K1.4

WORKING CAPITAL (LEAD-LAG STUDY)

1.0 INTRODUCTION

Working capital is the amount of funds required to finance the day-to-day operations of a regulated utility and is included as part of rate base for ratemaking purposes. The determination of working capital relies on a lead-lag study.

In 2009, Hydro One commissioned Navigant to carry out a lead-lag study. In the OEB's EB-2009-0096 Decision with Reasons, the OEB accepted the results of the Navigant lead-lag study. In 2013, Hydro One commissioned Navigant to conduct an updated lead-lag study which is included in Exhibit D1, Tab 1, Schedule 3, Attachment A (entitled Working Capital Requirements of Hydro One Networks' Distribution Business – dated December 3, 2013).

2.0 SUMMARY

Hydro One Distribution's net cash working capital requirement for the 2015 test year is $236.2 million or 7.4% of OM&A ($564.3M) and Cost of Power expenses ($2,626.9M). Applying the same formula the remaining test years are: 2016 - 7.4%; 2017 - 7.5%; 2018 - 7.5% and 2019 - 7.6%. Table 1 summarizes the net cash working capital requirements determined by using the lead/lag days from the Navigant study filed in Exhibit D1, Tab 1, Schedule 3, Attachment 1 to reflect the 2015 and 2019 test year revenues, expenses and HST amounts (Table 2).

The methodology used to determine the net working cash required is based on the Navigant study that was accepted by the OEB and updated as part of this filing, and it takes the following into consideration:

- has considered the most important elements of revenue lags, including the service, billing and collection lags;
- includes the most important elements of expense leads such as payroll and benefits, operations, maintenance, administration expenses, and taxes, including property taxes; and
- takes the major cost elements into consideration in calculating the net cash working capital.

Table 1

Distribution Net Cash Working Capital Requirement

(All Data in $millions Except Lead/Lag Days)

	Revenue Lag (Days)	Expense Lag (Days)	Net Lag (Lead Days)	2015 Test Year	2016 Test Year	2017 Test Year	2018 Test Year	2019 Test Year
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Expenses								
Cost of Power	52.25	32.74	19.51	2626.9	2623.4	2614.4	2586.2	2582.5
OM&A	52.25	27.11	25.14	564.3	610.2	614.0	603.9	600.0
Removal Costs	52.25	16.51	35.74	54.5	57.0	60.4	63.3	65.8
Environmental Costs	52.25	40.98	11.27	14.2	22.0	22.4	22.0	21.6
Interest on Long-Term Debt	52.25	8.93	43.32	177.9	188.6	200.4	217.5	238.2
PILS	52.25	128.37	(76.12)	55.6	61.6	62.2	65.6	69.4
Total				3493.2	3562.7	3573.8	3558.5	3577.6
HST (see Table 2)				941.4	957.1	961.2	960.3	966.7
Total Amounts Paid/Accrued				**4434.7**	**4519.8**	**4534.9**	**4518.7**	**4544.4**
Working Capital Required (Calculations based on above values, for each expense category, calculated using the following formula: For Test Years 2015 to 2019 (Col (D)*Col (C)/365))								
Cost of Power				140.4	139.8	139.7	138.2	138.0
OM&A				38.9	41.9	42.3	41.6	41.3
Removal Costs				5.3	5.6	5.9	6.2	6.4
Environmental Costs				0.4	0.7	0.7	0.7	0.7
Interest on Long-Term Debt				21.1	22.3	23.8	25.8	28.3
Income & Capital Tax				(11.6)	(12.8)	(13.0)	(13.7)	(14.5)
Total				194.6	197.5	199.4	198.8	200.3
HST (see Table 2)				41.7	41.6	41.4	41.0	40.9
Net Working Cash Required				**236.2**	**239.1**	**240.8**	**239.8**	**241.1**

Table 2

Distribution Summary of HST Cash Working Capital Requirement

(All Data in $M Except Lead-Lag Days)

	HST Lead Time (Days)	Working Capital Factor	2015 Test Year	2016 Test Year	2017 Test Year	2018 Test Year	2019 Test Year
Revenue (external)	(7.13)	-2.0%	(10.3)	(10.5)	(10.6)	(10.7)	(10.8)
OM&A	42.92	11.8%	3.2	3.5	3.5	3.5	3.4
Cost of power	45.92	12.6%	43.0	42.9	42.8	42.3	42.2
Removal costs	44.30	12.1%	0.1	0.1	0.1	0.1	0.1
Environmental costs	44.30	12.1%	0.1	0.1	0.1	0.1	0.1
Capital expenditures	44.30	12.1%	5.6	5.6	5.5	5.6	5.8
Total			**41.7**	**41.8**	**41.4**	**41.0**	**40.9**

Refer to page 11 of Attachment 1 for more detail on the Distribution HST Cash Working Capital Requirement.

