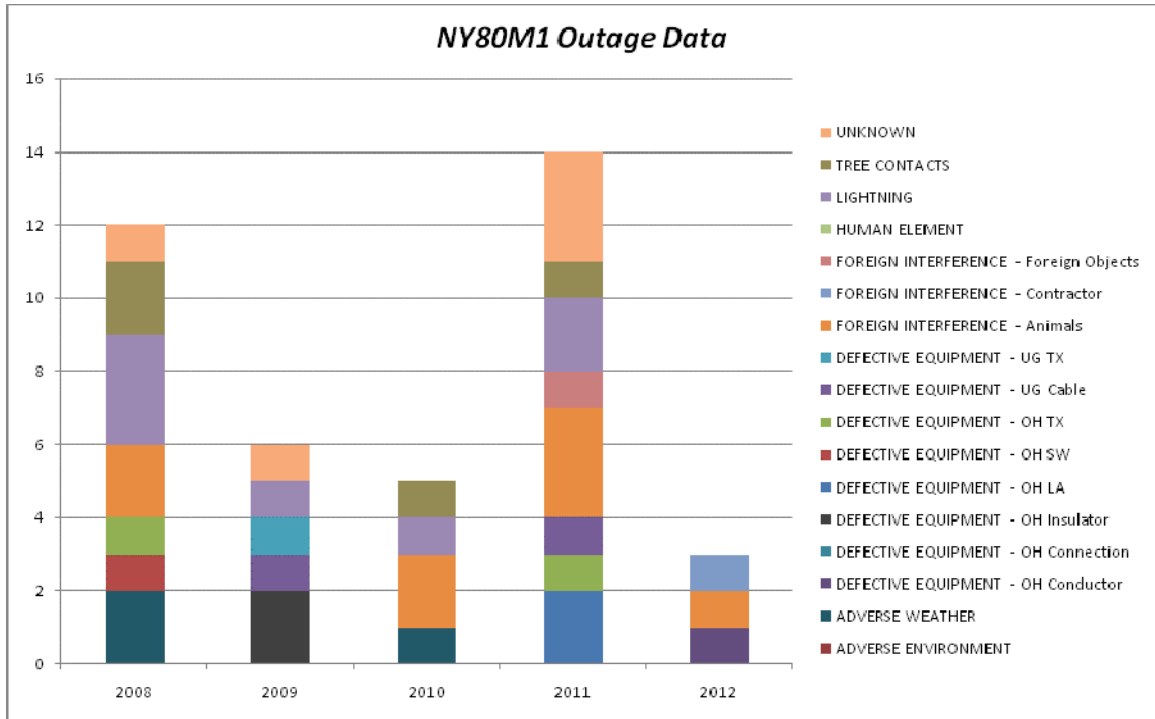
9 Feeder 80M1 has sustained 15 outages during the past year with three outages having already  
 10 taken place in 2012. Most of the assets are approaching end-of-life and many are non-standard.

11 The majority of the outages of this feeder have been caused by overhead equipment, see Figure

/c

12 74.

ICM Project | Overhead Infrastructure Segment



1 **Figure 74: NY80M1 Outage Data**

2

3 Information on the condition of the feeder has come in through feeder patrols. NY80M1  
 4 possesses non-standard equipment and assets past their useful lives, which pose a potential  
 5 safety risk to THESL personnel and the public. In addition to this, the increase of outages and  
 6 the duration of the outages have greatly impacted customers. Figures 75 and 76 show the  
 7 breakdown of the CI and CHI on this feeder. Tree contact has been one of the main contributors  
 8 to CI and CMO. For this reason bare conductor will be replaced by tree-proof conductor in areas  
 9 that are heavily-treed with follow-up tree trimming.

} /c



## ICM Project | Overhead Infrastructure Segment

1 The scope of work for these jobs is to replace end-of-life and non-standard assets, which include  
 2 poles in poor condition and porcelain insulators that have contributed to high CI and CHI, CSP  
 3 transformers will be replaced to current standard allowing proper animal guard installation to  
 4 prevent future animal contacts. The job area is bounded by Bathurst Street, Blake Avenue,  
 5 Talbot Road and Park Home Avenue.

### 7 25.3. Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
22180	W13204 – Elynhill_Ellerslie_Betty Ann_ Park Home Ph#2 Overhead Rehab NY80M1	2013	\$0.80
21920	W13185 – 80M1 Carney Rd Distribution Rehab	2013	\$0.70
22037	W13188 – 80M1 Finchhurst Dr and Fleetwell Crt OH Rebuild	2013	\$0.15
22041	W13189 – 80M1 Stafford Rd and Cloebury Crt	2013	\$0.19
21876	W13182 – Rehab Eldora_Kensington_Elmview 80M1	2013	\$0.13
21998	W13187 - Clarkhill Glenborough Park Ancona Overhead Rebuild	2013	\$0.64
22173	W13197 - 80M1 Ellerslie_Betty Ann_ Park Home Ph#1 OH rehab	2013	\$0.58
		<b>Total</b>	<b>\$3.19</b>

/c

**ICM Project | Overhead Infrastructure Segment**

1     **26.     Voltage Conversion on Rennie Park MS**

2

3     **26.1.   Objectives**

4     The objective of this job is to extend 38M29 along Morningside Avenue to enable conversion  
 5     from 4kV to 27.6kV in order to prepare Rennie Park MS (RK) for decommissioning. This  
 6     substation and its associated overhead equipment consist of end of life and non-standard  
 7     equipment. A decision has been made to decommission the substation instead of replacing  
 8     costly breakers and power transformers to support the obsolete equipment on the feeders it  
 9     supplies. This will avoid the cost of switchgear replacement. A voltage conversion on these  
 10    feeders will upgrade the equipment to current system standards and will reduce the risk of  
 11    future outages on equipment considered to have a high probability of failure.

12

13    **26.2.   Scope of Work**

14    This job will convert all components necessary to migrate to 27.6kV. Components that will be  
 15    replaced/upgraded are CSP transformers, poles, under-sized conductor and tree proof  
 16    conductor in heavily treed areas. The job is located in the vicinity of Morningside Avenue and  
 17    Ellis Avenue.

/c

18

19    **26.3.   Required Capital Costs**

Job Estimate Number	Project Phase	Year	Estimated Cost (\$M)
24161	W13376 Voltage Conversion Rennie Park (TOB1RK)	2013	\$1.59
<b>Total:</b>			<b>\$1.59</b>

/c

**ICM Project | Overhead Infrastructure Segment**

**27. Rehabilitation of the Overhead Distribution System**

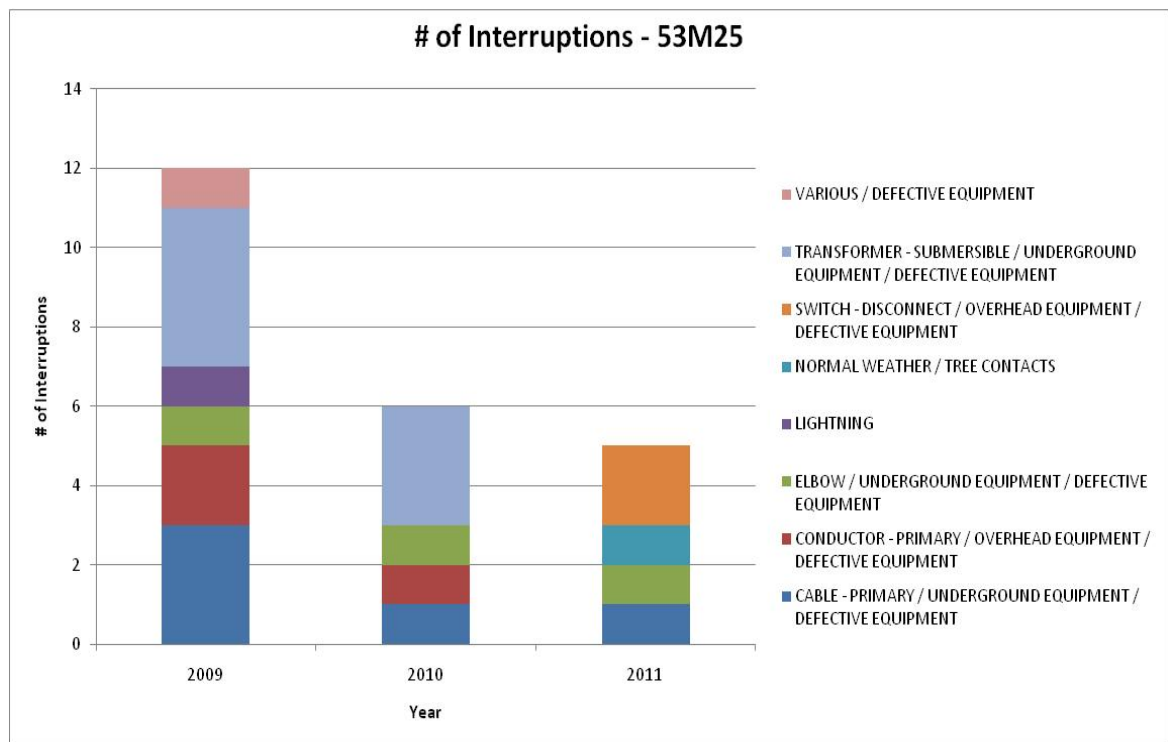
**27.1. Objectives**

The objective of these jobs is to rebuild the overhead distribution on these feeders by replacing deteriorated poles, porcelain insulators, lightning arresters, non-standard CSP transformers and bare conductors with tree proof in treed areas. The work addresses issues found by the feeder patrol and are based on components that are considered a safety issue or have a high probability of failure in the near future. The jobs will take place near the intersection of Victoria Park Avenue, Highway 401, Don Mills Road, Lawrence Avenue East, Port Union Road, Sheppard Avenue West, Kingston Road and Meadowvale Road.

NY53M25 has experienced five outages in the last 12 months and has a WPF rating of 198.

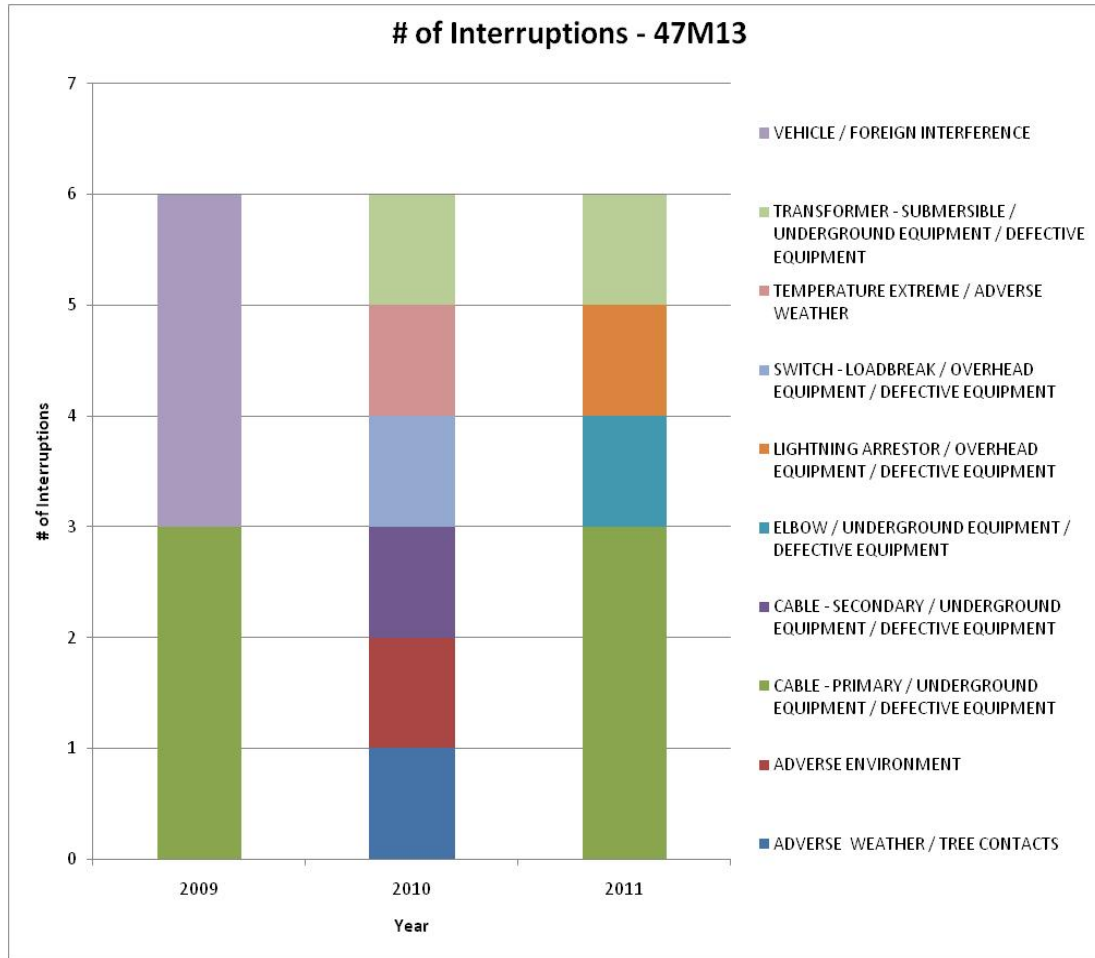
SCNA47M13 has experienced six outages in the last 12 months and has the very high WPF rating of 5, underscoring the urgency of this job.

/c



**Figure 77: Number of interruptions in 53M25**

ICM Project | Overhead Infrastructure Segment



1 **Figure 78: Number of interruptions in 47M13**

2

3 **27.2. Scope of Work**

4 The scope of work is to replace non-standard and end-of-life components such as non-standard  
 5 porcelain insulators and arrestors. These assets are considered to have a high probability of  
 6 failure and in some cases pose a potential safety risk to the public and field crews. The average /c  
 7 Health Index score of the poles addressed in these jobs is 50.1 (poor). Undersized primary  
 8 overhead conductors will be upgraded to standard size.

**ICM Project | Overhead Infrastructure Segment**

1 **27.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
22203	E12570 - NY53M25 Rehabilitation of the OH Distribution on	2013	\$1.20
21578	E11742 - Rehabilitation of the OH Distribution on SCNA47M13	2013	\$0.42
<b>Total:</b>			<b>\$1.62</b>

/c

2 **28. Overhead Rehabilitation and Voltage Conversion of feeder NYSS60F2**

3

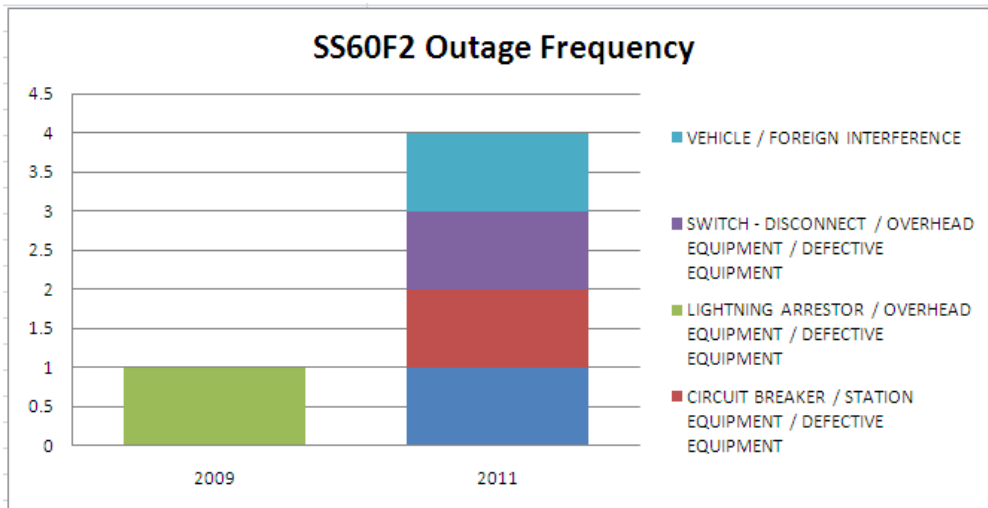
4 **28.1. Objectives**

5 The purpose of this job is to partially convert feeder NYSS60F2 from Churchill MS from 4kV to  
 6 27.6kV. This work will also address service reliability problems due to the poor condition plant  
 7 supplied by 4kV feeder NYSS60F2 (Churchill MS).

8

9 **28.2. Scope of Work**

10 As shown in Figure 79, SS60F2 had more frequent outages in 2011 compared to 2009.



11 **Figure 79: SS60F2 Outage Frequency**

## ICM Project | Overhead Infrastructure Segment

1 Churchill MS was originally built in 1961 and voltage conversion has begun to address obsolete  
 2 construction standards and deteriorated plant conditions. NYSS60F2 is in poor condition. It  
 3 consists of old, defective poles as well as non-standard overhead assets such as porcelain  
 4 insulators, porcelain switches, conductors, pole heights, porcelain lightning arrestors, animal  
 5 guards, and transformers.

6  
 7 The scope of work includes converting the 4 kV system (Churchill MS, NYSS60-F2) to a 27.6kV  
 8 distribution system, utilizing NY80M1 on Wynn Road, Hosham Avenue, Hounslow Avenue,  
 9 Yorkview Drive, Muirkirk Road, Wallbridge Court, Fleetwell Court and Finchurst Drive. Poles,  
 10 single-phase pole-top transformers, single-phase banked pole-top transformers, three-phase  
 11 pad-mounted transformers and overhead primary and secondary lines will be replaced as part  
 12 of this work.

### 14 28.3. Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
20773	W12123 - Churchill/Wynn OH Rehab and VC (SS60-F2 to 80M1)	2013	\$1.02
		<b>Total</b>	<b>\$1.02</b>

/c

### 15 ~~29. Overhead Feeder Upgrade~~

#### 17 ~~29.1. Objectives~~

18 ~~The objective of this job is to replace the undersize conductors of the main trunk of feeders~~  
 19 ~~SCNAR43M24 and SCNAR43M28 with THESL standard 556.5 kcmil conductor. The job mainly~~  
 20 ~~involves the replacement of undersized conductor, but in some locations poles that have been~~  
 21 ~~identified as being in poor condition will be replaced and new overhead transformers will be~~  
 22 ~~installed to avoid the impact upon customers in the future.~~

## ICM Project | Overhead Infrastructure Segment

### 29.2. Scope of Work

During load transfers, especially at peak load time, the undersized sections tend to be overloaded. This job will create a full capacity on the feeder's main trunk.

Feeder SCNAR43M24 is ranked 75<sup>th</sup> in WPF list and feeder SCNAR43M28 is ranked 16<sup>th</sup> in WPF. These jobs are expected to enable quick load transfer in the event of contingencies. When completed, these jobs will likely improve restoration time and the reliability profile of the feeder to the benefit of customers in the job area.

The scope of work for this job is to replace the undersized conductor on feeder SCNAR43M24 in the areas of Hollis Avenue, Milne Avenue, part of Mack Avenue and Birchmount Road. This will establish a full capacity feeder main and transfer ties with SCNAR43M23 and SCNR43M28. Undersized conductor will also be replaced on feeder SCNAR43M28 in the areas of Kennedy Road, Aylesworth Avenue, Highview Avenue and Aylesford Drive. This will establish a full capacity feeder main and transfer tie with SCNAR43M30.

### 29.3. Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
22994, 22995	E14136 OH Upgrade SCNAR43M24 Hollis Milne Birchmount	2014	\$0.88
22958	E14117 OH Rebuild SCNAR43M28 Aylesworth Kennedy	2014	\$0.75
		<b>Total:</b>	<b>\$1.64</b>

## ICM Project | Overhead Infrastructure Segment

### ~~30. Overhead Rebuild and Voltage Conversion on Ruddington MS~~

#### ~~30.1. Objectives~~

The purpose of this work is to convert a 4kV primary distribution system that was built in the early sixties to 27.6kV. These lines are fed by Ruddington MS (SS64), which contains transformers and circuit breakers that are past their useful life. There is a high risk of damage to other equipment if the oil circuit breakers were to fail catastrophically. These jobs will enable conversion of Ruddington MS. They are expected to lower the risk of outages with the replacement of the aged assets and reduce system losses.

#### ~~30.2. Scope of Work~~

The scope of work for this job is to convert the primary distribution of all overhead feeders from Ruddington MS. The job will cover replacing overhead transformers along Bayview Avenue and the installation of overhead conductor on Manorcrest Drive, Winlock Park and Feldbbar Court.

#### ~~30.3. Required Capital Costs~~

<del>Job Estimate Number</del>	<del>Job Title</del>	<del>Year</del>	<del>Estimated Cost (\$M)</del>
23978	E14286 OH Rebuild and Voltage Conversion of NYSS64F2 from Ruddington MS	2014	\$0.94
<b>Total:</b>			<b>\$0.94</b>

### 31. Goulding MS Voltage Conversion

#### 31.1. Objectives

The purpose of this job is to convert the existing 4kV feeders NYSS47F1 and NYSS47F2 from Goulding MS to 27.6kV with the final objective of decommissioning the station. Goulding MS was originally built in 1967.



## ICM Project | Overhead Infrastructure Segment

### 1 **31.2. Scope of Work**

2 The scope of work is to expand existing 27.6kV feeders NY80M2 and NY80M10 to replace  
 3 NYSS47F1 and NYSS47F2 that have been in service for over 40 years. The expansion of these  
 4 feeders includes new overhead conductor, poles and transformer. The job area is bounded by /c  
 5 Hilda Avenue, Theresa Avenue, Moore Park Avenue and Tefley Road.

### 7 **31.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
22245	W13211 – Goulding MS F1 and F2 VC Ph#1	2013	\$1.20
22248	W13216 – Goulding MS F1 and F4 VC Ph#2	2013	\$0.99
		<b>Total</b>	<b>\$2.19</b>

### 8 ~~32. North Queen Conductor Upgrade~~

#### 10 ~~32.1. Objectives~~

11 ~~The objective of this job is to upgrade the undersized conductor to a standard conductor for the~~  
 12 ~~feeder trunk circuit. An undersized conductor limits transfer capacity and can become a~~  
 13 ~~potential safety risk if overloaded for sustained periods of time.~~

#### 15 ~~32.2. Scope of Work~~

16 ~~The scope of this work is to replace the undersized 3/0 OH primary located on the feeder trunk~~  
 17 ~~with 556.5 kcmil ASC. Non-standard and aging equipment such as porcelain insulators and poor~~  
 18 ~~condition poles will also be replaced.~~

**ICM Project | Overhead Infrastructure Segment**

1 **32.3. Required Capital Costs**

<b>Job Estimate Number</b>	<b>Project Phase</b>	<b>Year</b>	<b>Estimated Cost (\$M)</b>
22960	38M27 North Queen conductor Upgrade	2014	\$0.21
<b>Total:</b>			<b>\$0.21</b>

2 **33. Overhead Feeder Rehabilitation on NY55M9**

3

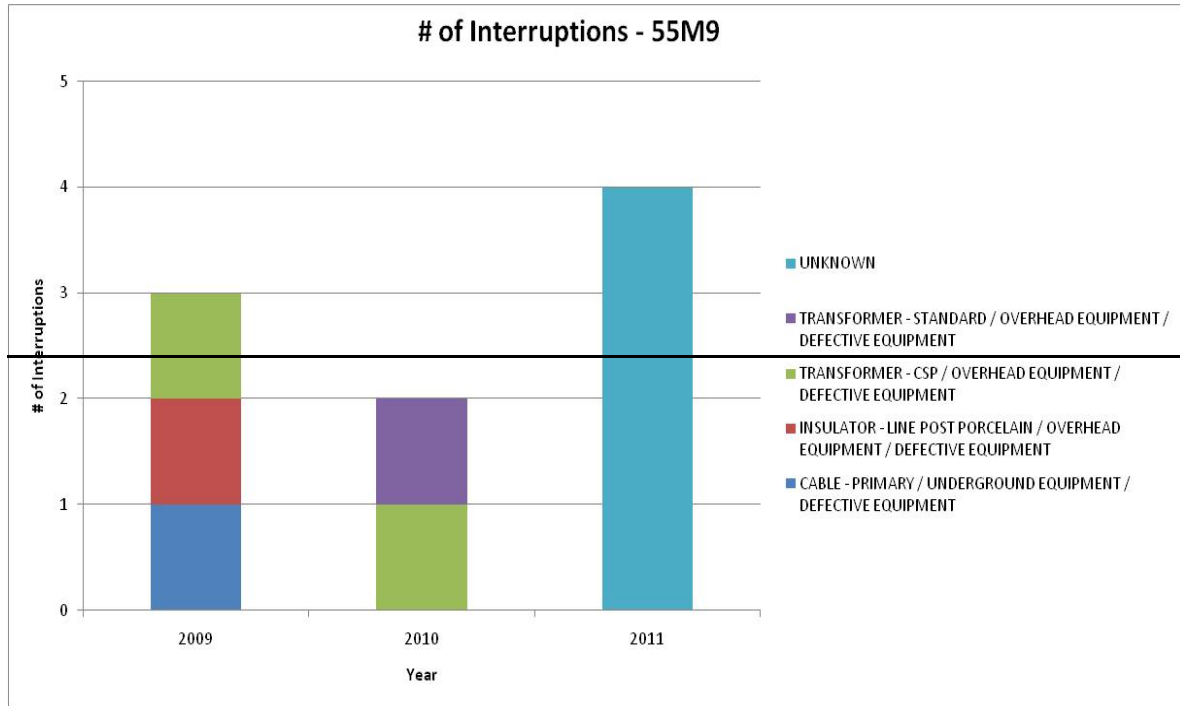
4 **33.1. Objectives**

5 The purpose of this job is to replace defective poles and non-standard equipment along Milvan  
 6 Drive, Penn Drive, Finch Avenue West, Toryork Drive and Weston Road on feeder NY55M9.

7

8 As shown in Figure 80, NY55M9 experienced 4 outages in 2011. Approximately 65% of the  
 9 outages over the last ten years were due to overhead-related faults and recent feeder patrol  
 10 reports have shown that most of the poles in the job area are aged, feathered at the top and are  
 11 at the risk of cracking, breaking and toppling over. Non-standard equipment on the overhead  
 12 distribution was also identified by feeder patrols. Approximately 20 percent of the overhead  
 13 related faults in the last ten years are related to defective insulators, terminators and arrestors.

ICM Project | Overhead Infrastructure Segment



1 **Figure 80: 55M9 number of interruptions**

2

3 **33.2. Scope of Work**

4 The scope of work is to refurbish the overhead lateral distribution system on feeder NY55M9 by  
 5 replacing defective poles and non-standard equipment (including insulators, brackets,  
 6 arrestors), replacing CSP transformers with appropriately sized equivalents and upgrading spans  
 7 of undersized primary lines (predominantly single-phase) including “open bus” secondary lines  
 8 identified on the NY55M9.

**ICM Project | Overhead Infrastructure Segment**

1 **33.3. Required Capital Costs**

2

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Estimated Cost (\$M)</b>
23089	W14150 – OH Feeder Rehab – Milvan / Penn	2014	\$1.02
23093	OH Feeder Rehab – Finch / Weston / TorYork	2014	\$0.64
		<b>Total</b>	<b>\$1.66</b>

3 **34. Overhead Rebuild and Spot Replacement on NY55M27**

4

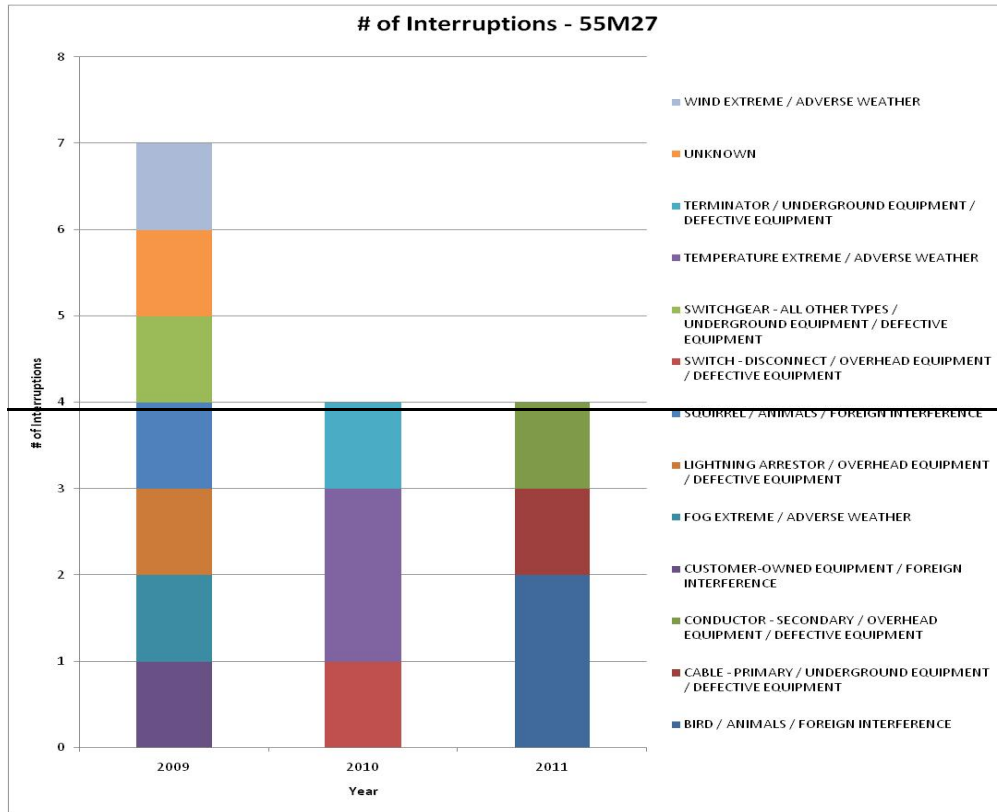
5 **34.1. Objectives**

6 This job will replace non-standard CSP transformers, porcelain insulators and poles in poor or  
 7 very poor condition on feeder NY55M27 in the vicinity of the intersection of Finch Avenue West  
 8 and Islington Avenue in order to improve reliability. The objective of this job is to address areas  
 9 of this feeder that have experienced outages and could have a high probability of outages in the  
 10 future. As seen in the chart below, over the last three years the majority of the outages were  
 11 due to failing equipment and interference on the overhead plant. Replacing end-of life and non-  
 12 standard equipment, which has a high probability of failure and may create a potential safety  
 13 risk to the public and field crews, will improve the reliability and safety of this feeder.

14

15 NY55M27 has sustained four interruptions during the past year. Due to the quantity of end-of  
 16 life components on the feeder, five jobs, separated for reasons of administrative convenience  
 17 and geography, were developed to rebuild overhead plant over the 2012–2014 period. In this  
 18 job package, job W14320 executes spot replacements along Ardwick Drive, job W14326 rebuilds  
 19 the Nabenby Avenue area, job W14329 rebuilds the Gracedale Boulevard area, job W14333  
 20 rebuilds the Aviemore Drive area, job W14334 rebuilds the Duncanwoods Drive and job W14340  
 21 rebuilds the feeder along Lindylou Road.

ICM Project | Overhead Infrastructure Segment



1 **Figure 81: 55M27 number of interruptions**

2

3 **34.2. Scope of Work**

4 The scope of this work is to replace end of life and non standard assets, considered to have a  
 5 high probability of failure in the near future. The assets to be replaced include CSP  
 6 transformers, end of life poles, porcelain insulators, and conductor. Historically, the  
 7 predominant mode of failure has been due to equipment failure and foreign interference in the  
 8 overhead plant.

**ICM Project | Overhead Infrastructure Segment**

1 **34.3. Required Capital Costs**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Estimated Cost (\$M)</b>
24129	W14320 — Ardwick Overhead Spot Replacement	2014	\$0.49
24166	W14326 — Nabenby Overhead Rebuild	2014	\$0.93
24218	W14329 — P03 Gracedale Blvd. Overhead Rebuild Finch TS NY55M27	2014	\$0.62
24257	W14333 — Aviemore Dr. Overhead Rebuild Finch TS	2014	\$0.60
24269	W14334 — Duncanwoods Dr. Overhead Rebuild Finch TS	2014	\$0.58
24295	W14340 — Lindylou Overhead Rebuild	2014	\$1.12
	<b>Total</b>		<b>\$4.33</b>

2 **35. Overhead feeder Rehab Signet, Weston, Fenmar**

3

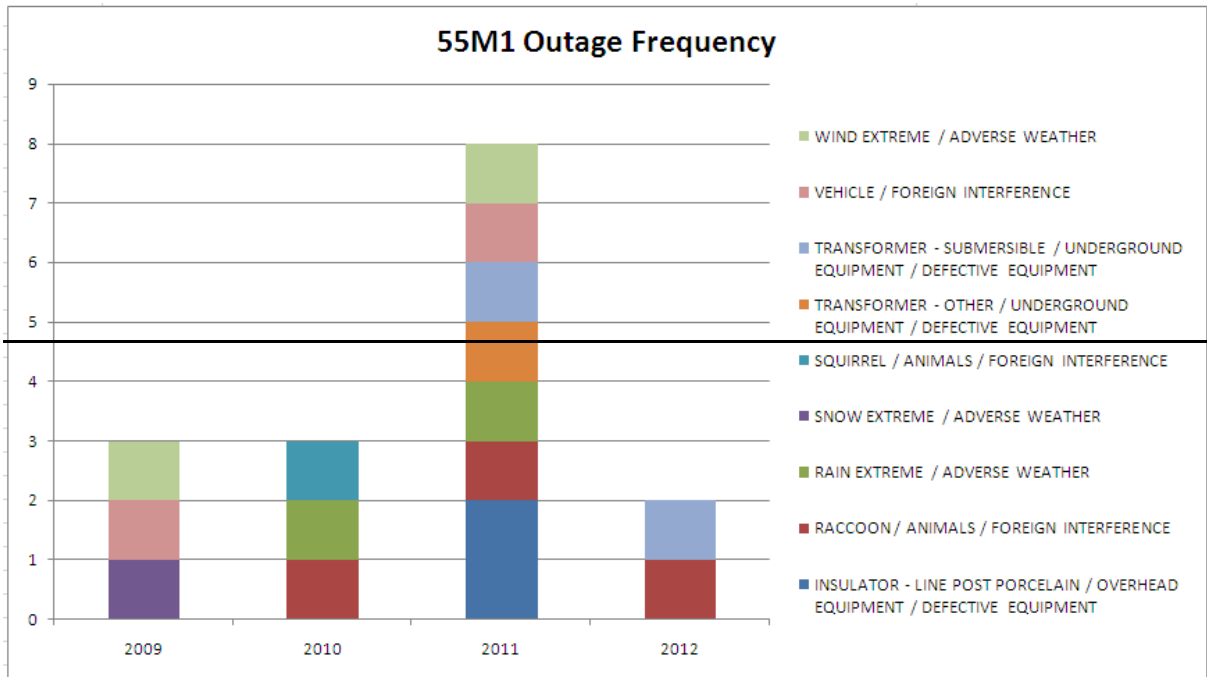
4 **35.1. Objectives**

5 The purpose of this job is to refurbish the OH distribution system by replacing defective poles  
 6 and non-standard equipment on feeder 55M1 in the area of Steeles Avenue and Weston Road.  
 7 Interference on the overhead plant has accounted for most of the outages on the feeder since  
 8 2009 and has caused the rise in the number of outages from three in 2009 and 2010 to eight in  
 9 2011 with two outages already recorded in the first quarter of 2012. This equipment is subject  
 10 to failure in adverse weather which increases the urgency to rehabilitate the feeder in 2012 so  
 11 as not to repeat, or worse exceed, the CHI levels (1,358 hours) experienced in 2011.

**ICM Project | Overhead Infrastructure Segment**

1 **35.2. Scope of Work**

2 As shown in Figure 82, 55M1 had a consistent trend of sustained interruptions with eight  
 3 outages in 2011. Two outages have already affected this feeder within the first three months of  
 4 2012.



5 **Figure 82: 55M1 Outage Frequency**

6  
 7 This work will replace defective poles, poor performing CSP transformers and under-sized  
 8 conductor, as well as install tree poof conductor in tree area. This rehab of overhead  
 9 infrastructure is intended to mitigate the continuing deterioration of this feeder.

**ICM Project | Overhead Infrastructure Segment**

1 **35.3. Required Capital Costs**

<b>Job Estimate Number</b>	<b>Project Phase</b>	<b>Year</b>	<b>Estimated Cost (\$M)</b>
23878	W14276 OH Feeder Rehab—Signet, Weston, Fenmar (NY55M1)	2014	\$1.97
		<b>Total:</b>	<b>\$1.97</b>

2 **36. Voltage Conversion—Westmount MS**

3

4 **36.1. Objectives**

5 The objective of these jobs is to convert the distribution infrastructure from Westmount MS to  
 6 27.6kV. The distribution and station equipment is old and approaching end-of-life and the  
 7 switchgear must be replaced. This voltage conversion job will upgrade the system by removing  
 8 obsolete and aging equipment and thereby allow for the eventual decommissioning of the  
 9 Westmount MS station once all three feeders that it serves have been converted to 27.6kV.

10

11 **36.2. Scope of Work**

12 The scope of work consists of replacing all the 4kV equipment with standard 27.6kV equipment.  
 13 All equipment will be transferred over to adjacent 27.6kV primary feeders wherever they exist  
 14 and new 27.56kV feeders will be extended to customers currently out of reach. There are three  
 15 jobs each converting a feeder from Westmount MS: RB-F1, RB-F2, and RB-F3. At the  
 16 completion of these jobs Westmount MS will be decommissioned. By completing the 4kV  
 17 conversion of the distribution plant, THESL will avoid the need to replace obsolete station  
 18 equipment in the near future.



## ICM Project | Overhead Infrastructure Segment

### 1 36.3. Required Capital Costs

<b>Job Estimate Number</b>	<b>Project Phase</b>	<b>Year</b>	<b>Estimated Cost (\$M)</b>
24320	W14343 Voltage Conversion RB-F3 Phase 1	2014	\$0.45
24321	W14344 Voltage Conversion Westmount MS RB F1	2014	\$0.60
24333	W14345 Voltage Conversion Westmount MS Phase 1	2014	\$0.48
<b>Total:</b>			<b>\$1.54</b>

/c

## ICM Project | Overhead Infrastructure Segment

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/C

1 **38. Overhead Rebuild on NY85M5 and NY55M23**

2

3 **38.1. Objectives**

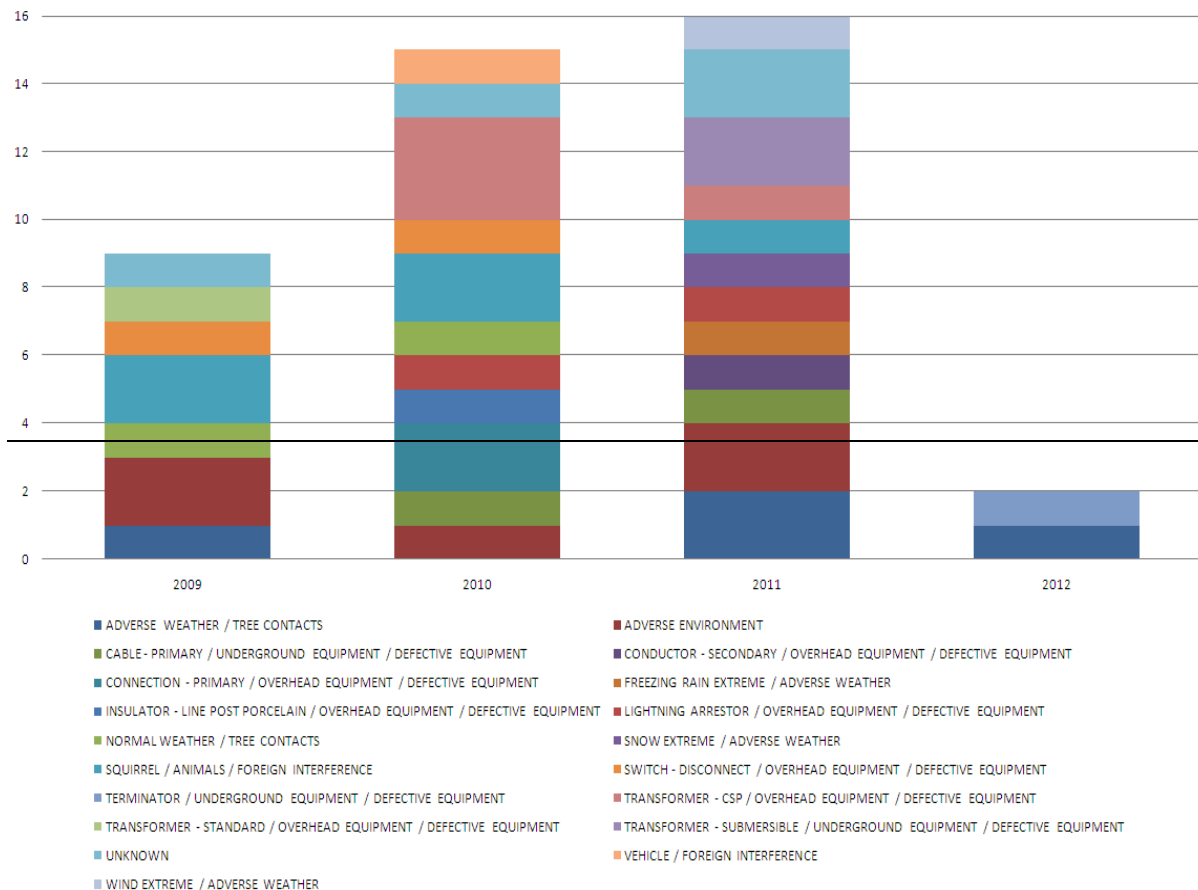
4 The purpose of these jobs is to replace old, poorly performing non-standard overhead  
5 distribution equipment and poles in poor condition on feeder NY85M5 and NY55M23. The jobs  
6 also involve upgrading undersized conductors on the primary conductor going through  
7 Carmichael Avenue, Allard Avenue, and to Wilson Avenue from NY85M25.

8

9 **38.2. Scope of Work**

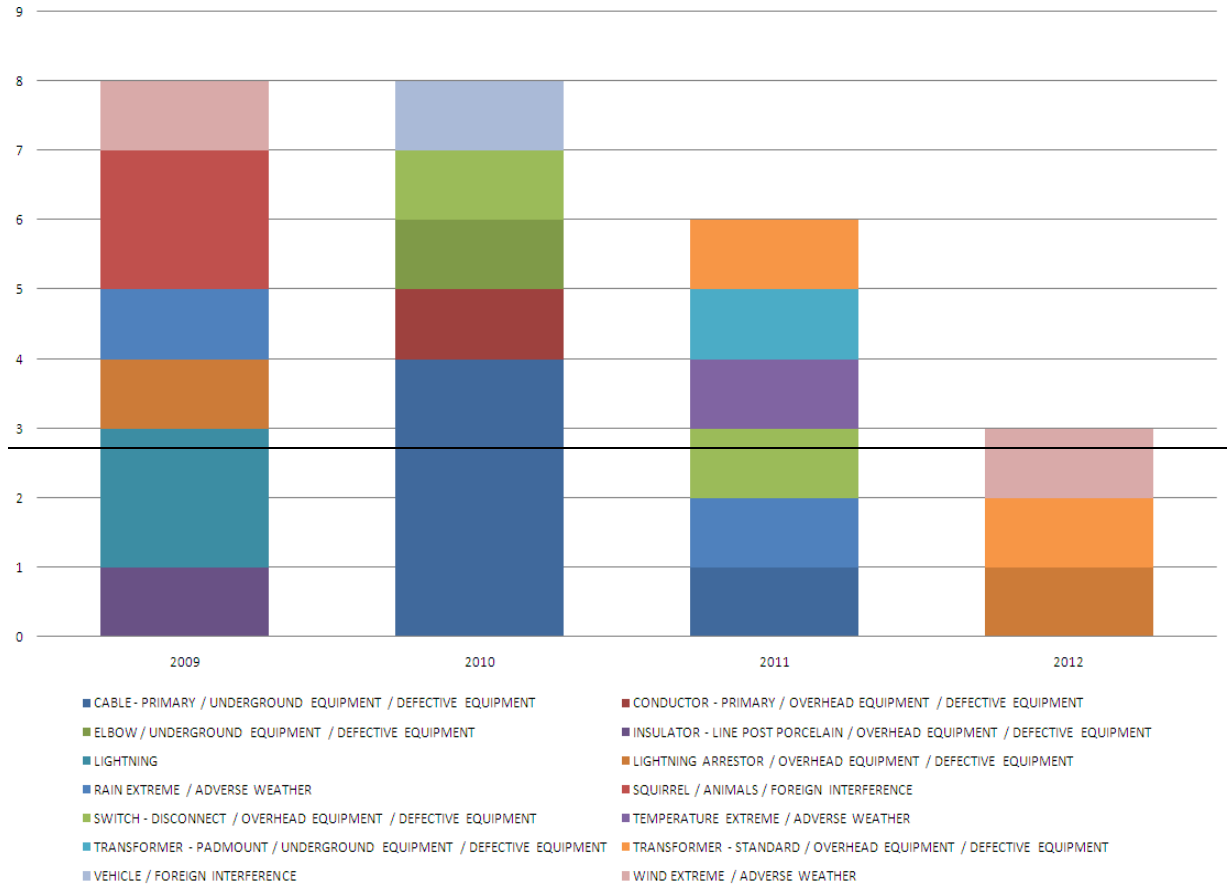
10 As shown in Figures 83 and Figure 84, NY85M5 and NY55M23 have shown evidence of  
11 deteriorating reliability in the past three years. NY85M5 had 15 and 16 outages in 2010 and  
12 2011, respectively, or an average of more than one outage every month. NY55M23 has  
13 experienced at least six failures per year over the last three years and has already had three  
14 sustained outages within the first three months of 2012.

ICM Project | Overhead Infrastructure Segment



1 **Figure 83: 85M5 Outage Frequency**

ICM Project | Overhead Infrastructure Segment



1 **Figure 84: 55M23 Outage Frequency**

2

3 These areas are primarily comprised of poorly performing, non-standard assets including CSP

4 transformers, porcelain insulators and arrestors. The scope of work requires the replacement of

5 end-of-life and non-standard assets. Within the boundaries of this job, all overhead primary

6 conductors, end-of-life poles and CSP transformers will be replaced with current standard

7 equipment. This job replaces poles, switches, insulators, pole-mounted transformers and

8 upgrades the overhead primary conductor to 556.5 kcmil and the replacement of underground

9 XLPE #1 Solid Cable in concrete-encased ducts.

10

11 More specifically, the primary overhead distribution on McAllister Road, Carmichael Avenue,

12 Pellatt Avenue, and Gary Avenue will be upgraded.

## ICM Project | Overhead Infrastructure Segment

### 1 ~~38.3. Required Capital Costs~~

<del>Job Estimate Number</del>	<del>Job Title</del>	<del>Year</del>	<del>Estimated Cost (\$M)</del>
<del>24052</del>	<del>W14306 – 85M5 – McAllister Rd. Overhead Rebuild</del>	<del>2014</del>	<del>\$0.30</del>
<del>24089</del>	<del>W14315 – 85M5 – Carmichael Ave. OH rebuild and conductor upgrade</del>	<del>2014</del>	<del>\$0.71</del>
<del>23979</del>	<del>W14285 – Pellatt OH and UG lateral Rebuild</del>	<del>2014</del>	<del>\$0.24</del>
<del>24007</del>	<del>W14289 – OH Rebuild off Gary Avenue</del>	<del>2014</del>	<del>\$0.80</del>
	<del>Total</del>		<del>\$2.06</del>

### 2 ~~39. Overhead Upgrade on feeder ET30M7 and Voltage Conversion on feeder ETRF2~~

3

#### 4 ~~39.1. Objectives~~

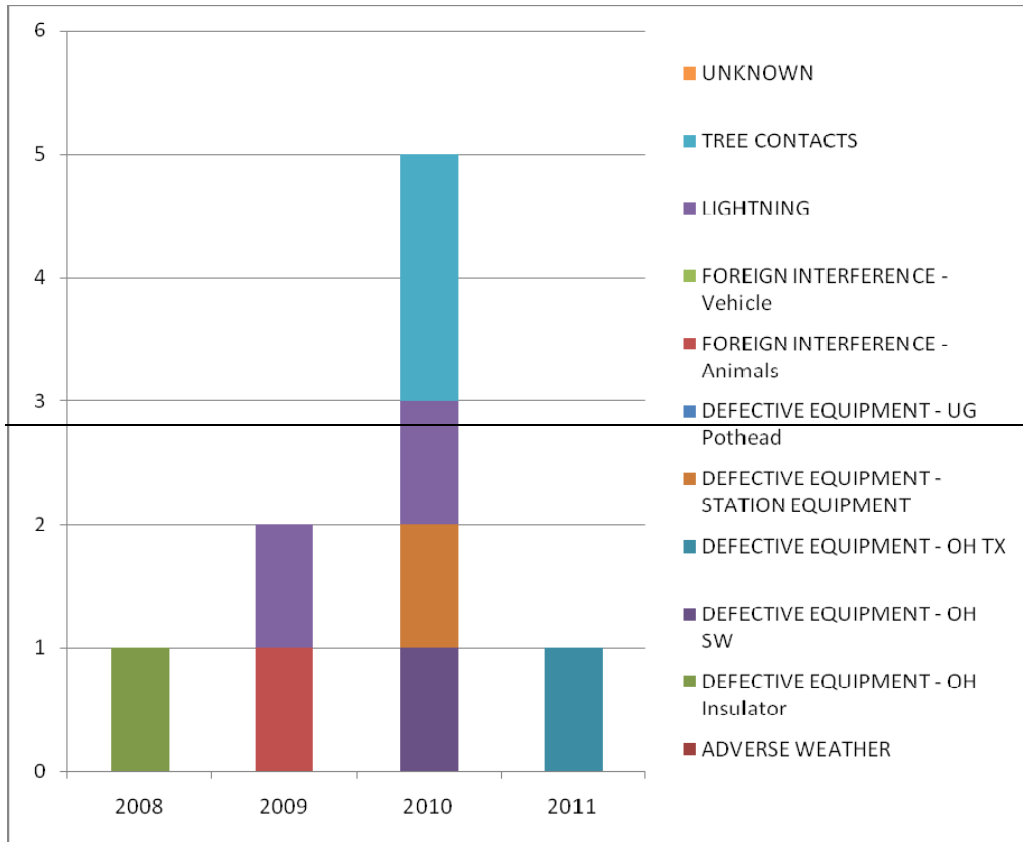
5 The purpose of this job is to upgrade the feeder ET30M7 from Horner TS and partially convert  
 6 Brown's Line and Burlingame MS from 4kV to 27.6kV. Brown's Line MS and Burlingame MS  
 7 were originally built in the 1950s and 1960s. They were built to obsolete construction standards  
 8 and are in deteriorated condition. The assets being replaced by this job are in the area bounded  
 9 by Thirtieth Street, Valermo Drive, Brown's Line, and Horner Avenue.

10

#### 11 ~~39.2. Scope of Work~~

12 ETRF2 is currently identified as a FESI 4 feeder, with a worst performing feeder rank of 433. The  
 13 feeder's condition has been deteriorating according to reliability data. A vast majority of the  
 14 faults were specifically caused by weather and tree contacts. Tree-trimming in this area is  
 15 scheduled for 2012 and 2013 to address such issues. Further improving the WPF status of ETRF2  
 16 and reducing the probability of failure requires replacing assets in poor condition and installing  
 17 proper fusing.

**ICM Project | Overhead Infrastructure Segment**



1 **Figure 85: ETRF2 Outage Frequency**

2

3 The scope of work is to install primary and secondary conductor, new poles and transformers to  
 4 accomplish the upgrade from 4 kV to 27.6 kV.

5

6 **39.3. Required Capital Costs**

Job Estimate Number	Project Phase	Year	Estimated Cost (\$M)
23361	30M7 OH Upgrade and ETRF2 OH VC	2014	\$2.04
		<b>Total:</b>	<b>\$2.04</b>

## ICM Project | Overhead Infrastructure Segment

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### 1    **40.    Worst Performing Feeder (WPF) Overhead Rebuilds**

#### 3    **40.1.   Objectives**

4    THESL has an ongoing WPF program, which is aimed at improving system reliability and asset  
5    performance by addressing those feeders that most impact reliability. The goal of this job is to  
6    improve system reliability and asset performance through a complete overhead rebuild of the  
7    primary distribution system in the areas listed below, which includes the refurbishment of poor  
8    condition poles, transformers, porcelain insulators, lightning arrestors, and the upgrade of  
9    conductor. The WPF feeders being addressed in these jobs have shown a trend of deteriorating  
10    reliability and have experienced a significant number of outages.

#### 12    **40.2.   Scope of Work**

13    Toronto Hydro has introduced a Worst Performing Feeder (WPF) program. It is intended to  
14    improve system reliability and asset performance by adjusting our planned asset replacement  
15    program, with the intent of eventually eliminating these problem feeders from the WPF list.  
16    The WPF program covers those feeders which have high numbers of Customer Interruptions (CI)  
17    and corresponding Customer Minutes Out (CMO). The top 40 worst performing feeders, as well  
18    as FESI-7 and FESI-12, are targeted for improvement.<sup>4</sup> Based on 2007 data, FESI-7 feeders  
19    contribute 37 percent of SAIFI and 32 percent of SAIDI. Going forward, as these feeders  
20    improve, THESL plans to continue work on adjacent groups of WPF (e.g., FESI-5). The scope of  
21    work for the selected jobs below targets the replacement of all aging and non-standard  
22    equipment that has a high probability of future failure and poses potential safety risks for the  
23    public and field crews. Based on historical reliability statistics these jobs focus on the probability  
24    of outages due to foreign interference and include replacing CSP transformers and bare  
25    conductor with tree proof conductor at heavily-treed locations.

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<sup>4</sup> FESI-X refers to those feeders that have had X or more sustained interruptions (more than one minute) within one year.

## ICM Project | Overhead Infrastructure Segment

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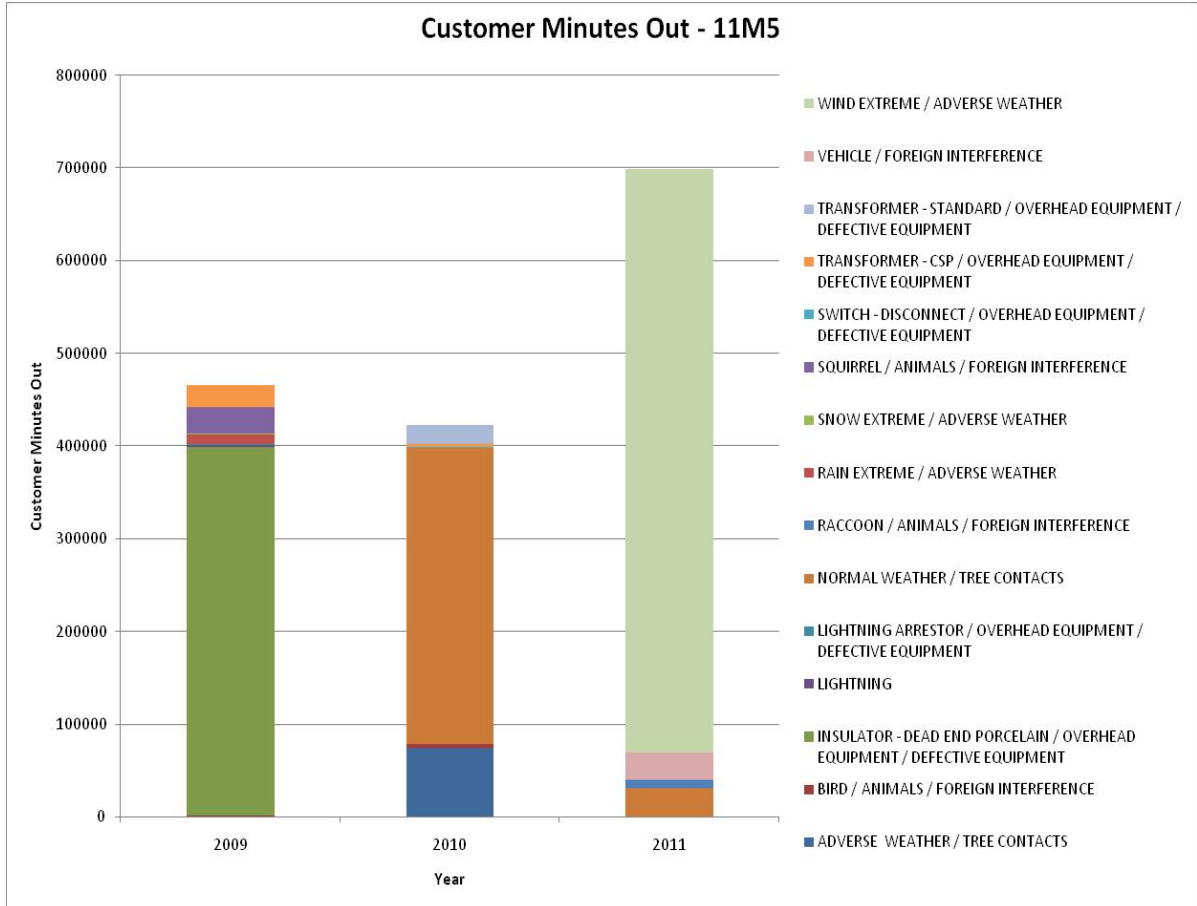
### 1 **40.3.1. W12351 FESI CSP and Conductor Replacement (Multiple Locations)**

2 This job executes spot replacements of poles, transformers, conductors and animal guards at a /c  
3 total of 127 locations on this feeder distributed among Battersea Crescent, Blandonan Road,  
4 Bluebell Gate, Brome Road, Bryn Road, Cleo Road, Circle Ridge, Clubine Avenue, Cirillo Court,  
5 Cornelius Parkway, Crioline Road, Delria Drive, Donofree Road, Dorsey Drive, Duval Drive, Erie  
6 Stret, Euphrasia drive, Falstaff Avenue, Govedale Avenue, Gracefield Avenue, Haverhill Avenue,  
7 Jay Street, Joyce Parkway, Keele Street, Kinkora Drive, Lawrence Avenue West, Macleod Street,  
8 Manresa Lane, Maple Leaf Drive, Marianfeld Avenue, North Park Drive Pember Drive, Queens  
9 Drive, Quinan Drive, Redberry Parkway, Rollet Drive, Romeo Street, Rustic Road, Sage Road,  
10 Treelawn Parkway, Valencia Crescent, Wickford Drive and Wyndale Drive. This feeder had 860  
11 CHI 2011. As shown in Figure 87, this feeder experienced seven outages in 2011. The majority  
12 of these outages were due to overhead component failure and interference. It has a high  
13 probability of future outages due to aging and non-standard equipment. This job addresses  
14 replacement of CSP transformers and upgrades to tree proof conductor in heavily-treed areas.



**ICM Project | Overhead Infrastructure Segment**

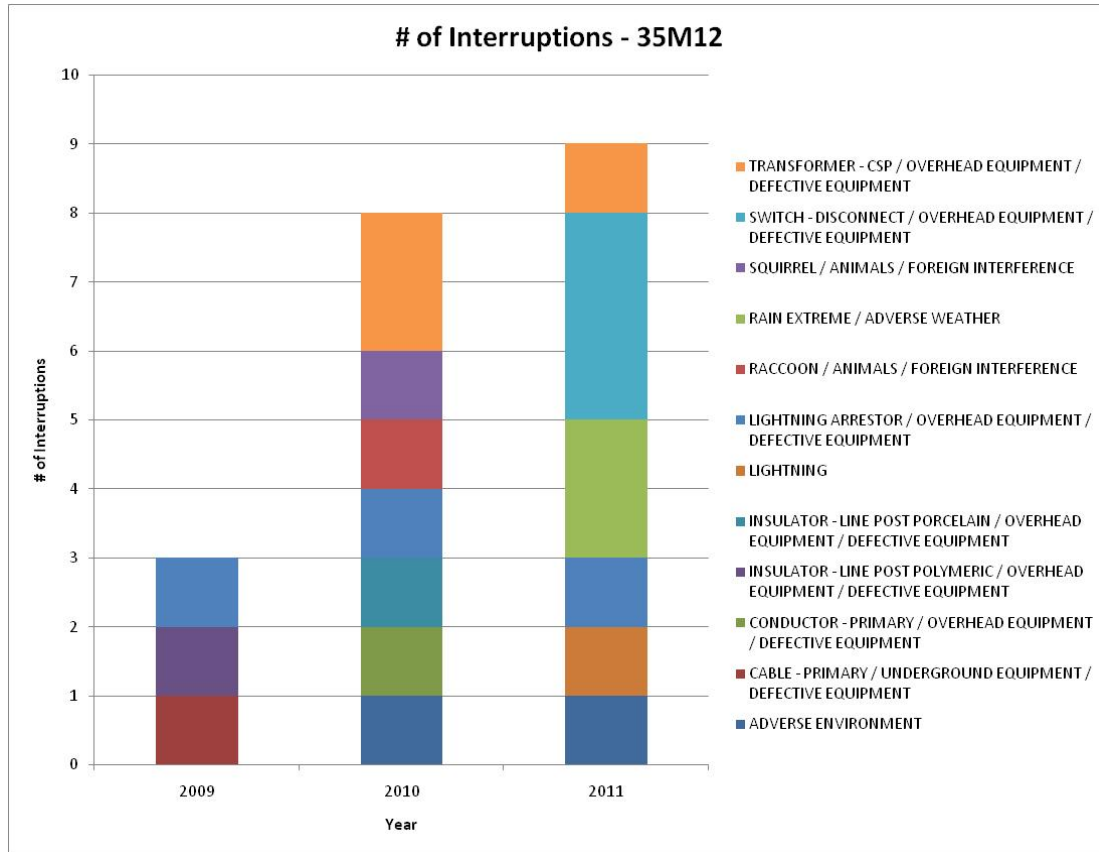
- 1 transformers and upgrade conductor to tree proof conductor in heavily treed areas where tree
- 2 contacts are most likely to occur during periods of adverse weather.



3 **Figure 88: 11M5 Customers Minutes Out**

/C

ICM Project | Overhead Infrastructure Segment



1 **Figure 89: 35M12 Number of Interruptions**

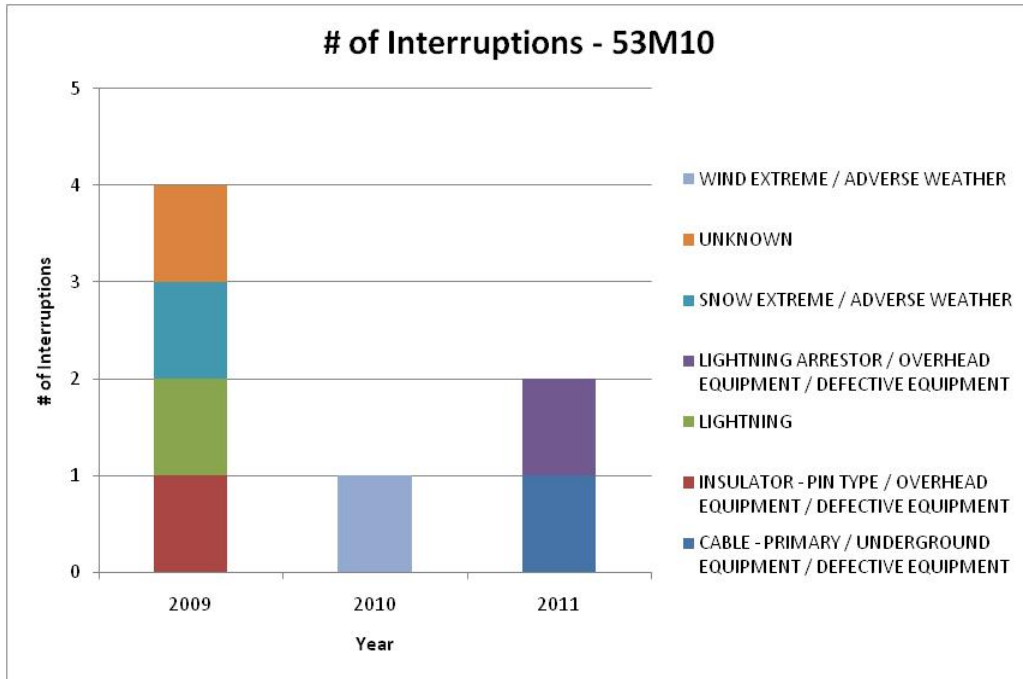
2

3 **40.3.4 E12104 Chipping Crossburn 53M10 OH Rebuild**

/c

4 Over the last three years there have been several failures concentrated on the OH distribution  
 5 on Chipping Road, Park Glen Drive and Crossburn Drive that require rehabilitation of Feeder  
 6 53M10 to improve the reliability in this area (See Figure 90). This job will replace defective and  
 7 non-standard equipment on this feeder.

**ICM Project | Overhead Infrastructure Segment**



1 **Figure 90: 53M10 Number of Interruptions**

2

3 **40.4. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)	/c
20499	W12339/P03 FESI CSP and Conductor Replacement on YK11M1 off Weston Road and Jane Street	2013	\$0.85	/US
20565	FESI CSP and Conductor Replacement	2012	\$4.41	
20379	CSP and Conductor Replacement	2013	\$1.02	
23677	Chipping Crossburn 53M10 OH Rebuild	2012	\$0.28	/UF
20875	George Andersen and Culford Rd. Overhead Rebuild	2012	\$1.63	
<b>Total:</b>			<b>\$8.19</b>	

## ICM Project | Overhead Infrastructure Segment

1 **41. Replacement of non-standard equipment and overload transformers**

2

3 **41.4. Objectives**

4 The objective of this job is to replace poorly performing assets on Feeder YK35M10. The /c  
 5 replacement of CSP transformers, switches, insulators and arresters will be undertaken under  
 6 this job to improve reliability. /c

7

8 **41.5. Scope of Work** /c

9 The scope of work includes the replacement of 131 poles, 7,500m of overhead conductors, 22 /c  
 10 CSP transformers, 16 switches, porcelain insulators and arresters in the areas primarily between  
 11 Genesee Avenue, St. Clair Avenue, Rushton Road and Dufferin Street and then between  
 12 Oakwood Avenue, Kirknewton Road, Hopewell Avenue and Rogers Road.

13

14 **41.6. Required Capital Costs** /c

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
19581	Replacement of non-standard and overloaded transformer on YK35M10	2012	\$0.53
<b>Total:</b>			<b>\$0.53</b>

15 **42. Installation of SCADA Switches**

16

17 **42.1. Objectives**

18 The purpose of this job is to replace existing manual switches with SCADA-Mate R2 switches as /c  
 19 well as upgrade existing remote switches with fault sensing software in order to improve  
 20 restoration time as part of the ongoing investment strategy for reducing Customers Hours  
 21 Interrupted (CHI). These switches are always installed on the main trunk portion of the feeder.  
 22 Outages on this portion of the feeder impact many customers. Typically, on residential feeders

## ICM Project | Overhead Infrastructure Segment

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1 approximately 3,000 customers will experience a sustained outage from a fault on the feeder  
2 trunk.

3

4 With the installation of remote fault sensing switches, typically three quarters of the customers  
5 will have their power restored within a few minutes. Thus, this provides an effective means of  
6 restoring customers quickly. Without remote fault sensing switches, crews will need to patrol  
7 the feeder until the root cause of the outage is found. Furthermore, a crew will need to operate  
8 the manually switches at multiple locations in order to isolate the faulted section of the feeder  
9 and re-supply non-affected portions of the feeder from neighbouring tie feeders. The presence  
10 of a remote fault sensing switch is expected to provide to major benefits; namely the ability to /c  
11 provide Power System Controllers with fault location information as well as the ability to  
12 remotely open and close various switches quickly.

13

14 In some cases, THESL does not have control of opening or closing station circuit breakers. With  
15 some feeders, this function is controlled by Hydro One Networks. The installation of a remote  
16 fault sensing switch close to the egress of the station would allow THESL Power System /c  
17 Controllers to effectively control power supply to the vast majority of the feeder. This shortens  
18 the outage duration since co-ordination with Hydro One Network personnel is no longer  
19 required.

20

21 The locations for switch installations was based upon installing the switches on feeders with  
22 poor reliability, those with no remote fault sensing tie points between two feeders, those with  
23 many customers or high load between sectionalizing switches, and those where Hydro One  
24 networks control the operation of the breaker. Areas that are targeted for this work include  
25 distribution feeders in the Fairbanks TS, Bathurst TS, HornerTS, Manby TS, Cavanagh TS, Malvern  
26 TS and Scarborough TS areas.

27

### 28 **42.2. Scope of Work**

29 The scope of work for this job is to replace existing manual switches with SCADA as well as /c  
30 upgrading current SCADA switches on the distribution system. These switches are in multiple  
31 locations across the THESL grid.

**ICM Project | Overhead Infrastructure Segment**

1 **42.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)	
19785	X12156 Replacement of the manual tie switches with SCADA 53-M8	2013	\$0.30	/c
19454	X11524 Replacement manual switch with SCADA, EYA11L	2012	\$0.07	/us
19453	X11525 Replacement manual switch with SCADA, EYA12L	2012	\$0.07	
19455	X11526 Replacement manual switch with SCADA, EYA14L	2012	\$0.08	/us
19837	X12163 Replacement of manual tie switches with SCADA 53-M6	2013	\$0.52	
19806	W12089-Remote SCADA Switch Install Bathurst TS	2013	\$0.09	
19792	X12158 Replacement of manual tie switches with SCADA 53-M7	2012	\$0.53	/UF
19892	X12176 Replacement of manual tie switches with SCADA 53-M5	2012	\$0.38	
19894	X12182 Replacement of manual tie switches with SCADA 34M5, 34M6 34M7	2012	\$0.20	
19452	X10449 Replacement of manual switch with SCADA EYA13L	2012	\$0.07	/UF
18456	E11374 SCADA Installation 34M6	2012	\$0.79	
17801	E10387 Bermondsey SCADA	2012	\$0.29	
20391, 19965	E11088 North York SCADA 53M10 Area A	2012	\$0.31	
20416	X12318 34M1 Scadamates Intallation	2013	\$0.17	

**ICM Project | Overhead Infrastructure Segment**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
22598	W13271 3 Feeder Riser SCADA Switch Installations Hydro Row	2013	\$0.29
20659	W12383-OH Switch Replacements to SCADA Controlled Switches	2013	\$0.21
24169	<del>E14319 New SCADA Switch on 43M24</del>	2014	<del>\$0.20</del>
24139	<del>E14318 New SCADA Switches on NY51M3</del>	2014	<del>\$0.19</del>
24060	E12744 - Bell Line Conversion	2012	\$0.08
		<b>Total:</b>	<b>\$4.45</b>

/UF

1 **43. Overhead Rebuild on feeder NY55M8**

/C

2

3 **43.1. Objectives**

4 The purpose of this job is to refurbish, rehabilitate and reconfigure feeders NY55M8 from Finch  
 5 TS.

/C

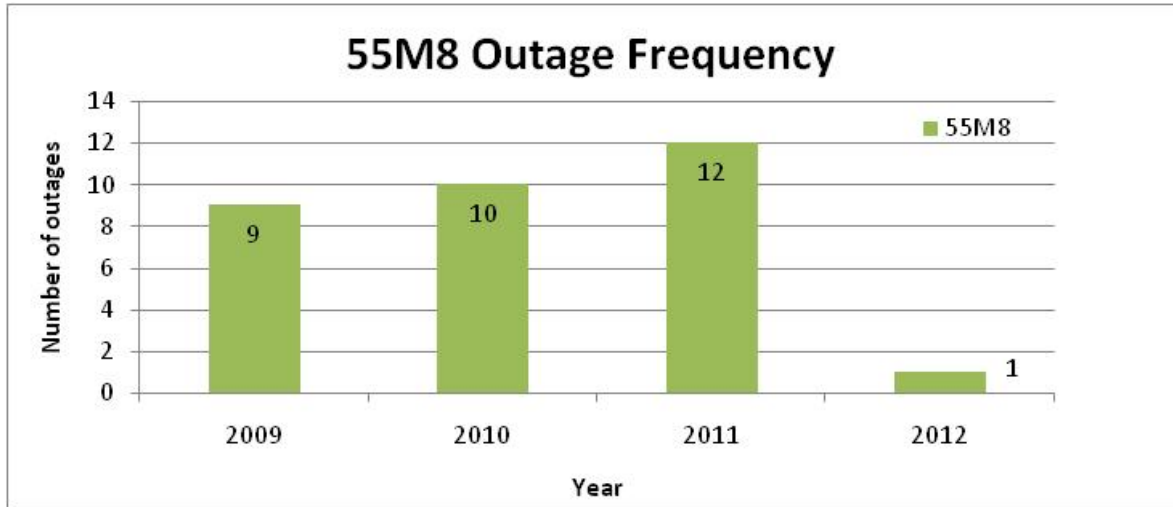
6

7 **43.2. Scope of Work**

8 As shown in Figure 91, feeder 55M8 shows a consistent or increasing trend of sustained outages  
 9 over the past three years.

} /C

**ICM Project | Overhead Infrastructure Segment**



1 **Figure 91: Outage Frequency on 55M8**

2

3 The scope of work is to install new poles as well as replacing non-standard overhead CSP  
 4 transformers and porcelain equipment to reduce the probability of equipment failure. New  
 5 animal guards are to be installed at the appropriate overhead locations.

6

7 **43.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
22859	W14073 — 55M31 OH Rebuild at intersection Steels Ave W and Weston RD.	2014	\$0.80
20296	W12270 OH Rebuild Spenvalley Dr and Surrounding Area	2013	\$0.69
		<b>Total</b>	<b>\$0.69</b>



**ICM Project | Overhead Infrastructure Segment**

~~44. Overhead Feeder Trunk Rehabilitation and Reconfiguration~~

~~44.1. Objectives~~

~~The purpose of this job is to refurbish the overhead distribution system of feeder NY85M4 along Alexdon Road, Chesswood Drive Champagne Drive and Toro Road by replacing defective poles and non-standard equipment.~~

~~44.2. Scope of Work~~

~~The scope of work is to refurbish the overhead lateral distribution system on feeder NY85M4 by replacing defective poles, non-standard equipment including CSP transformers, upgrading undersized primary conductor and upgrading "open bus" secondary lines.~~

~~Feeder 85M4 has had five outages in the last 12 months. In the last ten years, 55 percent of the sustained outage incidents on the feeder were caused by faults on the overhead system. The asset replacements, fault indicator replacements and system reconfiguration that form this job are needed immediately to improve reliability on the feeder.~~

~~44.3. Required Capital Costs~~

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Estimated Cost (\$M)</b>
23364	OH Feeder Rehab — Alexdon, Chesswood, Champagne	2014	\$0.54
		<b>Total</b>	<b>\$0.54</b>

**45. Overhead Rehabilitation on feeder NY55M25 and NY80M2**

**45.1. Objectives**

The purpose of these jobs is to replace the non-standard, aged and failing overhead distribution assets to improve the reliability of feeders NY55M25 and NY80M2. This job includes upgrading

/c

## ICM Project | Overhead Infrastructure Segment

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1 the undersized primary lines on the feeders and providing adequate backup to Rockford Public  
2 School.

3  
4 Over the past year, there were seven sustained power interruptions on feeder 55M25 and six on  
5 feeder 80M2. The available Health Index scores for the 50 percent of the poles evaluated in the  
6 job area was as low as 38. Defective and non-standard overhead equipment led to the 20,317 CI /c  
7 experienced on NY55M25 in 2011. In addition, Rockford Public School does not have adequate  
8 back-up. The inadequacy of back-up capacity, exacerbated by the undersized primary lines, was  
9 responsible for the increase in outage durations (CHI) from 705 in 2010 to 3,534 in 2011. In the  
10 event of a failure on the three-phase circuit currently supplying this customer, lengthy outage  
11 durations beyond the CHI experienced in 2011 will likely be experienced because restoration will /c  
12 be constrained by the inability to transfer loads to healthy adjacent feeders. The job is expected  
13 to improve reliability on these feeders. /c

### 14 15 **45.2. Scope of Work**

16 The scope of work for these jobs is to install new poles and replace CSP transformers as well as /c  
17 porcelain insulators along NY55M25 and NY80M2. Some 2,800 m of overhead conductors will  
18 be replaced along NY80M2 between Fisherville and Rockford to upgrade the line capacity  
19 providing adequacy for load transfer as required during contingencies. A normally open switch  
20 located at the intersection of Fisherville Road and Rockford Road will tie feeder NY80M2 to  
21 NY85M7 providing the required backup to feeder NY80M2 in the job area. /c

**ICM Project | Overhead Infrastructure Segment**

1 **45.3. Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)	/c
20946	W12462 – 3 Phase Extension along Rockford	2012	\$0.27	
20412	W12306 - FESI NY55M25 OH Feeder Equipment Rehab	2013	\$0.91	/c
<b>Total</b>			<b>\$1.18</b>	

2 **46. Overhead Rebuild and Trunk Reconfiguration on NY55M21**

3

4 **46.1. Objectives**

5 The purpose of this job is to reconfigure the trunk portion of feeder NY55M21 and to rebuild /c  
 6 portions of it in the area bounded by Weston Road, Yorkdale Crescent, Aura Lea, and Highbury  
 7 Road in order to improve reliability. NY55M21 has experienced two sustained power  
 8 interruptions during the past year. The job addresses aged poles in poor condition, and non- /c  
 9 standard, poorly performing assets such as CSP transformers, porcelain insulators, arrestors and  
 10 overhead conductors.

11

12 **46.2. Scope of Work**

13 The scope work is to replace end-of-life and non-standard assets including all overhead primary  
 14 conductors, end-of-life poles and CSP transformers. Furthermore, the trunk portion of the  
 15 feeder will be reconfigured in order to mitigate the impact of potential outages. /c

**ICM Project | Overhead Infrastructure Segment**

1    **46.3.    Required Capital Costs**

Job Estimate Number	Job Title	Year	Estimated Cost (\$M)
21999	W13167 – Clayson/Bartor Trunk Feeder Reconfiguration and Refurbishment	2013	\$1.10
<b>Total</b>			<b>\$1.10</b>

/c

2    **47.    Voltage Conversion of 4kV Etobicoke System**

3

4    **47.1.    Objectives**

5    The objective of this job is to convert obsolete and non-standard equipment on the 4kV  
 6    distribution system to the standard 27.6kV service in the Etobicoke area.

7

8    **47.2.    Scope of Work**

9    The 4 kV feeders, EBF1, EF1, EHF1, and KKF2 in the area of Kingsway MS, were selected based on  
 10    outages (as shown in Figure 92 below) and condition of equipment as observed by field crew.

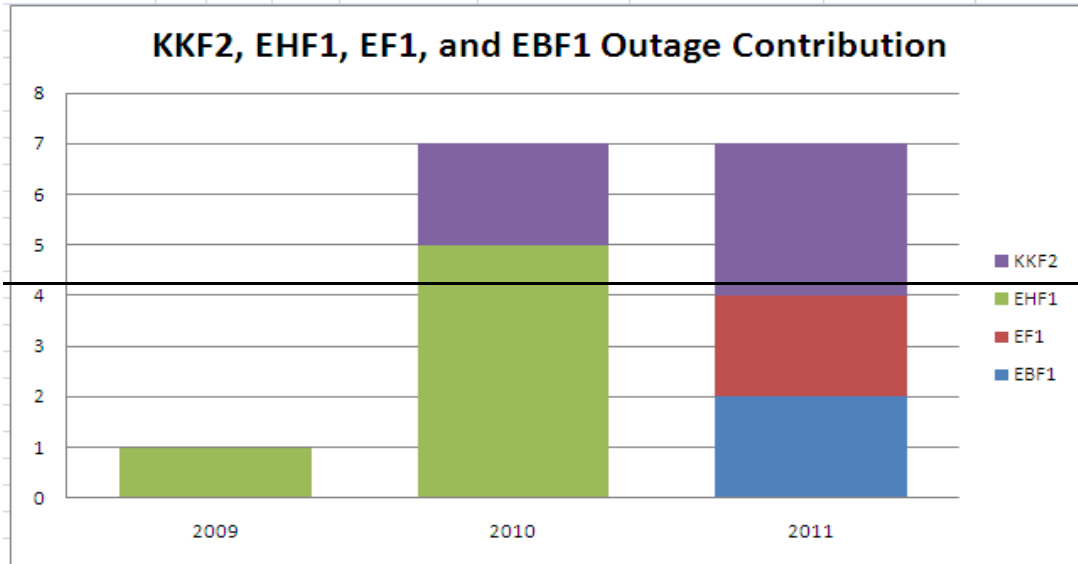
11    The majority of the equipment on this aging system has reached or is approaching end of life  
 12    and the substation equipment should be replaced or decommissioned. Furthermore, some of  
 13    the equipment is becoming difficult to purchase due to obsolescence. These jobs will convert all  
 14    the 4 kV loads to the 27.6kV system and remove any unnecessary equipment. The long term  
 15    goal is to convert all the customers on the 4kV station feeders and decommission the station.

16

17    The scope of work is to convert all customer loads on the 4kV system to the 27.6kV system  
 18    usually by a line transfer to an adjacent 27.6kV feeder. In some cases these jobs require  
 19    additional feeder configuration to accommodate customers that are currently beyond the  
 20    27.6kV system. Some trunk lines may be maintained to provide contingency options to 4kV

**ICM Project | Overhead Infrastructure Segment**

- 1 feeders that still serve customers. These lines will be removed when they are no longer
- 2 necessary and the substation has been decommissioned.



3 **Figure 92: Outage contribution on KKF2, EHF1, EF1 and EBF1**

4

5 **47.3. Required Capital Costs**

Job Estimate Number	Project Phase	Year	Estimated Cost (\$M)
23323	W14181 – Kingsway MS – OH Voltage Conversion (ETEF1)	2014	\$0.66
<b>Total:</b>			<b>\$0.66</b>

6 **48. Overhead Rebuild**

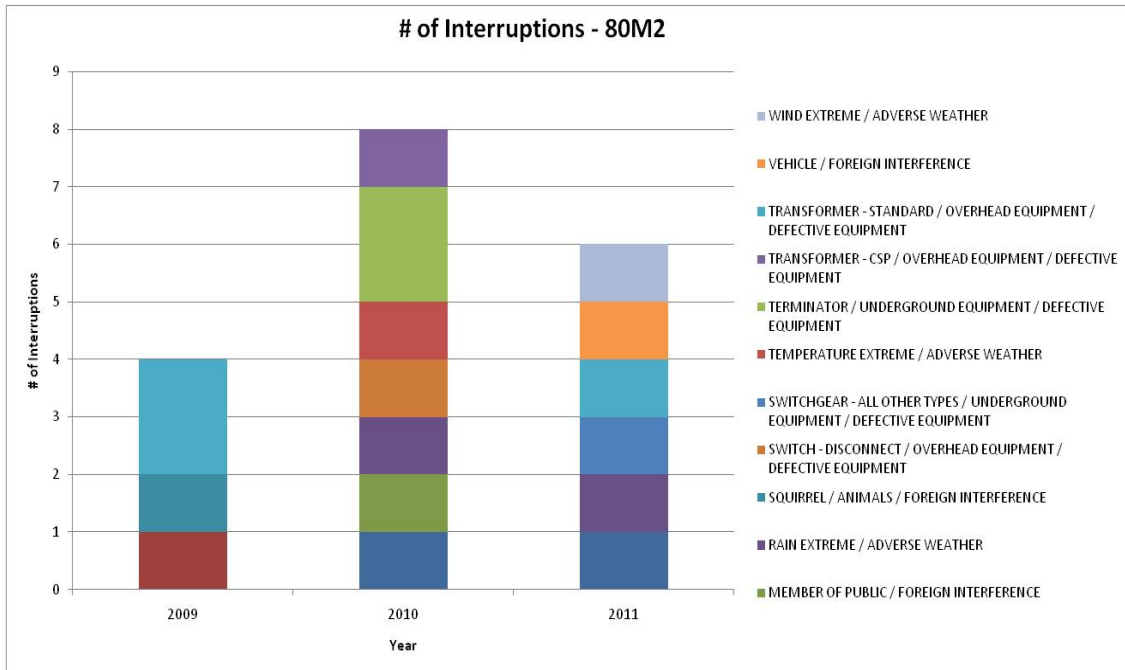
7

8 **48.1. Objectives**

9 The objective of these jobs is to replace end of life and non-standard equipment that has a high  
 10 probability of future failure and could possess a potential safety risk for the public and field  
 11 crew. These jobs will focus on the replacement of equipment such as poles, porcelain/glass

/c

ICM Project | Overhead Infrastructure Segment



1 **Figure 96: Number of interruptions on 80M2**

2

3 **48.2. Scope of Work**

4 The scope of this work is to replace all non-standard and aged equipment that can create a fault  
 5 or a potential safety issue on the listed feeders. This job focuses on the replacement of aging  
 6 poles, porcelain insulators and switches. Furthermore, this job will install animal guards and  
 7 insulated drop wires at strategic locations that are expected to reduce the probability of a fault  
 8 due to animal interference.

} /c

## ICM Project | Overhead Infrastructure Segment

### 1 48.3. Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost (\$M)	
22229	E12574 Overhead Rehabilitation of SCREF3	2013	\$0.83	/c
<del>23312</del>	<del>E14170 Rouge Park OH Rebuild Phase and VC of 3 SCXGF3</del>	2014	<del>\$0.62</del>	
21457	E13110 NYSS68-F9 OH Rebuild at Pleasant View	2012	\$0.54	/us
<b>Total:</b>			<b>\$1.37</b>	

### 2 49. Manby-Horner TS Feeder Reconfiguration

3

#### 4 49.1. Objectives

5 The objective of this job is to relieve overloaded feeders from the Manby TS east of Kipling Avenue by constructing a new feeder powered out of the Horner TS and slightly modifying the configuration of the existing feeders from both Manby and Horner Transformer Substations. /c

8

#### 9 49.2. Scope of Work

10 The scope of work of this job is to construct a new overhead line at the intersection of Evans Avenue and Kipling Avenue, eastwards to Royal York Road. The new arrangement will result in 25A load from Horner TS feeder 30M1 and 200A load from Manby TS feeder 38M13 transferred to the new feeder 30M12 off buses B of the Horner TS. About 200A load will be transferred off Manby feeder 38M7 to feeder 38M13 resulting in an overall transfer of 250A from Manby TS bus-Q feeder ET38M13 to the new Horner TS feeder ET30M12. /c

16

17 In addition to relieving the overloaded feeders, redistribution of load is expected to improve the effectiveness of the Feeder Automation that will be developed in the area by creating sufficient spare capacity to allow for the automatic backup of adjacent feeders in the event of outages. /c

19

/c

**ICM Project | Overhead Infrastructure Segment**

1 This job is related to the job described above in Section 8 as follows. The job in Section 8 builds  
 2 a new feeder ETR30M12 out of Horner TS to immediately relieve the Manby bus B-Y of 12MVA,  
 3 thus averting bus overloading by 2012. This job outlined in Section 49 extends the new feeder } /c  
 4 proposed in Section 8 (ETR30M12) North-East to further relieve the Manby TS of 14.8MVA by  
 5 reconfiguring the load and structure of the feeders ET38M7, ET38M13, ET38M20 and ETR30M1  
 6 averting the forecasted year 2014 overloading of Manby TS bus Q-Z as indicated in Figure 61 } /c  
 7 above.

8  
 9 **49.3. Required Capital Costs**

Job Estimate Number	Job Phase	Year	Estimated Cost (\$M)	/c
23430	P03 Evans Avenue and Royal York Rd, Reconfiguration of Feeders	2013	\$0.80	
<b>Total:</b>			<b>\$0.80</b>	

10 **50. CSP and Pole replacement on feeder NY80M5**

11

12 **50.1. Objective**

13 The objective of this job is to replace poles that have exceeded their useful lives and CSP  
 14 transformers on feeder NY80M5 out of Fairchild I TS to prevent future outages and potential  
 15 safety risks due to equipment failure.

16

17 **50.2. Scope of Work**

18 Feeder NY80M5 has been above FESI 7 for most of the last three years and is currently FESI 8  
 19 and WPF 53. In addition, this feeder is currently picking up customers from feeder NY51M7,  
 20 which results in additional customers also experiencing the failures from Fairchild TS and this  
 21 feeder. A feeder patrol was performed on the feeder, which noted the poor condition of assets.



**ICM Project** | **Overhead Infrastructure Segment**

---

1 **50.3. Required Capital Costs**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Estimated Cost (\$M)</b>
20881	E12457 - CSP Transformer and Pole Replacement	2012	\$0.44
<b>Total:</b>			<b>\$0.44</b>

/c

/us

## ICM Project | Overhead Infrastructure Segment

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1 When a project analysis is undertaken, assets within the project may be before, at, or beyond  
2 their optimal replacement time, thus some assets will have sacrificed economic life and others  
3 will have incurred excess risk. The cumulative sacrificed life and excess risk of the assets  
4 involved becomes a cost against the project, as shown by the red curve in Figure 3. Within the  
5 Overhead Infrastructure segment, multiple assets are replaced together as part of a linear job, /C  
6 and therefore there are concurrent intervention benefits that must be weighted against the  
7 total costs (cumulative asset excess risk and sacrificed life values) in order to produce an overall  
8 project net cost calculation. These benefits would include factors such as equipment rentals,  
9 transportation of crew and material, excavations, and road moratoriums. These benefits are  
10 illustrated by the green curve in Figure 3. Taking the sum of the costs (cumulative asset excess  
11 risk and sacrificed life values) and benefits, year-by-year, provides the Net Project Benefit for  
12 the Job-Based Approach, illustrated by the blue curve in Figure 3.

13

14 Since the optimal intervention year is the lowest point on the Project Net Cost curve,  
15 represented by the blue curve in Figure 3, the estimated risk costs for the project assets in 2015  
16 will exceed the estimated risks that exist today. By performing the work immediately as  
17 opposed to waiting until 2015, we can eliminate these estimated risks. Therefore, these  
18 avoided costs represent the benefits of the in-kind project execution in 2012 as opposed to  
19 2015.

20

21 The formula for this calculation is detailed below:

22

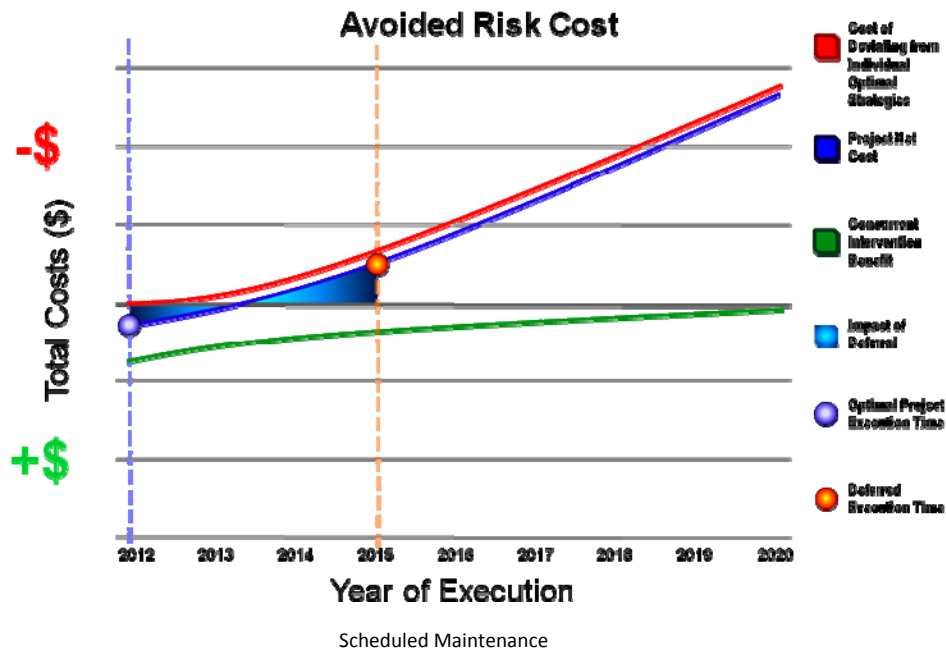
23 
$$\text{Avoided Estimated Cost} = \text{PV}(\text{PROJECT}_{\text{NET\_COST}}(2015)) - \text{PROJECT}_{\text{NET\_COST}}(2012)$$

24

25 Where:

- 26 ○  $\text{PROJECT}_{\text{NET\_COST}}(2012)$ : Represents the total project net costs in 2012.
- 27 ○  $\text{PV}(\text{PROJECT}_{\text{NET\_COST}}(2015))$ : Represents the present value of total project net costs in  
28 2015.

ICM Project | Overhead Infrastructure Segment



1 **Figure 3: Example of Project Net Benefit Analysis for Job-Based Approach**

2

3 Within the Overhead Infrastructure segment, individual optimal intervention timing results were /c  
 4 calculated for each of the assets to be replaced, based upon the processes identified in Section  
 5 1.1.

6

7 Each of these assets may possess an individual sacrificed life and an excess risk value, which  
 8 collectively produce a year-by-year cost. Each of these assets will also possess a year-by-year /c  
 9 concurrent intervention benefit that is produced by comparing the costs of replacing these  
 10 assets as part of an integrated job as opposed to replacing them individually. Therefore, the  
 11 individual year-by-year costs and benefits for each asset are aggregated to produce the overall  
 12 Project Net Cost year-by-year as illustrated in Figure 3. /c

13

14 As noted in the formula above, this Project Net Cost was then calculated for all overhead  
 15 infrastructure project assets at years 2012 and 2015 respectively as per these two execution  
 16 approaches. Project Net Costs quantified in 2015 were brought back to a present value and the  
 17 difference between this value and the Project Net Cost quantified in 2012 was taken as the  
 18 Avoided Estimated Risk Cost. The final results are provided in Table 1.

**ICM Project | Overhead Infrastructure Segment**

1 **Table 1: Avoided Estimated Risk Cost for Overhead Infrastructure Segment**

/c

<b>Business Case Element</b>	<b>Estimated Cost (in Millions)</b>
Present Value of Project Net Cost in 2015 ( $PV(\text{PROJECT}_{\text{NET\_COST}}(2015))$ )	\$ 222
Project Net Cost in 2012 ( $\text{PROJECT}_{\text{NET\_COST}}(2012)$ )	\$ 111
<b>Avoided Estimated Risk Cost =</b> <b>(<math>PV(\text{PROJECT}_{\text{NET\_COST}}(2015)) - \text{PROJECT}_{\text{NET\_COST}}(2012)</math>)</b>	<b>\$ 111</b>

/c

/c

e

# ICM Project – Overhead Infrastructure and Equipment

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## Box Construction Segment

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | Box Construction Segment

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$30.74 M to \$23.6 M, a reduction of \$7.14 M
- 3 • Revised number of jobs proposed for 2012/2013 to 15, with jobs for 2014 to be addressed in
- 4 Phase Two
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system
- 8 • Corrected job reference descriptions

## ICM Project | Box Construction Segment

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1    **I       EXECUTIVE SUMMARY**

2

3    **1.       Project Description**

4    Box construction refers to a type of legacy 4kV overhead construction that was previously used  
5    in the former City of Toronto and still exists in some areas of the city. The picture below shows  
6    a typical box construction installation in the city. There are a number of reliability, safety and  
7    load capacity issues associated with box construction (described below), which THESL plans to  
8    address through a proactive program to convert these feeders to standard 13.8kV overhead  
9    construction. In addition, there are specific issues that necessitate the conversion of box  
10   construction 4kV feeders supplied from stations such as Hazelwood MS (municipal station).  
11   These issues are described in detail in Section II, 2. The legacy overhead construction will be  
12   replaced with 13.8 kV overhead feeders. The estimated total cost of the proposed segment is  
13   \$23.6 million.

/UF, US



14   **Typical Box Construction Installation (January 16, 2012)**

15

16   Conversion of 16 4kV box construction feeders identified in the 15 jobs that comprise this  
17   segment for 2012-2013 will allow THESL to decommission the following 4kV stations: College,  
18   Hazelwood, Keele and St Clair. In addition, 4kV box construction feeders B2MD, B5DN, B4DN,  
19   ~~B2DU~~, B6DU B15J, B5J, B8J, will be converted to 13.8kV overhead construction as well as to  
20   facilitate the future decommissioning of additional stations.

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/US

## ICM Project | Box Construction Segment

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- 1       • Skill set to maintain legacy assets – It is becoming increasingly difficult to maintain 4kV  
2       box construction feeders.

3  
4       **3. Why the Proposed Project Is the Preferred Alternative**

5       THESL's program to replace obsolete legacy 4 kV box construction with new 13.8 kV feeders will  
6       improve safety, reliability and system efficiency as discussed in Section III. THESL evaluated the  
7       proposed box construction replacement segment, the preferred alternative, against the  
8       alternative of maintaining and replacing the equipment used in box construction, the status  
9       quo. Other than replacing box construction or leaving it in place and addressing individual  
10      assets as needed, there are no viable options to address the issues that box construction  
11      creates.

12  
13      The status quo would have THESL continue to maintain and repair box construction wherever it  
14      is currently found. Due to the high number of assets past their useful lives on these feeders as  
15      seen in Table-6, maintaining the status quo will likely result in additional maintenance cost and  
16      worse reliability. The safety and operational issues associated with box construction detailed  
17      above also will continue. In contrast, THESL's preferred alternative, the planned conversion  
18      program, will convert 16 outmoded 4kV box construction feeders to modern 13.8kV feeders in  
19      2012-2013.

20  
21      The effectiveness of the box construction segment can be further highlighted by comparing the  
22      difference in cost of ownership between the existing box construction asset class that will be  
23      replaced and the new standardized overhead asset class that will be installed. This difference in  
24      cost includes quantified risks, taking into account the assets' probability of failure, and  
25      multiplying this by direct and indirect cost attributes associated with in-service asset failures,  
26      including the costs of customer interruptions, emergency repairs and replacement (See  
27      Appendix J).

28  
29      Carrying out immediate work to replace the Box Construction 4kV feeders with 13.8kV feeders  
30      as proposed in this segment will result in an estimated net present value for the project of \$15.6  
31      million. To calculate this figure, THESL first calculated the cost of ownership of the current state

} /us



## ICM Project | Box Construction Segment

1 and then subtracted the ownership if the feeders are replaced and the total project cost, as  
 2 shown in Table-1. Please refer to Appendix J for a further explanation of this calculation.

3

4 **Table-1: Business Case Evaluation (BCE) for Box Construction Projects**

Business Case Element	Cost (\$, millions)	
<b>Cost of Ownership of Existing Box Construction (COO<sub>E</sub>)</b>		
Projected risk cost of existing box construction feeders (PV)*	\$40.3	
Projected risk cost of existing Stations (PV)**	\$17.4	
Projected non-asset risk cost of existing 4kV overhead (NPV)	\$ 64.7	/c
Stations Maintenance for existing system (PV)***	\$2.4	
4kV line losses relative to 13.8kV feeders (PV)	\$10.4	
<b>TOTAL (COO<sub>E</sub>)</b>	<b>\$ 135.2</b>	/c
<b>Cost of Ownership of New Standardized Overhead Construction (COO<sub>N</sub>)</b>		
Projected risk cost of converted feeders (PV)****	-\$7.5	
Projected non-asset risk cost of new 13.8kV overhead (NPV)	-\$ 53.6	/c
<b>TOTAL (COO<sub>N</sub>)</b>	<b>-\$ 61.1</b>	/c
<b>PROJECT COST</b>	<b>-\$58.5</b>	
<b>PROJECT NPV</b>	<b>\$15.6</b>	

5 Note for \*s, please see Table-44 in Appendix J

## ICM Project | Box Construction Segment

1 **Table-2: 4kV box construction proposed for conversion to 13.8kV**

Job Estimate Number	Job Title	Cost Estimate (\$ million)	Projected Year of Execution	
X11422	Hazelwood Overhead Conversion (B7HW)	\$1.82	2012	
X12445	B5HW and B3HW conversion/transfer	\$1.71	2013	/UF, US
X12325	B15J conversion to 13.8kV	\$3.64	2012	
X12352	B7CD conversion to 13.8kV	\$1.33	2013	/US
X11369	Keele/St. Clair MS Voltage Conversion from 4kV to 13.8kV System B1KS, B4KS	\$3.45	2013	
X12353	Voltage Conversion from 4kV to 13.8kV System TOB4CD	\$1.63	2013	
X11452	Millwood MS: B2MD, Merton MS:B1MR, Partial Voltage Conversion	\$2.73	2012	/US
X12054	Voltage Conversion from 4kV to 13.8kV System TOB5DN	\$1.81	2013	/UF
X12506	Voltage Conversion from 4kV to 13.8kV System Part 2 B4DN	\$0.17	2013	
X13186	Load Transfer (3MVA) A200E to new feeder AxxxE	\$1.18	2013	
X12193	B5J OH feeder voltage conversion	\$1.44	2013	
X13177	Convert Junction 4kV B8J to 13.8kV	\$0.21	2013	
X13178	Convert Junction 4kV B9J (south of Bloor) to 13.8kV	\$0.73	2013	
<del>X12129</del>	<del>Millwood MS: B3MD, Merton MS B2MR Voltage Conversion Millwood(4.16 kV)</del>	<del>\$4.84</del>	<del>2014</del>	
X12055	Voltage Conversion from 4kV to 13.8kV System TOB2DU (DESIGN ONLY)	\$0.23	2012	/UF, US
<del>X12161</del>	<del>Convert Junction 4kV B11J to 13.8kV</del>	<del>\$2.14</del>	<del>2014</del>	
<del>12194</del>	<del>Convert Junction 4kV B10J to 13.8kV</del>	<del>\$1.68</del>	<del>2014</del>	

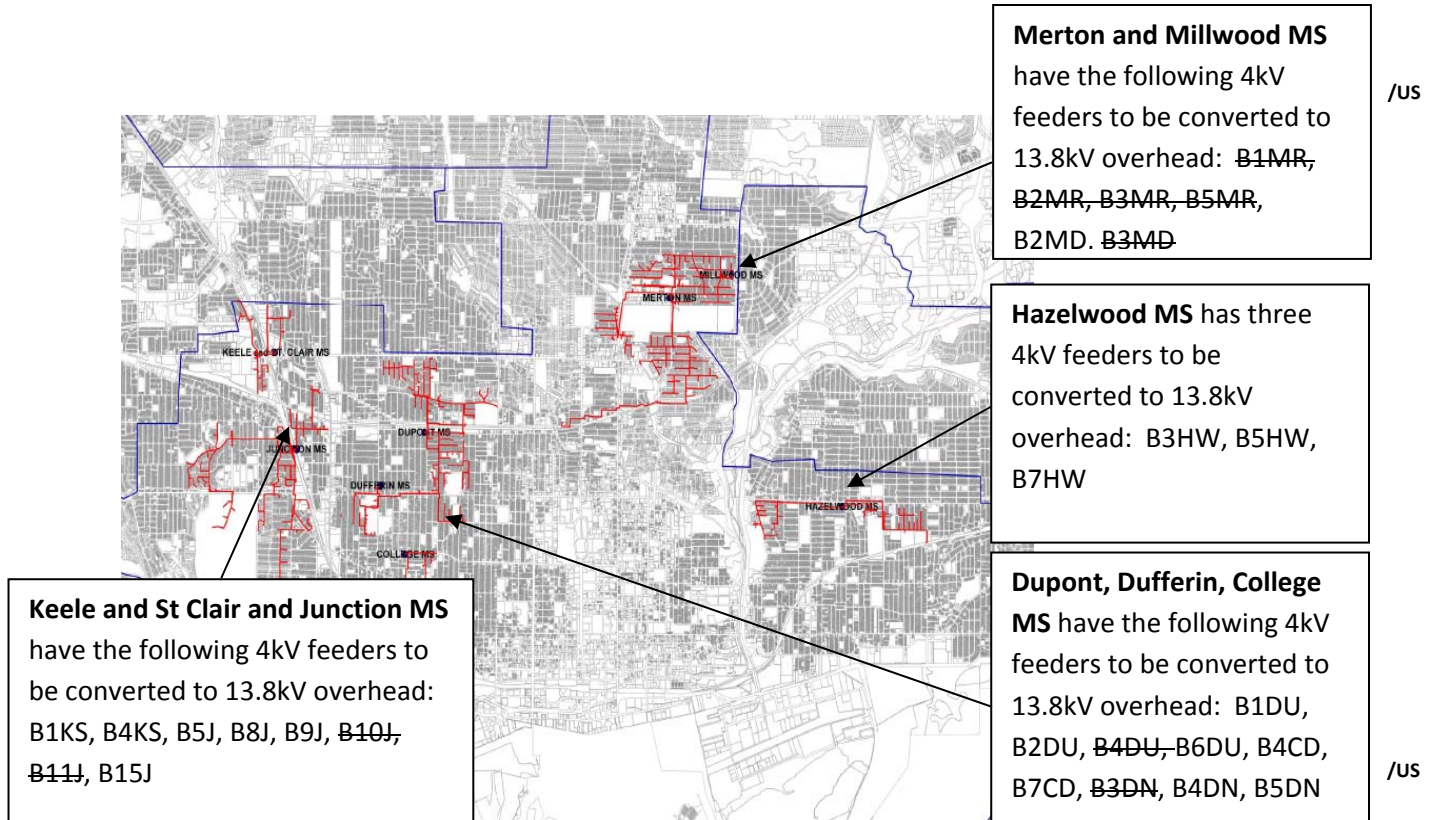
**ICM Project | Box Construction Segment**

Job Estimate Number	Job Title	Cost Estimate (\$ million)	Projected Year of Execution
X12142	Convert 4kV Merton Feeder B2MR to 13.8kV System	\$0.62	2014
X12145	Convert 4kV Merton Feeder B3MR to 13.8kV System	\$1.11	2014
X12174	Convert 4kV Merton Feeder B5MR to 13.8kV System	\$3.78	2014
X12143	Convert 4kV Merton Feeder B1MR, B2MR to 13.8kV System	\$2.24	2014
X13362	Convert 4kV B7H feeder to 13.8kV system	\$2.38	2014
X14202	B3DN Voltage conversion	\$2.07	2014
X13176	Convert Dupont 4kV B4DU to 13.8kV	\$3.67	2014
X13003	Convert 4kV Dupont B6DU to 13.8kV	\$1.48	2013
<b>TOTAL</b>		<b>\$23.6</b>	

} /UF, US

**ICM Project | Box Construction Segment**

1 Figure 3 shows the specific box construction feeders.



2 **Figure 3: Map shows locations of 4kV box construction feeders proposed for conversion to**  
 3 **13.8kV in 2012-2014**

**ICM Project | Box Construction Segment**

1 **III NEED**

2

3 This section presents the reasons why THESL must replace box construction now. The specific  
 4 jobs for 2012 and 2013 that THESL proposes to accomplish this segment are described in Section  
 5 V – Description of Work.

/us

6

7 **1. Safety**

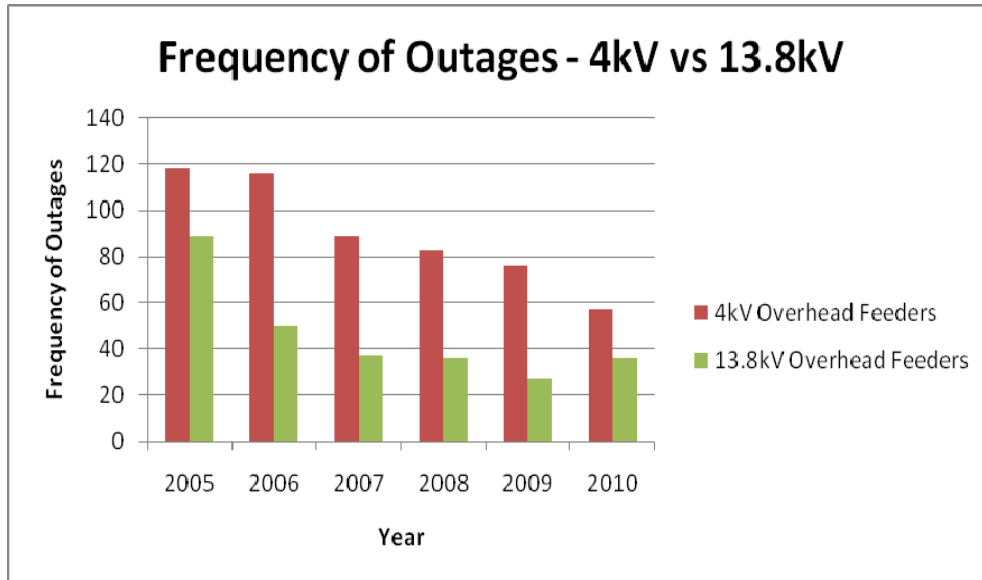
8 There are numerous potential safety issues associated with box construction. They are outlined  
 9 in Table-3.

10

11 **Table-3: Safety Issues Associated with Box Construction**

Safety Issue	Description
System Complexity	The conversion of box construction feeders to current 13.8kV overhead construction standards will improve workplace safety for crews by reducing the complexity associated with box construction poles. Box construction poles typically support more circuits compared to standard 13.8kV overhead circuits. High concentration of cables in one spot (the box construction) increases the potential risk of a shock hazard to crews working on it. See Figure 13 and Figure 14 for examples of typical 4kV box construction and 13.8kV overhead feeders. Furthermore, with box construction, some circuits cannot be accessed with bucket trucks due to the physical arrangement of the feeders running through a single box pole, forcing line crews to climb the poles and increasing the potential safety risk for Toronto Hydro employees.

## ICM Project | Box Construction Segment



1 **Figure 7: Frequency of Outages - 4kV vs 13.8kV Overhead feeders**

### 2 **5. Aging 4kV Stations Supplying Box Construction Feeders**

3 Several 4kV stations have been shown to have assets in poor condition that will require action  
4 over the 2012-2014 period. This problem can be addressed by either replacing station assets on  
5 a 'like-for-like' basis, or by converting all 4kV load served from that station to 13.8kV and  
6 decommissioning the station. Hazelwood MS is an example of a station that must be addressed /US  
7 in the near future, as shown in maintenance records in Table-7, Table-8 and Table-9. Dufferin  
8 MS (refer to Table-36) and Merton MS (refer to Table-32) also have station equipment that  
9 needs to be addressed. Rather than continue to sustain a 4kV legacy system and continue being  
10 exposed to the associated safety, clearance and reliability issues, THESL proposes to convert  
11 these 4kV box construction feeders, and decommission these legacy stations.

12  
13 Furthermore, decommissioning 4kV MS stations is expected to result in maintenance cost  
14 savings. Eliminating maintenance on these decommissioned stations will reduce THESL's need  
15 to hold inventory of obsolete 4kV equipment and maintain this equipment in good working  
16 order. It will also eliminate the labour costs incurred when obsolete 4kV station equipment  
17 must be replaced (as an example, see Hazelwood MS case study in Section 1.2).

## ICM Project | Box Construction Segment

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1 As more 4kV box construction feeders are converted to 13.8kV, access to 13.8kV overhead  
2 feeders increases. As a result, some 4kV feeders that previously could not be converted to  
3 13.8kV may now be candidates for conversion. In addition to the reasons provided above to  
4 explain the need for 4kV box construction conversion jobs in 2012-2013, the specific jobs  
5 discussed below also were selected because they are located in the vicinity of 13.8kV overhead  
6 feeders with adequate capacity.

/us

## ICM Project | Box Construction Segment

---

### 1 IV PREFERRED ALTERNATIVE

2  
3 THESL's program to replace obsolete legacy 4 kV box construction with new 13.8 kV feeders will  
4 improve safety, reliability and system efficiency as discussed extensively above. THESL  
5 evaluated the proposed box construction replacement segment, the preferred alternative,  
6 against the alternative of maintaining and replacing the equipment used in box construction, the  
7 status quo. Other than replacing box construction or leaving it in place and addressing  
8 individual assets as needed, there are no viable options to address the issues that box  
9 construction creates.

#### 11 1. Maintaining the Status Quo

12 The status quo would have THESL continue to maintain and repair box construction wherever it  
13 is currently found. Due to the high number of assets past their useful lives on these feeders as  
14 seen in Table-6, maintaining the status quo will likely result in additional maintenance cost and  
15 worse reliability. The safety and operational issues associated with box construction detailed  
16 above also will continue. In contrast, THESL's preferred alternative, the planned conversion  
17 program, will convert 16 outmoded 4kV box construction feeders to modern 13.8kV feeders.

/us

18  
19 Failure to execute this segment will force THESL to manage the issues described in Section III  
20 above in a reactive and less effective manner. It will also delay the decommissioning of some  
21 MS and, as a result, reduce the availability of 13.8kV feeders to support modernization of 4kV  
22 overhead box construction plant to existing overhead construction standards.

23  
24 The effectiveness of the box construction segment can be further highlighted by determining  
25 the difference in cost of ownership between the existing box construction asset class that will be  
26 replaced and the new standardized overhead asset class that will be installed. This difference in  
27 costs includes quantified risks, taking into account the assets' probability of failure, and  
28 multiplying this by the direct and indirect costs associated with in-service asset failures,  
29 including the costs of customer interruptions, emergency repairs and replacement.



## ICM Project | Box Construction Segment

1 Carrying out the proposed work on this asset class is expected to result in a net present value of  
 2 \$15.6 million, which represents the difference between these cost of ownership values with the  
 3 total project cost subtracted. This business case evaluation is explained in Appendix J.

4

### 5 1.1. Performance Impacts

6 A list of feeders that will be addressed under this program, along with the job costs and number  
 7 of assets past their useful life per circuit kilometre is provided in Table 5.

8

9 **Table-5: Assets Past their Useful Lives Per Circuit Kilometre on 4kV Feeders to be Converted**  
 10 **to 13.8kV**

Feeder	Estimated Project Cost (\$M)	Assets Past Useful Life	Circuit Length (km)	Quantity/km	Projected Year of Execution	
B3HW (X12445)	\$1.71	39	3.80952	10.2	2013	/UF, US
B5HW (X12445)		154	3.03309	50.8		
B7HW (X11422)	\$1.82	82	2.14393	38.2	2012	
B15J (X12325)	\$3.64	219	6.29048	34.8	2012	
B7CD (X12352)	\$1.33	78	1.4864	52.5	2013	/US
B4KS (X11369)	\$3.45	129	2.54616	50.7	2013	
B1KS (X11369)		45	2.42689	19.8		
B4CD (X12353)	\$1.63	0	1.11803	0.0	2013	
B2MD, B1MR (X11452)	\$2.73	63	3.83669	16.4	2012	/US
B5DN (X12054)	\$1.81	50	3.60117	13.9	2013	/UF
B1DU (X12054)		95	1.53529	61.9		

**ICM Project | Box Construction Segment**

Feeder	Estimated Project Cost (\$M)	Assets Past Useful Life	Circuit Length (km)	Quantity/km	Projected Year of Execution
B4DN (X12506)	\$0.17	35	0.61803	56.6	2013
transfer load (X13186)	\$1.18	0	0	n/a	2013
B5J (X12193)	\$1.44	28	1.90018	14.7	2013
B8J (X13177)	\$0.21	31	0.44607	69.5	2013
B9J (X13178)	\$0.73	210	4.65797	45.1	2013
B3MD, B2MR (X12129)	\$4.84	87	3.18416	27.3	2014
B2DU (X12055)	\$0.23	228	3.87552	58.8	2012
B11J (X12161)	\$2.14	149	2.74384	54.3	2014
B10J (X12194)	\$1.68	89	1.63134	54.6	2014
B2MR (X12142)	\$0.62	52	3.19	16.3	2014
B3MR (X12145)	\$1.11	69	4.47065	15.4	2014
B5MR (X12174)	\$3.78	37	3.60165	10.3	2014
B1MR, B2MR (X12143)	\$2.24	85	3.72	22.8	2014
B7H (X13362)	\$2.38	36	2.9141	12.4	2014
B3DN (X14202)	\$2.07	72	1.47931	48.7	2014
B4DU (X13176)	\$3.67	194	4.55508	42.6	2014

/UF, US

**ICM Project | Box Construction Segment**

Feeder	Estimated Project Cost (\$M)	Assets Past Useful Life	Circuit Length (km)	Quantity/km	Projected Year of Execution
B6DU (X13003)	\$1.48	136	4.06301	33.5	2013
<b>TOTAL</b>	<b>\$23.6</b>	<b>1,515*</b>	<b>47.39</b>		

} /UF, US

1 \*Total count is lower than the sum of the individual assets due to shared poles between feeders.

2 A higher number of assets past their useful lives indicates that the likelihood of outages due to  
 3 component failures will increase. Execution of the listed jobs will result in the modernization of  
 4 all assets on these feeders which are past their useful lives.

5

6 Table-6 shows the number of assets per feeder that are projected to fail by their respective  
 7 planned year of conversion. In addition, it shows the quantity of assets past their useful lives  
 8 per feeder, along with associated estimated 'like-for-like' replacement costs and quantified risk  
 9 cost.

10

11 **Table-6: Failure Projections, Assets past their useful lives and Associated Anticipated 'Like-for-  
 12 Like' Replacement Costs per Feeder**

Feeder	Proposed Year of Conversion	Station	Assets Presently Projected to Fail by Year of Conversion (in counts)	Risk Cost of Feeder up to Year of Conversion (\$M)	Assets Past Useful Life (in counts)	Estimated Cost of Replacement for Assets Past Useful Life (\$M)
B7CD	2012	College	3	\$0.12	78	\$1.03
B3HW	2013	Hazelwood	6	\$0.12	39	\$0.57
B5HW	2013	Hazelwood	13	\$0.24	154	\$1.85
B7HW	2012	Hazelwood	7	\$0.21	82	\$1.04
B15J	2012	Junction	12	\$0.45	219	\$2.69
B4CD	2013	College	2	\$0.08	0	\$0

} /US

**ICM Project | Box Construction Segment**

Feeder	Proposed Year of Conversion	Station	Assets Presently Projected to Fail by Year of Conversion (in counts)	Risk Cost of Feeder up to Year of Conversion (\$M)	Assets Past Useful Life (in counts)	Estimated Cost of Replacement for Assets Past Useful Life (\$M)
B5DN	2012	Dufferin	8	\$0.24	50	\$0.69
B4DN	2013	Dufferin	2	\$0.03	35	\$0.46
B1DU	2012	Dupont	9	\$0.35	95	\$1.35
B5J	2013	Junction	4	\$0.16	28	\$0.42
B8J	2013	Junction	2	\$0.02	31	\$0.37
B9J	2013	Junction	16	\$0.43	210	\$2.60
B4KS	2013	Keele and St Clair	13	\$0.65	129	\$1.85
B1KS	2013	Keele and St Clair	5	\$0.07	48	\$0.60
B2MD	2013	Millwood	6	\$0.12	30	\$0.36
B3DN	2014	Dufferin	9	\$0.65	72	\$0.96
B2DU	2012	Dupont	28	\$1.98	228	\$2.96
B4DU	2014	Dupont	29	\$1.29	194	\$2.54
B6DU	2013	Dupont	20	\$0.56	136	\$1.65
B7H	2014	Highlevel	17	\$0.40	36	\$0.44
B11J	2014	Junction	18	\$0.81	149	\$1.96
B10J	2014	Junction	10	\$0.23	89	\$1.07
B3MD	2014	Millwood	36	\$1.04	35	\$0.42
B2MR	2014	Merton	30	\$0.46	52	\$0.66
B3MR	2014	Merton	34	\$0.79	69	\$0.77
B5MR	2014	Merton	12	\$0.22	37	\$0.51
B1MR	2014	Merton	42	\$0.68	33	\$0.386
<b>TOTAL</b>			<b>393</b> <b>156</b>	<b>\$12.36**</b> <b>\$5.83**</b>	<b>2,305*</b> <b>1,515*</b>	<b>\$29.4*</b> <b>\$19.4*</b>

/us

/us

/us

/us

1 \*Total is lower than the sum of the individual assets due to shared poles between feeders

## ICM Project | Box Construction Segment

---

1 **V DESCRIPTION OF WORK**

2

3 **1. Conversion of College MS Feeders (X12352, X12353)**

/c

4

5 **1.1. Objective**

6 The objective of these jobs is to prepare College MS feeders for conversion from 4.16kV to  
7 13.8kV for eventual decommissioning of College MS. The main objective is to mitigate the  
8 safety concerns associated with working around energized box construction which is found on  
9 feeders from College MS. The main benefits of completing this work are improved reliability  
10 and mitigation of potential safety risks. The equipment that is being replaced is overhead 4kV  
11 distribution plant which includes conductor, poles, transformers and switches.

} /c

12

13 Figure 12 shows an example of obsolete assets on College MS feeder B7CD.

**ICM Project | Box Construction Segment**

1 **1.5. Required Capital Costs**

2

3 **Table-12: Capital Costs - College MS**

Job Estimate Number	Job Phase	Cost (\$, millions)	Projected Year of Execution
18761	X12352 – B7CD OH Feeder Voltage Conversion	\$1.33	2013
20567	X12353 – B4CD OH Feeder Voltage Conversion	\$1.63	2013
<b>Total:</b>		\$2.96	

/us  
/c

4 **1.6. Preferred Option for Feeders Supplied by College MS (B7CD, B4CD)**

5 Maintenance reports suggest that station assets in College MS are deteriorating, as shown in  
 6 Table-13 and Table-14 below.

7

8 **Table-13: College MS Transformer TR1 DGA results**

TR1	June 16, 2009	May 11, 2009	April 8, 2009
CO (PPM)	365*	412*	359*

9 **'\*\*'** indicates 'condition 2' status, meaning overheated cellulose insulation (transformer  
 10 insulation degradation, and eventual transformer failure) NOTE: 'PPM' means 'Parts Per Million'

11

12 Note that small changes in DGA readings can be attributed to change in solubility of gases into  
 13 mineral oil based on the oil temperature. For example, solubility of hydrogen into mineral oil  
 14 can increase up 79% over an oil temperature change from 0C to 80C.

**ICM Project | Box Construction Segment**

1 **Table-14: College MS Transformer TR3 DGA results**

TR3	December 15, 2009	April 8, 2009
Hydrogen (PPM)	217*	1,619**

2 '\*' indicates 'condition 2' status, and '\*\*' indicates 'condition 3' status meaning partial discharge  
 3 activity (intermittent conduction between windings, leads to eventual transformer failure)

4

5 Note that large changes in DGA readings can be caused by contamination during the oil  
 6 sampling. Regardless of the large difference in the reading in the above results, the lower value  
 7 in the more recent reading continues to indicate partial discharge activity is occurring between  
 8 the transformer windings.

9

10 The significant number of assets past their useful lives and assets projected to fail, along with  
 11 the safety concerns and increased complexity of box construction when compared to 13.8kV  
 12 overhead construction warrants executing these jobs.

13

14 Investing in converting legacy 4kV system to 13.8kV and decommissioning the station is  
 15 recommended.

16

17

18 **2. Conversion of Hazelwood MS Feeders (X11422, X12445)**

/c

19

20 **2.1. Objective**

21 The objective of these jobs is to prepare Hazelwood MS feeders for conversion from 4kV to  
 22 13.8kV for eventual decommissioning of Hazelwood MS. The main objective is to mitigate the  
 23 safety concerns from working around energized box construction, which is found on feeders  
 24 from Hazelwood MS. The benefits of completing this work are the elimination of safety hazards,  
 25 improved reliability and, when conversion is complete, reduced line losses. The equipment that  
 26 is being replaced is overhead 4kV distribution plant which includes conductor, poles,  
 27 transformers and switches.

} /c

## ICM Project | Box Construction Segment

### 1 2.3. Scope of Work

2 The scope of work in X11422, X12445 is to convert B7HW, B3HW and B5HW respectively from  
 3 4.16kV to 13.8kV.

4  
 5 **Table -16: Assets to be Replaced - Hazelwood MS**

Assets to be upgraded from 4.16kV to 13.8kV			
X11422		X12445	
Poles	96	Poles	200
Switches	8	Switches	7
Transformers	27	Transformers	23
Conductor	2.4 km	Conductor	6.8 km

### 6 2.4. Locations

7 The assets being replaced belong to B3HW, B5HW and B7HW and they are bounded by the area  
 8 Danforth Ave in the North, Jones Ave in the west, Felsted in the south and Coxwell in the east.

### 9 10 2.5. Required Capital Costs

11  
 12 **Table-17: Capital Costs - Hazelwood MS**

Job Estimate Number	Job Phase	Cost (\$, millions)	Projected Year of Execution
18629	X11422 – B7HW OH Feeder Voltage Conversion	\$1.82	2012
20919	X12445 – B3HW, B5HW OH Feeder Voltage Conversion	\$1.71	2013
<b>Total:</b>		\$3.53	

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## ICM Project | Box Construction Segment

---

1     **2.6. Preferred Option for Feeders Supplied by Hazelwood MS (B3HW, B5HW, B7HW)**

2     Maintenance reports suggest that station assets in Hazelwood MS need to be replaced in the  
3     2013 timeframe, as shown in Table-7, Table-8, and Table-9. It should be noted that these  
4     feeders need to be converted prior to 2013 in order to avoid 'like-for-like' replacement of legacy  
5     Hazelwood MS equipment by 2013.

6  
7     Furthermore, the significant number of assets past useful life, along with the potential safety  
8     risks and increased complexity of box construction when compared to 13.8kV overhead  
9     construction warrants executing these jobs.

10  
11     Decommissioning Hazelwood MS will also allow THESL to use MS land for other projects in the  
12     downtown area. See D for excerpt from a presentation that lists Hazelwood MS as a future  
13     switching location.

14  
15  
16     **3. Partial Conversion of Junction MS Feeders (X12325, X12193, X13177, X13178, ~~X12161 and~~** /c  
17     **~~X12194~~)**

18  
19     **3.1. Objectives**

20     The objective of these jobs is to prepare Junction MS feeders for conversion from 4.16kV to  
21     13.8kV for eventual decommissioning of Junction MS. The main objective is to mitigate the  
22     safety concerns from working around energized box construction, which is found on feeders  
23     from Junction MS. The benefits of completing this work are the mitigation of potential safety  
24     risks, improved reliability and, when conversion is complete, reduced line losses. The  
25     equipment that is being replaced is overhead 4kV distribution plant which includes conductor,  
26     poles, transformers and switches. Figure 20 shows an example of a typical box construction  
27     pole from Junction MS.

} /c

## ICM Project | Box Construction Segment

### 1 3.2. Historical Reliability Performance

2

3 **Table-18: Historical Reliability - Junction MS**

HISTORICAL RELIABILITY PERFORMANCE – Junction MS			
Reliability Metric	2008	2009	2010
Feeder CI	7,827	16,015	9,478
Feeder CHI	5,074	46,480	16,332

4 'CI' stands for 'Customers Interrupted' and 'CHI' stands for 'Customer Hours Interrupted'

5

### 6 3.3. Scope of Work

7 The scope of work in the following jobs is to convert most of the feeders from Junction MS to

8 13.8kV voltage.

- 9 • X12325: B15J
- 10 • X12193: B5J
- 11 • X13177: B8J
- 12 • X13178: B9J
- 13 • ~~X12161: B11J~~
- 14 • ~~X12194: B10J~~

15

16 **Table-19: Assets to be Replaced - Junction MS**

Assets to be upgraded from 4.16kV to 13.8kV	
Information from six conversion jobs	
Poles	231 Poles
Conductor	6.2 km

### 17 3.4. Locations

18 The assets being replaced belong to B5J, B8J, B9J, ~~B10J, B11J~~ and B15J in the general area of

19 Keele and Bloor Street.

**ICM Project | Box Construction Segment**

1 **3.5. Required Capital Costs**

2

3 **Table-20: Capital Costs - Junction MS**

<b>Job Estimate Number</b>	<b>Job Phase</b>	<b>Cost (\$, millions)</b>	<b>Projected Year of Execution</b>
20365	X12325 – B15J OH Feeder Voltage Conversion	\$3.64	2012
20368	X12193 – B5J OH Feeder Voltage Conversion	\$1.44	2013
20548	X13177 – B8J OH Feeder Voltage Conversion	\$0.21	2013
20476	X13178 – B9J OH Feeder Voltage Conversion	\$0.73	2013
20369	X12161 – B11J OH Feeder Voltage Conversion	\$2.14	2014
20366	X12194 – B10J OH Feeder Voltage Conversion	\$1.68	2014
<b>Total:</b>		<b>\$9.856.02</b>	

/US

4 **3.6. Preferred Option for Feeders Supplied by Junction MS (B15J, B5J, B8J, B9J, ~~B10J, B11J~~)**

/US

5 The significant number of assets past useful life, along with the potential safety risks and  
 6 increased complexity of box construction when compared to 13.8kV overhead construction (see  
 7 Table-3 and Table-8) warrants the undertaking of this conversion. Junction MS, which supplies  
 8 these feeders, is planned to be decommissioned in the future.

## ICM Project | Box Construction Segment

### 1 4. Conversion of Keele and St. Clair MS Feeders (X11369)

2

#### 3 4.1. Objectives

4 The objective of this work is to prepare Keele and St. Clair MS feeders for conversion from /c  
5 4.16kV to 13.8kV for eventual decommissioning of Keele and St Clair MS. The main objective is /c  
6 to mitigate the safety concerns from working around energized box construction which is found  
7 on these feeders. The benefits of completing this work are the elimination of safety hazards,  
8 improved reliability and, when conversion is complete, reduced line losses. The equipment that  
9 is being replaced is overhead 4kV distribution plant which includes conductor, poles,  
10 transformers and switches.

11

#### 12 4.2. Historical Reliability Performance

13

14 **Table-21: Historical Reliability - B1KS and B4KS**

HISTORICAL RELIABILITY PERFORMANCE – B1KS, B4KS			
Reliability Metric	2008	2009	2010
Feeder CI	1,745	2,538	1,102
Feeder CHI	3,241	1,743	2,931

15 'CI' stands for 'Customers Interrupted' and 'CHI' stands for 'Customer Hours Interrupted'

16

#### 17 4.3. Scope of Work

18 The scope of work in X11369 is to convert B1KS and B4KS from 4.16kV to 13.8kV.

**ICM Project | Box Construction Segment**

1 **5. Partial Conversion of Millwood MS Feeders (X11452\*, ~~X12129\*~~)** /C, /US

2

3 **5.1. Objectives**

4 The objective of these jobs is to prepare Millwood MS feeders for conversion from 4.16kV to /C  
 5 13.8kV for eventual decommissioning of Millwood MS. The main objective is to mitigate the /C  
 6 safety concerns from working around energized box construction, which is found on feeders  
 7 from Millwood MS. The benefits of completing this work are the mitigation of potential safety  
 8 risks, improved reliability and, when conversion is complete, reduced line losses. The  
 9 equipment that is being replaced is overhead 4kV distribution plant which includes conductor,  
 10 poles, transformers and switches.

11

12 **5.2. Historical Reliability Performance**

13

14 **Table-24: Historical Reliability - Millwood MS**

<b>HISTORICAL RELIABILITY PERFORMANCE – B2MD, <del>B3MD</del></b>			
Reliability Metric	2008	2009	2010
Feeder CI	0	1,010	0
Feeder CHI	0	1,128	0

/US

15 'CI' stands for 'Customers Interrupted' and 'CHI' stands for 'Customer Hours Interrupted'

16

17 **5.3. Scope of Work**

18 The scope of work of jobs X11452, ~~X12129~~ includes the conversion of B2MD and ~~B3MD~~  
 19 respectively from 4.16kV to 13.8kV. Jobs X11452 and ~~X12129~~ also involves one or more feeders  
 20 from Merton station, as discussed below.

