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July 31, 2019

**BY COURIER & RESS**

Ms. Kirsten Walli, Board Secretary
ONTARIO ENERGY BOARD
2300 Yonge Street, 26th Floor, P.O. Box 2319
TORONTO, ON M4P 1E4

Re: Board File No. EB-2019-0049 - 2020 Cost of Service Application
Kitchener-Wilmot Hydro Inc. - Licence No. ED-2002-0573

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Dear Ms. Walli:

On April 30, 2019, Kitchener-Wilmot Hydro Inc. ("KWHI") filed its Cost of Service application for rates effective January 1, 2020. The Board issued Procedural Order #1 (PO#1) in this rates case on June 20, 2019. In accordance with the direction provided in PO#1, KWHI now files its responses to the Interrogatories of Board staff and registered Intervenors.

KWHI's submission, which has been previously electronically filed through the Board's web portal, consists of two (2) hard copies.

Questions or concerns in this matter should be addressed to the undersigned.

Respectfully submitted,

*Original Signed By:*

Margaret Nanninga, MBA, CPA, CGA
Vice President Finance & CFO

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# OEB Staff Interrogatories
# 2020 Electricity Distribution Rates Application
# Kitchener-Wilmot Hydro Inc. (Kitchener-Wilmot Hydro)
# EB-2019-0049
# July 4, 2019

# Exhibit 1 – Administration

## 1-Staff-1 Updated Revenue Requirement Work Form (RRWF)

Upon completing all interrogatories from Ontario Energy Board (OEB) staff and intervenors, please provide an updated RRWF in working Microsoft Excel format with any corrections or adjustments that the Applicant wishes to make to the amounts in the populated version of the RRWF filed in the initial applications. Entries for changes and adjustments should be included in the middle column on sheet 3 Data_Input_Sheet. Sheets 10 (Load Forecast), 11 (Cost Allocation), 12 (Residential Rate Design) and 13 (Rate Design) should be updated, as necessary. Please include documentation of the corrections and adjustments, such as a reference to an interrogatory response or an explanatory note. Such notes should be documented on Sheet 14 Tracking Sheet, and may also be included on other sheets in the RRWF to assist understanding of changes.

KWHI has updated the RRWF model

The following adjustment were made:

- Increase the OM&A of $322,200 for the cancellation of the CDM programs (1-SEC-3)
- Decrease in the OM&A ($147,700) for delayed implementation of the CIS project
- Increase the cost of the CIS project ($1,100,000) (4-SEC-19, 2-VECC-5, 2-Staff-8)
- Decrease in the depreciation expense due to changes in capital spending
- Increased capital expenditures in 2019 due to the delay in CIS implementation costs
- Load Forecast changes
  - Remove WMP from Energy Sales (3-VECC-13)
  - Updated the CDM variable to include 2018 unverified results from the 2018 IESO Participation and Cost Report (updated filing requirements issued July 15, 2019)
  - Updated the 2019 and 2020 CDM manual adjustment with updated estimates (updated filing requirements issued July 15, 2019)
  - Updated Loss factor (8-Staff-62)
  - Updated formula for calculation of kW for Transformer allowance
  - Updated 2020 Cost of Power (updated filing requirements issued July 15, 2019)
  - Updated RTSR amounts (8-Staff-57)

## 1-Staff-2 Letters of Comment

Following publication of the Notice of Application, the OEB received six letters of comment. Section 2.1.7 of the Filing Requirements states that distributors will be expected to file with the OEB their response to the matters raised within any letters of comment sent to the OEB related to the distributor's application. If the applicant has not received a copy of the letters or comments, they may be accessed from the public record for this proceeding.

Please file a response to the matters raised in the letters of comment referenced above. Going forward, please ensure that responses to any matters raised in subsequent comments or letter are filed in this proceeding. All responses must be filed before the argument (submission) phase of this proceeding.

See attached document EB-2019-0049_KWHI_IR_ Letters of Comment Responses_20190731.

## 1-Staff-3 Scorecard

**Ref: Table 1.7.2-1 Projected Kitchener-Wilmot Hydro Scorecard**
**Ref: Exhibit 1 – 1.7.2 Scorecard – Billing Accuracy, p.96**
**Ref: Exhibit 1 – 1.7.2 Scorecard – Serious Electrical Incident Index, p.97**
Kitchener-Wilmot Hydro provided a scorecard up to 2018 in table 1.7.2-1. In the scorecard, the billing accuracy declined in the past few years. In Kitchener-Wilmot Hydro's explanation, it seemed to imply that billing accuracy is related to the use of an old legacy billing system.

a) Please confirm if the decline in billing accuracy is due to an old billing system or list the causes of the decline in billing accuracy.

KWHI can confirm that the decline in billing accuracy is predominately due to the complexities of KWHI's legacy CIS.

b) With the new Customer Information System (CIS) does Kitchener-Wilmot Hydro anticipate an improvement to the billing accuracy? If so, what aspects does the new system offer that the legacy system could not?

In the long-term, KWHI expects increased billing accuracy statistics following its implementation of its new CIS.

The new system has a relational database and includes rates table that will make the coding of new or changed rates easier to perform and test.

KWHI's existing COBOL system requires direct coding from a computer programmer in numerous places in order to implement any billing changes. Errors can occur as only one programmer is privy to the code changes rather than a team working together.

Kitchener-Wilmot Hydro also had an increase in the number of serious electrical incidents in 2018. Kitchener-Wilmot Hydro noted that the guidelines for reporting serious electrical incidents were revised in 2017.

c) Please provide the number of serious electrical incidents for 2018 if Kitchener-Wilmot Hydro was still reporting under the guidelines prior to 2017.

One (1). The other two incidents were related to broken primary conductor coming in proximity with the ground due to age and motor vehicle accident. The protective device operated in both cases to remove the danger.

## 1-Staff-4 Customer Contact

**Ref: Exhibit 1 – Table 1.6.1.2-2 Changes in Customer Contacts**
The referenced table shows that customer contact is trending towards digital communications and customers are expecting more digital tools to be available to them but do not want to pay extra.

a) What capabilities does the new CIS have to meet customers' expectations for more digital tools?

The new CIS has the capability to provide the following digital tools/integration:

- Self-serve portal – bill and payment management, account management, notification preferences, etc.
- Outage Notifications via IVR

However, due to the cost implications and customers unwillingness to pay extra for the enhanced features, these digital tools were not included in phase 1 of the CIS project.

b) For each of these digital tools, please provide the estimated contribution to the total CIS project cost and explain how Kitchener-Wilmot Hydro assessed that these digital tools are worth the costs to customers.

KWHI elected not to implement the enhanced features of the CIS in Phase 1 of the implementation due to customer feedback on cost. However, KWHI notes that its customers do expect a certain level of service with regard to digital tools and the items listed above are very typical of these types of systems which will be evaluated for implementation in Phase 2 of the CIS project.

# 1-Staff-5 Kitchener-Wilmot Hydro Electricity Videos

**Ref: Exhibit 1 – 1.6.1.4 Behind the Scenes**

Kitchener-Wilmot Hydro developed videos that provides information about electricity, bills, outages, hydro scams, and customers rules and rights. These videos are available on YouTube and have been viewed 11,000 times collectively.

a) Please provide the estimated cost and the number of views for each video.

Since the application was submitted, the videos have been viewed on YouTube more than 27,000 times. The videos are used for more than one purpose, for example school safety programs, Kitchener Ranger games, and staff and contractor education.

| | COST | You Tube Views | Cost per view |
|---|---|---|---|
| **CUSTOMER RELATED** | | | |
| Where Your Payment Goes | $ 2,170 | 240 | $ 9.04 |
| Ever wonder what happens when the power goes out? | $ 3,200 | 1,959 | $ 1.63 |
| Door to Door Marketers | $ 1,550 | 139 | $ 11.15 |
| Avoid getting caught by a utility phone scam | $ 2,600 | 213 | $ 12.21 |
| How power gets to your home | $ 4,100 | 8,884 | $ 0.46 |
| **SAFETY RELATED** | | | |
| If the power goes out - are you prepared? | $ 720 | 2,627 | $ 0.27 |
| Look Up & Look Out For Overhead Power Lines | $ 1,440 | 523 | $ 2.75 |
| Call Before You Dig | $ 480 | 410 | $ 1.17 |
| Powerline Car Safety | $ 2,400 | 7,870 | $ 0.30 |
| How Electricity Hurts | $ 4,400 | 1,736 | $ 2.53 |
| Make sure you know what is in the ground before you dig – A Lucky Squirrel Video | $ 720 | 557 | $ 1.29 |
| How dangerous are overhead power lines? – A Lucky Squirrel Video | $ 720 | 29 | $ 24.83 |
| How close can you come to overhead power lines? – A Lucky Squirrel Video | $ 720 | 351 | $ 2.05 |
| How dangerous is it to touch equipment inside a transformer box? – A Lucky Squirrel Video | $ 720 | 606 | $ 1.19 |
| How close can you come to downed overhead power lines? – A Lucky Squirrel Video | $ 720 | 357 | $ 2.02 |
| What to do if a power line falls on your vehicle – A Lucky Squirrel Video | $ 720 | 635 | $ 1.13 |
| **Totals** | **$ 27,380** | **27,136** | **$ 1.01** |

b) Does Kitchener-Wilmot plan to continue making these types of videos?

Yes. The videos are very informative and beneficial for the general public in terms of safety.

## 1-Staff-6 Succession Plans

**Ref: Appendix 1-2 Kitchener-Wilmot Hydro Business Plan – 5.1 People and Safety**
Kitchener-Wilmot Hydro provided in its business plan that there are eight eligible retirements in 2020, six in 2021, and nine in 2022. It also plans to develop a succession program in 2019-2020.

a) Please provide the roles and responsibilities of each eligible retirement.

| Role eligible to Retire 2020 | Summary of Responsibility |
|---|---|
| Control Room Operator | Responsible for carrying out all aspects of the Station Operator trade including monitoring, controlling and authorizing the operation of transformer stations and the electrical distribution system in accordance with the IESO Market Rules and to respond to system anomalies, direct switching operations and prepare and administer Work Protection and maintain system logs and maps. |
| Mechanic | Responsible for carrying out all aspects of the Vehicle Mechanic trade including the repair and maintenance of vehicles, tools and work equipment. |
| General Crew Foreman | As a front-line supervisor, the General Foreman supervises utility arborists and support personnel engaged in the management of vegetation in the vicinity of the corporation's overhead and underground distribution systems, transformer stations and distribution stations. Additional responsibilities of this position is to assist the Superintendent by planning, organizing and scheduling the Corporation's vegetation management program. |

| Role eligible to Retire 2020 | Summary of Responsibility |
|---|---|
| VP Operations | As an officer of the Corporation reporting to the President and CEO, the Vice-President is one of the guiding minds establishing the direction and objectives of the corporation. The incumbent is responsible for management and direction of the maintenance, replacement and expansion of the utility's infrastructure, including overhead and underground distribution systems, transformer stations and distribution stations. The incumbent plans and organizes the affairs of the department in alignment with the corporate strategic plan and is directly and indirectly responsible for 45% of the staff in the corporation. |
| Line Truck Driver | Responsible for operating heavy equipment including radial boom derricks, mobile cranes, and repair of the power distribution and street lighting systems and assisting with line construction work. |
| Carpenter | Responsible for carrying out all aspects of the construction, maintenance and repair of structures and buildings including but not limited to ducts, cables, poles, vaults, pull boxes, industrial/commercial substations, distribution stations, transformer stations, buildings and other corporate facilities. |
| Fleet Maintenance Foreman | Responsible for the supervision of all functions and activities related to the daily operation of the Fleet Maintenance department. The incumbent is accountable for the coordination and allocation of all work and duties of vehicle maintenance staff while ensuring the job performance is efficient, accurate, complete and safe. |
| Maintenance Person | Responsible for fuelling and washing of vehicles, assisting vehicle maintenance, cleaning and maintenance of buildings and yards, landscape/yard maintenance, performing manual labour in support of construction and maintenance activities and other duties assigned |

| Role Eligible to Retire 2021 | Summary of Responsibility |
|---|---|
| Senior Design Technologist | Responsible for designing, coordinating and administering electrical and civil engineering designs for utility distribution, transformer stations, customer service connections and street lighting construction projects. This position also administers third party agreements, easements, and related record keeping, and assists with the development of engineering standards and the training of junior technical staff. |
| Crew Foreman - Distribution | As a front-line supervisor, the Crew Foreman supervises powerline technicians and support personnel engaged in the construction and maintenance of the corporation's overhead and underground distribution systems, transformer stations and distribution stations. |
| Senior System Analyst - Business | Responsible for the design, development and implementation of new systems and maintenance of existing systems. This position is required to assume the role of Project Leader on systems development projects as assigned and must direct the daily activities of other Information Services personnel assigned to the project. |
| Journeyman Lineman | Responsible for carrying out all aspects of the Powerline Technician trade, including the construction, operation, maintenance, troubleshooting and repair of the power distribution and street lighting systems. The incumbent is responsible for safe and efficient installations that limit power outages and minimize service disruptions. |
| Crew Foreman - Construction | As a front-line supervisor, the Crew Foreman supervises personnel engaged in the construction and maintenance of duct banks, man holes and other civil works. |
| Billing Representative | Responsible for the acquisition, validation and editing of meter data for all customers. Also responsible for the accuracy of customer bills. |

| Role eligible to retire 2022 | Summary of Responsibility |
|---|---|
| Billing Representative | Responsible for the acquisition, validation and editing of meter data for all customers. Also responsible for the accuracy of customer bills. |
| Senior GIS/CAD Technician | The Senior Geographical Information System Computer-Aided Design (GIS/CAD) Technician is responsible for producing, modifying and maintaining engineering drawings from designs prepared by engineering technical staff, electrical distribution system maps, plans and schematics, spatial/tabular GIS data, and engineering records and databases. In addition, develop and implement new CAD and GIS standards, methodologies and practices, and assist in training GIS/CAD Technicians. |
| Crew Foreman - Distribution | As a front-line supervisor, the Crew Foreman supervises powerline technicians and support personnel engaged in the construction and maintenance of the corporation's overhead and underground distribution systems, transformer stations and distribution stations. |
| Superintendent of Construction | The Superintendent has overall responsibility for the administration and management of the Construction Department. Responsible to plan, organize and schedule the activities of personnel, equipment and contractors to construct and maintain the civil works in the overhead and underground distribution systems, transformer stations, distribution stations and other facilities. |
| Powerline Technician | This position is responsible for carrying out all aspects of the Powerline Technician trade, including the construction, operation, maintenance, troubleshooting and repair of the power distribution and street lighting systems. The incumbent is responsible for safe and efficient installations that limit power outages and minimize service disruptions. |
| Systems Analyst – Network Support | Responsible for second level help desk support, co-ordination of all hardware installation and upgrades, operating system software upgrades and network maintenance. |

| Role eligible to retire 2022 | Summary of Responsibility |
|---|---|
| Customer Services Supervisor | Responsible for the supervision of all functions and activities related to the daily operation of the Customer Services Department. The incumbent is accountable for the coordination and allocation of all work and duties of the Customer Services department staff, while ensuring their job performance is efficient, accurate, complete and safe. |
| Executive Assistant | Responsible for the day-to-day operation of the Executive Office including personnel records, employee benefits and preparation of confidential letters, reports, memos and Board minutes and agendas. |
| Customer Service Representative | Responsible for answering and responding to customer inquiries related to customer care; setting up and maintaining customer accounts; and the collection of overdue accounts. |

b) Has a succession plan program been developed? If so, please the program plan.

The Senior management team is currently working on the departmental critical roles and defining a succession plan. This task will be completed by the end of 2019.

## 1-Staff-7 Customer Engagement

**Ref: Appendix 1-26: Online Workbook Reports**

The customers' responses in the workbook report shows that 84% of customers are generally satisfied with the services they receive and would like to see lower rates as a priority. Customers further responded that Kitchener-Wilmot Hydro should keep spending levels consistent and defer investments to lessen the impact of bill increases. Finally, 56% of customers said that Kitchener-Wilmot Hydro should stick with a basic CIS solution. However, Kitchener-Wilmot has decided to go with a tier 1 CIS solution, which doesn't appear to be considered basic.

a) Please explain Kitchener-Wilmot Hydro's decision to invest in a tier 1 system when that it is not what the customers prefer.

During the customer engagement process, the basic CIS solution proposed was actually a Tier 1 solution without the additional functionality such as IVR, self-service customer portal and mobile workforce management.

KWHI has selected a very basic Tier 1 CIS solution. Significant functionality has been removed from the original project scope.

A Tier 1 solution offers the following benefits:

- Robust database design allowing access to historical data throughout the application and through reporting
- Data integrity enforced through database design and also user configurable system validation
- Configurability to deal with changing regulatory pressures (rates, programs, rebates, etc.)
- Flexibility to capture notes and documents at multiple levels (customer, premise, account, meter) for account management
- Intuitive and configurable screen design for ease of use
- Configurable workflows to streamline internal processes

Tier 2 solutions considered were rejected for the following reasons:

- The solutions had no other active Ontario customers;
- The solutions offered a lack of flexibility to keep pace with changing regulation;
- The solutions represented a loss of existing functionality from KWHI's legacy CIS;
- The solutions presented risks in data integrity through flaws in database design.
- Lack of flexibility inherent due to poor system design;
- Loss of existing functionality;
- Poor user interface which would create significant incremental training; and

- Risk through a lack of referential integrity.

b) As a result of investing more money in a tier 1 CIS system, were there a list of projects that were deferred and how did Kitchener-Wilmot Hydro assess that these projects were lower priority than the CIS system.

In keeping with its Total Spend Approach, KWHI has deferred some projects to accommodate the implementation of its CIS. The replacement of two power transformers at KWHI's #5TS has been delayed to 2023 and 2024. The installation of new feeders to downtown Kitchener is also being staged over three years rather than completing over one to two years.

Replacement of the CIS at this time is urgent and the existing system is fully past its useful life. Workforce resources are becoming increasingly difficult to find to maintain the legacy system. While the other projects are crucial to KWHI's distribution infrastructure, KWHI weighted the need to complete the above projects versus completing its CIS implementation using a number of risk factors/criteria such as customer satisfaction, reliability, asset health, etc. and its CIS replacement is the higher priority.

# Exhibit 2 – Rate Base

## 2-Staff-8 Rate Base

**Ref: Exhibit 2: Rate Base, Table 2.2-8 – 2019 Bridge vs 2020 Test**
**Ref: Chapter 2 Appendices – 2-BA Fixed Asset Cont**
In 2020, Kitchener-Wilmot Hydro's working capital allowance (WCA) changed from 13% to 7.5% and, among other factors, resulted in a decrease of $11.2 million for WCA. The total rate base, however, has shown almost no change because of higher average fixed assets, which offset the decrease in WCA. Kitchener-Wilmot Hydro explains that the higher average fixed assets were due to resetting its cost envelope and transferring the cost of the CIS from construction work in progress (CWIP) to rate base.

a) Please provide the balance in CWIP for each year from 2014 to 2019.

The balance in construction work in progress (CWIP) is shown below in addition to a line that captures non-construction work in process, Other Utility Plant. This latter line is where asset costs not immediately used in utility services are held.

KWHI increased 2020 CWIP by $1,400,000 compared to the CWIP filed during the original Cost of Service application filing of $3,623,032+ $1,400,000 to reflect the increased estimated costs of the new CIS while not increasing the overall capital ask. KWHI recognizes that the additional CIS costs will create a "bubble" in 2020 for the capital spend considering that it still needs to build upon/refresh its infrastructure. The incremental $1.4M to be spent on infrastructure was moved to CWIP so as not to impact the overall capital additions in 2020.

KWHI also reduced 2019 other utility plant account by $1,100,000 to reflect lower CIS expected 2019 spend, bringing the previously recorded $4,700,000, down to $3,600,000 due to the change in the implementation schedule of the CIS project. The difference of $1.1M was transferred to 2020 CAPEX as that is when the expenditure will occur.

| | 2014 Actual CGAAP | 2015 MIFRS | 2016 MIFRS | 2017 MIFRS | 2018 MIFRS | 2019 Bridge | 2020 Test |
|---|---|---|---|---|---|---|---|
| Construction Work In Progress | 5,171,577 | 4,672,368 | 6,900,659 | 4,342,795 | 3,623,032 | 3,623,032 | 5,023,032 |
| Other Utility Plant | - | - | - | 1,263,546 | 1,363,770 | 3,600,000 | - |

b) Please provide the methodology in forecasting the in-service additions for the test year based on forecasted capital expenditures.

KWHI records in-service additions according to the OEB Accounting Procedures Handbook. General plant costs not immediately used in utility services are held in account 2070, Other Utility Plant until such time these assets are put into service and reclassed to in-service additions. The balances of both accounts are included in KWHI's response to part a) above.

## 2-Staff-9 Information Technology/Operation Technology (IT/OT) Investments

**Ref: Distribution System Plan – 4.4.1.1 General Plant**
The investment in IT/OT systems were higher than expected in 2018. This project was the result of the server infrastructure being at end-of-life.

a) Please provide the business case for the replacement of the IT/OT systems.

The three physical servers that provided virtualization for KWHI's IT/OT environment were approaching end of life (5-years old in 2018) as per KWHI's asset management principles for IT assets. See Table 3-18 in the DSP document. KWHI evaluated the current technologies available for server infrastructure and decided to move to a hyperconverged infrastructure with built-in data duplication to reduce the requirements for physical storage and significantly improve data recovery during disasters. Appendix 1 - IR-2-Staff-9 - Business Case - 2018 – Simplivity provides the justification for this move.

## 2-Staff-10 Defective Equipment Outages

**Ref: Distribution System Plan - Table 2-18**
**Ref: Distribution System Plan - Table 2-19**
Kitchener-Wilmot Hydro provided a breakdown of outages for defective equipment and foreign interference for 2018 in Table 2-18 and Table 2-19.

a) Please provide a similar table for defective equipment outages and foreign interference for each year between 2014-2017.

As of April 2016, with the introduction of an outage management system (OMS), KWHI began collecting reliability data for different categories of defective equipment and sub-cause codes for Foreign Interference. The tables below show reliability data for Defective Equipment and Foreign Interference broken down into sub categories for the periods April 1, 2016 to December 31, 2016, January 1, 2017 to December 31, 2017. The data excludes Major Events. Data for 2018 can be found in Table 2-18 and Table 2-19 of the DSP.

**Defective Equipment Outages - April 2016 to December 2016**

| Secondary Cause | CHI | Customers Int. | SAIDI | SAIFI | CAIDI | # of Outages |
|---|---|---|---|---|---|---|
| Arrestor | 402 | 288 | 0.0043 | 0.0031 | 1.3950 | 8 |
| Breaker - Transformer | 1,300 | 2,669 | 0.0138 | 0.0283 | 0.4872 | 6 |
| Connector / Connections | 72 | 37 | 0.0008 | 0.0004 | 1.9576 | 11 |
| Cross arm | 594 | 115 | 0.0063 | 0.0012 | 5.1630 | 1 |
| Fuse | 93 | 20 | 0.0010 | 0.0002 | 4.6657 | 3 |
| Insulator | 17,333 | 8,432 | 0.1848 | 0.0899 | 2.0566 | 6 |
| Overhead transformer | 352 | 223 | 0.0037 | 0.0024 | 1.5773 | 10 |
| Overhead wire | 7,521 | 3,074 | 0.0795 | 0.0325 | 2.4468 | 11 |
| Padmount transformer | 53 | 27 | 0.0006 | 0.0003 | 1.9574 | 1 |
| Pole | 97 | 16 | 0.0010 | 0.0002 | 6.0736 | 2 |
| Pole fire | 2,909 | 1,187 | 0.0311 | 0.0127 | 2.4504 | 4 |
| Relay | 2,738 | 9,270 | 0.0291 | 0.0986 | 0.2953 | 12 |
| Service wire | 81 | 66 | 0.0009 | 0.0007 | 1.2216 | 6 |
| Submersible transformer | 4,359 | 918 | 0.0463 | 0.0098 | 4.7515 | 49 |
| Switch | 9,805 | 12,401 | 0.1044 | 0.1319 | 0.7915 | 32 |
| Underground cable | 113 | 18 | 0.0012 | 0.0002 | 6.26 | 1 |
| Underground transformer | 301.017 | 108 | 0.0032 | 0.0011 | 2.7871 | 2 |
| **Total** | **48,122** | **38,869** | **0.5120** | **0.4134** | **1.24** | **165** |

**Defective Equipment Outages – January 2017 - December 2017**

| Secondary Cause | CHI | Customers Int. | SAIDI | SAIFI | CAIDI | # of Outages |
|---|---|---|---|---|---|---|
| Arrestor | 3,404 | 2,645 | 0.0355 | 0.0276 | 1.2869 | 5 |
| Breaker - Transformer | 74 | 42 | 0.0008 | 0.0004 | 1.7571 | 3 |
| Bushing | 13 | 3 | 0.0001 | 0.0000 | 4.2111 | 1 |
| Connector / Connections | 1,170 | 383 | 0.0123 | 0.0040 | 3.0583 | 29 |
| Console | 63 | 62 | 0.0007 | 0.0007 | 1.0187 | 2 |
| Fuse | 130 | 80 | 0.0014 | 0.0008 | 1.6144 | 8 |
| Insulator | 1,160 | 1,293 | 0.0121 | 0.0136 | 0.8912 | 7 |
| Overhead transformer | 201 | 44 | 0.0021 | 0.0005 | 4.5662 | 8 |
| Overhead wire | 200 | 90 | 0.0021 | 0.0009 | 2.2256 | 11 |
| Padmount transformer | 437 | 130 | 0.0046 | 0.0014 | 3.3592 | 6 |
| Pole | 327 | 49 | 0.0034 | 0.0005 | 6.6676 | 3 |
| Pole fire | 14 | 7 | 0.0001 | 0.0001 | 2.0357 | 2 |
| Service wire | 228 | 114 | 0.0024 | 0.0012 | 2.0050 | 13 |
| Submersible transformer | 5,714 | 1,030 | 0.0600 | 0.0108 | 5.5506 | 46 |
| Switch | 4,943 | 21,286 | 0.0517 | 0.2227 | 0.2322 | 38 |
| Underground cable | 267 | 137 | 0.0028 | 0.0014 | 1.94 | 6 |
| Underground transformer | 1048.4 | 340 | 0.0110 | 0.0036 | 3.0882 | 7 |
| **Total** | **19,392** | **27,735** | **0.2031** | **0.2902** | **0.70** | **195** |

**Foreign Interference Outages - April 2016 to December 2016**

| Secondary Cause | CHI | Customers Int. | SAIDI | SAIFI | CAIDI | # of Outages |
|---|---|---|---|---|---|---|
| Animal Contact | 2,111 | 2,646 | 0.0225 | 0.0282 | 0.7959 | 29 |
| Motor Vehicle Accident | 18,239 | 8,582 | 0.1934 | 0.0910 | 2.1256 | 19 |
| Other | 4,503 | 2,153 | 0.0478 | 0.0229 | 2.0915 | 11 |
| Overhead Secondary Contact (Not Animal) | 95 | 14 | 0.0010 | 0.0001 | 6.7924 | 2 |
| Raccoon | 10 | 2 | 0.0001 | 0.0000 | 5.0647 | 2 |
| Squirrel | 3,452 | 8,851 | 0.0367 | 0.0941 | 0.3902 | 50 |
| Underground Secondary Contact | 134 | 19 | 0.0014 | 0.0002 | 7.0382 | 3 |
| **Total** | **28,544** | **22,267** | **0.3030** | **0.2366** | **1.28** | **116** |

**Foreign Interference Outages - January 2017 to December 2017**

| Secondary Cause | CHI | Customers Int. | SAIDI | SAIFI | CAIDI | # of Outages |
|---|---|---|---|---|---|---|
| Animal Contact | 721 | 521 | 0.0075 | 0.0054 | 1.3847 | 20 |
| Motor Vehicle Accident | 13,922 | 8,054 | 0.1453 | 0.0842 | 1.7259 | 25 |
| Other | 39 | 12 | 0.0004 | 0.0001 | 3.2415 | 4 |
| Overhead Primary Contact (Not Animal) | 6,782 | 8,549 | 0.0708 | 0.0893 | 0.7932 | 5 |
| Overhead Secondary Contact (Not Animal) | 36 | 39 | 0.0004 | 0.0004 | 0.9247 | 3 |
| Raccoon | 2,614 | 2,240 | 0.0273 | 0.0234 | 1.1671 | 4 |
| Squirrel | 7,006 | 10,087 | 0.0733 | 0.1053 | 0.6960 | 48 |
| Underground Secondary Contact | 32 | 25 | 0.0003 | 0.0003 | 1.2650 | 3 |
| Unknown | 33 | 1,525 | 0.0003 | 0.0158 | 0.0217 | 1 |
| **Total** | **31,186** | **31,052** | **0.3258** | **0.3243** | **1.00** | **113** |

## 2-Staff-11 System Losses

**Ref: Distribution System Plan - Table 2-25**

Kitchener-Wilmot Hydro provided system losses between 2014-2018 in Table 2-25 and it shows that there has been no improvement to losses from 2014 to 2018.

a) Has Kitchener-Wilmot Hydro reviewed the distribution system to identify areas that cause the most losses? If not, does Kitchener-Wilmot Hydro take into consideration losses during its planning?