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Working Capital Requirements of Hydro One Networks' Distribution Business

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Section I: Executive Summary

Summary

In preparation for a 2015-2019 distribution rate filing before the Ontario Energy Board ("OEB"), Hydro One Networks, Incorporated ("HONI") retained Navigant Consulting Limited ("Navigant") to prepare an update to its prior working capital study. This report provides the results of the update and the working capital requirements of HONI's distribution business.

Listed below are key findings and conclusions from this study:

1. In terms of lead-lag days, the results from this study are generally comparable with HONI's previous distribution working capital study (EB-2009-0096). Where there are differences, they have been identified, explained, and their impact on working capital requirements quantified;
2. The approach and methods used in this study are generally consistent with prior HONI studies as well as studies performed by other local distribution companies in Ontario; and,
3. Data from calendar year 2012 was used as a basis for this analysis. Results from the lead-lag study applied to HONI's test years identify the following working capital amounts.

Table 1: Summary of Working Capital Requirements

Year	2015	2016	2017	2018	2019
Percentage of OMA	7.40%	7.39%	7.46%	7.52%	7.58%
Working Capital Requirement $(M)	$236.21	$239.08	$240.76	$239.75	$241.11

Organization of the Report

Section II of this report discusses the lag times associated with HONI's collections of revenues. This includes a description of the sources revenues and how an overall revenue lag is derived.

Section III presents the lead times associated with HONI's expenses. This includes a description of the types of expenses incurred by HONI's distribution operations and how expenses are treated for the purposes of deriving an overall expenses lead.

Section IV presents the working capital requirements of HONI's distribution business including the working capital requirement associated with the Harmonized Sales Tax ("HST").

Section V presents a summary comparison of the results from this study with results from EB-2009-0096 study. Differences between the two have been noted, explained, and their impacts on working capital quantified. The intent of presenting the discussion in Section V is to demonstrate that the approach used in this study is an accurate reflection of the current distribution operations of HONI and that the results are reasonable when compared with the prior distribution studies.

Section II: Working Capital Methodology

Working capital is the amount of funds that are required to finance the day-to-day operations of a regulated utility and which are included as part of a rate base for ratemaking purposes. A lead-lag study is the most accurate basis for determination of working capital and was used by Navigant for this purpose.

A lead-lag study analyzes the time between the date customers receive service and the date that customers' payments are available to HONI (or "lag") together with the time between which HONI receives goods and services from its vendors and pays for them at a later date (or "lead")[1]. "Leads" and "Lags" are both measured in days and are dollar-weighted where appropriate.[2] The dollar-weighted net lag (lag minus lead) days is then divided by 365 (or 366 for leap years) and then multiplied by the annual test year expenses to determine the amount of working capital required. The resulting amount of working capital is then included in HONI's rate base for the purpose of deriving revenue requirements.

Key Concepts

Two key concepts need to be defined as they appear throughout this report:

Mid-Point Method

When a service is provided to (or by) HONI over a period of time, the service is deemed to have been provided (or received) evenly over the midpoint of the period, unless specific information regarding the provision (or receipt) of that service indicates otherwise. If both the service end date ("Y") and the service start date ("X") are known, the mid-point of a service period can be calculated using the formula:

$$\text{Mid-Point} = \frac{([Y-X]+1)}{2}$$

When specific start and end dates are unknown, but it is known that a service is evenly distributed over the mid-point of a period, an alternative formula that is generally used is shown below. The formula uses the number of days in a year (A) and the number of periods in a year (B):

$$\text{Mid-Point} = \frac{A/B}{2}$$

[1] A positive lag (or lead) indicates that payments are received (or paid for) after the provision of a good or service.

[2] The notion of dollar-weighting is pursued further in the sub-section titled "Key Concepts".

Statutory Approach

In conjunction with the mid-point method, it is important to note that not all areas of this study may utilize dates on which actual payments were made to (or by) HONI. In some instances, particularly for the HST, the due dates for payments are established by statute or by regulation with significant penalties for late payments. In these instances, the due date established by statute has been used in lieu of when payments were actually made.

Expense Lead Components

As used in this study, Expense Leads are defined to consist of two components:

1. Service Lead component (services are assumed to be provided to HONI evenly around the mid-point of the service period), and
2. Payment Lead component (the time period from the end of the service period to the time payment was made and when funds have left HONI's possession).