21

22 **Table-25: Assets to be Replaced - Millwood MS**

<b>Assets to be upgraded from 4.16kV to 13.8kV</b>	
Poles	130
Switches	9
Transformers	27
Conductor	3,100 m

/US

**ICM Project | Box Construction Segment**

1 **5.4. Locations**

2 Boundaries for this work are outlined in Table-26.

3

4 **Table-26: Project Boundaries for Millwood MS Conversion**

Project	Feeders	North Boundary	South Boundary	East Boundary	West Boundary
X11452	B1MR	Manor Road East	Belsize Drive	Bayview Avenue	Mt. Pleasant Road
<del>X12129</del>	<del>B2MR</del>	<del>Millwood Road</del>	<del>Merton Road</del>	<del>Bayview Avenue</del>	<del>Mt. Pleasant Road</del>

/us

5 **5.5. Required Capital Costs**

6

7 **Table-27: Capital Costs**

Job Estimate Number	Job	Cost (\$, millions)	Projected Year of Execution
18738	X11452 Millwood MS: B2MD, B1MR Partial Voltage Conversion*	\$2.73	2012
<del>19632</del>	<del>X12129 Millwood MS: B3MD, Merton MS B2MR Voltage Conversion*</del>	<del>\$4.84</del>	<del>2014</del>
<b>Total</b>		<del>\$7.57</del> <b>2.73</b>	

/us

8 \*Jobs convert feeders in both Merton MS and Millwood MS. Job cost included in Merton MS as  
 9 well

10

11 **5.6. Preferred Option for Feeders Supplied by Millwood MS (B2MD, ~~B3MD~~)**

The information on the preferred option for Millwood MS is discussed in section 6.6 below in association with the work on feeders from Merton MS.

**ICM Project | Box Construction Segment**

1 **6. Partial Conversion of Merton MS feeders (X11452, ~~X12129, X12142, X12145, X12174,~~** /US  
 2 **~~X12143~~)**

3  
 4 **6.1. Objectives**

5 The objective of these jobs is to prepare Merton MS feeders for conversion from 4.16kV to } /c  
 6 13.8kV for eventual decommissioning of Merton MS. The main objective is to mitigate the  
 7 potential safety risks from working around energized box construction, which is found on  
 8 feeders from Merton MS. Jobs X11452 and ~~X12129~~ also involves one or more feeders from /US  
 9 Millwood station. The benefits of completing this work are mitigation of potential safety risks,  
 10 improved reliability and, when conversion is complete, reduced line losses. The equipment that  
 11 is being replaced is overhead 4kV distribution plant which includes conductor, poles,  
 12 transformers and switches.

13  
 14 **6.2. Historical Reliability Performance**

15  
 16 **Table-28: Historical Reliability - Merton MS**

HISTORICAL RELIABILITY PERFORMANCE – B1MR, B2MR, B3MR, B5MR			
Reliability Metric	2008	2009	2010
Feeder CI	2,910	5,158	3,099
Feeder CHI	785	5,545	4,321

17 **6.3. Scope of Work**

18 The scope of work for the jobs listed in Table-29 is to convert feeders B1MR, ~~B2MR, B3MR,~~ /US  
 19 ~~B5MR~~ from 4.16kV to 13.8kV.

20  
 21 **Table-29: Assets to be Replaced - Merton MS**

Assets to be upgraded from 4.16kV to 13.8kV	
Poles	33
Switches	7
Transformers	8
Conductor	820 m

**ICM Project | Box Construction Segment**

1 **6.4. Locations**

2 The boundaries for this work are outlined in Table-30.

3

4 **Table-30: Project Boundaries for Merton MS Conversion**

Project	Feeders	North Boundary	South Boundary	East Boundary	West Boundary
X11452	B1MR	Manor Road East	Belsize Drive	Bayview Avenue	Mt.Pleasant Road
X12129	B2MR	Millwood Road	Merton Road	Bayview Avenue	Mt.Pleasant Road
X12142	B2MR	Moore Avenue	St.Clair Avenue East	Bayview Avenue	Mt.Pleasant Road
X12145	B3MR	Moore Avenue	Garfield Avenue	Bayview Avenue	Avoca Avenue
X12174	B5MR	Various			
X12143	B1MR,B2MR	Manor Road	Davisville Avenue	Mt.Pleasant Road	Yonge Street

} /us



**ICM Project | Box Construction Segment**

1 **6.5. Required Capital Costs**

2

3 **Table-31: Capital Costs**

<b>Job Estimate Number</b>	<b>Job</b>	<b>Cost (\$, millions)</b>	<b>Projected Year of Execution</b>
18738	X11452 Millwood MS: B2MD, B1MR Partial Voltage Conversion*	\$2.73	2012
19632	X12129 Millwood MS: B3MD, Merton MS B2MR Voltage Conversion*	\$4.84	2014
19712	X12142 Convert 4kV Merton Feeder B2MR to 13.8kV System B2MR	\$0.62	2014
19711	X12145 Convert 4kV Merton Feeder B3MR to 13.8kV System B2MR	\$1.11	2014
19977	X12174 Convert 4kV Merton MS Feeder B5MR to 13.8kV System TOB5MR	\$3.78	2014
19706	X12143 Convert 4kV Merton Feeder B1MR, B2MR to 13.8kV System B1MR B2MR	\$2.24	2014
<b>Total</b>		<b>\$15.312.73</b>	

/US

4 \*Jobs convert feeders in both Merton MS and Millwood MS. Job cost included in Millwood MS  
 5 as well.

**ICM Project | Box Construction Segment**

1 **6.6. Preferred Option for Feeders Supplied by Millwood MS (B2MD, ~~B3MD~~) and Merton**  
 2 **MS (B1MR, ~~B2MR, B3MR, B5MR~~)**

} /us

3 Maintenance reports suggest that station assets in Merton MS are deteriorating, as shown in  
 4 Table-32.

6 **Table-32: Merton MS Transformer TR1 DGA results**

TR1	March 5, 2010
CO(PPM)	361*

7 *'\** indicates 'condition 2' status, meaning overheated cellulose insulation (transformer  
 8 insulation degradation, and eventual transformer failure)

9  
 10 The significant number of assets past useful life, along with the safety concerns and increased  
 11 complexity of box construction when compared to 13.8kV overhead construction warrants  
 12 executing these jobs.

15 **7. Partial Conversion of Dufferin MS (X12054, X12506, X14202)**

17 **7.1. Objectives**

The objective of these jobs is to prepare Dufferin MS for conversion from 4.16kV to 13.8kV to mitigate potential safety risks from working around energized box construction. The expected benefits of completing this work are the mitigation of potential safety risks, improved reliability and, when conversion is complete, reduced line losses. .

**ICM Project | Box Construction Segment**

1 **7.5. Required Capital Costs**

2

3 **Table-35: Capital Costs**

Job Estimate Number	Job Phase	Cost (\$, millions)	Projected Year of Execution
22242	X12054 – Voltage Conversion from 4kV to 13.8kV (B5DN)	\$1.81	2013
21101	X12506 – Voltage Conversion from 4kV to 13.8kV (B4DN)	\$0.17	2013
<del>23358</del>	<del>X14202 – Voltage Conversion from 4kV to 13.8kV (B3DN)</del>	<del>\$2.07</del>	<del>2014</del>
<b>Total:</b>		<b>\$8.271.98</b>	

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/UF, US

4 **7.6. Preferred Option for Feeders Supplied by Dufferin MS (B3DN, B4DN, B5DN)**

5 Maintenance reports suggest that station assets in Dufferin MS are deteriorating, as shown in  
 6 Table-36.

7

8 **Table-36: Dufferin MS Transformer TR1 DGA results**

TR1	April 8, 2009	March 23, 2006
CO(PPM)	386*	398*

9 *‘\** indicates ‘condition 2’ status, meaning overheated cellulose insulation (transformer  
 10 insulation degradation, and eventual transformer failure)

11

12 Note that small changes in DGA readings can be caused by changes in solubility of gases into  
 13 mineral oil based on the oil temperature. For example, solubility of hydrogen into mineral oil  
 14 can increase up 79% over an oil temperature change from 0C to 80C.

**ICM Project | Box Construction Segment**

1 The significant number of assets past their useful lives and assets projected to fail, along with  
 2 the potential safety risks and increased complexity of box construction when compared to  
 3 13.8kV overhead construction warrants executing these jobs.

4  
 5 Decommissioning Dufferin MS will also allow THESL to use MS land for other projects in the  
 6 downtown area. See D for excerpt from a presentation that lists Dufferin MS as a future  
 7 switching location.

8  
 9

10 **8. Partial Conversion of Dupont MS Feeders (X12055, ~~X13176~~, X13003)** /c

11

12 **8.1. Project Objectives**

13 The objective of these jobs is to prepare Dupont MS feeders for conversion from 4.16kV to  
 14 13.8kV system for eventual decommissioning of Dupont MS. The main objective is to mitigate  
 15 potential safety risks from working around energized box construction. The benefits of  
 16 completing this work are the mitigation of safety risks, improved reliability and, when  
 17 conversion is complete, reduced line losses.

} /c

18

19 **8.2. Historical Reliability Performance**

20

21 **Table-37: Historical Reliability - Dupont MS**

HISTORICAL RELIABILITY PERFORMANCE – B2DU, B4DU and B6DU			
Reliability Metric	2008	2009	2010
Feeder CI	2,604	1,806	835
Feeder CHI	79,190	272,672	51,770

22 **8.3. Scope of Work**

23 The scope of work described in X12055, ~~X13176~~ and X13003 is to convert the Dupont MS  
 24 feeders B-2-DU, ~~B-4-DU~~ and B-6-DU from 4.16kV to 13.8kV system.

} /us

**ICM Project | Box Construction Segment**

1 **Table-38: Assets to be Replaced - Dupont MS**

Assets to be upgraded from 4.16kV to 13.8kV system					
X12055		X13176		X13003	
Poles	226	Poles	228	Poles	208
Switches	31	Switches	28	Switches	21
Transformers	38	Transformers	46	Transformers	39
Conductor	4.08 km	Conductor	5.12 km	Conductor	4.66 km

} /US

2 **8.4. Locations**

3 The assets being replaced belong to feeders B-2-DU, ~~B-4-DU~~ and B-6-DU. B-2-DU is located  
 4 around the intersection of Garnet Ave and Shaw Street. ~~B-4-DU is located around the~~  
 5 ~~intersection of Davenport Rd and Ossington Avenue.~~ B-6-DU is bounded by the area of  
 6 Rosemount Ave in the north, Westmount Avenue in the west, Davenport Rd in the south and  
 7 Winona Dr in the east.

} /US

8  
 9 **8.5. Required Capital Costs**

10  
 11 **Table-39: Capital Costs**

Job Estimate Number	Job Phase	Cost (\$, millions)	Projected Year of Execution
20992	X12055 – Voltage Conversion from 4kV to 13.8kV (B2DU) (DESIGN ONLY)	\$0.23	2012
19966	<del>X13176 – Voltage Conversion from 4kV to 13.8kV (B4DU)</del>	<del>\$3.67</del>	<del>2014</del>
19984	X13003 – Voltage Conversion from 4kV to 13.8kV (B6DU)	\$1.48	2013
<b>Total:</b>		<b>\$9.871.71</b>	

} /UF, US

**ICM Project | Box Construction Segment**

**8.6. Preferred Option for Feeders Supplied by Dupont MS (B-2-DU, ~~B-4-DU~~ and B-6-DU)**

/US

The significant number of assets past useful life, along with the safety concerns and increased complexity of box construction when compared to 13.8kV overhead construction warrants the undertaking of this conversion. Stations supplying these feeders (Dupont MS) are planned to be decommissioned going forward.

~~**9. Partial Conversion of High Level MS (X13362)**~~

~~**9.1. Objectives**~~

~~The objective of this work is to convert this feeder from 4.16kV to 13.8kV. Merton MS cannot be decommissioned before this Highlevel MS feeder is converted to 13.8kV, as B4MR from Merton MS is the standby feeder for B7H. This job will also mitigate the potential safety risks from working around energized box construction. The expected benefits of completing this work are the mitigation of safety risks, improved reliability and, when conversion is complete, reduced line losses.~~

~~**9.2. Historical Reliability Performance**~~

~~**Table 40: Historical Reliability – High Level MS**~~

<del><b>HISTORICAL RELIABILITY PERFORMANCE – B-7-H</b></del>			
<del><b>Reliability Metric</b></del>	<del><b>2008</b></del>	<del><b>2009</b></del>	<del><b>2010</b></del>
<del>Feeder CI</del>	<del>1,196</del>	<del>1,794</del>	<del>598</del>
<del>Feeder CHI</del>	<del>26,312</del>	<del>88,504</del>	<del>29,900</del>

~~**9.3. Scope of Work**~~

~~The scope of work described in X13362 is to completely convert the High Level feeder B-7-H from 4.16kV to 13.8kV.~~

## ICM Project | Box Construction Segment

1 **Table 41: Assets to be Replaced – High Level MS**

<b>Assets to be upgraded from 4.16kV to 13.8kV system</b>	
X13362	
Poles	87
Switches	10
Transformers	25 (1-Phase), 1 (3-Phase)
Conductor	1.581 km (1-Phase), 1.315 km (3-Phase)

2 **9.4. — Locations**

3 The assets being replaced belong to feeder B-7-H. The overhead section of this feeder is located  
 4 the intersection of Inglewood Drive and MacLennan Avenue. There is an underground portion to  
 5 feeder B7H that runs from Highlevel MS (MacPherson Avenue and Rathnelly Avenue) east along  
 6 Cottingham Street/Shaftesbury Avenue/Summerhill Avenue to a riser at the intersection of  
 7 Summerhill Avenue and MacLennan Avenue. Because the load on this feeder will be taken on  
 8 by 13.8kV feeders in the vicinity (A22L and A360CS), this underground portion will be removed.

9 **9.5. — Required Capital Costs**

10  
 11 **Table 42: Capital Costs**

<b>Job Estimate Number</b>	<b>Job Phase</b>	<b>Cost (\$, millions)</b>	<b>Projected Year of Execution</b>
24076	X13362 – Convert 4kV B7H feeder to 13.8kV system (TOB7H)	\$2.38	2014
<b>Total:</b>		<b>\$2.38</b>	

12 **9.6. — Preferred Option for Feeder Supplied by High Level MS (B-7-H)**

13 The significant number of assets past useful life, along with the potential safety risks and  
 14 increased complexity of box construction when compared to 13.8kV overhead construction  
 15 warrants the undertaking of this conversion. High Level MS supplying this feeder is planned to  
 16 be decommissioned going forward.

**ICM Project | Box Construction Segment**

1 **Table-2: Business Case Evaluation Shows Costs of Maintaining Status Quo Exceed Capital**

2 **Projects Cost**

<b>Business Case Element</b>	<b>Cost (in Millions)</b>
<b>Cost of Ownership of Existing Box Construction (COO<sub>E</sub>)</b>	
Projected risk cost of existing box construction feeders (PV)*	\$40.3M
Projected risk cost of existing Stations (PV)**	\$17.4M
Projected non-asset risk cost of existing 4kV overhead (PV)	\$ 64.7M
Stations Maintenance for existing system (PV)***	\$2.4M
4kV line losses relative to 13.8kV feeders (PV)	\$10.4M
<b>TOTAL (COO<sub>E</sub>)</b>	<b>\$ 135.2M</b>
<b>Cost of Ownership of New Standardized Overhead Construction (COO<sub>N</sub>)</b>	
Projected risk cost of converted feeders (PV)****	-\$7.5M
Projected non-asset risk cost of new 13.8kV overhead (PV)	-\$ 53.6M
<b>TOTAL (COO<sub>N</sub>)</b>	<b>-\$ 61.1M</b>
<b>PROJECT COST</b>	<b>-\$58.5M</b>
<b>PROJECT NPV</b>	<b>\$15.6M</b>

/c

/c

/c

3 \*'Projected risk cost of existing construction feeders (PV)' represents FIM analysis of relevant  
 4 existing 4kV box construction feeders, or cost of ownership of those feeder assets.

5 \*\*'Stations (NPV)' represents FIM analysis of relevant 4kV MSs, or cost of ownership of those  
 6 assets. The cost of ownership of the replacement is \$0 (4kV load from MS being taken on by  
 7 existing 13.8kV stations, not new stations), so that value was used in the business case.

8 \*\*\*'Stations Maintenance for existing system (PV)' represents the average annual cost of  
 9 maintenance for each relevant MS (average based on projected costs for 2012-2021), and then  
 10 projected out indefinitely which assumes the existing case will remain (100 years was used).

11 \*\*\*\*'Projected risk cost of converted feeders (PV)' represents FIM analysis of the converted  
 12 13.8kV feeders, or cost of ownership of those new feeder assets.



# ICM Project – Overhead Infrastructure and Equipment

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## Rear Lot Construction Segment



## ICM Project | Rear Lot Construction Segment

---

1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$55.10 M to \$45.78 M, a reduction of \$9.32 M
- 3 • Reduced number of jobs proposed from 30 to 26 with jobs for 2014 to be addressed in
- 4 Phase Two
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system
- 8 • Revised FIM model results to correct non-asset related risk calculation
- 9 • Corrected numerical and typographical errors

**ICM Project | Rear Lot Construction Segment**

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## ICM Project | Rear Lot Construction Segment

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1    **I       EXECUTIVE SUMMARY**

2

3    **1.       Project Description**

4

5    THESL is requesting approximately \$45.57million in ICM funding to finance non-discretionary       /UF, US  
6    civil and infrastructure jobs related to rear lot conversion between 2012 to2013. This amount is  
7    broken into discrete jobs, totalling approximately \$24.15 million in 2012, and \$21.42 million in       /UF, US  
8    2013. A detailed description of all the jobs, by year, is provided in Part V below.               /UF, US

9

10   The rear lot conversion segment responds to the critical need to move the distribution service  
11   currently located in backyards to the street, for reasons of safety, reliability and cost.

12

13   Rear lot service was implemented in certain Toronto neighbourhoods in the 1950s and 1960s.  
14   The equipment providing rear lot service is past its useful life and difficult to access and repair.  
15   As a result of its age and condition, THESL expects that this equipment will continue to fail at an  
16   increasing rate and when it does, efforts to repair it create safety, equipment availability and  
17   cost issues.

18

19   This segment will remove rear lot service in targeted areas that currently pose potential safety  
20   risks, greater reliability concerns and higher repair costs. It will be replaced with standard  
21   underground service constructed to current specifications. The result of the move to standard  
22   service will be reduced safety risks, improved reliability, and reduced costs to repair.

23   The work to be undertaken in each year covered by this application has been selected based on  
24   two factors:

- 25   (a) The priority associated with each specific rear lot conversion job; the need to undertake  
26       work in a logical sequence that reflects good planning, distribution contingencies and the  
27       local impacts of construction; and  
28   (b) The amount of work THESL can complete in a given year.

29

## ICM Project | Rear Lot Construction Segment

---

1 Each year's funding request represents THESL's current plans for rear lot conversions in that  
2 year and the funding approved will be used for this purpose. These jobs represent incremental  
3 capital spending that is above and beyond that anticipated when current rates were approved.  
4

### 5 **2. Why the Project is Needed Now**

6

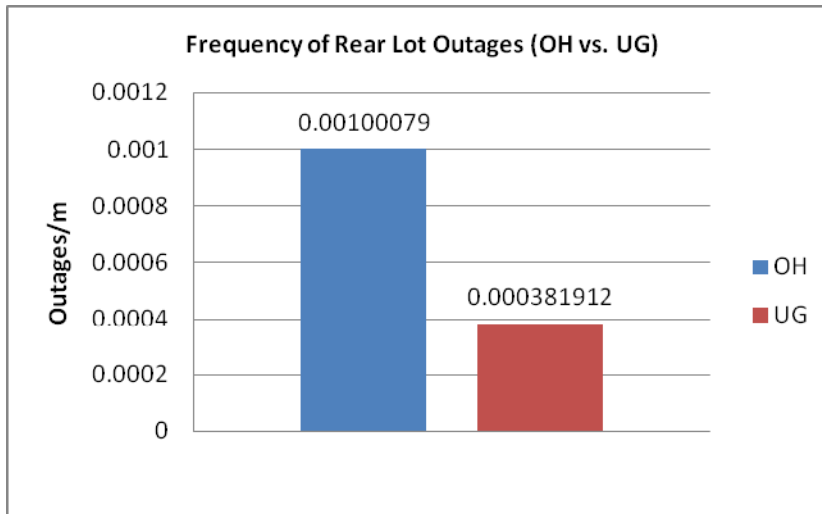
7 THESL believes that the rear lot conversion work is non-discretionary for the reasons that follow.  
8

9 If no action is taken, outages, safety risks, and costs resulting from rear lot equipment will likely  
10 accelerate to unacceptable levels. In addition to the acceleration in failure rates of the rear lot  
11 equipment, studies have shown that underground assets are more reliable and reduce  
12 maintenance costs compared to their overhead counterparts.<sup>1</sup> Typical outage restoration times  
13 for rear lot plant outages are more than twice those of front lot outages. Thus, customers  
14 supplied via the rear lot may experience outage durations that are much longer than normal.  
15 Additionally, for a typical rear lot outage, the likelihood of an outage occurring is significantly /c  
16 higher for the overhead system. The graph below presents the levels of the typical outages of /c  
17 overhead (OH) construction versus underground (UG) construction.

---

<sup>1</sup> Fenrick, S.A., and Lullit Getachew. "Cost and Reliability Comparisons of Underground and Overhead Power Lines". *Utilities Policy*, Volume 20, Issue 1, March 2012, pages 31-37.

## ICM Project | Rear Lot Construction Segment



1 **Figure 1: Frequency of Typical Rear Lot Outages (OH vs. UG)**

2  
3  
4 This segment is necessary to address the many critical issues inherent in rear lot service due to  
5 its location, and the age and condition of the equipment providing this service. The nature of  
6 these issues requires that they be addressed immediately or they will continue to pose potential  
7 safety risks to THESL crews and the public. Failure to address rear lot construction would also  
8 perpetuate ongoing cost and reliability issues, as THESL will be required to undertake expensive  
9 and time-consuming repairs on equipment that is past its useful life and difficult to access and  
10 maintain.

11  
12 The specific reasons that require this segment to be undertaken now are:

- 13
- 14 • Operational constraints – THESL field crews are constantly challenged to access customers’  
15 rear lot plant due to physical inability to use the machinery typically employed for  
16 distribution system repairs (e.g., bucket trucks, cranes and drilling machines). As a result,  
17 crews are at times required to hand-carry heavy assets such as poles and transformers to  
effect repairs. This increases potential physical risks to the crews, particularly at night and in



## ICM Project | Rear Lot Construction Segment

1 **Table 1: Summarization of business case results**

Business Case Element	Cost (in Millions)	
<b>Option 1: Status Quo (Remediation on a As-Needed Basis)</b> Cost of Ownership of Existing Rear Lot Construction [COO <sub>E</sub> ]	\$111.11	/c
<b>Option 2: Like-for-Like Replacement of Existing O/H Rear Lot with New O/H Rear Lot</b> Cost of Ownership of New O/H Rear Lot [COO <sub>RL</sub> ]	\$105.53	/c
<b>Option 4: Replacement of Existing O/H Rear Lot with New U/G Front Lot</b> Cost of Ownership of New U/G Front Lot [COO <sub>UG</sub> ]	\$11.98	/c
Upfront Project Cost (Option 1) [COST <sub>E</sub> ]	\$0	
Upfront Project Cost (Option 2) [COST <sub>RL</sub> ]	\$7.36	
Upfront Project Cost (Option 4) [COST <sub>UG</sub> ]	\$66.14	
<b>Option 2 versus Option 1 NPV [(COO<sub>E</sub> – COO<sub>RL</sub>) – COST<sub>RL</sub>]</b>	<b>-\$1.78</b>	/c
<b>Option 4 versus Option 1 NPV [(COO<sub>E</sub> – COO<sub>UG</sub>) – COST<sub>UG</sub>]</b>	<b>\$32.99</b>	/c
<b>Non-quantified benefits of Option 4 include: Increased employee and public safety and enhanced property values</b>		

2 From the Table above, Option 4 has the highest NPV and is the economically preferable and  
 3 most prudent option. The estimated value of the project is higher than Options 1, 2, and 4.  
 4 Option 4 provides an NPV of \$32.99 million, which represents the difference between the /c  
 5 current (existing rear lot) and future (new underground front lot) costs of ownership values  
 6 reduced by the total project cost of \$66.14M. This Option provides the most distinct economic  
 7 benefits to executing this work immediately. These results, as well as the business case  
 8 evaluation process, are further explained within the Appendix section. Additional benefits are  
 9 difficult to quantify, such as increased safety and property values. However, while these

## ICM Project | Rear Lot Construction Segment

---

1 Instead, crews must manually carry and operate equipment, often in tight and confined areas.  
2 Limited access becomes especially concerning during night-time and winter month restorations  
3 when visibility and footing, respectively, are poor. This ultimately results in a higher potential of  
4 injury to THESL crews due to slips, trips, falls, and muscle strain. Injuries due to such incidents in  
5 rear lots have been reported in recent years. /c

6 The proximity of rear lot plants to customers' backyards and homes presents a potential safety  
7 risk. Poles, energized cable, conductors, switches, and transformers can all be in close proximity  
8 to outdoor features and activities on customer property. Examples include sheds, eaves,  
9 trampolines, clotheslines, and pools.

10

11 In addition, there are characteristics of rear lot plant that tend to lead to increased outages.  
12 Due to the great number of mature trees in rear lot areas, animal and tree contact are frequent  
13 cause of outages.

## ICM Project | Rear Lot Construction Segment

---

- 1     • 12 occurred during adverse weather conditions; and  
2     • Four resulted from tree contacts.

3  
4     Rear lot configuration causes inconvenience to customers, due to potential interference with  
5     certain aspects of their properties, such as landscape, fences, gates, sheds, and pools. Work on  
6     rear lot facilities also may require people to confine their pets.

7  
8     Obtaining new easements from customers is also difficult. New easements require the consent  
9     of customers. They are often very reluctant to provide their consent, since customers typically  
10    do not want poles and other facilities on their property.

11  
12    In many cases, critical portions (of the primary trunk) of 4kV feeders are situated in the rear lot  
13    distribution plant. Therefore, an outage that occurs on the trunk portion of a feeder will disrupt  
14    service to all customers on that feeder. Rear lot jobs are also driven by the short-term need to  
15    convert 4kV feeders supplied by stations that are reaching the end of their serviceable lives and  
16    need to be decommissioned.

17  
18    Since highly complex rear lot conversion jobs are lengthy, some jobs are already in the middle of  
19    multi-year phases. Many stakeholders must be committed from start-to-finish to these jobs.  
20    These stakeholders include other utilities, such as Bell and Rogers, the City of Toronto (road  
21    reconstruction), and area residents, who are subjected to disruptions and construction impacts  
22    for extended periods of time.

23  
24    Figure 16 illustrates an already completed civil phase of a job awaiting electrical installation. In  
25    anticipation of funding for rear lot conversion, the civil construction for some of the rear lot jobs  
26    was initiated in 2011. Should Option 1 (Refer to Section IV: Alternatives for Addressing Rear Lot  
27    Construction) be selected and the proposed conversion activities postponed, THESL will have to  
28    return to these areas in 2015 (the anticipated next re-basing year) to complete the conversion  
29    work. This will result in further customer disruptions three years from now.

## ICM Project | Rear Lot Construction Segment



1 **Figure 16: Civil work that has been completed in the Rexdale Colony rear lot area, awaiting**  
2 **electrical installation (photo taken in 2012)**

3

4 Since most of these jobs take two to four years to complete (in phases), the failure to complete  
5 existing jobs between 2012-2013 means that these jobs may not be completed before 2016. /us

6 This would likely turn a two-year job into a five-year job for residents of these neighbourhoods  
7 and result in new customer disruptions and dissatisfaction. As well, in these instances, THESL  
8 crews and the public likely would continue to be exposed to all the risks previously discussed.

9 Thus, in the case of completed civil construction, it is particularly important to complete the  
10 electrical portion of the jobs and remove all rear lot assets. Doing so is expected to both  
11 increase system reliability and improve the safety of THESL's crews and the owners of properties  
12 served by rear lot construction.

13

### 14 **6. Conclusions Regarding Need**

15 The jobs proposed for 2012 and 2013 (Refer to Section V: Detailed Description of the Work)  
16 represent the work that must be undertaken in those years based on the considerations with  
17 respect to need, as discussed above. Should the rear lot conversion work be deferred to /us

## ICM Project | Rear Lot Construction Segment

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1 2015, these assets will continue aging beyond their useful service lives and their condition will  
2 continue to deteriorate. As a result, there will be a corresponding increase in the probability of  
3 high-impact outages in the areas with rear lot service. Reliability in these neighbourhoods will  
4 continue to decrease and maintenance and repair costs will continue increasing.

5

6 Rear lot conversion is targeted to neighbourhoods with the least reliable, oldest and worst  
7 condition rear lot distribution plants. The existing rear lot overhead feeders are mostly 4 kV and  
8 are often fed by direct-buried underground links. The rear lot areas designated for immediate  
9 conversion have experienced excessive outage durations, typically lasting between four to eight  
10 hours. Seven of the feeders being addressed in these rear lot areas have experienced at least /US  
11 one outage over 15 hours in duration during the last five years.

12

13 It is important to note that rear lot conversion jobs are typically multiphase initiatives, spread  
14 over two to four years. Due to this fact and the nature of the antiquated rear lot design,  
15 multiple feeders will require decommissioning in order to adequately reconfigure a front lot  
16 design. Further, 4kV tie point assessments will be required, which further complicate and  
17 lengthen the time required to complete rear lot conversions. For these reasons, once the  
18 rebuild of a 4kV area with rear lot service commences, it is prudent to convert all of the  
19 remaining rear lot supply in the area in a timely manner.

**ICM Project | Rear Lot Construction Segment**

1 **Table 6: Summary of the two rear lot conversion options**

Criteria	Option 3 OH	Option 4 UG
Safety	Favourable	Highly Favourable
Customer Service Initiative	Least Favourable	Highly Favourable
Corporate Communications	Least Favourable	Highly Favourable
Customer Acceptance	Least Favourable	Highly Favourable
City Approvals	Least Favourable	Favourable
Reliability	Least Favourable	Highly Favourable
Tree Trimming	Least Favourable	Favourable
Construction Cost (Initial)	Highly Favourable	Least Favourable
Service Connections	Least Favourable	Favourable
Scheduling	Least Favourable	Favourable

2  
 3 As is evident from Table 6, Option 4 (replacement with underground front lot distribution  
 4 assets) is the more favourable option on every dimension, except initial construction cost. This  
 5 Option's higher initial construction cost is expected to be overcome, however, by the lower  
 6 overall cost of ownership including lower maintenance, community engagement, and customer  
 7 outage cost. When comparing the overhead and underground front lot options, the  
 8 underground solution provides a cost of ownership that is approximately \$99.13M less when  
 9 compared to the overhead solution. This difference in cost of ownership is due to the reduced  
 10 risks associated with the underground plant when compared to the overhead plant, when  
 11 accounting for risks pertaining to asset failure as well as non-asset-related risks associated with  
 12 weather, animal and human-related events, which are directly associated to the overhead  
 13 system. As Option 4 is expected to be the most favourable option from the customers'  
 14 perspective, it is recommended.

/c

## ICM Project | Rear Lot Construction Segment

### 2. Economic Benefits of the Preferred Alternative

The effectiveness of the rear lot segment can be further highlighted by determining the difference in cost of ownership between the current overhead rear lot asset class and the future underground front lot asset class proposed to be installed. The cost of ownership for each state, current and future, includes quantified risk cost, which is the product of the assets' probability of failure and the various direct and customer costs associated with asset failures. The costs considered include those related to customer interruptions, emergency repairs and replacement. In addition, risks that are unrelated to asset age and condition, such as animal-related, human-related and weather-related events, are also considered.

Carrying out immediate work on this asset class will result in a net present value of approximately \$32.99M, which represents the difference between the current and future costs of ownership values reduced by the total segment cost of \$66.14M. Thus, there are quantifiable social and economic benefits expected from executing this work immediately. These results, as well as the business case evaluation process, are further explained in the Appendix in Section VI below.

In the following table, the NPV of Options 2 and 4 are shown relative to the remediation alternative (Option 1). These estimates demonstrate the economic value of Option 4 relative to Option 1 and Option 2. The details and assumptions behind these figures are shown in the Appendix in Section VI.

**Table 7: NPV of each Option relative to Option 1**

Alternatives*	NPV (in Millions)
Option 2 vs. Option 1 (Like-for-Like Replacement of Rear Lot)	-\$1.78
Option 4 vs. Option 1 (Replace Rear Lot with Front Lot U/G)	\$32.99

\*Option 3 was not considered as part of this quantitative analysis, as it was determined not to be a feasible solution for the reasons noted in the Appendix.

**ICM Project | Rear Lot Construction Segment**

1 **V DESCRIPTION OF WORK**

2

3 **1. Listing of All Jobs**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Cost Estimate (\$M)</b>
<b>21138</b>	X12113 Forest Hill Rear Lot Voltage Conversion Phase 4 – electrical	2012	\$3.92
<b>24342</b>	X11293 Forest Hill Rear Lot Voltage Conversion Phase 5 – civil	2012	\$3.32
<b>21034</b>	W12561 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 1	2012	\$1.00
<b>21250</b>	W12562 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 2	2012	\$0.21
<b>21251</b>	W12563 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 3	2012	\$0.47
<b>22607</b>	E12615 Banbury Larkfield RL Rebuild UG VC SS37F2_F4 Ph 2-Electrical	2012	\$1.51
<b>19501</b>	E12076 Banbury Larkfield RL Rebuild - Ph 1 – Elec	2012	\$2.55
<b>18580</b>	E11382 Livingston Guildwood VC Rear Lot Rebuild SCGGF1	2012	\$5.33
<b>24854</b>	E11383 Livingston Guildwood Part 2 OH VC SCGGF1	2012	\$0.94
<b>20677</b>	W11219 Rathburn SAF1 Rear Lot Conversion	2012	\$2.85

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**ICM Project | Rear Lot Construction Segment**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Cost Estimate (\$M)</b>
<b>21321</b>	W11168 Albion F1 Silverstone Rear Lot Conversion	2012	\$2.05
<b>2012 Total</b>			<b>\$24.15</b>
<b>20012</b>	X12114 Forest Hill Rear Lot Voltage Conversion Phase 5 – electrical	2013	\$3.05
<b>21155</b>	W12564 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 4	2013	\$1.18
<b>21248</b>	W12565 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 5	2013	\$1.03
<b>21252</b>	W12566 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 6	2013	\$0.09
<b>21320</b>	W12567 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 7	2013	\$0.17
<b>21315</b>	W13195 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 8	2013	\$1.24
<b>19755</b>	X12184 S/E Lawrence/Leslie P1 Electrical	2013	\$0.19
<b>19757</b>	X12185 S/E Lawrence/Leslie P2 Electrical	2013	\$0.97
<b>19759</b>	X12186 S/E Lawrence/Leslie P3 Electrical	2013	\$0.58
<b>20662</b>	W12381 Rear Lot #011 Civil Infrastructure Ph#1	2013	\$3.24
<b>20714</b>	W12401 Rear Lot #011 Civil Infrastructure Ph#2	2013	\$2.22
<b>20808</b>	W13019 Rear Lot #011 Ph#2 Electrical VC	2013	\$1.08
<b>21211</b>	W13067 Thorncrest (#011) RL VC Ph#3 Civil/Elec	2013	\$0.92
<b>21213</b>	W13068 Thorncrest (#011) RL VC Ph#4 Civil/Elec	2013	\$0.64
<b>21185</b>	W13142 Thorncrest (#011) RL VC Ph#5 Civil	2013	\$4.82
<b>2013 Total</b>			<b>\$21.42</b>

/UF, US

**ICM Project | Rear Lot Construction Segment**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Cost Estimate (\$M)</b>
<b>21484</b>	W11726 Markland Woods Rear Lot VC phase 1 Civil	2014	\$5.63
<b>24945</b>	W11726 Markland Woods Rear Lot VC phase 1 Electrical	2014	\$5.40
<b>2014 Total</b>			<b>\$11.03</b>
<b>2012 – 2013 Jobs Total</b>			<b>\$45.57</b>
<b>Reconciliation for job cost changes &lt; \$100,000 and rounding</b>			<b>\$ 0.21</b>
<b>2012 – 2013 Reconciled Total</b>			<b>\$45.78</b>

} /UF, US

## ICM Project | Rear Lot Construction Segment

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1     **2.       Forest Hill Rear Lot (X12113, X11293, X12114)**

2

3     **2.1      Objectives**

4     The purpose of this job is to improve reliability in the Forest Hill area by converting the rear lot  
5     electrical equipment from the following 4kV feeders to front lot underground: B72EG from  
6     Eglinton MS, B1CP from Chaplin MS, and B1OV and B5OV from Overdale MS. As discussed  
7     above, converting rear lot service is also expected to reduce safety risks for THESL crews and  
8     area residents and reduces outage time by eliminating access issues. Indeed, during 2010, a  
9     crew member suffered a knee injury in this area due to a slip, trip, and fall incident.

10

11    This job should be constructed in 2012-2013 since the area residents in the Forest Hill area     /us  
12    already have experienced construction disruptions for four years. This job represents the final  
13    phases for conversion of the area. As such, further delays to job completion would negatively  
14    impact the area residents. Further, half of the area proposed for this job already has civil  
15    construction completed. The rear lot plant is still likely to pose safety risks, however, as  
16    discussed above in Section III, until THESL assets are relocated to the street.

17

18    Residents in this area have been subject to long duration outages and remain susceptible to  
19    them. For instance, in 2007, area residents experienced a sustained outage that lasted over 19  
20    hours and, in 2010, area residents experienced a sustained outage that lasted over 12 hours.

21

22    **2.2      Scope of Work**

23    This job will replace both overhead and underground rear lot facilities by installing new 28kV  
24    aluminum TRXLPE-insulated cable in new concrete-encased front lot ducts. Poles are required  
25    to be installed along major streets in order to accommodate the proposed 27.6kV conductors  
26    supplying this area.

## ICM Project | Rear Lot Construction Segment

Asset Type		Assets Installed	
		Non-Linear Asset Count	Linear Asset Count (m)
Pole		21	
Switch			
Transformer	Dry		
	Network		
	Padmount		
	Polemount		
	Submersible	31	
	Vault		
Conductor			1,065
Cable			17,000
Underground-Civil work			5,400

1 **2.3 Locations**

2 The assets being replaced by this job are located in the vicinity of the intersection of Eglinton  
 3 Avenue West and Allen Road.

4

5 **2.4 Required Capital Costs**

Job Estimate Number	Job Title	Year	Cost Estimate (\$M)
21138	X12113 Forest Hill Rear Lot Voltage Conversion Phase 4 - electrical	2012	\$3.92
24342	X11293 Forest Hill Rear Lot Voltage Conversion Phase 5 – civil	2012	\$3.32
20012	X12114 Forest Hill Rear Lot Voltage Conversion Phase 5 - electrical	2013	\$3.05
		<b>Total</b>	<b>\$10.29</b>

} /UF, US

**ICM Project | Rear Lot Construction Segment**

1 **3.4 Locations**

2 The assets being replaced by this job are located in the vicinity of the intersection of Martin  
 3 Grove Road and Albion Road.

4

5 **3.5 Required Capital Costs**

Job Estimate Number	Job Title	Year	Cost Estimate (\$M)
21034	W12561 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 1	2012	\$1.00
21250	W12562 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 2	2012	\$0.21
21251	W12563 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 3	2012	\$0.47
21155	W12564 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 4	2013	\$1.18
21248	W12565 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 5	2013	\$1.03
21252	W12566 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 6	2013	\$0.09
21320	W12567 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 7	2013	\$0.17
21315	W13195 Rexdale Colony Park OH Rear Lot to UG front lot conversion phase 8	2013	\$1.24
		<b>Total</b>	<b>\$5.39</b>

} /UF, US

## ICM Project | Rear Lot Construction Segment

---

1     **5.       Livingston Guildwood Rear Lot (E11382, E11383)**

2

3     **5.1       Objectives**

4     The purpose of this job is to improve service reliability in the Guildwood Livingston rear lot area  
5     by converting both overhead and underground rear lot electrical equipment from the following  
6     4kV feeders to front lot underground: GGF1 from Livingston Guildwood MS and GEF2 from  
7     Galloway Dearhamwoods MS. This job should be constructed in 2012 since the area residents in  
8     the Livingston Guildwood area already have experienced construction disruptions for more than  
9     four years. As such, further delays to job completion would adversely impact the area residents.  
10    However, the rear lot plant will still pose the safety risks, as discussed above in Section III, to  
11    both THESL crew and area residents until THESL assets are relocated to the street.

/UF  
/C  
/C

12

13    Residents in this area remain susceptible to long duration outages. During the past year there  
14    has been one extended outage in this area, with more than 500 customers losing power for over  
15    two hours.

16

17    **5.2       Scope of Work**

18    This job will replace both overhead and underground rear lot facilities by installing new 28kV  
19    aluminum TRXLPE-insulated cable in new concrete-encased front lot ducts. Poles are required  
20    to be installed along major streets in order to accommodate the proposed 27.6kV conductors  
21    supplying this area.

**ICM Project | Rear Lot Construction Segment**

Asset Type		Assets Installed	
		Non-Linear Asset Count	Linear Asset Count (m)
Pole		95	
Switch		2	
Transformer	Dry		
	Network		
	Padmount		
	Polemount	20	
	Submersible	12	
	Vault		
Conductor			6,100
Cable			2,424
Underground-Civil work			2,424

} /c

1 **5.3 Locations**

2 The assets being replaced by this job are located in the vicinity of the intersection of Livingston  
 3 Road and Guildwood Parkway.

4  
 5 **5.4 Required Capital Costs**

Job Estimate Number	Job Title	Year	Cost Estimate (\$M)
18580	E11382 Livingston Guild VC Rear Lot Rebuild SCGGF1	2012	\$5.33
24854	E11383 Livingston Guildwood Part 2 OH VC SCGGF1	2012	\$0.94
		<b>Total</b>	<b>\$6.27</b>

**ICM Project | Rear Lot Construction Segment**

Asset Type		Assets Installed	
		Non-Linear Asset Count	Linear Asset Count (m)
Pole			
Switch			
Transformer	Dry		
	Network		
	Padmount		
	Polemount		
	Submersible	18	
	Vault		
Conductor			
Cable			5,600
Underground-Civil work			

1 **6.3 Locations**

2 The assets being replaced by this job are located in the vicinity of the area of Eglinton Avenue  
 3 West, Rathburn Road, and The East Mall.

4  
 5 **6.4 Required Capital Costs**

Job Estimate Number	Job Title	Year	Cost Estimate (\$M)
20677	W11219 Rathburn SAF1 Rear Lot Conversion	2012	\$2.85
		<b>Total</b>	<b>\$2.85</b>

} /UF



**ICM Project | Rear Lot Construction Segment**

Asset Type		Assets Installed	
		Non-Linear Asset Count	Linear Asset Count (m)
Pole		1	
Switch			
Transformer	Dry		
	Network		
	Padmount		
	Polemount		
	Submersible	17	
	Vault		
Conductor			
Cable			5,567
Underground-Civil work			

1 **7.3 Locations**

2 The assets being replaced by this job are located in the vicinity of the intersection of Martin  
 3 Grove Road and Albion Road.

4  
 5 **7.4 Required Capital Costs**

Job Estimate Number	Job Title	Job Year	Cost Estimate (\$M)
21321	W11168 Albion F1 Silverstone Rear Lot Conversion	2012	\$2.05
		<b>Total:</b>	<b>\$2.05</b>

} /UF

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## ICM Project | Rear Lot Construction Segment

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1     **8.       Lawrence Leslie Rear Lot (X12184, X12185, X12186)**

2

3     **8.1      Objectives**

4     The purpose of this job is to improve service reliability in the Lawrence and Leslie area by  
5     converting the rear lot electrical equipment from the 4kV feeder 37F2 to front lot underground.

6     This job should be constructed in 2013 since residents in the Lawrence Leslie area already have  
7     experienced construction disruptions. These jobs represent the final phases for conversion of  
8     the area. As such, further delays to job completion would negatively impact area residents.  
9     Further, all of the area proposed for this job already has civil construction completed.

/US

10

11    Residents in this area have been subject to long-duration outages and remain susceptible to  
12    them. During 2007, area residents experienced two sustained outages; one lasted over 40 hours  
13    and one lasted over 60 hours. Also, during the past year, area residents experienced a sustained  
14    outage that lasted 15 hours and three more lasting over two hours each.

15

16    **8.2      Scope of Work**

17    This job will replace both overhead and underground rear lot facilities by installing new 28kV  
18    aluminum TRXLPE-insulated cable in new concrete-encased front lot ducts. Poles are required  
19    to be installed along major streets in order to accommodate the proposed 27.6kV conductors  
20    supplying this area.

## ICM Project | Rear Lot Construction Segment

Asset Type		Assets Installed	
		Non-Linear Asset Count	Linear Asset Count (m)
Pole		21	
Switch		5	
Transformer	Dry		
	Network		
	Padmount		
	Polemount		
	Submersible	19	
	Vault		
Conductor			
Cable			4,650
Underground-Civil work			

1 **8.3 Locations**

2 The assets being replaced by this job are located in the vicinity of the intersection of Lawrence  
 3 Avenue East and Leslie Street.

4  
 5 **8.4 Required Capital Costs**

Job Estimate Number	Job Title	Year	Cost Estimate (\$M)
19755	X12184 S/E Lawrence/Leslie P1 Electrical	2013	\$0.19
19757	X12185 S/E Lawrence/Leslie P2 Electrical	2013	\$0.97
19759	X12186 S/E Lawrence/Leslie P3 Electrical	2013	\$0.58
	<b>Total</b>		<b>\$1.74</b>

} /us

## ICM Project | Rear Lot Construction Segment

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1     **9.       Thorncrest Area Rear Lot (W12381, W12401, W13019, W13067, W13068, W13142)**     /UF

2

3     **9.1     Objectives**

4     The purpose of this job is to improve reliability in the Thorncrest area by replacing and  
5     converting the rear lot electrical equipment from the following 4kV feeders to front lot  
6     underground: SBF1, BHF2, and RAF2. This job should be constructed in 2013 since the area  
7     residents in the Thorncrest area have experienced long duration outages and remain susceptible  
8     to them. During 2009, area residents experienced two sustained outages: one lasted over 25  
9     hours, and the other lasted over 40 hours. During 2011, area residents experienced two  
10    sustained outages, which lasted between 12 and 15 hours.

11

12    **9.2     Scope of Work**

13    This job will replace both overhead and underground rear lot facilities by installing new 28kV  
14    aluminum TRXLPE-insulated cable in new concrete-encased front lot ducts and associated  
15    equipment. Poles are required to be installed along Rathburn Rd and Kipling Ave in order to  
16    accommodate the proposed 27.6kV conductors supplying this area.

**ICM Project | Rear Lot Construction Segment**

Asset Type		Assets Installed	
		Non-Linear Asset Count	Linear Asset Count (m)
Pole		74	
Switch			
Transformer	Dry		
	Network		
	Padmount		
	Polemount	7	
	Submersible	12	
	Vault		
Conductor			6,500
Cable			5,850
Underground-Civil work			18,118

} /UF

1 **9.3 Locations**

- 2 The assets being replaced by this job are located in the vicinity of the intersection of Rathburn
- 3 Road and Islington Avenue.

**ICM Project | Rear Lot Construction Segment**

1 **9.4 Required Capital Costs**

Project Estimate Number	Project Title	Year	Cost Estimate (\$M)
20662	W12381 Rear Lot #011 Civil Infrastructure Ph#1	2013	\$3.24
20714	W12401 Rear Lot #011 Civil Infrastructure Ph#2	2013	\$2.22
20808	W13019 Rear Lot #011 Ph#2 Electrical VC	2013	\$1.08
21211	W13067 Thorncrest (#011) RL VC Ph#3 Civil/Elec	2013	\$0.92
21213	W13068 Thorncrest (#011) RL VC Ph#4 Civil/Elec	2013	\$0.64
21185	W13142 Thorncrest (#011) RL VC Ph#5 Civil	2013	\$4.82
<b>Total</b>			<b>\$12.92</b>

} /UF

2 **10. ~~Markland Woods Rear Lot (W11726)~~**

3

4 **10.1 ~~Objectives~~**

5 The purpose of this job is to improve reliability in the Markland Woods area by converting the  
 6 rear lot electrical equipment from the following 4kV feeders to front lot underground: ETLFF1,  
 7 ETLFF4, ETBAF4, ETLFF3, ETBAF1, and ETLFF2 from Mill MS and Neilson MS. This job should be  
 8 constructed in 2014 since the area residents in the Markland Woods area have experienced  
 9 long duration outages and remain susceptible to them. Since 2009, area residents have  
 10 sustained a total of 17 outages of varying durations. Specifically, during 2009, area residents  
 11 experienced three sustained outages; two lasted over ten hours and one lasted over 40 hours.  
 12 During 2010, area residents experienced a sustained outage that lasted over 25 hours. Finally,

13

## ICM Project | Rear Lot Construction Segment

1 during this past year, area residents experienced one sustained outage that lasted over ten  
 2 hours.

### 4 **10.2 — Scope of Work**

5 This job will begin to replace both overhead and underground rear lot facilities by installing new  
 6 concrete-encased front lot ducts.

Asset Type		Assets Installed	
		Non-Linear Asset Count	Linear Asset Count (m)
Pole		2	
Switch		7	
Transformer	Dry		
	Network		
	Padmount	18	
	Polemount		
	Submersible		
	Vault		
Conductor			
Cable		12,000	
Underground Civil work			5,979

### 7 **10.3 — Locations**

8 The assets being replaced by this job are located in the vicinity of the intersection of Mill Road  
 9 and Burnhamthorpe Road.

## ICM Project | Rear Lot Construction Segment

---

1 **10.4 — Required Capital Costs**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year</b>	<b>Cost Estimate (\$M)</b>
<b>21484</b>	W11726 Markland Woods Rear Lot VC phase 1 Civil	2014	\$5.63
<b>24945</b>	W11726 Markland Woods Rear Lot VC phase 1 Electrical	2014	\$5.40
		<b>Total</b>	<b>\$11.03</b>



**ICM Project | Rear Lot Construction Segment**

1 **Table A1: Status Quo (Remediation on an as-needed basis)**

Business Case Element	Estimated Cost (\$, millions)
<b>OPTION 1 – Status Quo (Remediation on an as-needed basis)</b>	
<b>Cost of Ownership of Existing Rear Lot Construction (COO<sub>E</sub>)</b>	
Projected risk cost of existing rear lot (NPV)	\$7.95
Projected non-asset risk cost of existing rear lot (NPV)	\$102.48
Maintenance cost of existing rear lot	\$0.68
<b>TOTAL (COO<sub>E</sub>)</b>	<b>\$111.11</b>

} /c

2 **Table A2: Like-for-Like Replacement of Existing O/H Rear Lot with New O/H Rear Lot**

Business Case Element	Estimated Cost (\$, millions)
<b>OPTION 2 – Like-for-Like Replacement of Existing O/H Rear Lot with New O/H Rear Lot</b>	
<b>Cost of Ownership of New Standardized Rear Lot Construction (COO<sub>N</sub>)</b>	
Projected risk cost of new overhead rear lot (NPV)	\$2.37
Projected non-asset risk cost of new overhead rear lot (NPV)	\$102.48
Maintenance cost of new overhead rear lot	\$0.68
<b>TOTAL (COO<sub>N</sub>)</b>	<b>\$105.53</b>
<b>Option 2 Project Net Benefit</b>	
<b>TOTAL (COO<sub>E</sub>)</b>	<b>\$111.11</b>
<b>TOTAL (COO<sub>N</sub>)</b>	<b>\$105.53</b>
<b>PROJECT COST</b>	<b>\$7.36</b>
<b>PROJECT NPV: ((COO<sub>E</sub> – COO<sub>N</sub>) – PROJECT COST)</b>	<b>-\$1.78</b>

} /c

} /c

**ICM Project | Rear Lot Construction Segment**

1 **Table A3: Replacement of Existing O/H Rear Lot with New U/G Front Lot**

Business Case Element	Estimated Cost (\$, millions)
<b>OPTION 4 – Replacement of Existing O/H Rear Lot with New U/G Front Lot</b>	
<b>Cost of Ownership of New Standardized Underground Front Lot Construction (COO<sub>N</sub>)</b>	
Projected risk cost of underground front lot (NPV)	\$11.55
Projected non-asset risk cost of underground front lot (NPV)	\$0
Maintenance cost of underground front lot	\$0.43
<b>TOTAL (COO<sub>N</sub>)</b>	<b>\$11.98</b>
<b>Option 4 Project Net Benefit</b>	
<b>TOTAL (COO<sub>E</sub>)</b>	<b>\$111.11</b>
<b>TOTAL (COO<sub>N</sub>)</b>	<b>\$11.98</b>
<b>PROJECT COST</b>	<b>\$66.14</b>
<b>PROJECT NPV: ((COO<sub>E</sub> – COO<sub>N</sub>) – PROJECT COST)</b>	<b>\$32.99</b>

} /c  
 } /c

2 To further illustrate the relationship between Non-Asset Risk and Asset Risk, a comparison was  
 3 made against historically tracked CHI over the last ten-year period due to asset and non-asset  
 4 causes for the rear lot feeders.

5

6 **Table A4: NPV and CHI ratios of Non-Asset to Asset Risk for Existing Rear Lot**

	NPV (\$ in Millions)	CHI (hrs)
<b>Asset Risk</b>	7.95	784.45
<b>Non-Asset Risk (NAR)</b>	102.48	6193.21
<b>Ratio (NAR/Asset Risk)</b>	12.89	7.90

} /c

7 The difference between the two ratios is attributed to the increasing trend of non-asset related  
 8 outages. The graph includes outages from tree contacts, animal contacts, lightning, and adverse  
 9 weather. Over the last five years, there has been an increasing trend in the amount of non-asset  
 10 related failures. This is further illustrated in Figure A4. The 12.89 ratio represents a value that  
 11 will be held constant over the next three years, even though the expected number of non-asset

/c

# ICM Project – Overhead Infrastructure and Equipment

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## Polymer SMD-20 Switches Segment

Toronto Hydro-Electric System Limited



## ICM Project | Polymer SMD-20 Switches Segment

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$6.01 M to \$1.53 M, a reduction of \$4.48 M
- 3 • 2014 jobs and spending shown in strike-through
- 4 • Restructured 2012 and 2013 jobs to recognize the work accomplished to
- 5 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 6 the continuing priority needs of the system

## ICM Project | Polymer SMD-20 Switches Segment

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1     **I           EXECUTIVE SUMMARY**

2

3     **1.        Project Description**

4

5     Polymer SMD-20 (“SMD-20”) switches are used to mount SMU fuse units on distribution poles.  
6     SMU fuse units are designed to protect upstream circuits and assets from faults encountered on  
7     downstream conductors and equipment in outdoor distribution systems. These switches must  
8     be physically operated by THESL crews using an 8’ LoadBuster tool with a significant amount of  
9     force. Opening and closing of these switches must be swift and purposeful. If the switches are  
10    opened slowly, there is the potential for drawing a large arc and possibly a flash over.

11

12    There have been two incidents reported since November 2011 where SMD-20 switches broke  
13    apart in the field during operation (See Appendix 1). These occurrences caused THESL to  
14    undertake a failure analysis study where THESL selected 14 new SMD-20 switches from its  
15    warehouse for testing. The results of this study showed that 13 of the 14 switches tested broke  
16    within ten operations with four of the switches failing during their first operation (See Section  
17    III, 1). Moreover, the manufacturer conducted similar testing procedures and derived to similar  
18    conclusions as shown in Appendix 5. Based on these results, and information from other  
19    industry sources, as discussed below, THESL determined that the SMD-20 switches installed  
20    during the period of 2006 and 2011 are defective.

21

22    There are 5,226 defective SMD-20 switches installed on 2,553 locations (many locations are on  
23    three phase systems and incorporate three defective SMD-20 switch installations) identified to  
24    require replacement on the THESL system and this segment targets replacing all of them with  
25    “new design” SMD-20 switches (See Section II, 1).

26

27    THESL has confirmed through testing that the manufacturer has remedied the defect in the new  
28    design. Priority for replacement will be given to locations that have experienced the highest  
29    number of outages due to faults of the type that would activate the fuses on the SMD-20  
30    switches and lead to their operation.

/us

## ICM Project | Polymer SMD-20 Switches Segment

1 The cost of the segment is presented in Table 1. These costs are all incremental because the  
 2 defect was not found until late 2011 and until it was found, THESL had no plans and received no  
 3 funding to replace these switches because they were assumed to have a useful life of 45 years.  
 4 THESL is in discussion with the manufacturer to determine the level of compensation that can  
 5 be recovered. THESL will return any compensation received for defective SMD-20 switches as  
 6 revenue offset at rebasing.

7

8 **Table 1: Cost of SMD-20 Switches to be replaced**

Job Estimate Number	Job Title	Project Year	Cost Estimate (\$M)
24773	SMD-20 Replacement	2012	-
24773	SMD-20 Replacement	2013	1.53
24943	SMD-20 Replacement	2014	2.94
<b>Total 2012-2013</b>		<b>\$1.53</b>	

} /UF /US

9 **2. Why the Project Is Needed Now**

10

11 SMD-20 switches have failed in the field. Failure analysis by THESL and others in the industry as  
 12 discussed below showed a switch manufacturing material defect. Although there have been no  
 13 injuries or property damage reported to date, the mode of failure for these switches may impact  
 14 public safety due to the potential for falling debris when the switch fails. SMD-20 failures can  
 15 also cause physical injuries to field crews by exposing them to electrical flash-over during live  
 16 operation. In addition, this issue can increase outage restoration times if the switch fails and  
 17 must be replaced during an emergency response situation.

## ICM Project | Polymer SMD-20 Switches Segment

---

1     **3.       Why the Proposed Project is the Preferred Alternative**

2

3     Given that the currently installed switches are defective and must eventually be replaced, only  
4     two options were evaluated: proactive and reactive replacement (See Section IV). Based on this  
5     evaluation, the proactive approach was selected. Under this approach THESL will begin  
6     replacing all SMD-20 switches immediately. /us

7

8     The reactive approach would replace defective polymer SMD-20 switches as they failed or once  
9     they exceeded their useful lives. Since the defective SMD-20 switches were recently  
10    manufactured, this would take decades. This replacement rate is unacceptable because  
11    defective SMD-20 switches would continue to pose risks for THESL crews and the public over  
12    this extended period.

## ICM Project | Polymer SMD-20 Switches Segment

---

1 **IV PREFERRED ALTERNATIVE**

2

3 **1. Description of the Preferred Alternative**

4

5 The preferred plan is to replace all 5,226 defective SMD-20 switches installed at 2,553 locations  
6 (many locations are on three phase systems and incorporate three defective SMD-20 switch  
7 installations) on the THESL system with the “new design” SMD-20 switches. /US

8

9 If the fuse on a defective SMD-20 switch blows due to a downstream fault, the switch itself will  
10 break and introduce a risk of injuries and property damage. Therefore, the replacements will be  
11 prioritized based on locations that experience the highest number of outages related to the  
12 types of faults that cause the fuses associated with SMD-20 switches to blow.

13

14 For each feeder, THESL monitors the number of outages experienced on all of its connected  
15 laterals. Priority is given to the switches connected to the feeders with the highest number of /US  
16 lateral outages.

17 Replacing the units in a proactive fashion will reduce the probability of potential safety hazards  
18 to the public and field crews as well as the possibility of the increased outage duration during  
19 emergency responses due to the need to replace the defective SMD-20 switch along with the  
20 fuse. Therefore, this is the preferred option.



## ICM Project | Polymer SMD-20 Switches Segment

### 2. Project Cost

Table 4 below present the costs of the segment. The labour and material cost for replacing each switch averages about \$1,711. THESL is in discussion with the manufacturer to determine the potential for compensation and the amount that may be recovered. THESL will return any compensation received for defective SMD-20 switches as revenue offset at rebasing.

**Table 4: Cost of SMD-20 Switches to be replaced**

Job Estimate Number	Job Title	Project Year	Cost Estimate (\$M)
24773	SMD-20 Replacement	2012	-
24773	SMD-20 Replacement	2013	\$1.53
24943	SMD-20 Replacement	2014	\$2.94
<b>Total 2012-2013</b>		<b>\$1.53</b>	

/UF /US

None of these costs are included in existing rates. THESL did not uncover the manufacturing defect in these switches until late 2011. Once the manufacturing defect was confirmed, THESL began planning to replace all existing SMD-20 switches with “new design” switches. Given that THESL had no plans to replace these switches prior to the discovery of the design defect, it neither sought nor obtained funding for this purpose in previous rate applications.

### 3. Economic Benefit of the Preferred Alternative

The effectiveness of the SMD-20 segment can be further highlighted by determining the difference in cost of ownership between the assets currently installed downstream from these SMD-20 switches, and the cost of ownership of those same downstream assets connected to a newly designed SMD-20 switch. This cost of ownership evaluation can be simplified by examining the incremental estimated quantified risks that are introduced due to the additional two-hour interruption as a result of the time required to replace defective SMD-20 switches when the associated fuse blows.

## ICM Project | Polymer SMD-20 Switches Segment

---

1 These estimated quantified risks represent the product of the assets' probability of failure and  
2 the various direct and customer costs associated with asset failures. The costs considered  
3 include customer interruptions, emergency repairs and replacement. In addition, risks that are  
4 unrelated to asset age and condition, such as animal-caused, human-caused and weather-  
5 caused events, are also considered.

6

7 Carrying out immediate work on this asset class will result in a present value of \$ 7.87 M, which /UF, US  
8 ultimately represents the difference between the current and future costs of ownership values  
9 reduced by the total segment cost. Thus, there are distinct economic benefits to executing this /UF, US  
10 work immediately. These results as well as the business case evaluation process are further  
11 explained in Appendix 6.

# ICM Project – Overhead Infrastructure and Equipment

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## SCADA-Mate R1 Switches Segment

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | SCADA-Mate R1 Switches Segment

---

1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2
- Reduced 2012-2013 budget from \$5.66 M to \$1.43 M, a reduction of \$4.23 M
- 3
- 2014 jobs and spending shown in strike-through
- 4
- Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 5
- the continuing priority needs of the system

## ICM Project | SCADA-Mate R1 Switches Segment

---

1 of the switches was caused by moisture buildup inside the motor operator compartment,  
2 which corroded internal components critical to the switch's operating mechanism.

3

4 The defect that causes the SCADA-Mate R1 switches to fail is not externally visible or  
5 testable. Thus, THESL crews must treat all of these switches as defective whenever they are  
6 encountered (See Section II, 2). To remedy this situation, THESL proposes spending \$1.43  
7 million to replace existing SCADA-Mate R1 switches that are located in heavily contaminated  
8 areas such as highways and arterial roads due to the increased failure probability of these  
9 switches (See Section IV, 1).

} /UF, US

/US

10

11 The work to replace these SCADA-Mate R1 switches is in addition to existing work planned.  
12 THESL has confirmed that these switches are subject to a defect that creates potential safety  
13 issues, which require their immediate replacement. Prior to confirming that the switches  
14 were defective, THESL had no plans to replace them.

/UF, US

### 15 **2. Why the Project Is Needed Now**

16

17 This safety risk is a result of the SCADA-Mate R1 design, which allows moisture to seep into  
18 the motor operator compartment of the switch, eventually leading to corrosion of the  
19 internal components. Failure of the motor operator prevents the switch from functioning as  
20 intended. An arc may develop as a result of the switch opening slowly under load, resulting  
21 in potential safety hazards to THESL crews. Arc flashes have the potential of producing a  
22 pressure wave that can disorient and injure a worker nearby (See Section II, 2).

23

24 THESL has determined that crews should not operate SCADA-Mate R1 switches or work in  
25 proximity to them due to the potential arc flash hazard (See Section III). Consequently, for

## ICM Project | SCADA-Mate R1 Switches Segment

---

1 **IV      PREFERRED ALTERNATIVE**

2

3 **1.      Project Description**

4

5 The entire population of 318 SCADA-Mate R1 switches requires replacement as soon as possible.

6 However, full replacement will have to be completed in phases for the following reasons:

- 7 • Switching required for replacement: SCADA-Mate switches are located on main feeders. If  
8 an alternate supply does not exist to serve all customers on that feeder, then complex  
9 switching and temporary disconnect switch installations are required to minimize any  
10 associated outages.
- 11 • Feeder loading restrictions: Load shifting is dependant on the state of the system. In the  
12 summer time, feeders tend to be running at capacity and load transfer may increase the risk  
13 of outages.
- 14 • Limited Control Room resources to accommodate the large number of planned outages  
15 required for replacement.
- 16 • Limited Protection and Control resources for commissioning and decommissioning of  
17 SCADA-Mate switches.

18

19 Due to the suspension of routine maintenance, the switches located in highly contaminated  
20 areas such as highways and arterial roads are more susceptible to failure. Moreover, there are  
21 many R1 switches in the Etobicoke area that are currently using an obsolete Remote Terminal  
22 Unit (RTU) complete with an obsolete radio system. The proposed plan is to replace the R1  
23 switches using the priority ranking listed in Table 1.

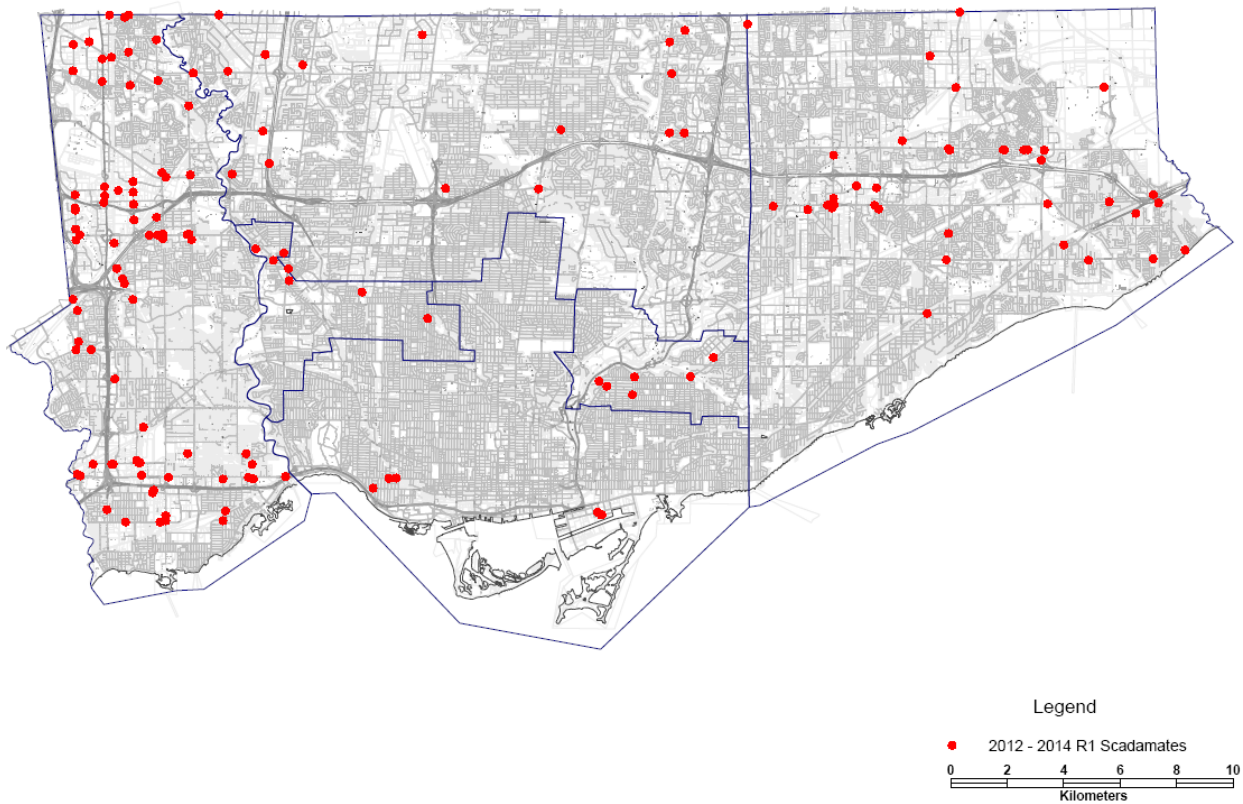
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## ICM Project | SCADA-Mate R1 Switches Segment

1 **Table 1: Priority list for replacing all SCADA-Mate R1 switches**

Priority	Quantity	Description
1	52	Switches in close proximity to highways/arterial roads and using obsolete RTU
2	51	Switches in close proximity (but further than the switches under priority 1) to highways/arterial roads and using obsolete RTU
3	49	Switches in close proximity to highways/arterial roads
4	166	Remaining R1 switches in the THESL overhead distribution system
<b>Total</b>	<b>318</b>	

2 The switches in the top 3 priorities are shown on the map in Figure 10. /us



3 **Figure 10: Map of SCADA-Mate R1 Switches to be replaced**

4

### 5 **2. Economic Benefit of the Proposed Plan**

6 The effectiveness of the proposed work on the SCADA-Mate R1 segment can be further  
 7 highlighted by determining how much cost is avoided by executing this work immediately as  
 8 opposed to executing it in 2015. These avoided costs include quantified risks, taking into

## ICM Project | SCADA-Mate R1 Switches Segment

1 account the assets' probability of failure, and multiplying this with various direct and indirect  
 2 costs associated with in-service asset failures, including the costs of customer interruptions,  
 3 emergency repairs and replacement.

4

5 Carrying out immediate work on this asset class will result in an avoided estimated risk cost of  
 6 about \$55 million, which represents this avoided cost of executing the planned replacements in /c  
 7 2012 as opposed to deferring them until 2015. This figure shows that there are expected to be  
 8 substantial economic benefits from executing this work immediately. These results are further  
 9 explained in Appendix 5, below.

10 Moreover, should the replacement of these switches be deferred to 2015 it will extend the time  
 11 these switches are in service and prolong the associated operational inefficiencies posed for  
 12 THESL's system and the safety risks faced by field crews.

13

### 14 3. Project Cost

15

16 Table 2 below presents the costs of the segment. The average cost for replacing each unit is  
 17 about \$55,000. /UF, US

18

19 **Table 2: Project Cost**

Project Estimate Number	Project Title	Project Year	Cost Estimate \$ M
22579	SCADA-Mate R1 Replacement	2012	-
22579	SCADA-Mate R1 Replacement	2013	1.43
24941	SCADA-Mate R1 Replacement	2014	\$2.69
<b>Total 2012-2013</b>			<b>\$1.43</b>

} /UF, US  
 /UF, US



**ICM Project | SCADA-Mate R1 Switches Segment**

1 **Table 1: Summary of values used in the determination of Avoided Estimated Risk Cost**

Business Case Element	Cost (in millions)
Present Value of Project Net Cost in 2015 (PV(PROJECT <sub>NET_COST</sub> (2015)))	\$ 55.04
Project Net Cost in 2012 (PROJECT <sub>NET_COST</sub> (2012))	\$ 0.28
<b>Avoided Estimated Risk Cost</b>	<b>\$ 54.76</b>

/c  
/c

2 When this avoided estimated risk cost is calculated as a positive value, it means that estimated  
 3 risk costs for the job assets in 2015 will exceed the estimated risks that exist today. By  
 4 performing the work immediately as opposed to waiting until 2015, we can eliminate these  
 5 estimated risks. Therefore, these avoided estimated risk costs represent the benefits of job  
 6 execution.

# ICM Project – Network Infrastructure and Equipment

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## Network Vaults and Roofs Segment

Toronto Hydro-Electric System Limited (THESL)



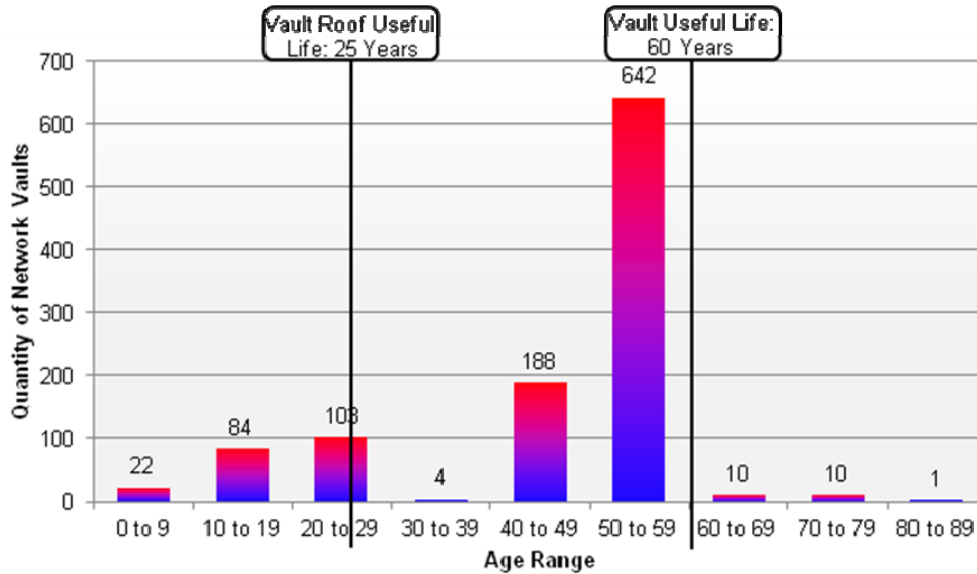
## ICM Project | Network Vaults and Roofs Segment

---

1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$25.88 M to \$21.47 M, a reduction of \$4.41 M
- 3 • Revised number of jobs proposed for 2012/2013 to 26 (three decommissioning, six roof
- 4 rebuilds, 17 vault rebuilds), with jobs for 2014 to be addressed in Phase Two, as proposed
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system
- 8 • Corrected numerical and typographical errors

**ICM Project | Network Vaults and Roofs Segment**



1 **Figure 1: Distribution of Network Vaults**

2

3 Under the Network Vaults and Roofs segment, THESL proposes to eliminate immediate  
 4 structural vault deficiencies of 26 high risk vaults in 2012-2013 (which represent 2.4% of all  
 5 vaults in THESL’s system): three through decommissioning at an estimated cost of \$0.1M, six  
 6 through roof rebuilding at an estimated cost of \$2.2M, and 17 through complete vault rebuilds  
 7 at an estimated cost of \$19.3 M. The total estimated cost of the segment over the 2012 through  
 8 2013 2014 period is \$41.45M-\$21.47M (See Section II, 1).

} /UF, /US

9

10

11 **2. Why the Project Needed Now**

12 The immediate need to rebuild the vaults has been highlighted by THESL’s Asset Condition  
 13 Assessment (ACA), developed by Kinectrics Inc., which has identified vaults classified as either  
 14 “very poor” or “poor” and which require major civil rebuilds (See Section III, 1). These vaults  
 15 pose an immediate safety concern to THESL workers, the public, and the reliability of the  
 16 network system. The ACA uses inspection data to determine the condition of an asset, and  
 17 drives replacement of that asset at the optimal time. The “very poor” status indicates that the  
 18 assets need to be replaced within one year, while the “poor” assets need to be replaced within  
 19 three years. In 2009, the ACA was revised to recognize that failing structural elements (roof,

## ICM Project | Network Vaults and Roofs Segment

---

1    **II        DETAILED PROJECT INFORMATION**

2

3    **1.    Project Description**

4    The network vaults associated with the secondary network system were constructed in the  
5    1950s and 1960s, mainly beneath the sidewalks in the busy downtown Toronto core. Today,  
6    there are many critical structural issues inherent with the condition of these assets which must  
7    be addressed immediately in order to mitigate potential safety risks to the public and to THESL’s  
8    workers, as well as the potential negative impact on the reliability and prudent operation of  
9    THESL’s distribution system.

10

11    Under the Network Vaults and Roofs segment, THESL proposes to eliminate immediate  
12    structural vault deficiencies of 26 high risk vaults identified by the ACA as being in “poor” or  
13    “very poor” condition in 2012-2013. This segment includes decommissioning 3 vaults at an  
14    estimated cost of \$0.1M, rebuilding 6 vault roofs at an estimated cost of \$2.2M and completely  
15    rebuilding 17 vaults at an estimated cost of \$19.3M. The estimated total cost of the segment  
16    over 2012-2013 is \$21.47M.

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17

18    **1.1.    Project Segment Category 1: Network Vault Decommissioning**

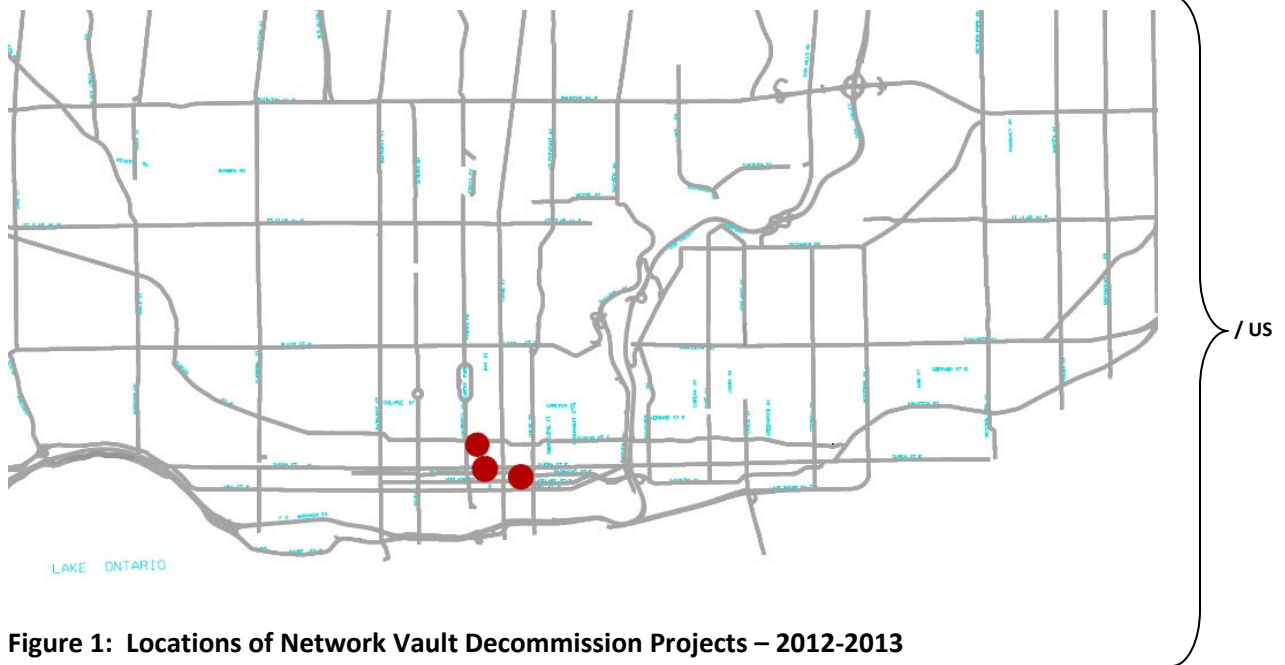
/US

19    THESL proposes to decommission 3 network vaults where load has been displaced and the  
20    vaults are no longer needed. This is expected to eliminate any structural deficiencies associated  
21    with these vaults and any corresponding safety issues for both THESL crews and pedestrians.

22

23    Decommissioning a network vault involves removing any network transformer and protectors  
24    within the vault, along with primary and/or secondary cables. The empty vault is then backfilled  
25    with gravel, and the sidewalk overtop is rebuild. Figure 1 below shows the locations where a  
26    vault decommissioning is required.

**ICM Project | Network Vaults and Roofs Segment**



1 **Figure 1: Locations of Network Vault Decommission Projects – 2012-2013**

2  
3

4 **Table 1: Required Capital Costs**

Job Number	Job Title	Job Year	Estimated Cost (\$M)
X12207	X12207 Loc #4287 60 Simcoe St	2012	\$0.01
X12858	X12858 Decommission 2 Network Vaults	2013	\$0.08
X14404	X14404 Decommission 2 Network Vaults	2014	\$0.12
<b>Total 2012-2013:</b>			<b>\$0.1</b>

/US  
  
/US

5 **1.2. Project Segment Category 2: Network Vault Roof Rebuild Program**

6 THESL proposes to rebuild six network vault roofs which have been identified by the ACA as  
 7 “poor” or “very poor” thereby having severe structural deficiencies, but which are located on  
 8 network vaults that are otherwise structurally sound. A roof replacement involves installing a

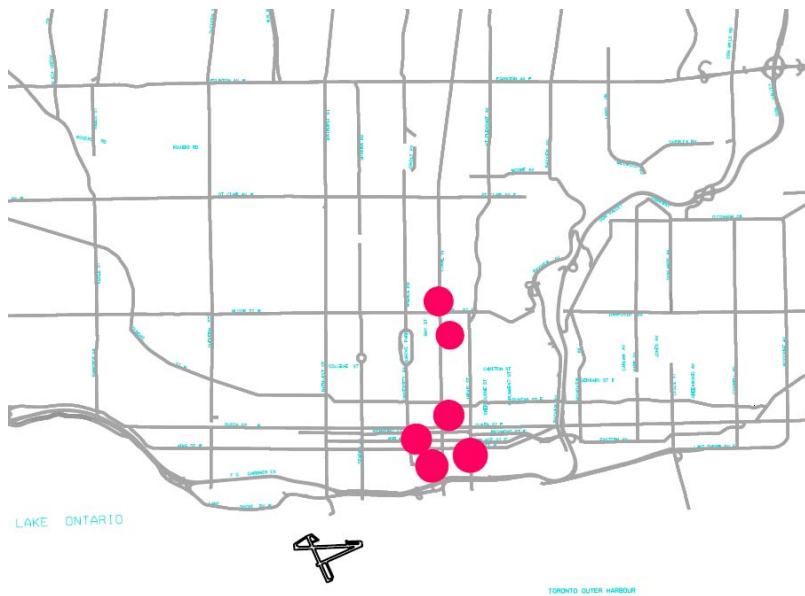
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## ICM Project | Network Vaults and Roofs Segment

1 temporary false roof under the existing roof to protect the vault equipment, cables, and fuse  
2 panels, removing any asbestos secondary cable and Paper Insulated Lead primary cables,  
3 installing new primary and secondary cables, rebuilding the actual vault roof, and rebuilding the  
4 adjoining sidewalk.

5

6 Figure 2 below shows the locations of the proposed network vault roof rebuild jobs for 2012,  
7 2013, and 2014.



/us

8 **Figure 2: Locations of Network Vault Roof Rebuild Projects – 2012-2013**

9

10 The Table below shows all capital costs required for the rebuilding of the vault roof, by job.  
11 These costs include any associated primary and secondary cable replacement activities. Where  
12 possible, the vaults in the worst structural condition have been prioritized to be addressed first.

**ICM Project | Network Vaults and Roofs Segment**

1 **Table 2: Vault Roof Rebuild Capital Costs by Job**

<b>Job Number</b>	<b>Job Title</b>	<b>Job Year</b>	<b>Estimated Cost (\$M)</b>	
X12350	X12350 Loc#4510, Rebuild Vault Roof, 60 Gloucester St A50CS and A51CS	2012	\$ 0.60	
X12652	X12652 Loc #4252 and 4308, Victoria and Shuter	2012	\$0.35	
X12321	X12321 Loc#4931, Rebuild Vault Roof Front St. East and Jarvis St. A40GD	2013	\$0.29	/US
X12208	X12208 - Loc#4485, 105 Adelaide St. West – Rebuild Vault Roof	2012	\$0.41	/UF
X12327	X12327 Loc#4262, Rebuild Vault Yorkville St and Yonge St. High Level Network	2012	\$0.29	
X11351	X11351 Rebuild Location #4174, Bay St/Front St. West	2013	\$0.12	
X14386	X14386-6 Vault Roof Rebuild	2014	\$1.69	
<b>Total 2012-2013:</b>			<b>\$2.1</b>	/UF, /US

2 **1.3. Project Segment Category 3: Network Vault Rebuild Program**

3 THESL proposes to rebuild 17 network vaults which have been identified as having severe /US  
 4 structural deficiencies requiring a complete reconstruction. These vaults cannot be  
 5 decommissioned, but require more extensive repairs beyond a vault roof replacement.



## ICM Project | Network Vaults and Roofs Segment

1 A complete network vault rebuild first involves inspections and testing of equipment in adjacent  
2 vaults, as these adjacent vaults will operate under contingency and will be required to supply  
3 additional loads to the grid while the vault is being rebuilt. In addition, in order to maintain  
4 power to customers during a vault rebuild, THESL has to install additional secondary cables from  
5 the network grid or add additional temporary transformers in an adjacent vault. In some cases,  
6 the vaults will be rebuilt in the original location and existing auxiliary civil infrastructure will be  
7 maintained. In other cases, a new vault along with auxiliary civil infrastructure will be  
8 constructed in a new location, and the old vault will be decommissioned. In both cases network  
9 units (transformer and protectors) are installed, along with new primary and secondary cables,  
10 and the sidewalk surface is repaired.

11

12 Figure 3 below shows the locations of the network vault rebuild jobs for 2012-2014.



/us

13 **Figure 3: Locations of Network Vault Rebuild Projects – 2012-2013**

## ICM Project | Network Vaults and Roofs Segment

1 **Table 3: Complete Vault Rebuild Capital Costs by Job 2012-2014**

Job Number	Job Title	Job Year	Estimated Cost (\$M)	
X12289	X12289 Vault Loc#4412, Build a new Vault Adelaide St. West/Grand Opera Lane	2013	\$1.88	/US
X11533	X11533 Loc#4818, Rebuild Vault at Richmond/Bay	2012	\$ 1.58	
X11362	X11362 -Loc# 4111 -Augusta and College	2012	\$0.04	/UF
X12371	X12371 -Loc# 4431 -Blue Jays Way and King St. West	2013	\$0.99	/US
X12830	X12830 Loc# 4432 vault rebuild job	2013	\$1.29	/UF, /US
X11441	X11441 -Loc# 4512 -Eglinton Ave E./Holly St	2012	\$0.11	/UF
X11487	X11487 Vault Rebuild, Loc#4312, King St. West/Yonge St.	2012	\$1.62	
X12834	X12834 Vault Rebuild Job	2012	\$2.28	/UF
X11234	X11234 Location # 4481, Eglinton Avenue East/ Holly St.	2013	\$2.06	
X11440	X11440 Vault Relocate, Loc#4642 St. Clair Ave. W/Yonge St.	2013	\$0.97	
X12345	X12345 Loc#4562, Vault Roof Rebuild, King St West/Jordan St. A54WR	2013	\$0.72	
X11529	X11529-2 Vaults--Loc# 4790 East + West Vault Wellington St. W/ Emily St	2012	\$2.78	/US
X12334	X12334 Loc#4299 Rebuild Vault Peter St/Adelaide St West A66WR	2013	\$1.58	
X13323	X13323 Vault Rebuild - TD-21 York and King	2013	\$0.29	
X13347	X13347 - Loc#4795, 77 Grenville St. Vault Rebuild	2013	\$0.23	

## ICM Project | Network Vaults and Roofs Segment

Job Number	Job Title	Job Year	Estimated Cost (\$M)
X11504	X11504 -Loc# V4511 -Overlea Blvd/William Morgan Dr. (E. York)	2013	\$0.86
X14385	X14385 9 units Vault Rebuild Job	2014	\$13.77
<b>Total 2012-2013:</b>			<b>\$ 19.3</b>

/UF, /US

## ICM Project | Network Vaults and Roofs Segment

---

1     **III.     NEED**

2

3     **1.    Asset Condition**

4     In addition to tracking the age of its assets, THESL has been analyzing asset life using its Asset  
5     Condition Assessment (“ACA”), developed by Kinectrics Inc. The ACA uses inspection data to  
6     determine the condition of an asset, and drive replacement of that asset at the optimal time.

7     The ACA for the network vaults indicates vaults are classified as either “very poor” or “poor” and  
8     require major civil rebuilds. The “very poor” status indicates that the assets need to be replaced  
9     within one year, while the “poor” assets need to be replaced within three years. Generally, the  
10    replacement of a network vault may take up to 24 months to complete because of the  
11    complexity of rebuilding civil and electrical work in the downtown core. This long timeframe  
12    further supports the need for a repair program to commence in the very near term.

13

14    Currently, THESL has 1,064 network vaults in the downtown core supplying the network system.  
15    Figure 1 below shows the age distribution of all network vaults and comparison to the useful life  
16    of both the overall vault and the roof. While a vast majority of vaults have reached or are  
17    quickly approaching their expected end-of-life (60% will have reached end-of-life within ten  
18    years or less), a majority (81%) of network vault roofs are already well past the vault roof  
19    expected life of 25 years, and in need of a rebuild. In addition, the ACA suggests that some  
20    vaults have been aging at an accelerated pace and require repairs even though they have yet to  
21    reach their expected end-of-life of 60 years. Under this segment, 2.44% of the total vaults will  
22    be addressed over 2012-2013.

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## ICM Project | Network Vaults and Roofs Segment

---

1 **IV PREFERRED ALTERNATIVE**

2

3 Generally, there are four options to mitigate risks associated with a structurally failing vault:

- 4 (a) Decommission the Vault
- 5 (b) Rebuild the Vault Roof
- 6 (c) Rebuild the Entire Vault
- 7 (d) Eliminate the vault and install a new supply

8

9 The above options are considered for the vaults mentioned in this document that are  
10 structurally failing, and beyond the point of repair. As vaults are inspected each year,  
11 maintenance to the civil structure is typically performed as needed to fix small problems, and  
12 further extend the life of a vault. However, once a vault reaches the point where there are  
13 major structural failures and repairs can no longer address the problem, the above options are  
14 considered.

/c

15

16 **1. Option (a) – Decommission the Vault**

17 In certain areas of the city, the low voltage, network secondary load is no longer desired when  
18 new high rise buildings are constructed and fed from a primary high-voltage arrangement. If the  
19 network secondary system no longer requires the capacity from a specific vault, this specific  
20 vault can be decommissioned. Decommissioned vaults are backfilled and the sidewalk is rebuilt  
21 to eliminate any safety risks. A typical cost to decommission a vault is approximately \$50,000  
22 and takes approximately one month to perform. Where possible, this is the most cost effective  
23 option to address structural and safety concerns with poor condition vaults.

24

25 **2. Option (b) – Rebuild Vault Roof**

26 A network vault roof rebuild is not as complex when compared to a total vault rebuild, but  
27 replacement or re-arrangement of the secondary and primary cables within the vault is still  
28 required. In most cases, this involves the removal of the existing damaged roof and the  
29 replacement with a new vault roof.

30

## ICM Project | Network Vaults and Roofs Segment

---

1 complexity, only those poor condition vaults which cannot be addressed via decommissioning or  
2 through a vault roof rebuild would need to be addressed through this option.

3

#### 4 **4. Option (d) – Eliminating Vault and Installing New Supply**

5 This option would involve eliminating the network system and supplying existing customers  
6 directly from the street via an alternate type of supply. In urban areas and within the  
7 downtown core, there are often limited options and physical constraints associated with  
8 installing alternative types of supply while also maintaining the same high reliability to the  
9 customer. This option could cost upwards of \$2M per customer to feed them with a new  
10 supply. Therefore, this is not considered a comparatively cost effective alternative to rebuilding  
11 the existing network civil infrastructure.

12

#### 13 **5. The Proposed Approach**

14 THESL submits that given the current circumstances and the options available, the most  
15 reasonable and cost effective approach is to undertake the option most suitable to the  
16 circumstances and conditions affecting any particular poor condition vault. This would involve  
17 decommissioning a vault in circumstances where the capacity is no longer required, rebuilding  
18 only the vault roof where the remaining structure is in an acceptable condition, and rebuilding  
19 the entire vault only where absolutely necessary. Figure 14 below shows a breakdown of vaults  
20 identified by the ACA as being in a condition requiring repair by 2014. Based on THESL's  
21 analysis, three vaults in "poor" or "very poor" condition can be decommissioned, six of the  
22 vaults will only require a roof rebuild, and 17 will required a complete vault rebuild over 2012-  
23 2013.

} /US

# ICM Project – Network Infrastructure and Equipment

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## Fibertop Network Units Segment

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | Fibertop Network Units Segment

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$17.37 M to \$9.13 M, a reduction of \$8.24 M
- 3 • Revised number of jobs proposed for 2012/2013 to 61, with jobs for 2014 to be addressed in
- 4 Phase Two, as proposed
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system



## ICM Project | Fibertop Network Units Segment

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1     **I           EXECUTIVE SUMMARY**

2

3     **1. Project Description**

4     The purpose of this segment is to mitigate the risk caused by existing Fibertop Network Units, by  
5     replacing these units with Submersible Network Units. The total cost of completing the segment  
6     in 2012 and 2013 is \$9.13M, which would address a total of 61 Fibertop Network Units. The  
7     Fibertop Network Units are currently the oldest vintage network protectors used on THESL's  
8     system. The assets selected for replacement have been identified as possessing the highest  
9     probability of failure, based on inspection of all THESL units (See Section II, 1).

/UF, /US

/US

10

11     Network Units are comprised of both a network transformer and a network protector. At least  
12     two Network Units are connected together to form a grid. For reliability, customers connected  
13     to this grid receive supply from multiple sources. One purpose of the protector is to open and  
14     isolate the secondary side of the circuit from the supply side when a fault is detected. This  
15     action prevents reverse current flowing from the low-voltage secondary network grid, feeding  
16     the fault on the supply side of the circuit. When a failure occurs at the top of a protector, it is  
17     unable to open the circuit to stop the fault current flow, often resulting in a vault fire.

18

19     **2. Why the Project is Needed Now**

20     Fibertop Network Units feature a design in which the top of the secondary protector, where  
21     interconnections are made to the secondary grid, is extremely susceptible to moisture and  
22     contamination (See Section III, 1). The interconnections themselves are also spaced very closely  
23     together. This design increases the probability of inter-phase tracking occurring between these  
24     connections, potentially igniting a vault fire. Such fires often result in extensive damage and the  
25     de-energization of the entire network grid, causing a substantial outage for a large number of  
26     customers.

27

28     Vault fires caused by Fibertop units can also affect the safety of THESL crews, fire fighters, and  
29     the general public due to the fact that the assets are often located in high traffic pedestrian  
30     areas. Additional hazards may be introduced because these assets are often connected to the

## ICM Project | Fibertop Network Units Segment

---

1     **II           DETAILED PROJECT INFORMATION**

2  
3     **1.   Project Description**

4     The purpose of this segment is to mitigate the risk caused by existing Fibertop Network Units in  
5     THESL's system, by replacing them with Submersible Network Units. The total cost of  
6     completing this segment is \$9.13M, which would address 61 Fibertop Network Units in     /UF, /US  
7     2013/2014 (of a total of 240 in operation). The assets selected for replacement have been     /UF, /US  
8     prioritized based on condition data retrieved during inspections. All units that are located below  
9     street level will be addressed as these are most susceptible to failure.

10  
11    Network Units are comprised of both a network transformer and a network protector. At least  
12    two Network Units are connected together to form a grid. For reliability, customers connected  
13    to this grid receive supply from multiple sources. One purpose of the protector is to open and  
14    isolate the secondary side of the circuit from the supply side, should a fault be detected. This  
15    action prevents reverse current flowing from the low-voltage secondary network grid, feeding  
16    the fault on the supply side of the circuit. When a failure occurs at the top of a protector, it is  
17    unable to open the circuit to stop the fault current flow, often resulting in a vault fire.

18  
19    The Fibertop Network Units are currently the oldest vintage network protectors used in THESL's  
20    network system. Because of their age and design, there is a much higher probability of a  
21    catastrophic failure than more modern designs used by THESL. In the past, these types of  
22    protectors have been directly linked to the cause of most network vault fires.

23  
24    The work associated with Network Unit replacements is constrained by operational concerns.  
25    When performing Network Unit replacements, the supplying primary feeders must be taken  
26    offline and grounded and all connected loads are transferred to adjacent feeders and backup  
27    supplies. During this time the distribution grid is highly susceptible to any further outages that  
28    may cascade into a larger outage with a larger impact to customers. As a result, any work that  
29    requires feeders to be de-energized cannot be performed during the summer season, when  
30    loading is at its highest levels. Given these constraints, THESL is required to schedule Fibertop

## ICM Project | Fibertop Network Units Segment

1 Network Units replacement over the course of the next three years. The segment cost schedule  
2 is shown below in Table-1. Complete job listings are shown in Appendix A.

3

4 **Table-1: Project Budget Details**

Project Title	Project Year	Estimated Cost (\$M)	
Fibertop Changeouts	2012	\$1.69	/UF, /US
Fibertop Changeouts	2013	\$7.44	/UF, /US
<del>Fibertop Changeouts</del>	2014	<del>\$9.36</del>	
	<b>Total 2013/2014</b>	<b>\$9.13</b>	/UF, /US

5 Figure 1 below shows the locations of the Fibertop Network Units that are scheduled to be  
6 replaced. Most are located in downtown Toronto and parts of East York, particularly along the  
7 Yonge Street corridor where dense commercial load requires reliable distribution equipment.

8

9 In the recent past THESL has replaced 40 to 60 Network units annually due to corrosion. Leaking  
10 transformers and fibertops have made up a significant portion of these replacements (40% in  
11 2009 and 60% in 2010). The proposed segment would be an increase to the existing  
12 replacement strategy as more units would be replaced annually.

## ICM Project | Fibertop Network Units Segment

---

1 be the ideal option, it is infeasible due to the potential contingency issues that would arise from  
2 executing all of this work at once.

3  
4 In order to replace a Fibertop Network Unit, the primary feeder needs to be taken out of service  
5 and therefore the entire load fed by that feeder has to be shifted onto back-up supplies. The  
6 system would be under first contingency (a situation in which one feeder may be de-energized  
7 and customers would remain energized) and would be vulnerable to any system outage that  
8 may occur. It is THESL policy not to operate under first contingency during high load times such  
9 as the summer period, and usually not to operate under first contingency for any extended  
10 period of time. Given these limitations, a complete replacement program for the entire  
11 population of Fibertop Network Units over 2012-14 would not be possible.

12  
13 Furthermore, highly skilled workers that are qualified to work on THESL plant are required to  
14 replace Fibertop Network Units; these worker's responsibilities encompass maintenance as well  
15 as most underground capital work. There are approximately 854 available crew days that must  
16 be divided amongst the entire underground capital program. Even if these resources were  
17 entirely dedicated to replace Fibertop Network Units, only approximately 131 units could be  
18 addressed annually.

19  
20 Given these constraints, THESL proposes to replace only units that are deemed high risk of  
21 immediate failure and have a direct impact on the safety of the general public. These 187  
22 Fibertop Network Units are all located below ground and subject to detrimental environmental  
23 conditions. THESL plans to replace 61 units in 2012 and 2013 for a total cost of \$9.13M.

/UF, /US

24  
25 Units not selected for immediate replacement are those located above ground in building  
26 electrical rooms (as seen in Figure 12 below) where they are less susceptible to catastrophic  
27 failure. These remaining units will be addressed over the next ten-year period such that all  
28 Fibertop Network Units are eventually removed from the system. THESL's ongoing inspection  
29 and maintenance program will ensure that Fibertop Network Units are prioritized to mitigate  
30 the risk associated with these units.

## ICM Project | Fibertop Network Units Segment



1 **Figure 10 – Walk-in Building Network Vault. (November 2011)**

2

3

### 4 **Economic Benefits of Preferred Solution**

5 THESL has calculated the economic benefits of undertaking the Fibertop Network Unit  
6 replacement segment, by determining how much cost is avoided by executing this work  
7 immediately, as opposed to executing it in 2015 (for comparison purposes). The avoided costs  
8 used in this model include quantified risks, taking into account the assets' probability of failure,  
9 and multiplying this with various direct and indirect cost attributes associated with in-service  
10 asset failures, including the costs of customer interruptions, emergency repairs, and  
11 replacement.

12

13 Based on THESL's calculations, carrying out immediate work on this asset class will result in an  
14 avoided estimated risk cost of \$37.4 million, which represents the avoided cost of executing the  
15 work immediately as opposed to deferring until 2015. This figure shows that there are

/UF, /C

## ICM Project | Fibertop Network Units Segment

- 1 APPENDIX A
- 2 Detailed List of Projects

Estimate Number	Project Title	Year	Cost Estimate (\$M)	
24911	4768SV_A11DX	2012	\$0.13	
24053	4540_A66DX	2013	\$0.14	/UF, /US
24053	4540_A61DX	2013	\$0.14	
24096	4491_A62DX	2012	\$0.13	
24086	4286_A53WR	2013	\$0.12	/US
24092	N1034_A65H	2013	\$0.12	
21583	4561_A55H	2012	\$0.12	
24912	4768SV_A13DX	2012	\$0.12	
22690	N1125_A67WR	2012	\$0.13	
24913	N1125_A64WR	2012	\$0.13	
23958	N1044_A65WR	2012	\$0.13	
23960	4517_A91A	2013	\$0.16	/US
23961	4517_A92A	2013	\$0.16	
24098	4643_A23T	2012	\$0.12	
24028	4794_A48CE	2013	\$0.12	/US
24090	4499WV_A66H	2013	\$0.14	
24146	4219EV_A54WR	2013	\$0.15	
24094	4646_A23T	2012	\$0.12	
24093	N1107_A53CS	2013	\$0.15	/US
24146	4219WV_A51WR	2013	\$0.15	
24520	4099_A66H	2013	\$0.13	
24530	4131_A67WR	2013	\$0.18	/UF, /US
24533	4131_A68WR	2013	\$0.35	
24521	4160_A69WR	2013	\$0.19	
24522	4336_A44GD	2013	\$0.19	

**ICM Project | Fibertop Network Units Segment**

Estimate Number	Project Title	Year	Cost Estimate (\$M)	
24523	4336_A48GD	2013	\$0.14	/UF, /US
24518	4523_A20T	2013	\$0.18	
24525	4553_A56H	2013	\$0.19	
24526	4625_A50DX	2013	\$0.13	/US
24534	4651_A53H	2013	\$0.37	/UF, /US
24535	4651_A54H	2013	\$0.18	/US
24519	4745_A55H	2013	\$0.14	
24536	4897NV_A43CE	2013	\$0.18	
24527	N1010_A41CE	2013	\$0.13	
24528	N1102_A71CE	2013	\$0.13	
24529	N1102_A72CE	2013	\$0.13	
25078	4768NV_A12DX	2013	\$0.14	
25078	N1029_A43GD	2013	\$0.14	
25078	4378_A43CE	2013	\$0.14	
25078	V4511_A16L	2013	\$0.14	
25078	4186_A69WR	2012	\$0.14	/US
25078	V4511_A17L	2013	\$0.14	
25078	4529WV_A49GD	2013	\$0.14	
25078	N1087_A67WR	2013	\$0.14	
25078	V4733_A16L	2013	\$0.14	
25078	4050_A83WR	2012	\$0.14	
25078	4172_A67H	2012	\$0.14	/US
25078	4205_A41GD	2013	\$0.14	
25078	4710NV_A62CS	2013	\$0.14	
25078	4340_A49GD	2013	\$0.14	
25078	4653SV_A65CS	2013	\$0.14	
25078	4521_A54WR	2013	\$0.14	
25078	4478_A66WR	2013	\$0.14	
25078	4776SV_A44CE	2013	\$0.14	

**ICM Project | Fibertop Network Units Segment**

Estimate Number	Project Title	Year	Cost Estimate (\$M)
25078	N1090_A37X	2013	\$0.14
25078	4376_A63H	2013	\$0.14
25078	N1011_A63WR	2013	\$0.14
25078	N1011_A66WR	2013	\$0.14
25078	4709_A39DN	2013	\$0.14
25078	4057_A73CS	2012	\$0.14
25078	N1045_A77CS	2013	\$0.14
24950	4230WV_A40GD	2014	\$0.14
24950	4769_A94B	2014	\$0.14
24950	4666EV_A86A	2014	\$0.14
24950	4666EV_A81A	2014	\$0.14
24950	4666WV_A82A	2014	\$0.14
24950	4666WV_A85A	2014	\$0.14
24950	4518_A73A	2014	\$0.14
24950	4917SV_A69WR	2014	\$0.14
24950	4766NV_A62CS	2014	\$0.14
24950	4766SV_A64CS	2014	\$0.14
24950	4543EV_A8GL	2014	\$0.14
24950	4238_A47GD	2014	\$0.14
24950	4238_A40GD	2014	\$0.14
24950	4340_A46GD	2014	\$0.14
24950	4637_A57H	2014	\$0.14
24950	4637_A55H	2014	\$0.14
24950	4885_A11E	2014	\$0.14
24950	4885_A12E	2014	\$0.14
24950	4407_A47H	2014	\$0.14
24950	4770_A56H	2014	\$0.14
24950	4653NV_A63CS	2014	\$0.14
24950	4026_A82CS	2014	\$0.14

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**ICM Project | Fibertop Network Units Segment**

Estimate Number	Project Title	Year	Cost Estimate (\$M)
24950	4654EV_A63CS	2014	\$0.14
24950	N1109_A65CS	2014	\$0.14
24950	N1115_A91CS	2014	\$0.14
24950	4723_A71CE	2014	\$0.14
24950	4658_A61CS	2014	\$0.14
24950	4658_A60CS	2014	\$0.14
24950	4387_A55WR	2014	\$0.14
24950	4509_A67A	2014	\$0.14
24950	4564_A18T	2014	\$0.14
24950	4654WV_A65CS	2014	\$0.14
24950	4696NV_A62CS	2014	\$0.14
24950	4696SV_A63CS	2014	\$0.14
24950	4774_A63H	2014	\$0.14
24950	4187_A11E	2014	\$0.14
24950	4187_A12E	2014	\$0.14
24950	V4476_A6L	2014	\$0.14
24950	V4476_A17L	2014	\$0.14
24950	N1114_A65WR	2014	\$0.14
24950	N1114_A69WR	2014	\$0.14
24950	4542_A4K	2014	\$0.14
24950	4022EV_A57WR	2014	\$0.14
24950	4244_A6K	2014	\$0.14
24950	4031_A64WR	2014	\$0.14
24950	N1128_A67WR	2014	\$0.14
24950	4562_A58WR	2014	\$0.14
24950	_A67WR	2014	\$0.14
24950	4826_A3K	2014	\$0.14
24950	4465_A90B	2014	\$0.14
24950	4733_A16L	2014	\$0.14

## ICM Project | Fibertop Network Units Segment

Estimate Number	Project Title	Year	Cost Estimate (\$M)
24950	4214_A54DX	2014	\$0.14
24950	N1048_A73CS	2014	\$0.14
24950	N1048_A77CS	2014	\$0.14
24950	N1196_A36MN	2014	\$0.14
24950	N1196_A38MN	2014	\$0.14
24950	4768-NV_A12DX	2014	\$0.14
24950	4648_A90B	2014	\$0.14
24950	4648_A91B	2014	\$0.14
24950	4481WV_A51DX	2014	\$0.14
24950	4154_A66DX	2014	\$0.14
24950	N5003_A67H	2014	\$0.14
24950	N5003_A65H	2014	\$0.14
24950	4539_A55CS	2014	\$0.14
24950	4100_A46CE	2014	\$0.14

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**ICM Project** | **Fibertop Network Units Segment**

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**ICM Project** | **Fibertop Network Units Segment**

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**ICM Project | Fibertop Network Units Segment**

1 **Table 1: Summary of values used in the determination of Avoided Estimated Risk Cost**

Business Case Element	Cost (in Millions)
Present Value of Project Net Cost in 2015 (PV(PROJECT <sub>NET_COST</sub> (2015)))	\$37.7
Project Net Cost in 2012 (PROJECT <sub>NET_COST</sub> (2012))	\$0.3
<b>Avoided Estimated Risk Cost</b>	<b>\$37.4</b>

/c

/c

- 2 When this avoided cost is calculated as a positive value, it means that estimated risk costs for  
 3 the job assets in 2015 will exceed the estimated risks that exist today. By performing the work  
 4 immediately as opposed to waiting until 2015, we can eliminate these estimated risks.  
 5 Therefore, these avoided costs represent the benefits of job execution.

# ICM Project – Network Infrastructure and Equipment

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## Automatic Transfer Switches (ATS) and Reverse Power Breakers (RPB) Segment

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | ATS and RPB Segment

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$6.57 M to \$5.27 M, a reduction of \$1.3 M
- 3 • Revised number of jobs proposed for 2012/2013 to 18 (14 ATS and 4 RPB), with jobs for
- 4 2014 to be addressed in Phase Two, as proposed
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system
- 8 • Corrected units used to measure outage costs

**ICM Project | ATS and RPB Segment**

1 **I EXECUTIVE SUMMARY**

2

3 **1. Project Description**

4 Automatic Transfer Switches (ATS) automatically switch a customer to a designated standby  
 5 feeder in the event the normal primary feeder fails. Reverse Power Breakers (RPB)  
 6 automatically open primary feeder supplies to customers in the event of feeder outages to  
 7 prevent dangerous backfeed conditions. ATS and RPB assets are generally used to supply  
 8 medium size customers that require a reliable supply, such as schools, supermarkets, seniors'  
 9 homes, and other mid- sized buildings (See Section II, 1).

10

11 Both ATS and RPB assets have degraded rapidly in 2010 and 2011. THESL's Asset Condition  
 12 Assessment (ACA) results indicate that approximately 30 ATS assets will need to be replaced  
 13 over the next three years (See Section III, 1 and Appendix 1). In addition, based on physical  
 14 inspection data, a further six RPB assets have been identified as requiring immediate  
 15 replacement. The proposed ATS and RPB Segment will replace these assets with Stand Alone  
 16 Network Protectors or Standard Network Equipment at a total cost of \$3.25M over 2012 and  
 17 2013.

/UF, /US

18

19 **Table 1: ATS and RPB Segment Capital Cost**

Description	Year	Design Estimate (\$M)	Estimated Total Cost (\$M)
Replace 10 ATS Locations	2013	\$2.54	\$2.54
Replace 10 ATS Locations	2014	\$2.52	
Replace 2 RPB Locations	2013	\$0.71	\$0.71
Replace 2 RPB Locations	2014	\$0.71	
<b>Total 2012-2013:</b>			<b>\$3.25</b>

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## ICM Project | ATS and RPB Segment

---

1    **II        DETAILED PROJECT INFORMATION**

2

3    **1.    Project Details**

4

5    Automatic Transfer Switches (ATS) are designed to automatically switch from the normal supply  
6    to the Standby supply in the case of an interruption on the normal supply feed. Reverse Power  
7    Breaker (RPB) assets normally supply customers from two primary supplies, and automatically  
8    open one of these supplies in the event of feeder outages in order to prevent dangerous  
9    backfeed conditions. ATS and RPB assets are generally used to supply medium size customers  
10    that require a reliable supply, such as schools, supermarkets, seniors' homes, and other mid-  
11    sized buildings.

12

13    The purpose of this segment is to replace end-of-life, very poor condition ATSs and RPBs. In  
14    2012 and 2013 there are 10 ATS locations and 2 RPB locations that have been identified as        /US  
15    requiring immediate equipment replacement. THESL's proposed ATS and RPB Segment will  
16    replace these assets with either new Stand-Alone Network Protectors or Standard Network  
17    Equipment at a total cost of \$3.25M for 2012 and 2013, as summarized in Table 2 and Table 3        /UF, /US  
18    below.

19

20    Each asset location will be assessed on a case by case basis to determine the best replacement  
21    solution. In cases where the transformer is salvageable it is reused and a Stand Alone Network  
22    Protector (SANP) is installed to replace the obsolete and failing equipment at an approximate  
23    average cost of \$145,000. If the transformer also requires replacement then the equipment will  
24    be replaced with standard network equipment, at an approximate average cost of \$325,000.

25

26    Given workforce constraints, THESL proposes to replace 10 ATS units and 2 RPB units in 2012 –  
27    2013. Jobs have been prioritized based on addressing the very poor condition units first,        /US  
28    followed by units that are currently in poor condition, but expected to degrade to very poor  
29    condition at the time of replacement.

**ICM Project** | **ATS and RPB Segment**

1 **Table 2: ATS Replacement Jobs**

Job Estimate Number	Job Title	Job Year	Cost Estimate (\$M)	
19381	D9012 – Near 654 Castlefield, Toronto	2013	\$0.32	/us
23252	D3031 - 2108 Queen St East, Toronto	2013	\$0.21	
24544	4862 - 77 Ryerson Ave, Toronto	2013	\$0.14	
24546	4023 - Near 142 Pears Ave, Toronto	2013	\$0.36	/UF, /US
24548	D9010 - 205 Richmond St W, Toronto	2013	\$0.14	/us
24549	D3022 – 75 Dowling Ave, Toronto	2013	\$0.14	
24550	4064 – 295 College St, Toronto	2013	\$0.37	
24634	D3002 – 70 Elmsthorpe, Toronto	2013	\$0.14	
24634	D9013 - 2727 Dundas W, Toronto	2013	\$0.36	
24634	4063 - 645 Adelaide St W, Toronto	2013	\$0.36	
24952	4027 – 14 Spadina Road	2013	\$0.32	
24952	4046 – Near 130 EGLINTON, Toronto	2013	\$0.32	
24952	4129 – Heath Street East	2013	\$0.32	
24952	4158 – Duncan Ave	2013	\$0.32	
24953	4817 – ADJ. to 330 GERRARD	2014	\$0.36	/us
24953	D9007 – 658 to 668 Danforth Ave, Toronto	2014	\$0.14	
24953	D3014 – 2001 Bloor St W, Toronto	2014	\$0.14	
24953	4157 – 175 Elm, Toronto	2014	\$0.36	
24953	D3041 – 1141 Bloor St W, Toronto	2014	\$0.14	
24953	D3003 – 75 Eglinton Ave W, Toronto	2014	\$0.14	
24953	4118 – 197 Wellesley St E, Toronto	2014	\$0.36	
24953	4763 – 700 Ontario St, Toronto	2014	\$0.14	
24953	4121 – 36 Earl, Toronto	2014	\$0.36	
24953	4861 – 165 Grange Ave, Toronto	2014	\$0.36	

**ICM Project** | **ATS and RPB Segment**

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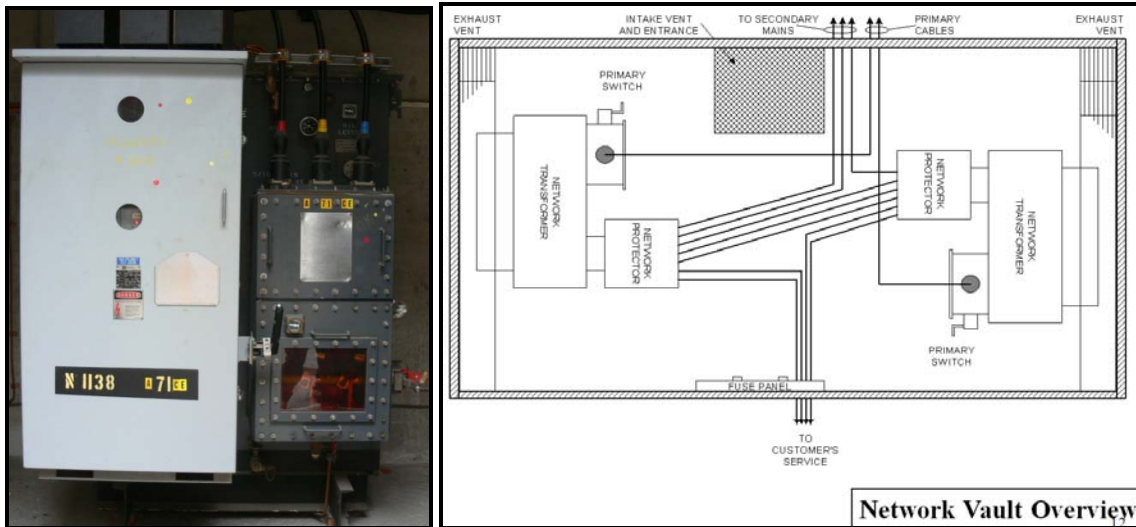
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1 **Table 3: RPB Replacement Jobs**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Job Year</b>	<b>Cost Estimate (\$M)</b>
24905	4515 - 25 Lascelles Blvd, Toronto	2013	\$0.35
24905	D3039 – 186 Cowan, Toronto	2013	\$0.35
24955	4175 – 160 John St, Toronto	2014	\$0.35
24955	4669 – 200 Balliol, Toronto	2014	\$0.35

} /us

## ICM Project | ATS and RPB Segment



1 **Figure 15: Network vault (submersible or non-submersible equipment)**

2

3

4 Both options (f) and (g) are expected to provide superior reliability due to the interconnection of  
5 multiple transformers and supply feeders. The main advantage of installing either SANPs or  
6 network equipment is the ability to utilize available civil infrastructure to supply THESL's  
7 customers with a highly reliable system that normally would be cost prohibitive due the need to  
8 construct additional civil infrastructure. Replacing the obsolete ATS and RPB equipment is  
9 expected to lead to higher reliability for customers and a safer environment for THESL  
10 employees and the general public. Installing Option (f), and Option (g) where required, is the  
11 preferred alternative because this approach provides the best combination of reliability, safety  
12 and cost.

13

### 14 **2. Economic Benefits of the Preferred Alternative**

15 THESL has calculated the economic benefits of undertaking this segment, by taking into account  
16 outage costs and the costs of emergency repairs and replacement. If no proactive replacements  
17 were to occur and equipment was run to failure, then the resulting NPV of this strategy would  
18 be \$12.67M. This accounts for the replacement cost and an average outage cost for each  
19 outage of \$0.06M per failure (with outage cost based on \$30 per KVA and \$15 per KVA-hour  
20 interrupted). The alternative proposed replacement strategy would yield an NPV of \$10.41M,  
21 resulting in a savings of \$2.26M.

/c

# ICM Project – Station Infrastructure and Equipment

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## Stations Power Transformers Segment

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | Station Power Transformers Segment

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Revised number of jobs proposed for 2012/2013 to 10, with jobs for 2014 to be addressed in
- 3 Phase Two, as proposed
- 4 • 2014 jobs and spending shown in strike-through
- 5 • Rescheduled two 2012 jobs to 2013 to recognize the work accomplished to date in 2012 and
- 6 the continuing priority needs of the system
- 7 • Corrected numerical and typographical errors

**ICM Project | Station Power Transformers Segment**

1 **I EXECUTIVE SUMMARY**

2

3 **1. Project Description**

4 This segment consists of replacing 10 power transformers at ten Municipal Stations (MS) over /UF, US  
 5 the period 2012 through 2013. The transformers to be replaced and their cost of replacement /US  
 6 are shown in Table 1. Total cost for this segment is approximately \$3.85 M. These transformers /UF, US  
 7 range in size from 3 MVA to 15 MVA and are used to step down voltage from primary voltages  
 8 of 27.6 kV or 13.8 kV to secondary voltages of 13.8 kV or 4.16 kV.

9

10 **Table 1: Job Cost Estimates**

Estimate Number	Job Title	Project Year	Cost Estimate (\$M)
18419	S12062 Ellesmere White abbey MS Replace Station Transformer TR1	2012	\$0.36
20647	S12376 Thistletown MS Replace Station Transformer TR1	2012	\$0.29
20675	S12389 Scarborough Golf Club Rd MS: Replace Station Transformer TR1.	2013	\$0.35
20685	S12391 Thistletown MS replace Station Transformer TR2 - 3/4 MVA.	2013	\$0.29
21573	S13127 Kingston Morningside MS: Replace Station Transformer TR1	2013	\$0.33
21651	S13144 Edenbridge MS Replace Station Transformer TR1	2013	\$0.37
21722	S13154 High Level MS Replace Station Transformer TR1	2013	\$0.46
21723	S13155 High Level MS Replace Station Transformer TR2	2013	\$0.54
21802	S13168 Blaketon MS Replace Station Transformer TR1	2013	\$0.47

} /US

## ICM Project | Station Power Transformers Segment

Estimate Number	Job Title	Project Year	Cost Estimate (\$M)
21852	S13170 Albion MS Replace Station Transformer TR2	2013	\$0.39
22876	<del>S14091 Norseman MS Replace Station Transformer TR1</del>	2014	<del>\$0.45</del>
22877	<del>S14092 Underwriter Crouse MS Station Replace Transformer TR1</del>	2014	<del>\$0.43</del>
<b>Total 2012-2013:</b>			<b>\$3.85</b>

/UF, US

### 1 2. Why the Project is Needed Now

2 In terms of both financial and operational risks, power transformers are the most important  
 3 assets employed in municipal stations. All customers supplied through municipal stations will  
 4 have their power pass through a station power transformer. Each municipal station serves  
 5 somewhere between a few hundred and a few thousand customers.

6  
 7 These jobs selected for this segment were chosen from 276 in-service station transformers  
 8 based on their age (See Table 2) transformer leakage, or their condition assessment (Refer to  
 9 Appendix 5). A significant proportion of power transformers on THESL's system were installed in  
 10 the 1950s, 1960s or early 1970s. Based on the Kinetrics Report, the typical end of useful life for  
 11 a station power transformer is 43 years. The 10 power transformers to be replaced in  
 12 2012/2013 are between 36 and 84 years old; only two are less than 43 years old.

13  
 14 Due to its low cost, high dielectric strength, excellent heat-transfer characteristics, and ability to  
 15 recover after dielectric overstress, mineral oil is the most widely used insulating material in  
 16 transformers. The presence of increasing levels of dissolved gases in transformer oil is indicative  
 17 of various faults (See Appendices 1, 2 and 3). For a majority of transformers, end of life is  
 18 expected to be indicated by the failure of pressboard and paper insulation. While the insulating  
 19 oil can be treated by oil reclamation or changed when there is presence of water or sludge, it is  
 20 not practical to change the paper and pressboard insulation. Although failure rates have been



## ICM Project | Station Power Transformers Segment

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1     **3.       Why This is the Preferred Alternative**

2     THESL considered three options to mitigate the potential reliability and safety risks associated  
3     with the deteriorated state of these 10 station power transformers: maintaining the status quo, /us  
4     eliminating the need for the station transformer via area voltage conversions in these selected  
5     stations or replacing the station transformer (See Section IV).

6  
7     The status quo option presents safety, reliability and performance risks (See Section IV, 1).  
8     Catastrophic failure of transformers may result in damage to other transformers and other  
9     station equipment, and if staff are present, potential injury to personnel. In addition to the risk  
10    of failure, when a station transformer's health decreases significantly, THESL transfers load to  
11    other transformers. This in turn increases their loading and decreases the capacity available to  
12    be used to deal with system contingencies, which impacts reliability. Performance risk also  
13    increases over time due to the deterioration of both the insulating oil and the paper insulation  
14    as moisture levels increase (See Section IV).

15  
16    Voltage conversion is not typically undertaken based on the condition of station equipment  
17    alone. The cost of the distribution system served by the station usually exceeds the cost of the  
18    station. Thus it is not economic to advance the replacement of distribution systems due to  
19    station asset issues.

20  
21    Carrying out immediate work on this asset class will result in the avoided estimated risk cost of  
22    approximately \$78.7 million (Refer to Appendix 4), as opposed to executing this work in 2015. /c  
23    Therefore, there are distinct economic benefits to executing this work immediately.

24  
25    The most cost-effective option is replacement of obsolete equipment before failure. Options  
26    have been examined to replace the units and the benefits of doing so in terms of reliability have  
27    been calculated. The result shows that the most cost-effective option is to replace the station  
28    power transformers, compared to the option of eliminating the need of station power  
29    transformers by conversion of the area to higher voltage.

**ICM Project | Station Power Transformers Segment**

1 **II DETAILED INFORMATION**

2

3 **1. Objectives**

4 The objective of the station transformer replacement program is to replace those Power  
 5 Transformers that are beyond their end of useful life, or have environmental leakage, and where  
 6 the risk of transformer failure is high due to deteriorating insulating conditions represented by  
 7 the Health Index shown in Appendix 5. In addition to aging, transformers with DGA oil tests  
 8 indicating poor insulation condition will be prioritized for replacement (See Appendices 1, 2 and  
 9 3). The objectives for each job are described in Table 3.

10

11 **Table 3: Objectives for each Transformer Replacement Job**

Job	Objectives	Planned Year
Ellesmere White abbey MS	Replace the existing 5/6.7 MVA, 27.6/4.16kV station transformer, TR1, with a new 27.6kV/4.16kV, 5/6.7MVA station transformer at Ellesmere White Abbey MS station.	2012
Thistletown MS	Replace the existing 3/4MVA, 27.6/4.16kV station transformer, TR1, with a new 3/4 MVA, 27.6/4.16kV station transformer at Thistletown MS station.	2012
Thistletown MS	Replace the existing 3/4MVA, 27.6/4.16kV station transformer, TR2, with a new 3/4 MVA, 27.6/4.16kV station transformer at Thistletown MS station.	2013
Scarborough Golf Club Rd MS	Replace the existing station transformer, TR1, with a new 5MVA, 27.6/4.16kV station transformer at Scarborough Gold Club Rd MS station.	2013

} /US

## ICM Project | Station Power Transformers Segment

Job	Objectives	Planned Year
Kingston Morningside MS	Replace the existing 5/6.7 MVA, 27.6/4.16kV station transformer, TR1, with a new 27.6kV/4.16kV, 5/6.7MVA station transformer at Kingston Morningside MS station.	2013
Edenbridge MS	Replace the existing 5/6.7 MVA, 27.6/4.16kV station transformer, TR1, with a new 27.6kV/4.16kV, 5/6.7MVA station transformer at Edenbridge MS station.	2013
High Level MS	Replace the existing 9/12 MVA, 13.8/4.16kV station transformer, TR1, with a new 9/12 MVA, 13.8/4.16kV station transformer at High Level MS station.	2013
High Level MS	Replace the existing 12/15 MVA, 13.8/4.16kV station transformer, TR2, with a new 12/15 MVA, 13.8/4.16kV station transformer at High Level MS station.	2013
Blaketon MS	Replace the existing 7.5/10 MVA, 27.6/13.8kV station transformer, TR1, with a new 7.5/10 MVA, 27.6/13.8kV station transformer at Blaketon MS station.	2013
Albion MS	Replace the existing 5/6.7 MVA, 27.6/4.16kV station transformer, TR2, with a new 5/6.7MVA, 27.6kV/4.16kV station transformer at Albion MS station.	2013
Norseman MS	Replace the existing 5/6.7 MVA, 27.6/4.16kV station transformer, TR1, with a new 5/6.7MVA, 27.6kV/4.16kV station transformer at Norseman MS station.	2014

## ICM Project | Station Power Transformers Segment

Job	Objectives	Planned Year
Underwriter-Crouse-MS	Replace the existing 5 MVA, 27.6/4.16kV station transformer, TR1, with a new 5/6.7MVA, 27.6kV/4.16kV, station transformer at Underwriter-Crouse-MS station.	2014

1    **2. Scope of Work**

2    The scope of work for all of the transformer replacement jobs listed above consists of the  
3    following tasks:

- 4        (a) Procure and purchase a new station transformer appropriately sized  
5        (b) Removal of the old TR1/TR2 transformer  
6        (c) Deliver and install the new station transformer to replace the existing TR1/TR2  
7            transformer  
8        (d) Perform testing, commissioning and energization of the new transformer

9

10   **3. Map and Locations**

11   The stations are located across Toronto as shown in Figure 3 below.

## ICM Project | Station Power Transformers Segment

1 **Table 4: Station name with their respective address**

Reference Number	Station Name - Transformer	Address
1	Ellesmere White Abbey MS – TR1	159 Ellesmere Rd, Toronto
2	Thistletown MS – TR1 and TR2	55 Thistle Down Blvd, Toronto
3	Scarborough Gold Club Rd MS – TR1	1000 Scarborough Golf Club Rd, Toronto
4	Kingston Morningside MS – TR1	4446 Kingston Rd, Toronto
5	Edenbridge MS – TR1	294 Scarlett Rd, Toronto
6	High Level MS – TR1 and TR2	292-296 MacPherson Ave, Toronto
7	Blaketon MS – TR1	395 The East Mall, Toronto
8	Albion MS – TR2	2 Rampart Rd, Toronto
9	<del>Norseman MS – TR1</del>	<del>1066 Islington Ave, Toronto</del>
10	<del>Underwriter Crouse MS – TR1</del>	<del>20 Underwriters Rd, Toronto</del>



## ICM Project | Station Power Transformers Segment

---

1 **Justification:**

- 2 (a) The transformer was manufactured in 1976 and has reached the end of its operating  
3 life.
- 4 (b) DGA results indicate degradation of insulation paper and dielectric strength, indicating  
5 an increased risk of failure with its associated impacts.
- 6 (c) The Dissolved Gas report indicates a trend of continuous degradation of insulation  
7 paper above normal acceptable level. The high CO<sub>2</sub> and CO value indicates internal  
8 arcing and shows that the paper insulation is becoming brittle and less resistant to  
9 electrical stress, which could lead to a transformer failure.
- 10 (d) The Dissolved Gas report indicates that the dissolved gas levels are elevated with  
11 Ethylene at 144 PPM. The elevated gas levels indicate overheating of the oil, likely the  
12 result of an overheating conductor, which could lead to a transformer failure.

13

14

15 ~~11. Norseman MS~~

16 ~~Transformer: TR1~~

17 ~~Age: 61~~

18 ~~Transformer Leakage: No~~

19 ~~DGA Results: Condition 1 (Refer to Appendix 2)~~

**ICM Project | Station Power Transformers Segment**

1 **Table 13: DGA result for TR1 transformer at Norseman MS**

<b>Dissolved Gas Analysis</b>			
<b>Test Type</b>	<b>Test Results</b>		<b>Result Analysis</b>
	02/06/2011	15/05/2009	
Oil Temperature (°C)	35	--	1. Acid number is well within the sludge forming range  2. Overall equipment condition code: 1
Hydrogen (H2) (PPM)	5	8	
Methane (CH4) (PPM)	2	2	
Ethane (C2H6) (PPM)	--	1	
Ethylene (C2H4) (PPM)	11	12	
Acetylene (C2H2) (PPM)	0	0	
Carbon Monoxide (CO) (PPM)	158	181	
Carbon Dioxide (CO2) (PPM)	1072	1535	
Nitrogen (N2) (PPM)	55939	75246	
Oxygen (O2) (PPM)	25451	35635	
Total Dissolved Gas (PPM)	82638	112620	
Total Dissolved Combustible Gas (PPM)	176	204	
Moisture in Oil (PPM)	18	16	
Acid Number (mg KOH/g)	<b>0.101</b>	0.073	
Dielectric Breakdown (kV)	28	45	
Power Factor at 25°C (%)	0.048	0.102	

2 **Duval Triangle Analysis:**

3 Based on the DGA tests recorded in our Ellipse system, analysis using the Duval Triangle method  
 4 (Refer to Appendix 3) shows a declining condition trend for the transformer (TR1) at Norseman  
 5 MS (Refer to Appendix 11). The condition of the transformer has been declining in the T3 region  
 6 which exhibits thermal faults at temperature greater than 700C.