During the period 2014-2018, KWHI did not review the distribution system to identify areas that caused the most losses. The existing system losses are within acceptable levels. Consideration for losses are taken into account during planning and designing. This includes conductor sizing, feeder length, capacitor bank placement, and distribution transformer loss formula used to evaluate new purchases.

## 2-Staff-12 Vegetation Management

**Ref: Distribution System Plan 3.3.1.3 Description of Maintenance and Inspection Practices**
**Ref: EB-2013-0147 Asset Management Strategy, February 2013**
Kitchener-Wilmot Hydro's asset management strategy in 2013 for vegetation management was a five-year clearing cycle. The current clearing cycle is a six-year cycle and Kitchener-Wilmot Hydro stated that a reduction in cycle frequency would result in cost savings.

a) Please provide the estimated cost savings of moving from a five-year vegetation management cycle to a six-year cycle.

The asset management strategy in 2013 incorrectly stated that vegetation management was on a five-year clearing cycle. Vegetation management was on a six-year schedule in 2013 and KWHI remains on the same schedule in 2019, with no current plans to increase or decrease the clearing cycle length.

b) Please provide the yearly OM&A spent or expected to spend on vegetation management from 2014-2020.

**Table 2-Staff-12**

| | 2014 Board Approved CGAAP | 2014 Actual CGAAP | 2015 Actual MIFRS | 2016 Actual MIFRS | 2017 Actual MIFRS | 2018 Actual MIFRS | 2019 Bridge MIFRS | 2020 Test MIFRS |
|---|---|---|---|---|---|---|---|---|
| Total Tree trimming | 840,000 | 743,731 | 842,913 | 758,620 | 679,077 | 720,250 | 789,900 | 805,900 |

c) Kitchener-Wilmot Hydro stated that each zone is inspected the year following tree trimming. Is that the only time that Kitchener-Wilmot Hydro inspects a zone?

KWHI conducts annual inspection and maintenance programs, such as OEB distribution system inspection, pole testing, infra-red survey and insulator washing, which identify areas where additional off-cycle vegetation management is required.

d) Does Kitchener-Wilmot Hydro clear each zone only based on cycle time or does it have a method to evaluate suspect trees to focus its vegetation management resources.

On an ongoing basis, KWHI reviews feeder outage frequency and related causes. Additional off-cycle tree trimming may occur resulting from a feeder experiencing higher than average outages caused by trees or animals. Additionally, KWHI's arborists may trim some areas more frequently to account for different growth rates of some species of trees.

## 2-Staff-13 Material Investments

**Ref: Appendix 2-AA Capital Projects table**
**Ref: Distribution System Plan 4.4.2 Material Investments – Table 4-33 Material Investments Allocated for 2020**

In Table 4-33, Kitchener-Wilmot Hydro provided projects in 2020 that were above the materiality threshold, which totalled to $18.8 million in capital expenditures, net of recoverable costs. The total capital expenditures requested in 2020 is approximately $24.6 million, a difference of $5.8 million. While most of this difference is due to recoverable costs, it is difficult to reconcile the two tables.

a) Please group each project in table 4-33 into the categories in Appendix 2-AA.

While the individual material project justifications included the correct amount for each project, Table 4-33 in the DSP did not include the correct amount for the System Access material projects. This is an error, and as such the revised Table 4-33 with total of $22.53 million is included with this interrogatory as attachment *"IR-2-Staff-13 Table 4-33 Material Projects and Priority List-revised"*.

The following table is a list of all 2020 material projects grouped into the categories of Appendix 2-AA.

Table 2-AA with DSP Table 4-33 Material Project Assignments

| Programs | Material Projects Description | 2020 Amount ($'000) |
|---|---|---|
| **System Access** | | |
| LRT Relocations | -NONE- | 0 |
| Roadway Relocations | Relocations Due to Roadway Modification Projects | 1,700 |
| Underground Residential Distribution | Underground Residential Distribution Servicing | 3,708 |
| Commercial, Industrial & Apartment Services | Large Commercial and Industrial Services | 1,209 |
| Revenue Meters & Generation Connections | Meter Installation and Replacement | 597 |
| **System Access Sub Total** | | **7,214** |
| **System Renewal** | | |
| TS and DS Renewal | No. 4 Transformer Station Replacement of 115 kV Switch with Circuit Switcher | 229 |
| | No. 6 Transformer Station Rebuild P & C and SCADA Equipment and Wiring | 879 |
| | No.5 TS Switchgear Arc Resistance | 757 |
| Replacement of Pole Line Assets | 4M26 Feeder - Pole Line Rebuild-Stage 1-H1 ROW from Fischer-Hallman Road to Westmount | 265 |

| Programs | Material Projects Description | 2020 Amount ($'000) |
|---|---|---|
| | 6M11 Feeder-H1 ROW between rear of 83 Trailwood Cres to Royal Orchard Dr | 353 |
| | Franklin Avenue South between Wilson Avenue and Connaught Street | 177 |
| | Mill Street: Ottawa Street South to Carwood Avenue | 329 |
| | Single Phase & Secondary Pole Line Rebuilds Due to Age and Condition | 935 |
| | Spot Replacement of Deteriorated Poles | 425 |
| | Stage 1-River Road East between Ottawa Street North and Halliwell Drive | 201 |
| | Victoria Street North between Weber Street West and Margaret Avenue | 529 |
| Voltage Conversion | Bridge Street: Puddicombe Road to Pinehill Road, Township of Wilmot | 289 |
| | Notre Dame Drive: Wilby Road to Erb's Rd, Township of Wilmot | 340 |
| | Underground Voltage Conversion | 400 |
| | Wilby Road: Nafziger Road and the Nith River, Township of Wilmot | 289 |
| Replacement of Primary Cables and Conduits | Underground System Renewal | 850 |
| Rebuild Transformer Vaults & Pull Boxes | Three Phase Transformer Vault Roof Replacements | 240 |
| Network Transformer Replacement | Network Transformer Replacements | 192 |
| Distribution Transformer Installation and Replacement | Overhead Transformer Purchases | 500 |
| | Transformer installations excluding URD | 850 |
| **System Renewal Sub Total** | | **9,029** |
| **System Service** | | |
| System Expansion to Supply New Developments - TS | -NONE- | 0 |
| System Expansion to Supply New Developments - O/H | Mannheim Rd: Witmer Rd to Huron Rd Line Extension | 403 |
| | Strasburg Rd Stage 1: Templewood Dr to South of Rockcliffe Dr. | 259 |
| System Expansion to Supply New Developments - U/G | Underground System Expansion to Supply New Developments | 1,700 |
| Innovation and Reliability | Innovation and Reliability Improvement - Overhead Distribution | 550 |
| **System Service Sub Total** | | **2,912** |
| **General Plant** | | |
| Land & Buildings | Emergency Backup Generator Replacement | 350 |
| | Pavement Replacement at Main Office – Phase 2 | 350 |

| Programs | Material Projects Description | 2020 Amount ($'000) |
|---|---|---|
| IT/OT Systems | CIS Replacement | 1,675 |
| Vehicles | Vehicle Replacement | 1,000 |
| **General Plant Sub Total** | | **3,375** |
| **Sub Total** | | **22,530** |
| Less Renewable Generation Facility Assets and Other Non Rate-Regulated Utility Assets (input as negative) | | 0 |
| **Total** | | **22,530** |

b) For all non-material projects, please group them together into the categories in Appendix 2-AA and provide the following: a sub-grouping of the projects as Kitchener-Wilmot Hydro deems appropriate; a narrative on the nature of the work for each sub-grouping; and the list of projects for each sub-grouping, as applicable.

The following table is a list of non-material projects for 2020 grouped per Appendix 2-AA where applicable plus additional grouping per KWHI's project/program categories. These non-material investments totalled approximately $2.0 million.

| | Table 2-AA | |
|---|---|---|
| | **Capital Projects Table - Non Material Projects** | |
| | | **2020** |
| **Programs** | **Sub-Program** | **($'000)** |
| **System Access** | | |
| LRT Relocations | -NONE- | 0 |
| Roadway Relocations | -NONE- | 0 |
| Underground Residential Distribution | -NONE- | 0 |
| Commercial, Industrial & Apartment Services | -NONE- | 0 |
| Revenue Meters & Generation Connections | -NONE- | 0 |
| System Expansion - Customer Growth | -NONE- | 0 |
| Miscellaneous U/G Customer Connections | Miscellaneous U/G Customer Connections | 450 |
| Miscellaneous O/H Customer Connections | -NONE- | |
| Miscellaneous - Tx installed and Others | -NONE- | |
| **System Access Sub Total** | | **450** |
| | | |
| **System Renewal** | | |
| TS and DS Renewal | Transformer Stations Miscellaneous Upgrades & Modifications | 138 |
| Replacement of Pole Line Assets | Misc. Overhead Distribution | 190 |
| Voltage Conversion | Misc. Voltage Conversion | 57 |
| Replacement of Primary Cables and Conduits | -NONE- | 0 |
| Rebuild Transformer Vaults & Pull Boxes | -NONE- | 0 |
| Network Transformer Replacement | -NONE- | 0 |
| Distribution Transformer Installation and Replacement | -NONE- | 0 |
| Miscellaneous U/G plant replacements | -NONE- | |
| Miscellaneous O/H plant replacements | -NONE- | |
| **System Renewal Sub Total** | | **385** |
| | | |
| **System Service** | | |
| System Expansion to Supply New Developments - TS | -NONE- | |
| System Expansion to Supply New Developments - O/H | -NONE- | 0 |
| System Expansion to Supply New Developments - U/G | -NONE- | 0 |
| Innovation and Reliability | Underground projects - various | 250 |
| Voltage Conversion - Reliability/Flexibility | -NONE- | |
| Miscellaneous | -NONE- | |
| **System Service Sub Total** | | **250** |
| | | |
| **General Plant** | | |
| Land & Buildings | Misc. building and facilities upgrades | 50 |
| Office Equipment | Office furniture and equipment | 70 |
| IT/OT Systems | New Computer Hardware - various | 235 |
| IT/OT Systems | Desktop Refresh | 50 |
| IT/OT Systems | IT New Systems Development | 50 |
| IT/OT Systems | Cyber Security | 85 |
| IT/OT Systems | Professional Services - Consulting & Application Development / Enhancements | 150 |
| IT/OT Systems | Misc hardware and software | 90 |
| Vehicles | -NONE- | 0 |
| Tools & Equipment | Small tools and communication equipment | 140 |
| **General Plant Sub Total** | | **920** |
| | | |
| **Total** | | **2,005** |

The following is a short narrative for the non-material projects/programs.

**System Access**

*1. Miscellaneous U/G Customer Connections ($450K)*

This program allows funding to be budgeted for new or upgraded underground services that are required to supply individual residential customers (not part of a subdivision or townhouse development), small commercial customers and unmetered scattered load customers. The projects in this program are non-discretionary (mandatory) and individual project costs are typically small. Specific projects are not known at the time that the budget is set, and total expenditures can vary from year to year.

**System Renewal**

*1. Transformer Stations Miscellaneous Upgrades & Modifications ($138K)*

This program is a subset of Transformer and Distribution Stations Renewal and includes a collection of small projects in which protection and control devices and switchgear equipment at existing transformer stations are replaced or upgraded due to age, deteriorating condition or functional obsolescence.

*2. Miscellaneous O/H Distribution ($190K)*

This program is a subset of Replacement of Pole Line Assets and includes a collection of small investments for asset replacements. These are typically pertinent to some other larger project e.g. during the installation of an underground cable it becomes necessary to replace a pole, install an additional pole or install additional guying. On occasion, the costs of unanticipated rebuild projects are attributed to this program. Spot replacement of rotted poles are normally captured under this program if not budgeted for in other programs. Carryovers from System Renewal projects that are substantially completed in a prior year are normally budgeted for in this category as well.

*3. Miscellaneous Voltage Conversion ($57K)*

This program is a subset of Voltage Conversion and includes a collection of small investments necessary to accommodate voltage conversion to 16/28kV for distribution pole lines (e.g. changing switches and arresters) or individual customer services.

**System Service**

*1. Innovation and Reliability – Underground Distribution ($250K)*

This program is a subset of Innovation and Reliability and includes a collection of small underground related projects to be implemented to improve system reliability…. Example of projects normally budgeted for in this program includes; installation of fibre

optics cable to connect underground network transformers for monitoring and control, expenditures for converting manual underground switchgear to remote operable switchgear, and expenditures to convert existing overhead distribution plant to underground distribution for reliability improvement and accessibility.

**General Plant**

*1. Misc. building and facilities upgrade ($50K)*

This program is a subset of Land & Buildings and includes budgeted amount for unforeseen expenditures required to replace and/or enhanced KWHI's main building and facilities.

*2. Office Equipment ($70K)*

This program captures the costs required to purchase additional office furniture and replace existing office furniture on an incremental basis.

*3. New Computer Hardware – various ($235K)*

This program is a subset of IT and OT Systems and includes expenditures required to procure new IT infrastructure to replace existing core infrastructure such as servers, switches, and storage devices. It also includes expenditures required to procure infrastructure for smart grid initiatives and mobile computing.

*4. Desktop Refresh – various ($50K)*

This program is a subset of IT and OT Systems and includes expenditures required to procure new desktop computers and monitors to replace existing desktop infrastructure based on KWHI's IT asset management practice.

*5. IT New systems Development ($50K)*

This program is a subset of IT and OT Systems and includes internal labour required to enhance/upgrade existing application systems (mainly legacy CIS) for regulatory compliance.

*6. Cyber Security ($85K)*

This program is a subset of IT and OT Systems and includes expenditures required to acquire tools, applications, and services required to bolster KWHI's cyber security posture as required by the Ontario Cyber Security Framework. It also includes infrastructure expenditures required to isolate IT and OT systems where required.

*7. Professional Services - Consulting & Application Development ($150K)*

This program is a subset of IT and OT Systems and includes professional services (external labour) required to enhance/upgrade existing enterprise application systems such as ERP system (JDE), OMS, GIS, and SCADA system.

*8. Miscellaneous IT Hardware and Software ($90K)*

This program is a subset of IT and OT Systems and includes expenditures required to acquire and implement unforeseen IT hardware and software systems.

*9. Small tools and communication equipment ($140K)*

This program captures the costs required to purchase tools and equipment required to support KWHI's distribution construction, operation and maintenance activities. Individual items that have a high purchase cost are capitalized. The program also captures costs for communication equipment required to build the radio network (such as repeaters and head-end units) that is required for distribution automated field devices.

## 2-Staff-14 Relocations Due to Roadway Modifications

**Ref: Appendix 2-AA Capital Projects table**
**Ref: Distribution System Plan, Appendix A – SA 3-20-3 and 4-20-6**
In Appendix A, the project justification for roadway relocations only shows a list of possible projects for 2020, along with the trending used for the forecasted $1.7 million. Kitchener-Wilmot Hydro also stated that the general intention is to complete the project one year prior to the road works.

a) Please update the list of projects based on the latest known road works.

The projects listed below are based on the latest known road projects as of date (July 2019).

- River Rd: Bleams Rd/ Wabanaki/ Hidden Valley Rd (81 poles)
- Fischer-Hallman Rd: Creek to Plains Rd (82 poles)
- Westmount Rd W: Glasgow St to Highland Rd W (20 poles)
- Ottawa St S: Strasburg Rd to International Rd (80 poles)
- Stirling Ave: Greenbrook to Mausser (15 poles)
- Bleams Rd: Strasburg Rd to Fischer-Hallman Rd (34 poles)
- Highland Rd: Fischer-Hallman Rd to Ira Needles Blvd (7 poles)
- Ottawa St.: Maurice to Weber St. (16 poles)

It should be noted that the list above has a significant larger scope of work and costs than included in the 2020 rebase capital budget. KWHI will adjust its plan, where appropriate, using the "Total Spend Approach" described in Exhibit 1 – 1.1.3.3 to accommodate the extra costs associated with mandatory road relocation projects.

b) Kitchener-Wilmot Hydro had forecasted future relocation expenditures based on trending the historical actuals between 2014-2018. During these years, there was significant work done to accommodate the Light Rail Transit (LRT) system. How has Kitchener-Wilmot Hydro normalized the trending to account for the incremental spending for the LRT system?

The LRT project was tracked separately from the normal road relocations project due to its scope and special funding arrangement. The historical costs shown for road relocation projects in Appendix A - SA 3-20-3 and 4-20-6 do not include LRT costs.

c) Kitchener-Wilmot Hydro stated that it tries to complete the relocations one year prior to the road works, which means that in 2019 Kitchener-Wilmot Hydro should have a confident list of projects for 2020. Please explain why Kitchener-Wilmot Hydro used a trending method instead of a bottom-up estimation of known projects for the test year?

KWHI's philosophy is to design and construct road relocation projects one year in advance to allow for the road works to occur the year in which they are scheduled. However, this is not normally the case for all road projects. Frequently, KWHI will have a change in schedule and priority of projects from the road authority resulting in a variation of the planned projects occurring with new ones brought into the mix as a net new, or budgeted projects get replaced or eliminated. The scope of the projects also varies and is only accurately known when a submission is received from the road authority. When sufficient information on the planned projects and their timelines are known, a bottom-up approach is used for budgeting. Otherwise, trending based on historical spending is used.

## 2-Staff-15 Voltage Conversion

**Ref: Appendix 2-AA Capital Projects table**
**Ref: Distribution System Plan 4.1.2.2 System Renewal. Table 4-3 2020-2024 System Renewal Expenditure Plan**
**Ref: EB-2013-0147 – Kitchener-Wilmot Capital Expenditure Program 2013-2022 Appendix A**

Kitchener-Wilmot Hydro has forecasted $1.375 million for voltage conversion in 2020 and continues to increase each year until 2024.

a) Kitchener-Wilmot Hydro stated that as assets reach end-of-life they would be replaced with assets that have a higher voltage rating in preparation for voltage conversions. Would replacing end-of-life assets in this way be considered a voltage conversion investments?

Classifying these projects as voltage conversion is dependent on what the main driver for the project is. Example, if the pole line is at end of life and KWHI is actively planning to convert that line segment within the near-term (0-5 years), it would be classified as a voltage conversion project.

b) Please provide Kitchener-Wilmot Hydro's voltage conversion strategy. (ie. When does it expect to fully remove the 8.32kV system? Is conversion done station by station, such that the station can be retired? Is conversion only used as a mechanism for load relief?)

The Township of Wilmot is currently supplied by both 27.6kV distribution system and 8.32kV distribution system. Since KWHI No.9 Transformer Station went in-service in December 2010, the 27.6kV distribution system changed from ungrounded system to multi-grounded system. There are four 27.6kV feeders out of KWHI No.9 Transformer Station. These four 27.6kV feeders supply about 1560 customers including six KWHI 8.32kV distribution stations. Additionally, there are seventeen 8.32 kV feeders out of these six distribution substations, feeding 6656 customers.

A planning study performed in 1995 examined the future of the distribution system in Wilmot Township. The principle recommendations were that the 8.3 kV distribution system be gradually converted to 27.6 kV operation and that a 27.6 kV transformer station be constructed near the load centre. Benefits of voltage conversion include:

(i) Improved system efficiency (by reducing line losses).

(ii) Improve voltage regulation.

(iii) Future costs to expand distribution stations to accommodate load growth are avoided.

(iv) Future costs to maintain/rebuild distribution substations are avoided.

(v) Reduced ground currents and stray voltages.

(vi) Improved ability to connect distributed generation. Increasing the capacity of a distribution feeder increases the size of distributed generation site that can be connected to that feeder.

Voltage conversion will eventually see the elimination of these 8.32kV distribution stations. KWHI plans to fully retire the 8.32kV distribution stations before they are at end of life and in need of replacement, i.e., in the next 20-30 years. At the end of this time period, the Township of Wilmot will be supplied by the 27.6kV distribution system only.

To mitigate the impact on customers, the distribution station decommissioning will be completed station by station following a sequence. The sequence of distribution station decommissioning has been determined based on multiple factors:

a) The age/condition of the distribution station equipment;

b) The age/condition of the pole lines within the distribution station service area;

c) The reliability and backup capability of the 8.32 and 27.6kV feeders.

Since the start of the voltage conversion process, KWHI was able to decommission one of the seven distribution stations. No. 5 DS was decommissioned in February 2019. By late 2030's, there may only be 2~3 distribution stations remaining in service. At that time, the backup of 8.32kV feeders and 8.32kV system reliability may become an issue. To mitigate these challenges, KWHI may need to increase voltage conversion expenditures and expedite the voltage conversion process for a few years until its completion. This voltage conversion plan follows the same methodology as used in Kitchener between 1982 – 1998 that eliminated twenty-six 4 kV substations.

KWHI began the conversion process to 27.6 kV in 1995. The following strategies have been implemented:

1. When a pole line rebuild project is triggered due to age/condition/road work, the new pole line is constructed to 27.6kV standard. All lines constructed in Wilmot Township since 1995 have been constructed with 27.6 kV insulation.
2. When a primary cable is installed for 8.32kV distribution system, 27.6/16 kV rated cable is installed. All primary cables installed in Wilmot Township since 1995 have been with 27.6 kV insulation.
3. When an existing 8.32kV transformer is replaced due to age/service upgrade, new dual voltage transformer which is suitable for future 27.6kV distribution system is installed. All overhead transformers installed in Wilmot Township since 2012 have been dual voltage.
4. For any new service or service upgrade, if the 27.6kV distribution system is available to the property, the service is connected to the 27.6kV system.

c) Please provide the number of 8.32kV circuit kilometers for each distribution feeder.

The table below shows the number of circuit lengths per 8.32kV feeder in kilometers.

| 8.32kV Feeders Circuit Lengths (kilometers) | | | | | |
|---|---|---|---|---|---|
| | Overhead Conductor | | Underground Cable | | Total Circuit Length |
| Feeder ID | 3-phase | 1-phase | 3-phase | 1-phase | |
| 1DS1 | 4.33 | 1.46 | 0.46 | 12.10 | **18.35** |
| 1DS2 | 2.14 | 2.38 | 0.11 | 0.00 | **4.63** |
| 1DS3 | 5.93 | 2.72 | 0.13 | 0.64 | **9.42** |
| 2DS1 | 1.76 | 0.29 | 0.04 | 5.98 | **8.06** |
| 2DS2 | 1.86 | 0.17 | 0.42 | 10.46 | **12.91** |
| 2DS3 | 2.51 | 0.49 | 0.23 | 6.50 | **9.72** |
| 3DS1 | 17.47 | 22.77 | 0.05 | 2.07 | **42.35** |
| 3DS3 | 8.82 | 4.42 | 0.17 | 3.19 | **16.60** |
| 5DS2 | 5.07 | 10.80 | 0.07 | 1.09 | **17.03** |
| 6DS1 | 13.78 | 2.74 | 0.22 | 3.13 | **19.87** |
| 6DS2 | 3.65 | 3.39 | 0.18 | 6.29 | **13.50** |
| 6DS3 | 18.86 | 19.74 | 0.36 | 0.34 | **39.30** |
| 7DS1 | 0.81 | 0.00 | 0.17 | 0.63 | **1.61** |
| 7DS2 | 14.54 | 37.96 | 0.12 | 0.66 | **53.28** |
| 7DS3 | 9.30 | 13.67 | 0.73 | 3.98 | **27.68** |
| 8DS1 | 0.26 | 19.20 | 0.03 | 0.34 | **19.84** |
| 8DS2 | 13.04 | 25.11 | 0.53 | 8.67 | **47.35** |
| 8DS3 | 15.04 | 4.61 | 0.34 | 0.49 | **20.48** |
| **Total** | **139.16** | **171.91** | **4.35** | **66.55** | **381.97** |
| **% of Total** | **36.4** | **45.0** | **1.1** | **17.4** | |

d) In EB-2013-0147, the capital expenditure forecast for voltage conversion was $600k. Kitchener-Wilmot Hydro's requested capital expenditure is twice that amount. Please explain what has changed since the last cost of service to justify the accelerated voltage conversion.

The voltage conversion program is not actually being accelerated. The change in budget amount allocated is based on how KWHI is currently classifying projects. Prior to 2016, projects classified as voltage conversion were based on the need to rebuild and convert an 8.3kV line to 27.6kV at the same time. Subsequently, KWHI took a different approach whereby if the pole line is at end of life and KWHI is actively planning to convert that line segment within the near-term (0-5 years), KWHI would classify the project as a voltage conversion project. The voltage conversion program together with the replacement of pole line assets program forms the larger pole line system renewal program.

The EB-2013-0147 application has overhead voltage conversion budgeted amount as $500K and replacement of pole line assets as $3,500K for a total of $4,000K. The current application has voltage conversion budgeted amount as $1,000K and replacement of pole line assets as $3,000K for a total of $4,000K.

## 2-Staff-16 System Access – Commercial, Industrial & Apartment Services

**Ref: Appendix 2-AA Capital Projects Table**
**Ref: Distribution System Plan 4.1.2.1.4 Installation of Commercial, Industrial & Apartment Services**
**Ref: Load Forecasting Model - Summary**

Kitchener-Wilmot Hydro forecasted a capital spend of $1.209 million in 2020 for commercial, industrial, and apartment services. This represents a 28.58% increase from the historical 6-year average. Kitchener-Wilmot Hydro stated in the Distribution System Plan (DSP) that it is anticipating an increase in development activities along the LRT route, which will require underground servicing. In the load forecasting model, only the residential rate class is showing growth while the GS<50 kW, GS>50 kW, and Large User rate classes are generally trending lower usage.

a) Please provide evidence to justify the anticipation of development along the LRT route.

See attached document titled *"IR-2-Staff-16 - Proposed_Downtown_Development_Projects_CONFIDENTIAL_July 2019"* which includes over 25 projects identified by the City of Kitchener for development within the next 3 years.

See attached document titled *"IR-2-Staff-16 - A development tsunami in Kitchener"* which is an excerpt from a local newspaper article detailing the proposed developments in Kitchener along the LRT route.

There is also physical evidence of active construction currently being undertaken in downtown Kitchener. See pictures below which are excerpts from TheRecord.com newspaper.


*A condo tower, seen through a construction fence, on Victoria Street in Kitchener, Friday. - Mathew McCarthy , Waterloo Region Record*


*Construction continues on a a six-storey office building at 345 King St. W. in downtown Kitchener. Perimeter Development Corp. is putting up the building next to its existing 12-storey building at 305 King St. W. In the background is a construction crane for the Charlie West condo project at Charles and Gaukel streets. - Peter Lee , Waterloo Region Record*

b) Please explain how Kitchener-Wilmot Hydro has reflected the expected new load in the load forecast.

The load forecast has not reflected any unusual load growth as these developments are still in the planning and/or building phase and do not have guaranteed occupancy in 2020. The full load may not be realized for 3 years. Load forecast variable take into account the growth in load.

## 2-Staff-17 Transformer and Distribution Stations Renewal

**Ref: Appendix 2-AA Capital Projects Table**
**Ref: Distribution System Plan 4.1.2.2.1 Transformer and Distribution Stations Renewal**
**Ref: EB-2013-0147 – Kitchener-Wilmot Capital Expenditure Program 2013-2022 Appendix B**

In Kitchener-Wilmot Hydro's last cost of service (EB-2013-0147), Kitchener-Wilmot Hydro had proposed to install arc resistance on the #5TS switchgear at the end of 2016 and replace #6TS's protections and control (P&C) equipment by the end of 2017. These projects are again proposed for the 2020 test year.

a) Please confirm if these are the same projects. If so, why are the investments reappearing in the test year?

The projects listed above and identified for implementation in 2016 and 2017 are the same projects being proposed for implementation in 2020. The projects are planned to begin in 2019 and be finished in 2020. The investments were deferred to accommodate the completion of No. 5TS P&C upgrade which was delayed due to the allocation of resources to complete the LRT relocation project between 2013 and 2017.

b) If the capital funds were deferred to other priorities/projects, please provide a record on where the funds were deferred and the justification.

The capital funds were deferred to the LRT relocation project which was required to meet the mandatory obligations of relocating KWHI's plant to accommodate the Region of Waterloo's LRT project.

## 2-Staff-18 #5TS – Replace Power Transformers & Oil Retention Pits

**Ref: Distribution System Plan – 4.1.2.2 System Renewal – Planned Initatives**
**Ref: Appendix O – Station's Major Equipment 10 Year Plan 2019-2028**
Kitchener-Wilmot Hydro provided a schedule of work to be done for transformation facilities between 2019 to 2028. One major project on the schedule, at a total cost of $6.4 million, is the replacement of power transforms and oil retention pits at #5TS. Kitchener-Wilmot Hydro also stated that this project replaces the two existing 83 MVA transformers, which are at end of life, with two 100 MVA transformers.

a) Please provide the business case and scope of work for this project.

No formal business case has been prepared to date to replace the two power transformers. However, the need for replacement has been identified. The scope of the #5TS – Replace Power Transformers and Oil Retention Pits project is to replace the existing two 50/83.3 MVA power transformers and to replace the existing, inadequate oil retention pits that are underneath them. One transformer and its oil retention pit are planned for 2023 and the second transformer and its oil retention pit are planned for 2024.

While the replacement of these two transformers is not within the scope of the 2019 and 2020 budgets, KWHI has worked with the IESO to identify the need to replace them. In the IESO's Kitchener-Waterloo-Cambridge-Guelph Region Scoping Assessment Outcome Report completed in May 2019, the replacement of the MTS#5 T9 and T10 supply transformers is listed among the upcoming projects that are required and KWHI is to coordinate with Hydro One to replace the existing transformers with standard units of a similar size. In this case, the size of a standard unit is 60/100 MVA, similar to the units KWHI has at No. 3TS.