Dollar Weighting

Both leads and lags should be dollar-weighted where appropriate and where data is available to accurately reflect the flow of dollars. For example, suppose that a particular transaction has a lead time of 100 days and has a dollar value of $100. Further, suppose that another transaction has a lead time of 30 days with a dollar value of $1 Million. A simple un-weighted average of the two transactions would give us a lead time of 65 days ([100+30]/2). However, when these two transactions are dollar weighted, the resulting lead time would be closer to 30 days which is more representative of how the dollars actually flow.

Methodology

Performing a lead-lag study requires two key undertakings:

1. Developing an understanding of how the regulated distribution business operates in terms of products and services sold to customers/purchased from vendors, and the policies and procedures that govern such transactions; and,
2. Modeling such operations using data from a relevant period of time and a representative data set. It is important to ascertain and factor into the study whether (or not) there are known changes to existing business policies and procedures going forward. Where such changes are known and material, they should be factored into the study.

To develop an understanding of HONI's operations, interviews with personnel within HONI's Accounts Payable, Customer Service, Wholesale Market Operations, Human Resources, Payroll, Treasury, and Tax Departments were conducted. Key questions that were addressed during the course of the interviews included:

1. What is being sold (or purchased)? If a service is being provided to (or by) HONI, over what time period was this service provided;
2. Who are the buyers (or sellers);
3. What are the terms for payment? Are the terms for payment driven by industry norms or by company policy? Is there flexibility in the terms for payment;
4. Are any changes to the terms for payment expected? Are these terms driven by industry or internally? What is the basis for any such changes;
5. Are there any new rules or regulations governing transactions relating to distribution operations that are expected to materialize over the time frame considered in this report; and,
6. How are payments made (or received)? Payment types have different payment lead times (i.e., internet payments have shorter deposit times than cheque deposit times)

Section III: Revenue Lags

A distribution utility providing service to its customers generally derives its revenue from bills paid for service by its customers. A revenue lag represents the number of days from the date service is rendered by HONI until the date payments are received from customers and funds are available to HONI.

Interviews with HONI personnel indicate that its distribution business receives funds from the following funding streams:

1. Retail Customers;
2. Rural Rate Assistant Customers;
3. The Ontario Ministry of Finance via the Independent Electricity System Operation ("IESO");
4. Other Sources (revenues from municipalities, electricity retailers and revenues for miscellaneous services such as jobbing and contracting work performed by HONI); and,
5. The Ontario Clean Energy Benefit ("OCEB").

The lag times associated with the funding streams above were weighted and combined to calculate an overall revenue lag time as shown below.

Table 2: Summary of Revenue Lag

Description	Lag Days	Revenues ($M)	Weighting	Weighted Lag
Retail Revenue	52.87	$5,283	83%	43.87
Rural Rate Assistance	32.74	$164	3%	0.84
Other Revenue	38.09	$392	6%	2.35
Ontario Clean Energy Benefit	62.38	$528	8%	5.19
Total		**$6,367**	**100%**	**52.25**

Retail Revenue lag consists of the following components[3]:

1. Service Lag;
2. Billing Lag; and,
3. Collections Lag.

The lag times for each of the above components, when added together, results in the Retail Revenue Lag for the purpose of calculating the working capital requirements for HONI's distribution business. Table 3 below summarizes the total Retail Revenue Lag.

[3] There is no additional lag time for payment processing as funds are available to HONI immediately after funds are deposited

Table 3: Summary of Retail Revenue Lag

Description	Lag Days
Service Lag	16.40
Billing Lag	7.70
Collections Lag	28.77
Total	52.87

The estimation of each component of the Retail Revenue Lag is described below.

Service Lag

The Service Lag is the time from HONI's provision of electricity to a customer, to the time the customer's service period ends, which is typically defined as when the meter is read. Interviews with customer service staff at HONI indicated that based upon revenue weighting, approximately 96% of customers are on a monthly billing schedule, 0.4% of customers are on a bi-monthly billing schedule and 3.6% of customers are on a quarterly billing schedule. The breakdown of the customer meter reading frequency shows a shift of more customers into the monthly billing category versus the prior study due to the implementation of smart meters, which allow for accurate monthly meter readings. Taking this information into account and using a mid-point methodology, the Service Lag was estimated to be 16.40 days.

Billing Lag

The Billing Lag is the time period from when the customer's service period ends, which is typically defined as when the meter is read, and the time that the customer's bill is generated and provided to the customer. Interviews with billing staff at HONI and analysis of meter billing data indicated that HONI customers have an average billing lag of 7.70 days, which is significantly shorter than billing lag in the prior study due to the implementation of a new customer information system.