## ICM Project | Station Power Transformers Segment

---

1 **Justification:**

- 2 ~~(a) The transformer was made in 1951 and has reached the end of its operating life.~~
- 3 ~~(b) DGA results indicate degradation of insulation paper, indicating an increased risk of~~  
4 ~~failure with its associated impacts.~~
- 5 ~~(c) High acid content of 0.101 mg KOH/g which is 1% higher than the limit of 0.1mg KOH/g.~~  
6 ~~Elevated acid number indicates oil oxidation is advanced, enough so to have produced~~  
7 ~~some sludge deposits within the transformer. Higher acidity has a damaging effect on~~  
8 ~~the paper insulation.~~

9

10

11 **~~12. Underwriter Crouse MS~~**

12 **~~Transformer: TR1~~**

13 **~~Age: 53~~**

14 **~~Transformer Leakage: No~~**

15 **~~DGA Results: Condition 1 (Refer to Appendix 2)~~**

**ICM Project | Station Power Transformers Segment**

1 **Table 14: DGA result for TR1 transformer at Underwriter Crouse MS**

<b>Dissolved Gas Analysis</b>			
<b>Test Type</b>	<b>Test Results</b>		<b>Result Analysis</b>
	07/12/2010	12/04/2008	
Oil Temperature (°C)	47	20	1. Dielectric breakdown exceeds limit for in-service oil (26kV) 2. Overall equipment condition code: 1
Hydrogen (H2) (PPM)	14	11	
Methane (CH4) (PPM)	2	2	
Ethane (C2H6) (PPM)	0	1	
Ethylene (C2H4) (PPM)	5	4	
Acetylene (C2H2) (PPM)	0	0	
Carbon Monoxide (CO) (PPM)	111	156	
Carbon Dioxide (CO2) (PPM)	2278	1261	
Nitrogen (N2) (PPM)	59201	72163	
Oxygen (O2) (PPM)	33837	36218	
Total Dissolved Gas (PPM)	95448	109816	
Total Dissolved Combustible Gas (PPM)	132	174	
Moisture in Oil (PPM)	34	11	
Acid Number (mg KOH/g)	0.020	0.027	
Dielectric Breakdown (kV)	23	46	
Power Factor at 25°C (%)	0.108	0.077	

2 **Duval Triangle Analysis:**

3 Based on the DGA tests recorded in our Ellipse system, analysis using the Duval Triangle method  
 4 (Refer to Appendix 3) shows a declining condition trend for the transformer (TR1) at  
 5 Underwriter Course MS (Refer to Appendix 1J). The condition of the transformer has been  
 6 declining in the T3 region which exhibits thermal faults at temperature greater than 700C.

## ICM Project | Station Power Transformers Segment

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1 **Justification:**

2 ~~(a) The transformer was made in 1959 and has reached the end of its operating life.~~

3 ~~(b) DGA results indicate degradation of dielectric strength, indicating an increased risk of~~  
4 ~~failure with its associated impacts.~~

5 ~~(c) The Dissolved Gas report shows high moisture content has degraded the dielectric~~  
6 ~~strength of the insulating oil to an operating level outside of limits and if left in service,~~  
7 ~~this unit is at risk of failure.~~

## ICM Project | Station Power Transformers Segment

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1 cost of the distribution system served usually exceeds the cost of the station, it is not economic  
2 to advance the replacement of distribution systems due to station asset issues.

### 4. Replacement

5 Replacement of the station power transformer is feasible and much more economical. Also, it  
6 reduces the risk to other stations whose customers are served by these transformers under  
7 contingency. Table 15 shows the benefit cost evaluation of this option.

### 5. Avoided Risk Cost of the Selected Option

8  
9  
10 The effectiveness of the Power Transformers replacement segment can be highlighted by  
11 determining how much cost is avoided by executing this work immediately as opposed to  
12 executing in 2015. These avoided costs include quantified risks, taking into account the assets'  
13 probability of failures, and multiplying this with various direct and indirect cost attributes  
14 associated with in-service asset failures, including the cost of customer interruptions,  
15 emergency repairs and replacement.

16  
17 Carrying out immediate work on this asset class will result in the avoided estimated risk cost of  
18 approximately \$78.7 million (Refer to Appendix 4), as opposed to executing this work in 2015. /c  
19 Therefore, there are distinct economic benefits to executing this work immediately. Further  
20 details with regards to the methodologies applied within business case are provided within  
21 Appendix 4.

### 6. Preferred Alternative

22  
23  
24 Based on comparison of the alternatives, replacement of the existing station power transformer  
25 is prudent since it is the most cost-effective option and provided a benefit/cost ratio greater  
26 than unity.

ICM Project | Station Power Transformers Segment

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1 ~~Appendix 11~~

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/us

ICM Project | Station Power Transformers Segment

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1 ~~Appendix 1~~

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/us

## ICM Project | Station Power Transformers Segment

1 estimated risks. Therefore, these avoided costs represent the benefits of the in-kind project  
 2 execution.

3  
 4 The formula for this calculation is detailed below:

5  
 6 
$$\text{Avoided Estimated Cost} = \text{PV}(\text{PROJECT}_{\text{NET\_COST}}(2015)) - \text{PROJECT}_{\text{NET\_COST}}(2012)$$

7  
 8 Where:

- 9 ○  $\text{PROJECT}_{\text{NET\_COST}}(2012)$ : Represents the total project net costs in 2012.
- 10 ○  $\text{PV}(\text{PROJECT}_{\text{NET\_COST}}(2015))$ : Represents the present value of total project net costs in  
 11 2015.

12  
 13 Within the Power Transformers segment, individual optimal intervention timing results were  
 14 calculated for each of the 12 power transformer assets, based upon the processes identified in  
 15 Section 1.1. Each of these assets may possess an individual sacrificed life and an excess risk  
 16 value, which are aggregated to produce the overall Project Net Cost year by year.

17  
 18 As noted in the formula above, this Project Net Cost was then calculated for all individual Power  
 19 Transformer assets within this project at years' 2012 and 2015 respectively. Project Net Costs  
 20 quantified in 2015 were brought back to a present value and the difference between this value  
 21 and the Project Net Cost quantified in 2012 was taken as the Avoided Estimated Risk Cost. The  
 22 final results are provided in Table 1 below:

23  
 24 **Table 1: Summary of values used in the determination of Avoided Estimated Risk Cost**

Business Case Element	Cost (in Millions)
Present Value of Project Net Cost in 2015 ( $\text{PV}(\text{PROJECT}_{\text{NET\_COST}}(2015))$ )	\$ 78.857
Project Net Cost in 2012 ( $\text{PROJECT}_{\text{NET\_COST}}(2012)$ )	\$ 0.144
<b>Avoided Estimated Risk Cost =</b> <b>(<math>\text{PV}(\text{PROJECT}_{\text{NET\_COST}}(2015)) - \text{PROJECT}_{\text{NET\_COST}}(2012)</math>)</b>	<b>\$78.713</b>

} /c

# ICM Project – Station Infrastructure and Equipment

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## Municipal Substation Switchgear Replacement Segment



Toronto Hydro-Electric System Limited (THESL)



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**ICM Project** | **Municipal Substation Switchgear Replacement Segment**

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$12.95 M to \$11.40 M, a reduction of \$1.55 M
- 3 • Revised number of jobs proposed for 2012/2013 to 5, with jobs for 2014 to be addressed in
- 4 Phase Two, as proposed
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system
- 8 • Corrected numerical and typographical errors

## ICM Project | Municipal Substation Switchgear Replacement Segment

### 1 I EXECUTIVE SUMMARY

2

#### 3 1. Project Description

4 Many Municipal Substations (MS) located outside of downtown Toronto employ switchgear that  
5 are past the end of their useful lives and rely on obsolete technology such as non arc-resistant  
6 designs with oil circuit breakers and mechanical relays. This type of aged equipment can be kept  
7 in service for a time by increased maintenance and harvesting parts from spares. However, as  
8 the asset condition continues to deteriorate and the risk of failure increases, maintaining this  
9 switchgear in service is unsustainable. In addition, the circuit breakers in some of these  
10 substations have auto re-closure problems (i.e., when a circuit breaker is taken out of service for  
11 maintenance and put back, it auto re-closes instead of locking, even though the circuit breaker is  
12 on open position and the auto re-closure is blocked by control authority), which create potential  
13 safety risks (See Section II).

14

15 The MS Switchgear to be replaced under this segment in 2012 and 2013 ~~and 2014~~ include Leslie  
16 MS, Lawrence Golf MS, Brian Elinor MS, York MS, Brimley Bernadine MS, Porterfield MS,  
17 Greencedar Lawrence MS, Neilson Drive MS, Midland Lawrence MS, ~~Pharmacy CPR MS, Islington~~  
18 ~~MS~~ and Thornton MS. The switchgears in all but one of these stations are more than 50 years /US  
19 old. The total cost of this segment is approximately \$11.40 million as shown in Table 1.

20

21 The switchgear selected for replacement in this segment were chosen from 181 switchgear /US  
22 across 170 Municipal Substations based upon advanced equipment age, equipment  
23 obsolescence employing obsolete oil circuit breakers, lack of arc-resistant design and safety  
24 related equipment issues. Based on available resources, jobs are scheduled over ~~three~~ two /US  
25 years to allow engineering, procurement, construction and commissioning and are closely  
26 coordinated with feeder transfers to minimize customer outages and limit single supply  
27 contingency.

**ICM Project | Municipal Substation Switchgear Replacement Segment**

1 **Table 1: Job Cost Estimate**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Year Installed</b>	<b>Job Year</b>	<b>Cost Estimate (\$M)</b>	
20427	S12320 Leslie MS Switchgear Replacement	1978	2013	4.08	/US
20427	S12320 Leslie MS Switchgear Replacement (Continuation	1978	2013	1.04	
20560	S11032 Lawrence Golf Switchgear Replacement	1957	2012	0.82	
20561	S11031 Brian Elinor MS Replace switchgear	1954	2012	0.83	
22620	S11642 York MS Replace Switchgear	1954	2012	1.39	
20544	S11040 Brimley Bernadine MS Replace Switchgear	1959	2012	1.09	
20750	S12416 Porterfield MS Replace Switchgear	1956	2013	1.23	/US
21338	S13090 Greencedar Lawrence MS Replace Switchgear	1960	2013	0.22	/UF
21581	S13126 Neilson Dr MS Replace Switchgear	1954	2013	0.30	/UF
21339	S14044 Midland Lawrence MS Replace switchgear	1960	2013	0.24	
<del>21339</del>	<del>S14044 Midland Lawrence MS Replace switchgear (Continuation)</del>	<del>1960</del>	<del>2014</del>	<del>0.62</del>	
20779	S14048 Pharmacy CPR MS Replace switchgear	1961	2014	0.94	
22804	S14068 Islington MS Replace Switchgear	1955	2014	1.51	

**ICM Project | Municipal Substation Switchgear Replacement Segment**

Job Estimate Number	Job Title	Year Installed	Job Year	Cost Estimate (\$M)
22805	S14070 Thornton MS Replace Switchgear (pre-work)	1955	2013	0.11
22805	S14070 Thornton MS Replace Switchgear (pre-work)		2014	0.86
<b>Jobs Total 2012-2013</b>				<b>11.35</b>
<b>Reconciliation for budget changes &lt; \$100,000 and rounding</b>				<b>\$0.05</b>
<b>TOTAL</b>				<b>\$11.40</b>

/us

/UF, US

1 **2. Why the Project is Needed Now**

2 All the Municipal Substation switchgear proposed to be replaced are over 50 years (with the  
 3 exception of Leslie MS) and have reached the end of their useful life. The switchgear employ  
 4 obsolete technology, such as non arc-resistance design, oil circuit breakers and mechanical  
 5 relays. Non arc-resistant switchgear does not have the ability to channel the energy released  
 6 during an internal arc fault in ways that minimize the potential injury to personnel and damage  
 7 to equipment in the surrounding area, including damaging the entire substation.

8  
 9 THESL experienced two substation fires in recent years due to faults in substation equipment  
 10 that were at their end of service life; one was in 2007 at Lesmil MS in North York area and the  
 11 second one was in 2009 at station J, in East York area. Both substations were over 50 years old  
 12 and the fire was attributed to faults in the substation switchgears. Switchgear which is over its  
 13 useful design life (50 years) can fail catastrophically at any time. Lesmil MS was severely  
 14 damaged as a result of the fire created due to the fault and Station J was burned down as a  
 15 result of the fire created by the arc fault in the switchgear and there was no substation  
 16 equipment left to repair.

17  
 18 The load of both of the above substations was temporarily transferred to their respective  
 19 adjacent substations. Lesmil MS was ultimately converted to 27.6kV because the station was  
 20 lightly loaded and replacing or repairing the aging switchgear was not cost effective. Station J  
 21 MS was also lightly loaded as a result of previous load conversion so converting substation was  
 22 more cost effective than replacing and/or repairing the aging switchgear. Load conversion also

## ICM Project | Municipal Substation Switchgear Replacement Segment

---

1 offered the advantage of addressing aging equipment on the distribution system outside the  
2 substation.

3  
4 In addition to the consequences of in-service failures, the existing circuit breakers in all of the  
5 switchgear are oil circuit breakers and are obsolete. The maintenance for this type of circuit  
6 breaker takes twice as long as the modern vacuum circuit breakers and replacement parts for  
7 this type of circuit breaker are no longer manufactured. If they can be obtained at all, they must  
8 be harvested from other switchgear or custom manufactured.

9  
10 The switchgear at Thornton MS, Islington MS, York MS, Porterfield MS and Neilson MS have /C, /US  
11 additional operational constraints that pose safety risks to operating personnel. The circuit  
12 breakers in these substations have auto re-closure problems, i.e., when a circuit breaker is taken  
13 out of service for maintenance and is put back after it is maintained, it auto re-closes instead of  
14 locking even though the circuit breaker is in the open position and the auto re-closure is  
15 blocked by the control authority. The auto re-closing poses safety risk to the operating  
16 personnel. To correct the auto re-closure problem, rewiring of the circuit breakers is required,  
17 however, rewiring circuit breakers that are at the end of their life is not cost effective.  
18 Therefore, it is prudent to replace the entire switchgear. To mitigate the safety risk temporarily,  
19 the circuit breakers are tagged with warning labels.

### 21 3. Why the Project is the Preferred Alternative

22 THESL considered the following options, which are fully discussed in Section IV:

- 23 1) Continue to maintain and operate the existing equipment.
- 24 2) Transfer load to adjacent sub-stations.
- 25 3) Convert the existing 4.16kV load to 27.6kV and decommission Switchgear
- 26 4) Replace switchgear with air insulated arc resistant Type C switchgear

27  
28 Option 1 option has the potential to defer capital investment, but would require increasing time  
29 and expense to repair switchgear as it continues to deteriorate (See Section IV, 1). Given the  
30 age and condition of this switchgear and the difficulty in obtaining spare parts, this option is not  
31 preferred. Option 2 is not feasible because it would create a significant capacity short fall on the

## ICM Project | Municipal Substation Switchgear Replacement Segment

---

1 system and limit the capability to restore during contingencies in the affected area (See Section  
2 IV, 2). Option 3 is not technically feasible because the MS to be addressed by this segment are  
3 not close to the 27.6kV distribution system and bringing 27.6kV service into these areas would  
4 not be cost effective (See Section IV, 3).

5  
6 Option 4, which would install air insulated arc resistant Type C switchgear and associated  
7 SCADA/RTU equipment, is the preferred alternative because it offers the following benefits:

- 8 • Increased system reliability due to the arc-resistant design of the switchgear and the use  
9 of remotely operated SCADA/RTU to control and monitor it, which will reduce outage  
10 time.
- 11 • Reduced maintenance and operating cost since the new switchgear will eliminate the  
12 need to maintain existing obsolete oil circuit breakers and also will be remotely  
13 operated.
- 14 • Increase operational efficiency and flexibility due to the installation of SCADA/RTU  
15 controlling and monitoring system. The equipment will be operated remotely and this  
16 will help operating personnel manage planned and unplanned outages efficiently.

17 Based on the advantages and disadvantages of each option, Option 4, which includes the  
18 installation of SCADA/RTU controlling and monitoring systems, is the preferred option (See  
19 Section IV, 4.3).

20  
21 The cost effectiveness of undertaking the proposed segment can be further evaluated by  
22 determining how much cost is avoided by executing this work immediately as opposed to  
23 executing it in 2015. The results of this exercise are shown in the Business Case Evaluation (BCE)  
24 found in Appendix 1. The BCE finds that conducting the proposed segment in 2012 will result in  
25 the avoided estimated risk cost of approximately \$655,000 as opposed to executing this work in  
26 2015. Therefore, there are distinct economic benefits to executing this work immediately.

/c

**ICM Project | Municipal Substation Switchgear Replacement Segment**

1 **II WORK DESCRIPTION**

2

3 There are 10 switchgears to be replaced in this segment of work in 2012 and 2013, and 2014.

/US

4 They are located in the east and west ends of Toronto as illustrated in Figure 1 below.

5



Map Reference Number	Station Name	Address
1	Leslie MS	5733 Leslie St, Toronto ON
2	Lawrence Scar Golf Club Rd MS	3782 Lawrence Ave E, Toronto ON
3	Brian Elinor MS	54 Brian Ave., Toronto ON
4	York MS	714 Royal York Rd., Toronto ON
5	Brimley Bernadine MS	1221 Brimley Rd., Toronto ON
6	Porterfield MS	2 Guinness Ave., Toronto ON
7	Greencedar Lawrence MS	29 Greencedar Circuit, Toronto ON
8	Neilson Dr MS	4237 Bloor St. W., Toronto ON
9	Midland Lawrence MS	1365 Midland Ave., Toronto ON
10	Pharmacy CPR MS	7 Trestleside Grove, Toronto ON
11	Islington MS	Cordova Ave., Toronto ON
12	Thornton MS	59 Glen Agar Dr., Toronto ON

**Figure 1: Job Locations**

## ICM Project | Municipal Substation Switchgear Replacement Segment

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1 The switchgear selected for replacement in this segment were chosen from 181 switchgear /us  
2 across 170 Municipal Substations based upon advanced equipment age, equipment  
3 obsolescence employing obsolete oil circuit breakers, lack of arc-resistant design and safety  
4 related equipment issues. Based on available resources, jobs are scheduled over two years to /us  
5 allow engineering, procurement, construction and commissioning and are closely coordinated  
6 with feeder transfers to minimize customer outages and limit single supply contingency.

7

### 8 **1. Leslie MS Switchgear Replacement**

9

#### 10 **1.1. Job Description**

11 The objective of this job is to construct a new electrical house (E-house) to replace the existing  
12 substation facility that is in poor condition, and replace the existing non-arc resistant switchgear /us  
13 with new arc-resistant switchgear in 2013.

14

#### 15 **1.2. Scope of Work**

- 16 • Preparing design drawings and necessary documentations
- 17 • Purchasing new 13.8kV arc resistant switchgear
- 18 • Purchasing a new e-house appropriate to the size of the proposed switchgear
- 19 • Building a concrete foundation where the e-house is to be placed, and a
- 20 • cable chamber and associated concrete encased ducts as necessary
- 21 • Installing and commission the new switchgear
- 22 • Installing SCADA/RTU equipment
- 23 • Purchasing and installing a new battery and charger set
- 24 • Installing a heating and ventilation system
- 25 • Installing a fire protection system
- 26 • Transferring load over to the new switchgear
- 27 • Decommissioning the existing substation

28

29 The switchgear at Leslie MS was installed in 1978 and has reached the end of its useful life.  
30 Some of the existing circuit breakers have been out of service due to aging and have re-closure



## ICM Project | Municipal Substation Switchgear Replacement Segment

1 issues. Getting replacement parts for the switchgear is becoming very difficult due to the  
2 obsolescence of the equipment. If they can be obtained at all, they must be custom  
3 manufactured.

4  
5 The Leslie MS building has deteriorated and is in poor condition. The switchgear housed in this  
6 building is obsolete with non-arc resistant design which represents potential safety risks to  
7 THESL personnel. Non arc-resistant switchgear does not have the ability to channel the energy  
8 released during an internal arc fault in ways that minimize the potential injury to personnel and  
9 damaging the equipment in the surrounding area, including damaging the whole substation. In  
10 1977, this substation was burned down as a result of an internal arc fault and failure. All the  
11 customers connected to it were out of power for several days.

12  
13 Leslie MS is an isolated 13.8kV distribution system surrounded by 27.6kV distribution systems  
14 and the significant area load makes it difficult to deal with during contingencies. In the event of  
15 a major failure at this substation, over 6,000 customers could experience a lengthy outage since  
16 there is no other 13.8kV municipal substation that can back up the load in the area.

### 18 **2. Switchgear Replacement for Remaining MS**

#### 20 **2.1. Job Description**

21 The remaining nine switchgear replacements at Lawrence Golf MS, Brian Elinor MS, York MS, /US  
22 Brimley Bernadine MS, Porterfield MS, Greencedar Lawrence MS, Neilson Drive MS, Midland  
23 Lawrence MS, Pharmacy CPR MS, Islington MS and Thornton MS are all driven by the same /US  
24 needs York MS. Porterfield MS, Neilson MS, and Thornton MS also have an additional safety /C  
25 concern, and which is explained in the next section. The objective of each of these jobs is to  
26 replace the existing switchgear with modern arc -resistant switchgear and to install a  
27 SCADA/RTU monitoring and controlling system.

#### 29 **2.2. Scope of Work**

30 Scope of work includes:

## ICM Project | Municipal Substation Switchgear Replacement Segment

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- 1       • Design and preparation of necessary drawings and documents to purchase switchgear
- 2       • Transferring existing load to neighbouring substations and removing existing switchgear
- 3       • Installation and commissioning of new switchgear
- 4       • Installation and commissioning of SCADA/RTU monitoring and controlling system
- 5       • Energizing new switchgear and transferring load to the new switchgear

6

7       The existing switchgear at these stations were installed more than 50 years ago and have  
8       reached the end of its useful life. The switchgear is obsolete and spare parts required to repair  
9       the switchgear are no longer manufactured. Replacement parts, if they can be obtained at all,  
10       must be custom made at significant cost.

11

12       The switchgear is non-arc resistant design and represents potential safety risk to THESL  
13       personnel. Non arc-resistant switchgear does not have the ability to channel the energy  
14       released during an internal arc fault in ways that minimize the potential injury to personnel and  
15       damaging the equipment in the surrounding area, including damaging the whole substation.  
16       Therefore, as the non-arc resistant switchgear continues to age, the safety risk to the operating  
17       personnel of THESL also increases and the system reliability decreases.

18

19       The oil circuit breakers that are used in the switchgear have a potential of failing catastrophically  
20       and due to their oil content and location within the substations, can cause substation fires that  
21       could result in the loss of the entire substation.

22

23       The switchgear at these substations is required to support the neighbouring substations during  
24       contingency or during switchgear or transformer maintenance. If this switchgear fails, there will  
25       be a cascading effect on the neighbouring substations that back up its load by limiting their  
26       capability to handle load under second contingency. If the switchgear at one MS fails and the  
27       switchgear at the back up MS also fails, a significant outage could occur since the load of two  
28       switchgears can not be backed up without experiencing capacity shortage and/or voltage drop  
29       problems.

## ICM Project | Municipal Substation Switchgear Replacement Segment

---

1 In addition to the consequences of in-service failures, the existing circuit breakers in all of the  
2 switchgear are oil circuit breakers and are obsolete. The maintenance for this type of circuit  
3 breaker takes twice as long as for modern vacuum circuit breakers and replacement parts are no  
4 longer manufactured. If they can be obtained at all, they must be custom manufactured and  
5 cost twice as much as spare parts supported by manufacturers. Custom parts also take longer  
6 time to obtain lengthening the time to repair equipment and put it back into service.

7  
8 The switchgear at Thornton MS, ~~Islington MS~~, York MS and Porterfield MS and Neilson MS have /C, /us  
9 additional operational constraints that pose potential safety risks to operating personnel. The  
10 circuit breakers in these substations have auto re-closure problems, i.e., when a circuit breaker  
11 is taken out of service for maintenance and is put back after it is maintained, it auto re-closes  
12 instead of locking even though the circuit breaker is in the open position and the auto re-closure  
13 is blocked by the control authority. The auto re-closing poses safety risk to the operating  
14 personnel. To correct the auto re-closure problem, re-engineering and rewiring of the circuit  
15 breakers is required. However, rewiring or re-engineering circuit breakers that are at the end of  
16 their life is not cost effective; therefore, it is prudent to replace the whole switchgear since the  
17 switchgear is at the end of its service life. To mitigate the safety risk temporarily, the circuit  
18 breakers are tagged with warning labels for safety reasons

19  
20 Neighbouring substations are often used to back up failed substations under single contingency  
21 event but are unable to handle load under second contingency that could also happen. THESL  
22 experienced this very problem in 2007 when Lesmil MS switchgear in North York failed  
23 catastrophically and while the Lesmil MS switchgear was out of service, a second substation,  
24 (Don Mills MS) in the area failed, resulting in outage to approximately 700 customers for about  
25 11 hours because the neighbouring substations could not handle load under second  
26 contingency. Therefore, it is prudent to replace switchgear that is at the end of life proactively  
27 to limit the potential negative reliability impacts of “run to failure”.

## ICM Project | Municipal Substation Switchgear Replacement Segment

- 1 • Minimize the maintenance and operating cost since the new switchgear will eliminate  
2 the existing obsolete oil circuit breakers whose maintenance is increasing due to the  
3 customer spare part requirements. The need to inspect the oil circuit breakers after  
4 every tripping condition will also be eliminated. The new switchgear will be remotely  
5 operated thus minimizing operating cost.
- 6 • Increase reliability to THESL customers. The very fact that the switchgear is arc-resistant  
7 means it will be more reliable. Furthermore the SCADA/RTU controlling and monitoring  
8 system will help minimize outage time.
- 9 • Increase operational efficiency and flexibility due to the installation of SCADA/RTU  
10 controlling and monitoring system. The equipment will be operated remotely and this  
11 will help operating personnel manage planned and unplanned outages efficiently.

### 12 13 **5. Avoided Risk Cost**

14 The effectiveness of the Stations Switchgear MS replacement project can be further highlighted  
15 by determining how much cost is avoided by executing this work immediately as opposed to  
16 executing in 2015. These avoided costs include quantified risks, taking into account the assets'  
17 probability of failure, and multiplying this with various direct and indirect cost attributes  
18 associated with in-service asset failures, including the costs of customer interruptions,  
19 emergency repairs and replacement.

20  
21 Carrying out immediate work on this asset class will result in the avoided estimated risk cost of  
22 approximately \$655,000, as opposed to executing this work in 2015. Therefore, THESL submits /c  
23 that there are economic benefits to ratepayers for executing this work now.

24  
25 As a practical matter given available resources, jobs are scheduled over three years to allow  
26 engineering, procurement, construction and commissioning and are closely coordinated with  
27 feeder transfers to minimize customer outages and limit single supply contingency. The  
28 methodologies applied within this business case are further described in the Appendix 1.

**ICM Project | Municipal Substation Switchgear Replacement Segment**

1 **Table 1: Summary of values used in the determination of Avoided Estimated Risk Cost**

Business Case Element	Estimated Cost (in Millions)
Present Value of Project Net Cost in 2015 ( $PV(\text{PROJECT}_{\text{NET\_COST}}(2015))$ )	\$2.810
Project Net Cost in 2012 ( $\text{PROJECT}_{\text{NET\_COST}}(2012)$ )	\$2.155
<b>Avoided Estimated Risk Cost =</b> <b>(<math>PV(\text{PROJECT}_{\text{NET\_COST}}(2015)) - \text{PROJECT}_{\text{NET\_COST}}(2012)</math>)</b>	<b>\$ 0.655</b>

/c

/c

2 When this avoided estimated risk cost is calculated as a positive value, it means that estimated  
 3 risk costs for the job assets in 2015 will exceed the estimated risks that exist today. By  
 4 performing the work immediately as opposed to waiting until 2015, THESL can eliminate these  
 5 estimated risks. Therefore, these avoided estimated risk costs represent the benefits of job  
 6 execution.

# ICM Project – Station Infrastructure and Equipment

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## Stations Switchgear – Transformer Stations Segment

Toronto Hydro-Electric System Limited (THESL)



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**ICM Project | Stations Switchgear – Transformer Stations Segment**

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$25.16 M to \$12.14 M, a reduction of \$13.02 M
- 3 • Reduced number of jobs proposed from 15 to five jobs which are scheduled for 2012 and
- 4 2013, with three jobs deferred and with jobs for 2014 to be addressed in Phase Two, as
- 5 proposed
- 6 • 2014 jobs and spending shown in strike-through
- 7 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 8 the continuing priority needs of the system
- 9 • Corrected numerical and typographical errors

## ICM Project | Stations Switchgear – Transformer Stations Segment

### 1 I EXECUTIVE SUMMARY

2

#### 3 1. Project Description

4 Switchgear operating at 13.8kV in many downtown Transformer Stations (TS) are past the end  
 5 of their useful lives and rely on obsolete technology such as brick and mortar enclosures, non  
 6 arc-resistant designs with air blast or air magnetic circuit breakers and mechanical relays and are  
 7 in poor condition (See Section II, 3). The existing non arc-resistant switchgear does not channel  
 8 the energy released during an internal arc fault to minimize potential injury to personnel and  
 9 minimize damage to surrounding equipment. As a result, this switchgear can cause damage that  
 10 impacts the entire station, interrupting service to thousands of customers. This equipment has  
 11 been kept in service via increased maintenance, custom fabrication and harvesting parts from  
 12 spares. The asset condition continues to deteriorate and safety concerns are increasing.

13

14 Switchgear requiring replacement in 2012, and 2013, and ~~2014~~ include the A7-8T switchgear at  
 15 Strachan TS, A6-7E switchgear at Carlaw TS, A3-4W and ~~A5-6W~~ switchgear at Wiltshire TS, ~~A5-~~  
 16 ~~6WR~~ switchgear at Windsor TS and A5-6DX at Duplex TS. All but one of these are more than 55  
 17 years old. The total cost of this segment is approximately \$12.14 million for the jobs shown in /UF, US  
 18 Table 1

19

20 **Table 1: Job Costs**

Estimate Number	Job Title	Year Installed	Customer Load Served (MVA)	Job Year	Cost Estimate (\$M)
18591	Strachan TS A7-8 switchgear replacement preparation	1956	34	2012	0.34
25425	Strachan TS A7-8 switchgear replacement	1956	34	2013	3.41

/UF



## ICM Project | Stations Switchgear – Transformer Stations Segment

Estimate Number	Job Title	Year Installed	Customer Load Served (MVA)	Job Year	Cost Estimate (\$M)	
24972	S14406 Strachan TS Load Transfer from A7-8T to A11-12T Switchgear	1956	34	2014	0.30	
22025	Carlaw TS A6-7E switchgear replacement	1968	26	2013	1.45	/UF, US
20877	Wiltshire TS A3-4W switchgear replacement	1954	20	2012	6.71	/UF, US
22719	Wiltshire TS A5-6W switchgear replacement	1954	22	2014	7.67	
21735	Windsor TS A5-6WR switchgear replacement	1956	56	2014	8.41	
20492	Duplex TS A5-6DX switchgear replacement	1954	42	2013	0.23	/UF
<b>2012-2013 Total</b>					<b>12.14</b>	<b>/UF, US</b>

1 These switchgear were selected for replacement based on the following considerations:

- 2 • Obsolescence (brick structures, non-arc resistant design, obsolete breakers)
- 3 • Age
- 4 • Condition
- 5 • Space available for transition switchgear, and
- 6 • Station egress for cabling

7

8 All the switchgear listed are to be replaced with 3,000A air-insulated, arc-resistant type C  
 9 switchgear with double-bus, double-breaker or breaker-and-half configuration except Duplex

**ICM Project | Stations Switchgear – Transformer Stations Segment**

1 **~~1.2.3. Scope of work in 2014~~**

- 2 • ~~Transfer load from the existing A7-8T switchgear to the new A11-12 T switchgear.~~ /US  
 3 • ~~Decommission the existing A7-8T switchgear~~

4

5 **1.3. Job Cost**

6

7 **Table 2: Strachan TS Costs**

Job Estimate Number	Job Title	Job Year	Total Estimated Cost (\$M)
18591	Strachan TS A7-8T switchgear replacement preparation	2012	0.34
25425	Strachan TS A7-8T switchgear replacement	2013	3.41
24972	<del>S14406 Strachan TS Load Transfer from A7-8T to A11-12T Switchgear</del>	2014	0.30

/c

/UF

**ICM Project | Stations Switchgear – Transformer Stations Segment**

1 **2. Carlaw TS A6-7E**

2

3 **2.1. Job Description - Carlaw TS A6-7E**

4 The objective of this job is to complete the second part of a two-part replacement job of the  
 5 Carlaw TS A6-7E switchgear. The first part of this job involved purchasing of the switchgear in  
 6 2011. The second part involves commissioning of the new switchgear and the station load  
 7 transfer from the existing to the new switchgear in subsequent years. /US

8

9 **2.2. Scope of Work-A6-7E**

- 10 • Prepare drawings to commission the switchgear
- 11 • Commission and energize the new switchgear that was purchased in 2011

12

13 **2.3. Job Costs** /US

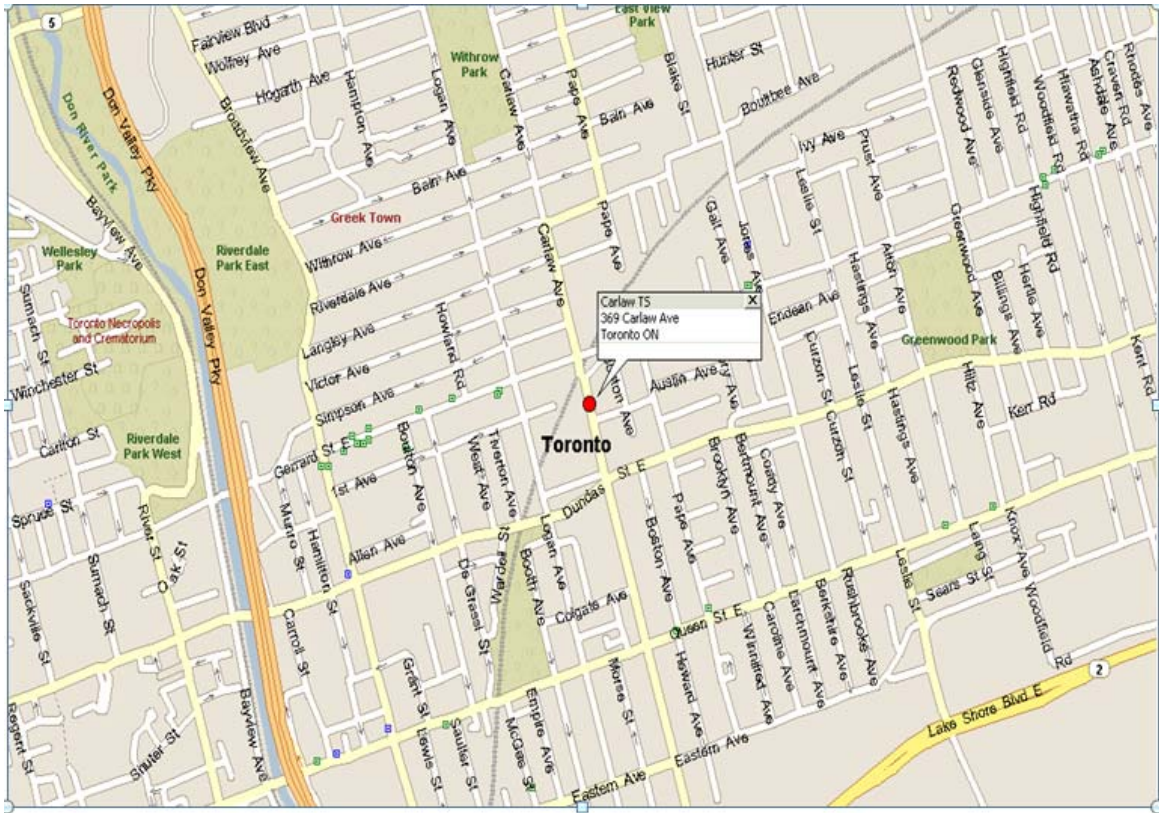
14

15 **Table 3: Carlaw TS Costs**

Job Estimate Number	Job Title	Job Year	Total Estimated Cost (\$M)
22025	Carlaw TS A6-7E switchgear replacement	2013	1.45

/UF, US

**ICM Project | Stations Switchgear – Transformer Stations Segment**



1 **Figure 4: Location of Carlaw TS**

2  
3

4 **3. Wiltshire TS A3-4W and A5-6W Switchgear**

/us

5

6 **3.1. Job Description**

7 The objective of these jobs is to design, purchase and install 13.8kV switchgear to replace the  
 8 obsolete A3-4W and A5-6W switchgear at Wiltshire TS with 3000A air insulated arc-resistant  
 9 type C switchgear with a breaker-and-half configuration in 2012, and 2014, respectively.

10 Preparation of floor space in Building A is required to accommodate the new switchgear in place  
 11 of the decommissioned switchgear.

} /us

## ICM Project | Stations Switchgear – Transformer Stations Segment

### 3.2. Scope of Work – A3-4W

- Design the proposed new A13-14W switchgear to fit into the space that is currently occupied by the obsolete A1-2W switchgear, (A1-2W is to be removed)
- Procure and purchase a new 13.8kV, 72MVA, 4-wire, air insulated, arc-resistant type switchgear and replace the aging and obsolete A3-4W (3-wire) switchgear
- Prepare the floor space where the decommissioned A1-2W was located to make space for installation of the proposed A13-14W switchgear
- Modify and/ or construct any necessary civil infrastructures within Wiltshire station property boundary to facilitate the feeder transfer from the existing and obsolete A3-4W switchgear to the proposed new switchgear A13-14W
- Install and commission the new A13-14W switchgear
- Coordinate with Hydro One to provide support for relocation of the HONI incoming LV supply cables from the existing location to the new switchgear location
- Energize and transfer load from the A3-4W to the new A13-14W switchgear
- Decommission and remove the A3-4W switchgear

### ~~3.3. Scope of Work – A5-6W~~

- ~~• Design the proposed new A15-16W switchgear to fit into the space that is currently occupied by the obsolete A1-2W switchgear~~
- ~~• Prepare the floor space by removing the decommissioned A1-2W to make space for installation of the proposed A15-16W switchgear~~
- ~~• Procure and purchase a new 13.8kV, 72MVA, 4-wire, air insulated, arc-resistant type switchgear to replace the aging and obsolete A5-6W (3-wire) switchgear~~
- ~~• Install and commission the new A15-16W switchgear~~
- ~~• Transfer load from the existing A5-6W switchgear to the new A15-16W switchgear~~
- ~~• Coordinate with Hydro One to provide support for relocation of the HONI incoming LV supply cables from the existing location to the new switchgear location~~
- ~~• Decommission the A5-6W switchgear and remove the brick structure from Wiltshire TS~~

/US

## ICM Project | Stations Switchgear – Transformer Stations Segment

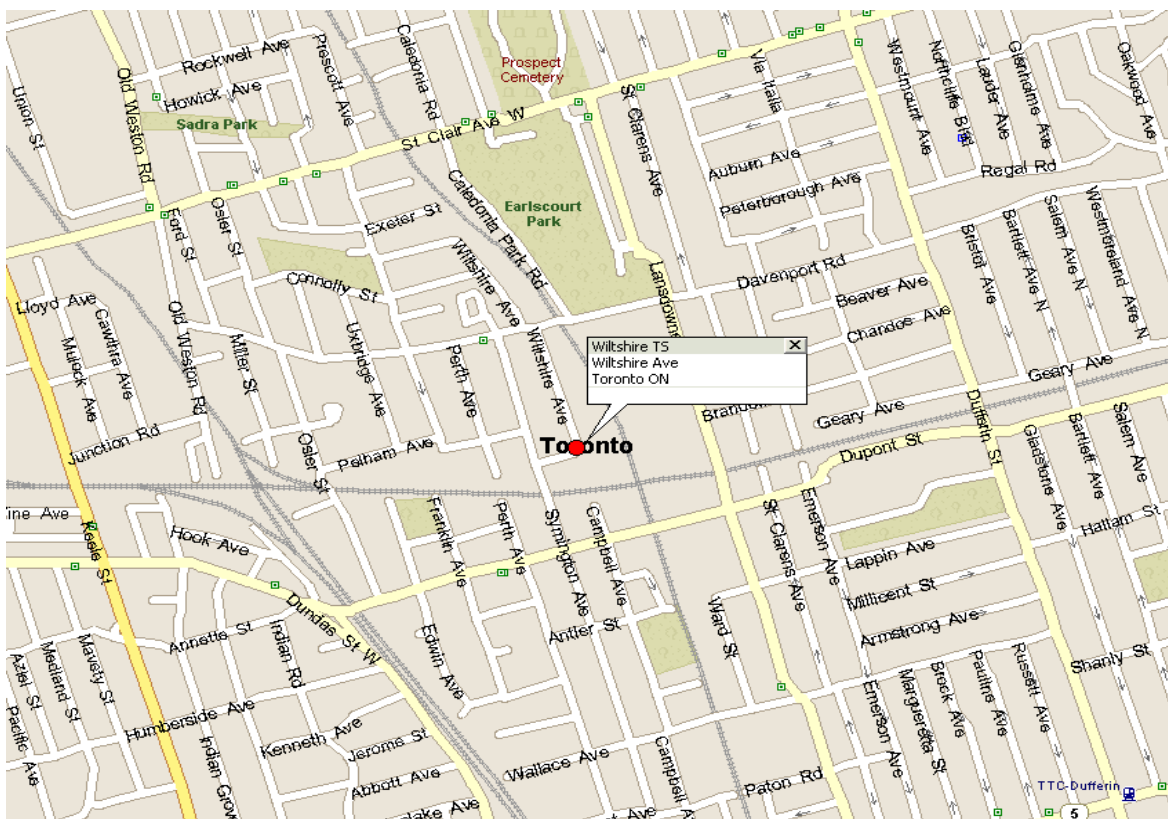
### 1 3.4. Job Costs

2

3 Table 4: Wiltshire TS Costs

Job Estimate Number	Job Title	Job Year	Total Cost (\$M)
20877	Wiltshire TS A3-4W switchgear replacement	2012	6.71
22719	WiltshireTS A5-6W switchgear replacement	2014	7.67

/UF, US



4 Figure 5: Location of Wiltshire TS

## ICM Project | Stations Switchgear – Transformer Stations Segment

1 ~~4. Windsor TS A5-6WR Switchgear~~

2

3 ~~4.1. Job Description~~

4 The objective of this sjob is to replace the existing A5-6WR switchgear at Windsor TS with 3000A  
 5 air insulated, arc-resistant type C type switchgear with double bus, double breaker or breaker-  
 6 and half switchgear in 2014.

7

8 ~~4.2. Scope of Work A5-6WR~~

- 9 ● ~~Design the proposed new A19-20WR switchgear to fit into the space that is currently~~  
 10 ~~occupied by the obsolete A5-6-9-10WR~~
- 11 ● ~~Decommission and remove the A5-6-9-10WR once load is transferred to Bremner TS~~
- 12 ● ~~Procure new 13.8kV, 72MVA, 4 wire, air insulated arc-resistant type switchgear~~
- 13 ● ~~Install and commission the new A19-20WR switchgear~~
- 14 ● ~~Energize the A19-20WR and transfer load from the A3-4WR switchgear~~
- 15 ● ~~Coordinate with Hydro One on purchase, installation and commissioning of incoming feeder~~  
 16 ~~cells and configuring the new bus as 4-wire~~
- 17 ● ~~Decommission and remove the existing A3-4WR switchgear in Windsor TS building~~

18

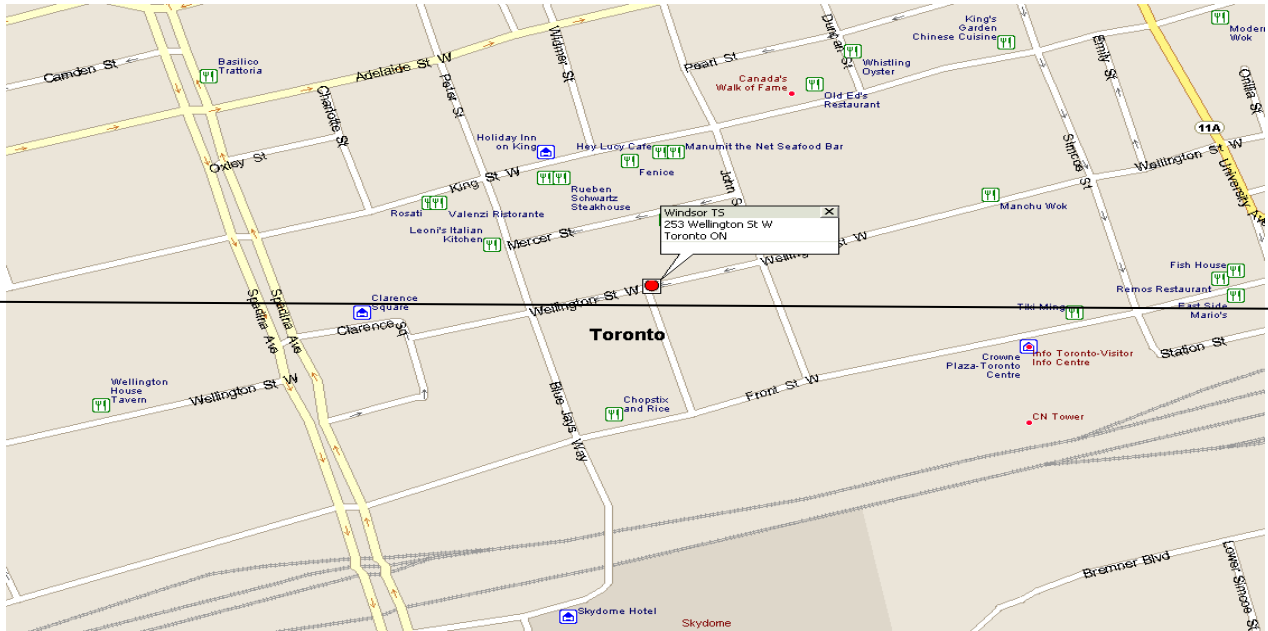
19 ~~4.3. Job Costs~~

20

21 ~~Table 5: Windsor TS Costs~~

<del>Job Estimate Number</del>	<del>Job Title</del>	<del>Job Year</del>	<del>Total Estimated Cost (\$M)</del>
<del>21735</del>	<del>Windsor TS A5-6WR switchgear replacement</del>	<del>2014</del>	<del>8.41</del>

## ICM Project | Stations Switchgear – Transformer Stations Segment



1 **Figure 6: Location of Windsor TS**

2

3

### 4 **5. Duplex TS A5-6DX Switchgear**

5

#### 6 **5.1. Job Description**

7 The objective of this job is to design and purchase new 13.8kV 3000A gas-insulated switchgear  
8 (GIS) to replace the existing A5-6DX switchgear in 2013.

9

#### 10 **5.2. Scope of Work- A5-6DX**

- 11 • Design the proposed A7-8DX switchgear and prepare space for a new switchgear

/UF



## ICM Project | Stations Switchgear – Transformer Stations Segment

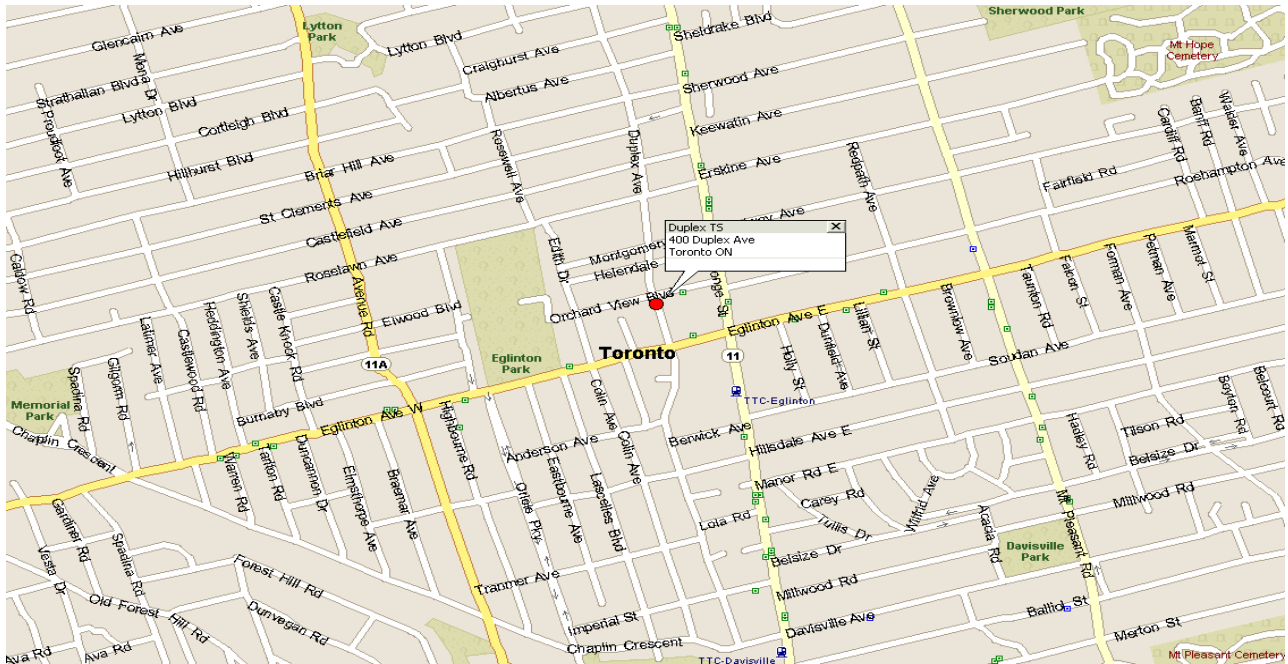
### 1 5.3. Job Costs

2

3 Table 6: Duplex TS Costs

Job Estimate Number	Job Title	Job Year	Total Cost (\$M)
20492	Duplex TS A5-6DX switchgear replacement	2013	0.23

/UF



4 Figure 7: Location of Duplex TS

## ICM Project | Stations Switchgear – Transformer Stations Segment

### III Need

#### 1. Overview

All the switchgear in this segment are non-arc resistant designs and past their useful lives. Non-arc resistant designs do not contain the energy released during fault conditions. When an internal arc fault occurs in this type of switchgear, the energy released has the potential to damage adjacent equipment and pose potential safety risks to personnel working in the vicinity. Even though station workers are not present inside stations on a daily basis, they do monthly routine inspections in all THESL stations and do planned maintenance and capital work in stations. If an internal arc fault occurs while station workers are in the vicinity there is a potential that a worker could be injured. A catastrophic failure also increases the severity of collateral damage to adjacent equipment and could potentially cause a complete station outage.

The probability of failure continues to increase with time as the condition of the equipment continues to deteriorate. Table 7 provides the impact resulting from the failure of one switchgear and the impact resulting from a whole station outage from collateral damage. The impact is presented in terms of load at risk and expected duration of outage.

**Table 7: Load at Risk and Duration**

Substation Name	Failure of One Switchgear		Failure of the Entire Substation	
	Load at Risk (MVA)	Duration(hours)	Load at Risk (MVA)	Duration (hours)
Strachan TS	34	168	138	336
Carlaw TS	26	168	75	336
Wiltshire TS	30	168	70	336
Duplex TS	45	168	113	336
<del>Windsor TS</del>	<del>56</del>	<del>168</del>	<del>311</del>	<del>336</del>

/us

Failure of any switchgear is expected to result in extended outages given that the loading and condition of the other switchgear within the station limits the ability to pick up the load.

## ICM Project | Stations Switchgear – Transformer Stations Segment



1 **Figure 8: Carlaw TS 13.8kV live parts of a switchgear in an open brick structure**

2

3 If the A6-7E switchgear fails, 26 MVA of load will be lost.

4

5

#### 6 **4. Wiltshire TS**

7 The existing Wiltshire TS A3-4W and ~~A5-6W~~ switchgear was installed in 1954. From the Asset  
8 Condition Assessment (“ACA”) update report in 2012, this switchgear was assigned a Health  
9 Index (HI) of 50 and ~~47~~ (out of 100) respectively which is considered in the Poor category, which  
10 means ~~they~~ it requires replacement within three years.

11

12 This switchgear is also in an open brick structure with similar limitations to those at Carlaw TS.

13 The Wiltshire TS switchgear supplies a large pumping station, which is a critical customer.

14

15 If the A3-4W or ~~A5-6W~~ switchgear fails, 21 MVA and ~~30 MVA~~ load will be lost, respectively.

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## ICM Project | Stations Switchgear – Transformer Stations Segment

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1    **5. Duplex TS**

2    In addition to the age of the switchgear, there is additional risk of the basement being flooded  
3    with water from the Hydro One deluge system which is located on the main floor above the  
4    switchgear. To mitigate this risk, and to address the aging issue of the switchgear, THESL plans  
5    to replace in stages all the switchgear at Duplex TS which are located in the basement with  
6    water-resistant, gas-insulated switchgear (GIS). The A5-6DX switchgear is the first to be  
7    replaced. This switchgear was assigned a Health Index (HI) of 67 (out of 100) which is considered  
8    as in fair condition category as per the Asset Condition Assessment (“ACA”) of 2010. Even  
9    though this switchgear is in fair condition, it must be replaced first in order to be able to replace  
10    the A1-2DX switchgear which is in a very poor condition but could not be replaced first due to  
11    space constraint.

12

13    If the A5-6DX switchgear fails, 45 MVA of load will be lost.

14

15    ~~**6. Windsor TS**~~

16    ~~The A5-6WR switchgear was installed in 1956. From the Asset Condition Assessment (“ACA”)~~  
17    ~~update report in 2012, Windsor TS A5-6WR switchgear was assigned a Health Index (HI) of 50~~  
18    ~~(out of 100) which is considered in the Poor category, and it needs replacement within three~~  
19    ~~years.~~

20

21    ~~The Windsor TS switchgear supports the financial district, which includes many large customers.~~

22

23    ~~If the A5-6WR switchgear fails, 56 MVA of load will be lost.~~

## ICM Project | Stations Switchgear – Transformer Stations Segment

- 1 (b) The supporting switchgear must have enough feeder positions to accept the transferred  
 2 feeders. This condition cannot be met for all of the switchgear proposed to be replaced.  
 3 As shown in Table 9, Gerrard TS, Main TS, and Terauley TS don't have enough spare  
 4 feeder positions to transfer load from Carlaw and Windsor TS, respectively. There are  
 5 enough feeder positions in the receiving stations for the rest of the switchgear proposed  
 6 to be replaced. However, as discussed in the previous paragraph (a), there is  
 7 insufficient available capacity in the receiving stations.
- 8 (c) Physical space for underground infrastructure must be available if load is to be  
 9 transferred to another station. THESL shares underground space with other utilities  
 10 such as Enbridge, Bell, Rogers, and Water and Sewer. Finding space to build  
 11 underground infrastructure in order to install cables to transfer the load is challenging.
- 12 (d) Voltage drop problem does not occur as a result of load transfer to neighboring station.  
 13 This condition cannot be met as the supplying station will be far from the load center  
 14 and voltage drop will be a problem.

15  
 16 **Table 7: Switchgear Load Transfer to switchgear within station**

Switchgear to be Decommissioned	Connected Customers	Load to be transferred(MVA)	% Loading at the Receiving Station(s) After Load transfer
Strachan TS A7-8 switchgear	4,270	37	96
Carlaw TS A6-7E switchgear	9,266	26	102
Wiltshire TS A3-4W switchgear	3,513	21	86
Duplex TS A5-6DX switchgear	4,078	45	141
<del>Wiltshire TS A5-6W switchgear</del>	<del>10,883</del>	<del>30</del>	<del>100</del>
<del>Windsor TS A5-6WR switchgear</del>	<del>14</del>	<del>56</del>	<del>111.1</del>

## ICM Project | Stations Switchgear – Transformer Stations Segment

1 **Table 8: Switchgear Load Transfer to Neighboring Station(s)**

<b>Switchgear To be Decommissioned</b>	<b>Load to be transferred (MVA)</b>	<b>Load to be transferred to</b>	<b>Combined Stations Percentage (%) Loading After Load transferred</b>
Strachan TS A7-8 switchgear	37	Dufferin TS	102
Carlaw TS A6-7E switchgear	26	Gerrard TS, Main TS	107
Wiltshire TS A3-4W switchgear	21	Dufferin TS, Bridgeman TS,	94
Duplex TS A5-6DX switchgear	45	Glengrove TS, Leaside TS,	98
<del>Wiltshire TS A5-6W</del> switchgear	<del>30</del>	<del>Dufferin TS, Bridgeman TS</del>	<del>93</del>
Windsor TS A5-6WR switchgear	56	Terauley TS	107

## ICM Project | Stations Switchgear – Transformer Stations Segment

1 **Table 9: Number of feeder positions required and available**

Switchgear Load to be transferred from	Number of feeders to be transferred	Station load to be transferred to	Number of available spare feeder positions
Strachan TS A7-8T switchgear	11	Dufferin TS	30
Carlaw TS A6-7E switchgear	7	Gerrard TS and Main TS	1
Wiltshire TS A3-4W switchgear	10	Dufferin TS and Bridgemen TS	31
Duplex TS A5-6DX switchgear	11	Glengrove TS and Leaside TS	14
<del>Wiltshire TS A5-6W switchgear</del>	<del>8</del>	<del>Dufferin TS and Bridgemen TS</del>	<del>31</del>
<del>Windsor TS A5-6WR switchgear</del>	<del>12</del>	<del>Terauley TS</del>	<del>6</del>

2 **3. Option 3: Replace the Existing Switchgear with Arc-Resistant Design with Vacuum**  
 3 **Breakers**

4 Replace existing switchgear with air insulated, arc-resistant switchgear or gas insulated  
 5 switchgear (GIS) with double bus double breaker or breaker and half configuration is  
 6 recommended. This option requires capital investment to replace the switchgear and is  
 7 expected to:

- 8 • Mitigate the safety risk to the operating personnel of THESL due to the arc-resistant  
 9 design of the switchgear. Arc-resistant switchgear contains the pressure due to internal  
 10 arc fault and channels the energy through the vents located on top of switchgear. This  
 11 is expected to mitigate the safety risk to personnel and damage to equipment in the  
 12 vicinity including causing outage to the whole station.
- 13 • Minimize the maintenance and operating cost since the new switchgear will eliminate  
 14 the air blast circuit breakers along with the air supply system (air compressors) whose

## ICM Project | Stations Switchgear – Transformer Stations Segment

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1 The anticipated effectiveness of the Switchgear TS replacement segment can be highlighted by  
2 determining how much cost is avoided by executing this work immediately as opposed to  
3 executing in 2015 as explained in the Business Case Evaluation found in Appendix 1. These  
4 avoided costs include quantified risks, taking into account the assets' probability of failure, and  
5 multiplying this with various direct and indirect cost attributes associated with in-service asset  
6 failures, including the costs of customer interruptions, emergency repairs and replacement.

7

8 Carrying out immediate work on this asset class is expected to result in the avoided estimated  
9 risk cost of approximately \$42 million, as opposed to executing this work in 2015. Therefore,  
10 there are economic benefits to ratepayers for executing this work now. As a practical matter  
11 given available resources, jobs are scheduled over three years to allow engineering,  
12 procurement, construction and commissioning and are closely coordinated with feeder transfers  
13 to minimize customer outages and limit single supply contingency.

14

#### 15 **4. Preferred Alternative**

16 Based on a comparison of the alternatives, replacement of existing switchgear is the preferred  
17 option based on reduced outage risk, technical viability and because it is the most cost-effective  
18 option.

/c



**ICM Project | Stations Switchgear – Transformer Stations Segment**

1 **Table 1: Summary of values used in the determination of Avoided Estimated Risk Cost**

Business Case Element	Estimated Cost (in Millions)
Present Value of Project Net Cost in 2015 ( $PV(\text{PROJECT}_{\text{NET\_COST}}(2015))$ )	\$ 42.037
Project Net Cost in 2012 ( $\text{PROJECT}_{\text{NET\_COST}}(2012)$ )	\$ 0.0298
<b>Avoided Estimated Risk Cost = (<math>PV(\text{PROJECT}_{\text{NET\_COST}}(2015)) - \text{PROJECT}_{\text{NET\_COST}}(2012)</math>)</b>	<b>\$ 42.007</b>

/c

/c

2 When this avoided estimated risk cost is calculated as a positive value, it means that estimated  
 3 risk costs for the job assets in 2015 will exceed the estimated risks that exist today. By  
 4 performing the work immediately as opposed to waiting until 2015, we can eliminate these  
 5 estimated risks. Therefore, these avoided estimated risk costs represent the benefits of job  
 6 execution.

# ICM Project – Station Infrastructure and Equipment

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## Stations Circuit Breakers Segment

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | Stations Circuit Breakers Segment

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$2.45 M to \$1.31 M, a reduction of \$1.14 M
- 3 • Revised number of jobs proposed for 2012/2013 to 8, with jobs for 2014 to be addressed in
- 4 Phase Two, as proposed
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system

## ICM Project | Stations Circuit Breakers Segment

1 **I EXECUTIVE SUMMARY**

2

3 **1. Description**

4 Station circuit breaker work proposed for 2012 consists of replacing 9 oil circuit breakers /UF, US

5 (27.6kV) mounted outdoors and associated control boxes with vacuum circuit breakers at five

6 Terminal Stations (TS). The estimated cost for the work is \$1.38 M as shown in Table 1: /UF, US

7

8 **Table 1: Job Cost Estimates**

Job Estimate Number	Job Title	Job Year	Cost Estimate (\$M)
17662	S11118 Finch TS: Replace KSO CB (55M27)	2012	\$0.07
17669	S11121 Finch TS: Replace KSO CB (55M28)	2012	\$0.07
17654	S11130 Bathurst TS: Replace KSO CB (85M24)	2012	\$0.07
18403	S12001 Leslie TS: Replace KSO OCB (51M4 and 51M6)	2012	\$0.39
18233	S12036 Fairchild TS: Replace KSO CB (80M1)	2012	\$0.19
18237	S12037 Fairchild TS: Replace KSO CB (80M3)	2012	\$0.19
18262	S12043 Fairchild TS: Replace KSO CB (80M5)	2012	\$0.20
18263	S12044 Fairchild TS: Replace KSO CB (80M9)	2012	\$0.20
22693	S14052 Finch TS: Replace KSO CB (55M24)	2014	\$0.19
22694	S14054 Finch TS: Replace KSO CB (55M25 and 55M8)	2014	\$0.41
22695	S14055 Bathurst TS : Replace 85M1 KSO CB	2014	\$0.19
22698	S14056 Bathurst TS: Replace 85M4 KSO CB	2014	\$0.20
22699	S14057 Bathurst TS: Replace 85M2 KSO CB	2014	\$0.19
22700	S14059 Bathurst TS: Replace 85M25 KSO CB	2014	\$0.19
<b>Jobs Total 2012-2013:</b>			<b>\$1.38</b>
<b>Reconciliation for budget changes &lt; \$100,000 and rounding</b>			<b>(\$0.07)</b>
<b>TOTAL</b>			<b>\$1.31</b>

} /UF

## ICM Project | Stations Circuit Breakers Segment

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1 The THESL station circuit breaker segment is focused on outdoor-mounted oil circuit breakers  
2 used in 27.6kV stations where the customers will experience average outage duration of two  
3 hours in case of a failure. Table 2 shows the number of customers that would be affected in  
4 case of a circuit breaker failure.

5  
6 Consequences of station circuit breaker failure include customer interruptions over significantly  
7 long durations. Catastrophic failure of circuit breakers may also result in collateral damage to  
8 other transformers, damage to other station equipment, and if staff are present, injury to  
9 personnel. Furthermore, considering they are filled with mineral oil, there is a risk of oil spills  
10 contaminating ground and water systems if the tank fails.

11  
12 The failure of an oil circuit breaker at Manby TS station on July 5, 2010 exemplifies the  
13 significant impacts that can occur. This event caused a Loss of Supply outage that interrupted a  
14 total of 117,042 customers (CI) for over two hours resulting in 14,439,408 customer minutes of  
15 outage (CMO).

16  
17 The oil circuit breakers selected for replacement were chosen from 64 outdoor-mounted oil /c  
18 circuit breakers based on their age and health condition. Based on the Kinectrics Report, the  
19 typical end of useful life for an oil circuit breaker is 42 years. As shown in Table 2, all but one of  
20 the circuit breakers selected for 2012 replacement are at or beyond this age. The age profile for  
21 all oil circuit breakers is shown in Figure 1. From the age profile, approximately 81 percent (52 /c  
22 out of 64) of oil circuit breakers are beyond their typical useful lives. In addition to aging, the /c  
23 deteriorating condition of the outdoor-mounted oil circuit breakers also was a factor in their  
24 being selected for replacement.

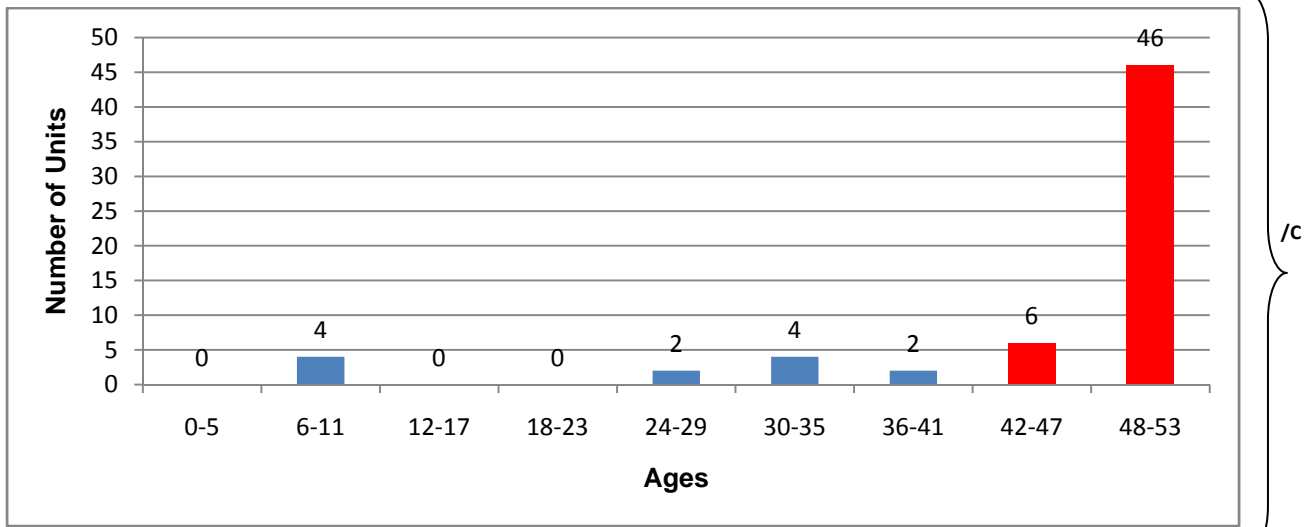
## ICM Project | Stations Circuit Breakers Segment

1 **Table 2: Age profile and Number of Customers Served for Circuit Breakers to be Replaced**

Station Name – Circuit Breaker ID	Age	Customers	Feeder Load (MVA)
Leslie TS – 51M4	50	781	10.7
Leslie TS - 51M6	50	781	13.0
Finch TS – 55M8	52	1,942	15.2
Finch TS – 55M24	52	68	13.6
Finch TS – 55M25	52	2,273	9.9
Finch TS – 55M27	52	2,379	10.8
Finch TS - 55M28	52	4,212	16.6
Fairchild TS – 80M1	42	2,640	9.9
Fairchild TS - 80M3	42	826	18.4
Fairchild TS - 80M5	42	1,134	22.5
Fairchild TS - 80M9	37	800	9.5
Bathurst TS – 85M1	50	2,690	13.9
Bathurst TS – 85M2	50	1,780	13.9
Bathurst TS – 85M4	50	914	13.6
Bathurst TS - 85M24	50	1,191	13.7
Bathurst TS – 85M25	50	2,503	15.0

/UF, US

## ICM Project | Stations Circuit Breakers Segment



1 **Figure 1: Age profile of outdoor-mounted oil circuit breakers**

2

### 3. Why the Project is the Preferred Alternative

4 THESL considered two alternatives to address the issues posed by oil circuit breakers: the status  
5 quo option of running them to failure and proactive replacement (See Section IV). Under the  
6 proactive replacement alternative, THESL considered two types of replacement circuit breakers.

7

8 THESL rejected the status quo approach of allowing these circuit breakers to run to failure  
9 because of the significant impacts it would have on reliability and safety (See Section IV, 2).

10 THESL also faces rising maintenance costs and increased difficulty in obtaining parts for oil  
11 circuit breakers. The evaluation in Appendix 1, shows that immediate replacement lowers the  
12 estimated avoided risk cost associated with these assets by approximately \$3.2 million when  
13 compared to deferring replacement to 2015. Thus the most cost-effective option is  
14 replacement of obsolete equipment before failure.

15

16 The two alternative technologies considered for replacing the existing oil circuit breakers are:

17 Vacuum circuit breaker or SF<sub>6</sub> circuit breaker. Both vacuum and SF<sub>6</sub> circuit breakers use  
18 technologies that exhibit high degrees of reliability under normal and abnormal conditions.

19 Each has their advantages and disadvantages. One significant advantage of the vacuum circuit  
20 breaker is its compact size and ease of maintenance and inspection compared to the SF<sub>6</sub> circuit  
21 breaker (See Section III, 1.1 and 1.2). Due to limited space in stations, size of the circuit breaker

**ICM Project | Stations Circuit Breakers Segment**

1 **II DESCRIPTION OF WORK**

2

3 **1. Overview**

4

5 KSO<sup>1</sup> circuit breaker replacements are driven by mitigation of collateral damage to adjacent  
 6 circuit breakers or transformers, which could cause a long outage to the whole bus or even a  
 7 station and potentially impact thousands of customers. The objectives are described in detail  
 8 below:

/c

9

10 **Table 3: Objectives for Each Station**

Station Name	Objectives	Planned Year
Leslie TS	Replace the 27.6kV KSO circuit breakers (51M4 and 51M6 ) and control box with a vacuum circuit breaker at Leslie TS	2012
Finch TS	Replace the 27.6kV KSO circuit breaker (55M28) and control box with a vacuum circuit breaker at Finch TS	2012
Finch TS	Replace the 27.6kV KSO circuit breaker (55M27) and control box with a vacuum circuit breaker at Finch TS	2012

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<sup>1</sup> These breakers were made by the same manufacturer and are referred to by their series designation KSO.



## ICM Project | Stations Circuit Breakers Segment

Station Name	Objectives	Planned Year
Finch TS	Replace the 27.6kV KSO circuit breaker (55M25 and 55M8) and control box with a vacuum circuit breaker at Finch TS	2014
Finch TS	Replace the 27.6kV KSO circuit breaker (55M24) and control box with a vacuum circuit breaker at Finch TS	2014
Fairchild TS	Replace the 27.6kV KSO circuit breaker (80M1) and control box with a vacuum circuit breaker at Fairchild TS	2012
Fairchild TS	Replace the 27.6kV KSO circuit breaker (80M3) and control box with a vacuum circuit breaker at Fairchild TS	2012
Fairchild TS	Replace the 27.6kV KSO circuit breaker (80M5) and control box with a vacuum circuit breaker at Fairchild TS	2012
Fairchild TS	Replace the 27.6kV KSO circuit breaker (80M9) and control box with a vacuum circuit breaker at Fairchild TS	2012
Bathurst TS	Replace the 27.6kV KSO circuit breaker (85M24) and control box with a vacuum circuit breaker at Bathurst TS	2012
Bathurst TS	Replace the 27.6kV KSO circuit breaker (85M1) and control box with a vacuum circuit breaker at Bathurst TS	2014
Bathurst TS	Replace the 27.6kV KSO circuit breaker (85M2) and control box with a vacuum circuit breaker at Bathurst TS	2014

## ICM Project | Stations Circuit Breakers Segment

Station Name	Objectives	Planned Year
Bathurst TS	Replace the 27.6kV KSO circuit breaker (85M25) and control box with a vacuum circuit breaker at Bathurst TS	2014
Bathurst TS	Replace the 27.6kV KSO circuit breaker (85M4) and control box with a vacuum circuit breaker at Bathurst TS	2014

1 **1.1. Scope of Work**

2 The KSO circuit breaker replacement work for all the selected jobs consists of the following  
 3 tasks:

- 4 (a) Design necessary drawings for the new vacuum circuit breaker
- 5 (b) Co-ordinate with Hydro One on scheduling of Circuit breaker replacement
- 6 (c) Transfer the 27.6kV feeder load to adjacent feeders and disconnect the DC supply to the  
 7 existing KSO circuit breaker
- 8 (d) De-energize, isolate and ground the existing KSO circuit breaker
- 9 (e) Remove the existing KSO breaker
- 10 (f) Install the new vacuum circuit breaker and complete all test requirements in accordance  
 11 with all THESL required specifications
- 12 (g) Reconnect the DC supply to the vacuum breaker and connect and energize the 27.6kV  
 13 feeder

14  
 15 **1.2. Map and Locations**

16 The stations across Toronto are shown in Figure 2 below:

## ICM Project | Stations Circuit Breakers Segment

---

1 **III NEED**

2

3 All nine of these circuit breakers selected are outdoor-mounted oil-type and are obsolete. /us

- 4
- Replacement parts are no longer being manufactured.
  - Any parts required need to be custom manufactured, making the cost of maintenance high and the repair and return to service time long.
  - The KSO oil circuit breakers have additional maintenance cost due to the added expensive of periodic maintenance and replacement of oil, and subsequently makes the overall maintenance cost of the oil circuit breaker high.
- 5
- 6
- 7
- 8
- 9

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**ICM Project** | **Stations Circuit Breakers Segment**

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## ICM Project | Stations Circuit Breakers Segment

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**Station Name:** ~~Finch TS~~

**Station Circuit Breaker ID:** ~~55M24~~

**Age of the Circuit Breaker:** ~~52~~

**Justification:**

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.



**Figure 17: Circuit Breaker at Finch TS 55M24 (February 2, 2012)**

## ICM Project | Stations Circuit Breakers Segment

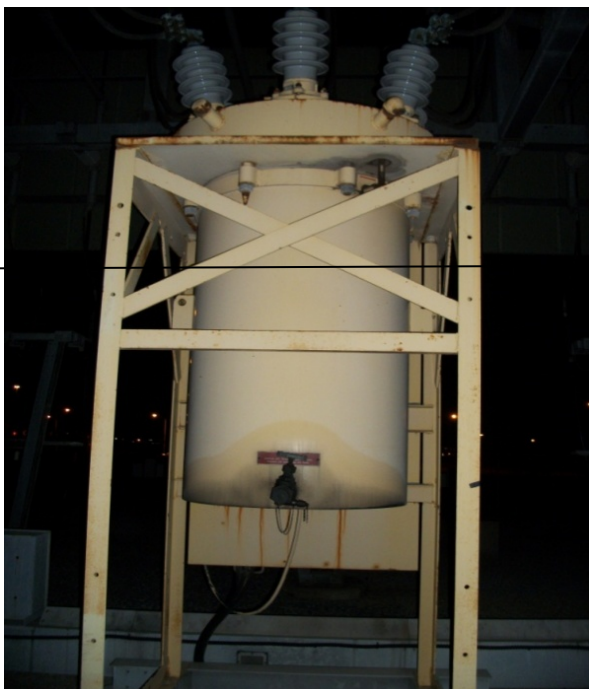
~~Station Name:~~ Finch TS

~~Station Circuit Breaker ID:~~ 55M25

~~Age of the Circuit Breaker:~~ 52

**Justification:**

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.



**Figure 18: Circuit Breaker at Finch TS 55M25 (February 2, 2012)**

## ICM Project | Stations Circuit Breakers Segment

~~Station Name:~~ Finch TS

~~Station Circuit Breaker ID:~~ 55M8

~~Age of the Circuit Breaker:~~ 52

**Justification:**

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.



**Figure 19: Circuit Breaker at Finch TS 55M8 (March 14, 2012)**

## ICM Project | Stations Circuit Breakers Segment

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**Station Name:** Bathurst TS

**Station Circuit Breaker ID:** 85M1

**Age of the Circuit Breaker:** 50

**Justification:**

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.



**Figure 20: Circuit Breaker at Bathurst TS 85M1 (February 2, 2012)**

## ICM Project | Stations Circuit Breakers Segment

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**Station Name:** Bathurst TS

**Station Circuit Breaker ID:** 85M4

**Age of the Circuit Breaker:** 50

**Justification:**

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.



**Figure 21: Circuit Breaker at Bathurst TS 85M4 (February 2, 2012)**

## ICM Project | Stations Circuit Breakers Segment

---

**Station Name:** Bathurst TS

**Station Circuit Breaker ID:** 85M2

**Age of the Circuit Breaker:** 50

**Justification:**

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.



**Figure 22: Circuit Breaker at Bathurst TS 85M2 (February 2, 2012)**

## ICM Project | Stations Circuit Breakers Segment

~~Station Name:~~ Bathurst TS

~~Station Circuit Breaker ID:~~ 85M25

~~Age of the Circuit Breaker:~~ 50

**Justification:**

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.



**Figure 23: Circuit Breaker at Bathurst TS 85M25 (February 2, 2012)**

## ICM Project | Stations Circuit Breakers Segment

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1     **III     PREFERRED ALTERNATIVE**

2

3     THESL considered three options to mitigate the reliability and safety risks associated with the  
4     deteriorated state of 9 obsolete 27.6kV outdoor-mounted oil circuit breakers in this segment:     /US

- 5         • replacement with vacuum circuit breakers
- 6         • replacement with SF<sub>6</sub> circuit breakers
- 7         • maintain status quo

8

9     **1. Vacuum Circuit Breakers and SF<sub>6</sub> Breakers**

10     Both SF<sub>6</sub> and vacuum circuit breakers make use of technologies that are considered to be  
11     reliable. Each has their own features and capabilities that must be considered when making a  
12     choice for particular applications as discussed below.

13

14     **1.1. Physical Dimension**

15     Both SF<sub>6</sub> and vacuum circuit breakers are significantly smaller in physical size compared to other  
16     circuit breakers on the market. However, SF<sub>6</sub> circuit breakers tend to be physically larger in  
17     dimensions than vacuum circuit breakers due to the SF<sub>6</sub> open gap being larger than that of a  
18     vacuum breaker in order to support the comparable BIL rating. Also, additional space is  
19     required by SF<sub>6</sub> circuit breakers to store the puffer cylinder. Physical dimension is an important  
20     consideration in the selection of a circuit breaker due to physical space constraint in stations.  
21     Therefore, installation of vacuum circuit breaker has an advantage over SF<sub>6</sub> circuit breaker in  
22     terms of physical dimensions.

23

24     **1.2. Maintenance**

25     It is not necessary to monitor the arc-quenching medium during operation of vacuum circuit  
26     breakers since the vacuum interrupter seals are manufactured with brazed joints. Also, periodic  
27     routine hi-pot checks assure vacuum integrity. On the other hand, SF<sub>6</sub> circuit breakers require  
28     continuous monitoring of the arc-quenching medium since seals leak with time. This tends to  
29     result in higher maintenance cost on SF<sub>6</sub> circuit breaker compared to vacuum circuit breaker.



## ICM Project | Stations Circuit Breakers Segment

- 1       • The health index of oil circuit breakers has had a 20% increase in the number in fair  
 2       condition and a corresponding decrease of 16% in good and very good condition from  
 3       2010 to 2011.
- 4       • Moreover, retaining the existing circuit breakers in service will likely have a negative  
 5       impact on maintainability:
- 6       • Spare parts for the KSO oil circuit breakers are no longer being manufactured; spare  
 7       parts required are obtained on special order at about twice the cost of the original spare  
 8       parts
- 9       • Maintenance on these breakers can only be done when there is favorable weather.

10

11       Table 6 below lists the large customers who would be affected in the event of a failure of the  
 12       selected circuit breakers:

13

14       **Table 6: Large Customers Affected in the event of Breaker Failures**

Customer Name	Peak kVA	Feeder ID
Customer A	3,386	51M4
Customer B	2,823	51M4
Customer C	1,945	51M4
Customer D	1,651	51M4
Customer E	1,211	51M4
Customer F	1,108	51M4
Customer G	1,047	51M7
Customer H	2,214	53M1
Customer I	5,787	53M11
Customer J	1,644	55M24
Customer K	4,740	55M28
Customer L	6,682	80M3
Customer M	1,105	80M3
Customer N	6,682	80M5
Customer O	1,693	80M5

**ICM Project | Stations Circuit Breakers Segment**

Customer Name	Peak kVA	Feeder ID
Customer P	1,654	80M5
Customer Q	825	80M5
Customer R	1,923	80M9
Customer S	1,394	80M9
Customer T	1,452	85M2
Customer U	1,363	85M2
Customer V	307	85M2
Customer W	4,740	85M25
Customer X	1,1567	85M4

1 After analysis of all three alternatives mentioned above, THESL proposes that replacement of  
 2 the outdoor-mounted oil circuit breakers with vacuum circuit breakers is the preferable option.

3

4 **3. Avoided Risk Cost of the Selected Option**

5 The effectiveness of the Circuit Breakers replacement jobs can be highlighted by determining  
 6 how much cost is avoided by executing this work immediately as opposed to executing in 2015.  
 7 These avoided costs include quantified risks, taking into account the assets' probability of  
 8 failures, and multiplying this with various direct and indirect cost attributes associated with in-  
 9 service asset failures, including the cost of customer interruptions, emergency repairs and  
 10 replacement.

11

12 Carrying out immediate work on this asset class will result in the avoided estimated risk cost of  
 13 approximately \$3.2 million (Refer to Appendix 1), as opposed to executing this work in 2015. /c

14 Therefore, there are distinct economic benefits to executing this work immediately. The  
 15 methodologies applied within this business case are further referenced within the Appendix.

16

17 **Table 7: Avoided Risk Cost (Refer to Appendix 1)**

Project Element	Station Circuit Breaker Project
Avoided Risk Cost	\$3.2 Million

/c

**ICM Project | Stations Circuit Breakers Segment**

1 **Table 1: Summary of values used in the determination of Avoided Estimated Risk Cost**

Business Case Element	Estimated Cost (in Millions)
Present Value of Project Net Cost in 2015 ( $PV(\text{PROJECT}_{\text{NET\_COST}}(2015))$ )	\$ 3.339
Project Net Cost in 2012 ( $\text{PROJECT}_{\text{NET\_COST}}(2012)$ )	\$ 0.157
<b>Avoided Estimated Risk Cost =</b> <b>(<math>PV(\text{PROJECT}_{\text{NET\_COST}}(2015)) - \text{PROJECT}_{\text{NET\_COST}}(2012)</math>)</b>	<b>\$ 3.182</b>

/c

/c

2 When this avoided estimated risk cost is calculated as a positive value, it means that estimated  
 3 risk costs for the job assets in 2015 will exceed the estimated risks that exist today. By  
 4 performing the work immediately as opposed to waiting until 2015, we can eliminate these  
 5 estimated risks. Therefore, these avoided estimated risk costs represent the benefits of job  
 6 execution.

# ICM Project – Station Infrastructure and Equipment

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## Stations Control and Communication Segment

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | Stations Control and Communication Segment

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$3.30 M to \$1.13 M, a reduction of \$2.17 M
- 3 • Revised number of jobs proposed for 2012/2013 to 5, with jobs for 2014 to be addressed in
- 4 Phase Two, as proposed
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system
- 8 • Clarified the formula for calculating the outage cost savings due to the SCADA system

**ICM Project | Stations Control and Communication Segment**

1 **I EXECUTIVE SUMMARY**

2

3 **1. Description**

4 THESL relies on an extensive Supervisory Control and Data Acquisition System (SCADA) for  
 5 control and monitoring of distribution equipment. THESL uses various types of communication  
 6 (SONET fibre optics, copper lines, radio system and leased telephone lines) to convey  
 7 information between station assets and distribution system assets. This communication system  
 8 is vital for operating the system and re-routing electrical supply during planned outages and  
 9 emergency situations.

10

11 Station control and communication work proposed for 2012 and 2013 ~~and 2014~~ consists of /US  
 12 improving SONET communication redundancy, upgrading SONET system communication  
 13 capacity and installing SCADA RTUs. The estimated cost for the work is \$1.13M, which consists /UF, US  
 14 of \$0.51M for improving SONET system and \$0.62M for replacing / installing SCADA RTUs, as /UF, US  
 15 presented in Table 1 and Table 2 below. Jobs were selected for inclusion in this segment based  
 16 upon need and execution capacity, and in coordination with other projects.

17

18 **Table 1: Job Cost Estimates for SONET System Redundancy/Upgrading**

Job Title	Job Year	Cost Estimate (\$M)
Improve SONET Redundancy: 14 Carlton to George and Duke MS and Esplanade TS	2012	\$0.23
Improve SONET Redundancy: Malvern TS to Sheppard TS	2012	\$0.22
Improve SONET Redundancy: Split Toronto SONET ring	2013	\$0.06
Improve SONET Redundancy: Duplex TS to Fairbank TS and Warden TS to Bermondsey TS	2014	\$0.39
<b>Jobs Total 2012-2013:</b>		<b>\$0.51</b>
<b>Reconciliation for budget changes &lt; \$100,000 and rounding</b>		<b>\$0.01</b>
<b>TOTAL</b>		<b>\$0.52</b>

/US

/UF, US

**ICM Project | Stations Control and Communication Segment**

1 **Table 2: Job Cost Estimates for SCADA RTUs Replacing/Installing**

Job Title	Job Year	Cost Estimate (\$M)
Replace 15 MOSCAD RTUs in Etobicoke	2012	\$0.28
Install 5 MS SCADA RTUs	2013	\$0.34
Replace 14 MOSCAD RTUs in Etobicoke	2014	\$0.59
Install 5 MS SCADA RTUs	2014	\$0.36
	<b>Subtotal:</b>	<b>\$0.62</b>

/UF

2 **2. Why This Work is Needed Now**

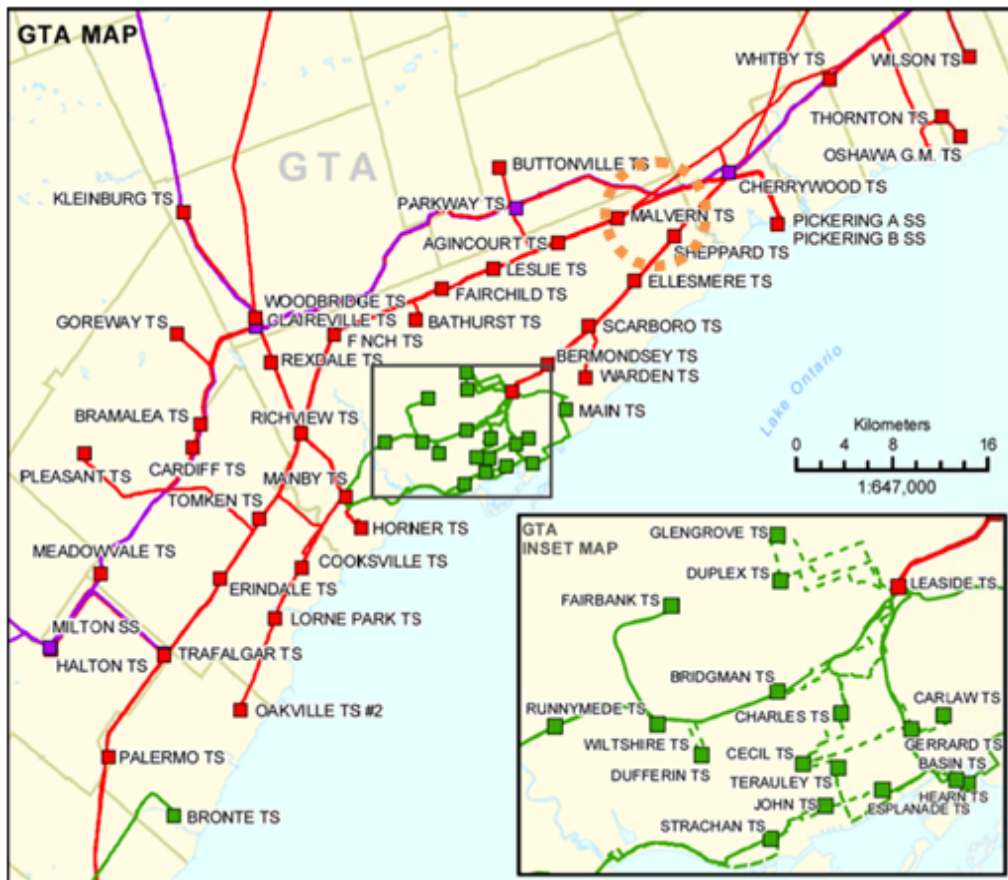
3 Elements of the SONET system and the radio system have developed reliability and maintenance  
 4 issues that require immediate attention. This segment will address the communication issues  
 5 that pose risks for THESL’s continued ability to remotely monitor and control the distribution  
 6 grid.

7  
 8 The SONET fibre optic communication system is normally designed as a redundant ring system  
 9 between station assets and the Control Centre, but some segments lack redundancy and as  
 10 these fibre optic lines age or are damaged by adjacent construction, there is a risk of a complete  
 11 SONET system failure (Section III, 1). Failure of the SONET system would likely result in:

- 12 • No communication to support SCADA system, which would prevent system operators  
 13 from monitoring and controlling vital substation equipment. The result would be longer  
 14 outages as manual, rather than remote, switching would be required.
- 15 • No information to/from the T1 data circuits used for the protection and control of HONI  
 16 115kV transmission feeders that supply THESL (i.e., loss of system security and  
 17 redundancy at HONI supply points and possibly longer outages from poor coordination  
 18 with HONI).
- 19 • No transfer trip protection for HONI 230kV transmission in the Scarborough area,  
 20 resulting in loss of system security and redundancy at HONI supply points and possibly

## ICM Project | Stations Control and Communication Segment

- 1 **1.1.2. Improve SONET Redundancy: Malvern TS to Sheppard TS (Cost Estimate: \$0.22M)**
- 2 The scope of this job is to add redundancy to the SONET line between Malvern TS and Sheppard
- 3 TS to improve communication integrity. The distance between Malvern TS and Sheppard TS is
- 4 approximately 5.2 kilometres.



- 5 **1.1.3. Improve SONET Redundancy: Split Toronto SONET Ring (Cost Estimate: \$0.06M)**
- 6
- 7 The scope of this job is to split the downtown SONET ring system into four more manageable
- 8 rings to improve communication integrity.

/us



## ICM Project | Stations Control and Communication Segment



- 1 **1.1.4. Improve SONET Redundancy: Duplex TS to Fairbank TS and Warden TS to Bermondsey**
- 2 **TS (Cost Estimate: \$0.39M)**
- 3 Scope of this job is to add redundancy to the SONET lines from Duplex TS to Fairbank TS and
- 4 Warden TS to Bermondsey TS to improve communication integrity. The distance between
- 5 Duplex TS and Fairbank TS is approximately 4.5 kilometres. The distance between Warden TS
- 6 and Bermondsey TS is approximately 5 kilometres.

# ICM Project | Stations Control and Communication Segment



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**ICM Project** | **Stations Control and Communication Segment**

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/c

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**ICM Project** | **Stations Control and Communication Segment**

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1    **2.        Replacing / Installing SCADA RTUs**

2

3    **2.1.      Job Description**

4

5    **2.1.1.    Replace 15 MOSCAD RTUs in Etobicoke in 2012 (Cost Estimate: \$0.28M)**

/UF

6    The scope of work includes replacing the MOSCAD RTU and DARCOM radio system with a MDS  
7    TransIT radio system in 15 Etobicoke substations. Testing and commissioning of the new radio  
8    system is also included.

9

10   The 15 locations were chosen to take advantage of planned station maintenance in 2012 in  
11   order to optimize the outage planning process and minimize costs. The numbered MS locations  
12   on the map below (Figure 7) are:

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**ICM Project** | **Stations Control and Communication Segment**

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/UF, US

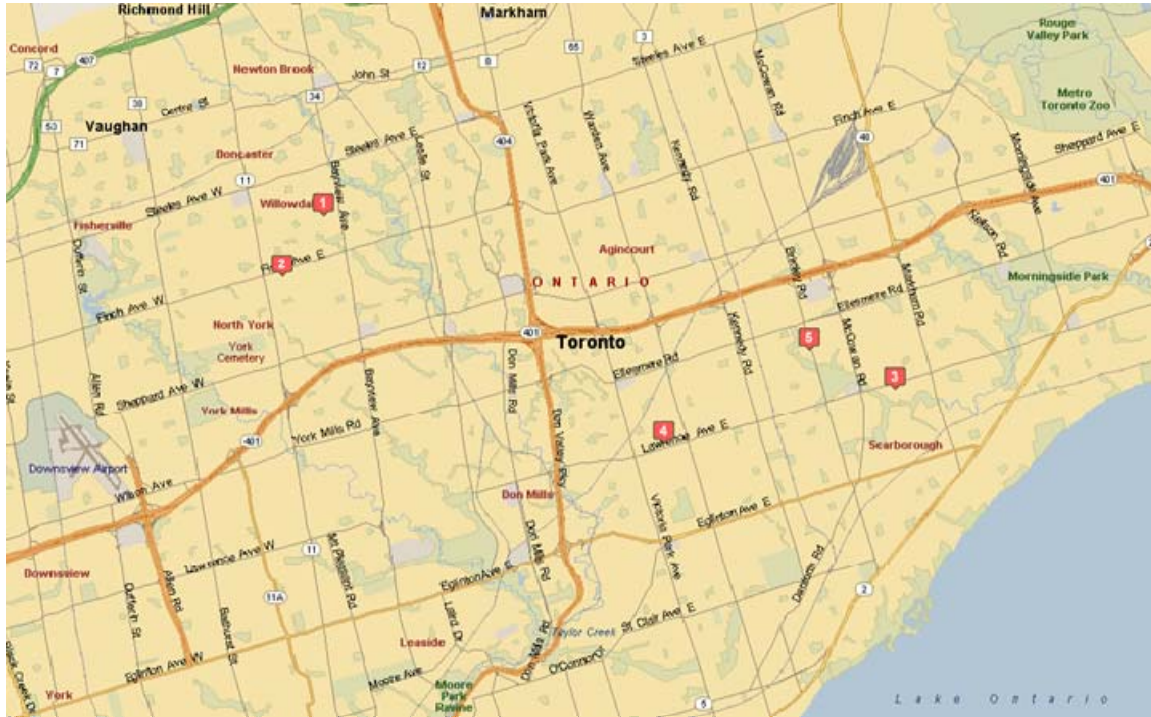
1    **2.1.2. Install 5 MS SCADA RTUs in 2013 (Cost Estimate: \$0.34M)**

2    Scope of work includes replacing the protection and control equipment and adding remote  
3    terminal units complete with a radio communication system. The numbered MS locations on  
4    the map below (Figure 9) are:

- 5        1) Estelle MS  
6        2) Pemberton MS  
7        3) Bellamy Lawrence MS

## ICM Project | Stations Control and Communication Segment

- 1 4) Brian Elinor MS
- 2 5) Brimley Bernadine MS



3 **Figure 9: Map and Locations**

- 4
- 5

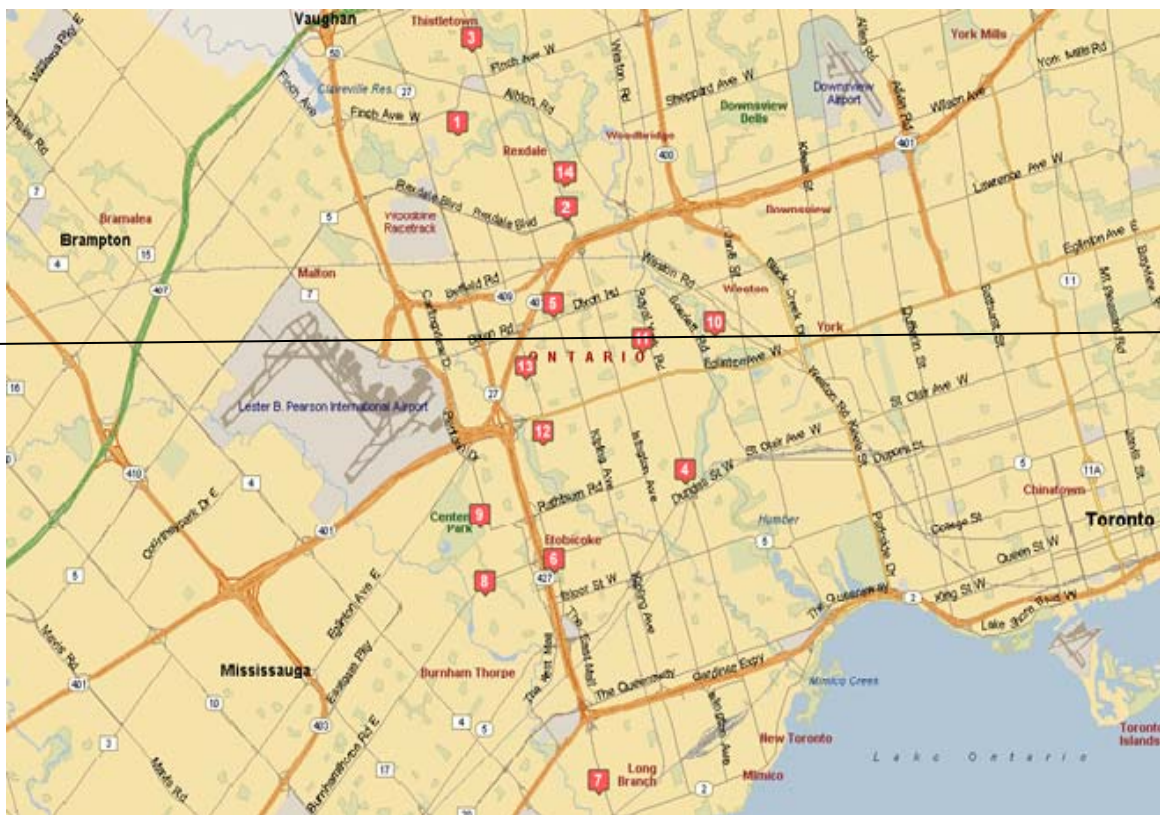
### 6 **2.1.3. Replace 14 MOSCAD RTUs in Etobicoke in 2014 (Cost Estimate: \$0.59M)**

- 7 Scope of work includes replacing the MOSCAD RTU and DARCOM radio system with MDS
- 8 TransIT radio system in 14 Etobicoke substations. Testing and commissioning of the new radio
- 9 system is also included.

## ICM Project | Stations Control and Communication Segment

1 The 14 locations were chosen to take advantage of planned station maintenance in 2012 in  
2 order to optimize the outage planning process and minimize costs. The numbered MS locations  
3 on the map below (Figure 10) are:

- |                    |                     |                  |
|--------------------|---------------------|------------------|
| 4 1) Albion MS     | 6) Blaketon MS      | 11) Chapman MS   |
| 5 2) Allenby MS    | 7) Burlingame MS    | 12) Dalegrove MS |
| 6 3) Annabelle MS  | 8) Burnhamthorpe MS | 13) Dunsany MS   |
| 7 4) Ashley MS     | 9) Centennial MS    | 14) Elmhurst MS  |
| 8 5) Blackfriar MS | 10) Centre Drive MS |                  |



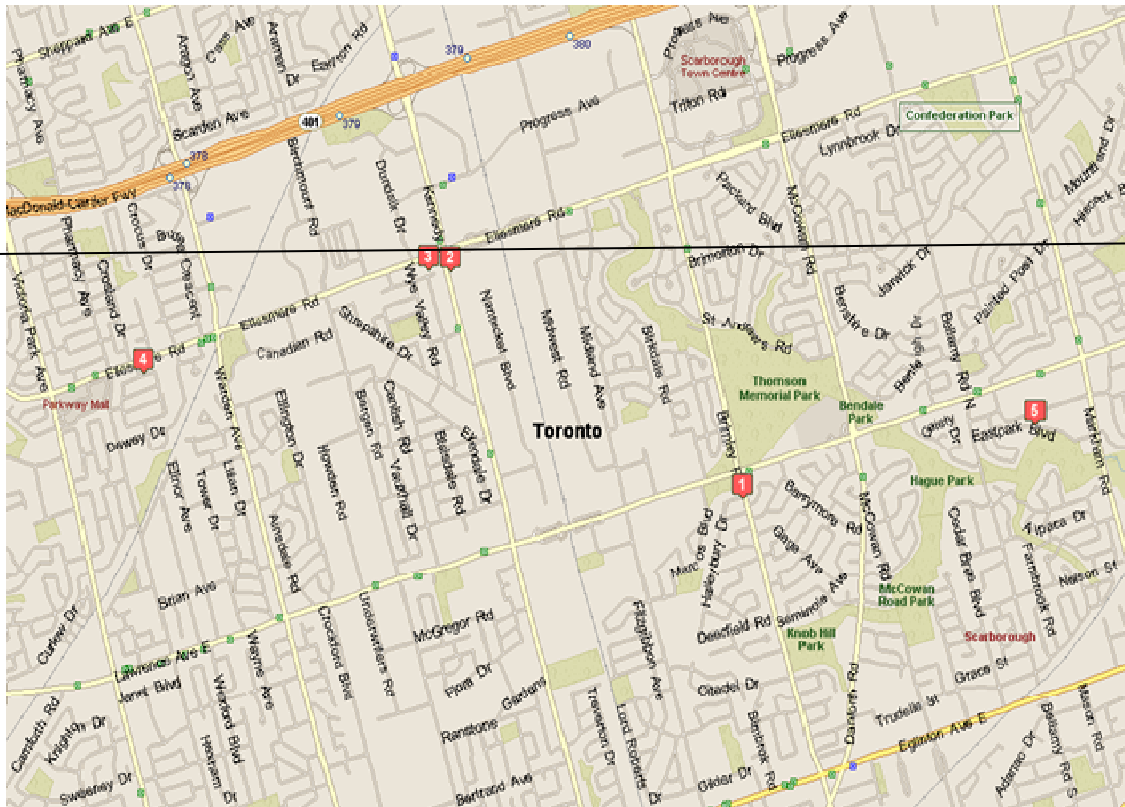
9 **Figure 10: Map and Locations**

## ICM Project | Stations Control and Communication Segment

1 **2.1.5. Install Five MS SCADA RTUs in 2014 (Cost Estimate: \$0.36M)**

2 Scope of work includes replacing the protection and control equipment and adding remote  
3 terminal units complete with a radio communication system. The numbered MS locations on  
4 the map below (Figure 11) are:

- 5 1) Brimley Lawrence MS  
6 2) Ellesmere Kennedy T1 MS  
7 3) Ellesmere Kennedy T2 MS  
8 4) Ellesmere White Abbey MS  
9 5) Greencedar Lawrence MS



10 **Figure 11: Map and Locations**



## ICM Project | Stations Control and Communication Segment

1

### 2 3. Benefit Cost Evaluation

3 The SONET improvement jobs and the MOSCAD replacement jobs will help THESL achieve more  
4 reliable communication. This provides more efficient, cost effective outage response and more  
5 reliable power supply to its customers since THESL control centre operators can monitor  
6 equipment conditions, correct faults remotely, provide automated switching and feeder re-  
7 routing in both planned outages and unplanned emergency work.

8

9 It is estimated that the duration of system outages can be reduced significantly with proper  
10 communication between control room, response crews and equipment. For the last five years  
11 (2007-2011), the average number of customers interrupted (CI) in Etobicoke is 181,785  
12 customers per year, and the average customer minutes outage (CMO) is 8,007,263 per year.  
13 The average outage duration is 44 minutes with SCADA system in service. Without SCADA  
14 system, the outage duration increases from 44 minutes to 175 minutes on average, and  
15 therefore the CMO become 31,812,305 (181,785 x 175). As a result, the CMO saving due to a  
16 SCADA system in service is 23,805,042. Based on the cost of interruption formula, the benefit  
17 can be derived as follow:

18

19 Assuming each customer has a load of 3 KVA, and 33% of the outage can be improved by SCADA  
20 system.

21

22 The kVA load served:  $23,805,042 \times 3 = 71,415,125 \text{ kVA} \times [\text{customer outage minutes}]$  /c

23

24 The 33% improvement by SCADA system:  $71,415,125 \times 33\% = 23,805,042 \text{ kVA} \times [\text{customer}$  } /c  
25  $\text{outage minutes}]$

26

27 Using \$15 per KVA x hour, the cost saving will be: /c

28

29 Outage cost saving =  $23,805,042 \times \$15 / 60 = \$5,951,260$

30

## ICM Project | Stations Control and Communication Segment

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- 1 The system-wide reduction in Customer Minute Outage (CMO) represents benefits of the order
  - 2 of approximately \$5.95 million every year. This one time investment of \$1.13 million will ensure
  - 3 that these benefits will continue to be realized; therefore this initiative has a benefit cost ratio
  - 4 well above unity.
- } /UF, US

# ICM Project – Station Infrastructure and Equipment

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## Downtown Station Load Transfer Facilities Segment

Toronto Hydro-Electric System Limited (THESL)



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**ICM Project** | **Downtown Station Load Transfer Facilities Segment**

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$3.34 M to \$2.82 M, a reduction of \$0.52 M
- 3 • Revised number of jobs proposed for 2012/2013 to 3, with jobs for 2014 to be addressed in
- 4 Phase Two
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 7 the continuing priority needs of the system

## ICM Project | Downtown Station Load Transfer Facilities Segment

1     **I       EXECUTIVE SUMMARY**

2

3     **1. Project Description**

4     This segment includes the completion of the Dufferin – Bridgman feeder tie work in 2012 that  
 5     was largely completed in 2011, and two new jobs for 2013 that are required to provide feeder  
 6     ties between Basin and George and Duke stations; and Basin and Carlaw stations, where no such  
 7     facilities present exist (See Section II). } /US

8

9     About 21% of the \$9.4M Dufferin-Bridgman feeder ties work remains for 2012 which includes /UF  
 10    completion of electrical work, feeder transfers, some feeder capacity upgrades and  
 11    commissioning (See Section II). This job plus the other two proposed jobs for 2013 combine for  
 12    a total cost of \$2.8M. None of the proposed work is included in existing rates. /UF, US

13

14    **Table 1: Proposed Feeder Ties**

Job Number	Job Identifier	Cost Estimate (\$M)	Year of Execution
X11620	Feeder Tie Dufferin to Bridgman	1.94	2012
X11424	Feeder Tie A203BN to A240GD	0.48	2013
X12086	A204BN tie to new Carlaw feeder	0.39	2013
<del>X12340</del>	<del>Feeder Tie A36DN to A67W</del>	<del>1.78</del>	<del>2014</del>
<del>X12342</del>	<del>Feeder Tie A13DN to A35W</del>	<del>1.81</del>	<del>2014</del>
	<b>Total</b>	<b>2.82</b>	

/UF

/US

/UF, US

## ICM Project | Downtown Station Load Transfer Facilities Segment

1 The other two jobs listed in Table 1 will allow rapid transfer of customer loads on the feeder  
2 pairs between Basin and George and Duke stations; and Basin and Carlaw stations. The load  
3 transfer capability that would become available represents up to roughly 3% of Basin TS loading;  
4 3% of George and Duke TS loading; and 5% of Carlaw TS loading;. It would provide increased  
5 reliability for these feeders, from any HONI or THESL incident that impacts station supply.

/US

6  
7 These jobs are expected to collectively provide mitigation for a portion of risks identified at five  
8 of the 15 downtown stations, and provide back-up supply to a total of 5,164 customers and 38.4  
9 MVA of load. This capital investment will result in a net benefit of \$54,000 through reduced  
10 customer interruption costs.

/UF, US

### 11 12 **3. Why the Project is the Preferred Alternative**

13  
14 Six alternatives were considered:

- 15 • Status quo
- 16 • Mobile generators
- 17 • Mobile switchgear
- 18 • Inter-station switchgear ties
- 19 • Intra-station switchgear ties
- 20 • Station-to-Station Feeder ties

21  
22 Under the status quo, customers will continue to be exposed to long duration outages in the  
23 event of a station failure and the benefits from the investments already made to tie Dufferin  
24 and Bridgman stations will not be realized (See Section IV, 1). Neither mobile generators nor  
25 mobile station-to-station feeder ties can completely address station failures as explained in  
26 Section IV, 2. Both inter and intra-station switchgear ties are typically available only for new  
27 switchgear installations and will typically not address all types of potential station failures. As  
28 such, these options do not represent viable remedies in the near-term (See Section IV, 3).  
29 Station to station feeder ties are the only solution capable of completely addressing any loss-of-

**ICM Project | Downtown Station Load Transfer Facilities Segment**

1 **Table 2: Dufferin – Bridgman Feeder Ties**

Job Number	Total Cost (\$M)	Outstanding Cost (\$M)	Year of Execution
W10356	1.33	0	Finished
W10358	1.03	0	Finished
W10359	0.48	0	Finished
W10357	0.73	0	Finished
X11677	0.48	0	Finished
X11620	5.35	1.94	2012
	9.40	1.94	

} /UF

2 An expenditure of approximately \$1.94 M, representing approximately 21% of the total project  
 3 cost, is expected to complete the work necessary to provide complete peak load feeder-to-  
 4 feeder tie capability for four Dufferin – Bridgman feeder pairs. The load transfer capability that  
 5 would become available represents up to roughly 29% of total Bridgman TS loading and up to  
 6 roughly 11% of total Dufferin TS loading. The remaining station loading is associated with other  
 7 feeders and will need to be addressed in future projects.

/UF

8  
 9 In addition, two additional feeder-to-feeder tie jobs are proposed. These projects are identified  
 10 in Table 3, and the geographic boundaries are illustrated in Figure 1, below, respectively.

/US

**ICM Project Downtown Station Load Transfer Facilities Segment**

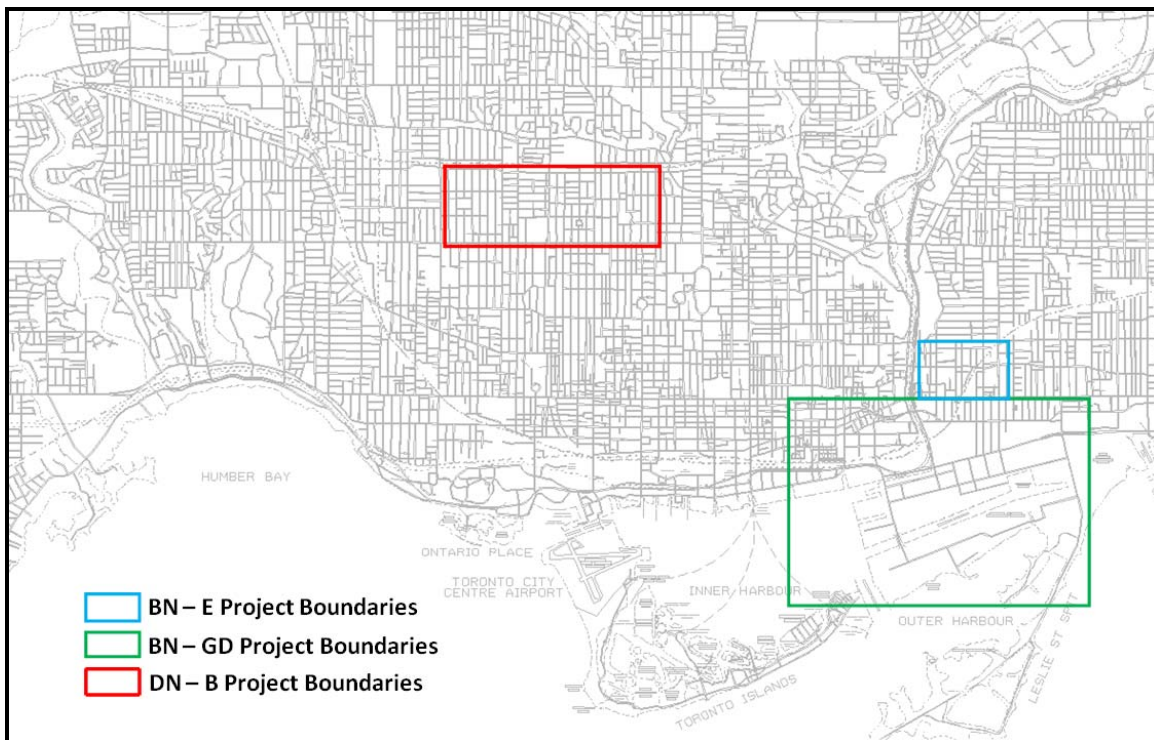
1 **Table 3: Proposed Feeder Ties – 2013,2014**

Job Number	Job Identifier	Cost Estimate (\$M)	Year of Execution
X11424	Feeder Tie A203BN to A240GD	0.48	2013
X12086	A204BN tie to new Carlaw feeder	0.39	2013
X12340	Feeder Tie A36DN to A67W	1.78	2014
X12342	Feeder Tie A13DN to A35W	1.81	2014
<b>Total</b>		<b>0.87</b>	

/US

/US

/US



/US

2 **Figure 1: Feeder Ties Area Boundaries**



## ICM Project | Downtown Station Load Transfer Facilities Segment

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1 The scope of each of these jobs is similar to that detailed for each individual Dufferin – Bridgman  
2 feeder pair. The proposed feeder ties are expected to allow rapid transfer of customer loads on  
3 the feeder pairs between Basin and George and Duke stations; and Basin and Carlaw stations.

4 The load transfer capability that would become available represents up to roughly 3% of Basin  
5 TS loading; 3% of George and Duke TS loading; and 5% of Carlaw TS loading. It would provide  
6 increased reliability for these feeders, from any HONI or THESL incident that impacts station  
7 supply.

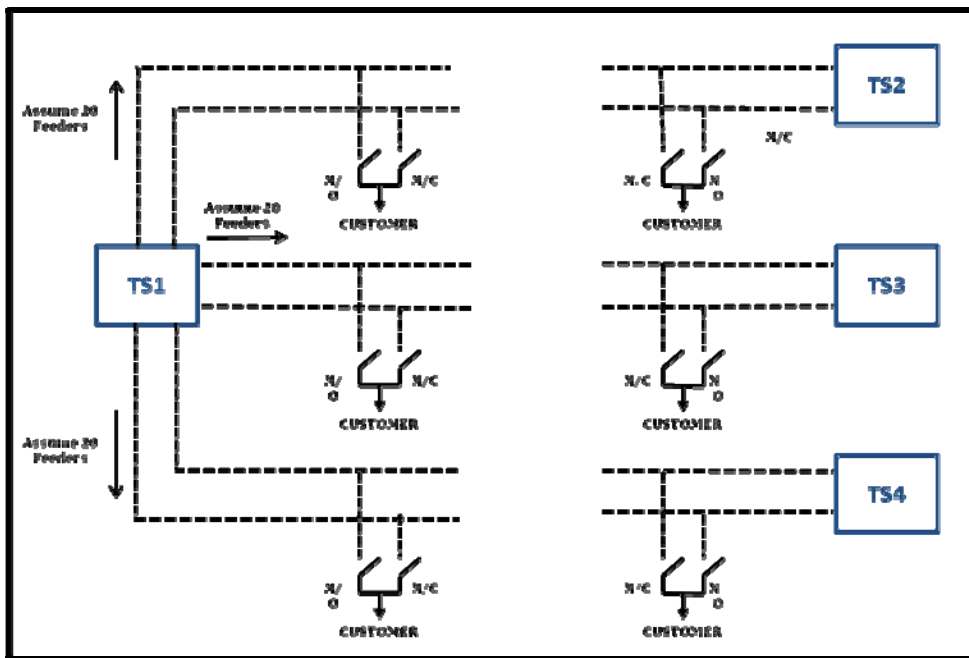
} /US

8  
9 These jobs are expected to collectively provide mitigation for a portion of risks identified at five  
10 of the 15 downtown stations, and provide back-up supply to a total of 5164 customers and 38  
11 MVA of load. The jobs will allow 100% load transfer capabilities for the specific feeder pairs  
12 under peak conditions. Other feeders from these stations would need to be addressed in future  
13 projects. Should this work not take place, customers on these feeders would face unmitigated  
14 outage durations for any major loss of supply incident at these stations.

} /US

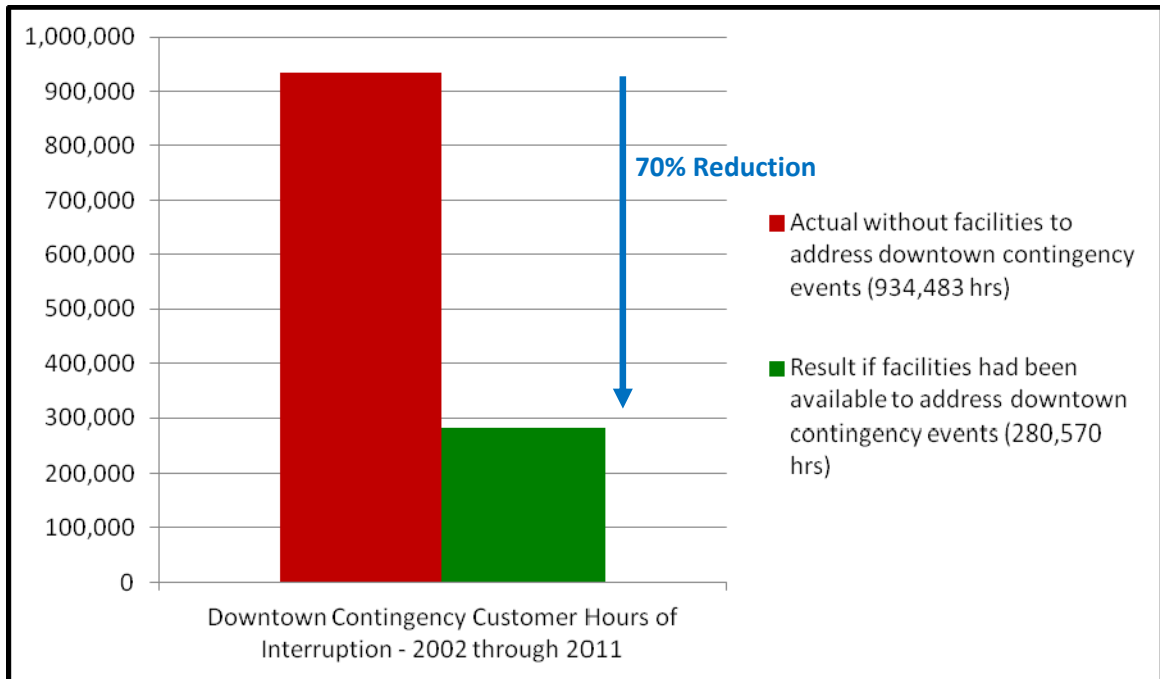
## ICM Project Downtown Station Load Transfer Facilities Segment

- 1 outage event cost, \$15/kVAh outage duration cost, 1.5 outages per year, 40% of station outage, /c
- 2 9.07-hour outage duration and peak system load).
- 3
- 4 The downtown radial design is depicted in Figure 2 below.



- 5 **Figure 2: Radial distribution design utilized in downtown area**
- 6
- 7 Outside of the downtown Toronto area, the distribution system is of an open-loop design. This
- 8 design incorporates many ties between feeders, and in particular, ties between feeders coming
- 9 from different stations. As a result, most areas can be quickly resupplied by an alternative
- 10 station when necessary. The open-loop design is depicted in Figure 3 below.

**ICM Project** | **Downtown Station Load Transfer Facilities Segment**



1 **Figure 4: Reliability Impact of Downtown Station Load Transfer Implementation**

2

3 All four major station outage events in downtown Toronto’s history occurred in the last decade.  
 4 This experience indicates that the conditions in and around the 15 downtown stations are  
 5 worsening as time progresses, and as a result the risks are increasing. Each of these historical  
 6 events resulted from causes external to THESL that negatively impacted the station distribution  
 7 equipment. Therefore, the only certain way to address such failures is to provide a back-up  
 8 supply to customers.

9

10 The purpose of this segment is to provide distribution load transfer capability from one station  
 11 area to another station area in order to manage the risks of partial, or complete, station  
 12 outages.

13

14 An investment of \$2.8M over the period of 2012 through 2013 is expected to complete the work  
 15 necessary to provide feeder-to-feeder tie capability for six feeder pairs. This work is expected to  
 16 allow rapid transfer of customer loads on these feeder pairs should mitigate virtually any loss-  
 17 of-supply incident occur at any of these stations.

} /UF, US

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## ICM Project | Downtown Station Load Transfer Facilities Segment

---

- 1 The work to enable station load transfers for the downtown stations must be undertaken over
- 2 many years. The proposed jobs for 2012 and 2013 represent the highest priority jobs based on
- 3 reasonable project scope and the ability of each station to pick-up the alternate feeder loads.

/us

## ICM Project | Downtown Station Load Transfer Facilities Segment

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1 Intra-station switchgear ties (i.e., ties between switchgear within the same station) can address  
2 some loss of HONI supply incidents but not loss of THESL switchgear incidents, and are also  
3 generally only practical to add to new station switchgear. For the limited types of loss of supply  
4 incidents that these alternatives can address, customers would be expected to experience  
5 interruptions of a few hours. New THESL station switchgear is now being designed with  
6 enhanced provisions for inter- and intra-station switchgear ties. As a result, these facilities will  
7 only become available in the long term.

8

#### 9 **4. Station-to-Station Feeder Ties**

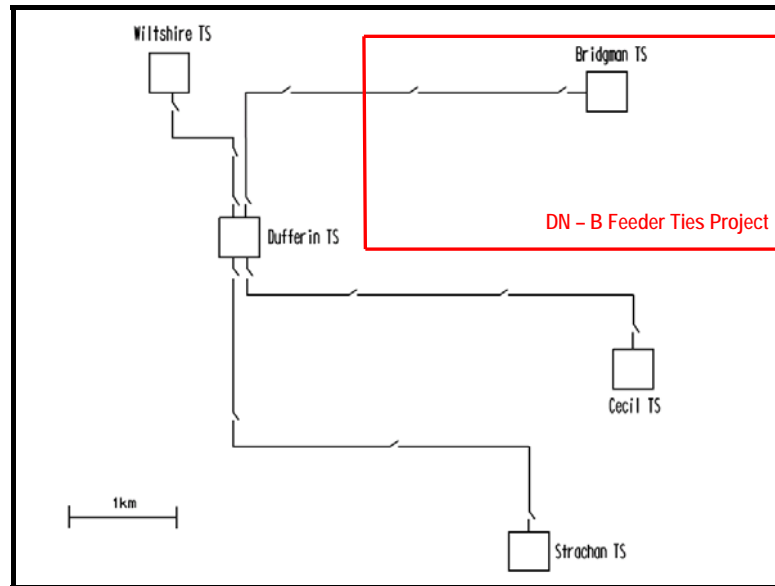
10 Only station-to-station feeder ties are capable of completely addressing any loss-of-supply  
11 incident. Customer load restoration times are also generally short, with an estimated 14 hours  
12 with local switch operation and an hour with the future addition of remote operation.

13

14 Figure 5 illustrates the typical proposed connections between Dufferin and the neighbouring  
15 stations. In order to ensure that sufficient spare station capacity exists to pick up the load from  
16 Dufferin at the receiving station, ties must be distributed from Dufferin to Bridgman, Cecil,  
17 Strachan and Wiltshire stations. The proposed Dufferin - Bridgman work will complete four  
18 feeder to feeder ties between Dufferin and Bridgman stations. This portion of the work is  
19 highlighted in red in figure 5.

/c

## ICM Project | Downtown Station Load Transfer Facilities Segment



1 **Figure 5: Schematic of Planned 13.8kV Interconnections between Dufferin TS and**  
2 **Neighbouring Stations (Typical)**

3  
4 The approach THESL has taken is to provide feeder ties across the downtown core area, rather  
5 than focus on a specific area or station. Feeder-to-feeder tie projects typically involve first  
6 installing remotely operable load break switches to permit the isolation of the feeders from the  
7 station. Then, remotely operable load break switches would be installed to tie individual  
8 feeders to feeders from neighbouring stations. Lastly, cabling is installed to tie feeders to these  
9 neighbouring stations. THESL expects that this approach provides the greatest opportunity to  
10 mitigate high impact station events for a number of stations and is the most cost effective  
11 solution.

12  
13 In addition to completing the Dufferin-Bridgman feeder ties, two new jobs are required to  
14 provide feeder ties between Basin and George and Duke stations; and Basin and Carlaw stations,  
15 where no such facilities presently exist. These feeders are presently exposed to unmitigated  
16 risks from major loss of supply incidents.

17  
18 The installation of these feeder-to-feeder ties is expected to ultimately allow future loss-of-  
19 supply incidents to be managed in a way that customers won't face extended outages.

} /us

---

## ICM Project | Downtown Station Load Transfer Facilities Segment

---

1 **5. Economic Benefits of Preferred Alternative**

2 If no proactive work were to take place to mitigate the risks of major downtown contingency  
3 incidents, the expected PV of outages would be \$3.23 million for the feeders involved in these /UF  
4 jobs. By executing the proactive feeder installation work identified in Table 1, the PV of all costs  
5 (including reduced customer outage costs, capital investment and increased maintenance)  
6 would be reduced to \$3.17 million. This represents a net benefit of \$54,000. The calculations /UF  
7 for this analysis can be found in the Appendix.

**ICM Project | Downtown Station Load Transfer Facilities Segment**

1 **APPENDIX**

2

3 **Table 3: Benefit-Cost Analysis Summary**

<b>DOWNTOWN STATION LOAD TRANSFER FACILITIES ANALYSIS</b>			
<b>A) Base Case – do nothing</b>	<b>Year 2012</b>	<b>Year 2013</b>	<b>Year 2014</b>
Capital Investment by year	\$0	\$0	\$0
PV of Outage Duration Cost	\$3,226,899		
Base Case PV	<b>\$3,226,899</b>		
<b>B) Feeder Tie Case</b>	<b>Year 2012</b>	<b>Year 2013</b>	<b>Year 2014</b>
Capital Investment by year	\$1,942,656	\$873,542	<del>\$3,591,941</del>
PV of Capital Investment	\$2,766,286		
PV of Maintenance Cost	\$50,616		
PV of Outage Duration Cost	\$355,646		
Feeder Tie Case PV	<b>\$3,172,549</b>		
<b>Results</b>			
<b>NPV</b>	<b>\$54,351</b>		

} /UF

/UF, US

} /UF

/UF

4 **Scenario A – Base Case:**

5 This is the scenario for run to failure with no proactive investments. Costs expected over the  
 6 next 20 years are included in the calculations. The station outage incident rate is derived from  
 7 the last ten years of experience in the downtown Toronto area, and applies to both cases. The



## ICM Project | Downtown Station Load Transfer Facilities Segment

1 historic outages used for the calculations are identified in Table 4. Outage duration for the base  
2 case is derived from the average outage duration over the last ten years in downtown Toronto,  
3 which is 9.07 hours. The kVA interrupted only includes feeders for which ties are proposed in  
4 Scenario B. The discount rate used for calculations is 6.06% in both cases. Customer  
5 interruption duration cost used is \$15 per kVAh in both cases, and represents the opportunity /c  
6 cost to customers from lost power. Outage event costs are not included in the calculations as  
7 they are identical in both cases.

8

### 9 **Scenario B – Feeder Tie Case:**

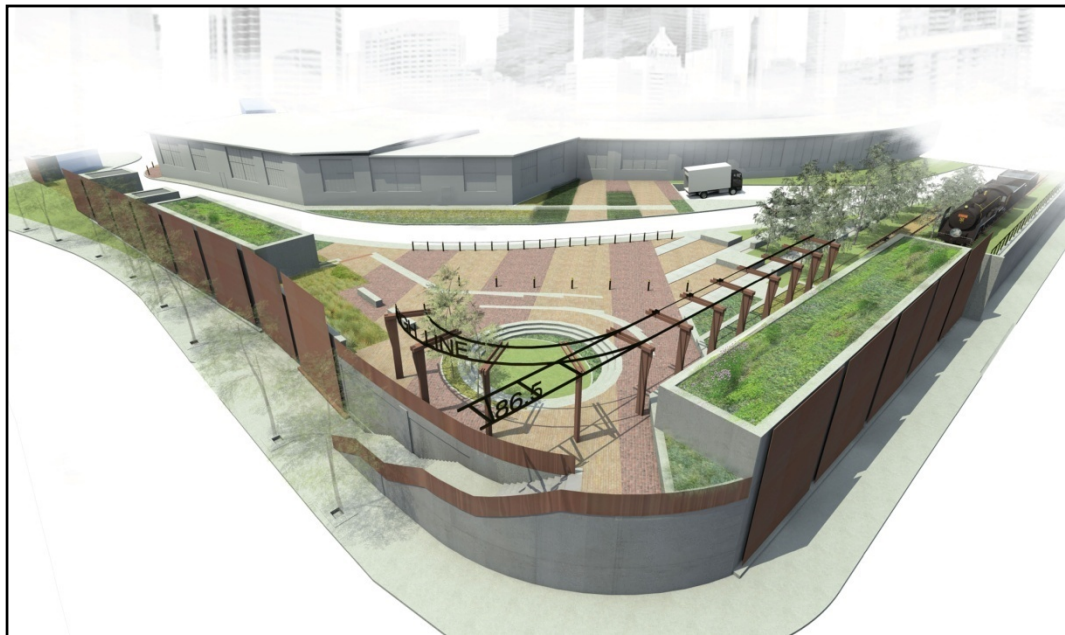
10 This is the scenario where feeder ties are installed over the years 2012 and 2013 as identified in /uS  
11 Table 1. Capital costs are identified in Table 1. Other costs (including customer outage costs  
12 and increased maintenance costs associated with additional equipment), expected over the next  
13 20 years are included in the calculations. The station outage incident rate is derived from the  
14 last ten years of experience in the downtown Toronto area as for the Base Case. Customer  
15 outage duration for the feeder tie case is assumed to be an hour for each incident beginning  
16 with the year following installation of station-to-station feeder ties. The kVA interrupted only  
17 includes feeders proposed to have feeder ties installed as identified in Table 1. Maintenance  
18 costs include \$190 per year per new vault. The discount rate used is 6.06%; the customer  
19 interruption duration cost is \$15 per kVAh; and the outage event costs are not included, all as /c  
20 per the Base Case.

21

22 Evaluating both scenarios leads the conclusion that proactive installation of feeder ties is the  
23 prudent approach. By mitigating potential customer outages, the net benefit is \$54,000. /uF

# ICM Business Case Evaluation

## Bremner TS



Toronto Hydro-Electric System Limited (THESL)



## ICM Project | Bremner TS

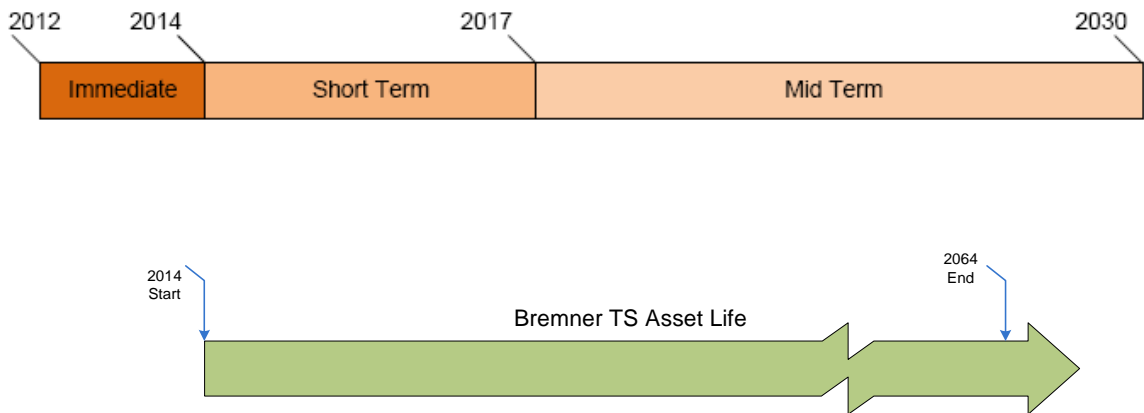
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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Schedule of project updated for each of 2012, 2013, 2014
- 3 • Costs by year updated for new schedule; total three-year costs for overall Phase 1 project
- 4 unchanged
- 5 • Load forecasts updated and 2011 actual loads provided by downtown station

## ICM Project | Bremner TS

1 EB 2009-0139 and EB 2010-0142<sup>1</sup>, described the immediate and short term need for a new  
2 source of supply. These applications followed over 20 years of study by THESL and Hydro One  
3 Networks Inc. (formerly Ontario Hydro) and the Independent Electrical Supply Operator (IESO,  
4 formerly IMO) of the immediate and short term need for additional supply in the downtown and  
5 the alternative options available to achieve this. The need horizons are illustrated in Figure 1  
6 below.