Long term planning as far back as 2012 identified the #5TS transformers as KWHI's oldest transformers and recommended their replacement in approximately 10-years. In addition to their age, replacement has been recommended due to the following conditions:

- Obsolescence of transformer components
- Rising costs of repair to keep the existing units running
- Core losses that are approximately double what would be expected from new transformers
- Existing transformers have no tested overload capacity to handle temporary abnormal distribution system loading conditions

Because the existing oil retention pits have large voids in their concrete walls, the retention pits would be unable to ensure that all of the oil resulting from a failed transformer tank rupture would be prevented from entering the ground. Therefore, KWHI is planning to replace the existing oil retention pits with new structures that have concrete sides and bottoms and that are sized for the total amount of oil that can fall out of one of the new transformers.

b) Please provide the cost differences between an 83 MVA and 100 MVA transformer unit.

Of the $6.4M estimated for the replacement of #5TS power transformers and their oil retention pits, the amount estimated for the purchase of the power transformers is $5.0 over 2 years or $2.5M per transformer, with one transformer being installed in each of the 2 years. Reduced capacity of the transformers would not reduce the transformer installation and oil retention pit costs so that the only reduction in the cost would be in the purchase price of the transformers. If the transformers' capacity was reduced from 100 MVA to 83 MVA, the estimated price difference per transformer would be approximately $200,000.

c) Is there anticipated load growth in this specific area? If so, please provide evidence of the load growth.

KWHI uses load forecasting based on coincident peak to assist with determining transformer station capacities. However, each of the main current carrying components in a transformer station has to be able to carry the non-coincident peak current that can pass through that component. Due to abnormal feeder loading brought about by transformer station rebuilds, transformer station maintenance and repairs and distribution feeder work including those jobs required to accommodate roadworks, transformer windings and other components may be overloaded beyond their nameplate rating for extended periods of time. These examples of TS and distribution system work do routinely occur, and KWHI is unable to restrict them to months other than May, June, July, August and September when it can expect to carry large loads.

To enable transformers to carry this extra load, all KWHI transformers installed since 1984 have a tested overload capability of approximately 20%. However, the T9 and T10 transformers at #5TS are older and are the only power transformers in KWHI's system that have no tested overload capability beyond their nameplate rating. For example, during the summer of 2018 when the 5TS feeders were connected in an abnormal configuration and KWHI had a transformer outage that was required for a P&C rebuild, the current on one of the transformer's LV windings not only exceeded the nameplate rating of 1695 A, it exceeded the 2000 A rating of the transformer's LV bushings. Transformer failure brought about by the failure of an overloaded bushing is

a risk that KWHI cannot accept. When KWHI replaces these transformers with 100 MVA units that have LV windings with a nameplate current carrying capability of 2032 A and 3000 A bushings, as are in use at all of KWHI's other TS's, KWHI will be able to handle this overload due to abnormal feeder and TS conditions in the future.

d) Please provide the distribution operating map of this area including neighbouring stations and feeders.

See document titled *"IR-2-Staff-18d Operating-Map-Current_Service_Areas"* for a depiction of KWHI's distribution operating map showing the service area of all transformer stations. No. 5TS is located in the north-east corner of KWHI's service territory and its service area is highlighted in green. As a general rule, feeders from No. 4TS and 7TS can provide some amount of relief for No. 5TS during contingencies.

## 2-Staff-19 Pole Replacement

**Ref: Appendix 2-AA Capital Projects Table**
**Ref: Distribution System Plan 4.1.2.2.2 Replacement of Pole Line Assets**
**Ref: Kitchener-Wilmot Hydro Asset Condition Assessment (ACA)**
Kitchener-Wilmot Hydro is proposing to replace 425-450 poles each year for the next 10 years with a capital budget of $3.5 million. The approximate unit cost of replacing each pole is $7,700-$8,200.

a) Please provide historical unit costs of replacing poles in the Kitchener-Wilmot service territory.

KWHI's historical costs for pole replacement includes the total costs to rebuild a pole line excluding installation of transformers. Included is labour, materials, overheads, and engineering for poles, wires, and services. Using sample projects from 2015 to 2018, the average unit cost to replace a pole is per the table below.

| Circuit Configuration | Cost/Pole |
|---|---|
| 1-ph single circuit | 7,500 |
| 3-Ph single circuit | 10,250 |
| 3-ph double circuit | 15,700 |

b) Please provide the number of poles replaced under road relocation, voltage conversion, and any other programs that involve the replacement of poles. If available, provide the demographics of the poles replaced.

The table below shows the historical quantities of poles replaced under different programs. Demographic data for poles replaced is unavailable.

| Category | 2016 | 2017 | 2018 | Total |
|---|---|---|---|---|
| **System Expansion** | 127 | 24 | 42 | **193** |
| **Rebuild** | 173 | 285 | 275 | **733** |
| **LRT** | 54 | 15 | 0 | **69** |
| **Relocation** | 67 | 94 | 115 | **276** |
| **Voltage Conversion** | 77 | 46 | 140 | **263** |
| **System Expansion** | 127 | 24 | 42 | **193** |
| **Grand Total** | **498** | **464** | **572** | **1534** |

The ACA also shows that the assessment methodology slightly weighs the pole strength higher than the pole demographics. The ACA only found 3,233 poles in poor and very poor condition but Kitchener-Wilmot proposes to replace 4,250 poles over the next 10 years.

c) Please explain how Kitchener-Wilmot Hydro assessed that approximately an additional 1000 poles in the fair category would need to be replaced.

See Table 4-18 and Table 4-19 in the Asset Condition Assessment (ACA) report where the recommendation of 425-450 poles per year is made. KWHI is proposing to replace 425-450 poles per year over the DSP period (2020-2024). This is equivalent to a total of 2,125 – 2,250 poles over the 5-year period. The replacement rate is expected to continue beyond the DSP period to replace all 3,233 poles in Poor and Very Poor condition plus additional poles that are currently listed in Fair condition but will likely deteriorate in condition over the next 10-years. Therefore, over a 10-year period, approximately 4,250 - 4,500 poles are estimated to be replaced.

The additional 1,000 poles (above the 3,233 in Poor and Very Poor condition) account for poles that are older than 45 years and in Fair condition but are beyond their typical useful life and might move into a Poor condition over the next five to ten years. With continuous inspection and monitoring, and future update to the ACA, the exact number of poles will be refined. However, based on current age demographics and condition assessment, 425-450 poles/year is a reasonable target which would allow for the pacing of investment in this program.

It should also be noted that the ACA recommendation to replace poles excluded concrete poles because of KWHI's lack of sufficient field data. However, based on KWHI's local knowledge and experience, concrete poles will require replacement during the DSP period. A program has commenced to perform visual inspection and gather condition data on all 7,130 concrete poles. It is KWHI's intention to fit the replacement of any concrete poles identified as being in Poor/Very Poor condition into the existing amount budgeted for pole replacement unless a large quantity is found to be in a deteriorating condition.

Additionally, KWHI has asked customers for their feedback during customer engagement on the option of replacing an additional 1,500 at-risk poles over the DSP period with the associated bill impact and results indicated that an average of 80% of respondents are in support of this option.

d) For the years 2014 to 2018, please provide the yearly outages caused by pole failures and the cause of the failure.

Prior to April 2016 when the OMS was commissioned, outages caused by pole failures were not discretely recorded and therefore are difficult to analyse. The data below shows outages caused by pole failures between April 1, 2016 and December 31, 2018 excluding Major Events.

| Year | Primary Cause | Secondary Cause | # of Outages | Customers Out | CHI (hrs) | SAIFI | SAIDI |
|---|---|---|---|---|---|---|---|
| 2016 | Defective Equipment | Pole Failure | 2 | 16 | 97 | 0.000 | 0.001 |
| 2016 | Defective Equipment | Pole Fire | 4 | 1,187 | 2,909 | 0.013 | 0.031 |
| 2017 | Defective Equipment | Pole Failure | 3 | 49 | 327 | 0.001 | 0.003 |
| 2017 | Defective Equipment | Pole Fire | 2 | 7 | 14 | 0.000 | 0.000 |
| 2018 | Defective Equipment | Pole Failure | 4 | 3,437 | 4,065 | 0.035 | 0.041 |
| 2018 | Defective Equipment | Pole Fire | 6 | 3,598 | 1,502 | 0.036 | 0.015 |

## 2-Staff-20 System Expansion to Supply New Developments

**Ref: Distribution System Plan 4.1.2.3.1 System Expansion to Supply New Developments**
**Ref: Underground System Expansion to Supply New Developments – Budget Item No: 4-20-5**

Kitchener-Wilmot Hydro has stated that it will continue with the construction of new underground distribution system to supply the increasing demand to Kitchener's downtown core. This was supported by Kitchener-Wilmot Hydro's capital project summary. The summary stated that there has been an influx of 3000-4000 new customers and an estimated peak demand of 12MVA. These developments were required to have foundation in the ground by July 2019.

a) Based on the numbers provided, the average peak demand per new customer is 3-4kVA assuming concurrent peaks. Please provide the assumptions used to estimate the 3-4kVA peak usage.

The estimated demand for the proposed developments is based on a bottom-up approach where the demand of each development is estimated separately and then aggregated to provide a total. See the attached development project list in Downtown Kitchener titled *"IR-2-Staff-20 Proposed Downtown Development Projects with demand forecast"*, including the transformer size and estimated load during the system peak time. KWHI estimated the demand assumption of each development based on several factors including; the number of units, the purpose and the square footage of commercial space, the developer inquiry and requirement, and the actual demand of similar building in service.

b) Please confirm if the 3000-4000 new customers have already fully materialized. If they have not fully materialized, please provide the expected dates the remaining load will materialize.

The 3,000 – 4,000 customers/residents have not yet materialized. It should be noted that the nature of these developments is mixed-use commercial/residential and tend to be bulk metered. Most of these projects are currently under construction with expected completion dates of 2020-2022. Some bigger sites will be developed in phases with later completion dates. See the attached development project list in Downtown Kitchener titled *"IR-2-Staff-20 Proposed Downtown Development Projects with demand forecast"*.

c) If there are customers that will materialize in 2020 from the numbers above, how has Kitchener-Wilmot Hydro taken this additional load into consideration in the load forecast?

KWHI has not taken the additional load into consideration in the load forecast. The load forecast is based on historical numbers and trends. In addition, KWHI cannot be certain that the load will materialize in 2020.

d) Please provide an update on the status of the developments and are they on track to have foundations completed by July 2019.

See attached development project list in Downtown Kitchener titled *"IR-2-Staff-16 Proposed_Downtown_Development_Projects_CONFIDENTIAL_July 2019" for updated project status*.

e) Please provide a list of neighbouring TSs and feeders that have the capability to supply this area.

Kitchener Downtown area is currently supplied by Kitchener #1 and #4 TS (the closest to the downtown area). Kitchener #5 TS has been used only as the backup TS for this area since #5 TS doesn't have enough system capacity to accommodate the downtown load due to station transformer capacity limit and the distance to the downtown area.

The downtown of the City of Kitchener is supplied by both a secondary grid network and 13.8kV underground loop feed system. The secondary network is a 125/216V 3-phase secondary network fed by four 13.8kV underground parallel feeders (1M4, 1M5, 1M6, 1M7) from Kitchener #1 MTS, consisting of 32 transformers with interconnected secondaries. It supplies the load customers with less than 500kW demand. Currently, there is enough system capacity in the secondary network feeders to accommodate the load growth on the secondary network.

Customers with demand larger than 500kW in the downtown area are supplied by two 13.8kV underground loop feeder from Kitchener #1 MTS (1M1 and 1M8, with 400 amp planned capacity each). These two loop feeders are backed up by multiple 13.8kV overhead feeders from Kitchener #4 and #5 TS (feeder 4M15, 4M25, 5M13, 5M14, 5M27). The majority of the proposed downtown development projects are larger than 500kW and therefore will be connected to the 13.8kV underground loop feeder system. In 2018, the total peak load on 1M1 and 1M8 was about 500 amps, with 300

amps or 6MW remaining system capacity. Considering the projected 10+ MW new load in the downtown area and system reliability, it is necessary to expand the underground loop feeder system and construct a third underground loop feeder to supply the new development prior to feeder 1M1 and 1M8 reaching their planned capacity.

The following tables show the list of feeders that currently supply the load in downtown Kitchener.

Kitchener 13.8kV Feeder for Downtown Secondary Grid Network (for customers smaller than 500kW)

| 13.8kV U/G feeder | MTS # |
|---|---|
| 1M4 | Kitchener #1 MTS |
| 1M5 | Kitchener #1 MTS |
| 1M6 | Kitchener #1 MTS |
| 1M7 | Kitchener #1 MTS |

Kitchener Underground Loop Feeder System (for customers larger than 500kW)

| 13.8kV U/G feeder | MTS # |
|---|---|
| 1M1 | Kitchener #1 MTS |
| 1M8 | Kitchener #1 MTS |

## 2-Staff-21 Innovation and Reliability

**Ref: Distribution System Plan 4.1.2.3.2 Innovation and Reliability**
**Ref: Innovation and Reliability Improvement – Overhead Distribution – Budget Item 3-20-7, 4-20-9**
**Ref: Ref: Appendix 1-2 KWHI Business Plan – 5.2 Innovation and Enabling Technologies**

Kitchener-Wilmot Hydro intends to install Smart Grid devices on selected feeders that either have a large exposure to elements that cause outages (long lines), feed customers critically sensitive to outage duration, or have a history of poor reliability or service customers that are remote from the service center.

a) Please provide the overall scope and project timeline for Kitchener-Wilmot Hydro's Smart Grid system.

The scope of KWHI's Smart Grid program includes communication infrastructure, smart devices, and computer infrastructure and applications. The following provides more details on these categories.

Communication

- Build a 900 MHz communication radio network within the boundaries of the City of Kitchener. Each recloser contributes to this network since they have a radio installed as part of their communication module. Head end units are strategically located throughout Kitchener on tall buildings. Repeaters are added to fill the coverage gaps.
- Expand leased public wireless communication infrastructure primarily in Wilmot Township where radio communication is more difficult for full coverage.
- Build a wired communication network utilising fibre cables to monitor and control underground equipment that have difficulties communicating using wireless-only technology. The downtown core of Kitchener is targeted for this application.

Smart Devices

- Replace existing manual operated switches with SCADA controlled and monitored reclosers. Proposing 1.5 reclosers per 13.8KV feeder and 2.5 - 3.5 reclosers per 27.6kV feeders. Estimated total of 170 reclosers to be replaced.
- Install sensors at strategic locations on the distribution system. These will fill the gaps where smart devices such as reclosers are unavailable to provide sufficient data for fault locating.
- Install supervisory controlled underground switchgear (primarily in downtown Kitchener) and capacitor banks.

Computer Infrastructure and Applications

- Enhance the existing Outage Management System
- Maintain/upgrade the existing SCADA system
- Implement a modern Customer Information System (CIS) that has a scalable and flexible architecture to make implementation and integration with other applications seamless. The CIS will serve as the foundation for providing customer information to other applications for outage notifications, energy usage, etc.
- Implement a Distribution Management System to assist the control room and field operating personnel with the monitoring and control of the electric distribution system in an optimal manner while improving safety and asset protection. The DMS will leverage all of the real time operational data available from Smart Meters, OMS and SCADA and will facilitate the implementation of a self-healing grid.
- Implement an Asset Management System to manage the distribution and transformer station assets to ensure a high degree of system reliability while optimizing O&M costs.

There is no predefined timeline for KWHI's Smart Grid System since it is a combination of targeted actions and part of its business-as-usual model. As more smart devices are added either as part of a rebuild process or targeted replacement, the need to add more devices will decline. The implementation of the required computer systems is targeted to occur over the next 5-years.

b) Has Kitchener-Wilmot Hydro seen reliability improvements on feeders with Smart Devices installed? If so, please provide evidence of that.

Yes. The installation of reclosers provides reliability savings by quickly isolating the faulted areas of a feeder that are downstream of the recloser location thereby reducing the number of customers impacted by momentary and sustained power outages. Using data from the OMS for the period April 2016 to July 2019, KWHI identified the outages that include the operation of a recloser and calculated the avoided outage minutes and momentary interruptions. A total of 82,450 momentary customer interruptions (MAIFI ~ 0.86), 11,200 customer-hours of interruption (SAIDI ~ 0.12 hours), and 35,600 customer interruptions (SAIFI ~ 0.37) were avoided.

c) Please provide the operational philosophy for the Smart Grid system.

KWHI opted to install reclosers as part of its Smart Grid system as opposed to sectionalizing switches because of the added benefits of reclosers in reducing overall feeder momentary outages. The operational philosophy of the line reclosers is as follows.

- Reclosers are normally installed at the feeder mid-point and at the normally open point with adjacent feeders
- Reclosers communicate with the control room over a 900 MHz radio network or a leased public cellular network with added security for private use by KWHI. Operators control these devices over the same communication network.
- Reclosers will automatically sectionalize a feeder for a fault that is downstream of the device resulting in less customers being impacted by a permanent or momentary outage (SAIFI and MAIFI reduction).
- For faults upstream of the recloser, the feeder circuit breaker will operate, initially creating an outage for all customers supplied by the feeder. However, since the reclosers can be controlled remotely from the Control Room, a downstream recloser can be remotely opened and another recloser remotely closed to transfer the healthy portion of the feeder to another feeder while isolating the faulted section. This can be done prior to a crew arriving on site using data from the reclosers and line sensors in the field.
- KWHI long-term goal is to automate the restoration process without the intervention of the control room operator thereby reducing the duration of outages and improving SAIDI.

d) Are the reclosers replaced prior to their end-of-life? If so, has Kitchener-Wilmot Hydro considered phasing in Smart Grid devices as assets reach end-of-life?

Manual switches replaced under this program include load interrupter switches that are at different stages of their typical useful life. The reason being that the driver for this program is neither age or condition dependent. However, if switches identified for replacement are part of a pole line that is targeted for rebuild in the near-term (0-3 years), the installation of Smart Grid devices will be delayed until the pole line is rebuilt and captured as part of the overall rebuild cost rather than as part of innovation and reliability.

KWHI will take into consideration the phasing in of smart devices as assets reach their end of life and is part of its overall Smart Grid implementation philosophy.

Kitchener-Wilmot Hydro also stated in its business plan that it plans to accelerate the automated recloser program by installing a minimum 6 to 8 per year.

e) Prior to acceleration, what was the number of reclosers replaced by automated reclosers?

2014 - 4 reclosers
2015 - 3 reclosers
2016 - 7 reclosers

2017 - 8 reclosers

f) Are replacements of reclosers during line rebuilds included in this program?

No.

## 2-Staff-22 Emergency Backup Generator Replacement

**Ref: Emergency Backup Generator Replacement – Budget Item 1-20-1**
Kitchener-Wilmot Hydro proposes to replace the existing 70kW backup generator with a 300kW unit to provide backup power for the entire office and service center in Kitchener.

a) Is the Kitchener-Wilmot Hydro Supervisory Control and Data Acquisition (SCADA) system located in this building?

Yes.

b) Please provide a list of the emergency loads.

The existing generator feeds the following electrical loads.

- Emergency lighting for the lower level, first floor, second floor, back stairwell, front stairwell, side stairwell, penthouse, and warehouse areas.
- Overhead door operators No. 3 & 4 in warehouse
- Elevator controller & lighting
- Fuel pumps (Pump 1 Gasoline, Pump 2 Diesel, Pump 2 Diesel) c/w contactor controls
- SCADA Room receptacles
- Halon fire suppression system panel in control room
- Charts Room receptacle(s)
- Rogers lower level receptacle(s)
- Storm Centre, Control Room, Computer Room receptacle(s)
- Fire alarm panel
- Engineering & Drafting Area (Radio) receptacle(s)
- Data Room fan unit & condenser
- West Ave. gate operator

c) Do any of the loads in the list above have an uninterruptable power supply (UPS)? If so, please provide the UPS's operation time.

The existing UPS has generator backup and feeds the following electrical loads.

- Storage Room (radio & Bell telephone boards) receptacle(s)
- Storage Room (private telephone; door opener; computer room) receptacle(s)
- Maintenance Garage (radio board) receptacle(s)
- Main Transformer Vaults receptacle(s)
- Control Room (door control; supervisory panel)

The load rating of the UPS is 64 kVA (40 + 24 kVA units) with 120 minutes of run time based on the existing connected load and 30 minutes run time at full load.

d) Please provide the building's outage history between the years 2014-2018.

KWHI does not track the outage history of individual buildings. However, an outage analysis of the feeders that normally supply the office building (1M3 and 4M15) is shown below for the period April 1, 2016 to December 31, 2018.

| Year | 1M3 | 4M15 |
|---|---|---|
| 2016 | 0 | 0 |
| 2017 | 0 | 2 |
| 2018 | 0 | 2 |

e) Does the office receive redundant supply from the distribution system? If not, why not?

The office has a redundant supply from the distribution system and is supplied by feeders 1M3 and 4M15.

## 2-Staff-23 Customer Information System

**Ref: Appendix P – CIS Replacement Business Case**

The business case differentiated a Tier 1 and Tier 2 CIS solution. A Tier 1 solution allows for greater integration of Kitchener-Wilmot Hydro's operations as the system develops. Phase 1 of a Tier 1 solution also had a scope that included the Geographic Information System (GIS) interface and Outage Management System (OMS) interface.

a) Please confirm if the current scope of work is creating a CIS system that allows for the capability to interface with the GIS and OMS systems in the future or will the communication between the CIS, GIS, and OMS be fully operational.

The current CIS scope of work includes interfacing to KWHI's GIS and OMS.

b) Has Kitchener-Wilmot Hydro considered how this CIS system can tie into its SCADA system or Smart Grid in the future?

Yes. The Oracle CC&B CIS platform has the capability to interface to a number of utility applications including GIS, OMS, DMS (future), and IVR (future). For security reasons, the CIS will not have a direct interface to SCADA.

Kitchener-Wilmot Hydro identified that one of the risks of not undertaking this project is that there would be limited analytics for management decisions and real-time data access.

c) How will Kitchener-Wilmot Hydro use this new CIS information for its asset management and capital expenditure planning?

The CIS was not intended to provide asset management and capital expenditure planning capabilities. However, the CIS will have the capability to interface to an asset management system which is a future endeavour for KWHI. The analytics engine that accompanies the new CIS will be used to track key operational metrics for customers, billing (credit & collections), and revenue.

In the recommendation section of the business case, Kitchener-Wilmot Hydro stated that there is a 15% contingency for this project.

d) Please provide the supporting information on assessing that a 15% contingency is appropriate.

As KWHI and previously, the consortium, worked with the various CIS vendors and their offers, inquiries were made as to what an appropriate contingency would be for a project of this magnitude. The general response was a 15% to 20% contingency to be appropriate. Based on this input, KWHI chose to select a 15% contingency.

One of the risk mitigations Kitchener-Wilmot Hydro identified was to maintain strict timelines to complete the CIS project.

e) Please provide the project schedule, milestones, and deliverables for the CIS project.

Appendix 3 – CIS Project Milestones and Deliverables is the high-level schedule, project milestones and the project deliverables of the CIS contract. Assumptions were made at that time as to project start date. As of this writing, the implementation start date is during August 2019 which will adjust the schedule accordingly.

Kitchener-Wilmot Hydro also identified a Phase 2 to the CIS system, which includes ability to contact customers, a customer portal, and field work order integration.

f) Please confirm that Phase 2 is independent of Phase 1 and will have its own independent business case to justify the costs.

Phase 2 will be independent of Phase 1 and will have its own independent business case to justify the costs.

g) Has Kitchener-Wilmot Hydro developed a scope of work for Phase 2? If so, please provide the scope of work.

No detailed scope of work has been developed for Phase 2.

# Exhibit 3 – Operating Revenue

## 3-Staff-24 Conservation Demand Management (CDM) Revenue

**Ref: App. 2-H Other Oper Rev – Account 4375**
Kitchener-Wilmot Hydro has included $4,562,600 in CDM revenues for 2020 and in past years have included CDM incentives in CDM revenues.

a) Please explain what else is included in the CDM revenue and if Kitchener-Wilmot Hydro has included any CDM incentives for 2020.

There is no incentive revenue included in CDM revenues for 2020. The amounts included in CDM revenues is equal to the expense of the CDM program.

## 3-Staff-25 Other Operating Revenue

**Ref: App. 2-H Other Oper Rev – Account 4210**

The amount Kitchener-Wilmot Hydro receives as revenue from pole rentals is shown in Account 4210.

a) Please confirm if the entire amount shown in Account 4210 is due to the wireline pole attachment charges.

No. There is Duct Rental, Lease Rental, and other revenue included in this account. The budget is calculated as follows:

| 2020 | Quantity | Price | Total |
|---|---|---|---|
| Number of cable and strand attachments. | 15,204 | $ 43.63 | $ 663,351 |
| Number of cable and strand attachments. - tree trimming | 5,570 | 2.77 | $ 15,429 |
| Number of clearance poles for service drops. | 242 | 21.81 | $ 5,278 |
| Number of accessories WITHOUT existing attachments. | 13 | 43.63 | $ 567 |
| Number of accessories WITH existing attachments. | 89 | 1.92 | $ 171 |
| Number of 2nd party overlashes PRE 2005. | 64 | 10.90 | $ 698 |
| Number of 2nd party overlashes POST 2005. | 8 | 43.63 | $ 349 |
| Duct Rental | 20,572 | $ 8.00 | $ 164,575 |
| **Total** | | | **$ 850,417** |

b) The wireline pole attachment charge took effect January 1, 2019 but the pole rental revenue for 2019 is similar to all the previous years. Please explain how Kitchener-Wilmot Hydro forecasted the pole rental revenue amount of $527,100 for 2019.

The excess revenue is placed in a deferral account as per Accounting Guidance issued July 20, 2018. Due to this transfer of revenue, the recorded revenue stays about the same for 2019 as was recorded in 2018.

c) The wireline pole attachment charge of $43.63 is a 195% increase from the previous charge of $22.35. Prorating this against the average pole rental revenue seen between 2014-2018, would indicate a rental revenue of $982,824. Please explain how Kitchener-Wilmot Hydro forecasted the pole rental revenue of $850,400.

The increase from 2018 - 2020 in account 4210 is $358,000. There are approximately 15,200 poles with attachments, representing an increase of $323,500 in this account. The balance of 4210 consists of other rental income. See part a)

## 3-Staff-26 Load Forecast

**Ref: Exhibit 3, page 6; Appendix 3-2**
Kitchener-Wilmot Hydro stated that it "has included an adjustment to the historic purchases for the loss of street lighting consumption due to the installation of LED lighting as well as the consumption loss of three (3) large use customers, thus reducing the historic purchases to more accurately model future customer consumption."

The Large Use rate class has historically included between one to four customers in each year. Over this time, energy use has varied considerably with periods of increases and decreases. Kitchener-Wilmot Hydro has proposed a Large Use adjustment of 48GWh in 2009, decreasing in every subsequent year. Since 2015, there has been one customer in the rate class, and this is expected to persist into 2020.

In preparing its forecast of Large Use customer class consumption, Kitchener-Wilmot Hydro has used a trend of average use per customer and forecasted customer counts. The trend of historic use per customer includes both the discontinued customers and the remaining customer. The forecast for this rate class has not been adjusted to reflect the wholesale purchases forecast, or planned CDM.

a) Please explain the derivation of the adjustment to wholesale purchases with respect to changes in the use of the Large Use customers.

   The consumption of the previous large users was removed from the purchases.

b) Has Kitchener-Wilmot Hydro considered removing Large Use consumption from wholesale purchases entirely and forecasting the rate class independent of other rate classes? If not, why not?

   This option was not considered. KWHI forecasted the load for the Large Use class using the methodology that has been accepted in its previous COS applications. KWHI did consider discontinuing the Large Use class entirely and merging it with the GS>50kW class but decided to keep the class active. The removal of the class was not considered economically feasible.

c) Has Kitchener-Wilmot Hydro considered using only the historic consumption of the remaining customer in order to forecast the energy and demand for the Large Use class in 2020?

   This analysis was performed in 2014's CoS application. Had the results varied from the remaining customers historic amounts, this would have been done again but it did not.

## 3-Staff-27 Load Forecast

**Ref: Exhibit 3, page 8; Appendix 3-2**
Kitchener-Wilmot Hydro has performed a regression model using heating and cooling degree days, number of days per month, a spring / fall flag, the number of peak hours in the month, CDM activity and a residential customer count as explanatory variables.

a) Has Kitchener-Wilmot Hydro prepared a regression model which uses an economic indicator such as GDP or employment as an explanatory variable?
    a. If so, please provide the results and explain why it was rejected.

        See Excel file EB-2019-0049_KWHI_IR_Load Forecast Model-3-Staff-27a_20190731 and EB-2019-0049_KWHI_IR_Load Forecast Model-3-Staff-27b_20190731.

        Employment did not provide substantially different results with or without the variable.

        Ontario GDP provided results that were unrealistically low.
    b. If not, please prepare a load forecast model and resulting class forecast where GDP is added as an explanatory variable.

        See Excel file EB-2019-0049_KWHI_IR_Load Forecast Model-3-Staff-27b_20190731.

b) The Residential Customers explanatory variable has a t-stat of 0.16. Please explain why this variable was retained despite the apparent lack of statistical significance.