Collections Lag

The Collections Lag is the time period from when the customer's bill is provided to the customer, to the time period that the customer provides a payment to HONI and when that payment is recorded in HONI's billing system. This period of time is measured by analyzing the receivables aging data contained in receivables reports used by HONI for normal business purposes. Using such data provided by HONI for the calendar year 2012, a dollar-weighted average collections lag of 28.77 days was determined for HONI's distribution operations. This collections lag is shorter than the collections lag in the prior study due to HONI's increased efficiencies in the collection of receivables outstanding from customers.

Section IV: Expense Leads

The determination of working capital requires both a measurement of the lag in the collection of revenues for services provided by HONI's distribution business, and the lead times associated with payments for services provided to HONI. Therefore, in conjunction with the calculation of the revenue lag, expense lead times were calculated for the following items:

1. Cost of Power;
2. OM&A Expenses;
3. Removal & Environmental Remediation Costs;
4. Interest on Long Term Debt;
5. Payments in Lieu of Taxes; and,
6. HST.

Cost of Power

HONI purchases its power supply requirements on a monthly basis from the IESO and pays for such supplies on a schedule defined within the IESO's billing and settlement procedures. Taking all this information on actual payments made by HONI in 2012, a dollar-weighted Cost of Power expense lead time of 32.74 days was calculated. Table 4 below summarizes the components of the Cost of Power expense lead calculation.

Table 4: Summary of IESO Cost of Power Expenses

Delivery Month	Amounts ($M)	Weighting Factor %	Payment Date	Service Lead Time	Payment Lead Time	Total Lead Time	Weighted Lead Time
Jan 12	$204.91	10.27%	2/16/2012	15.50	16.00	31.50	3.23
Feb 12	$189.54	9.50%	3/16/2012	14.50	16.00	30.50	2.90
Mar 12	$182.95	9.17%	4/19/2012	15.50	19.00	34.50	3.16
Apr 12	$147.67	7.40%	5/16/2012	15.00	16.00	31.00	2.29
May 12	$132.44	6.64%	6/18/2012	15.50	18.00	33.50	2.22
Jun 12	$148.15	7.42%	7/18/2012	15.00	18.00	33.00	2.45
Jul 12	$144.45	7.24%	8/17/2012	15.50	17.00	32.50	2.35
Aug 12	$190.68	9.55%	9/19/2012	15.50	19.00	34.50	3.30
Sep 12	$127.09	6.37%	10/17/2012	15.00	17.00	32.00	2.04
Oct 12	$159.96	8.01%	11/19/2012	15.50	19.00	34.50	2.76
Nov 12	$167.60	8.40%	12/18/2012	15.00	18.00	33.00	2.77
Dec 12	$200.53	10.05%	1/17/2013	15.50	17.00	32.50	3.27
Total	$1,995.97	100.00%					32.74

OM&A Expenses

For the purpose of the distribution lead-lag study, OM&A expenses were considered to consist of payments made by HONI to its vendors in the following categories:

1. Payroll & Benefits;
2. Property Taxes;
3. Corporate Procurement Card;
4. Trinity Lease Payments;
5. Payments to Inergi;
6. Consulting & Contract Staff; and,
7. Miscellaneous OM&A

Expense lead times were calculated individually for each of the items listed above and then dollar-weighted to derive a composite expense lead time of 27.11 days for OM&A expenses.

Table 5: Summary of OM&A Expenses

Description	Amounts ($M)	Weighting	Expense Lead Time	Weighted Lead Time
Payroll & Benefits	$1,091.25	60%	8.20	4.93
Property Taxes	$22.10	1%	-38.56	-0.47
Corporate Procurement Card	$100.09	6%	33.36	1.84
Trinity Lease Payments	$11.95	1%	-14.25	-0.09
Payments to Inergi	$152.09	8%	44.40	3.72
Consulting and Contract Staff	$200.55	11%	80.15	8.85
Miscellaneous OM&A	$237.83	13%	63.60	8.33
Total	$1,815.86	100%		27.11

Payroll & Benefits

The following items were considered to be expenses related to the Payroll & Benefits of HONI:

1. Four types of payroll including basic, trades, management, and board of directors payroll;
2. Three types of payroll withholdings including the Canada Pension Plan, Employment Insurance, and Income Tax withholdings;
3. Contributions made by Hydro One to the Hydro One Pension Plan;
4. Group Health, Dental, and Life Insurance related administrative fees and claims;
5. Payments made by Hydro One on account of the Employer Health Tax ("EHT"); and,
6. Payments made by Hydro One to the Worker Safety Improvement Board ("WSIB").

When all Payroll, Withholdings and Benefits were dollar-weighted using actual payment data, the weighted average expense lead time associated with Payroll & Benefits was determined to be 8.20 days as shown in Table 6 below.