7 **Figure 1: Immediate, Short term and Mid-term Need Timeline**

8  
9 In downtown Toronto, there is an immediate need for additional capacity at Windsor TS in order  
10 to enable staged replacements of its end-of-life, air-blast switchgear. There is also a short- and  
11 mid-term need for additional capacity to serve load growth in the downtown core.<sup>2</sup>  
12

<sup>1</sup> Detailed in Appendix 1: Previous Bremner TS pre-filed evidence and Interrogatory responses

<sup>2</sup> Since the submission of this ICM Business Case in May 2012, additional potential projects have emerged in the downtown core that indicate that the short term need may be realized sooner than originally anticipated, including the Gehry-Mirvish King West Project, the Oxford Properties Casino Plan and multiple data centres. These projects have not yet been incorporated into Toronto Hydro's load forecasts. Further information may be found in the links below:

- <http://www.thestar.com/news/gta/article/1265100--gehry-and-mirvish-toronto-s-star-duo-could-leave-a-towering-mark-on-king>
- <http://www.thestar.com/news/gta/cityhallpolitics/article/1270290--3-billion-casino-plan-unveiled-for-downtown-toronto>
- <http://www.datacenterknowledge.com/archives/2012/10/03/cologix-opens-new-space-at-151-front-street/>

## ICM Project | Bremner TS

---

1 the Bremner TS where the 115kV voltages will be stepped down, through transformers, for  
2 distribution to customers.

3

4 The Roundhouse site area, where the Bremner TS will be constructed, is both a federally and  
5 municipally designated heritage site. Therefore, the building is required to comply  
6 architecturally with heritage requirements applicable to the site as discussed in Appendix 6.

7 THESL is requesting, under Section 84(a) of the OEB act, that Bremner TS be deemed a  
8 distribution asset, for which cost recovery is through distribution rates.

9

10 The preliminary development work, including detailed engineering design and land acquisition  
11 has been completed on Bremner TS with expenditures approved in EB-2009-0139 and EB-2010-  
12 0142. Successful stakeholder engagement has been completed, including Public Information  
13 Centres (PICs). Information from these PICs as well as detailed information on the  
14 Environmental Site Reports has been compiled and made public on the Toronto Hydro Bremner  
15 TS website<sup>3</sup>. A Bremner TS presentation was delivered to the OEB staff on August 19, 2011. The  
16 Environmental Assessment for Bremner TS has been completed and THESL has received  
17 approval to proceed. Detailed drawings and specifications have been prepared as well as many  
18 procurement documents. Requests for Proposals (RFPs) have been issued on long-lead  
19 equipment.

20

21 THESL proposes to execute Bremner in two phases. For 2012, THESL proposes to initiate  
22 preparation of the Bremner TS site for major construction. In addition, THESL proposes to enter  
23 into commitments with suppliers and contractors so that major construction can be initiated by  
24 Q1 of 2013. Major construction for the project is expected to be completed over a 24 month  
25 period and, if construction begins in Q1 2013, the Transformer Station is scheduled to be  
26 constructed by the end of 2014. A block diagram has been included in Figure 10 of this  
27 document to set out the tasks to be completed in 2012 in order to start construction. The 2014  
28 completion date is aligned with the THESL TS Switchgear Replacement ICM for the Windsor TS

} /u

---

<sup>3</sup> See <http://www.torontohydro.com/sites/electricsystem/powerup/Pages/BremnerStationProject.aspx>

**ICM Project | Bremner TS**

1 THESL also reviewed solutions for TS installations in other metropolitan jurisdictions to compare  
 2 and validate current plans and estimates. The conclusions from this analysis reaffirmed that  
 3 proceeding with the current course of the Bremner TS project is THESL’s preferred option.  
 4

5 For 2012, an estimated total of \$8.5 million is requested (for THESL) to initiate preparation of  
 6 the Bremner TS site for major construction. For 2013, an estimated total of \$104.1 million is  
 7 requested so that the 24-month construction phase can be initiated. For 2014, an estimated  
 8 total of \$71.6 million is requested to complete the construction phase. The total amount  
 9 requested for 2012 to 2014 is \$184.1 million.  
 10

11 **Table 1: Requested costs for Bremner TS Phase 1**

Estimated Project Costs (\$, millions)	2012 Test	2013 Test	2014 Test	Total
THESL Budget	8.5	81.1	34.6	124.1
Capital Contribution to Hydro One		23.0	37.0	60.0
<b>Total</b>	8.5	104.1	71.6	184.1

/u

## ICM Project | Bremner TS

### 1 III NEED



**Figure 4: Immediate, Short Term and Mid-Term need timeline**

#### 2 1. Immediate Need (By 2014)

3 Windsor TS is currently using end-of-life air blast switchgear to supply key customers in  
4 Toronto's financial district. This 13.8 kV air blast switchgear, which was installed in 1956, needs  
5 to be replaced in stages (one bus at a time). In order to do so, existing loads served by the  
6 affected equipment will need to be transferred to another supply source, with 72 MVA capacity.  
7 This is an immediate need and action should be taken to complete this transfer as soon as is  
8 physically possible. The Windsor TS switchgear upgrade work has been included separately in  
9 the Stations Switchgear segment found at Tab 4, Schedule B13.2, Section II, 4.

10

#### 11 2. Short-term need (2014 to 2017)

12 In the short-term, additional capacity will be required to avoid overloading at three of the five  
13 key downtown stations.

14

15 THESL completes load forecasts for each of the 35 stations in downtown Toronto on a yearly  
16 basis. The methodology associated with these forecasts has been summarized in Appendix 2 to  
17 this narrative.

18

19 Based on THESL's load forecast, Table 2 below summarizes the anticipated load increases for the  
20 five downtown stations to 2017. As indicated in Table 2, overloading at Windsor TS is expected  
21 to occur by 2017. In addition, overloads at Esplanade TS, Strachan TS, and Cecil TS are expected /u

**ICM Project | Bremner TS**

1 to occur soon thereafter (2018, 2022 and 2022 respectively). Action must therefore be taken to /u  
 2 have new total capacity of 144 MVA available to avoid these overloads prior to 2017.

3  
 4 **Table 2: Load Forecasts for five downtown Toronto Stations**  
 5 **(Highlighting Shows Overload)**

Station	Station Rating	Year						
		2011 <sup>6</sup>	2012	2013	2014	2015	2016	2017
Cecil	224	187	183	186	190	195	199	202
Esplanade	198	180	180	184	189	188	191	194
Strachan	175	138	138	143	150	153	157	160
Terauley	240	190	193	196	201	205	209	213
Windsor	340	311	310	316	322	329	335	340
Total	1,177	1006	1004	1025	1052	1070	1091	1109

6  
 7

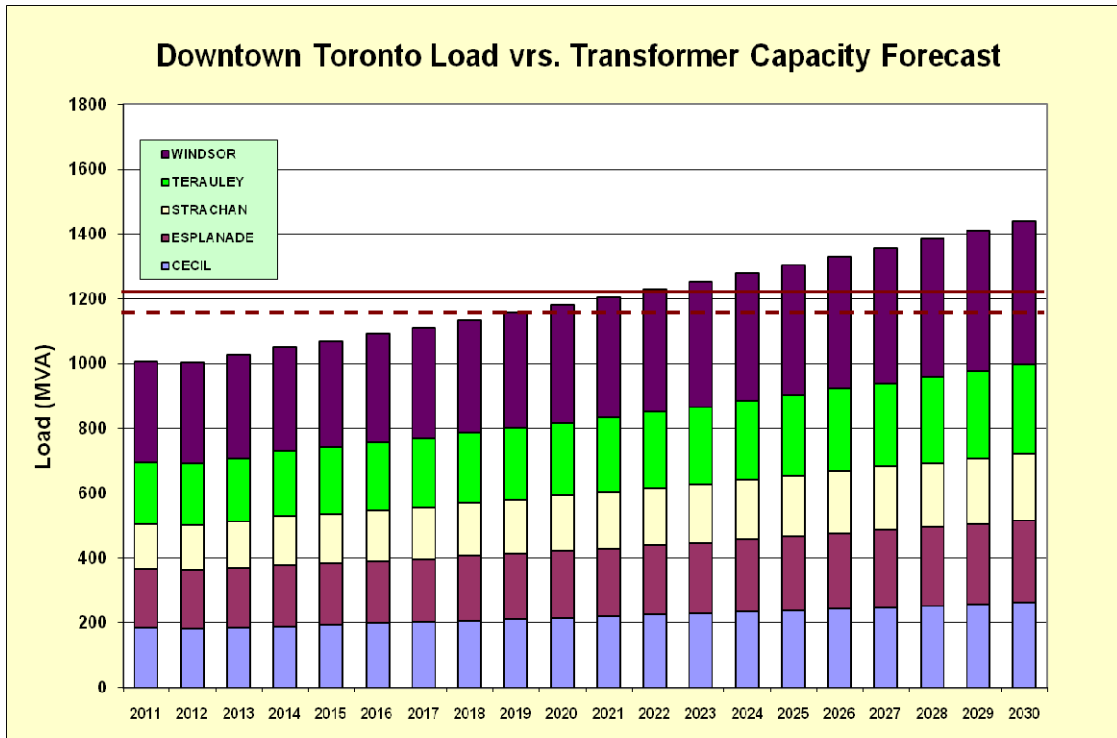
8 **3. Mid-term need (2018 – 2030)**

9 Also based on THESL’s load forecast, Figure 5 below indicates a consistent load growth to 2030  
 10 with a load of approximately 288 MVA over and above the total station capacity that is available  
 11 today. Therefore, for effective life cycle planning it would be prudent to at least incorporate  
 12 incremental growth options for future expansion, by having the space ready to accommodate  
 13 for additional switchgear that could supply these loads in future.

<sup>6</sup> In May’s ICM submission, the 2011 to 2017 load data had been issued as a forecasted number (based on the 2011 load forecast). With this update, the 2011 load data has been updated to show the actual, historic data for that year. The 2012 to 2017 load data are forecasted numbers (based on the 2012 load forecast).



ICM Project | Bremner TS



1 **Figure 5: Load Forecasts by station**

2 Note: Dashed horizontal line represents 95% firm capacity of five stations, solid horizontal line  
 3 represents 100% firm capacity of stations.

4  
 5  
 6 **4. Consequences of Deferral**

7 In addition to the above noted capacity constraints, the equipment asset condition at Windsor  
 8 presents what THESL regards as an unacceptable risk. Deferring switchgear replacement at  
 9 Windsor TS will lead to continued reliance on custom equipment repairs on the aging, obsolete  
 10 equipment. This stopgap approach is unsustainable and, even with these actions, the reliability  
 11 of this obsolete equipment will continue to decline, leading to increased risk of failure.

12 Equipment failure at Windsor TS is considered one of THESL’s highest risk events due to both the  
 13 state of equipment and the critical loads it supplies. There is no alternate supply to customers  
 14 should a switchgear fail, and restoration time would be measured in days, possibly weeks,  
 15 depending on the failure scenario. The work associated with upgrading Windsor TS has already  
 16 been planned for 2014 and is discussed separately at Tab 4, Schedule B13.2, Section II, 4.

17

## ICM Project | Bremner TS

---

1 In 2010, with approval from the Ontario Energy Board (EB-2009-0139), THESL acquired the land  
2 for the new station and engaged a consultant (IBI Group) to start detailed engineering.

3

4 In 2011, with approval from the OEB for that year (EB-2010-0142), detailed design for the  
5 station was completed to 95%. Concurrently, stakeholder engagement was completed by way  
6 of Public Information Centres (PICs) and presentations to key parties. THESL has also been  
7 working with IBI Group to process Requests for Proposals (RFPs) for major equipment and  
8 construction services for the Transformer Station.

9

10 For 2012, THESL's objective is to initiate preparation of the Bremner TS site for major  
11 construction and enter into commitments with suppliers and contractors so that major  
12 construction of Bremner TS Phase 1 can begin by January 2013. In order to enter into long-term  
13 commitments with suppliers and contractors, approval is required for 2012, 2013 and 2014  
14 funding.

15

16 For 2013, THESL's objective is to initiate Bremner TS phase 1, which includes construction of the  
17 cable tunnel and the Transformer Station building.

18

19 For 2014, THESL's objective is to complete reassembly of the Machine Shop building and  
20 commission the site by the end of that year.

21

22 A summary of tasks requiring execution for the two-year construction process for Bremner TS  
23 has been illustrated in Figure 10.

} /u

ICM Project | Bremner TS

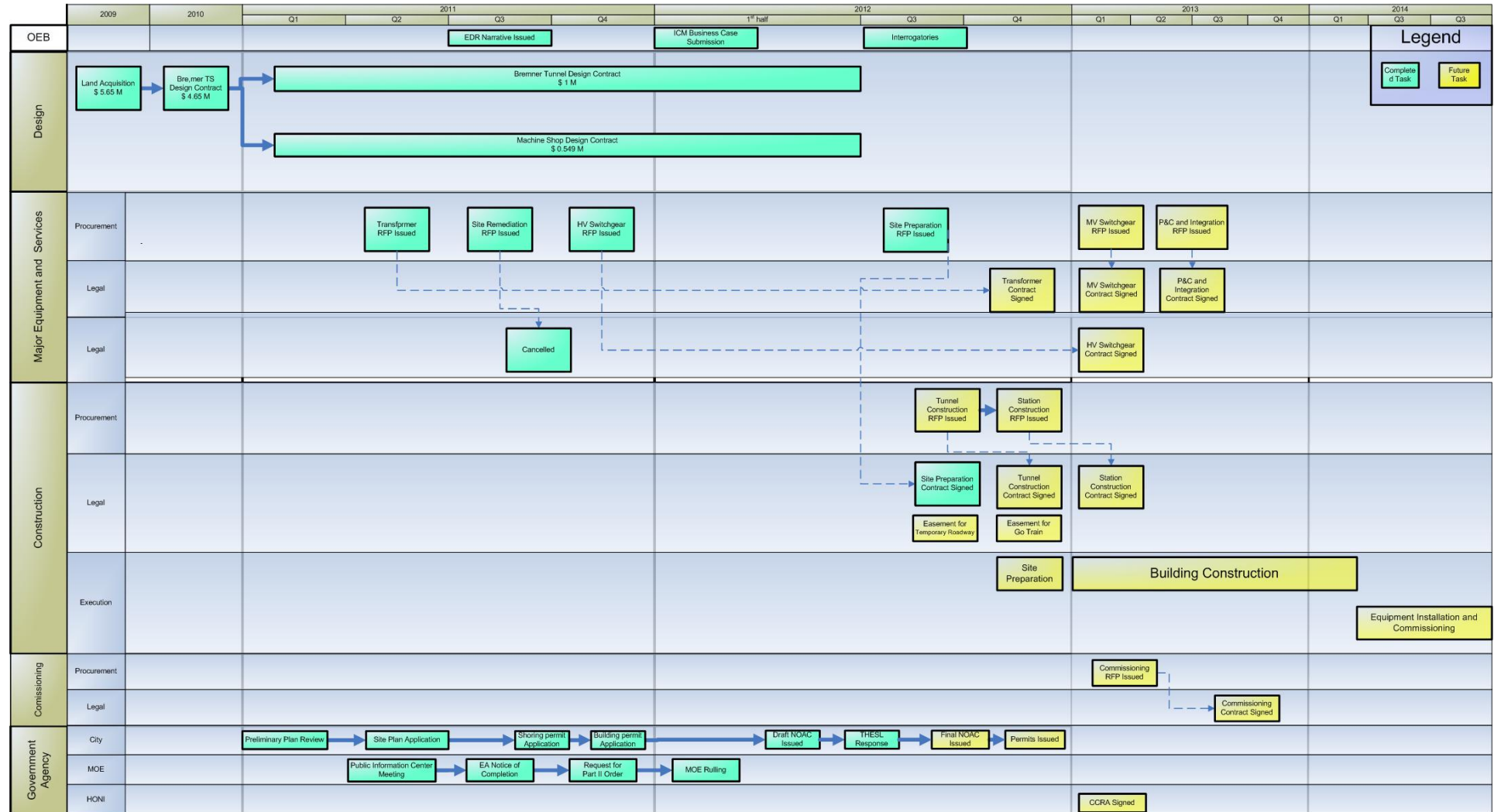


Figure 10: Tasks required for executing Bremner TS project /u

1 **5.2.2. Windsor TS Switchgear Upgrades**

2 Completion of the Bremner TS project in Q4 2014 will enable initiation of the much needed /u  
3 switchgear upgrades at Windsor TS in that same year. A separate request for Windsor TS has  
4 been included in Tab 4, Schedule B13.2, Section II, 4.

5  
6 **5.2.3. Asset Classification**

7 THESL intends to use Bremner TS solely to provide distribution services to customers at voltages  
8 less than 50kV. Though technically a transmission asset, THESL is requesting, under Section  
9 84(a) of the OEB act, that Bremner TS be deemed a distribution asset, and that cost recovery be  
10 effected through distribution rates. Such a classification has been granted in the past by the  
11 OEB for similar Transformer Station assets for THESL, Oakville Hydro and Guelph Hydro.

12  
13 **5.2.4. Required Capital Cost Estimates**

14  
15 **5.2.4.1. Total THESL Cost Estimates for Bremner TS Project, Phase 1**

16 In 2010, order of magnitude costs for the completion of Phase 1 of Bremner TS were the basis  
17 for the decision to proceed with the Bremner TS project and were derived from the best  
18 information available at the time.

19  
20 In 2011, upon completion of detailed engineering design for the Bremner TS Project, an updated  
21 cost estimate was completed. Table 10 below compares the 2010 and 2012 cost estimates.

**ICM Project | Bremner TS**

1 **Table 11: Estimated THESL Costs for Bremner TS, listed by task (\$ million)**  
 2 **(Excluding HONI Capital Contribution)**

Task	2010 Actual	2011 Actual	Total Actual	2012 Test	2013 Test	2014 Test	Total Test	Grand Total
Land acquisition	5.6		5.6				-	5.6
Construction of Building				2.4	28.7	22.2	53.3	53.3
Procurement of Major Equipment				1.5	40.6	10.5	52.6	52.6
Distribution Modification		0.8	0.8	1.5	-	-	1.5	2.3
Detailed Design / Construction PM		4.0	4.0	1.7	0.6	0.5	2.7	6.7
Construction of Cable Tunnel				1.4	11.2	1.4	14.0	14.0
<b>Total</b>	<b>5.6</b>	<b>4.8</b>	<b>10.4</b>	<b>8.5</b>	<b>81.1</b>	<b>34.6</b>	<b>124.1</b>	<b>134.5</b>

3 As stated in the "Project Timelines" section of this document, the year-by-year cost estimates  
 4 are based on major construction starting in January 2013, completion of the TS building and  
 5 cable tunnel in Q1 2014 and completion of the Machine Shop building and total site  
 6 commissioning by end of 2014.

**ICM Project | Bremner TS**

1                    **5.2.4.3. Year-by-Year Cost Estimates for Bremner TS Project - Hydro One**

2 A separate ICM project for the capital contribution to Hydro One has been included at Tab 4,  
 3 Schedule B18, Section II, 1.

4

5                    **5.2.4.4. Year-by-Year Cost Estimates for Bremner TS Project - Combined**

6 The combined THESL and Hydro One cost estimates to complete the Bremner TS project are  
 7 summarized in Table 12 below:

8

9 **Table 12: Estimated Capital costs for Bremner TS Project**

	<b>2010 Actual</b>	<b>2011 Bridge</b>	<b>2012 Test</b>	<b>2013 Test</b>	<b>2014 Test</b>	<b>Total</b>
THESL Budget	5.6	4.8	8.5	81.1	34.6	134.5
Capital Contribution to Hydro One		0.4	0	23.0	37.0	60.4
<b>Total</b>	5.6	5.2	8.5	104.1	71.6	194.9

} /u

## ICM Project | Bremner TS

---

1 **VII CONCLUSIONS**

2

3 In the OEB's decision, dated January 5, 2012, THESL's Bremner Transformer Station Project was  
4 noted as being potentially eligible for ICM funding.

5

6 An immediate need for new capacity exists in the City of Toronto in order to upgrade end of life  
7 equipment at Windsor TS. The City also has short term (increasing loads at five key stations  
8 downtown) and mid-term (future load growth) needs.

9

10 Having Bremner TS in service by Q3 2014 is the preferred solution to address these needs.

11

12 Preliminary work for the Bremner TS project has been approved in past applications to the OEB  
13 (EB-2009-0139, EB-2010-0142).

14

15 THESL is requesting, under Section 84(a) of the OEB act, that Bremner TS be deemed a  
16 distribution asset, with cost recovery provided through distribution rates.

17

18 Construction of Bremner TS Phase 1 is the next stage of the project and requires approval for  
19 multi-year funding so that long-term commitments to suppliers and contractors can be made.

20

21 Bremner TS would be built in 2 phases. Phase 1, the phase covered by this ICM filing, would last  
22 from 2012 to 2014 and would address the immediate need to upgrade Windsor TS. Phase 2 is  
23 expected to commence in 2021 and would involve installation of new equipment in the Bremner  
24 TS facility in order to address future loads. Funding for Bremner TS Phase 2 is not included in  
25 this application.

26

27 The total project budget for Phase 1 (2012-2014), including Hydro One and THESL costs, is  
28 \$194.9 million. To date, a total of \$ 10.8 million has been spent on land acquisition and design  
29 services. For 2012, a total of \$8.5 million has been requested so that development can continue /u  
30 and the multi-year construction of Phase I can be initiated. For 2013, a total of \$104.1 million /u

**ICM Project | Bremner TS**

1 has been requested to continue construction. For 2014, a total of \$71.6 million has been /u  
 2 requested to complete the construction of Phase I.

3

4 **Table 15: Summary of Actual and Estimated Costs for Bremner TS Phase 1**

	<b>2010 Actual</b>	<b>2011 Bridge</b>	<b>2012 Test</b>	<b>2013 Test</b>	<b>2014 Test</b>	<b>Total</b>
THESL Budget	5.6	4.8	8.5	81.1	34.6	134.5
Capital Contribution to Hydro One		0.4	0	23.0	37.0	60.4
<b>Total</b>	5.6	5.2	8.5	104.1	71.6	194.9

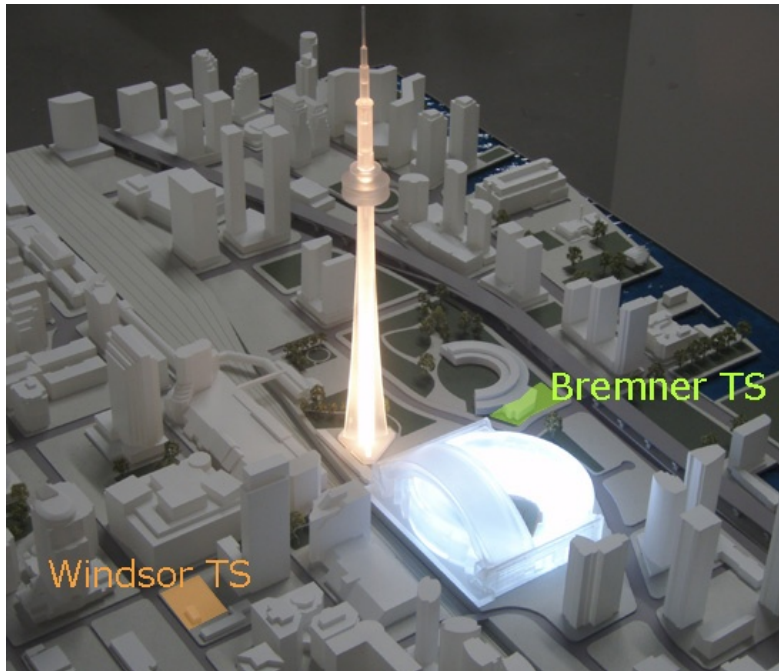


# Appendix 2: Load Growth

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## In Downtown Toronto Area

Figure 1 Downtown Core (photo courtesy Myles Burke Architectural Models)



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/u

# 1. Introduction:

## 1.1 Purpose<sup>1</sup>

This appendix further discusses load growth of Toronto downtown transformer stations based upon stated assumptions and THESL methodology. The primary purpose of this appendix is to demonstrate the load growth in proximity of the Bremner Transformer Station by examining forecasts, historical data and proposed customer connections in the Toronto downtown area circumscribed by the service areas of the five downtown transformer stations.

Two important components of the THESL load forecast are the natural load growth and the new customer connection requests. In this document, THESL validates the assumptions associated with calculation of natural load growth in the downtown Toronto core (2% growth per year). THESL also examines the magnitude of actual customer connection requests and future developments in the City of Toronto.

**Table 1 Load Forecasts (MVA) by Station**

Station	Station Rating	Year															
		2011 <sup>2</sup>	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Cecil	224	187	183	186	190	195	199	202	207	211	215	220	225	228	234	238	244
Esplanade	198	180	180	184	189	188	191	194	200	203	207	210	216	220	225	229	232
Strachan	175	138	138	143	150	153	157	160	164	166	170	174	176	179	183	187	192
Terauley*	240	190	193	196	201	205	209	213	217	222	226	230	234	240	244	250	254
Windsor	340	311	310	316	322	329	335	340	348	355	363	371	378	385	392	399	407
Total	1177	1006	1004	1025	1052	1070	1091	1109	1136	1157	1181	1205	1229	1252	1278	1303	1329

/U

<sup>1</sup> This document is not replacement for official THESL stations load forecast which includes all THSEL's Stations

<sup>2</sup> In May's ICM submission, the 2011 to 2017 load data had been issued as a forecasted number (based on the 2011 load forecast). With this update, the 2011 load data has been updated to show the actual, historic data for that year. The 2012 to 2017 load data are forecasted numbers (based on the 2012 load forecast).

## 1.2 Background

THESL distributes electricity to its customers in downtown corridor via 13.8kV feeders from the 115kV/13.8kV substations. This appendix does not focus on transmission planning issues directly nor does it reflect transmission capacity limitations. However, it is worth noting that the new Bremner TS has for many years been included in HONI plan to meet the future load growth of the Toronto downtown area. For example, Figure 2 below indicates a 'break out' at HONI's existing Front Street tunnel, installed in 2007 with the intention of connecting said tunnel to Bremner TS.

Figure 2 Existing break out at HONI transmission tunnel for Bremner TS tunnel



The resolution of the transmission capacity issue of downtown Toronto is considered in ongoing cooperative planning between THESL and HONI.

## 2. Load Growth methodology

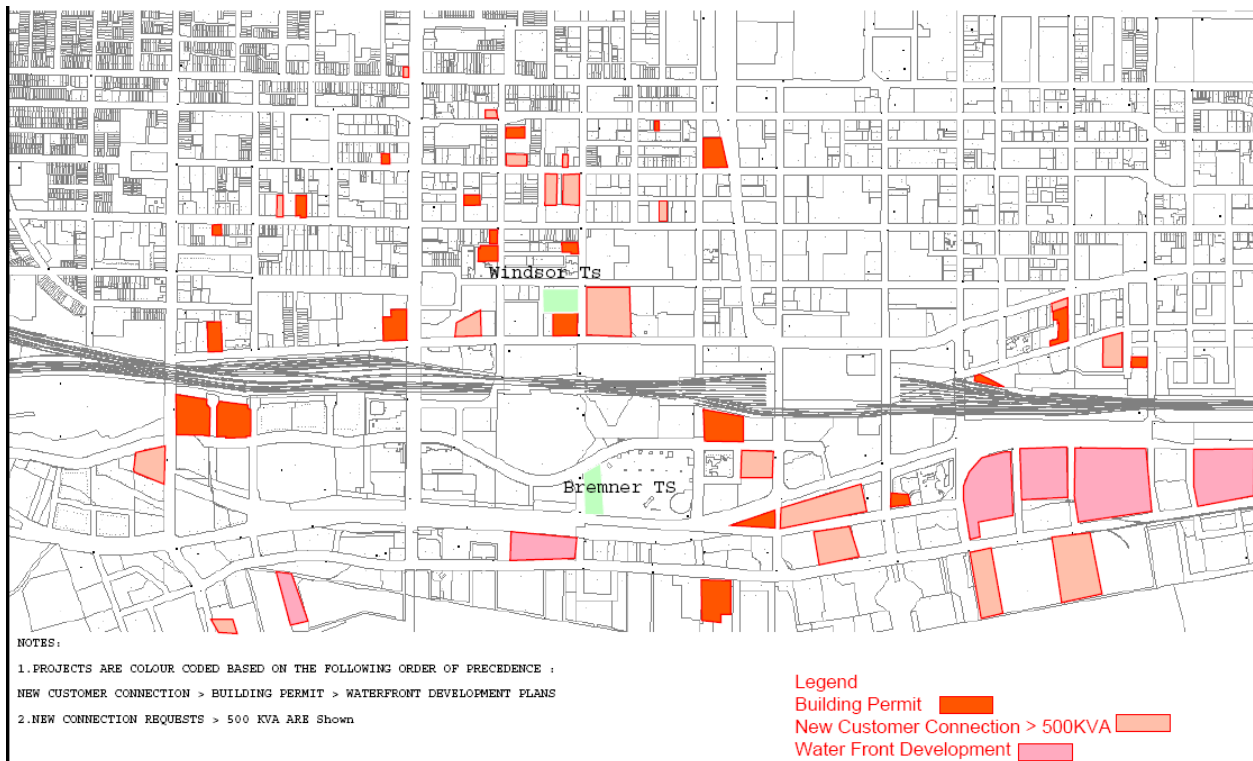
### 2.1 Forecasting Process

As the purpose of the forecast is to assess station bus capacity adequacy, the summer and winter maximum peak demands are forecast, rather than monthly peak demands.

The process for calculating peak demands follows three steps:

- a) Historical summer/winter peak demand for a bus is weather corrected,
- b) New loads are added to the weather- corrected demands according to the build-up formula, and
- c) Growth rates are applied to obtain annual peak demand forecasts for the Study period. The natural growth rate for the first two years of the study period is assumed to be zero. The forecast increase in demand is exclusively driven by new customer connections.

**Figure 6 Downtown Toronto Load Growth**



### 3. Summary

The natural load growth in the downtown core has been set at 2% since 2009 for the purposes of the load forecast. In previous sections, THESL has shown that load growth over the last 5 years is 2.16%, validating the load growth assumptions.

It should be noted that over the last 4 years, THESL has experienced an elevated growth rate of approximately 3.5% in the downtown core as a result of the local construction boom. This growth is consistent with the City of Toronto Official Plan and THESL customer connection requests.

Therefore, the 2% natural growth assumptions used in THESL midterm load forecasts to 2030 can be characterized as conservative.

# Appendix 5

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## **Bremner TS Site Integration**

## 5.0 Cost Comparison of Options

The costs for Option A and Option B have been summarized in Table 3-2. The costs for Option A are a 'Class B' estimate and based on a 95% complete design. The costs for Option B are a 'Class D' or 'order of magnitude' estimate and based on a design concept only and will therefore have a relatively higher margin of error.

**Table 2: Comparison of Costs for Options**

Task	Cost (\$ million)		% Variance from Option A
	Option A	Option B	
Land acquisition	5.6	5.6	
Distribution Modification	2.3	2.3	
Procurement of Major Equipment	52.6	52.6	
Detailed Design / Construction PM	6.7	9.0	34.3%
<b>Construction of Building</b>			
<i>Machine Shop Disassembly/Reassembly</i>	8.8	0.8	
<i>Shoring &amp; Excavation</i>	16.7	10.0	
<i>Structural Work</i>	21.5	24.8	
<i>Finishes</i>	2.2	1.8	
<i>Mechanical</i>	4.0	4.4	
<b>Sub-Total</b>	<b>53.3</b>	<b>41.8</b>	<b>- 21.6 %</b>
Construction of Cable Tunnel	14.0	14.9	6.4 %
<b>Total*</b>	<b>134.5</b>	<b>126.2</b>	<b>-6.5 %</b>

\* Totals are exclusive of Hydro One capital contribution costs for the project. For Option B, Hydro One costs are expected to increase due to an increased length of high voltage cabling (as a result of the longer cable tunnel).

# ICM Business Case Evaluation

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## HONI Capital Contributions

Toronto Hydro-Electric System Limited (THESL)





## ICM Project | HONI Capital Contributions

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 capital contributions from \$77.40M to \$72.88M, a reduction of \$4.52M
- 3 • 2014 jobs and capital contributions shown in strike-through, with the exception of Bremner-
- 4 related contributions
- 5 • Restructured 2012 and 2013 capital contributions to recognize contributions required to
- 6 date in 2012 and the current forecast of jobs that require capital contributions
- 7 • Added capital contributions in respect of Strachan TS A3-4 (\$3.27 M) and Glengrove TS A5-6
- 8 (\$2.20 M) jobs in 2012
- 9 • Corrected numerical and typographical errors

## ICM Project | HONI Capital Contributions

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1     **I           EXECUTIVE SUMMARY**

2

3     THESL is required to provide capital contributions to Hydro One Network Inc. (HONI) for non-  
4     contestable work on the transmission system to install new transmission assets or replace  
5     existing ones to support THESL work on the distribution system. The main driver for THESL work  
6     is the need to increase supply capacity to connect new customers and to meet current and  
7     future load growth.

8

9     Required capital contributions to HONI consist of \$24.76 million in 2012 and \$48.12 million in  
10    2013 ~~and \$36.00 million in 2014~~, with an addition capital contribution of \$37 million in 2014 in  
11    respect of Bremner TS. Detailed work descriptions appear in Section III of this document.

} /UF, US

12

13    There are two major jobs with large capital contribution required over the next three years. The  
14    first is the Bremner TS job with an estimated capital contribution requirement of \$60 million.  
15    The second is the Leaside-Birch transmission reinforcement job with an estimated capital  
16    contribution requirement of \$32.88 million. The third segment of estimated capital  
17    contributions totalling \$15.02 million is required to support THESL switchgear replacements and  
18    engineering studies at five transformer stations. The last segment of capital contribution  
19    totalling an estimated \$1.98 million is required for HONI to perform engineering feasibility  
20    studies to expand capacity at six transformer stations.

/UF  
/C  
/UF

21

22    The urgent need for these capital contributions, the prudence, the costs, and the details of  
23    these jobs are described below.

24

25    **1.           Project Description**

26

27    **1.1.        Overview**

28    HONI connection work on the transmission system is necessary to allow electricity to flow from  
29    the HONI transmission system to THESL's distribution system to provide power service to  
30    customers. This work will provide improved supply reliability for Toronto and is essential for  
31    providing increased system capacity. In particular, capacity is needed in the densely loaded

## ICM Project | HONI Capital Contributions

1 financial core district of Toronto. Each capital contribution cost is examined and agreed  
 2 between THESL and HONI through a Connection and Cost Recovery Agreement.

3

4 Capital Contributions to HONI are necessary investments for HONI to install equipment on the  
 5 transmission system to support THESL projects on the distribution system. HONI is the only  
 6 supplier permitted to perform non-contestable work on transmission system assets to address  
 7 THESL capacity issues. The capital contributions to HONI in 2012-2013, and the 2014 capital  
 8 contribution in respect of Bremner TS are summarized in Table 1 below:

} /US

9

10 **Table 1: Summary of Capital Contribution to HONI in 2012-2014**

Project Title	2012 Estimated Cost (\$, millions)	2013 Estimated Cost (\$, millions)	2014 Estimated Cost (\$, millions)
Bremner TS Capital Contribution	\$0	\$23.00	\$37.00
Leaside-Birch Transmission Reinforcement	\$17.60	\$15.28	-
Wiltshire TS switchgear replacements and engineering studies	\$0.07	\$3.17	<del>\$3.00</del>
Strachan TS switchgear replacements and engineering studies	\$3.34	\$3.07	<del>\$3.00</del>
Windsor TS switchgear engineering Study	-	\$0.10	<del>\$3.00</del>
Duplex TS A5-6 switchgear replacement and engineering study	\$0.07	\$3.00	-
Glengrove TS A5-6 switchgear replacement	\$2.20		
Malvern TS 2 new CBs and engineering study	\$1.30	-	-
Leslie MS switchgear replacement and engineering Study	\$0.18	-	-

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**ICM Project | HONI Capital Contributions**

<b>Project Title</b>	<b>2012 Estimated Cost (\$, millions)</b>	<b>2013 Estimated Cost (\$, millions)</b>	<b>2014 Estimated Cost (\$, millions)</b>
Horner TS second bus expansion engineering study	-	\$0.15	-
Runnymede TS second bus expansion engineering study	-	\$0.15	-
Bridgman TS transformer upgrade engineering study	-	\$0.10	-
Esplanade TS second bus expansion engineering study	-	\$0.10	-
<b>Capital Contribution by year:</b>	<b>\$24.76</b>	<b>\$48.12</b>	<b>\$37.00</b>
<b>Total Capital Contributions to HONI:</b>	<b>\$72.88</b>		<b>\$37.00</b>

} /UF, US

1 Cost estimates have been based upon agreed studies or the cost of previous similar work  
 2 adjusted for changes in scope of work.

3  
 4

5 **1.2. Segment Description**

6

7 **1.2.1. Bremner TS Supply**

8 There are immediate, short-term, and mid-term needs for additional capacity in the downtown  
 9 Toronto core. THESL has investigated a number of possibilities to address this need, such as  
 10 bus-to-bus load transfer and additional buses at existing Windsor TS, expansion of adjacent  
 11 transformer stations (Esplanade TS and Strachan TS), or construction of a new transformer  
 12 station (Bremner TS). Of these possible options, the expansion of adjacent transformer stations  
 13 (Esplanade TS and Strachan TS) and construction of the Bremner TS were identified as the most  
 14 practical solutions to meet the identified need. Detailed economic comparisons of these  
 15 alternatives were conducted and are outlined in the ICM Project for Bremer TS. The evidence  
 16 presented in that document shows that having Bremner TS in service by 2014 is the preferred  
 17 approach to address the supply needs for the downtown core.

## ICM Project | HONI Capital Contributions

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1 Estimated capital contributions to HONI are \$23 million in 2013 and \$37 million in 2014. /UF, US

2

### 3 **1.2.2. Leaside-Birch**

4 Additional transmission line capacity is required from Leaside TS to Bridgman TS to meet load  
5 growth for the Toronto Midtown area. The work was proposed in previous HONI rate filings and  
6 received regulatory approval in June 2010. Construction started in 2011 and will be continued  
7 in 2012 and 2013 with completion scheduled for 2014. An estimated total capital contribution /US  
8 of \$32.88 million is required, consisting of \$17.60 million in 2012 and \$15.28 million in 2013.

9

### 10 **1.2.3. Wiltshire, Strachan, Windsor, Duplex , Glengrove TS Switchgear Replacements** /US

11 Replacements of incoming circuit breakers and engineering studies by HONI are required to  
12 improve safety and reliability, and to meet current and future load growth. An estimated capital  
13 contribution in total of \$15.02 million is required over 2012-2013-2014, consisting of \$5.68 } /UF, US  
14 million in 2012 and \$9.34 million in 2013, and ~~\$9 million in 2014.~~

15

### 16 **1.2.4. Malvern, Leslie, Horner, Runnymede, Bridgman and Esplanade TSs**

17 Capital contributions are required for HONI to perform engineering feasibility studies to expand  
18 station capacity to meet load growth. A total capital contribution of estimate of \$1.98 million is } /UF  
19 required, consisting of \$1.48 million in 2012 and \$500K in 2013.

20

## 21 **2. Why These Project Are Needed Now**

22

23 The projects are needed now to install additional capacity on transmission system to meet the  
24 load growth on the THESL distribution system.

25

### 26 **2.1. Bremner TS job**

27 The distribution system requires additional capacity to meet load growth in downtown financial  
28 district, the new loads from waterfront developments, and to allow replacements of heavily  
29 loaded switchgear at Windsor TS. The Bremner TS project is described at Tab 4, Schedule B17.

## ICM Project | HONI Capital Contributions

---

1    **2.2.    Leaside-Birch job**

2    The current load of the Midtown area exceeds transmission line capacity during the summer  
3    peaks under the first contingency. To avoid rotating outages to customers during summer peak  
4    load, an additional 115kV circuit is required now. This project has already been approved by the  
5    Board and THESL's capital contribution is required in accordance with the Transmission System  
6    Code.

7  
8    **2.3.    Wiltshire, Strachan, Windsor, Duplex, and Glengrove TS**

9    Replacements of HONI incoming circuit breakers are required now in tandem with THESL  
10   replacements of switchgear. THESL's switchgear replacement projects are described at Tab 4,  
11   Schedule B13.2.

/us

12  
13   **2.4.    Malvern, Leslie, Horner, Runnymede, Bridgman and Esplanade TS**

14   Engineering feasibility studies are required now from HONI to expand station capacity to meet  
15   load growth on the THESL distribution system. Due to the long lead times needed for station  
16   expansion and installation of new busses, the engineering feasibility studies are required now to  
17   provide enough time to carry out the projects in time to meet the needs.

18  
19   **3.       Why the Proposed Project Is the Preferred Alternative**

20  
21   **3.1.    Bremner TS job**

22   See separate ICM Business Case Evaluation for Bremner TS at Tab 4, Schedule B17. Bremner TS  
23   is an important enabling job for other area stations.

24  
25   **3.2.    Leaside-Birch job**

26   This transmission project has already been approved by the Board and the capital contribution  
27   follows from that approval.

## ICM Project | HONI Capital Contributions

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1    **3.3.    Wiltshire, Strachan, Windsor, Duplex, Glengrove TS Replacements** /US

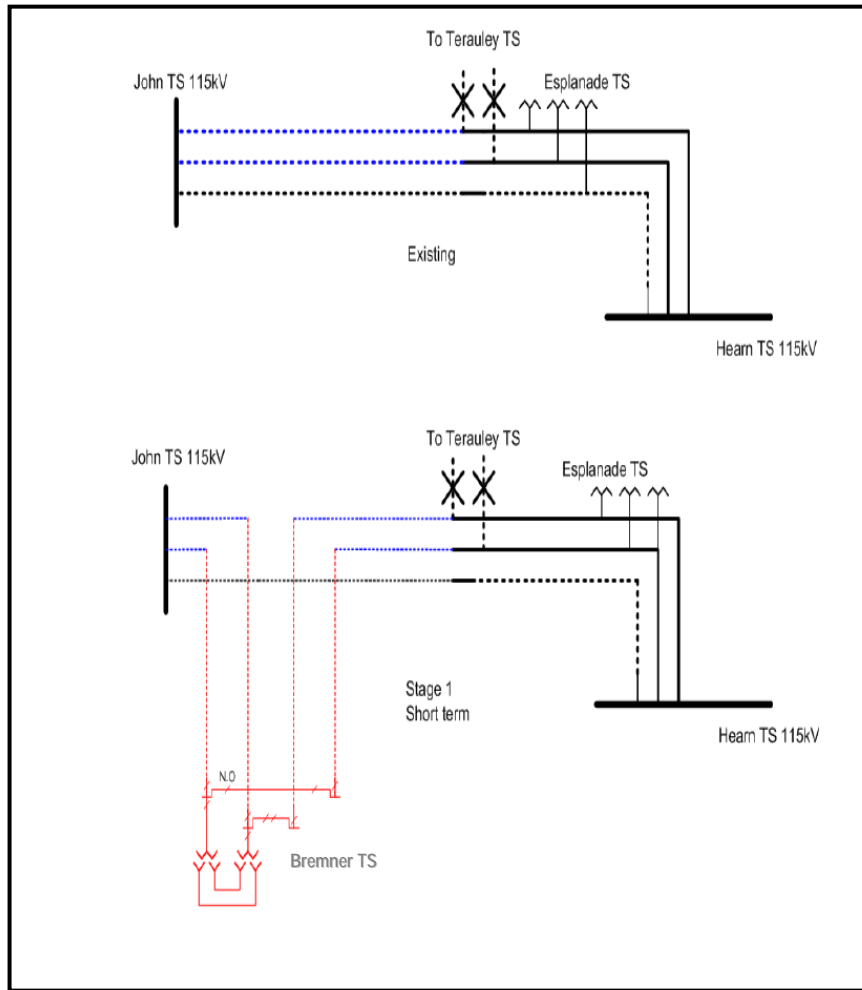
2    The alternative option is operating the existing equipment on a “run to fail” basis. However, the  
3    outage impact of that option on customers is intolerable because emergency repair of the  
4    equipment would likely take a week and replacement of the equipment would likely take 24  
5    months. In addition, the cost of replacement under emergency conditions after the equipment  
6    has failed is much higher than under planned replacement conditions.

7

8    **3.4.    Malvern, Leslie, Horner, Runnymede, Bridgman and Esplanade TS**

9    The alternative option is to transfer load to adjacent stations before connecting new customers  
10    until there is no available capacity at adjacent stations. However, since load has nearly reached  
11    the maximum capacity at several stations, this alternative option is not feasible due to lack of  
12    available capacity at adjacent stations such as Horner TS, Runnymede TS, Bridgman TS, and  
13    Esplanade TS.

ICM Project | HONI Capital Contributions



1 **Figure 2: Bremner TS Interconnection: Single-Line Diagram**

2

3 Since connection work from HONI transmission lines is necessary to supply power to THESL  
 4 equipment at Bremner TS, and this connection work is non-contestable, the only available  
 5 option is for HONI to carry out the work on transmission assets, and for THESL to pay the  
 6 corresponding capital contribution to HONI. HONI has informed THESL that an estimated capital  
 7 contribution of approximately \$60 million is required, which consists of \$23 million in 2013, and  
 8 \$37 million in 2014.

} /us



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## ICM Project | HONI Capital Contributions

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1    **3. TS Switchgear Replacements and Engineering Studies**

2

3    **3.1. Wiltshire TS Switchgear Replacements and HONI Capital Contributions**

4    The main drivers for Wiltshire TS A3-4 switchgear replacement are safety (existing switchgear is /us  
5    non-arc-resistant), aging, high maintenance, increased capacity for future load growth, and  
6    mitigation of the risk of significant customer outages. The load on Wiltshire TS A3-4 switchgear  
7    in 2012 is 20MVA. An estimate for a major outage duration is between eight hours to 168 hours /us  
8    (one week) to repair and put switchgear back in service. The need to replace Wiltshire A3-4  
9    switchgear is described separately in the evidence for TS Switchgear. /us

10

11    Since the incoming circuit breakers connected to the A3-4 switchgear and HONI transformers /us  
12    connected to A11-12 at Wiltshire TS are owned by HONI, there is no option for work to be  
13    performed by companies other than HONI. The work to be performed by HONI at Wiltshire TS is  
14    non-contestable according to the Transmission System Code and HONI is the only supplier.

15

16    To initiate the Wiltshire TS A3-4 switchgear replacements THESL is required to fund HONI /us  
17    engineering studies to determine project feasibility, and to provide the estimated amount of the  
18    required capital contribution for HONI to replace the incoming circuit breakers connected to the  
19    existing A3-4 switchgear and to upgrade HONI transformers connected to A11-12 at Wiltshire /us  
20    TS. This transformer upgrade is required to increase capacity and to provide 4-wire system  
21    configuration to the A11-12 bus for conversion of 4 kV system. The estimated costs of capital  
22    contribution to HONI for Wiltshire TS are as shown below:

**ICM Project | HONI Capital Contributions**

1 **Table 3: Capital Contribution for Wiltshire TS**

Job Description	Capital Contribution Estimate (\$, millions)	Year
Wiltshire TS, A3-4 switchgear replacement engineering study	\$0.07	2012
Wiltshire TS, A5-6 switchgear replacement engineering study	\$0.07	2013
Wiltshire TS, transformers upgrade for A1-2 bus engineering study	0.10	2013
Wiltshire TS, A3-4 replace incoming circuit breakers capital contribution	\$3.00	2013
<del>Wiltshire TS, A5-6 replace incoming circuit breakers capital contribution</del>	<del>\$3.00</del>	<del>2014</del>
<b>Total:</b>	<b>\$3.24</b>	

/UF

2 If funding for THESL's capital contributions is not available, THESL expects that HONI will not  
 3 carry out the engineering study needed to determine project feasibility and the required capital  
 4 contribution for HONI to replace HONI's incoming circuit breakers and upgrade HONI's  
 5 transformers. This could result in delay or possible cancellation of THESL A3-4 switchgear  
 6 replacements. THESL has already invested \$95,000 in the planning and design of Wiltshire TS  
 7 A3-4 switchgear.

/US

8  
 9 The ultimate system impact will likely be increased risks of outages as THESL continues to rely  
 10 on the non-arc resistant A3-4 switchgear at Wiltshire TS, and new capacity of 4-wire  
 11 configuration is not available if HONI transformers are not upgraded, preventing THESL from  
 12 proceeding with conversion of 4kV bus load to 13.8kV system at Wiltshire TS. This increased risk  
 13 is expected to impact approximately 17,000 customers connected to Wiltshire TS, currently  
 14 relying in whole or in part on the A3-4 switchgear for electricity distribution service.

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/US

## ICM Project | HONI Capital Contributions

---

1    **3.2.    Strachan TS Switchgear Replacement and HONI Capital Contributions**

2    The main drivers for Strachan TS A3-4 and A7-8 switchgear replacements are safety (existing                    /us  
3    switchgear is non-arc-resistant), aging, high maintenance, increase capacity for future load  
4    growth, and mitigation of the risk of significant customer outages. The load on Strachan TS A3-4                    /us  
5    and A7-8 switchgear in 2012 are 27 MVA and 37 MVA respectively. An estimate for a major                    /us  
6    outage duration is between eight hours to 168 hours (one week) to repair and put switchgear  
7    back in service. The need to replace Strachan TS switchgears is described in the evidence for TS  
8    Switchgear.

9  
10    Since the incoming circuit breakers connected to the A3-4 and A7-8 switchgear at Strachan TS                    /us  
11    are owned by HONI, there is no option for work to be performed by companies other than  
12    HONI. The work to be performed by HONI at Strachan TS is non-contestable according to  
13    Transmission System Code and HONI is the only supplier.

14  
15    HONI has completed the replacement of incoming breaker work on Strachan A3-4.                    /us

16  
17    To initiate the Strachan TS A7-8 switchgear replacement THESL is required to fund HONI                    /us  
18    engineering studies to determine project feasibility and to provide the estimated required  
19    capital contribution for HONI to replace the incoming circuit breakers connected to the existing  
20    A7-8 switchgear at Strachan TS. The estimated costs of capital contribution to HONI for                    /us  
21    Strachan TS are as shown below.

## ICM Project | HONI Capital Contributions

1 **Table 4: Capital Contribution for Strachan TS**

Job Description	Capital Contribution Estimate (\$, millions)	Year	
Strachan TS, A3-4 switchgear replacement capital contribution	\$3.27	2012	/UF, US
Strachan TS, A7-8 switchgear replacement engineering study	\$0.07	2012	
Strachan TS, A5-6 switchgear replacement engineering study	\$0.07	2013	
Strachan TS, A7-8 switchgear replacement capital contribution	\$3.00	2013	/C
<del>Strachan TS, A5-6 replace incoming circuit breakers capital contribution</del>	<del>\$3.00</del>	2014	
<b>Total:</b>	<b>\$6.41</b>		/UF

2 If funding for THESL's capital contribution is not available, THESL expects that HONI will not carry  
 3 out engineering study to determine project feasibility and the required capital contribution for  
 4 HONI to replace HONI's incoming circuit breakers at Strachan TS. This could result in delay or  
 5 possible cancellation of THESL A7-8 switchgear replacements.

/US

6  
 7 If the HONI capital contributions were denied, the likely ultimate system impact will be  
 8 increased risks of outages as THESL continues to rely on the non-arc resistant A7-8 switchgear at  
 9 Strachan TS. This increased risk would impact approximately 15,600 customers currently relying  
 10 in whole or in part on the A7-8 switchgear at the Strachan TS for electricity distribution service.

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/US

### 12 **3.3. Windsor TS Switchgear Replacement and HONI Capital Contributions**

13 The main drivers for Windsor TS A5-6 switchgear replacement are safety (existing switchgear is  
 14 non-arc-resistant), aging, obsolescence (brick structure enclosure), high maintenance (for the air  
 15 blast system), increased capacity for future load growth, and mitigation of the risk of significant  
 16 customer outages serving the financial district. The load on Windsor TS A5-6 switchgear in 2012

**ICM Project | HONI Capital Contributions**

1 is 55 MVA. An estimate for a major outage duration is between eight hours to 168 hours (one  
 2 week) to repair and put switchgear back in service.

/c

3  
 4 Since the incoming circuit breakers connected to the A5-6 switchgear at Windsor TS are owned  
 5 by HONI, there is no option for work to be performed by companies other than HONI. The work  
 6 to be performed by HONI at Windsor TS is non-contestable according to Transmission System  
 7 Code and HONI is the only supplier.

/c

8  
 9 To initiate the Windsor A5-6 switchgear replacement in 2014, THESL is required to fund a HONI  
 10 engineering study to determine project feasibility in 2013, and to provide the estimated  
 11 required capital contribution for HONI to replace the incoming circuit breakers connected to the  
 12 existing A5-6 switchgear at Windsor TS. The estimated costs of capital contribution to HONI for  
 13 Windsor TS are as shown below:

/us

/us

14  
 15 **Table 5: Capital Contribution for Windsor TS**

Job Description	Capital Contribution Estimate (\$, millions)	Year
Windsor TS, A5-6 switchgear replacement engineering study	\$0.10	2013
Windsor TS, A5-6 replace incoming circuit breakers capital contribution	\$3.00	2014
<b>Total:</b>	<b>\$0.10</b>	

/UF

16 If funding for THESL's capital contribution is not available, THESL expects that HONI will not carry  
 17 out the engineering study to determine project feasibility and THESL's required capital  
 18 contribution to replace HONI's incoming circuit breakers at Windsor TS. As a consequence, the  
 19 immediate impact is expected to be a delay or possible cancellation of switchgear replacement.  
 20 The ultimate likely system impact will be increased risks of outages as THESL continues to rely  
 21 on the non-arc-resistant and aging A5-6 switchgear at Windsor TS. This increased risk would

**ICM Project | HONI Capital Contributions**

1 If funding for THESL’s capital contribution is not available, THESL expects that HONI will not carry  
 2 out the engineering study to determine project feasibility and the capital contribution required  
 3 for HONI to replace its incoming circuit breakers at Duplex TS. As a consequence, the likely  
 4 impact is delay or possible cancellation of THESL A5-6 switchgear replacement at Duplex TS. The  
 5 ultimate likely impact will be increased risks of outage as THESL continues to rely on the existing  
 6 A5-6 switchgear at Duplex TS where risks of water flooding in the basement exist due to the  
 7 potential malfunction of the deluge system on the main floor.

8  
 9 Since the incoming circuit breakers connected to the A5-6 switchgear at Duplex TS are owned by  
 10 HONI, there is no alternative option for work to be performed by companies other than HONI.  
 11 The work to be performed by HONI at Duplex TS is non-contestable according to Transmission  
 12 System Code and HONI is the only supplier.

13  
 14 **3.5. Glengrove TS A5-6 Switchgear Replacement and HONI Capital Contributions**

15 The main driver for Glengrove TS A5-6 switchgear replacement is to mitigate the risk of  
 16 significant customer outages (27 MVA load with estimate outage duration of eight hours to 168  
 17 hours (one week) to repair and put switchgear back in service).

18  
 19 The work has been completed by HONI and THESL is required to make a capital contribution to  
 20 HONI for replacement of incoming circuit breakers.

21  
 22 **Table 7: Capital Contribution for Glengrove TS**

Job Description	Capital Contribution Estimate (\$, millions)	Year
Glengrove A5-6 switchgear replacement capital contribution	\$2.20	2012
<b>Total:</b>	<b>\$2.20</b>	

23 If funding for THESL’s capital contribution is not available, HONI may postpone or cancel further  
 24 work on other switchgear replacement projects.

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## ICM Project | HONI Capital Contributions

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- 1 Since the incoming circuit breakers connected to the A5-6 switchgear at Glengrove TS are
- 2 owned by HONI, there is no alternative option for work to be performed by companies other
- 3 than HONI. The work to be performed by HONI at Glengrove TS is non-contestable according to
- 4 Transmission System Code and HONI is the only supplier.

} /UF, US

## ICM Project | HONI Capital Contributions

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/US

1   **4. Other HONI Capital Contributions**

2

3   **4.1. Malvern TS 2 New Circuit Breakers and HONI Capital Contribution**

4   Existing feeders NT47M3 at Sheppard West TS are heavily loaded (18MVA) and have  
5   experienced a high number of outages, with the 12-month rolling average of 14 interruptions  
6   from February 2007 to December 2011. The feeder is direct-buried cable and was installed from  
7   1974 to 1978 (34 to 38 years old), with the long feeder length creating a voltage drop issue.

8

9   The purpose of this job is to provide two additional circuit breakers at Malvern TS in 2012 to  
10   allow THESL install two additional 27.6kV feeders to supply new customer load and to provide  
11   additional capacity to relieve the existing heavily loaded feeder NT47M3 at the adjacent  
12   Sheppard West TS. The work is required now to reduce the outage impact of NT47M3 on  
13   system reliability (with an 18MVA load, a 12-month rolling average of 14 interruptions from  
14   February 2007 to December 2011, with an average outage duration of 5.5 hours, affecting 6,430  
15   customers) and to provide approximately 32 MVA additional capacity to connect new  
16   customers. Without the new circuit breakers and feeders, connection of new customers will be  
17   at higher cost due the need to run long cables from Sheppard TS to provide service to customers



**ICM Project | HONI Capital Contributions**

1  
 2 For the medium-term, a second 192 MVA bus expansion at Horner TS is required to relieve load  
 3 at the adjacent Manby TS. Due to the long lead time of approximately five to six years required  
 4 to install a new 192 MVA bus at Horner TS, an engineering study is required now to identify any  
 5 constraints on the transmission line and determine the cost for possible reinforcements to  
 6 provide a feasible supply for the additional 192 MVA bus at Horner TS. Without the second bus,  
 7 Horner TS load will reach 95% of station capacity (182MVA load with 192MVA capacity) in 2016  
 8 and will reach 100% of station capacity in 2021.

9  
 10 Initial consultation with HONI indicates that there is adequate space to install the second 192  
 11 MVA bus at Horner TS. HONI has also informed THESL previously that there would be no space  
 12 readily available, without major transmission system rearrangements, for installation of an  
 13 additional bus at Manby TS. Therefore, the most feasible option to relieve load at Manby TS is  
 14 to install the second bus at Horner TS. The new capacity from the second bus at Horner TS will  
 15 be used to connect new customers in the Manby-Horner area, to balance load among Manby TS  
 16 and Horner TS, and to increase reliability to area customers.

17  
 18 Since the 27.6kV bus at Horner TS is owned by HONI, and this engineering study is a non-  
 19 contestable work, there is no alternative source for the engineering study. THESL estimates a  
 20 capital contribution of \$150,000 is required for HONI to perform this engineering study as  
 21 shown in Table 9 below.

22  
 23 **Table 9: Horner TS Second Bus Expansion - Capital Contribution for HONI Engineering Study**

Job Description	Capital Contribution Estimate (\$, millions)	Year
Horner TS second bus expansion engineering study	\$0.15	2013
<b>Total:</b>	<b>\$0.15</b>	

24 If funding is not available, THESL expects that HONI will not carry out engineering study to  
 25 determine project feasibility and the cost required to install a second bus at Horner TS. This will

**ICM Project | HONI Capital Contributions**

1 contribution of \$150,000 is required for HONI to perform the engineering study as shown in  
 2 Table below.

3

4 **Table 10: Runnymede TS Second Bus Expansion - Capital Contribution for HONI Engineering**  
 5 **Study**

Job Description	Capital Contribution Estimate (\$, millions)	Year
Runnymede TS second bus expansion HONI engineering study	\$0.15	2013
<b>Total:</b>	<b>\$0.15</b>	

/c

6 If funding is not available, THESL expects that HONI will not carry out engineering study to  
 7 determine project feasibility and the cost to install a second bus at Runnymede TS. As load  
 8 continues to grow at Runnymede TS, additional capacity must be installed to meet current and  
 9 future load growth. The likely impact of not being able to install additional capacity at  
 10 Runnymede TS is that THESL cannot connect new customers' load from Runnymede TS, and  
 11 significant risks of outages arise to approximately 20,700 customers, if overloaded equipment  
 12 fails at Runnymede TS. Until the second bus is installed, new customers' load will be supplied by  
 13 adjacent stations which are located at farther distance, meaning longer distribution routes for  
 14 cables and structures and more expense to connect new customers who are located nearer to  
 15 Runnymede TS.

16

17 **4.5. Bridgman TS Transformer Upgrade HONI Engineering Study**

18 The main driver for the engineering study for Bridgman TS transformer upgrade is the need to  
 19 increase transformer capacity for the A5-6H bus, and to provide 4-wire capacity for conversion  
 20 of aging and deteriorated 4kV system at High Level MS.

21

22 THESL A5-6H switchgear at High Level MS is rated at 72 MVA. This 72 MVA bus rating is higher  
 23 than the existing transformer capacity of 36 MVA. Providing larger transformer capacity will  
 24 allow THESL to use the greater capacity of A5-6 switchgear at High Level MS (i.e., 72MVA).

} /c

## ICM Project | HONI Capital Contributions

---

1 additional transformation capacity at Bridgman TS is that conversion of deteriorated 4kV system  
2 cannot proceed; as a result, approximately 7,750 customers in the area will face increased risks  
3 of outages.

4

### 5 **4.6. Esplanade TS Second Bus Expansion and HONI Capital Contribution**

/c

6 The main driver for this engineering study for second bus expansion at Esplanade is the future  
7 need to install additional capacity to meet new load demand from West Don Lands and East  
8 Bayfront development plans.

9

10 THESL has forecasted the load at Esplanade TS will reach 95% of station capacity in 2021,  
11 without the taking into account loads from the West Don Lands and East Bayfront  
12 developments. Due to the long lead time for installation of the second bus at Esplanade TS, an  
13 engineering study is required now to determine the project feasibility and the associated cost  
14 for a feasible transmission supply for the second bus at Esplanade TS. The new capacity is  
15 required to meet anticipated load growth for West Don Lands 80 acres development of  
16 approximately 6,000 residential units<sup>1</sup> and the East Bay front 55 acres development of  
17 approximately 6,000 residential units<sup>2</sup>. New connection requests continue to be received at  
18 Toronto Hydro for waterfront revitalization.

19

20 Since the building structures and the property at Esplanade TS are owned by HONI, and the  
21 work is non-contestable, there is no alternative source for the engineering study. THESL  
22 estimates a capital contribution of \$100,000 is required for HONI to perform this engineering  
23 study as shown in Table below.

---

<sup>1</sup> See [http://www.waterfrontoronto.ca/explore\\_projects2/west\\_don\\_lands](http://www.waterfrontoronto.ca/explore_projects2/west_don_lands)

<sup>2</sup> See [http://www.waterfrontoronto.ca/explore\\_projects2/east\\_bayfront](http://www.waterfrontoronto.ca/explore_projects2/east_bayfront)

**ICM Project | HONI Capital Contributions**

1 **Table 12: Esplanade TS Second Bus Expansion - Capital Contribution for HONI Engineering**  
 2 **Study**

<b>Job Description</b>	<b>Capital Contribution Estimate (\$, millions)</b>	<b>Year</b>
Esplanade TS second bus expansion HONI engineering study	\$0.10	2013
<b>Total:</b>	<b>\$0.10</b>	

/c

3 If funding is not available, THESL expects that HONI will not carry out an engineering study to  
 4 determine project feasibility and the cost required to install a second bus at Esplanade TS. As  
 5 load continues to grow at Esplanade TS, additional capacity must be installed to meet current  
 6 and future load growth from Waterfront revitalization developments. The expected impact of  
 7 not being able to install additional capacity at Esplanade TS is that THESL cannot connect new  
 8 customers' load from the West Don Lands and East Bay Front developments, and increased risks  
 9 of outages to approximately 6,620 customers, if overloaded equipment failure occurs at  
 10 Esplanade TS.

**ICM Project | HONI Capital Contributions**

1 **III DETAILED DESCRIPTION OF THE JOBS**

2

3 **1. LISTING OF ALL JOBS**

4

5 The list of jobs that require capital contribution to HONI is shown below.

6

7 **Table 13: List of jobs requiring Capital Contribution to HONI**

Estimate Number	Job Title	Estimated Cost (\$, millions)	Year
22463	Bremner TS Capital Contribution 2013	\$23.00	2013
25117	Bremner TS Capital Contribution 2014	\$37.00	2014
20757	Leaside-Birch Transmission Reinforcement Capital Contribution	\$17.60	2012
24733	Leaside-Birch Transmission Reinforcement Capital Contribution	\$15.28	2013
24744	Wiltshire TS A3-4 Capital Contribution	\$3.00	2013
<del>24748</del>	<del>Wiltshire TS A5-6 Capital Contribution</del>	<del>\$3.00</del>	<del>2014</del>
24740	Wiltshire TS A1-2 transformer upgrade HONI Engineering study	\$0.10	2013
24510	Wiltshire TS A3-4 switchgear replacement HONI Engineering Study	\$0.07	2012
24743	Wiltshire A5-6 switchgear replacement engineering study	\$0.07	2013
24745	Strachan TS A7-8 Capital Contribution	\$3.00	2013
<del>24749</del>	<del>Strachan TS A5-6 Capital Contribution</del>	<del>\$3.00</del>	<del>2014</del>
24511	Strachan TS A7-8 switchgear replacement HONI Engineering Study	\$0.07	2012

} /UF

## ICM Project | HONI Capital Contributions

Estimate Number	Job Title	Estimated Cost (\$, millions)	Year
24741	Strachan TS A5-6 switchgear replacement HONI Engineering Study	\$0.07	2013
27113	Strachan TS A3-4 capital contribution	\$3.27	2012
<del>24751</del>	<del>Windsor TS A5-6 capital contribution</del>	<del>\$3.00</del>	<del>2014</del>
24742	Windsor TS A5-6 switchgear replacement engineering Study	\$0.10	2013
24747	Duplex TS A5-6 Capital contribution	\$3.00	2013
24512	Duplex TS A5-6 switchgear replacement HONI Engineering Study	\$0.07	2012
27114	Glengrove TS A5-6 capital contribution	\$2.20	2012
22109	Malvern TS two new CBs HONI Capital Contribution Agreement	\$1.28	2012
24507	Malvern TS two new CBs HONI Engineering Study	\$0.02	2012
24509	Leslie MS switchgear replacement Capital Contribution estimate cost	\$0.15	2012
24508	Leslie MS switchgear replacement HONI Engineering Study	\$0.03	2012
24736	Horner TS second bus expansion HONI Engineering study	\$0.15	2013
24737	Runnymede TS second bus expansion HONI Engineering study	\$0.15	2013
24739	Bridgman/High Level transformers upgrade HONI Engineering study	\$0.10	2013
24738	Esplanade TS second bus expansion HONI Engineering study	\$0.10	2013
	<b>Total:</b>	<b>\$109.88</b>	

/UF, /US

/UF, /US

/UF

1 The map for all capital contribution work is shown below.

**ICM Project | HONI Capital Contributions**

1 **Table 14: Addresses of Capital Contribution Jobs**

Map Reference Number	Station	Address
1	Bremner TS	Bremner Blvd and Rees St
2	Leaside-Birch	1080 Millwood Ave
3	Malvern TS	1702 Neilson RD
4	Duplex TS	400 Duplex St
5	Strachan TS	6 Strachan Ave
6	Wiltshire TS	13-19 Wiltshire Ave
7	Leslie MS	5733 Leslie St
8	Horner TS	455 Kipling Ave
9	Runnymede TS	99 Woolner Ave
10	Esplanade TS	106 Lower Sherbourne St
11	Bridgeman/High Level	MacPherson Ave and Huron St
12	Windsor TS	253 Wellington St W
13	Glengrove TS	2829 Yonge St

/UF,US

2 **2. BREMNER TS CAPITAL CONTRIBUTION**

3

4 **2.1. Job Objectives**

5 The purpose of this job is to develop a new station, Bremner TS, to be located at Bremner  
 6 Boulevard and Rees Street in downtown Toronto. THESL owns the site and will be the station  
 7 developer. The job will include construction of a new underground cable tunnel, site  
 8 preparation, construction of the station building, installation of electrical equipment and site  
 9 landscaping work.

10

11 **2.2. Job Scope of Work**

12 The scope of work for Bremner TS capital contribution involves procurement and installation of:

- 13 • Install High voltage cabling from Front St breakout to Bremner TS

## ICM Project | HONI Capital Contributions

- 1 • Install four high voltage surge arrestors
- 2 • Install high voltage switchgear on HONI side
- 3 • Install Protection and control facilities
- 4 • Provide DC station services for HONI switchgear room
- 5 • Provide AC station services for HONI rooms
- 6 • Provide coordination services during the construction phase.

7

### 8 **2.3. Job Map and Locations**

9 Refer to Figure 5 in section 3.1 for map location.

10

### 11 **2.4. Required Capital Costs**

12 Currently, the cost provided for capital contribution to HONI for Bremner TS are estimates only.

13 HONI is in the process of firming up this cost, based on their detailed design.

14

15 **Table 15: Bremner TS Capital Contribution Requirement**

Estimate Number	Job Title	Estimated Cost (\$, millions)	Year
22463	Bremner TS Capital Contribution	\$23.00	2013
25117	Bremner TS Capital Contribution	\$37.00	2014
<b>Total:</b>		<b>\$60.00</b>	

} /us

## 16 **3. LEASIDE-BIRCH TRANSMISSION REINFORCEMENT**

17

### 18 **3.1. Job Objectives**

19 The objectives of this job are the following:

- 20 1) Replace an end-of-life underground cable section of the 115 kV L14W circuit between
- 21 Bayview Junction ("Jct.") and Birch Jct.



## ICM Project | HONI Capital Contributions

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1    **4. TS SWITCHGEAR REPLACEMENTS AND ENGINEERING STUDIES**

2

3    **4.1. WILTSHIRE TS SWITCHGEAR REPLACEMENTS AND ENGINEERING STUDIES**

4

5    **4.1.1. Job Objectives**

6    The purpose of this job is for Hydro One to perform engineering studies and to carry out  
7    replacement of incoming circuit breakers connected to the Wiltshire TS A3-4 switchgear, and to  
8    upgrade HONI transformers connected to A11-12 switchgear.

/US

9

10   **4.1.2. Job Scope of Work**

11   Hydro One is expected to provide cost estimates, replace incoming circuit breakers, and replace  
12   transformers as described in the following:

- 13        • Modification of the current double bus, single breaker A3-A4 switchgear configuration  
14            to a double bus, dual breaker arrangement on HONI side
- 15        • Replace existing HONI incoming cells with ten new, Hydro One owned cells (four cells for  
16            transformers, two cells for capacitor, four cells for links), to be located on the first floor  
17            of Building A
- 18        • Remove existing 2000 A LV transformer secondary cables and install new 3,000 A cables  
19            to supply the new switchgear
- 20        • Modification of the switchgear bus configuration from 3-wire to 4-wire
- 21        • Collaboration with THESL to install/modify and test all necessary Protection and Control  
22            equipment and commission the new protection schemes
- 23        • Purchase and installation of all necessary capacitor bank breakers and associated  
24            equipment required to meet switchgear configuration changes
- 25        • Purchase and installation of instrument transformers for revenue metering that meet all  
26            IESO requirements
- 27        • Replace HONI transformers connected to A11-A12 to increase supply capacity to 72  
28            MVA to A11-A12 bus, and provide 4-wire configuration to A11-A12 bus.

/US

## ICM Project | HONI Capital Contributions

### 1 4.1.3 Job Map and Locations

2 Refer to Figure 5 in Section 3.1 for map location.

3

### 4 4.1.3. Required Capital Contribution to HONI Costs

5

6 **Table 17: Wiltshire TS Capital Contributions to HONI jobs**

Estimate Number	Job Title	Estimated Cost (\$, millions)	Year
24744	Wiltshire TS A3-4 Capital Contribution	\$3.00	2013
<del>24748</del>	<del>Wiltshire TS A5-6 Capital Contribution</del>	<del>\$3.00</del>	<del>2014</del>
24740	Wiltshire TS A1-2 transformer upgrade HONI Engineering study	\$0.10	2013
24510	Wiltshire TS A3-4 switchgear replacement HONI Engineering Study	\$0.07	2012
24743	Wiltshire A5-6 switchgear replacement engineering study	\$0.07	2013
	<b>Total:</b>	<b>\$3.24</b>	

/UF

### 7 4.2. STRACHAN TS SWITCHGEAR REPLACEMENTS AND ENGINEERING STUDIES

8

#### 9 4.2.1. Job Objectives

10 The purpose of this job is for HONI to perform engineering study and to carry out replacements  
 11 of incoming circuit breakers connected to Strachan TS A7-8 switchgears.

/US

12

#### 13 4.2.2. Job Scope of Work

14 Hydro One is expected to perform engineering studies and to carry out the replacements of  
 15 incoming circuit breakers at Strachan TS as described below:

- 16 • Modification of the current double bus, single breaker A7-8 switchgear configuration to  
 17 a double bus, dual breaker arrangement Gas Insulated Switchgear (GIS).

/US

## ICM Project | HONI Capital Contributions

- 1 • Replacement of Hydro One’s incoming circuit breakers with four new circuit breakers,  
2 two on each side of the replacement A11-A12 switchgear
- 3 • Remove existing 2000 A LV transformer secondary cables and install new 3000A cables  
4 to supply the new switchgear
- 5 • Modification of the switchgear bus configuration from 3-wire to 4-wire
- 6 • Collaboration with THESL to install/modify and test all necessary Protection and Control  
7 equipment and commission the new protection schemes
- 8 • Purchase and installation of instrument transformers for revenue metering that meet all  
9 IESO requirements

### 11 4.2.3. Job Map and Locations

12 Refer to Figure 5 in Section 3.1 for map location.

### 14 4.2.4. Required Capital Costs

16 **Table 18: Strachan TS Capital Contributions to HONI jobs**

Estimate Number	Job Title	Estimated Cost (\$, millions)	Year
24745	Strachan TS A7-8 Capital Contribution	\$3.00	2013
24749	Strachan TS A5-6 Capital Contribution	\$3.00	2014
24511	Strachan TS A7-8 switchgear replacement HONI Engineering Study	\$0.07	2012
24741	Strachan TS A5-6 switchgear replacement HONI Engineering Study	\$0.07	2013
27113	Strachan TS A3-4 switchgear replacement capital contribution	\$3.27	2012
	<b>Total:</b>	<b>\$6.41</b>	

/UF, US

/UF

**ICM Project | HONI Capital Contributions**

1 **4.3.4. Required Capital Costs**

2

3 **Table 19: Windsor TS Capital Contributions to HONI jobs**

Estimate Number	Job Title	Estimated Cost (\$, millions)	Year
24751	Windsor TS A5-6 capital contribution	\$3.00	2014
24742	Windsor TS A5-6 switchgear replacement engineering Study	\$0.10	2013
	<b>Total:</b>	<b>\$0.10</b>	

/UF

4 **4.4. DUPLEX TS SWITCHGEAR REPLACEMENT AND ENGINEERING STUDY**

5

6 **4.4.1. Job Objectives**

7 The purpose of this job is for HONI to perform engineering study to determine job feasibility and  
 8 to replace the incoming circuit breakers connected to Duplex TS A5-6 switchgear.

9

10 **4.4.2. Job Scope of Work**

11 Hydro One is expected to perform engineering and to replace incoming circuit breakers at  
 12 Duplex TS as described below:

- 13 • Modification of the current double bus, single breaker Duplex TS A5-6 switchgear  
 14 configuration to a double bus, dual breaker arrangement Gas Insulated Switchgear (GIS).
- 15 • Replacement of Hydro One’s incoming circuit breakers with four new circuit breakers,  
 16 two on each side of the replacement Duplex TS A5-6 switchgear
- 17 • Remove existing LV transformer secondary cables and install new 3000A cables to  
 18 supply the new switchgear
- 19 • Modification of the switchgear bus configuration from 3-wire to 4-wire
- 20 • Collaboration with THESL to install/modify and test all necessary Protection and Control  
 21 equipment and commission the new protection schemes

**ICM Project | HONI Capital Contributions**

- Purchase and installation of instrument transformers for revenue metering that meet all IESO requirements

**4.4.3. Job Map and Locations**

Refer to Figure 5 in Section 3.1 for map location.

**4.4.4. Required Capital Costs**

**Table 20: Duplex TS Capital Contributions to HONI jobs**

Estimate Number	Job Title	Estimated Cost (\$, millions)	Year
24747	Duplex TS A5-6 Capital contribution	\$3.00	2013
24512	Duplex TS A5-6 switchgear replacement HONI Engineering Study	\$0.07	2012
	<b>Total:</b>	<b>\$3.07</b>	

**4.5. GLENGROVE TS SWITCHGEAR REPLACEMENT**

**4.5.1. Job Objectives**

The purpose of this job is for HONI to replace the incoming circuit breakers connected to Glengrove TS A5-6 switchgear.

**4.5.2. Job Scope of Work**

Hydro One completed the replacement of incoming circuit breakers at Glengrove TS as described below:

- Replacement of Hydro One’s incoming circuit breakers with four new circuit breakers for Glengrove TS A5-6 switchgear
- Remove existing LV transformer secondary cables and install new 3000A cables to supply the new switchgear

/UF US

**ICM Project | HONI Capital Contributions**

- 1 • Modification of the switchgear bus configuration from 3-wire to 4-wire
- 2 • Collaboration with THESL to install/modify and test all necessary Protection and Control
- 3 equipment and commission the new protection schemes
- 4 • Purchase and installation of instrument transformers for revenue metering that meet all
- 5 IESO requirements

6

7 **4.5.3. Job Map and Locations**

8 Refer to Figure 5 in Section 3.1 for map location.

9

10 **4.5.4. Required Capital Costs**

11

12 **Table 21: Glengrove TS Capital Contribution to HONI**

Estimate Number	Job Title	Estimated Cost (\$, millions)	Year
27114	Glengrove TS A5-6 switchgear replacement Capital contribution	\$2.20	2012
	<b>Total:</b>	<b>\$2.20</b>	

/UF US

## ICM Project | HONI Capital Contributions

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/UF

1 **5. OTHER CAPITAL CONTRIBUTIONS**

2

3 **5.1. MALVERN TS 2 NEW CIRCUIT BREAKERS AND ENGINEERING STUDY**

4

5 **5.1.1. Job Objectives**

6 The purpose of this job is for HONI to provide and install 2 new 27.6kV circuit breakers at  
7 Malvern TS. HONI has completed the engineering study and informed THESL that a capital  
8 contribution of \$1,275,047 is required to install the 2 new circuit breakers.

9

10 **5.1.2. Job Scope of Work**

11 The scope of work is for HONI to perform engineering study and install two feeder positions,  
12 M23 and M24, at Malvern TS for connection by the THESL. The scope of work includes items as  
13 described below:

14 1) Feeder Positions

# ICM Project

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## Feeder Automation

Toronto Hydro-Electric System Limited (THESL)





## ICM Project | Feeder Automation

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$24.1 M to \$22.6 M, a reduction of \$1.5 M
- 3 • 2014 jobs and spending shown in strike-through
- 4 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012 and
- 5 the continuing priority needs of the system
- 6 • Corrected non-asset risk and updated number of switching points in FIM analyses
- 7 • Corrected numerical and typographical errors

## ICM Project | Feeder Automation

1 **Table 1: Business Case Evaluation of Job Areas**

Project Location	Project Cost Allocated (\$ M)	Project Net Benefit (\$ M)	Option Benefit/Cost Ratio
Horner TS and Manby TS	\$3.40	\$358.39	<b>118.81</b>
Fairchild TS	\$2.78	\$211.58	<b>84.38</b>
Cavanagh TS and Agincourt TS	\$7.82	\$861.34	<b>111.14</b>
Scarborough East TS	\$7.66	\$416.55	<b>57.47</b>

/c

2 The general scope of work for these jobs consists of two phases. The first phase involves  
 3 choosing feeders that will benefit from automation. The second phase is effectively  
 4 sectionalizing the feeder. Feeder selection was based on reliability, network configuration, and  
 5 restoration capacity. Feeders were first selected on based on their reliability and focusing on  
 6 the number of outages that occurred on the trunk. Since this project builds on the existing FA  
 7 implementation, feeder selection also was based on designing a system that could connect into  
 8 the existing FA implementation through interconnection with other FA feeders. Non-automated  
 9 tie-points will be included where considered necessary to backfeed into established FA feeders.  
 10 Each feeder selected must be able to backfeed into a section and resupply a faulted feeder.

11  
 12 The number of feeders that can be addressed in an area at any one time is limited to maintain  
 13 operational flexibility in the case of an outage. Power system controllers require a sufficient  
 14 number of feeders available to ensure adequate flexibility to restore an area in the event of an  
 15 outage. One method used to maximize the amount of FA deployment is to work in multiple  
 16 areas of the system, the east, west and north areas of the city, at the same time.

17  
 18 By focusing on trunk feeders and effectively deploying an FA scheme to specific areas, THESL has  
 19 prepared a focused project that is expected to have a significant positive impact on SAIDI and  
 20 SAIFI.

**ICM Project | Feeder Automation**

1 **2. Why the Project is Needed Now**

2

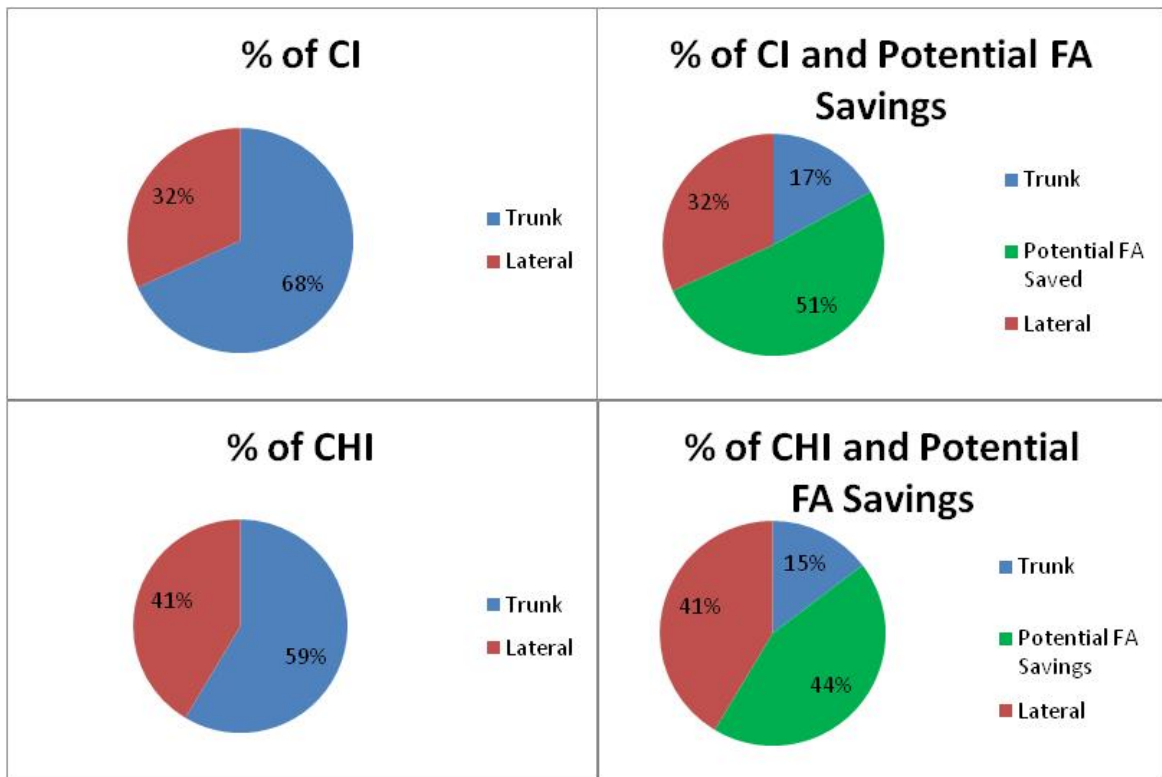
3 The project needs to be constructed on the selected feeders now for three reasons:

- 4 (a) to reduce the current reliability impact of feeder trunk outages,  
 5 (b) to reduce the risk of future outages due to the high probability of equipment failure,  
 6 and  
 7 (c) to ensure effective FA saturation on the system.

8

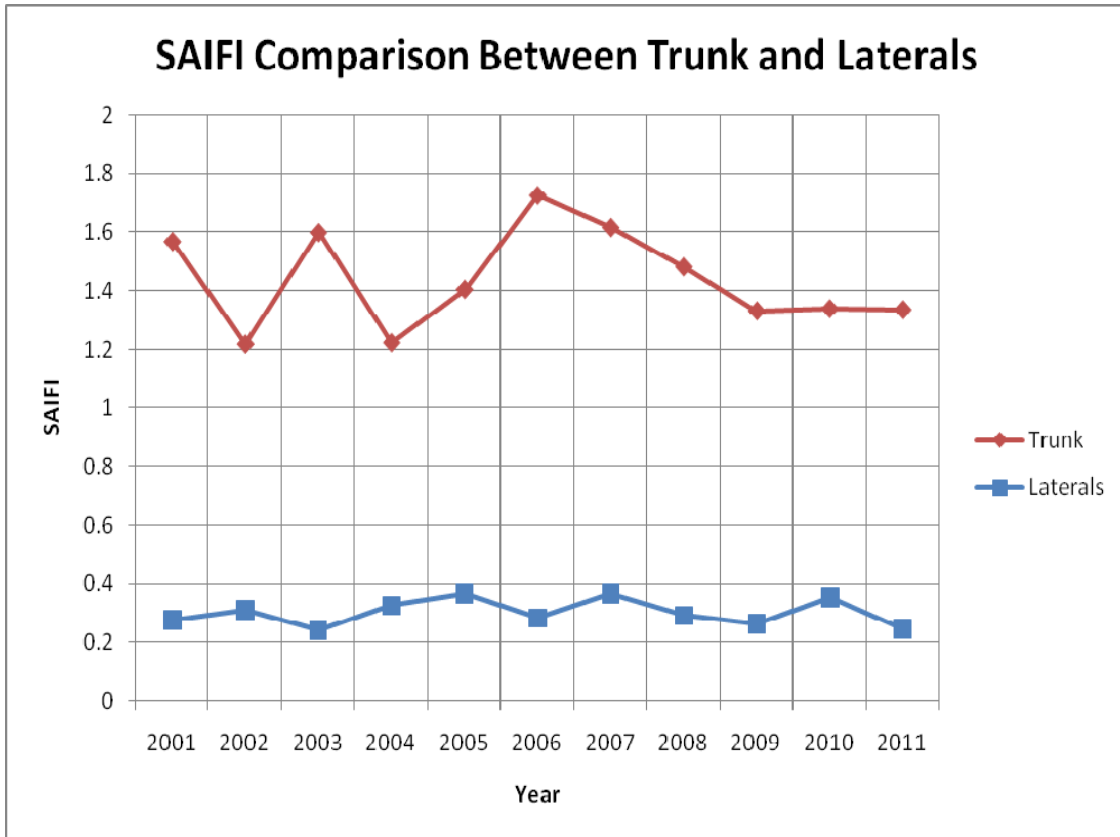
9 Of the customer interruptions (CI) on the selected feeders, 68% are attributable to the trunk /c  
 10 portions these feeders; for customer hours interrupted (CHI), 58% are attributable to the feeder  
 11 trunk (See Figure 1). By deploying FA on these feeders a potential reliability savings of 51% for /c  
 12 CI and 44% of CHI on the feeders can be achieved (See Section III). /c

13



14 **Figure 1: Reliability Impact and FA Savings on Selected Feeders**

ICM Project | Feeder Automation



1 **Figure 6: SAIFI Comparison between Trunk and Laterals**

2

3 Historical reliability data for feeders planned for inclusion in FA over the next three years are  
 4 shown in Table 3. Figures 7 and 8 present graphical representations of lateral and trunk  
 5 comparisons using the averages of the last five years. Figure 7 shows that, on average, more  
 6 than two thirds of the outages over this period occur on laterals. As shown in Figure 8,  
 7 however, trunk outages have a much larger impact on both CI and CHI (68% and 58%,  
 8 respectively). In other words, the roughly two thirds of the faults occurring on laterals cause  
 9 only one-third of the customers interruptions (CI) and 41% of the customer hours interrupted  
 10 (CHI). This aligns with the SAIDI and SAIFI graphs illustrated above in Figures 5 and 6.

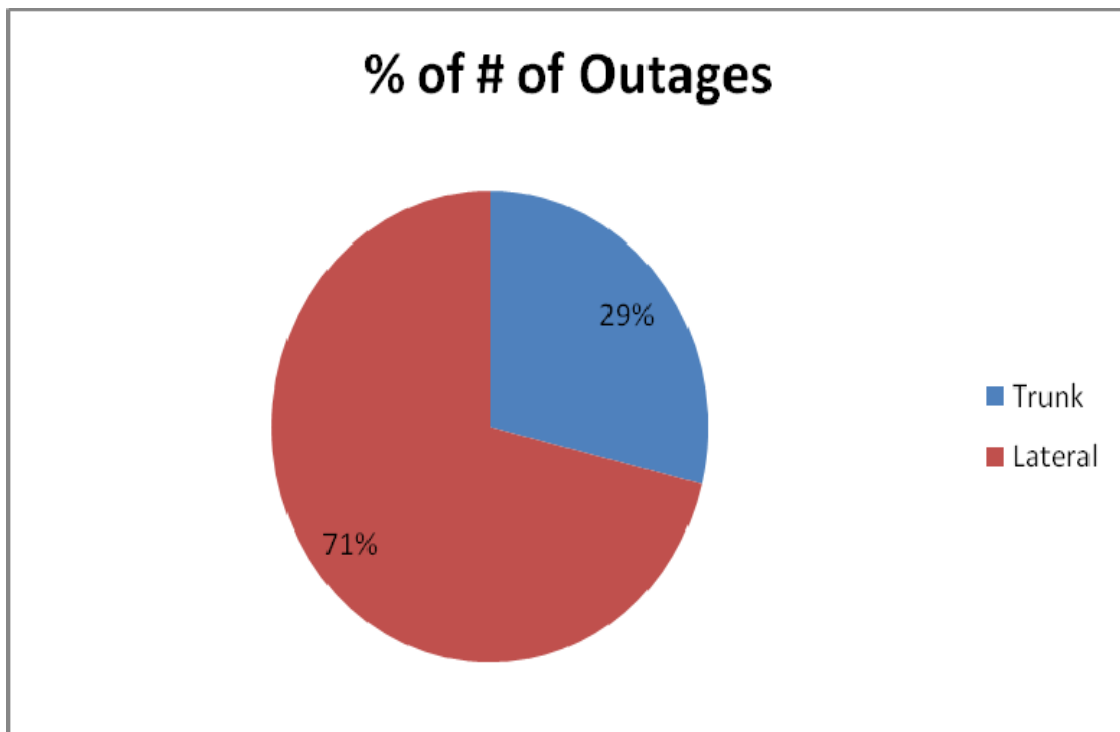
/C

/C

**ICM Project | Feeder Automation**

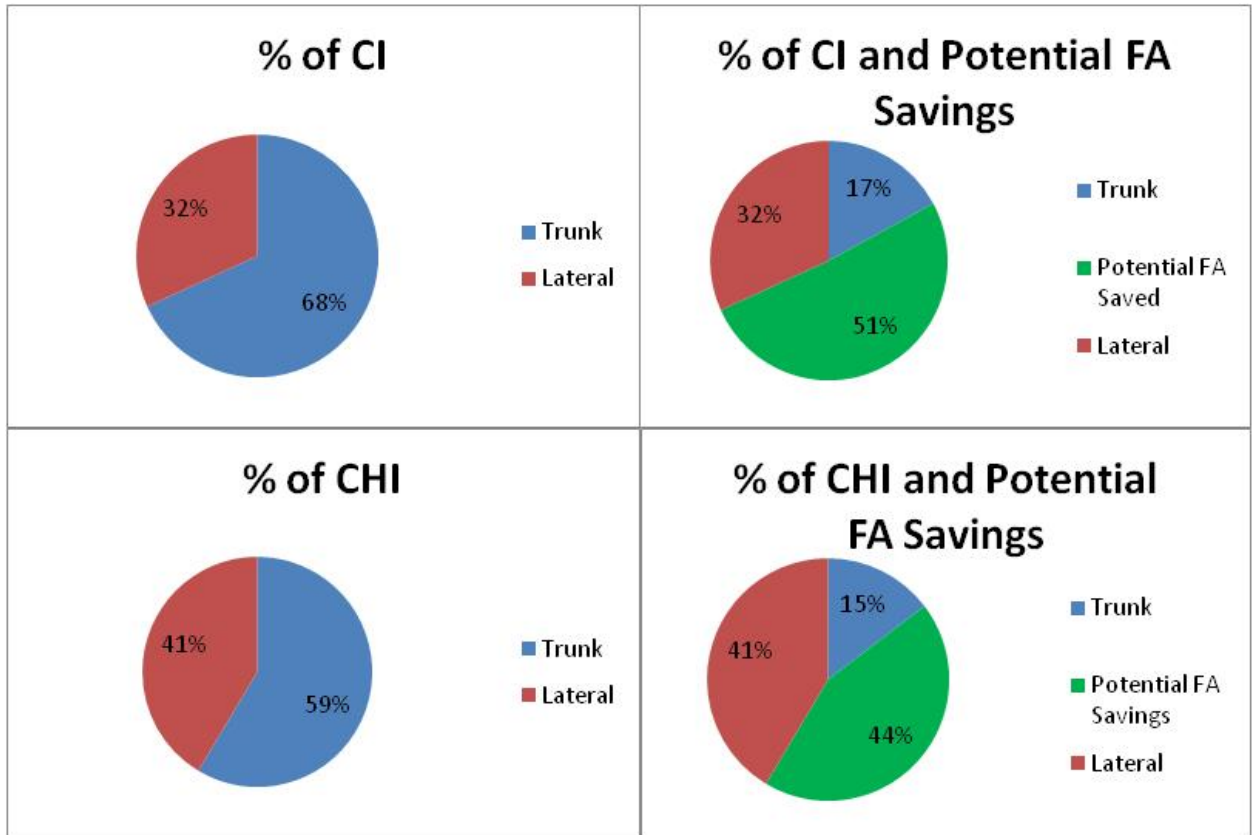
1 **Table 3: Historical Reliability Data of Selected Feeders for the FA Scheme**

Year	Total Feeder Outages			Total Trunk Outages			Potential FA Savings	
	Number of Outages	CI	CHI	Number of Outages	CI	CHI	CI	CHI
2007	176	222,039	94,557.7	53	159,808	48,750.8	119,856	36,563.1
2008	139	109,777	64,741.1	40	72,475	39,256.4	54,356	29,442.3
2009	145	177,342	181,106.6	45	131,076	133,744.6	98,307	100,308.5
2010	122	130,569	69,405.1	33	75,501	26,157.0	56,626	19,617.8
2011	108	113,426	109,680.5	28	74,596	56,420.4	55,947	42,315.3
<b>Total</b>	<b>690</b>	<b>753,153</b>	<b>519,491.0</b>	<b>199</b>	<b>513,456</b>	<b>304,329.3</b>	<b>385,092</b>	<b>228,246.9</b>
<b>Avg.</b>	<b>138</b>	<b>150,631</b>	<b>103,898.2</b>	<b>39.8</b>	<b>102,691</b>	<b>60,865.9</b>	<b>77,018</b>	<b>45,649.4</b>



2 **Figure 7: Percentage of Trunk and Lateral Outages on Selected Feeders**

**ICM Project | Feeder Automation**



1 **Figure 8: Reliability Impact and FA Savings on Selected Feeders**

2

3 As shown above, outages on feeder trunks are the major source of both CI and CHI because  
 4 trunk outages are lengthy and affect all the customers on a feeder. As long as there is no  
 5 effective method to mitigate the impact of trunk related outages, it will be difficult to improve  
 6 or even maintain current reliability levels as aging assets begin to fail at a higher frequency. The  
 7 most cost effective solution to mitigate the impact of trunk outages is to deploy an FA scheme  
 8 focusing on areas containing feeders with poor trunk reliability.

9

10 The true system benefits of FA can only be achieved by deploying it widely so that multiple  
 11 feeders and switching points are covered. If the FA jobs proposed here are delayed until the  
 12 next cost of service filing the number of feeders and areas that can be addressed will be  
 13 reduced. The number of feeders that can be addressed in an area at any one time must be  
 14 limited to maintain operational flexibility in the case of an outage. This is limitation is necessary  
 15 to allow power system controllers to have a sufficient number of feeders available to restore an

## ICM Project | Feeder Automation

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1     **IV       PREFERRED ALTERNATIVE**

2

3     **1.       Alternatives Considered and Assessed**

4     THESL's FA program is a cost-effective option to mitigate the system reliability consequences of  
5     outages in areas with poorly performing trunk feeders. THESL evaluated the FA program, the  
6     preferred alternative, against four other alternatives that also could be used to mitigate trunk  
7     related outages on these feeders:

- 8         • Do nothing. Respond to outages using existing switching capacity and processes.
- 9         • Reduce the impact of a fault on the trunk by adding more switching capability via  
10         manual switches;
- 11        • Reduce the impact of a fault on the trunk by adding more switching capability via  
12         SCADA enabled switches; and
- 13        • Reduce the probability of a fault on the trunk by rebuilding large portions of feeder  
14         trunks, up to and including the entire trunk portion.

15

16     **2.       Preferred Alternative – Install FA on Selected Feeder Trunks**

17     The material above shows the benefits of installing FA, which tends to significantly reduce the  
18     impact and the duration of outages by eliminating all the manual intervention from the  
19     controller and the field crew. As load growth continues, with new condominiums, the expansion  
20     of the TTC and future commercial development, the ability to perform load transfers via tie  
21     feeders will diminish. As a result, THESL will be required to undertake additional and more  
22     complex analyses of multiple feeders to sectionalize and re-supply feeder segments. Through  
23     an FA implementation, this analysis can be performed automatically with self-healing switches  
24     and pre-determined sections that automate load transfers. The cost and benefits associated  
25     with the preferred alternative are set out in Appendix 1.

26

27     As shown by Figure 9 below, installing FA is expected to improve the benefit/cost ratio (B/C)  
28     compared to manual switches (the green line) and shows an even greater improvement for FA  
29     compared to SCADA switches (the red line). The reason for the greater B/C ratio in the latter  
30     comparison is that the incremental cost of installing FA is relatively low once SCADA switches  
31     are already installed on the feeder. In contrast, if a feeder has only manual switches, FA

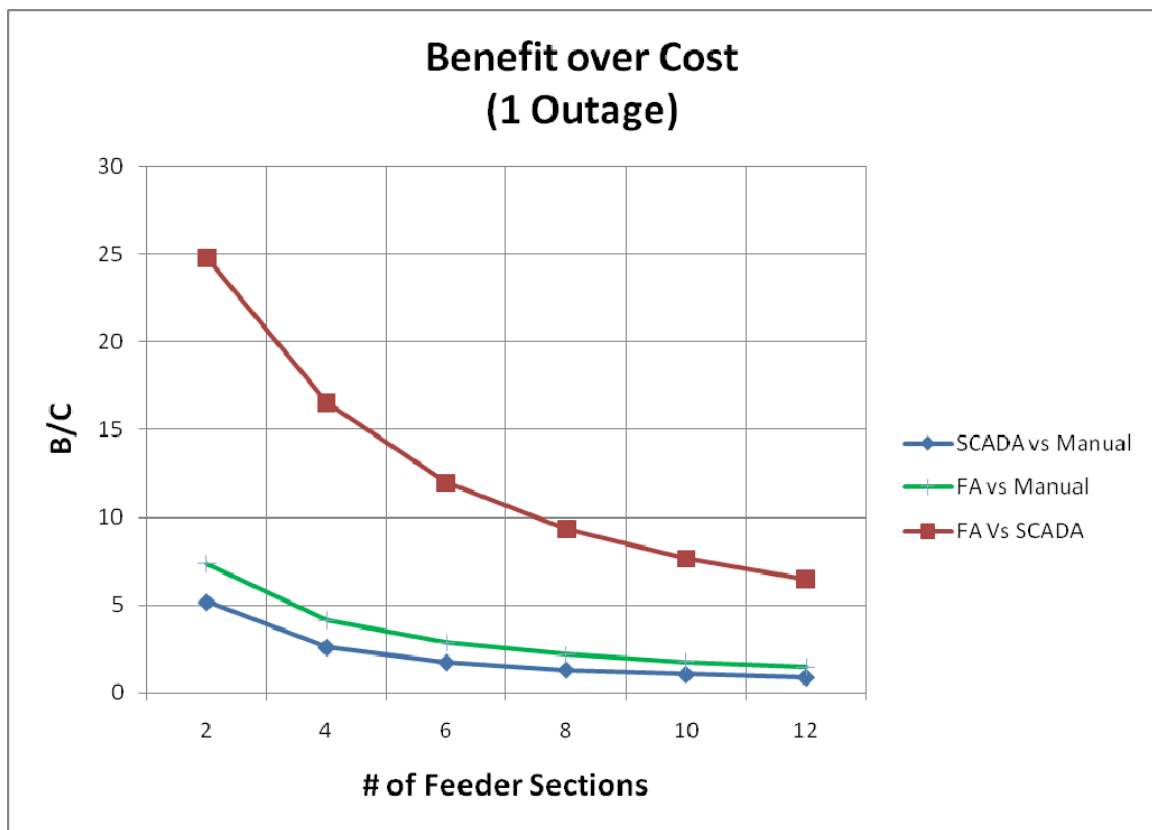
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**ICM Project | Feeder Automation**

1 requires the installation of SCADA switches as well as automation technology, which leads to  
 2 substantially higher cost.

3

4 Figure 9 is based on the relative values for a single outage, but the value of FA increases if there  
 5 are multiple outages on the feeder. The feeders to be addressed in the proposed jobs are likely  
 6 to experience frequent outages because they have been selected to target the worst performing  
 7 feeders. Tables D.1 through D.4 in Appendix 3, list the costs of implementation and the benefits  
 8 for each proposed job. /c



9 **Figure 9: Comparison B/C Ratios for Various Alternatives**

10

11 **3. Alternative 1: No Investment.**

12 Under this alternative, THESL will continue to respond to outages using existing manual  
 13 switching capacity and current processes and protocols. By not investing in any improvement  
 14 current reliability levels are likely to decline due to the high probability equipment failure that



## ICM Project | Feeder Automation

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1    **V        JOB INFORMATION OVERVIEW**

2

3    **1.        Implementation Plan**

4    THESL intends to expand upon its existing 2010 FA pilot project to maximize the benefits of the  
5    proposed expenditures. By expanding FA to the interconnecting feeders located on the  
6    periphery of the existing network, the options for automatic restoration are enhanced. The first  
7    expansion project is expected to incorporate the remaining of the feeders at Fairbanks T.S. to  
8    the FA arrangement

9

10   The second expansion project, scheduled for 2012, will incorporate the remaining feeders at  
11   Bathurst T.S. into the existing FA grid. Furthermore, there will be further expansion into  
12   Fairchild T.S. in 2012. Where necessary and feasible, each expansion project also will  
13   incorporate existing non-automated tie-points into the expansion, which will make the existing  
14   FA feeders more efficient and the network more flexible. This approach is expected to increase  
15   the number of feeders in the mesh network and allow for more restoration options.

16

17   The project is expected to continue with further expansion in the east and west of Toronto by  
18   incorporating new areas to improve the reliability to the worst performing feeders in those  
19   areas. In Scarborough, THESL will create a new network targeting the worst performing feeders  
20   from Cavanagh T.S. and Agincourt T.S. in 2012, and Scarborough East in 2013. In Etobicoke,  
21   starting in 2012, THESL intends to create a new network involving feeders from Manby T.S. and  
22   Horner T.S. and targeting the worst performing feeders in that area. This will be the initial hub  
23   of expansion in west-end of Toronto and expansion will continue to incorporate other poorly  
24   performing feeders in the area. This is expected to allow this new system to target multiple  
25   parts of the city rather than focusing exclusively on the central North York location. This  
26   approach is expected to produce greater coverage and a more rapid diffusion of the benefits of  
27   FA.

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## ICM Project | Feeder Automation

### 2. Business Case Evaluation (BCE) Results

THESL undertook a business case evaluation of FA projects being proposed for Etobicoke, North York, and Scarborough to demonstrate the benefits of FA in each area. The results are shown in Table 4. As Table 4 demonstrates, the proposed work in each area provides significant benefits compared to its cost of implementation.

**Table 4: Business Case Evaluation of FA Target Area Projects**

Project Location	Project Cost Allocated (\$ M)	Project Net Benefit (\$ M)	Option Benefit/Cost Ratio
Horner TS and Manby TS	\$3.40	\$358.39	118.81
Fairchild TS	\$2.78	\$211.58	84.38
Cavanagh TS and Agincourt TS	\$7.82	\$861.34	111.14
Scarborough East T.S.	\$7.66	\$416.55	57.47

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The effectiveness of each Feeder Automation project can be further highlighted by determining the difference in cost of ownership between the existing overhead assets installed along the feeder trunk circuits, and the cost of ownership of those same assets with FA implemented as explained in Appendix 3. With an FA system in place, the average estimated outage duration per feeder trunk asset will be reduced considerably. This difference in ownership cost includes quantified risk costs, which take into account the assets' probability of failure, and the various direct and indirect costs associated with in-service asset failures, including the costs of customer interruptions, emergency repairs and replacement, as well as non-asset-related risks associated with the existing overhead plant, including outages caused by animals, human activity and weather-related events.

As shown in Table 4 above, carrying out immediate work in Etobicoke, Horner TS and Manby TS, will result a net present value of approximately \$358.39 million, which represents the difference between these cost of ownership values and the total project cost of \$3.40 million. There is a benefit-to-cost ratio of 118.81 that is produced when this difference in cost of ownership is divided by the capital cost of the project.

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## ICM Project | Feeder Automation

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- 1 This project has an additional cost of \$0.36 million due to network improvement with the
- 2 addition of repeater radios and sight acceptance test. These additions will benefit the FA
- 3 network being constructed in this area and will create a communication backbone to assist any
- 4 FA projects that will expand onto this network in the future.

} /c

## ICM Project | Feeder Automation

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1 Carrying out immediate work in North York, Fairchild TS, will result a net present value of  
2 approximately \$211.58 million, which represents the difference between the cost of ownership  
3 values and the total project cost of \$2.78 million. There is a benefit-to-cost ratio of 84.38 that is  
4 produced when this difference in cost of ownership is divided by the capital cost of the project.  
5 This project has an additional cost of \$0.35 million due to network improvement with the  
6 addition of repeater radios and sight acceptance test. These additions will benefit the FA  
7 network being constructed in this area and will create a communication backbone to assist any  
8 FA projects that will expand onto this network in the future. Furthermore, there has been a  
9 change in the project that brought the cost down by \$0.11 million.

10

11 Carrying out immediate work in Scarborough will result a net present value of approximately  
12 \$861.34 million, which represents the difference between the cost of ownership values and the  
13 total project cost of \$7.82 million and a benefit-to-cost ratio of 111.14 for the Cavanagh TS and  
14 Agincourt TS project. For the Scarborough East TS project there is a net present value of  
15 \$416.55 million, which represents the difference between the cost of ownership values and the  
16 total project cost of \$7.66 million. There is a benefit-to-cost ratio of 57.47 that is produced when  
17 this difference in cost of ownership is divided by the capital cost of the project. The  
18 Scarborough East project has an additional cost of \$0.28 million due to network improvement  
19 with the addition of repeater radios. This addition will benefit the FA network being constructed  
20 in this area and will create a communication backbone to assist any FA projects that will expand  
21 onto this network in the future.

22

23 The business case evaluation results for the proposed FA work in each area show that the  
24 proposed FA installations will provide high value. This result is largely attributable to large  
25 number of outages and associated high risk cost due to the presence of failing equipment on  
26 these feeders. Based on the business case evaluation, these projects should be undertaken  
27 immediately. Customers will receive substantial benefits from the reliability improvement that  
28 this project will produce. Further details for each of these business cases and corresponding  
29 calculations are provided in, Appendix 3.

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**ICM Project | Feeder Automation**

1 **VI SPECIFIC JOBS PROPOSED**

2

3 **1. LISTING OF ALL JOBS**

4

5 **1.1. Listing of all Jobs**

6

7 **Table 5: Cost of Proposed FA Jobs**

<b>Job Title</b>	<b>Job Year</b>	<b>Cost Estimate (\$ M)</b>
Feeder Automation 2012 – Cavanaugh TS and Agincourt TS	2012	\$7.82
Feeder Automation 2012 – Horner T. S. and Manby T. S.	2012	\$3.40
Feeder Automation 2012 – Fairchild T. S.	2012	\$2.78
Feeder Automation 2013 – Scarborough East T.S.	2013	\$7.66
<b>Jobs Total:</b>		<b>\$21.66</b>
<b>Reconciliation for job cost changes &lt; \$100,000 and rounding</b>		<b>\$0.91</b>
<b>Reconciled Total:</b>		<b>\$22.57</b>

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8 **1.2. General Scope of Work**

9 The general scope of work for these jobs consists of two phases. The first phase involves  
 10 choosing feeders that will benefit from automation. The second phase is effectively  
 11 sectionalizing the feeder. Feeder selection was based on reliability, network configuration, and  
 12 restoration capacity. Feeders were first selected on based on their reliability and focusing on  
 13 the number of outages that occurred on the trunk. Since this project builds on the existing FA  
 14 implementation, feeder selection also was based on designing a system that could connect into  
 15 the existing FA implementation. This will require utilizing non-automated tie-points considered  
 16 to be necessary to backfeed into established FA feeders. The design considered feeders  
 17 experiencing poor reliability in the area and interconnected with one another. Each feeder  
 18 selected must be able to backfeed into a section and resupply a faulted feeder.

## ICM Project | Feeder Automation

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1 The design principle used for sectionalizing a feeder was to create segments with equal numbers  
2 of customers connected and similar amounts of load. Exceptions were made in cases where the  
3 feeder backfeeding into a segment had limited capacity. In these instances, efforts were  
4 undertaken to ensure that the load of that segment was reduced to accommodate the capacity  
5 limitations. In most cases, the existing infrastructure will be reused to reduce costs. Existing  
6 SCADA switches will be reused and a retrofit module installed in the RTU. This provides  
7 substantial savings when compared to installing a new SCADA switch with a new RTU.

8

### 9 **2. Feeder Automation 2012 – Cavanagh T.S. and Agincourt T.S.**

10

#### 11 **2.1. Job Objectives**

12 The objective of this job is to introduce a new FA mesh network to address the worst performing  
13 feeders in Scarborough incorporating 13 feeders from Cavanagh T.S. and Agincourt T.S. These  
14 stations were chosen due to their poor reliability, their location and ability to expand to other  
15 stations, and the number of overhead switches available. Once this job is completed, THESL  
16 intends to use it as a starting point for expansion to other feeders in Scarborough.

17

18 The selected feeders demonstrate poor reliability and high impact trunk outages affecting the  
19 customer (CHI). In the last five years, these feeders have had had 206,560 customers  
20 interruptions and 103,807.0 of CHI. If feeder automation had been installed five years ago, with  
21 the assumption that 75% of the feeder would be restored during a trunk outage, a savings of  
22 154,920 CI and 77,855.3 CHI would have been realized. These feeders are excellent candidates  
23 for FA and an opportunity for THESL to improve the reliability for the customers in this area.

24

25 Additional factors also motivated the selection of these feeders. Cavanagh T.S. and Agincourt  
26 T.S. are centred in the middle of Scarborough and provide excellent expansion opportunities to  
27 allow FA to be further integrated into the system. Greater integration is expected to facilitate  
28 lower cost or quicker implementation expansion that will increase the amount and speed of  
29 benefit accrual.

## ICM Project | Feeder Automation

1 **Table 6: Outage Data for 2012 FA Feeders (Cavanagh T.S. and Agincourt T.S.)**

Year	Total Feeder Outages			Trunk Outages			Forecasted Savings if FA is Implemented	
	Number of Outages	CI	CHI	Number of Outage	CI	CHI	CI	CHI
2007	58	103,791	44,673.3	24	79,722	27,905.0	59,792	20,928.7
2008	39	42,579	23,373.1	10	23,332	8,690.4	17,499	6,517.8
2009	47	63,280	52,854.3	17	55,851	33,906.2	41,888	25,429.6
2010	35	31,429	22,087.9	3	9,219	4,724.5	6,914	3,543.3
2011	25	57,780	59,766.9	10	38,436	28,581.1	28,827	21,435.8
<b>Total</b>	<b>204</b>	<b>298,859</b>	<b>202,755.4</b>	<b>64</b>	<b>206,560</b>	<b>103,807.0</b>	<b>154,920</b>	<b>77,855.3</b>

2 **2.2. Scope of Work**

3 This job anticipates implementing FA on 13 feeders from these two stations. At the completion  
 4 of this job, it is estimated there will be 57 self healing switching nodes on this network. It  
 5 will require retrofitting 27 existing SCADA switches, installing seven new switches, and  
 6 upgrading 23 manual switches to self-healing switches. This is summarized in Table 7, and  
 7 Figure 10 provides a schematic of the plan with feeder and switch locations.

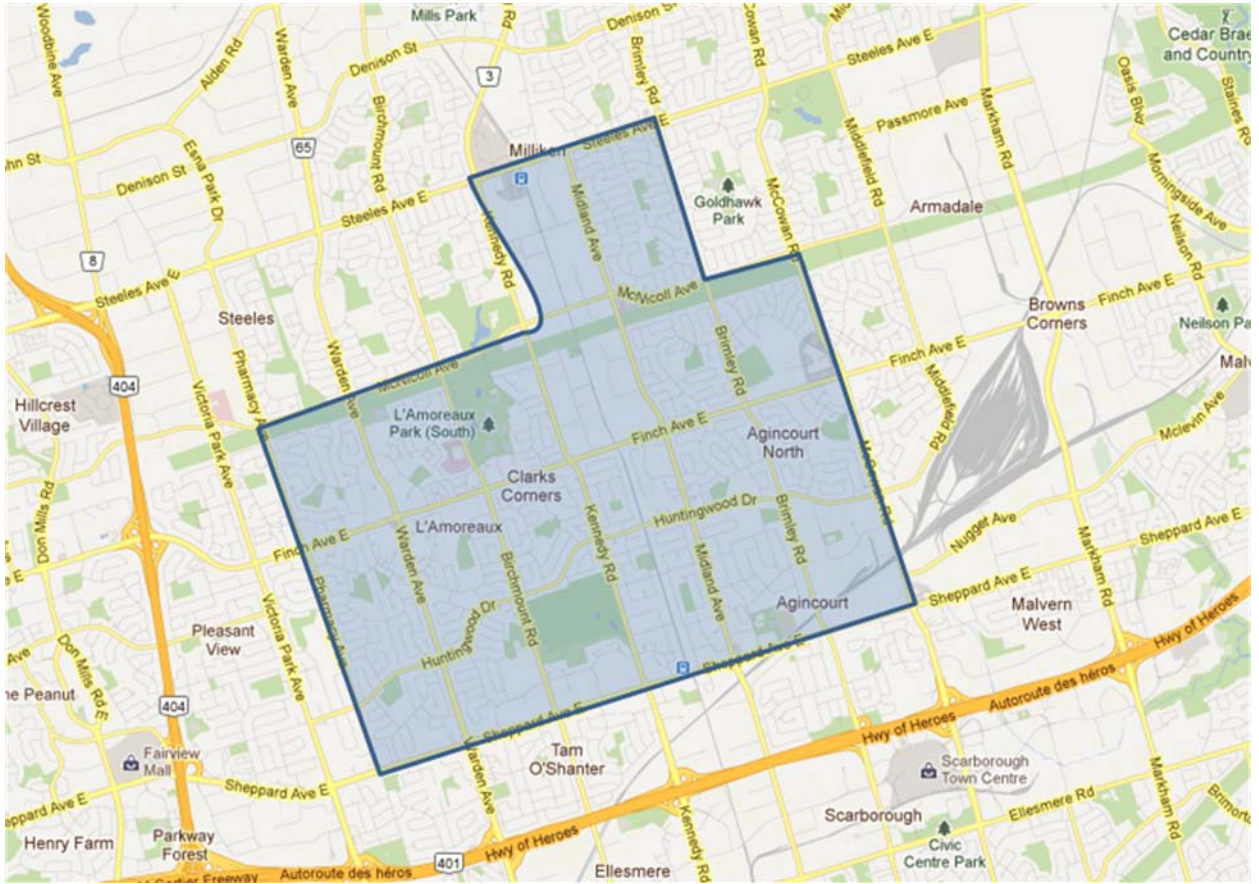
8

9 **Table 7: 2012 FA Cavanagh T.S. and Agincourt T.S. Unit Count**

Total of Switch Installations	
Type of Install	Cavanagh T.S. and Agincourt T.S.
Retrofit Existing SCADA	27
R1 to R2 Switch Upgrade	0
Install a New Switch	7
Replace Manual Switch	23
<b>Total</b>	<b>57</b>

## ICM Project | Feeder Automation

### 1 2.3. Job Map and Locations



2 Figure 10: 2012 Feeder Automation Cavanagh TS and Agincourt TS Map



**ICM Project | Feeder Automation**

1 **2.4. Required Capital Costs**

2

3 **Table 9: Total Cost for the 2012 Feeder Automation Cavanagh T.S. and Agincourt T.S. Job**

<b>Feeder Automation 2012 – Cavanagh TS and Agincourt TS</b>			
<b>Project Estimate Number</b>	<b>Project Title</b>	<b>Project Year</b>	<b>Cost Estimate (\$ M)</b>
22443	E12591 - PPEast 2012 Feeder Automation Project on SCNA502M22	2012	\$0.63
22444	E12592 - PPEast 2012 Feeder Automation Project on SCNA502M23	2012	\$0.79
22445	E12593 - PPEast 2012 Feeder Automation Project on SCNA502M24	2012	\$0.46
22446	E12594 - PPEast 2012 Feeder Automation Project on SCNA502M26	2012	\$0.71
22449	E12597 - PPEast 2012 Feeder Automation Project on SCNA502M29	2012	\$0.50
22450	E12598 - PPEast 2012 Feeder Automation Project on SCNT63M1	2012	\$0.21
22452	E12600 - PPEast 2012 Feeder Automation Project on SCNT502M32	2012	\$0.53
22453	E12601 - PPEast 2012 Feeder Automation Project on SCNT63M11	2012	\$0.37
22455	E12603 - PPEast 2012 Feeder Automation Project on SCNT63M4	2012	\$0.46
22456	E12604 - PPEast 2012 Feeder Automation Project on SCNT63M5	2012	\$0.82
22457	E12605 - PPEast 2012 Feeder Automation Project on SCNT63M6	2012	\$0.62

**ICM Project | Feeder Automation**

<b>Feeder Automation 2012 – Cavanagh TS and Agincourt TS</b>			
<b>Project Estimate Number</b>	<b>Project Title</b>	<b>Project Year</b>	<b>Cost Estimate (\$ M)</b>
22458	E12606 - PPEast 2012 Feeder Automation Project on SCNT63M12	2012	\$0.58
22459	E12607 - PPEast 2012 Feeder Automation Project on SCNT63M8	2012	\$0.56
22447	E12595 - PPEast 2012 FA Project - Radio Coordination Study & Repeater Radio Installation	2013	\$0.35
22448	E12596 - PPEast 2012 Feeder Automation Project - Site Acceptance Tests	2013	\$0.22
<b>Total:</b>			<b>\$7.82</b>

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1 **2.5. Job Business Case Evaluation (BCE) Results**

2

3 The 2012 FA job will improve reliability of the 13 new feeders from Cavanagh T.S. and Agincourt  
 4 T.S. and provide flexible switching capabilities that currently do not exist. The reliability of these  
 5 feeders, as shown in Table 6, is poor with numerous high impact trunk outages. Carrying out  
 6 immediate work on these feeders will result in present value benefits of approximately  
 7 \$861.34M. The proposed project will cost \$7.82 million to implement. The resulting benefit-to-  
 8 cost ratio is 111.14. FA will allow THESL to mitigate the risk of these feeders.

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9

10 **Table 10: BCE of Cavanagh T.S. and Agincourt T.S. Job**

<b>Project Location</b>	<b>Project Cost Allocated (\$ M)</b>	<b>Project Net Benefit (\$ M)</b>	<b>Option Benefit/Cost Ratio</b>
<b>Cavanagh TS and Agincourt TS</b>	\$7.82	\$861.34	111.14

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**ICM Project | Feeder Automation**

1 At completion, this job is expected to have 46 self-healing switching nodes on this network. This  
 2 figure will be achieved by retrofitting eight existing SCADA switches, upgrading 13 non-standard  
 3 R1 switches to R2 switches, installing ten new switches, and upgrading 15 manual switches to  
 4 self healing switches. This work is summarized in Table 11 and Figure 12 provides a schematic of  
 5 the plan with feeder and switch locations. Furthermore, this job is expected to upgrade 14  
 6 switches from the obsolete MOSCAD network and incorporate them into the new Speednet  
 7 network.

8

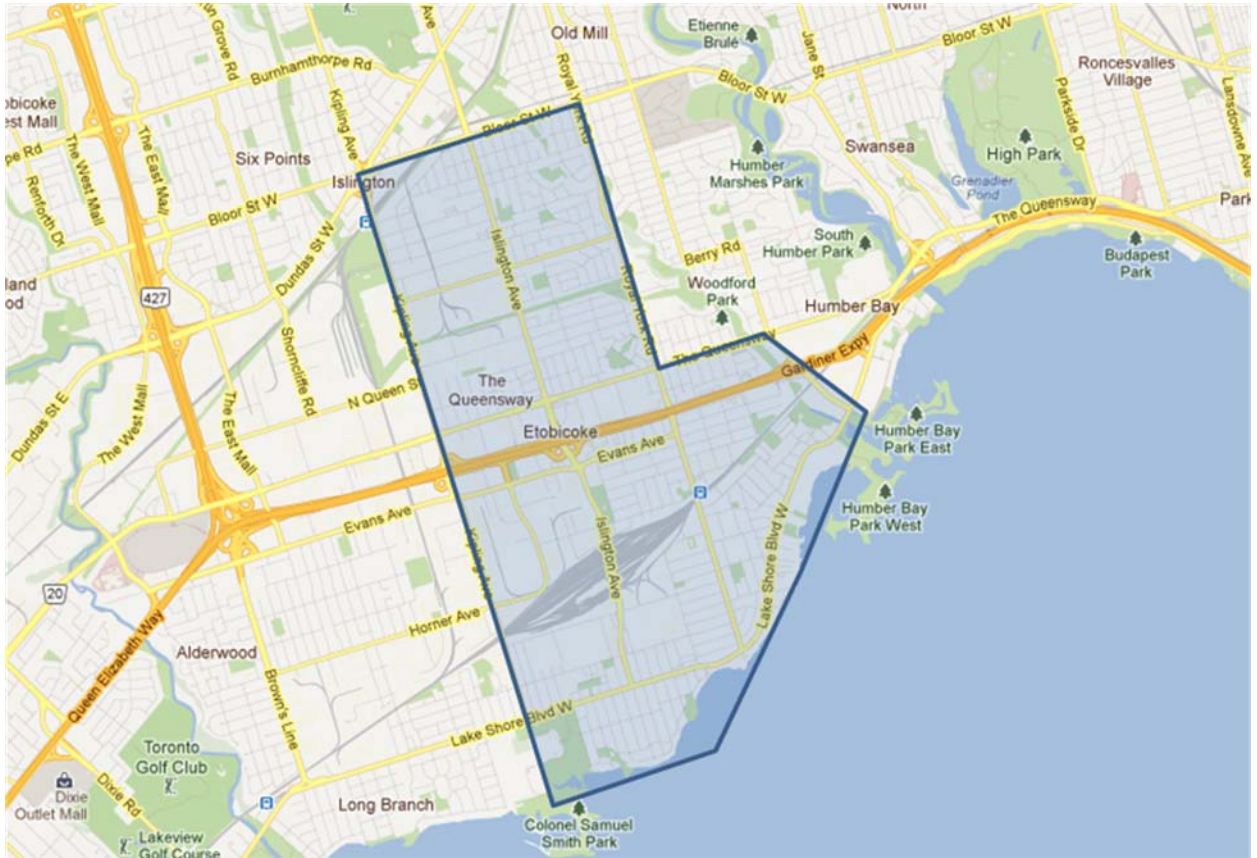
9 **Table 11: 2012 FA Unit Count**

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<b>Total of Switch Installations</b>	
<b>Type of Install</b>	<b>Manby TS and Horner TS</b>
Retrofit Existing SCADA	8
R1 to R2 Switch Upgrade	13
Install a New Switch	10
Replace Manual Switch	15
<b>Total</b>	<b>46</b>

## ICM Project | Feeder Automation

### 1 3.3. Job Map and Locations



2 **Figure 12: 2012 Feeder Automation Job for Manby T.S. and Horner T.S.**

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3

## ICM Project | Feeder Automation

1 Table 12: 2012 FA Manby T.S. and Horner T.S. Switch Locations

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Feeder Automation 2012 - Etobicoke - Manby T. S. and Horner T. S.					
Feeder	Scope	Switch ID	Type	Location	Notes
30M1	W13371	OSC69948	Upgrade	P464 Kipling Ave	Riser Switch
		New Switch 30M1_1	Replace	P415 Royal York Rd	Sectionalizer
		OSC17906	Upgrade	P159 Evans Ave	Sectionalizer
		OSC16303	Replace	P551 Royal York Rd	30M1/38M13
		OSC58022	Replace	P205 Evans Ave	Sectionalizer
		OSC73106	Upgrade	P884 Islington Ave	TP 30M1/38M8
		OSC75130	Upgrade	P445 Royal York Ave	Sectionalizer
		OSL61906	Replace	P327 Royal York Ave	TP 30M1/30M8
30M2	W13375	New Switch 30M2_1	Replace	P210 Horner Ave	Riser Switch
		OSC4821	Replace	P311-1 Cavell Ave	Sectionalizer
		OSL34893	Upgrade	P2269 Lake Shore Blvd	TP 30M2/30M8
30M4	W13377	OS95321	Replace	P215 Horner Ave	Riser Switch
		OSC2489	Replace	P40 New Toronto Ave	Sectionalizer
		OSC62786	Replace	P204 Islington Ave	TP 30M4/30M9
		OSL10621	Replace	P2636 Lake Shore Ave	TP 30M4/30M9
		OSL43741	Replace	P134 Mimico Ave	Sectionalizer
		OSL97364	Replace	P229 Royal York Rd	TP 30M4/30M2
30M8	W13378	New Switch 30M8_1	Replace	P220 Horner Ave	Riser Switch
		New Switch 30M8_2	Replace	P222 Judson St	Sectionalizer
		OSC10447	Replace	P31 Legion Rd	Sectionalizer
		OSC41616	Replace	P157 Park Lawn Rd	TP 30M8/38M13
		OSL1646	Replace	P177 Evans Ave	TP 30M8/30M1
30M9	W13379	New Switch 30M9_2	Replace	P2988 Lake Shore Blvd W	Sectionalizer
		New Switch 30M9_3	Replace	P2884 Lake Shore Blvd W	Sectionalizer
		New Switch 30M9_4	Replace	P11 Royal York Rd	Sectionalizer
		New Switch 30M9_1	Replace	P452 Kipling Ave	Riser Switch
		OSC67457	Replace	P100 Birmingham Ave	Sectionalizer
		OSC8146	Upgrade	P197 Royal York Rd	TP 30M9/30M4
		OSC93977	Upgrade	P3146 Lake Shore Blvd W.	TP 30M9/30M10
		OSL89332	Replace	P456 Kipling Ave	TP 30M9/30M1
38M12	W13380	New Switch 38M12_1	Replace	P1005 The Queensway	Sectionalizer
		OS38668	Replace	P87 Kipling Ave	Riser
		OSC10670	Replace	P787 The Queensway	TP 38M12/30M1
		OSC35254	Upgrade	P651 Kipling Ave	Sectionalizer
		OSL37500	Replace	P589 Kipling Ave	TP 38M12/30M3

**ICM Project | Feeder Automation**

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Feeder Automation 2012 - Etobicoke - Manby T. S. and Horner T. S.					
Feeder	Scope	Switch ID	Type	Location	Notes
38M4	W13384	OS98419	Replace	P67 North Queen St	Riser Switch
		OSC12081	Replace	P659 Kipling Ave	Sectionalizer
		OSC21749	Replace	P619 Kipling Ave	TP 38M4/30M1
		OSL55267	Replace	P723 Kipling Ave	TP 38M4/38M12
38M5	W13383	OS32405	Replace	P840 Kipling Ave	Riser Switch
		OSC58580	Upgrade	P888 Islington Ave	TP 38M5/30M1
		OS42073	Replace	P197 Norseman St	Sectionalizer
38M8	W13381	OS23912	Replace	P820 Kipling Ave	Riser Switch
		OSC31218	Replace	P1024 Islington Ave	Sectionalizer
		OSC65479	Replace	P65 Jutland Rd	TP 38M8/38M12
		New Switch 38M8_1	Replace	P245 Norseman St	TP 38M8/38M5

**ICM Project | Feeder Automation**

1 **3.4. Required Capital Costs**

2

3 **Table 13: 2012 FA Required Capital Costs**

Feeder Automation 2012 - Horner T. S and Manby T. S.			
Project Estimate Number	Project Title	Project Year	Cost Estimate (\$M)
24191	W13384 - 2012 FA - Etobicoke - Manby TS (38M4)	2012	\$0.29
24187	W13383 - 2012 FA - Etobicoke - Manby TS (38M5)	2012	\$0.16
24193	W13381 - 2012 FA - Etobicoke - 38M8	2012	\$0.30
24154	W13380 - 2012 FA - Etobicoke - 38M12	2012	\$0.26
24185	W13379 - 2012 FA - Etobicoke - Horner TS (30M9)	2012	\$0.49
24183	W13377 - 2012 FA - Etobicoke - Horner TS (30M4)	2012	\$0.45
24178	W13375 - 2012 FA - Etobicoke - Horner TS (30M2)	2012	\$0.23
24188	W13378 - 2012 FA - Etobicoke - Horner TS (30M8)	2012	\$0.40
24177	W13371 - 2012 FA - Etobicoke - Horner TS (30M1)	2012	\$0.46
26136	W13483 - FA 2012 - P3 - Etobicoke Repeater Radio Survey/Install	2013	\$0.20
26149	W13485 - P3 - FA 2012 - Etobicoke SAT	2013	\$0.16
<b>Total:</b>			<b>\$3.40</b>

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4 **3.5. Job Business Case Evaluation (BCE) Results**

5 Analyzing the reliability of the selected feeders shows that the outages occurring on the trunk  
 6 have the greatest impact on the customers connected to these feeders. This can be seen in  
 7 Table 14. Even though the number of outages that have occurred on the trunk are less than half  
 8 of the total amount of outages that occur on the feeder, they contribute over 90% of the  
 9 customer hours interrupted (CHI) on these feeders. Managing the trunk outages with self-

## ICM Project | Feeder Automation

1 healing switches is expected to reduce the CHI value on these feeders and also the number of  
 2 customers affected by each outage. This confirms that these feeders are good candidates for  
 3 feeder automation. Carrying out immediate work on these feeders will result in an approximate  
 4 net present value of approximately \$358.39 million as shown in Table 15. The proposed project  
 5 will cost \$3.40 million to implement resulting in a benefit-to-cost ratio of 118.81.