    During the process of testing the regression analysis, many different variables and times periods are tested to arrive to what KWHI deemed the best R-Squared and MAPE values. KWHI's rational behind selecting or dropping certain variables involves a "no-harm" rational. In other words, if a variable is justified and does not worsen the results, it is generally kept as one of the regression variables. In this case, the Residential Customers only slightly improved the R-Square and the MAPE values, therefore, the utility opted to keep them as part of the regression analysis.

## 3-Staff-28 Load Forecast

**Ref: Exhibit 3, page 10; Appendix 3-2**
Kitchener-Wilmot Hydro explained that the data sources for CDM explanatory variable as it relates to the 2006-2017 time period. It then states that "the impact of 2019 and 2020 CDM programs has not been included in the CDM activity variable since they do not impact the actual purchases used in the regression analysis."

The explanatory variable CDM used in the regression has a peak value of 12,083,877 in December 2017. It then decreases each month in 2018 (decrease of 16,696) and 2019 (decrease of 61,981) before increasing each month in 2020 (increase of 3,034).

a) Please confirm that the CDM variable does not reflect CDM program delivery in 2018.

Confirmed. At the time of application submission KWHI did not have the information available for the 2018 programs. KWHI has now received unverified actuals and updated its load forecast.

b) Please confirm that the decreases in 2018 and 2019 are due to losses in persistence of programs delivered in years up to and including 2017.

Confirmed.

c) Please explain the source of the increase in the CDM variable in 2020.

The source is the IESO target amounts before the cancellation of the programs.

d) If point a) cannot be confirmed, please provide a derivation of the CDM variable including program delivery, loss of persistence and other factors as required.

Point a) is confirmed.

e) If point a) is confirmed, please provide a load forecast scenario where the CDM variable also reflects CDM programs delivered in 2018. Please use the best available information for 2018 program delivery, and explain the source of the information. In the scenario, please ensure that a full load forecast is provided, including billing determinants and regression statistics.

See Excel file EB-2019-0049_KWHI_IR_Load Forecast Model-3-Staff-28_20190731. The source of the information is the 2018 unverified actuals from the IESO in the April 15th, 2019 Participation and Cost Report that has been filed with these interrogatory responses.

## 3-Staff-29 Load Forecast

**Ref: Exhibit 3, page 10; Appendix 3-2**

Kitchener-Wilmot Hydro explained that the Peak Hours explanatory variable as follows: “This measurement of the daylight hours per month captures the variation in demand between months due to the need for electric lighting”. However, this explanatory variable does not exhibit the expected seasonality of more daylight in the summer months than the winter months. In addition, the coefficient is positive indicating that more daylight results in more energy consumption. This appears counterintuitive in the context of the electric lighting explanation.

a) Please explain the derivation of the Peak Hours explanatory variable.

The peak hours variable consists of the number of hours on business days only in a year multiplied by 16 hours per day.

b) Please explain the apparent counterintuitive coefficient given the intent of this variable.

The Peak Hours variable is intended to capture the variation in usage between months due to the number of peak hours in a month. It is intended to deal with electricity use in general, not just electric lighting.

## 3-Staff-30 Load Forecast

**Ref: Exhibit 3, pages 12-13; Appendix 3-2; DSP Appendix B**
Kitchener-Wilmot Hydro stated that "The Residential class forecast customer count has been increased by 1.4% for the 2020 Test Year rather than the 1.5% calculated because 2016 and 2017 had some unusual increases that affected the geomean."
The Geomean growth rate of the years 2009-2015 is 1.45%, and the growth rate of 2018 was 1.55%.

It its DSP, Kitchener Wilmot Hydro identified 22 proposed development projects in downtown Kitchener, a majority of which have a residential component.

a) Please explain the cause of the increases in 2016 and 2017, and number of additional customers resulting from each cause.

During 2016 and 2017, KWHI installed Triacta Meters at three (3) apartment buildings that resulted in approximately 600 new residential customers that had not been forecasted. Typically, in the KWHI territory, developers are not in favour of this type of metering and any new customer (s) would be a GS>50 kW customer.

In late 2017, KWHI completed the transfers of long-term load transfers with its neighbouring utility, Hydro One Networks Inc. (HONI). As a result, 55 residential customers and five (5) General Service<50 kW (GS<50) customers were transferred from HONI to KWHI.

b) Please explain why a growth rate of 1.4% was selected when simply omitting 2016 and 2017 would result in a higher growth rate.

1.4% produced a result of 1,224 new residential customers in 2019 which aligned with the expected growth of customers. As of June 30, 2019, KWHI has only added 308 new residential customers.

c) Please provide a forecast of expected customer additions in 2019 and 2020 from development projects Kitchener-Wilmot Hydro is aware of.

As noted in 2-Staff-16 and 2-Staff-20, the customer additions in 2019 and 2020 are based on regular growth. Proposed projects may be in the development stage but would be out of the scope in determining 2020 rates.

## 3-Staff-31 Load Forecast

**Ref: Exhibit 3, pages 17-18; Appendix 3-2; Load Forecast Model, sheet Load**
Kitchener-Wilmot Hydro states that:

> *"The annual historical ratios are then calculated between the billed kW and the billed kWh. KWHI utilized the average of 2009 to 2018 for all classes, with the exception, of the GS>50 kW class. The average of 2013 to 2018 was used for this class because the transition of Class A customers and the Wholesale Market Participants (WMP) produced results that were unreasonable as the ratios are different for primary metered customers."*

Kitchener-Wilmot Hydro calculated 0.2657% for the historic actual ratio for GS > 50 kW. However, the Load Forecast model indicates that the ratio of 0.2657% applies only to the GS > 50 kW customers that are not WMP, and are not Class A. In fact, the load forecast appears to have calculated the GS > 50 kW rate class demand in three parts. It arrived at a forecast of GS > 50 kW demand for customers that are neither WMP nor Class A of 1,471,892 kW based on the six year average of ratios described above. It arrived at a forecast of 34,080 kW based on 2018 demand for GS > 50 kW WMP. Finally, it arrived at a forecast GS > 50 kW Class A demand of 502,671 kW based on a six year average of ratios for these customers. This results in a total GS > 50 kW class forecast of 2,008,643 kW.

a) Please confirm that there was only one Class A customer in the GS > 50 kW rate class in the years 2013-2016, and that this reflects four of the six years used in calculating the ratio of energy to demand used in forecasting demand for GS > 50 kW Class A customers.

   Confirmed.

b) Please also confirm that Kitchener-Wilmot Hydro had 34 Class A customers in its GS > 50 kW class in 2018, and has forecasted the same number of customers in 2019 and 2020.

   Confirmed.

c) As a scenario, please prepare a GS > 50 kW class total demand forecast based on a ratio of total class energy to total class demand.

   See Excel file EB-2019-0049_KWHI_IR_Load Forecast Model-3-Staff-31_20190731.

# 3-Staff-32 Load Forecast

**Ref: Exhibit 3 Appendix 3-2**

Kitchener-Wilmot Hydro has prepared its forecast of GS > 50 kW customers in three parts. A forecast of WMP customers, a forecast of Class A customers, and a forecast of GS > 50 kW customers who are neither WMP nor Class A.

a) As a scenario, please prepare a customer forecast where

1) GS > 50 kW customers as a whole are forecasted using a geometric mean growth rate.

This would produce the same results See Excel file EB-2019-0049_KWHI_IR_Load Forecast Model-3-Staff-31_20190731. This produces 950 GS>50 total customers.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | 83,106 | 7,796 | 939 | 0 | 0 | 1 | 1,637 | 891 | 94,370 | 1 | 94,371 |
| 2016 | 84,530 | 7,845 | 940 | 0 | 0 | 1 | 1,653 | 866 | 95,835 | 1 | 95,836 |
| 2017 | 86,064 | 7,936 | 936 | 0 | 0 | 1 | 1,696 | 886 | 97,519 | 1 | 97,520 |
| 2018 | 87,395 | 7,983 | 950 | 0 | 0 | 1 | 1,666 | 931 | 98,926 | 1 | 98,927 |
| 2019 | 88,619 | 8,059 | 950 | 0 | 0 | 1 | 1,681 | 943 | 100,253 | 1 | 100,254 |
| 2020 | 89,860 | 8,136 | 950 | 0 | 0 | 1 | 1,696 | 955 | 101,598 | 1 | 101,599 |

2) GS > 50 kW WMP and GS > 50 kW Class A customers are forecasted using the proposed methodology.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2015 | 83,106 | 7,796 | 934 | 4 | 1 | 1 | 1,637 | 891 | 94,370 | 1 | 94,371 |
| 2016 | 84,530 | 7,845 | 935 | 4 | 1 | 1 | 1,653 | 866 | 95,835 | 1 | 95,836 |
| 2017 | 86,064 | 7,936 | 905 | 4 | 27 | 1 | 1,696 | 886 | 97,519 | 1 | 97,520 |
| 2018 | 87,395 | 7,983 | 911 | 5 | 34 | 1 | 1,666 | 931 | 98,926 | 1 | 98,927 |
| 2019 | 88,619 | 8,059 | 905 | 5 | 61 | 1 | 1,681 | 943 | 100,274 | 1 | 100,275 |
| 2020 | 89,860 | 8,136 | 899 | 5 | 110 | 1 | 1,696 | 955 | 101,662 | 1 | 101,663 |

See Excel file EB-2019-0049_KWHI_IR_Load Forecast Model-3-Staff-32_20190731.

3) GS > 50 kW customers exclusive of GS > 50 kW WMP and GS > 50 kW Class A customers are calculated by subtracting the forecasts in part b. from the forecast in part a.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018 | 87,395 | 7,983 | 950 | 0 | 0 | 1 | 1,666 | 931 | 98,926 | 1 | 98,927 |
| 2019 | 88,619 | 8,059 | 950 | 0 | 0 | 1 | 1,681 | 943 | 100,253 | 1 | 100,254 |
| 2020 | 89,860 | 8,136 | 950 | 0 | 0 | 1 | 1,696 | 955 | 101,598 | 1 | 101,599 |
| 2019 | 88,619 | 8,059 | 905 | 5 | 61 | 1 | 1,681 | 943 | 100,274 | 1 | 100,275 |
| 2020 | 89,860 | 8,136 | 899 | 5 | 110 | 1 | 1,696 | 955 | 101,662 | 1 | 101,663 |
| | | | 950 | -5 | -110 | 835 | 3-Staff-32 Response | | | | |

950 customers produced “as a whole”. The geometric mean growth rate used in 3-Staff-32 produces five (5) wholesale market participants and 110 class A customers. Therefore 950 (from section a) total GS>50 kW customers subtract 110 Class A customers and 5 Wholesale Market Participants would leave 835 Class B customers.

## 3-Staff-33 Load Forecast

**Ref: Exhibit 3 page 19; Load Forecast Model, sheet CDM**

Kitchener-Wilmot Hydro has identified verified savings of 2.9 GWh in 2015, 3.5GWh in 2016, and 4.4 GWh in 2017. It forecasts 5.9 GWh in 2018, 8.8 GWh in 2019, and 17.6 GWh in 2020.

It calculated a 2020 CDM adjustment of 23.5 GWh by totalling 100% of 2018, 100% of 2019, and 50% of 2020 (8.8 GWh).

a) How does Kitchener-Wilmot Hydro plan to deliver CDM programs totalling 8.8 GWh of savings in 2019 and 17.6 GWh of savings in 2020 when the most it has delivered in the most recent three years of verified results is 4.4 GWh?

KWHI does not plan 8.8GWh of savings in 2019 or 17.6 GWh in 2020.

Table 3.2.1. reflects information that was incomplete at the time of filing.

Appendix 2-I has been updated with the 2018 unverified actuals and estimated savings for 2019 and 2020 information as per the 2020 updated filing requirements issued July 15th, 2019.

b) Why has Kitchener-Wilmot Hydro included 100% of forecasted CDM for 2018 when this is a historic actual year in the regression model?

At the time of the filing of the Application, KWHI did not have its actual 2018 CDM savings.

The 2018 unverified CDM savings has been updated to the historical information. See the live Excel file EB-2019-0049_KWHI_IR_Load Forecast Model-IR_20190731. The half year rule has been used for 2019.

c) Given the recent revocation of the 2015-2020 Conservation First Framework, please explain whether the overall CDM target of 105,710,000 kWh appropriately reflects planned CDM savings of those projects that Kitchener-Wilmot is contractually obligated to complete under the former Conservation First Framework.

Yes. KWHI has reviewed, as per the 2020 filing requirements as updated July 15th, 2019, and has concluded that it will exceed its target.

The planned CDM savings are appropriate as KWHI actually achieved 90,767,539 kWh of the 105,710,000 kWh without including the 2018 results.

d) For all projected CDM savings from outstanding CDM programs in 2019 and 2020 for the 2020 test year, please provide supporting documentation (such as detailed CDM

reports, revised CDM plan, or delivery agreements) to confirm the level of projected savings and associated projects under the former Conservation First Framework.

See filed Excel:

EB-2019-0049_KWHI_IR_2011-2015 LDC CDM Program Results-20170117
EB-2019-0049_KWHI_IR_2015-Final-Verified-Annual-LDC-CDM-Program Results-20160630
EB-2019-0049_KWHI_IR_2016-Final-Verified-Annual-LDC-CDM-Program Results-20170630
EB-2019-0049_KWHI_IR_2017-Final-Verified-Annual-LDC-CDM-Program Results-20180629
EB-2019-0049_KWHI_IR_2018 Participation and Cost Report-20190415

In the 2018 Participation and Cost Report KWHI has removed the company and contact information to avoid disclosing potentially commercially sensitive information about specific customers. However, the Application Number is in the spreadsheet for Staff to refer to if needed. This is not related to privacy as privacy applies to identifiable individuals and not companies.

e) Please re-file all relevant tables and supporting documentation to show the changes and impact on the load forecast.

See Excel file EB-2019-0049_KWHI_IR_Load Forecast Model-IR_20190731.

f) Please confirm the corresponding LRAMVA threshold requested for approval as part of the application, and proposed rate class breakdown of the LRAMVA threshold. Please update Appendix 2-I of the Chapter 2 Appendices based on the CDM adjustment data included in Kitchener-Wilmot's Load Forecast model.

Updated. See Excel file EB-2019-0049_KWHI_IR_LRAMVA_Workform_20190731.

# Exhibit 4 – Operating Expenses

## 4-Staff-34 Operating, Maintenance, and Administration (OM&A) Expenses

**Ref: Table 4.2.2.1 – Recoverable OM&A Expenses**
**Ref: Appendix 2-JC OM&A Programs Table**
Kitchener-Wilmot Hydro provided the total yearly OM&A in Table 4.2.2.1, but for 2015 it does not reconcile with the total OM&A levels provided in Appendix 2-JC.

a) Please confirm which table is correct or reconcile the values.

Table 4.2.2.1 – Recoverable OM&A Expenses shows the correct value for 2015 at $16,118,364. Appendix 2-JC OM&A Program Table has been updated to reflect the correct amount.

## 4-Staff-35 Cyber Security

**Ref: Exhibit 4 – Operating Costs – Cyber Security, p. 28 of 103**
Kitchener-Wilmot Hydro has proposed an incremental cost of $180k for cyber security, which provides the ability to monitor, detect, respond, and recover from cyber security events. This cost includes the expense of third-party network monitoring, training for staff, and annual audits.

a) Please provide the scope of work included in the Request for Tender for the third party network monitoring.

No pre-defined scope of work was presented to the IT security vendors. Based on the pending release of the Ontario Cyber Security Framework (OSCF), members of USF and GridSmartCity wanted to evaluate the managed security service offerings from different IT vendors especially around their capability for continuous network monitoring. The following process was used to have vendors prepare a volume price agreement.

- Members of USF and GridSmartCity were polled for IT Security vendors that we could invite to present at one of our sessions
- IT Security vendors were to present on their managed IT security services to those in attendance or on WebEx
- Members attending and those on WebEx were to complete an Evaluation Survey for each vendor that they saw a presentation by
- All survey results were then consolidated and the scoring that resulted allowed for the ranking of the vendors that presented
- Based on the survey results, 5 vendors were chosen to prepare a volume purchase agreement – there were teams of LDC members set-up to work with each vendor on their agreement and to also develop the pricing model with the vendor (pricing was negotiated by each team with their vendor for a “best price” model/approach)
- Finalized Volume Purchase Agreements (VPAs) once completed were distributed to all USF and GridSmartCity members so that they could chose the vendor agreement that best fit their needs

b) What were Kitchener-Wilmot Hydro’s selection criteria for the third party network monitoring vendor?

KWHI evaluated the top three vendors from the VPA based on their service offering for monitoring, threat detection and incident response, their availability for 24x7x365, and their overall cost.

c) Please provide the type of training provided to staff each year for cyber security.

Staff who utilise the company's computer network are provided with the following types of training.

- On site delivered by a consultant – 2017
- Electronic delivery via software (KnowBe4) – subsequent years

KWHI is currently evaluating awareness training options for outside staff that don't use the computer network or do so rarely. This will likely take the form of a video presentation or in-person presentation at a safety meeting.

d) Please provide the scope of work for the annual security audits and the results of the audits.

See attached document titled Appendix 2 - *Signed Proposal for Annual Security Audits* for the 2018 security audit scope of work.

Due to cyber security concerns, KWHI does not release the results of its security audits. At a high level, the latest audit identified two areas of focus for KWHI, namely; training and policies. KWHI's OM&A cyber security budget for 2020 includes funding to address these areas plus others. See below for a breakdown of the 2020 budget and the driver for the activities.

| Activity | Budget | Driver |
|---|---|---|
| Continuous monitoring of network | 85,000 | OEB Cyber Security Framework requirement |
| Training | 20,000 | OEB Cyber Security Framework requirement, security audit recommendation |
| Security Audit | 25,000 | OEB Cyber Security Framework requirement, best practice |
| Implement Ontario Cyber Security Framework | 50,000 | OEB Cyber Security Framework requirements |
| *Policies & procedures* | | |
| *Incident and Disaster Recovery Plans* | | |
| *Other* | | |
| **TOTAL** | **180,000** | |

e) Has Kitchener-Wilmot Hydro completed its Cyber Security Self-Certification requirement? If not, please provide a completed certification.

Yes.

f) Is the cyber security infrastructure on-site or cloud based?

Infrastructure is on site.

## 4-Staff-36 Variance Analysis Programs

**Ref: Exhibit 4 – 4.3.4 Variance Analysis Programs**
Kitchener-Wilmot Hydro has tried to separate the cost increases due to inflation for labour and non-labour components of the program.

a) Please provide the inflation factors assumed for each year for labour and non-labour components.

For the period 2015 – 2018, KWHI used the OEB inflation rate less the KWHI specific stretch factor of 0.15%. This inflation was further adjusted upwards for customer growth. For 2019 and 2020, KWHI used an estimate of 1.5% inflation rate adjusted for the stretch factor and customer growth. The results are shown in the table below:

| Inflation Assumptions | 2014 Board Approved OM&A | 2015 | 2016 | 2017 | 2018 | 2019 Bridge | 2020 Test |
|---|---|---|---|---|---|---|---|
| OEB Inflation | | 1.60% | 2.10% | 1.90% | 1.20% | 1.50% | 1.50% |
| Customer Growth | | 0.45% | 0.45% | 0.45% | 0.45% | 0.45% | 0.45% |
| Stretch Factor | | (0.15%) | (0.15%) | (0.15%) | (0.15%) | (0.15%) | (0.15%) |
| **Total** | | **1.90%** | **2.40%** | **2.20%** | **1.50%** | **1.80%** | **1.80%** |

This inflation factor was used for both labour and non-labour components.

## 4-Staff-37 Engineering and Operations

**Ref: Exhibit 4 – 4.3.4.2 Engineering and Operations, p. 50 of 103**
Kitchener-Wilmot Hydro has proposed to hire an asset manager in 2019 to provide the necessary oversight and direction of Kitchener-Wilmot Hydro's strategy and policy to manage the distribution assets. Kitchener-Wilmot Hydro also proposed to hire a part-time designer to address design work overflow.

a) Please provide the job posting for the two positions and an update on the status of filling two positions.

The part-time designer job was not posted. KWHI hired a retired Distribution Design Supervisor who has significant experience in overhead designs on an as-needed contract basis. The part-time designer is currently working for KWHI.

The asset manager position has not been filled and no job posting has been prepared to date. KWHI is in the process of drafting the job description and will conduct a job evaluation for compensation prior to posting.

b) With the estimated budget numbers on p. 50, it appears the budget for the two positions is approximately $256,500. Please confirm if this is correct or provide the expected budget for these two incremental positions.

The budgeted amount included in the 2020 budget for the asset manager and part-time designer is $263,000. This cost is fully burdened and includes all labour overheads.

c) Please confirm if the asset manager will maintain the DSP in the future.

Confirmed.

d) Is the design work overflow constant through out the year or a result of specific projects, such as new customer connections?

The design work overflow is constant.

e) Please provide the amount of charged overtime for design work between the years 2014-2018.

The table below shows the number of overtime hours worked and the associated costs for the engineering department. Overtime hours worked in the engineering department is primarily for design work.

| Description | Year | | | | |
|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 |
| OT Hours | 293 | 590 | 576 | 995 | 321 |
| Costs ($) | 23,655 | 46,481 | 43,433 | 76,842 | 25,307 |

f) Please breakdown the budget for the engineering and operations program between engineering, reliability monitoring, customer complaint response, managing damage claims, and other operational duties for the years 2014-2020. Alternatively, if there is a more suitable breakdown of this program please provide the information and justification. For each broken down item please provide a summary of the work included.

The engineering and operation budget are broken down into two main programs, namely, engineering and operations. Reliability monitoring, customer complaint response, and managing damage claims are functions carried out by members of the operations department. KWHI does not budget at this granular of a levels.

The 2020 budget for these two departments is as follows.

| Description | 2020 Amount |
|---|---|
| **Engineering** | $3,051,200 |
| **Operations** | $923,500 |

## Engineering Department

The engineering department is responsible for planning and designing of KWHI's power distribution system including transmission stations. The department performs design for the entire overhead and underground system for new construction, new customer load connection, planned asset replacement and reactive maintenance programs. The department also administers all distributed generation projects that are interconnected with KWHI's distribution system.

The department performs short, medium and long-term planning for the distribution system. Conducts connection impact studies for parallel generation including renewable generation under the FIT/microFIT program, energy storage and electric vehicles. The department is also responsible for conducting distribution analyses and providing customer with on demand information relating to system performance for arc-flash analysis.

The department also has a GIS/CAD group that is responsible for maintaining a Geographic Information System (GIS) which has the complete distribution network assets and attributes stored in a geospatial database. This group is also responsible for producing engineering drawings, prepared by engineers and technicians, in CAD format.

This department is also responsible for the design of communication networks and the necessary operations technology (OT) required to monitor and control transmission transformer stations, distribution stations and automated field devices. These

technologies include; SCADA systems, remote terminal units, relays and wireless routers.

**Operations Department**

The operations department is responsible for overseeing the construction and maintenance of KWHI's distribution system including transmission stations. The team has responsibility for ensuring that capital projects are completed on time and within budget. They work closely with the engineering department to provide input into the development and prioritisation of capital projects. The department develops the annual maintenance schedule for transformer stations and the distribution system and oversees the implementation to ensure that assets are maintained as outlined in KWHI's Asset Management Strategy and per the schedule developed.

The operations department provides administrative support and leadership to the Distribution Department in their efforts to provide 24/7 response to outages while ensuring the safe, efficient and reliable distribution of electricity in KWHI's service territory.

KWHI is often required to augment its in-house resource of powerline technicians with third party contractors to fulfill its obligations to renew, provide access to, and upgrade the distribution system. The operations department is responsible for the administration and management of these contracts.

The operations department is also responsible for the tracking and monitoring of system reliability, responding to customer complaints, and managing equipment damage claim requests.

## 4-Staff-38 Control Room and Stations Operations

**Ref: Exhibit 4 – 4.3.4.1 Control Room and Stations Operations, p. 43 of 103**
Kitchener-Wilmot Hydro attributed the difference of $300,200 between the test year and the 2014 OEB approved amount to the hiring of two control room operators and an increase in overtime charged for the control room during busy periods.

a) How many control room operators were approved in the 2014 OEB approved OM&A?

Six (6). In 2014, the Board approved budget did not include an estimate for the seventh operator's position left open since 2011 but was later filled in 2015.

b) Please provide the overtime costs charged for control room operations for the years 2014-2018.

The table below shows the number of overtime hours worked and the associated costs for the control room department. Overtime hours worked include schedule work on statutory holidays.

| Description | Year | | | | |
|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 |
| **OT Hours** | 749 | 850 | 1,023 | 865 | 1,183 |
| **Costs ($)** | 61,101 | 69,801 | 86,274 | 74,260 | 103,856 |

c) What is the status of hiring the 7th control room operator?

One of the primary duties of the seventh operator is to provide outage planning with crews and contractors. Management is currently in negotiations with the union representative and staff to finalise whether the position will be unionized or not. Once this decision is made, posting of the job will follow. It is KWHI's intention to post the job by mid-August.

d) Please provide information on daily operations of the control room, including but not limited to, the operator duties, the number of operators per shift, the length of each shift, rotational schedules, and succession plans.

KWHI has been providing 24x7 Control Room services since the 1950's. The role of the Control Room is to monitor and control KWHI-owned eight (8) transformer stations, seven (7) distribution stations and over thirty (30) remote operable field devices. The Control Room also monitors and controls PMTS, a transformer station jointly owned by Brantford Power and Energy+. In addition to monitoring and controlling transformer stations and distribution equipment, the Control Room is responsible for the day to day short-term outage planning with KWHI's field crews and contractors, and the long-term outage planning with Hydro One and the IESO.

Operator duties

The main duties of the control room operators are:

i. Outage planning, dispatching, and restoration
   a. This includes preparation of switch plans and work protection for planned and forced outages, and the associated outage restoration.
   b. Plan/coordinate permits and outages with line crews, protection and control crews, and all contractors.
   c. Dispatching work crews to respond to trouble calls and emergency calls received from customers and first responder agencies.

ii. Operate and Monitor devices, switch planning, network management
   a. Operating and monitoring the grid involves reacting to real-time information and working primarily with SCADA systems. Responding to station alarms, controlling distribution automation devices, composing and executing switch plans and network and device tagging.
   b. In addition to SCADA controlled devices, operating the grid also involves keeping the “as-operated” model of the distribution system up to date with current field conditions. Tracking manual switching operations along with SCADA actions help to keep the prediction model accurate for the outage management system (OMS) and ensure that switching actions are based on real time conditions.

Shift Schedule

Currently, there are four (4) operators who work on a 24-hour rotating shift with two spare operators who work 8-hours shift (Mondays to Fridays 7:00 a.m. to 3:00 p.m.) and backfill for the shift operators during time-offs. Each rotating shift is 12-hours long and the following rotational schedule is used.

| Operator | Week #1 SMTWTFS | Week #2 SMTWTFS | Week #3 SMTWTFS | Week #4 SMTWTFS |
|---|---|---|---|---|
| 1 | AAXXBBX | XXAAXXB | BBXXAAX | XXBBXXA |
| 2 | BBXXAAX | XXBBXXA | AAXXBBX | XXAAXXB |
| 3 | XXBBXXA | AAXXBBX | XXAAXXB | BBXXAAX |
| 4 | XXAAXXB | BBXXAAX | XXBBXXA | AAXXBBX |

The above schedule repeats every 28 days (Week #1 follows Week #4).

Legend:

A = 19:00 of previous day to 07:00

B = 07:00 to 19:00

X = Scheduled day off

Staffing Complement

Power system control room operators are part of a highly specialised work group that requires specific knowledge and training related to the electric utility. As a medium sized LDC, hiring fully trained control room operators has always been a challenge. As such, KWHI has had to train and develop these individuals from no experience to a fully qualified journeyman operator. It takes approximately four (4) years to train a fully qualified operator.

A minimum of seven operators is required to provide basic monitoring and operation of a 24x7 control room for a utility such as KWHI that owns and operates eight (8) transformer stations. Using six operators is only a short-term solution since it creates additional overtime and often results in insufficient coverage for the 24x7 shifts when operators are absent due to time off for vacation or illness.

KWHI's staffing strategy for the control room operator role is to have seven operators available who are fully qualified or at least within 1-2 years of having the necessary skills and competencies to operate the system. Currently, the staffing level is inadequate and the complement of six operators doesn't allow for an efficient operation and is the main reason for hiring a seventh operator.

Based on the existing age profile of KWHI's control room operators, there are two operators eligible to retire within the next one to four years (2020 and 2023).