Table 6: Summary of Payroll & Benefits Expenses

Description	Amounts ($M)	Weighting	Expense Lead Time	Weighted Lead Time
Pensions	$171.12	16%	-45.68	-7.16
WSIB	$6.61	1%	45.28	0.27
EHT	$17.54	2%	30.88	0.50
Group Life Insurance	$16.71	2%	6.56	0.10
Group Health & Dental – ASO	$6.71	1%	30.83	0.19
Group Health & Dental – Claims	$45.11	4%	1.89	0.08
Payroll – Basic	$355.68	33%	18.50	6.03
Payroll – Construction	$134.99	12%	18.50	2.29
Payroll – Management	$59.64	5%	-0.80	-0.04
Payroll – Board of Directors	$0.49	0%	59.64	0.03
Payroll – Sup Pensions	$2.18	0%	-15.13	-0.03
Payroll Withholdings – Basic	$181.20	17%	26.14	4.34
Payroll Withholdings – Construction	$57.44	5%	26.16	1.38
Payroll Withholdings – Management	$35.06	3%	7.22	0.23
Payroll Withholdings – Board of Directors	$0.19	0%	66.38	0.01
Payroll Withholdings – Sup Pensions	$0.59	0%	-8.50	0.00
Total	$1,091.25	100%	267.87	8.20

Property Taxes

HONI makes property tax payments to a number of municipalities and taxing authorities in the Province of Ontario. These payments are made in the current year for the current year and are typically made in installments. Using actual payment dates and amounts associated with HONI's distribution business for calendar year 2012, a dollar-weighted expense lead (-lag) time of -0.47 days was determined.

Corporate Procurement Card

Procurement (or charge) cards are used by the HONI's employees for a variety of company related reasons including, and not limited to, purchases of materials in the field, incidental expenses, and to settle charges for travel and accommodation. Based on actual invoices from the HONI's charge card provider and payments made by HONI, a dollar-weighted expense lead time of 1.84 days was determined.

Trinity Lease Payments

HONI leases its office space in the Bell Trinity Square Building from Northam Realty. HONI generally makes its lease payments on or around the end of the month prior for the current month. Taking this information into account and using actual invoices and payments for 2012, a dollar-weighted expense lead (-lag) time of -0.09 days was determined.

Payments to Inergi

Inergi (a division of CapGemini) provides a number of services to HONI including (and not limited to) customer service operations, finance, human resources, accounts payable, information technology, IESO settlement services, and supply management services. HONI generally makes payments to Inergi on or around the last day of the month for the current month. Based on a review of payments made by HONI to Inergi in 2012, a dollar-weighted expense lead time of 3.72 days was determined.

Consulting and Contract Staff

HONI engages consulting and contract staff to provide assistance in the areas of engineering, environmental services, receivables management, accounting, and general consulting.
A dollar-weighted expense lead time of 8.85 days was determined based on a review of invoices rendered and payments made by HONI in 2012.

Miscellaneous OM&A

This category of expense includes items such as product purchases, equipment rentals, and provision of general services to HONI. Based on transactions in HONI's accounts payable system under this category, a dollar-weighted expense lead time of 8.33 days was derived.

Removal and Environmental Remediation Costs

HONI incurs costs when removing or replacing equipment from existing sites or right of ways. Further, costs relating to environmental remediation at these sites are also incurred. While costs are required to be reported as a depreciation and amortization expense for accounting purposes, there is a cash flow impact associated with HONI's expenditures on such removal and environmental remediation costs. Based upon discussions with HONI staff, estimates for the derivation of removal and environmental remediation costs were determined and summarized in Table 7 below.

Table 7: Summary of Removal and Environmental Remediation Expenses

Description	Expense Lead Time	% of Remediation Expenses	Weighted Lead Time
Removal			
HONI Labour	8.20	85.00%	6.97
HONI Materials	63.60	15.00%	9.54
External Labour	80.15	0.00%	0.00
External Materials	63.60	0.00%	0.00
Total		100.00%	16.51
Environmental Remediation			
HONI Labour	8.20	51.00%	4.18
HONI Materials	63.60	9.00%	5.72
External Labour	80.15	34.00%	27.25
External Materials	63.60	6.00%	3.82
Total		100.00%	40.98

Interest on Long Term Debt

HONI makes interest payments on its long term debt outstanding out of current year revenues. Such payments are generally made twice a year. Taking into account the various bonds and other long term debt instruments, a dollar-weighted expense lead time of 8.93 days was determined for the 2012 calendar year.

Payments in Lieu of Taxes ("PILs")

HONI makes payments in lieu of taxes in monthly installments to the relevant taxing authorities. Using payment amounts that were made in calendar year 2012, a dollar-weighted expense lead time of 128.37 days was determined for PIL's.