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7 **Table 14: 2012 FA Feeders Reliability History**

Year	Total Feeder Outages			Trunk Outages			Potential FA Savings	
	Number of Outages	CI	CHI	Number of Outage	CI	CHI	CI	CHI
2007	26	3,202	2,392.4	8	2,389	1,289.7	1,792	967.3
2008	23	17,669	23,403.6	11	17,321	22,616.8	12,991	16,962.6
2009	27	22,910	54,133.5	10	17,878	52,369.3	13,409	39,276.9
2010	12	21,141	2,307.0	5	19,667	2,136.8	14,750	1,602.6
2011	17	22,674	19,171.1	6	17,145	18,455.8	12,859	13,841.8
<b>Total</b>	<b>105</b>	<b>87,596</b>	<b>101,407.6</b>	<b>40</b>	<b>74,400</b>	<b>96,868.3</b>	<b>55,800</b>	<b>72,651.2</b>

8 **Table 15: BCE for Horner T.S. and Manby T.S. Job**

Project Location	Project Cost Allocated (\$ M)	Project Net Benefit (\$ M)	Option Benefit/Cost Ratio
Horner TS and Manby TS	\$3.40	\$358.39	118.81

/C

9 **4. 2012 Feeder Automation – Fairchild T.S.**

/US

10

11 **4.1. Job Objectives**

12 The objective of this job is to expand the existing feeder automation network eastward from the  
 13 North York network, incorporating new feeders from Fairchild T.S. The North York network was



## ICM Project | Feeder Automation

1 initiated by a pilot project in 2010. Since the pilot project, THESL has designed two phases to  
 2 incorporate the remainder of Fairbanks T.S. and Bathurst T.S. This job will continue to expand  
 3 this network at Fairchild T.S. to improve customer reliability in this area. This is a mixed use area  
 4 consisting of residential and non-residential customers. This area is also considered one of the  
 5 four centres for development and growth in the city and is planned to include facilities such as  
 6 condominiums and office buildings. An expansion of FA eastward will improve the reliability in  
 7 one of Toronto’s developing neighbourhoods.

8

### 9 **4.2. Job Scope of Work**

10 This scope of work for this job focuses on expanding the FA scheme onto eight feeders from  
 11 Fairchild T.S. This is expected to incorporate these feeders onto the developed FA grid from  
 12 Bathurst T.S. and will contribute to expanding the grid in North York. This will improve switching  
 13 flexibility in the FA scheme. It is expected to establish more restoration options by introducing  
 14 additional tie-points and automating the non-automated tie-points. This job will incorporate 44  
 15 self-healing switches into this network. This figure includes retrofitting 18 existing SCADA  
 16 switches, installing seven new switches and upgrading 19 manual switches as shown in Table 16.

17

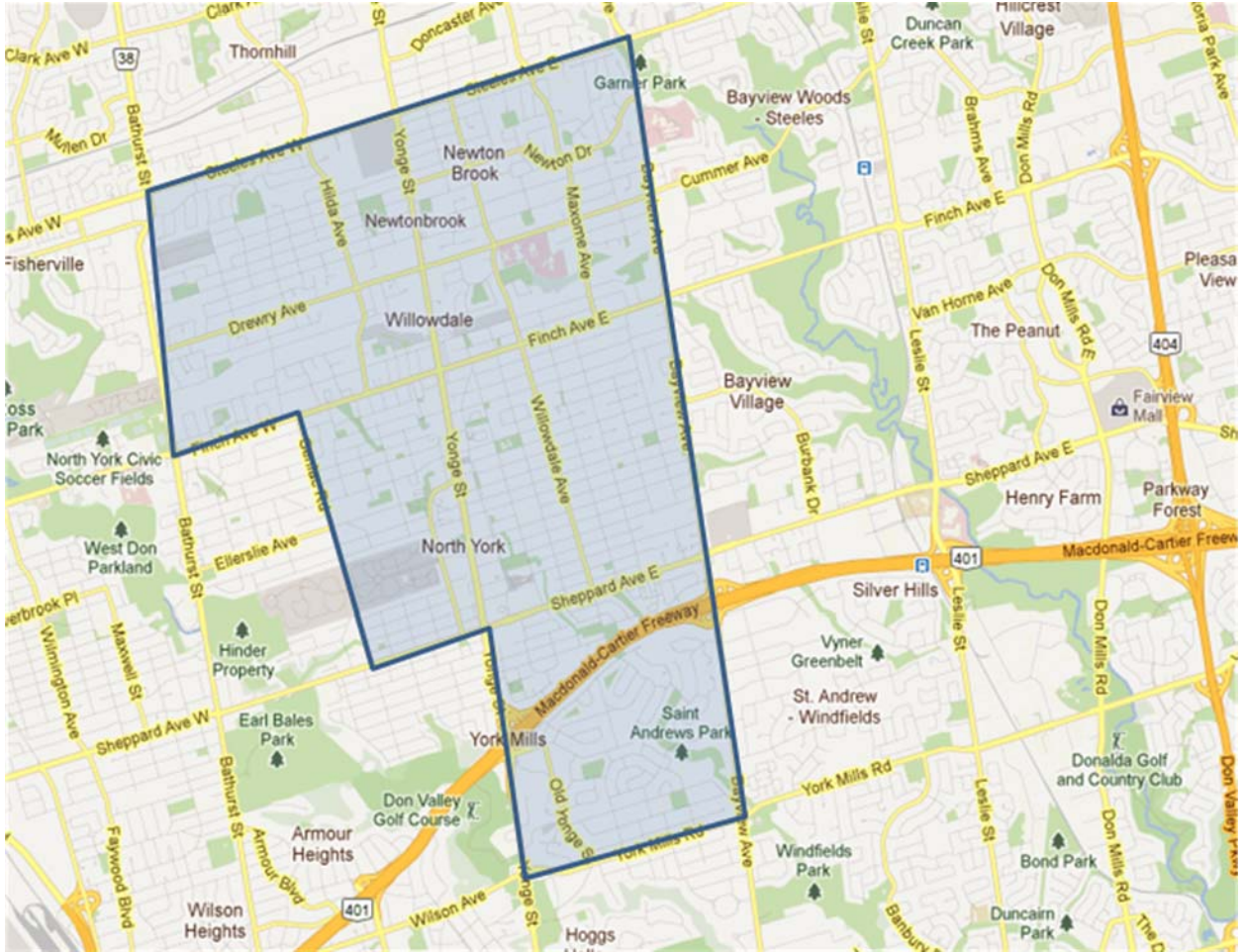
18 **Table 16: 2012 FA Fairchild T.S. Unit Count**

/US

Total of Switch Installations	
Type of Install	Fairchild TS
Retrofit Existing SCADA	18
R1 to R2 Switch Upgrade	0
Install a New Switch	7
Replace Manual Switch	19
<b>Total</b>	<b>44</b>

## ICM Project | Feeder Automation

### 1 4.3. Job Map and Locations



2 Figure 13: 2012 FA Fairchild T.S. Map

/US

**ICM Project | Feeder Automation**

1 **Table 17: 2012 FA Fairchild T.S. Job Breakdown**

/us

2012 Feeder Automation – Fairchild T.S.					
Feeder	Scope Package	Switch ID	Type	Location	Notes
80M2	W13367	OS95875/S1424	Manual	P97 Drewry Ave	Riser on the egress
		LC33	Manual	P85 Drewry Ave	Tie-point 80M4
		OSC3851/S47	R2	P459 Patricia Ave	Sectionalizer
		OSC59862/S186	R2	P5952 Bathurst St	Tie-point 80M8
		New SW1	NEW	P95 Cactus Ave.	Sectionalizer
		New SW2	NEW	P6200 Bathurst St	Sectionalizer
80M4	W13368	OS54675/OSL56852	Manual	P75 Drewry Ave	Riser on the egress
		OSC22676	R2	P61 Cummer Ave	Sectionalizer
		OSC61755	R2	P956 Willowdale Ave	Tie-point 80M6
		OS90738	Manual	P367 Cummer Ave	Sectionalizer
		OSC47012	R2	P497 Cummer Ave	Tie-point 80M21
		New SW2	NEW	P1131 Willowdale Ave	Tie-point 80M21
80M21	W13373	OSL97899	Manual	P309 Steeles Ave W	Tie-point 80M10
		OSC19741	R2	P11 Steeles Ave W	Sectionalizer
		OS77279	Manual	P3587 Bayview Ave	Sectionalizer
		OSC3939	R2	P375 Steeles Ave W	Tie-point 51M3
		OSC67980	R2	P3324 Bayview Ave	Tie-point 80M6
80M6	W13369	OS87184	Manual	P17-2 Hendon Ave.	Sectionalizer
		OSC64725	R2	P851 Willowdale Ave	Sectionalizer
		OSC4679	R2	P338 Willowdale Ave	Sectionalizer
		New SW1	NEW	P218 Willowdale Ave	Sectionalizer
		OSC4778	R2	P110 Willowdale Ave	Tie-point 80M29
80M8	W13370	New SW1	NEW	P5760 Bathurst St	Sectionalizer
		OSC573	R2	P4976 Bathurst St	Tie-point 80M1
		OSC48420	R2	P539 Finch Ave W	Sectionalizer
		OS6680	MANUAL	P75 Grantbrook St.	Sectionalizer
80M1	W13366	OSC7353	R2	P363 Senlac Rd	Sectionalizer
		OSL42108	Manual	P251 Finch Ave.	Sectionalizer
		OSL11444	Manual	P58 Senlac Rd	Sectionalizer
		New SW1	NEW	P28 Greenview Ave.	Sectionalizer
		OS63486	Manual	P205 Churchill Ave.	Sectionalizer
		OSL92822	Manual	P223 Sheppard Ave W	Tie-point 85M27

**ICM Project | Feeder Automation**

/us

2012 Feeder Automation – Fairchild T.S.					
Feeder	Scope Package	Switch ID	Type	Location	Notes
80M29	W13374	OS11106	Manual	P103 Willowdale Ave	Riser on the egress
		OS98881	Manual	P197 Avondale Ave	Sectionalizer
		OS57616	Manual	P229 Upper Highland Cres	Sectionalizer
		OSL44267	Manual	P152 York Mills Rd	Sectionalizer
		OSC9200	R2	P288 York Mills Rd	Tie-point 51M21
		OSC1727	R2	P52 York Mills Rd	Tie-point 85M8
80M10	W13372	OS59180	Manual	P103 Drewry Ave	Riser on the egress
		LC30	Manual	P177 Goulding Ave	Tie-point 80M2
		New SW1	NEW	P127 Hilda Ave	Sectionalizer
		OSC209	R2	P203 Hilda Ave	Sectionalizer
		OSC70288	R2	P160 Cactus Ave	Tie-point 80M2
		OSL39372/S424	Manual	P6168 Bathurst St	Tie-point 80M10

**ICM Project | Feeder Automation**

1 **4.4. Required Capital Costs**

2

3 **Table 18: 2012 FA Fairchild T.S. Job Cost**

/US

Feeder Automation 2012 - Fairchild T. S.			
Project Estimate Number	Project Title	Project Year	Cost Estimate (\$M)
24192	W13367 - 2012 FA - North York - Fairchild TS (80M2)	2012	\$0.34
24195	W13368 - 2012 FA - North York - Fairchild TS (80M4)	2012	\$0.34
24199	W13374 - 2012 FA - North York - Fairchild TS (80M29)	2012	\$0.39
24200	W13366 - 2012 FA - North York - Fairchild TS (80M1)	2012	\$0.42
24196	W13369 - 2012 FA - North York - Fairchild TS (80M6)	2012	\$0.23
24197	W13370 - 2012 FA - North York - Fairchild TS (80M8)	2012	\$0.19
24198	W13372 - 2012 FA - North York - Fairchild TS (80M10)	2013	\$0.24
24194	W13373 - 2012 FA - North York - Fairchild TS (80M21)	2012	\$0.27
26147	W13484 - P3 - FA 2012 Fairchild TS - Survey/Repeater Radio Installation	2013	\$0.19
26150	W13486 - P3 - FA 2012 Fairchild TS SAT	2013	\$0.16
<b>Total:</b>			<b>\$2.78</b>

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4 **4.5. Job Business Case Evaluation (BCE) Results**

5 Deploying a feeder automation scheme on these feeders can significantly reduce the impact of  
 6 the outages on the feeder trunk and the number of customers that would otherwise experience  
 7 a sustained outage. These reliability improvements are expected to become even more  
 8 significant based on the development that is occurring in this area. Significant customer growth  
 9 is occurring in both residential and non-residential load.

10

11 Beyond reliability benefits, this job is also necessary to expand the effectiveness of previous FA  
 12 installations nearby. Thus it not only is expected to improve reliability for the customers on the  
 13 targeted feeders, but also will improve performance on the existing automated feeders that  
 14 currently have non-automated tie-points. Carrying out immediate work on these feeders will  
 15 result in an approximate net present value of approximately \$211.58 million. The proposed

/UF

## ICM Project | Feeder Automation

- 1 project will cost \$2.78 million to implement and it is expected to provide a benefit-to-cost ratio /UF  
 2 of 84.38 as shown in Table 19. /UF

3

4 **Table 19: BCE for Fairchild T.S. Job**

Project Location	Project Cost Allocated (\$ M)	Project Net Benefit (\$ M)	Option Benefit/Cost Ratio
Fairchild TS	\$2.78	\$211.58	84.38

/c

5 **Table 20: 2012 FA Fairchild T.S. Feeder Reliability** /us

Year	Total Feeder Outages			Trunk Outages			Potential FA Savings	
	Number of Outages	CI	CHI	Number of Outage	CI	CHI	CI	CHI
2007	60	47,817	25,539.3	21	37,395	16,059.4	28,046	12,044.5
2008	45	33,673	32,950.4	9	16,549	19,375.3	12,412	14,531.5
2009	32	23,929	19,526.2	11	20,767	8,809.0	15,575	6,606.8
2010	38	32,494	23,486.9	10	11,958	7,516.3	8,969	5,637.2
2011	15	6,235	13,639.4	4	3,661	3,404.2	2,746	2,553.1
<b>Total</b>	<b>190</b>	<b>144,148</b>	<b>115,142.2</b>	<b>55</b>	<b>90,330</b>	<b>55,164.1</b>	<b>67,748</b>	<b>41,373.1</b>

**ICM Project** | **Feeder Automation**

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**ICM Project** | **Feeder Automation**

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**ICM Project** | **Feeder Automation**

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## ICM Project | Feeder Automation

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/c

1     **5.       2013 Feeder Automation – Scarborough East T.S.**

/us

2

3     **5.1.    Job Objectives**

4     The objective of this job is to continue expanding the Scarborough feeder automation network  
5     and proactively mitigate the risk of a future outage in this area of the city. This job will expand  
6     the FA network to include Scarborough East T.S. This feeder automation network is slated for  
7     construction for 2013, and is to be the take off point for additional expansion in the east end of  
8     Toronto. This job will upgrade 14 feeders and incorporate them into the Scarborough FA  
9     network that is to be created in 2012.

10

11    **5.2.    Job Scope of Work**

12    The scope of work for this job is to incorporate 14 feeders onto the FA scheme from  
13    Scarborough East T.S. This will continue expansion of the FA network from the proposed job in  
14    the east end of Toronto. This job will provide improved operational flexibility and efficiency by  
15    expanding on the FA scheme. This job is designed to incorporate 71 self-healing switches into  
16    this network. This figure will include retrofitting 14 existing SCADA switches, installing 14 new

## ICM Project | Feeder Automation

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1 switches installed, and upgrading 43 manual switches as shown in Table 26. This job will create  
2 a significant improvement of feeder functionality and the ability to restore service after an  
3 outage.

4

5 **Table 26: 2013 FA Scarborough East Unit Count**

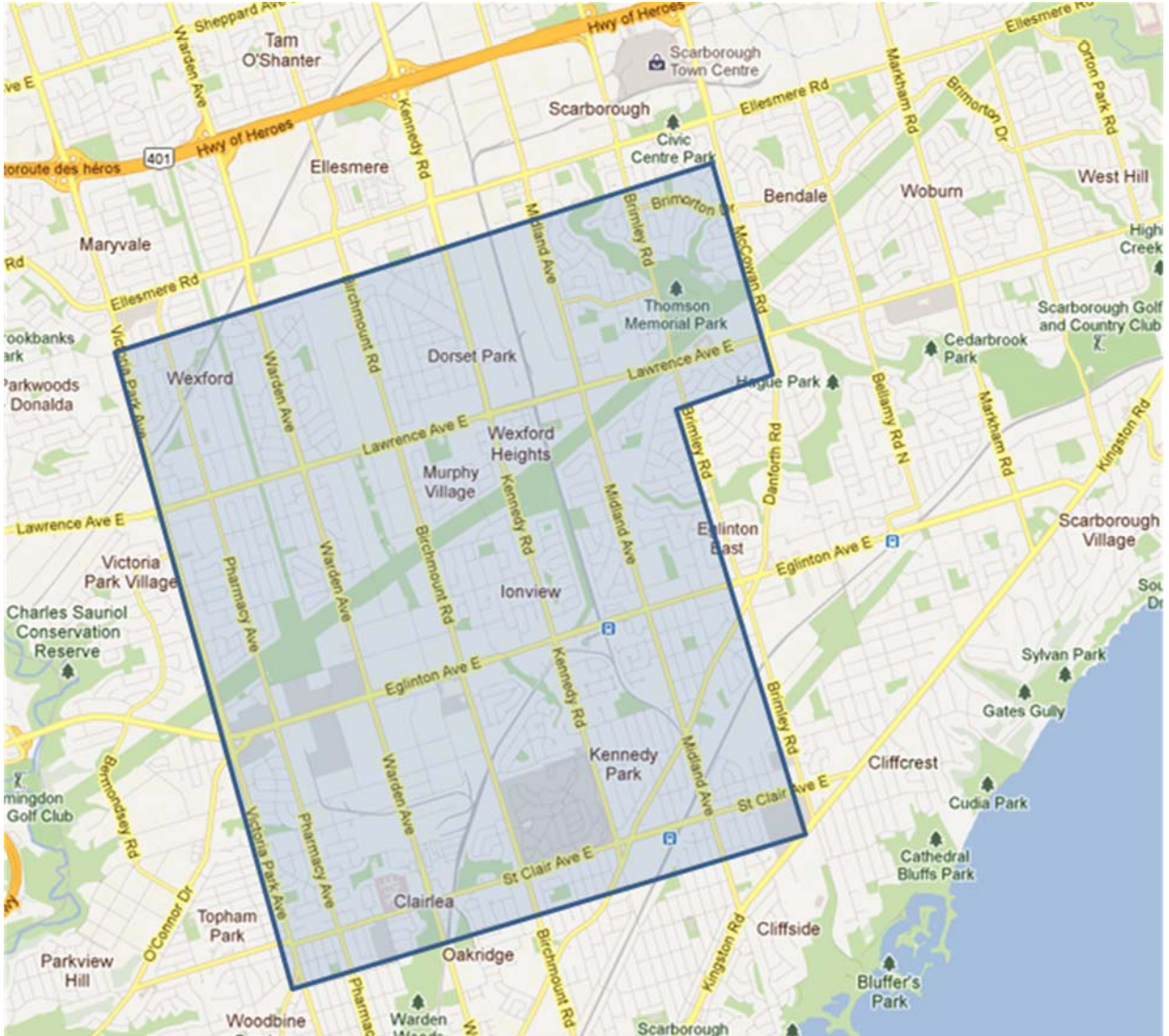
/us

Total of Switch Installations	
Type of Install	Scarborough East T.S.
Retrofit Existing SCADA	14
R1 to R2 Switch Upgrade	0
RTU Upgrade	0
Install a New Switch	14
Replace Manual Switch	43
<b>Total</b>	<b>71</b>



## ICM Project | Feeder Automation

### 1 5.3. Job Map and Locations



2 Figure 15: 2013 FA Scarborough T.S. East Map

/us

**ICM Project | Feeder Automation**

1 **Table 27: 2013 FA Scarborough Job Breakdown**

<b>Feeder Automation 2013 - Scarborough East T.S.</b>					
<b>Feeder</b>	<b>Scope Package</b>	<b>Switch ID</b>	<b>Type</b>	<b>Location</b>	<b>Notes</b>
E5M2	E14387	OS28708	Replace	P939-4A Kennedy Rd	Sectionalizer
		OSL26434	Replace	P100 Thermos Rd	Tie point E5M1
		OSC11803	Upgrade	P49 Bertrand Ave	Tie point R43M25
		OSL2215	Replace	P10 Ashtonbee Rd	Sectionalizer
		OSL939	Replace	P14-F Ashtonbee Rd	Sectionalizer
		OSC-1	New Switch	P14-F Ashtonbee Rd	Sectionalizer
		OSC-1	New Switch	22-238 Ashtonbee Rd	Sectionalizer
E5M4	E14388	OS2871	Replace	P939-4D Kennedy Rd	Sectionalizer
		OSL46348	Replace	P1568 Pharmacy Ave	Tie point 502M24
		LC28474	Replace	P911-2 Hydro One Row	Tie point E5M8
		OSL26066	Replace	P14 Underwriters Rd	Tie point E5M9
		23LIS-7	Replace	23-447 Warden Ave	Sectionalizer
		OSL26219	Replace	P17-12 Hydro One Row	Sectionalizer
E5M6	E14389	OS28715	Replace	P939-4B Kennedy Rd	Sectionalizer
		OSL22275	Replace	P1535-6 Hydro One Row	Tie point E5M6
		OS44769	Replace	3-283 Victoria Park Ave	Tie point 53M5
		OSC10521	Upgrade	P630 Pharmacy Ave	Tie point R43M27
		OSC-1	New Switch	P863 Pharmacy Ave	Sectionalizer
		OSC-1	New Switch	P12-320 Pharmacy Ave	Sectionalizer

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**ICM Project | Feeder Automation**

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<b>Feeder Automation 2013 - Scarborough East T.S.</b>					
<b>Feeder</b>	<b>Scope Package</b>	<b>Switch ID</b>	<b>Type</b>	<b>Location</b>	<b>Notes</b>
E5M8	E14390	OSL21776	Replace	P911-1 Hydro One Row	Sectionalizer
		OSL21775	Replace	P1723-A Victoria Park Ave	Tie point 53M6
		OSC11234	Upgrade	P1987 Lawrence Ave E.	Tie point E5M9
		OSC32426	Upgrade	P1313 Pharmacy Ave	Tie point E5M4
		OSC-1	New Switch	P13-197 Wexford Blvd	Sectionalizer
E5M10	E14391	OS25242	Replace	P2251-A Lawrence Ave E.	Sectionalizer
		OS25198	Replace	P2265 Lawrence Ave E.	Tie point E5M29
		OSL47932	Replace	P9 Rolark Dr	Tie point E5M9
		OSC-1	New Switch	24-354 Birchmount Rd	Sectionalizer
		OSC-1	New Switch	P1502 Birchmount Rd	Sectionalizer
E5M21	E14392	OSL31983	Replace	P3 LRT	Sectionalizer
		OSC15342	Upgrade	P1061 Ellesmere Serv Rd SE.	Tie point E5M29
		OS61429	Replace	P1423 Ellesmere Rd	Sectionalizer
		SUG-426 S1	Replace		Tie point H9M28
		OSC-1	New Switch	P1175 Ellesmere Rd	Sectionalizer
E5M22	E14393	OSL32181	Replace	P4 LRT	Sectionalizer
		OSL33477	Replace	P824 Midland Ave	Tie point E5M5
		OSL3600	Replace	P744 Brimley Rd	Sectionalizer
		OSC3515	Upgrade	56-35 Brimley Rd	Sectionalizer

**ICM Project | Feeder Automation**

/US

<b>Feeder Automation 2013- Scarborough East T.S.</b>					
<b>Feeder</b>	<b>Scope Package</b>	<b>Switch ID</b>	<b>Type</b>	<b>Location</b>	<b>Notes</b>
E5M23	E14394	OSL32429	Replace	P2 LRT	Sectionalizer
		OSC2007	Upgrade	P821 Brimley Rd	Tie point E5M22
		OSC9874	Upgrade	65-45 McCowan Rd	Tie point H9M28
		OSC-1	New Switch	3051-A Lawrence Ave E.	Sectionalizer
E5M24	E14395	OSL51826	Replace	P878-B Lawrence Ave E.	Sectionalizer
		OSL51903	Replace	P878-A Lawrence Ave E.	Tie point E5M23
		OSC47319	Upgrade	P374 Progress Ave	Tie point E5M26
		OSL52191	Replace	P1630 Brimley Rd	Sectionalizer
		OSC46418	Upgrade	P1988 Brimley Rd	Tie point 502M32
E5M25	E14396	OS34127	Replace	P805 Brimley Rd	Sectionalizer
		OSL3728	Replace	P255-C Brimley Rd	Tie point E5M22
		OSC36264	Upgrade	P111 Brimley Rd	Tie point R43M29
		OSC-1	New Switch	P55-152 Brimley Rd	Sectionalizer
E5M26	E14397	OSL3276	Replace	P21 Lawrence Serv Rd SW.	Sectionalizer
		OSL49694	Replace	P2160 Midland Ave	Sectionalizer
		PSC32511	Upgrade		Tie point 502M26
		OS58147	Replace	P34 Progress Ave	Sectionalizer
		OSC40834	Upgrade	P2190 Midland Ave	Tie point 63M5
		OSC-1	New Switch	P42-175 Progress Ave	Sectionalizer

**ICM Project | Feeder Automation**

<b>Feeder Automation 2013- Scarborough East T.S.</b>					
<b>Feeder</b>	<b>Scope Package</b>	<b>Switch ID</b>	<b>Type</b>	<b>Location</b>	<b>Notes</b>
E5M27	E14398	OSL32839	Replace	P11 Lawrence Serv Rd	Sectionalizer
		OSL48418	Replace	P506 Midwest Rd	Tie point E5M26
		OSL34944	Replace	P2759 Lawrence Ave E.	Tie point E5M23
		OSL51479	Replace	P1925 Midland Ave	Tie point E5M21
		OSC-1	New Switch	49-571 Midland Ave	Sectionalizer
		OSC-1	New Switch	P200 Midwest Rd	Sectionalizer
E5M29	E14399	OSL32855	Replace	P1041 Kennedy Rd	Sectionalizer
		OSL48363	Replace	P1164 Kennedy Rd	Tie point E5M30
		OS55079	Replace	P2 Munham Gate	Sectionalizer
		OSC-1	New Switch	32-33 Kennedy Rd	Sectionalizer
E5M30	E14400	OSL3313	Replace	P1035 Kennedy Rd	Sectionalizer
		OSC40880	Replace	P1933 Kennedy Rd	Tie point E5M29
		OSC38185	Upgrade	32-48 Ellesmere Rd	Tie point E5M10
		OSL47935	Replace	P1428 Kennedy Rd	Sectionalizer

/us

**ICM Project | Feeder Automation**

1 **5.4. Required Capital Costs**

2

3 **Table 28: 2013 FA Scarborough Job Cost Feeder Automation– Scarborough East T.S.**

/US

<b>2013 FA Scarborough East T.S.</b>			
<b>Project Estimate Number</b>	<b>Project Title</b>	<b>Project Year</b>	<b>Cost Estimate (\$ M)</b>
24675	E14387-P03 East Feeder Automation SCNAE5M2	2013	\$0.73
24680	E14388-P03 East Feeder Automation SCNAE5M4	2013	\$0.68
24681	E14389-P03 East Feeder Automation SCNAE5M6	2013	\$0.62
24685	E14390-P03 East Feeder Automation SCNAE5M8	2013	\$0.46
24689	E14391-P03 East Feeder Automation SCNAE5M10	2013	\$0.55
24709	E14392-P03 East Feeder Automation SCNAE5M21	2013	\$0.59
24690	E14393-P03 East Feeder Automation SCNAE5M22	2013	\$0.40
24704	E14394-P03 East Feeder Automation SCNAE5M23	2013	\$0.35
24691	E14395-P03 East Feeder Automation SCNAE5M24	2013	\$0.47
24699	E14396-P03 East Feeder Automation SCNAE5M25	2013	\$0.40
24730	E14397-P03 East Feeder Automation SCNAE5M26	2013	\$0.61
24700	E14398-P03 East Feeder Automation SCNAE5M27	2013	\$0.67
24732	E14399-P03 East Feeder Automation SCNAE5M29	2013	\$0.45
24702	E14400-P03 East Feeder Automation SCNAE5M30	2013	\$0.40
23912	E12679-East 2013 FA Repeater Radio Installation for Scarborough TS	2013	\$0.28
<b>Total:</b>			<b>\$7.66</b>

/c

/US

4 **5.5. Job Business Case Evaluation (BCE) Results**

/c

5 Historically, these feeders have performed poorly and have had consistent outages on the trunk.  
 6 There was some reliability improvement seen in 2011, however, this appears to be an anomaly  
 7 and THESL anticipates that the feeder’s future reliability will return to the levels experienced in

## ICM Project | Feeder Automation

1 prior years (See Table 3). Feeder Automation is a proactive solution that will mitigate the  
 2 impact of a trunk outage to the customers on these feeders. Furthermore, expanding the  
 3 Scarborough network will create a tighter more robust design with the existing feeders and  
 4 assist in incorporating future FA. The feeders in this area of Toronto require modernization  
 5 because the majority of them have only a few remote switches and the majority of switching  
 6 operations require manual intervention. Carrying out immediate work on these feeders will  
 7 result in an approximate net present value of approximately \$416.55 million. The proposed  
 8 project will cost \$7.66 million to implement and it will provide a benefit-to-cost ratio of 57.47 as  
 9 shown in Table 29. } /UF, /C

10

11 **Table 29: BCE of Scarborough East T.S.**

Project Location	Project Cost Allocated (\$ M)	Project Net Benefit (\$ M)	Option Benefit/Cost Ratio	/C
Scarborough East T.S.	\$7.66	\$416.55	57.47	/UF

12 **Table 30: 2013 FA Scarborough East T.S. Feeder Reliability**

/US

Year	Total Feeder Outages			Total Trunk Outages			Potential FA Savings	
	Number of Outages	CI	CHI	Number of Outages	CI	CHI	CI	CHI
2007	24	23,812	8,676.0	12	23,662	8,451.3	17,747	6,338.5
2008	14	14,177	6,794.5	7	11,009	6,058.2	8,257	4,543.7
2009	19	52,894	50,768.7	11	40,523	39,570.5	30,392	29,677.9
2010	26	29,572	13,527.2	13	22,667	10,029.0	17,000	7,521.8
2011	11	6,730	8,652.4	2	2,915	1,782.0	2,186	1,336.5
<b>Total</b>	<b>94</b>	<b>127,185</b>	<b>88,418.8</b>	<b>45</b>	<b>100,776</b>	<b>65,891.0</b>	<b>75,582</b>	<b>49,418.3</b>

## ICM Project | Feeder Automation

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- 1 failure which include direct and indirect cost attributes associated with in-service  
2 asset failures, costs of customer interruptions, emergency repairs and replacement.
- 3 ○ NAR2 represents the NPV calculation of non-asset risks associated with the new  
4 state, taking into account for the effects of Feeder Automation on the impact cost of  
5 non-asset incidents. Further explanation of the Non-Asset Risk calculation is  
6 provided in Section 5.2.

7

8 The overall project net present value is calculated as per the following formula shown below:

- 9 •  $\text{Project NPV} = (\text{COO}_E - \text{COO}_N) - \text{Project Cost}$ , which is shown as “Project Net Benefit” in  
10 Tables D.1 through D.4, below. /c

11 The benefit-cost ratio is calculated as per the following formula shown below:

- 12 •  $\text{Benefit-Cost Ratio} = (\text{COO}_E - \text{COO}_N) / \text{Project Cost}$

13

14 Thus, the Project NPV value reflects the difference in the cost of ownership between the existing  
15 construction and new construction, after the total cost of the project has been subtracted.

16

17 The Tables below show the BC ratios for the work proposed in the various areas. Tables D.1  
18 through D.4 show the B/C ratios for each of the specific jobs proposed. /c



**ICM Project | Feeder Automation**

1 **Table D.1: BCE of Cavanagh T.S. and Agincourt T.S. Job**

Project Location	Project Cost Allocated (\$ M)	Project Net Benefit (\$ M)	Option Benefit/Cost Ratio
Cavanagh TS and Agincourt TS	\$7.82	\$861.34	111.14

/c

2 **Table D.2: BCE for Horner T.S. and Manby T.S. Job**

Project Location	Project Cost Allocated(\$ M)	Project Net Benefit (\$ M)	Option Benefit/Cost Ratio
Horner TS and Manby TS	\$3.40	\$358.39	118.81

/c

**ICM Project | Feeder Automation**

1 **Table D.3: BCE for Fairchild T.S. Job**

Project Location	Project Cost Allocated (\$ M)	Project Net Benefit (\$ M)	Option Benefit/Cost Ratio
Fairchild TS	\$2.78	\$211.58	84.38

} /c

2 **Table D.4: BCE of Scarborough East T.S.**

Project Location	Project Cost Allocated (\$ M)	Project Net Benefit (\$ M)	Option Benefit/Cost Ratio
Scarborough East T.S.	\$7.66	\$416.55	57.47

} /c

# ICM Project

## Metering

### Wholesale Metering Market

#### Settlement Compliance



Market Rules

### Chapter 6 Wholesale Metering

### Seal Expiring Meters



 Measurement Canada / Mesures Canada  
An Agency of Industry Canada / Un organisme de Industrie Canada

#### Specifications

Category: STATISTICAL METHODS	Specification: S-S-06
Document(s):	Issue Date: 2010-xx-xx
	Supersedes: PS-S-04, LMB-E

Sampling Plans for the Inspection of Isolated Lots of Meters in Service

Toronto Hydro-Electric System Limited (THESL)



## ICM Project | Metering

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- 1 **SUMMARY OF CHANGES IN THE UPDATE**
- 2 • Reduced 2012-2013 budget by \$0.32 M
- 3 • 2014 jobs and spending shown in strike-through
- 4 • Corrected numerical and typographical errors

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1 **1.3. C. Summary of Relief Requested**

2 The estimated incremental cost of completing these measures in the 2012-2013 period (which /US  
 3 costs are not covered by PCI funded rates) are:

Item	2012	2013	2014	Total
Wholesale Metering Market Settlement Compliance	\$1.0M	\$6.3M	<del>\$9.1M</del>	\$7.3M
Seal Expiring Meters	\$5.0M	\$0.9M	<del>\$1.0M</del>	\$5.9M
<b>2012-2013 Total</b>	<b>\$6.0M</b>	<b>\$7.2M</b>	<b><del>\$10.1M</del></b>	<b>\$13.2M</b>

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4 **2. Why the Project is Needed Now**

5

6 **2.1. Wholesale Metering Market Settlement Compliance**

7 THESL's legacy transformer replacement efforts in 2012-2014 is required to ensure THESL  
 8 completes the upgrades to its delivery points in 2012, 2013 and 2014 necessary to complete full  
 9 meter upgrades at all applicable delivery points by 2021 in accordance with its IESO approved  
 10 proposal. These upgrades are required in response to the following two drivers:

- 11 (i) In order to remain in compliance with the Independent Electricity System Operator  
 12 (IESO) Market Rules, THESL is required to replace its legacy transformers with modern  
 13 instrument transformers (current transformers and potential transformers) to ensure its  
 14 wholesale metering points meet all of the criteria set forth in the Market Manuals  
 15 (MDP\_PRO\_0022) and the Market Rules (MDP\_RUL\_0002\_06 and  
 16 MDP\_RUL\_0002\_06A). THESL has committed to a long-term plan with the IESO to  
 17 complete full meter upgrades at all applicable delivery points by 2021. This plan was  
 18 initiated by way of a letter to the IESO on August 11, 2009 and approved by the IESO on  
 19 November 27, 2009. Once wholesale metering upgrades are complete (currently  
 20 scheduled to continue through 2021), there will be a total of 223 meter installations  
 21 upgraded (of which 87 have been completed prior to 2012, 67 will be addressed in  
 22 2012-2014 (the request that is subject of this ICM filing), leaving 69 metering upgrades

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1 for the treatment of compliance issues by both Market Participants and the  
 2 IESO.

3  
 4 THESL views this work as non-discretionary work that is required to remain compliant with the  
 5 requirements of Measurement Canada and the IESO Market Rules. THESL should perform the  
 6 work in accordance with the schedule outlined in Table 2. Any delay in this scope of work could  
 7 easily delay the overall implementation of compliant wholesale metering across the entire  
 8 THESL service territory. If the IESO does not perceive progress on this compliance effort, this  
 9 could in turn result in fines if THESL is found to be in non-compliance with the IESO Mark Rules  
 10 that could range from \$10,000 to more than \$100,000 for each wholesale transformer station  
 11 depending on the number of meters and metering equipment in breach. THESL would incur  
 12 these penalties in addition to the requirements to perform this work should THESL fail to stay on  
 13 schedule. The fines/penalties would escalate if THESL does not address any Market Rules  
 14 breaches expeditiously to the point of suspension or termination of THESL’s Market Participant  
 15 status.

16  
 17 THESL will upgrade meter installations by replacing instrument transformers and meters,  
 18 installing and splitting existing metering points such that each individual delivery point has a  
 19 dedicated meter. The number of upgrades required in each of 2012 and 2013 ~~and 2014~~ is  
 20 provided in Table 1 below.

21  
 22 **Table 1: Wholesale Metering Upgrades**

	<b>Test Year 2012</b>	<b>Test Year 2013</b>	<del><b>Test Year 2014</b></del>	<b>2012-2013 Total</b>
Number of Wholesale Metering Points	6	28	<del>33</del>	34

23 A detailed schedule of wholesale metering upgrades by location is provided in Table 2 below.

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1 **Table 2: Wholesale Metering Upgrades by Location**

Job Estimate Number	Job Title	Job Year	Cost Estimate (\$M)
TH4038	IESO Compliant Metering at Leslie TS ( T4J and T4Q)	2012	\$0.66
P0057669	IESO Compliant Metering at Strachan TS (T15-A9A10 and T13-A9A10)	2012	\$0.18
P0055759	IESO Compliant Metering at Wiltshire TS (T5-A11A12 and T2-A11A12)	2012	\$0.18
TH 7009	IESO Compliant Metering at Bermondsey TS (T1J, T1Q, T2J, T2Q, T3B, T3Y, T4B, T4Y)	2013	\$1.80
TH7006	IESO Compliant Metering at Scarboro TS (T21J, T21Q, T22J, T22Q, T23B, T23Y, T24B, T24Y)	2013	\$1.80
TH7010	IESO Compliant Metering at Dufferin TS (T2A5A6, T2A7A8, T4A5A6, T4A7A8)	2013	\$0.90
TH7015	IESO Compliant Metering at Fairbank TS (Y Bus, Z Bus, B Bus, Q Bus)	2013	\$0.90
TH7007	IESO Compliant Metering at Ellesmere TS (T3J, T3Q, T4J, T4Q)	2013	\$0.90
TH7021	IESO Compliant Metering at Gerrard TS (T1A4A5, T2A2A2, T3A1A2 and T4A4A5)	2014	\$1.00
TH7017	IESO Compliant Metering at Warden TS (J Bus and Q Bus)	2014	\$0.40
TH7008	IESO Compliant Metering at Basin TS (T3A5A6, T3A7A8, T5A5A6, T5A7A8)	2014	\$1.00
TH7013	IESO Compliant Metering at Main TS (T3 and T4)	2014	\$1.20
TH7005	IESO Compliant Metering at Manby TS (T13 and T14)	2014	\$0.50
TH7016	IESO Compliant Metering at Runnymede TS (T3 and T4)	2014	\$0.50

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<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Job Year</b>	<b>Cost Estimate (\$M)</b>
TH7011	IESO Compliant Metering at Bridgman TS (T5 and T11)	2014	\$1.00
TBD	IESO Compliant Metering at Leaside TS (M1, M2, M3, M4, M8, T19, T20, T21)	2014	\$1.80
TBD	IESO Compliant Metering at Esplanade TS (M11, M12, M13)	2014	\$0.70
TBD	IESO Compliant Metering at Terauley TS (T2, T3)	2014	\$0.50
TBD	IESO Compliant Metering at Strachan TS (T13, T15)	2014	\$0.50
<b>2012-2013</b>	<b>Total ICM Metering projects</b>	<b>Total:</b>	<b>\$7.32</b>

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1 **2. Seal Expiring Meters**

2 THESL is required to comply with the metering requirements set out by Measurement Canada in  
 3 Sections 9, 11 and 12 of the *Electricity and Gas Inspection Act*. These requirements state that all  
 4 meters must be resealed at specific intervals in order to ensure that a customer's electricity use  
 5 is being metered accurately.

6

7 Specifically:

8 Subsection 9(1) provides:

9 "Subject to subsections (2) and (3), where a contractor or purchaser intends  
 10 to use or cause to be used a meter for the purpose of obtaining the basis of  
 11 a charge for electricity or gas supplied by or to him, the meter shall not,  
 12 until it has been verified and sealed in accordance with this Act and the  
 13 regulations, be put into service."

14

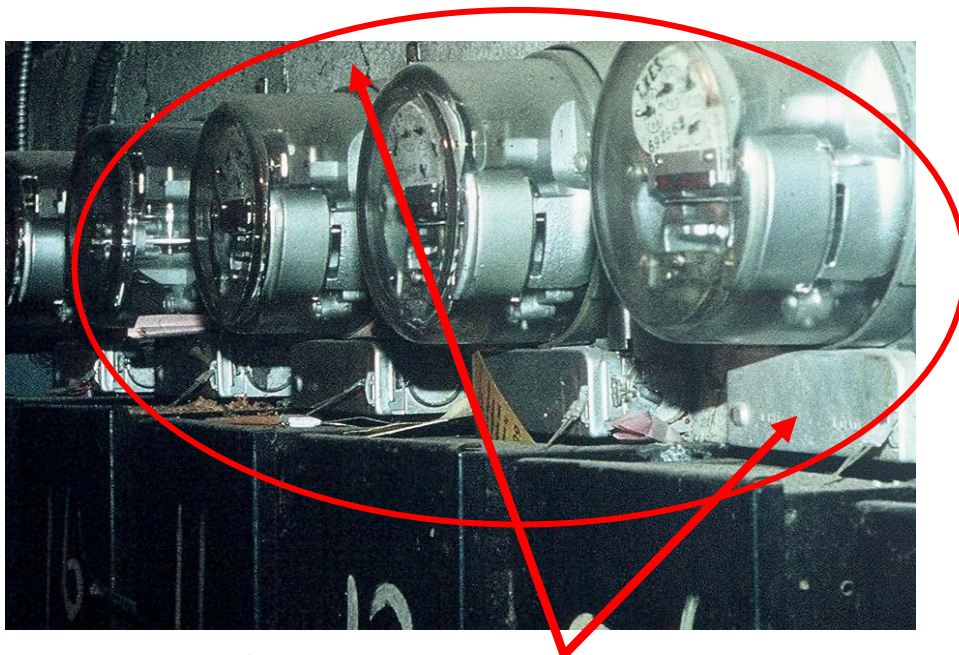
15 Subsection 11(2) provides:

16 "Any approval granted under subsection 9(3) or (4) or accreditation granted  
 17 under section 10 may, by notice given in prescribed manner, be revoked by



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1 As noted above, some of the meters are mounted on asbestos backer boards (See Figure 4,  
2 Figure 5 and Figure 6 for illustrative examples) and it is prudent for THESL to remove this  
3 potential hazard when completing the meter replacement. This is expected to mitigate, if not  
4 eliminate this safety issue, as any activity to change or by-pass these meters may result in /c  
5 creation of asbestos air-born particles, which present a potential safety risk to THESL crews and  
6 to the public. Furthermore, if a meter with an asbestos board fails it may not be possible to  
7 replace immediately on a reactive basis, resulting in an extended power outage to the customer.



10 **Figure 4: Example of Meters installed on Asbestos Backer Boards #1**

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1 **III DESCRIPTION OF WORK**

2

3 **1. Listing of all Jobs**

<b>Project Estimate Number</b>	<b>Job Title</b>	<b>Job Year</b>	<b>Cost Estimate (\$M)</b>
TH4038	IESO Compliant Metering at Leslie TS ( T4J and T4Q)	2012	\$0.66
P0057669	IESO Compliant Metering at Strachan TS (T15-A9A10 and T13-A9A10)	2012	\$0.18
P0055759	IESO Compliant Metering at Wiltshire TS (T5-A11A12 and T2-A11A12)	2012	\$0.18
25315 25316	ICM re-verification/reseal	2012	\$5.0
TH7009	IESO Compliant Metering at Bermondsey TS (T1J, T1Q, T2J, T2Q, T3B, T3Y, T4B, T4Y)	2013	\$1.80
TH7006	IESO Compliant Metering at Scarborough TS (T21J, T21Q, T22J, T22Q, T23B, T23Y, T24B, T24Y)	2013	\$1.80
TH7010	IESO Compliant Metering at Dufferin TS (T2A5A6, T2A7A8, T4A5A6, T4A7A8)	2013	\$0.90
TH7015	IESO Compliant Metering at Fairbank TS (Y Bus, Z Bus, B Bus, Q Bus)	2013	\$0.90
TH7007	IESO Compliant Metering at Ellesmere TS (T3J, T3Q, T4J, T4Q)	2013	\$0.90
24983	2013 RC4250 Re-verification Meter Replacement New	2013	\$0.90
TH7021	IESO Compliant Metering at Gerrard TS (T1A4A5, T2A2A2, T3A1A2 and T4A4A5)	2014	\$1.00
TH7017	IESO Compliant Metering at Warden TS (J Bus and Q Bus)	2014	\$0.40

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Project Estimate Number	Job Title	Job Year	Cost Estimate (\$M)
TH7008	IESO Compliant Metering at Basin TS (T3A5A6, T3A7A8, T5A5A6, T5A7A8)	2014	\$1.00
H7013	IESO Compliant Metering at Main TS (T3 and T4)	2014	\$1.20
TH7005	IESO Compliant Metering at Manby TS (T13 and T14)	2014	\$0.50
TH7016	IESO Compliant Metering at Runnymede TS (T3 and T4)	2014	\$0.50
TH7011	IESO Compliant Metering at Bridgman TS (T5 and T11)	2014	\$1.00
TBD	IESO Compliant Metering at Leaside TS (M1, M2, M3, M4, M8, T19, T20, T21)	2014	\$1.80
TBD	IESO Compliant Metering at Esplanade TS (M11, M12, M13)	2014	\$0.70
TBD	IESO Compliant Metering at Terauley TS (T2, T3)	2014	\$0.50
TBD	IESO Compliant Metering at Strachan TS (T13, T15)	2014	\$0.50
24985	2014 RC4250 Re-verification Meter Replacement New	2014	\$1.00
<b>2012-2013 Total:</b>			<b>\$13.2</b>

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1 **2. Proposal for Leslie TS – Replace T4J and T4Q Wholesale Revenue Metering**

2

3 **2.1. Job Objectives**

4 THESL is the MSP and intends to exit from Hydro One Networks Inc. (HONI)-owned wholesale  
 5 revenue metering installations. THESL intends to abandon the metering installations and build  
 6 new low voltage installations. This proposal is for the work associated with de-registering the

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1 existing two wholesale revenue metering points and with making ready two new fully compliant  
 2 IESO wholesale metering installations.

3  
 4 **2.2. Job Scope of Work**

5 The switchyard site is a 230/27.6 kV transformer station supplying local loads. There are two  
 6 transformers, designated as T4J and T4Q connected via 230kV lines. Both transformers T4J and  
 7 T4Q are the subject of this revenue metering upgrade.

8  
 9 **2.3. Location**

10 The assets being replaced are located at Leslie TS, 5655 Leslie Street, Toronto, Ontario, M2H  
 11 1W6.

12  
 13 **2.4. Required Capital Costs**

Estimate Number	Job Phase	Estimated Cost (\$M)
TH4038	Leslie TS – Replace T4J and T4Q Wholesale Revenue Metering	\$0.66
<b>Total:</b>		<b>\$0.66</b>

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14 **3. Proposal for Strachan TS – IESO Compliant Metering at Strachan TS (T13-A9A10 and T15-A9A10)**

15  
 16  
 17 **3.1. Job Objectives**

18 THESL is the MSP and expects to exit from the above mentioned HONI-owned wholesale  
 19 revenue metering installations. THESL expects to abandon the above mentioned metering  
 20 installations and build new low voltage installations inside Strachan TS. This proposal is for the  
 21 work associated with de-registering the existing one wholesale revenue metering points and  
 22 with making ready two new fully-compliant IESO wholesale metering installations.

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1 **10.4. Required Capital Costs**

Estimate Number	Job Phase	Cost (\$M)
TH7021	Gerrard TS (NT33) – Replace T1A4A5, T2A1A2, T3A1A2, and T4A4A5 Wholesale Revenue Metering	\$1.00
Total:		\$1.00

2 **11. Proposal for Warden TS – Replace J Bus and Q Bus Wholesale Revenue Metering**

3

4 **11.1. Job Objectives**

5 THESL is the MSP and expects to be exiting from the above mentioned HONI-owned wholesale  
 6 revenue metering installations. THESL expects to abandon the above mentioned metering  
 7 installations and build new low voltage installations inside Warden TS. This proposal is for the  
 8 work associated with de-registering the existing four wholesale revenue metering points and  
 9 with making ready four new fully compliant IESO wholesale metering installations.

10

11 **11.2. Job Scope of Work**

12 The switchyard site is a 230/27.6 kV, 60 Hz transformer station supplying local loads. There are  
 13 two power transformers (T3 and T4) providing step-down transformation from the 230 kV  
 14 system to 27.6 kV system. Both transformers are within the scope of this revenue metering  
 15 upgrade.

16

17 **11.3. Location**

18 The assets being replaced are located at Warden TS, 699 Warden Avenue, Toronto, Ontario,  
 19 M1L 3Z5.

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1 **11.4. Required Capital Costs**

Estimate Number	Job Phase	Estimated Cost (\$M)
TH7017	Warden TS – Replace J Bus and Q Bus Wholesale Revenue Metering	\$0.40
<b>Total:</b>		<b>\$0.40</b>

2 **12. Proposal for Basin TS (NT4) – Replace T3A5A6, T3A7A8, T5A5A6, and T5A7A8**  
 3 **Wholesale Revenue Metering**

4  
 5 **12.1. Job Objectives**

6 THESL is the MSP and expects to be exiting from the above mentioned HONI-owned wholesale  
 7 revenue metering installations. THESL expects to abandon the above mentioned metering  
 8 installations and build new low voltage installations inside Basin TS. This proposal is for the  
 9 work associated with de-registering the existing four wholesale revenue metering points and  
 10 with making ready four new fully-compliant IESO wholesale metering installations.

11  
 12 **12.2. Job Scope of Work**

13 The switchyard site is a 115/13.8 kV, 60 Hz TS supplying local loads. There are two power  
 14 transformers (T3 and T5) providing step down transformation from the 115 kV system to the  
 15 THESL owned 13.8 kV system. Both transformers are within the scope of this revenue metering  
 16 upgrade.

17  
 18 **12.3. Location**

19 The assets being replaced are located at Basin TS, 25 Basin Street, Toronto, Ontario, M4M 1A1.

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1 **12.4. Required Capital Costs**

<b>Estimate Number</b>	<b>Job Phase</b>	<b>Estimated Cost (\$M)</b>
TH7008	Proposal for Gerrard TS (NT33) – Replace T1A4A5, T2A1A2, T3A1A2, and T4A4A5 Wholesale Revenue Metering	\$1.00
<b>Total:</b>		<b>\$1.00</b>

2 **13. Proposal for Main TS – Replace T3 and T4 Wholesale Revenue Metering**

3

4 **13.1. Job Objectives**

5 THESL is the MSP and expects to be exiting from the above mentioned HONI owned wholesale  
 6 revenue metering installations. THESL expects to abandon the above mentioned metering  
 7 installations and build new low voltage installations inside Main TS. This proposal is for the  
 8 work associated with de-registering the existing four wholesale revenue metering points and  
 9 with making ready two new fully compliant IESO wholesale metering installations.

10

11 **13.2. Job Scope of Work**

12 The switchyard site is a 115/13.8 kV transformer station supplying local loads. There are two  
 13 transformers, designated as T3 and T4, connected via 115 kV, 60 Hz lines. They are both subject  
 14 of this revenue metering upgrade.

15

16 **13.3. Location**

17 The assets being replaced are located at Main TS, 131 Stephenson Avenue, Toronto, Ontario,  
 18 M4C 1G2.

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1 **13.4. Required Capital Costs**

<b>Estimate Number</b>	<b>Job Phase</b>	<b>Estimated Cost (\$M)</b>
TH7013	Proposal for Main TS – Replace T3 and T4 Wholesale Revenue Metering	\$1.20
<b>Total:</b>		<b>\$1.20</b>

2 **14. Proposal for Manby TS (NA38) – Replace T13 and T14 Wholesale Revenue Metering**

3

4 **14.1. Job Objectives**

5 THESL is the MSP and expects to be exiting from the above mentioned HONI owned wholesale  
 6 revenue metering installations. THESL expects to abandon the above mentioned metering  
 7 installations and build new low voltage installations inside Manby TS. This proposal is for the  
 8 work associated with de-registering the existing two wholesale revenue metering points and  
 9 with making ready two new fully compliant IESO wholesale metering installations.

10

11 **14.2. Job Scope of Work**

12 Manby TS (T13/T14) consists of two 220/28 kV, 50/67/93 MVA power transformers, each with a  
 13 winter 10-day Limited Time Rating (LTR) of 120.6 MVA. A meter only upgrade of the T13/T14  
 14 2EL metering installation was done in 2008 but a full metering upgrade is now needed to satisfy  
 15 the requirements of Market Rules. Before beginning work Hydro One will complete a detailed  
 16 design of two new IESO compliant metering installations; one to meter the energy being  
 17 delivered by transformer T13 and the other to meter that of transformer T14.

18

19 **14.3. Location**

20 The assets being replaced are located Manby TS, located in the City of Toronto, at 850 Kipling  
 21 Avenue, Toronto, Ontario, M8Z 5G5.



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1 **14.4. Required Capital Costs**

Estimate Number	Job Phase	Estimated Cost (\$M)
TH7005	Manby TS (NA38) – Replace T13 and T14 Wholesale Revenue Metering	\$0.50
<b>Total:</b>		<b>\$0.50</b>

2 **15. Proposal for Runnymede (NT11) – Replace T3 and T4 Wholesale Revenue Metering**

3

4 **15.1. Job Objectives**

5 THESL is the MSP and expects to be exiting from the above mentioned HONI owned wholesale  
 6 revenue metering installations. THESL expects to abandon the above mentioned metering  
 7 installations and build new low voltage installations inside Runnymede TS. This proposal is for  
 8 the work associated with de-registering the existing one wholesale revenue metering points  
 9 and with making ready two new fully compliant IESO wholesale metering installations.

10

11 **15.2. Job Scope of Work**

12 Runnymede TS is a 115/27.6 kV transformer station supplying local loads. There are two  
 13 transformers, designated as T3 and T4, connected via 115kV, 60 Hz lines K11W and K12W. Both  
 14 transformers are the subject of this revenue metering upgrade.

15

16 **15.3. Location**

17 The assets being replaced are located at Runnymede (TS), located in the City of Toronto, on 99  
 18 Woolner Avenue, South of Eglinton Avenue and east from Jane Street.

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1 **15.4. Required Capital Costs**

Estimate Number	Job Phase	Estimated Cost (\$M)
TH7016	Runnymede (NT11) – Replace T3 and T4 Wholesale Revenue Metering	\$0.50
<b>Total:</b>		<b>\$0.50</b>

2 **16. Proposal for Bridgman TS – Replace T5A4A6HL and T11A5A6HL Wholesale Revenue**  
 3 **Metering**

4  
 5 **16.1. Job Objectives**

6 THESL is the MSP and expects to be exiting from the above mentioned HONI-owned wholesale  
 7 revenue metering installations. THESL expects to abandon the above mentioned metering  
 8 installations and build new low voltage installations inside Bridgman TS. This proposal is for the  
 9 work associated with de-registering the existing two wholesale revenue metering points and  
 10 with making ready two new fully compliant IESO wholesale metering installations which is  
 11 further described in detail in the attached Scope of Work.

12  
 13 **16.2. Job Scope of Work**

14 The switchyard site is a 115/13.8 kV, 60 Hz TS supplying local loads. There are two power  
 15 transformers (T5 and T11) providing step down transformation from the 115 kV system to 13.8  
 16 kV system. Both are within the scope of this revenue metering upgrade.

17  
 18 **16.3. Location**

19 The assets being replaced are located at Bridgman TS, located in the City of Toronto, at 254  
 20 MacPherson Avenue, Toronto, Ontario, M4V 1A7.

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1 **16.4. Required Capital Costs**

Estimate Number	Job Phase	Estimated Cost (\$M)
TH7011	Bridgman TS – Replace T5A4A6HL and T11A5A6HL Wholesale Revenue	\$1.00
<b>Total:</b>		<b>\$1.00</b>

2 **17. Proposal for Leaside TS – Replace M1, M2, M3, M4, M8, T19, T20 and T21 Wholesale**  
 3 **Revenue Metering**

4  
 5 **17.1. Job Objectives**

6 THESL is the MSP and expects to be exiting from the above mentioned HONI-owned wholesale  
 7 revenue metering installations. THESL expects to abandon the above mentioned metering  
 8 installations and build new low voltage installations inside Leaside TS. This proposal is for the  
 9 work associated with de-registering the existing two wholesale revenue metering points and  
 10 with making ready six new fully compliant IESO wholesale metering installations  
 11

12 **17.2. Job Scope of Work**

13 The switchyard site is a 230/13.8 kV and 230/27.6 kV, 60 Hz TS supplying local loads. There are  
 14 three (3) power transformers (T19, T20 and T21) providing step-down transformation from the  
 15 230 kV system to 13.8 kV and 27.6 kV system. All are within the scope of this revenue metering  
 16 upgrade.  
 17

18 **17.3. Location**

19 The assets being replaced are located at Leaside (TS), located in the City of Toronto, at 1080  
 20 Millwood Avenue, Toronto, Ontario, M4H 1A2.

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### 1 17.4. Required Capital Costs

Estimate Number	Job Phase	Estimated Cost (\$M)
TBD	Leaside TS – Replace M1, M2, M3, M4, M8, T19, T20 and T21 Wholesale Revenue Metering	\$1.80
<b>Total:</b>		<b>\$1.80</b>

### 2 18. Proposal for Esplanade TS – Replace T11, T12 and T13 Wholesale Revenue Metering

3

#### 4 18.1. Job Objectives

5 THESL is the MSP and expects to be exiting from the above mentioned HONI owned wholesale  
 6 revenue metering installations. THESL expects to abandon the above mentioned metering  
 7 installations and build new low voltage installations inside Esplanade TS. This proposal is for the  
 8 work associated with de-registering the existing three wholesale revenue metering points and  
 9 with making ready three new fully compliant IESO wholesale metering installations.

10

#### 11 18.2. Job Scope of Work

12 The switchyard site is a 115/13.8 kV, 60 Hz TS supplying local loads. There are three power  
 13 transformers (T11, T12 and T13) providing step down transformation from the 115 kV system to  
 14 the 13.8 kV system. All are within the scope of this revenue metering upgrade.

15

#### 16 18.3. Location

17 The assets being replaced are located at Esplanade (TS), located in the City of Toronto, at 106  
 18 Lower Sherbourne Street, Toronto, Ontario, M5A 4S8.

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### 1 18.4. Required Capital Costs

Estimate Number	Job Phase	Estimated Cost (\$M)
TBD	Esplanade TS – Replace T11, T12 and T13 Wholesale Revenue Metering	\$0.70
<b>Total:</b>		<b>\$0.70</b>

### 2 19. Proposal for Terauley TS – Replace T2 and T3 Wholesale Revenue Metering

3

#### 4 19.1. Job Objectives

5 THESL is the MSP and expects to be exiting from the above mentioned HONI owned wholesale  
 6 revenue metering installations. THESL expects to abandon the above mentioned metering  
 7 installations and build new low voltage installations inside Terauley TS. This proposal is for the  
 8 work associated with de-registering the existing two wholesale revenue metering points and  
 9 with making ready two new fully compliant IESO wholesale metering installations.

10

#### 11 19.2. Job Scope of Work

12 The switchyard site is a 115/13.8 kV, 60 Hz TS supplying local loads. There are two power  
 13 transformers (T2 and T3) providing step down transformation from the 115 kV system to the  
 14 13.8 kV system. All are within the scope of this revenue metering upgrade.

15

#### 16 19.3. Location

17 The assets being replaced by this project are located at Esplanade (TS), located in the City of  
 18 Toronto, at 532 Bay Street, Toronto, Ontario, M7A 2C7.

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1 **19.4. Required Capital Costs**

<b>Estimate Number</b>	<b>Job Phase</b>	<b>Estimated Cost (\$M)</b>
TBD	Terauley TS — Replace T2 and T3 Wholesale Revenue Metering	\$0.50
<b>Total:</b>		<b>\$0.50</b>

2 **20. Proposal for Strachan TS — Replace T13 and T15 Wholesale Revenue Metering**

3

4 **20.1. Job Objectives**

5 THESL is the MSP and expects to be exiting from the above mentioned HONI owned wholesale  
 6 revenue metering installations. THESL expects to abandon the above mentioned metering  
 7 installations and build new low voltage installations inside Strachan TS. This proposal is for the  
 8 work associated with de-registering the existing two wholesale revenue metering points and  
 9 with making ready two new fully compliant IESO wholesale metering installations.

10

11 **20.2. Job Scope of Work**

12 The switchyard site is a 115/13.8 kV, 60 Hz TS supplying local loads. There are two power  
 13 transformers (T13 and T15) providing step down transformation from the 115 kV system to the  
 14 13.8 kV system. All are within the scope of this revenue metering upgrade.

15

16 **20.3. Location**

17 The assets being replaced by this project are located at Strachan TS, located in the City of  
 18 Toronto, at 6 Strachan Avenue, Toronto, Ontario, M6K 3N8.

**ICM Project | Metering**

1 **20.4. Required Capital Costs**

Estimate Number	Job Phase	Estimated Cost (\$M)
TBD	Strachan TS – Replace T13 and T15 Wholesale Revenue Metering	\$0.50
<b>Total:</b>		<b>\$0.50</b>

2 **21. Measurement Canada Compliance and Smart Meter Program – Mandatory**  
 3 **Replacement Program in 2012**

4  
 5 **21.1. Job Objectives**

6 To maintain THESL compliance with the Minister of Energy’s directive regarding smart meter  
 7 installations and to remain compliant with Measurement Canada requirements for seal expired  
 8 meters in 2012.

9  
 10 **21.2. Job Scope of Work**

11 To replace the 6,408 meters that have expired seals.

Type of Work	2012
Seal Expired Meters	6,408

12 **21.3. Job Locations**

13 These assets are located various specific locations dispersed throughout THESL’s service area.

14  
 15 **21.4. Required Capital Costs**

Estimate Number	Job Phase	Estimated Cost (\$M)
25315 25316	Meter Re-verifications and reseals - 2012	\$5.0
<b>Total:</b>		<b>\$5.0</b>

/UF

**ICM Project | Metering**

1 ~~23. Measurement Canada Compliance—Mandatory Replacement Program in 2014~~

2

3 ~~23.1. Job Objectives~~

4 To maintain THESL compliance with Measurement Canada requirements for seal expired meters  
 5 in 2014.

6

7 ~~23.2. Job Scope of Work~~

8 To replace the 5,299 meters that have expired seals.

Type of Work	2014
Seal Expired Meters	5,299

9

10 ~~23.3. Job Locations~~

11 These assets are located throughout Toronto Hydro's service area.

12

13 ~~23.4. Required Capital Costs~~

Estimate Number	Job Phase	Estimated Cost (\$M)
24985	Re-verification Replacement	\$1.00
<b>Total:</b>		<b>\$1.00</b>

14 ~~23.5. Conclusions~~


15 This work must be completed for THESL to remain in compliance with the Measurement  
 16 Canada.



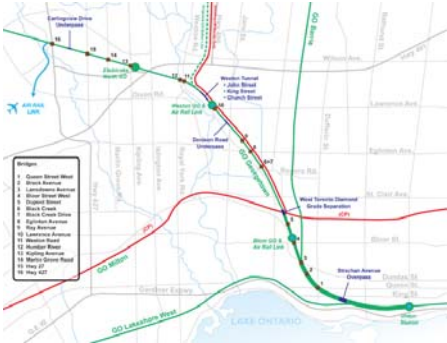
# ICM Project

## Externally-Initiated Plant Relocations and Expansions


**Waterfront Toronto**



**Go Transit / Metrolinx**



**Minsitry of Transportation / City of Toronto**



ServiceOntario  
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[Français](#)

Public Service Works on Highways Act

R.S.O. 1990, CHAPTER P.49

**Consolidation Period: From June 22, 2006 to the e-Laws currency date**

Last amendment: 2006, c.19, Sched.C, s.1 (1).

**Definitions**

1. In this Act

“appliances or works” means poles, wires, conduits, transformers, pipes, pipe lines or any other works, structures or appliances placed on or under a highway by an operating corporation; (“appareils ou ouvrages”)

“cost of labour” means.

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**ICM Project | Externally-Initiated Plant Relocations and Expansions**

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1 **SUMMARY OF CHANGES IN THE UPDATE**

- 2 • Reduced 2012-2013 budget from \$41.9 M to \$35.0 M, a reduction of \$6.9 M
- 3 • Revised number of jobs proposed for 2012/2013 to 24, with jobs and job phases for 2014 to
- 4 be addressed in Phase Two
- 5 • 2014 jobs and spending shown in strike-through
- 6 • Restructured 2012 and 2013 jobs to recognize the work accomplished to date in 2012,
- 7 forecast work for 2013
- 8 • Corrected numerical and typographical errors

## ICM Project | Externally-Initiated Plant Relocations and Expansions

- 1 Table 1: Summary of Externally-Initiated Plant Relocation and Expansion Jobs and Cost
- 2 Estimates

Job Estimate Number	Job Title	Year	THESL Cost Estimate (\$M)	Agency	Estimated Agency Cost (\$M)	
22851	Queens Quay Rebuild Phase 1	2012	\$3.78	Waterfront Toronto	\$0.60	/UF
22853	Queens Quay Rebuild Phase 2	2013	\$4.70	Waterfront Toronto	\$0.60	/US
22854	Queens Quay Rebuild Phase 3	2013	\$2.82	Waterfront Toronto	\$0.60	
24729	Queens Quay Rebuild Phase 4	2013	\$9.73	Waterfront Toronto	\$2.70	/US
24731	Queens Quay Rebuild Phase 5	2014	\$6.98	Waterfront Toronto	\$1.00	
23196	Metrolinx West of Hwy 27	2012	\$0.23	GO Transit	\$0	/UF
24079	GTS Bridge –Hwy 27	2012	\$0.14	GO Transit	\$0	
24895	Weston Tunnel	2012	\$0.28	GO Transit	\$0	
24784	Martin Grove Bridge	2012	\$0	GO Transit	\$0	
23497	Black Creek and Weston UG Reinstatement	2014	\$0.09	GO Transit	\$0	
23018	GO Strachan UG Crossing Civil	2012	\$0.26	GO Transit	\$0	/UF
24929	GO Strachan UG Crossing Civil	2012	\$0.13	GO Transit	\$0	

**ICM Project | Externally-Initiated Plant Relocations and Expansions**

Job Estimate Number	Job Title	Year	THESL Cost Estimate (\$M)	Agency	Estimated Agency Cost (\$M)
23759	Strachan Electrical Relocation Part 1	2012	\$1.67	GO Transit	\$0
20124	Strachan Electrical Relocation Part 2	2012	\$1.12	GO Transit	\$0
20125	Strachan Electrical Relocation Part 3	2012	\$1.01	GO Transit	\$0
20129	Strachan Electrical Relocation Part 4	2012	\$0.46	GO Transit	\$0
21862	Keele St and Hwy 401- PH2- Tunnelling Under Hwy 401	2012	\$0.62	MTO	\$0.15
23329	Eglinton Ramp Onto Hwy 427	2012	\$0.19	MTO	\$0.05
22170	Dunn Ave Directional Drilling	2013	\$0.75	City of Toronto	\$0.19
25276	Dundas Street Overhead to Underground Phase 1 - Design	2013	\$0.63	City of Toronto	\$0
25280	Dundas Street Overhead to Underground Phase 2	2013	\$3.02	City of Toronto	\$0.75
<del>25277</del>	<del>Dundas Street Overhead to Underground Phase 3</del>	<del>2014</del>	<del>\$6.27</del>	<del>City of Toronto</del>	<del>\$1.74</del>

} /UF

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**ICM Project | Externally-Initiated Plant Relocations and Expansions**

Job Estimate Number	Job Title	Year	THESL Cost Estimate (\$M)	Agency	Estimated Agency Cost (\$M)	
24615	North West PATH Addition Phase 1	2013	\$0.85	City of Toronto	\$0.21	/UF, US
24967	North West PATH Addition Phase 2	2013	\$1.08	City of Toronto	\$0.30	/US
24037	Front Street Streetscape Improvement	2012	\$0.41	City of Toronto	\$0.11	
23527	Beecroft OH Reconfiguration	2012	\$0.74	City of Toronto	\$0.18	} /UF
24963	Lawrence Avenue Relocation	2012	\$0.28	City of Toronto	\$0.07	
	<b>JOBS TOTAL</b>		<b>\$34.90</b>		<b>\$6.51</b>	
<b>Reconciliation for job cost changes &lt; \$100,000 and rounding</b>			<b>\$0.10</b>			
	<b>Reconciled Total</b>		<b>\$35.00</b>			/UF, US

**2. Why the Project is Needed Now**

According to the Act, THESL is obligated to relocate its infrastructure if asked to do so by the requesting Road Authority. While the date by which this relocation must be accomplished is typically negotiated with the requesting Road Authority, the Act provides a nominal allowance of only sixty days notice. Time is generally a critical element of these externally initiated projects, and THESL must strive to align its work with the overall infrastructure project schedule of the third party.

Similarly, if THESL is to complete anticipated expansion work on its facilities because it is prudent to do so concurrently with the relocation requirements to maximize efficiency for ratepayers, this work must be done within the timeline mandated by the requesting agency. There is a time-limited window to accomplish this expansion and if this window is missed, the

## ICM Project | Externally-Initiated Plant Relocations and Expansions

1 If only the required infrastructure for relocation is built at the present time, THESL will be  
2 limited by the existing civil infrastructure along Queens Quay Boulevard. This civil  
3 infrastructure, as detailed in Figure 6, is undersized and insufficient to accommodate existing  
4 circuits plus the additional feeders required to serve the loads anticipated along Queens Quay  
5 Boulevard shown in Figure 2.

6  
7 The restrictions and possible lack of space along the new revitalized Queens Quay Boulevard  
8 from Yo Yo Ma Lane to Parliament Street would prevent THESL from utilizing that route unless  
9 new ducts and chambers are added as part of the Queens Quay refurbishment. Otherwise,  
10 additional capital funds will have to be spent in future years for THESL to install the necessary  
11 new civil infrastructure for new feeders to supply customers via Bremner TS.

12  
13 This new civil infrastructure would, in turn, require new trenching along major routes such as  
14 York Street and Lakeshore Boulevard in order to access the high growth areas. This work would  
15 be significantly more costly because while the distance to be covered along Lakeshore is similar  
16 to that for Queens Quay Boulevard, additional work would be required on York Street.  
17 Moreover, Lakeshore is a higher traffic route resulting in more complex construction and  
18 maintenance restrictions. Overall, the long term costs associated with this approach are  
19 significantly higher than the costs associated with installing the necessary facilities as part of the  
20 expansion along Queens Quay Boulevard.

### 21 22 **1.2. Business Case Evaluation (BCE) Results**

23 The total cost for THESL to perform the relocations as requested by Waterfront Toronto and  
24 increase the duct capacity and civil infrastructure for future requirements is estimated at  
25 \$25.53M. This estimate can be divided into two portions. Portion 1, to be funded one hundred /UF  
26 percent by Waterfront Toronto, is estimated at \$4.50M and includes the civil and electrical plant /UF  
27 relocation based on preliminary design during project development and alignments proposed by  
28 Waterfront Toronto. Portion 2, required by THESL estimated at \$21.32M and includes the /UF  
29 expansion to a 32-duct 3.2 kilometre duct bank along Queens Quay Boulevard from Yo Yo Ma  
30 Lane to Parliament Street, approximately 55 cable chambers, all associated structure  
31 stabilization and all required road crossings.

## ICM Project | Externally-Initiated Plant Relocations and Expansions

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1

2 Alternatively, the total cost involved for THESL to perform only the relocations required, and  
3 then in future years construct new infrastructure to meet demand is an estimated \$35.32M. /UF

4 Similar to the scenario described above, this estimate includes a \$4.50M portion to be fully paid /UF  
5 for by Waterfront Toronto for the proposed civil and electrical relocation. In addition, it also

6 includes an estimated \$30.82M THESL portion for a 24-duct 3.2 kilometre duct bank along /UF

7 Lakeshore Boulevard from Yo Yo Ma Lane to Parliament Street, approximately 45 cable

8 chambers, all associated structure stabilization and all required road crossings, plus the rebuild

9 of approximately 150 metres and 300 metres of civil infrastructure on York Street and

10 Parliament Street respectively for distribution customer servicing.

11

12 The projected savings of an estimated \$10.79M arise because of the cost savings from not /UF

13 executing construction on Lakeshore Boulevard as well as the elimination of new facilities on

14 York Street and Parliament Street. Compared to Queens' Quay, Lakeshore Boulevard is a main

15 roadway with work restrictions that would result in escalated costs and complex construction

16 requirements. In addition, by performing its civil infrastructure activities in alignment with

17 external parties' required work, potential customer disruptions can be minimized.

18

19 The requested funds for the THESL expansion in both scenarios are initially driven from third

20 parties as a result of their relocation activities which are performed at their expense. THESL, in

21 turn, must respond to these third-party investments performing immediate expansion of THESL-

22 owned infrastructure located in these same locations to address future growth considerations.

23 If THESL does not take immediate action to address these assets, due to restrictions that are

24 placed by the third parties (such as Waterfront Toronto) following the execution of their

25 projects, THESL risks being unable to address the immediate load growth concerns and future

26 source of supply for customers.

27

28 All costs identified above for both scenarios include work required for relocation as requested

29 by Waterfront Toronto and work associated to additional expansion required by THESL. Only

30 the incremental capital required by THESL is being justified in this Business Case and does not

## ICM Project | Externally-Initiated Plant Relocations and Expansions

1 include the portion of relocation work to be one hundred percent funded by Waterfront  
 2 Toronto.

3  
 4 Given that THESL must undertake the relocation and expansion work on Queens Quay  
 5 Boulevard, installing sufficient duct capacity to meet future needs is the most prudent approach  
 6 for ratepayers. In addition, it will result in strategically located facilities that are optimally  
 7 integrated with the planned Bremner TS. It will also minimize construction disruption for the  
 8 neighbourhood area. In contrast, if future needs are not addressed, THESL will have insufficient  
 9 ducts and associated facilities to supply new customers along Queens Quay Boulevard and will  
 10 be forced to construct more expensive facilities in undesirable locations that will not support or  
 11 strengthen THESL's distribution system.

### 13 1.3. Detailed Descriptions of Specific Central Waterfront Revitalization Jobs

15 **Table 2: Waterfront Revitalization Jobs and Cost Estimates (2012-2013~~2014~~)**

Estimate Number	Job Title	THESL Cost Estimate (\$M)
22851	Queens Quay Rebuild Phase 1 (2012)	\$3.78
22853	Queens Quay Rebuild Phase 2 (2013)	\$4.70
22854	Queens Quay Rebuild Phase 3 (2013)	\$2.82
24729	Queens Quay Rebuild Phase 4 (2013)	\$9.73
<del>24731</del>	<del>Queens Quay Rebuild Phase 5 (2014)</del>	<del>\$6.98</del>
	<b>TOTAL</b>	<b>\$21.03</b>

16 The scope of work for this entire expansion project includes constructing a new 32-duct 3.2  
 17 kilometre duct bank along the south side of Queens Quay Boulevard from Yo Yo Ma Lane to  
 18 Parliament Street. The duct bank to be constructed will be designed as two 4x4 duct banks with  
 19 associated cable chambers required for splicing and jointing. Approximately 55 cable chambers  
 20 and structure stabilization material, such as Helix Anchors and piles for cable chamber  
 21 installation, will be required as a part of this project.

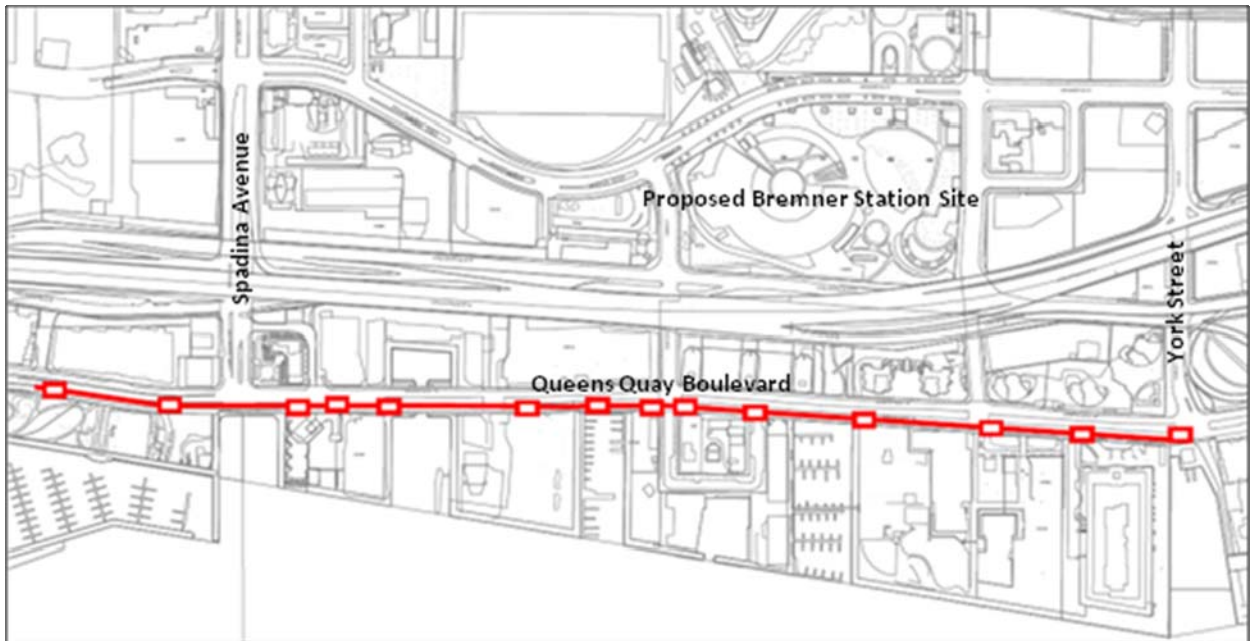


## ICM Project | Externally-Initiated Plant Relocations and Expansions

1  
2 For the section of work between York Street and Yonge Street, there will be additional design  
3 and construction complexities associated due to the underground streetcar tunnel access to  
4 Union Station that exists along Queens Quay Boulevard between York Street and Bay Street.  
5 The cost of the preliminary design includes funds required for directional drilling, tunnelling as  
6 well as structure stabilization in order to mitigate the impacts to TTC structures and assets.

7  
8 In addition, a number of road crossings at each major intersection (Spadina Street, Rees Street,  
9 Lower Simcoe Street and York Street) and several smaller intersections (Cooper Street, Jarvis  
10 Street, Lower Sherbourne Street and Bonnycastle Street) as well at customer locations will also  
11 be constructed as a part of the scope of work. THESL's 2012-13 costs for this expansion project /UF, US  
12 is projected to be \$21.03M. /UF

13  
14 Figure 7 through 9 show the proposed new 3.2 kilometre trench and duct bank layout outlined  
15 in red along with proposed double chamber locations.  
16



17 **Figure 7 –Proposed Area of Work from Yo Yo Ma Lane to York Street**

---

## ICM Project | Externally-Initiated Plant Relocations and Expansions

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1 Construction is anticipated to start in the second quarter of 2012. This has been requested by  
2 Waterfront Toronto in order to align with its construction timelines which is slated to begin in  
3 spring 2012.

4

5

### 6 **2. Externally Driven Relocation Jobs**

7

#### 8 **2.1. Introduction**

9 This initiative covers relocations requested by The City of Toronto, the MTO and GO Transit, to  
10 allow their infrastructure projects to proceed on schedule. The THESL facilities impacted by  
11 these projects are replaced on a case by case basis to ensure that current system capability and  
12 capacity are maintained. At each project location, the needs and requirements from the  
13 requesting agency are reviewed and compared with THESL's needs and requirements to  
14 determine what relocation options are available, optimizing constraints such as cost, schedule  
15 and system risk to achieve the objective of eliminating the project conflict. These include  
16 various relocation routes as well as the possibility of supporting and protecting THESL facilities in  
17 place as opposed to a relocation project.

18

19 In the sections below, THESL describes the jobs that it proposes be undertaken and associated  
20 capital spending to accomplish the relocation work necessitated by GO Transit, Ministry of  
21 Transportation and the City of Toronto projects. The amount of THESL's proposed capital  
22 spending and the agency's contribution, if any, are shown in the Table below. In sum, THESL's  
23 total capital spending on these jobs is projected at \$14.10M with an additional \$2.01M being  
24 spent by the initiating agencies through cost sharing arrangements.

/UF

**ICM Project | Externally-Initiated Plant Relocations and Expansions**

1 **Table 3: Summary of Externally Initiated Relocation Projects (2012-2013)**

Agency	THESL Cost Estimate (\$M)	Estimated Agency Cost (\$M)
GO Transit	\$5.30	\$0.00*
Ministry of Transportation	\$0.81	\$0.20
City of Toronto	\$7.99	\$1.81
TOTALS	\$14.10	\$2.01

} /UF

2 \* Crossing agreements between utility companies and railway corporations typically indicate  
 3 that the utility is required to pay 100% of relocation costs when requested to move by the  
 4 railway corporation.

5  
6

7 **2.2. GO Transit and Metrolinx Relocation Jobs**

8 GO Transit is expanding their service to Milton and the west of Toronto in a project called the  
 9 Georgetown South Service Expansion and will include a rail link to Pearson Airport to be  
 10 completed before the Pan Am Games. Due to this time constraint, THESL relocations need to be  
 11 complete in 2012 (with one exception for Black Creek and Weston) to allow GO Transit sufficient  
 12 time to expand the rail lines.

13

14 There are six main areas of relocations associated with the Georgetown South Service Expansion  
 15 where THESL has been requested to do work. These are:

- 16 (i) West of Hwy 27 (2012)
- 17 (ii) GTS Bridge –Hwy 27 (2012)
- 18 (iii) Weston Tunnel (2012)
- 19 (iv) Martin Grove Bridge (2012)
- 20 ~~(v) Black Creek and Weston Rd UG Reinstatement (2014)~~
- 21 (vi) Strachan Avenue Relocation (2012)

22

23 The largest of these jobs, the relocation at Strachan Avenue, is divided up into six individual jobs  
 24 for a total of 11 jobs.

**ICM Project | Externally-Initiated Plant Relocations and Expansions**

1 **GO Transit Initiated Relocation Jobs**

2

3 **Table 4: Summary of GO Transit and Metrolinx Relocation Jobs and Costs (2012-2013)**

Job Estimate Number	Job Title	Job Year	THESL Cost Estimate (\$M)	Agency	Estimated Agency Cost*
23196	Metrolinx West of Hwy 27	2012	\$0.23	GO Transit	\$0
24079	GTS Bridge –Hwy 27	2012	\$0.14	GO Transit	\$0
24895	Weston Tunnel	2012	\$0.28	GO Transit	\$0
24784	Martin Grove Bridge	2012	\$0.0	GO Transit	\$0
<del>23497</del>	<del>Black Creek and Weston UG Reinstatement</del>	<del>2014</del>	<del>\$0.09</del>	<del>GO Transit</del>	<del>\$0</del>
23018	GO Strachan UG Crossing Civil	2012	\$0.26	GO Transit	\$0
24929	GO Strachan UG Crossing Civil	2012	\$0.13	GO Transit	\$0
23759	Strachan Electrical Relocation Part 1	2012	\$1.67	GO Transit	\$0
20124	Strachan Electrical Relocation Part 2	2012	\$1.12	GO Transit	\$0
20125	Strachan Electrical Relocation Part 3	2012	\$1.01	GO Transit	\$0
20129	Strachan Electrical Relocation Part 4	2012	\$0.46	GO Transit	\$0
	<b>TOTALS</b>		<b>\$5.30</b>		<b>\$0</b>

} /UF

} /UF

## ICM Project | Externally-Initiated Plant Relocations and Expansions

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1 **~~2.2.5. Black Creek and Weston Road – UG Reinstatement (2014):~~**

2 ~~GO Transit is upgrading the bridge crossing at Black Creek Drive, and THESL has infrastructure~~  
3 ~~crossing under the existing bridge north of Weston Road and east of Black Creek Drive. GO~~  
4 ~~Transit has requested that THESL remove the duct bank temporarily while they are constructing~~  
5 ~~the foundation of the new rail bridge. Upon completion of the GO Transit bridge work, THESL~~  
6 ~~intends to rebuild the duct bank crossing the rail right of way. This is expected to allow the~~  
7 ~~distribution system to return to a normal state, as various feeder loading routes are being~~  
8 ~~altered to allow the duct bank to be removed.~~

9  
10 **2.2.6. Strachan Avenue Relocation (2012):**

11 Strachan Avenue is a main supply artery for THESL to serve several commercial and residential  
12 customers in the Liberty Village and Trinity-Bellwoods areas from Strachan Station, with a total  
13 of 60 ducts crossing under the railway at Strachan Avenue. These ducts are separated into three  
14 separate duct runs along Strachan Avenue, a 24 duct structure on the east side and two 18 duct  
15 structures on the west side. Within these ducts there are five 4kV feeders and sixteen 13.8kV  
16 feeders, for a total of 21 feeders crossing under the railway.

17  
18 These ducts and feeders need to be relocated to accommodate GO Transit lowering the grade of  
19 the current tracks by five meters. THESL proposes to relocate the feeders along Western  
20 Battery Road and tunnelling under the tracks to Douro Street. Due to the extent of the civil and  
21 electrical work involved with this relocation, it was divided into the following six projects; GO  
22 Strachan UG Crossing Civil, GO Strachan Crossing Feeder Relocate – Civil, Strachan Electrical  
23 Relocations Part 1(Relocate Feeders Serving Dafoe MS), Strachan Electrical Relocations Part 2  
24 (Relocate B11T/B9T/B2T/B3T/B6T), Strachan Electrical Relocations Part 3 (Relocate  
25 A22T/A49T/A53T), and Strachan Electrical Relocations Part 4 (Relocate A25T/A27T/A29T/A31T.)

26  
27 The first two jobs are to install new civil infrastructure in order to relocate the required feeders.  
28 This involves the construction of a new one kilometre 24-duct concrete encased duct bank with  
29 associated cable chambers. In addition, it also includes the installation of a new tunnel crossing  
30 approximately 500 metres west of the existing rail crossing at Strachan Avenue.

**ICM Project | Externally-Initiated Plant Relocations and Expansions**

1 **MTO Initiated Relocation Jobs**

2

3 **Table 5: Summary of MTO Relocation Jobs and Costs (2012)**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Job Year</b>	<b>THESL Cost Estimate (\$M)</b>	<b>Agency</b>	<b>Estimated Agency Cost (\$M)</b>
21862	Keele St and Hwy 401- PH2- Tunnelling Under Hwy 401	2012	0.62	MTO	\$0.15
23329	Eglinton Ramp Onto Hwy 427	2012	\$0.19	MTO	\$0.05
	<b>TOTALS</b>		<b>\$0.81</b>		<b>\$0.20</b>

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4

5

6 The map below shows the locations of the MTO infrastructure projects and the associated

7 THESL jobs to relocate facilities.

## ICM Project | Externally-Initiated Plant Relocations and Expansions

1 In order to accommodate a new access ramp to Highway 427 as proposed by the MTO, THESL  
 2 has been requested to lower existing conduit structures and one cable chamber where the new  
 3 ramp will be located on Eglinton Avenue in order to maintain the minimum clearance  
 4 requirement of 800 mm as required by THESL standard 31-0300 (refer to Appendix C).

### 6 2.4. City of Toronto Relocation Jobs

7 The City of Toronto is undertaking a number of infrastructure projects to rehabilitate bridges,  
 8 streets and public pathways in the City of Toronto. Some of these projects require THESL to  
 9 relocate its facilities according to the jobs listed in the following table and described below.

10  
 11 **Table 6: Summary of City of Toronto Relocation Jobs and Costs (2012-2013)**

Job Estimate Number	Job Title	Job Year	THESL Cost Estimate (\$M)	Agency	Estimated Agency Cost (\$M)	
22170	Dunn Ave Directional Drilling	2013	\$0.75	City of Toronto	\$0.19	/UF, US
25276	Dundas Street Overhead to Underground Phase 1 - Design	2013	\$0.63	City of Toronto	\$0	/UF, US
25280	Dundas Street Overhead to Underground Phase 2	2013	\$3.02	City of Toronto	\$0.75	/UF
25277	Dundas Street Overhead to Underground Phase 3	2014	\$6.27	City of Toronto	\$1.74	

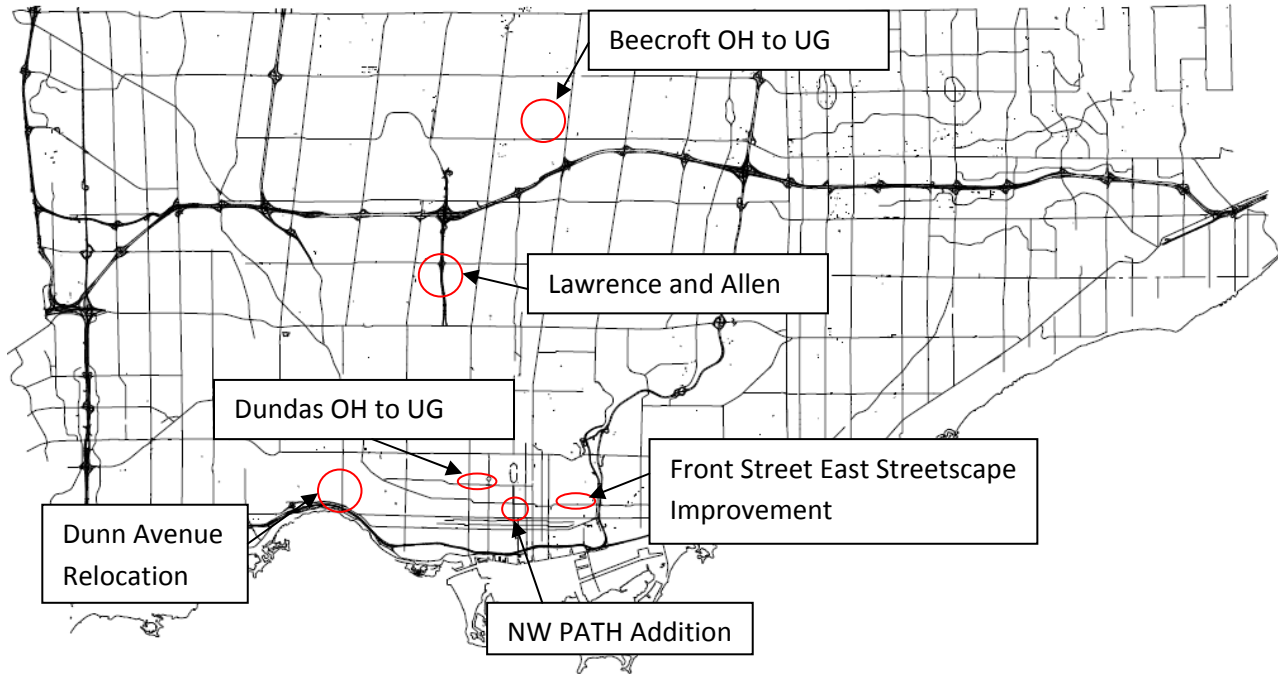
**ICM Project** | **Externally-Initiated Plant Relocations and Expansions**

<b>Job Estimate Number</b>	<b>Job Title</b>	<b>Job Year</b>	<b>THESL Cost Estimate (\$M)</b>	<b>Agency</b>	<b>Estimated Agency Cost (\$M)</b>	
24615	North West PATH Addition Phase 1	2013	\$0.85	City of Toronto	\$0.21	/UF, US
24967	North West PATH Addition Phase 2	2013	\$1.08	City of Toronto	\$0.30	/US
24037	Front Street Streetscape Improvement	2012	\$0.41	City of Toronto	\$0.11	/UF
24963	Lawrence and Allen Pole Relocation	2012	\$0.28	City of Toronto	\$0.07	
23527	Beecroft OH Reconfiguration	2012	\$0.74	City of Toronto	\$0.18	/UF, US
			<b>\$7.76</b>		<b>\$1.81</b>	



## ICM Project | Externally-Initiated Plant Relocations and Expansions

### 1 City of Toronto Initiated Relocation Jobs



2 **Figure 12 – City Projects**

3  
4

#### 5 **2.4.1. Dunn Avenue Bridge over the Gardiner Expressway (2013):**

6 The City of Toronto was rehabilitating the bridge over Gardiner Expressway and requested that  
7 THESL relocate existing ducts that were buried in the sidewalk of the bridge. To accommodate  
8 this request THESL and the City of Toronto agreed to relocate the ducts in a new 90-metre long  
9 duct structure under the Gardiner Expressway. The circuit has been temporarily relocated  
10 overhead to accommodate the bridge rehabilitation. Once the relocation construction is  
11 finished, the feeders are expected to be transferred to the new permanent infrastructure  
12 located under the Gardiner Expressway. The job is required to be completed in 2013.

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## ICM Project | Externally-Initiated Plant Relocations and Expansions

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1

2 **2.4.2. Dundas West Overhead To Underground Relocation Phases 1 to 2 (2013):** /US

3 This job is on Dundas Street West from Bathurst Street to University Avenue and it is part of City  
4 of Toronto revitalization capital program. The City of Toronto will be rebuilding a watermain  
5 and completing a sidewalk replacement along this stretch of road and have requested that  
6 THESL relocate its overhead infrastructure underground. THESL expects it will be required to  
7 install approximately 2,000 metres of civil duct, 40 cable chambers, ten transformer vaults,  
8 2,000 metres of underground circuits and multiple underground service points. The job is  
9 required to start design in 2013. /US

10

11 **2.4.3. North West Path Addition Phases 1 and 2 (2013):** /US

12 The North West PATH is a new underground extension to the City of Toronto underground PATH  
13 network from Union Station to Wellington Street via York Street. This expansion will provide  
14 additional capacity to accommodate the growing numbers of pedestrians accessing Union  
15 Station from the downtown core. The City of Toronto has requested that THESL relocates its  
16 infrastructure that is in conflict with proposed work from the intersection of York Street and  
17 Front Street to York Street and Wellington Street. Approximately 550m of duct and 13 cable  
18 chambers will have to be relocated, rebuilt or supported, for this project. North of the  
19 intersection at Front Street and York Street, much of the THESL infrastructure can be supported  
20 as opposed to relocated. Phase one of the project is required to be complete in early 2013, /US  
21 while phase two is required to be completed in late 2013. /US

22

23 **2.4.4. Front Street East Streetscape Improvement (2012):**

24 This project is to convert all THESL poles to decorative type poles on the south side on Front  
25 Street East between Sherbourne Street and Parliament Street. On this stretch of Front Street  
26 East, the majority of the poles are not the conventional direct buried poles, but rather these  
27 poles are mounted in a reinforced sidewalk bay, which add challenges to the relocation. The  
28 project also involves rerouting secondary conductors impacted by the project. The project is  
29 required to be completed in 2012.

1     **I           OPERATIONS PORTFOLIO CAPITAL OVERVIEW**

2

3     THESL’s Operations Portfolio Capital is made up of the following components:

- 4         • Engineering Capital
- 5         • Worst Performing Feeder Capital
- 6         • Customer Connections Capital
- 7         • Reactive Capital
- 8         • Continuing Projects and Emerging Issues Portfolio Capital

9

10    Table 1 below summarizes THESL’s planned spending by component. A discussion on each of  
 11    these components is found in the following section.

12

13    **Table 1: Operations Capital Budget 2012-2013 ~~2014~~ (\$ M)**

Project Name	2012	2013	<del>2014</del>
Engineering Capital	9.50	9.50	<del>9.50</del>
Worst Performing Feeder	4.90	5.44	<del>24.50</del>
Customer Connections (net of Customer Contributions)	24.98	37.39	<del>30.00</del>
Reactive Capital	25.40	29.30	<del>32.70</del>
Continuing Projects and Emerging Issues Portfolio	55.73	40.00	<del>24.90</del>
<b>TOTAL</b>	<b>120.51</b>	<b>121.63</b>	<b><del>121.60</del></b>

/UF, US

14    The proposed Operations Portfolio capital spending is required to meet THESL’s distribution  
 15    responsibilities to its growing customer base and address the factors leading to gradually  
 16    worsening reliability. THESL continues to address the following issues:

- 17         • A large quantity of aging and deteriorating infrastructure;
- 18         • Legacy assets that are no longer standard due to inherent safety and/or reliability  
 19         issues;
- 20         • Cresting retirements of staff in supervisory, engineering, trades and technical positions.

1 THESL’s Operations Portfolio Capital contains the capital spending necessary to meet THESL’s  
 2 operations requirements over the 2012-2013 ~~2014~~ period. Failure to complete the work funded  
 3 by this spending will lead to a continuing decline in reliability and a lower quality of service to  
 4 customers.

5  
 6

7 **II PROJECT DESCRIPTIONS**

8

9 **1. Engineering Capital**

10 Engineering capital represents labour costs that are capitalized although they are not directly  
 11 attributable to specific distribution system assets or projects. These consist of the labour costs  
 12 of engineers, technologists, design technicians and power system controllers (“PSCs”) for  
 13 engineering, design and planning work that they perform on distribution assets that are put in  
 14 service. Such planning and design work is non-discretionary and is critical to THESL’s ability to  
 15 complete capital work in 2012-2013 ~~2014~~ as it continues its focus on the following key areas:  
 16 the capital investment program to address aging equipment and legacy infrastructure,  
 17 development and implementation of new approaches for engineering decision support for  
 18 creation and optimization of capital programs, and modernization through new technologies  
 19 and systems.

20

21 Table 2 below presents the planned spending for Engineering Capital for 2012-2013 ~~2014~~. The  
 22 amounts are solely for projects within the Incremental Capital Module (ICM) materiality  
 23 threshold amount. The proposed ICM projects above the threshold have all their required  
 24 capital funding included within their proposed budgets.

25

26 **Table 2: Engineering Capital Summary (\$ M)**

2012	2013	<del>2014</del>
9.50	9.50	<del>9.50</del>

1     **2. Worst Performing Feeder Capital**

2     The Worst Performing Feeder (WPF) program is part of the effort to improve THESL's overall  
3     service reliability by improving service for customers supplied from poorly performing feeders.  
4     The program involves the identification of feeders that are experiencing sustained unplanned  
5     interruptions and planning, prioritizing and executing work to improve reliability on such  
6     feeders. This is a high priority program at THESL given the impact feeder performance has had  
7     on key service reliability indicators, System Average Interruption Frequency Index ("SAIFI"),  
8     System Average Interruption Duration Index ("SAIDI"). The WPF program identifies feeders that  
9     contribute significantly to SAIFI and SAIDI and total system interruptions. The analysis of the  
10    performance and inspection of the worst performing feeders identify deficiencies so that  
11    corrective actions can be implemented.

12

13    A component of the WPF program is the Feeders Experiencing Sustained Interruptions ("FESI")  
14    program which is intended to identify feeders that are experiencing sustained service  
15    interruptions, excluding those interruptions due to scheduled outages and those caused by Loss  
16    of Supply ("LoS"), Major Event Days ("MEDs"), and station, bus and network outages. The  
17    program uses the number of sustained outages experienced over the last 12 months as the basis  
18    for categorizing feeders. For example, feeders that have experienced seven or more sustained  
19    interruptions within a rolling 12-month period are assigned a classification of "FESI-7."

20

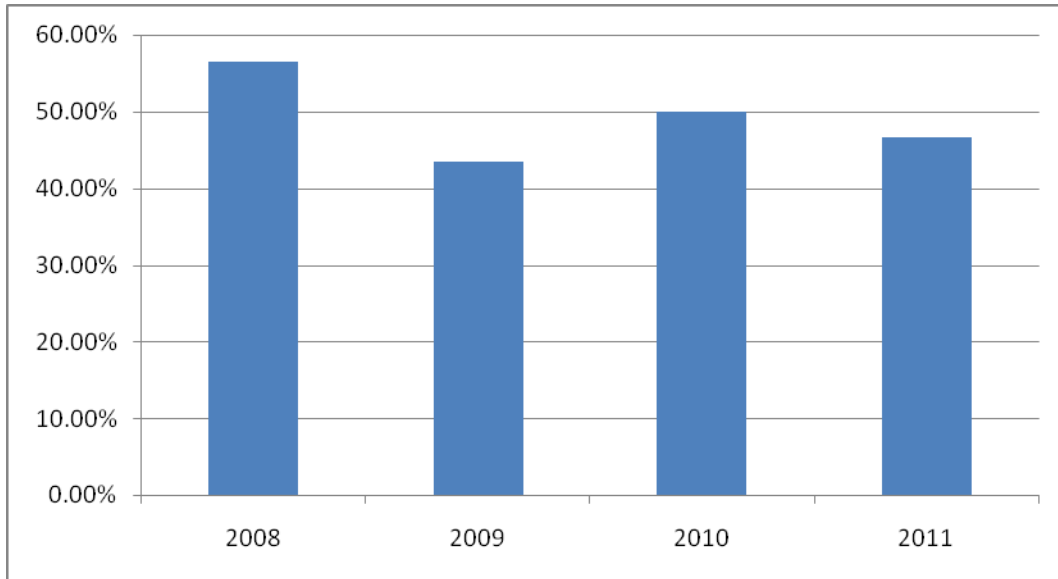
21    For 2011, "forced feeder interruptions" or unplanned interruptions on a feeder, constituted 71%  
22    of all outages (excluding MEDs). The high percentage indicates that addressing the reasons for  
23    the interruptions caused by the failures of feeders (as opposed to other equipment) will likely  
24    impact overall reliability more than addressing other reasons for service interruptions.

25

26    In 2011, there were a total of 1,961 outages compared to 2,158 outages in 2010. THESL  
27    attributes this improved feeder reliability to the swift and ongoing implementation of its WPF  
28    program. THESL must continue its WPF program for the years 2012-2013 ~~2014~~ as this program  
29    is necessary to maintain THESL's service reliability by reducing the impact of FESI-7 feeders on

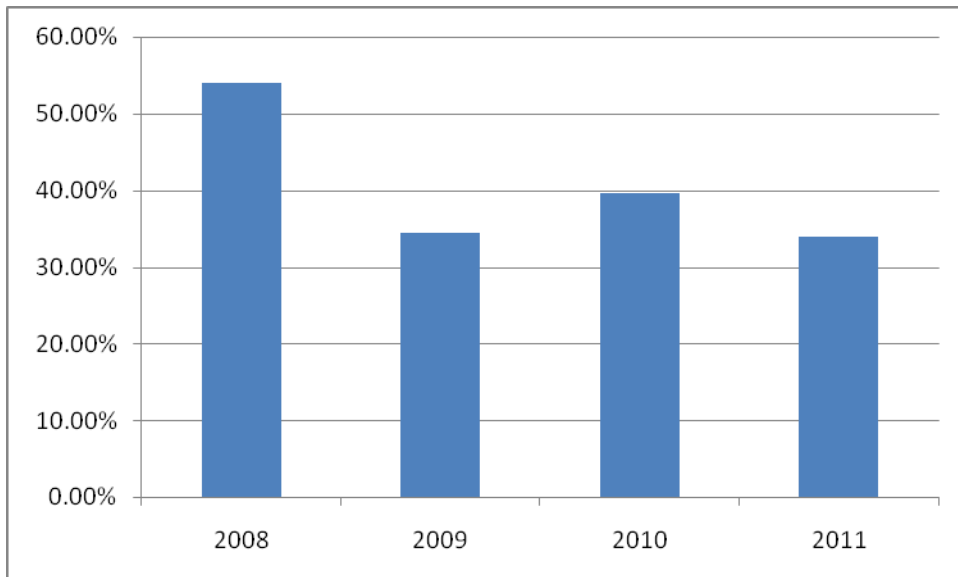
1 outage statistics. Figures 1 and 2 demonstrate the downward trend in the contribution of FESI-7  
2 feeders to system CI and CHI, respectively.

3



4 **Figure 1: Contribution of FESI-7 Feeders to System CI**

5



6 **Figure 2: Contribution of FESI-7 Feeders to System CHI**

1 Table 3 below shows the projected spending for the WPF program.

2

3 **Table 3: WPF Program Capital Summary (\$ M)**

2012	2013	2014
4.90	5.44	<del>24.50</del>

/UF, US

4

5

6 **3. Customer Connections (net of Customer Contributions) Capital**

7 THESL must make all reasonable efforts to connect new customers to its distribution system and  
 8 perform service upgrades requested by customers in accordance with the provisions of Section  
 9 3 of its Conditions of Service. Customer connections and upgrades are considered demand  
 10 work as they are driven by individual customer requests. Individual customers or developers  
 11 may request new service connections or may request a service upgrade due to an increase in  
 12 load. Connecting customers therefore constitutes non-discretionary work for the period 2012  
 13 to 2013 ~~2014~~.

14

15 The program requires significant capital investment. These investments range from the  
 16 connection of a single residential or small commercial customer to large commercial  
 17 connections or residential subdivision(s), and also include distributed generation connections.

18

19 The costs for customer connections, including new and upgrades to existing services, are based  
 20 on the capital expenditures for the different types of services and the number of each type of  
 21 customer connection per year. These costs are THESL's gross capital costs to connect customers  
 22 to existing THESL infrastructure. These costs are then reduced by the amounts of capital  
 23 contributions from customers to arrive at THESL's net budget for Customer Connections Capital  
 24 2012 to 2013 ~~2014~~. These amounts are shown in Table 4.

25

1 **Table 4: Customer Connections Capital Summary (\$ M)**

	2012	2013	2014
Customer Connections Capital (Gross)	42.08	49.25	<del>62.00</del>
Customer Contributions	(17.10)	(11.86)	<del>(32.00)</del>
Customer Connections Capital (Net)	24.98	37.39	<del>30.00</del>

} /UF, US

2

3

4 **4. Reactive Capital**

5 Reactive Capital is comprised of capital expenditures necessary to repair defective and failed  
 6 equipment. This work is non-discretionary in nature and required to restore power to  
 7 customers in the case of outages, to mitigate potential safety risks to the public, to maintain  
 8 system integrity, to maintain accurate billing, to perform corrective work to address failed and  
 9 defective equipment and/or to address other unexpected events that require immediate action.  
 10 Such work and the related capital expenditures are unplanned, but THESL allocates funds for  
 11 reactive work based on historical system performance, analyses of failure trends, and the trends  
 12 of the number of work requests for reactive capital work over the past five years. Table 5 below  
 13 presents the projected spending for Reactive Capital.

14

15 **Table 5: Reactive Capital Summary (\$ M)**

	2012	2013	2014
Underground Assets	16.10	17.80	<del>18.70</del>
Overhead Assets	7.80	9.60	<del>12.20</del>
Stations and Metering Assets	0.70	1.10	<del>1.00</del>
	0.80	0.80	<del>0.80</del>
Total	25.40	29.30	<del>32.70</del>

} /UF, US



1 As a whole, THESL's underground plant has been improving in reliability over the last few years  
2 due to increasing capital investment and replacement of assets which are at or beyond end of  
3 useful life. Despite this improvement, however, the remaining cables, as they continue to age,  
4 will continue to have more faults resulting in the need for more reactive capital funds to address  
5 the cable faults. A reduction in the planned spending on reactive capital can only exacerbate  
6 the current situation.

7

8 The need for expenditures on Overhead assets is projected to remain stable.

9

10 With respect to meters, THESL is responsible for maintaining the accuracy of all customers'  
11 billing and metering. It must address defective meters to be compliant with the Minister of  
12 Energy's directive on smart meter installation and the metering requirements set out by  
13 Measurement Canada in the Electricity and Gas Act. As part of this program, defective meters  
14 are replaced on a reactive basis. THESL forecasts a steady level of spending for these meter  
15 replacements.

16

## 17 **5. Continuing Projects and Emerging Issues Portfolio**

18 The Continuing Projects and Emerging Issues Portfolio consists of projects from 2011 which are  
19 being completed in 2012, and emerging projects which arise from issues that are difficult or  
20 impossible to anticipate and are likely to require attention within a year. The emerging projects  
21 are typically in response to reliability and/or safety issues and projects that have emerged on  
22 short notice such as externally- initiated relocations. The projects in the portfolio are non-  
23 discretionary and are classified into the following groups:

- 24 • Continuing projects from 2011 into 2012
- 25 • Emerging projects for 2012
- 26 • Emerging projects for 2013 and 2014

27

28 The continuing projects consist of: a) projects that were initiated in 2011 and scheduled to be  
29 completed in 2012 and b) projects that were deferred from 2011 to 2012 due to the emergence

1 of higher priority projects. These continuing projects address crucial reliability and/or safety  
2 issues, and support the infrastructure-related initiatives of external stakeholders such as the City  
3 of Toronto, the TTC, and GO Transit in their infrastructure-related initiatives. The deferral of  
4 2012 continuing projects could result in the further deterioration of THESL's service reliability  
5 and THESL breaking its contractual commitment to external stakeholders, which may result in  
6 THESL facing cancellation penalties from vendors or external entities.

7  
8 Emerging projects for 2012 consist of programs which include direct buried cables  
9 replacements, overhead rebuilds, and external plant relocations. Emerging projects aim to  
10 address pressing issues that require intervention within a year but not immediate attention, in  
11 contrast with those that are part of the Reactive Capital portfolio which deals with failed assets  
12 and assets that require immediate attention. These projects address many reliability issues  
13 (related to both the number of customer outages and the duration of outages) and replace and  
14 upgrade old and failing equipment. These projects include those for which THESL has entered  
15 into contracts with 3<sup>rd</sup> parties. The deferral or cancellation of any of these projects may add to  
16 the persistence of reliability and safety issues that have emerged in the recent. Work on  
17 emerging capital projects has already begun on selected projects to prevent further degradation  
18 of reliability of the system, potential safety risks, and uphold THESL's commitment to customer  
19 satisfaction.

20  
21 The emerging projects for 2013-2014, consist of capital projects that are anticipated to require  
22 attention and capital investment within a year of being identified. Based on issues requiring  
23 short-term intervention that have surfaced in the past, THESL anticipates that the emerging  
24 projects for 2013-2014 will be related to reliability, safety, external plant relocation requests,  
25 XLPE (cross-linked polyethylene) cable in duct, underground residential distribution (URD)  
26 system, egress cable civil infrastructure, and/or cable chambers. The deferment or cancellation  
27 of these projects would likely prevent THESL from addressing the reliability and safety issues  
28 that are anticipated to emerge during 2013-2014 and hinder work done by external

29

1 stakeholders, such as the City of Toronto, TTC, and Go Transit. Table 6 below summarizes the  
 2 2012-2014 projected spending in the portfolio.

3  
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**Table 6: Capital Investment Proposed for the Continuing Projects and Emerging Issues (\$M)**

	<b>2012</b>	<b>2013</b>	<b>2014</b>
Continuing Projects from 2011 into 2012	16.85	-	
Emerging Projects for 2012	38.88	-	
Emerging Projects for 2013 and 2014	-	40.00	24.90
<b>Total</b>	<b>55.73</b>	<b>40.00</b>	<b>24.90</b>

} /UF, US

1 **II INFORMATION TECHNOLOGY CAPITAL**

2

3 The Information Technology (IT) Capital Portfolio for 2012-2013 consists of required hardware /US  
 4 asset replacements, application upgrades and 2011 carryover projects that need to be  
 5 completed. The IT Capital Portfolio provides enabling technology to support critical business  
 6 processes; Meter-to-Cash, Legal and Regulatory compliance, stakeholder reporting, as well as  
 7 power delivery and restoration. A hardware asset failure due to end of life or a critical  
 8 application failure due to lack of vendor support would result in substantial and prolonged  
 9 disruption to THESL's operations and adversely impact customers. The IT Capital Portfolio is  
 10 required to mitigate the risk to THESL's ability to reliably deliver power, restore outages, bill  
 11 customers, and comply with Legal and Regulatory requirements including reporting.

12

13 Table 1 below summarizes THESL's planned spending by project for 2012-2013. /US

14

15 **Table 1: Projects for 2012-2014 (\$ M)**

Project Name	2012	2013	2014
Corporate Applications Upgrade	1.09	1.12	<del>0.45</del>
Billing and Regulatory Compliance Systems Upgrade	3.62	2.75	<del>2.14</del>
Geospatial Information System & Outage Management System Upgrade	0.40	2.63	<del>3.57</del>
Information Technology Hardware Asset Replacement	5.74	8.51	<del>8.85</del>
2011 Carryover Projects	11.15	-	
<b>TOTAL</b>	<b>22.00</b>	<b>15.00</b>	<b><del>15.00</del></b>

16 **1. Corporate Applications Upgrade**

17 THESL must upgrade its Financial Forecasting and Records Management systems to the most  
 18 recent versions. The Financial Forecasting system is critical to THESL's financial processes such  
 19 as capital/operational budgeting, financial consolidation and regulatory reporting. As part of  
 20 THESL's legal and governance framework, the Records Management system is the official core  
 21 repository of capital project artifacts including electrical drawings, standards, and Ontario

1 Energy Board filings, etc. Both systems are several versions behind the most current version and  
2 are no longer covered by vendor support. As a result of the expired support, these two core  
3 systems will no longer receive security upgrades or patches to resolve internal errors and will no  
4 longer be certified to work with third party applications where integration would be required.  
5 The upgrade is expected to ensure that these core systems are vendor supported thereby  
6 mitigating the risk to the Capital planning, budgeting, and forecasting processes.

7

## 8 **2. Billing and Regulatory Compliance Systems Upgrade**

9 THESL must upgrade technology components of its Meter-to-Cash process to the most recent  
10 versions. The Meter-to-Cash process and related technologies are utilized by THESL to collect  
11 data from meters as well as validate and compile the data to bill customers. The Meter  
12 Automation System (MAS) which enables the Meter-to-Cash process is aging. The system is  
13 three versions behind the currently available version and vendor support for some components  
14 have either expired or will soon expire. In addition, from time to time, THESL is mandated to  
15 comply with regulatory requirements that necessitate changes in its existing policies and  
16 systems. These changes are typically mandated through the Independent Electricity System  
17 Operator (IESO), Measurement Canada and the Ontario Energy Board (OEB). Some examples of  
18 these changes are the OEB's requirements relating to the application of the Ontario Clean  
19 Energy Benefit to eligible consumers' bills and the calculation of late payment charges taking  
20 into consideration the mode of payment; and Measurement Canada's requirements on the use  
21 of register readings for billing. Due to the volume of customer transactions involved, the  
22 regulatory changes create a requirement to reconfigure or enhance the technologies as well as  
23 related systems that generate bills as part of the Meter-to-Cash process. The upgrade is  
24 expected to ensure that the core system is vendor- supported, thereby mitigating the risks to  
25 revenue and customer billing.

26

## 27 **3. Geospatial Information System and Outage Management System Upgrade**

28 THESL must upgrade the Geospatial Information System (GIS) and Outage Management System  
29 (OMS) to the most recent versions. These systems are tightly integrated as the Outage

1 Management System relies on the Geospatial information system for connectivity of the electric  
2 distribution system and land-based information. The Geospatial Information System stores  
3 THESL's electrical distribution information which is used for engineering design, asset/feeder  
4 identification and/or locates. It is also used by the City of Toronto for work coordination and by  
5 other entities requiring geospatial information such as Bell or Rogers. The Outage Management  
6 System is primarily used to dispatch crews and record outage information for reporting  
7 purposes such as Police/Fire/Ambulance calls as well as Performance Based Regulatory  
8 measures. Both systems are several versions behind and are no longer covered by vendor  
9 support. The lack of vendor support for the Outage Management and Geospatial Information  
10 Systems exposes THESL to an unacceptable level of risk. Failure of these systems would result in  
11 either a substantial and prolonged disruption to the business, or in the worst credible scenario,  
12 a significant loss of THESL's physical/logical electrical plant data. As such, THESL faces a risk to  
13 its ability to reliably deliver power, restore outages and comply with regulatory reporting  
14 requirements.

15

#### 16 **4. Information Technology Hardware Asset Replacement**

17 THESL needs to replace its IT hardware assets which have reached their end of useful life. These  
18 assets include Servers, Storage and Backup, Network and Telephony, Printers and Plotters, User  
19 Endpoints (e.g., desktops, laptops etc.), and Security Appliances (e.g., Firewall System,  
20 Enterprise Data Warehouse etc.). The biggest detriment to the reliability of any hardware asset  
21 is usage of the asset beyond its useful life thereby increasing business continuity risk. THESL has  
22 developed and implemented a risk based asset model driven by standards aligned with industry  
23 best practices. These standards allow THESL to proactively identify and replace high risk assets.  
24 These asset replacements are necessary in order to mitigate the risk of interruptions to core  
25 business operations as all software systems rely on IT hardware assets to operate. Failure of IT  
26 hardware assets leads to disruptions in THESL's ability to reliably deliver and restore power, bill  
27 customers and comply with legal and regulatory reporting requirements.

1 **5. 2011 Carryover Projects**

2 THESL must complete the projects which were previously approved as part of the 2011 Cost of  
3 Service Electricity Distribution Rates (EDR) filing. THESL evaluated the projects contained in the  
4 2011 EDR application submission from a cost-benefit perspective and proceeded to execute  
5 once approval was granted.

6

7 These projects consist of the following:

- 8 • Customer Care and Service Area Enhancements – projects to meet the growing needs  
9 and expectations of tech savvy customers and improve online presence. THESL is  
10 enhancing customer experience via self serve features (such as customer profile  
11 creation/change/deletion and access to Time of Use Rate Information). The project also  
12 implements solutions to address changing regulatory requirements mainly the use of  
13 ‘register’ data instead of ‘interval’ data for Time-Of-Use billing and suite meter  
14 automated reading.
- 15 • Planned Work Automation Enhancements and Warehouse Management - includes the  
16 development of reports and analytics to support the distribution of work to field crews.  
17 The solution automates the customer service order process which enables crews to  
18 generate and report on reactive work in the field. The Warehouse Management project  
19 enables barcode scanning technology to minimize data entry errors and reduce input  
20 time. The project also enables asset inventory tracking as well as analytical reporting via  
21 Integration with THESL’s enterprise resource planning system.
- 22 • Logging, Data Loss Prevention and Governance Risk Console – The project delivers a  
23 security and event information management solution consisting of log aggregation,  
24 event correlation, analytics and reporting. It also focuses on creating clearly defined  
25 technical rules (technology system policies) which are monitored from a security  
26 perspective and evaluated via incidents where necessary actions would be identified.
- 27 • Time and Attendance - implements a unified time and attendance system providing  
28 improved controls, better governance and accurate reporting. The project automates

1           timekeeping data entry, approval, verification, processing, storage and reporting as well  
2           as exceptions, such as vacation or other absences.

3

4   The projects identified above are greater than 60% complete and deferral/cancellation of any of  
5   these projects may have negative consequences as follows:

- 6       • Inability of THESL to realize the value of the investment including defined operational  
7       benefits,
- 8       • Potential additional costs under existing vendor contracts, licence agreement  
9       cancellations, and project wrap-up costs,
- 10      • Given the relatively short (three to five years) lifecycle of the technology assets,  
11      additional investment may be required to finish the carry over projects at a later date
- 12      • Write-off of already incurred capital expenditures to OM&A.



1 **III FLEET CAPITAL**

2  
 3 THESL's Fleet is currently composed of 693 motor vehicles, including cars, pickups, bucket trucks /UF  
 4 and other vehicles (such as sweepers, backhoes and forklifts). The fleet capital spending  
 5 proposed for 2012 to 2013 ~~2014~~ is to acquire new vehicles and equipment to replace those  
 6 existing units that have reached the end of their service lives and where further repairs and  
 7 maintenance would not be appropriate or cost effective. It is also intended to include the  
 8 purchase of on-vehicle equipment, such as rubber power line covers. /UF

9  
 10 Table 1 below outlines THESL's forecast of units requiring replacement, the type of replacement /UF  
 11 vehicle to be acquired and the pre-tax cost of replacement in 2012 and 2013 and ~~2014~~ as well /UF  
 12 as the forecasted cost of rubber power line covers required in the same years. The projected /UF  
 13 fleet costs for 2012 are less than 10% of THESL's historic total fleet budget in recent years and /UF  
 14 those for 2013 are roughly 20% of the said budget. /UF

15  
 16 **Table 1: Fleet Costs for 2012-2014**

Vehicle Description	2012		2013		2014	
	Number	Cost	Number	Cost	Number	Cost
Car/Light Truck	5	0.14	-	-	-	-
Derrick	2	0.35	-	-	-	-
Forklift	1	0.11	-	-	-	-
Bucket Truck (Various Designs)	-	-	-	-	<del>6</del>	<del>1.69</del>
Cube Van	-	-	18	1.90	<del>3</del>	<del>0.31</del>
Vehicle Sub-Total	8	0.60	18	1.90	<del>9</del>	<del>2.00</del>
<b>On-Vehicle Equipment</b>						
Rubber Power Line Covers		0.20		0.10		
<b>Total</b>		<b>0.80</b>		<b>2.00</b>		<b>2.00</b>

} /UF

17 End-of-life vehicle replacement is non-discretionary and must occur during the test year period  
 18 if THESL is to have the adequate number and quality of vehicles required to accomplish its  
 19 distribution function. THESL's vehicle fleet must be safe, reliable and operate at reasonable  
 20 cost. As a result, THESL must replace vehicles that exhibit one or more of the following  
 21 conditions:

- 22 • are not consistently reliable and directly adversely impact THESL's ability to provide an  
 23 acceptable level of reliable customer service;

- 1 • incur maintenance costs that are consistently significantly greater than, or escalating at a
- 2 faster rate than a comparable peer vehicle within the fleet;
- 3 • demonstrate potential safety risks; and
- 4 • fail to meet THESL's functional needs or performance requirements (such as with a change
- 5 in long term Capital Plan work mix increasing the number of transformer installations, and
- 6 requiring the capacity, reach, and cargo-carrying capability of a material handling bucket
- 7 truck, as opposed to that of an autocrane-equipped truck that is planned for replacement).

8

9 In addition, prior to replacement, THESL generally reviews its vehicle requirements to determine  
10 whether there is an ongoing need for a certain vehicle, and if so, whether this need is best met  
11 by a vehicle in the same or an alternate class. This practice assists in enabling THESL to  
12 prudently adjust its fleet and equipment complement to adapt to emerging or changing work  
13 requirements. For example, in some projects, a cube van can be replaced by a sprinter van.  
14 Sprinter vans have lower cargo carrying capacity than cube vans but have a lower capital cost,  
15 are more manoeuvrable and more fuel efficient. If a sprinter van's specifications meet THESL's  
16 needs, then it may be chosen to replace a cube van.

17

18 The need for rubber power line covers is non-discretionary. The use of rubber power line covers  
19 is a legislative requirement for electrical field work where there is a risk of unintentional contact  
20 with exposed conductors. Rubber power line covers are required to be visually inspected on  
21 each use, and at minimum, electrically tested annually by a certified laboratory. Over time and  
22 through continued use, these can develop visual and/or insulative defects requiring that they  
23 be immediately removed from service and replaced.

1 **IV BUILDINGS AND FACILITIES CAPITAL**

2  
3 THESL's buildings and facilities include operating centers (500 Commissioners, 60 Eglinton, 6  
4 Monogram, 601 Milner); administrative buildings (14 Carlton, 5800 Yonge); and various  
5 electrical sub-stations located throughout the City of Toronto.

6  
7 The Facilities and Asset Management capital plan for 2012-2013 consists of specific non- /US  
8 discretionary projects required to prudently maintain THESL's facilities at an adequate level of  
9 repair and maintain compliance with the Canadian Standards Association, Ontario Building  
10 Code, Fire Protection and Prevention Act, and various Ontario Regulations of the Ontario Health  
11 and Safety Act (OHSA)<sup>1</sup>. Many of the planned initiatives focus on replacing components that are  
12 either failing or have reached their end-of-life wherein repairs or additional maintenance is not  
13 cost effective or appropriate, where THESL workers are exposed to potential safety risks that  
14 must be remedied, or where upgrades are mandatory in order for THESL to be able to carry out  
15 its distribution service in a reliable, safe, and cost effective way. In 2009, Pinchin Environmental  
16 Ltd. carried out a comprehensive building condition assessment ("the Pinchin Report") for  
17 THESL and released its report on the assessment in 2010. This Report identified several  
18 elements of the building envelope, structural, electrical and mechanical systems past their life  
19 cycle with recommendations for replacement. It has been filed with the Board as part of an  
20 interrogatory response in EB-2010-0142 as Exhibit R2, Tab 3, Schedule 3 dated February 23,  
21 2011<sup>2</sup>.

22  
23 Similarly, in 2011, Genivar Consultants carried out a Designated Substances and Hazardous  
24 Materials Survey of the sixth floor of the THESL building on 14 Carlton Street which identified a  
25 number of elements having Asbestos Containing Material which must be removed prior to any

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<sup>1</sup> Ontario Regulations 851, 213 and 278/05

<sup>2</sup> The report is over a thousand pages long. It is available at the Board's website at [http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/251690/view/THESL\\_IRR\\_AcctgUpdate\\_20110223.PDF](http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/251690/view/THESL_IRR_AcctgUpdate_20110223.PDF) and in THESL's external website at [http://www.torontohydro.com/sites/electricsystem/Documents/2011EDR/Tab3BOMA\\_AccountingUpdateIRs\\_20110223.pdf](http://www.torontohydro.com/sites/electricsystem/Documents/2011EDR/Tab3BOMA_AccountingUpdateIRs_20110223.pdf).

1 work being performed on these assets. The consultant’s report is provided in Tab 4, Schedule  
 2 D6. In planning its Facilities capital plan, THESL relies on the recommendations and findings of  
 3 these reports. THESL’s planned spending on Facilities capital projects for 2012-2014 is less than  
 4 half of actual historical spending in recent years, given that proposed expenditures are limited  
 5 to the highest-priority, non-discretionary items only.

6

7 Table 1 below summarizes THESL planned spending by project. The details of each project are  
 8 further summarized below.

9

10 **Table 1: Buildings and Facilities Budget 2012-2014 (\$ M)**

<b>Project Name</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
14 Carlton Street	2.20	2.01	<del>1.62</del>
500 Commissioners Street	0.70	1.60	<del>0.97</del>
6 Monogram Place	0.13	0.13	<del>0.11</del>
60 Eglinton Ave W	0.13	0.02	—
601 Milner Avenue	0.13	0.12	<del>0.40</del>
Card Access Security System	1.70	1.02	<del>1.90</del>
Installation of Backflow Preventer	0.01	0.08	—
<b>TOTAL</b>	<b>5.00</b>	<b>5.00</b>	<b><del>5.00</del></b>

/UF, US

11 **1. 14 Carlton Street**

12 Work at THESL’s Head Office at 14 Carlton involves a number of priority maintenance initiatives,  
 13 as well as several larger initiatives where THESL believes that further postponement and delay is  
 14 not a viable option. Notably, THESL plans to refurbish the existing sixth floor to retrofit the  
 15 cooling/heating fan coil units which are well past their life cycle and have started to fail. THESL  
 16 cannot risk allowing multiple failures of these coils since accessing them would involve  
 17 disturbing asbestos wrapping. The sixth floor also has a number of Asbestos Containing  
 18 Materials which were an integral part of the building construction. In accordance with the OHSA  
 19 and regulations, the Asbestos Containing Materials must be removed prior to any work being  
 20 performed on these assets. THESL also plans to install a new drainage pipe in the building, to

1 replace the current pipe which was installed in 1932 and is showing obvious signs of structural  
2 deterioration and corrosion. Similarly, THESL proposes to replace the outer layers of brick wall  
3 on the north side of the building and also replace and secure loose stone slabs where necessary.  
4 The cladding of the building was last refurbished in 1992 and (as stated in the 2009 Pinchin  
5 Report) there are visible signs of erosion in the panels with the danger that some slabs  
6 (measuring 6ft x 6ft) could come loose and fall off, posing a potential safety risk. Also, as a  
7 designated historical heritage building, its external façade must be preserved.

8

9 THESL also plans to continue with the installation of two backup power generators, which are  
10 required to ensure that emergency power is available to the building during emergency  
11 situations or system power failures. This initiative was started in 2008 with the purchase of two  
12 generators and associated switchgear. The multi-phase process has been ongoing since then,  
13 with expected completion in 2012.

14

## 15 **2. 500 Commissioners Street**

16 THESL's efforts at its main work centre at 500 Commissioners Street primarily involve the  
17 reconstruction and replacement of assets that have been failing and are already beyond their  
18 life expectancy. This work is mostly focussed on the replacement of life safety systems (such as  
19 corroded sprinkler system lines and malfunctioning associated pumps, control panels and  
20 valves) and various elements of the ventilations system (such as cracked heat exchangers,  
21 malfunctioning control systems and failed compressors in HVAC units). The consequences of  
22 not correcting these problems is a potential safety risk. THESL also plans to continue with the  
23 program of reconstruction of deteriorated internal concrete floors and external paved surfaces  
24 which began in 2010. In addition, THESL plans to complete the installation of a 1500kW Back Up  
25 Generator (which had begun in 2009 and is scheduled to be completed in 2012) to ensure that  
26 the work centre can continue to fully operate during emergency and power outage situations.