## 4-Staff-39 Overhead Maintenance

**Ref: Exhibit 4 – 4.3.4.1 Overhead Maintenance, p. 44 of 103**
**Ref: Distribution System Plan - Figure 2.23 Historical trend Tree Contact related outages**
**Ref: Distribution System Plan Table 2-17 Customer Hours Interrupted by Cause Codes (2014-2018) – excluding MEDs**

Kitchener-Wilmot Hydro has increased its outside contracting expenditures on its overhead maintenance program by $217,000 for tree trimming and animal proofing. Kitchener-Wilmot Hydro also increased its storm damage budget as it has experienced several major storms.

a) Please breakdown the budget for this program between tree trimming, animal proofing, storm damage, emergency repairs, equipment maintenance, and insulator washing for the years 2014-2020. Alternatively, if there is a more suitable breakdown of this program please provide the information and justification. For each broken down item please provide a summary of the work included.

| Overhead Maintenance | 2014 Board Approved CGAAP | 2014 Actual CGAAP | 2015 Actual MIFRS | 2016 Actual MIFRS | 2017 Actual MIFRS | 2018 Actual MIFRS | 2019 Bridge MIFRS | 2020 Test MIFRS |
|---|---|---|---|---|---|---|---|---|
| Animal Proofing | 150,000 | 243,216 | 93,390 | 193,659 | 164,254 | 198,615 | 313,000 | 313,200 |
| Tree Trimming | 840,000 | 743,731 | 842,913 | 758,620 | 679,077 | 720,250 | 789,900 | 805,900 |
| Storm Damage | 139,500 | 194,917 | 43,142 | 279,845 | 184,814 | 342,201 | 309,400 | 315,800 |
| Emergency Repairs | 1,136,500 | 1,489,990 | 1,343,778 | 1,376,380 | 1,557,195 | 1,633,172 | 1,390,000 | 1,415,700 |
| Equipment Maintenance | 238,800 | 247,571 | 156,292 | 84,141 | 82,125 | 176,671 | 148,600 | 152,400 |
| Insulator Washing | 32,000 | 26,400 | 27,412 | 13,720 | 10,414 | 14,457 | 14,600 | 14,800 |
| **Overhead Maintenance** | **2,536,800** | **2,945,824** | **2,506,926** | **2,706,365** | **2,677,878** | **3,085,367** | **2,965,500** | **3,017,800** |

**Animal Proofing** – KWHI and contractor costs to install animal guarding on overhead equipment.

**Tree Trimming** – KWHI and contractor costs for the vegetation management program.

**Storm Damage** – Repairs to poles, conductors, services and equipment and Forestry response as a result of inclement weather.

**Emergency Repairs** – Repairs to poles, conductors, services, transformers and other overhead equipment, generally as a result of report by another party.

**Equipment Maintenance** – Planned maintenance and repairs to poles, conductors, services and overhead equipment.

**Insulator Washing** – Contractor costs to complete annual insulator washing program.

b) Figure 2.23 shows that the historical trend of tree contact related outages has declined between 2014-2018. During 2014-2018, the Overhead Maintenance program, which

includes tree trimming, has had relatively constant costs. However, in 2019 and 2020 the Overhead Maintenance program increases by 13% and it appears this may be due to increased tree trimming. Please provide justification for increasing the budget required for tree trimming if there is already a declining trend.

The increase in budget for tree trimming is the result of hiring an additional arborist in the Forestry department in September of 2018. This restored the work group to the 2014/2015 staffing level of six; one supervisor and five arborists. The additional arborist allows KWHI to maintain two full crews on the road when one arborist is away for planned or unplanned reasons and this increases the efficiency of the department and contributes to KWHI completing its annual tree trimming program.

Figure 2.23 of the Distribution System Plan charts the number of customers interrupted by a tree contact related outage on an annual basis. As noted, Figure 2.23 exhibits a declining trend from 2014 to 2018: However, if the year 2017 is removed as an outlier, the trend line will level off to show only a slight decline or possibly no decline. KWHI is confident that its current Forestry department size is appropriate for completing its annual work and has budgeted to reflect this in 2019 and 2020.

c) Table 2-17 shows that with the exception of 2017, which appears to be an outlier, adverse weather outages are trending downwards. Please explain Kitchener-Wilmot Hydro's justification for the increase in storm damage budget even though it appears adverse weather outages are trending downwards.

Table 2.17 of the Distribution System Plan charts the number of customer hours of interruption time by cause codes in the period 2014 to 2018 but excludes Major Event Days (MEDs). MEDs are usually weather-related events and while excluded from reliability statistic reporting, repair costs are still incurred and are generally of a substantial nature. For this reason, the apparent trending of cause codes in Table 2.17 is not a good trend indicator for adverse weather outages.

Adverse weather is unpredictable, but it appears that adverse weather events are occurring with greater frequency and intensity. When preparing 2019 and 2020 budgets, KWHI budgeted storm damage costs using a five-year average of actual and forecasted costs for the period 2014-2018 and giving some consideration to KWHI's 2013 Storm Damage costs of $910,289. KWHI believes that the amounts budgeted for storm damage repairs in 2019 and 2020 are appropriate given its experience to date.

## 4-Staff-40 Regulatory Costs

**Ref: Exhibit 4 – 4.3.4.2 Regulatory Costs, p. 52 of 103**
**Ref: Appendix 2-M Regulatory Costs**
Kitchener-Wilmot Hydro has stated that the regulatory cost increases are due to OEB costs, the preparation of the cost of service, and increased salary costs for a regulatory accountant. Appendix 2-M also shows significant increase to OEB Annual Assessment, legal costs, and consultant costs.

a) For appendix 2-M, please breakdown the costs of "OEB Annual Assessment", as appropriate.

The "OEB Annual Assessment" consists of the OEB Cost Assessment fee only.

b) Please provide Kitchener-Wilmot's forecasting methodology and assumptions for the "OEB Annual Assessment" costs for 2020.

The fee is based on the actual cost from June 2018, plus inflation of 1.2% for 2019 and 1.5% for 2020.

c) For appendix 2-M, please breakdown the costs of "operating expenses associated with staff resource allocated to regulatory matters" between salaries and other expenses, as appropriate.

Operating expenses associated with staff resources allocated to regulatory matters consists of salaries of $339,100, benefits of $82,000 and other expenses of $9,800.

d) What are the roles and responsibility of each staff?

The Regulatory Department has three staff - a Manager of Regulatory Affairs, a Senior Regulatory Analyst and a Regulatory Accountant. From the position descriptions:

Manager of Regulatory Affairs

The position reports to the CFO and VP Finance and is responsible to maintain and share current knowledge of relevant regulations affecting the corporation. Assist other departments with regulatory compliance, assist with developing regulatory strategy; coordinate and administer all financial, statistical and service quality information report to the OEB, administer the Corporations rate submission, adjustment and supporting evidence to the Ontario Energy Board, coordinate the implementation of the OEB's electronic regulatory filing initiatives, administration of regulatory accounting processes to ensure OEB

compliance, supervise staff, provide leadership and maintain a team environment.

Senior Regulatory Analyst

The Senior Regulatory Analyst will be primarily responsible for calculating the cost of power using power data from the IESO; assisting with the recording and reporting of variance accounting; assisting with the preparation of supporting documentation for regulatory filing and rate submissions to the Corporation's regulatory body; provide assistance with financial, regulatory and cost analysis; as well as budgeting and cost of service studies; as well as provide back up

Regulatory Accountant

The Regulatory Accountant will ensure the proper alignment of distribution rate setting initiatives with financial planning, budgeting and investment activities. This position is responsible for the accurate, timely and effective analysis of capital expenditures, operating and maintenance expenses and regulatory financial results, and will support reporting to both external regulatory authorities and internal users.

e) The legal costs have increased by 57.11% since the last cost of service. Please explain what additional legal costs Kitchener-Wilmot Hydro expects to incur compared to 2014.

In KWHI's last Cost of Service filing, legal costs were not incurred until the Technical Conference. Due to the increasing regulatory burden, the use of legal is being required sooner and more often. At this point of the Cost of Service process in the 2014 filing, no dollars had yet been spent on legal fees. To date, $14,012 has been spent.

f) Please provide the legal costs accrued to date.

$14,012 as at June 30th.

g) For appendix 2-M, please breakdown the costs of "consultants' costs" to the particular tasks the consultants were hired to accomplish, such as the DSP or asset condition assessment.

| | |
|---|---|
| Distribution System Plan | $ 85,000 |
| Asset Management Strategy | $ 15,000 |
| Customer Engagement | $120,000 |
| Asset Condition Assessment | $ 38,000 |
| Other | $ 90,000 |

h) Please provide the consultant costs accrued to date.

$243,389 as at June 30th.

i) Please confirm if the regulatory costs included funding for a community meeting?

The Community Meeting costs are included in Other Consultants Costs ($20,000)

## 4-Staff-41 Information Technology (IT)

**Ref: Exhibit 2 – Appendix P – CIS Replacement Business Case**
**Ref: Exhibit 4 – 4.2.4 Customer Information System**
**Ref: Exhibit 4 – 4.3.4.1 Information Technology, p. 47 of 103**
Kitchener-Wilmot Hydro stated that its old CIS system, COBOL, is 30+ years old and is maintained in-house. This old CIS system only had three programmers that had the skills to maintain the system and two have already retired.

a) Please provide the number of hours that IT staff needed for the maintenance of the old CIS system.

The legacy CIS system, on average, has required 2 ½ full time programmers at 35 hours per week to maintain – 87.50 hours per week.

b) What efficiencies were gained with the new CIS system compared to the old CIS system in terms of yearly maintenance?

The efficiencies that will be gained will be outside of the new CIS itself. The programmers that have been maintaining the current CIS will be freed up to assist with other Enterprise systems that have been underdeveloped due to lack of IT resources. The JD Edwards ERP is one example of an Enterprise system in need of IT resources. Sharepoint is another.

c) Has Kitchener-Wilmot Hydro back filled the two retired IT positions? If not, what is the current status of those positions?

KWHI did refill the two retired IT positions; however, at present one of the positions is vacant due to a resignation. KWHI is in the process of refilling this position.

## 4-Staff-42 Compensation Strategy

**Ref: Exhibit 4 – 4.4.2 Overview of Compensation Strategy**
**Ref: Table 4.4.2.1 – Average Age**
Kitchener-Wilmot Hydro provided the average age of its employees and divided it into four categories in table 4.4.2.1. Kitchener-Wilmot Hydro also stated that it has been actively recruiting power line technicians and apprentices in order to prepare for retiring crew foremen.

a) Please provide the number of employees in each of the four categories provided in table 4.4.2.1.

Refer to Table 4-Staff-42 below.

b) For each category, what is the average years of experience for employees when they retire?

Refer to Table 4-Staff-42 below.

c) For each category, what is the average years of experience for new employees that replace the retired employees?

Refer to Table 4-Staff-42 below

d) Please provide the number of employees that have retired between 2014 and 2019.

The number of employees who retired between 2014-June 2019 is 41.

Table 4-Staff-42

| | | (a) | (b) | ( c) |
|---|---|---|---|---|
| 2018 | Weighted Avg. | Number of Employees (includes temps) | Avg. years of exp. when they retire | Avg. Years of Exp that replace the retired employees* |
| Crew Foreman | 54.3 | 16 | 32 | 5 or more |
| Inside | 42.8 | 46 | 18 | 3 to 5 |
| Management | 47.3 | 48 | 31 | 5 or more |
| Outside | 41.8 | 69 | 30 | 1 to 3 |

*Data is not readily available. Estimates provided.

Kitchener-Wilmot Hydro stated that its compensation plan is reviewed against Broader Public Sector and LDC Sector.

e) Please provide the analysis of Kitchener-Wilmot Hydro's compensation plan compared to other LDCs of similar size and geographic area.

KWHI last completed a market analysis of its management compensation wage schedule in 2017. With respect to an analysis with other LDCs of similar size and geographic area, the MEARIE Group LDC Management Compensation Survey 2017 data was used as a comparator. Position matches were made, where possible, using the Hay point system and the position titles in the MEARIE survey. While KWHI analyzed market data by individual position, where KWHI has three or less incumbents in a salary category, the salary category is combined with adjacent categories so that no category contains three or fewer employees.

The attached market analysis uses the following data from the MEARIE survey:

1. 40,000 to 79,999 customers. Group includes 9 LDCs. Both the Average and P75 Total Compensation values were used as comparators since KWHI is larger than any of the LDCs in this group with 95,757 customers in 2017.
2. 80,000 customers and above. Group only includes 5 LDCs but two are smaller and two are larger than KWHI.
3. Geographic Region 4. Both the Average and P75 Total Compensation values were used as comparators as KWHI is the largest participating LDC in this Region. Note that there are some very small LDC's in Region 4 and that geographic comparator data is of limited value when it compares salaries for LDCs with less than 20,000 customers with those who have over 80,000 customers.

| | | | 40,000 to 79,999 Customers | | Over 80,000 Customers | Region 4 | |
|---|---|---|---|---|---|---|---|
| Catogory | Position | KWH Average Salary | P75 | MEARIE AVERAGE | MEARIE AVERAGE | P75 | MEARIE AVERAGE |
| 1 | Executive | 197,322 | 227,325 | 209,750 | 217,200 | 174,175 | 158,275 |
| 2 | Senior Managers/Technical Specialists | 120,193 | 110,420 | 108,400 | 124,633 | 108,480 | 107,080 |
| 3 | Managers/Engineers | 107,089 | 108,960 | 106,733 | 110,525 | 101,520 | 100,590 |
| 4 | Supervisors | 101,046 | 105,686 | 103,714 | 99,822 | 101,633 | 98,000 |
| 5 | Analysts | 86,153 | 92,588 | 89,663 | 89,857 | 87,275 | 86,725 |
| 6 | Analyst Support | 77,168 | 85,450 | 82,950 | 85,850 | 84,300 | 82,350 |
| 7 | Administrative Assistants | 68,396 | 65,800 | 65,800 | 68,000 | 64,500 | 64,500 |

## 4-Staff-43 Headcount

**Ref: Table 4.4.3-1 – Employee Costs**
**Ref: Table 4.4.3.1-1 – Headcount at end of the year**
**Ref: Appendix 2-K Employee Costs**

Kitchener-Wilmot Hydro provided three tables that shows the number of employees in Kitchener-Wilmot Hydro's workforce.

a) The number of employees shown in Appendix 2-K does not match the number of employees shown in Table 4.4.3-1. Please reconcile the tables and explain the difference.

Appendix 2-K has been updated with corrected FTE numbers. In addition, the FTE reported in Table 4.4.3-1 for 2014 Actual and 2018 Actual required revisions and have been corrected as per below Table. The two schedules are now identical.

**Table 4.4.3-1 Employee Costs**

| | 2014 Board Approved | 2014 Actual | 2015 Actual | 2016 Actual | 2017 Actual | 2018 Actual | 2019 Bridge | 2020 Test |
|---|---|---|---|---|---|---|---|---|
| **Number of Employees (FTEs including Part-Time)** | | | | | | | | |
| Management (including executive) | 34 | 34 | 31 | 30 | 29 | 28 | 30 | 31 |
| Non-Management (union and non-union) | 141 | 141 | 145 | 153 | 157 | 156 | 156 | 157 |
| **Total** | **175** | **175** | **176** | **183** | **185** | **184** | **186** | **188** |
| **Total Salary and Wages including ovetime and incentive pay** | | | | | | | | |
| Management (including executive) | $ 3,610,775 | $ 3,734,214 | $ 3,575,959 | $ 3,633,300 | $ 3,535,632 | $ 3,499,556 | $ 3,672,100 | $ 3,736,799 |
| Non-Management (union and non-union) | $ 10,817,928 | $ 11,412,143 | $ 11,795,569 | $ 12,721,511 | $ 12,802,464 | $ 12,985,966 | $ 13,309,825 | $ 13,788,574 |
| **Total** | **$ 14,428,703** | **$ 15,146,357** | **$ 15,371,528** | **$ 16,354,811** | **$ 16,338,096** | **$ 16,485,522** | **$ 16,981,925** | **$ 17,525,372** |
| **Total Benefits (Current + Accrued)** | | | | | | | | |
| Management (including executive) | $ 859,641 | $ 875,986 | $ 845,597 | $ 828,795 | $ 813,172 | $ 785,567 | $ 839,982 | $ 847,125 |
| Non-Management (union and non-union) | $ 2,773,109 | $ 2,753,539 | $ 2,896,444 | $ 3,087,435 | $ 3,148,125 | $ 3,343,268 | $ 3,351,218 | $ 3,472,675 |
| **Total** | **$ 3,632,750** | **$ 3,629,526** | **$ 3,742,041** | **$ 3,916,231** | **$ 3,961,296** | **$ 4,128,835** | **$ 4,191,200** | **$ 4,319,800** |
| **Total Compensation (Salary, Wages, & Benefits)** | | | | | | | | |
| Management (including executive) | $ 4,470,416 | $ 4,610,200 | $ 4,421,556 | $ 4,462,096 | $ 4,348,804 | $ 4,285,123 | $ 4,512,082 | $ 4,583,924 |
| Non-Management (union and non-union) | $ 13,591,037 | $ 14,165,683 | $ 14,692,014 | $ 15,808,946 | $ 15,950,589 | $ 16,329,234 | $ 16,661,043 | $ 17,261,249 |
| **Total** | **$ 18,061,453** | **$ 18,775,883** | **$ 19,113,570** | **$ 20,271,042** | **$ 20,299,392** | **$ 20,614,357** | **$ 21,173,125** | **$ 21,845,172** |
| | | 104.0% | 101.8% | 106.1% | 100.1% | 101.6% | 102.7% | 103.2% |

b) Kitchener-Wilmot Hydro provided a headcount by department in Table 4.4.3.1-1. Please provide a breakdown for the total employee count by departments, similar to Appendix 2-K.

| Department | 2014 Board Approved | 2014 Actual | 2015 Actual | 2016 Actual | 2017 Actual | 2018 Actual | 2019 Bridge | 2020 Test |
|---|---|---|---|---|---|---|---|---|
| **Executive** | **4** | **5** | **5** | **4** | **4** | **4** | **4** | **4** |
| Management (including executive) | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| Non-Management (union and non-union) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **General Administration (Finance, HR and Safety)** | **11** | **11** | **11** | **11** | **11** | **12** | **12** | **12** |
| Management (including executive) | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Non-Management (union and non-union) | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 |
| **Customer Service (Customer Service Administration, Billing, Collection and Meter Reading)** | **24** | **21** | **22** | **25** | **25** | **25** | **26** | **27** |
| Management (including executive) | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 |
| Non-Management (union and non-union) | 21 | 18 | 19 | 22 | 22 | 22 | 22 | 23 |
| **Engineering** | **21** | **19** | **20** | **20** | **21** | **21** | **22** | **22** |
| Management (including executive) | 6 | 5 | 7 | 7 | 6 | 7 | 8 | 8 |
| Non-Management (union and non-union) | 15 | 14 | 13 | 13 | 15 | 14 | 14 | 14 |
| **Operations & Maintenance** | **98** | **97** | **98** | **99** | **97** | **96** | **100** | **101** |
| Management (including executive) | 20 | 20 | 20 | 21 | 20 | 22 | 22 | 22 |
| Non-Management (union and non-union) | 78 | 77 | 78 | 78 | 77 | 74 | 78 | 79 |
| **Purchasing/Stores** | **7** | **7** | **7** | **7** | **7** | **7** | **7** | **7** |
| Management (including executive) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Non-Management (union and non-union) | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Information Technology** | **10** | **10** | **10** | **10** | **9** | **10** | **10** | **10** |
| Management (including executive) | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 2 |
| Non-Management (union and non-union) | 6 | 6 | 6 | 8 | 7 | 8 | 8 | 8 |
| **Total Headcount** | **175** | **170** | **173** | **176** | **174** | **175** | **181** | **183** |

## 4-Staff-44 Payment in Lieu of Taxes (PILs)

**Ref: Exhibit - 4. Appendix 4-5**
**Ref: Exhibit - 4. Appendix 4-8**

a) Please provide a copy of the 2018 Income Tax Return

Attached see.pdf file EB-2019-0049_KWHI_IR_PILS 2018-12-31 Kitchener-Wilmot Hydro-T2_FINAL_Redacted_20190731.

b) Please update the PILs model (using the updated 2020 OEB PILs model) for the historical, bridge, and test years to align with Kitchener-Wilmot Hydro's closing 2018 tax continuity schedules as appropriate (Schedule 4, Schedule 8, Schedule 13), and update any other areas of the application that include the 2020 PILs forecast.

Attached see .pdf file EB-2019-0049_KWHI_IR_Appl_Test_Year_Income_Tax_PILS_4-Staff-44.

The attached PILs model does not include the AIIP adjustments provided in the newest PILs model released by staff in July 2019 as KWHI has used the CCA smoothing effect in Schedule 8 – CCA deductions in the model as discussed in 4-Staff-46 part E. The PILs model does not allow negative CCA class so a non-AIIP model was used and a smoothing effect adjustment on the bottom of Schedule 8 was made.

## 4-Staff-45 Payment in Lieu of Taxes

**Ref: Chapter 2 Appendix 2-C; Exhibit 4 – OEB PILs Model Tab T1**

The depreciation for 2020 in Appendix 2-C is calculated as $10,475,700. The amortization of tangible assets for 2020 in tab T1 of the OEB PILs model (add back for tax purposes) is $10,463,000.

a) Please explain the discrepancy between these two figures and, as appropriate, please update the OEB PILs tax model tab T1 to align with the depreciation figures used elsewhere in the application.

The discrepancy observed is appropriate, therefore, no adjustment is required. The amortization of tangible assets for 2020 in tab T1, of the OEB PILS model, includes the impact of socialized renewable generation assets that were added back for purpose of tax calculations. The socialized renewable generation assets were identified in KWHI's 2014 Cost of Service application. These same depreciation amounts for renewable generation assets are excluded from Appendix 2-C.

# 4-Staff-46 Payment in Lieu of Taxes

**Ref: Exhibit - 4 Table 4.10.2.3-1 - CIS CCA adjustment**
**Ref: Exhibit - 9 Tab 2b.**

The 2019 Budget Implementation Act (Bill C-97) was given royal assent on June, 21, 2019. Bill C-97 includes changes to the Income Tax Act that included new accelerated capital cost allowance (CCA) deductions on capital assets acquired after November 20, 2018. Generally speaking, the first-year CCA claim is three times the amount it would have been under the prior rules for these assets. The tax rates and rules assumed in Kitchener-Wilmot Hydro's existing rates do not include these tax deductions.

a) Please prepare an analysis to calculate the revenue requirement impact for 2018 as a result of the new accelerated CCA rules and adjust the Account 1592 principal and interest balances accordingly.

Based on the actual PILS returns for 2018 that KWHI filed, the amount to record to account 1592 during 2018 is $60,876.

**2018 AIIP Impact Analysis**

| 2018 ACTUALS - WITHOUT AIIP | Beginning UCC 2018 | Additions Year 2018 | AIIP Eligible Year 2018 | Proceeds on Dispositions | Half Year | AIIP Eligible | Total | CCA Rate | CCA for 2018 | Ending UCC December 31, 2018 |
|---|---|---|---|---|---|---|---|---|---|---|
| Class 1 (most buildings) | 80,928,209 | | | | 0 | | 80,928,209 | 4% | 3,237,128 | 77,691,081 |
| Class 1b (land and buildings) | 10,129,631 | 750,133 | | | 375,067 | | 10,504,698 | 6% | 630,282 | 10,249,482 |
| Class 2 (dist'n equip & plan acquired before 1988) | 6,218,471 | | | | 0 | | 6,218,471 | 6% | 373,108 | 5,845,363 |
| Class 3 (most buildings acquired before 1988 or 1990 if.....) | 2,114,861 | | | | 0 | | 2,114,861 | 5% | 105,743 | 2,009,118 |
| Class 8 (furniture, calculators and tools) | 4,082,678 | 1,292,326 | | 232 | 646,047 | | 4,728,725 | 20% | 945,745 | 4,429,027 |
| Class 10 (automobiles, vans, trucks, computers) | 1,132,199 | 1,128,142 | | 131,425 | 498,359 | | 1,630,558 | 30% | 489,168 | 1,639,749 |
| Class 17 (telephone) | 257,833 | | | | 0 | | 257,833 | 8% | 20,627 | 237,207 |
| Class 45 (general purpose computer equipment) | 1,076 | | | | 0 | | 1,076 | 45% | 484 | 592 |
| Class 46 (data network infrastructure equipment) | 9,992 | | | | 0 | | 9,992 | 30% | 2,998 | 6,994 |
| Class 47 (dist'n equip (excluding bldgs) acquired after 02/22/200 | 87,392,492 | 12,064,905 | | 2,800 | 6,031,053 | | 93,423,545 | 8% | 7,473,884 | 91,980,713 |
| Class 50 | 268,609 | 868,636 | | 1,870 | 433,383 | | 701,992 | 55% | 386,096 | 749,279 |
| | ***192,536,052*** | ***16,104,142*** | ***0*** | ***136,327*** | ***7,983,909*** | ***0*** | ***200,519,961*** | | ***13,665,262*** | ***194,838,605*** |

| 2018 ACTUALS - WITH AIIP | Beginning UCC 2018 | Additions Year 2018 | AIIP Eligible Year 2018 | Proceeds on Dispositions | Half Year | AIIP Eligible | Total | CCA Rate | CCA for 2018 | Ending UCC December 31, 2018 |
|---|---|---|---|---|---|---|---|---|---|---|
| Class 1 (most buildings) | 80,928,209 | | | | | 0 | 80,928,209 | 4% | 3,237,128 | 77,691,081 |
| Class 1b (land and buildings) | 10,129,631 | 750,133 | | | | 0 | 10,129,631 | 6% | 630,282 | 10,249,482 |
| Class 2 (dist'n equip & plan acquired before 1988) | 6,218,471 | | | | | 0 | 6,218,471 | 6% | 373,108 | 5,845,363 |
| Class 3 (most buildings acquired before 1988 or 1990 if.....) | 2,114,861 | | | | | 0 | 2,114,861 | 5% | 105,743 | 2,009,118 |
| Class 8 (furniture, calculators and tools) | 4,082,678 | 1,292,326 | 17,110 | 232 | | 8,555 | 4,091,233 | 20% | 949,167 | 4,425,605 |
| Class 10 (automobiles, vans, trucks, computers) | 1,132,199 | 1,128,142 | 70,787 | 131,425 | | 35,394 | 1,167,593 | 30% | 510,403 | 1,618,513 |
| Class 17 (telephone) | 257,833 | | | | | 0 | 257,833 | 8% | 20,627 | 237,207 |
| Class 45 (general purpose computer equipment) | 1,076 | | | | | 0 | 1,076 | 45% | 484 | 592 |
| Class 46 (data network infrastructure equipment) | 9,992 | | | | | 0 | 9,992 | 30% | 2,998 | 6,994 |
| Class 47 (dist'n equip (excluding bldgs) acquired after 02/22/200 | 87,392,492 | 12,064,905 | | 2,800 | | 0 | 87,392,492 | 8% | 7,473,884 | 91,980,713 |
| Class 50 | 268,609 | 868,636 | 372,841 | 1,870 | | 186,421 | 455,030 | 55% | 591,159 | 544,217 |
| | ***192,536,052*** | ***16,104,142*** | ***460,738*** | ***136,327*** | ***0*** | ***230,369*** | ***192,766,421*** | | ***13,894,983*** | ***194,608,885*** |

| | |
|---|---|
| Extra CCA due to AIIP | 229,721 |
| Tax Rate | 26.50% |
| **PILS reduction for 2019** | **60,876** |

b) Please provide the same analysis in a) above for calendar 2019 and confirm that Kitchener-Wilmot Hydro will record these entries in Account 1592 during 2019. If this is not confirmed, please explain Kitchener-Wilmot Hydro's position.

Confirmed.