HST

The expense lead times associated with the following items that attract HST were considered in HONI's distribution lead-lag study.

1. Revenues;
2. Cost of Power;
3. OM&A[4]; and,
4. Removals, Environmental Remediation and Capital Costs.

A summary of the expense lead times and working capital amounts associated with each of the above items is provided in Table 8. Note that the statutory approach described at the outset was used to determine the expense lead times associated with HONI's remittances and disbursements of HST (i.e., both remittances and collections are generally on the last day of the month following the date of the applicable invoice.

Table 8: Summary of HST Working Capital Amounts

Description	HST Lead Time	Working Capital Factor	2015 ($M)	2016 ($M)	2017 ($M)	2018 ($M)	2019 ($M)
Revenues	-7.13	-2%	-$10.3	-$10.5	-$10.6	-$10.7	-$10.8
Cost of Power	45.92	13%	$43.0	$42.9	$42.8	$42.3	$42.2
OM&A Expenses	42.92	12%	$3.2	$3.5	$3.5	$3.5	$3.4
Removals	44.30	12%	$0.1	$0.1	$0.1	$0.1	$0.1
Environmental Remediation	44.30	12%	$0.1	$0.1	$0.1	$0.1	$0.1
Capital	44.30	12%	$5.6	$5.6	$5.5	$5.6	$5.8
Total			**$41.7**	**$41.8**	**$41.4**	**$41.0**	**$40.9**

[4] Costs within OM&A that attract HST include Corporate Procurement Card, Trinity Lease Payments, Payments to Inergi, Consulting and Contract Staff and Miscellaneous OM&A

Section V: Hydro One Distribution – Working Capital Requirements

Using the results described under the discussion of revenue lags and expense leads, and applying them to HONI's proposed distribution expenses for the 2015-2019 test years, HONI's working capital requirements were determined and shown in the tables below.

Table 9: HONI Distribution Working Capital Requirements (2015)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses ($M)	Working Capital Requirements ($M)
Cost of Power	52.25	32.74	19.50	5%	$2,626.87	$140.35
OM&A Expenses	52.25	27.11	25.14	7%	$564.30	$38.87
PILS	52.25	128.37	-76.12	-21%	$55.60	-$11.59
Interest Expense	52.25	8.93	43.32	12%	$177.86	$21.11
Environmental Remediation	52.25	40.98	11.27	3%	$14.16	$0.44
Removals	52.25	16.51	35.73	10%	$54.46	$5.33
Total					$3,493.25	$194.51
HST						$41.70
Total - Including HST						**$236.21**
Working Capital as a Percent of OM&A incl. Cost of Power						7.40%

Table 10: HONI Distribution Working Capital Requirements (2016)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses ($M)	Working Capital Requirements ($M)
Cost of Power	52.25	32.74	19.50	5%	$2,623.37	$139.78
OM&A Expenses	52.25	27.11	25.14	7%	$610.18	$41.91
PILS	52.25	128.37	-76.12	-21%	$61.60	-$12.81
Interest Expense	52.25	8.93	43.32	12%	$188.57	$22.32
Environmental Remediation	52.25	40.98	11.27	3%	$22.00	$0.68
Removals	52.25	16.51	35.73	10%	$56.99	$5.56
Total					$3,562.71	$197.45
HST						$41.64
Total - Including HST						**$239.08**
Working Capital as a Percent of OM&A incl. Cost of Power						7.39%

Table 11: HONI Distribution Working Capital Requirements (2017)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses ($M)	Working Capital Requirements ($M)
Cost of Power	52.25	32.74	19.50	5%	$2,614.41	$139.69
OM&A Expenses	52.25	27.11	25.14	7%	$613.97	$42.29
PILS	52.25	128.37	-76.12	-21%	$62.24	-$12.98
Interest Expense	52.25	8.93	43.32	12%	$200.37	$23.78
Environmental Remediation	52.25	40.98	11.27	3%	$22.36	$0.69
Removals	52.25	16.51	35.73	10%	$60.40	$5.91
Total					$3,573.75	$199.38
HST						$41.38
Total - Including HST						**$240.76**
Working Capital as a Percent of OM&A incl. Cost of Power						7.46%

Table 12: HONI Distribution Working Capital Requirements (2018)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses ($M)	Working Capital Requirements ($M)
Cost of Power	52.25	32.74	19.50	5%	$2,586.17	$138.18
OM&A Expenses	52.25	27.11	25.14	7%	$603.86	$41.59
PILS	52.25	128.37	-76.12	-21%	$65.57	-$13.68
Interest Expense	52.25	8.93	43.32	12%	$217.54	$25.82
Environmental Remediation	52.25	40.98	11.27	3%	$22.03	$0.68
Removals	52.25	16.51	35.73	10%	$63.28	$6.20
Total					$3,558.46	$198.79
HST						$40.96
Total - Including HST						**$239.75**
Working Capital as a Percent of OM&A incl. Cost of Power						7.52%