1     **3. 6 Monogram Place**

2     The 6 Monogram location is THESL's main work centre for the western part of Toronto. Within  
3     this building, THESL must build a well-equipped Local Incident Command Centre (LICC) with  
4     sufficient work space, efficient I.T. equipment, reliable communication networks, grid status  
5     displays and workforce accommodations to effectively manage emergency events for west  
6     Toronto. The LICC is an integral part of the THESL's emergency management unit (EMU) and  
7     must be at a state of readiness to centralize and coordinate planning and communications  
8     during an emergency event which could impact THESL's operations, employees, and customers.  
9     Currently, 6 Monogram does not have a command centre that meets THESL's EMU  
10    requirements. The issue has been a concern since THESL occupied the building in 2007 and was  
11    highlighted in February 2009 when as part of the company's emergency response to contact  
12    voltage incidents in the city, a level III emergency<sup>3</sup> was declared at THESL and a makeshift  
13    incident command centre was set up for the 23-day duration of the emergency management  
14    operations. During that period, while the emergency was safely dealt with, the inadequacies of  
15    the location as a emergency command centre were highlighted such as unreliable cellular  
16    phone coverage, insufficient number of telephone landlines, insufficient space to accommodate  
17    all of the personnel required to be in the command centre and lack of monitors to display the  
18    status of outages. Since then, upgrades to the LICC have been undertaken and THESL needs to  
19    continue enhancements to the physical space and the I.T. infrastructure.

20

21    **4. 60 Eglinton Avenue West**

22    At 60 Eglinton Avenue West, THESL must replace 3 failing HVAC units and a failing central chiller  
23    plant which are all well past their 15-year lifespan, the current units are 25 years old. The  
24    building currently houses THESL's backup Control Room and is unmanned. The upgrades to the  
25    heating and cooling system need to be made so that in an emergency situation, such as the  
26    occurrence of a catastrophic event that would disable THESL's main control room, the backup  
27    Control Room will be in a state of readiness.

---

<sup>3</sup> A severe emergency management situation which requires the deployment of all resources of the company to appropriately respond to it.

1 **5. 601 Milner Avenue**

2 Planned work at this location involves a number of required upgrades, particularly to security  
3 and building automation. In addition, THESL plans to construct a vehicle wash-bay to allow for  
4 the proper cleaning and maintenance of fleet vehicles at this location. The wash bay is required  
5 to clean overhead line bucket trucks which have a bucket on hydraulic booms. Maintaining a  
6 clean fleet also has important worker safety implications, because all bucket trucks must  
7 undergo dielectric testing prior to daily use to ensure they can be used in close proximity to high  
8 voltage wires without forming a path to ground. If trucks are covered with dust and salt residue  
9 and remain uncleaned, they will not pass the THESL's safety tests (as the residue creates a path  
10 for electricity to travel to the ground) and cannot be used as they could result in an electrical  
11 flash which may pose a potential safety risk to THESL workers, equipment, and the public. The  
12 wash bay must be constructed in a separate space from the garage to avoid damage to the  
13 environmental management control systems in the fleet parking garage. Steam and spray from  
14 washing trucks within the garage can damage oxygen sensors that activate exhaust fan systems  
15 when air quality reaches unacceptable OHS limits while trucks are running or entering/exiting  
16 the garage. The 58 oxygen sensor units cost \$1,000 each to replace should they fail.

17

18 **6. Card Access Security System at Substations**

19 Over the last several years THESL began the installation of an electronic security system  
20 involving card access and CCTV cameras in its substations throughout the GTA. THESL plans to  
21 complete the card access security installations in the remaining 72 stations that currently do not  
22 have card access control as well as installing new CCTV cameras in the same 72 stations.  
23 Security remains a serious concern for THESL. In 2011 alone there were four incidences of theft,  
24 two incidences of trespassing, and one break and enter that had occurred at THESL's  
25 substations. In each case there was material theft, potential safety risk to the unauthorized  
26 entrants, and potential compromise of the electrical distribution grid. Given the number and  
27 nature of incidences that occurred in 2011, THESL must undertake this work over the next three  
28 years.

1 **7. Installation of Backflow Preventer**

2 The City of Toronto's Water Supply Bylaw (Municipal Code, Chapter 851) enacted on October  
3 22, 2007 states that every commercial building in the City of Toronto is required to have a  
4 backflow preventer installed on the City's water main coming in, to protect the City's potable  
5 water system. Phase I – the installation of the backflow preventers at the main operating  
6 centers was completed in 2011. Phase II is intended to complete the installation at the 45  
7 remaining affected stations by 2013. The installation of the backflow preventers is a mandatory  
8 by-law requirement.



## MEMORANDUM

TO: Toronto Hydro-Electric System Limited (THESL)  
FROM: Steve Fenrick and Erik Sonju, Power System Engineering, Inc. (PSE)  
DATE: October 31, 2012  
SUBJECT: Addendum to the Manager's Summary—Revised ICM Business Cases

A report by Power System Engineering, Inc. dated May 8, 2012, "ICM Business Cases – Summary Report" (PSE Summary Report) focused on the overall methodologies and strategies used by THESL in determining the economic merits of ten reliability-driven business cases found in its original 2012 ICM filing. THESL has now updated these business cases for the reasons identified in its "Addendum to the Manager's Summary," dated October 31, 2012.

THESL has asked PSE to provide comments regarding how the business case update influences PSE's findings and conclusions in the PSE Summary Report. Our three primary findings, as found in Section 1.2 of the PSE Summary Report, are:

1. The ten ICM business cases presented by THESL provide significant justification that the projects are required, and in particular that the proposed projects are based on one or more of the following factors: safety, reliability, operational concerns, and regulatory requirements.
2. THESL's evaluation of the proposed ICM projects applies industry-leading techniques that aim to economically justify projects from the standpoint of all stakeholders, including customers.
3. Deferral or abandonment of the proposed THESL ICM projects will likely increase the probability of lower reliability to customers served by the corresponding facilities, and may in some cases present potential safety hazard exposures to the public and utility workers.

Given that much of the work effort within the business cases is being pushed back to later dates, it is likely these projects are more pressing than originally estimated. As old assets continue to age, the probabilities of failure continue to increase. As the probability of asset failures increase, the risk costs increase as well. This likely intensifies the urgency of undertaking these projects based on their economic merits. Thus, PSE's primary findings and conclusions still stand.

To the extent that THESL's Feeder Investment Model (FIM) analyses materially change, PSE reserves the ability to revisit its opinions regarding the affected project segments that were considered in PSE's Summary Report.

**RIDER to Navigant Consulting Inc. Report Titled:**  
**INDEPENDENT ASSESSMENT OF TORONTO HYDRO BUSINESS CASES**  
**Ontario Energy Board Case No. EB-2012-0064.**

The following summarizes Navigant's review and assessment of updates and revisions recently made to projects included in Toronto Hydro-Electric System Limited's (THESL) Incremental Capital Module (ICM) application for rate adjustments submitted to the Ontario Energy Board (OEB) under EB-2012-0064. The findings and conclusions presented in our assessment reflect THESL's October 31, 2012 *Addendum to the Manager's Summary* and updated business cases for each of the 11 projects that Navigant originally evaluated in its May 8, 2012 report titled "*Independent Assessment of Toronto Hydro Business Cases*" (Tab 4, Schedule D5, 15 pages submitted in EB-2012-0064). Accordingly, the findings and conclusions Navigant presents below are intended to amend and supplement those contained in our May 8, 2012 report.

Navigant's independent review of the ICM project revisions resulted in a determination that the rationale and justification used to support the 11 business cases reviewed in our May 8, 2012 assessment has not materially changed as a result of the changes outlined in THESL's October 31, 2012 *Addendum to Manager's Summary* and business case updates.

Most important, the justification for each project, including costs versus expected benefits, has not materially changed. This is expected, as electric utilities commonly adjust project schedules and spending patterns due to factors outside of their direct control, or when circumstances suggest that such adjustments are justified and are expected to benefit customers. Notably, our May 8, 2012 report findings were not premised on specific dates or times when specific projects and jobs should be completed. Rather, our report highlights on page 13 that "*the proposed investment schedule will assure that renewal programs are implemented in a scheduled and orderly manner.*" The adjustments that THESL proposes are entirely consistent with this statement.

Given these facts, Navigant has no reason to change any of the six key conclusions presented in our May 8, 2012 report, or any of the findings in other sections of our report given THESL's recent ICM business case updates and revisions; nor does this rider alter in any text or tables included in our May 8, 2012 report.



Legend    DROP-DOWN MENU    INPUT FIELD    CALCULATION

Applicant Name	Toronto Hydro-Electric System Limited
Application Type	IRM3
LDC Licence Number	ED-2002-0497
Applied for Effective Date	May 1, 2012
Stretch Factor Group	III
Stretch Factor Value	0.6%
Last COS Re-based Year	2011
Last COS OEB Application Number	EB-2010-0142
ICM Billing Determinants for Growth - Numerator	2011 Re-Based Forecast
ICM Billing Determinants for Growth - Denominator	2010 Audited RRR



Ontario Energy Board

**Incremental Capital  
 Workform**

## Table of Contents

Sheet Name	Purpose of Sheet
<a href="#">A1.1 LDC Information</a>	Enter LDC Data
<a href="#">A2.1 Table of Contents</a>	Table of Contents
<a href="#">B1.1 Re-Based Bill Det &amp; Rates</a>	Set Up Rate Classes and enter Re-Based Billing Determinants and Tariff Rates
<a href="#">B1.2 Removal of Rate Adders</a>	Removal of Rate Adders
<a href="#">B1.3 Re-Based Rev From Rates</a>	Calculated Re-Based Revenue From Rates
<a href="#">B1.4 Re-Based Rev Req</a>	Detailed Re-Based Revenue From Rates
<a href="#">C1.1 Ld Act-Mst Rcent Yr</a>	Enter Billing Determinants for most recent actual year
<a href="#">D1.1 Current Revenue from Rates</a>	Enter Current Rates to calculate current rate allocation
<a href="#">E1.1 Threshold Parameters</a>	Shows calculation of Price Cap and Growth used for incremental capital threshold calculation
<a href="#">E2.1 Threshold Test</a>	Input sheet to calculate Threshold and Incremental Capital
<a href="#">E3.1 Summary of I C Projects</a>	Summary of Incremental Capital Projects
<a href="#">E4.1 IncrementalCapitalAdjust</a>	Shows Calculation of Incremental Capital Revenue Requirement
<a href="#">F1.1 Incr Cap RRider Opt A FV</a>	Option A - Calculation of Incremental Capital Rate Rider - Fixed & Variable Split
<a href="#">F1.2 Incr Cap RRider Opt B Var</a>	Option B - Calculation of Incremental Capital Rate Rider - Variable Allocation
<a href="#">Z1.0 OEB Control Sheet</a>	Not Shown



## Rate Class and Re-Based Billing Determinants & Rates

Select the appropriate Rate Groups and Rate Classes from the drop-down menus in Columns C and D respectively. Following your selection, all appropriate input cells will be shaded green.

				2011					
				EB-2010-0142					
Rate Group	Rate Class	Fixed Metric	Vol Metric	Re-based Billed Customers or Connections A	Re-based Billed kWh B	Re-based Billed kW C	Re-based Tariff Service Charge D	Re-based Tariff Distribution Volumetric Rate kWh E	Re-based Tariff Distribution Volumetric Rate kW F
RES	Residential	Customer	kWh	598,508	4,886,977,489		18.25	0.0151	
RES	Residential Urban	Customer	kWh	24,898	99,791,184		17.00	0.0257	
GSLT50	General Service Less Than 50 kW	Customer	kWh	65,792	2,139,318,076	0	24.30	0.0225	
GSGT50	General Service 50 to 999 kW	Customer	kW	13,067	#####	26,935,191	35.56		5.5956
GSGT50	General Service 1,000 to 4,999 kW	Customer	kW	514	4,626,928,262	10,587,119	686.46		4.4497
LU	Large Use	Customer	kW	47	2,376,778,323	4,993,733	3,009.11		4.7406
SL	Street Lighting	Connection	kW	162,777	110,165,016	322,023	1.30		28.7248
USL	Unmetered Scattered Load	Connection	kWh	1,130	56,231,585		4.84	0.0607	
USL	Unmetered Scattered Load	Connection	kWh	21,729	0		0.49		
NA	Rate Class 10	NA	NA						
NA	Rate Class 11	NA	NA						
NA	Rate Class 12	NA	NA						
NA	Rate Class 13	NA	NA						
NA	Rate Class 14	NA	NA						
NA	Rate Class 15	NA	NA						
NA	Rate Class 16	NA	NA						
NA	Rate Class 17	NA	NA						
NA	Rate Class 18	NA	NA						
NA	Rate Class 19	NA	NA						
NA	Rate Class 20	NA	NA						
NA	Rate Class 21	NA	NA						
NA	Rate Class 22	NA	NA						
NA	Rate Class 23	NA	NA						
NA	Rate Class 24	NA	NA						
NA	Rate Class 25	NA	NA						



## Removal of Rate Adders

Last COS Re-based Year   
 Last COS OEB Application Number

Rate Class	Re-based Tariff	Re-based Tariff	Re-based Tariff	Service Charge	Distribution	Distribution	Re-based Base	Re-based Base	Re-based Base
	Service Charge	Distribution Volumetric Rate kWh	Distribution Volumetric Rate kW	Rate Adders	Volumetric kWh Rate Adders	Volumetric kW Rate Adders	Service Charge	Distribution Volumetric Rate kWh	Distribution Volumetric Rate kW
	A	B	C	D	E	F	H = A - D	I = B - E	J = C - F
Residential	18.25	0.0151	0.0000	0.00	0.0000	0.0000	18.25	0.0151	0.0000
Residential Urban	17.00	0.0257	0.0000	0.00	0.0000	0.0000	17.00	0.0257	0.0000
General Service Less Than 50 kW	24.30	0.0225	0.0000	0.00	0.0000	0.0000	24.30	0.0225	0.0000
General Service 50 to 999 kW	35.56	0.0000	5.5956	0.00	0.0000	0.0000	35.56	0.0000	5.5956
General Service 1,000 to 4,999 kW	686.46	0.0000	4.4497	0.00	0.0000	0.0000	686.46	0.0000	4.4497
Large Use	3,009.11	0.0000	4.7406	0.00	0.0000	0.0000	3,009.11	0.0000	4.7406
Street Lighting	1.30	0.0000	28.7248	0.00	0.0000	0.0000	1.30	0.0000	28.7248
Unmetered Scattered Load	4.84	0.0607	0.0000	0.00	0.0000	0.0000	4.84	0.0607	0.0000
Unmetered Scattered Load	0.49	0.0000	0.0000	0.00	0.0000	0.0000	0.49	0.0000	0.0000



### Calculated Re-Based Revenue From Rates

Last COS Re-based Year   
 Last COS OEB Application Number

Rate Class	Re-based Billed Customers or Connections A	Re-based Billed kWh B	Re-based Billed kW C	Re-based Base Service Charge D	Re-based Base Distribution Volumetric Rate kWh E	Re-based Base Distribution Volumetric Rate kW F	Service Charge Revenue G = A * D * 12	Distribution Volumetric Rate Revenue kWh H = B * E	Distribution Volumetric Rate Revenue kW I = C * F	Revenue Requirement from Rates J = G + H + I	Service Charge % Revenue K = G / J	Distribution Volumetric Rate % Revenue kWh L = H / J	Distribution Volumetric Rate % Revenue kW M = I / J	Total % Revenue N = J / R
Residential	598,508	4,886,977,489	0	18.25	0.0151	0.0000	131,073,252	73,646,751	0	204,720,003	64.0%	36.0%	0.0%	38.8%
Residential Urban	24,898	99,791,184	0	17.00	0.0257	0.0000	5,079,192	2,559,644	0	7,638,836	66.5%	33.5%	0.0%	1.4%
General Service Less Than 50 kW	65,792	2,139,318,076	0	24.30	0.0225	0.0000	19,184,993	48,070,477	0	67,255,470	28.5%	71.5%	0.0%	12.7%
General Service 50 to 999 kW	13,067	10,116,374,153	26,935,191	35.56	0.0000	5.5956	5,575,758	0	150,718,556	156,294,314	3.6%	0.0%	96.4%	29.6%
General Service 1,000 to 4,999 kW	514	4,626,928,262	10,587,119	686.46	0.0000	4.4497	4,234,085	0	47,109,505	51,343,590	8.2%	0.0%	91.8%	9.7%
Large Use	47	2,376,778,323	4,993,733	3,009.11	0.0000	4.7406	1,697,138	0	23,673,292	25,370,430	6.7%	0.0%	93.3%	4.8%
Street Lighting	162,777	110,165,016	322,023	1.30	0.0000	28.7248	2,539,322	0	9,250,042	11,789,364	21.5%	0.0%	78.5%	2.2%
Unmetered Scattered Load	1,130	56,231,585	0	4.84	0.0607	0.0000	65,611	3,413,257	0	3,478,868	1.9%	98.1%	0.0%	0.7%
Unmetered Scattered Load	21,729	0	0	0.49	0.0000	0.0000	127,767	0	0	127,767	100.0%	0.0%	0.0%	0.0%
							169,577,117	127,690,129	230,751,395	528,018,642				100.0%



## Detailed Re-Based Revenue From Rates

Last COS Re-based Year	2011
Last COS OEB Application Number	EB-2010-0142

### Applicants Rate Base

			Last Rate Re-based Amount	
<b>Average Net Fixed Assets</b>				
Gross Fixed Assets - Re-based Opening	\$ 4,183,572,075	A		
Add: CWIP Re-based Opening	\$ 204,719,106	B		
Re-based Capital Additions	\$ 376,263,596	C		
Re-based Capital Disposals		D		
Re-based Capital Retirements		E		
Deduct: CWIP Re-based Closing	-\$ 232,060,508	F		
Gross Fixed Assets - Re-based Closing	\$ 4,532,494,269	G		
Average Gross Fixed Assets			\$ 4,358,033,172	H = ( A + G ) / 2
Accumulated Depreciation - Re-based Opening	\$ 2,285,733,698	I		
Re-based Depreciation Expense	\$ 138,815,781	J		
Re-based Disposals	\$ 2,807,234	K		
Re-based Retirements		L		
Accumulated Depreciation - Re-based Closing	\$ 2,427,356,713	M		
Average Accumulated Depreciation			\$ 2,356,545,206	N = ( I + M ) / 2
<b>Average Net Fixed Assets</b>			\$ 2,001,487,967	O = H - N
<b>Working Capital Allowance</b>				
Working Capital Allowance Base	\$ 2,479,952,766	P		
Working Capital Allowance Rate	12.0%	Q		
<b>Working Capital Allowance</b>			\$ 296,739,314	R = P * Q
<b>Rate Base</b>			\$ 2,298,227,281	S = O + R
<b>Return on Rate Base</b>				
Deemed ShortTerm Debt %	4.00%	T	\$ 91,929,091	W = S * T
Deemed Long Term Debt %	56.00%	U	\$ 1,287,007,277	X = S * U
Deemed Equity %	40.00%	V	\$ 919,290,912	Y = S * V
Short Term Interest	2.46%	Z	\$ 2,261,456	AC = W * Z
Long Term Interest	5.37%	AA	\$ 69,112,291	AD = X * AA
Return on Equity	9.58%	AB	\$ 88,068,069	AE = Y * AB
<b>Return on Rate Base</b>			\$ 159,441,816	AF = AC + AD + AE
<b>Distribution Expenses</b>				
OM&A Expenses	\$ 231,214,224	AG		
Amortization	\$ 138,815,781	AH		
Ontario Capital Tax (F1.1 Z-Factor Tax Changes)	\$ 6,802,382	AI		
Grossed Up PILS (F1.1 Z-Factor Tax Changes)	\$ 11,791,223	AJ		
Low Voltage		AK		
Transformer Allowance	\$ 11,479,842	AL		
	\$ -	AM		
		AN		
		AO		
			\$ 400,103,452	AP = SUM ( AG : AO )
<b>Revenue Offsets</b>				
Specific Service Charges	-\$ 7,580,526	AQ		
Late Payment Charges	-\$ 4,900,000	AR		
Other Distribution Income	-\$ 7,240,556	AS		
Other Income and Deductions	-\$ 6,300,000	AT	-\$ 26,021,082	AU = SUM ( AQ : AT )
<b>Revenue Requirement from Distribution Rates</b>			\$ 533,524,186	AV = AF + AP + AU
<b>Rate Classes Revenue</b>				
<b>Rate Classes Revenue - Total (B1.1 Re-based Revenue - Gen)</b>			\$ 528,018,642	AW
Difference			\$ 5,505,544	AZ = AV - AW
Difference (Percentage - should be less than 1%)			1.04%	BA = AZ / AW





**Load Actual - Most Recent Year**

Rate Class	Fixed Metric	Vol Metric	Billed Customers or Connections			Base Service Charge	Base Distribution Volumetric Rate kWh	Base Distribution Volumetric Rate kW	Service Charge Revenue	Distribution Volumetric Rate Revenue kWh	Distribution Volumetric Rate Revenue kW	Total Revenue by Rate Class
			A	B	C							
Residential	Customer	kWh	591,496	5,105,974,275	0	\$18.25	\$0.0151	\$0.0000	\$129,537,624	\$76,947,032	\$0	\$206,484,656
Residential Urban	Customer	kWh	24,898	99,791,184	0	\$17.00	\$0.0257	\$0.0000	\$5,079,192	\$2,559,644	\$0	\$7,638,836
General Service Less Than 50 kW	Customer	kWh	65,799	2,095,343,918	0	\$24.30	\$0.0225	\$0.0000	\$19,186,988	\$47,082,378	\$0	\$66,269,366
General Service 50 to 999 kW	Customer	kW	12,873	10,189,051,346	26,712,248	\$35.56	\$0.0000	\$5.5956	\$5,493,167	\$0	\$149,471,055	\$154,964,221
General Service 1,000 to 4,999 kW	Customer	kW	509	4,828,382,733	10,972,419	\$686.46	\$0.0000	\$4.4497	\$4,192,898	\$0	\$48,823,974	\$53,016,871
Large Use	Customer	kW	47	2,263,227,585	5,267,224	\$3,009.11	\$0.0000	\$4.7406	\$1,697,138	\$0	\$24,969,801	\$26,666,940
Street Lighting	Connection	kW	162,964	112,727,603	321,995	\$1.30	\$0.0000	\$28.7248	\$2,542,238	\$0	\$9,249,232	\$11,791,471
Unmetered Scattered Load	Connection	kWh	1,107	52,097,299	0	\$4.84	\$0.0607	\$0.0000	\$64,295	\$3,162,306	\$0	\$3,226,601
Unmetered Scattered Load	Connection	kWh	12,159	0	0	\$0.49	\$0.0000	\$0.0000	\$71,495	\$0	\$0	\$71,495
<b>\$167,865,035</b>									<b>\$129,751,360</b>	<b>\$232,514,062</b>	<b>\$530,130,457</b>	



This sheet is used to determine the applicants most current allocation of revenues (after the most recent revenue cost ratio adjustment, if applicable) to be used to calculate the incremental capital rate riders.

### Current Revenue from Rates

Rate Class	Fixed Metric	Vol Metric	Current Base Service Charge A	Current Base Distribution Volumetric Rate kWh B	Current Base Distribution Volumetric Rate kW C	Re-based Billed Customers or Connections D	Re-based Billed kWh E	Re-based Billed kW F	Current Base Service Charge Revenue G = A * D * 12	Current Base Distribution Volumetric Rate kWh Revenue H = B * E	Current Base Distribution Volumetric Rate kW Revenue I = C * F	Total Current Base Revenue J = G + H + I	Service Charge % Total Revenue L = G / \$K	Distribution Volumetric Rate % Total Revenue M = H / \$K	Distribution Volumetric Rate % Total Revenue N = I / \$K	Total % Revenue O = J / \$K
Residential	Customer	kWh	18.25	0.0151		598,508	4,886,977,489	0	131,073,252	73,646,751	0	204,720,003	24.8%	13.9%	0.0%	38.8%
Residential Urban	Customer	kWh	17.00	0.0257		24,898	99,791,184	0	5,079,192	2,559,644	0	7,638,836	1.0%	0.5%	0.0%	1.4%
General Service Less Than 50 kW	Customer	kWh	24.30	0.0225		65,792	2,139,318,076	0	19,184,993	48,070,477	0	67,255,470	3.6%	9.1%	0.0%	12.7%
General Service 50 to 999 kW	Customer	kW	35.56		5.5956	13,067	10,116,374,153	26,935,191	5,575,758	0	150,718,556	156,294,314	1.1%	0.0%	28.5%	29.6%
General Service 1,000 to 4,999 kW	Customer	kW	686.46		4.4497	514	4,626,928,262	10,587,119	4,234,085	0	47,109,505	51,343,590	0.8%	0.0%	8.9%	9.7%
Large Use	Customer	kW	3,009.11		4.7406	47	2,376,778,323	4,993,733	1,697,138	0	23,673,292	25,370,430	0.3%	0.0%	4.5%	4.8%
Street Lighting	Connection	kW	1.30		28.7248	162,777	110,165,016	322,023	2,539,322	0	9,250,042	11,789,364	0.5%	0.0%	1.8%	2.2%
Unmetered Scattered Load	Connection	kWh	4.84	0.0607		1,130	56,231,585	0	65,611	3,413,257	0	3,478,868	0.0%	0.6%	0.0%	0.7%
Unmetered Scattered Load	Connection	kWh	0.49			21,729	0	0	127,767	0	0	127,767	0.0%	0.0%	0.0%	0.0%
									169,577,117	127,690,129	230,751,395	528,018,642	32.1%	24.2%	43.7%	100.0%



## Threshold Parameters

### Price Cap Index

Price Escalator (GDP-IPI)	2.00%
Less Productivity Factor	-0.72%
Less Stretch Factor	-0.60%

**Price Cap Index** **0.68%**

### Growth

ICM Billing Determinants for Growth - Numerator : 2011 Re-Based Forecast \$ 528,018,642    A

ICM Billing Determinants for Growth - Denominator : 2010 Audited RRR \$ 530,130,457    B

**Growth** **-0.40%**    C = A / B



## Threshold Test

Year	2011	
<b>Price Cap Index</b>	<b>0.68%</b>	<b>A</b>
<b>Growth</b>	<b>-0.40%</b>	<b>B</b>
<b>Dead Band</b>	<b>20%</b>	<b>C</b>
<b>Average Net Fixed Assets</b>		
Gross Fixed Assets Opening	\$ 4,183,572,075	
Add: CWIP Opening	\$ 204,719,106	
Capital Additions	\$ 376,263,596	
Capital Disposals	\$ -	
Capital Retirements	\$ -	
Deduct: CWIP Closing	-\$ 232,060,508	
Gross Fixed Assets - Closing	\$ 4,532,494,269	
Average Gross Fixed Assets	<u>\$ 4,358,033,172</u>	
Accumulated Depreciation - Opening	\$ 2,285,733,698	
Depreciation Expense	\$ 138,815,781	<b>D</b>
Disposals	\$ 2,807,234	
Retirements		
Accumulated Depreciation - Closing	\$ 2,427,356,713	
Average Accumulated Depreciation	<u>\$ 2,356,545,206</u>	
<b>Average Net Fixed Assets</b>	<u>\$ 2,001,487,967</u>	<b>E</b>
<b>Working Capital Allowance</b>		
Working Capital Allowance Base	\$ 2,479,952,766	
Working Capital Allowance Rate	12%	
<b>Working Capital Allowance</b>	<u>\$ 296,739,314</u>	<b>F</b>
<b>Rate Base</b>	<u>\$ 2,298,227,281</u>	<b>G = E + F</b>
<b>Depreciation</b>	<b>D \$ 138,815,781</b>	<b>H</b>
<b>Threshold Test</b>	<b>124.62%</b>	<b>I = 1 + ( G / H ) * ( B + A * ( 1 + B ) ) + C</b>
<b>Threshold CAPEX</b>	<b>\$ 172,989,465</b>	<b>J = H * I</b>



Ontario Energy Board

**Incremental Capital  
 Workform**

## Summary of Incremental Capital Projects (ICPs)

Number of ICPs

1

Project ID #	Incremental Capital Non-Discretionary Project Description	Incremental Capital CAPEX	Amortization Expense	CCA
ICP 1	Summary of Projects (please see Schedule E1.2)	101,693,161	3,144,522	6,655,784
		<u>101,693,161</u>	<u>3,144,522</u>	<u>6,655,784</u>



## Incremental Capital Adjustment

### Current Revenue Requirement

Current Revenue Requirement - Total	\$ 533,524,186	A
-------------------------------------	----------------	---

### Return on Rate Base

Incremental Capital CAPEX		\$ 101,693,161	B
Depreciation Expense		\$ 3,144,522	C
Incremental Capital CAPEX to be included in Rate Base		\$ 98,548,639	D = B - C
Deemed ShortTerm Debt %	4.0%	E \$ 3,941,946	G = D * E
Deemed Long Term Debt %	56.0%	F \$ 55,187,238	H = D * F
Short Term Interest	2.46%	I \$ 96,972	K = G * I
Long Term Interest	5.37%	J \$ 2,963,555	L = H * J
Return on Rate Base - Interest		\$ 3,060,527	M = K + L
Deemed Equity %	40.0%	N \$ 39,419,456	P = D * N
Return on Rate Base -Equity	9.58%	O \$ 3,776,384	Q = P * O
Return on Rate Base - Total		\$ 6,836,910	R = M + Q

### Amortization Expense

Amortization Expense - Incremental	C \$ 3,144,522	S
------------------------------------	----------------	---

### Grossed up PIL's

Regulatory Taxable Income	O \$ 3,776,384	T
Add Back Amortization Expense	S \$ 3,144,522	U
Deduct CCA	\$ 6,655,784	V
Incremental Taxable Income	\$ 265,122	W = T + U - V
Current Tax Rate (F1.1 Z-Factor Tax Changes)	26.4% X	
PIL's Before Gross Up	\$ 69,992	Y = W * X
Incremental Grossed Up PIL's	\$ 95,098	Z = Y / (1 - X)

### Ontario Capital Tax

Incremental Capital CAPEX	\$ 101,693,161	AA
Less : Available Capital Exemption (if any)	\$ -	AB
Incremental Capital CAPEX subject to OCT	\$ 101,693,161	AC = AA - AB
Ontario Capital Tax Rate (F1.1 Z-Factor Tax Changes)	0.000% AD	
Incremental Ontario Capital Tax	\$ -	AE = AC * AD

### Incremental Revenue Requirement

Return on Rate Base - Total	Q \$ 6,836,910	AF
Amortization Expense - Total	S \$ 3,144,522	AG
Incremental Grossed Up PIL's	Z \$ 95,098	AH
Incremental Ontario Capital Tax	AE \$ -	AI
Incremental Revenue Requirement	\$ 10,076,530	AJ = AF + AG + AH + AI



### Calculation of Incremental Capital Rate Rider - Option A Fixed and Variable

Rate Class	Service Charge %	Distribution Volumetric Rate %	Distribution Volumetric Rate %	Service Charge Revenue	Distribution Volumetric Rate Revenue	Distribution Volumetric Rate Revenue	Total Revenue by Rate Class	Billed Customers or Connections	Billed kWh	Billed kW	Service Charge Rate Rider	Distribution Volumetric Rate kWh	Distribution Volumetric Rate kW
	A	B	C	D = \$N * A	E = \$N * B	F = \$N * C	G = D + E + F	H	I	J	K = D / H / 12	L = E / I	M = F / J
Residential	24.8%	13.9%	0.0%	\$ 2,501,357.83	\$ 1,405,449.81	\$ -	\$ 3,906,807.64	598,508	4,886,977,489	0	\$0.348277	\$0.000288	
Residential Urban	1.0%	0.5%	0.0%	\$ 96,929.59	\$ 48,847.38	\$ -	\$ 145,776.97	24,898	99,791,184	0	\$0.324422	\$0.000489	
General Service Less Than 50 kW	3.6%	9.1%	0.0%	\$ 366,119.94	\$ 917,360.81	\$ -	\$ 1,283,480.75	65,792	2,139,318,076	0	\$0.463733	\$0.000429	
General Service 50 to 999 kW	1.1%	0.0%	28.5%	\$ 106,405.89	\$ -	\$ 2,876,262.21	\$ 2,982,668.09	13,067	10,116,374,153	26,935,191	\$0.678615	\$0.000000	\$0.106785
General Service 1,000 to 4,999 kW	0.8%	0.0%	8.9%	\$ 80,801.86	\$ -	\$ 899,021.93	\$ 979,823.79	514	4,626,928,262	10,587,119	\$13.100172	\$0.000000	\$0.084917
Large Use	0.3%	0.0%	4.5%	\$ 32,387.61	\$ -	\$ 451,773.14	\$ 484,160.75	47	2,376,778,323	4,993,733	\$57.424843	\$0.000000	\$0.090468
Street Lighting	0.5%	0.0%	1.8%	\$ 48,459.56	\$ -	\$ 176,524.69	\$ 224,984.25	162,777	110,165,016	322,023	\$0.024809	\$0.000000	\$0.548174
Unmetered Scattered Load	0.0%	0.6%	0.0%	\$ 1,252.10	\$ 65,137.45	\$ -	\$ 66,389.55	1,130	56,231,585	0	\$0.092365	\$0.001158	
Unmetered Scattered Load	0.0%	0.0%	0.0%	\$ 2,438.26	\$ -	\$ -	\$ 2,438.26	21,729	0	0	\$0.009351		
				\$ 3,236,152.64	\$ 2,436,795.45	\$ 4,403,581.97	\$ 10,076,530.06						

Enter the above rate riders onto "Sheet 14. Proposed Rate\_Riders" in the 2012 OEB IRM3 Rate Generator as an "Rate Rider for Incremental Capital"



Ontario Energy Board

## Incremental Capital Workform

### Calculation of Incremental Capital Rate Rider - Option B Variable

Rate Class	Total Revenue \$ by Rate Class A	Total Revenue % by Rate Class B = A / \$H	Total Incremental Capital \$ by Rate Class C = \$I * B	Billed kWh D	Billed kW E	Distribution Volumetric Rate kWh Rate Rider F = C / D	Distribution Volumetric Rate kW Rate Rider G = C / E
Residential	\$204,720,003	38.77%	\$3,906,808	4,886,977,489	0	\$0.0008	
Residential Urban	\$7,638,836	1.45%	\$145,777	99,791,184	0	\$0.0015	
General Service Less Than 50 kW	\$67,255,470	12.74%	\$1,283,481	2,139,318,076	0	\$0.0006	
General Service 50 to 999 kW	\$156,294,314	29.60%	\$2,982,668	10,116,374,153	26,935,191		\$0.1107
General Service 1,000 to 4,999 kW	\$51,343,590	9.72%	\$979,824	4,626,928,262	10,587,119		\$0.0925
Large Use	\$25,370,430	4.80%	\$484,161	2,376,778,323	4,993,733		\$0.0970
Street Lighting	\$11,789,364	2.23%	\$224,984	110,165,016	322,023		\$0.6987
Unmetered Scattered Load	\$3,478,868	0.66%	\$66,390	56,231,585	0	\$0.0012	
Unmetered Scattered Load	\$127,767	0.02%	\$2,438	0	0		
	<b>\$528,018,642</b> H	<b>100.00%</b>	<b>\$10,076,530</b> I				

Enter the above rate riders onto "Sheet 14. Proposed Rate\_Riders" in the 2012 OEB IRM3 Rate Generator as an "Rate Rider for Incremental Capital"



## ICM Values Calculation - 2012

	Capital Cost	Amort. Exp	CCA
01 Underground Infrastructure	28,753,593	942,057	2,300,287
02 Paper Insulated Lead Covered Cable - Piece Outs and Leakers	80,959	2,024	6,477
03 Handwell Replacement	13,651,577	341,289	1,092,126
04 Overhead Infrastructure	9,069,739	238,757	725,579
05 Box Construction	582,984	14,770	46,639
06 Rear Lot Construction	16,357,431	466,706	1,308,594
07 Polymer SMD - 20 Fuses	0	0	0
08 Scadamate R1 Switches	0	0	0
09 Network Vault & Roofs	2,838,162	95,522	227,053
10 Fibertop Network Units	1,476,735	70,686	118,139
11 Automatic Transfer Switches (ATS) % Reverse Power Breakers (RPF	0	0	0
12 Stations Power Transformers	375,540	11,736	30,043
13 Stations Switchgear	1,727,687	44,078	139,771
14 Stations Circuit Breakers	759,658	25,322	60,448
15 Stations Control & Communication Systems	135,429	9,029	27,086
16 Downtown Station Load Transfers	679,135	16,978	54,331
17 Bremner Transformer Station	8,500,000	197,387	519,210
18 Hydro One Capital Contributions (Prorated)	16,704,532	668,181	0
<b>18 Hydro One Capital Contributions</b>	<b>22,977,664</b>	<b>919,107</b>	<b>0</b>
<b>18 Hydro One Capital Contributions (Prorated)</b>	<b>6,273,132</b>	<b>250,925</b>	<b>0</b>
19 Feeder Automation	2,303,905	75,664	184,312
20 Wholesale and Smart Metering	4,739,114	289,723	379,129
21 Externally-Initiated Plant Relocations and Expansions	10,163,652	300,769	813,092
PCI Total	149,509,662	0	0
<b>Total</b>	<b>274,682,626</b>	<b>4,061,603</b>	<b>8,032,317</b>

<b>Threshold CAPEX</b>	<b>\$ 172,989,465</b>
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	Capital Cost	Amort. Exp	CCA
Values Above Threshold for ICM Model	101,693,161	3,144,522	6,655,784
Threshold Values	172,989,465	917,081	1,376,534

## Calculation of Incremental Capital Rate Rider - Option A Fixed and Variable

Rate Class	Fixed Metric	Vol Metric	Service Charge Rate Rider K = D / H / 12	Distribution Volumetric Rate kWh Rate Rider L = E / I	Distribution Volumetric Rate kVA Rate Rider M = F / J	Service Charge Rate Rider (DOS)	Distribution Volumetric Rate kWh Rate Rider	Distribution Volumetric Rate kVA Rate Rider (DOS)
Residential	Customer	kWh	\$0.3483	\$0.000288		\$0.343506	\$0.000288	
Residential Urban	Customer	kWh	\$0.3244	\$0.000489		\$0.319978	\$0.000489	
General Service Less Than 50 kW	Customer	kWh	\$0.4637	\$0.000429		\$0.457380	\$0.000429	
General Service 50 to 999 kW	Customer	kW	\$0.6786	\$0.000000	\$0.1068	\$0.669319		\$0.105322
General Service 1,000 to 4,999 kW	Customer	kW	\$13.1002	\$0.000000	\$0.0849	\$12.920718		\$0.083754
Large Use	Customer	kW	\$57.4248	\$0.000000	\$0.0905	\$56.638201		\$0.089229
Street Lighting	Connection	kW	\$0.0248	\$0.000000	\$0.5482	\$0.024469		\$0.540665
Unmetered Scattered Load	Connection	kWh	\$0.0924	\$0.001158		\$0.091100	\$0.001158	
Unmetered Scattered Load	Connection	kWh	\$0.0094			\$0.009223		

**2012 ICM - Rate Adder**

Rate Class	Service Charge % Revenue A	Distribution Volumetric Rate % Revenue kWh B	Distribution Volumetric Rate % Revenue kW C	Service Charge Revenue D = \$N * A	Distribution Volumetric Rate Revenue kWh E = \$N * B	Distribution Volumetric Rate Revenue kVA F = \$N * C	Total Revenue by Rate Class G = D + E + F	Billed Customers or Connections H	Billed kWh I	Billed kVA J	Service Charge Adder K = D / H / 12	Distribution Volumetric Rate kWh Adder L = E / I	Distribution Volumetric Rate kVA Adder M = F / J	Service Charge Rate Adder (DOS)	Distribution Volumetric Rate kWh Adder Rider	Distribution Volumetric Rate kVA Rate Adder (DOS)
Residential	24.8%	13.9%	0.0%	\$ 3,752,036.74	\$ 2,108,174.71	\$ -	\$ 5,860,211.45	598,508	4,886,977,489	0	\$0.52	\$0.00043		\$0.52	\$0.00043	
Residential Urban	1.0%	0.5%	0.0%	\$ 145,394.39	\$ 73,271.07	\$ -	\$ 218,665.46	24,898	99,791,184	0	\$0.49	\$0.00073		\$0.48	\$0.00073	
General Service Less Than 50 kW	3.6%	9.1%	0.0%	\$ 549,179.91	\$ 1,376,041.21	\$ -	\$ 1,925,221.13	65,792	2,139,318,076	0	\$0.70	\$0.00064		\$0.69	\$0.00064	
General Service 50 to 999 kW	1.1%	0.0%	28.5%	\$ 159,608.83	\$ -	\$ 4,314,393.31	\$ 4,474,002.14	13,067	10,116,374,153	26,935,191	\$1.02		\$0.1602	\$1.00		\$0.1580
General Service 1,000 to 4,999 kW	0.8%	0.0%	8.9%	\$ 121,202.79	\$ -	\$ 1,348,532.90	\$ 1,469,735.69	514	4,626,928,262	10,587,119	\$19.65		\$0.1274	\$19.38		\$0.1256
Large Use	0.3%	0.0%	4.5%	\$ 48,581.42	\$ -	\$ 677,659.71	\$ 726,241.13	47	2,376,778,323	4,993,733	\$86.14		\$0.1357	\$84.96		\$0.1338
Street Lighting	0.5%	0.0%	1.8%	\$ 72,689.34	\$ -	\$ 264,787.04	\$ 337,476.38	162,777	110,165,016	322,023	\$0.04		\$0.8223	\$0.04		\$0.8110
Unmetered Scattered Load	0.0%	0.6%	0.0%	\$ 1,878.15	\$ 97,706.18	\$ -	\$ 99,584.32	1,130	56,231,585	0	\$0.14	\$0.00174		\$0.14	\$0.00174	
Unmetered Scattered Load	0.0%	0.0%	0.0%	\$ 3,657.39	\$ -	\$ -	\$ 3,657.39	21,729	0	0	\$0.01			\$0.01		
				\$ 4,854,228.96	\$ 3,655,193.17	\$ 6,605,372.96	\$ 15,114,795.09									

Incremental Revenue Requirement for 2012 (from ICM model)

A \$ 10,076,530.06

Total Revenue Requirement over 3 Years 2012-2014

B = A \* 3 \$ 30,229,590.18

Annual Revenue requirement over 2 Years 2013-2014


C = B / 2 \$ 15,114,795.09



Legend    DROP-DOWN MENU    INPUT FIELD    CALCULATION

Applicant Name	Toronto Hydro-Electric System Limited
Application Type	IRM3
LDC Licence Number	ED-2002-0497
Applied for Effective Date	May 1, 2012
Stretch Factor Group	III
Stretch Factor Value	0.6%
Last COS Re-based Year	2011
Last COS OEB Application Number	EB-2010-0142
ICM Billing Determinants for Growth - Numerator	2011 Re-Based Forecast
ICM Billing Determinants for Growth - Denominator	2010 Audited RRR



 Ontario Energy Board  
**Incremental Capital  
 Workform**

## Table of Contents

Sheet Name	Purpose of Sheet
<a href="#">A1.1 LDC Information</a>	Enter LDC Data
<a href="#">A2.1 Table of Contents</a>	Table of Contents
<a href="#">B1.1 Re-Based Bill Det &amp; Rates</a>	Set Up Rate Classes and enter Re-Based Billing Determinants and Tariff Rates
<a href="#">B1.2 Removal of Rate Adders</a>	Removal of Rate Adders
<a href="#">B1.3 Re-Based Rev From Rates</a>	Calculated Re-Based Revenue From Rates
<a href="#">B1.4 Re-Based Rev Req</a>	Detailed Re-Based Revenue From Rates
<a href="#">C1.1 Ld Act-Mst Rcent Yr</a>	Enter Billing Determinants for most recent actual year
<a href="#">D1.1 Current Revenue from Rates</a>	Enter Current Rates to calculate current rate allocation
<a href="#">E1.1 Threshold Parameters</a>	Shows calculation of Price Cap and Growth used for incremental capital threshold calculation
<a href="#">E2.1 Threshold Test</a>	Input sheet to calculate Threshold and Incremental Capital
<a href="#">E3.1 Summary of IC Projects</a>	Summary of Incremental Capital Projects
<a href="#">E4.1 IncrementalCapitalAdjust</a>	Shows Calculation of Incremental Capital Revenue Requirement
<a href="#">F1.1 Incr Cap RRider Opt A FV</a>	Option A - Calculation of Incremental Capital Rate Rider - Fixed & Variable Split
<a href="#">F1.2 Incr Cap RRider Opt B Var</a>	Option B - Calculation of Incremental Capital Rate Rider - Variable Allocation
<a href="#">Z1.0 OEB Control Sheet</a>	Not Shown



## Rate Class and Re-Based Billing Determinants & Rates

Select the appropriate Rate Groups and Rate Classes from the drop-down menus in Columns C and D respectively. Following your selection, all appropriate input cells will be shaded green.

				2011					
				EB-2010-0142					
Rate Group	Rate Class	Fixed Metric	Vol Metric	Re-based Billed Customers or Connections A	Re-based Billed kWh B	Re-based Billed kW C	Re-based Tariff Service Charge D	Re-based Tariff Distribution Volumetric Rate kWh E	Re-based Tariff Distribution Volumetric Rate kW F
RES	Residential	Customer	kWh	598,508	4,886,977,489		18.25	0.0151	
RES	Residential Urban	Customer	kWh	24,898	99,791,184		17.00	0.0257	
GSLT50	General Service Less Than 50 kW	Customer	kWh	65,792	2,139,318,076	0	24.30	0.0225	
GSGT50	General Service 50 to 999 kW	Customer	kW	13,067	10,116,374,153	26,935,191	35.56		5.5956
GSGT50	General Service 1,000 to 4,999 kW	Customer	kW	514	4,626,928,262	10,587,119	686.46		4.4497
LU	Large Use	Customer	kW	47	2,376,778,323	4,993,733	3,009.11		4.7406
SL	Street Lighting	Connection	kW	162,777	110,165,016	322,023	1.30		28.7248
USL	Unmetered Scattered Load	Connection	kWh	1,130	56,231,585		4.84	0.0607	
USL	Unmetered Scattered Load	Connection	kWh	21,729	0		0.49		
NA	Rate Class 10	NA	NA						
NA	Rate Class 11	NA	NA						
NA	Rate Class 12	NA	NA						
NA	Rate Class 13	NA	NA						
NA	Rate Class 14	NA	NA						
NA	Rate Class 15	NA	NA						
NA	Rate Class 16	NA	NA						
NA	Rate Class 17	NA	NA						
NA	Rate Class 18	NA	NA						
NA	Rate Class 19	NA	NA						
NA	Rate Class 20	NA	NA						
NA	Rate Class 21	NA	NA						
NA	Rate Class 22	NA	NA						
NA	Rate Class 23	NA	NA						
NA	Rate Class 24	NA	NA						
NA	Rate Class 25	NA	NA						



## Removal of Rate Adders

Last COS Re-based Year

2011

Last COS OEB Application Number

EB-2010-0142

Rate Class	Re-based Tariff Service Charge A	Re-based Tariff Distribution Volumetric Rate kWh B	Re-based Tariff Distribution Volumetric Rate kW C	Service Charge Rate Adders D	Distribution Volumetric kWh Rate Adders E	Distribution Volumetric kW Rate Adders F	Re-based Base Service Charge H = A - D	Re-based Base Distribution Volumetric Rate kWh I = B - E	Re-based Base Distribution Volumetric Rate kW J = C - F
Residential	18.25	0.0151	0.0000	0.00	0.0000	0.0000	18.25	0.0151	0.0000
Residential Urban	17.00	0.0257	0.0000	0.00	0.0000	0.0000	17.00	0.0257	0.0000
General Service Less Than 50 kW	24.30	0.0225	0.0000	0.00	0.0000	0.0000	24.30	0.0225	0.0000
General Service 50 to 999 kW	35.56	0.0000	5.5956	0.00	0.0000	0.0000	35.56	0.0000	5.5956
General Service 1,000 to 4,999 kW	686.46	0.0000	4.4497	0.00	0.0000	0.0000	686.46	0.0000	4.4497
Large Use	3,009.11	0.0000	4.7406	0.00	0.0000	0.0000	3,009.11	0.0000	4.7406
Street Lighting	1.30	0.0000	28.7248	0.00	0.0000	0.0000	1.30	0.0000	28.7248
Unmetered Scattered Load	4.84	0.0607	0.0000	0.00	0.0000	0.0000	4.84	0.0607	0.0000
Unmetered Scattered Load	0.49	0.0000	0.0000	0.00	0.0000	0.0000	0.49	0.0000	0.0000



### Calculated Re-Based Revenue From Rates

Last COS Re-based Year

Last COS OEB Application Number

Rate Class	Re-based	Re-based	Re-based	Re-based Base		Re-based Base	Distribution	Distribution	Revenue	Service Charge	Distribution	Distribution	Revenue	Revenue	Service Charge	Distribution	Distribution	Total %
	Billed			Billed kWh	Billed kW													
	A	B	C	D	E	F	G = A * D * 12	H = B * E	I = C * F	J = G + H + I	K = G / J	L = H / J	M = I / J	N = J / R				
Residential	598,508	4,886,977,489	0	18.25	0.0151	0.0000	131,073,252	73,646,751	0	204,720,003	64.0%	36.0%	0.0%	38.8%				
Residential Urban	24,898	99,791,184	0	17.00	0.0257	0.0000	5,079,192	2,559,644	0	7,638,836	66.5%	33.5%	0.0%	1.4%				
General Service Less Than 50 kW	65,792	2,139,318,076	0	24.30	0.0225	0.0000	19,184,993	48,070,477	0	67,255,470	28.5%	71.5%	0.0%	12.7%				
General Service 50 to 999 kW	13,067	10,116,374,153	26,935,191	35.56	0.0000	5.5956	5,575,758	0	150,718,556	156,294,314	3.6%	0.0%	96.4%	29.6%				
General Service 1,000 to 4,999 kW	514	4,626,928,262	10,587,119	686.46	0.0000	4.4497	4,234,085	0	47,109,505	51,343,590	8.2%	0.0%	91.8%	9.7%				
Large Use	47	2,376,778,323	4,993,733	3,009.11	0.0000	4.7406	1,697,138	0	23,673,292	25,370,430	6.7%	0.0%	93.3%	4.8%				
Street Lighting	162,777	110,165,016	322,023	1.30	0.0000	28.7248	2,539,322	0	9,250,042	11,789,364	21.5%	0.0%	78.5%	2.2%				
Unmetered Scattered Load	1,130	56,231,585	0	4.84	0.0607	0.0000	65,611	3,413,257	0	3,478,868	1.9%	98.1%	0.0%	0.7%				
Unmetered Scattered Load	21,729	0	0	0.49	0.0000	0.0000	127,767	0	0	127,767	100.0%	0.0%	0.0%	0.0%				
							169,577,117	127,690,129	230,751,395	528,018,642				100.0%				





## Detailed Re-Based Revenue From Rates

Last COS Re-based Year	2011
Last COS OEB Application Number	EB-2010-0142

### Applicants Rate Base

#### Average Net Fixed Assets

			Last Rate Re-based Amount	
Gross Fixed Assets - Re-based Opening	\$ 4,183,572,075	A		
Add: CWIP Re-based Opening	\$ 204,719,106	B		
Re-based Capital Additions	\$ 376,263,596	C		
Re-based Capital Disposals		D		
Re-based Capital Retirements		E		
Deduct: CWIP Re-based Closing	-\$ 232,060,508	F		
Gross Fixed Assets - Re-based Closing	\$ 4,532,494,269	G		
Average Gross Fixed Assets			\$ 4,358,033,172	H = ( A + G ) / 2

Accumulated Depreciation - Re-based Opening	\$ 2,285,733,698	I		
Re-based Depreciation Expense	\$ 138,815,781	J		
Re-based Disposals	\$ 2,807,234	K		
Re-based Retirements		L		
Accumulated Depreciation - Re-based Closing	\$ 2,427,356,713	M		
Average Accumulated Depreciation			\$ 2,356,545,206	N = ( I + M ) / 2

#### Average Net Fixed Assets

\$ 2,001,487,967 O = H - N

#### Working Capital Allowance

Working Capital Allowance Base	\$ 2,479,952,766	P		
Working Capital Allowance Rate	12.0%	Q		
<b>Working Capital Allowance</b>			\$ 296,739,314	R = P * Q

#### Rate Base

\$ 2,298,227,281 S = O + R

#### Return on Rate Base

Deemed ShortTerm Debt %	4.00%	T	\$ 91,929,091	W = S * T
Deemed Long Term Debt %	56.00%	U	\$ 1,287,007,277	X = S * U
Deemed Equity %	40.00%	V	\$ 919,290,912	Y = S * V
Short Term Interest	2.46%	Z	\$ 2,261,456	AC = W * Z
Long Term Interest	5.37%	AA	\$ 69,112,291	AD = X * AA
Return on Equity	9.58%	AB	\$ 88,068,069	AE = Y * AB
<b>Return on Rate Base</b>			\$ 159,441,816	AF = AC + AD + AE

#### Distribution Expenses

OM&A Expenses	\$ 231,214,224	AG		
Amortization	\$ 138,815,781	AH		
Ontario Capital Tax (F1.1 Z-Factor Tax Changes)	\$ 6,802,382	AI		
Grossed Up PILS (F1.1 Z-Factor Tax Changes)	\$ 11,791,223	AJ		
Low Voltage		AK		
Transformer Allowance	\$ 11,479,842	AL		
	\$ -	AM		
		AN		
		AO		
			\$ 400,103,452	AP = SUM ( AG : AO )

#### Revenue Offsets

Specific Service Charges	-\$ 7,580,526	AQ		
Late Payment Charges	-\$ 4,900,000	AR		
Other Distribution Income	-\$ 7,240,556	AS		
Other Income and Deductions	-\$ 6,300,000	AT	-\$ 26,021,082	AU = SUM ( AQ : AT )

#### Revenue Requirement from Distribution Rates

\$ 533,524,186 AV = AF + AP + AU

#### Rate Classes Revenue

Rate Classes Revenue - Total (B1.1 Re-based Revenue - Gen)	\$ 528,018,642	AW		
Difference	\$ 5,505,544	AZ = AV - AW		
Difference (Percentage - should be less than 1%)	1.04%	BA = AZ / AW		



## Load Actual - Most Recent Year

Rate Class	Fixed Metric	Vol Metric	Billed Customers or Connections			Billed kWh	Billed kW	Base Service Charge	Base Distribution Volumetric Rate kWh	Base Distribution Volumetric Rate kW	Service Charge Revenue	Distribution Volumetric Rate Revenue kWh	Distribution Volumetric Rate Revenue kW	Total Revenue by Rate Class
			A	B	C									
Residential	Customer	kWh	591,496	5,105,974,275	0		\$18.25	\$0.0151	\$0.0000	\$129,537,624	\$76,947,032	\$0	\$206,484,656	
Residential Urban	Customer	kWh	24,898	99,791,184	0		\$17.00	\$0.0257	\$0.0000	\$5,079,192	\$2,559,644	\$0	\$7,638,836	
General Service Less Than 50 kW	Customer	kWh	65,799	2,095,343,918	0		\$24.30	\$0.0225	\$0.0000	\$19,186,988	\$47,082,378	\$0	\$66,269,366	
General Service 50 to 999 kW	Customer	kW	12,873	10,189,051,346	26,712,248		\$35.56	\$0.0000	\$5.5956	\$5,493,167	\$0	\$149,471,055	\$154,964,221	
General Service 1,000 to 4,999 kW	Customer	kW	509	4,828,382,733	10,972,419		\$686.46	\$0.0000	\$4.4497	\$4,192,898	\$0	\$48,823,974	\$53,016,871	
Large Use	Customer	kW	47	2,263,227,585	5,267,224		\$3,009.11	\$0.0000	\$4.7406	\$1,697,138	\$0	\$24,969,801	\$26,666,940	
Street Lighting	Connection	kW	162,964	112,727,603	321,995		\$1.30	\$0.0000	\$28.7248	\$2,542,238	\$0	\$9,249,232	\$11,791,471	
Unmetered Scattered Load	Connection	kWh	1,107	52,097,299	0		\$4.84	\$0.0607	\$0.0000	\$64,295	\$3,162,306	\$0	\$3,226,601	
Unmetered Scattered Load	Connection	kWh	12,159	0	0		\$0.49	\$0.0000	\$0.0000	\$71,495	\$0	\$0	\$71,495	
											<b>\$167,865,035</b>	<b>\$129,751,360</b>	<b>\$232,514,062</b>	<b>\$530,130,457</b>



**Ontario Energy Board**  
**Incremental Capital Workform**

This sheet is used to determine the applicants most current allocation of revenues (after the most recent revenue cost ratio adjustment, if applicable) to be used to calculate the incremental capital rate riders.

**Current Revenue from Rates**

Rate Class	Fixed Metric	Vol Metric	Current Base Service Charge A	Current Base Distribution Volumetric Rate kWh B	Current Base Distribution Volumetric Rate kW C	Re-based Billed Customers or Connections D	Re-based Billed kWh E	Re-based Billed kW F	Current Base Service Charge Revenue G = A * D * 12	Current Base Distribution Volumetric Rate kWh Revenue H = B * E	Current Base Distribution Volumetric Rate kW Revenue I = C * F	Total Current Base Revenue J = G + H + I	Service Charge % Total Revenue L = G / \$K	Distribution Volumetric Rate % Total Revenue M = H / \$K	Distribution Volumetric Rate % Total Revenue N = I / \$K	Total % Revenue O = J / \$K
Residential	Customer	kWh	18.25	0.0151		598,508	4,886,977,489	0	131,073,252	73,646,751	0	204,720,003	24.8%	13.9%	0.0%	38.8%
Residential Urban	Customer	kWh	17.00	0.0257		24,898	99,791,184	0	5,079,192	2,559,644	0	7,638,836	1.0%	0.5%	0.0%	1.4%
General Service Less Than 50 kW	Customer	kWh	24.30	0.0225		65,792	2,139,318,076	0	19,184,993	48,070,477	0	67,255,470	3.6%	9.1%	0.0%	12.7%
General Service 50 to 999 kW	Customer	kW	35.56		5.5956	13,067	10,116,374,153	26,935,191	5,575,758	0	150,718,556	156,294,314	1.1%	0.0%	28.5%	29.6%
General Service 1,000 to 4,999 kW	Customer	kW	686.46		4.4497	514	4,626,928,262	10,587,119	4,234,085	0	47,109,505	51,343,590	0.8%	0.0%	8.9%	9.7%
Large Use	Customer	kW	3,009.11		4.7406	47	2,376,778,323	4,993,733	1,697,138	0	23,673,292	25,370,430	0.3%	0.0%	4.5%	4.8%
Street Lighting	Connection	kW	1.30		28.7248	162,777	110,165,016	322,023	2,539,322	0	9,250,042	11,789,364	0.5%	0.0%	1.8%	2.2%
Unmetered Scattered Load	Connection	kWh	4.84	0.0607		1,130	56,231,585	0	65,611	3,413,257	0	3,478,868	0.0%	0.6%	0.0%	0.7%
Unmetered Scattered Load	Connection	kWh	0.49			21,729	0	0	127,767	0	0	127,767	0.0%	0.0%	0.0%	0.0%
									169,577,117	127,690,129	230,751,395	528,018,642	32.1%	24.2%	43.7%	100.0%



## Threshold Parameters

### Price Cap Index

Price Escalator (GDP-IPI)	2.00%
Less Productivity Factor	-0.72%
Less Stretch Factor	-0.60%

**Price Cap Index** **0.68%**

### Growth

ICM Billing Determinants for Growth - Numerator : 2011 Re-Based Forecast	<u>\$ 528,018,642</u>	A
ICM Billing Determinants for Growth - Denominator : 2010 Audited RRR	<u>\$ 530,130,457</u>	B

**Growth** **-0.40%** C = A / B



## Threshold Test

Year	2011	
<b>Price Cap Index</b>	<b>0.68%</b>	<b>A</b>
<b>Growth</b>	<b>-0.40%</b>	<b>B</b>
<b>Dead Band</b>	<b>20%</b>	<b>C</b>
<b>Average Net Fixed Assets</b>		
Gross Fixed Assets Opening	\$ 4,183,572,075	
Add: CWIP Opening	\$ 204,719,106	
Capital Additions	\$ 376,263,596	
Capital Disposals	\$ -	
Capital Retirements	\$ -	
Deduct: CWIP Closing	-\$ 232,060,508	
Gross Fixed Assets - Closing	\$ 4,532,494,269	
Average Gross Fixed Assets	<u>\$ 4,358,033,172</u>	
Accumulated Depreciation - Opening	\$ 2,285,733,698	
Depreciation Expense	\$ 138,815,781	<b>D</b>
Disposals	\$ 2,807,234	
Retirements		
Accumulated Depreciation - Closing	\$ 2,427,356,713	
Average Accumulated Depreciation	<u>\$ 2,356,545,206</u>	
<b>Average Net Fixed Assets</b>	<u>\$ 2,001,487,967</u>	<b>E</b>
<b>Working Capital Allowance</b>		
Working Capital Allowance Base	\$ 2,479,952,766	
Working Capital Allowance Rate	12%	
<b>Working Capital Allowance</b>	<u>\$ 296,739,314</u>	<b>F</b>
<b>Rate Base</b>	<u>\$ 2,298,227,281</u>	<b>G = E + F</b>
<b>Depreciation</b>	<b>D \$ 138,815,781</b>	<b>H</b>
<b>Threshold Test</b>	<b>124.62%</b>	<b>I = 1 + ( G / H ) * ( B + A * ( 1 + B ) ) + (</b>
<b>Threshold CAPEX</b>	<b>\$ 172,989,465</b>	<b>J = H * I</b>

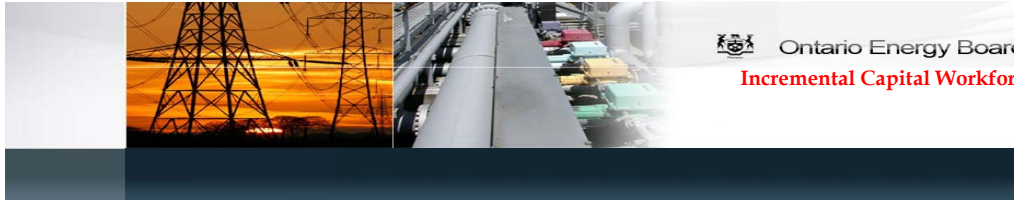


## Summary of Incremental Capital Projects (ICPs)

Number of ICPs

1

Project ID #	Incremental Capital Non-Discretionary Project Description	Incremental Capital CAPEX	Amortization Expense	CCA
ICP 1	Summary of Projects (please see Schedule E2.2)	406,102,932	12,415,194	27,093,771
		<u>406,102,932</u>	<u>12,415,194</u>	<u>27,093,771</u>



## Incremental Capital Adjustment

### Current Revenue Requirement

Current Revenue Requirement - Total	<u>\$533,524,186</u>	A
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### Return on Rate Base

Incremental Capital CAPEX	\$406,102,932	B
Depreciation Expense	\$ 12,415,194	C
Incremental Capital CAPEX to be included in Rate Base	<u>\$393,687,738</u>	D = B - C
Deemed ShortTerm Debt %	4.0%	E
Deemed Long Term Debt %	56.0%	F
	E \$ 15,747,510	G = D * E
	F \$ 220,465,133	H = D * F
Short Term Interest	2.46%	I
Long Term Interest	5.37%	J
	I \$ 387,389	K = G * I
	J \$ 11,838,978	L = H * J
Return on Rate Base - Interest	<u>\$ 12,226,366</u>	M = K + L
Deemed Equity %	40.0%	N
Return on Rate Base -Equity	9.58%	O
	N \$157,475,095	P = D * N
	O \$ 15,086,114	Q = P * O
Return on Rate Base - Total	<u>\$ 27,312,481</u>	R = M + Q

### Amortization Expense

Amortization Expense - Incremental	C \$ 12,415,194	S
------------------------------------	-----------------	---

### Grossed up PIL's

Regulatory Taxable Income	O \$ 15,086,114	T
Add Back Amortization Expense	S \$ 12,415,194	U
Deduct CCA	\$ 27,093,771	V
Incremental Taxable Income	<u>\$ 407,537</u>	W = T + U - V
Current Tax Rate (F1.1 Z-Factor Tax Changes)	26.4% X	
PIL's Before Gross Up	\$ 107,590	Y = W * X
Incremental Grossed Up PIL's	\$ 146,182	Z = Y / (1 - X)

### Ontario Capital Tax

Incremental Capital CAPEX	\$406,102,932	AA
Less : Available Capital Exemption (if any)	\$ -	AB
Incremental Capital CAPEX subject to OCT	<u>\$406,102,932</u>	AC = AA - AB
Ontario Capital Tax Rate (F1.1 Z-Factor Tax Changes)	0.000% AD	
Incremental Ontario Capital Tax	<u>\$ -</u>	AE = AC * AD

### Incremental Revenue Requirement

Return on Rate Base - Total	Q \$ 27,312,481	AF
Amortization Expense - Total	S \$ 12,415,194	AG
Incremental Grossed Up PIL's	Z \$ 146,182	AH
Incremental Ontario Capital Tax	AE \$ -	AI
Incremental Revenue Requirement	<u>\$ 39,873,856</u>	AJ = AF + AG + AH + AI



### Calculation of Incremental Capital Rate Rider - Option A Fixed and Variable

Rate Class	Distribution Volumetric			Service Charge Revenue D = \$N * A	Distribution Volumetric Rate Revenue kWh E = \$N * B	Distribution Volumetric Rate Revenue kW F = \$N * C	Total Revenue by Rate Class G = D + E + F	Billed Customers or Connections			Service Charge Rate Rider K = D / H / 12	Distribution Volumetric Rate kWh Rate Rider L = E / I	Distribution Volumetric Rate kW Rate Rider M = F / J
	Service Charge % Revenue A	Rate % Revenue kWh B	Rate % Revenue kW C					H	I	J			
Residential	24.8%	13.9%	0.0%	\$ 9,898,127.81	\$ 5,561,508.09	\$ -	\$ 15,459,635.90	598,508	4,886,977,489	0	\$1.378167	\$0.001138	
Residential Urban	1.0%	0.5%	0.0%	\$ 383,560.27	\$ 193,294.07	\$ -	\$ 576,854.34	24,898	99,791,184	0	\$1.283772	\$0.001937	
General Service Less Than 50 kW	3.6%	9.1%	0.0%	\$ 1,448,773.92	\$ 3,630,090.19	\$ -	\$ 5,078,864.12	65,792	2,139,318,076	0	\$1.835039	\$0.001697	
General Service 50 to 999 kW	1.1%	0.0%	28.5%	\$ 421,058.93	\$ -	\$ 11,381,662.63	\$ 11,802,721.56	13,067	10,116,374,153	26,935,191	\$2.685349	\$0.000000	\$0.422557
General Service 1,000 to 4,999 kW	0.8%	0.0%	8.9%	\$ 319,741.19	\$ -	\$ 3,557,521.39	\$ 3,877,262.58	514	4,626,928,262	10,587,119	\$51.838714	\$0.000000	\$0.336024
Large Use	0.3%	0.0%	4.5%	\$ 128,161.08	\$ -	\$ 1,787,712.35	\$ 1,915,873.42	47	2,376,778,323	4,993,733	\$227.235953	\$0.000000	\$0.357991
Street Lighting	0.5%	0.0%	1.8%	\$ 191,759.42	\$ -	\$ 698,526.20	\$ 890,285.62	162,777	110,165,016	322,023	\$0.098171	\$0.000000	\$2.169182
Unmetered Scattered Load	0.0%	0.6%	0.0%	\$ 4,954.68	\$ 257,755.53	\$ -	\$ 262,710.21	1,130	56,231,585	0	\$0.365497	\$0.004584	
Unmetered Scattered Load	0.0%	0.0%	0.0%	\$ 9,648.45	\$ -	\$ -	\$ 9,648.45	21,729	0	0	\$0.037003		
				<b>\$12,805,785.74</b>	<b>\$ 9,642,647.89</b>	<b>\$ 17,425,422.56</b>	<b>\$ 39,873,856.20</b>						

Enter the above rate riders onto "Sheet 14. Proposed Rate\_Riders" in the 2012 OEB IRM3 Rate Generator as an "Rate Rider for Incremental Capital"





 Ontario Energy Board

## Incremental Capital Workform

### Calculation of Incremental Capital Rate Rider - Option B Variable

Rate Class	Total Revenue \$ by Rate Class A	Total Revenue % by Rate Class B = A / \$H	Total Incremental Capital \$ by Rate Class C = \$I * B	Billed kWh D	Billed kW E	Distribution Volumetric Rate kWh Rate Rider F = C / D	Distribution Volumetric Rate kW Rate Rider G = C / E
Residential	\$204,720,003	38.77%	\$15,459,636	4,886,977,489	0	\$0.0032	
Residential Urban	\$7,638,836	1.45%	\$576,854	99,791,184	0	\$0.0058	
General Service Less Than 50 kW	\$67,255,470	12.74%	\$5,078,864	2,139,318,076	0	\$0.0024	
General Service 50 to 999 kW	\$156,294,314	29.60%	\$11,802,722	#####	26,935,191		\$0.4382
General Service 1,000 to 4,999 kW	\$51,343,590	9.72%	\$3,877,263	4,626,928,262	10,587,119		\$0.3662
Large Use	\$25,370,430	4.80%	\$1,915,873	2,376,778,323	4,993,733		\$0.3837
Street Lighting	\$11,789,364	2.23%	\$890,286	110,165,016	322,023		\$2.7647
Unmetered Scattered Load	\$3,478,868	0.66%	\$262,710	56,231,585	0	\$0.0047	
Unmetered Scattered Load	\$127,767	0.02%	\$9,648	0	0		
	<b>\$528,018,642</b> H	<b>100.00%</b>	<b>\$39,873,856</b> I				

Enter the above rate riders onto "Sheet 14. Proposed Rate\_Riders" in the 2012 OEB IRM3 Rate Generator as an "Rate Rider for Incremental Capital"

## ICM Values Calculation - 2013

	Capital Cost	Amort. Exp	CCA
01 Underground Infrastructure	58,942,371	1,914,501	4,715,390
02 Paper Insulated Lead Covered Cable - Piece Outs and Leakers	5,419,014	147,898	433,521
03 Handwell Replacement	16,650,488	416,262	1,332,039
04 Overhead Infrastructure	55,876,554	1,504,732	4,470,124
05 Box Construction	23,041,699	593,247	1,843,336
06 Rear Lot Construction	29,425,563	883,026	2,354,045
07 Polymer SMD - 20 Fuses	1,529,098	45,674	122,328
08 Scadamate R1 Switches	1,429,364	47,125	114,349
09 Network Vault & Roofs	18,760,753	622,764	1,500,860
10 Fibertop Network Units	7,711,050	370,465	616,884
11 Automatic Transfer Switches (ATS) % Reverse Power Breaker	3,263,232	146,567	261,059
12 Stations Power Transformers	3,482,290	108,923	278,289
13 Stations Switchgear	21,813,194	566,309	1,760,260
14 Stations Circuit Breakers	551,875	18,396	43,858
15 Stations Control & Communication Systems	1,000,375	66,692	200,075
16 Downtown Station Load Transfers	2,137,063	56,819	170,965
17 Bremner Transformer Station	81,000,000	2,054,162	4,800,313
18 Hydro One Capital Contributions	48,118,000	1,924,720	0
19 Feeder Automation	20,662,553	680,003	1,653,004
20 Wholesale and Smart Metering (Prorated)	5,288,397	246,909	423,072
<b>20 Wholesale and Smart Metering</b>	<b>8,404,098</b>	<b>392,377</b>	<b>672,328</b>
<b>20 Wholesale and Smart Metering (Prorated)</b>	<b>3,115,701</b>	<b>145,468</b>	<b>249,256</b>
21 Externally-Initiated Plant Relocations and Expansions	24,840,090	769,879	1,987,207
PCI Total	145,033,674	0	0
<b>Total</b>	<b>579,092,397</b>	<b>13,330,541</b>	<b>29,330,234</b>
<b>Threshold CAPEX</b>	<b>\$ 172,989,465</b>		
	Capital Cost	Amort. Exp	CCA
Values Above Threshold for ICM Model	406,102,932	12,415,194	27,093,771
Threshold Values	172,989,465	915,347	2,236,463

## Calculation of Incremental Capital Rate Adder - Option A Fixed and Variable

Rate Class	Service Charge Rate Adder K = D / H / 12	Distribution Volumetric Rate kWh Rate Adder L = E / I	Distribution Volumetric Rate kVA Rate Adder M = F / J	Service Charge Rate Adder (DOS)	Distribution Volumetric Rate kWh Rate Adder	Distribution Volumetric Rate kVA Rate Adder (DOS)
Residential	\$1.378167	\$0.001138		<b>\$1.36</b>	<b>\$0.00114</b>	
Residential Urban	\$1.283772	\$0.001937		<b>\$1.27</b>	<b>\$0.00194</b>	
General Service Less Than 50 kW	\$1.835039	\$0.001697		<b>\$1.81</b>	<b>\$0.00170</b>	
General Service 50 to 999 kW	\$2.685349	\$0.000000	\$0.422557	<b>\$2.65</b>		<b>\$0.4168</b>
General Service 1,000 to 4,999 kW	\$51.838714	\$0.000000	\$0.336024	<b>\$51.13</b>		<b>\$0.3314</b>
Large Use	\$227.235953	\$0.000000	\$0.357991	<b>\$224.12</b>		<b>\$0.3531</b>
Street Lighting	\$0.098171	\$0.000000	\$2.169182	<b>\$0.10</b>		<b>\$2.1395</b>
Unmetered Scattered Load	\$0.365497	\$0.004584		<b>\$0.36</b>	<b>\$0.00458</b>	
Unmetered Scattered Load	\$0.037003			<b>\$0.04</b>		

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
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## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C1 Underground Infrastructure

Year

2012

Details of Project

C1 Underground Infrastructure

Number of Asset Components

14

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	122,585	3%	47	8%
2 1835_Overhead Conductors and Devices	325,987	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	152,105	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	411,603	2%	47	8%
5 1840_Underground Conduit - Duct Bank	21,423,967	3%	47	8%
6 1840_Underground Conduit - Vault	395,387	3%	47	8%
7 1840_Underground Conduit - Vault Roof	9,568	5%	47	8%
8 1845_Underground Conductors and Devices	2,810,906	3%	47	8%
9 1845_Underground Conductors and Devices - Switch	1,417,854	5%	47	8%
10 1850_Line Transformers - OH	11,957	3%	47	8%
11 1850_Line Transformers - UG	1,353,547	3%	47	8%
12 1860_Meters - Smart Meters	1,558	7%	47	8%
13 1855_Services - UG	311,529	3%	47	8%
14 1855_Services - OH	5,039	2%	47	8%

	2012	2013
Closing Net Fixed Asset	27,811,537	26,869,480
Amortization Expense	942,057	942,057
CCA	2,300,287	2,116,264



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C1 Underground Infrastructure

**Asset Component**

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 122,585
Capital Investment	\$ 122,585	\$ -
Closing Capital Investment	\$ 122,585	\$ 122,585
Opening Accumulated Amortization	\$ -	\$ 3,065
Amortization	3% \$ 3,065	\$ 3,065
Closing Accumulated Amortization	\$ 3,065	\$ 6,129
Opening Net Fixed Assets	\$ -	\$ 119,521
Closing Net Fixed Assets	\$ 119,521	\$ 116,456
Average Net Fixed Assets	\$ 59,760	\$ 117,988

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 112,778
Capital Additions	\$ 122,585	\$ -
UCC Before Half Year Rule	\$ 122,585	\$ 112,778
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 122,585	\$ 112,778
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 9,807	\$ 9,022
Closing UCC	\$ 112,778	\$ 103,756





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1835 Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 325,987
Capital Investment	\$ 325,987	\$ -
Closing Capital Investment	\$ 325,987	\$ 325,987
Opening Accumulated Amortization	\$ -	\$ 6,520
Amortization	2% \$ 6,520	\$ 6,520
Closing Accumulated Amortization	\$ 6,520	\$ 13,039
Opening Net Fixed Assets	\$ -	\$ 319,468
Closing Net Fixed Assets	\$ 319,468	\$ 312,948
Average Net Fixed Assets	\$ 159,734	\$ 316,208

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 299,908
Capital Additions	\$ 325,987	\$ -
UCC Before Half Year Rule	\$ 325,987	\$ 299,908
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 325,987	\$ 299,908
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 26,079	\$ 23,993
Closing UCC	\$ 299,908	\$ 275,916



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 152,105
Capital Investment	\$ 152,105	\$ -
Closing Capital Investment	\$ 152,105	\$ 152,105
Opening Accumulated Amortization	\$ -	\$ 5,070
Amortization	3% \$ 5,070	\$ 5,070
Closing Accumulated Amortization	\$ 5,070	\$ 10,140
Opening Net Fixed Assets	\$ -	\$ 147,035
Closing Net Fixed Assets	\$ 147,035	\$ 141,965
Average Net Fixed Assets	\$ 73,518	\$ 144,500

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 139,937
Capital Additions	\$ 152,105	\$ -
UCC Before Half Year Rule	\$ 152,105	\$ 139,937
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 152,105	\$ 139,937
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 12,168	\$ 11,195
Closing UCC	\$ 139,937	\$ 128,742



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1840 Underground Conduit - Cable Chamber

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 411,603
Capital Investment	\$ 411,603	\$ -
Closing Capital Investment	\$ 411,603	\$ 411,603
Opening Accumulated Amortization	\$ -	\$ 8,232
Amortization	2% \$ 8,232	\$ 8,232
Closing Accumulated Amortization	\$ 8,232	\$ 16,464
Opening Net Fixed Assets	\$ -	\$ 403,371
Closing Net Fixed Assets	\$ 403,371	\$ 395,139
Average Net Fixed Assets	\$ 201,685	\$ 399,255

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 378,675
Capital Additions	\$ 411,603	\$ -
UCC Before Half Year Rule	\$ 411,603	\$ 378,675
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 411,603	\$ 378,675
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 32,928	\$ 30,294
Closing UCC	\$ 378,675	\$ 348,381



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1840 Underground Conduit - Duct Bank

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 21,423,967
Capital Investment	\$ 21,423,967	\$ -
Closing Capital Investment	\$ 21,423,967	\$ 21,423,967
Opening Accumulated Amortization	\$ -	\$ 714,132
Amortization	3% \$ 714,132	\$ 714,132
Closing Accumulated Amortization	\$ 714,132	\$ 1,428,264
Opening Net Fixed Assets	\$ -	\$ 20,709,835
Closing Net Fixed Assets	\$ 20,709,835	\$ 19,995,703
Average Net Fixed Assets	\$ 10,354,918	\$ 20,352,769

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 19,710,050
Capital Additions	\$ 21,423,967	\$ -
UCC Before Half Year Rule	\$ 21,423,967	\$ 19,710,050
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 21,423,967	\$ 19,710,050
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 1,713,917	\$ 1,576,804
Closing UCC	\$ 19,710,050	\$ 18,133,246



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1840 Underground Conduit - Vault

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 395,387
Capital Investment	\$ 395,387	\$ -
Closing Capital Investment	\$ 395,387	\$ 395,387
Opening Accumulated Amortization	\$ -	\$ 9,885
Amortization	3% \$ 9,885	\$ 9,885
Closing Accumulated Amortization	\$ 9,885	\$ 19,769
Opening Net Fixed Assets	\$ -	\$ 385,503
Closing Net Fixed Assets	\$ 385,503	\$ 375,618
Average Net Fixed Assets	\$ 192,751	\$ 380,560

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 363,756
Capital Additions	\$ 395,387	\$ -
UCC Before Half Year Rule	\$ 395,387	\$ 363,756
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 395,387	\$ 363,756
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 31,631	\$ 29,100
Closing UCC	\$ 363,756	\$ 334,656



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1840 Underground Conduit - Vault Roof

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 9,568
Capital Investment	\$ 9,568	\$ -
Closing Capital Investment	\$ 9,568	\$ 9,568
Opening Accumulated Amortization	\$ -	\$ 478
Amortization	5% \$ 478	\$ 478
Closing Accumulated Amortization	\$ 478	\$ 957
Opening Net Fixed Assets	\$ -	\$ 9,089
Closing Net Fixed Assets	\$ 9,089	\$ 8,611
Average Net Fixed Assets	\$ 4,545	\$ 8,850

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 8,802
Capital Additions	\$ 9,568	\$ -
UCC Before Half Year Rule	\$ 9,568	\$ 8,802
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 9,568	\$ 8,802
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 765	\$ 704
Closing UCC	\$ 8,802	\$ 8,098



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1845 Underground Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 2,810,906
Capital Investment	\$ 2,810,906	\$ -
Closing Capital Investment	\$ 2,810,906	\$ 2,810,906
Opening Accumulated Amortization	\$ -	\$ 70,273
Amortization	3% \$ 70,273	\$ 70,273
Closing Accumulated Amortization	\$ 70,273	\$ 140,545
Opening Net Fixed Assets	\$ -	\$ 2,740,633
Closing Net Fixed Assets	\$ 2,740,633	\$ 2,670,360
Average Net Fixed Assets	\$ 1,370,316	\$ 2,705,497

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 2,586,033
Capital Additions	\$ 2,810,906	\$ -
UCC Before Half Year Rule	\$ 2,810,906	\$ 2,586,033
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 2,810,906	\$ 2,586,033
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 224,872	\$ 206,883
Closing UCC	\$ 2,586,033	\$ 2,379,150



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,417,854
Capital Investment	\$ 1,417,854	\$ -
Closing Capital Investment	\$ 1,417,854	\$ 1,417,854
Opening Accumulated Amortization	\$ -	\$ 70,893
Amortization	5% \$ 70,893	\$ 70,893
Closing Accumulated Amortization	\$ 70,893	\$ 141,785
Opening Net Fixed Assets	\$ -	\$ 1,346,961
Closing Net Fixed Assets	\$ 1,346,961	\$ 1,276,068
Average Net Fixed Assets	\$ 673,480	\$ 1,311,515

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,304,425
Capital Additions	\$ 1,417,854	\$ -
UCC Before Half Year Rule	\$ 1,417,854	\$ 1,304,425
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,417,854	\$ 1,304,425
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 113,428	\$ 104,354
Closing UCC	\$ 1,304,425	\$ 1,200,071





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 10

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1850 Line Transformers - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 11,957
Capital Investment	\$ 11,957	\$ -
Closing Capital Investment	\$ 11,957	\$ 11,957
Opening Accumulated Amortization	\$ -	\$ 399
Amortization	3% \$ 399	\$ 399
Closing Accumulated Amortization	\$ 399	\$ 797
Opening Net Fixed Assets	\$ -	\$ 11,559
Closing Net Fixed Assets	\$ 11,559	\$ 11,160
Average Net Fixed Assets	\$ 5,779	\$ 11,359

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 11,001
Capital Additions	\$ 11,957	\$ -
UCC Before Half Year Rule	\$ 11,957	\$ 11,001
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 11,957	\$ 11,001
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 957	\$ 880
Closing UCC	\$ 11,001	\$ 10,121



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 11

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1850 Line Transformers - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,353,547
Capital Investment	\$ 1,353,547	\$ -
Closing Capital Investment	\$ 1,353,547	\$ 1,353,547
Opening Accumulated Amortization	\$ -	\$ 45,118
Amortization	3% \$ 45,118	\$ 45,118
Closing Accumulated Amortization	\$ 45,118	\$ 90,236
Opening Net Fixed Assets	\$ -	\$ 1,308,429
Closing Net Fixed Assets	\$ 1,308,429	\$ 1,263,310
Average Net Fixed Assets	\$ 654,214	\$ 1,285,870

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,245,263
Capital Additions	\$ 1,353,547	\$ -
UCC Before Half Year Rule	\$ 1,353,547	\$ 1,245,263
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,353,547	\$ 1,245,263
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 108,284	\$ 99,621
Closing UCC	\$ 1,245,263	\$ 1,145,642



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 12

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1860 Meters - Smart Meters

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,558
Capital Investment	\$ 1,558	\$ -
Closing Capital Investment	\$ 1,558	\$ 1,558
Opening Accumulated Amortization	\$ -	\$ 104
Amortization	7% \$ 104	\$ 104
Closing Accumulated Amortization	\$ 104	\$ 208
Opening Net Fixed Assets	\$ -	\$ 1,454
Closing Net Fixed Assets	\$ 1,454	\$ 1,350
Average Net Fixed Assets	\$ 727	\$ 1,402

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,433
Capital Additions	\$ 1,558	\$ -
UCC Before Half Year Rule	\$ 1,558	\$ 1,433
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,558	\$ 1,433
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 125	\$ 115
Closing UCC	\$ 1,433	\$ 1,319



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 13

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1855\_Services - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 311,529
Capital Investment	\$ 311,529	\$ -
Closing Capital Investment	\$ 311,529	\$ 311,529
Opening Accumulated Amortization	\$ -	\$ 7,788
Amortization	3% \$ 7,788	\$ 7,788
Closing Accumulated Amortization	\$ 7,788	\$ 15,576
Opening Net Fixed Assets	\$ -	\$ 303,741
Closing Net Fixed Assets	\$ 303,741	\$ 295,953
Average Net Fixed Assets	\$ 151,871	\$ 299,847

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 286,607
Capital Additions	\$ 311,529	\$ -
UCC Before Half Year Rule	\$ 311,529	\$ 286,607
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 311,529	\$ 286,607
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 24,922	\$ 22,929
Closing UCC	\$ 286,607	\$ 263,678



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 14

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1855\_Services - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 5,039
Capital Investment	\$ 5,039	\$ -
Closing Capital Investment	\$ 5,039	\$ 5,039
Opening Accumulated Amortization	\$ -	\$ 101
Amortization	2% \$ 101	\$ 101
Closing Accumulated Amortization	\$ 101	\$ 202
Opening Net Fixed Assets	\$ -	\$ 4,939
Closing Net Fixed Assets	\$ 4,939	\$ 4,838
Average Net Fixed Assets	\$ 2,469	\$ 4,888

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 4,636
Capital Additions	\$ 5,039	\$ -
UCC Before Half Year Rule	\$ 5,039	\$ 4,636
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 5,039	\$ 4,636
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 403	\$ 371
Closing UCC	\$ 4,636	\$ 4,265



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C1 Underground Infrastructure

Year

2013

Details of Project

C1 Underground Infrastructure

Number of Asset Components

14

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	402,061	3%	47	8%
2 1835_Overhead Conductors and Devices	388,921	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	762,053	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	813,301	2%	47	8%
5 1840_Underground Conduit - Duct Bank	38,382,445	3%	47	8%
6 1840_Underground Conduit - Vault	1,497,237	3%	47	8%
7 1840_Underground Conduit - Vault Roof	75,959	5%	47	8%
8 1845_Underground Conductors and Devices	9,597,074	3%	47	8%
9 1845_Underground Conductors and Devices - Switch	3,796,569	5%	47	8%
10 1850_Line Transformers - OH	34,377	3%	47	8%
11 1850_Line Transformers - UG	2,826,536	3%	47	8%
12 1860_Meters - Smart Meters	7,197	7%	47	8%
13 1855_Services - UG	317,627	3%	47	8%
14 1855_Services - OH	41,013	2%	47	8%

2013

Closing Net Fixed Asset

57,027,869

Amortization Expense

1,914,501

CCA

4,715,390



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 402,061
Closing Capital Investment	\$ 402,061
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 10,052
Closing Accumulated Amortization	\$ 10,052
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 392,010
Average Net Fixed Assets	\$ 196,005

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 402,061
UCC Before Half Year Rule	\$ 402,061
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 402,061
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 32,165
Closing UCC	\$ 369,896



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 388,921
Closing Capital Investment	\$ 388,921
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 7,778
Closing Accumulated Amortization	\$ 7,778
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 381,143
Average Net Fixed Assets	\$ 190,571

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 388,921
UCC Before Half Year Rule	\$ 388,921
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 388,921
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 31,114
Closing UCC	\$ 357,808





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 762,053
Closing Capital Investment	\$ 762,053
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 25,402
Closing Accumulated Amortization	\$ 25,402
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 736,652
Average Net Fixed Assets	\$ 368,326

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 762,053
UCC Before Half Year Rule	\$ 762,053
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 762,053
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 60,964
Closing UCC	\$ 701,089



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C1 Underground Infrastructure

**Asset Component**

1840 Underground Conduit - Cable Chamber

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 813,301
Closing Capital Investment	\$ 813,301
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 16,266
Closing Accumulated Amortization	\$ 16,266
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 797,035
Average Net Fixed Assets	\$ 398,518

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 813,301
UCC Before Half Year Rule	\$ 813,301
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 813,301
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 65,064
Closing UCC	\$ 748,237



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 5

**Name or General Description of Project**

C1 Underground Infrastructure

**Asset Component**

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

	2013 Forecasted
<b>Net Fixed Assets</b>	
Opening Capital Investment	\$ -
Capital Investment	<u>\$ 38,382,445</u>
Closing Capital Investment	<u>\$ 38,382,445</u>
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 1,279,415
Closing Accumulated Amortization	<u>\$ 1,279,415</u>
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	<u>\$ 37,103,030</u>
Average Net Fixed Assets	<u>\$ 18,551,515</u>

### For PILs Calculation

	2013 Forecasted
<b>UCC</b>	
Opening UCC	\$ -
Capital Additions	<u>\$ 38,382,445</u>
UCC Before Half Year Rule	<u>\$ 38,382,445</u>
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	<u>\$ 38,382,445</u>
CCA Rate Class	47
CCA Rate	8%
CCA	<u>\$ 3,070,596</u>
Closing UCC	<u>\$ 35,311,849</u>



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 6

**Name or General Description of Project**

C1 Underground Infrastructure

**Asset Component**

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,497,237
Closing Capital Investment	\$ 1,497,237
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 37,431
Closing Accumulated Amortization	\$ 37,431
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,459,806
Average Net Fixed Assets	\$ 729,903

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,497,237
UCC Before Half Year Rule	\$ 1,497,237
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,497,237
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 119,779
Closing UCC	\$ 1,377,458



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1840\_Underground Conduit - Vault Roof

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 75,959
Closing Capital Investment	\$ 75,959
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 3,798
Closing Accumulated Amortization	\$ 3,798
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 72,161
Average Net Fixed Assets	\$ 36,081

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 75,959
UCC Before Half Year Rule	\$ 75,959
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 75,959
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 6,077
Closing UCC	\$ 69,883



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

**Name or General Description of Project**

C1 Underground Infrastructure

**Asset Component**

1845 Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 9,597,074
Closing Capital Investment	\$ 9,597,074
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 239,927
Closing Accumulated Amortization	\$ 239,927
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 9,357,148
Average Net Fixed Assets	\$ 4,678,574

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 9,597,074
UCC Before Half Year Rule	\$ 9,597,074
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 9,597,074
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 767,766
Closing UCC	\$ 8,829,308



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

	2013 Forecasted
<b>Net Fixed Assets</b>	
Opening Capital Investment	\$ -
Capital Investment	\$ 3,796,569
Closing Capital Investment	\$ 3,796,569
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 189,828
Closing Accumulated Amortization	\$ 189,828
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,606,741
Average Net Fixed Assets	\$ 1,803,370

### For PILs Calculation

	2013 Forecasted
<b>UCC</b>	
Opening UCC	\$ -
Capital Additions	\$ 3,796,569
UCC Before Half Year Rule	\$ 3,796,569
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,796,569
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 303,726
Closing UCC	\$ 3,492,844



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 10

**Name or General Description of Project**

C1 Underground Infrastructure

**Asset Component**

1850\_Line Transformers - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 34,377
Closing Capital Investment	\$ 34,377
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 1,146
Closing Accumulated Amortization	\$ 1,146
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 33,231
Average Net Fixed Assets	\$ 16,615

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 34,377
UCC Before Half Year Rule	\$ 34,377
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 34,377
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 2,750
Closing UCC	\$ 31,627





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 11

**Name or General Description of Project**

C1 Underground Infrastructure

**Asset Component**

1850\_Line Transformers - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 2,826,536
Closing Capital Investment	\$ 2,826,536
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 94,218
Closing Accumulated Amortization	\$ 94,218
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 2,732,318
Average Net Fixed Assets	\$ 1,366,159

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 2,826,536
UCC Before Half Year Rule	\$ 2,826,536
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 2,826,536
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 226,123
Closing UCC	\$ 2,600,413



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 12

#### Name or General Description of Project

C1 Underground Infrastructure

#### Asset Component

1860 Meters - Smart Meters

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 7,197
Closing Capital Investment	\$ 7,197
Opening Accumulated Amortization	\$ -
Amortization	7% \$ 480
Closing Accumulated Amortization	\$ 480
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 6,717
Average Net Fixed Assets	\$ 3,358

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 7,197
UCC Before Half Year Rule	\$ 7,197
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 7,197
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 576
Closing UCC	\$ 6,621



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 13

**Name or General Description of Project**

C1 Underground Infrastructure

**Asset Component**

1855\_Services - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 317,627
Closing Capital Investment	\$ 317,627
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 7,941
Closing Accumulated Amortization	\$ 7,941
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 309,687
Average Net Fixed Assets	\$ 154,843

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 317,627
UCC Before Half Year Rule	\$ 317,627
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 317,627
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 25,410
Closing UCC	\$ 292,217



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 14

**Name or General Description of Project**

C1 Underground Infrastructure

**Asset Component**

1855\_Services - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 41,013
Closing Capital Investment	\$ 41,013
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 820
Closing Accumulated Amortization	\$ 820
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 40,192
Average Net Fixed Assets	\$ 20,096

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 41,013
UCC Before Half Year Rule	\$ 41,013
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 41,013
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 3,281
Closing UCC	\$ 37,732

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

Year

2012

Details of Project

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

Number of Asset Components

1

Asset Component (Click on the Number to View the Component Details)

1 1845\_Underground Conductors and Devices

Capital Cost

80,959

Depreciation  
Rate

3%

CCA Class

47

CCA Rate

8%

Closing Net Fixed Asset

2012  
78,935

2013  
76,911

Amortization Expense

2,024

2,024

CCA

6,477

5,959



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

#### Asset Component

1845\_Underground Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 80,959
Capital Investment	\$ 80,959	\$ -
Closing Capital Investment	\$ 80,959	\$ 80,959
Opening Accumulated Amortization	\$ -	\$ 2,024
Amortization	3% \$ 2,024	\$ 2,024
Closing Accumulated Amortization	\$ 2,024	\$ 4,048
Opening Net Fixed Assets	\$ -	\$ 78,935
Closing Net Fixed Assets	\$ 78,935	\$ 76,911
Average Net Fixed Assets	\$ 39,468	\$ 77,923

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 74,483
Capital Additions	\$ 80,959	\$ -
UCC Before Half Year Rule	\$ 80,959	\$ 74,483
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 80,959	\$ 74,483
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 6,477	\$ 5,959
Closing UCC	\$ 74,483	\$ 68,524



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

Year

2013

Details of Project

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

Number of Asset Components

7

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1840_Underground Conduit - Cable Chamber	209,069	2%	47	8%
2 1840_Underground Conduit - Duct Bank	1,599,888	3%	47	8%
3 1840_Underground Conduit - Vault	7,945	3%	47	8%
4 1840_Underground Conduit - Vault Roof	3,539	5%	47	8%
5 1845_Underground Conductors and Devices	3,595,225	3%	47	8%
6 1845_Underground Conductors and Devices - Switch	1,889	5%	47	8%
7 1855_Services - UG	1,460	3%	47	8%

2013

Closing Net Fixed Asset

5,271,116

Amortization Expense

147,898

CCA

433,521





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

**Asset Component**

1840\_Underground Conduit - Cable Chamber

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 209,069
Closing Capital Investment	\$ 209,069
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 4,181
Closing Accumulated Amortization	\$ 4,181
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 204,887
Average Net Fixed Assets	\$ 102,444

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 209,069
UCC Before Half Year Rule	\$ 209,069
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 209,069
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 16,726
Closing UCC	\$ 192,343



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

#### Asset Component

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,599,888
Closing Capital Investment	\$ 1,599,888
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 53,330
Closing Accumulated Amortization	\$ 53,330
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,546,558
Average Net Fixed Assets	\$ 773,279

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,599,888
UCC Before Half Year Rule	\$ 1,599,888
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,599,888
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 127,991
Closing UCC	\$ 1,471,897



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 3

**Name or General Description of Project**

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

**Asset Component**

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 7,945
Closing Capital Investment	\$ 7,945
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 199
Closing Accumulated Amortization	\$ 199
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 7,746
Average Net Fixed Assets	\$ 3,873

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 7,945
UCC Before Half Year Rule	\$ 7,945
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 7,945
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 636
Closing UCC	\$ 7,309



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

**Asset Component**

1840\_Underground Conduit - Vault Roof

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 3,539
Closing Capital Investment	\$ 3,539
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 177
Closing Accumulated Amortization	\$ 177
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,362
Average Net Fixed Assets	\$ 1,681

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 3,539
UCC Before Half Year Rule	\$ 3,539
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,539
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 283
Closing UCC	\$ 3,256



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

#### Asset Component

1845 Underground Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 3,595,225
Closing Capital Investment	\$ 3,595,225
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 89,881
Closing Accumulated Amortization	\$ 89,881
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,505,344
Average Net Fixed Assets	\$ 1,752,672

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 3,595,225
UCC Before Half Year Rule	\$ 3,595,225
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,595,225
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 287,618
Closing UCC	\$ 3,307,607



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

#### Asset Component

1845\_Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,889
Closing Capital Investment	\$ 1,889
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 94
Closing Accumulated Amortization	\$ 94
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,795
Average Net Fixed Assets	\$ 897

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,889
UCC Before Half Year Rule	\$ 1,889
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,889
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 151
Closing UCC	\$ 1,738



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers

#### Asset Component

1855\_Services - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,460
Closing Capital Investment	\$ 1,460
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 36
Closing Accumulated Amortization	\$ 36
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,423
Average Net Fixed Assets	\$ 712

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,460
UCC Before Half Year Rule	\$ 1,460
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,460
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 117
Closing UCC	\$ 1,343

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.





## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C3 Handwell Replacement

Year

2012

Details of Project

C3 Handwell Replacement

Number of Asset Components

1

Asset Component (Click on the Number to View the Component Details)

1 1830\_Poles Towers and Fixtures

Capital Cost

13,651,577

Depreciation  
Rate

3%

CCA Class

47

CCA Rate

8%

Closing Net Fixed Asset

2012  
13,310,288

2013  
12,968,998

Amortization Expense

341,289

341,289

CCA

1,092,126

1,004,756



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C3 Handwell Replacement

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 13,651,577
Capital Investment	\$ 13,651,577	\$ -
Closing Capital Investment	\$ 13,651,577	\$ 13,651,577
Opening Accumulated Amortization	\$ -	\$ 341,289
Amortization	3% \$ 341,289	\$ 341,289
Closing Accumulated Amortization	\$ 341,289	\$ 682,579
Opening Net Fixed Assets	\$ -	\$ 13,310,288
Closing Net Fixed Assets	\$ 13,310,288	\$ 12,968,998
Average Net Fixed Assets	\$ 6,655,144	\$ 13,139,643

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 12,559,451
Capital Additions	\$ 13,651,577	\$ -
UCC Before Half Year Rule	\$ 13,651,577	\$ 12,559,451
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 13,651,577	\$ 12,559,451
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 1,092,126	\$ 1,004,756
Closing UCC	\$ 12,559,451	\$ 11,554,695



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C3 Handwell Replacement

Year

2013

Details of Project

C3 Handwell Replacement

Number of Asset Components

1

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	16,650,488	3%	47	8%
<b>Closing Net Fixed Asset</b>	16,234,226			
<b>Amortization Expense</b>	416,262			
<b>CCA</b>	1,332,039			



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C3 Handwell Replacement

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 16,650,488
Closing Capital Investment	\$ 16,650,488
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 416,262
Closing Accumulated Amortization	\$ 416,262
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 16,234,226
Average Net Fixed Assets	\$ 8,117,113

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 16,650,488
UCC Before Half Year Rule	\$ 16,650,488
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 16,650,488
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 1,332,039
Closing UCC	\$ 15,318,449

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C4 Overhead Infrastructure

Year

2012

Details of Project

C4 Overhead Infrastructure

Number of Asset Components

14

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	2,437,691	3%	47	8%
2 1835_Overhead Conductors and Devices	2,086,837	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	1,033,849	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	173	2%	47	8%
5 1840_Underground Conduit - Duct Bank	51,860	3%	47	8%
6 1840_Underground Conduit - Vault	1,537	3%	47	8%
7 1840_Underground Conduit - Vault Roof	173	5%	47	8%
8 1845_Underground Conductors and Devices	973,508	3%	47	8%
9 1845_Underground Conductors and Devices - Switch	64,133	5%	47	8%
10 1850_Line Transformers - OH	1,760,540	3%	47	8%
11 1850_Line Transformers - UG	24,057	3%	47	8%
12 1860_Meters - Smart Meters	2,165	7%	47	8%
13 1855_Services - UG	623	3%	47	8%
14 1855_Services - OH	633,741	2%	47	8%
	<b>2012</b>	<b>2013</b>		
Closing Net Fixed Asset	8,832,102	8,593,317		
Amortization Expense	238,786	238,786		
CCA	725,671	667,617		



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 2,437,691
Capital Investment	\$ 2,437,691	\$ -
Closing Capital Investment	\$ 2,437,691	\$ 2,437,691
Opening Accumulated Amortization	\$ -	\$ 60,942
Amortization	3% \$ 60,942	\$ 60,942
Closing Accumulated Amortization	\$ 60,942	\$ 121,885
Opening Net Fixed Assets	\$ -	\$ 2,376,749
Closing Net Fixed Assets	\$ 2,376,749	\$ 2,315,806
Average Net Fixed Assets	\$ 1,188,374	\$ 2,346,278

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 2,242,676
Capital Additions	\$ 2,437,691	\$ -
UCC Before Half Year Rule	\$ 2,437,691	\$ 2,242,676
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 2,437,691	\$ 2,242,676
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 195,015	\$ 179,414
Closing UCC	\$ 2,242,676	\$ 2,063,262



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 2,086,837
Capital Investment	\$ 2,086,837	\$ -
Closing Capital Investment	\$ 2,086,837	\$ 2,086,837
Opening Accumulated Amortization	\$ -	\$ 41,737
Amortization	2% \$ 41,737	\$ 41,737
Closing Accumulated Amortization	\$ 41,737	\$ 83,473
Opening Net Fixed Assets	\$ -	\$ 2,045,101
Closing Net Fixed Assets	\$ 2,045,101	\$ 2,003,364
Average Net Fixed Assets	\$ 1,022,550	\$ 2,024,232

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,919,890
Capital Additions	\$ 2,086,837	\$ -
UCC Before Half Year Rule	\$ 2,086,837	\$ 1,919,890
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 2,086,837	\$ 1,919,890
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 166,947	\$ 153,591
Closing UCC	\$ 1,919,890	\$ 1,766,299





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,033,849
Capital Investment	\$ 1,033,849	\$ -
Closing Capital Investment	\$ 1,033,849	\$ 1,033,849
Opening Accumulated Amortization	\$ -	\$ 34,462
Amortization	3% \$ 34,462	\$ 34,462
Closing Accumulated Amortization	\$ 34,462	\$ 68,923
Opening Net Fixed Assets	\$ -	\$ 999,388
Closing Net Fixed Assets	\$ 999,388	\$ 964,926
Average Net Fixed Assets	\$ 499,694	\$ 982,157

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 951,141
Capital Additions	\$ 1,033,849	\$ -
UCC Before Half Year Rule	\$ 1,033,849	\$ 951,141
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,033,849	\$ 951,141
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 82,708	\$ 76,091
Closing UCC	\$ 951,141	\$ 875,050



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1840\_Underground Conduit - Cable Chamber

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 173
Capital Investment	\$ 173	\$ -
Closing Capital Investment	\$ 173	\$ 173
Opening Accumulated Amortization	\$ -	\$ 3
Amortization	2% \$ 3	\$ 3
Closing Accumulated Amortization	\$ 3	\$ 7
Opening Net Fixed Assets	\$ -	\$ 170
Closing Net Fixed Assets	\$ 170	\$ 166
Average Net Fixed Assets	\$ 85	\$ 168

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 159
Capital Additions	\$ 173	\$ -
UCC Before Half Year Rule	\$ 173	\$ 159
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 173	\$ 159
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 14	\$ 13
Closing UCC	\$ 159	\$ 147



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1840 Underground Conduit - Duct Bank

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 51,860
Capital Investment	\$ 51,860	\$ -
Closing Capital Investment	\$ 51,860	\$ 51,860
Opening Accumulated Amortization	\$ -	\$ 1,729
Amortization	3% \$ 1,729	\$ 1,729
Closing Accumulated Amortization	\$ 1,729	\$ 3,457
Opening Net Fixed Assets	\$ -	\$ 50,131
Closing Net Fixed Assets	\$ 50,131	\$ 48,402
Average Net Fixed Assets	\$ 25,066	\$ 49,267

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 47,711
Capital Additions	\$ 51,860	\$ -
UCC Before Half Year Rule	\$ 51,860	\$ 47,711
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 51,860	\$ 47,711
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 4,149	\$ 3,817
Closing UCC	\$ 47,711	\$ 43,894



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1840 Underground Conduit - Vault

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,537
Capital Investment	\$ 1,537	\$ -
Closing Capital Investment	\$ 1,537	\$ 1,537
Opening Accumulated Amortization	\$ -	\$ 38
Amortization	3% \$ 38	\$ 38
Closing Accumulated Amortization	\$ 38	\$ 77
Opening Net Fixed Assets	\$ -	\$ 1,499
Closing Net Fixed Assets	\$ 1,499	\$ 1,460
Average Net Fixed Assets	\$ 749	\$ 1,480

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,414
Capital Additions	\$ 1,537	\$ -
UCC Before Half Year Rule	\$ 1,537	\$ 1,414
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,537	\$ 1,414
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 123	\$ 113
Closing UCC	\$ 1,414	\$ 1,301



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 7

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1840\_Underground Conduit - Vault Roof

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 173
Capital Investment	\$ 173	\$ -
Closing Capital Investment	\$ 173	\$ 173
Opening Accumulated Amortization	\$ -	\$ 9
Amortization	5% \$ 9	\$ 9
Closing Accumulated Amortization	\$ 9	\$ 17
Opening Net Fixed Assets	\$ -	\$ 164
Closing Net Fixed Assets	\$ 164	\$ 156
Average Net Fixed Assets	\$ 82	\$ 160

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 159
Capital Additions	\$ 173	\$ -
UCC Before Half Year Rule	\$ 173	\$ 159
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 173	\$ 159
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 14	\$ 13
Closing UCC	\$ 159	\$ 147



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1845 Underground Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 973,508
Capital Investment	\$ 973,508	\$ -
Closing Capital Investment	\$ 973,508	\$ 973,508
Opening Accumulated Amortization	\$ -	\$ 24,338
Amortization	3% \$ 24,338	\$ 24,338
Closing Accumulated Amortization	\$ 24,338	\$ 48,675
Opening Net Fixed Assets	\$ -	\$ 949,171
Closing Net Fixed Assets	\$ 949,171	\$ 924,833
Average Net Fixed Assets	\$ 474,585	\$ 937,002

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 895,628
Capital Additions	\$ 973,508	\$ -
UCC Before Half Year Rule	\$ 973,508	\$ 895,628
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 973,508	\$ 895,628
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 77,881	\$ 71,650
Closing UCC	\$ 895,628	\$ 823,977



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 64,133
Capital Investment	\$ 64,133	\$ -
Closing Capital Investment	\$ 64,133	\$ 64,133
Opening Accumulated Amortization	\$ -	\$ 3,207
Amortization	5% \$ 3,207	\$ 3,207
Closing Accumulated Amortization	\$ 3,207	\$ 6,413
Opening Net Fixed Assets	\$ -	\$ 60,926
Closing Net Fixed Assets	\$ 60,926	\$ 57,719
Average Net Fixed Assets	\$ 30,463	\$ 59,323

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 59,002
Capital Additions	\$ 64,133	\$ -
UCC Before Half Year Rule	\$ 64,133	\$ 59,002
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 64,133	\$ 59,002
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 5,131	\$ 4,720
Closing UCC	\$ 59,002	\$ 54,282



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 10

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1850\_Line Transformers - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,760,540
Capital Investment	\$ 1,760,540	\$ -
Closing Capital Investment	\$ 1,760,540	\$ 1,760,540
Opening Accumulated Amortization	\$ -	\$ 58,685
Amortization	3% \$ 58,685	\$ 58,685
Closing Accumulated Amortization	\$ 58,685	\$ 117,369
Opening Net Fixed Assets	\$ -	\$ 1,701,856
Closing Net Fixed Assets	\$ 1,701,856	\$ 1,643,171
Average Net Fixed Assets	\$ 850,928	\$ 1,672,513

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,619,697
Capital Additions	\$ 1,760,540	\$ -
UCC Before Half Year Rule	\$ 1,760,540	\$ 1,619,697
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,760,540	\$ 1,619,697
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 140,843	\$ 129,576
Closing UCC	\$ 1,619,697	\$ 1,490,121





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 11

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1850 Line Transformers - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 24,057
Capital Investment	\$ 24,057	\$ -
Closing Capital Investment	\$ 24,057	\$ 24,057
Opening Accumulated Amortization	\$ -	\$ 802
Amortization	3% \$ 802	\$ 802
Closing Accumulated Amortization	\$ 802	\$ 1,604
Opening Net Fixed Assets	\$ -	\$ 23,255
Closing Net Fixed Assets	\$ 23,255	\$ 22,453
Average Net Fixed Assets	\$ 11,627	\$ 22,854

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 22,132
Capital Additions	\$ 24,057	\$ -
UCC Before Half Year Rule	\$ 24,057	\$ 22,132
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 24,057	\$ 22,132
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 1,925	\$ 1,771
Closing UCC	\$ 22,132	\$ 20,361



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 12

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1860 Meters - Smart Meters

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 2,165
Capital Investment	\$ 2,165	\$ -
Closing Capital Investment	\$ 2,165	\$ 2,165
Opening Accumulated Amortization	\$ -	\$ 144
Amortization	7% \$ 144	\$ 144
Closing Accumulated Amortization	\$ 144	\$ 289
Opening Net Fixed Assets	\$ -	\$ 2,021
Closing Net Fixed Assets	\$ 2,021	\$ 1,877
Average Net Fixed Assets	\$ 1,010	\$ 1,949

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,992
Capital Additions	\$ 2,165	\$ -
UCC Before Half Year Rule	\$ 2,165	\$ 1,992
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 2,165	\$ 1,992
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 173	\$ 159
Closing UCC	\$ 1,992	\$ 1,833



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 13

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1855\_Services - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 623
Capital Investment	\$ 623	\$ -
Closing Capital Investment	\$ 623	\$ 623
Opening Accumulated Amortization	\$ -	\$ 16
Amortization	3% \$ 16	\$ 16
Closing Accumulated Amortization	\$ 16	\$ 31
Opening Net Fixed Assets	\$ -	\$ 608
Closing Net Fixed Assets	\$ 608	\$ 592
Average Net Fixed Assets	\$ 304	\$ 600

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 573
Capital Additions	\$ 623	\$ -
UCC Before Half Year Rule	\$ 623	\$ 573
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 623	\$ 573
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 50	\$ 46
Closing UCC	\$ 573	\$ 528



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 14

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1855\_Services - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 633,741
Capital Investment	\$ 633,741	\$ -
Closing Capital Investment	\$ 633,741	\$ 633,741
Opening Accumulated Amortization	\$ -	\$ 12,675
Amortization	2% \$ 12,675	\$ 12,675
Closing Accumulated Amortization	\$ 12,675	\$ 25,350
Opening Net Fixed Assets	\$ -	\$ 621,066
Closing Net Fixed Assets	\$ 621,066	\$ 608,391
Average Net Fixed Assets	\$ 310,533	\$ 614,728

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 583,041
Capital Additions	\$ 633,741	\$ -
UCC Before Half Year Rule	\$ 633,741	\$ 583,041
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 633,741	\$ 583,041
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 50,699	\$ 46,643
Closing UCC	\$ 583,041	\$ 536,398



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C4 Overhead Infrastructure

Year

2013

Details of Project

C4 Overhead Infrastructure

Number of Asset Components

14

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	17,785,992	3%	47	8%
2 1835_Overhead Conductors and Devices	14,700,767	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	5,644,928	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	4,721	2%	47	8%
5 1840_Underground Conduit - Duct Bank	1,446,082	3%	47	8%
6 1840_Underground Conduit - Vault	31,869	3%	47	8%
7 1840_Underground Conduit - Vault Roof	1,862	5%	47	8%
8 1845_Underground Conductors and Devices	677,259	3%	47	8%
9 1845_Underground Conductors and Devices - Switch	238,069	5%	47	8%
10 1850_Line Transformers - OH	12,795,144	3%	47	8%
11 1850_Line Transformers - UG	1,037,522	3%	47	8%
12 1860_Meters - Smart Meters	171,508	7%	47	8%
13 1855_Services - UG	108,362	3%	47	8%
14 1855_Services - OH	1,232,470	2%	47	8%

2013

Closing Net Fixed Asset 54,371,822

Amortization Expense 1,504,732

CCA 4,470,124



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 17,785,992
Closing Capital Investment	\$ 17,785,992
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 444,650
Closing Accumulated Amortization	\$ 444,650
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 17,341,342
Average Net Fixed Assets	\$ 8,670,671

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 17,785,992
UCC Before Half Year Rule	\$ 17,785,992
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 17,785,992
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 1,422,879
Closing UCC	\$ 16,363,112



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 14,700,767
Closing Capital Investment	\$ 14,700,767
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 294,015
Closing Accumulated Amortization	\$ 294,015
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 14,406,752
Average Net Fixed Assets	\$ 7,203,376

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 14,700,767
UCC Before Half Year Rule	\$ 14,700,767
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 14,700,767
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 1,176,061
Closing UCC	\$ 13,524,706



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C4 Overhead Infrastructure

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 5,644,928
Closing Capital Investment	\$ 5,644,928
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 188,164
Closing Accumulated Amortization	\$ 188,164
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 5,456,764
Average Net Fixed Assets	\$ 2,728,382

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 5,644,928
UCC Before Half Year Rule	\$ 5,644,928
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 5,644,928
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 451,594
Closing UCC	\$ 5,193,334





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1840\_Underground Conduit - Cable Chamber

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 4,721
Closing Capital Investment	\$ 4,721
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 94
Closing Accumulated Amortization	\$ 94
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 4,626
Average Net Fixed Assets	\$ 2,313

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 4,721
UCC Before Half Year Rule	\$ 4,721
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 4,721
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 378
Closing UCC	\$ 4,343



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 5

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,446,082
Closing Capital Investment	\$ 1,446,082
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 48,203
Closing Accumulated Amortization	\$ 48,203
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,397,879
Average Net Fixed Assets	\$ 698,940

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,446,082
UCC Before Half Year Rule	\$ 1,446,082
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,446,082
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 115,687
Closing UCC	\$ 1,330,395



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 6

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 31,869
Closing Capital Investment	\$ 31,869
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 797
Closing Accumulated Amortization	\$ 797
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 31,072
Average Net Fixed Assets	\$ 15,536

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 31,869
UCC Before Half Year Rule	\$ 31,869
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 31,869
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 2,550
Closing UCC	\$ 29,319



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 7

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1840\_Underground Conduit - Vault Roof

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,862
Closing Capital Investment	\$ 1,862
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 93
Closing Accumulated Amortization	\$ 93
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,769
Average Net Fixed Assets	\$ 884

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,862
UCC Before Half Year Rule	\$ 1,862
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,862
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 149
Closing UCC	\$ 1,713



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1845 Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 677,259
Closing Capital Investment	\$ 677,259
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 16,931
Closing Accumulated Amortization	\$ 16,931
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 660,328
Average Net Fixed Assets	\$ 330,164

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 677,259
UCC Before Half Year Rule	\$ 677,259
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 677,259
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 54,181
Closing UCC	\$ 623,078



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 9

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 238,069
Closing Capital Investment	\$ 238,069
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 11,903
Closing Accumulated Amortization	\$ 11,903
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 226,165
Average Net Fixed Assets	\$ 113,083

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 238,069
UCC Before Half Year Rule	\$ 238,069
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 238,069
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 19,045
Closing UCC	\$ 219,023



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 10

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1850\_Line Transformers - OH

### Average Net Fixed Assets

**Net Fixed Assets**

2013

Forecasted

Opening Capital Investment	\$	-
Capital Investment	\$	12,795,144
Closing Capital Investment	\$	12,795,144
Opening Accumulated Amortization	\$	-
Amortization	3%	\$ 426,505
Closing Accumulated Amortization	\$	426,505
Opening Net Fixed Assets	\$	-
Closing Net Fixed Assets	\$	12,368,639
Average Net Fixed Assets	\$	6,184,320

### For PILs Calculation

**UCC**

2013

Forecasted

Opening UCC	\$	-
Capital Additions	\$	12,795,144
UCC Before Half Year Rule	\$	12,795,144
Half Year Rule (1/2 Additions - Disposals)	\$	-
Reduced UCC	\$	12,795,144
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$	1,023,612
Closing UCC	\$	11,771,533



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 11

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1850\_Line Transformers - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,037,522
Closing Capital Investment	\$ 1,037,522
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 34,584
Closing Accumulated Amortization	\$ 34,584
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,002,938
Average Net Fixed Assets	\$ 501,469

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,037,522
UCC Before Half Year Rule	\$ 1,037,522
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,037,522
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 83,002
Closing UCC	\$ 954,520





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 12

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1860 Meters - Smart Meters

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 171,508
Closing Capital Investment	\$ 171,508
Opening Accumulated Amortization	\$ -
Amortization	7% \$ 11,434
Closing Accumulated Amortization	\$ 11,434
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 160,075
Average Net Fixed Assets	\$ 80,037

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 171,508
UCC Before Half Year Rule	\$ 171,508
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 171,508
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 13,721
Closing UCC	\$ 157,788



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 13

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1855\_Services - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 108,362
Closing Capital Investment	\$ 108,362
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 2,709
Closing Accumulated Amortization	\$ 2,709
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 105,653
Average Net Fixed Assets	\$ 52,826

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 108,362
UCC Before Half Year Rule	\$ 108,362
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 108,362
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 8,669
Closing UCC	\$ 99,693



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 14

**Name or General Description of Project**

C4 Overhead Infrastructure

**Asset Component**

1855\_Services - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,232,470
Closing Capital Investment	\$ 1,232,470
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 24,649
Closing Accumulated Amortization	\$ 24,649
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,207,820
Average Net Fixed Assets	\$ 603,910

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,232,470
UCC Before Half Year Rule	\$ 1,232,470
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,232,470
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 98,598
Closing UCC	\$ 1,133,872

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C5 Box Construction

Year

2012

Details of Project

C5 Box Construction

Number of Asset Components

11

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	125,548	3%	47	8%
2 1835_Overhead Conductors and Devices	149,423	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	23,980	3%	47	8%
4 1840_Underground Conduit - Duct Bank	2,762	3%	47	8%
5 1845_Underground Conductors and Devices	30,198	3%	47	8%
6 1845_Underground Conductors and Devices - Switch	7,200	5%	47	8%
7 1850_Line Transformers - OH	124,926	3%	47	8%
8 1850_Line Transformers - UG	5,669	3%	47	8%
9 1860_Meters - Smart Meters	374	7%	47	8%
10 1855_Services - UG	107	3%	47	8%
11 1855_Services - OH	112,796	2%	47	8%

	2012	2013
Closing Net Fixed Asset	568,213	553,443
Amortization Expense	14,770	14,770
CCA	46,639	42,908



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C5 Box Construction

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 125,548
Capital Investment	\$ 125,548	\$ -
Closing Capital Investment	\$ 125,548	\$ 125,548
Opening Accumulated Amortization	\$ -	\$ 3,139
Amortization	3% \$ 3,139	\$ 3,139
Closing Accumulated Amortization	\$ 3,139	\$ 6,277
Opening Net Fixed Assets	\$ -	\$ 122,409
Closing Net Fixed Assets	\$ 122,409	\$ 119,270
Average Net Fixed Assets	\$ 61,204	\$ 120,840

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 115,504
Capital Additions	\$ 125,548	\$ -
UCC Before Half Year Rule	\$ 125,548	\$ 115,504
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 125,548	\$ 115,504
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 10,044	\$ 9,240
Closing UCC	\$ 115,504	\$ 106,264



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C5 Box Construction

#### Asset Component

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 149,423
Capital Investment	\$ 149,423	\$ -
Closing Capital Investment	\$ 149,423	\$ 149,423
Opening Accumulated Amortization	\$ -	\$ 2,988
Amortization	2% \$ 2,988	\$ 2,988
Closing Accumulated Amortization	\$ 2,988	\$ 5,977
Opening Net Fixed Assets	\$ -	\$ 146,434
Closing Net Fixed Assets	\$ 146,434	\$ 143,446
Average Net Fixed Assets	\$ 73,217	\$ 144,940

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 137,469
Capital Additions	\$ 149,423	\$ -
UCC Before Half Year Rule	\$ 149,423	\$ 137,469
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 149,423	\$ 137,469
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 11,954	\$ 10,998
Closing UCC	\$ 137,469	\$ 126,471



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C5 Box Construction

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 23,980
Capital Investment	\$ 23,980	\$ -
Closing Capital Investment	\$ 23,980	\$ 23,980
Opening Accumulated Amortization	\$ -	\$ 799
Amortization	3% \$ 799	\$ 799
Closing Accumulated Amortization	\$ 799	\$ 1,599
Opening Net Fixed Assets	\$ -	\$ 23,181
Closing Net Fixed Assets	\$ 23,181	\$ 22,381
Average Net Fixed Assets	\$ 11,590	\$ 22,781

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 22,062
Capital Additions	\$ 23,980	\$ -
UCC Before Half Year Rule	\$ 23,980	\$ 22,062
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 23,980	\$ 22,062
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 1,918	\$ 1,765
Closing UCC	\$ 22,062	\$ 20,297





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1840 Underground Conduit - Duct Bank

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 2,762
Capital Investment	\$ 2,762	\$ -
Closing Capital Investment	\$ 2,762	\$ 2,762
Opening Accumulated Amortization	\$ -	\$ 92
Amortization	3% \$ 92	\$ 92
Closing Accumulated Amortization	\$ 92	\$ 184
Opening Net Fixed Assets	\$ -	\$ 2,670
Closing Net Fixed Assets	\$ 2,670	\$ 2,578
Average Net Fixed Assets	\$ 1,335	\$ 2,624

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 2,541
Capital Additions	\$ 2,762	\$ -
UCC Before Half Year Rule	\$ 2,762	\$ 2,541
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 2,762	\$ 2,541
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 221	\$ 203
Closing UCC	\$ 2,541	\$ 2,338



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1845\_Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 30,198
Capital Investment	\$ 30,198	\$ -
Closing Capital Investment	\$ 30,198	\$ 30,198
Opening Accumulated Amortization	\$ -	\$ 755
Amortization	3% \$ 755	\$ 755
Closing Accumulated Amortization	\$ 755	\$ 1,510
Opening Net Fixed Assets	\$ -	\$ 29,444
Closing Net Fixed Assets	\$ 29,444	\$ 28,689
Average Net Fixed Assets	\$ 14,722	\$ 29,066

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 27,783
Capital Additions	\$ 30,198	\$ -
UCC Before Half Year Rule	\$ 30,198	\$ 27,783
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 30,198	\$ 27,783
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 2,416	\$ 2,223
Closing UCC	\$ 27,783	\$ 25,560



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C5 Box Construction

#### Asset Component

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 7,200
Capital Investment	\$ 7,200	\$ -
Closing Capital Investment	\$ 7,200	\$ 7,200
Opening Accumulated Amortization	\$ -	\$ 360
Amortization	5% \$ 360	\$ 360
Closing Accumulated Amortization	\$ 360	\$ 720
Opening Net Fixed Assets	\$ -	\$ 6,840
Closing Net Fixed Assets	\$ 6,840	\$ 6,480
Average Net Fixed Assets	\$ 3,420	\$ 6,660

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 6,624
Capital Additions	\$ 7,200	\$ -
UCC Before Half Year Rule	\$ 7,200	\$ 6,624
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 7,200	\$ 6,624
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 576	\$ 530
Closing UCC	\$ 6,624	\$ 6,094



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C5 Box Construction

#### Asset Component

1850 Line Transformers - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 124,926
Capital Investment	\$ 124,926	\$ -
Closing Capital Investment	\$ 124,926	\$ 124,926
Opening Accumulated Amortization	\$ -	\$ 4,164
Amortization	3% \$ 4,164	\$ 4,164
Closing Accumulated Amortization	\$ 4,164	\$ 8,328
Opening Net Fixed Assets	\$ -	\$ 120,762
Closing Net Fixed Assets	\$ 120,762	\$ 116,598
Average Net Fixed Assets	\$ 60,381	\$ 118,680

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 114,932
Capital Additions	\$ 124,926	\$ -
UCC Before Half Year Rule	\$ 124,926	\$ 114,932
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 124,926	\$ 114,932
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 9,994	\$ 9,195
Closing UCC	\$ 114,932	\$ 105,737



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C5 Box Construction

#### Asset Component

1850 Line Transformers - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 5,669
Capital Investment	\$ 5,669	\$ -
Closing Capital Investment	\$ 5,669	\$ 5,669
Opening Accumulated Amortization	\$ -	\$ 189
Amortization	3% \$ 189	\$ 189
Closing Accumulated Amortization	\$ 189	\$ 378
Opening Net Fixed Assets	\$ -	\$ 5,480
Closing Net Fixed Assets	\$ 5,480	\$ 5,291
Average Net Fixed Assets	\$ 2,740	\$ 5,386

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 5,216
Capital Additions	\$ 5,669	\$ -
UCC Before Half Year Rule	\$ 5,669	\$ 5,216
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 5,669	\$ 5,216
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 454	\$ 417
Closing UCC	\$ 5,216	\$ 4,799



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C5 Box Construction

#### Asset Component

1860 Meters - Smart Meters

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 374
Capital Investment	\$ 374	\$ -
Closing Capital Investment	\$ 374	\$ 374
Opening Accumulated Amortization	\$ -	\$ 25
Amortization	7% \$ 25	\$ 25
Closing Accumulated Amortization	\$ 25	\$ 50
Opening Net Fixed Assets	\$ -	\$ 349
Closing Net Fixed Assets	\$ 349	\$ 324
Average Net Fixed Assets	\$ 175	\$ 337

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 344
Capital Additions	\$ 374	\$ -
UCC Before Half Year Rule	\$ 374	\$ 344
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 374	\$ 344
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 30	\$ 28
Closing UCC	\$ 344	\$ 317



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 10

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1855\_Services - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 107
Capital Investment	\$ 107	\$ -
Closing Capital Investment	\$ 107	\$ 107
Opening Accumulated Amortization	\$ -	\$ 3
Amortization	3% \$ 3	\$ 3
Closing Accumulated Amortization	\$ 3	\$ 5
Opening Net Fixed Assets	\$ -	\$ 105
Closing Net Fixed Assets	\$ 105	\$ 102
Average Net Fixed Assets	\$ 52	\$ 103

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 99
Capital Additions	\$ 107	\$ -
UCC Before Half Year Rule	\$ 107	\$ 99
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 107	\$ 99
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 9	\$ 8
Closing UCC	\$ 99	\$ 91



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 11

#### Name or General Description of Project

C5 Box Construction

#### Asset Component

1855\_Services - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 112,796
Capital Investment	\$ 112,796	\$ -
Closing Capital Investment	\$ 112,796	\$ 112,796
Opening Accumulated Amortization	\$ -	\$ 2,256
Amortization	2% \$ 2,256	\$ 2,256
Closing Accumulated Amortization	\$ 2,256	\$ 4,512
Opening Net Fixed Assets	\$ -	\$ 110,540
Closing Net Fixed Assets	\$ 110,540	\$ 108,284
Average Net Fixed Assets	\$ 55,270	\$ 109,412

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 103,772
Capital Additions	\$ 112,796	\$ -
UCC Before Half Year Rule	\$ 112,796	\$ 103,772
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 112,796	\$ 103,772
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 9,024	\$ 8,302
Closing UCC	\$ 103,772	\$ 95,470





## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C5 Box Construction

Year

2013

Details of Project

C5 Box Construction

Number of Asset Components

15

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	4,921,766	3%	47	8%
2 1835_Overhead Conductors and Devices	4,973,736	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	1,242,095	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	1,094,417	2%	47	8%
5 1840_Underground Conduit - Duct Bank	307,118	3%	47	8%
6 1840_Underground Conduit - Vault	38,531	3%	47	8%
7 1840_Underground Conduit - Vault Roof	23,872	5%	47	8%
8 1845_Underground Conductors and Devices	3,199,658	3%	47	8%
9 1845_Underground Conductors and Devices - Switch	249,649	5%	47	8%
10 1850_Line Transformers - OH	3,796,782	3%	47	8%
11 1850_Line Transformers - UG	498,616	3%	47	8%
12 1850_Line Transformers - UG Network w/protector	115,671	5%	47	8%
13 1860_Meters - Smart Meters	28,696	7%	47	8%
14 1855_Services - UG	133,954	3%	47	8%
15 1855_Services - OH	2,417,137	2%	47	8%

2013

Closing Net Fixed Asset 22,448,452

Amortization Expense 593,247

CCA 1,843,336



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 4,921,766
Closing Capital Investment	\$ 4,921,766
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 123,044
Closing Accumulated Amortization	\$ 123,044
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 4,798,722
Average Net Fixed Assets	\$ 2,399,361

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 4,921,766
UCC Before Half Year Rule	\$ 4,921,766
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 4,921,766
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 393,741
Closing UCC	\$ 4,528,025



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 4,973,736
Closing Capital Investment	\$ 4,973,736
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 99,475
Closing Accumulated Amortization	\$ 99,475
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 4,874,261
Average Net Fixed Assets	\$ 2,437,131

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 4,973,736
UCC Before Half Year Rule	\$ 4,973,736
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 4,973,736
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 397,899
Closing UCC	\$ 4,575,837



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,242,095
Closing Capital Investment	\$ 1,242,095
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 41,403
Closing Accumulated Amortization	\$ 41,403
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,200,691
Average Net Fixed Assets	\$ 600,346

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,242,095
UCC Before Half Year Rule	\$ 1,242,095
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,242,095
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 99,368
Closing UCC	\$ 1,142,727



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1840\_Underground Conduit - Cable Chamber

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,094,417
Closing Capital Investment	\$ 1,094,417
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 21,888
Closing Accumulated Amortization	\$ 21,888
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,072,529
Average Net Fixed Assets	\$ 536,264

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,094,417
UCC Before Half Year Rule	\$ 1,094,417
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,094,417
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 87,553
Closing UCC	\$ 1,006,864



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C5 Box Construction

#### Asset Component

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 307,118
Closing Capital Investment	\$ 307,118
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 10,237
Closing Accumulated Amortization	\$ 10,237
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 296,881
Average Net Fixed Assets	\$ 148,440

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 307,118
UCC Before Half Year Rule	\$ 307,118
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 307,118
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 24,569
Closing UCC	\$ 282,549



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 38,531
Closing Capital Investment	\$ 38,531
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 963
Closing Accumulated Amortization	\$ 963
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 37,568
Average Net Fixed Assets	\$ 18,784

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 38,531
UCC Before Half Year Rule	\$ 38,531
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 38,531
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 3,083
Closing UCC	\$ 35,449



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1840\_Underground Conduit - Vault Roof

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 23,872
Closing Capital Investment	\$ 23,872
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 1,194
Closing Accumulated Amortization	\$ 1,194
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 22,678
Average Net Fixed Assets	\$ 11,339