Based on the revised capital additions amount that KWHI has now adjusted for, the amount to record to account 1592 during 2019 would be $630,026.

| 2019 AS FILED - REVISED CAPEX - WITHOUT AIIP | Beginning UCC 2019 | Additions Year 2019 | AIIP Eligible Year 2019 | Proceeds on Dispositions | Half Year | AIIP Eligible | Total | CCA Rate | CCA for 2019 | Ending UCC December 31, 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| Class 1 (most buildings) | 77,691,081 | | | | 0 | | 77,691,081 | 4% | 3,107,643 | 74,583,438 |
| Class 1b (land and buildings) | 10,249,482 | 750,000 | | | 375,000 | | 10,624,482 | 6% | 637,469 | 10,362,013 |
| Class 2 (dist'n equip & plan acquired before 1988) | 5,845,363 | | | | 0 | | 5,845,363 | 6% | 350,722 | 5,494,641 |
| Class 3 (most buildings acquired before 1988 or 1990 if.....) | 2,009,118 | | | | 0 | | 2,009,118 | 5% | 100,456 | 1,908,662 |
| Class 8 (furniture, calculators and tools) | 4,429,027 | 850,000 | | | 425,000 | | 4,854,027 | 20% | 970,805 | 4,308,222 |
| Class 10 (automobiles, vans, trucks, computers) | 1,639,749 | 1,549,200 | | 15,000 | 767,100 | | 2,406,849 | 30% | 722,055 | 2,451,894 |
| Class 17 (telephone) | 237,207 | | | | 0 | | 237,207 | 8% | 18,977 | 218,230 |
| Class 45 (general purpose computer equipment) | 592 | | | | 0 | | 592 | 45% | 266 | 326 |
| Class 46 (data network infrastructure equipment) | 6,994 | | | | 0 | | 6,994 | 30% | 2,098 | 4,896 |
| Class 47 (dist'n equip (excluding bldgs) acquired after 02/22/20( | 91,980,713 | 14,717,243 | | 10,000 | 7,353,622 | | 99,334,335 | 8% | 7,946,747 | 98,741,209 |
| Class 50 | 749,279 | 1,173,557 | | | 586,779 | | 1,336,058 | 55% | 734,832 | 1,188,004 |
| | ***194,838,605*** | ***19,040,000*** | ***0*** | ***25,000*** | ***9,507,501*** | ***0*** | ***204,346,106*** | | ***14,592,070*** | ***199,261,535*** |

| 2019 AS FILED - REVISED CAPEX - WITH AIIP | Beginning UCC 2019 | Additions Year 2019 | AIIP Eligible Year 2019 | Proceeds on Dispositions | Half Year | AIIP Eligible | Total | CCA Rate | CCA for 2019 | Ending UCC December 31, 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| Class 1 (most buildings) | 77,691,081 | | | | | 0 | 77,691,081 | 4% | 3,107,643 | 74,583,438 |
| Class 1b (land and buildings) | 10,249,482 | 750,000 | 750,000 | | | 375,000 | 10,624,482 | 6% | 682,469 | 10,317,013 |
| Class 2 (dist'n equip & plan acquired before 1988) | 5,845,363 | | | | | 0 | 5,845,363 | 6% | 350,722 | 5,494,641 |
| Class 3 (most buildings acquired before 1988 or 1990 if.....) | 2,009,118 | | | | | 0 | 2,009,118 | 5% | 100,456 | 1,908,662 |
| Class 8 (furniture, calculators and tools) | 4,425,605 | 850,000 | 850,000 | | | 425,000 | 4,850,605 | 20% | 1,140,121 | 4,135,484 |
| Class 10 (automobiles, vans, trucks, computers) | 1,618,513 | 1,549,200 | 1,549,200 | 15,000 | | 767,100 | 2,385,613 | 30% | 1,175,944 | 1,976,769 |
| Class 17 (telephone) | 237,207 | | | | | 0 | 237,207 | 8% | 18,977 | 218,230 |
| Class 45 (general purpose computer equipment) | 592 | | | | | 0 | 592 | 45% | 266 | 326 |
| Class 46 (data network infrastructure equipment) | 6,994 | | | | | 0 | 6,994 | 30% | 2,098 | 4,896 |
| Class 47 (dist'n equip (excluding bldgs) acquired after 02/22/20( | 91,980,713 | 14,717,243 | 14,717,243 | 10,000 | | 7,353,622 | 99,334,335 | 8% | 9,123,326 | 97,564,630 |
| Class 50 | 544,217 | 1,173,557 | 1,173,557 | | | 586,779 | 1,130,995 | 55% | 1,267,504 | 450,270 |
| | ***194,608,885*** | ***19,040,000*** | ***19,040,000*** | ***25,000*** | ***0*** | ***9,507,500*** | ***204,116,385*** | | ***16,969,526*** | ***196,654,359*** |

| | |
|---|---|
| Extra CCA due to AIIP | 2,377,456 |
| Tax Rate | 26.50% |
| **PILS reduction for 2019** | **630,026** |

c) Please confirm that Kitchener-Wilmot Hydro will update its forecast of the 2020 test year PILs calculation by incorporating the new accelerated CCA rules in Schedule 8 of the OEB PILs model.

Confirmed

d) Please provide an analysis of what the impact of the accelerated CCA tax rules will be over the full 2020 to 2024 period.

The analysis is attached in the table below. The total impact over the 2020 – 2024 period is $8.4M in additional CCA claims or $1.7M in PILs savings per year at a 26.5% income tax rate.

| Item | 2020 | 2021 | 2022 | 2023 | 2024 | Total | Annual |
|---|---|---|---|---|---|---|---|
| CCA - AIIP | 22,662,966 | 17,858,435 | 17,980,284 | 18,126,245 | 18,377,030 | 95,004,960 | 19,000,992 |
| CCA - No AIIP | 16,567,315 | 18,171,653 | 17,292,221 | 17,189,498 | 17,362,557 | 86,583,243 | 17,316,649 |
| Difference | 6,095,650 | (313,218) | 688,064 | 936,747 | 1,014,473 | **8,421,717** | **1,684,343** |
| Tax Rate | 26.50% | 26.50% | 26.50% | 26.50% | 26.50% | 26.50% | 26.50% |
| Tax Savings (Increase) | 1,615,347 | (83,003) | 182,337 | 248,238 | 268,835 | 2,231,755 | 446,351 |

The analysis has the assumption that the opening UCC for both methodologies is the same so that the comparison is limited to only those years affected. The opening UCC coincides with part b) above.

e) If the analysis in part d) shows that CCA deductions over the 2020 to 2024 period will be volatile for all assets (including the CIS system), please explain Kitchener-Wilmot Hydro's position on whether a smoothing technique should be applied for CCA in general (rather than just the CIS system).

KWHI would support the smoothing technique be used for the purposes of calculating CCA for the rebasing period for its 2020 rate application as well as any other LDCs that rebase within the period of which the CCA deduction is accelerated. The smoothing technique would leave both the customer and the LDC unharmed by this recent legislation.

Using the smoothing technique with KWHI's updated amounts would increase non-AIIP CCA calculated for the 2020 – 2024 period by $1.7M per year as shown in the table of part d) above.

## 4-Staff-47 Payment in Lieu of Taxes

**Ref: Exhibit – 4 Table 4.10.2.3-1 - CIS CCA adjustment**

Kitchener-Wilmot Hydro is proposing to calculate a 5-year average of CCA deductions available over the rate term, and use this calculated figure as the test year CCA, with respect to a new CIS system that is expected to go into service in 2020. Kitchener-Wilmot Hydro states that the CCA deductions over the five-year rebasing period would be lower in year 1 and then would peak in 2021, declining each year, resulting in a volatile CCA adjustment each year.

a) Please updated Table 4.10.2.3-1 to include the impacts of the accelerated CCA rules in 4-Staff-46.

| Item | Total Capital 2020 | CCA Rate | 2020 | Total Capital 2021 | 2021 | 2022 | 2023 | 2024 | Total 5 Year CCA | Annual Smoothed |
|---|---|---|---|---|---|---|---|---|---|---|
| CIS - Class 50 | $ 7,397,500 | 55% | $ 6,102,938 | $ 362,500 | $ 1,011,072 | $ 355,295 | $ 159,883 | $ 71,947 | $ 7,701,134 | $ 1,540,227 |

b) Please explain what process Kitchener-Wilmot Hydro undertook to identify any other variability in its forecast CCA deductions from 2020 to 2024, including whether there are any deductions available from 2021 to 2024 that are not proportionally reflected in the 2020 test year.

KWHI analyzed its long term estimated capital expenditures and noted that the only item of significant variability was the estimated Phase I CIS expenditures. Following the completion of Phase I of the CIS project, typical weighting of capital expenditures are expected to resume.

c) Please confirm that this CIS system is a one-time investment, and that there are no ongoing investments for assets of a similar nature from years 2021 to 2024.

KWHI can confirm that Phase I of its CIS system implementation is a one-time investment. KWHI expects that there will be a Phase II to this project where additional functionality will be added to meet customer expectations. Phase II is expected to occur within the rebasing cycle of 2020 through 2024 but the business case and the quantum of costs has not yet been estimated with certainty.

# Exhibit 5 – Cost of Capital

## 5-Staff-48 Debt Instruments

**Ref: Appendix 2-OB Debt Instruments**
**Ref: Exhibit 5 – 5.1.1 Long-Term Debt**
Kitchener-Wilmot Hydro stated that the long-term debt rate is the interest rate on the promissory note to the City of Kitchener and the City of Wilmot and uses the OEB established rate. For 2019, the OEB deemed long-term debt rate is 4.13%. In Appendix 2-OB, the long-term debt rate used was 4.88% in 2020.

a) Please reconcile the values or provide an explanation.

KWHI has changed Appendix 2-OB to be 4.13%

# Exhibit 7 – Cost Allocation

## 7-Staff-49 Cost Allocation

**Ref: Exhibit 7 page 4; Cost Allocation Model, sheet I5.2 Weighting Factors**
Kitchener-Wilmot Hydro states that "To determine the weighting factor to be used for each customer class, the cost for Billings and Collections were totaled and allocated to a typical bill for each customer class."

a) Please provide a derivation of the billing and collecting weighting factors used.

KWHI analyzed the cost to provide billing and collection activities for the past three years. Then KWHI took the 3-year average volume provided to each rate class and multiplied it by the cost to provide the activity. This provided a cost per customer. Setting the weighting for the Residential class as 1, the remaining class weightings were determined.

## 7-Staff-50 Cost Allocation

**Ref: Cost Allocation Model sheet I6.2 Customer Data; sheet I7.1 Meter Capital; sheet I7.2 Meter Reading**

Kitchener-Wilmot Hydro has proposed 89,860 residential customers but only 87,901 meters and meter reads are entered for the rate class. Similarly, Kitchener-Wilmot Hydro has proposed 8,136 GS < 50 kW customers but only have 8,024 meters and meter reads.

a) Please review the planned meter counts and meter reading counts to ensure that there is consistency between the expected number of customers and expected number of meters.

The Cost Allocation model has been updated to reflect the expected number of meters and customers for 2020. See Excel file EB-2019-0049_KWHI_IR_2019_Cost_Allocation_Model_20190731.

## 7-Staff-51 Cost Allocation

**Ref: Cost Allocation Model sheet I6.1 Revenue; sheet I6.2 Customer Data; sheet I8 Demand Data**

Kitchener-Wilmot Hydro has forecasted that in the GS > 50 kW rate class, 1,071,514kW of the 2,008,643kW billing demand will be subject to Transformer Ownership Allowance (TOA). Kitchener-Wilmot Hydro has stated that there are 938 customers in the class, of which, 768 customers require the use of a utility owned Line Transformer, implying that the remaining 170 customers will be served by their own transformers. However, the Line Transformer 4NCP and Secondary 4NCP for GS > 50kW are 487,951kW compared to the Primary 4NCP of 501,008kW.

a) Please reconcile the apparent discrepancy that nearly the entire Primary 4NCP is included in the Line Transformer 4NCP and Secondary 4NCP, while slightly more than half of the billing demand qualifies for TOA.

This has been adjusted in the current Cost Allocation Excel file EB-2019-0049_KWHI_IR_2019_Cost_Allocation_Model_20190731. The discrepancy was a result of not making the adjustment for the number of customers.

b) Please reconcile the similar discrepancies related to 1NCP and 12NCP.

This has been adjusted in the current Cost Allocation Excel file EB-2019-0049_KWHI_IR_2019_Cost_Allocation_Model_20190731. The discrepancy was a result of not making the adjustment for the number of customers.

## 7-Staff-52 Cost Allocation

**Ref: Exhibit 7 page 5; Cost Allocation Model; Chapter 2 Appendix 2-Q**
Kitchener-Wilmot Hydro has performed a direct allocation of costs to the embedded distributor using Appendix 2-Q.

Direct Allocation has been used with respect to the asset accounts

- 1808 – Buildings and Fixtures
- 1815 – Transformer Station Equipment
- 1830 – Poles, Towers and Fixtures
- 1835 – Overhead Conductors and Devices
- 1840 – Underground Conduit
- 1845 – Underground Conductors and Devices
- 1855 – Services

As well as a portion of 2105 – Accumulated Amortization of Electric Utility Plant.

There is no direct allocation nor any allocation through the model of costs related to:

- 1820 – Distribution Station Equipment
- 1860 – Meters

Appendix 2-Q appears inconsistent with the cost allocation model:

| | **Cost Allocation** | **Appendix 2-Q** |
|---|---|---|
| **Gross Fixed Assets** | | |
| 1830 – Poles, Towers and Fixtures | $53,694,577 | |
| 1835 – Overhead Towers and Fixtures | $52,971,333 | |
| Total Overhead | $106,665,910 | $85,644,736 |
| | | |
| 1840 – Underground Conduit | $46,058,892 | |
| 1845 – Underground Conductors and Devices | $60,244,444 | |
| Total Underground | $106,303,336 | $66,026,088 |
| | | |
| **Accumulated Amortization** | | |
| 1830 – Poles, Towers and Fixtures | $19,550,588 | |
| 1835 – Overhead Towers and Fixtures | $20,062,503 | |
| Total Overhead | $39,613,090 | $34,895,066 |
| | | |
| 1840 – Underground Conduit | $13,253,355 | |
| 1845 – Underground Conductors and Devices | $27,112,677 | |
| Total Underground | $40,366,032 | $32,066,613 |

a) Please confirm that Kitchener-Wilmot Hydro does not use a distribution station to serve the embedded distributor

Confirmed.

b) Please revise sheets I7.1 Meter Capital and I7.2 Meter Reading to reflect the costs of metering the embedded distributor, or explain why this is not necessary.

KWHI does not own the meter that serves the Embedded Distributor. The meter reading expense is immaterial (approximately $160/year).

Costs allocated to the Embedded Distributor are directly allocated so meter reading costs were set to zero.

c) Please reconcile the apparent inconsistencies identified above between the cost allocation model and Appendix 2-Q.

Appendix 2-Q incorrectly included contributed capital for O/H and U/G and used year-end balances from 2018. Appendix 2-Q has been updated with corrected asset values. In addition, the direct allocation in the Cost Allocation model (as updated by Interrogatory 7-Staff-53) has been updated as required and to exclude the direct allocation of account 1855.

## 7-Staff-53 Cost Allocation

**Ref: Exhibit 7, page 6; Cost Allocation Model sheet I9 Direct Allocation; sheet O1 Revenue Customer Data; sheet O6 Source Data for E2**

Kitchener-Wilmot Hydro stated that

> *"The 2019 Cost Allocation model used for this Application is different from the Cost Allocation model used in the 2014 Cost of Service Application. The updated model allocates to the embedded distributor expenses for General and Administration, Depreciation and Amortization, PILs, Interest and Allocated Net Income. This amount of $75,107 is the driver of the large increase."*

OEB staff has reviewed the cost allocation model filed with the 2014 Cost of Service application and the Cost Allocation model filed in this application and notes the following:

1. The NFA allocator, has been updated. This is used to allocate Cost of Capital Parameters (PILs, Interest and Allocated Net Income) as well as Taxes other than Income Taxes. It now includes the directly allocated net fixed assets. This is a result of a change to sheet O6 Source Data for E2, rows 94 (to add the directly allocated distribution plant gross fixed assets) and 100 (to capture directly allocated accumulated depreciation).
2. The NFA ECC allocator builds on the NFA allocator, and has also been updated. It has been changed in O6 Source Data for E2 row 98 (to capture directly allocated contributed capital). However, it has not been changed to capture directly allocated accumulated amortization (minus accumulated amortization on contributed capital).
3. The present functionality of the Cost Allocation model is to directly allocate cost of capital parameters on the bottom of sheet I9 Direct Allocation, then to allocate a share of the residual pooled cost of capital parameters using the NFA allocator (which includes directly allocated capital), resulting in a double allocation.
4. The NFA ECC allocator presented in O6 Source Data for E2 row 103 is overstated because it does not include the directly allocated accumulated depreciation.

To address these concerns, OEB staff have prepared an alternate version of the Cost Allocation model with the following revisions:

5. The directly allocated cost of capital parameters have been removed at the bottom of sheet I9 Direct Allocation.
6. Sheet O6, cell M101 has been revised to include the directly allocated accumulated depreciation.

a) Please state whether Kitchener-Wilmot Hydro agrees with each of OEB staff's observations numbered one through four, and if not why.

KWHI agrees with each of the Board staff's observations.

b) Please state whether Kitchener-Wilmot Hydro believes the each of OEB staff's modifications numbered five and six are appropriate. If Kitchener-Wilmot Hydro would make different changes or believes that none are required, please explain.

KWHI agrees that each of the changes are appropriate. The Cost Allocation model as originally filed double counted the PILs, return on debt, and return on equity. Also, the model did not account for the directly allocated accumulated depreciation.

## 7-Staff-54 Cost Allocation

**Ref: Exhibit 7 page 7, Exhibit 3 Appendix 3-2**
Kitchener-Wilmot Hydro proposes to continue charging its standby rate, which is approved on an interim basis.

a) Please provide a breakdown, by rate class of standby volume and revenue for the years 2014-2018.

All of the standby charges are charged to the Large User rate class

| | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|
| Standby Charges | $ - | $ 128 | $ 1,117 | $ 199 | $ 362 |
| kW | - | 208 | 1,208 | 129 | 233 |

b) Please confirm that standby kW demand is included in the historical actual kW demand by rate class.

The standby kW are not included in the historical actuals. The standby charges are calculated on a manual basis as they are too insignificant to justify a change in the customer information system. Therefore, the totals are not reported through KWHI's CIS.

## 7-Staff-55 Cost Allocation

**Ref: Exhibit 7 page 9**
Kitchener-Wilmot Hydro proposed to adjust all revenue-to-cost ratios from the status quo levels.

Three rate classes were outside the OEB prescribed ranges, and all three are proposed to move to the boundary. The revenue proposed for collection from the GS < 50 kW rate class was reduced from $6,254,854 (status quo) to $6,195,147, a reduction of $59,707. The revenue proposed for collection from the Street Lighting rate class was reduced from $358,532 (status quo) to $334,895, a reduction of $23,637. The revenue proposed for collection from the Embedded Distributor was increased from $111,076 (status quo) to $147,161, an increase of $36,085. In total, these reflect a reduction of $47,259, which would need to be recovered from other rate classes.

In addition, Kitchener-Wilmot Hydro proposed to reduce the Residential rate class revenue-to-cost ratio from 98% to 97.5% and the Unmetered Scattered Load (USL) rate class revenue-to-cost ratio from 113.7% to 110.0%. It also proposed to increase the GS > 50 kW revenue-to-cost ratio from 95.6% to 97.0% and the Large Use revenue-to-cost ratio from 99.9% to 100.0%.

a) Please provide a rationale for the proposal to reduce the residential revenue-to-cost ratio from 98% further below unity to 97.5%.

   The residential rate class was based on the residual amounts after all other classes had costs allocated to them.

b) Please provide the reason for reducing the USL revenue-to-cost ratio when this rate class was already within the range, and this change necessitates further movement in other rate classes.

   The USL revenue-to-cost ratio was moved down to move the rate class towards unity

c) Please provide the revenue-to-cost ratios and allocated revenue that would result from:
   1) Adjusting the revenue-to-cost ratios for those rate classes outside the range to the nearest boundary of the range.

| | Current Revenue to Cost Ratio | Proposed Revenue to Cost Ratio | Proposed Base Revenue |
|---|---|---|---|
| Residential | 98.0% | 98.0% | 26,452,610 |
| GS < 50 kW | 121.1% | 120.0% | 6,195,147 |
| GS >50 | 95.5% | 95.5% | 11,896,106 |
| Large Use | 99.9% | 99.9% | 297,509 |
| Street Lighting | 128.0% | 120.0% | 335,043 |
| Unmetered and Scattered | 113.7% | 113.7% | 157,305 |
| Embedded Distributor | 61.4% | 80.0% | 147,258 |
| | | | **45,480,978** |

2) Adjusting other revenue-to-cost ratios in other rate classes only as necessary to recover the overall shortfall that would result from implementing part 1.

By keeping all the revenue to cost ratios at the current revenue to cost ratio, KWHI only adjusted the revenue to cost ratio in the Residential class to recover the overall shortfall.

| | Current Revenue to Cost Ratio | Proposed Revenue to Cost Ratio | Proposed Base Revenue |
|---|---|---|---|
| Residential | 98.0% | 98.1% | 26,498,902 |
| GS < 50 kW | 121.1% | 120.0% | 6,195,147 |
| GS >50 | 95.5% | 95.5% | 11,896,106 |
| Large Use | 99.9% | 99.9% | 297,509 |
| Street Lighting | 128.0% | 120.0% | 335,043 |
| Unmetered and Scattered | 113.7% | 113.7% | 157,305 |
| Embedded Distributor | 61.4% | 80.0% | 147,258 |
| | | | **45,527,270** |

# Exhibit 8 – Rate Design

## 8-Staff-56 Non-payment of Account Service Charges

**Ref: Appendix 8-4 – KWHI Proposed Tariff Schedule**
**Ref: EB-2017-0183 Rate Order, March 14, 2019**
In the EB-2017-0183 Rate Order, the OEB eliminated the Collection of Account charge and the Late Payment – Per Annum. In addition, references to "disconnect/reconnect" should be read as "reconnect". These changes have not been reflected in Kitchener-Wilmot's proposed Tariff of Rates and Charges.

a) Please remove the Collection of Account charge and the Late Payment – Per Annum from the Tariff of Rates and Charges.

Removed.

b) Please update Other Operating Revenue to reflect this removal.

Other Operating Revenue does not include Collection of Account Charge. See Table 3.4.1-2.

c) Please update the "disconnect/reconnect" charges to read as "reconnect" in the Tariff of Rates and Charges.

Updated.

## 8-Staff-57 Retail Transmission Service Rates (RTSRs)

**Ref: RTSR Workform – 4. RRR Data**
**Ref: RTSR Workform – 5. UTR and Sub-Transmission**
**Ref: RTSR Workform – 6. Historical Wholesale**
In the RTSR Workform, Kitchener-Wilmot Hydro showed the Large User non-loss adjusted metered kW to be 64,612kW. In the Reporting and Record Keeping Requirements (RRR) filing for 2018, it shows the metered kW for Large Users to be 69,070kW.

a) Please reconcile the numbers or provide an explanation.

The uniform transmission rates (UTRs) for 2017 appear to be 2016 UTRs.

b) Please work with OEB staff to update the model with correct rates or use the 2020 RTSR model when it becomes available.

KWHI used the 2020 RTSR model which was released in July.

c) Please fill out the data for the 2017 year. If the intention was to use 2018 data because it will be 2020 UTRs, please update the RTSRs when the 2020 model becomes available.
The intention was to use the information that would be applied to the 2020 model when it became available. This new model has been filed in Excel named EB-2019-0049_KWHI_IR_2020 RTSR Model_20190731.

## 8-Staff-58 Specific Service Charge

**Ref: Exhibit 8 – Table 8.5-2 Meter Removal Without Authorization**

Kitchener-Wilmot Hydro is proposing to increase the specific service charge – meter removal without authorization from the current rate of $60 to $355.

a) In table 8.5-2, Kitchener-Wilmot Hydro showed a breakdown of the hours and resources used. Please explain the work done for each labour item in the table.

| Description | Effort Undertaken | Rate | Hours | Cost |
|---|---|---|---|---|
| Direct Labour (inside staff) Straight Time | * Coordination of communications across departments, Metering, Billing, Customer Services, Engineering.<br>* Documentation of all evidence.<br>* Processing of field paper work for meter removal, meter re-installation.<br>* Estimation of data.<br>* Communication with consumer.<br>* Communication with Electrical Safety Authority for inspection certificate. | $35.00 | 3 | $105.00 |
| Direct Labour (field staff) Straight Time | * Removal of meter (if still there).<br>* Installation of blank and lock ring.<br>* Installation of new meter after ESA Connection Authorization. | $35.00 | 1 | $35.00 |
| Other Labour (Specify) | * Interview with Police, filing of police report.<br>* Meet police on site.<br>* Potential evidence gathering assistance. | $35.00 | 1 | $35.00 |

## 8-Staff-59 Cost Allocation

**Ref: Exhibit 8, pages 6; Cost Allocation Model, O2 Fixed Charge|Floor|Ceiling**
Kitchener-Wilmot Hydro is proposing to increase the fixed charge for three rate classes which are already above the ceiling value related to the Minimum System with PLCC Adjustment. These are the GS < 50 kW rate class from $27.76 to $29.77, the GS > 50 kW rate class from $183.23 to $201.56, and the Large Use rate class from $17,188.81 to $18.636.69. In addition, the proposed fixed charge for the Unmetered Scattered Load rate class of $7.77 would put it above the ceiling of $7.75.

a) Please calculate the variable charges that would result from the scenario where the fixed charges for these rate classes were held to the greater of their existing fixed charge, or ceiling value related to the Minimum System with PLCC Adjustment.

| | Proposed Fixed Rate | Proposed Variable Rate |
|---|---|---|
| Residential | 24.40 | - |
| GS < 50 kW | 27.76 | 0.0151 |
| GS >50 | 183.23 | 5.3111 |
| Large Use | 17,188.81 | 1.9034 |
| Embedded Distributor | - | 3.3974 |
| Street Lighting | 0.76 | 5.0693 |
| Unmetered Scattered Load | 7.75 | 0.0151 |

## 8-Staff-60

**Ref: Exhibit 8, page 8; Revenue Requirement Work Form (RRWF), sheet 13. Rate Design**

The proposed distribution rates on page 8 do not reconcile to the rate calculated in the RRWF.

| | Fixed Charge | | Variable Charge | |
|---|---|---|---|---|
| | RRWF | Exhibit 8 | RRWF | Exhibit 8 |
| GS < 50 | **29.76** | **29.77** | 0.0143 | 0.0143 |
| GS > 50 | **190.08** | **201.56** | **4.9527** | **5.2084** |
| Large User | **16,148.43** | **18,636.69** | **1.4814** | **1.6556** |
| Street Lighting | 0.76 | 0.76 | **5.0585** | **5.0693** |
| Unmetered Scattered Load | **7.76** | **7.77** | 0.0151 | 0.0151 |

In addition, the column labelled Transformer Ownership Allowance in the RRWF is populated with $0.60 for both the GS > 50 and Large User rate classes. This column should be populated with the total allowance applicable to each rate class (i.e. rate * volume).

a) Please make the necessary revisions so that the RRWF and proposed rates are reconciled.

These changes are reflected in the RRWF filed in Excel as EB-2019-0049_KWHI_IR_2020_Rev_Reqt_Work_Form_20190731.

## 8-Staff-61 Rate Design

**Ref: Load Forecast Model, sheet Load; Exhibit 8, page 10; Cost Allocation Model**
Kitchener-Wilmot Hydro has forecasted that 1,071,514 kW of GS > 50 kW demand will be subject to transformer ownership allowance in 2020 and has calculated this to be a $642,908 credit to the applicable customers.

a) In the Load Forecasting Model, sheet Load, column H, rows 3-12, please clarify if the total historic actual transformer ownership allowance for all GS > 50 kW customers is included, or if specific groups of customers are excluded from these values.

Only customers that own their own transformer are given the allowance. Not all GS>50 kW customers own their transformer.

b) Please explain the purpose of the values in column J, rows 3-12 and 13-14 on the same worksheet.

Column J is used to calculate the percentage of kW in the class that are given the transformer credit. The percentages were averaged to determine the kW to be used for transformer ownership credit in 2019 and 2020.

c) Please explain the cause of the increase in the values in column J, rows 11-12 relative to rows 3-10.

The formula is incorrect in that column. See Excel file EB-2019-0049_KWHI_IR_8-Staff-61c_20190731 for an updated version.

d) Please explain why the denominator in the formulas in column J, rows 3-12 includes only the GS > 50 kW, excluding WMP and Class A, while the nominator in column H, rows 13-14 includes all three components of the GS > 50 kW class demand.

See above answer.

## 8-Staff-62 Loss Adjustment

**Ref: Exhibit 8, pages 17; Chapter 2 Appendix 2-R**
Kitchener-Wilmot Hydro has not populated values for row A(1) in the Loss Adjustment Factors calculation. The values in row B reflecting the "Portion of 'Wholesale' kWh delivered to distributor for its Large Use Customer(s)" are 1.0053 times the values in row E reflecting the "Portion of 'Retail' kWh delivered by distributor to its Large Use Customer(s)". The proposed Supply Facilities Loss Factor is 1.0053.

a) Please ensure that row A(1) is completed in the loss factor calculation.

Completed.

b) Please clarify whether the only losses applicable to the Large Use customer are the upstream supply facility losses, or if the losses reflect the losses in Kitchener-Wilmot Hydro's system.

The losses reflect the losses in KWHI's system.

c) Please ensure that the value in row E corresponds to the energy delivered to the Large Use customer at its meter point, and that the value entered in row B includes any losses in Kitchener-Wilmot Hydro's system, but not any upstream losses.

Confirmed.

# Exhibit 9 – Deferral and Variance Accounts

## 9-Staff-63 Interest Rate Applied

**Ref: Exhibit 9 – Table 9.2.6-1 Interest Rates Applied to Deferral and Variance Accounts**
**Ref: Exhibit 9 – Table 9.2.6-2 Interest Rates Applied to Account 1522**
Kitchener-Wilmot Hydro provided interest rates used for each quarter in 2019 and assumed the 1st quarter interest rates for the whole year. The OEB has since provided the 2nd quarter interest rates.

a) Please update all affected models and calculations with the new 2nd quarter interest rates from the 2nd quarter until year end.

Completed in the Excel file EB-2019-0049_KHWI_IR_2019_DVA_Continuity_Schedule_20190731.

## 9-Staff-64 Account 1580 Sub-account CBR Class B

**Ref: Exhibit 9 – 9.4.1 Overview**
**Ref: Filing Guidelines Chapter 3 - 3.2.5.4 Capacity Based Recovery**
Kitchener-Wilmot Hydro stated that it is not seeking the disposition of Account 1580 sub-account CBR Class B as the amount is too insignificant as to produce a rate rider in one or more rate classes. The chapter 2 filing guidelines states the following:

> *"in the event that the allocated CBR Class B amount results in a volumetric rate rider that rounds to zero at the fourth decimal place in one or more rate classes, the entire balance in Account 1580, Sub-account CBR Class B will be added to the Account 1580 WMS control account to be disposed through the general purpose Group 1 DVA rate riders"*

a) Please explain why Kitchener-Wilmot Hydro has chosen not to dispose the amount in Account 1580 sub-account CBR Class B.

KWHI tried to add the balance of Account 1580, sub account CBR Class B to the account 1580 WMS control account, however, the DVA continuity model did not allow for this functionality. In addition, on "tab 7. Rate Rider Calculations" of the DVA Continuity Schedule the wording states:

| |
|---|
| If the allocated Account 1580 sub-account CBR Class B amount does not produce a rate rider in one or more rate class (except for the Standby rate class), a distributor is to transfer the entire OEB-approved CBR Class B amount into account 1595 for disposition at a later date (see Accounting Guidance, Capacity Based Recovery July 25, 2016) |

KWHI will follow the guidance that is given.