Table 13: HONI Distribution Working Capital Requirements (2019)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses ($M)	Working Capital Requirements ($M)
Cost of Power	52.25	32.74	19.50	5%	$2,582.55	$137.99
OM&A Expenses	52.25	27.11	25.14	7%	$600.00	$41.33
PILS	52.25	128.37	-76.12	-21%	$69.39	-$14.47
Interest Expense	52.25	8.93	43.32	12%	$238.25	$28.27
Environmental Remediation	52.25	40.98	11.27	3%	$21.62	$0.67
Removals	52.25	16.51	35.73	10%	$65.82	$6.44
Total					$3,577.62	$200.23
HST						$40.88
Total - Including HST						**$241.11**
Working Capital as a Percent of OM&A incl. Cost of Power						7.58%

Section VI: Findings and Conclusions

The purpose of this section is to compare the results from this study to HONI's prior working capital distribution study as per EB-2009-0096. In addition, this section demonstrates that the results from this study reflect the current operations of HONI.

Comparison with Prior Distribution Study

Table 14: Working Capital Requirements (2010)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses ($M)	Working Capital Requirements ($M)
Cost of Power	69.99	32.67	37.32	10%	$2,008.40	$205.33
OM&A Expenses	69.99	22.92	47.07	13%	$591.00	$76.21
PILS	69.99	16.51	53.48	15%	$16.50	$2.42
Interest Expense	69.99	52.87	17.12	5%	$155.50	$7.29
Environmental Remediation	69.99	34.84	35.15	10%	$12.80	$1.23
Removals	69.99	30.02	39.97	11%	$33.00	$3.61
Total					$2,817.20	$296.10
GST						$8.02
Total - Including GST						$304.13
Working Capital as a Percent of OM&A incl. Cost of Power						11.70%

Table 15: HONI Distribution Working Capital Requirements (2015)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses ($M)	Working Capital Requirements ($M)
Cost of Power	52.25	32.74	19.50	5%	$2,626.87	$140.35
OM&A Expenses	52.25	27.11	25.14	7%	$564.30	$38.87
PILS	52.25	128.37	-76.12	-21%	$55.60	-$11.59
Interest Expense	52.25	8.93	43.32	12%	$177.86	$21.11
Environmental Remediation	52.25	40.98	11.27	3%	$14.16	$0.44
Removals	52.25	16.51	35.73	10%	$54.46	$5.33
Total					$3,493.25	$194.51
HST						$41.70
Total - Including HST						$236.21
Working Capital as a Percent of OM&A incl. Cost of Power						7.40%

Table 16: Working Capital Requirements (2015 VS 2010)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses ($M)	Working Capital Requirements ($M)
Cost of Power	-17.74	0.07	-17.81	-5%	$618.47	-$64.98
OM&A Expenses	-17.74	4.19	-21.93	-6%	-$26.70	-$37.34
PILS	-17.74	111.86	-129.60	-36%	$39.10	-$14.01
Interest Expense	-17.74	-43.94	26.20	7%	$22.36	$13.81
Environmental Remediation	-17.74	6.13	-23.88	-7%	$1.36	-$0.80
Removals	-17.74	-13.51	-4.23	-1%	$21.46	$1.72
Total					$676.05	-$101.60
HST						$33.68
Total - Including HST						**-$67.92**
Working Capital as a Percent of OM&A incl. Cost of Power						-4.30%

Revenue Lag

As shown in Table 16 above, the overall revenue lag in the current study has decreased significantly versus the prior study. The primary driver of this change is the reduction of the service lag which was due to a shift of the majority of the customers moving to monthly meter reading frequencies as a result of the implementation of smart meters. Another driver for this decrease in revenue lag is a result of HONI's new Customer Information System, which greatly reduced the billing lag. Furthermore, HONI's distribution collections lag also decreased indicating that HONI is collecting outstanding balances more efficiently.

Cost of Power

Cost of Power expense lead days have not changed significantly versus the prior study. HONI distribution still procures power from the IESO on a monthly basis and pays the IESO approximately two weeks after the end of the prior service period. Since payment schedules have not changed since the prior study, Cost of Power expense lead days have not changed significantly either.