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 23,872
UCC Before Half Year Rule	\$ 23,872
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 23,872
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 1,910
Closing UCC	\$ 21,962





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 8

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1845 Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 3,199,658
Closing Capital Investment	\$ 3,199,658
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 79,991
Closing Accumulated Amortization	\$ 79,991
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,119,666
Average Net Fixed Assets	\$ 1,559,833

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 3,199,658
UCC Before Half Year Rule	\$ 3,199,658
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,199,658
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 255,973
Closing UCC	\$ 2,943,685



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 9

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 249,649
Closing Capital Investment	\$ 249,649
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 12,482
Closing Accumulated Amortization	\$ 12,482
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 237,167
Average Net Fixed Assets	\$ 118,583

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 249,649
UCC Before Half Year Rule	\$ 249,649
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 249,649
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 19,972
Closing UCC	\$ 229,677



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 10

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1850\_Line Transformers - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 3,796,782
Closing Capital Investment	\$ 3,796,782
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 126,559
Closing Accumulated Amortization	\$ 126,559
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,670,222
Average Net Fixed Assets	\$ 1,835,111

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 3,796,782
UCC Before Half Year Rule	\$ 3,796,782
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,796,782
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 303,743
Closing UCC	\$ 3,493,039



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 11

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1850\_Line Transformers - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 498,616
Closing Capital Investment	\$ 498,616
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 16,621
Closing Accumulated Amortization	\$ 16,621
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 481,996
Average Net Fixed Assets	\$ 240,998

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 498,616
UCC Before Half Year Rule	\$ 498,616
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 498,616
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 39,889
Closing UCC	\$ 458,727



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 12

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1850\_Line Transformers - UG Network w/protector

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 115,671
Closing Capital Investment	\$ 115,671
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 5,784
Closing Accumulated Amortization	\$ 5,784
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 109,888
Average Net Fixed Assets	\$ 54,944

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 115,671
UCC Before Half Year Rule	\$ 115,671
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 115,671
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 9,254
Closing UCC	\$ 106,417



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 13

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1860 Meters - Smart Meters

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 28,696
Closing Capital Investment	\$ 28,696
Opening Accumulated Amortization	\$ -
Amortization	7% \$ 1,913
Closing Accumulated Amortization	\$ 1,913
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 26,783
Average Net Fixed Assets	\$ 13,392

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 28,696
UCC Before Half Year Rule	\$ 28,696
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 28,696
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 2,296
Closing UCC	\$ 26,401



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 14

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1855\_Services - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 133,954
Closing Capital Investment	\$ 133,954
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 3,349
Closing Accumulated Amortization	\$ 3,349
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 130,605
Average Net Fixed Assets	\$ 65,303

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 133,954
UCC Before Half Year Rule	\$ 133,954
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 133,954
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 10,716
Closing UCC	\$ 123,238



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 15

**Name or General Description of Project**

C5 Box Construction

**Asset Component**

1855\_Services - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 2,417,137
Closing Capital Investment	\$ 2,417,137
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 48,343
Closing Accumulated Amortization	\$ 48,343
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 2,368,794
Average Net Fixed Assets	\$ 1,184,397

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 2,417,137
UCC Before Half Year Rule	\$ 2,417,137
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 2,417,137
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 193,371
Closing UCC	\$ 2,223,766



1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C6 Rear Lot Construction

Year

2012

Details of Project

C6 Rear Lot Construction

Number of Asset Components

13

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	340,086	3%	47	8%
2 1835_Overhead Conductors and Devices	383,403	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	91,447	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	296,991	2%	47	8%
5 1840_Underground Conduit - Duct Bank	2,968,227	3%	47	8%
6 1840_Underground Conduit - Vault	388,989	3%	47	8%
7 1845_Underground Conductors and Devices	5,526,905	3%	47	8%
8 1845_Underground Conductors and Devices - Switch	557,775	5%	47	8%
9 1850_Line Transformers - OH	231,436	3%	47	8%
10 1850_Line Transformers - UG	1,877,090	3%	47	8%
11 1860_Meters - Smart Meters	109,448	7%	47	8%
12 1855_Services - UG	3,505,509	3%	47	8%
13 1855_Services - OH	80,125	2%	47	8%

	2012	2013
Closing Net Fixed Asset	15,890,724	15,424,018
Amortization Expense	466,706	466,706
CCA	1,308,594	1,203,907



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 340,086
Capital Investment	\$ 340,086	\$ -
Closing Capital Investment	\$ 340,086	\$ 340,086
Opening Accumulated Amortization	\$ -	\$ 8,502
Amortization	3% \$ 8,502	\$ 8,502
Closing Accumulated Amortization	\$ 8,502	\$ 17,004
Opening Net Fixed Assets	\$ -	\$ 331,584
Closing Net Fixed Assets	\$ 331,584	\$ 323,082
Average Net Fixed Assets	\$ 165,792	\$ 327,333

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 312,879
Capital Additions	\$ 340,086	\$ -
UCC Before Half Year Rule	\$ 340,086	\$ 312,879
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 340,086	\$ 312,879
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 27,207	\$ 25,030
Closing UCC	\$ 312,879	\$ 287,849



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 383,403
Capital Investment	\$ 383,403	\$ -
Closing Capital Investment	\$ 383,403	\$ 383,403
Opening Accumulated Amortization	\$ -	\$ 7,668
Amortization	2% \$ 7,668	\$ 7,668
Closing Accumulated Amortization	\$ 7,668	\$ 15,336
Opening Net Fixed Assets	\$ -	\$ 375,735
Closing Net Fixed Assets	\$ 375,735	\$ 368,067
Average Net Fixed Assets	\$ 187,868	\$ 371,901

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 352,731
Capital Additions	\$ 383,403	\$ -
UCC Before Half Year Rule	\$ 383,403	\$ 352,731
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 383,403	\$ 352,731
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 30,672	\$ 28,218
Closing UCC	\$ 352,731	\$ 324,513



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 91,447
Capital Investment	\$ 91,447	\$ -
Closing Capital Investment	\$ 91,447	\$ 91,447
Opening Accumulated Amortization	\$ -	\$ 3,048
Amortization	3% \$ 3,048	\$ 3,048
Closing Accumulated Amortization	\$ 3,048	\$ 6,096
Opening Net Fixed Assets	\$ -	\$ 88,398
Closing Net Fixed Assets	\$ 88,398	\$ 85,350
Average Net Fixed Assets	\$ 44,199	\$ 86,874

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 84,131
Capital Additions	\$ 91,447	\$ -
UCC Before Half Year Rule	\$ 91,447	\$ 84,131
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 91,447	\$ 84,131
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 7,316	\$ 6,730
Closing UCC	\$ 84,131	\$ 77,400



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1840\_Underground Conduit - Cable Chamber

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 296,991
Capital Investment	\$ 296,991	\$ -
Closing Capital Investment	\$ 296,991	\$ 296,991
Opening Accumulated Amortization	\$ -	\$ 5,940
Amortization	2% \$ 5,940	\$ 5,940
Closing Accumulated Amortization	\$ 5,940	\$ 11,880
Opening Net Fixed Assets	\$ -	\$ 291,051
Closing Net Fixed Assets	\$ 291,051	\$ 285,111
Average Net Fixed Assets	\$ 145,526	\$ 288,081

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 273,232
Capital Additions	\$ 296,991	\$ -
UCC Before Half Year Rule	\$ 296,991	\$ 273,232
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 296,991	\$ 273,232
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 23,759	\$ 21,859
Closing UCC	\$ 273,232	\$ 251,373



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1840 Underground Conduit - Duct Bank

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 2,968,227
Capital Investment	\$ 2,968,227	\$ -
Closing Capital Investment	\$ 2,968,227	\$ 2,968,227
Opening Accumulated Amortization	\$ -	\$ 98,941
Amortization	3% \$ 98,941	\$ 98,941
Closing Accumulated Amortization	\$ 98,941	\$ 197,882
Opening Net Fixed Assets	\$ -	\$ 2,869,286
Closing Net Fixed Assets	\$ 2,869,286	\$ 2,770,345
Average Net Fixed Assets	\$ 1,434,643	\$ 2,819,815

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 2,730,769
Capital Additions	\$ 2,968,227	\$ -
UCC Before Half Year Rule	\$ 2,968,227	\$ 2,730,769
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 2,968,227	\$ 2,730,769
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 237,458	\$ 218,461
Closing UCC	\$ 2,730,769	\$ 2,512,307



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 388,989
Capital Investment	\$ 388,989	\$ -
Closing Capital Investment	\$ 388,989	\$ 388,989
Opening Accumulated Amortization	\$ -	\$ 9,725
Amortization	3% \$ 9,725	\$ 9,725
Closing Accumulated Amortization	\$ 9,725	\$ 19,449
Opening Net Fixed Assets	\$ -	\$ 379,264
Closing Net Fixed Assets	\$ 379,264	\$ 369,539
Average Net Fixed Assets	\$ 189,632	\$ 374,402

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 357,870
Capital Additions	\$ 388,989	\$ -
UCC Before Half Year Rule	\$ 388,989	\$ 357,870
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 388,989	\$ 357,870
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 31,119	\$ 28,630
Closing UCC	\$ 357,870	\$ 329,240





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 7

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1845\_Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 5,526,905
Capital Investment	\$ 5,526,905	\$ -
Closing Capital Investment	\$ 5,526,905	\$ 5,526,905
Opening Accumulated Amortization	\$ -	\$ 138,173
Amortization	3% \$ 138,173	\$ 138,173
Closing Accumulated Amortization	\$ 138,173	\$ 276,345
Opening Net Fixed Assets	\$ -	\$ 5,388,732
Closing Net Fixed Assets	\$ 5,388,732	\$ 5,250,559
Average Net Fixed Assets	\$ 2,694,366	\$ 5,319,646

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 5,084,752
Capital Additions	\$ 5,526,905	\$ -
UCC Before Half Year Rule	\$ 5,526,905	\$ 5,084,752
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 5,526,905	\$ 5,084,752
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 442,152	\$ 406,780
Closing UCC	\$ 5,084,752	\$ 4,677,972



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1845\_Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 557,775
Capital Investment	\$ 557,775	\$ -
Closing Capital Investment	\$ 557,775	\$ 557,775
Opening Accumulated Amortization	\$ -	\$ 27,889
Amortization	5% \$ 27,889	\$ 27,889
Closing Accumulated Amortization	\$ 27,889	\$ 55,778
Opening Net Fixed Assets	\$ -	\$ 529,886
Closing Net Fixed Assets	\$ 529,886	\$ 501,998
Average Net Fixed Assets	\$ 264,943	\$ 515,942

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 513,153
Capital Additions	\$ 557,775	\$ -
UCC Before Half Year Rule	\$ 557,775	\$ 513,153
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 557,775	\$ 513,153
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 44,622	\$ 41,052
Closing UCC	\$ 513,153	\$ 472,101



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1850\_Line Transformers - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 231,436
Capital Investment	\$ 231,436	\$ -
Closing Capital Investment	\$ 231,436	\$ 231,436
Opening Accumulated Amortization	\$ -	\$ 7,715
Amortization	3% \$ 7,715	\$ 7,715
Closing Accumulated Amortization	\$ 7,715	\$ 15,429
Opening Net Fixed Assets	\$ -	\$ 223,722
Closing Net Fixed Assets	\$ 223,722	\$ 216,007
Average Net Fixed Assets	\$ 111,861	\$ 219,864

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 212,921
Capital Additions	\$ 231,436	\$ -
UCC Before Half Year Rule	\$ 231,436	\$ 212,921
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 231,436	\$ 212,921
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 18,515	\$ 17,034
Closing UCC	\$ 212,921	\$ 195,887



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 10

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1850\_Line Transformers - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,877,090
Capital Investment	\$ 1,877,090	\$ -
Closing Capital Investment	\$ 1,877,090	\$ 1,877,090
Opening Accumulated Amortization	\$ -	\$ 62,570
Amortization	3% \$ 62,570	\$ 62,570
Closing Accumulated Amortization	\$ 62,570	\$ 125,139
Opening Net Fixed Assets	\$ -	\$ 1,814,520
Closing Net Fixed Assets	\$ 1,814,520	\$ 1,751,951
Average Net Fixed Assets	\$ 907,260	\$ 1,783,235

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,726,923
Capital Additions	\$ 1,877,090	\$ -
UCC Before Half Year Rule	\$ 1,877,090	\$ 1,726,923
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,877,090	\$ 1,726,923
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 150,167	\$ 138,154
Closing UCC	\$ 1,726,923	\$ 1,588,769



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 11

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1860 Meters - Smart Meters

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 109,448
Capital Investment	\$ 109,448	\$ -
Closing Capital Investment	\$ 109,448	\$ 109,448
Opening Accumulated Amortization	\$ -	\$ 7,297
Amortization	7% \$ 7,297	\$ 7,297
Closing Accumulated Amortization	\$ 7,297	\$ 14,593
Opening Net Fixed Assets	\$ -	\$ 102,152
Closing Net Fixed Assets	\$ 102,152	\$ 94,855
Average Net Fixed Assets	\$ 51,076	\$ 98,503

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 100,692
Capital Additions	\$ 109,448	\$ -
UCC Before Half Year Rule	\$ 109,448	\$ 100,692
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 109,448	\$ 100,692
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 8,756	\$ 8,055
Closing UCC	\$ 100,692	\$ 92,637



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 12

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1855\_Services - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 3,505,509
Capital Investment	\$ 3,505,509	\$ -
Closing Capital Investment	\$ 3,505,509	\$ 3,505,509
Opening Accumulated Amortization	\$ -	\$ 87,638
Amortization	3% \$ 87,638	\$ 87,638
Closing Accumulated Amortization	\$ 87,638	\$ 175,275
Opening Net Fixed Assets	\$ -	\$ 3,417,872
Closing Net Fixed Assets	\$ 3,417,872	\$ 3,330,234
Average Net Fixed Assets	\$ 1,708,936	\$ 3,374,053

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 3,225,069
Capital Additions	\$ 3,505,509	\$ -
UCC Before Half Year Rule	\$ 3,505,509	\$ 3,225,069
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 3,505,509	\$ 3,225,069
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 280,441	\$ 258,005
Closing UCC	\$ 3,225,069	\$ 2,967,063



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 13

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1855\_Services - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 80,125
Capital Investment	\$ 80,125	\$ -
Closing Capital Investment	\$ 80,125	\$ 80,125
Opening Accumulated Amortization	\$ -	\$ 1,602
Amortization	2% \$ 1,602	\$ 1,602
Closing Accumulated Amortization	\$ 1,602	\$ 3,205
Opening Net Fixed Assets	\$ -	\$ 78,522
Closing Net Fixed Assets	\$ 78,522	\$ 76,920
Average Net Fixed Assets	\$ 39,261	\$ 77,721

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 73,715
Capital Additions	\$ 80,125	\$ -
UCC Before Half Year Rule	\$ 80,125	\$ 73,715
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 80,125	\$ 73,715
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 6,410	\$ 5,897
Closing UCC	\$ 73,715	\$ 67,818



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C6 Rear Lot Construction

Year

2013

Details of Project

C6 Rear Lot Construction

Number of Asset Components

12

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	2,094,448	3%	47	8%
2 1835_Overhead Conductors and Devices	1,453,818	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	103,680	3%	47	8%
4 1840_Underground Conduit - Duct Bank	13,778,365	3%	47	8%
5 1840_Underground Conduit - Vault	47,739	3%	47	8%
6 1845_Underground Conductors and Devices	4,287,715	3%	47	8%
7 1845_Underground Conductors and Devices - Switch	303,154	5%	47	8%
8 1850_Line Transformers - OH	540,999	3%	47	8%
9 1850_Line Transformers - UG	1,586,065	3%	47	8%
10 1860_Meters - Smart Meters	487,372	7%	47	8%
11 1855_Services - UG	3,414,407	3%	47	8%
12 1855_Services - OH	1,327,800	2%	47	8%

<b>Closing Net Fixed Asset</b>	<b>2013</b> 28,542,537
<b>Amortization Expense</b>	883,026
<b>CCA</b>	2,354,045





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 2,094,448
Closing Capital Investment	\$ 2,094,448
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 52,361
Closing Accumulated Amortization	\$ 52,361
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 2,042,087
Average Net Fixed Assets	\$ 1,021,044

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 2,094,448
UCC Before Half Year Rule	\$ 2,094,448
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 2,094,448
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 167,556
Closing UCC	\$ 1,926,893



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,453,818
Closing Capital Investment	\$ 1,453,818
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 29,076
Closing Accumulated Amortization	\$ 29,076
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,424,741
Average Net Fixed Assets	\$ 712,371

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,453,818
UCC Before Half Year Rule	\$ 1,453,818
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,453,818
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 116,305
Closing UCC	\$ 1,337,512



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 3

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 103,680
Closing Capital Investment	\$ 103,680
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 3,456
Closing Accumulated Amortization	\$ 3,456
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 100,224
Average Net Fixed Assets	\$ 50,112

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 103,680
UCC Before Half Year Rule	\$ 103,680
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 103,680
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 8,294
Closing UCC	\$ 95,386



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	<b>\$ 13,778,365</b>
Closing Capital Investment	<b>\$ 13,778,365</b>
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 459,279
Closing Accumulated Amortization	<b>\$ 459,279</b>
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	<b>\$ 13,319,086</b>
Average Net Fixed Assets	<b>\$ 6,659,543</b>

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	<b>\$ 13,778,365</b>
UCC Before Half Year Rule	<b>\$ 13,778,365</b>
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	<b>\$ 13,778,365</b>
CCA Rate Class	47
CCA Rate	8%
CCA	<b>\$ 1,102,269</b>
Closing UCC	<b>\$ 12,676,096</b>



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 5

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 47,739
Closing Capital Investment	\$ 47,739
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 1,193
Closing Accumulated Amortization	\$ 1,193
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 46,546
Average Net Fixed Assets	\$ 23,273

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 47,739
UCC Before Half Year Rule	\$ 47,739
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 47,739
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 3,819
Closing UCC	\$ 43,920



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 6

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1845\_Underground Conductors and Devices

### Average Net Fixed Assets

	2013 Forecasted
<b>Net Fixed Assets</b>	
Opening Capital Investment	\$ -
Capital Investment	\$ 4,287,715
Closing Capital Investment	\$ 4,287,715
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 107,193
Closing Accumulated Amortization	\$ 107,193
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 4,180,522
Average Net Fixed Assets	\$ 2,090,261

### For PILs Calculation

	2013 Forecasted
<b>UCC</b>	
Opening UCC	\$ -
Capital Additions	\$ 4,287,715
UCC Before Half Year Rule	\$ 4,287,715
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 4,287,715
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 343,017
Closing UCC	\$ 3,944,698



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C6 Rear Lot Construction

#### Asset Component

1845\_Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 303,154
Closing Capital Investment	\$ 303,154
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 15,158
Closing Accumulated Amortization	\$ 15,158
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 287,997
Average Net Fixed Assets	\$ 143,998

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 303,154
UCC Before Half Year Rule	\$ 303,154
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 303,154
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 24,252
Closing UCC	\$ 278,902



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1850\_Line Transformers - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 540,999
Closing Capital Investment	\$ 540,999
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 18,033
Closing Accumulated Amortization	\$ 18,033
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 522,966
Average Net Fixed Assets	\$ 261,483

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 540,999
UCC Before Half Year Rule	\$ 540,999
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 540,999
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 43,280
Closing UCC	\$ 497,719





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 9

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1850\_Line Transformers - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,586,065
Closing Capital Investment	\$ 1,586,065
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 52,869
Closing Accumulated Amortization	\$ 52,869
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,533,196
Average Net Fixed Assets	\$ 766,598

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,586,065
UCC Before Half Year Rule	\$ 1,586,065
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,586,065
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 126,885
Closing UCC	\$ 1,459,180



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 10

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1860 Meters - Smart Meters

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 487,372
Closing Capital Investment	\$ 487,372
Opening Accumulated Amortization	\$ -
Amortization	7% \$ 32,491
Closing Accumulated Amortization	\$ 32,491
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 454,880
Average Net Fixed Assets	\$ 227,440

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 487,372
UCC Before Half Year Rule	\$ 487,372
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 487,372
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 38,990
Closing UCC	\$ 448,382



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 11

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1855\_Services - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 3,414,407
Closing Capital Investment	\$ 3,414,407
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 85,360
Closing Accumulated Amortization	\$ 85,360
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,329,047
Average Net Fixed Assets	\$ 1,664,523

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 3,414,407
UCC Before Half Year Rule	\$ 3,414,407
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,414,407
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 273,153
Closing UCC	\$ 3,141,254



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 12

**Name or General Description of Project**

C6 Rear Lot Construction

**Asset Component**

1855\_Services - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,327,800
Closing Capital Investment	\$ 1,327,800
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 26,556
Closing Accumulated Amortization	\$ 26,556
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,301,244
Average Net Fixed Assets	\$ 650,622

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,327,800
UCC Before Half Year Rule	\$ 1,327,800
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,327,800
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 106,224
Closing UCC	\$ 1,221,576

1    **CONCERNING 2014 INFORMATION**

2

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## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C7 Polymer SMD-20 Fuses

Year

2012

Details of Project

C7 Polymer SMD-20 Fuses

Number of Asset Components

-

Asset Component (Click on the Number to View the Component Details)

1

Capital Cost

-

Depreciation  
Rate

0%

CCA Class

0

CCA Rate

0%

2012

2013

Closing Net Fixed Asset

-

-

Amortization Expense

-

-

CCA

-

-



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C7 Polymer SMD-20 Fuses

#### Asset Component

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ -
Capital Investment	\$ -	\$ -
Closing Capital Investment	\$ -	\$ -
Opening Accumulated Amortization	\$ -	\$ -
Amortization	0% \$ -	\$ -
Closing Accumulated Amortization	\$ -	\$ -
Opening Net Fixed Assets	\$ -	\$ -
Closing Net Fixed Assets	\$ -	\$ -
Average Net Fixed Assets	\$ -	\$ -

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ -
Capital Additions	\$ -	\$ -
UCC Before Half Year Rule	\$ -	\$ -
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ -	\$ -
CCA Rate Class	0	
CCA Rate	0%	
CCA	\$ -	\$ -
Closing UCC	\$ -	\$ -



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C7 Polymer SMD-20 Fuses

Year

2013

Details of Project

C7 Polymer SMD-20 Fuses

Number of Asset Components

4

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	261,034	3%	47	8%
2 1835_Overhead Conductors and Devices	195,476	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	1,034,050	3%	47	8%
4 1855_Services - OH	38,537	2%	47	8%

2013

Closing Net Fixed Asset 1,483,423

Amortization Expense 45,674

CCA 122,328





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C7 Polymer SMD-20 Fuses

**Asset Component**

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 261,034
Closing Capital Investment	\$ 261,034
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 6,526
Closing Accumulated Amortization	\$ 6,526
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 254,508
Average Net Fixed Assets	\$ 127,254

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 261,034
UCC Before Half Year Rule	\$ 261,034
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 261,034
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 20,883
Closing UCC	\$ 240,151



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

**Name or General Description of Project**

C7 Polymer SMD-20 Fuses

**Asset Component**

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 195,476
Closing Capital Investment	\$ 195,476
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 3,910
Closing Accumulated Amortization	\$ 3,910
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 191,567
Average Net Fixed Assets	\$ 95,783

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 195,476
UCC Before Half Year Rule	\$ 195,476
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 195,476
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 15,638
Closing UCC	\$ 179,838



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C7 Polymer SMD-20 Fuses

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,034,050
Closing Capital Investment	\$ 1,034,050
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 34,468
Closing Accumulated Amortization	\$ 34,468
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 999,582
Average Net Fixed Assets	\$ 499,791

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,034,050
UCC Before Half Year Rule	\$ 1,034,050
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,034,050
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 82,724
Closing UCC	\$ 951,326



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C7 Polymer SMD-20 Fuses

**Asset Component**

1855\_Services - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 38,537
Closing Capital Investment	\$ 38,537
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 771
Closing Accumulated Amortization	\$ 771
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 37,766
Average Net Fixed Assets	\$ 18,883

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 38,537
UCC Before Half Year Rule	\$ 38,537
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 38,537
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 3,083
Closing UCC	\$ 35,454

1    **CONCERNING 2014 INFORMATION**

2

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## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C8 Scadamate R1 Switches

Year

2012

Details of Project

C8 Scadamate R1 Switches

Number of Asset Components

-

Asset Component (Click on the Number to View the Component Details)

1

Capital Cost

-

Depreciation  
Rate

0%

CCA Class

0

CCA Rate

0%

2012

2013

Closing Net Fixed Asset

-

-

Amortization Expense

-

-

CCA

-

-



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C8 Scadamate R1 Switches

**Asset Component**

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ -
Capital Investment	\$ -	\$ -
Closing Capital Investment	\$ -	\$ -
Opening Accumulated Amortization	\$ -	\$ -
Amortization	0% \$ -	\$ -
Closing Accumulated Amortization	\$ -	\$ -
Opening Net Fixed Assets	\$ -	\$ -
Closing Net Fixed Assets	\$ -	\$ -
Average Net Fixed Assets	\$ -	\$ -

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ -
Capital Additions	\$ -	\$ -
UCC Before Half Year Rule	\$ -	\$ -
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ -	\$ -
CCA Rate Class	0	
CCA Rate	0%	
CCA	\$ -	\$ -
Closing UCC	\$ -	\$ -



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C8 Scadamate R1 Switches

Year

2013

Details of Project

C8 Scadamate R1 Switches

Number of Asset Components

2

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1835_Overhead Conductors and Devices	39,004	2%	47	8%
2 1835_Overhead Conductors and Devices - Switches	1,390,360	3%	47	8%

2013

Closing Net Fixed Asset 1,382,238

Amortization Expense 47,125

CCA 114,349





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C8 Scadamate R1 Switches

**Asset Component**

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 39,004
Closing Capital Investment	\$ 39,004
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 780
Closing Accumulated Amortization	\$ 780
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 38,223
Average Net Fixed Assets	\$ 19,112

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 39,004
UCC Before Half Year Rule	\$ 39,004
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 39,004
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 3,120
Closing UCC	\$ 35,883



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C8 Scadamate R1 Switches

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,390,360
Closing Capital Investment	\$ 1,390,360
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 46,345
Closing Accumulated Amortization	\$ 46,345
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,344,015
Average Net Fixed Assets	\$ 672,007

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,390,360
UCC Before Half Year Rule	\$ 1,390,360
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,390,360
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 111,229
Closing UCC	\$ 1,279,131

1    **CONCERNING 2014 INFORMATION**

2

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## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C9 Network Vault & Roofs

Year

2012

Details of Project

C9 Network Vault & Roofs

Number of Asset Components

14

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	2,844	3%	47	8%
2 1835_Overhead Conductors and Devices	2,130	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	10,805	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	367,287	2%	47	8%
5 1840_Underground Conduit - Duct Bank	255,320	3%	47	8%
6 1840_Underground Conduit - Vault	688,098	3%	47	8%
7 1840_Underground Conduit - Vault Roof	832	5%	47	8%
8 1845_Underground Conductors and Devices	534,383	3%	47	8%
9 1845_Underground Conductors and Devices - Switch	354,141	5%	47	8%
10 1850_Line Transformers - OH	3,336	3%	47	8%
11 1850_Line Transformers - UG	4,933	3%	47	8%
12 1850_Line Transformers - UG Network w/protector	610,228	5%	47	8%
13 1855_Services - UG	3,403	3%	47	8%
14 1855_Services - OH	420	2%	47	8%

	2012	2013
Closing Net Fixed Asset	2,742,640	2,647,119
Amortization Expense	95,522	95,522
CCA	227,053	208,889



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 2,844
Capital Investment	\$ 2,844	\$ -
Closing Capital Investment	\$ 2,844	\$ 2,844
Opening Accumulated Amortization	\$ -	\$ 71
Amortization	3% \$ 71	\$ 71
Closing Accumulated Amortization	\$ 71	\$ 142
Opening Net Fixed Assets	\$ -	\$ 2,773
Closing Net Fixed Assets	\$ 2,773	\$ 2,702
Average Net Fixed Assets	\$ 1,387	\$ 2,738

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 2,617
Capital Additions	\$ 2,844	\$ -
UCC Before Half Year Rule	\$ 2,844	\$ 2,617
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 2,844	\$ 2,617
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 228	\$ 209
Closing UCC	\$ 2,617	\$ 2,407



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 2,130
Capital Investment	\$ 2,130	\$ -
Closing Capital Investment	\$ 2,130	\$ 2,130
Opening Accumulated Amortization	\$ -	\$ 43
Amortization	2% \$ 43	\$ 43
Closing Accumulated Amortization	\$ 43	\$ 85
Opening Net Fixed Assets	\$ -	\$ 2,087
Closing Net Fixed Assets	\$ 2,087	\$ 2,045
Average Net Fixed Assets	\$ 1,044	\$ 2,066

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,960
Capital Additions	\$ 2,130	\$ -
UCC Before Half Year Rule	\$ 2,130	\$ 1,960
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 2,130	\$ 1,960
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 170	\$ 157
Closing UCC	\$ 1,960	\$ 1,803



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 10,805
Capital Investment	\$ 10,805	\$ -
Closing Capital Investment	\$ 10,805	\$ 10,805
Opening Accumulated Amortization	\$ -	\$ 360
Amortization	3% \$ 360	\$ 360
Closing Accumulated Amortization	\$ 360	\$ 720
Opening Net Fixed Assets	\$ -	\$ 10,445
Closing Net Fixed Assets	\$ 10,445	\$ 10,085
Average Net Fixed Assets	\$ 5,223	\$ 10,265

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 9,941
Capital Additions	\$ 10,805	\$ -
UCC Before Half Year Rule	\$ 10,805	\$ 9,941
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 10,805	\$ 9,941
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 864	\$ 795
Closing UCC	\$ 9,941	\$ 9,146



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1840\_Underground Conduit - Cable Chamber

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 367,287
Capital Investment	\$ 367,287	\$ -
Closing Capital Investment	\$ 367,287	\$ 367,287
Opening Accumulated Amortization	\$ -	\$ 7,346
Amortization	2% \$ 7,346	\$ 7,346
Closing Accumulated Amortization	\$ 7,346	\$ 14,691
Opening Net Fixed Assets	\$ -	\$ 359,941
Closing Net Fixed Assets	\$ 359,941	\$ 352,596
Average Net Fixed Assets	\$ 179,971	\$ 356,269

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 337,904
Capital Additions	\$ 367,287	\$ -
UCC Before Half Year Rule	\$ 367,287	\$ 337,904
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 367,287	\$ 337,904
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 29,383	\$ 27,032
Closing UCC	\$ 337,904	\$ 310,872





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1840 Underground Conduit - Duct Bank

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 255,320
Capital Investment	\$ 255,320	\$ -
Closing Capital Investment	\$ 255,320	\$ 255,320
Opening Accumulated Amortization	\$ -	\$ 8,511
Amortization	3% \$ 8,511	\$ 8,511
Closing Accumulated Amortization	\$ 8,511	\$ 17,021
Opening Net Fixed Assets	\$ -	\$ 246,810
Closing Net Fixed Assets	\$ 246,810	\$ 238,299
Average Net Fixed Assets	\$ 123,405	\$ 242,554

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 234,895
Capital Additions	\$ 255,320	\$ -
UCC Before Half Year Rule	\$ 255,320	\$ 234,895
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 255,320	\$ 234,895
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 20,426	\$ 18,792
Closing UCC	\$ 234,895	\$ 216,103



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 688,098
Capital Investment	\$ 688,098	\$ -
Closing Capital Investment	\$ 688,098	\$ 688,098
Opening Accumulated Amortization	\$ -	\$ 17,202
Amortization	3% \$ 17,202	\$ 17,202
Closing Accumulated Amortization	\$ 17,202	\$ 34,405
Opening Net Fixed Assets	\$ -	\$ 670,895
Closing Net Fixed Assets	\$ 670,895	\$ 653,693
Average Net Fixed Assets	\$ 335,448	\$ 662,294

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 633,050
Capital Additions	\$ 688,098	\$ -
UCC Before Half Year Rule	\$ 688,098	\$ 633,050
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 688,098	\$ 633,050
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 55,048	\$ 50,644
Closing UCC	\$ 633,050	\$ 582,406



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1840\_Underground Conduit - Vault Roof

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 832
Capital Investment	\$ 832	\$ -
Closing Capital Investment	\$ 832	\$ 832
Opening Accumulated Amortization	\$ -	\$ 42
Amortization	5% \$ 42	\$ 42
Closing Accumulated Amortization	\$ 42	\$ 83
Opening Net Fixed Assets	\$ -	\$ 790
Closing Net Fixed Assets	\$ 790	\$ 749
Average Net Fixed Assets	\$ 395	\$ 770

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 765
Capital Additions	\$ 832	\$ -
UCC Before Half Year Rule	\$ 832	\$ 765
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 832	\$ 765
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 67	\$ 61
Closing UCC	\$ 765	\$ 704



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1845 Underground Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 534,383
Capital Investment	\$ 534,383	\$ -
Closing Capital Investment	\$ 534,383	\$ 534,383
Opening Accumulated Amortization	\$ -	\$ 13,360
Amortization	3% \$ 13,360	\$ 13,360
Closing Accumulated Amortization	\$ 13,360	\$ 26,719
Opening Net Fixed Assets	\$ -	\$ 521,024
Closing Net Fixed Assets	\$ 521,024	\$ 507,664
Average Net Fixed Assets	\$ 260,512	\$ 514,344

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 491,633
Capital Additions	\$ 534,383	\$ -
UCC Before Half Year Rule	\$ 534,383	\$ 491,633
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 534,383	\$ 491,633
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 42,751	\$ 39,331
Closing UCC	\$ 491,633	\$ 452,302



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1845\_Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 354,141
Capital Investment	\$ 354,141	\$ -
Closing Capital Investment	\$ 354,141	\$ 354,141
Opening Accumulated Amortization	\$ -	\$ 17,707
Amortization	5% \$ 17,707	\$ 17,707
Closing Accumulated Amortization	\$ 17,707	\$ 35,414
Opening Net Fixed Assets	\$ -	\$ 336,434
Closing Net Fixed Assets	\$ 336,434	\$ 318,727
Average Net Fixed Assets	\$ 168,217	\$ 327,581

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 325,810
Capital Additions	\$ 354,141	\$ -
UCC Before Half Year Rule	\$ 354,141	\$ 325,810
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 354,141	\$ 325,810
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 28,331	\$ 26,065
Closing UCC	\$ 325,810	\$ 299,745



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 10

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1850 Line Transformers - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 3,336
Capital Investment	\$ 3,336	\$ -
Closing Capital Investment	\$ 3,336	\$ 3,336
Opening Accumulated Amortization	\$ -	\$ 111
Amortization	3% \$ 111	\$ 111
Closing Accumulated Amortization	\$ 111	\$ 222
Opening Net Fixed Assets	\$ -	\$ 3,225
Closing Net Fixed Assets	\$ 3,225	\$ 3,114
Average Net Fixed Assets	\$ 1,612	\$ 3,169

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 3,069
Capital Additions	\$ 3,336	\$ -
UCC Before Half Year Rule	\$ 3,336	\$ 3,069
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 3,336	\$ 3,069
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 267	\$ 246
Closing UCC	\$ 3,069	\$ 2,824



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 11

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1850 Line Transformers - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 4,933
Capital Investment	\$ 4,933	\$ -
Closing Capital Investment	\$ 4,933	\$ 4,933
Opening Accumulated Amortization	\$ -	\$ 164
Amortization	3% \$ 164	\$ 164
Closing Accumulated Amortization	\$ 164	\$ 329
Opening Net Fixed Assets	\$ -	\$ 4,768
Closing Net Fixed Assets	\$ 4,768	\$ 4,604
Average Net Fixed Assets	\$ 2,384	\$ 4,686

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 4,538
Capital Additions	\$ 4,933	\$ -
UCC Before Half Year Rule	\$ 4,933	\$ 4,538
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 4,933	\$ 4,538
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 395	\$ 363
Closing UCC	\$ 4,538	\$ 4,175



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 12

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1850 Line Transformers - UG Network w/protector

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 610,228
Capital Investment	\$ 610,228	\$ -
Closing Capital Investment	\$ 610,228	\$ 610,228
Opening Accumulated Amortization	\$ -	\$ 30,511
Amortization	5% \$ 30,511	\$ 30,511
Closing Accumulated Amortization	\$ 30,511	\$ 61,023
Opening Net Fixed Assets	\$ -	\$ 579,717
Closing Net Fixed Assets	\$ 579,717	\$ 549,206
Average Net Fixed Assets	\$ 289,859	\$ 564,461

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 561,410
Capital Additions	\$ 610,228	\$ -
UCC Before Half Year Rule	\$ 610,228	\$ 561,410
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 610,228	\$ 561,410
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 48,818	\$ 44,913
Closing UCC	\$ 561,410	\$ 516,497





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 13

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1855\_Services - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 3,403
Capital Investment	\$ 3,403	\$ -
Closing Capital Investment	\$ 3,403	\$ 3,403
Opening Accumulated Amortization	\$ -	\$ 85
Amortization	3% \$ 85	\$ 85
Closing Accumulated Amortization	\$ 85	\$ 170
Opening Net Fixed Assets	\$ -	\$ 3,318
Closing Net Fixed Assets	\$ 3,318	\$ 3,233
Average Net Fixed Assets	\$ 1,659	\$ 3,276

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 3,131
Capital Additions	\$ 3,403	\$ -
UCC Before Half Year Rule	\$ 3,403	\$ 3,131
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 3,403	\$ 3,131
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 272	\$ 250
Closing UCC	\$ 3,131	\$ 2,880



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 14

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1855\_Services - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 420
Capital Investment	\$ 420	\$ -
Closing Capital Investment	\$ 420	\$ 420
Opening Accumulated Amortization	\$ -	\$ 8
Amortization	2% \$ 8	\$ 8
Closing Accumulated Amortization	\$ 8	\$ 17
Opening Net Fixed Assets	\$ -	\$ 412
Closing Net Fixed Assets	\$ 412	\$ 403
Average Net Fixed Assets	\$ 206	\$ 407

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 386
Capital Additions	\$ 420	\$ -
UCC Before Half Year Rule	\$ 420	\$ 386
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 420	\$ 386
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 34	\$ 31
Closing UCC	\$ 386	\$ 355



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C9 Network Vault & Roofs

Year

2013

Details of Project

C9 Network Vault & Roofs

Number of Asset Components

14

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	24,079	3%	47	8%
2 1835_Overhead Conductors and Devices	18,032	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	91,476	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	1,845,734	2%	47	8%
5 1840_Underground Conduit - Duct Bank	1,135,426	3%	47	8%
6 1840_Underground Conduit - Vault	4,890,520	3%	47	8%
7 1840_Underground Conduit - Vault Roof	113,369	5%	47	8%
8 1845_Underground Conductors and Devices	4,526,475	3%	47	8%
9 1845_Underground Conductors and Devices - Switch	2,354,137	5%	47	8%
10 1850_Line Transformers - OH	28,243	3%	47	8%
11 1850_Line Transformers - UG	61,798	3%	47	8%
12 1850_Line Transformers - UG Network w/protector	3,616,796	5%	47	8%
13 1855_Services - UG	51,115	3%	47	8%
14 1855_Services - OH	3,555	2%	47	8%

2013

Closing Net Fixed Asset 18,137,989

Amortization Expense 622,764

CCA 1,500,860



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 24,079
Closing Capital Investment	\$ 24,079
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 602
Closing Accumulated Amortization	\$ 602
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 23,477
Average Net Fixed Assets	\$ 11,738

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 24,079
UCC Before Half Year Rule	\$ 24,079
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 24,079
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 1,926
Closing UCC	\$ 22,152



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 18,032
Closing Capital Investment	\$ 18,032
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 361
Closing Accumulated Amortization	\$ 361
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 17,671
Average Net Fixed Assets	\$ 8,836

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 18,032
UCC Before Half Year Rule	\$ 18,032
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 18,032
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 1,443
Closing UCC	\$ 16,589



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C9 Network Vault & Roofs

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 91,476
Closing Capital Investment	\$ 91,476
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 3,049
Closing Accumulated Amortization	\$ 3,049
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 88,427
Average Net Fixed Assets	\$ 44,213

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 91,476
UCC Before Half Year Rule	\$ 91,476
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 91,476
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 7,318
Closing UCC	\$ 84,158



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1840\_Underground Conduit - Cable Chamber

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,845,734
Closing Capital Investment	\$ 1,845,734
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 36,915
Closing Accumulated Amortization	\$ 36,915
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,808,819
Average Net Fixed Assets	\$ 904,410

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,845,734
UCC Before Half Year Rule	\$ 1,845,734
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,845,734
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 147,659
Closing UCC	\$ 1,698,075



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,135,426
Closing Capital Investment	\$ 1,135,426
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 37,848
Closing Accumulated Amortization	\$ 37,848
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,097,578
Average Net Fixed Assets	\$ 548,789

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,135,426
UCC Before Half Year Rule	\$ 1,135,426
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,135,426
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 90,834
Closing UCC	\$ 1,044,592





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 4,890,520
Closing Capital Investment	\$ 4,890,520
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 122,263
Closing Accumulated Amortization	\$ 122,263
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 4,768,257
Average Net Fixed Assets	\$ 2,384,128

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 4,890,520
UCC Before Half Year Rule	\$ 4,890,520
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 4,890,520
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 391,242
Closing UCC	\$ 4,499,278



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1840\_Underground Conduit - Vault Roof

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 113,369
Closing Capital Investment	\$ 113,369
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 5,668
Closing Accumulated Amortization	\$ 5,668
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 107,701
Average Net Fixed Assets	\$ 53,850

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 113,369
UCC Before Half Year Rule	\$ 113,369
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 113,369
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 9,070
Closing UCC	\$ 104,299



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1845 Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 4,526,475
Closing Capital Investment	\$ 4,526,475
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 113,162
Closing Accumulated Amortization	\$ 113,162
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 4,413,313
Average Net Fixed Assets	\$ 2,206,657

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 4,526,475
UCC Before Half Year Rule	\$ 4,526,475
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 4,526,475
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 362,118
Closing UCC	\$ 4,164,357



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 9

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 2,354,137
Closing Capital Investment	\$ 2,354,137
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 117,707
Closing Accumulated Amortization	\$ 117,707
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 2,236,430
Average Net Fixed Assets	\$ 1,118,215

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 2,354,137
UCC Before Half Year Rule	\$ 2,354,137
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 2,354,137
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 188,331
Closing UCC	\$ 2,165,806



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 10

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1850\_Line Transformers - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 28,243
Closing Capital Investment	\$ 28,243
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 941
Closing Accumulated Amortization	\$ 941
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 27,301
Average Net Fixed Assets	\$ 13,651

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 28,243
UCC Before Half Year Rule	\$ 28,243
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 28,243
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 2,259
Closing UCC	\$ 25,983



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 11

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1850\_Line Transformers - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 61,798
Closing Capital Investment	\$ 61,798
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 2,060
Closing Accumulated Amortization	\$ 2,060
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 59,738
Average Net Fixed Assets	\$ 29,869

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 61,798
UCC Before Half Year Rule	\$ 61,798
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 61,798
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 4,944
Closing UCC	\$ 56,854



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 12

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1850\_Line Transformers - UG Network w/protector

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 3,616,796
Closing Capital Investment	\$ 3,616,796
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 180,840
Closing Accumulated Amortization	\$ 180,840
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,435,956
Average Net Fixed Assets	\$ 1,717,978

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 3,616,796
UCC Before Half Year Rule	\$ 3,616,796
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,616,796
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 289,344
Closing UCC	\$ 3,327,453



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 13

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1855\_Services - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 51,115
Closing Capital Investment	\$ 51,115
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 1,278
Closing Accumulated Amortization	\$ 1,278
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 49,837
Average Net Fixed Assets	\$ 24,918

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 51,115
UCC Before Half Year Rule	\$ 51,115
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 51,115
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 4,089
Closing UCC	\$ 47,026





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 14

**Name or General Description of Project**

C9 Network Vault & Roofs

**Asset Component**

1855\_Services - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 3,555
Closing Capital Investment	\$ 3,555
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 71
Closing Accumulated Amortization	\$ 71
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,484
Average Net Fixed Assets	\$ 1,742

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 3,555
UCC Before Half Year Rule	\$ 3,555
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,555
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 284
Closing UCC	\$ 3,270

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C10 Fibertop Network Units

Year

2012

Details of Project

C10 Fibertop Network Units

Number of Asset Components

3

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1840_Underground Conduit - Vault	12,660	3%	47	8%
2 1845_Underground Conductors and Devices	112,219	3%	47	8%
3 1850_Line Transformers - UG Network w/protector	1,350,708	5%	47	8%

	2012	2013
Closing Net Fixed Asset	1,404,929	1,334,272
Amortization Expense	70,657	70,657
CCA	118,047	108,603



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C10 Fibertop Network Units

#### Asset Component

1840 Underground Conduit - Vault

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 12,660
Capital Investment	\$ 12,660	\$ -
Closing Capital Investment	\$ 12,660	\$ 12,660
Opening Accumulated Amortization	\$ -	\$ 316
Amortization	3% \$ 316	\$ 316
Closing Accumulated Amortization	\$ 316	\$ 633
Opening Net Fixed Assets	\$ -	\$ 12,343
Closing Net Fixed Assets	\$ 12,343	\$ 12,027
Average Net Fixed Assets	\$ 6,172	\$ 12,185

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 11,647
Capital Additions	\$ 12,660	\$ -
UCC Before Half Year Rule	\$ 12,660	\$ 11,647
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 12,660	\$ 11,647
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 1,013	\$ 932
Closing UCC	\$ 11,647	\$ 10,715



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C10 Fibertop Network Units

#### Asset Component

1845 Underground Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 112,219
Capital Investment	\$ 112,219	\$ -
Closing Capital Investment	\$ 112,219	\$ 112,219
Opening Accumulated Amortization	\$ -	\$ 2,805
Amortization	3% \$ 2,805	\$ 2,805
Closing Accumulated Amortization	\$ 2,805	\$ 5,611
Opening Net Fixed Assets	\$ -	\$ 109,414
Closing Net Fixed Assets	\$ 109,414	\$ 106,608
Average Net Fixed Assets	\$ 54,707	\$ 108,011

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 103,242
Capital Additions	\$ 112,219	\$ -
UCC Before Half Year Rule	\$ 112,219	\$ 103,242
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 112,219	\$ 103,242
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 8,978	\$ 8,259
Closing UCC	\$ 103,242	\$ 94,982



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C10 Fibertop Network Units

#### Asset Component

1850 Line Transformers - UG Network w/protector

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,350,708
Capital Investment	\$ 1,350,708	\$ -
Closing Capital Investment	\$ 1,350,708	\$ 1,350,708
Opening Accumulated Amortization	\$ -	\$ 67,535
Amortization	5% \$ 67,535	\$ 67,535
Closing Accumulated Amortization	\$ 67,535	\$ 135,071
Opening Net Fixed Assets	\$ -	\$ 1,283,173
Closing Net Fixed Assets	\$ 1,283,173	\$ 1,215,637
Average Net Fixed Assets	\$ 641,586	\$ 1,249,405

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,242,652
Capital Additions	\$ 1,350,708	\$ -
UCC Before Half Year Rule	\$ 1,350,708	\$ 1,242,652
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,350,708	\$ 1,242,652
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 108,057	\$ 99,412
Closing UCC	\$ 1,242,652	\$ 1,143,239



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C10 Fibertop Network Units

Year

2013

Details of Project

C10 Fibertop Network Units

Number of Asset Components

3

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1840_Underground Conduit - Vault	58,651	3%	47	8%
2 1845_Underground Conductors and Devices	544,849	3%	47	8%
3 1850_Line Transformers - UG Network w/protector	7,107,550	5%	47	8%

2013

Closing Net Fixed Asset 7,340,585

Amortization Expense 370,465

CCA 616,884



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C10 Fibertop Network Units

**Asset Component**

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 58,651
Closing Capital Investment	\$ 58,651
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 1,466
Closing Accumulated Amortization	\$ 1,466
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 57,184
Average Net Fixed Assets	\$ 28,592

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 58,651
UCC Before Half Year Rule	\$ 58,651
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 58,651
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 4,692
Closing UCC	\$ 53,959





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

**Name or General Description of Project**

C10 Fibertop Network Units

**Asset Component**

1845 Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 544,849
Closing Capital Investment	\$ 544,849
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 13,621
Closing Accumulated Amortization	\$ 13,621
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 531,228
Average Net Fixed Assets	\$ 265,614

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 544,849
UCC Before Half Year Rule	\$ 544,849
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 544,849
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 43,588
Closing UCC	\$ 501,261



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C10 Fibertop Network Units

#### Asset Component

1850\_Line Transformers - UG Network w/protector

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	<u>\$ 7,107,550</u>
Closing Capital Investment	<u>\$ 7,107,550</u>
Opening Accumulated Amortization	\$ -
Amortization	5% <u>\$ 355,377</u>
Closing Accumulated Amortization	<u>\$ 355,377</u>
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	<u>\$ 6,752,172</u>
Average Net Fixed Assets	<u>\$ 3,376,086</u>

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	<u>\$ 7,107,550</u>
UCC Before Half Year Rule	<u>\$ 7,107,550</u>
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	<u>\$ 7,107,550</u>
CCA Rate Class	47
CCA Rate	8%
CCA	<u>\$ 568,604</u>
Closing UCC	<u>\$ 6,538,946</u>

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

Year

2012

Details of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

Number of Asset Components

-

Asset Component (Click on the Number to View the Component Details)	Capital Cost		Depreciation Rate	CCA Class	CCA Rate	
	2012	2013	2012	2013	2012	2013
1	-	-	0%	0	0%	0%
Closing Net Fixed Asset	-	-				
Amortization Expense	-	-				
CCA	-	-				



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ -
Capital Investment	\$ -	\$ -
Closing Capital Investment	\$ -	\$ -
Opening Accumulated Amortization	\$ -	\$ -
Amortization	0% \$ -	\$ -
Closing Accumulated Amortization	\$ -	\$ -
Opening Net Fixed Assets	\$ -	\$ -
Closing Net Fixed Assets	\$ -	\$ -
Average Net Fixed Assets	\$ -	\$ -

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ -
Capital Additions	\$ -	\$ -
UCC Before Half Year Rule	\$ -	\$ -
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ -	\$ -
CCA Rate Class	0	
CCA Rate	0%	
CCA	\$ -	\$ -
Closing UCC	\$ -	\$ -



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

Year

2013

Details of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

Number of Asset Components

12

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	9,214	3%	47	8%
2 1835_Overhead Conductors and Devices	6,900	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	35,005	3%	47	8%
4 1840_Underground Conduit - Duct Bank	7,266	3%	47	8%
5 1840_Underground Conduit - Vault	31,861	3%	47	8%
6 1845_Underground Conductors and Devices	412,291	3%	47	8%
7 1845_Underground Conductors and Devices - Switch	424,741	5%	47	8%
8 1850_Line Transformers - OH	10,808	3%	47	8%
9 1850_Line Transformers - UG	245,152	3%	47	8%
10 1850_Line Transformers - UG Network w/protector	2,076,957	5%	47	8%
11 1855_Services - UG	1,677	3%	47	8%
12 1855_Services - OH	1,360	2%	47	8%

	<b>2013</b>
Closing Net Fixed Asset	3,116,665
Amortization Expense	146,567
CCA	261,059



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 9,214
Closing Capital Investment	\$ 9,214
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 230
Closing Accumulated Amortization	\$ 230
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 8,984
Average Net Fixed Assets	\$ 4,492

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 9,214
UCC Before Half Year Rule	\$ 9,214
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 9,214
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 737
Closing UCC	\$ 8,477



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 6,900
Closing Capital Investment	\$ 6,900
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 138
Closing Accumulated Amortization	\$ 138
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 6,762
Average Net Fixed Assets	\$ 3,381

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 6,900
UCC Before Half Year Rule	\$ 6,900
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 6,900
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 552
Closing UCC	\$ 6,348





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 35,005
Closing Capital Investment	\$ 35,005
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 1,167
Closing Accumulated Amortization	\$ 1,167
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 33,838
Average Net Fixed Assets	\$ 16,919

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 35,005
UCC Before Half Year Rule	\$ 35,005
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 35,005
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 2,800
Closing UCC	\$ 32,205



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 7,266
Closing Capital Investment	\$ 7,266
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 242
Closing Accumulated Amortization	\$ 242
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 7,024
Average Net Fixed Assets	\$ 3,512

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 7,266
UCC Before Half Year Rule	\$ 7,266
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 7,266
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 581
Closing UCC	\$ 6,685



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 31,861
Closing Capital Investment	\$ 31,861
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 797
Closing Accumulated Amortization	\$ 797
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 31,064
Average Net Fixed Assets	\$ 15,532

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 31,861
UCC Before Half Year Rule	\$ 31,861
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 31,861
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 2,549
Closing UCC	\$ 29,312



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1845\_Underground Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 412,291
Closing Capital Investment	\$ 412,291
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 10,307
Closing Accumulated Amortization	\$ 10,307
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 401,984
Average Net Fixed Assets	\$ 200,992

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 412,291
UCC Before Half Year Rule	\$ 412,291
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 412,291
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 32,983
Closing UCC	\$ 379,308



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 424,741
Closing Capital Investment	\$ 424,741
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 21,237
Closing Accumulated Amortization	\$ 21,237
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 403,504
Average Net Fixed Assets	\$ 201,752

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 424,741
UCC Before Half Year Rule	\$ 424,741
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 424,741
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 33,979
Closing UCC	\$ 390,762



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1850\_Line Transformers - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 10,808
Closing Capital Investment	\$ 10,808
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 360
Closing Accumulated Amortization	\$ 360
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 10,447
Average Net Fixed Assets	\$ 5,224

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 10,808
UCC Before Half Year Rule	\$ 10,808
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 10,808
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 865
Closing UCC	\$ 9,943



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1850\_Line Transformers - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 245,152
Closing Capital Investment	\$ 245,152
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 8,172
Closing Accumulated Amortization	\$ 8,172
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 236,980
Average Net Fixed Assets	\$ 118,490

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 245,152
UCC Before Half Year Rule	\$ 245,152
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 245,152
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 19,612
Closing UCC	\$ 225,540



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 10

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1850\_Line Transformers - UG Network w/protector

### Average Net Fixed Assets

	2013 Forecasted
<b>Net Fixed Assets</b>	
Opening Capital Investment	\$ -
Capital Investment	\$ 2,076,957
Closing Capital Investment	\$ 2,076,957
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 103,848
Closing Accumulated Amortization	\$ 103,848
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,973,109
Average Net Fixed Assets	\$ 986,554

### For PILs Calculation

	2013 Forecasted
<b>UCC</b>	
Opening UCC	\$ -
Capital Additions	\$ 2,076,957
UCC Before Half Year Rule	\$ 2,076,957
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 2,076,957
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 166,157
Closing UCC	\$ 1,910,800





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 11

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1855\_Services - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,677
Closing Capital Investment	\$ 1,677
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 42
Closing Accumulated Amortization	\$ 42
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,636
Average Net Fixed Assets	\$ 818

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,677
UCC Before Half Year Rule	\$ 1,677
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,677
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 134
Closing UCC	\$ 1,543



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 12

#### Name or General Description of Project

C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)

#### Asset Component

1855\_Services - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,360
Closing Capital Investment	\$ 1,360
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 27
Closing Accumulated Amortization	\$ 27
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,333
Average Net Fixed Assets	\$ 667

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,360
UCC Before Half Year Rule	\$ 1,360
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,360
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 109
Closing UCC	\$ 1,251

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
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8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C12 Stations Power Transformers

Year

2012

Details of Project

C12 Stations Power Transformers

Number of Asset Components

1

Asset Component (Click on the Number to View the Component Details)

1 1820\_DS Equip - Normally Primary below 50 kV - Power Transformer

Capital Cost

375,540

Depreciation  
Rate

3%

CCA Class

47

CCA Rate

8%

2012

2013

Closing Net Fixed Asset

363,804

352,069

Amortization Expense

11,736

11,736

CCA

30,043

27,640



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C12 Stations Power Transformers

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Power Transformer

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 375,540
Capital Investment	\$ 375,540	\$ -
Closing Capital Investment	\$ 375,540	\$ 375,540
Opening Accumulated Amortization	\$ -	\$ 11,736
Amortization	3% \$ 11,736	\$ 11,736
Closing Accumulated Amortization	\$ 11,736	\$ 23,471
Opening Net Fixed Assets	\$ -	\$ 363,804
Closing Net Fixed Assets	\$ 363,804	\$ 352,069
Average Net Fixed Assets	\$ 181,902	\$ 357,937

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 345,497
Capital Additions	\$ 375,540	\$ -
UCC Before Half Year Rule	\$ 375,540	\$ 345,497
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 375,540	\$ 345,497
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 30,043	\$ 27,640
Closing UCC	\$ 345,497	\$ 317,857



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C12 Stations Power Transformers

Year

2013

Details of Project

C12 Stations Power Transformers

Number of Asset Components

3

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1808_Buildings and Fixtures - Stn Shell Site	7,352	3%	01	4%
2 1820_DS Equip - Normally Primary below 50 kV - Power Transformer	3,433,562	3%	47	8%
3 1840_Underground Conduit - Duct Bank	41,376	3%	47	8%

2013

Closing Net Fixed Asset

3,373,367

Amortization Expense

108,923

CCA

278,289



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C12 Stations Power Transformers

**Asset Component**

1808\_Buildings and Fixtures - Stn Shell Site

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 7,352
Closing Capital Investment	\$ 7,352
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 245
Closing Accumulated Amortization	\$ 245
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 7,107
Average Net Fixed Assets	\$ 3,554

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 7,352
UCC Before Half Year Rule	\$ 7,352
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 7,352
CCA Rate Class	01
CCA Rate	4%
CCA	\$ 294
Closing UCC	\$ 7,058



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C12 Stations Power Transformers

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Power Transformer

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 3,433,562
Closing Capital Investment	\$ 3,433,562
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 107,299
Closing Accumulated Amortization	\$ 107,299
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,326,263
Average Net Fixed Assets	\$ 1,663,131

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 3,433,562
UCC Before Half Year Rule	\$ 3,433,562
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,433,562
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 274,685
Closing UCC	\$ 3,158,877





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

**Name or General Description of Project**

C12 Stations Power Transformers

**Asset Component**

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 41,376
Closing Capital Investment	\$ 41,376
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 1,379
Closing Accumulated Amortization	\$ 1,379
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 39,997
Average Net Fixed Assets	\$ 19,999

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 41,376
UCC Before Half Year Rule	\$ 41,376
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 41,376
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 3,310
Closing UCC	\$ 38,066

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C13 Stations Switchgear

Year

2012

Details of Project

C13 Stations Switchgear

Number of Asset Components

8

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1808_Buildings and Fixtures - Stn Shell Site	9,336	3%	01	4%
2 1820_DS Equip - Normally Primary below 50 kV - Switchgear Air	1,672,454	3%	47	8%
3 1830_Poles Towers and Fixtures	662	3%	47	8%
4 1835_Overhead Conductors and Devices	2,229	2%	47	8%
5 1835_Overhead Conductors and Devices - Switches	6,671	3%	47	8%
6 1840_Underground Conduit - Duct Bank	11,193	3%	47	8%
7 1845_Underground Conductors and Devices	9,062	3%	47	8%
8 1980_System Supervisory Equipment	16,080	7%	08	20%

	2012	2013
Closing Net Fixed Asset	1,683,609	1,639,531
Amortization Expense	44,078	44,078
CCA	139,771	128,218



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1808\_Buildings and Fixtures - Stn Shell Site

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 9,336
Capital Investment	\$ 9,336	\$ -
Closing Capital Investment	\$ 9,336	\$ 9,336
Opening Accumulated Amortization	\$ -	\$ 311
Amortization	3% \$ 311	\$ 311
Closing Accumulated Amortization	\$ 311	\$ 622
Opening Net Fixed Assets	\$ -	\$ 9,025
Closing Net Fixed Assets	\$ 9,025	\$ 8,714
Average Net Fixed Assets	\$ 4,512	\$ 8,869

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 8,963
Capital Additions	\$ 9,336	\$ -
UCC Before Half Year Rule	\$ 9,336	\$ 8,963
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 9,336	\$ 8,963
CCA Rate Class	01	
CCA Rate	4%	
CCA	\$ 373	\$ 359
Closing UCC	\$ 8,963	\$ 8,604



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C13 Stations Switchgear

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Switchgear Air

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,672,454
Capital Investment	\$ 1,672,454	\$ -
Closing Capital Investment	\$ 1,672,454	\$ 1,672,454
Opening Accumulated Amortization	\$ -	\$ 41,811
Amortization	3% \$ 41,811	\$ 41,811
Closing Accumulated Amortization	\$ 41,811	\$ 83,623
Opening Net Fixed Assets	\$ -	\$ 1,630,643
Closing Net Fixed Assets	\$ 1,630,643	\$ 1,588,831
Average Net Fixed Assets	\$ 815,321	\$ 1,609,737

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,538,658
Capital Additions	\$ 1,672,454	\$ -
UCC Before Half Year Rule	\$ 1,672,454	\$ 1,538,658
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,672,454	\$ 1,538,658
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 133,796	\$ 123,093
Closing UCC	\$ 1,538,658	\$ 1,415,565



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C13 Stations Switchgear

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 662
Capital Investment	\$ 662	\$ -
Closing Capital Investment	\$ 662	\$ 662
Opening Accumulated Amortization	\$ -	\$ 17
Amortization	3% \$ 17	\$ 17
Closing Accumulated Amortization	\$ 17	\$ 33
Opening Net Fixed Assets	\$ -	\$ 645
Closing Net Fixed Assets	\$ 645	\$ 629
Average Net Fixed Assets	\$ 323	\$ 637

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 609
Capital Additions	\$ 662	\$ -
UCC Before Half Year Rule	\$ 662	\$ 609
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 662	\$ 609
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 53	\$ 49
Closing UCC	\$ 609	\$ 560



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C13 Stations Switchgear

#### Asset Component

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 2,229
Capital Investment	\$ 2,229	\$ -
Closing Capital Investment	\$ 2,229	\$ 2,229
Opening Accumulated Amortization	\$ -	\$ 45
Amortization	2% \$ 45	\$ 45
Closing Accumulated Amortization	\$ 45	\$ 89
Opening Net Fixed Assets	\$ -	\$ 2,184
Closing Net Fixed Assets	\$ 2,184	\$ 2,139
Average Net Fixed Assets	\$ 1,092	\$ 2,162

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 2,050
Capital Additions	\$ 2,229	\$ -
UCC Before Half Year Rule	\$ 2,229	\$ 2,050
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 2,229	\$ 2,050
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 178	\$ 164
Closing UCC	\$ 2,050	\$ 1,886



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C13 Stations Switchgear

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 6,671
Capital Investment	\$ 6,671	\$ -
Closing Capital Investment	\$ 6,671	\$ 6,671
Opening Accumulated Amortization	\$ -	\$ 222
Amortization	3% \$ 222	\$ 222
Closing Accumulated Amortization	\$ 222	\$ 445
Opening Net Fixed Assets	\$ -	\$ 6,449
Closing Net Fixed Assets	\$ 6,449	\$ 6,226
Average Net Fixed Assets	\$ 3,224	\$ 6,338

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 6,138
Capital Additions	\$ 6,671	\$ -
UCC Before Half Year Rule	\$ 6,671	\$ 6,138
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 6,671	\$ 6,138
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 534	\$ 491
Closing UCC	\$ 6,138	\$ 5,647





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1840 Underground Conduit - Duct Bank

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 11,193
Capital Investment	\$ 11,193	\$ -
Closing Capital Investment	\$ 11,193	\$ 11,193
Opening Accumulated Amortization	\$ -	\$ 373
Amortization	3% \$ 373	\$ 373
Closing Accumulated Amortization	\$ 373	\$ 746
Opening Net Fixed Assets	\$ -	\$ 10,820
Closing Net Fixed Assets	\$ 10,820	\$ 10,447
Average Net Fixed Assets	\$ 5,410	\$ 10,634

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 10,298
Capital Additions	\$ 11,193	\$ -
UCC Before Half Year Rule	\$ 11,193	\$ 10,298
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 11,193	\$ 10,298
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 895	\$ 824
Closing UCC	\$ 10,298	\$ 9,474



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1845 Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 9,062
Capital Investment	\$ 9,062	\$ -
Closing Capital Investment	\$ 9,062	\$ 9,062
Opening Accumulated Amortization	\$ -	\$ 227
Amortization	3% \$ 227	\$ 227
Closing Accumulated Amortization	\$ 227	\$ 453
Opening Net Fixed Assets	\$ -	\$ 8,836
Closing Net Fixed Assets	\$ 8,836	\$ 8,609
Average Net Fixed Assets	\$ 4,418	\$ 8,722

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 8,337
Capital Additions	\$ 9,062	\$ -
UCC Before Half Year Rule	\$ 9,062	\$ 8,337
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 9,062	\$ 8,337
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 725	\$ 667
Closing UCC	\$ 8,337	\$ 7,670



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C13 Stations Switchgear

#### Asset Component

1980\_System Supervisory Equipment

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 16,080
Capital Investment	\$ 16,080	\$ -
Closing Capital Investment	\$ 16,080	\$ 16,080
Opening Accumulated Amortization	\$ -	\$ 1,072
Amortization	7% \$ 1,072	\$ 1,072
Closing Accumulated Amortization	\$ 1,072	\$ 2,144
Opening Net Fixed Assets	\$ -	\$ 15,008
Closing Net Fixed Assets	\$ 15,008	\$ 13,936
Average Net Fixed Assets	\$ 7,504	\$ 14,472

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 12,864
Capital Additions	\$ 16,080	\$ -
UCC Before Half Year Rule	\$ 16,080	\$ 12,864
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 16,080	\$ 12,864
CCA Rate Class	08	
CCA Rate	20%	
CCA	\$ 3,216	\$ 2,573
Closing UCC	\$ 12,864	\$ 10,291



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C13 Stations Switchgear

Year

2013

Details of Project

C13 Stations Switchgear

Number of Asset Components

18

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1808_Buildings and Fixtures - Stn Shell Site	129,458	3%	01	4%
2 1820_DS Equip - Normally Primary below 50 kV - Indoor Breaker	49,364	3%	47	8%
3 1820_DS Equip - Normally Primary below 50 kV - Stn Service Batteries	5,886	10%	47	8%
4 1820_DS Equip - Normally Primary below 50 kV - Stn Service Chargers	7,063	5%	47	8%
5 1820_DS Equip - Normally Primary below 50 kV - Switchgear Air	17,842,403	3%	47	8%
6 1820_DS Equip - Normally Primary below 50 kV - Switchgear GIS	224,633	3%	47	8%
7 1830_Poles Towers and Fixtures	154,302	3%	47	8%
8 1835_Overhead Conductors and Devices	303,642	2%	47	8%
9 1835_Overhead Conductors and Devices - Switches	728,483	3%	47	8%
10 1840_Underground Conduit - Cable Chamber	258,971	2%	47	8%
11 1840_Underground Conduit - Duct Bank	999,969	3%	47	8%
12 1840_Underground Conduit - Vault	4,167	3%	47	8%
13 1840_Underground Conduit - Vault Roof	1,856	5%	47	8%
14 1845_Underground Conductors and Devices	924,876	3%	47	8%
15 1845_Underground Conductors and Devices - Switch	6,491	5%	47	8%
16 1980_System Supervisory Equipment	169,860	7%	08	20%
17 1855_Services - UG	515	3%	47	8%
18 1855_Services - OH	1,253	2%	47	8%

2013

Closing Net Fixed Asset

21,246,886

Amortization Expense

566,309

CCA

1,760,260



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1808\_Buildings and Fixtures - Stn Shell Site

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 129,458
Closing Capital Investment	\$ 129,458
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 4,315
Closing Accumulated Amortization	\$ 4,315
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 125,143
Average Net Fixed Assets	\$ 62,571

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 129,458
UCC Before Half Year Rule	\$ 129,458
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 129,458
CCA Rate Class	01
CCA Rate	4%
CCA	\$ 5,178
Closing UCC	\$ 124,280



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C13 Stations Switchgear

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Indoor Breaker

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 49,364
Closing Capital Investment	\$ 49,364
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 1,645
Closing Accumulated Amortization	\$ 1,645
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 47,719
Average Net Fixed Assets	\$ 23,859

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 49,364
UCC Before Half Year Rule	\$ 49,364
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 49,364
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 3,949
Closing UCC	\$ 45,415



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C13 Stations Switchgear

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Stn Service Batteries

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 5,886
Closing Capital Investment	\$ 5,886
Opening Accumulated Amortization	\$ -
Amortization	10% \$ 589
Closing Accumulated Amortization	\$ 589
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 5,297
Average Net Fixed Assets	\$ 2,649

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 5,886
UCC Before Half Year Rule	\$ 5,886
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 5,886
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 471
Closing UCC	\$ 5,415



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1820\_DS Equip - Normally Primary below 50 kV - Stn Service Chargers

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 7,063
Closing Capital Investment	\$ 7,063
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 353
Closing Accumulated Amortization	\$ 353
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 6,710
Average Net Fixed Assets	\$ 3,355

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 7,063
UCC Before Half Year Rule	\$ 7,063
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 7,063
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 565
Closing UCC	\$ 6,498





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C13 Stations Switchgear

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Switchgear Air

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 17,842,403
Closing Capital Investment	\$ 17,842,403
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 446,060
Closing Accumulated Amortization	\$ 446,060
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 17,396,343
Average Net Fixed Assets	\$ 8,698,171

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 17,842,403
UCC Before Half Year Rule	\$ 17,842,403
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 17,842,403
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 1,427,392
Closing UCC	\$ 16,415,011



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C13 Stations Switchgear

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Switchgear GIS

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 224,633
Closing Capital Investment	\$ 224,633
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 5,616
Closing Accumulated Amortization	\$ 5,616
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 219,017
Average Net Fixed Assets	\$ 109,509

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 224,633
UCC Before Half Year Rule	\$ 224,633
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 224,633
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 17,971
Closing UCC	\$ 206,662



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 154,302
Closing Capital Investment	\$ 154,302
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 3,858
Closing Accumulated Amortization	\$ 3,858
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 150,445
Average Net Fixed Assets	\$ 75,222

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 154,302
UCC Before Half Year Rule	\$ 154,302
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 154,302
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 12,344
Closing UCC	\$ 141,958



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 8

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 303,642
Closing Capital Investment	\$ 303,642
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 6,073
Closing Accumulated Amortization	\$ 6,073
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 297,569
Average Net Fixed Assets	\$ 148,785

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 303,642
UCC Before Half Year Rule	\$ 303,642
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 303,642
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 24,291
Closing UCC	\$ 279,351



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 9

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 728,483
Closing Capital Investment	\$ 728,483
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 24,283
Closing Accumulated Amortization	\$ 24,283
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 704,201
Average Net Fixed Assets	\$ 352,100

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 728,483
UCC Before Half Year Rule	\$ 728,483
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 728,483
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 58,279
Closing UCC	\$ 670,205



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 10

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1840\_Underground Conduit - Cable Chamber

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 258,971
Closing Capital Investment	\$ 258,971
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 5,179
Closing Accumulated Amortization	\$ 5,179
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 253,791
Average Net Fixed Assets	\$ 126,896

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 258,971
UCC Before Half Year Rule	\$ 258,971
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 258,971
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 20,718
Closing UCC	\$ 238,253



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 11

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 999,969
Closing Capital Investment	\$ 999,969
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 33,332
Closing Accumulated Amortization	\$ 33,332
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 966,637
Average Net Fixed Assets	\$ 483,318

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 999,969
UCC Before Half Year Rule	\$ 999,969
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 999,969
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 79,998
Closing UCC	\$ 919,972



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 12

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 4,167
Closing Capital Investment	\$ 4,167
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 104
Closing Accumulated Amortization	\$ 104
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 4,063
Average Net Fixed Assets	\$ 2,032

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 4,167
UCC Before Half Year Rule	\$ 4,167
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 4,167
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 333
Closing UCC	\$ 3,834





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 13

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1840\_Underground Conduit - Vault Roof

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,856
Closing Capital Investment	\$ 1,856
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 93
Closing Accumulated Amortization	\$ 93
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,763
Average Net Fixed Assets	\$ 882

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,856
UCC Before Half Year Rule	\$ 1,856
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,856
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 149
Closing UCC	\$ 1,708



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 14

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1845 Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 924,876
Closing Capital Investment	\$ 924,876
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 23,122
Closing Accumulated Amortization	\$ 23,122
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 901,754
Average Net Fixed Assets	\$ 450,877

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 924,876
UCC Before Half Year Rule	\$ 924,876
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 924,876
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 73,990
Closing UCC	\$ 850,886



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 15

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 6,491
Closing Capital Investment	\$ 6,491
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 325
Closing Accumulated Amortization	\$ 325
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 6,167
Average Net Fixed Assets	\$ 3,083

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 6,491
UCC Before Half Year Rule	\$ 6,491
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 6,491
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 519
Closing UCC	\$ 5,972



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 16

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1980\_System Supervisory Equipment

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 169,860
Closing Capital Investment	\$ 169,860
Opening Accumulated Amortization	\$ -
Amortization	7% \$ 11,324
Closing Accumulated Amortization	\$ 11,324
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 158,536
Average Net Fixed Assets	\$ 79,268

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 169,860
UCC Before Half Year Rule	\$ 169,860
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 169,860
CCA Rate Class	08
CCA Rate	20%
CCA	\$ 33,972
Closing UCC	\$ 135,888



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 17

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1855\_Services - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 515
Closing Capital Investment	\$ 515
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 13
Closing Accumulated Amortization	\$ 13
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 502
Average Net Fixed Assets	\$ 251

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 515
UCC Before Half Year Rule	\$ 515
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 515
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 41
Closing UCC	\$ 474



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 18

**Name or General Description of Project**

C13 Stations Switchgear

**Asset Component**

1855\_Services - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,253
Closing Capital Investment	\$ 1,253
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 25
Closing Accumulated Amortization	\$ 25
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,228
Average Net Fixed Assets	\$ 614

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,253
UCC Before Half Year Rule	\$ 1,253
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,253
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 100
Closing UCC	\$ 1,153

1    **CONCERNING 2014 INFORMATION**

2

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## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C14 Stations Circuit Breakers

Year

2012

Details of Project

C14 Stations Circuit Breakers

Number of Asset Components

3

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1808_Buildings and Fixtures - Stn Shell Site	8,108	3%	01	4%
2 1820_DS Equip - Normally Primary below 50 kV - Outdoor Breaker	742,106	3%	47	8%
3 1840_Underground Conduit - Duct Bank	9,445	3%	47	8%

	2012	2013
Closing Net Fixed Asset	734,336	709,014
Amortization Expense	25,322	25,322
CCA	60,448	55,625





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C14 Stations Circuit Breakers

**Asset Component**

1808\_Buildings and Fixtures - Stn Shell Site

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 8,108
Capital Investment	\$ 8,108	\$ -
Closing Capital Investment	\$ 8,108	\$ 8,108
Opening Accumulated Amortization	\$ -	\$ 270
Amortization	3% \$ 270	\$ 270
Closing Accumulated Amortization	\$ 270	\$ 541
Opening Net Fixed Assets	\$ -	\$ 7,837
Closing Net Fixed Assets	\$ 7,837	\$ 7,567
Average Net Fixed Assets	\$ 3,919	\$ 7,702

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 7,783
Capital Additions	\$ 8,108	\$ -
UCC Before Half Year Rule	\$ 8,108	\$ 7,783
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 8,108	\$ 7,783
CCA Rate Class	01	
CCA Rate	4%	
CCA	\$ 324	\$ 311
Closing UCC	\$ 7,783	\$ 7,472



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C14 Stations Circuit Breakers

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Outdoor Breaker

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 742,106
Capital Investment	\$ 742,106	\$ -
Closing Capital Investment	\$ 742,106	\$ 742,106
Opening Accumulated Amortization	\$ -	\$ 24,737
Amortization	3% \$ 24,737	\$ 24,737
Closing Accumulated Amortization	\$ 24,737	\$ 49,474
Opening Net Fixed Assets	\$ -	\$ 717,369
Closing Net Fixed Assets	\$ 717,369	\$ 692,632
Average Net Fixed Assets	\$ 358,685	\$ 705,001

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 682,737
Capital Additions	\$ 742,106	\$ -
UCC Before Half Year Rule	\$ 742,106	\$ 682,737
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 742,106	\$ 682,737
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 59,368	\$ 54,619
Closing UCC	\$ 682,737	\$ 628,118



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C14 Stations Circuit Breakers

#### Asset Component

1840 Underground Conduit - Duct Bank

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 9,445
Capital Investment	\$ 9,445	\$ -
Closing Capital Investment	\$ 9,445	\$ 9,445
Opening Accumulated Amortization	\$ -	\$ 315
Amortization	3% \$ 315	\$ 315
Closing Accumulated Amortization	\$ 315	\$ 630
Opening Net Fixed Assets	\$ -	\$ 9,130
Closing Net Fixed Assets	\$ 9,130	\$ 8,815
Average Net Fixed Assets	\$ 4,565	\$ 8,973

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 8,689
Capital Additions	\$ 9,445	\$ -
UCC Before Half Year Rule	\$ 9,445	\$ 8,689
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 9,445	\$ 8,689
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 756	\$ 695
Closing UCC	\$ 8,689	\$ 7,994



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C14 Stations Circuit Breakers

Year

2013

Details of Project

C14 Stations Circuit Breakers

Number of Asset Components

3

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1808_Buildings and Fixtures - Stn Shell Site	7,308	3%	01	4%
2 1820_DS Equip - Normally Primary below 50 kV - Outdoor Breaker	536,231	3%	47	8%
3 1840_Underground Conduit - Duct Bank	8,337	3%	47	8%

2013

Closing Net Fixed Asset 533,480

Amortization Expense 18,396

CCA 43,858



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C14 Stations Circuit Breakers

**Asset Component**

1808\_Buildings and Fixtures - Stn Shell Site

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 7,308
Closing Capital Investment	\$ 7,308
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 244
Closing Accumulated Amortization	\$ 244
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 7,064
Average Net Fixed Assets	\$ 3,532

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 7,308
UCC Before Half Year Rule	\$ 7,308
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 7,308
CCA Rate Class	01
CCA Rate	4%
CCA	\$ 292
Closing UCC	\$ 7,015



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C14 Stations Circuit Breakers

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Outdoor Breaker

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 536,231
Closing Capital Investment	\$ 536,231
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 17,874
Closing Accumulated Amortization	\$ 17,874
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 518,357
Average Net Fixed Assets	\$ 259,178

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 536,231
UCC Before Half Year Rule	\$ 536,231
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 536,231
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 42,898
Closing UCC	\$ 493,333



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 3

**Name or General Description of Project**

C14 Stations Circuit Breakers

**Asset Component**

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 8,337
Closing Capital Investment	\$ 8,337
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 278
Closing Accumulated Amortization	\$ 278
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 8,059
Average Net Fixed Assets	\$ 4,029

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 8,337
UCC Before Half Year Rule	\$ 8,337
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 8,337
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 667
Closing UCC	\$ 7,670

1    **CONCERNING 2014 INFORMATION**

2

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## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C15 Stations Control & Communicaton Systems

Year

2012

Details of Project

C15 Stations Control & Communicaton Systems

Number of Asset Components

1

Asset Component (Click on the Number to View the Component Details)

1 1980\_System Supervisory Equipment

Capital Cost

135,429

Depreciation  
Rate

7%

CCA Class

08

CCA Rate

20%

2012

2013

Closing Net Fixed Asset

126,400

117,372

Amortization Expense

9,029

9,029

CCA

27,086

21,669



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C15 Stations Control & Communicaton Systems

#### Asset Component

1980\_System Supervisory Equipment

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 135,429
Capital Investment	\$ 135,429	\$ -
Closing Capital Investment	\$ 135,429	\$ 135,429
Opening Accumulated Amortization	\$ -	\$ 9,029
Amortization	7% \$ 9,029	\$ 9,029
Closing Accumulated Amortization	\$ 9,029	\$ 18,057
Opening Net Fixed Assets	\$ -	\$ 126,400
Closing Net Fixed Assets	\$ 126,400	\$ 117,372
Average Net Fixed Assets	\$ 63,200	\$ 121,886

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 108,343
Capital Additions	\$ 135,429	\$ -
UCC Before Half Year Rule	\$ 135,429	\$ 108,343
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 135,429	\$ 108,343
CCA Rate Class	08	
CCA Rate	20%	
CCA	\$ 27,086	\$ 21,669
Closing UCC	\$ 108,343	\$ 86,674



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C15 Stations Control & Communicaton Systems

Year

2013

Details of Project

C15 Stations Control & Communicaton Systems

Number of Asset Components

1

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1980_System Supervisory Equipment	1,000,375	7%	08	20%
<b>Closing Net Fixed Asset</b>	933,683			
<b>Amortization Expense</b>	66,692			
<b>CCA</b>	200,075			



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C15 Stations Control & Communicaton Systems

#### Asset Component

1980\_System Supervisory Equipment

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,000,375
Closing Capital Investment	\$ 1,000,375
Opening Accumulated Amortization	\$ -
Amortization	7% \$ 66,692
Closing Accumulated Amortization	\$ 66,692
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 933,683
Average Net Fixed Assets	\$ 466,842

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,000,375
UCC Before Half Year Rule	\$ 1,000,375
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,000,375
CCA Rate Class	08
CCA Rate	20%
CCA	\$ 200,075
Closing UCC	\$ 800,300

1    **CONCERNING 2014 INFORMATION**

2

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## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C16 Downtown Station Load Transfers

Year

2012

Details of Project

C16 Downtown Station Load Transfers

Number of Asset Components

1

Asset Component (Click on the Number to View the Component Details)

1 1845\_Underground Conductors and Devices

Capital Cost

679,135

Depreciation  
Rate

3%

CCA Class

47

CCA Rate

8%

2012

2013

Closing Net Fixed Asset

662,156

645,178

Amortization Expense

16,978

16,978

CCA

54,331

49,984



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C16 Downtown Station Load Transfers

#### Asset Component

1845 Underground Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 679,135
Capital Investment	\$ 679,135	\$ -
Closing Capital Investment	\$ 679,135	\$ 679,135
Opening Accumulated Amortization	\$ -	\$ 16,978
Amortization	3% \$ 16,978	\$ 16,978
Closing Accumulated Amortization	\$ 16,978	\$ 33,957
Opening Net Fixed Assets	\$ -	\$ 662,156
Closing Net Fixed Assets	\$ 662,156	\$ 645,178
Average Net Fixed Assets	\$ 331,078	\$ 653,667

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 624,804
Capital Additions	\$ 679,135	\$ -
UCC Before Half Year Rule	\$ 679,135	\$ 624,804
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 679,135	\$ 624,804
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 54,331	\$ 49,984
Closing UCC	\$ 624,804	\$ 574,820



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C16 Downtown Station Load Transfers

Year

2013

Details of Project

C16 Downtown Station Load Transfers

Number of Asset Components

10

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	29,340	3%	47	8%
2 1835_Overhead Conductors and Devices	49,375	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	84,548	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	107,041	2%	47	8%
5 1840_Underground Conduit - Duct Bank	114,455	3%	47	8%
6 1840_Underground Conduit - Vault	4,547	3%	47	8%
7 1840_Underground Conduit - Vault Roof	2,026	5%	47	8%
8 1845_Underground Conductors and Devices	1,642,438	3%	47	8%
9 1845_Underground Conductors and Devices - Switch	99,384	5%	47	8%
10 1855_Services - OH	3,909	2%	47	8%

2013

Closing Net Fixed Asset 2,080,244

Amortization Expense 56,819

CCA 170,965





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C16 Downtown Station Load Transfers

**Asset Component**

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 29,340
Closing Capital Investment	\$ 29,340
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 734
Closing Accumulated Amortization	\$ 734
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 28,607
Average Net Fixed Assets	\$ 14,303

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 29,340
UCC Before Half Year Rule	\$ 29,340
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 29,340
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 2,347
Closing UCC	\$ 26,993



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C16 Downtown Station Load Transfers

#### Asset Component

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 49,375
Closing Capital Investment	\$ 49,375
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 988
Closing Accumulated Amortization	\$ 988
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 48,388
Average Net Fixed Assets	\$ 24,194

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 49,375
UCC Before Half Year Rule	\$ 49,375
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 49,375
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 3,950
Closing UCC	\$ 45,425



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C16 Downtown Station Load Transfers

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 84,548
Closing Capital Investment	\$ 84,548
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 2,818
Closing Accumulated Amortization	\$ 2,818
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 81,730
Average Net Fixed Assets	\$ 40,865

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 84,548
UCC Before Half Year Rule	\$ 84,548
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 84,548
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 6,764
Closing UCC	\$ 77,784



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C16 Downtown Station Load Transfers

#### Asset Component

1840\_Underground Conduit - Cable Chamber

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 107,041
Closing Capital Investment	\$ 107,041
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 2,141
Closing Accumulated Amortization	\$ 2,141
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 104,900
Average Net Fixed Assets	\$ 52,450

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 107,041
UCC Before Half Year Rule	\$ 107,041
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 107,041
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 8,563
Closing UCC	\$ 98,477



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C16 Downtown Station Load Transfers

#### Asset Component

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 114,455
Closing Capital Investment	\$ 114,455
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 3,815
Closing Accumulated Amortization	\$ 3,815
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 110,640
Average Net Fixed Assets	\$ 55,320

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 114,455
UCC Before Half Year Rule	\$ 114,455
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 114,455
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 9,156
Closing UCC	\$ 105,299



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

**Name or General Description of Project**

C16 Downtown Station Load Transfers

**Asset Component**

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 4,547
Closing Capital Investment	\$ 4,547
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 114
Closing Accumulated Amortization	\$ 114
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 4,434
Average Net Fixed Assets	\$ 2,217

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 4,547
UCC Before Half Year Rule	\$ 4,547
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 4,547
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 364
Closing UCC	\$ 4,184



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C16 Downtown Station Load Transfers

#### Asset Component

1840\_Underground Conduit - Vault Roof

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 2,026
Closing Capital Investment	\$ 2,026
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 101
Closing Accumulated Amortization	\$ 101
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,924
Average Net Fixed Assets	\$ 962

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 2,026
UCC Before Half Year Rule	\$ 2,026
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 2,026
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 162
Closing UCC	\$ 1,864



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

**Name or General Description of Project**

C16 Downtown Station Load Transfers

**Asset Component**

1845 Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,642,438
Closing Capital Investment	\$ 1,642,438
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 41,061
Closing Accumulated Amortization	\$ 41,061
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,601,377
Average Net Fixed Assets	\$ 800,689

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,642,438
UCC Before Half Year Rule	\$ 1,642,438
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,642,438
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 131,395
Closing UCC	\$ 1,511,043





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C16 Downtown Station Load Transfers

#### Asset Component

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 99,384
Closing Capital Investment	\$ 99,384
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 4,969
Closing Accumulated Amortization	\$ 4,969
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 94,414
Average Net Fixed Assets	\$ 47,207

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 99,384
UCC Before Half Year Rule	\$ 99,384
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 99,384
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 7,951
Closing UCC	\$ 91,433



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 10

**Name or General Description of Project**

C16 Downtown Station Load Transfers

**Asset Component**

1855\_Services - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 3,909
Closing Capital Investment	\$ 3,909
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 78
Closing Accumulated Amortization	\$ 78
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,831
Average Net Fixed Assets	\$ 1,916

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 3,909
UCC Before Half Year Rule	\$ 3,909
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,909
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 313
Closing UCC	\$ 3,597

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C17 Bremner Transformer Station

Year

2012

Details of Project

C17 Bremner Transformer Station

Number of Asset Components

8

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1808_Buildings and Fixtures - Stn Shell Site	400,480	3%	01	4%
2 1808_Buildings and Fixtures - Stn Substructure	3,619,271	1%	01	4%
3 1815_TS Equip - Normally Primary above 50 kV - Disconnect Switch	1,174,252	3%	47	8%
4 1815_TS Equip - Normally Primary above 50 kV - Power Transformer	1,388,728	3%	47	8%
5 1815_TS Equip - Normally Primary above 50 kV - Station Service	412,865	3%	47	8%
6 1820_DS Equip - Normally Primary below 50 kV - Stn Service Batteries	61,208	10%	47	8%
7 1820_DS Equip - Normally Primary below 50 kV - Switchgear GIS	1,328,186	3%	47	8%
8 1820_DS Equip - Normally Primary below 50 kV - Station Service	115,011	3%	47	8%

	2012	2013
Closing Net Fixed Asset	8,302,613	8,105,226
Amortization Expense	197,387	197,387
CCA	519,210	484,105



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1808\_Buildings and Fixtures - Stn Shell Site

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 400,480
Capital Investment	\$ 400,480	\$ -
Closing Capital Investment	\$ 400,480	\$ 400,480
Opening Accumulated Amortization	\$ -	\$ 13,349
Amortization	3% \$ 13,349	\$ 13,349
Closing Accumulated Amortization	\$ 13,349	\$ 26,699
Opening Net Fixed Assets	\$ -	\$ 387,131
Closing Net Fixed Assets	\$ 387,131	\$ 373,782
Average Net Fixed Assets	\$ 193,566	\$ 380,456

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 384,461
Capital Additions	\$ 400,480	\$ -
UCC Before Half Year Rule	\$ 400,480	\$ 384,461
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 400,480	\$ 384,461
CCA Rate Class	01	
CCA Rate	4%	
CCA	\$ 16,019	\$ 15,378
Closing UCC	\$ 384,461	\$ 369,083



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1808 Buildings and Fixtures - Stn Substructure

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 3,619,271
Capital Investment	\$ 3,619,271	\$ -
Closing Capital Investment	\$ 3,619,271	\$ 3,619,271
Opening Accumulated Amortization	\$ -	\$ 48,257
Amortization	1% \$ 48,257	\$ 48,257
Closing Accumulated Amortization	\$ 48,257	\$ 96,514
Opening Net Fixed Assets	\$ -	\$ 3,571,014
Closing Net Fixed Assets	\$ 3,571,014	\$ 3,522,757
Average Net Fixed Assets	\$ 1,785,507	\$ 3,546,885

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 3,474,500
Capital Additions	\$ 3,619,271	\$ -
UCC Before Half Year Rule	\$ 3,619,271	\$ 3,474,500
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 3,619,271	\$ 3,474,500
CCA Rate Class	01	
CCA Rate	4%	
CCA	\$ 144,771	\$ 138,980
Closing UCC	\$ 3,474,500	\$ 3,335,520



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1815\_TS Equip - Normally Primary above 50 kV - Disconnect Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,174,252
Capital Investment	\$ 1,174,252	\$ -
Closing Capital Investment	\$ 1,174,252	\$ 1,174,252
Opening Accumulated Amortization	\$ -	\$ 39,142
Amortization	3% \$ 39,142	\$ 39,142
Closing Accumulated Amortization	\$ 39,142	\$ 78,283
Opening Net Fixed Assets	\$ -	\$ 1,135,111
Closing Net Fixed Assets	\$ 1,135,111	\$ 1,095,969
Average Net Fixed Assets	\$ 567,555	\$ 1,115,540

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,080,312
Capital Additions	\$ 1,174,252	\$ -
UCC Before Half Year Rule	\$ 1,174,252	\$ 1,080,312
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,174,252	\$ 1,080,312
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 93,940	\$ 86,425
Closing UCC	\$ 1,080,312	\$ 993,887



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1815\_TS Equip - Normally Primary above 50 kV - Power Transformer

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,388,728
Capital Investment	\$ 1,388,728	\$ -
Closing Capital Investment	\$ 1,388,728	\$ 1,388,728
Opening Accumulated Amortization	\$ -	\$ 43,398
Amortization	3% \$ 43,398	\$ 43,398
Closing Accumulated Amortization	\$ 43,398	\$ 86,795
Opening Net Fixed Assets	\$ -	\$ 1,345,330
Closing Net Fixed Assets	\$ 1,345,330	\$ 1,301,932
Average Net Fixed Assets	\$ 672,665	\$ 1,323,631

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,277,629
Capital Additions	\$ 1,388,728	\$ -
UCC Before Half Year Rule	\$ 1,388,728	\$ 1,277,629
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,388,728	\$ 1,277,629
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 111,098	\$ 102,210
Closing UCC	\$ 1,277,629	\$ 1,175,419





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1815\_TS Equip - Normally Primary above 50 kV - Station Service

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 412,865
Capital Investment	\$ 412,865	\$ -
Closing Capital Investment	\$ 412,865	\$ 412,865
Opening Accumulated Amortization	\$ -	\$ 10,322
Amortization	3% \$ 10,322	\$ 10,322
Closing Accumulated Amortization	\$ 10,322	\$ 20,643
Opening Net Fixed Assets	\$ -	\$ 402,543
Closing Net Fixed Assets	\$ 402,543	\$ 392,222
Average Net Fixed Assets	\$ 201,272	\$ 397,383

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 379,836
Capital Additions	\$ 412,865	\$ -
UCC Before Half Year Rule	\$ 412,865	\$ 379,836
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 412,865	\$ 379,836
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 33,029	\$ 30,387
Closing UCC	\$ 379,836	\$ 349,449



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Stn Service Batteries

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 61,208
Capital Investment	\$ 61,208	\$ -
Closing Capital Investment	\$ 61,208	\$ 61,208
Opening Accumulated Amortization	\$ -	\$ 6,121
Amortization	10% \$ 6,121	\$ 6,121
Closing Accumulated Amortization	\$ 6,121	\$ 12,242
Opening Net Fixed Assets	\$ -	\$ 55,087
Closing Net Fixed Assets	\$ 55,087	\$ 48,966
Average Net Fixed Assets	\$ 27,544	\$ 52,027

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 56,311
Capital Additions	\$ 61,208	\$ -
UCC Before Half Year Rule	\$ 61,208	\$ 56,311
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 61,208	\$ 56,311
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 4,897	\$ 4,505
Closing UCC	\$ 56,311	\$ 51,806



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Switchgear GIS

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,328,186
Capital Investment	\$ 1,328,186	\$ -
Closing Capital Investment	\$ 1,328,186	\$ 1,328,186
Opening Accumulated Amortization	\$ -	\$ 33,205
Amortization	3% \$ 33,205	\$ 33,205
Closing Accumulated Amortization	\$ 33,205	\$ 66,409
Opening Net Fixed Assets	\$ -	\$ 1,294,981
Closing Net Fixed Assets	\$ 1,294,981	\$ 1,261,777
Average Net Fixed Assets	\$ 647,491	\$ 1,278,379

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,221,931
Capital Additions	\$ 1,328,186	\$ -
UCC Before Half Year Rule	\$ 1,328,186	\$ 1,221,931
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,328,186	\$ 1,221,931
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 106,255	\$ 97,754
Closing UCC	\$ 1,221,931	\$ 1,124,177



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Station Service

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 115,011
Capital Investment	\$ 115,011	\$ -
Closing Capital Investment	\$ 115,011	\$ 115,011
Opening Accumulated Amortization	\$ -	\$ 3,594
Amortization	3% \$ 3,594	\$ 3,594
Closing Accumulated Amortization	\$ 3,594	\$ 7,188
Opening Net Fixed Assets	\$ -	\$ 111,416
Closing Net Fixed Assets	\$ 111,416	\$ 107,822
Average Net Fixed Assets	\$ 55,708	\$ 109,619

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 105,810
Capital Additions	\$ 115,011	\$ -
UCC Before Half Year Rule	\$ 115,011	\$ 105,810
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 115,011	\$ 105,810
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 9,201	\$ 8,465
Closing UCC	\$ 105,810	\$ 97,345



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C17 Bremner Transformer Station

Year

2013

Details of Project

C17 Bremner Transformer Station

Number of Asset Components

9

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1808_Buildings and Fixtures - Stn Interior	5,227,493	5%	01	4%
2 1808_Buildings and Fixtures - Stn Shell Site	5,959,821	3%	01	4%
3 1808_Buildings and Fixtures - Stn Substructure	30,804,869	1%	01	4%
4 1815_TS Equip - Normally Primary above 50 kV - Disconnect Switch	10,448,051	3%	47	8%
5 1815_TS Equip - Normally Primary above 50 kV - Power Transformer	12,135,252	3%	47	8%
6 1815_TS Equip - Normally Primary above 50 kV - Station Service	3,593,901	3%	47	8%
7 1820_DS Equip - Normally Primary below 50 kV - Stn Service Batteries	522,084	10%	47	8%
8 1820_DS Equip - Normally Primary below 50 kV - Switchgear GIS	11,327,643	3%	47	8%
9 1820_DS Equip - Normally Primary below 50 kV - Station Service	980,885	3%	47	8%

2013

Closing Net Fixed Asset 78,945,838

Amortization Expense 2,054,162

CCA 4,800,313



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1808\_Buildings and Fixtures - Stn Interior

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 5,227,493
Closing Capital Investment	\$ 5,227,493
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 261,375
Closing Accumulated Amortization	\$ 261,375
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 4,966,118
Average Net Fixed Assets	\$ 2,483,059

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 5,227,493
UCC Before Half Year Rule	\$ 5,227,493
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 5,227,493
CCA Rate Class	01
CCA Rate	4%
CCA	\$ 209,100
Closing UCC	\$ 5,018,393



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

**Name or General Description of Project**

C17 Bremner Transformer Station

**Asset Component**

1808\_Buildings and Fixtures - Stn Shell Site

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 5,959,821
Closing Capital Investment	\$ 5,959,821
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 198,661
Closing Accumulated Amortization	\$ 198,661
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 5,761,160
Average Net Fixed Assets	\$ 2,880,580

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 5,959,821
UCC Before Half Year Rule	\$ 5,959,821
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 5,959,821
CCA Rate Class	01
CCA Rate	4%
CCA	\$ 238,393
Closing UCC	\$ 5,721,428



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1808 Buildings and Fixtures - Stn Substructure

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	<b>\$ 30,804,869</b>
Closing Capital Investment	<b>\$ 30,804,869</b>
Opening Accumulated Amortization	\$ -
Amortization	1% \$ 410,732
Closing Accumulated Amortization	<b>\$ 410,732</b>
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	<b>\$ 30,394,138</b>
Average Net Fixed Assets	<b>\$ 15,197,069</b>

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	<b>\$ 30,804,869</b>
UCC Before Half Year Rule	<b>\$ 30,804,869</b>
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	<b>\$ 30,804,869</b>
CCA Rate Class	01
CCA Rate	4%
CCA	<b>\$ 1,232,195</b>
Closing UCC	<b>\$ 29,572,675</b>





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1815\_TS Equip - Normally Primary above 50 kV - Disconnect Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 10,448,051
Closing Capital Investment	\$ 10,448,051
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 348,268
Closing Accumulated Amortization	\$ 348,268
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 10,099,783
Average Net Fixed Assets	\$ 5,049,891

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 10,448,051
UCC Before Half Year Rule	\$ 10,448,051
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 10,448,051
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 835,844
Closing UCC	\$ 9,612,207



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

**Name or General Description of Project**

C17 Bremner Transformer Station

**Asset Component**

1815\_TS Equip - Normally Primary above 50 kV - Power Transformer

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 12,135,252
Closing Capital Investment	\$ 12,135,252
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 379,227
Closing Accumulated Amortization	\$ 379,227
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 11,756,025
Average Net Fixed Assets	\$ 5,878,012

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 12,135,252
UCC Before Half Year Rule	\$ 12,135,252
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 12,135,252
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 970,820
Closing UCC	\$ 11,164,431



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1815\_TS Equip - Normally Primary above 50 kV - Station Service

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 3,593,901
Closing Capital Investment	\$ 3,593,901
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 89,848
Closing Accumulated Amortization	\$ 89,848
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 3,504,054
Average Net Fixed Assets	\$ 1,752,027

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 3,593,901
UCC Before Half Year Rule	\$ 3,593,901
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 3,593,901
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 287,512
Closing UCC	\$ 3,306,389



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Stn Service Batteries

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 522,084
Closing Capital Investment	\$ 522,084
Opening Accumulated Amortization	\$ -
Amortization	10% \$ 52,208
Closing Accumulated Amortization	\$ 52,208
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 469,876
Average Net Fixed Assets	\$ 234,938

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 522,084
UCC Before Half Year Rule	\$ 522,084
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 522,084
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 41,767
Closing UCC	\$ 480,317



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Switchgear GIS

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	<b>\$ 11,327,643</b>
Closing Capital Investment	<b>\$ 11,327,643</b>
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 283,191
Closing Accumulated Amortization	<b>\$ 283,191</b>
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	<b>\$ 11,044,452</b>
Average Net Fixed Assets	<b>\$ 5,522,226</b>

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	<b>\$ 11,327,643</b>
UCC Before Half Year Rule	<b>\$ 11,327,643</b>
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	<b>\$ 11,327,643</b>
CCA Rate Class	47
CCA Rate	8%
CCA	<b>\$ 906,211</b>
Closing UCC	<b>\$ 10,421,431</b>



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C17 Bremner Transformer Station

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Station Service

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 980,885
Closing Capital Investment	\$ 980,885
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 30,653
Closing Accumulated Amortization	\$ 30,653
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 950,233
Average Net Fixed Assets	\$ 475,116

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 980,885
UCC Before Half Year Rule	\$ 980,885
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 980,885
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 78,471
Closing UCC	\$ 902,414

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
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## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C18 Hydro One Capital Contributions

Year

2012

Details of Project

C18 Hydro One Capital Contributions

Number of Asset Components

1

Asset Component (Click on the Number to View the Component Details)

1 1815\_TS Equip - Normally Primary above 50 kV - Contribution to HONI

Capital Cost

22,977,664

Depreciation  
Rate

4%

CCA Class

CEC

CCA Rate

0%

Closing Net Fixed Asset

2012  
22,058,558

2013  
21,139,451

Amortization Expense

919,107

919,107

CCA

-

-





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C18 Hydro One Capital Contributions

#### Asset Component

1815\_TS Equip - Normally Primary above 50 kV - Contribution to HONI

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 22,977,664
Capital Investment	\$ 22,977,664	\$ -
Closing Capital Investment	\$ 22,977,664	\$ 22,977,664
Opening Accumulated Amortization	\$ -	\$ 919,107
Amortization	4% \$ 919,107	\$ 919,107
Closing Accumulated Amortization	\$ 919,107	\$ 1,838,213
Opening Net Fixed Assets	\$ -	\$ 22,058,558
Closing Net Fixed Assets	\$ 22,058,558	\$ 21,139,451
Average Net Fixed Assets	\$ 11,029,279	\$ 21,599,004

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 22,977,664
Capital Additions	\$ 22,977,664	\$ -
UCC Before Half Year Rule	\$ 22,977,664	\$ 22,977,664
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 22,977,664	\$ 22,977,664
CCA Rate Class	CEC	
CCA Rate	0%	
CCA	\$ -	\$ -
Closing UCC	\$ 22,977,664	\$ 22,977,664



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C18 Hydro One Capital Contributions

Year

2013

Details of Project

C18 Hydro One Capital Contributions

Number of Asset Components

1

Asset Component (Click on the Number to View the Component Details)

1 1815\_TS Equip - Normally Primary above 50 kV - Contribution to HONI

Capital Cost

48,118,000

Depreciation  
Rate

4%

CCA Class

CEC

CCA Rate

0%

2013

Closing Net Fixed Asset

46,193,280

Amortization Expense

1,924,720

CCA

-



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C18 Hydro One Capital Contributions

#### Asset Component

1815\_TS Equip - Normally Primary above 50 kV - Contribution to HONI

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	<b>\$ 48,118,000</b>
Closing Capital Investment	<b>\$ 48,118,000</b>
Opening Accumulated Amortization	\$ -
Amortization	4% \$ 1,924,720
Closing Accumulated Amortization	<b>\$ 1,924,720</b>
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	<b>\$ 46,193,280</b>
Average Net Fixed Assets	<b>\$ 23,096,640</b>

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	<b>\$ 48,118,000</b>
UCC Before Half Year Rule	<b>\$ 48,118,000</b>
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	<b>\$ 48,118,000</b>
CCA Rate Class	CEC
CCA Rate	0%
CCA	\$ -
Closing UCC	<b>\$ 48,118,000</b>

1    **CONCERNING 2014 INFORMATION**

2

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## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C19 Feeder Automation

Year

2012

Details of Project

C19 Feeder Automation

Number of Asset Components

4

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	85,222	3%	47	8%
2 1835_Overhead Conductors and Devices	30,370	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	2,186,990	3%	47	8%
4 1855_Services - OH	1,323	2%	47	8%

Closing Net Fixed Asset

2012	2013
2,228,241	2,152,577

Amortization Expense

75,664	75,664
--------	--------

CCA

184,312	169,567
---------	---------



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C19 Feeder Automation

**Asset Component**

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 85,222
Capital Investment	\$ 85,222	\$ -
Closing Capital Investment	\$ 85,222	\$ 85,222
Opening Accumulated Amortization	\$ -	\$ 2,131
Amortization	3% \$ 2,131	\$ 2,131
Closing Accumulated Amortization	\$ 2,131	\$ 4,261
Opening Net Fixed Assets	\$ -	\$ 83,092
Closing Net Fixed Assets	\$ 83,092	\$ 80,961
Average Net Fixed Assets	\$ 41,546	\$ 82,026

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 78,405
Capital Additions	\$ 85,222	\$ -
UCC Before Half Year Rule	\$ 85,222	\$ 78,405
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 85,222	\$ 78,405
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 6,818	\$ 6,272
Closing UCC	\$ 78,405	\$ 72,132



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

**Name or General Description of Project**

C19 Feeder Automation

**Asset Component**

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 30,370
Capital Investment	\$ 30,370	\$ -
Closing Capital Investment	\$ 30,370	\$ 30,370
Opening Accumulated Amortization	\$ -	\$ 607
Amortization	2% \$ 607	\$ 607
Closing Accumulated Amortization	\$ 607	\$ 1,215
Opening Net Fixed Assets	\$ -	\$ 29,763
Closing Net Fixed Assets	\$ 29,763	\$ 29,155
Average Net Fixed Assets	\$ 14,881	\$ 29,459

### For PILs Calculation

**UCC**

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 27,941
Capital Additions	\$ 30,370	\$ -
UCC Before Half Year Rule	\$ 30,370	\$ 27,941
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 30,370	\$ 27,941
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 2,430	\$ 2,235
Closing UCC	\$ 27,941	\$ 25,705



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C19 Feeder Automation

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 2,186,990
Capital Investment	\$ 2,186,990	\$ -
Closing Capital Investment	\$ 2,186,990	\$ 2,186,990
Opening Accumulated Amortization	\$ -	\$ 72,900
Amortization	3% \$ 72,900	\$ 72,900
Closing Accumulated Amortization	\$ 72,900	\$ 145,799
Opening Net Fixed Assets	\$ -	\$ 2,114,090
Closing Net Fixed Assets	\$ 2,114,090	\$ 2,041,190
Average Net Fixed Assets	\$ 1,057,045	\$ 2,077,640

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 2,012,031
Capital Additions	\$ 2,186,990	\$ -
UCC Before Half Year Rule	\$ 2,186,990	\$ 2,012,031
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 2,186,990	\$ 2,012,031
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 174,959	\$ 160,962
Closing UCC	\$ 2,012,031	\$ 1,851,068





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C19 Feeder Automation

#### Asset Component

1855\_Services - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 1,323
Capital Investment	\$ 1,323	\$ -
Closing Capital Investment	\$ 1,323	\$ 1,323
Opening Accumulated Amortization	\$ -	\$ 26
Amortization	2% \$ 26	\$ 26
Closing Accumulated Amortization	\$ 26	\$ 53
Opening Net Fixed Assets	\$ -	\$ 1,297
Closing Net Fixed Assets	\$ 1,297	\$ 1,270
Average Net Fixed Assets	\$ 648	\$ 1,283

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 1,217
Capital Additions	\$ 1,323	\$ -
UCC Before Half Year Rule	\$ 1,323	\$ 1,217
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 1,323	\$ 1,217
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 106	\$ 97
Closing UCC	\$ 1,217	\$ 1,120



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C19 Feeder Automation

Year

2013

Details of Project

C19 Feeder Automation

Number of Asset Components

7

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	854,434	3%	47	8%
2 1835_Overhead Conductors and Devices	401,635	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	19,067,132	3%	47	8%
4 1845_Underground Conductors and Devices	12,479	3%	47	8%
5 1845_Underground Conductors and Devices - Switch	272,772	5%	47	8%
6 1855_Services - UG	1,079	3%	47	8%
7 1855_Services - OH	53,021	2%	47	8%

	2013
Closing Net Fixed Asset	19,982,550
Amortization Expense	680,003
CCA	1,653,004



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

**Name or General Description of Project**

C19 Feeder Automation

**Asset Component**

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 854,434
Closing Capital Investment	\$ 854,434
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 21,361
Closing Accumulated Amortization	\$ 21,361
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 833,074
Average Net Fixed Assets	\$ 416,537

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 854,434
UCC Before Half Year Rule	\$ 854,434
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 854,434
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 68,355
Closing UCC	\$ 786,080



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

**Name or General Description of Project**

C19 Feeder Automation

**Asset Component**

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 401,635
Closing Capital Investment	\$ 401,635
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 8,033
Closing Accumulated Amortization	\$ 8,033
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 393,602
Average Net Fixed Assets	\$ 196,801

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 401,635
UCC Before Half Year Rule	\$ 401,635
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 401,635
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 32,131
Closing UCC	\$ 369,504



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C19 Feeder Automation

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 19,067,132
Closing Capital Investment	\$ 19,067,132
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 635,571
Closing Accumulated Amortization	\$ 635,571
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 18,431,561
Average Net Fixed Assets	\$ 9,215,781

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 19,067,132
UCC Before Half Year Rule	\$ 19,067,132
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 19,067,132
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 1,525,371
Closing UCC	\$ 17,541,762



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

**Name or General Description of Project**

C19 Feeder Automation

**Asset Component**

1845 Underground Conductors and Devices

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 12,479
Closing Capital Investment	\$ 12,479
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 312
Closing Accumulated Amortization	\$ 312
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 12,167
Average Net Fixed Assets	\$ 6,084

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 12,479
UCC Before Half Year Rule	\$ 12,479
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 12,479
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 998
Closing UCC	\$ 11,481



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C19 Feeder Automation

#### Asset Component

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 272,772
Closing Capital Investment	\$ 272,772
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 13,639
Closing Accumulated Amortization	\$ 13,639
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 259,133
Average Net Fixed Assets	\$ 129,567

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 272,772
UCC Before Half Year Rule	\$ 272,772
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 272,772
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 21,822
Closing UCC	\$ 250,950



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

**Name or General Description of Project**

C19 Feeder Automation

**Asset Component**

1855\_Services - UG

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,079
Closing Capital Investment	\$ 1,079
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 27
Closing Accumulated Amortization	\$ 27
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,052
Average Net Fixed Assets	\$ 526

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,079
UCC Before Half Year Rule	\$ 1,079
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,079
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 86
Closing UCC	\$ 993





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 7

**Name or General Description of Project**

C19 Feeder Automation

**Asset Component**

1855\_Services - OH

### Average Net Fixed Assets

**Net Fixed Assets**

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 53,021
Closing Capital Investment	\$ 53,021
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 1,060
Closing Accumulated Amortization	\$ 1,060
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 51,961
Average Net Fixed Assets	\$ 25,980

### For PILs Calculation

**UCC**

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 53,021
UCC Before Half Year Rule	\$ 53,021
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 53,021
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 4,242
Closing UCC	\$ 48,779

1    **CONCERNING 2014 INFORMATION**

2

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## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C20 Wholesale and Smart Metering

Year

2012

Details of Project

C20 Wholesale and Smart Metering

Number of Asset Components

2

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1820_DS Equip - Normally Primary below 50 kV - Grid Point Meters	983,180	4%	47	8%
2 1860_Meters - Smart Meters	3,755,933	7%	47	8%

	2012	2013
Closing Net Fixed Asset	4,449,391	4,159,668
Amortization Expense	289,723	289,723
CCA	379,129	348,799



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C20 Wholesale and Smart Metering

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Grid Point Meters

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 983,180
Capital Investment	\$ 983,180	\$ -
Closing Capital Investment	\$ 983,180	\$ 983,180
Opening Accumulated Amortization	\$ -	\$ 39,327
Amortization	4% \$ 39,327	\$ 39,327
Closing Accumulated Amortization	\$ 39,327	\$ 78,654
Opening Net Fixed Assets	\$ -	\$ 943,853
Closing Net Fixed Assets	\$ 943,853	\$ 904,526
Average Net Fixed Assets	\$ 471,927	\$ 924,190

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 904,526
Capital Additions	\$ 983,180	\$ -
UCC Before Half Year Rule	\$ 983,180	\$ 904,526
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 983,180	\$ 904,526
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 78,654	\$ 72,362
Closing UCC	\$ 904,526	\$ 832,164



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C20 Wholesale and Smart Metering

#### Asset Component

1860 Meters - Smart Meters

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 3,755,933
Capital Investment	\$ 3,755,933	\$ -
Closing Capital Investment	\$ 3,755,933	\$ 3,755,933
Opening Accumulated Amortization	\$ -	\$ 250,396
Amortization	7% \$ 250,396	\$ 250,396
Closing Accumulated Amortization	\$ 250,396	\$ 500,791
Opening Net Fixed Assets	\$ -	\$ 3,505,538
Closing Net Fixed Assets	\$ 3,505,538	\$ 3,255,142
Average Net Fixed Assets	\$ 1,752,769	\$ 3,380,340

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 3,455,459
Capital Additions	\$ 3,755,933	\$ -
UCC Before Half Year Rule	\$ 3,755,933	\$ 3,455,459
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 3,755,933	\$ 3,455,459
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 300,475	\$ 276,437
Closing UCC	\$ 3,455,459	\$ 3,179,022



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C20 Wholesale and Smart Metering

Year

2013

Details of Project

C20 Wholesale and Smart Metering

Number of Asset Components

2

Asset Component (Click on the Number to View the Component Details)

1	1820_DS Equip - Normally Primary below 50 kV - Grid Point Meters
2	1860_Meters - Smart Meters

Capital Cost

6,296,119
2,107,979

Depreciation Rate

4%
7%

CCA Class

47
47

CCA Rate

8%
8%

2013

Closing Net Fixed Asset

8,011,721

Amortization Expense

392,377

CCA

672,328



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C20 Wholesale and Smart Metering

#### Asset Component

1820\_DS Equip - Normally Primary below 50 kV - Grid Point Meters

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 6,296,119
Closing Capital Investment	\$ 6,296,119
Opening Accumulated Amortization	\$ -
Amortization	4% \$ 251,845
Closing Accumulated Amortization	\$ 251,845
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 6,044,274
Average Net Fixed Assets	\$ 3,022,137

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 6,296,119
UCC Before Half Year Rule	\$ 6,296,119
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 6,296,119
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 503,690
Closing UCC	\$ 5,792,430



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C20 Wholesale and Smart Metering

#### Asset Component

1860 Meters - Smart Meters

### Average Net Fixed Assets

	2013 Forecasted
<b>Net Fixed Assets</b>	
Opening Capital Investment	\$ -
Capital Investment	\$ 2,107,979
Closing Capital Investment	\$ 2,107,979
Opening Accumulated Amortization	\$ -
Amortization	7% \$ 140,532
Closing Accumulated Amortization	\$ 140,532
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,967,447
Average Net Fixed Assets	\$ 983,723

### For PILs Calculation

	2013 Forecasted
<b>UCC</b>	
Opening UCC	\$ -
Capital Additions	\$ 2,107,979
UCC Before Half Year Rule	\$ 2,107,979
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 2,107,979
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 168,638
Closing UCC	\$ 1,939,340



1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

1st Year of IRM Cycle

Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

Year

2012

Details of Project

C21 Externally-Initiated Plant Relocations and Expansions

Number of Asset Components

12

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	467,216	3%	47	8%
2 1835_Overhead Conductors and Devices	642,660	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	83,917	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	253,040	2%	47	8%
5 1840_Underground Conduit - Duct Bank	4,159,150	3%	47	8%
6 1840_Underground Conduit - Vault	17,599	3%	47	8%
7 1840_Underground Conduit - Vault Roof	52,866	5%	47	8%
8 1845_Underground Conductors and Devices	3,777,042	3%	47	8%
9 1845_Underground Conductors and Devices - Switch	566,496	5%	47	8%
10 1850_Line Transformers - OH	75,802	3%	47	8%
11 1855_Services - UG	4,213	3%	47	8%
12 1855_Services - OH	63,653	2%	47	8%

	2012	2013
Closing Net Fixed Asset	9,862,883	9,562,114
Amortization Expense	300,769	300,769
CCA	813,092	748,045



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 467,216
Capital Investment	\$ 467,216	\$ -
Closing Capital Investment	\$ 467,216	\$ 467,216
Opening Accumulated Amortization	\$ -	\$ 11,680
Amortization	3% \$ 11,680	\$ 11,680
Closing Accumulated Amortization	\$ 11,680	\$ 23,361
Opening Net Fixed Assets	\$ -	\$ 455,535
Closing Net Fixed Assets	\$ 455,535	\$ 443,855
Average Net Fixed Assets	\$ 227,768	\$ 449,695

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 429,838
Capital Additions	\$ 467,216	\$ -
UCC Before Half Year Rule	\$ 467,216	\$ 429,838
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 467,216	\$ 429,838
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 37,377	\$ 34,387
Closing UCC	\$ 429,838	\$ 395,451



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 642,660
Capital Investment	\$ 642,660	\$ -
Closing Capital Investment	\$ 642,660	\$ 642,660
Opening Accumulated Amortization	\$ -	\$ 12,853
Amortization	2% \$ 12,853	\$ 12,853
Closing Accumulated Amortization	\$ 12,853	\$ 25,706
Opening Net Fixed Assets	\$ -	\$ 629,807
Closing Net Fixed Assets	\$ 629,807	\$ 616,953
Average Net Fixed Assets	\$ 314,903	\$ 623,380

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 591,247
Capital Additions	\$ 642,660	\$ -
UCC Before Half Year Rule	\$ 642,660	\$ 591,247
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 642,660	\$ 591,247
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 51,413	\$ 47,300
Closing UCC	\$ 591,247	\$ 543,947



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 83,917
Capital Investment	\$ 83,917	\$ -
Closing Capital Investment	\$ 83,917	\$ 83,917
Opening Accumulated Amortization	\$ -	\$ 2,797
Amortization	3% \$ 2,797	\$ 2,797
Closing Accumulated Amortization	\$ 2,797	\$ 5,594
Opening Net Fixed Assets	\$ -	\$ 81,119
Closing Net Fixed Assets	\$ 81,119	\$ 78,322
Average Net Fixed Assets	\$ 40,560	\$ 79,721

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 77,203
Capital Additions	\$ 83,917	\$ -
UCC Before Half Year Rule	\$ 83,917	\$ 77,203
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 83,917	\$ 77,203
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 6,713	\$ 6,176
Closing UCC	\$ 77,203	\$ 71,027



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1840 Underground Conduit - Cable Chamber

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 253,040
Capital Investment	\$ 253,040	\$ -
Closing Capital Investment	\$ 253,040	\$ 253,040
Opening Accumulated Amortization	\$ -	\$ 5,061
Amortization	2% \$ 5,061	\$ 5,061
Closing Accumulated Amortization	\$ 5,061	\$ 10,122
Opening Net Fixed Assets	\$ -	\$ 247,979
Closing Net Fixed Assets	\$ 247,979	\$ 242,918
Average Net Fixed Assets	\$ 123,990	\$ 245,449

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 232,797
Capital Additions	\$ 253,040	\$ -
UCC Before Half Year Rule	\$ 253,040	\$ 232,797
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 253,040	\$ 232,797
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 20,243	\$ 18,624
Closing UCC	\$ 232,797	\$ 214,173



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1840 Underground Conduit - Duct Bank

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 4,159,150
Capital Investment	\$ 4,159,150	\$ -
Closing Capital Investment	\$ 4,159,150	\$ 4,159,150
Opening Accumulated Amortization	\$ -	\$ 138,638
Amortization	3% \$ 138,638	\$ 138,638
Closing Accumulated Amortization	\$ 138,638	\$ 277,277
Opening Net Fixed Assets	\$ -	\$ 4,020,512
Closing Net Fixed Assets	\$ 4,020,512	\$ 3,881,873
Average Net Fixed Assets	\$ 2,010,256	\$ 3,951,192

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 3,826,418
Capital Additions	\$ 4,159,150	\$ -
UCC Before Half Year Rule	\$ 4,159,150	\$ 3,826,418
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 4,159,150	\$ 3,826,418
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 332,732	\$ 306,113
Closing UCC	\$ 3,826,418	\$ 3,520,305



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1840 Underground Conduit - Vault

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 17,599
Capital Investment	\$ 17,599	\$ -
Closing Capital Investment	\$ 17,599	\$ 17,599
Opening Accumulated Amortization	\$ -	\$ 440
Amortization	\$ 440	\$ 440
Closing Accumulated Amortization	\$ 440	\$ 880
Opening Net Fixed Assets	\$ -	\$ 17,159
Closing Net Fixed Assets	\$ 17,159	\$ 16,719
Average Net Fixed Assets	\$ 8,580	\$ 16,939

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 16,191
Capital Additions	\$ 17,599	\$ -
UCC Before Half Year Rule	\$ 17,599	\$ 16,191
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 17,599	\$ 16,191
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 1,408	\$ 1,295
Closing UCC	\$ 16,191	\$ 14,896





## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1840 Underground Conduit - Vault Roof

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 52,866
Capital Investment	\$ 52,866	\$ -
Closing Capital Investment	\$ 52,866	\$ 52,866
Opening Accumulated Amortization	\$ -	\$ 2,643
Amortization	5% \$ 2,643	\$ 2,643
Closing Accumulated Amortization	\$ 2,643	\$ 5,287
Opening Net Fixed Assets	\$ -	\$ 50,222
Closing Net Fixed Assets	\$ 50,222	\$ 47,579
Average Net Fixed Assets	\$ 25,111	\$ 48,901

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 48,636
Capital Additions	\$ 52,866	\$ -
UCC Before Half Year Rule	\$ 52,866	\$ 48,636
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 52,866	\$ 48,636
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 4,229	\$ 3,891
Closing UCC	\$ 48,636	\$ 44,746



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1845 Underground Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 3,777,042
Capital Investment	\$ 3,777,042	\$ -
Closing Capital Investment	\$ 3,777,042	\$ 3,777,042
Opening Accumulated Amortization	\$ -	\$ 94,426
Amortization	3% \$ 94,426	\$ 94,426
Closing Accumulated Amortization	\$ 94,426	\$ 188,852
Opening Net Fixed Assets	\$ -	\$ 3,682,616
Closing Net Fixed Assets	\$ 3,682,616	\$ 3,588,190
Average Net Fixed Assets	\$ 1,841,308	\$ 3,635,403

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 3,474,879
Capital Additions	\$ 3,777,042	\$ -
UCC Before Half Year Rule	\$ 3,777,042	\$ 3,474,879
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 3,777,042	\$ 3,474,879
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 302,163	\$ 277,990
Closing UCC	\$ 3,474,879	\$ 3,196,888



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 566,496
Capital Investment	\$ 566,496	\$ -
Closing Capital Investment	\$ 566,496	\$ 566,496
Opening Accumulated Amortization	\$ -	\$ 28,325
Amortization	5% \$ 28,325	\$ 28,325
Closing Accumulated Amortization	\$ 28,325	\$ 56,650
Opening Net Fixed Assets	\$ -	\$ 538,171
Closing Net Fixed Assets	\$ 538,171	\$ 509,846
Average Net Fixed Assets	\$ 269,085	\$ 524,008

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 521,176
Capital Additions	\$ 566,496	\$ -
UCC Before Half Year Rule	\$ 566,496	\$ 521,176
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 566,496	\$ 521,176
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 45,320	\$ 41,694
Closing UCC	\$ 521,176	\$ 479,482



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 10

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1850 Line Transformers - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 75,802
Capital Investment	\$ 75,802	\$ -
Closing Capital Investment	\$ 75,802	\$ 75,802
Opening Accumulated Amortization	\$ -	\$ 2,527
Amortization	3% \$ 2,527	\$ 2,527
Closing Accumulated Amortization	\$ 2,527	\$ 5,053
Opening Net Fixed Assets	\$ -	\$ 73,275
Closing Net Fixed Assets	\$ 73,275	\$ 70,748
Average Net Fixed Assets	\$ 36,638	\$ 72,012

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 69,738
Capital Additions	\$ 75,802	\$ -
UCC Before Half Year Rule	\$ 75,802	\$ 69,738
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 75,802	\$ 69,738
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 6,064	\$ 5,579
Closing UCC	\$ 69,738	\$ 64,159



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 11

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1855\_Services - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 4,213
Capital Investment	\$ 4,213	\$ -
Closing Capital Investment	\$ 4,213	\$ 4,213
Opening Accumulated Amortization	\$ -	\$ 105
Amortization	3% \$ 105	\$ 105
Closing Accumulated Amortization	\$ 105	\$ 211
Opening Net Fixed Assets	\$ -	\$ 4,108
Closing Net Fixed Assets	\$ 4,108	\$ 4,002
Average Net Fixed Assets	\$ 2,054	\$ 4,055

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 3,876
Capital Additions	\$ 4,213	\$ -
UCC Before Half Year Rule	\$ 4,213	\$ 3,876
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 4,213	\$ 3,876
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 337	\$ 310
Closing UCC	\$ 3,876	\$ 3,566



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 12

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1855\_Services - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2012 Forecasted	2013 Forecasted
Opening Capital Investment	\$ -	\$ 63,653
Capital Investment	\$ 63,653	\$ -
Closing Capital Investment	\$ 63,653	\$ 63,653
Opening Accumulated Amortization	\$ -	\$ 1,273
Amortization	2% \$ 1,273	\$ 1,273
Closing Accumulated Amortization	\$ 1,273	\$ 2,546
Opening Net Fixed Assets	\$ -	\$ 62,380
Closing Net Fixed Assets	\$ 62,380	\$ 61,107
Average Net Fixed Assets	\$ 31,190	\$ 61,743

### For PILs Calculation

#### UCC

	2012 Forecasted	2013 Forecasted
Opening UCC	\$ -	\$ 58,560
Capital Additions	\$ 63,653	\$ -
UCC Before Half Year Rule	\$ 63,653	\$ 58,560
Half Year Rule (1/2 Additions - Disposals)	\$ -	\$ -
Reduced UCC	\$ 63,653	\$ 58,560
CCA Rate Class	47	
CCA Rate	8%	
CCA	\$ 5,092	\$ 4,685
Closing UCC	\$ 58,560	\$ 53,876



## Incremental Capital Project Summary

Using the pull-down menu below, please identify what year of the IRM cycle you are in.

2nd Year of IRM Cycle

Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

Year

2013

Details of Project

C21 Externally-Initiated Plant Relocations and Expansions

Number of Asset Components

14

Asset Component (Click on the Number to View the Component Details)	Capital Cost	Depreciation Rate	CCA Class	CCA Rate
1 1830_Poles Towers and Fixtures	83,204	3%	47	8%
2 1835_Overhead Conductors and Devices	130,691	2%	47	8%
3 1835_Overhead Conductors and Devices - Switches	16,567	3%	47	8%
4 1840_Underground Conduit - Cable Chamber	2,590,674	2%	47	8%
5 1840_Underground Conduit - Duct Bank	18,814,555	3%	47	8%
6 1840_Underground Conduit - Vault	342,104	3%	47	8%
7 1840_Underground Conduit - Vault Roof	55,911	5%	47	8%
8 1845_Underground Conductors and Devices	2,625,760	3%	47	8%
9 1845_Underground Conductors and Devices - Switch	1,010	5%	47	8%
10 1850_Line Transformers - OH	5,946	3%	47	8%
11 1850_Line Transformers - UG	2,828	3%	47	8%
12 1850_Line Transformers - UG Network w/protector	163,664	5%	47	8%
13 1855_Services - UG	1,155	3%	47	8%
14 1855_Services - OH	6,021	2%	47	8%

2013

Closing Net Fixed Asset 24,070,211

Amortization Expense 769,879

CCA 1,987,207



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 1

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1830\_Poles Towers and Fixtures

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 83,204
Closing Capital Investment	\$ 83,204
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 2,080
Closing Accumulated Amortization	\$ 2,080
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 81,123
Average Net Fixed Assets	\$ 40,562

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 83,204
UCC Before Half Year Rule	\$ 83,204
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 83,204
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 6,656
Closing UCC	\$ 76,547





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 2

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1835\_Overhead Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 130,691
Closing Capital Investment	\$ 130,691
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 2,614
Closing Accumulated Amortization	\$ 2,614
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 128,078
Average Net Fixed Assets	\$ 64,039

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 130,691
UCC Before Half Year Rule	\$ 130,691
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 130,691
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 10,455
Closing UCC	\$ 120,236



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 3

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1835\_Overhead Conductors and Devices - Switches

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 16,567
Closing Capital Investment	\$ 16,567
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 552
Closing Accumulated Amortization	\$ 552
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 16,014
Average Net Fixed Assets	\$ 8,007

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 16,567
UCC Before Half Year Rule	\$ 16,567
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 16,567
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 1,325
Closing UCC	\$ 15,241



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 4

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1840 Underground Conduit - Cable Chamber

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 2,590,674
Closing Capital Investment	\$ 2,590,674
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 51,813
Closing Accumulated Amortization	\$ 51,813
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 2,538,861
Average Net Fixed Assets	\$ 1,269,430

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 2,590,674
UCC Before Half Year Rule	\$ 2,590,674
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 2,590,674
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 207,254
Closing UCC	\$ 2,383,420



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 5

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1840\_Underground Conduit - Duct Bank

### Average Net Fixed Assets

	2013 Forecasted
<b>Net Fixed Assets</b>	
Opening Capital Investment	\$ -
Capital Investment	\$ 18,814,555
Closing Capital Investment	\$ 18,814,555
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 627,152
Closing Accumulated Amortization	\$ 627,152
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 18,187,403
Average Net Fixed Assets	\$ 9,093,702

### For PILs Calculation

	2013 Forecasted
<b>UCC</b>	
Opening UCC	\$ -
Capital Additions	\$ 18,814,555
UCC Before Half Year Rule	\$ 18,814,555
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 18,814,555
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 1,505,164
Closing UCC	\$ 17,309,390



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 6

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1840\_Underground Conduit - Vault

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 342,104
Closing Capital Investment	\$ 342,104
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 8,553
Closing Accumulated Amortization	\$ 8,553
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 333,552
Average Net Fixed Assets	\$ 166,776

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 342,104
UCC Before Half Year Rule	\$ 342,104
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 342,104
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 27,368
Closing UCC	\$ 314,736



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 7

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1840\_Underground Conduit - Vault Roof

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 55,911
Closing Capital Investment	\$ 55,911
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 2,796
Closing Accumulated Amortization	\$ 2,796
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 53,115
Average Net Fixed Assets	\$ 26,558

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 55,911
UCC Before Half Year Rule	\$ 55,911
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 55,911
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 4,473
Closing UCC	\$ 51,438



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 8

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1845 Underground Conductors and Devices

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 2,625,760
Closing Capital Investment	\$ 2,625,760
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 65,644
Closing Accumulated Amortization	\$ 65,644
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 2,560,116
Average Net Fixed Assets	\$ 1,280,058

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 2,625,760
UCC Before Half Year Rule	\$ 2,625,760
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 2,625,760
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 210,061
Closing UCC	\$ 2,415,700



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 9

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1845 Underground Conductors and Devices - Switch

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,010
Closing Capital Investment	\$ 1,010
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 50
Closing Accumulated Amortization	\$ 50
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 959
Average Net Fixed Assets	\$ 480

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,010
UCC Before Half Year Rule	\$ 1,010
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,010
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 81
Closing UCC	\$ 929





## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 10

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1850\_Line Transformers - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 5,946
Closing Capital Investment	\$ 5,946
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 198
Closing Accumulated Amortization	\$ 198
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 5,748
Average Net Fixed Assets	\$ 2,874

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 5,946
UCC Before Half Year Rule	\$ 5,946
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 5,946
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 476
Closing UCC	\$ 5,470



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 11

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1850\_Line Transformers - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 2,828
Closing Capital Investment	\$ 2,828
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 94
Closing Accumulated Amortization	\$ 94
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 2,734
Average Net Fixed Assets	\$ 1,367

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 2,828
UCC Before Half Year Rule	\$ 2,828
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 2,828
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 226
Closing UCC	\$ 2,602



## Incremental Capital Project Summary

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### Fixed Asset Amortization and UCC 12

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1850\_Line Transformers - UG Network w/protector

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 163,664
Closing Capital Investment	\$ 163,664
Opening Accumulated Amortization	\$ -
Amortization	5% \$ 8,183
Closing Accumulated Amortization	\$ 8,183
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 155,481
Average Net Fixed Assets	\$ 77,740

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 163,664
UCC Before Half Year Rule	\$ 163,664
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 163,664
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 13,093
Closing UCC	\$ 150,571



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 13

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1855\_Services - UG

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 1,155
Closing Capital Investment	\$ 1,155
Opening Accumulated Amortization	\$ -
Amortization	3% \$ 29
Closing Accumulated Amortization	\$ 29
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 1,126
Average Net Fixed Assets	\$ 563

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 1,155
UCC Before Half Year Rule	\$ 1,155
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 1,155
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 92
Closing UCC	\$ 1,062



## Incremental Capital Project Summary

[Return to Main Summary](#)

### Fixed Asset Amortization and UCC 14

#### Name or General Description of Project

C21 Externally-Initiated Plant Relocations and Expansions

#### Asset Component

1855\_Services - OH

### Average Net Fixed Assets

#### Net Fixed Assets

	2013 Forecasted
Opening Capital Investment	\$ -
Capital Investment	\$ 6,021
Closing Capital Investment	\$ 6,021
Opening Accumulated Amortization	\$ -
Amortization	2% \$ 120
Closing Accumulated Amortization	\$ 120
Opening Net Fixed Assets	\$ -
Closing Net Fixed Assets	\$ 5,901
Average Net Fixed Assets	\$ 2,950

### For PILs Calculation

#### UCC

	2013 Forecasted
Opening UCC	\$ -
Capital Additions	\$ 6,021
UCC Before Half Year Rule	\$ 6,021
Half Year Rule (1/2 Additions - Disposals)	\$ -
Reduced UCC	\$ 6,021
CCA Rate Class	47
CCA Rate	8%
CCA	\$ 482
Closing UCC	\$ 5,539

1    **CONCERNING 2014 INFORMATION**

2

3    As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to consider  
4    the work programs identified for 2012 and 2013 together, and to defer consideration of the  
5    work program for 2014 to a later date. In light of this requested bifurcation and phasing of the  
6    proceeding, the material filed in this schedule regarding the 2014 work program cannot be  
7    updated during the first phase of this application and therefore is not currently of assistance to  
8    the OEB or intervenors. THESL will update the material in this schedule regarding the 2014 work  
9    program in the second phase of this application.

1 **FINAL DISPOSITION OF THE PILs DEFERRAL ACCOUNTS 1562 AND 1563**

2

3 In its June 24, 2011 EB-2008-0381 Decision, the Board announced its expectation that all  
4 distributors will apply for final disposition of Account 1562 in their next general rates filing. The  
5 Board noted that if the distributor files evidence in accordance with the various decisions made  
6 in the course of the proceeding, and uses the updated SIMPIL model, the determination of the  
7 account balance would be handled expeditiously and in an administrative manner.

8

9 THESL has reviewed recent OEB decisions and interrogatories in other distributors' proceedings  
10 with respect to Account 1562 in order to ensure that its evidence is in accordance with

11 them. THESL has calculated the credit balance of \$5.7 million for Account 1562 which

/U

12 THESL proposes to refund to customers. The amount is allocated to customer rate classes on the  
13 basis of the most recent Board-approved distribution revenue to calculate the proposed rate  
14 riders by rate class. The supporting calculations for the amount are provided in the following  
15 schedules under Tab 5:

- 16 • Schedule A – Summary Continuity Schedule for Account 1562
- 17 • Schedule B – Detailed Continuity Schedules for Account 1562
- 18 • Schedule C – 2001 SIMPIL Model
- 19 • Schedule D – 2002 SIMPIL Model
- 20 • Schedule E – 2003 SIMPIL Model
- 21 • Schedule F – 2004 SIMPIL Model
- 22 • Schedule G – 2005 SIMPIL Model

23

24 The amount and the disposition rate riders for Payments in Lieu of Taxes (PILs) are shown in  
25 Sheet 10 and 12 of the updated 2013 IRM Rate Generator model, respectively.

/U

## Index of Deferred Interrogatory Responses

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<b>Issue 1.1</b>	
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2.	VECC 3
<b>Issue 1.2</b>	
3.	CUPE 1
4.	CCC 9
<b>Issue 1.3</b>	
5.	EP 4
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7.	EP 10
8.	VECC 10
<b>Issue 2.1</b>	
9.	VECC 16
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<b>Issue 2.2</b>	
12.	OEB Staff 26
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18.	AMPCO 6
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30.	EP 55
31.	VECC 115
<b>Issue 4.2</b>	
32.	CCC 25
33.	CCC 29
34.	EP 56
35.	EP 57



**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 1.1**

1 **INTERROGATORY 2:**

2 **Reference(s):** **Tab 3, Schedule E1, page 4**

3 **Tab 2, Appendix 1, page 2**

4

5 a) Please reconcile the “% of Revenue” values shown columns K to N of the first  
6 reference with those shown in columns A to C of the second reference. (Note: The  
7 values in columns K-M of the first reference must be multiplied by the value in  
8 column N to get the comparable values in the second reference)

9

10 **RESPONSE:**

11 a) The values for “% of Revenue” in Tab 2, Appendix 1 are incorrect. THESL has  
12 provided a corrected and updated version of Tab 2, Appendix 1. See also response to  
13 EP interrogatory 7a (Tab 6C, Schedule 7-7, part a).

} /U

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 1.1**

1 **INTERROGATORY 3:**

2 **Reference(s):** Tab 4. Schedule E1.1, pages 5 and 7-9

3

4 **a) Please explain the basis for the loads/customer count and rates used on each of**  
5 **the following three pages: 5, 7 and 8.**

6

7 **RESPONSE:**

8 a) The loads and customer counts on Pages 5 and 8 (“Re-based billed customer,  
9 connections, kWh and kW”) are based on 2011 OEB-approved load and customer  
10 forecast. The load and customer count on page 7 represents 2010 actual billing units.  
11 The rates on all pages are the current 2011 Board-approved rates. Please also note  
12 that the customer/connection rates shown on Tab 4, Schedule E1.1, page 8 of for  
13 Residential Urban and Unmetered Scattered load are incorrect. THESL has provided  
14 an updated version of Schedule E1.1, reflecting the updated capital forecast, and  
15 corrections for the rates on page 8.

/U

16

17 **b) Please review the rates and loads associated with each class on pages 5 and 8 and**  
18 **reconcile any differences. For example, on page 5 the second USL class**  
19 **associates the \$0.49 service charge with 21.729 connections and no volumes or**  
20 **volumetric charges. However, on page 8, the first USL class associates the \$0.49**  
21 **service charge with 1,130 connections as well as volumetric use and volumetric**  
22 **charges.**

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
 COALITION INTERROGATORIES ON ISSUE 1.1**

1 **RESPONSE:**

2 b) Please see the response in part (a). THESL has a three-part rate for USL customers.  
 3 In order for these rates to be accommodated in the OEB's models, the class is shown  
 4 twice – once with the monthly service charge per customer and the volumetric charge,  
 5 and the second time with the connection charge.

6  
 7 **c) Please provide weather normalized usage values for 2010.**

8  
 9 **RESPONSE:**

10 c) The table below presents the 2010 loads normalized to 2011 OEB-approved weather  
 11 variables.

<b>Customer Class</b>	<b>Weather-Normalized Billed kWh</b>	<b>Weather-Normalized Billed kVA</b>
Residential	5,083,877,203	
Residentail Urban	99,359,319	
General Service less than than 50 kW	2,084,449,526	
General Service 50 to 999 kW	10,188,050,194	26,708,165
General Service 1,000 to 4,999 kW	4,830,124,728	10,974,154
Large Use	2,260,681,437	5,260,625
Street Lighting	112,727,603	321,995
USL	52,097,299	

12 **d) Please re-do page 7 based on weather normalized loads.**

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 1.1**

- 1 **RESPONSE:**
- 2 d) Please see attached Appendix A, which uses the values from the above table.

**RESPONSES TO CANADIAN UNION OF PUBLIC EMPLOYEES,  
LOCAL ONE INTERROGATORIES ON ISSUE 1.2**

1 **INTERROGATORY 1:**

2 **Reference(s):** **TAB 2 - Managers Summary, Page 9, Line 22 – Page 10,**  
3 **Line 13**

4

5 Please explain in detail the paragraphs in THESL's application noted above (and included  
6 below for your convenience).

7

8 Please provide the following details:

9

10 **a) What percentage of THESL's annual capital work program has, or will be**  
11 **completed by an external contractor/vendor for the years 2011, 2012, 2013 and**  
12 **2014.**

13

14 **RESPONSE:**

15 a) For 2011, the percentage of THESL's annual capital work program completed by  
16 external contractors/vendors was approximately 44%. For 2012 August year-to-date,  
17 the percentage was approximately 36%. For year-end 2012, the percentage is  
18 forecasted to be 47%. (When considering the percentage of the capital work program  
19 completed by external contractors/vendors, it is also important to note that, in  
20 absolute terms, THESL's spending on external contractors performing capital work  
21 has decreased significantly in 2012.) For 2013, the percentage is forecasted to be  
22 50%. THESL's absolute spending on the annual capital work program is discussed in  
23 the response to (b), below.

24

25 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB

/U

**RESPONSES TO CANADIAN UNION OF PUBLIC EMPLOYEES,  
LOCAL ONE INTERROGATORIES ON ISSUE 1.2**

1 to consider the work programs identified for 2012 and 2013 together, and to defer  
2 consideration of the work program for 2014 to a later date. In light of this requested  
3 bifurcation of the proceeding and THESL's obligation to update the 2014 information  
4 for any material changes prior to it being reviewed, it would not assist the OEB or  
5 intervenors to provide information on the 2014 work program in response to this  
6 interrogatory during the first phase of this application.

} /U

7

8 **b) What are the dollar values of THESL's annual capital work program that have,**  
9 **or will be completed by external contractors/vendors for the years 2011,**  
10 **2012, 2013 and 2014.**

11

12 **RESPONSE:**

13 b) For 2011, the dollar value of THESL's annual capital work program completed by  
14 external contractors/vendors was approximately \$141.4 million. For 2012 August  
15 year-to-date, the dollar value was approximately \$38.7 million. For year-end 2012,  
16 the dollar value is forecasted to be \$58.3 million. For 2013, the dollar value is  
17 forecasted to be \$215.5 million.

18

19 For the reasons described in the response to part (a), it would not assist the OEB or  
20 intervenors to provide information on the 2014 work program in response to this  
21 interrogatory during the first phase of this application.

22

23 **c) Please indicate how many external contracts/vendors THESL currently uses for**  
24 **the capital work program, and how many are planned for the years 2013, and**  
25 **2014.**

**RESPONSES TO CANADIAN UNION OF PUBLIC EMPLOYEES,  
LOCAL ONE INTERROGATORIES ON ISSUE 1.2**

1

2 **RESPONSE:**

3 c) THESL currently has contracted with six external contractor firms. This number is  
4 not expected to change during the period 2012-2014.

**RESPONSES TO CONSUMERS COUNCIL OF CANADA  
INTERROGATORIES ON ISSUE 1.2**

1 **INTERROGATORY 9:**

2 **Reference(s):**           **Tab 2**

3

4 Please provide, for the period 2006-2012 THESL's as filed forecast, Board approved and  
5 actual capital expenditures in the same format as Exhibit D1/T7/S1/p. 16  
6 (EB-2010-0142).

7

8 **RESPONSE:**

9 THESL is not able to present the capital expenditures for 2006 and 2007 in the requested  
10 format because it did not track capital costs in the same manner as that presented in  
11 Exhibit D1, Tab 7, Schedule 1 of EB-2010-0142. The table below presents the actual  
12 capital expenditures from 2008 to 2011 in the format requested. With respect to 2012  
13 information, THESL is not able to provide the actual and forecast capital expenditures in  
14 the same format requested as THESL adopted a different manner of presenting the said  
15 information as the current rates proceeding is under an incentive regulation mechanism  
16 and not cost of service. Please also see THESL's response to SEC interrogatory 6  
17 (Tab 6E, Schedule 10-6).

18

19 Table 2 below presents the 2012 actual capital expenditures until August 31, 2012 and  
20 the 2012 forecast total capital expenditures which include the said actual figures. This  
21 table is also presented in Table 1 of the Addendum to the Manager's Summary in Tab 2.

/U



**RESPONSES TO CONSUMERS COUNCIL OF CANADA  
 INTERROGATORIES ON ISSUE 1.2**

1 **Table 1**

	2008 Actual	2009 Actual	2010 Actual	2011 Actual
<b>OPERATIONAL INVESTMENTS</b>				
<b>Grid System Investments</b>				
Underground System	62.0	68.5	111.6	99.0
Overhead System	19.3	20.5	31.7	39.3
Network System	4.7	5.0	7.4	4.8
Stations	16.8	14.1	17.0	18.2
<b>Total Grid System Investments</b>	<b>102.9</b>	<b>108.2</b>	<b>167.7</b>	<b>161.4</b>
Reactive Work	19.3	20.7	25.1	28.6
Customer Connections	42.8	37.6	42.6	58.2
Customer Capital Contribution	(32.7)	(23.4)	(26.6)	(29.8)
Externally Initiated Plant Relocations	-	-	-	7.8
Capital Contributions to HONI	0.4	0.3	1.1	27.8
Engineering Capital	26.4	25.8	34.5	23.6
AFUDC	2.0	2.8	3.5	5.2
Other	(4.3)	3.1	12.3	(4.2)
<b>Total Distribution Plant Capital</b>	<b>156.8</b>	<b>175.1</b>	<b>260.3</b>	<b>278.6</b>
<b>CORPORATE OPERATIONAL INVESTMENTS</b>				
Fleet & Equipment Services	7.9	9.9	10.6	11.8
Facilities	3.4	7.6	12.1	25.3
Other	0.3	3.2	-	-
<b>Total Corporate Operational Investments</b>	<b>11.6</b>	<b>20.7</b>	<b>22.7</b>	<b>37.1</b>
<b>CUSTOMER SERVICES</b>				
Wholesale Metering	4.4	(0.5)	1.8	-
Smart Metering	5.6	2.6	0.4	10.1
Suite Metering	2.7	3.3	6.4	10.2
Other	0.5	0.3	0.2	0.0
<b>Total CUSTOMER SERVICES</b>	<b>13.2</b>	<b>5.6</b>	<b>8.8</b>	<b>20.3</b>
<b>Total INFORMATION TECHNOLOGY</b>	<b>24.1</b>	<b>35.7</b>	<b>33.0</b>	<b>32.4</b>
<b>Total OPERATIONAL INVESTMENTS</b>	<b>205.7</b>	<b>237.1</b>	<b>324.7</b>	<b>368.4</b>
<b>CRITICAL ISSUES</b>				
Standardization	-	5.7	30.2	44.6
Downtown Contingency	-	-	1.1	4.7
FESI / WPF	-	-	16.7	19.3
Stations System Enhancements	-	(1.0)	5.8	4.7
Secondary Upgrade	-	-	2.6	3.9
<b>Total CRITICAL ISSUES</b>		<b>4.7</b>	<b>56.4</b>	<b>77.1</b>
<b>TOTAL CAPITAL</b>	<b>205.7</b>	<b>241.7</b>	<b>381.1</b>	<b>445.5</b>

**RESPONSES TO CONSUMERS COUNCIL OF CANADA  
 INTERROGATORIES ON ISSUE 1.2**

1 **Table 2**

Schedule Number	Projects	Segments	2012 Actuals (Aug/12)	2012 Forecast
B1	Underground Infrastructure and Cable	Underground Infrastructure	14.63	28.75
B2		Paper Insulated Lead Covered Cable - Piece Outs and Leakers	-	0.08
B3		Handwell Replacement	6.37	13.65
B4	Overhead Infrastructure and Equipment	Overhead Infrastructure	1.63	9.07
B5		Box Construction	0.02	0.58
B6		Rear Lot Construction	9.36	16.36
B7		Polymer SMD-20 Switches		
B8		SCADA-Mate R1 Switches		
B9	Network Infrastructure and Equipment	Network Vault & Roofs	0.65	2.84
B10		Fibertop Network Units	0.00	1.48
B11		Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)		
B12	Station Infrastructure and Equipment	Stations Power Transformers	-	0.38
B13.1 & 13.2		Stations Switchgear - Municipal and Transformer Stations	1.05	1.73
B14		Stations Circuit Breakers	0.11	0.76
B15		Stations Control & Communication Systems	0.03	0.14
B16		Downtown Station Load Transfers	0.03	0.68
B17	Bremner TS	Bremner Transformer Station	3.38	8.50
B18	Hydro One Capital Contributions	Hydro One Capital Contributions	18.21	22.98
B19	Feeder Automation	Feeder Automation	-	2.30
B20	Metering	Metering	2.41	4.74
B21	Plant Relocations	Externally-Initiated Plant Relocations and Expansions	2.23	10.16
C1	Operations Portfolio Capital		71.92	120.51
C2	Information Technology Capital		13.53	22.00
C3	Fleet Capital		0.73	0.80
C4	Buildings and Facilities Capital		3.01	5.00
	Allowance for Funds Used During Construction			1.20
<b>Total</b>			<b>149.30</b>	<b>274.68</b>

Note: Updated amount for 2012 Hydro One Capital Contributions reflects a credit amount from a prior period, unrelated to proposed ICM projects.

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
INTERROGATORIES ON ISSUE 1.3**

1 **INTERROGATORY 4:**

2 **Reference(s):**           **Manager's Summary Tab 2, Page 3**

3

- 4 a) Please provide a schedule that shows the continuity of Rate Base for 2011-2014,  
5 including approved Opening 2011 Rate Base and 2011 Closing Rate Base.
- 6 b) Please include a breakdown of the major RB components including Gross and Net  
7 fixed Assets, CAPEX, Depreciation and Working Capital.
- 8 c) Please reconcile the 2011 Rate base to the EB-2010-0142 Settlement Agreement and  
9 Board Order and to the Amount shown in the Managers Summary Appendix 2 Line 1.

10

11

12 **RESPONSE:**

13 a), b) and c) Please see the table below.

/U

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
 INTERROGATORIES ON ISSUE 1.3**

	2011 <i>Approved</i>	2011 <i>Actual</i>	2012 <i>Forecast</i> <sup>(1)</sup>	2013 <i>Forecast</i> <sup>(1)</sup>
CAPEX	\$ 378.8	\$ 445.5	\$ 274.7	\$ 579.1
<i>GROSS FIXED ASSETS</i>				
Opening Balance	\$ 4,183.6	\$ 4,179.7	\$ 4,607.8	\$ 4,882.3
Additions	\$ 348.9	\$ 439.1	\$ 274.5	\$ 578.6
Disposals	\$ -	\$ (11.1)	\$ -	\$ -
Closing Balance	\$ 4,532.5	\$ 4,607.8	\$ 4,882.3	\$ 5,460.9
<i>ACCUMULATED DEPRECIATION</i>				
Opening Balance	\$ (2,285.7)	\$ (2,283.9)	\$ (2,424.2)	\$ (2,571.6)
Accumulated Depreciation	\$ (141.6)	\$ (148.6)	\$ (147.4)	\$ (156.5)
Disposals	\$ -	\$ 8.3	\$ -	\$ -
Closing Balance	\$ (2,427.4)	\$ (2,424.2)	\$ (2,571.6)	\$ (2,728.1)
<i>NET FIXED ASSETS OPENING BALANCE</i>	\$ 1,897.8	\$ 1,895.8	\$ 2,183.5	\$ 2,310.7
<i>NET FIXED ASSETS CLOSING BALANCE</i>	\$ 2,105.1	\$ 2,183.5	\$ 2,310.7	\$ 2,732.8
Average NFA	\$ 2,001.4	\$ 2,039.7	\$ 2,247.1	\$ 2,521.7
Working Capital Allowance	\$ 296.7	\$ 313.6	\$ 326.2	\$ 348.5
<i>Rate Base</i>	\$ 2,298.2	\$ 2,353.2	\$ 2,573.3	\$ 2,870.2
<i>As per Manager Summary and 2011 Decision</i>	\$ 2,298.2	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
Variance	\$ 0.0	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
(1) Additions are assumed as per the ICM framework to be effective January 1st of the year in which the capital spend is reported and well as the associated depreciation.				

1 The concept of Rate Base is applicable only to cost of service rate applications, and not  
 2 rate applications that are made under the OEB's Incentive Regulation Mechanism (IRM)  
 3 such as the current proceeding. Notwithstanding this, THESL presents for illustration  
 4 purposes in the schedule above the components the Board-approved rate base for 2011,  
 5 actual rate base for 2011, and assumed rate base for the years 2012 and 2013. The latter  
 6 amounts assume that (a) the OEB will approve, for purposes of calculating distribution

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
INTERROGATORIES ON ISSUE 1.3**

1 rates for the said years, capital expenditures that are at the same levels as those proposed  
2 in the current IRM on a/ICM application, and (b) the working capital allowance is  
3 determined on a historical basis.

4

5 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to  
6 consider the work programs identified for 2012 and 2013 together, and to defer  
7 consideration of the work program for 2014 to a later date. In light of this requested  
8 bifurcation of the proceeding and THESL's obligation to update the 2014 information for  
9 any material changes prior to it being reviewed, it would not assist the OEB or  
10 intervenors to provide the 2014 information requested in this interrogatory during the first  
11 phase of this application.

/U

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
INTERROGATORIES ON ISSUE 1.3**

1 **INTERROGATORY 6:**

2 **Reference(s):** **Manager's Summary Tab 2, Page 4**

3

4 **a) Please provide a continuity schedule for 2011A, 2012 YTD and 2012 E and 2013-**  
5 **2015 F showing CAPEX and Rate Base.**

6

7 **RESPONSE:**

8 a) The concept of Rate Base is applicable only to cost of service rate applications, and  
9 not rate applications that are made under the OEB's Incentive Regulation Mechanism  
10 (IRM) such as the current proceeding. Notwithstanding this, THESL presents for  
11 illustration purposes in the schedule below the components the Board-approved rate  
12 base for 2011, actual rate base for 2011, and assumed rate base for the years 2012 and  
13 2013. The latter amounts assume that (a) the OEB will approve, for purposes of  
14 calculating distribution rates for the said years, capital expenditures that are at the  
15 same levels as those proposed in the current IRM on a/ICM application, and (b) the  
16 working capital allowance is determined on a historical basis.

/U

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
 INTERROGATORIES ON ISSUE 1.3**

	2011 Approved	2011 Actual	2012 (YTD Actual)	2012 Forecast <sup>(1)</sup>	2013 Forecast <sup>(1)</sup>
<b>CAPEX</b>	\$ 378.8	\$ 445.5	\$ 152.5	\$ 274.7	\$ 579.1
<b>GROSS FIXED ASSETS</b>					
Opening Balance	\$ 4,183.6	\$ 4,179.7	\$ 4,607.8	\$ 4,607.8	\$ 4,882.3
Additions	\$ 348.9	\$ 439.1	\$ 120.8	\$ 274.5	\$ 578.6
Disposals	\$ -	\$ (11.1)	\$ (6.2)	\$ -	\$ -
<b>Closing Balance</b>	<b>\$ 4,532.5</b>	<b>\$ 4,607.8</b>	<b>\$ 4,722.3</b>	<b>\$ 4,882.3</b>	<b>\$ 5,460.9</b>
<b>ACCUMULATED DEPRECIATION</b>					
Opening Balance	\$ (2,285.7)	\$ (2,283.9)	\$ (2,424.2)	\$ (2,424.2)	\$ (2,571.6)
Accumulated Depreciation	\$ (141.6)	\$ (148.6)	\$ (93.0)	\$ (147.4)	\$ (156.5)
Disposals	\$ -	\$ 8.3	\$ 5.7	\$ -	\$ -
<b>Closing Balance</b>	<b>\$ (2,427.4)</b>	<b>\$ (2,424.2)</b>	<b>\$ (2,511.5)</b>	<b>\$ (2,571.6)</b>	<b>\$ (2,728.1)</b>
<b>NET FIXED ASSETS OPENING BALANCE</b>	\$ 1,897.8	\$ 1,895.8	\$ 2,183.5	\$ 2,183.5	\$ 2,310.7
<b>NET FIXED ASSETS CLOSING BALANCE</b>	\$ 2,105.1	\$ 2,183.5	\$ 2,210.9	\$ 2,310.7	\$ 2,732.8
Average NFA	\$ 2,001.4	\$ 2,039.7	\$ 2,197.2	\$ 2,247.1	\$ 2,521.7
Working Capital Allowance	\$ 296.7	\$ 313.6	n/a	\$ 326.2	\$ 348.5
Rate Base	\$ 2,298.2	\$ 2,353.2	n/a	\$ 2,573.3	\$ 2,870.2

(1) Additions are assumed as per the ICM framework to be effective January 1st of the year in which the capital spend is reported and well as the associated depreciation.

/U

- 1 **b) Please reconcile to Gross and Net fixed assets in the Spreadsheet “Incremental**
- 2 **Capital Proj. Wksheet 20120510”.**

3

4 **RESPONSE:**

- 5 b) Please see the schedules below.

/U

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
 INTERROGATORIES ON ISSUE 1.3**

	2012 Forecast	2013 Forecast
<b>CAPEX</b>	\$ 274.7	\$ 579.1
<b>GROSS FIXED ASSETS</b>		
Opening Balance	\$ 4,607.8	\$ 4,882.3
C1 Underground Infrastructure	\$ 28.8	\$ 58.9
C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers	\$ 0.1	\$ 5.4
C3 Handwell Replacement	\$ 13.7	\$ 16.7
C4 Overhead Infrastructure	\$ 9.1	\$ 55.9
C5 Box Construction	\$ 0.6	\$ 23.0
C6 Rear Lot Construction	\$ 16.4	\$ 29.4
C7 Polymer SMD-20 Fuses	\$ -	\$ 1.5
C8 Scadamate R1 Switches	\$ -	\$ 1.4
C9 Network Vault & Roofs	\$ 2.8	\$ 18.8
C10 Fibertop Network Units	\$ 1.5	\$ 7.7
C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)	\$ -	\$ 3.3
C12 Stations Power Transformers	\$ 0.4	\$ 3.5
C13 Stations Switchgear	\$ 1.7	\$ 21.8
C14 Stations Circuit Breakers	\$ 0.8	\$ 0.6
C15 Stations Control & Communicaton Systems	\$ 0.1	\$ 1.0
C16 Downtown Station Load Transfers	\$ 0.7	\$ 2.1
C17 Bremner Transformer Station	\$ 8.5	\$ 81.0
C18 Hydro One Capital Contributions	\$ 23.0	\$ 48.1
C19 Feeder Automation	\$ 2.3	\$ 20.7
C20 Wholesale and Smart Metering	\$ 4.7	\$ 8.4
C21 Externally-Initiated Plant Relocations and Expansions	\$ 10.2	\$ 24.8
PCI Total	\$ 149.3	\$ 144.5
Additions	\$ 274.5	\$ 578.6
Disposables	\$ -	\$ -
<b>Closing Balance</b>	<b>\$ 4,882.3</b>	<b>\$ 5,460.9</b>

/U



**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
 INTERROGATORIES ON ISSUE 1.3**

	2012 Forecast	2013 Forecast
<i>ACCUMULATED DEPRECIATION</i>		
Opening Balance	\$ (2,424.2)	\$ (2,571.6)
C1 Underground Infrastructure	\$ (0.9)	\$ (1.9)
C2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers	\$ (0.0)	\$ (0.1)
C3 Handwell Replacement	\$ (0.3)	\$ (0.4)
C4 Overhead Infrastructure	\$ (0.2)	\$ (1.5)
C5 Box Construction	\$ (0.0)	\$ (0.6)
C6 Rear Lot Construction	\$ (0.5)	\$ (0.9)
C7 Polymer SMD-20 Fuses	\$ -	\$ (0.0)
C8 Scadamate R1 Switches	\$ -	\$ (0.0)
C9 Network Vault & Roofs	\$ (0.1)	\$ (0.6)
C10 Fibertop Network Units	\$ (0.1)	\$ (0.4)
C11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)	\$ -	\$ (0.1)
C12 Stations Power Transformers	\$ (0.0)	\$ (0.1)
C13 Stations Switchgear	\$ (0.0)	\$ (0.6)
C14 Stations Circuit Breakers	\$ (0.0)	\$ (0.0)
C15 Stations Control & Communicaton Systems	\$ (0.0)	\$ (0.1)
C16 Downtown Station Load Transfers	\$ (0.0)	\$ (0.1)
C17 Bremner Transformer Station	\$ (0.2)	\$ (2.1)
C18 Hydro One Capital Contributions	\$ (0.9)	\$ (1.9)
C19 Feeder Automation	\$ (0.1)	\$ (0.7)
C20 Wholesale and Smart Metering	\$ (0.3)	\$ (0.4)
C21 Externally-Initiated Plant Relocations and Expansions	\$ (0.3)	\$ (0.8)
Depreciation on 2012 Additions		\$ (4.1)
PCI Total /Depreciation on 2012 Opening Balance/Accounting vs ICM Depreciation Calcu	\$ (143.3)	\$ (139.1)
Accumulated Depreciation	\$ (147.4)	\$ (156.5)
Disposables	\$ -	\$ -
<b>Closing Balance</b>	<b>\$ (2,571.6)</b>	<b>\$ (2,728.1)</b>
<i>NET FIXED ASSETS OPENING BALANCE</i>	\$ 2,183.5	\$ 2,310.7
<i>NET FIXED ASSETS CLOSING BALANCE</i>	\$ 2,310.7	\$ 2,732.8
Average NFA	\$ 2,247.1	\$ 2,521.7
Working Capital Allowance	\$ 326.2	\$ 348.5
Rate Base	\$ 2,573.3	\$ 2,870.2

/U

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
INTERROGATORIES ON ISSUE 1.3**

1 **INTERROGATORY 10:**

2 **Reference(s):** **Managers Summary Tab 2, Page 8 &**  
3 **EB-2010-0142 Exhibit B1, Tab 7, Schedule 1, Appendix A**  
4 **Corrected: 2010 Nov 8, Proforma statement of cash Flows**

5

6 THESL indicates that “The only source of funds available to THESL to cover the cost of  
7 the investment is revenue through distribution rates”.

8

9 Please provide a proforma Statement of Cash Flows 2011-2014 in the same format as the  
10 second reference.

11

12 **RESPONSE:**

13 The 2011 actual and 2012 and 2013 proforma Statement of Cash Flow is presented  
14 below.

} /U

## RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES ON ISSUE 1.3

\$ Millions, Rounding variances may exist	mCGAAP	USGAAP	USGAAP
Consolidated Statements of Cash Flows As at December 31	Actual 2011	Forecast 2012	Budget 2013
	THESR	THESR	THESR
Net income for the period	94.6	90.7	113.1
<b><u>Adjustments for non-cash items</u></b>			
Equity in net income of subsidiary companies	-	-	-
Depreciation and amortization	146.4	137.6	141.5
Change in fair value of investment	-	-	-
Net change in other assets and liabilities	(1.5)	(2.0)	(5.6)
Payments in lieu of corporate taxes	(6.2)	8.7	-
Post-employment benefits	9.6	12.3	8.0
Dividends from subsidiary	-	-	-
Future Income taxes	0.3	(0.3)	-
Gain on disposal of PP&E	(3.9)	(1.5)	(1.5)
<b><u>Changes in non-cash working capital balances</u></b>			
Decrease (increase) in accounts receivable	(6.8)	(36.8)	10.5
Decrease (increase) in unbilled revenue	20.9	(9.1)	5.8
Increase (decrease) in current assets	0.0	1.7	(0.8)
Increase (decrease) in restructuring costs	-	10.2	(10.2)
Increase (decrease) in current liabilities	38.4	(22.7)	56.7
<b>Net cash provided by operating activities</b>	<b>291.7</b>	<b>188.9</b>	<b>317.5</b>
<b>Investing activities</b>			
Purchase of property, plant, eq. and intangibles	(425.9)	(288.9)	(582.0)
Investment in subsidiary	-	-	-
Purchase of investment	-	-	-
Proceeds from investments	-	1.7	2.0
Increase in note receivable from related party	-	-	-
Net change in regulatory assets and liabilities	(31.7)	(7.5)	3.5
Proceeds from sale of assets	5.0	-	-
Common shares issued	-	-	-
<b>Net cash used in investing activities</b>	<b>(452.6)</b>	<b>(294.7)</b>	<b>(576.5)</b>
<b>Financing activities</b>			
Dividends paid	-	-	(46.7)
Increase in notes payables and debentures	53.0	60.0	725.1
Repayment of debentures	-	-	(485.1)
Borrowings (payment) from/of line of credit	-	-	37.0
Increase (decrease) in customers' advance dep.	(8.2)	9.0	6.7
Other financing activities	-	-	-
<b>Net cash provided by (used in) financing activities</b>	<b>44.8</b>	<b>69.0</b>	<b>237.0</b>
<b>Net incr. (decr.) in C&amp;E during the period</b>	<b>(116.1)</b>	<b>(36.8)</b>	<b>(22.0)</b>
<b>Cash and cash equivalents, beginning of period</b>	<b>175.51</b>	<b>59.4</b>	<b>22.6</b>
<b>Cash and cash equivalents, end of period</b>	<b>59.4</b>	<b>22.7</b>	<b>0.6</b>

/U

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
INTERROGATORIES ON ISSUE 1.3**

1 As described in the cover letter, dated October 31, 2012, THESL has asked the OEB to  
2 consider the work programs identified for 2012 and 2013 together, and to defer  
3 consideration of the work program for 2014 to a later date. In light of this requested  
4 bifurcation of the proceeding and THESL's obligation to update the 2014 information for  
5 any material changes prior to it being reviewed, it would not assist the OEB or  
6 intervenors to provide the 2014 information requested in this interrogatory during the first  
7 phase of this application.

/U

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 1.3**

1 **INTERROGATORY 10:**

2 **Reference(s):** Tab 2. Appendix 1

3

4 **a) Please confirm that the allocation of the \$12.9 M for 2012 to customer classes is**  
5 **based on each class' revenue contribution to the approved base distribution**  
6 **revenue requirement using 2011 rates and loads.**

7

8 **RESPONSE:**

9 a) The allocation of the \$12.9M for 2012 to customer classes is based on each class'  
10 revenue contribution to the approved base distribution revenue requirement using  
11 2011 OEB-approved rates and loads.

12

13 **b) If this is the case, please explain why the resulting rider for the Residential class**  
14 **is more than twice that for the Competitive Sector Multi-Unit Residential class**  
15 **(\$0.44 vs. \$0.17) when the monthly service charge is only 7.3% higher (\$18.25 vs.**  
16 **\$17).**

17

18 **RESPONSE:**

19 b) The values for percentage of revenue used in the tables filed are incorrect. Please see  
20 the response to EP interrogatory 7a (Tab 6C, Schedule 7-7, part a).

21

22 **c) Please provide the working excel spreadsheet that derives the fixed and variable**  
23 **revenues for each rate class based on approved rates and the resulting**  
24 **percentages set out in columns A-C of the tables on pages 2-4.**

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 1.3**

1 **RESPONSE:**

2 c) The derivation of the fixed and variable revenues is contained in Tab 4, Schedule  
3 E1.1, page 8. The attached Appendix A recreates this sheet from the ICM model in  
4 Excel format.

5

6 THESL has provided an updated and corrected version of Tab 4, Schedule E1.1, as  
7 well as an updated and corrected version of Tab 2, Appendix 1.

} /U

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
 COALITION INTERROGATORIES ON ISSUE 2.1**

1 **INTERROGATORY 16:**

2 **Reference(s):** Tab 2, page 16, lines 3-5 Tab 4, Schedule A, Appendix 1, page 1

- 3
- 4 a) How much of the capital spending for each year (as set out in Tab 4) is for facilities  
 5 that will actually be in-service by the end of the year in which the capital is reported  
 6 as being spent?
- 7 b) If all the capital spending set out in Tab 4 will not be in-service the same year in  
 8 which the spend occurs, please provide a schedule that sets out for each of 2012  
 9 through 2014 year ends, the capital spending that is “in-service” versus “work-in-  
 10 progress”.

11

12 **RESPONSE:**

13 a) and b)

14

15 Forecasted spend in-service and not in-service for 2012 and 2013 year-ends is as follows:

Year	Forecasted Capital Spend (\$M)	Forecasted Capital In- Service (%)	Forecasted Capital In- Service (\$M)	Forecasted Capital Not In- Service (\$M)
2012	274.68	41%	112.62	162.06
2013	579.09	49%	283.76	295.34

16 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB  
 17 to consider the work programs identified for 2012 and 2013 together, and to defer  
 18 consideration of the work program for 2014 to a later date. In light of this requested  
 19 bifurcation of the proceeding and THESL’s obligation to update the 2014 information

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.1**

1 for any material changes prior to it being reviewed, it would not assist the OEB or  
2 intervenors to provide information on the 2014 work program in response to this  
3 interrogatory during the first phase of this application.

} /U



**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.1**

1 **INTERROGATORY 17:**

2 **Reference(s):**           **Tab 2, page 23, lines 1-2**

3

4 Preamble:

5 The Board's ICM filing requirements as set out on pages VI and VII of Appendix B in  
6 the Supplementary require the Applicant to provide a description of the actions the  
7 distributor will take in the event that the Board does not approve the application.

8

9 **a) Is it THESL's position that it will not undertake the proposed capital spending if**  
10 **the ICM request is not approved (per the statement on page 23)?**

11

12 **RESPONSE:**

13 a) On a planned basis, THESL will expect to operate within the resource envelope  
14 approved by the OEB in this proceeding. If unforeseen critical contingencies arise  
15 after the decision is released, THESL may be required to re-prioritize the deployment  
16 of its remaining resources to meet the most critical needs.

17

18 **b) If yes, what actions will THESL take to address/manage the issues identified in**  
19 **the Application?**

20

21 **RESPONSE:**

22 b) Please see THESL's response to OEB Staff interrogatory 10 (Tab 6A, Schedule  
23 1-10).

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
 COALITION INTERROGATORIES ON ISSUE 2.1**

1 c) What is the current status of the ICM spending proposed for 2012? Please  
 2 provide a schedule that sets out the actual 2012 spending to date for each  
 3 project.  
 4

5 **RESPONSE:**

6 c) The following table provides the actual spending for each project to the end of August  
 7 2012:

Schedule Number	Projects	Segments	2012 Actuals (Aug/12)
B1	Underground Infrastructure and Cable	Underground Infrastructure	14.63
B2		Paper Insulated Lead Covered Cable - Piece Outs and	-
B3		Handwell Replacement	6.37
B4	Overhead Infrastructure and Equipment	Overhead Infrastructure	1.63
B5		Box Construction	0.02
B6		Rear Lot Construction	9.36
B7		Polymer SMD-20 Switches	
B8		SCADA-Mate R1 Switches	
B9	Network Infrastructure and Equipment	Network Vault & Roofs	0.65
B10		Fibertop Network Units	0.00
B11		Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)	
B12	Station Infrastructure and Equipment	Stations Power Transformers	-
B13.1 & 13.2		Stations Switchgear - Municipal and Transformer Stations	1.05
B14		Stations Circuit Breakers	0.11
B15		Stations Control & Communicaton Systems	0.03
B16		Downtown Station Load Transfers	0.03
B17		Bremner TS	Bremner Transformer Station
B18	Hydro One Capital Contributions	Hydro One Capital Contributions	18.21
B19	Feeder Automation	Feeder Automation	-
B20	Metering	Metering	2.41
B21	Plant Relocations	Externally-Initiated Plant Relocations and Expansions	2.23
B22	Grid Solutions	Grid Solutions	
C1	Operations Portfolio Capital		71.92
C2	Information Technology Capital		13.53
C3	Fleet Capital		0.73
C4	Buildings and Facilities Capital		3.01
	Allowance for Funds Used During Construction		
<b>Total</b>			<b>149.30</b>

/U

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.1**

1 **INTERROGATORY 19:**

2 **Reference(s):**           **Tab 4, Schedule E1.1, page 11**

3

4 a) Please provide fully accessible versions of the ICM models that allow parties to see  
5 the derivation of the Incremental Capital CAPEX (e.g. \$275,754,831 for 2012).

6

7 **RESPONSE:**

8 a) An updated Tab 4, Schedule E1.1, E1.2 and E1.3 reflecting the updated capital for  
9 2012 has been filed in Excel and hardcopy formats. Schedule E1.2 shows the  
10 derivation of the Incremental Capital amount input on page 11 of Tab 4, Schedule  
11 E1.1.

} /U

## RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES ON ISSUE 2.2

1 **INTERROGATORY 26:**

2 **Reference(s):** **T4/S A/App. 1 and *Filing Requirements for Electricity***  
3 ***Transmission and Distribution Applications, June 28, 2012,***  
4 **Ch. 3**

5

6 On page 8 of Chapter 3 of the Filing Requirements, it is stated that:

7 “A distributor applying for recovery of incremental capital should calculate the  
8 eligible incremental capital amount by taking the difference between the 2012  
9 total non-discretionary capital expenditure and the materiality threshold.”

10 [emphasis added].

11

12 The first reference is to the “Summary of the Capital Program provided by THESL which  
13 is a table listing the various projects that make up THESL’s requests in the present  
14 application:

15

16 **a) Please state the definition of ‘non-discretionary’ that THESL is using for the**  
17 **purposes of this application. If the definition includes more than one factor,**  
18 **please provide at least one example for each factor from this application.**

19

20 **RESPONSE:**

21 a) Please refer to the Revised Manager’s Summary discussion of this issue under the  
22 headings ‘Need’ and ‘Safety Considerations Pertinent to Need’ at pages 16-19.

23 Please also refer to THESL’s responses to SEC interrogatories 8 and 9 (Tab 6E,  
24 Schedules 10-8 and 10-9).

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
INTERROGATORIES ON ISSUE 2.2**

1 **b) Please provide a priority ranking for each of the projects listed in this table from**  
2 **Schedule Number B1 to B22 from “1” for most important to “22” for least**  
3 **important.**

4

5 **RESPONSE:**

6 b) THESL does not believe that the projects can be ranked in terms of priority. The  
7 projects in THESL’s application have been identified and included because they meet  
8 the ICM eligibility factors, are essential to maintain the safety and reliability of the  
9 distribution system and THESL has no other options to fund them at this time. While  
10 THESL can only implement a limited number of jobs in a given year for a variety of  
11 reasons (including resource availability, project planning constraints, external factors  
12 such as availability and timing of permits, etc.), each aggregate project contains jobs  
13 that require more or less equally essential work.

14

15 **c) For each of the years 2012 to 2014, please break down the amounts in this table**  
16 **into assets that will be in service in the year in question versus those which will**  
17 **be in service in subsequent years.**

18

19 **RESPONSE:**

20 c) Please see THESL’s response to VECC interrogatory 16 (Tab 6E, Schedule  
21 11-16).

22

23 **d) Please state how much of the capital program outlined in this table was not**  
24 **included in the capital program proposed by THESL in the EB-2011-0144**  
25 **application.**

} /U

## **RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES ON ISSUE 2.2**

1 **RESPONSE:**

2 d) Of the jobs comprising the capital program outlined in the referenced table,  
3 \$120.89M was not included in the capital program identified by THESL in the  
4 EB-2011-0144 application.

5

6 **e) Please state how much of the capital program proposed in this application was**  
7 **not included in the capital program proposed by THESL in the EB-2010-0142**  
8 **application.**

9

10 **RESPONSE:**

11 e) Of the jobs comprising the capital program outlined in the referenced table,  
12 \$1,371.33M was not included in the capital program as filed by THESL in its  
13 EB-2010-0142 application. As stated in the Revised Manager's Summary, the ICM  
14 projects and associated jobs are new and incremental to the rebasing year (2011)  
15 revenue requirement. The limited overlap between capital work that was originally  
16 proposed in THESL's 2011 application (EB-2010-0142) and this application consists  
17 of:

18 (i) continuing capital work that was begun in 2011 and scheduled to be  
19 completed in 2012 (see Tab 4, Schedule C1, pp. 7-9), and

20 (ii) non-discretionary jobs initially proposed for construction in 2011 that could  
21 not proceed due to the unique circumstances of each job. No capital work was  
22 previously undertaken (i.e., prior to 2012) in respect of jobs in this category.

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 67:**

2 **Reference(s):** T4/S C1/p. 2

3

4 The above reference indicates that Engineering Capital consists of the labour costs of  
5 engineers, technologists, design technicians and power system controllers for  
6 engineering, design and planning work that they perform on distribution assets that are  
7 put in service. These costs are estimated at \$9.5M per year for 2012-2014.

8

9 **a) Please explain why the proposed engineering capital costs are not assigned to the**  
10 **associated distribution system assets or projects to which the work pertains.**

11

12 **RESPONSE:**

13 a) Engineering capital has been assigned directly to the ICM projects, but presented  
14 separately for projects within the materiality threshold. Engineering capital costs are  
15 allocated to projects at the time of completion based on the cost of each project before  
16 the allocation. The total cost of each project is then capitalized to a specific asset.  
17 Thus, all Engineering Capital costs are ultimately capitalized to project-specific  
18 assets.

19

20 **b) Please explain how the proposed \$9.5M per year for 2012-2014 for Engineering**  
21 **Capital was arrived at, including appropriate cost breakdowns.**

22

23 **RESPONSE:**

24 b) \$9.5 million represents approximately 8% of the distribution asset capital budget for  
25 projects comprising the Operations Portfolio Capital for 2012 and 2013. The 8% is

} /U

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
INTERROGATORIES ON ISSUE 2.2**

1 the proportion of the 2011 Engineering Capital amount to the 2011 total distribution  
2 capital expenditures. Both the Engineering Capital and total distribution capital  
3 expenditures are based on gross distribution capital (excluding recoverable customer  
4 contributions), and excluding station enhancement capital. As stated in Tab 4,  
5 Schedule C1, page 2, Engineering Capital consist of the labour costs of engineers,  
6 technologists, design technicians and power system controllers (“PSCs”) for  
7 engineering, design and planning work that they perform on distribution assets that  
8 are put in service.

9  
10 As described in the cover letter, dated October 31, 2012, THESL has asked the OEB  
11 to consider the work programs identified for 2012 and 2013 together, and to defer  
12 consideration of the work program for 2014 to a later date. In light of this requested  
13 bifurcation of the proceeding and THESL’s obligation to update the 2014 information  
14 for any material changes prior to it being reviewed, it would not assist the OEB or  
15 intervenors to provide information on the 2014 work program in response to this  
16 interrogatory during the first phase of this application.

/U



## RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES ON ISSUE 2.2

1 **INTERROGATORY 68:**

2 **Reference(s):** T4/S C1/p. 2

3

4 Table 3 on page 5 of the reference provides THESL's proposed expenditures for Worst  
5 Performing Feeder (WPF) of \$6.10M, \$24.50M and \$24.50M for 2012, 2013 and 2014,  
6 respectively for a total WPF expenditure of \$55.1M.

7

8 Please explain how the proposed WPF expenditures shown in Table 3 of the reference  
9 were arrived at, including appropriate cost breakdowns.

10

11 **RESPONSE:**

12 THESL's proposed expenditures for the Worst Performing Feeder (WPF) program are  
13 based on the most recent cost estimates to complete each specific project under the  
14 program. The updated proposed estimated expenditures are \$4.90 million and \$5.44  
15 million for 2012 and 2013, respectively.

16

17 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to  
18 consider the work programs identified for 2012 and 2013 together, and to defer  
19 consideration of the work program for 2014 to a later date. In light of this requested  
20 bifurcation of the proceeding and THESL's obligation to update the 2014 information for  
21 any material changes prior to it being reviewed, it would not assist the OEB or  
22 intervenors to provide information on the 2014 work program in response to this  
23 interrogatory during the first phase of this application.

24

25 Tables 1 and 2 below present the breakdown of 2012 and 2013 forecast costs by project.

/U

## RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES ON ISSUE 2.2

1 **Table 1: 2012 WPF Projects**

/U

Project Name	Estimated Cost (\$ Million)
W11204 FESI NY55M07 UG Cable ENHN-Phase IV	0.01
W12747 FESI - Dovehaven Crt.Voltage Conversion (SS55-F5)	0.28
W10504 BRIAN D W10504 McGLASHAN CRT UG REBUILD	0.32
W12729 FESI - Harlandale OH 80M1 Civil (poles & anchors) and Electrical	0.02
E12349 Leslie Railway/Steeles Porcelain Insulator Replacement NYSS68F4	0.18
E12356 Finch Ave Pole Rep. NY51M8 OH Rebuild	0.08
E12682 NY53M8 FESI Lightning Arrestors and Pole Replacement	0.18
W10495 - 1040 SHEPPARD AVE E APRIL 2012	0.04
W10495 - 3533 BATHURST ST MARCH 2012	0.02
W10495 - 3575 Bathurst Street Created Oct 2010	0.04
W10495 -560 St Germain & 95 Falkirk Created Oct 2010	0.03
W10495 - 145 Neptune Drive Created Oct 2010	0.05
W10495 - 125 Neptune Drive Created Oct 2010	0.10
W10495 - 130 Neptune Drive Created Oct 2010	0.11
W10495 - 20 DANBY AVE APRIL 2012	0.02
W12328 - Ridley UG Rebuild & Cable	0.17
W10505 Spot Tx Replacement on Feeder 85M8 (est.22284)	0.48
X11733 P0067837 35m11 Pole/Tx Replac	0.01
E11704 XJF3 OH Tree Proof Rebuild Deep Dene	0.31
W10473 FESI-12 NY85M5 Harlock St Area OH Rbld	0.17
W10491 FESI-12 YK11M4 Runnymede UG Rehabs Ph1	0.00
W10495 FESI-12 85M5 Bathurst St UG Rehab (Ph1)	0.37
E11639 Finch-404 Feeder Upgrade (SS68-F9)	0.34
W10491 FESI-12 YK11M4 Runnymede UG Rehabs Ph2	0.32
W10495 FESI-12 85M5 Bathurst St UG Rehab (Ph2) (DESIGN ONLY)	0.03
W12729 FESI - Harlandale OH 80M1 Civil (poles & anchors) and Electrical	0.34

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
 INTERROGATORIES ON ISSUE 2.2**

<b>Project Name</b>	<b>Estimated Cost (\$ Million)</b>
W12328 FESI Ridley Blvd UG Reb and Cable Rep NY85M8	0.22
FESI Mitigation Patrols	0.66
<b>Total</b>	<b>4.90</b>

1 **Table 2: 2013 WPF Projects**

/U

<b>Project Name</b>	<b>Estimated Cost (\$ Million)</b>
W11204 FESI 55M7 Weston Knob Hill	1.34
W12294 FESI - Lateral Cable Replacmnt Finch TS 55M25	0.73
E11713 Installation of Animal Guards RC 4210	0.02
E11704 Deep Deene XJF3 Tree proof OH	0.26
W11443-Fairchild Trunk Cable Rehab Fairchild TS	1.99
FESI Mitigation CAPEX 2013	1.10
<b>Total</b>	<b>5.44</b>

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 69:**

2 **Reference(s):** T4/S C1/pp. 5-6

3

4 Table 4 on page 6 of the reference provides THESL's proposed expenditures for  
5 Customer Connections (net of Customer Contributions) of \$25.8M, \$30.00M and  
6 \$30.00M for 2012, 2013 and 2014, respectively for a total expenditure of \$85.8M.

7

8 Please explain how the proposed customer connection expenditures shown in Table 4 of  
9 the reference were arrived at, including appropriate cost breakdowns.

10

11 **RESPONSE:**

12 THESL's proposed estimated expenditures for Customer Connections are calculated  
13 based on the historical costs associated with the different types of activities that are  
14 anticipated to occur based on historical customer connection work and additional  
15 confirmed large customer connection requests. These activities include normal  
16 construction work to supply new residential services and general services class  
17 customers. The historical costs and labour requirements for each specific activity  
18 performed by THESL crews are determined and normalized over the past three years and  
19 are used to forecast future requirements and costs. Information for large customer  
20 connection requests is gathered through existing signed or draft Offers to Connect, as  
21 well as through communications between THESL designers and developers.

22

23 The updated proposed expenditures are \$24.98 million and \$37.39 million for 2012 and  
24 2013, respectively.

25

/U

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
 INTERROGATORIES ON ISSUE 2.2**

1 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to  
 2 consider the work programs identified for 2012 and 2013 together, and to defer  
 3 consideration of the work program for 2014 to a later date. In light of this requested  
 4 bifurcation of the proceeding and THESL’s obligation to update the 2014 information for  
 5 any material changes prior to it being reviewed, it would not assist the OEB or  
 6 intervenors to provide information on the 2014 work program in response to this  
 7 interrogatory during the first phase of this application.

8  
 9 The table below provides the breakdown of the updated proposed expenditures for  
 10 Customer Connections (net of Customer Contributions) for 2012 and 2013.

<b>Customer Class</b>	<b>2012</b>	<b>2013</b>
Residential services	\$2.55	\$3.90
General services	\$15.57	\$17.31
Large customer requests	\$6.87	\$16.19
<b>TOTAL</b>	<b>\$24.98</b>	<b>\$37.39</b>

/U

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
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1 **INTERROGATORY 70:**

2 **Reference(s):** T4/S C1/pp. 6-7

3

4 Table 5 on page 6 of the reference provides THESL's proposed Reactive Capital  
5 expenditures of \$27.70M, \$31.90M and \$32.70M for 2012, 2013 and 2014, respectively  
6 for a total expenditure of \$92.3M.

7

8 Please explain how the proposed Reactive Capital expenditures shown in Table 5 of the  
9 reference were arrived at, including appropriate cost breakdowns.

10

11 **RESPONSE:**

12 The Reactive Capital program focuses on work requiring capital expenditures on  
13 overhead assets, underground assets and stations and metering assets needed to restore  
14 power to customers in the case of outages, to mitigate potential safety risks to the public,  
15 to maintain system integrity, to maintain accurate billing, to perform corrective work to  
16 address failed and defective equipment and/or to address other unexpected events that  
17 require immediate action. THESL calculated the proposed expenditures by for each of  
18 these asset classifications based on their historical system performance, analyses of  
19 failure trends, and the trends of the number of work requests for reactive capital work  
20 over the past five years.

21

22 The updated proposed expenditures for the Reactive Capital work are \$25.43 million and  
23 \$29.30 million for 2012 and 2013, respectively.

24

} /U

## RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES ON ISSUE 2.2

1 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to  
2 consider the work programs identified for 2012 and 2013 together, and to defer  
3 consideration of the work program for 2014 to a later date. In light of this requested  
4 bifurcation of the proceeding and THESL's obligation to update the 2014 information for  
5 any material changes prior to it being reviewed, it would not assist the OEB or  
6 intervenors to provide information on the 2014 work program in response to this  
7 interrogatory during the first phase of this application.

8  
9 The table below provides the breakdown of the updated proposed expenditures for  
10 Reactive Capital for 2012 and 2013.

11  
12 **Table 1: Reactive Capital Summary (\$ M)**

Asset Classification	2012	2013
Underground Assets	16.10	17.80
Overhead Assets	7.80	9.60
Stations and Metering Assets	0.70 0.80	1.10 0.80
<b>Total</b>	<b>25.40</b>	<b>29.30</b>

13 Table 2 summarizes the historical Reactive Capital investments in 2008-2011 and the  
14 proposed Reactive Capital budget in 2012-2013.

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
 INTERROGATORIES ON ISSUE 2.2**

1 **Table 2: Historical Reactive Capital Summary (\$ millions)**

	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 Projected	2013 Projected
Underground Assets	11.2	9.4	12.9	17.6	16.10	17.80
Overhead Assets	7.6	10.7	11.7	10.7	7.80	9.60
Stations Assets	0.5	0.6	0.5	0.3	0.70	1.10
Metering Assets	-	-	-	-	0.80	0.80
<b>Total</b>	19.3	20.7	25.1	28.6	25.40	29.30

2 As shown in Table 2, Reactive Capital expenditures have been steadily increasing from  
 3 2008 to 2011 and the trend is expected to continue for the period 2012 to 2013.

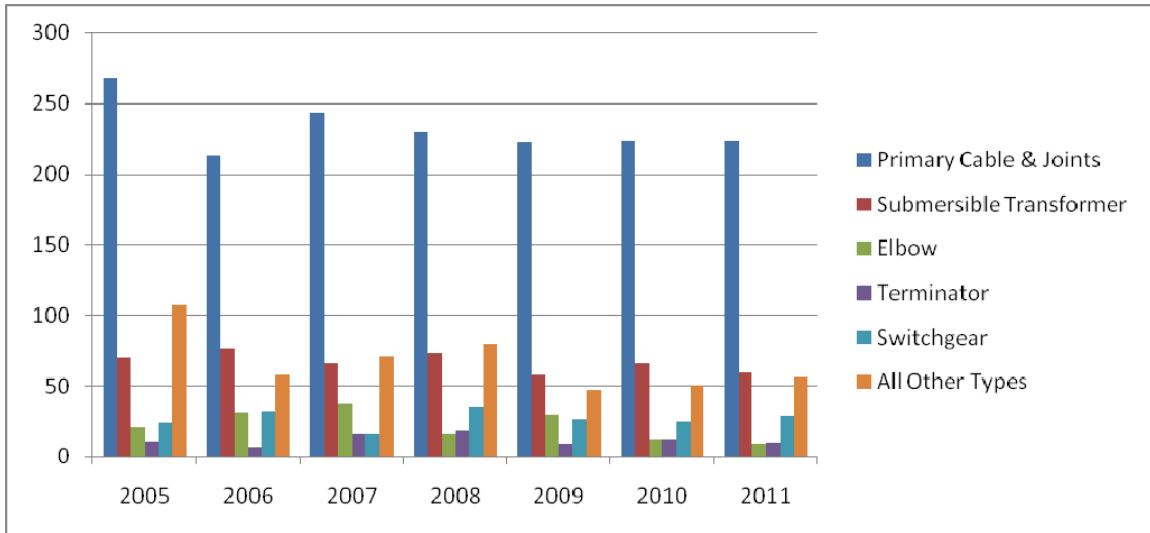
4  
 5 **Underground Assets**

6 The Underground Reactive Capital expenditure indicates an increasing historical trend in  
 7 Table 2. The cause of defective underground equipment outages by asset class is shown  
 8 below in Figure 1 with primary underground cable and joint breakdown being the major  
 9 contributors. This reactive work is very costly but is necessary to restore power to the  
 10 system. The projected spend in 2012 is lower than 2011 and that is attributed to the  
 11 successful upgrades and replacements on THESL's underground system over the last  
 12 several years. The deteriorating underground assets issues are not sustained and are  
 13 anticipated to continue to occur in 2013.

/U



**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
 INTERROGATORIES ON ISSUE 2.2**



1 **Figure 1: Historical Cause of Underground Outages**

2

3 **Overhead Assets**

4 The historical expenditures from 2008-2011 for Overhead Reactive Capital work in  
 5 Table 2, shows a slow but steady increase in spending to address the outages and  
 6 subsequent corrective work requests. Based on this trend, THESL projects \$7.8 million  
 7 in 2012 and \$9.6 million in 2013 to address all overhead system corrective work requests

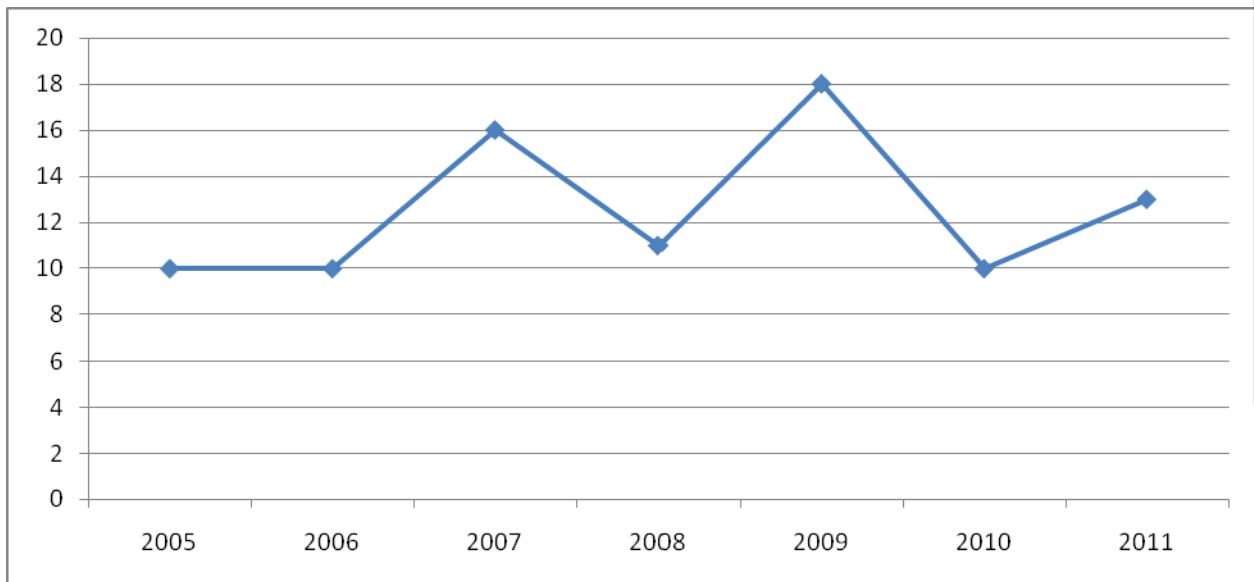
8

9 **Stations Assets**

10 The Stations Reactive Capital budget consists of the replacement of station equipment  
 11 failures such as transformers, circuit breakers, batteries/chargers, SCADA telemetry  
 12 and/or control equipment, station alarms, DC panels, station heating and ventilations, and  
 13 sump pumps installed inside stations. THESL is projecting a continuation of the above-  
 14 mentioned trends for all classes of distribution and stations equipment through 2012-  
 15 2013. The outages caused by defective stations equipment are shown in Figure 2. Based

## RESPONSES TO ONTARIO ENERGY BOARD STAFF INTERROGATORIES ON ISSUE 2.2

1 on historical portfolio trends, and asset age, THESL projects the Stations Reactive  
2 Capital of \$0.7 million in 2012, and an increase to \$1.0 million in 2013.



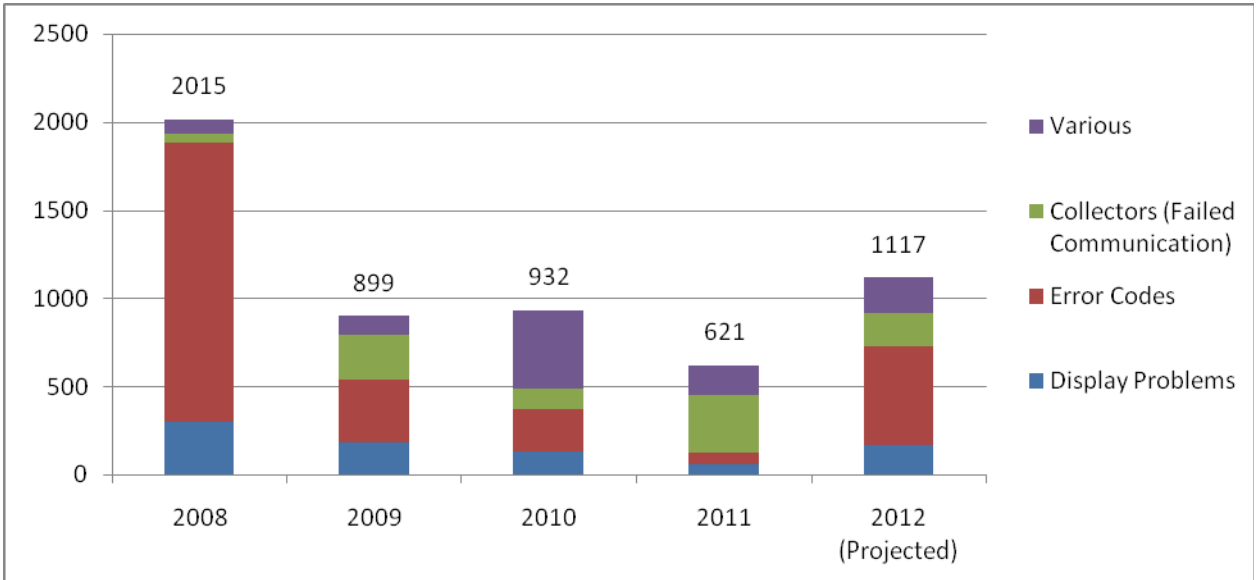
3 **Figure 2: Historical Outages due to Defective Stations Equipment**

4

### 5 **Metering Assets**

6 THESL has replaced close to 685,000 conventional meters with smart meters to date.  
7 Smart meters consist of more complex components than traditional mechanical meters.  
8 As shown in Figure 3, the potential failure of smart meters can be caused by the  
9 following malfunctions: liquid crystal display (LCD), health check, meter error codes,  
10 wide area network (WAN) communication modems, firmware, local area network (LAN)  
11 transmitters and receivers. The 2012 projection is based on historic average number of  
12 malfunctions experienced from 2008 to 2011.

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
INTERROGATORIES ON ISSUE 2.2**



1 **Figure 3: Metering Assets Failure Causes**

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 71:**

2 **Reference(s):** T4/S C1/pp. 7-9

3

4 The proposed capital expenditures for each of these groups is given in Table 6 on page 9  
5 of the reference which indicates expenditures of \$52.60M, \$25.70M and \$24.90M for  
6 2012, 2013 and 2014, respectively for a total expenditure of \$103.2M.

7

8 Please explain how the proposed capital expenditures shown in Table 6 of the reference  
9 were arrived at, including appropriate cost breakdowns.

10

11 **RESPONSE:**

12 The proposed capital expenditures in the Continuing Projects and Emerging Issues  
13 Portfolio were arrived at through the identification and forecasting of capital work that  
14 satisfies the criteria described in the referenced evidence. The updated proposed  
15 expenditures for the Continuing Projects and Emerging Issues Portfolio are  
16 \$55.73 million and \$40.00 million for 2012 and 2013, respectively. The forecast costs  
17 are based on the most recent cost estimates to complete each specific project or program.

18

19 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to  
20 consider the work programs identified for 2012 and 2013 together, and to defer  
21 consideration of the work program for 2014 to a later date. In light of this requested  
22 bifurcation of the proceeding and THESL's obligation to update the 2014 information for  
23 any material changes prior to it being reviewed, it would not assist the OEB or  
24 intervenors to provide information on the 2014 work program in response to this  
25 interrogatory during the first phase of this application.

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**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
 INTERROGATORIES ON ISSUE 2.2**

1 Tables 1 to 3 below present the breakdown of forecast costs as follows:

- 2 • Table 1 – Breakdown of Continuing Projects from 2011 to 2012
- 3 • Table 2 – Breakdown of Emerging Projects for 2012
- 4 • Table 3 – Breakdown of Emerging Projects for 2013

} /U

5

6 **Table 1: Breakdown of Continuing Projects from 2011 to 2012**

/U

Project Name	Estimated Cost (\$ Million)
X11633 Roncesvalles Dundas TTC OH Rearrangement (DC-Carry Over)	\$0.19
E11664 Duncan Mills Road Bridge Rehabilitation NY51M29	\$0.07
S11651 Bathurst TS UIM for feeder automation NY85	\$0.08
S11652 Bathurst TS New relays for Grid NY85	\$0.24
X11414 ATS Replacement Locn #D9010 Richmond St. W. (Carry Over)	\$0.06
X11402 Replace 1-750KVA NW Tx A46GD	\$0.13
X12056 B2CD VC - Box Construction (Carry Over)	\$0.82
W11192 Eglinton MS Stage 3 B-3-5-EG OH Conv	\$0.78
W10096 O'Hara St OH VC	\$0.30
X11242 Runnymede YK11M8 (Carry Over)	\$1.27
W10365 Etobicoke Richview TS 88M1 to 88M16 Fusing (71 loc'ns)	\$0.01
E11749 PCB Transformer Rep OT72762 SCREF3	\$0.01
W10365 Etobicoke Richview TS 88M1 to 88M16 Fusing (71 loc'ns)	\$0.18
S11459 Bathurst ORC Customer project station work	\$0.28
S11446 Strachan TS feeder transfers (5 feeders remain & HONI work on 2nd TX connection to new bus)	\$0.09
S10160 Wiltshire TS remove tie to old bus & make safe	\$0.04
S10157 Glengrove TS remove tie to old bus & make safe	\$0.12

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
 INTERROGATORIES ON ISSUE 2.2**

<b>Project Name</b>	<b>Estimated Cost (\$ Million)</b>
S09346 George & Duke TS decomm- contractor on site in progress -relocate G&D to X group trip panel	\$0.17
S11608 Windsor TS: new CBC feeder - pilot wire	\$0.01
S11650 Terrauley TS: 3 new feeders Sick Kids Hospital - pilot wire	\$0.23
S12623 continue S11099 Centennial D'arcy Magee MS: Replace TR	\$0.47
S12777 Various MS Switchgear commitments with suppliers	\$0.40
S12627 High Level MS replace TR4 - high risk and high impact on reliability	\$0.22
S12626 High Level MS replace TR3 - high risk and high impact on reliability	\$0.22
S11656 Sherbourne MS: finish install of T3- tx on site- load on 2 remaining TX's primary LB switch to arrive Jan 16, 2012.	\$0.06
S11442 Jane MS: Replace TR#1 (to continue remaining work)	\$0.03
S10109 University MS Continue to complete TR3 & TR4 transformer replacement	\$0.40
S11099 Centennial D'arcy Magee MS: Replace TR (to continue remaining work)	\$0.12
S10438 Dufferin TS: Transfer A13DN and A14 DN (Carried over from 2011)	\$0.02
S11112 Improve SONET Redundancy: Parkdale MS (PQ) to Strachan TS	\$0.03
S11171 Scar Civic Centre: Replace RTU	\$0.05
S11398 Terauley TS: Replace S.S. main AC panel & Replace obsolete station Alarm Annunciator panel	\$0.12
X10421 Load Transfer Dufferin TS A5-6DN	\$0.03
E12424 Braymore West SCN47M14 UG Rebuild Electrical Ph1	\$0.59
E11158 Crow Trail 26M34 Underground Rehab Area A (Electrical)	\$0.29

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
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<b>Project Name</b>	<b>Estimated Cost (\$ Million)</b>
E11160 Crow Trail/Dunsfold 26M34 UG Rehab Area C (Electrical)	\$0.36
E11159 - Crow Trail B	\$0.01
E11457 Baylawn Petworth UG SCSGF2 (Civl)	\$0.02
E12215 Morningside Casebridge SCNT47M1 - Civil	\$0.01
E12423 Braymore W NA47M14 UG Rebuild Ph 1 (Civil)	\$0.02
X11292 FESI-12 Lawrence UG Feeder Cable Rebuild (NY34M7)	\$0.04
W11203 A3-4T to A9-22T Strachan Fdr Transfer	\$0.23
W11033 A47-49H Feeder Upgrade	\$0.01
W10335 Blaketon MS FUSING	\$0.17
W11757 PCB Transformers and Cable replacement	\$0.03
E10182 Conlins Morningside HWY401 UG Crossing NT47M8,NA47M15	\$0.10
W11033 A47-49H Feeder Upgrade	\$0.08
W10335 BLAKETON MS FUSING & SCADA INSTALLATION ETHLF2	\$0.01
Costs for completion of in-progress work elements, site restoration, work site demobilisation, contract design completion, customer engagement	\$7.63
<b>Total:</b>	<b>\$16.85</b>

1 **Table 2: Breakdown of Emerging Projects for 2012**

/U

<b>Program</b>	<b>Estimated Cost (\$ Million)</b>
Externally Initiated Plant Relocation	\$1.54
Feeder Automation	\$1.67
Network System Rebuild	\$1.88
Network Transformer Replacements	\$3.44

**RESPONSES TO ONTARIO ENERGY BOARD STAFF  
 INTERROGATORIES ON ISSUE 2.2**

<b>Program</b>	<b>Estimated Cost (\$ Million)</b>
Network Vault	\$1.00
Overhead Rear Lot Rebuild	\$2.02
Overhead System	\$8.22
Standardization	\$0.99
Stations Capital Work	\$2.83
Underground Capacity Growth	\$0.99
Underground Direct Buried Cable Replacement	\$7.87
Underground PILC	\$1.43
Underground Rehab	\$5.00
<b>Total:</b>	<b>\$38.88</b>

1 **Table 3: Breakdown of Emerging Projects for 2013**

/U

<b>Program</b>	<b>Estimated Cost (\$ Million)</b>
Externally Initiated Plant Relocation	\$2.77
Network Automation	\$2.14
Network Transformer Replacements	\$2.30
Overhead System	\$5.36
Stations Capital Work	\$4.74
Underground Capacity Growth	\$5.39
Underground Direct Buried Cable Replacement	\$5.26
Underground Rehab	\$12.04
<b>Total:</b>	<b>\$40.00</b>



**RESPONSES TO ASSOCIATION OF MAJOR POWER  
 CONSUMERS IN ONTARIO INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 6:**

2 **Reference(s):** Tab 4, Schedule A, Appendix 1, Page 1

3

4 **a) Please provide the labour components of the capital programs listed in Appendix**  
 5 **1.**

6

7 **RESPONSE:**

8 a) Please see table below:

/U

Summary of Capital Program			Cost Estimates (\$M)				
Schedule Number	Projects	Segments	2012 Forecast	2012 Labour	2013 Budget	2013 Labour	Total
B1	Underground Infrastructure and Cable	Underground Infrastructure	28.75	1.77	58.94	7.37	87.70
B2		Paper Insulated Lead Covered Cable - Piece Outs and Leakers	0.08	0.06	5.42	3.35	5.50
B3		Handwell Replacement	13.65	-	16.65	-	30.30
B4	Overhead Infrastructure and Equipment	Overhead Infrastructure	9.07	4.01	55.88	23.79	64.95
B5		Box Construction	0.58	0.26	23.04	9.39	23.62
B6		Rear Lot Construction	16.36	3.28	29.43	6.80	45.78
B7		Polymer SMD-20 Switches		-	1.53	1.25	1.53
B8		SCADA-Mate R1 Switches		-	1.43	0.15	1.43
B9	Network Infrastructure and Equipment	Network Vault & Roofs	2.84	0.46	18.76	3.75	21.60
B10		Fibertop Network Units	1.48	0.21	7.71	0.98	9.19
B11		Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)		-	3.26	0.92	3.26
B12	Station Infrastructure and Equipment	Stations Power Transformers	0.38	0.09	3.48	0.69	3.86
B13.1 & 13.2		Stations Switchgear - Municipal and Transformer Stations	1.73	0.63	21.81	4.16	23.54
B14		Stations Circuit Breakers	0.76	0.28	0.55	0.15	1.31
B15		Stations Control & Communicaton Systems	0.14	0.06	1.00	0.27	1.14
B16		Downtown Station Load Transfers	0.68	0.33	2.14	0.80	2.82
B17	Bremner TS	Bremner Transformer Station	8.50	-	81.00	-	89.50
B18	Hydro One Capital Contributions	Hydro One Capital Contributions	22.98	-	48.12	-	71.10
B19	Feeder Automation	Feeder Automation	2.30	0.40	20.66	3.54	22.97
B20	Metering	Metering	4.74	1.57	8.40	1.65	13.14
B21	Plant Relocations	Externally-Initiated Plant Relocations and Expansions	10.16	2.53	24.84	1.89	35.00
B22	Grid Solutions	Grid Solutions					-
C1	Operations Portfolio Capital		120.51	34.01	121.63	35.05	242.14
C2	Information Technology Capital		22.00	7.52	15.00	5.12	37.00
C3	Fleet Capital		0.80	0.04	2.00	0.04	2.80
C4	Buildings and Facilities Capital		5.00	0.36	5.00	0.36	10.00
	Allowance for Funds Used During Construction		1.20	-	1.40	-	2.60
<b>Total</b>			<b>274.68</b>	<b>57.85</b>	<b>579.09</b>	<b>111.47</b>	<b>853.78</b>

Panel: Part (a)-(d) Capital Planning Process

Panel: Parts (e)-(h) Rates and Revenue Requirement

**RESPONSES TO ASSOCIATION OF MAJOR POWER  
CONSUMERS IN ONTARIO INTERROGATORIES ON ISSUE 2.2**

1 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB  
2 to consider the work programs identified for 2012 and 2013 together, and to defer  
3 consideration of the work program for 2014 to a later date. In light of this requested  
4 bifurcation of the proceeding and THESL's obligation to update the 2014 information  
5 for any material changes prior to it being reviewed, it would not assist the OEB or  
6 intervenors to provide information on labour components of the 2014 work program  
7 in response to this interrogatory during the first phase of this application.  
8

U

9 **b) Please discuss the basis for the budget amounts i.e. which ones will be**  
10 **determined by competitive bidding?**

11  
12 **RESPONSE:**

13 b) THESL's practice is to undertake work that maximises the use of internal labour first.  
14 Once internal resources are fully utilised, the remaining work is provided to external  
15 contractors in accordance with their bid unit prices. The particular breakdown of  
16 what portions of each segment are to be contracted is dependent on scheduling and  
17 resource availability, and can change over time.  
18

19 **c) Please provide details of any new hires planned to carry out the incremental**  
20 **projects and reconcile total labour costs with new hires.**

21  
22 **RESPONSE:**

23 c) THESL currently has no plans for additional hires to carry out the incremental  
24 projects.  
25

**RESPONSES TO ASSOCIATION OF MAJOR POWER  
CONSUMERS IN ONTARIO INTERROGATORIES ON ISSUE 2.2**

1 **d) Please reproduce the Summary of Capital Program Table in Appendix 1 on the**  
2 **basis of highest priority to lowest priority.**

3

4 **RESPONSE:**

5 d) Please refer to THESL's response to OEB Staff interrogatory 26 (Tab 6F, Schedule  
6 1-26 part b).

7

8 **e) Please provide a Capital Spending Schedule that sets out on a comparative basis**  
9 **2009 actual capital spending, 2010 actual capital spending, 2011 approved**  
10 **(EB-2011-0142), 2011 actual, 2012 year to date and the proposed capital**  
11 **spending for 2012, 2013 and 2014 using the spending categories from**  
12 **EB-2011-0142 (Tab 8, Schedule 1, Page 5).**

13

14 **RESPONSE:**

15 e) Please refer to THESL's response to SEC interrogatory 6 (Tab 6E, Schedule 10-6).

16

17 **f) Please provide explanations for any categories where the variance is plus/minus**  
18 **10 % between 2011 approved and the 2011 actual.**

19

20 **RESPONSE:**

21 f) The OEB has historically approved overall total amounts for capital expenditures; it  
22 has not divided that amount between capital portfolios. As a result, it is not possible  
23 to compare variance by category between 2011 approved and the 2011 actuals.

24 Please refer to THESL's response to SEC interrogatory 6 (Tab 6E, Schedule 10-6).

25

**RESPONSES TO ASSOCIATION OF MAJOR POWER  
CONSUMERS IN ONTARIO INTERROGATORIES ON ISSUE 2.2**

1 **g) Please explain any significant variances for 2012, 2013 and 2014 compared to**  
2 **previous years.**

3

4 **RESPONSE:**

5 g) Please refer to THESL's response to SEC interrogatory 6 (Tab 6E, Schedule 10-6).

6

7 **h) Please identify the spending in the 2012, 2013 and 2014 budget that does not**  
8 **include replacement.**

9

10 **RESPONSE:**

11 h) Of the capital spending over 2012 to 2014, \$366.74M does not pertain to work  
12 including replacement.

**RESPONSES TO ASSOCIATION OF MAJOR POWER  
CONSUMERS IN ONTARIO INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 9:**

2 **Reference(s):** Tab 4, Schedule B1

3

4 **a) Page 4 – The evidence indicates that in 2011 Customers Interrupted (CI) and**  
5 **Customer Hours Interrupted (CHI) values for direct buried cables accounted for**  
6 **57% and 43% respectively for the CI and CHI for the entire underground**  
7 **distribution system. Please provide a breakdown of the other causes that make**  
8 **up 100% of the CI and CHI values in 2011.**

9

10 **RESPONSE:**

11 a) Table 1 below provides a breakdown of CI and CHI for 2011 by underground asset  
12 type.

13

14 **Table 1: Breakdown of CI and CHI for 2011 by underground asset type**

Asset	% CI	% CHI
Direct buried cable	57.0	43.0
Cable in duct	18.7	29.6
Elbow	3.0	1.7
Pothead	0.2	0.3
Switch	8.0	11.5
Termination	4.6	2.1
Transformer	8.4	11.9

15 **b) The Table on Page 4 provides the number of interruptions attributed to direct**  
16 **buried cable failures. Please explain the increase in 2005 and decrease in 2006.**

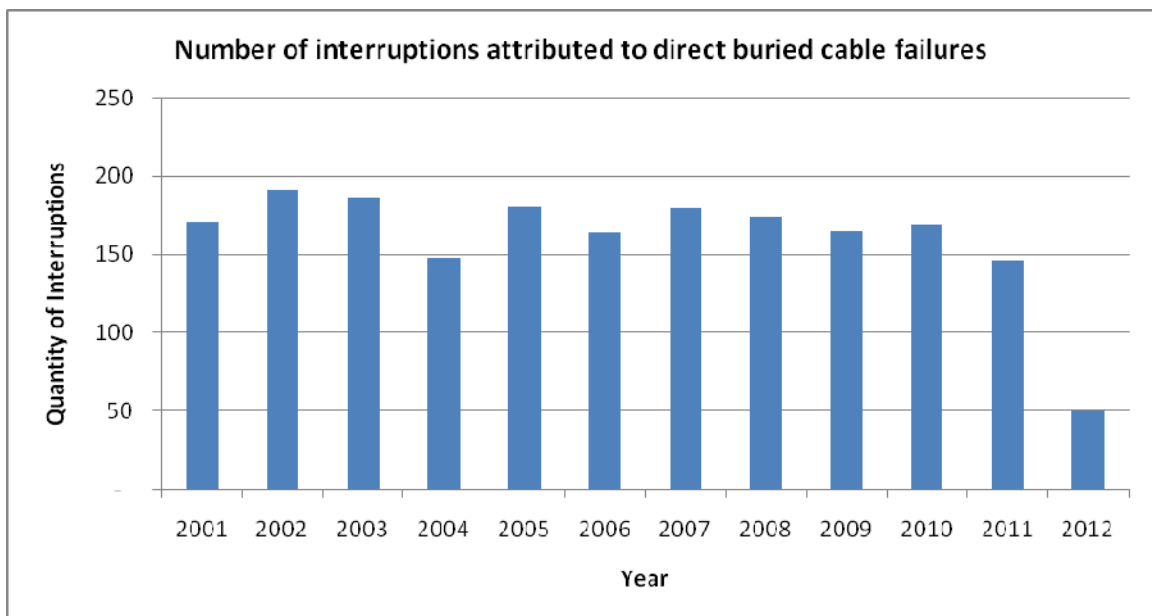
## RESPONSES TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO INTERROGATORIES ON ISSUE 2.2

1 **RESPONSE:**

2 b) Please note that Figures 1 and 43 in Tab 4, Schedule B1, which are the same, include  
3 both momentary and sustained interruptions attributed to direct buried cable failures.  
4 This is an error as the figure should only include sustained interruptions.

5  
6 Figure 1 below updates and corrects Figures 1 and 43. It shows only sustained  
7 interruptions due to direct buried cable failures. As is evident from the figure, there is  
8 only a slight difference between the number of interruptions attributed to direct buried  
9 cable failures in 2005 and 2006 that is well within the range of variation fluctuation  
10 seen among the years.

11  
12 The number for 2012 is for the first six months of the year.



13 **Figure 1: Number of interruptions attributed to direct buried cable failures.**

**RESPONSES TO ASSOCIATION OF MAJOR POWER  
CONSUMERS IN ONTARIO INTERROGATORIES ON ISSUE 2.2**

- 1 c) **Page 110 – The evidence indicates that 66% of the direct buried XLPE cables**  
2 **(580 circuit kilometres) are in need of immediate attention. Please confirm the**  
3 **total km proposed for replacement in 2012, 2013 and 2014.**

4

5 **RESPONSE:**

- 6 c) The total conductor kilometres of direct buried XLPE cable proposed for replacement  
7 in 2012 and 2013 are 237 and 49, respectively.

8

9 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB  
10 to consider the work programs identified for 2012 and 2013 together, and to defer  
11 consideration of the work program for 2014 to a later date. In light of this requested  
12 bifurcation of the proceeding and THESL's obligation to update the 2014 information  
13 for any material changes prior to it being reviewed, it would not assist the OEB or  
14 intervenors to provide information on the 2014 work program in response to this  
15 interrogatory during the first phase of this application.

10  
15

**RESPONSES TO ASSOCIATION OF MAJOR POWER  
CONSUMERS IN ONTARIO INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 11:**

2 **Reference(s):** Tab 4, Schedule B3

3

4 **a) Please provide the number of proposed handwell replacements by year.**

5

6 **RESPONSE:**

7 a)

Year	Number of Handwell Replacements (Target)
2012	2,587
2013	2,078
<b>Total</b>	<b>4,665</b>

} /U

8 **b) Please provide the number of handwell replacements in the downtown core by**  
9 **year.**

10

11 **RESPONSE:**

12 b)

Year	Number of Handwell Replacements in the Downtown Core
2010	2,592 (actual)
2011	2,999 (actual)
2012	2,587 (target)
2013	0

} /U



**RESPONSES TO ASSOCIATION OF MAJOR POWER  
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1 **INTERROGATORY 19:**

2 **Reference(s):**           **Tab 4, Schedule B10, Appendix A**

3

4 Preamble:

5 Appendix A contains a detailed list of projects.

6

7 a) Please confirm the number of proposed replacements by year is 61 in 2012, 61 in  
8       2013 and 65 in 2014.

9

10 **RESPONSE:**

11 The number of proposed replacements is 13 in 2012 and 48 in 2013.

12

13 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to  
14 consider the work programs identified for 2012 and 2013 together, and to defer  
15 consideration of the work program for 2014 to a later date. In light of this requested  
16 bifurcation of the proceeding and THESL's obligation to update the 2014 information for  
17 any material changes prior to it being reviewed, it would not assist the OEB or  
18 intervenors to provide information on the 2014 work program in response to this  
19 interrogatory during the first phase of this application.

} /U

**RESPONSES TO ASSOCIATION OF MAJOR POWER  
 CONSUMERS IN ONTARIO INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 29:**

2 **Reference(s):** Tab 4, Schedule C1

3

4 **a) Please reproduce Table 1 on Page 1 to include data for 2009 to 2011.**

5

6 **RESPONSE:**

7 a) Please see the table below.

8

9 **Operations Capital Budget 2009-2011 (\$ M)**

Project Name	2009	2010	2011
Engineering Capital	25.80	34.50	23.60
Worst Performing Feeder	<i>see Note 1</i>	16.70	19.30
Customer Connections (net of Customer Contributions)	14.20	16.00	28.40
Reactive Capital	20.70	25.10	28.60
Continuing Projects and Emerging Issues Portfolio	<i>see Note 2</i>	<i>see Note 2</i>	<i>see Note 2</i>
<b>TOTAL</b>	<b>60.70</b>	<b>92.30</b>	<b>99.90</b>

Note 1: 2009 Spending in Worst Performing Feeder

THESL introduced the Worst Performing Feeder portfolio at the beginning of 2010 to ensure the continued improvement in system reliability. This portfolio was not tracked prior to 2010. Therefore, THESL is unable to provide 2009 capital expenditure for the Worst Performing Feeder portfolio.

Note 2: 2009-2011

Spending in the Continuing Projects and Emerging Issues Portfolio

/U

**RESPONSES TO ASSOCIATION OF MAJOR POWER  
CONSUMERS IN ONTARIO INTERROGATORIES ON ISSUE 2.2**

1 THESL developed the “Emerging Issues” portfolio in May of 2012 as part of the  
2 change to IRM regulatory framework to address urgent and non-discretionary projects  
3 that emerge throughout the year that require short term attention. Historically, under  
4 Cost of Service (COS), THESL did not have a unique portfolio to keep track of  
5 Emerging issues as such projects were spread in other portfolios such as Customer  
6 Connection, Worse Performing Feeder, Overhead Infrastructure, Underground  
7 Infrastructure, etc. Therefore, THESL is unable to provide historical capital  
8 expenditure for the Emerging portfolio.

} /U

9

10 **b) Please provide a breakdown of the Continuing projects from 2011 into 2012 in**  
11 **Table 6 on Page 9.**

12

13 **RESPONSE:**

14 b) Please see the response in OEB Staff interrogatory 71 (Tab 6F, Schedule 1-71).

## **RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 27:**

2 **Reference(s):** **Tab 2, Appendix 4, pages 3 -5 Supplemental Report of the**  
3 **Board (EB-2007-0673), Appendix B, page VII**

4

5 **a) Does the Risk Cost associated with the existing asset include the ongoing**  
6 **maintenance costs as well as any additional maintenance costs associated with**  
7 **repairing the assets when/if they fail?**

8

9 **RESPONSE:**

10 a) As maintenance costs are typically the same between the existing asset to be replaced  
11 and the new asset to be installed, these costs are not included within the business case  
12 as they would cancel each other out. There are only two specific business cases –  
13 rear lot and box construction conversion – where a maintenance savings are identified  
14 between the existing assets to be replaced and the new assets to be installed. Under  
15 these instances, the differing maintenance costs are identified as an “ongoing cost”  
16 within the cost of ownership for the existing and new assets. The risk cost of the  
17 existing asset does include the cost of emergency repairs should an asset failure take  
18 place.

19

20 **b) To the extent earlier replacement is justified on the basis of lower risk costs are**  
21 **there not O&M savings accruing to THESL as compared to the non-early**  
22 **replacement case? If not, please explain why.**

## **RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES ON ISSUE 2.2**

1   **RESPONSE:**

2   b) Typically, when performing like-for-like replacement of assets, there is no difference  
3       in maintenance policy to the assets in question, and therefore no change in  
4       maintenance costs. In the case of non-in-kind replacement projects, where existing  
5       infrastructure is replaced with new infrastructure with new configurations and  
6       designs, there may be maintenance savings achieved. For instance, there is typically  
7       a savings in maintenance costs achieved with rear lot conversion, as tree trimming  
8       activities no longer need to be performed. Similarly, there is a savings in  
9       maintenance costs achieved for box construction conversion, as maintenance to the  
10      corresponding 4kV municipal stations assets will no longer be required once these  
11      assets can be decommissioned.

12  
13   **c) Given that such savings represent a source of funds, how are they accounted for**  
14      **in the determination of the ICM requirements – as directed in the Supplemental**  
15      **Report of the Board?**

16  
17   **RESPONSE:**

18   c) The avoided maintenance costs are small in the context of the overall capital spend  
19      contained in this application and thus do not represent a significant source of funds.

20  
21   **d) For each of the Segments that utilize a Business Case Evaluation which relies on**  
22      **Avoided Risk cost analysis to support the investment decision, please identify the**  
23      **O&M costs avoided over the 2012-2014 period.**

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.2**

1 **RESPONSE:**

2 d) Total O&M costs expected to be avoided would be as follows:

- 3 1. Total O&M Savings due to Box Construction ICM Project (due to Stations  
4 decommissioning): \$26,831  
5 2. Total O&M Savings due to Rear Lot Conversion ICM Project (due to Tree  
6 Trimming & Pole Inspection savings): \$12,400

7  
8 Therefore, the total savings achieved between 2012 and 2014 in terms of associated  
9 O&M costs are expected to be \$39,231. These savings are expected to grow in future  
10 years as rear lot and box construction are eliminated from the system. As stated in  
11 (b), only the Rear Lot and Box Construction business cases would possess an  
12 applicable savings for O&M costs. The remaining business cases would not see any  
13 associated O&M savings.

/U

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 31:**

2 **Reference(s):** Tab 4, Schedule B1, page 2

3

4 **a) As of 2006 how many kilometers of direct buried cable did THESL have?**

5

6 **RESPONSE:**

7 a) As the end of year 2006, there were 1,358 conductor kilometres of direct buried cable  
8 in the system.

9

10 **b) Please provide a schedule that sets out the kilometers of direct buried cable that  
11 were replaced each year between 2007 and 2011.**

12

13 **RESPONSE:**

14 b) Please see the response to AMPCO interrogatory 10 e (Tab 6F, Schedule 2-10,  
15 part e).

16

17 **c) Was all of this direct buried cable replaced with cable in concrete-encased ducts  
18 and, if not, why not?**

19

20 **RESPONSE:**

21 c) In planned projects since 2007, all direct buried cables were replaced with cable in  
22 concrete-encased ducts. However, in emergency repairs, direct buried cables are  
23 usually replaced with direct buried cables because replacing the failed direct buried  
24 cable with cable in concrete-encased ducts would significantly lengthen the outage  
25 duration.

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.2**

1 **d) Over the same 2007-2011 period, was there any replacement of air-insulated**  
2 **pad-mounted switchgear units? If so, were they all replaced with SF<sub>6</sub>-insulated**  
3 **pad-mounted switch gear units and, if not, why not?**  
4

5 **RESPONSE:**

6 d) Yes, air-insulated pad-mounted switchgear units were replaced over this period. Not  
7 all air-insulated pad-mounted switchgear units were replaced with SF<sub>6</sub>-insulated pad-  
8 mounted switchgear units when repairs were made on a reactive basis. During  
9 emergency repairs, replacement air-insulated pad-mounted switchgear units were  
10 installed when installing SF<sub>6</sub>-insulated pad-mounted switchgear would have  
11 significantly prolonged the outage. In some cases this was because the existing cable  
12 was not long enough to allow for the connection to SF<sub>6</sub>-insulated pad-mounted  
13 switchgear units, which require longer cable than air-insulated pad-mounted  
14 switchgear units in order to make the proper terminations.  
15

16 **e) Based on the timing of the jobs set out in Table 1, how many kilometers of direct**  
17 **buried cable will be replaced in each year 2012-2014?**  
18

19 **RESPONSE:**

20 e) The total conductor kilometres of direct buried XLPE cable proposed for replacement  
21 in 2012 and 2013 are 237 and 49, respectively.

22  
23 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB  
24 to consider the work programs identified for 2012 and 2013 together, and to defer

} /U



**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.2**

1 consideration of the work program for 2014 to a later date. In light of this requested  
2 bifurcation of the proceeding and THESL's obligation to update the 2014 information  
3 for any material changes prior to it being reviewed, it would not assist the OEB or  
4 intervenors to provide information on the 2014 work program in response to this  
5 interrogatory during the first phase of this application.

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**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 37:**

2 **Reference(s):** Tab 4, Schedule B2, pages 1-2

3

4 **a) Given that the issues identified with PILC cable have existed since 1990, please**  
5 **provide a schedule that sets out the annual capital spending on PILC cable over**  
6 **the period 2007-2011 and the kilometres of PILC cable replaced each year.**

7

8 **RESPONSE:**

9 a) The table below highlights the capital spending (rounded to nearest \$1,000) and  
10 kilometres of PILC cable replaced pertaining only to piecing out congested cable  
11 chambers and repairing leaking PILC cable from 2007 to 2011.

	2007	2008	2009	2010	2011
Capital Spending	\$0	\$799,000	\$234,000	\$732,000	\$344,000
Kilometres of PILC cable replaced	0.0	9.7	9.6	11.5	7.7

12 Note that as per Appendix A in reference document Tab 4, Schedule B2, page 29, the  
13 average piece out or leaker PILC segment is 0.157km.

14

15 **b) Please provide a similar schedule for the period 2011-2014 based on THESL's**  
16 **proposed spending.**

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.2**

1 **RESPONSE:**

2 b)

	2011	2012	2013
Capital Spending (estimated)	\$344,000	\$2,430,003	\$3,030,579
Kilometres of PILC cable replaced (estimated)	7.7	24.0	10.2

3 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB  
4 to consider the work programs identified for 2012 and 2013 together, and to defer  
5 consideration of the work program for 2014 to a later date. In light of this requested  
6 bifurcation of the proceeding and THESLs obligation to update the 2014 information  
7 for any material changes prior to it being reviewed, it would not assist the OEB or  
8 intervenors to provide information on the 2014 work program in response to this  
9 interrogatory during the first phase of this application.

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**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 57:**

2 **Reference(s):**           **Tab 4, Schedule B6, pages 5 and 9**

3

4 a) What are the reductions in O&M cost for each year 2012-2014 as a result of  
5 removing the rear lot service in the targeted areas and moving to underground  
6 service?

7

8 **RESPONSE:**

9 a) The maintenance savings from 2012 to 2014 are expected to be approximately  
10 \$12,400 in total, which include \$400 in savings realised due to 2012 projects, and  
11 \$12,000 in savings realised due to 2013 projects respectively. Note that station  
12 maintenance savings (due to the eventual removal of station equipment) have not  
13 been included because these are not expected within the specified time frame.

} /U

## **RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES ON ISSUE 2.2**

1 **INTERROGATORY 87:**

2 **Reference(s):** **Tab 4, Schedule B17, pages 4-5 and 30**

3

4 **a) Please confirm that the Brenner TS is expected to be in-service Q3 of 2014.**

5

6 **RESPONSE:**

7 a) The originally anticipated in-service date for Bremner TS was Q3 2014, but it  
8 currently appears more likely that the project will be in service in Q4 2014. This date  
9 is based on the same sequence of events, but anticipates that construction will begin  
10 in January 2013.

11

12 **b) Does THESL include spending on the Brenner TS in its ICM-based revenue**  
13 **requirement calculations for years prior to the station's in-service date? If yes,**  
14 **please explain why.**

15

16 **RESPONSE:**

17 b) Yes, THESL includes spending on the Brenner TS in its ICM-based revenue  
18 requirement calculations for years prior to the station's in-service date. THESL  
19 understands that this is in accordance with the ICM filing guidelines, and that the true  
20 up process will resolve the matter of when the assets go into service.

21

22 **c) What is the impact on the annual ICM rate-riders, if the spending on Brenner**  
23 **(plus capitalized interest) is only included in the rate rider calculations once the**  
24 **station is in-service.**

**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.2**

1 **RESPONSE:**

2 c) The updated capital expenditures for Bremner are \$8.5M in 2012 and \$81.0M in  
3 2013. Under the ICM standard methodology, the amounts translate into revenue  
4 requirements of approximately \$0.8M in 2012 and \$7.6M in 2013. The impact on the  
5 calculated ICM rate adders of including these revenue requirements only upon station  
6 in-service is an approximate reduction of \$0.04 on the monthly fixed portion, and  
7 \$0.00003 on the variable portion for the updated 2012 Residential class ICM rate  
8 adders. The impact on the 2013 Residential rate adder would be an approximate  
9 reduction of \$0.26 on the fixed portion, and \$0.00022 on the variable portion.

/U

**RESPONSES TO SCHOOL ENERGY COALITION  
INTERROGATORIES ON ISSUE 2.3**

1 **INTERROGATORY 28:**

2 **Reference(s):** none provided

3

4 Has the Applicant begun any of the projects to date? If so, please provide details.

5

6 **RESPONSE:**

7 Yes, YTD August 2012, THESL has begun work on the following projects from

8 Schedule B:

ICM Projects begun in 2012
Metering
Network Infrastructure and Equipment
Overhead Infrastructure and Equipment
Plant Relocations
Station Infrastructure and Equipment
Underground Infrastructure and Cable
Bremner TS
Hydro One Capital Contributions

} /U

## RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES ON ISSUE 2.3

Within these projects, work has commenced on the following jobs:

/U

ICM Projects begun in 2012	Specific Jobs begun in 2012
<b>Metering</b>	22138_001 2012 RC4250 Grid Supply Points CapEx
	25047_001 Smart Meter Conversion
	25315_001 2012 RC4250 Reseal of Meter Asbestos
	25316_001 ICM 2012 Reverification/Reseal of Meters CAPEX
<b>Network Infrastructure and Equipment</b>	X11487 Vault Rebuild Locn #4312 King ST. W.
	X12207 Simcoe St. Abandon Vault
	X12652 Victoria and Shuter Loc 4252 & 4308 TOA64A
<b>Overhead Infrastructure and Equipment</b>	E11088 NY OH SCADA INSTALL "A"
	E11088 NY Panacomm Repl "D" Replacing North York Panacomm RTUs
	E11374 Scada Installations (8 switches) (NY34M6)
	E12104 CHIPPING CROSSBURN OH REBUILD POLE & ELECTRICAL INSTALLATION
	W10275 Manby TS Load Transfer to Horner TS ET38M12
	W11168 Albion MGF1 Silverstone VC
	W11219 Rathburn UG VC Phase III
	W12397 Queensway/Lakeshore SMD-20 Switch Replace
	W12561 Rexdale Colony RL VC Phase I Electrical
	X11293 Forest Hill Phase V (Civil + Cable Pulling, by contractor)
	X12113 Forest Hill VC Phase IV Electrical
	X12182 Brentcliffe-Eglinton Repl. SCADA Sw's (34M5)
	X12453 FESI George Anderson / Culford OH (NY35M12)



## RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES ON ISSUE 2.3

ICM Projects begun in 2012	Specific Jobs begun in 2012
	X12460 Arrowsmith Ave OH ReblD (NY35M12)
<b>Plant Relocations</b>	W10498 Weston Tunnel GO Xing Relocn ET88M12
	W10508 Hwy427/Eglinton MTO Relocn
	W12545 MTO Keele St. Bridge - HWY 401 Ph 2
	W12663 Beecroft Road Extension (11NY-01RD)
	X10492 Strachan Av Grade Separation UG Crossing Ph 1
	X11602 Relocate feeders serving Dafoe MS
	X11603 Relocate B11T/B9T/B2T/B3T/B6T
	X11604 Relocate A22T/A49T/A53T
	X11605 Relocate A25T/A27T/A29T/A31T
	X11606 GO Strachan Crossing Feeder Relocate - Civil
<b>Station Infrastructure and Equipment</b>	S11118 Finch TS: Replace KSO CB 55M27
	S11121 Finch TS: Replace KSO CB 55M28
	S11130 Bathurst TS: Replace KSO CB 85M24
	S12031 Improve SONET Redundancy: Malvern TS to Sheppard TS
	S12048 Strachan TS: A7-8 Switchgear replacement
	S12554 Etobicoke replace 15 MOSCAD RTU's
	S12557 Carlaw TS:Commission Switchgear A10-11E
	X11620 Electrical cable and switch in
<b>Underground Infrastructure and Cable</b>	A10395 1420 12&18" HW Lids Phase 2 Maps 147-162,207-362
	A10395-Handwell Stdzn MAP 129ABC
	A10395-Handwell Stdzn MAP- 179C,188C Gerrard
	A10395-Handwell Stdzn MAP-132CD
	A10395-Handwell Stdzn MAP-146A
	A10395-Handwell Stdzn MAP-146B 170A

**RESPONSES TO SCHOOL ENERGY COALITION  
 INTERROGATORIES ON ISSUE 2.3**

ICM Projects begun in 2012	Specific Jobs begun in 2012
	A10395-Handwell Stdzn MAP-146C 170D
	A10395-Handwell Stdzn MAP-146C
	A10395-Handwell Stdzn MAP-147AB
	A10395-Handwell Stdzn MAP-160B North
	A10395-Handwell Stdzn MAP-160B South
	A10395-Handwell Stdzn MAP-161D
	A10395-Handwell Stdzn MAP-169A,179A,188A Danforth
	A10395-Handwell Stdzn MAP-169AB Adelaide
	A10395-Handwell Stdzn MAP-169B Lakeshore
	A10395-Handwell Stdzn MAP-179C&188D
	A11498 HW Replacement Map #153D, 153C,VAR
	A11498 HW Replacement Map 128A, 138D, 151AB
	A11498 HW Replacement Map 137A&B
	A11498 HW Replacement Map 137C
	A11498 HW Replacement Map 138A&B
	A11498 HW Replacement Map 138CD
	A11498 HW Replacement Map 139A,B,C,D
	A11498 HW Replacement Map 139D, 156EFH,164D
	A11498 HW Replacement Map 148A,B,D
	A11498 HW Replacement Map 151 B&C
	A11498 HW Replacement Map 151A
	A11498 HW Replacement Map 151B
	A11498 HW Replacement Map 151C (Partial)
	A11498 HW Replacement Map 152D
	A11498 HW Replacement Map 153AB
	A11498 HW Replacement Map 153D Part 1
	A11498 HW Replacement Map 154ABCD,163B
	A11498 HW Replacement Map 161A,170ABC

**RESPONSES TO SCHOOL ENERGY COALITION  
 INTERROGATORIES ON ISSUE 2.3**

ICM Projects begun in 2012	Specific Jobs begun in 2012
	A11498 HW Replacement Map 161B & 178A
	A11498 HW Replacement Map 162ABC
	A11498 HW Replacement Map 162D, 178B, 199AE
	A11498 HW Replacement Map 163D + Various Areas
	A11498 HW Replacement Map 215ABC
	A11498 HW Replacement Maps 180D, 172D, 204A 213A Var
	A11498 HW Replcmt Maps 147CD
	A11498 HW Replcmt Maps 152A
	A11498 HW Replcmt Maps 152B
	A11498 HW Replcmt Maps 152C
	A11498 HW Replcmt Maps 161C
	A12236 Contact Voltage HW area 100ACD
	A12236 Contact Voltage HW area 106,109,117
	A12236 Contact Voltage HW Area 128CD
	A12236 Contact Voltage HW Remediation 83ABCD&90D
	A12236 Contact Voltage HW Remediation 92AD
	A12236 Handwell Standaridization 128A-B (PLP)
	A12236 HW Rep Areas 130,140,141,155,156,164,165
	A12236 HW Replacement Maps 180D, 172D, 204A, 203C, 213A
	A12236 HW Replacement Maps 198A, 189D
	A12236 HW Replacement Maps 203B, 204B, 204C
	A12236 HW Replacement Maps 221A, 187A, 179E
	E11072 Bridletowne U/G Rebuild
	E11087 Grand Marshall Cable Repl SCNT47M1
	E11191 FESI-12 McLevin/Alford UG rebuild (SC47M3)

## RESPONSES TO SCHOOL ENERGY COALITION INTERROGATORIES ON ISSUE 2.3

ICM Projects begun in 2012	Specific Jobs begun in 2012
	E11301 FESI-12 Hupfield UG rebuild Phase 1 (SC47M3)
	E11356 FESI-12 Pennyhill UG rebuild (SC47M3)
	E11372 FESI-12 Hupfield UG rebuild Phase 2 (SC47M3)
	E11380 FESI-12 Empringham/McLevin UG rebuild (SC47M3)
	E11421 Glamorgan/Dundalk UG Rebuild (SC51M29) -Civil
	E11472 Rebuild Ingleton UG SCNT63M12 Main (Civil) - Ph A
	E11483 Rebuild Ingleton 63M12 - Ph 1 - Civil
	E11484 Rebuild Ingleton SCNT63M12 Ph 2 (Civil)
	E11592 FESI-12 NY51M6 Leslie/Nymark UG Cable Rehab Prt2
	E11593 FESI-12 NY51M6 Leslie/Nymark UG Cable Rehab Ph1
	E11618 Rebuild Ingleton UG SCNT63M12 Main (Civil) - Ph B
	E12157 Morningside/OldFinch UG Rehab -Civil (26M23 / 47M3)
	E12275 Muirbank UG Rebuild Ph 2 - Civil
	E12319 Morningside/OldFinch UG Rehab -Electrical (26M23 / 47M3)
	E12494 Revis Ph2 Civil
	E12520 Conlins Milner NT47M1 - Civil
	E12529 FESI Braymore West Ph2 SCN47M14 UG Rebuild Civil SCNA47M14
	E12656 Harrison Garden PH 1

**RESPONSES TO SCHOOL ENERGY COALITION  
INTERROGATORIES ON ISSUE 2.3**

ICM Projects begun in 2012	Specific Jobs begun in 2012
	W11455 FESI-12 Yonge St UG Fdr Cable rehab (NY80M30/M27)
	W11460 FESI-12 NY80M30 Johnston/Yonge UG Fdr Cable rehab
	W11615 FESI Keegen Cr. DB Cable Replace (SS58F1)
	W12077 Hoggs Hollow Ph2 (Plymbridge/Maytree) Civil

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
INTERROGATORIES ON ISSUE 2.4**

1 **INTERROGATORY 55:**

2

3 **Reference(s): Tab 3, Appendix 3, Schedule C1.2, Sheet 19 and equivalent**  
4 **Sheets for 2013 (C2.2) and 2014 (C3.2)**

5

6 **a) Please provide sheet 19 and similar Residential schedules in Active Excel**  
7 **Spreadsheet format and consolidate the base and 3 IRM years into one schedule**  
8 **and spreadsheet.**

9

10 **RESPONSE:**

11 a) Energy Probe has advised that its reference to Sheet 19 in this interrogatory is  
12 incorrect. The correct reference is Tab 3, Schedule C1.2 (and C2.2 and C3.2).

13

14 THESL provides with this response an excel file which contains a summary of the  
15 updated Residential rates presented in the updated Tab 3, Schedules C1.2 and C2.2,  
16 which pertain to the years 2012 and 2013.

17

18 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB  
19 to consider the work programs identified for 2012 and 2013 together, and to defer  
20 consideration of the work program for 2014 to a later date. In light of this requested  
21 bifurcation of the proceeding and THESL's obligation to update the 2014 information  
22 for any material changes prior to it being reviewed, it would not assist the OEB or  
23 intervenors to provide the 2014 information requested in this interrogatory during the  
24 first phase of this application.

25

/U

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
INTERROGATORIES ON ISSUE 2.4**

1 **b) Confirm that Sheet 19 is based on the Board Approved Average 2011 Rate base.**

2

3 **RESPONSE:**

4 b) The distribution rates shown as “current”, are THESL’s 2011 OEB-approved rates.

5 These rates were based on OEB-approved 2011 rate base, which is an average of  
6 opening and closing balances. The rates shown for 2012 through 2014 are based on  
7 the OEB’s IRM and ICM models, as filed by THESL in Tab 3, Schedules C1.1, C2.1,  
8 and C3.1, and Tab 3 Schedules E1.1, E2.1, and E3.1.

9

10 **c) If not, also provide a spreadsheet version with the average 2011 rate base. Please**  
11 **list all assumptions and sources of data for each line.**

12

13 **RESPONSE:**

14 c) Please see the response in part b).

## RESPONSES TO VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES ON ISSUE 2.4

1 **INTERROGATORY 115:**

2 **Reference(s):**           **Tab 2, page 13, Table 1**

3

4 a) Please provide references as to specifically where in the Application the various  
5 values presented in Table 1 are calculated and can be found. If there are no  
6 supporting calculations, please provide.

7

8 **RESPONSE:**

9 a) The values shown for the Standard Methodology Revenue Requirements can be  
10 found at Tab 4, Schedule E1.1, E2.1, and E3.1, page 12. The values shown for the  
11 Standard Methodology Rate Adders can be found at Tab 4, Schedules E1.3, E2.3, and  
12 E3.3, page 1.

13

14 The values shown for the Alternative Methodology Revenue Requirement and Rate  
15 Adders use exactly the same ICM models, but remove the deadband from the  
16 Threshold calculation, and apply the half year rule to the ICM amounts.

17

18 THESL is providing the updated 2012 and 2013 ICM models and related schedules in  
19 live excel format with this interrogatory response.

20

21 ICM Alternative Models (live excel models):

- 22 • Appendix A, 2012 Alternative Model ICM Workform
- 23 • Appendix B, 2012 Alternative Model Threshold
- 24 • Appendix C, 2012 Alternative Model ICM Rates – Days of Service
- 25 • Appendix D, 2013 Alternative Model ICM Workform

/U



**RESPONSES TO VULNERABLE ENERGY CONSUMERS  
COALITION INTERROGATORIES ON ISSUE 2.4**

- 1 • Appendix E, 2013 Alternative Model Threshold
- 2 • Appendix F, 2013 Alternative Model ICM Rates – Days of Service

} /U

**RESPONSES TO CONSUMERS COUNCIL OF CANADA  
 INTERROGATORIES ON ISSUE 4.2**

1 **INTERROGATORY 25:**

2 **Reference(s):** none provided

3

4 Please provide a schedule setting out an average annual THESL residential bill for each  
 5 year 2006-2011. Please provide a forecast for 2012, 2013 and 2014, assuming THESL's  
 6 proposals are approved.

7

8 **RESPONSE:**

9 a) The table below presents the estimated annual residential bill amounts for 2006 to  
 10 2013.

Estimated Annual Residential Bills		
Calendar Year	Distribution (including rate/riders)	Total Bill (before tax)
2006	\$337.36	\$1,130.20
2007	\$333.66	\$1,109.24
2008	\$344.93	\$1,097.68
2009	\$338.45	\$1,153.53
2010	\$356.74	\$1,244.94
2011	\$360.17	\$1,300.66
2012	\$368.63	\$1,373.45
2013	\$408.27	\$1,434.14

Notes:  
 1. Average residential RPP customer using 800 kWh/month (830 kWh TLF adjusted).  
 2. Distribution includes Rate Riders  
 3. Energy prices are tiered RPP. The prices and the threshold amount (600 and 1000 kWh) change twice per year.

/U

**RESPONSES TO CONSUMERS COUNCIL OF CANADA  
INTERROGATORIES ON ISSUE 4.2**

1 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to  
2 consider the work programs identified for 2012 and 2013 together, and to defer  
3 consideration of the work program for 2014 to a later date. In light of this requested  
4 bifurcation of the proceeding and THESL's obligation to update the 2014 information for  
5 any material changes prior to it being reviewed, it would not assist the OEB or  
6 intervenors to provide the 2014 information requested in this interrogatory during the first  
7 phase of this application.

} /U

**RESPONSES TO CONSUMERS COUNCIL OF CANADA  
 INTERROGATORIES ON ISSUE 4.2**

1 **INTERROGATORY 29:**

2 **Reference(s):**           **Tab 2**

3

4 Please provide a schedule setting out THESL's approved and actual ROE for each year  
 5 2006-2011. Please provide the most current estimate of its expected ROE for 2012.

6

7 **RESPONSE:**

8 Please see the table below.

<u>Period</u>	<u>Rate Mechanism</u>	<u>Approved ROE</u>	<u>Actual ROE<sup>2</sup></u>	<u>Projected</u>
2006	COS	9.00%	11.32%	n/a
2007 <sup>1</sup>	IRM	9.08%	9.29%	n/a
2008	COS	8.57%	10.12%	n/a
2009	COS	8.01%	6.35%	n/a
2010	COS	9.85%	7.44%	n/a
2011	COS	9.58%	9.94%	n/a
2012 <sup>3</sup>	IRM	9.58%	n/a	8.77%

} /U

<sup>1</sup> 2007 implicit ROE based on 2006 approved ROE (9.00%) increased by "Price Cap Index" of 0.9%

<sup>2</sup> As per THESL published financial statements

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
INTERROGATORIES ON ISSUE 4.2**

1 **INTERROGATORY 56:**

2 **Reference(s):** **Managers Summary Tab 2, Page 27**

3

4 Please provide a Summary Schedule that shows by rate class the following Components  
5 of rates for 2011 base rates through to 2014 (prefer Excel Spreadsheet):

- 6 1. 2012 price cap adjustment
- 7 2. adjusted Retail Transmission Service Rates
- 8 3. rate rider to refund shared tax savings
- 9 4. rate rider for disposition of account balances in accounts 1521 Special Purpose  
10 Charge and account 1562 PILs Deferral Account
- 11 5. rate adder for incremental capital projects

12

13 **RESPONSE:**

14 Please see the attached Attachment A which summarizes the information provided in  
15 Exhibits Tab 3, C1.2 and C2.2.

16

17 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to  
18 consider the work programs identified for 2012 and 2013 together, and to defer  
19 consideration of the work program for 2014 to a later date. In light of this requested  
20 bifurcation of the proceeding and THESL's obligation to update the 2014 information for  
21 any material changes prior to it being reviewed, it would not assist the OEB or  
22 intervenors to provide the 2014 information requested in this interrogatory during the first  
23 phase of this application.

∩

**Residential**

Rate component	2011	2012 Interim	2013
<b>2012 price cap adjustment</b>			
Service Charge (fixed)	\$ 18.25	\$ 18.25	\$ 18.50
Distribution Volumetric Rate	\$ 0.01520	\$ 0.01520	\$ 0.01527
Rate rider to refund shared tax savings	n/a	n/a	n/a
Deferral Account rate rider	-\$ 0.00232	n/a	-\$ 0.00043
<b>Rate adder for incremental capital projects</b>			
2011 Unfunded Capex Rate Rider (fixed)	n/a	n/a	\$ 0.65
2012 Foregone IRM Rate Rider (fixed)	n/a	n/a	\$ 0.06
2012 ICM Rate Adder (fixed)	n/a	n/a	\$ 0.52
2013 ICM Rate Adder (fixed)	n/a	n/a	\$ 1.36
2011 Unfunded Capex Rate Rider (variable)	n/a	n/a	\$ 0.00054
2012 Foregone IRM Rate Rider (variable)	n/a	n/a	\$ 0.00005
2012 ICM Rate Adder (variable)	n/a	n/a	\$ 0.00043
2013 ICM Rate Adder (variable)	n/a	n/a	\$ 0.00114
<b>Adjusted Retail Transmission Service Rates</b>			
Network Service Rate	\$ 0.00703	\$ 0.00703	\$ 0.00807
Line and Transformation Connection Service Rate	\$ 0.00513	\$ 0.00513	\$ 0.00561

**Multi-unit residential**

Rate component	2011	2012 Interim	2013
<b>2012 price cap adjustment</b>			
Service Charge (fixed)	n/a	n/a	\$ 17.23
Distribution Volumetric Rate	n/a	n/a	\$ 0.02600
Rate rider to refund shared tax savings	n/a	n/a	-\$ 0.00010
Deferral Account rate rider	n/a	n/a	-\$ 0.00047
<b>Rate adder for incremental capital projects</b>			
2011 Unfunded Capex Rate Rider (fixed)	n/a	n/a	\$ 0.60
2012 Foregone IRM Rate Rider (fixed)	n/a	n/a	\$ 0.05
2012 ICM Rate Adder (fixed)	n/a	n/a	\$ 0.48
2013 ICM Rate Adder (fixed)	n/a	n/a	\$ 1.27
2011 Unfunded Capex Rate Rider (variable)	n/a	n/a	\$ 0.00092
2012 Foregone IRM Rate Rider (variable)	n/a	n/a	\$ 0.00008
2012 ICM Rate Adder (variable)	n/a	n/a	\$ 0.00073
2013 ICM Rate Adder (variable)	n/a	n/a	\$ 0.00194
<b>Adjusted Retail Transmission Service Rates</b>			
Network Service Rate	n/a	n/a	\$ 0.00807
Line and Transformation Connection Service Rate	n/a	n/a	\$ 0.00561

**GS<50 kW**

Rate component	2011	2012 Interim	2013
<b>2012 price cap adjustment</b>			
Service Charge (fixed)	\$ 24.3	\$ 24.30	\$ 24.63
Distribution Volumetric Rate	\$ 0.02247	\$ 0.02247	\$ 0.02277
Rate rider to refund shared tax savings	n/a	n/a	n/a
Deferral Account rate rider	-\$ 0.00223	n/a	-\$ 0.00032
<b>Rate adder for incremental capital projects</b>			
2011 Unfunded Capex Rate Rider (fixed)	n/a	n/a	\$ 0.86
2012 Foregone IRM Rate Rider (fixed)	n/a	n/a	\$ 0.07
2012 ICM Rate Adder (fixed)	n/a	n/a	\$ 0.69
2013 ICM Rate Adder (fixed)	n/a	n/a	\$ 1.81
2011 Unfunded Capex Rate Rider (variable)	n/a	n/a	\$ 0.00081
2012 Foregone IRM Rate Rider (variable)	n/a	n/a	\$ 0.00007
2012 ICM Rate Adder (variable)	n/a	n/a	\$ 0.00064
2013 ICM Rate Adder (variable)	n/a	n/a	\$ 0.00170
<b>Adjusted Retail Transmission Service Rates</b>			
Network Service Rate	\$ 0.00680	\$ 0.00680	\$ 0.00780
Line and Transformation Connection Service Rate	\$ 0.00463	\$ 0.00463	\$ 0.00506

**GS 50-999 kW**

Rate component	2011	2012 Interim	2013
<b>2012 price cap adjustment</b>			
Service Charge (fixed)	\$ 35.6	\$ 35.56	\$ 36.05
Distribution Volumetric Rate	\$ 5.59560	\$ 5.59560	\$ 5.67200
Rate rider to refund shared tax savings	n/a	n/a	-\$ 0.0067
Deferral Account rate rider	-\$ 0.79260	n/a	-\$ 0.05390
<b>Rate adder for incremental capital projects</b>			
2011 Unfunded Capex Rate Rider (fixed)	n/a	n/a	\$ 1.26
2012 Foregone IRM Rate Rider (fixed)	n/a	n/a	\$ 0.11
2012 ICM Rate Adder (fixed)	n/a	n/a	\$ 1.00
2013 ICM Rate Adder (fixed)	n/a	n/a	\$ 2.65
2011 Unfunded Capex Rate Rider (variable)	n/a	n/a	\$ 0.19880
2012 Foregone IRM Rate Rider (variable)	n/a	n/a	\$ 0.01720
2012 ICM Rate Adder (variable)	n/a	n/a	\$ 0.15800
2013 ICM Rate Adder (variable)	n/a	n/a	\$ 0.41680
<b>Adjusted Retail Transmission Service Rates</b>			
Network Service Rate	\$ 2.43510	\$ 2.43510	\$ 2.79470
Line and Transformation Connection Service Rate	\$ 1.76300	\$ 1.76300	\$ 1.92860

**GS 1,000-4,999 kW**

Rate component	2011	2012 Interim	2013
<b>2012 price cap adjustment</b>			
Service Charge (fixed)	\$ 686.5	\$ 686.46	\$ 695.83
Distribution Volumetric Rate	\$ 4.44970	\$ 4.44970	\$ 4.51050
Rate rider to refund shared tax savings	n/a	n/a	-\$ 0.0056
Deferral Account rate rider	-\$ 0.90550	n/a	-\$ 0.0421
<b>Rate adder for incremental capital projects</b>			
2011 Unfunded Capex Rate Rider (fixed)	n/a	n/a	\$ 24.39
2012 Foregone IRM Rate Rider (fixed)	n/a	n/a	\$ 2.11
2012 ICM Rate Adder (fixed)	n/a	n/a	\$ 19.38
2013 ICM Rate Adder (fixed)	n/a	n/a	\$ 51.13
2011 Unfunded Capex Rate Rider (variable)	n/a	n/a	\$ 0.15810
2012 Foregone IRM Rate Rider (variable)	n/a	n/a	\$ 0.01370
2012 ICM Rate Adder (variable)	n/a	n/a	\$ 0.12560
2013 ICM Rate Adder (variable)	n/a	n/a	\$ 0.33140
<b>Adjusted Retail Transmission Service Rates</b>			
Network Service Rate	\$ 2.35270	\$ 2.35270	\$ 2.70020
Line and Transformation Connection Service Rate	\$ 1.76130	\$ 1.76130	\$ 1.92680

**Large Use**

Rate component	2011	2012 Interim	2013
<b>2012 price cap adjustment</b>			
Service Charge (fixed)	\$ 3,009.1	\$ 3,009.11	\$ 3,050.17
Distribution Volumetric Rate	\$ 4.74060	\$ 4.74060	\$ 4.80530
Rate rider to refund shared tax savings	n/a	n/a	-\$ 0.00590
Deferral Account rate rider	-\$ 0.98110	n/a	-\$ 0.0437
<b>Rate adder for incremental capital projects</b>			
2011 Unfunded Capex Rate Rider (fixed)	n/a	n/a	\$ 106.92
2012 Foregone IRM Rate Rider (fixed)	n/a	n/a	\$ 9.25
2012 ICM Rate Adder (fixed)	n/a	n/a	\$ 84.96
2013 ICM Rate Adder (fixed)	n/a	n/a	\$ 224.12
2011 Unfunded Capex Rate Rider (variable)	n/a	n/a	\$ 0.16840
2012 Foregone IRM Rate Rider (variable)	n/a	n/a	\$ 0.01460
2012 ICM Rate Adder (variable)	n/a	n/a	\$ 0.13380
2013 ICM Rate Adder (variable)	n/a	n/a	\$ 0.35310
<b>Adjusted Retail Transmission Service Rates</b>			
Network Service Rate	\$ 2.68200	\$ 2.68200	\$ 3.07810
Line and Transformation Connection Service Rate	\$ 1.95670	\$ 1.95670	\$ 2.14050



**Street Lighting**

Rate component	2011	2012 Interim	2013
<b>2012 price cap adjustment</b>			
Service Charge (fixed, per connection)	\$ 1.3	\$ 1.30	\$ 1.32
Distribution Volumetric Rate	\$ 28.72480	\$ 28.72480	\$ 29.11680
Rate rider to refund shared tax savings	n/a	n/a	-\$ 0.0425
Deferral Account rate rider	-\$ 0.93670	n/a	-\$ 0.3877
<b>Rate adder for incremental capital projects</b>			
2011 Unfunded Capex Rate Rider (fixed)	n/a	n/a	\$ 0.05
2012 Foregone IRM Rate Rider (fixed)	n/a	n/a	\$ -
2012 ICM Rate Adder (fixed)	n/a	n/a	\$ 0.04
2013 ICM Rate Adder (fixed)	n/a	n/a	\$ 0.10
2011 Unfunded Capex Rate Rider (variable)	n/a	n/a	\$ 1.02060
2012 Foregone IRM Rate Rider (variable)	n/a	n/a	\$ 0.08830
2012 ICM Rate Adder (variable)	n/a	n/a	\$ 0.81100
2013 ICM Rate Adder (variable)	n/a	n/a	\$ 2.13950
<b>Adjusted Retail Transmission Service Rates</b>			
Network Service Rate	\$ 2.16580	\$ 2.16580	\$ 2.48570
Line and Transformation Connection Service Rate	\$ 2.10220	\$ 2.10220	\$ 2.29970

**Unmetered Scattered Load**

Rate component	2011	2012 Interim	2013
<b>2012 price cap adjustment</b>			
Service Charge (fixed, per connection)	\$ 0.5	\$ 0.49	\$ 0.50
Service Charge (fixed, per customer)	\$ 4.84000	\$ 4.84000	\$ 4.91000
Distribution Volumetric Rate	\$ 0.06070	\$ 0.0607	\$ 0.06152
Rate rider to refund shared tax savings	n/a	n/a	-\$ 0.00010
Deferral Account rate rider	-\$ 0.0	n/a	-\$ 0.00088
<b>Rate adder for incremental capital projects</b>			
2011 Unfunded Capex Rate Rider (fixed)	n/a	n/a	\$ 0.17
2011 Unfunded Capex Rate Rider (fixed, per connection)	n/a	n/a	\$ 0.02
2012 Foregone IRM Rate Rider (fixed)	n/a	n/a	\$ 0.01
2012 ICM Rate Adder (fixed)	n/a	n/a	\$ 0.14
2012 ICM Rate Adder (fixed, per connection)	n/a	n/a	\$ 0.01
2013 ICM Rate Adder (fixed)	n/a	n/a	\$ 0.36
2013 ICM Rate Adder (fixed, per connection)	n/a	n/a	\$ 0.04
2011 Unfunded Capex Rate Rider (variable)	n/a	n/a	\$ 0.00219
2012 Foregone IRM Rate Rider (variable)	n/a	n/a	\$ 0.00019
2012 ICM Rate Adder (variable)	n/a	n/a	\$ 0.00174
2013 ICM Rate Adder (variable)	n/a	n/a	\$ 0.00458
<b>Adjusted Retail Transmission Service Rates</b>			
Network Service Rate	\$ 0.00428	\$ 0.00428	\$ 0.00491
Line and Transformation Connection Service Rate	\$ 0.00324	\$ 0.00324	\$ 0.00354

**RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION  
INTERROGATORIES ON ISSUE 4.2**

1 **INTERROGATORY 57:**

2 **Reference(s):** **EB-2010-0142 Settlement Agreement Appendix B, Table 1**

3

4 a) Please Provide a version of the Referenced Table that projects the data from 2011-  
5 2014. (prefer Excel Spreadsheet)

6 b) Please provide any necessary explanatory notes

7

8 **RESPONSE:**

9 a) and b)

10

11 The referenced exhibit, which summarizes the components of Revenue Requirement for  
12 each year, is not applicable to the IRM/ICM application THESL has filed. Under the  
13 IRM/ICM framework, Revenue Requirement for components other than the ICM  
14 components is not derived. Nevertheless, THESL has produced a representative example  
15 of that table, based on the current IRM/ICM application, for the 2011-2013 period.  
16 Assumptions are contained in notes in Attachment A to this Schedule.

17

18 As described in its cover letter, dated October 31, 2012, THESL has asked the OEB to  
19 consider the work programs identified for 2012 and 2013 together, and to defer  
20 consideration of the work program for 2014 to a later date. In light of this requested  
21 bifurcation of the proceeding and THESL's obligation to update the 2014 information for  
22 any material changes prior to it being reviewed, it would not assist the OEB or  
23 intervenors to provide the 2014 information requested in this interrogatory during the first  
24 phase of this application.

/U

	2011 Board Approved	2011 Actual	2012	2013	Assumptions for 2012-13
Base Revenue Requirement	522.0	532.5	535.7	579.1	
Revenue Offsets	26.0	24.3	26.2	26.4	Applies PCI to 2011 Board Approved Revenue Offsets
Service Revenue Requirement	548.1	556.7	561.9	605.5	
OM&A Expenses	238.0	235.8	239.6	241.3	Applies PCI to 2011 Board Approved OM&A
Depreciation Expense	138.8	146.4	142.9	156.3	Applies PCI to 2011 Board Approved Depreciation, plus depreciation related to ICM amounts
Income Tax Expense	11.8	9.0	12.0	12.2	Applies PCI to 2011 Board Approved Income Tax expense, plus income tax expense related to ICM amounts
Cost of Capital	159.4	165.5	167.4	195.8	Applies PCI to 2011 Board Approved Return on Ratebase, plus return on Ratebase related to ICM amounts
Capital Expenditures	378.8	445.5	274.7	579.1	Total Capex as filed. See updated Tab 4, Schedule A, Appendix 1 for summary.

Notes:

- assumes PCI of 0.68% each year
- ICM incremental Depreciation, PILS and Return on Rate Base from updated Tab 4, Schedules E1.1, and E2.1, page 12