## 9-Staff-65 Global Adjustment

**Ref: Ex. 9.7.1 Global Adjustment Settlement Process**

On February 21, 2019 the OEB issued a letter (the letter), as well as detailed Accounting Guidance, to all rate-regulated licensed electricity distributors, which stated the following:

> *"Today, the OEB is providing an initial set of standardized requirements for regulatory accounting and RPP settlements. For some distributors, the result of implementing this guidance may be that changes will be required to their current processes even though the current processes result in accurate balances."*

The letter further stated:

*"If any distributor is of the view that there may be systemic issues with their RPP settlement and related accounting processes that may give rise to material errors or discrepancies, or if the OEB has identified issues with balances, those distributors are expected to correct those balances before filing for disposition in an annual rate application. Distributors not adjusting balances prior to January 1, 2019 should confirm in their rate application that they have considered the accounting guidance and are of the view that no adjustments are required."*

a) Please confirm whether or not Kitchener-Wilmot Hydro has incorporated the updated regulatory accounting and RPP settlement guidance into its processes, as of the current date. If so, when did KWHI make these changes? If not, when does Kitchener-Wilmot Hydro expect to make these changes?

KWHI has incorporated the updated regulatory accounting and RPP settlement guidance into its processes. KWHI made the changes in June.

b) If the changes above have already been made, please describe the nature and magnitude of any significant changes required in order for Kitchener-Wilmot Hydro to comply with the standardization requirements laid out in the guidance.

KWHI needed to change the timing of a report. Previously, true up information was received three months after settlement. This has been changed to the next month.

c) Did Kitchener-Wilmot Hydro revise any 2018 transactions (or prior years not disposed of on a final basis) within Accounts 1588 or 15899 as a result of implementing the new accounting guidance? If so please itemize a detailed list of the adjustment(s), the reason for the adjustment(s), the dollar impacts, and which cells they are included in within the DVA continuity schedule. If not, please provide confirmation, as indicated in

the letter, that Kitchener-Wilmot Hydro has considered the accounting guidance and is of the view that no adjustments are required.

KWHI will not be revising any 2018 transactions as a result of implementing the new guidance.

KWHI confirms that it has considered the Accounting Guidance and is of the view that no adjustments to balances are required, with the exception of a small true up balance that arose after the application was filed (see 9-Staff-67 and 9-Staff-68).

## 9-Staff-66 Global Adjustment

**Ref: Exhibit – 9 9.7.1 Global Adjustment Settlement Process (pp. 35 of 38)**
Kitchener-Wilmot Hydro states the following with respect to its RPP settlement process:

> *"When providing consumption estimates for the RPP versus market price claim via the IESO portal, KWHI forecasts the RPP volume based on meter readings. The volume is based on actual consumption in a month. True ups are performed starting three months after the initial forecast and continue for six months after the first true up. The true up uses the actual GA charge"*

a) Please differentiate (if any difference exists) between what information is used for RPP volume upon initial estimate versus RPP volume in true-up processes.

There is no difference between what information is used RPP volume for initial estimate versus RPP true up volumes, except for timing. Meter readings are used for both.

b) If estimated volume is based on meter readings, does this mean the Kitchener-Wilmot Hydro does not have a quantity variance in its true-up processes, and rather only a price variance? Please explain.

There is a quantity and price variance in KWHI's true up processes. The price used on the fourth business day is not yet final when settlement occurs.

c) If there is no quantity variance, please provide rationale for the need to wait between three and six months after a settlement month to true-up with the IESO based on actual quantities and prices?

There is a quantity variance based on the fact that actual meter readings are not available. The three to six month settlement period is based on previous methodologies that took into account bi-monthly billing but catch-up occurs quickly due to monthly billing.

d) Please confirm that all price and quantity true-ups for each month of 2018 is included in either the 2018 transactions or 2018 principal adjustments in the DVA continuity schedule.

Confirmed.

## 9-Staff-67 Global Adjustment

**Ref: GA Analysis Workform**
**Ref: DVA Continuity Schedule Tab 2a**

OEB Staff is seeking a full reconciliation between the amounts requested for disposition and the amounts reported in RRR by calendar year. Currently, there is a variance in column BV for Account 1588 in the amount $2,055,092. OEB Staff also notes that Kitchener-Wilmot Hydro has included an amount of $955,570 in Column BF with respect to Account 1588.

a) Please provide a more detailed breakdown of all the adjustments that comprise the $955,570 and, for each component, indicate the following:

1) A detailed description of the adjustment (eg. reversing entry from prior year adjustments, settlement true-ups recorded in 2019 that relate to 2018, unbilled revenue differences recorded in 2019 that relate to 2018, etc.)

| | | |
|---|---|---|
| 2017 Continuity Adj Reversal | 698,162 | |
| 2017 Continuity Adj Reversal | 2,312,500 | |
| COP Accrual vs Invoice | 0 | |
| 1st True Up - Actual GA | 0 | |
| 2nd True Up - RPP vs Non RPP | -2,250,083 | |
| 3rd True Up - RPP vs Non RPP | 195,074 | |
| 2018 Continuity Adjustment | | 955,653 |

The amount of the adjustment has changed from the original DVA Continuity filed with the original Application as the balance was estimated. The original Application's value was $955,570.

2) The fiscal year this adjustment pertains to

2018.

3) The fiscal year that this adjustment was actually journalized to the general ledger

2019.

4) If any of the components relate to settlement true-ups, please provide additional details with respect to which months are being trued-up and what is being trued up (GA price, HOEP, or RPP/Non-RPP quantities).

Settlement process has GA HOEP etc. all combined

October 2018, November 2018 and December 2018 were trued up in 2019. KWHI has changed its true-up schedule in 2019 as per the Accounting Guidance issued February 21, 2019. KWHI keeps its financial records open at year-end until the IESO invoice is issued for December so that GA rates are known.

## 9-Staff-68 Global Adjustment

**Ref: GA Analysis Workform**
**Ref: DVA Continuity Schedule Tab 2a**

OEB Staff is seeking a full reconciliation between the amounts requested for disposition and the amounts reported in RRR by calendar year. Currently, there is a variance in column BV for Account 1589 in the amount ($2,250,159). OEB Staff also notes that Kitchener-Wilmot Hydro has included an amount of $1,551,997 in Column BF with respect to Account 1589.

a) Please provide a more detailed breakdown of all the adjustments that comprise the $1,551,997 and, for each component, indicate the following:

1) A detailed description of the adjustment (eg. reversing entry from prior year adjustments, settlement true-ups recorded in 2019 that relate to 2018, unbilled revenue differences recorded in 2019 that relate to 2018, etc.)

| | | |
|---|---|---|
| 2017 Continuity Adj Reversal | (698,162) | |
| 2017 Continuity Adj Reversal | | |
| COP Accrual vs Invoice | 0 | |
| 1st True Up - Actual GA | 0 | |
| 2nd True Up - RPP vs Non RPP | 2,250,083 | |
| 3rd True Up - RPP vs Non RPP | (2) | |
| 2018 Continuity Adjustment | | 1,551,919 |

The amount of the adjustment has changed from the original DVA Continuity filed with the original Application as the value was estimated. The original application value was $1,551,997.

2) The fiscal year this adjustment pertains to

2018

3) The fiscal year that this adjustment was actually journalized to the general ledger

2019

4) If any of the components relate to settlement true-ups, please provide additional details with respect to which months are being trued-up and what is being trued up (GA price, HOEP, RPP/Non-RPP consumption, etc).

Settlement process has GA HOEP etc. all combined
October 2018, November 2018 and December 2018 were trued up in 2019.
KWHI has changed its true-up schedule in 2019 as per the accounting

guidance issued February 21, 2019. KWHI keeps its books open at year end until the IESO invoice is issued for December so that GA rates are known.

## 9-Staff-69 Deferral and Variance account

**Ref: DVA Continuity Schedule Tab 2b – Account 1508 Sub-account Pole Rental Revenue**
**Ref: Chapter 2 Appendices Appendix 2-H Other Operating Revenue**
Kitchener-Wilmot Hydro has proposed to dispose of the excess pole rental revenue earned up to December 31, 2018, which was recognized as a result of the charge increasing from $22.35 to $28.09 in September 30, 2018.

a) Please confirm that Kitchener-Wilmot Hydro has included the most recent charge of $43.63, effective January 1, 2019, for the purposes of forecasting other operating revenue. If this is not the case, please explain why not.

As per a Board letter issued July 20, 2018, excess incremental revenue is to be recorded in account 1508 – Sub Account – Pole Attachment Revenue Variance. Once the new pole attachment charge is incorporated in a cost-based rate application, the variance account will no longer be required.

KWHI has included the new pole attachment revenue charge for its rates starting January 1, 2020.

b) Please confirm that Kitchener-Wilmot Hydro has commencing charging the Pole Rental rate of $43.63 as of January 1, 2019, and has been recording the difference between $43.63 and $22.35 in this sub-account during 2019. If this is not the case, please explain why not.

Confirmed.

c) Does Kitchener-Wilmot Hydro believe that it can reasonably forecast the December 31, 2019 balance in the Pole Rental Revenue account? If so, what would Kitchener-Wilmot Hydro's position be with respect to refunding these amounts in the current application and discontinuing this sub-account effective January 1, 2020, rather than waiting until the subsequent cost-based application?

KWHI could predict the balance in the account at the end of 2019.

KWHI does not want to dispose of the account at this time as there will be other variance accounts to be disposed in the next rate application that have carried over (i.e. 1508 Cost Assessment Variance).

d) Please provide Kitchener-Wilmot Hydro's best estimate of what the Pole Rental Revenue sub-account balance will be as of the end of December 31, 2019, given year to date amounts and projections for the remainder of 2019.

$520,910.

e) If Kitchener-Wilmot Hydro can reasonably forecast the December 31, 2019 balance in the Pole Rental Revenue account, please make this adjustment in the DVA continuity schedule and recalculate the amount requested for disposition and the associated rate riders.

KWHI does not wish to dispose of the account at this time (see part c above)

## 9-Staff-70 Deferral and Variance account

**Ref: DVA Continuity Schedule Tab 2b – Accounts 1518 and 1548 Retail Service Charges**
**Ref: Chapter 2 Appendices Appendix 2-H Other Operating Revenue**
**Ref: Decision and Order In the matter of energy retailer service charges effective May 1, 2019 (EB-2015-0304)**[1]
Kitchener-Wilmot Hydro is proposing to dispose of the balances in Accounts 1518 and 1548 as of December 31, 2018, for the excess of costs over revenues with respect to services rendered for retail services.

a) Please confirm that Kitchener-Wilmot Hydro has included the revenues (in Appendix 2-H) and costs (in OM&A) for retail services in its proposed distribution rates using the updated charges outlined in the EB-2015-0304 Decision and Order. If this is not the case, please explain why not.

Confirmed.

Please confirm that Kitchener-Wilmot Hydro has implemented the new service charges outlined in the Decision and Order above with respect to retail services as of May 1, 2019, and has continued to accumulate the retail service cost and revenue variances in Accounts 1518 and 1548. If this is not the case, please explain why not.

Confirmed.

b) Please provide Kitchener-Wilmot Hydro's best estimate of what the Account 1518 and 1548 balances will be as of the end of December 31, 2019, given year to date amounts and projections for the remainder of 2019.

| | December-31-19 | | |
|---|---|---|---|
| | Principal | Interest | Total |
| 1518 | 34,532 | 1,578 | 36,109 |
| 1548 | 34,473 | 2,287 | 36,760 |

c) Does Kitchener-Wilmot Hydro believe that it can reasonably forecast the December 31, 2019 balances in these accounts? If so, what would Kitchener-Wilmot Hydro's position be with respect to collecting these amounts in the current application, as well as discontinuing these accounts effective January 1, 2020, as opposed to waiting until the subsequent cost-based application?

[1] Decision and Order (EB-2015-0304)

KWHI believes that it can reasonably forecast the amounts.

Due to the immaterial amounts involved and the issue of carrying forward these balances until the 2025 Cost of Service year, KWHI would agree to the disposing of these amounts in this Application and discontinue the accounts effective January 1, 2020.

If Kitchener-Wilmot Hydro can reasonably forecast the December 31, 2019 balance in Accounts 1518 and 1546, please make this adjustment in the DVA continuity schedule and recalculate the amount requested for disposition and the associated rate riders.

The DVA Schedule is adjusted. See *EB-2019-0049_KWHI_IR_2020 DVA Continuity Schedule_20190731.*

d) The use of Account 1518 and Account 1548 is predicated on the fact that retail service costs and revenues are excluded from distribution rates (and thus are recorded in variance accounts instead). Please confirm that Kitchener-Wilmot Hydro excluded these items from the calculation of their distribution rates in their prior rate application. If this is not the case, please explain, in detail, the types of costs and revenues included in distribution rates versus the ones that have been recorded in these variance accounts.

Confirmed – KWHI excluded retail service costs from distribution rates in its 2014 rate application.

## 9-Staff-71 Lost Revenue Adjustment Mechanism Variance Account (LRAMVA)

**Ref: EB-2013-0147, 2014 Settlement Agreement (Table #3e), p. 22 of 46**
**Ref: Table 2-a (Tab 2) of LRAMVA workform**
**Ref: Tables 5-a and 5-b (Tab 5) of LRAMVA workform**
In this LRAMVA application, Kitchener-Wilmot Hydro is seeking to claim lost revenues from 2015 and 2016 program activity, including the persistence of 2011 and 2012 programs into 2015 and 2016.

In the approved settlement proposal for 2014 rates, the LRAMVA threshold of 18,623,388 kWh was comprised of only the persistence of 2013 and 2014 forecast savings in 2014.

a) Please confirm whether the 2014 load forecast from the last rebasing application was reduced by actual 2011 and 2012 CDM savings. If yes, please discuss the appropriateness of including the persistence of 2011 and 2012 actual savings in 2015 and 2016 of this LRAMVA claim.

   The 2014 load forecast was reduced by the actual 2011 results and the estimated results for 2012.

b) Please discuss whether Kitchener-Wilmot Hydro agrees to remove the persistence of 2011 and 2012 programs in 2015 and 2016 in Table 5-a and Table 5-b.

   KWHI removed the 2011 and 2012 persistence from the LRAMVA workform.

## 9-Staff-72 LRAMVA

**Ref: Table 5-a (Tab 5) of LRAMVA workform (program #4)**
In 2015, Kitchener-Wilmot Hydro allocated 2% of savings from the HVAC Initiative to the GS<50 kW class. OEB staff noticed that previous year's HVAC savings were attributable to only residential customers from 2011 to 2014 and in 2016.

a) Please explain how the 2% allocation of savings from the 2015 HVAC program to the GS<50 kW class was derived, and why there is a change in allocation from historical years noted above.

Results for 2011-2014 did not include a list of the actual installations. Therefore, an assumption was made that all the installations related to Residential customers. In the 2015 report, actual installations are listed and an allocation can be made between the classes.

## 9-Staff-73 LRAMVA

**Ref: Table 5-a (Tab 5) of LRAMVA workform (program #8)**
**Ref: 2017 Final Verified Results Report (available through IESO website)**
It appears the savings adjustment for the 2015 Direct Install Lighting and Water Heating Initiative was not included in Table 5-a of the LRAMVA workform.

a) Please discuss the rationale for not including the savings adjustment for the 2015 Direct Install Lighting and Water Heating Initiative. If this was excluded in error, please include the adjustments for this program in Table 5-a.

This was excluded in error. The LRAMVA Workform has been adjusted for the change. The changes made to the LRAMVA workform are listed on Table A2

## 9-Staff-74 LRAMVA

**Ref: Exhibit 9 of Application**

Section 2.4.6.2 of the Chapter 2 Filing Requirements indicates that distributors should file an excel copy of the savings documentation issued by the IESO to support the figures included in the LRAMVA workform.

a) Please file an excel copy of the following:
- 2014 Final CDM Annual Report
- 2011-2014 Persistence Savings Report
- 2017 Final Verified Annual CDM Program Results

Filed.

b) If Kitchener-Wilmot Hydro has made any changes to the LRAMVA work form as a result of its responses to the above LRAMVA interrogatories, please file an updated LRAMVA work form, a revised LRAMVA balance requested for disposition, and a table summarizing the revised rate riders.

Changes were made to both the Load Forecast and as a result of 9-Staff-71. Revised rate riders are:

| | Residential | GS< | GS> |
|---|---|---|---|
| New LRAM balance | 313,514 | 121,448 | 401,716 |
| forecasted kW or kWh | 660,525,997 | 229,178,008 | 2,042,617 |
| | 0.0005 | 0.0005 | 0.1967 |
| | per kWh | per kWh | per kW |

c) Please confirm any changes to the LRAMVA workform in response to these LRAMVA interrogatories in “Table A-2. Updates to LRAMVA Disposition (Tab 2)”.

Table has been updated.

# Appendix 1 - Business Case - 2018 – Simplivity

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INTERNAL DOCUMENT

# MEMORANDUM

TO: Greig Cameron

FROM: Mark Herbert

DATE: August 28, 2017

SUBJECT: Business Case - 2018 - SimpliVity

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## Table of Contents

## Solution Overview

The Hewlett Packard Enterprise (HPE) SimpliVity solution combines both compute and storage resources in a 2U form factor (Node). The solution utilizes deduplication technology unique to HPE that provides extreme deduplication ratios (usually in the range of 50:1). High availability for both storage and compute provide protection from node failures to multiple disk failures. In addition, the solution simplifies administration and provides backup and replication capabilities.

## Management Benefits

The SimpliVity solution integrates with VMware Virtual Centre, providing a single pane of glass for administering both VMware and SimpliVity.

Information Technology spends a great deal of time planning upgrades of the ESX operating system that runs our virtual infrastructure. SimpliVity patches/upgrades ESX on our behalf keeping ESX up to date and secure from known vulnerabilities in a timely manner.

## Disaster Recovery

Disaster recovery is always a pain point when trying to replicate data offsite that adheres to our defined recovery point objective (RPO). Deploying SimpliVity at the DR has great benefits. Not only is data replicated offsite that will exceed our current RPO objectives, it alleviates the requirement for encryption at rest and in transit as everything is deduplicated and only changed blocks replicated offsite preventing anybody from rehydrating the data. Bandwidth is reclaimed due to a reduction in replication time. Greater RPO's for critical systems can be achieved as a result, with the ability to create multiple restore points throughout the day, opposed to just once a day.

## Backup Retention

Our current storage for backups has the capacity to store seven daily differential backups and one monthly backup per job. SimpliVity has the capacity to store multiple month ends, providing greater protection for the organization regarding data loss and cybersecurity attacks (i.e. malware). Multiple offsite copies ensure that at least one of the copies is free from corruption. We will continue to utilize our existing backup and replication solution (Veeam) as this is not a direct replacement but a compliment. Veeam has unique features that assist with restoration activities such as but not limited to Active Directory and Databases.

## Licensing

VMware licensing is expensive and calculated based on the number of physical processors residing in each host. Our production infrastructure has twelve physical processors and the DR has four, for a grand total of sixteen physical processors. Each SimpliVity node comes with two processors, and if we go with the recommended three node implementation, we would be able to reduce our VMware licensing by ten processors!

# Synopsis

The Information Technology strategy outlines the lifecycle for all devices; Servers and SAN's should be replaced every three to five years as per the strategy. The reason we replace infrastructure is to provide new features, technologies and security improvements that are unattainable with older equipment.

Our current production servers are in year four of their lifecycle and our SANs are in year six of their lifecycle. Our server infrastructure utilizes our SAN infrastructure for all storage requirements. Our SAN infrastructure has less than 1TB of storage remaining and either needs to be replaced or capacity increased. Adding capacity to the SAN would be very costly and not provide any additional benefits.

The HPE SimpliVity solution addresses all these issues. SimpliVity combines both compute and storage in a per-node form factor, which would allow KWHI to replace three aging servers and four aged SANs with two DL380 Gen10 Large Nodes and an additional node for the DR creating a holistic approach to disaster recovery. The solution presented by HPE provides both compute and storage for future growth, including the new CIS. SimpliVity can be expanded by simply adding additional nodes and can be upgraded in the same manner all with no downtime or impact on production.

It is by recommendation of the Manager, Technology Infrastructure that we proceed with the implementation of 3x HPE SimpliVity Gen10 DL380 Large Nodes for Production (2) and DR (1).

X

Mark Herbert
Manager, Technology Infrastructure

X

Greig Cameron
VP Engineering & IT

# Appendix 2 - Signed Proposal for Annual Security Audits

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Digital Boundary Group

Proposal

# Information Technology Security Assessment

**Prepared For:**

**Kitchener-Wilmot Hydro Inc.**
301 Victoria Street South
Kitchener, ON
N2G 4L2

**Prepared by:**

Sean Gillen

**Date:**

May 30, 2018

Proposal Number: C18-01683-01-1

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# Digital Boundary Group Company Overview

Digital Boundary Group (DBG) is an information technology security assurance services firm serving clients worldwide.

DBG provides information technology security auditing and compliance assessment services. In addition, we offer information security consulting, network security assessments, penetration testing (PCI), application security testing (web and mobile), vulnerability scanning, wireless security assessments, SCADA security assessment, physical security assessment and network intrusion investigation. Our training offerings include hands-on network security and hardening windows networks courses.

DBG's operational security testing provides organizations with a comprehensive assessment of their security posture, both externally and internally. Reporting consists of an Executive Summary and Detailed Technical Reports, including prioritized recommendations based on vulnerabilities and issues discovered.

We are vendor neutral regarding hardware and software solutions but maintain ongoing relations with Tier-One and other vendors in order to stay current with relevant technology developments. We do not sell hardware or software and do not sell network design, installation, management or remediation services.

Other sectors include: Financial / Insurance Services firms; Federal, Provincial/State and Municipal governments; Law Enforcement; Utilities (including electricity generation and distribution and water/wastewater treatment facilities); Oil & Gas / Energy sectors; Healthcare; Retail; Gaming / Entertainment; Transportation / Logistics firms and Professional Services Firms.

We are Associate Corporate Members of The Canadian Association of Chiefs of Police (CACP) and Associate Corporate Members of The International Association of Chiefs of Police (IACP).

We maintain Certified Information Systems Security Professional designations for our senior technical staff and are authorized by the global security standards organization, (isc)², as a Continuing Professional Education Provider for information security professionals.

Digital Boundary Group operates from our offices in London, ON and Dallas, TX.

# External Penetration Test

An External Penetration Test provides independent verification of the security status of an organization's Internet presence. If external vulnerabilities are found within a network, results are verified by performing controlled attacks. This type of test is valuable in determining an organization's overall security posture.

To ensure a safe and thorough Penetration Test our team follows a structured methodology that includes the following steps: Discovery, Enumeration, Research, Exploitation and Reporting.

## Discovery

Discovery is one the most important components and is often overlooked. Discovery involves gathering details about your organization, its systems and employees through publicly available sources. The information gathered is used to assist the testing team during the exploitation phase as well as shed light on your current external presence.

## Enumeration

Once the discovery phase has yielded information such as domain names, host names and network boundaries, i.e., firewalls, routers and intrusion detection systems, the testing team will attempt to extract as much information as possible about each component. This information is gathered through the use of various tools and procedures including:

- Port scanning
- SNMP
- Null Session
- NetBIOS browsing
- Vulnerability scanners

## Research

From the data gathered in the discovery and enumeration phases, the testing team will then use the following databases (as an example) to determine how reported vulnerabilities can be exposed and exploited:

## Security Focus

- CVE
- CERT
- SANS
- MITRE

Our skilled Security Specialists manually validate significant vulnerabilities to ensure thorough and accurate results.

## Exploitation

With the customer's permission, the testing team will attempt to exploit the vulnerabilities that have been identified in the enumeration phase.

Various techniques will be used depending on the vulnerabilities discovered:

- Brute Force / Dictionary Attacks
- Bad Input / Buffer Overflows
- Software Vulnerabilities
- Social Engineering

Digital Boundary Group utilizes a number of commercial and in-house developed exploitation frameworks to accurately emulate a real world attack.

# Network Security Assessment

An internal network / infrastructure security assessment of the IT environment will include a review of the following components:

## Physical Security

Physical security in this audit will focus primarily on IT assets.

- Server rooms, wiring closets, and communication rooms
- Access to network from areas such as boardrooms and public spaces
- Access control mechanisms such as card entry, and biometrics
- Surveillance, alarms, and monitoring
- Sign-in and sign-out procedures
- Visitor and subcontractor procedures

## Network Management and Monitoring

Review of management and monitoring tools that are required to maintain a secure network.

- Event log management of servers and workstations
- Logs from key devices such as routers, switches, and firewalls
- Network traffic monitoring for bandwidth, top talkers, top protocols, etc.
- SNMP, RMON, etc.
- Remote control of desktops, laptops, and servers
- Network inventory
- Patch management

## Firewall

The firewall section involves review of the firewall implementation including rules, monitoring and ongoing assessment of vulnerabilities.

- Review overall design and implementation
- Review firewall rules, routes, and objects
- Review change management procedures
- Review logging and reporting processes
- Review program for firewall evasion tests
- Review program for port scans between interfaces

### Antivirus, Malicious Code and Spyware

Antivirus systems are reviewed in this section including desktop PCs, servers, email, web and ftp systems.

- Review desktop and server antivirus solution
- Review mail server and Internet gateway antivirus solution including SMTP, FTP, HTTP, and HTTPS
- Reporting and alerting capabilities
- Review incident response plan and/or processes

### Host Security – Servers

Servers represent the core computing infrastructure in most organizations and contain sensitive information such as user credentials, customer details, financial and human resource records. The audit will review the following:

- Hardening techniques of various Server Operating Systems (Solaris, Windows, Linux, AIX, HPUX, Apple OSX)
- Directory security and configuration (Active Directory, eDirectory, LDAP, etc.)
- Current patch levels and patching process
- Adherence to vendor and industry best practices

### Host Security – Workstations

Workstations represent the largest percentage of devices found in most organizations' networks and are the most common target of malicious code. Workstations are used by a wide range of employees who are often targets of phishing, adware and spyware attacks. The assessment team will review the following elements of workstation security.

- Program in place to identify malicious code or other unwanted programs
- Monitoring patch levels and patching process
- Hardening techniques of workstation Operating Systems (Windows, Apple OSX)
- Adherence to vendor and industry best practices

### Internet Traffic Analysis

Review of existing program to monitor all egress and ingress traffic. The team will review the following:

- Detecting malicious traffic from Trojans and worms
- Identifying covert communication channels such as tunneled traffic over common ports. An example might be peer-to-peer file sharing through UDP port 53, normally used by DNS
- Accessing the amount of bandwidth consumed by non-business traffic such as Internet radio, peer-to-peer file sharing, etc.
- Detecting business traffic that may be using clear text passwords or transmitting sensitive traffic in clear text
- Locating devices on the network that may be improperly configured such as DNS and DHCP servers

### Content Inspection

Content controls and inspection mechanisms are reviewed in this section. Content inspection and gateway antivirus scanning often overlap. Antivirus gateway inspection is covered in the antivirus section of this report. URL blocking, ActiveX blocking, malicious code inspection and end-user auditing are covered in this section.

- Determine whether the content inspection system can be bypassed through use of proxy servers or covert channels
- Access the ability to block access to harmful content

### Network Intrusion Detection / Prevention System

Detecting and blocking malicious activity at key points on a network is a critical component of a secure network. The testing team will review the following:

- Placement of network sensors and overall design
- Detection ability through active log analysis
- Ability to detect and/or block sample attacks generated by the testing team
- Incident response procedures

### Authentication

The methods of establishing a user's identity on the network are reviewed including:

- Password strength
- Enforcement of password complexity
- Account lockout
- Password history
- Password age
- Authentication protocols

### File System Security

File systems store various types of information which range in sensitivity from public knowledge to top secret. The security and integrity of these documents while at rest on a network are the responsibility of the file system. This section examines the following file system components:

- File and disk level encryption
- Integrity
- Share level access controls
- Local file system access controls
- Scan to locate open shares

### LAN Infrastructure

Typical components of a local area network include switches, routers, bridges and internal firewalls. These components are responsible for the reliable and secure delivery of data as it travels over the local network. The review will focus on the following LAN related areas:

- Layer 2 security and access control
- Secure management of switches, routers, etc.
- Review protocols and transports
- DNS and DHCP Security
- Secure use of SNMP, RMON and other network management protocols
- Access controls
- Virtual LANs (VLANs)

### WAN Infrastructure

Similar to the local area network infrastructure, wide area network components include devices such as switches, routers, firewalls, and VPN concentrators. These components are responsible for the reliable and secure delivery of data as it travels between remote branch offices, remote workers and partner networks. The review focuses on the following WAN related areas:

- Secure management of switches, routers, etc.
- Review of protocols and transports
- Security of 3rd party connections such as partner networks
- Encryption
- Access controls
- Virtual LANs (VLANs)

## Wireless Security Review

A review of the wireless network infrastructure is conducted during the assessment. The review will include the following:

- Infrastructure security
- Authentication and encryption mechanisms
- Access controls
- Isolation of wireless networks from corporate networks
- Wireless intrusion detection

## Remote Access

The remote access section of the analysis deals with the various components that provide remote connectivity to the network from mobile workers, home offices and smaller remote branches not equipped with permanent wide area connections:

- Dial-up modem access
- Telnet, SSH, VNC, Terminal Services, etc.
- Web based email
- Virtual Private Networks
- Third party vendor access
- Audit controls and logging
- Authentication
- Access controls

## Vulnerability Assessment

The ability for an organization to perform ongoing vulnerability assessments is essential to maintaining a secure network. The following criteria will be reviewed:

- Current vulnerability assessment practices and procedures
- Vulnerability assessment tools
- Incident response and reporting
- Escalation procedures
- Regular reporting

## IT Policies and Procedures

Policies and Procedures are used to guide an organization and define day-to-day operations. The organization's policies and procedures will be reviewed and compared against industry and vendor best practices. The review will also include the organization's ability to monitor and enforce the rules defined in each policy and procedure.

The following are an example of the type of policies to be reviewed:

- Acceptable Use
- Confidential Data
- Email
- Mobile Device
- Password
- Authentication
- Data Classification
- Guest Access
- Network Access
- Physical Security
- Backup
- Encryption
- Incident Response
- Network Security
- Remote Access

## Documentation

Failure to properly document and diagram a network can lead to design errors and improperly configured devices such as firewalls, routers, switches, etc. Thoroughness and organization of the network documentation will be reviewed during the assessment. The greater security concern associated with sensitive documentation is the proper encryption of the data while at rest (storage) and while in transit (over the network). The assessment team will review the following:

- Thoroughness of network documentation including network diagrams
- Storage location of documentation
- Encryption of documentation at the disk and network levels

## Future IT Plans

Discussion of IT plans for the next 12-18 months as they relate to security.

# SCADA Network Security Assessment

SCADA systems have traditionally been viewed as being isolated and therefore 'safe' and less exposed to remote cyber-attacks. Risk assessment and management methodologies, correspondingly, have largely been directed at legacy SCADA systems in which underlying protocols were designed without modern security requirements in mind.

Business drivers for SCADA integration with enterprise management systems, load management and smart grid environments has meant that SCADA systems have become interconnected with corporate business networks, customer premises, or directly with the internet. This, together with the rapid advancement of technology, shifting threat landscape and the changing business environment, is increasing the exposure of SCADA systems to network vulnerabilities and internet security threats.

Securing ICS networks is similar to securing commercial networks as ICS networks have evolved to use many of the same technologies. The ICS assessment includes the 16 network security assessment domains and the following ICS specific components. The ICS assessment is based on NIST SP 800-53.

## Physical Security

Physical security in this assessment focuses primarily on IT and SCADA assets including main SCADA location and two local substations.

- Server room(s), wiring closet(s) and communications room(s)
- Access to network from areas such as boardrooms and public spaces
- Access control mechanisms such as card entry, biometrics, etc.
- Visitor and subcontractor procedures
- Review system access and change management (Exit/Entry procedures for staff, passwords)
- Central Storage and Control
- Decentralized Storage and Control
- Shared Communication Links (Alarm Systems. Video)

## Network Management and Monitoring

This section focuses on management and monitoring tools that are required to maintain a secure network.

- Event logs from servers and workstations
- Syslog's from key devices such as routers, switches, firewalls
- Network bandwidth, top talkers, top protocols, etc.
- SNMP, RMON, etc.

## Firewall

The firewall section involves review of the firewall implementation including rules, monitoring and ongoing assessment of vulnerabilities.

- Firewall design and effectiveness
- Review firewall rules
- Logging and reporting

## Antivirus, Malicious Code and Spyware

Antivirus systems are reviewed in this section including desktop PCs, servers, email, web and ftp systems.

- Review current antivirus solution
- Review spyware and adware solution
- Test effectiveness by attempting to pass a test virus through the system
- Reporting capabilities
- Regularity of scans, workstations, servers, email traffic, HTTP, FTP
- Review incident response plan and/or processes

## Host Security – Servers (Review and vulnerability scan of all servers)

Servers represent the core computing infrastructure in most organizations and contain sensitive information such as user credentials, customer details, financial and human resource records. A significant amount of time is allocated to reviewing server security.

- Vulnerability scan of all servers is performed using multiple scanning tools such as GFI LANGuard and Nessus
- Hardening techniques of various Server Operating Systems (Solaris, Windows, Linux, AIX, HPUX, NetWare, AS/400)
- Directory security and configuration (Active Directory, eDirectory, LDAP, etc.)
- Adherence to vendor and industry best practices

## Host Security – Workstations

Workstations represent the largest percentage of devices found in most organizations' networks and are the most common target of malicious code. Workstations are used by a wide range of employees who are often targets of phishing, adware and spyware attacks. The assessment team thoroughly tests the following elements of workstation security.

- Vulnerability scans are performed against all workstations or in the case of large organizations a cross section of workstation images
- Current patch levels and patching process
- Malicious code detection and control
- Hardening techniques used to minimize exposure to attack (services, privileges, etc.)
- Adherence to vendor and industry best practices

## Internet Traffic Analysis

A network traffic analyzer is placed at key points on the network, usually just before the firewall, to monitor all egress and ingress traffic. The analyzer is capable of:

- Detecting malicious traffic from Trojans and worms
- Identifying covert communication channels such as tunneled traffic over common ports. An example might be peer-to-peer file sharing through UDP port 53, normally used by DNS
- Accessing the amount of bandwidth consumed by non-business traffic such as Internet radio, peer-to-peer file sharing, etc.
- Detecting business traffic that may be using clear text passwords or transmitting sensitive traffic in clear text
- Locating devices on the network that may be improperly configured such as DNS and DHCP servers

## Content Inspection

Content controls and inspection mechanisms are reviewed in this section. Content inspection and gateway antivirus scanning often overlap. Antivirus gateway inspection is covered in the antivirus section of this report. URL blocking, ActiveX blocking, malicious code inspection and end-user auditing are covered in this section.

## Network Intrusion Detection / Prevention System

Detecting and blocking malicious activity at key points on a network is a critical component of a secure network. The testing team will assess the following:

- Placement of network sensors and overall design
- Ability to detect and/or block sample attacks generated by the testing team
- Incident response procedures

## Authentication

The methods of establishing a user's identity on the network are assessed including:

- Password strength
- Enforcement of password complexity
- Account lockout
- Password history
- Password age
- Authentication protocols

## File System Security

File systems store various types of information which range in sensitivity from public knowledge to top secret. The security and integrity of these documents while at rest on a network are the responsibility of the file system. This section examines the following file system components:

- File and disk level encryption
- Integrity
- Share level access controls
- Local file system access controls
- Open shares

## LAN Infrastructure

Typical components of a local area network include switches, routers, bridges and internal firewalls. These components are responsible for the reliable and secure delivery of data as it travels over the local network. The assessment will focus on the following LAN related areas:

- Layer 2 security
- Secure management of switches, routers, etc.
- Review protocols and transports
- DNS and DHCP Security
- Secure use of SNMP, RMON and other network management protocols
- Access controls
- Virtual LANs (VLANs)

## WAN Infrastructure

Similar to the local area network infrastructure, wide area network components include devices such as switches, routers, bridges, firewalls, PLC's and VPN concentrators. These components are responsible for the reliable and secure delivery of data as it travels between remote branch offices, remote workers and partner networks. The assessment focuses on the following WAN related areas:

- Secure management of switches, routers, etc.
- PLC's and other SCADA devices
- Review of protocols and transports
- Security of 3rd party connections such as partner networks
- Encryption
- Access controls
- Virtual LANs (VLANs)

## Wireless Security Review

A review of the wireless network infrastructure is conducted during the assessment. The review will include basic penetration attempts (see the note below for further details):

- Infrastructure security
- Authentication and encryption mechanisms
- Access controls

**Note:** A wireless penetration test may be performed to determine if the wireless network can be breached. An attempt will be made depending on a number of variables, including encryption and authentication / authorization mechanisms.

## Remote Access

The remote access section of the assessment deals with the various components that provide remote connectivity to the network from mobile workers, home offices and smaller remote branches not equipped with permanent wide area connections:

- Dial-up modem access
- Telnet, SSH, VNC, PCAnywhere, Terminal Services, etc.
- Web based email
- Virtual Private Networks
- Third party vendor access
- Audit controls and logging
- Authentication
- Access controls

## Vulnerability Assessment

The ability for an organization to perform ongoing vulnerability assessments is essential to maintaining a secure network. The following criteria will be reviewed:

- Current vulnerability assessment practices and procedures
- Vulnerability assessment tools
- Incident response and reporting
- Escalation procedures
- Regular reporting

## IT Policies and Procedures and Key SCADA Security Elements

The majority of organizations have a basic set of IT policies and procedures covering end-user acceptable use, password strength, Internet access and email. While these policies are important and help define an organization's security program, the assessment does not focus heavily on policy and procedure review. It has been our experience that these basic policies have matured in most organizations in part due to industry and government regulations. The assessment does focus on the ability of the IT department to monitor and manage the compliance of these policies. Templates for acceptable encryption, password strength, information sensitivity and a dozen additional policies are provided with the final report.

## Documentation

Failure to properly document and diagram a network can lead to design errors and improperly configured devices such as firewalls, routers, switches, etc. Thoroughness and organization of the network documentation will be reviewed during the assessment. The greater security concern associated with sensitive documentation is the proper encryption of the data while at rest (storage) and while in transit (over the network). The assessment team will review the following:

- Thoroughness of network documentation including network diagrams
- Storage location of documentation
- Encryption of documentation at the disk and network levels
- Security Policy
- Security Plan
- Implementation Guides
- Security Enforcement
- Audit Controls
- Security Training
- Configuration / Change Management

## Future IT Plans

Discussion of IT plans for the next 12-18 months as they relate to security.

## Analysis of the Assessment

From the data collected during the assessment phase, each piece is assembled, categorized and analyzed. The analysis consists of determining:

- What is being done well?
- What could be improved?

## Observation and Recommendations

From the data gathered in the analysis of the assessment, specific observations and recommendations will be documented. In some cases these remarks will be based on industry best practices.

# Analysis and Reporting

An executive summary including an overall grade, risk levels and high priority recommendations based on the work performed and results obtained.

From the data collected during the assessment process we will prepare reports outlining: strengths, weaknesses, observations, implications and recommendations pertaining to each phase.

Detailed information will be provided on security risk, vulnerabilities and the necessary countermeasures and corrective actions required.

Information will be provided in regard to automated tools and software that can be used to facilitate and expedite the implementation of the recommendations, fixes, patches, etc.

Overall test results including:

- General description of the specific test and feature
- Description of findings/security concerns/potential threats
- Risk level (i.e., Low, Moderate, High)
- Recommendation(s) including known fixes, patches, etc.

Final report(s) will consist of the following three sections:

**Executive Summary Report** – high level overview of findings, recommendations and comments on the overall effectiveness of the network.

**Detailed Technical Report** – intended for IT Management, highlighting specific technical findings, observations and recommendations.

**Raw Scan Results & Discovery Findings** – included for reference purposes containing specific findings, detailed logs, testing team notes and hyperlinks to test results referenced.

Reports are encrypted and posted to a secure site with access notification sent via email.

Access to technical resources involved in the engagement for a period of up to six months following final report(s) delivery, with questions as they relate to the material contained in the documentation.

# Fee Structure

Total fee for **Information Technology Security Assessment** $29,900.00+ applicable taxes

This proposal will remain open for acceptance for 60 days.

An invoice will be processed and emailed after testing has been completed, prior to report delivery.

**Expenses:** Reasonable and customary travel and living expenses are not included in the fee schedule. Travel expenses including (but not limited to) airfare, lodging, rental car, gasoline and parking will be invoiced at actual cost. Meal costs will be billed on a per diem basis of $60.00 per day + applicable tax per individual for each day of onsite work that is performed, and/or a full travel day is incurred.

**Pricing Table**

| Assessment Service | Scope/Price |
|---|---|
| External Penetration Test | External Vulnerability Scan of up to 44 IPs. External Penetration Test of up to 10 IP Addresses plus Social Engineering - $9,500.00 |
| Network Security Assessment | 76 Servers, 175 Workstations, 2 days onsite – $14,900.00 |
| SCADA Network Security Assessment | 3 Virtual servers, 13 workstations, 1 day onsite - $5,500.00 |

# Terms and Conditions

This proposal is subject to 2021945 Ontario Inc., c.o.b. as Digital Boundary Group standard terms and conditions.

# Acceptance

| | **Kitchener-Wilmot Hydro Inc.** | **2021945 Ontario Inc. c.o.b. as Digital Boundary Group** |
|---|---|---|
| By: | | |
| Name: | MARK HERBERT | John Millar |
| Title: | MANAGER TECHNOLOGY INFRASTRUCTURE | President |
| Date: | JUNE 15, 2018 | May 30, 2018 |

# Appendix 3 – CIS Project Milestones and Deliverables

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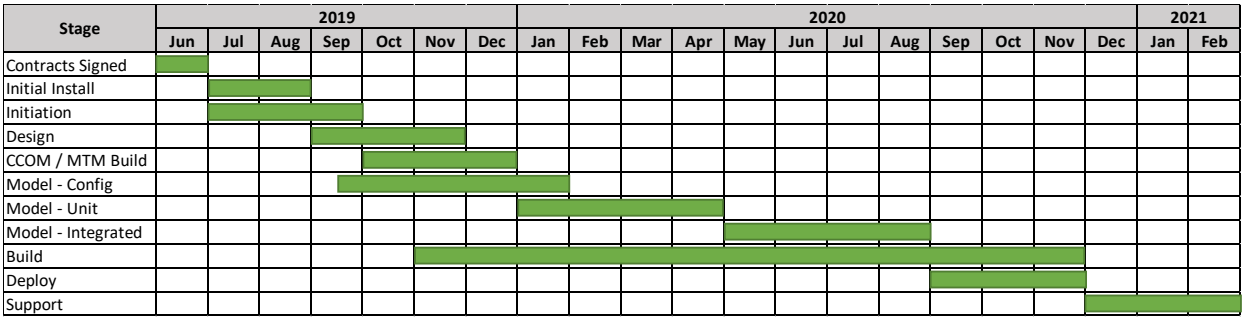
## High level schedule




**Project Milestones**

| Milestone | Description |
|---|---|
| Non-production environments installed and working | KWHI will surface test or observe a surface test to confirm environments have been installed. |
| Project Charter completed | Executive sponsor will review project charter and confirm completion. |
| Design complete | Design documents for the functional areas are completed and signed off by the respective business owners. Additional designs for development and conversions are not part of this milestone. |
| Substantial Initial configuration completed | AITO will configure the software based on the design documents. Once testing begins the system will be considered to be substantially configured even though additional configurations and configuration changes will occur during the modeling phase |
| Test Scripts 25% complete | Percentage of scripts that have been attempted regardless of whether they pass or fail. |
| Test Scripts 50% complete | Percentage of scripts that have been attempted regardless of whether they pass or fail. |
| Test Scripts 75% complete | Percentage of scripts that have been attempted regardless of whether they pass or fail. |
| Test Scripts 100% complete | Percentage of scripts that have been attempted regardless of whether they pass or fail. |
| Integrated Testing 50% complete | Percentage of scripts passed in integrated testing. |
| Integrated Testing 95% complete | Percentage of scripts passed in integrated testing. There is an expectation that there may be some tests the will require additional development, testing, and or re-work. |
| Production Configured | Production environment is configured and ready for conversion. |
| Go Decision | Steering Committee decision to go live |
| Live Processing | Software is being utilized in a live environment (final sign off) |
| Second month of live processing completed | Second month has been completed in a live environment |

- **The major project deliverables grouped by project stage are as follows:**

| MAJOR PROJECT DELIVERABLES | AITO | KWHI | DELIVERABLES | COMMENTS |
|---|---|---|---|---|
| | | | | |
| **PLANNING** | | | | |
| Project Kickoff | R | C | - | Launch meeting. All KWHI team members to attend |
| Project Charter | C | R, A | Yes | Formally authorises project, identifying partners, resources. AITO will provide the initial working draft. Jointly developed and co-managed by KWHI and AITO PMs. |
| Assumption Log | R | A, C | Yes | Tracks all assumptions and constraints throughout the duration of the project. Jointly developed and co-managed by KWHI and AITO PMs. |
| Financial Plan | R | A, C | Yes | Describes how costs will be planned, controlled, includes budget. Jointly developed and co-managed by KWHI and AITO PMs. |
| Communication Plan | R | A, C | Yes | Describes how, when and by whom project information will be administered and shared. Jointly developed and co-managed by KWHI and AITO PMs. |
| Project Change Management Plan | R | A, C | Yes | Establishes the change control board, describes change control process. Jointly developed and co-managed by KWHI and AITO PMs. |
| Project Standards & Templates | R | A, C | | Will use KWHI standards and templates where available otherwise AITO will provide samples for review. |
| Requirements Traceability Matrix | R | A, C | Yes | Links project requirements to the relevant deliverables. Starting point will be the requirements from the RFP. Jointly developed and co-managed by KWHI and AITO PMs. |
| Scope Definition | A, C | R | Yes | Jointly developed and co-managed by KWHI and AITO PMs. |
| Milestone List | R | A, C | Yes | List of significant project events with planned dates. Jointly developed and co-managed by KWHI and AITO PMs. |
| Detailed Schedule | R | A, C | Yes | Schedule of activities, with dependencies, required resources. Jointly developed and co-managed by KWHI and AITO PMs. |
| Project Calendar | R | A, C | Yes | Outlines project team working days and availability for scheduled activities. Jointly developed and co-managed by KWHI and AITO PMs. |
| Project Org Chart | R | R | Yes | Visual diagram of project team structure, team members and their roles. Jointly developed and co-managed by KWHI and AITO PMs. |
| Roles and Responsibilities | A, C | R | Yes | Jointly developed and co-managed by KWHI and AITO PMs. |
| Project Contact List | A, C | R | Yes | Project team member contact lists will be provided by KWHI and AITO |

| MAJOR PROJECT DELIVERABLES | AITO | KWHI | DELIVERABLES | COMMENTS |
|---|---|---|---|---|
| Risk Register | C | R | Yes | Tracks identified risks and related decisions / actions. Jointly developed and co-managed by KWHI and AITO PMs. |
| Stakeholder Register | C | R | Yes | Identifies and classifies project stakeholders. Jointly developed and co-managed by KWHI and AITO PMs. Potentially managed by KWHI Change Manager. |
| Project Charter Signoff | I | R, A | Yes | Executive sponsor approval |
| Issue Log | C | R, A | Yes | Records and monitors issues. Jointly developed and co-managed by KWHI and AITO PMs. |
| | | | | |
| **DESIGN** | | | | |
| Current State Review Sessions | R | C | - | AITO to facilitate sessions of walk through current processes |
| Current State Documentation | C | R | Yes | KWHI to provide relevant high-level existing documentation. AITO will develop current state process workflows where they do not already exist and are required. |
| Report Inventory | I | R | Yes | KWHI to provide list and samples of reports currently in use |
| Design Workshops | R | C | Yes | Includes review of existing RFP requirements. AITO will facilitate design workshops with KWHI team leads and SMEs. KWHI project champion to attend all design workshops when possible . |
| Gap Analysis | R | C | Yes | Analysis of those areas where software does not align with existing business processes in order to determine next steps. |
| Business Rules | R | A, C | Yes | Jointly developed based on KWHI feedback during the design workshops |
| Stakeholder Analysis | C | R | Yes | Quantitative and qualitative information regarding stakeholders' interests. Jointly developed by KWHI and AITO. Potentially managed by KWHI Change Manager. |
| System Overview | R | I | Yes | Overview of the software being implemented. May be spread out over multiple sessions |
| Proposed Processes | R | A, C | Yes | Jointly developed based on current processes and best practices offered by the system. KWHI will determine which process(es) to utilise. AITO will document proposed processes. |
| Reporting Requirements | C | R | Yes | KWHI will provide functional details re reporting requirements. |
| Conceptual Design Documents | R | A, C | Yes | Document per business area, functional group. Combines all the above design details, identifies key stakeholders, approvals. AITO will lead the project team through initial draft of the design document. Project team will update and maintain the design document. KWHI owns final compilation of the document. |

| MAJOR PROJECT DELIVERABLES | AITO | KWHI | DELIVERABLES | COMMENTS |
|---|---|---|---|---|
| Design Documents signoff (Design Acceptance) | I | R, A | Yes | KWHI team leads will present the design documents for review and approval from the business owners for the various areas. |
| Interface Plan | R | A | Yes | AITO will lead drafting detailed plan for each required interface. KWHI owns final planning decisions |
| Conversion Plan | R | A, C | Yes | AITO will lead drafting detailed plan for each required data conversion. KWHI owns final data conversion decisions. |
| | | | | |
| **MODEL** | | | | |
| Project Team Training | R | I | Yes | Project team members will receive ongoing training throughout the modeling stage |
| Configure Prototype Environment | R | C | | Proposed design will be configured in prototype environment. |
| Test Planning and Scheduling | R | A, C | Yes | Strategy jointly developed by KWHI and AITO |
| Unit Testing | R | A | | Testing config changes to verify expected results |
| Create Test Scripts | R | A, C | Yes | AITO will provide test scripts templates and compile test scripts based on KWHI feedback. KWHI will define the required areas of testing and provide the details of all scenarios to be tested, including negative testing. |
| Gathering Test Data | C | R | Yes | KWHI will gather the data that will be used for testing |
| Execute Test Scripts | C | R | - | KWHI to work through the test scripts, documenting the steps and the results. AITO will provide guidance and support. |
| Security Matrix | R | A, C | Yes | Details required access to system functionality based on business roles. AITO will lead writing security matrix, KWHI will define details. |
| Menus, Navigation | R | A, C | - | KWHI will define navigation requirements per business roles. AITO will lead drafting system navigation |
| Integrated Testing | C | R, A | - | Combined testing of end-to-end business process including interfaces and any customisations, using defined security. KWHI will complete the testing and update the test scripts, AITO will provide guidance and issue resolution. |
| User Acceptance Test Scripts | C | R, A | Yes | User acceptance test scripts typically a subset of the prototype test scripts, required list of tests to be defined by KWHI. |
| User Acceptance Testing | C | R, A | - | Final user testing. |
| User Acceptance Testing Signoff | I | R, A | Yes | |
| Go-Live Cutover Plan | R | A, C | Yes | Plan will need to be jointly developed to ensure impact to normal operations is kept to a minimum |
| Go-Live Cutover Plan Signoff | I | R, A | Yes | |

| MAJOR PROJECT DELIVERABLES | AITO | KWHI | DELIVERABLES | COMMENTS |
|---|---|---|---|---|
| Training Plan | C | R, A | Yes | End user training |
| | | | | |
| **BUILD** | | | | |
| Approved Build List | R | A, C | Yes | AITO will draft build list to track approved development through the development cycle. Managed by KWHI |
| Development Requirements | R | A, C | Yes | AITO will detail functional requirements and will lead writing technical requirements (specifications). KWHI will review and approve. |
| Development – Forms | R | A, C | Yes | |
| Development – Reports | R | A, C | Yes | |
| Development – Interfaces | R | A, C | Yes | |
| Development – Conversions | R | A, C | Yes | |
| Development – Letters | R | A, C | Yes | |
| Development – Bill Print Extracts and Bill Presentment | R | A, C | Yes | |
| Development – Algorithms | R | A, C | Yes | |
| Development – Scripts | R | A, C | Yes | |
| Development – Query Zones | R | A, C | Yes | |
| Development – Enhancements | R | A, C | Yes | |
| CCOM Development | R, A | I | Yes | |
| Unit Testing (Forms, Reports, Interfaces, Conversions) | R | A | - | Dev unit testing before prototype / user testing |
| CCOM Unit Testing | R, A | I | - | |
| Identify Scenarios for Testing | R | A, C | | KWHI will define the relevant scenarios required for testing all possible outcomes for the various development items. AITO will compile as test scripts. |
| Prototype Testing | C | R, A | | KWHI will complete the testing and update the test scripts, AITO will provide guidance and support issue resolution. |
| Integrated Testing | C | R, A | | KWHI will complete the testing and update the test scripts, AITO will provide guidance and support issue resolution. |
| Development Testing Signoff | I | R, A | | Before development items can be promoted, all testing and approvals must be completed. |

| MAJOR PROJECT DELIVERABLES | AITO | KWHI | DELIVERABLES | COMMENTS |
|---|---|---|---|---|
| | | | | |
| **DEPLOY** | | | | |
| Configure Production Environment | R | A, C | - | KWHI will lead setup based on approved prototype results as best as possible, AITO will support (lead if necessary) and verify setup. |
| Implement Security Setup | R | A, C | - | AITO will implement the initial security setup with KWHI. KWHI will handle subsequent security changes with AITO supporting |
| Implement Navigation Setup | R | A, C | | AITO will implement the initial navigation setup with KWHI. KWHI will handle subsequent navigation changes with AITO supporting |
| Surface Test Production Environment and Signoff | C | R, A | | Verify basic functionality – including transactions, inquiries, reports, customisations |
| Mock Cutovers | R | A, C | | Jointly done - AITO executes, KWHI validates. Includes data conversions, deployments |
| End User Training | | R, A | | |
| Go Live Decision (Final Acceptance) | C, I | R, A | | |
| Final Conversions | R | A, C | | Final production data conversions and validations. AITO will execute data conversions. KWHI will validate and signoff. |
| Cutover Communications | I | R | - | |
| | | | | |
| **SUPPORT** | | | | |
| Post Go-Live Support | R | A | | KWHI first level support, AITO second level support |
| Outstanding Issues List | C | R, A | Yes | AITO will draft based on outstanding items from Issue Log. KWHI will finalise |
| Transition to Operations | C | R, A | | AITO will support |
| Final Project Report | R | A, C | | Jointly developed by KWHI and AITO |
| Project Close | R | A | | |
| | | | | |
| **TECHNOLOGY** | | | | |
| Install Oracle Database 12c | R | I | Yes | |
| Install Oracle WebLogic Server (WLS) 12c | R | I | | |
| Install Oracle Fusion Middleware Infrastructure | R | I | | |

| MAJOR PROJECT DELIVERABLES | AITO | KWHI | DELIVERABLES | COMMENTS |
|---|---|---|---|---|
| Install Oracle GoldenGate | R | I | | |
| Install Oracle Data Integrator (ODI) | R | I | | |
| Install Oracle Application Express (APEX) | R | I | | |
| Install Oracle Utilities Customer Care & Billing (CC&B) 2.7 | R | I | | |
| Install Oracle Business Intelligence Enterprise Edition (OBIEE) | R | I | | |
| Install Oracle Utilities Analytics (OUA) 2.7 | R | I | | |
| Build Required Environments (Dev, Test, Train, Conversion) | R | I | Yes | |
| Build Production Environment | R | I | Yes | |
| Final Network Diagram | R | A, C | Yes | |

**Scope, Services and Deliverables**

This project includes all the activities required to implement Oracle Utilities Customer Care & Billing and Analytics for Kitchener-Wilmot Hydro, as outlined below.

***Modules***

- CC&B
  - Customers
    - Customer Information
    - Appointments
    - Case Management
  - Meters and Equipment
    - Meter Management
    - Meter Reads
    - Asset Inventory
  - Rates and Billing
    - Billing
    - Rates
    - Adjustments
    - Interval Billing
    - Service Orders
    - Financial Transactions
    - Statements
    - Quotes
  - Cashiering
    - Payments

    - Credit and Collections
        - Credit & Collections
        - Deposits
        - Non-Billed Budgets
        - Overdue Financial Obligations
        - Loans
    - Customer Program Management
        - Sales & Marketing
        - Rebate Claims
        - Umbrella Agreement Management
    - Service Orders
    - Base (Foundation)
        - Job Streams
        - Workflow and Notifications
        - Dashboards
        - To Do Processing
        - Reports

- Analytics
    - CC&B Extractors and Schema
    - Customer Analytics
    - Credit and Collections Analytics
    - Revenue Analytics
    - Exception Analytics

- Oracle Consulting Services' Custom Components for Ontario Market
    - Market Transaction Management
    - Meter Data Management Repository
    - Low Power Consumption
    - Meter Seal Testing

***Interfaces***

- Services DB
- MV90
- EBT Hub
- OESP
- IESO
- OEB
- Sensus
- MDM/R
- Savage ODS
- Utilismart Corp
- Telpay
- Bank of Montreal
- Paymentus
- My Account
- eBill
- ePost
- Generation Invoice
- JDEdwards
- ACS Outage Management
- GIS
- City of Kitchener
- Region of Waterloo

***Conversions***

- Including:
  - Customers
  - Accounts
  - Service Agreements
  - Premises
  - Service Points
  - Meters
  - Open AR
  - Deposits
  - Open Service Orders (Field Activities)

***Services***

The complete solution delivery will include services across the following areas:

- Technology Services, includes:
  - Installation of software, creation of environments
  - Day-to-day system management
  - Object management and migration
  - Troubleshooting technical issues
  - Security
- Application Services, includes:
  - Business requirements analysis
  - Lead functional design
  - Software configuration
  - Lead project team training
  - Support project team testing
  - Conversion support
  - Deployment and post Go-live support
- Development Services, includes:
  - Development of forms, letters, interfaces, conversions and other customizations
  - Document development specs
  - Unit test all development
  - OCS will be subcontracted to deliver the required CCOM functionality
- Project Management Services, includes:
  - Supporting development of project charter and project plan
  - Co-managing the project and project scope
  - Activity and resource planning
  - Monitoring progress
  - Identify and manage risk, other issues
  - Escalation point for any issues