OM&A Expenses

OM&A expense lead days have increased slightly by approximately 4 days versus the prior study. Factors driving this increase include longer expense lead times for Payments to Inergi, Consulting and Contract Staff and Miscellaneous OM&A. After dollar-weighting all OM&A categories however, the impact of these slightly increased expense lead times is minimal on HONI's overall working capital requirements.

Interest Expense

Interest expense lead days have increased significantly versus the prior study. This study has a revised methodology for calculating interest expense versus the prior study. Previously, the expense lead calculation summed the lead days relating to the two payments in the year for each outstanding debt instrument, and calculated the weighted lead days for this instrument by weighting the total bond value. This study treats each debt instrument payment as an individual payment and the weighted lead days for each payment is based upon that individual debt instrument payment amount. Navigant believes the change is an improvement in the methodology and is consistent with interest lead time calculations for other utilities across Ontario.

PILs

PILs expense lead days have increased significantly in this study versus the prior study primarily due to a large true-up payment made in 2012 for 2011. Discussions with HONI subject matter experts indicated that these true-up payments are expected to continue with the same magnitude and scheduling parameters in the future. Navigant believes the change is an improvement in the methodology and is consistent with PILs lead time calculations for other utilities across Ontario.

Removals & Environmental Remediation

Removals & Environmental Remediation expense lead days have decreased by approximately 13 days and increased by approximately 6 days respectively. This change is primarily driven by different allocations of Removals & Environmental Remediation expenses into HONI Labour/Materials, and Outside Labour/Materials. Discussions with HONI subject matter experts confirmed that these updated allocations are indicative of how Removals & Environmental Remediation expenses are currently allocated and how they are supposed to be allocated in the future. After dollar-weighting all OM&A categories however, the impact of these changes is minimal on HONI's overall working capital requirements.

Comparison with the Prior Distribution Working Capital Study Using Constant Revenue Lag Days

Since the revenue lag days was one of the most significant changes over the prior study, an analysis using constant revenue lag days was conducted to show the individual impacts of the differences in expense leads days. Table 16 below shows that when holding revenue lag days constant, working capital requirement in 2015 is approximately 1% higher than the amount in 2010.

Table 17: Working Capital Requirements with 2010 Revenue Lag Days Held Constant (2015 VS 2010)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses ($M)	Working Capital Requirements
Cost of Power	0.00	0.07	-0.07	0%	$618.47	$62.71
OM&A Expenses	0.00	4.19	-4.19	-1%	-$26.70	-$9.91
PILS	0.00	111.86	-111.86	-31%	$39.10	-$11.31
Interest Expense	0.00	-43.94	43.94	12%	$22.36	$22.46
Environmental Remediation	0.00	6.13	-6.13	-2%	$1.36	-$0.11
Removals	0.00	-13.51	13.51	4%	$21.46	$4.37
Total					$676.05	$68.20
HST						$33.68
Total - Including HST						**$101.88**
Working Capital as a Percent of OM&A incl. Cost of Power						1.02%

Conclusions

The results of this study indicate a lower working capital requirement compared to HONI's EB-2009-0096 distribution lead-lag study. The reasons for the differences lie primarily with the revenue lag days, where this figure has decreased significantly in the current study due to the shift of customers to monthly billing frequencies, the upgrade of HONI's Customer Information System, and HONI's ability to collect outstanding balances more efficiently. Table 17 below summarizes the working capital requirements calculated in this study along with historical working capital amounts.

Table 18: Summary of Historical Working Capital Requirements

Year	Working Capital Requirements %
2010	*11.7%*
2011	*11.9%*
2015	**7.40%**
2016	7.39%
2017	**7.46%**
2018	7.52%
2019	7.58%

Comparison with Other Lead-Lag Studies

Navigant has prepared a table comparing the components of lead-lag studies that have been filed and is public. The results are shown in Table 19 below. Note that the prior studies are based on data of an older vintage and are mostly based on the customer weighting method for revenue lags. This is an obsolete methodology and HONI's current study is based upon the revenue weighting method for revenue lags.

Table 19: Comparison with Other Lead-Lag Studies

Name of Utility	Working Capital Requirements (Filed)	Vintage For Base Year Data	Type of Service	Customer/Retail Revenues	IESO/ISO Revenues	Other Revenues	Payroll & Withholdings	Employee Benefits	Cost of Power	Other OM&A	Income & Related Taxes	GST/HST	Interest Expense
Hydro One Networks	11.70%	2009	Electric Distribution	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Toronto Hydro	12.45%	2005	Electric Distribution	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hydro Ottawa Ltd.	14.20%	2008	Electric Distribution	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Horizon's Utilities Corp.	14.20%	2009	Electric Distribution	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
London Hydro Inc.	11.42%	2010	Electric Distribution	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes